ION.ANT.– 77

IONOSPHERIC DATA AT SYOWA STATION

(ANTARCTICA)

January – December 2010

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 2010. The observations were conducted by the National Institute of Information and Communications Technology under the sponsorship of the National Institute of Polar Research of Japan. The location of the station, specifications of the ionosonde, and symbols used in this data book are as follows:

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

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

SPECIFICATIONS OF THE IONOSONDE USED AT SYOWA STATION

Items	Specifications
Frequency Range	1MHz - 15MHz
Transmitting Power	10kW (peak value)
Duration of Sweep	15 s
Transmitted Pulse Width	80 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. Nakamoto

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.

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2010 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 53	X 54	X 50	X 52	X 58	X 70	X 83	X 81	O X 74	X 74	X 74	X 73	X 66	X 62	X 61	X 58	O X 52	O X 48	O X 48	X 48	O X 55	O X 54	O X 54	X 52
2	X 58	53	X 49	X 49	O X 61	X 68	X 70	X 78	O X 77	X 74	O X 74	O X 74	O X 68	O X 68	X 58	O X 54	O X 54	O X 52	O X 47	X 56	X 53	X 56	X 55	X 56
3	X 52	X 49	X 46	X 50	X 56	X 57	X 63	X 63	X 63	X 63	X 68	X 69	O X 71	O X 73	O X 74	O X 67	O X 64	X 61	O X 60	X 49	X 49	A	A	X 47
4	X 46	X 46	X 45	O X 46	O X 44	50	X 50	67	X 67	X 63	O X 66	X 64	X 62	X 69	X 59	R	O X 58	O X 54	X 53	X 54	O X 53	X 52	X 49	X 46
5	X 46	49	48	X 48	X 48	O X 64	X 61	X 65	X 63	X 64	X 59	X 60	A	A	X 60	A	A	X 49	X 46	X 54	X 58	X 56	X 51	47
6	X 50	X 49	X 52	X 50	X 47	X 48	X 47	X 51	O X 54	O X 55	A	A	A	A	A	A	A	O X 53	A	O X 50	X 48	A	X 49	X 47
7	50	X 45	X 48	X 53	X 60	X 61	X 68	O X 75	X 66	X 62	X 62	X 59	R	O X 58	R	R	O X 54	X 50	X 46	X 48	50	X 55	X 48	X 48
8	X 47	47	47	53	X 52	O X 53	X 60	X 63	X 70	X 66	X 62	X 58	X 58	O X 62	R	R	R	O X 51	O X 52	O X 51	X 53	O X 60	X 50	56
9	57	63	56	X 52	X 55	X 62	X 63	68	X 72	74	O X 73	A	O X 66	X 56	O X 59	R	O X 53	O X 52	X 51	X 51	X 50	X 56	X 54	51
10	X 48	X 51	54	56	56	X 60	X 62	X 63	X 64	X 66	X 66	X 64	X 65	O X 68	X 63	X 58	X 60	X 56	O X 54	X 50	X 50	X 54	X 54	50
11	52	44	48	69	56	X 52	63	66	68	X 68	70	77	68	67	O X 69	X 71	X 64	O X 54	O X 48	X 50	X 52	X 49	X 53	X 48
12	58	O X 41	O X 46	A	X 44	B	O X 42	O X 47	O X 52	O X 54	R	O X 54	A	A	R	R	O X 49	O X 49	O X 49	X 47	X 47	X 44	A	X 45
13	X 40	X 41	O X 44	A	R	R	O X 47	A	B	R	O X 53	X 56	O X 56	R	O X 56	O X 55	O X 53	O X 51	O X 51	X 50	O X 47	X 41	X 38	38
14	O X 41	A	A	R	O X 40	O X 45	X 49	R	R	O X 52	O X 54	O X 56	R	R	R	R	R	R	O X 47	O X 49	O X 51	X 46	X 40	X 32
15	35	45	X 45	49	X 49	52	59	57	66	X 68	X 69	X 65	X 59	X 57	O X 48	O X 55	O X 51	O X 51	O X 54	O X 50	O X 54	X 49	46	39
16	43	O X 40	X 40	O X 42	X 49	X 56	X 56	X 60	O X 52	O X 56	X 56	X 60	R	O X 66	X 57	O X 56	O X 50	X 50	X 53	O X 52	X 49	X 48	X 46	X 47
17	X 45	X 47	X 47	X 49	X 50	X 57	X 67	O X 69	X 73	X 73	X 73	X 68	X 62	O X 62	O X 55	A	O X 55	R	O X 48	A	O X 50	X 48	X 51	X 48
18	X 46	X 48	X 50	53	X 46	X 63	X 65	70	O X 67	X 68	X 65	O X 67	O X 68	R	R	R	O X 54	O X 54	O X 54	X 50	X 51	X 44	X 44	X 40
19	40	X 40	X 44	42	51	O X 61	64	68	X 68	X 68	X 68	X 68	X 67	O X 64	O X 57	O X 54	O X 53	O X 52	O X 50	X 50	X 50	X 48	51	56
20	59	59	57	52	X 55	67	72	73	73	76	75	O X 70	X 75	X 66	R	X 61	O X 53	X 57	X 51	O X 50	R	R	A	X 49
21	X 40	A	B	A	B	X 38	R	R	B	R	B	B	B	B	B	B	X 47	O X 47	B	X 46	A	X 48	X 50	X 50
22	X 49	X 46	X 44	X 52	X 62	X 62	X 64	X 67	70	69	X 62	O X 63	O X 64	R	R	R	O X 53	O X 54	O X 50	O X 52	O X 51	O X 51	X 51	47
23	40	X 46	45	50	B	R	B	R	O X 53	R	B	X 66	O X 70	O X 71	B	O X 64	R	B	B	O X 48	X 48	O X 47	X 46	X 49
24	44	52	X 44	X 44	A	R	R	A	A	R	R	R	X 62	R	B	X 59	O X 56	O X 52	B	B	O X 42	X 44	X 39	A
25	R	O X 35	A	58	O X 47	X 53	X 57	X 62	X 63	X 64	X 58	X 59	R	X 59	X 60	R	O X 48	X 49	O X 48	X 48	O X 48	O X 48	X 45	X 45
26	X 45	X 42	R	B	O X 45	58	X 65	X 58	X 61	X 61	X 66	X 58	O X 55	R	R	R	B	O X 52	O X 50	X 46	X 49	X 53	X 54	50
27	35	40	43	52	52	46	53	61	66	68	69	X 69	X 66	X 59	X 59	X 58	O X 56	O X 53	X 52	X 50	X 50	X 49	X 49	64
28	57	R	X 49	O X 49	A	A	O X 52	R	R	O X 53	O X 54	O X 61	R	R	O X 57	O X 54	X 56	O X 52	X 53	X 51	X 50	X 50	34	A
29	34	36	41	O X 40	O X 40	X 45	X 52	X 56	62	O X 66	X 62	R	O X 63	O X 59	R	R	O X 55	O X 55	R	O X 52	X 52	X 51	X 47	X 45
30	X 46	X 42	42	X 40	57	A	A	A	51	X 58	66	67	X 63	O X 66	X 56	O X 55	X 51	O X 50	X 51	X 48	X 48	X 46	34	33
31	34	A	A	B	B	R	O X 47	O X 53	O X 54	X 60	R	X 56	X 56	A	X 58	O X 55	O X 53	O X 51	O X 47	O X 46	O X 46	X 44	X 37	O X 37
	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	27	26	25	25	24	27	24	26	27	25	26	22	19	18	16	25	28	26	29	29	28	28	29
MED	X 46	X 46	X 46	X 50	X 51	X 57	X 61	X 64	X 66	X 66	X 66	X 64	X 64	O X 64	X 58	O X 57	O X 53	O X 52	O X 50	X 50	X 50	X 49	X 49	X 47
U Q	52	49	X 49	52	X 56	X 62	X 65	X 68	X 70	X 68	X 70	X 68	O X 68	O X 68	X 60	X 60	O X 56	O X 54	O X 53	X 51	X 52	X 54	X 51	50
L Q	40	X 41	X 44	X 47	O X 46	X 51	X 52	X 59	O X 61	O X 60	X 60	X 59	X 62	X 59	O X 57	O X 55	O X 52	O X 50	O X 48	X 48	X 48	X 46	X 44	X 45

JAN. 2010 fxI (0.1MHz)

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IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2010 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	47	48	44	46	52	J R 64	J R 77	75	R 68	68	68	67	60	56	J R 55	52	R 46	42	R 42	J R 42	R 49	R 48	R 48	46
2	52	F 44	43	43	55	62	J R 64	72	R 71	68	R 68	R 68	R 62	R 62	52	R 48	48	46	R 41	50	47	48	49	50
3	46	43	40	44	50	51	57	57	57	57	62	63	R 65	67	68	R 61	R 58	J R 55	R 54	43	43	A	A	41
4	40	40	39	R 40	34	F 39	44	F 57	61	57	R 60	58	56	63	53	R	R 52	R 48	47	48	R 47	46	43	40
5	40	F 39	F 39	42	J R 42	58	55	59	57	58	53	J R 54	A	A	54	A	A	43	40	48	J R 52	50	45	41
6	44	43	46	44	41	42	41	45	R 48	R 49	A	A	A	A	A	A	A	R 47	A	R 44	42	A	43	41
7	F 41	39	42	47	54	55	62	R 69	60	56	56	J R 53	R	R 52	R	R	R 48	44	J R 40	42	44	J R 49	42	42
8	41	F 38	F 33	F 42	46	47	54	57	65	60	56	J R 52	52	R 56	R	R	R	R 45	R 46	R 45	47	54	45	F 43
9	F 47	F 52	F 42	46	49	56	57	F 59	66	68	R 67	A	R 60	50	R 53	R	R 47	46	45	45	44	50	48	F 41
10	42	45	F 43	F 46	F 47	54	56	57	58	60	60	58	59	62	57	J R 52	J R 54	50	48	44	44	48	48	F 39
11	F 39	F 32	40	F 31	F 41	46	F 54	F 56	F 57	62	F 62	F 64	F 58	F 57	63	65	58	R 48	R 42	44	46	43	47	42
12	R 34	R 35	R 40	A	38	B	36	41	R 46	R 48	R	R 48	A	A	R	R	R 43	R 43	R 43	J R 41	41	J R 38	A	39
13	34	35	R 38	A	R	A	R 41	A	B	R	R 47	50	50	R	U R 50	R 49	R 47	R 45	R 45	44	R 41	35	32	F 29
14	R 35	A	A	A	R 34	39	43	R	R	R 46	R 48	R 50	R	R	R	R	R	R	R 41	R 43	R 45	40	34	26
15	F 23	F 34	39	F 39	43	F 43	F 50	F 47	F 55	62	63	59	J R 53	51	R 42	R 49	R 45	R 45	R 48	R 44	R 48	43	F 36	F 28
16	F 33	R 34	34	R 36	43	50	J R 50	54	R 46	R 50	50	J R 54	R	R 60	51	R 50	R 44	44	47	R 46	43	42	40	41
17	39	41	41	43	44	51	61	63	67	67	67	62	56	R 56	R 49	A	R 49	R	R 42	A	R 44	42	45	42
18	40	42	44	F 42	41	57	59	F 60	R 61	62	59	R 61	R 62	R	R	R	R 48	R 48	R 48	44	45	38	38	34
19	F 31	34	38	F 33	F 40	55	F 56	F 57	62	62	62	62	61	R 58	R 51	R 48	R 47	R 46	R 44	44	44	42	F 40	F 45
20	F 46	F 47	F 46	F 42	49	F 54	F 60	F 62	F 64	F 64	F 64	64	J R 69	60	R	J R 55	R 47	J R 51	45	R 44	R	R	A	43
21	34	A	B	A	B	32	A	A	B	R	B	B	B	B	B	B	J R 41	R 41	B	J R 40	A	42	44	44
22	43	40	38	46	56	56	58	61	F 60	F 55	56	R 57	58	R	R	R	R 47	R 48	R 44	R 46	45	45	45	F 36
23	F 28	40	F 36	F 39	B	A	B	A	47	R	B	60	64	R 65	B	R 58	R	B	B	R 42	42	41	40	43
24	F 36	F 38	38	38	A	A	A	A	A	R	A	R	56	R	B	J R 53	R 50	R 46	B	B	R 36	38	33	A
25	A	R 29	A	Y	R 41	47	51	56	57	58	J R 52	J R 53	R	J R 53	54	R	R 42	R 43	42	42	R 42	42	39	39
26	39	36	R	B	39	F 46	59	52	55	J R 55	60	J R 52	49	R	R	R	B	R 46	44	40	43	47	48	F 39
27	F 22	F 21	F 34	F 39	F 39	F 30	F 43	F 50	F 56	F 58	F 60	63	60	J R 53	J R 53	J R 52	R 50	47	46	44	44	43	43	F 54
28	F 46	R	43	R 43	A	A	R 46	A	A	R 47	R 48	R 55	R	R	R 51	R 48	50	R 46	J R 47	45	44	44	F 24	A
29	F 20	F 26	F 31	R 34	R 34	39	J R 46	50	56	R 60	56	R	R 57	R 53	R	R	R 49	R 49	R	R	R 46	J R 46	45	41	39
30	40	36	F 32	34	F 40	A	A	A	A	52	F 55	61	58	R 60	50	R 49	J R 45	R 44	45	42	42	40	F 24	F 24
31	F 23	A	A	B	B	R	41	47	48	54	R	50	50	A	J R 52	R 49	R 47	R 45	R 41	R 40	R 40	38	30	R 31
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	27	26	24	25	24	27	24	25	27	25	26	22	19	18	16	25	28	26	29	29	28	28	29
MED	40	39	40	42	42	50	54	57	57	58	60	58	58	R 57	52	R 51	R 47	R 46	R 44	44	44	43	42	41
U Q	43	43	43	44	49	56	59	60	63	62	62	62	R 61	62	54	R 54	R 50	R 48	R 47	45	R 46	48	45	43
L Q	F 34	F 34	F 38	38	40	42	44	51	55	R 54	R 54	R 53	56	R 53	R 51	R 49	R 46	44	R 42	42	42	40	37	38

JAN. 2010 foF2 (0.1MHz)

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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	35	27	25	34	39	31	29	30	30	31	33	34	42	44	34	34	37	36	38	42	36	30	30	36
2	17	22	25	25	29	31	24	35	40	42	32	44	58	39	31	31	36	30	32	37	61	92	57	73
3	81	38	27	24	29	29	31	32	27	33	28	35	33	62	38	43	40	89	33	41	92	58	136	30
4	29	36	70	40	38	41	56	32	30	27	36	42	35	43	35	44	32	38	38	43	35	38	70	78
5	44	66	34	32	30	28	56	43	43	36	43	45	66	64	56	81	85	28	32	46	31	29	34	31
6	42	41	41	40	40	39	34	28	64	61	61	61	60	120	98	82	60	45	68	70	99	90	59	91
7	71	70	72	70	68	57	34	37	34	32	34	35	32	32	30	36	34	31	25	27	22	26	30	34
8	30	23	28	28	35	40	40	40	35	48	26	33	34	40	34	38	30	32	42	59	42	27	24	29
9	14	30	19	29	42	30	34	34	39	39	69	88	68	46	32	32	46	37	68	70	30	32	29	24
10	28	32	30	30	29	29	28	31	34	35	41	41	66	50	43	30	40	39	39	36	31	25	24	16
11	40	33	36	46	46	44	33	28	30	54	E B 56	33	38	30	56	33	59	G 25	E B 28	42	24	32	40	31
12	28	36	36	46	37	B	37	29	30	32	28	32	59	60	47	30	30	39	44	41	29	44	52	27
13	40	35	32	51	36	42	41	50	B	34	36	34	32	30	32	32	29	28	30	31	E B 24	K 21	30	31
14	42	39	47	32	28	29	42	42	39	31	32	31	30	32	31	E B 36	30	25	28	32	26	25	22	26
15	25	33	46	48	21	31	30	30	33	32	30	32	47	42	68	28	28	30	43	35	32	37	31	30
16	35	31	16	16	18	19	K 23	24	26	32	30	30	31	28	22	28	30	30	25	22	K 22	19	16	26
17	44	40	29	25	30	26	26	26	25	32	34	64	44	34	40	60	45	42	37	86	24	41	56	32
18	41	16	24	24	26	29	30	G 17	24	26	34	31	36	32	43	34	28	28	24	28	32	20	K 17	K 17
19	K 17	25	25	23	29	29	32	32	29	31	35	40	41	43	32	30	28	32	37	25	K 21	25	44	16
20	E B 14	15	21	24	35	38	33	33	32	39	36		43	76	43	34	46	26	K 24	38	32	38	48	46
21	87	71	B	40	B	24	43	43	B	G	B	B	B	B	B	B	27	E B 33	B	33	41	47	32	18
22	17	30	17	24	30	27	24	31	32	E B 28	28	30	32	32	28	31	41	43	36	26	38	40	21	16
23	30	36	32	25	B	39	B	45	37	G 28	B	34	33	E B 55	B	E B 44	28	B	B	E B 28	30	78	49	34
24	27	35	37	40	47	41	44	47	42	38	40	33	28	32	B	E B 30	25	E B 28	B	B	25	25	38	41
25	35	35	52	32	36	36	40	G 22	30	36	49	32	33	30	32	27	28	E B 28	E B 25	E B 25	27	20	34	E B 16
26	E B 14	36	31	B	40	26	24	29	25	G	32	27	30	31	30	28	B	28	E B 26	23	24	34	30	46
27	18	E B 14	25	25	27	30	32	32	30	31	37	37	42	33	42	71	32	31	28	45	32	40	71	42
28	21	32	31	31	46	36	42	35	G 28	27	32	32	32	27	35	30	29	27	27	28	31	18	37	40
29	23	26	37	32	40	19	G 19	24	25	26	24	32	35	31	31	27	35	58	30	32	32	26	26	31
30	31	57	30	23	17	40	50	41	G 19	32	30	32	32	32	28	29	29	26	29	31	28	24	30	16
31	25	36	47	B	B	40	40	33	28	22	25	30	34	40	32	38	29	25	34	29	33	43	16	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	31	31	30	29	28	30	30	31	29	31	29	29	30	30	28	30	30	30	28	30	31	31	31	31
MED	30	35	31	31	35	31	34	32	30	32	34	33	35	35	34	32	31	30	32	34	31	32	32	31
U Q	41	38	37	40	40	40	41	40	36	36	38	40	44	46	43	38	40	38	38	42	35	41	49	40
L Q	21	27	25	24	29	29	29	29	28	G	30	32	32	32	31	30	29	28	28	28	25	25	26	24

JAN.2010 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2010 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	13	12	12	13	12	14	14	13	15	14	13	12	13	13	13	12	13	12	11	12	14	12
2	13	12	12	12	12	12	12	12	12	12	14	13	13	13	13	12	12	13	12	13	12	13	13	13
3	13	13	12	12	12	12	11	12	19	16	14	14	14	13	13	13	12	14	14	13	13	14	21	16
4	14	14	14	14	16	13	15	13	13	13	22	31	13	16	14	15	14	14	12	14	20	15	16	16
5	19	14	14	14	17	18	13	14	14	16	13	13	13	13	13	13	13	12	13	13	12	14	13	13
6	12	12	12	12	12	13	12	13	12	13	14	14	14	19	13	13	13	13	13	12	12	11	13	11
7	13	12	12	12	12	13	12	13	14	13	12	13	12	12	12	12	13	13	12	12	12	12	12	12
8	12	12	13	13	12	12	12	12	14	12	12	12	16	13	12	13	13	14	12	12	12	13	13	12
9	12	13	12	13	12	13	14	13	13	12	14	14	13	14	13	13	12	13	14	12	12	12	12	12
10	13	13	13	12	13	12	12	14	13	14	14	13	13	15	14	13	14	13	13	12	13	12	13	12
11	13	12	12	13	12	14	12	13	12	18	56	14	13	14	12	18	20	18	28	24	15	13	12	12
12	13	13	15	14	14	B	14	13	14	14	14	13	14	13	17	15	14	12	14	13	13	12	12	13
13	12	13	15	18	26	13	21	28	B	18	14	14	18	15	15	15	14	18	14	12	24	18	12	12
14	13	18	14	21	16	13	14	13	12	13	14	13	16	20	16	36	14	16	19	16	19	13	14	12
15	12	13	12	12	13	13	12	17	14	12	15	16	13	13	20	14	13	13	13	12	14	12	13	12
16	14	13	12	13	12	13	12	12	12	18	15	16	13	14	14	15	12	13	13	16	12	14	13	13
17	13	11	12	14	13	13	12	13	15	13	15	14	15	18	14	15	16	15	14	14	14	13	13	12
18	14	12	12	12	12	12	12	13	16	14	13	14	18	22	25	20	13	14	12	13	13	14	14	13
19	12	12	13	12	12	12	13	13	13	16	13	14	19	14	14	13	13	16	13	15	11	13	13	12
20	14	13	12	12	13	13	13	13	12	11	13	55	16	15	33	19	16	14	13	12	13	19	13	14
21	14	14	B	18	B	13	20	18	B	23	B	B	B	B	B	B	23	33	B	26	20	14	14	13
22	13	12	13	14	12	14	14	28	23	28	13	14	18	19	25	24	14	19	17	19	22	20	13	11
23	12	16	14	13	B	24	B	16	14	15	B	24	29	55	B	44	25	B	B	28	19	18	14	14
24	13	13	14	22	20	27	24	26	16	16	20	23	18	13	B	30	20	28	B	B	18	13	13	12
25	14	12	26	22	15	14	13	14	14	13	14	14	15	17	14	14	15	28	25	25	24	14	16	16
26	14	12	16	B	14	14	13	15	14	24	15	21	14	22	20	19	B	20	26	14	16	15	14	12
27	12	14	13	14	13	14	12	12	13	13	15	14	14	14	13	15	14	14	13	12	13	12	12	12
28	13	18	13	20	14	15	14	13	14	14	12	14	16	13	16	14	13	14	14	12	11	13	12	14
29	11	12	12	13	15	12	12	12	13	12	13	13	13	12	13	14	12	12	13	13	12	12	13	12
30	12	12	12	12	13	14	14	14	13	13	13	14	14	12	13	13	14	14	13	12	12	14	12	12
31	12	16	14	B	B	20	15	14	12	15	14	14	16	14	20	13	15	16	14	20	23	14	12	11
	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	13	13	13	13	13	13	13	13	14	14	14	14	14	14	14	14	14	14	13	13	13	13	13	12
U Q	14	14	14	18	16	14	14	14	14	16	15	16	16	18	20	19	15	18	17	16	19	14	14	13
L Q	12	12	12	12	12	13	12	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12	12	12

JAN. 2010 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2010 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	210	200	230	A	E A 246	194	194	198	182	204	206	196	216	190	192	192	210	H 182	194	E A 226	196	212	220	216
2	214	204	210	220	222	202	192	182	216	210	206	216	202	194	194	180	194	194	200	204	A	A 242	E A 260	236
3	242	Q 212	206	206	198	198	184	192	202	210	198	208	190	202	200	204	204	212	198	196	226	A	A	234
4	234	Q 260	E A 250	220	194	196	208	204	176	198	A	A	204	A	208	A	192	208	202	266	216	222	E A 252	242
5	E A 260	E A 262	E A 244	242	244	206	A	208	A	210	E A 230	A	A	A	A	A	A	192	194	214	226	208	200	220
6	228	232	248	232	228	220	220	224	A	A	A	A	A	A	A	A	A	202	A	E A 226	196	A	242	E A 232
7	226	244	244	A 254	218	214	210	E A 204	188	178	178	198	194	206	192	192	190	188	178	190	196	210	208	228
8	240	232	232	226	210	216	226	216	186	230	188	202	198	202	210	210	184	188	224	224	208	188	204	Q 228
9	Q 226	Q 230	230	212	208	222	204	190	202	202	A	A	A	A	196	202	A	202	202	214	196	222	210	Q 204
10	214	Q 236	Q 224	208	200	200	182	210	188	188	198	192	A	A	198	198	216	202	204	204	212	218	208	Q 222
11	Q 248	Q 276	242	A	E A 238	222	192	202	178	A	B	188	204	196	A	224	220	190	232	E A 244	214	Q 248	218	A
12	A	216	230	A	220	B	206	226	218	198	202	210	A	A	196	192	202	206	A	196	210	A	A	228
13	234	A	A	A	A	A	226	A	B	A	194	196	212	198	210	190	186	196	232	196	220	220	Q 236	Q 236
14	A	A	A	A	A	254	260	226	E A 266	206	H 182	186	192	194	200	216	194	198	200	E A 240	222	208	218	A
15	Q 248	Q 268	A	E A 272	206	218	208	198	198	198	188	192	264	190	180	186	202	192	196	212	202	194	214	Q 246
16	A	E A 294	230	198	214	214	198	198	182	234	194	194	A	220	H 182	184	184	196	208	208	190	204	222	212
17	E A 242	E A 268	244	226	226	214	204	194	194	194	198	A	194	212	216	A	A	A	208	A	208	228	224	214
18	242	Q 242	240	238	228	214	198	198	204	204	194	198	186	186	A	222	190	190	206	196	204	Q 204	218	Q 218
19	Q 238	Q 232	Q 234	206	244	202	188	188	192	196	224	216	A	210	198	198	198	210	198	H 190	Q 196	196	228	Q 218
20	Q 226	Q 226	Q 222	242	A 242	216	196	196	194	208	210	B	A	A	A	202	212	184	190	196	A	A	A	E A 254
21	208	A	B	A	B	200	A	A	B	A	B	B	B	B	B	B	202	234	B	248	A	E A 288	242	232
22	236	Q 256	E B 276	Q 248	244	Q 218	202	230	182	190	182	194	188	218	A	222	206	194	208	212	E A 242	252	224	Q 232
23	Q 252	200	A	A 268	B	A	B	196	A	A	B	214	Y	E B 298	B	E B 292	A	B	B	226	212	224	E A 248	Q 252
24	Q 252	E A 288	250	A	A	A	A	A	A	214	A	A	196	216	B	206	208	208	B	B	224	226	234	A
25	A	234	A	A	A	A 252	E A 260	210	222	196	A	202	A 222	196	204	198	196	204	200	214	216	218	E A 246	230
26	236	A	A	B	210	E A 258	214	202	194	A	200	198	188	204	204	208	B	194	196	196	Q 222	234	Q 228	216
27	A 240	Q 280	240	Q 218	226	226	204	210	194	188	196	228	214	202	188	202	198	194	204	224	194	206	244	Q 224
28	Q 224	A	260	A	A	A	A	A	A	220	202	208	196	204	204	198	198	192	192	208	204	220	E A 274	A
29	240	248	E A 284	216	214	H 168	196	180	194	194	196	202	202	202	202	194	198	200	200	226	210	Q 198	Q 212	Q 226
30	220	244	258	254	214	A	A	A	A	192	190	204	214	196	190	196	196	194	208	212	220	220	Q 248	Q 242
31	Q 250	A	A	B	B	A	A	204	198	190	194	194	194	A	204	208	202	204	A	180	230	230	238	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	27	25	23	20	23	24	24	26	23	25	23	23	21	22	22	26	25	29	25	29	28	27	28	26
MED	235	237	235	224	217	214	204	201	194	198	196	198	198	202	199	199	198	196	200	208	210	219	222	228
U Q	Q 242	E A 265	250	245	238	221	212	210	202	210	202	208	213	210	204	208	205	204	208	226	221	228	E A 243	Q 236
L Q	226	228	230	214	210	201	195	196	186	193	190	194	193	196	192	192	193	192	196	196	199	206	216	218

JAN. 2010 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB.2010 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 35	O X 40	B	A	R	R	R	R	R	X 57	X 60	O X 62	B	X 58	O X 55	O X 53	X 53	X 51	O X 48	X 39	A	A	X 35
2	R	A	O X 38	A	B	B	B	B	R	R	B	B	R	B	B	R	O X 48	O X 48	O X 49	B	X 42	X 40	O X 36	39
3	O X 38	A	34	A	R	B	R	O X 52	O X 54	O X 54	R	B	B	B	O X 68	B	B	R	X 45	B	X 41	X 41	O X 31	X 34
4	O X 34	A	O X 40	R	R	R	R	R	O X 45	O X 51	O X 53	R	R	R	O X 56	R	R	O X 51	O X 48	O X 48	X 42	X 46	X 46	X 40
5	30	35	38	41	X 41	O X 51	X 56	X 63	X 67	X 67	O X 66	O X 65	O X 65	X 63	X 62	X 57	O X 55	O X 52	O X 51	O X 44	X 44	X 46	X 46	52
6	44	32	32	X 40	X 45	X 48	X 48	X 53	X 63	X 65	X 65	O X 66	O X 67	R	X 59	X 59	O X 58	X 58	X 55	X 50	O X 48	R	R	R
7	A	A	A	A	X 40	X 42	O X 48	O X 52	O X 52	X 52	X 56	X 56	R	X 58	X 55	R	R	O X 50	R	O X 50	X 48	X 46	X 45	O X 40
8	R	A	R	38	B	R	A	A	R	R	O X 51	R	O X 53	R	X 57	R	O X 53	O X 53	O X 51	O X 51	X 48	X 47	X 46	X 43
9	X 42	X 42	X 42	X 43	X 46	A	R	O X 49	X 57	X 60	X 62	X 59	A	R	R	A	R	A	O X 51	X 50	X 46	X 48	X 46	X 46
10	X 39	X 32	38	X 40	A	A	A	A	X 50	O X 52	R	R	X 58	X 60	R	X 62	X 58	O X 55	O X 52	R	O X 49	X 48	X 48	X 46
11	X 34	27	X 36	36	X 44	X 45	O X 48	X 50	X 50	B	B	X 64	O X 65	X 62	X 59	X 56	X 56	O X 52	O X 52	X 51	X 48	X 46	X 44	44
12	42	33	41	40	O X 40	A	R	B	B	B	B	O X 54	R	B	R	X 57	R	O X 55	O X 51	X 48	X 43	B	O X 38	X 32
13	X 27	X 30	32	X 36	O X 46	A	B	R	R	R	O X 55	R	R	X 55	X 61	X 57	O X 55	X 55	O X 53	X 49	X 46	39	A	R
14	A	A	38	40	A	A	O X 41	R	O X 52	X 56	X 60	X 60	X 61	R	X 64	63	X 63	X 63	X 56	X 56	X 50	X 44	36	X 39
15	X 43	X 38	A	A	R	R	R	B	R	B	R	B	B	B	B	B	R	X 57	O X 52	R	B	A	A	A
16	82	A	78	58	A	R	R	R	R	O X 54	R	B	B	B	B	R	B	O X 50	X 49	X 48	X 44	X 40	X 33	A
17	A	A	A	R	O X 46	A	R	R	R	R	R	R	R	X 58	X 58	X 57	X 56	O X 53	X 51	X 50	X 49	X 49	X 45	X 39
18	44	34	A	R	X 41	X 47	R 53	O X 60	O X 62	X 62	X 62	O X 62	O X 62	O X 67	O X 71	X 71	X 68	X 61	X 62	X 62	X 46	X 32	A	R
19	30	28	30	33	O X 39	41	R	48	64	X 64	X 64	X 61	X 60	X 59	X 63	X 63	X 63	X 63	X 60	O X 52	O X 50	X 46	X 44	X 42
20	32	31	32	37	43	44	X 51	X 57	X 60	X 62	X 65	X 67	X 67	X 66	X 66	X 66	X 61	X 57	X 53	53	X 51	X 48	X 45	53
21	52	51	50	51	51	X 47	X 54	X 58	X 63	X 66	X 67	X 68	X 70	X 68	X 71	X 69	X 64	X 62	X 57	X 54	X 56	X 47	X 42	X 38
22	38	X 28	36	33	43	54	O X 48	A	X 60	67	X 63	X 63	X 63	X 68	74	80	X 63	X 57	X 57	X 52	X 52	X 51	39	A
23	O X 38	A	O X 41	A	B	B	A	A	O X 54	X 58	O X 58	R	X 60	X 64	X 62	X 59	X 55	X 56	X 54	X 49	X 48	X 46	40	37
24	33	34	34	42	44	57	58	X 56	B	68	67	66	X 67	X 72	X 72	X 72	X 67	X 60	X 57	X 54	X 50	X 48	50	X 31
25	A	A	A	O X 36	A	R	X 49	X 54	X 68	X 68	X 68	O X 70	O X 73	O X 70	X 70	X 69	X 64	X 61	X 55	X 52	X 49	X 44	X 42	X 42
26	X 29	58	A	A	A	A	X 44	52	X 58	X 58	X 60	X 64	O X 70	X 77	X 81	X 75	X 63	X 59	X 56	X 56	X 56	X 49	X 48	50
27	X 40	X 40	42	42	43	50	56	66	66	X 65	X 65	X 65	X 70	X 70	X 70	X 69	X 66	X 60	X 54	X 50	X 46	X 41	X 39	40
28	36	39	38	42	48	50	X 50	X 57	X 62	X 67	X 70	O X 71	O X 71	X 72	X 68	X 72	X 71	X 63	X 62	X 56	X 47	X 49	36	32
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	21	18	21	18	16	12	14	15	19	20	20	18	18	17	22	20	21	26	27	24	27	24	23	22
MED	38	34	38	40	X 44	48	X 50	X 54	X 60	X 62	X 62	X 64	X 65	X 66	X 64	X 63	X 61	X 56	X 53	X 50	X 48	X 46	X 44	X 40
U Q	42	39	41	42	X 46	50	54	X 58	X 63	X 66	X 66	O X 66	O X 70	X 70	X 70	X 70	X 64	X 60	X 56	X 54	X 50	X 48	X 46	44
L Q	32	31	34	36	X 41	44	X 48	52	O X 52	O X 55	O X 58	X 60	X 61	X 60	X 59	X 57	O X 55	O X 53	X 51	X 49	X 44	X 42	X 38	X 37

FEB.2010 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB.2010 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 29	R 34	B	A	A	R	R	R	R	51	54	R 56	B	52	R 49	R 47	47	J R 45	R 42	33	A	A	29
2	R	A	R 32	A	B	B	B	B	A	R	B	B	R	B	B	R	R 42	R 42	R 43	B	36	34	R 30	F 27
3	R 32	A	Z 28	A	R	B	A	R 46	R 48	R 48	R	B	B	B	R 62	B	B	R	39	B	35	35	25	28
4	R 28	A	R 34	R	A	A	A	A	R 39	U R 45	R 47	R	R	R	R 50	R	R	R 45	42	R 42	36	40	40	34
5	F 20	F 25	F 28	V 31	35	R 45	50	57	61	61	R 60	R 59	R 59	57	J R 56	51	R 49	R 46	R 45	R 38	38	40	40	F 42
6	F 33	F 20	F 20	34	39	42	42	47	57	59	59	R 60	R 61	R	J R 53	53	R 52	52	49	44	R 42	R	R	R
7	A	A	A	A	34	36	R 42	R 46	R 46	46	50	50	R	J R 52	J R 49	R	R	R 44	R	44	42	40	39	34
8	A	A	A	F 29	B	R	A	A	A	R	U R 45	R	R 47	R	J R 51	R	R 47	R 47	R 45	R 45	42	41	40	37
9	36	35	36	37	40	A	R	R 43	51	54	56	53	A	R	R	A	R	A	R 45	44	40	42	40	40
10	33	26	F 24	34	A	A	A	A	44	R 46	R	R	J R 52	J R 54	R	55	J R 52	R 49	R 46	A	R 43	42	42	40
11	F 24	F 18	30	F 24	38	39	R 42	44	J R 44	B	B	58	R 59	56	J R 53	50	J R 50	R 46	R 46	45	42	40	38	F 34
12	F 30	F 24	F 30	F 29	R 34	A	R	B	B	B	B	R 48	R	B	R	J R 51	R	R 49	R 45	42	37	B	R 32	26
13	21	24	F 22	30	R 40	A	B	R	R	R	R 49	R	R	49	55	J R 51	R 49	49	R 47	43	40	32	A	A
14	A	A	F 29	F 30	A	A	R 35	R	R 46	J R 50	J R 54	J R 54	J R 55	R	58	57	57	57	50	50	44	38	30	33
15	37	32	A	A	A	A	R	B	R	B	R	B	B	B	B	B	R	51	R 46	R	B	A	A	A
16	28	A	32	A	A	R	A	A	R	R 48	R	B	B	B	B	R	B	R 44	43	42	38	34	27	A
17	A	A	A	A	40	A	R	R	A	R	R	R	R	J R 52	52	51	50	R 47	45	44	43	43	39	33
18	A	F 24	A	A	35	41	47	U R 54	R 56	56	56	56	56	61	65	65	62	55	56	56	V 40	26	A	A
19	F 20	F 18	F 20	F 25	R 33	F 31	A	F 38	F 54	58	58	55	J R 54	J R 53	57	57	57	57	J R 54	R 46	R 44	40	38	36
20	F 20	F 19	F 21	F 21	F 26	F 34	45	51	J R 54	56	59	61	61	60	60	60	55	51	47	47	45	42	39	Z 41
21	Z 43	Z 41	F 36	F 38	F 39	41	48	J R 52	57	60	61	62	64	62	65	63	58	J R 56	51	48	50	41	36	32
22	Z 28	22	F 18	F 23	F 22	F 30	R 42	A	54	F 57	57	57	57	62	F 66	F 66	57	51	51	46	46	45	F 28	A
23	R 32	A	R 35	A	B	B	A	A	R 48	52	U R 52	R	J R 54	58	56	53	49	50	48	43	42	40	F 30	F 27
24	F 22	F 24	F 22	F 22	F 33	F 46	F 48	50	B	F 56	F 53	F 56	61	66	66	66	61	54	51	48	44	42	F 40	25
25	A	A	A	R 30	A	R	43	48	62	62	62	64	67	R 64	64	63	58	55	49	46	43	38	36	36
26	23	A	A	A	A	A	38	F 42	52	52	54	58	64	J R 71	J R 75	69	57	53	50	50	J R 50	43	42	F 40
27	34	34	F 32	F 32	F 32	F 40	F 44	F 56	F 56	59	59	59	64	64	64	63	60	J R 54	48	44	40	35	33	F 24
28	F 24	F 22	F 23	F 26	F 29	F 38	44	51	56	61	64	R 65	65	66	62	66	65	57	56	50	41	43	F 26	F 19
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	20	17	21	17	16	12	14	15	19	20	20	18	18	17	22	20	21	26	27	24	27	24	23	22
MED	28	F 24	F 29	F 30	34	40	44	48	54	56	56	58	59	60	58	57	55	50	47	44	42	40	38	34
U Q	33	30	R 33	33	39	42	47	52	56	59	59	60	64	64	64	64	58	54	50	48	44	42	40	37
L Q	F 22	F 21	F 22	F 24	F 32	F 35	42	44	R 46	R 49	R 52	54	J R 55	J R 54	R 53	51	R 49	R 47	45	43	38	36	30	F 27

FEB.2010 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB.2010 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 32	K 32	K 32	B	41	42	42	32	32	28	30	28	26	B	24	32	28	27	37	29	25	42	36	K 18
2	K 34	74	39	39	B	B	B	B	42	34	B	B	35	B	B	E B 33	E B 32	G	26	B	21	E B 18	30	30
3	K 35	80	33	42	32	B	42	32	28	28	42	B	B	B	E B 50	B	B	27	27	B	21	20	16	E B 13
4	24	32	32	32	36	34	41	41	37	26	E B 34	E B 30	32	28	33	27	27	27	24	26	20	21	25	E B 14
5	26	32	27	28	28	19	20	22	25	27	24	24	33	31	30	22	25	28	26	22	21	18	17	17
6	E B 13	23	22	22	23	18	22	31	30	28	40	26	34	36	30	33	39	30	22	23	33	28	40	22
7	35	83	46	42	32	20	26	27	27	28	29	32	32	32	32	32	32	37	27	31	25	30	E B 14	E B 12
8	37	90	43	56	B	39	52	49	40	34	33	33	32	34	33	40	33	30	30	29	38	16	16	23
9	14	30	21	27	37	56	38	33	33	33	30	43	62	32	48	142	40	92	65	32	30	30	48	29
10	E B 14	32	32	44	47	50	48	44	31	27	E B 33	35	34	30	36	42	30	29	33	50	22	17	19	33
11	29	24	E B 14	16	18	20	29	30	42	B	B	36	41	43	29	30	35	24	21	24	27	27	28	70
12	41	30	39	33	56	50	32	B	B	B	B	G 26	E B 31	B	E B 32	30	26	26	G 21	25	18	B	E B 23	30
13	25	30	24	40	51	44	B	40	38	42	31	36	34	42	47	44	31	31	25	24	20	40	43	34
14	40	38	34	33	39	40	35	31	29	27	32	29	30	39	42	29	26	26	26	28	27	27	23	34
15	26	24	90	38	33	39	24	B	31	B	32	B	B	B	B	B	E B 28	G	24	E B 23	B	41	43	71
16	38	42	34	38	56	33	G 34	G 33	42	39	G	B	B	B	B	36	B	32	E B 26	20	24	18	14	34
17	52	41	69	33	28	55	32	41	46	42	33	33	35	31	31	28	27	25	20	23	20	26	16	20
18	34	70	36	33	19	30	G	21	22	24	23	30	30	32	32	38	25	24	22	E B 24	19	30	38	30
19	K 22	25	25	26	32	39	40	36	32	24	30	27	33	42	35	27	26	30	20	E B 23	E B 20	18	18	34
20	K 22	27	28	28	16	17	G	30	33	G 20	30	33	36	34	31	31	26	28	26	20	18	16	25	E B 12
21	19	18	17	E B 12	E B 12	22	25	28	26	34	29	28	33	39	42	40	32	31	29	16	16	24	24	E B 12
22	E B 12	21	28	29	29	24	47	47	34	31	30	30	40	35	32	40	25	49	28	21	28	16	31	40
23	40	40	42	39	B	B	42	49	39	38	32	28	30	30	28	26	24	23	21	17	16	E B 13	40	E B 12
24	E B 12	E B 12	36	24	32	25	50	47	B	E B 28	32	30	29	30	27	27	24	G 17	21	22	15	15	E B 12	29
25	40	35	36	47	41	36	G 24	G 19	G	30	27	G	30	30	30	29	24	33	26	31	18	E B 13	E B 12	E B 12
26	E B 14	36	42	44	58	46	43	21	22	28	28	30	33	42	33	37	25	36	30	29	17	14	E B 12	E B 12
27	E B 13	19	E B 12	24	22	20	29	29	24	30	24	39	33	34	30	28	35	32	30	31	22	28	28	26
28	E B 12	23	E B 12	E B 12	E B 12	E B 14	18	22	24	27	28	30	31	27	34	32	24	24	27	19	E B 12	E B 13	E B 12	31
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	27	25	25	26	25	26	25	25	24	25	22	25	26	26	28	28	26	27	27	28	28
MED	26	32	32	33	32	34	G	32	32	28	30	30	33	33	32	32	26	28	26	24	21	20	24	28
U Q	36	40	39	40	41	43	42	41	38	34	32	33	34	39	36	38	32	32	28	29	25	28	34	34
L Q	E B 14	24	24	26	22	20	26	28	26	27	28	28	30	30	30	28	25	24	22	22	18	16	E B 16	E B 14

FEB.2010 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB.2010 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	14	B	14	18	15	15	13	12	12	13	16	B	14	13	14	19	13	22	16	17	14	13
2	12	28	13	16	B	B	B	B	16	29	B	B	29	B	B	33	32	20	14	B	13	19	16	12
3	12	22	13	26	25	B	25	15	14	19	18	B	B	B	50	B	B	16	18	B	15	12	13	13
4	12	12	12	24	13	18	23	22	16	16	34	30	20	20	18	18	20	16	14	13	14	12	12	14
5	14	17	14	14	14	14	14	13	12	14	14	15	15	19	22	16	15	15	19	15	14	13	13	13
6	13	12	12	12	12	12	16	14	12	13	13	17	15	16	19	13	14	14	13	13	23	12	13	14
7	22	23	16	14	14	13	14	14	13	13	14	14	19	17	19	22	13	18	17	13	12	11	14	12
8	12	14	14	13	B	20	15	22	27	22	28	16	16	23	18	18	18	16	14	16	12	12	12	12
9	12	12	12	13	13	13	19	16	14	16	16	14	14	15	16	16	16	16	18	13	15	13	12	12
10	14	13	14	14	14	15	19	14	12	12	33	20	14	14	20	16	18	17	14	18	17	14	13	12
11	16	11	14	13	12	13	14	13	14	B	B	14	19	15	15	14	15	14	14	12	13	12	13	14
12	13	12	13	13	14	15	13	B	B	B	B	20	31	B	32	26	22	20	16	20	15	B	23	12
13	12	12	13	12	14	14	B	14	14	18	14	15	14	16	18	18	18	16	13	12	12	12	12	20
14	16	23	13	12	15	13	13	12	12	14	14	16	19	15	19	20	14	16	17	14	15	12	12	12
15	12	12	12	14	14	23	18	B	23	B	22	B	B	B	B	B	28	20	14	23	B	16	18	12
16	12	20	16	14	17	23	20	18	16	18	16	B	B	B	B	29	B	24	26	14	13	13	12	12
17	12	12	13	24	16	23	15	22	20	16	14	14	15	14	19	16	18	17	15	16	15	13	11	12
18	12	12	21	16	13	13	15	13	13	13	14	17	21	20	19	15	14	13	13	24	12	12	14	18
19	11	11	12	12	14	13	15	13	14	13	13	14	14	16	14	16	18	14	15	23	20	13	12	13
20	14	14	16	12	13	12	12	12	12	13	12	14	20	16	18	14	14	13	12	13	12	12	11	12
21	12	12	12	12	13	13	14	13	12	13	14	14	15	15	19	15	15	13	12	13	14	13	12	12
22	12	13	12	12	12	12	14	14	13	12	14	14	16	16	14	30	22	14	14	13	12	12	11	12
23	12	12	12	21	B	B	19	18	14	18	15	14	23	18	14	16	13	14	13	14	12	13	13	12
24	12	12	12	12	13	14	13	13	B	28	17	15	13	13	20	18	14	13	12	14	12	12	12	12
25	12	12	12	13	20	16	14	16	14	12	13	14	17	14	20	19	13	13	12	12	12	13	12	12
26	14	22	13	18	22	20	14	13	13	13	14	14	14	18	14	15	16	13	13	12	13	12	12	12
27	13	13	12	12	14	12	12	13	13	13	13	13	16	18	15	19	14	13	12	12	12	11	12	12
28	12	12	12	12	12	14	14	14	13	14	14	16	13	12	14	13	12	12	12	11	12	13	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	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	12	12	13	13	14	14	15	14	14	14	14	15	16	16	19	17	16	16	14	14	13	12	12	12
U Q	14	16	14	16	16	20	19	18	16	18	20	18	20	B 22	20	21	19	17	16	19	15	13	13	13
L Q	12	12	12	12	13	13	14	13	13	13	14	14	14	15	15	15	14	13	13	13	12	12	12	12

FEB.2010 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB.2010 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 256	248	B	A	A	A	A	232	192	H 192	192	A	B	208	204	196	196	218	214	250	A	A	268
2	A	A	A	A	B	B	B	B	A	A	B	B	A	B	B	220	216	200	232	B	216	238	E A 274	274
3	A	A	236	A	A	B	A	198	218	212	A	B	B	B	B	B	B	212	218	B	212	234	A 252	226
4	180	A	220	A	A	A	A	A	238	204	208	194	A	194	214	198	198	202	204	204	214	232	232	226
5	B 300	E A 300	290	E A 284	A 236	232	202	H 194	194	H 176	194	190	220	200	200	194	198	198	208	192	210	230	220	220
6	210	254	270	Q 254	242	226	206	198	198	198	A	198	208	A	198	196	206	210	214	206	202	A	A	A
7	A	A	A	A	A	248	216	216	204	204	204	204	A	208	A	206	206	200	202	206	220	236	230	218
8	212	A	A	204	B	A	A	A	A	A	196	H 178	A	194	202	220	212	212	214	238	238	220	220	228
9	236	246	250	272	A	A	A	E A 274	246	H 192	200	200	A	196	A	A	196	A	218	204	218	224	218	220
10	244	E A 302	E A 302	E A 314	A	A	A	A	240	198	216	A	200	Y	208	208	196	214	222	A	238	232	238	250
11	292	A	E B 304	Q 258	242	E A 274	234	232	228	B	B	226	222	A 270	194	194	208	202	206	234	212	218	Q 234	226
12	Q 242	294	E A 282	224	220	A	A	B	B	B	B	220	198	B	236	214	A	210	218	236	240	B	E B 286	E B 252
13	A	E B 290	A	A	A	A	B	A	A	A	198	A	200	222	A	202	202	212	212	222	230	Q 292	A	A
14	A	A	238	A 294	A	A	A	218	198	186	194	248	234	234	222	222	204	214	214	228	216	230	246	272
15	244	260	A	A	A	A	R	B	A	B	A	B	B	B	B	B	208	208	230	E B 264	B	A	A	A
16	A 252	A	A	A	A	A	A	A	A	E A 258	222	B	B	B	B	A	B	E A 252	E B 226	230	230	234	256	A
17	A	A	A	A	A	A	A	A	A	A	222	196	E A 232	222	208	208	212	212	202	224	224	216	224	238
18	A	E A 280	A	A	A	256	232	206	208	H 182	198	198	192	E A 242	204	220	194	194	204	226	222	E A 274	A	A
19	A 234	A	A	A	A	242	A	A 244	196	190	196	196	204	222	222	196	198	212	210	216	226	226	238	254
20	A	E A 326	E B 322	310	272	236	218	198	198	H 182	192	198	228	208	208	196	196	196	196	218	210	208	220	216
21	224	230	238	262	248	232	232	208	198	194	194	194	200	208	234	212	214	196	204	198	210	200	226	238
22	E B 246	E B 284	A	B	286	222	A	A	242	204	214	196	206	196	224	A	198	216	218	Q 218	Q 214	Q 218	258	A
23	192	A	A	A	B	B	A	A	A	204	222	198	196	200	200	206	202	202	208	Q 214	Q 214	Q 214	Q 226	Q 236
24	E B 250	E B 270	B 270	E B 334	A	200	206	A	B	206	226	200	200	200	198	198	206	204	208	218	204	Q 220	Q 228	A 240
25	A	A	A	A	A	A	204	220	202	206	194	212	202	204	202	204	208	222	214	214	214	214	Q 224	Q 224
26	E B 300	A	A	A	A	A	E A 272	216	202	196	198	198	202	214	212	208	198	208	214	214	212	214	216	Q 224
27	236	244	242	Q 258	268	238	218	200	194	192	196	202	202	200	214	200	208	204	204	206	202	208	226	Q 262
28	Q 288	Q 282	Q 232	Q 244	Q 258	236	234	224	204	H 188	196	192	194	202	190	190	200	206	196	196	196	Q 192	212	Q 252
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	18	15	15	13	9	12	12	15	19	21	22	22	19	20	21	23	25	27	28	25	27	24	23	22
MED	239	U 263	244	258	248	235	218	212	204	195	198	198	202	204	208	204	202	207	212	215	214	221	227	234
U Q	252	E A 294	E 290	302	270	245	233	224	232	204	214	202	220	222	218	212	208	212	218	227	226	233	246	252
L Q	224	254	238	249	239	229	206	198	198	H 189	194	194	200	200	200	196	198	200	204	206	210	214	220	224

FEB.2010 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2010 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	30	A	A	A	X 40	R	A	R	70	X 70	X 72	X 72	X 78	X 84	X 76	X 70	X 66	X 66	65	67	X 56	X 42	X 38	38
2	35	31	A	A	34	48	51	X 50	X 56	60	X 56	X 57	X 62	X 63	X 62	X 66	X 80	X 72	R	O X 47	X 47	X 40	36	O X 34
3	A	A	40	37	49	54	R	R	B	59	O X 52	X 52	X 57	X 58	X 65	X 65	X 62	O X 62	B	X 48	X 36	R	A	A
4	A	A	A	A	A	A	R	R	B	R	O X 49	O X 51	R	R	X 56	X 57	X 56	X 58	X 58	X 51	B	40	40	X 33
5	A	A	X 25	X 44	R	R	B	X 48	X 50	O X 53	B	O X 56	B	B	X 66	X 63	X 58	O X 54	X 49	X 46	X 44	X 39	34	X 30
6	30	O X 31	R	B	R	R	O X 42	X 50	O X 51	O X 56	X 57	X 57	X 61	X 63	X 65	X 61	X 64	X 56	X 53	X 49	X 46	34	32	B
7	B	A	A	B	A	A	A	40	O X 42	R	B	B	B	O X 58	R	O X 63	X 59	O X 52	O X 48	O X 41	X 40	X 34	X 26	23
8	B	R	R	O X 33	R	35	O X 44	B	R	O X 51	X 59	X 60	X 65	X 63	X 58	X 57	X 54	X 52	X 52	X 47	43	36	X 27	A
9	R	R	O X 36	X 29	X 30	31	X 30	X 38	X 46	X 51	X 60	R	X 60	X 60	X 62	X 60	X 57	X 56	X 52	X 46	X 42	35	33	30
10	28	B	R	A	A	35	37	X 44	X 46	X 49	O X 52	X 56	X 64	X 71	X 62	66	X 54	X 54	O X 52	X 41	O X 28	A	A	A
11	A	B	R	A	R	B	R	A	A	B	B	B	B	B	B	B	B	B	B	O X 43	O X 38	27	A	A
12	A	A	R	A	A	A	R	X 42	B	B	R	R	R	B	B	X 61	X 61	R	B	B	A	O X 28	O X 23	46
13	A	R	A	B	R	A	36	O X 42	R	X 46	O X 51	R	X 62	O X 64	O X 65	X 72	X 64	X 59	O X 54	X 47	X 38	32	25	A
14	A	B	A	A	R	A	O X 39	O X 44	O X 45	B	O X 49	R	B	B	B	B	X 60	X 58	R	O X 48	B	R	R	R
15	O X 42	R	A	R	O X 30	O X 32	O X 40	X 46	O X 55	R	R	O X 55	O X 57	R	X 61	X 62	X 61	X 52	X 49	X 42	38	32	25	A
16	A	A	A	A	A	39	50	56	56	O X 53	X 58	X 60	X 68	X 68	X 67	X 63	60	O X 55	X 51	X 43	X 37	X 34	O X 29	O X 24
17	A	A	A	X 33	41	53	41	X 42	O X 48	B	B	64	X 64	72	73	67	X 56	X 52	X 50	X 46	X 41	38	36	32
18	A	A	A	A	B	A	B	R	O X 49	O X 50	O X 52	X 60	X 68	X 67	X 67	X 66	X 69	X 60	X 54	X 46	X 36	X 30	26	A
19	51	A	A	A	32	33	40	X 47	X 50	X 56	X 61	X 70	X 74	X 83	X 80	X 70	X 64	X 64	X 55	X 52	X 40	X 34	O X 29	O X 25
20	O X 27	A	A	A	X 34	40	A	A	B	R	X 56	B	O X 70	X 73	X 75	X 64	X 68	X 63	X 58	O X 47	X 39	B	A	X 31
21	X 30	B	B	A	R	A	B	43	54	X 60	R	B	X 73	O X 85	X 81	O X 73	O X 68	X 63	X 56	X 41	X 35	O X 29	O X 24	O X 23
22	O X 23	B	B	B	B	B	X 29	A	O X 55	X 63	O X 70	X 75	X 78	X 82	X 74	X 74	X 69	X 60	O X 54	X 44	O X 37	X 30	X 26	B
23	B	B	B	B	57	B	B	O X 43	O X 50	X 63	X 75	X 78	X 82	X 84	O X 87	X 81	X 68	X 58	O X 47	X 43	X 44	X 34	O X 24	B
24	R	R	R	B	50	42	41	X 45	X 50	X 58	X 67	X 73	X 81	O X 86	X 87	X 69	X 68	X 60	X 53	X 46	X 35	X 28	A	O X 26
25	50	A	A	A	A	X 31	A	R	X 52	X 62	X 66	X 68	O X 70	X 74	X 73	X 64	X 61	X 57	X 56	X 40	34	26	82	A
26	58	57	42	43	A	X 48	A	X 50	X 48	X 55	X 61	X 62	X 72	X 69	X 64	X 63	X 61	O X 58	O X 51	O X 39	O X 32	X 32	B	O X 25
27	B	29	29	A	A	A	51	X 48	O X 54	X 58	X 64	X 68	X 76	X 80	X 76	X 69	X 66	X 57	X 51	X 42	X 42	X 41	36	34
28	31	28	29	30	36	44	46	42	A	B	B	B	67	X 74	71	X 69	73	66	X 59	B	A	B	A	B
29	B	R	R	A	A	A	39	O X 43	X 46	O X 55	X 61	X 71	X 80	X 74	X 74	X 68	X 64	O X 62	X 50	X 41	O X 32	B	B	A
30	A	A	A	B	B	A	R	R	O X 42	X 48	O X 54	X 61	O X 66	X 63	X 66	X 64	X 58	X 56	X 46	X 37	O X 34	O X 31	A	A
31	B	A	A	A	A	A	A	A	A	B	X 49	X 58	X 64	X 75	O X 77	B	B	B	B	O X 39	B	A	B	R
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	12	5	6	7	11	14	16	20	22	21	23	22	25	25	27	28	29	28	25	29	26	24	20	15
MED	30	31	32	X 33	36	40	40	X 44	X 50	X 56	X 58	X 60	X 68	X 72	X 67	X 66	X 62	X 58	X 52	X 46	X 38	X 34	29	X 30
U Q	46	44	40	43	49	48	45	X 48	X 54	X 60	X 64	X 70	X 75	X 81	X 76	X 69	X 68	X 62	X 56	X 47	X 42	X 37	36	34
L Q	29	28	29	30	X 32	33	38	X 42	X 46	X 51	O X 52	X 57	X 63	X 63	X 64	X 63	X 58	X 56	X 50	X 41	O X 35	X 30	26	O X 25

MAR. 2010 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2010 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	F 18	A	A	A	J R 34	A	A	A	F 58	64	66	66	72	78	70	64	60	60	F 54	F 56	50	36	32	F 27
2	F 24	F 20	A	A	F 24	F 38	F 40	44	50	F 50	50	51	56	57	56	60	74	66	R	R 41	41	34	F 26	28
3	A	A	F 30	F 27	F 38	Y	A	R	B	F 48	R 46	46	J R 51	52	59	59	56	56	B	42	30	A	A	A
4	A	A	A	A	A	A	R	R	B	R	R 43	R 45	R	R	50	51	50	J R 52	52	45	B	F 31	F 30	27
5	A	A	19	J R 38	R	R	B	42	44	R 47	B	R 50	B	B	60	57	52	R 48	43	40	38	33	F 24	24
6	F 20	R 25	R	B	R	A	R 36	44	R 45	R 50	51	J R 51	55	57	59	J R 55	58	50	47	43	40	F 23	F 20	B
7	B	A	A	B	A	A	A	F 31	R 36	R	B	B	B	R 52	R	R 57	53	U R 46	R 42	35	34	28	20	F 12
8	B	R	A	R 27	R	F 24	38	B	R	R 45	53	54	59	57	J R 52	51	48	46	J R 46	41	37	F 26	21	A
9	R	R	R 30	23	24	F 21	24	32	40	45	54	R	J R 54	J R 54	56	54	51	50	46	40	36	F 26	F 23	F 18
10	F 18	B	A	A	A	F 26	F 28	38	40	43	R 46	R 50	58	65	56	F 55	48	48	R 46	35	R 22	A	A	A
11	A	B	A	A	R	B	A	A	A	B	B	B	B	B	B	B	B	B	B	R 37	R 32	F 18	A	A
12	A	A	A	A	A	A	R	36	B	B	R	R	R	B	B	55	55	R	B	B	A	R 22	R 17	A
13	A	R	A	B	R	A	F 26	R 36	R	J R 40	R 45	R	J R 56	R 58	R 59	66	58	J R 53	R 48	41	32	F 21	F 15	A
14	A	B	A	A	R	A	R 33	R 38	R 39	B	R 43	R	B	B	B	B	J R 54	52	R	R 42	B	R	A	A
15	R 36	R	A	R	R 24	R 26	R 34	40	R 49	R	R	R 49	R 51	R	J R 55	56	55	46	43	36	F 28	F 23	F 15	A
16	A	A	A	A	A	F 29	F 40	F 39	F 42	R 47	J R 52	J R 54	62	62	61	57	54	R 49	45	37	31	28	R 23	R 18
17	A	A	A	27	F 25	F 26	F 24	36	R 42	B	B	58	58	F 63	F 60	F 59	50	46	44	40	35	F 29	F 27	F 24
18	A	A	A	A	B	A	B	A	43	44	R 46	J R 54	62	61	61	60	63	J R 54	48	40	30	24	F 16	A
19	A	A	A	A	F 21	F 23	F 30	41	J R 44	50	J R 55	64	68	77	74	64	57	58	49	46	34	28	R 23	R 19
20	21	A	A	A	28	F 28	A	A	B	R	50	B	R 64	67	69	58	62	57	52	R 41	33	B	A	25
21	24	B	B	A	R	A	B	F 34	F 44	J R 54	R	B	67	R 79	75	R 67	62	57	50	35	29	R 23	R 18	R 17
22	R 17	B	B	B	B	B	23	A	R 49	57	R 64	J R 69	J R 72	J R 76	68	68	63	54	R 48	38	R 31	24	20	B
23	B	B	B	B	R 46	B	B	R 37	R 44	57	69	J R 72	J R 76	78	R 81	J R 75	62	52	R 41	37	38	28	R 18	B
24	R	R	A	B	F 40	F 28	F 24	39	44	52	61	J R 67	J R 75	R 80	81	63	62	54	47	40	29	22	A	R 20
25	A	A	A	A	A	25	A	R	46	56	60	62	64	68	67	58	55	51	50	34	F 24	F 17	A	A
26	37	F 23	F 30	F 22	A	42	A	44	42	50	55	56	66	63	58	57	J R 55	R 52	R 45	33	26	26	B	R 19
27	B	F 19	F 20	A	A	A	F 39	42	R 48	52	57	62	J R 70	74	70	63	60	51	45	36	36	35	F 24	F 24
28	F 21	F 20	F 18	F 20	F 26	F 25	F 20	F 24	A	B	B	B	F 57	68	F 60	63	F 64	F 56	J R 53	B	A	B	A	B
29	B	R	R	A	A	A	F 30	R 37	40	R 49	J R 55	65	74	68	68	62	58	R 56	44	35	26	B	B	A
30	A	A	A	B	B	A	R	R	R 36	42	R 48	J R 55	R 60	57	60	58	52	50	40	31	R 28	R 25	A	A
31	B	A	A	A	A	A	A	A	A	B	43	52	58	69	R 71	B	B	B	B	R 33	B	A	B	R
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	5	6	7	11	13	16	20	22	21	23	22	25	25	27	28	29	28	25	29	26	24	19	14
MED	21	F 20	F 25	27	F 26	F 26	F 30	38	44	50	52	54	62	65	60	58	56	52	46	40	32	26	F 21	22
U Q	24	24	30	R 27	F 38	F 28	F 37	42	46	53	57	64	J R 69	75	70	63	62	56	50	41	36	28	F 24	25
L Q	F 18	F 20	19	F 22	F 24	F 24	F 24	36	40	45	R 46	R 51	R 56	57	58	56	52	50	44	35	29	F 23	F 18	18

MAR. 2010 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2010 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	29	43	65	65	43	39	50	51	31	29	G 23	29	31	28	29	G 17	23	23	22	18	17	24	29	E B 12
2	E B 13	23	57	42	33	30	16	20	G	29	28	30	37	33	31	25	E B 32	E B 28	E B 27	E B 26	E B 21	22	22	33
3	40	71	69	44	32	33	G 30	35	B	25	30	30	28	28	26	30	27	E B 23	B	E B 22	15	29	43	40
4	43	41	73	41	K 36	K 41	30	34	B	38	30	26	25	26	26	24	24	20	E B 20	E B 24	B	E B 22	16	33
5	40	41	30	32	30	22	B	E B 20	24	E B 26	B	E B 29	B	B	27	24	23	19	21	21	22	31	29	34
6	39	E B 16	25	B	27	41	G 23	21	22	23	29	G	29	28	27	32	24	23	20	17	17	E B 12	E B 12	B
7	B	44	79	B	96	40	44	43	50	36	B	B	B	E B 45	30	28	E B 26	E B 24	E B 26	E B 23	E B 17	16	E B 12	E B 12
8	B	23	31	34	28	44	42	B	30	32	28	31	29	30	25	29	23	22	18	E B	16	25	24	30
9	22	21	26	23	30	E B 13	E B 13	17	22	24	27	35	28	28	28	34	30	20	18	18	E B 13	E B 11	25	E B 12
10	E B 14	B	27	57	49	34	16	19	21	28	25	E B 28	28	27	27	32	24	22	E B 20	24	29	39	57	50
11	57	B	26	72	21	B	34	43	42	B	B	B	B	B	B	B	B	B	B	E B 30	E B 26	E B 12	30	28
12	32	32	K 30	40	40	40	35	22	B	B	E B 30	E B 31	E B 29	B	B	E B 26	E B 27	E B 29	B	B	35	31	26	37
13	31	K 26	38	B	31	33	25	22	E B 23	G	28	G	28	28	27	26	E B 25	E B 24	E B 21	E B 20	E B 13	E B 12	E B 12	36
14	K 31	B	59	43	20	40	24	22	24	B	27	27	B	B	B	B	27	22	E B 29	22	B	18	32	37
15	43	34	46	34	20	23	35	30	20	23	27	27	27	27	47	38	24	34	31	31	27	27	31	38
16	30	33	30	31	33	24	29	23	E B 20	E B 23	27	27	26	28	G 22	26	27	28	30	E B 20	21	18	18	22
17	25	33	42	32	29	22	15	19	33	B	B	29	E B 28	27	27	28	22	22	17	E B 15	15	19	E B 14	24
18	29	36	94	62	B	34	B	35	E B 27	28	30	32	27	65	66	47	G 18	20	19	24	18	E B 13	21	33
19	21	40	47	30	16	21	21	24	19	22	31	29	30	27	25	31	28	20	18	E B 15	E B 15	E B 16	E B 15	18
20	33	36	K 35	48	43	33	40	50	B	33	30	B	E B 56	30	28	E B 24	21	18	22	E B 22	22	B	36	16
21	E B 13	B	B	29	20	43	B	34	19	E B 23	E B 28	B	41	30	32	81	40	22	E B 20	E B 20	E B 16	16	E B 14	E B 13
22	E B 13	B	B	B	B	B	E B 15	83	24	E B 24	E B 54	E B 30	E B 30	36	E B 30	34	27	33	22	33	36	26	15	B
23	B	B	B	B	E B 34	B	B	E B 22	E B 22	E B 26	25	30	32	28	39	24	23	E B 27	E B 23	E B 19	E B 16	15	20	B
24	21	16	30	B	E B 19	E B 23	E B 12	E B 16	22	24	26	33	29	25	25	37	21	20	16	30	E B 12	40	34	Q 33
25	34	58	44	41	33	33	44	35	24	G	25	24	28	30	27	G 17	19	18	21	21	15	E B 13	38	69
26	Q 46	71	40	30	58	37	44	40	42	39	30	31	29	27	24	22	E B 23	E B 29	E B 24	E B 23	E B 16	E B 14	B	E B 15
27	B	E B 12	36	45	44	42	30	37	E B 31	26	27	34	32	30	23	24	22	20	25	34	32	28	28	E B 13
28	E B 12	E B 12	E B 12	E B 19	E B 24	E B 21	E B 12	38	56	B	B	B	E B 56	E B 56	E B 24	24	29	E B 25	E B 25	B	38	B	44	B
29	B	21	30	K 30	30	41	30	26	E B 19	24	24	32	36	32	41	35	45	69	44	38	21	B	B	25
30	33	38	42	B	B	34	26	32	30	G 21	23	31	26	32	22	24	18	E B 15	E B 16	E B 16	15	E B 15	K 35	35
31	B	43	43	42	42	57	70	51	41	B	E B 24	37	34	34	E B 56	B	B	B	B	E B 22	B	30	B	16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	25	28	24	28	28	27	30	27	25	26	26	27	27	28	28	29	29	27	28	28	28	28	27
MED	31	34	39	40	31	34	30	31	24	24	28	30	28	28	27	27	24	21	20	E B 22	16	18	26	30
U Q	40	42	52	44	41	40	40	38	31	29	30	31	32	32	30	33	27	28	25	25	24	28	33	36
L Q	E B 21	22	30	30	26	24	E B 16	22	21	23	25	27	28	27	25	24	22	20	19	E B 20	15	E B 14	E B 16	E B 16

MAR. 2010 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2010 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	12	12	14	20	14	16	20	13	14	13	14	16	13	13	13	13	13	14	13	14	13	12	12
2	13	12	13	13	13	12	12	12	12	13	13	14	13	13	13	17	32	27	28	26	21	16	13	14
3	11	16	13	13	22	17	25	28	B	15	20	26	14	16	14	14	15	23	B	22	11	12	12	21
4	16	22	18	17	20	14	15	26	B	16	20	13	15	16	13	13	13	14	20	24	B	22	13	13
5	12	11	13	12	13	15	B	20	20	26	B	29	B	B	22	19	18	14	15	14	12	12	16	12
6	12	16	13	B	14	16	14	18	18	15	14	16	18	15	15	15	15	13	13	12	12	12	12	B
7	B	12	12	B	14	14	17	15	16	25	B	B	B	45	26	22	26	24	26	23	17	12	12	12
8	B	11	12	11	12	14	14	B	25	21	16	16	20	14	13	16	18	16	13	16	11	13	12	12
9	12	12	12	16	19	13	13	12	13	14	13	16	14	12	14	16	13	13	12	12	13	12	13	12
10	14	B	12	12	13	12	12	13	12	13	14	28	14	23	14	13	12	13	20	11	13	12	14	12
11	16	B	19	30	13	B	28	33	26	B	B	B	B	B	B	B	B	B	B	30	25	12	12	14
12	12	11	11	18	17	19	18	15	B	B	30	31	29	B	B	26	27	29	B	B	20	13	12	12
13	15	16	20	B	22	17	18	18	23	18	14	22	19	20	21	21	25	24	21	20	14	12	12	12
14	12	B	13	24	14	18	19	16	14	B	18	23	B	B	B	B	16	19	29	18	B	13	12	12
15	16	18	18	13	11	12	12	13	12	14	16	19	21	20	17	15	16	13	12	14	11	12	12	12
16	13	12	12	13	13	13	13	12	20	23	14	18	16	17	17	14	13	13	14	20	13	12	13	12
17	12	12	14	13	12	12	12	13	18	B	B	20	28	19	18	13	14	12	13	15	12	16	14	12
18	10	12	17	27	B	24	B	30	27	19	16	14	20	18	15	16	15	13	13	12	13	13	12	12
19	12	12	17	12	12	12	12	13	14	12	14	13	14	13	15	13	13	12	13	15	15	16	15	12
20	12	12	12	14	11	13	15	15	B	24	24	B	56	27	21	25	13	14	13	23	15	B	13	13
21	13	B	B	14	12	19	B	22	12	23	28	B	27	25	18	30	20	16	20	20	16	13	14	13
22	13	B	B	B	B	B	15	14	18	24	54	30	30	28	30	21	19	17	18	13	13	12	11	B
23	B	B	B	B	34	B	B	22	22	26	19	25	24	17	19	16	13	27	23	19	16	12	12	B
24	12	12	15	B	19	23	12	16	19	16	16	18	19	16	16	13	13	12	12	12	12	11	12	12
25	12	12	13	12	15	14	14	20	12	15	19	18	15	14	12	13	12	12	12	14	11	13	12	14
26	12	16	13	12	15	12	13	14	17	13	15	14	19	24	13	14	23	29	24	22	16	14	B	15
27	B	12	12	15	13	18	14	15	31	14	14	15	12	13	12	13	13	12	12	11	12	12	13	13
28	12	12	12	19	24	21	12	14	26	B	B	B	56	56	24	17	24	25	25	B	13	B	18	B
29	B	13	15	13	18	16	18	19	19	12	15	15	14	20	14	14	16	14	16	14	12	B	B	12
30	12	15	21	B	B	20	14	16	18	20	14	14	16	17	14	14	12	15	16	16	11	15	12	12
31	B	15	17	24	16	15	15	14	16	B	24	16	16	14	56	B	B	B	B	22	B	12	B	12
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	13	12	13	15	15	15	15	16	18	19	16	18	19	18	16	16	15	14	16	16	13	13	12	12
U Q	B 16	B 18	18	B 30	20	19	18	20	26	B 26	B 28	B 29	29	27	22	21	23	24	25	22	16	15	14	14
L Q	12	12	12	13	13	13	13	14	14	14	14	15	15	14	14	13	13	13	13	13	12	12	12	12

MAR. 2010 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2010 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	268	A	A	A	A	A	A	A	A	204	202	200	198	188	208	198	200	212	212	Q 208	208	200	218	248
2	258	A	A	A	A	304	226	204	206	202	202	200	200	192	192	196	E B 236	B 226	242	216	238	244	266	268
3	A	A	206	A	310	Y	A	A	B	204	186	206	206	204	194	204	206	B 218	B	214	232	204	A	A
4	A	A	A	A	A	A	A	A	B	A	222	190	H 180	H 194	212	218	208	208	224	224	B	E B 256	E A 254	252
5	A	A	232	Y	A	A	B	E B 248	210	210	B	190	B	B	212	212	210	202	210	216	216	228	256	A 264
6	A 256	B	A	B	A	A	A	246	216	H 174	186	216	216	210	210	196	218	210	206	212	202	Q 228	B	B
7	B	A	A	B	A	A	A	210	230	A	B	B	B	E B 352	220	232	214	232	226	226	222	234	E B 272	B
8	B	A	A	206	A	A	A	B	A	214	212	H 200	220	212	204	210	206	206	226	212	212	218	E A 260	A
9	A	A	A	A	A	E B 274	220	208	198	198	198	198	190	198	202	214	204	204	204	204	204	214	A 256	E B 302
10	B	B	A	A	A	208	266	224	204	192	192	210	208	208	210	214	202	212	B 228	B 228	A	A	A	A
11	A	B	A	A	A	B	A	A	A	B	B	B	B	B	B	B	B	B	B	E B 256	E B 282	254	222	A
12	A	A	A	A	A	A	A	288	B	B	230	222	226	B	B	216	222	248	B	B	A	E A 292	A	A
13	A	A	A	B	A	A	A	288	230	198	208	214	206	200	200	222	204	220	202	204	200	234	E B 294	A
14	A	B	A	A	A	A	A	A	228	B	236	210	B	B	B	B	210	226	222	222	B	A	A	A
15	232	A	A	A	A	A	A	230	218	216	228	204	210	208	A	E A 216	216	206	198	210	224	E A 250	E A 312	A
16	A	A	A	A	A	A	204	198	200	198	198	208	202	190	190	208	212	212	212	214	240	222	E A 292	A
17	A	A	A	204	E A 332	302	E A 264	220	222	B	B	208	198	210	206	210	204	216	214	212	216	234	222	E A 244
18	A	A	A	A	B	A	B	A	230	H 192	214	198	220	E A 286	E A 272	A 208	212	212	204	206	218	240	E A 268	A
19	A	A	A	A	E A 382	A	244	206	198	200	208	214	206	188	196	204	204	212	Q 202	210	210	232	E B 276	E A 290
20	A	A	A	A	A	A	A	A	B	A	226	B	B	A 232	214	214	218	220	Q 206	242	244	B	A	A
21	E B 262	B	B	A	A	A	B	232	214	198	218	B	A	220	200	E A 260	224	202	206	198	212	258	258	E B 260
22	E B 292	B	B	B	B	B	248	A	224	210	288	214	218	272	200	218	218	200	198	208	E A 272	234	E A 230	B
23	B	B	B	B	B	B	B	240	222	224	222	208	208	206	212	216	202	194	198	216	210	202	E A 252	B
24	A	A	A	B	E B 336	B	246	204	222	216	218	220	214	206	218	210	210	200	200	214	222	230	A	230
25	A	A	A	A	A	A	A	A	250	230	228	200	200	212	210	200	194	206	202	192	234	E B 294	A	E A 244
26	A	A	228	A	A	200	A	210	258	212	212	194	210	198	202	208	218	214	210	228	E B 258	240	B	B
27	B	E B 264	A	A	A	A	Q 288	Q 278	254	224	200	210	210	210	210	206	206	196	Q 196	Q 220	Q 228	222	Q 228	Q 240
28	246	E B 258	E B 270	B	B	B	E B 276	208	A	B	B	B	B	E B 278	210	210	232	212	218	B	A	B	A	B
29	B	A	A	A	A	A	A	E A 284	232	212	212	182	206	214	214	214	204	218	206	248	E A 262	B	B	A
30	A	A	A	B	B	A	A	A	A	E A 258	242	208	218	208	208	208	204	196	200	212	222	234	A	A
31	B	A	A	A	A	A	A	A	A	B	226	234	216	214	278	B	B	B	B	238	B	A	B	R
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	7	2	4	2	4	5	10	19	21	22	26	26	24	27	27	28	29	29	27	29	25	25	18	11
MED	252	E B 261	224	205	E 334	274	241	217	222	206	213	208	208	207	209	210	209	212	206	214	219	231	E 257	248
U Q	268		251		E 359	303	266	248	230	216	226	214	216	214	212	216	218	218	218	225	E 239	E 247	E B 272	E 268
L Q	246		217		321	204	226	208	208	198	202	200	201	198	200	207	204	203	202	209	211	222	230	244

MAR. 2010 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2010 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	A	A	R	A	R	A	B	B	X 57	X 66	X 64	X 75	O X 88	X 88	X 76	B	B	X 24	B	O X 25	R
2	A	A	A	A	B	B	O X 38	B	B	B	B	B	B	B	B	B	B	B	B	41	R	A	A	A
3	A	R	B	B	A	A	A	B	B	B	X 48	O X 52	X 55	X 58	X 58	X 55	X 55	X 50	B	A	A	85	A	A
4	R	A	B	A	R	44	B	B	B	B	B	B	B	B	O X 55	O X 58	X 60	B	B	B	B	B	70	A
5	R	A	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	40	X 32	A	A	A	A	A
6	B	C	B	A	A	B	B	B	B	B	B	B	B	40	B	B	B	52	R	A	52	A	A	B
7	B	A	A	B	B	B	A	B	B	R	B	B	B	B	B	B	B	X 40	39	88	72	71	A	A
8	52	B	B	B	B	B	B	A	R	B	B	B	B	B	B	B	O X 46	O X 40	B	B	B	B	A	46
9	B	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 28	R
10	O X 37	A	A	A	A	R	R	O X 28	O X 38	X 48	B	B	O X 52	X 64	X 64	X 58	X 59	B	B	O X 24	O X 22	B	B	B
11	B	B	R	A	A	A	A	R	O X 40	O X 43	O X 43	O X 54	O X 58	O X 63	R	X 57	O X 51	O X 48	X 41	X 29	93	A	52	A
12	A	B	58	A	B	B	B	A	B	A	B	B	B	B	O X 49	O X 55	O X 55	B	B	B	B	A	A	A
13	70	A	A	A	R	O X 25	X 28	O X 30	X 36	O X 42	O X 41	X 50	X 52	O X 54	X 57	O X 52	X 49	O X 38	O X 30	O X 24	B	B	B	B
14	A	A	A	A	R	R	A	A	X 37	X 46	X 48	O X 54	X 57	X 58	X 60	X 63	X 53	X 45	O X 32	O X 24	O X 21	B	32	A
15	A	O X 56	32	B	B	B	A	53	B	R	O X 45	X 46	B	O X 53	O X 58	B	R	O X 50	X 41	O X 38	B	O X 23	B	B	B
16	R	R	X 39	A	A	O X 31	A	A	A	A	X 52	O X 52	X 59	X 63	X 63	X 63	X 59	O X 41	O X 31	O X 30	X 27	O X 22	B	Y
17	B	B	B	B	R	A	A	40	41	X 46	X 52	X 57	X 63	X 72	X 68	O X 54	O X 53	X 44	O X 32	O X 25	B	B	47	69
18	X 26	O X 26	X 37	A	A	A	A	R	X 37	X 48	X 56	X 63	X 70	74	X 76	X 74	X 56	X 40	X 34	O X 26	B	B	B	B
19	R	B	R	O X 37	O X 34	A	X 41	36	X 42	X 48	60	X 66	69	82	X 83	76	O X 57	O X 42	B	B	B	A	A	A
20	O X 35	O X 34	A	A	A	31	30	30	34	X 41	X 51	X 56	X 66	77	75	X 70	X 60	X 47	X 38	X 38	30	O X 24	A	A
21	O X 37	A	A	A	O X 36	A	A	O X 35	O X 38	B	B	O X 46	X 48	O X 53	X 58	O X 51	X 47	X 40	X 34	O X 27	B	B	B	B
22	B	R	R	53	R	X 36	R	B	33	O X 42	B	B	68	X 72	68	X 58	X 47	X 42	O X 31	B	B	B	B	80
23	30	A	A	61	B	B	A	B	A	B	O X 45	B	X 55	O X 55	X 53	X 48	X 46	X 37	O X 34	B	B	B	B	51
24	A	A	A	R	A	B	B	B	O X 38	O X 47	X 47	X 50	O X 50	X 56	X 56	X 57	O X 49	B	B	B	B	B	O X 24	B
25	B	B	B	B	B	B	R	B	B	B	58	68	X 72	X 75	68	O X 60	X 55	36	O X 31	Y	B	B	B	R
26	B	A	O X 32	O X 27	X 29	40	40	36	36	X 48	X 49	X 60	X 71	X 71	X 68	X 71	X 52	O X 33	B	B	B	B	B	B
27	B	B	B	B	57	B	A	A	X 34	X 42	X 55	X 60	X 62	X 64	X 68	X 73	X 51	40	31	25	X 20	X 21	Y	B
28	B	B	B	36	35	B	36	B	X 31	X 42	X 50	B	71	X 77	X 68	X 63	X 47	O X 35	O X 29	O X 23	B	O X 23	O X 23	B
29	A	A	A	A	A	B	B	B	B	X 43	X 49	X 49	X 64	X 66	X 63	O X 50	X 42	X 36	X 30	X 24	X 22	A	28	O X 28
30	A	A	A	A	A	A	A	A	O X 34	X 40	X 47	X 54	X 56	X 61	X 66	X 63	X 46	X 36	X 32	X 28	O X 26	B	B	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	7	3	5	5	5	6	7	7	15	16	18	17	22	23	22	23	25	24	18	15	12	6	9	5
MED	X 37	O X 34	X 37	37	X 35	34	38	35	X 37	X 44	X 49	X 54	X 60	X 64	X 65	X 58	X 52	X 40	X 32	O X 26	X 25	X 24	28	51
U Q	52	O X 56	48	57	46	40	41	36	X 38	X 48	X 52	X 60	68	72	X 68	X 70	X 56	X 44	X 34	30	41	71	50	74
L Q	30	O X 26	32	32	X 32	31	30	30	34	X 42	O X 47	X 51	X 55	X 58	X 58	O X 55	X 47	X 38	O X 31	O X 24	X 22	X 22	O X 24	37

APR. 2010 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2010 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	A	A	A	A	A	B	B	51	60	58	69	82	82	70		B	B	18	B	R 19	R
2	A	A	A	A	B	B	R 32	B	B	B	B	B	B	B	B	B	B	B	B	F 31	R	A	A	A
3	A	A	B	B	A	A	A	B	B	B	42	R 46	49	52	52	49	49	44	B	A	A	A	A	A
4	A	A	B	A	A	F 32	B	B	B	B	B	B	B	B	R 49	R 52	54	B	B	B	B	B	A	A
5	A	A	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	F 31	J R 26	A	A	A	A	A
6	B	C	B	A	A	B	B	B	B	B	B	B	B	F 30	B	B	B	F 25	A	A	F 36	A	A	B
7	B	A	A	B	B	B	A	B	B	R	B	B	B	B	B	B	B	J R 34	F 29	A	A	A	A	A
8	R 31	B	B	B	B	B	B	A	A	B	B	B	B	B	B	B	R 40	R 34	B	B	B	B	A	A
9	B	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 22	R
10	R 31	A	A	A	A	R	R	R 22	R 32	42	B	B	R 46	58	58	52	53	B	B	R 18	R 16	B	B	B
11	B	B	A	A	A	A	A	R	R 34	R 37	R 37	48	R 52	57	D R 41	51	R 45	42	35	J R 23	A	A	F 30	A
12	A	B	R 29	A	B	B	B	A	B	A	B	B	B	B	R 43	R 49	R 49	B	B	B	B	A	A	A
13	A	A	A	A	R	R 19	22	R 24	30	36	36	44	46	R 48	J R 51	R 46	43	R 32	R 24	R 18	B	B	B	B
14	A	A	A	A	A	A	A	A	J R 31	40	42	R 48	51	J R 52	54	57	47	39	R 26	R 18	R 15	B	R 26	A
15	A	R 50	F 21	B	B	A	F 40	B	A	R 39	40	B	47	R 52	B	R	R 44	35	R 32	B	R 17	B	B	B
16	A	A	33	A	A	F 25	A	A	A	A	J R 46	46	53	57	57	57	J R 53	35	25	R 24	21	R 16	B	Y
17	B	B	B	B	R	A	A	F 30	F 31	40	46	51	57	66	62	R 48	R 47	38	R 26	R 19	B	B	Y	A
18	20	R 20	J R 31	A	A	A	A	A	31	42	J R 50	57	64	F 65	J R 70	68	50	34	28	R 20	B	B	B	B
19	R	B	R	R 31	R 28	A	35	F 26	36	42	F 54	60	F 58	F 71	77	F 64	R 51	R 36	B	B	B	A	A	A
20	R 29	R 28	A	A	A	F 21	F 20	F 20	F 24	35	45	50	60	F 68	F 65	64	54	41	32	32	F 20	R 18	A	A
21	R 31	A	A	A	R 30	A	A	R 29	R 32	B	B	R 40	42	R 47	J R 52	R 45	J R 41	34	28	R 21	B	B	B	B
22	B	R	A	F 40	A	30	A	B	F 24	R 36	B	B	F 57	66	F 59	52	41	36	R 25	B	B	B	B	A
23	F 20	A	A	A	B	B	A	B	A	B	R 39	B	49	R 49	47	42	40	31	R 28	B	B	B	B	A
24	A	A	A	A	A	B	B	B	R 32	R 41	41	44	R 44	J R 50	50	51	R 43	B	B	B	B	B	R 18	B
25	B	B	B	B	B	B	A	B	B	B	F 48	F 55	66	69	F 58	R 54	49	F 26	R 25	Y	B	B	B	R
26	B	A	R 26	R 21	23	F 21	F 20	F 20	F 21	42	43	54	65	65	62	65	46	R 27	B	B	B	B	B	B
27	B	B	B	B	F 35	B	A	A	28	36	49	54	56	58	J R 62	67	45	F 30	F 21	F 16	14	15	Y	B
28	B	B	B	F 26	F 25	B	F 26	B	25	36	44	B	F 61	71	62	57	41	R 29	R 23	R 17	B	R 17	R 17	B
29	A	A	A	A	A	B	B	B	B	37	43	43	58	60	57	R 44	36	30	24	18	16	A	F 19	R 22
30	A	A	A	A	A	A	A	A	R 28	34	41	48	50	55	60	57	40	30	26	22	R 20	B	B	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	3	5	4	5	6	7	7	15	16	18	17	22	23	23	23	25	24	18	14	10	4	7	1
MED	R 30	R 28	R 29	28	28	F 23	F 26	F 24	31	38	43	48	54	58	58	52	46	34	26	R 20	18	R 16	R 19	R 22
U Q	R 31	R 50	32	36	32	30	35	29	R 32	42	46	54	60	66	62	64	50	37	28	23	20	R 18	26	
L Q	20	R 20	24	24	24	21	F 20	F 20	F 25	36	41	45	49	R 52	R 51	R 49	41	30	25	18	16	16	R 18	

APR. 2010 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2010 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	37	B	47	44	K 29	36	33	48	B	B	27	27	23	22	E B 22	E B 20	E B 19	B	B	16	B	27	22
2	36	38	42	44	B	B	30	B	B	B	B	B	B	B	B	B	B	B	B	25	28	41	32	K 40
3	74	37	B	B	40	44	37	B	B	B	21	22	25	24	G 16	22	E B 19	E B 20	B	K 27	36	34	42	46
4	K 33	44	B	37	36	30	B	B	B	B	B	B	B	B	E B 25	E B 26	E B 20	B	B	B	B	B	41	71
5	K 34	44	B	B	B	B	B	46	B	B	B	B	B	B	B	B	B	23	35	36	35	57	51	58
6	B	C	B	40	40	B	B	B	B	B	B	B	B	E B 26	B	B	B	27	35	92	91	72	43	71
7	B	36	79	B	B	B	40	B	B	32	B	B	B	B	B	B	B	E S 28	E B 21	42	36	38	38	72
8	65	B	B	B	B	B	B	31	34	B	B	B	B	B	B	B	E B 31	E B 27	B	B	B	B	32	35
9	B	43	B	B	B	31	33	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 19	23
10	30	43	33	42	40	31	23	16	E B 20	E B 24	B	B	E B 36	E B 26	E B 24	E B 25	E B 23	B	B	17	E B 12	B	B	B
11	B	B	K 37	38	53	38	42	26	E B 22	E B 19	E B 27	E B 26	E B 23	E B 26	E B 24	E B 26	E B 26	E B 17	E B 12	30	44	60	61	82
12	72	B	35	64	B	B	B	39	B	42	B	B	B	B	E B 28	E B 23	E B 29	B	B	B	B	29	K 39	K 36
13	35	37	42	33	17	E B 13	16	E B 12	E B 17	E B 20	E B 22	E B 24	E B 23	E B 24	E B 20	E B 22	E B 17	E B 17	E B 17	E B 12	B	B	B	B
14	32	33	42	42	32	30	40	42	29	24	22	25	E B 23	22	E B 22	E B 21	E B 19	E B 20	E B 16	E B 14	14	B	E B 24	39
15	58	32	76	B	B	38	21	B	31	33	22	B	E B 34	E B 41	B	E B 29	E B 26	E B 15	E B 18	B	E B 12	B	B	B
16	24	22	K 26	30	38	K 27	29	35	36	33	26	25	24	27	22	21	E B 20	E B 21	E B 17	E B 13	17	17	B	17
17	B	B	B	B	19	50	34	29	E B 18	E B 19	22	22	22	26	22	E B 22	E B 18	E B 14	E B 18	E B 12	B	B	14	34
18	16	21	35	40	33	43	33	32	22	18	20	24	24	24	21	20	15	20	E B 12	28	B	B	B	B
19	23	B	27	37	34	42	40	28	31	28	22	22	25	24	23	E B 30	E B 30	E B 22	B	B	B	30	30	30
20	43	45	66	46	35	18	23	E B 13	E B 14	E B 12	E B 18	20	24	22	22	22	18	E B 12	E B 12	E B 15	22	32	41	46
21	45	41	36	36	44	41	53	36	31	B	B	E B 28	E B 26	E B 25	18	E B 18	E B 20	E B 12	E B 12	E B 12	B	B	B	B
22	B	28	K 35	37	32	31	34	B	E B 12	E B 20	B	B	E B 35	E B 28	E B 26	E B 24	22	30	E B 15	B	B	B	B	40
23	32	32	32	41	B	B	43	B	50	B	E B 24	B	22	33	36	26	E B 19	E B 14	K 21	B	B	B	B	28
24	81	44	44	34	K 35	B	B	B	E B 22	22	25	E B 21	E B 22	22	19	E B 21	E B 19	B	B	B	B	B	15	B
25	B	B	B	B	B	B	34	B	B	B	22	28	E B 24	E B 26	26	G	32	27	19	14	B	B	B	18
26	B	28	30	33	22	E B 13	E B 13	E B 13	30	E B 13	18	E B 23	E B 22	22	E B 22	E B 22	E B 20	E B 17	B	B	B	B	B	B
27	B	B	B	B	34	B	40	40	32	26	G 16	20	20	20	31	41	20	E B 13	E B 12	E B 12	E B 12	E B 14	17	B
28	B	B	B	E B 25	30	B	E B 24	B	E B 12	15	30	B	E B 29	E B 23	21	28	E B 20	23	E B 15	E B 13	B	E B 13	E B 12	B
29	29	36	76	71	69	B	B	B	B	28	E B 20	22	20	E B 21	E B 22	E B 20	E B 15	E B 12	E B 12	E B 12	E B 12	32	E B 12	27
30	K 28	32	30	42	45	34	33	29	29	16	18	20	24	24	24	E B 16	E B 13	E B 13	E B 12	16	E B 13	B	B	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	21	19	21	21	18	23	17	20	19	18	17	22	23	23	24	25	24	19	19	15	13	19	20
MED	34	37	36	40	35	31	34	31	29	21	22	22	23	23	22	E B 22	E B 20	E B 20	E B 16	15	17	32	32	38
U Q	52	43	44	43	42	41	40	38	32	28	24	26	E B 26	26	25	E B 26	E B 24	23	19	28	36	49	41	52
L Q	30	32	32	35	32	29	24	E B 21	E B 19	18	20	22	22	22	21	E B 21	E B 18	E B 14	E B 12	E B 12	E B 12	23	17	28

APR. 2010 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2010 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	29	B	27	22	22	32	23	16	B	B	25	18	20	15	22	20	19	B	B	13	B	12	12
2	12	27	20	19	B	B	23	B	B	B	B	B	B	B	B	B	B	B	B	22	19	17	13	15
3	14	16	B	B	20	18	24	B	B	B	18	20	16	15	14	14	19	20	B	18	14	14	16	22
4	28	20	B	28	23	13	B	B	B	B	B	B	B	B	25	26	20	B	B	B	B	B	12	17
5	20	19	B	B	B	B	B	17	B	B	B	B	B	B	B	B	B	20	13	12	14	20	12	12
6	B	C	B	23	23	B	B	B	B	B	B	B	B	26	B	B	B	12	13	20	16	12	12	50
7	B	27	21	B	B	B	16	B	B	22	B	B	B	B	B	B	B	E S 28	21	12	12	18	18	14
8	12	B	B	B	B	B	B	20	28	B	B	B	B	B	B	B	31	27	B	B	B	B	13	12
9	B	23	B	B	B	25	26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19	12
10	11	12	26	16	22	19	15	13	20	24	B	B	36	26	24	25	23	B	B	12	12	B	B	B
11	B	B	20	18	12	24	13	15	22	19	27	26	23	26	24	26	26	17	12	16	12	13	12	12
12	13	B	12	18	B	B	B	28	B	26	B	B	B	B	28	23	29	B	B	B	B	10	13	12
13	13	13	13	12	15	13	12	12	17	20	22	24	23	24	21	22	17	17	17	12	B	B	B	B
14	20	12	14	15	17	15	15	14	16	15	14	17	23	19	22	21	19	20	16	14	11	B	24	12
15	13	12	13	B	B	26	14	B	18	26	15	B	34	41	B	29	26	15	18	B	12	B	B	B
16	14	12	13	12	14	14	13	24	25	22	19	20	16	18	17	14	20	21	17	13	12	12	B	13
17	B	B	B	B	12	13	12	15	18	19	16	14	14	16	14	22	18	14	18	12	B	B	12	12
18	12	12	12	14	12	12	12	12	12	13	14	11	13	13	12	13	12	13	12	11	B	B	B	B
19	12	B	11	12	13	12	12	13	15	14	14	18	18	17	18	30	30	22	B	B	B	12	12	12
20	12	13	19	20	15	13	14	13	14	12	17	14	12	14	15	14	13	12	12	15	12	12	12	12
21	13	14	12	13	12	18	13	12	12	B	B	28	26	25	14	18	20	12	12	12	B	B	B	B
22	B	12	13	13	12	12	12	B	12	20	B	B	35	28	26	24	15	14	15	B	B	B	B	12
23	12	14	12	14	B	B	23	B	20	B	24	B	18	20	19	20	19	14	14	B	B	B	B	12
24	14	13	13	30	22	B	B	B	22	15	13	21	22	19	12	21	19	B	B	B	B	B	11	B
25	B	B	B	B	B	B	26	B	B	B	12	12	24	26	16	22	14	16	12	11	B	B	B	12
26	B	14	11	12	12	13	13	13	13	13	13	23	22	12	22	22	20	17	B	B	B	B	B	B
27	B	B	B	B	12	B	12	13	13	12	13	14	14	13	13	12	12	13	12	12	12	14	13	B
28	B	B	B	25	13	B	24	B	12	12	12	B	29	23	16	13	20	14	15	13	B	13	12	B
29	17	13	15	17	20	B	B	B	B	16	20	12	14	21	22	20	15	12	12	12	12	17	12	10
30	12	13	14	17	13	14	12	12	14	13	14	12	17	13	12	16	13	13	12	12	13	B	B	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	14	16	20	20	20	23	16	24	20	22	21	26	23	24	22	22	20	17	17	16	B	B	14	14
U Q	B	B	B	B	B	B	B 32	B	B	B	B	B	B	B 41	B 28	B 29	B 29	B 27	B	B	B	B	B	B
L Q	12	13	13	14	13	13	13	13	14	15	14	17	17	17	15	18	17	14	12	12	12	14	12	12

APR. 2010 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2010 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	A	A	A	B	B	246	226	222	224	224	228	220	B	B	E A 290	B	A 238	A
2	A	A	A	A	B	B	E A 274	B	B	B	B	B	B	B	B	B	B	B	B	E A 274	A	A	A	A
3	A	A	B	B	A	A	A	B	B	B	242	230	206	206	210	204	220	218	B	A	A	A	A	A
4	A	A	B	A	A	212	B	B	B	B	B	B	B	B	220	238	220	B	B	B	B	B	A	A
5	A	A	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	E B 360	A	A	A	A	A	A
6	B	C	B	A	A	B	B	B	B	B	B	B	B	E B 252	B	B	B	A 218	A	A	220	A	A	B
7	B	A	A	B	B	B	A	B	B	A	B	B	B	B	B	B	B	E S 260	254	A	A	A	A	A
8	238	B	B	B	B	B	B	A	A	B	B	B	B	B	B	B	224	240	B	B	B	B	A	A
9	B	A	B	B	B	126	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	198	A
10	202	A	A	A	A	A	A	A	E B 272	230	B	B	E B 256	224	222	214	204	B	B	E B 254	B	B	B	B
11	B	B	A	A	A	A	A	A	E B 256	242	E B 242	234	204	212	206	210	202	200	220	A	A	A	226	A
12	A	B	A	A	B	B	B	A	B	A	B	B	B	B	E B 266	E B 244	238	B	B	B	B	A	A	A
13	A	A	A	A	A	B	A	E B 270	248	230	226	226	208	214	228	210	212	208	224	B 258	B	B	B	B
14	A	A	A	A	A	A	A	A	E A 292	250	222	228	220	210	206	208	206	206	202	E B 264	244	B	244	A
15	A	A	A 240	B	B	A	E A 284	B	A	E A 296	244	B	E B 274	E B 284	B	226	202	208	228	B	E B 276	B	B	B
16	A	A	196	182	182	A	A	A	A	A	236	224	222	214	212	Q 204	194	208	216	242	232	A 290	B	Y
17	B	B	B	B	198	A	A	E A 304	E B 250	220	220	208	204	212	200	198	192	Q 200	200	230	B	B	Y	A
18	192	192	A	A	A	A	A	A	E A 260	A 226	218	A 196	216	Q 198	208	196	186	188	200	202	B	B	B	B
19	A	B	A	204	236	A	A	E A 306	E A 252	184	212	212	212	220	214	208	196	E B 216	B	B	B	A	A	A
20	A 258	234	A	A	A	A	A	296	264	H 168	218	192	214	Q 210	Q 200	206	Q 184	198	202	226	A 284	E A 272	A	A
21	226	A	A	A	226	A	A	A	A	B	B	262	242	230	214	204	232	Q 204	218	248	B	B	B	B
22	B	A	A	A	A	A	A	B	242	232	B	B	236	214	208	202	194	206	212	B	B	B	B	A
23	A 240	A	A	A	B	B	A	B	A	B	E B 274	B	242	E A 246	230	222	222	208	E A 258	B	B	B	B	A
24	A	A	A	A	A	B	B	B	E B 274	222	222	230	222	222	222	212	194	B	B	B	B	B	208	B
25	B	B	B	B	B	B	A	B	B	B	Q 214	214	216	212	192	202	198	A 222	214	Y	B	B	B	A
26	B	A	198	A	A	A	B	E B 286	Q 220	Q 190	Q 190	212	206	202	200	196	188	206	B	B	B	B	B	B
27	B	B	B	B	232	B	A	A	E A 334	212	224	210	210	204	214	194	Q 184	Q 194	194	216	E B 258	E B 270	Y	B
28	B	B	B	B	A	B	B	B	244	202	214	B	214	206	190	184	188	214	E B 248	E B 278	B	E B 252	E B 256	B
29	A	A	A	A	A	B	B	B	B	278	242	228	234	224	214	200	202	194	194	232	232	A	196	202
30	A	A	A	A	A	A	A	A	A	242	216	224	206	212	208	198	Q 188	208	214	232	232	B	B	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	2	3	2	5	2	2	5	13	16	18	17	22	23	23	24	25	24	17	13	9	4	7	1
MED	232	213	198	193	226	169	E A 279	E 296	E 256	226	220	224	215	213	211	204	202	207	213	234	238	E 271	217	202
U Q	A 240		A 240		234			E A 305	E 273	242	242	230	234	224	222	213	220	218	226	E B 261	E A 280	A 281	244	
L Q	202		196		190			E B 278	246	207	216	211	208	210	206	199	190	202	201	228	232	E B 261	198	

APR. 2010 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2010 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	41	O X 35	A	A	A	27	X 33	O X 43	51	X 56	X 62	71	X 72	X 56	51	O X 33	B	O X 23	23	A	B	O X 28
2	B	B	O X 29	A	X 42	39	38	34	32	43	58	70	X 74	X 68	X 77	O X 94	80	82	R	A	A	A	A	R
3	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 36	A	O X 38	B
4	B	A	B	B	B	B	B	R	O X 32	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
5	44	A	B	B	B	A	A	O X 29	A	O X 35	B	B	B	B	B	B	B	B	B	B	O X 23	B	B	A
6	A	B	A	R	Y	O X 25	O X 26	24	27	B	B	B	B	69	70	O X 54	B	B	B	B	A	B	A	O X 32
7	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	X 58	O X 47	B	B	B	A	A	A	A
8	A	A	A	B	A	B	A	B	A	B	B	B	B	B	O X 56	B	B	34	B	B	B	B	B	R
9	O X 28	X 30	R	R	R	B	R	R	31	X 36	X 47	X 59	X 58	O X 64	O X 52	O X 53	X 37	X 31	O X 26	B	B	B	B	B
10	B	R	B	B	X 31	A	A	A	31	37	O X 50	X 59	X 67	X 58	56	60	38	X 27	O X 24	B	B	B	B	B
11	A	R	O X 40	R	A	A	A	36	X 34	34	X 45	X 58	X 61	57	X 51	X 49	X 36	26	O X 24	23	O X 23	A	A	A
12	A	A	A	38	A	A	A	43	32	X 36	X 46	53	X 53	X 61	X 73	O X 40	X 40	O X 40	B	B	B	B	B	B
13	B	A	A	A	A	B	O X 28	O X 28	X 27	36	X 46	X 56	X 56	X 59	62	45	O X 26	A	24	B	B	B	B	B
14	A	B	A	R	B	B	B	B	Y	30	X 41	X 58	O X 54	O X 53	X 58	X 41	O X 30	B	B	B	B	B	B	B
15	B	B	A	Y	O X 34	A	B	A	A	A	X 40	X 46	X 57	O X 52	X 48	X 44	X 34	O X 22	O X 20	B	A	A	R	A
16	B	B	A	B	35	O X 27	X 29	X 30	X 29	29	X 44	X 47	X 49	X 54	X 48	51	X 25	B	B	B	B	A	A	A
17	A	24	A	38	A	A	B	A	A	X 30	O X 37	50	X 46	X 44	X 44	X 44	X 33	B	A	B	B	A	A	A
18	A	B	A	A	A	A	A	A	A	B	B	B	O X 46	B	O X 68	B	B	B	B	B	B	R	R	A
19	A	A	A	O X 30	R	X 24	O X 27	Y	B	X 28	X 36	X 44	51	X 50	X 48	O X 37	O X 31	A	A	X 27	O X 26	A	A	A
20	A	A	A	A	A	A	A	A	A	A	R	B	B	B	O X 41	X 36	X 33	B	B	B	B	B	A	A
21	A	51	71	B	B	R	B	Y	A	B	B	O X 46	B	B	X 40	38	O X 32	R	R	B	B	B	B	B
22	B	Y	R	A	Y	R	B	B	B	B	X 33	58	X 60	X 49	X 53	B	R	R	R	R	R	B	B	B
23	B	B	B	R	A	A	O X 24	A	A	27	41	46	X 59	X 48	X 49	O X 38	B	B	B	B	B	B	B	B
24	B	R	B	B	B	A	B	B	B	O X 24	X 40	X 47	X 48	O X 48	X 46	36	O X 25	B	B	B	B	R	B	Y
25	R	R	B	A	A	R	A	Y	B	B	34	X 49	O X 55	X 50	O X 53	B	B	B	R	R	B	B	B	R
26	O X 30	A	A	O X 33	A	X 26	O X 25	A	A	X 26	X 31	X 45	59	X 59	X 60	34	O X 28	B	B	B	R	R	R	A
27	A	A	A	34	A	B	A	33	33	32	40	X 48	X 44	52	47	41	X 23	B	B	B	R	B	B	B
28	A	A	R	R	O X 35	O X 37	R	A	B	B	O X 37	51	57	52	X 52	52	B	B	B	B	B	B	R	A
29	A	59	A	A	B	A	A	B	B	B	B	X 34	B	B	B	A	A	A	A	52	61	A	A	A
30	A	A	A	41	R	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	A	46	B	A
31	A	A	B	90	B	R	A	B	A	B	B	B	B	B	B	B	B	B	A	R	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	3	4	4	8	5	6	7	9	11	16	19	21	20	20	24	21	18	8	5	4	6	1	1	2
MED	O X 30	40	40	36	X 35	X 26	O X 27	30	32	33	X 41	X 50	X 56	X 54	X 52	X 44	X 33	X 32	O X 24	25	O X 24	46	O X 38	O X 30
U Q	44	55	56	40	X 38	37	29	35	X 33	X 36	X 46	X 58	X 60	X 60	X 61	X 54	38	37	O X 25	40	36			
L Q	O X 28	27	O X 34	O X 34	X 32	X 25	O X 25	28	X 29	X 28	X 37	X 46	X 50	X 50	X 48	38	O X 28	X 26	22	23	23			

MAY 2010 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2010 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	F 28	R 29	A	A	A	F 18	27	R 37	F 38	50	56	F 61	66	50	F 41	R 27	B	R 17	F 13	A	B	R 22
2	B	B	R 23	A	36	F 26	F 24	F 24	F 22	F 30	Z 52	F 60	68	62	71	88	F 70	R 70	R	A	A	A	A	A
3	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 30	A	R 32	B
4	B	A	B	B	B	B	B	R	R 26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
5	A	A	B	B	B	A	A	R 23	A	R 29	B	B	B	B	B	B	B	B	B	B	R 17	B	B	A
6	A	B	A	A	Y	R 19	R 20	F 15	F 16	B	B	B	B	F 58	F 61	R 48	B	B	B	B	A	B	A	R 26
7	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	52	R 41	B	B	B	A	A	A	A
8	A	A	A	B	A	B	A	B	A	B	B	B	B	B	R 50	B	B	F 24	B	B	B	B	B	R
9	R 22	24	R	A	A	B	A	R	F 20	30	41	53	52	R 58	R 46	R 47	31	25	R 20	B	B	B	B	B
10	B	R	B	B	25	A	A	A	F 21	F 28	R 44	J R 53	61	52	F 44	F 51	F 25	21	R 18	B	B	B	B	B
11	A	A	R 34	R	A	A	A	F 25	28	F 24	39	52	55	F 47	45	43	30	F 17	R 18	F 14	R 17	A	A	A
12	A	A	A	A	A	A	A	28	F 22	30	40	F 43	47	55	67	R 34	34	R 34	B	B	B	B	B	B
13	B	A	A	A	A	B	R 22	R 22	21	F 26	40	50	50	53	F 48	F 34	20	A	F 14	B	B	B	B	B
14	A	B	A	R	B	B	B	B	Y	F 20	35	J R 52	R 48	R 47	52	35	R 24	B	B	B	B	B	B	B
15	B	B	A	Y	28	A	B	A	A	A	34	40	J R 51	R 46	41	38	28	R 16	R 14	B	A	A	A	A
16	B	B	A	B	F 24	R 21	23	24	23	F 19	38	41	43	48	42	F 41	19	B	B	B	B	A	A	A
17	A	F 14	A	F 26	A	A	B	A	A	24	R 31	F 40	40	38	38	38	27	B	A	B	B	A	A	A
18	A	B	A	A	A	A	A	A	A	B	B	B	R 40	B	R 62	B	B	B	B	B	B	A	A	A
19	A	A	A	R 24	A	18	R 21	Y	B	22	30	38	F 41	44	42	R 31	R 25	A	A	21	R 20	A	A	A
20	A	A	A	A	A	A	A	A	A	A	R	B	B	B	R 35	30	27	B	B	B	B	B	A	A
21	A	A	A	B	B	R	B	Y	A	B	B	R 40	B	B	34	F 28	R 26	R	A	B	B	B	B	B
22	B	Y	R	A	Y	R	B	B	B	B	27	F 41	54	43	47	B	R	A	A	R	R	B	B	B
23	B	B	B	A	A	A	R 18	A	A	F 14	F 29	F 38	53	42	43	R 32	B	B	B	B	B	B	B	B
24	B	R	B	B	B	A	B	B	B	R 18	34	41	42	R 42	V 40	F 27	R 19	B	B	B	B	R	B	Y
25	R	A	B	A	A	R	A	Y	B	B	F 24	43	49	44	47	B	B	B	A	A	B	B	B	A
26	R 24	A	A	R 27	A	20	19	A	A	20	25	39	53	53	54	F 24	R 22	B	B	B	R	R	A	A
27	A	A	A	F 24	A	B	A	F 19	F 18	F 19	F 28	42	38	F 39	F 36	F 30	17	B	B	B	R	B	B	B
28	A	A	R	A	R 29	R 31	R	A	B	B	R 31	F 40	F 44	F 41	46	F 40	B	B	B	B	B	B	R	A
29	A	A	A	A	B	A	A	B	B	B	B	H 28	B	B	B	A	A	A	A	F 36	A	A	A	A
30	A	A	A	F 24	R	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	A	F 35	B	A
31	A	A	B	A	B	A	A	B	A	B	B	B	B	B	B	B	B	B	A	A	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	2	3	6	5	6	7	9	11	16	19	21	20	20	24	21	18	8	5	4	5	1	1	2
MED	R 23	19	R 28	25	28	20	R 21	F 23	F 22	24	34	41	50	47	46	38	26	24	R 18	19	R 17	F 35	R 32	R 24
U Q			R 34	R 27	32	26	23	F 24	26	30	40	51	54	54	53	48	31	R 30	R 19	28	R 25			
L Q			R 23	F 24	24	19	19	F 18	F 20	F 20	F 29	40	42	42	42	F 30	22	19	14	16	15			

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2010 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	38	47	36	42	39	33	29	30	E B 22	E B 18	20	24	24	24	24	25	22		B E B 12	E B 12	30	B	24
2	B	B	22	30	43	36	28	E B 12	E B 12	18	18	22	22	30	18	E B 16	25	44	22	51	71	91	66	22
3	70	44	62	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	36	34	43	B
4	B	60	B	B	B	B	B	33	E B 20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	35
5	40	40	B	B	B	37	35	E B 20	35	E B 24	B	B	B	B	B	B	B	B	B	B	18	B	B	40
6	44	B	35	27	17	E B 13	31	E B 13	E B 14	B	B	B	B	E B 38	E B 20	E B 24	B	B	B	B	30	B	43	33
7	68	66	75	67	B	B	B	B	B	B	B	B	B	B	B	E B 27	E B 29	B	B	B	32	31	40	39
8	31	32	40	B	44	B	44	B	43	B	B	B	B	B	E B 29	B	B	E B 12	B	B	B	B	B	18
9	27	28	19	27	34	B	34	24	E B 14	E B 17	E B 16	E B 23	E B 27	E B 28	E B 24	E B 16	E B 15	35	E B 13	B	B	B	B	B
10	B	18	B	B	15	40	40	36	16	E B 14	E B 18	E B 20	E B 20	E B 20	E B 19	E B 17	E B 12	15	16	B	B	B	B	B
11	29	25	32	28	44	42	38	28	E B 14	E B 13	E B 16	E B 18	E B 20	28	E B 18	19	E B 13	E B 14	16	E B 12	21	33	30	34
12	43	32	36	31	40	41	48	34	28	E B 13	E B 17	E B 20	E B 22	E B 21	E B 29	E B 26	E B 14	E B 25	B	B	B	B	B	B
13	B	32	40	35	44	B	21	E B 15	E B 13	E B 12	E B 15	E B 20	E B 20	E B 18	E B 19	E B 15	23	34	E B 12	B	B	B	B	B
14	28	B	30	22	B	B	B	B	17	E B 13	E B 18	E B 24	E B 28	E B 23	E B 20	E B 22	30	B	B	B	B	B	B	B
15	B	B	29	19	32	46	B	50	33	32	26	20	E B 20	25	24	E B 12	E B 12	E B 12	E B 12	B	32	31	24	26
16	B	B	32	B	E B 23	E B 16	E B 13	E B 15	E B 13	E B 13	E B 12	16	18	E B 15	28	28	18	B	B	B	B	33	30	26
17	30	43	53	70	K 48	52	B	40	42	28	32	17	E B 18	E B 16	E B 13	15	24	B	29	B	B	33	30	40
18	42	B	42	41	50	43	43	40	31	B	B	B	E B 37	B	E B 55	B	B	B	B	B	B	32	32	33
19	34	40	K 40	37	32	26	29	17	B	16	15	20	25	27	34	34	26	38	38	22	38	K 39	41	42
20	45	K 42	49	43	68	50	43	38	30	29	30	B	B	B	E B 23	16	E B 15	B	B	B	B	B	31	26
21	69	45	39	B	B	26	B	19	32	B	B	E B 19	B	B	25	19	40	20	30	B	B	B	B	B
22	B	19	22	29	16	19	B	B	B	B	E B 19	E B 21	E B 19	E B 18	36	B	28	32	32	28	21	B	B	B
23	B	B	B	32	40	42	20	25	37	E B 12	E B 13	17	16	E B 13	18	E B 19	B	B	B	B	B	B	B	B
24	B	26	B	B	B	36	B	B	B	32	26	15	17	31	33	E B 13	E B 12	B	B	B	B	18	B	15
25	22	28	B	34	41	21	42	16	B	B	E B 20	E B 20	E B 20	E B 15	E B 15	B	B	B	22	22	B	B	B	28
26	36	74	43	36	79	70	58	50	31	23	22	32	17	E B 19	E B 16	E B 15	E B 12	B	B	B	16	17	27	34
27	50	44	70	51	46	B	50	30	E B 13	18	E B 13	E B 14	E B 14	19	22	28	E B 12	B	B	B	18	B	B	B
28	30	45	18	27	E B 26	E B 23	29	32	B	B	34	28	27	16	16	E B 12	B	B	B	B	B	B	18	30
29	32	36	100	44	B	42	48	B	B	B	B	E B 14	B	B	B	34	58	42	58	80	43	43	89	74
30	44	48	47	66	27	B	B	40	37	70	B	B	B	B	B	B	B	B	B	B	K 32	67	B	50
31	51	42	B	K 254	B	33	42	B	34	B	B	B	B	B	B	B	B	B	43	24	42	K 41	41	44
	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	24	24	23	22	22	21	23	23	19	20	21	20	20	24	22	20	13	13	8	15	15	15	21
MED	38	40	40	35	40	38	38	29	30	E B 18	E B 18	E B 20	E B 20	E B 20	E B 22	E B 19	18	25	22	23	32	33	32	33
U Q	45	44	48	44	44	42	44	38	34	28	24	22	24	28	28	26	27	36	35	40	38	41	43	40
L Q	30	30	31	28	27	26	29	E B 17	E B 14	E B 13	E B 16	17	18	E B 17	E B 18	E B 15	E B 12	E B 14	E B 14	E B 17	18	31	30	26

MAY 2010 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2010 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	12	12	13	13	13	12	12	22	18	17	15	15	14	15	13	13	B	12	12	12	B	12
2	B	B	12	12	12	13	14	12	12	12	13	15	15	14	12	16	12	12	14	13	12	12	17	12
3	12	26	16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	14	12	B
4	B	22	B	B	B	B	B	22	20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	14
5	15	30	B	B	B	22	14	20	20	23	B	B	B	B	B	B	B	B	B	B	12	B	B	18
6	15	B	14	15	12	13	18	13	13	B	B	B	B	38	20	24	B	B	B	B	12	B	12	13
7	18	12	13	29	B	B	B	B	B	B	B	B	B	B	B	26	29	B	B	B	13	13	12	15
8	14	13	13	B	20	B	24	B	19	B	B	B	B	B	29	B	B	12	B	B	B	B	B	12
9	12	12	12	12	20	B	20	14	14	17	16	23	27	28	25	16	15	13	13	B	B	B	B	B
10	B	13	B	B	12	19	14	12	11	14	18	20	20	20	19	17	12	11	12	B	B	B	B	B
11	11	12	13	20	15	13	12	12	14	13	16	18	20	16	18	14	13	14	12	12	12	12	12	12
12	12	14	12	12	14	16	15	12	13	13	17	20	22	21	29	26	14	25	B	B	B	B	B	B
13	B	12	13	20	13	B	16	15	13	12	15	20	21	18	19	15	12	13	12	B	B	B	B	B
14	12	B	12	12	B	B	B	B	12	13	18	24	28	23	20	22	16	B	B	B	B	B	B	B
15	B	B	13	12	12	13	B	17	14	13	14	18	20	16	16	12	12	12	12	B	12	14	18	15
16	B	B	12	B	23	16	13	15	13	13	12	12	13	15	13	12	12	B	B	B	B	11	12	12
17	12	12	12	14	15	20	B	20	16	14	16	15	18	16	13	12	13	B	23	B	B	12	11	12
18	21	B	20	13	14	15	16	12	14	B	B	B	37	B	55	B	B	B	B	B	B	23	13	12
19	13	12	14	13	13	13	13	12	B	12	14	16	16	13	17	18	12	12	12	12	12	12	12	12
20	12	13	13	12	25	14	18	14	13	13	23	B	B	B	23	11	15	B	B	B	B	B	15	13
21	12	13	19	B	B	16	B	14	24	B	B	19	B	B	16	13	14	13	12	B	B	B	B	B
22	B	16	13	13	14	12	B	B	B	B	19	21	19	18	18	B	22	13	14	15	12	B	B	B
23	B	B	B	14	12	13	15	14	12	12	13	12	12	13	14	19	B	B	B	B	B	B	B	B
24	B	12	B	B	B	12	B	B	B	13	12	11	12	13	14	13	12	B	B	B	B	12	B	11
25	12	12	B	13	14	11	12	12	B	B	20	20	20	15	15	B	B	B	12	14	B	B	B	12
26	12	21	16	13	12	13	13	12	13	12	13	13	12	19	16	15	12	B	B	B	12	12	13	12
27	12	20	13	13	16	B	12	12	13	13	13	14	14	12	12	13	12	B	B	B	12	B	B	B
28	12	12	12	13	26	23	14	14	B	B	14	13	14	13	12	12	B	B	B	B	B	B	13	13
29	12	20	20	15	B	20	20	B	B	B	B	14	B	B	B	14	14	14	21	12	29	14	16	12
30	20	14	12	12	20	B	B	26	21	25	B	B	B	B	B	B	B	B	B	B	13	13	B	16
31	21	20	B	20	B	20	25	B	22	B	B	B	B	B	B	B	B	B	12	18	13	12	12	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	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	14	14	13	14	16	16	18	14	14	17	18	20	21	20	19	17	15	B	B	B	B	B	B	14
U Q	B	B 30	B 20	B	B	B	B	B	B	B	B	B	B	B	B 55	B	B	B	B	B	B	B	B	B
L Q	12	12	12	12	13	13	14	12	13	13	14	15	15	15	14	13	12	13	12	18	12	12	12	12

MAY 2010 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2010 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	Q 238	232	A	A	A	A	224	248	Q 204	Q 202	206	202	202	188	198	A 254	B	E B 258	E B 248	A	B	200
2	B	B	A	A	E A 280	A	A	Q 264	E A 282	Q 236	Q 212	206	206	192	224	228	236	192	R	A	A	A	A	A
3	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	204	A	E A 276	B
4	B	A	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
5	A	A	B	B	B	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	A 234	B	B	A
6	A	B	A	A	Y	B	B	E B 314	E B 302	B	B	B	B	224	202	188	B	B	B	B	A	B	A	A
7	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	222	214	B	B	B	A	A	A	A
8	A	A	A	B	A	B	A	B	A	B	B	B	B	B	226	B	B	202	B	B	B	B	B	A
9	A	242	A	A	A	B	A	A	E B 298	234	216	202	208	206	202	188	188	200	E B 218	B	B	B	B	B
10	B	A	B	B	A	A	A	A	A 298	222	Q 218	200	192	190	Q 200	Q 200	Q 180	204	A 254	B	B	B	B	B
11	A	A	E A 270	A	A	A	A	E A 286	E B 272	252	218	196	204	192	Q 186	Q 194	194	E B 264	A 246	238	E A 262	A	A	A
12	A	A	A	A	A	A	A	A	A	Q 246	Q 226	204	194	210	200	202	216	264	B	B	B	B	B	B
13	B	A	A	A	A	B	A	E B 300	E B 264	Q 216	Q 196	194	190	Q 204	194	Q 190	Q 180	A	238	B	B	B	B	B
14	A	B	A	A	B	B	B	B	Y	238	216	198	190	188	192	200	216	B	B	B	B	B	B	B
15	B	B	A	Y	A	A	B	A	A	A	238	216	204	190	192	196	184	E B 244	B	B	A	A	A	A
16	B	B	A	B	E B 266	B	E B 294	B	B	E B 242	198	188	200	180	190	Q 184	204	B	B	B	B	A	A	A
17	A	240	A	202	A	A	B	A	A	E A 302	A	Q 216	216	204	H 174	Q 208	222	B	A	B	B	A	A	A
18	A	B	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
19	A	A	A	228	A	E A 248	A	Y	B	272	218	224	Q 214	Q 200	200	A 226	E A 256	A	A	E A 288	E A 244	A	A	A
20	A	A	A	A	A	A	A	A	A	216	A	B	B	B	222	234	216	B	B	B	B	B	A	A
21	A	A	A	B	B	A	B	Y	A	B	B	214	B	B	196	Q 200	A 238	A	A	B	B	B	B	B
22	B	Y	A	A	Y	A	B	B	B	B	230	Q 218	Q 192	204	200	B	A	A	A	A	A	B	B	B
23	B	B	B	A	A	A	A	A	A	E B 256	222	182	Q 198	Q 184	188	194	B	B	B	B	B	B	B	B
24	B	A	B	B	B	A	B	B	B	B 274	208	196	190	182	196	186	214	B	B	B	B	A	B	Y
25	A	A	B	A	A	A	A	Y	B	B	E B 264	E B 226	198	204	188	B	B	B	B	A	A	B	B	A
26	206	A	A	216	A	A	A	A	A	A	206	220	Q 208	210	198	200	200	B	B	B	A	A	A	A
27	A	A	A	A	A	B	A	A	B 288	262	Q 196	210	Q 184	198	Q 186	Q 190	190	B	B	B	A	B	B	B
28	A	A	A	A	B	B	A	A	B	B	A	Q 222	Q 204	Q 198	Q 204	Q 188	B	B	B	B	B	B	R	A
29	A	A	A	A	B	A	A	B	B	B	B	E B 292	B	B	B	A	A	A	A	A	A	A	A	A
30	A	A	A	198	A	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	A	218	B	A
31	A	A	B	A	B	A	A	B	A	B	B	B	B	B	B	B	B	B	A	A	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	2	2	5	2	1	1	4	8	15	17	21	19	20	23	21	18	8	4	3	5	1	1	1
MED	206	241	254	216	E 273	E A 248	E B 294	E 293	E B 285	242	216	204	200	199	198	196	206	U 212	242	E 258	E A 244	218	E A 276	200
U Q				230				E B 307	E B 298	262	224	219	206	204	202	205	216	259	A 250	E A 288	E 255			
L Q				200				275	E B 268	234	Q 205	197	192	190	190	188	190	201	228	238	219			

MAY 2010 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2010 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	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	A	A
2	A	B	A	B	A	B	B	R	B	A	R	O X 37	O X 40	O X 45	X 40	X 35	X 32	B	B	B	B	B	B	A
3	A	A	R	O X 33	A	A	A	A	A	B	B	B	X 46	B	B	B	B	B	B	B	B	B	R	A
4	A	A	B	B	B	49	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R
5	R	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R
6	A	A	B	B	B	A	B	B	A	B	B	B	B	O X 46	R	B	B	B	B	B	B	A	A	A
7	A	A	A	A	B	A	A	R	B	R	B	O X 41	X 43	O X 48	O X 40	O X 36	B	B	B	B	B	B	B	A
8	A	A	A	A	59	A	X 26	B	R	A	X 27	X 38	42	X 36	X 36	39	R	B	B	B	B	B	B	B
9	B	R	R	45	O X 32	A	X 27	X 27	O X 26	A	X 32	X 33	X 42	O X 38	O X 38	X 34	B	B	B	A	B	A	R	B
10	B	B	A	A	A	A	A	X 30	37	34	33	41	42	43	X 40	X 31	O X 28	A	B	B	A	B	B	R
11	A	R	O X 28	A	A	A	A	A	R	B	X 28	42	50	43	42	30	A	B	O X 23	B	B	B	R	A
12	A	A	A	A	A	A	A	A	B	B	31	38	X 40	40	X 36	X 37	R	A	R	B	B	B	B	A
13	A	A	A	A	R	R	O X 32	R	R	B	B	X 36	46	B	X 39	B	B	B	B	R	A	R	A	A
14	A	A	A	A	A	A	A	A	A	A	B	B	B	O X 39	O X 39	B	B	B	B	A	A	B	B	R
15	A	A	X 30	B	A	A	O X 29	X 26	B	A	30	O X 38	X 40	41	B	O X 38	B	B	B	A	B	B	Y	O X 22
16	B	68	A	A	B	A	B	A	B	B	B	B	B	B	B	B	B	B	B	A	B	O X 28	A	A
17	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	A	A
18	57	A	A	65	A	A	A	B	A	A	32	O X 38	X 39	X 48	O X 46	B	B	B	B	A	R	Y	B	B
19	O X 23	A	A	R	X 31	O X 32	A	X 30	B	B	X 26	X 34	X 38	X 37	40	O X 28	B	B	Y	B	A	A	B	B
20	B	A	A	A	B	R	A	A	A	B	30	36	X 42	41	37	X 30	R	Y	A	R	A	A	A	A
21	A	A	A	R	A	A	A	R	A	A	X 24	34	X 39	X 50	34	O X 29	R	B	R	A	A	B	R	A
22	A	A	A	A	A	A	A	A	A	A	O X 30	36	X 42	X 48	34	X 27	B	A	A	A	A	A	Y	A
23	A	A	A	A	A	A	A	Y	A	A	27	37	41	B	B	B	B	B	B	B	Y	B	A	R
24	B	A	A	R	B	B	R	B	B	B	O X 29	X 35	X 37	X 45	X 33	X 33	B	B	A	A	R	A	R	A
25	A	A	R	A	A	A	A	R	O X 27	R	31	36	X 39	X 36	44	30	A	A	A	B	B	B	B	A
26	A	A	41	A	59	68	A	A	Y	A	A 32	B	B	B	B	B	B	B	B	B	B	A	A	A
27	A	X 32	B	A	A	A	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	A	A	A
28	A	A	B	B	A	A	B	A	A	R	O X 33	X 34	B	B	B	B	B	B	B	A	B	B	B	R
29	A	A	Y	A	A	A	A	B	A	A	R	B	B	B	B	B	B	R	B	B	B	B	34	A
30	A	A	B	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	A	B	O X 26	C	C
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	2	2	3	3	4	3	4	4	3	1	16	18	18	17	16	14	2		1			2	1	1
MED	40	50	X 30	45	46	49	X 28	X 28	O X 27	34	30	X 36	X 42	X 43	X 39	X 32	X 30		O X 23			O X 27	34	O X 22
U Q			41	65	59	68	O X 30	X 30	37		32	O X 38	X 42	X 47	X 40	X 36								
L Q			O X 28	O X 33	X 32	O X 32	X 26	X 26	O X 26		X 28	X 35	X 39	X 38	X 36	X 30								

JUN. 2010 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2010 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	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	A	A
2	A	B	A	B	A	B	B	A	B	R	R	R 31	R 34	R 39	34	29	26	B	B	B	B	B	B	A
3	A	A	R	R 27	A	A	A	A	A	B	B	B	40	B	B	B	B	B	B	B	B	B	R	A
4	A	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	A
5	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R
6	A	A	B	B	B	A	B	B	A	B	B	B	B	U R 40	R	B	B	B	B	B	B	A	A	A
7	A	A	A	A	B	A	A	R	B	R	B	R 35	37	R 42	R 34	R 30	B	B	B	B	B	B	B	A
8	A	A	A	A	A	A	20	B	R	A	21	32	F 32	30	30	F 29	R	B	B	B	B	B	B	B
9	B	R	A	A	R 26	A	21	21	R 20	A	26	27	36	R 32	R 32	28	B	B	B	A	B	A	A	B
10	B	B	A	A	A	A	A	24	F 22	F 20	F 21	F 29	F 31	F 32	34	25	R 22	A	B	B	A	B	B	R
11	A	R	R 22	A	A	A	A	A	R	B	22	Z 36	F 41	F 34	F 31	F 18	A	B	R 17	B	B	B	R	A
12	A	A	A	A	A	A	A	A	B	B	F 20	F 28	34	F 29	30	31	R	A	R	B	B	B	B	A
13	A	A	A	A	A	A	R 26	A	R	B	B	30	F 36	B	33	B	B	B	B	A	A	A	A	A
14	A	A	A	A	A	A	A	A	A	A	B	B	B	R 33	R 33	B	B	B	B	A	A	B	B	A
15	A	A	24	B	A	A	R 23	20	B	A	F 19	R 32	34	F 30	B	R 32	B	B	B	A	B	B	Y	R 16
16	B	A	A	A	B	A	B	A	B	B	B	B	B	B	B	B	B	B	B	A	B	R 22	A	A
17	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
18	A	A	A	A	A	A	A	B	A	A	F 22	R 32	33	42	R 40	B	B	B	B	A	A	Y	B	B
19	R 17	A	A	A	25	R 26	A	24	B	B	20	28	32	31	F 30	R 22	B	B	Y	B	A	A	B	B
20	B	A	A	A	B	A	A	A	A	B	F 17	F 27	36	F 30	F 26	24	R	Y	A	R	A	A	A	A
21	A	A	A	A	A	A	A	A	A	A	18	28	33	44	F 23	R 23	R	B	A	A	A	B	A	A
22	A	A	A	A	A	A	A	A	A	A	R 24	F 26	36	42	F 24	21	B	A	A	A	A	A	Y	A
23	A	A	A	A	A	A	A	Y	A	A	F 15	F 26	F 30	B	B	B	B	B	B	B	Y	B	A	A
24	B	A	A	A	B	B	A	B	B	B	R 23	29	31	39	27	27	B	B	A	A	A	A	A	A
25	A	A	A	A	A	A	A	R	R 21	R	F 21	30	33	30	F 34	24	A	A	A	B	B	B	B	A
26	A	A	F 28	A	A	A	A	A	Y	A	A	B	B	B	B	B	B	B	B	B	B	A	A	A
27	A	26	B	A	A	A	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	A	A	A
28	A	A	B	B	A	A	B	A	A	A	R 27	28	B	B	B	B	B	B	B	A	B	B	B	A
29	A	A	Y	A	A	A	A	B	A	A	A	B	B	B	B	B	B	R	B	B	B	B	B	A
30	A	A	B	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	A	B	R 20	C	C
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	1	1	3	1	2	1	4	4	3	1	15	18	18	17	16	14	2		1			2		1
MED	R 17	26	24	R 27	26	R 26	22	22	R 21	F 20	21	29	34	33	32	26	24		R 17			R 21		R 16
U Q			F 28				R 24	24	F 22		R 23	R 32	36	41	34	29								
L Q			R 22				20	20	R 20		F 19	F 28	F 32	F 30	F 28	23								

JUN. 2010 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2010 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	27	B	B	B	B	B	39	B	B	B	B	B	B	B	B	B	B	B	B	B	B	K 21	51	42
2	56	B	34	B	50	B	B	32	B	24	22	E B 19	E B 26	E B 22	E B 20	E B 15	18	B	B	B	B	B	B	31
3	36	39	18	34	43	39	40	37	36	B	B	B	27	B	B	B	B	B	B	B	B	B	22	71
4	44	71	B	B	B	28	34	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	21	28
5	33	46	37	40	40	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	16
6	30	56	B	B	B	33	B	B	41	B	B	B	B	E B 26	E B 24	B	B	B	B	B	B	31	K 35	38
7	40	46	44	40	B	40	56	32	B	34	B	27	22	E B 16	E B 18	E B 22	B	B	B	B	B	B	B	29
8	29	33	35	37	48	37	31	B	25	33	41	43	29	32	15	32	26	B	B	B	B	B	B	B
9	B	22	30	31	32	32	32	32	15	42	15	22	E B 17	E B 20	E B 23	42	B	B	B	28	B	32	26	B
10	B	B	29	65	69	49	48	33	25	28	E B 13	E B 12	31	28	25	E B 14	E B 13	27	B	B	30	B	B	18
11	32	22	46	38	39	52	43	38	24	B	22	22	18	21	22	33	32	B	16	B	B	B	15	58
12	66	56	32	34	82	74	41	43	B	B	E B 13	16	28	E B 13	17	E B 13	16	27	G 15	B	B	B	B	24
13	26	42	51	38	30	32	27	32	22	B	B	E B 16	32	B	E B 20	B	B	B	B	20	28	22	38	32
14	41	41	43	44	45	43	44	38	34	32	B	B	B	E B 27	E B 29	B	B	B	B	30	64	B	B	19
15	30	33	37	B	43	44	36	38	B	44	29	E B 17	22	E B 13	B	E B 20	B	B	B	30	B	B	15	26
16	B	41	K 51	42	B	69	B	41	B	B	B	B	B	B	B	B	B	B	B	36	B	32	44	37
17	43	42	51	53	B	48	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	20	25	70
18	41	K 44	K 41	42	40	47	57	B	32	35	25	E B 20	E B 20	E B 22	E B 22	B	B	B	B	34	20	18	B	B
19	23	30	34	30	22	27	34	E B 24	B	B	E B 13	E B 12	15	E B 14	E B 14	E B 15	B	B	16	B	30	31	B	B
20	B	31	34	28	B	28	28	40	30	B	E B 13	28	19	26	E B 12	E B 12	17	16	28	25	37	44	40	30
21	34	31	31	30	33	36	30	25	33	48	32	E B 16	21	24	20	31	19	B	28	72	42	B	30	36
22	65	66	105	75	51	58	42	57	28	32	69	66	69	E B 13	30	E B 13	B	51	52	40	31	31	16	31
23	36	50	47	44	38	33	28	17	29	30	30	28	36	B	B	B	B	B	B	B	16	B	26	22
24	B	30	33	28	B	B	30	B	B	B	22	E B 12	16	16	E B 14	E B 13	B	B	30	32	27	32	28	30
25	35	30	30	35	72	40	37	22	16	16	16	23	25	25	22	22	69	26	33	B	B	B	B	24
26	33	81	72	51	43	37	62	52	17	30	31	B	B	B	B	B	B	B	B	B	B	44	42	44
27	46	68	B	43	43	48	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	28	38	40
28	34	40	B	B	37	44	B	33	33	22	18	28	B	B	B	B	B	B	B	41	B	B	B	21
29	30	31	20	44	43	48	34	B	30	31	28	B	B	B	B	B	B	20	B	B	B	B	E B 25	29
30	70	91	B	38	42	B	B	63	B	B	B	B	B	B	B	B	B	B	B	30	B	27	C	C
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	25	27	24	24	22	25	23	20	17	15	18	18	18	17	17	14	8	6	8	12	10	14	18	25
MED	35	41	36	39	43	40	37	35	29	32	22	21	23	E B 22	E B 20	E B 18	18	26	28	31	30	31	27	30
U Q	44	56	46	44	48	48	43	40	33	35	30	28	29	26	E B 24	31	29	27	32	38	37	32	38	39
L Q	30	31	32	34	38	33	31	32	23	28	E B 15	E B 16	19	E B 15	E B 16	E B 13	16	20	16	29	27	22	22	24

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2010 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	15	B	B	B	B	B	22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	12	20
2	18	B	24	B	20	B	B	29	B	19	15	19	26	22	20	15	13	B	B	B	B	B	B	12
3	19	12	12	14	16	16	29	12	13	B	B	B	18	B	B	B	B	B	B	B	B	B	12	38
4	14	14	B	B	B	13	20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	13	12
5	12	15	16	18	18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12
6	12	26	B	B	B	21	B	B	13	B	B	B	B	26	24	B	B	B	B	B	B	20	12	12
7	24	12	12	20	B	25	29	21	B	22	B	18	16	16	18	22	B	B	B	B	B	B	B	20
8	11	11	12	12	18	12	12	B	12	12	12	14	12	14	11	13	12	B	B	B	B	B	B	B
9	B	13	12	12	11	11	13	12	11	13	13	13	17	20	23	14	B	B	B	14	B	12	20	B
10	B	B	12	12	11	12	14	13	13	12	13	12	12	12	13	14	13	13	B	B	15	B	B	12
11	12	12	12	25	18	13	14	16	17	B	120	13	12	13	14	13	13	B	12	B	B	B	12	20
12	13	13	12	12	12	12	12	13	B	B	13	12	12	13	12	13	13	13	12	B	B	B	B	12
13	12	12	12	12	13	12	12	12	13	B	B	16	12	B	20	B	B	B	B	13	13	11	12	12
14	12	14	14	17	13	12	13	20	20	15	B	B	B	27	29	B	B	B	B	20	18	B	B	12
15	12	12	11	B	17	14	13	12	B	13	12	17	13	13	B	20	B	B	B	13	B	B	13	12
16	B	21	13	19	B	24	B	17	B	B	B	B	B	B	B	B	B	B	B	20	B	13	12	18
17	24	17	15	14	B	14	19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	13	21
18	19	17	12	21	22	15	14	B	22	22	17	20	20	22	22	B	B	B	B	13	15	13	B	B
19	12	11	12	11	13	12	14	24	B	B	13	12	11	14	14	15	B	B	12	B	13	12	B	B
20	B	12	12	12	B	18	21	13	13	B	13	13	13	13	12	12	12	12	11	12	13	13	12	12
21	12	12	11	11	12	12	12	12	12	12	11	16	13	13	13	14	13	B	13	14	13	B	16	12
22	12	11	12	12	12	12	12	15	13	12	13	13	13	13	13	13	B	13	13	13	13	12	12	11
23	12	12	13	12	12	12	12	12	12	12	12	12	12	B	B	B	B	B	B	B	12	B	12	12
24	B	13	12	12	B	B	14	B	B	B	14	12	12	12	14	13	B	B	13	12	12	14	14	12
25	12	12	12	12	18	27	14	13	13	13	12	12	11	12	12	12	13	14	19	B	B	B	B	16
26	12	30	12	14	13	13	13	14	13	20	25	B	B	B	B	B	B	B	B	B	B	12	22	12
27	12	13	B	30	18	16	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	23	12	12
28	16	14	B	B	28	16	B	20	16	13	13	13	B	B	B	B	B	B	B	16	B	B	B	12
29	12	13	14	14	22	25	28	B	22	14	20	B	B	B	B	B	B	13	B	B	B	B	25	12
30	14	14	B	16	20	B	B	16	B	B	B	B	B	B	B	B	B	B	B	21	B	12	C	C
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	29	30	30	30	30	30	30	30	30	30	30	30	29	29
MED	12	13	12	14	18	14	14	18	21	B	17	18	18	24	24	B	B	B	B	B	B	B	16	12
U Q	B 19	17	B 16	B 25	B	B 25	B 29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	20
L Q	12	12	12	12	13	12	13	13	13	13	13	13	12	13	14	14	13	B	19	14	15	12	12	12

JUN. 2010 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2010 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	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
2	A	B	A	B	A	B	B	A	B	A	A	228	E B 258	216	208	200	208	B	B	B	B	B	B	A
3	A	A	A	208	A	A	A	A	A	B	B	B	230	B	B	B	B	B	B	B	B	B	A	A
4	A	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
5	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R
6	A	A	B	B	B	A	B	B	A	B	B	B	B	228	202	B	B	B	B	B	B	A	A	A
7	A	A	A	A	B	A	A	A	B	A	B	A 270	242	198	198	276	B	B	B	B	B	B	B	A
8	A	A	A	A	A	A	208	B	A	A	250	194	Q 190	194	202	Q 196	A	B	B	B	B	B	B	B
9	B	A	A	A	A	A	222	A	A	A	A 250	196	212	194	202	198	B	B	B	A	B	A	A	B
10	B	B	A	A	A	A	A	210	234	E A 278	Q 232	Q 206	202	Q 186	Q 200	212	208	A	B	B	A	B	B	R
11	A	A	248	A	A	A	A	A	A	B	A 254	196	Q 202	Q 196	204	188	A	B	240	B	B	B	R	A
12	A	A	A	A	A	A	A	A	B	B	214	Q 206	210	Q 178	212	194	R	A	A	B	B	B	B	A
13	A	A	A	A	A	A	A	A	A	B	B	234	Q 214	B	210	B	B	B	B	A	A	A	A	A
14	A	A	A	A	A	A	A	A	A	A	B	B	B	E B 236	226	B	B	B	B	A	A	B	B	A
15	A	A	214	B	A	A	212	222	B	A	E A 256	234	208	216	B	234	B	B	B	A	B	B	Y	202
16	B	A	A	A	B	A	B	A	B	B	B	B	B	B	B	B	B	B	B	A	B	220	A	A
17	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	198
18	A	A	A	A	A	A	A	B	A	A	E B 254	E B 252	E B 224	226	206	B	B	B	B	A	A	196	B	B
19	A	A	A	A	A	B	A	E B 252	B	B	236	196	Q 190	198	192	202	B	B	Y	B	A	A	B	B
20	B	A	A	A	B	A	A	A	A	B	E B 258	204	Q 194	206	184	188	A	A	A	A	A	A	A	A
21	A	A	A	A	A	A	A	A	A	A	E A 280	222	232	198	192	206	A	B	A	A	A	B	A	A
22	A	A	A	A	A	A	A	A	A	A	A	212	212	192	192	210	B	A	A	A	A 198	A	Y	A
23	A	A	A	A	A	A	A	A	A	A	A 214	Q 228	216	B	B	B	B	B	B	B	Y	B	A	A
24	B	A	A	A	B	B	A	B	B	B	E A 280	192	200	190	188	180	B	B	A	A	A	A	A	A
25	A	A	A	A	A	A	A	A	A	224	234	208	212	198	Q 186	196	A	A	A	B	B	B	B	A
26	A	A	224	A	A	A	A	A	Y	A	A	B	B	B	B	B	B	B	B	B	B	A	A	A
27	A	198	B	A	A	A	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	A	A	A
28	A	A	B	B	A	A	B	A	A	A	A 236	E A 268	B	B	B	B	B	B	B	A	B	B	B	A
29	A	A	A	A	A	A	A	B	A	A	A	B	B	B	B	B	B	A	B	B	B	B	228	A
30	A	A	B	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	A	B	206	C	C
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		1	3	1			3	3	1	2	14	18	18	17	17	14	2		1		1	3	1	2
MED		198	224	208			212	216	234	251	U 236	208	210	198	202	199	208		240		A 198	206	228	200
U Q			248				222	E B 252			E A 256	234	224	216	207	210						220		
L Q			214				208	210			234	196	Q 202	193	192	194						196		

JUN. 2010 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2010 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	B	A	Y	A	A
2	42	A	A	B	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
3	R	B	A	B	B	R	B	B	R	B	O X 33	O X 39	O X 40	X 40	O X 42	B	B	B	B	B	B	B	Y	A
4	A	A	A	A	B	B	R	B	B	B	X 30	X 33	O X 42	X 40	X 42	O X 40	B	B	R	Y	Y	B	B	R
5	A	A	A	Y	A	R	R	Y	B	A	O X 28	X 36	X 44	O X 58	O X 36	B	B	R	B	B	B	B	A	A
6	R	A	A	A	A	A	A	R	Y	Y	X 28	X 39	40	43	40	33	A	A	B	B	A	A	A	A
7	X 28	A	O X 31	A	A	A	B	Y	B	A	B	X 39	X 39	41	X 42	X 33	B	Y	A	A	A	B	B	R
8	Y	A	A	O X 31	A	R	A	B	R	O X 24	31	X 37	X 40	X 47	X 40	45	O X 24	R	B	B	B	B	B	B
9	A	A	A	X 33	A	A	A	A	A	A	B	O X 39	B	B	60	B	B	B	B	B	B	B	B	A
10	A	A	A	A	A	A	A	B	B	B	35	46	44	X 41	X 38	36	X 27	R	B	B	R	R	R	A
11	A	Y	A	A	A	A	A	A	B	B	O X 31	O X 39	47	X 45	X 38	O X 31	25	B	B	B	B	B	Y	B
12	A	A	A	A	33	33	31	X 27	X 24	O X 24	31	X 38	X 41	X 42	X 34	X 42	29	B	B	R	R	B	O X 28	O X 27
13	O X 27	A	A	X 27	A	30	X 26	X 28	O X 28	25	32	41	X 38	X 44	X 36	X 36	B	B	B	B	B	B	B	B
14	B	A	O X 30	B	A	A	O X 28	O X 28	A	A	30	41	X 42	X 42	X 43	O X 36	B	B	B	B	B	B	B	R
15	A	A	A	A	B	A	B	B	B	B	B	B	B	O X 42	B	B	B	B	B	B	B	B	O X 25	A
16	A	A	A	A	A	O X 24	A	R	A	O X 23	32	O X 40	X 42	X 51	X 46	O X 36	B	B	R	R	B	B	B	R
17	R	X 28	32	A	A	A	A	A	A	A	36	44	X 44	X 42	X 41	37	X 23	Y	O X 22	B	A	A	A	Y
18	A	A	A	A	X 34	R	R	A	R	30	35	X 40	X 48	R 47	X 42	33	R	R	A	B	A	A	B	B
19	R	B	A	A	A	28	28	28	A	27	36	X 43	X 44	53	X 41	38	O X 26	A	A	R	Y	Y	B	R
20	R	R	R	A	48	31	A	A	A	31	34	B	B	O X 51	O X 44	O X 36	29	A	R	B	B	B	B	R
21	29	31	30	A	A	36	X 30	B	B	B	O X 38	X 43	X 46	X 46	46	X 32	R	A	A	A	Y	A	O X 29	R
22	O X 28	A	X 27	X 38	33	A	A	A	A	34	36	51	X 56	X 49	X 45	X 40	X 32	O X 26	A	B	B	B	B	A
23	O X 28	A	O X 29	X 23	31	28	A	A	A	A	X 37	X 43	57	X 52	52	42	X 30	X 29	O X 26	A	A	A	A	A
24	X 31	A	A	52	41	46	R	Y	B	27	X 37	X 56	X 53	X 57	X 56	X 48	X 29	A	A	A	B	X 22	25	X 20
25	O X 26	A	A	A	A	A	B	X 24	26	X 24	X 37	X 42	X 46	O X 52	X 50	X 41	37	28	30	Y	B	A	A	A
26	A	A	44	A	A	A	A	A	B	B	B	X 47	49	X 49	60	X 40	X 34	37	X 24	B	B	B	B	A
27	A	O X 29	A	A	B	A	A	B	B	B	O X 36	B	B	B	B	B	B	B	B	B	A	O X 28	R	A
28	A	A	A	A	B	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	A	B	O X 28	A
29	O X 29	A	B	B	A	A	B	A	R	O X 30	X 36	B	B	X 65	B	B	B	X 31	O X 32	B	B	R	A	B
30	O X 26	A	O X 31	A	A	A	A	A	R	B	B	B	O X 62	X 62	X 60	B	B	B	O X 26	A	B	B	O X 27	O X 31
31	A	A	A	A	B	A	A	O X 28	R	X 34	X 46	X 48	X 66	X 60	X 67	X 52	39	X 30	40	B	B	B	B	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	3	8	6	6	8	5	6	3	12	23	23	23	26	25	21	13	6	7			2	6	3
MED	O X 28	X 29	X 30	X 32	34	30	X 28	X 28	X 26	27	X 35	X 41	X 44	X 47	X 42	X 37	X 29	X 30	O X 26			X 25	O X 28	O X 27
U Q	X 29	31	32	38	41	34	30	O X 28	O X 28	30	X 36	44	X 49	X 52	X 51	X 42	33	31	32				O X 28	O X 31
L Q	O X 27	X 28	X 30	X 27	33	28	27	X 27	X 24	O X 24	31	X 39	X 41	X 42	X 40	34	X 26	28	X 24				25	X 20

JUL. 2010 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2010 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	B	A	Y	A	A
2	A	A	A	B	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
3	R	B	A	B	B	R	B	B	R	B	R 27	R 33	R 34	J R 34	36	B	B	B	B	B	B	B	Y	A
4	A	A	A	A	B	B	A	B	B	B	24	J R 27	R 36	34	36	R 34	B	B	R	Y	Y	B	B	A
5	A	A	A	Y	A	A	R	Y	B	A	R 22	30	38	R 52	R 30	B	B	A	B	B	B	B	A	A
6	A	A	A	A	A	A	A	A	Y	Y	22	33	F 30	F 33	F 29	F 23	A	A	B	B	A	A	A	A
7	J R 22	A	R 25	A	A	A	B	Y	B	A	B	33	33	F 31	36	27	B	Y	A	A	A	B	B	R
8	Y	A	A	R 25	A	R	A	B	A	R 18	F 20	31	34	41	34	F	R 18	R	B	B	B	B	B	B
9	A	A	A	J R 27	A	A	A	A	A	A	B	33	B	B	R 33	B	B	B	B	B	B	B	B	A
10	A	A	A	A	A	A	A	B	B	B	F 20	F 37	F 34	35	32	F 26	21	R	B	B	R	A	R	A
11	A	Y	A	A	A	A	A	A	B	B	R 25	R 33	F 36	39	32	25	F 15	B	B	B	B	B	Y	B
12	A	A	A	A	F 23	F 20	F 21	21	18	R 18	F 20	32	35	36	28	36	F 18	B	B	A	A	B	R 22	R 21
13	R 21	A	A	21	A	F 20	20	22	R 22	F 14	F 22	F 31	32	38	30	30	B	B	B	B	B	B	B	B
14	B	A	R 24	B	A	A	R 22	R 22	A	A	F 21	F 31	36	36	37	R 30	B	B	B	B	B	B	B	R
15	A	A	A	A	B	A	B	B	B	B	B	B	B	R 36	B	B	B	B	B	B	B	B	R 19	A
16	A	A	A	A	A	R 18	A	R	A	R 17	F 23	R 34	36	45	40	R 30	B	B	A	A	B	B	B	R
17	R	22	F 22	A	A	A	A	A	A	A	F 25	F 34	38	36	35	F 27	17	Y	R 16	B	A	A	A	Y
18	A	A	A	A	28	R	R	A	R	F 20	F 23	34	42	41	36	F 22	A	A	A	B	A	A	B	B
19	A	B	A	A	A	F 19	F 20	F 18	A	21	F 22	37	38	F 40	35	F 26	R 20	A	A	A	Y	Y	B	R
20	R	A	A	A	F 26	F 23	A	A	A	F 19	F 24	B	B	R 45	R 38	R 30	F 19	A	R	B	B	B	B	R
21	F 20	F 20	F 20	A	A	F 26	24	B	B	B	R 32	37	40	40	F 37	26	A	A	A	A	Y	A	R 23	A
22	R 22	A	21	J R 32	F 20	A	A	A	A	F 24	F 27	F 38	V 46	43	39	34	26	R 20	A	B	B	B	B	A
23	R 22	A	R 23	17	F 21	F 18	A	A	A	A	31	37	F 47	46	F 42	F 30	24	23	R 20	A	A	A	A	A
24	J R 25	A	A	R 25	F 31	F 32	R	Y	B	F 18	31	50	47	J R 51	50	42	23	A	A	A	B	16	F 14	14
25	R 20	A	A	A	A	A	B	J R 18	F 18	18	31	36	40	R 46	44	35	F 27	F 18	F 20	Y	B	A	A	A
26	A	A	A	A	A	A	A	A	B	B	B	41	F 40	43	54	34	V 28	F 24	18	B	B	B	B	A
27	A	R 23	A	A	B	A	A	B	B	B	R 30	B	B	B	B	B	B	B	B	B	A	R 22	R	A
28	A	A	A	A	B	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	A	B	R 22	A
29	23	A	B	B	A	A	B	A	A	R 24	J R 30	B	B	J R 59	B	B	B	25	R 26	B	B	A	A	B
30	R 20	A	R 25	A	A	A	A	A	R	B	B	B	R 56	56	54	B	B	B	R 20	A	B	B	R 21	R 25
31	A	A	A	A	B	A	A	R 22	R	28	40	42	60	54	61	46	F 30	24	F 28	B	B	B	B	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	9	3	7	6	6	8	5	6	3	12	23	23	23	26	25	20	13	6	7			2	6	3
MED	R 22	22	R 23	R 25	F 24	F 20	21	22	18	18	24	34	38	40	36	30	21	24	R 20			19	R 22	R 21
U Q	J R 22	R 23	R 25	J R 27	28	F 24	23	R 22	R 22	22	30	37	42	R 46	41	34	26	24	26				R 22	R 25
L Q	R 20	F 20	21	21	F 21	F 18	20	18	18	18	F 22	32	34	36	32	F 26	18	20	18				19	14

JUL. 2010 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2010 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	B	34	16	29	48
2	36	70	55	B	B	B	B	32	34	B	B	B	B	B	B	B	B	B	B	B	B	B	B	41
3	K 33	B	66	B	B	32	B	B	30	B	E B 13	E B 25	E B 19	E B 22	E B 15	B	B	B	B	B	B	B	18	30
4	34	38	33	34	B	B	29	B	B	B	E B 11	E B 14	E B 12	E B 12	E B 23	E B 22	B	B	22	18	16	B	B	23
5	30	64	70	19	31	30	22	15	B	32	29	16	22	E B 19	E B 24	B	B	21	B	B	B	B	30	30
6	25	32	36	32	33	36	41	31	17	15	16	E B 14	E B 16	19	16	E B 13	34	42	B	B	33	29	27	30
7	32	29	30	35	58	32	B	18	B	31	B	32	22	19	16	17	B	16	31	33	34	B	B	19
8	17	44	40	32	32	24	32	B	26	E B 12	E B 13	15	18	30	16	28	E B 13	18	B	B	B	B	B	B
9	31	37	44	48	70	61	43	43	43	34	B	E B 27	B	B	J A 25	B	B	B	B	B	B	B	B	29
10	32	34	30	35	32	35	42	B	B	B	E B 12	E B 12	19	37	17	36	16	17	B	B	21	24	17	43
11	27	16	32	29	43	51	41	32	B	B	E B 14	42	30	22	E B 15	E B 16	15	B	B	B	B	B	15	B
12	26	32	82	43	70	68	51	30	31	33	E B 13	15	17	16	19	E B 12	E B 12	B	B	23	22	B	E B 12	31
13	30	30	41	44	38	25	E B 12	30	20	16	16	E B 13	16	21	E B 12	E B 12	B	B	B	B	B	B	B	B
14	B	24	22	B	34	33	25	23	30	40	E B 13	E B 16	25	24	E B 14	E B 15	B	B	B	B	B	B	B	21
15	32	44	42	41	B	32	B	B	B	B	B	B	B	E B 29	B	B	B	B	B	B	B	B	24	27
16	32	40	40	43	32	24	38	21	30	32	24	E B 28	33	20	E B 18	E B 15	B	B	33	33	B	B	B	20
17	14	29	31	43	40	40	28	36	51	40	28	39	28	29	18	17	22	16	15	B	27	30	36	17
18	40	38	31	30	64	30	31	32	27	E B 12	E B 12	30	48	47	32	25	26	27	30	B	44	30	B	B
19	26	B	31	30	30	31	30	28	36	35	38	38	40	29	16	E B 12	15	72	42	26	15	15	B	19
20	21	26	31	37	33	30	53	36	32	26	35	B	B	E B 20	E B 19	E B 13	17	30	25	B	B	B	B	25
21	32	30	30	48	32	32	31	B	B	B	21	66	40	61	46	26	28	38	56	63	16	30	29	23
22	41	32	38	44	45	50	46	40	41	30	40	41	69	28	E B 21	E B 20	42	16	32	B	B	B	B	31
23	26	39	32	32	33	31	48	48	39	31	19	21	29	30	33	33	35	33	40	33	40	34	33	33
24	40	44	46	57	30	24	24	18	B	E B 12	E B 14	32	48	36	63	34	43	62	66	49	B	E B 12	31	24
25	34	48	39	49	59	44	B	37	15	17	17	16	22	22	19	26	22	16	E B 12	22	B	36	42	30
26	33	80	30	42	57	43	40	42	B	B	B	E B 19	17	E B 17	31	18	18	17	E B 12	B	B	B	B	29
27	28	40	41	42	B	43	35	B	B	B	E B 25	B	B	B	B	B	B	B	B	B	32	32	22	42
28	44	51	41	40	B	B	B	40	35	28	B	B	B	B	B	B	B	B	B	B	32	B	32	57
29	34	42	B	B	32	48	B	32	23	27	27	B	B	E B 57	B	B	B	31	E B 20	B	B	25	30	B
30	33	38	44	39	42	31	32	30	21	B	B	B	E B 30	15	20	B	B	B	E B 13	31	B	B	34	33
31	42	38	43	44	B	38	G 32	31	22	E B 13	E B 17	22	19	E B 18	E B 18	E B 16	E B 13	17	31	B	B	B	B	27
	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	23	27	23	23	20	20	23	23	23	26	25	21	16	17	16	10	13	12	17	26
MED	32	38	39	40	34	32	32	32	30	29	16	U 19	22	22	18	E B 17	20	21	30	32	32	30	29	30
U Q	34	44	44	44	57	43	42	37	36	32	27	32	33	30	24	26	31	36	36	33	34	31	32	33
L Q	26	31	31	32	32	30	29	28	22	E B 16	E B 13	E B 15	18	E B 19	E B 16	E B 14	E B 15	16	E B 18	23	18	20	20	23

JUL. 2010 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2010 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	B	12	12	12	13
2	12	18	31	B	B	B	B	13	20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	14
3	23	B	20	B	B	26	B	B	15	B	13	25	19	22	15	B	B	B	B	B	B	B	12	12
4	12	19	18	18	B	B	12	B	B	B	11	14	12	12	23	22	B	B	14	13	12	B	B	12
5	12	12	12	14	13	12	12	12	B	12	12	13	13	19	24	B	B	14	B	B	B	B	12	12
6	12	12	13	13	20	13	13	13	12	12	12	14	16	13	14	13	13	16	B	B	23	11	11	12
7	12	11	12	12	12	11	B	13	B	14	B	14	12	13	12	12	B	12	12	13	13	B	B	13
8	12	13	12	13	11	11	12	B	11	12	12	11	12	13	12	13	13	12	B	B	B	B	B	B
9	12	14	13	12	13	20	14	13	11	12	B	27	B	B	25	B	B	B	B	B	B	B	B	12
10	12	13	12	12	12	12	12	B	B	B	12	12	12	12	13	13	12	13	B	B	13	12	12	12
11	12	13	12	12	12	12	12	12	B	B	14	15	14	20	15	16	12	B	B	B	B	B	12	B
12	12	12	14	13	11	12	12	12	13	12	13	13	14	12	12	12	12	B	B	14	12	B	12	12
13	12	12	12	12	12	12	12	16	12	12	12	13	12	12	12	12	B	B	B	B	B	B	B	B
14	B	12	12	B	12	12	13	12	15	11	13	16	12	14	14	15	B	B	B	B	B	B	B	12
15	13	14	14	12	B	20	B	B	B	B	B	B	B	29	B	B	B	B	B	B	B	B	12	11
16	12	12	12	12	12	12	11	12	12	14	12	28	12	12	18	15	B	B	14	16	B	B	B	12
17	12	12	12	12	12	12	12	12	12	12	12	12	12	13	12	12	11	11	12	B	12	11	12	12
18	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	15	12	B	12	13	B	B
19	12	B	12	12	12	12	12	12	12	12	14	13	13	12	12	12	12	12	12	11	12	12	B	15
20	12	13	12	12	12	20	20	21	12	12	14	B	B	20	19	13	14	14	12	B	B	B	B	12
21	13	11	15	12	11	13	12	B	B	B	15	14	13	12	12	12	14	14	12	12	12	22	12	11
22	12	12	12	12	12	12	12	12	10	12	17	12	13	15	21	20	14	12	16	B	B	B	B	20
23	12	11	12	12	11	12	14	15	12	12	12	13	12	12	11	11	12	12	12	11	12	15	13	14
24	13	12	12	12	13	14	13	13	B	12	14	13	14	13	12	12	13	12	12	12	B	12	12	10
25	12	12	12	13	13	17	B	13	12	12	12	12	16	18	14	12	12	12	12	14	B	12	12	12
26	12	12	20	22	18	20	26	27	B	B	B	19	14	17	13	12	12	12	12	B	B	B	B	12
27	11	12	12	18	B	16	20	B	B	B	25	B	B	B	B	B	B	B	B	B	15	12	12	12
28	12	20	21	26	B	B	B	14	13	18	B	B	B	B	B	B	B	B	B	B	16	B	12	12
29	13	13	B	B	26	19	B	16	18	15	15	B	B	57	B	B	B	12	20	B	B	19	13	B
30	12	12	13	18	16	14	12	14	12	B	B	B	30	11	12	B	B	B	13	12	B	B	12	12
31	12	22	14	13	B	20	13	12	12	13	17	15	16	18	18	16	13	14	13	B	B	B	B	12
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31
MED	12	12	12	12	12	13	13	13	13	12	14	14	14	14	14	15	14	15	20	B	B	B	13	12
U Q	12	14	14	18	B 26	20	B 26	B 27	B	B	B 25	B 28	B 30	20	B 23	B	B	B	B	B	B	B	B	B 14
L Q	12	12	12	12	12	12	12	12	12	12	12	13	12	12	12	12	12	12	12	14	12	12	12	12

JUL. 2010 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2010 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	B	A	Y	A	A
2	A	A	A	B	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
3	A	B	A	B	B	A	B	B	A	B	206	210	202	216	220	B	B	B	B	B	B	B	Y	A
4	A	A	A	A	B	B	A	B	B	B	230	218	196	170	224	208	B	B	A	Y	A	B	B	A
5	A	A	A	Y	A	A	A	Y	B	A	A 230	196	216	204	E B 240	B	B	A	B	B	B	B	200	A
6	A	A	A	A	A	A	A	A	Y	Y	256	222	196	218	196	206	A	A	B	B	A	A	A	A
7	202	A	202	A	A	A	B	Y	B	A	B	202	Q 200	208	184	184	B	Y	A	A	A	B	B	A
8	Y	A	A	A	A	210	A	B	A	B	220	208	206	202	Q 190	Q 190	212	A	B	B	B	B	B	B
9	A	A	A	212	A	A	A	A	A	A	B	E B 258	B	B	206	B	B	B	B	B	B	B	B	A
10	A	A	A	A	A	A	A	B	B	B	Q 208	Q 216	184	Q 184	192	Q 192	204	A	B	B	A	A	A	A
11	A	Y	A	A	A	A	A	A	B	B	234	244	190	196	188	208	234	B	B	B	B	B	Y	B
12	A	A	A	A	A	A	A	A	A	202	232	218	218	194	180	Q 184	210	B	B	A	A	B	196	208
13	A	A	A	A	A	A	E B 248	A	A	E B 270	214	190	194	194	200	176	B	B	B	B	B	B	B	B
14	B	A	A	B	A	A	A	A	A	A	220	210	214	202	202	182	B	B	B	B	B	B	B	A
15	A	A	A	A	B	A	B	B	B	B	B	B	B	B 242	B	B	B	B	B	B	B	B	E A 270	A
16	A	A	A	A	A	206	A	212	A	A	204	E B 244	204	Q 208	194	202	B	B	A	A	B	B	B	A
17	A	200	244	A	A	A	A	A	A	A	Q 220	194	Q 196	Q 206	198	178	216	Y	246	B	A	A	A	Y
18	A	A	A	A	A	204	A	A	A	E B 232	204	Q 186	188	194	Q 194	Q 196	204	A	A	B	A	A	B	B
19	A	B	A	A	A	A	A	200	A	242	196	Q 188	Q 200	Q 180	Q 194	182	188	A	A	A	Y	Y	B	A
20	A	A	A	A	E A 244	A	A	A	A	E B 232	234	B	B	208	192	174	232	A	A	B	B	B	B	232
21	194	262	224	A	A	A	A	B	B	B	216	216	184	192	208	196	A	A	A	A	Y	A	196	A
22	220	A	200	200	194	A	A	A	A	A 276	A 262	Q 220	Q 202	208	204	204	246	E A 262	A	B	B	B	B	A
23	202	A	190	220	196	A	A	A	A	A	228	200	Q 184	184	Q 206	Q 190	196	218	A	A	A	A	A	A
24	198	A	A	222	A	A	A	Y	B	E B 274	218	198	228	208	208	198	206	A	A	A	B	192	A	A 254
25	232	A	A	A	A	A	B	A	E A 284	A 252	228	216	214	234	182	196	Q 196	254	244	Y	B	A	A	A
26	A	A	A	A	A	A	A	A	B	B	B	210	200	188	196	204	196	Q 204	204	B	B	B	B	A
27	A	202	A	A	B	A	A	B	B	B	E B 274	B	B	B	B	B	B	B	B	B	A	218	A	A
28	A	A	A	A	B	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	A	B	A 224	A
29	212	A	B	B	A	A	B	A	A	206	220	B	B	E B 256	B	B	B	230	E B 250	B	B	A	A	B
30	196	A	218	A	A	A	A	A	A	B	B	B	224	196	222	B	B	B	E B 256	A	B	B	230	216
31	A	A	A	A 188	B	A	A	A	A	242	230	182	184	192	208	202	194	E A 258	Q 242	B	B	B	B	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	8	3	6	5	3	3	1	2	1	10	23	23	23	26	25	21	14	6	6			2	6	4
MED	202	202	210	212	195	206	E B 248	206	E A 284	237	220	209	200	200	197	196	205	U 226	U 234			205	205	224
U Q	216	262	224	221	E A 244	210				E B 270	232	218	214	208	208	203	216	E A 258	E B 250				230	243
L Q	197	200	200	194	194	204				232	214	196	190	192	192	183	196	218	242				196	212

JUL. 2010 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG.2010 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	A	A	A	A	A	O X 25	X 23	33	X 44	X 61	X 62	X 62	X 55	X 42	B	O X 38	X 30	Y	B	B	B	O X 28
2	R	A	A	O X 30	R	R	A	R	R	R	X 44	B	X 60	60	X 51	59	O X 48	O X 36	X 28	B	B	R	B	B
3	O X 28	X 34	A	A	A	A	O X 29	B	R	B	B	X 50	X 60	B	B	O X 50	O X 44	X 42	B	B	B	A	B	A
4	B	Y	A	A	B	A	B	A	A	B	B	O X 41	X 47	X 47	X 47	X 57	X 53	B	A	A	67	34	A	B
5	A	A	A	B	A	A	A	B	B	B	B	O X 38	X 38	B	O X 44	X 44	B	B	34	B	B	B	Y	O X 32
6	X 36	X 27	O X 35	B	B	R	A	B	B	B	B	B	B	O X 48	X 48	X 48	39	O X 39	O X 38	B	B	R	A	O X 35
7	A	A	A	A	A	O X 26	A	A	A	O X 37	X 43	O X 50	B	69	X 56	O X 48	B	B	B	B	B	B	B	B
8	B	B	A	O X 28	O X 34	35	28	X 26	31	X 38	52	X 52	61	70	X 59	59	O X 47	O X 34	X 30	R	B	B	A	B
9	B	B	B	B	B	O X 26	B	A	B	B	B	B	B	O X 67	O X 53	O X 52	O X 53	B	X 37	B	Y	Y	A	A
10	A	A	Y	O X 32	R	B	A	B	B	B	X 48	O X 53	B	X 69	O X 69	X 38	O X 43	O X 36	O X 36	B	B	B	B	B
11	R	65	A	B	70	O X 29	A	A	O X 33	B	B	B	B	O X 30	B	B	B	X 42	X 42	B	B	B	A	A
12	A	A	A	A	O X 30	B	A	A	A	A	X 54	B	X 61	X 62	X 56	X 53	O X 43	40	29	B	B	B	B	A
13	A	A	A	A	A	30	B	B	R	41	O X 49	O X 54	X 58	X 63	X 63	X 50	X 43	50	X 31	31	X 24	B	B	B
14	B	R	R	O X 33	X 32	O X 33	A	28	X 32	X 40	X 49	X 51	X 61	X 61	X 56	O X 49	X 48	O X 40	O X 34	O X 27	O X 26	B	B	B
15	R	B	R	R	A	A	B	A	R	X 42	O X 46	X 48	O X 58	O X 57	66	X 58	O X 58	42	X 36	B	B	B	B	B
16	A	X 30	A	A	A	A	A	B	O X 31	O X 33	X 40	B	B	X 58	X 60	B	B	X 50	B	B	B	A	A	O X 32
17	A	A	O X 32	A	A	B	A	A	B	B	O X 50	X 62	X 62	X 58	X 56	62	X 49	O X 39	38	36	B	B	A	A
18	A	A	A	O X 33	O X 33	O X 34	B	A	B	R	X 51	X 54	X 56	X 62	X 56	X 50	53	44	X 34	34	B	B	B	B
19	A	Y	Y	A	A	A	A	31	38	B	X 51	X 56	O X 66	B	B	B	B	B	X 31	B	B	B	B	B
20	B	A	A	A	R	R	R	B	34	44	51	60	66	X 54	X 53	X 60	X 49	X 44	40	B	B	Y	B	A
21	A	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	X 50	X 48	X 43	X 30	B	B	B	B	B
23	Y	B	Y	O X 35	40	37	38	39	34	X 44	X 47	X 64	X 70	R	X 56	X 48	X 60	42	X 29	X 27	X 20	O X 27	O X 27	O X 26
24	O X 28	49	72	A	63	69	70	A	X 40	A	B	B	X 49	X 41	X 44	X 48	B	41	R	A	B	A	A	A
25	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R	A
26	B	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	B	A
27	A	58	A	A	R	A	A	R	B	B	B	R	B	B	B	B	B	B	O X 38	O X 34	A	B	Y	O X 30
28	A	A	A	A	B	A	A	B	B	O X 44	B	B	B	B	B	B	B	B	B	B	O X 32	B	Y	B
29	43	A	Y	Y	B	A	R	O X 30	X 39	X 44	X 49	O X 48	X 56	O X 51	X 60	X 50	X 51	X 41	X 30	X 30	X 25	X 21	B	B
30	Y	R	Y	B	R	Y	B	X 26	38	O X 46	X 52	X 55	O X 55	O X 55	X 54	X 56	X 51	X 40	X 33	30	O X 25	O X 22	B	A
31	B	A	Y	R	Y	B	B	B	40	X 47	O X 50	X 52	X 62	X 56	O X 50	O X 48	X 46	O X 38	O X 34	O X 27	B	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	6	3	6	7	9	4	7	12	13	18	18	19	21	22	23	19	21	22	9	7	4	1	6
MED	X 32	42	O X 35	O X 32	X 34	O X 33	34	X 28	34	X 42	X 49	X 52	X 60	X 58	X 56	X 50	X 48	X 41	X 34	X 30	X 25	X 24	O X 27	O X 31
U Q	40	58	72	O X 33	63	36	54	31	38	X 44	X 51	X 56	X 62	X 62	X 59	57	X 53	X 42	X 37	34	32	30		O X 32
L Q	O X 28	X 30	O X 32	O X 30	X 32	O X 28	28	X 26	X 32	X 38	X 46	O X 50	X 56	X 52	X 51	X 48	O X 44	O X 38	X 30	O X 27	X 24	X 22		O X 28

AUG.2010 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG.2010 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	A	A	R 19	17	F 23	38	55	56	56	49	36	B	R 32	24	Y	B	B	B	R 22
2	A	A	A	R 24	A	A	A	A	A	A	38	B	J R 54	F 50	44	F 49	U R 42	R 30	22	B	B	D R 31	B	B
3	R 22	28	A	A	A	A	23	B	A	B	B	44	54	B	B	R 44	R 38	J R 36	B	B	B	A	B	A
4	B	Y	A	A	B	A	B	A	A	B	B	R 35	41	41	41	51	47	B	A	A	A	F 24	A	B
5	A	A	A	B	A	A	A	B	B	B	B	32	32	B	R 38	38	B	B	F 23	B	B	B	Y	R 26
6	30	21	R 29	B	B	A	A	B	B	B	B	B	B	R 42	42	J R 42	F 29	33	R 32	B	B	R	A	29
7	A	A	A	A	A	R 20	A	A	A	R 31	37	44	B	F 58	50	R 42	B	B	B	B	B	B	B	B
8	B	B	A	R 22	R 28	F 25	F 19	20	F 20	32	F 42	46	F 51	Z 64	J R 53	Z 53	R 41	R 28	24	A	B	B	A	B
9	B	B	B	B	B	R 20	B	A	B	B	B	B	B	R 61	R 47	R 46	47	B	31	B	Y	Y	A	A
10	A	A	Y	R 26	A	B	A	B	B	B	42	R 47	B	J R 63	R 63	32	R 37	R 30	R 30	B	B	B	B	B
11	R	A	A	B	R 22	R 23	A	A	R 27	B	B	B	B	R 24	B	B	B	36	36	B	B	B	A	A
12	A	A	A	A	R 24	B	A	A	A	A	48	B	55	56	50	47	R 37	F 30	F 19	B	B	B	B	A
13	A	A	A	A	A	F 20	B	B	A	F 31	R 43	48	52	57	57	44	37	F 40	25	F 21	18	B	B	B
14	B	A	A	27	26	R 27	A	F 19	25	34	43	J R 45	55	55	50	R 43	42	R 34	28	21	R 20	B	B	B
15	R	B	R	R	A	A	B	A	R	36	40	42	R 52	R 51	F 57	52	R 52	F 32	30	B	B	B	B	B
16	A	24	A	A	A	A	A	B	25	27	J R 34	B	B	J R 52	J R 54	B	B	J R 44	B	B	B	A	A	R 26
17	A	A	R 26	A	A	B	A	A	B	B	R 44	J R 56	J R 56	52	J R 50	F 51	43	R 33	F 29	F 27	B	B	A	A
18	A	A	A	R 27	R 27	R 28	B	A	B	R	45	48	50	56	50	44	F 43	F 34	28	F 25	B	B	B	B
19	A	Y	Y	A	A	A	A	F 18	F 27	B	J R 45	J R 50	R 60	B	B	B	B	B	25	B	B	B	B	B
20	B	A	A	A	A	R	A	B	F 23	F 35	F 41	F 49	F 56	48	47	54	43	38	F 30	B	B	Y	B	A
21	A	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	44	42	37	24	B	B	B	B	B
23	Y	B	Y 58	29	F 31	F 27	F 26	F 24	F 24	38	41	58	64	R	50	V 42	54	F 31	23	21	14	R 21	R 21	R 20
24	R 22	F 38	A	A	F 23	A	Y	A	J R 34	A	B	B	43	35	38	42	B	F 31	R	A	B	A	A	A
25	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R	A
26	B	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	B	A
27	A	A	A	A	A	A	A	R	B	B	B	R	B	B	B	B	B	B	R 32	R 28	A	B	Y	R 24
28	A	A	A	A	B	A	A	B	B	38	B	B	B	B	B	B	B	B	B	B	R 26	B	Y	B
29	F 30	A	Y	Y	B	A	R	R 24	33	38	43	U R 42	50	R 45	53	44	45	35	24	24	19	15	B	B
30	Y	A	Y	B	R	Y	B	20	F 28	40	46	49	49	R 49	48	J R 50	45	34	27	F 20	R 19	R 16	B	A
31	B	A	Y	A	Y	B	B	B	F 30	41	R 44	J R 46	56	50	R 44	R 42	J R 40	32	R 28	R 21	B	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	4	3	6	7	8	3	7	12	13	18	18	19	21	22	23	19	21	22	9	6	5	1	6
MED	26	26	R 29	R 26	R 26	R 24	F 23	20	26	35	42	46	54	52	50	44	42	33	28	21	19	R 21	R 21	R 25
U Q	30	33	Y 58	27	28	R 27	F 26	24	29	38	44	49	56	56	53	50	45	36	30	F 26	R 20	28		26
L Q	R 22	22	R 26	R 24	23	R 20	F 19	F 19	F 24	31	40	44	50	46	44	42	R 38	31	24	21	18	16		R 22

AUG.2010 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2010 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	30	30	47	39	35	29	28	25	E B 13	E B 13	E B 12	19	22	20	18	16	B	E B 20	E B 21	17	B	B	B	23
2	24	36	40	32	29	G 24	41	31	32	32	23	B	30	25	E B 27	E B 19	E B 26	E B 23	E B 20	B	B	E B 24	B	B
3	32	37	47	51	44	40	34	B	31	B	B	E B 20	E B 19	B	B	E B 28	E B 29	E B 26	B	B	B	32	B	43
4	B	22	42	35	B	K 42	B	37	35	B	B	E B 24	E B 22	E B 20	20	E B 20	E B 23	B	43	42	75	69	82	B
5	65	81	K 34	B	37	37	30	B	B	B	B	E B 24	24	B	E B 21	20	B	B	24	B	B	B	15	27
6	35	38	34	B	B	28	30	B	B	B	B	B	B	E B 32	E B 22	E B 26	26	E B 23	22	B	B	20	39	39
7	36	37	32	33	34	42	46	33	30	E B 24	E B 20	E B 20	B	E B 22	E B 22	E B 23	B	B	B	B	B	B	B	B
8	B	B	30	30	32	29	E B 14	E B 12	16	16	22	24	E B 20	24	24	24	24	22	28	30	B	B	32	B
9	B	B	B	B	B	32	B	35	B	B	B	B	B	E B 36	E B 29	E B 37	E B 17	B	32	B	16	15	32	39
10	34	33	20	29	28	B	42	B	B	B	27	E B 40	B	E B 56	E B 40	E B 24	E B 20	E B 24	28	B	B	B	B	B
11	24	39	77	B	E B 14	32	44	52	40	B	B	B	B	E B 13	B	B	B	E B 29	E B 20	B	B	B	41	38
12	42	40	43	48	46	B	46	56	46	40	E B 30	B	E B 30	25	21	E B 20	E B 23	26	E B 18	B	B	B	B	32
13	37	43	42	34	34	29	B	B	25	32	E B 27	E B 23	E B 22	22	25	E B 17	16	E B 14	E B 16	E B 13	E B 12	B	B	B
14	B	25	26	35	37	36	36	16	29	E B 16	E B 18	E B 20	21	24	20	E B 20	20	E B 20	E B 14	E B 12	E B 12	B	B	B
15	20	B	23	22	38	44	B	36	26	E B 14	E B 18	23	22	24	22	18	E B 15	E B 15	E B 13	B	B	B	B	B
16	37	39	36	42	58	75	52	B	32	32	E B 22	B	B	E B 49	E B 28	B	B	E B 26	B	B	B	32	41	34
17	33	31	30	35	38	B	43	41	B	B	32	24	21	E B 22	E B 22	20	E B 26	E B 18	E B 15	E B 17	B	B	31	40
18	K 39	40	43	46	48	36	B	69	B	29	E B 20	24	22	24	20	18	E B 17	E B 14	E B 16	E B 15	B	B	B	B
19	32	20	16	33	31	32	34	24	30	B	E B 26	E B 23	24	B	B	B	B	B	E B 18	B	B	B	B	B
20	B	32	32	40	29	21	31	B	E B 13	16	22	23	29	25	25	24	16	E B 13	E B 13	B	B	18	B	32
21	30	64	51	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	22	16	E B 12	E B 12	B	B	B	B	B
23	15	B	28	20	E B 24	E B 21	E B 20	E B 18	E S 13	18	25	26	25	26	21	19	17	21	E B 12	30	E B 11	E B 18	20	E B 12
24	30	42	69	68	50	30	21	52	48	41	B	B	E B 25	21	26	21	B	20	33	30	B	31	35	37
25	42	48	42	40	51	38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	20	18	38
26	B	66	36	B	35	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	22	B	29
27	32	34	46	37	37	45	36	32	B	B	B	E B 12	B	B	B	B	B	B	E B 22	E B 27	42	B	16	23
28	31	77	51	40	B	40	32	B	B	E B 22	B	B	B	B	B	B	B	B	B	B	E B 20	B	18	B
29	31	42	17	16	B	35	22	E B 13	E B 15	20	22	E B 22	24	22	24	21	18	E B 14	E B 13	E B 11	E B 11	18	B	B
30	16	23	14	B	24	16	B	E B 12	E B 14	E B 19	22	24	G 18	26	26	22	20	15	E B 12	E B 12	16	E B 12	B	31
31	B	30	18	30	21	B	B	B	E B 18	20	25	26	26	26	E B 25	24	24	E B 15	E B 15	15	B	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	26	29	23	24	24	20	18	19	17	18	19	19	22	22	23	19	21	24	13	9	13	13	16
MED	32	38	36	35	35	34	34	32	29	20	22	E B 23	22	23	22	20	18	E B 20	E B 18	E B 17	E B 16	20	32	33
U Q	37	42	44	40	41	40	42	41	32	32	E B 26	24	25	E B 26	E B 26	24	E B 24	E B 24	23	30	31	32	40	38
L Q	30	31	27	30	29	29	29	E B 18	E B 15	E B 16	E B 20	E B 20	21	E B 22	21	19	17	E B 14	E B 14	E B 12	E B 12	18	18	28

AUG. 2010 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2010 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	12	12	12	11	12	12	13	13	12	14	12	14	15	12	B	20	21	13	B	B	B	12
2	12	12	12	12	12	12	12	14	20	22	16	B	24	23	27	19	26	23	20	B	B	24	B	B
3	12	13	14	17	17	12	12	B	20	B	B	20	19	B	B	28	29	26	B	B	B	15	B	25
4	B	19	26	20	B	20	B	17	16	B	B	24	22	20	12	20	23	B	12	12	14	12	19	B
5	24	25	22	B	23	24	15	B	B	B	B	24	19	B	21	11	B	B	12	B	B	B	12	12
6	12	14	12	B	B	17	12	B	B	B	B	B	B	32	22	26	21	23	19	B	B	14	12	12
7	12	12	12	12	13	11	13	20	15	24	20	20	B	22	22	23	B	B	B	B	B	B	B	B
8	B	B	12	13	13	12	14	12	11	12	13	12	20	12	14	12	17	12	12	18	B	B	16	B
9	B	B	B	B	B	12	B	15	B	B	B	B	B	36	29	37	17	B	13	B	12	12	12	13
10	19	17	12	15	14	B	12	B	B	B	15	40	B	56	40	24	20	24	20	B	B	B	B	B
11	12	12	13	B	14	24	23	18	16	B	B	B	B	13	B	B	B	29	20	B	B	B	12	12
12	12	12	13	15	14	B	16	20	12	19	30	B	30	18	15	20	23	18	18	B	B	B	B	13
13	12	12	12	12	13	12	B	B	13	14	27	23	22	18	16	17	13	14	16	13	12	B	B	B
14	B	12	10	15	13	12	14	12	14	16	18	20	15	19	16	20	13	20	14	12	12	B	B	B
15	12	B	12	12	16	24	B	14	15	14	18	18	18	18	16	14	15	15	13	B	B	B	B	B
16	12	13	23	15	13	15	13	B	17	17	22	B	B	49	28	B	B	26	B	B	B	12	12	12
17	12	12	12	11	12	B	12	13	B	B	22	20	18	22	22	16	26	18	15	17	B	B	12	12
18	12	12	13	12	12	13	B	24	B	20	20	16	12	20	16	14	17	14	16	15	B	B	B	B
19	22	14	12	12	13	13	16	12	15	B	26	23	19	B	B	B	B	B	18	B	B	B	B	B
20	B	12	12	12	12	12	12	B	13	12	13	19	20	15	16	17	13	13	13	B	B	13	B	12
21	12	18	12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	14	13	12	12	B	B	B	B	B
23	12	B	20	16	24	21	20	18	13	12	16	14	14	13	13	14	12	11	12	12	11	18	16	12
24	12	16	16	12	12	13	16	13	12	12	B	B	25	19	15	17	B	14	23	12	B	12	12	12
25	12	22	20	15	22	12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	12	12
26	B	12	29	B	28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	14	B	12
27	12	12	12	12	20	16	12	24	B	B	B	12	B	B	B	B	B	B	22	27	12	B	11	12
28	12	15	12	23	B	24	13	B	B	22	B	B	B	B	B	B	B	B	B	B	20	B	12	B
29	11	13	12	12	B	16	13	13	15	17	15	22	16	16	14	13	14	14	13	11	11	12	B	B
30	14	12	12	B	12	12	B	12	14	19	14	16	15	19	16	16	13	11	12	12	11	12	B	11
31	B	12	12	12	12	B	B	B	18	16	19	18	20	20	25	18	20	15	15	12	B	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	29	29	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30
MED	12	13	12	15	14	15	15	20	16	22	22	23	22	20	22	20	23	22	17	B	B	B	B	19
U Q	B 24	18	16	B 22	B 24	B 24	B	B	B	B	B	B	B	B	B	B 37	B	B	B 22	B	B	B	B	B
L Q	12	12	12	12	12	12	12	13	14	15	16	18	18	18	16	14	15	14	13	13	14	13	12	12

AUG. 2010 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2010 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	E B 326	210	178	Q 208	200	196	190	184	B	220	220	Y	B	B	B	190
2	A	A	A	192	A	A	A	A	A	A	234	B	218	Q 214	210	Q 202	204	258	220	B	B	216	B	B
3	E A 242	224	A	A	A	A	226	B	A	B	B	216	216	B	B	198	244	224	B	B	B	A	B	A
4	B	Y	A	A	B	A	B	A	A	B	B	E B 264	264	234	234	288	208	B	A	A	A	202	A	B
5	A	A	A	B	A	A	A	B	B	B	B	246	E A 258	B	240	Q 228	B	B	Q 228	B	B	B	Y	208
6	222	A	238	B	B	A	A	B	B	B	B	B	B	202	208	194	212	246	260	B	B	A	A	216
7	A	A	A	A	A	210	A	A	A	E B 286	226	222	B	200	194	206	B	B	B	B	B	B	B	B
8	B	B	A	238	A 288	222	342	E A 310	238	Q 206	Q 196	206	204	Q 192	Q 184	Q 200	194	214	212	A	B	B	A	B
9	B	B	B	B	B	212	B	A	B	B	B	B	B	222	208	232	196	B	Q 200	B	Y	Y	A	A
10	A	A	Y	202	A	B	A	B	B	B	232	E B 250	B	226	214	204	204	E B 282	E A 250	B	B	B	B	B
11	A	A	A	B	218	244	A	A	212	B	B	B	B	202	B	B	B	222	210	B	B	B	A	A
12	A	A	A	A	A 236	B	A	A	A	A	220	B	202	212	214	198	216	E A 228	E B 260	B	B	B	B	A
13	A	A	A	A	A	A	B	B	A	240	B 254	228	220	212	190	196	196	210	212	220	220	B	B	B
14	B	A	A	206	206	210	A	A	E A 280	232	202	202	212	212	200	194	198	210	214	204	E B 248	B	B	B
15	A	B	A	A	A	A	B	A	A	216	214	220	208	194	208	208	190	194	226	B	B	B	B	B
16	A	226	A	A	A	A	A	B	204	E A 280	230	B	B	B	210	B	B	238	B	B	B	A	A	226
17	A	A	202	A	A	B	A	A	B	B	216	218	218	206	212	Q 204	204	214	238	B 252	B	B	A	A
18	A	A	A	238	228	236	B	A	B	A	222	222	218	218	210	200	204	196	250	240	B	B	B	B
19	A	A	A	A	A	A	A	A	A 268	B	224	236	220	B	B	B	B	B	252	B	B	B	B	B
20	B	A	A	A	A	A	A	B	Q 226	192	Q 234	196	208	208	202	214	198	210	224	B	B	Y	B	A
21	A	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	202	208	192	184	B	B	B	B	B
23	Y	B	Y	Y	E B 372	E B 362	E B 392	E B 392	228	218	210	E A 228	E A 228	196	200	200	204	182	216	216	242	E B 266	206	202
24	262	246	A	A	212	A	Y	A	A	A	B	B	238	208	228	228	B	254	A	A	B	A	A	A
25	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
26	B	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A
27	A	A	A	A	A	A	A	A	B	B	B	196	B	B	B	B	B	B	E B 314	E B 348	A	B	Y	224
28	A	A	A	A	B	A	A	B	B	222	B	B	B	B	B	B	B	B	B	B	E B 270	B	Y	B
29	218	A	Y	Y	B	A	A	E B 272	218	234	220	192	212	186	206	184	198	184	200	200	226	212	B	B
30	Y	A	Y	B	A	Y	B	272	230	218	192	206	208	208	208	212	188	Q 188	196	202	236	238	B	A
31	B	A	Y	A	A	B	B	B	228	228	210	216	220	204	194	200	206	184	200	224	B	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	3	2	5	7	7	3	4	11	13	18	19	19	21	22	23	19	21	22	9	6	5	1	6
MED	226	226	220	206	223	217	U 284	E 291	227	220	220	213	215	208	208	202	204	212	216	218	231	214	206	212
U Q	252	246		238	288	244	E B 392	E 351	E A 268	237	230	228	220	213	212	212	208	233	250	B 246	E B 248	252		224
L Q	220	224		197	212	210	226	272	218	213	210	206	208	198	200	198	196	193	210	203	226	207		202

AUG. 2010 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP.2010 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	O X 30	29	X 33	30	O X 32	B	O X 29	O X 41	X 47	X 48	X 56	X 72	X 61	X 56	X 55	O X 51	43	X 38	33	B	B	A	A
2	A	59	A	A	A	A	A	A	A	O X 40	X 46	X 48	X 48	B	X 51	X 49	X 48	X 43	X 40	X 38	Y	A	A	A
3	A	A	52	A	A	A	O X 30	X 31	X 36	X O 42	O X 46	X 47	X 50	X 53	X 51	X 56	X 54	X 45	X O 32	O X 28	30	O X 23	B	B
4	O X 32	B	B	B	B	X 29	B	31	X 45	X 54	X 56	X 58	X 61	X 59	X 57	X 64	X 53	52	X 35	X 32	X 30	O X 24	B	O X 33
5	O X 38	R	O X 31	A	B	B	B	33	46	X 50	X 57	X 62	X 66	X 61	X 54	X 53	59	O X 47	38	X 36	X 26	O X 21	B	B
6	68	A	A	56	A	A	A	A	B	B	B	B	X 54	O X 50	O X 62	X 55	O X 50	X 50	O X 42	X 34	X 30	B	A	A
7	A	A	A	B	A	B	B	A	A	X 44	X O 50	X 58	X 58	X 60	B	B	O X 58	X 52	X 49	X 38	R	A	R	A
8	A	58	A	A	A	A	B	C	C	C	C	C	X 51	X 59	X 58	O X 55	X 54	X 55	R	X 34	A	X O 40	O X 34	71
9	A	A	A	A	O X 30	R	35	X 35	46	X 50	X O 50	O X 50	X 61	X 61	X 56	X 55	62	64	42	A	X 24	23	R	A
10	A	A	O X 32	A	A	O X 38	O X 31	X 31	X 39	X O 46	O X 49	X 58	X 58	X 63	O X 64	O X 60	X 53	X 58	42	X 33	33	B	B	B
11	B	B	Y	B	B	B	B	37	X 44	X 48	X O 63	O X 66	O X 66	O X 66	O X 66	X 52	X 48	X 52	48	X 42	35	28	B	B
12	B	Y	B	O X 35	O X 32	37	B	38	X 49	X 49	X 50	B	X 64	O X 63	B	X 64	O X 54	O X 54	O X 40	X 31	X 30	O X 25	B	B
13	B	O X 26	X 33	O X 35	O X 36	B	B	O X 38	X 48	X 50	X 56	X 64	X 64	O X 64	R	O X 56	X 64	X 51	X 40	X 34	X 30	X 22	32	A
14	B	A	A	43	X 30	A	A	A	A	B	B	B	B	66	X 63	O X 58	X 56	X 57	X 51	46	A	A	A	A
15	A	A	O X 34	O X 34	B	R	B	A	X 41	X 41	O X 43	B	B	O X 48	O X 49	O X 48	O X 47	X 42	X 34	O X 33	O X 29	O X 25	O X 23	O X 21
16	O X 22	A	O X 33	A	A	A	36	X 38	X 45	X 48	O X 51	X 59	X 54	X 56	X 56	O X 50	X 50	X 50	X 46	42	35	A	A	A
17	A	A	38	R	A	37	A	A	R	B	O X 39	B	B	O X 50	B	B	B	B	B	O X 36	B	R	A	A
18	A	A	R	A	33	B	R	O X 39	O X 44	O X 45	O X 48	O X 48	X 59	X 63	X 63	O X 55	O X 52	X 52	O X 46	X 40	31	26	O X 22	B
19	Y	Y	B	O X 32	O X 26	28	X 30	X 42	X 49	X 54	X 60	X 60	X 66	X 64	O X 65	X 62	X 59	X 59	X 54	X 48	X 29	26	B	B
20	A	B	X 32	O X 33	A	A	X 36	X O 46	O X 47	O X 53	X 57	X 63	X 65	X 68	X O 69	O X 64	X 56	X 60	X 46	48	34	B	B	B
21	O X 27	A	A	46	O X 33	46	A	C	52	58	65	70	68	76	X 72	72	X 61	X 56	X 57	48	39	34	30	28
22	O X 23	51	34	A	33	33	42	X 44	X 52	X 59	X 64	X 70	X 78	X 77	X 65	X 63	X 62	58	X 47	47	40	34	28	30
23	O X 31	41	38	32	36	X 37	B	46	X 52	X 63	X 65	75	X 77	X 82	X 76	X 80	X 71	X 60	X 53	57	48	37	30	29
24	A	26	31	31	38	A	69	B	A	A	B	B	O X 51	B	B	O X 52	O X 65	O X 70	B	R	B	A	A	A
25	50	B	B	B	B	B	B	A	O X 38	B	B	B	B	B	B	B	B	O X 54	O X 54	O X 44	X 31	B	B	R
26	41	Y	R	R	B	R	O X 38	X 42	O X 48	O X 52	O X 59	B	B	R	R	O X 65	R	R	X 52	X 42	X 37	B	B	A
27	B	B	A	A	A	O X 33	X 36	O X 40	O X 42	O X 45	O X 48	R	O X 48	O X 53	R	R	B	R	O X 52	X O 46	O X 40	R	A	A
28	B	A	B	B	B	B	B	O X 40	O X 41	O X 45	O X 51	R	B	B	B	B	O X 54	X 63	X 56	B	B	B	B	Y
29	36	Y	Y	B	B	B	A	B	B	O X 47	B	B	B	B	B	X 67	X 70	X O 65	X O 59	B	B	X 33	O X 32	O X 28
30	B	B	B	B	B	B	O X 41	B	O X 49	X 58	X 58	X 58	R	B	O X 71	R	B	R	O X 50	X 48	X 44	O X 35	X 31	X 26
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	10	7	12	11	11	10	11	18	22	24	24	18	22	23	20	24	25	26	27	26	21	16	9	8
MED	O X 34	41	33	X 34	X 33	35	X 36	X 38	X 46	X 48	X 51	X 58	X 61	X 61	X 62	X 56	X 54	X 54	X 46	X 39	X 31	X 26	X 30	28
U Q	41	58	36	43	36	X 37	41	X 42	X 49	X 54	X 58	X 64	X 66	X 66	X 66	X 64	X 62	X 59	X 52	46	38	34	O X 32	32
L Q	O X 27	26	32	32	X 30	X 32	O X 31	X 33	X 41	O X 45	O X 48	X 56	X 54	O X 56	X 56	X 54	O X 52	X 50	X 40	X 34	X 30	O X 24	O X 26	X 27

SEP.2010 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP.2010 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	R 24	F 19	26	F 20	R 26	B	R 23	R 35	41	J R 42	J R 50	66	J R 55	50	J R 49	45	F 33	32	F 24	B	B	A	A
2	A	A	A	A	A	A	A	A	A	R 34	40	42	42	B	45	43	42	37	34	32	Y	A	A	A
3	A	A	A	A	A	A	R 24	25	30	36	R 40	41	44	47	45	50	48	38	26	R 22	F 21	R 17	B	B
4	R 26	B	B	B	B	23	B	F 22	39	47	50	52	55	J R 53	51	58	47	F 41	29	26	24	R 18	B	R 27
5	R 32	R	R 25	A	B	B	B	F 20	F 37	44	J R 51	56	60	55	48	47	Z 53	41	F 29	30	20	R 15	B	B
6	A	A	A	A	A	A	A	A	B	B	B	B	48	R 44	56	49	44	44	R 36	28	24	B	A	A
7	A	A	A	B	A	B	B	A	A	38	44	R 52	52	54	B	B	R 52	46	43	32	R	A	A	A
8	A	30	A	A	A	A	B	C	C	C	C	C	45	J R 53	52	R 49	48	49	A	J R 28	A	34	R 28	A
9	A	A	A	A	R 24	R	21	29	40	44	44	R 44	J R 55	55	50	49	F 52	F 54	F 30	A	18	F 13	A	A
10	A	A	R 26	A	A	R 32	R 25	25	33	40	R 43	J R 52	J R 52	57	R 58	R 54	47	52	Z 36	27	F 23	B	B	B
11	B	B	Y	B	B	B	B	F 27	38	42	57	R 60	R 60	R 60	R 60	46	42	46	F 37	36	F 25	F 19	B	B
12	B	Y	B	R 29	26	F 27	B	F 28	43	43	44	B	J R 58	R 57	B	58	R 48	R 48	R 34	25	24	R 19	B	B
13	B	R 20	27	R 29	R 30	B	B	R 32	42	44	50	58	58	R 58	R	R 50	58	45	34	28	F 20	16	16	A
14	B	A	A	A	24	A	A	A	A	B	B	B	B	F 57	57	R 52	50	51	45	F 35	A	A	A	A
15	A	A	R 28	U R 28	B	A	B	A	35	35	R 37	B	B	42	R 43	R 42	R 41	36	28	R 27	R 23	R 19	R 17	R 15
16	16	A	R 27	A	A	A	F 24	32	39	42	R 45	53	J R 48	50	J R 50	R 44	44	44	40	F 33	F 25	A	A	A
17	A	A	F 29	A	A	F 26	A	A	A	B	R 33	B	B	R 44	B	B	B	B	B	R 30	B	A	A	A
18	A	A	A	A	F 23	B	A	R 33	R 38	39	R 42	U R 41	J R 53	57	57	R 49	R 46	46	40	34	F 21	F 15	R 16	B
19	Y	Y	B	26	20	F 20	24	36	43	48	J R 54	J R 54	60	58	59	56	J R 53	J R 53	J R 48	42	23	F 18	B	B
20	A	B	26	R 27	A	A	30	40	R 41	U R 47	J R 51	57	59	J R 62	63	58	50	54	40	F 38	F 24	B	B	B
21	21	A	A	A	R 27	F 34	A	C	F 43	F 46	F 56	F 61	F 57	F 67	66	F 58	55	50	J R 51	42	F 30	F 25	F 21	F 16
22	R 17	A	F 23	A	F 23	F 24	F 32	38	46	J R 53	58	J R 64	72	71	V 59	57	56	F 48	41	F 39	F 28	F 21	F 18	F 20
23	R 25	F 20	F 25	F 21	F 26	31	B	40	46	57	59	F 65	71	76	70	J R 74	65	J R 54	47	F 48	F 39	F 27	F 20	F 19
24	A	F 16	F 24	F 21	F 28	A	A	B	A	A	B	B	R 45	B	B	R 46	R 59	R 64	B	A	B	A	A	A
25	A	B	B	B	B	B	B	A	R 32	B	B	B	B	B	B	B	B	R 48	R 48	R 38	25	B	B	R
26	B	Y	A	A	B	R	R 32	36	R 42	R 46	R 53	B	B	R	D R 57	R 59	R	R	46	36	31	B	B	A
27	B	B	A	A	A	R 27	30	R 34	R 36	R 39	R 42	R	R 42	R 47	R	R	B	R	R 46	40	R 34	A	A	A
28	B	A	B	B	B	B	B	R 34	R 35	R 39	R 45	R	B	B	B	B	U R 48	57	50	B	B	B	B	Y
29	A	Y	Y	B	B	B	A	B	B	R 41	B	B	B	B	B	61	64	59	R 53	B	B	27	R 26	R 22
30	B	B	B	B	B	B	R 35	B	R 43	J R 52	J R 52	J R 52	R	B	U R 65	R	B	R	R 44	42	38	29	25	20
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	5	11	8	11	10	10	18	22	24	24	18	22	23	21	24	25	26	27	26	21	16	9	7
MED	R 23	20	26	26	24	26	28	32	39	42	R 45	52	55	55	57	50	48	48	40	32	24	19	20	20
U Q	R 26	27	R 27	R 28	R 27	31	R 32	36	43	R 46	52	58	60	58	60	58	54	53	R 46	38	29	26	R 26	R 22
L Q	17	F 18	F 24	F 24	F 23	F 24	24	25	35	39	R 42	R 50	48	50	50	48	46	44	34	28	22	16	R 16	16

SEP.2010 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP.2010 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 38	32	37	25	49	21	B	E B 14	E B 20	E B 24	29	25	25	25	25	23	22	20	E B 12	E B 14	B	B	30	36
2	38	51	52	42	52	38	55	52	39	43	22	E B 24	25	B	25	24	E B 27	E B 15	E B 16	E B 16	16	36	32	38
3	32	36	38	42	43	36	30	E B 16	15	19	25	26	32	30	31	26	20	E B 18	E B 15	E B 13	E B 12	E B	B	B
4	24	B	B	B	B	21	B	E B 14	E B 20	21	26	27	26	32	32	24	22	18	E B 12	E B 12	E B 12	E B	B	25
5	21	26	38	31	B	B	B	E B 14	18	28	31	34	34	36	25	26	24	E B 18	E B 14	E B 13	E B 12	E B 11	B	B
6	42	52	47	46	59	36	37	42	B	B	B	B	30	24	E B 26	E B 21	20	19	E B 23	E B 15	E B 13	B	36	41
7	42	45	68	B	57	71	B	37	42	22	31	30	30	24	B	B	E B 24	18	E B 16	E B 14	32	47	31	33
8	31	E B 29	47	58	42	69	B	C	C	C	C	C	26	23	22	E B 27	27	17	38	34	40	92	72	43
9	35	43	38	34	28	20	16	16	26	30	31	34	28	27	26	23	24	20	28	39	28	32	22	27
10	36	32	36	39	38	43	24	24	26	23	E B 26	25	E B 31	E B 27	E B 29	27	21	22	E B 16	E B 16	E B 18	B	B	B
11	B	B	16	B	B	B	B	E S 16	43	25	32	37	27	28	35	32	24	20	E B 14	E B 13	E B 13	E B 12	B	B
12	B	20	B	27	E B 24	E B 24	B	20	20	22	E B 26	B	E B 43	E B 26	B	E B 25	E B 24	E B 21	E B 19	E B 12	E B 16	E B 13	B	B
13	B	E B 11	E B 21	16	E B 23	B	B	E B 15	E B 23	31	28	34	36	33	E B 28	E B 29	25	18	18	E B 12	E B 12	20	19	22
14	B	29	29	25	51	51	52	43	41	B	B	B	B	E B 27	30	G	19	G	E B 12	E B 14	35	41	39	58
15	43	43	70	40	B	27	B	39	22	21	G	B	B	25	30	G	E B 23	E B 19	E B 19	E B 24	E B 16	E B 13	E B 13	E B 13
16	17	68	40	50	71	42	31	E B 17	19	21	23	25	37	28	25	22	27	22	E B 15	E B 12	E B 13	57	79	38
17	41	35	70	32	43	34	42	44	32	B	28	B	B	E B 26	B	B	B	B	B	E B 26	B	29	33	37
18	40	38	33	34	56	B	30	26	18	24	24	24	24	24	26	25	E B 23	20	E B 19	E B 13	E B 13	E B 12	E B 12	B
19	15	16	B	29	23	E S 16	E B 13	16	21	21	25	27	33	28	E B 26	E B 26	22	E B 24	E B 18	E B 16	E B 13	E B 12	B	B
20	30	B	34	41	50	50	34	20	38	E B 30	28	26	30	28	27	27	26	26	16	E B 13	17	B	B	B
21	36	34	35	33	60	80	42	C	57	37	30	30	27	28	29	E B 17	E B 23	27	24	E B 12	E B 12	E B 12	E B 12	E B 12
22	E B 12	22	24	36	34	33	34	28	28	32	32	27	33	34	33	26	27	27	16	E B 12	E B 12	E B 12	E B 12	E B 17
23	E B 19	26	28	22	29	26	B	30	32	31	31	30	28	32	29	30	24	20	24	E B 12	E B 12	E B 12	E B 12	30
24	32	31	27	24	23	37	44	B	33	39	B	B	26	B	B	E B 38	E B 26	E B 36	B	36	B	42	42	40
25	43	B	68	B	B	B	B	34	34	B	B	B	B	B	B	B	B	E B 30	E B 33	E B 17	E B 13	B	B	24
26	E B 26	16	31	26	B	K 24	G	G	19	26	E B 30	B	B	20	E B 28	E B 30	E B 27	E B 27	26	E B 16	E B 12	B	B	33
27	B	B	36	35	35	18	E B 15	15	32	E B 28	24	24	26	26	25	28	B	E B 27	18	13	25	27	39	42
28	B	32	B	B	B	B	B	E B 24	18	E B 28	25	E B 28	B	B	B	B	E B 26	22	19	B	B	B	B	17
29	34	16	15	B	B	B	32	B	B	23	B	B	B	B	B	28	E B 26	22	E B 26	B	B	E B 20	16	30
30	B	B	B	B	B	B	E B 28	B	G	E B 26	26	29	34	B	30	31	B	E B 25	E B 36	E B 18	E B 12	E B 13	E B 13	E B 13
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	24	25	23	21	22	18	25	27	25	24	20	23	24	23	26	26	29	28	28	25	23	19	22
MED	33	32	36	34	43	35	32	20	26	25	26	27	29	27	28	25	24	19	E B 18	E B 14	E B 13	E B 13	30	32
U Q	40	40	47	41	54	43	42	36	34	30	30	30	33	29	30	28	26	E B 26	24	E B 16	18	36	39	38
L Q	24	24	28	26	28	24	24	E B 16	19	22	25	25	26	25	25	23	22	18	E B 16	E B 12	E B 12	E B 12	E B 13	E B 22

SEP.2010 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP.2010 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 13	12	12	13	12	B 14	20	24	17	18	13	17	14	18	14	12	12	14	B	B	12	16		
2	14	16	13	18	15	12	13	12	20	13	14	24	16	B 19	15	27	15	16	16	12	12	12	11	
3	12	12	11	14	19	12	12	16	12	13	13	14	14	13	14	14	15	18	15	13	12	12	B	B
4	12	B	B	B	B 14		B 14	20	13	14	16	14	12	13	12	12	12	12	12	12	12	12	B	12
5	13	12	12	11	B	B	B 14	12	13	12	12	12	13	16	13	14	18	14	13	12	11	B	B	
6	14	12	12	17	23	20	20	14	B	B	B	B	19	20	26	21	16	14	23	15	13	B	12	13
7	13	12	21	B	18	60	B	18	19	18	14	16	15	21	B	B 24	13	16	14	13	12	19	12	
8	12	28	14	28	24	24	B	C	C	C	C	C	19	15	13	27	14	12	12	12	12	13	11	13
9	14	16	13	14	12	12	12	12	12	12	12	11	14	18	13	18	12	13	12	20	12	12	12	12
10	11	11	11	13	13	13	19	13	12	16	26	22	31	27	29	14	14	12	16	16	18	B	B	B
11	B	B 12		B	B	B	B	E S 16	12	11	13	14	13	14	15	14	18	15	14	13	13	12	B	B
12	B 16		B	16	24	24	B	12	14	14	26	B	43	26	B	25	24	21	19	12	16	13	B	B
13	B 11	21	12	23		B	B	15	23	16	18	12	13	14	28	29	20	13	14	12	12	11	12	11
14	B 13	12	12	12	12	12	14	16	13	B	B	B	B	27	19	14	13	13	12	13	12	12	12	12
15	12	14	13	14	B	16	B	12	15	15	15	B	B	14	25	14	23	19	19	24	16	13	13	12
16	12	20	14	17	22	13	12	17	16	13	12	13	12	15	15	14	14	12	15	12	12	13	12	20
17	14	20	18	23	20	14	14	13	21	B	16	B	B	26	B	B	B	B	B	26	B	14	13	12
18	12	13	13	13	18	B	20	17	13	14	15	18	18	18	19	21	23	18	19	13	13	12	12	B
19	12	12	B	13	12	E S 16	13	12	12	12	12	15	14	13	26	26	18	23	18	16	13	12	B	B
20	12	B	12	13	14	12	13	13	14	30	21	12	13	14	13	14	12	12	14	13	12	B	B	B
21	13	12	12	33	13	12	14	C	15	12	16	15	14	13	20	17	23	12	14	12	12	12	12	12
22	12	18	12	12	12	12	11	12	12	14	12	12	14	14	14	12	13	13	12	12	12	12	12	17
23	19	12	18	18	19	12	B	14	16	12	14	12	14	15	12	14	13	14	12	12	12	12	12	12
24	12	13	12	11	11	12	18	B	16	18	B	B 22		B	B 38		26	36	B	21	B	12	20	12
25	13	B	56	B	B	B	B	20	14	B	B	B	B	B	B	B	B	30	33	17	13	B	B	13
26	26	13	12	12	B	14	12	12	12	12	30	B	B	18	28	30	27	27	12	16	12	B	B	24
27	B	B	28	26	16	12	14	12	14	28	12	15	19	20	22	25	B	27	15	11	14	13	13	16
28	B	24	B	B	B	B	B	24	17	28	12	28	B	B	B	B	26	14	12	B	B	B	B	13
29	12	12	12	B	B	B	19	B	B	14	B	B	B	B	B	13	26	14	26	B	B	20	13	16
30	B	B	B	B	B	B	28	B	18	26	20	20	28	B	22	25	B	25	36	18	12	13	13	13
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	28	29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	13	14	13	16	20	14	20	14	15	14	15	18	17	18	21	18	19	14	15	14	12	12	13	13
U Q	B 24	B 21	B 33	B	B	B	B 17	20	27	B 26	B	B 43	B 27	B 29	27	26	21	19	17	B 16	B 20	B	B	
L Q	12	12	12	13	13	12	13	12	12	13	12	14	14	14	14	14	14	13	12	12	12	12	12	12

SEP.2010 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP.2010 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	196	202	E A 308	E A 292	A	B	250	226	222	212	212	212	212	206	206	198	208	208	208	B	B	A	A
2	A	A	A	A	A	A	A	A	A	A	A 226	224	216	B	Q 214	206	214	222	232	250	Y	A	A	A
3	A	A	A	A	A	A	E A 350	E B 284	212	224	192	192	192	196	Q 212	210	196	198	204	E B 228	208	E B 244	B	B
4	234	B	B	B	B	236	B	250	230	210	216	206	206	198	210	214	202	210	186	216	204	E B 244	B	200
5	E A 272	A	212	A	B	B	B	228	Q 196	Q 208	192	204	206	186	196	196	206	192	196	214	214	E B 272	B	B
6	A	A	A	A	A	A	A	A	B	B	B	B	236	216	218	202	212	224	222	240	240	B	A	A
7	A	A	A	B	A	B	B	A	A	232	238	A 222	198	198	B	B	214	206	206	226	A	A	A	A
8	A	B	A	A	A	A	B	C	C	C	C	C	204	204	204	220	208	Q 204	A	200	A	202	E A 300	A
9	A	A	A	A	214	A	E A 310	234	226	236	202	202	216	202	210	208	208	198	Q 202	A	194	E B 270	A	A
10	A	A	A 248	A	A	A 246	A	A 290	198	216	228	228	228	210	E B 216	200	212	196	208	246	224	B	B	B
11	B	B	Y	B	B	B	B	224	208	210	228	216	206	206	220	200	200	218	Q 200	208	212	220	B	B
12	B	Y	B	A	B	B	B	216	222	202	218	B	222	208	B	224	210	200	200	198	206	220	B	B
13	B	200	B	A	B	B	B	222	216	216	216	202	230	192	212	206	218	198	214	198	E B 212	A 280	A	A
14	B	A	A	A	A	A	A	A	A	B	B	B	B	226	210	206	208	220	226	Q 274	A	A	A	A
15	A	A	A	A 224	B	A	B	A	220	A 226	232	B	B	204	A	210	222	214	B 242	B	E B 256	E B 254	B	B
16	206	A	A	A	A	A	A	B 262	212	198	190	208	206	222	212	202	236	214	Q 214	Q 204	Q 222	A	A	A
17	A	A	224	A	A	192	A	A	A	B	208	B	B	200	B	B	B	B	B	E B 266	B	A	A	A
18	A	A	A	A	A 268	B	A	A	214	190	220	202	206	204	202	190	210	212	202	196	210	240	B 288	B
19	Y	Y	B	A	A	E S 342	Q 258	222	184	190	200	206	196	216	200	206	204	212	218	198	210	200	B	B
20	A	B	A 238	E A 244	A	A	A	218	A	250	214	198	202	200	200	194	206	206	200	Q 192	206	B	B	B
21	204	A	A	A	A 248	198	A	C	E A 242	222	236	206	210	210	218	210	202	Q 204	204	196	196	216	220	228
22	E B 258	A	A	A	220	A	A	252	204	196	202	224	214	196	196	Q 202	206	200	Q 192	Q 210	Q 190	Q 192	238	B 320
23	154	190	198	A	A	A	B	A 240	210	202	Q 196	196	196	196	216	200	214	200	204	202	Q 194	Q 210	E B 222	A
24	A	E A 256	A	A	A	A	A	B	A	A	B	B	A	B	B	B	262	248	B	A	B	A	A	A
25	A	B	B	B	B	B	B	A	A	B	B	B	B	B	B	B	B	214	234	206	208	B	B	A
26	B	Y	A	A	B	R	E Y 270	E Y 238	202	210	222	B	B	212	208	208	214	216	198	196	218	B	B	A
27	B	B	A	A	A	A	236	236	202	212	210	206	198	208	216	230	B	212	212	216	232	A	A	A
28	B	A	B	B	B	B	B	E B 242	208	230	210	200	B	B	B	B	204	216	Q 222	B	B	B	B	Y
29	A	Y	Y	B	B	B	A	B	B	224	B	B	B	B	B	E A 222	228	210	216	B	B	E B 240	E A 262	E A 314
30	B	B	B	B	B	B	B	B	220	206	194	202	208	B	222	210	B	208	216	206	204	218	222	E B 286
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	4	6	3	5	5	5	17	20	23	24	20	22	24	22	25	26	29	27	25	21	16	7	5
MED	U 200	196	218	E A 244	U 234	U 217	E 270	236	212	212	213	206	206	204	210	206	209	210	208	207	209	U 216	230	U 257
U Q	E 258	228	A 238	E A 308	A 280	294	E A 330	251	221	224	224	214	216	211	216	210	214	215	218	227	220	E B 249	288	317
L Q	204	193	202	A 224	217	195	247	223	203	202	201	202	202	198	204	201	204	200	200	198	204	213	222	214

SEP.2010 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2010 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	36	X 26	31	29	38	42	X 46	50	X 52	X 57	X 63	X 72	X 72	R	O X 66	X 65	R	O X 58	X 52	X 41	X 33	X 30	O X 26
2	B	B	B	X 32	37	38	43	X 45	49	X 57	X 58	60	X 61	X 63	X 64	X 64	X 61	X 57	X 56	X 46	X 42	40	34	31
3	30	30	X 26	30	40	34	B	X 39	B	X 59	X 64	X 67	X 68	X 63	X 66	X 66	X 63	X 56	X 51	X 46	46	43	37	34
4	28	B	A	Y	27	36	X 49	X 56	X 63	X 65	X 68	X 70	X 66	X 74	X 78	X 73	66	X 60	X 51	X 48	X 47	40	34	30
5	Y	A	R	86	62	A	X 42	43	51	B	B	R	B	B	X 81	X 77	B	B	B	X 50	B	B	R	R
6	R	R	R	A	A	A	X 44	X 49	X 51	R	R	X 53	X 64	X 75	X 80	81	X 72	B	B	X 40	B	B	A	A
7	A	A	53	A	A	A	A	O X 38	B	B	R	X 53	O X 56	B	B	B	B	O X 56	B	B	O X 39	O X 35	B	O X 30
8	O X 27	A	A	A	A	A	A	A	A	38	B	O X 56	R	R	O X 60	R	R	R	R	X 48	X 39	B	30	B
9	27	X 24	28	B	A	B	R	X 48	X 51	R	O X 52	X 58	R	B	B	B	O X 58	O X 50	X 49	X 46	X 40	X 32	O X 29	Y
10	B	B	B	B	X 24	35	X 40	O X 46	O X 48	R	O X 49	B	X 57	X 57	X 58	X 59	X 65	60	X 52	O X 44	X 38	X 28	B	A
11	B	A	A	58	R	R	X 49	A	A	R	B	60	X 65	X 67	O X 73	B	R	B	B	R	A	A	A	A
12	A	A	B	B	O X 38	B	B	B	B	B	B	O X 42	B	B	R	B	B	B	X 43	B	B	A	B	R
13	A	B	B	B	B	R	R	R	O X 42	R	B	B	B	O X 53	R	B	O X 48	O X 46	O X 46	O X 43	X 41	X 31	B	B
14	X 26	A	A	B	R	B	B	B	B	R	R	R	R	R	X 59	X 57	R	O X 53	X 53	X 48	X 40	X 37	X 37	34
15	34	50	43	O X 41	X 39	X 41	O X 41	O X 42	B	O X 64	R	R	X 57	72	X 65	X 64	X 66	X 63	B	X 49	O X 48	O X 39	34	A
16	B	A	B	A	B	B	A	O X 48	B	B	O X 63	B	R	R	R	R	X 63	O X 59	X 61	X 54	O X 40	28	A	A
17	A	A	A	42	A	A	A	A	B	B	B	B	B	B	B	B	B	B	O X 47	O X 45	O X 45	X 37	A	A
18	A	B	A	A	B	B	A	O X 49	O X 49	O X 50	O X 50	R	R	R	B	B	B	O X 54	X 50	X 47	X 44	X 43	O X 30	66
19	A	A	B	B	X 39	A	A	R	B	B	O X 44	O X 50	O X 51	R	O X 53	R	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	40	33
21	A	R	O X 36	A	B	A	X 40	X 46	X 46	O X 47	O X 49	R	O X 51	R	X 58	X 59	X 57	X 63	X 56	X 49	X 46	40	31	33
22	33	31	X 36	O X 36	A	49	O X 56	R	O X 52	X 55	X 58	X 61	B	B	B	B	X 62	X 66	X 60	X 55	X 52	X 46	51	46
23	X 40	O X 35	R	A	O X 38	A	B	A	O X 47	B	B	B	R	B	B	B	R	B	B	O X 32	X 37	O X 33	A	A
24	68	A	64	B	A	B	R	B	B	B	B	R	B	B	B	B	B	B	B	X 44	O X 39	A	A	A
25	A	A	B	B	A	B	A	A	O X 40	O X 44	R	B	B	R	O X 52	B	B	B	O X 54	O X 50	X 48	X 45	R	O X 30
26	X 22	24	A	B	B	B	B	O X 42	O X 42	O X 50	O X 51	R	B	B	B	B	B	B	O X 54	O X 52	X 47	R	B	B
27	A	R	B	O X 37	43	X 45	X 48	X 50	R	B	B	R	R	O X 56	O X 55	B	O X 51	O X 51	X 50	O X 47	O X 45	X 42	X 39	A
28	A	O X 28	32	43	X 53	X 49	X 50	X 50	O X 54	O X 54	R	R	X 56	X 56	B	R	O X 56	O X 56	B	O X 50	O X 48	X 43	38	31
29	30	37	41	43	X 49	B	O X 43	O X 46	O X 49	O X 51	O X 57	O X 57	R	R	R	R	O X 52	X 53	X 54	O X 48	O X 48	O X 46	46	45
30	43	40	X 37	X 36	B	O X 48	X 57	O X 58	X 58	R	O X 58	O X 59	X 60	S	R	X 58	X 56	X 56	X 56	X 50	X 49	X 47	42	44
31	47	40	B	A	B	41	O X 53	O X 54	X 61	X 62	R	X 58	R	R	O X 60	X 58	X 57	O X 53	O X 52	X 48	O X 47	X 46	X 44	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	13	11	11	12	13	11	15	19	18	14	14	15	13	11	15	12	17	18	20	26	25	22	17	15
MED	30	35	36	39	X 39	41	X 44	X 46	X 50	X 53	O X 57	X 58	X 60	X 63	X 60	X 64	X 61	X 56	X 52	X 48	X 45	X 40	37	33
U Q	42	40	43	43	46	X 48	X 50	X 50	X 52	X 59	X 58	X 61	X 66	X 72	X 73	X 70	X 65	X 60	X 56	X 50	O X 48	X 43	41	45
L Q	X 27	X 28	X 28	34	33	36	X 42	O X 43	O X 47	O X 50	O X 50	X 53	O X 56	O X 56	O X 58	X 58	O X 56	O X 53	X 50	O X 46	X 40	X 33	X 30	O X 30

OCT. 2010 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2010 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	F 26	20	F 19	F 20	F 28	F 30	40	F 41	46	51	57	66	J R 66	R	R 60	59	U R 50	R 52	46	35	27	24	R 20
2	B	B	B	26	F 26	F 26	F 32	39	43	J R 51	J R 52	J R 53	J R 55	57	58	58	J R 55	J R 51	50	40	36	F 29	F 25	F 22
3	F 18	F 20	20	F 17	F 24	F 24	B	33	B	53	58	61	62	57	60	60	57	50	45	40	F 37	F 32	F 28	F 23
4	F 17	B	A	Y	F 18	F 25	43	50	57	59	62	64	60	68	J R 72	67	60	54	45	42	41	F 30	F 24	Z 24
5	Y	A	R	A	F 51	A	36	F 31	F 40	B	B	R	B	B	J R 75	71	B	B	B	44	B	B	A	A
6	A	A	A	A	A	A	38	43	J R 45	R	R	J R 47	58	69	74	F 71	66	B	B	34	B	B	A	A
7	A	A	F	A	A	A	A	R 32	B	B	R	47	R 50	B	B	B	B	50	B	B	33	R 29	B	24
8	21	A	A	A	A	A	A	A	A	F 27	B	R 50	R	R	R 54	R	D R 43	R	R	42	33	B	F 22	B
9	F 16	18	F 18	B	A	B	A	42	R 45	R	R 46	52	R	B	B	B	R 52	R 44	43	40	34	26	R 23	Y
10	B	B	B	B	18	F 26	34	R 40	42	R	R 43	B	51	51	52	J R 53	59	J R 54	46	R 38	32	22	B	A
11	B	A	A	28	A	A	R 43	A	A	R	B	J R 54	59	61	R 67	B	R	B	B	R	A	A	A	A
12	A	A	B	B	R 32	B	B	B	B	B	B	36	B	B	R	B	B	B	37	B	B	A	B	A
13	A	B	B	B	B	A	A	R	36	R	B	B	B	47	R	B	R 42	R 40	R 40	37	35	25	B	B
14	20	A	A	B	R	B	B	B	B	R	R	R	R	R	J R 53	51	R	47	47	42	34	31	31	F 24
15	F 24	F 26	F 24	R 35	33	J R 35	R 35	R 36	B	R 58	R	R	J R 51	J R 66	59	58	J R 60	57	B	R 43	R 42	R 33	F 24	A
16	B	A	B	A	B	B	A	42	B	B	57	B	R	R	R	R	57	R 53	54	48	34	F 21	A	A
17	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	R 41	R 39	39	31	A	A
18	A	B	A	A	B	B	A	R 43	R 43	R 44	R 44	R	R	R	B	B	B	R 48	44	41	38	V 37	24	A
19	A	A	B	B	33	A	A	A	B	B	R 38	R 44	R 45	R	R 47	R 40	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	F 30	F 24
21	A	R	R 30	A	B	A	34	40	40	41	43	R	R 45	R	52	53	51	57	50	43	40	F 21	F 17	F 24
22	F 20	F 20	30	30	A	F 38	R 50	R	R 46	J R 49	52	J R 55	B	B	B	B	56	60	54	49	46	40	F 40	F 36
23	34	R 29	R	A	32	A	B	A	R 41	B	B	B	R	B	B	B	R	B	B	26	31	R 27	A	A
24	A	A	A	B	A	B	A	B	B	B	B	R	B	B	B	B	B	B	B	38	33	A	A	A
25	A	A	B	B	A	B	A	A	34	R 38	R	B	B	R	R 46	B	B	B	R 48	U R 44	42	39	R	24
26	16	F 18	A	B	B	B	B	R 36	R 36	R 44	R 45	R	B	B	B	B	B	B	R 48	46	41	R	B	B
27	A	R	B	31	F 34	39	42	44	R	B	B	R	R	R 50	R 49	B	R 45	R 45	44	R 41	39	36	33	A
28	A	R 22	Z 26	Z 37	47	43	R 44	44	R 48	R 48	R	R	J R 50	50	B	R	R 50	R 50	B	44	42	37	F 28	F 22
29	F 19	F 21	F 28	F 32	43	B	R 37	R 40	43	R 45	R 51	R 51	R	R	R	R	46	47	48	R 42	42	40	F 36	F 36
30	F 32	F 30	31	30	B	R 42	51	R 52	52	R	52	R 53	J R 54	S	R	52	J R 50	50	50	44	43	41	F 30	F 29
31	F 37	30	B	A	B	F 30	R 47	R 48	J R 55	R 56	R	J R 52	R	R	U R 54	J R 52	J R 51	47	46	42	41	40	38	F 36
	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	11	9	10	13	11	15	19	18	14	14	15	13	11	15	13	18	19	20	26	25	22	17	14
MED	F 20	F 22	26	30	32	F 30	38	40	43	R 47	51	R 52	R 54	57	R 54	58	55	50	46	42	38	31	F 28	F 24
U Q	F 28	29	30	32	38	39	R 44	44	R 46	53	52	55	60	66	R 67	64	59	54	50	44	42	37	32	F 29
L Q	F 18	F 20	20	F 26	F 22	F 26	34	R 36	40	44	R 44	47	R 50	50	R 52	52	R 50	R 47	44	40	34	27	24	F 23

OCT. 2010 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2010 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 12	29	28	K 21	E B 13	34	33	26	G 19	40	36	36	30	G	G	24	G	E B 23	18	E B 12	E B 12	E B 12	E B 12	E B 14
2	B	B	B	E S 16	21	E B 14	17	G 15	G 17	28	29	30	29	29	32	32	24	21	18	16	27	22	28	E B 12
3	E B 12	E B 13	E B 12	E B 13	E B 14	E B 14	B	28	B	30	30	32	32	32	30	25	22	21	21	E B 14	E B 12	E B 13	E B 12	E B 13
4	E B 13	B 28	18	E S 14	E B 12	G 13	G	25	G 22	G	G 20	G 21	30	28	25	29	24	20	16	E B 12	E B 12	E B 12	E B 13
5	17	32	31	42	48	41	41	42	G	B	B	E B 29	B	B	E B 54	E B 29	B	B	B	E B 18	B	B	32	K 29
6	24	25	K 24	K 33	33	48	30	24	28	25	26	26	G	28	30	30	27	B	B	E B 17	B	B	41	42
7	42	31	31	38	41	39	39	G 28	B	B	34	G 25	30	B	B	B	B	E B 23	B	B	E B 22	E B 24	B	E B 18
8	E B 13	41	64	48	38	40	42	42	42	41	B	30	33	24	28	25	G	E B 30	E B 29	15	E B 17	B	20	B
9	E B 12	E B 12	E B 11	B	36	B	41	28	28	28	30	32	30	B	B	B	26	E B 29	E B 22	17	16	E B 15	16	K 14
10	B	B	B	B	16	17	20	G 18	G	G	30	B	G 20	G	30	25	G 20	G	26	E B 31	E B 14	30	B	33
11	B	36	36	36	34	36	35	50	36	30	B	26	G	G	26	B	32	B	B	40	86	56	34	38
12	42	38	B	B	22	B	B	B	B	B	B	30	B	B	G 22	B	B	B	24	B	B	36	B	32
13	55	B 32	B	31	34	34	31	G 24	32	B	B	B	28	E B 33	B	E B 30	G	E B 30	18	18	E B 12	B	B
14	32	32	K 31	B	30	B	B	B	B	G 22	G 19	31	28	28	32	27	26	25	E B 23	G 14	E B 14	19	E B 14	E B 13
15	E B 12	E B 12	26	E B 30	K 35	E B 16	E B 22	E B 26	B	27	25	G 25	G 25	G 24	27	27	G 22	27	B	E B 22	E B 25	E B 22	E B 12	65
16	B	33	B	34	B	B	40	G	B	B	31	B	G 21	E B 33	E B 30	25	G 22	26	G 19	28	E B 20	17	31	40
17	36	45	43	39	42	35	44	46	B	B	B	B	B	B	B	B	B	B	E B 26	E B 30	E B 24	15	40	54
18	46	B 39	45	B	B	38	34	31	30	30	E B 29	G 24	G 20	B	B	B	E B 30	G	18	E B 14	E B 12	38	33
19	47	36	B	B 32	86	51	41	B	B	29	G	E B 22	G 18	G	31	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E B 16	E B 15
21	34	26	41	51	B	51	36	G 16	30	32	31	32	34	35	36	32	31	32	29	21	17	30	16	E B 12
22	22	K 30	25	28	34	27	32	41	40	32	32	G	B	B	B	B	E B 29	G 20	E B 24	E B 20	E B 16	E B 20	E B 13	E B 16
23	34	48	K 31	38	34	60	B	50	35	B	B	B	G	B	B	B	28	B	B	E B 16	27	30	40	90
24	82	42	58	B	48	B	36	B	B	B	B	E B 30	B	B	B	B	B	B	B	33	E B 20	K 34	37	K 37
25	41	42	B	B	44	B	34	40	35	G 18	29	B	B	G	26	B	B	B	24	E B 24	E B 19	16	37	K 30
26	22	26	G 15	B	B	B	B	27	G	27	G 24	29	B	B	B	B	B	B	E B 29	E B 19	G 14	31	B	B
27	37	G 25	B	26	G	E B 21	24	G 20	G 20	B	B	G	31	G 24	30	B	24	E B 25	E B 27	E B 22	E B 20	16	E B 12	G
28	33	26	25	22	G 12	G 14	23	31	31	29	27	31	29	30	B	29	29	G 20	B	G 17	17	E B 12	E B 12	E B 12
29	E B 13	E B 14	E B 13	14	18	B	40	36	G	31	32	28	32	G 24	G 27	25	26	29	29	G	E B 19	E B 19	E B 14	E B 12
30	E B 13	E B 16	E B 18	E B 22	B	E B 22	G 19	27	26	G 24	28	32	32	S	30	36	43	30	24	G 16	23	16	E B 13	37
31	E B 12	34	B	E B 22	B	27	24	25	28	31	29	G 24	34	31	G 20	26	21	24	25	G	25	E B 15	E B 14	E B 12
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	25	22	21	24	21	25	27	21	21	21	24	22	20	21	17	21	20	21	27	26	26	25	27
MED	32	31	30	30	32	34	34	28	28	29	29	29	29	E G 26	29	26	25	23	22	17	E B 18	17	16	18
U Q	42	37	36	38	37	40	40	41	33	32	31	31	32	30	31	30	29	29	E B 28	E B 22	23	30	36	37
L Q	E B 13	E B 25	E B 24	22	17	E B 16	24	G 26	G	G	26	G	G 25	G	G	25	G	G 21	20	16	E B 14	E B 15	E B 12	E B 13

OCT. 2010 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2010 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 13	12	12	13	13	12	12	12	12	12	12	12	15	19	23	15	14	23	14	12	12	12	12	14
2	B	B	B 16	15	13	12	12	12	12	13	12	12	14	13	12	13	12	13	12	12	12	11	12	12
3	12	13	12	13	14	14	B	18	B	13	14	15	15	12	15	14	14	15	14	14	12	13	12	13
4	13	B 13	12	E S 14	13	12	14	13	18	14	15	19	23	17	14	14	12	12	12	11	12	12	13	
5	12	12	20	13	12	16	12	12	12	B	B	29	B	B	54	29	B	B	B 18	B	B	12	12	
6	12	12	12	15	20	16	13	12	12	13	18	22	23	18	14	19	13	B	B 17	B	B	12	15	
7	15	15	17	28	14	13	14	13	B	B	20	16	14	B	B	B	B	23	B	B	22	24	B	18
8	13	12	18	15	24	12	24	22	21	14	B	22	28	16	16	23	21	30	29	14	17	B	11	B
9	12	12	11	B	29	B	18	12	12	13	20	16	19	B	B	B	24	29	22	12	14	15	13	12
10	B	B	B	B	13	12	13	14	18	20	28	B	18	21	15	15	16	15	16	31	13	14	B	15
11	B	14	26	12	20	18	15	17	27	24	B	23	22	23	19	B	27	B	B	25	13	20	27	14
12	15	18	B	B	13	B	B	B	B	B	B	22	B	B	20	B	B	B	15	B	B	12	B	13
13	23	B	27	B	28	23	21	19	18	28	B	B	B	22	33	B	30	14	30	14	13	12	B	B
14	13	12	14	B	22	B	B	B	B	18	16	28	20	17	21	16	12	14	23	14	14	14	14	13
15	12	12	12	29	13	16	22	26	B	18	19	22	16	22	13	15	14	12	B	22	25	22	12	16
16	B	25	B	23	B	B	29	20	B	B	21	B	18	33	30	18	14	12	12	13	19	12	11	15
17	18	12	22	14	16	26	19	20	B	B	B	B	B	B	B	B	B	B	26	30	24	13	11	14
18	20	B	23	23	B	B	20	15	12	15	20	29	16	14	B	B	B	30	15	15	14	12	12	23
19	14	15	B	B	15	28	14	28	B	B	25	19	19	12	18	23	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	16	15
21	12	12	13	24	B	20	13	13	12	12	12	14	14	13	13	14	12	12	12	11	11	11	12	12
22	12	12	12	16	15	12	12	16	16	19	15	22	B	B	B	B	29	17	24	20	16	20	13	16
23	12	12	21	16	12	23	B	14	16	B	B	B	20	B	B	B	15	B	B 16	12	14	12	12	
24	16	19	13	B	24	B	21	B	B	B	B	30	B	B	B	B	B	B	B 15	20	12	13	15	
25	14	18	B	B	18	B	21	16	13	15	15	B	B	20	19	B	B	B	15	24	19	12	14	12
26	12	13	12	B	B	B	B	20	15	20	18	16	B	B	B	B	B	B	29	19	12	14	B	B
27	31	18	B	17	20	21	13	12	13	B	B	24	22	16	15	B	17	25	27	23	20	12	12	20
28	12	13	12	13	11	13	12	13	13	13	15	15	15	13	B	19	18	15	B 14	12	13	12	12	
29	13	14	13	12	13	B	15	14	26	15	18	13	14	14	17	17	13	12	13	16	19	19	14	12
30	13	16	18	22	B	22	14	20	17	20	22	17	18	S	14	12	12	12	13	12	12	12	13	13
31	12	14	B	22	B	13	15	13	13	19	23	17	18	13	14	14	15	12	12	14	15	15	14	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	30	30	30	30	29	30	30	29	29	29	29	29	29	30	30
MED	13	14	18	22	17	20	15	16	16	19	20	22	19	21	20	23	17	23	23	15	14	13	12	14
U Q	B 20	B 18	B	B	B 28	B	B 22	20	B	B	B	B 29	B	B	B	B	B	B	B	22	20	20	B 14	16
L Q	12	12	12	14	13	13	13	13	13	14	15	16	16	14	15	15	14	12	14	14	12	12	12	12

OCT. 2010 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2010 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 290	S 324	E A 370	E B 314	A	A	A 234	182	212	Q 192	206	Q 196	202	190	210	198	208	208	206	Q 200	208	232	E B 298
2	B	B	B	E S 320	292	254	Q 232	Q 206	198	214	200	200	204	208	210	210	214	206	204	204	212	196	214	214
3	248	288	E B 348	E B 338	B 296	234	B	222	B	186	190	192	204	202	216	216	216	212	204	196	Q 208	Q 208	Q 224	Q 240
4	246	B	A	Y	E S 304	Q 226	220	212	Q 208	212	212	208	210	192	220	206	204	204	192	202	Q 206	Q 210	Q 226	244
5	Y	A	A	A	A	A	228	248	200	B	B	216	B	B	B	216	B	B	B	212	B	B	A	A
6	A	A	A	A	A	A	A 232	214	196	202	202	194	H 184	196	200	212	208	B	B	218	B	B	A	A
7	A	A	A	A	A	A	A	E A 226	B	B	E A 260	228	192	B	B	B	B	214	B	B	224	E B 272	B	E B 344
8	E B 334	A	A	A	A	A	A	A	A	A 216	B	216	220	210	200	B 218	224	216	208	208	206	B	262	B
9	E B 272	E B 286	B 292	B	A	B	A	220	222	212	198	212	194	B	B	B	212	228	222	208	220	256	A 294	Y
10	B	B	B	B	E A 282	228	224	198	202	202	220	B	200	200	210	194	198	220	206	228	222	E A 270	B	A
11	B	A	A	A	A	A	E A 292	A	A	A	B	218	204	226	196	B	A	B	B	A	A	A	A	A
12	A	A	B	B	226	B	B	B	B	B	B	198	B	B	218	B	B	B	232	B	B	A	B	A
13	A	B	B	B	B	A	A	A	200	A	B	B	B	A	B 232	B	240	204	226	220	220	B 252	B	B
14	196	A	A	B	A	B	B	B	B	196	216	208	198	196	A	202	210	210	216	202	198	Q 216	224	232
15	Q 248	E B 262	E A 300	E B 322	A 252	226	236	B 234	B	200	206	206	200	218	210	208	200	216	B	218	218	230	232	A
16	B	A	B	A	B	B	A	226	B	B	194	B	212	226	194	198	E A 216	222	214	228	240	E A 324	A	A
17	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	274	242	250	258	A	A
18	A	B	A	A	B	B	A	E A 240	204	206	194	194	194	202	B	B	B	238	212	Q 212	Q 216	224	A 248	A
19	A	A	B	B	Q 294	A	A	A	B	B	232	234	226	226	226	210	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	248	Q 248
21	A	A	A	A	B	A	210	202	200	198	198	198	198	206	208	198	Q 198	206	Q 196	Q 212	Q 218	Q 252	Q 250	Q 236
22	Q 276	A	A	A	A	A 242	204	A	204	198	210	210	B	B	B	B	204	216	216	208	216	224	Q 232	240
23	248	190	A	A	212	A	B	A	218	B	B	B	218	B	B	B	E A 242	B	B	196	262	206	A	A
24	A	A	A	B	A	B	A	B	B	B	B	212	B	B	B	B	B	B	B	E A 290	244	A	A	A
25	A	A	B	B	A	B	A	A	A 258	214	204	B	B	204	204	B	B	B	220	226	222	222	A	208
26	A	A	A	B	B	B	B	E A 248	216	216	202	196	B	B	B	B	B	B	232	222	222	A	B	B
27	A	A	B	A	A	E B 274	234	214	202	B	B	218	206	210	210	B	222	230	224	228	232	222	232	A
28	200	A	E A 342	A 294	248	222	216	200	188	206	206	192	196	196	B	196	208	216	B	222	222	216	222	E B 302
29	Q 262	Q 276	Q 270	Q 262	240	B	A	A	A	210	194	194	190	196	196	206	198	204	200	220	232	210	Q 216	Q 232
30	Q 258	Q 276	292	300	B	236	200	208	202	184	222	194	194	S	198	196	196	196	196	H 176	204	222	224	Q 232
31	Q 234	A	B	200	B	254	220	212	194	208	A 228	194	194	202	202	208	218	196	196	218	212	222	218	218
	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	7	7	8	11	10	13	18	18	19	21	24	22	19	19	17	20	20	21	26	25	22	17	14
MED	248	276	296	310	U 265	233	222	214	202	206	203	206	199	202	208	208	208	213	212	214	220	220	232	235
U Q	267	288	E 342	E B 330	E B 296	254	233	A 234	208	212	218	214	206	210	216	211	217	218	223	222	228	252	248	E B 248
L Q	240	262	292	278	240	226	213	208	198	198	196	194	194	196	198	198	199	205	202	206	210	210	223	232

OCT. 2010 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2010 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	40	39	47	41	40	X 47	O X 48	X 49	O X 52	O X 53	R	R	R	R	X 60	B	R	X 48	X 51	X 51	X 46	X 46	X 44	43
2	42	X 38	38	44	44	50	O X 57	X 54	X 57	X 59	O X 60	R	B	B	B	R	R	O X 55	X 55	X 52	X 48	X 42	X 41	35
3	34	34	R	A	A	A	R	R	R	X 60	X 61	R	O X 63	X 60	O X 64	X 57	X 60	X 59	X 56	X 48	O X 44	X 47	42	B
4	X 31	R	B	A	A	A	B	R	O X 50	O X 52	R	R	R	R	R	O X 52	O X 52	O X 50	O X 55	X 46	X 44	X 47	X 45	X 45
5	X 46	46	45	O X 45	X 40	X 52	X 58	62	X 65	X 64	X 64	O X 65	R	S	O X 63	O X 62	X 56	O X 53	X 55	X 54	X 46	X 39	41	44
6	45	47	50	51	53	62	65	68	70	X 66	X 64	X 64	X 66	X 68	X 68	62	X 61	X 57	X 57	X 51	X 51	52	57	52
7	52	39	54	52	56	64	66	71	71	70	66	73	73	68	66	X 61	X 60	X 58	X 55	X 53	X 53	50	49	36
8	38	40	57	58	X 56	62	X 60	X 66	X 67	X 66	X 64	68	X 64	X 63	X 68	X 68	X 67	X 64	X 57	X 58	X 50	32	41	36
9	35	40	42	46	50	X 42	A	A	60	R	B	X 58	X 66	X 65	X 62	X 61	X 62	X 57	O X 53	X 52	56	X 48	47	48
10	X 47	41	R	A	X 48	X 54	X 56	X 65	X 68	X 70	X 71	X 80	79	R	R	O X 68	66	65	O X 64	X 57	52	58	O X 39	X 38
11	75	92	X 41	X 56	A	B	R	O X 52	X 57	O X 57	X 59	X 61	X 61	O X 70	X 76	X 76	X 74	R	R	R	A	40	A	O X 37
12	R	38	O X 35	B	O X 46	O X 46	B	R	B	R	B	B	B	B	B	B	B	O X 47	R	B	O X 46	X 44	X 34	X 34
13	X 36	B	B	B	R	B	X 51	X 57	X 62	X 60	X 62	X 62	O X 54	O X 54	R	X 47	R	R	R	X 48	X 48	X 47	X 40	B
14	B	B	B	B	B	X 63	X 62	R	B	R	X 58	R	X 58	X 59	R	R	X 57	O X 56	X 55	X 52	40	O X 38	A	X 44
15	B	A	R	A	B	R	B	R	R	O X 44	O X 44	O X 44	O X 48	B	O X 46	B	B	B	O X 50	O X 47	O X 45	X 47	X 45	X 48
16	49	A	X 34	B	O X 44	B	B	O X 50	O X 53	X 57	R	X 57	B	R	R	R	O X 56	R	X 52	O X 49	O X 49	R	B	X 48
17	X 52	58	X 49	52	58	O X 52	O X 52	X 52	O X 52	B	B	B	B	B	O X 64	R	B	X 60	R	R	R	O X 50	X 51	X 43
18	X 37	X 42	X 46	X 44	A	R	A	R	B	O X 62	O X 65	O X 65	R	O X 69	R	X 60	O X 53	R	X 59	O X 53	O X 55	X 50	X 37	37
19	X 38	X 41	X 39	A	R	R	O X 50	R	66	O X 64	O X 66	O X 67	R	O X 59	X 58	R	R	O X 56	O X 55	X 50	X 50	X 50	X 47	X 48
20	X 50	X 56	66	68	X 69	X 69	X 66	X 70	R	R 71	O X 73	B	R	B	X 59	R	R	X 57	X 58	O X 53	O X 52	X 49	X 48	X 48
21	44	X 41	X 40	R	A	X 48	X 54	67	70	70	X 66	A	O X 65	R	O X 64	R	R	R	X 54	O X 54	X 53	X 50	O X 40	X 33
22	38	44	O X 46	O X 45	O X 48	A	O X 47	R	66	63	X 63	X 66	X 65	R	R	R	A	O X 53	O X 50	B	X 47	R	A	X 46
23	O X 40	A	A	A	A	A	A	O X 52	X 53	O X 56	B	O X 64	R	R	X 60	X 60	X 56	X 57	X 51	X 48	B	B	41	B
24	A	R	R	X 43	B	R	O X 49	O X 52	X 57	O X 58	X 58	B	R	R	R	R	O X 49	O X 45	O X 50	X 50	X 45	R	O X 38	A
25	O X 42	O X 41	R	B	B	R	O X 46	O X 49	O X 49	O X 51	X 54	A	R	R	O X 48	R	O X 55	O X 53	O X 50	O X 48	O X 46	X 45	X 46	X 46
26	X 46	48	50	51	51	X 58	X 62	X 65	X 66	O X 67	X 64	X 64	X 59	O X 54	O X 54	R	X 56	X 56	X 54	X 52	O X 52	O X 51	X 48	37
27	41	42	49	50	X 59	X 60	X 62	X 63	X 69	X 70	O X 69	R	R	R	R	O X 60	O X 56	X 61	X 57	X 56	X 51	X 48	40	A
28	A	A	B	50	R	R	R	R	R	X 59	O X 56	R	O X 59	R	R	R	X 56	X 56	O X 55	X 56	X 50	O X 44	X 43	41
29	A	B	B	R	R	R	A	R	O X 55	O X 55	X 60	R	R	R	R	O X 57	R	O X 54	R	X 52	X 50	X 50	39	X 39
30	X 40	A	X 49	X 44	R	X 47	X 50	X 56	X 57	R	R	X 57	R	R	R	R	R	O X 50	B	R	X 50	O X 46	X 48	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	24	20	19	17	15	16	19	19	23	25	22	16	14	11	16	14	18	24	24	25	27	26	26	25
MED	42	41	46	50	X 50	X 53	X 56	X 57	X 60	X 60	X 64	X 64	X 64	X 63	X 62	X 60	X 56	X 56	X 55	X 52	X 50	X 47	X 42	X 43
U Q	X 46	46	50	52	X 56	62	X 62	66	67	X 66	X 66	X 66	66	O X 68	X 65	X 62	X 61	X 58	X 56	X 54	X 52	X 50	X 47	X 47
L Q	38	40	X 40	X 44	44	X 48	O X 50	O X 52	O X 53	O X 56	X 59	X 60	X 59	O X 59	O X 58	X 57	O X 56	O X 53	O X 52	X 48	X 46	X 44	X 40	37

NOV. 2010 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2010 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	F 30	F 25	Y	F 28	F 29	41	R 42	43	R 46	U R 47	R	R	R	R	J R 54	B	R	42	45	45	40	40	38	F 33
2	F 33	32	F 28	F 34	F 28	F 37	R 51	48	J R 51	J R 53	R 54	R	B	B	B	R	R	R 49	49	R 46	42	36	35	F 24
3	Z 28	F 24	R	A	A	A	R	R	R	J R 54	J R 55	R	R 57	J R 54	R 58	51	54	53	50	42	38	41	36	B
4	25	A	B	A	A	A	B	A	R 44	R 46	R	R	R	R	R	R 47	R 46	R 44	R 48	40	38	41	39	39
5	40	F 33	F 33	R 39	34	46	52	F 50	J F 59	J R 58	58	R 59	R	S	57	R 56	50	R 47	49	48	40	33	F 31	F 33
6	F 34	F 31	F 35	F 43	F 43	F 50	F 55	F 58	F 60	60	58	58	60	62	62	56	55	51	51	45	45	F 43	F 40	F 40
7	F 39	F 24	F 27	F 31	F 32	F 55	F 51	F 57	F 60	F 58	F 56	F 62	F 62	F 57	F 56	55	J R 54	52	49	47	47	44	F 39	F 26
8	F 24	F 22	F 30	F 41	50	F 49	54	60	61	60	58	F 59	58	57	62	62	61	58	J R 51	52	44	F 21	F 30	F 24
9	F 24	F 25	F 28	Z 40	F 40	36	A	A	F 50	R	B	52	60	59	56	55	56	51	47	46	F 46	42	F 37	F 37
10	41	F 27	R 32	A	42	48	R 50	59	62	64	J R 65	J R 74	F 69	R	R	R 62	F 57	F 56	58	51	F 42	F 47	R 33	32
11	R 31	R 34	35	50	A	B	R	R 46	51	R 51	53	55	J R 55	64	R 70	70	68	R	R	R	A	R 34	A	R 31
12	A	F 28	R 29	B	R 40	R 40	B	R	B	R	B	B	B	B	B	B	B	R 41	R	B	R 40	38	28	28
13	30	B	B	B	R	B	J R 45	51	56	54	56	J R 56	R 48	R 48	R	41	R	R	D R 42	42	42	41	34	B
14	B	B	B	B	B	57	56	R	B	R	52	R	J R 52	53	R	R	51	R 50	49	46	F 32	R 32	A	38
15	B	A	R	A	B	R	B	R	R	E G 38	E G 38	E G 38	R 42	B	E G 40	B	B	B	R 44	41	39	41	39	42
16	F 39	A	28	B	R 38	B	B	R 44	47	J R 51	R	J R 51	B	R	R	R	R 50	R	46	R 43	R 43	R	B	42
17	46	44	43	F 41	F 48	R 46	R 46	46	U R 46	B	B	B	B	B	R 58	R	B	J R 53	R	R	R	R 44	45	37
18	31	36	40	38	A	R	A	R	B	R 56	59	R 59	R	R 63	R	54	R 47	R	J R 53	47	J R 49	44	31	F 24
19	32	35	33	A	A	R	R 44	R	F 56	R 58	R 60	R 61	R	R 53	52	R	R	R 50	R 49	44	44	44	41	42
20	44	50	F 55	F 58	J R 63	J R 63	60	64	R	U R 65	R 67	B	R	B	53	R	R	J R 51	J R 52	47	R 46	43	42	42
21	F 30	35	34	R	A	42	48	F 55	F 58	F 62	60	A	59	R	R 58	R	R	R	48	R 47	47	44	R 34	27
22	F 25	F 32	R 40	39	42	A	R 41	R	F 56	F 53	57	60	59	R	R	R	R	R 47	R 44	B	41	R	A	40
23	R 34	A	A	A	A	A	A	46	47	R 50	B	R 59	R	R	54	54	50	J R 51	45	42	B	B	F 31	B
24	A	A	R	37	B	A	R 43	46	51	R 52	52	B	R	R	R	R	R 43	R 38	U R 44	44	39	R	32	A
25	R 36	R 35	R	B	B	A	R 40	43	R 43	R 45	R 48	R	R	R	R 42	R	U R 49	R 47	44	42	40	39	40	40
26	40	F 38	F 37	F 39	F 41	52	56	59	60	61	58	58	J R 53	R 48	48	R	50	50	48	R 46	46	R 45	42	F 28
27	F 30	F 33	F 38	F 42	53	J R 54	56	57	63	64	63	R	R	R	R	R 54	R 50	J R 55	J R 51	50	45	42	F 29	A
28	A	A	B	F 40	A	R	R	A	R	J R 53	50	R	R 53	R	R	R	50	50	R 49	J R 50	44	38	37	35
29	A	B	B	R	R	R	A	A	49	R 49	J R 54	R	R	R	R	51	R	R 48	R	46	44	44	F 29	33
30	34	A	43	38	R	41	44	50	51	R	R	J R 51	R	R	R	R	A	R 44	B	R	44	R 40	42	F 35
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	20	19	17	15	16	19	19	23	25	22	16	14	11	16	14	18	24	25	25	27	26	26	25
MED	32	F 32	34	F 39	41	47	50	50	51	R 54	56	58	58	57	56	54	50	R 50	49	46	43	41	36	35
U Q	39	35	40	F 42	48	53	55	58	60	60	59	R 60	60	62	R 58	56	55	52	J R 50	47	45	44	40	40
L Q	F 30	F 26	F 29	F 38	F 34	41	R 44	46	R 47	R 50	53	54	R 53	R 53	52	51	R 50	R 47	R 45	42	40	38	F 31	F 28

NOV. 2010 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2010 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	E B 13	30	20	24	22	29	16	25	32	32	34	31	31	G 20	G 24	B	31	G 18	27	27	18	E B 14	E B 13	E B 12
2	16	37	41	38	28	29	30	23	31	30	33	38	B	B	B	37	25	21	23	21	17	E B 15	E B 13	29
3	25	40	28	45	49	50	40	38	36	32	32	25	G 25	33	33	G 22	G 22	G 20	26	23	E B 23	30	35	B
4	33	34	B	37	41	36	B	42	34	20	G 24	30	32	34	G 23	23	G 23	G 22	30	23	20	E B 16	18	E B 12
5	E B 13	33	32	35	36	27	28	30	31	29	E B 28	G	G 25	S	G 25	G 20	G 22	26	G 23	29	24	E B 18	17	19
6	E B 13	29	30	24	28	28	G 16	32	32	31	28	36	G 27	34	35	G 20	32	28	25	G 18	30	27	16	24
7	33	30	31	26	28	41	36	32	G 24	33	G 26	32	36	34	33	G 24	G 24	33	29	28	27	17	30	33
8	30	40	46	27	28	28	30	32	33	44	34	31	59	57	36	G 21	40	43	39	G	32	34	34	36
9	37	29	28	23	31	68	52	52	32	G	B	32	34	35	34	48	42	30	24	G	32	17	G	17
10	E B 18	E B 17	40	42	35	G 28	28	33	30	34	24	40	42	32	G	42	37	33	42	47	63	24	32	32
11	63	44	40	44	87	B	34	41	34	33	34	G 20	37	G 28	E B 33	G 24	31	35	26	40	48	41	40	40
12	36	26	59	B	30	32	B	40	B	36	B	B	B	B	B	B	B	G	33	B	26	G	27	36
13	33	B	B	B	32	B	34	G 21	31	G 21	G 21	28	29	28	33	33	32	30	E B 26	24	24	18	23	B
14	B	B	B	B	B	32	36	38	B	44	34	24	G 24	32	32	27	29	26	26	24	33	34	39	39
15	B	42	G 24	58	B	38	B	33	34	34	34	35	G	B	E B 34	B	B	B	E B 30	G	E B 20	G	19	17
16	16	69	59	B	24	B	B	G	G 22	33	34	33	B	28	G 24	G 24	28	E B 30	G	E B 39	E B 24	E B 25	B	34
17	22	E B 23	E B 31	28	25	47	42	33	G 26	B	B	B	B	B	E B 36	34	B	G 24	E B 26	E B 28	22	E B 20	14	16
18	E B 19	E B 24	24	33	43	39	57	35	B	G 25	E B 32	G 22	31	35	G 23	G 25	21	G 18	32	26	E B 25	17	30	27
19	21	28	36	38	34	34	G 24	39	34	30	G 24	29	32	32	32	28	25	G	G 14	G	24	26	16	16
20	16	E B 15	17	24	28	24	27	30	E B 30	G 23	30	B	36	B	39	37	36	38	26	26	25	34	47	36
21	26	E B 22	64	26	41	38	27	32	36	33	45	87	29	G 26	G 25	E B 22	G	G 21	G	G	23	20	38	26
22	19	28	42	39	41	51	45	A	37	G 24	32	31	G 21	34	G 29	29	30	27	E B 30	B	29	36	42	42
23	48	71	49	47	42	57	50	46	33	33	B	33	35	32	32	32	32	32	31	25	B	B	31	B
24	42	35	28	31	B	41	34	32	33	G	G 22	B	29	G 24	27	G	28	25	G 20	24	29	36	32	39
25	34	32	34	B	B	41	41	32	G	34	33	29	29	40	30	34	G 20	26	G	25	G	21	18	23
26	32	22	29	27	29	29	30	48	48	37	32	38	34	35	33	31	34	31	30	25	G	G	21	16
27	21	15	26	25	25	29	30	34	33	33	34	33	35	33	43	40	37	32	30	30	24	28	39	41
28	63	41	B	36	43	38	G	46	34	33	32	35	32	36	39	42	36	35	30	25	30	28	41	37
29	44	B	B	32	35	34	58	45	34	33	36	33	36	36	35	36	35	28	29	31	30	30	36	G
30	26	60	32	44	37	40	33	32	35	32	30	33	38	33	G	36	47	41	B	E B 28	28	23	25	E B 24
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	27	25	25	26	27	26	29	27	29	26	26	26	24	28	27	27	29	29	28	29	29	29	27
MED	26	30	32	33	33	36	34	33	33	33	32	32	32	33	32	29	31	28	26	24	25	22	30	27
U Q	35	40	42	40	41	41	41	40	34	34	34	35	36	35	34	36	36	32	30	28	30	30	37	36
L Q	E B 18	E B 24	28	26	28	29	28	32	G 31	G	G 28	29	G 29	G 30	G 28	G 24	G	G	G 24	G 22	22	17	18	17

NOV. 2010 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2010 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	13	12	12	12	12	13	12	13	12	12	15	B	11	12	12	11	13	14	13	12
2	12	12	12	12	12	12	13	12	12	14	13	13	B	B	B	21	18	15	12	12	13	15	13	12
3	12	12	23	16	14	19	16	17	18	15	12	20	18	13	12	12	22	16	14	18	23	16	12	B
4	11	16	B	15	24	24	B	13	22	12	12	13	13	13	13	12	15	15	14	13	13	17	12	12
5	13	11	12	19	13	11	11	12	13	12	28	21	22	S	14	13	14	19	21	13	12	18	12	14
6	13	12	12	12	12	12	13	12	12	14	14	16	16	13	13	15	14	12	12	16	13	12	12	12
7	13	12	12	12	13	13	13	12	13	12	13	13	13	13	15	14	13	13	12	12	11	12	12	13
8	12	12	12	12	12	12	12	14	12	13	14	14	13	14	13	14	12	12	12	12	13	12	12	12
9	12	13	12	12	12	12	14	16	13	28	B	20	19	14	19	14	16	14	13	16	14	13	12	14
10	18	17	16	13	12	12	12	12	14	12	13	13	15	19	18	17	13	13	12	12	14	12	16	12
11	13	16	13	13	23	B	15	12	14	13	14	13	14	14	33	19	14	14	14	12	13	12	12	12
12	18	13	14	B	17	18	B	29	B	26	B	B	B	B	B	B	B	22	20	B	20	12	12	11
13	12	B	B	B	24	B	17	14	13	13	17	19	19	24	19	18	17	23	27	15	12	12	12	B
14	B	B	B	B	B	14	13	24	B	15	19	22	19	16	20	26	17	12	12	13	12	12	12	12
15	B	25	18	12	B	23	B	29	24	14	14	16	16	B	34	B	B	B	30	16	20	15	14	14
16	13	34	15	B	22	B	B	20	16	14	15	16	B	20	16	18	22	30	15	39	24	25	B	13
17	14	23	31	12	12	13	12	14	22	B	B	B	B	B	36	24	B	16	26	28	14	20	12	13
18	19	24	16	19	23	28	23	13	B	23	32	14	17	16	21	13	16	14	12	24	24	12	12	12
19	12	15	18	23	18	29	20	16	17	13	20	17	13	14	18	15	13	14	12	13	12	12	13	12
20	12	14	12	11	12	13	12	12	30	13	18	B	32	B	22	24	20	20	19	12	13	12	12	12
21	12	22	13	22	18	13	13	12	11	13	13	14	16	15	18	18	20	16	14	15	12	12	12	14
22	12	13	14	13	16	19	16	15	16	18	22	28	14	13	27	18	25	20	30	B	12	14	15	12
23	12	15	17	16	24	15	16	12	12	12	B	23	18	19	15	14	13	12	12	12	B	B	12	B
24	24	29	22	20	B	23	21	12	14	16	20	B	26	23	13	21	19	23	19	12	11	14	12	11
25	20	14	27	B	B	23	15	25	21	16	15	19	14	15	17	14	15	17	17	19	21	13	12	11
26	12	12	11	12	12	12	11	12	13	13	13	14	14	14	14	16	14	12	12	18	20	19	12	12
27	12	12	11	11	12	12	12	13	15	14	14	14	14	12	14	14	12	17	12	12	12	12	13	13
28	18	33	B	15	21	19	24	12	20	16	16	20	14	20	18	13	14	14	12	11	12	12	13	14
29	14	B	B	25	20	23	18	12	14	14	13	15	20	18	16	16	13	19	23	14	14	10	12	12
30	12	12	12	12	16	13	12	12	12	26	13	16	18	18	18	31	24	15	B	28	21	20	12	24
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	29	30	30	30	30	30	30	30	30	30	30
MED	13	14	14	14	16	14	14	12	14	14	14	16	16	16	18	16	16	15	14	14	13	12	12	12
U Q	18	24	B 23	B 22	23	23	20	16	21	16	20	21	20	B 22	21	21	20	19	20	18	20	16	13	14
L Q	12	12	12	12	12	12	12	12	13	13	13	14	14	14	14	14	13	13	12	12	12	12	12	12

NOV. 2010 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2010 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	Q 214	Q 256	Y	E A 306	E A 290	218	210	210	200	190	196	210	198	A	198	B	204	192	198	212	218	220	222	230
2	Q 244	276	196	A	Q 228	212	198	198	186	H 168	190	196	B	B	B	A	204	202	202	208	216	226	220	Q 270
3	E A 282	A	A	A	A	A	A	A	A	214	H 182	194	194	200	226	198	212	222	218	218	226	240	E A 268	B
4	A 270	A	B	A	A	A	B	A	216	188	H 182	192	196	196	218	208	208	208	200	210	216	226	232	232
5	244	Q 258	E A 280	A	236	224	212	198	204	196	192	200	A	S	192	196	196	212	212	222	Q 200	238	Q 240	Q 226
6	Q 242	Q 270	Q 266	Q 264	228	218	224	198	192	196	196	204	198	188	206	206	198	202	216	226	Q 222	Q 218	Q 218	Q 212
7	Q 246	Q 258	Q 292	Q 254	212	212	214	Q 206	Q 206	182	194	194	194	186	200	196	204	198	204	204	Q 214	198	Q 228	E A 292
8	Q 260	Q 234	Q 256	244	Q 226	212	206	190	198	202	202	196	212	240	Q 196	198	198	202	210	218	Q 232	224	E A 282	A
9	A	A	A	E A 266	234	216	A	A	H 180	230	B	212	202	202	206	E A 218	212	206	208	194	222	Q 210	Q 226	Q 238
10	262	268	A	A	A	232	208	208	208	198	200	208	208	204	204	204	190	202	224	222	Q 222	Q 230	A	A
11	A	188	236	230	A	B	A	208	190	208	200	208	208	208	220	198	198	A	A	A	A 228	A	A	240
12	A	E A 286	A	B	A	A 240	B	A	B	R	B	B	B	B	B	B	B	246	236	B	236	266	286	228
13	218	B	B	B	A	B	276	208	208	208	192	208	194	194	200	214	206	212	216	206	216	236	252	B
14	B	B	B	B	B	228	240	A	B	E A 266	224	200	200	204	204	212	200	200	224	214	242	A	A	242
15	B	A	A	A	B	A	B	A	A	202	204	204	204	B	214	B	B	B	228	210	194	244	252	Q 258
16	Q 250	A	A	B	E A 234	B	B	208	194	208	200	204	B	204	204	204	214	218	222	E B 300	234	270	B	Q 258
17	238	256	B	208	E A 254	238	A	E A 252	A	B	B	B	B	B	214	204	B	204	206	228	230	Q 220	Q 220	246
18	E B 262	B 262	A 282	A	A	A	A	A	B	Y	202	190	196	196	206	206	204	218	218	210	226	230	A 236	226
19	E A 280	E A 292	A	A	A	A	A	204	198	194	Y	196	196	196	196	214	194	196	196	206	206	226	222	Q 238
20	Q 256	Q 266	Q 252	236	226	236	242	206	200	220	210	B	204	B	216	A	210	E A 248	220	204	222	228	E A 260	230
21	248	E B 294	E A 304	R	A	202	248	206	192	192	206	A	198	A	200	234	210	210	212	206	222	228	A	E A 308
22	Q 268	288	244	216	A	A	260	A	258	200	200	208	198	206	212	202	202	204	220	B	Q 230	A	A	A
23	E A 228	A	A	A	A	A	A	216	198	194	B	210	198	202	206	206	188	204	198	E A 332	B	B	Q 244	B
24	A	A	A	A 230	B	A	A	202	192	190	200	B	192	202	202	202	204	E Y 226	214	214	216	A	210	A
25	A	A	A	B	B	A	A	232	188	194	200	A	196	194	194	202	198	190	202	208	216	226	238	Q 242
26	E A 254	Q 266	Q 268	Q 236	Q 222	Q 218	Q 198	204	A	202	198	206	204	190	190	202	200	208	200	192	214	232	212	196
27	Q 244	Q 244	228	Q 210	222	216	204	198	198	192	202	A	A	A	210	210	194	Y	200	202	196	Q 208	A 256	A
28	A	A	B	176	A	A	A	A	206	220	194	204	204	206	206	216	198	206	198	210	236	224	E A 236	A 226
29	A	B	B	A	A	210	A	A	222	196	A	196	A	208	R	E A 250	236	200	212	212	226	Q 234	A	224
30	234	A	268	E A 290	A	A	214	188	192	R	192	180	190	216	200	220	A	E A 242	B	E B 234	214	226	226	208
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	17	13	14	12	16	15	20	23	26	24	23	23	21	27	25	26	27	28	27	29	25	23	22
MED	246	262	259	230	226	218	214	206	198	196	200	204	198	202	204	205	203	205	212	210	222	226	231	232
U Q	262	E 281	A 281	E A 264	235	230	242	208	206	208	202	208	204	206	212	214	208	218	219	222	229	235	A 252	246
L Q	240	Q 256	240	216	224	212	206	198	192	192	193	196	196	195	200	202	198	202	201	206	215	Q 222	222	226

NOV. 2010 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2010 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 43	X 44	X 44	R	R	Y	R	X 57	X 64	X 65	A	R	A	R	R	O X 55	X 52	R	X 52	X 50	X 50	52	X 48	56
2	X 40	X 42	X 45	X 52	A	A	A	R	R	R	X 58	Y	R	O X 60	R	R	O X 51	O X 55	O X 46	O X 62	O X 59	O X 48	X 52	50
3	X 44	X 45	X 46	X 51	X 60	X 66	O X 69	X 73	O X 78	72	B	R	O X 66	R	O X 65	O X 57	O X 64	O X 55	X 56	X 54	X 54	X 54	X 50	X 46
4	47	50	56	57	X 62	69	74	76	X 69	B	O X 69	R	R	O X 66	X 65	O X 67	R	R	R	R	O X 53	O X 51	X 52	X 43
5	X 46	X 46	X 49	X 53	X 58	X 64	R	X 73	Y	77	X 68	O X 68	O X 68	O X 68	X 64	A	X 58	O X 56	X 52	X 52	X 52	X 52	X 53	X 54
6	69	64	R	X 46	60	70	75	X 81	78	X 74	X 67	O X 66	O X 66	O X 66	X 66	X 63	X 61	R	X 58	X 58	X 56	X 56	X 56	X 47
7	X 47	X 46	R	R	O X 46	X 56	66	64	X 70	X 73	R	O X 66	O X 68	O X 68	O X 65	X 66	X 66	X 64	X 63	X 54	X 47	R	X 39	X 45
8	A	A	A	R	R	R	R	R	R	R	R	X 59	O X 67	R	R	X 56	X 54	O X 53	O X 52	X 49	R	X 44	O X 44	R
9	R	B	X 44	R	R	R	R	O X 55	X 61	X 65	O X 66	R	R	R	R	R	R	R	O X 53	O X 52	X 52	O X 50	X 53	X 53
10	O X 48	X 49	X 58	57	X 55	69	X 71	X 77	X 79	X 80	X 75	O X 73	R	R	R	X 62	X 61	R	O X 54	O X 53	X 57	X 54	X 51	51
11	X 58	58	57	57	X 57	X 52	X 60	69	77	X 82	X 83	X 70	R	Y	R	X 59	X 58	O X 53	X 51	X 53	X 57	X 56	X 50	52
12	54	X 60	64	X 58	60	O X 66	75	76	X 80	O X 86	X 80	X 71	X 63	B	X 58	R	X 60	X 59	X 57	O X 54	X 51	X 48	O X 45	X 46
13	R	R	R	A	95	R	R	R	R	R	B	B	B	R	O X 54	R	A	X 57	R	O X 54	O X 52	O X 47	O X 45	B
14	X 42	O X 41	81	R	R	R	R	B	Y	R	R	R	R	O X 63	B	B	R	R	B	O X 48	O X 48	O X 47	O X 45	A
15	41	R	B	B	B	X 58	B	B	R	O X 54	O X 56	R	R	O X 56	R	X 56	O X 55	B	O X 46	B	X 46	X 43	X 45	X 40
16	X 42	X 42	O X 45	X 50	R	R	R	R	X 60	X 63	O X 62	B	B	B	R	B	B	R	R	X 55	X 56	R	R	O X 36
17	X 41	X 42	X 46	X 48	X 50	R	R	R	R	X 56	X 58	X 62	O X 62	R	R	R	R	R	R	X 56	X 52	O X 46	X 40	X 46
18	O X 44	X 41	X 47	X 52	O X 60	62	X 57	A	R	X 57	X 57	R	R	R	R	A	X 58	O X 53	O X 53	O X 52	O X 49	O X 52	O X 52	X 47
19	X 42	X 45	O X 50	R	R	R	X 57	X 58	X 59	X 65	O X 67	O X 66	R	59	R	R	R	X 52	R	R	O X 52	O X 52	O X 55	X 53
20	X 47	X 49	B	B	R	X 58	68	B	B	B	R	R	R	R	X 57	A	B	O X 45	O X 48	O X 49	O X 50	X 46	O X 45	X 40
21	B	A	A	B	R	R	R	R	X 60	B	B	O X 55	R	B	X 59	B	R	O X 52	O X 54	O X 51	X 46	X 44	X 43	X 42
22	X 43	X 48	X 49	X 49	X 58	R	X 69	X 73	O X 71	O X 66	X 64	X 59	O X 56	A	X 59	X 59	X 57	X 57	O X 54	X 50	X 50	X 50	X 49	X 51
23	X 55	X 58	X 59	X 62	66	X 66	68	70	73	81	X 71	70	X 71	X 64	X 65	X 62	X 61	O X 54	O X 54	X 55	X 58	X 52	X 53	X 54
24	X 53	X 51	X 62	X 63	68	X 75	77	X 81	O X 77	B	O X 77	O X 71	O X 73	O X 74	70	X 65	A	R	X 57	X 57	B	O X 52	X 47	48
25	44	49	X 47	X 50	O X 49	O X 53	R	O X 56	X 62	X 64	X 64	X 62	X 61	O X 61	X 63	X 64	X 62	R	X 64	X 65	X 56	X 46	R	46
26	45	X 44	R	X 46	R	R	X 59	66	68	X 65	X 63	X 60	R	R	R	R	R	R	X 60	X 60	X 52	O X 48	X 48	O X 47
27	B	X 42	X 43	O X 51	B	R	X 53	X 62	X 64	O X 68	O X 66	O X 66	O X 64	X 56	R	O X 48	O X 48	X 48	O X 52	O X 52	X 56	X 47	O X 49	X 54
28	X 46	X 43	X 44	X 48	X 52	X 55	64	X 65	76	X 71	X 65	X 66	X 60	X 60	X 60	O X 54	O X 54	X 52	R	A	66	R	A	A
29	X 44	X 41	X 40	X 45	48	A	R	R	X 60	X 57	O X 57	O X 56	B	B	X 62	X 63	O X 55	O X 52	O X 50	X 52	X 52	X 46	X 42	X 44
30	X 43	X 43	X 46	O X 48	O X 52	X 56	X 60	X 62	X 66	X 66	O X 67	X 70	X 67	R	R	A	O X 52	X 58	X 60	X 59	X 49	R	X 43	R
31	O X 46	X 56	X 44	O X 47	63	R	R	O X 53	O X 55	X 56	X 60	X 62	X 62	R	O X 63	X 60	X 64	X 59	X 54	X 48	X 44	X 44	O X 46	X 47
	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	23	21	19	16	17	20	22	23	23	20	15	13	16	17	20	19	24	27	29	27	28	26
MED	X 44	X 46	X 47	X 51	X 58	X 63	X 68	X 68	X 68	X 66	X 66	X 66	O X 66	O X 63	X 63	X 60	X 58	O X 54	X 54	X 53	X 52	X 48	X 48	X 47
U Q	X 47	X 50	57	57	62	68	72	X 74	X 77	X 74	X 69	X 70	O X 68	O X 67	X 65	X 64	X 61	X 57	X 57	X 56	X 56	X 52	X 52	X 52
L Q	X 43	X 42	X 44	X 48	X 52	X 56	X 60	X 60	X 61	X 63	X 60	X 61	X 62	X 60	X 59	O X 56	O X 54	X 52	O X 52	X 51	X 50	X 46	X 45	X 45

DEC.2010 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2010 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	37	38	38	A	R	Y	R	J R 41	58	J R 59	A	R	A	R	A	49	J R 46	R	46	44	44	46	42	R 37
2	34	36	39	46	A	A	A	A	R	R	52	Y	R	R 54	R	R	R 45	R 49	R 40	56	53	42	46	F 40
3	38	39	40	45	54	60	63	67	R 72	J R 66	B	R	F 56	R	R 59	J R 51	R 58	49	50	48	48	48	44	40
4	F 36	F 38	F 43	F 47	56	F 58	F 64	F 64	J R 63	B	R 63	R	R	R 60	59	R 61	R	R	R	R	47	45	46	37
5	40	40	43	J R 47	J R 52	58	R	67	Y	F 68	62	62	R 62	62	58	A	52	50	46	46	46	46	47	48
6	F 42	41	A	40	F 48	F 58	F 66	75	F 68	68	62	60	60	R 60	J R 60	57	55	R	52	52	50	50	50	41
7	41	40	A	A	R 40	50	F 57	F 56	64	67	R	R 60	R 62	R 62	59	60	60	58	57	48	41	A	33	39
8	A	A	A	R	A	R	R	R	R	R	R	53	R 61	R	R	J R 50	J R 48	R 47	46	43	R	38	38	A
9	R	B	38	R	R	R	R	49	55	59	R 60	R	R	R	R	R	R	R	U R 47	U R 46	46	R 44	47	J R 47
10	42	43	52	F 46	49	F 57	65	71	73	74	R 68	67	R	R	R	J R 56	J R 55	A	R 48	R 47	51	48	45	F 41
11	52	F 49	F 47	F 47	J R 51	46	54	F 58	F 66	J R 76	77	64	R	Y	R	53	J R 52	47	45	47	51	50	44	F 41
12	Z 48	54	F 54	52	F 51	60	A 65	F 66	74	80	J R 74	65	57	B	J R 52	R	J R 54	J R 53	51	R 48	45	42	R 39	40
13	A	A	A	A	A	R	R	A	R	R	B	B	B	R	R 48	R	A	J R 51	R	R 48	R 46	41	39	B
14	36	35	R 43	R	R	R	R	B	Y	R	R	R	R	57	B	B	R	R	B	R 42	R 42	41	R 39	A
15	F 30	A	B	B	B	52	B	B	R	R 48	R 50	R	R	50	R	50	R 49	B	R 40	B	40	37	39	34
16	36	36	39	44	R	R	R	R	J R 54	J R 57	56	B	B	B	R	B	B	R	R	49	R 50	R	R	30
17	35	36	40	42	44	R	R	R	R	50	52	56	R 56	R	R	R	R	R	R	50	46	40	34	40
18	38	35	41	46	54	F 51	51	A	R	51	51	R	R	R	R	A	J R 52	47	R 47	46	R 43	46	46	41
19	36	39	R 44	R	R	R	51	J R 52	J R 53	59	61	60	R	J R 53	R	R	R	J R 46	R	R	R 46	R 46	R 49	47
20	J R 41	43	B	B	R	R 52	F 58	B	B	B	R	R	R	R	J R 51	A	B	R 39	42	43	R 44	40	39	J R 34
21	B	A	A	B	R	R	R	A	J R 54	B	B	R 49	R	B	J R 53	B	R	U R 46	48	45	J R 40	38	37	36
22	37	42	43	43	R 52	R	63	67	65	60	58	J R 53	R 50	A	J R 53	J R 53	51	51	R 48	44	44	44	43	45
23	49	52	53	56	F 56	F 56	F 57	F 60	F 65	Z 75	65	F 60	65	58	59	56	55	R 48	48	49	52	46	J R 47	48
24	47	45	56	57	F 58	69	F 68	75	R 71	B	R 71	R 65	R 67	R 68	F 58	59	A	R	51	51	B	R 46	41	F 39
25	F 33	F 40	41	44	R 43	R 47	R	R 50	56	58	58	56	55	R 55	57	58	J R 56	R	58	59	50	40	A	F 31
26	Z 39	38	R	40	R	R	53	F 56	F 58	59	57	J R 54	R	R	R	R	R	R	J R 54	J R 54	J R 46	R 42	42	41
27	B	36	37	45	B	R	J R 47	56	58	62	60	R 60	U R 58	J R 50	R	R 42	R 42	42	46	46	50	41	43	48
28	40	37	38	42	46	49	F 54	59	F 66	65	59	60	54	J R 54	J R 54	48	48	46	R	A	A	R	A	A
29	38	35	34	39	Z 42	A	R	R	54	51	R 51	R 50	B	B	56	57	R 49	R 46	R 44	46	46	40	36	38
30	37	37	40	42	46	50	54	56	60	60	R 61	64	61	R	R	A	R 46	J R 52	J R 54	53	43	R	37	R
31	R 40	50	38	41	40	A	R	47	49	50	54	J R 56	56	R	57	54	58	J R 53	48	42	38	38	40	41
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	26	23	21	18	16	17	20	22	23	23	20	15	13	16	17	20	19	24	27	28	27	28	26
MED	38	39	41	45	50	54	57	58	62	60	60	60	58	R 57	57	54	R 52	R 48	48	47	46	42	42	40
U Q	41	43	44	47	54	58	F 64	67	66	68	R 63	63	R 62	R 61	59	58	55	J R 51	51	50	50	46	46	41
L Q	36	36	38	42	44	50	54	54	55	57	54	R 55	56	R 54	J R 53	50	R 48	R 46	46	45	44	40	39	37

DEC.2010 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2010 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	30	43	42	36	17	36	34	40	55	68	41	60	50	52	32	32	31	43	40	27	27	30	38
2	34	32	38	34	58	47	48	48	39	A	29	G 24	G 27	33	32	36	34	40	33	36	36	34	16	45
3	29	29	32	34	43	30	25	31	25	G 24	B	34	39	32	26	34	38	28	30	28	25	26	25	26
4	26	26	27	26	28	29	28	32	G	B	33	G 28	38	36	34	30	28	26	G 21	E B 28	E B 30	24	32	17
5	17	26	25	28	E B 23	25	G 22	30	32	35	G 24	40	40	48	65	72	46	34	26	26	27	36	36	39
6	29	28	G 28	32	28	27	29	33	34	29	36	37	41	35	38	34	39	30	48	42	33	26	21	23
7	29	28	45	41	42	21	22	G	34	33	36	34	34	38	35	35	35	34	30	G 15	32	44	34	38
8	50	51	46	41	49	41	45	42	43	34	34	33	34	41	34	G 24	34	30	30	37	31	30	G 19	40
9	32	B	42	29	26	38	39	G 22	30	G	25	30	E B 33	30	28	30	34	25	G 20	25	22	20	27	31
10	27	32	26	28	34	32	28	28	33	34	30	33	35	34	36	47	50	59	48	40	36	38	32	28
11	32	25	35	31	38	35	40	39	44	39	G 25	G 26	35	28	38	41	40	46	43	36	33	40	42	32
12	27	36	30	32	31	43	50	36	38	35	34	G 28	G 21	B	42	42	34	38	31	40	32	28	G	31
13	41	42	40	42	43	39	44	48	42	41	B	B	B	G 24	G 22	32	144	G 22	32	G 16	G 19	21	20	B
14	25	33	38	42	G	40	38	B	33	31	34	30	31	E B 52	B	B	27	31	B	E B 29	G 28	E B 31	G	88
15	40	G	B	B	B	30	B	B	35	32	G 28	34	34	32	32	G 24	G 23	B	E B 30	B	34	26	G 16	21
16	24	21	31	31	31	39	36	36	30	G 24	28	B	B	B	G	B	B	G	G	26	E B 24	E B 24	E B 23	E B 19
17	19	24	27	27	G 20	41	44	G 24	G 20	G 21	G 22	G 24	G 22	33	37	33	33	G	29	G	22	29	20	G 16
18	30	24	24	G 18	28	31	31	49	42	31	31	34	36	48	32	59	28	34	G	26	E B 24	22	20	19
19	21	28	32	38	G 31	24	G	28	31	33	34	30	30	24	26	33	33	28	24	26	33	34	25	G 15
20	G	25	B	B	35	34	29	B	B	B	G 28	35	34	38	36	59	B	33	37	27	27	37	37	35
21	B	42	67	B	41	36	37	49	35	B	B	E B 36	E B 37	B	G 24	B	28	40	36	31	G 16	G	G	G
22	21	27	29	27	30	33	36	36	36	33	35	45	37	62	39	34	29	31	25	25	35	25	30	25
23	33	28	28	35	36	28	34	33	32	33	36	46	33	44	45	48	35	42	34	33	34	43	60	70
24	30	26	27	28	31	35	38	37	E B 56	B	E B 56	E B 54	E B 56	143	42	36	76	36	26	26	B	E B 32	22	33
25	30	41	77	31	32	32	46	35	G 24	32	34	G 23	32	32	34	30	31	G	30	32	24	34	42	26
26	24	34	40	31	38	38	34	27	30	34	G 23	32	32	G 23	33	31	G 19	32	32	34	24	24	16	18
27	B	23	20	21	B	36	G	31	G	G	34	G 28	G 26	36	23	30	35	37	32	32	34	27	25	20
28	25	30	31	39	34	41	32	36	33	33	32	32	33	33	32	32	34	32	30	52	52	40	48	48
29	41	43	52	39	70	66	44	48	34	33	G 22	34	B	B	33	35	30	E B 30	30	27	24	31	29	24
30	21	26	25	26	26	25	G 22	30	34	34	34	34	33	G	G 26	67	G 21	25	29	29	G	35	32	36
31	39	40	37	36	35	47	41	34	32	35	29	26	G 19	32	30	32	37	61	32	36	40	33	36	30
	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	30	29	28	29	31	30	28	30	26	28	29	28	27	30	28	29	30	30	30	30	31	31	30
MED	29	28	32	32	34	35	36	34	34	33	32	32	34	34	34	34	34	32	30	29	G	29	25	29
U Q	32	34	41	38	40	40	41	38	38	34	34	36	37	44	38	42	38	37	33	36	34	35	34	38
L Q	24	26	27	28	29	29	28	30	30	G 31	G 28	G 28	G 32	32	28	32	28	28	26	26	24	25	G 20	20

DEC.2010 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2010 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	16	13	17	18	15	16	12	13	13	17	20	13	18	13	13	14	29	12	13	12	11	11	12
2	11	13	12	13	21	12	13	17	13	15	12	18	20	21	22	15	13	12	18	12	11	12	11	11
3	12	12	12	13	12	12	12	12	13	18	B	24	15	16	22	13	12	12	13	12	12	13	12	12
4	12	12	11	12	12	12	12	12	22	B	15	19	22	14	16	13	21	23	18	28	30	12	12	12
5	12	13	14	12	23	15	17	13	28	15	16	16	18	12	13	15	14	13	13	14	12	11	12	12
6	12	12	12	12	14	12	12	12	12	12	13	15	17	13	13	12	12	13	13	12	12	11	12	15
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	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	13	12	13	13	14	14	13	13	13	14	14	15	16	16	16	14	14	15	14	13	13	12	13	13
U Q	13	14	14	14	20	18	15	14	14	18	17	19	20	22	20	16	19	19	15	14	14	14	14	14
L Q	12	12	12	12	12	12	12	13	13	13	13	14	14	14	13	14	13	13	13	12	12	12	12	12

DEC.2010 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2010 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	256	E A 282	A 230	A	A	Y	190	198	226	A	A	A	A	A	A	190	192	206	222	214	Q 200	Q 200	Q 236	228
2	228	A	214	Y	A	A	A	A	A	226	198	Y	196	196	196	220	198	196	A 236	220	A 232	216	Q 228	Q 238
3	Q 238	Q 256	190	230	214	208	194	194	204	196	B	198	192	208	208	198	206	198	198	198	216	Q 216	Q 220	Q 226
4	Q 238	Q 238	Q 236	Q 216	Q 222	200	204	194	210	B	198	A	A	198	198	184	180	198	208	208	246	216	Q 236	236
5	Q 248	248	242	224	196	212	202	200	Y	194	A	204	A	A	214	A	198	198	198	202	212	218	240	Q 218
6	Q 226	232	A	238	Q 216	Q 216	206	198	198	196	196	192	208	198	Y	224	200	194	A	208	208	210	238	194
7	Q 212	244	A	A	190	Y	216	190	192	200	208	210	198	198	198	198	210	210	194	Q 190	212	A	226	A
8	A	A	A	A	A	A	A	A	A	A	218	A	202	A	200	190	202	198	206	286	A	Q 234	234	A
9	A	B	A	A	A	A	A	204	194	194	194	204	192	R	202	184	184	216	190	204	214	214	220	234
10	Q 244	E A 264	264	234	214	198	198	188	202	196	190	194	204	216	A	A	A	A	E A 254	202	220	Q 212	Q 230	Q 228
11	Q 240	Q 232	Q 232	E A 242	216	216	210	200	200	198	198	192	190	A	194	194	204	216	218	200	218	Q 206	206	210
12	Q 222	Q 240	Q 228	Q 224	222	202	A 232	202	202	206	202	A	A	B	202	200	192	206	198	202	192	198	232	Q 232
13	A	A	A	A	A	A	A	A	A	232	B	B	B	198	204	204	A	204	204	198	188	196	234	B
14	272	A	A	A	A	A	A	B	A	198	204	192	192	B	B	B	192	176	B	266	A	E B 232	A	A
15	A 252	A	B	B	B	224	B	B	A	206	182	E A 230	204	204	204	204	194	B	218	B	206	212	A 234	E A 268
16	238	A 252	A	212	A	A	A	228	196	196	190	B	B	B	200	B	B	200	198	200	200	248	228	E B 254
17	226	E A 246	E A 246	234	226	A	A	226	188	188	A	200	200	210	198	212	184	198	198	206	198	234	206	224
18	E A 268	E A 246	246	266	232	232	232	A	A	202	188	196	A	A	194	A	194	204	198	196	208	208	216	216
19	224	244	E A 276	A	A	E A 248	A	192	196	196	196	196	R	200	234	200	A	200	200	204	204	206	206	216
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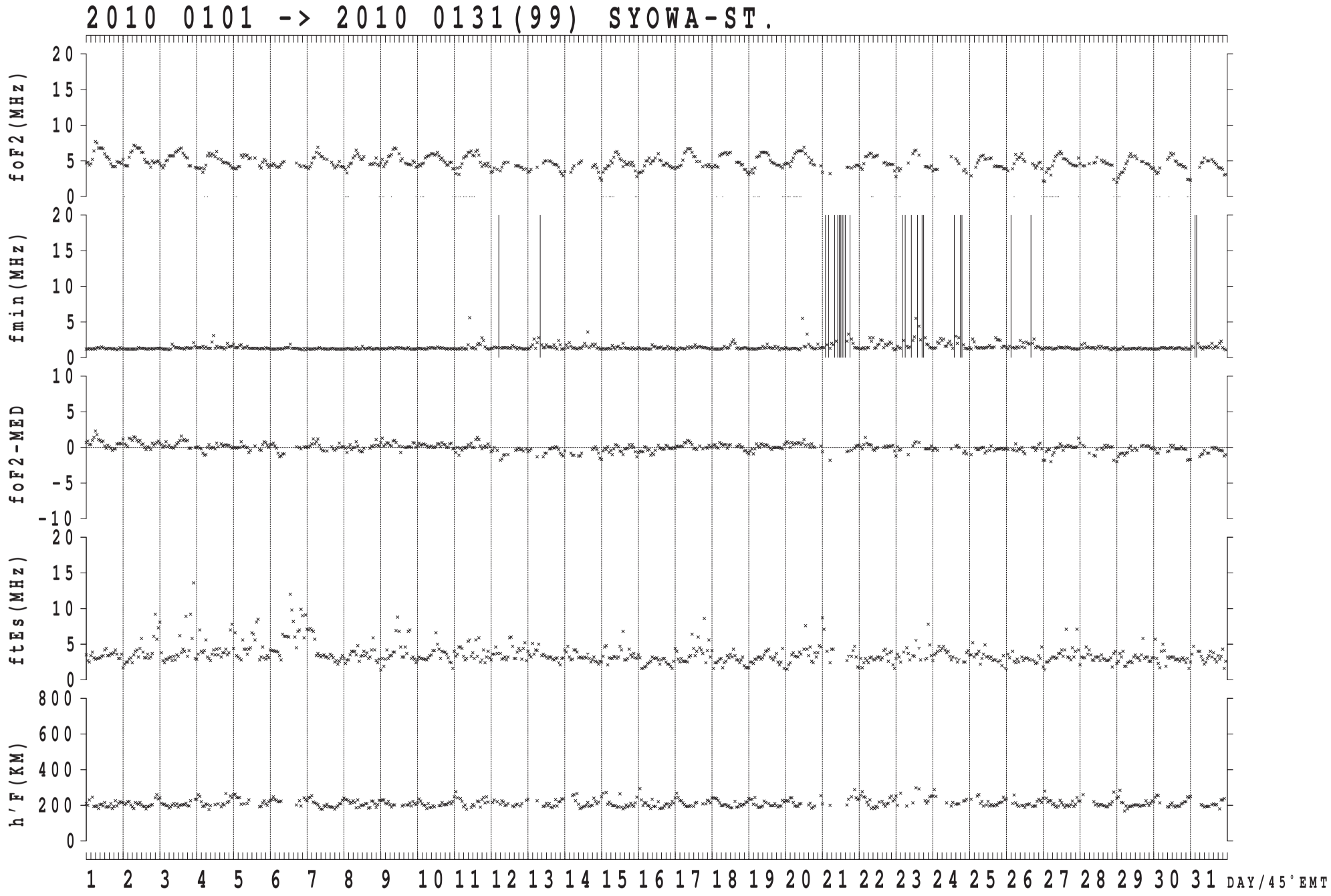
21	B	A	A	B	A	A	A	A	206	B	B	B 220	E B 242	B	204	B	190	214	204	206	196	E A 228	214	218
22	234	Q 234	242	230	230	200	212	198	188	202	198	A	212	A	A	E A 210	196	H 180	196	200	200	216	218	Q 218
23	Q 236	Q 232	Q 226	234	216	Q 198	200	200	200	194	184	206	196	200	A	A	204	200	196	202	202	E A 240	236	224
24	Q 218	Q 222	Q 232	218	210	210	196	204	B	B	B	B	B	A	A	196	A	A	206	210	B	B	214	Q 226
25	Q 226	Q 238	E A 232	232	238	196	A	270	194	194	A 220	186	192	192	198	198	198	196	196	196	210	E A 234	A	Q 222
26	E A 262	A	A	192	A	A	228	H 190	190	206	202	192	E A 216	220	A	190	A 224	E A 246	E A 262	226	198	204	218	214
27	B	Q 232	Q 228	216	B	A	216	198	190	186	184	202	194	188	186	186	192	198	208	194	202	196	202	214
28	222	Q 236	276	216	216	228	180	170	H 170	190	190	202	188	190	190	192	194	210	A	A	A	A	A	A
29	A	230	204	200	196	A	A	A	Q 200	208	186	212	B	B	194	234	194	206	206	210	210	218	Q 218	200
30	E A 238	E A 238	A 228	184	184	212	184	184	188	224	190	190	190	200	192	A	202	208	212	212	230	A	E A 242	A
31	228	A	A	A	210	A	A	198	H 174	214	192	A	192	202	194	204	220	198	202	Q 226	A	226	E A 284	230
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	22	19	19	18	17	18	22	22	25	23	20	21	17	22	22	25	28	28	29	26	27	28	25
MED	232	236	231	224	216	211	205	198	196	198	196	198	195	200	198	198	196	200	202	204	208	213	226	221
U Q	246	A 246	246	234	222	226	216	202	202	206	202	205	206	206	204	204	203	209	215	213	214	E 228	235	233
L Q	225	232	228	216	210	200	196	192	190	194	190	192	192	197	194	190	192	198	198	200	200	206	217	216

DEC. 2010 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN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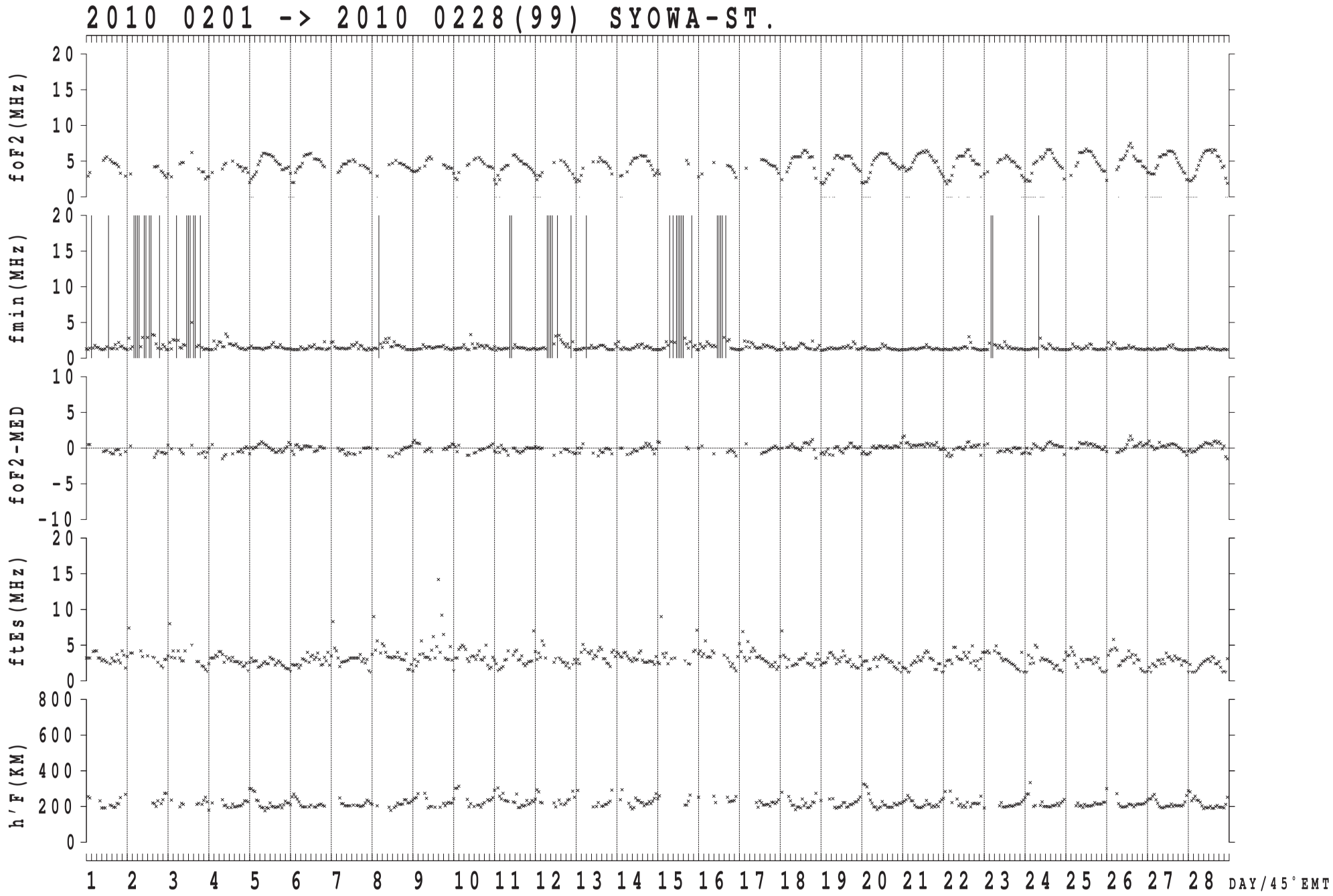
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT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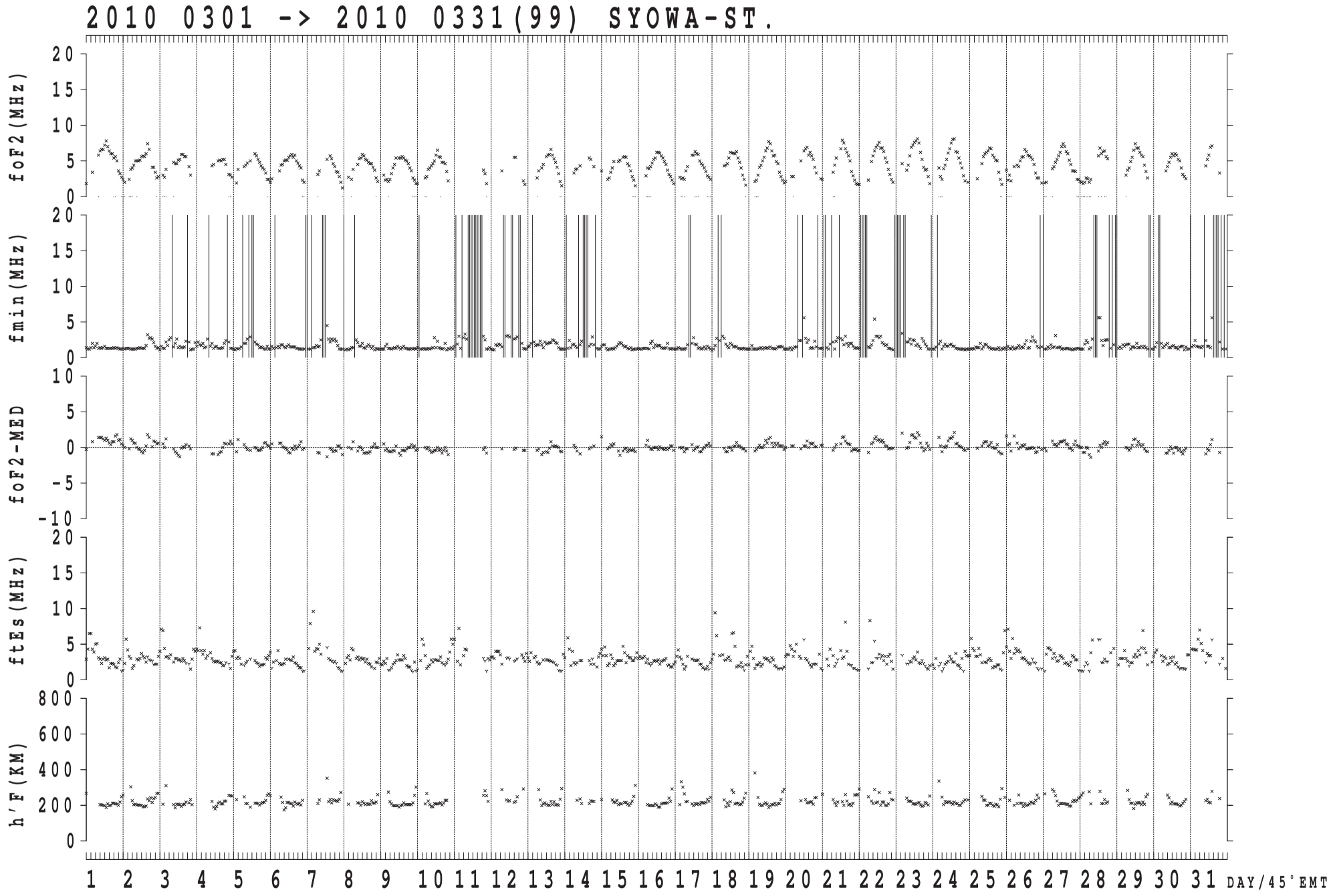
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT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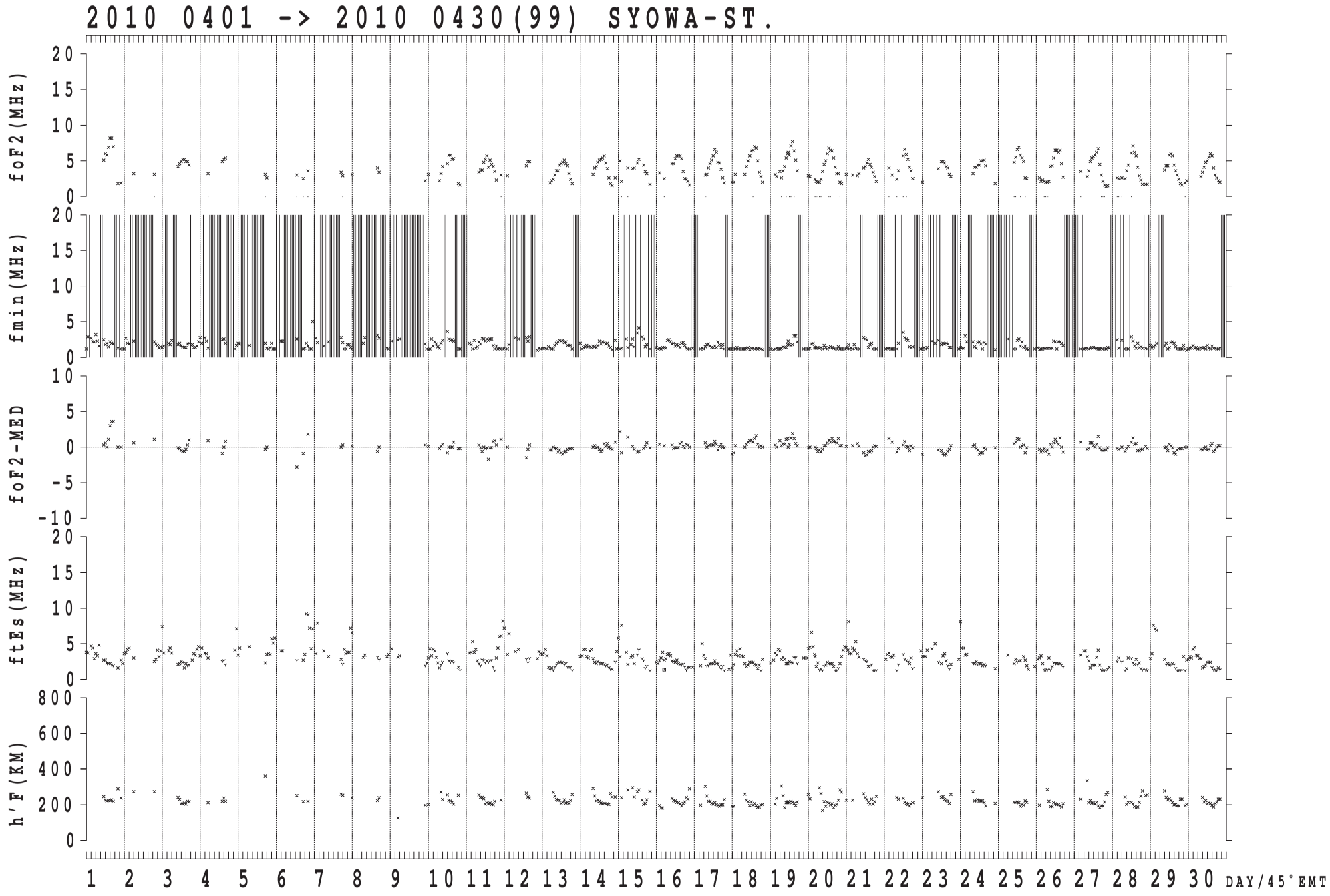
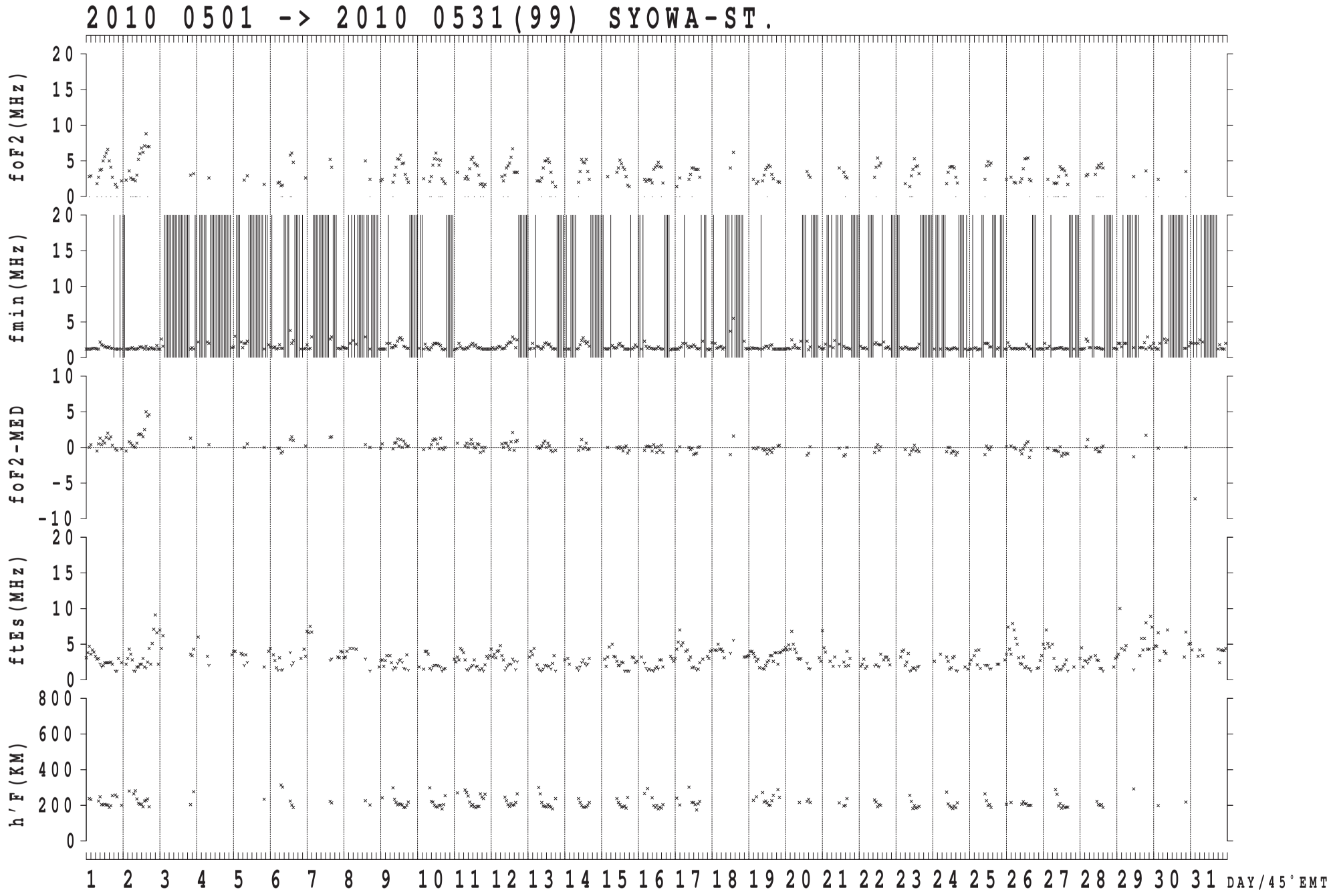
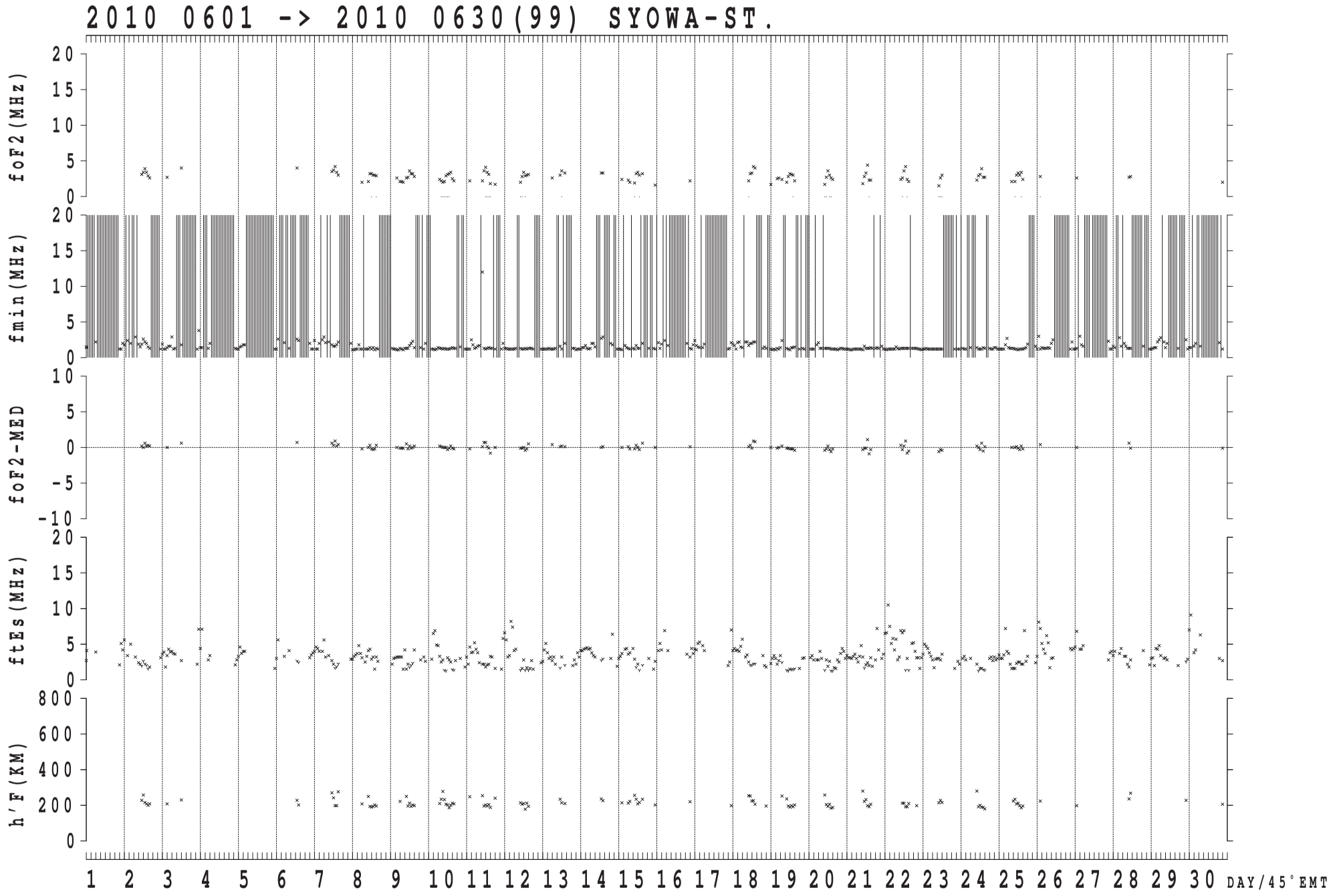
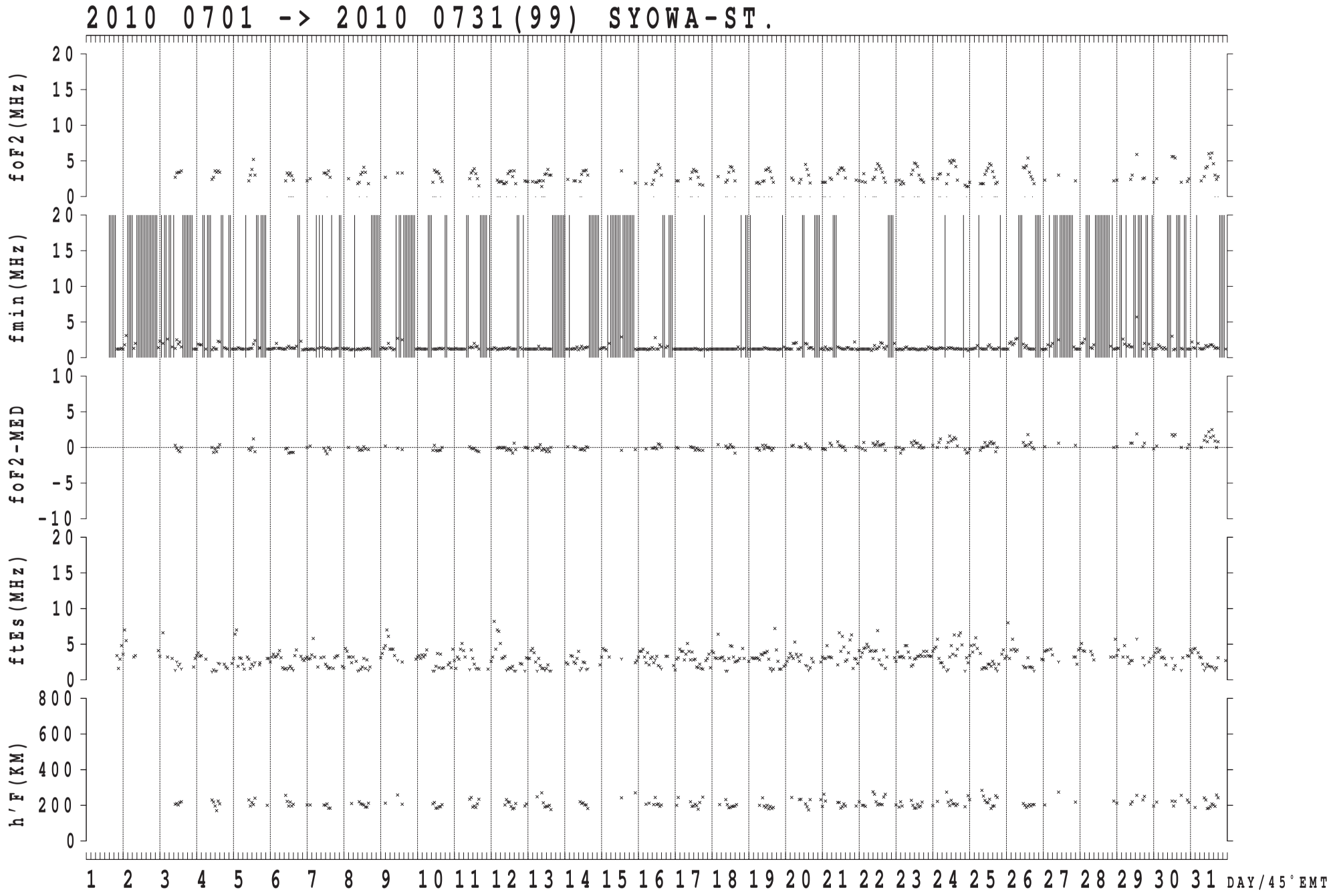
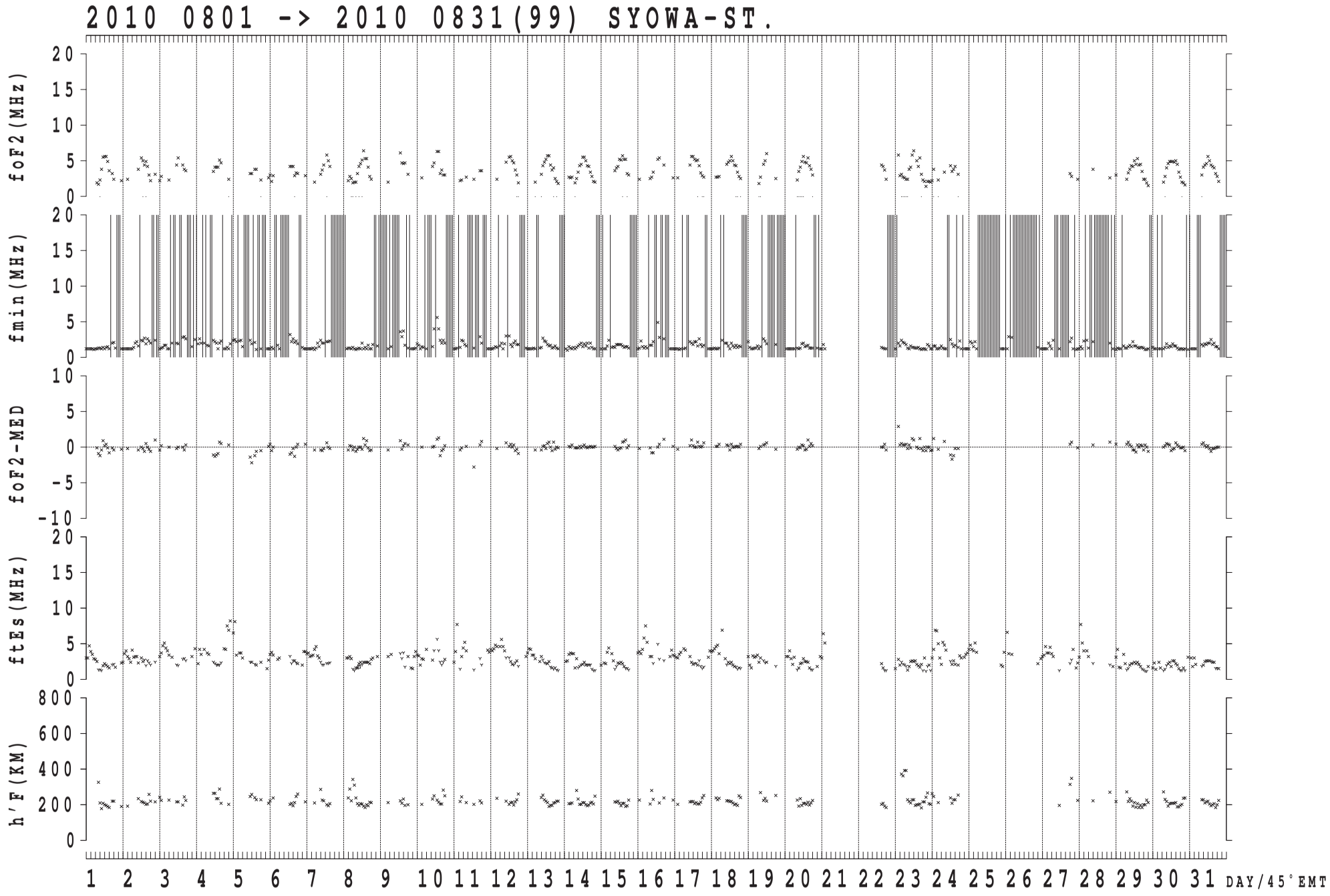
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2010 0401 -> 2010 0430(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2010 0501 -> 2010 0531(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2010 0601 -> 2010 0630(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2010 0701 -> 2010 0731(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2010 0801 -> 2010 0831(99) SYOWA-ST.
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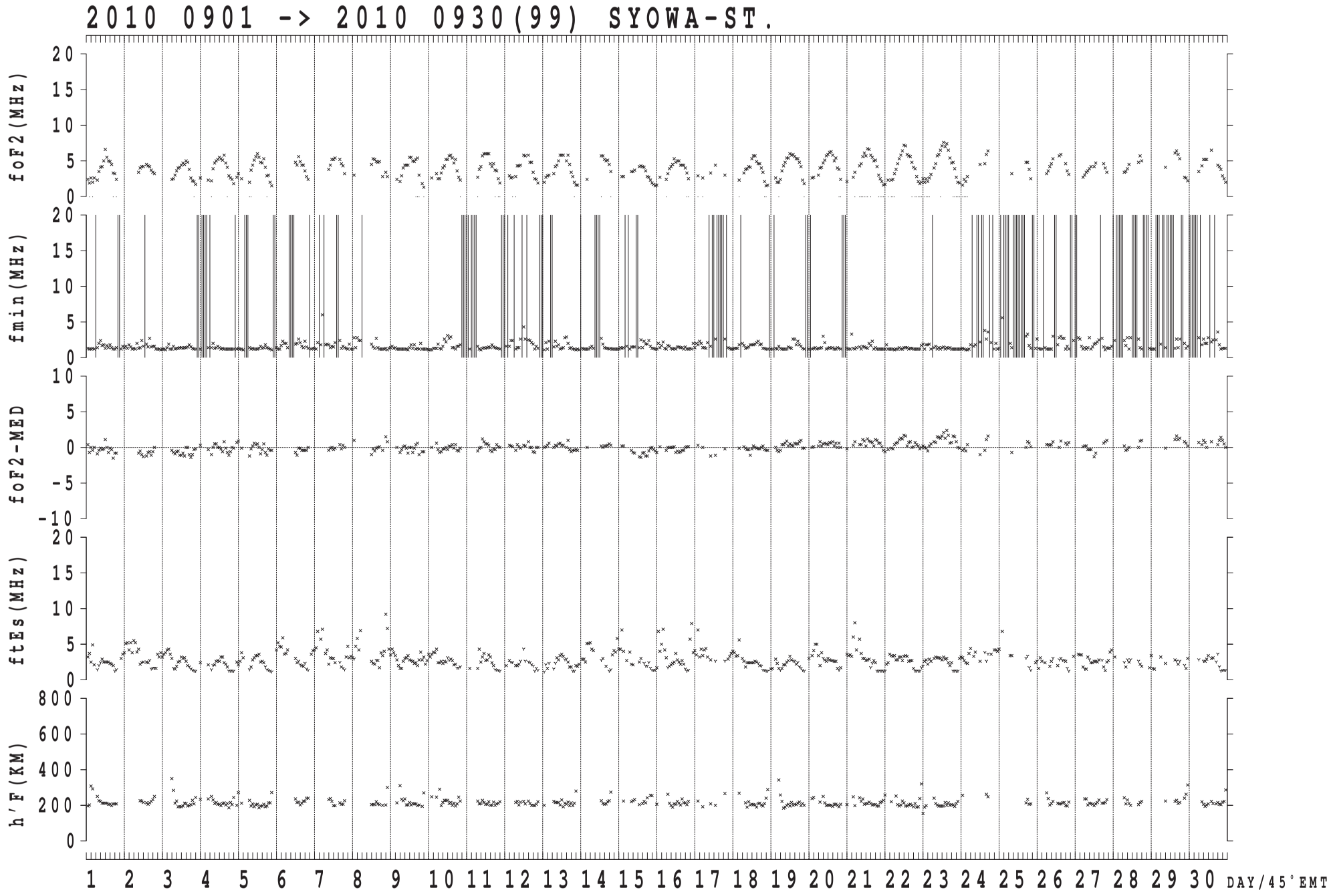
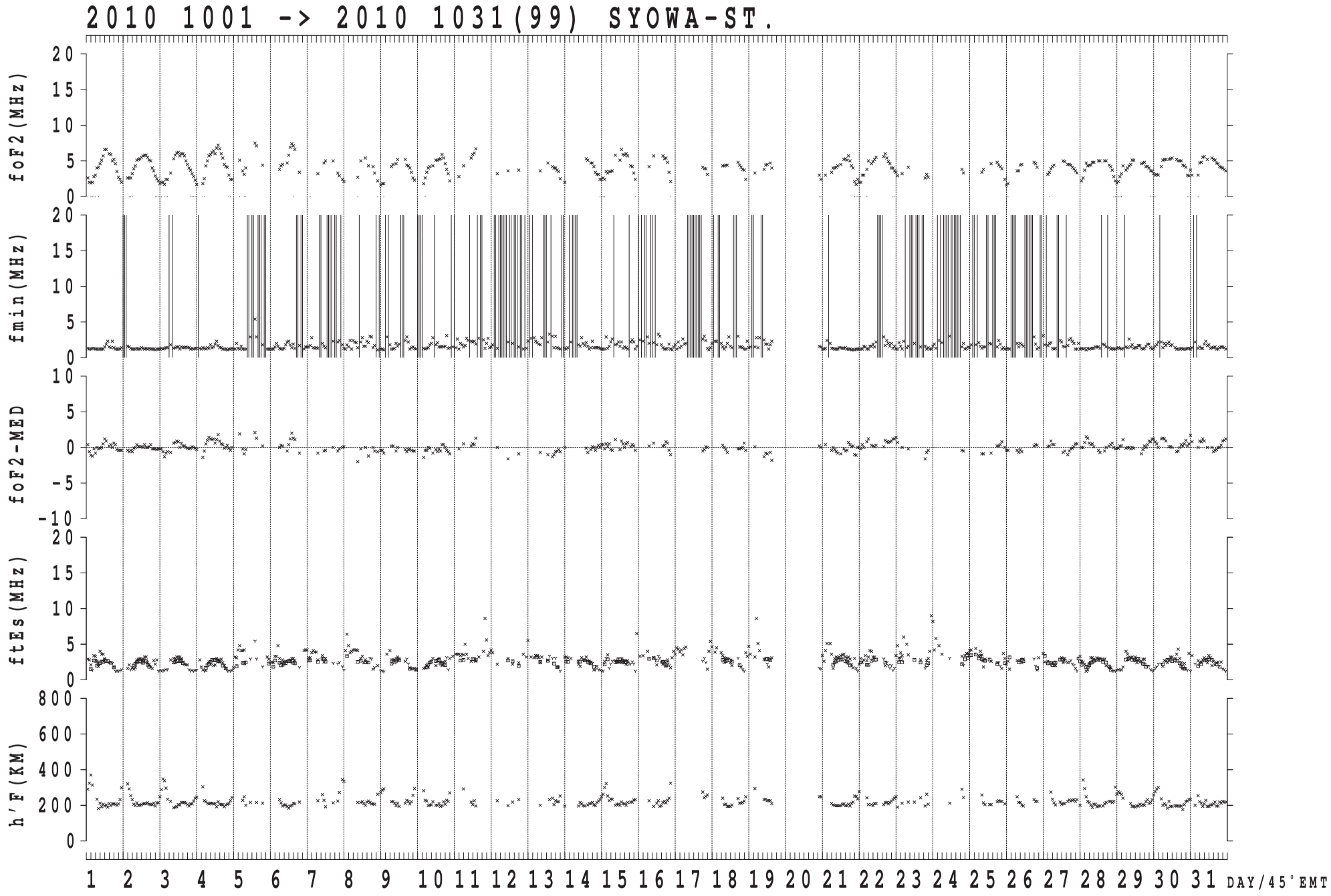
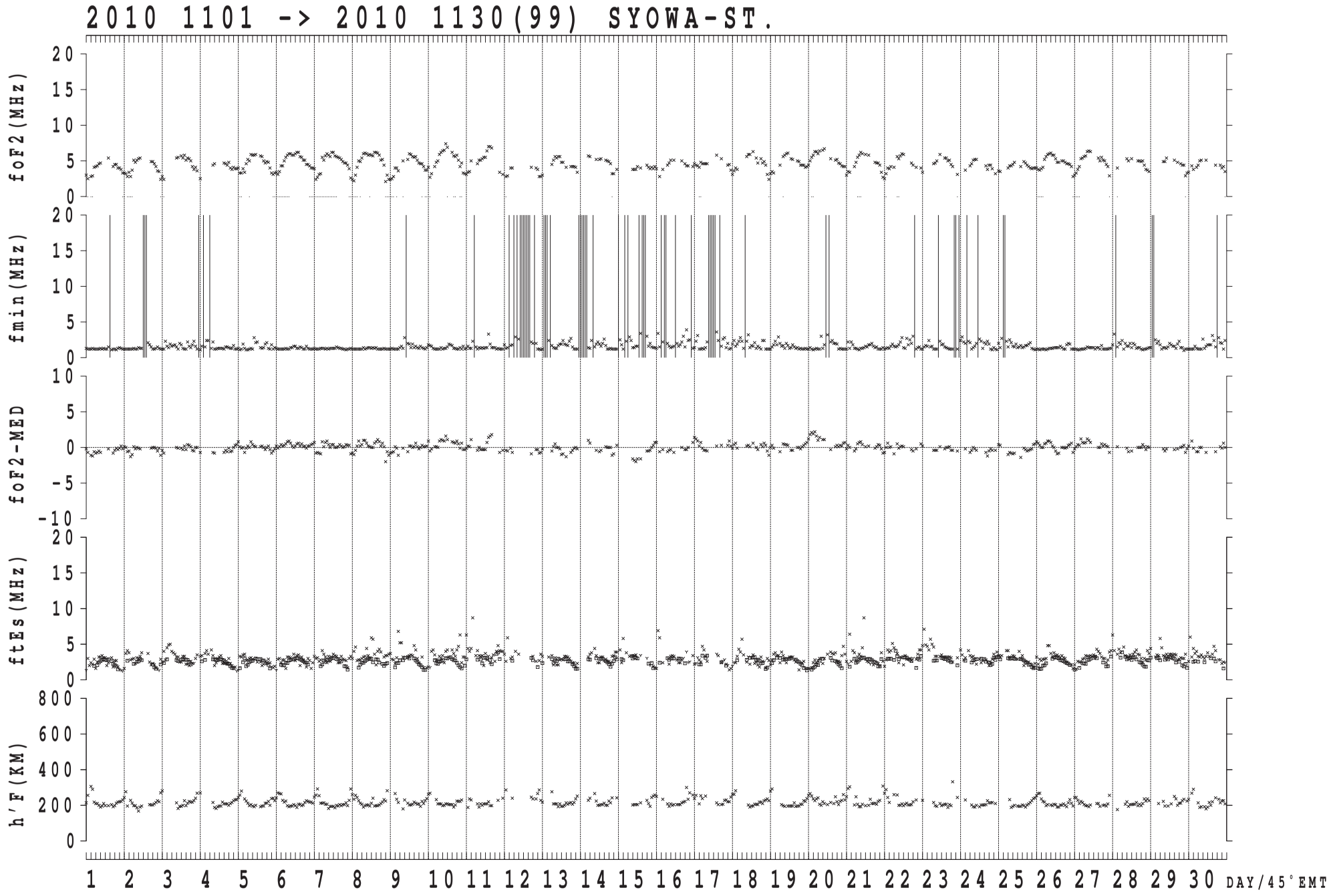
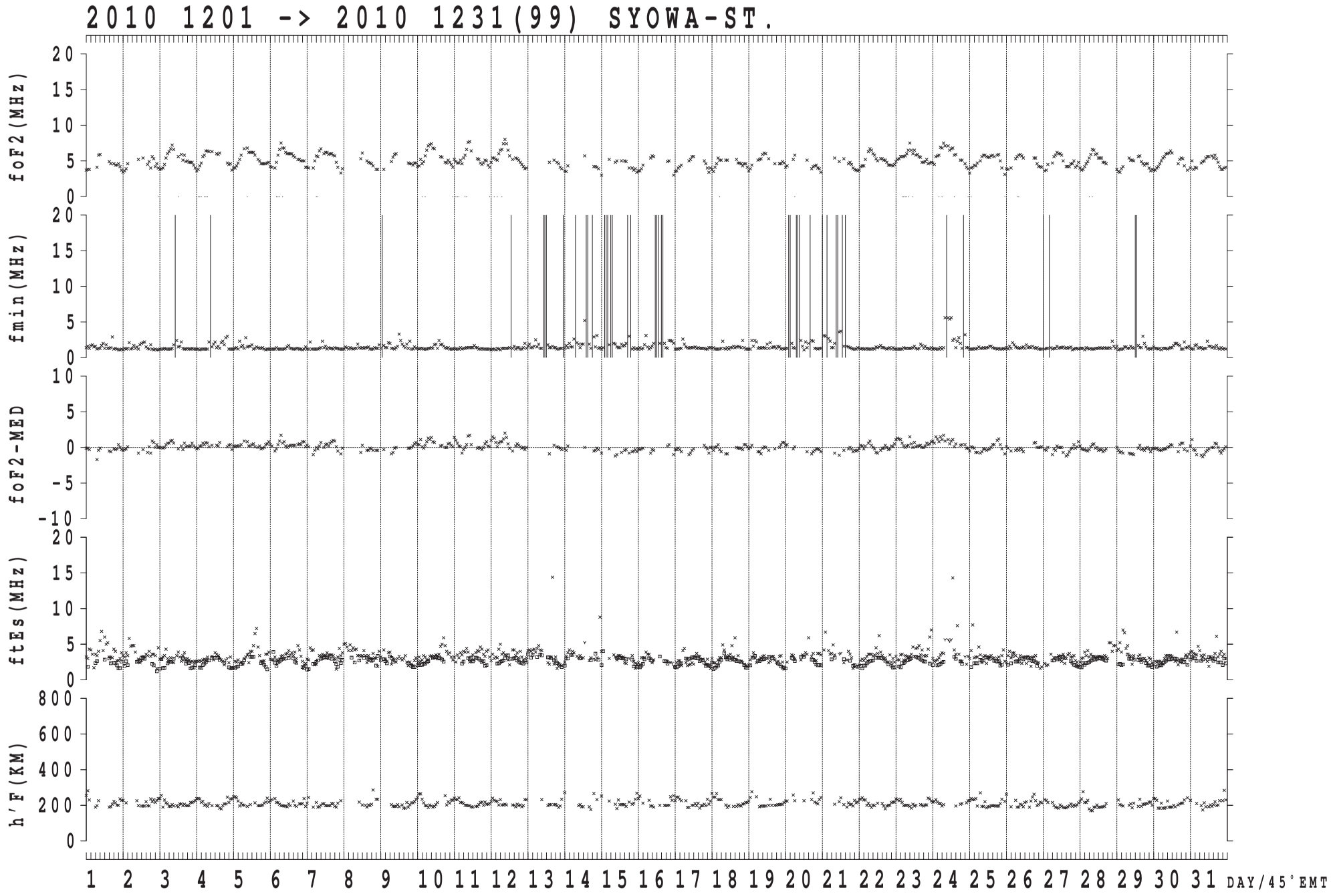
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2010 0901 -> 2010 0930(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT

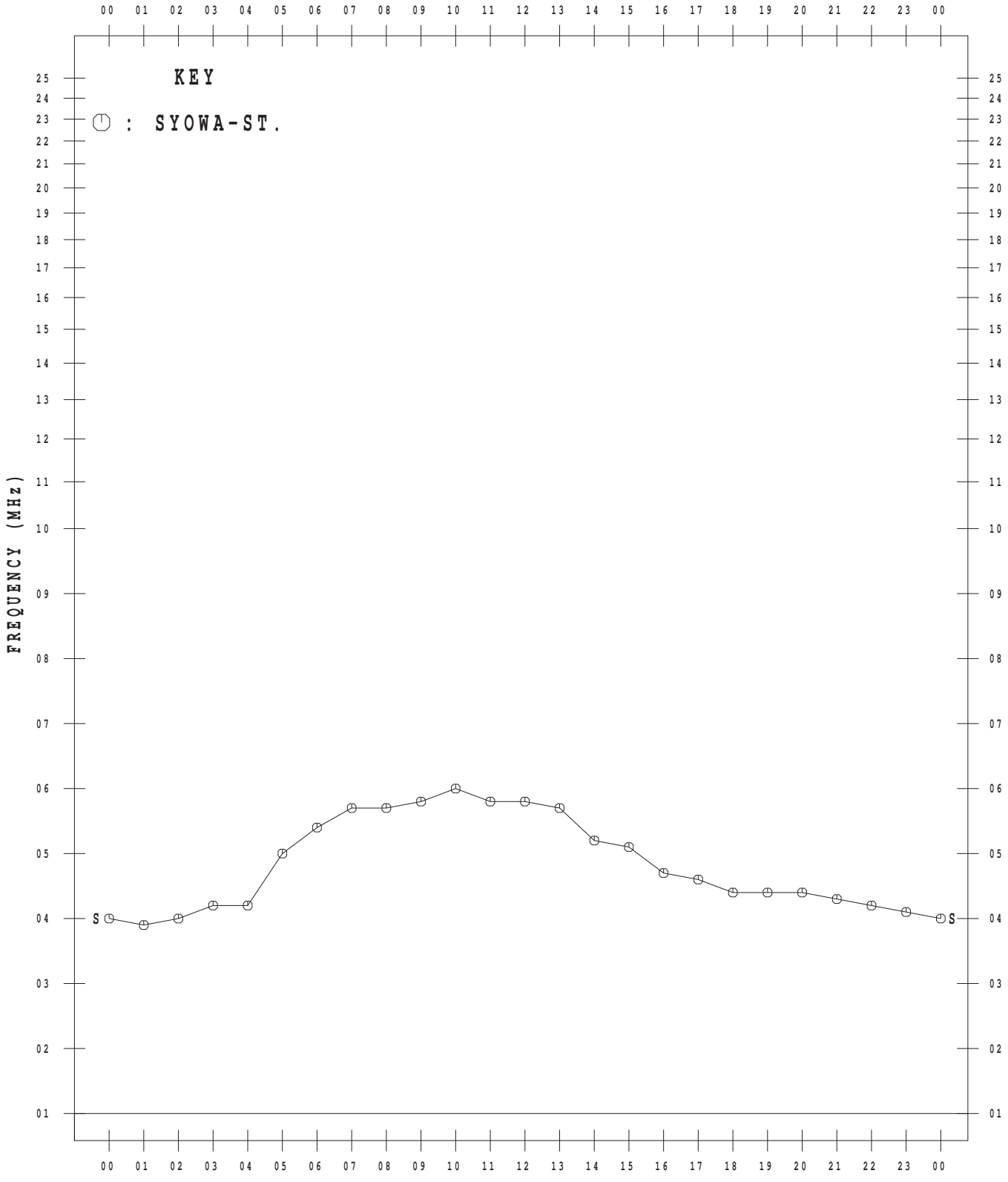

2010 1001 -> 2010 1031(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2010 1101 -> 2010 1130(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2010 1201 -> 2010 1231(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT

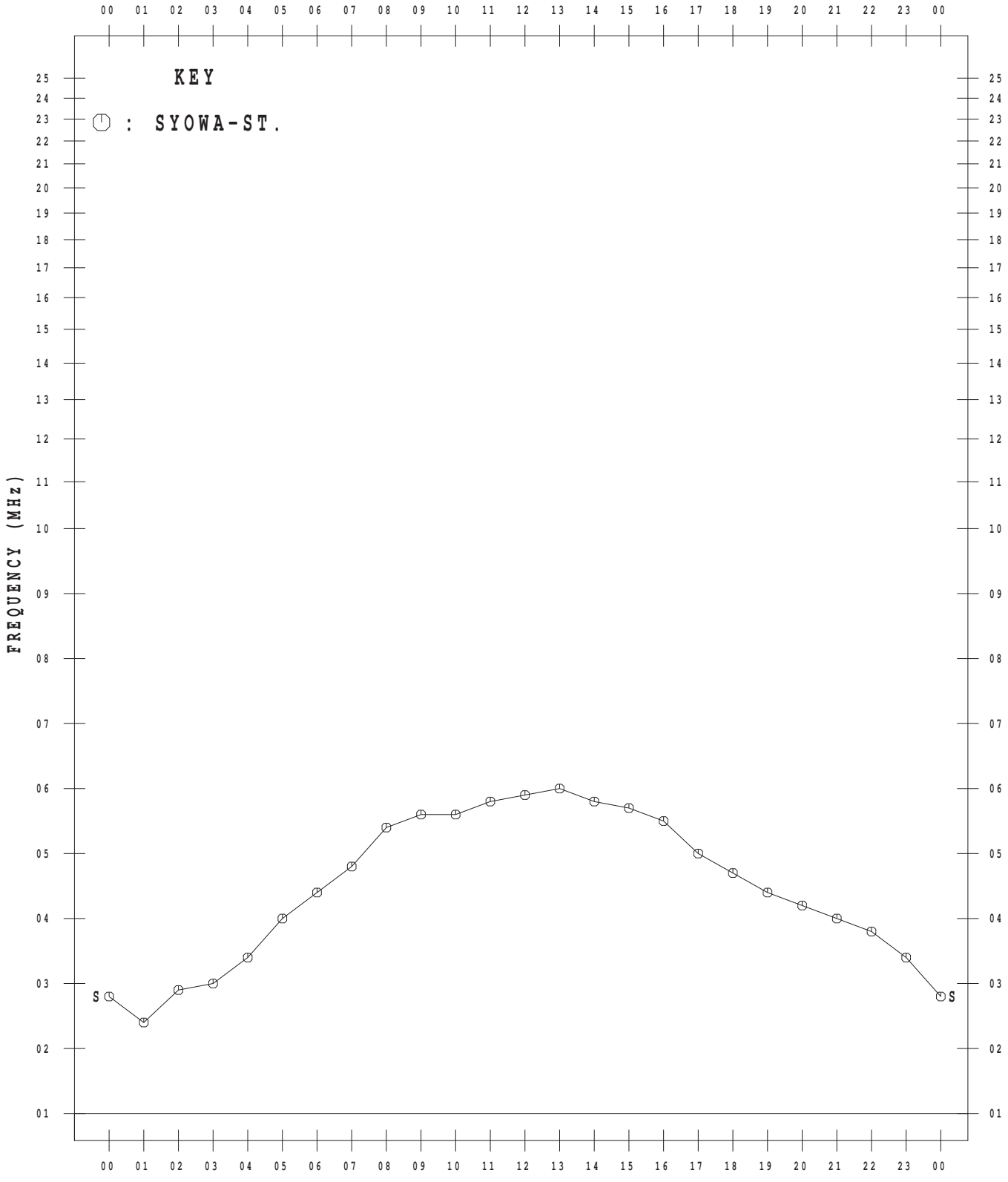
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME JAN. 2010



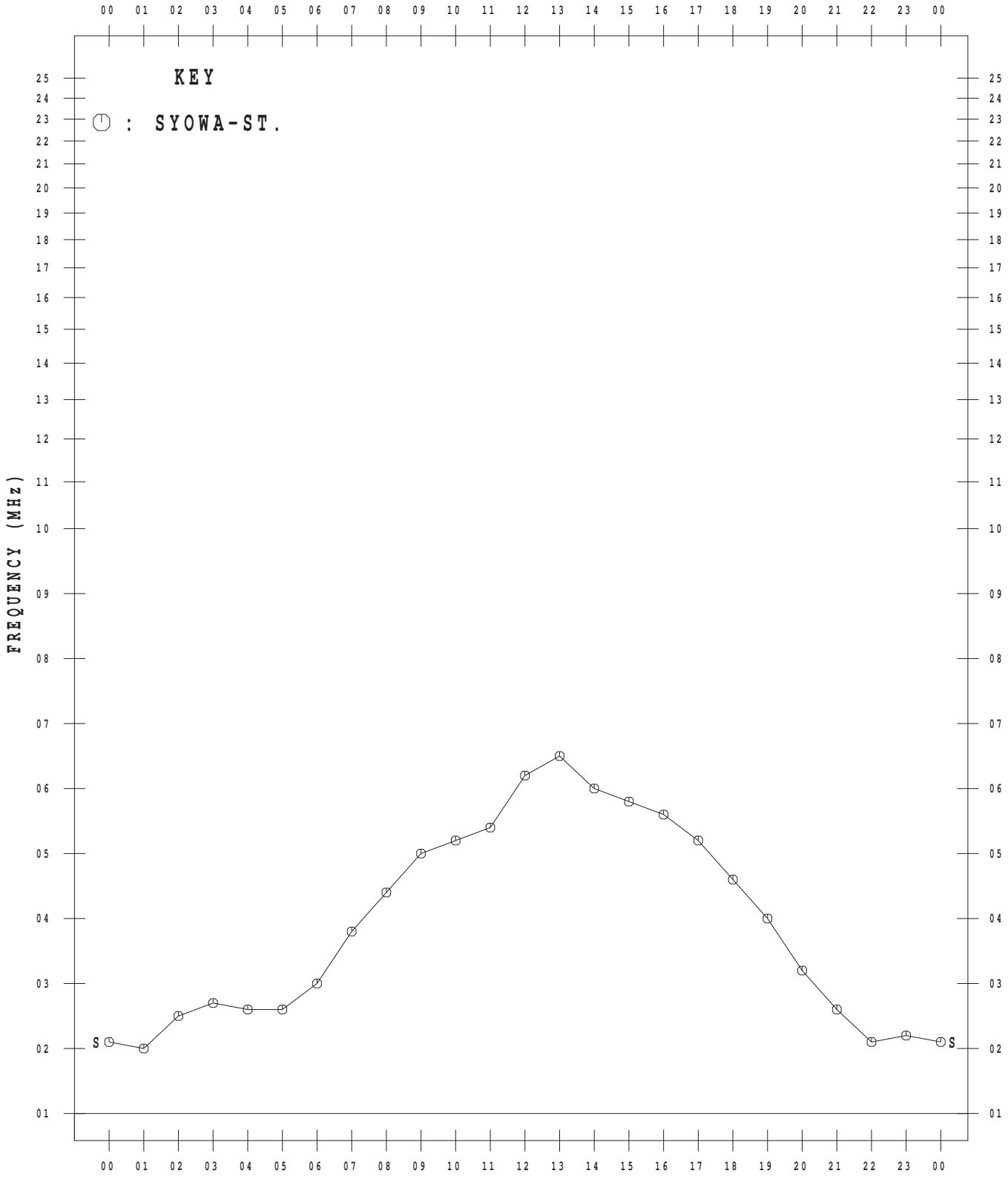
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME FEB. 2010



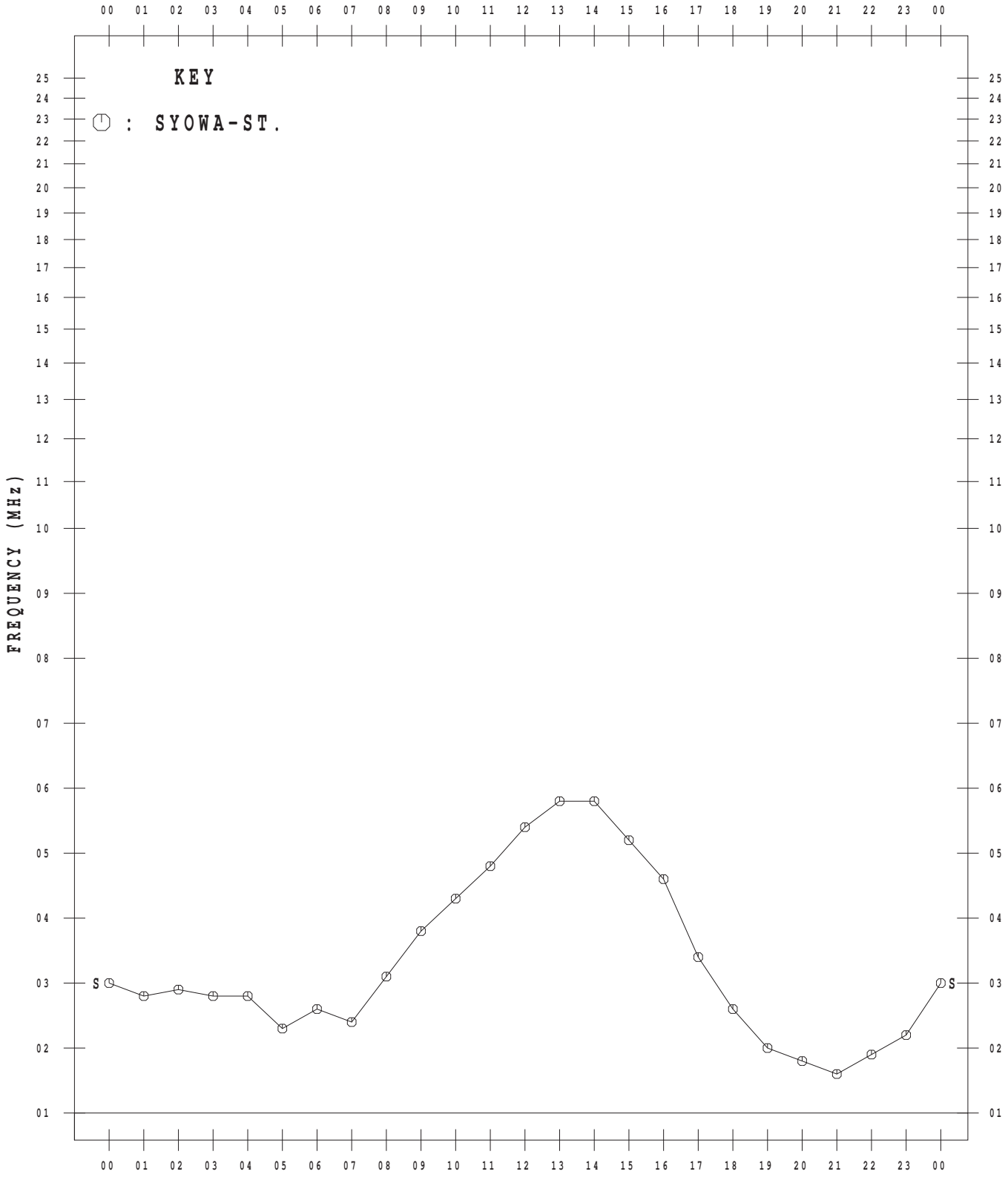
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME MAR. 2010



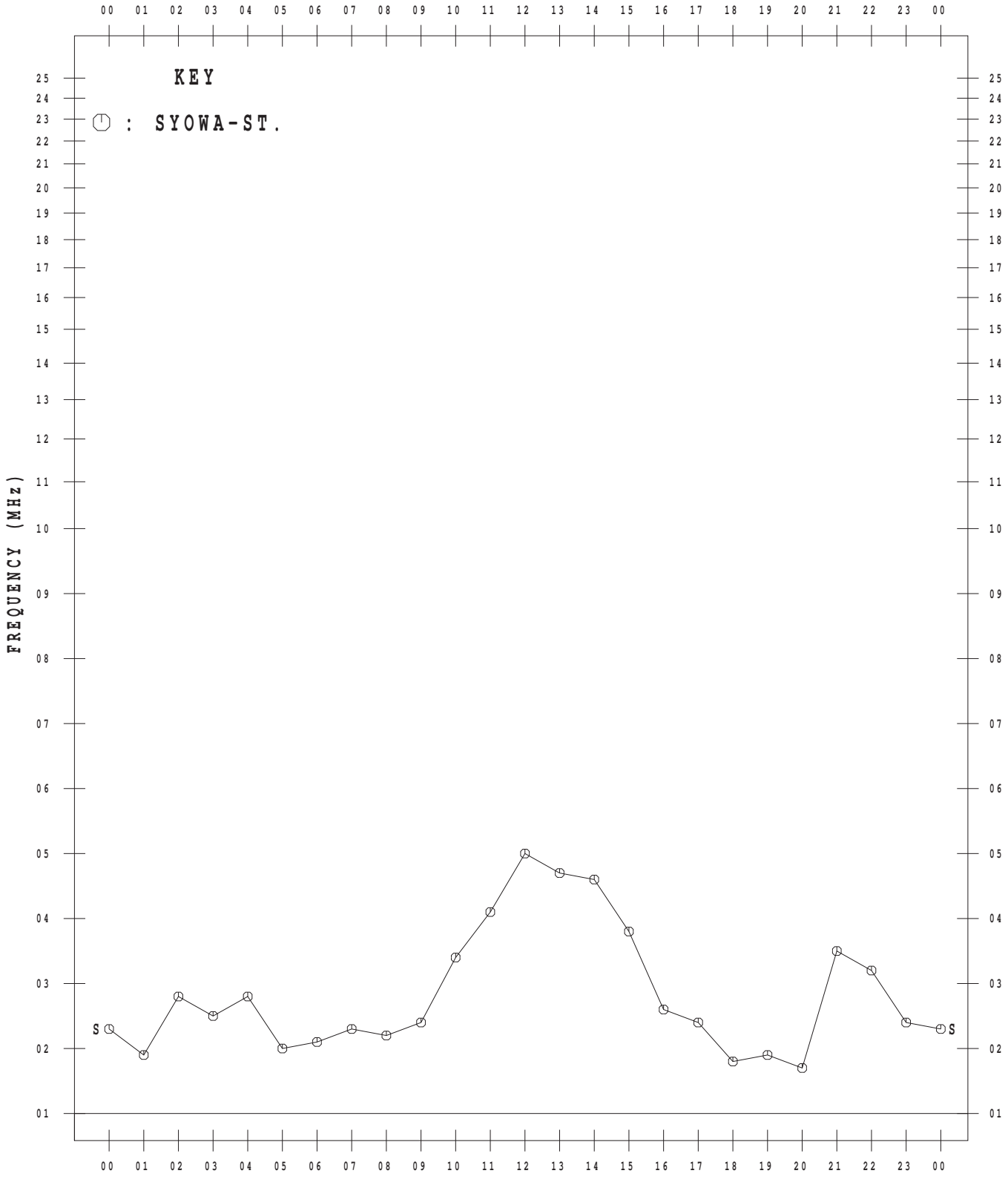
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME APR. 2010



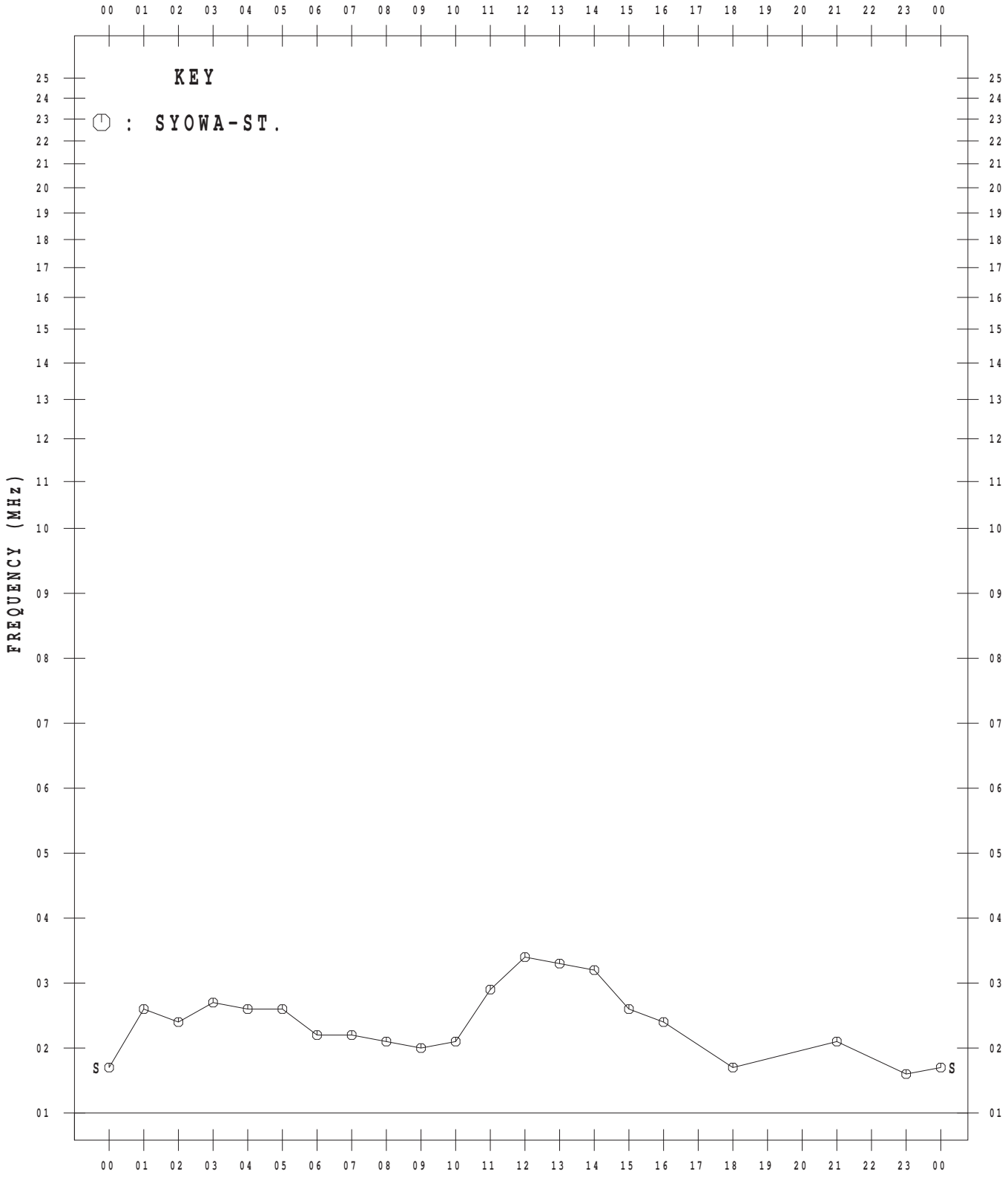
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME MAY 2010



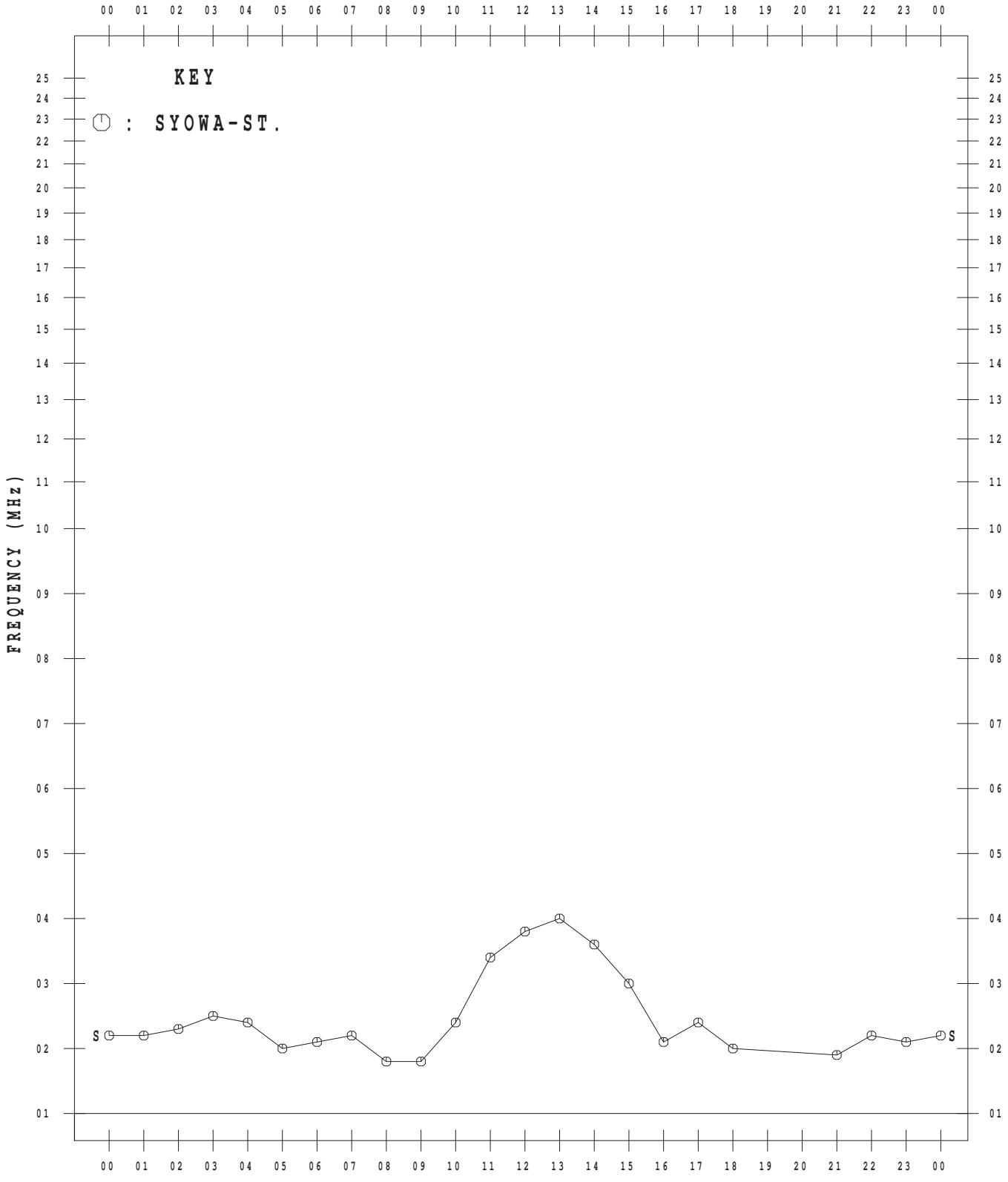
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME JUN. 2010



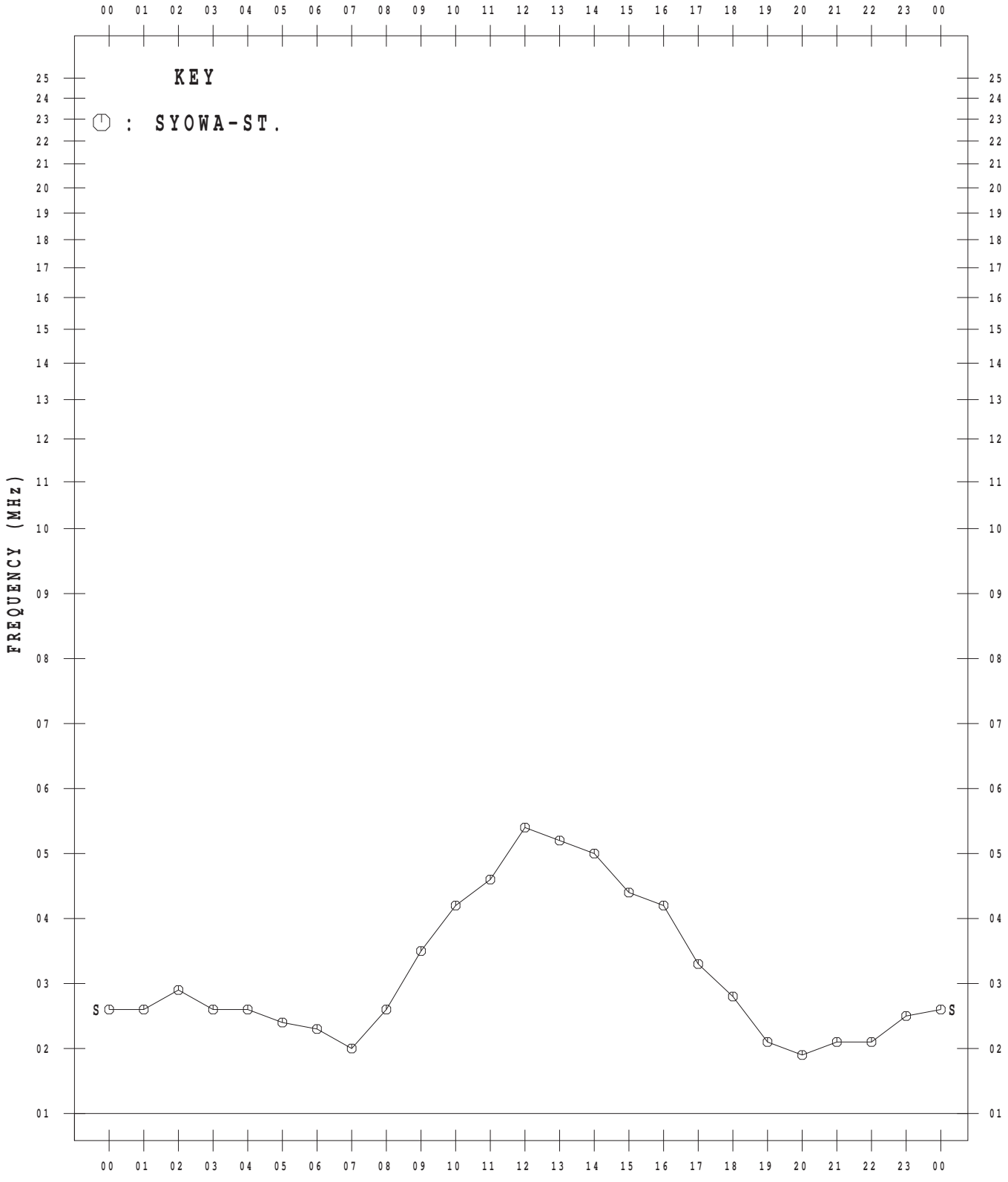
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME JUL. 2010



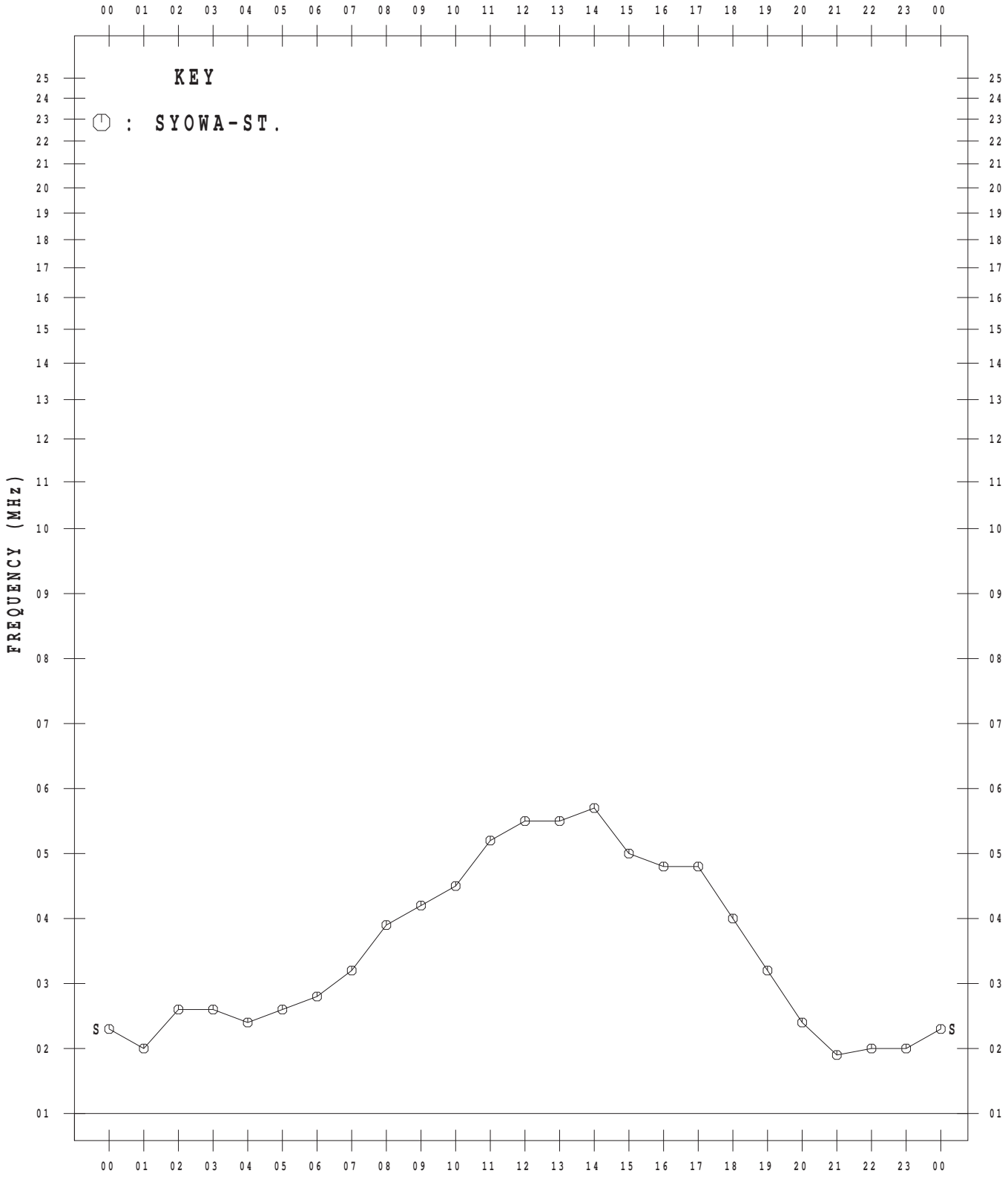
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME AUG. 2010



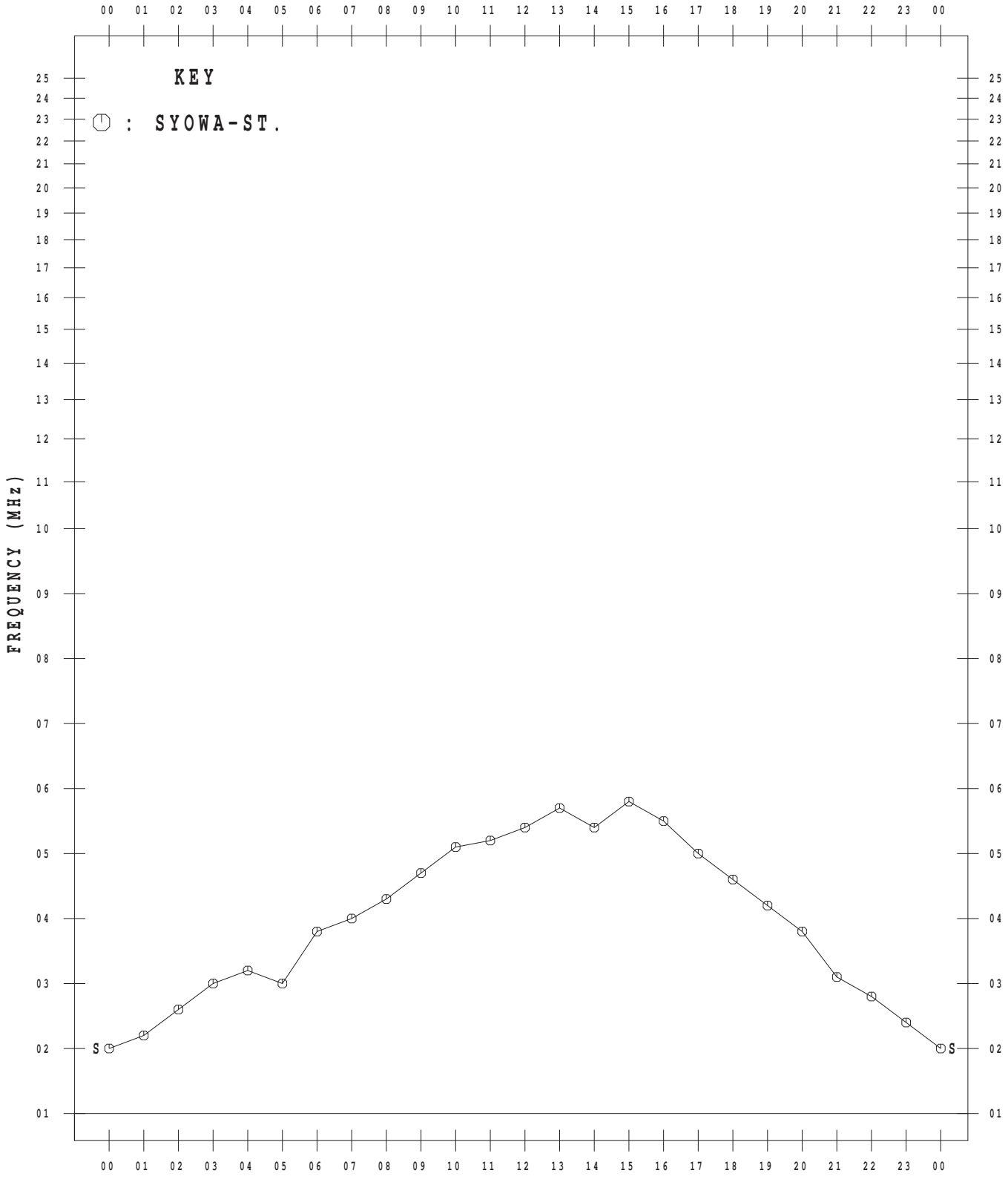
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME SEP. 2010



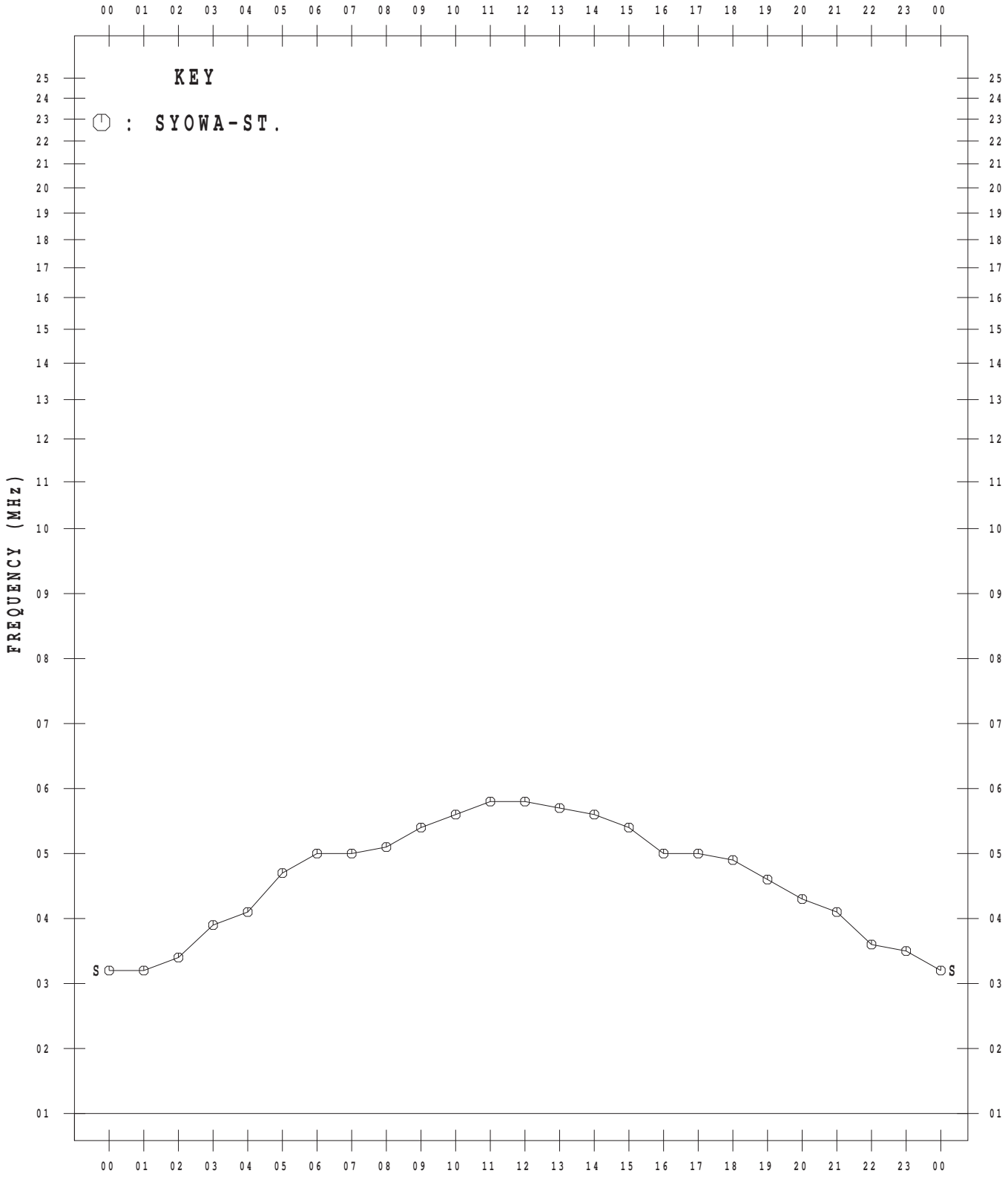
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME OCT. 2010



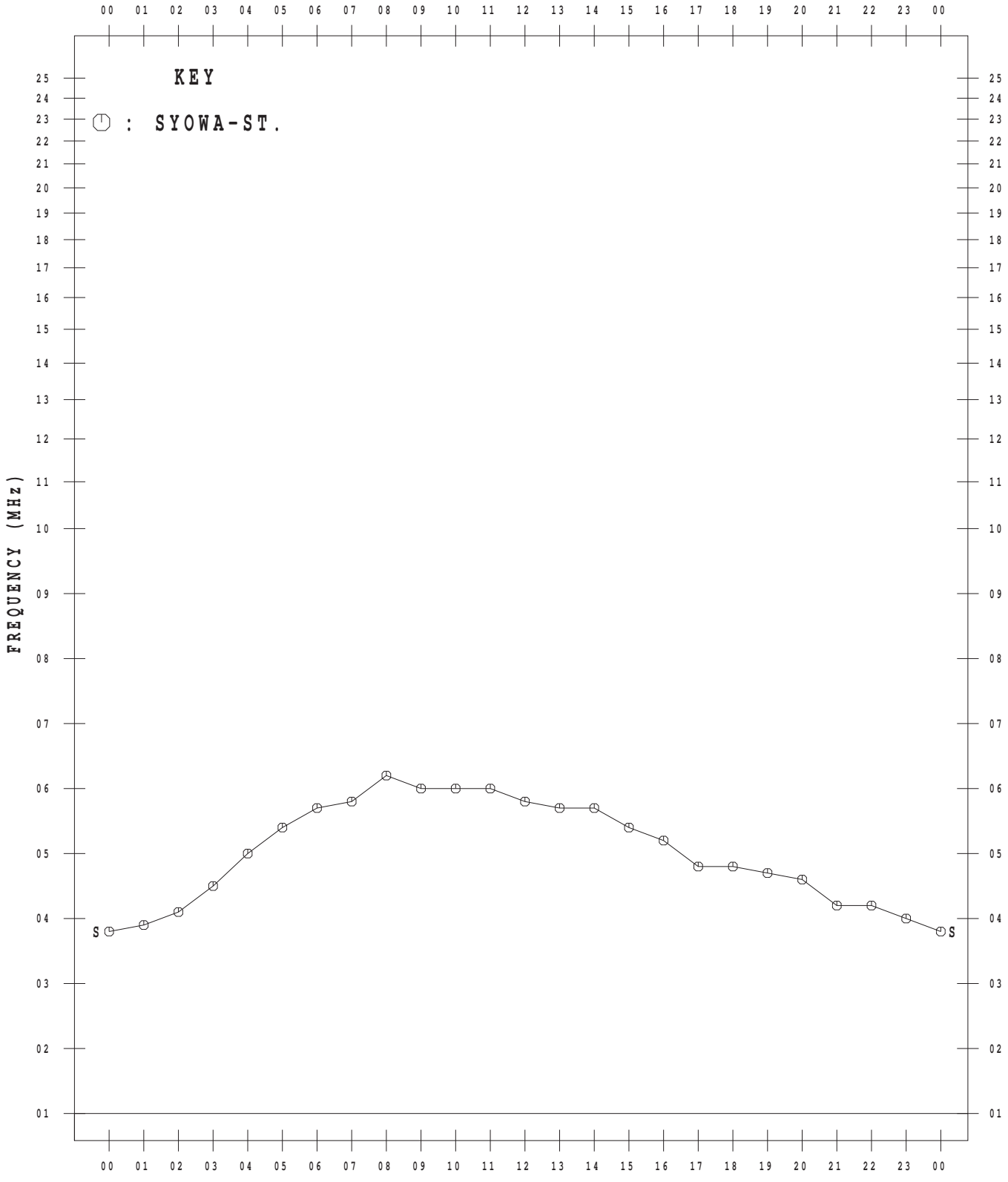
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME NOV. 2010



MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME DEC. 2010



MONTHLY MEDIAN VALUES OF ftEs

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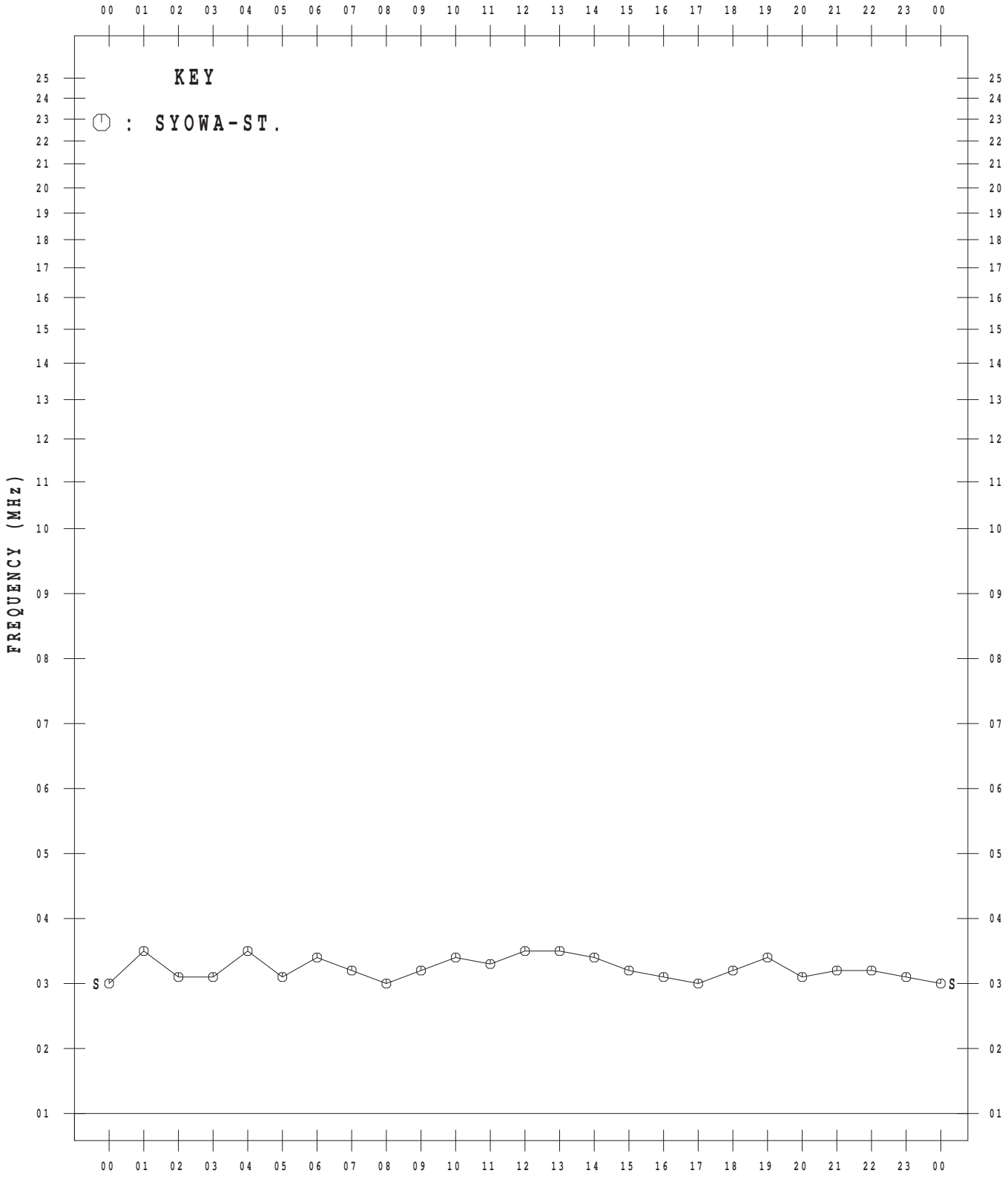
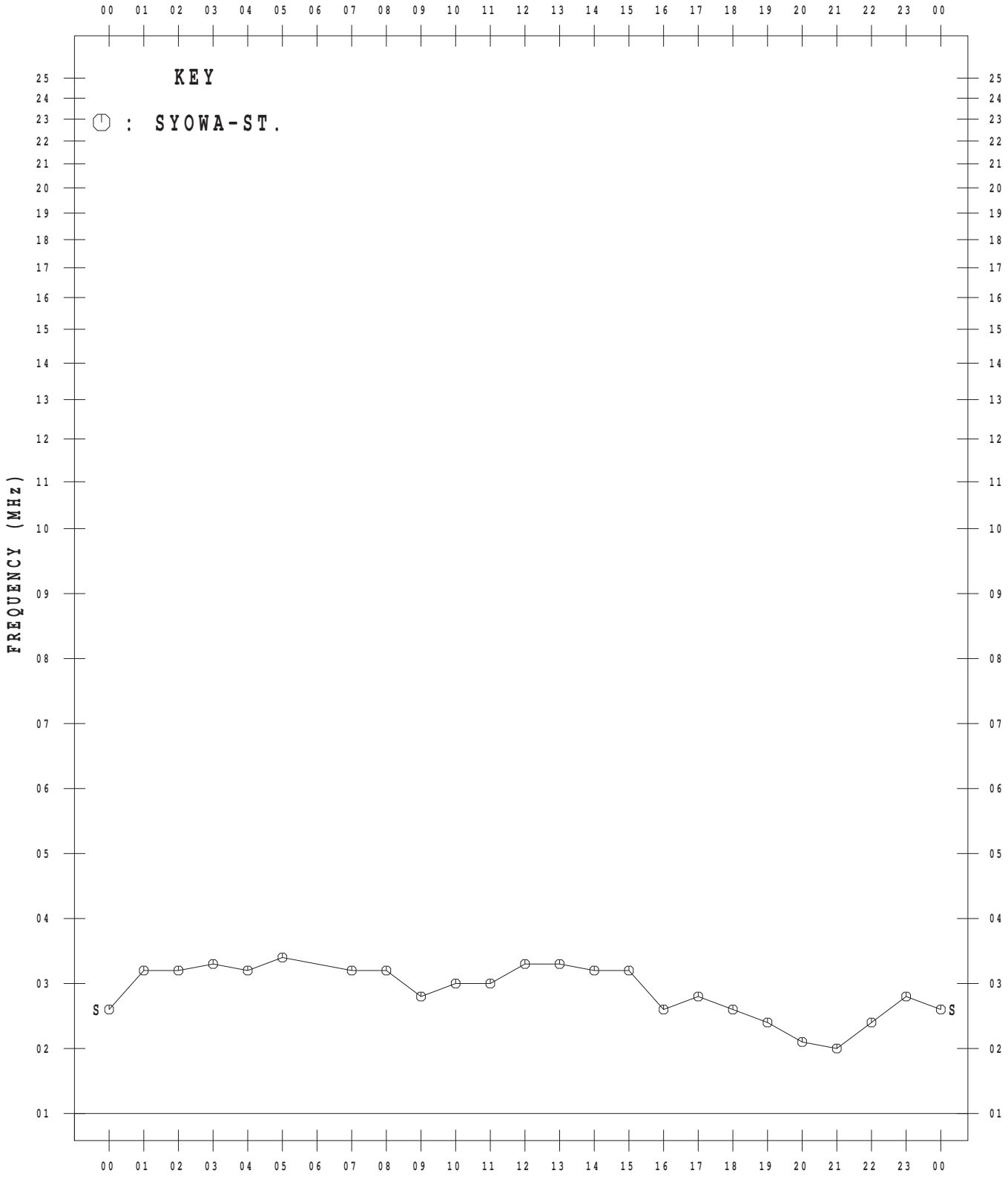


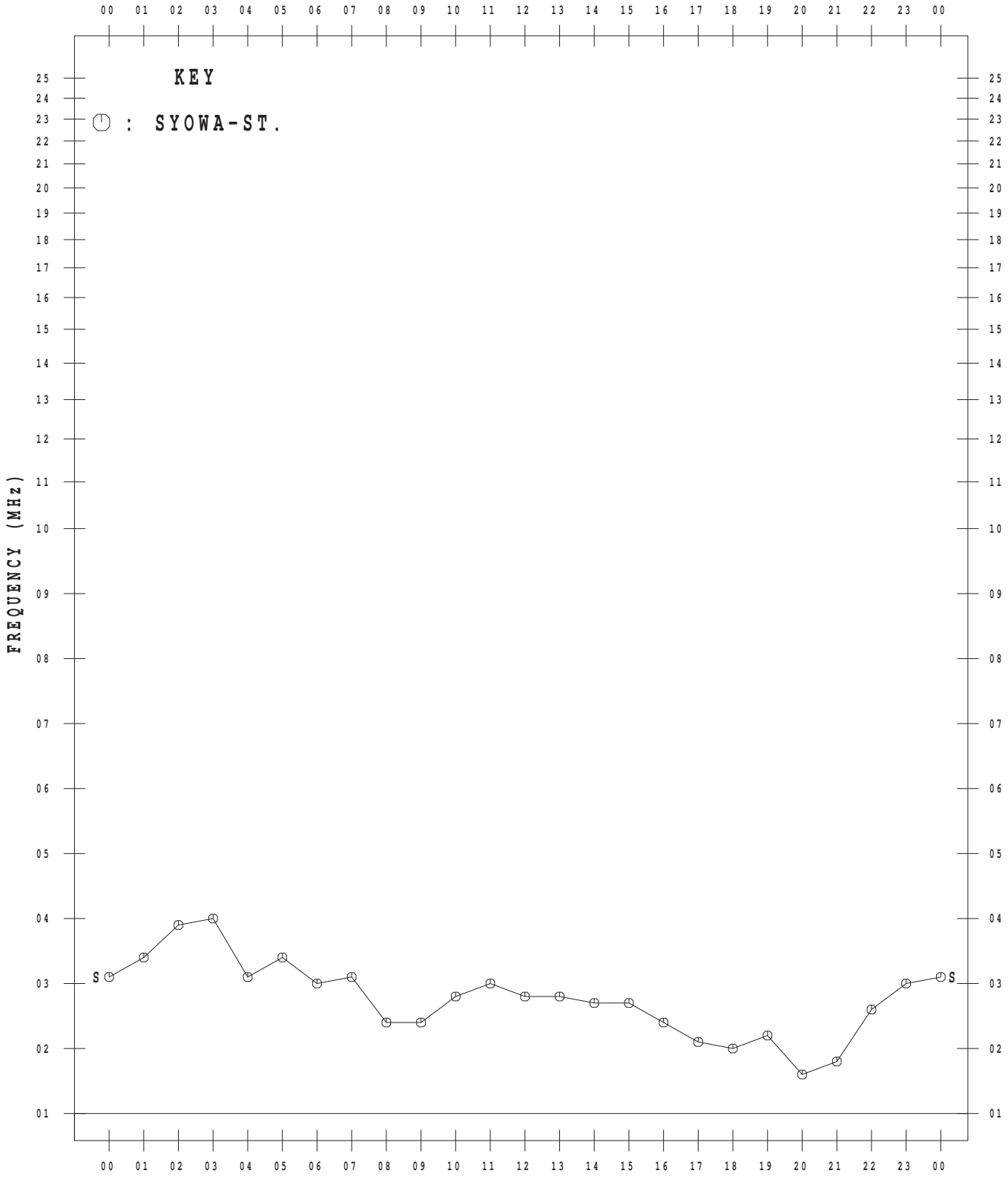
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME FEB. 2010



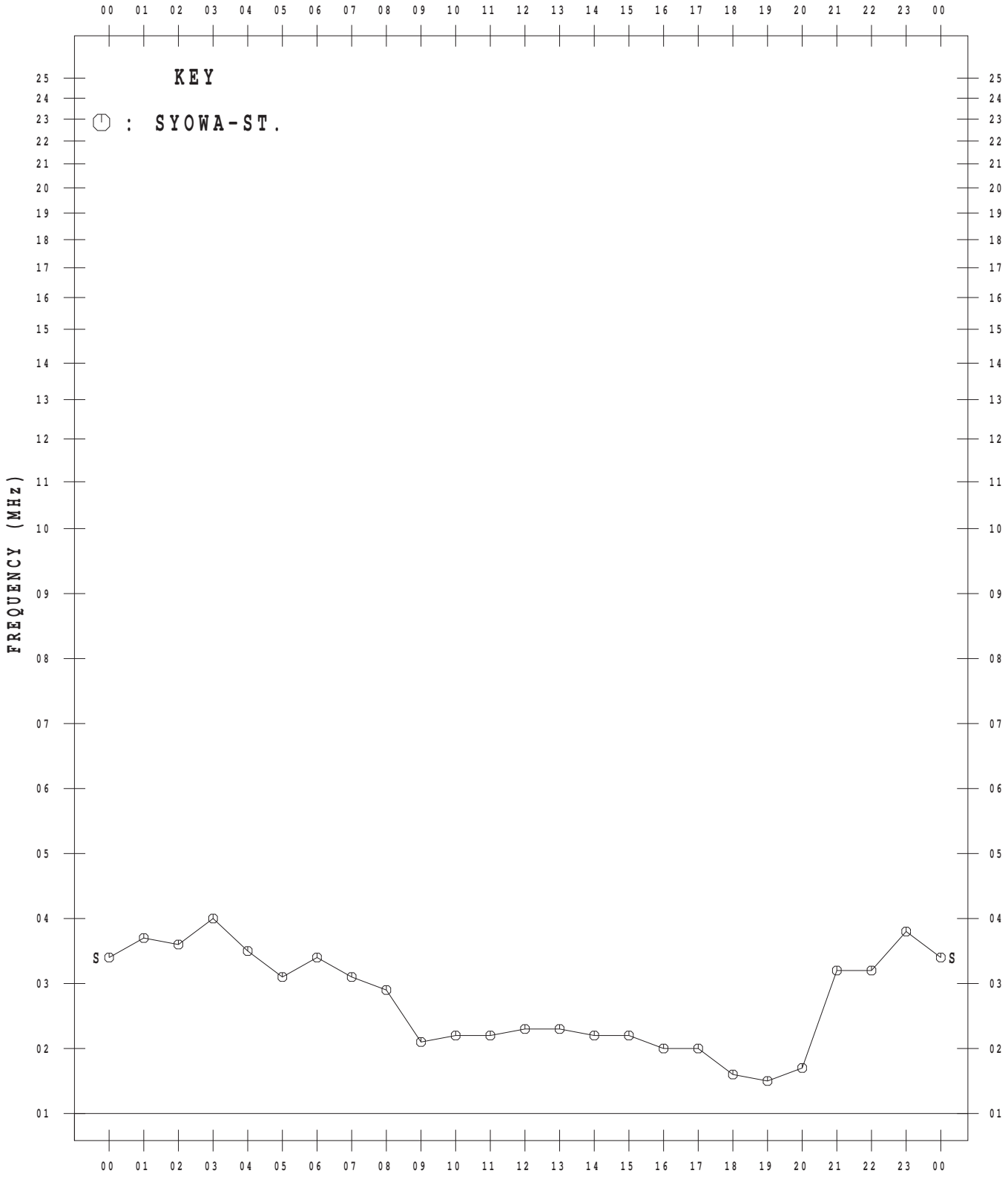
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME MAR. 2010



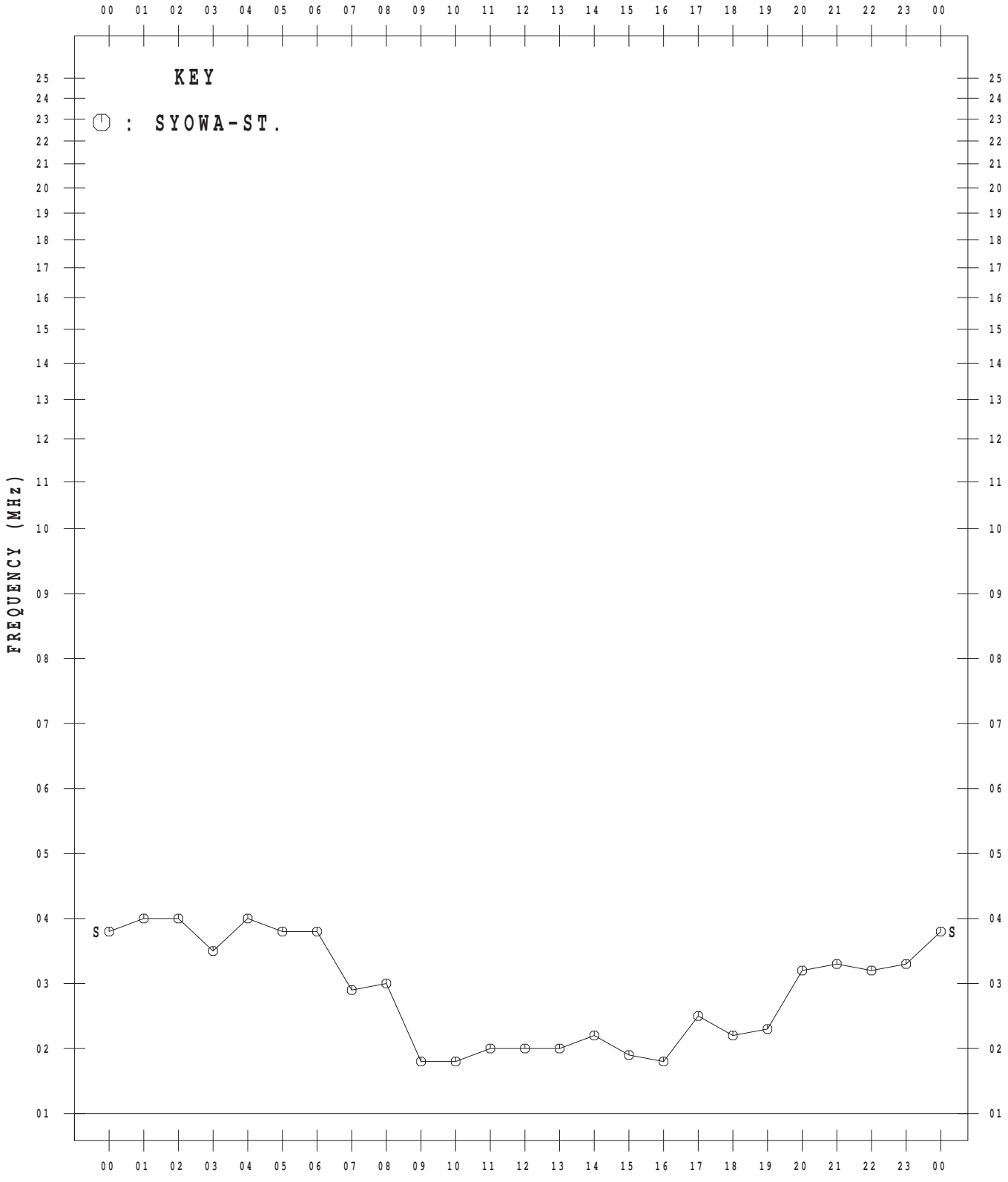
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME APR. 2010



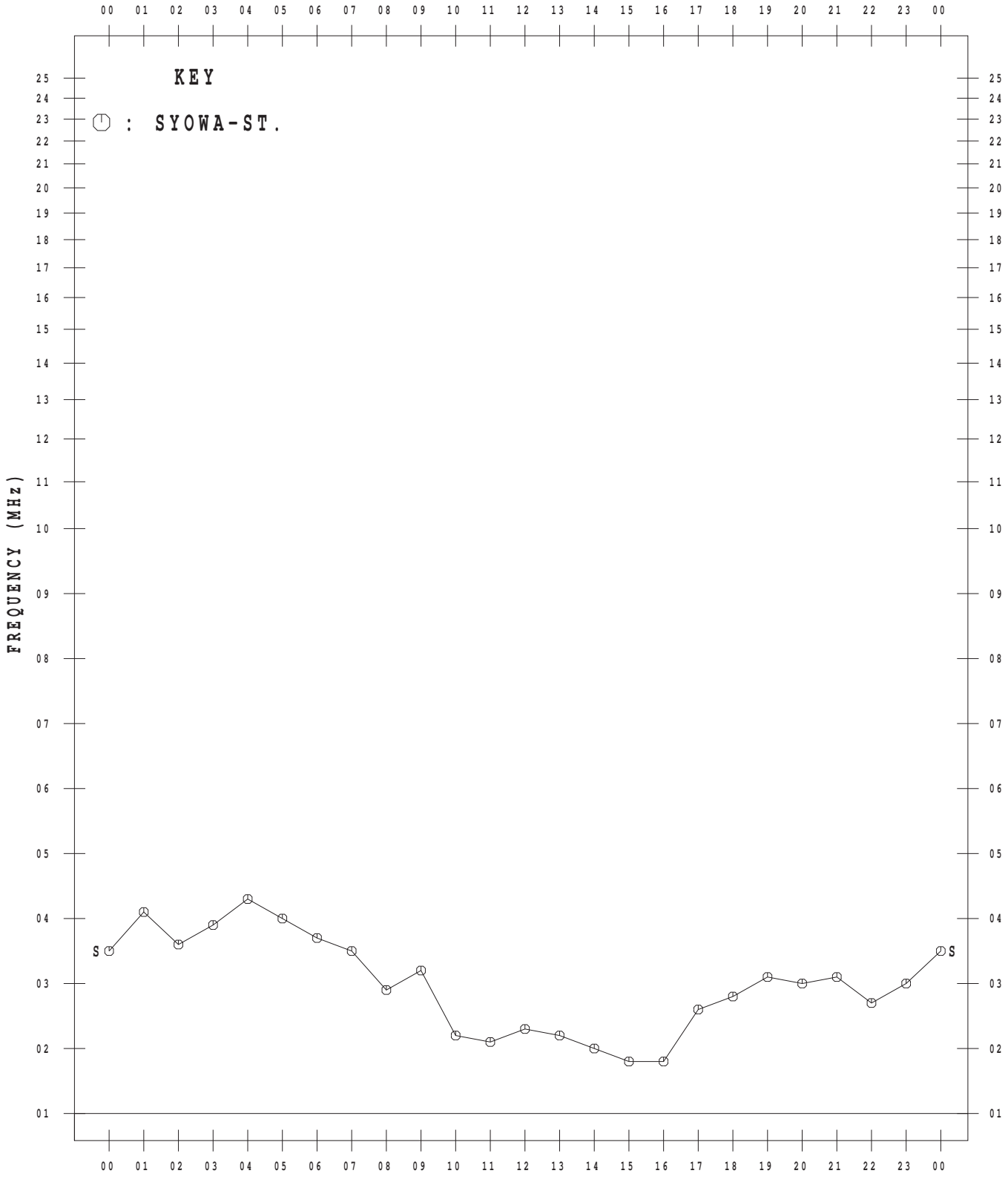
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME MAY 2010



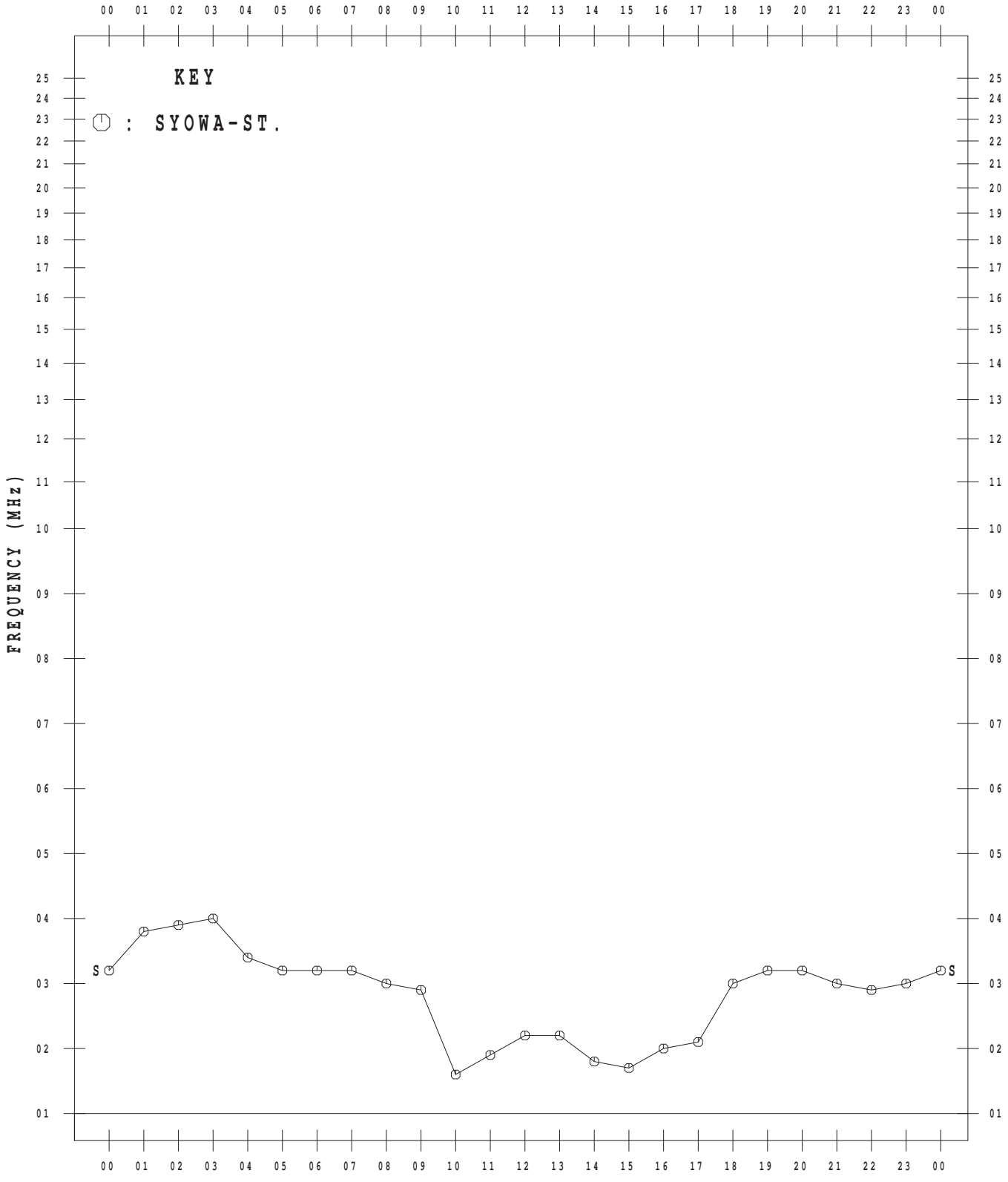
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME JUN. 2010



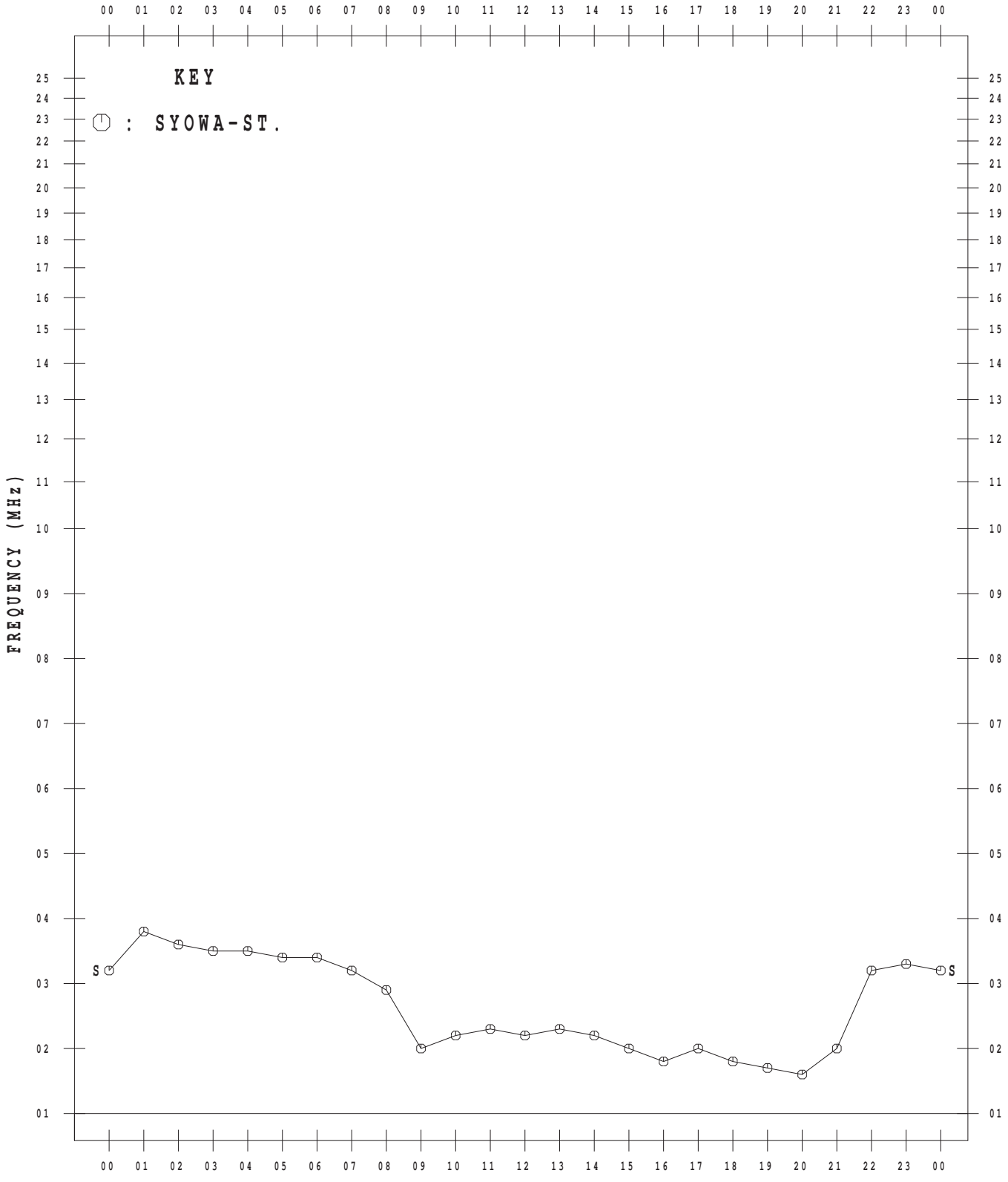
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME JUL. 2010



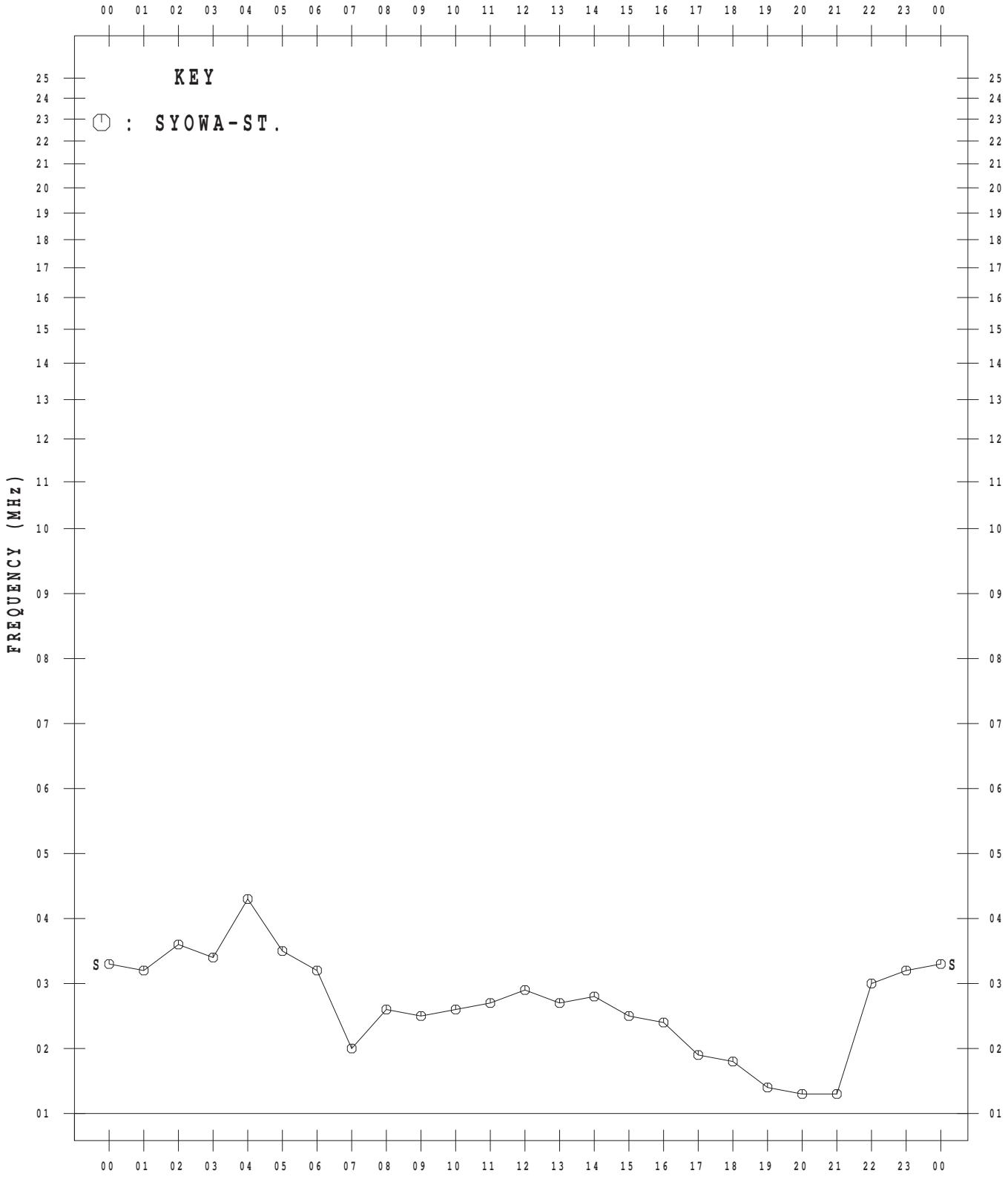
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME AUG. 2010



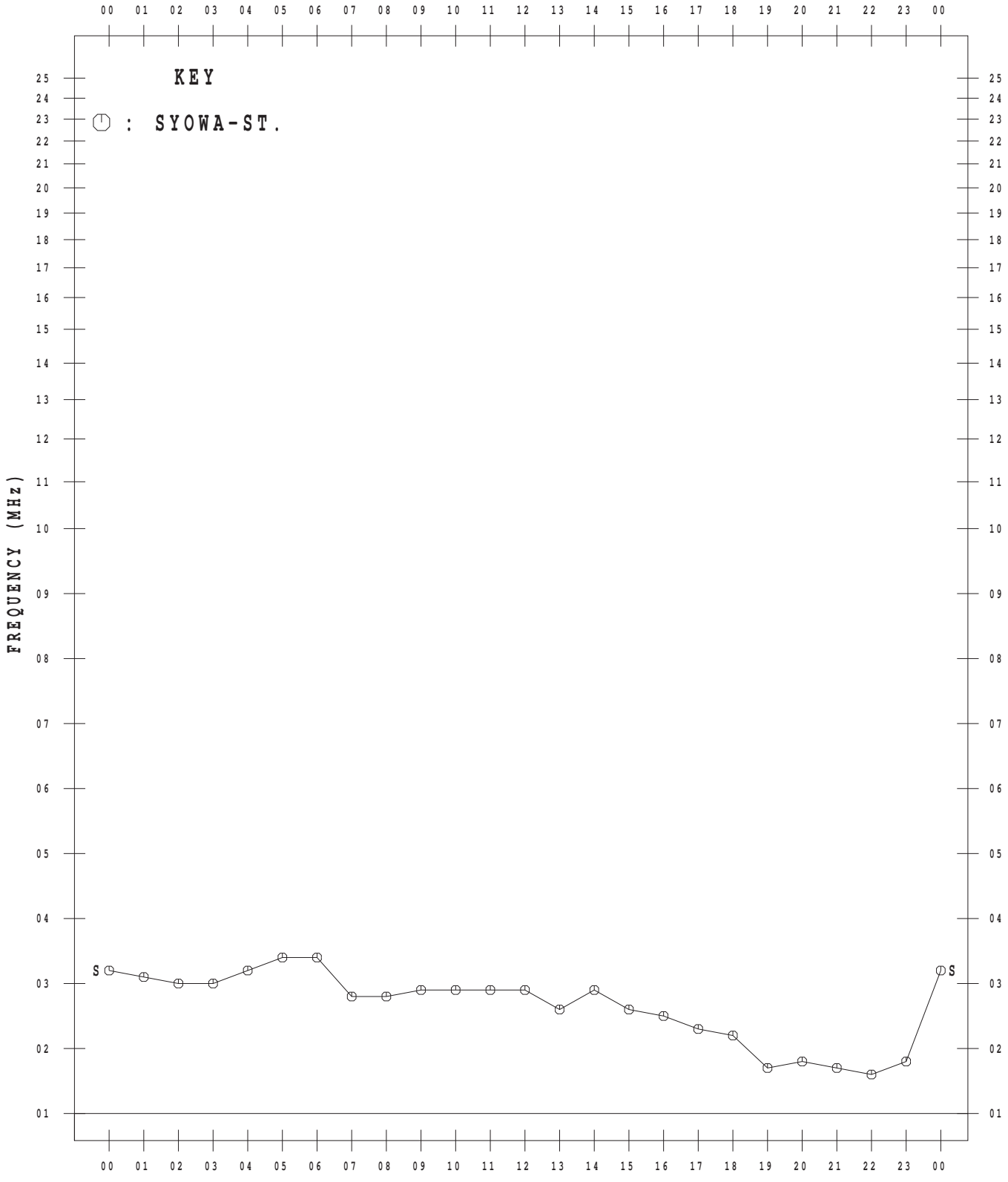
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME SEP. 2010



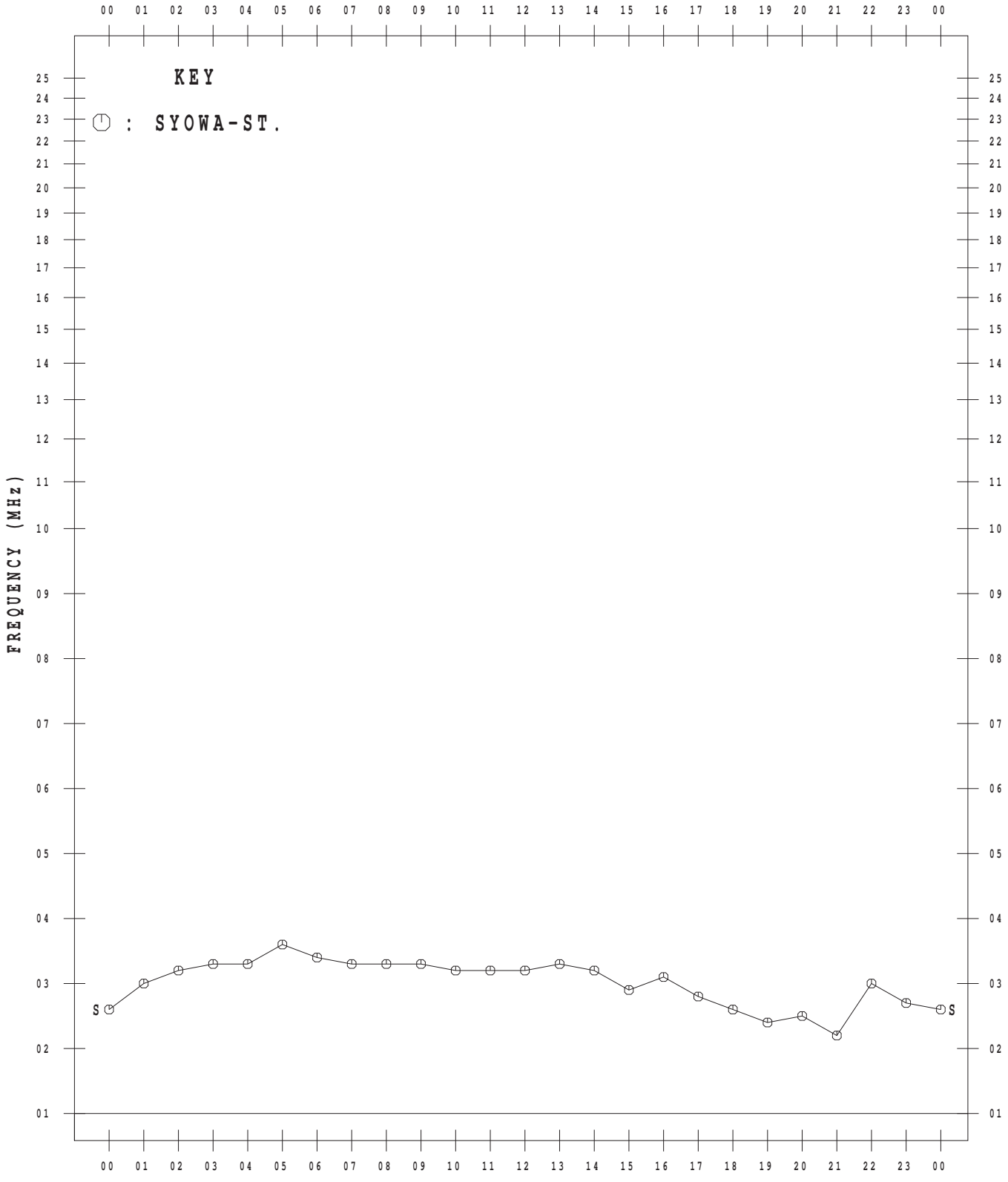
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME OCT. 2010



MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME NOV. 2010



MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME DEC. 2010