ISSN 0389-8237

ION.ANT.– 82

IONOSPHERIC DATA AT SYOWA STATION

(ANTARCTICA)

January – December 2015

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 2015. The observations were conducted by the National Institute of Information and Communications Technology. The location of the station, specifications of the ionosonde, and symbols used in this data book are as follows:

Geographic		Geomagnetic *	
Latitude	Longitude	Latitude (Deg.)	Longitude (Deg.)
69°00.4'S	39°35.4'E	- 70.5	86.1

* Geomagnetic latitude and longitude were calculated using IGRF-12 (2015)

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

Note: From 2016, new type of Ionosonde will be used for routine ionospheric observations at Syowa Station.

OBSERVERS

Observer: T. Kondo

Scaler: K. Fukushima

DESCRIPTION

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

b. Characteristics of Ionosphere

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

Symbols

(i) Descriptive Letters.
The following letters are entered after, or used to replace, numerical values on the monthly tabulation sheets.

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

W Measurement influenced or impossible because the echo lies outside the recorded height range.
X Measurement refers to the extraordinary component.
Y Lacuna phenomena, severe layer tilt .
Z Third magneto- electronic component present.

(ii) Qualifying Letters

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

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

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

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

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

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

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2015 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 52	X 52	O X 53	O X 67	X 67	X 67	X 71	73	67	V 71	X 73	X 74	X 74	X 70	X 66	X 66	X 64	X 69	X 65	X 64	X 62	X 55	X 50	X 52
2	B	B	A	R	O X 58	X 64	X 73	X 66	X 70	X 72	X 70	X 71	O X 72	O X 68	O X 62	O X 63	X 65	X 64	X 67	R	X 57	O X 62	94	70
3	O X 48	64	50	50	66	B	A	R	R	67	O X 71	O X 71	O X 70	O X 63	X 63	O X 71	X 69	X 72	X 61	X 52	X 61	X 60	X 54	X 48
4	X 53	V 55	X 55	R	R	61	R	X 61	X 63	70	X 78	X 75	76	78	X 74	O X 74	O X 60	R	R	X 47	X 52	82	69	92
5	A	47	53	A	89	A	A	A	C	C	C	C	C	C	O X 66	O X 73	X 64	X 70	X 61	R	X 53	X 52	X 47	R
6	A	B	R	X 46	O X 46	57	61	R	X 58	68	R	R	R	B	B	O X 67	X 63	O X 64	X 66	X 57	R	X 56	X 55	X 50
7	X 50	X 50	X 57	75	B	X 56	X 58	X 65	X 74	O X 71	X 64	R	R	X 80	O X 65	R	R	R	53	X 46	O X 51	X 53	X 61	X 56
8	X 55	R	68	51	49	O X 52	O X 52	R	R	B	66	O X 69	O X 70	X 66	O X 70	X 72	X 78	O X 69	X 57	O X 54	X 53	X 52	X 57	X 57
9	X 52	57	R	65	R	X 57	X 66	O X 64	X 78	X 82	X 83	X 83	X 89	X 84	X 77	X 77	X 74	O X 72	X 72	X 64	X 59	X 50	O X 52	X 54
10	X 56	X 60	O X 64	O X 64	R	R	B	R	O X 64	O X 71	O X 71	X 71	X 74	X 73	X 76	X 80	X 80	O X 72	X 73	X 52	O X 48	O X 51	X 55	X 64
11	X 58	X 64	X 62	X 64	70	X 69	X 63	70	80	X 76	O X 75	X 82	B	B	X 82	B	B	X 57	X 60	X 63	X 61	64	X 60	X 56
12	R	O X 49	X 60	X 61	68	70	76	88	X 96	X 90	X 93	O X 87	X 79	77	O X 68	X 76	X 73	X 69	X 68	X 61	X 54	X 54	O X 50	X 54
13	R	56	B	B	74	O X 69	R	O X 75	X 74	82	X 92	X 90	X 82	X 78	X 76	O X 73	X 73	X 73	X 64	O X 64	X 58	X 53	X 58	O X 55
14	57	65	X 64	71	O X 62	X 62	X 66	82	X 89	X 84	X 81	X 84	X 76	X 80	X 80	X 77	O X 74	O X 69	V 74	V 72	X 61	X 63	X 64	X 49
15	52	57	68	70	66	71	X 69	X 75	X 76	X 82	X 83	X 82	X 80	O X 72	X 70	X 69	X 66	X 64	X 57	X 64	O X 52	O X 61	X 58	X 58
16	X 56	X 62	65	70	72	72	73	X 70	R	70	O X 67	R	O X 68	O X 64	X 62	O X 71	O X 71	A	A	R	O X 62	66	X 54	X 42
17	O X 47	O X 50	O X 48	A	O X 60	63	B	B	R	O X 56	X 60	70	69	X 65	O X 65	O X 67	O X 67	X 65	X 64	X 64	62	X 64	X 65	X 59
18	X 58	X 60	R	R	X 57	X 64	B	X 66	O X 86	X 86	O X 85	X 80	X 76	X 76	X 67	X 70	X 68	X 66	X 69	X 64	66	X 63	58	X 46
19	X 50	O X 47	56	61	64	B	R	O X 62	X 69	X 72	X 74	X 74	X 72	O X 73	70		O X 64	O X 64	X 64	X 63	X 62	O X 63		X 41
20	O X 50	R	O X 53	X 61	69	X 62	72	X 80	X 86	X 86	X 83	O X 85	X 78	X 78	X 76	X 72	X 65	X 62	X 63	X 63	X 64	X 63	X 60	X 57
21	60	X 58	66	70	73	79	X 81	X 90	O X 90	X 92	O X 90	X 90	O X 90	X 81	X 82	X 78	X 78	X 74	X 61	O X 49	O X 50	A	A	A
22	R	38	42	A	A	R	A	X 45	R	R	X 56	R	R	X 58	X 63	R	X 58	R	R	A	O X 51	X 55	O X 46	O X 46
23	B	R	53	A	A	A	O X 50	R	R	B	B	O X 56	R	R	R	O X 64	X 59	R	X 60	X 56	X 46	X 45	O X 45	O X 49
24	X 46	X 47	X 46	O X 52	58	R	X 63	X 63	X 71	X 82	X 78	X 73	O X 72	X 74	O X 73	X 72	X 74	X 72	X 70	R	X 48	X 56	X 50	X 50
25	X 39	A	R	O X 50	O X 64	X 65	66	R	R	O X 66	68	V 64	X 64	X 69	O X 69	O X 68	X 64	X 64	O X 62	X 58	X 56	X 53	X 52	X 50
26	X 44	48	A	B	R	O X 46	X 47	68	R	O X 57	O X 57	O X 62	O X 68	B	X 64	X 65	X 66	X 57	X 58	X 51	O X 47	O X 56	R	R
27	O X 46	X 40	X 41	83	X 48	67	R	R	A	R	R	Y	R	R	X 60	O X 63	O X 63	R	X 61	X 53	X 50	X 50	X 50	R
28	A	70	X 48	A	O X 41	R	A	X 63	X 67	X 67	69	B	O X 69	B	B	B	B	X 62	X 60	X 58	X 57	X 54	X 52	X 46
29	X 42	49	R	A	R	R	X 61	R	R	X 64	X 68	O X 72	O X 72	R	O X 71	X 68	O X 71	X 69	X 66	X 57	X 57	X 46	A	A
30	A	O X 48	X 49	47	O X 49	X 51	75	X 60	R	R	R	X 63	R	O X 66	B	X 60	X 59	X 59	X 58	X 60	X 49	R	A	O X 44
31	R	R	O X 49	O X 46	55	X 56	X 63	R	R	X 65	O X 68	X 71	X 71	X 72	O X 70	X 72	O X 69	X 66	X 62	X 56	O X 50	O X 46	69	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	21	24	23	20	23	22	20	20	18	25	26	24	23	23	27	26	28	25	28	26	30	29	26	25
MED	X 52	X 54	X 53	62	64	X 64	X 66	X 67	X 74	X 71	X 72	X 74	X 72	X 73	X 70	X 71	X 66	X 66	X 62	X 58	X 55	X 55	X 55	X 52
U Q	X 56	X 60	64	70	69	69	72	X 75	X 86	X 82	X 83	X 82	X 78	X 78	X 76	X 73	X 73	X 71	X 66	X 64	X 61	X 63	X 60	X 57
L Q	X 46	X 48	X 49	50	X 55	X 57	X 61	X 63	X 67	X 67	X 68	X 70	O X 70	X 66	X 65	O X 67	X 64	X 64	X 60	X 53	X 50	X 52	X 50	X 47

JAN. 2015 fxI (0.1MHz)

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IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2015 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT.69°00.4'S LON.039°35.4'E kSWEEP 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	46	46	47	R 61	61	61	65	F 58	F 55	V 65	67	68	68	64	60	60	58	63	59	58	56	49	44	46
2	B	B	A	R 46	R 52	58	67	60	64	66	64	65	66	62	56	57	59	58	61	R	51	R 56	F 40	F 54
3	R 42	F 44	F 37	F 38	F 54	B	A	R	R	F 58	65	R 65	64	R 57	57	65	63	66	55	46	55	54	48	42
4	47	V 48	49	R	R	A	R	J R 45	57	F 61	J R 72	69	F 66	F 63	68	R 68	R 54	R	R	41	46	A	F 39	A
5	A	F 33	F 38	A	R 36	A	A	A	C	C	C	C	C	C	60	67	58	64	55	R	47	46	41	R
6	A	B	R	40	40	F 47	F 40	R	J R 52	R	R	R	R	B	B	U R 61	57	58	60	51	R	50	49	44
7	44	44	51	F 60	B	50	R 52	J R 59	68	65	58	R	R 65	74	R 59	R	R	R 48	J R 48	41	45	47	54	50
8	48	R	F 59	F 31	F 39	R 46	R 46	R 55	R	B	F 58	63	64	60	64	66	72	63	51	48	47	46	R 51	51
9	46	F 48	R	F 52	R	J R 51	60	58	J R 72	J R 76	77	77	83	78	J R 71	J R 71	68	R 66	66	58	53	44	46	J R 48
10	50	54	R 58	R 58	R	R	B	R	58	65	59	65	68	67	J R 70	J R 73	74	66	67	46	42	R 45	49	58
11	J R 52	58	56	58	F 57	63	57	F 57	F 65	70	R 68	J R 76	B	B	76	B	B	51	54	57	55	F 55	54	50
12	R	43	54	55	F 58	64	F 58	F 70	90	84	87	R 81	73	J R 71	R 62	J R 70	67	63	62	55	48	48	44	48
13	R	F 43	B	B	F 56	63	R	R 69	68	F 68	J R 86	J R 84	76	J R 72	J R 70	R 67	67	67	58	R 58	52	47	J R 52	49
14	F 44	F 42	58	F 55	R 56	56	60	F 69	83	78	75	78	70	74	74	71	68	R 63	V 68	V 66	55	57	58	43
15	F 40	F 42	F 49	55	F 58	F 58	63	69	70	76	77	J R 76	74	R 66	64	63	60	58	51	58	U R 46	55	52	52
16	50	56	F 56	F 58	F 60	F 55	F 62	64	R	F 60	61	R	R 62	R 58	56	R 65	R 65	A	A	R 56	56	F 58	48	36
17	41	44	R 42	A	R 54	F 52	B	B	R	50	54	F 58	F 58	59	59	61	61	R 59	58	58	56	58	59	53
18	52	54	A	R	51	58	B	60	80	80	79	74	J R 70	70	61	64	62	60	63	58	60	57	52	40
19	44	41	F 38	F 47	F 54	B	R	R 56	63	66	68	68	66	66	R 64	58	R 58	R 58	58	57	56	57	46	35
20	R 44	U R 48	U R 47	55	F 56	56	F 61	74	80	80	77	R 79	J R 72	J R 72	70	66	59	56	57	57	58	57	54	51
21	F 50	52	F 56	F 58	F 59	F 68	75	84	R 84	86	84	84	84	75	76	J R 72	J R 72	68	55	R 43	R 44	A	A	A
22	R	F 28	F 32	A	A	R	A	39	A	R	R 50	R	R	52	57	R	J R 52	R	R 58	R	45	49	40	40
23	B	A	F 40	A	A	A	R 44	A	A	B	B	R 50	R	R	R	R 58	53	R	54	51	40	39	39	43
24	40	41	40	46	F 48	R	57	57	65	76	72	67	66	68	67	67	68	66	64	R	42	J R 50	44	44
25	33	A	A	44	R 58	U S 59	F 56	R	R 60	R 60	F 57	V 58	58	63	63	R 62	R 58	58	56	52	50	47	46	44
26	38	F 35	A	B	A	R 40	R 41	F 39	A	51	R 51	56	R 62	B	58	J R 59	60	51	52	45	41	R 50	R	A
27	R 40	34	35	F 36	42	J R 60	R	R	A	R	R	Y	R	R	54	57	R 57	R	J R 55	47	44	44	44	A
28	A	A	42	A	35	R	A	57	61	61	Y	B	R 63	B	B	B	B	56	54	52	51	48	46	40
29	36	F 39	A	A	R	R	55	R	R	58	62	66	66	U R 66	65	62	65	63	60	51	51	40	A	A
30	A	R 42	J R 43	F 39	R 43	45	39	54	R	R	R	57	R	60	B	54	R 53	J R 53	J R 52	54	43	R	A	R 38
31	R	R	R 43	40	F 42	50	57	R	R	59	62	65	65	66	64	66	63	60	56	50	44	40	R	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	24	23	21	23	21	20	21	19	24	25	24	24	24	27	27	28	26	29	27	30	28	26	24
MED	44	44	47	52	F 54	56	57	58	65	66	67	68	66	66	64	65	60	60	57	52	49	49	47	45
U Q	49	48	56	58	F 58	60	62	69	80	76	77	R 76	71	72	70	J R 67	67	64	60	58	55	56	52	50
L Q	40	F 41	F 40	F 40	42	50	R 49	56	60	60	58	64	64	61	59	60	58	58	54	47	44	46	44	41

JAN. 2015 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION SHOWA-ST.

JAN.2015 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	86	35	37	G	29	G	40	40	42	36	36	33	40	G 27	35	50	G 24	32	39	E B 30	32	29	25	33
2	69	93	56	40	G 30	47	B	G	35	30	G	38	38	G 30	36	G 32	G 27	G	G 18	G	40	41	64	69
3	57	42	62	41	78	B	45	40	G 26	38	E B 56	E B 56	E B 53	G 33	G 23	G	33	33	G	33	40	32	26	34
4	36	36	30	G	36	82	40	40	G	37	G	G 29	G 25	36	35	30	36	31	33	G	107	72	65	45
5	58	46	50	92	37	88	41	41	C	C	C	C	C	C	G	33	37	34	34	32	36	34	41	34
6	101	B	36	34	34	G 26	37	34	35	40	42	35	G	B	B	E B 55	G	34	34	31	43	41	37	36
7	39	36	36	44	B	34	34	34	39	G	G	G	E B 55	33	33	30	G	36	42	36	39	40	33	35
8	33	G	33	36	36	36	36	G 32	G	B	G 24	G	E A 38	B	G	30	G	E B 54	31	39	40	36	35	30
9	36	92	37	70	39	39	G	40	40	G 40	G	E B 40	G 28	36	E B 41	G 33	G 21	E B 58	32	G 21	37	34	35	33
10	31	36	29	G	G 28	G 33	B	40	36	39	43	G 27	37	E B 58	G 31	35	E B 55	G	G	39	39	26	37	30
11	33	36	42	35	41	49	36	36	38	36	E B 55	E B 66	B	B	30	B	B	G	E B 29	G	35	42	44	30
12	38	45	37	37	37	G 27	40	37	35	34	32	34	37	35	38	46	G 28	G	G	39	36	35	41	42
13	42	38	B	B	33	43	46	43	E B 53	34	G 23	31	32	G 32	34	G 27	37	G	32	E B 32	26	36	41	36
14	42	40	68	49	57	43	43	G	G	38	38	G 25	G	G 23	G 24	G 28	E B 54	G	G	31	33	33	33	38
15	32	36	39	34	34	37	32	32	32	G 23	G 34	G 22	G 22	G	35	35	41	G	G	31	31	E B 40	G	43
16	46	42	42	35	35	41	34	44	41	49	G 28	31	36	G 26	40	E B 54	79	117	78	40	35	35	35	40
17	37	39	G	79	G	32	B	B	41	41	G	G	G	G 26	G	E B 37	G 21	E B 30	G 15	G 15	26	34	25	21
18	23	33	46	43	40	40	B	40	36	G	36	27	36	G 22	35	41	34	81	65	32	30	G	22	39
19	66	43	33	74	28	B	35	38	G 23	35	36	43	38	43	38	38	49	33	33	33	35	25	32	30
20	41	45	46	71	34	34	34	43	37	37	37	G 21	G 21	G 21	G	G	G 23	32	G 15	G 15	26	23	21	17
21	22	E B 18	E B 22	29	33	G 17	32	32	33	34	34	38	52	40	59	81	48	34	34	26	36	50	50	50
22	39	71	70	41	51	G 24	45	34	42	35	35	38	G 29	G	G 24	G 24	G	G 27	32	39	46	36	37	40
23	B	41	32	46	46	40	40	44	44	B	B	G 31	G 22	G 22	G	31	E B 35	E B 30	E S 31	31	31	28	28	32
24	34	37	92	E B 32	55	G	37	42	52	E B 56	G	G 26	36	38	36	36	35	32	32	E B 38	32	34	37	37
25	70	54	43	40	G	33	51	34	40	32	G	36	37	59	G	G 22	32	G 22	G 19	31	31	33	G	G 24
26	32	40	100	B	42	42	40	39	49	49	G	G 23	E B 55	B	G	G	38	34	36	38	39	39	44	46
27	36	134	40	31	31	E B 56	49	40	55	30	40	G	G 28	G	G	G 20	33	G	G	29	35	32	32	45
28	58	58	38	86	46	G 29	G	44	G	36	39	B	E B 56	B	B	B	B	33	G 21	G	26	22	G	28
29	34	34	47	50	41	40	G	G 22	39	34	G 24	G 24	33	30	G	G	36	50	34	G	26	33	51	55
30	48	38	31	G	40	40	32	28	46	G	G 29	38	38	G 28	B	34	G	G 23	33	37	G	36	93	35
31	38	38	G 34	G 22	G 22	G 19	G 24	36	42	36	36	36	G	34	36	38	36	G 24	G	26	34	41	41	54
	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	30	29	27	30	30	28	29	29	29	25	28	29	29	31	31	31	31	31	31	31
MED	38	40	38	40	36	36	37	38	38	36	E G 34	E G 31	E G 36	G	G	G	33	31	32	31	35	34	35	36
U Q	57	45	47	50	41	42	41	40	42	G	38	38	38	36	36	38	38	34	34	37	39	40	41	43
L Q	34	36	34	G 32	G 31	G 32	G 32	34	G 33	34	G	G 27	G	G 26	G	G 30	G	G	G	G	31	32	26	30

JAN.2015 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2015 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	14	15	30	13	16	21	13	14	12	13	14	13	13	14	16	16	15	17	30	18	13	12	13
2	56	85	21	13	18	14	62	12	12	12	12	13	13	12	13	13	11	13	15	23	14	14	12	12
3	13	12	13	13	14	B	13	14	18	13	56	56	53	24	16	14	11	13	13	13	13	13	14	12
4	12	13	13	28	22	17	12	11	12	12	24	25	15	15	14	22	14	12	13	12	15	14	13	13
5	14	13	14	13	11	13	12	14	C	C	C	C	C	C	24	14	14	14	12	26	11	12	12	22
6	12	B	19	11	13	13	13	14	13	13	25	12	24	B	B	55	23	25	19	13	12	13	12	12
7	14	13	15	19	B	13	13	13	16	23	15	24	55	20	14	14	14	13	12	12	13	13	13	11
8	14	23	12	12	12	12	12	12	18	B	17	30	19	56	25	23	22	55	16	12	14	14	10	12
9	13	13	24	14	22	13	21	14	15	32	22	40	24	28	41	24	14	58	29	19	13	16	12	13
10	13	12	18	25	25	30	B	20	15	13	17	20	17	58	22	17	55	22	16	13	13	15	13	12
11	12	14	14	17	15	16	23	13	16	16	55	66	B	B	26	B	B	15	29	22	14	14	14	13
12	24	14	14	15	13	15	12	12	14	14	19	16	14	14	14	14	24	19	22	13	12	12	13	15
13	22	12	B	B	13	22	16	15	54	16	15	14	16	16	15	23	13	13	20	32	15	12	13	26
14	12	12	24	13	17	15	14	14	15	13	16	14	17	19	17	20	54	20	14	15	13	14	13	13
15	12	12	13	13	13	12	14	14	13	13	12	18	17	20	15	12	14	14	14	15	26	40	17	12
16	12	12	12	12	12	15	11	11	16	16	13	21	20	19	16	54	30	26	57	22	21	15	13	13
17	13	14	16	28	20	15	B	B	27	17	21	20	23	23	29	36	17	30	11	12	13	13	13	12
18	12	12	16	15	16	14	B	14	14	15	15	16	14	14	14	14	16	16	14	14	15	15	16	13
19	12	13	13	13	15	B	19	14	13	13	15	15	14	16	16	13	13	13	14	13	13	11	13	13
20	22	16	16	13	14	14	13	13	13	12	13	13	14	16	19	17	17	17	13	13	15	15	12	13
21	13	18	22	12	12	12	12	12	15	15	14	14	15	15	20	18	13	13	13	13	13	14	14	13
22	27	12	13	15	13	15	14	14	17	21	18	15	16	16	15	21	20	23	19	25	16	14	12	12
23	B	13	12	14	19	15	15	12	14	B	B	26	20	20	20	13	34	30	31	23	10	15	24	14
24	13	13	13	32	15	25	12	19	14	56	24	24	16	16	30	18	16	28	15	38	12	12	12	12
25	12	13	16	14	22	15	13	12	14	12	11	12	15	13	14	14	14	20	14	12	12	12	13	14
26	12	20	12	B	20	18	11	12	12	13	14	14	55	B	19	27	18	15	13	12	12	14	13	15
27	19	14	13	14	11	56	12	16	13	13	16	20	16	24	20	15	20	27	16	14	12	12	16	12
28	24	15	15	20	16	24	20	13	20	18	24	B	57	B	B	B	B	22	18	15	12	15	15	14
29	12	13	18	18	15	14	14	18	15	23	20	16	16	19	23	23	14	14	13	12	16	18	14	24
30	13	16	19	14	14	14	14	16	23	26	25	20	13	19	B	20	21	19	15	16	16	19	23	21
31	21	20	18	14	17	16	14	23	29	22	25	14	14	14	20	14	14	16	19	15	20	15	17	15
	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	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31
MED	13	13	15	14	15	15	14	14	15	15	17	17	16	19	19	18	16	17	15	14	13	14	13	13
U Q	21	16	18	20	19	18	20	15	17	22	24	24	23	24	25	23	23	25	19	22	15	15	14	14
L Q	12	12	13	13	13	14	12	12	13	13	14	14	14	15	15	14	14	14	13	13	12	13	12	12

JAN. 2015 fmin (0.1MHz)

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2015 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	238	A 246	240	Y	Q 234	E A 246	A	A	210	E A 218	200	196	196	210	198	E A 226	198	216	202	B 208	222	H 198	202	206
2	B	B	A	A	A	236	B	E A 258	200	194	194	194	204	198	208	192	198	212	204	202	192	196	204	198
3	A	A 230	196	200	F 200	B	A	A	A	A	B	B	E Y	220	216	216	204	198	210	196	E A 236	236	198	198
4	218	246	246	R	E A 226	A	A	A 236	224	200	Y	Y	210	208	202	Y	202	A	202	202	202	A	A 198	A
5	A	A	E A 242	A	214	214	A	A	C	C	C	C	C	C	226	210	210	210	210	218	196	204	226	A
6	A	B	A	242	264	258	E A 258	A	196	A	E A 236	236	208	B	B	B	216	236	A 244	244	A	200	A	E A 248
7	258	254	242	E A 262	B	208	216	204	A	A	A	A	B	Y	A	A	E A 256	222	216	194	200	A	246	E A 214
8	238	A	230	230	230	220	216	A 226	A	B	200	A	A 214	B	226	218	218	B	202	226	210	A 234	E A 234	234
9	234	E A 270	A	E A 232	A	288	E A 244	204	A	Y	204	E B 238	E A 230	E Y 254	E B 230	202	202	B	A 220	204	222	E A 256	A 242	A 242
10	A	A	A	A	A	A	B	A	222	A 222	206	196	Y	B	208	208	B	206	216	196	A 230	198	A 246	A
11	218	234	276	A 222	200	A	A 288	A 262	A 220	206	B	B	B	B	214	B	B	204	204	230	240	E A 242	E A 256	256
12	A	A	214	A	224	E A 302	A 268	220	214	214	204	E A 214	196	196	196	E A 278	218	206	E A 228	228	194	198	226	240
13	A	E A 270	B	B	242	A	A	A	B	204	204	200	200	200	200	A	224	224	216	E B 246	196	240	240	A
14	Q 268	268	A	226	A	228	A 250	196	206	218	202	192	192	194	192	A 208	B 208	A	208	212	212	212	204	A 246
15	246	232	232	232	E A 284	236	242	218	204	230	212	200	E Y 256	208	230	202	202	202	234	234	E B 230	B	E A 246	A 202
16	Q 270	A 270	A	214	214	220	226	E A 276	A	206	E A 226	A	A	A	196	B	A	A	B	A	228	226	224	A
17	236	236	A	A	A	A 232	B	B	A	214	198	198	194	202	Y	210	210	202	210	210	204	220	A	A 216
18	202	264	A	A	218	A	B	E A 250	208	198	230	200	A 210	202	202	202	202	A	202	220	A 220	E A 220	A 214	242
19	A	A	198	216	216	B	A	A	200	110	198	106	A 220	204	200	206	A	206	206	206	214	218	202	268
20	A	A	A	A	204	226	220	192	182	182	E A 240	E A 228	200	200	214	206	206	206	206	202	220	220	220	A 194
21	214	296	262	252	252	242	204	204	194	222	202	234	212	204	208	A	A	226	E A 242	E A 242	A	A	A	A
22	A	A	230	A	A	A	A	A 230	A	A	A 218	200	200	200	212	212	212	212	226	E A 244	E A 246	Q 228	220	A 228
23	B	A	A	A	A	A	A	A	A	B	B	A	208	208	204	194	218	204	224	224	240	194	A	A
24	A 254	E A 264	A 240	E B 240	E A 254	210	E A 254	A	A	B	210	198	198	202	A	202	212	A 218	218	B	208	236	236	236
25	236	A	A	A	214	A	E A 276	A	220	202	200	200	232	A	210	200	200	214	206	214	A 214	A 262	234	Q 258
26	E A 290	206	A	B	A	A	212	E A 232	A	A	192	210	B	B	252	E A 244	A 224	218	218	264	E A 264	224	A	A
27	A	198	242	248	E A 286	E B 238	A	A	A	A	A	Y	238	222	212	212	212	E A 280	214	206	210	202	208	A
28	A	A	202	A	A	A	A	A	A	A	A	B	B	B	B	B	B	218	218	218	Q 230	230	242	Q 242
29	238	A	A	A	A	A	A	E A 230	A	208	200	200	A	212	212	A	212	A	212	212	212	258	A	A
30	A	A	306	Q 244	A	E A 264	220	216	A	A	A	A	E A 236	216	B	216	216	214	218	226	206	A	A	E A 262
31	A	A	A	198	A	Q 242	E A 218	A	A	Y	Y	218	214	202	E A 218	212	204	210	210	202	198	E A 270	270	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	16	16	16	15	18	18	16	17	14	17	21	20	22	21	25	22	25	24	30	29	29	26	24	20
MED	238	242	238	229	220	230	226	U 215	207	206	202	200	206	203	209	208	210	212	212	212	212	220	223	234
U Q	256	A 269	244	244	E A 252	E A 246	E A 256	E A 243	220	218	A 215	216	220	211	217	216	217	218	218	229	230	A 236	A 242	247
L Q	226	233	222	216	214	220	217	204	200	199	200	197	200	200	201	202	202	206	206	203	203	202	206	210

JAN. 2015 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB.2015 fxI (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	A	R	O X 72	B	62	O X 50	R	O X 63	67	X 62	X 63	X 69	X 70	X 66	X 64	O X 62	X 60	X 60	X 53	X 48	R	45	X 49
2	B	A	R	O X 46	59	B	R	X 42	R	R	65	B	B	O X 48	X 58	B	B	O X 47	O X 49	B	O X 47	O X 47	A	O X 44
3	R	B	O X 47	B	B	B	R	B	B	R	B	B	B	B	B	B	O X 67	X 63	X 59	O X 52	O X 53	O X 46	X 42	X 44
4	50	B	R	B	B	R	R	B	X 61	V 70	X 75	X 75	O X 75	X 77	X 77	X 73	X 76	X 70	B	X 66	X 58	X 50	X 52	C
5	C	C	C	C	C	C	C	C	B	X 66	X 74	X 74	X 74	X 74	O X 72	X 72	X 74	X 70	X 57	O X 44	O X 44	X 51	R	X 44
6	44	69	X 57	X 55	O X 50	66	X 65	75	X 83	X 83	X 87	83	82	X 83	X 78	X 70	X 71	X 68	X 68	X 65	X 64	X 61	X 58	X 48
7	49	52	58	72	67	71	80	X 90	O X 91	O X 91	O X 99	B	B	B	80	81	O X 76	O X 74	X 67	X 64	X 59	O X 61	X 48	O X 47
8	O X 47	O X 49	52	X 48	65	64	66	X 60	B	B	O X 53	O X 61	B	B	O X 84	X 80	X 78	X 76	X 76	X 72	58	X 48	X 42	X 45
9	R	O X 45	O X 48	X 50	B	R	X 60	72	X 82	X 80	X 82	X 84	X 85	X 90	X 88	X 92	X 87	X 84	X 74	X 74	X 76	X 62	X 54	X 41
10	R	55	O X 49	B	B	72	88	X 70	R	R	X 66	X 69	X 72	X 72	O X 67	X 71	X 71	X 70	X 70	X 70	70	X 65	37	32
11	R 36	O X 44	O X 62	S	66	77	B	B	X 63	X 72	X 75	X 75	X 75	X 82	X 76	X 76	X 79	X 81	X 80	X 73	X 68	X 63	68	66
12	64	70	70	70	R	70	O X 72	81	X 82	X 92	X 100	X 94	R	X 91	O X 88	X 85	X 77	X 79	X 75	72	X 49	X 45	X 40	R
13	X 40	57	60	X 70	X 70	70	X 77	X 82	X 88	O X 90	O X 106	X 104	X 97	O X 86	X 84	X 84	78	X 80	X 72	72	X 66	65	X 66	70
14	65	58	72	71	71	73	82	78	X 82	90	90	90	X 92	X 88	X 83	X 80	X 78	X 74	X 73	X 67	X 70	70	70	64
15	X 57	66	70	57	70	70	72	80	X 91	104	X 101	X 108	X 107	O X 110	X 103	91	X 80	X 74	X 76	X 74	69	66	70	O X 62
16	S	48	S	44	52	S	X 64	O X 74	X 84	X 81	X 86	X 84	X 80	X 72	X 66	X 64	X 64	X 63	X 62	X 59	X 57	X 58	X 56	S
17	47	71	70	74	70	74	54	82	72	R	R	R	R	66	O X 76	X 80	X 67	X 61	S	S	X 42	96	79	A
18	80	92	A	A	A	S	O X 47	S	A	S	B	B	B	B	R	X 65	X 57	B	B	X 55	X 47	R	R	R
19	78	A	R	R	43	B	R	B	R	R	O X 65	B	B	O X 66	O X 64	O X 64	X 64	O X 64	X 56	X 57	X 51	X 50	X 48	R
20	58	R	S 46	46	54	60	67	B	R	S	67	X 65	X 65	X 75	X 80	X 86	X 81	81	X 71	X 73	X 62	X 57	58	50
21	65	A	A	45	A	57	44	44	A	X 58	X 54	X 58	X 66	X 72	O X 68	O X 68	O X 68	X 68	X 64	X 59	X 56	X 56	41	R
22	R	57	A	A	A	68	R	R	R	R	R	X 64	O X 64	X 66	X 65	X 64	X 65	X 65	X 61	X 59	X 58	X 49	X 31	A
23	A	A	X 49	41	A	B	R	R	R	A	O X 64	R	X 70	B	B	X 70	X 76	71	X 58	47	60	63	76	84
24	48	42	42	A	66	62	B	B	B	B	B	B	B	B	O X 63	R	B	S	X 58	O X 52	52	X 40	40	X 39
25	41	62	53	X 54	60	O X 56	R	71	78	78	O X 76	74	O X 75	X 76	X 77	X 71	X 66	O X 64	X 59	X 57	X 42	R	X 31	31
26	R	O X 35	A	R 38	O X 38	R	O X 53	66	74	X 80	X 84	O X 85	X 87	X 93	X 87	X 81	X 80	X 73	X 66	X 70	X 62	X 56	56	50
27	40	38	38	45	58	S	70	70	X 81	X 82	X 90	O X 90	O X 90	X 96	O X 100	X 88	X 86	X 81	74	X 60	63	X 58	53	42
28	68	A	O X 46	44	X 56	B	R	X 71	X 64	B	B	O X 78	X 80	X 80	X 84	O X 84	X 78	X 76	X 66	X 50	R	R	R	52
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	18	18	19	17	16	17	17	16	16	22	20	19	22	25	25	26	26	25	26	27	24	24	20
MED	50	56	52	50	60	69	66	72	X 82	X 80	X 76	X 76	X 75	X 76	X 77	X 76	X 76	X 70	X 66	X 62	X 58	X 58	52	48
U Q	65	66	62	70	68	72	74	80	X 84	X 90	X 90	X 88	X 87	X 88	X 84	X 84	X 78	X 76	X 74	X 72	X 64	63	62	57
L Q	44	O X 45	47	45	53	62	O X 54	68	X 68	X 71	X 65	X 67	X 70	X 72	X 66	X 69	X 67	X 64	X 59	X 55	X 49	X 50	X 42	43

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2015 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 43	A 38	R 41	66	B 50	F 48	R 44	A 36	R 57	F 55	56	57	63	64	60	58	56	54	54	47	42	R 41	F 36	43
2	B 38	A 38	A 41	R 40	50	B 38	R 38	36	R 38	R 38	R 38	B 38	B 38	R 42	52	B 38	B 38	42	R 43	B 38	R 41	41	A 38	38
3	R 38	B 38	41	B 38	B 38	B 38	R 38	B 38	B 38	R 38	B 38	B 38	B 38	B 38	B 38	B 38	R 61	57	53	U R 46	47	40	36	38
4	F 39	B 38	R 38	B 38	B 38	R 38	R 38	B 38	55	V 64	69	69	R 69	J R 71	71	67	J R 70	64	B 38	60	52	44	46	C 38
5	C 38	C 38	C 38	C 38	C 38	C 38	C 38	C 38	B 38	60	68	68	68	68	R 66	66	68	64	51	38	38	45	R 38	38
6	F 31	R 40	51	49	44	F 54	59	69	77	77	81	77	J R 76	77	72	64	65	62	62	59	58	55	52	42
7	43	F 42	F 43	F 56	F 56	F 56	F 68	J R 84	R 85	U R 85	93	B 38	B 38	B 38	F 67	F 71	70	68	61	R 58	53	R 55	42	41
8	R 41	43	F 26	42	A 38	F 55	F 51	54	B 38	B 38	U R 47	R 55	B 38	B 38	78	74	72	70	70	66	F 48	42	36	39
9	A 38	R 39	R 42	44	B 38	R 38	54	66	76	74	76	78	J R 79	84	82	86	81	78	68	68	70	56	48	35
10	R 38	F 42	43	B 38	B 38	F 60	F 74	64	R 38	R 38	60	63	66	66	R 61	65	65	64	64	64	64	59	F 26	26
11	30	38	56	S 38	F 53	F 66	B 38	B 38	57	66	69	69	69	76	70	70	73	75	74	67	62	57	F 55	F 54
12	F 52	F 56	F 59	F 61	R 38	F 60	66	F 65	76	86	94	88	U R 89	J R 85	82	79	71	73	69	F 58	43	39	34	A 38
13	34	F 44	F 48	64	64	F 59	71	76	82	R 84	R 100	J R 98	J R 91	80	78	78	72	74	66	66	60	61	60	F 60
14	F 46	F 39	F 58	F 56	F 56	F 58	F 67	F 67	76	F 74	F 79	F 77	J R 86	82	77	74	72	68	67	61	64	F 60	F 58	F 52
15	J R 51	F 53	F 34	F 37	F 42	F 58	F 58	F 65	85	F 92	92	102	101	104	97	F 78	74	68	70	68	F 56	F 56	S 38	56
16	U S 32	F 36	S 38	F 33	F 42	S 38	58	68	78	J R 75	80	78	74	66	60	58	58	57	56	53	51	52	J R 50	S 38
17	F 24	F 24	F 24	F 21	F 44	59	F 59	F 30	F 57	R 38	R 38	R 38	R 38	F 57	70	74	61	55	S 38	43	36	A 38	R 38	A 38
18	A 38	A 38	A 38	A 38	A 38	S 38	41	S 38	A 38	S 38	B 38	B 38	B 38	B 38	R 38	R 59	51	B 38	B 38	48	41	R 38	R 38	R 38
19	A 38	A 38	A 38	R 38	F 29	B 38	R 38	B 38	R 38	R 38	R 59	B 38	B 38	60	R 58	58	58	R 58	50	51	45	44	42	R 38
20	R 34	A 38	40	F 38	F 42	F 44	F 55	B 38	R 38	S 38	F 54	59	59	69	74	80	75	F 70	65	67	56	51	F 46	F 25
21	F 18	A 38	A 38	F 24	A 38	F 43	F 33	A 38	A 38	52	R 48	52	60	66	62	R 62	62	62	58	J R 53	J R 50	J R 50	F 30	A 38
22	A 38	F 41	A 38	A 38	A 38	S 42	S 38	S 38	R 38	R 38	R 38	58	R 58	60	59	58	59	59	J R 55	53	52	43	25	A 38
23	A 38	A 38	43	F 23	A 38	B 38	R 38	R 38	R 38	A 38	58	R 38	64	B 38	B 38	64	70	F 61	J R 52	F 31	F 38	F 29	F 56	A 38
24	F 27	F 32	F 26	A 38	F 50	F 48	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	R 57	R 38	B 38	S 38	J R 53	U S 46	F 44	34	F 24	33
25	A 38	A 38	F 24	48	F 44	R 50	R 38	F 61	F 68	F 65	R 70	F 64	69	70	71	65	60	58	53	51	36	A 38	25	F 23
26	A 38	29	A 38	R 32	R 32	R 226	R 47	F 55	F 63	74	78	79	81	87	81	75	J R 74	67	60	64	56	J R 51	F 43	F 39
27	F 23	F 23	F 24	F 22	F 43	S 38	F 58	F 58	75	R 76	84	R 84	R 84	J R 90	94	82	80	J R 75	F 66	54	F 49	52	F 40	F 24
28	F 50	A 38	R 40	F 30	50	B 38	R 38	J R 65	58	B 38	B 38	72	J R 74	J R 74	78	78	J R 72	70	60	44	A 38	A 38	A 38	R 30
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	16	16	18	19	16	17	17	16	16	16	21	20	20	22	25	25	26	26	25	27	26	23	22	19
MED	F 34	F 40	F 42	F 40	F 44	F 56	F 58	65	76	74	70	70	72	70	71	70	70	64	60	54	50	51	42	38
U Q	F 44	F 42	F 48	F 56	F 52	F 60	F 66	68	78	80	82	78	R 82	82	78	78	72	70	66	64	56	56	50	F 43
L Q	F 28	F 34	F 26	F 30	F 42	F 48	49	F 56	58	64	58	61	65	66	60	63	61	58	53	47	43	42	34	F 30

FEB. 2015 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB.2015 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 177	49	36	70	B 34	35	50	46	41	G 35	G 40	G 21	36	46	36	36	G 21	G	37	34	37	38	31	40
2	48	42	37	34	B 42	31	35	35	40	B	B	A	G	B	B	G	26	B 42	42	47	38			
3	B 32	43	B	B	B 34	B	B	34	B	B	B	B	B	B	B	B	E B 53	G	27	E B 31	25	25	28	23
4	B 72	33	B	B	B 36	32	B	39	36	G 24	G 22	G 28	G	32	G 28	E B 32	B	28	34	24	26	C		
5	C	C	C	C	C	C	C	C	B	G 22	23	G	G	G	48	G	G	S	S	39	E S 30	48	41	40
6	43	40	46	46	E B 46	36	40	32	38	E B 54	G	51	30	32	33	27	33	33	G 25	34	30	38	20	16
7	24	30	41	31	31	31	34	35	39	G 35		B	B	B	E B 55	G 33	E B 39	B	26	34	41	48	40	43
8	43	38	33	66	42	41	35	36	B 37	B		G	B	B	E B 61	E B 60	G	G	G 22	22	36	40	41	41
9	42	70	K 29	35	B	34	40	34	G 17	G 24	G 18	G	G	G 29	40	G	G 34	34	27	E B 31	E B 25	G	16	K 19
10	35	37	35	B	B	G	32	G	41	43	38	G 26	G	G 26	32	G 18	G 24	G	40	S 24	G	G	30	32
11	90	45	49	35	G 19	E S 30	B	B	32	G 24	G 24	31	G 23	G 20	G 20	31	G	G 22	G 18	G	36	G	22	18
12	32	35	32	32	43	40	56	37	27	G 34	G 24	G 23	G 25	G	G	33	35	42	59	32	38	38	38	42
13	42	K 31	42	60	G	38	32	32	G	35	43	43	G	41	43	36	34	36	33	30	G	G	E B 13	E B 13
14	34	35	35	68	G	34	42	42	49	G 22	G 18	37	37	G 27	G 33	42	52	36	33	31	27	33	44	62
15	71	36	34	70	22	G 25	42	E S 26	47	38	33	E B 56	E B 55	36	36	A	31	34	28	32	27	G	38	40
16	44	43	44	34	20	G 17	S 26	S	34	S 36	32	G 16	68	58	55	G	31	40	36	34	28	30	36	38
17	33	42	44	51	G	44	44	59	45	28	44	G 28	G 24	G	E S 52	E B 29	E S 52	36	70	E S 30	40	71	27	46
18	70	46	83	102	43	S 27	36	44	44	G 20	B	B	B	B	32	E B 33	G	B	B	31	31	38	39	39
19	38	59	37	36	25	B	24	B	37	47	36	B	B	E B 38	E B 33	E B 33	G	E B 40	31	31	G	G	30	39
20	41	43	44	33	33	S	35	B	46	40	G	E B 36	G	34	33	E B 34	28	E B 29	E B 52	E B 27	27	22	42	31
21	58	72	109	66	44	41	34	G	49	32	32	37	39	S	E S 33	30	30	E B 26	S	36	23	24	19	34
22	39	83	105	70	44	44	S 24	S	31	42	37	E S 31	G	G 21	S 26	G 23	34	G 22	G 18	G 18	29	G	35	35
23	38	71	78	53	72	B	42	42	37	43	40	34	E B 38	B	B	E B 56	G	41	44	G	41	41	50	93
24	39	46	44	100	84	G	B	B	B	B	B	B	B	B	G	E B 31	B	E S 31	28	G	25	G 18	21	34
25	38	60	70	35	32	G	37	41	41	42	Y	G 26	Y	E B 34	Y	E B 32	E B 30	E B 30	G	G	E B 22	40	K 16	33
26	31	34	78	32	35	43	44	36	G	G	G 22	E B 38	Y	E B 34	30	G 26	32	S	E B 36	E B 25	36	36	23	16
27	34	25	31	25	32	S	G	G	E B 29	E S	E S 34	E S 32	E B 34	32	37	37	34	55	33	31	20	E B 15	16	16
28	44	49	42	41	41	B	32	E B 67	42	B	B	E B 54	E B 55	E B 54	E B 53	E S 30	30	G	26	24	46	46	48	66
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	26	25	27	24	22	20	25	19	24	24	23	22	19	20	25	25	26	24	24	27	28	28	28	27
MED	40	43	42	44	33	34	35	36	38	E G 34	32	29	G	E G 32	33	32	G	31	29	31	30	32	30	38
U Q	44	54	49	67	43	40	42	42	43	41	37	37	E B 38	37	E 46	35	34	36	36	32	36	40	40	41
L Q	34	36	35	34	G 22	G	32	G 31	32	G 30	G 24	G 26	G	G	32	G 30	31	G	G 26	G 24	25	G	22	23

FEB.2015 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2015 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	18	18	56	B	16	14	14	19	16	12	14	14	14	15	14	16	13	13	13	13	20	14	14
2	54	16	12	13	15	B	15	13	27	18	13	B	B	20	21	B	B	24	20	B	14	11	14	13
3	26	B	17	B	B	B	20	B	B	20	B	B	B	B	B	B	53	20	14	31	19	13	12	12
4	14	B	25	B	B	30	24	B	16	14	18	18	22	26	29	22	18	32	B	22	14	15	12	C
5	C	C	C	C	C	C	C	C	B	18	20	20	13	14	48	21	18	16	14	13	30	14	18	12
6	13	12	13	14	17	13	16	13	13	54	17	14	28	21	19	19	15	14	14	13	14	12	14	12
7	12	13	11	12	12	12	14	16	16	14	27	B	B	B	55	28	39	38	18	14	14	15	13	13
8	12	12	12	14	17	14	13	18	B	B	17	21	B	B	61	60	26	22	15	18	14	12	12	12
9	18	15	16	22	B	24	15	13	14	12	14	16	16	18	18	15	12	12	12	31	25	14	13	12
10	21	13	24	B	B	14	14	26	21	16	15	20	17	16	16	15	13	14	14	12	11	13	12	12
11	12	12	15	19	15	E S 30	B	B	14	15	14	14	15	14	14	13	13	14	16	15	18	15	12	12
12	12	12	14	14	17	14	15	13	12	14	14	20	21	20	22	16	13	12	13	13	16	12	12	20
13	12	16	14	26	17	13	13	11	13	15	14	13	16	14	13	14	13	13	13	12	12	12	14	13
14	12	12	12	12	14	12	12	13	13	14	13	14	13	15	17	14	13	14	13	12	12	12	12	11
15	12	12	12	12	14	17	14	26	14	14	20	56	55	29	32	21	14	12	15	20	16	15	13	12
16	12	12	14	12	12	12	12	12	12	13	15	13	13	10	16	15	13	14	12	11	13	12	12	12
17	11	12	11	12	12	A 15	13	13	13	12	16	20	23	18	E S 51	29	E S 52	21	18	E S 30	12	28	15	14
18	18	14	14	20	14	13	14	14	13	13	B	B	B	B	15	33	19	B	B	12	12	12	12	13
19	18	16	20	24	12	B	18	B	18	20	18	B	B	38	33	33	18	40	12	12	16	17	12	11
20	13	15	14	14	12	12	16	B	18	22	14	36	19	19	22	34	16	29	52	27	20	14	12	12
21	10	12	12	12	16	13	11	14	16	14	14	14	14	26	E S 33	18	26	26	16	15	14	12	12	12
22	12	18	16	12	14	16	14	14	14	14	28	E S 31	16	14	14	18	14	14	13	14	13	12	13	12
23	12	12	13	13	47	B	24	23	20	16	17	19	38	B	B	56	14	13	25	14	12	13	13	14
24	12	14	14	11	16	13	B	B	B	B	B	B	B	B	20	31	B	E S 31	16	16	13	12	12	12
25	12	19	13	14	12	19	22	17	16	14	28	21	28	34	26	32	29	29	19	14	22	14	12	12
26	12	13	17	20	14	18	13	13	13	14	16	38	26	34	25	20	23	18	36	25	17	13	14	12
27	12	12	12	12	12	14	14	14	29	E S 30	34	E S 32	34	18	17	14	14	11	12	12	13	15	12	12
28	15	13	13	14	19	B	27	67	18	B	B	54	55	54	53	E S 30	14	18	14	15	16	17	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	27	27	27	27	27	27	27	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27
MED	12	13	14	14	15	14	14	14	16	14	17	20	24	20	21	20	16	16	14	14	14	13	12	12
U Q	18	16	16	22	B 19	B 30	20	B 67	20	20	28	B 55	B	B 46	40	32	26	28	18	21	16	15	14	13
L Q	12	12	12	12	12	13	13	13	13	14	14	15	16	16	16	15	14	14	13	12	13	12	12	12

FEB. 2015 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB.2015 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 244	A 230	A	B	B	A	A	A	A	192	198	210	184	A 230	226	202	212	206	206	206	A	A	194	E A 244
2	B	A	A	A 204		B	A	218	A	A	A	B	B	220	202	B	B	A	E A 240	B	240	A	A	E A 314
3	A	B	A	B	B	B	A	B	B	A	B	B	B	B	B	B	B	208	216	244	234	202	202	A
4	A	B	A	B	B	A	A	B	208	208	210	200	200	210	210	202	210	B 228	B	228	A 214	240		C
5	C	C	C	C	C	C	C	C	B	228	202	196	204	210	E B 316	214	214	206	212	S	E S 304	234	A	234
6	208	A	A	A 226	A	232	232	224	216	B	210	210	208	200	218	Y	208	214	210	224	224	226	262	256
7	264	278	230	Q 298	Q 308	264	254	214	214	206	214	B	B	B	B	232	E B 252	232	240	240	E A 260	A	228	282
8	A	240	Q 258	260	A	228	242	206	B	B	A	206	B	B	B	B	220	220	E A 230	234	270	228	228	248
9	A	A 216	A	A	B	A	A	268	218	210	206	E A 228	220	202	202	202	210	198	198	232	212	212	228	238
10	A	A	A	B	B	A	226	A	A	A	208	196	208	206	212	214	216	210	216	230	228	202	210	222
11	A	222	A	A	A	282	B	B	216	216	198	208	212	212	212	194	218	218	218	218	228	228	Q 228	Q 228
12	Q 260	Q 260	260	A	A	198	A	198	204	204	200	212	198	214	214	200	200	A 222	E A 298	226	282	E A 276	A	A
13	A 266	A 358	A	E A 266	A	A	236	212	E S 214	206	206	218	204	198	216	208	210	204	204	204	206	Q 224	Q 224	Q 214
14	214	242	A	A	A	E A 286	234	220	A	246	202	194	214	194	220	220	206	206	Q 216	196	216	Q 220	A 218	264
15	A	Q 272	Q 294	A	190	A	202	S	230	228	206	B	B	Y	Y	A 226	214	194	224	244	E A 252	222	A	A
16	222	A	A	A	A	196	238	212	212	S 212	206	194	A	A	A	212	200	214	214	E A 224	224	E A 224	222	232
17	A	A	A	Q 234	202	A	A	196	228	A	A	A	A	240	S	224	S	E A 260	A	S	A	A	A	A
18	A	A	A	A	A	S	S	A	A	204	B	B	B	B	222	E B 228	206	B	B	222	240	A	A	A
19	A	A	A	A	A 240	B	A	B	A	A	A	B	B	B 232	216	216	216	304	198	204	E A 216	A	236	A
20	A	A	S	S	S	236	S	B	E A 262	B	204	204	208	212	222	236	212	228	E B 278	B	E A 226	Q 226	Q 232	282
21	Q	A	A	A	A	A 236		A	A	200	200	212	212	S	212	212	212	E B 220	E A 210	216	E A 226	226	258	A
22	A	A	A	A	A	A	A	S	A	A	A	226	194	H 180	216	204	220	E A 240	214	200	E A 228	206	A	A
23	A	A		A	B	B	R	A	A	A	A	S	B	B	B	B	230	240	A	198	F	A	A	A
24	E A 244	A 230	A	A	214	Q 232	B	B	B	B	B	B	B	B	240	S 240	B	S 242	232	A	Q 234	234	324	A
25	A	A	194	A	A	A	A	E A 254	254	A	Y	252	Y	222	E Y 222	E B 220	220	228	218	204	B	A	370	E A 350
26	A	220	A	A	A	A	208	208	208	208	204	B	212	234	210	210	210	222	238	230	E B 226	Q 226	Q 238	Q 258
27	206	254	A 284	246	A	S	224	230	218	S 214	E S 228	S 208	208	196	196	204	192	202	Q 226	202	200	Q 212	Q 212	Q 234
28	242	A 222		A	A	B	A	B	A	B	B	B	B	B	B	222	212	212	206	276	A	A	A	A
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	9	11	7	6	6	9	11	13	14	15	17	17	15	18	20	23	24	26	24	23	22	19	19	16
MED	232	242	258	246	209	232	234	213	216	208	205	208	208	211	214	213	212	216	214	224	227	224	228	241
U Q	262	272	284	266	240	273	238	227	228	216	209	215	212	222	222	224	217	228	E 231	232	240	228	240	273
L Q	211	222	222	234	202	213	224	207	212	204	201	198	200	200	211	204	209	206	210	204	224	212	218	233

FEB.2015 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR.2015 fxI (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT.69°00.4'S LON.039°35.4'E KSWEEP 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	87	A	51	71	A	57	59	R	B	B	O X 45	B	B	R	R	R	X 58	B	O X 51	X 54	X 46	X 42	X 29	A
2	A	A	A	X 47	R	B	B	B	O X 40	A	B	B	B	B	B	B	R	B	X 50	O X 44	X 46	39	R	R
3	S	A	A	34	R	B	B	O X 47	B	B	B	B	B	B	O X 68	B	B	O X 73	X 71	X 63	O X 51	X 40	O X 33	A
4	A	A	A	A	B	B	B	O X 69	X 72	O X 75	X 83	X 83	X 81	X 76	B	O X 74	X 74	O X 68	O X 61	X 61	X 58	X 55	49	38
5	57	45	A	A	A	X 47	X 49	X 57	X 68	X 74	X 76	X 82	X 88	O X 89	O X 93	X 105	99	X 84	X 73	X 73	63	40	32	S
6	A	A	43	44	69	O X 60	R	X 65	X 66	70	B	B	77	B	X 75	X 73	X 73	O X 75	X 71	67	58	X 47	38	A
7	54	X 44	58	X 43	56	57	R	B	B	B	B	B	O X 73	X 75	O X 72	O X 75	X 72	X 71	O X 62	O X 52	R	X 39	A	A
8	A	A	X 43	S	B	R	R	X 59	X 67	X 76	B	X 80	O X 86	O X 85	X 82	X 85	X 85	X 59	B	B	X 32	R	R	O X 27
9	A	A	Y	X 36	A	B	R	B	67	X 70	X 70	X 70	X 73	X 77	X 79	X 76	X 78	X 72	X 67	X 62	X 54	X 53	X 47	X 44
10	59	67	53	77	56	R	X 58	72	X 76	X 81	X 82	X 94	X 103	Y	O X 98	X 97	X 88	86	X 70	68	65	O X 48	X 45	45
11	45	50	44	44	45	56	X 62	X 58	X 69	X 70	X 83	90	O X 108	X 111	X 108	X 91	X 102	X 93	X 82	O X 57	X 39	A	A	A
12	O X 43	R	O X 38	42	41	R	O X 63	B	B	B	X 67	70	X 73	X 75	B	O X 85	R	O X 72	X 67	X 59	O X 46	X 31	35	40
13	42	35	43	69	44	O X 36	65	X 58	X 68	X 72	O X 76	X 81	X 87	X 94	X 87	X 82	X 81	X 88	X 83	X 74	X 49	41	44	41
14	50	51	A	A	A	55	70	70	B	B	B	74	79	X 86	X 97	86	80	X 87	X 83	73	64	X 47	47	44
15	38	X 42	51	A	41	A	O X 46	S	A	R	B	B	O X 74	X 81	X 81	X 87	X 83	X 90	X 79	X 72	X 61	X 34	R	X 36
16	39	43	R	56	B	B	B	B	B	R	B	B	X 68	X 75	X 74	X 74	X 72	X 65	X 65	X 63	X 58	47	R 36	B
17	O X 46	S	40	B	B	B	B	B	O X 49	O X 48	B	B	B	B	O X 74	R	B	B	B	S	S	B	A	R
18	R	A	70	B	R	B	R	B	B	B	R	S	B	B	B	B	S	B	73	B	R	A	A	A
19	X 39	A	B	B	B	B	40	B	B	B	B	B	B	B	B	X 72	B	O X 47	S	39	O X 44	33	A	43
20	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 66	X 65	B	O X 49	O X 44	O X 38	A	A
21	A	A	R	B	B	B	B	B	B	B	B	B	B	B	X 63	B	X 64	B	B	O X 45	O X 37	X 28	O X 24	A
22	R	A	A	A	43	44	44	B	B	R	B	B	B	B	B	X 71	X 70	X 73	68	64	X 39	X 30	R	A
23	R	A	42	A	54	40	B	B	B	B	X 56	O X 56	B	B	O X 67	O X 83	X 82	X 80	X 57	O X 46	X 42	32	R	R
24	43	A	43	43	B	A	X 39	54	X 56	X 66	75	X 76	X 82	X 83	X 82	X 88	X 94	X 87	X 68	X 39	O X 33	R	R	A
25	A	A	62	A	A	R	A	R	R	X 68	B	O X 77	X 86	O X 86	B	B	X 101	O X 87	X 70	63	X 48	40	55	64
26	45	O X 44	A	X 35	A	A	A	X 57	X 56	O X 65	X 72	B	O X 98	X 91	X 95	O X 92	X 91	88	X 64	X 58	X 49	32	R	A
27	R	R	A	B	B	S	S	B	R	B	B	B	O X 72	O X 73	X 76	X 83	X 79	X 77	O X 49	R	X 37	X 32	A	A
28	A	A	A	A	R	O X 29	54	R	X 63	S	O X 63	B	O X 72	76	83	O X 74	X 74	X 70	X 66	X 64	44	X 40	A
29	A	89	A	71	R	A	A	A	B	B	B	B	B	O X 69	O X 74	X 81	X 75	X 70	X 66	X 58	52	R	O X 47	R
30	R	68	A	A	B	52	R	R	R	S	O X 53	X 62	X 72	X 80	X 84	X 87	X 77	X 75	X 68	S	O X 47	S	O X 22	S
31	A	S	A	A	X 40	45	42	X 47	S	X 62	68	X 74	X 86	X 88	X 100	X 88	X 94	X 90	X 80	X 58	X 47	36	X 41	O X 43
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	14	11	14	14	10	12	13	12	13	13	14	14	20	19	22	23	25	26	26	26	27	24	17	11
MED	45	45	44	44	44	50	54	X 58	X 67	X 70	X 71	X 76	X 80	X 81	X 82	X 83	X 79	X 75	X 68	X 60	X 47	X 40	40	43
U Q	54	67	53	69	56	56	62	67	X 68	X 74	X 76	X 82	X 86	X 88	X 93	X 88	X 90	X 87	X 73	X 64	58	X 46	47	44
L Q	42	43	43	42	41	42	43	X 56	X 56	X 66	O X 63	X 70	X 73	X 75	O X 74	X 74	X 72	X 70	O X 64	O X 52	X 42	X 32	O X 32	X 38

MAR.2015 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2015 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 37	A	F 37	F 19	A	R 38	F 34	A	B	B	R 39	B	B	R	R	R	J R 52	B	R 45	48	40	36	23	A
2	A	A	A	41	R	B	B	B	R 34	A	B	B	B	B	B	B	R	B	44	R 38	40	F 28	A	R
3	S	A	A	F 22	R	B	B	R 41	B	B	B	B	B	B	R 62	B	B	67	65	57	R 45	34	R 27	A
4	A	A	A	A	B	B	B	R 62	66	69	77	77	J R 75	70	B	U R 68	68	62	55	55	52	49	F 39	F 25
5	A	F 30	A	A	A	41	43	51	62	68	J R 70	76	82	R 83	87	99	F 88	78	67	F 67	F 52	F 24	F 24	S
6	A	A	F 28	F 28	F 40	U S 54	R	59	60	F 59	B	B	F 64	B	R 69	67	67	69	65	61	F 48	41	F 27	A
7	F 22	38	F 46	37	F 43	F 40	R	B	B	B	B	B	R 67	69	R 66	R 69	66	65	R 56	S 46	R	33	A	A
8	A	A	37	R	B	R	R	53	61	70	B	74	80	79	76	79	79	J R 53	B	B	26	A	A	21
9	A	A	Y	30	A	B	A	B	F 54	64	64	64	67	71	73	70	72	66	61	56	48	47	41	38
10	F 33	42	F 26	F 27	F 25	A	52	F 59	70	75	76	88	J R 97	Y 82	R 92	91	J R 82	Z 80	64	F 58	F 55	S 42	39	F 32
11	F 37	F 38	F 33	F 34	F 22	F 32	56	J S 52	63	64	77	J R 84	102	105	102	85	J R 96	87	76	51	33	A	A	A
12	R 37	R	R 32	F 29	F 30	R	R 57	B	B	B	61	F 59	67	69	B	79	U R 79	66	61	53	40	25	F 24	F 30
13	F 29	F 24	R 30	F 23	F 24	30	F 46	52	62	66	70	J R 75	81	88	81	76	75	82	77	68	43	F 31	F 30	F 29
14	F 24	F 30	A	A	A	F 40	F 57	56	B	B	B	F 62	F 69	80	91	80	F 70	81	77	F 64	F 50	41	F 30	F 24
15	F 20	36	F 23	A	F 26	A	39	S	A	R	B	B	68	75	75	81	77	J R 84	73	66	55	28	R	30
16	F 26	F 28	R	F 36	B	B	B	B	B	R	B	B	62	69	68	68	66	59	59	57	52	F 38	S 30	B
17	R 40	S 42	F 31	B	B	B	B	B	R 43	42	B	B	B	B	R 68	R	B	B	B	A	S	B	A	R
18	A	A	F 35	B	R	B	R	B	B	B	R	S	B	B	B	B	S	B	S	B	R	A	A	A
19	33	A	B	B	B	B	F 30	B	B	B	B	B	B	B	B	66	B	S 41	S 42	32	R 38	S 25	A	F 26
20	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	60	59	B	R 43	R 38	R 32	A	A
21	A	A	R	B	B	B	B	B	B	B	B	B	B	B	J R 57	B	58	B	B	39	31	22	R 18	A
22	R	A	A	A	A	S	F 35	B	B	R	B	B	B	B	B	65	64	67	F 58	F 53	33	24	A	A
23	R	A	A	A	A	F 24	B	B	B	B	50	R 50	B	B	R 61	77	76	R 74	J S 51	R 40	36	F 23	R	A
24	F 24	A	F 31	F 28	B	A	33	F 43	50	60	Z 69	70	76	77	76	82	88	81	62	33	R 27	R	A	A
25	A	A	A	A	A	R	A	R	R	62	B	70	80	R 80	B	B	J R 95	81	64	F 48	42	F 31	R	R 57
26	F 33	38	A	29	A	A	A	J R 51	J R 50	59	66	B	R 92	J R 85	89	R 86	85	82	58	52	43	F 22	R	A
27	A	A	A	B	B	S	S	B	R	B	B	B	66	R 67	J R 70	77	73	71	43	R 43	31	26	A	A
28	A	A	A	A	A	23	F 41	R	57	U S 46	R 57	B	R 66	F 66	Z 76	R 68	68	J R 64	J R 60	58		38	F 23	A
29	A	A	A	A	A	A	A	A	B	B	B	B	B	R 63	68	75	69	64	R 60	52	F 43	A	R 41	A
30	A	F 24	A	A	B	27	A	R	R	S	U S 47	56	66	74	78	81	71	69	62	S	41	S	R 16	S
31	A	S	A	A	J S 34	F 33	F 25	41	S 43	56	F 57	68	80	82	94	82	88	84	74	52	41	F 22	J R 35	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	13	11	12	13	8	11	13	12	14	14	14	14	20	20	22	23	26	26	26	27	27	24	16	11
MED	F 33	F 36	F 32	F 29	F 28	33	F 41	52	58	63	65	70	72	76	76	77	72	69	61	52	41	31	28	F 30
U Q	37	38	F 36	35	F 37	40	54	58	62	68	70	76	80	82	87	82	82	81	65	58	F 48	38	37	37
L Q	F 24	F 28	F 29	F 25	F 24	27	F 34	47	50	59	57	62	66	69	R 68	68	67	64	56	R 43	36	F 24	24	F 25

IONOSPHERIC DATA STATION SHOWA-ST.

MAR.2015 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	44	66	35	35	56	40	26	47	B	B	40	B	B	G	E B 32	29	E B 30	B	30	41	24	23	25	38
2	46	60	52	52	32	B	B	B	32	58	B	B	B	B	B	B	33	B	33	E B 26	32	29	26	27
3	S 24	39	42	36	37	B	B	38	B	B	B	B	B	B	E S 32	B	B	E B 59	E B 55	34	56	32	35	43
4	37	60	70	39	B	B	B	35	33	34	S 23	G	29	G	B	E B 56	38	E B 34	E B 30	E B 28	E B 23	E B 18	21	33
5	35	90	44	51	46	42	G 20	G	G	G 19	G 16	G	33	35	38	42	32	G 23	25	22	32	E B 14	32	27
6	42	90	34	29	34	42	42	44	43	37	B	B	E B 35	B	E B 55	E S 53	E S 31	E S 31	E B 24	G	G 22	31	33	37
7	71	43	44	42	40	31	28	B	B	B	B	B	E B 56	E B 53	E B 54	E B 52	E B 29	29	E S 28	33	39	S 22	43	93
8	54	42	32	35	B	G	G 32	43	40	E S 30	B	E B 34	E S 55	E B 54	E B 32	S	E B 34	29	B	B	G	36	30	32
9	34	39	K 26	31	47	B	40	B	32	G	G	35	31	28	G 24	G 23	G 16	G 20	22	17	E B 16	E B 12	E B 13	E B 13
10	18	K 36	32	35	32	39	40	40	34	E B 35	E B 59	E B 54	32	G 25	E B 54	E B 30	E B 56	E B 29	E B 36	E S 31	E B 21	E B 19	E B 13	E B 12
11	E B 12	E B 12	32	21	E B 13	28	G	35	42	E S 53	E B 48	E B 39	G	G 24	E B 59	G	G 17	E B 23	21	37	E B 20	44	42	56
12	37	35	K 26	30	69	36	G 29	B	B	B	G 26	G	E B 32	E B 53	B	E B 54	E B 61	E B 49	E B 23	K 29	18	24	K 15	16
13	33	22	36	32	22	24	E B 20	G 18	E B 27	S	E S 30	E S 32	30	39	31	28	G 18	G	E B 39	E B 26	42	34	33	37
14	49	71	90	44	44	36	G	38	B	B	B	G	32	G 25	G	G	G	G	G	E B 19	E B 16	E B 16	28	E B 13
15	31	K 33	52	61	55	59	E S 32	36	60	42	B	B	E S 56	E S 55	E S 32	G	G	E B 27	E S 24	E B 18	E B 16	33	K 22	32
16	31	31	K 26	S 24	B	B	B	B	B	30	B	B	G	E B 32	E B 54	26	G	G	E B 23	E B 22	E B 19	E B 16	E B 19	B
17	E S 31	E S 31	E B 22	B	B	B	B	B	E B 22	28	B	B	B	B	E B 55	G	B	B	B	44	G 17	B	45	21
18	37	42	K 16	B	34	B	37	B	B	B	34	S	B	B	B	B	E B 21	B	S	B	K 19	42	71	60
19	71	54	B	B	B	B	24	B	B	B	B	B	B	B	B	E B 29	B	E S 30	32	E B 20	23	23	44	76
20	68	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 55	E B 29	B	E B 27	37	36	42	45
21	36	69	33	B	B	B	B	B	B	B	B	B	B	B	E B 49	B	E B 26	B	B	E B 23	E B 17	18	18	33
22	33	36	43	40	34	S	G	B	B	32	B	B	B	B	B	E B 26	E B 49	E B 27	E B 28	30	27	30	27	30
23	24	28	65	31	36	41	B	B	B	B	25	G	B	B	E B 55	E S 30	E S 53	E B 26	E S 31	31	31	31	19	34
24	51	51	40	42	B	40	40	G	G	29	G	E B 38	E B 47	G	30	30	E B 48	G 22	E B 27	G	23	29	29	K 32
25	K 32	58	40	87	48	35	53	40	48	42	B	E B 58	E B 58	E B 56	B	B	G 27	E B 29	E B 19	G	E B 15	36	35	89
26	59	72	70	42	42	49	44	G 27	G	G	E B 54	B	E B 38	34	31	G 28	G 21	G	G 14	E B 13	E B 14	17	K 22	36
27	38	S 43	73	B	B	34	S	B	57	B	B	B	E S 53	E S 52	E B 54	E B 30	E S 27	G	E B 27	E B 29	E B 17	22	44	31
28	35	68	48	44	33	30	G	G 16	G	G 18	E S 54	B	G	G	G	E B 55	E B 37	E B 54	E B 56	E B 29	26	18	41
29	54	69	64	47	40	47	51	44	B	B	B	B	B	G	E B 56	E B 29	37	E B 28	E B 50	E B 20	20	42	54	43
30	42	33	43	40	B	33	31	35	40	40	S	E S 31	E S 32	S	S	E S 29	S	E S 31	E S 30	E S 30	E S 31	E B 16	B 12	S 23
31	71	36	42	38	S	G	S 30	S	E S 31	32	G 32	G	E S 32	S	E S 29	G 20	S 30	G 16	20	21	E B 20	16	35	40
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	29	25	20	20	22	17	18	18	14	14	20	19	22	24	27	26	26	29	30	30	31	30
MED	37	42	42	39	38	36	G	36	32	31	G	G	E 32	E G 32	E B 35	28	E 30	E 28	E 28	E 26	21	25	29	34
U Q	51	66	52	44	46	42	40	42	42	40	E B 48	E B 38	E 50	E B 53	E B 54	E B 36	E B 38	E B 30	E B 32	30	31	33	42	43
L Q	32	35	32	32	34	30	29	G	G	G 28	26	G	30	G	31	G	G 27	G	23	20	E B 17	E B 18	19	27

MAR.2015 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR.2015 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	13	12	12	14	14	14	18	B	B	16	B	B	27	32	24	30	B	21	14	14	13	12	12
2	14	12	14	14	26	B	B	B	18	18	B	B	B	B	B	B	30	B	13	26	13	10	10	12
3	13	13	13	13	18	B	B	19	B	B	B	B	B	B	32	B	B	59	55	14	20	13	12	12
4	16	20	15	13	B	B	B	20	14	22	20	21	18	18	B	56	19	34	30	28	23	17	13	12
5	12	13	16	19	17	17	16	15	16	15	13	16	16	17	17	14	13	17	14	15	13	14	18	12
6	12	17	14	12	12	20	20	17	22	26	B	B	35	B	55	E S 53	E S 31	E S 31	24	14	13	13	13	11
7	11	12	14	14	13	18	25	B	B	B	B	B	56	53	54	52	29	18	28	20	12	12	12	16
8	19	12	14	28	B	23	23	18	15	E S 30	B	34	55	54	32	15	34	20	B	B	13	11	12	12
9	11	12	24	16	20	B	26	B	18	20	20	21	21	23	19	17	13	15	14	14	16	12	13	13
10	12	13	12	12	11	20	20	14	14	35	59	54	22	20	54	30	56	29	36	E S 31	20	19	13	12
11	12	12	12	13	14	14	14	14	21	E S 53	48	39	22	20	61	19	15	23	16	20	20	13	13	13
12	11	16	15	16	18	22	24	B	B	B	17	27	32	54	B	54	61	49	23	20	14	13	11	12
13	12	11	13	12	12	13	19	15	27	20	E S 30	E S 32	17	15	18	16	13	15	39	26	13	12	12	12
14	13	16	14	16	13	12	12	15	B	B	B	19	18	22	24	15	20	20	20	19	16	16	16	13
15	12	12	13	16	15	23	E S 32	20	28	E S 25	B	B	E S 56	E S 54	E S 32	22	20	27	24	18	16	13	14	16
16	14	14	14	16	B	B	B	B	B	25	B	B	26	32	54	15	18	20	23	22	19	16	19	B
17	E S 31	E S 31	22	B	B	B	B	B	22	18	B	B	B	B	55	18	B	B	B	20	14	B	14	14
18	21	18	13	B	16	B	27	B	B	B	20	21	B	B	B	B	21	B	18	B	12	12	12	25
19	12	13	B	B	B	B	16	B	B	B	B	B	B	B	B	29	B	E S 30	18	20	15	15	12	12
20	16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	55	29	B	27	12	11	13	13
21	19	17	22	B	B	B	B	B	B	B	B	B	B	B	49	B	26	B	B	23	17	12	12	12
22	11	12	17	12	12	12	13	B	B	26	B	B	B	B	B	26	49	27	29	16	15	12	12	12
23	14	13	12	12	19	12	B	B	B	B	22	28	B	B	55	E S 30	E S 53	E S 26	E S 31	18	20	13	13	12
24	13	20	13	13	B	21	12	15	17	14	22	38	47	23	14	15	48	14	27	14	14	18	14	12
25	11	18	30	21	18	25	22	20	14	15	B	58	58	56	B	B	19	29	20	12	14	14	12	14
26	12	18	22	18	14	16	16	15	18	20	54	B	38	28	20	17	15	16	12	13	14	13	13	12
27	12	20	13	B	B	23	17	B	25	B	B	B	E S 53	E S 52	54	30	E S 27	18	27	29	17	15	12	12
28	12	16	14	14	12	12	12	13	16	13	E S	B	19	19	18	55	36	54	56	29		16	12	13
29	12	13	33	15	15	14	17	15	B	B	B	B	B	26	56	29	19	28	50	20	14	11	12	12
30	12	12	16	12	B	14	12	16	22	16	19	E S 31	E S 32	20	16	E S 29	20	E S 31	E S 30	E S 30	E S 30	16	13	12
31	13	13	13	13	11	13	13	14	E S 31	20	19	19	E S 32	20	E S 29	14	14	13	13	12	20	12	13	12
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	30	31	31	31
MED	12	13	14	15	18	21	20	20	26	26	B	B	U 50	U 42	54	28	U 24	27	26	20	14	13	13	12
U Q	14	18	22	B 21	B	B	B	B	B	B	B	B	B	B	B	B 55	49	B 49	39	27	19	16	13	13
L Q	12	12	13	13	13	14	14	15	18	20	20	28	22	20	24	17	19	18	18	14	13	12	12	12

MAR.2015 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2015 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	224	A	224	A	A	A	192	A	B	B	E S 238	B	B	E A 270	B	222	E B 242	B	Q 254	A 254	Q 242	256	E A 334	A
2	A	A	A	A	A	B	B	B	A	A	B	B	B	B	B	B	A	B	A	B	Q 244	Q 256	202	256
3	A	A	A	198	A	B	B	A	B	B	B	B	B	B	E S 214	B	B	B	E B 262	Q 218	A 234	Q 246	A	A
4	A	A	A	A	B	B	B	A	S	E A 284	S	204	204	204	B	B	A	B	E B 232	248	226	226	Q 238	A 238
5	A	F	A	A	A	A 236	A	226	226	214	H 206	210	216	216	228	218	210	Q 210	Q 210	Q 210	Q 262	280	E A 286	A
6	A	A	220	210	204	S	A	A	A	A	B	B	B	B	B	E S 318	E S 240	E S 242	224	214	Q 214	Q 250	292	A
7	F	A	A	A	A 224	224	218	B	B	B	B	B	B	B	B	B	230	230	E S 244	E A 234	A	196	A	A
8	A	222	A	A	B	A	A	A	A	E S 252	B	252	E S 320	E B 312	238	204	E B 250	A	B	B	260	A	A	230
9	A	A	Y	Q 268	A	B	A	B	A 246	230	212	212	202	E A 238	216	212	212	212	208	Q 208	208	216	226	Q 248
10	Q 286	216	254	230	230	A	A	A	A 250	E B 250	B	B	234	206	B	210	E B 256	B 236	222	E S 230	222	222	Q 232	Q 250
11	Q 256	Q 256	Q 248	Q 306	308	A	260	236	A	E S 360	E B 334	E B 262	E A 218	E A 222	E B 268	228	214	224	206	E A 296	F 264	A	A	A
12	E A 332	A	A	A	256		258	B	B	B	E A 282	244	244	B	B	E B 288	288	256	224	252	252	E A 284	264	A 280
13	284	E A 306	A	224	A	A	E B 292	E A 256	244	E S 230	S 208	214	196	216	216	216	216	216	E B 246	222	236	236	246	234
14	224	194	A	A	A	A	A	A	B	B	B	204	204	222	222	216	228	200	202	212	212	226	A 264	E B 290
15	A 344	266	A	A	194	A	S	S	A	S	B	B	S	S	E S 228	218	218	B	218	218	226	A	A	A
16	A 252	A	A	S	B	B	B	B	B	A 244	B	B	E B 286	236	296	214	214	220	226	226	226	228	268	B
17	302	226	E B 316	B	B	B	B	B	E B 230	200	B	B	B	B	B	E S 222	B	B	B	A	A 252	B	A	A
18	A	A	A	B	A	B	A	B	B	B	A	E S	B	B	B	B	216	B	S	B	A	A	A	A
19	A	A	B	B	B	B	A	B	B	B	B	B	B	B	B	E S 244	B	E S 256	A	B	A 300	258	A	226
20	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	244	A	A	A	A
21	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	252	B	B	E B 242	E B 242	234	A	A
22	A	A	A	A	A	A	A	B	B	A	B	B	B	B	B	210	B	B	242	F 218	A 286	234	A	A
23	A	A	A	A	A	234	B	B	B	B	A 236	E A 236	B	B	B	E S 256	E S 256	S	E S 242	304	250	246	246	A
24	A	A	A	A	B	A	212	A	E A 256	226	E A 252	E B 244	280	216	212	218	230	E A 240	204	A	204	A	A	A
25	A	A	A	A	A	A	A	A	A	208	B	B	B	B	B	B	E A 224	B 210	206	Q 234	Q 234	E A 268	A	A
26	Q 190	A	A	234	A	206	A	A	A	E A 254	B	B	E B 260	A 220	216	216	E A 216	204	196	216	208	A 254	A	A
27	A	A	A	B	B	S	S	B	A	B	B	B	S	298	S	E B 234	E S 236	240	E B 236	248	218	A 274	A	A
28	A	A	A	A	A	242	216	E A 254	236	S 238	S	B	E A 260	A 228	A 224	B	E B 242	E B 252	E B 266	E B 236		Q 234	A 252	A
29	A	A	A	A	A	A	A	A	B	B	B	B	B	248	B	242	E A 242	E B 244	B	250	266	A	A	A
30	A	196	A	A	B	234	A	A	A	A	E S 234	230	230	E S 230	216	216	210	216	216	234	240	240	240	A
31	A	S	A	A	A	A	A	206	S	A	240	222	E S 252	214	S 226	226	216	216	216	216	232	Q 232	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	10	8	5	7	6	6	7	5	7	13	10	12	15	17	14	22	24	19	23	25	27	23	14	9
MED	262	222	U 236	230	227	234	217	U 221	240	U 223	U 222	218	U 219	219	220	216	222	218	215	228	235	237	246	243
U Q	A 302	261	285	Q 268	256	236	260	E A 255	A 250	E 253	E A 252	244	E 260	E 243	228	E 234	E B 242	E 242	E 242	248	252	256	268	268
L Q	224	206	222	210	204	224	212	216	230	220	212	211	204	216	216	216	216	212	208	217	222	228	238	232

MAR. 2015 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2015 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	64	47	60	70	43	50	43	58	68	X 73	X 83	X 88	X 96	X 90	X 88	X 90	X 78	X 66	X 49	X 39	65	43	R
2	72	X 60	64	64	71	46	X 46	53	60	70	X 72	X 76	X 88	X 99	X 93	X 94	O X 90	X 73	X 80	65	R	A	R	A
3	A	A	53	56	46	50	50	X 48	70	78	X 79	X 84	X 84	O X 86	X 92	X 92	X 92	X 90	X 73	66	40	X 30	A	O X 36
4	A	X 31	B	B	A	A	R	R	O X 66	O X 73	X 76	X 86	X 98	X 90	X 98	X 107	B	O X 85	76	45	B	S	X 23	S
5	S	S	S	S	B	A	A	A	R	O X 50	V 67	X 72	X 82	X 83	X 85	X 93	X 92	X 78	X 67	X 58	X 52	X 30	R	O X 28
6	R	O X 38	R	B	A	77	B	B	O X 65	70	X 76	X 87	X 90	99	X 100	X 94	X 82	X 92	X 75	X 65	X 46	O X 32	B	O X 22
7	A	R	O X 27	O X 36	A	A	B	B	B	68	76	X 84	O X 89	X 96	X 95	X 90	X 91	X 88	70	X 59	X 54	O X 30	O X 24	A
8	A	B	B	A	43	64	67	57	S 59	74	X 88	100	R	R	O X 112	93	X 92	X 91	X 58	X 52	46	O X 28	A	28
9	Y	O X 26	X 25	X 30	A	A	A	A	B	B	O X 69	84	X 97	X 104	X 112	X 106	X 105	O X 95	X 91	X 74	X 63	R	R	A
10	A	A	86	69	62	A	O X 38	B	B	B	R	B	B	X 67	X 67	X 66	X 69	X 68	67	50	S	81	A	89
11	118	A	A	87	B	A	A	92	B	B	B	R	B	B	B	B	B	52	X 40	64	70	R	44	O X 44
12	A	48	36	A	O X 37	O X 56	R	50	51	O X 54	R	X 65	X 69	X 71	X 71	X 69	X 65	X 57	X 47	X 31	O X 25	O X 22	A	75
13	68	A	A	42	42	42	R	A	R	B	X 66	O X 76	C	C	C	C	C	C	C	C	C	B	A	A
14	A	53	A	A	A	X 36	41	45	S	X 71	X 74	X 77	X 94	X 100	106	X 104	S	X 87	70	A	74	54	62	A
15	X 42	A	81	69	58	56	66	64	70	74	69	74	83	X 83	X 84	O X 109	X 111	X 71	X 42	R	A	80	88	50
16	S	B	B	X 39	B	B	R	B	B	B	B	B	S	B	X 70	X 70	O X 70	O X 70	67	44	81	A	52	82
17	A	A	A	B	B	A	O X 34	B	B	B	B	B	B	B	B	O X 66	O X 64	X 50	S	B	B	O X 24	61	A
18	R	52	B	A	B	B	R	A	B	B	X 67	O X 67	X 68	B	O X 73	X 73	X 72	X 65	X 61	50	O X 27	52	X 38	A
19	A	A	A	B	B	Y	R	O X 40	B	B	B	X 67	X 70	X 80	X 80	X 76	X 74	X 72	X 61	B	O X 33	B	A	60
20	A	A	X 30	A	A	X 34	B	B	B	B	B	X 71	X 82	X 93	X 90	X 89	X 91	X 86	X 65	S	34	O X 23	43	71
21	71	63	51	F	58	X 33	A	R	A	87	B	B	X 82	X 88	B	X 95	B	B	71	66	R	A	43	A
22	A	A	A	65	54	X 38	O X 45	S	66	67	X 71	B	B	B	B	X 104	O X 102	X 80	77	71	46	X 30	O X 24	43
23	A	A	A	A	A	A	A	B	B	X 58	X 70	X 80	X 88	R	B	X 96	X 88	X 83	78	X 59	41	B	B	B
24	58	72	70	A	O X 36	A	B	B	B	X 64	X 76	X 82	X 89	X 96	X 113	O X 113	X 103	X 76	68	X 42	33	X 23	B	O X 22
25	X 22	X 23	X 24	X 34	51	39	B	B	B	X 66	X 82	X 103	X 111	X 108	X 112	X 110	X 88	X 71	64	X 37	X 30	O X 23	B	B
26	B	58	X 53	53	52	52	69	70	71	73	O X 95	X 108	X 111	X 110	O X 110	X 107	X 82	X 82	52	X 41	X 32	O X 26	B	B
27	B	72	80	56	52	48	62	72	74	72	X 82	X 99	X 111	O X 90	B	B	O X 89	X 92	X 79	X 66	44	65	68	A
28	53	O X 36	A	A	A	A	A	A	A	R	S	X 76	91	X 89	B	X 99	O X 91	89	X 69	B	R	S	A	O X 28
29	40	O X 36	A	B	A	A	A	A	43	X 57	74	80	O X 98	104	X 105	X 95	O X 76	X 88	65	32	O X 26	B	B	O X 34
30	A	47	43	61	B	B	R	A	50	X 52	X 62	X 70	X 83	O X 88	X 94	X 82	X 73	X 63	X 53	X 42	O X 26	B	B	86
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	16	15	15	14	15	11	11	13	20	21	24	23	22	22	27	25	28	28	23	22	18	13	16
MED	56	50	51	56	52	46	50	53	65	69	X 74	X 80	X 88	X 92	X 94	X 94	X 89	X 79	X 67	X 52	X 40	X 30	43	44
U Q	71	62	70	65	58	56	66	70	70	73	X 78	X 85	X 97	X 99	X 106	X 104	X 92	X 88	X 74	65	52	54	62	73
L Q	X 42	O X 36	X 30	X 39	43	X 38	O X 41	45	54	X 61	X 69	X 73	X 82	X 86	X 84	X 82	X 74	X 70	X 61	X 42	O X 32	O X 24	X 31	O X 28

IONOSPHERIC DATA STATION SHOWA-ST.

APR.2015 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT.69°00.4'S LON.039°35.4'E kSWEEP 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 37	F 32	F 28	F 34	F 25	F 23	F 23	F 35	F 43	F 58	66	77	82	90	84	82	84	72	60	43	33	F 19	F 24	A
2	33	54	F 51	R	F 28	R 34	40	F 30	F 41	F 58	66	70	R 82	J R 93	87	88	84	67	74	F 56	R	A	R	A
3	A	A	F 40	F 35	F 37	F 27	F 30	R 42	F 59	F 69	73	78	78	R 80	J R 86	U R 86	86	84	67	F 54	F 34	R 24	A	R 30
4	A	25	B	B	A	A	A	A	60	67	70	80	92	84	J R 92	J R 100	B	R 79	F 66	F 34	B	S	R 17	S
5	S	S	S	S	B	A	A	A	R 40	S 44	V 61	66	76	77	79	87	J R 86	72	61	52	46	24	R 18	R 22
6	A	R 32	A	B	A	A	B	B	R 59	F 59	70	81	84	J R 95	J R 94	J R 88	76	86	69	59	40	26	B	16
7	A	A	21	30	A	A	B	B	B	F 58	F 67	78	R 82	90	89	84	85	82	F 59	53	48	U S 24	18	A
8	A	B	B	A	F 28	F 38	F 38	F 38	53	F 65	82	J R 94	D R 84	D R 83	106	J R 87	86	85	52	46	F 36	R 22	A	R 17
9	Y	20	19	24	A	A	A	A	B	B	63	77	J R 91	97	106	100	J R 99	R 89	J R 85	68	57	A	R	A
10	A	A	F 24	F 59	A	A	32	B	B	B	R	B	B	61	61	60	63	62	F 56	F 37	U S 21	18	A	A
11	B	A	A	F 24	B	A	A	A	B	B	B	R	B	B	B	B	B	F 38	34	A	A	A	34	R 38
12	A	A	F 21	A	R 31	R 50	R	F 38	Z 45	R 48	R	59	63	65	65	63	59	51	42	25	19	16	A	A
13	A	A	A	A	R 30	A	A	A	A	B	60	70	C	C	C	C	C	C	C	C	C	B	A	A
14	A	A	A	A	A	30	F 27	F 36	S 41	65	68	71	88	J R 94	J R 100	J R 98	93	81	F 58	A	A	A	A	A
15	36	A	F	F	F	F 29	F 24	F	F 58	F 58	F 58	F 65	F 74	77	78	R 103	105	65	36	A	A	A	A	F 26
16	S	B	B	33	B	B	A	B	B	B	B	B	S	B	64	64	R 64	64	F 55	F 26	A	A	28	B
17	A	A	A	B	B	A	27	B	B	B	B	B	B	B	B	R 60	R 58	44	S 42	B	B	R 18	A	A
18	R	A	B	A	B	B	R	A	B	B	61	61	62	B	R 67	67	66	59	55	F 40	21	A	32	A
19	A	A	A	B	B	Y	A	R 34	B	B	B	61	64	74	74	70	68	66	55	B	R 27	B	A	F 27
20	A	A	24	A	A	28	B	B	B	B	B	65	76	87	84	81	85	80	59	S 44	F 23	R 17	A	A
21	R 51	32	F 21	F	F	27	A	R	A	R	B	B	76	82	B	89	B	B	F 57	F 56	R	A	A	A
22	A	A	A	F 39	F 24	32	R 39	S 42	F 55	F 58	65	B	B	B	B	J R 98	S 96	J R 74	F 65	F 57	F 32	R 24	R 18	F 27
23	A	A	A	A	A	A	A	B	B	J S 52	64	74	82	R 78	B	J R 90	82	77	F 68	53	S	B	B	B
24	A	A	F 26	A	30	A	B	B	B	58	70	76	J R 83	J R 90	107	R 107	97	70	F 58	36	F 22	R 17	B	15
25	16	17	18	28	F 21	F 15	B	B	B	60	76	97	105	103	R 106	J R 104	82	65	58	31	24	R 17	B	B
26	B	R 16	J R 47	F 43	F 31	F 20	F 29	F 29	F 36	F 62	89	J R 102	105	104	104	101	76	76	F 42	35	26	20	B	B
27	B	28	F 29	R 44	F 29	F 24	F 47	F 26	F 40	F 54	76	93	105	R 84	B	B	R 83	J R 86	J R 73	60	F 29	R 37	A	A
28	R 36	R 30	A	A	A	A	A	A	A	A	S 46	J R 70	F 81	J R 83	B	J R 93	R 85	F 77	J R 63	B	A	S	A	R 22
29	A	R 30	A	B	A	A	A	A	F 35	51	F 64	F 68	R 92	F 93	99	J R 89	R 70	82	F 51	F 20	R 20	B	B	S 28
30	A	F 26	F 23	R	B	B	A	A	F 38	46	56	64	77	R 82	88	J R 76	67	57	47	36	20	B	B	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	12	14	11	11	13	11	10	15	19	22	24	24	24	22	27	26	28	29	23	19	15	8	11
MED	36	29	F 24	F 34	F 29	F 28	F 30	F 36	F 43	F 58	66	72	82	85	88	R 88	84	73	58	44	27	R 20	21	26
U Q	R 37	32	F 29	F 43	F 31	33	39	38	58	F 62	70	79	90	93	100	R 98	86	82	66	56	36	24	30	R 28
L Q	33	22	21	28	F 25	F 24	F 27	F 30	F 40	52	61	66	76	79	78	76	68	64	52	35	21	R 17	R 18	17

APR.2015 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR.2015 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT.69°00.4'S LON.039°35.4'E KSWEEP 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 35	40	36	36	35	32	20	20	G 22	G 22	30	36	67	42	44	G 21	G 23	32	37	34	29	28	32	35
2	44	50	42	41	39	39	35	34	G	G	E S	34	G 20	E B 32	G	36	32	31	40	32	24	K 34	K 21	48
3	66	50	40	K 32	J A 32	51	K 22	G 20	29	G	28	40	36	E B 48	E B 28	G	E B 55	E B 27	E B 24	E B 23	27	J A 28	29	34
4	35	71	B	B	59	48	36	36	35	E S 53	E S 56	E S 30	E S 30	G	S	E S 30	B	E S 54	18	K 19	B	20	20	S
5	S 28	S	35	38	B	E S 31	38	38	E S 32	E S 29	E S 31	G	S	41	S	S	E B 56	S 22	S 24	E B 18	E B 17	B 14	E B 14	16
6	24	41	34	B	46	42	B	B	E S 30	E S 26	G	28	28	G 30	G	G 18	G	G	E B 12	E B 15	E B 18	E B 18	B	16
7	34	34	27	41	41	38	B	B	B	E B 24	E S 30	S	27	G 20	G 20	E B 24	22	E B 18	34	31	31	E B 14	16	28
8	36	B	B	38	34	21	28	E B 13	18	27	28	34	34	32	25	G	G 18	E B 20	E B 12	E B 13	E B 13	28	32	30
9	15	35	24	32	43	50	66	60	B	B	E B 55	E B 37	E B 37	E B 37	G	G	E B 23	E B 22	E B 28	E B 17	E B 15	34	18	37
10	41	46	65	43	39	43	39	B	B	B	30	B	B	E S 57	E S 55	E S 34	S	E S 58	S 30	E B 14	30	S 28	41	69
11	E B 84	40	41	90	B	43	48	81	B	B	B	35	B	B	B	B	B	31	44	41	48	40	44	75
12	42	38	32	95	33	36	41	28	26	E B 26	E B 24	S	S 26	39	32	34	34	G	20	E B 13	E B 13	E B 12	24	32
13	41	35	39	32	35	49	34	42	39	B	G 23	E B 30	C	C	C	C	C	C	C	C	C	B	32	18
14	29	38	70	39	39	35	30	21	40	G 22	E S 29	G	G 20	S	28	G	42	32	32	44	43	49	60	46
15	42	92	67	44	31	43	43	50	36	37	E B 25	E B 24	G 19	G 20	G	E B 87	G 19	35	31	39	41	41	83	64
16	E S 29	B	B	60	B	B	36	B	B	B	B	B	E S 30	B	E B 56	E B 29	E B 39	30	27	40	73	88	62	E B 54
17	42	42	38	B	B	40	99	B	B	B	B	B	B	B	B	E S 31	E S 29	E B 20	E S 31	B	B	S 24	43	43
18	35	42	B	62	B	B	32	43	B	B	E B 28	E B 27	E B 54	B	E B 54	E B 30	E B 20	32	26	20	28	37	40	70
19	37	37	64	B	B	24	33	29	B	B	B	E B 47	E B 48	E B 30	E B 32	E B 24	E B 23	E B 19	E B 20	B	E B 19	B	41	72
20	78	42	41	35	47	61	B	B	B	B	B	E B 36	E S 29	E S 30	E S 30	E S 30	E B 35	E S 24	E S 28	18	E B 13	E B 12	39	78
21	42	57	57	60	46	41	54	38	51	36	B	B	E B 41	E B 36	B	30	B	B	E B 14	38	32	37	40	42
22	68	45	40	36	31	K 32	32	39	G 24	G 32	E B 31	B	B	B	B	E B 56	E B 58	E B 57	E B 20	17	E B 14	E B 18	26	39
23	54	57	60	40	39	36	39	B	B	E S 30	E S 30	E S 30	E S 30	E S 55	B	E S 60	E S 31	E B 34	E B 16	E B 22	E B 19	B	B	B
24	32	32	32	39	36	43	B	B	B	E S 29	E B 24	E B 25	E S 29	E S 29	E S 30	E B 19	G	E B 16	E B 14	E B 12	E B 13	E B 13	B	26
25	24	32	21	E B 16	22	E B 14	B	B	B	E B 22	E B 22	E B 26	E B 26	E B 24	E B 20	23	23	30	E B 14	E B 13	16	E B 12	B	B
26	B	E B 12	E B 33	22	37	19	32	E B 13	E B 13	E B 19	E B 29	E B 25	E S 29	E B 27	E S 30	E B 23	30	E B 15	E B 14	E B 13	E B 16	E B 13	B	B
27	B	36	30	41	41	43	31	18	E B 12	28	G	G	E S 29	E S 32	B	B	E S 30	E B 31	E B 25	E B 24	22	37	52	59
28	56	44	77	64	81	60	47	46	41	52	36	E S 30	S	E S 29	B	E S 58	E S 55	E B 21	E B 39	B	37	30	32	35
29	35	33	59	B	77	43	53	52	57	43	E B 20	E B 25	E B 29	29	E B 22	E B 20	E B 24	37	E B 14	E B 14	E B 13	B	B	37
30	70	74	53	25	70	B	38	50	34	G 16	E B 22	E B 22	E B 23	E B 23	E B 21	29	E B 17	E B 13	30	E B 14	E B 12	B	B	37
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	27	26	25	24	27	25	21	18	21	23	23	23	23	20	26	25	28	29	26	27	25	23	26
MED	38	41	40	39	39	41	36	38	30	28	E 28	E 30	E 29	E 30	E 28	E 29	E 29	E 28	E 25	E B 18	19	28	32	38
U Q	49	50	59	52	46	43	45	48	39	G	E 30	35	E B 36	39	E 32	E 34	E B 37	32	31	32	31	37	43	59
L Q	33	35	33	34	34	32	32	20	24	23	G	E B 26	26	E 29	G	G	E B 23	E B 20	E B 15	E B 14	E B 14	E B 14	24	32

APR.2015 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2015 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT.69°00.4'S LON.039°35.4'E kSWEEP 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	11	12	12	14	14	14	19	15	18	18	16	15	15	12	13	12	12	12	12	12
2	13	13	12	12	12	14	12	12	14	13	14	13	13	32	20	27	15	13	24	12	20	12	11	14
3	12	12	10	12	12	12	14	14	13	16	22	19	20	48	28	20	55	27	23	23	16	14	10	14
4	14	12	B	B	25	22	25	22	24	ES 53	ES 56	ES 30	ES 29	17	17	ES 30	B	ES 54	13	12	B	13	12	11
5	13	13	14	16	B	ES 31	20	18	ES 31	29	ES 31	18	14	15	15	15	56	14	14	18	17	14	14	12
6	13	11	25	B	20	32	B	B	ES 30	ES 26	22	17	18	16	19	14	18	14	12	15	18	18	B	14
7	12	13	12	12	20	19	B	B	B	24	ES 30	20	15	15	14	24	17	18	12	11	13	14	12	12
8	11	B	B	12	12	14	13	13	13	13	13	13	14	15	15	13	12	20	12	13	13	12	12	12
9	12	15	11	12	13	14	17	27	B	B	55	38	37	37	18	14	23	22	28	17	15	14	13	13
10	14	12	12	12	13	17	13	B	B	B	24	B	B	ES 57	ES 55	ES 34	18	ES 58	12	14	12	12	13	18
11	84	15	14	12	B	21	14	22	B	B	B	20	B	B	B	B	B	14	12	13	15	13	12	12
12	13	12	12	17	17	16	14	11	14	26	24	18	19	18	15	12	13	12	12	13	13	12	14	12
13	12	22	21	14	13	20	15	22	23	B	21	30	C	C	C	C	C	C	C	C	C	B	11	12
14	11	11	28	16	12	13	12	15	14	15	ES 29	18	16	14	14	14	13	12	11	12	12	13	13	12
15	14	19	12	11	10	12	12	12	15	12	25	24	15	18	15	87	12	14	20	14	13	12	14	12
16	ES 29	B	B	13	B	B	ES 29	B	B	B	B	B	ES 30	B	56	29	39	22	14	12	16	17	15	54
17	20	13	20	B	B	19	18	B	B	B	B	B	B	B	B	ES 31	ES 29	20	ES 31	B	B	12	13	13
18	20	12	B	13	B	B	17	17	B	B	28	27	54	B	54	30	20	12	17	12	14	12	11	12
19	8	14	13	B	B	16	24	24	B	B	B	47	48	30	32	24	23	19	20	B	19	B	12	12
20	14	12	14	26	19	14	B	B	B	B	B	36	ES 29	ES 30	ES 30	ES 30	38	ES 24	ES 28	13	13	12	13	13
21	15	12	12	12	12	16	28	30	20	27	B	B	41	36	B	20	B	B	14	13	11	11	12	12
22	13	12	14	12	13	20	19	14	16	26	31	B	B	B	B	56	58	56	20	12	14	18	12	12
23	12	12	15	20	19	13	20	B	B	ES 30	ES 30	ES 30	ES 30	55	B	ES 60	ES 31	34	16	22	20	B	B	B
24	12	12	12	14	13	13	B	B	B	ES 29	24	25	ES 29	ES 29	ES 30	19	14	16	14	12	13	13	B	12
25	12	13	11	16	15	14	B	B	B	22	22	26	26	24	20	17	12	14	14	13	12	12	B	B
26	B	12	33	12	12	12	13	13	13	19	ES 29	25	ES 29	27	ES 30	23	13	15	14	13	16	13	B	B
27	B	12	12	13	13	13	12	12	12	13	16	20	ES 29	ES 32	B	B	ES 30	31	25	24	17	14	13	13
28	12	14	13	28	22	19	19	16	ES 29	20	ES 29	ES 30	18	ES 29	B	ES 58	ES 54	21	39	B	13	13	13	13
29	13	14	20	B	22	21	14	14	13	18	20	25	29	19	22	20	24	14	14	14	13	B	B	12
30	13	13	13	13	51	B	19	16	12	13	22	22	23	23	21	15	17	13	13	14	12	B	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	30	30	30	30	30	30	30	30	30	30	30	30	29	29	29	29	29	29	29	29	29	30	30	30
MED	13	12	14	13	16	16	18	20	U 22	24	U 25	24	28	U 26	U 24	U 20	U 20	16	14	13	14	13	13	12
U Q	14	14	21	B 20	B 25	21	B 25	B	B	B	B 55	B 36	39	B 52	B	32	46	26	22	18	17	B 17	B 15	14
L Q	12	12	12	12	12	13	13	14	14	16	22	19	18	18	16	15	14	14	12	12	13	12	12	12

APR. 2015 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR.2015 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	296	256	244	A	244	238	A 222	A	E A 248	244	234	E A 244	E A 306	A 226	216	224	Q 216	202	202	202	248	A 306	234	A
2	246	208	258	A	A 198	268	228	186	196	218	234	216	A 230	232	232	E B 240	A 218	218	E A 254	Q 228	A	A	202	A
3	A	A	194	E A 380	A 236	200	210	198	240	254	248	220	220	B	240	E A 240	E B 244	224	224	E B 236	E B 250	A 254	A	202
4	260	A	B	B	A	A	A	A	A	E S 330	E S 326	236	S 230	S 228	E S 228	240	B	236	Q 208	268	B	A	A 342	220
5	258	A	A	A	B	A	A	A	S	E S 264	E S 248	226	E S 222	216	E S 220	226	E B 234	206	210	210	218	238	B	A
6	A	A 238	A	B	A	A	B	B	260	228	228	214	222	204	218	198	204	214	196	204	204	B 262	B	276
7	A	A	A	E A 368	A	A	B	B	B	B	S	S 222	218	216	212	200	198	198	198	198	198	198	E B 276	A
8	A	B	B	A	A	A	A	Q 258	206	206	214	216	216	216	216	190	190	200	Q 188	Q 200	Q 210	250	A	216
9	A	A	A 262	A 258	A	A	A	A	B	B	E B 276	B 244	B 236	236	222	218	218	204	224	202	Q 210	A	A	A
10	A	A	262	E A 254	A	A	A	B	B	B	A	B	B	S	S	E S 310	E S 258	S 286	Q 238	Q 274	A	A	A	A
11	B	A	224	A	B	A	A	A	B	B	B	A	B	B	B	B	B	A 224	226	A	A	A	212	232
12	A	A	A	A	A	A	A	A	222	B	E B 252	S 230	S 228	S	S 228	E S 216	204	186	Q 194	212	E B 230	E B 296	A	A
13	A	A	A	A	A	A	A	A	A	B	238	E B 238	C	C	C	C	C	C	C	C	C	B	A	A
14	A	A	A	A	A	A	E A 394	E A 336	E A 250	E A 232	S	E S 224	218	208	202	206	196	Q 206	Q 222	A	A	A	A	A
15	226	A	A	A	198	230	212	A	200	200	E B 254	226	226	242	236	B	210	A	S	A	A	A	A	A
16	S	B	B	194	B	B	A	B	B	B	B	B	E S 258	B	B	E B 290	290	E A 260	Q 254	240	A	A	196	196
17	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	S	E S 268	236	S	B	B	202	A	A
18	A	198	B	A	B	B	A	A	B	B	B 206	B	B	B	B	E B 226	226	Q 226	E A 228	222	208	A	232	A
19	A	A	A	B	B	A	A	A	B	B	B	B	B	E B 240	240	220	220	210	210	B	254	B	A	A
20	A	A	258	A	A	A	B	B	B	B	B	E B 248	E S 244	E S 240	E S 224	216	B 220	220	216	216	214	B 232	A	A
21	A	A	A	F	F	A	A	A	A	A	B	B	B	276	B	E A 290	B	B	Q 258	A	214	A	A	A
22	A	A	A	220	E A 310	A 312	A	A	A	E A 306	284	B	B	B	B	E B 244	E B 244	E B 246	228	222	224	E B 270	192	242
23	A	A	A	A	A	A	A	B	B	E S 242	234	224	224	230	B	E S 236	198	226	206	206	206	B	B	B
24	A	A	206	A	234	A	B	B	B	E S 254	228	216	208	208	204	206	194	Q 194	Q 202	Q 194	Q 206	B 260	B	224
25	206	A 304	A 320	B	A	E B 346	B	B	B	224	212	212	216	204	196	196	A 184	Q 202	202	Q 200	206	B 252	B	B
26	B	B 334	B	E B 278	A	A	A 310	Q 310	Q 246	212	212	204	204	204	198	198	Q 192	192	200	198	208	208	B	B
27	B	208	204		A	A	A	A	204	Q 212	212	212	204	210	B	B	198	B 222	204	204	Q 218	A	A	A
28	A 246	A	A	A	A	A	A	A	A	A	E S 264	214	220	226	B	226	232	216	238	B	S	A	A	234
29	A	A	232	B	A	A	A	A	E A 362	200	238	220	220	220	212	212	192	202	Q 202	204	E B 246	B	B	226
30	A	234	A	A	B	B	A	A	226	E A 242	E B 242	220	232	218	200	192	198	198	214	204	218	B	B	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	7	8	11	7	6	6	6	5	12	17	21	22	22	21	19	25	26	27	27	22	20	13	8	10
MED	246	236	244	E A 258	226	244	221	U 228	U 219	U 219	U 225	218	221	218	215	U 209	206	210	209	204	212	245	214	225
U Q	260	280	A 262	E A 368	244	312	A 310	323	E A 249	E S 254	E 253	230	230	234	228	E 240	E 232	226	228	222	227	B 266	255	234
L Q	226	208	206	220	198	230	212	192	205	212	221	216	218	209	204	203	198	202	202	202	207	220	199	216

APR.2015 h'F (KM)

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2015 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	36	32	32	31	32	32	34	A	R	58	70	78	83	96	95	80	74	70	56	32	27	B	B	25
2	X 25	31	52	52	42	63	70	64	70	64	70	80	X 94	X 106	X 106	85	69	X 66	74	50	32	S	A	A
3	A	A	A	A	A	A	B	B	A	R	B	B	108	108	108	88	82	O X 59	X 48	O X 35	O X 27	B	R	A
4	A	A	A	X 42	A	A	A	X 42	52	O X 51	X 66	X 75	X 83	X 98	100	S 95	69	71	67	B	B	B	B	A
5	A	49	X 29	A	A	36	44	40	52	49	73	88	86	X 102	X 108	B	O X 87	O X 78	X 58	O X 30	A	R	A	A
6	57	A	A	B	A	B	61	A	A	B	O X 74	X 69	77	78	X 77	94	X 106	B	A	93	71	92	A	A
7	56	60	A	O X 41	A	O X 48	X 47	54	51	X 46	X 55	X 62	X 73	78	X 83	X 64	X 61	X 53	X 45	X 30	O X 20	B	X 22	X 24
8	42	52	43	A	A	A	A	O X 35	O X 47	O X 47	X 62	O X 74	X 87	O X 93	X 107	107	86	82	75	X 39	34	B	A	A
9	A	A	O X 41	A	A	41	41	44	50	60	69	80	X 98	X 92	X 97	X 90	70	O X 64	X 48	42	X 28	B	A	41
10	64	A	A	O X 34	34	X 30	A	56	59	B	B	71	94	X 96	X 110	O X 113	O X 109	101	B	O X 39	O X 32	A	A	58
11	88	A	54	70	45	B	B	B	A	B	R	B	B	B	X 71	X 74	77	X 72	B	R	A	A	A	68
12	B	O X 32	48	60	52	40	54	B	B	B	B	B	C	C	C	B	79	84	B	A	A	S	44	A
13	A	40	O X 36	88	A	B	A	A	A	B	B	B	B	S	B	X 72	84	O X 48	R	R	A	A	A	A
14	34	A	B	A	A	A	B	B	B	B	B	B	B	B	X 85	X 82	O X 54	X 50	X 50	B	B	B	B	B
15	69	A	R	A	B	A	A	B	B	O X 40	B	B	X 76	B	B	B	B	B	O X 69	B	B	R	A	O X 22
16	O X 24	A	A	A	41	B	A	A	X 35	X 43	B	X 82	X 96	101	X 99	81	72	S	59	B	B	B	A	A
17	A	X 46	R	R	S	S	B	S	46	O X 42	B	B	R	X 93	X 105	X 82	O X 50	O X 46	B	S	O X 22	B	A	A
18	S	X 30	X 31	O X 32	31	38	B	S	S 27	X 38	X 47	X 74	O X 84	X 92	X 108	O X 97	X 88	102	86	B	B	R	O X 33	O X 32
19	60	A	54	86	68	B	B	59	A	R	X 49	X 64	X 66	X 73	X 88	X 77	X 72	60	X 43	30	24	A	A	A
20	A	44	A	X 30	49	A	A	B	B	B	B	X 74	X 76	X 87	X 82	X 75	75	C	C	C	C	C	C	36
21	Y	O X 36	R	A	A	A	O X 36	A	41	X 41	X 55	X 76	X 79	88	77	72	R	X 39	X 38	R	B	B	B	Y
22	X 37	X 28	30	O X 26	62	A	A	X 34	34	41	S	R	O X 72	X 78	X 72	X 58	X 42	X 34	O X 26	R	B	B	B	A
23	B	B	A	A	R	R	R	A	R	B	S	X 57	X 66	X 73	68	O X 68	X 36	S	S	B	B	B	B	R
24	A	A	S	A	A	A	A	A	A	48	57	X 65	X 76	X 82	X 72	O X 60	46	X 37	30	R	B	R	R	R
25	A	X 35	A	54	A	A	44	56	41	41	X 47	X 66	X 76	X 70	X 62	S 49	X 36	X 32	X 29	O X 22	B	O X 23	B	A
26	R	A	A	41	A	A	R	A	O X 46	52	65	X 65	X 63	X 65	X 66	65	X 52	O X 37	O X 32	Y	B	34	A	A
27	A	A	A	A	A	40	S	O X 23	30	42	X 46	X 62	X 59	O X 63	66	X 52	X 36	33	34	X 32	A	A	A	A
28	A	A	A	A	A	A	A	B	R	36	X 42	X 49	X 58	X 65	X 70	X 60	62	52	S	B	B	A	S	A
29	O X 30	O X 32	S	43	59	70	72	75	70	65	55	61	X 82	X 75	68	X 48	48	34	30	30	O X 24	A	A	A
30	O X 32	A	A	S 26	X 26	O X 24	S	O X 25	O X 25	33	X 43	X 56	X 67	68	X 59	47	34	38	30	B	Y	R	R	30
31	A	O X 35	53	42	84	O X 39	46	52	54	57	X 43	64	70	70	58	X 43	41	41	28	B	B	30	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	14	15	12	17	13	12	11	14	18	21	19	23	26	26	28	28	29	26	22	13	11	4	3	9
MED	40	X 35	42	42	45	40	46	48	46	46	X 55	X 69	X 76	X 84	X 82	X 74	69	X 52	46	X 32	X 27	32	X 33	32
U Q	60	46	52	57	60	44	61	56	52	54	69	76	X 86	X 96	X 102	86	80	71	59	40	32	63	44	50
L Q	O X 32	32	32	X 32	33	34	41	O X 35	35	41	X 47	X 62	X 70	X 73	69	X 60	47	X 38	30	30	O X 24	26	X 22	X 24

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2015 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 21	F 20	F 20	F 20	F 18	F 15	A	A	R	58	F 58	F 67	76	89	88	F 69	60	F 56	F 38	F 24	F 16	B	B	18
2	18	18	A	A	F 28	62	F 39	F 40	F 48	F 52	F 60	72	88	100	100	78	F 57	60	F 59	F 34	F 23	R 19	A	A
3	A	A	A	A	A	A	B	B	A	R 46	B	B	102	102	102	82	76	53	42	29	21	B	A	A
4	A	A	A	36	A	A	A	36	F 38	45	60	69	77	92	F 88	89	F 58	F 57	F 57	B	B	B	B	A
5	A	F 31	23	A	A	F 26	F 28	F 24	F 25	43	F 58	82	J R 80	96	102	B	81	U R 72	R 52	24	A	A	A	A
6	A	A	A	B	A	B	A	A	A	B	68	63	F 64	F 66	71	F 74	100	B	A	A	A	A	A	A
7	32	A	A	35	A	R 42	41	F 41	F 30	40	48	56	67	72	77	58	55	47	39	24	14	B	16	18
8	21	F 38	F 34	A	A	A	A	29	R 41	41	56	68	81	R 87	101	F 98	F 69	F 64	F 56	33	F 24	B	A	A
9	A	A	R 35	A	A	F 24	F 28	F 30	F 29	F 48	F 58	F 66	J R 92	86	91	84	F 60	58	42	F 30	22	B	A	F 26
10	R 43	A	A	R 28	F 22	24	A	F 40	F 41	B	B	F 61	F 76	90	104	R 107	103	F 90	B	R 33	R 26	A	A	A
11	A	A	A	A	F 36	B	B	B	A	B	A	B	B	B	65	68	F 66	66	B	R	A	A	A	A
12	B	R 26	R 32	F 24	F 26	F 22	A	B	B	B	B	B	C	C	C	B	F 68	F 74	B	A	A	A	A	A
13	A	34	R 30	A	A	B	A	A	A	B	B	B	B	S 42	B	66	F 66	R 42	R	R	A	A	A	A
14	F 24	A	B	A	A	A	B	B	B	B	B	B	B	B	J R 79	J R 76	R 48	44	44	B	B	B	B	B
15	A	A	A	A	B	A	A	B	B	34	B	B	70	B	B	B	B	B	R 63	B	B	A	A	R 16
16	R 18	A	A	A	F 30	B	A	A	29	37	B	76	R 90	R	R	F 64	F 56	S 43	F 43	B	B	B	A	A
17	A	40	A	A	A	A	B	S	F 33	36	B	B	R 80	87	99	76	44	40	B	S 25	R 16	B	A	A
18	A	24	25	26	F 22	F 28	B	S 23	U S 21	32	R 41	68	78	86	102	91	82	F 80	80	B	B	B	R 27	R 26
19	A	A	A	A	F 50	B	B	A	A	R	43	58	60	67	82	71	66	F 48	37	F 19	F 15	A	A	A
20	A	A	A	24	F 16	A	A	B	B	B	B	68	70	81	76	69	F 65	C	C	C	C	C	C	A
21	Y	R 30	A	A	A	A	R 30	A	F 29	35	49	J R 70	73	F 72	F 65	F 59	R	33	32	A	B	B	B	Y
22	F 27	R 22	F 20	20	A	A	R	28	F 22	F 23	R 46	R	66	72	66	J S 52	36	28	20	R 17	B	B	B	A
23	B	B	A	A	R	R	R	A	A	B	S 42	51	60	67	F 58	R 62	J R 30	S 24	R 24	B	B	B	B	R
24	A	A	S	A	A	A	A	A	A	F 36	F 42	59	70	76	66	54	F 30	31	F 17	R 16	B	R	R	R 22
25	A	J R 29	A	A	A	A	J R 38	F 26	F 25	F 29	41	60	70	64	56	43	30	26	23	16	B	17	B	A
26	A	A	A	A	A	A	A	A	40	F 36	F 51	J R 59	57	59	60	F 56	46	R 31	26	Y	B	F 20	A	A
27	A	A	A	A	A	F 20	S	17	F 18	F 23	40	56	53	R 57	F 57	46	30	F 22	F 26	26	A	A	A	A
28	A	A	A	A	A	A	A	B	A	F 26	36	43	52	59	64	54	F 43	F 37	S 21	B	B	A	S	A
29	24	U S 26	S 30	F 29	A	F	F 56	F 64	F 16	F 22	F 35	F 49	76	69	F 54	42	F 35	F 22	F 20	F 20	R 18	A	A	A
30	R 26	A	A	20	20	18	S 21	R 19	S 19	F 20	37	50	J R 61	F 56	53	F 38	F 22	F 25	F 20	B	Y	R	R	R
31	A	R 29	A	R 29	A	33	F 24	F 21	F 21	S 25	37	F 47	F 59	F 57	F 45	F 37	F 30	F 24	F 17	B	B	F 19	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	13	9	11	10	11	9	14	18	22	21	23	27	26	27	28	29	28	24	15	10	4	2	6
MED	24	29	30	26	F 24	F 24	F 30	F 28	F 29	36	46	61	70	72	76	67	57	44	38	24	20	19	22	20
U Q	27	32	R 33	29	F 30	33	F 40	F 40	F 38	43	F 58	68	R 80	87	99	77	67	59	48	30	F 23	20		26
L Q	21	23	F 22	20	F 20	F 20	F 26	23	F 21	F 26	40	56	61	64	F 60	54	36	30	F 22	19	F 16	18		18

MAY 2015 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2015 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT.69°00.4'S LON.039°35.4'E KSWEEP 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	30	27	24	17	16	29	40	33	42	E B 23	E B 24	E B 21	21	E B 20	E B 18	G	32	E B 12	E B 14	E B 12	B	B	E B 14
2	E B 13	24	32	42	55	F 36	42	32	27	32	32	G	G	J A 47	33	J A 29	19	E B 14	19	19	16	E B 13	35	33
3	66	55	43	40	45	44	B	B	41	E B 31	B	B	E B 58	E B 28	G	E B 26	E B 23	E B 40	E B 22	E B 18	E B 14	B	K 26	31
4	32	56	41	79	65	58	51	39	K 18	G 21	S 24	21	S 22	E B 20	E B 19	19	G	E B 12	E B 13	B	B	B	B	35
5	42	37	33	72	33	K 22	20	E B 14	36	E B 18	E B 24	E B 28	E S 53	E B 54	E B 25	B	E B 53	E B 56	E B 23	33	43	27	31	36
6	38	44	45	B	44	B	39	51	46	B	E B 39	G	G	G	E B 38	E B 26	E B 41	B	36	44	44	38	43	49
7	49	42	71	42	42	39	34	22	41	22	26	37	34	E B 21	21	31	E B 12	E B 17	E B 14	E B 13	E B 13	B	E B 12	21
8	22	32	29	70	42	43	40	32	32	35	E B 21	22	23	22	G	E B 28	20	E B 15	E B 15	E B 13	E B 18	B	31	42
9	54	58	42	48	46	41	39	40	29	31	E B 23	G	32	E B 21	G	19	E B 13	E B 13	17	E B 11	E B 12	B	34	29
10	72	57	41	32	K 18	78	41	33	26	B	B	E B 37	E B 24	G	E B 18	E B 21	E B 27	E B 26	B	E B 21	31	38	38	42
11	42	40	38	54	44	B	B	B	104	B	38	B	B	B	E B 28	E B 27	E B 38	18	B	26	40	50	34	43
12	36	42	24	44	34	35	32	B	B	B	B	B	C	C	C	B	E B 20	27	B	37	40	S 48	40	43
13	40	90	44	64	72	B	40	58	33	B	B	B	B	E S 30	B	E S 30	E B 21	41	23	22	33	101	102	72
14	94	46	B	35	32	33	B	B	B	B	B	B	B	B	E B 56	E B 38	E B 25	E B 20	E B 20	B	B	B	B	B
15	54	60	33	38	B	48	42	B	B	E B 27	B	B	E B 52	B	B	B	B	B	E B 39	B	B	30	36	27
16	27	40	40	43	32	B	38	38	42	31	B	E B 25	E B 56	E S 56	E S 30	G	E B 17	E B 16	E B 20	B	B	B	33	36
17	37	44	44	44	S 44	39	B	38	44	E B 19	B	B	E B 59	E S 30	E S 30	E B 16	E B 16	E B 14	B	E B 17	E B 13	B	37	32
18	20	30	30	28	32	E B 17	B	15	E B 14	E B 16	E B 19	E B 19	E B 21	S	E B 17	S 24	E B 22	E S 30	E B 37	B	B	24	31	38
19	51	71	44	73	66	B	B	46	48	35	E B 20	E B 29	E B 24	E B 26	E B 20	E B 22	E B 17	K 15	E B 12	E B 12	E B 13	30	35	39
20	38	38	82	72	43	41	50	B	B	B	B	E B 29	E B 30	E B 38	E B 32	E B 28	E B 14	C	C	C	C	C	C	25
21	15	25	32	43	43	40	34	42	37	G	G	G 15	32	E B 26	E B 26	E B 53	E B 29	29	E B 16	33	B	B	B	17
22	24	28	32	27	42	44	34	34	24	E B 14	E B 15	17	31	G	28	23	E B 14	E B 12	E B 14	E B 13	B	B	B	43
23	B	B	33	31	22	20	28	39	34	B	E B 24	E B 18	E B 23	E B 24	E S 30	E S 29	E B 22	E B 18	E B 16	B	B	B	B	K 15
24	31	36	39	43	44	72	59	66	50	38	20	20	25	22	G	G	43	13	E B 12	17	B	20	15	35
25	71	68	43	62	50	39	34	30	E B 13	24	32	G	28	G	G	23	28	E B 13	31	E B 13	B	26	B	24
26	22	28	28	32	50	44	38	42	52	42	G	G	31	G	24	23	E B 19	E B 20	E B 18	18	B	41	38	38
27	33	33	30	31	29	22	E B 12	K 14	24	G	20	G	42	G 18	G	G	E B 13	E B 13	25	39	39	40	44	43
28	44	77	71	45	51	57	42	B	33	31	E B 16	G	G 17	22	20	E B 15	17	E B 20	E B 15	B	B	32	S 24	33
29	36	40	43	45	44	33	31	26	29	E B 12	33	E B 22	G 27	G	G	31	30	28	E B 12	E B 12	16	31	30	34
30	33	38	36	S 27	K 15	K 15	E S 15	E S 14	24	27	25	26	G	26	21	34	16	E B 14	E B 12	B	18	24	22	20
31	28	33	44	40	43	42	27	30	39	43	36	28	28	23	G	G	23	35	15	B	B	36	B	29
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	26	25	24	27	23	22	24	27	26	28	28	30	28	26	21	17	18	22	30
MED	38	40	40	43	43	40	38	36	33	27	24	E G 20	26	E G 22	E G 20	E G 24	E B 20	E B 18	E B 16	E B 18	18	32	34	34
U Q	49	56	44	54	46	44	42	41	42	35	32	E B 27	E B 34	E 28	E 29	29	E B 27	28	23	30	40	40	38	42
L Q	28	33	32	32	32	33	30	28	26	E B 21	G	G	E B 24	G	G	G	G	E B 14	E B 14	E B 13	E B 13	26	30	27

MAY 2015 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2015 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	11	12	12	12	12	12	12	18	27	19	23	24	21	22	20	18	12	12	12	14	12	B	B	14
2	13	13	12	12	13	13	14	13	12	13	20	20	14	20	18	14	14	14	14	12	12	13	12	11
3	12	19	18	16	19	20	B	B	20	31	B	B	58	28	18	26	23	40	22	18	14	B	21	14
4	12	12	11	13	17	23	16	12	12	12	14	14	18	21	19	12	13	12	13	B	B	B	B	12
5	13	12	12	13	14	14	14	14	14	18	23	28	E S 53	54	25	B	53	56	23	17	14	13	12	11
6	12	14	15	B	21	B	30	20	13	B	39	21	20	20	38	26	41	B	23	13	20	14	12	15
7	12	12	12	14	15	15	12	12	14	12	15	15	14	20	16	12	12	17	14	13	13	B	12	12
8	11	11	13	17	20	13	23	17	21	15	21	15	17	16	16	28	20	15	15	13	18	B	12	12
9	13	14	20	13	12	12	12	13	13	14	23	15	16	21	14	12	13	13	12	11	12	B	12	11
10	14	15	14	13	12	12	12	12	11	B	B	37	24	15	18	21	27	26	B	21	15	14	13	12
11	12	14	12	12	13	B	B	B	21	B	29	B	B	B	28	27	38	14	B	13	13	17	14	15
12	28	11	22	12	12	13	17	B	B	B	B	B	C	C	C	B	20	14	B	13	13	20	13	13
13	13	15	14	16	18	B	22	17	22	B	B	B	B	E S 30	B	E S 30	21	12	16	15	12	14	18	14
14	13	19	B	15	16	14	B	B	B	B	B	B	B	B	56	38	25	20	20	B	B	B	B	B
15	13	12	27	14	B	19	13	B	B	26	B	B	52	B	B	B	B	B	39	B	B	14	13	12
16	12	12	12	18	15	B	22	19	16	20	B	25	56	E S 56	E S 30	13	17	16	20	B	B	B	11	12
17	12	14	23	14	E S 29	28	B	22	12	19	B	B	59	E S 30	E S 30	16	16	14	B	17	13	B	12	13
18	12	12	12	13	11	17	B	12	13	16	19	20	20	16	17	14	22	E S 30	37	B	B	13	15	12
19	14	13	14	12	12	B	B	14	17	30	20	29	24	26	20	22	17	12	12	12	13	11	11	12
20	12	12	15	13	13	24	13	B	B	B	B	29	30	38	32	28	14	C	C	C	C	C	C	12
21	12	11	13	13	14	14	13	14	12	13	12	13	15	26	26	53	29	20	16	13	B	B	B	12
22	12	12	10	11	14	12	13	13	12	14	15	14	17	16	11	14	14	12	14	13	B	B	B	23
23	B	B	20	15	15	14	15	14	14	B	24	18	23	24	E S 30	E S 29	22	18	16	B	B	B	B	12
24	12	16	11	13	12	19	15	14	13	13	12	12	12	14	12	11	12	10	12	9	B	12	11	14
25	13	12	12	16	14	12	12	12	13	11	13	12	12	13	12	12	12	13	13	13	B	12	B	12
26	13	12	11	11	13	13	13	12	12	12	12	12	12	12	12	12	19	20	18	12	B	12	12	12
27	12	12	12	12	12	12	13	12	12	12	12	14	13	13	13	12	13	13	11	11	14	14	12	15
28	13	13	13	12	14	12	29	B	22	15	16	15	12	12	12	15	14	20	15	B	B	12	14	13
29	13	11	13	12	12	12	12	13	12	12	13	21	19	14	13	12	14	11	12	12	13	12	12	12
30	12	12	12	12	12	12	E S 15	E S 14	13	13	11	12	13	12	13	13	11	14	12	B	12	15	14	12
31	12	12	12	12	12	12	11	12	12	12	12	12	12	12	12	12	12	12	12	B	B	11	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	30	30	30	31	31	30	30	30	30	30	30	31
MED	12	12	13	13	14	14	15	14	13	16	21	20	19	19	17	15	17	14	16	14	16	14	13	12
U Q	13	14	15	15	16	B 23	B 29	B 22	21	B	B	B 37	52	30	30	28	23	20	23	B	B	B	B	14
L Q	12	12	12	12	12	12	13	12	12	13	13	14	14	14	13	12	13	12	12	13	13	13	12	12

MAY 2015 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2015 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	F	202	A	222	E A 352	E A 362	A 226	A	A	116	Q 220	212	212	224	204	194	186	Q 194	Q 202	B 242	216	B	B	E B 286
2	194	E A 318	A	A	A 220	240	220	228	Q 274	104	A 222	222	214	108	204	108	Q 186	196	Q 196	Q 202	222	E B 240	A	A
3	194	A	A	A	A	A	B	B	A	E B 270	B	B	242	218	200	198	198	260	210	222	238	B	A	A
4	A	A	A	A 258	A	A	A	A	Q 288	E A 236	218	216	200	224	194	188	Q 188	Q 218	Q 218	B	B	B	B	A
5	A	A	216	162	A	A 342	Q 298	E B 298	E B 288	236	E B 230	250	230	230	210	B	238	272	210	222	A	A	A	A
6	216	A	A	B	A	B	A	A	A	B	B	E A 276	256	256	228	274	272	B	A	A	A	A	A	A
7	222	204	A	E A 240	A	198	216	E A	Q 298	220	E A 246	E A 224	E A 226	214	200	192	188	200	204	204	E B 262	B	E B 276	E A 276
8	A	222	262	A	A	A	A	A	A	E S 276	218	222	196	202	204	214	206	206	Q 206	206	238	B	A	A
9	A	A	A	A	A	A	230	A	220	E A 260	218	200	200	192	200	190	Q 180	204	Q 196	Q 212	212	B	A	260
10	E A 256	A	A	A	A	244	A	214	224	B	B	B	240	E A 248	232	200	240	218	B	E B 266	E A 306	A	A	A
11	A	A	A	A	A	B	B	B	A	B	A	B	B	B	E B 248	228	E B 256	292	B	A	A	A	A	A
12	B	A	212	212	248	A	A	B	B	B	B	B	C	C	C	B	Q 260	Q 250	B	A	A	A	A	A
13	A	194	220	238	A	B	A	A	A	B	B	B	B	S	B	S	262	A	A	A	A	A	A	A
14	A	A	B	A	A	A	B	B	B	B	B	B	B	B	238	E B 220	E B 204	236	222	B	B	B	B	B
15	A	A	A	A	B	A	A	B	B	B	B	B	E B 258	B	B	B	B	B	268	B	B	A	A	202
16	A	A	A	A	A	B	A	A	A	E A 242	B	E B 230	E B 230	E S 230	S 204	Q 204	Q 212	230	230	B	B	B	A	A
17	A	A	A	A	A	A	B	A	A	B	B	B	E B 230	210	216	198	190	234	B	214	E B 282	B	A	A
18	A	E A 248	E A 292	A	A	B	B	E A 340	E B 336	B 266	E B 238	220	202	194	Q 222	236	192	E S 232	E B 262	B	B	A	E A 280	218
19	A	A	A	A	A	B	B	A	A	A	E B 258	E B 258	E B 222	E B 240	228	228	230	220	202	E B 274	E B 244	A	A	A
20	A	A	A	A	A	A	A	B	B	B	B	234	216	224	224	234	224	C	C	C	C	C	C	A
21	Y	A	A	A	A	A	A		218	208	208	208	200	212	212	236	212	212	212	A	B	B	B	Y
22	A	216	A 284	284	A	A	A	216	236	Q 254	212	198	198	198	188	188	188	210	222	E B 218	B	B	B	A
23	B	B	A	A	A	R	A	A	A	B	218	202	202	204	E S 222	196	224	E B 244	E B 220	B	B	B	B	A
24	A	A	214	A	A	A	A	A	A	A	216	A 206	206	Q 186	198	Q 188	Q 210	206	228	E A 284	B	A	A	A
25	A	200	A	A	A	A	A	Q 302	256	E A 250	A 230	E B 218	200	194	194	194	186	E B 226	Q 218	E B 230	B	A 230	B	A
26	A	A	A	A	A	A	A	A	A	A	Q 224	Q 196	Q 196	Q 210	Q 210	Q 196	206	250	B 238	Y	B	Q 218	A	A
27	A	A	A	A	A	A	E B 340	E A 340	E A 302	E B 256	Q 218	212	188	198	Q 226	198	Q 186	216	Q 238	A 272	A	A	A	A
28	A	A	A	A	A	A	A	B	A	E A 262	224	226	222	216	216	216	216	216	216	B	B	A	A	A
29	A	224	236	208	A	A	Q 302	A	A 292	E B 256	E A 250	232	208	198	204	194	Q 218	206	E B 270	E B 242	E A 232	A	A	A
30	242	A	A	218	A	218	E S 336	E S 314	E A 292	A 256	E A 220	Q 208	192	Q 192	Q 190	Q 190	Q 200	222	Q 194	B	Y	A	A	A
31		A	A	A	A	A	A	A	E A 284	E A 304	210	Q 196	Q 202	Q 192	Q 186	Q 196	Q 196	Q 224	204	B	B	A	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	6	9	8	9	3	6	8	8	14	18	20	23	27	26	28	27	30	27	24	15	10	3	2	5
MED	212	209	223	220	U 234	236	U 244	U 258	U 258	E 255	219	213	204	205	206	197	206	218	214	214	U 226	224	E 278	U 231
U Q	242	E A 236	A 273	A 249	E A 352	A 342	E 319	E A 327	292	E 262	E 230	230	230	224	223	220	224	236	229	E 266	E B 262	E B 240		E 281
L Q	194	201	215	210	A 220	218	223	222	236	236	218	206	200	194	200	192	188	206	Q 204	212	222	Q 218		210

MAY 2015 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2015 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	42	41	A	A	A	O X 42	A	A	B	B	B	69	X 63	B	B	B	B	B	B	B	B	41	58
2	A	A	34	O X 39	39	O X 36	O X 48	O X 59	R	R	X 39	58	69	68	61	44	35	43	B	O X 22	A	B	O X 22	Y
3	A	A	34	X 36	52	44	52	52	Y	51	43	X 62	69	X 74	70	O X 41	O X 34	O X 29	B	A	B	A	B	B
4	A	A	A	A	A	O X 36	54	A	A	O X 26	X 47	X 57	X 67	X 70	X 50	X 41	34	35	A	A	A	A	B	B
5	R	R	A	A	A	59	A	X 53	R	A	X 46	X 58	X 64	X 61	X 56	X 44	X 27	X 30	B	X 22	A	S	A	X 21
6	A	A	B	O X 24	S	S	A	A	43	48	65	X 63	X 62	X 76	X 65	X 50	X 47	X 34	O X 30	R	A	Y	B	Y
7	64	A	S	A	A	43	44	S	44	B	B	X 52	84	87	75	68	52	43	43	34	O X 23	B	B	A
8	59	77	70	71	42	A	A	A	A	A	B	B	B	O X 48	88	66	61	X 40	R	R	A	A	A	B
9	A	A	B	R	A	R	B	B	B	B	B	B	B	B	B	S	B	S	39	S	A	69	A	A
10	A	A	B	B	B	B	A	A	X 32	B	B	B	B	B	B	B	B	B	B	A	B	A	A	A
11	A	A	A	A	A	B	A	B	B	A	X 42	B	B	74	69	X 66	X 51	O X 42	X 35	30	A	X 21	A	A
12	A	A	A	A	A	A	A	A	A	B	B	X 56	68	79	64	48	S	S	S	S	O X 24	B	O X 24	O X 22
13	S	A	A	40	64	B	A	44	S	B	B	S	72	B	O X 72	B	R	B	B	B	B	A	B	B
14	A	A	A	41	B	A	A	54	A	A	R	B	B	B	B	B	B	B	B	B	B	A	A	X 34
15	A	A	A	A	A	A	A	A	B	A	O X 32	X 46	B	B	O X 71	B	B	B	B	A	A	A	X 36	A
16	A	A	A	A	B	B	A	A	A	B	B	B	B	B	O X 48	B	B	B	B	B	R	A	O X 24	A
17	O X 24	A	A	57	A	88	B	B	70	A	B	B	B	B	B	B	B	O X 70	R	A	R	A	A	A
18	A	A	A	A	60	A	B	B	A	B	44	B	R	O X 65	70	X 57	46	X 41	B	B	A	B	B	B
19	B	B	R	R	A	B	A	A	A	A	41	O X 47	O X 51	O X 49	X 65	O X 50	B	B	B	B	B	B	B	Y
20	B	O X 22	O X 22	R	B	A	S	38	S	B	O X 40	61	X 56	X 56	60	X 39	S	O X 28	O X 27	B	B	B	B	B
21	B	O X 22	Y	O X 39	36	34	34	36	37	S	41	S	X 52	67	48	53	R	R	A	B	B	B	B	B
22	B	A	B	B	B	B	B	B	O X 65	O X 75	B	B	B	B	B	B	B	B	B	B	B	B	B	B
23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B
24	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	A
25	A	A	A	A	A	64	A	A	X 38	X 36	56	B	B	B	86	B	B	B	A	A	A	X 31	A	A
26	B	A	A	A	B	B	B	B	B	B	B	O X 39	B	B	B	B	B	B	B	B	B	B	B	B
27	R	A	A	A	B	B	A	B	O X 23	O X 27	X 31	B	B	B	B	B	B	B	B	B	B	B	B	B
28	B	A	70	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
29	A	A	A	R	A	A	A	37	35	35	O X 38	B	O X 57	B	B	B	B	B	B	B	B	A	B	B
30	B	B	A	A	B	A	55	B	B	B	B	B	O X 52	59	O X 48	O X 36	O X 31	Y	Y	B	B	Y	A	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	3	4	6	8	6	8	7	8	9	7	14	11	14	15	18	14	10	11	5	4	2	3	5	4
MED	59	32	38	40	47	44	48	48	38	X 36	X 42	X 57	X 66	X 67	65	X 49	40	X 40	X 35	26	O X 24	X 31	O X 24	X 28
U Q	64	60	70	49	60	62	54	X 54	54	51	46	X 61	69	74	71	57	51	43	41	32		69	38	46
L Q	O X 24	O X 22	34	O X 38	39	O X 36	42	38	X 34	O X 27	X 39	O X 47	X 56	X 59	X 56	X 41	X 34	O X 30	O X 28	X 22		X 21	O X 23	X 22

JUN. 2015 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2015 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT.69°00.4'S LON.039°35.4'E kSWEEP 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	R 36	A	A	B	B	B	F 58	57	B	B	B	B	B	B	B	B	A	A
2	A	A	F 24	R 33	A	R 30	R 42	53	R	R	33	F 46	F 54	F 56	Z 51	F 30	F 24	F 33	B	R 16	A	B	R 16	Y
3	A	A	F 23	30	F 26	F 27	F 28	F 28	Y	F 20	F 30	56	F 59	68	F 57	35	28	R 23	B	A	B	A	B	B
4	A	A	A	A	A	R 30	A	A	A	20	41	J R 51	61	64	44	35	F 24	F 22	A	A	A	A	B	B
5	R	A	A	A	A	29	A	47	A	A	40	52	58	55	50	38	21	24	B	16	A	A	A	15
6	A	A	B	R 18	U S 18	S	A	A	A	F 21	F 31	S 57	56	70	59	44	41	28	24	R	A	Y	B	Y
7	S	A	S	A	A	F 23	F 22	S 22	F 22	B	B	J R 46	F 66	F 68	F 55	F 43	F 37	F 26	F 27	F 21	R 17	B	B	A
8	F 21	F	F 29	29	F 20	A	A	A	A	A	B	B	B	42	F 66	F 52	Z 51	34	A	A	A	A	A	B
9	A	A	B	A	A	A	B	B	B	B	B	B	B	B	B	S 45	B	S 24	F 26	S 22	A	A	A	A
10	A	A	B	B	B	B	A	A	26	B	B	B	B	B	B	B	B	B	B	A	B	A	A	A
11	A	A	A	A	A	B	A	B	B	A	36	B	B	F 59	F 59	60	45	36	29	F 18	A	J R 15	A	A
12	A	A	A	A	A	A	A	A	A	B	B	50	F 56	F 67	F 53	F 37	S	S	S 23	20	18	B	R 18	R 16
13	A	A	A	F 28	F 23	B	A	F 30	S	B	B	S 44	F 53	B	R 66	B	R 38	B	B	B	B	A	B	B
14	A	A	A	F 18	B	A	A	F 30	A	A	R	B	B	B	B	B	B	B	B	B	B	A	A	28
15	A	A	A	A	A	A	A	A	B	A	S 26	40	B	B	65	B	B	B	B	A	A	A	30	A
16	A	A	A	A	B	B	A	A	A	B	B	B	B	B	42	B	B	B	B	B	R	A	18	A
17	R 18	A	A	A	A	A	B	B	A	A	B	B	B	B	B	B	B	64	R	A	R	A	A	A
18	A	A	A	A	A	A	B	B	A	B	F 29	B	R	R 59	F 58	51	F 36	35	B	B	A	B	B	B
19	B	B	R	R	A	B	A	A	A	A	R 32	41	R 45	R 43	59	44	B	B	B	B	B	B	B	Y
20	B	R 16	R 16	R	B	A	U S 20	S 22	S	B	34	F 48	50	50	F 47	33	S	U S 22	S 21	B	B	B	B	B
21	B	R 16	Y	R 116	F 24	F 25	F 24	F 21	F 21	F 18	F 27	S 44	S 46	F 59	F 40	F 41	R	A	A	B	B	B	B	B
22	B	A	B	B	B	B	B	B	R 59	69	B	B	B	B	B	B	B	B	B	B	B	B	B	B
23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B
24	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
25	A	A	A	A	A	A	A	A	32	30	F 29	B	B	B	F 70	B	B	B	A	A	A	J R 25	A	A
26	B	A	A	A	B	B	B	B	B	B	B	33	B	B	B	B	B	B	B	B	B	B	B	B
27	R	A	A	A	B	B	A	B	17	R 21	25	B	B	B	B	B	B	B	B	B	B	B	B	B
28	B	A	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
29	A	A	A	R	A	A	A	F 25	F 26	F 22	R 32	B	51	B	B	B	B	B	B	B	B	A	B	B
30	B	B	A	A	B	A	R 35	B	B	B	B	B	R 46	F 47	R 42	30	25	Y	Y	B	B	Y	A	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	2	2	4	7	5	6	7	9	7	8	14	13	14	15	18	15	11	12	6	6	2	2	4	3
MED	20	R 16	F 24	29	F 23	28	28	F 28	26	21	32	46	55	59	56	41	36	27	25	19	18	J R 20	18	16
U Q			F 26	R 33	F 25	R 30	R 36	38	32	26	34	52	F 58	67	F 59	45	41	34	27	21			24	28
L Q			20	18	19	F 25	22	S 22	21	F 20	29	42	50	50	47	35	F 24	24	S 23	16			17	15

JUN. 2015 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2015 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	28	31	34	82	57	56	43	77	42	B	B	B	G	16	B	B	B	B	B	B	B	B	32	41
2	34	30	46	36	36	43	E B 28	32	44	38	E B 15	E B 18	E B 21	25	30	28	16	E B 14	B	E B 13	29	B	E B 13	17
3	28	31	41	43	40	32	21	18	21	28	32	52	33	73	E B 19	E B 24	E B 19	E B 15	B	35	B	40	B	B
4	32	71	44	43	30	25	43	70	59	21	E B 14	22	G	43	25	25	29	33	31	36	29	28	B	B
5	21	29	34	57	90	60	32	30	47	58	49	70	G	17	G	33	38	32	B	E B 12	24	S 21	45	34
6	27	33	B	22	22	35	S 44	43	32	E B 14	26	28	22	48	57	28	21	E B 18	17	22	32	20	B	16
7	S 25	35	32	70	64	S 28	22	S 25	E B 13	B	B	43	39	36	36	30	29	19	21	71	E B 14	B	B	31
8	44	78	70	38	68	45	53	50	42	72	B	B	B	E B 27	E B 26	29	20	36	36	31	89	93	42	B
9	79	48	B	35	64	34	B	B	B	B	B	B	B	B	B	E S 25	B	16	23	S 24	37	40	S 44	40
10	37	41	B	B	B	B	34	48	27	B	B	B	B	B	B	B	B	B	B	28	B	27	38	36
11	42	76	49	41	53	B	36	B	B	36	31	B	B	E B 23	G	E B 21	E B 24	E B 17	E B 21	E B 13	36	28	29	34
12	38	38	44	51	47	41	48	42	38	B	B	E B 23	E B 18	E B 24	G	E B 15	E B 20	32	E B 14	23	20	B	22	S 23
13	33	41	42	43	59	B	44	34	34	B	B	E S 34	E B 26	B	E B 62	B	E B 29	B	B	B	B	36	B	B
14	43	41	43	31	B	50	35	70	48	41	31	B	B	B	B	B	B	B	B	B	B	33	32	38
15	89	60	46	45	43	42	32	44	B	32	30	S	B	B	E B 56	B	B	B	B	35	42	30	51	43
16	42	42	48	42	73	B	49	49	48	B	B	B	B	B	E B 30	B	B	B	B	B	26	36	30	30
17	32	44	38	40	52	71	B	B	58	39	B	B	B	B	B	B	B	E B 56	26	36	22	44	43	41
18	38	37	56	36	36	77	B	B	42	B	E B 18	B	E B 33	E B 49	E B 31	56	K 18	K 16	B	B	32	B	B	B
19	B	B	21	23	69	B	40	37	43	40	E B 25	E S 28	E B 22	E B 22	E B 29	E B 28	B	B	B	B	B	B	B	17
20	B	K 14	16	16	B	32	S 22	23	E S 23	B	29	29	E B 20	E B 16	E B 16	E B 15	E B 18	E B 14	E B 14	B	B	B	B	B
21	B	E B 12	17	E B 26	33	21	18	E B 16	E B 12	29	E B 13	18	16	24	G	24	26	31	37	B	B	B	B	B
22	B	37	B	B	B	B	B	B	E B 52	E B 30	B	B	B	B	B	B	B	B	B	B	B	B	B	B
23	B	B	B	B	B	B	B	80	B	B	B	B	B	B	B	B	B	B	B	B	B	33	B	B
24	B	B	30	94	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	26	25
25	30	34	39	30	28	42	48	44	S 25	30	35	B	B	B	E B 27	B	B	B	46	36	43	28	40	76
26	B	28	41	69	B	B	B	B	B	B	B	E B 21	B	B	B	B	B	B	B	B	B	B	B	B
27	K 23	34	35	35	B	B	35	B	K 16	27	E B 13	B	B	B	B	B	B	B	B	B	B	B	B	B
28	B	34	42	43	86	43	B	36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	30	40
29	52	38	35	K 28	39	43	43	26	20	20	K 18	B	E B 22	B	B	B	B	B	B	B	B	39	B	B
30	B	B	33	61	B	31	E B 29	B	B	B	B	B	E B 23	31	E B 23	E B 15	E B 18	18	20	B	B	15	32	37
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	26	25	27	21	20	22	21	22	16	15	12	15	15	18	15	14	15	12	14	14	17	16	18
MED	34	37	41	41	52	42	36	42	38	31	26	27	E B 22	24	E B 26	25	20	18	22	30	30	33	32	35
U Q	42	42	45	51	66	48	44	50	47	40	31	38	26	43	E B 31	29	29	32	34	36	37	40	42	40
L Q	28	31	34	31	36	32	29	28	23	28	E B 15	22	G 16	22	G	E B 21	18	E B 16	18	E B 22	24	28	30	25

JUN. 2015 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2015 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	11	11	11	13	15	16	15	22	16	B	B	B	17	11	B	B	B	B	B	B	B	B	12	12
2	11	10	12	14	12	19	28	16	13	14	15	18	21	14	13	13	12	12	B	12	12	B	13	13
3	11	11	12	12	12	12	12	12	12	15	13	13	13	12	19	24	19	15	B	20	B	15	B	B
4	11	12	12	12	12	13	14	13	12	12	14	13	13	12	12	12	12	12	11	12	11	12	B	B
5	14	11	12	13	10	12	13	11	12	13	14	14	13	13	11	12	10	11	B	12	12	12	12	12
6	12	11	B	11	13	12	13	16	15	14	13	12	12	12	12	12	11	18	15	14	13	12	B	12
7	12	11	12	12	11	14	12	13	13	B	B	21	16	12	11	12	12	13	12	14	14	B	B	12
8	12	12	13	13	12	19	16	23	24	18	B	B	B	26	26	14	14	18	11	11	20	14	12	B
9	14	23	B	20	19	12	B	B	B	B	B	B	B	B	B	25	B	12	12	11	12	11	13	23
10	20	13	B	B	B	B	24	15	14	B	B	B	B	B	B	B	B	B	B	12	B	11	12	25
11	12	13	21	22	19	B	18	B	B	16	19	B	B	22	16	21	24	17	21	13	12	12	11	12
12	12	12	22	20	13	22	25	25	25	B	B	23	18	24	13	15	20	13	12	13	12	B	13	11
13	12	12	12	14	12	B	13	12	11	B	B	34	E S 26	B	62	B	29	B	B	B	B	13	B	B
14	14	19	17	12	B	21	12	13	22	25	24	B	B	B	B	B	B	B	B	B	B	12	12	12
15	11	11	12	15	17	15	16	20	B	18	15	13	B	B	56	B	B	B	B	12	12	12	13	13
16	12	12	16	12	41	B	18	16	17	B	B	B	B	B	30	B	B	B	B	B	11	12	12	12
17	10	13	12	12	16	19	B	B	27	14	B	B	B	B	B	B	B	56	17	15	12	12	11	11
18	11	12	12	12	12	16	B	B	24	B	18	B	33	49	31	14	13	12	B	B	18	B	B	B
19	B	B	13	13	26	B	16	20	20	21	25	E S 28	22	22	29	28	B	B	B	B	B	B	B	13
20	B	11	12	12	B	12	13	12	15	B	23	18	20	16	16	15	18	14	14	B	B	B	B	B
21	B	12	13	26	17	12	11	16	12	13	13	11	14	13	14	14	14	14	15	B	B	B	B	B
22	B	28	B	B	B	B	B	B	52	E S 30	B	B	B	B	B	B	B	B	B	B	B	B	B	B
23	B	B	B	B	B	B	B	54	B	B	B	B	B	B	B	B	B	B	B	B	B	24	B	B
24	B	B	23	28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19	20
25	18	20	19	18	16	19	23	17	14	11	13	B	B	B	27	B	B	B	14	14	16	14	15	14
26	B	15	15	18	B	B	B	B	B	B	B	21	B	B	B	B	B	B	B	B	B	B	B	B
27	14	19	23	19	B	B	16	B	14	12	13	B	B	B	B	B	B	B	B	B	B	B	B	B
28	B	27	14	14	15	E S 31	B	16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	16	13
29	17	16	14	24	15	16	17	13	12	12	13	B	22	B	B	B	B	B	B	B	B	18	B	B
30	B	B	19	14	B	12	29	B	B	B	B	B	23	15	23	15	18	16	14	B	B	12	12	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	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	14	12	14	14	16	19	18	18	18	U 26	B	B	B	B	30	B	B	B	B	B	B	16	18	17
U Q	B	20	B 22	20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
L Q	12	11	12	12	12	13	13	13	13	14	14	18	18	14	16	14	14	14	14	13	12	12	12	12

JUN. 2015 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2015 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	A	B	B	B	Q 220	210	B	B	B	B	B	B	B	B	A	A
2	A	A 210	216		A	A	196	A	A	A	230	218	204	194	198	Q 190	Q 224	Q 196	B	E B 262	A	B	E B 222	Y
3	A	A	A	A	A	A	A	A	A	A	Q 228	222	196	202	204	204	224	230	B	A	B	A	B	B
4	A	A	A	A	A	A	A	A	A	E A 290	220	196	196	Q 204	200	192	Q 234	210	A	A	A	A	B	B
5	A	A	A	A	A	A	A	A	A	A	234	208	208	194	190	192	232	Q 196	B	B 212	A	A	A	212
6	A	A	B	A	A	A	A	A	A	E B 276	Q 236	Q 204	196	216	202	202	220	228	216	A	A	A	B	A
7	198	A	A	A	A	E A 292	Q 260	280	304	B	B	E A 260	E A 254	Q 216	Q 196	Q 188	Q 210	Q 244	Q 236	216	B 310	B	B	A
8	A	228	208	224	208	A	208	A	A	A	B	B	B	292	234	290	286	A	A	A	A	A	A	B
9	A	A	B	A	A	A	B	B	B	B	B	B	B	B	B	206	B	E B 270	Q 240	240	A	A	208	A
10	A	A	B	B	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	202	B	A	A	A
11	A	A	A	A	A	B	A	B	B	A	A	B	B	220	226	216	224	216	246	244	A	A	A	A
12	A	A	A	A	A	A	A	A	A	B	B	212	200	222	Q 194	190	232	A	E A 242	260	E A 248	B	A	202
13	A	A	A	A	198	B	A	A	A	B	B	E S 268	E S 256	B	256	B	E B 296	B	B	B	B	A	B	B
14	A	A	A	234	B	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	A	A	220
15	A	A	A	A	A	A	A	A	B	A	S	E B 258	B	B	B	B	B	B	B	A	A	A	224	A
16	A	A	A	A	B	B	A	A	A	B	B	B	B	B	258	B	B	B	B	B	A	A	204	A
17	198	A	A	A	A	A	B	B	A	A	B	B	B	B	B	B	B	256	A	A	A	A	A	A
18	A	A	A	A	214	A	B	B	A	B	266	B	E B 244	E B 246	E B 216	194	Q 210	Q 254	B	B	A	B	B	B
19	B	B	A	A	A	B	A	A	A	A	266	E S 238	222	208	230	220	B	B	B	B	B	B	B	Y
20	B	212	A	A	B	A	A	A	A	B	S	E A 244	200	200	Q 214	Q 186	B	E B 294	220	B	B	B	B	B
21	B	E B 290	Y	E B 282	A	A	E A 334	E B 316	E B 268	E A 268	Q 224	Q 192	200	Q 204	194	Q 200	212	A	A	B	B	B	B	B
22	B	A	B	B	B	B	B	B	E B 368	E S 264	B	B	B	B	B	B	B	B	B	B	B	B	B	B
23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B
24	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
25	A	A	A	A	A	A	A	A	A	A 298	A 338	B	B	B	272	B	B	B	A	A	A	194	A	A
26	B	A	A	A	B	B	B	B	B	B	B	242	B	B	B	B	B	B	B	B	B	B	B	B
27	A	A	A	A	B	B	A	B	A	A 304	254	B	B	B	B	B	B	B	B	B	B	B	B	B
28	B	A	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
29	A	A	A	A	A	A	A	208	Q 296	322	288	B	230	B	B	B	B	B	B	B	B	A	B	B
30	B	B	A	A	B	A	E B 224	B	B	B	B	B	242	196	204	188	214	Y	A	B	B	Y	A	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	2	3	2	4	3	1	5	3	4	7	11	13	15	15	17	15	13	11	6	7	2	1	4	3
MED	198	220	209	224	208	E A 292	216	U 244	291	E A 290	236	U 209	204	206	204	194	224	223	233	U 228	279	194	210	212
U Q		E B 290		258	214		297	E B 316	336	304	266	E 251	E 242	220	232	206	233	E B 256	242	260			223	220
L Q		212		220	198		202	208	282	E 268	Q 228	206	200	200	197	190	213	Q 210	220	212			206	202

JUN. 2015 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2015 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	54	O X 53	A	42	46	38	42	X 48	X 50	X 57	54	46	32	32	32	S	B	Y	Y	A
2	A	A	44	B	X 22	A	30	X 20	O X 24	R	B	O X 47	X 61	O X 58	58	X 32	A	O X 26	O X 22	B	B	A	Y	B
3	B	B	A	B	30	40	42	41	36	31	41	52	X 50	R	X 49	X 40	X 26	B	A	A	B	B	B	A
4	A	A	A	A	50	53	64	53	O X 48	67	54	X 52	X 61	X 58	X 60	X 57	X 38	X 35	A	A	A	A	91	A
5	59	A	A	A	B	A	A	R	B	B	B	B	B	B	O X 49	B	O X 40	B	R	B	R	A	A	A
6	A	A	A	B	A	B	B	46	B	B	B	B	B	B	O X 67	B	B	B	B	Y	B	R	R	A
7	A	R	R	A	A	A	34	40	39	O X 28	50	O X 49	67	76	76	74	R	X 27	X 36	R	R	B	Y	A
8	43	A	A	A	A	A	A	A	A	A	X 41	58	72	B	78	X 60	X 43	O X 31	B	B	B	O X 35	32	A
9	A	A	A	O X 33	O X 26	X 28	X 29	B	A	A	52	63	64	67	73	60	41	X 40	O X 35	B	B	B	A	A
10	53	X 32	A	A	A	A	A	A	O X 38	41	45	58	68	65	69	X 62	X 32	41	B	Y	R	R	Y	R
11	A	X 40	X 59	X 83	A	58	B	A	B	A	O X 48	B	B	71	64	B	73	B	X 42	R	A	A	A	69
12	A	A	A	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
13	A	A	B	A	B	B	A	A	B	B	B	B	B	O X 45	77	X 71	73	R	O X 44	54	A	70	A	R
14	A	54	A	A	B	B	A	A	B	R	B	B	B	B	X 50	X 40	X 35	O X 33	B	B	B	B	B	A
15	O X 23	A	73	43	R	35	47	42	A	41	O X 49	O X 50	69	64	X 65	O X 56	B	X 31	O X 33	B	B	B	A	A
16	A	A	A	50	A	B	B	O X 34	X 32	B	B	O X 46	X 57	B	B	B	B	B	O X 25	B	B	B	B	B
17	A	A	58	A	A	A	A	A	A	A	X 41	B	B	X 64	O X 53	X 50	X 48	B	B	B	B	B	B	B
18	B	Y	O X 26	S	S	A	X 27	32	S	S	S	O X 49	X 59	48	B	X 62	X 35	R	S	S	B	B	Y	A
19	O X 32	A	A	A	A	A	A	R	R	R	X 42	O X 48	68	X 58	X 57	B	X 34	R	O X 25	A	A	R	B	B
20	Y	A	A	A	A	A	42	X 52	52	40	O X 41	O X 49	X 67	X 52	O X 56	X 63	B	X 30	B	A	A	A	R	B
21	A	A	53	70	53	56	57	A	B	70	52	O X 42	B	X 63	76	70	70	O X 44	B	B	B	A	A	A
22	A	A	X 33	O X 34	65	65	A	38	35	35	R	O X 50	X 50	X 63	X 70	X 56	O X 42	X 42	R	B	B	43	X 39	A
23	A	58	O X 40	A	A	B	A	A	B	B	B	B	B	O X 41	B	B	O X 36	B	B	B	B	R	A	A
24	60	O X 34	A	B	A	A	A	A	R	O X 29	B	R	X 50	X 46	X 53	X 52	38	B	B	A	R	B	R	A
25	A	A	A	A	B	B	A	A	X 28	X 31	X 42	X 42	B	B	B	B	B	B	B	B	B	B	B	A
26	X 34	X 31	A	A	B	A	B	A	B	B	B	X 49	X 56	B	B	B	B	O X 42	O X 36	B	B	B	B	B
27	A	A	A	A	61	A	57	A 57	38	41	O X 42	B	B	X 64	82	B	B	B	O X 34	R	A	A	A	A
28	X 37	A	58	A	A	A	A	A	B	B	B	B	B	X 65	B	B	B	B	B	B	B	A	O X 27	A
29	A	A	A	A	A	A	49	A	R	A	52	X 55	X 62	X 66	V 74	X 47	B	B	B	B	B	B	A	30
30	A	A	A	A	58	A	A	A	X 34	X 36	B	X 57	67	65	65	X 58	X 47	O X 38	B	B	A	30	72	A
31	A	A	A	A	A	A	A	A	A	X 38	O X 42	X 52	X 54	X 63	X 64	X 64	X 53	X 47	52	R	85	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	8	6	9	6	9	8	11	12	12	14	17	20	19	22	24	20	19	15	12	1	1	4	5	2
MED	40	X 37	53	46	53	53	42	42	37	38	X 42	X 50	X 61	X 63	64	X 58	X 40	X 35	O X 34	54	85	39	39	50
U Q	56	54	58	70	60	57	57	49	42	41	51	54	67	65	74	X 62	48	X 42	X 39			56	82	
L Q	O X 33	X 32	O X 36	O X 34	X 28	38	X 30	36	X 33	X 31	X 42	O X 48	X 54	X 57	X 55	X 48	X 35	X 31	O X 28			32	30	

JUL. 2015 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2015 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	29	47	A	F 26	F 28	F 24	F 30	42	44	51	F 42	F 39	F 19	F 21	F 21	S	B	Y	Y	A
2	A	A	A	B	J R 16	A	F 16	14	R 18	R	B	41	R 55	R 52	F 42	26	A	R 20	16	B	B	A	Y	B
3	B	B	A	B	R	F 14	F 24	F 25	F 14	F 17	F 28	46	44	R	43	34	20	B	A	A	B	B	B	A
4	A	A	A	A	F 38	F 44	F 54	F 43	R 42	19	F 28	46	55	52	54	51	32	29	A	A	A	A	F	A
5	F 29	A	A	A	B	A	A	A	B	B	B	B	B	B	42	B	R 34	B	R	B	R	A	A	A
6	A	A	A	B	A	B	B	F 36	B	B	B	B	B	B	60	B	B	B	B	Y	B	R	A	A
7	A	A	A	A	A	A	F 24	F 24	F 22	U S 22	F 30	R 43	F 52	F 58	F 67	F 64	R	21	30	A	R	B	Y	A
8	F 31	A	A	A	A	A	A	A	A	A	35	F 43	F 60	B	F 69	54	37	R 25	B	B	B	R 29	F 20	A
9	A	A	A	R 27	20	22	23	B	A	A	F 36	F 49	F 52	F 55	F 53	F 38	F 28	34	29	B	B	B	A	A
10	F 31	26	A	A	A	A	A	A	R 32	F 32	F 36	Z 52	F 54	F 50	F 57	56	26	F 30	B	Y	A	A	Y	R
11	A	34	53	77	A	F 23	B	A	B	A	42	B	B	F 62	F 53	B	F 62	B	36	R	A	A	A	A
12	A	A	A	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
13	A	A	B	A	B	B	A	A	B	B	B	B	B	39	F 67	65	F 64	R	R 38	R	A	A	A	R
14	A	A	A	A	B	B	A	A	B	R	B	B	B	B	44	34	29	27	B	B	B	B	B	A
15	17	A	A	F 34	A	F 24	F 29	F 26	A	F 23	43	R 44	F 52	F 52	59	R 50	B	25	27	B	B	B	A	A
16	A	A	A	A	A	B	B	R 28	26	B	B	R 40	51	B	B	B	B	B	19	B	B	B	B	B
17	A	A	A	A	A	A	A	A	A	A	35	B	B	58	R 47	44	42	B	B	B	B	B	B	B
18	B	Y	R 20	S	S	A	21	F 21	S	S	S	43	53	F 38	B	56	29	A	S	S	B	B	Y	A
19	R 26	A	A	A	A	A	A	R	A	A	36	42	F 58	52	J R 51	B	28	R	19	A	A	A	B	B
20	Y	A	A	A	A	A	F 29	46	F 31	F 20	R 35	43	61	46	50	57	B	24	B	A	A	A	A	B
21	A	A	A	A	A	18	R 24	A	B	21	F 28	R 36	B	57	F 57	F 56	F 43	R 38	B	B	B	A	A	A
22	A	A	27	R 28	A	A	A	F 28	F 24	F 25	R	44	44	57	64	50	R 36	36	R	B	B	A	33	A
23	A	A	34	A	A	B	A	A	B	B	B	B	B	R 35	B	B	R 30	B	B	B	B	R	A	A
24	F 25	R 28	A	B	A	A	A	A	A	23	B	R	43	40	U R 47	46	F 28	B	B	A	R	B	R	A
25	A	A	A	A	B	B	A	A	22	25	36	J R 36	B	B	B	B	B	B	B	B	B	B	B	A
26	28	25	A	A	B	A	B	A	B	B	B	43	50	B	B	B	B	R 36	R 30	B	B	B	B	B
27	A	A	A	A	29	A	F 24	A	F 26	F 30	36	B	B	58	F 67	B	B	B	R 28	A	A	A	A	A
28	30	A	A	A	A	A	A	A	B	B	B	B	B	59	B	B	B	B	B	B	B	A	R 21	A
29	A	A	A	A	A	A	A	A	A	A	F 42	49	56	60	V 68	41	B	B	B	B	B	B	A	F
30	A	A	A	A	A	A	A	A	28	30	B	J R 51	F 56	F 54	F 55	52	41	32	B	B	A	F 16	A	A
31	A	A	A	A	A	A	A	A	A	32	R 36	46	48	57	58	58	47	41	F 29	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	8	4	4	4	5	7	10	11	12	14	17	20	19	22	24	20	19	15	12			2	3	
MED	28	27	30	31	29	F 23	F 24	F 26	26	24	36	43	52	53	54	50	32	29	28			22	21	
U Q	F 30	31	44	56	34	44	F 29	F 36	30	30	36	46	F 56	58	F 62	56	F 42	36	30				33	
L Q	26	26	24	R 28	18	18	23	F 24	22	21	F 30	42	48	50	47	40	28	24	20				F 20	

JUL. 2015 foF2 (0.1MHz)

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2015 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	43	45	44	42	42	E B 32	52	40	23	K 15	18	18	24	G	G	E B 14	16	E B 12	21	S 26	B	19	21	40
2	34	38	33	B	18	42	59	30	32	21	B	E B 24	33	30	E B 19	42	33	E B 14	E B 13	B	B	31	15	B
3	B	B	30	B	26	E B 12	27	30	24	E B 11	E B 11	E B 12	G	E B 28	E B 17	E B 13	20	B	32	37	B	B	B	35
4	35	40	37	32	70	30	34	34	33	E B 12	E B 12	23	23	22	40	21	E B 12	30	27	31	29	42	132	50
5	53	70	60	40	B	46	36	38	B	B	B	B	B	B	E B 26	B	E B 19	B	30	B	21	40	40	40
6	64	42	42	B	44	B	B	40	B	B	B	B	B	B	E B 52	B	B	B	B	21	B	E B 28	36	41
7	30	32	34	38	38	39	34	34	28	S 22	E B 14	31	40	32	E B 32	32	28	25	E B 14	32	29	B	18	32
8	42	44	42	44	42	70	43	34	32	41	34	29	E B 54	B	E B 23	E B 19	E B 17	E B 19	B	B	B	36	37	37
9	44	43	43	36	29	29	32	B	32	33	G 22	30	E B 22	E B 18	18	E B 14	18	38	36	B	B	B	32	38
10	34	38	38	40	43	44	40	47	42	38	40	33	29	G	G	24	E B 16	E B 15	B	21	33	32	18	15
11	42	44	72	56	58	35	64	56	B	56	50	B	B	E B 22	E B 18	B	E B 20	B	E B 20	23	38	36	50	44
12	50	45	40	B	42	B	44	52	B	B	B	B	B	B	B	B	B	B	B	B	32	35	32	44
13	82	43	B	38	B	B	49	50	B	B	B	B	B	E B 30	E B 40	28	E B 20	34	34	31	50	65	65	34
14	54	33	32	76	B	B	50	54	B	31	B	B	B	B	E B 29	E B 19	K 20	E B 21	B	B	B	B	B	30
15	30	30	36	68	34	32	32	40	36	34	E B 23	E B 23	G	29	G	E B 27	B	E B 13	E B 21	B	B	B	34	32
16	42	46	43	38	48	B	B	34	26	B	B	E B 28	E B 24	B	B	B	B	B	E B 12	B	B	B	B	B
17	27	35	36	32	37	42	38	43	43	38	37	B	B	29	E B 19	E B 14	E B 13	B	B	B	B	B	B	B
18	B	20	16	24	S 25	60	18	E B 14	S	S	S	E B 25	E B 30	E B 20	B	E B 24	35	32	S	S	B	B	17	34
19	25	34	40	32	65	64	57	21	31	33	32	G	28	24	E B 21	B	E B 17	25	E B 14	25	25	22	B	B
20	18	34	56	48	47	43	29	36	16	28	18	G	18	E B 16	E B 22	E B 17	B	E B 17	B	36	48	28	22	B
21	31	37	38	39	43	32	22	34	B	E B 14	E B 16	E B 24	B	31	50	40	22	E B 23	B	B	B	27	31	43
22	43	50	43	70	47	42	48	37	24	26	36	32	33	G	E B 19	E B 23	E B 26	E B 19	27	B	B	34	41	36
23	40	40	48	82	42	B	42	42	B	B	B	B	B	26	B	B	E B 22	B	B	B	B	26	66	88
24	70	72	80	B	39	44	40	28	23	18	B	31	E B 29	G	21	G 21	19	B	B	36	21	B	22	35
25	74	40	40	58	115	B	47	43	33	K 16	G	E B 17	B	B	B	B	B	B	B	B	B	B	B	31
26	70	69	72	82	B	42	B	45	B	B	B	E B 24	35	B	B	B	B	E B 28	E B 20	B	B	B	B	B
27	30	44	48	70	38	54	35	40	43	32	43	B	B	E B 32	E B 21	B	B	B	35	28	31	31	32	33
28	50	43	43	40	40	50	48	46	B	B	B	B	B	E B 56	B	B	B	B	B	B	B	37	33	38
29	41	41	45	44	44	50	38	44	34	40	G	30	28	G	G 22	E B 20	B	B	B	B	B	B	26	29
30	27	33	41	33	41	58	31	48	35	E B 18	B	E B 24	G	G	G	G 18	E B 14	21	B	B	34	33	53	52
31	59	41	72	68	41	43	43	53	53	34	G	32	G	G	G	G	E B 20	E B 13	31	22	41	42	42	43
	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	30	26	27	24	28	30	20	22	18	21	19	23	24	20	21	18	16	13	13	19	24	25
MED	42	41	42	41	42	42	40	40	32	30	G	24	U 26	E G 22	E B 22	E B 21	E B 20	E B 21	24	28	32	33	32	37
U Q	54	44	48	68	47	50	48	46	36	34	36	30	33	30	E B 28	26	22	28	32	34	40	37	42	43
L Q	30	35	37	38	38	34	33	34	25	E B 18	E B 18	20	G 18	G	E B 20	E B 18	E B 16	E B 15	E B 17	22	27	28	22	32

JUL. 2015 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2015 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	11	13	13	14	15	32	14	12	12	12	11	12	13	12	12	14	10	12	12	13	B	12	12	14
2	12	13	11	B	13	13	12	13	13	13	B	23	25	14	19	14	13	14	13	B	B	12	11	B
3	B	B	12	B	11	12	11	12	12	11	12	12	12	27	18	14	13	B	14	14	B	B	B	12
4	11	12	10	11	11	12	12	12	12	12	13	11	13	12	12	12	12	12	14	14	12	13	12	12
5	12	12	17	12	B	31	12	20	B	B	B	B	B	B	26	B	19	B	12	B	16	12	12	12
6	17	19	12	B	12	B	B	15	B	B	B	B	B	B	53	B	B	B	B	16	B	12	12	13
7	12	13	14	14	26	14	13	12	12	14	14	13	12	14	32	18	15	13	13	15	16	B	12	12
8	11	13	13	14	19	18	15	26	16	16	13	12	54	B	23	19	17	19	B	B	B	13	12	12
9	11	16	13	12	12	12	12	B	21	22	14	15	22	18	12	14	13	15	24	B	B	B	19	10
10	12	12	12	13	13	16	18	20	14	14	17	13	12	12	12	13	16	15	B	13	13	13	12	12
11	12	14	23	24	19	12	55	19	B	30	18	B	B	22	18	B	20	B	20	12	12	11	11	12
12	14	14	12	B	22	B	20	15	B	B	B	B	B	B	B	B	B	B	B	B	12	11	12	10
13	13	16	B	24	B	B	22	14	B	B	B	B	B	30	40	23	20	14	11	11	13	13	12	28
14	13	12	14	23	B	B	22	17	B	26	B	B	B	B	29	19	16	21	B	B	B	B	B	13
15	11	11	12	14	12	12	12	14	14	14	23	23	14	13	11	27	B	13	21	B	B	B	12	12
16	12	14	14	25	28	B	B	15	12	B	B	28	24	B	B	B	B	B	12	B	B	B	B	B
17	12	11	12	13	13	20	20	14	15	14	15	B	B	16	20	14	13	B	B	B	B	B	B	B
18	B	13	12	12	12	12	12	14	S	S	S	25	30	20	B	24	16	25	S	S	B	B	13	11
19	10	12	15	12	11	13	12	12	12	15	16	20	21	15	20	B	16	16	14	14	12	14	B	B
20	12	12	12	12	13	12	12	12	13	14	13	12	14	16	22	17	B	17	B	18	13	16	14	B
21	23	12	13	12	12	11	14	16	B	14	16	24	B	22	14	14	14	23	B	B	B	14	12	12
22	12	14	11	12	12	19	12	11	11	12	25	19	13	13	19	23	26	19	15	B	B	12	12	12
23	12	11	13	13	20	B	18	20	B	B	B	B	B	19	B	B	22	B	B	B	B	15	13	14
24	12	12	12	B	20	16	14	12	12	12	B	29	29	15	14	13	12	B	B	12	14	B	15	11
25	12	13	13	20	44	B	14	13	12	12	13	17	B	B	B	B	B	B	B	B	B	B	B	11
26	13	12	14	14	B	24	B	16	B	B	B	24	18	B	B	B	B	28	20	B	B	B	B	B
27	13	13	14	18	18	15	12	14	14	14	14	B	B	32	21	B	B	B	13	14	14	16	11	11
28	12	11	14	16	19	16	13	16	B	B	B	B	B	56	B	B	B	B	B	B	B	12	11	11
29	11	12	14	14	14	14	18	14	21	20	20	17	14	15	13	20	B	B	B	B	B	B	11	12
30	11	12	12	12	12	17	18	13	11	18	B	24	18	17	16	12	14	16	B	B	20	12	12	11
31	13	13	21	16	28	22	16	14	18	17	23	20	20	18	16	17	20	13	11	14	12	11	11	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	30	30	30	31	31	31	31	31	31	31	30	30	31	31	31	31
MED	12	13	13	14	15	16	14	14	14	16	22	24	25	19	20	20	19	23	22	B	B	14	12	12
U Q	13	14	14	B 24	26	B 32	20	16	B	B	B	B	B	B	B 53	B	B	B	B	B	B	B	B 19	B 14
L Q	11	12	12	12	12	12	12	12	12	14	14	15	14	15	14	14	14	15	13	14	13	12	12	11

JUL. 2015 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2015 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 220	206	196	A	280	Q 266	244	Q 196	202	202	206	206	198	232	232	A	B	A	Y	A
2	A	A	A	B	A	A	A 316	A	A 324	A	B	218	218	194	194	194	A	A	E B 272	B	B	A	Y	B
3	B	B	A	B	A	E B 350	A	E A 360	E A 322	E B 274	Q 214	194	194	216	190	190	202	B	A	A	B	B	B	A
4	A	A	A	A	A	A	A	A	A	E B 272	232	Q 202	202	202	202	202	Q 192	Q 204	A	A	A	A	A	A
5	218	218	A	A	B	A	A	A	B	B	B	B	B	B	E B 266	B	248	B	A	B	A	A	A	A
6	A	A	A	B	A	B	B	196	B	B	B	B	B	B	B	B	B	B	B	Y	B	A	A	A
7	A	A	A	A	A	A	A	240	232	A	196	E A 230	Q 208	Q 206	242	214	A	A	220	A	A	A	B	Y	A
8	200	A	A	A	A	A	A	A	A	A	E A 274	220	E B 264	B	218	198	222	B	B	B	B	222	A	210
9	A	A	A	A	212	A	A	B	A	A	A 254	E A 224	220	206	Q 198	Q 196	218	202	A	B	B	B	A	A
10	210	218	A	A	A	A	A	A	A	A	218	Q 204	Q 218	Q 194	Q 210	Q 196	196	Q 204	B	A	A	A	Y	206
11	A	A	A	244	A	220	B	A	B	A	A	B	B	234	222	B	Q 250	B	240	A	A	A	A	A
12	A	A	A	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
13	A	A	B	A	B	B	A	A	B	B	B	B	B	E B 404	B	246	Q 314	A	A	A	A	A	A	R
14	A	A	A	A	B	B	A	A	B	A	B	B	B	B	216	204	240	216	B	B	B	B	B	A
15	A	A	A	A	A	A	A 304	288	A	208	250	E B 222	Q 208	Q 198	Q 198	198	B	E B 264	B 244	B	B	B	A	A
16	A	A	A	A	A	B	B	A	E A 276	B	B	252	216	B	B	B	B	B	E B 240	B	B	B	B	B
17	A	A	A	A	A	A	A	A	A	A	E A 250	B	B	Q 210	210	210	200	B	B	B	B	B	B	B
18	B	A	A	A	A	A	A	E B 320	S	S	S	E B 232	E B 212	212	B	230	198	A	S	S	B	B	Y	A
19	A	A	A	A	A	A	A	A	A	A	228	E A 228	200	200	200	B	216	A	236	A	A	A	B	B
20	Y	A	A	A	A	A	A	A	A	248	220	208	198	218	208	B	226	B	A	A	A	A	B
21	A	A	A	A	214	A	A	A	B	E B 286	E B 256	E B 304	B	A 236	Q 212	Q 212	244	226	B	B	B	A	A	A
22	A	A	208	A	A	A	A	A	222	242	A	E A 244	220	220	220	194	258	216	A	B	B	A	A	A
23	A	A	A	A	A	B	A	A	B	B	B	B	B	A	B	B	344	B	B	B	B	A	A	A
24	208	234	A	B	A	A	A	A	A	A	B	A	B 214	198	198	198	Q 214	B	B	A	A	B	A	A
25	A	A	A	A	B	B	A	A	212	256	218	200	B	B	B	B	B	B	B	B	B	B	B	A
26	200	A	234	A	B	A	B	A	B	B	B	228	222	B	B	B	B	234	234	B	B	B	B	B
27	A	A	A	A	A	A	A	A	A	A	A	B	B	E B 266	Q 244	B	B	B	A 270	A	A	A	A	A
28	240	A	A	A	A	A	A	A	B	B	B	B	B	E B 260	B	B	B	B	B	B	B	A	A 220	A
29	A	A	A	A	A	A	A	A	A	A	E A 228	212	208	208	200	200	B	B	B	B	B	B	A	F
30	A	A	A	A	A	A	A	A	A	266	B	224	Q 200	Q 202	Q 202	Q 202	212	A 238	B	B	A	A	A	A
31	A	A	A	A	A	A	A	A	A	A	E B 280	E A 246	E A 242	E A 212	206	224	224	212	214	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	6	3	2	1	3	3	3	5	7	8	15	20	19	22	22	20	19	12	10			1	1	2
MED	209	218	221	244	214	213	A 304	U 242	U 254	U 246	U 231	U 212	210	204	207	202	218	218	236			222	A 220	208
U Q	218	234			A 220	E B 350	A 316	E 340	A 322	E B 273	E 254	E 231	220	220	218	211	248	233	B 244					
L Q	200	218			212	206	196	218	222	249	218	208	202	200	200	197	200	208	232					

JUL. 2015 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2015 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	B	R	B	B	B	O X 46	X 56	68	X 68	68	X 66	70	X 32	35	B	A	A	A	A
2	A	A	A	A	B	B	B	B	B	R	X 43	B	B	B	X 65	X 62	X 64	O X 48	B	B	B	A	B	R
3	A	53	A	A	A	A	B	A	A	B	B	B	X 64	X 61	X 60	X 60	X 59	X 47	X 42	R	B	B	B	B
4	A	51	A	A	A	A	B	R	R	O X 38	X 45	X 54	X 59	X 60	X 68	X 67	X 65	X 42	X 36	17	B	A	A	A
5	B	A	A	A	B	A	A	O X 32	X 33	41	X 51	X 55	X 66	X 66	X 67	X 65	X 56	32	35	X 27	O X 24	B	B	A
6	A	A	A	A	A	A	X 32	40	35	X 36	X 44	X 57	X 60	B	B	B	O X 87	X 71	B	B	R	A	R	R
7	A	A	A	A	A	64	B	R	A	B	B	B	B	B	B	B	B	O X 48	R	B	R	R	R	A
8	A	X 32	41	A	A	A	A	A	B	B	B	R	B	B	B	B	X 81	80	62	B	R	R	A	A
9	53	A	38	A	X 34	57	R	R	A	B	B	B	B	B	B	B	B	B	B	B	B	R	R	R
10	A	A	R	A	B	B	B	B	B	B	B	B	O X 63	B	X 69	R	B	X 59	B	B	R	B	R	R
11	A	R	A	A	A	34	A	A	O X 36	X 41	B	B	B	B	B	B	B	B	B	B	B	A	B	R
12	A	X 42	R	R	64	R	A	A	A	R	B	B	B	O X 65	X 64	X 63	R	X 46	X 40	B	B	O X 24	A	A
13	A	A	A	A	A	74	70	A	A	X 33	B	B	B	B	O X 96	B	B	B	B	B	R	A	A	52
14	A	A	A	52	48	A	O X 32	42	37	X 44	X 54	X 64	X 64	71	X 69	X 60	X 60	42	36	30	B	B	R	30
15	32	A	A	A	A	A	A	41	41	41	X 45	Y	B	O X 49	O X 49	B	X 72	X 42	R	X 30	A	X 61	A	A
16	A	A	A	B	B	A	B	A	R	B	B	R	B	B	B	O X 38	O X 38	X 33	R	A	86	89	A	A
17	A	A	A	B	B	R	41	B	A	B	B	B	B	B	B	B	40	B	R	A	A	A	A	A
18	A	B	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	X 33	O X 39	B	B	B	B
19	A	A	44	68	A	R	B	B	B	B	B	B	B	B	B	O X 50	O X 48	B	R	Y	R	A	A	A
20	64	A	A	61	42	62	R	B	B	O X 41	X 46	O X 49	Y	B	B	O X 55	B	B	B	B	B	A	A	A
21	A	A	A	A	O X 41	A	57	R	A	B	47	B	B	B	B	B	B	47	43	39	28	Y	B	B
22	A	A	A	A	A	A	A	33	X 36	X 44	X 51	B	O X 66	O X 68	80	75	69	X 51	O X 46	O X 41	A	A	A	A
23	A	A	60	A	42	82	R	B	A	A	B	B	B	B	B	B	70	R	81	A	A	A	A	A
24	A	R	R	R	R	B	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	A
25	A	A	A	A	R	B	A	B	B	B	B	B	B	B	B	B	X 58	X 56	X 55	O X 32	A	71	A	A
26	A	R	65	31	A	68	B	R	A	B	B	B	B	O X 48	O X 55	B	53	B	61	A	57	A	92	B
27	A	50	88	B	74	A	R	B	B	A	R	B	B	B	B	B	Y	83	71	53	68	A	A	88
28	A	A	A	B	R	R	B	B	B	B	B	B	B	B	B	B	O X 33	A	91	A	A	A	A	A
29	A	A	A	S	S	S	A	A	A	R	B	B	R	B	B	B	B	B	B	B	R	A	A	A
30	A	47	A	O X 38	A	A	X 27	X 30	X 36	O X 42	O X 48	O X 54	Y	X 58	X 61	X 54	X 60	52	X 40	41	26	O X 20	R	A
31	O X 22	A	A	A	A	A	X 28	X 32	O X 39	B	X 51	O X 52	X 62	71	X 66	70	63	58	42	42	35	O X 22	O X 22	Y
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	6	6	5	7	7	7	7	8	10	12	8	9	11	14	13	19	19	17	11	7	6	2	3
MED	42	48	52	52	42	64	X 32	33	X 36	X 41	X 46	X 54	X 64	X 65	X 66	X 62	X 60	X 48	42	39	35	X 42	57	52
U Q	58	51	65	64	64	74	57	41	38	X 42	X 51	X 56	X 66	68	X 69	66	X 70	58	62	41	68	71		88
L Q	27	X 42	41	34	X 41	57	X 28	X 32	X 36	X 38	X 45	O X 53	X 61	O X 58	X 61	O X 54	O X 53	X 42	36	30	26	O X 22		30

AUG. 2015 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2015 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	B	A	B	B	B	R 40	50	F 58	62	Z 57	60	F 61	26	F 20	B	A	A	A	A
2	A	A	A	A	B	B	B	B	B	A	37	B	B	B	59	56	58	42	B	B	B	A	B	A
3	A	A	A	A	A	A	B	A	A	B	B	B	58	J R 55	54	54	53	41	36	R 27	B	B	B	B
4	A	A	A	A	A	A	B	R	A	R 32	39	48	53	J R 54	62	61	59	36	30	R 18	B	A	A	A
5	B	A	A	A	B	A	A	R 26	27	F 31	45	49	60	60	61	59	50	F 21	F 24	21	R 18	B	B	A
6	A	A	A	A	A	A	26	F 28	F 22	30	38	51	54	B	B	B	81	65	B	B	R	A	R	R
7	A	A	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	R 42	R	B	A	R	R	A
8	A	26	F 24	A	A	A	A	A	B	B	B	U R 50	B	B	B	B	75	F 68	R 56	B	R	R	A	A
9	F 33	A	F 21	A	28	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
10	A	A	A	A	B	B	B	B	B	B	B	B	U R 57	B	63	R	B	53	B	B	R	B	A	A
11	A	R	A	A	A	28	A	A	30	35	B	B	B	B	B	B	B	B	B	B	B	R	B	A
12	A	35	A	A	F 28	A	A	A	A	A	B	B	B	59	58	57	R	40	34	B	B	R 18	A	A
13	A	A	A	A	A	A	A	A	A	27	B	B	B	B	R 90	B	B	B	B	B	A	A	A	F 25
14	A	A	A	A	R 32	A	26	F 23	F 28	38	48	58	58	F 58	63	54	54	F 29	F 19	F 19	B	B	A	F 15
15	F 16	A	A	A	A	A	A	F 29	F 29	35	39	Y 48	B	R 43	R 43	B	66	36	A	R 24	A	55	A	A
16	A	A	A	B	B	A	B	A	A	B	B	R	B	B	B	R 32	R 32	R 27	A	A	A	A	A	A
17	A	A	A	B	B	A	F 24	B	A	B	B	B	B	B	B	B	R	B	A	A	A	A	A	A
18	A	B	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	27	F 29	B	B	B	B
19	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	44	R 42	B	R	Y	R	A	A	A
20	A	A	A	A	F 23	A	A	B	B	35	40	R 43	Y	B	B	49	B	B	B	B	B	A	A	A
21	A	A	A	A	35	A	A	A	A	B	V 41	B	B	B	B	B	B	F 36	F 33	F 27	F 18	Y	B	B
22	A	A	A	A	A	A	A	F 22	30	38	J R 45	B	60	62	Z 74	F 62	F 59	45	40	R 35	A	A	A	A
23	A	A	A	A	F 28	F 27	A	B	A	A	B	B	B	B	B	B	F 63	A	A	A	A	A	A	A
24	A	A	A	A	A	B	A	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	A
25	A	A	A	A	R 33	B	A	B	B	B	B	B	B	B	B	B	J R 52	50	49	26	A	A	A	A
26	A	R	A	F 18	A	F 23	B	A	A	B	B	B	B	42	R 49	B	F 41	B	A	A	F 34	A	F 26	B
27	A	A	24	B	A	A	R	B	B	A	A	B	B	B	B	B	Y	R 30	A	31	F 25	A	A	A
28	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	27	A	A	A	A	A	A	A
29	A	A	A	S	S	S	A	A	A	R	B	B	R	B	B	B	B	B	B	B	R	A	A	A
30	A	B	A	32	A	A	21	24	30	36	42	48	Y 44	52	55	48	54	F 42	34	F 23	F 15	R 14	R 16	A
31	R 16	A	A	A	A	A	22	26	R 33	B	J R 45	R 46	56	F 58	60	F 58	F 55	F 46	F 31	F 31	F 23	R 16	R 16	Y
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	3	2	3	2	7	3	5	7	8	10	12	10	10	11	14	13	18	19	13	12	6	4	3	2
MED	F 16	30	F 24	25	28	F 27	24	F 26	30	35	40	48	58	58	60	56	54	41	33	26	F 20	R 17	R 16	F 20
U Q	F 33		F 24		33	28	26	F 28	30	36	45	50	58	60	63	60	61	46	38	30	F 25	36	F 26	
L Q	F 16		F 21		28	F 23	22	F 23	F 28	31	39	R 48	54	52	55	48	50	30	F 26	22	F 18	R 15	R 16	

AUG. 2015 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2015 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	85	42	39	40	37	B	30	B	B	B	E B 23	E B 24	G	E B 24	E B 20	E B 19	E B 16	E B 20	E B 12	B	37	42	42	41
2	45	71	43	42	B	B	B	B	B	33	26	B	B	B	E B 32	E B 20	E B 14	E B 25	B	B	B	40	B	26
3	34	48	36	54	46	56	B	43	34	B	B	B	G	G	E B 20	G	E B 16	E B 12	E B 12	E B 15	B	B	B	B
4	32	30	39	41	42	56	B	34	34	36	E B 20	E B 20	E B 21	E B 24	E B 24	24	E B 16	E B 20	E B 15	E B 12	B	31	Q 32	31
5	B	64	40	40	B	38	50	35	27	G	G	G	G	28	27	19	G 19	18	18	21	E B 13	B	B	28
6	70	51	43	81	52	49	31	E B 15	E B 15	G	E B 20	35	G	B	B	B	E B 54	E B 37	B	B	31	34	K 26	37
7	41	72	48	42	42	42	B	39	47	B	B	B	B	B	B	B	B	E B 27	34	B	42	33	35	44
8	46	46	62	55	44	44	54	50	B	B	B	E B 29	B	B	B	B	E B 42	E B 26	E B 24	B	22	33	44	53
9	72	42	50	66	42	K 27	42	50	65	B	B	B	B	B	B	B	B	B	B	B	B	38	46	47
10	84	50	45	56	B	B	B	B	B	B	B	B	E B 36	B	E B 45	E B 34	B	E B 28	B	B	32	B	40	42
11	48	40	70	38	42	53	46	42	31	G 20	B	B	B	B	B	B	B	B	B	B	B	21	B	31
12	37	66	42	42	65	42	60	59	60	40	B	B	B	E B 28	E B 23	E B 20	E B 24	E B 14	E B 12	B	B	30	77	67
13	80	74	42	42	42	48	39	48	43	36	B	B	B	B	E B 46	B	B	B	B	B	28	40	49	36
14	70	58	58	36	40	43	43	29	E B 14	G	G	31	G	30	G	G	30	23	29	26	B	B	26	26
15	36	43	45	74	41	44	49	34	30	G	G	G	B	E B 23	E B 20	B	32	34	37	37	43	74	61	40
16	72	56	96	59	B	50	B	41	34	B	B	32	B	B	B	E B 24	E B 24	24	31	34	44	44	74	67
17	53	50	71	B	B	32	29	B	42	B	B	B	B	B	B	B	28	B	39	40	37	40	40	41
18	67	B	32	B	B	B	50	39	B	B	B	B	B	B	B	B	B	B	E B 18	E B 21	B	B	B	B
19	42	51	37	58	56	33	B	B	B	B	B	B	B	B	B	E B 28	E B 24	B	29	15	20	32	41	38
20	44	44	52	36	42	60	33	B	B	33	E B 27	E B 26	E B 28	B	B	G	B	B	B	B	B	39	38	43
21	43	66	70	41	41	42	44	41	48	B	G	B	B	B	B	B	B	E B 14	E B 13	E B 16	E B 14	16	B	B
22	28	34	71	70	54	50	33	31	31	22	E B 25	B	E B 28	E B 28	28	E B 24	E B 32	G	E B 20	42	42	38	42	35
23	40	36	42	76	53	64	36	B	58	52	B	B	B	B	B	B	E B 38	39	49	28	30	38	44	38
24	52	38	44	42	42	B	36	26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	18	36
25	69	59	51	40	38	B	55	B	B	B	B	B	B	B	B	B	E B 38	E B 22	E B 20	E B 14	40	53	108	91
26	42	41	89	26	47	88	B	41	48	B	B	B	B	G	E B 33	B	E B 24	B	38	82	38	92	68	B
27	50	42	33	B	65	68	36	B	B	61	44	B	B	B	B	B	28	K	41	30	70	69	67	49
28	42	94	62	B	38	40	B	B	B	B	B	B	B	B	B	B	E B 22	48	44	85	88	80	77	44
29	51	33	40	S	S	S	43	34	39	G	B	B	E B 27	B	B	B	B	B	B	B	G	42	36	37
30	39	E B 36	67	81	45	32	26	25	G	G	E B 24	E B 25	E B 24	E B 25	E B 23	G	E B 20	18	E B 15	21	E B 13	E B 13	16	27
31	30	32	43	42	55	51	39	29	32	B	E B 29	E B 26	29	28	G	G	E B 20	E B 20	E B 15	E B 13	E B 14	E B 14	26	18
	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	31	26	24	24	22	21	20	15	13	11	12	11	14	14	21	20	22	18	21	25	25	27
MED	46	47	45	42	42	46	40	39	34	22	E B 26	E B 29	G	E B 28	E B 27	E G 20	E B 24	E B 22	21	24	32	38	42	38
U Q	69	59	62	59	52	54	49	42	48	36	26	31	G	28	E B 32	E B 24	E B 32	28	37	37	42	43	64	44
L Q	40	40	40	40	42	41	33	30	30	G	E B 24	E B 25	E B 28	E B 24	E B 23	G	E B 20	18	E B 15	E B 15	G	32	34	31

AUG. 2015 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2015 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	11	17	16	16	17	B	17	B	B	B	23	24	14	24	20	19	16	20	12	B	13	12	12	12
2	14	20	24	18	B	B	B	B	B	19	15	B	B	B	32	20	14	25	B	B	B	11	B	11
3	12	14	17	15	14	18	B	14	16	B	B	B	17	18	20	13	16	12	12	15	B	B	B	B
4	12	15	22	17	16	20	B	28	24	14	20	20	21	24	24	18	16	20	15	12	B	12	10	10
5	B	12	19	21	B	26	12	169	12	12	13	15	15	15	14	13	11	13	12	12	13	B	B	12
6	21	18	12	18	14	14	14	15	15	14	20	17	14	B	B	B	54	37	B	B	11	11	12	12
7	14	12	13	18	11	14	B	24	16	B	B	B	B	B	B	B	B	27	21	B	16	13	13	12
8	12	12	12	12	12	12	14	18	B	B	B	29	B	B	B	B	42	26	24	B	12	12	12	12
9	12	12	14	15	11	18	17	19	17	B	B	B	B	B	B	B	B	B	B	B	B	12	12	11
10	14	17	17	14	B	B	B	B	B	B	B	B	35	B	45	33	B	28	B	B	20	B	14	12
11	11	15	12	12	14	13	22	24	18	14	B	B	B	B	B	B	B	B	B	B	B	13	B	11
12	12	13	15	14	15	22	21	15	27	17	B	B	B	28	23	20	24	14	12	B	B	10	14	12
13	12	11	16	25	26	14	15	24	22	16	B	B	B	B	46	B	B	B	B	B	14	12	11	12
14	12	12	12	15	13	14	12	14	14	13	15	14	19	19	18	22	16	13	12	13	B	B	15	10
15	12	12	12	13	21	14	14	13	13	12	16	17	B	23	20	B	28	15	12	12	12	13	12	11
16	14	16	15	55	B	15	B	27	22	B	B	24	B	B	B	24	24	14	11	18	12	12	12	12
17	12	13	10	B	B	23	12	B	21	B	B	B	B	B	B	B	21	B	13	13	12	13	10	18
18	12	B	20	B	B	B	18	16	B	B	B	B	B	B	B	B	B	B	18	20	B	B	B	B
19	19	11	12	19	22	21	B	B	B	B	B	B	B	B	B	28	24	B	20	12	13	12	12	12
20	13	13	14	12	12	12	17	B	B	22	27	26	28	B	B	24	B	B	B	B	B	13	13	12
21	17	12	23	16	15	13	19	21	19	B	20	B	B	B	B	B	B	14	13	16	14	14	B	B
22	12	12	12	19	14	13	13	12	11	13	25	B	28	28	21	24	32	15	20	13	12	12	11	11
23	13	17	12	13	10	12	25	B	18	18	B	B	B	B	B	B	38	13	14	12	12	11	11	25
24	16	13	27	29	27	B	24	16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	11	11
25	11	23	16	15	13	B	21	B	B	B	B	B	B	B	B	B	38	22	20	14	12	15	12	13
26	13	13	22	12	14	14	B	27	26	B	B	B	B	26	33	B	24	B	14	14	12	12	12	B
27	12	12	12	B	11	16	22	B	B	24	18	B	B	B	B	B	22	19	14	11	11	12	13	11
28	12	14	18	B	26	15	B	B	B	B	B	B	B	B	B	B	22	15	12	12	15	13	16	12
29	14	13	28	S	S	S	13	13	16	19	B	B	27	B	B	B	B	B	B	B	12	11	10	11
30	11	36	28	16	12	12	12	14	14	15	24	25	24	25	23	18	20	11	15	12	13	13	11	11
31	11	11	11	18	14	12	13	E S 16	16	B	29	26	20	24	20	20	20	20	14	13	14	14	11	12
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	12	13	15	16	14	15	19	24	22	B	B	B	B	B	B	B	28	22	15	16	14	13	12	12
U Q	14	17	20	21	B 26	B 23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B 14	B 15	12
L Q	12	12	12	14	13	13	14	15	16	15	20	25	24	25	23	20	20	14	12	12	12	12	11	11

AUG. 2015 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2015 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	B	A	B	B	B	242	246	E A 222	206	202	218	204	208	238	B	A	A	A	A
2	A	A	A	A	B	B	B	B	B	A	E A 262	B	B	B	236	212	210	210	B	B	B	A	B	A
3	A	A	A	A	A	A	B	A	A	B	B	B	208	196	208	194	224	204	Q 220	E B 264	B	B	B	B
4	A	A	A	A	A	A	B	A	A	A	252	212	222	222	210	204	210	208	200	E B 304	B	A	A	A
5	B	A	A	A	B	A	A	A	242	E A 254	206	200	226	204	Q 196	200	Q 190	212	230	226	E B 226	B	B	A
6	A	A	A	A	A	A	226	E B 308	272	204	246	E A 246	228	B	B	B	256	234	B	B	A	A	A	A
7	A	A	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	278	A	B	A	238	A	A
8	A	220	226	A	A	A	A	A	B	B	B	E B 244	B	B	B	B	272	242	250	B	208	A	A	A
9	196	A	198	A	E A 230	200	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
10	A	A	A	A	B	B	B	B	B	B	B	B	E B	B	B	234	B	234	B	B	A	B	A	A
11	A	A	A	A	A	194	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	A	B	A
12	A	220	A	A	194	A	A	A	A	A	B	B	B	202	202	204	204	234	220	B	B	192	A	A
13	A	A	A	A	A	A	A	A	A	206	B	B	B	B	254	B	B	B	B	B	A	A	A	200
14	A	A	A	A	204	A	A	E B 292	232	202	202	E B 204	196	E A 224	204	Q 214	206	Q 218	240	240	B	B	A	240
15	A	A	A	A	A	A	A	204	212	220	220	206	B	E B 248	240	B	E A 234	E A 330	A	192	A	A	A	A
16	A	A	A	B	B	A	B	A	A	B	B	A	B	B	B	E B 248	E A 268	228	A	A	A	A	A	A
17	A	A	A	B	B	A	224	B	A	B	B	B	B	B	B	B	A	B	A	A	A	A	A	A
18	A	B	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	244	224	B	B	B	B
19	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	248	280	B	A	Y	A	A	A	A
20	A	A	A	A	A	A	A	B	B	A	E B 258	E B 232	256	B	B	E A 270	B	B	B	B	B	A	A	A
21	A	A	A	A	218	A	A	A	A	B	E A 248	B	B	B	B	B	B	Q 206	Q 232	202	216	Y	B	B
22	A	A	A	A	A	A	A	216	234	196	E B 234	B	E B 234	238	E A 230	E B 230	220	208	290	226	A	A	A	A
23	A	A	A	A	212	194	A	B	A	A	B	B	B	B	B	B	278	A	A	A	A	A	A	A
24	A	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	202	A
25	A	A	A	A	226	B	A	B	B	B	B	B	B	B	B	B	E B 246	B 214	246	E B 238	A	A	A	A
26	A	238	A	216	A	202	B	A	A	B	B	B	B	E A 254	B	B	E B 290	B	A	A	202	A	A	B
27	A	230	228	B	216	A	A	B	B	A	A	B	B	B	B	B	A	A	A	192	210	A	A	210
28	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A
29	A	A	A	S	S	S	A	A	A	A	B	B	E B 266	B	B	B	B	B	B	B	A	A	A	A
30	A	B	A	216	A	A	210	A	A	224	198	212	200	212	214	Q 194	200	Q 200	200	Q 220	214	E B 252	206	A
31	A	A	A	A	A	A	A	A	A	B	226	210	202	218	Q 218	230	Q 208	202	230	206	Q 220	B 236	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1	4	3	2	7	4	3	4	5	7	12	10	11	11	12	14	18	18	13	12	7	4	2	3
MED	196	225	226	216	214	197	224	254	234	205	U 226	208	215	211	210	210	214	212	232	U 214	212	U 226	204	210
U Q		234	228		226	201	226	E B 300	257	224	E 250	E 244	E B 234	E 238	233	234	268	234	245	E B 239	220	245		240
L Q		220	198		204	194	210	210	222	202	213	206	202	204	203	204	206	208	220	204	208	214		200

AUG. 2015 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP.2015 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	O X 30	72	43	A	B	A	X 29	X 30	O X 36	B	O X 48	X 49	X 64	X 70	X 64	X 65	X 65	B	B	B	B	B	B	A
2	A	A	A	A	A	A	A	A	O X 40	46	O X 48	X 57	X 58	X 60	X 60	X 62	63	51	X 38	X 37	X 29	20	A	A
3	48	A	69	A	A	A	A	A	R	B	O X 49	X 52	X 57	X 67	X 67	59	X 53	58	48	X 38	B	O X 30	A	58
4	A	A	A	93	A	50	A	B	B	B	R	B	B	B	B	B	B	B	R	A	R	A	A	B
5	A	A	A	A	A	B	A	B	R	R	B	B	B	B	B	B	B	O X 50	O X 49	B	R	A	C	C
6	B	A	A	A	B	75	B	R	R	B	B	B	B	B	B	B	X 58	B	B	X 30	Y	42	64	A
7	A	R	R	42	54	A	A	R	B	B	B	B	B	B	52	B	B	X 42	R	34	40	43	A	A
8	B	B	43	B	B	B	72	B	B	B	B	R	R	R	R	R	R	R	R	X 30	X 23	O X 22	A	A
9	A	49	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	72	51	O X 72	A	R	R
10	A	R	B	B	R	R	R	O X 42	O X 38	O X 39	R	R	B	R	B	B	O X 63	X 55	X 46	X 36	74	59	A	60
11	A	70	56	48	70	A	A	A	O X 48	B	R	S	B	B	B	81	R	B	48	84	A	A	A	O X 47
12	47	R	A	A	B	B	R	A	A	B	B	B	B	B	B	B	B	B	B	X 33	R	R	O X 29	A
13	A	X 28	A	A	R	A	A	X 42	O X 48	O X 50	X 48	O X 54	X 66	B	B	X 86	B	B	X 50	54	A	A	R	R
14	R	A	A	O X 50	A	A	O X 31	X 42	B	A	O X 52	R	B	B	B	B	B	B	X 47	A	88	A	A	A
15	B	A	R	A	A	B	B	B	B	B	O X 48	O X 49	B	B	R	X 62	O X 63	X 70	56	32	A	R	R	A
16	A	A	A	59	B	A	A	A	B	B	B	B	B	B	B	O X 51	X 56	X 54	X 48	O X 38	B	O X 29	B	R
17	A	A	A	B	B	B	B	B	A	R	O X 48	B	B	B	B	B	B	X 58	57	O X 42	X 39	X 30	32	30
18	53	A	A	B	A	A	B	A	O X 46	O X 48	B	B	B	X 68	B	X 80	X 70	O X 64	O X 51	O X 37	R	A	A	A
19	A	A	A	B	B	B	B	B	B	R	B	B	B	B	B	B	O X 51	B	O X 46	O X 42	O X 36	O X 32	O X 26	A
20	44	54	A	A	A	B	A	B	B	B	B	B	B	B	O X 110	88	O X 41	O X 41	108	A	84	A	A	A
21	A	82	A	A	B	R	B	A	B	O X 49	B	O X 69	X 68	X 72	82	68	X 67	X 63	53	49	X 44	35	36	37
22	Y	48	R	64	38	54	R	59	O X 63	X 59	X 59	O X 64	B	B	X 79	69	X 69	X 65	71	R	B	O X 25	A	A
23	A	A	A	A	A	36	44	50	X 50	X 56	O X 64	X 72	X 82	B	O X 88	93	X 94	B	58	58	A	58	86	A
24	A	A	51	R 37	R	41	B	R	R	57	X 53	65	X 65	X 61	X 67	X 66	X 64	X 61	X 56	X 56	39	B	A	A
25	82	A	A	A	A	A	B	O X 46	X 47	O X 54	X 54	X 58	X 65	X 65	X 68	B	O X 75	X 66	X 56	X 53	50	43	X 26	X 25
26	O X 49	R	A	A	O X 38	A	O X 45	X 47	X 50	O X 57	R	X 66	X 72	X 74	X 76	X 79	X 72	66	68	X 52	X 38	31	A	A
27	A	A	O X 39	A	A	A	O X 43	X 47	X 48	X 54	X 62	X 65	X 70	X 74	X 72	O X 70	X 66	X 69	X 54	58	46	41	34	34
28	56	O X 45	R	A	A	A	X 46	X 49	X 53	X 58	X 62	X 64	X 67	X 75	X 72	X 69	74	X 68	X 65	X 49	41	30	A	R
29	R	A	A	A	B	B	B	R	A	R	O X 53	R	X 59	O X 69	O X 70	X 70	X 65	X 64	X 59	X 49	X 41	X 37	X 33	33
30	X 27	30	R 27	A	42	43	49	X 48	O X 61	X 56	X 60	X 66	72	X 69	X 79	X 73	X 67	X 65	X 59	X 53	43	X 36	X 31	31
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	9	9	7	7	5	6	8	11	13	13	15	14	13	12	15	18	20	19	24	24	17	18	10	9
MED	48	49	43	50	42	46	X 44	X 47	O X 48	X 54	O X 53	X 64	X 66	X 69	X 72	X 70	X 65	X 63	X 55	X 46	41	34	32	34
U Q	54	71	56	64	62	54	48	49	X 52	X 57	X 60	X 66	X 71	X 73	X 79	80	X 70	X 66	59	53	61	42	36	52
L Q	X 37	X 38	39	42	38	41	O X 37	X 42	O X 43	O X 48	O X 48	X 54	X 62	X 66	X 67	X 65	X 60	X 54	X 48	X 36	X 38	O X 30	O X 29	30

SEP.2015 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP.2015 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	R 24	A	A	A	B	A	23	24	30	B	R 42	J R 43	58	64	58	59	59	B	B	B	B	B	B	A
2	A	A	A	A	A	A	A	A	34	39	R 42	51	J R 52	54	54	56	F 52	F 41	32	31	23	14	A	A
3	F 25	A	A 147	A	A	A	A	A	R	B	R 43	46	51	61	61	52	47	52	F 35	32	B	24	A	A
4	A	A	A	A	A	A	A	B	B	B	A	B	B	B	B	B	B	B	R 33	A	A	A	A	B
5	A	A	A	A	A	B	A	B	R	R	B	B	B	B	B	B	B	R 44	R 43	B	R	A	C	C
6	B	A	A	A	B	Y	B	R	R	B	B	B	B	B	B	B	52	B	B	24	Y	A	A	A
7	A	R	A	F 22	A	A	A	R	B	B	B	B	B	B	45	B	B	36	R	F 21	F 21	F 29	A	A
8	B	B	F 32	B	B	B	Y	B	B	B	B	R	R	R	R	R	R	R	R	24	17	R 16	A	A
9	A	F 30	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	F 26	66	A	R 32	R 52
10	A	R	B	B	R	R	R	R 36	R 32	33	R	R	B	R	B	B	R 57	49	40	30	A	F 30	A	F 26
11	A	F 42	F 33	F 21	45	A	A	A	R 42	B	U R 42	U S 45	B	B	B	F 60	U R 49	B	F 34	R	A	A	A	41
12	F 34	A	A	A	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	27	A	R 17	R 23	A
13	A	22	A	A	R	A	A	R 36	R 42	R 44	42	R 48	60	B	B	80	B	B	R 44	A	A	A	A	A
14	R	A	A	R 44	A	A	R 25	36	B	A	46	R	B	B	B	B	B	B	41	A	A	A	A	A
15	B	A	A	A	A	B	B	B	B	B	R 42	43	B	B	R	56	57	64	R 43	26	A	R	R	A
16	A	A	A	A	B	A	A	A	B	B	B	B	B	B	B	R 45	50	48	42	32	B	R 23	B	R
17	A	A	A	B	B	B	B	B	A	R 41	42	B	B	B	B	B	B	52	F 45	R 36	33	24	F 20	F 18
18	A	A	A	B	A	A	B	A	R 40	42	B	B	B	62	B	74	64	58	R 45	R 31	A	A	A	A
19	A	A	A	B	B	B	B	B	B	A	B	B	B	B	B	B	45	B	40	R 36	30	26	20	A
20	F 25	R	A	A	A	B	A	B	B	B	B	B	B	B	104	F 65	35	35	A	A	A	A	A	A
21	A	A	A	A	B	A	B	A	B	43	B	R 63	62	66	J R 76	F 58	61	57	F 43	F 40	38	F 24	F 21	R 22
22	Y	R 28	A	R 28	F 28	R 41	R 41	F 46	R 57	53	53	58	B	B	J R 73	F 60	63	59	F 61	U R 46	B	R 18	A	A
23	A	A	A	A	A	F 24	Z 37	F 38	44	50	R 58	66	76	B	R 82	F 80	88	B	F 50	F 48	A	F 29	A	A
24	A	A	R 29	R 31	A	Z 35	B	A	A	F 47	47	F 55	59	55	61	60	58	55	50	R 48	F 28	B	A	A
25	A	A	A	A	A	A	B	R 40	41	48	48	52	59	59	62	B	69	60	50	47	F 40	F 30	20	19
26	R 43	R	A	A	32	A	R 38	41	44	R 51	R 52	J R 60	66	68	70	73	66	F 58	F 58	46	32	F 21	A	A
27	A	A	R 33	A	A	A	37	41	42	48	56	59	64	68	66	64	60	63	48	F 48	F 35	F 28	F 22	F 20
28	A	R 39	A	A	A	A	40	43	47	52	56	58	61	69	66	63	F 66	J S 62	59	43	F 30	F 21	A	A
29	A	A	A	A	B	B	B	A	A	A	R 47	U R 49	J R 53	R 63	64	64	59	58	53	43	35	31	27	F 22
30	21	F 20	R 21	A	F 22	F 24	F 37	42	R 55	50	54	60	66	63	73	67	61	59	53	47	F 33	30	25	F 22
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	6	6	5	4	4	8	11	13	14	17	16	13	12	15	18	21	19	23	23	14	18	9	9
MED	25	29	32	R 28	30	30	37	40	42	48	47	54	60	63	66	62	59	57	44	36	32	24	22	F 22
U Q	34	39	33	R 38	38	38	R 39	42	46	50	54	60	65	67	R 73	67	64	59	50	46	35	F 29	26	34
L Q	24	22	R 29	F 22	F 25	F 24	31	36	37	42	R 42	47	56	60	61	58	51	48	40	27	28	R 21	20	F 20

SEP.2015 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP.2015 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	34	67	35	60	B	43	23	24	28	B	E B 29	E B 24	G 24	E B 28	25	E B 28	E B 22	B	B	B	B	B	B	34
2	37	51	49	40	42	51	60	34	G	G	27	G	26	26	26	26	23	19	E B 13	E B 13	E B 13	31	37	86
3	69	94	46	64	55	50	56	58	34	B	32	G	G	26	E B 39	G 65	E B 25	E B 18	E B 16	E B 17	B	22	36	41
4	67	42	69	65	44	43	33	B	B	B	42	B	B	B	B	B	B	B	E B 26	40	32	39	69	B
5	69	90	46	50	42	43	42	B	36	38	B	B	B	B	B	B	B	E B 27	E B 28	B	33	90	C	C
6	B	47	40	43	B	41	B	G	40	B	B	B	B	B	B	B	E B 22	B	B	21	24	K 34	69	60
7	48	33	36	36	42	49	48	42	B	B	B	B	B	B	E B 28	B	B	36	G	27	70	66	89	69
8	B	B	36	B	B	B	38	B	B	B	B	G	G	30	E B 26	26	E B 26	G	G	24	22	26	26	40
9	48	60	52	41	43	B	B	B	B	B	B	B	B	B	B	B	B	B	41	41	41	92	42	36
10	70	36	B	B	37	41	33	48	31	21	G	E B 25	B	E B 33	B	B	G 27	G 17	G 16	E B 14	39	80	99	69
11	92	104	48	30	42	46	57	51	36	B	E B 30	E S 29	B	B	B	34	31	B	71	34	45	45	45	52
12	36	34	65	57	B	B	35	49	43	B	B	B	B	B	B	B	B	B	B	E B 18	30	22	32	36
13	44	30	K 34	39	31	81	43	E B 23	33	E B 28	30	28	31	B	B	E B 29	B	B	E B 23	38	40	66	34	31
14	K 33	61	59	66	52	43	26	G 19	B	43	G	G	B	B	B	B	B	B	E B 14	75	48	101	34	36
15	B	81	35	42	42	B	B	B	B	B	30	29	B	B	E B 29	G	E B 28	E B 28	E B 24	30	45	40	40	40
16	104	38	G 34	43	B	48	52	40	B	B	B	B	B	B	B	E B 26	30	E B 22	18	E B 20	B	20	B	K 18
17	41	52	67	B	B	B	B	B	51	34	G	B	B	B	B	B	B	E B 23	G	K 24	E B 20	E B 14	E B 14	E B 13
18	21	59	36	B	42	42	B	42	36	G	B	B	B	E B 40	B	E B 54	E B 22	E B 31	E B 26	28	K 32	K 38	60	48
19	37	43	59	B	B	B	B	B	B	39	B	B	B	B	B	B	E B 24	B	E B 19	E B 20	E B 18	E B 19	E B 14	26
20	35	34	76	42	55	B	43	B	B	B	B	B	B	B	E B 56	E B 50	32	28	41	122	32	90	76	52
21	42	36	41	55	B	33	B	42	B	34	B	E B 46	G	30	G 30	G 26	G 29	22	31	19	27	E B 14	E B 14	25
22	19	K 30	35	34	34	31	34	41	E B 31	36	30	G 32	B	B	E B 32	E B 30	G	26	E B 18	E B 24	B	21	32	36
23	36	41	36	35	41	29	31	31	G	G	E B 41	G	G	B	E B 58	E B 37	E B 29	B	E B 25	E B 22	74	85	42	46
24	38	34	36	40	29	33	B	40	32	36	32	G	32	34	30	30	28	22	E B 14	16	E B 12	B	E B 12	42
25	43	47	82	51	42	44	B	32	31	27	27	31	30	30	31	B	E B 56	E B 50	21	30	28	33	43	31
26	36	27	48	42	36	50	42	38	33	31	32	G 26	28	G 24	30	G	26	26	29	19	E B 13	17	28	70
27	43	37	93	47	47	41	44	38	G	30	32	G	32	33	36	G	G	G	G	E B 17	20	E B 12	E B 12	E B 12
28	33	35	42	48	41	53	41	35	35	31	34	G	36	36	34	30	32	24	G	26	20	28	39	24
29	22	42	42	57	B	B	B	39	60	38	32	G 24	32	G	E B 40	G	G 30	E B 26	E B 19	E B 20	E B 12	E B 12	E B 13	E B 12
30	E B 12	17	34	34	26	E B 14	18	26	30	33	G	34	34	40	34	37	32	32	G	G	E B 12	E B 12	E B 12	E B 12
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	29	25	21	22	20	22	20	18	19	19	14	14	17	19	22	20	27	28	26	28	27	28
MED	38	42	42	43	42	43	42	38	33	32	30	G	29	30	30	32	28	U 22	E G 19	22	29	32	36	36
U Q	48	60	59	56	44	49	46	42	36	36	32	G	32	34	E B 38	G 65	30	28	26	30	40	66	45	50
L Q	34	34	36	40	36	41	33	31	30	G 27	G 27	28	G	26	E B 28	28	E B 25	20	G	E B 18	E B 20	E B 20	E B 14	26

SEP.2015 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP.2015 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	11	18	13	18	B	14	13	11	14	B	29	24	20	28	19	28	23	B	B	B	B	B	B	12
2	11	15	17	14	12	15	14	12	15	16	16	19	20	18	17	17	15	13	13	13	12	12	10	17
3	12	13	13	13	20	25	15	24	26	B	24	16	16	14	39	20	25	18	16	17	B	15	13	13
4	12	11	24	17	18	15	12	B	B	B	28	B	B	B	B	B	B	B	26	14	14	12	12	B
5	12	18	30	20	28	38	13	B	26	22	B	B	B	B	B	B	B	26	28	B	11	20	C	C
6	B	12	24	17	B	26	B	23	20	B	B	B	B	B	B	B	23	B	B	14	18	11	13	16
7	21	19	12	12	14	14	14	15	B	B	B	B	B	B	28	B	B	13	19	10	13	14	20	22
8	B	B	12	B	B	B	25	B	B	B	B	17	20	17	26	20	26	14	12	12	12	12	11	11
9	12	12	14	15	14	B	B	B	B	B	B	B	B	B	B	B	B	B	11	12	16	14	16	15
10	29	23	B	B	21	20	16	13	19	18	16	25	B	33	B	B	23	14	13	14	14	13	12	13
11	17	14	14	12	13	14	13	14	28	B	30	E S 29	B	B	B	19	20	B	12	14	12	14	14	14
12	12	12	12	13	B	B	23	20	26	B	B	B	B	B	B	B	B	B	B	18	11	12	12	10
13	12	12	13	14	13	13	12	23	17	28	16	17	18	B	B	29	B	B	23	14	12	20	14	12
14	27	13	18	13	16	16	12	14	B	23	19	20	B	B	B	B	B	B	14	13	13	19	13	19
15	B	18	27	12	23	B	B	B	B	B	22	20	B	B	29	18	28	28	24	12	15	12	11	14
16	15	26	27	19	B	20	19	24	B	B	B	B	B	B	B	25	19	22	12	20	B	14	B	12
17	22	12	14	B	B	B	B	B	23	23	25	B	B	B	B	B	B	23	14	20	17	14	14	13
18	12	22	14	B	24	20	B	23	18	20	B	B	B	40	B	54	22	31	26	20	12	12	11	16
19	25	14	18	B	B	B	B	B	B	22	B	B	B	B	B	B	24	B	19	20	18	19	14	15
20	14	12	41	26	18	B	21	B	B	B	B	B	B	B	56	50	18	20	13	13	11	16	15	14
21	24	14	12	17	B	16	B	29	B	24	B	46	22	24	20	17	19	15	12	12	12	14	14	12
22	14	12	14	12	18	14	21	14	31	17	17	22	B	B	32	30	20	14	18	24	B	12	12	12
23	14	12	13	12	17	13	12	13	18	16	41	18	25	B	58	37	29	B	25	22	12	13	14	14
24	19	20	16	14	14	12	B	22	22	15	18	12	17	14	16	18	16	14	14	12	12	B	12	12
25	12	13	23	19	14	14	B	16	14	15	14	14	14	12	13	B	56	50	14	12	13	13	13	12
26	12	20	17	24	11	14	12	11	14	13	17	16	15	16	16	14	14	14	14	14	13	12	12	21
27	13	18	25	14	15	15	13	13	13	13	14	14	14	14	18	13	15	15	12	17	13	12	12	12
28	12	12	19	15	13	18	14	18	18	14	14	14	17	16	14	15	14	13	17	12	12	12	12	11
29	13	12	23	16	B	B	B	24	14	19	20	20	18	25	40	22	14	26	19	20	12	12	13	12
30	12	11	11	11	12	14	12	13	13	14	14	14	15	14	20	14	14	14	13	14	12	12	12	12
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29
MED	14	14	16	16	18	17	18	22	24	23	26	22	B	B	48	30	23	24	15	14	13	13	13	13
U Q	22	18	24	B 20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	24	20	16	15	14	16
L Q	12	12	13	13	14	14	13	14	17	16	17	17	18	17	20	18	18	14	13	12	12	12	12	12

SEP.2015 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP.2015 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	218	194	204	A	B	A	A	206	A	B	262	204	198	220	136	E B 248	214	B	B	B	B	B	B	A
2	A	A	A	A	A	A	A	A	206	198	210	186	208	204	204	Q 212	Q 196	Q 196	Q 192	236	210	A	A	A
3	A	A	A	A	A	A	A	A	A	B	A	A	226	226	254	236	222	216	210	230	B	A	A	A
4	A	A	A	A	A	A	A	B	B	B	A	B	B	B	B	B	B	B	E B 282	A	A	A	A	B
5	A	A	A	A	A	B	A	B	A	A	B	B	B	B	B	B	B	216	256	B	A	A	C	C
6	B	A	A	A	B	Y	B	A	A	B	B	B	B	B	B	B	B 244	B	B	260	Y	A	A	A
7	A	A	A	A	A	A	A	A	B	B	B	B	B	B	256	B	B	A	A	218	A	A	A	A
8	B	B	A	B	B	B	Y	B	B	B	B	220	E A 294	254	242	E A 248	E B 260	E A 248	240	300	200	194	A	A
9	A	Q 214	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	202	204	A	198	200
10	A	A	B	B	A	A	A	194	A	E A 256	E A 238	238	B	E B 248	B	B	248	Q 208	Q 208	212	A	A	A	232
11	A	222	A 222	A	216	A	A	A	210	B	240	228	B	B	B	170	A	B	E A 236	A	A	A	A	208
12	200	A	A	A	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	E B 244	A	204	A	A
13	A	208	A	A	A	A	A	E B	E A 244	244	E A 238	202	202	B	B	238	B	B	250	A	A	A	A	A
14	A	A	A		A	A	192	A	B	A	248	E A 238	B	B	B	B	B	B	222	A	A	A	A	A
15	B	A	A	A	A	B	B	B	B	B	A	254	B	B	226	204	230	220	220	E A 282	A	A	A	A
16	A	A	A	A	B	A	A	A	B	B	B	B	B	B	B	220	A	220	Q 214	236	B	198	B	A
17	A	A	A	B	B	B	B	B	A	A	E B 270	B	B	B	B	B	B	206	Q 204	218	234	250	248	276
18	A	A	A	B	A	A	B	A	A 242	E A 236	B	B	B	B	B	E B 298	222	222	B	E A 276	A	A	A	A
19	A	A	A	B	B	B	B	B	B	A	B	B	B	B	B	B	228	B	B	228	256	270	258	A
20	234	198	A	A	A	B	A	B	B	B	B	B	B	B	B	B	E A 282	E A 250	A	A	A	A	A	A
21	A	A	A	A	B	A	B	A	B	E A 264	B	B	206	206	E A 224	200	194	194	194	Q 194	208	208	208	A
22	Y	204	A	A	A	204	194	204	E B 290	206	206	196	B	B	E B 234	E B 236	Q 218	198	Q 210	E B 224	B	202	A	A
23	A	A	A	A	A	202	E A 248	248	198	198	B	200	214	B	B	246	234	B	E B 214	220	A	198	A	A
24	A	A	A	A	A	202	B	A	A	202	202	202	224	224	202	214	198	E A 216	194	Q 204	Q 228	B	122	A
25	A	A	A	A	A	A	B	A	238	208	214	208	216	216	204	B	B	304	202	Q 216	Q 216	Q 216	204	A
26	206	A	A	A	206	A	216	216	216	214	H 198	214	226	220	210	196	196	Q 212	214	198	Q 226	254	A	A
27	A	A	196	A	A	A	230	A	228	206	206	212	210	198	224	208	208	208	196	Q 214	Q 198	Q 206	Q 208	Q 242
28	A	236	A	A	A	A	218	A	236	212	224	A	210	194	218	208	A 222	206	194	Q 194	Q 208	A 228	A	A
29	A	A	A	A	B	B	B	A	A	A	A	A	210	Y	B	196	202	216	216	208	Q 202	Q 214	Q 238	238
30	246	A	A	A	A	E B 262	204	A 222	226	210	204	198	214	210	210	198	208	208	208	208	196	Q 206	Q 212	250
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	7	3		2	4	7	6	11	13	14	15	14	12	14	18	19	19	22	23	13	14	9	7
MED	218	208	204		211	202	210	211	222	208	212	206	211	216	216	208	218	212	210	215	208	207	208	238
U Q	240	222	A 222			233	230	222	E A 242	E A 240	240	228	224	225	234	E 238	234	220	222	236	227	228	243	250
L Q	203	198	196			202	194	204	210	204	206	200	208	205	204	200	202	206	202	208	201	202	201	208

SEP.2015 h'F (KM)

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2015 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	34	59	40	A	A	A	A	O X 56	X 63	X 68	O X 72	X 82	O X 85	X 83	X 84	X 88	X 82	X 82	X 70	R	R	67	A	A
2	90	A	B	A	42	X 56	R	R	R	R	R	R	B	B	B	B	B	B	R	O X 33	A	A	A	A
3	A	A	A	A	B	R	B	R	A	B	B	B	B	B	B	B	B	R	R	B	R	A	A	A
4	A	34	38	O X 30	A	B	B	B	B	B	B	B	B	B	B	B	B	R	O X 41	X 35	O X 33	82	O X 40	R
5	A	A	R	A	A	R	A	B	B	B	B	B	B	B	B	B	B	B	B	O X 48	30	A	A	A
6	A	71	A	A	A	B	B	B	B	B	B	O X 48	O X 53	R	X 55	X 60	X 64	B	R	Y	94	A	A	A
7	A	A	86	X 52	A	B	R	Y	B	B	B	B	B	B	B	B	R	R	40	49	62	41	B	O X 41
8	U R 38	A	A	R	R	R	R	B	B	B	B	B	B	B	B	R	B	A	B	A	39	62	R	A
9	X 32	B	A	A	B	B	B	B	B	B	B	B	R	B	B	B	B	R	O X 36	O X 38	A	A	B	B
10	A	B	B	R	B	B	B	B	B	B	B	B	B	B	B	O X 50	B	B	42	36	37	O X 25	R	A
11	A	A	A	B	B	B	B	B	B	B	B	B	B	B	R	R	B	B	O X 50	X 40	O X 39	R	A	A
12	A	A	B	A	B	R	B	B	B	R	O X 48	B	B	B	B	B	X 66	B	X 47	X 39	96	41	A	A
13	41	A	A	43	A	40	B	B	B	B	B	B	B	B	B	B	B	R	X 44	59	A	A	R	A
14	A	B	A	B	R	X 38	B	B	B	B	B	B	B	B	B	B	B	B	O X 42	X 42	X 33	57	64	A
15	A	B	R	B	B	R	R	X 48	X 50	B	B	B	B	B	B	O X 74	B	O X 56	X 54	O X 42	X 39	O X 36	A	A
16	O X 36	X 30	X 31	A	B	X 38	B	B	B	R	B	B	B	O X 66	O X 68	C	C	C	C	C	C	C	C	C
17	C	C	C	R	R	R	R	B	B	A	O X 55	X 58	O X 64	B	O X 73	X 72	X 71	X 60	59	42	O X 46	A	A	A
18	A	B	A	42	B	B	A	A	R 60	B	B	X 63	O X 64	74	B	71	68	X 59	X 56	X 45	61	65	A	A
19	O X 43	R	B	R	R	B	X 54	B	69	71	72	X 74	74	X 72	X 69	X 72	X 71	X 68	X 66	58	54	X 51	X 46	47
20	41	R	A	70	R	B	B	B	X 63	X 67	O X 70	X 71	X 80	X 80	B	B	X 72	X 74	X 69	X 58	42	76	A	A
21	A	A	A	52	50	X 57	O X 42	Y	B	B	R	X 70	X 70	X 71	X 71	X 71	X 64	X 69	X 60	X 57	O X 39	X 33	53	X 33
22	X 34	A	A	O X 46	O X 47	55	51	68	X 68	X 70	X 75	X 75	O X 75	O X 73	66	X 61	X 64	X 66	X 69	X 65	X 64	54	A	A
23	A	B	A	R	R	R	O X 52	R	X 65	X 65	X 68	X 64	X 65	O X 65	X 66	X 62	X 62	X 62	X 63	X 62	X 53	A	C	C
24	C	C	C	C	B	A	R	B	B	B	B	B	B	O X 63	R	X 65	X 60	X 60	X 60	X 59	X 58	52	44	A
25	A	56	R	A	O X 46	Y	40	A	A	O X 55	X 61	X 61	O X 66	O X 67	X 62	X 59	X 59	X 56	X 54	X 53	X 51	X 48	X 49	44
26	43	44	54	55	57	61	X 61	X 70	X 70	X 74	X 75	X 78	X 80	X 76	X 74	X 73	X 68	X 66	X 66	O X 62	X 55	X 53	X 46	X 49
27	X 45	54	52	52	56	61	66	73	78	X 79	X 84	X 84	X 85	X 86	X 82	X 76	X 75	O X 75	O X 71	O X 62	X 59	X 54	X 48	X 48
28	X 42	A	X 37	X 49	62	X 64	X 70	X 76	X 81	X 80	X 81	X 81	X 79	X 79	X 78	X 80	X 77	X 73	X 70	X 64	X 60	X 60	X 58	X 58
29	X 59	X 57	53	X 40	X 57	70	78	X 82	X 85	X 93	X 94	X 87	O X 87	O X 87	O X 87	O X 87	X 86	X 78	X 69	X 66	X 64	X 48	X 47	A
30	X 34	42	X 43	94	A	A	72	X 80	X 82	X 74	X 78	X 82	X 78	X 80	X 80	X 80	X 84	X 80	X 61	O X 45	R	A	R	R
31	51	A	A	B	B	X 59	X 67	X 73	X 74	X 75	X 76	X 72	X 67	X 58	X 64	X 58	X 64	X 62	X 59	X 55	O X 40	A	X 35	X 34
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	9	9	12	8	11	11	9	13	12	14	16	16	16	15	18	18	17	25	26	24	19	11	8
MED	X 41	54	43	50	53	X 57	X 61	X 73	X 69	X 72	X 74	X 73	X 74	X 74	X 71	X 72	X 68	X 66	X 59	X 51	X 52	53	X 47	X 46
U Q	45	58	54	54	57	61	70	X 78	X 80	X 77	X 78	X 82	X 80	X 80	X 80	X 76	X 75	X 74	X 68	X 59	60	62	53	X 48
L Q	X 34	38	X 38	42	O X 46	X 40	51	X 62	X 63	X 68	X 68	X 64	O X 66	O X 66	X 66	X 61	X 64	X 60	X 46	X 42	X 39	X 41	X 44	X 38

OCT. 2015 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2015 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 24	R 19	A	A	A	A	A	R 50	57	62	66	76	79	77	78	82	76	76	64	R	R	F 34	A	R
2	F 28	A	B	A	F 27	50	R	R	A	A	R	R	B	B	B	B	B	B	R	27	A	A	A	A
3	A	A	A	A	B	A	B	A	A	B	B	B	B	B	B	B	B	R 45	R 40	B	A	A	A	A
4	A	F 20	F 24	24	A	B	B	B	B	B	B	B	B	B	B	B	B	R	R 35	29	R 27	R 30	R 34	R
5	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	42	F 19	A	A	A
6	A	A	A	A	A	B	B	B	B	B	B	R 42	47	U R 48	49	54	58	B	R	Y	R 50	A	A	A
7	A	A	A	46	A	B	R	Y	B	B	B	B	B	B	B	B	R	R	F 24	F 28	F 25	F 21	B	R 35
8	R 32	A	A	A	A	R	R	B	B	B	B	B	B	B	B	R	B	A	B	A	F 26	A	A	A
9	26	B	A	A	B	B	B	B	B	B	B	B	R	B	B	B	B	R	R 30	R 32	A	A	B	B
10	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	44	B	B	36	30	X R	R 19	R	A
11	A	A	A	B	B	B	B	B	B	B	B	B	B	B	R	R	B	B	R 44	34	32	A	A	A
12	A	A	B	A	B	R	B	B	B	R	R 42	B	B	B	B	B	60	B	41	33	A	F 20	A	A
13	F 23	A	A	F 24	A	F 27	B	B	B	B	B	B	B	B	B	B	B	U R 45	38	B	A	A	A	A
14	A	B	A	B	R	32	B	B	B	B	B	B	B	B	B	B	B	B	36	36	27	R 29	27	A
15	A	B	A	B	B	A	A	42	J R 44	B	B	B	B	B	B	R 68	B	50	48	36	33	32	A	A
16	R 30	24	25	A	B	32	B	B	B	A	B	B	B	60	R 62	C	C	C	C	C	C	C	C	C
17	C	C	C	R	R	R	A	B	B	A	R 49	52	58	B	67	66	65	54	F 47	F 33	40	A	A	A
18	A	B	A	F 19	B	B	A	A	54	B	B	57	R 58	F 59	B	F 58	F 57	R	50	39	A	A	A	A
19	R 37	A	B	R	R	B	48	B	F 59	F 58	F 59	68	68	66	63	66	65	62	60	52	48	45	40	F 20
20	F 30	R 34	A	F 55	R	B	B	B	57	61	64	65	J R 74	J R 74	B	B	66	68	63	52	F 31	A	A	A
21	A	A	A	F 36	F 37	51	R 36	Y	B	B	R 66	64	64	65	65	65	58	63	54	51	R 33	27	A	27
22	28	A	A	R 40	41	F 41	F 42	F 57	62	64	69	69		67	61	55	58	60	63	59	58	F 38	A	A
23	A	B	A	R	R	R	R 46	R	59	59	62	58	59	59	60	56	56	56	57	56	47	A	C	C
24	C	C	C	C	B	A	R	B	B	B	B	B	B	57	R	59	54	54	54	53	52	46	F 34	A
25	A	F 38	A	A	40	Y	F 27	A	A	49	55	55	60	R 61	56	J R 53	53	50	48	47	45	42	43	F 29
26	F 27	F 30	F 26	F 41	F 42	F 47	55	64	64	68	69	72	J R 74	70	68	67	62	60	60	56	49	47	42	43
27	39	F 20	F 24	F 28	F 39	F 51	F 54	F 64	F 65	J R 73	78	78	79	80	76	70	69	69	R 65	56	53	48	42	42
28	J R 36	A	31	43	F 47	58	64	70	75	74	75	75	73	73	J R 72	74	71	67	64	58	54	54	52	52
29	53	51	F 30	34	J R 51	F 57	F 67	75	79	87	88	81	81	81	81	81	80	72	63	60	58	42	41	A
30	28	F 32	37	A	A	A	F 56	74	76	68	72	76	72	74	74	74	78	74	55	39	A	A	A	A
31	A	A	A	B	B	53	61	67	68	69	J R 70	66	61	J R 52	58	52	58	56	53	49	34	A	29	28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	14	9	7	11	8	11	11	9	13	12	15	16	15	17	15	18	18	18	26	25	21	16	10	8
MED	29	F 30	F 26	F 36	F 40	50	54	64	62	66	66	67	68	66	65	66	61	60	52	42	40	36	40	32
U Q	36	36	31	43	F 44	53	61	72	72	71	72	76	74	74	74	70	69	68	60	54	51	46	42	42
L Q	F 27	F 20	F 24	F 24	F 38	32	F 42	54	57	60	59	58	59	59	60	55	58	54	40	33	F 29	28	34	28

OCT. 2015 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2015 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	21	21	31	45	49	49	59	38	G	33	E B 51	G	G	G 23	G 28	31	28	G	29	40	42	91	93	50
2	37	90	B	47	33	47	34	32	56	51	34	G 27	B	B	B	B	B	B	G	G	41	41	41	41
3	38	76	43	57	B	34	B	47	56	B	B	B	B	B	B	B	B	E B 27	G	B	45	45	54	42
4	38	74	36	34	50	B	B	104	B	B	B	B	B	B	B	B	B	G	30	26	32	52	36	33
5	69	43	37	48	60	36	40	B	B	B	B	B	B	B	B	B	B	B	B	46	16	38	72	J A 69
6	70	42	38	34	38	B	B	B	B	B	B	G 25	G	G	G 24	30	E B 54	B	E B 24	25	40	108	68	60
7	41	57	120	65	68	B	43	34	B	B	B	B	B	B	B	B	35	34	32	33	40	41	B	44
8	61	62	69	34	37	G 27	G	B	B	B	B	B	B	B	B	E B 27	B	B	B	105	40	80	40	44
9	71	B	41	39	B	B	B	B	B	B	B	B	E B 30	B	B	B	B	29	E B 22	E B 26	39	44	B	B
10	43	B	B	37	B	B	B	B	B	B	B	B	B	B	B	G	B	B	G	G	32	16	18	33
11	34	37	32	B	B	B	B	B	B	B	B	B	B	B	G	30	B	B	E B 23	G	G	37	52	95
12	57	82	B	43	B	30	B	B	B	33	G	B	B	B	B	B	G	B	G 26	G	31	71	72	44
13	70	42	44	33	43	44	B	B	B	B	B	B	B	B	B	B	B	E B 28	25	E B 48	38	38	31	40
14	88	B	47	B	32	29	B	B	B	B	B	B	B	B	B	B	B	B	40	33	28	36	47	38
15	38	B	36	B	B	36	39	33	G	B	B	B	B	B	B	E B 60	B	E B 36	G	G	36	44	42	47
16	58	72	68	42	B	70	B	B	B	58	B	B	B	E B 54	E B 41	C	C	C	C	C	C	C	C	C
17	C	C	C	40	41	40	50	B	B	57	G	G 26	E B 54	B	E B 34	E B 31	E B 55	G	28	42	42	52	50	40
18	41	B	71	54	B	B	41	51	48	B	B	33	E B 47	30	B	E B 33	33	G 25	41	G	41	40	34	44
19	34	41	B	34	G	B	37	B	31	G	G 26	34	32	G	32	G	32	32	28	G	30	E B 18	E B 13	30
20	34	54	75	46	G	B	B	B	45	G	E B 56	E B 54	E B 55	E B 58	B	B	G 24	G 23	29	27	G	50	43	58
21	57	57	48	40	G 19	G 25	40	Y 33	B	B	E B 54	G	G	G 25	G 22	G	34	G 30	G	32	35	31	42	70
22	71	53	36	34	40	50	43	36	33	33	52	40	36	G	33	32	G	G 20	30	30	32	34	39	38
23	38	B	93	41	38	39	36	G	G	G 23	G 23	G 23	G	21	G 32	J A 19	33	31	26	G	E B 20	42	C	C
24	C	C	C	C	B	37	E B 30	B	B	B	B	B	B	G	E B 38	G	G 26	30	G 22	22	G	E B 17	32	49
25	47	35	36	47	41	20	44	51	47	G	35	G 34	E B 34	G	G 22	G 23	28	28	26	E B 21	21	G	E B 14	18
26	31	28	30	G 19	30	30	30	31	33	36	36	45	G	41	G 23	33	33	32	30	26	G	E B 14	E B 13	32
27	E B 12	30	24	18	44	32	42	42	G	G 24	G	G 26	G	33	G	G	33	E B 29	E B 55	E B 29	E B 22	E B 15	E B 13	16
28	94	42	K 26	30	26	G 20	30	33	41	G 23	G 25	G 25	G 28	G 33	40	G 29	32	32	G	G	20	E B 12	E B 12	E B 13
29	E B 13	E B 13	30	24	41	34	28	30	G 24	G 30	30	30	G	G 28	E B 56	E B 54	G 26	E B 30	E B 40	E B 26	E B 27	E B 19		58
30	39	42	70	63	42	44	38	G 22	31	G 32	36	G 35	29	G 26	G 25	G 25	32	G 24	32	42	38	51	39	K 39
31	36	65	48	B	B	G	G 17	G 23	36	G 22	33	33	33	36	34	40	35	30	G 19	22	40	40	28	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	29	23	25	26	21	22	20	17	16	16	16	17	17	17	17	20	19	22	28	29	30	30	26	28
MED	41	43	41	40	40	35	38	33	33	G	E G 34	33	E G 29	G	G	G	32	G	E G 26	26	32	40	40	42
U Q	65	65	68	47	44	44	42	44	46	34	E B 44	G	E B 35	34	E B 36	32	34	31	30	33	40	50	50	50
L Q	35	37	34	34	31	G 29	30	G 30	G	G 27	G	G 26	G	G 27	G 24	G	G	G 28	G	G	21	E B 19	E B 28	34

OCT. 2015 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2015 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	18	18	12	16	16	17	14	51	29	22	15	15	15	14	15	12	16	16	14	15	16
2	14	41	B	20	14	16	27	19	24	18	23	19	B	B	B	B	B	B	23	14	12	15	13	14
3	14	12	17	14	B	14	B	24	19	B	B	B	B	B	B	B	B	27	18	B	11	12	14	13
4	12	13	14	12	27	B	B	62	B	B	B	B	B	B	B	B	B	23	18	14	14	13	13	19
5	14	18	15	20	21	20	20	B	B	B	B	B	B	B	B	B	B	B	B	16	13	12	19	13
6	14	13	17	20	23	B	B	B	B	B	B	21	23	18	18	17	54	B	24	12	28	14	14	14
7	22	15	14	18	13	B	23	24	B	B	B	B	B	B	B	B	22	24	15	14	13	11	B	14
8	122	16	14	19	13	14	18	B	B	B	B	B	B	B	B	27	B	50	B	18	15	24	19	14
9	14	B	20	16	B	B	B	B	B	B	B	B	30	B	B	B	B	18	22	26	12	14	B	B
10	11	B	B	21	B	B	B	B	B	B	B	B	B	B	B	23	B	B	17	14	12	12	14	12
11	13	14	23	B	B	B	B	B	B	B	B	B	B	B	23	20	B	B	23	13	14	11	11	16
12	14	14	B	22	B	24	B	B	B	22	19	B	B	B	B	B	16	B	14	13	18	12	12	14
13	12	13	20	12	24	12	B	B	B	B	B	B	B	B	B	B	B	28	15	48	14	11	18	12
14	13	B	17	B	24	19	B	B	B	B	B	B	B	B	B	B	B	B	16	14	13	12	12	15
15	14	B	28	B	B	20	20	16	14	B	B	B	B	B	B	60	B	36	20	14	13	16	14	11
16	12	11	18	32	B	18	B	B	B	26	B	B	B	54	41	C	C	C	C	C	C	C	C	C
17	C	C	C	24	27	27	21	B	B	19	26	18	54	B	34	31	55	19	14	14	13	13	15	18
18	14	B	12	13	B	B	28	14	15	B	B	33	47	20	B	33	15	21	14	18	13	15	15	24
19	19	27	B	21	20	B	15	B	27	19	20	20	24	23	18	22	14	18	14	14	14	18	13	13
20	12	22	18	23	25	B	B	B	16	20	56	54	55	58	B	B	14	16	20	13	11	14	13	15
21	14	19	19	12	13	20	16	21	B	B	54	26	25	22	15	24	18	21	18	15	13	12	12	14
22	13	15	23	21	14	14	17	16	13	14	14	22	16	18	18	13	25	13	13	13	13	13	13	13
23	15	B	29	33	24	24	19	19	21	18	15	19	17	16	18	14	14	14	14	14	20	17	C	C
24	C	C	C	C	B	16	30	B	B	B	B	B	B	28	38	27	20	14	14	14	12	17	16	14
25	13	12	19	15	14	13	14	17	17	28	18	19	34	26	18	18	16	14	14	21	14	14	14	12
26	12	12	12	12	12	12	13	12	13	13	18	14	17	14	18	15	13	13	13	13	12	13	13	13
27	12	14	14	14	14	14	12	15	18	18	28	20	18	15	18	20	18	29	55	29	22	15	13	12
28	24	16	20	13	13	13	12	15	15	14	14	17	18	23	16	16	16	13	18	14	12	12	13	13
29	12	13	12	13	21	16	14	14	17	22	18	19	20	23	56	54	20	30	40	26	27	19	14	16
30	12	13	15	19	20	22	22	18	21	14	15	20	17	18	16	17	15	15	15	13	13	20	14	16
31	14	14	24	B	B	14	14	14	16	16	18	17	14	14	15	16	12	12	12	11	12	15	13	12
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	30	31	31	31	31	31	31	31	31	31	31	31	30	30	30	30	30	30	30	29	29
MED	14	15	18	20	24	20	22	24	27	28	56	33	54	54	41	27	21	22	16	14	13	14	14	14
U Q	14	B 34	24	23	B	B	B	B	B	B	B	B	B	B	B	B	B	B 50	22	18	14	15	15	16
L Q	12	13	14	14	14	14	16	16	17	18	18	19	20	18	18	17	15	15	14	13	12	12	13	13

OCT. 2015 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2015 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	E A 356	A	A	A	A	A	A	224	196	B	224	206	224	200	196	206	228	Q 222	A	A	208	A	A
2	206	A	B	A	196	222	A	196	A	A	196	A	B	B	B	B	B	B	A	206	A	A	A	A
3	A	A	A	A	B	A 198	B	A	A	B	B	B	B	B	B	B	B	E B 266	A	B	A	A	A	A
4	A	138	186	222	A	B	B	B	B	B	B	B	B	B	B	B	B	E A 262	A	264	A	A	192	A
5	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	274	E B 286	A	A	A
6	A	A	A	A	A	B	B	B	B	B	B	E A 232	232	202	210	240	B	B	B	Y	A	A	A	A
7	A	A	A	A	A	B	A	Y	B	B	B	B	B	B	B	B	A 672	A	202	228	A	200	B	210
8	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	E B 240	B	B	B	A	A 234	A	A	A
9	232	B	A	A	B	B	B	B	B	B	B	B	214	B	B	B	B	A	B	B	A	A	B	B
10	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	210	B	B	222	268	A	A	R	A
11	A	A	A	B	B	B	B	B	B	B	B	B	B	B	198	214	B	B	220	234	E A 264	A	A	A
12	A	A	B	A	B	A	B	B	B	A	218	B	B	B	B	B	218	B	196	196	A	196	A	A
13	A	A	A	206	A	200	B	B	B	B	B	B	B	B	B	B	B	244	202	B	A	A	A	A
14	A	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	E A 238	A	248	264	196	A
15	A	B	A	B	B	A	A	234	202	B	B	B	B	B	B	B	B	240	218	E A 242	A 244	E A 256	A	A
16	222	216	A	A	B	A	B	B	B	A	B	B	B	B	B	C	C	C	C	C	C	C	C	C
17	C	C	C	A	A	A	A	B	B	A	E A 248	200	B	B	216	216	B	216	222	A	A	A	A	A
18	A	B	A	A	B	B	A	A	A	B	B	232	B	220	B	E B 254	A	A 226	A	E A 226	A	A	A	A
19	A	A	B	A	A	B	226	B	A 270	224	216	208	208	A	208	198	204	204	208	204	202	210	244	262
20	212	A 276	A	A	A	B	B	B	E A 252	206	B	B	B	B	B	B	206	210	226	214	200	A	A	A
21	A	A	A	A	200	A	A	A	B	B	B	A	212	206	214	214	218	218	212	236	A	242	A	208
22	200	A	A	A	A	224	196	204	110	218	218	E A 218	210	210	204	204	204	212	198	206	202	216	A	A
23	A	B	A	A	A	A	A	198	206	206	200	196	224	202	196	208	208	208	196	200	238	A	C	C
24	C	C	C	C	B	A	B	B	B	B	B	B	B	206	228	Y	E Y 204	204	222	222	210	210	246	A
25	A	234	A	A	220	Y	A 222	A	A	Y	200	198	222	238	214	214	E A 214	198	214	228	A 234	228	Q 232	Q 246
26	236	312	240	200	200	250	222	214	200	200	196	E A 230	200	200	200	208	208	202	202	230	206	216	Q 216	Q 226
27	250	Q 316	302	Q 306	E A 280	236	216	206	206	206	214	204	204	204	204	204	204	228	E B 246	216	206	216	Q 216	Q 258
28	270	A	A	A	216	E A 244	226	198	198	210	210	210	210	198	202	202	202	202	202	202	202	Q 210	Q 218	Q 230
29	Q 240	Q 246	230	194	A	A	204	202	208	200	200	206	206	210	B	B	E A 238	210	E B 234	226	212	216	E B 256	A
30	A	E A 284	244	A	A	A	234	202	236	198	208	208	208	208	208	220	220	220	218	A	A	A	A	A
31	A	A	A	B	B	A	232	214	218	228	230	196	196	198	200	208	192	210	210	220	222	A	A 254	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	9	5	5	6	7	9	10	12	11	13	14	14	14	15	17	16	20	22	21	16	14	10	7
MED	232	U 255	240	206	204	223	222	203	206	206	209	205	209	206	204	209	206	212	212	224	212	214	221	Q 230
U Q	245	314	273	264	220	244	229	214	230	218	218	224	214	210	214	218	218	228	222	235	241	228	246	258
L Q	209	225	208	197	200	200	210	198	201	200	200	200	206	202	200	204	204	206	202	206	204	210	216	210

OCT. 2015 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2015 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	113	A	A	72	O X 55	O X 53	77	R	A	A	A	B	Y	X 58	X 66	O X 69	X 62	B	X 48	55	O X 45	58	A	A
2	O X 42	X 40	X 43	52	X 49	X 61	R 60	X 63	65	C	C	C	X 72	R 66	X 74	X 75	X 73	65	X 62	X 56	X 51	X 55	58	58
3	58	52	X 58	62	63	57	R	R	A	R	68	X 72	X 72	O X 87	X 87	82	X 68	O X 46	O X 47	X 41	R	72	46	48
4	R	R	40	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	X 42	X 49	X 50	X 43	R 46	52
5	44	A	A	39	X 40	B	R	R	O X 48	R 50	R	O X 56	B	B	O X 74	B	X 69	X 60	O X 49	X 49	X 46	88	O X 38	A
6	R	A	A	B	B	B	R	R	R	B	B	B	B	B	X 61	X 57	B	R	B	B	X 54	X 53	X 30	B
7	60	A	B	58	A	A	B	B	B	B	B	B	B	B	B	B	B	98	R	A	A	B	A	A
8	A	A	O X 39	O X 39	X 38	X 43	O X 47	O X 43	R	R	R	R	R	R	R	X 60	X 57	O X 49	O X 42	O X 42	O X 46	X 44	O X 45	R
9	B	O X 56	X 49	R	B	B	B	R	B	B	B	B	B	B	B	B	B	89	100	87	84	O X 47	A	R
10	A	48	61	O X 35	R	B	R	B	B	B	B	B	B	B	O X 60	B	B	R	X 49	88	90	O X 45	52	36
11	B	R	O X 38	X 40	B	B	R	R	B	B	B	B	B	B	B	R	B	O X 47	X 48	O X 47	71	92	70	43
12	R	R	R	B	R	O X 49	X 57	X 64	X 68	X 69	X 67	X 66	R	B	B	B	B	B	X 57	B	R	X 52	X 52	X 48
13	48	47	X 56	X 47	A	X 57	X 67	X 68	O X 72	X 78	O X 77	B	B	X 69	X 72	O X 76	X 73	X 71	B	O X 49	O X 47	86	R	O X 46
14	O X 42	43	A	44	59	O X 45	R	R	R	R	X 57	X 58	B	B	X 62	X 62	B	R	X 57	R	X 52	X 47	X 44	40
15	O X 47	44	R	62	B	R	X 70	X 69	B	O X 65	71	68	71	X 73	X 74	O X 73	O X 70	O X 65	X 63	X 59	X 57	X 61	X 58	X 40
16	O X 62	65	A	R	B	B	B	B	B	B	B	R	O X 59	B	B	O X 72	O X 73	X 59	B	69	60	68	R	R
17	50	46	A	B	R	R	O X 51	B	R	O X 63	O X 64	O X 64	X 58	X 64	B	O X 64	X 63	O X 66	X 61	X 56	X 45	O X 43	X 43	C
18	C	C	57	X 58	56	62	O X 65	R	O X 63	66	70	X 64	X 68	O X 71	B	B	B	B	X 59	X 54	R	X 46	X 46	A
19	C	O X 41	A	R	R	R	R	R	O X 55	60	O X 55	X 59	X 60	O X 60	X 60	B	R	R	O X 55	X 54	X 56	X 51	X 45	X 42
20	52	57	X 60	X 59	X 65	X 68	74	X 80	X 85	O X 85	X 84	O X 89	O X 83	X 83	O X 75	O X 68	X 68	X 63	X 66	X 62	X 61	X 57	X 57	X 59
21	X 59	X 64	X 63	X 67	S	B	R	R	X 62	X 68	68	X 68	X 73	X 70	X 70	X 68	X 66	X 68	X 66	X 64	X 63	X 55	X 52	48
22	O X 41	X 53	60	58	R	X 56	X 55	O X 62	X 70	X 70	X 73	X 74	X 74	O X 72	X 66	X 66	X 68	X 64	X 62	X 61	X 58	X 58	X 55	X 49
23	47	54	55	X 62	X 68	76	X 77	X 84	90	O X 87	O X 86	X 80	X 73	X 71	X 72	X 70	X 68	X 66	X 64	X 58	X 58	X 58	X 53	X 54
24	X 57	X 62	65	65	70	77	82	89	X 92	X 94	X 94	X 87	X 84	X 80	X 73	X 73	X 67	X 65	X 65	X 64	X 62	X 59	X 61	63
25	65	70	77	82	X 85	X 97	X 104	X 108	X 101	X 103	X 99	X 97	X 95	X 88	X 82	X 76	X 73	X 68	X 66	X 60	X 57	X 58	X 62	X 64
26	69	71	72	81	X 88	98	X 98	X 101	X 97	X 103	X 96	X 95	O X 88	X 83	X 83	X 80	X 73	X 67	X 65	X 63	X 62	X 57	X 40	A
27	X 54	X 62	62	59	X 58	57	R	R	R	R	X 59	X 63	X 62	X 60	X 67	X 64	X 62	X 60	X 58	X 56	X 56	X 55	X 53	X 47
28	64	X 46	X 49	X 48	57	66	X 67	X 72	X 74	X 77	X 77	X 74	X 65	X 65	X 58	X 56	X 68	X 69	X 61	X 59	X 55	X 54	X 51	X 51
29	A	64	66	94	52	X 46	X 61	65	X 72	X 69	O X 68	O X 69	X 62	X 64	X 68	X 61	X 54	X 53	X 52	X 49	X 54	X 49	42	67
30	A	O X 47	43	57	A	R	R	R	R	B	B	O X 62	B	B	X 66	B	B	B	X 54	R	X 50	X 46	X 48	O X 42
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	19	21	20	23	15	17	16	13	15	16	18	19	17	18	21	20	19	21	26	25	26	29	25	20
MED	54	53	58	58	X 58	X 57	X 67	X 69	X 72	X 70	X 70	X 68	X 72	X 70	X 70	X 68	X 68	X 65	X 58	X 56	X 56	X 55	X 51	X 48
U Q	62	63	62	65	X 68	72	X 77	X 86	X 90	X 86	X 84	X 80	X 78	X 80	X 74	X 74	X 73	X 68	X 64	X 62	X 61	58	X 56	56
L Q	O X 47	46	X 46	X 47	X 52	O X 51	X 58	X 64	O X 63	66	X 67	X 63	X 62	X 64	X 64	X 63	X 63	X 60	X 49	X 49	X 50	X 47	X 44	42

NOV. 2015 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2015 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	F 56	R 49	R 47	F 52	R	A	A	A	B	Y	52	59	R 63	56	B	42	41	39	A	A	A
2	36	34	37	F 41	43	55	54	57	58	C	C	C	66	60	68	69	67	59	56	50	45	49	F 45	F 46
3	F 45	F 42	52	F 42	F 50	F 42	A	A	A	A	F 57	66	66	81	81	Z 74	62	R 40	R 41	35	A	A	F 22	F 31
4	R	R	F 29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	36	43	44	37	R 40	R 44
5	F 30	A	A	F 30	34	B	R	R	42	R 44	R 45	R 50	B	B	R 68	B	63	54	43	43	40	R	32	A
6	A	A	A	B	B	B	R	R	R	B	B	B	B	B	55	J R 51	B	R	B	B	48	J R 47	24	B
7	F 25	A	B	R 31	A	A	B	B	B	B	B	B	B	B	B	B	B	36	R	A	A	B	A	A
8	A	A	R 33	33	32	37	41	37	R	R	R	R	R	R	R	J R 54	51	U R 43	R 36	R 36	40	38	39	A
9	B	50	43	R	B	B	B	R	B	B	B	B	B	B	B	B	B	B	Y	Y	R 43	41	A	A
10	A	F 24	A	R 29	R	B	R	B	B	B	B	B	B	B	R 54	B	B	R	43	R	Y	39	40	F 25
11	B	A	32	34	B	B	R	R	B	B	B	B	B	B	B	R	B	41	42	R 41	Y	40	34	F 31
12	R	R	R	B	R	43	51	58	62	63	J R 61	60	R	B	B	B	B	B	51	B	U R 50	46	46	42
13	F 31	F 34	50	41	A	51	61	62	66	72	U R 71	B	B	63	66	70	67	65	B	R 43	41	A	R	40
14	R 36	F 23	A	F 30	F 50	39	R	R	R	R	J R 51	J R 52	B	B	56	R 56	B	R	51	R	46	41	38	34
15	R 41	F 30	A	F 41	B	R	64	63	B	59	F 59	F 57	F 59	67	68	67	64	59	57	53	51	55	52	34
16	56	F 53	A	R	B	B	B	B	B	B	B	R	R 53	B	B	R 66	67	54	B	40	A	R 36	A	A
17	F 28	F 26	A	B	R	R	R 45	B	R	R 57	58	58	52	58	B	R 58	57	R 60	55	50	39	R 37	37	C
18	C	C	F 39	52	F 41	F 51	58	R	57	60	F 58	58	62	R 65	B	B	B	B	53	J R 48	R	40	40	A
19	C	R 35	A	A	A	A	A	A	R 49	F 49	R 49	R 53	J R 54	54	54	B	R	R	49	48	50	45	39	36
20	F 35	F 40	54	53	59	62	F 59	74	79	78	78	83	77	77	R 69	62	62	57	60	R 56	55	51	51	53
21	53	58	57	J S 61	S	B	R	R	56	62	F 57	62	67	64	64	62	60	62	60	58	57	49	46	F 36
22	35	47	F 48	F 50	R	J R 50	49	56	64	64	67	68	68	66	60	60	62	58	56	55	52	52	49	43
23	F 38	F 43	F 44	56	J R 62	F 66	71	78	F 80	R 81	80	74	67	65	66	64	62	60	58	52	52	52	47	48
24	51	56	F 54	F 52	F 55	F 67	F 71	F 79	J R 86	J R 88	J R 88	81	78	74	67	67	61	59	59	58	56	53	55	F 53
25	F 54	F 57	F 65	F 70	79	91	98	102	95	J R 96	J R 93	91	89	82	76	70	67	62	60	54	51	52	56	58
26	F 58	F 58	F 65	F 70	82	92	92	95	91	J R 97	J R 90	89	82	77	77	74	67	61	59	58	56	51	34	A
27	J R 48	56	F 45	F 46	52	F 48	R	A	R	A	53	56	56	54	61	58	56	54	52	50	50	49	47	41
28	F 29	40	43	42	F 47	F 56	61	66	68	71	J R 71	68	59	59	J R 52	50	62	63	55	53	49	48	45	45
29	A	F 39	F 50	F 30	F 30	40	55	F 56	66	63	62	63	56	58	62	55	48	47	46	43	48	43	A	A
30	A	41	F 25	34	A	A	A	A	A	B	B	R 56	B	B	J R 60	B	B	B	48	R	44	40	42	R 36
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	21	19	23	15	17	16	13	15	16	19	19	17	18	21	20	19	20	25	23	24	25	24	19
MED	F 37	F 41	F 45	F 42	50	51	58	63	66	64	61	62	66	64	64	62	62	58	52	50	48	46	41	41
U Q	51	54	F 54	53	59	64	68	78	80	J R 80	J R 78	74	72	74	68	68	67	60	58	54	52	51	47	46
L Q	F 31	F 34	37	33	41	42	52	56	57	60	R 57	R 56	56	58	58	57	57	50	43	43	44	40	38	F 34

NOV. 2015 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2015 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	77	79	42	30	32	45	32	G	50	47	50	B	32	33	G 26	E B 57	G	B	40	43	40	43	41	41
2	42	36	36	50	35	32	G	27	32	C	C	C	34	34	34	39	34	30	28	31	G 22	31	31	34
3	31	34	30	29	31	32	47	49	70	62	40	35	35	E B 46	G	G 29	41	34	36	32	41	49	55	44
4	38	35	36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	30	G	G 22	G 22	40	41
5	69	87	48	36	24	B	32	40	34	34	G 24	R 33	B	B	E B 56	B	28	31	25	25	34	72	31	37
6	34	48	42	B	B	B	41	42	G	B	B	B	B	B	G	G	B	E B 28	B	B	G	31	32	B
7	70	154	B	39	87	56	B	B	B	B	B	B	B	B	B	B	B	32	35	38	45	B	104	53
8	43	43	36	33	35	G 21	28	29	50	32	32	32	G 28	33	32	32	32	G	G 22	38	40	37	79	43
9	B	64	30	G 34	B	B	B	37	B	B	B	B	B	B	B	B	B	E B 81	G 26	G 38	40	42	117	G
10	44	62	108	30	29	B	G 35	B	B	B	B	B	B	B	G 30	B	B	30	30	36	32	33	68	51
11	B	40	33	30	B	B	36	36	B	B	B	B	B	B	B	31	B	G 22	G 20	G 30	38	35	G	72
12	34	G	28	B	G 28	31	28	33	G 24	G 27	G 27	G	E B 36	B	B	B	B	B	30	B	E B 27	G	G	38
13	32	24	34	37	48	38	35	38	E B 56	32	E B 56	B	B	30	G	E B 52	E B 20	31	B	G	42	48	42	42
14	42	92	68	41	50	33	42	35	G	G	G 28	G 28	B	B	G 25	G	B	28	E B 34	36	34	28	30	G 25
15	89	66	G	39	B	39	39	34	B	E B 40	G 28	21	34	33	29	E B 57	G	E B 41	E B 28	24	24	32	25	38
16	33	66	96	37	B	B	B	B	B	B	B	G 32	E B 36	B	B	E B 56	G	30	B	44	46	38	42	44
17	34	33	60	B	G 26	36	28	B	38	G	G 26	22	G 22	G 28	B	E B 54	G 27	G 26	30	30	37	40	40	C
18	C	C	35	34	34	36	42	42	45	38	32	35	G 24	E B 54	B	B	B	B	G 22	38	32	32	42	50
19	C	50	65	44	41	45	39	42	50	34	34	34	36	32	G 29	B	G	40	32	G 22	33	33	36	38
20	38	34	E B 22	G 22	22	35	35	35	37	37	G	36	46	42	36	34	39	34	39	33	33		37	17
21	17	24	29	G	E B 29	B	35	40	34	38	38	44	G	44	34	32	32	33	36	33	31	28	26	36
22	41	32	36	40	46	46	37	47	38	38	34	35	37	41	39	40	40	33	32	34	31	27	19	29
23	25	30	30	G	32	28	32	35	35	37	34	34	34	38	35	62	45	34	34	32	38	38	24	36
24	30	30	40	59	64	37	68	39	35	35	36	38	38	34	41	36	31	G 19	32	26	32	27	25	22
25	17	17	26	27	27	30	33	33	33	34	38	41	38	G	40	47	43	34	34	34	32	28	25	22
26	33	25	27	27	38	34	32	34	34	43	43	46	60	76	68	35	39	34	34	31	30	27	46	56
27	45	49	65	28	82	34	35	49	39	53	42	34	38	36	37	37	35	32	30	30	30	30	33	30
28	101	41	57	45	42	42	31	32	36	36	G 33	36	36	42	59	36	42	31	35	41	38	29	G	42
29	124	49	69	37	34	34	45	34	34	34	30	35	38	39	39	36	34	32	32	32	29	30	43	48
30	76	46	42	42	64	42	42	42	43	B	B	E B 35	B	B	E B 57	B	B	B	42	44	39	31	36	76
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	29	29	26	24	22	26	25	23	21	21	21	20	19	22	21	20	25	27	28	30	28	30	28
MED	40	41	36	35	34	36	35	36	36	36	E G 34	35	36	35	34	34	33	32	32	34	33	32	36	40
U Q	69	63	58	40	47	42	41	42	45	39	39	36	38	42	40	E B 53	40	34	35	G	39	38	42	46
L Q	33	31	30	30	29	32	32	34	34	33	G 29	G	G 33	33	G	32	G	G 29	G 28	30	30	28	25	32

NOV. 2015 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2015 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	16	13	16	17	19	14	36	19	18	27	B	26	15	20	57	19	B	14	13	13	15	14	14
2	15	13	14	14	14	12	12	13	14	C	C	C	15	28	14	14	14	12	16	14	14	12	12	12
3	13	11	20	13	13	12	20	20	14	16	15	15	15	46	30	18	14	13	12	12	14	12	12	11
4	27	25	12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	17	20	14	14	12	14
5	12	22	20	13	12	B	23	14	14	14	16	15	B	B	57	B	15	15	15	12	18	16	16	14
6	18	27	26	B	B	B	24	23	26	B	B	B	B	B	26	22	B	28	B	B	19	14	12	B
7	12	39	B	12	14	23	B	B	B	B	B	B	B	B	B	B	B	14	15	13	17	B	13	17
8	12	14	12	14	15	14	13	14	14	14	16	14	14	22	14	14	16	14	12	14	12	12	12	19
9	B	14	14	26	B	B	B	22	B	B	B	B	B	B	B	B	B	81	16	28	15	14	25	28
10	12	10	13	14	17	B	24	B	B	B	B	B	B	B	20	B	B	16	14	12	14	12	14	11
11	B	23	16	12	B	B	24	24	B	B	B	B	B	B	B	23	B	15	18	24	14	13	20	12
12	29	26	23	B	26	17	14	13	15	18	21	28	36	B	B	B	B	B	20	B	27	15	14	12
13		12	12	18	22	15	17	13	56	15	56	B	B	14	23	52	16	13	B	16	13	13	15	15
14	14	14	29	12	12	21	19	20	26	26	24	19	B	B	23	26	B	18	34	25	19	12	11	22
15	16	12	24	12	B	24	15	15	B	40	27	15	20	28	24	57	29	41	28	16	15	15	12	12
16	17	12	26	24	B	B	B	B	B	B	B	23	36	B	B	56	21	12	B	14	14	13	11	13
17	12	12	19	B	20	21	14	B	24	15	15	15	12	17	B	54	16	18	13	12	12	13	12	C
18	C	C	15	16	12	12	18	22	20	16	16	13	13	54	B	B	B	B	13	13	20	11	12	12
19	C	14	19	31	25	13	13	13	15	12	14	14	14	25	14	B	23	28	26	15	13	13	12	12
20	11	13	22	16	18	14	12	12	12	12	16	21	17	18	30	23	19	16	16	14	14	12	13	11
21	12	12	12	16	29	B	16	21	16	16	13	20	23	17	13	13	15	15	13	13	12	13	12	12
22	12	13	12	15	13	17	13	12	12	14	13	13	14	14	15	13	14	14	12	14	14	11	12	12
23	12	12	13	13	12	12	12	11	13	13	16	14	14	14	12	14	14	15	13	14	16	16	12	12
24	12	12	12	12	13	13	13	13	12	12	13	13	14	12	13	13	13	13	13	13	13	10	11	12
25	11	12	12	12	12	12	11	12	12	12	14	16	17	12	15	12	13	12	12	12	12	12	12	12
26	14	14	12	12	12	12	12	12	12	12	14	14	12	12	13	14	12	12	12	12	12	12	12	13
27	12	13	12	12	12	12	17	17	14	18	12	14	14	13	15	12	12	12	12	12	13	12	12	12
28	13	12	12	12	13	12	12	12	13	13	13	13	13	14	14	13	12	12	13	13	13	12	14	12
29	14	13	14	14	13	13	13	12	12	12	14	12	12	12	13	12	12	13	13	13	12	12	12	12
30	14	14	16	14	22	14	16	14	12	B	B	35	B	B	57	B	B	B	14	25	13	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	27	29	30	30	30	30	30	30	30	29	29	29	30	30	30	30	30	30	30	30	30	30	30	29
MED	13	13	14	14	16	16	16	14	15	16	16	16	18	26	23	24	18	15	14	14	14	13	12	12
U Q	16	15	20	18	B 26	B	23	B 23	B 56	B	B	B	B	B	B	B	B	B 28	18	16	15	14	14	14
L Q	12	12	12	12	13	12	13	13	13	13	14	14	14	14	14	14	14	13	13	13	13	12	12	12

NOV. 2015 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2015 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	198	A	A	A	A	B	Y	198	202	B	A	B	A	A	A	A	A	A
2	232	A	232	232	228	202	222	116	208	C	C	C	200	Y	208	200	210	218	222	226	220	Q 222	Q 222	Q 248
3	250	288	212	A	Q 204	Q 204	A	A	A	A	212	204	204	B	E A 290	234	Q 204	E A 256	E A 248	222	A	A	F 212	212
4	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	208	A	196	A	A	224
5	200	A	A	A	A	B	A	A	A	206	202	228	B	B	B	B	210	198	198	206	202	212	A	A
6	A	A	A	B	B	B	A	A	A	B	B	B	B	B	212	212	B	212	B	B	230	A	A	B
7	F	A	B	202	A	A	B	B	B	B	B	B	B	B	B	B	B	E A 244	A	A	A	B	A	A
8	A	A	218	220	116	112	254	244	228	208	220	220	198	A	220	194	206	E A 258	212	A	E A 330	E A 296	A	A
9	B	A	A	A	B	B	B	A	B	B	B	B	B	B	B	B	B	E B 266	Y	Y	A	250	A	A
10	A	236	A	204	A	B	A	B	B	B	B	B	B	B	E A	B	B	214	230	A	Y	A	A	208
11	B	A	A	A	B	B	A	A	B	B	B	B	B	B	B	204	B	212	212	A	A	288	A	A
12	A	A	A	B	A	280	232	200	200	210	198	200	206	B	B	B	B	B	212	B	230	226	238	A
13	214	Q 266	A	A	A	A	E A 266	228	B	196		B	B	196	210	B	210	206	B	A	A	A	A	A
14	A	218	A	234	268	E A 290	A	A	Y	202	200	212	B	B	196	204	B	228	246	E A 246	A 224	250	250	136
15	A	A	A	230	B	A	A	206	B	262	216	100	194	214	Y	B	206	B	218	224	222	238	228	228
16	A	222	A	A	B	B	B	B	B	B	B	A	222	B	B	B	204	H 194	B	A	A	A	A	A
17	264	200	A	B	A	A	200	B	A	198	196	214	196	206	B	B	226	216	216	216	246	E A 282	A	C
18	C	C	A	A	A	236	E A 238	A	278	204	196	196	202	B	B	B	B	B	194	A	274	244	244	A
19	C	228	A	A	A	A	A	A	228	200	210	206	206	Y	206	B	208	A	208	208	222	236	220	A
20	240	240	218	A	272	E A 240	A 226	200	200	230	194	212	A	A	E A 238	216	216	216	216	A 248	220	234	234	Q 234
21	Q 252	212	A	A	E B 248	B	A	A	212	198	A 216	A 216	202	202	202	202	218	206	206	216	228	228	228	232
22	246	A	232	A	A	A	A 218	A	204	212	E A 202	E A 214	214	202	202	196	204	204	210	210	220	228	Q 228	204
23	Q 254	Q 244	A	308	248	208	E A 224	210	202	210	194	212	202	202	212	A	226	198	214	202	228	A 226	Q 226	252
24	Q 238	A	Q 254	222	Q 222	222	A	196	198	198	198	216	206	224	208	200	210	204	204	204	206	224	Q 216	Q 228
25	Q 230	Q 250	234	240	Q 230	224	220	196	200	200	200	A	202	212	212	A 228	198	206	206	208	208	232	Q 232	Q 232
26	Q 236	Q 256	Q 232	232	236	222	216	204	204	204	204	234	A	A	216	202	202	202	202	214	218	216	260	A
27	214	A	A	Q 232	A	228	A	A	A	A	210	194	A	204	196	214	206	200	200	200	210	236	240	242
28	A	A	200	214	A	218	212	200	200	200	200	200	206	196	206	206	206	214	214	226	224	Q 224	Q 246	250
29	A	244	220	220	208	208	208	204	198	204	196	198	198	202	210	210	190	210	210	210	Q 224	224	A	A
30	A	A	224	224	A	A	A	A	A	B	B	210	B	B	B	B	B	B	224	252	236	256	224	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	13	13	11	14	11	14	14	12	14	18	19	19	16	12	18	15	19	23	24	18	22	22	17	14
MED	238	240	224	227	229	218	218	202	203	204	200	211	202	202	208	204	206	209	212	214	222	230	228	230
U Q	251	Q 253	Q 232	232	248	236	232	208	212	210	210	216	206	209	212	214	210	E 218	217	226	230	250	242	242
L Q	222	220	218	220	208	208	212	198	200	200	196	200	199	200	202	200	204	204	206	208	218	224	223	212

NOV. 2015 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2015 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	C	C	C	R	A	R	X 60	X 64	X 64	O X 66	X 57	X 60	B	X 60	C	X 56	R	A	65	O X 48	84	80
2	41	B	B	A	B	B	A	A	R	R	O X 62	B	B	B	B	O X 65	O X 64	X 67	X 47	O X 44	X 48	X 45	O X 46	R
3	O X 43	R	56	53	R	R	R	X 63	X 68	B	O X 68	X 67	B	A	A	A	R	X 55	X 57	U R 55	X 54	X 50	X 50	X 48
4	48	42	83	R	58	X 62	X 68	B	67	69	X 71	X 72	R	X 79	X 74	X 66	60	X 63	X 61	X 67	X 66	X 66	X 59	X 58
5	X 56	54	A	R	A	B	B	X 57	O X 65	65	X 63	66	O X 69	C	C	68	X 65	R	O X 59	O X 50	113	54	R	A
6	X 44	50	A	B	B	X 41	A	R	R	B	R	B	B	R	R	O X 55	B	B	O X 48	O X 56	O X 48	O X 43	70	B
7	O X 40	B	A	B	R	B	R	R	R	B	B	R	R	B	B	O X 69	R	B	O X 50	X 50	X 50	X 50	R	77
8	R	B	45	B	B	B	B	B	B	R	R	R	R	B	R	R	X 61	B	O X 48	O X 49	X 49	X 48	X 45	X 46
9	X 48	B	O X 44	O X 45	B	B	B	X 70	R	R	67	X 63	X 61	X 59	X 61	X 59	X 61	X 58	O X 55	O X 51	X 49	O X 46	X 48	O X 46
10	B	B	B	X 58	B	B	R	R	B	R	O X 54	R	B	B	B	R	X 64	X 58	O X 54	R	X 54	O X 51	R	A
11	A	51	X 53	B	R	B	B	R	O X 68	B	B	R	B	B	B	B	B	R	R	R	X 51	X 50	X 49	A
12	A	A	O X 45	B	49	R	R	58	B	R	B	B	B	B	B	R	B	B	X 48	O X 48	O X 46	X 46	X 49	X 49
13	X 46	O X 44	R	B	B	R	R	O X 61	B	O X 66	O X 67	O X 74	O X 73	O X 73	O X 73	O X 67	O X 68	O X 67	O X 66	X 56	X 55	X 53	O X 54	X 54
14	X 54	X 54	X 52	O X 50	B	B	R	X 60	X 63	X 70	X 71	X 72	X 76	X 74	O X 72	O X 65	O X 65	X 60	X 59	B	66	58	65	61
15	X 54	A	R	48	A	A	A	R	R	R	R	B	B	R	R	R	R	R	O X 46	X 46	X 50	O X 47	X 50	X 50
16	O X 44	R	A	B	R	66	R	B	R	R	O X 54	O X 50	R	R	O X 52	O X 62	O X 55	O X 50	R	O X 55	X 56	X 55	O X 54	X 54
17	X 54	X 58	X 61	X 62	X 68	X 70	79	76	O X 85	X 79	X 72	X 70	O X 70	O X 70	O X 70	X 68	O X 68	X 67	X 61	O X 50	X 49	X 48	O X 47	R
18	B	B	101	X 44	A	X 44	A	X 61	O X 64	O X 66	64	X 61	X 66	R	O X 66	O X 64	O X 63	X 62	X 58	X 58	X 57	X 54	O X 53	X 54
19	X 57	R	R	R	X 58	R	66	R	O X 65	X 71	X 72	X 72	O X 68	X 67	X 64	X 64	X 61	X 61	X 57	X 58	O X 49	X 47	A	A
20	69	A	A	A	O X 63	58	R	B	B	B	B	B	B	R	R	O X 54	R	R	X 58	58	X 60	62	A	A
21	117	R	66	B	A	B	A	A	A	A	B	R	R	B	R	R	R	R	O X 46	X 46	X 46	X 48	X 49	68
22	74	R	R	R	R	X 42	A	R	R	R	R	R	R	R	R	B	B	B	R	A	X 56	X 54	X 44	O X 44
23	A	O X 46	R	O X 45	O X 46	R	R	53	O X 45	63	O X 64	O X 64	X 65	O X 63	O X 51	R	R	O X 48	X 55	O X 54	O X 52	X 56	60	R
24	R	43	R	R	49	47	X 44	A	R	R	B	B	O X 66	R	R	X 60	X 64	R	O X 54	X 58	X 52	X 56	X 42	X 42
25	X 46	R	X 46	X 40	R	R	O X 53	68	X 58	X 68	O X 69	X 71	B	X 71	X 64	X 61	X 59	O X 58	X 56	X 58	X 56	O X 49	X 52	O X 48
26	O X 47	49	X 45	57	X 51	57	R	O X 56	O X 58	63	X 65	X 66	X 66	O X 64	X 64	X 64	X 65	X 62	R	R 55	O X 48	X 53	X 47	X 50
27	A	B	R	51	59	R	O X 44	X 46	O X 47	73	B	B	B	B	B	B	B	B	B	R	X 54	X 50	X 49	X 51
28	X 49	R	52	R	R	X 58	X 60	72	X 78	X 78	X 75	X 73	X 74	X 73	O X 69	O X 67	X 63	O X 63	O X 59	O X 51	O X 54	X 55	X 60	X 54
29	X 52	O X 58	O X 63	B	B	Y	X 64	X 72	X 79	X 80	X 82	O X 84	80	X 75	X 72	X 68	X 64	X 68	X 62	X 57	X 52	X 50	O X 45	X 56
30	R	A	O X 48	O X 50	O X 59	X 64	70	78	82	X 82	O X 87	O X 88	O X 86	O X 72	X 57	X 59	X 57	X 61	X 66	X 54	60	X 55	X 50	X 46
31	51	O X 47	X 52	55	B	O X 60	68	B	71	X 71	X 71	X 70	79	O X 76	O X 72	O X 86	B	Y	67	A	A	O X 51	O X 45	43
	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	12	16	13	10	12	10	15	17	16	20	18	15	14	15	21	18	18	25	24	30	31	26	22
MED	X 49	X 50	X 52	X 50	X 58	X 58	X 65	X 61	X 65	X 70	X 68	X 70	X 69	X 72	O X 66	X 64	X 64	X 61	X 57	X 54	X 53	X 50	X 50	X 50
U Q	55	X 54	62	56	O X 59	X 63	68	72	X 74	X 76	X 72	O X 72	76	X 74	O X 72	X 68	O X 65	X 63	X 60	X 58	56	X 55	54	56
L Q	X 45	45	X 46	X 45	49	X 46	O X 53	X 57	O X 59	66	X 64	X 66	X 66	X 64	X 61	X 60	X 61	X 58	O X 49	O X 50	X 49	X 48	X 47	X 46

DEC.2015 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2015 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	C	C	C	R	A	R 106	J R 54	58	58	R 60	51	54	B	54	C	50	R	A	41	42	R 35	F 29
2	F 32	B	B	A	B	B	A	R	A	R	R 56	B	B	B	B	R 59	58	61	41	38	42	39	40	A
3	R 37	A	F 30	F 30	A	R	R	57	62	B	62	61	B	A	A	A	R	49	51	49	48	44	44	V 42
4	F 39	F 33	Y	A	F 48	56	62	B	F 58	F 57	65	66	J R 71	J R 73	68	60	J R 54	57	55	61	60	60	53	52
5	50	F 41	A	R	A	B	B	51	59	F 52	57	F 56	63	C	C	F 59	59	R	U R 53	R 44	R 49	F 43	A	A
6	38	F 39	A	B	B	35	A	R	A	B	R	B	B	R	R	R 49	B	B	42	50	R 42	R 39	A	B
7	R 34	B	A	B	R	B	A	A	A	B	B	R	R	B	B	63	R	B	44	44	44	44	R	A
8	R	B	F 36	B	B	B	B	B	B	R	R	R 49	R	B	R	R	55	B	R 42	R 43	43	42	39	40
9	42	B	38	39	B	B	B	64	R	R	F 56	57	55	J R 53	55	J R 53	55	J R 52	U R 49	R 45	43	R 40	J R 42	40
10	B	B	B	52	B	B	R	R	B	R	48	R	B	B	B	R	58	52	48	R	48	45	R	A
11	A	F 39	47	B	R	B	B	R	R 62	B	B	R	B	B	B	B	B	R	R	R	45	44	43	A
12	A	A	39	B	F 36	R	R	R	B	R	B	B	B	B	B	R	B	B	42	R 42	40	40	43	43
13	40	R 38	R	B	B	R	A	55	B	60	61	68	67	66	R 67	61	R 62	61	R 60	J R 50	49	47	48	48
14	48	48	46	44	B	B	R	J R 54	57	64	65	66	J R 70	J R 68	R 66	59	59	54	53	B	F 55	F 44	F 45	F 49
15	R 48	A	R	F 35	A	A	A	R	R	R	R	B	B	R	R	R	R	R	40	40	44	43	44	44
16	38	A	A	B	R	R	R	B	R	R	48	R 44	R	R	R 46	R 56	49	R 44	R	49	50	49	48	48
17	48	52	55	56	62	64	F 63	F 62	79	73	66	64	64	64	64	62	62	61	55	44	43	42	R 41	R
18	B	B	27	38	A	38	A	J R 55	58	60	57	55	60	R	60	R 58	57	J R 55	J R 52	R 52	51	48	R 47	48
19	51	A	A	R	52	R	R	R	59	65	66	66	62	61	R 58	58	55	J R 55	J R 51	52	R 43	41	A	A
20	F 57	A	A	A	R 57	F 36	R	B	B	B	B	B	B	R	R	R 48	R	R	J R 52	F 38	54	F 40	A	A
21	A	A	F 39	B	A	B	A	A	A	A	B	R	R	B	R	R	R	R	40	40	40	42	43	R 43
22	41	A	A	A	A	36	A	A	A	R	R	R	R	R	R	B	B	B	R	A	50	48	38	R 38
23	A	40	R	R 39	40	A	R	A	38	F 55	R 58	58	59	U R 57	U R 45	U R 51	R	42	R 49	U R 48	46	J R 50	J R 54	R
24	R	F 31	R	A	F 31	F 34	38	A	R	R	B	B	60	R	R	54	58	R	48	J R 52	46	50	36	36
25	40	A	40	R 34	A	A	R 47	R	52	62	63	65	B	65	58	55	53	U R 52	50	52	50	43	46	42
26	41	F 37	39	F 40	45	J R 52	R	R 50	R 52	F 50	59	60	60	58	58	58	59	56	R	49	42	47	41	44
27	A	B	A	F 32	R 36	R	R 38	R 40	41	A	B	B	B	B	B	B	B	B	B	U R 41	J R 48	44	R 43	45
28	43	A	F 34	A	A	52	54	F 60	72	72	69	67	68	67	63	61	57	57	53	45	48	49	54	48
29	46	52	57	B	B	Y	58	66	73	J R 74	76	78	73	69	66	62	58	62	56	J R 51	46	44	39	J R 50
30	R	A	42	R 44	53	58	F 57	F 64	76	76	81	R 82	80	66	J R 51	J R 53	J R 52	J R 55	60	48	J R 54	49	44	40
31	F 40	R 41	46	F 45	B	R 54	F 56	B	F 56	65	65	64	F 68	R 70	R 66	80	B	Y	F 56	A	A	45	39	F 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	20	12	15	13	10	11	9	13	17	15	20	19	16	14	15	22	18	18	25	25	30	31	25	21
MED	41	40	39	39	46	52	56	57	58	62	62	64	64	66	60	58	58	55	51	48	46	44	43	43
U Q	48	44	46	44	53	56	60	64	67	72	66	66	69	R 68	R 66	61	59	57	54	R 50	50	48	46	48
L Q	38	F 38	F 36	F 34	F 36	36	R 42	R 52	53	F 57	57	57	60	58	R 55	R 54	55	52	43	42	43	42	40	40

DEC.2015 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2015 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	48	B	C	C	C	G	42	G 22	39	37	J A 49	35	35	34	B	G 25	C	34	39	41	44	G 34	38	82
2	35	B	B	41	B	B	50	44	41	36	G 27	B	B	B	B	E B 56	E B 32	G 23	32	28	38	39	42	42
3	42	42	81	42	39	36	39	36	34	B	E B 54	41	B	66	62	60	33	28	G 24	G 17	24	26	G	28
4	35	57	39	42	37	34	32	B	37	G 29	G 27	G	G	G	35	36	36	30	G 22	G 16	28	21	21	25
5	29	34	56	40	61	B	B	46	48	31	36	38	E B 54	C	C	E B 33	G	E B 34	E B 29	38	41	45	45	73
6	42	35	50	B	B	37	41	41	41	B	G	B	B	G 31	35	G 31	B	B	G 34	39	39	43	40	B
7	35	95	51	B	G 30	B	40	40	40	B	B	G 28	G 31	B	B	G	G 26	B	32	26	40	34	40	40
8	G 35	B	34	60	B	B	B	B	B	G 32	33	31	31	B	G	30	G 24	B	E B 30	30	25	30	24	27
9	25	B	34	57	B	B	B	48	42	37	32	37	34	32	G 30	33	34	32	29	G 18	31	E B 25	36	89
10	B	B	B	32	B	B	42	37	B	44	G 28	G 30	B	B	B	G 27	G 20	34	E B 29	43	34	43	42	58
11	49	36	69	B	40	B	B	50	G 31	B	B	G 31	B	B	B	B	B	G 27	34	G 24	G 19	42	48	60
12	47	37	33	B	35	38	39	50	B	40	B	B	B	B	B	G	B	B	G 23	G 24	G	26	30	30
13	30	36	40	B	B	42	42	42	B	E B 56	E B 56	G	G	E B 37	E B 56	E B 55	E B 54	E B 34	G	29	25	25	E B 40	28
14	28	32	G 18	46	B	B	39	39	G 25	37	37	37	34	G 30	G 31	G 29	G 29	G 21	G 24	B	34	44	68	50
15	60	108	39	34	58	44	43	40	42	39	A	B	B	G 33	G 30	G 28	G 26	32	38	32	34	32	33	32
16	28	41	50	B	31	41	41	B	36	38	36	35	G 24	G 26	G 26	37	34	34	G 22	30	41	58	50	42
17	54	31	57	48	50	33	40	34	G 24	48	42	48	38	38	34	38	G 25	25	34	G 19	41	36	62	46
18	B	B	33	33	66	33	42	34	34	37	38	41	38	35	35	36	36	G 24	27	G 22	25	30	31	26
19	36	55	48	37	39	G 32	40	42	43	35	G 30	38	36	39	39	35	35	33	33	G 22	32	26	65	58
20	48	67	58	49	70	37	40	B	B	B	B	B	B	34	32	35	37	31	41	34	52	45	50	64
21	66	44	59	B	68	B	109	68	66	104	B	36	36	B	G 30	36	38	G 22	32	34	35	37	34	37
22	45	49	34	50	44	34	41	39	41	38	31	34	G 29	33	36	B	B	B	40	58	68	34	35	40
23	41	44	44	40	36	A	43	43	38	G 26	38	G 26	E B 53	G	37	G 27	34	G	28	27	G 22	46	44	G
24	42	70	41	42	32	54	50	52	34	40	B	B	G	40	51	G 36	G	G	30	37	34	26	41	30
25	38	45	48	87	42	G 34	39	44	39	G 25	B	G 30	B	G	42	G 36	60	37	G 27	33	33	G	29	40
26	72	104	40	35	39	39	A	44	44	35	33	37	31	G 31	38	35	G 28	35	E B 35	G 22	34	31	34	42
27	122	B	43	35	G 21	37	37	37	G 30	40	B	B	B	B	B	B	B	B	B	E B 29	33	26	32	28
28	42	45	32	41	46	42	44	32	34	36	36	36	39	35	32	G 29	34	32	G	37	32	32	32	G 16
29	19	E B 37	37	B	B	G 30	38	G 22	G 28	G 23	61	39	64	40	40	38	33	33	28	E B 28	25	24	40	43
30	39	78	43	35	G 31	32	24	36	32	36	38	44	44	55	44	58	37	32	30	27	G	24	G	G 16
31	28	34	38	38	B	53	41	B	44	34	32	G 29	G 29	E B 54	E B 55	G 27	B	27	62	56	51	44	43	40
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	24	28	22	21	21	26	26	26	26	22	24	21	22	23	28	24	25	30	30	31	31	31	30
MED	41	44	42	41	39	37	41	40	38	36	34	36	32	E G 34	35	36	34	31	30	29	34	34	40	40
U Q	48	62	50	48	54	42	42	44	42	40	38	38	38	39	42	36	36	34	34	37	40	43	44	50
L Q	32	36	36	35	34	34	39	36	G 34	G 34	G 31	G	G	G 33	G	G 30	G 28	G	G 28	G 24	25	26	32	28

DEC.2015 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2015 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	38	C	C	C	22	22	14	14	14	14	14	14	14	B	14	C	13	13	12	16	19	13	13
2	14	B	B	23	B	B	16	24	18	28	23	B	B	B	B	56	32	20	12	15	13	12	12	14
3	12	23	14	11	27	19	20	13	11	B	54	27	B	30	25	26	19	16	16	15	14	11	12	12
4	12	14	21	19	12	11	11	B	15	14	23	26	30	27	17	14	12	15	12	12	12	12	12	13
5	13	14	24	14	14	B	B	14	17	13	13	14	54	C	C	33	21	34	29	14	10	14	14	12
6	10	12	20	B	B	13	18	18	18	B	27	B	B	23	13	18	B	B	14	11	13	13	12	B
7	12	68	16	B	20	B	27	26	18	B	B	18	22	B	B	20	16	B	12	13	12	13	18	14
8	17	B	12	56	B	B	B	B	B	23	14	15	18	B	24	23	14	B	30	16	12	12	12	12
9	12	B	20	16	B	B	B	19	28	27	16	14	14	18	16	14	15	12	13	13	12	25	12	13
10	B	B	B	21	B	B	26	16	B	16	13	24	B	B	B	26	16	13	29	14	12	13	21	19
11	14	12	14	B	18	B	B	23	15	B	B	30	B	B	B	B	B	18	12	14	14	12	12	12
12	20	11	13	B	12	26	16	17	B	19	B	B	B	B	B	24	B	B	17	13	15	12	12	12
13	12	13	18	B	B	24	21	19	B	56	56	24	24	37	56	55	54	34	22	22	14	13	40	12
14	13	13	13	13	B	B	20	21	14	12	13	14	14	19	18	23	14	14	14	B	12	11	14	13
15	12	12	16	12	23	15	19	20	20	18	25	B	B	22	14	15	16	13	12	14	15	13	13	11
16	20	18	18	B	20	29	15	B	23	15	15	16	18	14	18	12	14	14	15	17	13	12	17	14
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19	12	20	16	22	14	20	28	24	15	22	16	13	13	13	15	17	20	14	13	13	11	13	13	12
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21	18	12	12	B	15	B	13	16	12	23	B	21	18	B	17	13	12	19	14	12	12	12	11	12
22	12	14	13	16	12	11	12	14	13	13	14	14	20	22	14	B	B	B	28	15	13	12	13	13
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26	16	13	11	11	12	13	13	13	13	12	13	13	17	21	13	12	14	13	35	16	27	18	12	12
27	24	B	21	12	13	21	13	12	19	17	B	B	B	B	B	B	B	B	B	29	26	12	12	12
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31	16	19	16	15	B	16	16	B	14	12	20	17	18	54	55	21	B	19	12	13	12	12	13	12
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	30	30	30	31	31	31	31	31	31	31	31	30	30	31	30	31	31	31	31	31	31	31
MED	14	15	16	18	20	20	18	17	17	17	17	16	22	22	18	17	17	15	14	14	13	12	12	12
U Q	17	B 38	20	B	B	B	22	B 24	B 20	B 27	B 58	B 30	B	B	B 56	26	B 32	B 34	22	15	14	14	14	14
L Q	12	13	13	13	13	13	14	13	13	13	14	14	14	14	15	14	14	14	12	13	12	12	12	12

IONOSPHERIC DATA STATION SHOWA-ST.

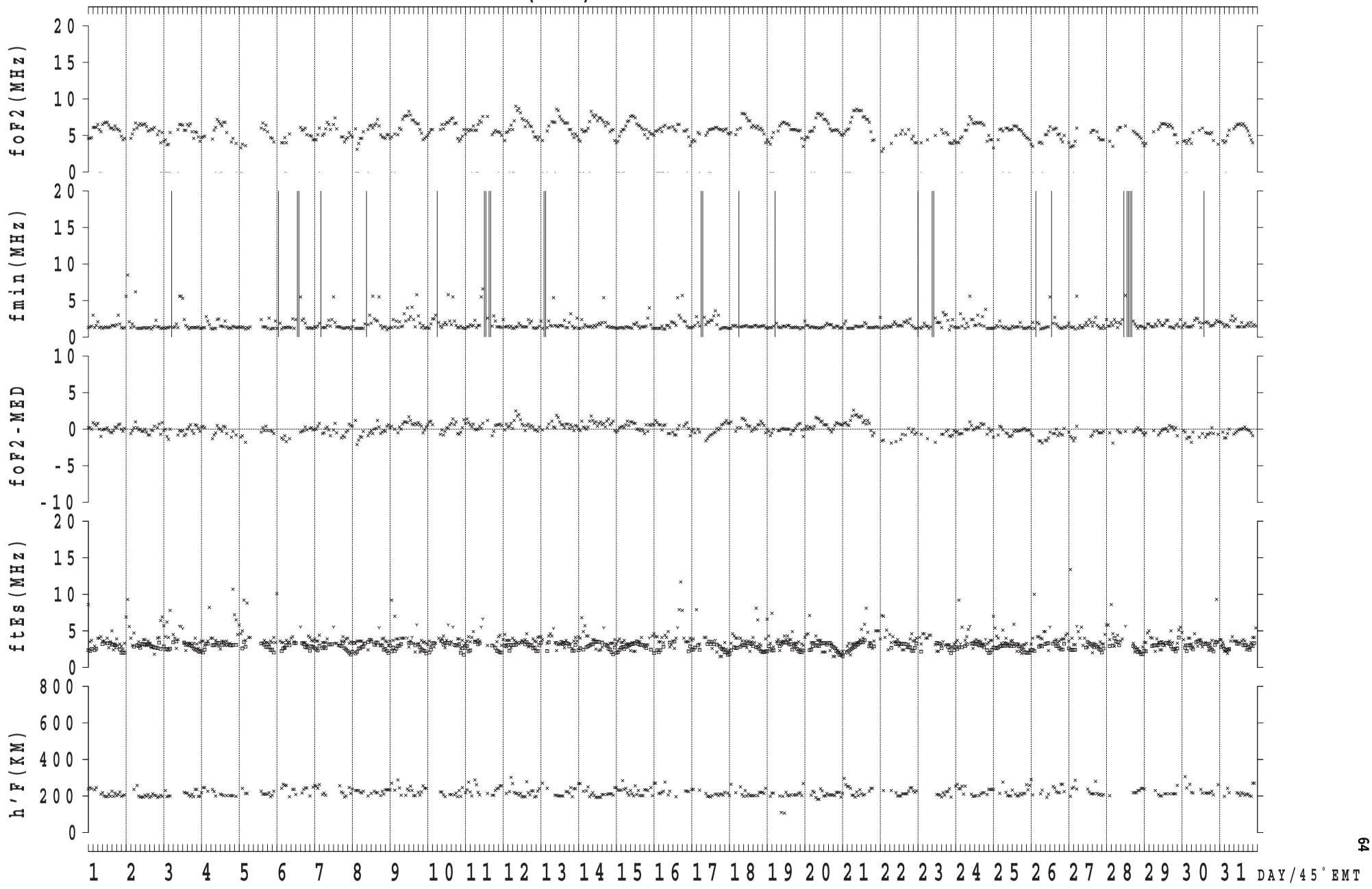
DEC.2015 h'F (KM) 45°E MEAN TIME (G.M.T. + 3 H)

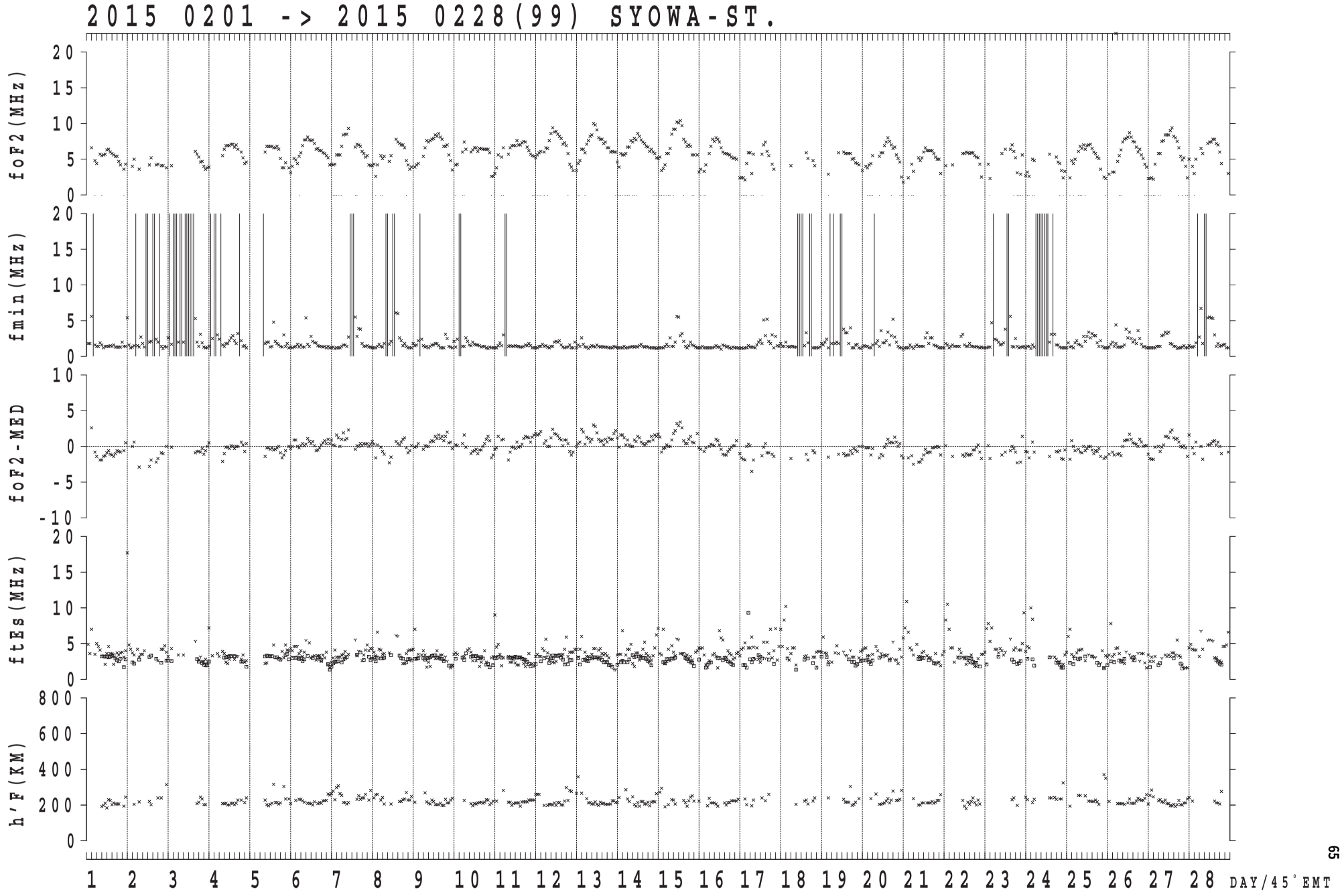
LAT.69°00.4'S LON.039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

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 228	A	C	C	C	A	A	A	198	196	A	196	196	198	B	222	C	194	A	A	A	A	A	F
2	A	B	B	A	B	B	A	A	A	A	208	B	B	B	B	B	220	208	198	202	202	210	218	A
3	A	A	A	234	A	A	A	200	200	B	B	202	B	A	A	A	E A 234	190	210	E B 216	208	212	E A 212	244
4	228	A	Y	A	216	216	188	B	A	196	Y	Y	Y	Y	E A 218	204	194	202	202	210	212	206	206	228
5	240	240	A	A	A	B	B	200	A	96	188	218	B	C	C	226	216	230	206	A	A	242	A	A
6	A	200	A	B	B	212	A	202	A	B	A	B	B	224	194	238	B	B	238	274	218	A	A	B
7	A	B	A	B	A	B	A	A	A	B	B	204	196	B	B	A	A	B	H 168	216	202	A 252	A	A
8	A	B	210	B	B	B	B	B	B	E A 232	A	192	192	B	R	214	204	B	214	A 214	228	200	204	202
9	140	B	A	A	B	B	B	A	A	A	210	200	200	200	198	198	206	206	226	198	218	230	198	202
10	B	B	B	A	B	B	A	212	B	204	E A 246	224	B	B	B	206	208	208	212	A	A	216	A	A
11	A	A	216	B	A	B	B	216	Y	B	B	R	B	B	B	B	B	210	230	214	204	A	252	A
12	A	A	A	B	E A 256	A	A	A	B	A	B	B	B	B	B	212	B	B	196	A	196	218	238	244
13	254	224	A	B	B	A	A	A	B	B	B	Y	Y	224	B	B	B	E B 218	218	214	214	E A 228	B	232
14	220	A	A	A	B	B	A	230	202	H 184	196	198	196	196	208	208	208	204	216	B	204	214	216	242
15	230	A	A	216	A	A	A	A	A	A	A	B	B	218	196	218	196	148	E A 266	E A 232	232	236	246	236
16	A	A	A	B	R	A	A	B	A	A	196	194	212	206	206	210	208	204	218	234	224	E A 238	238	248
17	E A 270	218	218	E A 260	242	240	200	200	E A 224	A	A	A	194	204	202	202	214	206	198	214	H 232	202	200	A
18	B	B	204	A	A	198	A	210	216	208	192	192	202	202	208	200	200	200	212	204	218	218	244	E A 234
19	248	A	A	A	A 236	E A 298	A	A	A	196	196	196	196	210	200	200	200	200	212	200	230	202	A	A
20	228	A	A	A	204	214	A	B	B	B	B	B	B	200	224	200	A	A	224	202	242	220	A	A
21	A	220	A	B	A	B	A	A	A	A	B	A	A	B	R	238	210	E A 262	226	236	260	266	248	254
22	234	A	A	A	A	204	A	A	A	A	198	196	194	214	196	B	B	B	E A 248	A	216	E A 232	224	224
23	A	A	A	A	198	A	A	A	208	214	188	190	B	A	208	206	206	198	214	240	214	258	242	A
24	A	212	A	A	102	204	230	A	E A 260	A 234	B	B	202	218	A	206	E A 222	208	218	232	220	232	228	204
25	224	A	208	208	A	A	A	A	204	194	B	190	B	Y	204	204	200	E A 222	208	222	222	E A 264	242	242
26	E A 298	224	240	236	230	230	R	A	230	200	206	190	204	Y	204	204	198	198	B	216	E A 226	252	266	214
27	A	B	A	228	E A 248	A	E A 260	206	A	A	B	B	B	B	B	B	B	B	B	E B 228	246	246	270	198
28	214	A	202	A	A	202	202	230	194	200	H 182	202	206	200	200	208	208	208	218	218	218	218	226	216
29	196	B	200	B	B	Y	A	194	206	194	A	210	210	210	200	200	202	202	202	238	210	200	A	A
30	A	A	A	A	Y	A	200	200	214	214	214	A	208	A	212	A	200	200	200	200	212	212	222	234
31	192	200	A	A	B	A	E A 250	B	A	232	Y	204	196	B	358	226	B	Y	A	A	A	A	E A 246	256
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	8	8	6	9	10	7	12	12	16	13	18	16	15	18	23	21	23	27	24	27	27	22	19
MED	226	219	209	226	U 217	210	201	204	205	199	196	197	198	206	204	206	205	203	213	215	218	218	230	234
U Q	248	224	217	236	E A 245	230	E A 250	214	220	214	209	204	205	218	208	218	212	208	224	232	228	242	246	244
L Q	214	206	203	216	201	204	200	200	201	195	190	192	196	200	200	202	200	200	202	207	210	212	216	214

DEC.2015 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN


2015 0101 -> 2015 0131(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT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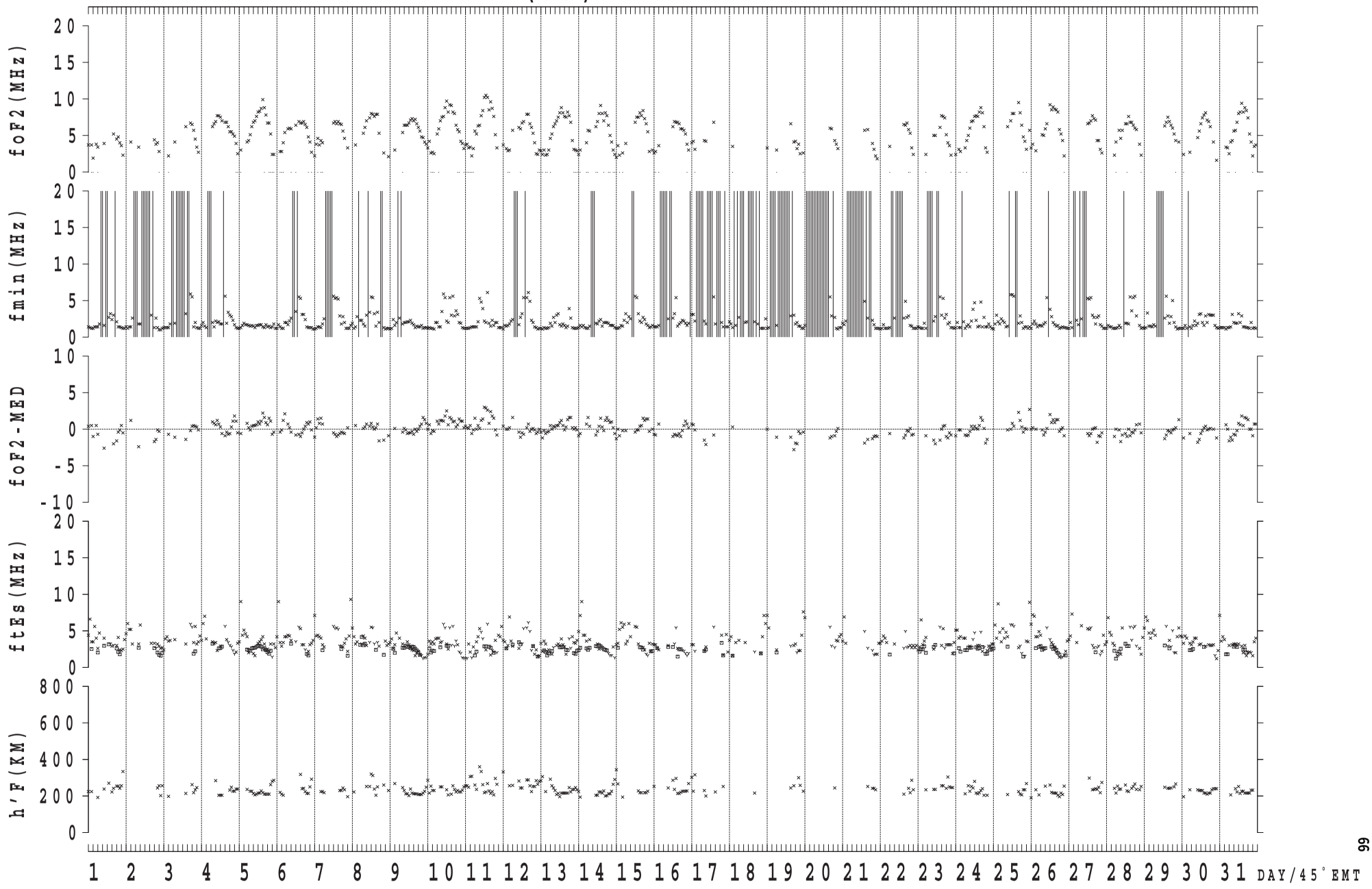
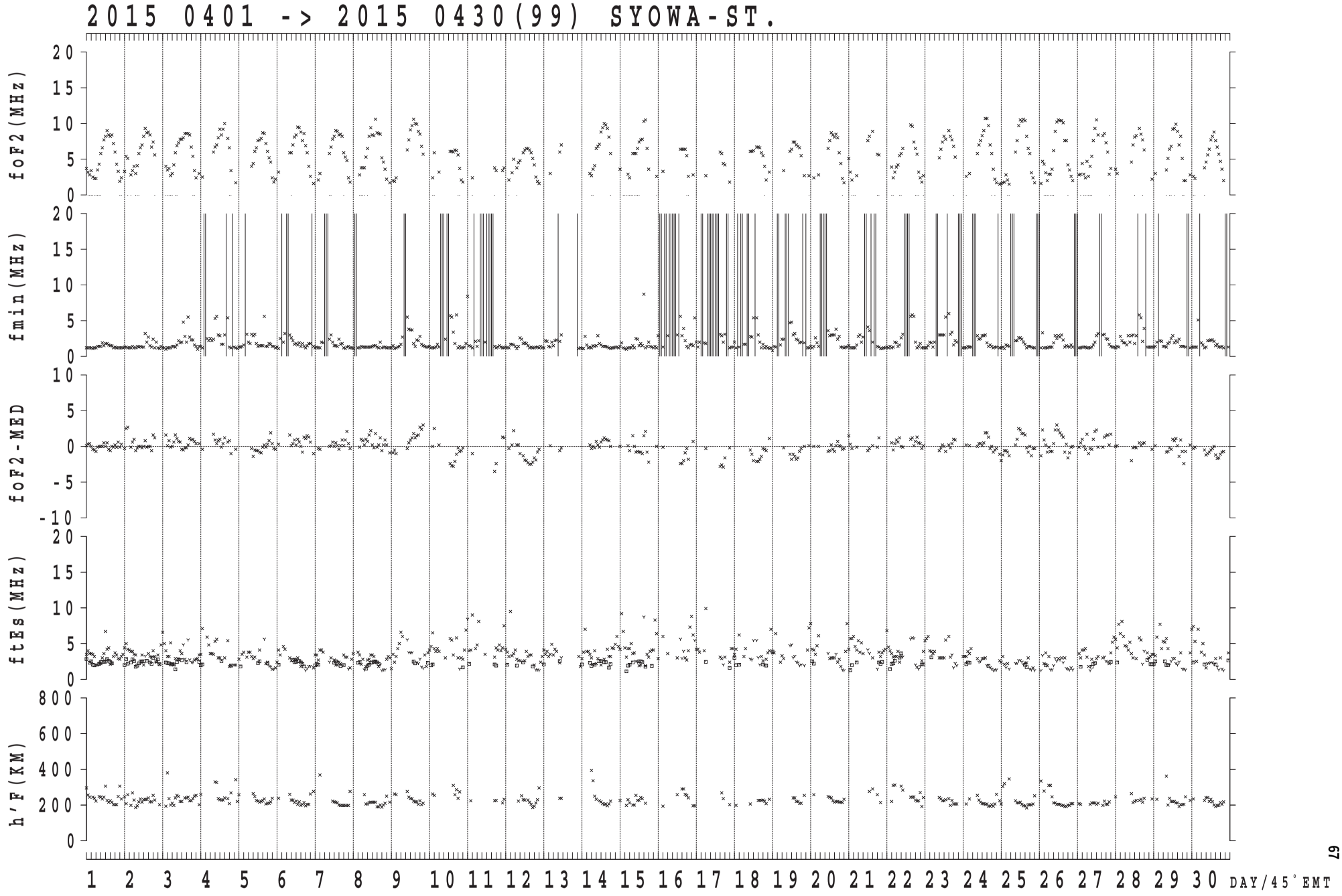
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2015 0301 -> 2015 0331(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT
99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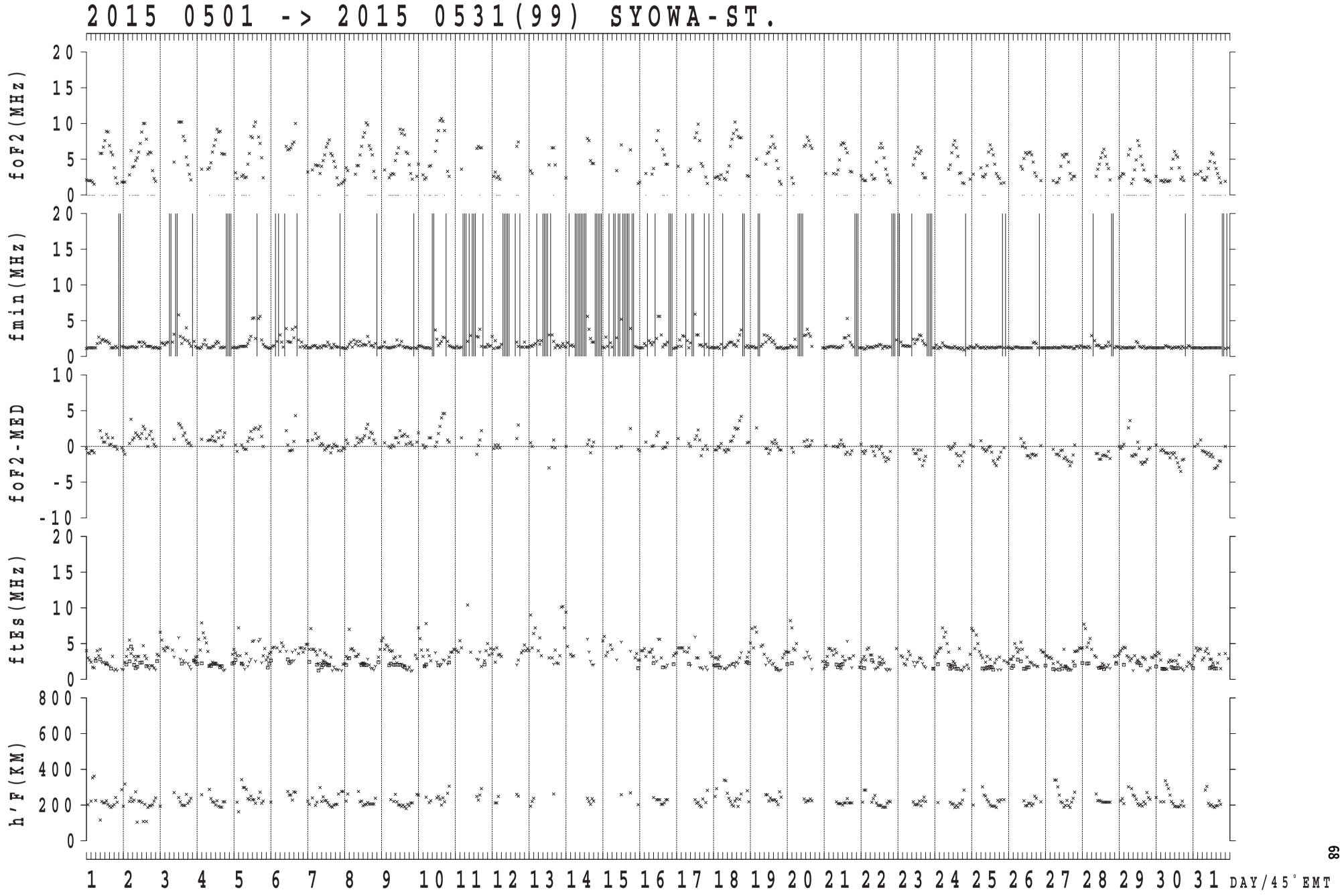
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT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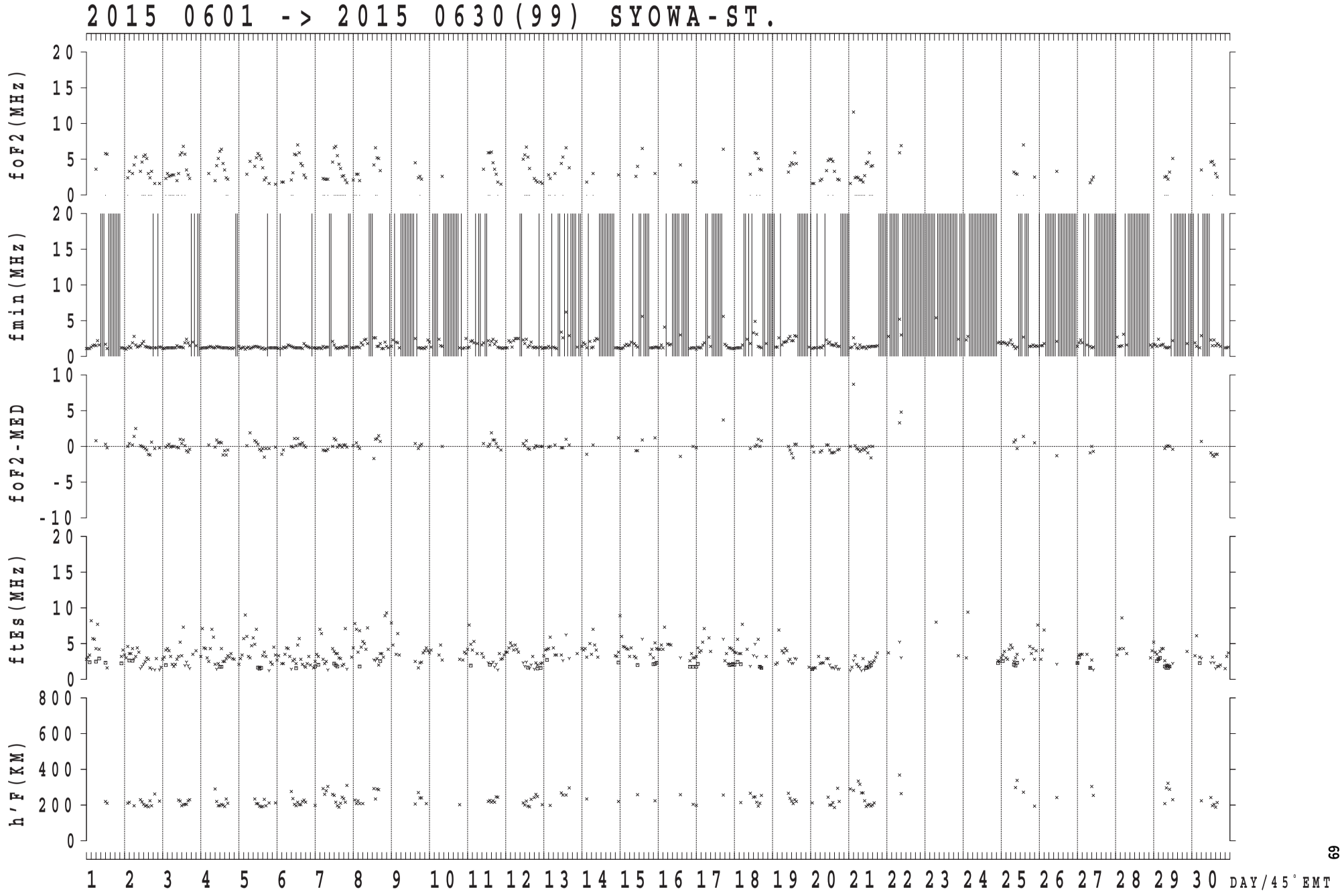
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT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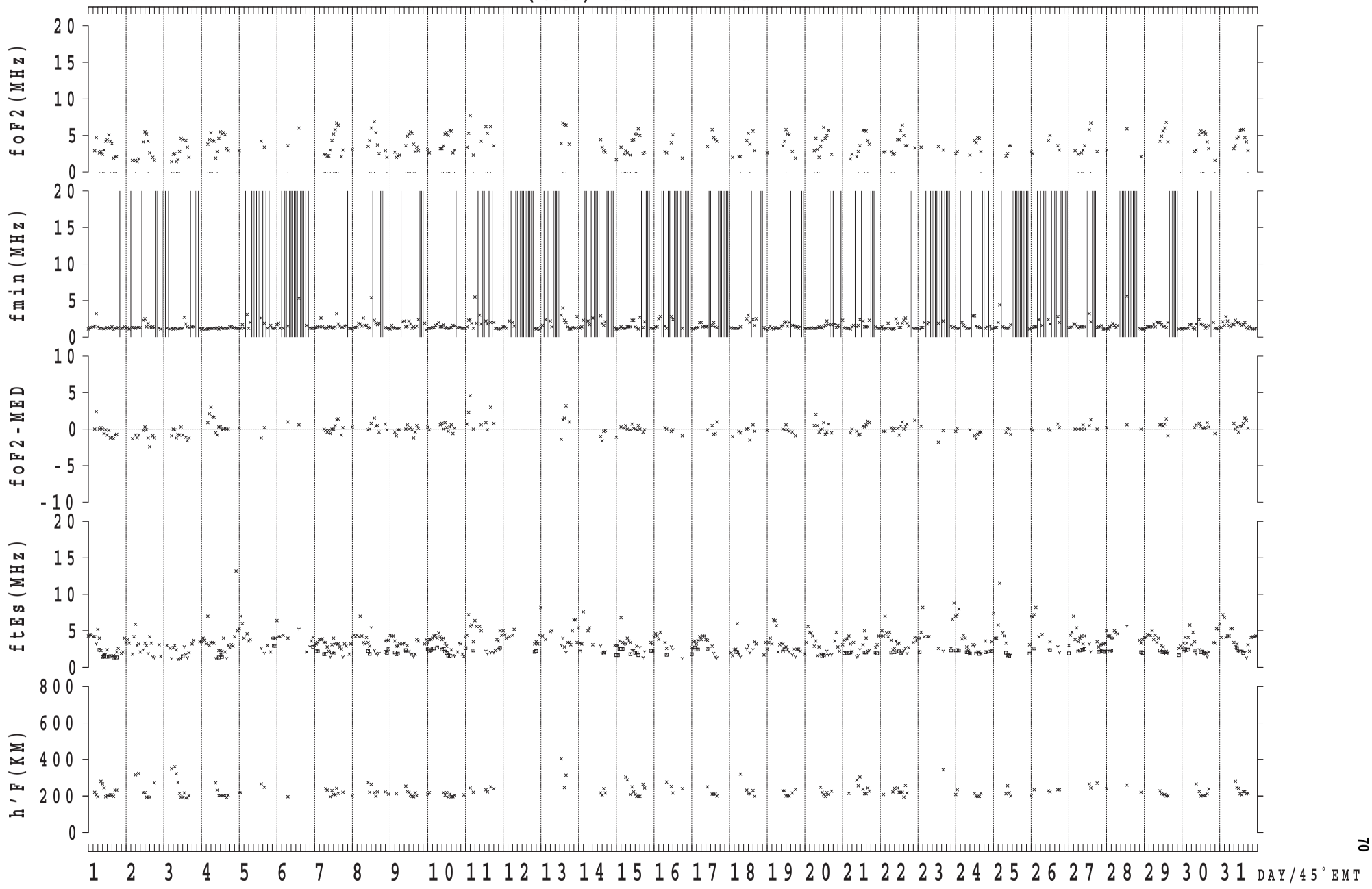
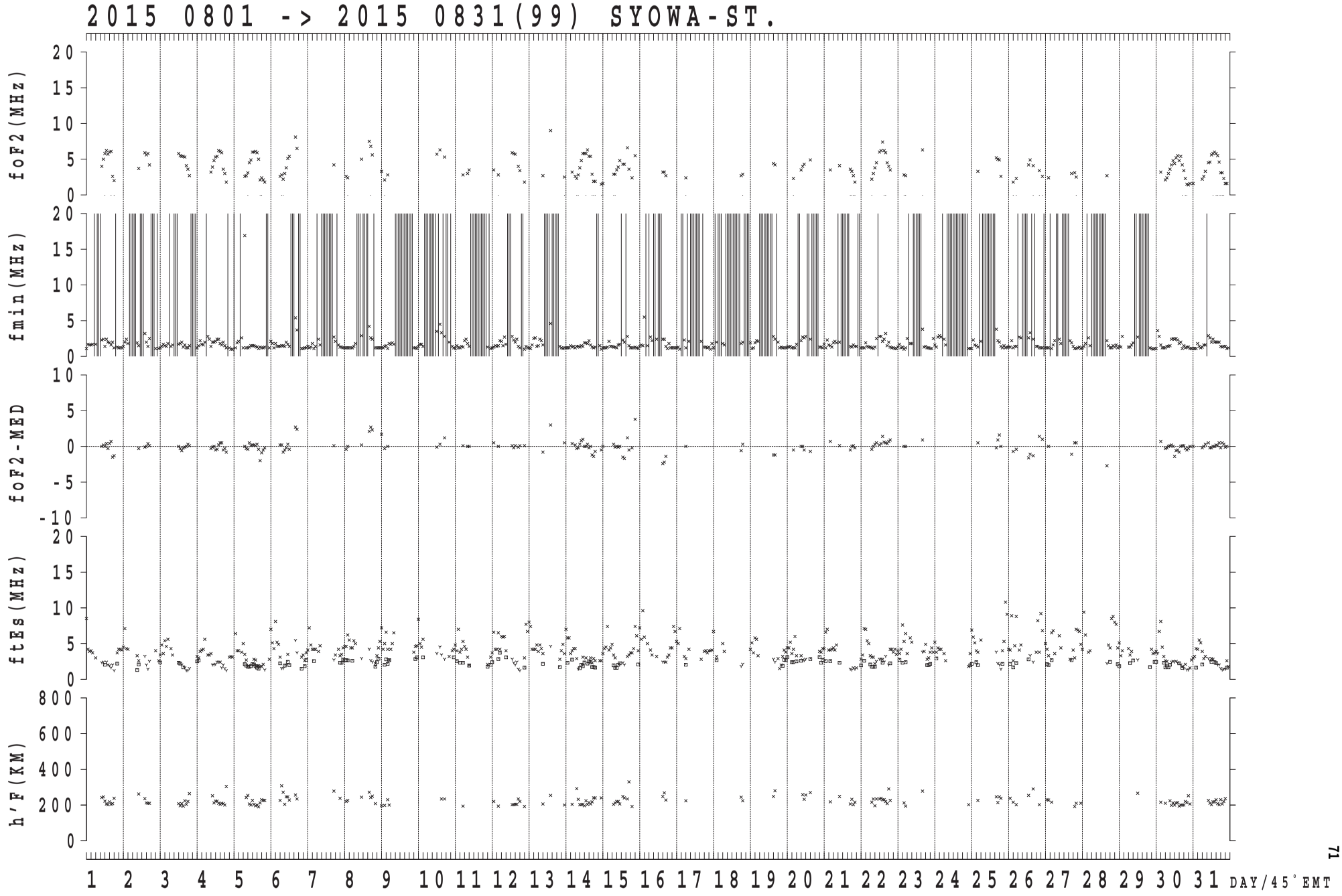
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2015 0701 -> 2015 0731(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT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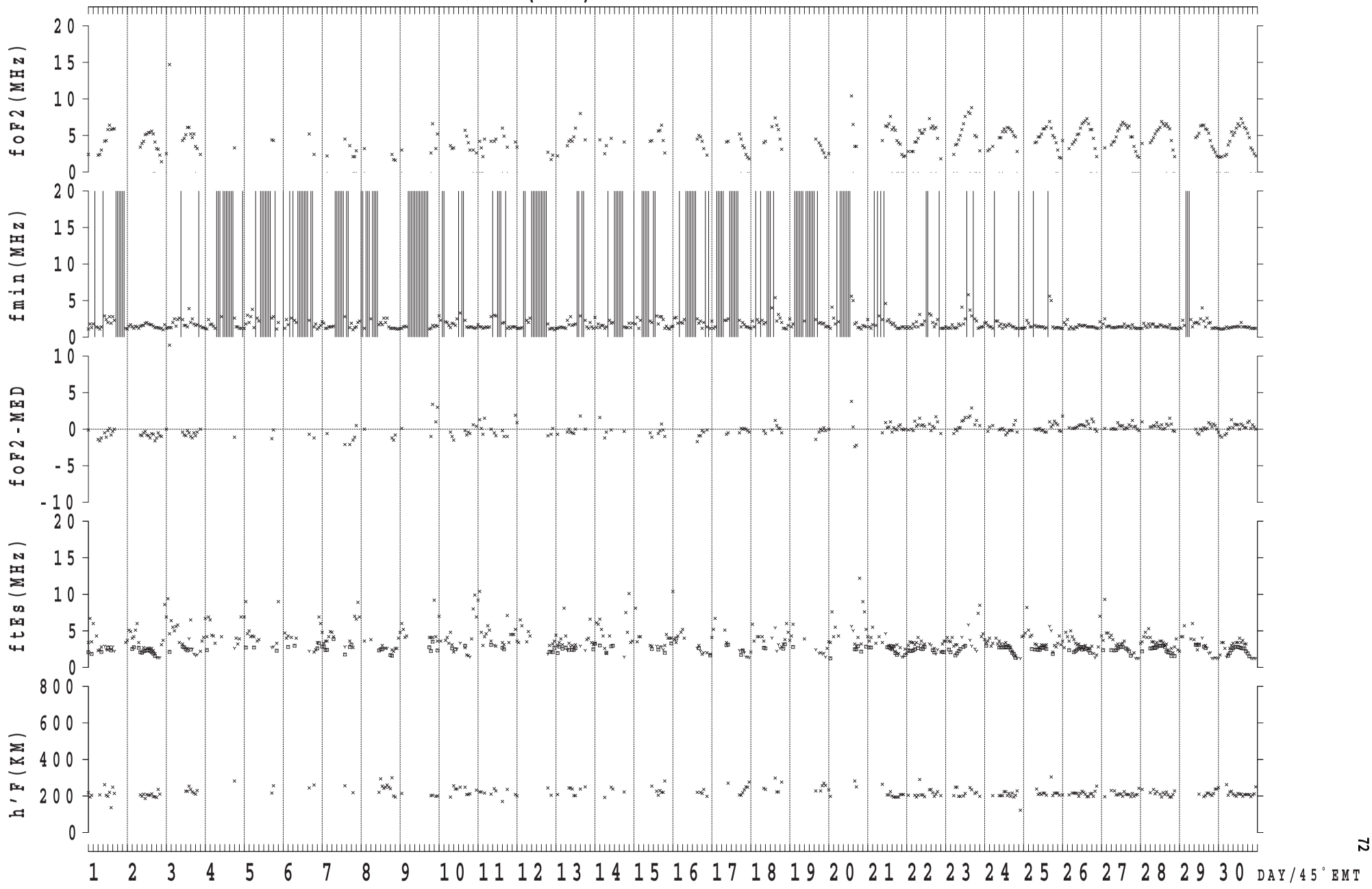
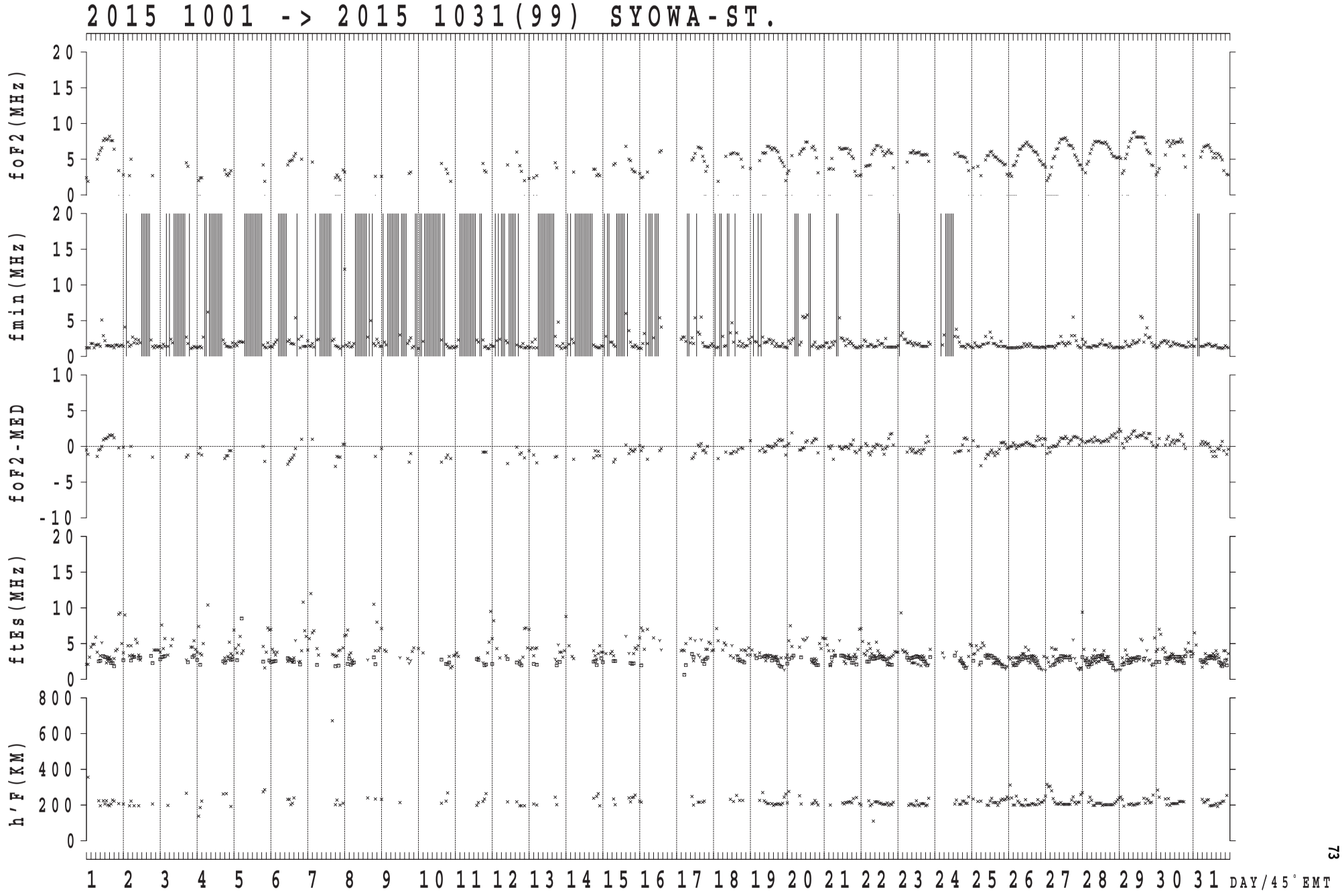
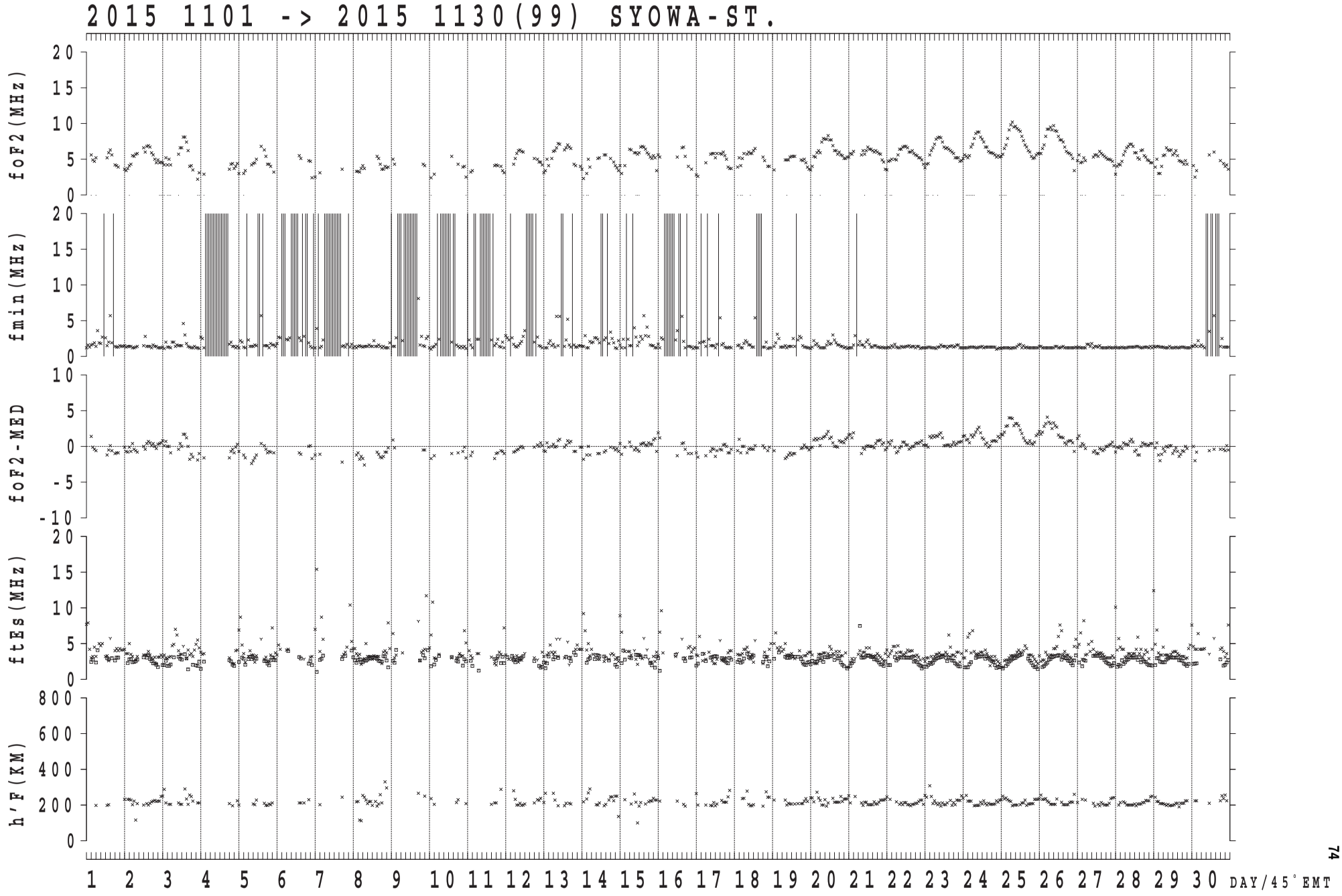
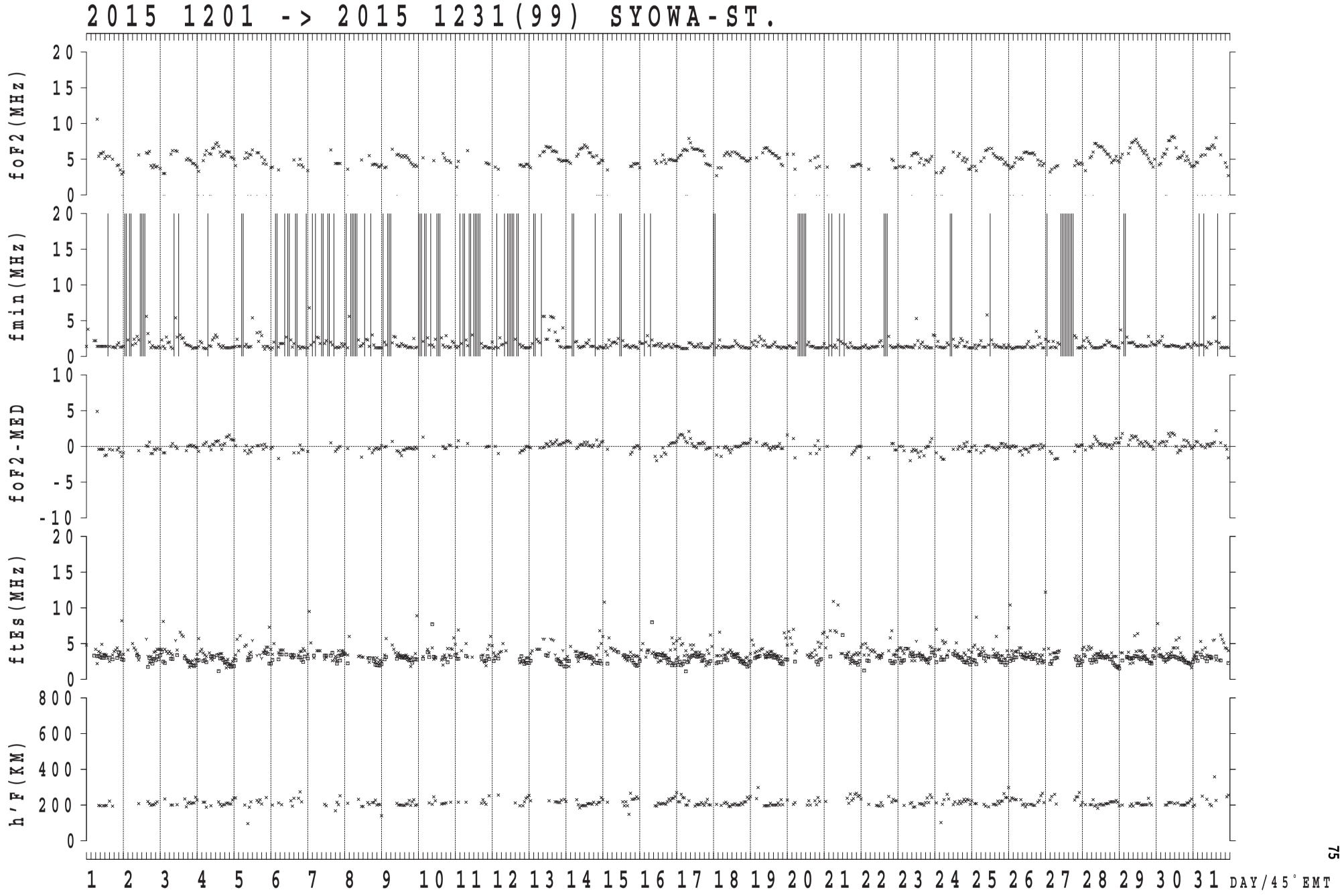
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2015 0901 -> 2015 0930(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT

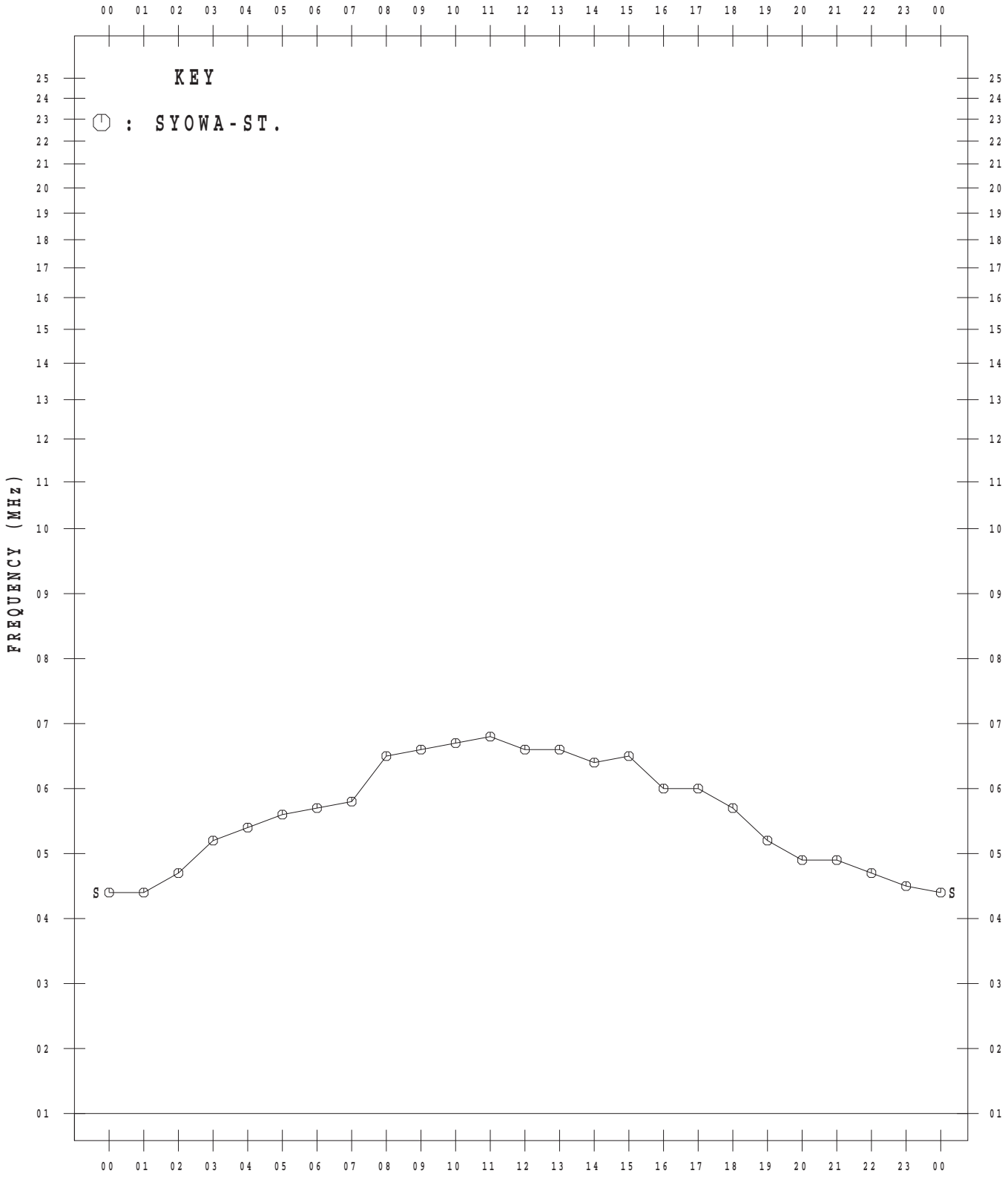

2015 1001 -> 2015 1031(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2015 1101 -> 2015 1130(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2015 1201 -> 2015 1231(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT

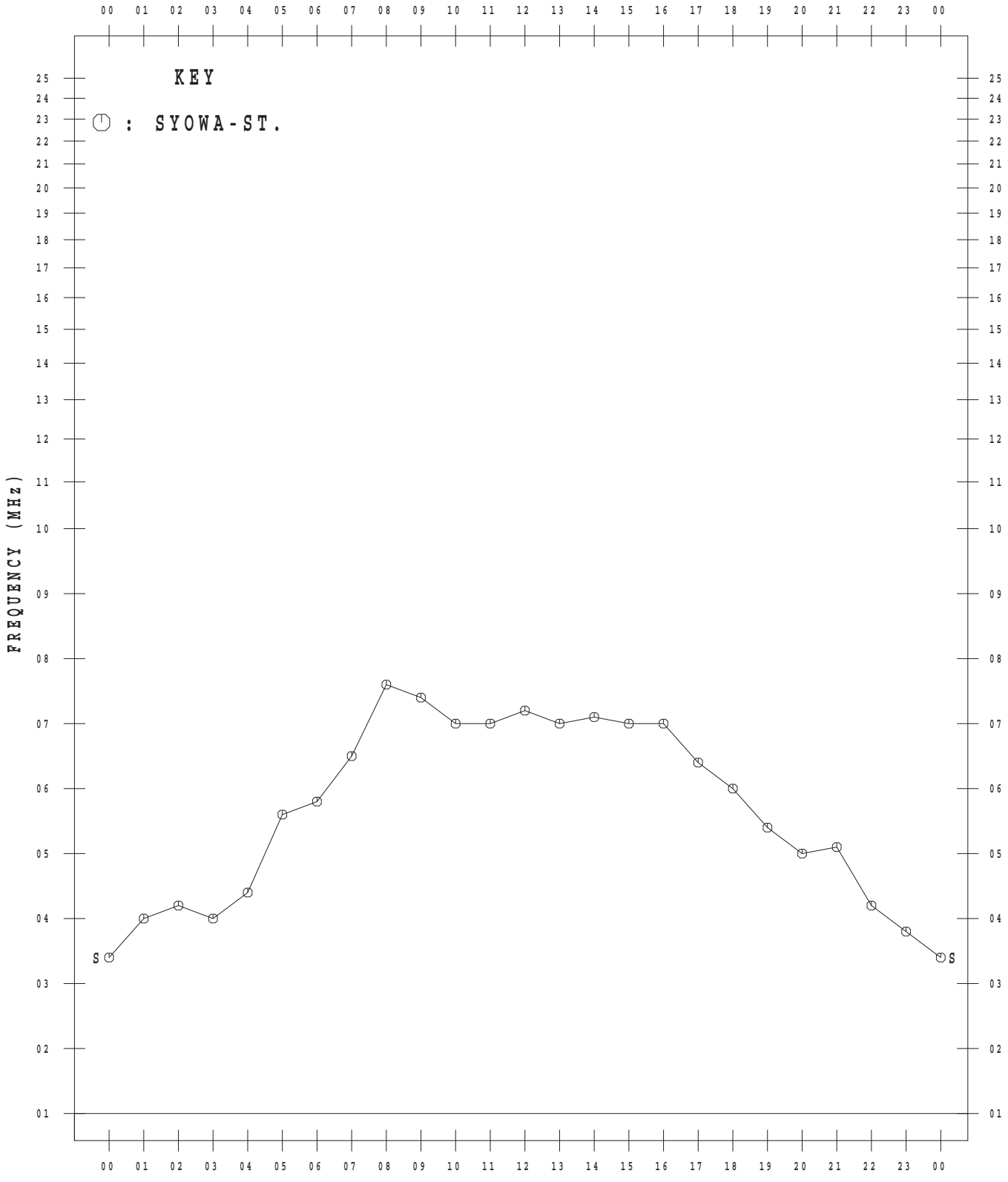
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME JAN. 2015



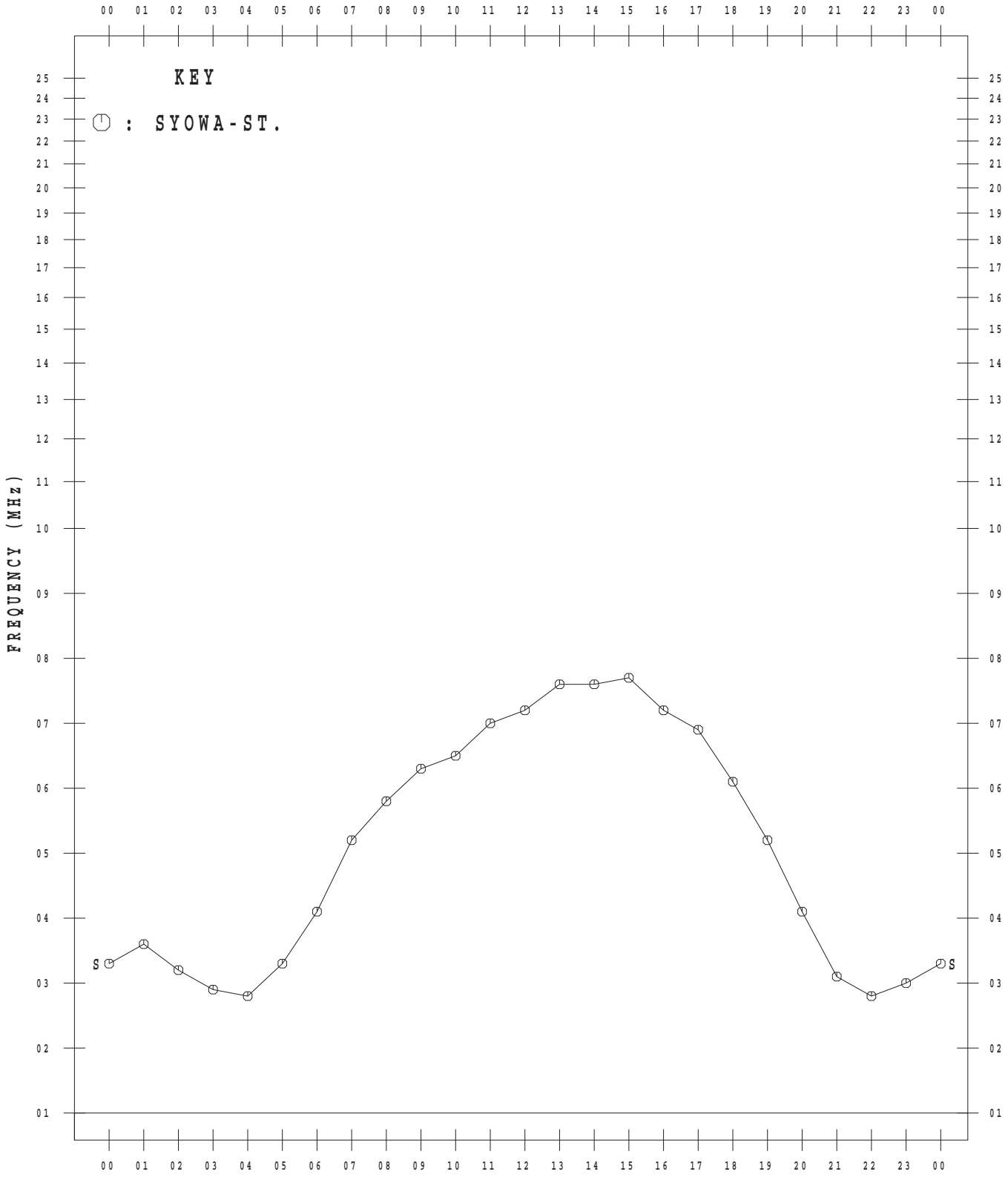
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME FEB. 2015



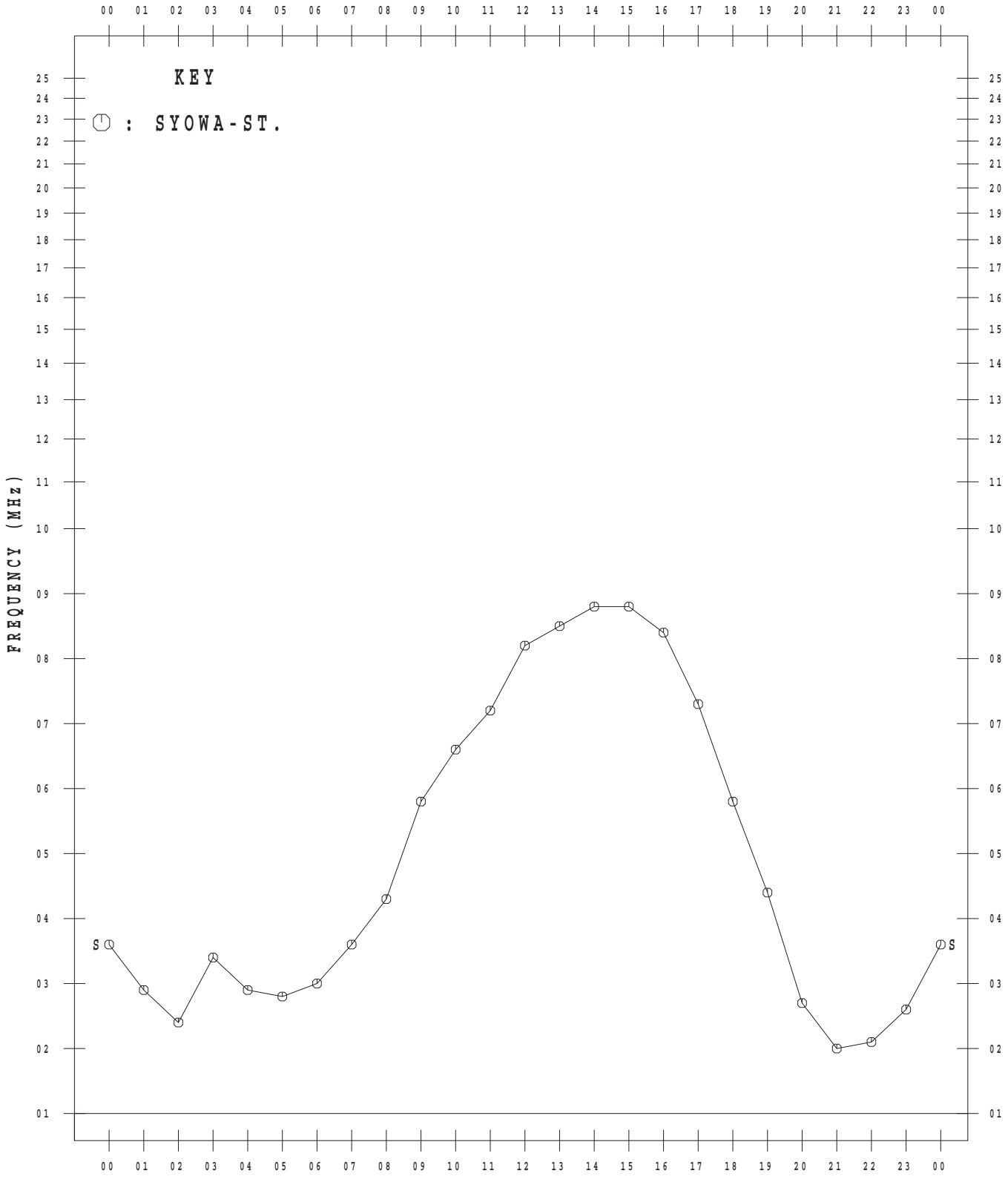
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME MAR. 2015



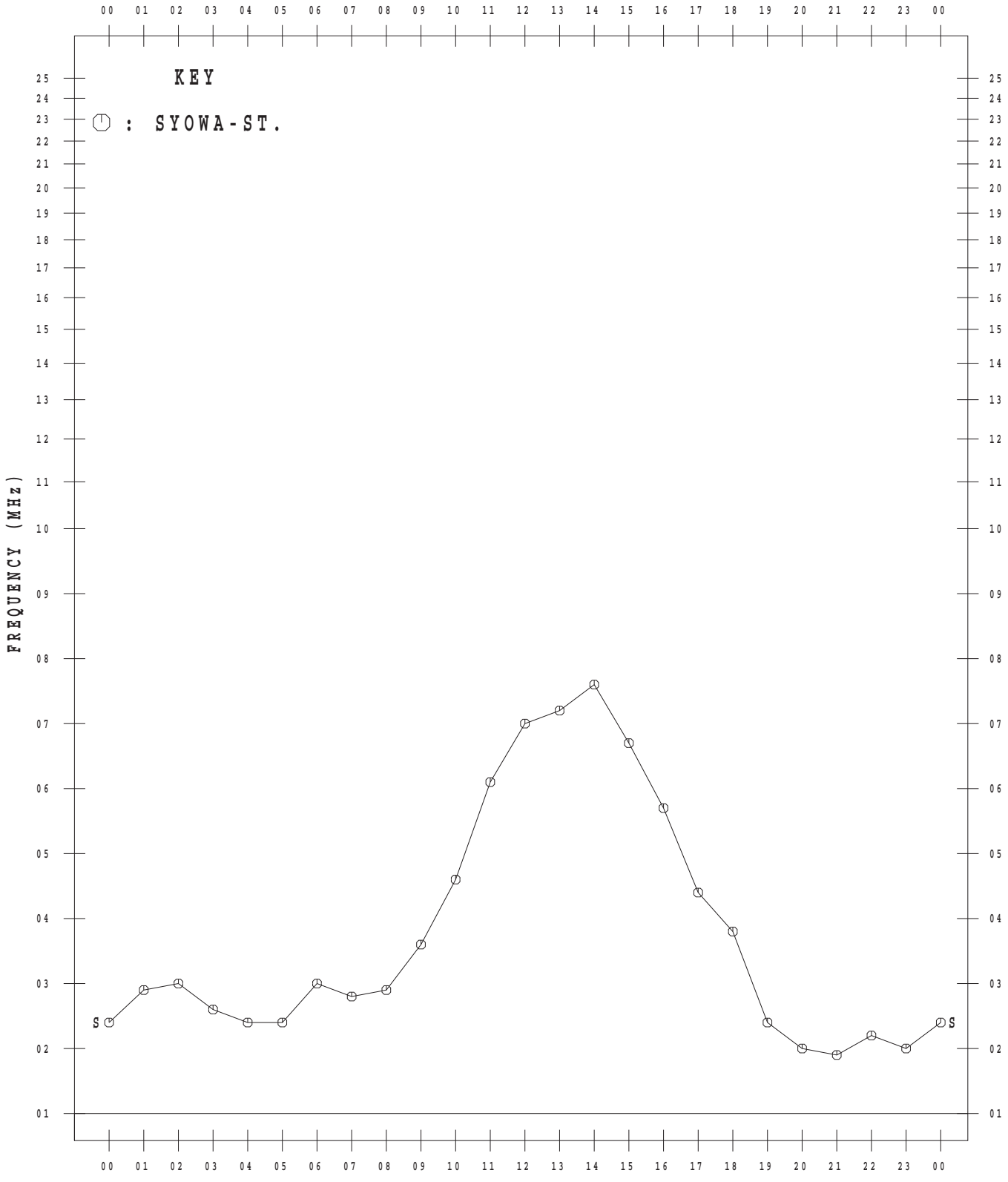
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME APR. 2015



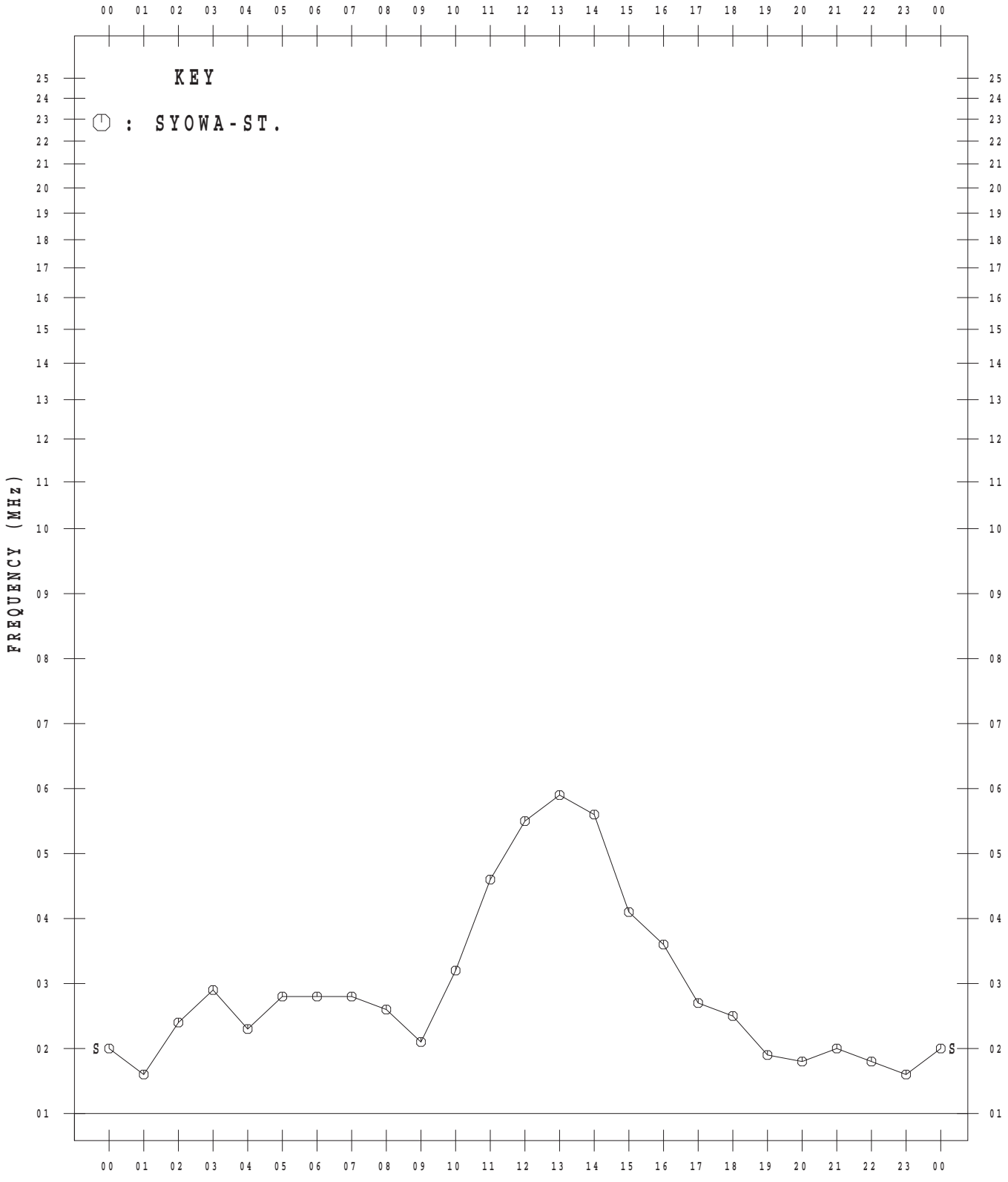
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME MAY 2015



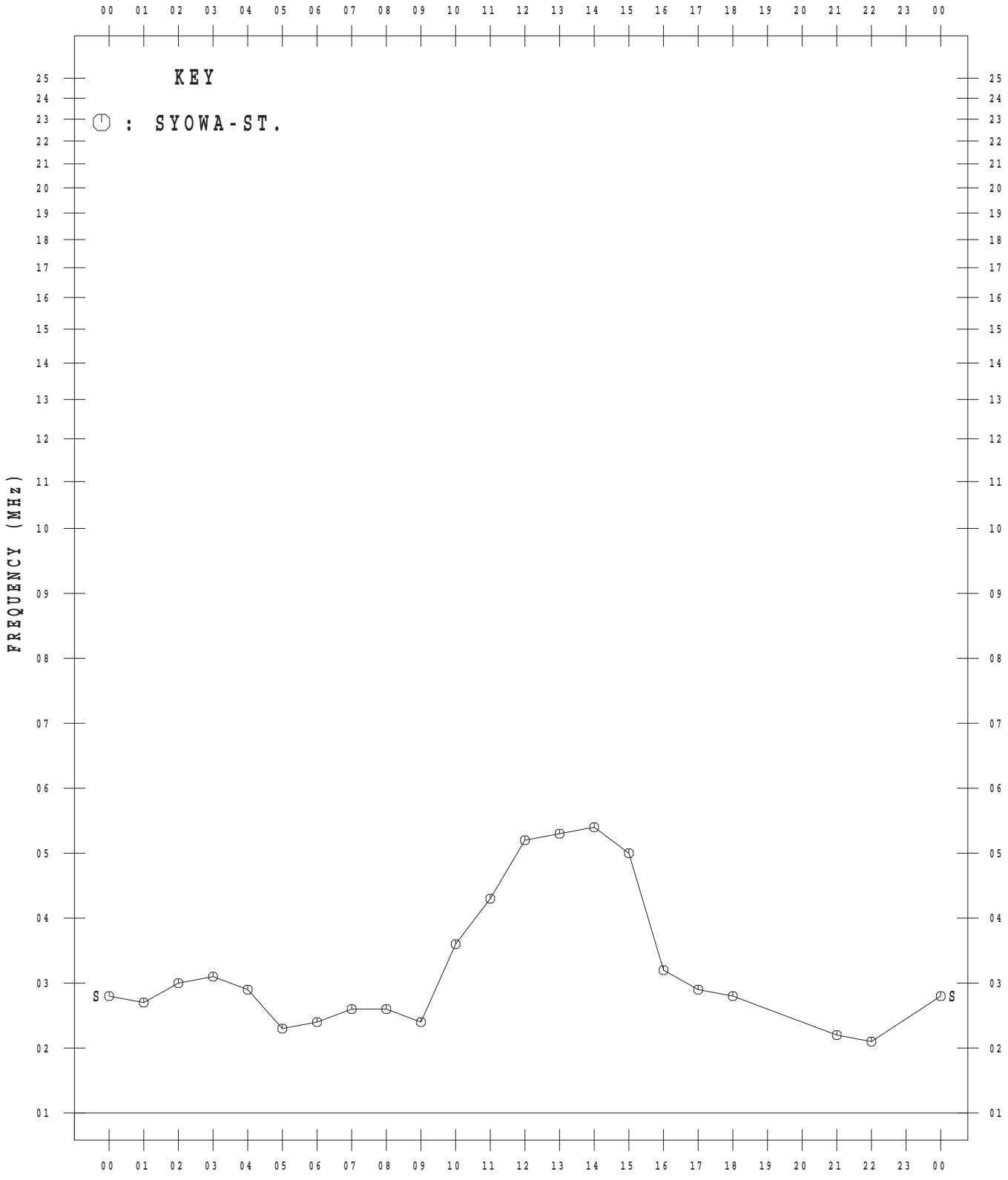
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME JUN. 2015



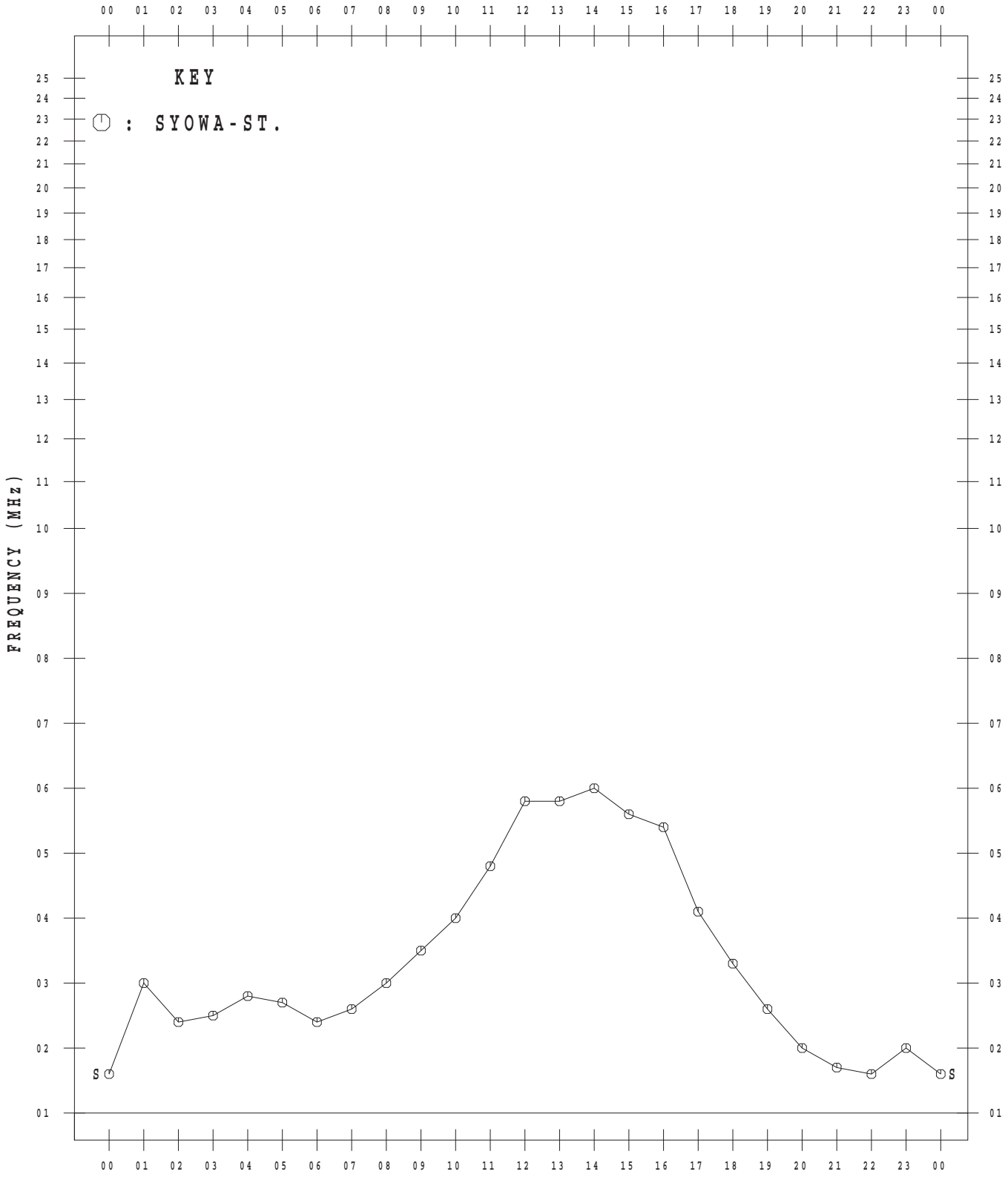
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME JUL. 2015



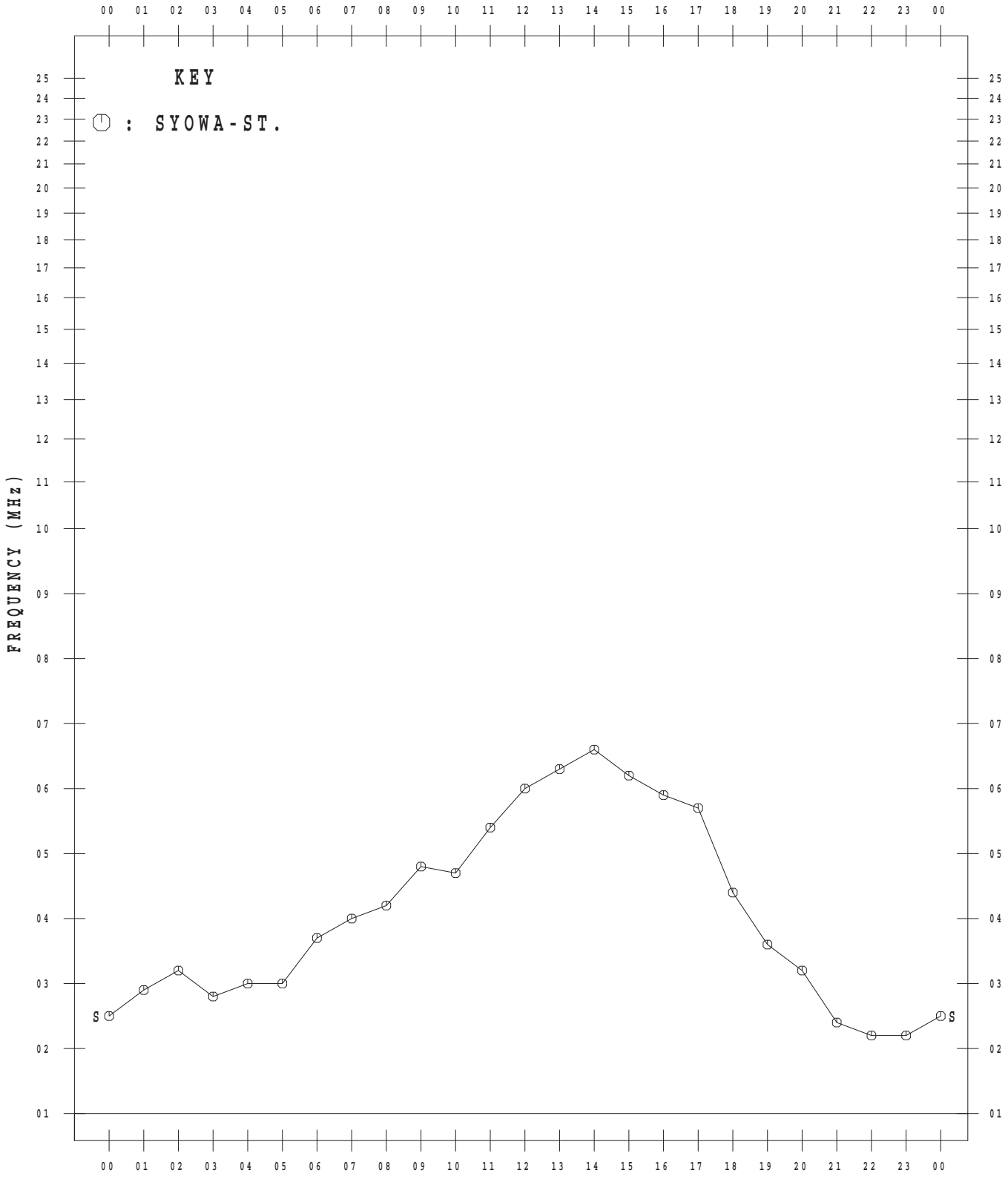
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME AUG. 2015



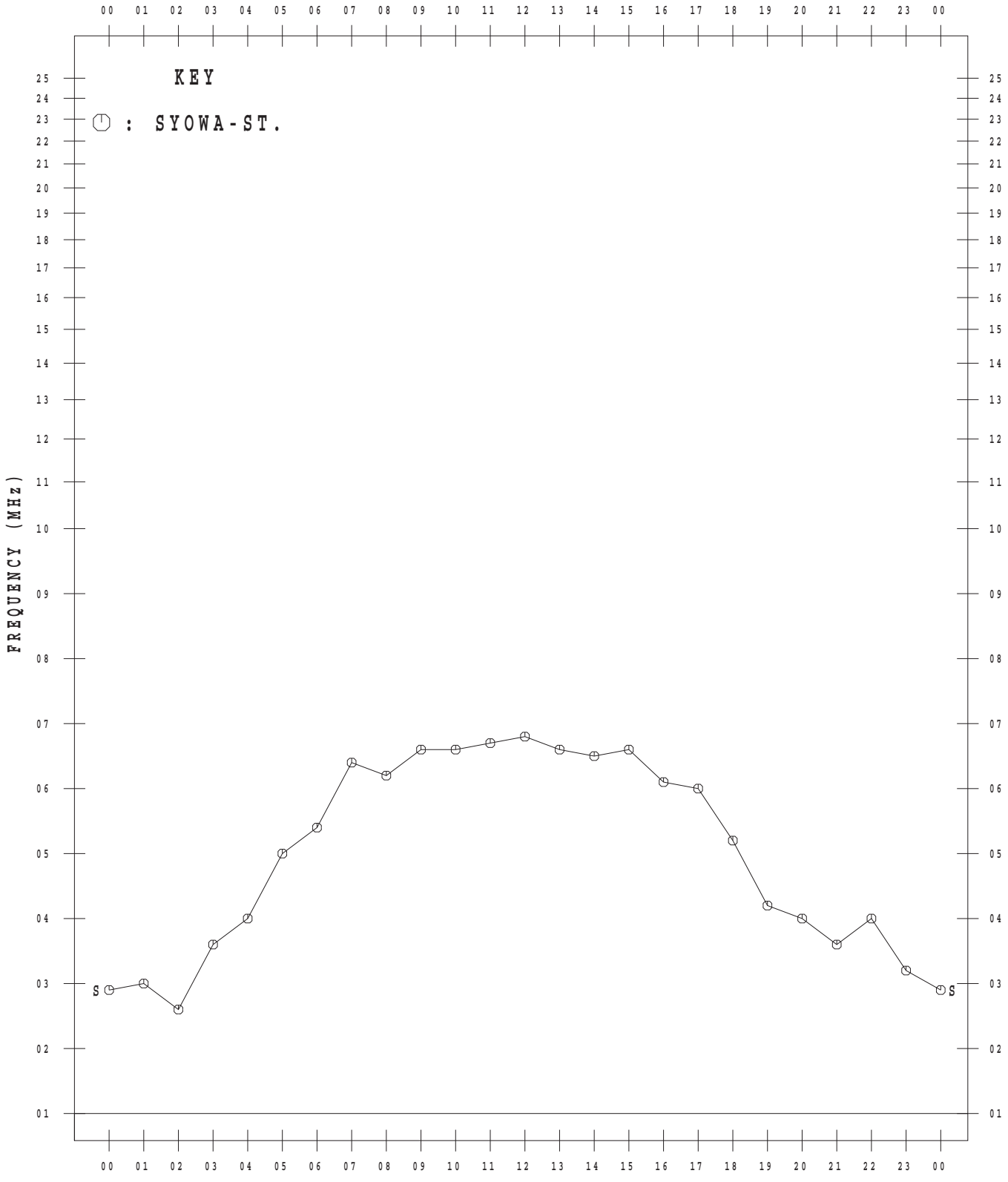
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME SEP. 2015



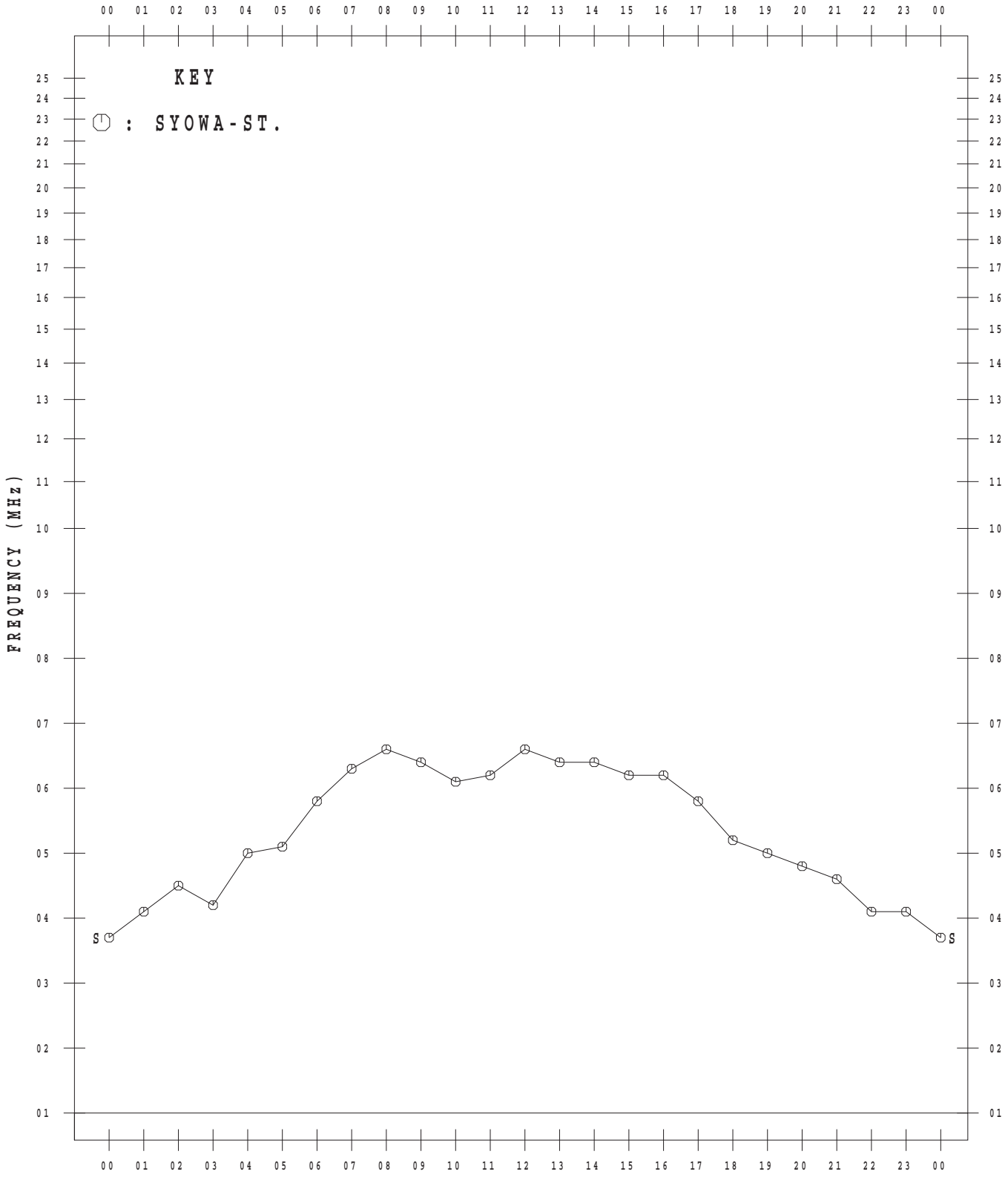
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME OCT. 2015



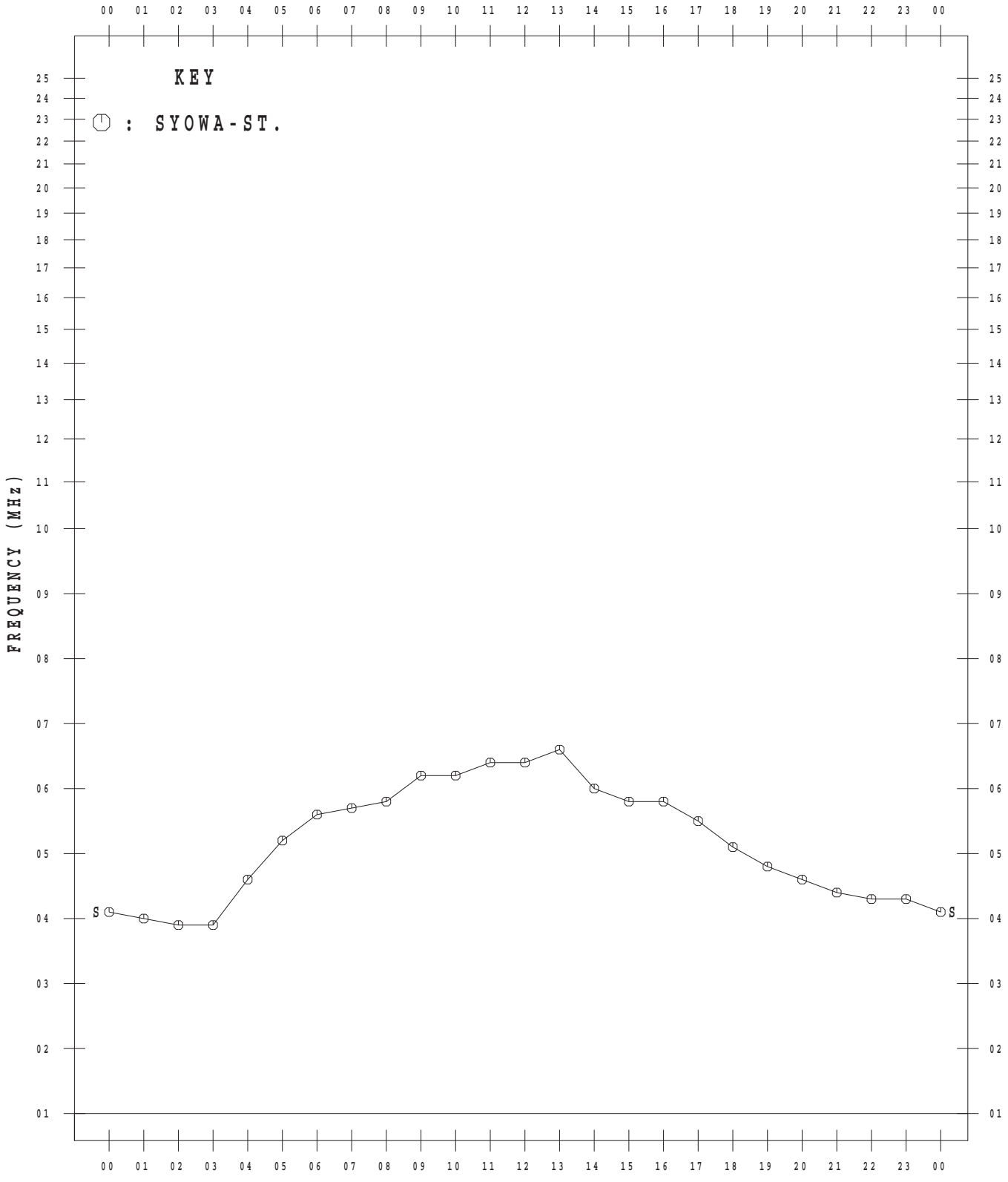
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME NOV. 2015



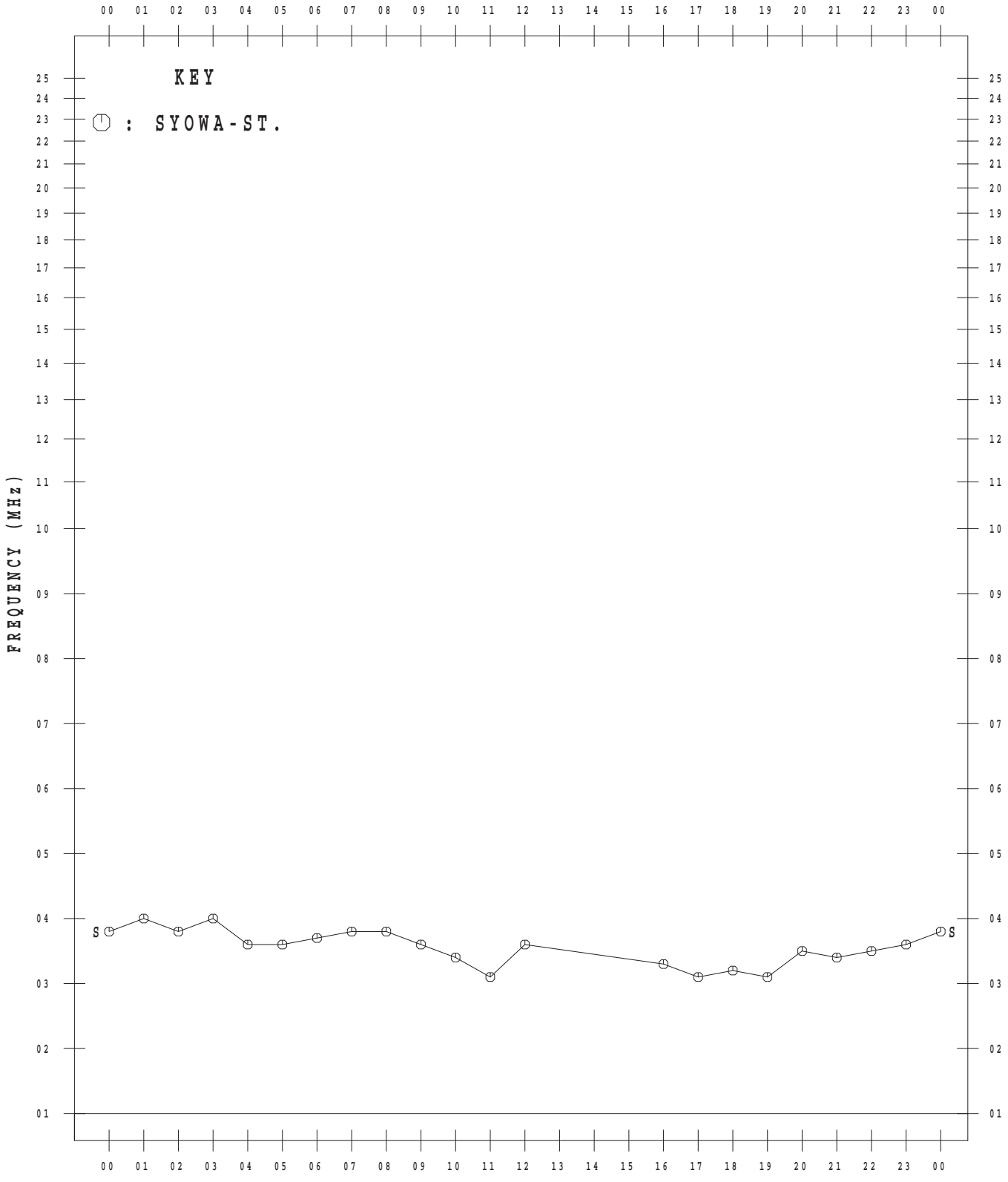
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME DEC. 2015



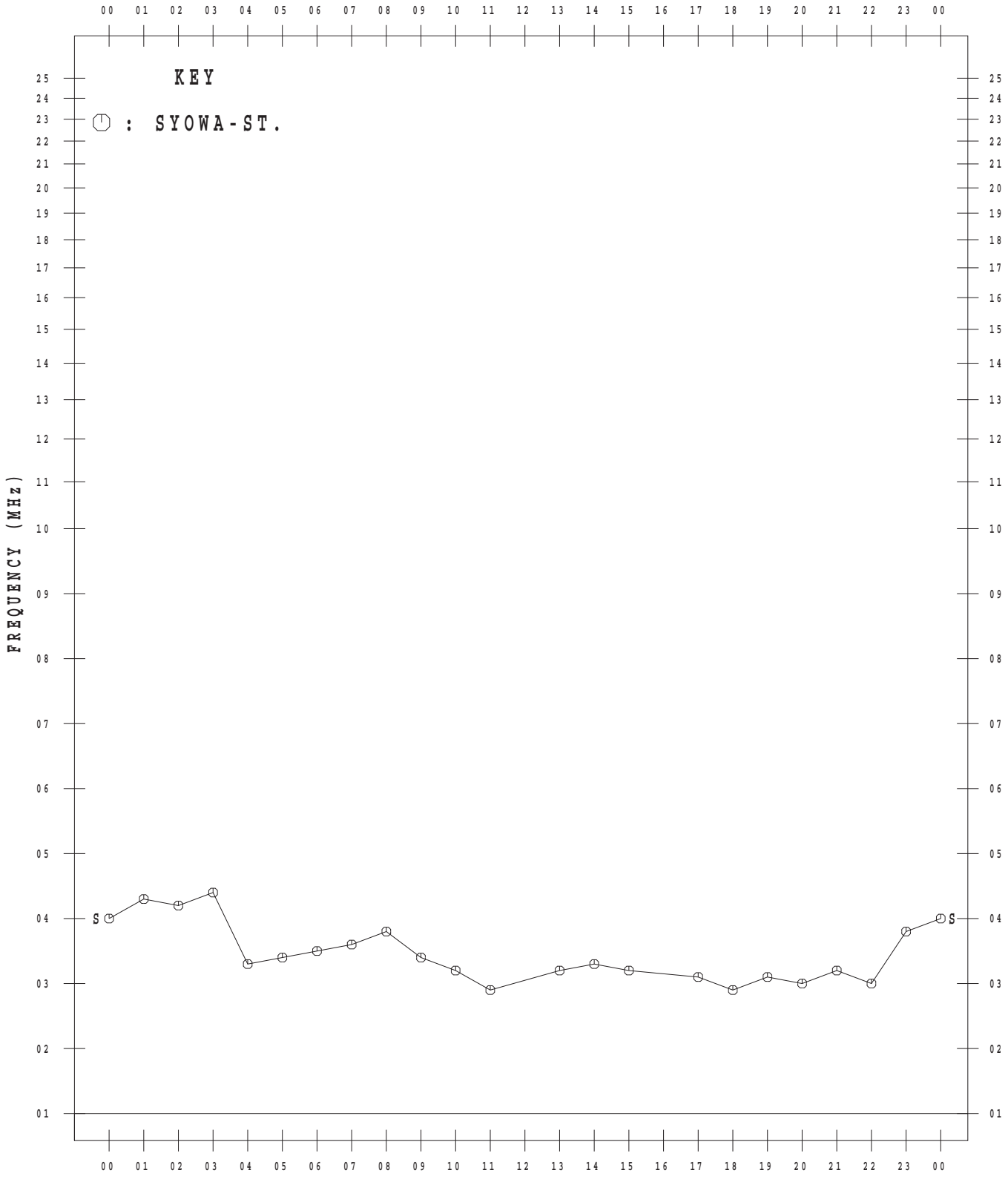
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME JAN. 2015



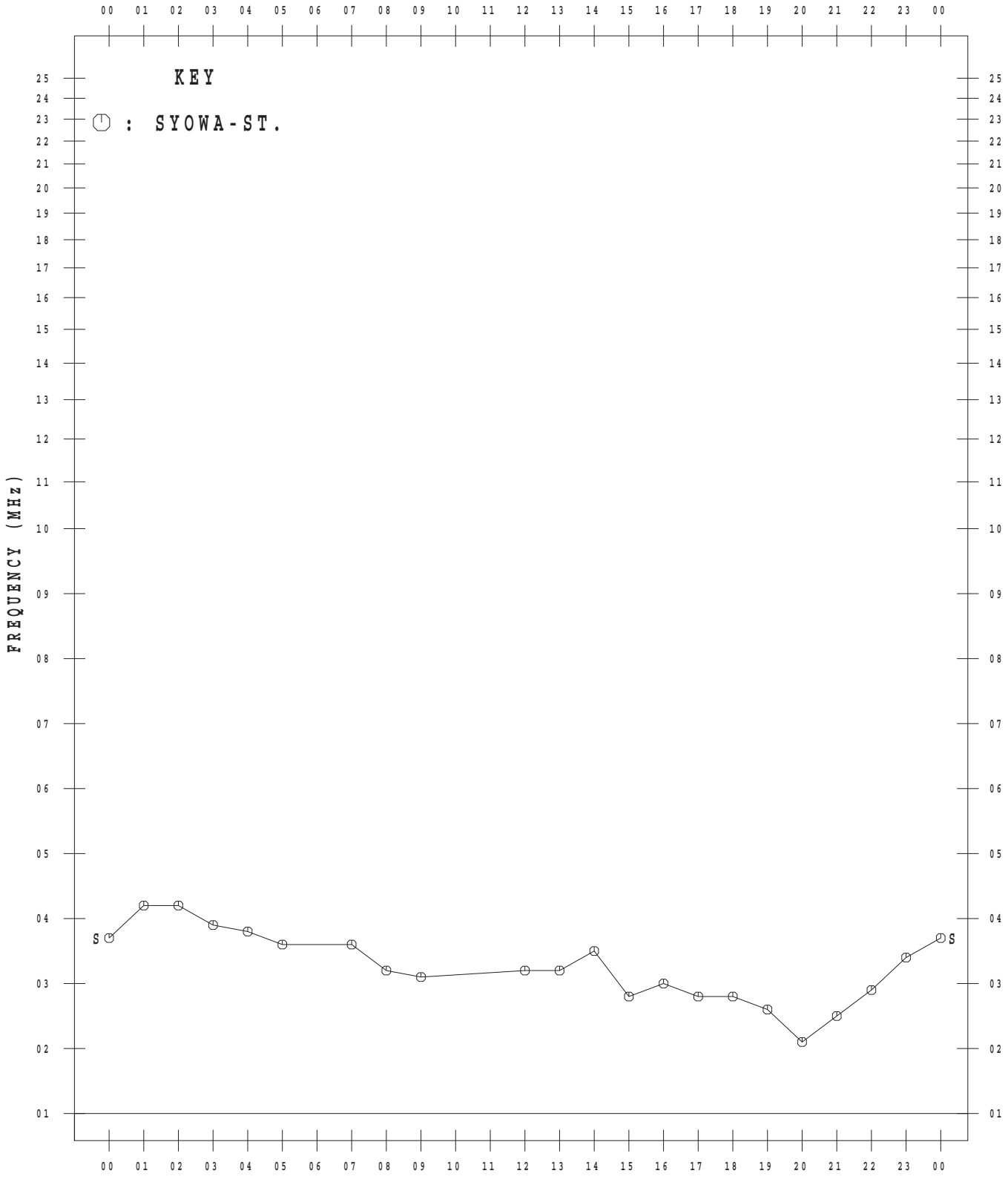
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME FEB. 2015



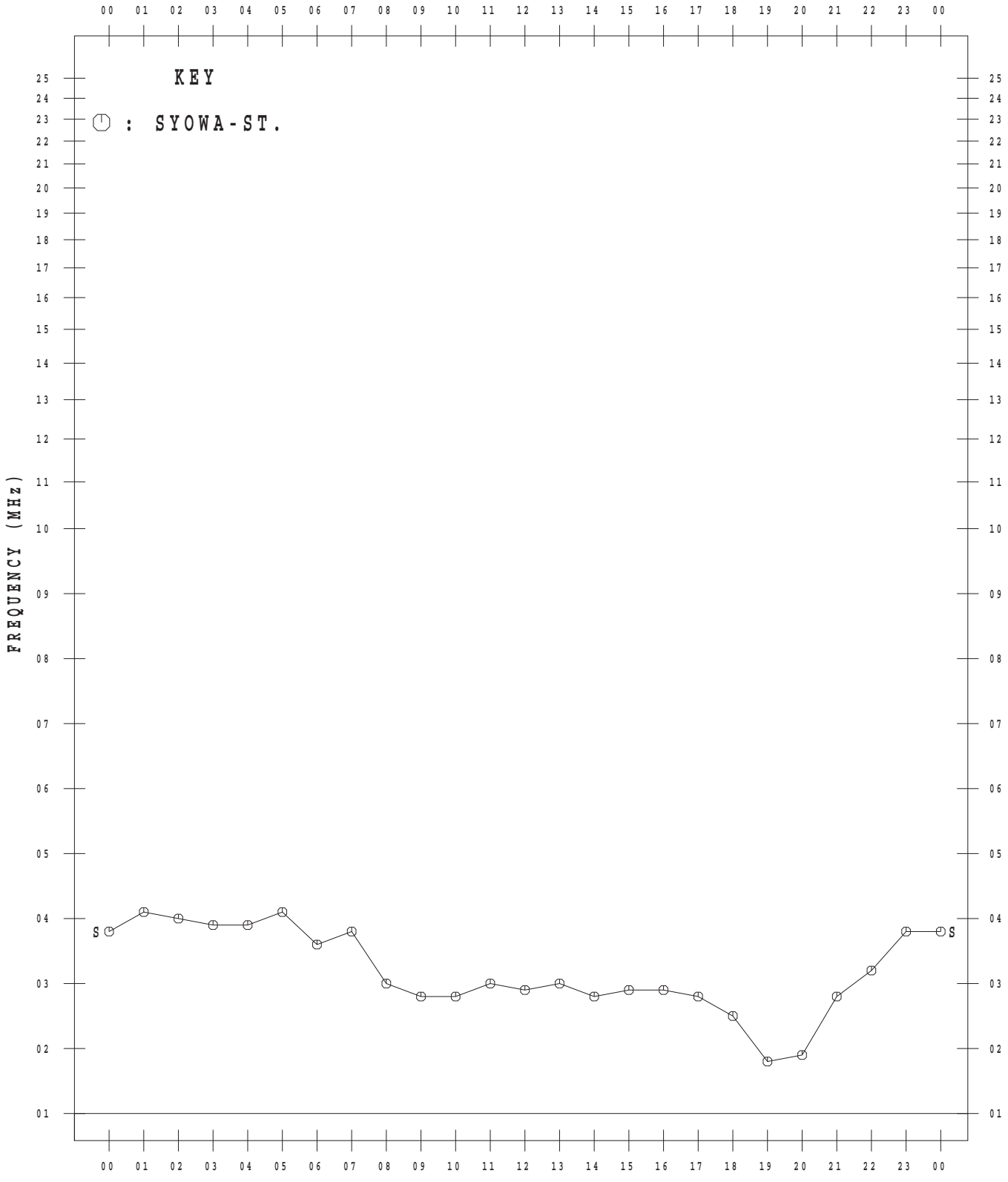
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME MAR. 2015



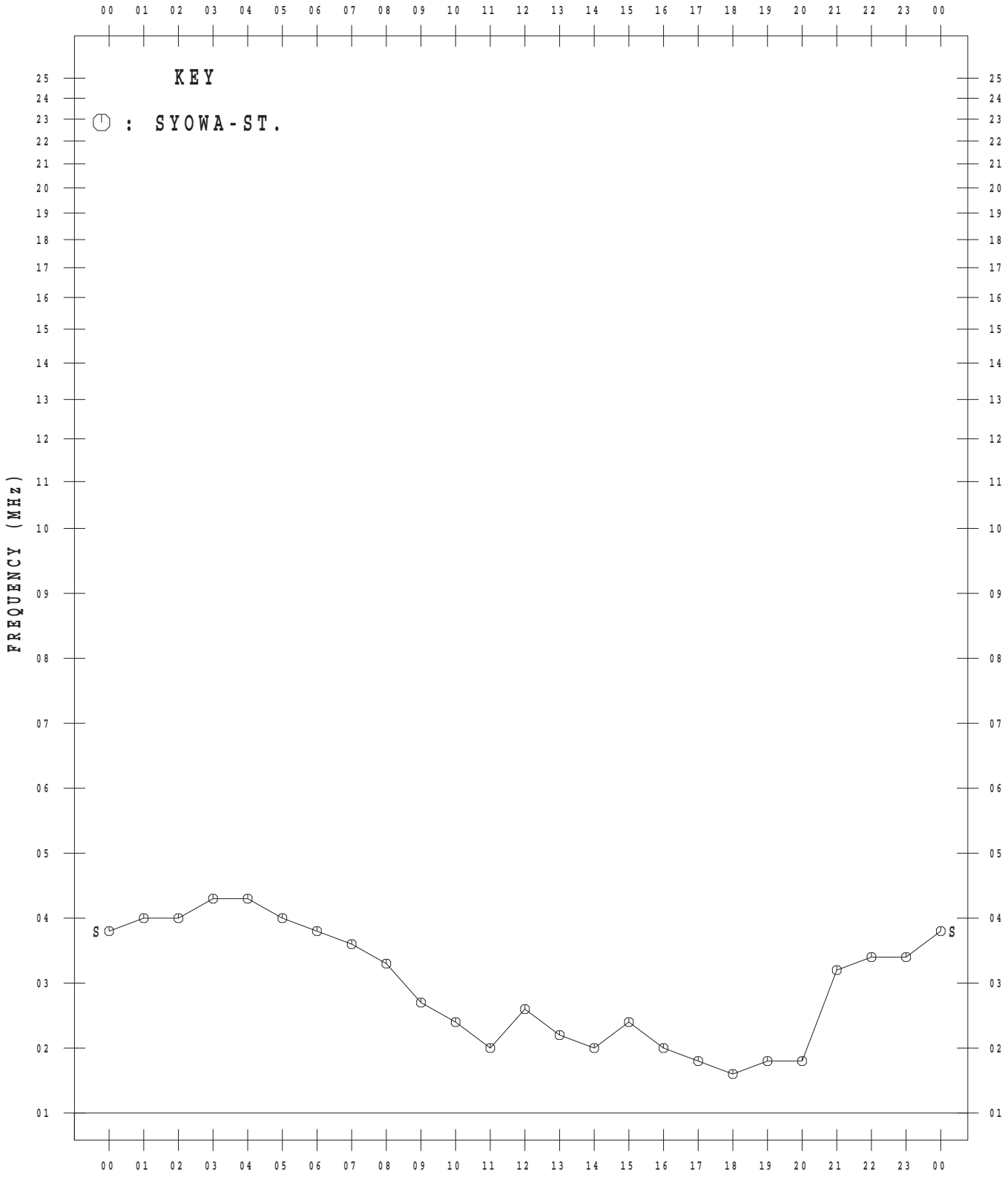
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME APR. 2015



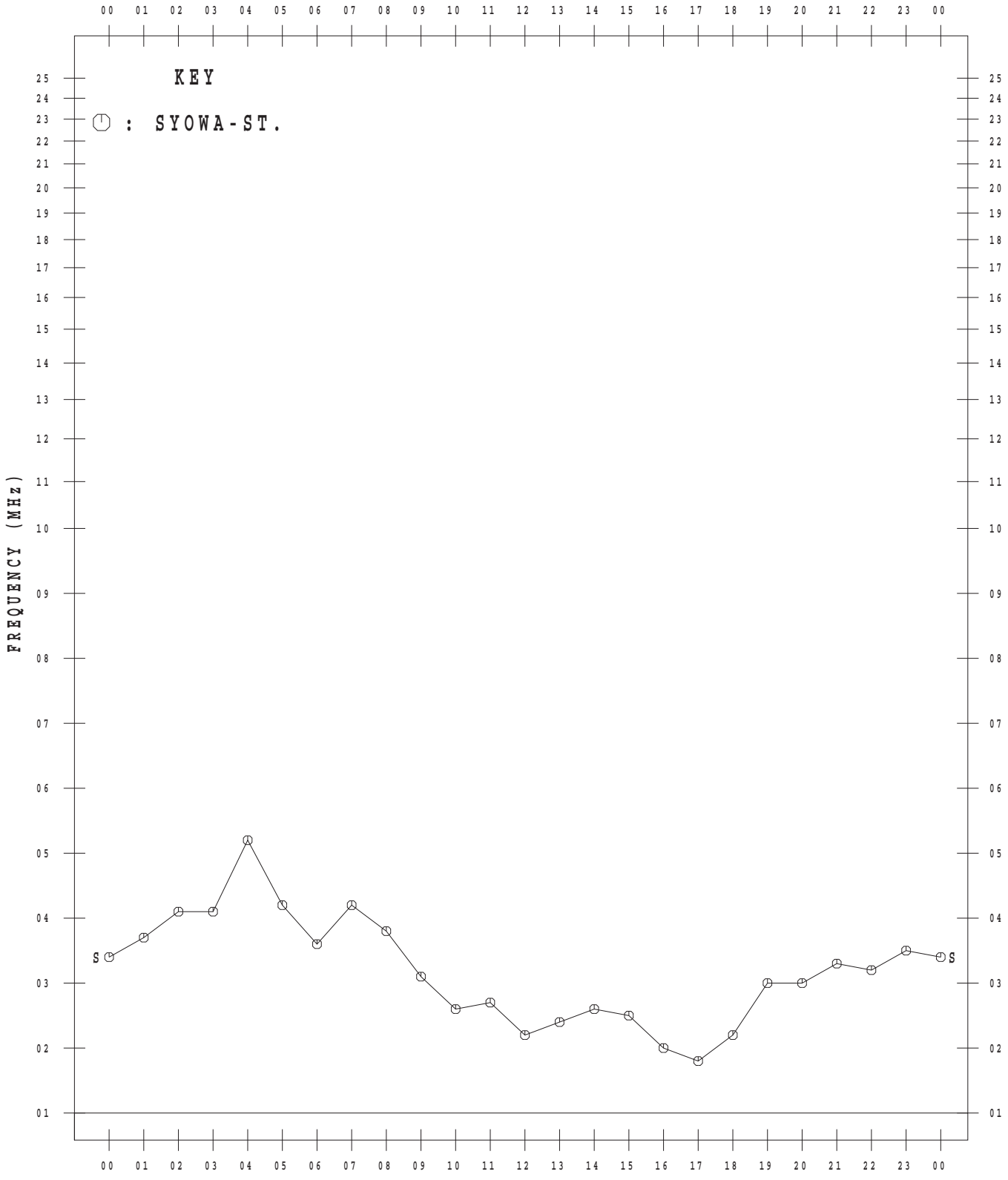
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME MAY 2015



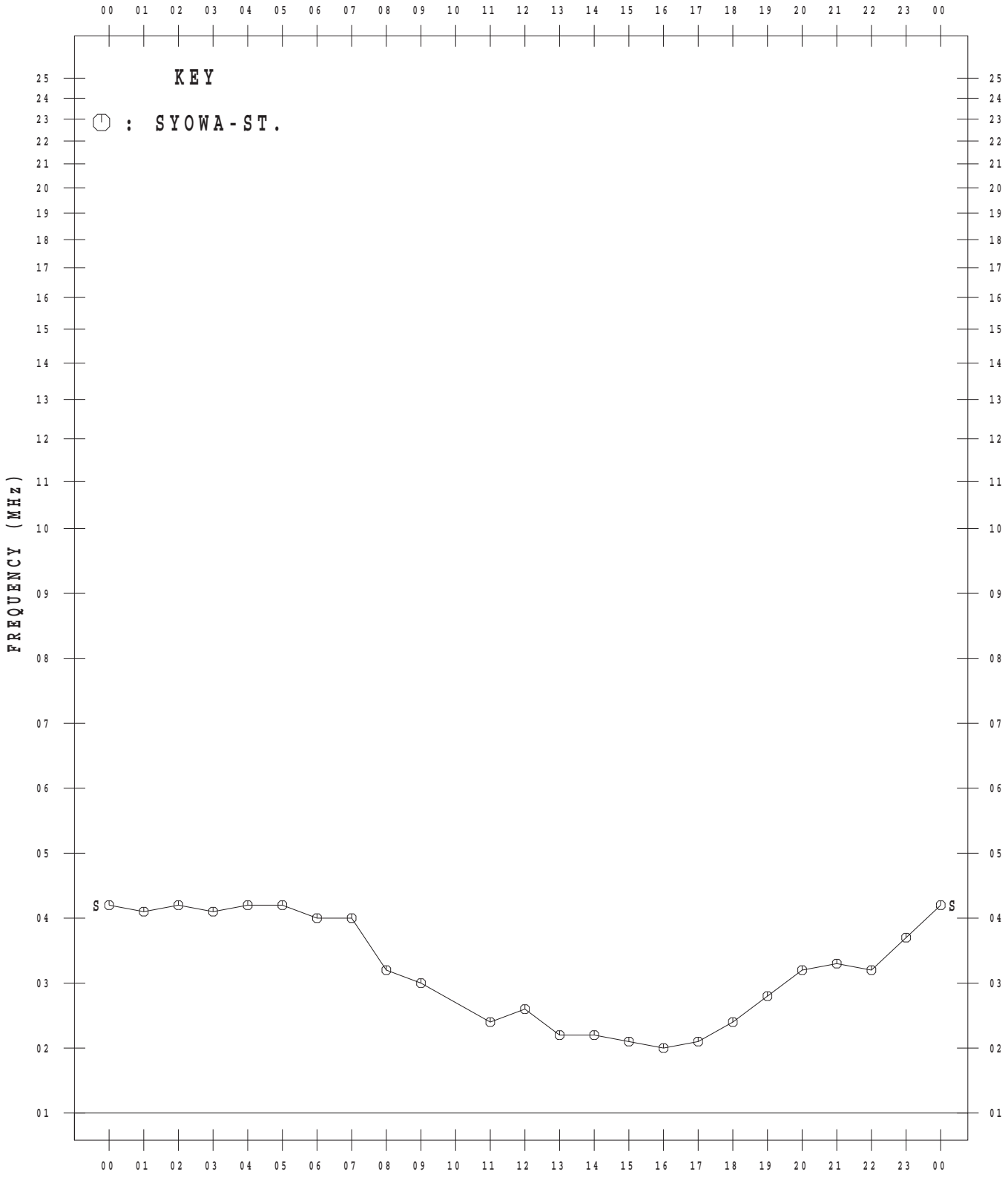
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME JUN. 2015



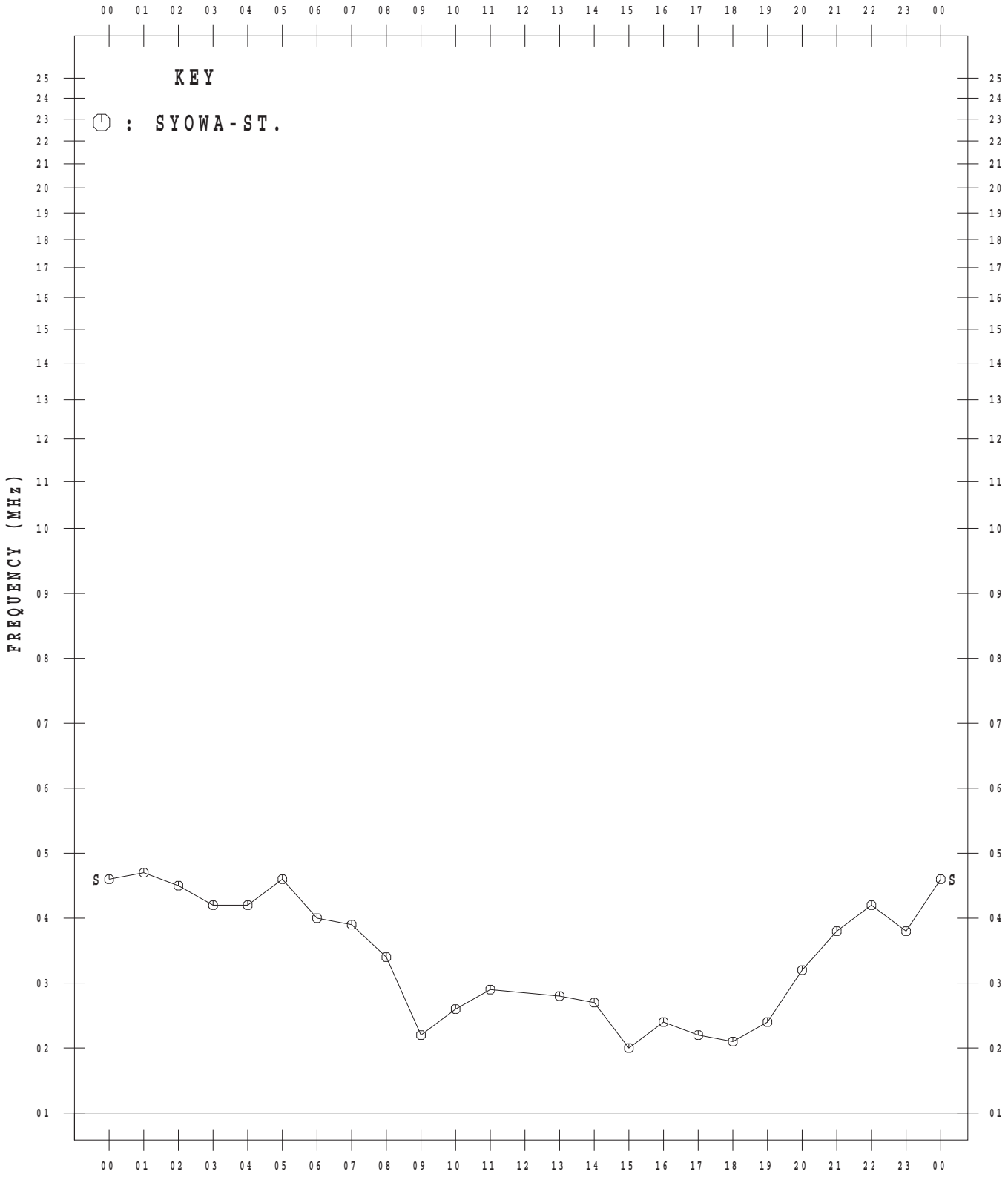
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME JUL. 2015



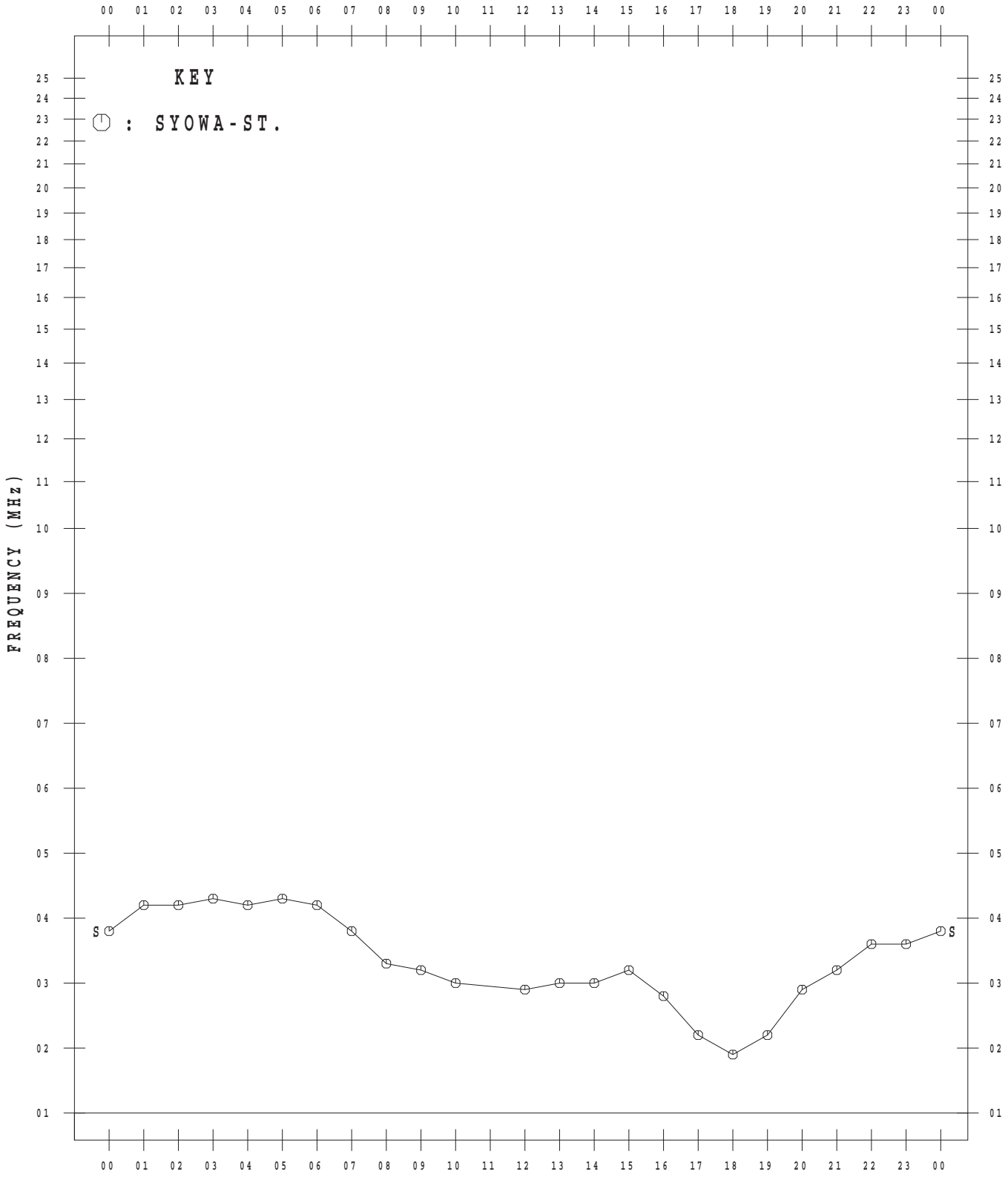
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME AUG. 2015



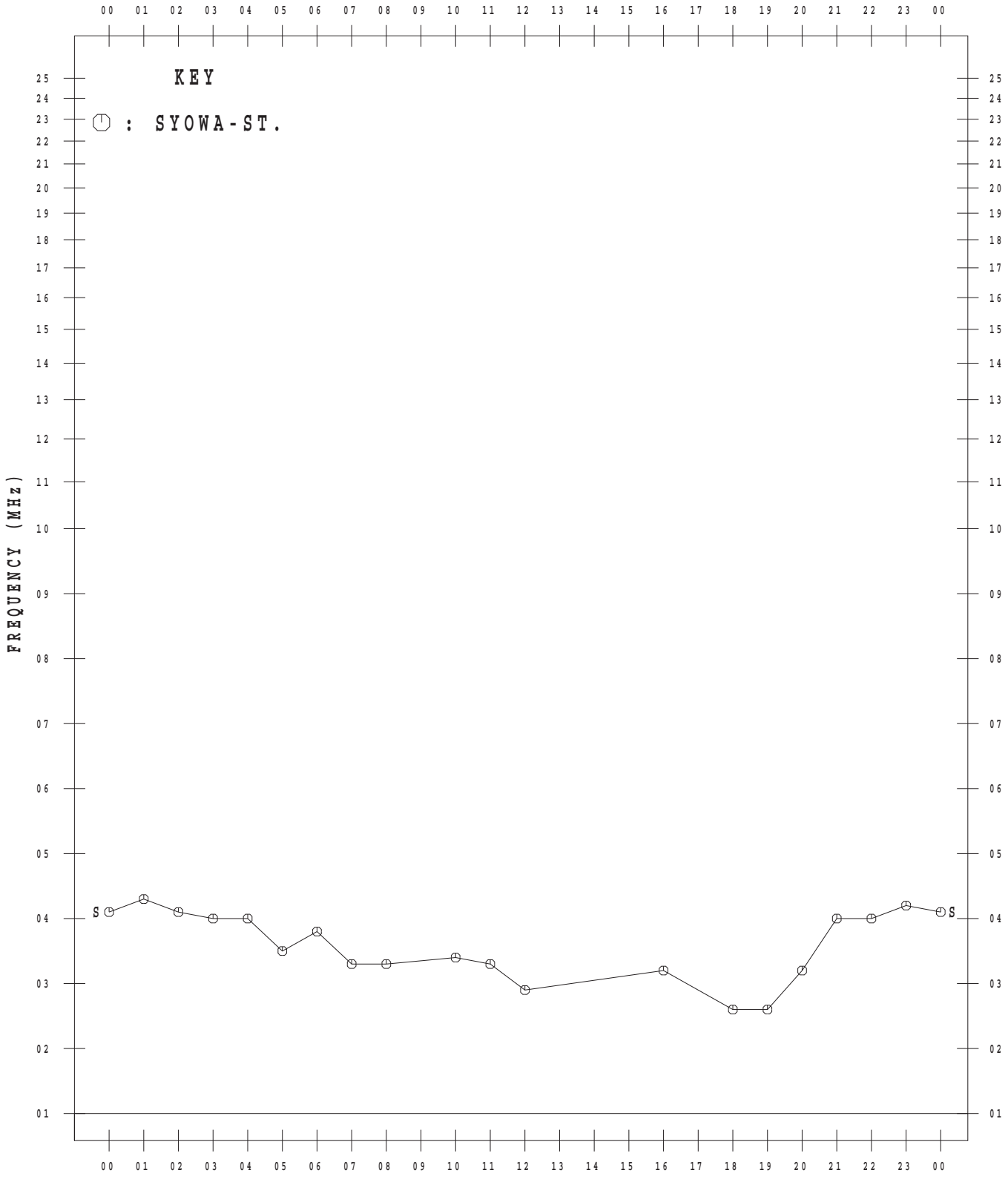
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME SEP. 2015



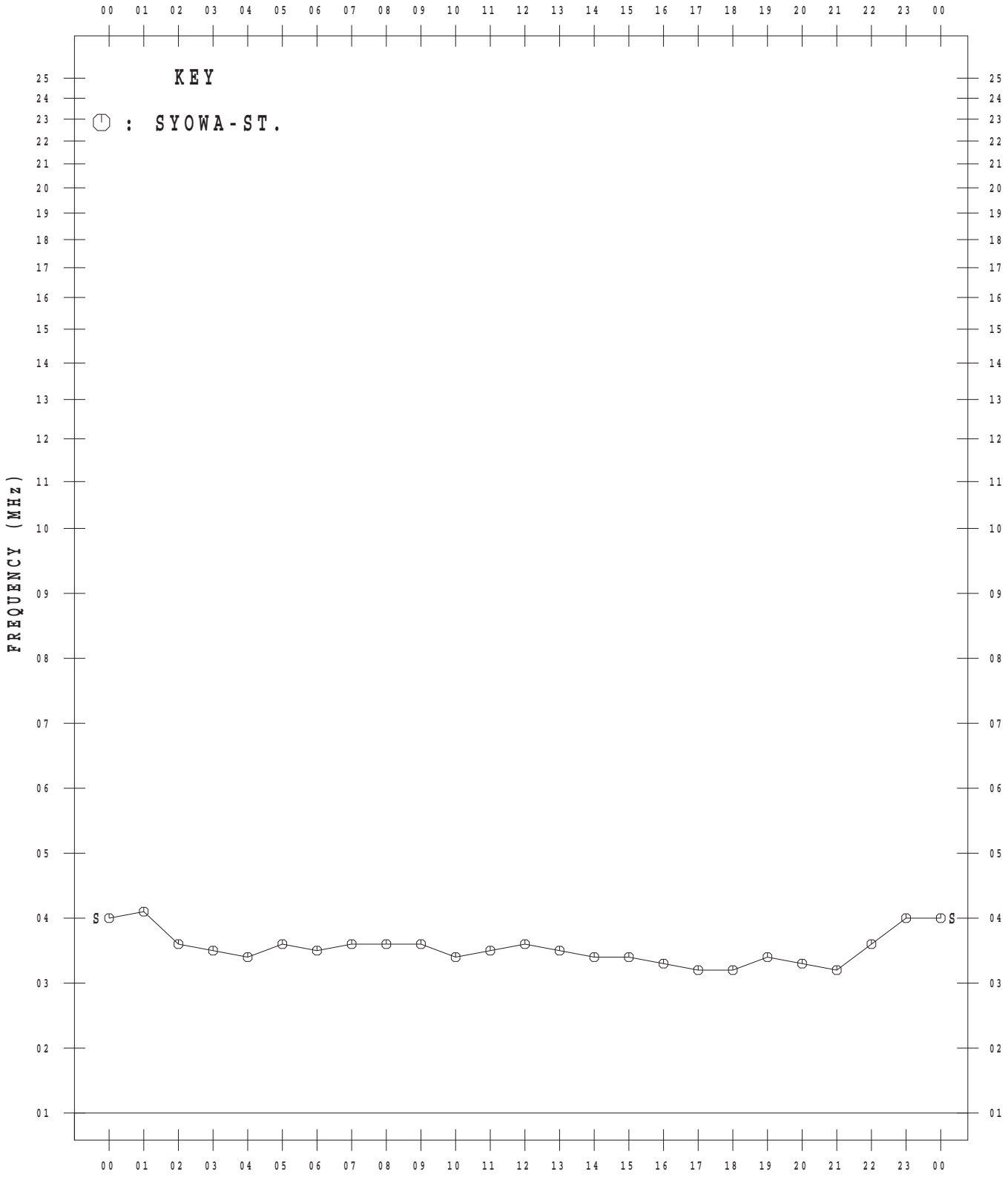
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME OCT. 2015



MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME NOV. 2015



MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME DEC. 2015