

IONOSPHERIC DATA AT SYOWA STATION (ANTARCTICA)

January – December 2016

CONTENTS

	Page
Introduction ·····	1
Tables ·····	4
Monthly plots of f_xI , $foF2$, $ftEs$, $fmin$ and $h'F$ ·····	64
Monthly median plots of $foF2$ ·····	76
Monthly median plots of $ftEs$ ·····	88



NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

This data book summarizes the results for vertical soundings of the ionosphere at Syowa Station, Antarctica in 2016. 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	86.4

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

SPECIFICATIONS OF THE IONOSONDE USED AT SYOWA STATION

Items	FM/CW Ionosonde Specifications
Frequency Range	0.5MHz - 16MHz
Transmitting Power	100W
Duration of Sweep	max 155s
Transmitted Pulse Width	1-10ms
Pulse Repetition Frequency	1kHz
Height Range	60 - 1000km
Recording Media	Hard drive
Power Supply	100V-AC, 1.5kVA
Transmitting Antenna and Receiving Antenna	40-m-high vertical delta antennas terminated by 400Ω

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

OBSERVERS

Observer: T. Naoi

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. 2016 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	A	88	A	A	A	A	A	B	A	A	57	A	O X	A	B	O X	O X	X	X	X	X	46	47
2	R	B	X	O X	72	A	A	A	R	O X	R	X	O X	O X	O X	O X	60	58	60	56	51	54	51	O X	X
3	X	X	X	O X	O X	R	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	50
4	X	A	A	X	58	66	59	67	74	78	72	70	70	66	64	62	58	59	53	54	52	56	46	45	
5	X	X	X	X	X	X	X	C	C	C	C	C	C	C	X	X	X	X	X	X	X	X	X	X	58
6	58	41	R	62	A	A	A	O X	X	X	X	X	V	O X	O X	X	94	62	54	53	53	50	49	56	
7	71	57	58	67	62	B	B	A	X	X	X	X	X	O X	X	X	X	X	X	X	B	X	X	X	X
8	X	X	X	O X	X	62	65	58	71	74	78	64	64	67	65	67	67	62	53	56	55	51	49	47	
9	48	47	46	47	B	X	X	X	X	X	X	X	O X	X	X	X	70	69	65	57	49	47	50	53	
10	X	X	X	A	A	A	A	A	74	73	78	73	74	84	77	73	70	74	65	60	55	52	56	81	
11	R	A	O X	O X	O X	A	A	A	A	X	X	X	X	X	X	X	X	X	X	X	X	123	54	A	X
12	B	113	A	52	A	51	A	A	O X	X	X	O X	X	X	X	X	X	X	X	X	X	X	58	51	
13	A	O X	A	B	118	A	A	O X	A	X	X	A	X	O X	X	X	X	X	X	X	O X	X	X	X	X
14	X	X	X	X	X	X	A	X	X	X	X	X	X	B	B	X	X	X	X	X	B	X	X	X	X
15	A	X	A	B	A	A	O X	X	X	X	X	X	X	X	X	X	60	63	62	60	58	44	45	48	
16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	X	X	X	R	X	X	X	V	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19	X	X	A	X	A	A	R	X	A	62	72	66	67	66	66	64	60	66	62	56	56	54	54	58	
20	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	R	R	R	X	X	A	A	
21	A	68	72	46	58	A	98	A	A	A	X	X	X	X	X	X	X	C	X	X	X	A	A	A	
22	A	A	B	A	75	A	A	A	O X	A	A	X	X	B	X	O X	X	X	X	X	X	X	X	O X	X
23	A	R	A	O X	X	58	58	B	A	A	47	B	B	X	X	X	X	X	O X	X	X	X	X	40	40
24	O X	X	A	R	60	A	R	B	R	X	X	X	X	X	X	X	X	X	X	X	X	X	A	A	
25	A	X	52	42	52	54	51	62	70	67	70	72	66	61	60	56	60	55	54	51	52	52	50	47	
26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27	X	X	X	O X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
28	X	49	50	R	X	66	78	86	93	78	76	77	82	86	90	80	71	58	56	56	54	46	43	51	
29	X	A	X	X	X	O X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30	X	X	A	A	66	56	62	72	73	73	71	67	66	66	67	68	64	60	56	52	54	54	52	52	52
31	X	X	A	A	A	A	X	A	X	X	X	X	X	X	X	X	X	X	X	X	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	21	24	20	23	22	19	19	19	24	24	26	28	28	28	30	30	29	29	30	30	29	30	26	27	
MED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
U Q	48	48	50	52	58	61	65	67	72	72	72	70	70	68	65	64	61	60	56	54	54	51	48	47	
L Q	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	45	46	48	46	52	55	57	58	56	64	65	64	64	62	58	57	58	58	53	51	51	47	45	45	

JAN. 2016 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2016 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

JAN. 2016 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2016 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	84	69	67	57	70	59	84	69	67	B	70	52	68	111	65	74	B	G	E	B	E	B	E	B	G	G	26	
2	39	B	36	86	30	47	46	48	40	39	33	38	E	B	E	B	E	B	39	26	E	B	E	B	36	81		
3	146	59	71	60	E	B	G	G	G	E	B	E	B	E	B	E	B	G	G	30	30	32	57	B				
4	82	57	65	56	G	27	85	38	32	34	G	31	33	36	34	88	32	33	30	34	25	20	20	B				
5	25	28	18	26	G	32	28	26	C	C	C	C	C	90	43	46	151	45	26	41	37	37	26	27				
6	52	55	31	34	66	74	69	54	60	G	G	39	136	145	145	G	G	E	B	E	B	E	B	G	28	58		
7	33	71	59	G	86	B	B	57	99	76	G	E	B	E	B	E	B	E	B	42	39	84	122	17	28	58		
8	70	39	44	71	G	42	42	60	E	97	47	31	31	81	G	31	115	E	B	44	29	29	28	59	22	22	22	
9	51	30	26	35	B	35	37	88	34	34	33	32	98	36	36	34	32	G	G	29	G	29	27	22	149	G		
10	G	G	G	81	57	66	55	89	34	G	34	34	34	34	E	B	E	B	E	B	E	B	24	21	36	36		
11	41	126	32	31	48	43	52	96	114	52	36	38	32	34	34	34	34	34	31	27	35	38	39	89	56			
12	B	73	92	32	60	58	57	57	72	72	G	E	B	E	B	112	84	64	E	B	34	30	26	24	23	43	39	
13	52	38	71	69	B	56	48	59	76	75	36	63	66	36	26	26	G	G	82	68	72	58	G	58	58			
14	27	36	36	34	36	94	60	41	65	33	34	G	E	B	B	36	69	72	G	G	26	B	35	38	39			
15	56	56	92	B	53	58	57	44	78	33	36	34	36	48	42	51	38	26	30	30	24	24	19	27				
16	21	22	22	30	34	36	30	36	30	16	35	35	35	46	46	56	32	32	28	27	26	21	18	21				
17	37	18	18	36	G	24	51	30	30	32	G	23	35	38	36	47	56	37	37	44	32	23	31	39	34			
18	34	30	27	44	30	30	26	28	33	33	34	34	44	36	34	34	31	28	28	25	28	G	G	24	24			
19	30	30	44	34	62	76	33	61	54	44	36	36	E	B	E	B	G	31	31	32	42	42	42	25	67	94		
20	20	28	22	30	33	31	26	32	89	31	108	33	34	G	G	33	64	36	36	26	33	24	33	66	58			
21	46	40	44	33	45	65	43	56	44	63	63	33	32	27	26	G	30	94	C	35	39	90	57	70	122			
22	123	74	B	56	43	53	59	48	77	123	116	36	74	B	E	B	E	B	G	G	28	131	29	131	23	22	25	48
23	53	32	71	24	22	24	29	B	58	63	34	B	B	E	B	E	B	E	B	E	B	E	B	20	21	34		
24	34	33	57	35	36	53	35	B	35	28	A	G	34	31	29	29	29	32	20	G	G	26	24	28	144	54		
25	70	30	27	21	20	23	A	28	32	28	A	G	35	36	31	31	24	60	30	G	G	23	16	14	16			
26	G	16	18	19	G	28	24	40	G	16	G	34	27	38	52	35	33	30	24	25	23	20	19	14	G			
27	16	16	30	34	34	38	46	45	28	25	34	34	50	36	36	34	32	30	30	43	22	21	18	E	B	12		
28	59	18	28	33	30	47	25	28	31	31	24	37	E	B	E	B	E	B	48	40	34	40	49	24	33	37	38	
29	68	75	41	34	28	34	30	40	36	36	32	34	36	14	30	35	30	30	32	15	22	22	17	G				
30	27	46	44	50	42	41	32	34	28	29	33	33	34	54	36	39	40	26	G	34	24	26	G	32	27			
31	16	32	32	70	56	52	46	58	46	46	40	31	G	G	G	31	31	31	G	G	35	51	52	52	64			
	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	29	30	29	28	30	29	29	29	29	30	30	31	30	29	31	30	30	31	31	31	31	G		
MED	40	34	36	34	35	42	43	46	42	33	36	34	36	36	35	34	33	32	29	30	26	22	32					
U Q	59	57	59	56	54	58	56	58	72	58	36	38	47	46	46	46	43	40	37	41	37	33	52	57				
L Q	27	28	27	31	G	31	30	37	32	31	34	33	33	32	31	G	32	G	G	26	26	24	20	21	26			

JAN. 2016 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2016 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

JAN. 2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2016 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	A	A	A	A	A	A	A	B	A	A	A	E A 270	A	A	B E A 260	B	A	B	236	248	E A 282	E A 284	
2	A	B	A	A	218	A	A	A	A	A	A	A	B E A 248	B	B	B E A 232	202	A	A	226	226	E B 248	A	A	
3	A	A	A	B	B	A	194	198	198	196	B	B	B	A	214	198	188	204	206	206	E A 232	A	A	244	
4	206	A	A	A E A 266	254	244	212	E A 222	192	196	196	196	188	206	206	198	210	226	226	236	268	228	A		
5	268	A E A 300	294	270	236	214	C	C	C	C	C	C	C	196	212	210	194	244	A	H E A 282	E A 226	242	244	276	
6	E A 318	A	A	A	A	A	A	A	A E A 204	242	220	198	A	B	B E A 222	206	B	B	A	256	230	230	E A 250	A	
7	238	196	A	A E A 278	B	B	A	E A 226	200	176	H	B	274	E A 234	B	226	B	196	196	B	238	A E A 272	A		
8	A	A E A 338	A	A	A	A	A	A	A	A	198	188	H	180	198	214	214	B	208	216	216	E B 248	236	232	232
9	E A 310	242	E A 294	A	B	A E A 266	200	216	196	198	198	198	198	212	204	206	198	202	202	202	202	240	E A 266	266	
10	254	260	A	A	A	A	A	A	E A 222	232	198	194	H	E B	194	190	232	204	212	290	E A 254	254	206	206	E A 304
11	220	A	A	A	A	A	A	A	A	A	194	208	264	198	202	204	204	232	208	A	A	A	A	A	
12	B	A	A	A	A	A	A	A	A	216	200	B	200	200	200	202	202	E B 232	200	236	218	234	A	A	
13	A	A	A	A	B	A	A	A	246	A E A 268	214	190	B	E A 238	216	216	216	226	218	210	226	E A 252	252	E A 256	
14	A	A	A	A	A	A	A E A 276	202	212	204	188	B	B	B	200	194	202	202	216	B E A 294	E A 280	228	A		
15	A E A 274	134	B	A	A	A E A 302	218	202	198	192	216	196	196	A	202	202	206	214	214	210	242	A	A		
16	A	A	A	A	A E A 314	244	268	200	192	198	194	194	212	E A 256	198	202	202	202	202	202	212	226	210	214	
17	E A 260	E A 260	258	E A 250	232	208	210	198	188	206	198	200	222	206	200	A	A	222	202	E A 256	204	226	250	248	
18	222	A	200	A	202	242	228	196	202	202	196	198	198	188	188	194	206	202	206	216	E A 254	E A 262	254	242	
19	E A 240	E A 240	A	A	A	A	A	A	A	A	196	228	216	210	210	210	202	230	220	E A 264	234	234	A	A	
20	A	A	190	194	A E A 260	212	226	200	200	206	202	196	202	236	162	H E A 264	218	A	A	A	218	222	196	A	
21	A	A	A	A	A	A	A	A	E A 250	A	A	A	202	194	196	226	226	226	C	A	A	A	A	A	
22	A	A	B	A	A	A	A	A	224	A	A	A	198	B	212	206	216	234	222	222	244	242	E A 258	192	
23	A	198	A	206	A	214	236	B	A	A	198	B	B	E B 226	226	194	186	228	250	218	A	H	172	198	198
24	A	A	B	A	A	A	A	B	A	206	206	202	190	H	194	194	210	210	202	226	192	242	E A 260	A	
25	A	A	200	238	E A 252	240	A	192	190	196	194	194	222	190	196	216	202	204	218	218	234	232	E B 234	198	
26	198	A	A	232	222	222	204	192	204	198	220	200	198	198	198	198	198	206	200	200	216	A	220	A	
27	212	E A 244	A	A	A	A	A	228	214	198	196	198	206	202	192	200	200	188	202	202	E A 260	218	218	238	216
28	A	A	A	A	A	206	206	206	H 186	176	208	208	B	B	208	226	222	222	226	E A 234	222	E A 292	A	A	
29	A	A	A	A	A	E A 256	242	A	232	200	218	208	196	198	206	220	192	204	208	220	212	212	200	234	
30	A	A	A	A E A 294	A E A 238	198	194	182	176	H 212	194	208	208	202	210	206	206	208	208	200	226	226	E A 226	232	
31	246	A	A	A	A	A	A	A E A 218	A	A	198	198	230	222	210	228	228	214	A	A	A	A	A	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	13	8	8	6	9	11	14	14	22	20	24	23	23	26	27	27	28	29	26	27	25	26	21	15	
MED	230	220	196	227	235	231	220	200	202	198	198	200	198	198	205	205	204	206	207	217	224	228	236	224	
U Q	E A 264	E A 260	E A 297	E A 250	E A 274	E A 256	E A 242	E A 226	E A 222	E A 206	E A 206	E A 208	E A 216	E A 212	E A 222	E A 216	E A 216	E A 229	E A 222	E A 236	E A 237	E A 252	E A 255	E A 266	
L Q	216	219	195	206	220	214	210	198	198	196	196	194	194	196	200	200	200	202	202	210	215	218	227	214	

JAN. 2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB.2016 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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	55	A	A	A	47	55	A	A	A	A	A	X	X	X	X	X	X	X	X	X	X	X
2	X	X	82	X	X	X	58	58	68	72	72	75	65	64	66	60	57	57	58	57	56	45	A	68
3	X	A	58	A	A	80	A	A	A	A	A	R	R	X	X	X	X	X	X	X	X	X	X	X
4	X	55	51	51	44	57	58	62	68	71	75	75	A	X	X	X	X	X	X	X	X	X	X	X
5	51	47	48	48	51	A	42	A	57	60	66	74	65	68	66	A	67	63	60	55	55	46	A	A
6	A	A	A	R	B	59	A	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	A	A	B	A	51	66	64	76	80	70	76	78	78	77	74	78	80	75	60	43	R	X	A	A
8	A	A	X	A	A	R	58	R	R	A	R	R	R	X	X	X	X	X	X	X	X	X	X	X
9	A	52	49	54	50	A	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10	A	82	A	A	X	A	A	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11	A	A	A	X	A	A	A	A	A	A	69	65	70	69	72	62	63	56	47	52	53	57	47	47
12	A	A	A	A	A	O	X	A	R	A	R	R	R	X	X	X	X	X	O	X	A	X	X	A
13	A	A	A	57	O	X	47	55	60	64	62	56	58	53	57	58	60	58	58	55	52	55	53	46
14	O	X	41	53	46	51	54	76	55	72	72	O	X	66	76	70	76	78	86	91	82	67	57	50
15	A	A	A	57	A	O	X	48	56	57	67	O	X	69	73	63	53	61	68	63	66	65	56	54
16	56	38	A	87	X	A	R	X	A	A	A	X	O	X	70	66	70	64	66	52	R	72	66	71
17	A	A	A	A	A	B	A	A	A	A	A	B	B	O	X	56	64	62	54	X	B	A	A	A
18	A	A	A	A	54	O	X	49	50	B	A	A	A	R	B	O	X	58	B	O	X	X	X	R
19	A	A	A	A	A	O	X	32	O	X	B	A	A	B	B	O	X	58	O	X	O	X	O	X
20	A	A	A	A	A	O	X	46	R	O	X	A	A	O	X	54	57	63	61	55	57	62	55	50
21	A	A	A	A	R	X	A	46	55	61	62	65	68	64	64	63	65	59	58	55	55	50	X	A
22	A	A	A	A	X	X	X	42	49	52	56	66	67	69	68	75	77	71	68	58	55	56	55	52
23	X	92	66	A	O	X	A	44	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	R
24	A	A	A	A	O	X	A	52	A	A	A	A	X	X	X	X	X	X	X	X	X	X	X	A
25	57	A	64	A	A	A	A	X	O	X	49	53	57	62	71	73	69	70	68	66	65	64	56	46
26	46	A	R	39	R	90	58	59	O	X	48	56	59	63	70	66	72	71	70	64	58	58	54	49
27	A	A	58	A	X	39	49	57	60	65	68	73	72	75	78	81	77	64	60	56	53	53	47	47
28	40	78	O	X	X	33	43	65	O	X	50	58	71	70	66	68	72	77	78	76	71	66	61	58
29	58	77	X	A	A	54	58	66	72	76	79	83	86	86	85	74	71	66	56	A	X	51	58	60
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	10	13	11	15	19	17	17	19	19	21	22	21	28	29	27	29	28	27	26	28	24	23	15
MED	46	54	51	51	50	55	57	60	65	65	68	67	70	66	68	65	62	58	55	54	53	49	46	44
U Q	56	78	61	57	54	66	58	68	72	69	74	72	75	72	73	71	69	64	57	55	54	54	56	50
L Q	X	47	48	48	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

FEB.2016 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2016 f_oF₂ (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2016 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	52	92	23	59	78	71	58	46	54	59	54	53	48	34	32	G	30	30	30	26	34	21	22	G	
2	34	32	27	32	24	27	41	32	30	28	29	E B 33	34	51	38	36	33	38	G	26	27	41	46	49	
3	66	100	37	75	66	47	64	64	66	63	53	34	G	G	G	G	22	35	32	32	34	26	23	17	17
4	28	30	30	30	58	32	32	33	41	41	45	62	118	67	115	58	36	39	25	31	24	18	21	21	
5	29	56	31	57	32	59	35	54	40	40	31	G	G	G	24	70	72	39	29	42	E B 25	22	27	91	42
6	44	57	50	G 37	B	40	67	60	51	44	36	34	34	34	44	39	32	E B 33	27	29	38	24	54	34	
7	48	55	B	59	28	113	82	46	28	29	32	34	34	40	48	44	85	E B 33	25	36	G	44	72	44	
8	48	47	40	78	75	50	52	52	44	60	56	54	32	34	G	32	28	31	31	26	30	26	20	24	
9	36	34	27	27	22	54	51	30	22	33	33	35	34	31	37	48	E B 39	30	29	23	23	20	26	48	
10	57	55	83	46	35	64	56	48	43	44	G	G	32	30	30	G	E B 30	28	28	27	25	14	G	G	16
11	36	44	57	36	56	65	58	60	77	60	49	41	36	36	34	34	29	E B 27	28	31	34	36	30	35	
12	63	54	48	72	69	48	58	48	62	52	33	33	33	43	36	G	E B 29	23	88	72	29	24	31	44	
13	49	41	41	30	25	25	25	G	G	G	36	47	32	38	54	47	36	28	26	G	20	43	52	57	
14	57	42	32	33	30	25	33	38	36	47	42	33	E B 33	G	G	G	Y	G	26	26	26	34	19	17	49
15	50	46	48	51	58	76	42	49	49	54	30	27	G	35	33	28	27	29	34	28	28	36	28	18	41
16	45	30	58	30	12	105	42	29	42	68	58	31	E B E B E B 31 47 36	G	G	32	37	41	46	33	49	46	94		
17	55	48	88	60	47	B	58	51	59	54	47	B	E B E B 36	G	G	24	G	B	54	37	27	40	50	62	
18	54	67	67	60	30	24	28	B	55	98	70	G	B	E B E B 42	B	34	E B 39	32	G	21	24	31	44		
19	81	68	53	61	46	51	52	B	58	49	B	B	E B E B E B 36 29 41	E B E B E B 41 40 32	Y	G	G	25	30	G	23	36	44		
20	58	52	41	112	52	28	38	40	56	56	E B E B E B 42 32 42	E B E B E B 41 33	28	46	56	43	30	38	27	31	28	25	37	57	
21	30	47	46	46	30	G	40	58	42	47	E B 28	G	28	46	56	43	30	38	27	31	28	25	37	57	
22	96	54	48	38	26	G	20	38	15	22	G	G	30	30	31	G	G	26	24	34	22	17	14	11	12
23	20	31	35	48	94	58	53	29	137	19	35	31	31	32	31	28	20	31	23	18	22	58	26	77	
24	58	56	46	66	44	62	53	60	52	37	E B E B E B 42 36 33	E B E B E B 33 34	30	34	30	30	30	26	24	20	G	13	24	28	
25	K 34	47	39	93	57	52	44	27	37	64	43	G	30	34	30	G	30	26	24	20	G	13	24	28	
26	25	33	31	27	24	32	35	34	32	28	32	27	29	20	44	18	26	26	23	19	16	16	12	38	
27	36	36	33	42	42	30	22	38	49	41	29	32	32	42	35	40	30	28	28	20	18	18	12	33	
28	34	45	43	34	39	37	22	11	G	G	26	32	30	32	23	39	29	40	35	32	41	116	58	18	29
29	34	37	58	54	56	32	23	18	G	G	26	30	56	60	46	48	32	27	40	62	60	32	36	37	20
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	29	29	28	29	28	28	29	27	29	29	28	26	26	28	29	27	28	28	29	29	29	29	29	29	29
MED	48	47	42	48	43	48	42	40	49	44	34	32	33	34	34	30	30	30	28	26	25	24	26	38	
U Q	57	56	52	60	58	60	57	52	58	58	46	36	G	42	44	41	36	36	32	32	32	38	42	48	
L Q	34	36	32	34	29	29	32	30	36	28	30	27	32	30	G	G	28	28	25	21	G	19	18	23	

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2016 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	9	11	8	16	21	14	18	18	10	10	13	12	12	8	20	13	10	8	11	10	13	14	13	7
2	7	6	9	8	8	10	8	8	8	8	11	33	21	14	9	10	9	9	9	9	10	8	9	9
3	9	9	9	12	8	10	14	12	14	9	9	12	22	15	14	14	8	12	12	10	11	11	7	7
4	7	6	8	10	8	7	9	9	8	8	9	10	16	14	10	10	11	16	13	8	8	6	7	6
5	6	10	8	10	12	8	16	12	12	22	17	19	16	18	29	25	16	14	20	26	15	8	9	10
6	10	10	14	24	B	17	26	15	10	8	8	14	14	9	11	17	14	33	16	10	14	10	7	8
7	16	16	B	20	23	24	14	14	9	7	8	10	9	9	7	8	13	33	10	8	14	8	20	7
8	8	6	8	12	10	17	11	15	9	10	34	33	13	14	17	19	16	16	8	8	9	12	9	6
9	7	8	10	8	6	12	9	9	7	6	8	9	9	12	9	15	39	15	18	16	16	7	8	13
10	14	10	8	11	8	14	11	15	10	16	14	19	19	10	12	18	30	13	14	12	10	7	6	7
11	9	14	17	16	16	8	16	10	10	12	9	9	9	14	12	16	14	27	19	10	10	9	8	6
12	8	9	9	13	8	8	7	11	9	10	9	9	7	10	13	21	29	18	14	14	9	7	7	6
13	6	10	12	9	7	6	9	7	8	8	22	15	10	10	10	10	10	10	7	11	8	7	7	7
14	8	8	8	8	8	8	8	8	8	16	16	8	33	18	18	16	15	15	15	12	9	10	9	8
15	10	10	13	15	13	20	10	10	8	14	11	14	10	10	17	9	10	15	18	18	14	10	7	7
16	10	8	8	8	5	11	10	8	8	10	13	16	31	47	36	18	9	14	9	8	24	8	8	11
17	12	7	8	9	8	B	15	17	14	14	10	B	B	36	21	14	8	B	14	10	8	8	8	7
18	8	9	7	8	9	11	18	B	15	13	7	16	B	B	42	B	14	38	15	11	13	8	8	12
19	21	11	29	18	12	10	12	B	20	26	B	B	B	36	29	41	40	32	16	14	9	9	7	9
20	9	14	10	16	19	10	17	19	13	24	42	32	42	41	33	18	13	11	9	6	13	11	9	7
21	8	9	11	13	15	15	18	14	6	47	15	33	19	12	11	9	8	7	7	15	10	17	8	12
22	9	12	11	18	13	13	6	11	10	8	10	9	8	9	10	12	8	7	8	8	7	6	6	8
23	8	8	8	14	15	19	14	7	9	8	10	10	8	6	8	10	9	9	7	8	10	8	14	12
24	8	10	6	8	10	10	8	12	17	10	42	36	33	33	18	30	14	36	28	14	9	7	8	8
25	8	13	11	11	13	10	10	8	10	16	22	17	17	10	12	12	13	12	13	9	9	6	6	8
26	7	9	9	8	11	8	9	9	9	9	6	7	10	10	10	7	8	8	8	8	8	10	8	8
27	8	8	8	6	10	8	6	6	8	8	5	6	12	35	26	16	8	18	19	13	9	8	8	8
28	8	8	9	8	8	8	6	6	8	10	10	11	10	14	11	9	6	8	10	10	11	8	8	6
29	6	8	11	9	12	8	11	8	5	6	6	7	7	8	12	13	13	9	13	16	13	11	9	7
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	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
MED	8	9	9	11	10	10	11	11	9	10	10	14	14	14	12	14	13	14	13	10	10	8	8	8
U Q	10	10	11	16	14	14	16	15	11	15	16	26	26	26	20	18	14	22	16	14	13	10	9	9
L Q	8	8	8	8	8	8	8	8	8	8	8	9	10	10	10	10	8	9	9	8	9	7	7	7

FEB. 2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2016 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	214	A	A	A	A	A	A	A	A	A	A	E A	216	204	218	202	220	220	210	E A	E A	A	A
2	A	A	A	202	202	202	E A	A	200	200	204	204	186	A	232	202	200	236	210	210	A	A	A	A	
3	A	A	A	A	A	A	A	A	A	A	A	190	230	206	196	208	218	250	240	232	248	A	242	A	
4	A	228	E A	E A	E A	E A	220	210	210	202	212	A	A	E A	216	202	216	216	200	E A	E A	E A	E A	E A	
5	278	322	E A	E A	A	A	A	A	A	250	Y	210	176	200	E A	A	E A	A	222	220	246	246	A	A	A
6	A	A	A	A	B	A	A	A	A	216	190	192	186	190	234	198	206	226	218	E A	E A	E A	E A	A	A
7	A	A	B	A	228	A	A	A	200	196	196	204	210	202	258	240	A	216	220	A	212	A	A	A	A
8	A	A	A	A	A	A	A	A	A	A	A	200	172	226	220	222	222	234	234	E A	E A	236	E B	A	A
9	A	E A	E A	A	A	A	A	A	A	228	214	204	196	216	198	198	218	A	B	204	212	240	E A	A	A
10	A	A	A	288	A	A	A	A	A	216	200	228	216	210	190	204	200	204	226	232	232	238	A	A	A
11	A	A	A	A	A	A	A	A	A	E A	268	218	258	240	240	220	220	216	216	250	A	A	226	A	A
12	A	A	A	A	A	226	A	A	A	A	206	216	218	222	E A	E A	256	236	224	226	A	A	A	A	A
13	A	A	A	A	A	A	254	230	230	202	A	216	202	196	216	254	196	226	224	218	A	E A	E A	E A	E A
14	E A	A	A	A	A	A	A	E A	E A	A	A	218	220	234	216	210	216	210	198	226	E A	E A	E A	E A	E A
15	A	A	A	A	A	196	A	A	A	A	E B	222	236	208	208	228	212	212	218	218	202	E A	E A	E A	E A
16	A	A	A	A	258	A	A	A	A	A	A	E A	E B	B	E B	290	222	256	A	A	A	204	A	A	A
17	A	A	A	A	A	B	A	A	A	A	A	B	B	E A	E A	228	224	B	A	E A	E A	274	A	A	A
18	A	A	A	A	A	198	B	A	A	A	A	A	B	B	A	B	212	290	240	A	E A	E A	196	A	196
19	A	A	A	A	A	180	212	B	A	A	B	B	B	E B	256	204	B	B	B	226	A	182	182	A	A
20	A	A	A	A	A	A	A	A	A	A	B	220	B	B	238	244	210	210	224	222	E A	236	236	248	268
21	A	A	A	A	G	G	A	A	194	B	E B	218	242	226	272	212	208	204	E B	Q	240	230	A	A	A
22	A	A	A	A	A	A	A	242	198	202	186	196	198	204	200	214	202	204	224	226	218	A	224	228	A
23	E A	A	A	A	A	A	A	A	248	208	182	204	204	204	212	198	198	206	206	224	226	220	218	196	A
24	A	A	A	A	A	A	A	A	182	B	B	E B	276	260	236	214	224	224	264	244	240	250	A	A	A
25	A	A	A	A	A	A	A	252	228	A	A	218	202	224	208	226	222	214	214	222	218	226	282	A	A
26	A	A	A	A	A	A	A	244	208	226	202	216	204	196	210	214	214	148	194	220	220	240	A	A	A
27	A	A	A	A	E A	E A	246	246	264	212	212	212	212	A	240	212	196	212	A	214	206	232	252	E A	300
28	A	A	A	A	A	A	A	204	204	204	198	188	216	210	196	208	234	224	222	222	222	222	222	264	A
29	A	A	268	A	A	A	254	232	198	216	216	A	A	E A	A	200	202	216	222	A	E A	E A	244	238	230
30																									
31																									
CNT	3	3	3	5	3	6	7	10	13	15	16	23	22	23	27	26	26	26	25	23	25	17	16	7	
MED	E A	322	241	242	228	201	233	237	206	204	204	208	208	208	212	211	210	216	220	224	226	225	232	246	
U Q	E A	E A	E A	A	E A	E A	254	248	229	216	217	220	220	236	238	224	222	226	225	240	247	247	250	276	
L Q	278	228	214	212	202	196	212	218	199	200	199	200	202	204	200	208	202	212	215	214	219	219	226	228	

FEB. 2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR.2016 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 30	58	60	A	92	A	X 68	80	80	84	X 86	X 87	X 90	X 86	X 84	X 86	X 75	X 67	X 60	X 54	X 51	X 49	X 42	R	
2	A	43	A	A	A	64	X 61	6	79	27	X 77	X 74	X 73	X 73	X 80	X 78	X 70	X 70	X 62	X 57	X 53	R	R	X 40	
3	R	R		A	A	X 55	X 58	X 56	X 66	X 69	X 70	X 70	X 74	X 74	X 75	X 78	X 70	X 66	X 61	X 50	X 51	X 46	X 41	X 38	
4	X 33	63	67	56	A	A ⁰ 55	X 55	X 67	X 78	X 78	X 75	X 76	X 78	X 80	X 71	X 68	X 68	X 64	X 60	X 55	X 53	X 46	X 41	X 38	
5	46	52	X 49	X 51	X 49	X 51	X 58	X 65	X 72	X 76	X 87	X 90	X 93	X 104	X 102	X 96	X 98	X 83	X 67	X 62	X 48	X 43	X 40	X 49	
6	X 46	R	48	X 50	54	60	56	69	X 62	X 74	X 76	X 86	X 86	X 89	X 86	X 77	X 72	X 74	X 65	X 52	R	95	74	A	
7	81	A	A	X 94	81	77	R	A	A	58	B	A	B ⁰	X 54	X ⁰ 56	X 58	X 56	X 52	X 44	X 46	X 76	X 48	X 77	A	
8	A	A	A	67	A	A	R	R	X 52	X 53	X 54	X 56	X 59	X 60	X 56	X 56	X 55	X 52	X 52	X 44	X 34	A	R	A	
9	R	A	A	A	A	A	A	X 52	X 54	X 61	X 63	X 68	X 72	X 77	X 74	X 70	X 68	X 64	X 56	X 50	X 42	X 47	X 43	X 69	
10	A	44	55	A	A	A	A	R	B	A	58	X 53	X 62	X 70	X 74	X 73	X 64	X 62	X 58	X 44	X 47	X 46	X 59	A	
11	A	A	A	A	A	X	R	A	A	A	A	X 50	X 62	X 61	X 64	X 75	X 57	X 45	X B	X 49	X 34	X 28	A	X 64	
12	75	A	A	A	A	A	A	A ⁰	X ⁰	X	X	X	X	X	X	X	X	X	X	X	X	X	A	X 125	
13	A	A	A	A	A	A	46	50	54	60	64	69	70	66	65	61	59	56	54	48	40	34	30	X 30	
14	X 28	X 26	83	X 47	66	R	X 66	X 64	X 67	X 68	75	77	84	90	80	74	70	66	57	54	X ⁰ 47	X 36	A	X 68	
15	74	A	A	A	59	R	A	A	86	89	84	B	B	B	B	62	50	52	52	54	X ⁰ 42	X 27	93	A	
16	A	A	A	60	A	A	R	R	A	R	B	B	B ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	A	
17	A	A	A	A	X 40	A	B		B	B	B ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	R	R	R	
18	A	A	R	R	A	A	B ⁰	X 40	X 48	X 48	B	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	A	A	X 82	
19	A	92	A	A	A	A	A	A	A	B	B	A	B	B	B ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	X ⁰	A	A	A	R
20	A	A	A	A	A	68	A	A	A ⁰	X 44	B	X 56	X 60	X 65	X 69	X 72	X ⁰ 71	X ⁰ 55	X ⁰ 51	X ⁰ 70	X 36	X 36	X 147	X 116	
21	A	A ⁰	X 43	45	A	A	A ⁰	X 34	X 45	X 48	X 52	X 57	X 60	X 58	X 53	X 52	X 51	X 50	X 47	X 36	X 36	X R	X A	A	
22	R	A	A	57	A	A	A	49	52	58	61	62	72	78	73	70	58	52	50	44	40	37	28	X 27	
23	46	A	46	X 42	X 40	46	A	X 52	A	B	X 56	X 53	X 77	X 88	X 82	84	68	58	55	48	39	X ⁰ 28	X ⁰ 24	X 54	
24	A	56	A	A	A	X 41	B	X 50	X 49	X 53	X 59	X 68	X 82	X 86	X 72	X ⁰ 70	X ⁰ 64	X ⁰ 58	X ⁰ 53	X ⁰ 42	X ⁰ 34	X ⁰ 34	X ⁰ 24	A	
25	50	A	62	81	A	A	A	A	X 48	X 51	X 58	X 61	X 68	X 69	X 71	X 68	X 59	X 50	X 54	X 40	X 32	A	A	A	
26	A	A	A	A	57	X ⁰ 40	44	X ⁰ 36	X ⁰ 49	X 58	X 65	X 72	X 84	X 78	X 74	X 71	X 64	X 54	X 49	X ⁰ 39	X ⁰ 33	X 30	X 30	X 29	
27	58	A	86	59	66	134	54	58	63	66	70	83	79	89	92	92	91	88	58	60	123	A	A	A	
28	A	A	92	A	A	A	A	A	B	B ⁰	X ⁰ 52	X 56	X 58	X 60	X 64	X 65	X 70	X 61	X 54	X 54	X ⁰ 39	X ⁰ 31	X 55	X 62	
29	X 45	A	A	A	R	B	A	A	B	B	B	60	62	69	67	68	73	62	58	37	28	A	A	A	
30	A	A	A	A	A	A	A ⁰	X 44	X 49	X 51	X 55	X 58	X 66	X 69	X 72	X 83	X 91	X 66	X 52	X 48	A	A	A	A	
31	A	B	A	A	A	A	B	B	X 46	X 51	X 54	X 56	X 62	X 68	X 69	X 66	X ⁰ 60	X ⁰ 50	X ⁰ 45	X ⁰ 44	X ⁰ 34	X ⁰ 25	X ⁰ 21	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	12	8	12	12	10	10	10	18	21	23	23	27	27	28	30	31	31	30	28	31	25	18	19	14	
MED	46	54	61	56	58	58	57	52	54	58	63	61	70	70	71	70	64	58	54	48	40	36	42	52	
U Q	66	60	82	64	66	68	61	65	70	69	75	74	79	83	75	77	70	66	58	54	51	46	74	68	
L Q	X 39	X 44	X 48	X 49	X 46	X 54	X ⁰ 44	X 49	X 49	X 51	X 56	X 56	X 60	X 62	X 64	X 59	X 57	X 52	X 52	X 44	X ⁰ 34	X 31	X 30	X 38	

MAR.2016 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR.2016 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		24	F 38	F 46	A	A	A	62	F 64	F 74	78	80	81	84	80	78	80	69	61	54	48	45	43	36	A
2		A	A	A	A	A	F 50	55	F 60	F 68	66	69	68	67	F 67	74	72	64	64	56	51	47	R	R	34
3		R	R	A	A	A	49	F 46	F 50	F 55	F 56	F 59	64	F 63	F 63	69	72	64	60	55	44	45	40	35	32
4		27	A	A	A	A	A	49	F 57	F 68	F 66	69	70	72	74	65	62	62	58	54	49	47	40	35	32
5		F 32	F 35	43	45	43	45	52	59	66	70	81	84	87	98	96	90	92	76	60	55	42	37	F 30	F 31
6		F 36	A	A	44	F 43	F 48	F 40	F 53	55	68	70	80	80	83	80	71	66	68	59	F 42	A	F 85	A	A
7		A	A	A	A	A	A	A	A	A	A	B	A	B	48	50	52	50	46	38	32	R	A	A	A
8		A	A	A	A	A	A	A	A	46	47	48	50	53	54	50	50	49	46	46	38	28	A	R	A
9		A	A	A	A	A	A	A	46	48	55	57	62	66	71	68	64	62	58	50	44	36	F 36	F 31	A
10		A	A	A	A	A	A	A	R	B	A	F 49	47	56	F 60	68	67	58	56	52	38	F 30	A	A	A
11		A	A	A	A	A	A	A	A	A	A	A	44	56	V 55	58	69	51	39	B	43	28	22	A	A
12		A	A	A	A	A	A	A	A	R	44	46	52	54	54	57	60	54	51	50	47	44	R	A	A
13		A	A	A	A	A	A	F 36	44	48	54	58	63	64	60	59	55	53	50	48	42	34	28	24	24
14		22	20	A	41	A	A	F 49	58	61	62	F 62	71	78	84	74	68	64	60	51	48	41	30	R	A
15		A	A	A	A	A	A	A	A	A	A	R	B	B	B	55	44	46	46	44	36	21	A	A	A
16		A	A	A	R	A	A	R	A	A	R	B	B	B	45	50	53	49	B	B	38	30	27	A	A
17		A	A	A	A	34	A	B	A	B	B	B	40	42	R	52	R 52	R 52	40	A	39	R	R	R	A
18		A	A	A	A	A	A	B	R 34	42	42	B	51	47	51	46	47	53	61	48	44	R	A	A	A
19		A	A	A	A	A	A	A	A	A	B	B	A	B	B	B	R 50	43	F 38	F 43	F 36	A	A	A	A
20		A	A	A	A	A	A	A	A	A	A	B	50	54	59	63	66	65	49	45	32	A	A	A	A
21		A	A	37	A	A	A	A	R 28	39	42	46	51	54	52	47	46	45	44	41	30	30	A	A	A
22		A	A	A	A	A	A	A	F 38	46	52	55	56	66	72	67	64	52	46	44	38	34	31	22	21
23		A	A	A	36	34	F 34	A	46	A	B	50	47	F 59	82	76	F 72	62	52	49	42	33	22	18	A
24		A	A	A	A	A	35	B	F 38	43	47	53	62	76	80	66	64	58	52	47	36	28	27	18	A
25		A	A	R 46	A	A	A	A	A	42	45	52	55	62	63	65	62	53	44	F 42	34	26	A	A	A
26		A	A	A	A	A	34	F 34	30	43	52	59	66	78	72	68	65	58	48	43	33	27	24	20	F 19
27		19	A	A	A	A	A	F 46	F 52	57	60	64	77	73	83	86	86	Z 85	F 59	52	F 45	A	A	A	A
28		A	A	A	A	A	A	A	A	B	B	46	50	52	54	58	59	F 56	55	48	F 39	F 30	25	A	A
29		39	A	A	A	R	B	A	A	B	B	B	54	56	63	61	62	F 62	56	52	31	22	B	A	A
30		A	A	A	A	A	A	A	R 38	43	45	49	52	60	63	66	77	85	60	46	F 35	A	A	A	A
31		A	B	R 44	A	A	A	B	B	40	45	48	50	56	62	63	60	54	44	39	38	28	R 19	15	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		7	3	5	4	4	7	10	17	20	21	22	27	27	28	30	31	31	30	28	31	23	16	11	7
MED		27	F 35	44	42	38	45	F 48	46	47	52	56	55	62	63	65	64	58	52	48	39	30	29	24	31
U Q		36	F 38	46	44	43	49	F 52	F 58	59	64	64	68	73	77	69	71	64	60	52	44	42	38	35	32
L Q		22	20	40	38	34	34	F 40	38	43	45	49	50	54	56	58	53	51	46	44	36	28	24	18	21

MAR.2016 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2016 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	19	38	17	76	54	44	43	28	25	29 ^G	27	31	30	32	48	55	38	27	24	27		85	28	35	
2	39	35	70	65	43	41	42	18	26	75	29	32	105	94	54	35	23	23	18	19	22	36	33	30	
3	30	30	48	52	54	46	43	46	28	29	35	28	30	30	^E 32	28	24		^G 27	^E 26	30	21	^E 15	20	
4	19	40	36	45	51	60	44	44	16 ^G	26	18 ^G	32	34	34	42	47	27	49	64	22	16	27	24	20	
5	27	14	16	25	19	19	19		15 ^G	19	30	36	28	28	41	33	41	56	46	42	28	32	47	34	
6	32	38	40	40	34	30	19	16 ^G	14 ^G	23	30		38	46	30	28	17 ^G	44	41		45	72	48	86	
7	50	63	47	73	60	37	45	62	42	51		B		^E 32	^E 39	^E 40	29	24	26	36	34	48	71	84	
8	64	113	44	48	55	53	40	44	63	^E 38	^E 30	^E 39	^E 30	^E 30	^E 30	^E 23	26	26	^E 24	30	29	39	22	^K 48	
9	30	^K 38	49	39	47	58	43	50	34	28	34	32	30	^E 31	^E 34	^E 37	25	25	25		19	18	12	53	
10	82	36	50	43	52	48	56	31		48	35	28	^E 28	^E 22	^E 28	28	28	24	24	^E 19	16	34	37	72	
11	70	63	69	54	54	48	31	46	51	56	56	39		^E 31	^E 26	^E 29	34			29	18	18	82	41	
12	60	70	48	51	45	49	54	50	^E 37	^E 40	31	31	31	31	31	25	20	14	20		23	72	55	58	
13	46	42	46	56	52	44	19	21	23	25	28	32	31	31	31	27	17	24	20	28	28	58	12	^E 9	
14	11	14	26	50	29	48		25	39	39	28	31	31	31	25	23	25	18	15	19	^E 15	48	44	48	
15	51	66	54	56	52	42	52	63	58	60		B	B	^E 32	^E 28	26					21	28	72	58	
16	54	87	52	34	53	52	38	48	48	44		B	B	^E 38	^E 42	^E 38					54	65	59	48	80
17	92	92	71	59	59	55		54		B		^E 28		^E 39	^E 39	^E 38	24	50	26		32	34	32	35	
18	59	42	36	^K 34	47	51		113	24	28		^E 39	^E 41		^E 39	^E 37	^E 38	^E 45	^E 40	18	36	52	47	62	
19	90	52	59	48	50	43	50	53	48		B	B	B	^E 43	^E 33	^E 30	30	30	18		38	46	37	41	
20	58	58	103	57	42	44	58	56	47	29	^G	^E 37	^E 34	27	23		^E 24	^E 43	35		134	108	77	82	
21	92	59	35	34	81	48	44	19	22	^G	25	72	29	^E 32	28	^E 28		^E 21		70	16	30	53	137	
22	^K 29	86	52	39	58	52	48	71		^G 24	^G 27	22	22	26		24	34	26	29	27	17	17	17	16	
23	30	42	42	20	27	32	52	58	59		^E 43	^E 31	^E 33	^E 31	^E 31	^E 37	^E 24	^E 20	^E 19	19	^E 15	16	35	39	
24	100	38	62	64	65	23		26	23	^G	36	32	^E 32	^E 31	21	21		^E 18	^E 56	16	13	56	14	31	
25	35	72	69	43	53	62	58	58	^E 38	24	29	27	27		20	23	^E 22	26	26	24	48	52	30	58	
26	47	58	30	30	30	58	59	30	^E 31	^E 32	28	28	36	36	32		^E 20	^E 20	^E 18		14	13	36	46	
27	19	44	40	40	37	58	44	38	107	22	24	24	20	^G	^E 27	19	23	23	21	28	41	49	49	36	
28	45	66	66	47	44	45	45	65		B	^E 23	^E 23	27	126	23	25	22	27		^E 12	14	24	37	34	
29	52	59	54	70	38		68	47		B	B	B		^E 25	^E 42	^E 40	^E 37	^E 23	^E 13	19		34	34		
30	34	74	57	52	57	68	53	58	^G 17	20	20	25		^E 23	^E 17		^E 33	^E 24	23	44	38	46	56		
31	42	^E 34	^E 50	58	54			29		^G 28		^E 28		89	21	26	116	^E 32	22	58	^E 19	63	52	52	
	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	31	31	31	30	27	30	27	26	24	29	27	28	30	31	31	30	29	31	31	30	31	31	
MED	46	55	48	48	52	48	44	46	30		28	30		^E 31	^E 31	26			24	20	22	38	37	46	
U Q	60	66	59	56	55	54	53	58	48	40	32	36	33	33	39	^E 37	33	33	32	28	36	56	49	58	
L Q	30	38	36	39	42	43	40	28	^G 23	25		28	29		^G 25	^G 24	24	23	20		16	27	28	34	

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2016 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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	7	9	7	15	8	11	13	8	8	9	6	14	11	10	8	8	10	10	7	8	8	8	8	8	
2	6	9	10	7	10	11	11	5	6	8	8	8	7	7	8	10	9	8	8	9	12	8	5	7	
3	6	7	8	16	15	11	12	10	17	11	11	8	10	16	32	18	14	16	27	26	20	15	15	13	
4	11	9	8	12	11	14	16	12	10	9	9	9	9	10	8	8	8	10	9	9	6	6	9	8	
5	8	7	7	6	6	6	7	7	7	11	14	14	18	13	8	8	31	17	10	7	8	7	6	10	
6	9	10	9	8	9	9	6	8	8	10	10	10	16	9	10	6	6	7	7	7	10	8	6	10	
7	9	9	11	7	11	6	6	14	9	10	B	14	B	32	39	40	11	15	11	9	7	12	8	10	
8	9	10	10	8	10	20	20	18	13	38	30	39	30	15	14	12	9	14	24	10	6	8	6	6	
9	7	10	9	13	8	12	12	14	8	6	6	8	12	31	34	37	11	10	8	13	11	8	7	12	
10	8	10	12	8	11	12	18	13	B	24	20	16	28	15	23	20	21	14	13	20	9	7	7	9	
11	8	11	8	9	8	12	10	10	13	13	11	39	20	24	31	16	29	7	B	13	8	6	7	10	
12	10	8	14	8	6	19	14	14	37	40	26	21	21	24	19	15	10	10	11	9	8	8	8	13	
13	8	13	8	8	13	10	6	6	5	6	6	9	10	10	9	9	7	8	9	7	7	7	8	9	
14	6	6	10	8	10	10	25	6	11	10	12	12	12	16	9	9	8	9	11	14	15	13	8	10	
15	8	8	8	8	15	13	30	21	17	28	22	B	B	B	30	21	12	19	15	15	7	7	9	7	
16	13	10	12	13	13	33	24	16	16	24	B	B	B	38	42	38	24	B	B	16	13	11	10	10	
17	14	16	14	10	12	12	B	43	B	B	B	28	19	B	39	39	38	24	38	9	9	7	8	7	
18	17	18	14	12	13	24	B	15	14	14	B	39	41	17	39	37	38	45	40	18	7	8	11	7	
19	9	40	16	14	18	14	19	19	19	B	B	14	B	B	B	43	33	16	21	8	8	6	9	9	
20	7	7	9	15	8	14	15	15	15	15	B	37	34	19	16	16	24	43	17	8	8	11	11	9	
21	8	8	9	8	34	19	14	12	8	16	10	12	17	32	21	28	15	21	13	8	8	8	7	7	
22	9	9	16	15	13	12	20	14	8	8	8	12	9	26	16	10	10	9	15	8	9	11	8	8	
23	7	7	10	8	8	8	21	15	14	B	43	31	32	31	31	37	24	20	19	14	15	13	10	9	
24	10	7	18	13	14	8	B	15	10	11	9	32	32	31	16	16	16	11	9	16	10	7	9	8	
25	10	16	14	9	14	17	20	23	38	17	14	13	15	14	14	12	22	17	14	11	13	9	9	10	
26	10	12	8	11	10	10	12	13	31	32	17	23	23	16	16	16	14	20	20	18	14	8	9	9	
27	12	12	11	12	9	10	10	12	12	12	12	12	12	19	27	11	10	10	11	11	11	12	9	8	
28	15	10	15	11	12	12	13	32	B	B	17	14	14	16	16	16	22	12	9	11	14	12	8	8	
29	11	8	11	10	25	B	22	40	B	B	B	33	20	16	25	42	40	37	23	13	9	B	12	9	
30	6	8	14	21	18	14	18	14	9	10	11	9	16	16	19	8	19	33	24	9	8	11	8	11	
31	14	B	34	12	11	24	B	B	B	11	16	14	28	17	16	16	12	27	32	14	21	19	13	11	11
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	9	9	10	10	11	12	16	14	13	14	14	14	18	16	19	16	15	15	14	11	9	8	8	9	
U Q	11	12	14	13	14	17	22	18	19	32	43	32	32	31	31	37	24	21	23	15	13	12	9	10	
L Q	7	8	8	8	9	10	12	10	8	10	10	12	12	15	14	10	10	10	9	8	8	7	7	8	

MAR. 2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2016 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	244	214	244	A	A	A	A	254	210	208	206	218	206	216	214	A	E A	228	228	E A	E A	E A	E A	A
2	A	A	A	A	A	A	A	A	204	202	228	216	222	A	E A	254	A	220	206	A	222	222	222	A	A
3	A	A	A	A	A	A	A	A	A	A	224	194	194	206	196	230	230	226	226	A	238	222	234	236	Q
4	A	A	A	A	A	A	A	A	232	204	204	204	232	200	212	248	E A	206	224	E A	254	220	220	220	A
5	264	264	264	280	280	A	214	230	208	200	208	208	208	208	238	218	A	E A	A	A	E A	E A	226	222	A
6	A	A	A	A	A	E A	340	256	230	228	204	206	206	228	244	202	202	202	A	226	224	A	A	A	A
7	A	A	A	A	A	A	A	A	A	A	B	A	B	E B	260	B	B	232	234	B	A	224	A	A	A
8	A	A	A	A	A	A	A	A	A	A	B	258	B	E B	232	212	212	212	E A	246	B	E A	E A	A	A
9	A	A	A	A	A	A	A	A	A	A	A	218	218	228	212	216	248	B	E A	A	E A	E A	E A	A	A
10	A	A	A	A	A	A	A	A	202	B	A	246	192	208	238	242	230	A	234	224	240	E A	254	A	A
11	A	A	A	A	A	A	A	A	A	A	A	A	B	270	230	262	224	E B	240	A	B	E A	E A	A	A
12	A	A	A	A	A	A	A	A	B	B	E B	E A	E A	E A	A	A	218	216	214	232	E A	232	232	A	A
13	A	A	A	A	A	A	A	A	232	224	216	216	214	202	202	214	210	210	220	A	214	214	224	236	236
14	270	E A	312	A	A	A	A	B	A	A	E A	290	208	216	200	200	214	206	224	232	216	220	220	244	A
15	A	A	A	A	A	A	A	A	A	A	R	B	B	B	E B	E A	234	234	234	254	254	234	354	A	A
16	A	A	A	188	A	A	A	A	A	A	A	B	B	B	B	B	A	B	B	A	E A	E A	E A	A	A
17	A	A	A	A	236	A	B	A	B	B	B	E B	262	226	B	B	B	B	250	A	E A	276	A	A	A
18	A	A	A	A	A	A	B	A	246	220	B	B	B	B	B	B	B	E B	274	252	E B	252	A	A	A
19	A	A	A	A	A	A	A	A	A	A	B	B	A	B	B	E B	E B	280	274	290	272	A	A	A	A
20	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	220	206	218	216	254	208	248	A	A	A
21	A	A	230	A	A	A	A	A	242	202	208	204	204	204	E B	228	E B	206	B	A	A	240	A	A	A
22	A	A	A	A	A	A	A	A	242	216	216	204	218	222	222	216	212	212	226	226	230	230	250	266	A
23	A	A	A	A	E A	A	A	A	336	342	A	A	B	B	E B	252	234	246	246	240	E B	E B	E A	E A	A
24	A	A	A	A	A	A	B	A	E A	E A	A	236	236	212	B	E B	242	242	216	224	E A	190	214	214	A
25	A	A	240	A	A	A	A	A	A	A	B	E A	238	230	218	198	226	212	222	E B	230	212	224	212	A
26	A	A	A	A	A	A	E A	E A	286	244	E B	E B	260	226	210	E A	E A	E A	E A	208	208	204	214	214	A
27	A	A	A	A	A	A	A	A	244	220	232	210	212	226	232	212	208	208	A	220	244	228	228	250	A
28	A	A	A	A	A	A	A	A	B	B	234	210	196	208	208	222	232	220	202	206	234	262	A	A	A
29	A	A	A	A	A	B	A	A	B	B	B	E B	294	218	230	230	B	246	E B	226	214	234	A	A	A
30	A	A	A	A	A	A	A	A	A	E A	A	234	200	228	218	218	204	230	216	226	B	234	248	A	A
31	A	B	254	A	A	A	B	B	A	E A	A	230	224	242	212	198	228	214	206	220	220	222	240	E A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	4	3	5	3	3	1	3	7	12	19	21	22	24	27	25	24	26	24	22	27	22	15	9	6	
MED	264	239	244	280	258	340	256	230	230	212	216	212	212	215	218	218	214	225	222	223	230	230	238	254	
U Q	267	E A	312	259	336	342	E A	286	244	242	230	231	228	232	238	233	230	230	241	238	240	246	264	267	266
L Q	254	214	235	188	236		214	204	217	204	208	206	206	208	212	213	208	220	216	220	224	224	225	250	

MAR. 2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2016 f_{XI} (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	R	A	R	R	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	0	X	A	A		A	58	52	54	54	59	76	74	78	74	66	66	57	46	43	89		A	A
3	115		A	A	A	A	65		A	A	B	B		51	50	54	56	54	49	41	32		57	A
4	A	A	88	A	B	A	A	A	A	A	X	B	B	0	X	53	54	53	50		0	B	B	R
5	A	A	A	A	A	A	A	A	A	0	X	B	B	X	X	X	X	X	X	0	X	X	A	A
6	A	A	A	A	A	A	A	A	A	0	X	X	X	X	X	X	0	X	X	X	X	B	0	X
7	56		A	A	A	A	A	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	84
8	90		B			A	R	A		X	X	X	X	X	X	X	X	X	X	X	X	X	X	45
9	48	60	59	52	55	68	39	51	43	48	56	58	62	67	72	64	56	49	43	34	26	20	18	B
10	0	X	A					0	X	X	X	X	X	X	X	X	X	X	X	X	X	A	A	0
11	Y		A	A	A			X	X	X	X	X	X	X	X	X	X	X	X	X	X	A	A	R
12	58		A	A	A	A	A		46	51	58	54	60	64	65	66	67	84	48				71	A
13	A		78	108		B	A	B		53	68	83			54	50		B	B	R		R	A	B
14	A	A	A	A	A	R	A	A	B	B	B	X	B	X	B	X	X	R				A	A	A
15	A	R	0	X	A	A	A	X	0	X	X	X	X	X	X	X	X	X	X	X	0	X	X	X
16	44	62		A	A	X	X	X	X	X	X	X	X	0	X	X	R	X	X	R	A	A	A	A
17	A	A	46	A	B	A	A	A	B	B	B	B	B	0	X	0	X	0	X	A	A	A	A	87
18	A	96		83	55	35			32	38	40	44	50	58	57	54	48	48	29	27	18	18	A	
19	26	27	0	X	39	X	47	47	37	46	50	54	60	64	64	68	54	45	28		B	A	0	
20	0	X	0	X	0	X	0	X	A	A		56	53	65	66	86	93	88	70	50	33	24		R
21	R	60	57	A	A	A	A	A		57	50	51	56	57	58	59	59	54	48	35	28		28	A
22	45	A	A	54	R	X	A	A		48	40	58	66	66	62	72	81	89	46	43	36		A	A
23	A	A	A	A	A	R	A	A		45	49	60	67	69	77	72	68	52	25		A	A	A	78
24	57	A	A	A	57	48		48	48	44	51	56	67	69	70	71	57	43	39		38	B	A	58
25	R	A	A		A	X	X	X	X	B	B	X	X	X	X	0	X	X	X	R	0	X	A	A
26	0	X	R	R	42	38	37	37	X	A	R	46	54	60	65	86	82	68	55	0	X	0	X	A
27	63		A	A	A	0	X	X	A	A	A	X	X	X	X	X	X	X	X	X	A	A	A	59
28	A	A	A	59	A	A	A		32	37	45	56	65	67	76	82	72	58	38		B	A	0	X
29	A	A	59	A	A	X	39	43	48	47	64	82	67	79	79	79	48	35	35	25	18		A	A
30	A	70	70		53	49	48	56	47	58	62	70	74	78	102	93	66	51	40		R	R	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	13	9	11	11	12	14	14	14	20	24	24	25	26	28	29	29	28	27	26	18	12	7	10	10
MED	48	60	59	54	55	38	42	48	46	48	51	58	61	66	66	66	56	50	40	32	26	24	20	58
U Q	60	66	78	70	61	48	56	52	52	52	57	65	67	77	78	72	62	53	43	36	28	31	28	83
L Q	0	X	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2016 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	R	A	A	A	34	43	45	52	60	62	60	60	56	53	48	40	35	24	18	18	16
2	R	A	A	A	A	A	F	46	46	48	48	53	70	68	72	68	60	F	40	37	F	A	A	R
3	A	A	A	A	A	A	A	A	A	A	B	B	F	40	44	48	50	R	43	35	26	R	A	A
4	A	A	A	A	B	A	A	A	A	A	39	B	B	47	48	47	47	44	B	28	B	B	A	A
5	A	A	A	A	A	A	A	A	A	A	B	B	46	49	53	53	50	47	B	26	19	A	A	A
6	A	A	A	A	A	A	A	A	A	34	37	43	49	52	52	51	49	43	36	B	B	R	A	A
7	A	A	A	A	A	A	A	A	33	38	44	48	50	50	49	52	48	44	32	23	18	22	50	R
8	A	B	A	49	A	A	R	A	A	44	45	54	54	52	53	51	49	44	38	30	F	16	15	F
9	F	F	F	F	49	R	F	45	37	42	50	52	56	61	66	J	R	50	43	37	28	20	14	12
10	A	R	A	A	R	R	F	25	25	38	42	44	51	53	63	72	65	53	50	37	25	A	A	B
11	Y	R	A	A	A	F	F	21	22	25	38	49	50	58	66	61	60	65	53	50	43	32	A	R
12	A	A	A	A	A	A	A	A	F	35	45	52	48	54	58	59	60	F	F	A	A	A	R	A
13	A	A	A	A	B	A	B	A	R	R	B	B	B	B	B	48	44	B	B	R	R	R	A	B
14	A	A	A	A	A	R	A	A	B	B	B	44	B	45	B	63	65	R	R	R	A	A	A	A
15	A	A	R	A	A	A	58	A	27	A	39	44	46	45	45	45	42	38	31	20	18	18	14	A
16	A	F	A	A	A	27	27	28	32	40	44	45	53	Z	67	70	84	R	47	34	A	A	A	A
17	A	A	A	A	B	A	A	A	B	B	B	B	B	B	43	B	41	B	24	A	A	A	A	A
18	A	A	A	A	A	A	A	A	26	32	34	38	44	44	51	48	42	37	23	21	12	12	R	A
19	A	R	A	33	22	27	F	F	31	40	44	48	54	58	58	62	48	39	22	B	A	A	13	15
20	13	13	10	R	R	32	26	A	A	Z	48	47	59	60	73	F	F	F	F	R	B	A	A	A
21	A	A	A	A	A	A	A	A	F	43	44	45	50	51	52	53	53	47	F	29	22	20	A	A
22	A	A	A	F	R	A	A	A	F	32	34	52	54	56	56	66	75	F	38	37	30	A	A	A
23	A	A	A	A	A	A	A	A	A	38	43	54	61	63	71	66	62	46	19	R	A	A	A	A
24	A	A	A	A	A	A	A	F	F	35	34	38	45	50	61	63	64	65	51	37	33	A	B	A
25	A	A	A	A	A	30	50	44	56	B	B	46	52	65	J	R	J	R	F	A	R	A	A	A
26	R	A	A	A	R	F	31	A	R	40	48	54	59	80	76	62	49	31	28	14	B	B	13	A
27	A	A	A	A	J	R	F	A	A	A	44	54	60	F	F	F	F	49	46	32	A	A	A	A
28	A	A	A	A	A	A	A	26	31	39	50	59	61	V	70	76	65	52	32	B	B	A	B	R
29	A	A	A	A	A	22	F	F	F	41	58	76	61	72	73	62	F	42	29	23	19	12	A	A
30	A	A	A	A	A	F	42	50	41	F	46	56	64	68	72	F	87	60	45	F	A	R	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	4	6	3	4	5	11	13	12	18	22	24	25	26	28	29	29	28	27	25	18	11	7	9	5
MED	21	33	32	38	23	28	27	34	34	40	45	52	55	60	60	60	50	43	32	26	18	18	14	16
U Q	29	46	49	45	38	34	44	44	41	45	51	58	61	68	70	65	54	46	37	30	20	22	30	22
L Q	14	21	10	34	21	25	22	26	31	38	44	47	51	51	52	52	48	38	26	21	15	14	13	16

APR. 2016 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2016 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	51	31	71	31	39	37 ^K	37 ^K	20	20	24	18	18	18	22	19	28	26	19	16	52	15	28	37		
2	29	50	50	34	47	55	26	113	G	23	28	25	25	G	26	20	15	G	G	46	90	90	41		
3	68	56	80	66	62	77	52	46	51	51	B	B ^E	B ^E	B ^E	B ^E	B ^E	B ^E	B ^E	B ^E	16	24	35	90	63	
4	84	76	62	53	53	48	39	46	54	47	G	B	B ^E	B ^E	B ^E	B ^E	20	B ^E	B ^E	B	B	27	30 ^K		
5	48	34 ^K	45	42	54	57	53	49	44	28	B	B ^E	B	G	G	22	17	22	B ^E	B ^E	12	33	53	114	
6	83	49	85	34	64	49	56	58	63	60	25	24	24	21	26	32	38	18	17	B	103	21	40	43	
7	26	68	50	40	58	59	53	51	114	57	18	22	20	20	18	38	38	26	11	9	10	12	74	24	
8	68	B	78	38	43	85	41	90	58	48	E ^B	36	28	25	25	68	23	26	G	15	58	6	25		
9	30	30	33 ^K	27 ^K	27 ^K	30	22	13	G	G	24	25	26	24	22	22	22	16	12	42	13	45	78	B	
10	29	32	66	41	48	71	58	19	54	57	25	23	40	G	G ^E	B ^E	B ^E	B ^E	B ^E	B ^E	B ^E	B ^E	B ^E	B ^E	
11	14	25	82	48	38	48	13	10	106	19	21	19	30	17	17	19	23	24	26	12	46	44	28	31	
12	42	40	52	52	43	88	54	58	32	64	22	27	27	24	20	17	G ^E	B	16	32	44	30	55	56	57
13	52	102	52	41	B	45	66	40	26	35	B	B	B ^E	B ^E	B ^E	B ^E	B	B	36	22	24	46	108	160	
14	107	51	85	37	39	31	54	48	B	B	B ^E	B ^E	B ^E	B ^E	B ^E	B ^E	B ^E	B ^E	G	30	35	66	86	116	
15	67	48	81	72	66	42	61	57	40	23	91	23	28	28	G	20	G	G	G	58	10	13	11	11	58
16	34	28	46	46	41	19	66	11	49	54	22	33	34	23	60	35	33	17	19	39	49	49	56	81	
17	53	59	35	78	B	48	58	47	B	B	B	B	B	B ^E	B ^E	B ^E	B ^E	B ^E	B	38	47	46	56	60	64
18	95	53	54	47	43	28	35	58	G	G	18	20	55	20	20	20	20	G	G	11	54	54	30	57	
19	18	50	58	22	17	12 ^K	20	84	G	G	17	24	19	23	30	18	19	13	12	B	59	62	47	44	
20	57	64	58	114	52	14	79	79	58	38	23	29	20	33	32	17	24	56	B ^E	B	56	50	23	K	
21	22 ^K	39	37	44	47	52	56	54	36	23	116	25	25	22	25	14	17	13	10	10	48	28	24	34	
22	38	45	48	31	42	23	57	91	36	18	74	34	29	29	26	22	17	G	58	11	40	37	35	35	
23	78	60	48	37	49	30	58	59	47	23	56	21	21	19	19	G	G	G	19	31	57	27	43	43	
24	41	75	57	62	33	48	48	30	G	55	19	21	41	20	20	G ^E	B	14	G	13	33	33	37	52	
25	29	42	37	37	54	17 ^K	20	14	47	B	B ^E	B ^E	B ^E	B ^E	B ^E	B ^E	B ^E	B ^E	B ^E	19	31	26	32	28	
26	28	34	34	54	91	66	68	66	26	24	20	25	26	26	25	G ^E	B	34	G ^E	B	B	64	12	40	
27	39	50	41	28	26 ^K	18	16	39	55	55	22	28	33	24	29	15	20	14	10	54	59	56	47	35	
28	60	35	58	48	45	57	49	52	G	G	19	22	23	36	29	28	17	19	B	B	57	B	60	60	
29	27	36	33	40	37	29	15	18	G	G	20	18	18	20	43	G	18	16	16	B ^E	9	50	48	39	51
30	56	24	61	48	48	20	20	20	14	G	17	17	21	33	33	15	17	14	26	32	26	44	48	47	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	29	30	30	28	30	30	30	28	27	24	26	26	28	29	29	29	28	27	27	27	27	29	29	
MED	45	48	53	42	46	46	52	48	38	28	23	23	24	22	22	20	20	14	17	22	46	46	47	43	
U Q	67	58	66	52	54	57	58	58	54	55	G	28	30	27	34	30	G	20	26	40	57	56	60	59	
L Q	29	34	45	37	39	28	26	20	G	G	23	20	21	23	20	19	17	G	11	11	24	32	29	32	

APR. 2016 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2016 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	9	9	9	14	12	14	12	12	10	15	7	7	10	10	10	10	8	8	9	7	8	8	9	8	
2	8	8	8	11	17	15	8	8	12	14	12	12	12	12	10	10	10	10	7	8	8	8	14	6	
3	10	13	13	17	8	10	23	20	20	33			30	24	41	37	42	20	16	11	6	8	9	10	
4	8	11	15	14	34	18	12	16	15	12	16	B	B	37	41	24	14	21	B	B	B		12	8	
5	8	10	10	10	13	13	10	12	16	28	B	B		29	16	17	13	11	24	B	16	12	7	9	10
6	13	14	34	9	6	12	12	14	14	12	10	10	12	16	26	32	38	18	17	B		70	7	8	12
7	7	12	12	12	13	16	16	12	7	8	13	14	14	13	14	12	12	7	6	5	8	7	10	8	
8	10	B	10	8	12	13	9	10	12	13	36	23	12	12	11	16	13	12	9	10	8	9	7	7	
9	8	6	8	10	10	9	8	8	8	11	14	12	11	10	9	12	12	8	8	8	8	8	9	B	
10	7	7	11	10	12	10	8	10	11	16	8	23	40	16	17	22	22	13	19	11	11	14		12	
11	10	9	11	12	8	7	7	6	10	10	8	8	10	10	11	10	9	6	7	7	8	7	7	6	
12	8	8	12	10	9	19	9	11	14	12	13	14	12	13	16	12	10	18	15	10	7	15	9	9	
13	8	14	8	11	B	14	45	15	16	23	B	50	B	B	40	36	B	B	9	12	12	6	13	99	
14	20	25	12	13	13	18	12	32	B	B	B		32	B	B	40	19	20	11	11	7	11	20	8	
15	38	16	11	12	15	8	21	17	14	18	12	16	17	13	14	14	16	18	13	8	7	7	8	6	
16	8	13	13	13	10	8	6	8	6	6	9	33	34	23	60	35	33	17	19	10	10	10	8	8	
17	9	14	12	9	B	9	16	12	B	B	B	B	B	B	32	B	32	B	10	11	9	16	8	14	
18	10	17	10	8	8	8	12	8	10	13	14	14	11	10	10	14	13	10	8	6	8	7	8	6	
19	9	8	10	9	7	7	7	8	6	7	7	14	23	16	14	11	9	12	12	B	19	24	8	8	
20	8	7	9	6	7	8	7	16	14	14	11	13	9	33	32	14	24	9	9	12	B	11	18	11	
21	15	7	10	13	13	12	10	10	10	10	10	7	10	11	11	7	9	7	9	8	8	8	8	8	
22	8	6	8	12	13	8	12	10	10	14	16	22	14	12	12	12	17	7	12	12	10	7	6	8	
23	8	15	15	10	10	8	19	10	15	12	12	7	9	8	10	10	6	6	12	18	17	13	8	8	
24	8	8	14	9	8	16	15	9	8	7	11	14	41	20	20	12	14	7	7	7	8	B	8	8	
25	6	8	8	214	8	8	8	8	8	B	B		32	25	17	22	44	18	12	8	9	6	8	7	8
26	8	8	8	8	7	7	7	14	17	24	20	23	26	26	25	16	34	15	14	12	B	53	9	9	
27	8	15	15	11	8	9	9	8	22	17	14	16	33	25	29	11	8	14	10	11	14	10	10	7	
28	10	18	17	21	17	15	19	116	10	10	10	10	15	36	29	28	17	20	B	B	17	B	9	9	
29	8	7	8	19	11	9	6	6	7	7	7	7	7	8	8	12	9	11	11	9	9	14	10	12	
30	18	6	16	9	12	9	6	7	7	8	8	8	10	33	33	15	8	8	9	10	7	10	12	11	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	8	10	11	11	12	10	10	10	12	13	12	14	14	16	17	14	14	12	10	10	8	10	9	8	
U Q	10	14	13	13	13	14	15	14	15	18	20	32	33	25	32	28	22	18	15	12	14	14	10	11	
L Q	8	8	9	9	8	8	8	8	8	10	10	10	11	12	11	12	9	8	9	8	8	7	8	8	

APR. 2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2016 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
1	A	A	A	A	A	A	A	A	A	200	218	206	202	202	196	A	204	202	200	210	200	214	246	A						
2	180	A	A	A	A	A	A	A	A	220	198	212	222	206	206	198	212	194	194	202	200	210	194	A	A	232				
3	A	A	A	A	A	A	A	A	A	A	B	B	E	B	B	E	B	B	E	A	A	A	A	A	A					
4	A	A	A	A	B	A	A	A	A	A	A	B	B	B	B	242	200	E	B	B	254	B	B	A	A					
5	A	A	A	A	A	A	A	A	A	A	B	B	246	224	240	220	230	218	B	246	294	A	A	A						
6	A	A	A	A	A	A	A	A	A	E	A	232	220	214	222	214	E	B	262	236	230	230	B	B	A	A				
7	A	A	A	208	A	A	A	A	A	200	228	212	216	202	212	E	A	A	214	206	204	192	222	198	198	E	A	296		
8	A	B	A	E	A	A	202	A	A	A	B	248	234	244	226	226	E	A	E	A	210	218	240	A	E	A	242			
9	234	218	280	270	218	A	A	242	192	216	234	214	196	212	208	202	200	198	202	202	222	276	276	A	E	A	B			
10	A	A	A	A	A	222	A	A	E	A	232	222	200	242	278	220	216	218	216	194	212	212	A	A	A	B	E	B	304	
11	Y	214	A	A	A	E	A	338	318	276	232	230	200	208	226	212	200	218	208	208	196	242	A	A	A	A	A			
12	A	A	A	A	A	A	A	A	A	A	A	A	A	232	232	230	230	204	222	E	A	A	A	A	A	220	A			
13	A	A	A	A	B	A	B	A	A	A	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	A	B		
14	A	A	A	A	A	A	A	A	A	B	B	B	B	E	B	B	B	Y	A	A	E	A	A	A	A	204	A			
15	A	A	208	A	A	A	A	A	A	A	246	232	250	A	216	246	226	236	228	228	244	272	A	E	A	E	A	196		
16	A	200	A	A	A	332	302	282	E	A	E	A	E	A	E	B	E	B	E	B	230	230	236	A	A	A	A	A		
17	A	A	A	A	B	A	A	A	B	B	B	B	B	B	B	B	E	B	B	282	B	A	A	A	A	A	A	A		
18	A	A	A	A	A	A	A	A	222	E	A	E	A	202	202	198	194	206	E	B	210	202	212	212	214	228	A	A	A	
19	A	182	A	194	202	316	338	288	A	246	222	210	222	228	236	210	216	196	210	226	B	A	A	E	A	E	A	228		
20	E	A	E	A	E	A	A	A	A	E	A	A	E	A	234	284	232	218	218	204	204	218	B	A	A	A	A	A		
21	A	A	A	A	A	A	A	A	A	E	A	E	A	E	A	A	216	202	192	206	244	234	A	A	A	A	A	A		
22	A	234	A	A	A	194	A	A	212	264	238	238	228	210	210	E	A	218	208	208	230	278	B	A	A	A	A	A		
23	A	A	A	A	A	A	A	A	A	E	A	E	A	242	232	222	212	198	200	194	194	188	274	A	A	A	A	A		
24	A	A	A	A	A	A	A	A	192	A	226	210	B	220	212	202	194	192	Q	208	A	A	B	A	A	A	A	A		
25	A	A	A	A	A	198	312	314	202	B	B	E	B	258	242	230	218	240	220	220	212	A	A	A	A	A	A	A		
26	176	A	A	A	A	E	A	Q	A	A	248	234	202	240	230	216	200	216	212	238	238	B	A	A	A	A	A	A		
27	A	A	A	A	A	A	A	A	A	A	254	250	214	224	224	198	188	212	236	A	A	A	A	A	A	A	A	A		
28	A	A	A	A	A	A	A	A	A	E	B	236	222	218	202	202	222	206	200	246	B	B	A	B	246	A	A	A		
29	A	A	A	A	A	A	A	A	E	A	E	A	226	196	182	H	188	208	190	190	206	206	236	E	A	A	A	A		
30	A	A	A	A	A	A	Q	Q	E	A	296	280	248	200	206	206	E	A	B	198	192	202	A	A	A	A	A	A		
31																														
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	4	6	3	5	2	8	9	7	13	17	22	23	25	26	25	26	27	27	23	18	11	6	9	6						
MED	U	192	212	U	244	U	212	210	U	296	318	280	U	215	215	224	214	220	218	214	214	204	207	210	225	228	214	U	E	237
U Q	255	234	316	301		341	337	288	249	245	234	242	241	232	224	230	220	222	236	244	244	272	272	296						
L Q	178	200	208	201		210	299	242	200	214	218	206	204	202	209	202	196	202	204	212	214	200	212	228						

APR. 2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2016 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	69	A	A	A	A	A	37	B	B	X	X	66	72	X	X	70	A	A	A	A	91	A		
2	A	A	A	A	A	R	A	R	B	B	B	O	X	B	B	X	O	X	A	A	A	A	92	117		
3	A	A	B	A	A	A	A	B	A	B	B	B	B	B	B	B	O	X	B	B	A	R	B	R	A	
4	B	A	A	A	A	A	A	R	A	X	X	X	X	X	X	X	X	X	38	40	38	B	O	X	B	A
5	R	X	37	30	26	25	24	23	A	X	B	X	X	X	X	B	X	X	52	50	52	A	A	R	R	R
6	R	R	X	A	A	A	A	A	A	R	A	B	O	X	54	64	64	B	B	B	R	A	A	A	A	
7	O	X	A	A	A	A	A	A	A	X	X	X	B	X	B	O	X	X	O	X	B	B	R	B	R	A
8	A	A	58	A	A	B	A	A	A	B	B	B	R	O	X	B	B	R	R	105	R	A	A	A	108	
9	A	A	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	
10	A	B	A	B	B	A	B	A	A	A	B	B	B	B	B	B	B	B	A	R	B	B	R	A	A	
11	A	A	A	B	A	A	A	A	A	X	X	X	X	X	X	X	X	O	X	X	A	A	A	A	A	
12	A	A	A	A	A	A	B	A	A	X	X	X	X	X	X	X	X	O	X	B	A	O	X	O	X	
13	A	A	A	A	A	A	O	X	R	O	X	X	V	B	88	87	72	57	48	38	56	A	A	A	A	
14	A	A	A	A	A	A	A	A	87	A	R	O	X	X	O	X	B	B	O	X	B	A	R	A	A	A
15	106	93	56	49	67	R	A	A	A	X	B	B	O	X	O	X	X	X	X	B	R	A	A	A	A	
16	A	A	A	A	91	70	92	A	A	A	X	B	B	61	B	B	O	X	B	O	X	A	A	A	A	
17	A	A	A	A	57	A	A	A	R	R	O	X	B	95	B	B	O	X	O	X	B	B	A	A	A	
18	A	A	A	62	A	A	A	B	B	B	A	O	X	O	X	B	O	X	O	X	B	B	B	A	Y	R
19	R	A	A	A	A	A	48	51	56	57	64	61	B	B	B	O	X	A	B	A	A	A	A	A	42	
20	A	A	A	48	67	A	A	A	A	X	X	X	X	X	X	52	48	50	30	A	R	R	A	R	R	
21	A	56	A	A	A	A	A	A	60	53	B	B	B	53	66	B	B	68	A	A	A	R	R	R	R	
22	R	A	O	X	X	A	A	A	A	B	X	O	X	O	X	B	X	X	B	B	B	B	B	A	R	
23	58	71	R	A	A	A	O	X	A	A	O	X	57	88	84	B	O	X	B	A	B	R	A	A	A	
24	A	A	A	67	A	A	A	A	X	O	X	X	X	X	X	X	B	B	B	A	B	B	B	B	B	
25	A	A	A	A	A	A	A	O	X	A	X	X	X	O	X	O	X	B	A	B	R	R	R	A	A	
26	B	R	R	R	A	R	R	A	A	A	A	X	X	50	53	A	A	A	X	O	X	A	A	A	A	
27	A	56	68	59	87	A	A	A	A	A	56	57	58	59	58	47	58	58	42	O	X	A	A	A	A	
28	A	A	A	A	A	A	A	A	R	83	B	B	B	B	B	X	B	B	A	B	A	B	A	A	A	
29	A	B	B	A	A	A	A	B	R	X	X	X	X	B	O	X	B	B	A	A	A	R	B	A	56	
30	A	A	A	46	R	A	R	A	A	A	B	B	B	O	X	B	B	B	B	B	B	A	B	R	A	
31	A	89	A	A	A	A	A	A	A	A	R	B	B	B	X	B	B	B	B	R	R	A	X	51		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	3	6	8	9	6	4	4	5	6	13	15	20	18	22	18	15	17	16	11	5	2	2	4	6		
MED	58	64	57	49	67	60	36	51	34	36	47	58	59	60	64	53	46	40	38	38	62	58	64	54		
U Q	106	89	68	64	87	66	70	70	56	50	56	60	64	66	67	60	56	50	46	68			92	108		
L Q	O	X	X	X	57	42	24	34	30	34	41	52	53	53	58	45	42	36	30	23			X	42		

MAY 2016 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2016 f_oF₂ (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	A	A	A	A	A	31	B	B	54	59	56	66	66	55	54	A	A	A	A	A	A
2	A	A	A	A	A	R	A	A	B	B	B	40	43	B	B	46	41	37	A	A	A	A	A	A
3	A	A	B	A	A	A	A	A	B	A	B	B	B	B	B	B	36	B	B	A	A	B	R	A
4	B	A	A	A	A	A	A	R	A	34	44	48	58	56	61	51	40	32	Z	Z	B	B	B	A
5	R	31	F	20	21	19	18	17	A	B	43	58	70	82	84	B	50	F	F	A	A	A	R	A
6	A	A	47	A	A	A	A	A	A	A	A	B	44	F	F	F	B	B	B	R	A	A	A	A
7	37	A	R	A	A	A	A	A	A	30	38	44	B	43	B	39	32	25	B	B	R	B	R	A
8	A	A	A	A	A	B	A	A	A	B	B	R	R	41	B	B	R	R	R	R	A	A	A	A
9	A	A	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A
10	A	B	A	B	B	A	B	A	A	A	B	B	B	B	B	B	B	B	A	R	B	B	A	A
11	A	A	A	B	A	A	A	A	A	29	36	45	51	52	53	51	39	26	16	A	A	A	A	A
12	A	A	A	A	A	A	B	A	A	28	41	49	57	53	58	52	35	25	R	B	A	A	12	R
13	A	A	A	A	A	A	A	R	A	R	V	B	F	F	F	F	F	F	F	A	A	A	A	A
14	A	A	A	A	A	A	A	A	F	A	R	F	40	41	43	45	B	B	32	B	A	A	A	A
15	A	A	A	43	A	R	A	A	A	35	B	B	45	44	41	37	32	31	29	B	R	A	A	A
16	A	A	A	A	A	A	A	A	A	A	30	B	B	F	B	B	60	40	R	R	A	A	A	A
17	A	A	A	A	A	A	A	A	A	A	F	R	B	F	B	B	33	29	24	B	B	A	A	A
18	A	A	A	R	B	A	A	B	B	B	A	F	44	52	54	B	47	38	31	B	B	A	Y	R
19	R	A	A	A	A	A	F	F	50	F	F	Z	B	B	B	R	38	A	B	A	A	A	A	A
20	A	A	A	A	A	A	A	A	A	40	39	54	64	58	56	45	33	37	24	R	A	R	R	A
21	A	F	A	A	A	A	A	A	A	F	B	B	B	F	F	B	B	R	A	A	A	R	A	A
22	A	A	34	J R	A	A	A	A	A	A	B	52	55	62	B	54	45	B	B	B	B	B	A	R
23	A	R	A	A	A	A	A	A	A	F	R	F	B	B	B	30	B	A	B	A	A	A	A	A
24	A	A	A	A	A	A	A	A	24	28	40	48	54	76	56	B	B	B	B	A	B	B	B	B
25	A	A	A	A	A	A	A	R	R	A	F	F	F	R	Z	R	B	A	B	R	R	R	A	A
26	B	R	R	R	A	R	A	A	A	A	43	56	38	F	41	A	A	A	15	13	A	A	A	A
27	A	A	A	A	A	A	A	A	A	A	F	F	F	53	52	41	44	40	F	F	F	R	A	A
28	A	A	A	A	A	A	A	A	A	A	B	B	B	B	60	B	B	39	B	A	B	A	A	A
29	A	B	B	A	A	A	A	B	A	21	33	40	52	B	R	B	B	A	A	A	R	B	A	A
30	A	A	A	A	R	A	R	A	A	A	B	B	B	58	B	B	B	B	B	B	A	B	R	A
31	A	A	A	A	A	A	A	A	A	A	A	B	B	B	52	B	B	B	B	A	R	A	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1	2	3	4	1	1	3	3	6	12	15	20	18	22	18	15	17	15	10	4	1	1	2	1
MED	37	36	34	34	19	18	18	R	28	29	39	48	53	54	56	46	38	32	30	22	16	17	21	R
U Q			47	40			F	R	46	34	43	54	57	58	60	52	44	37	34	28				
L Q			F	20	26			R	17	24	24	28	35	44	46	44	F	39	34	29	24	17		

MAY 2016 f_oF₂ (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2016 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	108	70	48	71	56	53	53	38	125	B	B	E B	33	26	34	20	E B	E B	17	50	41	48	54	53	91	
2	94	64	83	40	58	52	74	58	B	B	B	36	E B	33	B	B	E B	E B	28	43	46	63	65	53	64	
3	58	83	B	60	60	55	62	47	B	B	B	B	B	B	B	B	E B	E B	B	B	58	26	B	28	40	
4	51	46	44	48	50	53	59	55	42	19	18	G	G	25	21	18	13	E B	10	13	E B	B	45	88	58	
5	23	29	47	16	22	15	30	44	42	B	63	28	17	E B	E B	B	E B	E B	18	60	82	55	39	29	26	
6	K 27	E B 30	E B 40	57	50	62	60	58	58	46	57	B	E B	E B	22	E B	B	B	B	29	46	63	117	86		
7	44	65	30	72	66	47	70	84	41	41	65	E B	25	B	20	B	E B	E B	B	B	22	B	22	38		
8	38	57	48	48	44	B	56	62	58	B	B	B	20	G E	B	B	B	30	48	24	42	61	66	84	89	
9	58	70	80	45	62	39	B	50	64	B	B	B	B	B	B	B	B	B	B	61	39	42	47	47		
10	74	B	72	B	B	55	65	80	58	62	B	B	B	B	B	B	B	B	B	B	B	B	30	46		
11	61	36	74	B	89	78	52	64	97	18	22	23	18	22	28	28	18	E B	12	52	31	34	35	37	57	
12	63	61	90	58	59	49	B	54	42	19	21	21	66	24	21	18	E B	E B	B	B	57	57	47	24	55	
13	34	40	45	56	67	54	48	57	31	33	G E	B	19	B	E B	E B	E B	E B	37	17	51	19	40	48	44	
14	48	40	37	52	51	83	56	52	52	52	40	58	E B	E B	E B	B	B	E B	E B	B	57	29	62	43	73	
15	72	86	45	36	56	38	107	47	58	26	B	B	E B	33	31	19	18	10	12	23	B	K	24	59	41	35
16	38	42	95	48	52	51	58	99	57	35	44	B	B	28	B	B	E B	E B	B	36	29	48	46	46	47	
17	50	105	45	51	42	59	56	47	42	38	G E	B	41	E B	46	B	B	E B	E B	15	B	B	41	36	42	
18	101	50	76	23	B	54	56	B	B	B	36	G E	B	E B	B	B	E B	B	43	59	51	B	B	53	16	30
19	K 29	35	65	48	45	45	36	19	42	18	G	E B	19	B	B	E B	E B	28	58	63	B	68	38	33	47	39
20	40	38	40	54	59	57	56	48	47	20	E B	B	E B	23	80	21	22	E B	16	16	23	58	21	22	48	32
21	32	41	87	138	63	48	58	48	79	36	B	B	B	G E	B	B	B	E B	33	35	48	53	26	36	34	
22	37	44	48	59	47	46	54	68	62	44	B	E B	E B	54	B	B	E B	E B	25	B	B	B	B	111	28	
23	27	30	32	31	35	26	35	44	50	112	40	30	36	B	B	E B	E B	B	20	62	37	56	116	61	46	
24	28	28	31	59	51	46	57	57	48	41	94	37	20	20	22	B	B	B	B	76	B	B	B	B	B	
25	86	59	40	68	77	45	65	33	46	52	21	G	G	G E	B	15	15	22	B	65	B	23	24	16	50	58
26	B	24	25	23	46	12	28	48	38	65	72	29	26	67	29	84	83	49	52	12	22	22	27	28		
27	41	38	44	39	73	55	52	56	64	66	32	G	G	21	18	14	14	59	20	30	44	53	57	44		
28	46	70	66	66	56	51	46	52	36	35	B	B	B	E B	B	34	B	E B	E B	60	B	57	42	42		
29	125	B	B	57	77	45	50	B	33	25	17	52	G	B	E B	B	B	B	58	61	58	23	B	55	55	
30	85	60	59	36	28	58	28	51	56	62	B	B	B	E B	E B	B	B	B	B	B	33	B	30	133		
31	54	50	77	56	56	43	48	93	58	58	29	B	B	B	E B	E B	B	B	B	33	27	39	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	30	29	29	29	29	30	29	29	28	25	20	21	19	22	18	17	19	22	16	25	24	24	30	30		
MED	49	46	48	52	56	51	56	52	51	41	34	24	E G	U	U	E B	E B	U	25	22	36	42	38	46	42	45
U Q	72	64	75	59	62	55	60	60	58	60	60	36	E B	36	42	E B	E B	B	37	51	52	58	50	58	53	58
L Q	37	37	40	40	46	45	48	47	42	26	20	G	G	22	21	18	E B	16	17	23	29	25	37	30	38	

MAY 2016 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2016 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	13	12	13	12	14	16	11	8	10	B	B	33	20	34	16	19	16	9	6	10	14	11	6	14
2	15	16	13	13	9	23	11	13	B	B	B	19	33	B	B	33	32	10	10	8	9	9	8	11
3	8	20	B	12	6	6	14	11	B	B	B	B	B	B	B	B	18	B	B	13	7	B	10	8
4	44	14	15	16	13	13	9	12	11	12	15	11	19	11	8	11	9	10	8	13	B	6	73	15
5	10	8	8	9	9	6	6	10	8	B	21	16	13	42	32	B	33	18	17	22	11	8	14	7
6	7	8	40	14	24	19	14	13	12	16	16	B	36	27	8	18	B	B	B	12	7	12	10	12
7	8	6	8	17	14	15	14	12	8	12	16	25	B	15	B	18	12	18	B	B	7	B	13	8
8	16	8	15	8	9	B	10	12	40	B	B	10	22	33	B	B	17	9	11	8	7	8	8	10
9	11	7	14	8	13	17	B	20	57	B	B	B	B	B	B	B	B	B	B	7	8	8	10	16
10	9	B	22	B	B	11	44	12	18	36	B	B	B	B	B	B	B	B	B	B	B	12	8	8
11	15	23	18	B	39	22	13	16	10	10	14	14	14	13	14	10	9	12	9	8	8	8	9	16
12	9	16	9	20	16	14	B	11	9	8	13	15	17	24	14	10	18	17	B	12	12	15	9	10
13	8	10	16	17	94	10	10	9	121	11	14	19	B	39	42	26	16	10	10	19	11	8	9	9
14	14	12	11	14	12	17	16	11	20	39	23	12	32	33	41	B	B	23	B	13	13	11	8	6
15	13	22	12	11	12	12	12	11	11	8	B	B	33	31	19	18	10	12	14	B	10	10	8	6
16	10	10	13	11	15	12	13	16	8	12	12	B	B	12	B	B	41	B	16	19	9	8	8	8
17	11	7	9	9	8	12	8	15	12	13	10	41	B	44	B	B	17	22	10	B	B	7	7	16
18	10	10	16	9	B	18	14	B	B	B	16	17	39	42	B	43	23	19	B	B	15	11	11	11
19	8	8	10	10	9	8	7	7	9	11	15	20	B	B	B	28	16	44	B	16	10	6	7	7
20	7	8	8	7	7	12	14	10	8	8	20	25	23	21	14	14	16	13	13	14	12	10	11	8
21	7	8	8	14	8	10	10	12	18	11	B	B	B	24	25	B	B	33	15	11	26	10	6	6
22	5	6	11	11	14	18	16	11	16	13	B	35	46	46	B	34	26	B	B	B	B	8	6	6
23	8	8	8	7	7	7	10	9	8	13	16	22	11	B	B	20	B	22	B	16	21	12	12	8
24	9	8	6	6	12	9	10	10	8	7	8	8	6	6	12	B	B	B	B	15	B	B	B	B
25	11	11	7	10	7	8	6	8	8	18	12	8	13	12	14	14	B	18	B	10	12	10	11	20
26	B	12	9	8	7	8	10	11	11	12	12	11	11	12	12	7	7	7	6	7	7	8	9	7
27	7	9	9	9	14	16	7	14	16	11	11	10	12	12	9	7	9	12	11	8	10	10	10	8
28	11	10	16	24	17	17	14	37	13	13	B	B	B	B	34	B	B	26	19	B	8	7	11	11
29	23	B	B	16	8	12	16	B	13	12	10	10	15	B	48	B	B	34	41	15	14	B	7	14
30	11	14	12	11	14	37	21	19	12	14	B	B	B	43	B	B	B	B	B	B	8	10	8	8
31	9	12	18	15	13	13	9	12	12	11	18	B	B	B	40	B	B	B	B	7	13	12	7	9
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	10	10	12	11	13	13	12	12	12	13	16	22	33	34	41	34	26	22	41	14	12	10	9	9
U Q	13	14	16	16	15	17	14	15	18	36	B	B	B	B	B	B	B	B	B	19	26	15	11	14
L Q	8	8	9	9	8	10	10	10	9	11	13	12	15	15	14	18	16	12	10	10	8	8	8	8

MAY 2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2016 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	A	A	A	A	A	302	B	B	B	226	226	226	204	212	206	A	A	A	A	A	A
2	A	A	A	A	A	206	A	A	B	B	B	A	B	B	B	B	256	216	302	A	A	A	A	A
3	A	A	B	A	A	A	A	A	B	A	B	B	B	B	B	B	228	B	B	A	A	B	A	A
4	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	194	204	204	224	B	188	B	A
5	A	A	A	A	A	220	A	A	A	A	A	A	A	A	A	B	252	220	226	A	A	A	A	A
6	A	A	214	A	A	A	A	A	A	A	A	B	B	B	B	236	256	B	B	B	A	A	A	A
7	200	A	A	A	A	A	A	A	A	A	A	B	B	A	B	B	228	302	234	B	B	A	B	A
8	A	A	A	A	A	B	A	A	B	B	B	A	A	B	B	B	A	A	A	A	A	A	A	A
9	A	A	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A
10	A	B	A	B	B	A	B	A	A	A	B	B	B	B	B	B	B	B	A	A	B	B	A	A
11	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	204	196	254	A	A	A	A	A
12	A	A	A	A	A	A	B	A	A	A	A	A	A	A	A	A	216	270	B	A	A	A	A	A
13	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	238	234	220	282	A	A	A	A
14	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	266	B	B	A	A	A	A	A
15	A	A	A	304	A	A	A	A	A	A	B	B	B	B	B	B	234	226	284	338	B	A	A	A
16	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	244	B	A	A	A	A	A	A
17	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	198	268	256	B	B	A	A	A
18	A	A	A	206	B	A	A	B	B	B	A	A	A	A	A	A	308	250	250	B	B	B	A	A
19	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	214	222	A	A	B	A	A	A
20	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	210	266	212	212	A	A	A	A
21	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	214	B	B	A	A	A	A	A
22	A	A	200	198	A	A	A	A	A	A	B	B	B	B	B	B	250	228	B	B	B	B	B	A
23	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	A	B	A	A	A	A
24	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	A	B	B	B
25	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	A	B	A	A	A	A	A
26	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
27	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	194	230	230	206	246	A	A	A
28	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	232	B	B	A	A	A	A	A
29	226	B	B	A	A	A	A	B	A	A	A	A	A	A	A	A	250	B	B	A	A	A	B	A
30	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	A	B	H
31	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	A	A	A	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	2		2	3		2	1	2	4	8	11	15	15	19	18	15	17	16	9	4	1	1	1	2
MED	213		207	206		213	344	274	302	254	238	232	211	217	210	205	225	221	216	245	236	188	258	208
U Q			304						310	291	250	244	230	246	236	250	247	267	255	264				
L Q				198					266	246	216	216	208	208	202	202	214	213	205	234				

MAY 2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2016 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

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

JUN. 2016 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2016 f_oF₂ (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

JUN. 2016 f_oF₂ (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2016 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	58	57	B	47	40	70	56	50	55	38		B	E	B	E	B															
2		38	32	69	66	57	28 ^K	42	28	32	12	13	16	16	G	15	57	18	18	51	54	27	30	29	50	26							
3		38	54	35	55	48	43	45	53	48	42	112	22	G	39	23	17	12	K	56	48	28	30	30	19	52	26						
4		46	28	50	51	44	31	67	44	25	66	14	14	G	32	16	108	14	58	10	28	38	55	101	28	28							
5		31	28	31	57	55	51	39	45	66	46	19	19	G	G	G	E	B	E	B		E	B	28	17	45	59	68	68	71	72		
6		58	40	64	63	B	B	47	90	89		B	B	B	B	B	B	B	B	B							28	46	48	92	50	48	
7		46	66	84	48	57	57	57	45	54	30	21	24	G	23	G	E	B	B	B	E	B	B	B	B	B	B	B	B	K	38		
8		78	140	48	51	B	45	87	B	53	61	16	16	G	130	G	E	B	B	B	B	B	B	B	B	B	B	B	B	B	64		
9		26	59	39	59	48	51	42	49	37	34	21		G	20	20	14	12	12	38	16										58		
10		62	113	49	54	35	55	29	48	70	60	60	60	G	58	22	22	54	57	59	59	64	48	53	28	53							
11		59	44	40	54	66	41	54	56	54	66	58		G	23	14	93	23	78	58	64	28	18	58	45	36							
12		50	101	50	52	56	54	54	60	60	42	39		B	E	B	E	B	E	B	B	B	B	B	B	B	B	B	B	B	43		
13		48	49	57	79	84	48	39	58	60	42	16		G	15	17	20															34	
14		41	45	85	48	63	B	50	47	52	26	18	16	K	G	E	B	E	B	B	B	B	B	B	B	B	B	B	B	B	75		
15		46	83	62	56	86	59	118	56		46		B	G	E	B	E	B	E	B	B	E	B	B	B	B	B	B	B	B	29		
16		37	37	38	45	36	83	48	58	88	54	106	106	B	56	39	38	15	E	B	53	48	36	30	60	65	58	55					
17		42	39	38	31	31	31	39	45	55	48		31	E	B	26	82	24	51	B	B	B	B	B	B	B	B	B	B	B	39		
18		30	37	38	57	56	59	71	63	66		106		B	E	B	E	B	E	B	B	B	B	B	B	B	B	B	B	B	44		
19		36	40	42	152	89	56	53	52	56		B	B	B	111	26	26	G	59	46	27	B	B	B	B	B	B	B	B	B	B		
20		B	38	63	55	48	55	51	62	45	53		B	E	B	B	G	20	16	B	B	104	50	22	20						55		
21		47	30	22	46	30	37	50	71	39	57	59	24	G	20	15	22	20	36	20	19	28	15	57	24	20							
22		39	49	59	29	47	38	70	70	16	11	40	19	21	21	50	E	B	E	B	B	B	B	B	B	B	B	B	B	B	87		
23		96	70	77	39	56	97	44	78		48	20		G	19	16	G	E	B	B	B	B	B	B	B	B	B	B	B	B	56		
24		41	48	56	62	70	53	62	82	51	58	61	59		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	44		
25		47	66	E	B	43	61	59	59	63	55	49	53	54	36	B	E	B	E	B	E	B	B	K	B	B	B	B	B	B	B	58	
26		58	58	48	59	51	52	57	53	52	43		62	B	E	B	B	E	B	E	B	B	B	B	B	B	B	B	B	B	44		
27		50	48	73	59	53	70	54	55	47	50	50		B	B	B	E	B	B	33	15	18	B	B	B	B	B	B	B	B	62		
28		38	61	58	56	50	50	47	47	58	58		B	G	17	B	B	E	B	B	B	B	B	B	B	B	B	B	B	B	48		
29		28	28	91	45	49	49	55	56	51	26	63	73		G	24	G	18	57	24	24	19	K	38	46	56	40						
30		34	30	41	43	43	62	35	49	68	33	46	28	52		G	G	57	25	17	19	55	24	37	48	56							
31																																	
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
CNT		29	30	30	29	28	28	30	29	28	27	24	24	25	26	27	25	21	20	20	21	24	28	26	29								
MED		46	48	50	55	52	52	52	55	52	48	43		22		23	19	36	42	40	38	43	40	50	44								
U Q		50	61	63	59	58	58	62	61	60	57	60	34	36	26	38	26	56	55	58	54	56	58	57	57								
L Q		38	37	40	47	47	42	44	48	48	34	20	20	G	G	17	20	16	17	20	24	28	28	30	35								

JUN. 2016 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2016 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	13	13	13	B	19	19	8	9	16	13	18	B	33	34	18	15	15	22	10	14	10	12	12	8	
2	7	7	9	14	14	10	8	8	7	6	8	8	8	8	8	10	12	11	10	9	6	7	7	6	
3	6	7	6	9	10	10	8	8	9	13	11	13	8	8	10	8	8	7	7	8	8	8	8	7	
4	5	7	10	9	8	7	8	9	7	6	7	5	10	10	8	8	7	7	8	6	7	14	7	7	
5	6	6	6	6	12	12	8	8	11	11	10	8	7	5	24	19	12	17	9	7	13	9	12	13	
6	10	6	9	12	B	B	39	20	31	B	B	B	B	B	B	B	B	B	12	10	7	8	10	11	
7	10	10	8	15	21	14	13	8	12	8	8	10	10	15	43	B	B	19	B	B	B	9	8	11	
8	22	11	9	14	B	30	10	B	32	11	8	10	10	11	14	21	B	B	B	24	17	B	14	15	
9	12	12	9	15	14	9	13	12	12	12	9	8	10	10	8	8	7	10	12	B	12	8	8	14	
10	10	7	8	7	7	9	7	8	11	11	18	12	12	12	8	9	9	18	12	20	11	12	6	8	
11	8	11	11	8	14	8	13	17	12	14	17	18	10	10	12	12	15	13	11	7	7	12	7	8	
12	13	11	11	12	10	14	10	11	11	12	22	B	32	21	20	18	14	6	10	7	B	7	7	6	
13	6	5	6	6	10	8	11	8	15	12	8	7	8	6	11	B	B	39	40	21	B	16	9	6	
14	8	7	8	9	9	B	10	10	10	7	9	10	10	24	14	14	12	8	8	B	18	8	12	11	
15	11	8	10	14	14	14	23	26	B	22	B	16	27	21	27	24	18	12	12	15	15	12	8	8	
16	8	8	8	8	9	7	7	9	6	6	7	6	12	12	8	15	14	19	9	10	22	8	8	8	
17	8	7	6	8	6	8	8	9	12	8	B	22	26	35	11	12	B	B	B	B	13	7	8	9	
18	8	6	6	14	14	14	14	15	11	B	9	2	23	20	25	B	B	B	B	B	8	12	13	8	
19	6	9	12	11	16	9	9	14	14	B	12	B	25	14	20	24	16	14	B	14	B	37	B	B	
20	B	11	8	9	7	7	14	14	14	14	B	25	14	12	12	12	B	B	13	11	11	11	B	10	
21	8	8	8	6	7	7	7	7	7	7	6	6	6	5	6	6	6	12	7	11	11	11	8	13	
22	8	6	6	7	10	10	9	7	7	6	5	8	8	7	8	11	12	B	B	8	8	12	13	13	
23	12	13	11	9	9	6	10	40	B	20	14	11	8	9	14	10	10	9	B	8	6	7	7	9	
24	9	13	13	12	26	16	12	16	20	13	13	43	B	B	B	B	B	B	B	B	11	6	8	8	
25	9	15	43	14	15	33	14	13	13	6	14	19	B	31	22	20	12	19	8	B	24	14	12	8	
26	8	12	20	20	22	15	14	9	8	7	B	20	B	32	11	24	14	B	20	12	12	6	6	7	
27	9	14	16	12	16	13	22	18	19	15	9	B	B	B	32	12	11	B	B	B	B	B	B	8	
28	9	13	17	19	22	16	16	11	15	12	B	13	13	B	B	16	B	B	B	B	B	8	B	9	
29	6	6	7	8	12	12	12	9	8	6	15	12	11	18	12	11	12	9	12	10	12	12	11	7	
30	7	7	8	7	7	7	7	7	7	8	7	6	6	8	11	8	9	10	10	10	6	6	9	9	
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	8	8	9	12	13	11	10	10	12	12	12	12	12	13	13	14	14	18	12	14	12	10	8	8	
U Q	10	12	11	14	16	15	14	15	15	14	22	25	27	31	24	24	B	B	B	B	B	22	12	12	11
L Q	7	7	8	8	9	8	8	8	8	7	8	8	8	9	10	10	11	10	10	10	8	8	8	8	

JUN. 2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2016 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	A	B	A	A	A	A	A	A	A	B	228	222	206	206	274		A E A	A	A	A		A		
2	A	A	A	A	A	A	A	A	A	A	A	228	198	192	198	192	186	210	A E A	A	A	A	248	A		
3	196	A	A	260	A	A	A	A	A	A	230	228	206	182	200	194	200	E A E A	A	A	A	A	A	A		
4	A	A	A	A	A	A	A	A	A	A	244	226	214	196	196	196	210	226	190	A	A	A	A	A		
5	A	A	A	A	A	A	A	A	A	A	238	248	234	220	210	254	302	320	A	A	A	A	A	A		
6	A	A	A	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A		
7	A	A	A	A	A	A	A	A	A	A	278	234	230	230	230		B	B	B	B	B	B	A	A		
8	A	A	A	A	B	A	A	B	B	A	264	234	222	222	212	204		B	B	B	A	A	B	A		
9	A	A	A	A	A	A	A	A	A	A	314	254	204	204	192	210	176	208	A	Y	B	A	A	A		
10	A	A	A	A	A	A	A	A	A	A	208	220	230	206	190	176		A	A	A	A	A	A	A		
11	A	A	A	A	A	A	A	A	A	A	248	222	220	230	230		A	A	A	234	234	198	A	A		
12	A	A	A	A	A	A	A	A	A	A		B	E	B	238	224	212	212	E	B	A	E	A	A		
13	A	A	A	A	A	A	A	A	A	A	196	260	236	214	210	208		B	B	B	B	A	B	A		
14	A	A	A	A	A	B	A	A	A	A	214	270	224	202	236	212	214	280	254	232	A	B	A	A		
15	A	A	A	A	A	A	A	A	B	A		B	E	B	E	B	E	B	E	B	A	Y	A	A		
16	A	A	A	A	H	A	A	A	A	A	236	216	216	240	220	216		A	A	A	E	A	A	A		
17	A	A	A	A	A	A	A	A	A	A	B	A	246	240	228	240		B	B	B	B	A	A	A		
18	A	A	A	A	A	A	A	A	A	B	B	B	232	212				B	B	B	B	A	A	A		
19	A	A	A	A	A	A	A	A	A	B	A	B	E	B	E	A		A	A	B	A	B	A	B		
20	B	A	A	A	A	A	A	A	A	A	B	E	B	A	A			B	B	A	A	A	A	B		
21	A	A	A	A	A	A	A	A	A	A	194	190	196	194	222	196		A	Y	A	A	Y	A	A		
22	A	A	A	A	A	A	A	A	A	A	260	232	192	212	190	190	214	200		B	B	A	A	A		
23	A	A	A	A	A	A	A	B	B	A	276	228	208	188	212	220	314		A	B	A	A	A	A		
24	A	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	A	A	A		
25	A	A	A	A	A	A	A	A	A	A	A	A	B	E	B	E	B	E	B	E	A		B	A		
26	192	A	A	A	A	A	A	A	A	A	B	A	B	B	E	B	228	250	226		B	A	A	A		
27	A	A	A	A	A	A	A	A	A	A	A	B	B	B	E	B	236	200	220		B	B	B	B		
28	A	A	A	A	A	A	A	A	A	A	B	E	A				256		B	B	B	B	A	B		
29	A	A	A	A	A	A	A	A	A	A	264	222	222	222	262	202		A	A	A	A	A	A	A		
30	A	A	A	A	A	A	A	A	A	A	290	254	226	210	190	218	208		A	Y	Y	A	A	A		
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	2	1	3	2	1	1	4		2	6	15	20	25	25	26	25	15	5	8	2	3	4	3	2		
MED	194	204	212	239	190	204	206		E	A	E	A	245	227	211	208	205	207	213	242	232	241	228	197	206	210
U Q			E	A			219			E	A	292	264	236	231	229	230	235	280	287	261		254	209	248	
L Q			208				193				260	232	212	205	195	208	198	208	232	226		198	183	200		

JUN. 2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL.2016 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	A	57	A	A	A	A	B	A	A	O X 32	B	B	B	B	B	A	Y	R	Y	B	R	A	
2	A	A	A	A	A	A	A	A	A	A	A	42	47	O X 42	B	X 32	R	R	R	B	A	A	A	A	
3	A	A	A	A	A	52	A	A	A	A	A	X 34	O X 41	X 48	B	X 36	A	A	X 18	O X 22	A	A	A	A	
4	90	A	A	A	A	A	A	A	A	R	X 28	O X 49	O X 40	X 52	X 33	X 33	B	R	R	B	B	R	R	57	
5	62	A	A	A	A	A	A	A		R	B O X 38	X 48	60	40	X 34	X 34	R	R	A	R	R	R	B	R	
6	A O X 26	A	A	A	A		31	28	30	O X 20	X 32	X 37	X 47	O X 39	X 46	X 37	A	A	R	R O X 19	O X 21	A	A	A	
7	X 35	A	67	92	75	A	R	O X 97	X 44	A	A	A	X 50	B	O X 47	50	O X 32	X 33	A	A	A	A	A	100	
8	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	O X 70	B	37	A	A	A	A	A	A	
9	58	A	R O X 32	A	A	A	A		B	A	A	B	B	B	B	B	O X 25	B	A	A	A	A	A	A	
10	A	A	56	65	A	A	A	A	A	A	A	B O X 51	64		B	B	B	B	A	A	A	A	O X 20	A	
11	A	A	A	A	A	A	A	A	A	A	A	X 46	X 52	X 46	X 46	X 52	B	B	A	A	X 36	R	A	A	
12	A	A	58	A	A	A	B	A	B	B	B	B	B	B O X 62	B	B	B	B	B	B	R	R	R	A	
13	A	A	A	A	A	A	A	A	R	A	B O X 45	X 51	X 51	B	B	B	B	O X 38	X 26	A	B	B	A	B	
14	R	A	A	A	A	A	A	A	A	A	B	B	B	B O X 59	O X 45	O X 36	X 28	X 28	B	B	B	B	R	A	
15	A	A	A	A	A	A	A	A	A	A	B	B	B	B O X 63	B	B	B	B	B	B	B	R	R	A	
16	A	A	A	A	A	B	A	A	R	A	A	X 48	X 54	X 56	X 50	X 54	X 45	X 46	X 34	B	B	B	R	R	
17	59	A	A	A	A	A	A	A	A	B	R O X 46	X 54	X 61	X 52	X 48	X 48	B	49	37	O X 20	A	A	A	A	
18	A	A	A	A	A	A	O X 28	30	30	X 38	X 48	X 49	X 56	X 60	X 55	X 55	R	A	A	R	B	R	R	R	
19	R	R	A	A	A	R	X 32	X 25	X 27	X 28	X 42	X 48	R	O X 50	X 56	X 43	X 32	X 27	X 20	X 20	R	A	R	R	
20	A	A	A	A	A	125	78	R	A	A	A	B	B	B O X 46	O X 42	O X 39	X 31	X 31	A	A	A	A	R	A	A
21	X 26	A	59	A	A	A	R	R	R	R	X 36	X 45	X 56	X 51	X 52	X 52	R	A	X 27	X 27	A	A	A	A	A
22	A	A	A	A	A	A	A	R	X 26	A	42	43	56	64	61		B	B	B	A	A	92	A	A	
23	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B O X 43	B	B	B	B	B	A	A	42	
24	A	A	A	A	R	A	A	A	A	X 29	X 35	X 41	X 51	X 51	X 44	X 54	X 39	A	O X 20	O X 21	82	A	A	A	
25	A	A	83	A	A	A	A	B		B	A	B	B	B	B	B	A	O X 33	A	A	A	A	A	A	
26	A	66	57	R	A	A	A	A	A	B	B O X 41	O X 42	X 46	X 41	X 39	X 30	X 26	X 22	R	B	B	B	B	A	
27	A	A	A	A O X 32	A	49	27		A	X 27	X 38	X 46	X 52	X 45	X 51	X 46	X 35		X 29	B O X 20	A	A	A	A	
28	A	57	64	A	A	A	A	A	A	A	A	A	X 40	X 45	X 49	X 59	X 48	O X 48	X 34	X 25	82	106	A	A	
29	A	A	A	65	R	A	A	A	A	B	B	B	B	B	B	B	B	A	R	B	R	B	A	A	
30	A	A	A	A	A	A	A	A	A	B O X 34	X 42	X 44	X 48	X 44		B	B O X 32	X 22	A	R	A	A	A	A	
31	A	A	A	A	A	A	A	A	A	X 31	X 38	X 47	X 51	X 50	X 55	X 37	X 32	X 28	X 29	X 18	A	B	B	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	6	3	7	5	2	2	4	6	7	6	10	19	20	20	20	20	11	13	12	4	6	3	1	3	
MED	58	57	59	65	54	88	40	28	30	X 28	X 37	X 43	X 50	X 50	X 52	X 44	X 35	X 33	X 26	O X 20	X 29	O X 92	O X 20	57	
U Q	62	66	67	78			64	85	56	30	38	46	52	58	58	51	39	38	29	20	82	106		100	
L Q	X O 35	X 26	X 57	44			32	27	27	X 27	X 27	X 34	X 40	X 47	X 46	X 46	X 37	X 32	X 28	X 22	X O 19	X O 20	X O 21	42	

JUL.2016 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL.2016 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

JUL.2016 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL.2016 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	56	60	54	35	111	64	64	42		B	60	77	24		B	B	B											
2	61	47	50	27	93	32	58	60	84	48	45	E	B	E	B	B			62	22	29	21		B	27	59		
3	52	144	68	64	58	56	57	57	57	57	56	20	18	E	B	B						K						
4	48	71	64	58	40	58	51	58	47	26	49	B	E	B	E	B	B					B						
5	44	47	50	87	48	K	50	64	53	42	25		B	G	E	B	G											
6	49	49	30	37	54	44	28	56	36	36	14	17	18	22	29	24	57	54	30	22	22	47	46	36				
7	40	55	49	39	53	96	49	56	36	60	59	45	52		B	E	B	E	B	E	B							
8	52	95	60	97	68	97	47	58	54	64	57		B	B	B	B	E	B	B									
9	46	56	48	62	68	59	49	63	157	53	54		B	B	B	B												
10	58	69	63	58	57	60	66	49	44	58	59		B	E	B	G	B	B										
11	39	46	52	59	57	62	57	59	59	51	54	21	23	23	18	33												
12	59	52	50	47	92	45		55																				
13	67	48	69	56	54	51	57	51	26	69		B	E	B	B	B	B	B	B	B	B	B	B	B	B	B		
14	30	36	58	70	49	88	58	56	48	49		B	B	B	B	E	B	E	B	B								
15	82	36	46	62	57	62	62	68	64	48		B	B	B	E	B	B	B	B	B	B	B	B	B	B	B		
16	60	42	65	62	65		39	49	31	58	84	24	22	27	32	15	18	18	88									
17	32	35	51	72	55	63	56	49	50		32	G	E	B	G	E	B	E	B	B	B	B	B	B	B	B		
18	39	36	70	66	43	41	29	35	14	13	68	17	19		G													
19	28	30	36	42	37	30	87	13	12	58		G	G															
20	36	30	30	61	109	62	34	14	60	57	53																	
21	35	50	34	84	34	84	30	28	24	23	23	E	B	E	B	18	21	17	18	21	47	19	85	51	34	32	28	62
22	77	82	55	58	48	49	56	30	11	44	24	56	25	27	25													
23	43	42	78	88	55	62	49	40	52																			
24	39	91	47	38	27	59	54	36	97	42	16	18	17	16		G												
25	76	99	57	57	60	104	51		53		58																	
26	78	64	60	32	58	51	40	49	45	64		B	26	24	24	G	G	E	B	E	B	E	B	B	B	B	B	
27	58	45	48	36	29	37	42	100	29	86	16	17	22	22		G	G											
28	99	38	72	48	59	62	66	51	58	58	49	32																
29	54	57	56	47	51	68	70	59	57		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
30	46	36	45	47	58	49	53	54	50		B	60	82	G	E	B	B	B	B	E	B	E	B	B	B	B	B	
31	58	30	48	56	52	58	46	29	56	13	K	G	G	G														
	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	30	30	30	29	25	23	20	21	20	20	21	18	25	26	20	23	24	28	30				
MED	52	48	52	58	55	59	54	52	50	53	53		22	G	E	G												
U Q	60	64	63	64	60	63	58	58	58	59	59	26	26	26	39	37	56	54	55	55	50	50	49	54				
L Q	39	36	48	42	48	49	46	40	34	39	23	18	20	21	18	20	E	B	E	B	E	B	B	B	B	B	B	

JUL.2016 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL.2016 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	9	9	7	7	17	10	20	8	B	13	10	17	B	B	B	B	B	25	16	14	13	B	19	11	
2	12	8	8	11	11	12	9	13	14	8	12	26	17	24	B	14	9	9	16	B	14	11	11	9	
3	6	8	8	34	10	14	12	9	8	9	11	12	8	36	B	19	12	10	7	8	7	6	11	10	
4	8	8	11	11	12	12	8	13	10	11	6	B	32	25	19	10	B	17	13	B	B	12	11	7	
5	9	11	12	15	12	17	11	16	10	6	B	17	21	12	11	11	11	10	11	8	9	10	B	10	
6	6	7	6	7	7	7	6	8	7	6	6	7	11	11	10	11	10	9	10	7	8	8	8	7	
7	8	8	10	8	12	12	10	9	6	9	11	11	15	B	31	25	15	13	8	13	7	6	6	7	
8	10	8	10	9	10	9	8	10	14	12	16	B	B	B	B	55	B	13	11	12	9	8	11	14	
9	12	12	18	8	7	13	10	16	76	11	11	B	B	B	B	B	14	44	11	13	10	6	8	9	
10	10	13	11	8	10	11	12	13	12	12	15	B	36	11	B	B	B	B	14	10	11	13	8	7	
11	8	9	9	12	10	8	15	13	9	11	14	12	12	8	8	33	B	B	21	12	9	6	8	6	
12	12	13	13	10	10	22	B	43	B	B	B	B	B	B	48	B	B	B	B	B	12	18	7	6	
13	10	14	10	22	15	20	18	15	10	44	B	24	21	B	B	B	B	22	16	18	B	B	12	B	
14	7	7	11	12	14	22	12	12	12	19	B	B	B	B	47	33	17	14	B	B	B	B	6	6	
15	8	7	8	14	7	16	19	29	28	13	B	B	B	39	B	B	B	B	B	B	B	12	7	7	
16	8	12	21	23	11	B	18	13	13	10	10	14	9	27	32	15	18	18	38	B	B	B	6	11	
17	6	7	6	8	11	10	18	14	12	B	12	17	18	17	26	33	B	12	8	7	15	20	11	11	
18	8	6	9	16	12	9	12	8	8	8	8	9	11	9	8	11	17	28	13	14	B	13	15	10	
19	6	6	6	100	8	7	8	6	5	6	6	9	10	8	6	7	8	9	8	10	11	10	7		
20	7	8	9	12	8	6	6	5	17	14	20	B	B	B	28	21	17	13	12	12	10	8	9	8	
21	8	7	7	6	6	9	10	13	13	14	16	18	15	17	11	13	15	12	9	13	7	6	6	6	
22	6	7	8	13	11	9	8	11	8	8	9	13	25	13	25	B	B	B	B	11	9	14	7	8	
23	12	10	10	9	13	16	14	8	12	B	B	B	B	B	B	22	B	B	B	B	B	7	9	11	
24	8	14	9	9	8	15	15	8	12	10	10	12	13	16	11	7	8	7	7	7	6	10	12	8	
25	8	16	13	10	12	12	14	B	10	B	24	B	B	B	B	B	18	12	9	8	8	8	B	11	
26	8	8	10	9	15	12	12	9	9	52	B	16	15	16	14	11	14	14	12	B	B	B	8	8	
27	13	16	10	10	10	9	6	6	9	7	10	14	16	16	15	9	9	8	12	B	9	11	8	8	
28	8	9	14	11	14	20	14	15	14	18	17	12	17	11	11	11	17	20	14	B	7	13	9	9	
29	9	9	9	12	36	14	16	16	10	B	B	B	B	B	B	B	B	40	18	B	6	B	8	8	
30	12	13	14	20	12	13	13	12	16	B	18	13	13	11	25	B	B	17	13	12	14	8	8	8	
31	10	8	8	22	12	12	9	7	7	8	8	11	9	11	16	11	12	12	7	8	15	B	B	11	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	30	31	
MED	8	8	10	11	11	12	12	12	12	12	14	17	18	24	28	22	17	14	13	13	10	11	9	8	
U Q	10	12	11	15	12	16	15	15	14	44	B	B	B	B	B	B	B	B	B	40	18	B	20	11	11
L Q	8	7	8	9	10	9	9	8	9	9	10	12	13	11	11	11	12	12	9	8	8	8	8	7	

JUL.2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL.2016 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	A	A	A	A	A	A	B	A	A	E A 294	B	B	B	B	B	A	Y	A	Y	B	A	A	
2	A	A	A	A	A	A	A	A	A	A	A	B	206	232	B	210	A	A	A	B	A	A	A	A	
3	A	A	A	A	A	E A 252	A	A	A	A	A	E A 282	E A 240	E B 248	B	A	A	A	A	A	204	A	A	A	
4	A	A	A	A	A	A	A	A	A	A	E A 282	B	224	240	226	222	Q	A	B	A	A	B	A	A	
5	A	A	A	A	A	A	A	A	A	A	B	E A 264	212	200	182	198		A	A	A	A	A	A	B	A
6	A	E A 262	A	A	A	A	A	A	E A 246	E A 208	E A 224	A	216	192	192	200	A	A	A	A	236	170	H	A	A
7	234	A	A	A	A	A	A	A	196	A	A	E A 286	A	E B 260	224	280	E B 280	A	A	A	A	A	A	A	A
8	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	E B 300	B	E B 272	A	A	A	A	A	A	A
9	A	A	A	A	A	A	A	A	B	A	A	B	B	B	B	B	E B 310	B	B	A	A	A	A	A	A
10	A	A	A	A	A	A	A	A	A	A	A	B	E B 256	E B 230	B	B	B	B	A	A	A	A	202	A	A
11	A	A	A	A	A	A	A	A	A	A	A	E A 232	206	210	216	220	B	B	A	A	A	A	A	A	A
12	A	A	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
13	A	A	A	A	A	A	A	A	A	B	B	E B 236	232	B	B	B	B	E B 264	E B 264	A	B	B	A	B	B
14	A	A	A	A	A	A	A	A	A	A	B	B	B	B	E B 290	E B 228	E B 260	A	E B	B	B	B	B	A	A
15	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
16	A	A	A	A	A	B	A	A	A	A	A	E A 232	E A 226	E B 208	B	E B 208	E B 238	E B 222	E B 254	B	B	B	A	A	A
17	A	A	A	A	A	A	A	A	A	B	A	E A 242	A	226	200	220	B	B	244	206	260	A	A	A	A
18	A	A	A	A	A	A	A	E A 320	E A 294	E A 258	A	H 178	H 196	192	204	196	204	A	A	A	A	B	A	A	A
19	A	A	A	A	A	A	A	A	198	E A 252	E A 212	212	200	200	E A 200	194	192	A	244	E A 240	A	A	A	A	A
20	A	A	A	A	A	A	A	A	A	A	A	B	B	B	E B 254	E B 240	E B 294	E B 246	A	A	A	A	A	A	A
21	212	A	A	A	A	A	A	A	A	A	A	228	216	200	208	E B 190	A	E A 272	E A 236	A	A	A	A	A	A
22	A	A	A	A	A	A	A	A	A	A	E A 278	E A 264	A	B	E B 220	240	B	B	B	B	A	A	A	A	A
23	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	244	B	B	B	B	B	A	A	H 190
24	A	A	A	A	A	A	A	A	A	A	E A 260	E A 254	E A 238	212	206	200	200	192	A	192	214	A	A	A	A
25	A	A	A	A	A	A	A	B	A	B	A	B	B	B	B	B	B	A	A	A	A	A	A	A	A
26	A	A	A	A	A	A	A	A	A	B	B	E A 236	E A 226	E A 210	210	E A 216	210	210	210	B	B	B	B	A	A
27	A	A	A	A	A	A	A	A	A	196	E A 218	A	216	198	198	190	198	A	A	B	216	A	A	A	A
28	A	218	214	A	A	A	A	A	A	A	A	A	A	E A 242	E A 216	E A 224	218	230	E A 266	B	A	A	A	A	A
29	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	A	A	B	202	B	A	A	A
30	A	A	A	A	A	A	A	A	A	B	E B 254	E B 236	E A 226	E A 218	218	B	B	206	298	A	A	A	A	A	A
31	A	A	A	A	A	A	A	A	A	252	196	196	214	204	210	190	198	228	212	200	A	B	B	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	2	2	1	1	1	1		1	3	6	10	17	19	19	17	20	11	12	11	4	4	1	1	1	
MED	223	240	214	210	200	E A 252		E A 320	197	252	223	236	211	204	204	206	208	230	224	217	210	170	202	190	
U Q									E A 294	E A 258	E A 254	E A 253	E A 226	E A 230	E B 223	232	E B 280	E B 262	E B 264	250	226				
L Q									196	246	208	214	206	200	199	199	198	225	210	207	203				

JUL.2016 h'F (KM)

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2016 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	55	X 25	X 28	A	A	A	A	X 32	X 40	X 48	X 50	49	46	X 46	X 38	B	B	Y	A	A	A	R		
2	A	A	75	62	A	A	A	O 22	X 23	X 26	X 34	X 48	53	53	52	42	X 37	X 33	X 30	X 25	O 23	O 22	O 34	A		
3	A	61	A	A	89	A	A	A	A	81	B	B	R	B	B	B	B	R	R	R	87	A	A	A		
4	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	32	X A	R	66	92	A	A	A	
5	A	A	A	A	A	A	A	A	A	B	B	B	O 47	X B	B	B	X 53	X 52	B	R	R	R	A	A	A	
6	A	A	A	A	A	A	O 59	X A	A	B	B	B	B	B	B	B	B	B	A	A	A	A	R	A	A	
7	67	A	61	A	A	B	A	A	X 29	X 35	X 43	X 50	X 51	48	58	58	50	X R	X 28	B	R	Y	A	A		
8	A	A	A	A	A	B	B	A	A	A	B	B	B	B	X 58	X 58	X 45	X 38	X 34	A	A	A	A	A	A	
9	A	A	A	A	A	A	A	A	A	O 35	X 42	X 46	X 52	B	X 64	72	66	45	49	A	R	R	R	R	R	
10	A	A	A	B	A	A	A	R	B	B	B	B	B	O 54	X 78	X B	B	B	B	A	B	R	A	A	A	
11	A	B	A	A	59	A	A	R	X 29	X 37	X 50	X 52	X 64	63	62	56	58	X 37	O 24	X A	A	62	64	A		
12	A	A	A	A	A	A	B	A	A	B	B	B	B	B	B	X 58	60	O 54	B	B	B	R	B	A	A	
13	A	A	A	A	A	A	A	A	A	B	B	O 52	X 57	B	O 56	X 59	X 54	B	B	B	B	A	A	A	A	
14	A	A	B	B	A	R	A	R	X 34	X 44	X 52	X 57	X 61	X 56	X 56	X 67	54	38	X B	B	B	B	A	R	R	
15	A	R	R	R	A	A	O 27	X 24	X 33	O 45	X 54	X 56	X 64	X 59	X 63	X 64	X 50	X 51	X 31	O 25	X B	B	B	R	A	
16	46	R	R	R	A	A	R	X 27	X 40	R	X 52	X 56	X 74	X 80	X 60	X 63	X 50	X 48	X 48	O 33	R	R	R	A	A	
17	A	A	A	A	A	A	O 43	X B	B	B	X 46	X 49	X 51	X 55	O 53	X 54	X 50	X 46	B	B	B	B	Y	58	B	
18	A	64	A	A	B	A	B	A	B	A	A	B	B	B	X 50	X 51	X 47	B	B	B	B	B	B	B	B	
19	A	A	A	A	A	Y	O 24	X 25	X 34	X 43	X 47	X 56	X 65	X 61	X 54	X 58	R	X 47	X 49	X 41	R	O 28	X A	A	A	
20	A	A	A	A	A	A	B	A	X 35	X 42	B	B	O 57	X 61	X 55	X 53	X 47	X 35	X 38	X 33	B	B	B	B	B	
21	B	60	A	A	O 25	X 36	X 31	R	X 34	X 45	X 50	X 54	X 64	X 71	X 57	X 59	X 52	X 41	X 37	X 38	X 25	A	A	A	A	
22	A	X 39	40	A	A	A	A	A	A	A	X 41	X 43	X 47	X 54	X 60	X 48	X 49	X 46	X 46	X 38	X 34	B	R	A	A	A
23	A	A	A	A	A	A	A	A	A	O 36	X 44	X 48	X 51	X 53	X 55	X 56	X 57	X 55	R	R	90	67	A	78	A	
24	A	A	A	R	A	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	51	
25	A	B	A	B	B	A	A	R	O 28	X 34	X 34	B	B	B	B	B	B	O 36	X 25	B	A	A	A	A	A	
26	B	A	A	B	B	B	B	A	A	X 40	X 39	X 43	X 43	X 47	X 48	X 45	X 44	X 37	X 29	X 29	X 29	X 26	A	A	A	
27	A	A	A	A	A	B	A	B	A	B	B	O 52	X 50	X 58	X 57	X 57	B	B	O 37	B	B	B	B	B	A	
28	A	A	R	X 65	42	46	46	44	B	X 46	X 52	X 57	X 59	X 59	X 65	X 56	X B	B	B	B	B	B	B	B	B	
29	A	B	Y	B	B	B	B	B	X 42	X 54	X 63	X 72	X 67	X 67	X 68	X 63	X 53	X 47	X 49	X 43	Y	A	A	A	A	
30	74	A	A	49	56	A	A	A	A	O 46	X 48	X X	X 61	X 62	X 63	X 66	X 54	X 57	X 86	A	93	A	A	A	A	
31	71	A	A	A	A	A	A	A	X 38	X 42	X 46	X 54	X 59	X 53	X 54	X 55	X 53	X 48	X 42	R	O 32	X 29	R	R	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	4	4	4	4	6	2	5	7	12	19	19	19	22	20	24	25	23	20	16	13	8	4	2	4		
MED	69	60	58	56	49	41	O 31	X 27	X 34	X 42	X 46	X 52	X 57	X 58	X 56	X 57	X 52	X 46	X 38	X 33	O 58	X 27	48	61		
U Q	72	62	68	64	59		52	44	36	45	52	56	64	62	62	61	54	48	48	40	91	48		71		
L Q	56	50	48	37	X 28		O 26	X 24	X 29	X 35	X 42	X 48	X 51	X 53	X 54	X 53	X 47	X 37	X 32	X 25	X 27	X 24		54		

AUG. 2016 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2016 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	A	19	22	A	A	A	A	26	34	42	44	43	40	40	F 27	B	B	Y	A	A	A	R	
2	A	A	A	A	A	A	A	16	17	20	28	42	47	F 44	46	36	31	27	24	19	R	R	R	A	
3	A	A	A	A	A	A	A	A	A	A	B	B	R	B	B	B	F 37	A	A	A	A	A	A	A	
4	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	26	A	A	A	A	A	A	
5	A	A	A	A	A	A	A	A	A	A	B	B	B	41	B	B	47	46	B	R	R	R	A	A	
6	A	A	A	A	A	A	53	A	A	B	B	B	B	B	B	B	B	A	A	A	A	R	A	A	
7	A	A	A	A	A	B	A	A	23	29	37	44	45	42	50	52	44	R	22	B	R	Y	A	A	
8	A	A	A	A	A	B	B	A	A	A	B	B	B	B	52	52	39	32	28	A	A	A	A	A	
9	A	A	A	A	A	A	A	A	A	R	29	36	40	46	B	58	F 60	F 49	39	43	A	R	R	R	A
10	A	A	A	B	A	A	A	R	B	B	B	B	B	R	48	71	B	B	F 33	A	B	R	A	A	
11	A	B	A	A	F 43	A	A	R	27	23	31	44	46	58	57	56	44	52	31	B	R	A	A	A	
12	A	A	A	A	A	A	B	A	A	B	B	B	B	B	B	52	F 48	48	B	B	B	B	A	B	A
13	A	A	A	A	A	A	A	A	A	B	B	46	51	B	R	50	53	F 44	B	B	B	B	A	A	A
14	A	A	B	B	A	A	A	A	28	38	46	51	55	50	50	61	F 43	R 32	B	B	B	B	A	R	
15	A	R 19	A	A	A	A	21	18	27	R 39	V 48	Z 50	Z 58	53	48	53	F 37	F 42	F 25	19	B	B	B	R	
16	R 25	R	R	R	A	A	R	21	F 30	R 48	46	50	64	74	51	57	44	42	42	27	A	A	A	A	
17	A	A	A	A	A	A	A	R 37	B	B	40	43	45	49	47	48	44	40	B	B	B	B	Y	A	
18	A	R	A	A	B	A	B	A	B	A	A	B	B	B	44	45	41	B	B	B	B	B	B	B	
19	A	A	A	A	A	Y	R 18	19	28	37	41	50	59	55	48	52	R	41	43	F 31	R	22	A	A	
20	A	A	A	A	A	A	B	A	29	36	B	B	51	55	49	47	41	R 31	32	27	B	B	B	B	
21	B	Y	A	A	19	R 30	25	A	28	39	44	48	58	65	51	53	46	F 30	29	32	19	A	A	A	
22	A	R 33	A	A	A	A	A	A	A	35	37	41	42	54	42	43	40	40	32	F 23	B	A	A	A	
23	A	A	A	A	A	A	A	A	A	30	38	42	45	47	49	50	51	49	R	A	A	A	A	A	
24	A	A	A	A	A	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
25	A	B	A	B	B	A	A	A	R 22	U 28	R 28	B	B	B	B	B	B	30	B	19	A	A	A	A	
26	B	A	A	B	B	B	B	A	A	34	33	37	37	42	42	39	38	31	23	23	23	20	A	A	
27	A	A	A	A	A	B	A	B	A	B	B	45	44	52	R 51	51	B	B	31	B	B	B	B	A	
28	A	A	A	28	36	F 32	F 30	38	B	40	46	51	53	53	59	50	B	B	B	B	B	B	B	B	
29	A	B	Y	B	B	B	B	B	36	48	57	66	61	J 61	R 62	57	47	41	43	37	Y	A	A	A	
30	A	A	A	A	A	A	A	A	A	R 40	42	B	55	56	57	60	48	51	A	A	A	A	A	A	
31	A	A	A	A	A	A	A	A	32	36	40	48	53	47	48	49	47	42	V 35	R 26	23	R	R	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	1	2		2	5	2	5	7	12	19	19	19	22	20	24	25	23	20	15	12	4	3	2		
MED	R 25	R 26		24	29	31	25	21	28	36	40	46	51	52	50	51	44	40	32	24	21	20	R 23		
U Q				40		42	37	30	39	46	50	58	56	54	53	47	42	42	29	23	22				
L Q				20		20	18	23	29	36	42	45	47	48	46	39	31	25	19	18	16				

AUG. 2016 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2016 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	28	26	41	41	23	59	50	38	34	65	14	18	G	G	G	28	19	B	B	15	34	58	59	27			
2	60	60	36	51	34	58	29	90	103	53	59	G	22	66	76	56	20	46	13	K	58	44	57	20	35		
3	39	42	69	55	63	52	58	54	48	51	B	B	G	B	B	B	G	44	43	39	50	45	40	46			
4	68	72	64	79	63	58	58	56	55	B	B	B	B	B	B	B	BE	B	19	37	48	32	66	91	54		
5	35	43	56	62	53	48	48	44	67	B	B	BE	B	B	BE	BE	B	B	B	B	33	28	20	27	45	43	
6	48	50	60	59	58	59	44	53	47	B	B	B	B	B	B	B	B	63	63	47	52	22	35	42			
7	50	113	48	61	62	B	52	56	15	17	16	G	G	G	22	22	22	24	26	E	B	13	56	14	14	32	32
8	35	71	69	50	52	B	52	70	60	60	B	B	B	BE	BE	BE	BE	B	K	20	27	38	43	49	41	42	
9	42	47	40	40	46	51	46	52	48	G	G	20	G	BE	BE	BE	BE	BE	B	24	50	26	32	29	38		
10	47	66	58	57	48	64	63	24	B	B	B	B	BE	BE	BE	B	B	BE	B	20	47	B	26	36	58		
11	47	B	64	57	78	44	36	28	18	G	G	18	18	33	35	40	30	E	BE	B	BE	B	11	29	71	38	48
12	K	85	64	57	53	62	B	62	68	B	B	B	B	B	B	BE	BE	BE	BE	B	B	B	B	B	B	B	B
13	30	34	43	62	64	64	53	48	48	B	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	B	B	B	B	B	B	B
14	34	34	B	56	53	34	36	27	15	21	16	24	21	21	24	19	17	16	BE	BE	BE	BE	B	B	B	B	B
15	48	15	K	28	37	44	39	30	25	30	23	23	33	35	35	24	G	BE	BE	BE	BE	B	14	9	B	B	B
16	24	34	31	31	45	42	34	19	13	20	20	36	32	29	27	24	19	15	32	E	B	19	30	32	33	40	
17	40	58	58	104	68	44	44	22	B	B	27	27	20	23	G	19	G	BE	B	B	B	B	B	B	B	B	B
18	43	26	48	51	B	59	B	64	B	51	44	B	B	BE	BE	BE	BE	B	B	B	B	B	B	B	B	B	B
19	35	40	40	52	32	15	12	E	B	G	E	B	G	E	B	B	G	G	G	K	E	B	K	14	19	30	34
20	36	47	49	80	52	56	46	54	35	17	B	BE	BE	BE	B	21	E	B	BE	BE	B	B	B	B	B	B	B
21	B	G	38	39	50	32	32	26	11	G	G	26	26	23	33	21	21	17	13	20	8	43	36	36	B	B	
22	48	34	27	60	48	46	54	54	48	38	23	32	24	28	22	G	G	G	12	10	B	30	38	39	B	B	
23	37	58	44	59	58	70	56	43	48	26	G	G	23	31	30	G	36	E	B	42	45	42	56	69	66	B	
24	105	71	42	33	57	81	55	52	55	B	B	B	B	B	B	B	B	B	B	B	B	32	30	30	44	B	
25	80	48	51	B	B	37	54	26	26	19	G	B	B	B	B	B	BE	B	BE	B	14	23	38	40	33	B	
26	B	84	51	48	B	B	B	56	48	G	G	22	24	27	24	29	G	54	K	16	17	E	B	11	14	36	36
27	40	40	38	38	48	B	46	B	59	B	BE	BE	BE	BE	BE	BE	B	B	BE	B	B	B	B	B	B	B	B
28	31	32	25	24	25	22	15	E	B	BE	BE	B	G	29	GE	BE	BE	B	B	B	B	B	B	B	B	B	B
29	56	B	16	B	B	B	B	BE	B	17	22	26	G	26	26	G	G	G	16	58	58	20	19	38	36	52	
30	78	56	46	32	42	104	58	57	53	64	46	BE	BE	BE	B	23	23	15	22	36	44	58	47	90	75	B	
31	58	84	49	61	57	47	49	48	45	53	56	G	G	G	G	G	G	18	E	BE	BE	BE	B	13	16	12	100
	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	30	29	27	26	27	29	27	22	20	19	23	20	24	25	24	23	21	23	20	24	25	28			
MED	43	47	47	55	52	52	48	48	48	G	G	G	G	26	23	G	20	20	20	20	30	35	36	38			
U Q	53	68	58	60	58	59	54	56	55	51	26	E	BE	BE	BE	BE	BE	B	B	B	47	42	48	40	47		
L Q	35	34	38	40	45	42	36	26	26	21	G	22	24	24	23	22	19	17	14	E	B	16	24	30	32		

AUG. 2016 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2016 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

AUG. 2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2016 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
1	A	A	A	200	206	A	A	A	A	242	194	226	202	202	214	220	208	B	B	A	A	A	A	A						
2	A	A	A	A	A	A	A	E	E	E	E	A	192	222	224	242	202	196	226	206	218	216	208	198	A	A				
3	A	A	A	A	A	A	A	A	A	A	B	B	A	B	B	B	270		A	A	A	A	A	A	A					
4	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	260		A	A	A	A	A	A					
5	A	A	A	A	A	A	A	A	A	A	B	B	E	B	B	E	B	B	B	B	A	A	A	A	A					
6	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A					
7	A	A	A	A	A	B	A	A	A		E	A	A	204	204	214	224	216		A		B		A	A					
8	A	A	A	A	A	B	B	A	A	A	B	B	B	B	E	B	E	B	E	B		A	A	A	A					
9	A	A	A	A	A	A	A	A	A	A	E	A			B	E	B	Q				A	A	A	A					
10	A	A	A	B	A	A	A	A	A	B	B	B	B	B	E	B	B	B	B			A	B	A	A					
11	A	B	A	E	A	A	A	E	A		E	A		B	B	E	A				E	B	A	A	A					
12	A	A	A	A	A	A	B	A	A	B	B	B	B	B	B	E	B	E	B		B	B	B	A	B	A				
13	A	A	A	A	A	A	A	A	A	B	E	B			E	B					B	B	B	A	A	A				
14	A	A	B	B	A	A	A	A	A		244	246	214	218	208	198	198	228	206	234		B	B	B	A	A				
15	A	198	A	A	A	A	A	A	A	A				E	B	E	B					B	B	B	A	A				
16	196	A	A	A	A	A	A	A	A		244	206	210	220	206	224	202	202	198	198	230	E	B	A	A	A				
17	A	A	A	A	A	A	A	B	E	A	E	A	A	212	232	212	202	202	214		B	B	B	Y	A					
18	A	A	A	A	B	A	B	A	B	A	A	B	B	B	E	B	E	B	E	B		B	B	B	B	B				
19	A	A	A	A	A	Y	A	E	B	Y					E	B									A	A				
20	A	A	A	A	A	A	B	A	E	A		B	B	E	B										B	B	B	B		
21	B	Y	A	A	A	A	A	A		E	A														A	A	A	A		
22	A	200	A	A	A	A	A	A	A	E	A				E	B									B	A	A	A		
23	A	A	A	A	A	A	A	A	A	A					A	E	A								A	A	A	A		
24	A	A	A	A	A	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A		
25	A	B	A	B	B	A	A	A	A		E	A		B	B	B	B	B	B	B	B	B	B	A	A	A	A	A		
26	B	A	A	B	B	B	B	A	E	A	250	202	220	220	206	224	222	216	214	254	228	226	200		A	A	A	A		
27	A	A	A	A	A	B	A	B	A	B	B	B	B	B	E	B					B	B	B	B	B	B	B	A		
28	A	A	A		E	A	A		B	E	B	E	B																	
29	A	B	Y	B	B	B	B	B																						
30	A	A	A	A	A	A	A	A	A	A	A	A	B	E	B	E	B	E	A	E	A	A	A	A	A	A	A	A	A	
31	A	A	A	A	A	A	A	A	E	A	E	A																		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	1	2		2	3	1	2	5	8	15	18	17	20	19	23	25	24	20	15	12	6	4	1							
MED	196	199		203	201	E	A	A	U																					
U Q				E	A			E	E	A	E	A	E	A	E	B	E	B	E	B		E								
L Q				196				199	235	208	202	212	210	204	202	203	204	207	220	214	208	198								

AUG. 2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2016 f_{XI} (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	A	56	67	B	A	A	A	93	132	B	B	B	B	B	X	X	X	R	A	A	A	X	
2	88	A	A	A	A	A	B	A	A	B	B	B	R	X	B	X	0	X	B	0	X	A	A	A	A
3	A	B	A	A	A	A	A	B	B	B	B	B	B	B	B	B	A	0	X	0	X	R	A	A	A
4	A	A	A	A	A	A	R	R	B	B	B	B	B	B	B	0	X	B	X	B	B	R	R	A	A
5	A	A	B	A	B	A	A	B	B	B	B	B	B	B	B	B	0	X	0	X	0	X	A	A	A
6	B	R	A	A	A	A	B	B	A	X	B	B	B	0	X	X	B	B	0	X	0	B	R	R	A
7	A	A	A	A	57	A	A	0	X	X	X	X	X	X	X	X	X	0	X	X	X	A	A	A	A
8	A	R	A	A	A	A	A	100	B	B	B	0	X	X	X	B	B	X	0	X	0	X	A	A	A
9	A	53	A	A	A	A	R	X	X	X	X	X	X	X	X	X	X	X	X	57	57	45	36	30	24
10	A	A	A	A	A	0	X	X	X	X	X	X	X	X	X	X	65	71	60	49	45	44	23	24	26
11	A	A	A	A	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	X	A	A	A
12	A	87	A	A	A	A	A	A	X	46	46	48	53	54	50	54	54	54	50	46	40	39	28	18	21
13	62	A	A	A	A	A	A	A	A	54	59	66	74	74	70	66	60	55	59	41	35	27	27	A	
14	54	A	A	74	42	A	A	A	X	49	46	50	60	66	60	62	63	62	72	56	47	A	A	A	
15	79	A	55	A	85	78	A	A	A	A	A	A	A	A	A	48	52	45	42	40	33	28	26	31	
16	58	55	42	A	A	43	26	41	47	51	56	61	70	60	63	63	57	49	49	37	29	27	A	A	
17	A	A	A	A	A	A	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	39	30	24	22
18	X	66	54	62	52	A	56	54	55	48	41	55	62	69	70	76	76	65	56	48	46	A	A	A	
19	A	70	57	A	A	A	A	X	X	X	X	0	X	X	X	84	104	72	51	56	64	A	A	A	
20	A	68	A	A	79	A	A	A	A	A	A	B	B	B	B	X	0	X	0	X	X	A	R	R	60
21	53	A	R	53	A	A	A	0	X	B	0	X	0	X	0	X	X	X	X	X	0	X	X	X	A
22	40	49	A	70	A	A	A	0	X	X	X	X	X	X	X	X	X	X	X	X	42	34	27	25	X
23	X	X	56	57	41	45	34	45	52	59	68	63	66	68	64	62	64	60	56	46	46	34	30	25	
24	X	X	56	57	41	45	34	45	52	59	68	63	66	68	64	62	64	60	56	46	46	34	30	25	
25	A	A	48	40	47	56	36	45	51	57	63	63	62	69	79	70	64	52	52	46	42	31	31	A	
26	A	A	109	A	A	A	A	B	B	B	X	X	X	X	X	X	X	X	0	X	X	A	A	A	90
27	A	A	A	A	A	68	50	52	B	0	X	X	X	X	X	X	X	X	B	B	A	B	B	A	A
28	A	56	B	A	B	B	B	A	B	B	B	B	B	B	B	0	X	0	X	0	X	A	A	A	88
29	B	A	X	A	A	A	B	B	B	A	B	B	B	B	B	B	0	X	0	X	0	X	A	A	A
30	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	58	A	A	A
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	10	10	8	7	8	7	7	14	14	16	17	17	18	20	21	21	23	25	24	23	14	11	14	9	
MED	56	54	56	56	60	56	36	45	46	48	53	56	60	60	58	60	57	50	48	42	36	28	30	26	
U Q	66	68	60	70	73	68	50	52	48	54	60	63	66	68	69	66	62	56	56	46	42	30	88	74	
L Q	X	X	45	52	44	43	30	41	44	45	48	52	54	56	55	56	50	44	44	37	34	27	24	23	

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2016 f_oF₂ (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

SEP. 2016 f_oF₂ (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2016 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	69	78	90	51	50	B	81	58	55	58	28	B	B	B	B	B	G	21	34	34	44	44	53	25				
2	69	50	86	53	50	105	B	59	64	B	B	B	25	G	B	B	B	B	B	12	86	43	42	61				
3	89	B	56	90	46	58	57	B	B	B	B	B	B	B	B	B	52	25	11	20	77	41	54	58				
4	73	60	60	59	68	82	41	49	B	B	B	B	B	B	B	B	40	B	G	B	B	18	29	38	68			
5	68	74	B	77	B	57	56	B	55	B	B	B	B	B	B	B	B	B	B	B	B	42	84	78	67			
6	B	27	54	57	42	46	B	B	44	22	B	B	B	B	B	B	43	24	B	B	B	B	29	18	39			
7	48	43	33	55	55	47	62	B	44	G	G	G	G	G	G	G	19	G	B	B	34	34	37	39				
8	39	30	48	57	47	53	58	60	B	B	B	B	B	B	B	B	B	B	B	B	46	52	46	42				
9	48	81	64	46	52	51	31	16	21	G	G	26	28	67	26	G	G	23	91	19	26	9	8	62	26			
10	42	30	84	58	54	60	37	14	G	G	36	36	37	27	27	20	G	G	22	20	14	14	12	29	51	46		
11	69	62	59	50	42	42	16	G	18	21	G	G	26	28	16	21	21	18	14	16	22	38	44	49				
12	69	47	41	57	60	48	57	47	26	21	25	29	27	37	36	69	26	18	33	17	16	17	17	21				
13	31	64	58	54	66	58	58	59	59	48	27	G	28	28	22	G	23	G	B	B	11	11	13	24				
14	35	63	48	61	39	58	58	46	24	24	24	26	26	27	G	G	22	18	26	22	43	43	86	55				
15	47	58	42	39	50	48	119	50	60	78	61	46	55	62	26	24	21	19	G	59	14	16	25	32				
16	40	K	37	56	27	22	17	25	25	G	24	74	28	48	20	22	19	19	16	13	10	43	29	29				
17	32	38	46	58	60	54	37	14	22	52	25	27	29	26	26	26	22	20	12	58	10	B	B	30				
18	10	31	37	46	43	49	27	26	24	24	26	26	25	18	35	34	25	20	25	38	44	47	49	44				
19	41	68	46	38	55	46	32	52	G	22	23	23	25	21	33	25	25	25	47	44	47	54	42	57				
20	58	32	62	45	48	64	62	55	60	59	62	B	B	B	B	27	B	B	B	B	36	23	24	36	20	30	36	
21	37	40	30	41	58	51	40	48	40	B	B	B	B	B	B	B	B	26	20	16	13	11	53	26	26			
22	34	33	92	50	60	48	39	26	14	56	27	21	28	20	16	17	32	21	18	19	14	12	12	27				
23	30	28	28	30	25	K	14	17	90	G	B	B	24	33	29	26	26	28	26	23	21	G	B	B	B	B	B	
24	E	B	8	38	20	23	14	E	B	8	G	19	23	26	27	33	28	28	26	26	20	13	18	G	10	13	18	61
25	50	52	25	79	91	56	52	B	B	B	28	10	26	52	23	25	25	25	E	B	17	16	50	75	71			
26	82	41	88	52	51	42	26	26	B	50	26	E	B	39	38	28	G	B	B	B	41	49	77	50	70			
27	70	46	38	66	47	72	51	54	56	B	152	B	B	B	B	B	B	B	B	B	B	49	68	54				
28	55	33	B	59	B	63	B	59	B	B	B	B	B	B	B	B	36	24	92	62	45	49	49	84				
29	B	51	21	67	44	52	B	B	63	47	B	B	B	B	B	B	B	B	B	B	44	44	47	44	103	50		
30	57	90	58	51	75	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	G	36	72	54	90			
31																												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	28	29	28	30	28	28	25	23	23	20	20	18	20	21	21	21	24	24	26	28	28	30	30	30				
MED	48	46	48	54	50	52	40	48	26	25	G	25	28	26	24	G	22	20	18	20	28	42	43	45				
U Q	69	62	61	59	59	58	58	58	56	51	30	E	B	28	41	E	B	26	29	24	33	40	44	49	54	61		
L Q	36	33	37	46	44	46	29	25	G	G	24	G	26	G	G	G	G	G	G	G	E	B	17	25	29			

SEP. 2016 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2016 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

SEP. 2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2016 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
1	A	A	A	A	A	B	A	A	A	200	Y	B	B	B	B	B	A	A	A	A	A	A	A	212						
2	A	A	A	A	A	A	B	A	A	B	B	B	256	240	B	E	B	E	B	B	Y	A	A	A	A					
3	A	B	A	A	A	A	A	B	B	B	B	B	B	B	B	B	A	E	A	A	A	A	A	A	A					
4	A	A	B	A	A	A	A	A	B	B	B	B	B	B	B	E	B	E	A	B	B	A	A	A	A					
5	A	A	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	232	232	E	B	A	A	A	A					
6	B	A	A	A	A	A	B	B	A	228	B	B	B	B	E	B	B	B	B	B	A	B	A	A	A					
7	A	A	A	A	A	A	A	B	A	E	A	194	218	200	214	202	210	196	B	E	B	A	A	A	A					
8	A	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	E	A	A	A	A	A	A					
9	A	A	A	A	A	A	A	A	A	238	212	226	212	204	204	230	212	232	204	218	200	222	206	234	196	200				
10	A	A	A	A	A	A	A	A	A	196	A	E	A	242	246	202	202	212	E	A	E	A	E	A	E	A				
11	A	A	A	A	A	A	A	E	A	262	196	196	196	208	200	216	218	204	196	210	210	296	196	A	A	A				
12	A	A	A	A	A	A	A	A	A	196	198	212	216	204	220	202	218	206	E	A	214	202	214	206	E	A	A			
13	A	A	A	A	A	A	A	A	A	E	A	256	208	214	224	224	216	208	208	206	212	212	238	264	272	A				
14	A	A	A	A	A	A	A	E	A	E	A	286	256	208	184	H	256	208	216	214	218	218	218	228	E	A	A			
15	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E	B	264	244	258	198	E	A	250	244	E	A	A		
16	A	A	A	A	A	A	A	A	E	A	238	208	196	A	220	210	198	204	200	200	192	204	246	238	A	A	A			
17	A	A	A	A	A	A	A	A	A	202	202	208	192	192	H	224	200	220	196	204	A	194	208	208	208	228	220			
18	A	A	A	A	A	A	A	A	A	224	212	232	208	208	208	208	204	210	240	236	226	216	242	310	A	A	A			
19	A	A	A	A	A	A	A	A	A	236	214	H	188	H	H	208	220	E	B	E	B	E	B	E	B	E	A	A		
20	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	E	A	E	B	254	A	A	A	A		
21	A	A	A	A	A	A	A	A	E	A	B	B	B	B	B	B	E	A	198	204	E	A	E	A	220	E	A	A		
22	A	A	A	A	A	A	A	A	A	274	286	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	A		
23	292	A	A	A	A	E	A	E	A	300	208	230	212	206	206	192	198	204	212	200	220	210	234	210	216	304	A			
24	236	302	A	A	E	A	E	A	314	250	202	214	202	268	216	200	212	202	218	188	196	196	208	204	230	210	212			
25	A	A	A	A	A	A	A	A	A	A	B	B	B	E	A	E	A	198	212	200	224	E	A	234	238	230	A	A	A	
26	A	A	A	A	A	A	A	A	A	192	240	224	B	A	218	B	238	236	216	E	B	E	B	294	310	200	A	A	A	A
27	A	A	A	A	A	A	B	A	B	A	B	A	B	B	B	B	B	B	B	B	B	B	A	B	B	A	A	A	A	
28	A	A	B	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	E	A	A	A	A	A	A	A	A	A	
29	B	A	256	A	A	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	A	
30	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	228	A	A	A	A	A	A	
31																														
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	3	1	1	1	1	3	3	12	11	15	16	15	17	17	20	21	20	22	21	19	13	11	10	8						
MED	236	302	256	212	E	A	U	220	242	216	211	205	206	211	204	216	207	215	204	210	203	215	208	232	210	208				
U Q	292				E	A	E	A	314	250	250	238	228	218	246	214	224	221	236	235	238	231	254	240	264	248	216			
L Q	224					192	240	202	208	200	196	206	200	210	201	211	199	204	196	208	205	228	202	201						

SEP. 2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2016 f_{XI} (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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	58	A	R	A	A	B	B	B	B	O X 48	B	O X 52	B	B	O X 46	B	B	30	A	A	75	
2	A	A	A	A	A	A	O X 65	B	A	A	B	B	O X 53	O X 56	60	59	56	B	B	O X 40	R	B	R	91	
3	B	A			A	R	O X 46	48	88		B	B	X 52	B	B	O X 51	54	56	56	B	O X 41	O X 34	A	A	
4	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	X 46	X 41	A	X 25	X 41	101
5	A	58	60		A	B	O X 35	A	R	B	A	B	B	B	B	O X 50	O X 51	53	50	48	37	33	R	R	
6	A	A	A	A	A	R	R	X 53	X 52	X 52	X 53	X 55	X 58	X 58	57	58	59	60	55	48		R	A	A	
7	R	A		A	A	A		X 46	X 46	X 53	X 50	X 52	X 58	X 59	60	59	62	56	56	55	40	O X 30	A	A	
8	A	A	A		A	A	A	A	R	O X 50	X 48	X 51	X 53	X 55	X 57	X 61	X 58	X 52	X 53	X 46	X 39	R	X 21	R	
9	A	A	A	A	A	A	A	X 51	X 53	X 53	X 55	X 59	X 64	X 68	X 73	X 68	X 64	X 56	X 56	X 58	X 46	X 46	X 35	A	
10	O X 29	A	A	A	A	A	A	A	A	A	O X 59	X 66	X 66	X 67	X 67	X 68	X 69	X 69	X 66	X 56	X 104	X 67		90	
11	66	54			55	54	50	57	52	56	60	65	66	68	67	63	67	64	64	57	50	52	47	46	
12	59	X 45	42		58	50	55	56	56	61	66	66	66	66	67	60	58	58	58	54	46	48	42	47	
13	X 62	47			O X 47	R	O X 55	X 55		A	A	R	B	B	O X 57	X 93	69		51	47	84		83	A	
14	124		52	55		B	B	A	B	B	B	B	B	B	B	O X 42	X 48	X 45	X 40	X 37	X 35	X 30	X 25	X 25	
15	A	A	A	A	A	X 42	B	A	O X 44	X 42		X 48	X 48	53	50	55	54		B	X 52	X 47	67	A	A	
16	A	52			A	A	A	X 44	X 45	X 44	X 49	X 48		B	B	O X 51		X 49	X 47	X 47	X 48	X 38	A	A	
17	A	A	A	B	B	B	A	A		B	A	B	B	B	B	B	B	B	X 47	X 46	X 31	X 37	X 32	A	A
18	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	X 49	X 46		X 40	X 30	31	A
19	A	A	A	B	A	O X 41	A	X 47	X 50	X 52	X 52	X 53	X 59	X 64	X 64	X 63	X 60	X 57	X 57	X 52	X 44	X 33	X 30	A	
20	X 26	X 26	X 29	45	50			X 52	X 56	X 52	X 54	X 59	X 59	60	64	60	56	56	57	51	52	50	46	46	
21	X 23	60	44	44	52	56	56	X 51	X 53	X 56	X 57	X 59	X 61	60	60	62	61	56	54	52	46	42	40	40	
22	X 45	X 35	34	32	42		56	60	60	60	59	56	59	62	62	62	58	55	58	52	46	45	35	O X 34	
23	57				X 43	X 50	X 56	X 58	X 58	X 59	87	62	65	62	61	57	52	52	49	44	40		A	A	
24	R	A	A	A	A	R	A		67	98	106		B	B	B	X 57	X 60	X 58	X 53	B	O X 39	A	A	A	A
25	70				A	A	B	A	R	B	R	R	B	B	B	O X 53		89		R	A	A	A	A	A
26	A	B	B	R	R	B	A	B	A	B	B	B	B	B	B	B	B	50	B	A	A		50	90	B
27	A	A	A	B	R	B	X 50	B	B	B	B	B	B	O X 53	B	X 56	X 54		55		A	A	A	A	X 46
28	A	A			A	A	O X 36	A	A	R	R	B	B	B	B	B	B	X 44	X 44	R	R	R	O X 32	X 31	A
29	A	A	O X 38		B	B	B		72		A	B	B	B	B	B	O X 58	O X 62	X 53	X 66	X 65		63	A	A
30	A	A	A		O X 60	X 35	A	B	A	B	B	B	B	B	B	B	B	O X 52	X 91	X 42	R	R	O X 45	A	A
31	A	A	B	B	B	A	A	A	A	B		O X 56	X 51	R	B	B	O X 54	X 53	X 49	X 44	X 38	X 36	X 34	X 28	A
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	
CNT	10	8	10	8	8	7	10	15	15	14	14	16	16	16	24	22	25	24	24	22	22	16	15	12	
MED	58	50	48	54	48	42	52	53	53	52	56	57	59	60	60	60	56	54	54	48	42	44	35	46	
U Q	66	56	58	59	54	54	56	58	60	56	59	60	64	65	64	62	60	56	57	52	46	50	46	82	
L Q	X 29	X 40	X 38	44	X 42	O X 36	X 50	X 48	X 52	X 50	X 52	X 52	X 53	X 57	X 52	X 55	X 53	X 48	X 46	X 40	X 36	X 32	X 30	X 43	

IONOSPHERIC DATA STATION SHOWA-ST.

OCT.2016 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	A	A	A	A	A	A	B	B	B	B	42		46	B	B	R	B	B	F	A	A	A		
2	A	A	A	A	A	A	R	B	A	A	B	B	47	50	54	53	50	B	B	34	A	B	A	A		
3	B	A	F	A	A	R	40	F	A	B	B		B	B	R				B	R	R	A	A	A		
4	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B		40	35	A	19	35	A	
5	A	20	20		A	R	A	B	B	A	B	B	B	B		R	44	45	47	44	42	F	R	R	R	27
6	A	A	A	A	A	A		47	46	46	47	49	52	52	51	52	53	54	49	42		R	A	A	A	
7	A	A		A	A	A		40	47	44	46	52	53	54	53	56	50	50	49	34	24		A	A	R	27
8	A	A	A	R	A	A	A	A		44	42	45	47	49	51	55	52	46	47	40	33		A	15	R	
9	A	A	A	A	A	A		45	47	47	49	53	58	62	67	62	57	50	50	44	F	40	40	29	A	
10	R	A	A	A	A	A	A	A	A		53	60	60	61	61	62	63	63	60	33	F	R	A	A	A	
11	A	A	R	A	F	F	44	44	F	R															F	
12	24	39	F	A	A	A	44	49	50	50	55	60	60	60	61	54	52	52	52	48	40	42	30	37	F	
13	56	34	F	A	R	R	49	49	A	A	R	B	B	R	51	87	57	F	F	R	A	A	A	A	F	
14	A	A	R	F	A	B	B	A	B	B	B	B	B	B	R										F	
15	A	A	A	A	A	R	36	B	A	R		R	42	42	47	44	49	48	B	46	41	A	A	A	A	
16	A	A	A	B	A	A		38	39	38	42	42		B	B	45		43	41	41	42	32		A	A	A
17	A	A	A	B	B	B	A	A	B	B	A	B	B	B	B	B	B	B	41	40	25	F	26	A	A	
18	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	43	40		34	24	25	Z	A
19	A	A	A	B	A	R	35	A	41	44	46	46	47	53	R	58	58	57	54	51	51	46	38	27	24	A
20	20	20	F	F	F	F	F	F	46	47	46	48	53	53	54	58	54	50	50	51	45	46	44	40	28	F
21	17		F	F	F	F	F	F	43	45	47	50	51	53	55	54	54	56	55	50	48	46	40	36	34	34
22	39	29	28	26	36		50	54	54	54	53	50	53	56	56	56	56	52	49	52	46	40	34	29	28	R
23	A	A	A	A	37	44	50	52	52	53	57	55	59	56	55	51	45	46	43	38	34		A	A	A	A
24	R	A	A	A	A	R	A	F	A	A	B	B	B	B	F	51	50	52	46	B	33	A	A	A	A	A
25	A	A	A	A	A	A	B	A	R	B	R	R	B	B	R	47	B	A	R	A	A	R	A	A	A	A
26	A	B	B	A	R	B	A	B	A	B	B	B	B	B	B	B	B	44	B	A	A	A	F	A	B	A
27	A	A	A	B	A	B		44		B	B	B	B	B	B	R	R	R	R	F	A	A	A	A	40	A
28	A	A	A	A	A	R	30	A	A	R	A	B	B	B	B	B	B	38	38	A	R	A	R	26	25	A
29	A	A	R	B	B	B	B	R	A	B	B	B	B	B	B	52	56	47	R	R	R	A	A	A	A	A
30	A	A	A	A	A	R	A	B	A	B	B	B	B	B	B	B	R	46	36	36	R	R	A	A	A	A
31	A	A	B	B	B	A	A	A	A	B	F	R	U	R	B	B	R	48	47	43	38	32	30	28	22	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	5	9	4	7	7	9	15	12	13	14	16	17	16	24	22	24	23	23	22	20	14	13	9		
MED	24	29	31	28	36	36	44	46	47	46	48	51	53	54	52	54	50	46	46	39	34	29	29	28		
U Q	39	36	40	37	41	44	50	49	48	50	53	54	58	59	58	56	52	50	51	45	40	40	34	36		
L Q	20	20	26	23	F	R	44	41	45	44	46	46	47	51	46	49	46	41	40	33	28	26	23	27		

OCT.2016 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2016 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	54	50	60	51	58	40	55	55	B	B	B	B	B	B	B	B	B	B	B	B	12	30	92	48				
2	38	35	55	58	58	58	G	B	98	67	B	B	B	B	B	B	B	B	B	B	20	36	B	31	70			
3	B	96	36	53	42	39	46	28	59	B	B	B	B	B	B	B	B	B	G	B	B	13	47	36	45			
4	44	49	63	52	54	B	B	B	B	B	B	B	B	B	B	B	B	B	B	31	41	35	24	34	44			
5	40	28	32	52	B	53	61	55	B	B	B	B	B	B	B	B	B	B	B	20	20	56	26	31	40			
6	76	87	49	56	61	44	47	30	24	28	38	30	30	30	26	23	24	23	20	G	G	42	36	30				
7	32	47	E B	24	45	58	45	43	50	30	31	29	23	23	25	30	21	24	20	G	G	16	37	50	34			
8	81	46	46	26	53	56	57	56	49	36	G	G	G	G	E	B	E	B	E	B	B	B	35	30	28			
9	54	49	48	58	57	51	52	36	24	27	E	B	E	B	E	B	E	B	E	B	B	B	15	24	39			
10	29	47	67	70	62	52	62	64	68	54	E	B	E	B	E	B	E	B	E	B	E	B	42	46	62	47		
11	40	45	21	34	21	22	26	19	24	28	29	30	106	35	29	29	26	27	G	G	12	12	56	57				
12	18	28	28	48	41	46	28	28	25	24	29	41	31	31	29	29	24	G	G	G	11	E	B	16				
13	33	38	42	50	41	24	40	29	57	62	26	B	B	B	B	B	B	B	B	62	76	44	105	54				
14	47	100	46	39	101	B	57	44	61	B	B	B	B	B	B	B	B	B	B	32	27	21	57	18	17	29	51	
15	41	40	34	36	30	26	B	40	31	G	28	G	G	E	B	E	B	E	B	G	G	36	36	31	50			
16	63	41	106	B	45	58	48	56	23	61	G	G	B	B	B	B	B	B	B	G	G	18	45	96	51			
17	64	59	58	B	B	B	59	93	E	B	B	B	B	B	B	B	B	B	B	24	20	23	29	51	E	B	29	
18	60	49	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	25	24	22	18	47	38			
19	69	49	66	B	36	29	50	E	B	34	58	G	58	30	E	B	E	B	E	B	E	B	18	58	12	41		
20	52	58	13	14	37	52	47	24	23	25	30	E	B	34	75	30	33	26	G	G	23	18	18	10	13	E	B	10
21	19	34	28	19	16	G	G	G	E	B	E	B	B	G	G	G	G	G	G	19	24	19	19	13	13	11		
22	13	12	E	B	11	12	20	48	33	G	32	22	29	29	38	31	31	28	12	1	21	20	14	G	19	32		
23	47	66	48	41	G	37	22	27	26	30	30	E	B	G	G	30	28	21	25	20	20	G	29	45	50			
24	38	90	57	51	65	28	46	38	60	62	B	B	B	B	B	B	B	B	B	26	28	44	70	50	50	59		
25	35	103	92	50	47	96	49	56	43	B	41	G	B	B	B	B	B	B	B	40	48	49	46	24	70	92	116	B
26	92	B	B	44	26	B	85	B	58	B	B	B	B	B	B	B	B	B	B	28	106	128	80	G	58	B		
27	44	56	64	B	57	B	57	B	B	B	B	B	B	B	B	B	B	B	B	G	E	B	97	41	50	84		
28	78	58	58	67	49	42	58	60	34	50	B	B	B	B	B	B	B	B	B	30	G	37	23	42	17	17	88	
29	68	85	76	B	B	B	B	E	B	35	78	B	B	B	B	B	B	B	B	40	48	33	25	29	42	41	100	62
30	82	47	36	42	46	68	B	59	B	B	B	B	B	B	B	B	B	B	B	41	G	E	B	19	46	38	53	
31	52	61	B	B	54	49	54	61	52	B	36	G	E	B	B	B	B	B	B	40	38	26	23	26	23	24	14	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	30	30	28	24	27	24	26	26	25	19	18	17	17	16	24	22	27	26	28	29	30	30	31	30				
MED	47	49	48	49	47	46	48	39	40	28	30	G	30	E	G	E	B	G	G	28	22	22	20	30	36	46		
U Q	64	61	62	52	58	52	57	56	58	50	42	E	B	E	B	E	B	E	B	12	1	27	24	35	42	44	56	54
L Q	38	41	33	38	36	33	40	28	26	G	G	G	G	G	G	G	G	G	B	G	G	G	17	24	34			

OCT. 2016 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT.2016 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	7	7	7	11	20	19	16	20	B	B	B	B	27	B	40	B	B	32	B	B	6	9	9	17
2	16	11	19	19	19	22	27	B	24	24	B	B	40	44	39	43	34	B	B	21	10	B	10	8
3	B	8	8	21	13	14	14	9	20	B	B	33	B	B	34	38	16	19	B	22	6	12	8	8
4	16	24	22	14	27	B	B	B	B	B	B	B	B	B	B	B	B	B	13	13	8	10		13
5	11	8	9	11	B	10	17	40	B	19	B	B	B	B	37	36	25	21	14	10	10	8	8	8
6	10	14	16	18	25	33	15	13	12	27	38	20	18	18	17	20	24	23	16	9	18	10	7	6
7	10	10	24	20	32	24	18	12	11	11	17	13	14	16	16	16	16	12	10	10	6	8	10	7
8	13	12	12	13	17	14	14	18	37	21	22	18	18	14	43	28	24	38	21	16	7	7	6	9
9	8	14	10	11	14	11	10	10	10	10	42	36	21	17	17	20	15	14	22	22	14	14	12	7
10	8	7	16	13	10	22	19	16	14	14	44	32	44	42	41	32	10	31	12	8	11	8	14	8
11	7	10	6	7	9	11	13	12	9	10	11	11	11	11	12	10	10	7	7	7	6	7	7	6
12	8	8	10	12	9	7	6	10	10	13	11	15	12	12	11	11	12	13	11	9	6	6	9	9
13	7	10	15	11	19	9	8	11	16	16	21	B	B	40	32	13	12	12	9	6	12	6	10	9
14	10	6	8	8	8	B	47	19	39	B	B	B	B	B	31	B	12	12	10	8	12	8	8	8
15	6	11	8	10	14	8	B	24	12	11	10	10	13	32	12	12	12	B	19	12	10	8	7	11
16	11	8	11	B	20	15	18	10	11	11	12	12	B	B	40	B	19	12	22	10	8	7	26	10
17	24	14	17	B	B	B	22	37	56	B	46	B	B	B	B	B	B	24	20	12	9	9	21	29
18	25	10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	24	24	B	13	10	7	7
19	15	16	9	B	24	13	21	34	38	15	15	14	42	32	32	36	38	36	24	13	10	6	8	8
20	10	8	8	10	8	25	11	10	11	11	11	33	11	11	9	9	10	7	7	9	7	7	6	10
21	8	8	8	8	7	7	7	7	37	38	24	16	10	16	11	12	11	12	12	12	11	8	10	7
22	7	7	11	8	10	13	8	9	8	9	10	10	9	16	16	16	13	9	8	9	9	9	9	9
23	11	8	15	18	13	16	10	8	8	8	8	28	20	12	12	10	10	11	20	9	9	8	9	9
24	8	8	40	13	15	24	18	11	25	34	B	B	B	40	40	20	26	B	21	13	10	10	12	10
25	8	6	12	13	25	17	41	22	24	B	24	20	B	B	40	B	14	7	13	11	8	11	13	9
26	32	B	B	19	13	B	13	B	39	B	B	B	B	B	B	B	111	B	14	14	25	6	7	B
27	16	8	9	B	40	B	23	B	B	B	B	B	40	B	31	40	15	28	23	11	11	13	11	7
28	10	17	7	12	10	17	19	34	19	19	B	B	B	B	B	B	13	19	10	10	9	10	9	8
29	8	10	9	B	B	B	B	35	26	B	B	B	B	B	40	48	15	14	12	10	8	8	8	7
30	7	6	6	20	10	24	B	22	B	B	B	B	B	B	B	41	13	30	12	16	10	6	8	9
31	12	13	B	B	44	22	33	19	36	B	19	17	34	B	B	40	38	26	14	11	12	9	8	8
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31
MED	10	10	11	13	17	19	18	19	24	24	42	33	42	44	37	36	15	21	14	11	10	8	9	8
U Q	15	13	17	21	27	33	33	35	39	B	B	B	B	B	43	B	34	32	22	14	11	10	10	10
L Q	8	8	8	11	10	13	13	10	11	11	15	16	18	16	16	16	12	12	11	9	8	7	8	7

OCT.2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT.2016 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	A	A	A	A	A	A	B	B	B	B	192	B	B	B	B	E B	B	B	E A	A	A	A		
2	A	A	A	A	A	A	E Y 246	B	A	A	B	B	B	B	B	B	B	B	B	E B	B	A	B	A	A	
3	B	A	A	A	A	A	E A 290	E A 280	A	B	B	B	B	E B	E B	B	E B	E B	E B	E B	E A	A	A	A		
4	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	E A	E A	E A	A	E A	A	A	
5	A E A 300	A	234	A	B	A	A	B	B	A	B	B	B	B	B	B	E B	B	222	234	198	A	E A	A	204	
6	A	A	A	A	A	A	A	244	210	240	B	236	204	212	204	210	214	230	E A	220	216	A	A	A	A	
7	A	A	242	A	A	A	A	A	234	194	198	218	226	208	224	222	206	226	230	240	A	A	A	226		
8	A	A	A	A	A	A	A	A	A	234	236	216	224	212	B	234	214	B	234	224	E A	A	198	A		
9	A	A	A	A	A	A	E A 296	E A 320	A	232	B E B	276	202	228	210	216	226	228	234	240	E A	240	262	314	A	
10	A	A	A	A	A	A	A	A	A	A	B	250	B	272	258	248	220	232	228	254	A	196	A	A	A	
11	A	A	A	A	A	A	308	236	200	202	214	208	204	226	222	196	214	214	210	208	212	220	206	216	216	
12	E A 308	276	A	A	A	A	184	230	208	214	214	210	218	196	204	204	208	E A	E A	E A	204	206	220	240	240	
13	246	A	A	A	202	A	196	196	A	A	214	B	B	E B	E A	280	262	A	E A	A	A	A	A	A	A	
14	A	A	A	A	A	B	B	A	B	B	B	B	B	B	234	B	236	254	254	E A	E A	E A	E A	A	A	
15	A	A	A	A	A	A	B	A	206	194	220	214	194	E B	266	222	212	212	B	242	234	A	A	A	A	
16	A	A	A	B	A	A	A	204	204	196	244	216	B	B	B	B	216	234	E B	E A	E A	E A	A	A	A	
17	A	A	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	E B	E B	E B	E B	A	A	A	A	
18	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B	E B	E B	B	A E A	E A	A	A	
19	A	A	A	B	E A 340	A	A	B	B	198	224	208	B	218	E B	278	E B	E B	E B	240	224	212	230	276	A	
20	A	A E A 326	E A 304	A	A	A	242	200	190	220	224	206	204	204	204	204	204	226	220	218	218	204	220	266	266	
21	A	A	A	E A 266	E A 226	206	208	B	B E Y	200	198	196	206	202	194	212	212	216	202	196	236	236	236	236	A	
22	236	258	284	270	270	A	216	198	194	198	196	204	226	208	206	196	214	220	216	220	220	220	242	A	A	
23	A	A	A	A	A	A	280	208	192	214	208	208	208	212	212	208	208	200	222	224	200	A	A	A	A	
24	208	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	222	240	B	216	A	A	A	A	A	
25	A	A	A	A	A	A	B	A	A	B	A E A 280	B	B	B	B	B	A	222	A	A	242	A	A	A	A	
26	A	B	B	A	A	B	246	B	A	B	B	B	B	B	B	B	218	B	A	212	A	228	A	B		
27	A	A	A	B	A	B	A	B	B	B	B	B	B	B	236	B	248	E B	E B	E B	A	A	A	A	192	
28	A	A	A	A	A	A	A	A	224	A	B	B	B	B	B	B	222	234	A	246	A	A	E A	A	A	
29	A	A	A	B	B	B	B E B 252	A	B	B	B	B	B	B	B	E B	E B	E A	338	282	244	250	276	A	200	
30	A	A	208	E A 288	A	B	A	B	B	B	B	B	B	B	B	B	E Y	E B	H	266	232	178	256	178	230	A
31	A	A	B	B	B	A	B	A	B	B	A	200	E B 262	B	B	B	B	216	220	A	E A	E A	E B	A	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	4	3	5	2	4	2	8	12	11	12	12	17	13	13	16	17	23	25	25	23	18	13	12	8		
MED	232	267	238	287	E A 268	283	236	220	205	200	216	213	204	212	216	212	214	227	226	227	U	215	224	232	221	
U Q	277	E A 300	305	E A 279		285	248	224	223	223	234	221	227	235	255	236	241	241	254	244	E A	260	280	238		
L Q	222	258	221		234		201	208	200	194	211	208	200	206	207	205	208	220	218	216	212	212	220	202		

OCT.2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV.2016 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	43	A	B	R	A	X	B	O	X	X	X	B	X	X	X	X	X	X	X	X	X
2	A	X	X	A	B	R	A	A	A	B	X	X	X	X	X	X	X	X	X	X	X	X	A	X
3	A	X	B	A	X	A	A	A	A	A	O	X	B	B	B	X	B	O	X	X	X	X	A	A
4	A	A	A	A	109	44	X	A	58	55	56	X	X	X	X	X	X	X	X	X	X	X	X	X
5	58	54	55	50	54	55	62	67	67	70	67	60	60	60	60	60	60	58	52	49	50	47	44	49
6	57	50	48	X	A	59	56	69	74	67	65	70	68	68	69	66	66	57	54	50	52	46	45	48
7	A	A	A	A	A	A	A	X	X	X	X	X	X	X	X	X	X	A	X	X	X	X	X	X
8	X	44	44	49	50	57	57	63	66	70	68	65	60	58	59	60	65	61	54	50	X	46	47	47
9	X	X	A	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	A	X	A
10	A	B	58	56	56	56	59	65	55	57	61	63	66	70	71	71	71	R	A	R	70	77	58	A
11	A	A	94	A	A	A	51	A	X	O	X	X	O	X	X	X	X	X	X	X	X	X	A	A
12	A	A	O	X	A	A	A	A	A	B	R	O	X	O	X	X	X	B	O	X	X	X	A	A
13	A	B	R	42	A	B	A	A	A	B	B	B	B	B	B	54	B	R	B	B	X	O	X	A
14	A	A	B	R	A	O	X	X	R	X	X	X	O	X	O	X	X	X	X	O	X	O	X	X
15	A	A	A	A	X	A	A	A	A	42	48	47	48	49	52	O	56	50	48	45	49	44	42	39
16	X	X	X	X	X	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	O	X	B	B	R	X	X	X	X	X	Y	X	X	X	X	X	57	54	54	51	49	48	43	42
18	X	X		B	A	66	62	58	67	68	63	59	60	61	62	61	61	56	52	51	44	38	40	38
19	50	48	X	X	X	X	X	X	X	X	X	X	X	X	X	X	55	55	A	X	X	X	X	36
20	A	O	X	42	46	52	56	58	62	67	73	65	60	60	60	58	56	54	55	57	59	57	56	50
21	56	91	48	54	56	59	76	74	75	67	64	62	62	61	62	60	59	56	56	59	47	33	76	A
22	52	60	64	49	42	54	94	A	X	X	X	X	X	X	X	X	X	X	X	X	X	A	A	A
23	O	X	A	A	A	A	A	A	A	A	X	B	O	X	X	X	X	X	X	X	X	X	O	X
24	R	O	X	X	A	A	A	A	A	A	X	X	O	X	X	X	X	R	A	91	67	46	71	57
25	57		71	96	A	A	A	A	A	B	B	R	B	B	B	60	X	X	X	X	A	A	A	A
26	B	50	B	O	X	A	B	A	A	A	B	O	X	O	X	X	O	X	O	X	X	X	X	A
27	A	A	A	R	A	R	A	A	R	A	B	B	X	X	X	X	X	X	X	B	X	X	X	X
28	R	X	A	A	A	A	X	X	B	X	X	X	O	X	X	X	X	X	X	X	R	O	X	X
29	A	A	A	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30	A	A	A	X	X	45	57	55	54	56	59	59	63	66	63	66	71	73	68	57	53	50	48	43
31				44	53	62	65	74	73	68	62	68	73	78	68	59	64	58	54	56	56	51	47	44
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	12	15	15	14	14	15	17	16	21	21	25	25	27	27	27	29	26	27	26	29	26	23	25	20
MED	48	44	47	48	52	57	58	63	59	62	59	59	60	59	60	60	60	57	55	50	49	46	44	46
U Q	56	50	58	52	56	61	62	67	68	68	62	63	63	63	64	66	63	58	54	52	50	47	48	50
L Q	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	42	42	45	44	48	55	54	58	55	56	52	52	54	57	57	56	53	50	48	46	44	41	41	36

NOV.2016 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2016 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	A	45	B	R	45	46	47	52	B	60	42	41	R	36	35	29	29	29	
2	A	37	32	A	B	R	A	A	44	B	46	46	48	47	48	51	47	R	34	F	31	31	A	A	28	
3	A	32	B	A	A	A	A	A	A	A	R	B	B	B	51	B	R	41	40	36	34	A	A	A	A	
4	A	A	A	A	A	38	A	A	F	F	44	45	44	44	45	46	47	45	45	44	43	41	39	37	37	
5	27	F	F	F	F	F	F	F	F	F	56	53	61	64	61	54	54	54	54	54	52	46	43	44	F	
6	F	F	F	A	A	F	F	F	F	F	50	63	68	61	59	64	62	62	63	60	51	48	44	46	F	
7	A	A	A	A	A	A	A	A	49	52	56	54	52	48	47	48	46	A	46	43	43	40	40	40	40	
8	40	Z	J	R	44	51	51	57	60	64	62	59	54	52	53	54	59	55	48	44	40	41	41	39		
9	33	38	A	35	48	56	52	57	62	62	59	60	60	65	69	68	62	53	42	40	A	32	A	F		
10	A	B	F	F	F	F	F	F	F	F	49	51	55	57	60	64	65	65	65	R	A	F	A	A	A	
11	A	A	A	A	A	A	F	A	44	43	43	46	46	51	54	49	50	F	45	44	40	26	34	A	A	
12	A	A	40	A	A	A	A	A	A	B	R	45	43	49	49	50	B	R	41	43	39	A	A	A	A	
13	A	B	R	F	A	B	A	A	A	B	B	B	B	B	B	48	B	R	B	35	32	35	36	A		
14	B	A	B	R	A	R	55	48	R	F	47	50	50	49	50	53	49	46	42	42	38	31	33	30		
15	A	A	A	A	46	A	A	A	36	42	41	R	42	43	46	49	44	42	39	43	38	36	33	27		
16	30	35	38	41	42	42	46	51	54	52	52	57	56	52	47	44	44	44	44	43	42	39	33	A		
17	R	B	B	B	A	48	50	57	53	49	52	53	56	60	58	51	48	48	45	43	42	37	32	A		
18	39	34	F	B	A	A	A	F	F	F	44	46	52	52	53	54	55	56	55	50	46	45	38	32	F	
19	F	F	F	B	44	50	54	56	62	60	55	54	56	J	R	53	53	50	49	48	A	44	48	40	F	
20	A	R	F	F	F	52	56	61	67	59	54	54	54	52	50	48	49	51	53	51	F	50	44	40	44	
21	F	A	42	40	50	53	70	55	F	F	55	69	53	58	56	56	54	53	50	50	46	41	27	A	A	
22	F	A	A	F	F	F	A	A	57	52	56	57	58	60	58	54	47	44	48	48	A	A	A	A	A	
23	R	A	A	A	A	A	A	A	A	A	40	B	R	48	48	53	48	55	55	55	48	41	40	42	40	40
24	A	R	36	40	A	A	A	A	A	A	A	47	47	50	51	58	61	R	A	45	A	A	A	A	A	
25	R	A	A	36	A	A	A	A	A	B	B	R	B	B	B	F	48	48	48	39	40	A	A	A	A	
26	B	F	B	R	A	B	A	A	A	B	46	44	50	51	58	59	55	52	46	40	35	38	40	A		
27	A	A	A	R	A	A	A	A	A	A	B	B	50	55	63	60	62	49	B	42	39	36	37	34		
28	R	43	A	A	A	A	44	51	B	50	49	50	57	55	57	58	57	58	51	43	A	36	37	43		
29	A	A	A	A	R	J	R	48	50	53	53	57	60	57	60	65	67	62	51	47	44	42	37	31		
30	A	A	A	38	47	F	Z	F	F	F	61	62	56	62	67	72	62	53	58	52	48	50	50	45	41	38
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	11	13	12	13	13	14	15	15	21	21	25	25	27	27	27	29	26	26	25	28	22	22	20	17		
MED	39	37	38	40	44	49	50	55	52	53	52	53	54	53	54	54	50	48	44	43	40	38	37	37		
U Q	F	40	38	41	42	47	52	56	57	62	60	56	57	57	57	58	60	57	52	48	44	42	40	40	40	
L Q	30	34	37	36	38	F	44	46	49	46	50	46	46	48	51	50	49	47	44	42	40	35	35	33	30	

NOV. 2016 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2016 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	34	35	79	38	82	B	52	52	39	B	E	B	E	B	G	B	G	E	B	G	26	27	20	30	20				
2	36	46	46	62	B	36	55	48	38	B	Y	Y	24	23	28	23	E	B	27	27	25	30	33	45	34	25			
3	40	63	B	52	28	51	54	65	66	56	46	B	B	B	E	B	B	E	B	28	28	28	36	40	58	38	47		
4	77	50	64	59	32	26	53	59	44	39	30	G	G	E	B	G	29	25	22	37	20	28	24	34					
5	30	22	27	42	29	35	27	27	26	18	32	31	E	B	40	32	33	30	24	24	22	A	25	57	32	34			
6	13	31	24	48	53	34	24	26	26	18	32	32	32	34	34	32	J	A	94	26	22	59	18	G	25	39			
7	60	47	39	53	55	48	44	32	30	30	30	35	30	34	62	32	65	60	21	21	53	15	14	12					
8	11	15	57	36	42	36	19	14	G	30	22	32	29	32	33	33	28	36	19	22	26	17	18	15					
9	28	30	48	37	27	21	25	26	28	30	34	34	31	31	46	42	35	30	35	35	70	68	44	112					
10	71	B	34	37	61	31	27	27	29	33	33	33	42	43	32	32	27	G	44	41	G	28	47	43	89				
11	47	44	48	50	65	46	33	57	38	G	E	B	32	31	59	G	26	24	28	25	23	48	34	43	46				
12	48	110	88	55	61	48	48	48	52	B	G	G	G	30	28	33	B	E	B	32	25	26	38	47	52	57			
13	50	B	32	55	52	B	55	53	62	B	B	B	B	B	B	E	B	B	B	66	B	23	23	21	G	58			
14	48	57	B	28	53	G	58	43	G	E	B	G	E	B	E	B	E	B	30	30	24	25	26	36	21	19			
15	38	76	55	46	30	G	50	49	47	56	31	31	29	32	28	31	G	G	25	E	B	32	24	56	56	47			
16	17	16	33	36	32	48	31	27	87	28	22	26	82	23	23	28	28	60	34	31	20	18	17	38					
17	26	80	67	B	40	30	17	27	48	46	35	46	61	54	39	32	36	29	24	35	21	G	24	51					
18	34	28	28	B	52	45	59	30	28	33	33	48	47	71	54	65	43	44	59	26	22	19	18	20					
19	17	56	17	17	21	22	25	35	23	G	28	32	33	46	69	44	114	G	35	72	72	15	28	28	30	21			
20	28	G	24	33	30	29	26	27	27	E	B	G	32	54	73	70	41	59	36	40	32	22	22	27	24				
21	31	47	G	38	36	46	41	35	30	48	21	34	51	40	77	65	38	34	23	G	28	22	27	43	48				
22	94	52	44	39	30	24	46	52	34	32	32	28	32	32	32	32	30	21	17	24	43	45	48	42					
23	33	60	41	93	58	55	99	76	53	37	B	E	B	E	B	E	B	G	E	B	E	B	21	32	36	72	49		
24	39	G	39	77	71	98	77	58	58	50	94	G	E	B	E	B	G	42	34	23	114	57	71	74	43	44	52	55	46
25	33	64	45	23	124	52	58	56	72	B	B	29	B	B	B	B	G	24	94	93	57	47	49	44	42	112			
26	B	29	B	39	52	51	62	63	93	B	E	B	E	B	E	B	E	B	E	B	E	B	B	G	23	39	34	53	
27	59	63	58	34	58	46	56	64	50	64	B	B	E	B	E	B	E	B	E	B	E	B	B	G	23	19	34		
28	G	G	96	47	49	48	56	68	B	28	28	30	E	B	E	B	32	42	41	43	33	31	G	23	19	34			
29	83	60	58	48	24	G	40	55	G	32	32	E	B	E	B	42	50	47	39	93	30	32	E	B	25	41	32	32	55
30	32	45	46	30	26	32	32	G	31	30	24	32	34	44	46	90	31	G	24	27	59	22	G	18	18				
31																													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	29	28	27	28	29	28	30	30	29	24	24	26	26	27	27	29	28	30	28	29	30	30	30	30	30				
MED	34	46	45	40	49	42	48	45	38	32	31	31	34	33	33	32	G	29	26	27	28	30	31	40					
U Q	49	60	58	52	58	48	56	57	54	39	34	34	47	44	46	78	41	36	39	36	40	45	43	51					
L Q	28	G	32	36	30	30	27	27	28	G	G	G	32	30	30	30	28	26	24	23	22	20	21	24					

NOV. 2016 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2016 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	27	15	28	46	B	22	16	15	B	41	34	20	20	B	17	15	33	20	17	10	8	7	8	
2	12	16	8	14	B	22	25	14	12	B	19	18	13	13	12	11	27	16	13	12	7	8	8	7	
3	14	7	B	20	9	19	22	21	11	38	39	B	B	B	44	B	28	14	8	14	11	12	9	8	
4	7	10	23	25	12	12	16	16	14	14	16	16	16	21	33	14	12	14	14	13	14	9	7	8	
5	8	8	7	10	8	6	8	7	12	10	16	18	40	18	11	11	12	12	12	11	11	10	12	7	
6	7	6	6	24	15	11	7	8	8	8	11	14	12	11	9	11	14	18	10	10	8	8	8	10	
7	15	12	11	15	15	12	8	7	6	8	8	9	8	10	10	10	11	11	12	6	5	6	5	6	
8	6	7	9	10	12	9	9	7	8	9	12	10	8	8	8	10	8	8	11	13	10	10	7	7	
9	8	8	15	10	10	8	7	7	7	9	8	10	10	10	10	10	10	7	11	9	9	8	9	7	
10	8	B	23	10	8	11	9	8	6	8	10	11	8	10	11	11	10	12	10	8	8	8	8	12	
11	9	9	14	12	22	8	10	18	16	19	32	13	16	11	16	17	14	13	14	8	9	8	5	9	
12	12	16	14	22	12	10	12	12	10	B	23	21	16	13	11	19	B	32	14	11	8	8	18	7	
13	16	B	16	10	34	B	19	18	17	B	B	B	B	B	B	30	B	24	B	10	10	9	8	17	
14	40	11	B	12	11	36	11	15	10	39	14	26	44	46	41	15	15	13	25	26	14	8	8	8	
15	9	33	17	32	23	20	34	12	10	12	11	11	12	9	11	18	16	14	32	15	16	10	8	7	
16	8	7	7	17	13	13	11	8	8	6	13	15	15	15	9	9	9	7	12	8	7	6	6	12	
17	8	43	35	B	19	11	8	8	6	7	9	11	11	12	9	8	10	6	8	7	7	6	9	6	
18	10	10	10	B	14	20	22	9	7	7	10	10	11	12	10	10	9	9	6	8	8	7	12	8	
19	9	8	7	8	7	7	7	7	7	7	8	8	11	7	7	7	8	8	7	8	5	6	7	8	
20	10	12	8	10	11	8	8	8	14	31	17	13	8	8	8	8	7	7	7	6	8	7	5	6	
21	6	10	17	15	12	11	6	8	12	12	8	8	8	7	7	10	10	17	11	8	8	9	16	7	
22	7	7	16	8	11	10	11	12	6	8	6	7	12	12	12	12	8	8	8	8	12	6	11	7	
23	7	16	7	14	13	10	18	16	16	16	B	42	36	32	17	40	29	35	12	8	13	9	9	20	
24	21	17	11	16	20	14	14	19	18	17	17	23	42	34	11	25	13	11	12	8	12	10	10	11	
25	6	9	6	6	12	12	16	16	16	B	B	19	B	B	B	16	12	16	12	10	7	13	14	20	
26	B	6	B	23	15	42	20	34	35	B	40	41	41	42	50	42	42	27	16	12	9	13	19	13	
27	14	6	40	19	33	17	14	24	24	17	B	B	32	42	41	43	33	31	B	19	18	8	8	8	
28	17	10	18	14	19	14	11	8	B	19	14	17	33	42	19	18	40	28	25	14	11	11	10	18	
29	32	46	27	24	16	12	16	9	7	10	42	42	16	16	9	13	21	32	19	24	11	6	7	7	
30	9	14	10	15	11	8	7	6	6	10	10	12	18	11	11	11	11	12	12	12	11	6	8	8	
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	9	10	14	15	13	12	11	10	10	13	15	16	16	13	11	12	12	14	12	10	10	8	8	8	
U Q	14	16	23	23	19	19	18	16	16	38	39	26	36	34	33	18	27	24	16	13	11	10	10	11	
L Q	8	8	8	10	11	10	8	8	7	8	10	11	11	10	9	10	10	9	10	8	8	7	7	7	

NOV. 2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2016 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	A	A	B	B	A	A	E A	A	B	B	240	214	206	B	H	B	A	A	A	A	E A	A		
2	A	228	214	A	B	A	A	A	220	A	B	Y	236	206	202	230	216	222	A	246	A	A	A	254	278	
3	A	286	B	A	E A	A	A	A	A	A	226	B	B	B	B	B	E B	220	204	202	A	A	A	A	A	
4	A	A	A	A	A	E A	A	A	A	A	220	A	204	226	224	220	204	194	H	210	216	218	E A	E A	A	
5	A	E A	A	A	A	210	194	208	194	192	214	214	224	B	202	200	204	204	194	200	228	228	E A	E A	E A	
6	Q	234	260	A	A	A	230	198	210	H	186	202	202	202	E A	228	218	216	216	210	E A	E A	234	248	A	
7	A	A	A	A	A	A	A	228	204	190	194	H	176	198	212	212	198	A	198	198	216	208	234	222	E A	
8	230	A	E A	E A	A	A	218	204	214	200	200	200	198	H	H	186	210	196	210	200	218	E A	240	238	A	
9	E A	272	266	A	220	218	224	218	204	210	208	200	192	206	214	A	212	210	202	A	A	A	A	A	A	
10	A	B	A	A	A	196	200	224	212	204	204	212	198	198	218	212	H	196	196	A	A	208	A	A	A	
11	A	A	A	A	A	A	A	A	A	A	294	230	A	252	220	200	208	210	218	224	Q	278	A	A	A	
12	A	A	A	A	A	A	A	A	A	B	A	214	214	200	200	E A	A	B	E B	278	232	A	A	A	A	
13	A	B	A	A	A	B	A	A	A	B	B	B	B	B	B	214	B	204	B	222	E A	276	240	A	A	
14	B	A	B	A	A	A	202	202	224	A	198	214	B	B	B	214	208	196	226	224	200	A	A	A	A	
15	A	A	A	A	A	A	A	A	212	196	204	190	212	198	198	218	212	200	E B	256	238	E A	244	E A	252	
16	266	E A	A	A	A	A	308	232	198	206	194	184	204	204	196	190	200	200	212	212	A	224	A	A	A	
17	A	B	B	B	A	E A	284	214	194	190	A	E A	220	A	A	204	204	200	198	206	222	220	E A	A	A	
18	A	A	A	B	A	A	A	230	188	204	202	A	A	192	208	A	218	E A	212	212	200	212	230	A	E A	232
19	E A	E A	A	A	A	228	226	216	216	200	200	202	192	E A	A	198	A	204	204	A	204	226	226	A	E A	270
20	A	A	E A	A	A	E A	272	218	208	214	202	202	198	202	A	A	216	200	200	206	206	198	210	A	A	
21	A	A	A	A	A	A	228	196	186	206	194	194	A	H	A	E A	A	A	202	220	216	E A	A	A	A	
22	224	A	A	E A	A	A	A	A	196	212	204	188	218	204	196	192	H	210	208	208	208	A	A	A	A	
23	A	A	A	A	A	A	A	A	A	202	B	B	E B	264	204	204	212	222	222	194	A	A	A	A	A	
24	A	A	A	A	A	A	A	A	A	A	A	A	A	B	E B	256	222	222	A	A	222	A	A	A	A	
25	A	A	A	A	A	A	A	A	A	A	B	B	R	B	B	B	218	218	A	218	A	A	A	A	A	
26	B	A	B	A	A	B	A	A	A	B	B	B	B	B	B	B	B	B	224	204	272	224	A	A	A	
27	A	A	B	A	A	A	A	A	A	A	B	B	208	B	B	B	B	E B	B	B	214	E A	E A	200	A	
28	A	A	A	A	A	A	A	A	224	B	E Y	242	196	196	214	B	214	210	202	E B	218	196	196	A	A	
29	A	A	A	A	A	A	A	206	220	218	A	B	B	A	A	H	E A	202	220	206	222	E A	E A	E A	E A	
30	A	A	A	A	196	206	198	190	H	210	210	200	196	214	246	206	A	190	196	204	E A	250	222	222	230	232
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	6	7	5	5	6	11	12	15	19	17	20	21	17	20	20	24	25	25	24	22	19	16	10	11		
MED	234	265	213	A	213	210	211	210	203	204	202	202	209	204	204	211	208	202	210	216	217	226	234	E A	240	
U Q	266	286	281	E A	274	272	230	218	224	214	211	208	217	216	219	218	218	E	214	221	224	238	234	E A	E A	270
L Q	230	260	210	202	210	196	201	196	192	201	198	192	203	199	198	204	200	199	204	208	212	223	230	E A	232	

NOV. 2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2016 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 42	71	52	59	X 61	70	73	73	80	75	70	69	69	X 62	X 65	X 63	X 64	X 62	X 59	X 56	X 56	X 50	X 47	X 53
2	X 53	X 55	X 57	O 62	X 70	X 79	X 82	X 84	X 82	X 85	X 66	X 66	X 72	X 68	X 70	X 64	X 67	X 66	X 64	X 56	X 53	X 46	X 44	X 58
3	X 45	R	A	X 54	O 64	X 65	80	82	81	X 79	X 73	X 64	X 66	X 66	A	X 64	X 71	X 65	X 56	X 57	X 53	X 51	X 43	X 42
4	X 42	X 50	X 48	X 58	X 64	X 70	X 70	X 78	X 78	X 78	X 75	X 69	X 65	X 62	X 65	X 64	X 63	X 58	X 59	X 52	X 53	X 52	X 52	X 52
5	X 58	X 58	X 76	X 52	X 55	A	A	X 70	X 71	X 72	X 71	X 64	X 64	X 66	X 63	X 58	X 62	X 62	X 58	X 55	X 55	X 50	X 48	X 41
6	X 43	X 40	X 48	X 83	X 112	A	X 84	X 88	X 79	X 73	X 66	X 66	X 69	X 70	X 65	X 62	X 63	B	B	X 50	X 44	X 44	X 44	X 44
7	X 54	A	A	O 65	X 48	X 58	X 59	X 64	X 57	R	X 59	X 59	X 66	X 77	X 83	X 73	X 62	X 54	X 41	X 45	X 96	X 60	X 68	A
8	R	A	78	A	A	96	A	A	69	51	57	51	50	X 49	X 55	X 55	X 60	X 43	X 46	X 44	X 41	X 38	X	A
9	B	B	B	A	B	X 55	60	A	50	X 52	X 55	X 57	X 58	X 52	X 54	X 59	X 62	X 52	B	X 48	X 44	X 78	A	A
10	A	A	R	R	A	A	A	A	A	A	A	R	A	B	O 54	X 49	X 49	X 44	X 45	X 50	X 41	A	A	A
11	R	R	B	B	B	A	A	A	B	R	R	X 50	X 49	X 54	X 53	X 55	X 55	X 52	X 46	X 41	X 44	X 44	X	X
12	A	B	A	A	A	A	A	A	X 45	X 58	X 55	X 46	X 50	X 54	X 49	X 49	X 49	X 51	X 50	X 46	X 46	X 46	X 49	X 46
13	X 43	91	A	A	A	A	A	A	X 50	X 57	X 60	X 56	X 58	X 54	X 54	X 53	X 53	X 51	X 50	X 50	X 45	X 45	X 45	X 48
14	X 44	X 36	X 43	X 49	X 57	X 54	X 70	X 66	X 63	X 70	X 64	X 65	X 58	X 60	X 62	X 61	X 58	X 56	X 51	X 48	X 52	X 46	X 42	X 39
15	X 46	X 45	X 45	X 48	X 54	X 54	X 58	X 58	X 64	X 66	X 62	X 60	X 56	X 58	X 58	X 57	A	X 54	X 56	X 53	X 52	X 53	X 49	X 42
16	X 43	X 42	X 46	X 51	X 54	X 58	X 55	X 60	X 66	X 66	X 66	X 63	X 60	X 64	X 55	X 58	X 52	X 52	A	X 56	X 53	X 54	X 52	X 52
17	X 43	X 48	X 49	X 52	X 54	X 64	X 69	X 74	X 76	X 76	X 70	X 57	X 54	X 53	X 53	X 52	X 53	X 58	X 56	X 59	X 52	X 46	X 43	X 42
18	A	A	A	X 39	A	X 81	X 53	A	A	A	R	O 51	X 54	X 56	X 52	X 53	X 53	X 54	X 52	X 48	X 49	X 42	X 48	X 41
19	X 41	X 56	X 48	X A	X A	X 44	X A	X 64	X 64	X 56	X 54	X 56	X 56	X 65	X 65	X 59	X 59	X 56	X 54	X 55	X 47	X 43	X 44	X
20	A	A	X 39	X 46	X 50	X 56	X 50	X 49	X 51	X 54	X 57	X 58	X 61	X 62	X 72	X 62	X 60	X 52	X 52	X 48	X 41	X 46	X 46	X 45
21	O 65	X 44	X 71	A	A	X 55	X 58	X 60	X 62	X 60	X 63	X 60	X 54	X 61	X 69	X 74	X 47	X A	X 84	A	A	X 50	X 46	X
22	A	R	A	A	X 38	X 41	A	A	O 42	X 48	X 49	B	X 55	A	O 57	X 48	X 46	X 44	X 43	A	A	X 72	A	A
23	X 58	X 47	X 48	X 41	X 86	X 40	X B	A	B	O 50	X 53	X 57	X 60	X 64	X 64	X B	X B	A	X 49	X 53	X 45	X A	X A	X
24	B	B	X 48	B	B	A	A	A	X 52	X 54	X B	X 66	X 64	X 59	X 54	X 54	X 47	X 44	X 46	X 44	X 46	X 46	X 46	X
25	A	A	A	A	A	A	A	A	X 52	X 53	X 53	X 56	X 56	X 63	X 63	X 56	X 52	X 42	X 44	X 42	X 85	A	A	A
26	A	A	A	X 39	A	59	R	B	A	A	A	X 54	X 58	X 61	X 61	X B	X 58	X 43	X 42	X 58	X 46	X 41	X 41	X
27	A	A	A	A	A	A	A	X 48	X 50	X 54	X 51	X 52	X 55	X 58	X 55	X 52	X 50	X 48	X 49	X 44	X 43	X 43	X 42	X
28	X 47	O 45	X 45	A	X 42	X 48	X 52	X 58	X 63	X 66	X 70	X 70	X 65	X 60	X 58	X 52	X 53	X 50	X 48	X 49	X 46	X 42	X 40	X 44
29	X 46	X 40	X 42	O 41	B	A	A	X 55	X 60	X 61	X 60	X 63	X 58	X 61	X 58	X 59	X 57	X 57	X 46	X 42	X 45	X 42	X 47	X 41
30	X 40	X 42	X 45	X 44	A	A	X 51	X 55	X 58	X 58	X 57	X 58	X 57	X 54	X 53	X 54	X 54	X 57	X 52	X 50	X 42	X 46	X 47	X 40
31	X 39	A	X 56	A	X 54	X 57	X 65	X 63	X 70	X 70	X 74	X 68	X 68	X 63	X 63	X 78	X 73	A	O 40	X 45	X A	X A	X A	X 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	19	16	19	17	15	18	19	18	24	24	27	29	28	30	29	29	28	25	26	30	30	26	24	22
MED	X 44	X 46	X 48	X 51	X 54	X 58	X 59	X 64	X 63	X 65	X 60	X 58	X 58	X 60	X 61	X 58	X 58	X 54	X 50	X 49	X 46	X 46	X 47	X 43
U Q	53	56	56	58	64	70	70	74	70	72	70	64	65	63	64	62	62	58	56	54	53	50	50	46
L Q	X 42	X 42	X 45	X 42	X 50	X 55	X 52	X 58	X 52	X 56	X 55	X 54	X 56	X 54	X 54	X 54	X 53	X 52	X 46	X 45	X 44	X 44	X 44	X 41

DEC.2016 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2016 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	00	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	49	Z 46	F 50		F 55	F 60	F 60	F 62	F 62	F 60	F 58	F 55	F 55	56	59	57	58	55	53	50	50	44	41	46			
2	47	49	51	56	64	73	76	78	76	F 60	60	F 50	F 50	Z 66	62	64	58	61	60	58	50	47	40	38	37			
3	39		R A	48	F 49	59	F 64	F 71	75	73	R 67	58	60	60		A	58	65	59	50	51	47	45	37	32			
4	36	F 36	F 42	F 45	J 58	R 63	R 64	R 72	74	72	69	63	59	56	59	58	57	52	53	46	47	46	46	46				
5	F 44	F 40	F 41	F 46	48		A	A	F 60	Z 65	Z 66	65	58	58	60	57	52	56	56	52	49	49	44	42	35			
6	37	34	F 37	R 39	F 46	A	F 54	Z 82	73	F 67	60	60	60	F 60	64	59	56	57		B	B	44	38	38	38			
7	F 37	A	A	R 42	R 42	F 46	J 53	R 52	F 51	A	Z 53	53	60	F 66	F 67	F 57	56	48	35	39	F 51	54		A	A			
8	A	A	25	A	A	A	A	A	F 44	R 45	51	45	44	43	49	49	50	54	37	40	38	35	32		A			
9	B	B	B	A	B		F 49	F 44	A	A	46	49	51	52	46	48	53	56	46		R	B	42	38	62	A	A	
10	A	A	R	R	A	A	A	A	A	A	A	R	A	B	R 48	43	43		R	38	39	44	35		A	A		
11	R	R	B	B	B	A	A	A	B	R	R		44	43	48	47	49	49	46	40	35	38	38		A	32		
12	A	B	B	A	A	A	B	A		J 39	R 52	R 49	R 40	44	48	43	43	43	45	44	40	40	40	43	40			
13	37		A	A	A	A	A	A		44	46	F 49	F 50	52	48	48	47	47	45	44	44	39	39	39	42			
14	38	30	37	R 39	F 46	48	F 54	F 50	F 49	F 59	58	59	52	54	56	55	52	50	45	42	46	40	36	30				
15	F 33	F 33	39	42	44	48	52	52	58	60	56	54	50	52	52	51		A	48	50	47	46	F 44	43	36			
16	F 31	36	40	45	48	45	F 49	54	60	60	F 55	57	54	58	49	52	46	46		A	50	47	48	46	46			
17	37	F 33	J 43	R 46	F 48	F 54	F 63	F 61	70	70	F 60	51	48	47	47	R 46	47	52	50	53	46	40	37	36				
18	A	A	A	33	A	R 40	F 43	A	A	A	A		45	48	50	46	47	47	48	46	F 36	43	36	42	35			
19	35	F 43	42		A	A	38		51	F 49	50	48	50	50	59	53	53	53	50	47	J 49	R 41	37	38				
20	A	A	33	40	44	A	44	43	45	48	51	52	55	56	66	56	54	46	42	F 42	R 42	35	40	40	39			
21	R 45	38	A	A	A	A	49	52	F 48	F 53	F 48	F 47	F 47	48	55	63	68	41		A			A	44	40			
22	A	R	A	A	32	35	B	A	36	B	R 42	U 43	R 43	B	49		51		R	42	40	38	37		A	A	A	
23	F 33	F 34	F 38	35	B	A	34	B	A	B	R 44	F 42	F 51	54	58		B	B	B		F 43	40	38		A	A	A	
24	B	B	42	B	B	A	A	A		46	R 48	B	B	F 56	58	53	48	48	41	38	J 40	R 38	40	38	40	A		
25	A	A	A	A	A	A	A	A	46	47	47	50	50	57	57	50	46		B	36	38	36			A	A	A	
26	A	A	A	33	A	R 46	R	B	A	A	A		48	52	55	55	B	52		B	37	36	37	40		A	35	
27	A	A	A	A	A	A	A		42	44	F 44	45	46	49	52	49	46	44	42		A	43	38	37		R	36	
28	41	39	39		36	42	46	52	57	60	64	64	59	54	52	46	47	44	42	43	40	36	34	38				
29	40	34	36	35	B	A	A		49	54	55	54	57	52	55	52	53	51	51	40	36	39	36	41	35			
30	34	36	39	38	A	A	45	49	52	52	51	52	51	48	47	48	48	51	46	44	36	40	40	34		A	A	A
31	33	A	R 38	A	48	F 45	F 51	57	64	64	68	62	53	57	57	F 68	F 64		A	R 34		39				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	19	15	18	17	15	15	19	18	25	24	27	29	28	30	29	29	28	25	26	29	30	26	21	22				
MED	37	36	39	42	48	48	51	53	52	57	53	51	52	54	55	52	52	48	44	42	40	40	40	36				
U Q	40	40	42	46	49	59	60	62	64	62	60	58	56	57	58	56	56	52	50	47	47	44	42	40				
L Q	F 34	34	37	36	44	45	44	50	44	48	49	46	50	48	48	48	47	46	40	38	38	38	37	35				

DEC.2016 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2016 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

$\frac{H}{D}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	26	^E 34 ^B	26	26	28	40	17	^G 28	^G 27	34	34	29	^G 32	^G	32	23	^G 23	26	28	16	^G 22	22	^G 22	^G 15	
2	15	15	17	79	29	24	28	^G 30	^G 32	39	34	^G	^G	45	57	42	30	27	22	24	^G	42	56	90	
3	32	29	49	36	40	18	26	26	30	45	18	43	63	69	114	90	40	44	43	36	28	^G 19	28	50	
4	93	22	^G 14	^G 19	^G	24	26	30	31	32	34	28	42	36	32	32	28	28	101	23	23	22	22	15	
5	18	35	40	30	44	60	58	31	32	32	32	34	34	34	37	^G	29	30	30	26	^G 18	22	22	24	
6	20	42	32	38	38	56	43	28	30	30	32	35	45	49	34	25	^G	^G	^B	^B	34	70	30	25	36
7	36	65	81	44	26	39	52	44	41	53	34	96	140	98	96	32	^E 33 ^B	^E 31 ^B	65	26	46	60	57	60	
8	49	90	^G 19	69	68	99	58	66	25	93	96	92	28	30	32	^G	63	29	34	^G	25	46	29	73	
9	^B	^B	^B	66	^B	46	96	52	36	29	^E 40 ^B	^E 42 ^B	^E 44 ^B	34	22	^G 43	132	129	92	39	26	34	98	62	
10	95	125	40	35	91	47	53	55	58	72	34	35	124	^B	^B	^G 33	18	76	^E 31 ^B	60	35	24	32	43	91
11	^G	35	^B	124	75	70	42	64	^B	44	35	22	24	^G	^G	^E 41 ^B	40	40	40	60	24	24	21	45	30
12	40	^B	43	49	45	50	48	77	65	72	^E 31 ^B	126	^E 38	38	60	28	68	26	25	53	21	18	56	19	
13	29	56	50	46	55	59	58	59	30	^G	30	33	44	35	32	30	^G	28	44	27	69	26	70	22	
14	34	18	30	32	44	40	35	27	27	31	40	39	77	44	35	51	67	63	68	25	23	23	21	21	
15	56	34	18	24	^G 17	25	^G	28	29	28	32	34	35	46	41	52	59	70	36	25	23	20	20	22	
16	36	27	22	24	23	25	28	28	33	30	34	34	46	37	82	68	68	76	75	64	30	20	29	29	
17	22	20	20	36	26	26	26	28	38	33	^G	32	34	43	77	66	41	31	33	28	21	36	33	40	
18	46	72	56	24	99	29	30	47	62	67	48	43	90	32	58	62	58	64	^E 31 ^B	^G	31	31	42	42	
19	42	42	56	76	75	60	57	60	45	47	31	32	32	^E 42 ^B	36	^G	29	27	27	24	32	40	40	45	
20	44	^G	35	35	46	44	39	64	32	30	30	35	35	35	32	31	29	^G 32	^G 33	37	39	31	52	24	
21	29	36	38	65	57	82	42	40	39	41	^G	^G	32	32	36	41	39	125	46	27	49	57	49	56	
22	52	33	62	46	46	^G 138	47	30	130	128	^G	^B	128	130	114	141	86	25	30	24	46	58	56		
23	33	83	73	81	96	114	58	^B 124	^B	34	^B	^E 41 ^B	^E 33 ^B	132	124	^B	132	56	37	^G	20	100	50	98	
24	^B	^B	41	^B	^B	56	64	70	66	^G 44	^B	^B	^E 28 ^B	^E 42 ^B	38	33	41	33	34	57	39	32	55		
25	48	49	81	50	80	58	58	48	30	64	35	34	30	30	117	114	114	^B	^B	63	33	30	104	38	70
26	60	58	60	57	96	124	117	^B 128	116	127	136	^E 39 ^B	^E 41 ^B	41	41	^B	32	^B	34	59	39	27	44	57	
27	42	92	60	38	122	126	59	48	36	41	74	96	32	33	123	^E 32 ^B	31	29	114	32	29	50	22	58	
28	36	40	63	72	48	57	58	68	^E 39 ^B	34	34	34	32	110	33	26	^G 30	^G	^G	27	26	18	^G 21	16	
29	30	22	21	32	^B	51	50	40	32	33	32	32	41	44	31	41	30	30	^G	25	42	40	23	21	
30	58	58	30	27	64	46	32	^G	30	30	30	35	35	39	47	33	44	28	27	22	^G	^G	21	19	26
31	30	45	34	51	37	35	25	29	29	31	^G	^G	^G 20	34	32	^G	32	50	50	56	57	57	51	45	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	28	29	30	28	31	31	29	30	30	31	29	29	30	31	30	30	28	30	31	31	31	31	31	
MED	36	38	40	41	46	47	48	44	32	34	34	34	34	36	39	34	34	32	35	27	26	31	38	42	
U Q	48	58	58	65	75	60	58	60	41	53	40	42	44	44	77	52	63	64	60	36	39	46	51	58	
L Q	29	28	24	32	33	29	28	28	30	30	31	34	32	33	32	28	^G	^G	28	28	24	22	22	22	22

DEC.2016 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2016 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	8	34	12	11	9	8	7	7	10	10	13	11	11	13	12	10	10	15	9	10	11	8	8	10		
2	7	8	10	6	8		8	14	21	12	20	13	25	16	16	18	14	11	16	11	20	20	9	9		
3	8	20	19	12	12	6	8	9	9	12	12	11	11	11	8	6	11	8	10	8	9	8	7	8		
4	10	9	8	7	9	8	8	9	7	8	10	11	10	10	7	10	13	10	10	9	9	9	7	7		
5	7	11	16	12	12	20	12	10	9	10	10	9	7	10	10	7	7	9	9	7	8	8	10	13		
6	8	11	10	27	10	17	8	7	7	7	6	7	6	8	7	7	10		B	B	15	8	8	7		
7	8	12	12	21	8	12	11	10	8	11	13	12	29	19	19	24	33	31	8	8	10	7	12	8		
8	8	8	8	12	16	14	10	11	17	14	34	22	12	7	11	9	14	14	10	10	9	7	8	12		
9	B	B	B	8		11	19	14	8	9	40	42	44	34	11	43	43	32	42	11	13	10	6	18		
10	42	42	11	10	8	20	38	18	20	14	34	35	46		32	13	11	31	7	11	8	8	9	10		
11	22	7		56	55	13	18	32		18	14	14	11	21	41	40	40	40	12	11	16	8	8	11		
12	14		36	13	19	24	35	19	14	11	31	25	38	27	17	16	9	10	10	12	10	6	8	7		
13	10	12	13	11	11	9	23	12	7	8	7	7	10	12	8	11	11	11	11	8	8	11	8	10		
14	9	6	7	10	10	10	6	7	7	8	8	8	13	8	8	8	18	30	14	16	15	8	6	7		
15	9	9	7	7	8	6	20	12	14	18	18	16	12	14	11	16	12	12	12	12	9	9	8	6		
16	6	9	7	8	8	8	6	7	7	7	7	7	11	8	8	9	7	7	7	8	8	9	6	6		
17	7	9	7	6	6	6	6	7	8	8	5	8	8	11	8	8	8	8	8	8	7	7	8	9		
18	7	13	10	8	10	8	8	14	11	14	15	12	12	8	8	8	8	11	31	11	12	6	6	9		
19	10	8	10	10	7	7	12	12	12	8	8	7	7	23	42	21	23	20	16	11	8	8	8	12		
20	12	20	11	13	12	10	8	7	7	8	9	9	9	13	13	15	15	15	10	8	10	13	12	16		
21	7	7	8	12	7	16	12	10	15	11	10	10	8	8	8	8	16	10	10	10	7	14	13	10		
22	40	20	9	7	8	8	40	9	13	45	24	18		34	52	26	19	16	12	7	11	11	30	23		
23	6	8	8	7	44	18	10		33		20	40	41	33	28	92		56	15	9	10	10	10	8		
24	B	B		B	B		36	16	12	12	11	44		28	42	38	32	41	33	34	9	8	8	18		
25	12	11	18	8	20	19	14	10	10	7	12	14	18	12	33	14	14		B		8	7	7	12	10	9
26	11	17	8	6	16	37	44		27	34	40	32	39	41	41		27		B		11	11	8	8	8	
27	24	13	37	19	28	31	37	17	20	13	13	26	10	10	31	31	16	16	21	13	9	8	7	8		
28	19	16	19	16	23	8	8	20	39	17	17	13	7	16	9	13	12	9	11	9	7	9	11	8		
29	6	8	10	11		20	12	8	7	7	7	10	10	7	11	13	10	10	10	11	9	8	8	6		
30	10	10	20	11	20	10	7	9	10	8	8	9	7	10	6	9	9	9	9	9	7	8	8	7		
31	15	15	14	13	10	9	7	8	10	10	16	16	9	8	9	8	10	10	10	10	6	11	7	8		
	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	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
MED	10	11	10	11	11	10	11	10	10	11	13	12	11	12	11	13	13	14	10	10	9	8	8	9		
U Q	15	20	18	13	20	19	19	14	17	14	20	22	29	23	31	24	19	31	15	11	10	10	10	11		
L Q	7	8	8	8	8	8	8	8	8	8	8	9	9	8	8	8	10	10	9	8	8	8	7	7		

DEC.2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2016 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

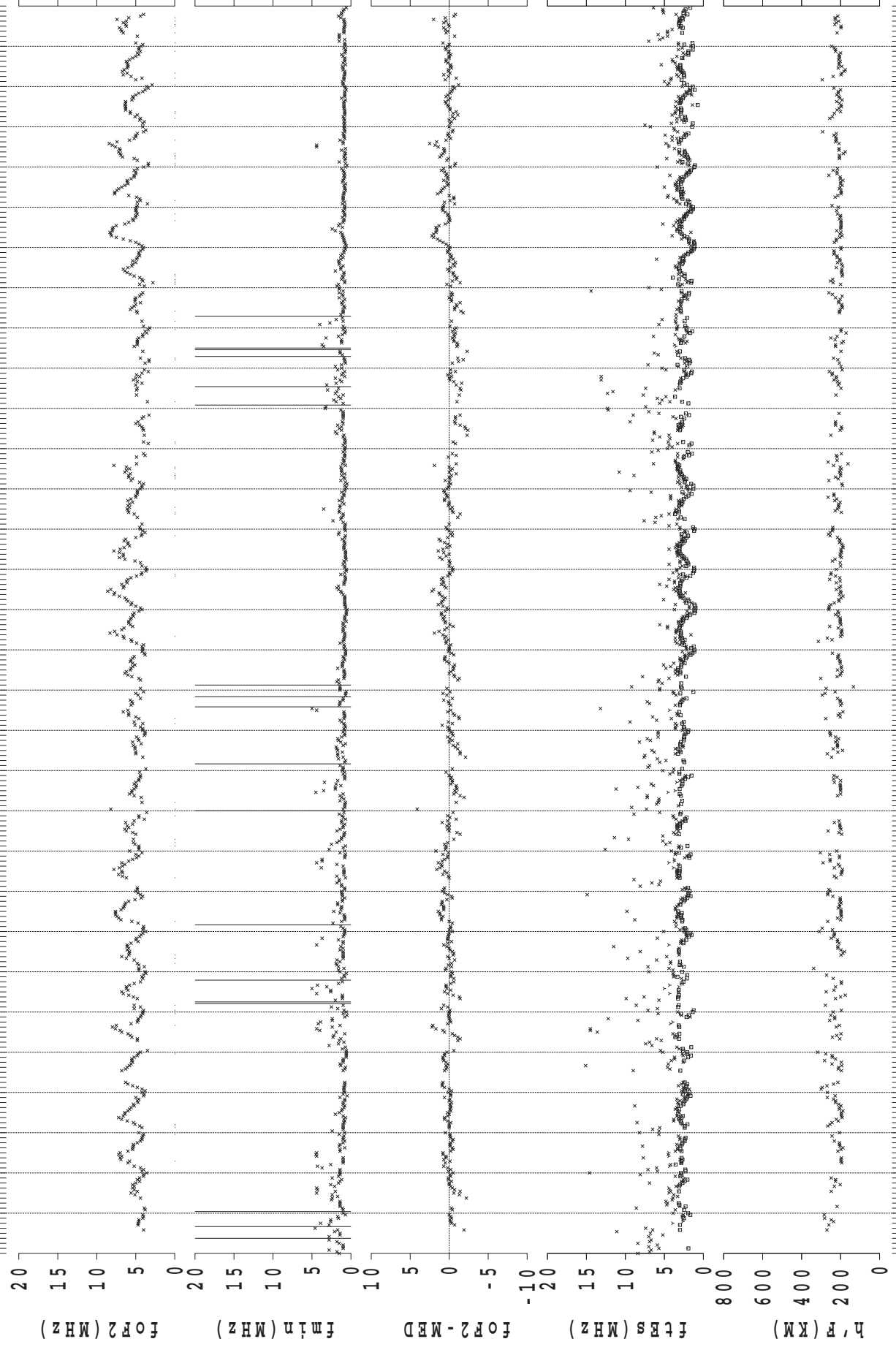
LAT.69°00.4'S LON.039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	B	A	A	E A	278	198	208	198	200	210	210	196	188	192	210	210	206	206	206	206	232	214	204	236
2	A	A	A	E A	234	224	202	E A	E A	220	208	196	198	228	A	198	198	206	200	218	224	228	E A	E A	A
3	E A	A	A	A	A	A	260	208	198	198	200	196	202	A	A	A	204	198	E A	E A	222	204	196	E A	E A
4	228	A	230	210	212	206	210	190	E A	236	210	220	200	194	198	198	230	202	196	204	204	200	208	228	224
5	A	220	220	196	A	A	A	204	H	218	192	160	216	216	200	204	196	H	208	212	202	218	208	E A	E A
6	E A	A	A	A	A	A	200	182	H	188	194	194	204	204	200	192	190	202	B	B	A	E A	E A	A	A
7	232	A	A	E A	232	A	A	A	A	A	204	204	A	A	E A	216	216	E B	218	208	220	A	A	A	A
8	A	A	222	A	A	A	A	A	202	226	248	B	E A	210	202	206	222	204	E A	300	214	222	E A	E A	A
9	B	B	B	A	B	A	A	A	200	206	A	B	B	B	206	198	A	B	B	B	B	E A	A	A	A
10	A	B	A	A	A	A	B	A	A	A	226	E B	A	B	B	206	208	E B	250	204	288	228	A	A	A
11	A	A	B	B	B	A	A	A	B	A	216	206	200	200	A	B	B	B	B	212	A	204	A	A	A
12	A	B	B	A	A	A	B	E A	E A	236	200	218	A	B	A	204	188	202	202	200	198	196	210	216	E A
13	A	A	A	A	A	A	A	A	204	190	190	228	E A	E A	222	200	192	200	A	A	206	198	228	228	238
14	E A	232	E A	E A	A	A	204	204	188	214	202	202	210	196	A	A	208	A	A	192	214	210	210	234	224
15	204	204	232	E A	232	208	206	196	200	196	228	182	210	200	E A	262	200	A	A	210	228	198	222	198	E A
16	E A	250	200	212	208	188	198	186	192	190	194	214	204	208	A	A	218	A	A	A	A	218	218	224	206
17	A	234	246	E A	238	224	214	194	194	194	194	194	192	198	198	216	A	198	196	206	208	212	A	A	A
18	A	A	A	222	A	216	204	A	A	A	A	A	A	226	218	200	200	202	H	E A	E B	222	234	190	A
19	A	A	A	A	A	A	A	A	A	E A	222	188	188	206	A	B	228	212	214	214	224	E A	A	A	216
20	A	A	A	A	A	A	A	H	160	192	234	190	198	204	196	220	194	208	208	208	236	A	E A	E A	E A
21	E A	246	A	A	A	A	A	A	216	E A	196	196	190	190	194	198	232	E A	222	188	A	216	A	A	A
22	A	A	A	A	E A	222	B	A	A	B	E A	224	196	248	B	E A	222	210	202	202	256	A	A	A	A
23	E A	284	A	A	B	E A	256	B	B	B	A	B	B	B	E B	204	A	B	B	B	220	214	A	192	A
24	B	B	A	B	B	B	A	A	192	B	B	B	B	210	B	B	212	B	B	E B	232	B	A	A	A
25	A	A	A	A	A	A	A	A	198	206	206	210	222	190	234	198	210	228	E A	270	A	A	A	A	A
26	A	A	E A	E A	E A	234	A	B	A	A	E A	236	B	B	B	B	206	B	A	210	A	A	A	E A	232
27	A	A	B	A	A	B	A	A	214	A	196	212	198	202	214	200	194	200	200	E A	E A	230	230	230	242
28	A	A	A	A	248	280	246	A	B	A	198	212	198	202	H	204	186	190	202	196	230	196	210	200	242
29	E A	E A	E A	A	B	A	A	236	202	196	208	186	198	186	198	212	186	208	180	204	A	230	244	E A	234
30	A	E A	A	A	A	A	A	186	210	198	196	196	190	H	H	H	200	200	206	198	198	208	238	226	248
31	A	A	A	A	A	228	198	192	188	182	182	186	186	196	214	196	214	A	A	A	A	E 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	11	10	10	10	8	12	13	15	21	22	25	26	21	27	23	22	27	21	24	24	22	18	17	16	
MED	E A	231	230	227	219	212	202	196	198	200	196	201	199	201	204	200	203	204	204	210	212	213	222	237	
U Q	E A	E A	E A	E A	A	A	A	E A	E A	A	216	214	209	212	208	214	218	216	210	216	224	227	230	230	243
L Q	218	228	222	210	210	206	198	186	193	194	192	196	196	196	196	198	196	198	201	200	204	204	208	220	228

DEC.2016 h'F (KM)

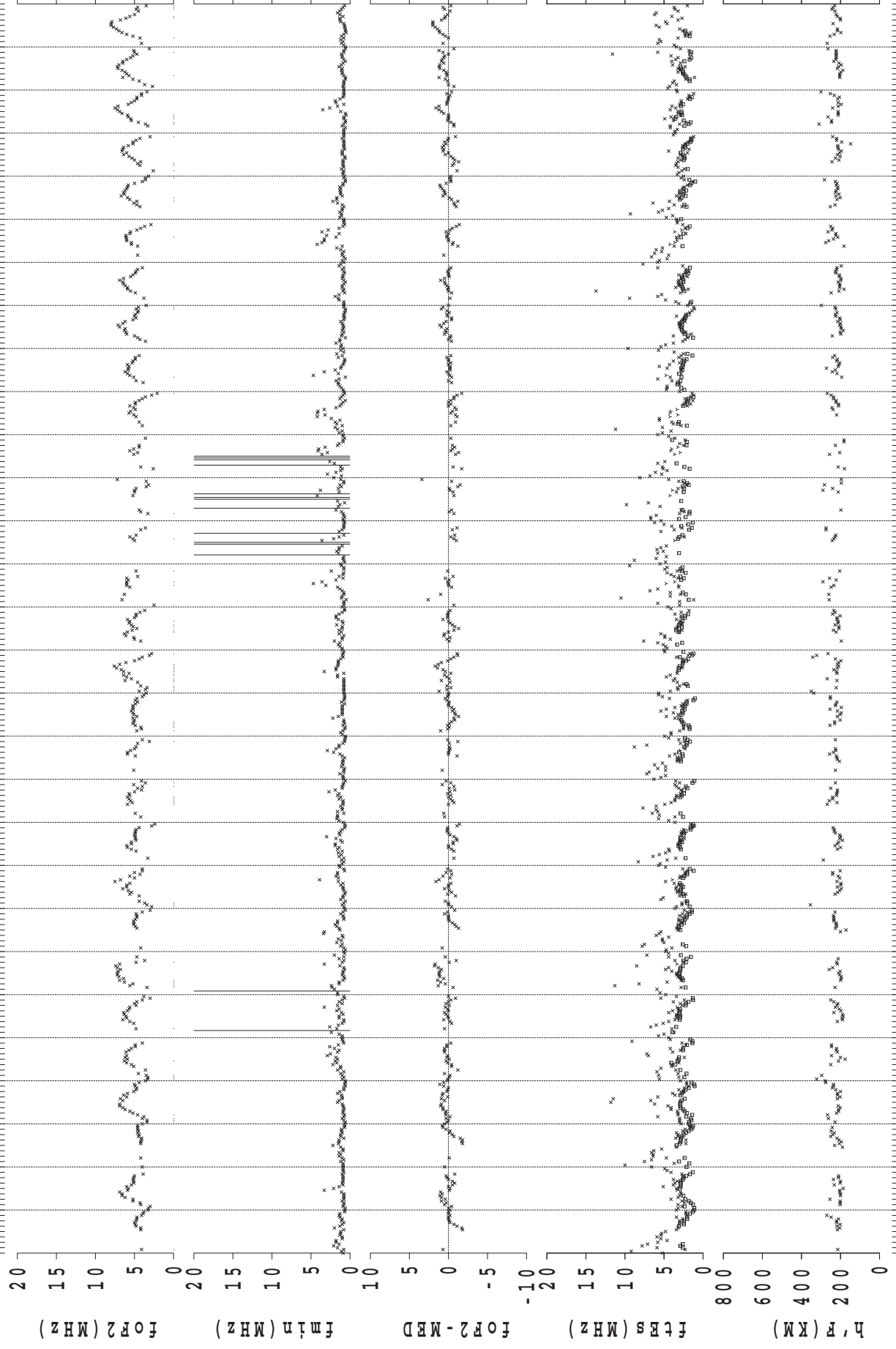
NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

2016 0101 -> 2016 0131(99) SYOWA-ST.



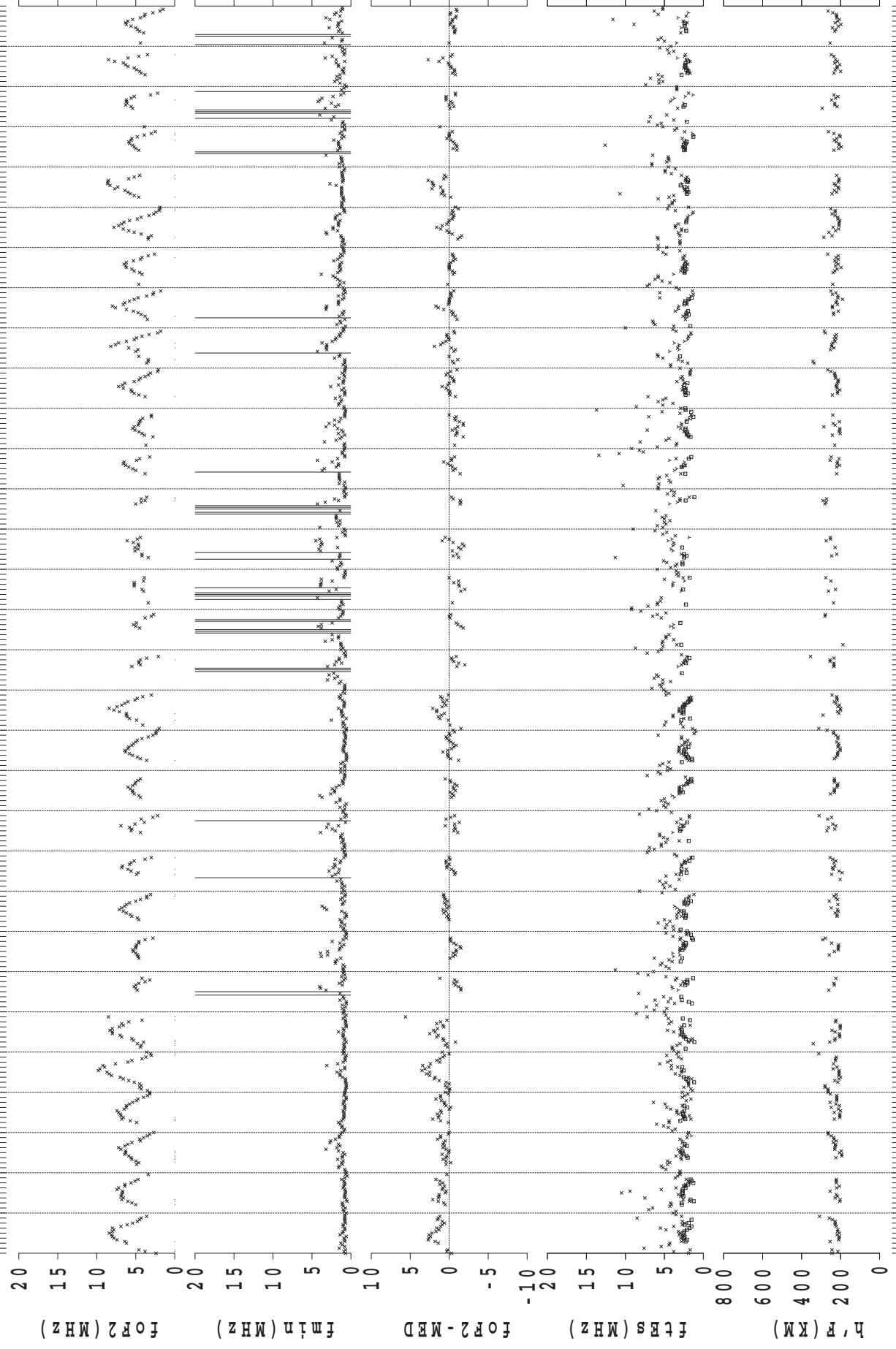
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45° EMT

2016 0201 -> 2016 0229 (99) SYOWA-ST.



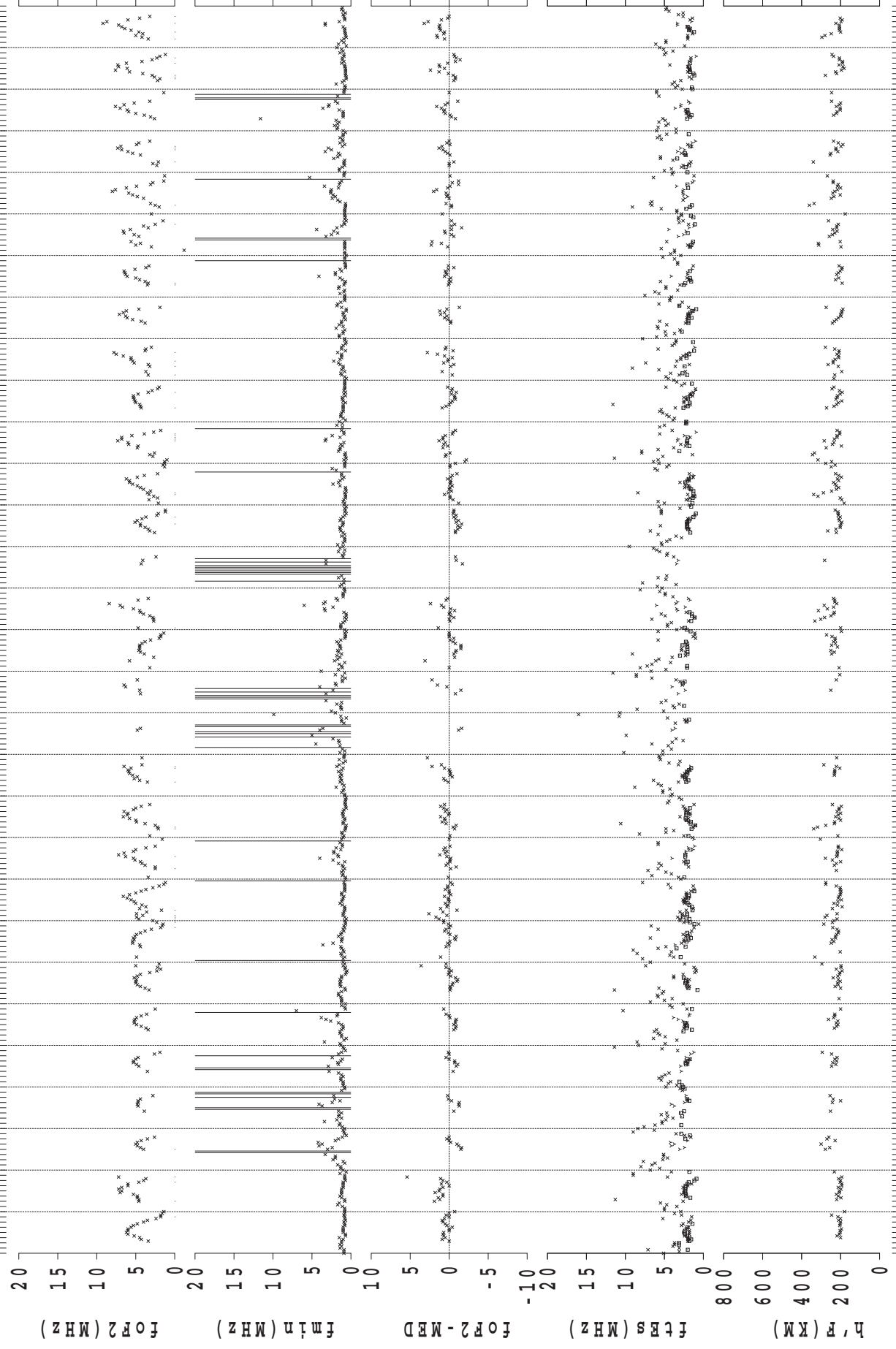
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 DAY/45° EMT

2016 0301 -> 2016 0331(99) SYOWA-ST.



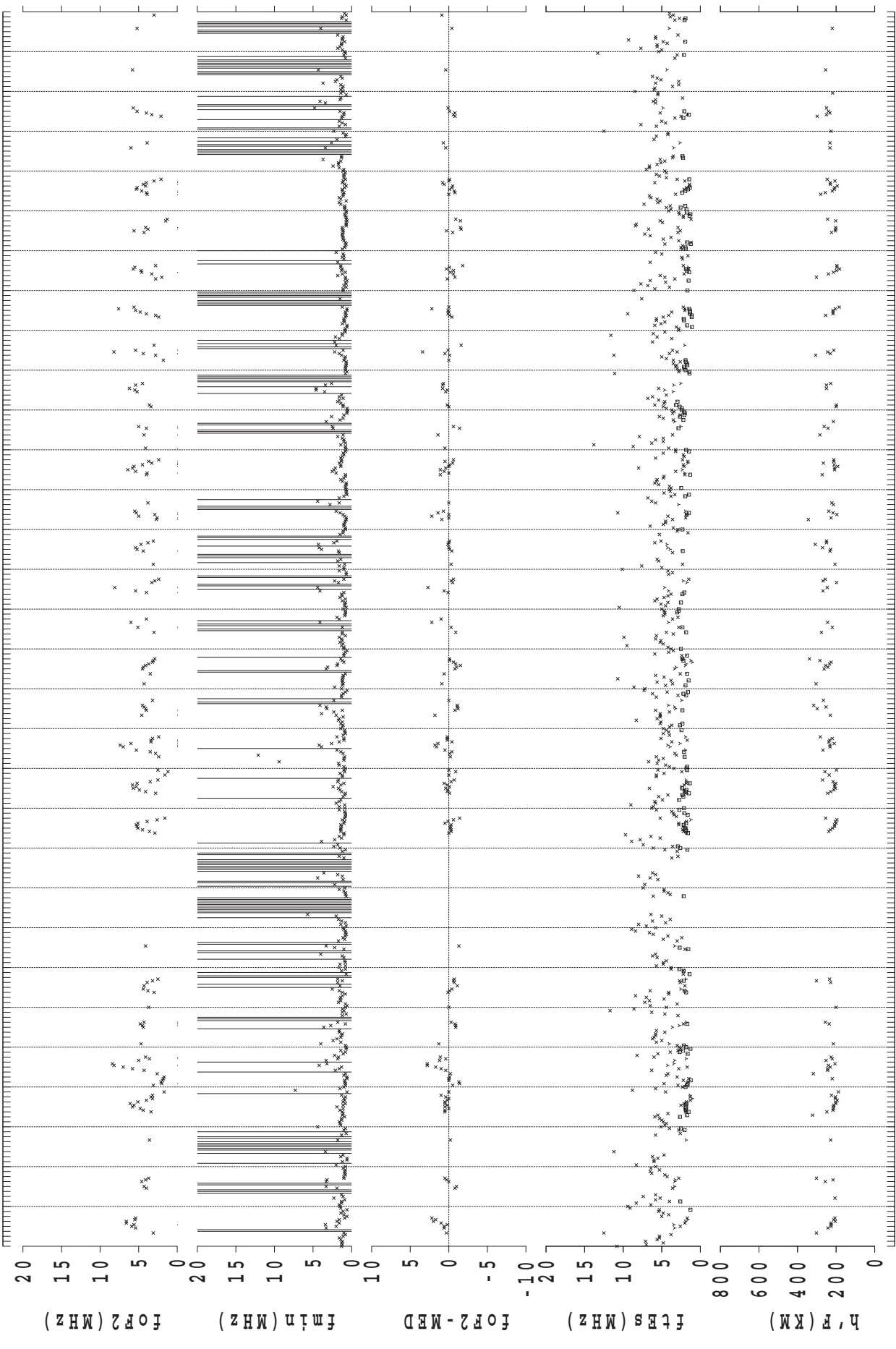
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45° EMT

2016 0401 -> 2016 0430 (99) SYOWA-ST.



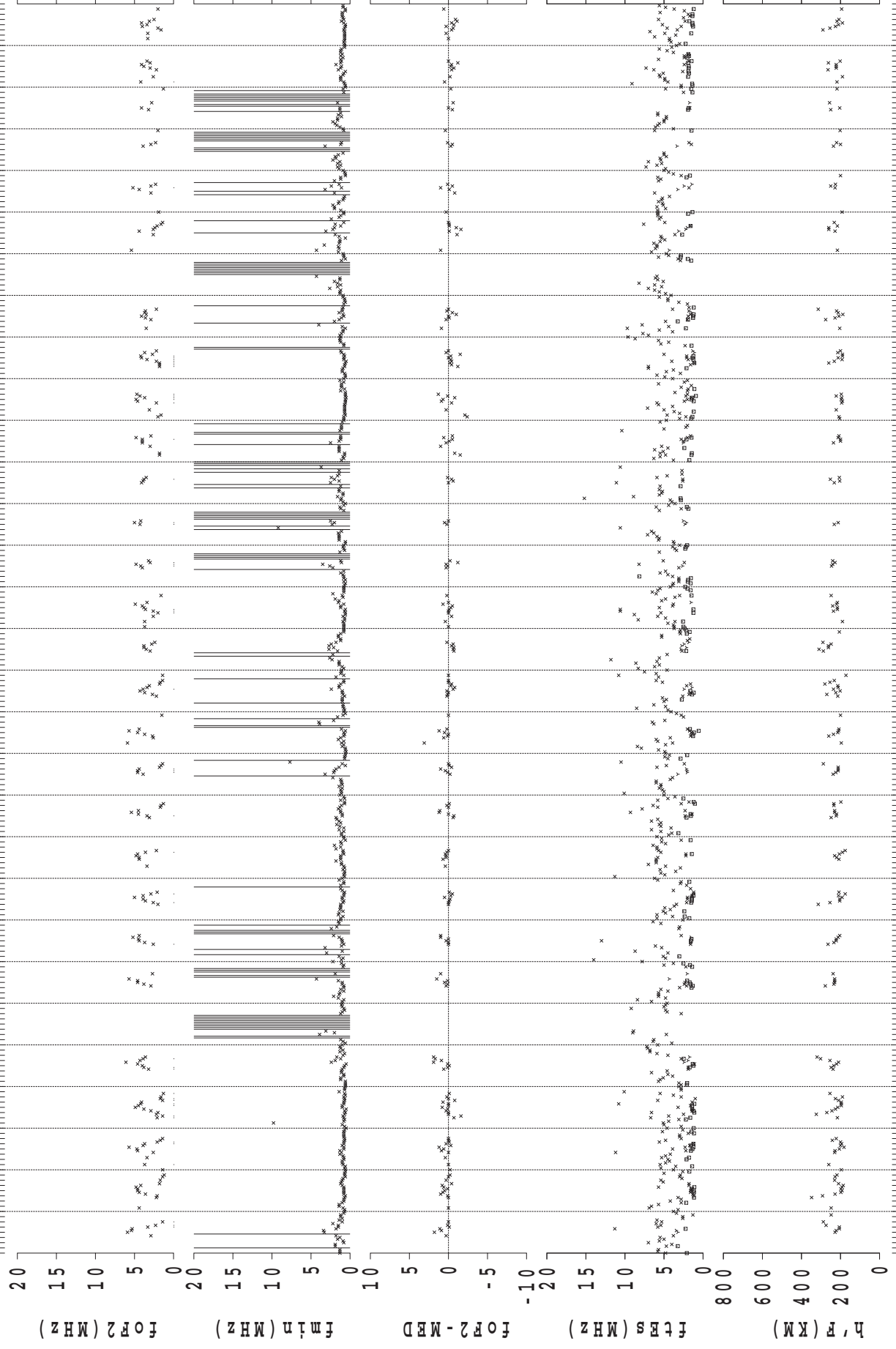
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 DAY/45° EMT

2016 0501 -> 2016 0531(99) SYOWA-ST.



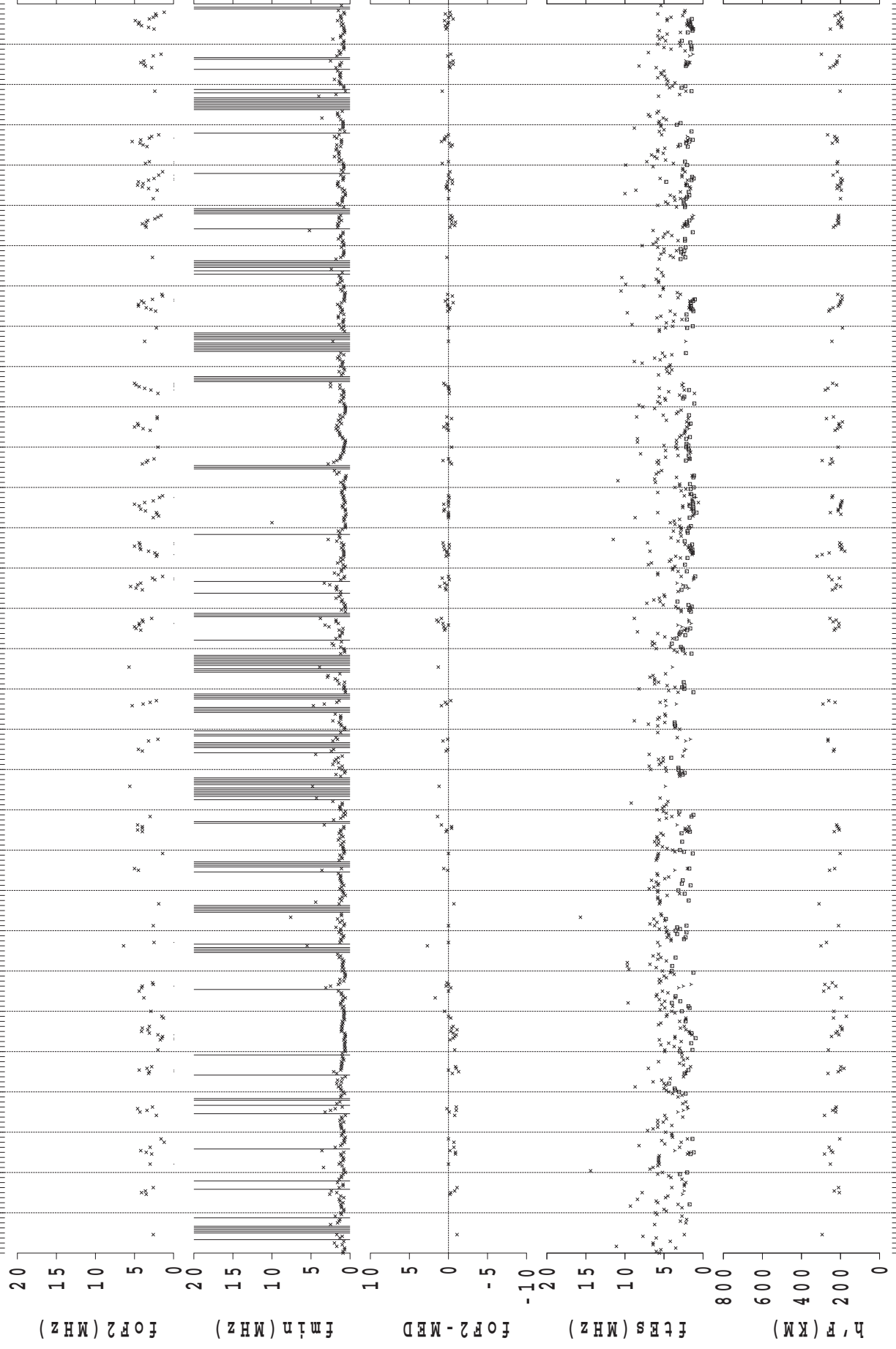
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45° EMT

2016 0601 -> 2016 0630 (99) SYOWA-ST.



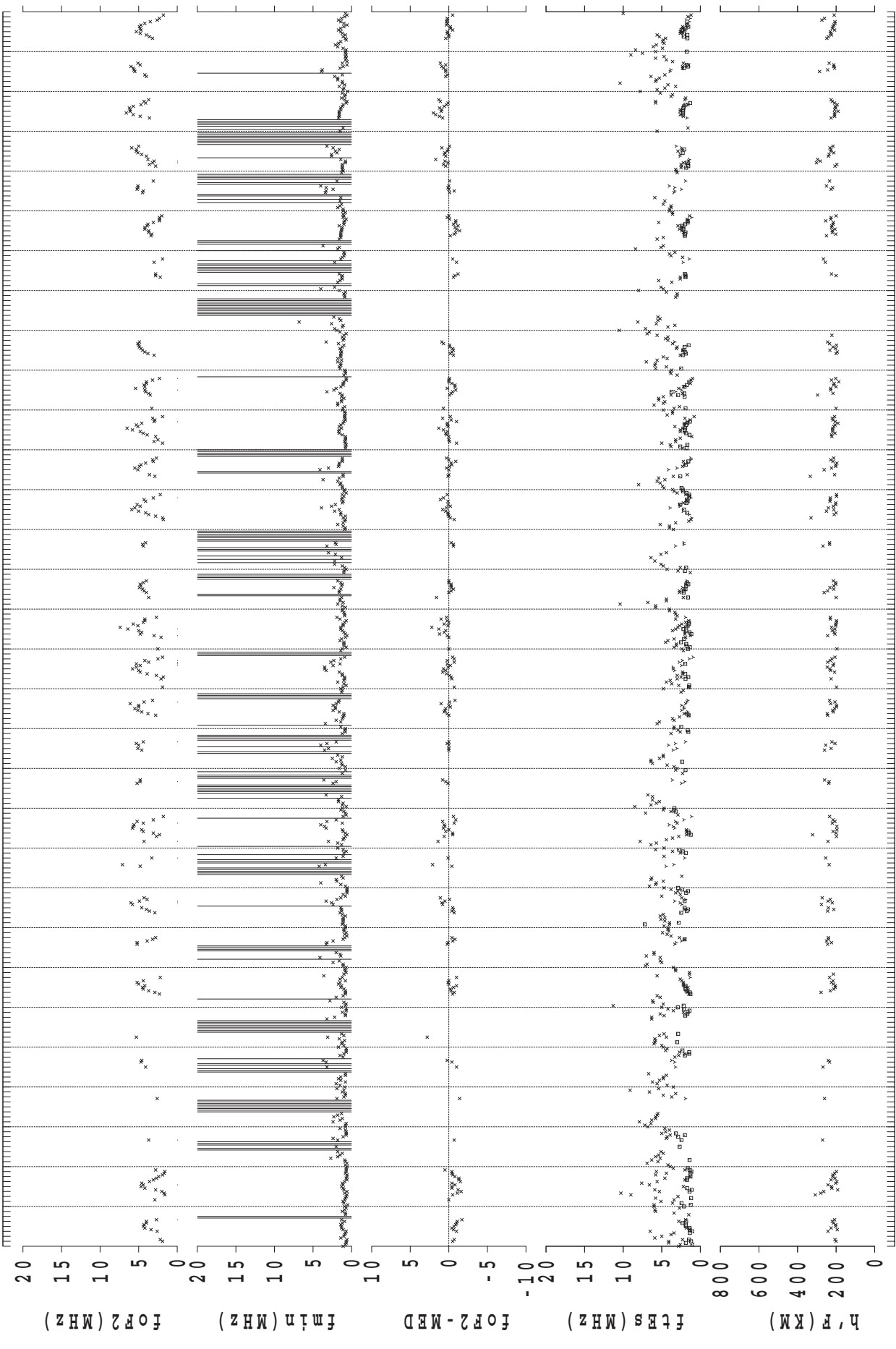
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 DAY/45° EMT

2016 0701 -> 2016 0731(99) SYOWA-ST.



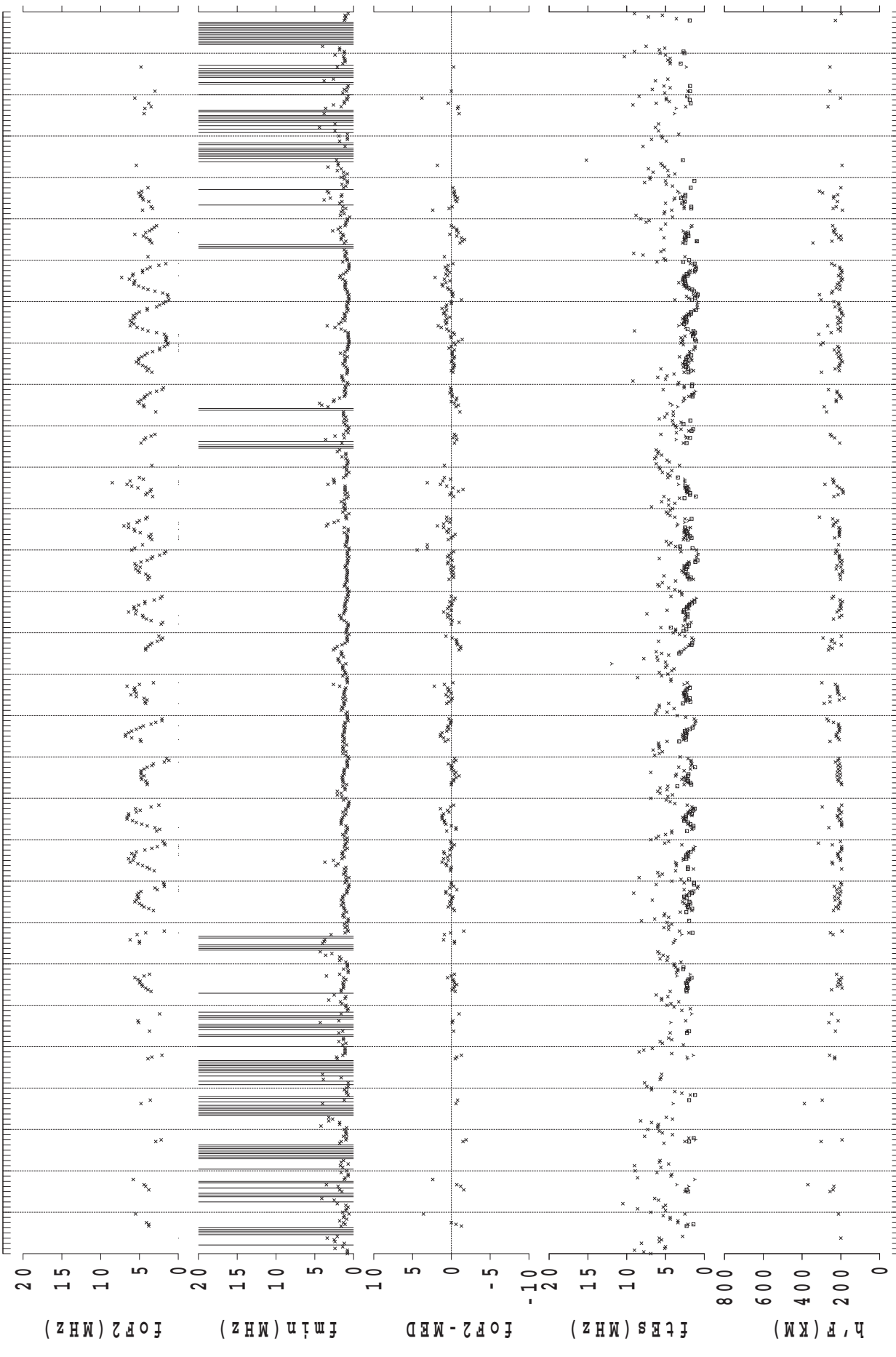
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45° EMT

2016 0801 -> 2016 0831 (99) SYOWA-ST.



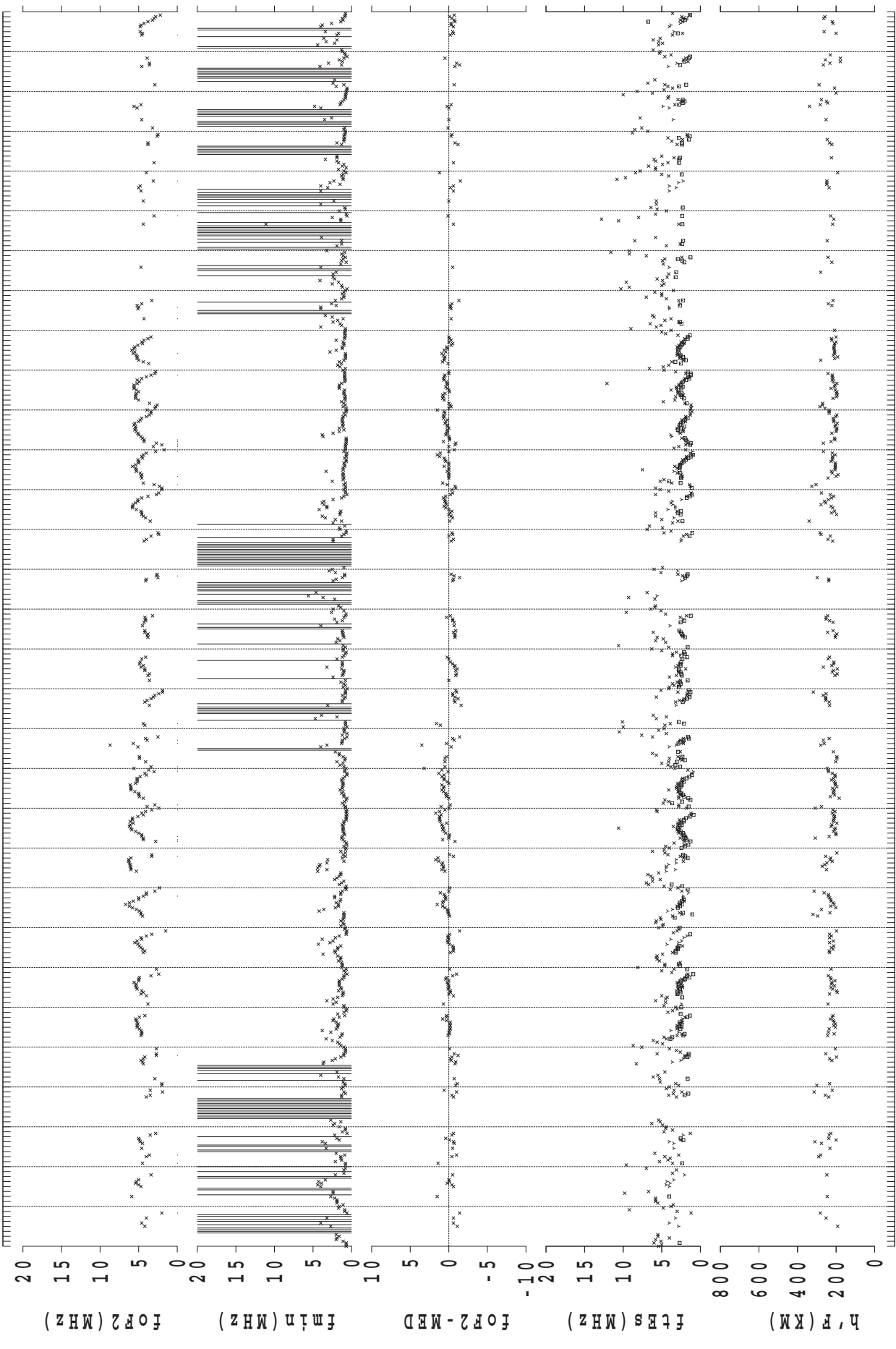
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45° EMT

2016 0901 -> 2016 0930 (99) SYOWA-ST.



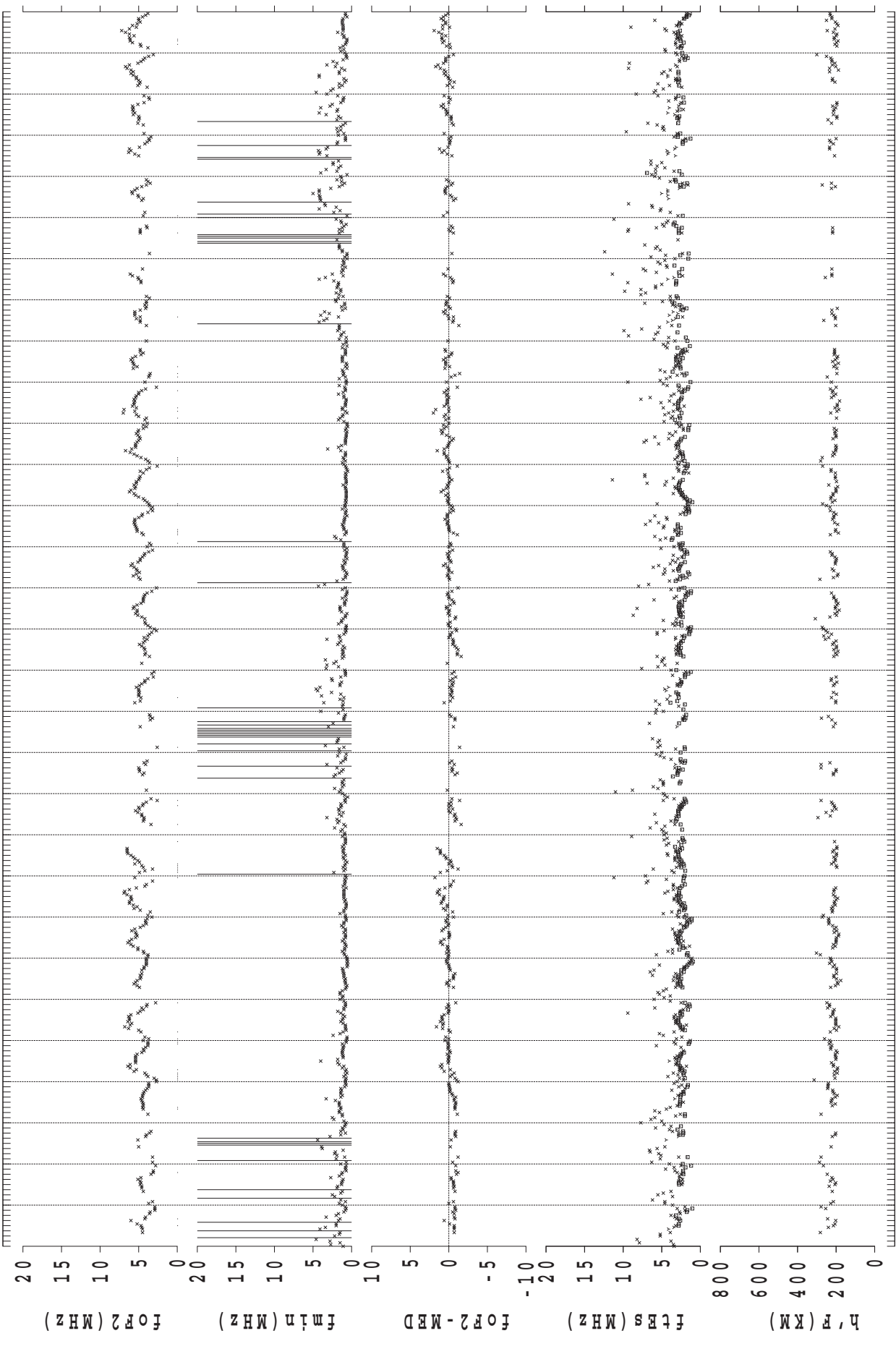
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 DAY/45° EMT

2016 1001 -> 2016 1031(99) SYOWA-ST.



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

2016 1101 -> 2016 1130 (99) SYOWA-ST.



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

2016 1201 -> 2016 1231(99) SYOWA-ST.

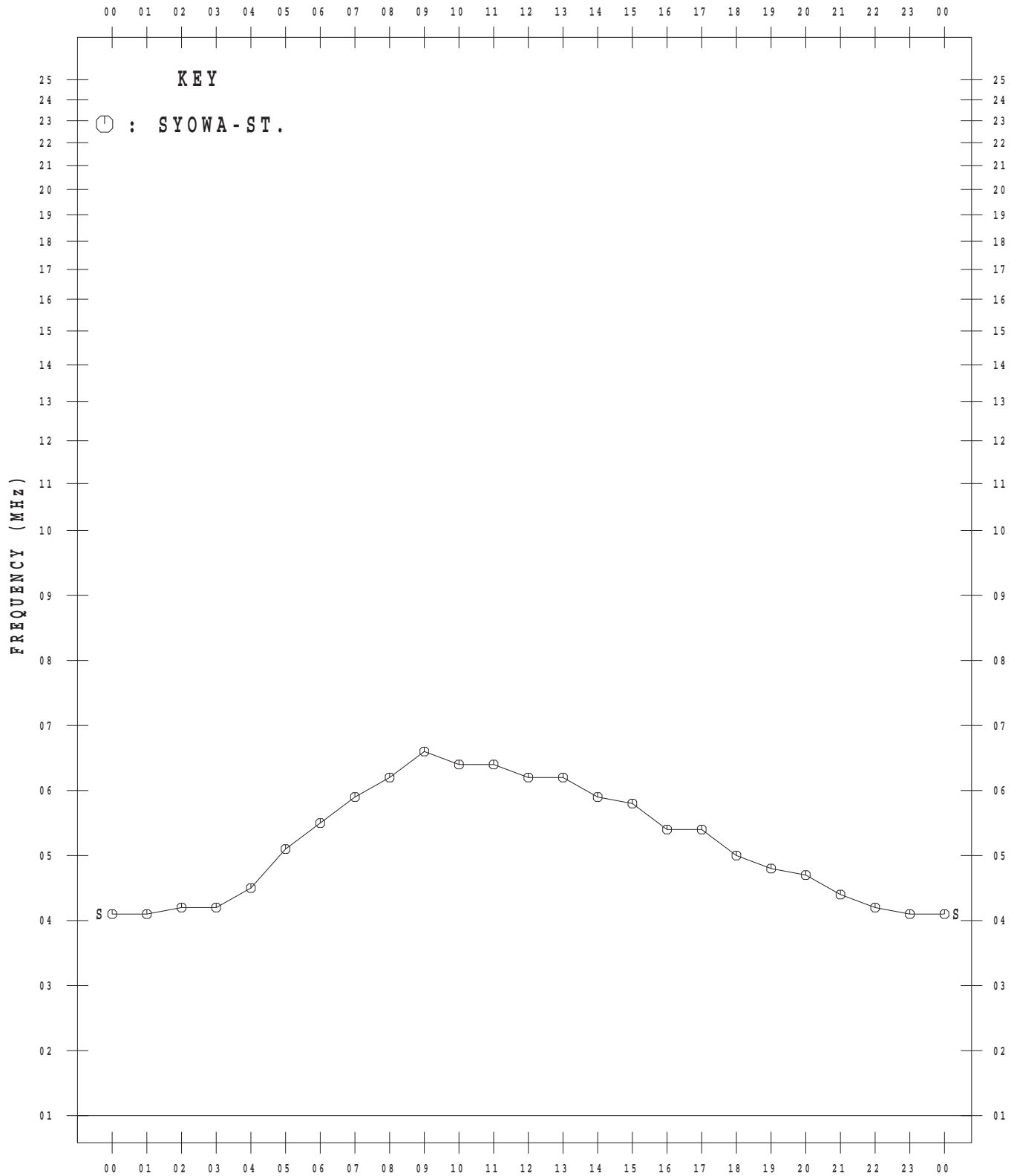


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45° EMT

MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

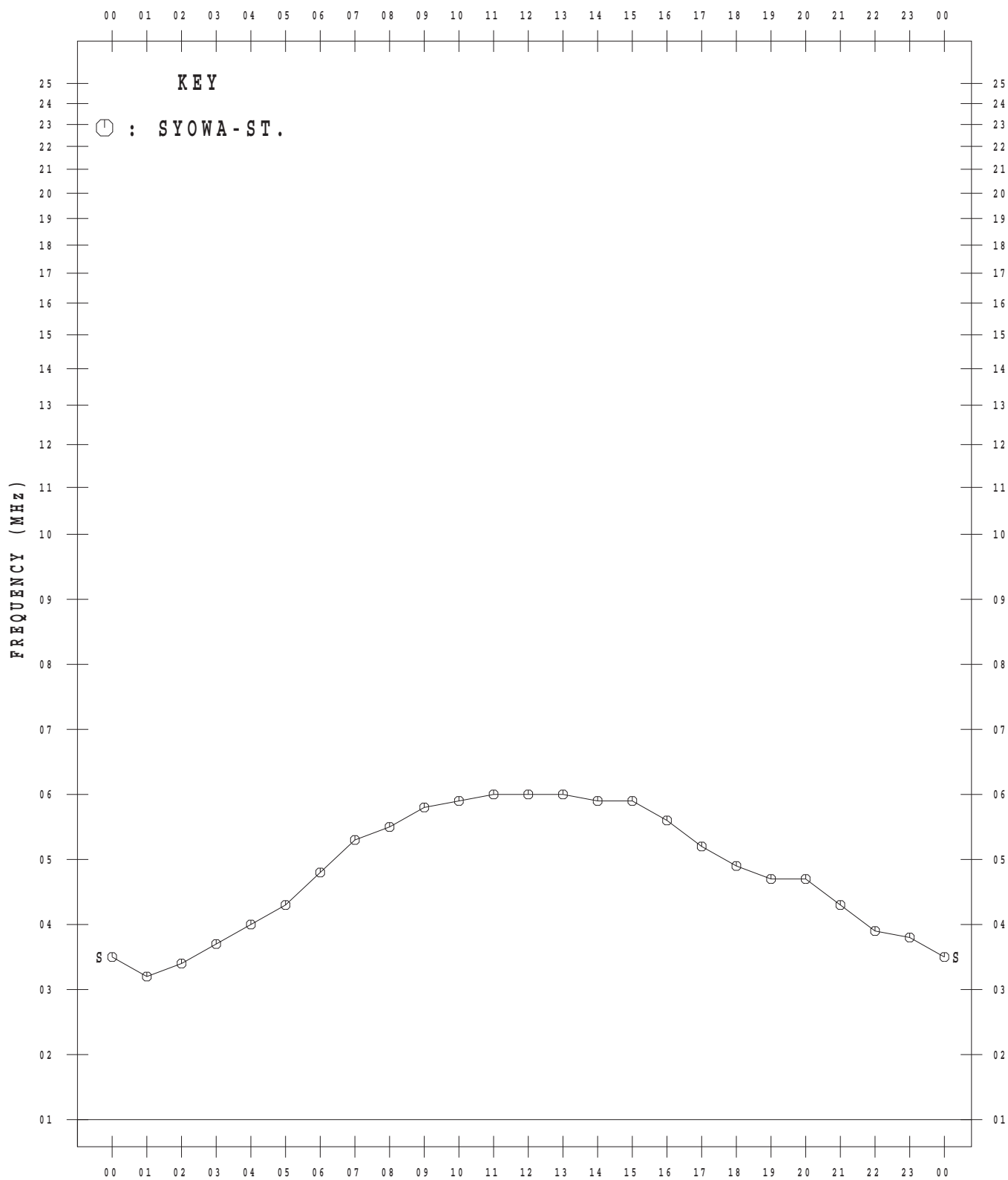
JAN. 2016



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

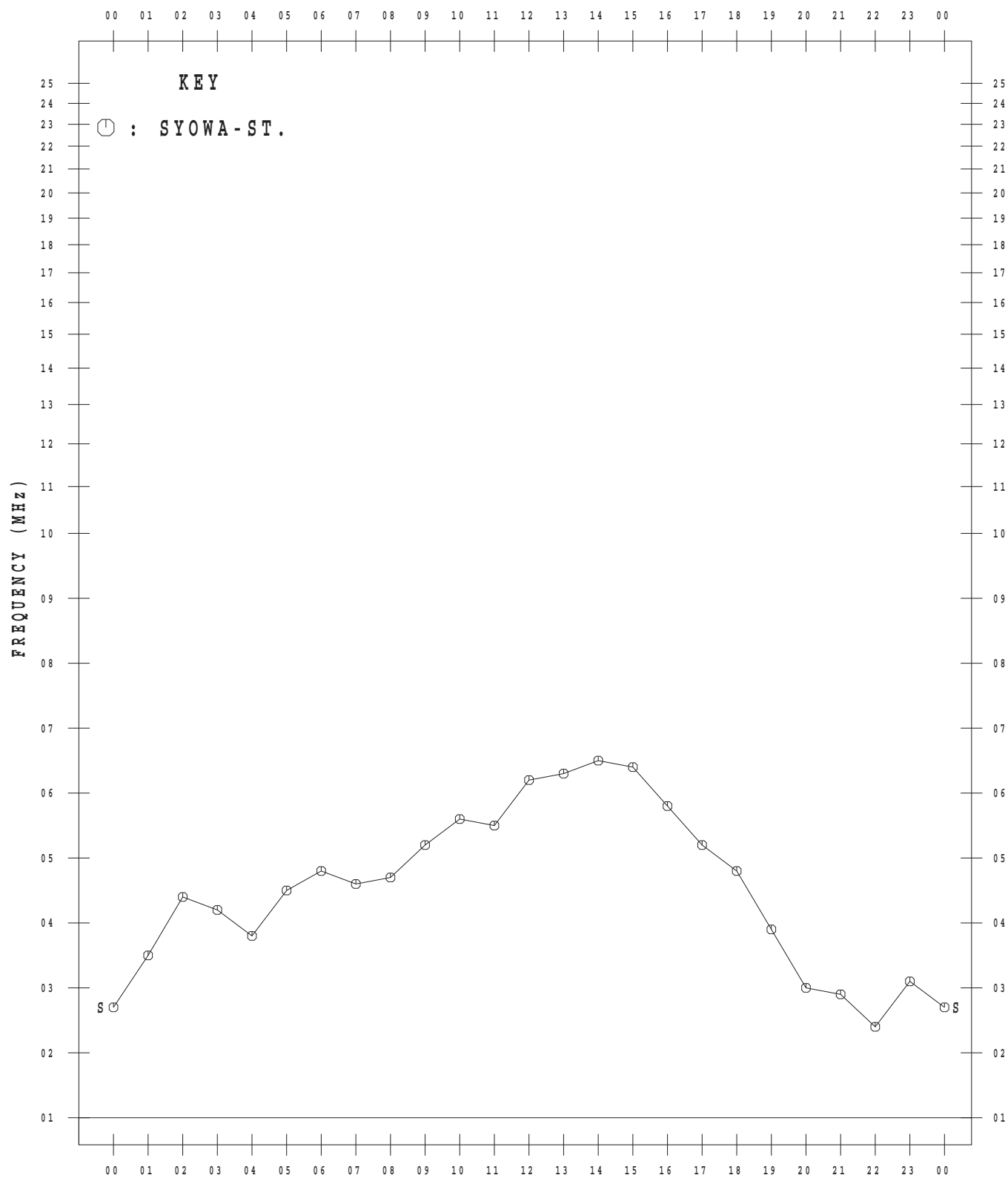
FEB. 2016



MONTHLY MEDIAN VALUES OF f_oF_2

45°E MEAN TIME

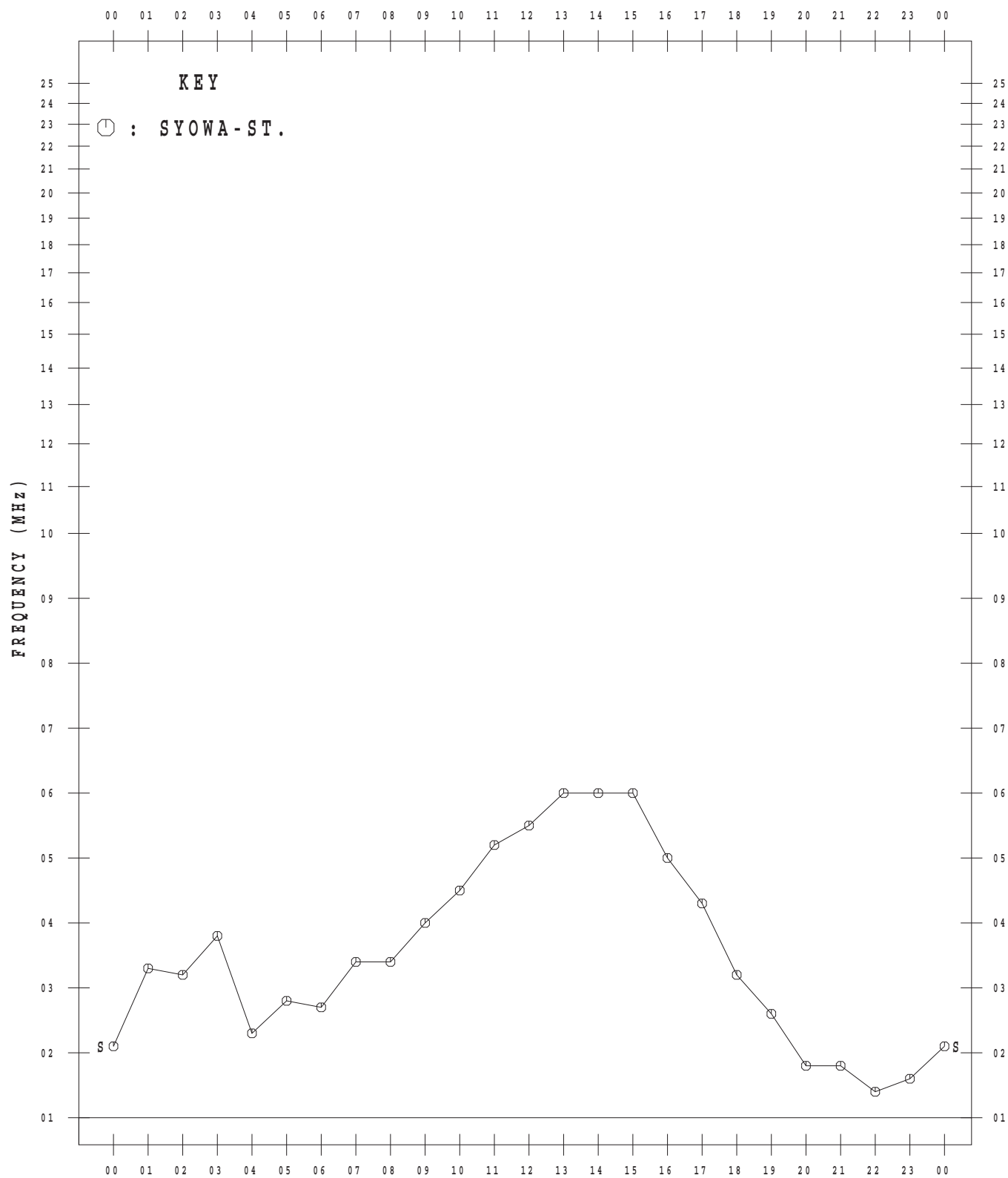
MAR. 2016



MONTHLY MEDIAN VALUES OF f_oF_2

45°E MEAN TIME

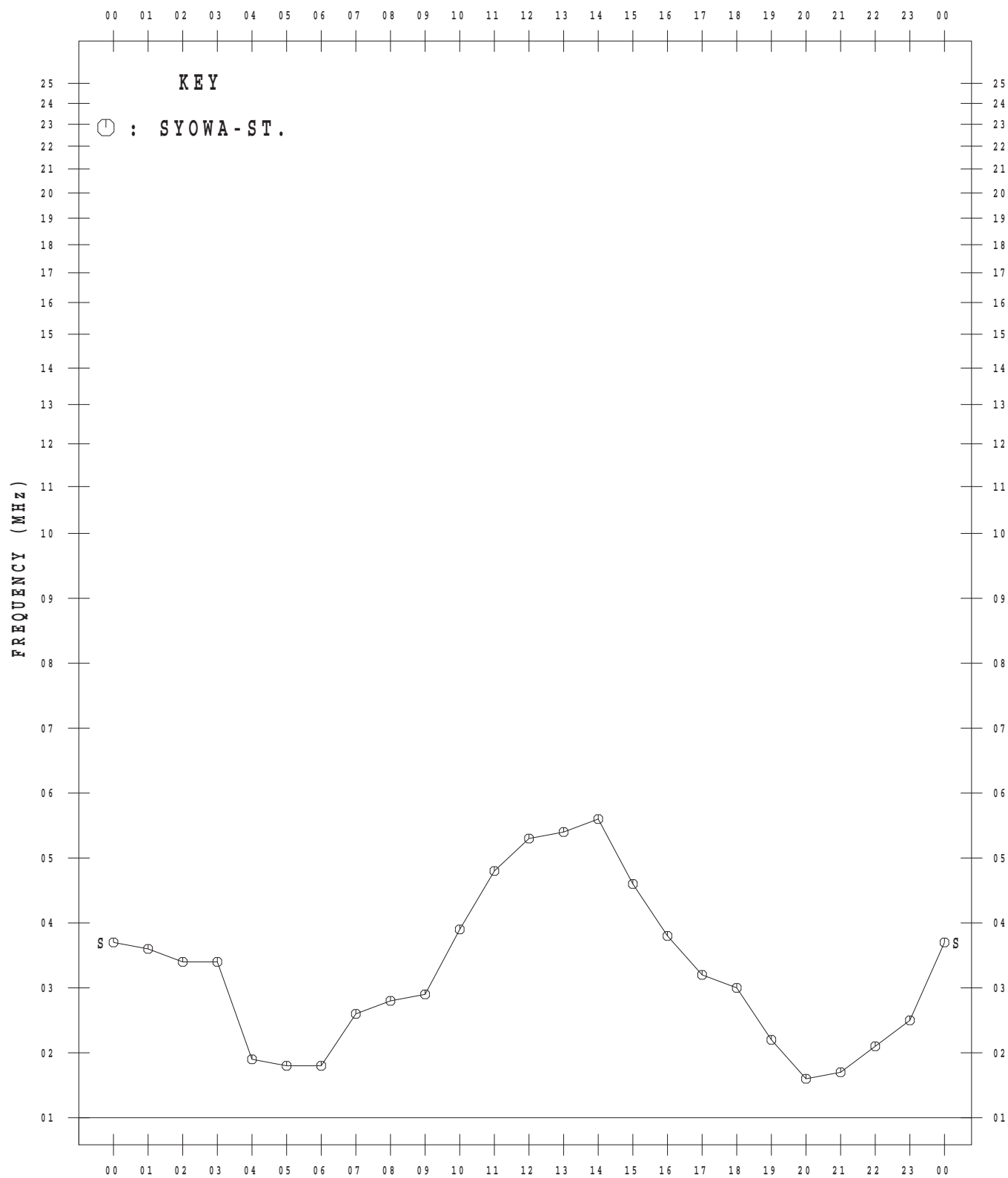
APR. 2016



MONTHLY MEDIAN VALUES OF f_oF_2

45°E MEAN TIME

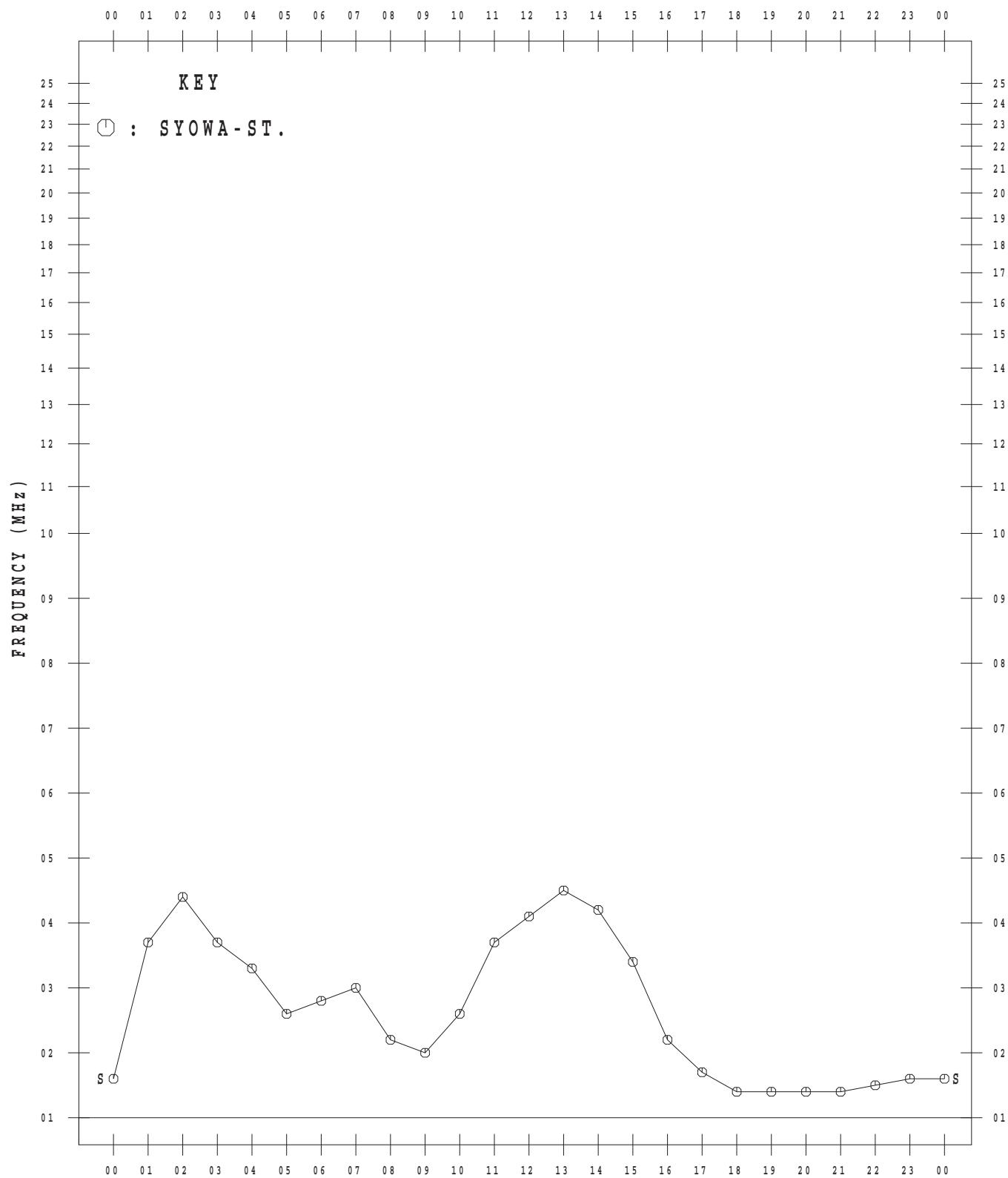
MAY 2016



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

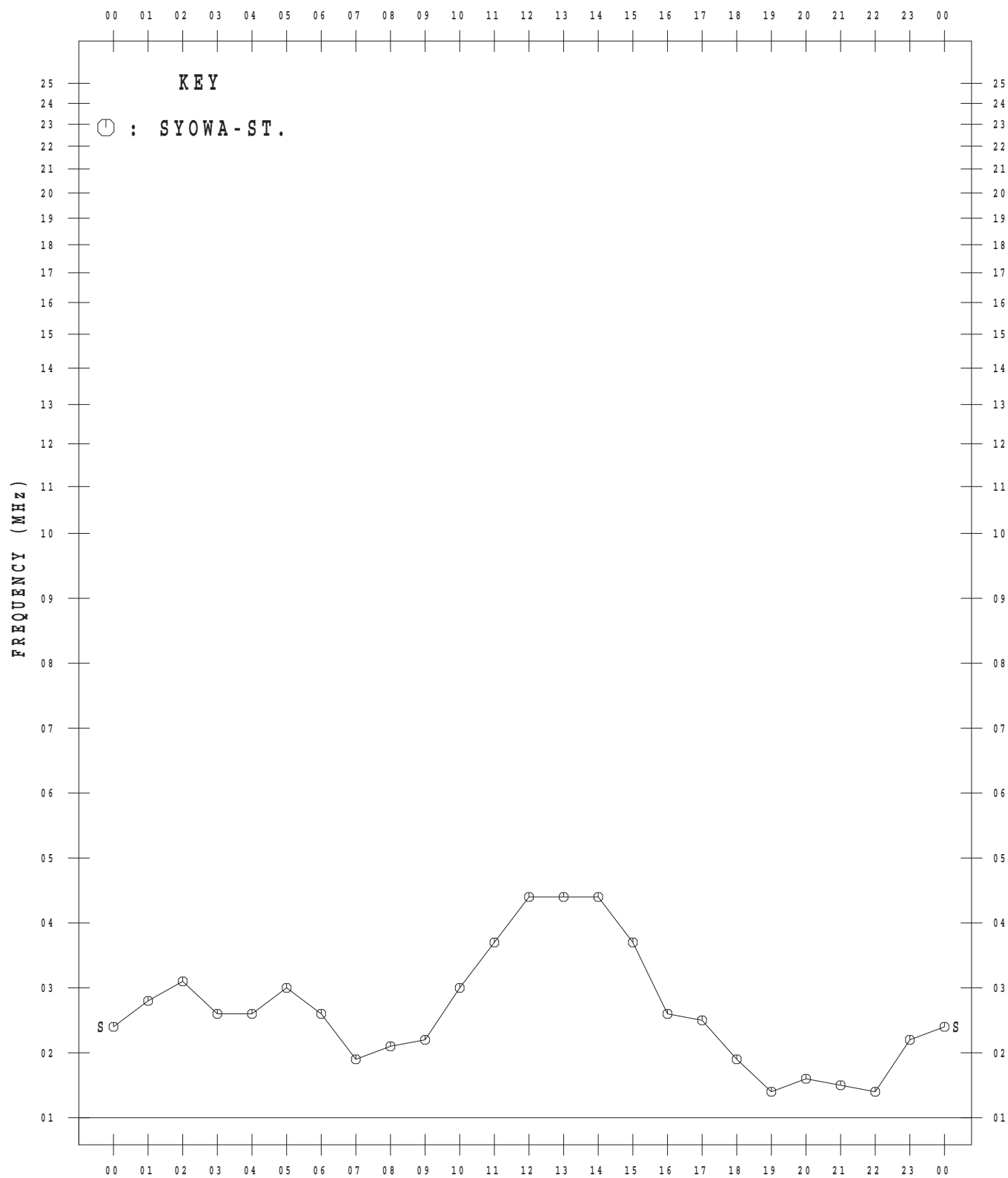
JUN. 2016



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

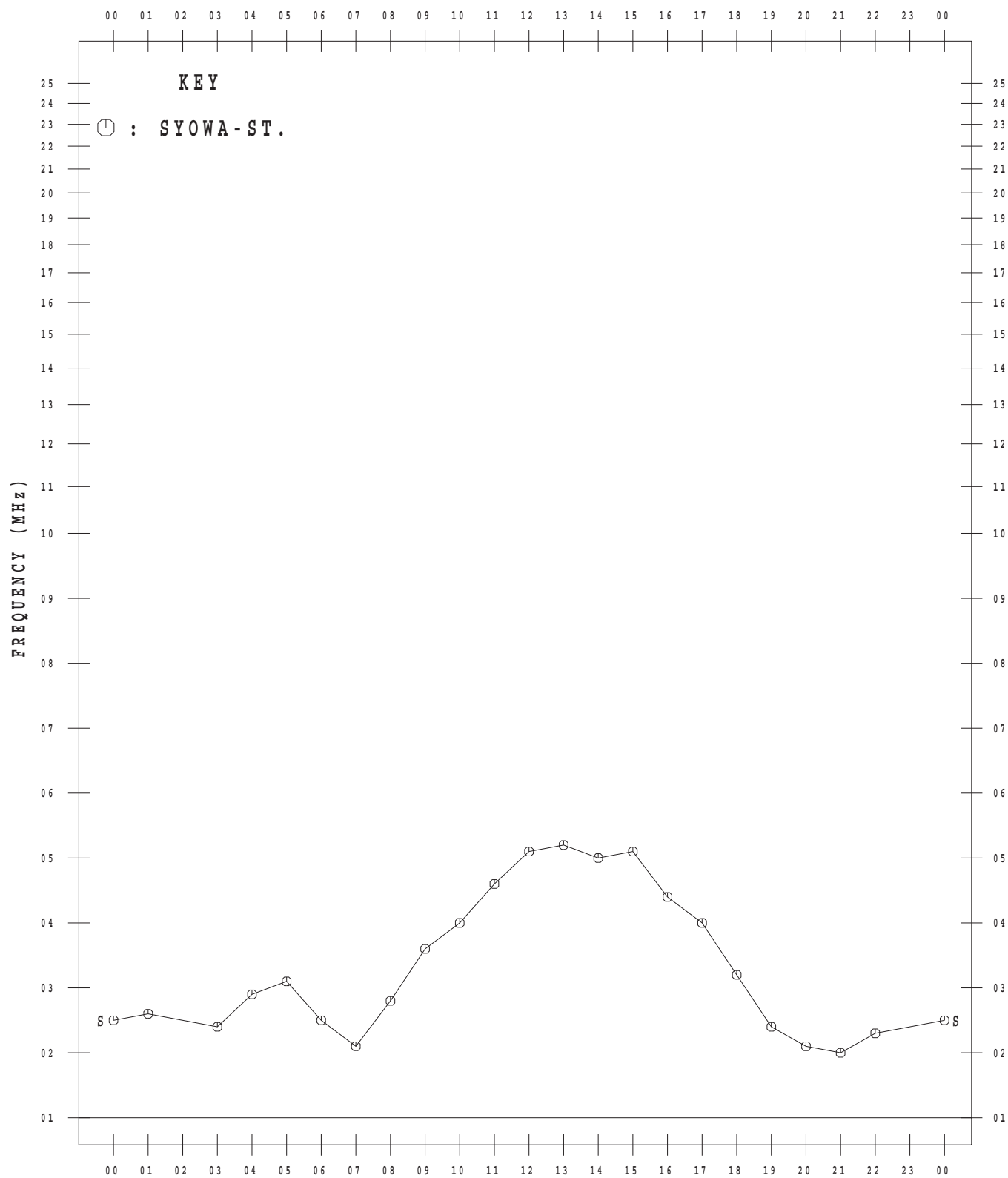
JUL. 2016



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

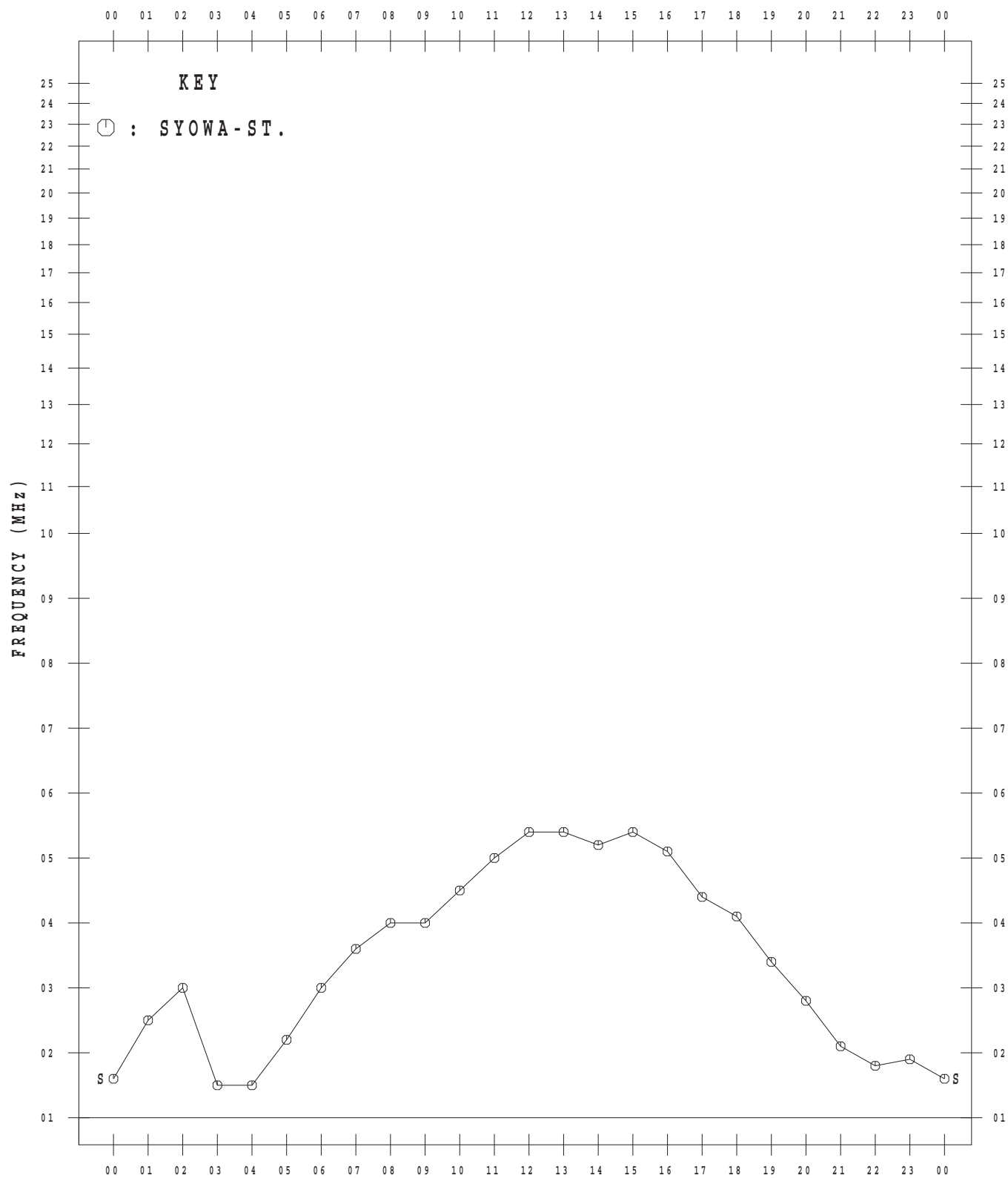
AUG. 2016



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

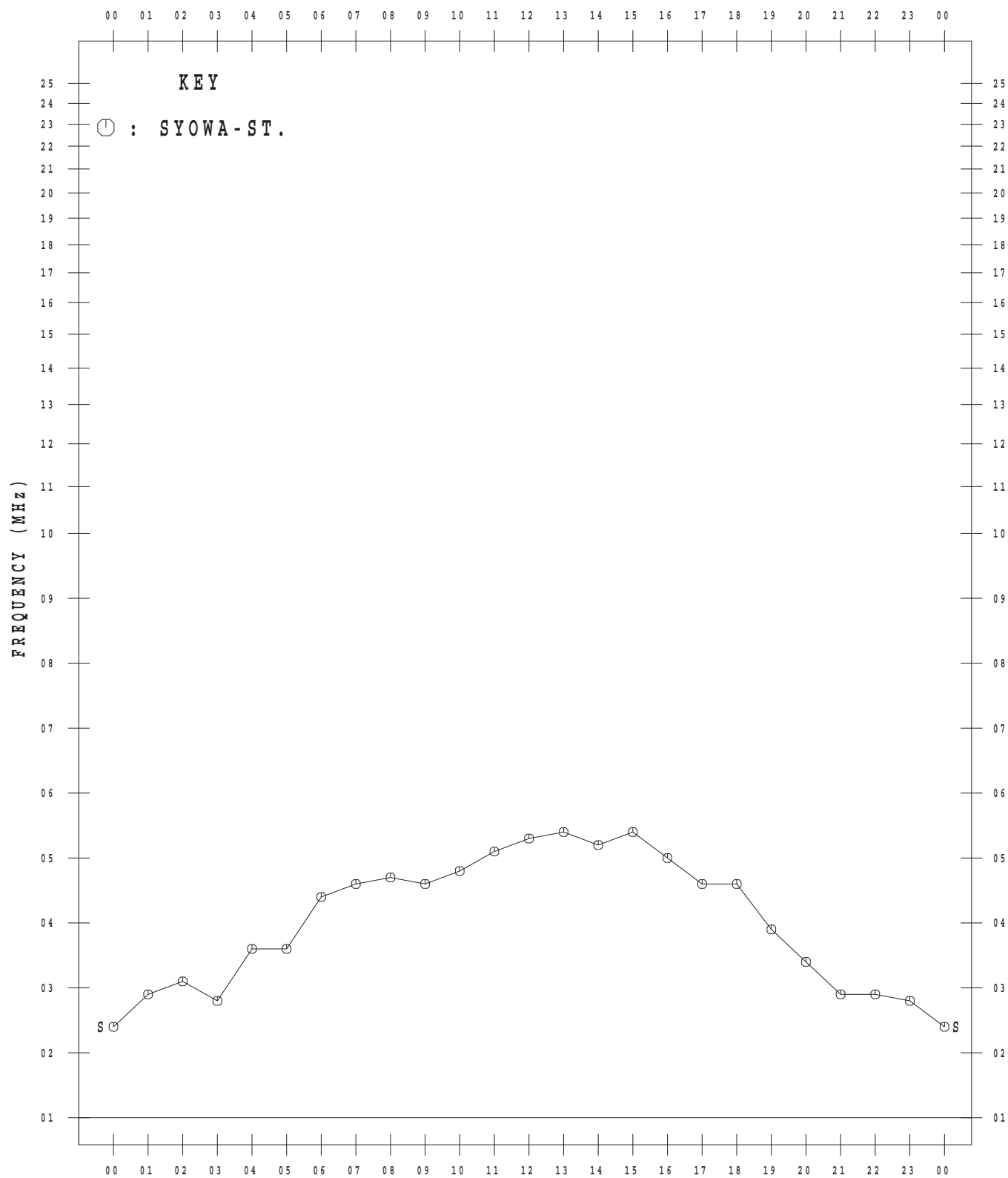
SEP. 2016



MONTHLY MEDIAN VALUES OF f_oF_2

45°E MEAN TIME

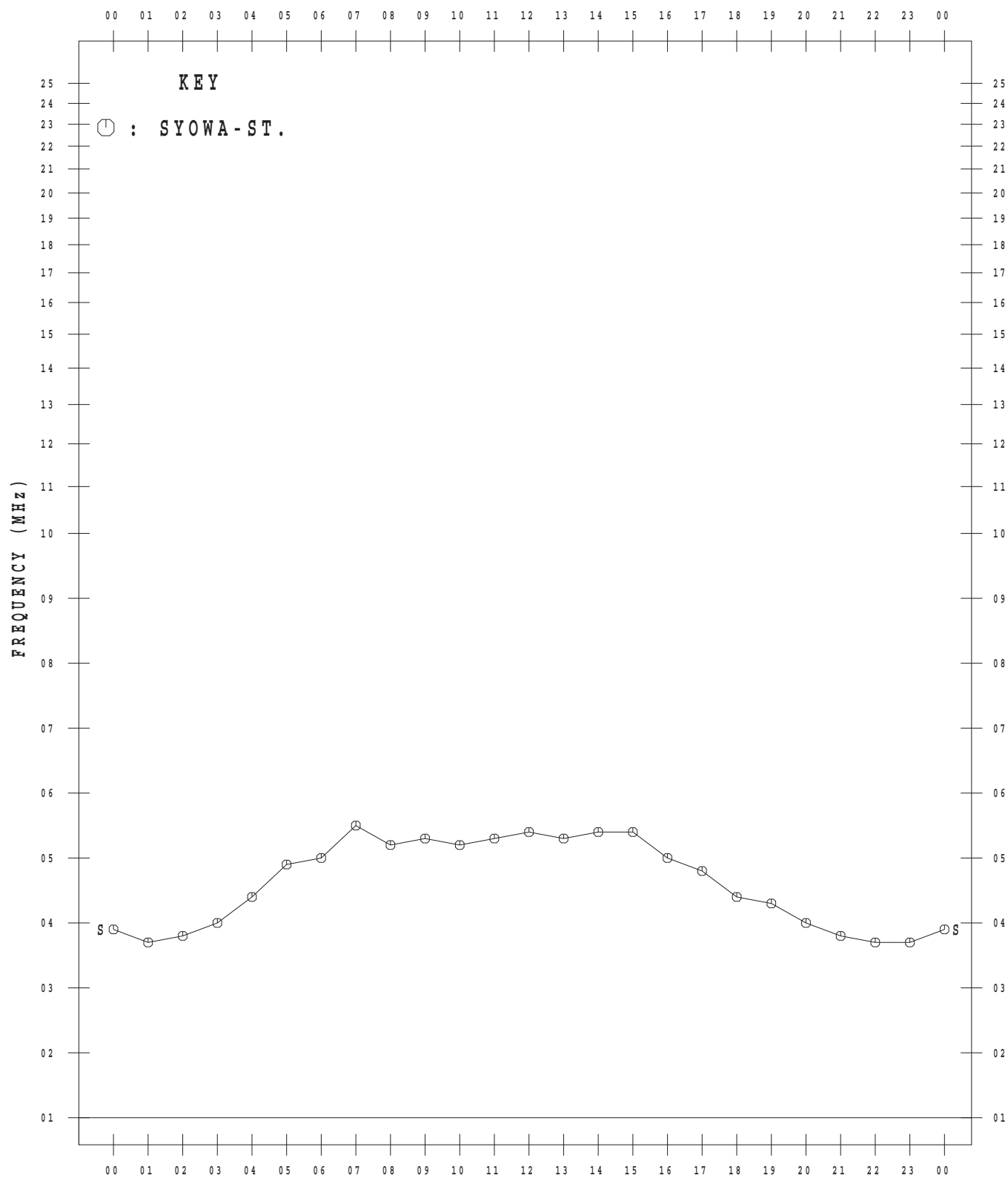
OCT. 2016



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

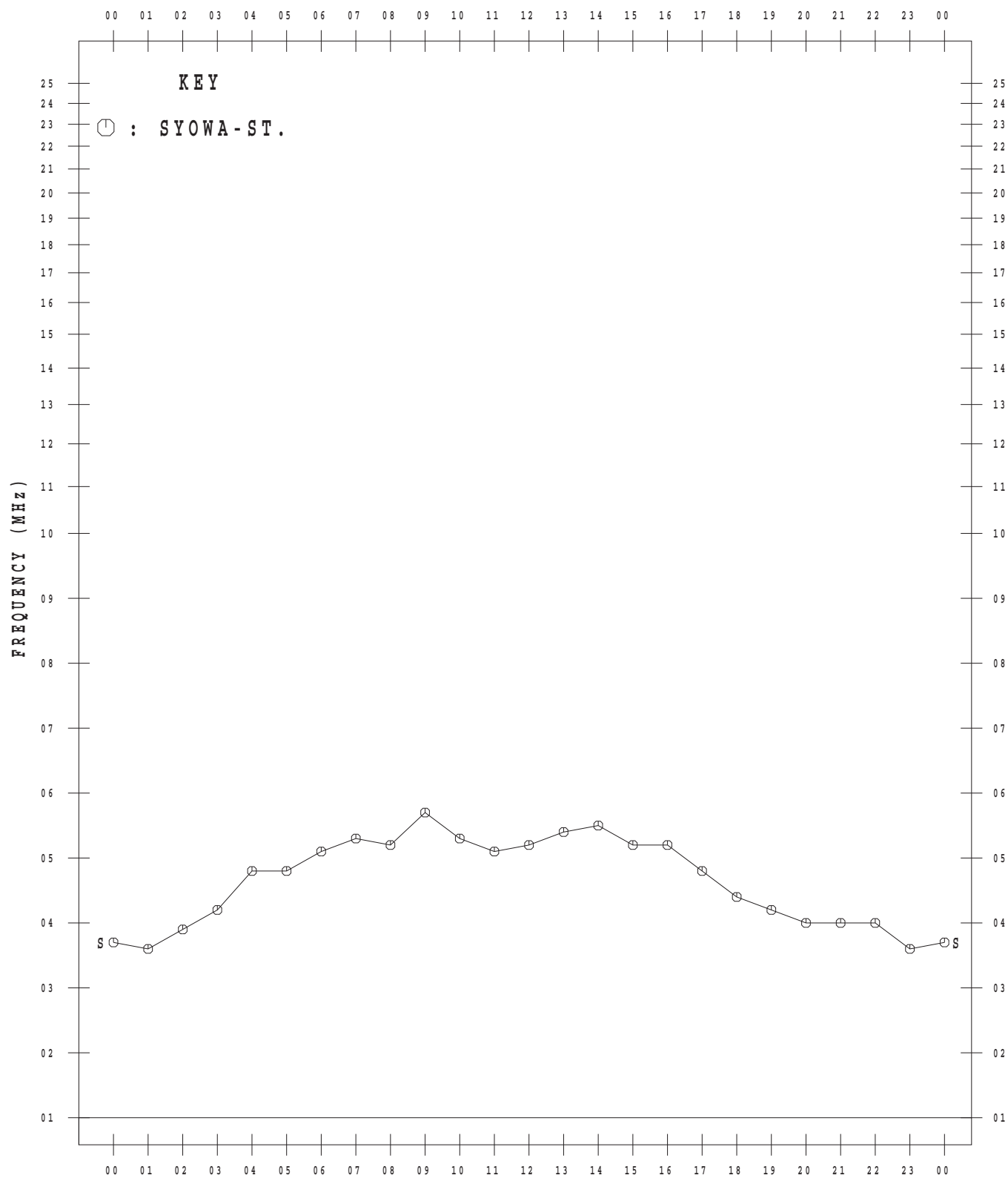
NOV. 2016



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

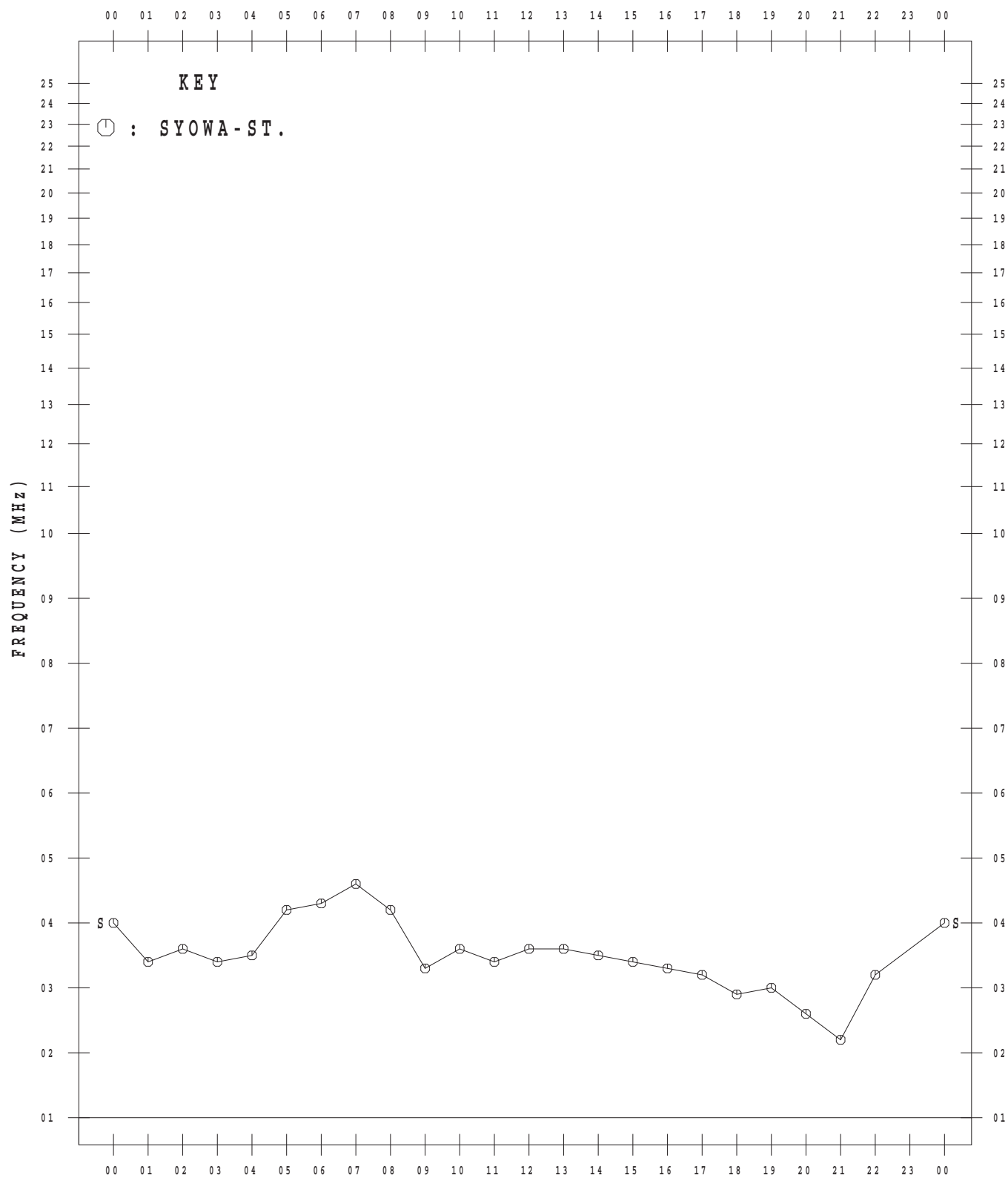
DEC. 2016



MONTHLY MEDIAN VALUES OF f_{tEs}

45°E MEAN TIME

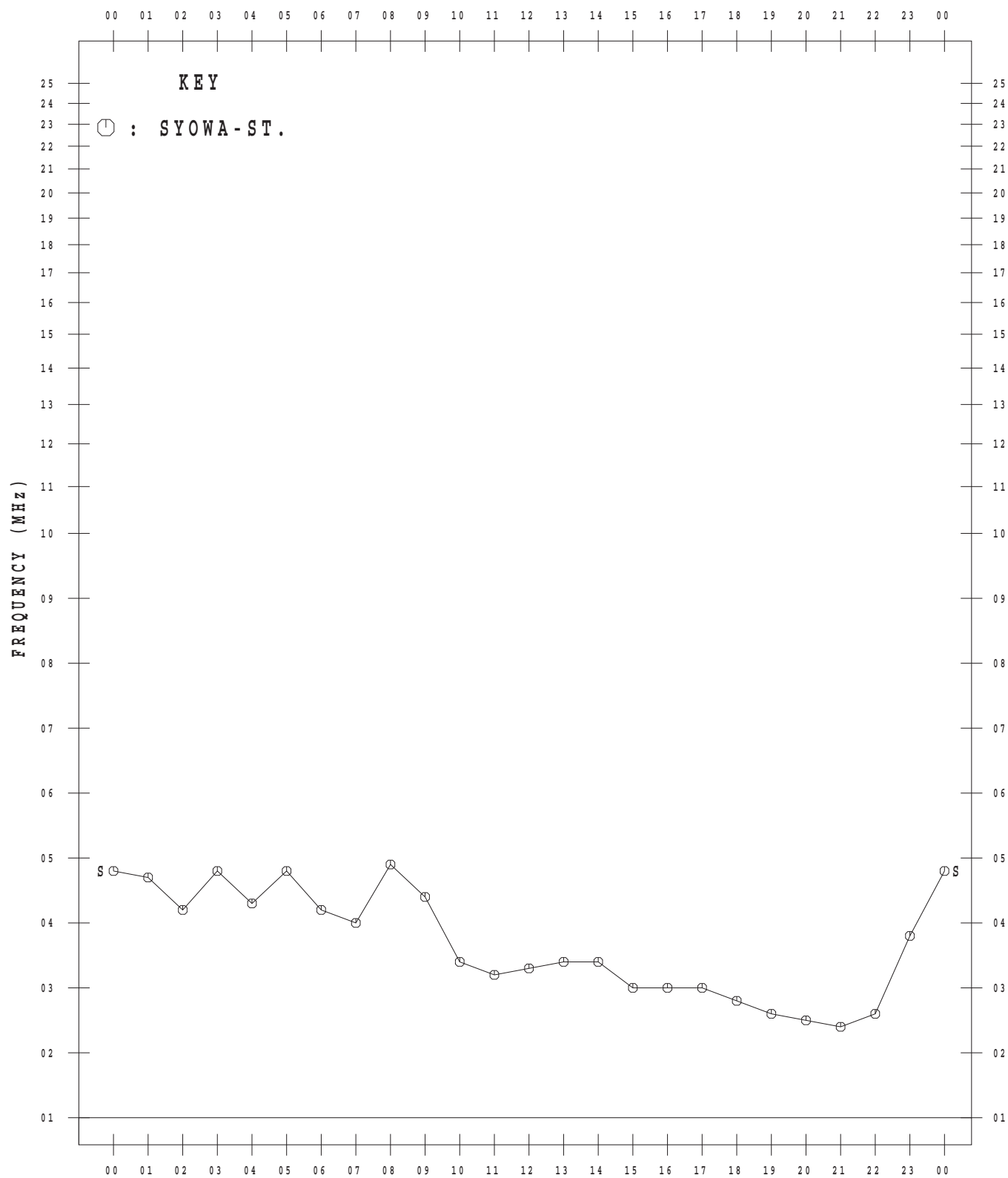
JAN. 2016



MONTHLY MEDIAN VALUES OF f_{tEs}

45°E MEAN TIME

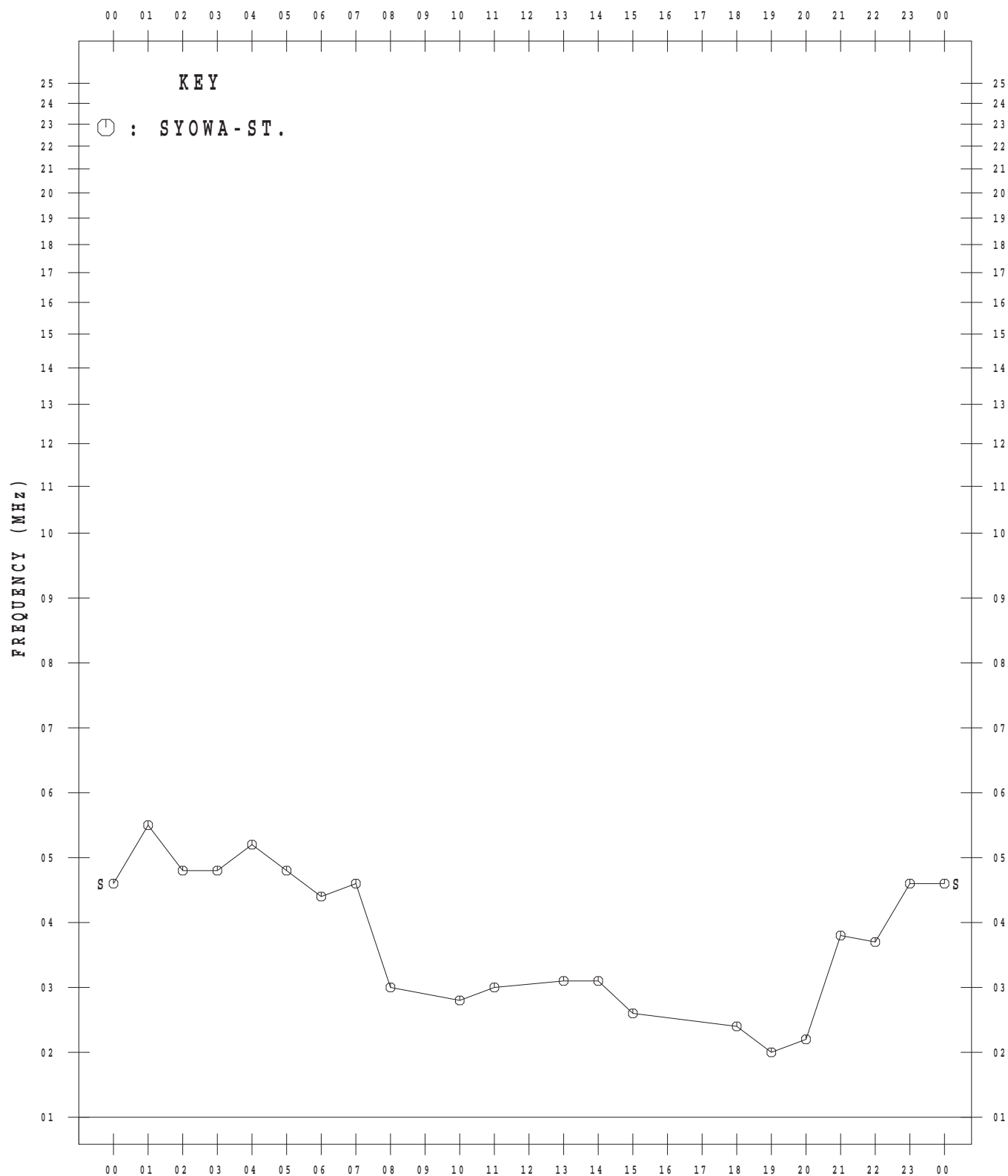
FEB. 2016



MONTHLY MEDIAN VALUES OF f_{tEs}

45°E MEAN TIME

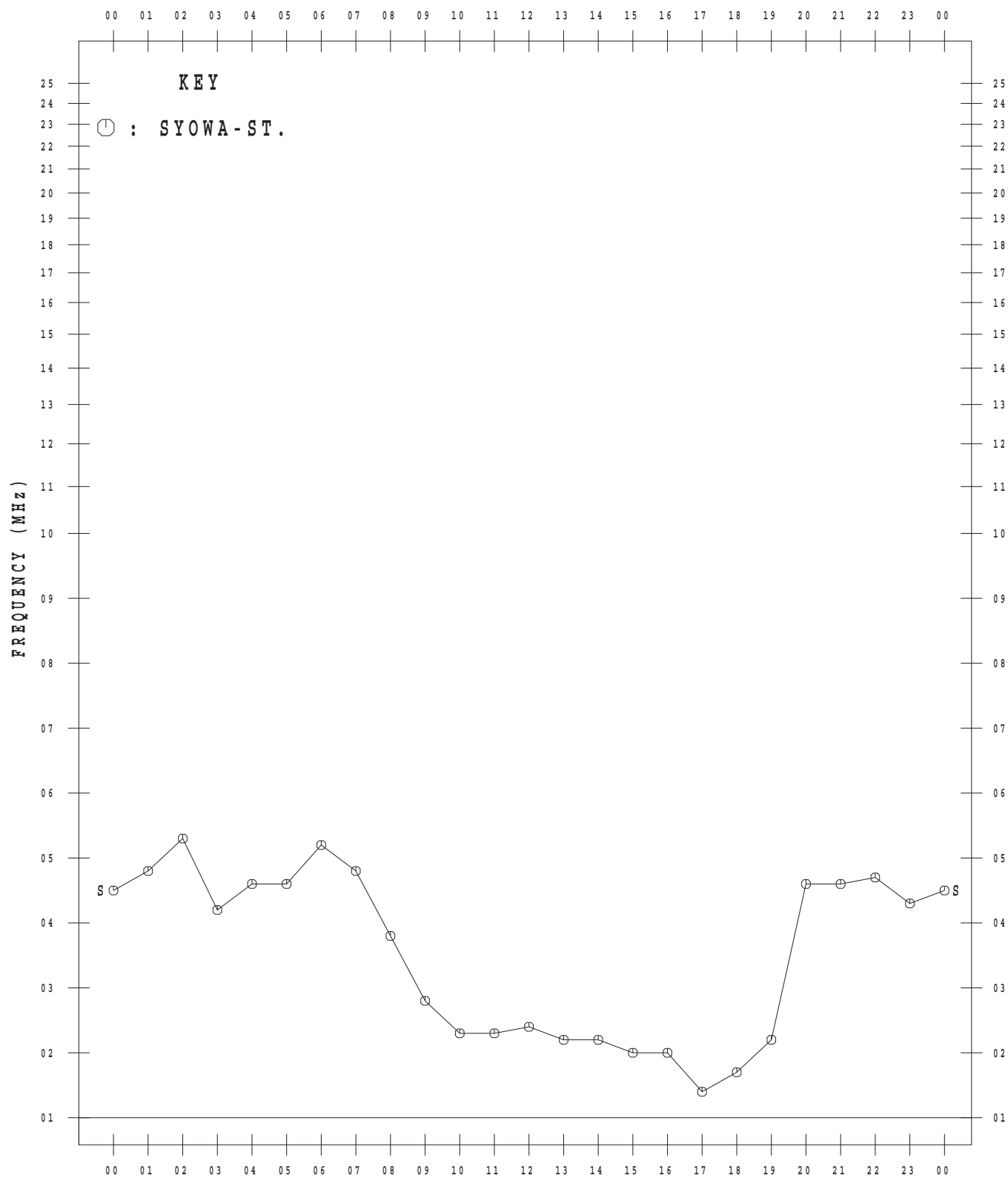
MAR. 2016



MONTHLY MEDIAN VALUES OF f_{TE}s

45°E MEAN TIME

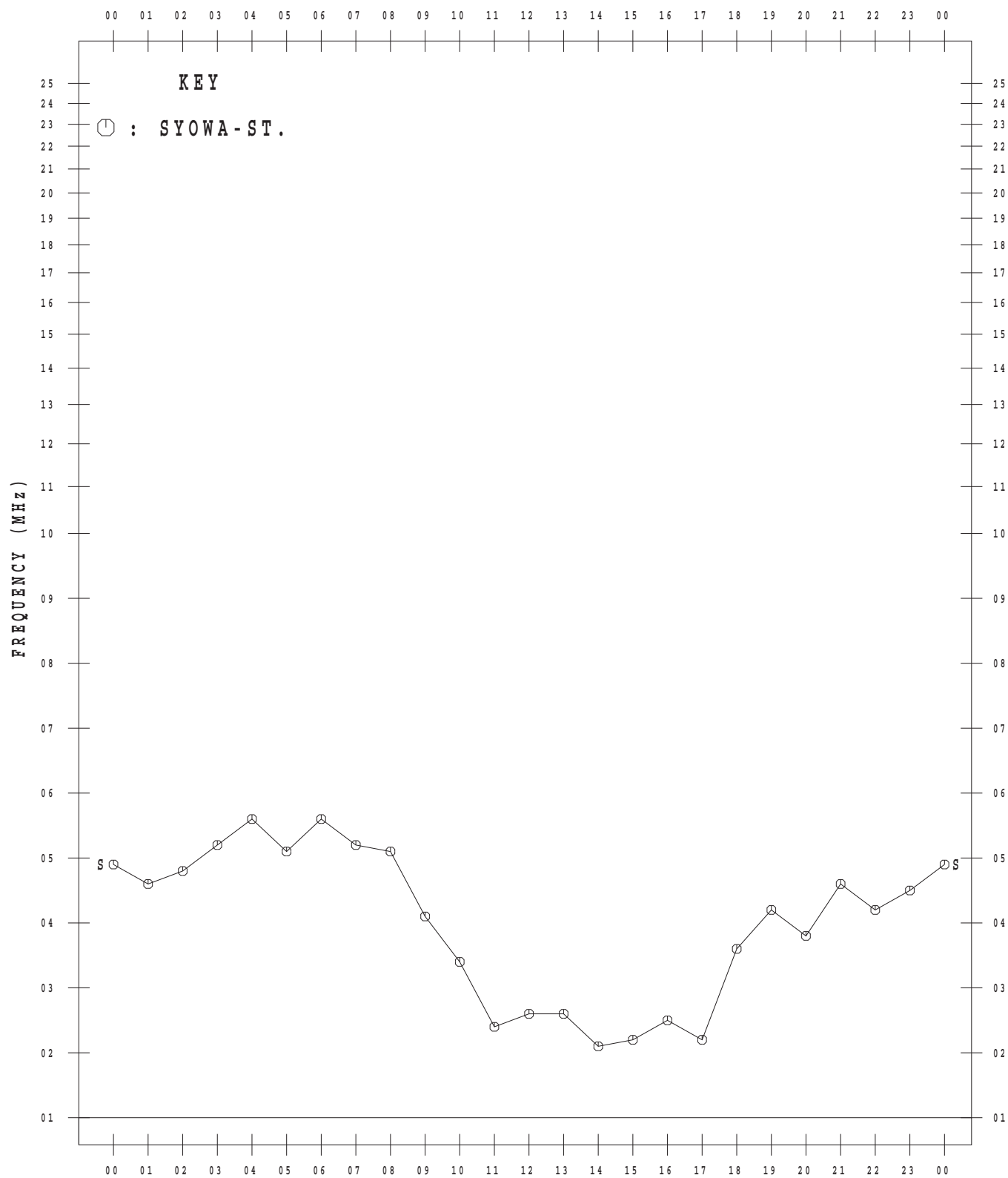
APR. 2016



MONTHLY MEDIAN VALUES OF f_{tEs}

45°E MEAN TIME

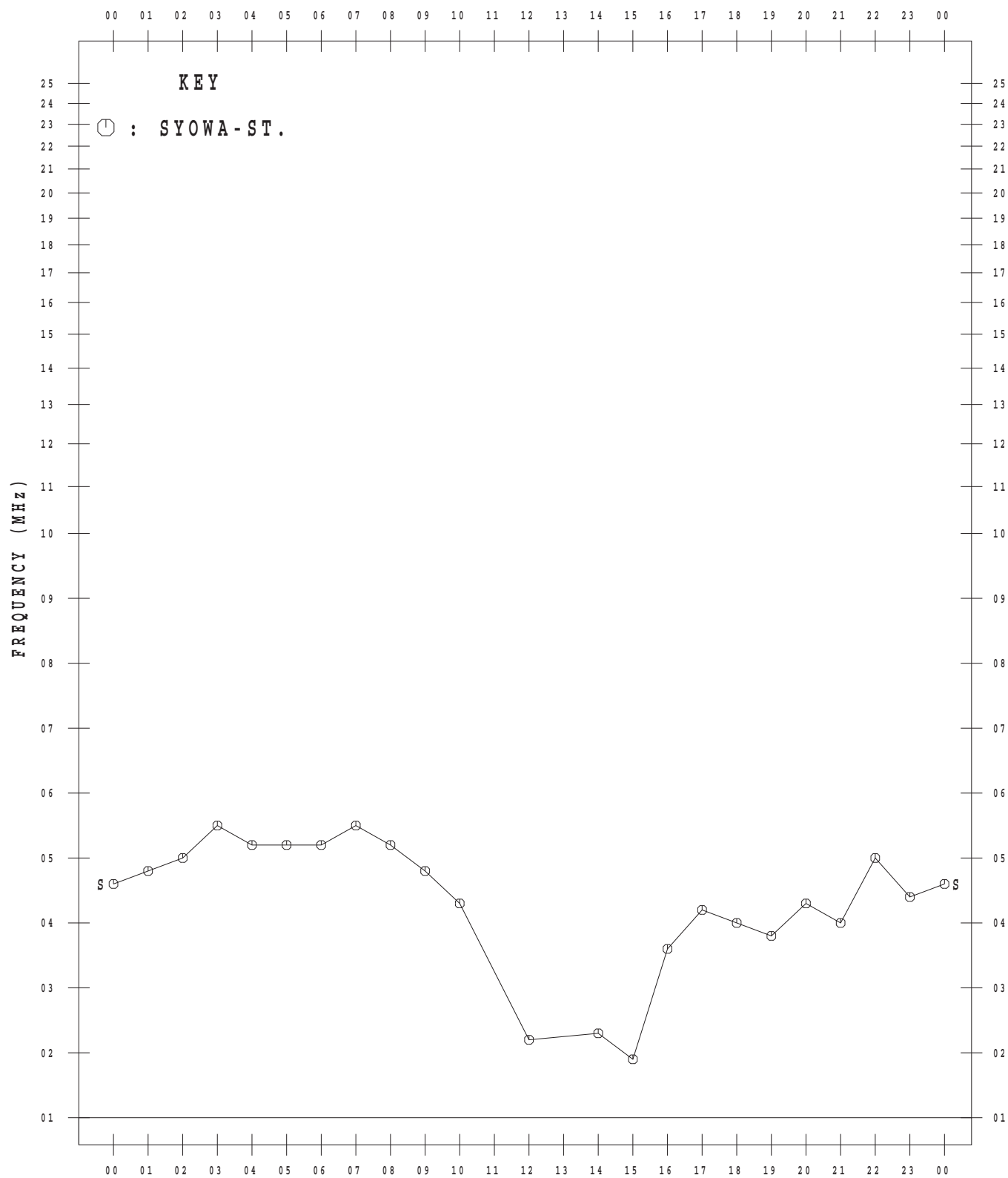
MAY 2016



MONTHLY MEDIAN VALUES OF f_{TE}s

45°E MEAN TIME

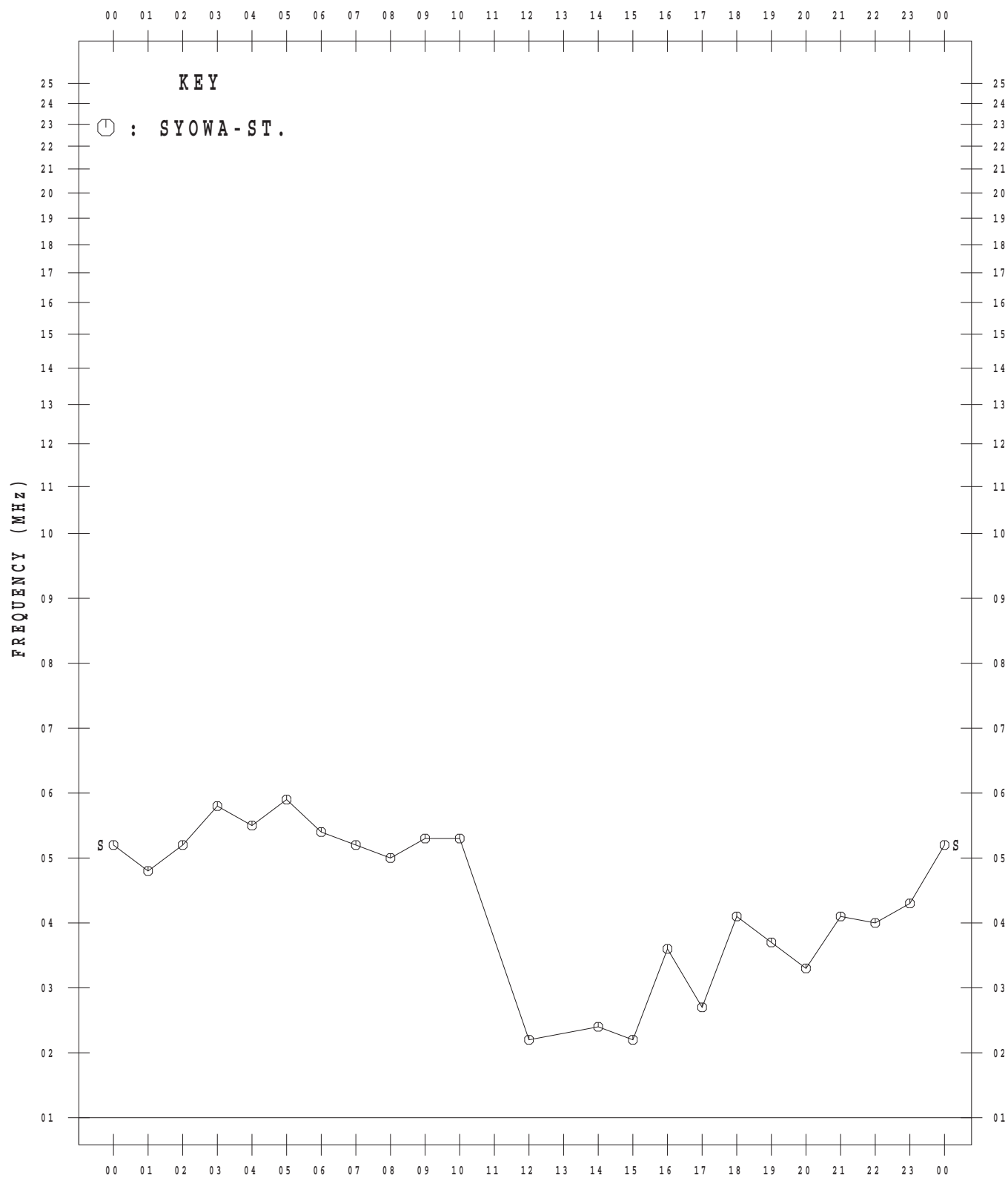
JUN. 2016



MONTHLY MEDIAN VALUES OF f_{tE}s

45°E MEAN TIME

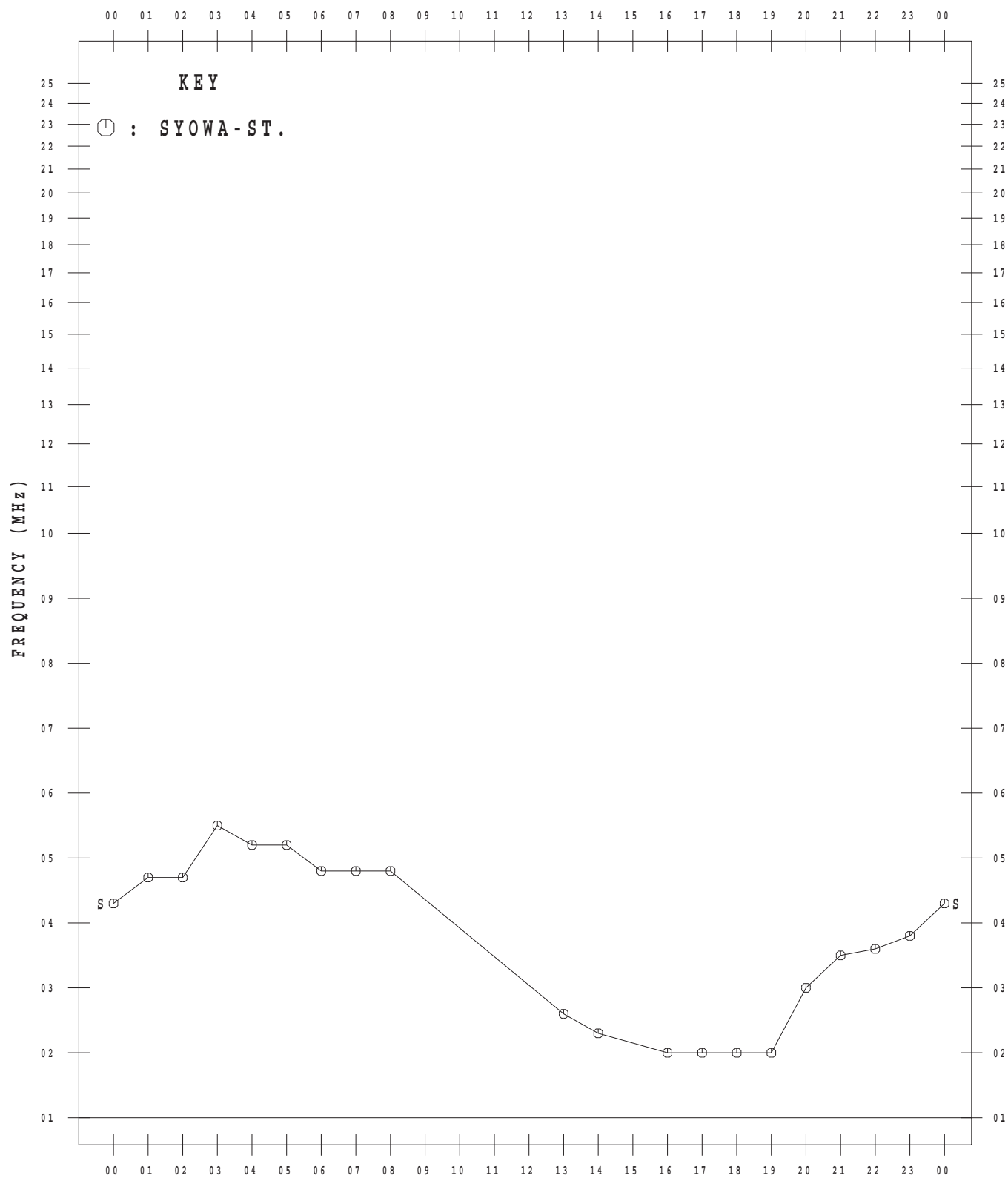
JUL. 2016



MONTHLY MEDIAN VALUES OF f_tE_s

45°E MEAN TIME

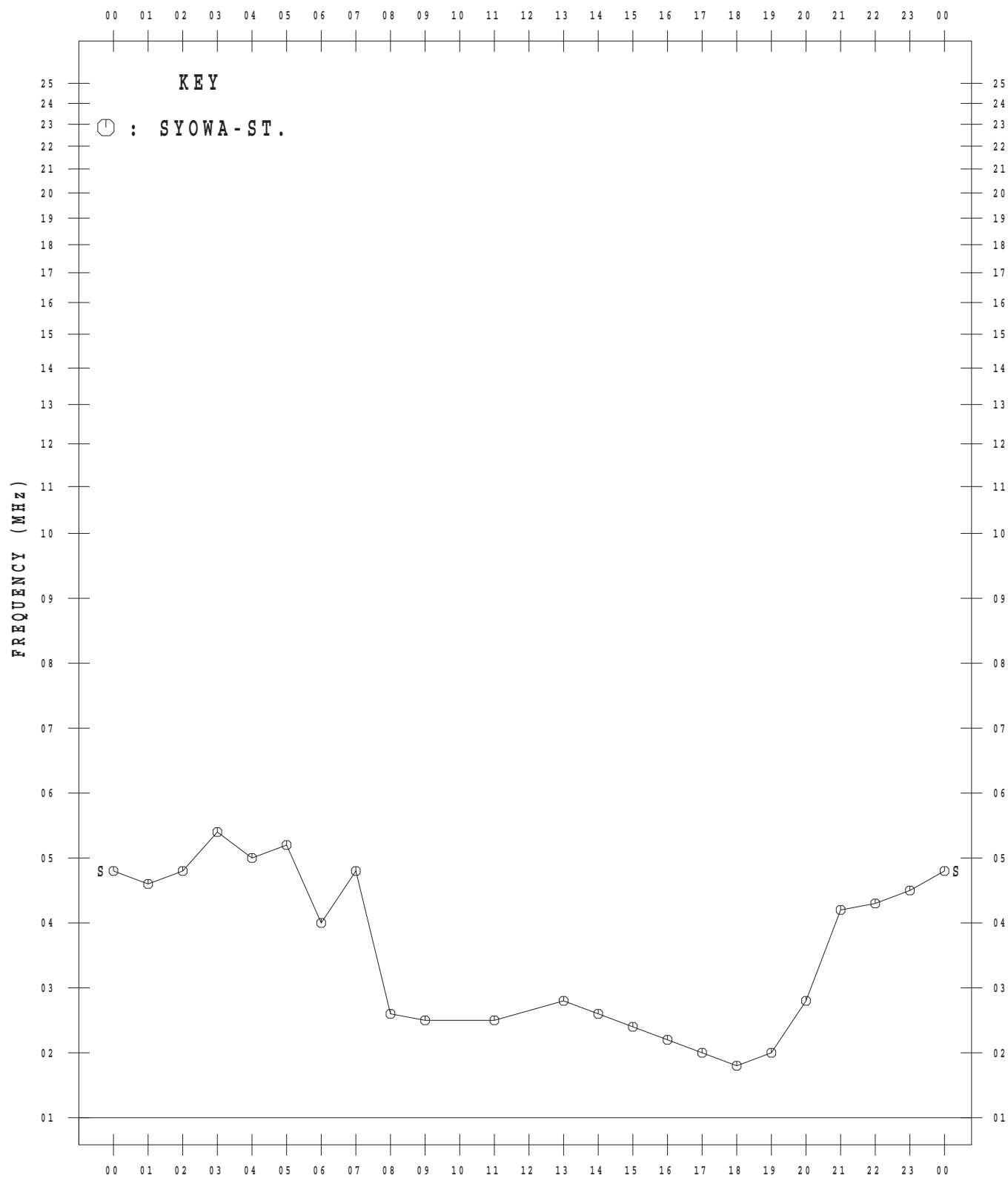
AUG. 2016



MONTHLY MEDIAN VALUES OF f_tE_s

45°E MEAN TIME

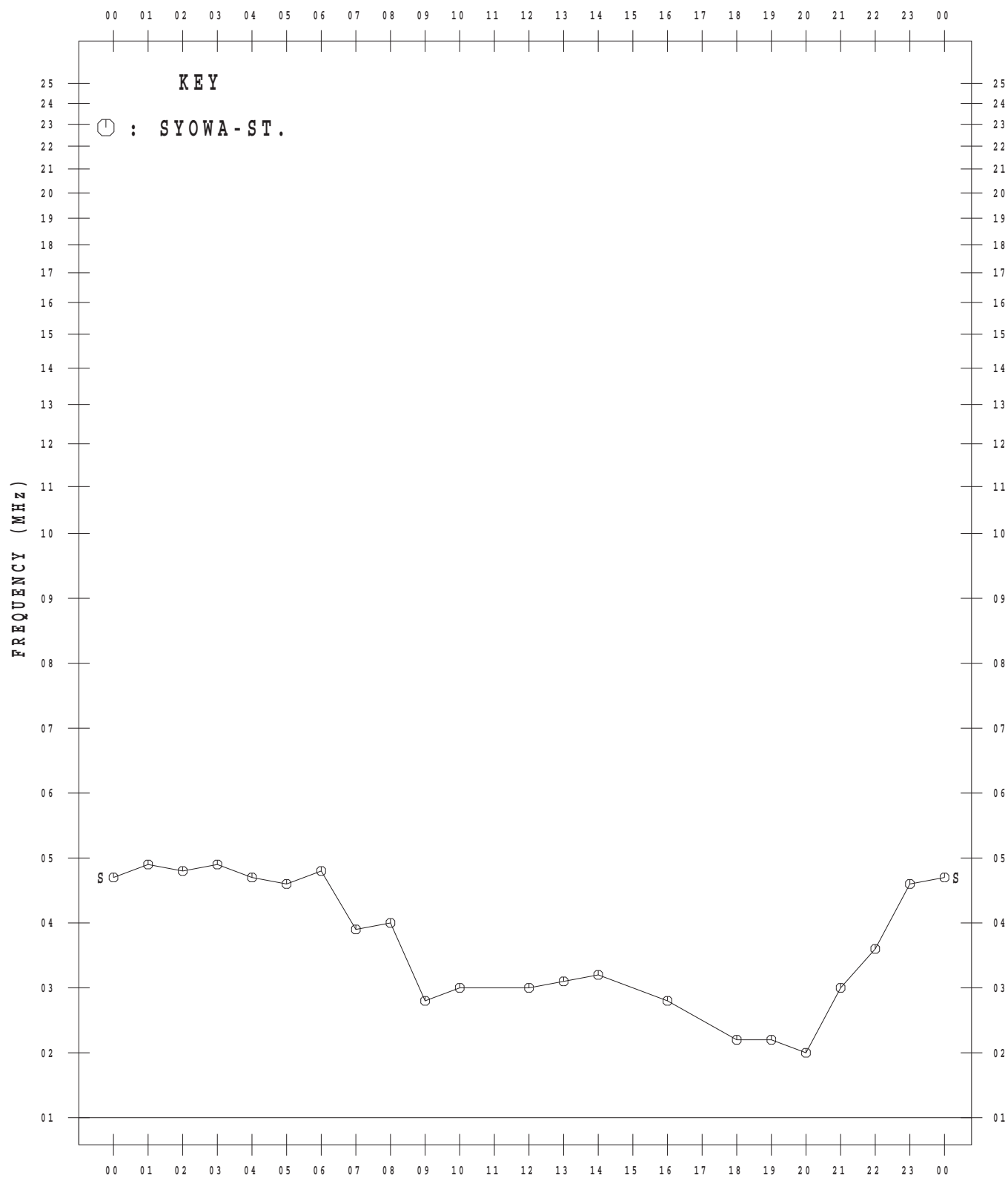
SEP. 2016



MONTHLY MEDIAN VALUES OF f_{tEs}

45°E MEAN TIME

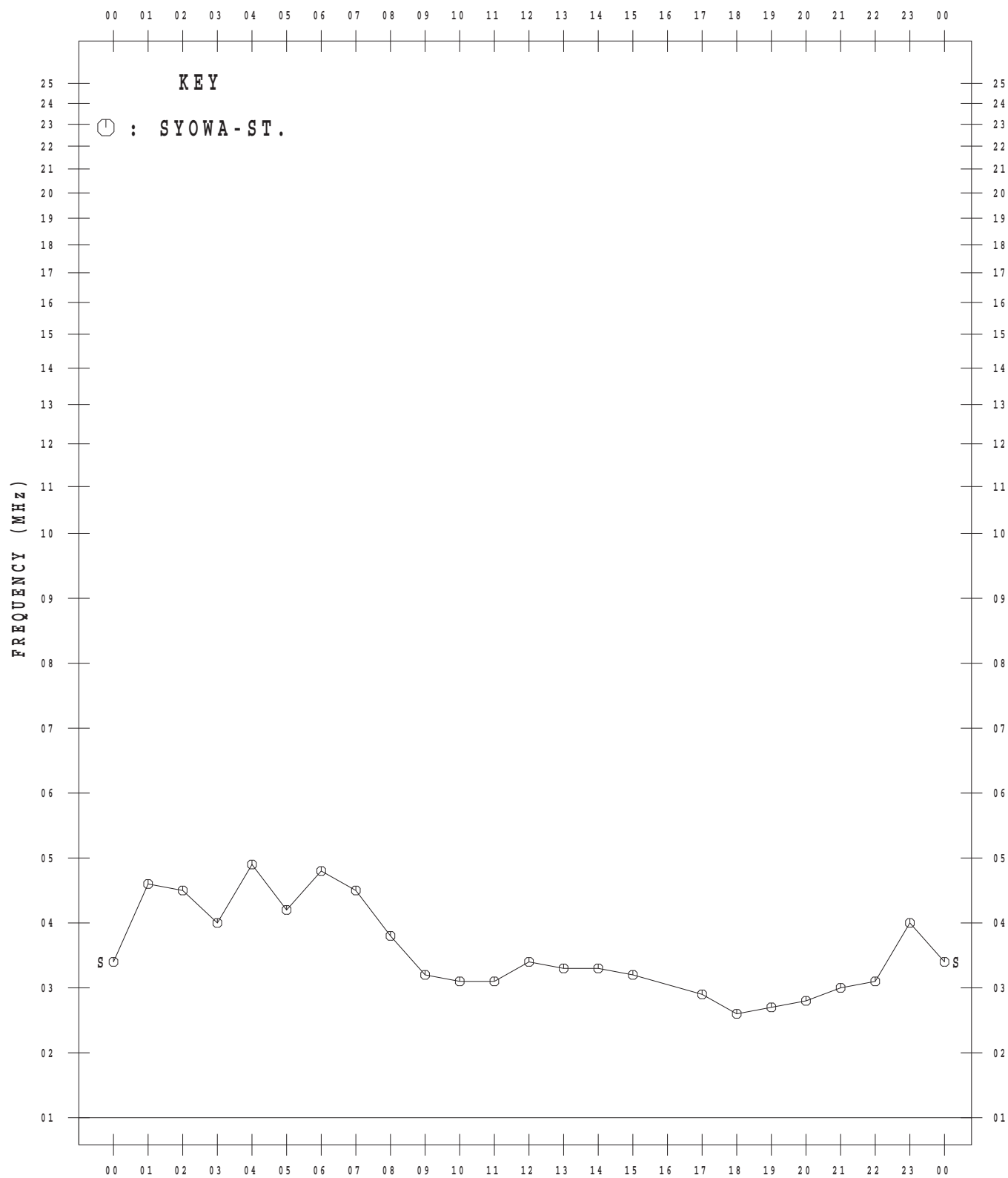
OCT. 2016



MONTHLY MEDIAN VALUES OF f_{tEs}

45°E MEAN TIME

NOV. 2016



MONTHLY MEDIAN VALUES OF f_{tEs}

45°E MEAN TIME

DEC. 2016

