

IONOSPHERIC DATA AT SYOWA STATION (ANTARCTICA)

January – December 2025

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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 2025. 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	87.6

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

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

OBSERVERS

Observer: A. Tanaka

Scaler: H.Uchida

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. 2025 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 ^O 54	X 49	75	69	A	58	A	A	102	A	R	X 53	X 52	X 53	X 69	A	X 52	X 49	X 48	X 47	A	A	A	X 48
2	A	A	A	X 43	X 45	X 45	X 47	X 55	X 57	X 59	X 67	X 64	X 65	X 69	X 69	X 62	X 52	X 50	A	64	A	X 55	X 53	X 48
3	X 50	X 51	X 53	A	X 53	X ^O 54	X 63	X 68	X 79	X 69	X 72	X 71	X 69	X 67	X 66	X 68	X 69	X 69	X 68	X 65	X 64	X 61	X 63	X 62
4	X 65	X 55	X 56	X 55	X 44	X 45	X 60	X 47	X 58	X 49	A	X ^O 49	X 86	X 73	X 63	X 62	X 66	X 68	X 56	X 56	X 72	X 57	A	X 59
5	A	A	A	A	B	X 49	X 58	X 66	X 69	X ^O 75	X 80	X 75	X 70	X 70	X 70	X 63	X ^O 51	X ^O 51	X 46	X 54	X 51	A	X 46	X 47
6	X 48	X 48	X 51	X 53	X 56	X ^O 44	X ^O 58	X A	A	X 64	X 69	X ^O 69	X 69	X 72	X 72	X 77	X 77	X 79	X 66	X 56	X 44	X 61	X 59	X 58
7	X 52	X 55	X 62	X 59	A	X ^O 58	A	A	X ^O 64	X ^O 61	X 63	X 65	X 66	X 73	X 74	X 69	X 68	X 68	X 59	X 58	X 55	X 57	X 56	X 59
8	X 58	X 51	X 55	A	X 52	X 65	X 70	X 71	X 79	X 93	X 93	X 83	X 79	X 71	X 66	X 67	X 69	X 65	X 67	X 60	X 52	X 56	X 46	X 57
9	X 55	X 59	X 63	X 70	X 63	X 66	X 71	X 78	X 89	X 97	X 99	X 92	X 94	X 95	X 92	X 88	X 68	X 55	X 56	X 51	X 69	X 68	X 70	X 59
10	X 61	X 55	X 60	X 66	X 69	X 75	X 61	A	A	A	X 62	X 71	X 62	X 70	X 68	X 69	X 51	X 52	X 60	X 60	X 55	X 60	X 46	X 46
11	X 49	X 72	X 58	X 55	X 71	X 80	X 71	X 63	X 81	X 87	X 86	X 86	X 75	X 74	X 73	X 74	X 71	X 66	X 63	X 55	X 51	X 58	X 60	X 54
12	X 67	X 59	X 62	X 65	X 67	X 58	X 74	X 82	X 95	X 99	X 97	X 94	X 91	X 87	X 85	X 83	X 80	X 71	X 65	X 67	X 71	X 68	X 68	X 61
13	X 53	X 64	X 62	X 68	X 90	X 59	X A	X 69	X 74	X 76	X 74	X 77	X 77	X 76	X 75	X 74	X 69	X 69	X 70	X 67	X 46	X 47	X 54	X 48
14	A	A	X 56	X 51	X 62	X 58	X 45	X 70	X ^O 61	X 51	X 62	X 70	X 63	X 68	X 66	X 66	X 65	X 62	X 63	X 54	X 52	X 54	X 54	X 49
15	A	A	X 49	X 59	X 66	A	A	A	X 52	A	X 59	X ^O 60	X 60	X 65	A	X 61	X 60	X 61	X 51	X 46	X 45	X 58	X 50	X 50
16	X 49	X 55	X 59	X 48	A	A	A	X 89	X 66	X 51	X 63	X 66	X 61	X 60	X 63	X 61	X 67	X 66	X 61	X 62	X 52	A	A	X 53
17	A	X 53	X 56	X 53	X 85	A	A	A	X 71	X 68	X 91	X ^O 55	X ^O 54	X 63	X 55	X 68	X 69	X 64	X 53	X 57	X 58	X 59	X 56	X 76
18	X ^O 47	X A	A	X 55	X 55	X 65	X 68	X 72	X 69	X 72	X 68	X 66	X 65	X ^O 64	X 64	X 64	X 62	X 65	X 62	X 58	X 60	X 56	X 50	X 49
19	X 58	X 57	X 57	X 59	X 57	X 62	X 61	X 76	X 90	X ^O 78	X ^O 55	X ^O 57	X 67	X 69	X 66	X 74	X 69	X 56	X 59	X 57	X ^O 59	X 79	X R	X 51
20	X 55	X 49	X 47	A	A	X 55	X 92	X 47	A	A	X ^O 53	X 52	X 51	X 64	X 60	X 61	X 61	X 54	X 55	X 57	X 52	X 54	X 50	A
21	X 51	A	X 48	X A	X 55	X 59	X 68	X 61	X 58	X ^O 65	X 62	X 61	X 69	X 64	X 65	X 66	X 66	X 68	X 60	X 57	X 58	X 50	X 58	A
22	X ^O 49	X 54	X 57	A	X 61	X 73	X 61	X 51	X ^O A	X ^O 52	X 62	X ^O 62	X 69	X 69	X 72	X 71	X 67	X 66	X 67	X 61	X 56	X 60	X 59	X 55
23	X ^O 54	X 60	X 59	X 54	X 59	X 63	X 65	X 58	A	A	X 55	X 70	X 70	X 68	X 71	X 70	X 68	X 68	X 67	X 68	X 60	X 48	X 48	X 50
24	X 49	X 51	X 52	X 52	A	X 63	X 68	X 71	X 71	X 72	X 74	X 73	X 72	X 68	X 64	X 65	X 64	X 63	X 61	X 64	X 60	X 57	X 58	X 49
25	X 48	X ^O 58	X 55	X 58	X 59	X 70	X 81	X 71	X 82	X 86	X 80	X 79	X 80	X 75	X 71	X 70	X 70	X 69	X 66	X 67	X 64	X 60	X 58	X 52
26	X 53	X 50	X 61	X 61	X 65	X 69	X 73	X 62	X 71	X 90	X 89	X 86	X 82	X 80	X 76	X 72	X 69	X 71	X 68	X 70	X 66	X 64	X 64	X 60
27	X 59	X 57	X 62	X 67	X 72	X 82	X 84	X 97	X ^O 105	X ^O 107	X ^O 106	X ^O 101	X 99	X 100	X 92	X 83	X 79	X 78	X 71	X 61	X 51	X 66	X 57	X 57
28	A	A	X 52	X 57	X 55	X 55	X 62	X 68	X 85	X 88	X 86	X 79	X 77	X 74	X 80	X 75	X 71	X 57	X 51	X 58	A	A	A	X 54
29	X 57	X 42	X 49	X 51	X 48	X 61	X 69	X 70	X 73	X 79	X 79	X 76	X 73	X 72	X 75	X 76	X 71	X 61	X 58	X 59	X 55	X 54	X 48	X 49
30	X 66	A	X 61	X 49	X 60	X 67	X 76	X 88	X 97	X 95	X 95	X 93	X 95	X 90	X 81	X 76	X 71	X 66	X 69	X 68	X 63	X 62	X 58	X 56
31	X 59	X 57	X 59	X 71	X 64	X 72	X 71	X 77	X 94	X 89	X ^O 100	X 95	X 95	X 92	X 91	X 90	X 91	X 77	X 70	X 67	X 63	X 67	X 62	X 57
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	24	28	25	25	26	26	27	26	27	28	30	31	31	30	30	31	31	30	31	28	28	26	29
MED	X 54	X 55	X 57	X 57	X 60	X 62	X 68	X 70	X 74	X 76	X 73	X 71	X 69	X 71	X 70	X 69	X 68	X 66	X 62	X 59	X 56	X 58	X 56	X 54
U Q	X 58	X 58	X 61	X 66	X 66	X 69	X 71	X 76	X 89	X 90	X 88	X 83	X 79	X 76	X 75	X 75	X 71	X 69	X 68	X 64	X 63	X 63	X 59	X 58
L Q	X 50	X 50	X 52	X 52	X 55	X 58	X 61	X 61	X 66	X 61	X 62	X 64	X 63	X 67	X 66	X 65	X 62	X 57	X 58	X 56	X 52	X 56	X 50	X 49

JAN. 2025 f_{XI} (0.1MHz)

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IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2025 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	48	43	59	A	A	40	A	A	44	A	48	47	46	47	64	A	46	43	42	41	A	A	A	42
2	A	A	A	37	39	J R 39	41	49	51	53	61	58	59	63	63	56	46	44	A	F 45	A	49	47	42
3	44	A	47	A	47	48	57	F 59	F 58	63	66	65	63	61	60	62	63	63	62	59	58	55	57	56
4	F 54	49	50	49	38	38	54	41	52	A	A	A	43	80	67	57	56	60	62	50	F 49	43	A	53
5	A	A	A	A	B U 40	R 40	52	60	F 63	69	74	69	64	64	64	57	45	45	R 42	47	43	A J R 40	41	
6	42	42	45	Z 47	50	A	39	R 52	A	58	63	63	63	66	66	71	71	73	60	50	38	55	53	52
7	46	49	56	53	53	A	52	A	F 44	R 55	R 57	59	60	67	64	63	62	62	53	F 38	49	51	50	F 49
8	52	45	F 47	A	46	59	64	65	73	F 74	Z 87	J R 77	J R 73	65	60	61	63	59	61	54	46	F 46	40	51
9	49	53	57	F 62	57	F 54	65	72	79	J R 85	J R 93	85	88	J R 89	82	82	62	49	50	45	63	62	64	53
10	F 42	F 32	F 49	60	F 55	F 63	55	A	A	A	55	F 48	F 56	F 60	62	63	45	F 43	50	54	49	54	40	F 33
11	43	F 50	F 48	F 43	F 60	F 53	65	57	67	F 75	F 80	F 57	F 69	F 68	67	68	65	60	57	49	45	52	54	F 48
12	61	53	56	F 49	F 56	F 54	68	76	F 74	F 67	F 67	F 75	F 85	81	79	77	74	65	59	61	65	60	62	F 50
13	47	F 44	F 51	F 51	F 70	J R 53	A	63	68	70	68	71	71	70	69	68	63	63	64	61	40	41	48	42
14	A	A	50	R 45	R 56	R 52	39	F 54	55	45	56	64	57	62	61	A 60	59	56	J R 57	48	46	48	48	43
15	A	A	J R 43	F 53	F 55	A	A	A	46	A	53	54	54	59	A	55	54	55	J R 45	40	39	47	45	F 39
16	43	J R 49	F 53	F 33	A	A	A	83	F 46	F 45	F 57	60	55	54	57	55	61	60	55	56	46	A	A	47
17	A	44	42	F 41	A	A	A	38	F 41	F 44	A	49	48	57	V 49	62	63	58	47	51	52	53	48	A 76
18	A	F 41	A	F 43	49	59	F 53	F 58	F 54	F 56	62	60	59	58	58	58	56	59	56	52	54	50	44	43
19	52	Z 51	Z 51	53	51	56	F 51	F 60	84	F 67	49	51	60	63	60	68	63	50	53	51	53	50	R	45
20	49	F 41	41	A	A	F 49	F 54	41	A	A	47	46	53	58	54	55	55	48	49	51	44	48	44	A
21	47	A	42	J R 49	J R 53	J R 62	55	53	59	56	55	62	58	59	60	60	60	61	54	51	52	44	52	A
22	43	48	44	A	55	53	55	A 51	A	R 46	56	56	63	63	65	65	61	60	61	54	50	54	53	49
23	F 39	54	53	48	53	57	59	52	A	A 55	F 59	64	62	65	64	62	62	61	62	54	42	42	47	44
24	43	F 45	F 43	43	A	50	46	F 60	F 64	F 58	68	67	66	62	58	59	58	57	55	58	54	51	52	43
25	42	F 44	F 49	50	46	58	F 54	65	76	F 78	74	73	74	69	65	64	64	63	60	61	58	54	52	46
26	47	44	F 51	F 55	59	63	67	F 56	F 61	F 69	F 74	80	J R 76	74	70	66	63	65	62	64	60	58	58	54
27	53	Z 51	F 45	F 53	66	F 64	F 74	84	99	101	100	95	93	94	86	77	73	72	65	55	F 42	F 56	48	F 50
28	F 57	A	46	51	49	49	56	F 57	F 69	82	F 72	73	71	68	74	69	65	F 51	F 45	F 37	A	F 56	A	F 38
29	F 49	36	43	45	42	41	63	64	67	73	73	70	67	66	69	70	65	55	43	40	49	47	42	43
30	43	A	F 40	43	54	61	F 60	82	91	88	88	87	89	84	75	70	F 62	60	69	F 59	57	56	52	50
31	F 45	F 44	F 53	64	56	F 63	Z 65	F 60	75	83	Z 94	88	89	86	85	84	82	71	64	61	57	61	56	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	25	24	28	24	25	26	26	27	26	26	29	30	31	31	30	30	31	31	31	31	28	28	26	29
MED	47	45	48	49	53	53	56	59	64	67	66	64	63	65	64	63	62	60	56	51	49	52	49	47
U Q	50	50	52	53	56	59	64	65	74	75	74	73	73	70	69	69	64	63	62	58	56	56	53	51
L Q	43	44	44	F 43	48	49	52	52	52	55	56	56	57	60	60	59	56	51	49	47	44	48	45	42

JAN. 2025 foF2 (0.1MHz)

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JAN. 2025 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	69	69	45	33	43	31	40	65	35	55	47	41	38	40	37	49	43	35	35	G	30	72	49	80		
2	61	54	91	23	36	G	31	34	36	47	37	42	40	38	42	35	36	57	39	43	45	28	42	17		
3	64	72	23	59	35	35	33	31	43	40	37	40	49	48	47	42	38	42	34	31	36	24	40	21		
4	37	37	38	26	35	36	49	47	41	57	62	55	G	36	146	35	G	36	36	G	30	29	38	36	67	
5	50	79	59	42	37	30	30	29	41	32	E B	38	E B	E B	33	36	32	28	E B	42	40	E B	39	56	45	33
6	38	39	106	22	46	37	33	47	55	123	131	127	41	35	33	30	E B	E B	E B	G	29	41	41	44		
7	45	31	33	37	79	47	45	61	37	55	38	G	E B	E B	G	33	31	30	32	33	31	27	42	41		
8	37	39	32	43	28	34	40	G	48	43	51	38	38	39	35	34	35	35	30	26	35	30	E B	31	21	
9	34	28	29	29	48	28	52	35	36	33	41	41	49	61	42	35	33	E B	37	39	46	43	39	33	42	
10	42	28	43	33	25	29	70	55	61	65	50	40	35	37	36	33	37	39	33	69	50	26	39	35		
11	36	26	53	32	37	26	47	33	34	44	36	38	37	35	36	35	37	34	33	G	38	29	25	36		
12	35	28	35	33	G	47	43	43	35	37	36	G	38	G	G	33	32	E B	35	29	32	36	24	27	25	
13	38	38	37	50	66	47	67	44	52	39	40	41	39	47	37	32	38	31	36	29	31	34	36	41		
14	79	94	51	70	25	38	36	35	54	59	49	36	39	38	36	33	35	34	31	30	28	37	36	47		
15	57	59	35	35	27	74	59	74	73	68	38	42	49	E B	41	135	E B	37	G	73	32	23	41	48	43	
16	46	26	19	23	53	68	43	35	75	77	41	32	42	38	36	49	33	32	32	72	29	60	32	49		
17	108	48	37	23	69	74	52	33	39	41	56	75	43	34	34	35	G	32	33	45	37	39	47	58		
18	52	35	71	41	92	G	37	37	46	44	53	41	E B	39	39	E B	38	33	31	30	31	31	31	28	22	34
19	24	49	44	37	41	35	42	33	35	42	63	35	G	G	39	35	40	37	37	35	29	46	57	102		
20	56	22	66	49	43	44	31	38	48	57	62	41	E B	39	33	36	34	40	G	E B	34	32	33	40	33	45
21	42	115	28	52	42	32	31	43	70	41	41	38	37	36	35	35	34	30	30	28	22	25	45	43		
22	40	56	35	67	27	38	37	47	62	53	37	38	E B	48	40	41	35	34	33	29	G	23	25	26	23	
23	41	63	38	36	71	49	49	49	67	56	42	37	39	35	34	30	35	G	32	27	31	35	39	40		
24	45	36	31	21	65	26	36	45	37	43	53	41	36	41	38	36	35	33	29	42	30	26	22	30		
25	37	40	94	36	25	44	31	43	31	39	41	40	54	46	55	39	37	32	33	29	25	31	19	19		
26	40	36	48	41	36	34	41	47	45	37	36	42	45	41	46	36	45	44	31	37	33	21	27	18		
27	14	26	30	38	42	35	45	41	39	41	39	57	43	36	65	54	52	37	32	34	47	41	41	43		
28	55	58	36	44	45	28	43	33	34	40	36	36	38	40	48	38	34	41	32	32	47	48	64	64		
29	57	31	63	24	66	31	33	37	35	37	35	40	38	63	46	43	36	32	32	46	41	41	38	47		
30	40	85	41	72	35	29	37	49	33	33	37	40	47	50	42	38	33	31	32	30	25	42	18	34		
31	33	18	41	23	30	43	32	34	33	40	37	38	44	45	39	36	G	33	G	26	27	22	13	18		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	31	31	30	29	31	30	31	31	31	29	30	29	29	30	29	28	29	27	31	31	31	31		
MED	42	39	38	36	42	35	40	42	41	43	41	40	39	40	38	35	35	34	32	32	31	35	36	41		
U Q	56	59	53	44	53	46	47	47	54	56	52	42	44	46	44	38	38	37	36	42	38	41	42	47		
L Q	37	28	33	26	35	30	33	34	35	39	37	38	38	36	36	33	33	32	31	30	29	26	27	25		

JAN. 2025 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2025 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	10	9	13	11	11	17	9	11	19	24	10	26	26	11	10	9	9	8	10	18	7	9	
2	15	9	7	6	9	6	8	10	9	11	8	13	11	14	24	11	10	11	10	9	9	8	11	8	
3	8	8	8	23	8	8	8	9	8	8	14	14	10	10	10	18	10	9	8	8	8	E	E	8	
4	9	8	8	8	6	7	6	9	12	24	16	28	18	9	15	13	28	9	9	10	7	8	8	8	
5	12	15	15	26	36	24	23	25	27	24	52	25	39	40	21	24	24	22	42	25	39	24	36	24	
6	25	19	16	14	24	18	17	14	12	17	24	21	23	13	11	25	34	32	17	11	9	9	8	11	
7	12	13	17	20	18	13	25	22	13	12	15	17	37	43	27	29	15	10	17	11	11	8	14	27	
8	24	23	10	17	7	11	23	11	15	17	25	30	13	9	11	14	10	8	10	8	8	8	31	8	
9	8	11	8	10	11	10	16	12	8	8	10	8	10	12	11	9	18	37	13	8	8	8	6	14	
10	11	8	11	6	6	10	15	23	10	12	11	18	13	11	17	11	10	9	9	7	6	8	8	7	
11	7	7	12	10	7	7	6	9	11	11	13	11	8	7	10	14	9	10	11	6	8	11	6	9	
12	8	13	18	7	19	16	9	9	12	9	9	7	17	23	13	29	12	35	13	7	10	8	11	9	
13	11	7	7	7	18	15	11	14	12	10	9	9	11	10	13	13	10	10	9	6	6	9	7	18	
14	12	11	16	14	6	6	7	9	10	13	18	16	13	11	15	13	11	9	9	9	9	6	8	12	
15	24	7	8	9	8	16	11	10	11	11	11	13	42	41	28	37	11	11	14	12	10	7	10	7	
16	7	7	7	7	14	11	13	11	18	26	14	29	24	21	19	10	14	20	25	18	21	10	9	10	
17	8	19	9	7	16	12	9	10	11	11	11	13	23	13	11	26	13	12	9	12	21	6	8	12	
18	23	9	15	9	13	24	23	16	14	14	24	14	39	24	38	24	22	19	15	18	15	15	8	7	
19	7	10	11	15	16	16	15	8	9	14	21	27	15	15	23	26	14	16	13	27	9	13	7	7	
20	16	7	7	13	7	9	9	9	12	23	16	24	39	20	13	22	12	18	34	13	11	8	7	11	
21	8	7	11	19	15	12	9	10	9	23	28	23	15	18	20	14	24	23	20	7	9	15	34	23	
22	27	13	10	17	6	9	9	10	12	12	12	33	48	40	33	25	20	22	25	15	17	13	11	6	
23	12	9	23	11	11	10	24	19	12	15	24	11	12	15	14	20	16	13	16	9	11	9	15	15	
24	11	9	8	5	14	10	11	11	9	13	22	37	26	23	20	15	14	10	10	15	8	11	7	6	
25	8	10	9	E	E	E	11	11	13	9	12	11	11	9	9	9	10	10	12	9	8	9	12	9	7
26	8	10	14	13	12	9	11	11	11	10	9	9	9	10	11	7	9	8	7	7	9	7	5	7	
27	6	7	9	9	11	6	6	7	9	9	9	13	9	12	23	15	12	13	7	9	12	7	11	7	
28	9	10	7	9	9	7	9	9	11	11	10	9	11	10	8	9	8	10	12	11	8	6	5	9	
29	7	7	8	8	12	9	11	11	10	10	11	9	9	8	7	21	9	8	9	7	7	7	7	10	
30	7	6	6	7	6	7	9	9	7	8	7	10	7	7	7	8	8	9	8	7	7	6	7	7	
31	8	7	7	9	7	7	7	9	7	11	9	9	8	9	11	11	12	24	16	11	6	5	6	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	9	9	9	9	11	10	11	10	11	12	13	14	13	13	14	14	12	11	11	9	9	8	8	9	
U Q	12	11	14	14	15	13	15	14	12	15	21	24	24	23	23	24	16	20	16	12	11	11	11	12	
L Q	8	7	8	7	7	7	9	9	9	10	10	10	10	10	10	11	10	9	9	7	8	7	7	7	

JAN. 2025 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2025 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	A	A	A	208	A	A	202	A	A	204	220	235	E A 274	A	256	225	238	232	A	A	A	A	
2	A	A	A	320	A	321	288	272	242	A	224	215	220	226	232	228	249	255	A	A	285	A	A	A	
3	300	E A 286	282	A	270	256	228	210	244	208	209	202	E A 244	E A 220	210	224	230	225	234	234	240	250	265	278	
4	E A 259	A	A	228	A	204	A	222	220	A	A	A	212	252	233	H 168	248	254	260	240	245	296	A	200	
5	A	A	A	A	B	A	E A 296	A	E A 280	A	E A 299	192	E B 277	230	E A 228	E A 220	228	236	232	258	E B 302	A	A	A	
6	A	A	A	A	A	A	A	A	A	A	A	230	235	213	194	182	223	228	232	246	260	280	295	295	318
7	A	340	334	345	A	A	A	A	190	A	228	198	210	E A 280	223	208	214	218	202	253	270	265	328	A	
8	A	290	343	308	A	298	260	280	244	310	245	236	204	245	212	H 206	H 224	196	204	225	220	258	282	230	270
9	250	279	311	282	A	242	A	262	206	195	184	186	240	225	225	214	236	246	248	A	286	288	240	298	
10	A	E A 280	334	230	242	236	A	A	A	A	225	200	208	208	208	194	220	224	212	290	346	256	320	A	
11	A	370	266	354	274	356	236	228	215	162	250	208	204	208	208	210	216	224	220	232	150	356	284	262	267
12	278	301	E A 340	280	264	A	A	264	235	222	220	194	196	194	204	214	208	210	214	210	216	230	225	255	230
13	A	A	384	A	299	A	A	202	A	192	222	210	214	234	208	212	225	218	220	226	274	282	268	358	
14	A	A	A	A	A	250	A	262	232	262	224	208	211	202	220	210	194	216	208	225	228	260	278	330	406
15	A	A	A	295	266	A	A	A	A	285	A	212	202	622	274	A	224	230	234	215	329	280	275	316	330
16	385	345	310	275	A	A	A	238	220	265	230	248	206	208	202	210	206	230	240	242	270	A	A	A	
17	A	440	320	280	248	A	A	250	232	220	A	226	206	184	218	230	230	225	244	A	286	286	360	A	
18	A	A	A	A	A	A	A	266	228	258	278	A	255	212	215	215	198	208	232	232	227	252	252	262	330
19	288	360	A	A	A	352	A	192	212	212	A	280	242	234	230	224	220	244	E A 292	234	247	A	246	372	
20	A	A	A	A	A	A	A	258	257	A	E A 246	252	244	218	212	232	252	224	E A 238	239	284	A	296	A	
21	A	A	390	A	388	308	258	231	A	242	260	212	196	222	196	218	228	222	234	228	250	270	260	A	
22	A	463	A	A	336	338	288	262	A	270	210	E A 252	B	222	228	220	216	225	232	230	242	268	254	284	
23	A	A	328	A	A	A	A	A	A	A	A	232	182	208	200	210	220	214	230	225	218	368	360	342	358
24	444	A	A	175	A	266	270	310	294	240	A	248	206	215	218	212	225	228	236	243	252	252	264	286	
25	A	318	A	A	304	280	E A 264	256	208	222	217	210	A	212	210	212	210	218	230	228	202	255	242	242	
26	267	300	A	A	370	320	306	250	246	218	200	200	209	203	198	200	206	238	232	230	230	245	248	232	
27	174	304	322	352	328	296	252	249	229	220	218	A	195	201	266	236	240	190	234	302	A	278	316	345	
28	A	A	A	A	A	307	254	212	200	210	192	214	210	215	235	221	220	252	214	333	A	228	A	336	
29	A	348	A	288	A	A	264	170	230	234	225	220	190	222	216	230	218	234	228	A	282	296	307	388	
30	A	A	360	A	A	270	277	A	232	214	192	H 210	192	214	190	202	210	213	216	232	228	250	244	370	
31	236	269	A	271	251	A	221	281	210	231	230	215	H 204	210	217	230	220	234	193	180	238	252	234	242	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	14	18	17	16	14	17	20	25	24	23	25	29	29	31	30	30	31	31	30	27	27	25	25	23	
MED	289	309	331	280	284	270	264	244	228	222	220	210	209	214	214	219	220	225	230	232	260	270	264	318	
U Q	363	345	357	308	328	314	278	262	252	245	230	232	224	225	228	224	230	234	238	253	282	285	316	358	
L Q	259	280	310	250	251	239	253	218	209	212	208	202	205	208	208	208	214	218	220	227	242	252	247	267	

JAN. 2025 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2025 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	69	63	66	60	X 57	X 55	A	A	X 72	X 74	X 77	X 72	O X 71	85	X 70	X 76	73	67	A	X 47	A	A	A	A
2	A	55	59	X 57	53	53	X 52	X 53	A	A	X 52	O X 60	68	73	80	85	72	56	72	54	58	54	53	47
3	X 42	X 47	R 48	X 56	X 58	X 59	X 70	X 75	X 76	X 76	X 77	X 75	X 76	X 73	X 73	X 73	X 69	X 65	X 65	X 65	X 58	X 62	X 62	X 61
4	X 58	X 55	X 50	X 59	X 69	X 70	X 78	X 96	X 97	X 99	X 99	X 101	X 94	X 92	X 89	X 88	X 82	X 76	X 73	X 71	X 72	X 67	X 55	X 45
5	X 53	X 58	X 48	X 70	X 61	X 70	X 73	X 72	102	113	111	107	100	97	92	86	79	75	76	66	55	50	52	50
6	50	50	X 42	X 62	X 68	X 71	X 78	X 66	X 78	X 90	X 90	X 86	X 89	X 83	X 79	X 73	X 73	X 75	X 75	X 66	X 59	X 57	X 55	X 47
7	50	X 47	X 65	O X 67	X 69	X 71	X 82	X 88	X 92	X 89	X 91	X 90	X 87	X 83	X 78	X 73	X 77	X 70	X 68	A	X 65	X 70	X 68	X 70
8	76	72	X 73	X 73	X 77	X 87	X 97	X 104	X 110	X 78	X 64	X 105	R	96	97	81	74	58	60	66	69	57	44	A
9	X 45	X 43	X 51	X 53	X 63	X 58	X 71	X 80	X 82	X 95	X 87	X 90	X 87	X 84	X 78	X 78	X 71	X 72	X 64	B	X 49	A	A	A 83
10	A	A	A	60	51	A	A	X 55	A	X 61	X 56	X 61	O X 50	X 68	X 68	X 64	X 58	X 49	A	X 44	O X 53	A	A	B
11	A	A	57	49	B	A	A	A	O X 45	X 52	X 59	X 62	X 63	X 61	X 65	X 70	X 71	X 57	X 55	X 57	X 53	X 54	X 57	X 47
12	58	X 56	A	A	A	X 53	X 58	X 85	A	A	70	X 61	X 64	X 70	X 68	X 69	X 62	X 66	X 62	X 58	X 63	X 57	X 55	A
13	A	A	49	55	A	A	A	A	A	55	A	O X 49	O X 57	O X 58	B	X 64	X 66	X 62	X 48	X 47	X 53	X 58	X 58	A
14	A	A	A	A	A	O X 58	A	A	A	59	X 49	A	B	O X 59	X 60	X 59	X 57	X 55	X 50	X 41	X 45	A	A	A
15	A	A	A	A	A	X 55	A	X 42	X 44	A	O X 49	O X 50	O X 51	X 65	X 61	X 71	X 63	X 63	X 49	X 57	A	A	A	A
16	X 58	X 43	R 54	A	X 51	X 52	A	A	A	A	A	A	O X 58	O X 65	X 66	B	X 66	X 61	X 58	X 48	X 58	X 47	X 47	A
17	X 45	X 51	X 49	X 59	X 72	X 53	O X 69	X 63	A	R 65	X 67	X 72	X 68	X 72	X 68	X 72	X 69	X 65	X 57	O X 39	O X 48	X 45	X 43	A
18	A	O X 31	A	48	X 58	X 49	A	O X 61	A	56	X 51	X 57	X 60	X 61	X 63	X 63	X 61	X 62	X 62	X 61	X 53	X 47	X 50	X 44
19	X 41	X 37	A	64	X 62	A	A	A	59	X 55	X 59	O X 48	O X 49	X 70	X 67	X 70	X 66	X 62	X 60	X 62	X 56	X 44	X 56	A
20	A	A	A	A	X 66	X 46	X 47	A	A	X 59	X 64	X 62	X 67	X 68	X 65	X 65	X 64	X 63	X 63	X 63	X 63	X 57	X 56	70
21	59	X 59	X 56	61	A	X 57	A	X 63	X 77	X 80	X 84	X 84	X 88	X 85	X 82	X 82	X 85	X 84	X 84	X 78	X 78	X 70	X 59	59
22	52	58	A	59	A	58	A	X 65	X 76	X 79	X 82	X 82	X 84	X 83	X 83	X 84	X 85	X 77	X 73	X 74	X 69	X 66	X 85	61
23	57	70	71	62	64	X 53	X 74	X 54	A	X 68	X 78	X 77	X 82	X 80	X 79	X 80	X 82	X 79	X 72	X 71	X 72	X 68	X 60	X 56
24	X 49	X 60	X 59	A	X 56	X 89	X 62	X 87	X 91	X 100	X 94	X 97	X 102	X 102	X 105	X 104	X 96	X 87	X 84	X 69	X 72	A	A	A 69
25	X 50	X 53	X 58	X 50	X 55	R 45	X 56	O X 60	X 73	X 83	X 85	X 86	X 83	X 78	X 73	X 74	X 78	X 73	X 73	X 68	X 53	X 60	X 48	A
26	A	67	49	57	O X 49	X 57	X 64	X 69	A	B	53	X 64	X 63	X 69	X 65	X 72	X 72	X 68	X 59	X 46	A	A	A	A
27	A	58	A	O X 45	X 51	X 57	X 56	X 68	O X 56	X 65	X 62	X 69	X 67	X 73	X 65	X 60	X 72	X 60	X 49	X 94	X 42	A	A	A
28	A	A	A	A	A	X 61	A	A	73	89	47	R	B	O X 75	X 81	X 78	X 75	X 73	X 50	O X 96	X 36	X 69	X 74	A
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	21	19	21	20	24	16	20	17	23	26	25	25	28	27	27	28	28	26	25	25	20	20	14
MED	52	55	55	59	60	X 57	X 70	X 67	X 76	X 76	X 68	X 72	X 71	X 73	X 73	X 73	X 72	X 65	X 62	X 63	X 58	X 57	X 56	X 58
U Q	58	60	59	62	67	X 66	X 76	X 82	X 92	X 89	X 85	X 88	X 87	X 84	X 80	X 81	X 78	X 74	X 73	X 70	X 67	X 66	X 61	X 69
L Q	X 47	X 47	X 49	X 54	X 54	X 53	X 57	X 60	X 66	X 59	X 56	O X 61	O X 63	X 66	X 65	X 69	X 66	X 60	X 57	X 51	X 51	X 54	X 51	X 47

FEB. 2025 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2025 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	39	50	F 55	F 47	51	49	A	A	Z 66	68	71	R 66	F 55	F 61	64	70	62	61	A	41	A	A	A	A	
2	A	F 37	F 49	51	F 39	F 40	46	47	A	A J	R 46	R 54	F 59	F 63	74	F 75	66	50	F 62	48	52	F 42	47	41	
3	36	J 37	R 42	50	52	53	64	69	70	70	71	69	70	67	67	67	63	59	59	59	52	56	56	55	
4	52	49	44	53	57	64	F 66	81	91	80	F 93	95	88	86	83	82	76	70	67	65	66	61	49	39	
5	33	46	42	62	55	64	67	66	81	F 85	F 85	F 84	94	86	F 81	79	73	69	70	60	49	44	47	F 38	
6	F 36	37	36	F 51	52	60	72	60	72	84	81	80	83	77	73	67	67	69	69	60	53	43	41	41	
7	F 37	41	43	43	F 50	65	76	82	81	83	85	84	81	77	72	67	71	64	62	A	59	64	62	64	
8	F 64	55	67	67	J 71	R 81	J 91	R 98	96	72	58	F 70	63	F 78	F 88	75	68	52	54	54	63	51	35	A	
9	F 33	F 37	39	F 41	J 57	R 52	F 55	60	76	89	81	F 78	81	78	72	72	65	66	58	B	43	A	A	A	
10	A	A	A	48	F 35	A	A	49	A	55	51	55	A	44	62	62	58	52	43	A	38	47	A	B	
11	A	A	40	A	B	A	A	A	39	F 43	53	56	57	55	F 56	64	65	51	49	51	47	42	F 40	41	
12	F 51	47	A	A	A	47	52	R	A	A	58	55	58	64	62	63	56	60	56	52	54	51	39	Z A	
13	A	A	F 41	49	A	A	A	A	A	49	A	43	51	52	B	58	60	56	42	41	47	38	52	A	
14	A	A	A	A	A	48	A	A	A	F 48	43	A	B	R 53	54	53	51	A	44	35	39	A	A	A	
15	A	A	A	A	A	49	A	36	38	A	43	44	45	F 52	55	65	R 57	57	43	U 39	A	A	A	A	
16	35	34	R 52	A	45	46	A	A	A	A	A	A	52	59	60	B	60	55	53	42	F 50	A	41	A	
17	J 39	R 45	44	F 41	F 54	47	51	57	A J	R 59	61	66	62	J 66	62	66	63	59	51	R 33	42	39	37	A	
18	A	25	A	F 33	F 43	43	A	56	A	F 44	45	51	J 54	R 55	J 57	57	55	56	56	55	47	41	44	J 38	
19	35	31	A	F 43	F 50	A	A	A	39	F 40	47	42	R 43	R 59	R 61	64	60	56	54	56	50	38	50	A	
20	A	A	A	A	49	46	41	A	A	53	58	56	61	62	59	59	58	57	57	57	57	51	50	46	
21	F 50	47	50	F 43	A	51	A	57	71	74	78	79	83	79	76	76	79	78	78	72	72	61	53	F 47	
22	F 38	F 56	A	42	A	F 48	A	59	67	73	76	76	78	77	77	78	79	71	67	68	63	60	59	F	
23	37	F 38	F 44	F 45	46	47	43	48	R	A	R 62	72	71	76	74	73	74	76	73	66	65	66	62	54	50
24	43	F 38	F 38	A	45	F 77	56	81	J 85	R 94	88	90	96	96	99	98	90	81	78	63	59	A	A	A	
25	44	F 42	43	44	49	45	50	R 54	F 62	77	79	80	77	72	67	68	72	67	67	62	47	F 36	31	A	
26	A	43	43	51	39	51	F 52	F 57	A	B	B	58	57	63	59	66	66	62	52	36	26	A	A	A	
27	A	F 47	F 55	39	45	51	50	F 58	50	59	56	63	61	60	59	54	F 54	54	43	27	36	A	A	A	
28	A	A	A	A	A	55	A	A	A	F 69	R 44	B	69	75	72	69	67	44	A	A	28	52	A	A	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	17	21	19	20	20	24	16	19	16	23	25	25	26	28	27	27	28	27	26	24	26	20	19	11	
MED	38	42	43	46	50	50	54	58	70	69	61	66	62	65	67	67	65	59	56	54	50	49	47	41	
U Q	F 47	47	50	51	53	58	66	69	81	80	80	80	81	77	74	75	72	69	67	61	59	58	53	50	
L Q	36	37	41	42	45	47	50	54	56	F 53	49	55	57	59	59	63	59	55	51	41	43	42	40	39	

FEB. 2025 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2025 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	35	41	36	23	27	29	48	88	56	43	39	36	40	37	36	35	33	31	49	45	50	58	52	69	
2	48	35	125	93	37	42	155	30	85	55	42	E B 47	35	32	31	E B 37	E B 35	32	47	39	30	49	44	37	
3	40	35	73	35	31	26	28	29	33	36	42	37	47	42	36	37	36	33	29	27	22	32	15	22	
4	16	K 16	28	29	29	27	44	33	30	32	35	34	35	39	34	36	40	33	G 30	G 30	25	19	15	16	
5	23	27	24	34	33	27	29	42	42	41	35	36	36	45	55	54	39	46	G 29	G 24	33	28	38	38	
6	39	33	33	48	44	K 45	46	41	47	34	35	34	34	E B 35	E B 39	36	32	28	28	26	34	26	37	40	
7	38	47	63	37	39	40	26	32	34	38	57	55	52	34	35	35	53	45	115	94	53	48	35	24	
8	16	17	25	23	G 20	24	27	29	33	48	49	E B 36	E B 38	37	38	39	30	36	G 38	B 33	34	33	35	K 35	
9	28	28	30	35	37	25	38	29	31	31	33	G 32	G 33	33	35	33	32	30	G 27	B 38	59	52	41	B 41	
10	105	69	55	40	33	63	48	44	48	45	49	47	31	42	G 32	G 32	G 28	G 29	G 57	G 41	55	57			
11	56	39	29	E B 26	B 52	50	55	58	39	45	35	44	E B 37	E B 38	E B 35	31	33	29	G 30	G 26	35	39	40		
12	54	51	59	45	63	36	47	36	54	47	47	34	28	33	E B 39	E B 88	29	27	28	G 29	G 29	27	22	89	
13	53	55	41	37	56	59	62	63	39	36	55	59	39	33	B E 46	B E 46	28	31	33	25	22	43	41	60	
14	57	57	59	39	71	42	78	60	56	44	45	46	B E 48	B E 32	B E 123	G 36	33	30	G 32	G 32	58	85	59		
15	55	56	50	71	60	47	47	27	35	54	34	E B 36	E B 39	E B 35	E B 38	E B 47	E B 48	E B 35	29	29	89	113	95	57	
16	41	59	56	37	K 33	30	36	69	67	67	49	E B 53	E B 43	E B 38	G 38	B 29	28	E B 36	E B 28	51	41	96	71		
17	60	42	95	29	30	30	32	G 44	44	34	34	G 35	33	G 35	33	29	29	29	32	27	32	36	50	42	
18	46	71	68	25	36	18	56	43	49	51	37	G 33	34	33	33	31	30	G 28	G 31	23	26	17	17	18	
19	18	29	54	42	40	63	56	53	35	32	38	68	55	E B 38	E B 39	34	30	E B 28	E B 28	G 27	K 28	K 29	35	69	
20	65	49	61	73	37	30	110	34	58	45	E B 26	39	97	41	47	34	30	E B 30	G 24	20	20	15	20		
21	11	K 16	30	37	68	68	58	44	37	31	32	33	35	34	41	34	31	29	30	27	E B 21	E B 14	15	70	
22	31	45	82	30	49	41	44	37	27	33	31	35	35	34	39	32	31	28	E B 27	E B 23	E B 21	E B 17	E B 12	17	
23	23	12	32	43	42	K 28	43	34	56	55	34	34	34	36	32	32	29	33	35	36	29	17	15	18	
24	30	37	21	48	38	22	26	45	30	33	35	33	33	32	34	33	30	28	29	29	19	49	63	54	
25	38	28	31	17	E B 26	E B 25	31	E B 44	E B 32	29	33	34	34	34	33	33	29	29	27	E B 18	E B 21	E B 34	E B 30	43	
26	25	35	22	28	15	67	36	G 51	B E 51	B E 42	42	42	36	35	G 30	G 27	30	27	26	28	43	92	82	56	
27	39	35	21	53	22	39	27	42	49	45	46	E B 37	E B 39	E B 34	E B 32	E B 37	E B 39	E B 32	E B 28	E B 22	33	42	33	60	
28	45	60	71	61	58	34	46	63	50	51	46	B E 41	B E 35	B E 30	30	28	E B 30	G 49	G 13	40	47	83	60		
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	27	28	28	26	28	27	28	26	27	28	24	25	26	27	26	27	28	28	28	27	
MED	39	38	46	37	37	35	45	42	46	41	38	36	36	34	34	34	30	30	29	28	31	36	38	42	
U Q	54	53	62	46	49	46	53	53	55	48	46	46	41	38	39	38	35	33	33	30	39	49	54	60	
L Q	26	28	30	29	30	27	32	33	34	33	34	34	34	34	32	33	30	28	28	24	24	26	20	24	

FEB. 2025 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2025 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	6	9	14	7	9	8	9	9	9	14	15	11	12	17	20	11	11	8	9	9	8	13	15	9	
2	8	7	7	9	13	8	6	13	15	15	26	47	28	23	24	37	35	13	13	10	9	15	9	8	
3	9	9	7	9	11	10	11	22	8	9	9	11	12	9	9	11	10	12	9	6	6	6	12	9	
4	7	7	7	6	10	7	15	9	13	14	13	25	17	13	23	21	19	23	21	19	13	12	10	7	
5	6	7	7	22	8	14	7	8	11	10	10	17	9	9	9	9	10	8	7	9	20	7	7	9	
6	9	13	7	13	13	21	18	11	9	10	21	15	11	13	39	11	9	24	10	9	7	7	7	7	
7	7	20	11	10	11	9	7	9	9	11	12	14	9	14	15	9	10	12	11	9	7	12	9	9	
8	10	8	7	9	7	10	13	11	14	16	12	17	38	18	14	11	28	9	9	14	11	6	6	7	
9	8	9	9	5	9	5	7	7	7	8	9	14	19	17	9	11	9	7	7	B	11	7	7	9	
10	11	10	9	12	7	11	9	9	13	9	11	13	22	12	18	23	17	22	10	9	8	8	13	B	
11	10	10	9	26	B	35	16	9	7	15	25	21	25	37	38	35	10	15	9	20	8	9	7	8	
12	8	7	26	10	12	20	10	11	25	21	14	13	24	25	39	23	18	13	9	9	13	9	10	8	
13	11	24	21	15	23	24	26	20	14	11	17	14	23	18	B	46	12	7	12	12	7	7	7	12	
14	9	7	11	8	13	7	25	16	29	9	10	15	B	48	25	17	12	11	15	7	9	11	7	7	
15	9	9	8	6	15	11	9	7	7	15	11	25	39	21	38	47	48	35	15	12	10	13	7	8	
16	6	9	12	9	20	14	14	9	15	15	12	37	43	38	25	B	15	19	36	9	12	9	9	8	
17	7	9	7	10	7	9	12	7	15	15	24	20	14	13	12	20	11	12	7	24	11	13	9	10	
18	9	8	9	9	10	9	13	9	14	13	19	11	14	16	11	10	9	9	11	13	8	12	10	7	
19	7	7	6	11	11	13	9	11	9	8	12	25	17	25	39	23	15	18	28	15	10	8	7	12	
20	12	11	6	7	6	6	12	18	15	20	26	12	15	12	13	17	23	30	15	16	10	7	8	7	
21	7	6	8	14	11	11	19	13	13	11	8	7	8	15	29	14	11	11	17	10	11	14	10	8	
22	8	11	13	12	12	14	12	13	13	11	12	11	11	10	11	13	11	16	27	23	21	17	12	7	
23	9	8	5	9	15	9	11	12	11	12	7	11	10	11	9	15	10	10	6	6	7	9	6	6	
24	6	10	9	8	9	6	7	8	7	8	12	12	11	11	10	11	11	11	13	9	10	12	8	7	
25	5	7	7	7	12	25	26	44	32	22	24	17	16	14	19	24	15	15	21	18	21	14	13	11	
26	10	13	10	9	11	19	19	16	21	B	42	29	15	17	15	24	17	15	12	11	11	9	8	8	
27	6	7	7	6	9	13	10	11	12	13	32	37	39	27	9	37	21	32	10	22	8	8	8	E E 5	
28	E E 5	9	6	7	9	9	7	24	11	21	13	B	41	35	24	20	30	11	15	11	11	9	5	9	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	
MED	8	9	8	9	11	10	12	11	13	13	12	15	16	16	18	18	12	12	12	11	10	9	8	8	
U Q	9	10	10	12	13	14	16	14	15	15	22	25	26	24	27	24	18	18	15	17	11	12	10	9	
L Q	6	7	7	7	9	8	9	9	9	10	11	12	12	12	11	11	10	10	9	9	8	8	7	7	

FEB. 2025 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2025 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
1	326	330	320	275	272	240				254	242	224	240	202	188	214	228	238		A	A	A	A	A									
2	A	A	A	A	A	A	284	216		A	A	259	B	230	232	228	220	236	232	298	302	238	352	376	306								
3		A	E	A	E	A	264	283	256	248	218	215	228	234	238	230	214	198	242	236	215	244	245	247	258	255							
4	255	E	A	E	A	E	A	A		A	232	236	197	200	198	222	228	212	230	222	233	214	244	248	236	248	288						
5	298	275	246	256	333	240	252	364	260	252	218	216	204	200	280	254	220	230	208	200		A	298	294	350								
6	A	A	A	A	A	A		A		A																							
7	A	A	A	E	A	A	225	206	228	202		236	206	232	180	210	251	248		A	A	E	A	A	E	A							
8	250	257	296	300	302	262	236	232	228	279	272	230	258	234	234	219	228	236	242	E	A	E	A	A	A								
9	A	A	A	A	A	A	240	309	234	210	218	222	206	232	200	200	218	224	218	252		B	154		A	A	A						
10	A	A	A	E	A	E	A	A	A	A	A	A	A																				
11	A	A	A	A	B	A	A	A	A		A		E	A	E	B	E	B	174	242	269	240	288	298		A	A						
12	A	A	A	A	A	A	378	250			184	204	206	230	270	220	218	170	234	280	252	256	292			A							
13	A	A	A	290	A	A	A	A	A		223	A	E	A	256	204	228		B	B	205	240	275	259		A	A	A					
14	A	A	A	A	A	A	A	A	A		218	196															A	A					
15	A	A	A	A	A	A		218	260		238	244	A	B		254	E	B	B	E	B	288	254			A	A	A	A				
16	A	A	187	A	E	A	A	A	A	A	A	A	B		256	232		B	230	224	310	262				A	A	A	A				
17	A	A	A	A	E	A	318	298	264	236		242	200	222	218	204	216	228	228	228	278		A	296		A	A	A	A				
18	A	205	A	A	E	A	A	A	A		255	255	172	211	228	205	202	200	216	E	A	246	259	266	250	260	265		A				
19	274	A	A	A	346	A	A	A	A		244	202	202	A	A		230	260	242	212	234	232	248	255	248				A				
20	A	A	A	A	A	A	312				A	E	B	E	A	E	A	E	A														
21	273	290	A	E	A	A	A	A	E	A	248	210	202	223	182	240	234	216	236	225	245	250	E	A	E	A	E	A	E	A			
22	A	A	A	E	B	A	E	A	A	A	248	215	225	222	218	220	228	227	230	227	236	242	238	236	232	260							
23	E	A	A	182	A	A	A	A	E	A	A	A	H																				
24	E	A	A	E	A	A	203	203	270	220	214	238	207	239	224	232	225	232	224	242	248	240											
25	A	A	E	A	A	A	B	A	B		260	234	238	230	210	202	215	246	236	236	240	238	238										
26	A	A	E	A	E	A	A	A	E	A	A	B		E	B	H	E	A	E	A	E	A	E	A	A	A	A	A	A	A			
27	A	A	A	E	A	A	A	E	A	A	A	A	A	E	B	E	B	E	A	E	A	B	A	E	A	A	A	A	A	A			
28	A	A	A	A	A	A	A	A	A		230	A	B		B	B	E	A	E	B	H	A	A										
29																																	
30																																	
31																																	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
CNT	8	9	12	12	13	12	9	14	14	19	20	22	23	27	27	25	27	27	24	19	21	15	12	11									
MED	273	283	273	299	316	284	246	238	239	216	219	218	216	229	228	219	226	234	244	246	244	250	252	260									
U Q	303	325	328	336	370	370	290	270	260	242	240	244	238	240	244	230	236	242	266	262	256	298	293	306									
L Q	264	266	252	266	286	251	230	232	228	210	202	212	206	220	215	215	218	227	235	238	238	236	240	246									

FEB. 2025 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2025 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	56	A	A	58	69	X	A	A		O	X	X		B	X	X	X	X	X	X	X	A	A				
2	A	48	A	A	58	71	72	83	93	97	96	100	105	99	94	92	89	79	75	70	X	63	59	53	59			
3	51	49	49	70	84	65	73	91	91	99	105	106	111	115	110	118	103	104	85	76	66	59	48	59				
4	A	A	58	86	83	86	65	68	72	83	90	95	93	101	101	96	93	85	78	74	70	58	43	A				
5	A	A	71	93	65	54	A	O	X	R		62	70	87	92	94	86	82	80	70	58	57	47	A				
6	A	A	A	90	59		A	R	X		61	64	69	75	79	86	88	84	77	72	67	61	57	63				
7	A	A	58	57	88	70	64	81	O	X	X	O	X	X	X	X	X	X	X	X	X	X	A	A				
8	A	57	A	69	61	71	70	88	71	74	76	X	B		93	96	85	82	80	69	67	46	84	A				
9	A	54	A	R	R	R		A	A	A	O	X	X	B	B	X	X	X	X	X	X	X	X	A				
10	A	A	A	A	A	A	O	X	X	O	X	X	O	X	X	X	X	X	X	X	X	59	60	56	37			
11	A	A	A	46	45	58	49	A	A	B	A	60	56	67	73	80	87	82	76	68	58	49	A	A				
12	A	A	A	X	A	55	62	A	A	A	A	O	X	O	X	72	86	71	47	43	38	A	O	X	A			
13	A	53	A	A	A	X	62	A	A	B	A	B	B	B	65	51	42	49	51	42	O	X	X	A				
14	A	O	X	A	A	O	X	A	A	A	B	B	O	X	X	X	X	X	X	O	X	A	A	A	A			
15	A	A	51	A	A	X	O	X	B	A	B	B	O	X	X	X	93	100	89	45	49	49	A	A	A			
16	42	45	X	X	A	A	72	64	68	77	102	109	115	131	134	134	133	114	85	85	86	58	A	A	A			
17	A	A	X	A	O	X	54	60	84	O	X	57	A	A	B	O	X	X	92	93	101	93	68	39	59	A	A	A
18	A	A	59	A	81	A	C	C	C	C	C	O	X	X	X	X	X	X	X	X	X	O	X	A	A	A		
19	61	A	A	58	A	A	R	A	B	A	A	A	B	O	X	X	X	X	X	X	X	56	A	A	A	A		
20	A	A	59	A	A	115	53	57	A	A	X	60	68	75	81	87	94	98	91	88	71	66	53	46	45			
21	A	A	54	59	B	O	X	B	B	B	X	80	77	83	88	91	92	94	91	86	84	59	67	68	85			
22	83	58	A	A	A	A	62	A	A	R	O	X	X	O	X	X	X	X	X	X	X	A	A	A	A	A		
23	A	A	A	B	A	A	A	A	A	A	A	B	B	60	68	67	68	73	77	69	67	59	A	A	47			
24	A	A	R	35	80	A	A	A	A	A	X	70	65	70	75	85	97	93	72	68	49	54	A	A	A			
25	53	83	O	X	54	43	B	A	A	A	X	53	63	81	92	101	110	110	106	87	69	79	68	A	A	A		
26	A	A	77	A	A	A	A	A	R	X	X	58	56	58	59	59	59	X	A	91	78	97	A	A	A			
27	A	X	X	A	66	49	53	A	X	O	X	B	B	B	X	72	63	61	54	94	O	X	A	A	A	65		
28	A	A	A	71	91	65	53	51	B	60	67	74	88	106	105	101	103	88	74	X	O	X	44	42	44	60		
29	A	A	70	108	71	63	65	A	B	X	65	73	86	90	91	94	99	94	86	85	69	57	50	43	38	A		
30	35	A	58	A	X	53	59	65	B	79	94	110	111	118	121	117	113	103	95	86	72	55	47	A	A	A		
31	A	37	R	A	O	X	49	65	86	74	77	79	75	88	108	102	107	108	125	127	112	103	93	73	60	O	X	25
	00	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	12	16	15	16	22	20	14	13	16	20	22	26	28	30	31	31	30	31	31	31	25	20	15	11			
MED	53	54	56	69	66	60	63	64	62	70	72	74	78	82	90	90	89	81	71	63	59	54	52	59				
U Q	61	58	59	86	82	69	72	74	82	79	85	88	90	96	96	99	101	91	85	74	71	59	57	63				
L Q	42	48	50	55	X	X	55	57	X	56	62	61	65	63	69	71	72	71	69	65	49	48	46	44	38			

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2025 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	R	A	A	F 46	50	49	A	A	51	62	61	65	B	88	84	85	58	59	51	42	33	A	A					
2	A	42	A	A	F 41	52	65	78	81	85	90	94	99	93	83	86	83	73	69	64	57	53	47	44					
3	J	R	35	42	48	50	J	R	69	71	93	99	100	105	109	104	112	97	98	79	70	60	52	42	35				
4	A	A	F	F	56	61	58	Z	J	R	J	R	J	R	89	87	95	95	90	87	79	72	68	64	49	36			
5	A	A	63	66	58	48	A	47	50	R	54	64	75	F	J	R	84	78	74	74	64	52	48	32	A	A			
6	A	A	A	A	A	49	A	R	57	55	56	63	69	73	80	82	78	71	66	61	55	51	39	27	A	A			
7	A	A	A	40	40	45	35	F	52	54	56	63	66	76	71	77	81	92	86	84	66	57	50	A	A	A			
8	A	48	A	36	44	49	52	50	82	60	62	70	B	60	83	F	74	71	74	63	57	40	A	R	A	A			
9	A	R	A	R	R	R	36	A	A	A	A	45	47	B	B	50	51	44	41	38	38	27	A	A	A	A			
10	A	A	A	A	A	A	A	45	45	50	51	59	64	64	65	73	J	R	73	70	65	48	44	23	24	F			
11	A	A	A	A	A	F	41	43	A	A	B	A	F	54	50	61	67	74	81	76	70	62	52	25	A	A	A		
12	A	A	A	A	A	F	36	F	52	A	A	A	A	A	42	50	59	F	F	62	41	37	32	A	A	R	A		
13	A	40	A	A	A	45	48	A	A	B	A	B	B	B	59	45	36	R	43	45	36	28	23	35	F	A	A		
14	A	45	A	A	48	50	Z	A	A	A	B	B	B	57	63	65	66	64	55	38	32	A	A	A	A	A	A		
15	A	A	36	A	A	46	49	43	B	A	B	B	B	60	57	64	87	94	63	39	43	39	A	A	A	A	A		
16	34	A	28	35	A	A	F	48	58	62	71	96	J	R	F	F	F	98	95	105	95	79	70	65	41	A	A	A	
17	A	A	A	A	R	F	F	45	52	48	F	A	A	B	B	70	86	87	F	91	87	44	33	43	F	A	A	A	
18	A	A	F	A	49	A	C	C	C	C	C	C	C	R	53	57	55	61	63	59	65	49	41	R	A	A	A	A	
19	34	A	A	R	A	A	R	A	B	A	A	A	A	B	57	65	74	65	63	57	43	F	A	A	A	A	A	A	
20	A	A	36	A	A	47	36	50	A	A	54	56	69	75	81	88	92	85	82	62	47	38	35	30	A	R	A	A	
21	A	A	33	45	B	R	B	B	B	64	64	71	77	82	85	86	88	85	80	78	53	A	A	51	53	A	A	A	
22	A	A	A	A	A	A	41	A	A	R	R	R	R	67	67	72	63	55	40	40	60	A	A	A	A	A	A	A	A
23	A	A	A	B	A	A	A	A	A	A	A	B	B	F	F	49	55	56	62	67	71	60	56	44	A	A	A	36	A
24	A	A	R	48	A	A	A	A	A	A	64	59	64	69	79	91	87	54	58	43	A	A	A	A	A	A	A	A	A
25	A	46	49	31	B	A	A	A	A	A	47	57	75	86	95	J	R	J	R	J	R	J	R	A	A	A	A	A	A
26	A	A	A	A	A	A	A	A	R	45	55	52	50	52	53	53	53	53	A	29	A	A	A	A	A	A	A	A	A
27	A	43	44	A	A	A	42	A	R	B	B	B	B	69	66	57	55	48	A	25	A	A	A	A	A	A	A	A	A
28	A	A	A	F	49	37	45	47	45	B	51	61	68	82	F	87	99	95	97	82	68	45	F	52	A	A	A	A	A
29	A	A	52	52	55	59	F	F	A	B	59	63	80	84	Z	V	85	88	88	88	80	75	63	49	44	34	26	A	A
30	28	A	A	A	46	31	33	37	B	64	76	90	105	112	115	111	107	97	89	73	61	35	21	A	A	A	A	A	A
31	A	23	R	A	43	F	45	48	68	56	62	69	82	99	94	101	102	F	F	F	87	88	73	50	42	19	R	A	A
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					
CNT	4	8	14	11	15	20	20	15	13	15	20	22	26	28	30	31	31	30	30	30	23	15	12	7					
MED	34	43	40	48	46	47	48	52	56	62	63	68	70	70	82	84	83	74	64	56	49	38	36	35					
U Q	36	46	49	52	49	50	52	62	68	71	72	82	84	86	88	91	92	85	75	63	57	49	42	44					
L Q	31	41	35	40	43	45	42	45	46	55	54	57	57	60	65	66	64	58	45	43	42	27	30	26					

MAR. 2025 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2025 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	62	36	73	53	108	31	24	35	G	61	40	47	34	E B	37	E B	29	34	E B	29	33	27	25	19	18	107	59				
2	55	46	58	40	K	27	25	37	G	33	32	47	58	E B	E B	E B	E B	31	G	26	24	E B	21	13	18	17	14				
3	16	30	31	58	41	39	43	45	31	38		33	31	36	37	32	36	43	29	18	17	12	13	27							
4	37	43	66	72	42	41	49	45	31	28	32	32	36	G	31	33	33	31	26	22	25	28	E B	10	35	72					
5	62	58	21	23	54	35	42	38	47	51	37	46	36	E B	E B	31	29	25		G	25	27	E B	11	35	58					
6	47	83	68	53	60	34	58	51	48	51		G	G	33	35	32	30	G	G	22	16	E B	10	19	44						
7	54	34	32	33	37	29	39	42	54	42	30	30	30	E B	41	30	E B	29	28	E B	25	G	E B	11	35	49	53				
8	58	37	70	21	28	39	41		G	62	48	37	E B	42	B	31	30	E B	E B	31	27	23	E B	21	21	75	59	58			
9	61	23	73	102	39	30	35	66	41	135	64	E B	36	33	B	B	G	31	29	28	34	20	103	18	38	K	92				
10	61	61	71	49	24	37	33	63	28	43	42	E B	32	33	E B	E B	E B	E B	E B	E B	E B	E B	E B	26	23	34	49	30			
11	46	55	58	72	23	41	31	51	72	49	54	35	G	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	15	17	27	81			
12	37	46	91	100	58	26	52	59	47	65	61	65	35	E B	39	45	38	29	32	E B	29	57	68	35	82	87					
13	54	25	33	72	59	43	K	26	52	53		B	B	B	E B	37	34	32	32	G	22	15	22	30	73						
14	50	36	72	84	36	42	57	53	51	52		B	E B	E B	E B	G	E B	26	30	22	20	34	59	43	60						
15	69	62	41	90	58	31	E B	39	39		B	E B	E B	46	33	32	42	E B	31	29	23	21	33	55	30	51					
16	43	31	70	18	51	88	44	114	34	35	30	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	32	22	49	39				
17	78	109	95	59	59	30	28	32	32	47	57	B	B	E B	E B	E B	E B	G	26	25	28	22	33	47	57	55					
18	38	71	23	72	44	57	C	C	C	C	C	C	33	39	31	29	24	26	36	36	38	37	53	29							
19	42	46	47	53	45	53	68	26	B	62	65	52	E B	E B	E B	32	31	34	23	G	31	46	42	61	50						
20	68	46	36	50	37	27	25	22	G	49	56	34	35	E B	34	31	26	24	21	21	21	13	14	15	12						
21	39	44	29	32	23	56	B	B	B	43	35	34	41	32	29	27	25	23	E B	G	25	17	15	51	47	52					
22	43	34	42	47	56	60	37	68	42	30	36	33	33	34	33	27	27	26	34	22	52	85	68	42							
23	60	88	68	B	50	53	59	48	35	55	G	B	E B	E B	G	G	28	38	26	25	21	20	30	36	37						
24	54	78	27	22	54	57	94	63	55	53	34	G	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	46	36	59	58				
25	42	39	85	56	18	B	54	56	55	59	33	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	35	46	85	63				
26	68	47	65	40	37	59	60	52	41	36	39	31	31	27	G	24	G	28	41	23	49	33	65	55	143						
27	64	40	55	55	46	34	32	55	42	44	B	B	B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	
28	57	68	45	47	37	36	29	E B	40	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	
29	59	58	42	45	27	38	34	51	B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	
30	K	16	29	44	56	43	28	27	31		45	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	
31	35	29	37	35	27	17	29	24	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
CNT	31	31	31	30	31	30	29	28	24	29	24	23	26	28	30	31	31	30	28	31	31	31	31	31	31	31	31	31	31	31	
MED	54	46	55	53	42	38	39	50	44	45	36	34	32	E B	35	30	29	28	26	24	22	27	28	43	52						
U Q	61	61	70	72	54	53	53	56	54	54	49	40	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	
L Q	42	34	36	40	28	30	30	36	34	37	34	32	33	32	29	28	26	E B	25	23	18	17	17	27	37						

MAR. 2025 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2025 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	6	7	8	7	8	7	16	9	13	47	17	37	B	29	34	29	11	18	9	12	7	7	9	
2	8	11	12	19	11	17	12	15	12	23	47	58	35	33	34	19	16	15	18	21	10	7	8	6	
3	6	6	7	12	11	12	15	11	10	23	15	23	13	12	12	8	11	9	9	7	7	7	6	7	
4	8	7	9	8	15	19	14	14	10	7	11	9	8	12	13	11	13	9	8	12	14	10	7	9	
5	8	16	7	8	11	14	11	11	13	37	24	19	18	35	35	18	7	21	15	8	8	11	7	13	
6	8	8	12	11	11	14	15	14	16	18	17	11	20	24	18	12	14	19	13	13	11	9	9	11	
7	12	9	9	8	8	5	12	19	14	15	11	12	14	41	22	29	24	25	15	11	15	24	9	15	
8	11	8	20	7	7	13	13	9	12	9	11	42	B	21	6	35	31	15	17	21	7	8	6	14	
9	7	E	E	9	7	5	17	8	11	9	13	17	36	26	B	B	11	21	13	6	10	8	8	21	
10	24	21	11	13	12	24	10	10	9	43	42	26	24	51	34	32	11	18	25	11	16	8	7	6	
11	8	14	14	11	5	20	15	16	20	17	23	23	26	36	41	28	27	42	34	24	15	7	7	7	
12	9	13	15	11	15	9	15	45	13	42	24	15	23	39	31	38	11	32	19	11	8	6	13	11	
13	5	12	7	12	9	12	10	39	14	B	24	B	B	B	37	20	23	25	18	9	8	7	8	10	
14	8	6	15	8	6	12	24	23	19	21	B	B	42	34	23	29	23	14	13	11	8	8	9	12	
15	9	8	7	11	13	14	39	30	B	18	B	B	46	25	32	42	31	10	14	11	8	13	7	7	
16	8	11	9	6	10	12	12	13	13	23	24	38	B	53	41	41	24	38	25	24	16	24	11	7	8
17	7	10	6	9	9	9	9	12	8	42	22	B	B	58	32	33	17	11	20	15	10	9	7	11	
18	11	24	14	17	E	E	C	C	C	C	C	C	24	28	31	23	16	7	36	12	6	7	8	11	
19	11	9	14	15	15	8	42	17	B	47	25	23	B	45	45	17	17	18	17	6	9	7	7	6	
20	7	9	10	17	11	7	7	15	8	15	16	35	29	34	23	17	17	21	21	21	10	11	13	10	
21	9	9	17	14	13	7	B	B	B	37	23	14	19	19	17	19	13	23	15	8	7	13	11	13	
22	7	7	8	15	17	11	9	17	17	17	15	16	16	26	25	18	15	13	17	15	8	9	7	7	
23	7	18	34	B	14	7	9	18	19	25	B	B	34	25	22	24	18	20	25	16	9	7	8	7	
24	14	9	12	13	25	37	65	23	35	31	24	35	55	39	15	15	24	13	11	11	10	9	10	15	
25	11	9	14	9	9	B	15	15	16	16	15	31	37	38	17	30	44	35	15	14	13	7	8	9	
26	14	14	13	7	11	13	13	14	15	23	19	17	16	17	15	12	14	21	13	12	9	11	13	9	
27	13	8	8	11	10	14	14	35	7	B	B	B	B	38	29	28	19	16	11	11	11	10	12	14	
28	17	32	16	15	8	7	7	40	B	41	35	40	35	35	37	25	31	23	46	17	11	9	7	11	
29	15	15	15	11	23	33	25	30	B	35	35	24	28	39	39	27	16	12	15	24	16	25	18	12	
30	8	7	7	11	13	14	11	11	B	38	31	28	36	23	15	43	14	15	12	18	17	13	8	8	
31	8	7	8	14	14	13	11	15	27	30	35	35	17	17	40	34	17	26	34	28	25	24	24	14	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	
MED	8	9	11	11	11	13	12	16	14	23	24	30	29	35	29	24	17	18	17	12	10	9	8	10	
U Q	11	14	14	14	14	17	15	23	B	38	35	42	B	B	41	37	32	24	23	21	17	14	11	10	13
L Q	7	7	8	8	8	9	10	13	10	17	17	17	19	24	17	17	14	13	13	11	8	7	7	7	

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2025 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	A	A	A	A	E A 316	A	A	A	A	E B 230	E B 246	B	E B 252	E B 242	224	E A 264	E A 238	E A 260	E A 258	E A 296	A	A	
2	A	A	A	A	E A 340	E A 300	A	E A 318	E A 278	E A 248	B	B	242	215	220	220	215	216	E A 240	222	225	E A 232	E A 232	250	
3	E A 266	A	A	A	A	A	A	A	E A 260	E A 265	E A 232	218	228	E A 216	E A 236	224	E A 240	E A 240	224	174	223	218	E A 255	E A 264	
4	A	A	A	A	A	A	A	A	E A 240	E A 240	230	210	225	228	220	218	210	228	216	228	222	222	A	A	
5	A	E A 244	E A 183	A	A	A	A	A	A	A	A	E A 288	E A 264	E A 260	E B 238	230	224	E B 250	171	E A 260	E A 298	E B 270	A	A	
6	A	A	A	A	A	A	A	A	A	A	E A 270	228	E A 236	228	212	228	220	233	230	230	E A 232	E B 250	A	A	
7	A	A	A	A	A	A	A	A	A	A	A	230	229	220	E B 290	234	228	232	242	249	233	210	A	A	
8	E A 274	A	A	A	235	A	E A 185	E A 190	A	A	E A 278	B	B	E A 248	228	240	242	240	256	275	270	A	A	A	
9	A	A	A	A	A	A	A	A	A	A	A	E B 340	E A 246	B	B	E A 250	E A 270	242	A	E A 280	E A 262	A	A	A	
10	A	A	A	A	A	A	A	A	A	H 272	B	B	A	228	B	E B 244	E B 238	236	248	228	227	248	236	A	A
11	A	A	A	A	A	A	A	A	A	A	B	A	H 258	E B 238	E B 278	E B 274	E B 232	248	275	232	225	E B 238	E A 306	A	A
12	A	A	A	A	A	A	A	A	A	A	A	A	E A 270	A	A	A	A	B	A	A	A	A	E A 310	A	A
13	A	A	A	A	A	A	H 254	A	A	B	A	B	B	B	E B 280	E A 258	A	E A 270	294	302	H 166	A	E A 240	A	A
14	A	A	A	A	A	A	A	A	A	A	B	B	A	E B 238	E B 244	E B 252	258	248	367	296	A	A	A	A	
15	A	A	A	A	A	A	A	B	A	B	A	B	B	E A 251	B	241	B	E A 256	E A 252	A	E A 280	E A 296	A	A	A
16	211	A	A	A	A	A	A	A	E A 306	E A 244	234	240	288	254	252	234	214	214	232	228	E A 240	E A 240	A	A	
17	A	A	A	A	A	A	A	E A 298	283	A	A	B	B	A	E B 236	E B 238	244	H 258	E A 262	289	E A 304	A	A	A	
18	A	A	183	A	A	A	C	C	C	C	C	C	228	E B 268	E B 240	E B 252	H 173	E A 265	E A 252	260	A	A	A	A	
19	A	A	A	A	A	A	A	A	A	B	A	A	A	B	B	B	E A 248	E A 252	E A 282	275	A	A	A	A	A
20	A	A	A	A	A	A	A	A	A	A	A	H 260	E B 260	E B 246	E B 248	E B 236	240	206	220	225	E B 210	E A 206	E A 236	E B 244	E B 258
21	A	A	A	A	B	A	B	B	B	E B 305	E B 278	A	E A 230	E A 242	E A 238	E A 226	H 232	E B 238	238	220	228	E A 412	A	A	A
22	A	A	A	A	A	A	A	A	A	E A 244	A	E A 260	E A 270	E A 266	E A 258	E A 212	275	A	A	A	240	A	A	A	A
23	A	A	A	B	A	A	A	A	A	A	A	B	E B 266	E B 258	H 238	E A 242	E A 250	E A 236	E A 234	E B 240	H 255	E A 240	A	A	A
24	A	A	A	A	A	A	A	A	A	A	A	H 268	E B 262	B	E B 323	E B 248	E B 255	E A 288	E A 346	A	A	A	A	A	A
25	A	E A 238	E A 256	A	A	A	B	A	A	A	E A 302	E A 246	E A 264	E A 254	E A 236	E B 235	E B 236	E B 228	214	225	A	A	A	A	A
26	A	A	A	A	A	A	A	A	A	A	E A 288	E A 260	E A 300	E A 246	E A 264	E A 293	H 304	A	A	A	A	A	A	A	A
27	A	E A 228	A	A	A	A	A	A	A	B	B	B	B	E B 298	E B 254	E B 282	265	300	A	A	A	A	A	A	A
28	A	A	A	342	A	A	A	B	B	B	A	B	B	E B 252	E B 248	E B 262	230	238	232	262	228	A	A	A	A
29	A	A	A	A	A	A	A	A	A	B	E B 278	E B 280	E B 254	234	254	248	236	234	220	230	217	E B 228	E B 256	E B 250	E B 256
30	A	A	A	A	A	A	E A 360	E A 268	A	E A 272	E A 244	228	E B 252	E B 228	E B 234	E B 230	225	213	196	E B 206	218	242	B	H	A
31	A	A	A	A	A	Q 404	E A 382	E A 345	E B 304	E B 264	E B 262	E B 242	E B 242	E B 236	E B 250	E B 224	230	220	232	228	E B 224	234	344	386	
	00	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	5	3	3	2	5	5	7	10	16	19	23	24	28	30	30	28	24	26	21	13	8	5	
MED	238	274	238	280	256	352	285	298	278	264	251	246	246	250	240	230	230	230	228	224	232	240	252	258	
U Q			269	342	340		371	332	304	278	284	260	264	263	252	250	256	261	254	260	260	263	327	325	
L Q			206	183	235		220	229	260	244	239	229	234	237	236	228	224	228	226	225	222	233	242	253	

MAR. 2025 h'F (KM)

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2025 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	O X 36	B	B	B	71	65	O X 60	B	B	B	O X 76	O X 84	X 97	X 103	X 100	X 108	X 114	X 114	96	75	X 69	X 51	B	B
2	60	61	A	B	A	A	O X 57	B	B	B	B	B	X 73	B	111	111	112	96	54	X 51	66	58	51	A
3	48	A	62	87	A	61	A	O X 49	O X 53	X 59	X 64	X 72	X 72	93	97	91	83	79	87	71	61	A	69	53
4	A	A	61	O X 52	A	A	A	A	B	B	A	B	B	O X 57	B	87	87	64	38	A	A	A	A	A
5	A	A	A	A	A	A	B	A	A	B	B	B	O X 42	57	57	55	52	41	41	A	A	A	A	A
6	A	A	A	A	X	A	A	A	A	O X 43	B	O X 59	B	B	B	O X 59	X 64	X 54	X 59	A	A	A	A	A
7	A	A	A	B	A	A	A	A	A	X 50	B	X 59	X 64	X 72	X 84	X 97	95	88	94	58	A	A	A	A
8	A	X	A	64	A	A	A	A	B	B	B	B	B	O X 62	X 60	X 60	X 64	X 55	X 58	O X 38	A	A	A	A
9	A	A	A	A	A	B	B	A	60	A	B	B	B	B	100	112	86	70	67	60	57	52	A	A
10	A	A	51	A	A	A	A	B	A	O X 44	A	B	O X 60	O X 76	103	117	107	94	X 79	O X 48	55	A	A	A
11	60	A	B	O X 55	O X 52	X 46	B	A	X 52	X 56	63	X 76	X 77	78	87	85	88	87	87	65	58	A	A	A
12	A	A	A	A	B	A	51	56	48	56	A	O X 44	O X 64	71	80	94	87	95	88	A	A	A	A	A
13	A	A	A	A	A	A	A	A	93	A	B	B	B	72	94	111	120	103	95	65	53	39	118	B
14	A	A	A	X 48	A	43	A	A	B	B	B	X 55	X 56	73	69	83	95	78	62	36	62	A	50	A
15	A	A	A	41	41	A	A	A	A	A	X 54	X 59	69	76	76	75	X 79	75	63	31	A	A	50	83
16	73	A	A	56	68	83	68	50	42	65	68	68	76	81	86	70	54	55	33	39	A	A	A	61
17	A	58	56	55	52	50	54	A	A	X 43	X 52	X 57	X 59	67	71	68	63	61	57	50	28	31	53	59
18	61	86	64	76	67	A	A	A	A	A	A	A	59	63	66	82	78	75	71	61	A	A	A	A
19	51	A	X 47	A	A	B	B	A	A	A	A	B	B	77	71	95	110	106	A	A	94	A	A	A
20	A	A	A	A	A	O X 53	X 39	A	A	X 39	X 51	O X 53	O X 60	63	66	71	83	82	76	71	71	53	A	A
21	X 36	A	60	62	57	A	A	A	X 46	68	64	X 82	O X 53	61	90	115	74	66	A	A	52	A	62	B
22	A	A	A	60	A	58	A	A	A	A	B	B	B	X 80	X 76	80	76	70	66	53	46	A	A	A
23	A	A	A	64	59	X 51	A	A	O X 56	X 65	76	80	X 93	X 97	X 105	X 114	X 114	95	90	64	44	O X 28	O X 25	A
24	A	A	A	A	A	68	67	A	67	70	B	B	O X 66	93	122	116	152	113	113	83	58	O X 26	A	57
25	A	A	59	O X 49	A	43	X 45	X 51	X 73	100	112	X 122	X 126	X 127	X 127	X 121	X 97	91	71	47	28	24	22	58
26	75	57	A	X 52	X 47	56	59	65	57	72	92	108	127	130	133	134	X 121	116	94	68	59	59	A	56
27	A	A	A	93	49	X 37	56	64	65	71	78	112	128	143	133	127	X 115	X 114	92	69	67	89	51	44
28	A	59	A	64	A	X 50	69	64	67	73	84	100	X 116	X 118	X 128	X 129	X 115	X 90	X 79	X 55	O X 37	O X 26	O X 27	O X 22
29	29	59	61	59	51	56	56	57	59	65	86	100	X 118	X 129	X 131	X 132	X 130	X 114	X 94	X 72	61	40	A	52
30	49	56	60	48	A	A	65	R 67	67	111	A	86	85	111	130	117	115	110	99	95	O X 48	A	49	
31																								
CNT	11	7	10	17	12	14	13	11	16	19	14	20	25	27	28	30	30	30	28	23	19	12	12	11
MED	51	59	60	59	52	54	57	57	56	65	72	74	72	77	94	96	92	88	71	55	58	36	50	56
U Q	61	61	61	64	63	61	66	65	66	71	84	93	95	103	116	117	114	96	91	69	62	55	58	59
L Q	X 36	57	56	X 52	49	50	52	49	51	53	63	59	64	71	80	78	75	66	58	47	O X 44	X 26	X 31	49

APR. 2025 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2025 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	R 30	B	B	B	F 53	57	54	B	B	B	70	78	91	97	94	102	J 108	R 108	J 70	R 69	A	63	45	B	B
2	A	46	A	B	A	A	R 51	B	B	B	B	B	67	B	80	F 84	89	70	48	45	38	42	A	A	
3	34	A	38	55	A	41	A	38	47	53	58	66	66	82	87	82	77	69	58	36	28	A	50	35	
4	A	A	53	46	A	A	A	A	B	B	A	B	B	R 51	B	62	75	45	29	A	A	A	A	A	
5	A	A	A	A	A	A	B	A	A	B	B	B	R 36	50	51	49	41	35	35	A	A	A	A	A	
6	A	A	A	A	A	A	A	A	A	37	B	53	B	B	B	53	58	R 48	A	A	A	A	A	A	
7	A	A	A	B	A	A	A	A	A	A	B	53	58	66	78	91	83	82	F	A	A	A	A	A	
8	A	A	A	43	A	A	A	A	B	B	B	B	B	56	54	50	58	49	47	R 32	A	A	A	A	
9	A	A	A	A	A	B	B	A	53	A	B	B	B	B	80	90	V 80	F 52	51	39	A	A	A	A	
10	A	A	U 35	R A	A	A	A	B	A	38	A	B	54	70	95	F 92	86	85	73	42	41	A	A	A	
11	A	A	B	42	46	40	B	A	46	50	57	70	69	70	72	79	F	74	74	69	50	41	A	A	
12	A	A	A	A	B	A	42	A	37	38	A	38	58	60	74	F 87	81	69	55	A	A	A	A	A	
13	A	A	A	A	A	A	A	A	A	A	B	B	64	78	92	F 114	96	67	52	37	28	A	A	B	
14	A	A	A	42	A	31	A	A	B	B	B	49	50	58	F 58	64	63	71	52	A	A	A	A	A	
15	A	A	A	32	A	A	A	A	A	A	48	53	61	67	67	69	73	65	52	23	A	A	A	A	
16	58	A	A	A	U 38	R A	34	30	32	53	54	57	64	75	80	64	43	33	24	29	A	A	A	R 53	
17	A	A	37	33	42	A	A	A	A	37	46	51	53	61	65	62	57	55	45	40	22	25	21	A	
18	42	A	A	A	A	A	A	A	A	A	A	53	57	60	71	72	69	65	55	Z	A	A	A	A	
19	A	A	41	A	A	B	B	A	A	A	A	B	B	70	67	85	89	55	A	A	56	A	A	A	
20	A	A	A	A	A	A	R 33	A	45	47	54	57	60	65	73	76	70	65	57	41	B	A	29	A	
21	30	A	A	J 56	R 40	F A	A	A	40	52	58	59	47	54	59	89	F 49	50	A	A	A	A	A	B	
22	A	A	A	A	A	A	A	A	A	48	B	B	Z 74	70	70	70	59	60	47	Z 40	A	A	A	A	
23	A	A	A	A	40	45	A	A	50	59	65	74	87	91	99	108	92	75	80	F 54	32	22	19	A	
24	A	A	A	A	A	44	F	A	F 53	55	B	B	60	74	84	101	110	72	F	F	30	20	R	A	
25	A	A	A	A	R 43	A	32	Z 39	45	67	94	Z 106	116	120	121	115	91	81	65	41	22	18	16	14	
26	A	A	A	R 46	A	45	F 52	F 43	F 45	58	77	99	115	119	127	128	115	104	F 88	57	50	36	A	A	
27	A	A	A	A	R 43	R 31	F 26	A	47	58	68	97	112	127	122	121	110	104	F 81	61	39	30	A	A	
28	A	A	A	A	A	R 44	44	48	52	56	72	94	110	112	122	123	109	84	73	49	31	22	21	R 16	
29	A	A	A	A	A	F 40	F 42	49	38	42	66	94	112	Z 123	F 125	126	108	108	J 88	R 66	F 49	J 34	R	A	
30	A	A	A	31	A	A	45	R 57	62	57	A	70	76	82	105	96	95	F 98	F 90	F 70	21	20	R	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	5	1	5	10	8	10	11	7	15	19	14	20	25	27	28	30	30	30	26	21	16	11	6	4	
MED	34	46	38	42	42	42	42	43	46	52	62	62	64	70	80	86	80	69	55	42	35	25	21	26	
U Q	50		47	46	44	45	51	49	52	57	70	86	89	91	97	102	95	82	73	56	45	36	29	44	
L Q	30		36	33	40	40	33	38	40	42	54	53	58	60	68	69	63	55	47	38	28	20	19	15	

APR. 2025 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2025 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	23	B	B	B	E 27	B 24	E 37	B	B	B	E 63	B 48	E 38	E 32	B 32	E 32	B 37	E 37	B 30	E 27	B 25	E 16	B	B	
2	32	E 25	B 65	B	74	64	46	B	B	B	B	161	E 34	B 161	E 36	B 50	E 35	B 35	E 33	B 23	E 17	B 21	47	51	
3	80	72	81	45	53	34	48	30	38	E 45	B 35	27	E 40	B 40	E 27	B 25	E 23	B 18	E 27	31	31	47	32	39	
4	64	55	49	72	48	47	56	54	B	B	59	B	E 29	B	E 29	B 43	E 28	B 25	E 28	77	44	76	45	36	
5	93	58	49	51	54	52	B	60	53	B	B	E 31	B 35	E 31	E 44	B 21	E 23	17	37	45	94	78	61		
6	34	42	61	63	84	54	46	56	33	61	B	E 43	B	B	B	E 41	B 29	E 43	19	30	49	42	83	87	
7	49	43	45	B	45	62	55	56	59	33	B	E 39	B 28	E 35	B 27	E 31	B 25	E 25	21	37	44	97	31	117	
8	66	89	41	30	51	66	55	52	B	B	B	B	E 39	B 28	E 32	B 24	E 21	B 23	E 24	B 28	47	36	44		
9	53	45	47	45	53	B	49	43	45	23	B	B	B	E 44	B 33	E 31	B 27	E 32	17	41	40	39	70		
10	59	68	E 30	B 52	46	55	43	B	44	34	53	B	E 44	B 49	E 55	B 46	E 32	B 35	E 25	B 29	E 16	34	36	59	
11	53	99	B	54	48	30	B	43	33	41	36	E 27	B 43	E 45	B 33	E 32	E 25	B 23	E 33	B 23	15	33	44	80	
12	53	102	50	48	B	61	31	31	30	33	49	49	48	30	38	25	E 44	B 27	E 45	48	49	79	69	115	
13	115	62	53	86	45	54	52	52	52	50	B	B	E 38	B 37	E 25	B 24	E 59	B 28	E 23	B 24	49	42	44	71	
14	69	60	65	47	61	31	44	71	B	B	B	E 38	B 39	E 37	B 39	E 29	B 21	E 19	B 21	E 29	39	43	42	81	
15	89	86	59	55	55	41	55	59	57	45	E 31	B 38	E 34	B 28	E 26	21	E 26	B 26	E 15	B 14	19	85	68	44	
16	36	33	89	45	38	45	37	27	25	49	33	E 26	B 29	E 23	25	21	24	10	15	15	67	71	55	49	
17	112	38	38	35	50	34	13	53	50	36	23	22	23	29	20	23	E 26	B 19	11	11	9	12	13	16	
18	24	104	52	46	33	49	68	55	54	58	50	E 31	B 25	E 28	B 27	E 25	B 17	E 16	B 12	E 37	61	43	71	52	
19	45	45	31	64	K 52	B	B	67	58	57	62	B	B	E 36	B 61	E 30	21	39	36	44	45	45	71	63	
20	71	71	50	74	58	37	22	43	39	45	E 45	B 42	E 28	B 27	E 35	B 32	E 31	B 20	E 23	B 25	B	25	49	73	
21	35	63	47	41	32	61	58	64	34	45	E 27	B 25	E 35	B 30	E 29	B 24	E 24	B 43	E 46	B 35	29	44	58	B	
22	39	33	28	49	78	57	58	41	54	39	B	B	E 47	B 41	E 40	B 25	E 19	B 24	E 14	B 11	39	42	39	51	
23	75	58	38	37	29	39	58	45	38	29	24	20	21	47	66	43	22	25	35	13	14	56	34	31	
24	59	60	57	59	57	44	37	51	31	21	B	B	E 47	B 29	E 26	B 35	E 29	B 27	E 28	B 14	21	20	57	39	
25	41	49	53	35	65	38	K 17	12	11	19	35	37	70	25	24	22	22	18	15	14	51	54	47	49	
26	29	34	52	42	33	35	51	41	31	17	G 23	23	26	28	23	18	E 54	B 49	E 29	B 24	E 27	B 17	56	33	
27	39	42	45	45	40	37	23	65	70	42	33	22	24	E 18	B 21	G 17	E 13	B 14	E 14	B 9	12	29	41	35	
28	46	42	84	69	52	45	32	28	17	16	23	23	28	23	23	17	12	E 10	B 10	E 10	9	12	12	31	
29	K 17	17	28	23	17	14	11	12	E 10	B 14	21	E 37	B 23	E 21	25	19	23	23	19	21	13	16	36	38	
30	42	45	42	41	65	60	47	58	E 54	B 29	46	E 48	B 32	E 48	B 37	E 35	B 33	E 14	B 21	E 15	11	35	58	35	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	29	28	27	29	28	27	27	25	24	20	21	25	28	28	30	30	30	30	30	29	30	29	28	
MED	51	55	50	47	51	45	46	52	39	36	34	E 37	B 34	E 31	B 28	E 30	B 25	E 24	B 20	E 23	29	42	45	50	
U Q	69	70	58	59	58	56	55	58	54	45	50	E 42	B 42	E 40	B 38	E 35	B 31	E 28	B 30	E 31	45	54	58	70	
L Q	36	42	42	41	39	36	32	41	31	26	26	24	27	28	25	23	22	E 19	B 15	E 14	B 16	25	36	37	

APR. 2025 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2025 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	16	B	B	B	17	24	37	B	B	B	63	48	38	32	32	32	37	37	30	27	25	16	B	B	
2	25	25	23	B	22	28	31	B	B	B	B	161	34	161	36	50	35	35	33	23	17	13	15	13	
3	15	13	15	24	17	25	19	18	30	45	35	18	40	40	27	25	18	18	27	17	15	14	13	12	
4	11	48	14	17	12	15	45	39	B	B	21	B	B	29	B	43	21	25	13	24	15	14	13	12	
5	12	27	13	13	36	36	B	31	24	B	B	B	31	35	25	44	21	18	16	8	9	13	8	12	
6	18	33	25	20	24	21	15	15	21	24	B	43	B	B	B	41	29	43	9	7	11	11	9	12	
7	7	13	23	B	25	19	15	34	27	24	B	39	28	35	27	31	25	25	15	9	9	11	7	7	
8	18	14	9	11	25	21	19	44	B	B	B	B	B	39	28	32	24	15	11	24	9	6	7	11	
9	39	30	28	14	16	B	23	15	18	16	B	B	B	B	44	26	25	18	12	11	9	7	8	7	
10	17	15	30	15	10	9	12	B	40	25	23	B	44	49	55	46	32	35	18	29	16	9	9	17	
11	15	15	B	14	22	23	B	34	19	17	26	27	43	45	33	32	25	23	33	23	15	8	8	11	
12	11	27	15	15	B	9	15	9	15	15	31	25	32	24	38	20	44	27	11	11	13	11	7	8	
13	9	24	23	13	30	15	28	24	24	17	B	B	38	37	25	16	59	9	14	24	12	9	9	14	
14	7	8	12	14	9	7	26	23	B	B	B	38	39	37	39	29	21	11	21	7	8	7	11	8	
15	9	9	19	17	17	34	25	18	15	31	31	38	34	28	26	7	26	26	15	14	12	15	15	7	
16	11	8	10	11	10	9	8	9	7	7	16	26	29	15	15	8	14	6	6	7	7	6	20	16	
17	11	8	7	7	9	7	9	15	16	11	12	17	18	15	15	12	26	12	6	6	6	5	7	7	
18	8	14	7	10	9	9	44	11	13	15	21	31	25	28	20	25	14	16	12	9	11	11	11	9	
19	9	12	12	25	15	B	B	28	24	19	27	B	B	36	61	30	13	11	25	9	11	11	9	9	
20	11	46	27	16	24	12	11	14	11	24	45	42	28	27	35	32	31	20	23	25	B	14	10	11	
21	9	9	9	7	9	9	39	14	14	29	27	25	35	30	29	24	19	13	10	9	10	10	9	B	
22	16	25	10	8	10	9	23	24	45	15	B	B	47	41	40	25	15	24	14	11	7	9	9	11	
23	9	35	29	11	10	23	16	25	23	15	18	13	14	47	66	43	22	25	35	13	14	25	11	9	
24	11	10	11	13	15	12	12	25	16	15	B	B	47	29	26	35	29	15	28	14	10	10	11	9	
25	10	9	9	10	11	11	8	8	9	7	12	11	11	11	8	8	11	9	6	E	E	6	6	6	
26	7	7	9	12	9	8	15	9	10	11	17	15	19	22	20	18	54	49	29	24	27	17	14	7	
27	7	8	7	7	9	8	7	12	18	19	14	10	15	18	15	11	13	14	14	9	7	8	7	7	
28	7	7	8	15	10	9	8	7	6	7	11	14	14	13	12	11	7	10	10	10	9	9	7	7	
29	9	7	7	8	6	8	7	7	10	8	16	37	23	16	13	12	16	13	13	11	10	10	8	7	
30	12	8	7	8	14	39	11	15	35	29	32	48	32	48	37	35	33	14	21	15	11	21	13	6	
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	11	14	12	14	14	14	18	18	20	19	31	38	34	34	28	28	24	18	14	11	11	10	9	9	
U Q	15	27	23	17	22	24	31	31	35	31	B	B	44	41	39	35	31	25	25	23	15	14	13	12	
L Q	9	8	9	10	10	9	11	12	14	15	18	25	25	24	20	16	16	13	11	9	9	8	8	7	

APR. 2025 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2025 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23												
1	A	B	B	B	364	A	A	B	B	B	A	E B	E B	E B	E B	E B	218	206	E B	E B	E B	E B	B	B												
2	A	E B	A	B	A	A	A	B	B	B	B	B	282	B	B	300	306	258	268	E B	E B	E B	E B	A	A											
3	A	A	A	A	A	A	A	A	A	A	E B	E B	A	B	E B	B	238	258	222	278	284	A	A	A	A											
4	A	A	318	A	A	A	A	A	B	B	A	B	E B	E B	B	B	280	284	342	A	A	A	A	A	A											
5	A	A	A	A	A	A	B	A	A	B	B	E B	E B	E A	B	E B	E B	E A	A	A	A	A	A	A	A											
6	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	E B	E B	E B	E A	A	A	A	A	A	A											
7	A	A	A	B	A	A	A	A	A	A	B	E B	E B	H	244	234	212	214	224	Q	A	A	A	A	A											
8	A	A	A	E A	A	A	A	A	B	B	B	B	E B	E B	E B	E B	E B	E B	E A	B	A	A	A	A	A											
9	A	A	A	A	A	B	B	A	A	A	B	B	B	B	E A	E A	358	272	246	246	306	258	A	A	A											
10	A	A	B	A	A	A	A	B	A	E A	A	B	B	B	E B	E B	268	238	234	228	218	E B	244	A	A											
11	A	A	B	A	A	A	B	A	360	368	A	E B	E B	E B	E B	250	240	252	244	228	230	A	A	A	A											
12	A	A	A	A	B	A	A	A	A	A	A	A	A	E A	E A	E B	E B	E B	E B	A	A	A	A	A	A											
13	A	A	A	A	A	A	A	A	A	A	B	E B	E B	296	258	242	212	242	240	198	290	278	A	A	B											
14	A	A	A	260	A	A	A	A	B	B	B	B	E B	E B	E B	E B	E B	E B	E B	E B	A	A	A	A	A											
15	A	A	A	A	A	A	A	A	A	A	A	B	E B	E B	E B	290	265	249	240	240	234	214	286	A	A											
16	A	A	A	A	A	A	A	A	203	174	A	E A	E A	A	350	284	284	222	250	266	A	198	178	230	A	A										
17	A	A	A	E A	A	A	A	A	A	A	A	216	170	265	246	256	234	236	228	197	208	204	230	252	A											
18	228	A	A	A	A	A	A	A	A	A	A	A	B	264	288	240	240	244	228	218	A	A	A	A	A											
19	A	A	238	A	A	B	B	A	A	A	A	B	E B	E B	E B	E A	280	278	282	A	A	A	A	A	A											
20	A	A	A	A	A	A	A	A	A	A	A	A	B	E B	E B	E B	230	230	225	216	240	B	A	A	A											
21	175	A	A	Q	A	A	A	A	A	A	E B	E B	B	A	E B	E B	E A	A	A	A	A	A	A	A	B											
22	A	A	A	A	A	A	A	A	A	A	A	B	E B	E B	E B	296	244	260	230	216	236	215	230	A	A	A										
23	A	A	A	A	A	A	A	A	A	A	A	A	A	E B	E B	E B	244	230	210	226	220	200	228	270	308											
24	A	A	A	A	A	E A	A	A	E A	A	B	B	E B	E B	E B	256	269	238	244	204	270	266	278	A	A											
25	A	A	A	A	A	A	A	A	205	228	240	242	224	E B	234	210	208	209	194	198	199	206	E A	H	H	A										
26	E A	A	A	A	A	A	A	A	Q	A	A	A	A	220	212	220	215	232	230	215	234	246	248	A	A	A										
27	A	A	A	A	A	A	A	A	468	A	A	A	A	280	250	225	218	228	205	208	210	210	228	210	272	A	A	A								
28	A	A	A	A	A	A	E A	E A	A	A	A	A	A	356	275	246	190	235	230	223	210	216	207	200	178	198	190	217	195	280	258					
29	A	A	A	A	E A	A	E A	E A	A	A	E A	A	A	348	342	248	280	232	234	230	236	208	199	194	206	212	204	215	215	A	A	A				
30	A	A	A	A	A	A	A	A	A	A	B	A	B	E B	E B	252	260	232	208	220	216	215	210	242	A	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	1	2	4	2	3	4	5	7	11	12	13	21	25	27	28	29	29	26	20	14	10	5	1												
MED	U	E B				E A	A	U		U		U	E B	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U		
U Q	224	275	278	268	359	282	352	240	247	269	240	230	253	260	239	226	228	226	211	220	226	238	280	258												
L Q	292			362		406	412	373	350	318	299	269	293	283	269	261	263	249	270	275	246	270	308													
	202			263		196	344	204	228	240	233	226	238	232	232	220	217	211	212	208	217	212	248													

APR. 2025 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2025 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	56	67	60	54	67	A	A	A	A	A	B	B	68	62	70	101	104	114	87	65	A	63	67	A	
2	47	A	A	51	A	A	A	A	A	A	A	B	51	O X	X	84	73	79	A	A	59	A	A	A	
3	A	A	A	A	A	B	A	A	87	B	B	B	B	B	107	69	95	61	59	A	A	A	A	A	
4	A	37	A	A	A	A	A	A	A	X	B	B	O X	X	X	X	84	69	94	66	A	84	70	A	
5	A	A	A	A	B	A	A	A	B	B	A	B	B	B	91	71	76	87	82	A	B	43	A	A	
6	A	A	A	B	B	B	A	B	A	B	B	B	O X	B	85	87	88	81	71	46	A	A	59	58	
7	A	A	B	B	B	A	A	A	A	A	B	B	O X	O X	115	109	89	89	56	O X	B	B	A	A	
8	A	A	A	A	A	A	A	A	A	B	B	B	X	O X	X	X	X	X	X	A	A	A	A	A	
9	A	78	B	O X	A	A	A	A	A	X	X	X	68	69	83	82	78	78	64	86	A	A	O X	57	
10	A	A	A	51	A	O X	A	A	A	O X	O X	X	X	X	X	X	X	X	X	B	43	35	A	A	
11	B	A	A	A	B	A	B	A	A	A	A	O X	O X	X	X	X	X	X	X	A	A	A	A	84	
12	83	A	O X	A	A	O X	O X	X	X	X	X	X	X	X	X	X	X	X	X	O X	A	A	A	A	
13	41	54	69	65	A	56	58	62	67	66	66	80	92	107	118	112	70	64	70	51	A	A	85	A	
14	A	A	A	A	A	A	A	A	A	B	48	52	70	85	98	94	89	57	53	A	A	A	66	A	
15	48	62	A	A	A	A	O X	A	A	O X	O X	B	72	80	92	81	77	66	59	69	59	A	A	A	
16	A	A	A	A	A	63	A	A	A	A	O X	O X	B	86	79	81	77	68	56	56	A	A	A	A	
17	A	A	O X	A	A	A	A	A	A	A	B	52	O X	X	X	X	X	X	A	A	A	A	A	A	
18	A	A	A	A	A	A	A	A	A	O X	B	B	B	B	X	O X	X	X	O X	O X	A	A	A	A	
19	A	A	A	A	A	A	A	A	A	O X	B	B	B	B	X	O X	X	X	B	B	B	A	A	A	
20	A	A	A	A	60	58	X	A	A	A	B	B	66	79	89	97	72	95	93	66	O X	A	A	A	
21	A	A	A	A	A	A	A	O X	A	B	B	B	X	B	X	X	X	X	O X	O X	B	B	A	A	
22	A	A	A	A	A	A	A	A	A	B	B	X	75	97	91	88	75	61	58	49	36	A	A	A	
23	A	A	O X	A	A	A	O X	A	57	62	63	57	74	102	90	75	84	69	58	42	A	O X	A	A	
24	55	A	X	A	A	O X	A	44	35	46	41	57	63	82	102	95	85	68	54	45	O X	O X	B	O X	
25	A	A	A	A	57	O X	57	X	65	67	79	79	93	97	90	65	84	65	O X	O X	A	B	A	A	
26	A	O X	X	A	A	X	O X	A	41	43	42	48	70	89	88	69	78	55	55	39	34	A	A	A	
27	A	A	A	53	A	A	A	A	A	B	56	68	88	87	82	74	79	84	67	72	A	A	79	65	
28	A	A	A	A	34	A	A	126	A	A	B	B	O X	O X	B	B	B	B	O X	A	A	A	A	A	
29	A	A	O X	O X	A	A	A	A	A	62	A	A	A	O X	B	B	X	O X	A	A	75	A	A	X	
30	B	A	A	A	B	A	B	A	46	A	A	A	B	B	B	61	58	51	B	A	A	A	A	A	
31	A	A	A	A	A	A	A	A	A	32	B	B	O X	76	81	82	74	B	B	B	B	B	B	55	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	6	6	8	9	5	6	7	10	8	13	14	16	26	25	28	30	30	28	24	17	10	4	7	7	
MED	52	58	50	53	57	46	49	46	52	46	56	64	71	87	88	81	77	67	56	44	51	49	66	57	
U Q	56	67	56	58	64	58	58	56	66	62	57	70	81	91	97	85	87	82	65	62	75	66	79	65	
L Q	47	37	O X	51	44	33	39	44	46	42	48	57	O X	O X	X	X	X	O X	O X	O X	O X	30	28	59	51

MAY 2025 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2025 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	42	A	34	31	A	A	A	A	A	A	B	B	F 55	56	64	F 92	89	60	56	A	A	A	A	A
2	A	A	A	A	A	A	A	A	A	A	A	B	37	43	R 53	Z 54	57	41	A	A	A	A	A	A
3	A	A	A	A	A	B	A	A	49	B	B	B	B	B	77	48	53	45	33	A	A	A	A	A
4	A	A	A	A	A	A	A	A	A	40	B	B	51	67	61	F 78	F 63	65	42	A	A	A	A	A
5	A	A	A	A	B	A	A	A	B	B	A	B	B	65	66	70	76	F 62	A	B	A	A	A	A
6	A	A	A	B	B	B	A	B	A	B	B	B	R 60	B	F 76	78	67	45	59	27	A	A	A	A
7	A	A	B	B	B	A	A	A	A	A	B	B	R 56	83	95	83	68	48	45	26	A	B	B	A
8	A	A	A	A	A	A	A	A	A	B	B	B	62	63	77	70	72	72	40	A	A	A	A	A
9	A	37	B	53	A	A	A	A	A	40	50	63	72	83	F 101	99	69	67	38	27	A	A	A	51
10	A	A	A	35	A	A	R 33	A	A	A	R 40	42	53	60	61	66	58	47	45	B	A	A	A	A
11	B	A	A	A	B	A	B	A	A	A	49	57	75	84	89	88	82	57	36	A	A	A	A	36
12	A	A	41	A	A	27	R 43	R 38	38	41	50	63	65	75	87	79	60	51	F 40	27	15	A	A	A
13	A	38	57	A	A	46	45	34	F 60	F 42	F 47	74	86	J 96	R 111	F 104	56	49	44	31	18	A	A	A
14	A	A	A	A	A	A	A	A	A	B	R 42	46	57	79	86	80	70	49	37	A	A	A	A	A
15	A	A	A	A	A	A	A	39	A	38	40	B	66	74	79	66	62	52	35	A	A	A	A	A
16	A	A	A	A	A	28	A	A	A	A	R 45	51	B	F 73	67	70	65	57	F 38	33	59	A	A	A
17	A	A	37	A	A	A	A	A	A	A	B	40	42	42	49	53	51	43	A	A	A	A	A	A
18	A	A	A	A	A	A	A	A	A	28	B	B	B	B	82	67	R 69	70	28	18	R	A	A	A
19	A	A	A	A	A	A	A	A	A	Z 36	39	56	64	66	58	67	51	B	B	B	A	A	A	A
20	A	A	A	A	45	52	A	A	A	B	B	56	58	F 72	84	66	F 67	71	53	R 54	A	R	A	A
21	A	A	A	A	A	A	A	R 38	A	B	B	B	R 65	B	89	Z 76	63	52	R 38	B	B	A	A	A
22	A	A	A	A	A	A	A	A	A	B	B	69	81	F	75	66	55	50	41	30	A	A	A	A
23	A	A	A	R 41	A	A	A	R 42	32	34	46	51	68	77	78	69	71	51	30	31	A	R	A	A
24	A	A	R 31	A	A	38	26	29	35	51	57	76	96	89	79	56	40	29	18	24	B	14	17	
25	A	A	A	A	A	R 31	R 39	50	52	50	42	60	74	86	68	50	F	46	22	22	A	B	A	A
26	A	24	43	A	A	26	24	Z 29	26	31	42	55	63	70	63	62	F 42	34	24	17	A	A	A	A
27	A	A	A	A	A	A	A	A	A	B	F 40	54	F 68	75	72	68	73	61	51	51	A	A	65	43
28	A	A	A	A	28	A	A	A	A	A	B	A	B	R 50	54	B	B	B	28	A	A	A	A	A
29	A	A	R 46	52	A	A	A	A	A	A	B	A	A	B	B	65	53	50	A	A	A	A	A	45
30	B	A	A	A	B	A	B	A	A	A	A	A	B	B	B	50	52	31	B	A	A	A	A	A
31	A	A	A	A	A	A	A	A	A	26	B	B	54	F 62	59	68	68	B	B	B	B	B	B	41
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1	3	7	5	3	6	6	9	7	12	14	16	26	24	28	30	29	28	24	14	4	2	2	6
MED	42	37	41	41	44	30	38	38	38	37	44	56	62	72	76	68	63	50	38	27	21	R 17	40	42
U Q		38	46	52	45	46	43	40	52	40	49	62	68	81	86	79	70	60	44	31	42			45
L Q		24	34	33	28	27	33	30	29	32	40	51	54	62	64	66	56	46	32	22	16			36

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2025 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	39	33	33	49	58	109	55	69	47	59	B	B	23	24	32	19	27	33	43	32	46	57	99	45			
2	42	62	75	59	63	60	87	54	62	62	58	B	E	B	E	B	E	B	21	47	66	71	52	45	69		
3	99	70	41	44	66	B	54	52	35	B	B	B	B	B	E	B	E	B	K	22	61	58	35	47	42		
4	45	61	57	69	57	54	43	52	44	31	B	B	E	B	E	B	E	B	E	B	32	61	37	42	48	52	
5	87	51	60	55	B	36	40	56	B	B	B	B	E	B	E	B	E	B	B	B	B	K	39	40	54		
6	71	44	35	51	B	B	49	B	39	B	B	B	E	B	B	E	B	E	B	E	B	22	45	38	48		
7	57	51	B	B	B	55	53	51	51	43	B	B	E	B	E	B	B	E	B	E	B	B	B	44	37		
8	36	59	52	58	54	63	71	56	65	B	B	B	E	B	E	B	E	B	E	B	35	57	57	55	46	113	
9	67	54	B	E	B	26	55	45	49	34	49	19	19	23	35	25	26	20	34	23	23	12	51	64	45	48	
10	55	51	84	42	47	49	25	45	54	45	33	36	35	28	35	17	11	27	23	B	37	54	36	43			
11	B	55	66	50	B	34	B	60	63	48	34	38	42	37	38	20	32	28	36	32	21	45	54	38			
12	62	71	56	59	47	49	45	42	33	23	18	21	22	22	22	19	E	B	E	B	E	B	54	29	34	31	
13	62	35	27	45	49	43	31	36	13	15	19	21	21	22	19	19	13	14	15	14	11	47	54	98			
14	55	48	57	80	57	40	58	58	57	B	E	B	E	B	E	B	E	B	E	B	K	40	65	43	45		
15	39	47	58	48	68	58	59	27	52	39	E	B	B	E	B	E	B	E	B	E	B	39	61	55	50		
16	37	60	67	73	47	K	27	49	47	84	60	53	E	B	B	E	B	E	B	E	B	K	51	45	55	56	
17	60	57	69	74	65	41	50	45	38	55	B	E	B	E	B	E	B	E	B	K	42	35	45	48	55	57	
18	84	58	58	41	65	89	42	44	51	39	B	B	B	B	E	B	E	B	E	B	B	39	50	39	75		
19	57	45	51	44	64	52	51	21	46	47	53	20	25	23	29	21	21	B	B	B	B	K	55	22	19	24	
20	36	59	37	41	40	46	48	58	52	B	B	B	E	B	E	B	E	B	E	B	E	B	45	29	39	42	
21	38	54	49	73	71	62	97	45	54	B	B	B	E	B	B	E	B	E	B	E	B	B	11	33	41		
22	67	121	55	43	59	47	54	50	61	B	B	E	B	E	B	E	B	E	B	E	B	58	67	13	40	34	
23	38	54	56	50	53	57	58	49	25	21	E	B	E	B	E	B	E	B	E	B	E	42	16	26	27		
24	51	41	67	47	49	47	21	17	16	K	K	13	16	19	18	53	43	20	11	12	55	51	31	B	12	13	
25	37	51	49	48	50	49	41	36	38	47	28	E	B	25	30	30	22	22	28	E	B	49	B	34	47		
26	33	37	42	50	59	12	21	12	25	50	14	19	21	23	20	20	16	13	15	46	38	41	41	42			
27	70	65	49	40	55	58	64	58	57	B	29	37	31	18	18	17	E	B	E	B	E	B	55	52	88	K	21
28	71	60	59	46	18	61	53	60	70	59	B	B	E	B	E	B	B	B	B	E	B	57	64	96	68		
29	61	56	87	59	38	64	62	53	54	55	B	59	39	B	B	E	B	25	26	55	64	57	56	44	44	60	
30	B	85	52	55	B	53	46	49	54	61	76	59	B	B	B	E	B	E	B	B	B	55	27	53	47	68	
31	80	39	60	54	50	53	55	60	53	47	B	B	E	B	E	B	E	B	E	B	B	B	B	B	B	B	30
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	29	31	29	30	26	29	30	30	30	22	17	18	26	25	28	30	30	29	28	26	28	27	30	31			
MED	57	54	56	50	55	52	50	50	52	47	30	24	E	B	E	B	E	B	E	B	E	45	45	44	45		
U Q	68	60	63	59	63	59	58	56	57	55	52	38	39	40	40	37	34	30	36	55	55	54	54	57			
L Q	38	47	49	44	49	44	43	42	38	31	18	21	26	24	24	20	E	B	E	B	E	37	35	38	37		

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2025 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	5	5	6	8	11	15	18	13	14	B	B	19	15	13	8	15	20	15	8	7	9	7	5
2	E 5	18	9	13	21	11	27	18	15	16	44	B	28	37	23	30	28	13	9	14	9	8	6	8
3	9	7	25	12	17	B	24	36	24	B	B	B	B	B	36	33	26	8	15	7	11	7	7	7
4	15	9	7	21	22	23	39	35	35	16	B	B	39	38	40	40	39	23	10	9	8	10	14	17
5	7	14	24	36	B	17	13	14	B	B	45	B	B	41	43	43	38	16	9	B	11	12	11	40
6	23	25	10	15	B	B	30	B	22	B	B	B	45	B	46	46	18	22	27	18	5	10	12	15
7	13	43	B	B	B	35	41	37	36	38	B	B	44	61	44	46	31	15	31	17	B	B	11	8
8	7	18	16	14	22	18	17	23	23	B	B	B	43	41	35	35	20	14	10	9	9	13	9	8
9	9	7	B	26	33	17	15	15	15	9	13	16	35	25	26	20	34	12	23	12	9	9	15	14
10	8	13	17	15	24	17	11	12	23	23	33	36	35	28	35	13	11	27	17	B	7	8	7	8
11	B	21	12	18	B	15	B	28	15	25	34	38	42	37	38	20	32	28	9	23	10	15	9	9
12	8	13	13	7	11	14	14	10	9	8	7	15	10	15	22	9	19	26	19	12	8	9	8	7
13	7	7	13	8	9	9	8	9	7	8	9	8	16	15	12	8	13	14	15	11	8	7	8	8
14	8	9	25	43	16	13	15	12	13	B	36	25	27	39	33	25	15	32	13	18	9	9	6	9
15	9	6	11	25	7	25	14	9	13	15	33	B	33	49	41	46	37	25	11	7	8	9	10	8
16	7	17	14	19	15	13	17	12	19	17	24	40	B	41	31	26	35	33	20	13	8	8	10	7
17	9	9	9	15	15	13	15	12	11	15	B	33	31	24	33	25	15	11	13	9	7	7	11	8
18	7	7	8	6	9	8	13	36	7	17	B	B	B	B	41	48	51	31	21	9	9	17	13	9
19	14	11	9	7	15	13	11	15	5	18	13	17	16	18	15	21	21	B	B	B	15	7	11	12
20	9	7	7	8	9	12	11	18	19	B	B	21	26	33	44	37	37	25	29	35	20	13	7	8
21	9	11	11	11	15	14	19	21	26	B	B	B	60	B	36	45	34	29	33	B	B	11	9	11
22	11	14	17	28	25	23	27	24	9	B	B	39	26	25	16	13	19	15	14	13	32	9	8	7
23	7	9	9	9	16	14	13	9	9	10	15	38	54	38	28	11	9	15	9	14	9	7	7	7
24	7	8	11	12	13	11	10	11	7	7	7	13	15	14	12	11	7	9	16	13	22	B	9	10
25	6	8	9	12	9	7	8	7	8	18	11	25	20	15	15	11	14	19	13	11	9	B	11	9
26	9	9	10	9	9	8	8	7	7	5	7	13	9	11	10	7	7	7	7	7	8	8	8	8
27	11	16	18	13	17	9	16	14	9	B	24	25	15	11	13	6	23	24	23	21	17	9	11	10
28	15	9	15	11	6	16	19	15	15	23	B	B	39	36	B	B	B	25	21	7	8	13	7	11
29	7	8	20	6	12	7	16	7	15	15	B	17	29	B	B	25	14	9	7	7	9	5	15	7
30	B	9	9	14	B	39	11	6	13	14	35	45	B	B	B	25	24	14	B	9	13	11	14	38
31	18	5	14	17	12	11	34	15	15	16	B	B	33	31	29	20	48	B	B	B	B	B	B	27
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	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	12	13	15	14	15	15	15	17	44	39	33	37	33	25	23	20	15	13	9	9	9	8
U Q	13	14	17	19	24	18	24	23	22	B	B	B	45	49	41	40	35	27	23	21	15	13	11	11
L Q	7	7	9	9	9	11	11	10	9	14	15	21	20	18	16	11	15	14	10	9	8	8	7	8

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2025 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	E A 274	A	A	A	A	A	A	A	A	A	B	B	E A 286	E A 282	E A 272	Q 292	224	246	228	A	A	A	A	A
2	A	A	A	A	A	A	A	A	A	A	A	B	B	A	B E 318	B E 266	265	322	A	A	A	A	A	A
3	A	A	A	A	A	B	A	A	192	B	B	B	B	B	B E 280	B E 272	254	248	306	A	A	A	A	A
4	A	A	A	A	A	A	A	A	A E 340	B	B	B	E B 304	E B 294	242	246	252	240	262	A	A	A	A	A
5	A	A	A	A	B	A	A	A	B	B	A	B	B	E B 298	E B 268	298	230	230	A	B	A	A	A	A
6	A	A	A	B	B	B	A	B	A	B	B	B	E B 286	B	252	230	198	202	E B 244	258	A	228	A	A
7	A	A	B	B	B	A	A	A	A	A	B	B	B	318	288	222	228	220	E B 236	246	B	B	A	A
8	A	A	A	A	A	A	A	A	A	B	B	B	E B 300	E B 238	228	212	232	226	E A 290	A	A	A	A	A
9	A	212	B	A	A	A	A	A	382	A	A	240	E B 242	E B 220	218	202	206	E B 256	E B 290	270	246	A	A	A
10	A	A	A	A	A	A	263	A	A	A	B	306	E B 316	E B 286	252	250	239	204	E A 238	246	B	A	A	A
11	B	A	A	A	B	A	B	A	A	A	A	260	E B 254	E B 252	232	242	230	220	E B 238	284	A	A	A	222
12	A	A	205	A	A	174	A	A	A E 370	A E 273	250	248	214	222	200	218	E B 234	E B 229	214	E B 256	A	A	A	A
13	E A 364	E A 342	230	A	A	A	A	A	Q 278	242	220	232	236	229	218	200	190	204	218	204	242	A	A	A
14	A	A	A	A	A	A	A	A	A	B	B	A	E B 278	E B 254	246	222	E B 228	E B 324	280	A	A	A	A	A
15	A	A	A	A	A	A	A	A	A	A	B	B	B	E B 258	E B 254	232	224	250	206	230	A	A	A	A
16	A	A	A	A	A H 297	A	A	A	A	A	A	B	B	232	246	238	E B 260	E B 250	254	248	204	A	A	A
17	A	A E 274	A	A	A	A	A	A	A	A	B	B	384	312	330	306	282	300	328	A	A	A	A	A
18	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	E B 244	E B 282	256	220	254	A	A	A
19	A	A	A	A	A	A	A	A	A	B	B	324	248	238	210	220	E B 228	E B 218	B	B	B	A	A	A
20	A	A	A	A	A	A	A	A	A	B	B	254	265	222	236	E B 250	Q 246	214	E B 284	294	A	181	A	A
21	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	218	238	258	242	268	B	A	A
22	A	A	A	A	A	A	A	A	A	B	B	238	206	220	Q 204	194	210	208	212	225	A	A	A	A
23	A	A	A	A	A	A	A	A E 422	A E 344	A E 298	246	E B 260	E B 258	238	215	210	204	208	246	E A 266	A	A	A	A
24	A	A	180	A	A	A	A E 388	A E 352	A E 284	A H 280	242	202	215	210	218	206	186	220	292	290	300	A	B	292
25	A	A	A	A	A	A	A	A	A	A	A E 352	274	230	234	208	205	206	Q 244	218	242	258	A	B	A
26	A	228	240	A	A	A	A E 348	A E 310	A E 278	244	228	198	194	202	206	190	218	222	240	A	A	A	A	
27	A	A	A	A	A	A	A	A	A	B	B	A	Q 264	Q 235	224	196	236	220	212	254	234	A	A	280
28	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	288	A	A	A	A	198
29	A	A	A	A	A	A	A	A	A	A	B	A	A	B	B	E B 288	E B 232	A	A	A	A	A	A	242
30	B	A	A	A	A	A	B	A	A	A	A	A	B	B	B	E B 268	E B 286	310	B	A	A	A	A	A
31	A	A	A	A	A	A	A	A	A	A	B	B	E B 294	E B 254	234	230	E B 264	B	B	B	B	B	B	240
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	3	3	6	3	2	4	2	4	5	11	12	16	24	24	28	30	30	27	24	13	5	2	2	6
MED	E A 296	E A 220	226	308	302	356	326	367	281	296	250	246	248	228	228	220	222	224	248	244	244	204	286	241
U Q	E A 364	E A 342	A 274	A 320	A	A	A	A	A	A	A	A	B	B	B	E B 266	E B 254	248	284	268	278			264
L Q	E A 274	E A 212	A 205	A 102	A	A	A	A	E A 350	A	A	A	A	A	A	A	A	A	A	A	A	A	A	222

MAY 2025 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2025 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A	B	
2	48	A	51	A	A	A	A	57	A	A	B	B	B	O X 42	B	111	119	65	67	50	63	58	O X 29	A	
3	O X 64	A	70	88	A	A	A	A	A	B	A	B	X O 30	X O 35	X O 43	X O 42	A	A	69	A	A	A	A	53	
4	A	A	O X 43	O X 37	48	33	43	O X 44	46	A	A	55	63	O X 56	O X 80	X 82	62	A	A	A	A	A	A	A	
5	A	A	A	A	A	A	A	A	A	A	B	O X 54	X 67	X 66	X 66	X 68	56	48	43	30	O X 26	A	A	A	
6	53	O X 57	A	A	A	A	A	A	A	B	A	O X 55	68	B	O X 88	O X 70	B	B	35	O X 31	A	A	A	A	
7	A	56	69	A	A	A	A	A	71	A	B	67	69	92	86	65	40	X O 28	A	A	A	A	A	58	
8	A	83	A O X 37	45	A	A	55	47	50	58	60	71	73	O X 95	60	61	59	61	58	82	89	A O X 52	A		
9	X 44	A	A	A	46	A	A	A	B	A	A O X 48	B	56	56	53	41	O X 32	O X 22	A	A	A	A	59	A	
10	A	A	A	A	A	A	A	A	A O X 35	B	B	65	76	81	O X 48	B	35	O X 35	O X 18	A	A	A	A	A	
11	A	A	A O X 40	A	A	A	B	A	B	A	O X 38	52	60	66	60	61	48	B	A	A	A	A	A	A	
12	61	45	A	A	A	A	A	O X 41	A	B	B	B	B	O X 55	X 43	X 41	A	A	A	O X 62	A	A	A	A	
13	A	A	A	A	B	A	62	A	A	B	A	A	A	X 38	B	44	42	A	A	58	88	70	65	A	
14	53	97	A	A	A	60	84	A	60	52	A	B	O X 43	O X 43	B	O X 44	O X 34	O X 29	A	A	A	A	A	57	66
15	A	A	A	A	52	45	49	O X 37	48	51	42	O X 51	67	76	78	O X 87	57	57	28	30	A	A	A	A	
16	47	A	A	49	47	55	45	58	A	A	A	54	70	66	73	54	X O 42	X O 48	O X 43	O X 34	A	A	A	A	
17	A	A	A	A	66	59	A	X 57	54	O X 46	57	O X 62	79	71	59	48	46	O X 42	A	A	A	57	43	A	
18	A	A	A	A	A O X 61	X 61	A	A	A	A	51	57	71	B	X 72	80	O X 61	54	B	A	A	A	A	63	
19	A	A	A	A	A	A	A	A	A	A	A	66	67	88	70	59	35	A O X 32	A	A O X 17	36	A	A	A	
20	A	A	B	A	A	A	X 34	X 42	X 52	B	63	68	B	B	R	X 57	X 59	X 38	X 39	X 37	A	A	A	A	
21	A	A	A	57	B	A	A	A	B	49	52	60	78	X 75	X 64	X 59	X 52	X 46	B	A	88	69	A	A	
22	A	A	A	A	A	A	A	A	A	A O X 52	50	64	65	58	59	48	B	B	B	A	A	A	A	A	
23	A	A	A	A	A	A	A	X 40	X 38	35	40	42	62	65	70	66	X B	B	B	A	A	A	A	A	
24	A	A	A	A	A	X 37	A	55	59	56	52	65	61	68	70	58	X 37	61	40	30	A	28	A	A	
25	A	A	A	A	A	A	50	59	65	59	68	68	61	73	61	57	X 38	52	B	B	A	A	A	A	
26	A	A	A	A	A	A	A	A O X 49	A O X 69	B	B	B	B	X 54	X 48	X 52	X 58	X 53	A	A	A	A	A	A	
27	70	B	A	A	A	A	A	A	B	A	B	B	O X 49	B	B	O X 56	O X 56	O X 50	B	A	A	A	A	47	
28	56	A	A	A	A	A	A	A	B	B	B	B	B	B	O X 65	O X 68	X O 70	X O 52	X O 36	X O 21	A	A	A	A	
29	A	A	A	A	A	A	A	A	A	A	B	51	B	B	O X 69	O X 61	70	49	A	A	30	A	A	A	
30	A	A	A	A	A	A	A	B	A	B	A	B	55	O X 68	B	B	B	B	O X 34	O X 19	83	57	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	9	5	4	6	5	7	9	9	12	9	12	19	22	21	25	28	23	19	16	12	10	7	5	7	
MED	53	57	60	44	47	55	50	55	50	51	52	55	64	66	69	59	48	49	38	30	66	58	57	53	
U Q	62	90	70	57	50	61	62	58	60	55	60	65	68	76	76	67	61	54	50	54	82	65	58	63	
L Q	48	50	47	O X 37	46	37	44	X 41	46	42	44	X 51	X 60	X O 56	X 58	X 54	X 40	X O 39	X O 34	X O 26	30	28	32	47	

JUN. 2025 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2025 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	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A	B	
2	33	A	45	A	A	A	A	A	A	A	B	B	B	36	B	57	F 48	F 48	A 58	25	23	21	23	A	
3	58	A	A	A	A	A	A	A	A	B	A	B	24	29	37	36	A	A	A	A	A	A	A	A	
4	A	A	19	31	36	A	A	38	40	A	A	41	46	50	74	67	56	A	A	A	A	A	A	A	
5	A	A	A	A	A	A	A	A	A	A	B	48	51	60	60	55	39	32	28	24	20	A	A	A	
6	41	51	A	A	A	A	A	A	A	B	A	49	54	B	82	64	B	B	26	25	A	A	A	A	
7	A	A	A	A	A	A	A	A	A	A	B	47	47	51	78	59	34	R 22	A	A	A	A	A	A	
8	A	A	A	R 31	A	A	A	F 25	39	31	35	54	F 57	Z 67	89	48	42	43	41	A	65	A	A	A	
9	38	A	A	A	28	A	A	A	B	A	A	42	B	F 46	41	36	F 32	26	16	A	A	A	A	A	
10	A	A	A	A	A	A	A	A	A	29	B	B	46	63	64	42	R	B	24	29	12	20	A	A	A
11	A	A	A	36	A	A	A	B	A	B	32	42	54	60	52	51	38	B	A	A	A	A	A	A	
12	A	25	A	A	A	A	A	A	R 35	A	B	B	B	B	49	37	35	A	A	A	R 56	A	A	A	
13	A	A	A	A	B	A	A	A	A	B	A	A	32	B	R 38	34	A	A	A	A	22	A	A	A	
14	A	A	A	A	A	A	A	A	A	28	A	B	R 37	37	38	28	23	A	A	A	A	A	A	A	
15	A	A	A	A	A	A	A	R 31	42	23	36	45	61	66	F 64	81	44	44	F 22	20	A	A	A	A	
16	A	A	A	A	A	A	R 39	A	A	A	A	42	48	60	F 65	48	36	F 40	F 37	28	A	A	A	A	
17	A	A	A	A	A	A	A	A	51	53	40	F 45	56	57	F 60	F 46	F 39	F 32	F 36	A	A	A	A	A	
18	A	A	A	A	A	55	55	A	A	A	F 43	38	52	F 66	Z 62	55	46	A	A	A	A	A	A	A	
19	A	A	A	A	A	A	A	A	A	A	A	56	48	69	52	42	26	A	26	A	A	11	A	A	
20	A	A	B	A	A	A	J 28	R 36	R 46	B	F 43	52	B	B	R 51	F 50	32	32	R 31	A	A	A	A	A	
21	A	A	A	A	B	A	A	A	B	F 40	42	54	Z 64	69	58	53	Z 46	Z 40	B	A	A	A	A	A	
22	A	A	A	A	A	A	A	A	A	A	46	38	F 43	59	50	44	35	B	B	B	A	A	A	A	
23	A	A	A	A	A	A	A	34	32	F 26	34	48	Z 56	J 50	R 64	Z 60	B	B	B	A	A	A	A	A	
24	A	A	A	A	A	R 31	A	F 46	J 53	R 46	F 36	45	F 49	55	F 53	46	31	32	F 32	A	A	A	A	A	
25	A	A	A	A	A	A	31	31	46	F 25	30	38	42	62	48	40	32	37	B	B	A	A	A	A	
26	A	A	A	A	A	A	A	A	R 43	A	R 63	B	B	48	42	46	52	33	A	A	A	A	A	A	
27	A	B	A	A	A	A	A	A	B	A	B	B	R 43	B	B	50	41	44	B	A	A	A	A	A	
28	A	A	A	A	A	A	A	A	B	B	B	B	B	B	59	F 58	J 64	R 46	30	15	A	A	A	A	
29	A	A	A	A	A	A	A	A	A	A	B	41	B	B	63	R 55	F 48	F 43	A	A	24	A	A	A	
30	A	A	A	A	A	A	A	B	A	B	A	B	43	R 62	B	B	B	B	28	13	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	2	2	3	2	2	4	7	10	9	12	19	22	21	25	28	23	19	14	8	7	2	1	2	
MED	40	38	32	31	32	43	35	34	42	29	38	45	48	59	59	49	39	37	30	22	23	16	23	52	
U Q	50			36			47	38	R 46	F 43	43	49	54	62	64	58	48	44	36	25	56				
L Q	36			31			30	31	39	F 26	34	41	43	49	50	42	32	32	26	14	20				

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2025 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	72	59	55	45	55	57		B	B	B	B	B	B	B	B	B	B	B	B		34		29	48	B		
2	42	64	57	73	57	40	58	41	62	65		B	B	B	B	B	B	B	B	48	18	55	45	28	113		
3	^K 21	114	50	28	100	49	51	67	54	68	67		B	B	B	B	B	B	B								
4	52	99	18	71	45	19	45	55	24	52	56	E	B	B	B	B	B	B	B	24	38	35	74	98	47	56	49
5	90	57	62	67	75	53	59	65	58	61		B	B	B	B	B	B	B	B								
6	40	46	55	62	59	59	59	63	51	52	45	36	E	B	B	B	B	B	B								
7	49	42	53	46	57	58	59	49	51	55		B	B	B	B	B	B	B	B								
8	82	58	41	37	37	46	50	56	21	21	21	22	E	B	B	B	B	B	B	40	42	58	49	61	51		
9	62	59	47	39	28	70	61	66		B			B	B	B	B	B	B	B	41	27	48	39	41	83		
10	84	81	89	24	65	^K 40	51	55	87	49		B	B	B	B	B	B	B	B	16	15	57	51	31	56	60	
11	46	55	80	86	58	55	37	51	55	53	36	18	^K 20	^K 31	^K 31	^K 25	^K 21			57	55	99	48	64	65		
12	51	55	61	54	49	84	74	41	51	65		B	B	B	B	B	B	B	B								
13	55	46	61	46		60	46	67	64		23	49	^K 28			55	18	45	39	45	60	43	68	160	79		
14	45	59	42	27	68	58	42	58	41	29	54	53	E	B	B	B	B	B	B								
15	54	53	74	75	44	65	42	63	29	14	18	E	B	B	B	B	B	B	B	E	B						
16	45	42	46	47	62	46	48	39	59	75	49	27	E	B	B	B	B	B	B	B	B	B	59	55	27	49	35
17	35	36	38	60	46	47	55	65	53	47	36	31	E	B	B	B	B	B	B	^K 13	13	34	47	35	45	41	
18	66	46	45	68	50	47	60	24	55	48	34	23	^K 27			35	25	38	36			52	52	56	43	54	
19	49	47	83	82	53	58	50	56	51	58	47	E	B	B	B	B	B	B	B								
20	59	53	35	48	67	47	25	64	39		30	35				45	29	15	14	57	57	58	26	34	41		
21	60	^K 43	38	37	45	37	39	69		B	^K 23	^K 19	^K 17	^K 23	20	E	B	B	B	B	B	B					
22	62	48	57	99	105	59	45	56	52	57	25	29	27	24	E	B	B	B	B			30		28	36	29	47
23	42	49	61	64	56	59	49	47	17	16	17	21	18	25	42	27						42	33	26	38	40	
24	28	28	38	44	^K 44	51	55	44	^K 30	19	E	B	27	27	24	24	14	13	9	55	55	50	14	40	59		
25	42	37	43	43	49	49	21	26	44	32	13	16	E	B	B	B	B	B	B								
26	84	71	45	69	53	64	60	50	42	75	60		B	B	B	B	B	B	B	61	46	53	50	45	41	67	
27	37	^B	60	49	60	51	56	51	48	50		B	B	B	B	B	B	B	E	B			^K 26	41	47	84	
28	42	81	46	58	63	56	54	49		B		B	B	B	B	B	B	B	B	60	28	15	30	43	52	51	
29	59	128	89	52	69	67	22	55	51	65		B	E	B	B	B	B	B	B	32	50	54	23	47	92	50	
30	52	74	55	16	45	50	43		B		57		B	E	B	B	B	B	B								
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	30	29	30	30	29	30	29	28	26	26	21	21	22	21	25	28	25	24	24	28	29	30	30	29			
MED	52	55	54	50	56	54	50	55	51	52	36	26	E	B	B	B	B	B	B								
U Q	62	68	61	68	64	59	58	64	55	61	50	30	E	B	B	B	B	B	B								
L Q	42	46	43	43	46	47	42	48	41	32	20	22	23	22	24	17	15	17	26	34	31	35	41	41			

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2025 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	24	37	15	31	39	27	B	B	B	B	B	B	B	B	B	B	B	B	B	19	B	25	27	B	
2	15	14	14	37	50	25	20	15	7	7	B	B	B	23	B	36	17	16	12	11	13	15	16	15	
3	11	15	15	12	24	15	14	15	18	37	17	B	19	25	25	27	19	10	10	9	12	14	15	14	
4	10	9	9	14	9	9	13	15	14	7	25	24	33	42	37	17	11	9	8	10	13	12	14	11	
5	8	13	16	8	39	15	11	13	14	8	B	26	12	17	25	17	15	16	8	7	9	9	8	7	
6	9	9	19	17	14	15	25	9	21	16	23	36	31	B	61	44	B	B	16	12	14	9	8	7	
7	27	7	8	12	11	18	15	14	14	13	B	25	27	22	19	24	19	9	9	6	7	9	7	7	
8	24	32	9	9	6	12	9	7	7	7	8	15	21	10	14	11	7	8	7	7	7	7	8	7	
9	7	23	10	11	7	9	7	15	B	11	17	18	B	37	21	18	15	17	11	8	7	6	7	13	
10	14	24	16	19	24	27	15	17	16	17	B	B	37	44	33	36	B	16	15	8	7	7	8	14	
11	6	8	15	9	17	21	15	15	27	17	26	9	13	31	31	25	21	B	38	18	7	9	11	8	
12	7	8	10	25	15	23	13	14	13	25	B	B	B	B	35	17	15	9	8	8	9	8	7	7	
13	13	10	29	14	B	14	12	23	17	B	18	10	11	B	23	9	11	8	9	11	9	9	10	14	
14	12	15	11	11	13	11	9	15	25	15	19	38	24	27	B	25	23	11	12	11	9	12	9	9	
15	9	11	12	11	7	9	13	11	10	7	8	22	37	15	13	16	26	15	15	12	8	15	8	8	
16	7	9	8	13	10	12	14	7	14	25	17	19	17	26	31	16	25	23	24	32	25	14	7	7	
17	8	7	8	5	8	7	11	12	12	14	18	27	45	33	31	32	26	8	7	11	10	13	7	7	
18	9	15	14	10	8	15	19	24	16	14	17	15	13	B	35	25	38	36	B	24	14	9	7	7	
19	8	9	7	9	13	12	15	11	14	15	19	27	15	25	34	21	14	20	16	11	16	15	7	25	
20	11	15	21	9	10	11	9	11	9	B	15	18	B	B	45	29	15	14	15	35	12	9	7	6	
21	7	7	7	7	9	9	9	18	B	10	9	9	11	10	13	16	11	21	B	14	9	7	7	8	
22	7	14	7	9	6	7	14	12	25	8	13	13	13	17	23	25	16	B	16	B	21	9	6	6	
23	5	9	9	24	14	19	12	5	7	10	11	13	9	25	42	27	B	B	B	12	9	7	8	7	
24	7	8	9	8	7	7	8	12	8	7	14	13	27	24	24	7	7	9	16	8	7	7	7	11	
25	8	8	8	9	14	8	8	7	6	8	7	8	27	42	34	13	17	17	B	B	7	7	6	6	
26	15	17	13	19	12	9	9	8	9	6	9	B	B	B	34	32	12	21	11	10	12	8	8	6	13
27	5	B	18	9	7	21	9	27	18	13	B	B	39	B	37	9	34	B	19	8	8	8	8	8	
28	7	9	13	23	15	17	10	13	B	35	B	B	B	B	47	35	17	20	15	9	10	7	7	7	
29	9	16	38	14	15	10	7	6	9	8	B	B	B	B	46	47	23	8	16	10	9	7	9	12	
30	10	9	34	10	18	21	25	B	16	B	28	B	B	38	48	B	B	B	B	22	11	10	12	11	15
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	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	12	11	13	13	12	14	14	14	18	24	29	34	34	25	18	16	15	11	9	9	8	8	
U Q	12	15	16	17	17	19	15	15	21	25	B	B	B	B	46	35	26	34	24	18	13	12	9	13	
L Q	7	9	9	9	8	9	9	11	9	8	14	15	15	24	24	16	15	9	10	9	8	7	7	7	

JUN. 2025 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2025 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A	B
2	288	A	191	A	A	A	A	A	A	A	B	B	B	340	B	470	268	232	344	290	246	294	353	A
3	355	A	A	A	A	A	A	A	A	B	A	B	366	402	412	392	B	A	A	A	A	A	A	A
4	A	A	190	224	188	A	A	410	180	A	A	292	310	361	258	259	A	A	A	A	A	A	A	A
5	A	A	A	A	A	A	A	A	A	A	B	E	272	210	230	234	208	204	280	230	246	235	A	A
6	E	A	A	A	A	A	A	A	A	B	A	B	E	B	B	B	B	B	B	A	A	A	A	A
7	290	415	A	A	A	A	A	A	A	A	B	306	266	B	268	228	B	B	262	250	A	A	A	A
8	A	A	A	230	A	A	A	342	294	324	274	244	220	196	210	238	252	246	325	A	326	A	A	325
9	248	A	A	A	190	A	A	A	A	B	A	A	B	E	B	B	E	B	E	A	A	A	A	A
10	A	A	A	A	A	A	A	A	A	A	B	302	278	214	230	236	246	280	A	A	A	A	A	A
11	A	A	A	215	A	A	A	B	A	B	180	244	238	208	214	224	208	B	A	A	A	A	A	A
12	A	230	A	A	A	A	A	A	A	A	B	B	B	B	B	E	B	296	272	266	E	310	A	A
13	A	A	A	A	B	A	A	A	A	B	A	A	A	B	A	A	A	A	A	A	A	190	A	A
14	A	A	A	A	A	A	A	A	A	A	A	B	E	B	E	B	B	B	296	240	A	A	A	A
15	A	A	A	A	A	A	A	A	A	E	A	E	A	256	232	238	224	237	E	B	E	B	E	B
16	A	A	A	A	A	A	254	A	A	A	A	E	A	284	222	230	212	218	E	B	E	B	E	B
17	A	A	A	A	A	A	A	A	A	E	A	308	250	E	B	220	230	240	302	232	236	A	A	A
18	A	A	A	A	A	180	A	A	A	A	B	390	238	230	B	254	236	242	244	B	A	A	A	A
19	A	A	A	A	A	A	A	A	A	A	A	242	240	208	248	196	214	A	228	A	A	A	A	A
20	A	A	B	A	A	A	A	A	A	B	E	A	E	A	B	B	B	290	248	198	254	292	A	A
21	A	A	A	A	B	A	A	A	B	E	A	308	258	224	210	196	210	224	208	262	B	A	A	A
22	A	A	A	A	A	A	A	A	A	A	A	322	258	232	216	252	216	228	B	B	B	A	A	A
23	A	A	A	A	A	A	A	A	A	A	A	326	262	272	282	238	208	210	256	214	B	B	B	A
24	A	A	A	A	A	A	A	A	E	A	B	302	278	290	244	248	222	202	204	234	238	222	304	A
25	A	A	A	A	A	A	E	A	A	A	A	366	350	318	268	246	230	238	252	204	E	B	B	A
26	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	280	288	250	284	296	A	A
27	A	B	A	A	A	A	A	A	B	A	B	B	B	B	B	B	E	B	252	258	228	B	A	A
28	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	230	254	230	E	A	262	275
29	A	A	A	A	A	A	A	A	A	A	B	E	B	B	B	B	B	244	274	234	204	A	A	A
30	A	A	A	A	A	A	A	B	A	B	A	B	E	B	B	B	B	292	288	B	B	290	284	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	2	2	3	2	2	3	4	6	8	11	19	21	21	24	27	22	18	14	9	7	1	1	1
U	278	322	190	224	189	287	366	346	266	294	273	250	235	226	239	232	240	240	254	270	227	294	353	325
U Q	322			230			390	380	302	321	308	284	286	289	257	254	268	262	290	287	310			
L Q	268			215			254	334	245	275	268	244	226	213	214	216	228	232	230	255	191			

JUN. 2025 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2025 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	A	A	A	A	A	O X 42	A	B	B	B	X 69	X 62	X 62	X 62	O X 35	X 40	A	A	A	A	A	A	A
2	X 51	X 51	A	A	A	A	A	A	A	A	A	B	O X 65	68	71	81	64	37	28	A	36	A	A	A	
3	A	A	A	O X 50	A	A	A	A	A	62	65	90	87	67	67	64	60	46	44	A	A	A	A	57	
4	A	A	62	A	A	A	A	A	A	A	A	B	B	B	73	O X 63	X 48	A	B	A	A	59	A	A	
5	A	A	A	A	A	A	59	X 48	A	A	B	A	46	53	88	O X 77	59	65	70	A	O X 34	A	57	A	
6	A	A	A	A	A	A	B	A	A	A	A	A	B	O X 50	O X 61	B	B	O X 34	A	A	A	37	A	O X 54	
7	A	64	80	57	A	A	A	A	A	A	B	B	53	53	65	66	49	42	O X 26	A	85	36	A	A	
8	A	50	44	A	A	64	B	A	A	A	B	53	55	B	B	O X 68	B	B	A	A	A	A	A	A	
9	A	A	A	A	B	A	B	A	A	A	B	B	X 57	B	O X 74	A	B	B	B	B	A	A	A	A	
10	A	A	A	A	A	O X 23	X 27	X 24	X 26	X 30	X 54	X 56	61	65	60	57	28	34	O X 27	A	O X 19	A	A	A	
11	A	54	68	A	51	52	62	56	56	61	52	63	68	95	83	B	O X 91	X 66	A	A	A	A	58	X 63	
12	A	A	54	A	A	A	44	59	A	A	A	63	67	81	92	X 54	66	57	B	B	A	A	A	A	
13	A	A	A	A	X 49	A	A	A	A	A	A	B	B	O X 60	O X 57	B	O X 63	71	A	A	A	A	A	A	
14	A	A	A	A	A	A	A	A	A	A	A	O X 50	X 69	X 61	X 71	61	X 52	O X 35	B	B	A	A	A	A	
15	A	A	A	A	A	B	A	A	B	B	O X 42	B	B	B	B	B	O X 75	X 61	55	53	A	A	A	A	
16	A	61	A	A	A	A	A	A	A	B	B	B	B	O X 62	O X 68	B	B	B	O X 40	X 37	B	B	A	A	
17	A	A	A	A	A	A	A	A	A	A	A	X 47	B	B	114	92	89	71	A	A	X 23	A	A	A	
18	A	A	A	A	A	A	A	A	A	X 33	X 45	X 63	O X 57	O X 63	89	109	B	55	B	B	R	A	A	A	
19	O X 47	A	A	A	A	A	A	A	A	A	X 40	B	O X 54	X 58	69	73	84	65	52	X 28	X 24	A	27	A	
20	A	A	A	A	A	A	A	X 56	X 47	B	X 51	X 58	X 67	X 72	X 75	X 64	X 45	X 60	X 44	A	A	O X 18	O X 26	A	
21	A	A	A	A	A	A	A	A	A	50	45	59	64	68	85	58	36	38	40	21	A	A	O X 19	A	
22	A	A	A	A	O X 38	X 39	50	X 52	A	66	77	85	91	79	81	74	A	O X 58	X 48	A	O X 20	X 38	47	76	
23	78	A	A	A	A	A	A	A	A	B	O X 36	X 43	O X 47	B	64	X 62	52	67	A	A	A	A	64	A	
24	A	A	A	A	A	A	A	A	B	A	A	B	B	B	O X 74	O X 79	84	71	65	46	A	A	A	A	
25	A	A	A	A	A	A	A	A	A	B	B	O X 68	X 80	X 82	O X 70	69	68	57	O X 37	O X 26	X 23	A	A	X 40	
26	A	A	A	54	A	A	A	A	A	A	O X 49	61	78	92	81	82	95	105	60	A	A	A	A	46	
27	A	A	A	A	A	A	X 29	X 27	X 28	X 40	X 53	X 64	X 69	91	100	63	59	54	O X 32	X 36	A	O X 21	A	A	
28	A	A	A	A	X 39	41	59	63	63	43	X 67	X 70	X 92	X 73	X 85	89	54	55	X 60	45	A	A	59	A	
29	A	B	B	A	A	A	65	A	A	B	64	63	71	82	106	83	60	58	45	O X 30	A	A	O X 20	X 26	
30	A	A	X 63	A	A	A	A	A	53	56	70	84	92	65	95	84	X 73	X 73	X 68	X 36	O X 22	A	A	O X 53	
31	A	A	A	A	A	A	A	A	A	X 37	X 47	X 63	X 83	X 93	X 87	85	86	71	43	47	A	A	A	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	3	5	6	3	4	5	8	9	6	11	15	21	25	25	28	26	25	28	18	8	8	7	8	8	
MED	X 51	54	62	54	X 44	41	54	52	50	43	52	63	67	69	76	68	61	56	44	X 33	X 23	36	52	X 54	
U Q	78	62	68	57	50	58	60	58	56	61	65	66	79	82	86	84	70	66	48	40	35	38	58	60	
L Q	O X 47	50	54	O X 50	X 38	31	X 36	X 34	X 28	X 37	X 45	X 54	X 58	X 64	X 68	X 62	X 50	X 41	O X 32	X 25	O X 21	O X 21	O X 23	X 43	

JUL. 2025 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2025 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	A	A	A	A	R 36	A	B	B	B	63	56	56	56	29	F 26	A	A	A	A	A	A
2	R 45	R 45	A	A	A	A	A	A	A	A	A	B	59	58	F 62	75	F 54	31	22	A	A	A	A	A
3	A	A	A	44	A	A	A	A	A	56	F 37	51	63	56	61	58	46	40	38	A	15	A	A	44
4	A	A	A	A	A	A	A	A	A	A	A	B	B	B	F 64	57	42	A	B	A	A	53	A	A
5	A	A	A	A	A	A	A	R 42	A	A	B	A	32	41	71	71	53	52	51	A	A	27	A	A
6	A	A	A	A	A	A	B	A	A	A	A	A	B	44	55	B	B	28	A	A	A	28	A	48
7	A	A	A	A	A	A	A	A	A	A	B	B	42	40	49	48	36	34	20	A	A	A	A	A
8	A	40	A	A	A	A	B	A	A	A	B	38	49	B	B	63	B	B	26	A	A	A	A	A
9	A	A	A	A	B	A	B	A	A	A	B	B	51	B	B	A	B	B	B	B	A	A	A	A
10	A	A	A	A	A	17	21	18	20	24	48	J R 50	45	59	52	51	20	21	21	A	13	A	A	A
11	A	A	A	A	F 39	F 44	A	50	F 47	48	41	46	62	67	77	B	85	60	A	A	A	A	A	57
12	A	A	F 45	A	A	A	38	A	A	A	A	F 50	F 53	58	60	48	52	46	B	B	A	A	A	A
13	A	A	A	A	R 43	A	A	A	A	A	A	B	B	54	51	B	57	51	A	A	A	A	A	A
14	A	A	A	A	A	A	A	A	A	A	A	44	63	55	59	49	46	29	B	B	A	A	A	A
15	A	A	A	A	A	B	A	A	B	B	36	B	B	B	B	69	55	42	32	A	A	A	A	A
16	A	41	A	A	A	A	A	A	B	B	B	B	56	62	B	B	B	33	31	B	B	A	A	A
17	A	A	A	A	A	A	A	A	A	A	A	41	B	B	F 73	F 74	54	58	A	A	17	A	A	A
18	A	A	A	A	A	A	A	A	A	27	39	57	51	R 57	F 64	Z 90	B	F 38	B	B	R	A	A	A
19	41	A	A	A	A	A	A	A	A	Z 34	B	48	52	54	58	78	39	39	F 22	18	A	18	A	A
20	A	A	A	A	A	A	A	50	41	B	45	49	61	66	60	58	Z 39	F 45	30	A	A	12	20	A
21	A	A	A	A	A	A	A	A	A	F 40	39	53	58	Z 62	79	52	30	Z 32	22	15	A	A	13	A
22	A	A	A	A	32	33	32	R 46	A	54	38	54	59	61	72	63	A	52	J R 42	A	14	A	41	A
23	A	A	A	A	A	A	A	A	A	B	30	37	41	B	48	56	46	23	A	A	A	A	A	A
24	A	A	A	A	A	A	A	B	A	A	B	B	B	67	73	78	F 47	52	28	A	A	A	A	A
25	A	A	A	A	A	A	A	A	A	B	B	61	74	69	64	60	52	39	31	20	17	A	A	34
26	A	A	A	41	A	A	A	A	A	A	43	55	72	86	58	76	89	99	54	A	A	A	A	A
27	A	A	A	A	A	A	23	21	22	34	47	58	Z 63	73	Z 94	57	45	40	26	30	A	15	A	A
28	A	A	A	A	J R 33	33	34	45	F 57	37	61	64	F 66	67	79	83	38	J R 49	F 50	27	A	A	A	A
29	A	B	B	A	A	A	A	A	A	B	46	57	65	76	78	74	54	52	31	24	A	A	14	20
30	A	A	57	A	A	A	A	A	44	39	57	66	86	Z 89	75	78	67	67	62	30	R 16	A	A	47
31	A	A	A	A	A	A	A	A	A	31	41	57	70	87	81	74	71	55	34	23	A	A	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	2	3	2	2	4	4	5	8	6	11	15	21	25	25	28	26	25	28	19	8	7	5	4	6
MED	43	41	51	42	36	33	32	44	42	37	41	51	59	62	64	62	47	41	31	24	16	18	17	46
U Q		R 45			41	38	36	48	F 47	48	47	57	64	70	74	75	54	52	38	28	17	40	30	48
L Q		40			32	25	22	28	22	31	38	45	51	56	58	56	39	32	22	19	14	14	14	34

JUL. 2025 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2025 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	50	39	61	30	68	59	63	54	55	43	B	B	E	E	E	E	E	E	E	52	55	53	60	58	89				
2	35	38	83	53	52	57	48	71	43	59	58	B	E	E	E	E	E	E	E	42	51	29	47	55					
3	50	48	78	61	66	51	51	81	47	57	29	24	K	18	19	18	17	13	34	35	33	17	44	36	40				
4	88	66	44	65	57	58	57	61	59	60	54	B	B	E	E	E	E	E	B	B	18	41	49	59	72				
5	83	50	70	56	58	48	79	54	50	64	B	28	30	E	E	E	E	B	K	53	49	52	42	42	94				
6	48	59	44	22	24	71	B	48	69	60	45	62	B	E	E	E	B	B	B	43	29	45	45	42	40				
7	33	39	69	47	61	69	K	45	42	45	48	B	B	E	E	E	B	K	E	B	E	B	E	K	K				
8	93	73	34	K	55	31	49	K	78	51	49	B	E	B	B	E	B	B	B	56	37	K	E	B	65				
9	43	K	45	68	B	50	B	60	53	56	B	B	E	B	E	E	B	B	B	B	B	11	29	K	54				
10	K	47	K	48	K	64	78	K	13	K	12	11	K	K	K	K	15	53	14	12	54	28	K	K	20				
11	55	50	30	K	K	35	40	22	70	44	33	28	E	B	E	B	E	B	B	69	49	54	43	42	45	53	70		
12	105	60	36	47	55	61	35	50	52	60	58	26	K	K	K	E	B	E	B	E	B	62	52	31	31	49	58		
13	53	54	85	73	56	64	56	74	49	56	62	B	B	E	B	E	B	E	B	50	29	31	44	29	51	56	67		
14	69	61	57	54	53	55	64	56	63	45	45	E	B	E	B	E	B	E	B	E	B	49	53	45	39	33			
15	64	61	44	59	69	B	54	52	B	B	B	28	B	B	B	B	E	B	E	B	63	45	19	25	23	26	21	47	31
16	55	37	59	61	55	64	54	57	B	B	B	B	E	B	B	B	B	B	E	B	E	B	B	B	27	27	63		
17	55	70	71	71	65	56	59	52	59	28	47	35	B	B	E	B	K	E	B	K	71	47	55	41	52	57			
18	55	55	74	54	43	44	54	51	55	15	20	E	B	K	E	B	E	B	B	B	22	B	B	K	19	43	45	49	
19	47	K	42	53	52	63	53	49	58	53	B	B	E	B	B	E	B	E	B	E	B	23	56	52	13	41	38		
20	51	49	K	36	45	52	30	38	58	B	25	26	31	19	27	20	23	E	B	B	17	20	47	58	58	58			
21	49	41	38	50	59	59	72	62	56	36	63	39	31	43	G	20	18	15	18	K	12	11	54	52	33	55			
22	58	55	53	25	44	53	31	56	49	62	23	29	24	51	22	17	17	13	27	53	63	26	38	42					
23	36	64	52	53	69	71	61	66	53	B	50	E	B	E	B	E	B	E	B	B	36	30	37	39	52				
24	57	52	85	52	52	54	51	B	53	45	B	B	B	E	B	E	B	E	B	K	15	35	46	54	48	52			
25	54	40	58	57	53	54	44	44	45	B	B	E	B	E	B	E	B	E	B	E	69	49	71	28	40	30			
26	38	68	58	38	56	46	53	53	57	45	E	B	E	B	E	B	E	B	E	B	38	52	57	33	40	42			
27	51	56	34	39	72	55	47	45	13	18	15	K	21	25	33	25	E	B	E	B	52	16	59	59	63	64			
28	35	47	100	71	55	15	29	35	33	23	15	K	E	B	48	32	19	15	K	E	B	7	10	33	37	39	57		
29	48	55	60	104	49	52	57	91	53	60	E	B	E	B	B	E	B	E	B	E	B	26	34	49	16				
30	36	74	71	72	61	58	60	61	54	33	33	37	G	23	24	15	E	B	E	B	15	31	22	44	41	41			
31	52	58	46	49	81	59	80	51	65	54	22	18	E	B	E	B	E	B	E	B	E	B	53	42	45	43			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	31	31	31	31	30	30	29	30	29	26	22	22	25	25	28	27	26	29	27	28	30	31	31	31					
MED	52	55	57	53	55	56	54	54	53	48	31	27	E	B	E	B	E	B	E	B	20	27	42	45	41	45	54		
U Q	57	61	71	61	61	61	60	62	58	59	50	E	B	E	B	E	B	E	B	E	B	50	53	45	52	64			
L Q	47	47	44	47	52	51	46	49	46	33	23	24	26	24	22	17	17	18	15	26	29	29	39	40					

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2025 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	31	26	16	23	18	11	24	18	30	B	B	28	25	25	21	22	18	13	19	13	11	11	8
2	7	8	6	14	11	9	11	8	7	7	17	B	48	42	29	41	33	19	19	17	9	8	8	9
3	8	9	12	25	19	9	14	17	16	25	12	16	13	16	13	13	11	7	7	9	9	7	7	9
4	12	8	18	15	7	16	17	16	20	25	22	B	B	B	45	32	34	19	B	12	14	15	15	10
5	13	10	10	14	15	12	9	15	11	16	B	14	21	24	50	35	15	9	16	15	10	8	16	13
6	7	8	10	7	7	11	B	15	18	11	24	22	B	37	49	B	B	15	13	16	19	11	8	11
7	7	9	14	18	34	37	15	14	14	15	B	B	27	24	25	12	18	18	15	14	7	10	12	14
8	15	7	8	17	11	9	13	9	22	15	B	17	37	B	B	54	B	B	7	8	11	8	8	9
9	9	23	16	23	B	17	B	10	12	11	B	B	35	B	44	45	B	B	B	B	9	8	11	11
10	9	8	13	15	11	9	9	8	9	9	7	9	8	9	9	11	10	11	9	15	8	8	8	8
11	7	7	9	9	11	9	13	19	15	15	9	35	44	25	32	B	69	15	8	13	8	7	8	7
12	7	11	6	14	11	9	10	13	12	13	12	16	13	14	11	38	25	35	10	18	14	9	6	7
13	11	9	6	7	6	20	13	11	21	E	E	B	B	41	49	B	50	13	11	10	E	E	7	7
14	7	24	12	19	17	14	19	9	8	7	12	38	40	34	27	29	25	24	B	40	10	7	15	8
15	11	10	7	10	24	B	15	18	B	B	28	B	B	B	B	63	45	19	25	15	17	14	9	7
16	9	9	9	9	11	11	33	13	B	B	B	B	45	50	B	B	B	25	24	B	B	13	13	8
17	8	9	10	7	8	11	17	13	6	6	17	25	B	B	36	14	21	16	14	11	10	6	7	7
18	12	23	13	12	12	13	15	13	11	15	12	27	48	37	25	15	B	11	B	B	11	9	9	9
19	9	14	11	8	10	11	11	11	7	9	B	42	21	11	18	27	19	27	19	17	9	6	7	6
20	8	7	7	8	7	9	7	7	8	B	14	14	15	9	9	12	16	23	13	15	7	7	6	8
21	7	8	8	8	12	11	8	7	9	9	15	23	16	15	13	9	9	7	7	7	9	8	7	7
22	8	7	7	7	9	7	7	10	9	10	16	13	13	9	11	7	7	7	7	8	7	6	6	9
23	12	15	24	8	16	14	9	13	17	B	46	23	31	B	24	26	36	9	5	8	8	7	7	13
24	16	9	11	16	21	20	16	B	28	15	B	B	B	59	47	49	12	14	10	7	7	9	11	8
25	9	15	31	12	17	14	10	6	9	B	45	35	25	53	37	34	20	16	11	7	8	7	7	
26	9	9	14	17	43	14	13	13	13	13	34	32	29	22	25	8	32	11	7	15	9	7	7	8
27	7	8	9	7	6	6	8	7	7	7	8	13	15	14	14	21	23	21	15	11	9	9	7	6
28	7	7	7	6	7	6	E	E	7	7	6	8	17	15	15	9	8	11	9	7	7	6	8	7
29	7	18	7	22	13	14	16	15	12	19	31	38	15	35	46	37	25	21	17	15	14	17	7	7
30	7	7	13	7	9	11	11	11	6	11	9	18	15	14	12	12	11	11	11	9	10	9	9	9
31	12	9	9	9	11	9	9	10	7	13	14	13	27	35	22	12	8	28	15	11	7	7	8	7
	00	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	12	11	11	13	13	12	13	17	27	29	25	25	27	25	18	13	14	9	8	8	8
U Q	12	14	13	16	17	14	16	15	18	25	B	B	48	50	47	45	45	23	19	17	11	9	11	9
L Q	7	8	7	8	9	9	9	9	8	9	12	16	15	15	13	12	12	11	8	9	7	7	7	7

JUL. 2025 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2025 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
1	A	A	A	A	A	A	A	A	A	B	B	B	232	224	218	225	235	244	A	A	A	A	A	A						
2	A	A	A	A	A	A	A	A	A	A	A	B	E	B	E	B	228	E	B	E	B	A	A	A	A					
3	A	A	A	A	A	A	A	A	A	E	A	A	218	212	220	225	210	E	A	A	E	A	A	A	A					
4	A	A	A	A	A	A	A	A	A	A	A	B	B	B	E	B	250	A	B	A	A	E	A	A	A					
5	A	A	A	A	A	A	A	A	A	A	B	A	E	A	E	B	B	B	A	A	A	222	A	230	A					
6	A	A	A	A	A	A	B	A	A	A	A	A	B	B	A	B	B	A	A	A	A	A	A	A	A					
7	A	A	A	A	A	A	A	A	A	A	B	B	E	B	E	B	280	A	A	A	A	A	A	A	A					
8	A	230	A	A	A	A	B	A	A	A	B	E	A	E	B	B	E	B	B	B	A	A	A	A	A					
9	A	A	A	A	B	A	B	A	A	A	B	B	232	B	E	B	E	B	B	B	B	A	A	A	A					
10	A	A	A	A	A	A	A	355	348	274	200	206	198	203	230	208	232	E	A	A	198	A	A	A	A					
11	A	A	A	A	A	A	A	288	212	370	354	320	322	258	260	300	B	E	B	B	A	A	A	A	258					
12	A	A	A	A	A	A	E	A	A	A	A	280	228	228	228	328	B	A	A	B	B	A	A	A	A					
13	A	A	251	A	A	A	A	A	A	A	A	B	B	262	329	B	B	320	218	A	A	A	A	A	A					
14	A	A	A	A	A	A	A	A	A	A	A	368	240	220	190	244	218	278	B	B	A	A	A	A	A					
15	A	A	A	A	A	B	A	A	B	B	B	324	B	B	B	B	300	265	252	242	A	A	A	A	A					
16	A	A	A	A	A	A	A	A	B	B	B	B	E	B	E	B	B	B	E	B	E	B	B	A	A	A				
17	A	A	A	A	A	A	A	A	A	A	A	320	A	B	B	B	264	232	232	426	A	A	A	A	A					
18	A	A	A	A	A	A	A	A	A	B	A	330	250	236	300	254	244	205	B	E	A	B	B	R	A	A	A			
19	218	A	A	A	A	A	A	A	A	A	A	370	310	230	210	228	215	248	216	252	274	A	180	A	A	A				
20	A	A	A	A	A	A	A	A	A	A	B	244	218	228	195	218	198	260	244	222	A	A	195	182	A	A				
21	A	A	A	A	A	A	A	A	A	A	A	A	372	340	238	236	216	217	202	184	246	244	246	A	A	A	A			
22	A	A	A	A	A	A	A	A	A	A	A	365	320	254	216	210	232	206	205	210	230	197	A	266	340	A	A			
23	A	A	A	A	A	A	A	A	A	B	A	B	B	B	B	B	294	252	362	354	A	A	A	A	A	A	A			
24	A	A	A	A	A	A	A	B	A	A	B	B	B	301	290	220	220	204	240	A	A	A	A	A	A	A	A			
25	A	A	A	A	A	A	A	A	A	B	B	E	B	280	215	220	251	272	234	248	240	286	236	A	A	A	A			
26	A	A	A	228	A	A	A	A	A	A	A	E	B	284	240	220	224	235	254	228	298	A	A	A	A	A	A			
27	A	A	A	A	A	A	A	A	A	A	A	352	268	225	220	214	208	219	213	190	202	242	210	A	228	A	A			
28	A	A	A	A	A	B	A	E	A	A	A	302	256	225	194	190	196	220	200	202	230	218	228	A	A	A	A			
29	A	B	B	A	A	A	A	A	A	A	B	E	B	E	B	284	278	224	220	237	228	225	220	224	214	A	A	A	A	
30	A	A	213	A	A	A	A	A	A	A	E	A	414	316	250	229	210	220	220	202	196	209	215	255	219	A	A	E	A	286
31	A	A	A	A	A	A	A	A	A	A	A	378	256	240	246	235	210	200	195	215	254	220	A	A	A	A	A	A	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	2	2	2	1	1	2	3	3	5	11	13	20	24	25	28	27	26	28	19	8	7	5	5	5						
MED	298	292	232	228	340	332	365	320	352	325	252	246	229	220	224	220	234	236	241	237	229	212	292	262						
U Q							A	A	A	A	A	U	E	B	E	B	B	B	A		A	A	A	A	A					
L Q							453	355	392	372	322	297	256	261	262	252	260	273	265	264	258	278	334	325						
							E	A				282	212	325	274	234	224	216	214	218	205	210	219	222	217	219	188	206	240	

JUL. 2025 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2025 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	83	A	A	A	A	A	A	A	B	B	X	X	97	89	79	70	0	X	X	42	A	A	A	62			
2	A	A	A	A	A	A	A	A	A		50	55	64	72	86	83	70	76	57	45	32	A	B	O	X	34	59	
3	A	A	A	A	A	A	A		40	40	55	59	72	84	83	86	88	72	68	60	36	24	X	A	A			
4	A	A	A	A	A		45	52	58	51	58	44	64	81	107	109	92	80	62	51	0	X	0	X	A	A		
5	A	A	A	A	A	A	A	A	A	0	X	X	X	X	X	X	X	X	X	0	X	A	A	A		57		
6	A	A	A	A		49	A	A	A	0	X	X	X	79	91	80	79	65	56	43	33	32	B	B		31		
7	62	0	X	A	A		34	33	30		47	67	74	77	87	87	69	69	51	56	34	30	A	A	A			
8	67	55	A	A		33	36	40	55	59	53	66	72	76	81	83	69	111	84	94		A	90	74	A			
9	82	A	0	X	47	67	64	36	A	A	B	A	A	B	0	X	B	X	0	X		A	A	A	A			
10	A	A		59	A	A	A	A	A	A	A	B	0	X	B	B	0	X		B	A	A	A	A	A			
11	A	A	A	A	B	A	A	A	A	A	B	B	0	X	B	X	X					A	A	A	A			
12	A	A	A	A	A	A	A	A	A	A	B	X	X	X	X	X	X					A	A	A	A			
13	50	A	A	A	A	A	A	A	A	A	B	B	0	X	69	66	68				B	A	A	A	A			
14	A	A	A	A	0	X	A	A	A	A	A	A		X	B	X	81	79	64	60	33	A	0	X	A	A		
15	A	A	A	A	A	A	A	A	A		78	64	69	79	80	97	110	71	85	56	45	0	X	A	A			
16	A	A	0	X	0	X	A	A	A	X	X	X	X	X	89	109	106	87	68	47	35	A	X	A	A			
17	67	A	A	A	A	A	A	A	A	A	A	X	X	X	106	91	87	73	95	61	40	0	X	A	A			
18	A	A	A	A	X	0	X	A	0	X	X	X	X	X	X	X	92	94	104	64	32	A	A	A	A			
19	X	R	A	A	42	A	0	X	A		64	64	76	90	75	92	94	94	97	68	58	A	A	77	66	A		
20	A	61	A	A	A	A	A	A	A	X	A	B	B	0	X	0	X	0	X	0	X		35	A	A	A		
21	80	A	A	A	B	A	A	A	X	X	X	X	X	X	X	X	85	80	63	85	47	31	71	117	A			
22	A	A	A	X	A	A	A		53	53	56	64	72	75	82	84	81	85	71	54	54	0	X	A	A			
23	A	83	A	A	54	A	A	A	A	A	B	75	81	79	79	81	85	81	62	57	39	0	X	0	X	18	34	
24	47	A	A	A	A	A	A	A	A	X	X	X	X	X	X	X	X					0	X	A	A	69		
25	A	A	57	47	50	52		A	0	X	43	62	69	92	95	87	86	81	83	61	70	56	0	X	A	A	60	
26	A	A	92	40	51	53		78	A	A	A	55	73	72	80	87	93	83	87	64	43	26	B	B	A			
27	A	46	0	X	A	A	A	0	X	46	57	70	74	89	100	93	101	93	92	96	108	48		B	B	A	60	
28	A	55	A	A	A	A	A	A	X	X	50	59	64	75	85	102	105	98	91	103	85	50	31	0	X	B	A	
29	A	54	A	A	125	A	A	A	B	X	X	X	X	X	X	X	X					37	28	A	A	36		
30	A	A	A	A	A	A	A	A	49	55	62	67	70	78	88	91	96	96	87	82	59	36	A	A	A			
31	A	A	A	A	0	X	0	X	A		68	63	65	77	90	100	109	110	102	104	92	79	57	51	42	0	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	8	9	6	4	12	8	4	10	14	20	24	29	29	28	29	31	31	31	30	28	18	11	6	10				
MED	64	55	58	45	50	40	46	51	50	58	64	72	79	87	87	85	80	68	58	42	31	28	50	58				
U Q	74	74	59	57	58	0	X	56	58	57	62	71	82	88	92	92	94	87	87	71	55	36	71	74	60			
L Q	50	54	0	X	42	38	36	36	X	X	X	X	X	X	X	X	X					0	X	X	0	X	36	

AUG. 2025 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2025 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	R 46	A	A	A	A	A	A	A	B	B	56	77	88	72	62	62	69	R 48	28	A	A	A	A	
2	A	A	A	A	A	A	A	A	A	40	43	58	F 62	J 80	R 77	57	62	41	39	26	A	B	28	A	
3	A	A	A	A	A	A	A	28	29	37	53	66	78	J 77	R 80	82	62	45	J 54	R 20	15	J 20	R A	A	
4	A	A	A	A	A	24	20	28	29	39	38	58	71	81	90	76	66	Z 56	38	26	A	R 16	A	A	
5	A	A	A	A	A	A	A	A	A	40	Z 52	57	61	62	66	71	45	Z 51	42	18	A	A	A	A	
6	A	A	A	A	A	B	A	A	41	Z 42	51	61	73	79	74	60	59	Z 50	36	24	F 24	B	B	23	
7	A	59	A	A	A	23	27	24	A	41	58	68	71	81	58	63	F	28	39	21	F 18	A	A	A	
8	A	A	A	A	23	24	26	27	23	37	Z 60	Z 66	66	70	75	77	Z 75	88	F	A	A	A	A	A	
9	A	A	41	29	A	A	A	A	B	A	A	B	37	29	B	48	47	41	A	F 38	A	A	A	A	
10	A	A	A	A	A	A	A	A	A	A	B	50	B	B	66	F	Z 52	48	B	A	A	A	A	A	
11	A	A	A	A	B	A	A	A	A	B	B	48	55	B	63	63	58	46	36	A	A	A	A	A	
12	A	A	A	A	A	A	A	A	A	B	50	63	62	72	76	89	77	59	Z 43	22	A	A	A	A	
13	A	A	A	A	A	A	A	A	A	B	B	63	60	F 61	B	63	55	58	46	B	A	A	A	A	
14	A	A	A	A	56	A	A	A	A	A	A	54	57	B	67	69	F 68	58	Z 54	25	A	A	A	A	
15	A	A	A	A	A	A	A	A	A	A	55	63	73	74	F 88	93	59	55	37	32	17	A	A	A	
16	A	A	A	37	22	A	A	A	42	Z 52	59	67	84	83	87	F 91	65	Z 62	Z 41	29	A	21	A	A	
17	A	A	A	A	A	A	A	A	A	A	54	73	74	91	71	Z 81	67	F	50	24	21	A	A	A	
18	A	A	A	A	26	29	38	29	F 46	F 46	F 80	F 80	F 80	F 82	86	86	86	97	Z 58	20	A	A	A	A	
19	43	R 48	A	A	F 30	A	54	A	F 42	55	58	66	69	86	88	87	80	57	31	A	A	59	A	A	
20	A	A	A	A	A	A	A	A	A	A	A	B	B	R 44	R 50	51	48	44	29	19	23	A	A	A	
21	A	A	A	A	B	A	A	A	33	43	51	63	88	70	77	55	68	57	53	29	20	A	A	A	
22	A	A	A	A	A	A	A	A	36	36	50	58	66	69	Z 76	78	75	79	60	41	33	21	16	A	A
23	A	A	A	A	A	A	A	A	A	B	65	72	J 73	R 70	75	79	75	Z 56	41	33	18	12	12	19	
24	A	A	A	A	A	A	A	A	55	67	81	93	77	64	J 69	R 59	59	F	40	34	22	A	A	A	
25	A	A	A	41	A	A	A	A	37	47	63	78	F	81	80	75	77	Z 51	F	38	25	A	A	A	
26	A	A	A	R 34	R 45	47	A	A	A	A	49	67	64	74	76	87	70	62	47	27	20	B	B	A	
27	A	35	R 29	A	A	A	A	A	40	47	60	68	83	94	87	95	87	86	82	F 74	42	B	B	A	A
28	A	A	A	A	A	A	A	A	44	53	58	69	75	F 82	89	80	72	73	61	31	F 23	22	B	A	A
29	A	A	A	A	A	A	A	A	B	Z 55	J 58	R 77	79	85	84	81	J 81	R F	64	F	28	21	A	A	A
30	A	A	A	A	A	A	A	R 43	42	56	61	60	F 62	82	85	87	Z 89	72	67	F	27	A	A	A	
31	A	A	A	A	43	51	A	F 29	38	59	71	84	94	J 105	R 104	92	93	86	62	39	35	32	18	A	
CNT	1	4	2	4	7	6	4	9	14	19	23	28	28	27	29	30	30	28	27	24	16	10	3	2	
MED	43	47	35	36	30	26	26	29	38	47	58	66	72	79	77	76	68	57	43	28	22	21	18	21	
U Q		54		39	45	47	40	39	42	55	61	70	78	83	86	87	77	66	54	33	24	22	28		
L Q		40		32	23	24	23	28	29	40	51	59	62	70	69	63	59	49	39	23	19	16	12		

AUG. 2025 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2025 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	53	73	61	59	54	60	57	62	47		B	E	B	E	B	E	B	E	B	E	B	55	40	31	31					
2	70	57	45	47	55	58	65	56	71	59	29	E	B	26	24	22	G	E	B	19	E	B	E	B	56	B	26	53		
3	72	60	58	K	58	53	53	17	K	K	17	31	34	24	39	19	15	15	12	15	10	11	45	54						
4	35	49	53	51	48	19	18	16	20	13	16	E	B	27	39	26	17	E	B	E	B	E	B	31	51	15	40	46		
5	48	46	73	39	68	55	57	53	55	33	31	19	19	23	21	E	B	19	19	14	16	E	B	56	17	44	41			
6	59	52	60	47	45	42	51	59	34	35	25	13	23	23	19	19	13	E	B	E	B	9	18	B	B	20				
7	K	73	53	43	40	19	20	E	B	12	46	27	23	20	21	23	22	21	K	19	15	13	12	19	32	51	35			
8	40	41	41	40	55	47	15	17	18	11	21	E	B	29	22	G	21	21	E	B	E	B	E	B	32	61	42	57		
9	66	64	34	32	34	30	59	67		B	57	12	6	31	23	64	23	25	36	42	31	51	54	61	70					
10	49	55	54	87	58	50	55	46	52	56		E	B	B	B	E	B	E	B	E	B	E	B	41	42	57	52			
11	68	60	54	40		K	36	45	58	48		B	E	B	E	B	E	B	E	B	E	B	K	K	34	36	55	45		
12	91	75	72	70	56	59	64	54	59		E	B	E	B	E	B	E	B	E	B	E	B	E	B	11	38	45	41	37	
13	46	60	K	53	46	51	50	60	58	52		B	E	B	E	B	E	B	E	B	E	B	E	B	34	45	47	44		
14	53	79	49	59	46	56	64	57	61	61	61	E	B	E	B	E	B	E	B	E	B	E	B	59	55	14	43	42		
15	61	61	65	61	62	60	58	63	58	57	40	36	E	B	E	B	E	B	E	B	E	B	E	B	47	37	40	47		
16	56	44	34	58	21	33	58	51	48	21	19	24	24	25	24	31	20	18	14	11	41	31	26	29						
17	39	80	55	53	50	52	58	59	53	56	45	29	E	B	E	B	E	B	E	B	16	E	B	E	B	E	B	55		
18	K	32	31	31	29	23	27	30	E	B	E	B	E	B	27	29	42	25	19	E	B	E	B	K	51	47	56	44		
19	58	42	89	93	19	55	48	45	38	42	32	23	24	23	22	40	E	B	E	B	24	26	16	59	41	44	40	112		
20	84	51	51	58	62	85	61	51	77	47	48		B	E	B	E	B	E	B	E	B	E	B	17	40	45	68			
21	60	85	54	59	54	52	59	54	49	31	31	23	26	27	23	25	19	15	11	14	27	44	44	52						
22	61	55	51	56	41	67	54	24	27	E	B	30	23	25	25	24	E	B	18	13	11	10	17	33	37	37				
23	45	52	60	55	61	57	54	62	58		E	B	33	29	29	27	22	26	E	B	E	B	E	B	55	51	38	23		
24	29	29	47	59	53	54	58	57	53	23	26	27	28	25	27	24	20	23	15	14	56	30	28	23						
25	37	35	44	38	45	43	57	54	53	19	26	G	32	31	28	30	31	22	14	K	17	23	31	38	39	39				
26	34	39	71	38	27	35	60	70	57	66	31	E	B	E	B	31	27	27	28	30	E	B	E	B	E	B	E	B	33	
27	37	75	75	63	55	49	53	45	28	E	B	E	B	30	35	28	26	23	22	19	15	18		B	B	K	41			
28	43	37	K	61	51	56	53	59	49	29	25	24	25	E	B	E	B	27	26	21	E	B	25	17	11	16	E	B	19	38
29	69	46	43	44	92	57	46	46		B	G	G	25	27	29	29	30	29	27	19	19	13	9	11	16	33	83			
30	48	48	60	52	57	55	50	47	E	B	33	23	25	28	E	B	E	B	E	B	E	B	E	B	11	35	K	30		
31	32	36	51	37	42	32	45	21	E	B	G	G	G	27	28	31	29	26	23	21	E	B	17	E	B	11	38	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	31	31	31	31	30	31	31	31	29	26	27	29	29	28	30	31	31	31	31	30	30	27	30	31						
MED	49	52	54	51	54	52	57	53	48	27	26	27	28	26	26	23	E	B	23	18	E	B	14	34	37	40	42			
U Q	61	64	61	59	57	57	59	58	56	56	33	E	B	E	B	E	B	E	B	E	B	27	27	23	28	51	45	45	53	
L Q	37	42	47	40	42	36	48	45	28	23	23	24	26	24	23	21	19	15	13	11	17	17	34	35						

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2025 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	17	10	8	13	14	7	13	10	B	B	39	27	27	26	15	26	51	41	16	8	7	6	7
2	12	39	17	17	9	13	7	25	14	9	16	23	16	16	15	17	19	21	13	16	14	B	9	8
3	15	13	17	15	15	15	12	7	8	8	9	11	15	13	10	9	7	6	7	6	6	6	8	11
4	9	9	9	9	7	7	7	6	6	6	9	25	27	26	19	13	16	27	19	11	10	11	7	13
5	9	6	7	9	32	17	14	23	17	24	15	11	13	13	15	19	11	11	7	11	31	9	6	11
6	7	11	16	14	27	16	11	8	15	10	13	13	14	15	11	13	10	14	13	6	9	B	B	12
7	6	11	15	11	10	8	8	8	17	14	10	14	13	13	13	12	9	9	7	8	9	7	7	7
8	8	7	7	7	7	7	7	8	9	8	21	14	15	15	11	36	37	51	13	9	11	11	7	7
9	11	8	6	7	7	8	12	12	B	16	5	B	24	23	35	11	25	7	9	6	7	7	12	7
10	6	13	6	19	16	15	16	12	13	21	B	38	B	B	51	35	25	9	16	9	7	7	13	7
11	7	17	13	7	B	15	16	15	14	B	B	36	44	B	45	40	26	11	11	7	8	9	8	11
12	6	7	7	15	7	14	8	20	30	B	37	36	34	25	48	28	29	20	13	7	7	8	7	7
13	8	9	13	30	14	24	14	25	23	B	B	39	39	43	B	44	34	21	44	B	8	6	9	9
14	6	11	16	16	23	27	11	6	26	40	19	38	39	B	39	25	34	29	24	34	11	5	6	7
15	18	12	18	16	7	13	15	13	21	24	24	20	36	51	47	40	25	13	13	10	7	7	8	8
16	8	7	9	11	11	8	11	14	9	11	9	14	9	11	16	31	20	18	14	11	7	10	8	12
17	7	19	11	13	15	13	11	8	14	13	14	17	39	33	35	20	12	14	15	14	15	18	15	16
18	16	14	10	8	10	16	15	14	15	20	22	18	17	18	15	17	30	33	18	12	8	7	8	7
19	10	9	7	13	7	9	12	9	8	16	20	17	15	17	14	5	24	26	8	7	13	7	7	13
20	7	6	9	17	39	11	14	12	29	21	33	B	B	42	47	33	37	32	18	18	10	7	7	9
21	7	11	17	23	24	13	19	34	17	17	14	15	14	11	11	8	10	7	9	9	6	7	7	7
22	11	17	12	12	9	13	11	9	13	30	18	11	12	11	9	9	18	8	11	8	7	7	7	7
23	14	8	15	16	13	11	12	9	18	B	33	23	20	18	15	19	29	15	15	13	7	7	7	7
24	7	8	7	14	11	12	11	9	14	17	18	12	15	18	16	16	14	9	15	14	13	9	7	7
25	7	8	9	8	9	11	9	13	17	13	14	17	15	15	15	15	15	10	9	14	15	9	8	8
26	21	13	11	9	13	13	11	36	23	28	23	31	27	18	18	30	27	23	16	12	12	B	B	11
27	11	5	15	15	14	14	15	14	19	25	28	19	25	21	17	16	15	14	15	12	B	B	12	11
28	12	24	16	17	15	14	12	12	14	25	17	17	29	28	20	18	17	25	13	11	8	10	8	11
29	12	12	21	13	15	11	11	15	B	20	17	19	22	16	16	16	13	13	13	9	7	7	9	11
30	21	11	15	15	18	7	12	11	33	20	16	18	35	38	27	29	25	22	13	8	7	10	8	8
31	10	7	7	8	8	8	7	9	23	14	19	18	15	21	20	15	13	14	14	7	8	11	9	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	9	11	11	13	13	13	11	12	17	20	18	18	22	18	17	17	20	14	13	11	8	8	8	8
U Q	12	13	16	16	16	15	14	15	23	28	28	36	35	33	35	30	27	25	16	14	12	11	9	11
L Q	7	8	7	9	9	9	9	9	13	13	14	14	15	15	15	13	13	10	11	8	7	7	7	7

AUG. 2025 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2025 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	234	A	A	A	A	A	A	A	B	B	252	240	223	209	210	B	E	B	E	B	A	A	A	A					
2	A	A	A	A	A	A	A	A	A	E	A	283	240	240	220	227	205	205	E	B	270	265	225	A	B	214	A			
3	A	A	A	A	A	A	A	E	A	H	298	205	230	204	202	200	192	214	192	270	208	210	240	188	A	A	A			
4	A	A	A	A	A	A	E	A	A	A	250	258	264	238	250	210	215	Q	E	B	215	280	240	278	A	A	A			
5	A	A	A	A	A	A	A	A	A	A	452	258	204	240	228	234	214	216	225	240	224	A	A	A	A	A	A			
6	A	A	A	A	346	A	A	A	A	A	A	246	229	224	198	200	196	205	200	228	260	234	B	B	199	A	A			
7	A	238	A	A	A	A	A	B	A	E	A	278	228	225	218	214	194	194	199	Q	200	216	212	254	A	A	A			
8	A	A	A	A	A	A	A	A	A	A	318	245	228	215	232	210	249	E	B	E	B	Q	A	A	A	A	A			
9	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E	B	A	A	A	A	A	A	A	A			
10	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	Q	270	246	E	A	B	A	A	A	A	A			
11	A	A	A	A	B	A	A	A	A	A	B	B	290	316	B	E	B	252	230	220	230	320	A	A	A	A	A			
12	A	A	A	A	A	A	A	A	A	A	B	250	289	250	248	256	B	235	222	238	224	190	A	A	A	A	A			
13	A	A	A	A	A	A	A	A	A	A	B	E	B	E	B	B	272	262	280	E	B	232	256	240	B	A	A	A		
14	A	A	A	A	A	A	A	A	A	A	A	E	B	E	B	B	306	280	244	232	232	230	218	240	A	212	A	A		
15	A	A	A	A	A	A	A	A	A	A	A	266	254	230	252	236	245	202	208	202	218	190	A	A	A	A	A			
16	A	A	A	250	222	A	A	A	E	A	298	236	216	220	224	208	225	212	Q	204	208	188	218	A	A	A	A			
17	A	A	A	A	A	A	A	A	A	A	A	296	238	E	B	250	220	200	210	Q	206	210	205	268	B	A	A	A		
18	A	A	A	A	A	A	A	A	A	A	Q	292	240	Q	218	218	206	Q	232	222	234	228	222	252	A	A	A	A		
19	E	A	A	A	A	A	A	A	A	E	A	374	250	209	236	242	228	240	199	232	266	A	A	212	366	A	A	A		
20	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	318	244	E	B	E	B	240	220	256	A	A	A	A
21	A	A	A	A	B	A	A	A	A	A	A	344	266	244	212	230	210	210	209	200	204	232	194	214	A	A	A	A		
22	A	A	A	A	A	A	A	A	A	E	B	340	316	250	240	225	215	205	218	208	202	203	202	204	268	229	A	A	A	
23	A	A	A	A	A	A	A	A	A	A	B	238	220	196	220	206	204	210	183	186	220	190	240	330	199	A	A	A	A	
24	A	A	A	A	A	A	A	A	A	A	A	242	225	225	225	210	202	209	204	210	Q	230	218	264	A	A	A	A	A	
25	A	A	A	A	A	A	A	A	A	A	A	242	230	238	232	218	215	216	218	202	234	218	320	A	A	A	A	A	A	
26	A	A	A	A	368	194	A	A	A	A	A	A	A	A	252	222	230	232	216	212	200	204	204	240	B	B	A	A	A	
27	A	192	204	A	A	A	A	A	E	A	286	234	237	222	238	218	218	224	220	206	210	222	B	B	A	A	A	A		
28	280	A	A	A	A	A	A	A	A	A	350	252	238	234	258	230	220	228	208	236	204	196	238	240	A	B	A	A	A	
29	A	A	A	A	A	A	A	A	A	B	262	224	232	220	224	222	215	212	225	Q	204	194	Q	238	280	A	A	A	A	
30	A	A	A	A	A	A	A	A	A	A	306	264	238	228	262	242	245	E	B	240	229	204	214	212	Q	228	A	A	A	A
31	A	A	A	A	A	A	A	A	A	B	298	284	236	230	245	240	228	230	225	218	210	192	206	204	216	293	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	4	2	3	5	3	4	6	10	18	23	28	28	27	27	30	30	30	30	28	26	15	10	4	2					
MED	282	236	266	250	340	390	347	346	302	246	238	228	231	222	219	216	212	216	218	218	238	214	312	199						
U Q		254		368	427	510	363	372	318	266	250	252	245	242	234	232	229	238	233	240	264	240	348							
L Q		213		204	208	352	276	340	292	240	228	220	221	210	206	210	204	204	204	204	206	214	201	254						

AUG. 2025 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2025 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	39	A	A	A	A	A	A	0	X	X	X	X	X	X	X	X	X	X	X	X	X	0	X	B	A			
2	B	A	0	X	A	A	A	A	A	A	A	0	X	X	X	X	X	X	X	X	A	A	84	92	A			
3	83	X	56	97	A	A	A	A	A	56	B	X	X	0	X	X	X	0	X	X	X	40	A	53	58			
4	A	A	54	A	58	0	X	X	X	61	33	66	68	71	77	84	85	93	86	95	83	70	44	A	A			
5	A	47	73	59	73	55	52	56	65	71	77	86	88	96	103	101	97	96	68	61	56	57	53	67				
6	59	A	68	A	92	65	A	70	63	A	B	X	X	X	71	82	97	87	86	86	A	A	53	79				
7	79	A	A	77	63	57	33	42	54	60	66	72	79	88	86	84	93	72	73	59	35	28	X	A				
8	A	A	R	57	54	A	A	59	A	B	A	X	X	B	A	115	112	114	103	88	68	52	A	A	85			
9	60	A	A	60	A	A	A	A	A	0	X	X	X	X	X	X	X	X	X	X	X	32	A	A	A			
10	A	A	A	A	0	X	B	A	A	X	X	0	X	X	X	X	X	X	X	X	0	X	0	X	A	A		
11	A	A	71	55	A	B	A	B	A	A	B	0	X	X	X	X	X	X	X	X	0	X	A	A	A			
12	A	A	A	A	A	X	48	42	A	X	0	X	0	X	81	97	90	85	92	92	92	82	30	68	A	A		
13	A	A	X	47	0	X	A	A	A	55	60	66	0	X	75	85	85	67	68	75	71	68	43	A	A	A		
14	A	A	X	44	A	A	A	A	A	X	X	X	X	X	81	81	76	83	82	67	61	47	A	A	A			
15	54	46	0	X	59	A	A	A	A	47	78	B	0	X	54	59	75	63	48	126	42	33	56	A	A	66		
16	A	A	A	A	A	A	A	B	B	B	B	B	0	X	62	61	61	63	70	70	58	A	A	58	A	A		
17	60	A	A	B	52	A	B	A	0	X	X	B	0	X	64	67	81	69	0	X	X	0	X	0	X	A	55	
18	A	A	A	A	A	A	A	B	52	53	63	79	89	97	109	118	105	89	83	70	55	41	A	A	A	A		
19	A	A	A	A	A	54	58	57	X	X	X	X	X	105	106	108	114	104	98	94	90	59	60	43	34	A	A	
20	55	31	A	60	58	83	52	85	98	90	99	109	118	120	124	112	106	95	91	86	67	69	59	43	A	A		
21	52	0	X	84	66	85	39	60	79	48	77	89	86	95	98	104	108	104	95	95	82	79	64	51	35	50		
22	94	56	59	0	X	0	X	0	X	0	X	0	X	0	X	0	X	0	X	0	X	0	X	0	X	A	A	A
23	104	A	A	57	36	131	A	A	64	65	59	66	65	67	71	71	77	70	58	66	A	A	69	40	A	A	A	
24	A	A	47	A	88	A	59	A	58	73	80	87	99	101	109	114	104	105	85	68	57	50	A	31	A	A	X	
25	34	79	0	X	58	56	58	59	65	74	82	83	87	100	106	103	103	102	86	68	58	57	57	A	57	A	X	
26	A	A	B	A	83	61	65	0	X	58	73	75	86	92	93	96	100	106	107	102	92	76	54	25	60	A	A	
27	47	A	A	60	80	A	67	80	75	83	100	111	113	111	110	109	114	115	96	88	85	67	53	85	A	A	X	
28	A	A	A	0	X	48	44	A	A	65	70	71	75	79	78	79	81	82	79	75	75	55	A	A	A	A	X	
29	33	71	A	A	81	A	0	X	55	90	57	A	B	46	52	85	77	73	60	A	54	59	84	A	A	A	A	
30	A	A	A	A	A	0	X	B	B	B	B	B	B	A	0	X	44	46	49	A	59	88	68	A	75	0	X	45
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	14	8	13	11	16	16	15	15	22	24	23	24	27	29	30	30	30	29	29	28	24	16	13	13				
MED	57	56	59	59	59	59	58	56	64	66	67	76	81	85	86	84	90	87	71	64	55	52	58	50				
U Q	79	75	70	60	80	66	61	59	66	74	86	90	98	100	108	104	103	97	86	76	59	68	77	63				
L Q	47	46	47	55	52	54	48	46	54	54	60	64	65	69	77	71	73	71	68	54	40	30	53	38				

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2025 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	A	A	A	A	A	A	A	34	43	45	57	73	92	91	99	92	97	75	62	F	30	22	B	A				
2	B	A	41	A	A	A	A	A	A	R	29	33	33	46	58	64	61	60	53	39	A	A	A	A				
3	A	50	A	A	A	A	A	A	34	B	48	51	48	51	51	51	48	45	43	39	33	A	A	A				
4	A	A	A	A	A	52	43	27	48	53	65	71	78	79	83	80	78	77	57	32	A	A	A	A				
5	A	R	41	53	46	67	44	46	50	59	65	71	80	82	90	97	95	91	F	F	54	51	27	A	A	A		
6	A	A	A	A	A	40	A	A	35	A	B	53	58	65	76	85	59	F	A	A	A	35	A	A	A			
7	A	A	A	A	A	27	R	27	36	48	54	J	R	60	66	73	83	79	78	75	66	59	41	27	22	A	A	
8	A	A	R	51	38	A	A	49	A	B	A	52	58	B	F	Z	108	97	63	51	41	A	A	A	A	A		
9	A	A	A	36	A	A	A	A	47	54	59	59	73	F	F	71	74	79	74	F	71	51	23	A	A	A		
10	A	A	A	A	A	29	B	A	A	43	47	56	59	65	69	69	69	74	V	58	41	15	16	A	A	A		
11	A	A	A	A	A	B	A	B	A	A	B	B	59	69	67	69	63	60	55	33	28	A	A	A	A			
12	A	A	A	A	A	29	28	36	A	R	Z	44	58	56	63	79	79	79	72	F	F	F	A	A	A	A		
13	A	A	41	A	47	A	A	A	A	49	54	60	69	F	F	65	65	61	62	69	F	58	52	27	A	A	A	
14	A	A	38	A	F	40	39	36	42	A	50	57	63	65	75	75	70	73	67	61	55	36	A	A	A	A		
15	A	F	53	A	A	A	A	A	A	A	B	B	48	R	R	53	61	57	R	R	R	36	27	A	A	A	A	
16	A	A	A	A	A	A	A	B	B	B	B	B	B	R	R	56	55	55	57	64	48	39	A	A	A	A		
17	A	A	A	B	A	A	B	A	43	43	B	B	58	R	R	61	67	63	68	64	60	48	34	27	A	A	A	
18	A	A	A	A	A	A	A	B	F	47	57	73	83	91	J	R	103	103	97	81	71	50	36	F	A	A	A	
19	A	A	A	A	A	29	F	48	59	71	81	89	99	95	93	F	86	F	F	F	66	60	44	F	F	R	19	
20	27	A	A	48	F	F	F	58	61	84	87	89	109	106	118	102	F	F	F	89	72	68	47	39	30	28	28	
21	F	50	60	33	33	44	46	42	52	61	73	77	84	91	96	98	F	F	79	66	73	36	45	29	44	44	44	
22	A	40	29	A	R	R	45	55	51	52	58	64	F	F	91	97	103	97	108	106	87	57	F	A	A	A	A	
23	A	A	A	33	30	A	A	A	A	A	R	53	60	59	61	65	65	67	58	36	35	A	A	28	A	A	A	
24	A	A	A	A	A	A	A	A	47	60	74	81	93	95	103	108	98	99	99	79	52	41	30	A	15	A	A	
25	25	A	A	52	A	42	52	49	59	68	76	77	81	92	98	97	97	97	92	70	62	45	A	A	A	A	A	
26	A	A	B	A	F	F	54	50	57	52	67	69	78	86	87	90	94	98	101	96	86	70	48	19	A	24	24	
27	33	A	A	29	40	47	73	69	77	94	105	107	105	104	103	108	102	90	F	F	F	F	F	27	57	57	57	
28	A	A	A	A	R	F	42	36	A	A	56	58	65	69	73	72	73	75	76	73	69	69	49	A	A	29	29	
29	A	A	A	A	A	A	A	R	R	F	A	B	35	46	Z	79	71	67	54	A	A	37	59	A	A	A	A	
30	A	A	A	A	A	31	R	B	B	B	B	B	A	B	38	40	43	A	A	A	A	42	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	4	8	8	10	14	12	14	18	21	22	23	27	29	29	29	28	27	26	25	20	9	5	8				
MED	30	46	46	37	42	40	46	48	51	54	60	69	73	75	79	78	74	73	60	50	36	27	29	28				
U Q	44	50	53	47	47	44	50	52	59	66	74	80	87	91	98	98	97	81	71	58	44	37	30	42				
L Q	26	40	40	33	40	29	34	36	47	46	54	58	59	63	66	64	62	63	54	39	28	20	28	22				

SEP. 2025 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2025 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	37	40	35	47	50	53	52	26 ^K	17	26 ^{E B}	23	27 ^G	29	26 ^G	26 ^G	24	22	19	11 ^{E B E B E B E B}	11 ^{E B E B E B E B}	13 ^{E B E B E B E B}	13 ^{E B E B E B E B}		48 ^K	
2	^B	61	38	75	54	55	42	44 ^K	34	32	31	31	28 ^G	28	23	25	25	19	16 ^K	39	63	49	38	67	
3	55	51	48	49	61	45	49	23	24		35	26 ^{E B E B E B E B}	40 ^{E B E B E B E B}	41 ^{E B E B E B E B}	23	25	36	15	14 ^{E B E B E B E B}	17 ^{E B E B E B E B}	16	46	41	37	
4	^K	20	38	29	31 ^K	33 ^K	17	18	39	31	23	35 ^{G E B E B E B E B}	39 ^{E B E B E B E B}	70 ^{E B E B E B E B}	36	38	23	19	7 ^{G E B}	23	22	44	108	92	
5	95	42	26	30	24 ^{E B}	39	36	19	21	28	43	30	48	29	41 ^{E B E B E B E B}	36 ^{E B E B E B E B}	29	17	19	30	15	27	39	56	
6	55	59	43	69	57	33	58	42	62	64		28	28	27 ^{E B E B E B E B}	27 ^{E B E B E B E B}	32	27	32	43	61	52	31	55	46	
7	44	110	116	32	28	27	25 ^K	16 ^K	20	24	32	32	30	51	41	29	27	23	22	18	15 ^{E B}	14	30	31	
8	78	69	41	35	51	47	31	60		51	34 ^{E B E B E B E B}	41 ^{E B E B E B E B}	27	35 ^{E B E B E B E B}	39 ^{E B E B E B E B}	27	31	22	33	39	36	45	46		
9	46	45	66	29	53	54	60	53	41	29	39	47	31	28	24	39	28	29	20	26	17	45	48	84	
10	85	61	71	57	62	63		49	55	38	28	42	37 ^{G E B E B E B E B}	34 ^{E B E B E B E B}	27	37	24	19	15	18	11	15	15	44	
11	47	50	27	52	60		59		56	57			45 ^{E B E B E B E B}	39 ^{E B E B E B E B}	33	33	31	29	24	19	16	49	19	30	
12	36	83	50	32	38 ^K	23	16 ^K	18 ^K	63	47	26	47 ^{E B E B E B E B}	43 ^{E B E B E B E B}	33 ^{E B E B E B E B}	33 ^{E B E B E B E B}	27	25	19	14	35 ^K	24	42	48	48	
13	45	45	40	58	38	59	105	67	52	60	47	43 ^{E B E B E B E B}	40 ^{E B E B E B E B}	35 ^{E B E B E B E B}	29	38	37	25	21	21	14	31	44	55	
14	51	45	33	45	30	30	34	24	40	34	28	29	32	31	29	27	24	22	21	15	12	35	41	58	
15	46	30	30	71	55	60	58	65	23	56	61		39 ^{E B E B E B E B}	27	29		32	46	38	31	46	43	91	63	
16	72	54	60	57	49 ^K	62	68						46 ^{E B E B E B E B}	28	32	23	51	25	17	41	28 ^K	38	40		
17	41	65	51	45	59	57		56	31	34			43 ^{E B E B E B E B}	47 ^{E B E B E B E B}	45	52	36	24	19	19	22	11	24	36 ^K	
18	45	47	45	48	50	51	59		37	27	25	28	31	36	27	27	27	21	18	11	14	15	31	33	
19	34	57	33	52	41	21	14	18	23	25	28	29	30	29	27	26	25	22	18	16	17	15	15	33	
20	22	24	29	19	64	39	42	44	37	28	28	35	32	46 ^{E B E B E B E B}	39	29	26	23	15	23 ^G	15	9	8	13	
21	12	32	37	26	32	32	47	25 ^{E B}	45	33	31	30	33	31	29	27	26	25	19	12 ^K	15	18	29	36	
22	59	35	41	54	41	44	49	50	49	31	29	33	32	36	29	27	25	26	18	17	25	46	47	108	
23	66	53	40	30	58	53	53	43	37	60	48	42	33	31	28	27	26	25	20	38	43	46	39	39	
24	85	42	40	49	47	51	36 ^K	49	41	33	37	44	47	41	31	48	32	28	31	17	12	13	39	43	
25	43	46	60	38	55	38	35	21	24	33	31	30	31	30	31	27	23	24	26	17 ^K	13	35	44	39 ^K	
26	41 ^K	53		60	28	47	38 ^{E B}	49	34	29	28	33	32	30	29	33	26	21	18	11	14	10	31	34 ^K	
27	64	52	49	29	35	60	37 ^G	39	30	28	30	37	32	32	29	29	27	21	18	15 ^{G E B}	10	15	11	42	
28	61	59	51	35	35	28	50	51	43	29	35	30	29	30	29	29	28	24	19	13 ^K	10	35	40	21	
29	28	44	52	52	74	79	55	23	37	28	49		37	37	32	33	37	32	54	35	14	59	86	97	
30	65	129	77	57	46	34	20		33					50		29	29	31	30	23	48	32	79	53	37
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	30	29	30	30	29	28	26	28	27	25	24	28	29	30	30	30	30	30	30	30	30	29	30	
MED	46	50	41	48	50	47	44	42	37	32	30	30	31	30	28	28	26	22	18	18	16	33	39	42	
U Q	64	59	52	57	57	56	56	50	44	47	38	42	40	40	33	36	31	29	23	31	25	45	48	56	
L Q	39	42	34	32	35	32	34	23	27	28	28	30	31	29	27	27	25	21	18	16 ^{E B}	14	15	30	36	

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2025 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	11	13	13	14	12	10	15	26	15	15	15	15	14	13	14	13	11	11	13	13	B	21	
2	B	36	25	18	23	12	19	17	16	15	15	15	16	15	8	9	9	14	10	8	11	9	9	14	
3	9	18	15	11	19	12	16	14	10	B	18	26	40	41	18	25	36	13	14	17	16	7	8	6	
4	9	9	8	9	11	7	7	7	15	15	17	35	39	70	36	38	17	15	7	6	16	7	13	7	
5	24	19	13	19	24	19	12	8	11	11	13	13	15	14	41	36	29	14	13	14	8	7	7	8	
6	6	14	7	11	21	10	27	15	9	25	B	22	23	27	27	32	27	8	18	6	8	6	6	10	
7	7	8	8	7	7	7	6	6	10	13	13	14	13	13	14	13	15	15	10	12	15	7	8	6	
8	8	7	7	15	16	16	11	16	B	32	34	41	B	27	35	39	27	31	10	7	8	6	7	15	
9	13	7	7	7	15	17	15	24	17	29	39	47	31	22	17	39	28	29	20	26	17	7	6	8	
10	9	11	12	44	14	11	B	23	33	17	24	42	37	34	17	37	15	19	15	11	11	8	9	7	
11	8	29	15	12	12	B	35	B	35	29	B	B	45	39	33	33	31	29	24	19	7	6	11	9	
12	7	11	13	9	10	10	9	13	35	12	19	47	43	33	33	27	25	19	9	9	7	9	9	7	
13	9	11	7	6	9	12	13	24	29	16	37	43	40	35	29	38	37	25	21	21	11	9	7	13	
14	16	8	7	7	7	9	8	7	27	15	11	11	14	31	21	22	19	14	21	15	6	9	6	9	
15	8	8	7	12	14	40	14	14	12	35	17	B	39	19	16	27	24	19	9	13	7	7	8	7	
16	12	14	8	9	34	24	25	B	B	B	B	B	B	46	28	32	15	51	14	11	9	6	7	7	
17	26	8	17	25	32	14	B	15	17	25	B	B	43	47	45	52	36	24	11	19	22	11	7	8	
18	15	15	37	15	19	13	21	B	15	14	16	28	25	36	17	27	27	21	15	11	14	10	8	7	
19	7	9	10	21	14	8	7	11	11	14	14	11	16	15	15	5	14	13	8	8	12	11	6	7	
20	8	6	7	7	9	9	11	15	15	12	17	23	16	46	39	15	10	14	8	23	15	9	8	8	
21	8	8	8	9	9	8	9	25	16	15	19	14	15	13	9	9	8	11	11	7	7	11	15	8	
22	9	7	8	10	7	8	9	11	9	11	12	13	14	13	12	12	9	10	14	7	6	7	7	6	
23	9	9	7	7	9	17	11	10	15	14	48	42	33	24	14	9	11	25	11	8	9	7	7	6	
24	13	24	9	15	17	8	16	15	9	10	11	13	13	12	10	11	7	28	31	8	9	6	7	7	
25	8	15	14	15	14	11	14	7	10	10	13	11	13	17	18	9	11	11	26	17	7	7	8	18	
26	17	21	B	16	13	14	38	22	13	12	10	15	13	18	14	14	15	15	14	11	14	10	8	10	
27	9	13	14	15	15	17	15	13	13	28	23	20	17	14	13	13	8	9	14	15	10	7	7	11	
28	11	17	14	10	9	7	12	19	11	12	13	13	14	14	13	13	13	13	9	8	7	7	7	8	
29	9	12	11	11	7	7	13	9	10	11	25	B	13	13	15	14	37	18	18	7	6	12	8	9	
30	7	7	11	9	8	7	7	B	19	B	B	B	34	B	18	14	26	11	11	8	7	14	8	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	11	10	11	14	12	13	15	15	15	18	24	20	23	17	18	16	15	14	11	9	7	8	8	
U Q	13	15	14	15	17	16	19	23	19	28	37	47	39	36	29	33	27	24	18	15	14	10	8	10	
L Q	8	8	7	9	9	8	9	10	11	12	13	14	14	14	14	13	11	13	10	8	7	7	7	7	

SEP. 2025 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2025 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	A	A	A	A	A	A	223	264	199	200	244	219	218	214	228	202	198	205	218	288	A	B	A	
2	B	A	A	A	A	A	A	A	A	220	318	294	250	264	238	224	234	230	254	A	A	A	A	A	A	
3	A	A	A	A	A	A	A	A	E A	B E A	A	B	B	B	B	B	B	218	223	220	256	A	A	A	A	
4	A	A	A	A	A	A	A	E A	A	286	306	264	246	262	E B	B	232	232	222	210	215	262	A	A	A	
5	A	A	A	E A	A	A	A	A	250	252	238	216	244	228	238	222	215	208	215	250	210	A	A	A	A	
6	A	A	A	A	A	A	A	A	236	A	B	216	252	234	238	E B	290	244	290	A	A	A	216	A	A	
7	A	A	A	A	A	A	A	H	392	320	265	245	240	234	220	225	225	208	200	215	202	214	286	252	A	A
8	A	A	A	218	A	A	A	A	A	356	A	A	B	280	240	256	238	260	218	266	304	A	A	A	A	
9	A	A	A	261	A	A	A	A	A	A	A	B	B	B	B	B	B	218	206	242	240	B	A	A	A	
10	A	A	A	A	A	A	B	A	A	E B	288	270	298	256	E B	232	232	236	227	213	223	B	A	A	A	
11	A	A	A	A	A	B	A	B	A	A	B	B	B	E B	352	320	262	248	251	226	215	240	E A	A	A	
12	A	A	A	A	A	A	A	A	A	A	A	B	E B	292	250	242	260	256	230	220	195	A	A	A	A	
13	A	A	220	A	A	A	A	A	A	294	A	348	270	272	248	248	248	232	215	232	228	A	A	A	A	
14	A	A	200	E A	E A	A	E A	A	E A	314	288	254	244	234	242	224	226	234	209	230	220	225	A	A	A	
15	A	A	245	A	A	A	A	A	A	A	A	B	B	B	B	B	B	A E B	258	E B	258	246	222	A	A	A
16	A	A	A	A	A	A	A	B	B	B	B	B	B	B	A E B	380	236	250	256	258	246	222	220	A	A	A
17	A	A	A	B	A	A	B	A	A	A	B	B	E B	392	340	275	259	247	223	225	210	252	240	A	A	A
18	A	A	A	A	A	A	A	B	A	284	236	236	233	223	258	238	230	222	230	202	240	218	222	E A	A	A
19	A	A	A	A	A	A	Q	214	256	210	233	228	216	220	222	214	220	220	210	205	210	207	248	230	294	A
20	188	A	A	A	A	Q	Q	378	374	390	276	270	230	218	218	224	252	250	217	220	210	215	208	210	216	224
21	256	197	288	A	A	A	A	A	B	292	280	224	232	216	202	206	204	208	210	215	208	208	225	232	320	A
22	A	254	230	A	A	208	A	A	A	A	A	244	228	208	228	224	228	228	236	217	210	215	236	A	A	A
23	A	A	A	A	A	A	A	A	A	A	A	B	A	256	229	227	238	256	259	300	A	A	A	227	A	A
24	A	A	A	A	A	A	A	A	A	296	256	245	238	252	208	225	238	232	236	220	219	218	244	A	220	A
25	A	A	A	A	A	A	A	197	240	240	230	220	238	198	234	224	234	230	220	229	221	A	A	A	A	A
26	A	A	B	A	A	A	B	A	250	232	208	190	248	220	220	229	228	218	213	208	210	256	A	260	A	
27	329	A	A	A	A	A	A	A	240	211	228	232	214	230	214	225	225	199	210	212	208	207	228	256	A	
28	A	A	A	A	204	294	A	A	A	A	A	224	230	230	220	230	210	216	234	228	225	220	220	A	A	A
29	A	A	A	A	A	A	A	A	A	296	228	A	Q	240	262	254	272	282	258	A	A	176	A	A	A	A
30	A	A	A	A	A	A	231	B	B	B	B	B	B	A	B	264	264	272	A	A	A	255	A	A	A	A
31																										
CNT	4	3	5	4	4	6	6	8	17	20	21	21	26	28	30	30	30	28	27	25	22	12	6	6		
MED	292	254	230	U	U	U	292	294	268	268	238	234	231	240	235	234	230	234	219	215	220	222	242	228	249	
U Q	384	270	266	320	362	450	390	303	301	264	257	271	256	260	248	250	256	230	225	240	252	254	230	294	A	
L Q	222	197	210	240	230	208	221	254	240	229	228	216	224	224	224	224	225	212	210	211	210	219	220	224		

SEP. 2025 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2025 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	68	37	64	70	X 49	B	B	A	B	B	B	74	71	58	59	42	85	45	79	114	48	A	
2	A	A	79	58	61	B	B	57	B	A	A	B	O 57	X 57	73	57	53	51	48	X 40	X 40	A	A	A	
3	O 42	X 69	57	X 46	A	B	B	B	O 42	X 42	B	B	B	B	X 75	81	76	54	X 59	X 51	94	A	72	88	
4	68	A	B	B	A	A	A	O 57	X 52	R	B	B	B	O 65	X 85	68	63	O 61	X 62	X 57	X 60	A	A	A	
5	61	92	X 57	A	X 49	A	A	A	B	A	B	B	B	67	77	78	85	82	X 67	O 66	X 67	X 54	X 47	49	
6	38	42	59	X 49	65	61	69	69	75	X 73	X 87	X 88	X 91	X 92	X 95	91	93	84	X 76	X 65	69	61	A	A	
7	A	A	A	69	65	A	X 52	A	66	67	62	66	81	107	109	104	81	49	X 57	X 37	51	75	65	A	
8	A	81	O 59	X 44	61	A	A	81	A	53	O 56	X 67	X 67	71	75	70	60	53	X 53	X 59	52	62	A	A	
9	A	53	A	O 53	X 56	49	61	59	68	70	76	79	79	79	81	76	75	77	71	70	60	58	56	66	
10	68	82	54	59	B	A	O 93	X 44	91	A	R	58	66	72	75	74	81	82	74	73	67	67	58	82	56
11	A	A	79	51	59	47	X 50	X 68	O 60	B	64	O 59	X 66	81	83	89	88	90	71	55	57	43	45	O 48	
12	A	82	A	86	93	47	X 42	O 42	A	B	O 50	X 54	X 58	63	65	78	71	56	79	53	54	85	A	92	
13	A	O 52	A	B	B	O 40	X 40	B	B	A	B	B	B	O 61	X 59	58	56	61	O 56	X 54	44	44	A	A	
14	A	A	A	A	A	B	98	61	62	66	70	76	78	84	79	80	76	73	71	67	58	45	39	O 40	
15	A	A	A	O 47	B	B	X 53	X 52	B	60	68	O 72	X 74	B	80	72	68	71	70	61	57	57	55	53	
16	50	A	X 43	A	O 56	X 83	X 83	90	96	97	101	102	102	103	99	85	83	77	75	60	56	49	A	A	
17	58	A	66	58	64	79	O 76	X 60	X 86	77	89	95	96	98	100	92	87	78	77	65	64	46	41	A	
18	O 54	X 61	X 50	X 58	X 61	73	A	X 68	X 71	A	70	51	62	79	77	82	76	63	67	57	83	A	63	A	
19	74	108	87	93	B	A	A	140	A	O 50	X 48	X 60	X 56	X 59	X 61	X 59	X 61	X 59	X 50	X 40	X 38	50	A	A	
20	A	A	A	52	80	54	R	A	A	O 65	X 64	X 66	72	73	70	65	66	64	59	59	60	56	48	51	48
21	64	X 33	X 45	94	54	A	O 79	X 86	X 81	83	76	78	75	71	71	69	67	68	65	61	49	47	A	A	
22	A	A	X 46	X 58	A	58	70	74	81	84	88	85	77	78	75	84	79	75	74	64	56	55	61	X 58	
23	59	47	A	O 51	A	50	X 52	X 56	68	70	72	77	77	83	86	86	85	82	72	68	61	59	59	59	
24	A	A	57	A	A	A	A	X 60	68	72	71	81	81	90	95	89	84	85	76	62	57	77	A	A	
25	43	A	A	A	R 49	57	41	A	A	A	O 48	65	68	80	90	84	81	80	79	70	63	57	53	X 52	
26	O 51	X 59	66	67	54	55	X 64	X 71	X 78	X 88	X 98	O 105	X 110	X 110	X 105	X 100	92	87	82	72	67	62	56	60	
27	60	61	67	O 47	X 55	X 57	X 65	77	82	91	96	95	100	101	99	96	89	81	77	70	64	53	A 60		
28	A	A	60	A	A	X 54	57	A	A	X 63	O 69	X 73	76	77	79	81	79	73	61	61	59	A	O 58	A	
29	83	57	A	O 53	X 51	57	57	63	64	66	69	B	69	67	68	69	65	64	57	70	82	42	82	A	
30	A	56	59	90	A	82	85	65	A	75	61	X 68	83	81	A	O 45	X 45	X 69	X 91	X 98	O 76	X 46	A	A	
31	58	A	O 53	A	60	51	51	52	B	X 47	B	B	B	77	81	R	X 49	X 60	53	58	76	46	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	16	16	20	22	19	18	20	23	19	21	24	22	27	28	31	29	31	31	31	31	31	24	20	14	
MED	58	60	59	56	60	56	62	63	68	70	74	74	78	79	81	76	67	70	62	60	56	56	57	57	
U Q	66	82	66	67	64	61	78	74	81	80	82	85	81	87	90	89	84	80	76	68	67	62	62	60	
L Q	50	52	X 54	X 49	54	50	X 52	X 57	X 64	X 64	X 62	X 66	X 67	X 71	X 71	X 70	X 63	X 56	X 59	X 55	X 56	X 48	X 48	X 49	

OCT. 2025 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2025 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	38	31	A	A	Z 43	B	B	A	B	B	B	64	65	52	A	36	A	35	A	A	R 22	A	
2	A	A	24	A	28	B	B	49	B	A	A	B	B	51	51	A	51	45	43	42	34	A	A	A	
3	36	32	F 48	R 40	A	B	B	B	36	B	B	B	B	B	69	64	F	48	53	43	47	A	30	A	
4	A	A	B	B	A	A	A	52	R 46	B	B	B	59	B	79	58	46	55	F 50	51	A	A	A	A	
5	A	41	J 51	R A	43	A	A	B	A	57	B	B	54	66	68	72	76	61	60	61	40	35	35	F	
6	22	A	38	43	46	41	44	56	63	67	81	82	85	86	89	82	85	78	66	F	51	35	A	A	
7	A	A	A	33	51	A	46	A	F 56	61	56	60	75	88	101	98	71	V 43	A	26	42	A	A	A	
8	A	50	R 53	A 38	F	A	A	76	A	46	50	53	61	59	65	64	V 54	47	40	59	A	A	A	A	
9	A	A	A	47	46	43	50	52	62	64	70	73	73	73	75	70	69	68	F 65	64	56	51	32	A	
10	A	54	44	50	B	A	A	38	A	A	R 52	51	F	61	68	75	76	68	67	61	53	38	A	A	
11	A	A	A	R 45	F J	R 41	44	62	54	R	B	58	53	52	67	77	83	82	74	56	32	F	28	A	R 42
12	A	A	A	45	41	A	F 36	A	B	44	48	52	54	54	72	65	50	39	34	46	A	A	A	A	
13	A	R 46	A	B	B	R 34	B	B	A	B	B	B	55	53	52	50	55	50	48	38	28	A	A	A	
14	A	A	A	A	A	B	98	55	52	60	64	70	72	78	73	74	70	67	65	61	F 52	37	33	34	
15	A	A	A	R 41	B	B	47	46	B	54	F 56	66	68	B	74	66	62	65	64	55	51	40	F	41	
16	34	A	37	A	50	A	53	F 68	F 80	90	91	95	96	96	97	93	79	77	J R 71	69	54	Z 50	26	A	
17	A	A	40	F 43	48	66	70	54	62	71	76	89	90	92	94	86	81	72	71	59	F 50	R 37	Z 35	A	
18	R 39	J 55	R 44	F	55	F	A	A	R 62	65	A	56	45	F 56	65	71	76	70	57	61	51	R 48	A	48	A
19	54	59	48	57	B	A	A	A	A	46	42	54	50	53	55	53	55	53	44	34	32	A	A	A	
20	A	A	A	F 27	49	R 48	A	A	54	58	60	66	67	J R 64	59	60	58	53	53	54	47	42	33	F	
21	A	R 27	39	60	F 41	A	73	F	75	65	70	72	69	65	65	65	63	61	62	58	55	40	28	A	
22	A	A	40	43	A	44	54	66	68	78	82	79	71	72	69	78	73	69	68	58	A	50	49	55	52
23	34	35	A	45	A	40	46	50	60	64	66	69	71	77	80	80	F	76	66	62	55	53	42	34	A
24	A	A	44	A	A	A	A	A	54	56	66	65	75	75	84	89	83	78	79	70	56	51	A	A	A
25	35	A	A	A	R 34	45	A	A	A	A	42	51	62	74	Z 84	75	75	74	73	64	57	51	47	46	
26	45	53	45	44	48	44	58	65	72	82	89	99	104	101	97	94	86	81	76	66	61	56	50	44	
27	47	F 31	48	41	49	V 51	J 59	R 64	70	81	87	89	94	95	93	90	83	75	71	64	58	36	A	54	
28	A	A	F 46	A	A	48	51	A	A	57	63	67	67	71	73	75	73	63	55	55	51	A	52	A	
29	53	39	A	47	30	33	51	57	58	60	57	B	63	61	62	57	59	58	51	A	46	29	55	59	
30	A	50	F 53	A	A	65	64	A	A	52	55	B	54	77	75	A	39	39	44	65	36	A	A	A	
31	29	A	A	A	R 42	45	45	36	B	41	B	B	B	67	72	40	G 43	G 40	40	40	42	38	40	A	A
CNT	11	13	19	19	15	16	18	20	18	21	24	22	26	28	31	29	28	31	29	29	27	18	16	9	
MED	36	46	44	43	46	44	51	54	61	61	62	68	68	69	73	74	70	61	61	56	50	40	35	44	
U Q	47	54	48	47	49	48	59	63	68	69	73	79	75	81	84	82	77	74	68	62	54	50	49	53	
L Q	34	34	39	40	41	41	46	50	54	56	56	53	56	62	65	62	56	50	49	42	42	36	31	38	

OCT. 2025 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2025 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	K 69	61	37	26	43	32	34	B	B	57	B	B	E 36	B 30	28	27	E 25	B 24	K 22	107	42	17	94			
2	87	79	22	48	23	B	B	48	B	58	53	B	E 33	B 29	B 33	E 39	B 31	G 24	26	20	34	55	41			
3	43	26	38	35	48	B	B	B	G 29	B	B	B	B	E 43	B 33	B 27	G 27	G 29	36	38	72	20	52			
4	51	62	B	B	60	27	45	E 52	B 35	B	B	B	E 37	B 57	B 45	B 45	G 23	E 42	28	26	34	K 68	88	39		
5	31	31	35	52	E 34	B 50	49	B	E 50	B 36	B	B	E 46	B 35	B 37	B 40	B 37	40	E 42	B 25	B 17	B 17	17	13		
6	27	K 34	23	25	21	19	20	23	26	27	28	33	33	32	31	28	27	23	21	17	E 14	B 16	36	35		
7	48	49	56	32	43	45	36	57	45	38	37	44	54	42	28	25	34	E 25	B 34	B 22	36	23	43	55		
8	48	47	40	30	22	84	82	54	60	39	42	40	37	35	28	25	32	E 37	B 26	B 38	55	49	49	49		
9	K 46	44	36	31	29	27	20	24	28	30	38	32	32	34	31	33	28	25	23	28	16	23	20	39		
10	51	K 34	25	43	B	52	46	29	56	54	39	E 41	B 33	G 30	B 33	E 38	B 37	G 26	E 19	B 21	B 15	B 14	K 43	42		
11	45	46	36	69	38	35	27	44	45	B	G 37	E 35	B 42	B 46	B 41	E 32	B	G	27	25	30	33	14	20	39	48
12	46	53	57	27	56	35	64	44	57	B	E 35	B 33	B	G	30	29	E 32	B 29	B 51	K 29	45	56	87	62		
13	55	45	47	B	B	33	B	B	52	B	B	B	E 46	B 31	B 37	28	38	E 43	25	28	23	49	36	51		
14	50	53	61	45	61	B	59	36	E 31	B 41	B 35	B 36	E 37	B 37	B 32	32	29	26	23	20	K 17	E 11	B 13	24		
15	37	61	52	46	B	B	31	39	B	E 46	B 37	B 48	B 63	B	B	E 44	31	29	24	E 35	B 26	B 19	B 13	29	35	
16	35	38	29	84	K 38	49	39	25	G	27	31	31	33	G	34	32	31	27	24	G	23	20	E 13	B 11	16	51
17	49	64	47	48	37	28	44	54	40	31	32	31	33	G 33	E 33	B 33	G 30	E 28	B 33	B 26	43	K 33	21	36		
18	37	29	26	45	29	49	62	58	63	90	57	55	34	G 32	G 31	G 30	30	26	G 24	B 25	45	71	41	53		
19	45	41	27	33	B	54	47	54	61	55	32	41	G 31	G 31	30	29	28	25	26	39	K 24	47	55	69		
20	K 71	K 49	37	21	63	48	38	42	G	33	48	E 47	B 35	B 36	B 32	B 33	30	G 28	G 25	G 23	23	19	17	15	32	
21	31	45	58	40	23	32	41	40	44	42	44	34	34	35	31	30	29	25	25	22	16	12	19	35		
22	91	K 43	33	35	76	43	26	28	G	35	38	37	32	32	32	32	30	G	26	25	21	20	15	15	33	
23	18	K 31	K 42	43	49	35	37	40	34	37	36	36	33	36	35	36	35	E 27	B 24	G	19	16	14	14	29	
24	72	53	42	85	47	57	51	41	36	37	E 37	B 32	G 32	33	32	31	29	E 29	B 22	G 23	E 25	B 36	K 36	38		
25	40	53	49	54	37	38	30	53	55	86	E 35	B 34	B 35	E 39	B 35	B 32	G	29	25	25	19	22	17	13	15	
26	28	31	28	39	51	43	25	32	32	36	32	38	35	38	34	31	28	28	24	20	10	15	12	15		
27	13	17	46	48	46	48	24	33	30	38	44	39	38	34	36	33	30	29	G 23	G 22	21	K 18	44	55		
28	72	68	25	56	47	42	47	59	71	54	41	35	34	E 32	B 30	B 29	32	31	G 26	G 35	29	53	82	46		
29	31	39	82	48	31	26	26	29	39	37	52	B	33	E 35	B 33	31	28	25	25	35	46	22	43	85		
30	67	47	38	87	37	29	33	55	59	43	E 36	B 36	B	E 34	B 41	B 63	31	27	37	71	44	59	45	49		
31	25	64	46	64	53	30	37	35	B	E 36	B	B	B	B	E 30	B 33	31	29	32	37	E 24	B 37	63	43	59	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	30	29	27	27	28	27	27	26	25	22	27	28	31	31	31	31	31	31	31	31	31	31	31	
MED	46	46	38	45	43	38	38	40	40	38	37	34	34	33	31	30	29	26	24	24	22	23	36	42		
U Q	55	53	47	53	51	49	47	54	56	54	43	40	E 37	B 36	B 36	B	32	29	30	29	38	49	44	53		
L Q	31	34	29	32	31	30	28	32	32	36	35	33	33	32	31	29	28	25	G 23	21	16	15	17	35		

OCT. 2025 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2025 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	33	7	11	9	15	15	12	B	B	32	B	B	B	36	22	18	17	25	20	8	13	17	10	15	
2	11	11	7	23	8	B	B	26	B	35	23	B	B	33	29	33	39	17	20	17	12	10	12	30	
3	9	8	13	13	31	B	B	B	15	B	B	B	B	B	43	33	18	21	15	9	9	10	7	7	
4	7	7	B	B	32	19	42	52	23	B	B	B	37	B	57	45	17	42	22	14	7	9	11	16	
5	15	13	18	19	34	39	25	B	45	36	B	B	46	35	37	40	37	40	42	25	17	17	9	8	
6	7	8	9	9	7	14	14	14	18	17	23	16	15	15	17	18	16	12	11	10	11	16	9	8	
7	10	9	23	13	18	33	18	16	12	11	37	44	54	42	21	18	14	14	15	9	7	7	7	11	
8	13	7	8	7	7	19	19	41	18	24	36	17	21	15	24	23	25	37	26	9	12	11	9	12	
9	13	11	24	17	17	15	10	13	12	11	12	13	15	13	14	12	11	9	7	6	6	6	6	9	
10	7	15	15	15	B	19	15	12	14	16	15	41	18	15	33	38	37	19	17	21	15	10	7	8	
11	7	9	15	12	17	15	15	16	37	B	18	35	42	46	32	32	18	16	22	13	9	7	7	9	
12	9	7	9	8	13	13	31	18	15	B	35	33	15	16	15	21	32	29	9	7	12	16	15	7	
13	50	25	15	B	B	18	B	B	36	B	B	B	46	21	37	28	38	43	13	11	8	7	7	21	
14	16	20	22	37	16	B	17	15	31	41	5	36	37	37	B	16	19	19	19	9	15	8	11	9	6
15	8	11	15	15	B	B	18	19	B	46	37	48	63	B	44	31	14	13	35	26	19	13	7	8	
16	8	12	13	18	15	24	13	14	13	13	15	15	16	15	13	23	14	15	17	15	13	11	9	12	
17	11	19	18	16	17	13	16	18	14	12	16	23	15	33	16	33	24	28	33	9	7	8	7	7	
18	9	8	7	11	12	12	18	14	15	16	19	15	22	16	16	15	18	11	24	12	9	9	9	30	
19	13	13	5	9	B	23	21	15	15	23	15	14	15	15	14	13	13	13	13	12	10	13	13	11	
20	11	16	11	9	9	15	12	13	15	33	47	35	34	19	21	15	13	13	13	13	13	9	7	6	
21	20	7	13	7	8	9	12	15	32	21	44	34	16	16	16	13	13	9	7	8	5	6	8	8	
22	12	15	15	14	35	15	8	8	13	13	15	15	15	15	16	15	13	10	8	8	6	7	9	7	
23	7	8	11	13	21	12	9	9	9	13	9	9	12	13	13	9	9	7	7	11	9	7	7	7	
24	15	12	8	7	5	14	13	12	11	13	37	20	15	15	13	12	17	29	15	12	25	12	14	13	
25	12	25	21	17	12	28	14	17	14	78	35	26	35	39	35	32	21	13	9	15	16	9	6	7	
26	7	7	11	17	12	9	7	8	8	9	13	15	16	15	10	13	13	10	10	9	7	9	7	7	
27	7	7	14	12	13	15	7	6	8	10	8	12	10	11	13	13	13	13	13	9	11	9	10	12	
28	9	10	7	16	16	15	16	18	13	17	31	23	15	16	24	15	8	15	15	11	6	9	7	7	
29	8	6	19	9	7	7	6	9	14	17	16	B	22	35	33	15	15	17	19	11	9	6	6	9	
30	8	7	8	14	8	7	13	15	18	15	36	B	34	17	48	13	17	13	11	9	10	16	14	6	
31	7	13	14	14	9	20	18	9	B	36	B	B	B	17	33	21	15	12	13	24	9	15	22	25	
	00	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	10	13	14	15	15	15	15	15	21	31	34	22	17	21	18	17	15	15	11	9	9	9	8	
U Q	13	13	18	17	31	24	19	19	32	41	44	B	46	36	33	32	21	25	20	15	13	13	10	12	
L Q	7	7	9	9	9	13	12	12	13	13	15	15	15	15	15	13	13	12	10	9	7	7	7	7	

OCT. 2025 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2025 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	A	A	A	A	A	B	B	A	B	B	B	268	254	264	A E B	A	233		A	A	A	A		
2	A	A	A	A	A	B	B	A	B	A	A	B	B	260	242	294	B E B	E A	248	300			A	A	A	
3	A	A	A	A	A	B	B	B		B	B	B	B	B	B	B	B	B	B	208	208		A E A	A	A	
4	A	A	B	B	A	A	A	B		B	B	B	B	B	B	B	B	B	B	248	248		A	A	A	
5	A	A	A	A	B	A	A	B	A E B	B	B	B	B	B	B	B	B	B	B	248	248				Q	
6	A	A	A	A E A	A	A																			A	
7	296	342	404	360	310	211	218	236	222	220	218	218	218	218	236	222	222	234	222	218	250	234		A	A	
8	A	332	A	A	306	A	A	A	A	A	A	A	A	252	254	269	254	248	265	286	338	394		A	A	
9	A	A	A	A	A	A	258	224	228	218	210	202	205	214	232	225	228	222	215	215	216	220	260	250	A	
10	A	324	324	344	A	A	A	213		A	A	A	A	220	202	228	262	242	228	234	230	220	220		A	
11	A	A	A	364	A	A	314	250		A	B	A	B	376	246	236	246	258	289	382	195	316		A	A	
12	A	A	A E A	A	A	A	A	A	A	B	B	B	B	228	224	228	238	260	272	205	356			A	A	
13	A	A	A	B	B	A	B	B	A	B	B	B	B	228	268	238	302	343	252	315	296			A	A	
14	A	A	A	A	A	B	520	272	252		267	258	254	234	225	210	234	236	230	225	234	230	260		A	
15	A	A	A	A	B	B E A	296	A	B	B	B	B	B	B	B	B	286	220	230	236	234	220	220	238	302	A
16	A	A	A	A	A	A	342	252	218	228	214	208	208	228	234	222	220	232	228	225	215	210	256		A	
17	A	A	A	A E A	A	A	452	254	228	224	222	212	228	236	226	230	229	236	228	E A	A	A	305		A	
18	A	272	189	350	284	294	A	A	A	A	A	A	A	246	236	254	242	248	244	254	268	258			A	
19	E A	E A	E A	E A	252						338	210	238	228	230	238	238	242	236	268	382	340			A	
20	A	A	A	344	210							B	B	266	246	234	218	218	228	242	242	248	232	248	274	452
21	A	307	A	262	292	A	A	268		A E A	B	B	B	248	236	230	222	220	218	203	230	228	228	216	290	A
22	A	A	A	392		A	275	238	228	218	220	212	240	208	220	218	230	224	240	214	222	227	278	340		
23	E A	282	A	A	A	A	294	238	206	255	230	218	214	228	206	216	222	224	232	229	200	238	238	199		
24	A	A	A	A	A	A	A	290	206	222	274	212	208	218	220	220	214	236	236	234	228				A	A
25	337		A	A	A	A	A	A	A	A	296	256	236	256	234	218	218	234	232	226	239	234	239	258		
26	E B	E A	260	254		A	238	204	218	223	224	224	224	200	200	218	210	212	228	228	194	232	228	238		
27	248	282	255	A	A	A		218	210	218	250	214	206	208	219	220	220	228	228	225	225	270			A	
28	A	A	252	A	A	296		A	A	A	A	A	A	218	214	222	225	222	234	256	220	242	225	192	A	
29	E A	E A	A	A	A E A	A	286	224	190	218	236		B	230	240	236	214	228	238	244		A	A	A	A	
30	A	A E A	292	A	A	300	266	A	A	220	218	B	B	260	236		A	A	A	298	232	318			A	
31	236	A	A	A	A	A	A	240		B	A	B	B	236	238	286	218	260	316	305					A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	8	8	8	12	8	7	12	16	14	16	17	20	22	27	29	29	29	30	29	29	22	16	14	7		
U	278	296	265	327	290	300	266	239	221	225	227	227	228	230	234	222	230	234	234	232	226	232	254	250		
E A	316	322	308	378	352	310	305	270	236	272	277	252	240	254	244	246	247	260	272	282	239	255	278	340		
L Q	265	287	254	268	281	294	244	218	216	221	219	216	214	218	224	218	220	229	229	225	216	224	238	238		

OCT. 2025 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV.2025 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	B	O	X	B	B	B	O	X	B	O	X	O	X	O	X	X	X	X		A		58	48	A							
2	A	O	X	A	B	A	A	B	O	X	A	X	X	71	70	O	X	O	X	61	54	49	55	86	A	R	53	59				
3	45		61				51	46					O	X	B	O	X	B	X		A		A	A				76				
4	A	60	88	53	36	59	62	O	X	62	60	62	70	O	X	67	66	77	77	66	66	O	X	61	56	55	49	X	A	A	39	39
5	58	57	R	45	53	X	O	X	A	X	B	A			X	O	X	X			X	X	X	X	X	X	X	X	A	85	77	
6	56	68	A	O	X	55	69			70	83	45	129		A	O	X	X	X	X	X	X	60	53	50		A		89	A	A	
7	45			A	A	O	X	A	A	A	A	B		B	O	X	46	49	58	68	63	67	62	50	45	51	52		A	A		
8	A	X	A	O	X	54	87			A	A	A	X	B	B		B	B	B	X	X	X	X	X	X	X	X	X	X	59	57	
9	A	52	55	X	X	54	53	X	59	62	75	72	80	79	77	81	80	84	80	78	81	73	69	68	67	68	80					
10	59	67	B	A		65	67	X	73	85	88	86	82	78	77	76	75	71	70	52	46											
11	51		A	B	O	X	O	X	X	O	X	A	B		O	X	O	X	O	X	O	X	O	X	O	X	O	X	O	X	O	X
12	X	O	X	O	X	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
14	O	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	X	X	X	X	X	
15	61	61	X	58	61	61	48	O	X	51	65	73	82	98	106	105	100	100	87	83	80	77	71	68	61	63	51					
16	O	X	X	59	56	70	67	64			A	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
17	A	48	55	X	51	57	62	O	X	56		A	O	X	O	X	B	70	64	62	60	59	61	58	61	63	61	62	61	52		
18	A	54	X	59	63	61				A	A		O	X	X	O	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	
19	52	58	X	57	58	59	66	X	72	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
20	63	83	64	58	67	71	76	73	82	87	97	95	92	88	81	83	81	81	78	73	67	58	60	89								
21	A	53		A	O	X	39	67	O	X	44	46	62	64	63	66	68	68	66	62	60	55	50									
22	A	O	X	57	55	57	95			A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
23	58		A		A			X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
24	A		A	X	49	56	59	A	O	X	59	70			A	X	X	X	X	X	X	A	A	A								
25	A	82	64	O	X	R	46	B			O	X	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
26	A	X	R	A	X	A	A	X	47	57	67	O	X	A	O	X	O	X	60	70	76	79	71	46	45	55	61	51	68	41	A	
27	A	57	O	X	O	X	B			58	86	84	83	109	61	66	81	97	85	49	46	50	54	55	53	54	50					
28	B	A	55	O	X	46	A	A		47	A	A	X	60	68	76	68	85	88	82	49	54	44	55	62	57	50	57				
29	X	O	X	A	A	A				B																						
30	A	O	X	A		A	O	X	52	69	69	69	69	A	X	70	69	73	74	87	83	71	61	53	59	51	55	51	49			
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	14	22	19	21	19	18	22	20	19	20	22	25	24	26	28	29	27	28	28	28	24	22	21	19								
MED	54	56	55	54	57	58	60	68	72	65	68	69	70	74	76	69	64	61	56	55	56	58	53	53								
U Q	58	60	59	58	67	65	69	73	81	79	78	74	76	77	84	78	70	67	62	62	62	62	62	59								
L Q	46	X	X	O	X	X																										

NOV.2025 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2025 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

NOV. 2025 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2025 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	50	B	K 42	B	B	B	33	B	43	48	35	E B 47	E B 35	E B 49	E B 46	E B 52	E B 36	E B 28	29	40	41	94	35	47	
2	47	42	56	B	43	48	B	45	62	51	45	E B 43	E B 37	E B 34	33	E B 39	G 33	30	26	31	39	52	46	46	
3	116	49	44	63	45	34	31	B	58	59	61	37	B	E B 50	35	34	B	36	38	37	70	56	85	62	
4	65	29	K 31	41	39	29	37	34	44	42	48	E B 47	41	36	35	E B 37	E B 35	E B 44	29	32	21	47	41	G 27	
5	36	K 33	73	86	34	35	60	41	B	59	47	B	E B 35	E B 37	34	31	E B 33	G	35	45	46	81	38	58	
6	31	K 20	58	52	49	64	47	38	49	44	60	53	35	31	39	33	29	27	23	34	45	44	85	59	
7	71	68	67	52	56	G 32	55	53	49	B	B	E B 36	32	33	32	G E 35	34	32	29	26	41	39	55	61	
8	65	28	61	25	27	53	61	54	29	B	B	36	B	B	B	31	31	29	32	39	37	17	31	41	
9	33	24	22	52	41	28	32	40	34	36	36	37	37	35	44	37	33	29	31	35	23	17	23	28	
10	35	21	B	65	56	52	43	40	35	39	38	35	38	40	38	34	34	E B 32	E B 39	E B 27	B	E B 46	E B 39	E B 28	
11	E B 26	94	B E 37	B B 37	E B 38	E B 38	29	54	B	34	51	47	B	E B 45	E B 47	E B 47	E B 43	E B 40	E B 42	E B 37	E B 39	E B 35	E B 33		
12	E B 34	E B 37	E B 44	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
14	24	K E 24	E B 26	E B 31	E B 31	E B 30	G 28	28	35	30	35	E B 38	E B 42	43	36	36	29	29	28	E B 27	E B 29	E B 26	E B 26	E B 29	
15	E B 27	E B 31	E B 36	E B 35	E B 40	E B 38	G 30	27	E B 31	36	36	36	38	42	35	38	40	44	34	35	G 26	23	33	35	
16	51	25	44	23	35	25	49	59	51	40	36	36	34	37	33	34	33	33	41	26	28	43	57	51	
17	K 51	K 27	22	48	37	38	44	62	45	47	B E 39	B 34	35	33	34	29	27	25	24	G 24	G 24	19	20	33	
18	51	39	36	58	40	45	46	41	45	44	42	E B 36	E B 46	34	32	31	30	28	37	30	49	25	21	17	
19	25	37	40	42	42	41	31	31	33	35	55	68	44	38	33	37	35	44	58	23	45	32	19	K 19	
20	36	59	G 33	37	32	38	31	33	45	42	38	67	64	49	47	62	57	45	28	24	21	19	42	54	
21	52	36	88	46	36	G 23	44	42	43	36	31	36	51	54	37	37	29	32	26	29	43	56	44	67	
22	52	52	31	64	52	45	45	45	33	36	55	45	35	44	41	30	32	33	27	23	24	32	38	41	
23	45	84	61	63	44	34	43	47	39	36	45	37	36	35	31	31	28	33	33	47	37	54	49	49	
24	58	48	41	23	32	45	62	54	62	58	E B 44	E B 37	G 32	31	30	31	51	55	24	85	41	41	76	57	
25	54	23	42	41	38	B	42	63	B	B	B	B	B	B	E B 30	E B 47	35	35	41	35	38	54	58	B	
26	123	37	79	64	33	40	G 31	32	39	50	E B 46	E B 50	E B 48	E B 32	E B 40	29	33	E B 34	26	41	47	44	E B 32	51	
27	53	26	31	E B 38	B	46	31	35	41	45	E B 44	E B 44	E B 45	E B 47	E B 32	E B 37	66	34	31	38	27	42	37	52	
28	B	61	39	G 33	81	112	61	69	53	40	41	35	E B 53	E B 35	33	33	39	31	35	33	43	42	62	55	
29	33	50	60	59	47	44	32	B	61	38	50	E B 46	E B 47	E B 59	E B 54	E B 35	31	39	46	G 33	44	48	50	40	
30	46	43	57	56	72	41	35	38	40	45	32	38	E B 35	36	E B 38	E B 38	E B 34	31	27	29	31	40	26	34	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	27	26	26	26	27	25	26	24	24	26	24	26	28	29	28	29	29	29	28	29	28	28	28
MED	48	37	42	47	40	39	42	41	44	42	40	37	36	36	34	34	32	32	30	32	38	42	38	44	
U Q	54	50	60	59	47	45	47	54	51	48	48	E B 47	E B 46	E B 44	E B 40	37	36	40	36	38	44	50	52	54	
L Q	34	26	33	37	35	34	31	34	35	36	36	36	35	34	33	33	31	30	27	27	26	29	32	31	

NOV. 2025 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV.2025 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	B	24	B	B	B	15	B	25	36	24	47	35	49	46	52	36	28	12	14	13	16	9	17	
2	25	7	39	B	16	19	B	21	22	15	21	43	37	34	16	39	23	26	7	7	11	11	15	13	
3	7	13	12	30	35	9	8	B	21	17	15	30	B	50	26	17	B	11	11	7	14	13	8	9	
4	11	8	9	11	12	9	9	11	17	24	19	47	19	16	23	37	35	44	17	13	11	12	11	11	
5	7	8	17	7	20	20	31	24	B	16	17	B	B	35	37	27	23	33	9	9	26	13	10	11	
6	12	11	18	25	16	25	14	13	13	11	19	16	26	15	14	13	11	11	11	7	18	12	9	25	
7	12	14	25	31	15	9	32	25	16	B	B	36	16	20	15	35	15	23	17	15	15	14	16	13	
8	13	12	18	11	14	14	35	30	11	B	B	26	B	B	B	16	17	14	11	13	11	11	15	13	
9	25	9	11	19	19	13	15	15	10	15	16	31	16	23	15	10	17	15	15	12	11	9	7	7	
10	8	7	B	15	13	23	14	13	9	11	13	13	13	35	22	20	21	32	39	27	B	41	39	21	
11	26	38	B	37	29	38	38	23	37	B	27	51	47	B	45	47	47	43	40	42	37	39	35	33	
12	34	37	44	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	35	30	33	24	19	27	25	19	B	25	
14	22	18	26	21	31	30	19	17	15	17	15	38	42	36	25	25	20	22	20	27	29	26	26	29	
15	27	31	36	35	40	38	17	17	31	15	16	15	17	25	17	19	25	23	19	19	16	16	17	16	
16	23	16	18	14	29	13	23	24	15	32	19	16	13	11	10	9	15	15	9	10	11	9	14	15	
17	8	8	8	10	13	15	18	15	15	21	B	39	29	13	27	11	9	11	11	14	9	7	7	7	
18	10	14	17	7	15	15	12	11	9	24	18	36	46	17	14	12	13	12	14	15	12	5	7	5	
19	8	15	11	10	9	11	7	6	7	7	12	9	13	15	13	12	11	9	7	9	9	6	7	8	
20	8	17	20	15	15	24	9	14	19	22	16	14	13	14	11	10	11	7	10	8	8	7	9	11	
21	8	11	8	8	7	8	11	11	9	9	13	9	11	12	9	12	12	10	7	6	9	11	11	11	
22	11	13	13	7	14	11	12	10	12	10	10	11	11	9	9	9	7	8	9	12	9	7	8	19	
23	14	11	9	11	11	10	9	13	8	9	12	9	13	11	13	16	9	27	9	9	8	11	15	15	
24	7	11	13	7	6	9	12	10	9	13	44	37	24	15	15	10	11	13	9	9	12	6	6	8	
25	7	5	16	15	9	B	16	15	B	B	B	B	B	18	47	22	11	11	10	15	12	13	13	B	
26	7	7	8	17	12	26	11	8	25	38	46	50	48	25	40	19	11	34	8	8	11	9	32	36	
27	21	9	16	38	B	15	6	13	15	17	44	44	45	47	23	37	34	14	11	7	9	6	8	19	
28	B	25	25	12	7	15	23	14	18	15	24	16	53	35	25	14	12	13	10	7	9	8	13	11	
29	7	14	18	22	26	8	14	B	16	14	32	46	47	59	B	54	35	14	15	13	18	15	13	9	
30	19	12	15	11	12	9	7	19	15	29	26	17	35	17	38	38	34	16	15	9	13	7	6	16	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	12	12	18	15	15	15	14	15	16	17	20	36	35	24	23	19	16	15	11	12	12	11	11	14	
U Q	23	17	25	31	29	26	23	24	B	B	B	47	48	47	B	38	35	33	27	17	15	16	14	16	
L Q	8	9	12	11	12	10	11	13	11	14	16	16	16	15	14	12	11	11	9	8	9	7	8	11	

NOV.2025 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2025 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	B	A	B	B	B	E A	B	A	A	A	B	216	B	E B	B	B	240	262	352	A	A	A	A	A
2	A	A	A	B	A	A	B	264	A	A	272	B	260	230	222	H	270	242	240	242	E A	A	A	A	A
3	A	A	E A	A	A	A	A	B	A	A	A	A	B	B	270	256	B	A	A	A	A	A	A	A	A
4	A	A	A	A	A	A	A	A	A	A	A	B	A	A	270	232	232	246	248	314	224	248	220	A	E A
5	E A	304	280	258	256	310	304	286	B	A	A	B	B	254	264	244	238	246	278	A	A	A	A	A	
6	A	Q	A	2	A	A	A	A	A	A	A	A	222	212	222	248	216	246	220	306	A	A	A	A	
7	A	A	A	A	A	A	A	A	A	B	B	266	250	250	245	230	248	238	270	280	E A	A	A	A	
8	A	E A	A	E A	E A	A	A	A	A	B	B	232	B	B	B	230	248	234	292	302	252	246	290	348	
9	A	E A	E A	A	E A	A	A	256	272	212	198	208	258	218	218	210	208	222	230	218	224	232	236	242	
10	A	350	246	B	A	A	A	320	296	214	198	210	216	224	234	248	236	222	238	B	240	B	E B	290	
11	A	304	A	B	B	A	B	B	A	A	B	B	B	B	B	E B	B	A	E B	E B	B	E B	B	B	
12	B	308	330	353	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	226	236	228	238	256	249	248	272	B	A	
14	B	328	324	310	E A	E B	B	252	234	215	202	204	220	254	220	227	212	214	218	228	238	244	250	248	
15	E B	268	298	E B	E B	E B	B	262	218	210	228	215	204	202	218	202	210	218	230	246	242	245	248	222	
16	A	E A	A	E A	A	B	A	A	A	A	A	A	248	212	212	216	230	234	247	278	205	265	A	A	
17	A	E A	E A	A	A	A	A	A	A	A	A	B	244	223	204	216	212	206	226	199	242	242	244	252	
18	A	388	370	A	A	A	A	346	252	272	212	237	214	204	220	210	216	212	236	250	242	248	250	E A	
19	264	E A	314	A	A	E A	296	256	212	210	209	E A	422	199	210	202	204	220	254	E A	230	252	234	240	
20	A	318	A	A	A	A	A	220	A	A	A	A	320	256	209	204	322	293	228	228	234	195	218	A	
21	A	368	A	A	A	A	220	244	234	296	188	210	248	A	236	220	220	225	230	240	E A	A	220	A	
22	A	A	224	255	A	A	A	314	262	192	224	214	196	204	216	212	210	215	220	206	236	244	248	366	
23	E B	330	A	A	A	A	322	A	A	H	196	219	224	223	206	224	208	210	222	225	208	196	A	A	
24	A	A	A	E A	A	A	A	A	A	A	A	B	246	204	214	218	224	A	A	A	A	322	288	A	
25	A	Q	344	A	A	B	A	210	B	B	B	B	B	B	234	B	246	218	302	242	266	A	A	B	
26	A	E A	342	A	A	A	A	282	339	204	A	B	A	B	214	256	214	280	210	A	H	316	A	A	
27	A	A	A	B	B	A	A	248	242	250	206	B	B	B	216	224	232	234	204	E A	278	242	264	324	
28	B	A	A	A	A	A	A	256	A	A	210	254	222	B	232	230	218	244	220	278	256	E A	E A	A	
29	A	A	A	A	A	A	A	260	260	190	A	B	B	B	B	226	218	296	A	A	306	A	316	316	
30	A	A	A	A	A	A	A	292	242	250	A	228	224	210	210	252	247	218	228	200	252	264	E A	300	
31																									
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	9	16	13	10	9	12	15	17	14	16	17	19	19	21	26	28	26	28	25	26	21	17	15	13	
MED	306	306	311	212	316	292	257	242	218	212	224	228	222	218	223	226	222	235	235	245	248	247	248	295	
U Q	329	345	352	338	384	323	290	291	252	254	250	266	254	232	248	246	244	246	278	278	303	289	321	346	
L Q	286	300	287	256	293	288	252	226	210	200	211	220	206	211	216	213	218	226	219	236	242	243	242	271	

NOV. 2025 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2025 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	A	A	A	X	62	73	87	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	56					
2	53	61	59	55	O	X	56	66	68	61	71	87	71	72	76	75	77	78	70	67	62	60	56	62	50	O	X	49		
3	X	57	53	60	70	68	77	71	79	82	88	83	85	90	95	95	88	65		A		A		68	95		A			
4	A	A		55	A	X	54	49	X	A	A	A	A	O	X	O	X	60	58	49	47	53		A	78	87		73		
5	A	X	50	63	59	O	X	63	69	A	A	A	A	A	B	O	X	O	X	73	76	75	63	62	56	55	56	86		
6	A	X	54	57	O	X	X	54	62	X	X	X	X	B	O	X	X	X	X	76	76	69	66	58	59	55	57	57		
7	X	53	55	57	57	65	62		A	A	A	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	A		
8	X	65	71		A	X	X	81	82	85	92	97	96	94	95	97	92	85	81	78	77	77	72	70	62	63	62	58		
9	X	58	58	65	67	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	57		
10	X	49	50	51	X	A	X	O	X	O	X	O	X	R	R	R		70	68	77	X	R	X		X	X	X	A		
11	X	60		A	A	X	57	62	137	55	67		A	51	50	56	70	63	64	62	61	57	46	56	71	69	O	X	53	
12	X	48		A	X	A		71	86		47		A	A	O	X	A		O	X		X				A	A	A		
13	A	O	X	47	A	A	A	43	49	52		A	X	55	52		R	R	R	R	61	54	63	55	58	57	51	45	58	47
14	46		A	A	O	X	X	49	49	A	X	X	63	65	66	80	72	71	65	61	60	60	62	62	60	58	58	55	37	50
15	55	56	57	58	A	X	58	71	86	90	88	91	81	77	72	70	73	66	67	56	62	61	55	54	54	52				
16	59	62	53	62	90	59		A	O	X	R	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	A	
17	X	A	A	A	A	X	58	95	68	67	60	70	64	70	69	73	67	65	62	56	53	48	50	55	55				A	
18	A	A	X	A	X	X	61	44		X	A	X	X	X	B	O	X	X	X	O	X	X	X	X	X	X	X	X	X	61
19	X	44	B		A	A	A		A	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
20	O	X	47	52		A	X	X	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	56	
21	56		A	53	62	65		A	62	70	86	82	85	95	94	85	92	79	82	60	64		A	A	O	X	A	A		
22	O	X	58	57	86		A	A		A	O	X	O	X	O	X	X					A		X	X	X	X		A	A
23	57		A	53	A	O	X	X	55	49	61		B	O	X	O	X	O	X	B									A	
24	58	58	59	52	54	B	O	X	O	X	R	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
25	61		A	56	A	O	X	X	56	53	68	72		A	R		X	82	80	79	80	70	66	58	56	60	54	60	57	
26	52	57	O	X	X	57	65	64		R	O	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
27	X	61	66	58	50	67	71	79	80	72	80	85	78	82	78	72	73	74	71	68	68	65	60	54	59				59	
28	56	53	O	X	57		A	60	73	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	71	
29	X	O	X	59	53	55	62	65	58	70	67	73	71	74	75	73	74	76	71	70	72	68	63	63	64	67			67	
30	X	57	68	110	63	X	73	70	88	91	79	86	105	98	97	85	76	75	71	67		B		64	143	66	62	57		
31	59	64	59	67	64	79	89	111	109	108	101	97	87	82	80	77	70	69	65	63	61	63	58	51					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	24	21	23	19	26	26	24	25	21	26	25	27	28	30	31	31	30	29	30	28	29	29	27	21						
MED	X	57	57	57	57	60	63	68	68	71	74	71	69	70	73	76	73	70	63	60	58	57	57	57	57					
U Q	X	59	62	59	63	65	70	82	82	87	88	86	83	83	82	80	77	74	69	65	62	62	63	60	58					
L Q	X	52	53	54	O	X	X	X	X	O	X	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

DEC.2025 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2025 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	56	F 62	81	82	82	77	77	79	81	81	79	76	66	51	46	47	46	49	46
2	44	43	F 47	49	50	50	50	R 55	58	63	65	66	70	69	71	72	64	61	56	54	50	35	41	43
3	Z 51	47	F	50	57	65	65	73	70	75	77	F 74	84	89	89	82	55	B	A	A	A	A	F 41	A
4	A	A	36	A	Z 48	R 43	A	A	A	A	A	R 50	53	52	54	52	43	41	47	A	43	F	A	A
5	A	44	F 54	F	57	58	A	A	A	A	A	B	57	62	F	65	F	57	56	50	49	50	52	A
6	A	48	45	41	R 48	56	47	51	R 52	47	B	F	53	59	70	70	63	60	52	53	49	51	51	47
7	V 47	43	F	44	45	49	A	A	A	53	57	59	63	61	63	65	67	61	59	55	55	A	54	A
8	59	65	A	75	76	79	86	91	90	88	89	91	86	79	75	71	71	71	66	64	56	57	56	52
9	52	52	54	54	54	63	J 61	R 78	94	91	84	79	75	79	82	83	82	J 76	R	60	46	47	53	49
10	J R 43	43	J R 45	A	R 53	R 52	49	R 60	R 58	R 54	R	R	R	F 50	59	58	60	65	47	48	40	F 50	R 50	53
11	J R 54	A	A	A	R 51	R	F	49	E G 43	A E G 45	E G 44	R 50	54	57	58	56	55	51	40	F	F	F	47	47
12	J R 42	40	A	R 41	A	39	44	A	41	A	A	43	A	R	52	57	56	42	F 38	F 51	F	A	A	A
13	A	41	A	A	A	R	41	42	A	49	46	R	R	R	55	48	57	49	52	51	45	39	39	41
14	38	A	A	43	43	A	57	59	49	68	63	65	59	55	54	54	56	56	54	52	52	49	43	44
15	49	50	51	47	A	R 52	F J 54	R 80	80	80	85	75	71	66	64	67	60	61	50	55	55	49	48	46
16	F 43	F 50	47	47	F	F	A	46	R	59	61	56	57	61	65	60	59	56	50	56	41	41	48	A
17	A	A	A	A	A	J R 52	51	J R 62	A J 54	R 64	58	64	63	67	61	59	56	50	47	42	44	49	A	A
18	A	A	48	A	J R 47	52	38	A	J R 52	R 56	52	B	59	67	75	62	61	55	51	44	F 41	47	49	39
19	R 38	B	43	A	36	A	A	41	A	52	57	55	55	54	55	50	52	54	57	54	51	47	40	42
20	41	41	A	45	44	A	52	61	61	68	64	63	62	62	60	61	60	57	60	58	50	43	42	48
21	F 45	A	J R 45	R 56	56	A	51	59	80	76	79	89	83	79	86	73	F	A	50	56	A	55	A	A
22	52	46	50	A	47	39	A	A	A	42	48	55	62	66	68	64	57	A	45	47	49	49	A	A
23	F 40	A	41	A	49	43	43	55	B	45	51	57	B	73	F 75	67	49	45	51	40	47	41	A	A
24	43	F 42	F 43	41	F 37	B	47	55	R	53	56	53	54	68	F 66	57	A	53	46	45	48	47	47	47
25	48	A	43	A	50	47	F 54	R 66	A	R	R	62	64	69	66	66	64	60	44	50	54	48	54	51
26	40	44	52	51	49	54	R 63	R 53	56	64	60	65	66	70	71	71	71	63	59	51	50	51	49	52
27	55	53	F 46	R 44	56	F	66	67	60	67	67	F 64	73	72	66	67	F 61	65	62	62	59	54	48	46
28	F 43	F 46	R 51	A	54	67	R 54	56	72	76	80	76	73	71	71	67	69	65	54	51	53	51	51	47
29	55	53	47	49	48	39	R 52	58	61	62	65	68	69	67	68	F 70	65	64	66	62	57	Z 57	57	60
30	50	F 49	53	57	F 60	59	F 67	71	Z 73	80	81	81	F 81	76	70	69	65	61	B	45	51	F 56	R 52	51
31	46	46	42	F	Z 58	F 65	F 73	80	71	F 76	81	91	81	76	74	71	64	63	57	57	55	57	52	43
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	21	21	17	25	22	23	25	20	26	25	26	28	29	30	31	28	29	29	28	27	26	26	20
MED	46	46	47	47	50	52	52	60	61	62	64	64	64	67	68	66	61	57	52	51	50	49	49	47
U Q	52	50	51	52	56	59	62	72	76	76	80	76	74	74	74	71	65	63	58	55	54	53	52	50
L Q	42	43	43	44	47	47	47	55	52	53	56	56	57	61	60	60	56	54	50	46	47	46	47	44

DEC. 2025 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2025 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	62	61	52	57	118	37	43	35	34	38	36	35	41	37	37	32	43	30	30	35	35	34	43	47
2	^E 40	^B 38	42	36	51	44	33	36	39	41	35	37	41	38	40	33	32	29	31	^G 27	37	32	^G 33	43
3	^G 42	^G 39	45	37	^G 26	29	33	52	40	38	35	^E 35	^B 34	39	53	30	30	28	36	49	59	45	40	55
4	55	46	27	57	30	43	54	40	55	53	57	^E 39	^B 34	35	35	33	38	41	33	92	47	41	73	59
5	47	39	36	23	28	30	50	51	56	61	65	^B 47	^E 39	^B 33	32	31	30	28	^G 28	33	44	46	63	
6	64	45	27	54	30	51	41	37	39	37	^G 38	^B 37	^E 34	31	33	33	30	31	32	25	25	34	34	
7	44	41	48	32	30	29	57	55	^E 57	^B 39	35	34	^E 37	35	35	33	39	29	^E 31	^B 44	69	67	73	73
8	52	65	88	38	32	34	32	35	^E 41	40	40	55	71	64	54	49	43	48	38	42	35	29	25	30
9	19	25	22	37	^G 36	39	^G 36	46	35	37	35	36	37	52	51	34	33	33	^E 37	^B 33	38	34	^G 31	32
10	48	42	28	75	50	34	39	44	53	47	60	40	42	38	35	34	33	66	36	35	68	49	50	64
11	78	63	86	63	44	29	63	49	^G 35	62	36	34	62	39	37	36	35	32	^E 45	^B 29	25	40	45	45
12	37	22	71	39	67	32	33	64	64	61	106	114	68	39	113	33	^E 35	^B 39	31	44	41	56	60	75
13	126	114	85	54	51	42	35	38	53	36	37	63	37	36	35	31	31	30	45	31	27	41	35	37
14	33	93	64	36	54	77	42	43	50	33	32	35	51	32	34	38	35	35	32	30	29	25	31	^G 19
15	41	33	31	42	52	40	^G 29	30	30	36	35	^E 37	50	44	34	33	37	^E 32	^B 27	^G 25	^G 26	22	21	23
16	38	45	47	48	41	38	49	44	36	38	35	48	93	41	46	34	31	30	28	29	41	31	39	52
17	73	67	51	62	47	31	50	55	57	49	^E 47	^B 37	32	49	37	83	31	29	30	29	^G 32	^G 25	32	55
18	115	66	50	65	49	39	33	60	48	38	47	^B 46	^E 37	^B 50	^E 46	^B 34	^G 27	^G 26	^G 33	39	^G 26	47	36	
19	35	^B 38	42	31	55	46	31	59	45	^E 44	^B 35	^E 35	35	34	31	30	30	30	32	27	25	21	21	37
20	45	37	63	^G 37	71	56	41	34	30	30	32	34	36	34	40	33	44	35	^E 29	^B 34	30	25	28	33
21	36	49	48	38	51	62	49	49	35	35	32	^E 35	^B 37	35	30	^E 45	33	36	43	51	59	51	61	56
22	47	29	62	42	24	28	74	53	61	63	^E 38	45	^E 45	^B 48	125	32	31	59	35	37	40	46	69	65
23	31	118	35	65	27	83	64	42	^B 36	37	^E 49	^B 49	^E 40	^B 34	^E 35	33	33	32	32	41	33	44	106	
24	34	20	33	34	25	^B 42	54	57	^E 37	35	36	138	51	37	34	127	130	32	30	30	35	41	43	
25	30	58	39	53	44	37	41	36	65	61	128	^E 37	^B 36	^E 54	^B 61	^E 37	^B 32	34	32	29	26	24	26	35
26	30	30	54	41	31	35	47	60	54	36	38	42	^E 39	^B 39	38	37	^E 38	^B 30	28	34	29	27	36	34
27	40	27	41	^E 37	^B 33	35	52	^E 38	37	37	41	35	41	40	41	34	30	28	39	29	27	30	29	
28	28	37	^E 49	^B 54	^E 51	^B 45	49	48	46	38	35	37	52	41	37	38	33	32	29	41	32	26	24	43
29	42	47	44	44	27	38	73	49	51	49	37	^E 38	124	^E 44	^B 39	^E 37	31	36	41	39	42	74	31	25
30	36	38	32	29	31	29	44	42	42	42	48	39	39	38	35	36	34	^E 50	^B 44	45	47	54	52	
31	45	63	28	53	52	50	38	46	36	36	41	^G 38	36	40	40	47	39	34	32	31	43	43	26	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	31	30	31	31	31	30	31	31	30	31	30	29	30	31	31	31	31	31	31	30	31	31	31	31
MED	42	44	44	42	39	38	42	46	47	38	36	37	38	38	37	34	33	32	32	33	35	34	36	43
U Q	52	63	54	54	51	45	50	52	56	49	47	42	51	44	46	38	38	36	36	41	42	45	47	56
L Q	35	37	33	37	30	32	35	37	36	36	35	35	36	36	35	33	31	30	29	29	29	26	30	34

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2025 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	23	17	22	22	35	11	25	15	12	11	13	14	11	26	21	11	7	12	16	13	8	11	19	13
2	40	16	17	13	28	11	7	14	13	13	15	11	13	12	11	20	15	13	13	16	12	14	14	25
3	24	10	11	13	9	11	10	15	11	16	18	35	13	15	36	25	22	14	12	13	11	19	13	35
4	9	14	9	9	10	9	19	9	9	15	11	39	19	19	16	13	11	9	9	10	8	8	7	10
5	13	17	7	8	7	11	21	11	15	18	25	B	47	39	18	14	13	20	20	14	9	12	13	27
6	36	17	11	15	9	16	12	14	17	16	B	38	37	22	15	20	22	26	14	10	9	7	6	17
7	15	21	16	15	10	11	19	20	25	13	12	14	37	15	13	23	20	17	31	15	13	11	9	8
8	6	7	8	7	6	7	11	11	41	10	19	9	12	9	12	10	13	7	8	6	7	6	9	6
9	6	6	7	14	24	15	25	14	13	9	14	19	15	23	15	15	12	12	37	33	7	10	15	15
10	16	14	12	18	12	7	12	13	9	13	18	14	15	23	19	17	13	19	14	8	13	11	14	8
11	7	14	18	13	11	7	15	11	11	9	12	14	30	13	23	10	16	13	45	9	9	8	7	6
12	7	8	8	8	9	7	9	15	13	13	24	38	25	24	21	26	35	11	11	11	8	9	7	9
13	8	7	7	8	7	9	8	7	9	9	9	8	9	9	13	9	9	10	9	7	6	7	5	8
14	7	17	25	7	5	11	11	9	8	9	9	10	9	9	9	9	7	11	9	14	8	7	6	7
15	7	6	11	10	16	9	7	7	7	7	16	37	17	13	9	13	8	32	14	14	16	15	8	6
16	11	13	13	7	7	8	7	31	7	13	12	9	12	9	10	7	8	9	7	6	7	6	7	17
17	9	15	13	15	13	7	13	10	14	13	47	37	24	19	18	25	9	8	7	14	7	8	6	11
18	11	9	6	9	16	8	7	12	15	12	23	B	46	37	50	46	34	16	15	13	9	8	9	11
19	21	B	15	22	10	23	27	8	13	12	44	35	19	12	13	14	14	11	10	12	8	8	6	8
20	24	11	26	24	11	19	12	7	11	8	8	13	14	9	12	8	9	8	29	15	6	9	7	8
21	15	32	15	6	18	10	10	8	9	10	11	35	37	10	24	45	9	14	9	9	9	7	12	6
22	6	7	13	8	6	8	14	15	13	15	38	32	45	48	44	23	15	8	12	14	8	8	9	18
23	9	18	7	15	7	15	24	27	B	17	17	49	B	40	24	35	17	9	13	11	8	13	18	16
24	7	7	13	8	7	B	11	15	37	37	15	28	25	51	37	15	46	41	9	15	9	7	11	23
25	7	37	13	23	14	11	11	9	14	35	47	37	36	23	36	37	32	13	10	25	7	13	12	7
26	13	13	23	16	18	20	7	11	14	12	10	11	39	39	18	18	38	25	19	15	13	9	9	6
27	8	9	14	37	8	13	15	26	38	11	25	10	11	12	15	24	17	21	19	16	11	7	8	7
28	9	33	49	24	51	45	12	13	10	14	8	12	12	8	17	24	24	26	13	12	12	15	7	13
29	12	14	8	7	7	11	15	9	11	15	14	38	39	44	39	37	23	25	32	21	12	23	14	9
30	8	7	12	19	7	13	8	9	8	14	18	16	15	15	13	14	23	50	B	9	9	9	8	9
31	11	7	5	11	7	11	9	7	9	7	7	26	17	11	13	9	8	20	8	15	19	9	7	5
	00	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	14	13	13	10	11	12	11	13	13	15	26	19	15	17	17	15	13	13	13	9	9	9	9
U Q	15	17	16	18	16	15	15	15	15	15	24	37	37	26	24	25	23	21	19	15	12	12	13	16
L Q	7	7	8	8	7	8	9	9	9	10	11	12	13	11	13	11	9	10	9	10	8	7	7	7

DEC.2025 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2025 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

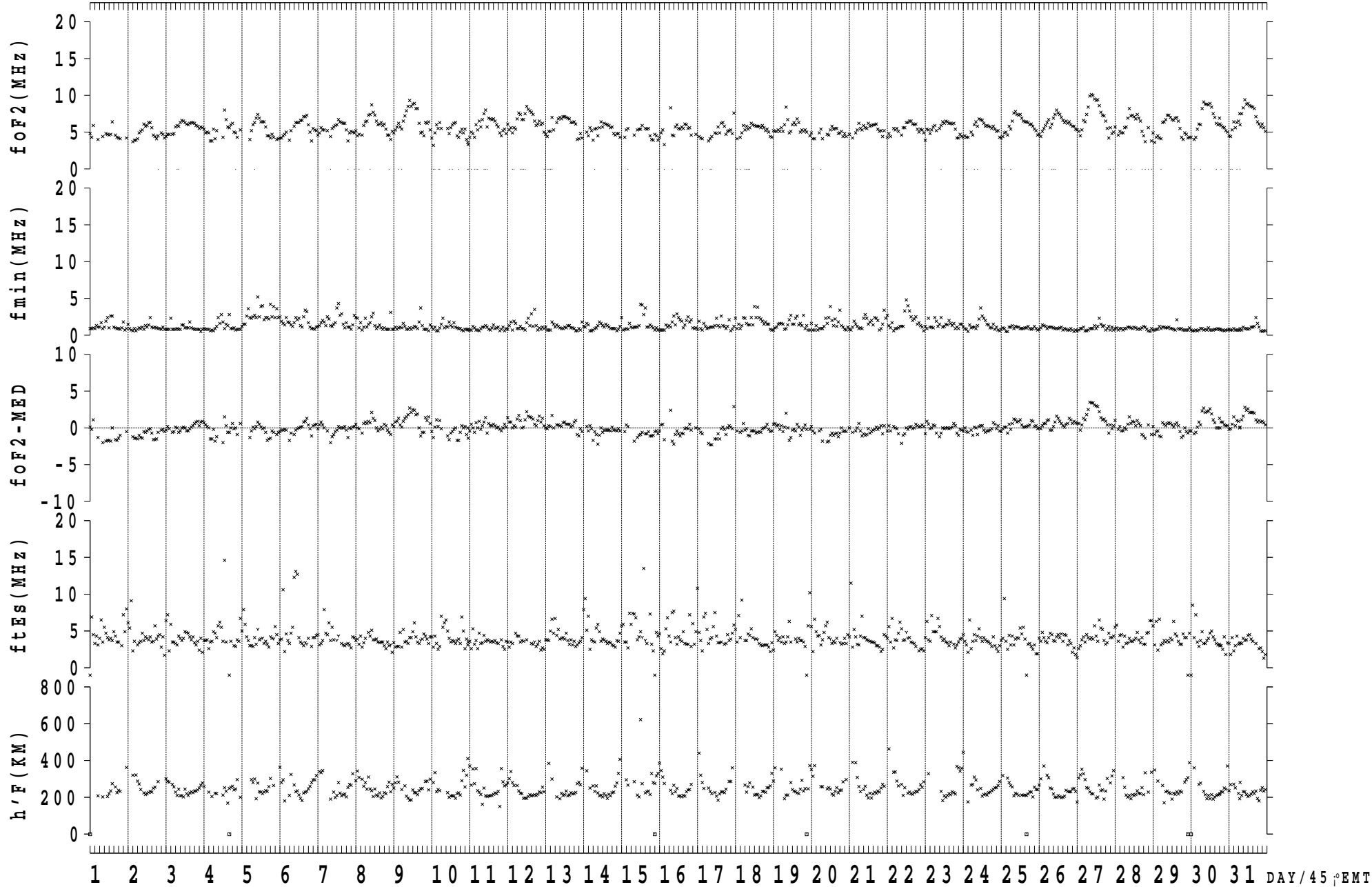
LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	A	A	A	A	254	202	204	194	196	198	220	220	218	218	216	204	E A	E A	A	A	A
2	B	A	350	A	A	A	242	256	222	245	214	200	214	200	H	H	215	220	225	228	234	A	A	A
3	A	A	A	E A	E A	240	232	E A	260	222	215	210	204	240	A	230	228	A	A	A	A	A	A	A
4	A	A	272	A	A	A	A	A	A	A	A	A	B	282	240	232	214	228	244	264	237	A	A	A
5	A	A	A	E A	280	250	260	A	A	A	A	A	B	B	E B	210	214	230	224	216	210	A	E A	A
6	A	A	E A	280	304	272	A	A	E A	A	A	B	222	260	220	216	218	219	228	220	268	252	255	250
7	E A	386	380	A	E A	E A	A	A	A	A	200	195	210	240	202	218	218	220	222	219	E A	A	A	A
8	E A	318	A	A	E A	E A	240	230	230	278	222	220	E A	E A	A	254	184	206	218	216	222	220	236	255
9	259	254	286	432	234	A	H	275	236	196	192	229	224	235	H	A	A	216	210	E B	259	248	264	250
10	A	342	318	A	A	260	A	264	A	A	341	334	228	258	232	212	218	210	246	E A	290	338	314	360
11	A	294	A	A	A	230	200	330	195	A	260	254	245	218	220	214	232	220	A	E A	284	258	222	283
12	E A	304	E A	A	210	A	E A	E A	A	214	A	A	B	A	A	260	232	232	240	288	A	A	A	A
13	A	323	A	A	A	A	A	246	240	A	246	220	216	210	222	216	214	208	214	242	244	234	A	E A
14	390	A	A	A	A	A	A	268	A	A	178	196	196	214	184	202	198	202	208	248	228	230	232	278
15	252	E A	E A	A	A	A	A	254	202	194	213	218	232	234	200	198	210	208	H	220	218	238	238	245
16	A	316	238	A	A	E A	E A	A	A	208	280	224	212	A	208	208	208	208	198	240	242	390	270	256
17	A	A	A	A	A	300	240	A	A	220	A	230	208	222	210	204	208	202	230	242	280	236	250	A
18	A	A	362	A	A	A	A	260	A	252	224	A	B	A	E B	A	210	198	222	280	A	A	268	E A
19	A	B	386	A	A	A	A	214	A	268	A	A	202	210	195	192	190	212	214	215	229	234	204	264
20	E A	290	A	A	A	A	A	260	218	218	196	186	208	212	198	208	205	200	212	223	220	E A	263	234
21	286	A	A	336	A	A	A	A	A	216	194	202	194	218	Q	208	228	A	228	224	263	A	A	A
22	A	288	A	A	208	236	A	A	A	286	256	A	B	A	B	214	210	175	A	266	254	H	E A	A
23	E A	296	A	A	A	A	A	A	A	B	A	A	B	B	236	202	214	218	213	230	202	246	200	A
24	A	352	298	282	352	195	B	A	A	A	248	202	224	234	A	218	192	A	A	228	238	255	280	336
25	332	A	358	A	A	A	264	294	236	A	A	A	228	209	214	212	202	218	222	224	238	240	234	250
26	E A	303	E A	A	A	A	A	A	A	214	208	198	232	220	212	196	218	220	220	E A	291	240	232	248
27	E A	265	278	330	198	E A	E A	236	217	248	202	202	202	220	210	204	208	206	225	230	244	224	244	264
28	274	380	B	A	A	A	A	220	238	206	198	208	236	208	208	218	209	216	245	298	A	274	236	240
29	E A	316	A	A	A	277	269	344	248	A	296	195	190	A	260	224	212	214	218	228	252	260	310	262
30	E A	268	300	A	200	246	201	238	240	224	234	246	194	187	194	220	196	210	A	B	296	188	284	A
31	A	302	A	248	316	A	A	258	260	204	204	202	205	210	210	216	212	210	236	230	230	232	248	268
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	13	13	12	16	16	17	19	17	26	23	27	24	28	30	29	30	27	27	28	28	23	24	17
U	291	294	321	295	256	254	250	238	218	221	214	210	218	218	214	212	213	220	226	241	248	240	257	282
U Q	325	332	360	344	272	270	268	264	250	246	229	228	238	234	220	218	219	224	242	274	277	280	282	313
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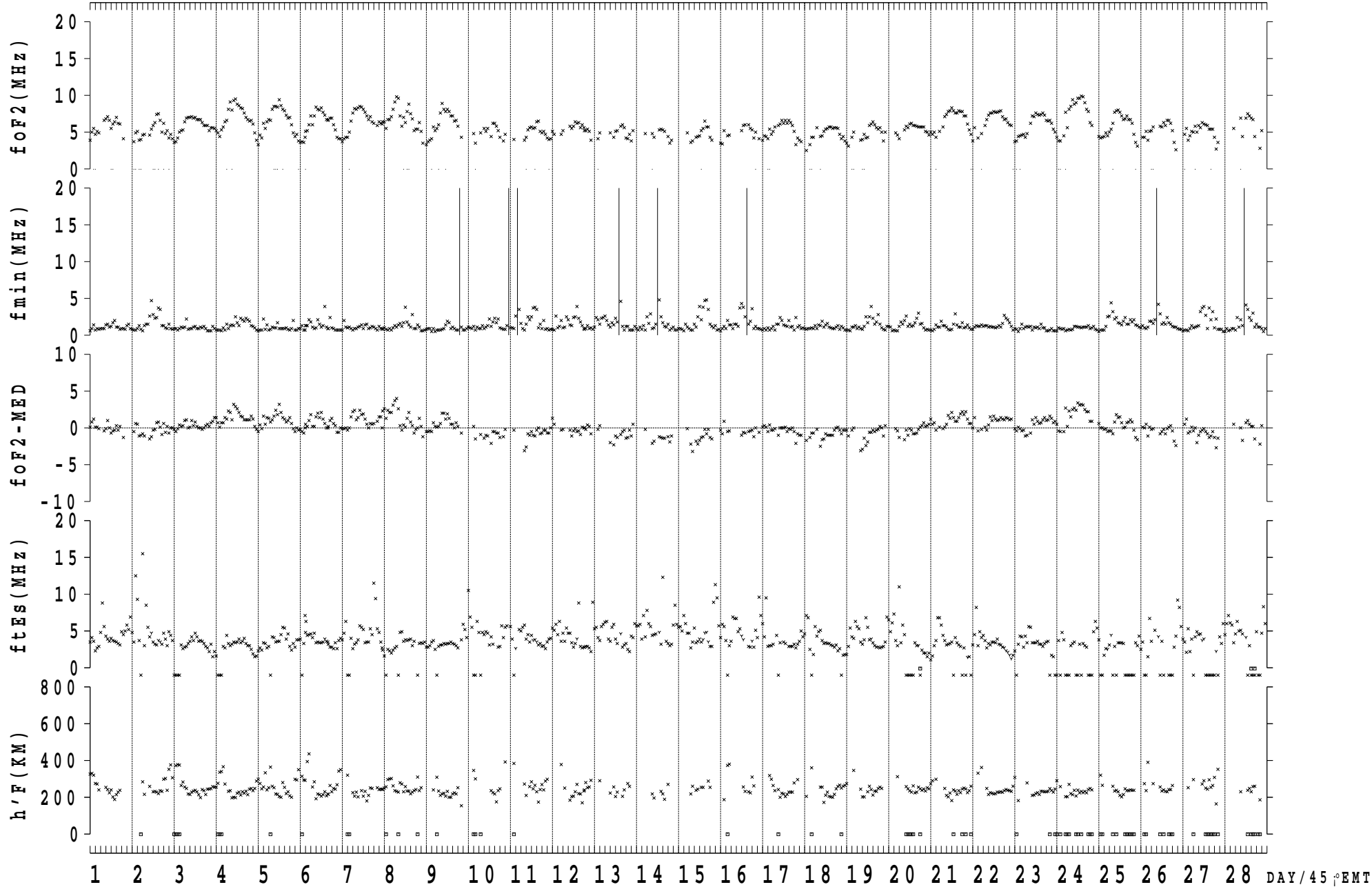
DEC. 2025 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

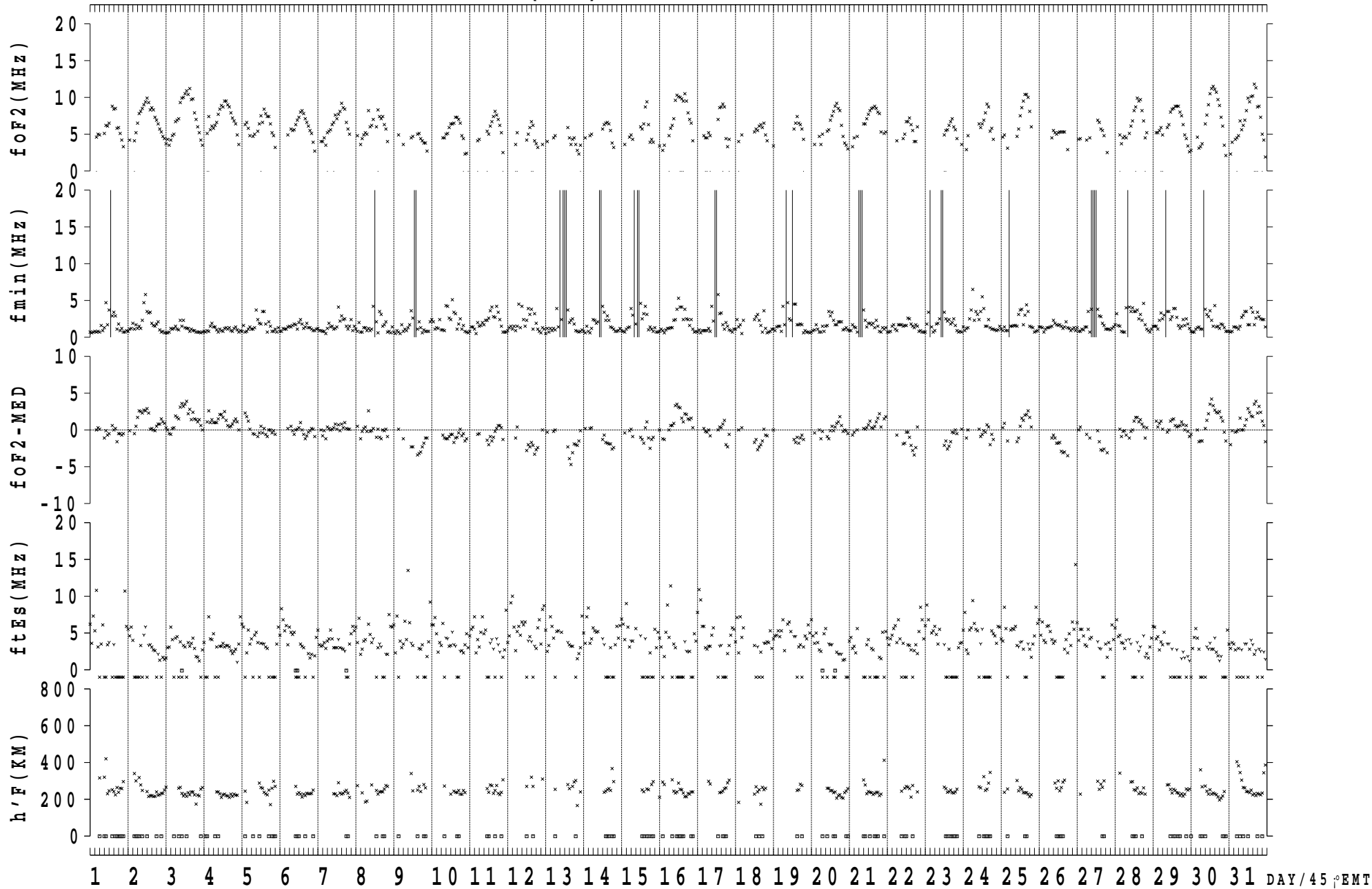
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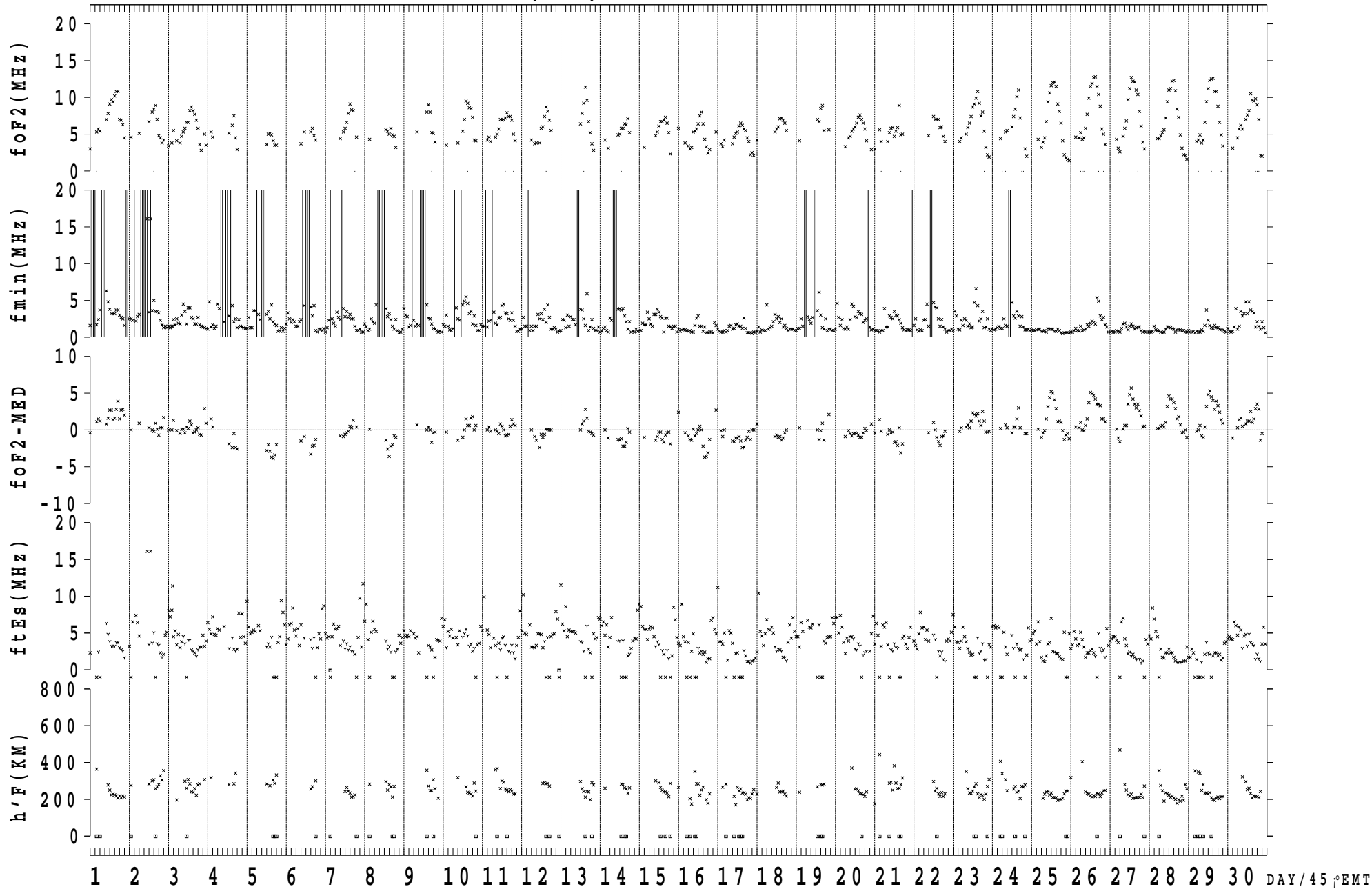
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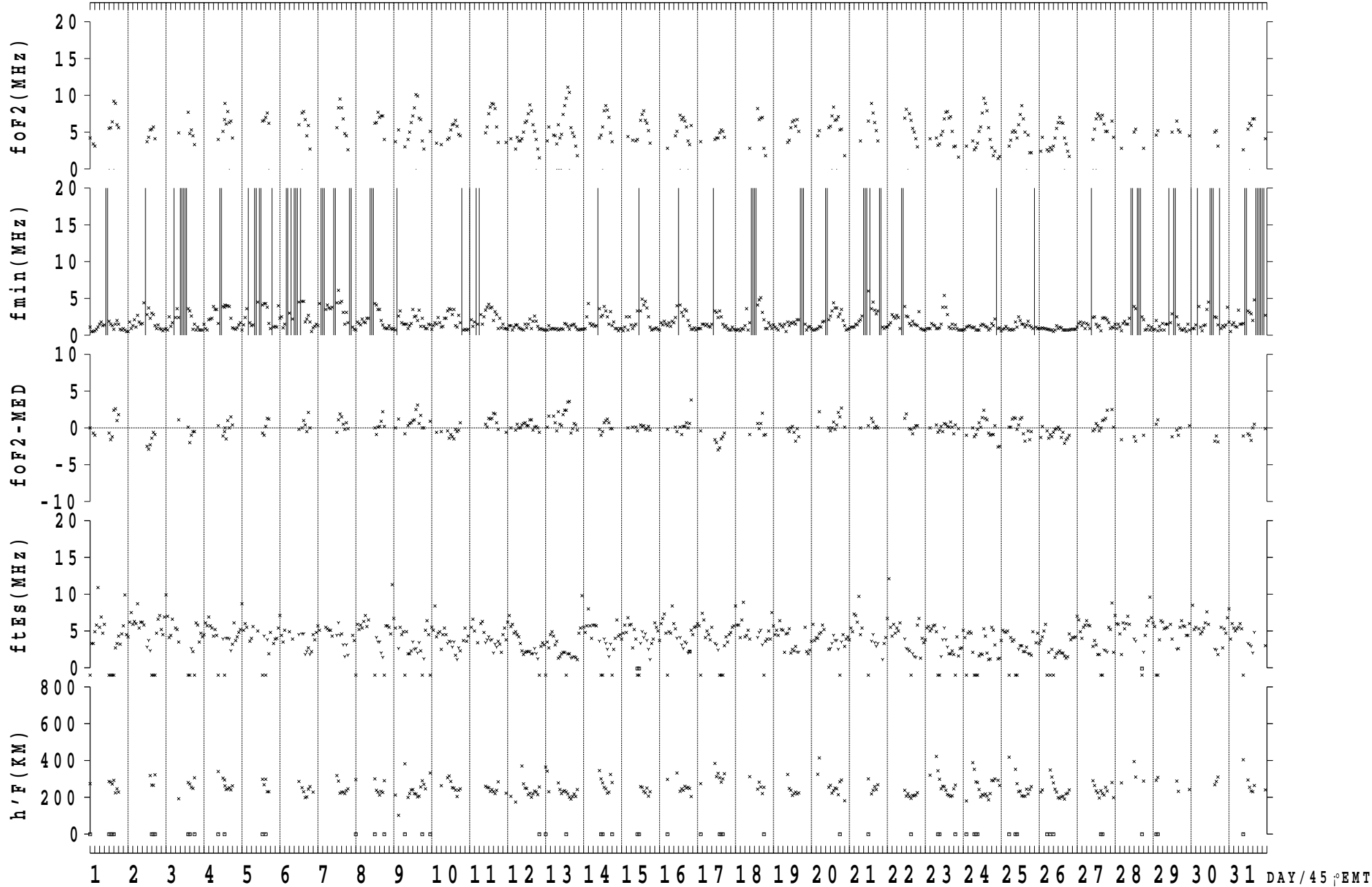
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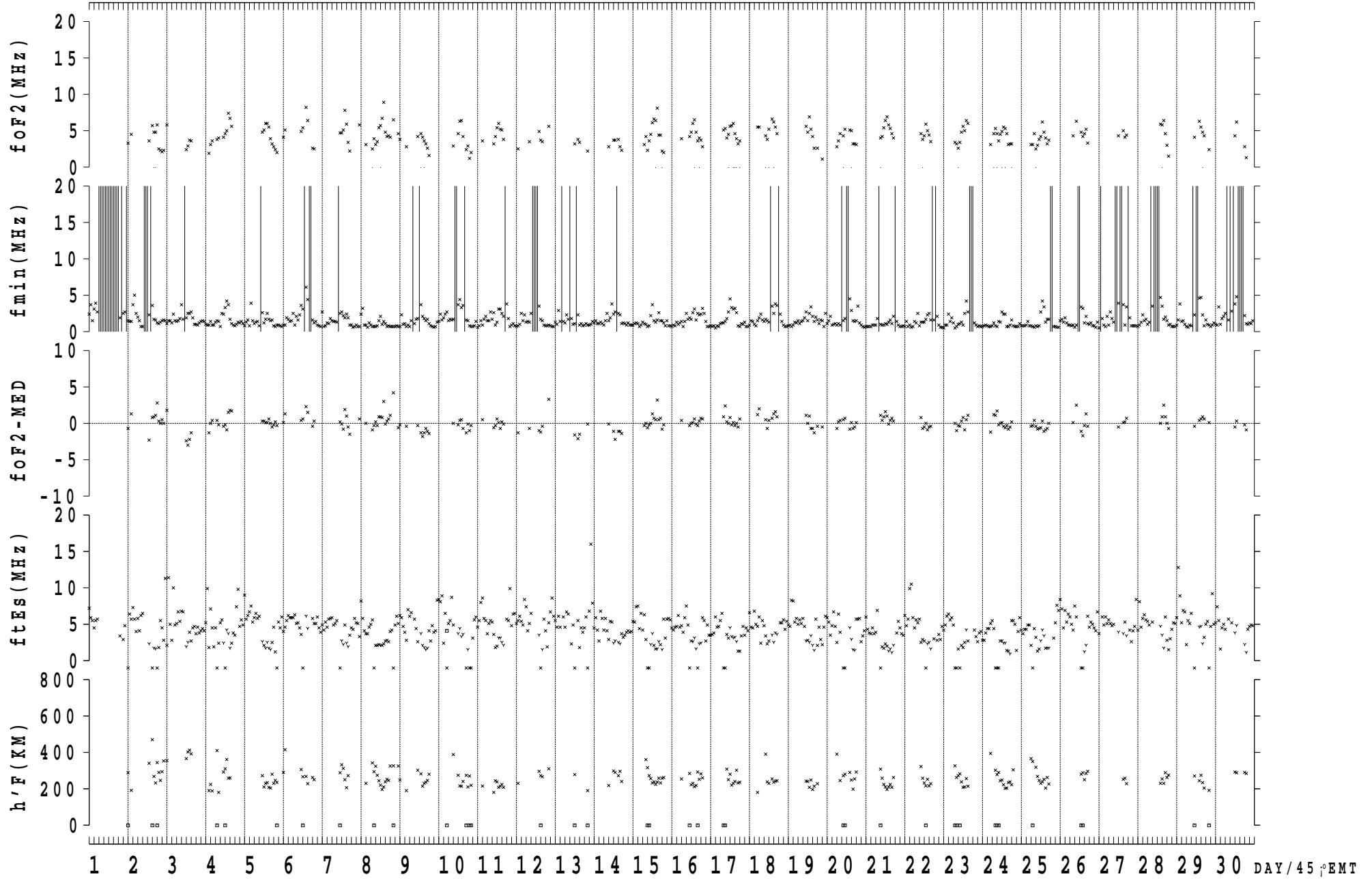
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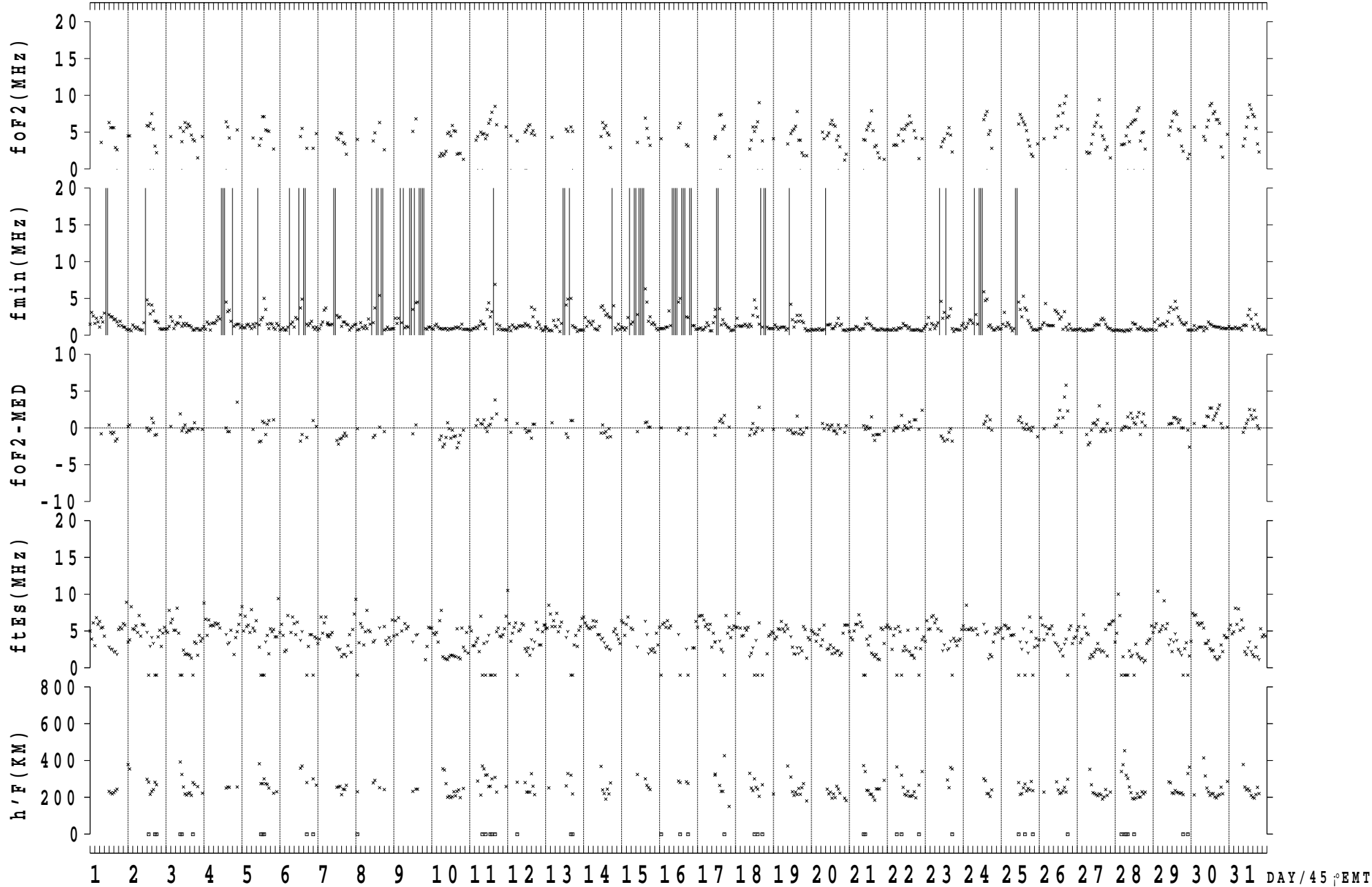
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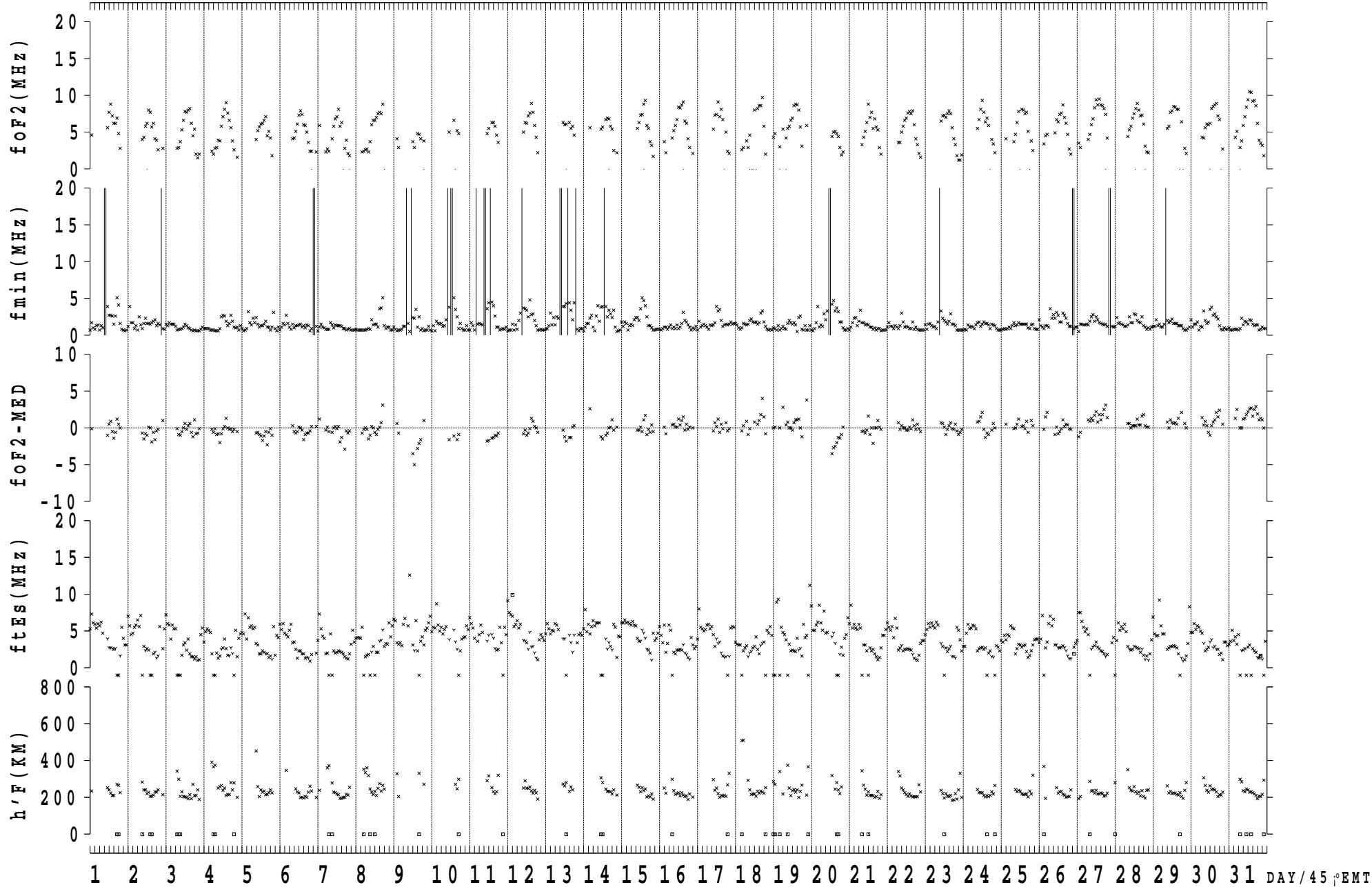
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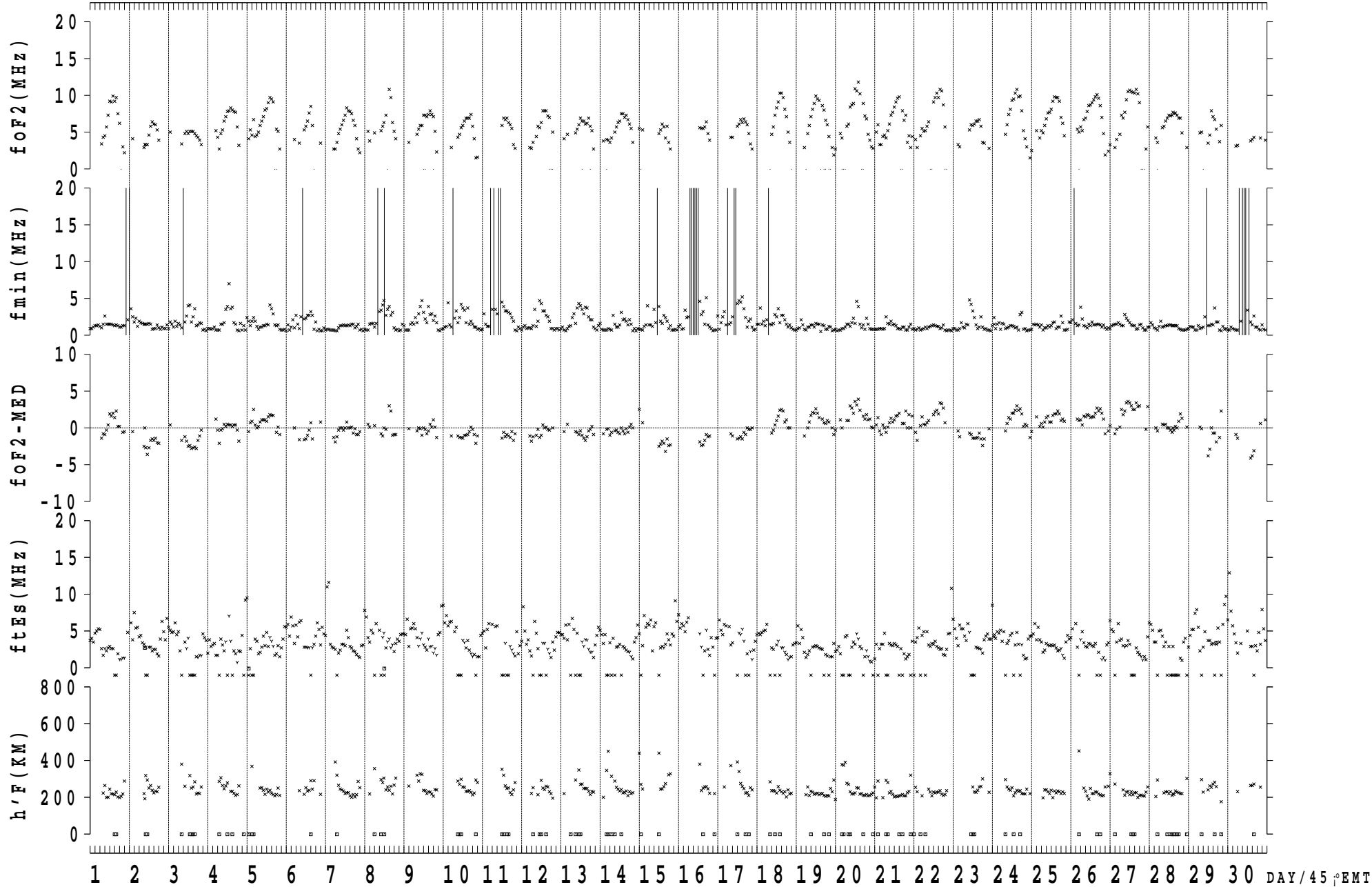
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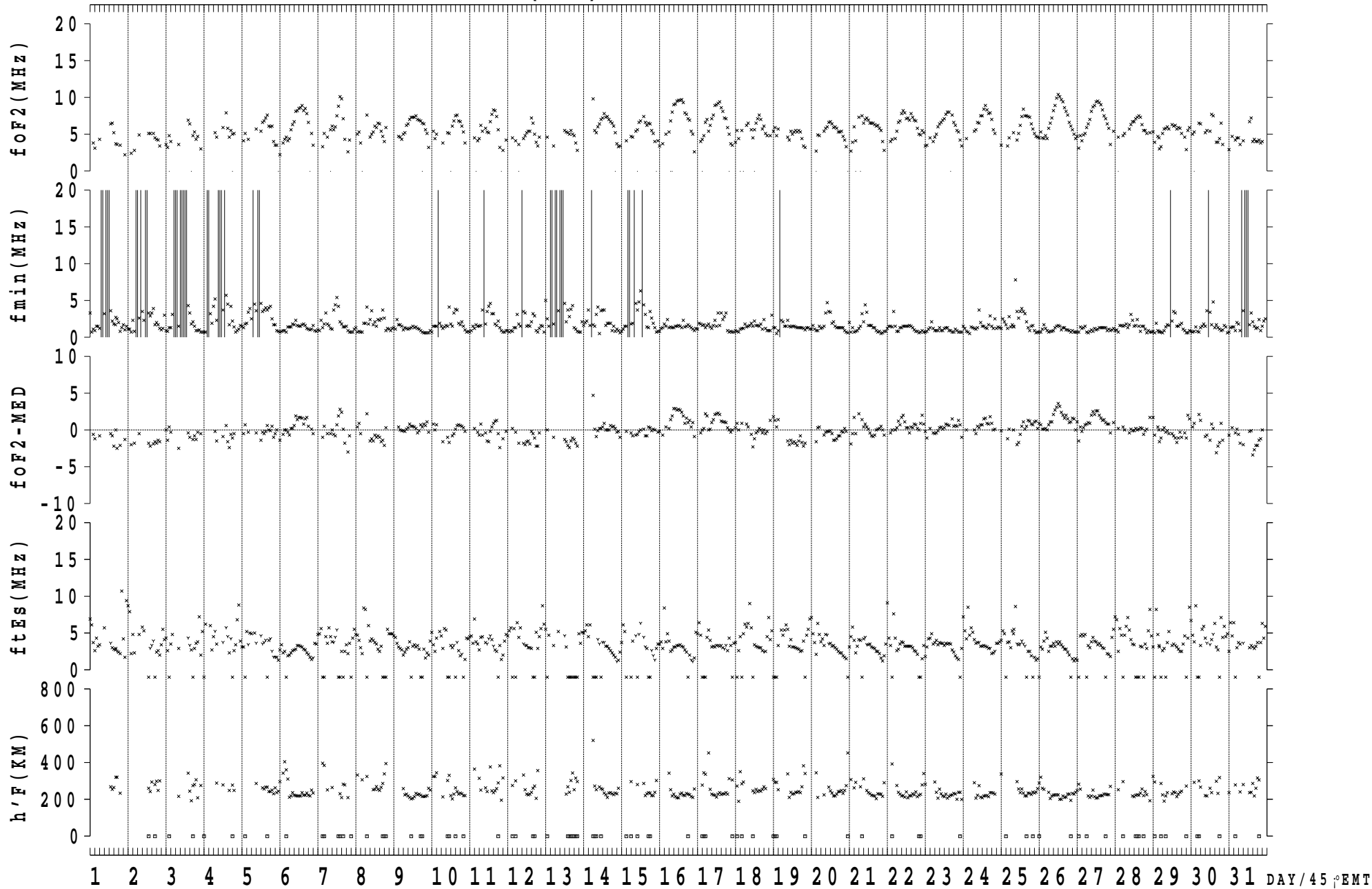
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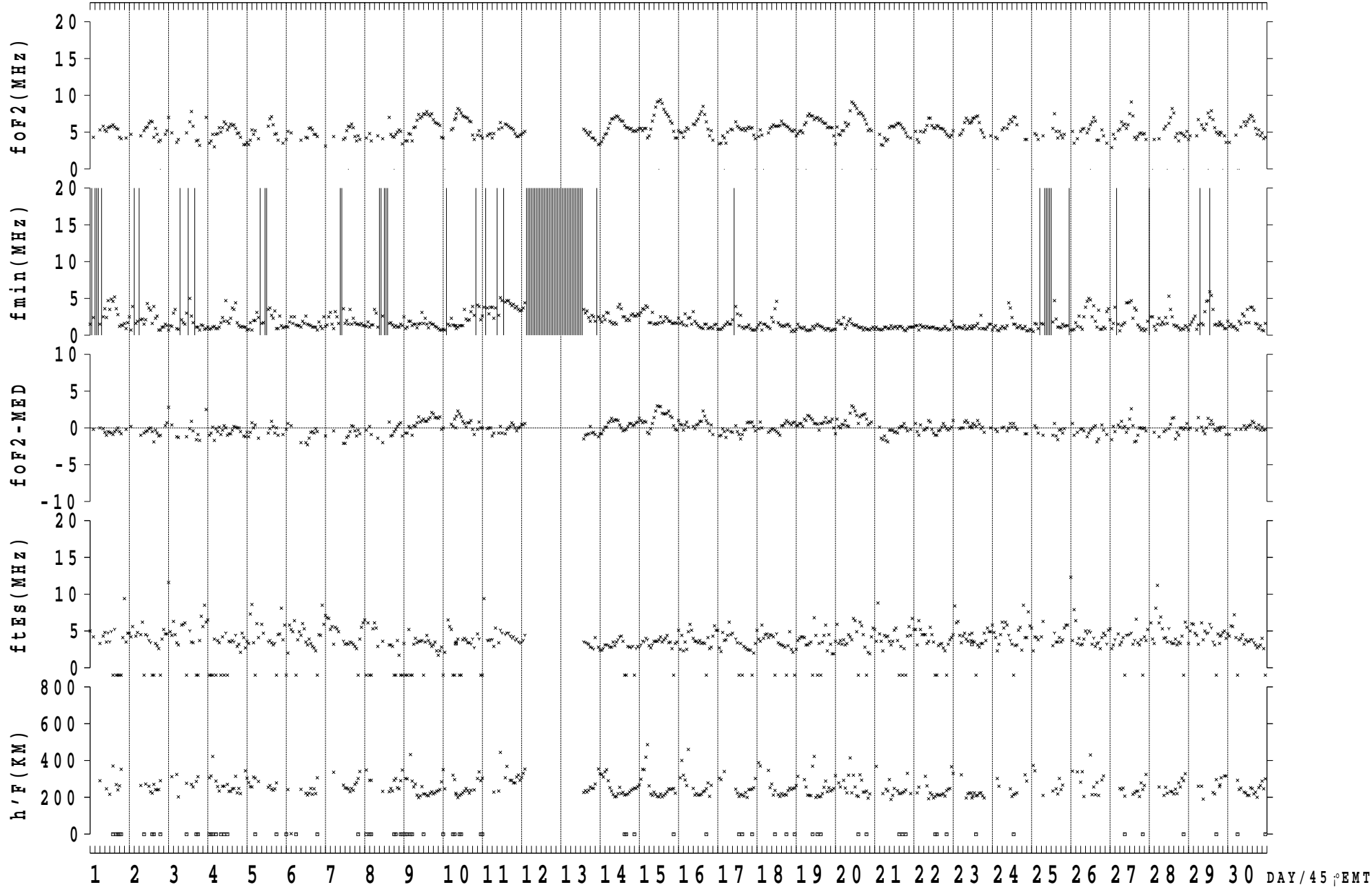
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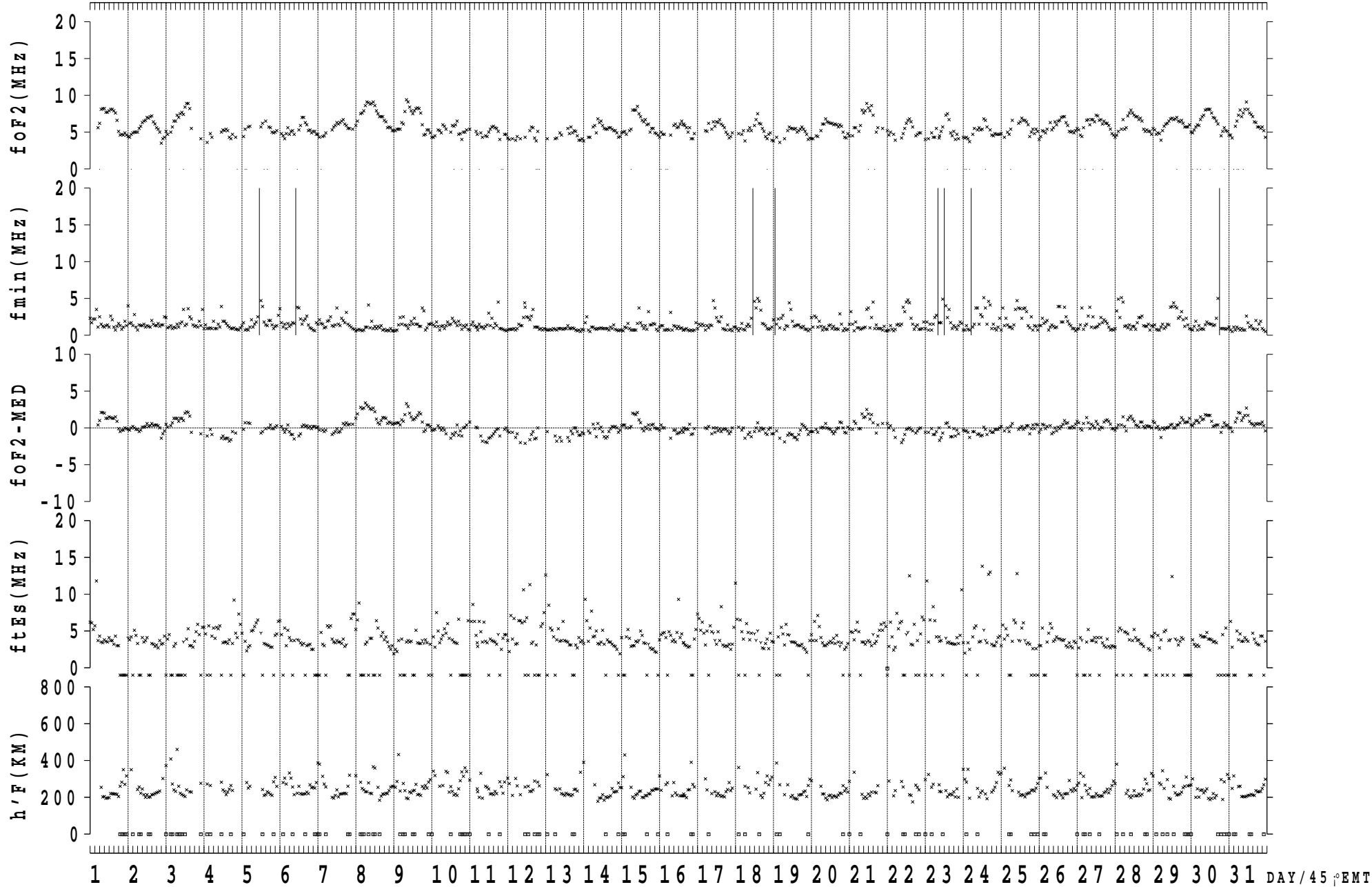
2025 1001 -> 2025 1031(99) SYOWA-ST.



2025 1101 -> 2025 1130(99) SYOWA-ST.



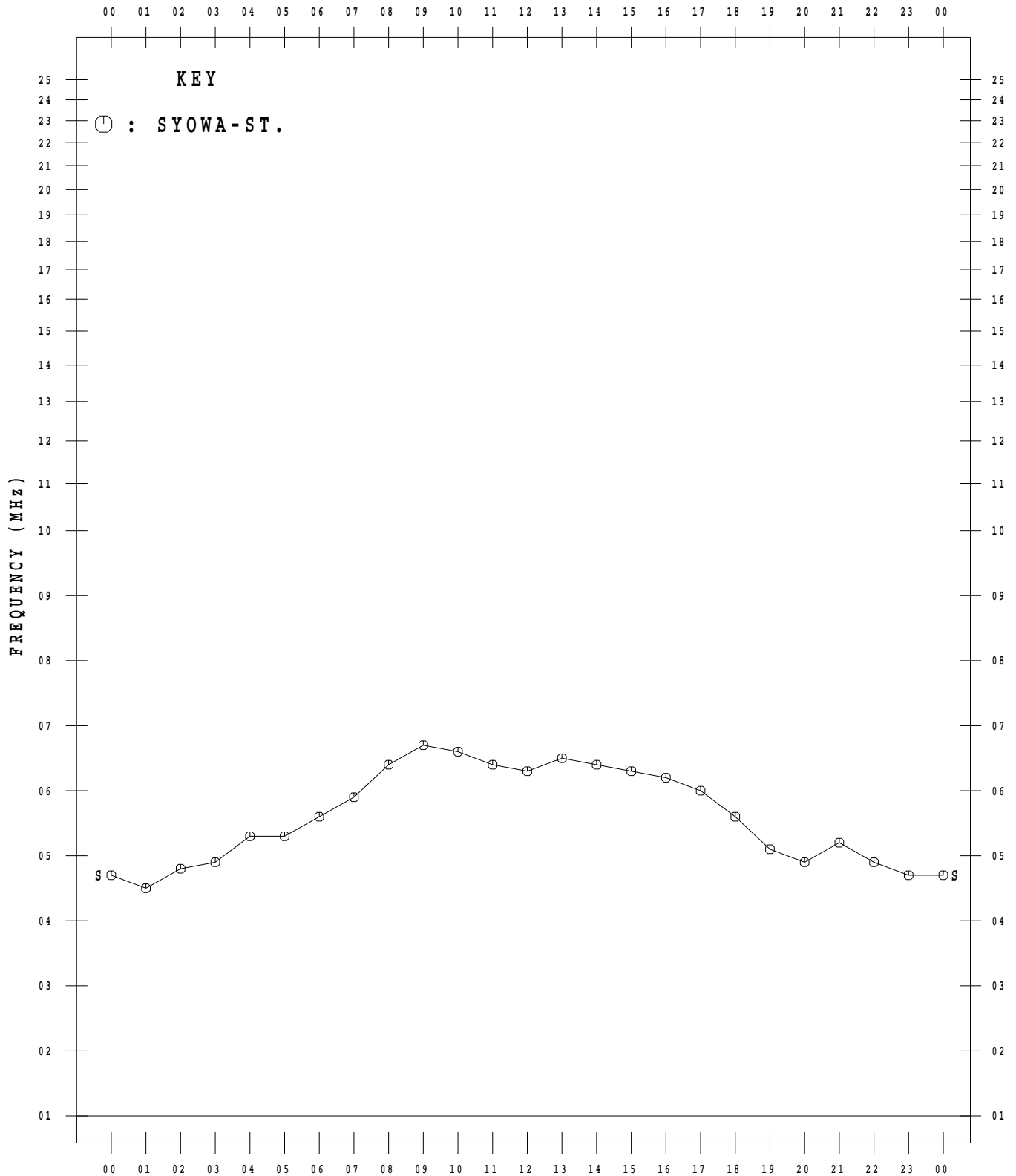
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MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

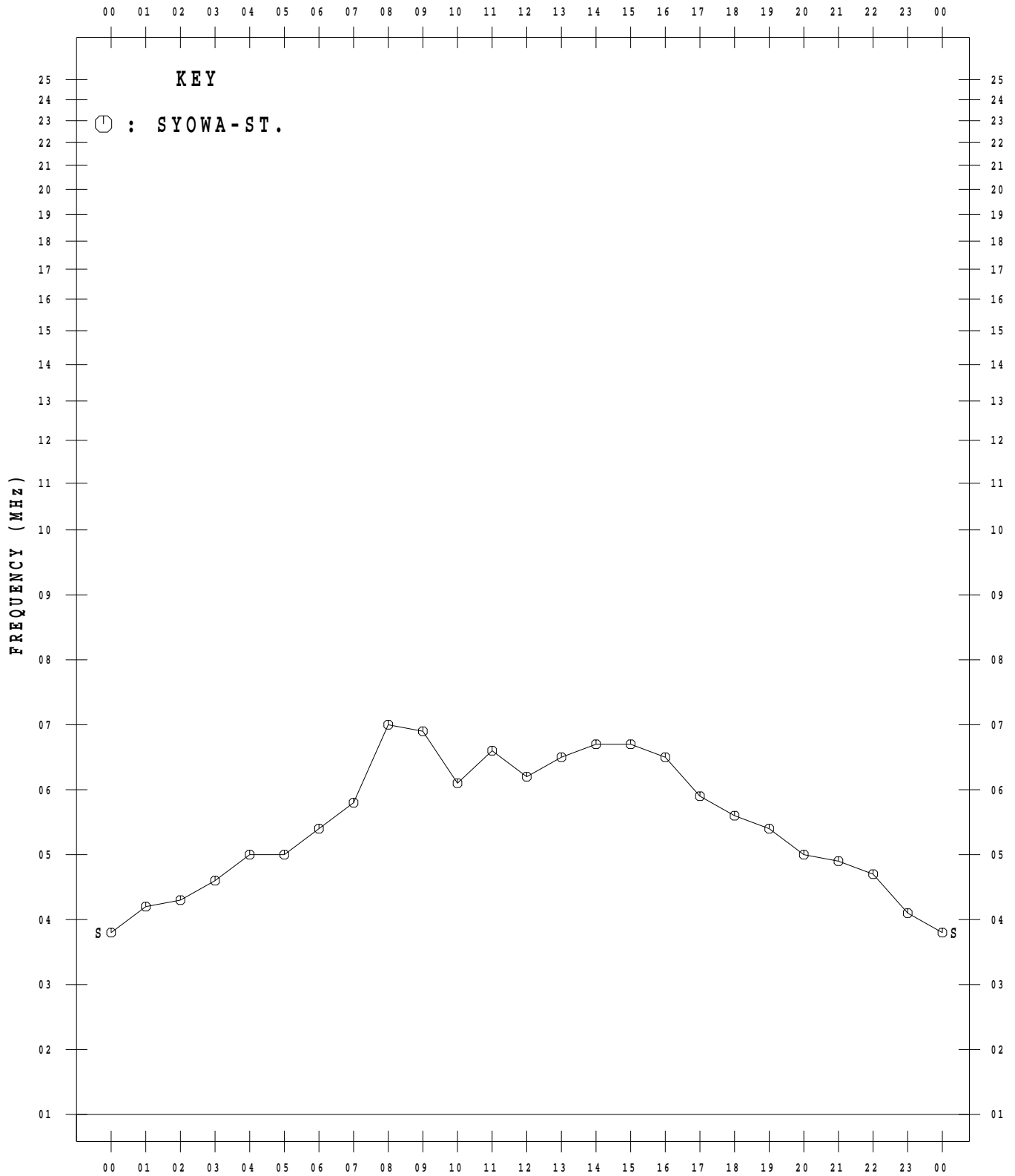
JAN. 2025



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

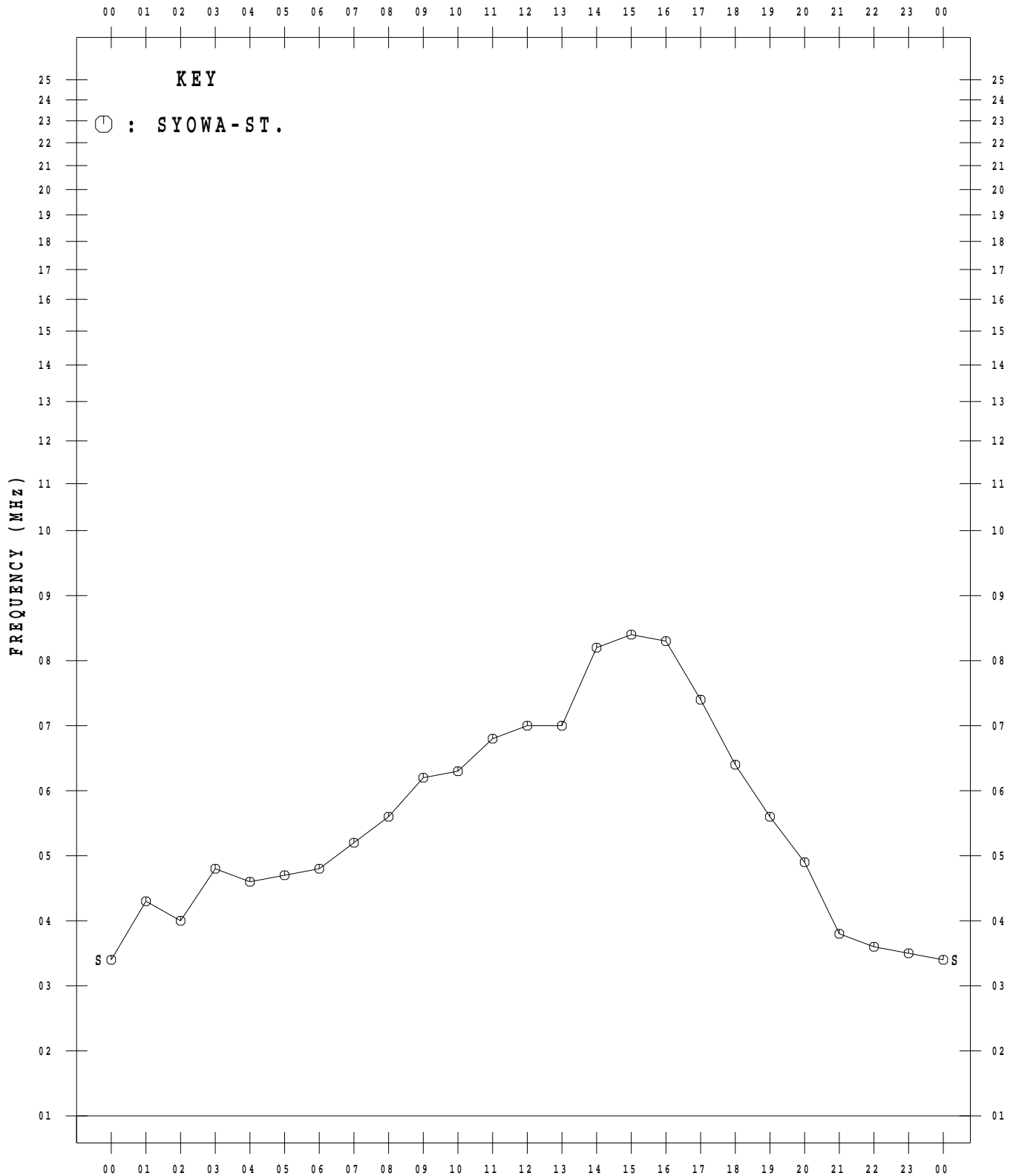
FEB. 2025



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

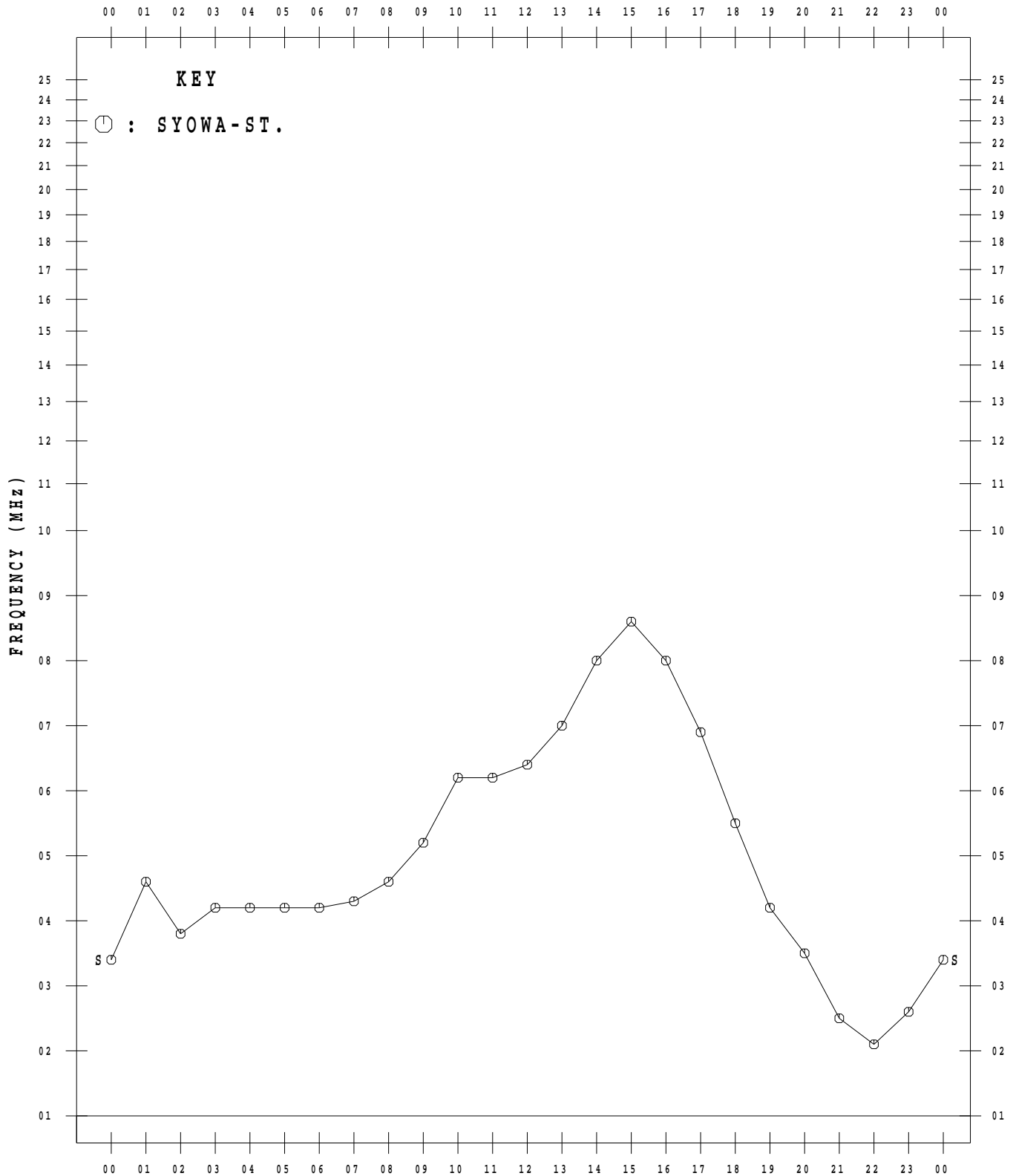
MAR. 2025



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

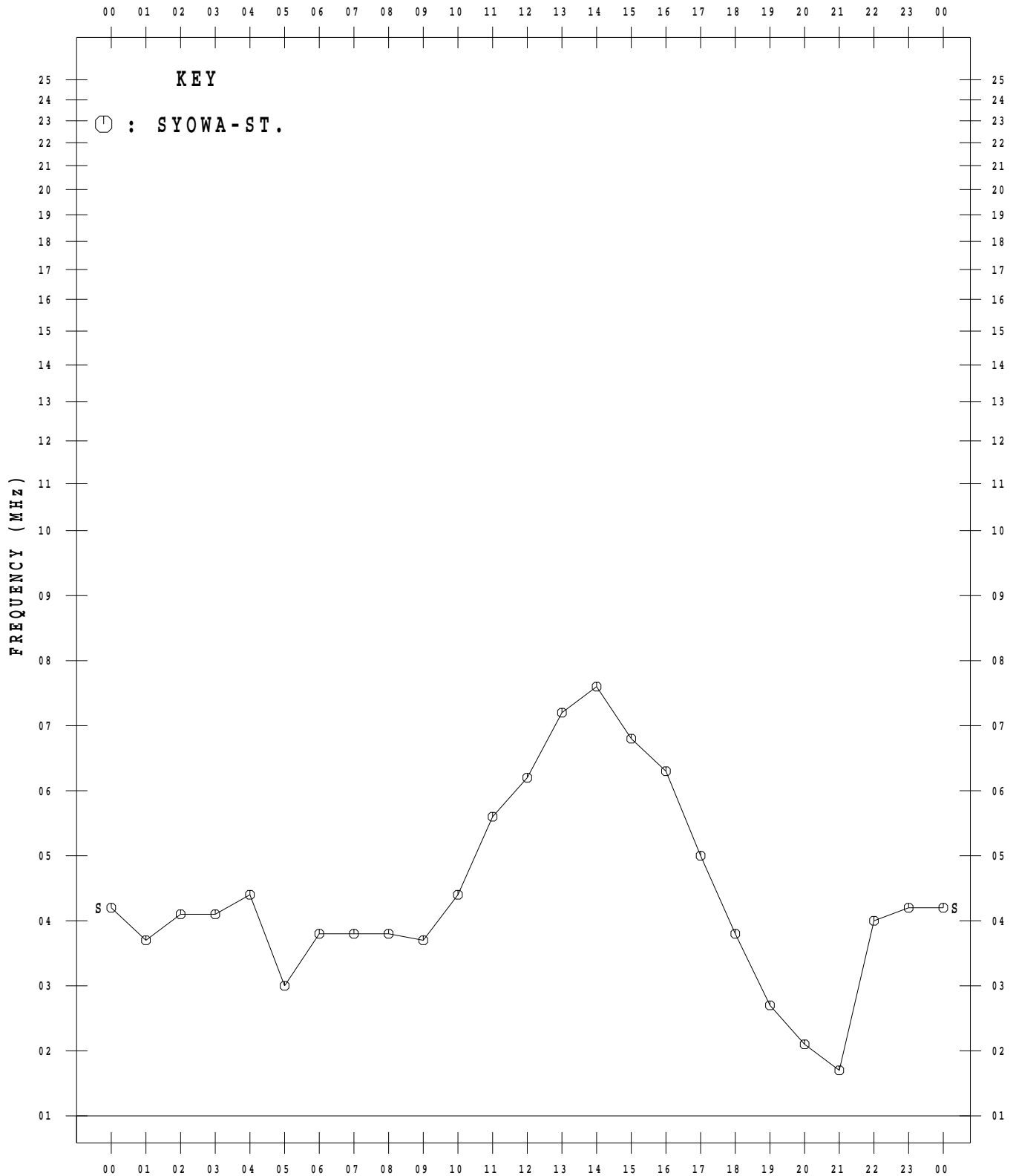
APR. 2025



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

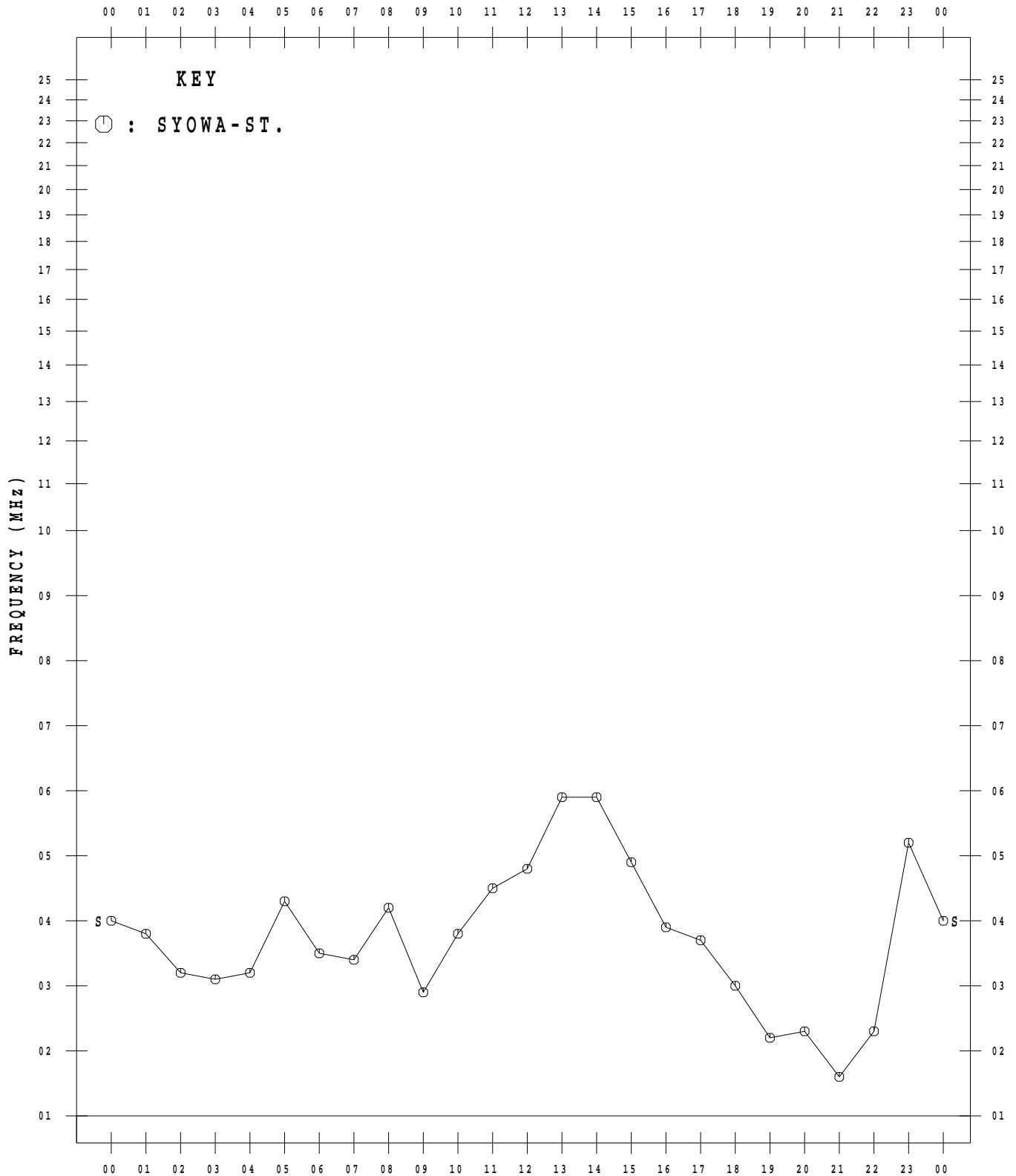
MAY 2025



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

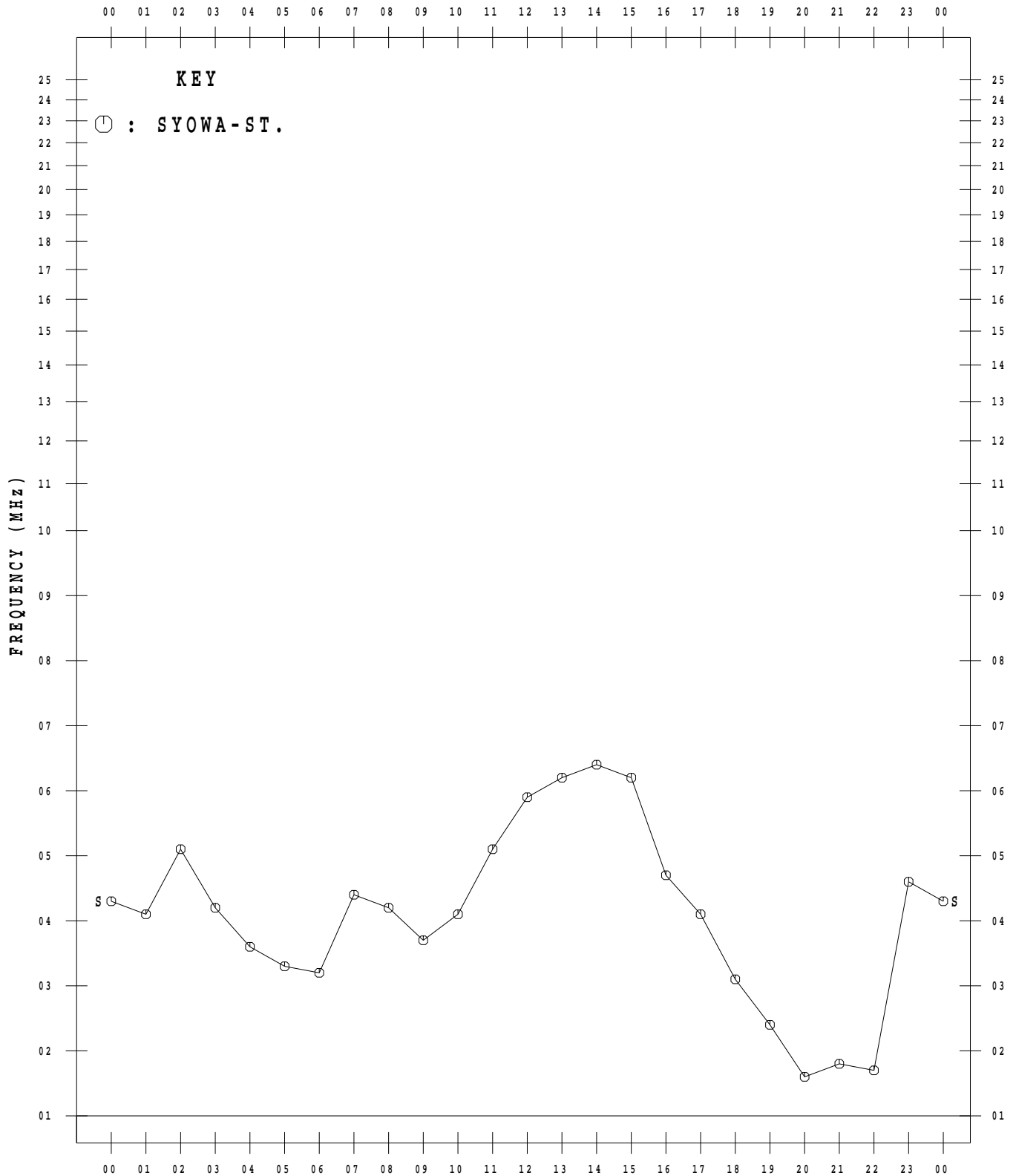
JUN. 2025



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

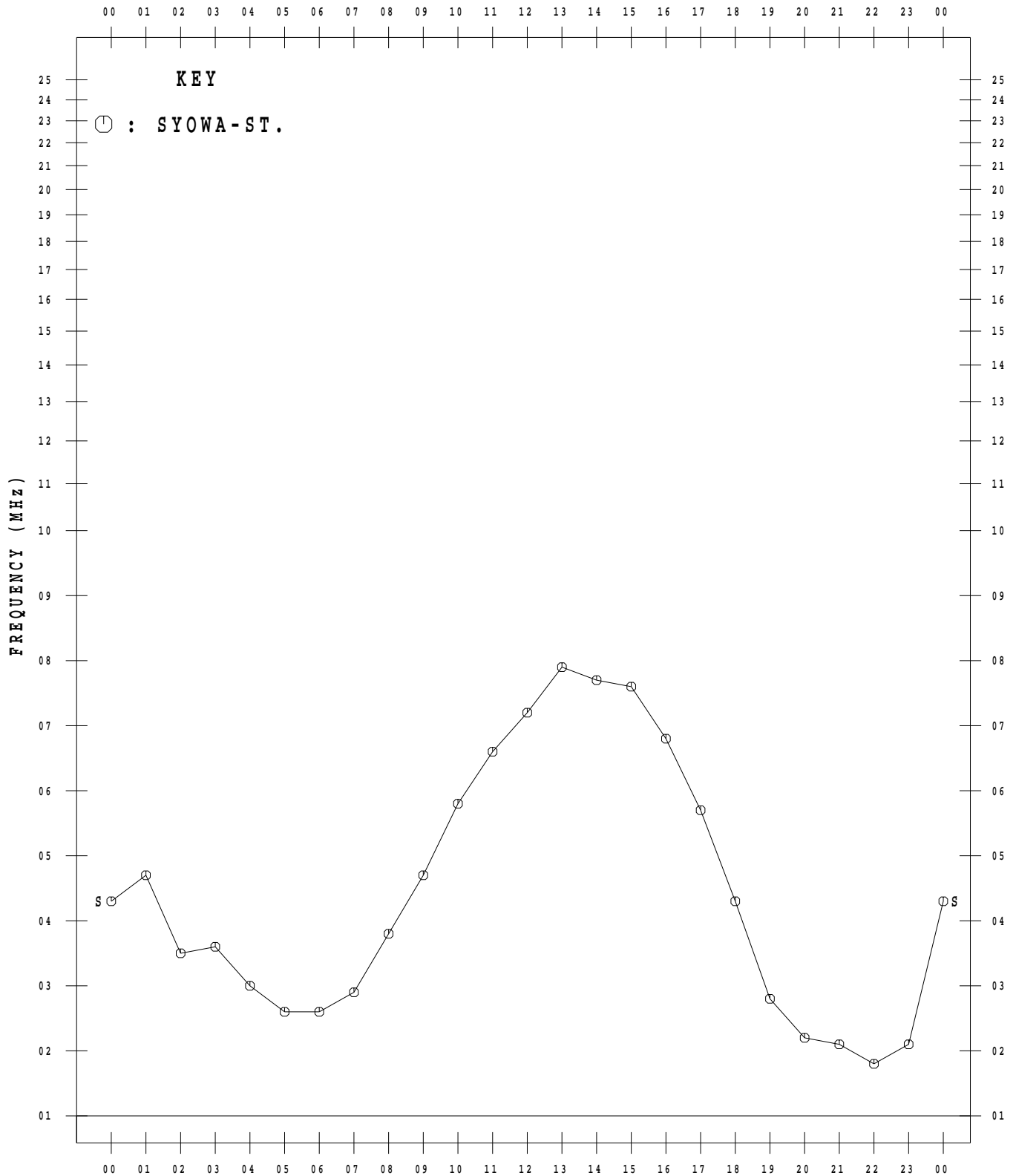
JUL. 2025



MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME

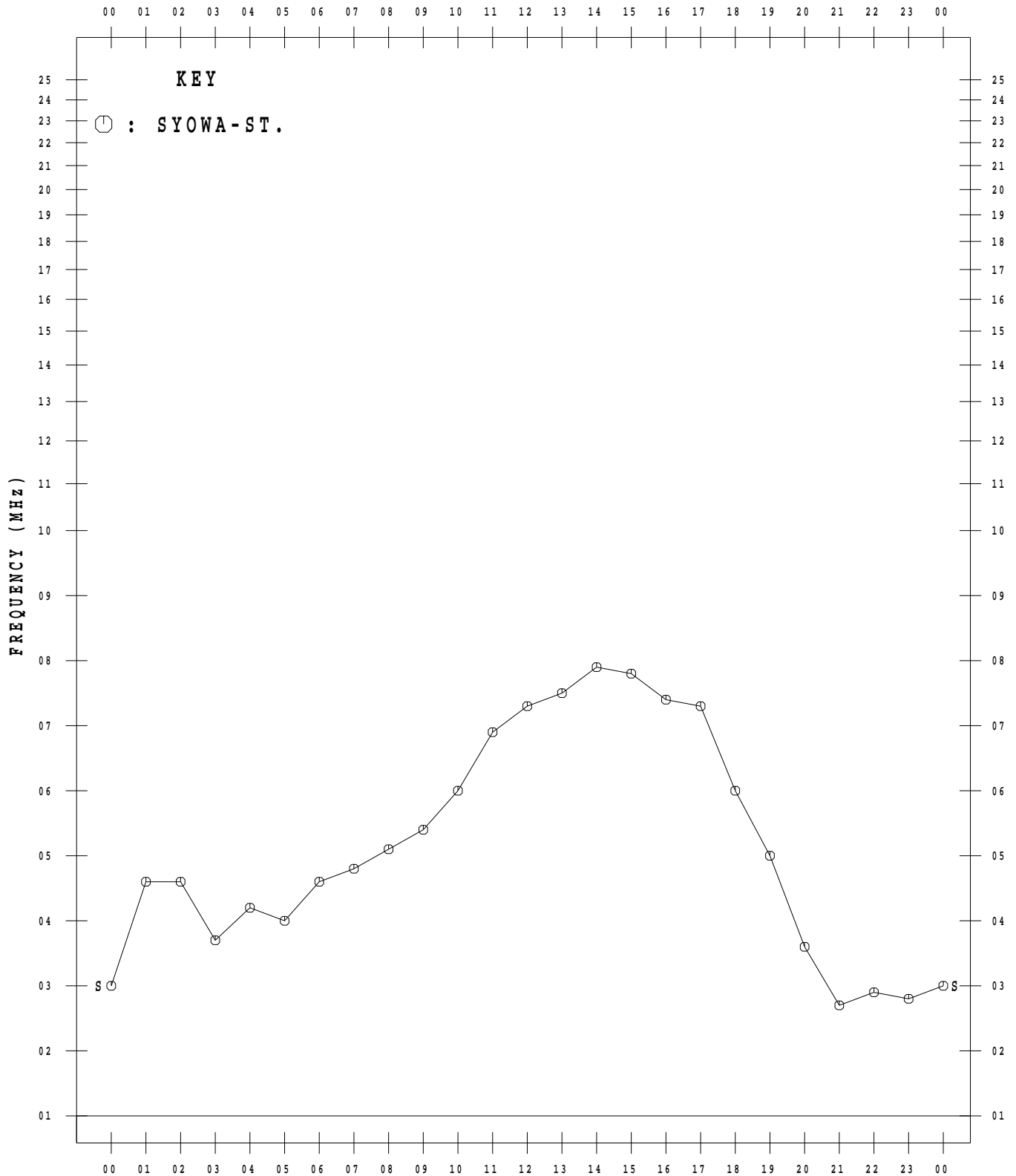
AUG. 2025



MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME

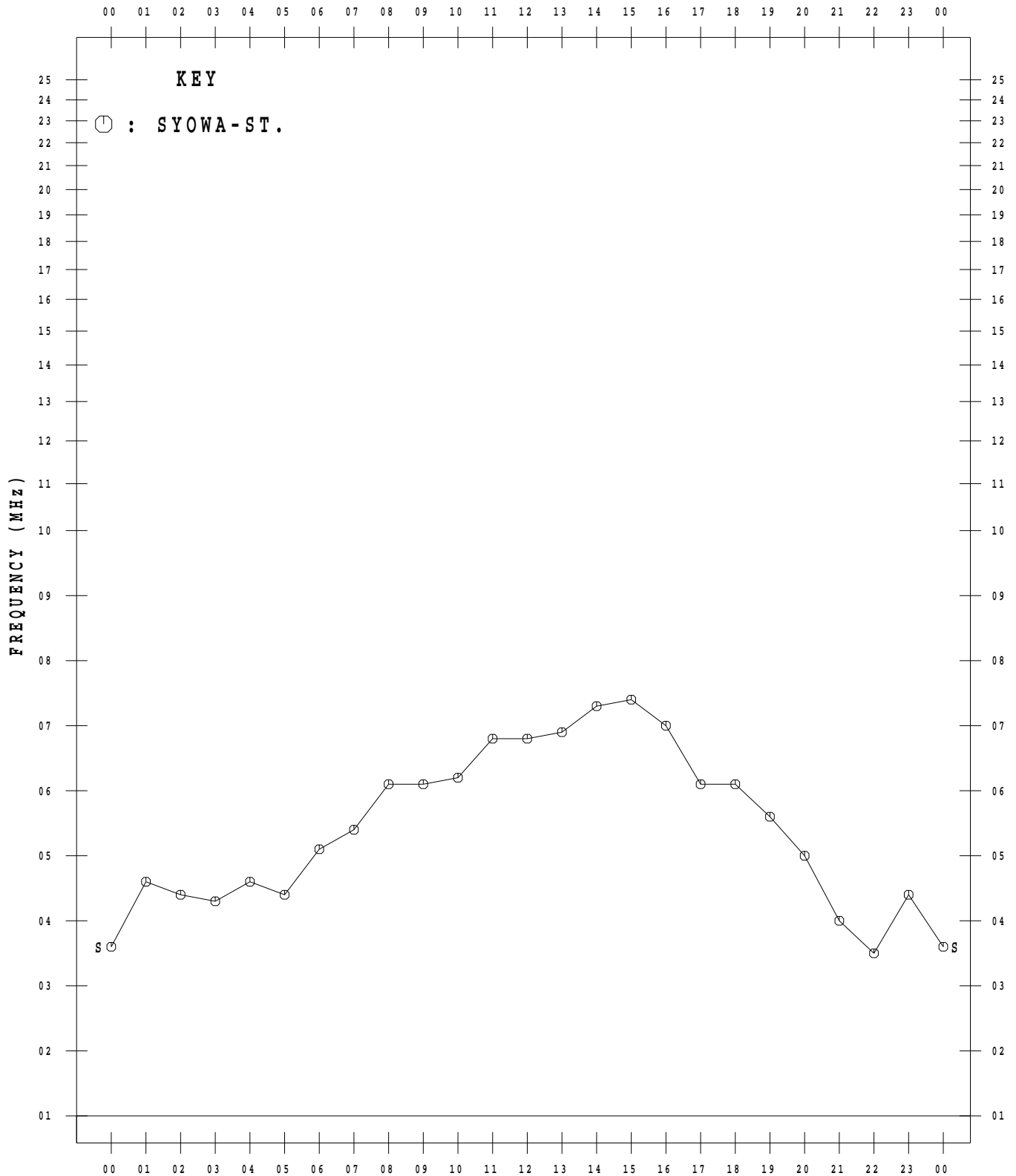
SEP. 2025



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

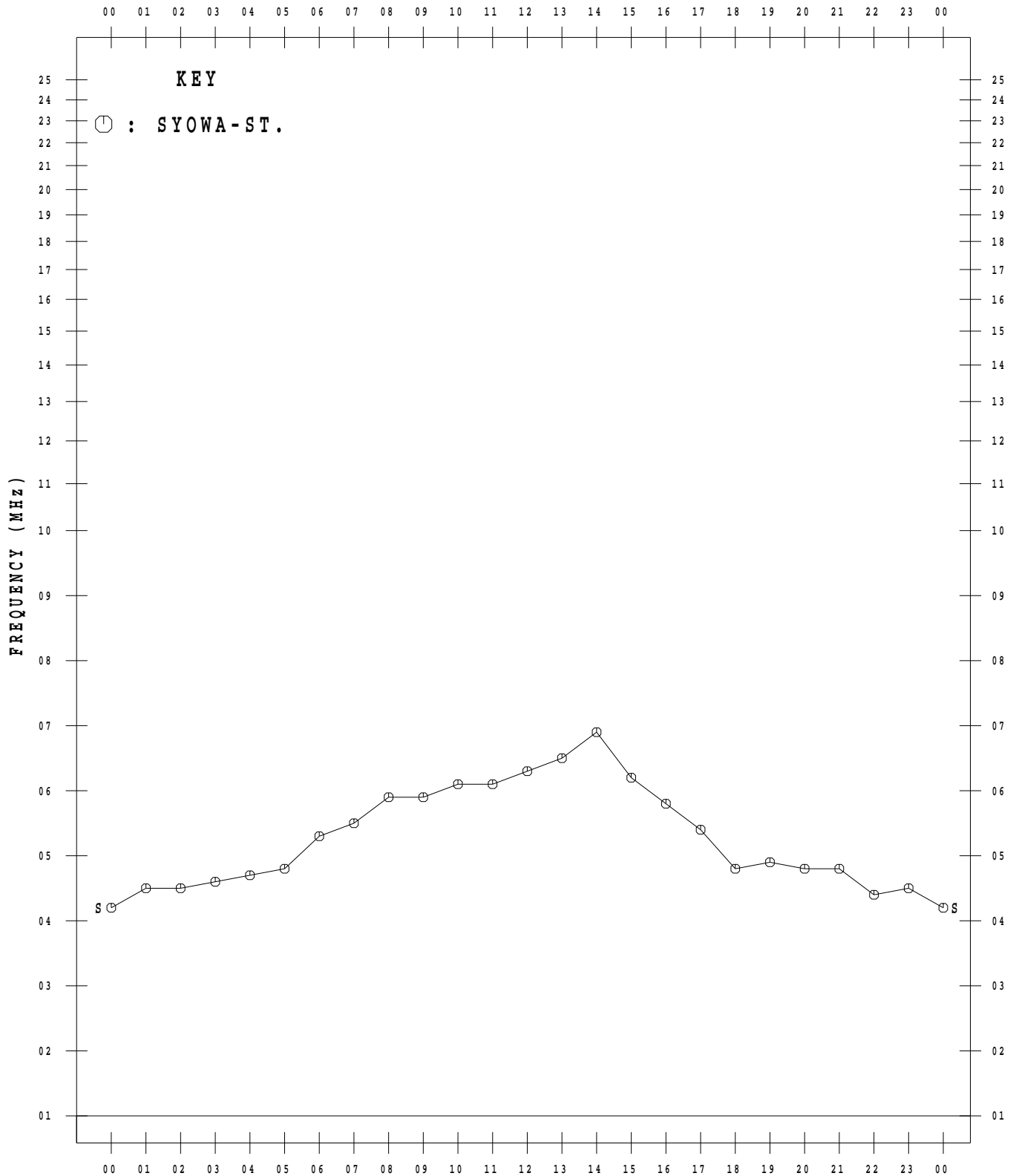
OCT. 2025



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

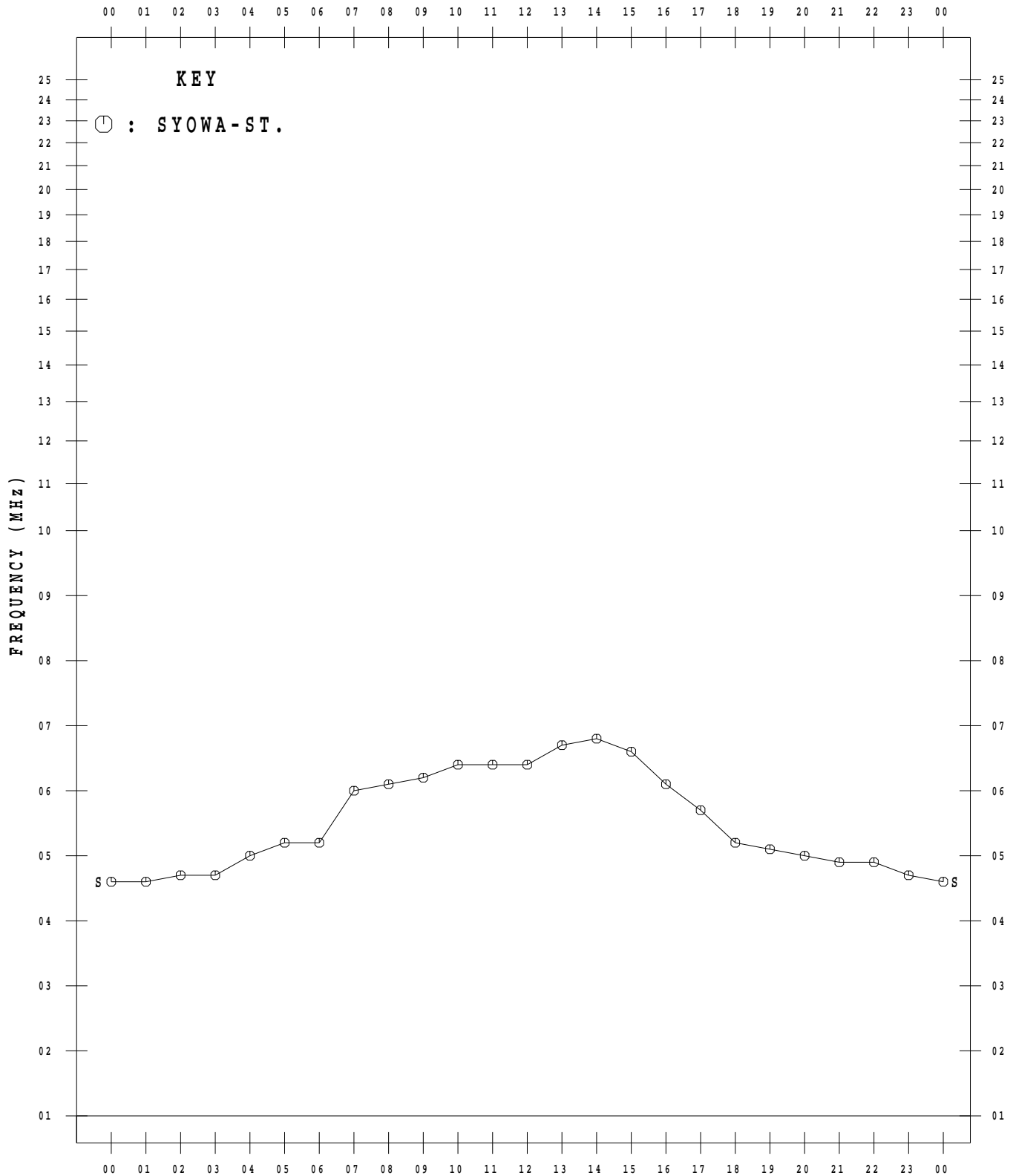
NOV. 2025



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

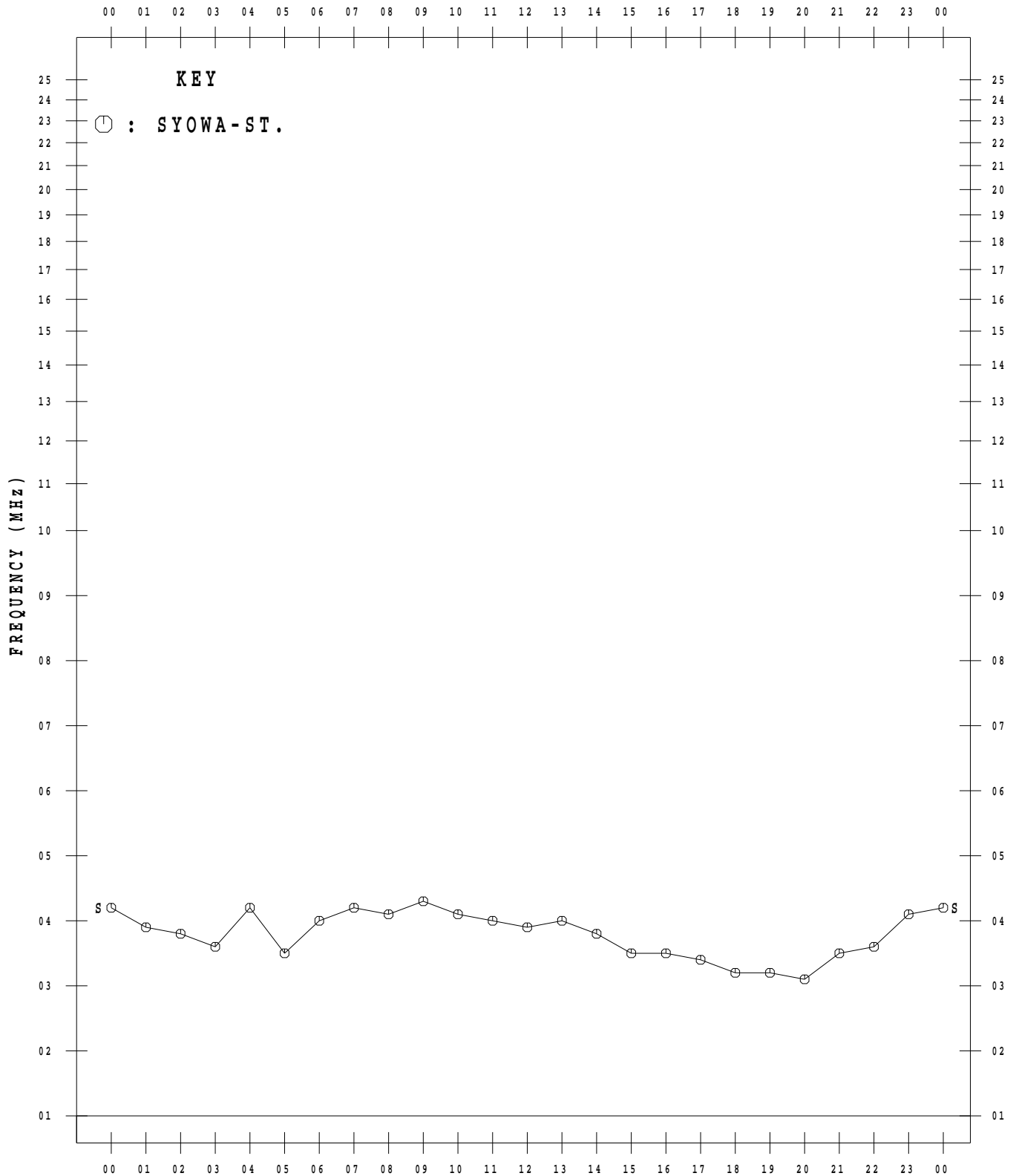
DEC. 2025



MONTHLY MEDIAN VALUES OF f_{tEs}

45°E MEAN TIME

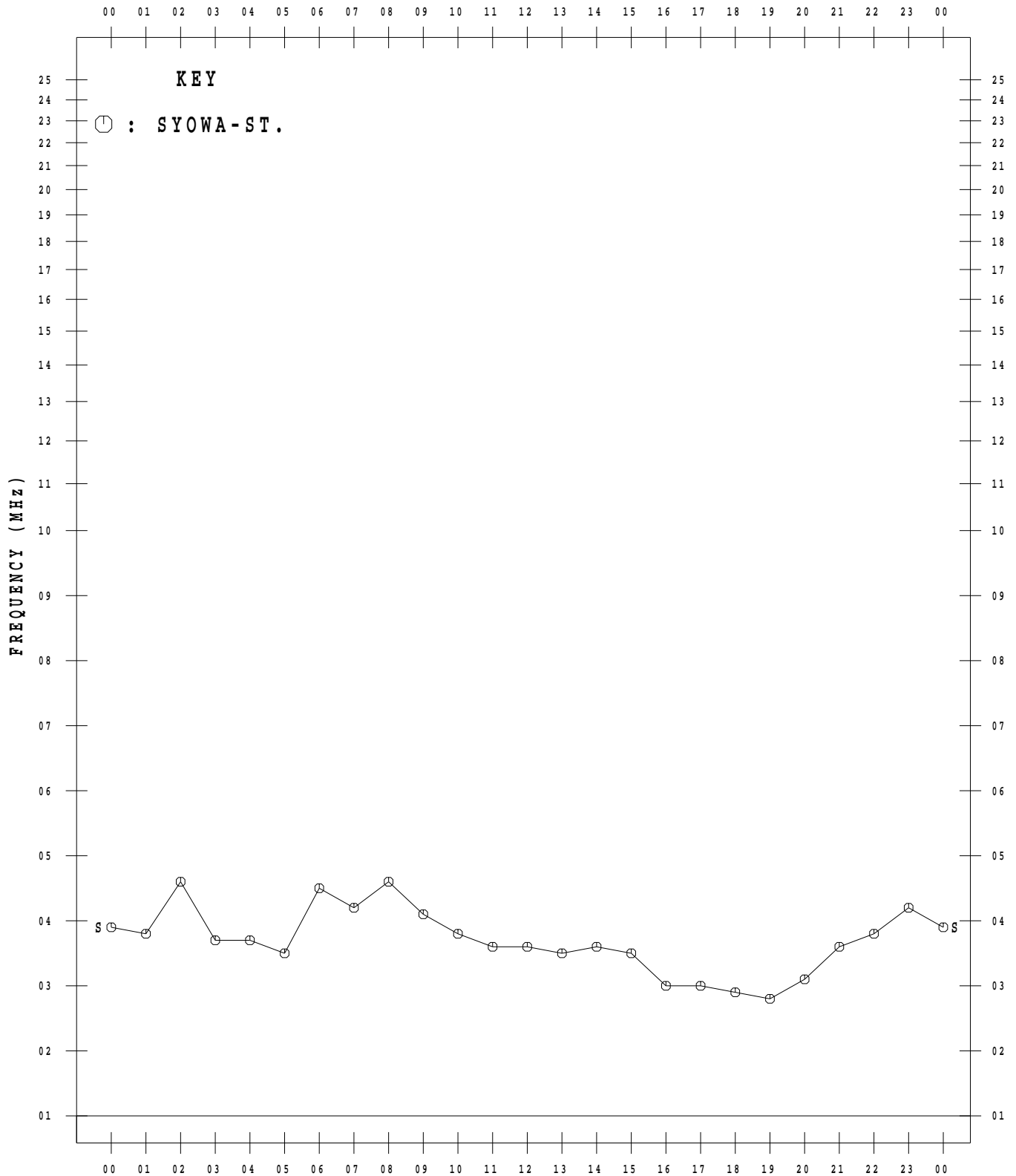
JAN. 2025



MONTHLY MEDIAN VALUES OF f_{tEs}

45°E MEAN TIME

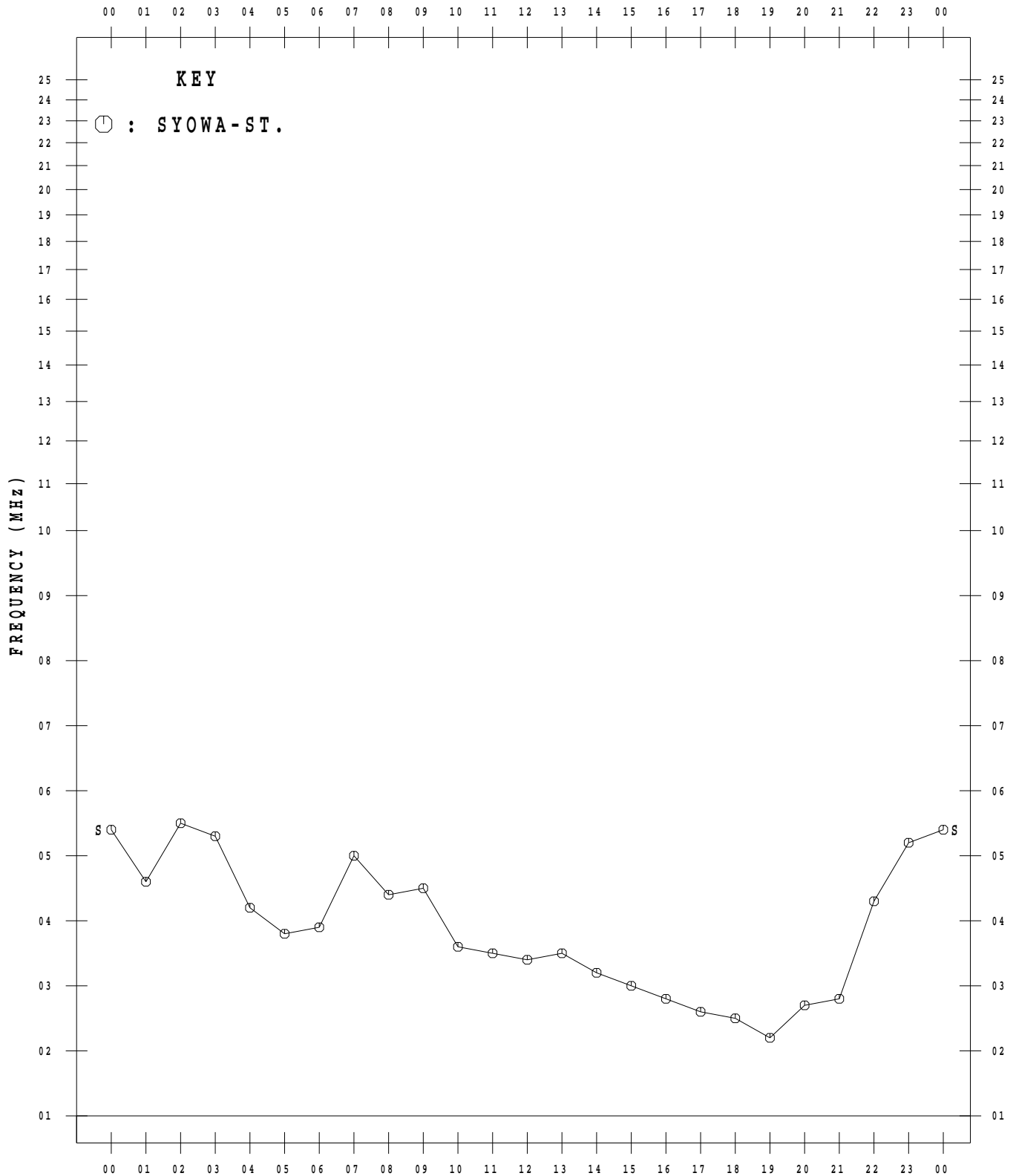
FEB. 2025



MONTHLY MEDIAN VALUES OF f_tE_s

45°E MEAN TIME

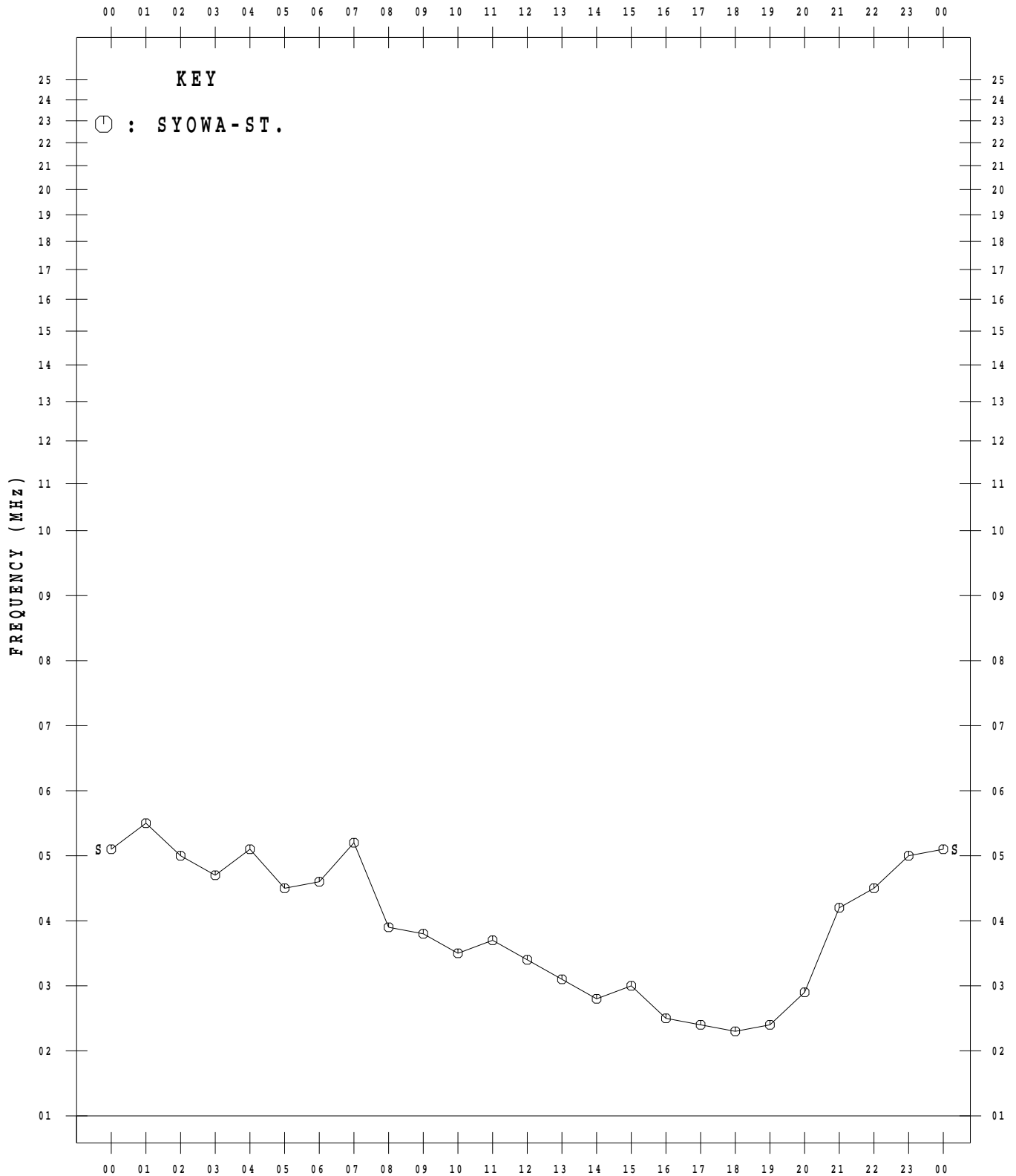
MAR. 2025



MONTHLY MEDIAN VALUES OF f_{tEs}

45°E MEAN TIME

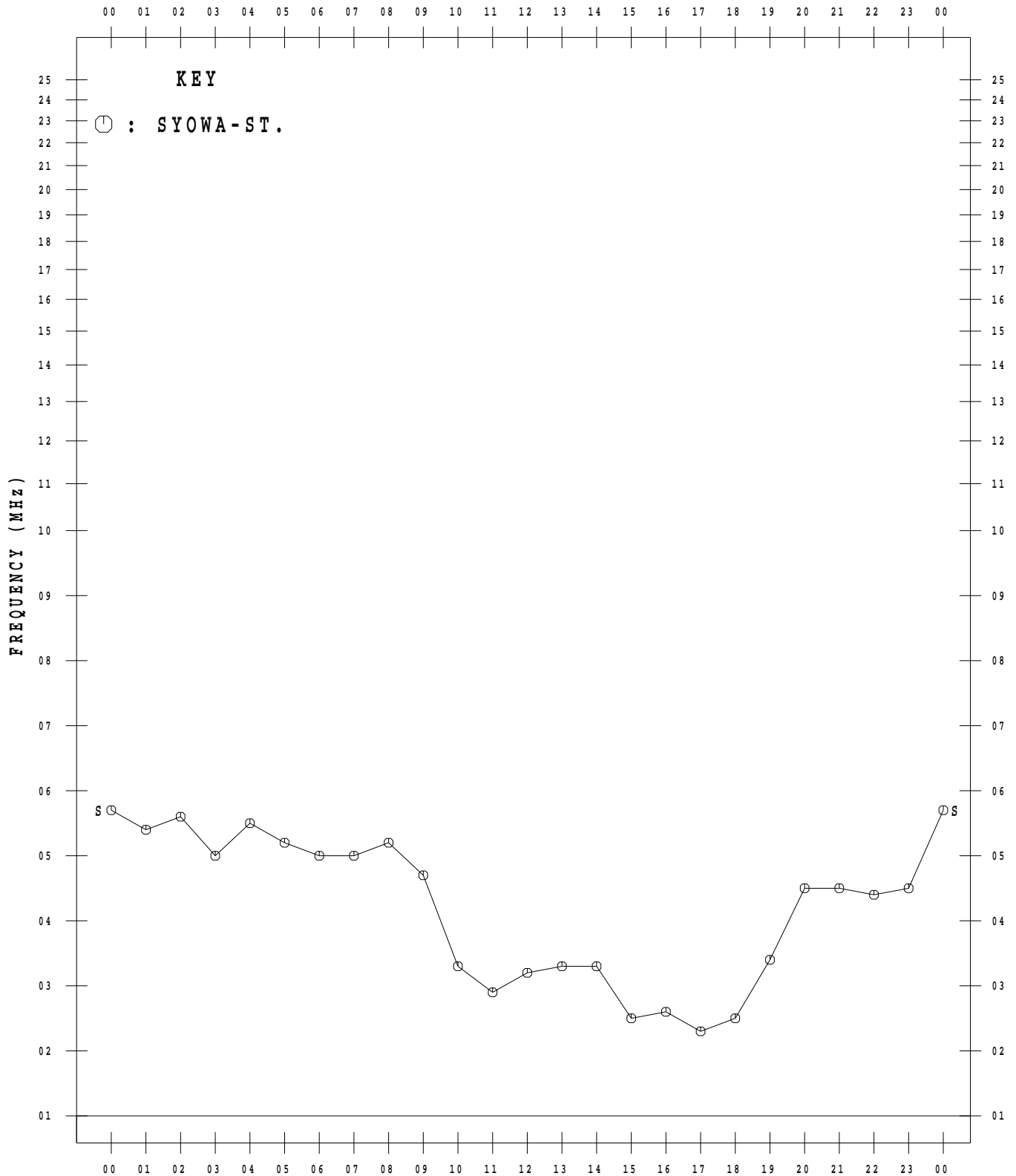
APR. 2025



MONTHLY MEDIAN VALUES OF f_{TE}s

45°E MEAN TIME

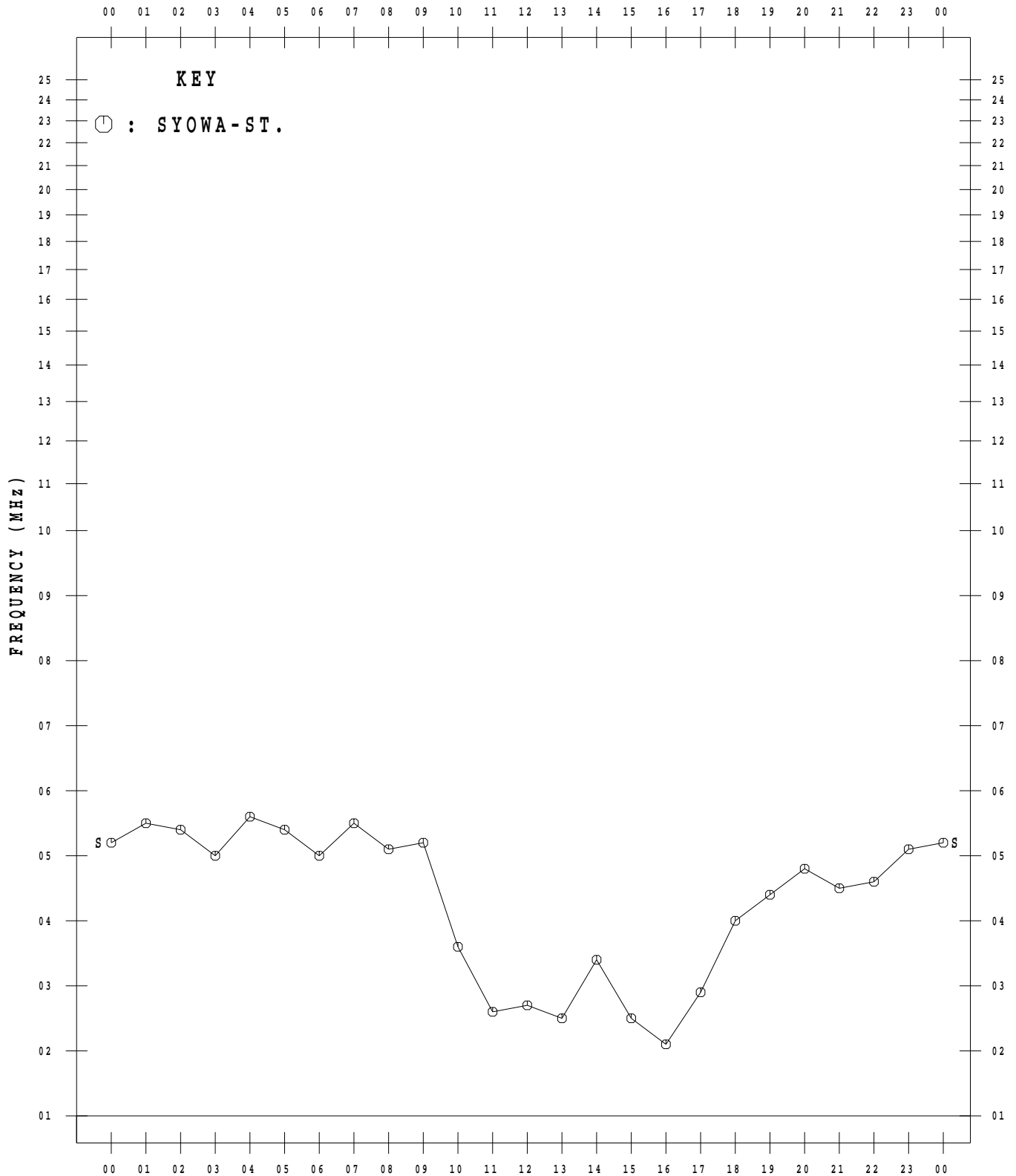
MAY 2025



MONTHLY MEDIAN VALUES OF f_{te}s

45°E MEAN TIME

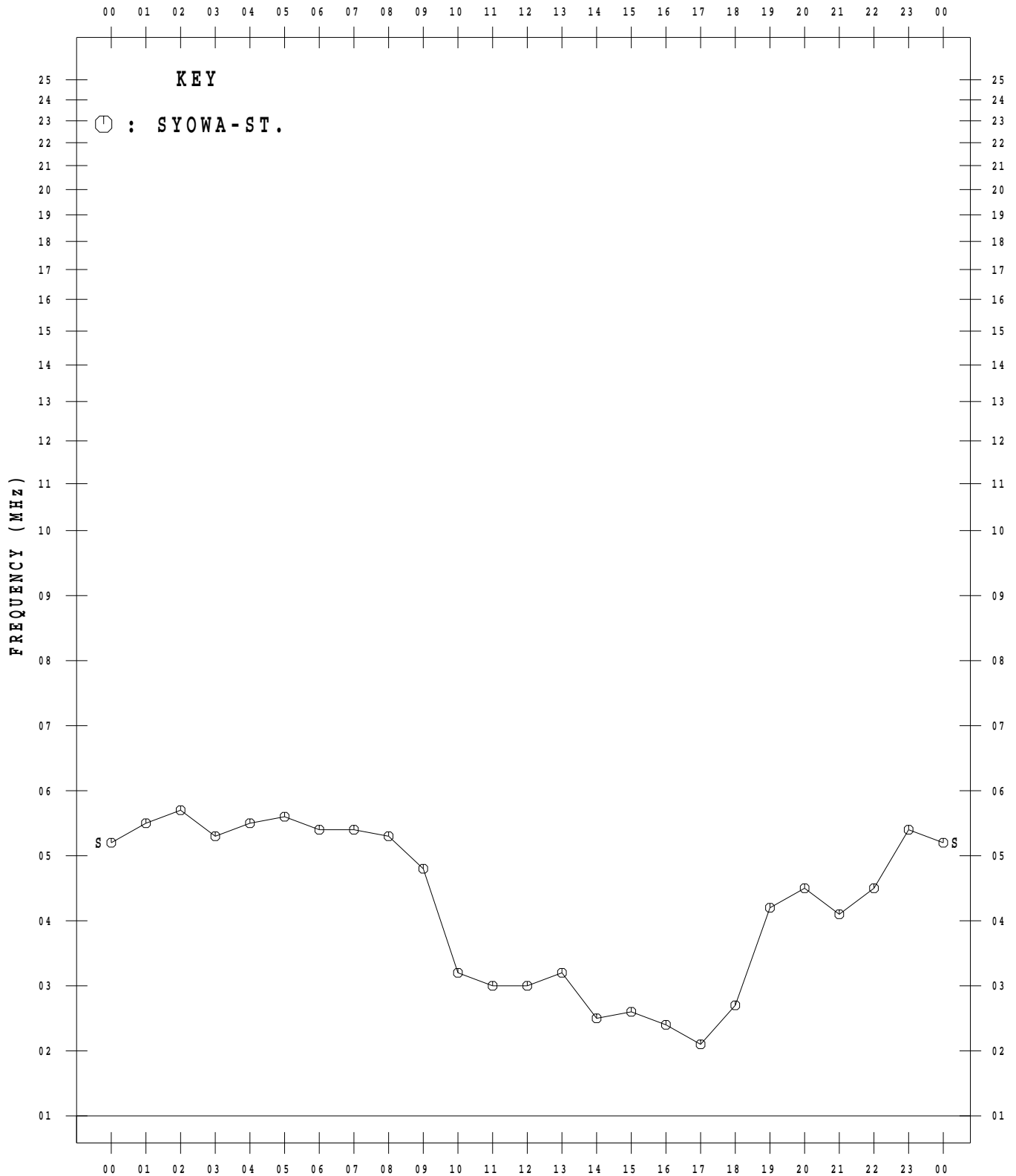
JUN. 2025



MONTHLY MEDIAN VALUES OF f_{TE}s

45°E MEAN TIME

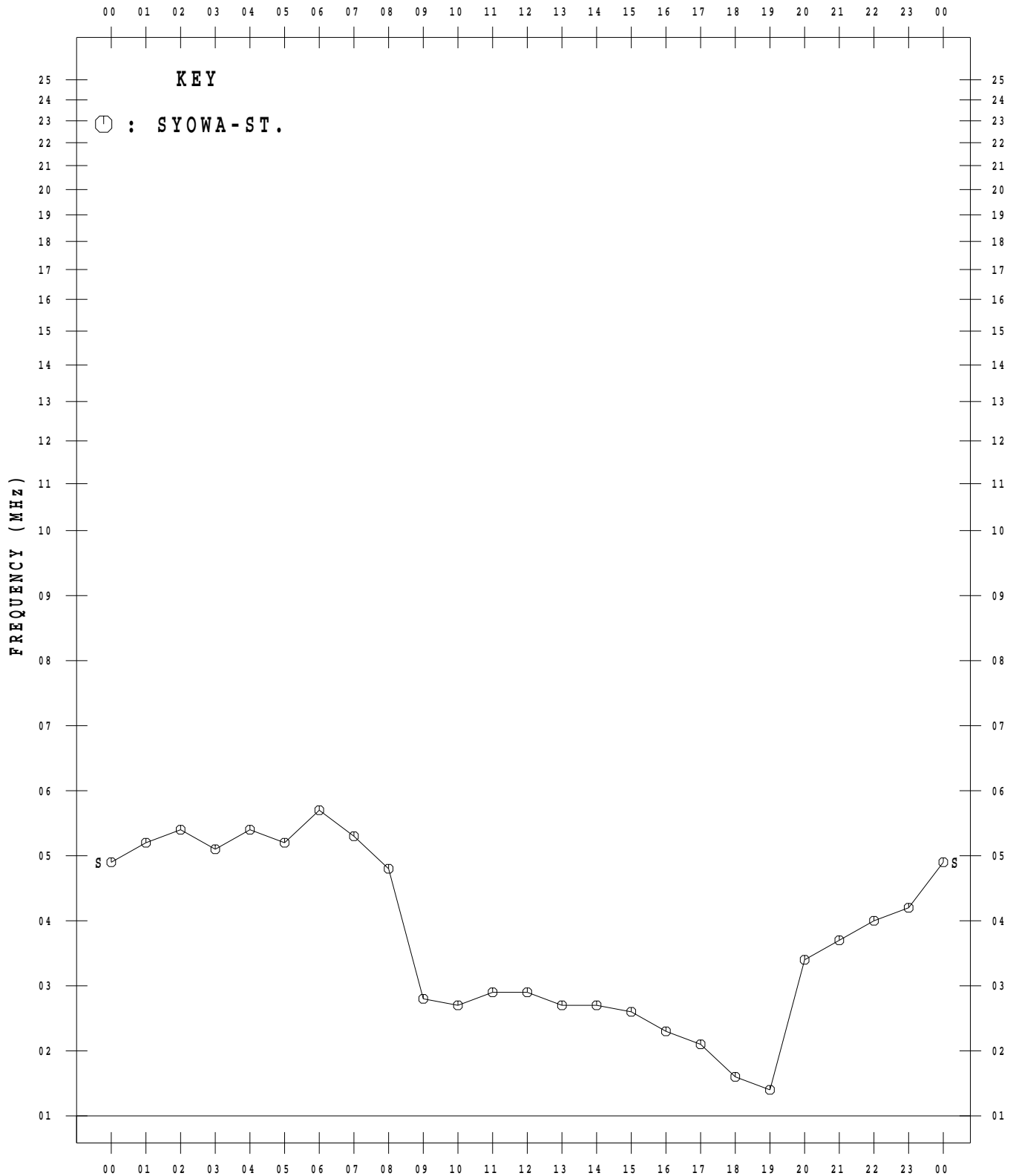
JUL. 2025



MONTHLY MEDIAN VALUES OF f_{tEs}

45°E MEAN TIME

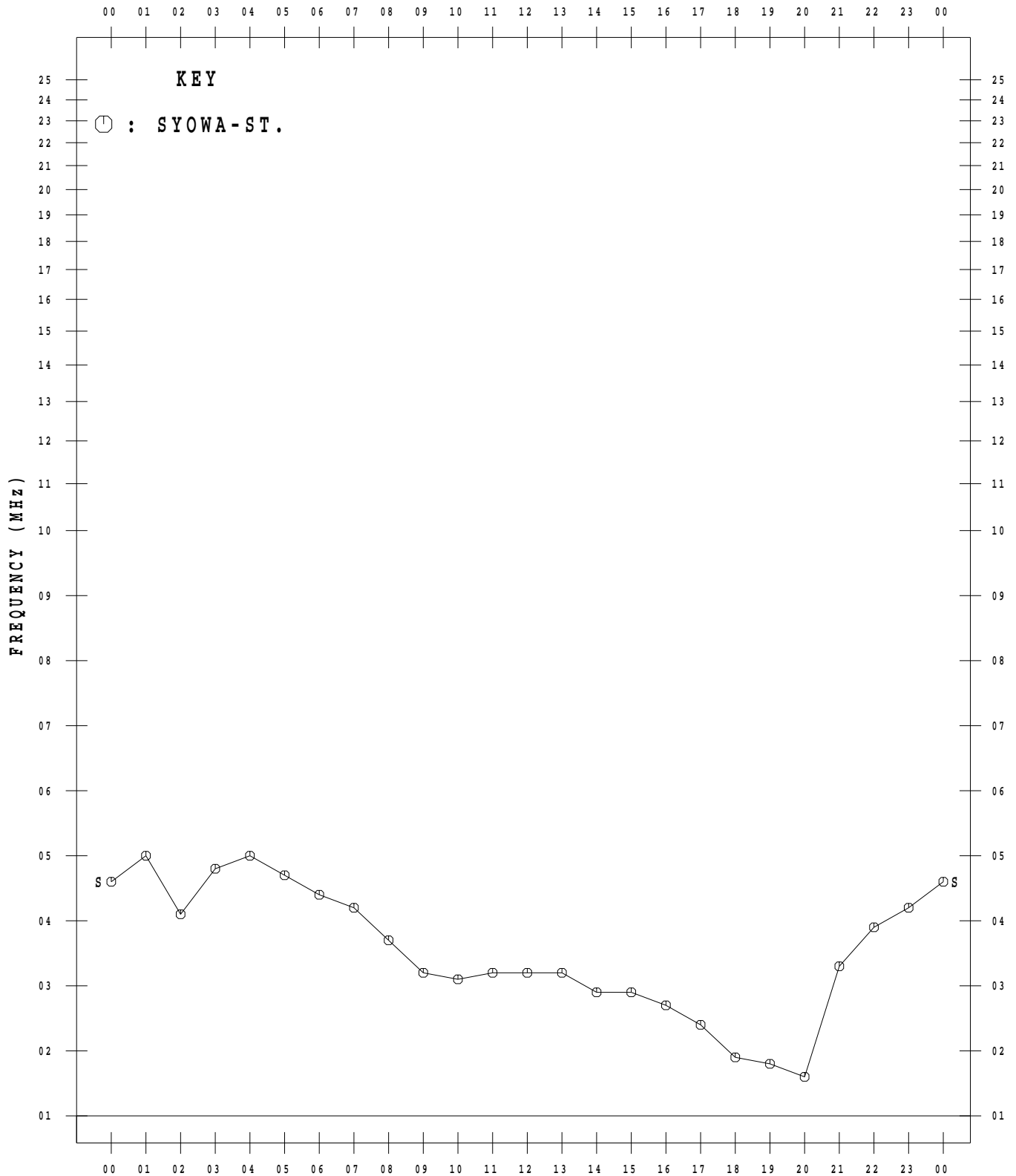
AUG. 2025



MONTHLY MEDIAN VALUES OF f_tE_s

45°E MEAN TIME

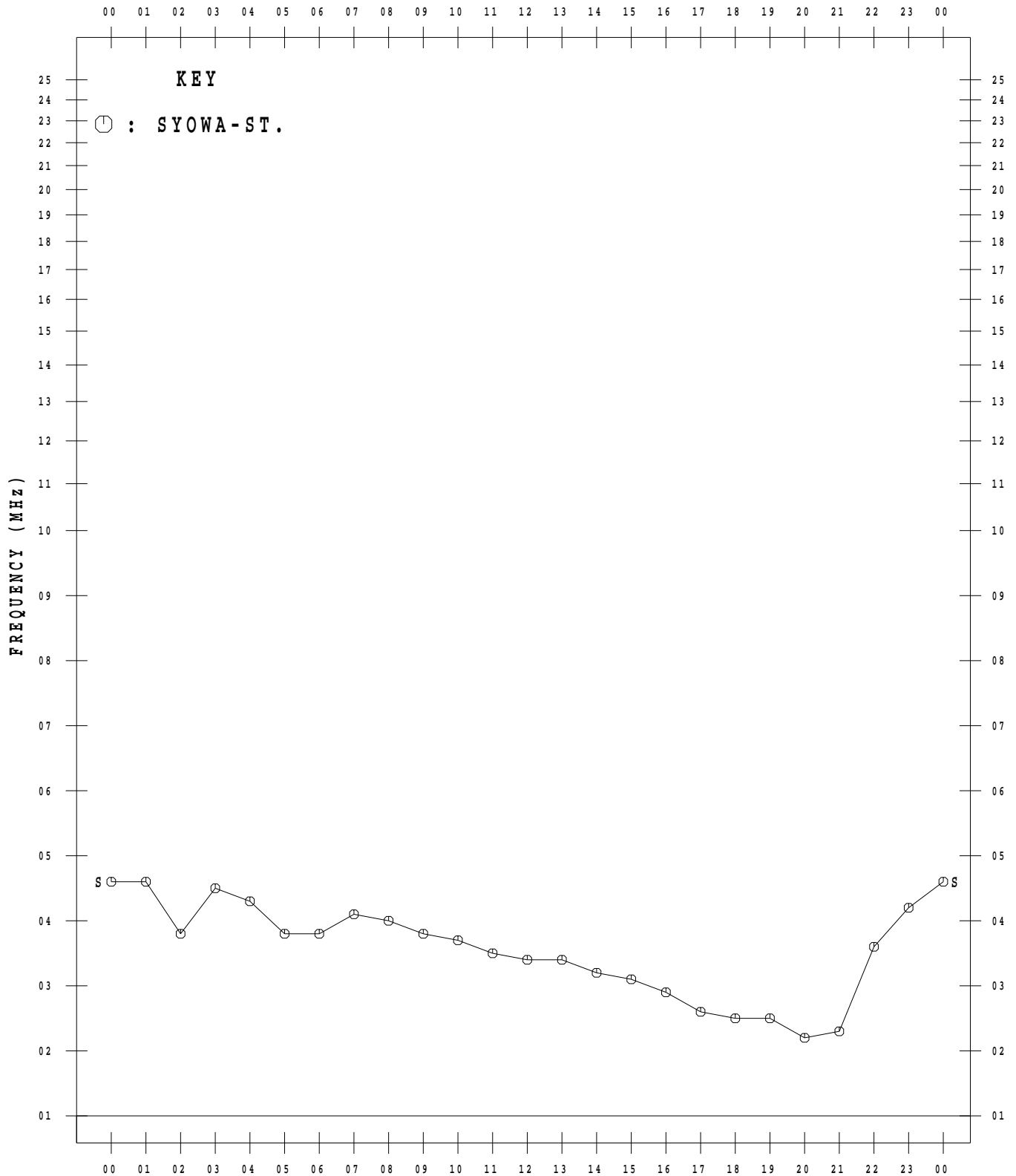
SEP. 2025



MONTHLY MEDIAN VALUES OF f_{tEs}

45°E MEAN TIME

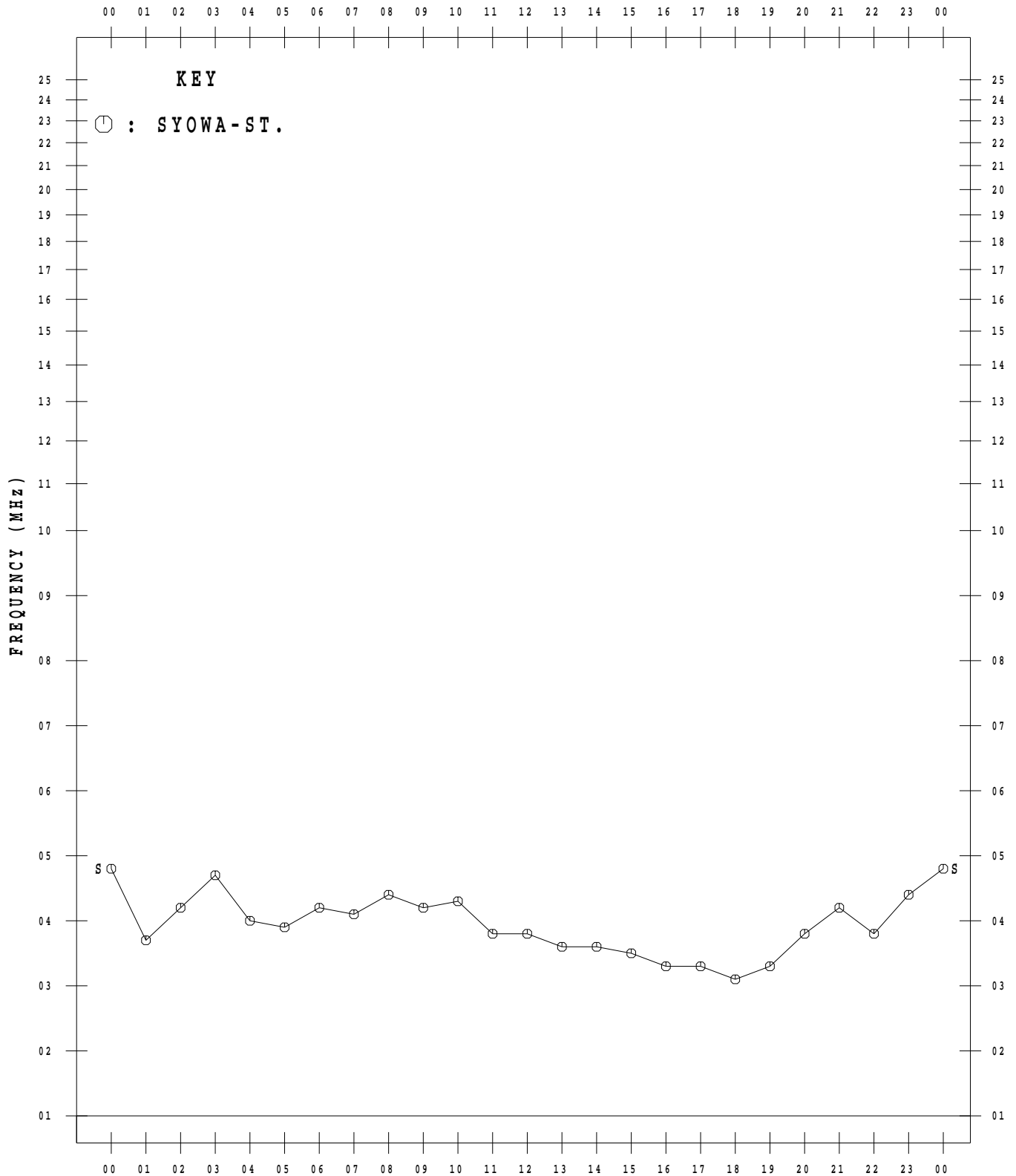
OCT. 2025



MONTHLY MEDIAN VALUES OF f_tE_s

45°E MEAN TIME

NOV. 2025



MONTHLY MEDIAN VALUES OF f_tE_s

45°E MEAN TIME

DEC. 2025

