

ION.ANT.—69

IONOSPHERIC DATA AT SYOWA STATION
(ANTARCTICA)

January 2002 — December 2002

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NiCT

NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

This data book gives summarized results for vertical soundings of the ionosphere at Syowa Station, Antarctica in 2002. The observations were conducted by the National Institute of Information and Communications Technology under the sponsorship of the National Institute of Polar Research of Japan. The location of the station, specifications of the ionosonde, and the symbols used in this data book are as follows:

LOCATION of SYOWA STATION

Geographic		Geomagnetic	
Latitude	Longitude	Latitude	Longitude
69° 00.4' S	39°35.4'E	- 69.8°	78.2°

SPECIFICATIONS OF THE IONOSONDE USED AT SYOWA STATION

Items	Specifications
Frequency Rang	500kHz - 15MHz
Transmitting Power	10kW (peak value)
Duration of Sweep	20 s
Transmitted Pulse Width	80 μ s
Pulse Repetition Frequency	50 Hz
Frequency Marker	every 1 MHz
Height Range	0 - 900km
Height Marker	every 50km
Recording Media	8mm digital tape
Power Supply	100V-AC, 2.0kVA
Transmitting Antenna and Receiving Antenna	30-m-high vertical delta antennas terminated by 600 Ω

OBSERVERS

Observer: N. Obara

Scaler: K. Fukushima

DESCRIPTION

- a. All symbols and terminology in the tables or figures of ionospheric data are used in accordance with the "URSI Handbook of Ionogram Interpretation and Reduction (Second Edition 1972)"

b. Characteristics of Ionosphere

fxI	Top frequency of spread F traces or oblique traces.
foF2	Ordinary wave critical frequency for the F2 layer.
fEs(ftEs)	Top frequency of Es layer as reflected overhead
fmin	Lowest frequency showing vertical ionospheric reflection.
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, a numerical value 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 by or impossible because the trace has no sufficiently definite cusp between layers.
M	Interpretation of measurement questionable because the 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	Man-made perturbation of parameters - Presence of polar spur traces
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 atmospheric.
T	Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
V	Forked trace which may influence the measurement.
W	Measurement influenced or impossible because the echo lies outside the height range recorded.
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 a numerical value 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.
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 the CNT, MED, UQ and LQ

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

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2002 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	X	X	X	B	B	B	B	B	B	B	B	B	R	B	X	B	B	X	X	X	X	X	X
5	B	B	X	B	X	B	B	Y	B	B	B	B	B	X	B	B	B	B	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X	R	R	X	X	X	X	X	X	X	X	X	X
7	68	75	67	68	79	89	100	102	99	98	98	96	90	87	85	86	B	X	X	X	X	X	X	X
8	60	62	61	63	R	R	A	50	52	X	X	X	X	X	71	75	78	B	X	X	X	X	X	X
9	60	67	61	63	67	75	80	90	90	88	88	87	83	80	78	77	74	76	72	75	63	62	66	67
10	62	64	68	71	71	72	Y	66	72	75	81	85	87	84	87	82	74	70	77	Y	R	R	B	R
11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	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
14	B	B	B	B	X	X	X	B	B	B	B	B	B	X	B	X	B	B	B	B	B	B	B	B
15	B	B	B	R	B	R	B	B	B	B	B	B	B	X	B	B	B	B	B	B	B	B	B	B
16	B	B	B	B	B	B	B	B	B	X	Y	B	B	B	B	A	X	X	X	X	X	X	X	X
17	73	74	78	78	73	63	65	70	80	80	81	87	85	86	88	88	86	85	80	80	76	62	62	70
18	64	B	A	X	61	63	69	B	B	70	70	66	80	79	77	81	73	73	72	70	67	66	68	68
19	70	73	75	82	89	98	104	103	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
20	57	66	57	X	B	R	R	72	66	R	B	B	B	X	C	C	71	68	66	63	58	56	53	69
21	68	A	R	R	R	X	B	B	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
22	58	64	57	60	63	66	61	71	80	88	83	84	B	X	80	85	78	73	79	68	68	68	64	63
23	56	60	61	63	B	X	X	X	94	94	86	85	82	81	82	86	B	B	B	B	68	63	69	R
24	67	72	62	55	45	49	59	R	B	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
25	55	60	60	68	66	62	72	70	83	83	81	88	77	76	79	75	75	72	69	B	R	59	52	
26	50	55	50	53	A	A	R	48	52	R	R	B	R	R	B	B	74	R	67	66	62	51	54	55
27	B	58	52	A	A	R	B	R	R	R	R	B	R	B	B	B	70	70	64	70	58	61	59	56
28	48	40	R	R	R	A	65	62	R	74	75	80	B	X	73	68	68	68	68	63	65	62	49	48
29	A	A	54	60	59	91	46	R	R	67	64	70	68	72	73	76	73	74	70	67	62	64	64	62
30	63	64	63	66	67	69	69	82	95	96	91	87	88	79	76	72	71	72	70	71	69	68	66	65
31	55	58	64	66	A	X	64	70	B	61	72	82	76	78	83	83	84	81	80	76	72	67	69	64
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	18	19	17	14	15	16	14	12	14	15	16	15	18	17	19	18	21	22	21	20	22	24	20
MED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
U Q	67	71	68	72	72	80	76	90	94	94	88	87	87	83	84	84	75	75	72	72	68	68	66	68
L Q	56	58	57	60	63	63	64	66	66	74	75	73	72	72	72	72	72	70	67	63	62	56	52	57

JAN. 2002 f_{XI} (0.1MHz)

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2002 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R	B			
4	B	R	R	R	B	B	B	B	B	B	B	B	B	R	B	R	B	B	R	R	R	R	R	R			
5	B	B	R	B	R	B	B	Y	B	B	B	B	B	R	B	B	B	R	R	R	R	67	65	44	49		
6	R	58	51	58	66	61	74	76	J	R	J	R	R	R	J	R	J	R	J	R	R	60	56	59	62		
7	F	57	59	61	62	69	83	90	F	R	J	R	92	88	90	84	81	79	80	B	R	J	R	R	A		
8	54	50	55	52	F	R	R	A	R	R	R	B	B	B	R	J	R	B	R	R	R	47	49	48	59		
9	54	61	55	57	57	66	74	84	J	R	84	82	82	81	77	74	72	71	68	70	66	69	57	56	60	61	
10	56	58	62	60	F	F	F	Y	R	J	R	R	R	R	R	R	R	R	R	R	Y	R	R	B	R		
11	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		
12	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	R	B	B	B	R	B	B		
14	B	B	B	B	66	59	58	B	B	B	B	B	B	R	B	R	B	B	B	B	B	B	R	B	B		
15	B	B	B	R	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	58	
16	B	B	B	B	B	B	B	B	B	R	Y	B	B	B	B	A	R	R	R	R	R	R	R	R	R	64	
17	67	68	72	J	R	F	R	R	R	R	R	R	R	R	R	R	R	R	R	J	R	J	R	R	R	64	
18	58	B	A	55	54	60	F	B	F	B	B	F	F	F	J	R	J	R	J	R	R	R	R	R	R	62	
19	64	67	69	76	83	92	98	97	R	R	R	R	90	94	82	82	R	R	J	R	R	A	R	F	48		
20	F	F	51	B	R	R	F	F	R	B	B	B	J	R	R	C	C	R	R	R	R	R	R	R	R	F	
21	R	A	R	R	R	55	B	B	R	R	R	R	59	62	R	R	66	62	R	R	R	R	R	R	R	R	
22	52	52	51	54	54	60	55	65	R	R	74	82	77	78	B	R	J	R	R	J	R	R	R	R	R	F	F
23	F	F	F	F	B	60	57	72	J	R	J	R	80	79	76	R	R	R	B	B	B	R	R	R	R	R	
24	39	66	56	49	39	43	53	R	R	B	R	R	R	60	64	63	66	65	66	66	62	57	60	60	55	50	
25	F	F	54	F	R	R	F	R	R	R	R	R	82	71	70	73	69	69	66	63	B	R	F	R	R	R	
26	44	27	39	47	A	A	R	R	42	46	R	R	R	B	R	R	B	B	R	R	R	R	R	R	R	R	
27	B	F	F	A	A	R	B	R	R	R	R	R	B	R	B	B	R	R	R	R	R	R	R	R	R	R	
28	R	U	R	A	A	R	A	F	R	R	R	J	R	B	R	R	R	R	R	R	R	R	R	R	R	R	
29	A	A	F	54	47	40	R	R	R	R	61	58	64	62	66	67	70	67	68	64	61	56	58	58	56		
30	57	53	48	54	F	F	F	F	J	R	J	R	J	R	R	R	J	R	R	R	R	R	R	R	R	R	
31	F	F	F	F	A	R	F	B	R	R	J	R	J	R	R	J	R	R	J	R	J	R	R	R	R	R	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	17	18	19	17	14	14	16	14	12	14	15	16	15	18	17	19	18	21	22	21	20	21	24	20			
MED	54	52	55	55	60	60	60	64	76	76	76	78	74	73	71	72	67	66	64	62	57	56	54	57			
U Q	58	61	62	64	64	66	67	84	88	88	82	81	81	77	78	78	69	69	66	66	62	61	60	60			
L Q	F	F	F	F	53	54	56	56	60	68	69	67	66	66	66	66	66	64	61	57	56	50	46	51			

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2002 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B				
2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B				
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	BE	BE	B				
4	BE	BE	BE	BE	B	B	B	B	B	B	B	B	BE	B	B	B	B	BE	BE	BE	BE	BE	BE	BE				
5	B	BE	B	B	BE	B	B	G	B	B	B	B	BE	B	B	B	B	B	36	30	50	E	BE	BE				
6	E	BE	BE	BE	B	34	40	40	29	32	36	E	B	54	33	30	36	35	32	41	41	46	35	29				
7	E	B	29	32	23	60	30	32	41	44	34	37	37	41	40	39	39	B	BE	B	G	30	32	34				
8	67	70	41	37	41	40	50	34	36	43	B	B	B	48	34	30	B	BE	B	G	37	28	40	34				
9	K	K	22	34	28	28	29	34	G	32	41	49	76	34	65	60	58	47	30	50	G	53	23	20				
10	22	26	34	36	30	49	26	42	G	G	27	34	26	E	B	34	G	E	B	38	38	26	32	35				
11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B				
12	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	BE	B	B	B	B	BE	B			
14	B	B	B	BE	BE	BE	BE	B	B	B	B	B	BE	B	BE	B	B	B	B	B	B	B	BE	BE	B			
15	B	B	B	B	B	B	B	B	B	B	B	B	BE	B	B	B	B	B	B	B	B	B	B	BE	B			
16	B	B	B	B	B	B	B	B	BE	B	G	B	B	B	B	B	E	B	50	E	BE	BE	BE	B	E	BE	B	
17	E	BE	BE	BE	BE	BE	B	G	E	B	G	G	34	45	66	40	37	35	32	G	G	B	22	30				
18	G	B	76	35	28	B	G	B	BE	B	G	34	38	G	BE	BE	B	G	37	33	32	22	22	24	33			
19	20	32	18	18	G	32	30	G	G	34	35	G	G	34	80	66	33	35	G	28	G	59	46	G	44			
20	G	30	23	35	B	41	36	44	41	32	B	B	B	G	G	C	C	36	34	35	32	G	G	39	44			
21	57	49	43	41	40	43	B	B	36	G	E	B	G	G	G	E	B	29	42	E	B	53	30	49	E	B	23	94
22	38	39	G	35	36	41	38	36	39	33	39	34	B	33	65	49	36	G	G	31	G	31	21	27	G			
23	20	34	38	30	B	47	43	G	33	36	40	40	39	42	40	38	B	B	BE	B	G	49	38	G				
24	G	87	G	34	28	33	35	G	B	37	38	32	G	35	35	38	50	35	35	G	B	36	32	29	21			
25	24	35	46	40	G	53	48	43	37	39	40	37	34	50	41	67	36	G	G	G	B	44	53	107	33			
26	51	44	50	31	49	48	32	28	34	34	34	B	35	32	B	B	36	G	G	G	31	34	23	26	33			
27	B	10	33	57	51	G	B	30	35	36	G	B	G	B	B	66	38	G	GE	BE	B	30	E	B	E	B	24	
28	25	Z	38	36	39	41	46	36	40	35	34	36	35	B	BE	B	28	39	68	34	G	32	35	36	32	34	34	
29	42	73	42	39	34	51	35	39	37	38	34	35	G	37	46	38	35	50	38	G	30	39	36	38	G	20		
30	17	17	81	22	42	36	35	38	35	37	49	44	38	49	36	42	39	40	29	33	34	27	G	21				
31	22	21	15	22	48	G	46	B	48	40	49	35	62	50	47	37	34	41	30	49	G	29	17	15				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	19	20	22	21	21	21	19	18	18	20	19	16	19	21	18	20	18	22	22	22	22	23	24	25	24			
MED	27	32	G	34	38	38	35	35	35	37	35	34	34	U	38	40	40	37	36	G	31	32	31	U	26	30		
U Q	38	46	46	39	48	48	44	40	37	42	40	37	41	E	B	53	60	59	41	46	35	34	36	41	36	38		
L Q	22	26	32	30	29	31	32	28	G	G	34	G	G	G	34	35	38	36	G	30	30	G	28	22	22			

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2002 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	46	32	B		
4	B	54	59	58	B	B	B	B	B	B	B	B	B	58	B	54	B	B	55	53	34	54	33	30		
5	B	B	53	B	48	B	B	31	B	B	B	B	B	58	B	B	B	30	25	46	32	29	31	30		
6	27	26	26	21	25	25	25	28	27	54	26	20	30	16	20	17	15	25	8	18	18	18	15	19		
7	25	18	20	17	15	18	16	13	18	13	16	17	20	20	28	25	B	54	28	22	16	25	15	16		
8	26	16	16	16	16	20	18	14	16	20	B	B	B	25	16	14	B	35	29	25	22	15	18	15		
9	12	13	15	16	16	16	14	16	15	28	26	25	20	21	20	30	16	13	21	14	14	53	15	15		
10	15	13	15	15	14	16	19	16	18	16	15	28	22	57	27	18	38	26	19	18	22	29	B	26		
11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
12	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	54	B	B	B	B	B		
14	B	B	B	B	60	54	34	B	B	B	B	B	56	60	B	B	B	B	B	B	B	30	31	B		
15	B	B	B	26	B	28	B	B	B	B	B	B	59	B	B	B	B	B	B	B	B	B	B	41		
16	B	B	B	B	B	B	B	B	B	64	33	B	B	B	B	34	56	31	33	34	29	18	24	26		
17	25	31	30	32	31	29	52	28	29	30	29	21	20	18	16	21	32	28	26	20	22	B	18	19		
18	18	B	25	24	21	B	20	B	B	53	20	20	19	12	54	64	25	29	22	17	15	15	12	12		
19	12	15	10	12	12	10	13	15	18	29	26	26	20	12	14	14	16	13	16	15	16	14	12	10		
20	13	10	16	B	18	12	12	16	16	B	B	B	15	12	C	C	13	14	13	12	16	12	10	15		
21	11	14	19	14	10	12	B	B	24	28	55	21	17	16	14	53	25	33	53	14	16	28	15	22		
22	13	16	15	18	18	13	14	12	15	11	13	17	B	22	15	19	16	25	18	13	20	21	10	10		
23	9	12	15	13	B	19	19	19	13	12	12	13	14	12	16	29	B	B	B	33	14	28	19	14		
24	16	16	20	16	14	10	17	25	B	29	20	25	18	15	15	15	13	15	11	13	10	12	10	8		
25	8	11	16	12	16	24	14	17	15	20	15	19	16	18	17	16	15	13	10	B	16	16	16	12		
26	15	8	10	14	15	14	12	16	14	18	26	B	26	20	B	B	29	26	25	19	15	11	16	16		
27	B	10	10	11	18	18	B	21	30	18	19	B	19	B	B	26	24	15	55	32	25	25	18	24		
28	18	10	15	18	16	25	14	17	15	16	18	19	B	56	17	18	17	17	14	15	17	17	16	14		
29	21	16	14	16	15	20	20	15	15	19	19	15	20	18	25	20	30	26	15	14	15	18	15	10		
30	E S	11	9	12	13	10	14	14	11	13	14	15	16	23	19	20	14	15	14	13	15	14	14	E S		
31	E S	E S	10	11	10	14	21	16	18	B	15	15	14	16	19	26	16	16	14	13	18	14	14	16	13	10
	00	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	30	30	31	31	31	31	31	31	31	31	
MED	25	16	20	18	21	24	20	28	27	29	26	28	26	25	28	30	32	29	26	22	20	25	18	19		
U Q	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
L Q	13	12	15	14	15	16	14	16	15	18	18	19	19	18	16	18	16	15	16	15	15	16	15	12		

JAN. 2002 fmin (0.1MHz)

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2002 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6	274	258	258	256	268	256	232	238										208	220	228	244	248	242	264
7	284	316		310	256	226	212	238	182															
8	286	220	196		202			262										220	220	214	268		302	284
9	300	344	348	344	308	262	236	236	232	238								258	232	262	218		238	248
10	256	278	314	350	284																			
11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	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
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
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17	274	284	304	334	304													224		226	230	300		
18	280				302													230	240	230	238	248	256	280
19	268	282	230	276	248	242	242	224	222									238	230					
20	256	336	320															212	210	226	232	248	268	270
21	250																	214			242	260	272	288
22		356																	218	222	236	248	258	258
23	282	232		318																	240	250		
24																								
25		330																						
26																								
27	B	A	A	A	A	A	B	A	A	A	A	B	A	B	B	A								
28	318	456																						
29																								
30	290	304	356	318	254	262	256	252	228	224	206	246	238											
31	350	348	252	300																				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	14	15	11	12	11	8	11	10	10	8	3	5	3	5	4	8	12	15	17	19	19	18	21	19
MEQ	281	300	283	312	276	262	248	246	227	229	207	238	230	237	231	232	225	229	227	237	248	257	269	268
UQ	290	344	354	347	308	289	262	262	240	244	278	247	238	273	234	239	231	236	233	248	254	272	295	288
LQ	268	278	252	288	254	249	236	238	222	225	206	235	212	224	226	222	219	220	225	232	240	254	254	256

JAN. 2002 h'F (KM)

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2002 fxI (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	O X 46	57	A	R	X 62	68	R	A	R	B	O X 72	R	Y	B	Y	R	O X 69	R	O X 67	X 60	R	O X 60	X 64	X 69
4	X 60	X 55	X 65	C	R	O X 47	R	R	R	B	B	R	C	C	R	R	O X 67	X 80	X 79	X 76	A	O X 46	X 48	X 56
5	R	42	A	65	94	R	R	R	X 61	X 63	B	B	B	R	R	O X 71	X 74	B	X 70	X 67	O X 45	X 55	X 49	A
6	50	A	A	X 41	44	O X 56	R	R	R	R	B	B	B	B	B	B	R	Y	O X 46	O X 48	O X 50	X 50	R	R
7	A	B	55	B	B	R	B	O X 48	R	B	B	B	B	B	Y	Y	B	B	B	X 71	X 67	X 57	X 48	X
8	54	A	A	B	B	Y	O X 48	R	B	B	B	B	B	Y	B	B	O X 73	B	B	O X 42	X 43	X 46	X 56	X 45
9	O X 43	A	B	B	X 58	B	B	B	B	B	Y	C	B	B	B	Y	B	X 60	B	B	O X 59	X 63	X 58	X 42
10	44	B	B	B	R	B	R	R	R	R	B	B	B	C	C	B	X 65	X 66	X 69	O X 74	X 67	X 56	X 52	X
11	X 46	47	42	54	69	R	B	O X 71	X 74	R	X 72	X 80	B	B	O X 75	O X 86	B	B	B	B	O X 50	R	O X 42	X 48
12	R	A	O X 46	R	B	B	B	R	R	O X 67	B	B	B	B	R	R	X 67	O X 69	X 70	X 69	X 69	X 68	X 62	X 56
13	O X 43	46	A	O X 65	55	R	B	R	R	R	X 81	B	B	B	B	B	O X 84	X 76	C	C	C	C	C	C
14	C	42	X 49	X 49	X 74	O X 73	O X 71	X 94	R	O X 91	R	R	B	R	R	R	R	B	B	X 74	75	74	73	70
15	70	73	72	75	80	O X 87	97	104	104	106	103	97	B	O X 90	O X 89	O X 91	O X 94	O X 98	O X 82	O X 81	O X 82	O X 78	O X 74	67
16	X 50	62	66	73	66	B	B	X 79	X 94	X 99	X 98	X 100	O X 98	X 96	X 86	X 87	X 83	X 80	X 84	X 78	X 61	X 53	X 68	X 65
17	69	74	73	78	60	B	B	B	R	X 77	B	B	O X 71	O X 70	X 77	X 80	X 80	X 80	X 80	X 73	X 61	X 58	X 45	X 40
18	A	B	A	A	A	O X 57	68	44	X 66	B	O X 74	O X 74	B	B	O X 69	O X 59	O X 73	O X 70	O X 72	O X 68	O X 66	O X 60	O X 58	A
19	A	X 40	X 56	X 56	X 60	X 65	X 60	X 66	X 73	X 72	X 77	X 79	X 80	X 80	X 72	X 80	X 77	X 72	X 78	X 67	X 66	X 58	X 56	X 45
20	51	53	O X 39	57	O X 62	X 74	X 72	X 81	X 92	X 99	X 94	B	O X 91	B	O X 91	O X 87	O X 86	O X 82	O X 87	O X 79	O X 77	O X 72	O X 63	O X 42
21	86	53	A	O X 42	O X 57	O X 60	X 48	R	R	O X 72	X 76	X 79	X 80	X 79	X 77	X 77	X 72	X 76	X 74	X 73	X 65	X 50	X 40	X 40
22	A	A	A	A	A	R	B	B	R	O X 68	X 72	X 74	X 84	X 84	X 82	X 80	X 81	X 80	X 77	X 74	X 64	X 64	X 84	X 36
23	A	A	A	A	R	91	A	O X 44	R	O X 63	X 71	X 78	X 78	X 74	X 71	X 73	X 72	X 71	X 70	X 68	X 64	X 63	X 57	X 50
24	44	43	56	61	63	50	R	R	X 74	X 78	X 85	X 86	X 89	X 85	X 88	X 90	X 92	X 90	X 82	X 75	X 72	X 69	X 45	A
25	O X 36	O X 37	A	A	A	A	69	75	89	98	89	92	B	O X 86	O X 80	X 77	B	B	75	68	66	60	48	A
26	A	A	A	65	70	O X 64	61	Y	Y	B	B	B	O X 74	O X 79	X 87	X 80	X 80	X 79	X 78	X 78	X 70	A	A	A
27	O X 39	A	A	A	A	X 58	R	R	X 67	X 72	X 79	X 79	X 80	X 79	X 76	X 71	X 72	X 73	X 73	X 72	X 67	X 58	X 45	X 40
28	O X 38	X 43	X 44	O X 46	O X 47	X 60	B	R	O X 68	X 68	Y	B	B	B	R	B	O X 63	O X 70	X 78	X 79	X 80	X 74	X 63	X 56
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	15	12	13	16	14	9	11	9	15	13	11	10	12	14	16	20	18	20	22	23	21	22	21
MED	46	47	56	57	62	62	68	71	74	72	77	80	80	80	78	80	74	77	76	73	66	60	56	48
U Q	57	57	66	69	68	73	72	81	93	98	92	92	86	88	86	86	82	80	80	78	71	68	64	56
L Q	O X 43	X 42	X 45	O X 48	O X 58	O X 57	O X 54	O X 48	X 68	X 67	X 72	X 79	X 78	X 76	X 75	X 73	O X 70	X 72	X 70	X 67	O X 60	X 56	X 48	X 42

FEB. 2002 fxI (0.1MHz)

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2002 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	R
3	R	F	A	R	56	59	R	A	R	B	R	R	Y	B	Y	R	R	R	R	J	R	R	R	R
4	J	R	R	R	C	R	R	R	R	B	B	R	C	C	R	R	R	J	R	J	R	R	A	R
5	R	F	A	F	A	R	R	R	J	R	R	B	B	B	R	R	R	J	R	B	64	61	39	40
6	F	A	A	A	F	R	R	R	R	R	B	B	B	B	B	B	R	Y	R	R	R	R	R	R
7	A	B	F	B	B	R	B	U	R	R	B	B	B	B	Y	Y	B	B	B	B	65	61	51	42
8	F	A	A	B	B	Y	R	R	B	B	B	B	B	Y	B	B	R	B	B	R	R	R	R	R
9	R	A	B	B	52	B	B	B	B	B	Y	C	B	B	B	Y	B	J	R	B	B	J	R	F
10	F	B	B	B	R	B	R	R	R	R	B	B	B	C	C	B	J	R	J	R	53	57	52	33
11	40	F	A	A	F	R	B	J	R	R	J	R	B	B	R	R	B	B	B	B	44	R	R	R
12	R	A	R	A	B	B	B	R	R	R	B	B	B	B	R	R	61	63	64	63	J	R	R	R
13	F	R	A	R	R	R	B	R	R	R	R	J	R	B	B	B	78	70	C	C	C	C	C	C
14	C	F	J	R	R	R	R	J	R	R	U	R	R	B	R	R	R	B	B	68	63	66	64	60
15	F	F	F	F	F	R	J	R	F	F	J	R	R	B	R	R	J	R	R	J	R	J	R	F
16	44	48	56	54	56	B	B	B	J	R	73	88	J	R	R	92	94	92	90	80	81	77	74	78
17	F	F	F	F	F	B	B	B	R	J	R	B	B	R	J	R	J	R	J	R	74	74	74	67
18	A	B	A	A	A	51	58	38	B	60	68	B	B	63	53	67	64	66	62	60	54	52	J	R
19	A	34	50	46	54	59	54	60	67	66	71	73	74	76	66	74	71	66	72	S	61	60	52	50
20	31	35	33	46	56	68	66	75	J	R	86	93	88	85	B	U	R	R	R	J	R	J	R	F
21	32	30	A	F	R	R	R	R	R	J	R	J	R	J	R	J	R	J	R	R	R	R	R	F
22	A	A	A	A	A	R	B	B	R	62	66	68	78	78	76	74	75	74	71	68	58	58	51	25
23	A	A	A	A	D	R	A	A	R	R	F	R	J	R	J	R	R	R	R	R	58	57	51	44
24	F	F	F	F	F	R	R	R	R	J	R	79	80	83	79	82	84	86	84	J	R	R	F	
25	R	R	A	A	A	F	J	R	R	R	R	B	B	80	74	71	B	B	F	F	60	54	28	A
26	A	A	A	A	F	F	R	F	Y	Y	B	B	R	73	81	74	74	73	68	72	F	A	A	A
27	R	A	A	A	A	52	R	R	61	66	73	73	74	73	70	65	66	67	67	66	61	52	33	30
28	R	37	F	R	R	F	B	R	R	Y	B	B	B	R	B	57	64	J	F	J	R	74	68	57
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	15	11	12	16	13	9	11	9	15	13	11	10	12	14	16	20	18	20	22	23	22	22	21
MED	33	F	F	F	54	54	58	65	68	66	71	74	74	74	72	74	68	71	68	67	60	55	50	42
UQ	42	F	F	F	57	64	66	75	87	92	86	86	80	82	80	80	76	74	74	J	R	63	61	57
LQ	F	F	F	F	R	R	R	R	R	R	R	J	R	R	R	R	R	R	R	R	R	R	R	F
	31	31	40	42	52	50	48	42	62	61	66	73	72	70	69	67	64	66	64	61	54	47	36	34

FEB. 2002 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2002 ftEs (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C						
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C						
3	34	30	46	23	23	28	33	36	38	B	28	G	28	B	G	27	34	36	35	24	28	24	22	19	24					
4	22	28	27	C	G	G	36	38	36	B	B	32	C	C	35	36	40	37	34	49	58	G	35	K						
5	K	33	50	41	33	40	43	G	39	34	G	B	B	B	G	35	G	38	B	26	30	38	38	42	50					
6	86	37	41	35	31	27	28	33	G	37	B	B	B	B	B	B	B	39	34	33	49	38	40	41	50					
7	38	B	28	B	B	35	B	33	36	B	B	B	B	B	32	31	B	B	B	B	35	23	K	18	28					
8	38	41	41	B	B	22	70	37	B	B	B	B	B	B	32	B	B	G	B	B	G	36	G	32	38					
9	40	38	B	B	28	B	B	B	B	B	36	C	B	B	B	32	B	G	B	B	32	29	20	35						
10	66	B	B	B	28	B	31	37	37	36	B	B	B	C	C	B	G	G	G	G	32	E	B	23	19					
11	20	33	40	39	48	39	B	36	40	39	40	38	B	B	33	G	B	B	B	B	35	35	38	K	40					
12	32	36	34	34	B	B	B	39	G	E	B	B	B	B	36	34	30	31	29	31	26	28	16	23						
13	38	37	89	26	34	36	B	G	36	39	G	G	B	B	B	B	G	G	C	C	C	C	C	C	C					
14	C	27	31	28	35	29	22	31	30	34	36	43	B	40	38	34	35	B	B	G	25	22	18	36	19					
15	18	28	30	17	G	E	B	32	34	38	E	B	E	B	E	B	43	30	E	B	E	B	24	20	24	19				
16	94	31	24	34	36	B	B	40	33	31	33	32	40	36	40	48	44	36	28	34	G	24	E	B	E	B	41			
17	38	55	38	31	E	B	B	B	36	38	B	B	34	32	31	30	34	32	50	34	22	18	31	34						
18	42	B	36	37	34	36	30	30	B	E	B	54	38	B	E	B	57	42	34	29	31	28	26	26	26	51	39			
19	44	37	37	23	32	30	37	34	G	30	32	34	36	36	38	34	34	34	30	28	32	22	18	13	24					
20	38	32	58	86	40	49	37	32	G	32	35	34	B	E	B	B	E	B	E	B	E	B	36	21	35	37				
21	41	Q	34	40	34	35	34	G	35	36	32	E	B	E	B	E	B	E	B	E	B	E	B	E	B	44				
22	45	48	48	48	42	35	B	B	37	32	G	28	36	34	36	31	34	31	28	25	G	20	20	36	27					
23	38	37	41	60	E	B	51	38	42	33	G	35	38	35	35	33	32	32	30	34	31	26	23	G	E	B	21	16	22	21
24	30	40	42	44	31	39	42	G	44	32	38	37	G	G	E	B	E	B	E	B	E	B	E	B	E	B	E	B	32	
25	42	44	95	66	G	40	40	36	34	30	33	33	35	B	40	33	32	B	B	27	32	22	17	34	69					
26	102	38	38	41	49	41	34	G	19	40	B	B	E	B	E	B	E	B	E	B	G	32	30	26	28	31	41	43	40	
27	38	81	70	31	40	27	38	G	G	30	32	34	32	33	34	38	34	33	31	30	24	19	28	18	31					
28	70	43	48	44	44	47	B	38	39	34	B	B	B	32	B	G	35	30	30	28	22	E	B	E	S	K	12	42		
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	25	23	24	21	23	21	17	23	23	21	16	14	11	16	20	22	22	20	20	22	25	25	25	26						
MED	38	37	40	34	34	35	36	34	35	35	35	36	34	34	34	34	34	G	28	28	25	22	28	36						
U Q	44	43	47	44	40	40	38	37	37	39	G	38	E	B	E	B	E	B	37	39	33	30	32	35	30	36	40			
L Q	34	32	35	30	31	28	32	G	32	32	34	32	33	32	32	32	33	30	30	28	25	22	20	18	24					

FEB. 2002 ftEs (0.1MHz)

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2002 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	9			
3	15	8	16	16	14	14	18	13	26		B	18	16	25	B	19	18	16	14	15	16	15	15	12	12			
4	10	10	13		C	15	16	21	12	16		B	B	19	C	20	13	14	16	13	13	16	10	15	11			
5	12	11	12	10	11	20	16	15	14	17		B	B	B	B	22	15	14	14	B	14	13	24	11	11	10		
6	11	12	10	11	11	11	14	12	16	28		B	B	B	B	B	24	14	12	13	13	11	12	11				
7	26	B	E	S	B	B		B				B	B	B	B	26	20		B	B	B	B	15	12	11	12		
8	12	15	13		B	B	19	19	26		B	B	B	B	B	21	15	B	B		26	25	15	11	10			
9	17	15	B	B		B	B	B			B	B	C	B	B		15	B	B		B	B	21	16	15	10		
10	12	B	B	B		B	25	24	26	20		B	B	B	C	C	B			20	25	12	13	14	30	16	9	
11	10	11	15	20	10	27	B	15	17	14	16	15		B	B	15	28					14	14	10	16			
12	19	25	15	12	B	B	B		21	29	54		B	B	B	30	20	16	12	12	14	14	14	10	12	C		
13	9	16	11	12	11	30		B	20	26	22	12	14		B	B	B		13	16		C	C	C	C	C	C	
14	C	9	10	11	10	10	16	15	12	15	17	12		B	20	26	25	20		B	B	10	8	9	11	10		
15	9	9	9	11	9	30	18	26	21	73	57	61		B	57	28	20	10	14	29	30	17	9	9	11			
16	10	10	9	9	14	B	B		29	12	9	16	12	12	12	11	14	14	13	15	10	14	21	27	10			
17	10	10	14	10	27	B	B	B		30	15		B	B	31	28	18	16	16	10	11	15	14	14	8	10		
18	12	B	14	16	16	24	14	11		B	54	29		B	B	57	15	12	16	14	12	10	9	12	12	11		
19	10	16	16	9	10	8	11	14	13	10	12	14	15	10	18	15	17	14	12	11		9	11	9	10			
20	10	10	10	13	14	16	16	11	11	21	14		B	75	B	72	28	54	32	47	29	18	12	12	11			
21	12	11	12	12	14	21	19	27	25	18	17	54	57	58	55	55	24	16	26	21	26	16	14	11				
22	12	20	11	14	16	26		B	22	12	19	14	16	16	14	16	12	11	13	15	14	12	10	10				
23	11	26	14	15	51	12	13	18	18	14	24	18	14	17	25	20	13	14	15	16	15	16	10	8				
24	10	11	13	14	12	11	23	17	16	20	28	18	15	13	53	16	74	56	18	25	52	25	14	12				
25	11	10	13	12	18	20	14	10	12	11	16	12		B	29	28	29		B	B	16	12	15	12	10	13		
26	13	15	19	18	11	14	19	16	14	25		B	B	58	58	54	57	24	16	16	20	14	10	15	12			
27	13	12	17	12	25	18	19	22	15	11	16	25	20	19	16	17	21	13	12	16	11	12	E	S	12	12		
28	12	13	16	13	16	12	B		16	14	25		B	B	B	25	B	16	20	16	24	18	27	12	E	S	12	13
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	25	26	26	25	26	26	26	26	26	26	26	25	25	24	25	26	26	26	25	25	25	25	25	25	26			
MED	12	12	13	13	14	20	19	16	16	20	28	54		B	43	26	20	18	16	15	16	15	12	12	11			
U Q	12	16	16	17	18	30		B	26	26	54		B	B	B	B	64	29	24	56	38	26	20	16	14	12		
L Q	10	10	11	11	11	14	16	13	14	14	16	14	22	20	17	16	14	14	12	13	14	11	10	10				

FEB. 2002 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2002 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHZ TO 15.0MHZ IN 20.0SEC 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C							
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	A							
3	A	216	A	A	A	Q	A	A	A	B	Y	A	Y	B	Y	A	218	A	A	226	216	254	268	246	252						
4	A	244	292	230	C	A	E	A	A	A	B	B	A	C	C	A	A	A	Y	232	238	A	A	A	E	A	268				
5	A	A	A	Q	A	A	296	A	262	218	Y	B	B	B	A	A	Y	238	B	238	238	Q	A	A	A	A	268				
6	A	A	A	202	A	A	A	E	A	A	B	B	B	B	B	B	B	A	A	E	A	A	A	A	A	A	A				
7	A	B	242	B	B	A	B	E	A	A	B	B	B	B	B	A	A	B	B	B	B	B	268	248	278	290	A				
8	A	A	A	B	B	Y	E	A	A	B	B	B	B	B	A	B	B	A	B	B	A	A	E	A	A	A	A				
9	276	A	B	B	A	B	B	B	B	B	A	C	B	B	B	A	B	222	B	B	252	262	262	262	262	A	A				
10	230	A	B	B	B	B	A	A	A	A	B	B	B	C	C	B	220	222	230	244	250	250	264	264	264	A	A				
11	268	258	A	A	Q	A	B	E	A	Y	A	A	Y	B	B	Y	Y	B	B	B	B	B	A	A	A	250	342				
12	A	A	A	A	B	B	B	B	A	A	B	B	B	B	B	A	A	Y	A	A	238	234	246	238	238	258	A				
13	A	252	A	E	A	A	A	B	A	A	A	A	226	B	B	B	B	226	226	C	C	C	C	C	C	C	C				
14	C	A	342	342	350	A	E	A	264	236	246	222	Y	Y	B	A	A	228	228	B	B	240	236	232	236	234	Q	Q			
15	Q	Q	262	288	302	Q	E	B	250	242	246	A	B	B	B	B	E	Y	E	Y	A	232	228	228	240	234	226	226	Q	Q	
16	A	A	A	A	Y	B	B	Y	A	242	210	198	Y	Y	Y	Y	A	240	330	232	240	240	240	296	252	266	254	Q	Q		
17	Q	A	Q	Q	B	B	B	A	Y	B	B	B	Y	Y	Y	Y	A	242	234	246	246	244	E	A	290	258	312	A	A		
18	A	B	A	A	A	A	A	Q	B	B	Y	B	B	Y	A	254	206	222	230	242	260	242	282	A	A	A	A	A	A		
19	A	A	A	Q	Q	E	A	240	250	228	228	216	228	Y	Y	224	228	216	246	236	238	238	218	244	E	A	270	A	A		
20	E	S	A	A	A	A	A	E	A	264	230	230	236	B	B	B	B	222	B	B	E	B	B	244	228	246	236	A	A	A	
21	A	F	A	A	A	A	A	A	A	A	Y	A	B	B	B	B	Y	238	240	230	250	284	328	A	A	A	A	A	A		
22	A	A	A	A	A	A	B	B	A	Y	Y	Y	Y	Y	Y	Y	224	220	222	232	232	228	236	252	A	A	A	A	A		
23	A	A	A	A	B	A	A	A	250	230	234	250	Y	Y	Y	Y	228	228	224	246	242	246	234	260	Q	Q	Q	Q	Q		
24	A	A	A	A	A	A	A	A	A	Y	230	244	Y	Y	E	B	334	228	E	B	E	B	E	B	320	238	232	290	A	A	
25	248	234	A	A	A	A	A	250	234	234	A	236	B	Y	234	234	B	B	244	226	258	258	354	A	A	A	A	A	A		
26	A	A	A	A	E	B	A	Y	324	Y	A	B	B	B	B	B	240	240	244	268	250	Q	A	A	A	A	A	A	A		
27	A	A	A	A	A	Y	A	A	222	234	240	Y	Y	E	B	Y	298	232	230	240	244	240	254	236	270	Q	Q	Q	Q	Q	
28	228	A	A	A	A	B	A	A	A	A	B	B	B	A	B	222	232	242	250	266	252	244	256	274	226	Q	Q	Q	Q	Q	
29																															
30																															
31																															
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
CNT	12	8	6	9	9	7	6	10	9	7	8	5		3	7	12	17	16	20	22	20	21	19	16							
MED	256	255	265	292	297	290	254	250	234	230	230	236		231	239	228	228	233	238	240	248	250	254	256							
U Q	275	277	304	322	319	308	282	276	246	234	235	247		298	330	233	236	243	244	246	258	264	278	280							
L Q	242	239	230	241	254	280	250	250	225	222	215	227		222	224	221	222	227	232	234	242	237	238	239							

FEB. 2002 h'F (KM)

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2002 fxI (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	B	A	A	A	91	49	A	R	O	X	R	B	B	B	B	O	X	O	X	X	X	X	X	X	X			
2	40	32	56	57	62	R	X	X	80	94	80	81	86	87	97	R	O	X	X	X	X	X	X	X	X			
3	42	45	63	49	41	54	56	63	80	86	102	98	104		B	B	B		X	X	X	O	X	R	A			
4	A	A	A	69	71	58	A	A	R	R	R	R	X	X	X	O	X	X	X	X	O	X	X	X	X			
5	55	53	48	51	44	50	B	R	A	B	B	B	B	O	X	B	X	X	B	X	71	66	47	110	A			
6	A	A	A	B	59	B	B	A	X	B	B	B	B	O	X	B	O	X	B	O	X	72	B	40	90	A		
7	A	B	A	42	58	B	O	X	X	X	B	B	B	O	X	O	X	O	X	X	X	X	B	X	X	X		
8	54	X	O	X	A	O	X	X	X	X	O	X	B	O	X	O	X	O	X	O	X	O	X	O	X	X		
9	50	49	48	46	60	67	72	80	96	103	106	106	116	109	88	106	90	89	102	73	48	46	38	36	X			
10	X	34	42	33	41	50	64	81	92	87	93	90	101	110	113	B	B	O	X	B	75	78	68	65	52	X		
11	56	46	68	69	72	70	72	B	B	B	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
12	54	91	O	X	O	X	X	O	X	X	X	X	X	X	X	B	X	X	O	X	X	X	X	X	X	X		
13	O	X	A	B	O	X	A	A	81	81	98	99	98	97	93	99	98	90	104	97	101	93	82	70	68	53		
14	47	42	37	38	72	69	80	72	88	102	106	82	O	X	X	X	X	X	X	X	X	X	X	X	X	X		
15	36	37	58	57	59	74	92	94	80	96	102	113	114	123	110	113	111	104	104	94	90	81	70	58	X			
16	O	X	86	62	78	88	79	80	80	92	91	106	107	121	114	127	129	114	115	114	100	92	94	80	75	62		
17	50	45	43	44	49	64	63	68	90	98	98	105	112	130	133	128	91	125	110	95	88	84	70	54	O	X		
18	O	X	X	O	X	B	O	X	B	B	B	X	X	O	X	X	X	O	X	X	X	X	X	X	X	B	B	
19	B	B	B	O	X	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X	O	X	O	X	
20	B	B	B	O	X	O	X	X	B	B	R	O	X	X	O	X	X	O	X	X	X	B	O	X	B	O	X	B
21	O	X	O	X	O	X	R	O	X	B	R	X	X	X	O	X	O	X	X	X	X	X	X	X	X	X	X	
22	30	34	A	A	40	43	B	B	B	O	X	B	B	B	X	O	X	X	X	X	X	X	X	X	X	X	X	
23	O	X	B	O	X	O	X	O	X	X	O	X	O	X	B	O	X	O	X	O	X	O	X	O	X	O	X	X
24	B	Y	B	A	B	B	B	B	B	B	B	O	X	B	B	B	B	B	B	B	B	O	X	A	R	X		
25	B	O	X	X	A	A	A	A	A	B	B	B	O	X	X	X	X	X	X	O	X	X	X	X	X	X	X	
26	X	46	72	54	44	38	48	37	44	46	B	X	X	X	O	X	X	X	X	O	X	O	X	X	X	X	X	
27	A	A	A	O	X	48	69	68	69	67	66	69	84	97	103	97	107	100	96	103	102	86	71	62	56	40	O	X
28	41	39	74	69	58	66	R	73	80	100	106	114	121	108	119	116	108	111	104	82	79	67	61	40	O	X	X	
29	36	35	38	36	41	57	57	64	78	86	111	120	132	129	131	136	127	112	107	102	85	67	43	30	O	X	X	
30	O	X	X	A	64	64	F	B	R	R	R	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
31	B	A	55	46	49	53	58	55	O	X	R	R	O	X	B	B	B	X	X	X	X	X	X	X	X	X	X	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	21	20	20	24	25	23	18	18	21	20	22	22	24	24	24	27	28	28	29	29	29	29	27	24	21			
MED	47	42	51	48	58	58	68	73	80	86	90	90	99	96	94	100	100	102	93	80	71	67	58	42				
UQ	54	48	62	61	66	67	80	81	90	100	105	106	111	108	108	106	104	108	102	91	83	79	70	56				
LQ	36	38	40	43	42	49	58	64	68	80	77	78	82	82	89	90	92	94	83	72	58	55	44	38				

MAR. 2002 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2002 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	B	A	A	A	A	F	A	R	R	R	B	B	B	B	B	58	60	60	57	59	55	49	F	F				
2	F	F	F	F	F	J	F	F	F	F	J	R	J	R	R	R	J	R	90	82	80	80	67	59	54			
3	F	F	F	R	F	F	F	F	F	F	J	R	J	R	B	B	F	J	R	71	59	R	R	A	A			
4	A	A	A	F	F	F	A	A	R	R	R	J	R	R	R	R	R	R	R	85	82	56	F	F	F	F		
5	F	F	F	F	F	F	B	R	A	B	B	B	B	R	B	B	B	B	B	65	54	F	F	A	A	A		
6	A	A	A	B	F	B	B	A		B	B	B	B	R	B	R	B	F	R	65	59	66	B	F	A	A		
7	A	B	A	F	F	B	F	R		B	B	R	R	R	R	R	J	R	B		B		F	F	F	F		
8	F	F	A	R	A	R	F	J	R	J	R	R	B	R	R	R	R	R	R	98	84	80	F	F	F	F		
9	F	F	F	F	F	F	F	F	F	R	J	R	R	R	J	R	R	R	R	96	67	42	36	30	30			
10	28	F	A	F	J	R	F	F	F	F	R	R	R	J	R	R	B	B	R	B	F	F	F	F	F	F		
11	F	F	F	R	F	F	F	B	B	B	R	J	R	J	R	J	R	J	R	88	88	78	66	52	42			
12	36	41	R	R	F	R	F	F	F	R	J	R	J	R	J	R	B	J	R	J	R	J	R	F	F	F		
13	R	A	B	R	A	A	F	F	J	R	J	R	J	R	R	J	R	J	R	91	95	87	64	56	43			
14	F	F	F	F	F	F	F	R	J	R	J	R	R	R	R	R	R	R	R	87	87	86	84	76	52	33	22	
15	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	98	94	88	84	75	60	48		
16	R	56	F	F	F	J	R	F	F	F	F	J	R	R	J	R	R	J	R	94	86	88	63	65	52			
17	F	F	F	F	F	F	F	J	R	J	R	J	R	R	R	R	J	R	J	85	119	104	89	82	78	64	48	
18	R	34	R	B	R	B	B	B	B	91	99	96	91	86	83	92	96	98	92	89	74	49	J	R	B	B		
19	B	B	B	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	J	R	57	59	50	42	34	34		
20	B	B	B	R	R	B	B	R	R	J	R	R	J	R	R	R	R	R	R	80	33	B	R	B	R	B		
21	R	R	R	R	D	R	U	S	B	R	J	R	R	R	J	R	J	R	J	76	73	76	74	65	59	56	33	
22	F	F	A	A	F	F	B	B	B	R	B	B	72	76	81	96	95	88	75	70	60	52	46	34				
23	R	B	R	R	R	U	R	R	R	40	40	66	78	85	97	85	93	102	84	86	94	72	B	Y	A	A		
24	B	Y	B	A	B	B	B	B	B	B	R	B	B	B	B	B	B	B	B	B	B	R	R	A	A	R		
25	B	R	A	A	A	A	A	A	B	B	B	B	R	J	R	J	R	J	R	62	41	J	R	F	F	F	F	
26	40	61	43	31	26	42	31	36	40	B	J	R	J	R	R	J	R	J	R	87	94	80	74	54	35	25	21	
27	A	A	A	R	F	F	F	F	F	R	R	J	R	R	F	R	J	J	R	91	93	78	72	59	31	F	A	A
28	F	F	F	F	F	F	R	F	F	F	F	F	F	F	J	R	F	F	F	96	96	80	65	56	47	34		
29	F	F	F	F	F	F	F	F	F	J	R	R	R	J	R	J	R	J	R	90	97	96	80	65	56	47	34	
30	R	32	54	A	F	F	F	F	B	R	R	J	R	R	J	R	J	R	R	106	101	96	76	58	34	24		
31	B	A	A	F	F	F	F	R	R	R	R	B	B	B	J	R	J	R	F	80	34	31	F	A	A	A		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	21	20	18	24	24	23	18	18	20	20	22	22	25	24	24	27	28	28	29	29	28	24	22	21				
MED	F	F	F	F	F	F	F	F	F	R	R	R	R	R	R	R	R	R	R	94	96	87	74	64	56	46	34	
U Q	41	38	39	42	50	57	64	69	81	92	97	99	105	102	102	100	98	102	95	85	76	64	56	46				
L Q	F	F	F	F	F	F	F	F	R	R	R	R	R	R	R	R	R	R	R	86	88	77	66	46	41	33	30	

MAR. 2002 foF2 (0.1MHz)

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2002 ftEs (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	B	37	124	63	44	23	38	38	40	40	B	B	B	B	BE	B	G	34	31	33	30	25	22	18	25	30		
2	33	32	30	38	91	43	40	32	29	34	35	34	35	41	31	32	G	G	29	31	24	23	28	22	22			
3	29	30	36	43	41	38	33	28	28	30	33	34	48	B	B	BE	B	56	28	50	36	42	34	93	39			
4	43	38	41	33	42	31	48	48	42	31	34	35	37	37	38	32	30	28	26	22	K	17	24	33	37			
5	49	35	22	34	30	36	B	G	45	B	B	B	B	BE	B	B	G	B	28	23	38	69	36	36				
6	37	45	40	B	43	B	B	41	44	B	B	B	BE	B	BE	B	BE	BE	BE	BE	B	B	90	76	34			
7	94	B	50	48	36	B	30	41	30	34	B	BE	BE	BE	BE	BE	BE	BE	BE	B	33	50	32	28				
8	27	35	40	36	44	37	32	37	30	31	55	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	19		
9	17	16	23	23	27	35	34	29	27	30	32	35	36	36	32	27	BE	B	G	26	23	24	40	39	34	36		
10	31	35	34	35	34	80	22	24	28	30	57	54	50	31	49	B	BE	B	BE	B	52	40	22	19	18			
11	30	48	64	BE	B	38	40	26	B	B	BE	B	G	34	33	46	64	28	26	55	26	23	22	24	32			
12	34	49	43	40	31	38	40	36	G	G	28	31	34	34	58	B	30	27	24	23	35	25	26	20	31			
13	94	38	B	41	41	45	40	26	G	G	22	32	30	30	34	29	30	28	27	32	27	21	15	14	14			
14	BE	14	17	34	20	24	16	18	26	29	30	31	34	30	48	30	31	28	26	26	32	28	28	BE	SE	SE	SE	
15	ES	14	19	28	44	32	33	24	22	27	36	31	32	32	33	32	34	29	28	25	30	29	19	BE	SE	SE	SE	
16	42	50	70	91	31	32	41	23	26	28	31	28	29	35	30	28	29	26	22	26	BE	BE	BE	BE	BE	BE	BE	
17	16	BE	BE	SE	SE	SE	SE	SE	BE	B	G	28	26	28	36	33	33	30	50	22	25	22	20	23	17	51	29	
18	BE	BE	BE	B	B	35	B	B	BE	BE	B	BE	BE	B	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	B		
19	B	B	B	36	38	B	B	B	B	B	B	B	B	B	B	B	B	B	BE	BE	BE	BE	BE	BE	BE	BE	BE	
20	B	B	B	20	BE	BE	B	B	BE	BE	BE	BE	BE	B	B	B	BE	B	G	BE	BE	BE	BE	BE	BE	BE	BE	
21	34	22	BE	BE	B	41	38	B	32	30	23	29	30	32	BE	B	48	30	31	20	26	BE	BE	BE	BE	BE	BE	
22	20	26	34	38	27	23	B	B	BE	B	B	B	G	34	32	32	29	29	22	BE	BE	BE	BE	BE	BE	BE	BE	
23	BE	B	BE	BE	BE	BE	BE	BE	BE	BE	B	BE	BE	BE	B	BE	BE	BE	BE	BE	BE	B	40	44	68			
24	B	34	41	B	B	B	B	B	B	BE	B	B	B	B	B	B	B	29	B	B	49	39	73	41	36			
25	B	42	41	43	38	33	48	38	B	B	BE	BE	BE	BE	B	58	56	30	31	27	49	23	20	19	18	20	12	17
26	18	32	32	22	23	24	23	BE	BE	B	BE	BE	B	BE	BE	B	G	24	26	26	28	22	15	20	30	32	61	
27	52	79	34	30	22	17	18	20	22	26	28	32	18	27	29	54	30	26	21	15	14	28	18	35	SE	14		
28	19	32	38	31	27	31	40	37	32	30	28	30	28	33	27	28	23	22	23	35	22	24	28	14	SE	14		
29	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	B	22	26	31	34	49	31	30	30	G	G	20	18	15	15	13	21	28
30	22	34	38	50	32	34	38	B	32	37	32	31	29	G	G	29	50	30	28	26	17	43	40	42	36			
31	B	38	34	36	38	37	33	28	40	38	30	B	B	BE	B	56	28	27	21	18	18	28	41	41	79			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	25	27	27	29	30	26	23	24	26	24	23	22	25	25	24	27	28	28	29	29	29	30	30	29				
MED	29	34	34	36	33	33	33	29	30	30	31	33	32	32	30	30	28	26	24	BE	B	25	24	26	26	29		
UQ	40	38	41	43	41	38	40	37	32	33	33	BE	BE	BE	BE	BE	B	30	28	BE	B	30	34	36	39	36	36	
LQ	BE	26	BE	26	24	27	23	24	24	27	29	29	31	30	31	30	28	28	25	22	BE	BE	BE	BE	BE	BE	20	

MAR. 2002 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2002 fmin (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		B	28	16	14	21	15	30	16	16	18	B	B	B	B	B	34	24	13	25	20	15	12	13	13	
2		11	12	14	13	12	18	14	16	13	26	19	21	28	16	20	16	15	13	13	15	E S	12	E S	E S	
3		E S	E S	E S	E S	12	13	14	15	13	14	12	13	15	48	B	B	56	20	21	12	13	14	12	16	
4		14	20	20	11	E S	11	14	11	14	12	12	18	15	17	18	25	15	14	26	14	12	11	12	12	
5		12	12	12	9	12	12	B	20	14	B	B	B	B	60	B	24	13	B	21	16	13	12	13	15	
6		13	20	21	B	15	B	B	25	25	B	B	B	B	32	B	57	B	28	36	28	B	14	12	13	
7		12	B	14	13	14	B	25	17	14	14	B	B	60	56	53	75	32	52	18	B	19	12	11	13	
8		12	13	19	19	15	25	26	18	17	20	55	B	93	B	59	41	20	54	26	25	58	26	17	12	
9		12	12	13	13	13	12	18	16	15	15	16	14	26	24	24	20	36	15	14	12	12	13	12	12	
10		12	12	15	13	14	13	14	14	18	30	57	54	18	21	16	B	B	32	B	52	15	15	10	12	
11		12	12	12	59	15	16	15	B	B	B	55	19	20	15	46	64	15	17	55	26	23	18	8	7	
12		11	13	12	10	9	14	12	28	18	18	15	25	18	58	B	17	25	16	19	14	11	E S	E S	12	
13		20	20	B	18	13	22	13	14	14	13	16	16	25	19	20	16	14	14	32	15	13	15	14	E S	
14		14	13	13	13	14	16	15	18	19	16	16	25	18	20	16	15	13	14	13	12	13	13	14	E S	
15		E S	14	13	13	12	14	14	14	14	15	20	20	16	16	14	15	12	14	13	12	12	E S	E S	E S	
16		14	16	13	14	12	15	14	15	14	15	13	15	15	16	15	14	16	14	13	26	26	15	13	12	
17		12	16	E S	E S	E S	E S	25	25	19	19	23	36	25	22	18	19	14	14	17	12	14	17	51	29	
18		29	26	25	B	22	B	B	B	52	32	15	17	26	19	57	54	29	29	31	26	15	25	B	B	
19		B	B	B	30	30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	54	54	26	21	19	21
20		B	B	B	16	29	19	B	B	26	30	32	52	19	16	20	32	21	25	30	B	20	B	30	B	
21		25	20	26	25	20	19	B	26	24	21	19	26	25	48	20	16	15	26	15	16	15	15	18	16	
22		16	14	19	20	15	17	B	B	B	31	B	B	15	25	32	29	29	18	25	19	26	17	20	21	
23		18	B	20	20	20	18	29	31	30	31	B	33	52	28	24	15	15	25	25	40	B	30	35	30	
24		B	26	B	20	B	B	B	B	B	B	27	B	B	B	B	B	25	B	B	15	15	20	13	14	
25		B	16	13	14	15	22	14	16	B	B	B	58	56	30	27	20	20	18	20	19	18	8	12	9	
26		10	9	10	12	19	10	13	19	22	B	29	30	17	20	20	16	26	28	22	15	12	14	15	14	
27		13	55	24	22	15	14	18	14	15	20	16	21	13	25	20	54	30	26	20	15	E S	14	13	14	14
28		E S	E S	E S	14	14	12	14	36	15	25	24	16	19	21	33	24	28	18	14	12	15	14	14	E S	
29		E S	E S	E S	E S	E S	E S	E S	13	15	21	18	27	20	22	30	26	20	16	14	15	15	E S	13	13	14
30		E S	14	13	15	14	19	17	12	B	28	27	21	21	19	26	19	16	18	16	15	12	14	12	12	17
31		B	16	20	12	13	13	16	20	26	24	30	B	B	B	56	25	27	13	14	18	14	14	13	13	
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED		14	16	15	14	14	16	18	18	19	24	23	27	25	25	24	25	20	18	21	16	15	14	13	14	
U Q		B	25	26	21	20	19	22	B	B	B	B	B	60	58	59	54	29	28	30	26	20	17	17	16	
L Q		12	13	13	13	13	14	14	15	15	18	16	19	18	19	20	16	15	14	14	14	13	12	12	12	

MAR. 2002 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2002 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
1		B	A	A	A	A	A	A	A	A	A	B	B	B	B	B	232	244	238	242	270	A	Q	S	S						
2		328	348	250	A	F	A	A	A	246	230	242	234	238	226	A	232	220	220	228	218	232	220	212	224	242					
3		300	S	A	A	A	A	E	A	300	244	220	232	230	228	B	B	B	B	E	B	A	A	A	A	A					
4		A	A	A	A	A	A	A	A	262	222	A	A	242	242	242	Y	228	230	232	232	236	228	250	F	E	A	A			
5		A	A	A	A	A	A	B	A	A	A	B	B	B	B	B	B	242	238	B	244	288	Q	A	A	A	A				
6		A	A	A	B	A	B	B	A	A	B	B	B	B	B	220	B	B	B	B	B	E	B	B	A	A	A				
7		A	B	A	A	A	B	A	Y	274	274	B	B	B	B	B	B	B	E	B	E	B	B	240	232	252	Q	A			
8		A	288	A	A	A	A	A	Y	258	230	B	B	B	B	B	230	218	250	234	224	E	B	280	232	230	Q	238			
9		Q	Q	A	A	A	A	A	Q	252	230	230	230	226	226	A	Y	Y	E	B	B	A	A	A	A	A	A				
10		242	342	A	A	A	Q	Q	Q	246	240	B	B	B	B	232	246	230	B	B	252	B	Q	Q	Q	Q	Q				
11		362	276	236	B	A	236	A	B	B	B	B	236	224	234	B	B	B	E	B	B	224	222	220	238	Q	Q				
12		A	A	214	A	208	234	A	A	F	Q	A	226	234	B	B	228	228	228	238	256	A	A	A	E	A	A				
13		E	A	A	B	A	A	A	A	348	262	236	220	242	232	A	228	218	230	222	224	224	224	212	218	220	232	234			
14		250	E	282	A	A	A	A	A	376	286	250	250	228	220	234	226	222	232	222	228	208	196	210	210	214	230	E	S		
15		E	S	E	S	S	S	A	E	A	A	A	A	A	A	A	218	234	218	214	226	220	212	216	216	202	216	Q	Q		
16		A	234	A	A	A	Y	Y	A	256	232	214	222	216	220	226	222	222	216	218	214	220	230	204	216	226	E	B			
17		254	292	E	S	E	S	E	S	E	S	E	S	E	S	E	A	E	A	E	A	218	212	200	202	214	228	290	264		
18		254	E	B	E	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	224	234	232	234	212	268	B	B		
19		B	B	B	Y	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	E	B	
20		B	B	B	Y	B	B	B	B	258	246	232	324	Y	226	224	236	222	226	246	B	B	B	B	B	B	B	E	B		
21		Y	A	E	B	E	B	Y	B	A	A	A	A	A	E	B	238	222	232	276	230	222	224	232	222	2312	A	A			
22		A	A	A	A	A	A	B	B	B	E	B	B	B	E	A	264	260	238	242	242	242	238	224	230	242	242	250	E	B	
23		E	B	B	E	B	B	E	B	E	B	E	B	B	B	B	B	B	B	B	B	242	222	236	308	B	B	A	A	A	
24		B	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	
25		B	232	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	Q	216	224	216	224	204	216	Q	Q	A	
26		A	248	240	A	A	A	A	A	E	B	B	242	232	226	Q	230	230	230	232	222	216	232	234	272	236	A	A	A		
27		A	A	A	A	A	A	326	290	252	230	240	242	216	226	220	240	218	222	210	202	202	214	218	242	A	242	A	A		
28		S	A	226	238	238	A	A	A	326	266	238	220	218	218	228	222	222	204	208	202	208	Q	Q	Q	Q	Q	Q	Q	Q	A
29		S	E	S	S	E	S	E	S	Q	258	234	226	234	232	218	214	220	220	208	186	204	204	208	216	250	Q	A	A	A	
30		A	A	A	A	204	A	A	B	230	A	256	248	228	250	242	236	244	258	250	286	Q	292	A	A	A	A	A	A	A	
31		B	A	A	288	A	A	A	A	A	A	A	A	B	B	B	E	B	B	272	228	248	238	218	246	A	A	A	A	A	
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT		13	14	13	8	8	10	9	14	19	21	20	20	19	20	18	23	28	28	26	28	23	20	21	19						
MED		255	284	U	U	U	U	U	U	248	268	302	256	236	235	234	232	225	228	228	228	226	228	224	226	226	222	234	252	A	
U Q		316	328	339	348	333	340	348	290	252	244	242	237	234	234	232	232	242	242	236	255	242	244	258	284	A	A	A	A	A	
L Q		250	272	238	275	223	234	294	250	230	227	230	226	218	226	222	222	219	222	214	214	214	214	214	223	238					

MAR. 2002 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2002 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	O X	X	X		B	O X	A	A	O X
2		O X	X	B	B	A	B	A	B	B	B	B	B	B	B	B	B	X	O X	X				X	O X	A
3		A	X	A	A	B	B	B	A	B	B	B	X	X	B	B	B	B	O X	O X	X	X	O X	X	A	O X
4		B	A	B	B	R	B	B	B	B	B	X	O X	X	B	X	X	B	B	B	B	B			X	X
5		30	X	A		O X			B	B	O X	X	X	O X	O X	X	X	O X	X	X	O X	X	X			X
6		34	39	34	30	42	55	53	O X	X	X	X	X	X	O X	X	X	O X	X	X	X	X				X
7		R	O X																							X
8		28	25	23	50	23		O X	X	X	X	X	X	X	O X	X	X	O X	O X	X	X	X				X
9		X																								X
10		32	35	X	32	69	32	86	43	67	80	97	123	135	135	137	134	131	134	116	102	X	O X	X	X	
11		43	47	42	44	57	65	70	66	O X	X	X	X	X	X	X	X	X	O X	X	X	X				X
12		X																								X
13		O X	X	X	R	R																				X
14		A		B	68	70																				X
15		A	43	65	43	50	57	64		B	R	X	X	X	X	X	X	X	X	X	X	X				X
16		A	A	A	B	O X																				X
17		93	A	51	66	X	74																			X
18		A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19		A	A	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
20		B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
21		O X		X		R	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
22		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
23		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
24		A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
25		A	42	A	A	B	A	X	O X	O X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26		B	B	A	X																					X
27		74	X	45	42	42																				X
28		O X	A	A		B	B	X																		X
29		A	A	O X	55	35	43																			X
30		O X	A	A	A	A	B	A																		X
31																										X
		00	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	16	12	16	14	11	14	14	12	14	18	18	18	17	19	22	21	25	23	23	21	20	15	18	
MED		40	40	44	47	54	65	66	52	66	76	82	100	104	116	115	114	112	108	104	89	70	47	38	38	
U Q		49	47	53	66	69	73	70	71	70	80	93	109	115	124	126	130	116	114	111	102	81	67	53	41	
L Q		30	32	33	38	42	55	53	43	56	68	75	88	98	104	106	102	106	99	86	66	43	36	O X	O X	

APR. 2002 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2002 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	RJ	R		F	B	R	A	A	R					
2	RJ	R	B	B	A	B	A	B	B	B	B	B	B	B	B	R	R		F	B	R	A	A	R					
3	A	41	A	A	B	B	B	A	B	B	B	J	R	R	B	B	B		R	R	R	A	A	R					
4	B	A	B	B	R	B	B	B	B	B	J	R	R	R	B	B	B		R	R	R	A	A	R					
5	F	20	20	A	F	F	R	F	B	B	R		R	R	R	R	R		S	S	F	F	F	F					
6	F	24	25	23	18	19	24	35	51	70	87	92	85	102	108	96	101	92	100	83	65	61	43	22					
7	R	32	46	F	F	A	60	61	61	80	81	102	108	115	120	120	106	106	102	90	74	62	26	19					
8	F	18	17	16	44	17	22	36	62	81	92	104	108	111	119	110	110	109	101	88	69	45	44	32					
9	24	19	22	F	F	F	60	69	58	68	87	96	104	120	126	132	130	127	122	105	94	75	59	37	28				
10	F	22	20	16	17	19	19	23	36	60	74	91	117	129	129	131	128	125	128	110	96	90	90	59	46				
11	F	33	32	33	26	44	49	57	31	58	71	82	82	96	101	102	111	98	108	119	100	64	54	20	20				
12	F	33	27	A	F	A	A	R	J	R	A	J	R	J	R	J	R	D	R	J	R	F	F	F	F				
13	23	24	43	R	R	F	53	B	R	J	R	R	R	J	R	96	99	104	J	R	U	S	F	F	F				
14	A	28	B	F	F	B	A	B	A		67	B	B	B	J	R	97	100	105	101	98	86	36	26	26				
15	A	A	F	F	F	F	B	R	J	R	72	88	102	110	124	120	128	122	119	110	103	60	23	32	44				
16	A	A	A	B	F	U	R	F	A	R	B	72	B	J	R	F	105	112	103	110	111	109	97	77	60	34	23	26	
17	F	58	A	F	F	J	R	R	A	A	B	B	59	103	99		98	103	63	U	R	B	B	B	B	B	B	B	
18	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A	A			
19	A	A	A	B	B	B	A	B	B	B	B	B	B	B	B	B	F	93	B	B	A	A	B	A	A	B			
20	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	U	R	R	F	A	R	B	A			
21	U	R	F	R	D	R	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
22	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
23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	J	R	R	B	A	R	C			
24	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	J	R	R	F	B	B	B	R		
25	A	A	A	A	B	A		F	R	J	R	J	R	J	R	R	B	J	R	R	R	F	R	R	R	R			
26	B	B	A		F	R	R	R	R	40	62	81	102	D	R	J	R	J	R	U	S	F	F	F	F	F	F	F	
27	A	31	32	33	36	A	54	59	58	54	74	104	113	106	109	124	101	102	99	94	60	31	A	A	A				
28	R	43	A	A	F	B	B		F	B	B	B	B	B	B	J	R	B	R	106	98	94	58	28	A	A	F	26	
29	A	A	R	F	F	B	A	F	F	J	R	68	74	96	109	130	124	126	122	102	60	26	F	A	A	A	A		
30	R	36	A	A	A	B	A	F	F	B	R		J	R	J	R	J	R	F	B		B	R	R	R	R			
31								48	56	69	82	90	92	102	89	104	100				66								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	13	14	12	15	13	9	14	14	12	14	18	18	19	17	19	23	21	25	23	23	21	20	14	17					
MED	33	28	32	33	30	49	46	38	58	70	76	94	98	109	108	108	104	100	97	83	60	40	29	26					
U Q	42	32	45	38	51	58	57	59	62	74	87	103	109	118	120	124	110	108	102	94	68	60	43	32					
L Q	F	22	20	22	20	19	26	31	35	50	62	69	82	90	98	100	89	100	93	80	58	30	24	20	19				

APR. 2002 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2002 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	41	39	40	B	B	56	40	B	B	B	B	B	B	B	B	58	30	30	25	B	16	31	40	22			
2	34	39	B	B	42	B	44	B	B	B	B	B	B	B	B	30	56	53	28	33	38	20	19	38			
3	36	43	67	40	B	B	B	B	B	B	53	35	B	B	B	B	B	56	56	32	25	21	30	41			
4	B	38	B	B	33	B	B	B	B	B	36	34	60	B	36	48	B	B	B	B	26	20	19	16			
5	28	28	32	31	18	E B	40	24	B	B	38	55	54	55	65	29	26	28	18	17	15	16	13	12	14		
6	18	30	18	20	17	E S	13	13	15	28	25	54	30	31	29	29	28	28	25	27	22	15	13	14	13		
7	23	43	40	44	36	K	38	48	33	23	25	28	28	30	32	28	23	24	56	15	13	19	22	16	13		
8	36	36	31	29	17	B	E	B	B	B	B	B	B	B	B	B	B	B	E	S	E	S	E	S	E	S	
9	E S	13	17	30	17	40	44	39	32	22	26	26	26	30	30	29	27	22	18	15	12	14	12	12	15		
10	E B	12	18	21	22	13	E	B	B	B	B	B	B	B	B	G	G	E	B	B	B	B	B	B	B	B	
11	11	33	40	34	32	20	32	87	17	23	27	41	31	29	27	34	32	21	20	14	19	14	22	26			
12	36	55	49	54	68	62	38	35	40	32	27	29	27	28	23	26	22	19	26	17	14	13	18	16			
13	22	34	37	31	39	E S	13	B	E	B	B	E	B	E	B	E	B	E	B	E	B	38	43	48	48		
14	39	44	B	37	33	B	45	B	54	46	B	B	B	B	B	B	G	E	B	25	20	21	22	29	40	37	35
15	36	38	35	39	34	31	19	B	E	B	25	26	30	28	28	34	28	22	44	14	15	23	31	36	44		
16	44	39	41	B	66	40	38	62	38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
17	56	41	53	33	41	42	48	38	B	B	B	B	B	B	B	B	B	87	25	38	B	B	B	B	B	B	
18	33	32	B	38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
19	40	39	35	B	B	B	97	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
20	B	B	B	B	36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
21	36	34	36	39	35	38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
22	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	
23	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	
24	63	44	39	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
25	68	33	73	43	B	36	32	26	20	E	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
26	B	B	68	15	18	12	E	B	28	31	E	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
27	27	32	24	24	72	45	35	20	16	19	26	23	23	24	34	25	16	13	15	13	34	21	35	44			
28	69	46	46	64	B	B	49	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
29	34	41	32	86	43	B	40	28	18	18	26	22	E	B	B	B	B	B	B	B	B	B	B	B	B	B	
30	43	42	39	39	42	B	38	39	37	B	E	B	B	B	B	B	B	B	B	B	B	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	25	26	23	21	21	16	21	17	16	15	18	18	19	17	19	23	21	25	24	24	23	25	25	25			
MED	36	38	39	37	36	38	38	32	22	25	E	B	30	27	E	B	E	B	E	B	E	B	E	B	E	B	
U Q	42	42	46	42	42	43	44	40	38	32	38	34	33	30	34	34	31	48	28	32	32	32	36	39			
L Q	25	33	32	26	E	E	E	B	20	23	26	27	E	B	E	B	E	B	E	B	E	B	E	B	E	B	

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2002 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	19	21	13	B	B	16	22	B	B	B	B	B	B	B	B	58	30	30	12	B	16	13	13	13	
2	14	14	B	B	26	B	20	B	B	B	B	B	B	B	B	30	56	53	28	33	38	20	12	13	
3	12	12	25	18	B	B	B	28	B	B	B	53	35	B	B	B	B	B	56	56	32	25	12	11	11
4	B	21	B	B	29	B	B	B	B	B	36	34	60	B	36	48	B	B	B	B	187	20	19	13	
5	13	12	13	12	12	40	10	B	B	38	55	54	55	65	29	26	16	18	17	15	16	13	12	14	
6	12	12	12	13	12	E S	E S	15	28	25	54	30	31	14	29	28	28	25	27	22	15	E S	14	13	
7	12	14	12	12	11	21	16	14	16	18	18	24	20	20	21	19	20	55	12	13	13	13	13	13	
8	16	14	13	13	E S	B	15	19	21	31	32	30	31	30	30	28	25	14	E S	13	E S	E S	E S	E S	
9	E S	13	12	13	E S	13	12	13	12	13	15	16	18	20	19	19	18	15	15	15	E S	12	E S	11	
10	12	12	12	11	8	15	14	16	15	12	19	18	21	16	18	26	26	25	15	15	12	12	12	12	
11	10	12	11	12	11	10	10	17	11	15	13	19	22	29	16	20	24	19	20	14	19	10	10	10	
12	E S	12	10	18	12	14	21	21	13	18	15	14	13	12	12	13	14	12	10	26	17	E S	10	E B	
13	19	13	13	12	E S	B	54	55	20	55	25	33	31	27	30	22	15	12	15	18	12	15	15		
14	14	14	B E S	13	13	15	B	23	25	B	B	B	55	30	32	18	14	21	15	E S	12	14	12	13	
15	12	13	15	14	14	13	E S	B	29	16	26	16	16	18	19	15	13	12	14	15	E S	E S	E S	14	
16	13	14	14	B	16	16	16	16	30	B	36	B	42	30	29	27	25	16	14	11	9	12	9	8	
17	12	11	10	20	16	19	25	29	B	B	38	24	30	B	B	87	25	32	B	B	B	B	B	B	
18	28	24	B	28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	20	B	18	25	
19	28	26	27	B	B	B	22	B	B	B	B	B	B	B	B	51	B	B	24	22	B	28	32	B	
20	B	B	B	B	24	B	B	B	B	B	B	B	B	B	B	B	B	28	13	10	10	9	B	20	
21	12	16	13	10	29	16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	
24	25	20	26	B	B	B	B	B	B	B	B	B	B	B	B	57	57	B	57	33	76	B	B	12	
25	20	11	18	16	B	22	15	13	12	27	30	27	27	29	B	29	20	31	25	16	11	15	14	9	
26	B	B	15	10	10	10	28	27	25	25	25	26	30	18	15	12	16	9	8	7	6	11	10	8	
27	9	9	8	10	12	14	12	8	9	14	14	17	16	17	13	25	16	E S	13	E S	14	13	14	12	
28	13	13	14	13	B	B	25	14	B	B	B	B	B	B	77	B	86	55	25	26	18	E S	13	13	
29	E S	13	13	14	E S	E S	B	13	13	13	14	17	18	25	25	24	21	19	12	15	18	12	12	12	
30	12	16	12	15	29	B	19	12	13	B	56	28	27	27	25	20	56	30	B	30	B	13	10	12	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	
MED	13	14	14	14	20	31	20	28	42	B	54	32	34	43	30	30	26	29	22	18	16	13	13	13	
U Q	B	25	21	27	B	B	B	B	B	B	B	B	B	B	B	87	B	B	B	B	B	B	B	B	
L Q	12	12	13	12	12	15	14	14	16	18	25	24	25	20	21	21	19	15	14	14	13	12	12	12	

APR. 2002 fmin (0.1MHz)

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2002 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHZ TO 15.0MHZ IN 20.0SEC IN MANUAL SCALING

H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	246	240	294	Q	B	B	A	A	A
2	234	250	B	B	A	B	A	B	B	B	B	B	B	B	B	226	280	E	B	B	B	B	E	A	A
3	A	A	A	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	E	B	A	A
4	B	A	B	B	A	B	B	B	B	B	E	B	E	B	B	242	242	B	B	B	B	260	276		
5	A	A	A		A	B	A	B		B	E	B	E	B	B	266	264	250	248	244	224	214	206	192	202
6	S	S		S	E	S	E	S	E	S	E	B	E	B			220	230	218	208	226	222	220	246	
7	A	232	242	A	206	A	A	Q	308	256	242	230	230	206	210	224	220	188	238	186	198	232	220	246	
8	244	A	E	A	234	S	B	E	B	E	B	Q	248	246	216	218	222	206	224	200	224	192	196	218	
9	278	364	A	E	A	A	A	Q	382	334	280	216	218	208	204	222	228	220	204	210	200	200	200	196	
10	250		A	A	A	A	E	B	E	B	Q	418	360	286	220	206	200	222	222	216	226	188	188	192	
11	214	238	222	316	A	A	A	S	218	316	212	212	226	264	242	222	218	234	218	218	218	206	230	230	
12	A	266	A	248	A	A	Y		218		A	E	A	254	242	242	234	236	236	218	218	252	232	212	
13	A	A	A	A	A	Q	B	B	B	A	B	E	A	E	B	E	B	280	266	254	244	250	244	262	
14	A	250	A	248	A	B	A	B	A	A	B	B	B	E	B	B	262	240	214	232	248	202	230	242	
15	A	A	318	A	A	A	A	B	254	230	216	216	226	204	210	210	204	210	206	220	Q	Q	E	S	
16	A	A	A	B	Q	Y	A	A	A	A	B	E	B	B	B	270	248	226	220	214	192	216	198	190	
17	A	A	Q	A	A	A	A	A	B	B	E	B	E	A	E	B	B	B	B	B	B	Y	B	B	
18	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
19	A	A	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	B	
20	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E	A	A	B	
21	E	Y	A	E	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	
24	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	240	232	B	E	B	B	B	A	
25	A	A	A	A	B	A	A	A	280	218	212	218	214	234		210	194	222	202	182	208	222	E	B	
26	B	B	A	A	A	A	B	A	E	B	294	226	216	228	210	204	200	206	194	194	192	198	214	196	
27	A	A	A	A	A	A	E	A	Q	Q	348	342	286	226	198	220	224	230	218	216	196	208	218	202	
28	Q	A	A	E	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	300	232	238	244	
29	A	A	A	E	S	A	B	A	Q	340	302	254	224	208	190	202	232	198	188	200	212	200	A	A	
30	208	A	A	A	A	B	A	E	A	Q	B	E	B	266	226	220	220	228	214	E	B	B	B	E	
31																									
CNT	10	8	8	12	5	4	7	10	12	14	17	17	19	17	18	20	21	23	22	21	19	18	13	14	
MED	243	258	246	255	223	348	348	304	258	230	217	224	224	223	224	214	211	215	209	208	221	216	230	258	
U Q	250	328	274	312	317	400	364	326	287	254	E	B	A	E	B	260	245	248	235	236	223	241	248	232	
L Q	234	244	232	241	201	316	334	280	234	218	214	218	220	208	220	208	194	200	202	200	208	200	220	246	

APR. 2002 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2002 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C		44	41	38	X	X		C	B	O	X	O	X	O	X	X	X	X	X	O	X	O	X	X
2		28	26		26	B	A				67	71	66	69	80	104	105	118	129	129	116	107	98	78	57
3			Y	B	B	X	X	X	B	B				80	97	107	113	130	127	117	95	94	73	52	32
4		B	B	B	B		B	B	B	O	X		B	B						O	X			X	O
5	O	X																							
6		42	X		O	X	O	X			69	78	81	91	87	103	114	132	133	132	132	130	116	96	74
7		39			A	A	B		A	O	X	O	X												
8		34	O	X	A	A	B	A	B																
9			42	36		A	A	A	X																
10		55	O	X		A	O	X	A																
11		68																							
12		85	O	X																					
13		61																							
14	O	X	O	X	O	X	O	X																	
15																									
16	R	R	R	R	B	R	O	X	A	B	B	X	O	X	X	O	X	B	O	X	X				
17		A	B		A	A	A	O	X																
18	X	46	54		A	A		38	56	58	56	49	62	80	89	92	88	90	79	66	49	45	30		
19	R		A		A																				
20	O	X	O	X	O	X																			
21																									
22	X	24	R	X																					
23	A	A	O	X	A	O	X	B	A	B	B	B	B	B	B	B	B	X	B	B	B	B	B	B	A
24	B	A	B	R	O	X	B	B	X	O	X	X	B	B	R	B	X	X							
25	O	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26	R		R	O	X	O	X	O	X																
27	A	A	A	A	A	A	A	B	O	X															
28	O	X	O	X	A	A																			
29	B	A	A	A	A	A	B	B	B																
30																									
31																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		16	13	16	12	17	15	17	17	19	18	21	19	20	23	25	27	29	29	27	26	20	12	10	17
MED		42	42	40	40	42	41	42	48	49	50	67	80	98	102	108	105	105	95	75	55	40	31	28	39
UQ		50	46	50	56	48	55	62	62	58	66	74	97	106	112	114	124	112	103	93	70	46	38	31	48
LQ		31	32	34	34	36	35	39	43	36	44	62	69	84	92	102	98	82	70	58	39	30	24	25	24

MAY 2002 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2002 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	C	F	F	F	33	33	F	C	B	R	R	R	R	J	R	128	107	103	J	R	R	R	R	R	F			
2	F	R	B	R	B	A	J	R	F	F	F	J	R	J	R	J	R	R	R	F	F	F	F	R	B			
3	B	Y	B	B	18	18	20		B	B	B	F	91	101	107	124	121	111	J	R	88	64	F	F	F			
4	B	B	B	B	F	B	B	B	30		61			101	104	112	102	F	F	92	73	54	F	F	F			
5	R	F	F	F	A	A	F	F	F	F	J	F	J	R	133	128	125	J	R	F	R	F	F	F	F			
6	F	R	F	R	R	F	F	F	F	F	F	F	102	126	127	126	126	J	R	J	R	90	62	R	A	A	F	
7	F	B	A	A	B	B	A	R	R	R	F		97	106	109	101	98	F	F	F	F	F	F	A	A	A		
8	F	R	A	A	B	A	B	B	A	B	R		62	62	74	91	100	107	104	90	70	30	F	C	A	A	23	33
9	A	F	F	A	A	A	J	R	F									F	F	F	F	F	F	B	B	F	15	
10	F	R	F	A	F	R	A	A	F	B	B	R	B	B	B	J	R	F	F	B	R	F	R	B	A	F	53	
11	F	A	B	A	A	J	R	F	F	F	R	B	B	J	R	B	J	R	F	F	R	A	F	A	A	A	A	
12	A	31	A	A	F	F	B	R	B	A	B	B	B	R	R	F	68	62	61	76	80	54	24	B	B	A	A	
13	A	B	B	A	A	A	B	A	B	B	R	R	F	96	98	102	105	99	J	R	F	F	F	A		R	36	
14	R	R	R	R	F	F	A	A	A	A	B	B	B	B	B	F	B	F	F	B	B	R	R	A	Y	A	A	
15	A	A	A	A	B	B	B	B	R	R	R	B	B	B	B	B	B	62	54	42	23	B	B	A	R	50	A	
16	R	R	R	R	B	R	R	A	B	B	49	64	71	86	99		94	81	66				B	A	A	A	A	
17	A	B	F	A	A	A	36	31	32	41	57	63	J	R	80	93	92	82	64	56	48	19	F	Y	Y	R	26	
18	40	40	F	A	A	F	F	F	F	F	J	R	R	J	R	R	J	R	F	F	F	F	R	B	B	R	R	
19	R	A	F	A	F	F	A	A	B	B	B	B	R	F	45	46	44	39	33	B	B	B	B	R	A	A	A	
20	R	R	R	R	F	F	R	B	R	R	F	F	J	R	J	R	J	R	F	F	F	F	F	R	A	F	18	
21	A	A	R	R	B	B	A	F	F	F	B	B	B	R	B	F	R	R	B	B	B	B	B	B	B	B	B	
22	18	R	30	30	33	32	28	31	24	57	64	68	81	77	102		B	B	J	R	R	R	R	R	A	A	A	
23	A	A	U	R	A	R	B	A	B	B	B	B	B	B	B	B	J	R	B	B	B	B	B	B	B	B	A	
24	B	A	B	R	R	B	B		R		B	B	D	R	B	J	R	J	R	F	F	F	F	R	R	R	R	
25	R	R	22	21	21	22	23	24	27	34	56	80	98	99	100	94	53	38	39	21	B	R	R	R	B	B	B	
26	R	R	R	R	R	R	F	F	F	F	F	B	R	83	98	96	99	92	72	69	56	28	18	R	Y	A	A	
27	A	A	A	A	A	A	B	R	F	B	B	B	B	B	B	F	F	F	F	A	A	A	A	R	A	R	R	
28	R	R	A	A	A	A	A	R	B	B	B	B	B	B	B	B	J	R	90	96	58	43	B	B	B	A	A	
29	B	A	A	A	A	A	B	B	B	F	D	R	R	F	B	J	R	99	97	104	60	52	30	F	B	B	B	R
30	R	A	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	R	B	B	B	
31	B	B	R	A	F	F	F	F	F	F	F	R	F	J	R	F	F	F	J	F	F	R	F	A	B	R	R	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	14	13	16	10	16	15	17	17	19	18	22	19	21	23	25	26	28	29	27	25	20	11	9	16				
MED	26	33	28	30	32	29	33	38	39	38	61	72	89	94	99	98	96	88	68	43	32	22	19	22				
U Q	37	40	35	32	35	38	46	50	43	56	65	91	98	106	108	112	103	95	77	59	40	30	24	34				
L Q	18	24	24	22	22	26	28	31	30	36	56	63	74	86	92	91	76	62	52	30	21	17	18	18				

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2002 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	C		34	36	31	39	27	17		C			BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE
2	18	E B		BE S		B	44	46	40	16	18	E	BE	BE	BE	BE	BE	BE	SE	SE	SE	SE	BE	BE
3	B		19	B	BE	SE	SE		B	B	BE	BE	BE	BE	BE	BE		E	BE	SE	SE	SE	SE	SE
4	B	B	B	BE	B	B	B	BE	B	BE	B	B	BE	BE	BE	BE		E	B	E	S		16	15
5	38	42	40	41	70	37	38	36	29		G	18	21	E	BE	B		20	18	26	22	12	E	BE
6	31	34	41	37	45	41	42	34	30	19	21	22	34	28	22	18	KE	B	15	12	31	32	33	49
7	65	B		42	38	B	B	40	35	E	BE	B	G	22	28	25	25	20	15	23	24	40	42	40
8	39	38	66	39	B	36	B	B	60	BE	B	55	28	E	B	GE	B	E	BE	BE	SE	C	31	32
9	44	70	72	68	40	44	41	35	22	G	29	33	24	E	BE	BE	BE	BE	B	E	BE	B	B	B
10	35	74	55	40	39	42	48	42	34	B	BE	B	44	B	B	BE	BE	B	BE	BE	SE	BE	B	B
11	60	94	B	38	33	35	34	23	18	KE	B	B	18	27	B	BE	B	BE	BE	B	41	40	43	34
12	40	76	38	42	58	37	B	32	B	B	B	B	BE	BE	BE	BE	BE	BE	BE	B	19	B	B	40
13	35	B	B	40	84	35	B	37	B	BE	BE	BE	BE	BE	BE	B	22	E	BE	BE	B	E	B	28
14	34	44	34	29	18	22	72	36	40	38	B	B	B	B	BE	B	BE	B	BE	B	36	79	93	44
15	72	40	40	40	B	B	B	B	35	40	38	B	B	B	B	B	BE	BE	BE	BE	B	B	B	31
16	33	37	42	32	B	40	43	45	B	B	E	BE	BE	BE	BE	B	BE	BE	BE	B	B	B	40	38
17	43	B	61	41	48	41	41	22	E	BE	BE	BE	BE	BE	BE	B	E	BE	S	E	BE	BE	BE	BE
18	34	42	42	37	40	33	22	18	KE	15	16	16	24	30	25	18	15	14	18	16	15	E	B	20
19	42	42	40	90	54	36	24	44	35	B	B	BE	BE	BE	BE	B	E	B	22	23	19	32	B	22
20	28	32	29	32	23	24	23	BE	BE	BE	B	19	18	18	18	17	19	17	E	BE	BE	BE	B	E
21	33	33	32	58	B	B	39	34	30	18	B	B	BE	BE	BE	BE	BE	BE	BE	B	B	B	B	B
22	20	22	32	28	23	26	17	14	54	38	27	52	54	61	56	B	BE	BE	BE	BE	B	E	B	32
23	39	39	40	43	E	B	B	B	B	B	B	B	B	B	B	BE	B	B	B	B	B	B	B	B
24	B	34	B	29	32	B	BE	BE	BE	B	B	BE	B	56	BE	BE	BE	BE	B	K	13	14	11	16
25	14	E	B	28	11	16	14	13	14	13	13	14	19	23	27	20	16	22	30	12	E	B	B	23
26	33	23	32	35	36	31	E	B	15	21	61	39	15	BE	BE	BE	BE	B	E	BE	BE	BE	BE	BE
27	40	44	46	38	55	87	B	34	22	B	B	B	B	B	B	23	18	53	20	40	44	40	33	44
28	38	60	40	33	38	37	46	44	B	BE	B	30	B	B	B	BE	BE	BE	BE	BE	BE	B	B	B
29	B	37	48	65	43	39	B	B	BE	BE	BE	BE	BE	BE	BE	B	BE	BE	BE	BE	BE	B	B	B
30	34	39	35	24	32	19	16	16	E	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	BE	B	B
31	B	B	29	33	36	38	22	37	E	S	15	20	17	28	30	28	30	20	20	28	14	17	23	28
CNT	25	26	25	29	25	25	23	23	23	21	23	19	21	23	25	27	29	29	28	27	21	20	23	27
MED	35	38	40	38	38	36	38	34	25	19	25	22	E	BE	BE	BE	BE	BE	BE	E	BE	BE	BE	BE
U Q	41	44	44	41	46	40	42	37	35	34	32	36	33	54	29	36	26	27	E	B	25	25	32	33
L Q	33	33	33	32	24	26	22	22	18	E	18	17	21	24	25	22	18	18	16	14	14	15	16	18

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2002 fmin (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		C ^E S ^S 13	13	E ^S S ^S 14	14	15	13		C ^E B	29	25	26	28	29	25	25	19	26	20	53	32	25	14	13		
2	13	15	B	14	B	15	13	13	E ^S S ^S 13	13	20	27	28	26	25	16	15	E ^S S ^S 12	E ^S S ^S 12	E ^S S ^S 12	16	16	15	B		
3	B	15	B	B ^E S ^S 14	E ^S S ^S 14	13		B	B	B	26	25	25	26	25	20	13	14	E ^S S ^S 13	E ^S S ^S 13	12	12	14	13		
4	B	B	B	B	14	B	B	B	19		38			54	53	14	13	16	14	E ^S S ^S 13	12	10	15	14		
5	13	E ^S S ^S 12	13	12	14	20	15	14	13	12	15	18	24	26	20	15	13	13	12	E ^S S ^S 12	15	E ^S S ^S 13	13	E ^S S ^S 14		
6	13	13	12	13	16	13	13	13	11	12	14	15	19	16	16	13	15	8	7	11	10	15	9	9		
7	9	B	25	28	B	B	12	14	25	29	15	16	16	20	25	25	20	15	18	24	13	12	14	16		
8	13	12	26	30	B	31	B	B	26	B	55	22	16	28	15	19	13	20	19	E ^S S ^S 13	C	15	13	13		
9	26	14	13	19	25	14	16	12	15	17	22	14	32	53	86	36	22	15	14	15	15	B	B	13		
10	13	16	25	16	14	14	16	11	13	B	B	44	B	B	B	58	54	B	54	E ^S S ^S 14	25	B	14	13		
11	E ^S S ^S 14	14	B	18	26	19	13	14	12	14	27	B	B	63	B	55	59	13	14	17	12	13	14	13		
12	14	13	26	16	13	13	B	20	B	13	B	B	B	60	54	26	19	20	16	14	B	B	21	13		
13	13	B	B	16	13	29	B	27	B	B	54	56	35	53	24	15	15	19	25	13	18	15	13	14		
14	14	14	15	25	13	14	41	24	29	16	B	B	B	B	33	B	27	14	B	13	14	15	24	14		
15	13	28	16	14	B	B	B	B	22	25	30	B	B	B	B	B	25	29	15	14	B	B	13	24		
16	26	26	20	27	B	18	13	25	B	B	21	48	24	34	24	B	37	26	16	B	B	14	14	14		
17	14	B	13	20	16	16	14	14	15	16	16	24	30	25	15	15	14	12	16	15	15	14	14	14		
18	14	13	14	26	14	14	13	14	13	13	10	17	18	18	8	8	6	8	6	10	17	B	B	13		
19	15	18	19	12	16	13	14	16	B	B	B	30	19	20	15	16	15	11	B	B	B	12	11			
20	10	8	8	8	10	14	12	B	19	18	18	10	9	10	14	41	54	25	18	9	10	8	10	8		
21	8	7	8	11	B	B	20	10	14	15	B	B	B	54	B	25	55	19	B	B	B	B	B	B		
22	7	13	14	9	9	8	10	8	11	15	17	52	54	61	56	B	B	52	28	25	26	14	16	25		
23	26	26	22	24	26	B	21	B	B	B	B	B	B	B	B	53	B	B	B	B	B	B	B	28		
24	B	28	B	21	25	B	B	26	19	25	B	B	56	B	28	25	16	14	10	11	11	9	10	9		
25	10	14	11	8	8	12	8	9	8	8	8	10	13	13	10	9	8	8	9	14	B	7	7	B		
26	11	12	9	8	8	9	15	12	9	8	15	B	51	55	26	54	15	24	25	16	18	E ^S S ^S 14	13	14		
27	E ^S S ^S 13	13	E ^S S ^S 14	13	25	20	B	15	14	B	B	B	B	B	20	14	53	13	13	13	14	17	13	14		
28	24	14	13	20	13	24	16	13	B	B	30	B	B	B	B	55	14	29	20	14	B	B	B	13		
29	B	13	18	26	15	26	B	B	B	18	30	36	30	B	21	16	25	16	26	17	B	B	B	12		
30	13	13	13	13	12	13	12	16	E ^S S ^S 13	E ^S S ^S 13	E ^S S ^S 14	E ^S S ^S 13	14	13	20	20	15	12	18	15	E ^S S ^S 14	24	21	B	B	B
31	B	B	14	13	14	14	12	15	E ^S S ^S 14	12	13	14	13	14	14	13	13	13	14	12	13	14	B ^E S ^S 12	12		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	
MED	14	14	15	16	14	15	15	14	15	18	26	44	30	53	25	25	18	15	16	14	18	15	14	14		
UQ	B	B	B	25	B	B	B	B	B	B	B	B	B	B	B	56	54	37	25	25	24	B	B	B	16	
LQ	13	13	13	13	13	14	13	13	13	13	15	17	20	20	16	15	14	13	13	13	13	13	13	13	13	

MAY 2002 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2002 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	C	218	E S	A	A	204	A	C	B E B	240	204	204	204	208	216	206	208	220	196	282	250	E B	242	E B
2	E S E B	338	376	B E S	384	B	A E A	Q	Q	Q	220	214	200	204	208	176	176	186	178	196	196	232	254	B
3	B	Y	B	B	S	S	A	B	B	B	254	222	200	206	206	200	188	198	202	180	196	E S	240	S
4	B	B	B	B	B	B	B	B	E B	B	266	B	B	228	232	198	194	180	202	174	180	208	240	E A
5	220	220	S	218	232	A	A	216	338	290	238	212	198	204	210	216	194	206	184	200	196	202	210	S
6	S	260	306	A	A	246	A	320	280	230	208	220	220	188	198	188	182	196	196	274	350	A	A	E A
7	A	B	A	A	B	B	A	A	B E B	Q	210	232	230	196	210	210	208	202	232	202	224	C	A	A
8	E A	322	352	A	A	B	A	B	B	A	B E B	346	240	228	234	224	196	180	188	194	214	A	A	S
9	A	238	A	A	A	A	A	A	E A	A	210	202	216	252	268	242	190	200	206	210	218	B	B	A
10	A	224	248	A	A	222	236	A	A E A	B	B	268	B	B	B	B	214	220	B E B	256	210	230	B	A
11	A	A	B	A	A	A	A	Q	Q	312	278	238	248	B	B	B	226	302	210	A	A	F	A	A
12	A	218	B	B	A	A	A	B	A	B	A	B	B	B	E B	302	232	238	236	236	Q	A	B	B
13	202	A	A	A	A	A	A	B	A	B	B E B	326	266	224	234	216	198	182	210	202	178	204	A	S
14	A	214	A	222	A	A	A	A	A	A	A	B	B	B	B	242	220	268	268	270	A	A	A	Y
15	A	A	A	A	B	B	B	B	A	A	A	B	B	B	B	B	226	224	194	244	B	B	A	A
16	A	A	A	A	B	A	A	A	B	B	270	E B	244	230	218	218	228	224	192	Q	B	B	A	A
17	A	B	288	A	A	A	A	334	280	230	212	218	194	214	214	206	172	196	186	208	232	Y	Y	226
18	218	214	A	A	A	214	350	316	298	228	228	210	178	178	186	194	176	204	190	198	210	B	B	A
19	A	A	A	A	A	244	A	A	A	A	B	B	B	300	244	238	232	278	268	248	B	B	B	A
20	A	A	A	218	222	398	A	A	B E B	B E B	300	222	228	228	210	262	290	220	230	230	190	A	A	318
21	A	A	246	A	B	B	A	A	300	230	Q	B	B	B	B	258	216	E B	224	B	B	B	B	B
22	A	A	A	212	236	356	356	348	E A	366	316	248	268	260	282	254	B	B	B	238	210	220	312	280
23	A	A	248	A	E B	B	A	B	B	B	B	B	B	B	B	E B	334	B	B	B	B	B	B	B
24	B	A	B	A	A	B	B E B	B E B	B E B	B	B	B	B	B	B	B	252	188	206	186	172	202	208	232
25	E A	328	328	250	316	370	360	372	350	302	260	202	202	214	190	204	212	182	222	188	224	B	A	A
26	A	A	196	196	194	A	B	A	A	A	258	260	256	218	218	236	210	228	198	216	272	318	A	A
27	A	A	A	A	A	A	B	A	Q	B	B	B	B	B	B	Q	258	218	246	252	A	A	A	A
28	A	A	A	A	A	A	A	A	B	B E B	B E B	B E B	B	B	B	B	220	238	240	196	208	B	B	B
29	B	A	A	A	A	A	B	B	B E B	B E B	B E B	228	B	186	196	214	196	224	214	B	B	B	B	A
30	A	A	A	A	A	A	S E S	S	S	328	278	248	222	228	202	190	194	210	188	222	198	206	242	B
31	B	B	A	A	A	A	A	Q E S	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	A	A	B E S
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	11	11	8	8	10	7	11	16	18	22	19	21	21	25	27	29	29	26	24	18	10	7	13
MED	U	246	221	248	224	226	242	283	324	286	239	U	225	217	218	212	213	208	201	209	200	210	U	215
U Q	E A E	328	328	306	292	279	356	372	348	349	284	E B	266	244	230	234	235	226	233	226	210	222	E	250
L Q	220	218	224	215	222	214	214	312	279	230	212	210	201	196	201	196	182	196	194	200	202	210	240	228

MAY 2002 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2002 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
1	X	26	28	30	33	32	34	33	33	34	40	52	74	B	X	O	X	X	O	X	X		Y	B	B	B								
2		63	68	51	86	B	A	R	B	A	R	B	X	87	102	106	112	110	93	73	66	95	79	O	X	R	O	X						
3	A	A	A	R	O	X	O	X	O	X	R	B	O	X	B	B	B	O	X	O	X	B	B	B	B	A	R							
4	A	A	R	B	A	B	B	B	R	B	B	O	X	B	B	O	X	X			B	B	Y	X	A	O	X							
5	A	O	X	A	B	A	A	B	A			X	X	X	X	X	X			X	B	B	B	Y	O	X	X							
6	A	O	X	O	X	A	A	A	B	B	R	X	X	O	X	B		B			72	48	33	O	X	O	X	X	A					
7	A	60	R	A	A	O	X				41	48	67	79	104		103			72	48	33	O	X	O	X	X	A						
8	A	60	A	38	40	43	43	43	48	44	46	66	80	93	96	77	64	56	49	50	31	24	51	61	O	X	O	X	A					
9	O	X	A	A	R	B	B	A	A	B	B	B	B	B	B	X	X	B	B	O	X	B	B	A	A	O	X	O	X	A				
10	A	O	X	A	A	O	X	A			A	O	X	B	B	X	B			O	X	A	O	X	A	O	X	O	X	A				
11		36	B	B	B	A	A	A	B	B	37	41		B	B	B	B			O	X		B	B	O	X	X	X	A					
12	A	A	O	X	59	34	A	A	A	B	A			X	X	X	X			47	40		B	B	B	O	X	X	X	A				
13	X	37	A	B	A	A	O	X	A	B	B	B		X	X	O	X	O	X	59	51	32	28	O	X	O	X	O	X	A				
14	O	X	O	X	A	A	A	B	A	X				B		X	X			X	X			O	X	O	X	O	X	A				
15	A	A	A	A	A				34	42	38	42	52		70	80	49	41	44	48	27	22	20	19	B	O	X	X	A					
16	O	X	R	A	A	68	48	A	O	X	48	58	57	54	50	61	80	79	55	70	76	47	28	B	B	B	B	B	A					
17	A	A	A	A	A	A	A	38	B	X	B			X	X	X	X			X	B	B	O	X	B	O	X	O	X	A				
18	B	O	X	O	X	X	X	47	45	44	39	37	45	61	69	71	78	74	74	60	30	23	23	O	X	O	X	O	X	A				
19	A	O	X	O	X	O	X	45	45	52	48	66	78	66		78	80	80	90	76	65	36	25	24	O	X	O	X	O	X	A			
20	O	X	A	A	O	X	A	A	B	R	A	A	B	B	X	X	X	B			B	B	B	O	X	R	R	R	R	A				
21	A	O	X	O	X	O	X	X	O	X	B	R	A	O	X	X	X	X			X	O	X	B	A	R	O	X	O	X	A			
22	O	X	R	A	O	X	O	X	A	O	X					X	O	X	X	X	O	X	A	A		O	X	O	X	O	X	A		
23	A	50	A	A	A	X	O	X	B	B	B	B	B	B	O	X	B	O	X	X	X	B	B	B	B	B	B	B	O	X	A			
24	O	X	O	X	O	X	O	X	A	A	O	X		B	X	X	X	O	X			O	X	O	X	O	X	O	X	O	X	A		
25	X	O	X	A	A	O	X	A	A	O	X	X	A		O	X	X	R	X	O	X	X	B	B	B	A	A	A	A	A	A			
26	A	A	A	A	A	A	A	A	O	X	37	39	33	40	54	62	68	72	70	39	38	38	28	B	B	B	A	A	A	A	A			
27	O	X	A	A	A	33	35	40	38	45	41	47	62	74	67	73	50	50	55	29	22	O	X	A	R	A	O	X	O	X	A			
28	O	X	A	X	X	X	X	O	X	26	26	28	44	56	66	80	80	42	34	38	28	22	21	A	A	A	A	A	A	A	A			
29	23	31	37	36	43	A			43	39	56	46	50	51	60	65	79	61	38	38	33	22	19											
30	A	O	X	A	A	A			A	A	B	B	B	O	X	B	B	B	B	R														
31																																		
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
CNT		14	16	11	12	14	14	15	17	18	19	20	22	21	23	26	25	26	27	24	17	14	9	14	14									
MED		O	X	O	X	X	X	40	43	43	44	40	46	56	66	80	80	68	65	62	40	25	22	24	31	30								
U Q		O	X	O	X	X	X	44	48	45	49	55	46	49	62	76	86	86	84	75	73	48	30	24	36	51	48							
L Q		X	O	X	X	X	X	34	38	36	39	37	43	52	62	70	78	60	50	51	35	22	21	21	24	28								

JUN. 2002 f_{XI} (0.1MHz)

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2002 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	F	17	18	18	19	19	19	20	21	22	27	46	68	J	R	B	R	J	R	F	F	F	Y	B	B	B				
2	A		37	42	53	B	A	R	B	A	R	B	68	74	96	98	106	104	J	R	F	F	R	R	R	R				
3	A	A	A	R	R	49	30	38	44	36	A	B	R	B	B	B	R	R	R	B	B	B	B	A	R					
4	A	A	R	B	A	B	B	R	B	B	R	B	40	B	B	R	96	98	F	F	B	Y		A	R					
5	A	R	A	B	A	A	B	A	F	F	F	40	43	56	J	R	73	74	80	80	62	60	50	B	R	Y	R	25		
6	A	R	R	A	A	A	B	B	A	F	F	34	42	56	F	F	R	B	F	B	F	F	R	R	R	R	A			
7	A	R	R	A	A	R	F	F	F	F	F	B	B	B	R	R	78	94	72	44	57	32	26	18	B	A	R	22		
8	A	R	A	F	F	F	F	F	F	F	F	40	60	71	81	90	71	58	46	38	37	20	18	33	55	R	R	55		
9	R	A	A	R	B	B	A	A	B	B	B	B	B	B	B	J	R	J	R	B	R	B	B	A	A	8	A	8		
10	A	R	A	A	R	A	R	R	A	R	F	B	B	B	F	R	B	F	F	R	A	R	A	R	F	F	30	F	30	
11	F	B	B	B	A	A	A	B	B	F	F	28	35	B	B	B	B	B	F	R	F	B	B	R	A	A	A	A	A	
12	A	A	R	F	A	A	A	B	A	F	F	25	35	41	60	68	76	52	B	F	F	B	B	B	R	R	R	R	17	
13	31	A	B	A	A	R	A	B	B	B	B	B	43	60	56	65	63	R	R	F	F	F	R	R	R	R	R	R	R	
14	R	U	R	A	A	A	B	A	F	F	F	F	F	B	F	F	F	F	F	F	F	F	F	F	F	F	F	F	A	
15	A	A	A	A	A	F	F	A	R	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	A	
16	R	R	A	A	F	F	A	R	F	F	F	F	F	J	R	F	F	F	F	F	F	F	B	B	F	A	A	A	A	
17	A	A	A	A	A	A	A	25	49	F	F	47	57	65	74	J	R	71	58	62	56	B	B	17	B	R	R	R	R	
18	B	R	R	F	F	F	F	F	F	F	F	F	F	F	F	J	R	F	F	F	F	R	R	A	R	R	R	R	A	
19	A	R	R	R	F	R	R	F	R	F	B	B	B	F	F	F	F	F	F	F	F	30	19	18	18	A	A	A	A	
20	R	A	A	R	A	A	B	R	A	A	B	B	B	57	74	82	B	F	B	B	B	R	R	R	R	R	R	R	R	
21	A	R	R	R	F	R	B	R	A	R	R	R	R	F	61	74	56	51	51	47	16	B	A	R	R	R	R	R	23	
22	R	A	A	R	R	A	R	F	F	F	F	37	46	59	72	79	62	39	38	30	A	A	12	12	34	R	R	R	R	
23	A	F	A	A	A	V	R	B	B	B	B	B	B	R	B	R	76	60	58	B	B	B	B	B	B	B	B	B	R	20
24	R	R	R	R	R	A	A	R	F	F	B	B	B	J	R	J	R	F	F	R	R	R	R	R	A	A	A	A	A	
25	33	22	A	A	R	A	A	R	32	32	39	52	69	65	70	65	52	60	46	B	B	B	B	B	A	A	A	A	A	
26	A	A	A	A	A	A	A	31	26	24	34	48	56	62	58	58	33	22	32	22	22	B	B	B	B	A	A	A	A	
27	R	A	A	A	F	F	F	F	F	F	F	F	F	56	68	61	63	40	39	40	17	16	A	R	A	R	R	R	14	
28	R	A	16	17	17	19	19	17	16	20	34	50	54	74	74	36	23	30	22	16	15	R	R	A	A	A	A	A	A	
29	F	F	F	F	R	A	F	F	F	F	F	F	F	J	R	F	J	R	F	F	F	F	R	A	A	A	A	A	A	
30	A	R	A	A	A	R	A	A	B	B	B	B	R	B	B	B	B	D	R	F	F	F	B	R	A	A	A	A	A	
31																														
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT		13	16	10	12	14	14	15	18	18	19	20	22	21	24	26	25	27	27	24	16	14	9	13	13					
MED		R	R	R	24	24	28	30	30	32	30	38	50	60	74	74	62	58	54	32	18	16	18	18	24					
U Q		R	R	R	R	R	F	R	R	F	F	42	56	68	78	80	76	67	62	40	20	18	30	30	38					
L Q		R	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	R	R	R	R					
		18	22	21	22	19	26	26	28	26	26	35	43	56	64	70	50	39	40	28	16	15	15	14	21					

JUN. 2002 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2002 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
1	29	E	S	E	S	E	S	E	S	E	S	E	S		E	S	E	S	E	S	E	S		B	B	B								
2	30	40	42	51		B	49	40		B	49	40		B	E	B	E	B	E	B	E	B	18	13	18	13								
3	76	74	32	40	49	26	34	38	49	36				B	B	B																		
4	38	46	32		B	61		B	B	36				B	E	B	E	B	E	B	E	B												
5	34	39	34		B	40	38		B	36	33	20	19	30	20	30	20	20	25	15	15													
6	39	36	36	45	42	54				B	32	33	25	22	E	B	E	B	E	B	E	B	23	18	10	31								
7	29	40	38	74	41	38	32	23	17	40				B	B																			
8	41	48	40	30	27	32	35	23	36	46	29	16	14	18	16	24	23	18	14	E	B	10	27	31	46	39								
9	96	42	42	31					56	39																								
10	42	42	66	44	46	35	26	48	47	40	19			B	E	B	E	B	E	B	E	B	44	59	50	68								
11	60		B	B					B	B				B	B																			
12	40	36	31	40	43	58	43		B	32	32	16	16	17	18	23	25																	
13	40	66		50	50	38	50		B	B	B	B	21	19	22	22	31	E	B	E	B	E	B	14	21	35	33							
14	44	42	32	42	72			39	38	20	18	16	18																					
15	42	44	62	42	44	41	31	41	14	11	13	13	18	E	B	E	B	E	B	E	B	E	B	14	16	22	32							
16	66	39	50	45	32	30	52	51	32	17	12	17	23	E	B	E	B	E	B	E	B	E	B	28	42									
17	58	39	91	40	62	57	30		B	34		23	18	16	16	17	21	29	34															
18		32	27	32	41	38	27	16	69	E	B	10	13	15	15	22	26	19	11	12	22	E	B	E	B	10	37	35	50					
19	56	50	45	39	68	42	55	50	56	36				B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	26	39				
20	36	91	42	40	50	46		B	23	40	37			B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	12	16	19	16		
21	22	30	32	33	41	16	29		B	33	32	34	20	E	B	31	26	41	33	34	34	28	E	B	11		36	20	18					
22	30	34	42	34	32	36	44	33	30	21	15	14	23	38	29	28	38	29	18	30	32	14	16	45										
23	46	90	44	41	34	30	47		B	B	B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	28				
24	36	40	44	39	48	38	44	38	33	34				B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	10	14	15	36		
25	32	26	43	36	46	59	44	38	39	36	30	42	42	40	64	45	35	E	B	E	B	E	B	E	B	E	B	24	42					
26	39	39	65	43	40	35	40	35	20	22	E	B	20	18	E	B	19	15	16	14	16	17	E	B	10		B	B	B	24				
27	36	37	48	45	32	32	23	28	30	28	33	17	18	23	18	13	E	B	12	12	E	B	12	13	22	14	39	17						
28	24	42	39	12	13	11	13	28	15	18	E	B	13	34	E	B	17	18	31	32	46	31	29	27	16	18	22	24						
29	E	B	8	23	28	25	27	51	46	36	22	14	13	23	24	20	24	27	41	18	29	15	E	B	8	23	30	27						
30	31	37	42	56	64	34	39	45		B	B	B			B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	38	46	44		
31																																		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23										
CNT	29	29	28	27	28	27	26	22	24	24	20	22	21	24	26	25	27	27	24	19	18	18	27	29										
MED	39	40	42	40	42	38	40	36	32	32	18	19	18	20	E	B	E	B	E	B	E	B	E	B	16	32	28	36						
UQ	45	45	44	45	50	46	46	39	40	36	25	25	E	B	E	B	E	B	E	B	E	B	E	B	23	39	40	43						
LQ	30	36	32	33	32	32	30	28	21	18	14	17	17	18	18	19	17	15	15	12	12	16	19	28										

JUN. 2002 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2002 fmin (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	
	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	B	B	B	B	E S	E S	E S	E S	E S	B	B	B	
1	13	12	14	14	14	14	13	13	12	13	14	25		25	21	16	13	13	13	13	12				
2	E S		14	14	14		16	25		21	24		36	16	16	22	15	13	21	19	13	E S	14	14	14
3		25	14	13	24	17	15	21	18	15	15		29				52	56							
4	E S		14	15		24			30			25			58	56	51	24			10	9	8	7	
5		11	12	19		24	20		24	14	10	15	10	15	30	20	20	26	15	15			10	8	
6		9	9	10	22	25	26			28	16	25	15	18	55		20		16	15	14	7	8	10	9
7		9	8	12	37	13	14	10	8	7	10				54	16	26	25	15	20	13	11		9	8
8	16	10	10	10	8	8	8	8	9	8	8	11	8	10	8	8	14	7	8	10	8	8	10	11	
9	9	20	9	11				28	19							59	55			26			10	9	10
10	11	8	15	8	9	20	11	30	26	13	12				22	16		54	13	10	9	12	9	10	8
11	9				25	26	18				16	13						14	56	17			9	9	12
12	22	21	18	11	19	15	14		15	16	10	11	13	13	11	25			10	9				10	7
13	8	25		14	15	13	18					15	12	22	22	31	25	26	11	9	9	8	15	11	
14	11	14	13	18	18		15	10	11	10	11	9		29	19	9	11	11	12	9	8	8	6	7	
15	11	22	21	18	15	10	9	10	9	8	8	8	9	25	19	19	27	26					9	8	
16	10	19	15	11	10	9	15	11	11	8	8	8	10	25	18	16	10	10	11	14			9	12	
17	11	9	12	18	14	11	7		29		20	10	10	10	17	21	29	20			12		9	8	
18		10	8	8	8	8	8	9	16	10	7	10	8	22	26	19	11	12	14	12	10	9	8	12	
19	10	14	9	8	14	8	11	10	15	24			26	10	19	25	26	25	12	11	14		8	7	
20	7	11	15	12	14	21		20	32	25			26	29	56		25				12	10	10	10	
21	8	8	8	8	9	8	8		29	20	25	18	31	16	15	12	12	8	7	11		13	10	8	
22	9	8	8	9	10	12	13	9	9	8	10	8	11	10	8	9	9	10	15	12	9	9	8	9	
23	9	16	13	14	14	10	16						33		56	25	16							10	
24	9	13	12	11	10	22	14	10	7	11		15	10	10	15	10	25	16	19	14	10	9	9	10	
25	8	10	10	10	11	12	20	10	12	20	12	16	8	12	10	9	28	20	16				8	11	
26	12	8	9	10	12	25	25	8	10	11	25	10	13	19	10	12	10	10	13	10				14	
27	8	8	9	9	10	10	8	7	7	7	7	9	12	11	11	9	12	9	12	10	10	9	8	9	
28	11	8	8	8	8	8	9	8	8	8	13	16	17	11	9	9	8	9	9	9	8	8	6	6	
29	8	8	6	8	7	10	8	10	6	7	7	8	7	8	9	8	9	9	9	8	8	7	10	8	
30	12	9	13	18	18	12	14	12				20					26	12	14	15		13	9	10	
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	30
MED	10	12	12	12	14	14	14	12	15	14	18	16	16	22	19	20	25	15	14	14	12	12	9	10	
U Q	12	14	15	18	18	21	21		29	24				54	56	31	28	25	20				10	11	
L Q	9	8	9	9	10	10	9	10	9	10	10	10	10	11	11	10	12	10	11	10	10	9	8	8	

JUN. 2002 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2002 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	S	272	306	306	318	286	306	300	274	260	230	222	190		190	206	194	180	198	204	264	A	B	B	B
2	A		236	198		B	A	A	B	A	A	B	262	228	242	216	196	200	224	204	298	A	A	A	E B
3	A	A	A	A		210		A	A	A	A	B	268		B	B	B	250	234		B	B	B	A	A
4	A	A	A	B	A	B	B	A	B	B	E B	336		B	B	E B	254	232	234	194		B	A	A	A
5	A	A	A	B	A	A	B	A	A	Q	A	Q	240	198	192	204	184	194	208	186		B	B	A	E A
6	A	A	A	A	A	A	B	B	A	E A	Q	328	264	202	202	E B	B	220	206	184	E B	A	A	132	A
7	A	A	A	A	A	210	230	322	290	Q	Q	A	B	B	B	Q	Q	208	210	196	230	216	220	206	220
8	A	216	A	214	214	340	298	302	268	232	232	184	202	198	206	224	210	226	188	220		A	212	202	
9	190	A	A	A	B	B	A	A	B	B	B	B	B	B	E B	E B	290	262		242		B	B	A	202
10	A	254	A	A	A	A	A	208	264		A	A	Q	B	B	Q	B	206	244		258	290	196		220
11	A	B	B	B	A	A	A	B	B	A	A	B	B	B	B	B	B	210	308	234		Q	B	312	A
12	A	A	282	240	A	A	A	B	A	E A	Q	396	228	212	212	218	186	208		Q	Q	B	B	B	204
13	202	A	B	A	A	206	A	A	B	B	B	248	202	212	212	228	254	224	206	216		Q	A	216	
14	210	256	A	A	A	B	A	A	Q	A	Q	300	284	214	230	Q	B	230	200	174	262	192	210	216	
15	A	A	A	A	A	230	A	E A	310	238	248	222	226	202	198	194	222	232	218		B	B	B	B	
16	290	196	A	A	232	324	A	212	212	252	216	228	222	208	200	174	234	204	204	240		Q	B	B	
17	A	A	A	A	A	A	222	B	A	B	Q	268	214	208	208	210	192	238	194		Q	B	E B	264	
18	B	A	E A	A	A	A	A	A	A	Q	Q	282	258	218	194	176	190	180	212	212	158	210	236	274	
19	A	210	224	A	236	A	208	208	A	A	B	344		238	204	204	234	200	222	212	274	274	B	A	
20	218	A	A	A	A	A	B	A	A	A	B	B	E B	228	228	224		210		B	B	E B	A	A	
21	A	210	214	202	206	E A	380	210	B	A	A	A	Q	248	192	218	200	230	212	186	204		A	A	
22	A	A	A	226	232	222	226	274	232	214	182	212	182	180	190	168	210	222		Q	A	A	272	232	
23	A	244	A	A	A	A	A	212	B	B	B	B	E B	274	B	E B	B	210		B	B	B	B	B	
24	210	228	208	200	226	A	A	A	E A	E A	A	344	280	206	202	222	180	182	224	188	220	234	254	278	
25	E A	A	A	A	A	A	A	A	A	E A	A	378	252	250	194	184	200	170	222	230	214		B	B	
26	A	A	A	A	A	A	A	A	A	Q	E B	262	286	286	198	192	212	172	188	210	220	206	240	B	
27	248	A	A	A	192	248	296	266	246	200	220	190	174	186	160	190	192	204	232		Q	A	A	A	
28	A	A	264	260	270	290	294	266	252	256	206	206	194	200	190	188	274	206	212	260	190		A	A	
29	E B	254	280	276	302	332	354	372	284	230	214	188	162	186	200	186	214	214	212	198	216		A	A	
30	A	220	A	A	A	A	A	A	B	B	B	A	B	B	B	B		208	232	192	200		A	A	
31																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		10	15	10	10	12	9	11	14	15	17	20	22	21	24	26	25	27	27	24	17	11	6	10	11
MED	U	222	244	224	228	229	250	222	261	268	251	222	220	202	204	202	195	218	211	209	219	244	241	212	215
U Q		272	264	276	302	253	315	300	298	302	307	270	240	225	215	216	221	234	224	220	262	262	278	270	266
L Q		210	216	214	214	208	220	210	226	258	233	214	202	193	191	194	185	200	204	204	205	220	216	202	204

JUN. 2002 h'F (KM)

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2002 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	R	B	A	R	R	B	R	A	B	R	J	R	R	B	B	R	F	B	B	R	R	R	R		
			38				32	42				44	52	62				82	59					34	56		
2	F	R	A	A	A	A	R	F	F	F	F	F	F	F	F	F	F	F	F	R	R	R	R	R	A		
	41	33					41	30	25	26	32	52	49	60	75	55	40	30	24	17	15	14	17				
3	F	R	R	F		R	F	R	F	F	F	F	F	F	F	F	F	F	F	R	R	R	R	R	A		
	49	34	29	24	33	32	33	49	37	42	39	57	61	75	72	60	41	36	30	23			12	22			
4	J	R	F	F	F	F	R	A	F	F	F	F	F	F	F	F	F	F	F	R	R	R	R	R	R		
	25	20	21	18	17	23	30	30	29	39	46	58	66	67	57	29	25	23	17				13	14			
5	R	R	R	F	B	A	A	F	J	R	F	F	J	R	R	R	B	R	F	F	A	A	A	A	A		
		82	36	32				43	66	53	45	51	60	78		47	57	43	30								
6	A	A	R	A	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	R	A	A	A	A	A		
			41																	43							
7	A	A	A	A	B	B	A	R	R	R	B	B	B	B	B	B	B	B	B	B	R	A	A	A	A		
									21						58	65	54			33	24						
8	J	R	R	R	B	F	A	A	F	F		R					B	B	R	F	R	B	B	Y	B	A	
	36	28	32		29				30	30	29	39	51	61	58			41	37	24							
9	A	F	A	B	A	A	B	R	A	F		B	B	B	R	R	B	B	B	R	R	A	A	A	F		
		21						46		27	28				60	60				24	21				31		
10	R	B	B	R	A	A	A	R	B	B	B	B	B	B	B	B	B	B	J	R	J	R	B	B	B	A	F
	50														78				72	57						19	
11	R	A	F	R	A	F	F	F	F	F	F	J	R		R	J	R	F	F	R	R	B	B	B	B	A	
			42	28		22	23	29	38	27	36	54	58	66	70	64	36	54	29	16							
12	A	A	A	A	A	A	A	R	Q	F	F	F	B	B	R	F	F	F	F	F	A	A	A	A	A	A	
								44	38	37	40	41			43	70	80	62	69								
13	A	A	A	A	A	B	A	A	B	B	B	B	B	B	R	J	R	R	R	R	B	B	B	B	B	A	
															69	57	46	41									
14	A	A	A	A	A	F	F	F	F	F		J	R		R	R	R	R	R	R	R	B	B	B	B	A	
					29	29	31	29	30	41	54	64	68	77	52	42	36	27	19								
15	R	A	A	A	R	F	F	F	F	F		R		F	F	U	R	F	F	R	A	B	B	B	R	A	
	17				18	20	27	26	26	26	35	61	77	74	38	43	44	19								17	
16	F	F	A	A	A	F	F	F	R	B	R	R	F	F	J	R	J	R	R	R	F	R	B	A	A	A	
	21	20				31	16	33	54		44	45	66	71	88	72	62	56	61	23							
17	A	A	A	A	A	R	B	B	A	R	R	B	B	B	B	B	B	B	R	B	B	B	B	B	B	B	
				39		33				41								65									
18	B	B	B	B	B	B	B	B	R	R	B	B	B	B	R	R	B	B	B	B	B	B	B	B	B	B	
									38					61		64											
19	B	B	B	B	B	B	B	B	B	B		R	J	R				R	U	R	B	B	B	B	B	B	
											38	61	61	62	74	74			44								
20	R	B	A	B	B	B	B	A	B	B	U	R	B	B	B	B	B	B	B	R	B	B	R	R	A	A	
											41																
21	R	B	R	A	B	B	B	B	B	A	R	B	B	B	R	B	B	B	R	R	B	R	A	A	A	A	
											44				70		56										
22	A	A	R	R	R	B	B	R	R	B	B	B	B	B	B	B	B	B	71	34		B	B	R	R	R	
			33		58																						
23	B	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	A	
24	B	B	B	B	B	B	A	R	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	
								39						60													
25	A	A	A	A	A	B	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	
												66						58									
26	A	A	B	B	R	B	R	B	B	B	B	B	B	B	B	B	B	B	B	R	B	R	R	A	A		
																			50	35							
27	A	A	R	A	B	B	B	B	R	B	B	B	B	R	J	R	B	B	B	B	R	R	R	R	R	R	
														64	74		98	98									
28	A	A	A	B	B	R	A	B	R	B	R	R	J	R	R	B	B	B	J	R	R	B	R	R	R	R	
												45	54	61		67											
29	R	R	A	R	F	A	A	A	A	F	R	B	R	B	B	B	91	65	70	61	32	17				A	
	30	56		34	29					36	50		81														
30	A	R	F	R	R	R	F	R	F	R	F	V	R	R	J	R	66	55	49	54	20	15	14		A	A	
		31	30	40	35		39	42	30		55	61	79	83	91	66											
31	R	R	A	A	A	A	A	F	F	F	F	F	F	R	J	R	J	R	J	R	F	A	R	R	R	A	
	34	32						27	26	37	52	65	76	81	74	73		73	66	66	33						
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT		9	10	9	7	7	8	8	14	12	14	18	15	18	18	17	18	19	22	22	12	4	3	6	6		
MED		R	R	R	F			F	F	F	F	R		R	R	R				R	R	R	R	R	R		
		34	32	33	32	29	30	31	32	30	30	40	52	61	67	71	65	56	46	34	22	16	14	24	22		
U Q		F	R	R	R	R	R	R	F	F	F	F	R	R	J	R						R	R	R	R		
		45	34	40	39	35	32	40	43	38	37	44	61	64	77	74	73	65	62	54	24	27	14	30	31		
L Q		R	F	F	F	F	F	F	F	F	F	R						F		R	R	R	R	R	R		
		23	21	30	24	18	22	25	30	28	27	38	45	58	61	66	55	41	38	27	18	15	12	17	17		

JUL. 2002 foF2 (0.1MHz)

IONOSPHERIC DATA STATION SHOWA-ST.

JUL.2002 ftEs (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT.69°00.4'S LON.039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	60	42	43	B	38	36	38	B	36	44		BE B	21	35	B	BE B	54	22	B	B	22	42	42	38			
2	42	40	60	46	66	44	48	37	35	16	14	26	31	24	18	32	20	17	BE BE	BE BE	BE BE	18	10	33			
3	54	41	40	44	80	44	42	30	20	22	22	21	19	28	17	16	16	12	15	15		10	24	50			
4	22	22	30	27	20	49	50	23	19	16	28	32	49	30	19	14	14	14	28	17	14	15	12	13			
5	27	91	37	34	B	47	52	33	28	29	18	21	33	25		26	34	28	40	65	34	27	45	36			
6	97	59	42	41	37	B	B	B	72	55		B	B	B	B	B	B	BE BE	BE BE	32	40	38	41	48	38		
7	58	58	44	68	B	B	42	29	19	17		B	BE BE	BE BE	BE BE	B	B	BE BE	BE BE	25	16		17	30			
8	38	34	38	B	72	41	44	31	30	15	14	15	21	22		BE BE	BE BE	BE BE	BE BE	19	20	19		30			
9	35	60	49	B	43	45	B	52	40	21	34		BE BE	BE BE	B	B	B	BE BE	BE BE	15	14	38	40	44	73		
10	84	B	B	38	36	34	42	33		B	B	B	BE BE	BE BE	B	B	B	BE BE	BE BE	32	25		34	22			
11	20	40	34	44	40	29	18	14	14	14	14	14	21	25	38	18	17	14	13	14		B	B	B	35		
12	48	35	44	49	39	45	38	45	35	13	17	15		B	BE BE	BE BE	BE BE	BE BE	31	32	37	36	32	43	41		
13	40	38	40	60	36		44	47		B	B	B	B	B	BE BE	BE BE	BE BE	BE BE	B	B	B	B	B	B	31		
14	36	38	45	42	44	35	27	27	14	14	28	20	36	17	18	23	15	19	23	18		B	B	B	23		
15	18	32	41	32	34	28	18	22	22	34	23	BE BE	25	33	31	20	19	23	19	28	30		B	B	18		
16	28	29	36	43	41	40	42	43	23		22	38	23	23	18	38	31	22	15	16		29	53	52			
17	42	40	89	42	45	32		33	38	28		B	B	B	B	B	BE BE	BE BE	55	B	B	B	B	B	B		
18	B	B	B	B	B	B	B	B	35	29		B	BE BE	BE BE	BE BE	B	B	B	B	B	B	B	B	B	B		
19	B	B	B	B	B	B	B	B	B		BE BE	BE BE	BE BE	BE BE	BE BE	B	BE BE	BE BE	37	B	B	B	B	B	B		
20	28	B	36	B	B	B	B	93	B	BE BE	B	B	BE BE	BE BE	BE BE	BE BE	25	30	30	21	28		17	23	71		
21	31	B	39	35	B	B	B	B	94	37		B	BE BE	B	B	BE BE	BE BE	15	34	30		41	35	50	106		
22	41	35	38	37	34		B	40	40		B	B	B	B	B	B	B	BE BE	BE BE	25	25		19	34	25		
23	B	41	32	36	49		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	38		
24	B	B	B	B	B		42	42	48		B	B	BE BE	B	B	B	BE BE	B	B	B	B	B	B	B	33		
25	57	39	34	44	48		B	40		B	BE BE	B	B	B	B	B	BE BE	B	B	B	B	B	B	B	36		
26	56	50		B	35		B	35	B	B	B	B	B	B	B	B	B	BE BE	BE BE	36	16		18	21	36	100	
27	37	43	39	39	B	B	B	B	39		B	B	BE BE	BE BE	B	BE BE	BE BE	30	55	30	55		29	40	28	44	31
28	44	40	40			35	45		36		34	23	25	46		BE BE	BE BE	25	26	18	14		19	37	23		
29	38	42	45	36	31	40	37	44	36	30	26	BE BE	BE BE	B		BE BE	BE BE	30	20	25	30	20	24	21	22	41	
30	42	37	45	43	41	40	34	46	48	33	32	BE BE	BE BE	B		BE BE	BE BE	BE BE	BE BE	BE BE	BE BE	BE BE	BE BE	BE BE	BE BE	37	
31	48	38	39	32	37	41	43	30	18	17	28	20	22	20	20	17	17	16	16	23	42	31	32	36			
CNT	27	25	26	22	22	18	20	21	23	19	19	16	18	19	17	18	20	23	22	17	13	19	21	28			
MED	41	40	40	42	40	40	42	37	35	22	24	BE BE	BE BE	BE BE	BE BE	BE BE	BE BE	BE BE	BE BE	BE BE	BE BE	BE BE	BE BE	BE BE	BE BE	36	
U Q	54	42	44	44	45	44	44	44	39	34	32	BE BE	33	46	34	30	30	31	28	30	39	32	44	41			
L Q	31	36	37	36	36	35	36	30	20	16	18	20	22	22	18	19	17	18	16	14	16	18	23	30			

JUL.2002 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2002 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	12	12	B	28	15	12	B	21	15	B	36	14	35	B	B	54	13	B	B	10	7	7	11	
2	10	7	10	17	28	18	10	8	9	11	10	26	12	24	12	10	10	14	16	12	10	8	8	8	
3	25	9	9	9	10	13	9	10	8	8	8	9	11	10	10	16	16	12	15	15	B	8	7	8	
4	7	8	8	7	8	10	16	8	8	8	8	9	12	9	9	9	9	8	10	9	9	9	9	8	
5	8	30	11	14	B	17	15	10	20	12	10	21	33	25	B	26	14	13	14	13	12	9	9	22	
6	15	15	12	12	18	B	B	B	35	18	B	B	B	B	B	B	B	B	32	8	8	8	10	14	
7	10	8	12	15	B	B	16	19	13	16	B	B	B	22	29	25	B	B	25	9	B	B	11	10	
8	10	10	10	B	10	16	12	10	10	9	9	10	21	11	B	B	19	20	19	B	B	14	B	11	
9	8	10	12	B	25	25	B	15	16	13	21	B	B	54	28	B	B	B	15	8	9	14	10	8	
10	10	B	B	21	17	10	18	28	B	B	B	B	B	54	B	B	B	32	25	B	B	B	13	13	
11	13	13	14	14	14	14	13	E S	E S	E S	E S	14	14	21	25	14	13	17	14	13	E S	B	B	B	13
12	16	16	21	20	30	16	25	14	13	7	9	15	B	B	37	25	25	14	16	13	14	14	14	13	
13	14	13	14	15	19	B	18	14	B	B	B	B	B	B	57	26	18	21	B	B	B	B	B	13	
14	13	13	13	14	13	13	13	14	14	E S	14	13	13	15	13	14	14	15	14	14	13	B	B	B	13
15	E S	13	14	14	13	13	13	14	14	14	13	15	25	18	13	14	15	13	12	13	14	B	B	B	13
16	10	13	13	8	10	10	10	8	10	B	22	38	18	14	9	8	8	11	9	16	B	10	12	15	
17	25	16	19	14	15	15	B	B	26	20	16	B	B	B	B	B	B	55	B	B	B	B	B	B	
18	B	B	B	B	B	B	B	B	30	29	B	B	26	33	30	B	B	B	B	B	B	B	B	B	
19	B	B	B	B	B	B	B	B	B	B	26	28	26	56	26	30	29	13	B	B	B	B	B	B	
20	12	B	19	B	B	B	B	B	B	B	B	B	B	B	25	30	30	21	28	B	B	12	14	16	
21	20	B	25	30	B	B	B	B	B	74	37	B	B	B	58	B	15	34	30	B	10	12	14	12	
22	11	16	12	15	19	B	B	20	25	B	B	B	B	B	B	B	B	25	25	B	B	15	12	20	
23	B	27	28	26	36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	21	31	
24	B	B	B	B	B	B	26	16	26	B	B	B	29	B	B	B	B	B	B	B	B	B	B	15	
25	26	15	20	17	19	B	B	25	B	B	B	25	B	B	B	B	26	B	B	B	B	B	B	19	
26	22	24	B	B	26	B	21	B	B	B	B	B	B	B	B	B	B	36	16	B	14	15	13	17	
27	21	29	25	13	B	B	B	B	21	B	B	B	30	55	B	30	55	B	B	15	12	17	11	15	
28	13	13	14	B	B	30	15	B	16	B	31	23	25	46	B	25	B	26	18	14	B	10	10	12	
29	10	11	15	12	10	18	20	15	15	10	26	B	58	B	B	30	20	25	14	12	11	13	12	9	
30	10	11	10	15	10	10	9	10	11	21	13	24	24	16	18	30	13	18	15	8	9	8	10	8	
31	12	8	10	10	10	20	10	9	9	9	10	14	14	14	14	10	7	16	16	10	8	8	9	8	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	13	14	14	15	19	20	18	16	20	20	26	38	30	54	57	30	26	21	19	15	B	14	13	13	
U Q	22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	17	
L Q	10	11	12	13	13	14	13	10	13	12	13	21	18	16	14	16	15	14	15	12	10	9	10	10	

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2002 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	A	A	A	B	A	252	306	A	B	A	A	B	B	226	260	B	B	236	186	Q	B	B	226	A	222	236		
2	208	216	A	A	A	A	194	A	E	A	320	260	228	236	196	220	190	188	Q	Q	186	222	246	208	230	238	A	
3	A	228	320	354	234	208	194	220	232	268	242	214	190	210	190	180	218	190	226	172	Q	B	188	218	A			
4	258	272	E	A	E	A	E	A	264	242	226	218	196	210	200	210	174	226	210	250	210	194	A	A	218	A		
5	A	196	A	A	B	A	A	A	A	310	262	248	230	276	234	B	208	224	206	220	Q	A	A	A	A	A		
6	A	A	220	A	A	B	B	B	A	A	B	B	B	B	B	B	B	B	E	B	228	A	A	A	A	A		
7	A	A	A	A	B	B	A	A	A	A	B	B	B	222	210	198	B	B	E	B	230	296	B	B	A	A		
8	224	214	204	B	A	A	A	A	306	278	208	190	224	228	Q	B	B	228	224	278	E	B	B	A	B	A		
9	A	A	A	B	A	A	B	220	A	304	340	B	B	B	228	B	B	B	B	252	A	A	A	A	A	Q		
10	196	B	B	A	A	A	A	A	B	B	B	B	B	226	B	B	B	232	204	Q	B	B	B	A	268	A		
11	A	A	264	202	A	E	A	A	E	S	E	S	S	190	226	210	194	226	194	212	222	Q	E	S	B	B	B	A
12	A	A	A	A	A	A	A	202	286	198	206	250	Q	B	E	B	304	270	208	232	258	A	A	A	A	A		
13	A	A	A	A	A	B	A	A	B	B	B	B	B	B	E	B	228	188	204	212	B	B	B	B	B	A		
14	A	A	A	A	A	A	A	A	E	B	252	234	206	218	Q	Q	206	202	202	176	204	208	198	212	B	B	B	A
15	S	A	A	A	A	A	A	288	202	242	196	222	204	176	178	178	204	188	190	Q	A	A	B	B	B	A		
16	A	A	A	A	A	248	A	A	A	B	E	B	E	B	204	186	208	180	174	224	196	200	B	A	A	A		
17	A	A	A	E	A	A	A	B	A	A	E	A	B	B	B	B	B	B	E	B	272	B	B	B	B	B		
18	B	B	B	B	B	B	B	B	A	E	B	B	B	212	200	226	B	B	B	B	B	B	B	B	B	B		
19	B	B	B	B	B	B	B	B	B	B	218	200	220	270	E	B	228	208	220	258	Q	E	B	B	B	B		
20	A	B	A	B	B	B	B	A	B	B	B	B	B	B	B	206	220	214	214	278	E	B	B	B	A	A	A	
21	A	B	A	A	B	B	B	B	B	A	B	B	B	B	B	B	B	188	238	232	B	214	A	A	A	A		
22	A	A	198	228	Y	B	B	A	A	B	B	B	B	B	B	B	B	B	B	E	B	B	B	A	A	A		
23	B	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	
24	B	B	B	B	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	
25	A	A	A	A	A	B	B	A	B	B	B	222	B	B	B	B	190	B	B	B	B	B	B	B	B	B	A	
26	A	A	B	B	A	B	A	B	B	B	B	B	B	B	B	B	B	B	E	B	B	B	A	A	A	A		
27	A	A	A	A	B	B	B	B	A	B	B	B	230	E	B	E	B	B	B	B	B	A	A	A	A	A		
28	A	A	A	B	B	A	A	B	A	B	A	248	252	272	B	222	B	222	208	230	E	B	B	A	A	E	A	
29	222	222	A	A	A	A	A	A	A	Q	272	228	228	B	B	206	212	242	230	212	246	A	A	A	A	A		
30	A	216	218	212	238	224	A	A	A	A	258	226	236	204	182	188	212	194	216	188	224	Q	E	B	A	A	A	
31	224	220	A	A	A	A	A	A	A	Q	280	234	224	196	214	194	200	200	222	198	224	246	Q	A	196	194	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	7	9	7	7	4	6	4	7	10	13	16	15	18	18	16	18	19	23	22	11	6	3	6	4				
MED	224	220	219	224	252	226	250	223	265	260	224	221	212	212	206	194	210	211	220	206	215	196	220	234				
U Q	246	238	302	318	326	252	325	288	306	275	253	236	228	234	227	208	224	232	250	246	226	230	226	252				
L Q	208	215	204	212	236	208	194	220	242	234	213	200	204	200	195	180	204	194	212	200	208	188	218	222				

JUL. 2002 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2002 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	O X	O X	X	37	38	43	A	X	B	B	B	X	X	X	95	A	A		A	A	A	A
2	O X	O X	A	O X	B	A	B	Y	B	A	A	B	B	O X	O X	X	48	X	O X	O X	A	67	A	A
3	A	A	R	B	B	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	O X	A
4	42	A	A	A	A	B	B	A	B	A	A	B	B	B	B	X	B	O X	O X	B	B	R	A	34
5	65	58	36	42	34	60	40	O X	38	34	56	72	79	99	75	74	78	65	46	25		O X	X	55
6	68	A	A	O X	X	A	A	A		37	46	64	76	X	X	X	88	82	68	35	30	O X	O X	O X
7	A	A	O X	A	A	A	O X	44	44	46	B	B	72	79	87	96	90	86	67	46	29	B	O X	O X
8	B	A	O X	R	42	60	A	A	O X	54	68	73	80	87	89	79	94	80	72	50	33	24	B	A
9	57	O X	40	80	58	O X	A	A		66	65	62	69	79	98	93	78	81	87	95		A	A	40
10	A	A	A	A	A	A	A	B	B	B	B	B	O X	O X	X	X	X	X	X	B		X	A	A
11	A	O X	O X	A	A	A	A	A	A	B		O X	X	X	X	X	112	98	66	O X	O X	A	O X	A
12	O X	O X	A		A	A	B	A	B	B	B	B	B	O X	X	B	B	X	X	B	B	A	R	A
13	A	O X	36	49	A	A	A	B	A	B	B	B	B	X	B	B	B	X	B	O X	O X	Y	R	O X
14	O X	O X	A	A	O X	A	O X	A	O X	R	B	B	B	B	B	B	B	B	O X	O X	B	B	A	A
15	A	A	B	R	B	R	A	X	35	B	B	B	B	B	B	B	B	B	X	80		O X	A	A
16	A	A	38	55	A	B	A	A		54	B	B	B	B	B	B	B	X	107	B	B	B	O X	O X
17	R	A	A	O X	O X	26	30	A	B	B	B	B	B	B	B	X	O X	O X	B	B	O X	B	R	A
18	A	A	A	A	A	B	B	B	B	B	B	B	B	O X	B	R	X	X				B	B	R
19	A	O X	B	A	A	65	40	A	B	B	B	B	B	B	O X	O X	X	X	X	X		R	A	A
20	A	A	B	A	B	A	B	A	B	B	B	B	B	B	B	O X	X	R	X	X	O X	A	A	O X
21	B	A	B	R	R	B	B	B	B	B	B	B	B	B	B	B	X	75	69	71	B	R	O X	O X
22	A	O X	A	A	A	R	R	R	A	B	B	B	B	O X	B	X	X	X	X	O X	O X	O X	O X	B
23	B	Y	58	47	45	42	42	48	O X	O X	O X	O X	O X	O X	O X	X	X	X	X	X		O X	O X	O X
24	59	A	51	35	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	X	B	B	B	B
25	B	B	B	B	A	B	O X	O X	B	B	B	B	B	O X	B	O X	B	B	O X	O X	O X	R	B	B
26	B	R	A	A	A	B	B	R	B	B	B	B	B	O X	X	X	X	X	X	X	R	B	R	34
27	R	A	A	B	A	39	58	B	B	B	B	B	B	B	B	B	B	B	B	X	A	O X	A	A
28	O X	42	60	A	A	O X	O X	40	44	52	B	B	X	X	X	X	X	88	88	69	57	40	32	O X
29	A	A	A	A	R	B	R	38	45	54	67	79	81	91	86	92	94		94	52		B	B	A
30	O X	32	A	O X	43	42	42	B	B	B	B	B	B	B	O X	X	X	X	X	X	A	A	A	A
31	A	43	R	A	O X	A	A	O X	44	68	75	83	B	X	X	B	X	X	X	X	O X	O X	O 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	10	11	11	11	12	10	10	8	12	6	8	11	16	16	21	22	22	24	23	20	11	8	10	13
MED	58	O X	42	48	47	41	42	42	42	46	61	68	79	86	90	86	88	88	94	70	36	O X	O X	O X
U Q	60	50	54	55	46	60	O X	44	46	53	68	72	80	93	98	106	94	106	101	88	54	40	41	39
L Q	O X	O X	O X	O X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	O X	O X	O X
	42	37	38	38	38	38	40	38	42	54	66	72	79	83	78	74	78	70	50	30	24	26	20	24

AUG. 2002 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2002 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23												
1	A	A	R	R		F	R	A		B	B	B		56	66	73	66	82	A	A	F	A	A	A	A												
2	R	R	A	R	B	A	B	Y	B	A	A	B	B		38	44	46	38	38	29	17		A	A	A	A											
3	A	A	R	B	B	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	A											
4	F	A	A	A	A	B	B	A	B	A	A	B	B	B	B	B		B		R	B	B	B	R	A	9											
5	F	29	27	F	F	F	F	R	F	B		J	R	F	F	F	F	R	R	R	R	B	R	J	F	A											
6	F	A	A	R	J	R	A	A	A		31	36	58	67	90	78	78	F	F	59	40	19		B	R	J	F	A									
7	A	A	36	A	A	A	R	F	F	B	B		66	73	81	90	84	81	53	40	23		B	B	R	R	A										
8	B	A	R	R	F	R	A	A	R	F	F		48	57	64	74	81	83	73	85	68	64	44	27	18		A										
9	A	R	F	F	R	A	A	F	F	F	F		55	48	50	63	65	92	87	72	75	81	75	89			F	A									
10	A	A	A	A	A	A	A	B	B	B	B		55	64	81	77	79	100	90		B	F	22	16	A	A	A	F	A								
11	A	R	R	A	A	A	A	A	A	B	F		60	79	84	91	86	86	100	86	57	22		A	A	R	A	A									
12	R	R	A	F	A	A	A	B	A	B	B	B		B	B	B	B	B	B	89	95		B	B	A	R	A	A									
13	A	R	F	A	A	A	B	A	B	B	B	B	J	R	B	B	B	B	B		96		38	21	Y	R	R	A	A								
14	R	R	A	A	R	A	R	A	R	R	B	B	B	B	B	B	B	B	B		93	71		B	B	B	A	A	A								
15	A	A	B	R	B	R	A		29	B	B	B	B	B	B	B	B	B	B		B	J	R	B	U	R	A	A	A								
16	A	A	F	F	A	B	A	A	F	B	B	B	B	B	B	B	B	B	B		B	B	B	B	B	B	R	R	A	A							
17	A	A	A	R	R	F	F	A	B	B	B	B	B	B		97	104	104		B	B	43		B	R	A	A	A	A	A							
18	A	A	A	A	A	B	B	B	B	B	B	B	B	R	B	R	J	R	J	R	J	R	J	R	B	B	B	R	R	A	A						
19	A	R	B	A	A	F	F	A	B	B	B	B	B	B	B	B	B	B	B		59	68	62	57	50	28		R	A	A	A	A					
20	A	A	B	A	B	A	B	A	B	B	B	B	B	B	B	B	B	B	B		58	61		53	23	18		R	A	A	R	A					
21	B	A	B	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B		69	60	60		R	R	R	R	R	A	A	A					
22	A	R	A	A	A	R	R	R	A	B	B	B	B		98	106	97	97	93	57	38	26	20	18		R	R	R	B	B	A	A					
23	B	Y			R	F	F	F	R		J	R		103	107	105	104	106	103	72	51	31	20		B	B	B	B	B	B	A	A					
24	F	A	F	F	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B		96																
25	B	B	B	B	A	B	R	R	B	B	B	B	B	R	B	R	B	B	R	R		95	82	55	41		R	R	R	R	R	R	A	A			
26	B	R	A	A	A	B	B	R	B	B	B	B	B	R	B	B	B	B	B		80	84	104	99	104	99	80		R	R	R	R	F	A	A		
27	R	A	A	B	A	F	F	B	B	B	B	B	B	B		51	53	58	67	72	61	21		A	R	A	A	A	A	A	A	A	A				
28	R	F	A	A	R	R	F	F	F	B	B		61	73	76	73	84	84	80	61	43	29	21	18	39		R	R	R	R	R	R	R	R			
29	A	A	A	A	R	B	R	F			F	J	R	J	R	J	R	J	R	J	R	B	F	F	B	B	A	A	A	A	A	A	A	A			
30	R	A	R	F	F	F	B	B	B	B	B	B	B	B	B	B	B	B	B		80	82	80	86	87	51		A	A	A	A	A	A	A	A		
31	A	A	R	A	R	R	A	A	R	F				B	J	R		B	F	J	R	F	F	R	A	A	R	A	R	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		8	10	10	11	11	9	10	8	12	6	8	11	16	16	21	22	22	24	24	20	10	7	9	12												
MED		R	R		F	R	F	F	F		F		R		84	80	80	82	86	66	28	24	21	18	28												
U Q		R	R	R	R	R	R	R	F		F		R		R		R				R	R	R	R	R												
L Q		R		F	F	R	F	F	F		J	R		J	R		B	F	J	R	F	F	R	R	R												
		28	27	30	26	26	25	23	28	34	48	59	65	73	77	72	66	67	60	47	22	18	20	13	17												

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2002 fmin (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	8	8	8	7	7	8	8	9	10	B	B	B	18	20	26	36	24	8	7	7	7	16	16	9
2	11	11	9	10	B	15	B	11	B	12	16	B	B	30	19	21	15	8	15	10	7	10	12	10
3	9	16	12	B	B	B	B	B	26	20	B	B	B	B	B	B	B	B	B	B	B	B	15	8
4	8	26	8	19	9	B	B	26	B	29	22	B	B	B	B	23	B	17	20	B	B	9	9	9
5	10	10	10	10	9	8	8	16	10	B	16	15	15	20	15	25	26	26	26	12	B	11	8	16
6	8	16	29	13	10	25	25	12	10	12	10	14	14	16	13	10	9	25	10	10	10	B	8	8
7	11	10	9	19	13	12	10	9	24	B	B	54	55	31	24	9	10	9	16	16	B	11	9	
8	B	11	10	9	10	8	14	16	12	8	9	14	15	14	15	12	8	8	12	9	13	B	9	9
9	9	8	8	8	14	15	14	11	8	8	7	15	15	16	15	12	10	10	21	16	10	26	12	11
10	10	15	11	34	14	26	18	B	B	B	B	25	55	25	16	25	21	29	B	18	8	8	12	7
11	13	12	10	19	15	19	15	9	11	B	16	8	8	14	12	18	52	21	10	9	8	8	18	17
12	9	8	8	7	18	27	15	B	19	B	B	B	B	55	88	B	B	26	51	B	B	16	11	8
13	9	10	8	16	18	17	B	25	B	B	B	B	55	B	B	B	B	62	B	33	15	14	11	6
14	8	11	14	12	13	13	15	12	18	27	B	B	B	B	B	B	B	25	25	B	B	29	20	
15	40	11	B	22	B	24	16	20	B	B	B	B	B	B	B	B	B	B	26	B	B	13	14	13
16	15	16	16	E S 13	21	B	19	15	14	B	B	B	B	B	B	B	B	53	B	B	B	13	13	
17	12	13	13	13	13	12	13	22	B	B	B	B	B	B	48	75	76	B	B	19	B	14	15	14
18	24	26	15	16	25	B	B	B	B	B	B	B	54	B	71	25	21	15	54	B	B	29	18	
19	16	15	B	37	20	18	18	25	B	B	B	B	B	B	40	29	28	13	15	16	14	14	15	15
20	16	20	B	22	B	15	B	16	B	B	B	B	B	B	B	29	29	30	21	12	E S 12	12	52	15
21	B	20	B	24	13	B	B	B	B	B	B	B	B	B	B	36	27	14	B	14	18	13	14	14
22	16	12	13	25	15	14	19	25	15	B	B	B	64	B	52	36	30	21	16	16	18	15	E S 14	B
23	B E S 13	E S 13	E S 14	E S 13	E S 13	E S 13	13	26	17	26	29	31	30	54	35	26	25	16	15	14	21	14	B E S 13	B
24	14	14	E S 14	13	B	17	13	16	B	B	B	B	B	B	B	B	B	B	55	B	B	B	B	B
25	B	B	B	B	25	B	25	28	B	B	B	B	72	B	75	B	B	53	26	18	19	25	B	B
26	B	26	21	25	25	B	B	27	B	B	B	B	30	30	24	17	15	13	E S 13	17	B	14	12	11
27	19	19	26	B	13	14	13	B	B	B	B	B	B	28	38	19	15	30	14	16	E S 13	13	13	E S 14
28	14	E S 14	E S 19	E S 13	13	12	12	12	13	B	B	15	20	15	20	22	19	13	19	15	13	E S E S 13	12	13
29	13	20	19	41	19	B	14	15	14	14	14	15	24	20	15	19	15	B	15	15	B	13	14	
30	14	13	13	13	14	13	B	B	B	B	B	B	B	B	46	36	31	29	16	20	17	E S E S 13	14	19
31	16	16	22	25	15	20	15	14	20	18	27	53	B	58	28	B	62	20	18	26	14	12	14	13
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	14	14	13	16	15	17	16	20	26	B	B	B	72	58	40	29	28	25	20	16	18	14	14	13
U Q	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	53	54	B	B	B	16	16
L Q	9	11	10	13	13	13	13	12	14	26	22	25	24	20	19	19	15	13	15	14	13	13	12	9

AUG. 2002 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2002 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	214	A	A	202	A	196	B	B	B	232	196	236	256	286	A	A	232	A	A	A	A				
2		240	244	A	A	B	A	B	Y	B	A	A	B	B	A	272	218	210	210	186	A	A	A	A					
3		A	A	214	B	B	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	284	A				
4		214	A	A	A	A	B	B	A	B	A	A	B	B	B	B	238	B	218	234	B	B	A	A	230				
5		228	248	246	228	E A	A	A	A	A	B	F	Q	Q	Q	Q	180	210	192	208	224	B	A	E A	A				
6		F	A	A	A	310	A	A	A	A	E A	Q	Q	206	212	176	184	184	182	204	206	220	244	B	A	E A			
7		A	A	228	A	A	A	198	200	314	E B	B	B	E B	E B	248	238	224	210	198	188	194	224	234	B	A	E A		
8		B	A	214	A	228	216	A	A	A	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	198	214	B	A	E A		
9		212	244	196	208	236	A	A	224	234	224	190	228	204	184	170	180	198	234	214	A	A	A	A	A	212			
10		A	A	A	A	A	A	A	B	B	B	B	B	234	210	196	230	222	198	B	E	B	E	A	A	A	A		
11		A	210	208	A	A	A	A	A	A	B	222	202	218	212	200	226	216	228	302	268	A	A	A	198	A			
12		210	196	A	196	A	A	A	B	A	B	B	B	B	240	B	B	B	B	228	256	B	B	A	A	A			
13		A	202	F	A	A	A	A	A	B	B	B	B	248	B	B	B	B	236	B	E	B	E	B	Y	A	204		
14		208	208	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	240	264	B	B	B	B	A	A	A		
15		A	220	B	A	B	A	A	A	B	B	B	B	B	B	B	B	B	B	240	B	B	202	A	A	A			
16		212	A	A	F	A	B	A	A	E A	B	B	B	B	B	B	B	B	228	B	B	B	B	B	A	A	A		
17		A	A	A	196	196	A	A	A	B	B	B	B	B	B	E B	E B	E B	B	B	B	B	B	B	A	A	A		
18		A	A	A	A	A	B	B	B	B	B	B	B	232	B	E B	254	256	270	B	B	B	B	B	A	A	Y		
19		A	A	B	A	A	A	A	A	B	B	B	B	B	B	E B	280	226	206	246	210	236	A	A	A	A	A		
20		A	A	B	A	B	A	B	A	B	B	B	B	B	B	B	B	230	226	210	210	286	298	A	A	220			
21		B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	260	Q	B	A	A	E A	A	224			
22		A	A	A	A	A	A	A	A	A	B	B	B	E B	B	E B	200	208	184	184	216	234	254	258	B	B	224		
23		B	Y	S	S	S	E A	E A	E S	206	230	212	226	216	230	218	186	206	188	182	212	208	244	B	B	242			
24		Q	A	A	A	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
25		B	B	B	B	A	B	E B	B	B	B	B	B	B	B	B	B	B	B	230	218	196	198	224	A	B	A	B	B
26		B	232	A	A	A	B	B	A	B	B	B	B	226	226	204	202	190	184	200	A	B	A	A	A	260			
27		A	A	A	B	A	E A	A	B	B	B	B	B	B	222	286	234	240	258	200	244	Q	E B	A	E A	222	A		
28		220	236	A	A	220	220	A	220	A	B	B	224	230	230	Y	202	202	196	186	200	208	220	284	252	A			
29		A	A	A	A	A	B	A	E A	290	256	256	238	232	222	204	232	226	B	206	230	Q	B	B	A	A	A		
30		S	A	A	206	212	344	B	B	B	B	B	B	B	B	220	212	216	230	214	214	A	A	A	A	A	A		
31		A	A	A	A	A	A	A	E B	Q	E B	B	E B	B	E B	B	B	272	198	206	236	226	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		10	12	6	7	7	5	4	5	8	6	8	11	14	15	20	21	21	25	24	20	10	6	10	11				
MED		212	231	214	208	224	232	232	212	248	222	221	216	222	217	206	207	212	210	210	220	229	225	252	227				
U Q		220	244	228	228	310	E A	A	E A	E A	E A	E B	E B	236	238	232	230	251	233	226	232	229	236	244	244	284	260		
L Q		210	209	208	196	212	218	200	210	220	224	208	206	212	196	199	193	200	195	203	213	214	208	240	218				

AUG. 2002 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2002 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	A	A	A	B	B	B	X	X	B	B	X	B	B	X	X	X	X	X	X	33	A	A	A	
2	B	A	A	B	B	B	B	B	B	A	B	X	X	X	X	B	X	X	B	B	X	41	30	28	28	
3	40	42	R	B	56	38	40	48	58	64	80	90	103	108	110	102	109	97	75	58	50	40	36	30		
4	88	A	A	O	X	A	54	B	B	B	B	B	B	B	B	102	73	43	A	A	A	53	82	A		
5	A	A	A	A	A	A	42	B	B	B	B	O	X	X	X	B	B	X	X	B	70	40	36	30		
6	A	A	43	34	A	A	53	43	X	B	B	B	B	R	O	X	X	X	X	X	95	R	X	B		
7	O	X	O	X	A	B	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
9	44	A	A	59	63	53	62	68	78	91	97	96	91	90	86	88	86	83	71	60	40	57	A	57		
10	A	40	B	R	57	B	B	O	X	R	B	B	O	X	X	X	108	76	72	50	45	118	36	41		
11	A	A	A	O	X	B	A	O	X	X	X	O	X	B	B	B	86	83	87	80	46	56	47	47		
12	93	A	63	A	72	42	R	B	B	B	B	B	B	B	B	B	X	B	O	X	R	A	O	X		
13	A	A	55	58	45	63	R	B	B	B	B	B	B	B	B	B	88	78	65	65	A	O	X	A		
14	O	X	R	A	A	A	O	X	O	X	B	B	B	X	O	X	B	O	X	X	X	X	X	A		
15	O	X	63	72	64	38	A	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
16	A	A	59	50	67	R	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
17	34	O	X	O	X	47	30	49	30	51	46	B	B	B	B	B	X	O	X	X	75	A	A	O	X	
18	A	A	41	50	B	A	R	A	A	X	B	B	B	B	B	B	B	B	B	X	X	B	40	56		
19	A	B	A	A	A	A	B	O	X	B	B	B	O	X	X	X	X	X	B	B	X	B	R	O	X	
20	39	A	R	O	X	46	51	50	60	68	77	79	87	R	O	X	R	R	O	X	O	X	X	X	34	
21	24	A	X	O	X	29	34	54	50	70	78	80	92	B	B	O	X	O	X	X	X	X	X	X	43	
22	37	31	R	43	A	49	53	66	63	79	79	88	88	B	O	X	X	X	X	X	O	X	B	A	A	
23	A	A	A	X	O	X	A	O	X	75	82	86	95	96	96	89	86	84	91	90	84	70	62	42	35	
24	33	33	33	38	58	54	46	54	66	88	97	96	111	107	122	114	103	108	109	94	73	57	38	28		
25	O	X	B	O	X	29	39	49	58	68	78	86	93	96	104	104	102	102	104	94	83	71	54	45	36	
26	30	X	O	X	B	A	A	O	X	70	67	77	85	99	102	112	112	114	112	106	110	108	91	67	41	28
27	O	X	A	A	B	A	O	X	R	X	X	X	X	O	X	X	X	X	X	X	X	X	X	X	A	
28	A	58	A	A	A	A	47	47	63	72	82	87	112	111	99	100	102	90	80	70	54	47	43	X		
29	42	40	44	42	54	56	57	68	72	85	86	104	96	99	106	104	104	101	99	86	79	64	53	44		
30	X	44	60	A	63	61	59	A	B	B	B	B	66	72	84	85	90	78	47	55	52	32	69	58	48	
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	11	12	17	17	13	19	17	16	17	14	18	20	21	20	24	27	24	26	26	22	23	20	19		
MED	37	42	44	43	54	50	51	58	68	78	81	89	92	99	106	102	103	103	90	78	58	47	40	36		
U Q	43	58	57	60	60	55	57	68	76	85	86	96	96	108	114	110	106	108	104	86	70	59	46	44		
L Q	34	33	35	38	43	40	47	48	63	65	79	78	79	89	94	94	88	86	75	62	41	36	32	30		

SEP. 2002 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2002 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	A	A	A	B	B	B	J R	R	B	B	J R	B	B	R	R				F	A	A	A		
2	B	A	A	B	B	B	B	B	B	A	B	J R	62	62	74	81	B	R	R	B	B	R	F	F	F	
3	A	F	A	B	R	F	F	F	F			J R	J R			U S		J R				F	F	F		
4	A	A	A	A	U R	A	A	B	B	B	B	B	B	B	B	F	F		B		A	A	F	A	A	
5	A	A	A	A	A		F	B	B	B	B	R		R	B	B	R	R	B	R	F	R	R	R	A	
6	A	A	F	F	A	A	F	J R	B	B	B	B	D R	R							D R		B	R		
7	R	R	A	R	F	B	F	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R		R	J R	F	F	R	B	R	
9	F	A	A	F	F	F	F	F	J R		B	J R	J R				R	R	R	R	R	F	A	F		
10	A	F	B	D R	F	B	B	R	R	B	B	R	J R	J R	B	B	F	R	R		A	A	Y	F	F	
11	A	A	A	A	B	A	R	J R	R	B	B	B	B	B	B	B	80	77	79	74	A	F	26	50	26	41
12	R	A	F	A	F	F	R	B	B	B	B	B	B	B	B	B	B	B	B	B	R	A	A	R	A	
13	A	A	A	A	F	F	R	B	B	B	B	B	U R	F	B	B	R	R	R	R	J R	F	J R	R	A	
14	R	R	A	A	A	R	R	B	B	B		J R	R	B	R	F			F	F		A	A	A	A	
15	R	28	53	55	F	A	A	J R	R	B	B	J R	J R	J R	R	R	R	R	R	R	R	B	R	R	R	
16	A	A	F	F	F	R		J R	J R	J R	R	J R	J R	J R							J R		F	F	F	
17	F	R	R	F	F	F	J R	B	B	B	B	J R	R	R	F				B	B	F	A	A	R	A	
18	A	A	F	A	B	A	R	A	A	B	B	B	B	B	B	B	B	B	B	B	J R	B	F	A	A	
19	A	B	A	A	A	A	B	R	B	B	J R	J R	J R	R	R	92	95		B	B	J R	F	B	R	R	
20	F	A	A	B	R	F	F	F				R	R	R	R	R	R	R	R	R	R	F	F	F	F	
21	F	A	23	28	R	F	A	B	R	J R	J R	J R	R	B	B	R	R		F	J F	F	F	F	F	F	
22	F	F	R	20	A	F	F	F	F			R	B	R	J R	108	109	106	102	93	75	73	49	26	29	
23	A	A	A	35	R	A	F	S	F			J R	J R	J R	R	R	100	104	100	102	92	72	31	B	A	A
24	F	F	F	F	F	F	F	F				J R	J R	J R	R	B	R	J R	J R	J R	J R	F	F	F	F	
25	R	B	R	A	F	F	F	R	J R			J R	J R	J R	R	J R	R	R	R	R	S J R	S J R	F	F	F	
26	F	19	23	31	R	A	A	R	F	J R	R	R	R	R	R	R	R	R	R	R	F	F	F	R	A	
27	R	A	A	F	B	A	R	R				J R	R	J R	R	R	R	R	R	R	F	F	F	F	F	
28	A	F	A	A	A	A	41	34	57	66	76	81	R	R	R	106	105	93	94	96	84	74	61	44	37	33
29	F	F	F	F	F	F	F	F				R	R	J R	J R	J R	J R	J R	J R	J R	J R	J R	J R	F	F	F
30	38	R	A	F	F	F	A	B	B	B	B	F	F	F	F	R	J R	J R	J R		R	F	F	F	R	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	15	9	12	16	17	13	18	17	16	16	14	18	21	21	20	23	27	23	26	24	23	21	18	18		
MED	F	F	F	F	F	F	F	F	62	72	75	J R U	86	93	101	96	96	95	84	72	52	32	26	27		
U Q	R	R	F	F	F	F	51	58	68	79	80	R J R	90	90	102	108	104	100	102	97	82	64	49	33	33	
L Q	F	F	F	F	F	F	F	R	57	63	73	72	73	83	88	84	82	80	69	56	31	26	25	22		

SEP. 2002 foF2 (0.1MHz)

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2002 ftes (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	44	72	41	36	38	B	B	B	39	38	B	BE	B	B	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE					
2	B	68	54	B	B	B	B	B	B	37	BE	BE	BE	BE	BE	B	BE	BE	B	BE	BE	20	19	19	22				
3	34	39	30	B	38	68	42	24	18	22	22	23	38	27	30	24	22	19	E	SE	SE	SE	SE	SE	SE				
4	35	42	48	61	106	48	38	B	B	B	B	B	B	B	BE	B	53	36	B	19	39	35	93	42	36				
5	40	67	59	58	33	30	23	B	B	B	BE	BE	BE	BE	B	B	BE	BE	B	BE	B	20	37	33	31				
6	38	37	E	B	55	43	50	35	38	B	B	B	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	28				
7	34	37	55	42	30	B	26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B				
8	B	B	B	B	B	B	B	B	B	B	B	B	B	BE	BE	BE	30	36	28	25	17	16	13	16	B	23			
9	26	65	50	24	22	23	40	23	E	BE	B	B	32	30	29	26	24	28	E	BE	BE	BE	BE	BE	BE	S			
10	56	56	B	42	45	B	BE	B	B	BE	BE	B	B	G	BE	BE	BE	BE	BE	B	54	17	34	34	24	46	72		
11	45	42	70	59	B	39	46	27	E	B	B	B	B	B	B	BE	BE	B	30	30	23	19	42	74	91	46	105		
12	45	36	46	33	31	31	22	B	B	B	B	B	B	B	B	B	BE	B	BE	B	BE	B	22	36	68	61			
13	36	55	33	43	38	36	37	B	B	B	B	B	BE	BE	B	B	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE		
14	38	34	57	66	42	34	38	B	B	BE	B	G	BE	B	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	S			
15	33	34	34	35	30	39	41	34	24	24	B	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	S		
16	56	64	41	42	31	32	40	38	32	24	27	30	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
17	26	29	32	30	30	16	16	E	B	B	B	BE	BE	BE	BE	BE	BE	BE	BE	B	BE	B	15	39	39	31	46		
18	110	42	32	36	B	39	26	42	41	32	B	B	B	B	B	B	B	B	B	BE	BE	B	B	39	30	35			
19	34	B	45	40	41	40	30	B	B	BE	B	35	31	32	28	30	E	B	B	B	22	31	B	30	23	34			
20	41	28	30	B	33	27	18	20	23	24	G	29	29	28	29	24	26	23	15	12	E	B	12	13	13	12			
21	E	S	30	21	22	17	30	40	B	31	26	36	31	B	BE	BE	BE	B	36	28	24	24	20	15	29	16	30	30	
22	17	E	B	29	32	44	30	31	26	22	23	28	30	B	BE	BE	B	61	53	27	23	E	BE	BE	BE	B	B	34	35
23	38	42	39	38	43	42	34	22	24	24	28	28	29	28	28	28	36	22	15	13	11	E	B	11	10	11			
24	17	12	12	10	E	B	16	17	21	24	26	28	32	30	30	27	24	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	
25	26	B	21	31	16	E	B	13	19	23	31	29	30	30	35	30	28	G	24	24	20	16	17	E	B	10	14	22	
26	28	31	34	B	50	44	G	G	31	24	26	28	34	37	33	31	28	27	23	18	14	12	30	34	32				
27	50	38	39	40	B	43	29	40	39	32	30	31	30	28	29	27	E	B	24	20	E	BE	BE	BE	BE	BE	BE	BE	
28	39	32	43	45	44	45	44	34	28	31	35	32	33	33	32	34	31	30	18	G	13	11	11	13					
29	13	13	12	15	26	13	23	28	24	28	28	36	G	31	36	35	33	28	22	15	E	B	10	12	28	34			
30	49	42	42	38	38	35	46	B	B	B	B	38	31	30	E	B	22	24	37	35	36	29	46	46	42	51			
31																													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	28	27	28	25	25	25	25	19	18	18	14	19	22	22	21	24	27	24	26	28	27	27	27	29					
MED	37	38	39	38	38	35	35	28	24	26	E	G	30	31	29	29	27	E	BE	BE	18	E	B	17	22	30	32		
U Q	44	55	47	44	43	42	40	34	32	31	30	36	37	35	59	44	37	42	26	30	29	36	35	42					
L Q	27	31	31	32	30	28	23	22	23	24	28	G	30	28	29	27	26	24	18	14	E	E	14	17	22				

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2002 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	20	15	29	25	31	B	B	B	13	26	B	B	30	B	B	62	54	29	25	16	E S	13	12	12	13	
2	B	14	13	B	B	B	B	B	B	25	B	53	35	33	30	B	56	55	B	B	20	12	13	14		
3	13	12	16	B	16	12	12	E S	E S	13	13	15	20	15	16	16	13	15	12	13	E S	E S	15	E S		
4	13	13	14	13	13	15	15	B	B	B	B	B	B	B	B	B	53	16	B	13	13	13	13	12	14	
5	14	22	12	15	19	16	13	B	B	B	B	B	36	30	45	B	B	65	58	B	E S	13	14	13	13	
6	14	14	32	13	20	13	14	14	B	B	B	B	B	59	56	78	53	29	30	26	30	26	19	B	E S	
7	14	13	30	26	16	B	16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	30	36	28	25	13	16	13	16	B	15	
9	14	14	16	14	16	14	13	15	26	30	B	30	25	21	20	19	28	19	15	E S	E S	E S	E S	15	13	
10	14	16	B	14	14	B	B	28	26	B	B	B	54	58	25	B	52	33	54	14	26	12	16	14	12	
11	15	16	14	25	B	20	13	15	19	27	B	B	B	B	B	B	30	30	18	19	13	13	13	14	16	
12	15	29	13	14	15	13	13	B	B	B	B	B	B	B	B	B	26	B	53	20	E S	E S	E S	14	13	
13	13	13	13	12	12	12	27	B	B	B	B	B	56	35	B	B	59	55	59	25	29	E S	13	13	13	
14	E S	E S	E S	19	55	14	26	18	B	B	B	29	19	30	B	88	74	33	57	26	25	E S	E S	E S	E S	
15	12	14	12	12	15	30	20	14	19	18	B	B	32	86	65	34	E S	E S	E S	E S	25	19	B	E S	8	
16	8	10	9	10	8	26	14	15	16	16	21	19	37	23	98	26	26	26	14	13	10	12	12	7		
17	8	9	11	9	10	8	9	20	B	B	B	B	58	36	71	35	60	B	B	15	8	9	10	10		
18	12	16	10	9	B	26	14	15	17	25	B	B	B	18	B	B	B	B	25	37	B	10	8	9		
19	9	B	20	25	20	26	B	24	B	B	35	25	18	20	21	61	B	B	B	12	20	B	10	9	10	
20	12	14	16	B	12	14	15	14	16	15	20	21	24	25	18	15	15	8	8	9	12	10	B	E S	13	
21	E S	13	10	9	18	E S	12	13	25	B	20	19	36	26	B	B	36	28	15	18	20	15	9	9	8	9
22	12	15	9	9	15	10	11	12	16	16	15	25	B	B	61	53	20	15	26	56	15	10	B	14	10	
23	9	14	14	13	17	22	13	18	14	15	16	12	15	16	16	12	15	12	10	8	7	11	7	7		
24	6	8	7	6	10	8	8	12	12	12	14	20	25	25	26	18	32	25	25	20	12	10	10	11		
25	10	B	8	8	8	12	9	10	12	11	12	14	10	13	12	16	10	14	12	9	8	10	8	7		
26	8	8	10	B	18	16	13	15	7	13	13	14	16	17	18	16	14	16	14	7	8	8	8	27		
27	9	25	25	11	B	18	16	22	16	13	13	26	22	16	16	21	26	21	16	20	16	14	8	7		
28	8	9	21	12	12	16	12	10	10	12	12	16	16	13	15	10	12	12	10	9	8	7	8	6		
29	7	8	8	8	9	8	9	11	9	11	13	11	20	15	11	12	9	11	7	8	10	7	8	10		
30	12	7	16	14	11	12	16	B	B	B	B	18	15	14	22	20	10	13	15	10	12	12	10	10		
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	30	
MED	12	14	14	14	15	16	14	19	20	26	B	28	31	29	44	32	28	26	17	16	12	12	12	11		
U Q	14	16	20	25	B	B	B	B	B	B	B	B	B	B	B	B	62	54	57	30	25	16	14	14	13	
L Q	9	10	10	11	12	12	13	14	14	15	16	19	20	17	18	18	15	16	13	13	10	10	8	9		

SEP. 2002 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2002 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHZ TO 15.0MHZ IN 20.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	A	A	A	A	A	B	B	B	A	A	B	B	240	B	B	B	B	B	B	B	198	190	A	A	A		
2	B	A	A	B	B	B	B	B	B	A	B	B	258	218	242	B	240	226	B	B	234	244	A	A	A		
3	A	A	A	B	A	A	A	A	Q	232	220	226	200	202	194	194	190	194	190	178	190	198	202	226	308		
4	A	A	A	A	210	A	A	B	B	B	B	B	B	B	B	B	Q	B	A	A	A	F	A	A			
5	A	A	A	A	A	A	A	B	B	B	B	B	252	238	240	B	272	240	B	B	234	S	A	S	A		
6	A	A	B	234	A	A	A	A	B	B	B	B	268	292	B	232	228	230	204	214	E	B	B	A			
7	206	224	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
8	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		
9	A	A	A	Q	A	A	A	A	A	A	B	Y	220	234	212	212	218	202	190	208	200	252	A	198			
10	A	A	B	A	B	B	B	A	B	B	B	B	224	B	B	B	B	B	B	256	A	A	Y	A	A		
11	A	A	A	A	B	A	202	A	A	B	B	B	B	B	B	B	230	208	202	252	Q	A	246	A	208		
12	200	A	192	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	Q	A	A	A	A	A		
13	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	212	240	A	A	A		
14	224	E	A	A	A	A	A	B	B	B	B	B	218	226	218	B	B	B	B	218	212	220	A	A	A		
15	A	210	A	A	A	A	A	A	224	200	B	B	240	B	B	B	278	210	230	226	208	220	226	A	230		
16	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
17	A	206	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
18	A	A	222	A	B	A	A	A	A	A	B	B	B	Y	B	B	B	B	B	B	B	B	B	B	B		
19	A	B	A	A	A	A	B	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
20	E	A	A	A	B	A	A	A	260	224	258	220	220	234	Y	Y	Y	200	216	196	182	198	194	180	208	208	238
21	S	A	A	A	A	A	A	A	B	E	A	E	B	B	B	B	216	218	212	196	Q	Q	192	192	206	268	A
22	A	A	A	A	A	A	A	A	262	218	226	200	218	B	B	B	244	232	220	208	204	210	230	A	B	A	A
23	A	A	A	A	A	A	A	A	E	Y	290	202	204	212	230	200	228	200	194	222	212	202	200	192	194	202	218
24	246	282	A	A	A	A	Q	270	208	214	218	220	202	224	214	202	204	208	200	212	204	204	184	222	240	A	
25	A	B	A	A	A	A	A	A	A	222	222	212	224	202	226	232	200	214	198	186	184	204	184	188	216	A	
26	A	A	A	B	A	A	A	A	A	218	200	232	222	202	218	202	216	216	202	210	200	200	A	A	A	A	
27	222	A	A	A	B	A	Y	A	H	Y	278	192	244	228	228	204	216	234	230	Q	200	218	206	236	284	A	
28	A	F	A	A	A	A	230	248	214	238	220	210	222	206	204	192	222	204	194	208	188	188	204	242	A		
29	256	312	336	334	322	312	284	228	226	198	202	224	206	206	206	200	202	212	200	214	198	212	234	262	A		
30	252	222	A	A	224	A	A	B	B	B	B	228	230	230	228	226	E	A	246	270	252	200	226	256	240		
31																											
CNT	10	9	8	6	5	3	8	9	14	15	14	15	20	19	17	21	26	23	26	25	20	17	15	12			
MED	228	224	236	272	235	308	227	226	222	221	218	221	221	222	208	213	215	204	207	206	199	215	216	229			
U Q	250	263	297	306	334	312	277	261	232	238	230	226	239	236	232	231	238	230	244	225	223	240	256	241			
L Q	206	214	216	234	217	290	221	216	218	200	212	212	210	214	202	202	208	200	200	196	192	198	208	212			

SEP. 2002 h'F (KM)

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2002 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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		69	63	55	R	66	55	52	60	X	B	B	X	R	R	76	75	X	W	X	37	36	35	A	X	A		
2		A	A	A	A	A	A	R	B	O	X	B	B	B	B	B	B	B	X	O	X	B	X	A	O	X		
3		A	B	B	B	67	A	B	R	70	72	B	B	B	O	X	O	X	X	B	B	B	35	31	47	90		
4		64	O	X	A	A	R	B	B	B	B	B	O	X	O	X	O	X	O	X	R	O	X	A	O	X		
5		A	A	B	A	B	B	B	B	B	R	B	B	B	B	O	X	O	X	B	B	46	43	Y	A	A		
6		A	O	X	O	X	X	B	R	R	B	B	B	B	B	B	B	O	X	B	O	X	B	X	O	X		
7		56	B	B	X	70	77	X	B	B	B	B	B	B	O	X	O	X	B	X	B	O	X	65	54	54		
8		A	35	B	B	R	B	B	B	B	R	B	B	B	B	O	X	O	X	X	X	X	X	X	X	A		
9		O	X	B	B	B	B	X	B	R	B	B	B	B	B	O	X	X	O	X	R	X	A	O	X	A		
10		B	X	50	67	46	44	44	O	X	R	A	R	B	B	B	O	X	X	B	B	X	X	A	O	X		
11		O	X	35	55	A	R	R	B	O	X	B	B	B	O	X	O	X	B	B	O	X	O	X	R	A		
12		A	O	X	X	X	A	R	R	R	R	X	X	X	O	X	X	X	O	X	O	X	X	X	X	A		
13		41	55	58	48	O	X	A	X	O	X	B	B	B	O	X	O	X	X	O	X	O	X	X	X	A		
14		60	A	34	44	R	O	X	A	B	R	B	B	B	B	B	R	X	B	R	57	A	42	36	A			
15		B	56	36	50	O	X	A	A	X	O	X	B	A	B	B	O	X	X	X	X	X	O	X	O	X		
16		94	32	40	44	O	X	O	X	R	X	X	X	X	O	X	X	O	X	X	X	X	X	X	X	A		
17		68	88	42	42	B	B	R	R	R	B	B	B	B	O	X	O	X	B	X	X	X	X	X	X	A		
18		A	A	A	B	A	O	X	B	B	R	B	B	B	R	R	A	X	X	X	X	X	X	X	X	A		
19		A	A	A	A	B	B	B	R	B	B	B	B	B	B	B	R	O	X	O	X	B	O	X	O	A		
20		36	B	B	B	A	A	A	R	B	B	B	B	B	O	X	O	X	X	B	X	X	B	X	B	A		
21		O	X	X	O	X	B	R	B	B	B	B	B	R	B	B	X	X	B	X	X	X	X	X	X	O	X	
22		R	42	50	51	O	X	B	X	R	X	X	O	X	X	X	B	B	X	X	B	X	X	X	X	X	A	
23		O	X	X	O	X	B	R	X	O	X	X	X	B	B	O	X	X	O	X	X	X	X	X	X	A	A	
24		R	A	A	O	X	B	B	A	B	B	B	B	B	B	B	O	X	Y	B	B	B	B	B	B	A		
25		A	44	46	B	B	B	B	R	O	X	B	B	B	B	B	B	B	B	R	O	X	X	X	O	X	R	
26		B	B	B	A	O	X	O	X	B	B	B	B	B	B	B	B	B	X	B	B	O	X	O	X	A	A	
27		66	X	X	B	B	B	R	B	B	B	B	B	B	B	B	B	X	O	X	X	A	46	64	A	A		
28		A	42	B	A	B	B	B	B	R	B	B	B	B	B	Y	B	O	X	X	R	O	X	O	X	A	R	
29		32	X	A	B	O	X	B	B	B	B	B	B	B	B	B	B	B	B	X	B	B	B	B	X	X	A	
30		48	A	A	A	A	O	X	B	O	X	R	B	B	B	B	B	B	B	X	X	X	O	X	O	X	A	
31		B	B	B	B	B	R	B	B	B	B	B	B	B	B	B	B	B	B	X	O	X	R	O	X	A	O	X
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT		15	19	15	14	11	9	8	7	8	6	3	7	8	12	16	19	21	19	22	25	24	23	15	7			
MED		51	43	46	52	50	55	55	60	66	68	73	71	71	73	73	70	70	68	64	57	49	43	50	43			
UQ		66	56	55	65	67	60	61	64	71	69	78	78	76	82	81	78	80	81	73	67	61	54	56	61			
LQ		40	39	40	46	O	X	X	O	X	X	X	O	X	O	X	O	X	X	X	X	X	X	X	X	X		

OCT. 2002 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2002 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	F 59	F 52	F 46	R	A	F 38	F 43	F 52	61	B	B	R 60	R	R	F 65	J 69	W	31	F 26	F 26	A	R 32	A	A		
2	A	A	A	A	A	A	R	B	R 34	R 63	B	B	B	B	B	B	J 51	R 45	R	B	40	F 25	A	R 50	F 30	
3	A	B	B	B	F 57	A	B	R	F 58	66	B	B	B	66	57	64	66	B	B	F 26	18	F 37	A	A		
4	A	R 33	A	A	R	B	B	B	B	R 38	A	R 38	R 38	R 40	B	38	36	A	R	36	R	A	R	B	A	
5	A	A	B	A	B	B	B	B	B	R	B	B	B	B	R 60	77	75	R	B	F 37	F 29	Y	A	A	A	
6	A	R 29	R 35	F 49	J 64	R	B	R	R	B	B	B	B	B	B	B	59	B	R 44	B	58	42	31	A	A	
7	F 39	B	B	B	F 65	J 55	R 71	B	B	B	B	B	B	98	100	B	60	B	R	F 38	31	40	F 26	F 27	A	
8	A	F 28	B	B	R	B	B	B	R	B	B	B	B	B	40	41	39	40	42	39	30	A	R	A	A	
9	R 34	F 29	B	B	B	B	J 61	R	B	R	B	B	B	B	R 82	74	60	R	R	36	A	R 28	F 40	A	F 33	
10	B 62	J 62	F	F 55	F 33	F 34	F 34	38	R	A	R	B	B	B	65	66	B	B	J 52	34	37	F 34	A	R 34	A	
11	R 44	F 25	F 48	A	R	R	B	R	B	B	B	B	B	R 67	66	62	B	B	R	63	60	R	F 25	A	A	
12	A	39	47	59	54	A	R	R	R	J 67	R 72	J 74	R 81	R 92	J 92	98	100	80	59	32	F	A	F 32	F 30	A	
13	F 31	F 40	F 46	30	39	A	56	60	76	B	B	B	B	64	67	76	72	74	76	78	74	69	38	F	A	A
14	R 34	A	F 26	38	R	R	A	B	R	B	B	B	B	B	B	B	R 63	J 63	R	B	R	F 48	A	F 28	F 26	A
15	B 27	F 19	F	A	R 34	A	A	A	R	B	A	B	B	57	68	65	68	66	61	58	45	30	36	A	A	
16	F 29	F 25	F 28	38	42	32	36	R	66	61	62	65	67	67	B	64	64	62	66	62	62	62	33	A	A	
17	F 53	F 60	F	30	B	B	R	R	R	B	B	B	B	61	62	58	B	60	59	57	50	45	44	36	A	A
18	A	A	A	B	A	R	B	B	R	B	B	B	B	R	R	A	59	59	59	61	58	54	27	F	A	A
19	A	A	A	A	B	B	B	R	B	B	B	B	B	B	R	R	60	63	54	B	R 46	R 42	F 27	A	A	
20	F 25	B	B	B	A	A	A	R	B	B	B	B	R	J 62	J 66	J 71	B	J 73	73	B	B	J 49	B	F 30	F 21	A
21	R 45	44	34	36	B	R	B	B	B	B	B	R	B	B	J 74	J 71	B	B	75	67	65	56	50	27	20	F
22	R	F 30	F 41	45	B	F 34	J 54	R	R	61	72	79	76	82	R	R	95	F 88	J 69	B	52	47	44	A	A	A
23	R 33	36	40	46	B	R 52	J 58	R 59	62	B	B	B	66	72	66	97	92	J 88	J 86	69	57	A	A	R	47	A
24	R	A	A	60	B	B	A	B	B	B	B	B	B	B	B	R 54	Y	B	B	B	A	B	R	A	A	A
25	A	F 26	F 38	B	B	B	B	R	39	B	B	B	B	B	B	B	B	B	R	45	47	42	34	A	R	A
26	B	B	B	A	R 36	F 41	R 45	B	B	B	B	B	B	B	B	B	B	64	B	B	A	R 40	A	F 30	A	A
27	F 41	61	37	B	B	B	R	B	B	B	B	B	B	B	B	B	62	64	57	B	A	A	F 29	A	A	A
28	A	F 27	B	A	B	B	B	B	A	B	B	B	B	Y	B	R 62	62	56	R	R 48	R 45	41	37	A	R	A
29	F 19	37	A	B	44	B	B	B	B	B	B	B	B	B	B	B	B	68	B	B	B	B	56	48	A	A
30	F 32	F	A	A	A	A	R 49	B 38	R	B	B	B	B	B	B	B	B	B	63	57	62	35	40	A	A	A
31	B	B	B	F 36	B	B	R	B	B	B	B	B	B	B	B	B	B	B	J 55	R 46	R	36	A	A	R	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	14	19	13	13	10	9	8	7	8	6	3	7	8	12	16	19	21	19	21	23	23	21	12	7		
MED	F 34	F 33	F 38	45	43	40	48	52	58	62	J 67	65	65	67	66	64	64	62	57	48	42	34	33	30		
U Q	44	44	46	57	55	54	R 55	R 58	64	63	J 72	72	70	76	75	72	74	75	66	60	52	40	40	41		
L Q	F 31	F 27	F 31	F 36	F 36	F 34	F 40	38	38	61	62	60	62	64	59	60	60	54	40	34	35	28	28	21		

OCT. 2002 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2002 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D ^H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
1	42	34	37	33	48	37	35	31	33		B	B	33	31	30	28	26	31	18	28	24	61	47	99	66							
2	58	40	50	66	74	38	23		32	27		B		B	B	B		32	35		B	30	29	32	72	92						
3	80		B	B			B	B		39	24	23			30	27	28	26			B	B	E S	65	14	74	58	42				
4	40	46	74	78	38		B	B	B		B	G	28	118	33	32	E B	34		32	32	22	28	94	48		B	38				
5	61	69		B	49		B	B	B	B		B		B	B	E B	E B	E B	E B	E B	B	G		41	24	80	82	74				
6	40	40	32	31	32		B	33	35		B	B	B	B	B	B	E B	B		E B	B	B	G		27	38	91	68				
7	83		B	B			B	B	B	B	B	B	B	B	E B	E B	B			B		B										
8	42	56		B	B	28		B	B	B		B	B	B	E B	E B	E B	E B			34	30	22	28	38	34	35					
9	43	36		B	B		B		B	B	B	B	B	B	E B	B				G	B											
10		B	39	65	32	35	23	74	33	36	49	38		B	B	E B	B				B	B										
11	37	46	69	42	38	34		B	G		B	B		B		34	30	29		B	E B	B		E B	30	23	E B	28	27	37	36	
12	64	44	75	91	42	36	32	38	33		G	G	G	E B		E B			E B	E B	E B	E B										
13	54	48	37	46	55	40	27	43	E B	24		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		
14	34	69	52	32	E B	48	34	40		B	B	B	B	B	B	B	G				B											
15		B	28	57	39	42	37	38	33	32		G	B	B	B	E B	B				30	33	31	31	28	24	32	40	67	40	87	
16	36	33	33	66	57	32	38	36	32		G	G	G	G		B																
17	33	63	24	28		B		B		G	B	B	B		B	E B	G	B														
18	38	45	39		B		B	B		B	B	B	B	B	B	B																
19	39	40	37	37		B		B		B	B	B	B	B	B	E B																
20	23		B	B	B					B	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	E B	
21	32	34	36	33		B		B		B	B	B	B	B	E B	B																
22	33	20	16	37		B				G																						
23	39	34	35	37		B				G																						
24	35	48	48	40		B				B	B	B	B	B	B	B																
25	38	68	57		B	B	B			B	B	B	B	B	B	B																
26		B	B	B						B	B	B	B	B	B	B																
27	38	59	31		B	B	B			B	B	B	B	B	B	E B	B															
28	41	61		B	51		B	B	B		B	B	B	B	B	E B	B															
29	32	32	35		B		B	B	B		B	B	B	B	B	B																
30	41	81	43	41	36	32		B		B	B	B	B	B	B	B																
31		B	B	B		B				B	B	B	B	B	B	B																
				23				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	27	26	22	23	19	18	18	16	18	9	6	8	10	15	18	21	22	23	23	28	29	30	30	31								
MED	39	44	38	39	38	35	36	34	33		G	33	31	31	31	E B	34	30	30	29	28	30	28	38	42	42						
U Q	43	59	57	50	48	38	38	37	38	36	38	32	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	
L Q	35	34	35	33	35	32	32	33	32	28		G	G																			

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2002 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	8	7	8	8	9	10	13	8	B	B	24	25	25	14	15	14	13	E S	E S	14	12	14	15	
2	14	18	17	19	60	26	15	B	14	18	B	B	B	B	B	B	14	16	B	13	13	13	17	19	
3	14	B	B	B	17	32	B	22	16	17	B	B	B	21	19	16	20	B	B	E S	14	8	8	7	
4	12	12	15	11	27	B	B	B	B	18	16	20	19	34	B	24	28	26	13	14	13	14	B	14	
5	14	14	B	13	B	B	B	B	B	25	B	B	B	B	36	54	30	B	19	13	13	13	16	22	
6	22	13	15	13	20	B	29	25	B	B	B	B	B	B	B	50	B	B	B	16	E S	13	13	12	
7	13	B	B	17	16	17	B	B	B	B	B	B	B	64	55	B	16	B	29	15	E S	13	13	56	
8	15	13	B	B	16	B	B	B	25	B	B	B	B	B	34	31	30	15	E S	13	E S	16	14		
9	13	14	B	B	B	B	22	B	25	B	B	B	B	B	35	25	53	25	20	28	14	14	13	12	
10	B	22	14	13	15	14	20	19	27	25	26	B	B	B	56	25	B	B	15	14	12	12	13	13	
11	14	12	13	16	29	27	B	16	B	B	B	24	B	25	24	18	B	B	30	14	28	14	12	14	
12	13	13	12	25	14	26	24	27	25	28	24	16	35	25	57	14	57	30	29	16	14	13	13	14	
13	13	13	13	12	13	29	20	20	24	B	B	25	56	38	35	52	32	30	54	24	E S	12	E S	E S	
14	14	16	18	13	48	26	15	B	19	B	B	B	B	B	B	17	14	B	16	12	E S	12	14	13	
15	B	12	13	25	12	14	21	14	15	B	20	B	B	17	33	16	16	20	14	13	12	13	13	13	
16	14	13	13	17	14	12	16	19	E S	14	13	21	15	18	14	B	20	20	18	14	17	22	13	24	14
17	12	16	19	12	B	B	28	15	19	B	B	B	19	35	22	B	15	14	13	14	14	15	13	12	
18	12	25	25	B	30	16	B	B	27	B	B	B	B	18	21	16	15	16	13	14	13	13	12	13	
19	29	20	25	24	B	B	B	29	B	B	B	B	B	B	25	33	16	22	B	28	E S	13	17	27	
20	16	B	B	B	26	26	29	25	B	B	B	B	36	58	35	B	55	54	B	B	38	B	14	12	
21	13	14	20	16	B	21	B	B	B	B	B	20	B	B	62	26	B	57	15	24	13	12	E S	12	
22	13	13	E S	13	B	12	16	15	19	15	16	16	16	17	B	B	17	19	30	B	15	14	14	24	
23	16	12	14	18	B	25	13	19	14	16	B	B	59	19	16	15	14	17	18	14	12	13	14	12	
24	E S	13	14	13	B	B	B	20	B	B	B	B	B	B	20	19	B	B	B	13	B	E S	13	13	
25	13	14	13	B	B	B	B	20	15	B	B	B	B	B	B	B	B	20	24	16	E S	14	14	25	
26	B	B	B	26	16	18	25	B	B	B	B	B	B	B	B	B	24	B	B	25	14	25	13	13	
27	13	26	14	B	B	B	B	29	B	B	B	B	B	B	B	34	14	18	62	18	16	13	15	13	
28	13	13	B	14	B	B	B	B	24	B	B	B	B	27	B	32	17	30	15	20	16	13	14	27	
29	13	12	28	B	14	B	B	B	B	B	B	B	B	B	B	B	B	17	B	B	B	27	13	29	
30	13	19	26	30	19	14	B	24	20	B	B	B	B	B	B	B	B	32	27	16	20	12	14	58	
31	B	B	B	13	B	B	20	B	B	B	B	B	B	B	B	B	B	19	16	16	15	25	14	21	
	00	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	30	31	31	31	31	31	31	31	31	31	31	31	31	
MED	13	14	18	17	29	27	29	29	25	B	B	B	B	B	56	32	28	26	24	16	14	13	14	14	
U Q	16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	24	19	14	15	22	
L Q	13	13	13	13	16	17	20	19	19	25	B	25	36	25	25	18	16	18	15	14	13	13	13	13	

OCT. 2002 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2002 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHZ TO 15.0MHZ IN 20.0SEC 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	210	200	A	A	A	196	224	240	214	B	B	A	236	A	254	192	248	A	F	F	A	A	A	A					
2	A	A	A	A	A	A	A	B	A	Y	B		B	B	B	B	238	340	B	246	250		232	270					
3	A	B	B	BE	A	A	B	A	A		B	B	B	224	224	234	218		B	A	S		A	A					
4	A	234	A	A	A	B	B	B	B		A	A	AE	B	B	A	A	A	Y	A	AE	A	B	A					
5	A	A	B	A	B	B	B	B	B	A	B	B	B	BE	B	B	260	268	BE	AE	A	A	A	A					
6	A	240	A	310	A	B	A	A	B	B	B	B	B	B	B	B	B	B	242	B	230	264	228	192	212				
7	Q	248	B	B	A	A	A	B	B	B	B	B	B	B	B	B	BE	Y	B	A		F	A	A					
8	A	A	B	B	A	B	B	B	A	B	B	B	B	BE	BE	BE	BE	B	AE	AE	AE	A	A	A	A				
9	EA	EA	A	B	B	B	A	B	A	B	B	B	B	BE	B	B	B	B	AE	B	AE	A		A	A				
10	B	Y	A	AE	AE	AE	AE	AE	A	A	A	B	B	B	BE	A	B	BE	A	AE	A	H	A	A	A				
11	A	A	A	A	A	A	B	Y	B	B	BE	A	B	YE	A	A	B	BE	B	BE	B	AE	A	A	A				
12	A	A	268	A	A	A	A	A	A	A	232	236	204	208	B	218	294	216	226	256	332	A	A	A	A				
13	246	238	292	A	A	A	292		252		222		BE	B	242	212	BE	BE	BE	BE	BE	Q	A	A					
14	A	A	204	AE	B	A	A	B	A	B	B	B	B	B	B	234		Y	B	A		A	A	A					
15	B	166	F	A	216	210	268	226		B	A	B	B	214	212	212	218	214	EA	Q	AE	A	A	A					
16	EA	A	A	A	AE	AE	A	A	H	208	212	230	226	212	B	226	220	238	230	224	244		A	A					
17	244	A	A	A	B	B	A	A	Y	B	B	B	YE	B	242	238	B	230	226	250	252	276	232	A	A				
18	A	A	A	B	A	A	B	B	A	B	B	B	B	A	A	A	236	214	224	218	240	250	250	226	288				
19	A	A	A	A	B	B	B	A	B	B	B	B	B	B	B	B	234	236	236	238	B	BE	B	A	A				
20	A	B	B	B	A	A	A	A	B	B	B	B	B	B	B	B	B	B	BE	B	B	BE	B	B	A	A			
21	A	260	A	A	B	A	B	B	B	B	B	A	B	B	B	Y	BE	BE	BE	BE	B	234	258	332	Q	EA	B	S	
22	224	378	334	A	B	A	278		A	198	212	Y	218	222	B	B	212	236	244	B	236	276	278		A	A	A		
23	A	AE	AE	A	B	A	Y		A	Y	B	B	B	A	A	A	220	224	224	220	220	240	224	240		A	A	A	
24	A	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	240	A	A	B	B	A	B	208		A	A	A	
25	A	A	A	B	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	A	250	252		A	A	A	A	A	
26	B	B	B	A	A	A	306	B	B	B	B	B	B	B	B	B	B	230	B	B	A	A	A	A	F	A	A	A	
27	EA	A	A	B	B	B	A	B	B	B	B	B	B	B	B	BE	B	224	236	242	B	A	A	A	A	A	A	A	
28	A	A	B	A	B	B	B	B	A	B	B	B	B	A	B	B	230	230	236	248	266	EA	EA	A		A	A	A	
29	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	236	B	B	B	252	252	Q	A	A	
30	F	A	A	A	AE	AE	B	A	A	B	B	B	B	B	B	B	B	BE	B	EA	EA	A	A	A	A	A	A	A	
31	B	B	B	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	AE	AE	AE	A	A	A	EA	A	A	A	
							318												270	290	284				338				
CNT	8	10	5	1	4	5	6	5	9	4	3	6	6	10	14	16	18	19	18	22	16	16	10	3					
MED	246	243	280	310	249	220	285	268	248	209	212	230	227	218	229	226	226	237	250	241	249	248	256	241					
U Q	259	348	360		319	298	306	294	263	211	232	236	236	242	240	235	248	264	266	266	281	312	282	338					
L Q	234	234	236		222	203	274	250	220	203	212	222	218	214	224	224	220	226	242	232	238	230	232	212					

OCT. 2002 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2002 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	B	B	57	R	B	B	O X	R	X	X	O X	O X	B	O X	X	X	X	X	B		X	X	O X	X	
2	B	B	O X	X	B	R	R	R	R	B	B	B	B	B	B	B	B	R	O X	O X		90	A	A	76
3	A	A	O X	A	X	R	B	O X	B	B	B	B	R	B	B	B	O X	B	R	A		55	A	A	A
4	A	A	A	B	A	A	B	B	B	R	B	B	B	B	B	O X	B	O X	O X	R		A	A	A	51
5	50		A	B	R	O X	X	B	B	B	B	B	B	B	B	R		B	O X	B	O X	X	R	A	
6	A	O X	O X		B	R	B	R	B	B	R	B	B	B	B	B	O X	X	R	O X		A	B	B	B
7	O X	B	O X	B	O X	O X	B	R	O X	B	B	B	B	B	B	B	B	O X	O X	O X			O X	O X	B
8	55	B	R	O X	B	X	X	R	A	X	X	X	X	X	X	X	X	B	O X	X	X	X	A	54	
9	O X	X	X	X	R	X	X	X	O X	X	X	X	O X	O X	X	X	O X	91	81	81	75	76	B	O X	O X
10	68	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11	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
12	X	A	A	X	O X	O X	R	R	O X	O X	B	X	R	O X	X	X	X	B	X	X	X	X	X	X	X
13	A	A	R	R	X		R	R	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	X	O X	O X	B	B	B	R	B	B	B	O X	X	X	B	O X	X	X	X	X	O X	X	X	X	X	X
15	X	O X	R	B	R	B	B	B	R	R	O X	O X	B	B	B	B	B	B	B	B	B	B	B	B	B
16	A	A	49	43	B	A	A	R	X	X	O X	X	R	Y	R	R	O X	O X	X	X	X	X	X	X	X
17	A	O X	R	B	A	B	R	R	X	O X	O X	X	R	O X	Y	Y	X	X	O X	O X	X	X	X	X	X
18	68	A	49	62	A	R	Y	R	R	R	R	B	B	B	B	Y	B	O X	O X	O X		B	A	A	O X
19	X	O X	A	A	O X	O X	R	R	B	B	B	B	B	B	B	B	B	O X	O X	B	X	X	X	X	X
20	A	X	R	R	A	O X	O X	A	O X	Y	R	R	R	R	R	R	R	X	X	X	O X	X	A	O X	O X
21	B	A	96	A	A	O X	R	R	R	R	B	R	B	R	R	R	R	O X	Y	Y	R	R		A	A
22	A	A	48	B	B	B	B	O X	B	B	B	B	B	B	B	B	B	B	B	R	R		B	B	R
23	B	B	B	B	Y	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
24	B	57	55	40	49	B	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
25	O X	49	48	A	X	B	R	O X	Y	B	R	B	R	B	B	B	B	B	B	B	B	B	B	B	B
26	O X	46	B	B	B	B	B	B	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
27	B	A	A	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
28	B	R	B	R	O X	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
29	A	B	B	O X	A	B	B	R	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	R	B	54	B	R	R	B	R	R	B	B	B	B	B	B	B	B	B	B	Y	R	X	R	B	O X
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	12	9	15	10	7	9	8	3	6	6	8	5	6	7	10	10	16	15	19	17	24	15	14	17	
MED	X	X	X	X	O X	O X	O X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
U Q	56	56	55	62	68	59	71	97	70	87	80	86	88	90	87	84	76	71	67	69	64	62	56	53	
L Q	X	O X	O X	O X	O X	O X	O X	X	X	O X	O X	X	X	O X	O X	X	O X	O X	O X	O X	O X	O X	X	X	X
	47	49	47	41	48	43	45	45	63	66	66	70	76	68	71	74	59	48	48	55	50	45	47	46	

NOV. 2002 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2002 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	B	B	F 31	A	B	B	R 40	R	60	67	66	69	R	B	R J	R	78	80	73	B	F 62	57	35	R 45	43
2	B	B	41	42	B	R	R	R	R	B	B	B	B	B	B	B	B	B	R	R	42	47	A	A	A
3	A	A	41	A	48	R	B	R	B	B	B	B	R	B	B	B	B	R	B	R	A	F	A	A	A
4	A	A	A	B	A	A	B	B	B	R	B	B	B	B	B	B	R	B	40	41	R	R	A	A	F 38
5	F 39	A	B	B	R	R	37	36	B	B	B	B	B	B	B	R	B	B	B	40	R	B	40	41	R
6	A	R	R	F 32	B	A	B	R	B	B	R	B	B	B	B	B	R	J	R	R	R	A	B	B	B
7	R	B	R	B	R	R	B	R	R	B	B	B	B	B	B	B	B	60	58	51	J	R	F	J	R
8	F	B	R	R	B	J	R	56	R	A	J	R	J	R	J	R	J	R	B	R	J	R	J	R	F
9	R	54	J	R	F	R	J	R	J	R	J	R	J	R	J	R	J	R	85	68	F	J	R	J	R
10	F	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11	B	B	B	B	B	B	B	B	B	B	B	B	B	J	R	R	R	R	64	65	60	62	60	56	49
12	42	A	A	49	F	R	R	R	R	R	R	R	B	J	R	R	J	R	81	78	82	B	J	R	F
13	A	A	R	R	34	F	R	R	R	R	R	R	B	B	B	B	R	J	R	52	B	B	B	R	F
14	38	R	R	B	B	B	R	B	B	B	R	J	R	J	R	B	R	J	R	J	R	R	52	40	R
15	50	44	R	B	R	B	B	B	R	R	R	R	R	B	B	B	B	B	B	B	B	J	R	B	R
16	A	A	F 37	F 35	B	A	A	R	58	60	61	R	R	R	Y	R	R	R	50	56	55	53	52	52	51
17	A	R	R	B	A	B	R	R	J	R	R	R	R	R	Y	Y	J	R	71	71	65	65	61	60	56
18	A	A	R	F 32	A	R	Y	R	R	R	R	R	B	B	B	B	Y	B	47	41	39	R	A	A	39
19	30	30	41	A	A	R	R	R	R	B	B	B	B	B	B	B	B	R	61	60	B	55	58	49	34
20	A	45	32	R	A	F	R	A	R	Y	R	A	R	R	R	R	R	54	R	J	R	J	R	A	F
21	B	A	R	A	A	R	R	R	R	R	B	R	B	R	R	R	R	R	R	42	Y	Y	R	R	F
22	A	A	F 36	B	B	B	B	42	B	B	B	B	B	B	B	B	B	B	B	B	R	R	B	B	R
23	B	B	B	B	Y	B	R	B	B	B	B	B	B	B	B	R	62	61	B	B	J	R	R	J	R
24	B	38	43	A	R	B	B	R	B	B	B	B	B	B	B	B	B	J	R	R	R	R	R	A	B
25	R	F	A	B	B	R	R	Y	B	R	B	R	B	B	B	B	B	B	B	B	B	R	R	A	R
26	40	B	B	B	B	B	B	B	R	B	B	B	B	R	B	B	B	B	B	B	B	R	R	A	R
27	B	A	A	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	42	42	R	D	R	A
28	B	R	B	R	38	54	R	B	B	B	B	B	B	B	B	R	R	R	B	B	43	B	R	R	B
29	A	B	B	R	A	B	B	R	R	R	R	B	B	B	R	R	R	R	62	63	60	56	57	57	A
30	D	R	B	F 44	B	R	R	B	R	R	B	B	B	B	B	B	B	B	B	B	Y	R	59	R	R
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	12	9	13	9	7	9	8	3	6	6	8	5	6	7	9	10	16	15	19	17	24	15	14	16	
MED	42	45	41	36	42	37	40	42	59	64	64	69	76	67	75	70	62	56	51	55	52	49	44	42	
U Q	48	48	44	54	F	R	R	91	64	81	74	80	82	84	80	78	70	65	61	62	58	53	49	44	
L Q	40	36	36	34	36	36	39	39	57	60	60	64	70	62	64	68	53	42	42	49	42	39	41	38	

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2002 ftes (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	B	B	39	38	B	B	33	36	37	32	E B	E B	B	E B	34	49	27	E B	B	E B	26	22	G	21	36	36		
2	B	B	31	30	B	34	32	40	42	B	B	B	B	B	B	B	B	32	31	32	49	82	66	39				
3	40	69	40	72	57	33	B	28	B	B	B	B	32	B	B	B	E B	B	B	30	40	49	76	73	39			
4	39	37	42	B	36	34	B	B	B	40	B	B	B	B	B	28	B	27	32	39	35	37	102	39				
5	38	43	B	B	35	24	30	B	B	B	B	B	B	B	B	32	B	B	B	B	27	38	40	39				
6	49	39	74	95	B	36	B	42	B	B	B	B	B	B	B	B	32	34	26	49	44	B	B	B				
7	40	B	33	B	32	32	B	50	38	B	B	B	B	B	B	B	28	27	E B	31	35	33	40	40	B			
8	58	B	40	E B	B	36	36	40	38	35	36	34	36	36	E B	55	33	29	B	E B	30	28	22	19	38	24		
9	18	17	E B	21	22	30	37	32	30	30	32	30	37	37	39	37	33	32	28	50	34	21	B	E B	E B	B		
10	E 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		
11	B	B	B	B	B	B	B	B	B	B	B	B	B	E B	58	33	59	37	37	30	28	30	33	34	36	35		
12	28	44	43	27	23	35	31	30	23	27	32	B	E B	54	37	36	35	32	B	39	40	32	24	37	42			
13	42	42	28	30	24	23	38	33	34	37	34	B	B	B	B	32	31	B	B	B	E B	28	20	21	23			
14	34	45	32	B	B	B	B	37	B	B	E B	56	32	32	B	33	50	28	30	32	28	23	32	23	35			
15	44	30	37	B	38	B	B	B	36	35	32	31	B	B	B	B	B	B	B	B	E B	29	B	40	35			
16	43	40	35	40	B	42	38	38	34	30	35	36	38	30	32	36	30	28	28	26	24	20	22	39				
17	91	42	34	B	44	B	G	G	G	31	30	39	32	31	33	34	31	27	E B	29	35	24	27	18	26			
18	37	42	37	57	42	38	23	30	30	40	44	B	B	B	B	29	B	31	32	31	B	48	42	40				
19	40	32	38	47	40	36	34	27	31	B	B	B	B	B	B	B	E B	E B	E B	E B	35	46	30	32	24	41	64	
20	40	39	22	33	90	26	41	38	35	22	36	37	40	43	34	32	28	32	32	41	28	68	37	37				
21	B	B	E B	50	51	43	32	32	30	37	B	38	B	31	31	29	32	32	24	28	34	36	66	40				
22	60	62	23	B	B	B	B	29	B	B	B	B	B	B	E B	55	B	B	B	E B	32	36	42	B	32			
23	B	B	B	B	20	B	32	B	B	B	B	B	B	B	B	G	29	18	B	B	31	44	30	43	42	36		
24	B	35	34	34	40	B	B	37	B	B	B	B	B	33	33	B	29	28	36	35	42	39	B	B				
25	33	68	44	94	B	32	31	22	B	37	B	33	B	B	B	B	B	B	B	34	27	38	38	36	B			
26	29	B	B	B	B	B	B	B	37	B	B	B	B	E B	56	B	B	B	B	B	E B	30	28	26	41	38		
27	B	49	34	B	32	B	B	B	B	B	B	B	B	B	B	B	B	B	E B	34	36	27	29	33	57	40		
28	B	35	B	35	32	71	B	B	B	B	B	B	B	B	B	30	31	B	B	28	B	G	G	40	B			
29	38	B	B	41	75	B	B	37	38	31	B	B	B	E B	58	31	37	33	22	24	28	27	44	36	48			
30	36	B	35	B	37	33	B	34	36	B	B	B	B	B	B	B	B	B	B	B	22	36	42	39	B	G		
31																												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	22	20	23	17	19	18	16	20	17	14	12	10	9	12	15	17	17	17	24	25	28	25	25	24				
MED	40	42	35	38	37	34	32	35	35	34	34	36	U	34	34	32	32	30	29	30	32	30	36	40	38			
U Q	43	47	40	54	44	37	36	38	38	37	40	38	E B	47	50	37	36	E B	B	B	32	32	33	38	36	42	42	40
L Q	34	36	32	30	32	32	32	30	30	31	32	33	32	32	31	30	28	28	28	28	26	24	36	35				

IONOSPHERIC DATA STATION SHOWA-ST.

NOV.2002 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT.69°00.4'S LON.039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		B	B	16	30	B	B	20	26	21	22	56	46	B	57	21	16	25	30	B	26	16	14	14	13	
2		B	B	14	17	B	29	29	26	26	B	B	B	B	B	B	B	B	15	16	15	21	16	30	19	
3		24	19	13	16	19	16	B	19	B	B	B	B	24	B	B	B	33	B	26	28	20	46	16	20	
4		14	25	20	B	20	18	B	B	B	30	B	B	B	B	B	21	B	15	20	13	14	14	14	13	
5		13	14	B	B	24	15	19	B	B	B	B	B	B	B	B	17	B	B	15	B	13	13	16	13	
6		13	13	16	20	B	26	B	26	B	B	22	B	B	B	B	B	26	15	20	14	13	B	B	B	
7		14	B	20	B	16	20	B	24	20	B	B	B	B	B	B	B	18	18	31	12	15	16	16	B	
8		12	B	24	27	B	22	16	22	21	16	19	21	30	19	55	19	18	B	30	25	19	16	12	13	
9		14	12	21	14	18	26	14	15	13	15	16	22	25	33	18	24	19	18	13	13	18	B	31	30	
10		28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11		B	B	B	B	B	B	B	B	B	B	B	B	58	22	58	30	28	20	20	26	16	16	15	14	
12		13	14	16	14	15	20	18	17	16	20	28	B	54	28	20	15	14	B	29	14	16	15	14	13	
13		14	16	21	20	13	13	28	15	20	21	19	B	B	B	B	25	13	B	B	B	28	16	14	12	
14		13	13	27	B	B	B	25	B	B	B	55	28	25	B	25	15	17	16	32	28	15	19	16	12	
15		12	13	25	B	20	B	B	B	25	17	15	24	B	B	B	B	B	B	B	B	29	B	16	20	
16		31	14	15	15	B	16	24	25	15	16	17	20	24	19	20	16	14	16	12	15	16	12	12	12	
17		19	15	16	B	28	B	28	20	14	16	16	21	20	25	20	16	16	12	29	12	13	11	13	10	
18		16	13	12	14	16	14	14	13	16	18	30	B	B	B	B	24	B	19	14	26	B	10	12	12	
19		20	11	12	26	13	13	12	12	26	B	B	B	B	B	B	B	35	46	B	30	24	16	15	13	
20		29	14	15	13	15	12	13	13	14	19	26	16	29	25	15	15	19	32	14	16	24	11	12	12	
21		B	15	46	12	13	13	12	16	22	26	B	20	B	26	19	12	14	28	E S	11	13	14	19	11	11
22		25	14	12	B	B	B	B	15	B	B	B	B	B	B	55	B	B	B	32	13	12	B	B	25	
23		B	B	B	B	14	B	18	B	B	B	B	B	B	B	21	14	B	B	27	15	13	14	12	18	
24		B	16	13	14	25	B	B	28	B	B	B	B	B	21	17	B	19	15	12	12	13	13	B	B	
25		16	16	18	13	B	13	14	12	B	32	18	B	B	B	B	B	B	B	14	16	20	16	18	B	
26		18	B	B	B	B	B	B	B	26	B	B	B	B	56	B	B	B	B	B	B	30	28	21	16	15
27		B	19	20	B	27	B	B	B	B	B	B	B	B	B	B	B	B	26	36	24	29	21	24	20	
28		B	20	B	21	18	16	B	B	B	B	B	B	B	B	15	26	B	B	15	B	17	15	15	B	
29		29	B	B	25	21	B	B	21	27	25	B	B	B	58	12	37	33	13	10	19	14	14	13	11	
30		12	B	12	B	18	16	B	16	15	B	B	B	B	B	B	B	B	B	15	25	14	14	B	11	
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED		20	16	20	26	22	24	28	24	26	B	B	B	B	B	B	28	33	31	23	22	16	16	16	14	
U Q		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
L Q		14	14	15	15	16	16	18	16	20	20	26	24	54	28	20	16	18	16	14	14	14	14	13	12	

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2002 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	B	B	A	A	B	B	E A 266	A	Y	Y	B	E B 318	B	B	A	E A 226	E A 230	E A 230	212	B	E B 238	236	A	A	A	
2	B	B	E A 268	A 276	B	A	A	A	A	B	B	B	B	B	B	B	B	B	A	E A 222	E A 254	E A 296	A	A	A	
3	A	A	A	A	A	A	B	A	B	B	B	B	A	B	B	B	E B 238	B	B	252	A	A	A	A	A	
4	A	A	A	B	A	A	B	B	B	A	B	B	B	B	B	230	B	Y	A	258	A	A	A	A	A	
5	A	A	B	B	A	186	222	A	B	B	B	B	B	B	B	B	Y	B	B	A	B	A	A	A	A	
6	A	248	A	A	B	A	B	A	B	B	A	B	B	B	B	B	B	234	274	A	230	A	A	B	B	B
7	A	B	A	B	A	A	B	A	Y	B	B	B	B	B	B	B	218	224	238	258	E A 280	A	A	A	B	
8	A	B	A	E B 280	B	A	Y	A	A	Y	Y	Y	Y	Y	Y	B	A	226	214	B	E B 238	246	222	246	A	
9	254	258	270	E A 290	A 308	A	A	280	240	220	222	210	Y	Y	Y	218	226	218	232	226	E A 234	E A 244	B	E B 270	E B 264	
10	E B 260	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
11	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	B	Y	Y	254	254	266	256	278	E A 298	E A 264	A	
12	298	A	A	A	Y	Y	A	202	Y	Y	B	B	A	Y	Y	218	234	A	B	E B 244	252	240	266	A	A	
13	A	A	A	A	E A 282	242	A	A	222	A	A	B	B	B	B	210	226	B	B	B	E B 280	290	268	A	A	
14	A	316	A	B	B	B	A	B	B	B	B	Y	Y	B	Y	196	206	234	E B 222	E B 226	266	A	302	302		
15	E A 298	A	A	B	A	B	B	B	A	236	A	Y	B	B	B	B	B	B	B	B	B	B	B	A	A	
16	A	A	A	A	B	A	A	A	Y	232	196	A	A	Y	Y	218	220	220	226	228	226	242	266	256	258	
17	A	234	A	B	A	B	A	A	198	198	A	A	Y	Y	Y	238	224	230	E Y 224	238	238	238	234	280		
18	A	A	A	A	A	A	Y	A	A	A	A	B	B	B	B	Y	B	E A 236	252	A	B	A	A	E A 266		
19	A	A	A	A	A	A	E A 264	A	A	B	B	B	B	B	B	B	E B 242	B	B	E B 256	E B 254	A	E A 274	E A 262		
20	A	A	F	R	A	E A 266	E A 298	A	A	Y	A	A	E A 230	A 240	A 230	202	234	230	224	E A 258	E A 330	E A 242	E A 224	A		
21	B	A	E B 250	A	A	A	A	A	A	A	B	A	B	A	A	A	E A 238	A	Y	Y	Y	A	A	A	A	
22	A	A	A	B	B	B	B	194	B	B	B	B	B	B	B	B	B	B	E B 260	A	E A 266	B	B	A		
23	B	B	B	B	Y	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	E A 238	226	218	A	
24	B	A	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	E A 214	228	A	A	A	B	B	
25	A	240	A	A	B	A	252	Y	B	A	B	A	B	B	B	B	B	B	B	E A 256	A	E A 250	E A 300	E A 258	B	
26	A	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	E B 240	E B 236	E B 268	A	248		
27	B	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	E B 250	272	210	234	A	A	
28	B	A	B	A	A	A	B	B	B	B	B	B	B	B	A	A	B	B	B	234	B	E A 278	E A 266	226	B	
29	A	B	B	A	A	B	B	A	A	A	B	B	B	B	B	A	E B 206	E B 228	188	208	222	226	A	A	A	
30	A	B	A	B	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	Y	A	A	A	B	A	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	4	6	5	3	3	4	6	3	5	4	2	1	1	2	6	13	16	15	20	16	22	13	12	10		
MED	U 268	253	240	E A 280	A 290	A 234	U 251	U 204	211	227	203	E B 318	E A 230	230	220	219	220	229	234	240	240	256	U 241	264		
U Q	298	266	269	E A 290	A 308	A 284	280	240	237	234					226	230	E 234	A 236	254	E 257	E A 266	275	E 272	280		
L Q	257	240	225	276	282	214	252	194	200	210					218	207	218	222	227	230	236	243	228	258		

NOV. 2002 h'F (KM)

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2002 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	49	A	B	X	A	X	B	B	B	B	R	B	B	B	B	B	B	B	R	R	O	X	R	X	O	X					
2	A	94	B	B	B	B	B	R	B	B	B	B	B	B	B	B	B	B	B	O	X	R	X	R	A						
3	A	A	O	X	R	B	X	R	B	R	B	O	X	Y	O	X	O	X	B	B	O	X	B	B	O	X	X	O	X	X	X
4	X	O	X	X	O	X	X	B	R	X	X	X	B	B	B	X	X	O	X	R	O	X	X	O	X	R	X	O	X	X	
5	B	58	49	A	O	X	O	X	B	B	R	O	X	O	X	B	B	B	B	B	X	X	O	X	O	X	X	X	X	X	
6	X	O	X	X	B	O	X	R	O	X	X	X	X	B	X	O	X	X	X	O	X	O	X	X	X	X	O	X	X	X	
7	A	A	R	B	70	45	69	78	58	73	X	O	X	B	B	B	R	O	X	O	X	O	X	O	X	X	A	R	X	X	
8	41	A	O	X	X	O	X	O	X	R	R	R	R	R	R	R	R	O	X	O	X	O	X	O	X	O	X	O	X	O	X
9	O	X	O	X	R	B	R	R	X	X	X	O	X	R	R	O	X	R	O	X	X	X	X	X	O	X	O	X	X	X	
10	X	X	X	O	X	R	R	R	X	X	X	O	X	O	X	O	X	X	R	O	X	O	X	O	X	O	X	O	X	X	X
11	R	R	X	X	X	X	O	X	O	X	R	O	X	R	R	R	R	X	X	O	X	O	X	O	X	O	X	X	X	X	
12	O	X	O	X	B	X	R	X	X	X	O	X	X	O	X	O	X	R	O	X	O	X	X	X	X	X	O	X	X	X	
13	X	X	B	R	R	R	R	R	X	X	O	X	R	R	R	O	X	O	X	O	X	O	X	X	X	X	X	O	X	X	
14	X	B	A	X	R	R	A	R	R	R	R	R	R	R	R	O	X	O	X	X	O	X	R	R	R	O	X	X	X		
15	50	46	A	A	O	X	B	R	R	R	R	B	R	B	O	X	R	O	X	R	R	O	X	X	X	X	X	X	X	X	
16	70	58	64	62	62	63	47	76	76	69	78	74	Y	O	X	R	Y	Y	R	X	X	X	X	X	A	X	X	X	X		
17	O	X	O	X	X	O	X	X	X	O	X	X	R	O	X	R	A	O	X	X	O	X	X	X	X	X	X	X	X	X	
18	70	60	62	66	76	74	77	77	79	76	Y	R	X	R	O	X	O	X	O	X	O	X	O	X	O	X	O	X	O	X	
19	O	X	X	X	X	B	B	R	R	B	O	X	O	X	O	X	O	X	X	R	Y	A	X	X	X	X	X	X	X	X	
20	O	X	O	X	O	X	B	B	B	B	B	B	B	B	B	B	B	B	B	X	O	X	O	X	X	R	O	X	X		
21	R	A	O	X	R	63	A	B	O	X	B	B	B	B	R	R	R	R	O	X	X	X	X	O	X	X	O	X	O	X	
22	44	63	58	O	X	R	R	R	O	X	R	R	R	R	O	X	O	X	O	X	X	O	X	X	X	X	X	X	X	X	
23	60	55	56	O	X	R	A	A	R	B	B	B	B	R	B	R	R	R	R	X	R	X	O	X	O	X	X	X	X	X	
24	50	41	A	A	R	R	O	X	O	X	O	X	O	X	O	X	B	B	B	B	O	X	B	R	B	X	O	X	R	B	
25	R	54	64	58	R	B	B	R	R	R	R	R	R	O	X	X	X	X	X	R	B	X	X	X	X	R	R	R	R		
26	B	R	63	R	44	R	B	R	R	R	R	R	B	O	X	X	B	B	B	B	X	R	X	R	A	A	A	A	A		
27	O	X	X	A	A	A	O	X	R	B	B	B	B	B	B	R	B	B	B	R	O	X	O	X	O	X	O	X	X	R	
28	R	48	B	R	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X	O	X	R	O	X	X	O	X		
29	X	O	X	X	O	X	B	B	X	X	O	X	X	O	X	B	B	B	B	B	B	B	X	O	X	O	X	X	X	X	
30	B	R	R	B	62	B	B	B	B	X	B	B	X	X	B	O	X	X	B	B	B	B	X	O	X	X	X	X	X	X	
31	B	O	X	B	B	B	R	R	B	B	X	B	B	X	X	X	X	B	X	O	X	X	B	O	X	O	X	X	X	X	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
CNT	20	22	20	16	18	10	11	14	14	14	13	12	11	11	15	10	17	16	20	26	27	26	24	22							
MED	X	X	X	X	X	X	X	X	X	X	O	X	O	X	O	X	O	X	X	X	O	X	X	X	X	X	X	X	X	X	
UQ	56	58	60	62	64	64	66	74	76	77	74	74	73	73	74	74	70	68	65	60	57	55	56	56							
LQ	67	63	64	67	67	74	72	78	79	84	80	81	81	77	79	79	72	70	68	66	66	65	64	64							
	O	X	X	O	X	O	X	O	X	X	O	X	O	X	O	X	O	X	O	X	O	X	O	X	O	X	X	X	X	X	X
	50	50	51	51	60	60	47	68	68	70	70	73	69	68	70	71	67	61	61	55	50	52	52	55							

DEC. 2002 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2002 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT.69°00.4'S LON.039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	F 41	A 51	B 38	R 38	A 38	R 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	R 40	R 43	R 43	R 43	52	44		
2	A 42	R 42	B 42	B 42	B 42	B 42	B 42	R 42	B 42	B 42	B 42	B 42	B 42	B 42	B 42	B 42	B 42	B 42	B 42	B 42	R 42	48	R 42	A 42		
3	A 42	A 43	R 43	R 43	B 58	R 58	B 58	R 58	B 58	R 58	B 58	R 58	Y 61	R 61	R 61	B 61	B 61	R 61	B 61	B 52	R 47	R 41	R 39	46		
4	52	44	51	57	56	B 63	R 63	F 63	J 71	R 78	J 84	B 84	B 84	B 84	73	J 73	63	R 63	R 45	49	48	R 48	50	52		
5	B 45	F 31	F 31	A 60	R 70	R 70	B 70	B 70	R 62	R 65	B 65	B 65	B 65	B 65	B 65	B 65	B 65	B 65	60	57	57	48	R 40	R 42	R 51	
6	J 44	R 44	R 55	B 55	S 59	F 60	F 61	R 61	R 62	64	67	J 72	B 72	J 73	R 66	R 60	R 60	R 62	R 64	R 61	51	J 47	R 50	R 52		
7	A 44	A 44	R 55	B 55	F 60	R 39	F 56	R 56	R 52	67	R 67	B 67	B 67	67	59	R 67	R 67	R 61	49	60	60	40	49	R 49	A 49	
8	F 27	A 34	F 38	R 38	54	54	41	41	R 41	R 41	R 41	R 41	R 41	R 41	R 41	R 41	R 41	59	45	44	40	45	44	37	42	
9	R 49	R 45	R 45	B 60	R 60	R 60	R 60	J 67	J 75	J 74	R 70	67	R 67	R 67	R 67	R 67	R 67	R 67	R 48	J 54	J 55	51	52	47	J 46	
10	J 47	R 55	U 58	S 60	R 60	R 60	R 60	J 70	J 59	J 78	R 82	82	83	82	76	R 76	R 76	R 76	J 70	J 68	R 64	64	62	60	59	50
11	R 47	R 55	57	65	68	73	66	74	J 73	J 88	R 88	80	75	R 75	73	R 73	R 73	R 66	69	65	68	66	64	63	60	
12	S 58	57	B 58	F 58	66	R 66	60	72	79	80	76	68	R 68	R 68	R 68	R 68	R 68	R 68	R 68	R 68	R 68	F 68	59	58	58	
13	J 62	R 62	B 62	R 62	R 62	R 62	R 62	R 62	R 62	J 64	R 72	68	R 68	R 68	R 68	R 68	R 68	R 68	R 68	R 68	R 68	R 68	R 68	R 68	R 68	
14	60	B 60	A 60	F 55	R 53	B 53	R 53	R 53	R 53	R 53	R 53	R 53	R 53	R 53	R 53	R 53	R 53	R 53	R 53	R 53	R 53	R 53	R 53	R 53	R 53	
15	F 36	F 32	A 32	A 40	R 40	B 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	
16	F 57	J 52	R 58	R 56	R 56	57	41	70	J 70	J 63	J 72	R 68	Y 62	R 62	R 62	R 62	Y 62	Y 62	R 62	R 56	R 56	J 48	59	A 60	60	
17	R 62	R 64	S 59	S 56	S 59	55	64	J 74	J 78	R 83	R 83	76	R 76	R 76	R 76	R 76	R 76	R 76	R 76	R 76	R 76	R 76	R 76	R 76	R 76	
18	F 58	J 54	R 56	F 60	F 62	J 68	R 71	J 71	J 73	J 70	Y 70	R 70	J 72	R 72	R 72	R 72	R 72	R 72	R 72	R 72	R 72	R 72	R 72	R 72	R 72	
19	R 63	R 65	F 59	F 65	61	B 61	B 61	B 61	B 61	B 61	B 61	B 61	B 61	B 61	B 61	B 61	B 61	B 61	B 61	B 61	B 61	B 61	B 61	B 61	B 61	
20	R 38	R 32	R 41	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	R 40	
21	R 47	A 47	R 47	F 55	A 55	B 55	R 47	R 47	B 47	B 47	B 47	B 47	R 47	R 47	R 47	R 47	R 47	R 47	R 47	R 47	R 47	R 47	R 47	R 47	R 47	
22	F 33	F 55	F 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	R 48	
23	F 50	F 42	F 42	R 42	F 36	R 36	A 36	A 36	R 36	R 36	R 36	R 36	R 36	R 36	R 36	R 36	R 36	R 36	R 36	R 36	R 36	R 36	R 36	R 36	R 36	
24	F 39	F 26	A 26	A 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	R 26	
25	R 39	F 54	F 49	F 49	R 49	B 49	B 49	B 49	R 49	R 49	R 49	R 49	R 49	R 49	R 49	R 49	R 49	R 49	R 49	R 49	R 49	R 49	R 49	R 49	R 49	
26	B 54	R 54	F 54	R 38	R 38	B 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	
27	S 59	F 51	F 38	A 38	A 38	A 38	R 43	R 43	B 43	B 43	B 43	B 43	B 43	B 43	B 43	B 43	B 43	B 43	B 43	B 43	B 43	B 43	B 43	B 43	B 43	
28	R 38	F 38	B 38	R 38	R 38	R 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	B 38	
29	49	R 44	J 54	S 49	F 49	B 49	B 49	B 49	J 62	R 70	J 67	R 71	68	64	B 64	B 64	B 64	B 64	B 64	B 64	B 64	B 64	B 64	B 64	B 64	
30	B 48	R 48	R 48	B 48	R 48	B 48	B 48	B 48	B 48	B 48	B 48	B 48	B 48	B 48	B 48	B 48	B 48	B 48	B 48	B 48	B 48	B 48	B 48	B 48	B 48	
31	B 62	F 52	B 52	B 52	B 52	R 52	R 52	R 52	B 52	B 52	B 52	B 52	B 52	B 52	B 52	B 52	B 52	B 52	B 52	B 52	B 52	B 52	B 52	B 52	B 52	
CNT	21	22	20	15	18	10	11	13	14	14	13	12	11	11	15	10	17	16	20	27	27	26	24	21		
MED	49	48	53	56	56	58	60	67	70	71	68	68	67	67	68	68	64	62	59	54	51	49	50	50		
U Q	58	55	56	60	60	68	64	72	73	78	74	75	75	71	73	73	66	64	62	60	60	59	58	58		
L Q	F 40	F 42	F 42	R 42	R 49	R 54	R 41	R 54	R 62	R 64	R 64	R 67	R 63	R 62	R 64	R 65	R 61	R 55	R 55	R 44	R 44	R 45	R 46	R 48		

DEC. 2002 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2002 ftes (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC 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	38	44	B	32	68	27	B	B	B	B	31	B	B	B	B	B	B	B	30	35	42	35	39	41				
2	42	38	B	B	B	B	B	34	B	B	B	B	B	B	B	B	B	B	B ^E	B ^B	30	41	40	35	94			
3	41	39	G	36	B	44	35	B	34	B	34	31	28	30	B	B ^E	B	B	B	G	23	34	30	36	G			
4	34	32	31	32	34	B	38	36	31	36	25	B	B	B	48	38	33	28	G	32	29	38	30	44	40			
5	B	38	39	39	67	32	B	B	41	38	33	B	B	B	B	B	B	G	23	31	31	35	34	39	37			
6	40	38	38	B	39	33	36	40	42	37	31	30	B ^E	B	32	31	G	27	30	27	B ^E	B	24	40	39	46		
7	60	56	34	B	34	36	36	41	40	B ^E	B ^B	B	B	31	30	30	34	32	33	34	30	31	39	43	39			
8	69	35	24	B ^E	74	67	38	35	34	35	33	26	31	32	33	34	34	32	24	G	33	31	40	38	38	31		
9	36	27	32	B	35	37	G	30	30	31	32	30	38	37	37	35	32	30	36	31	26	23	23	29				
10	21	23	31	34	37	33	37	32	36	30	32	28	39	39	31	35	G	28	28	30	26	32	36	B ^E	B	30		
11	32	28	22	23	G	31	G	28	22	G	32	37	39	39	40	40	39	41	36	26	33	30	106	68	41			
12	31	31	B	28	32	49	40	32	36	32	37	42	30	58	60	39	48	30	23	32	36	26	25	29				
13	28	20	B	38	39	39	38	42	35	41	39	36	38	33	44	65	59	46	34	31	49	44	21	28				
14	19	B	62	45	34	32	29	60	37	49	30	32	38	41	36	27	34	38	38	33	32	33	35	G	73			
15	24	70	42	36	35	B	35	38	38	37	32	B	30	B	37	31	34	32	28	B ^E	B	28	23	26	24			
16	23	30	27	39	39	42	28	33	36	34	37	16	34	39	31	30	27	26	G	23	33	29	34	82	29			
17	30	40	35	31	27	34	38	35	31	47	64	44	79	41	59	76	37	39	36	40	44	47	43	22				
18	22	26	28	30	28	28	39	38	38	41	33	41	39	38	35	38	36	38	36	49	38	33	30	20	B			
19	30	26	28	30	49	B	B	31	49	B	33	31	32	33	35	32	31	26	22	55	34	32	28	B				
20	G	31	38	23	B ^E	B	B	B	B	B	B	B	B	B	B	B	B	B	G	B ^E	B	23	27	30	28	40	36	42
21	35	100	32	39	37	75	B	G	B	B	B	B	30	31	33	33	31	31	32	29	31	35	32	35				
22	44	33	35	81	32	37	33	38	41	36	36	34	35	28	32	31	30	31	30	32	40	27	32	33				
23	32	35	24	68	31	38	35	41	40	B	B	B	32	B	27	35	32	38	38	42	33	28	G	32	48			
24	36	34	42	38	G	33	32	36	34	32	27	35	B	B	B	B	26	B	B	B	34	43	42	G	B			
25	39	32	42	35	37	B	B	34	31	32	30	38	38	50	35	30	31	26	B	28	43	37	38	39				
26	B	35	36	42	G	G	B	42	38	39	34	B	32	B ^E	B	B	B	31	27	41	42	56	42	38				
27	41	49	31	43	43	97	30	40	B	B	B	B	B	B	30	B	B	B	B	33	23	43	41	38	34			
28	33	42	B	34	38	29	B	B	B	B	B	B	B	B	B	B	B	B	B ^E	B	34	28	30	32	48	32		
29	32	40	35	32	36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	34	40	19	23	28			
30	B	38	33	B	30	B	B	B	32	B	B	B	B	B	B	B	B	B	B	B	G	G	20	22	31	35	37	
31	B ^E	B	46	38	B	B	B	35	41	B	B	G	B	B	31	34	55	B	B	B	B	B	34	25	30	21		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	27	30	26	25	27	22	20	25	24	20	23	19	21	19	22	21	21	23	26	29	31	31	31	29				
MED	33	36	32	36	35	36	35	36	36	36	33	32	34	U	36	34	34	32	30	31	31	34	34	35	35			
U Q	40	40	38	40	39	39	38	40	39	40	36	38	39	41	40	38	35	38	34	34	41	40	39	40				
L Q	30	31	28	32	32	32	31	32	32	32	31	30	32	31	32	31	30	26	27	29	30	30	30	29				

DEC. 2002 ftes (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2002 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		11	26	B	12	54	15	B	B	B	B	26	B	B	B	B	B	B	B	12	12	12	27	20	19		
2		16	20	B	B	B	B	B	15	B	B	B	B	B	B	B	B	B	B	B	30	15	15	31	10		
3		18	20	12	18	B	16	25	B	26	B	30	25	24	11	B	B	34	B	B	16	10	30	10	13		
4		20	13	12	12	26	B	25	10	10	12	18	B	B	B	34	25	15	16	15	14	12	14	12	16		
5		B	10	15	20	15	12	B	B	22	15	18	B	B	B	B	B	B	15	15	15	12	17	12	14		
6		13	14	16	B	16	13	15	30	22	17	12	28	B	60	18	15	10	12	16	30	12	13	25	13		
7		17	15	28	B	13	14	12	14	12	62	B	B	25	21	16	16	12	19	14	18	11	13	10	19		
8		10	10	10	11	E S	9	14	10	10	14	16	17	13	11	11	12	15	11	11	11	12	11	12	15	15	
9		25	20	20	B	28	20	14	10	14	12	14	26	25	17	19	12	11	10	12	11	11	10	12	11		
10		10	14	12	16	15	13	12	12	18	16	16	15	16	14	14	12	20	13	11	10	12	12	29	10		
11		16	14	12	13	14	12	11	15	14	11	12	16	12	15	14	20	16	16	12	12	15	24	14	11		
12		8	9	B	10	14	12	12	9	11	10	10	12	10	15	13	18	19	14	15	11	12	21	11	10		
13		11	9	B	15	13	12	11	12	9	11	12	15	12	19	18	15	12	19	12	10	11	10	11	12		
14		12	B	15	10	10	10	11	16	32	11	18	11	10	10	11	11	12	18	33	11	11	10	15	15		
15		9	11	10	10	10	B	14	11	14	14	15	B	16	B	18	21	13	10	14	31	10	12	10	15		
16		13	10	11	11	13	11	12	12	12	13	16	11	30	23	28	21	18	17	12	12	11	11	11	13		
17		9	9	18	16	10	9	12	12	14	14	14	22	18	15	12	14	16	13	11	11	11	10	9	10		
18		18	12	10	9	10	12	10	10	9	11	29	16	19	12	11	16	14	12	10	12	11	12	11	10	B	
19		9	9	9	10	11	B	B	15	18	B	15	15	13	18	13	21	25	15	10	10	10	9	7	B		
20		10	7	14	29	B	B	B	B	B	B	B	B	B	B	B	B	B	16	15	30	13	15	15	12		
21		26	22	16	12	16	12	B	16	B	B	B	B	11	20	12	14	10	11	16	12	14	15	15	12		
22		14	12	9	10	11	12	15	11	26	15	15	15	16	14	20	12	12	10	12	9	15	11	10	13		
23		14	14	14	12	12	16	14	20	27	B	B	B	13	B	17	18	15	11	10	12	12	11	14	15	B	
24		10	9	33	11	16	12	10	17	19	15	13	14	B	B	B	B	19	B	12	B	10	12	15	B		
25		12	8	9	10	15	B	B	25	11	17	12	13	18	18	29	25	16	21	B	14	10	12	15	26		
26		B	10	10	36	10	16	B	19	14	10	28	B	13	54	B	B	B	13	15	12	12	25	11	29		
27		19	20	14	11	15	14	10	20	B	B	B	B	B	B	18	B	B	B	12	9	14	11	13	20		
28		11	10	B	26	29	16	B	B	B	B	B	B	B	B	B	B	B	B	34	12	10	12	16	11		
29		16	16	17	11	11	B	B	14	32	15	12	12	55	B	B	B	B	B	B	15	12	10	12	10		
30		B	29	28	B	13	B	B	B	16	B	B	B	18	56	B	54	34	B	B	B	16	14	12	16	25	
31		B	46	10	B	B	B	B	20	26	B	B	B	16	13	B	16	15	55	B	56	34	B	29	25	18	10
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT		31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
MED		14	13	14	12	14	14	15	15	18	16	17	22	24	21	18	21	18	16	14	12	12	12	13	13		
U Q		19	20	28	29	26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	33	16	13	15	15	19	
L Q		10	10	10	11	11	12	12	12	14	12	14	14	13	15	14	15	12	12	12	11	11	11	11	11		

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2002 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

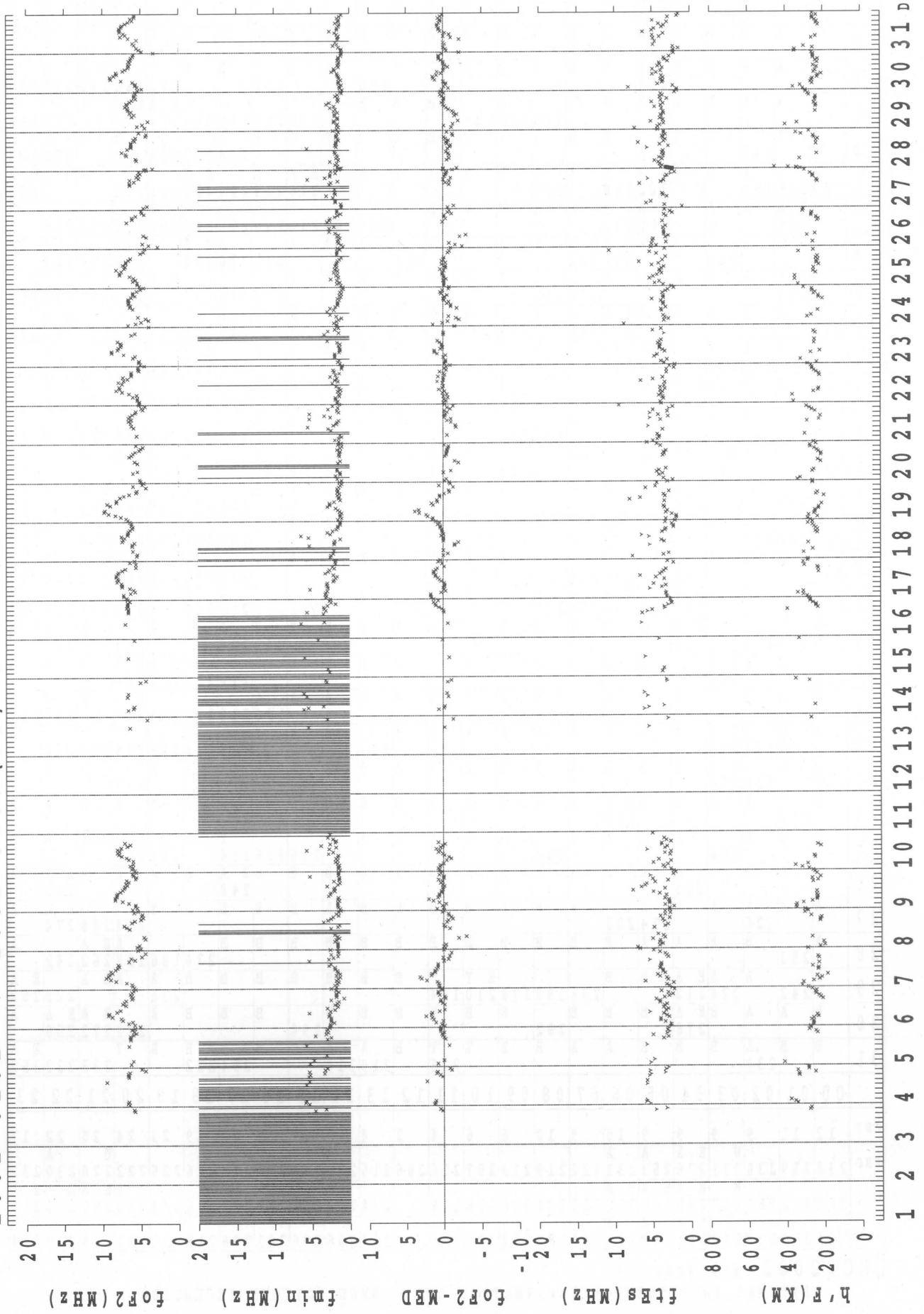
LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
1	A	A	B	A	A	E	A	B	B	B	B	A	B	B	B	B	B	B	B	A	270	A	E	A	A							
2	A	A	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	E	B	A	A	A							
3	A	A	A	A	B	A	A	B	A	B	Y	Y	Y	Y	196	B	B	196	B	B	208	184	E	B	A							
4	A	A	A	A	A	B	A	Y	228	208	226	B	B	B	A	200	212	200	218	E	A	E	A	A								
5	B	A	210	A	A	260	B	B	A	Y	Y	B	B	B	B	B	B	208	222	204	A	A	A	A								
6	A	A	A	B	A	E	A	A	A	A	A	Y	B	A	Y	E	A	A	214	E	Y	212	230	A	A							
7	A	E	A	A	B	A	E	A	A	A	B	B	B	Y	226	206	216	204	202	208	222	208	212	206	A							
8	A	A	A	214	A	A	E	A	E	A	A	A	A	216	A	A	A	216	220	216	A	A	248	194	224							
9	A	E	A	A	B	A	A	Y	222	222	Y	Y	Y	A	A	A	A	198	194	194	E	A	E	A	E							
10	A	A	A	A	A	A	E	A	A	Y	Y	Y	Y	A	Y	A	Y	Y	A	E	A	216	216	228	246							
11	A	A	A	A	260	252	238	Y	Y	Y	206	A	A	A	A	A	A	A	222	222	222	240	234	248	222							
12	220	A	B	A	E	A	A	254	212	190	218	204	A	A	A	A	A	A	206	220	238	208	240	240	240							
13	244	236	B	A	A	A	A	A	192	202	216	A	A	A	A	A	A	A	200	238	244	208	210	220	224							
14	200	B	A	E	A	A	A	A	A	A	218	220	A	B	A	A	218	206	220	206	A	A	A	A	Q							
15	Q	232	230	A	A	E	A	B	A	A	A	A	B	A	B	A	A	A	216	234	220	248	260	242	282							
16	280	238	226	A	A	A	A	A	236	220	206	Y	Y	Y	Y	A	A	A	228	226	226	232	230	A	E							
17	E	A	A	A	A	276	270	234	224	Y	A	A	A	A	A	A	A	Y	222	236	248	E	A	E	A							
18	262	A	A	A	E	A	A	E	A	A	A	Y	A	A	A	A	196	220	208	246	260	252	210	220	220							
19	242	276	276	282	E	A	B	B	A	A	B	236	Y	Y	Y	Y	Y	242	224	A	Y	A	E	A	B							
20	A	A	A	E	B	B	B	B	B	B	B	B	B	B	B	B	B	B	210	270	228	236	A	A	A							
21	A	A	A	A	Y	A	B	226	B	B	B	B	A	A	A	A	A	196	218	232	236	E	A	A	230	224						
22	A	Q	Q	E	A	A	A	A	A	A	A	A	A	A	Y	Y	Y	Y	216	228	228	226	246	240	A							
23	A	A	220	E	A	A	A	A	A	B	B	B	B	A	B	A	A	A	A	A	A	A	192	A	Y	A						
24	A	196	A	A	A	A	E	A	A	Y	Y	Y	Y	B	B	B	B	210	Y	B	A	B	A	A	A	B						
25	A	A	A	208	A	B	B	A	232	A	A	A	A	A	Y	196	206	234	Y	B	224	216	A	A	A							
26	B	A	A	A	E	A	A	B	A	A	A	B	Y	B	B	B	B	E	A	A	A	A	A	E	A							
27	A	A	A	A	A	A	214	202	A	B	B	B	B	B	B	A	B	B	B	B	A	Y	214	244	E	A						
28	A	252	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	236	186	198	262	242	A						
29	A	242	A	A	E	A	B	B	204	188	178	E	Y	B	B	B	B	B	B	B	B	A	A	E	A	E						
30	B	A	A	B	E	A	B	B	B	B	Y	B	B	B	B	B	B	B	B	B	B	A	228	272	258	A						
31	B	B	A	B	B	B	A	A	B	B	Y	Y	B	A	A	B	B	E	B	E	B	B	Y	238	222	E	A					
			230									216			210	210			294	222												
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
CNT		12	11	9	9	9	10	9	10	6	6	4	2	4	3	7	12	22	19	23	24	20	22	17								
MED		238	239	230	U	31	E	A	276	253	231	222	219	213	207	216	206	216	210	198	211	214	226	226	222	228	230	232				
U Q		263	252	263	E	267	E	A	E	A	E	A	280	269	252	225	224	218	226	218		224	218	216	218	222	236	244	244	256	242	255
L Q		221	230	223	219	E	A	251	244	226	210	192	202	206	205		203	206	196	201	206	218	220	211	224	220	224					

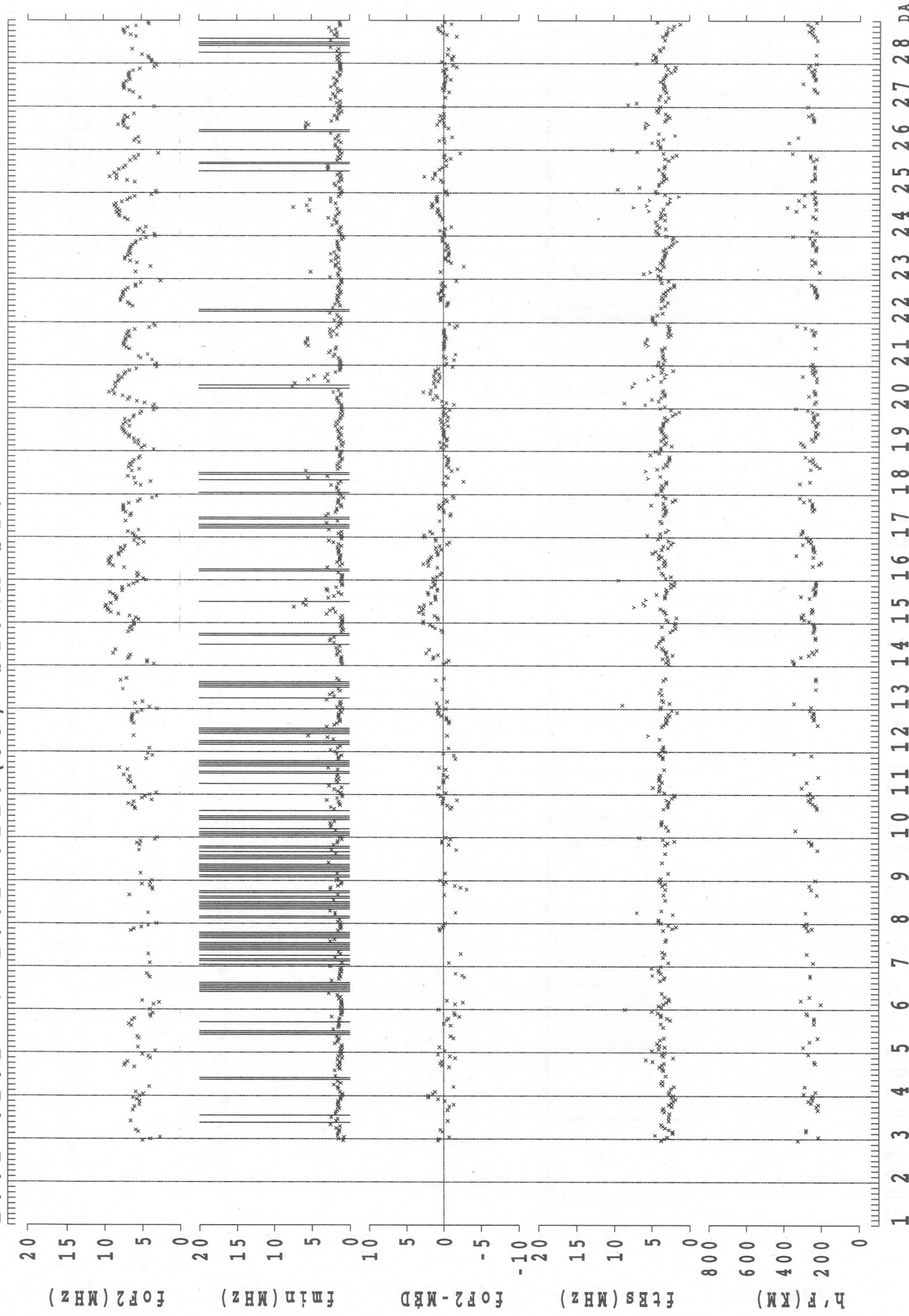
DEC. 2002 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

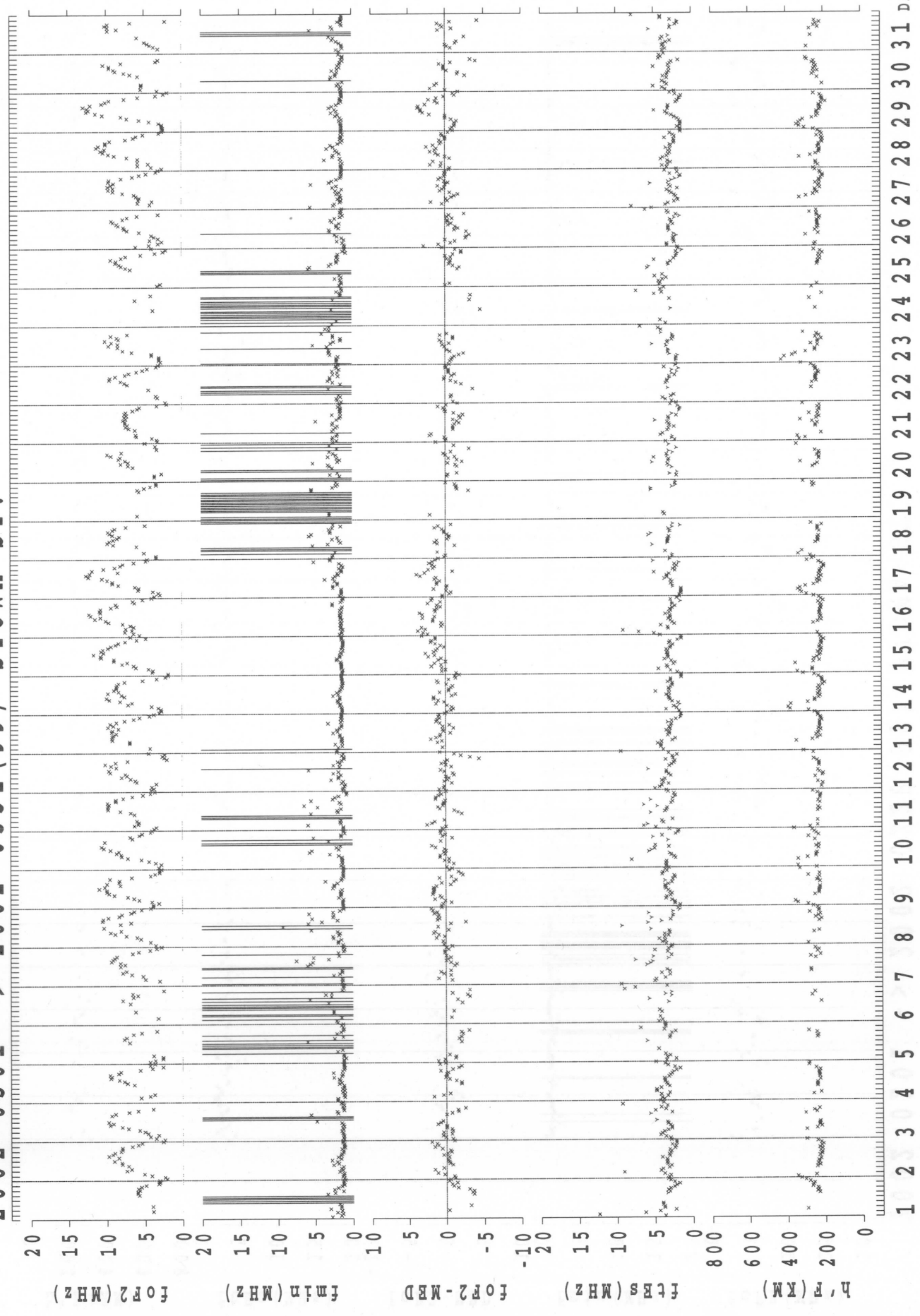
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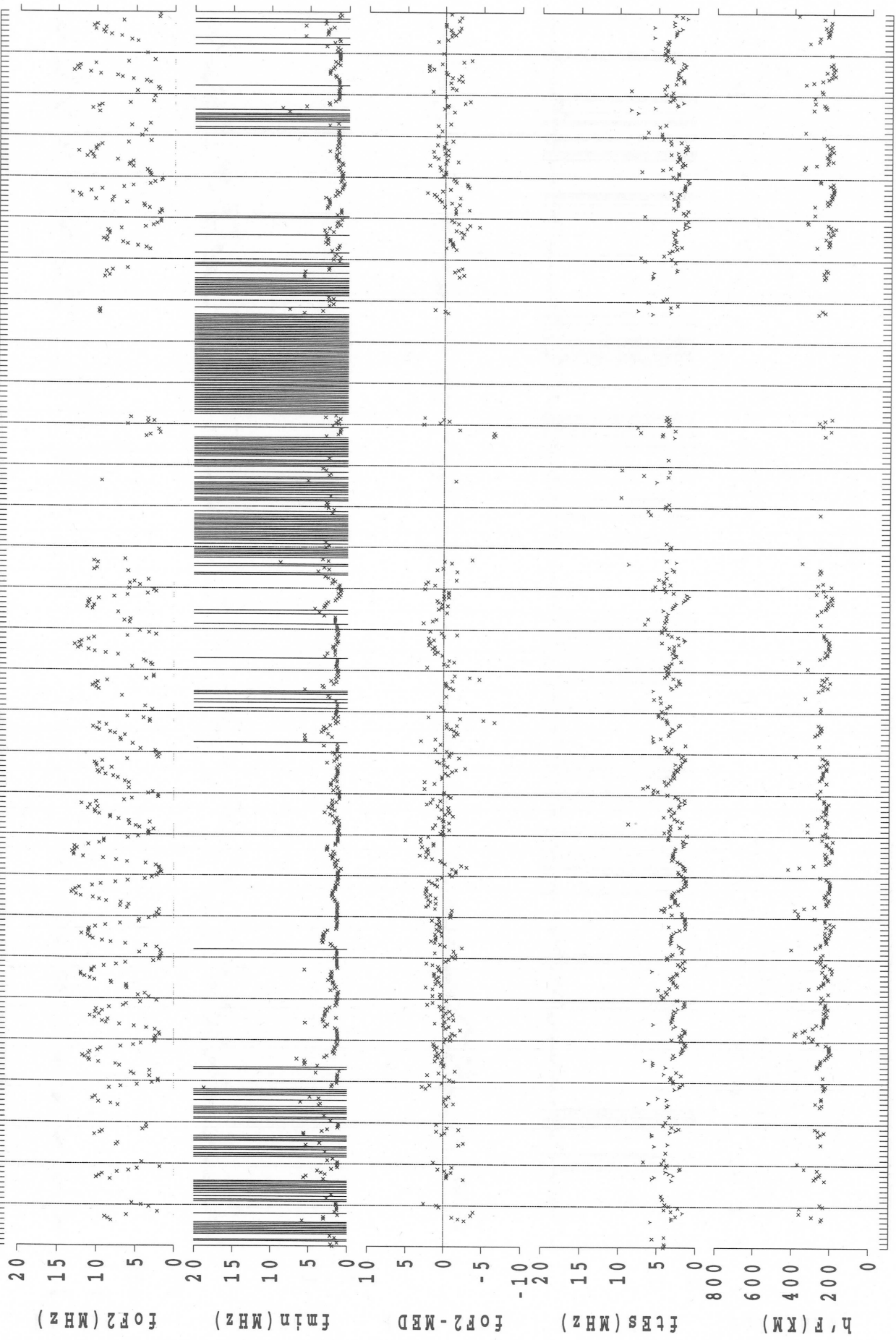


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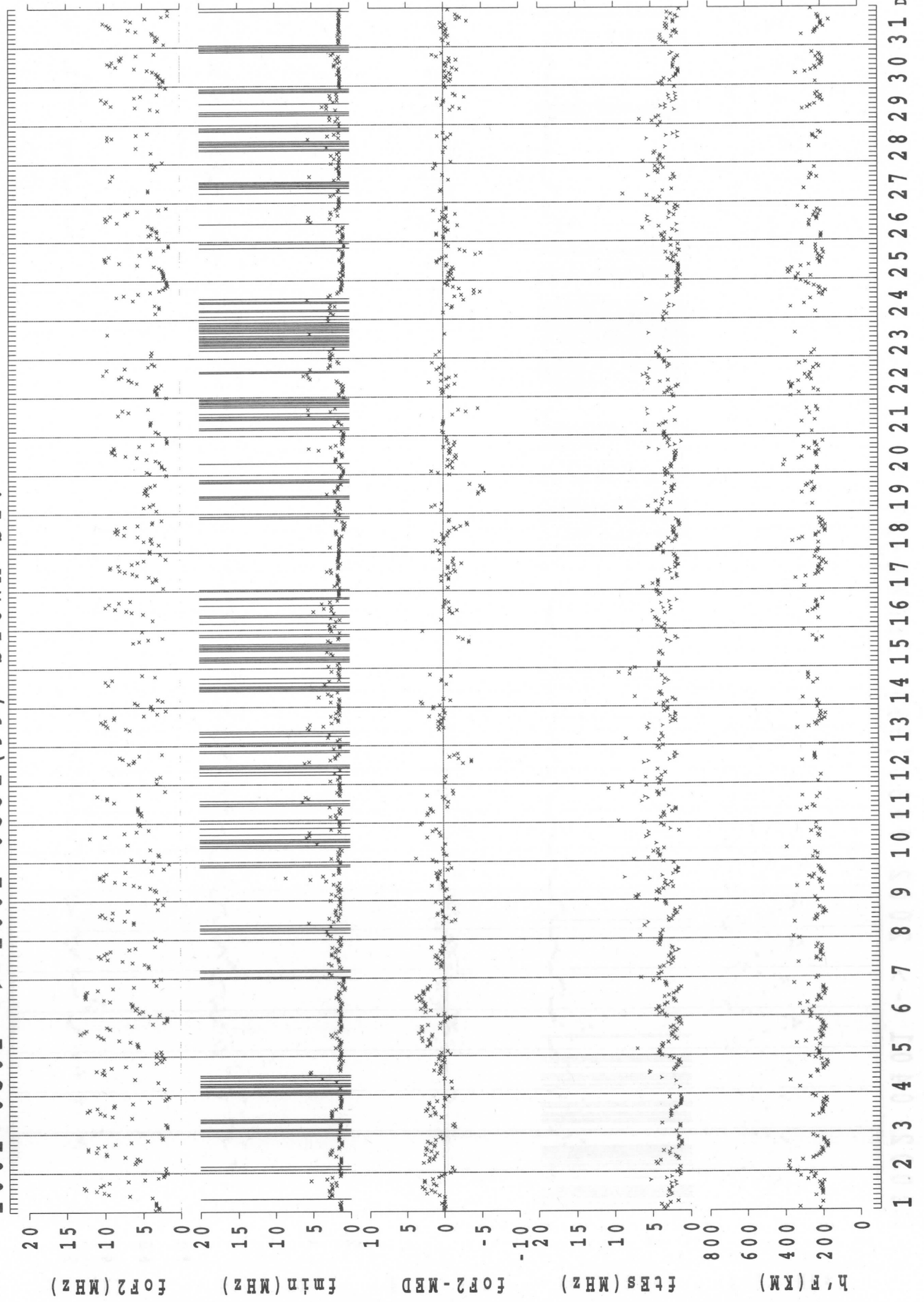


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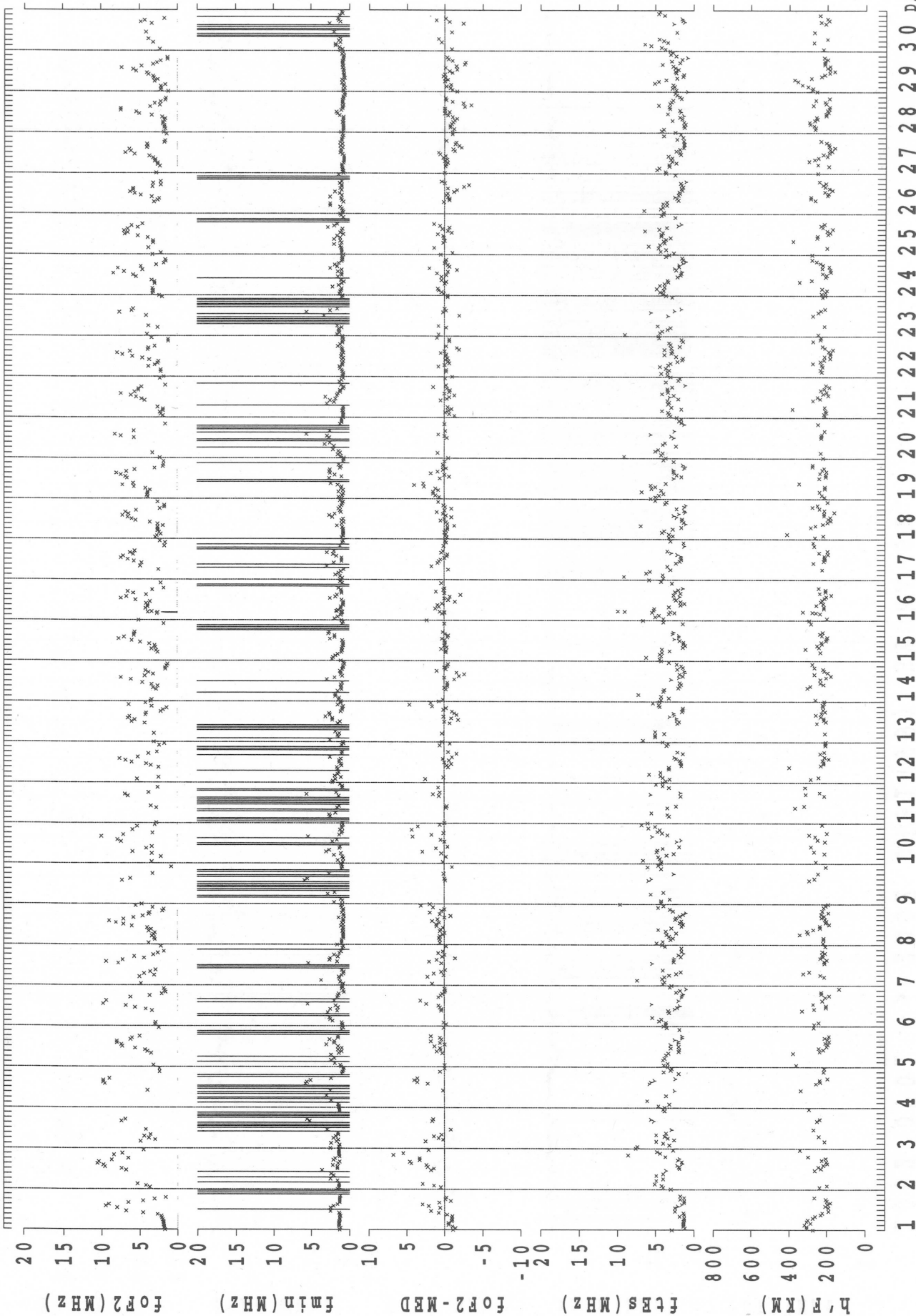


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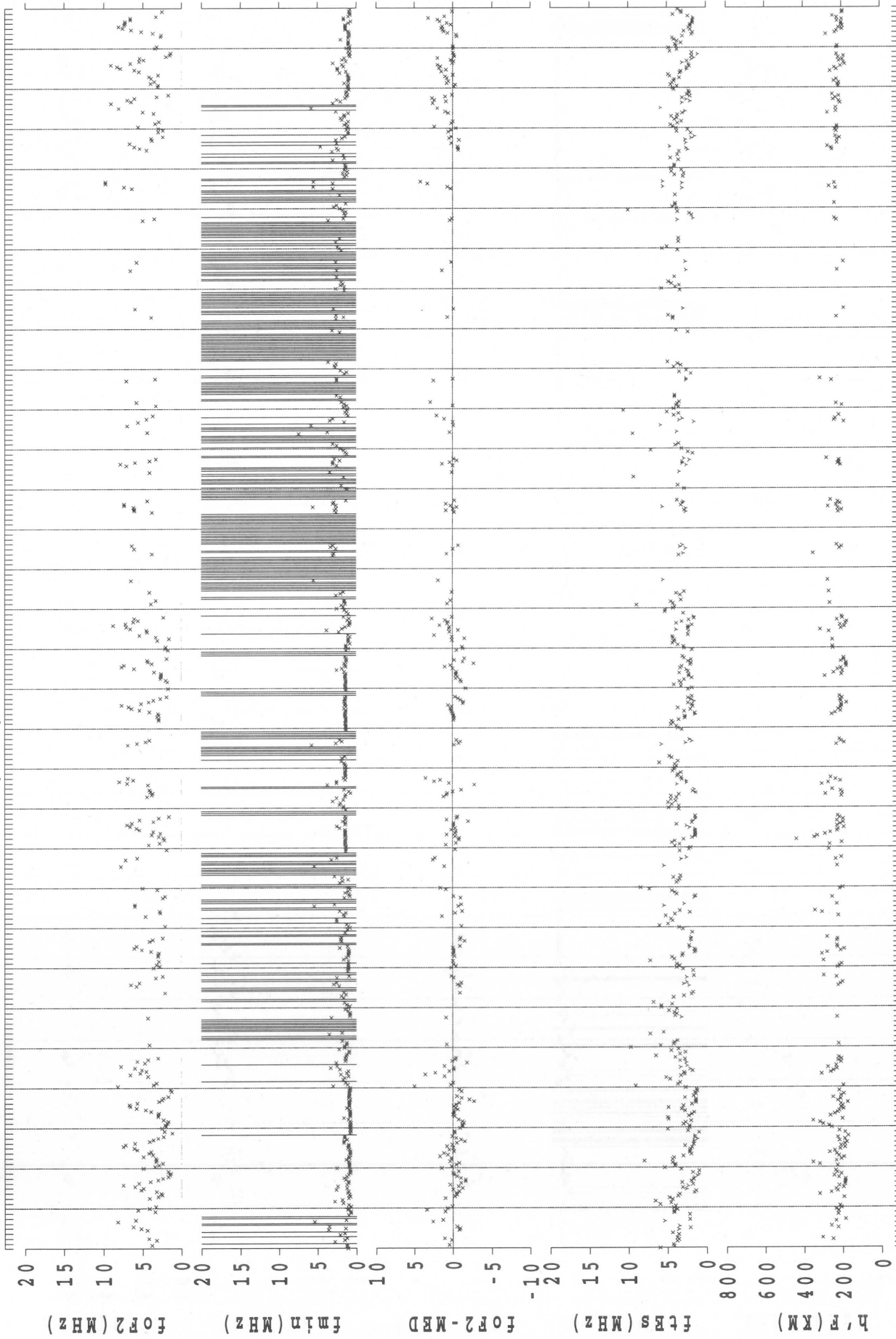


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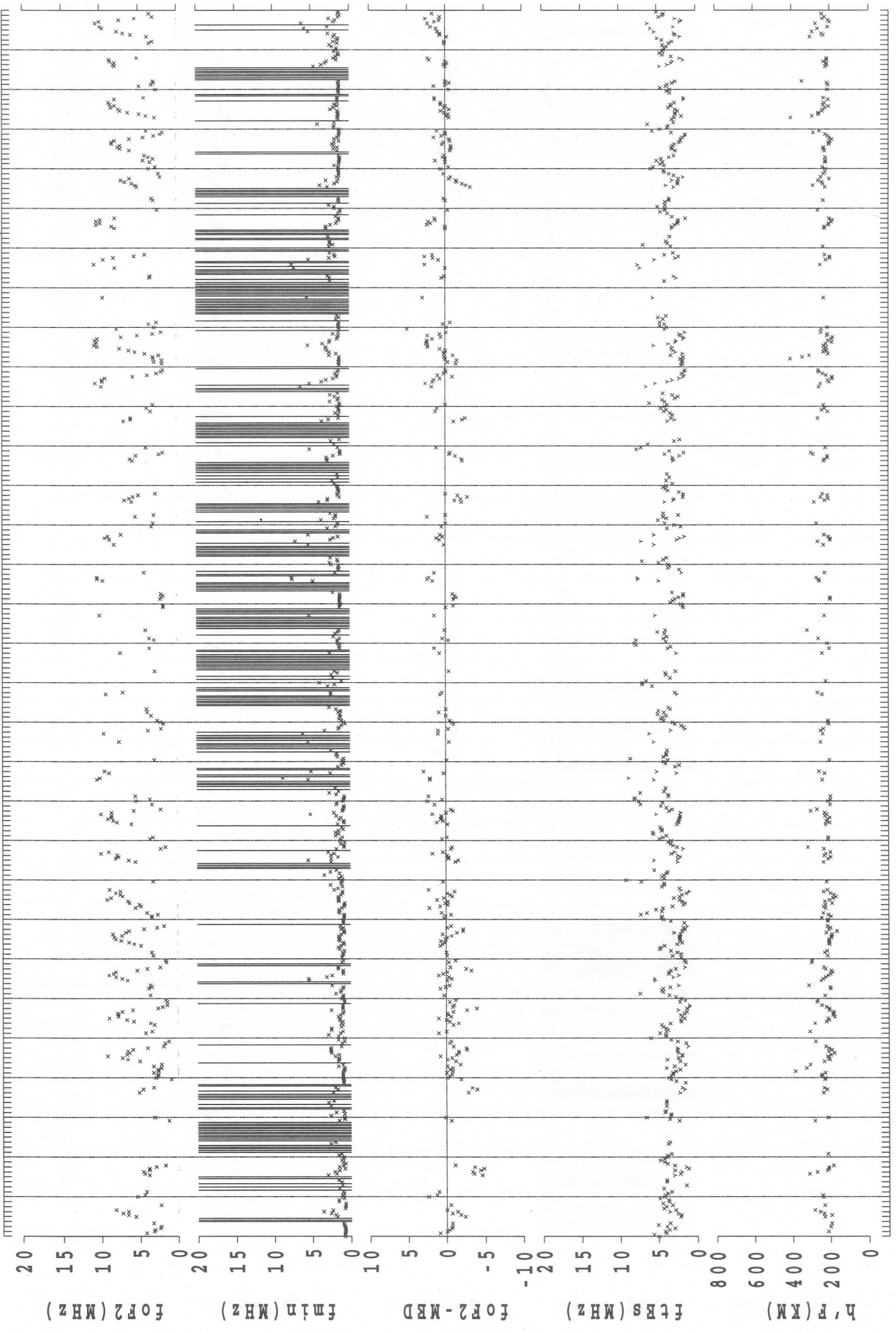


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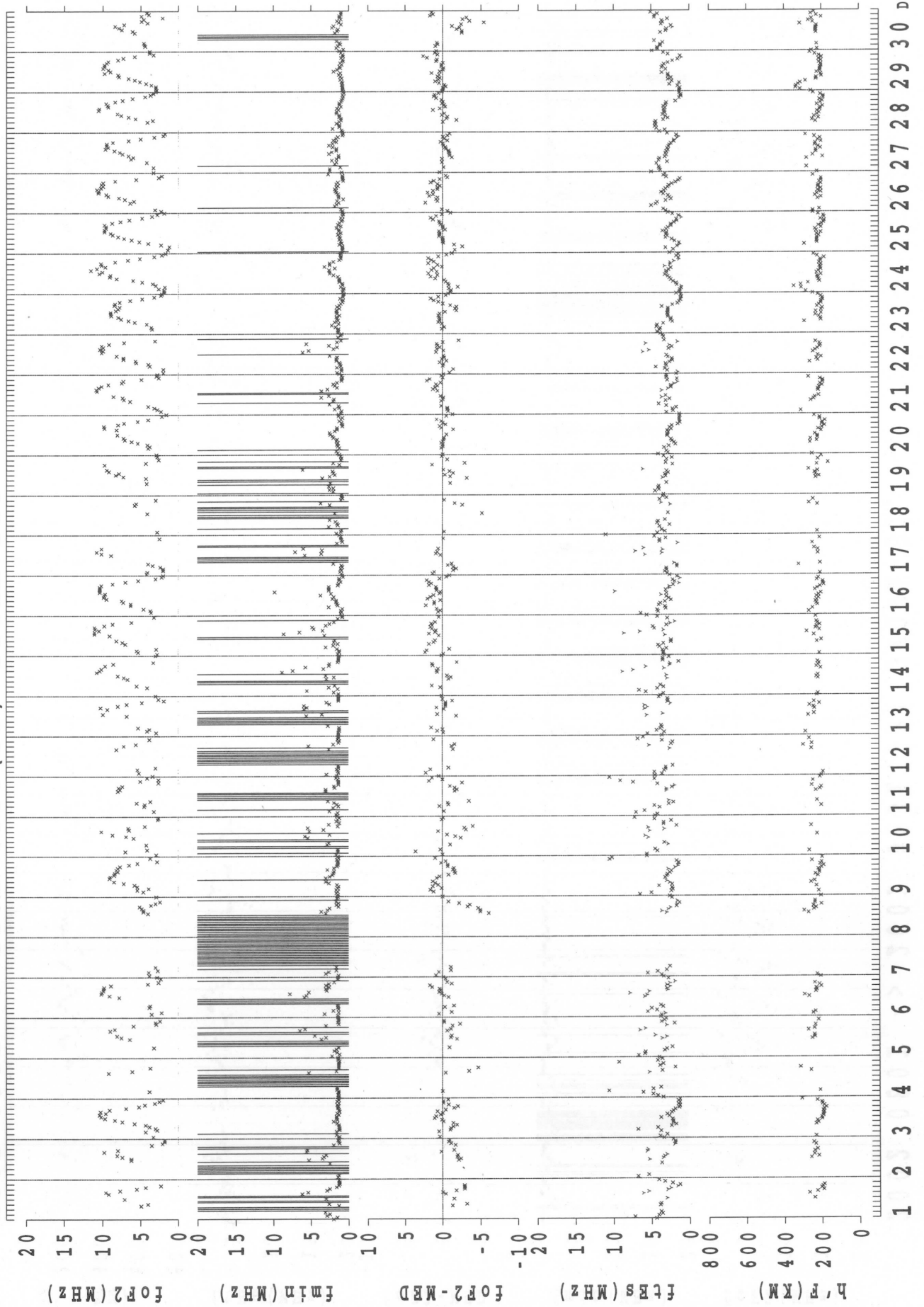


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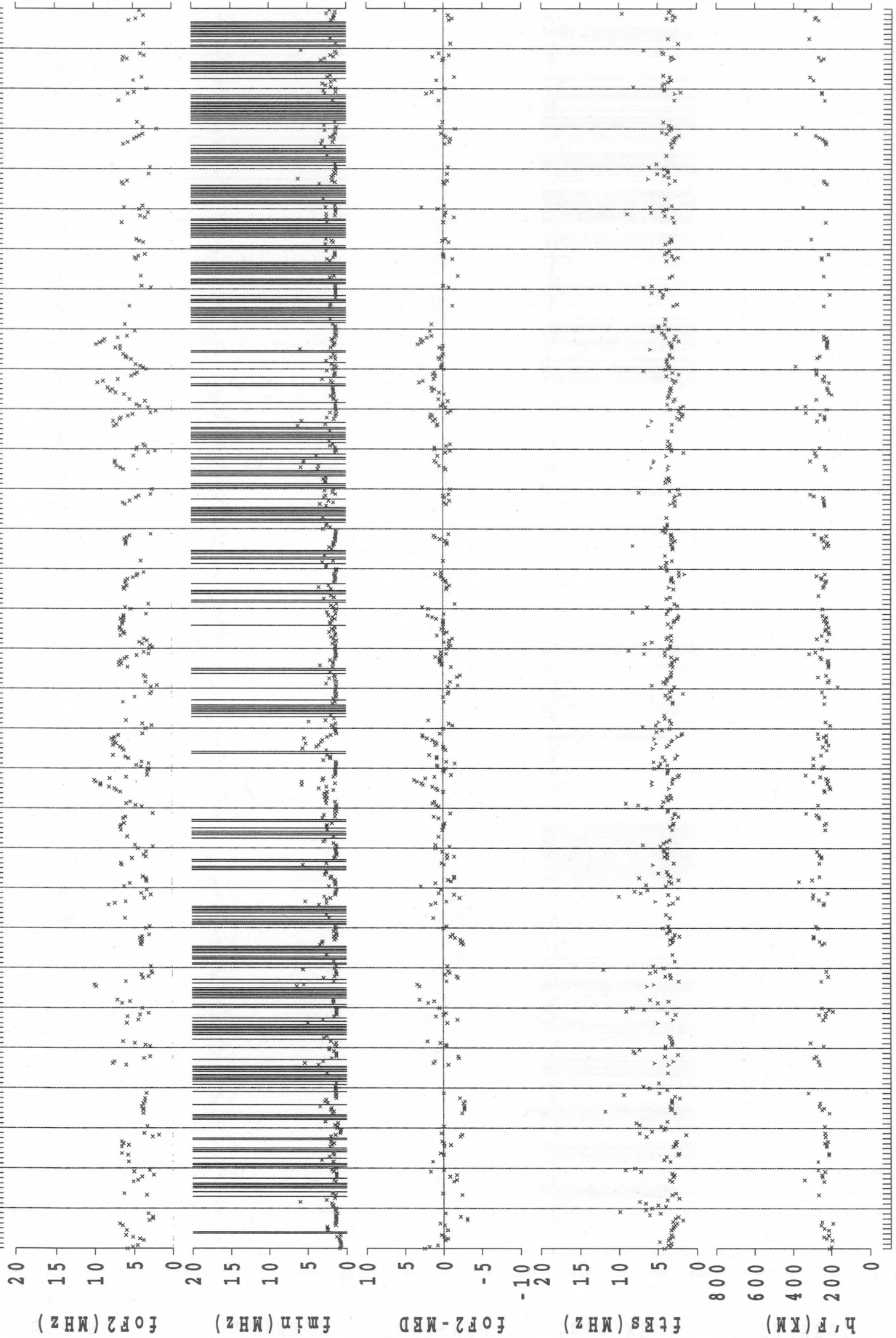


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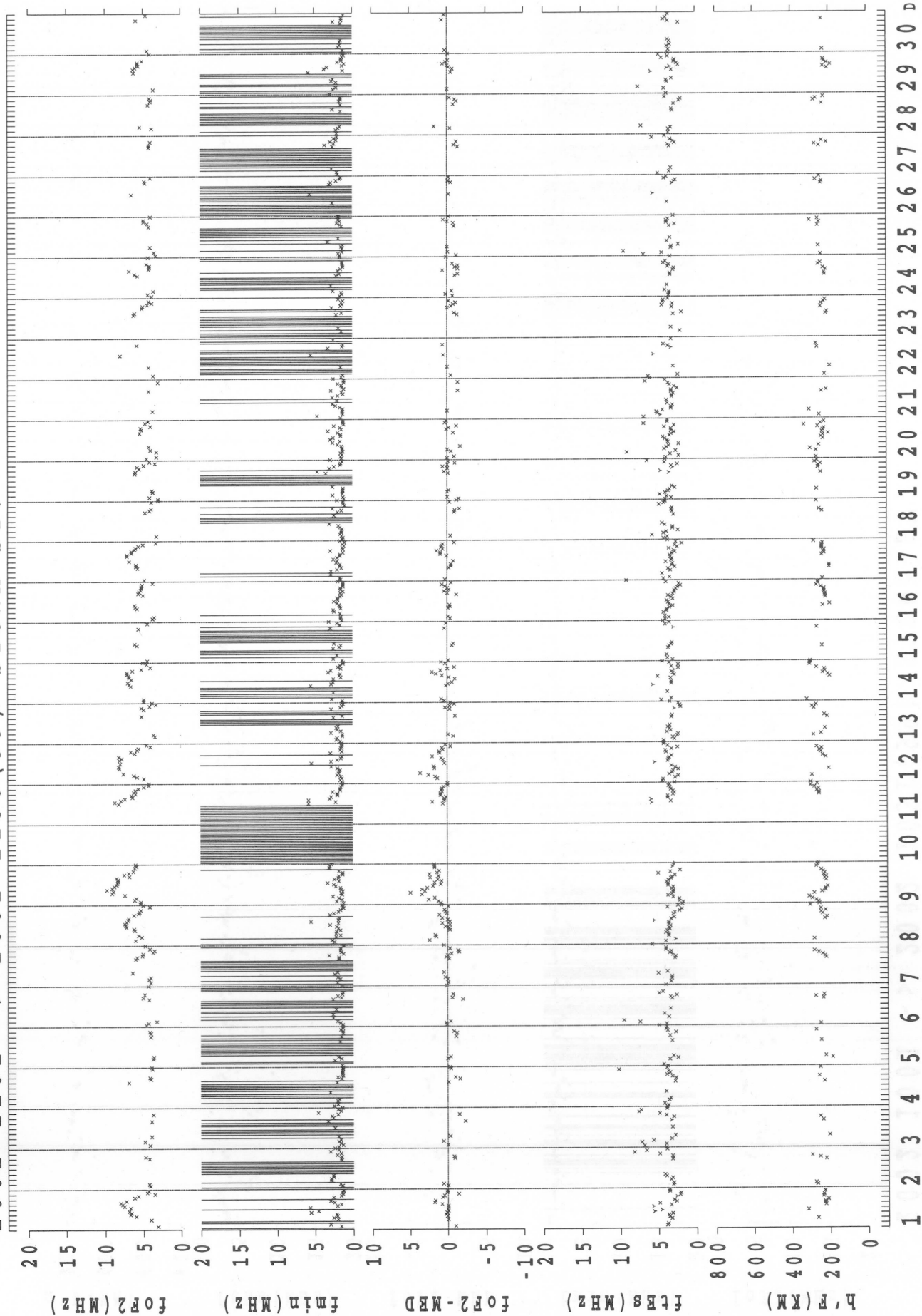


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2002 1001 -> 2002 1031 (99) SYOWA-ST.

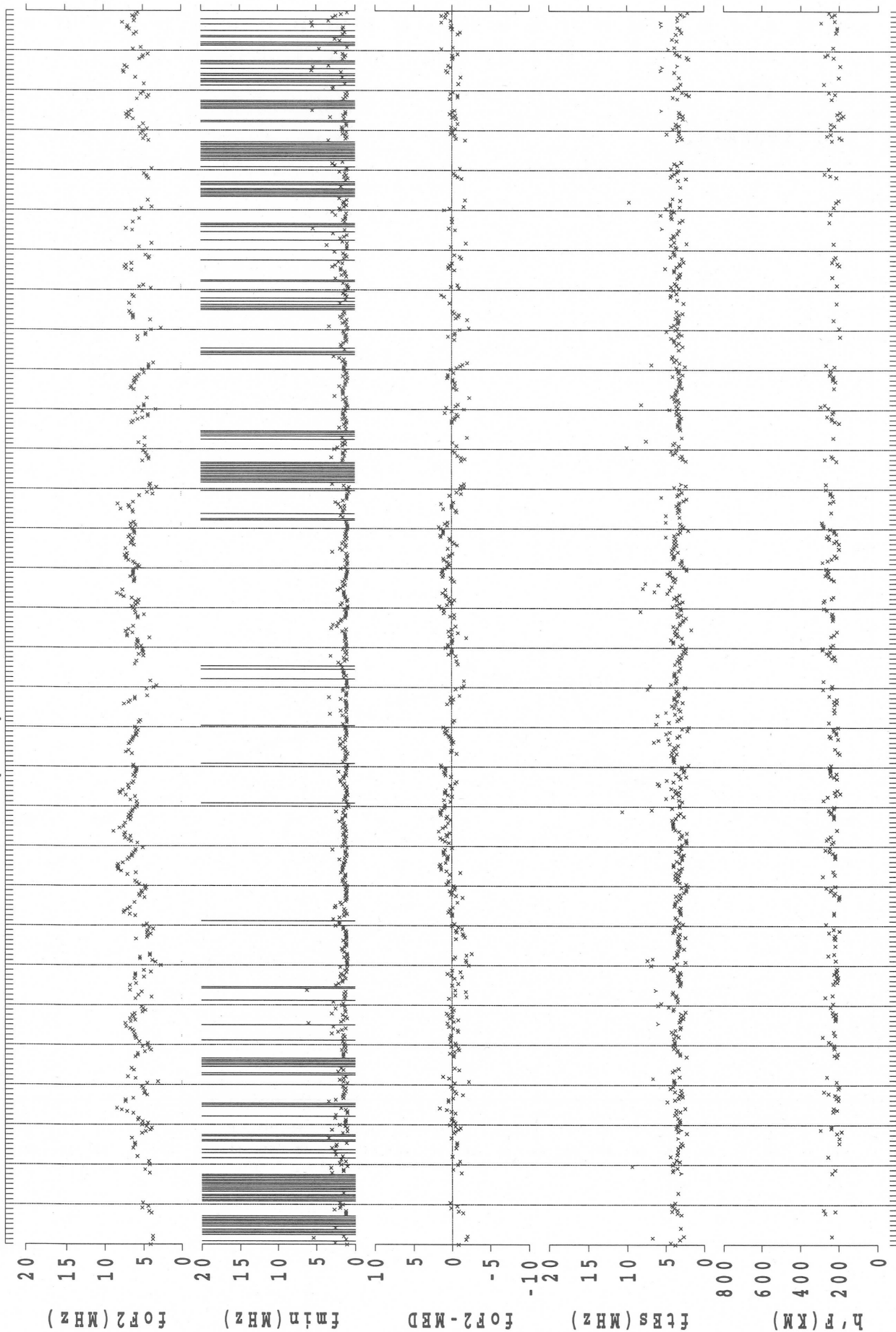


2002 1101 -> 2002 1130 (99) SYOWA-ST.



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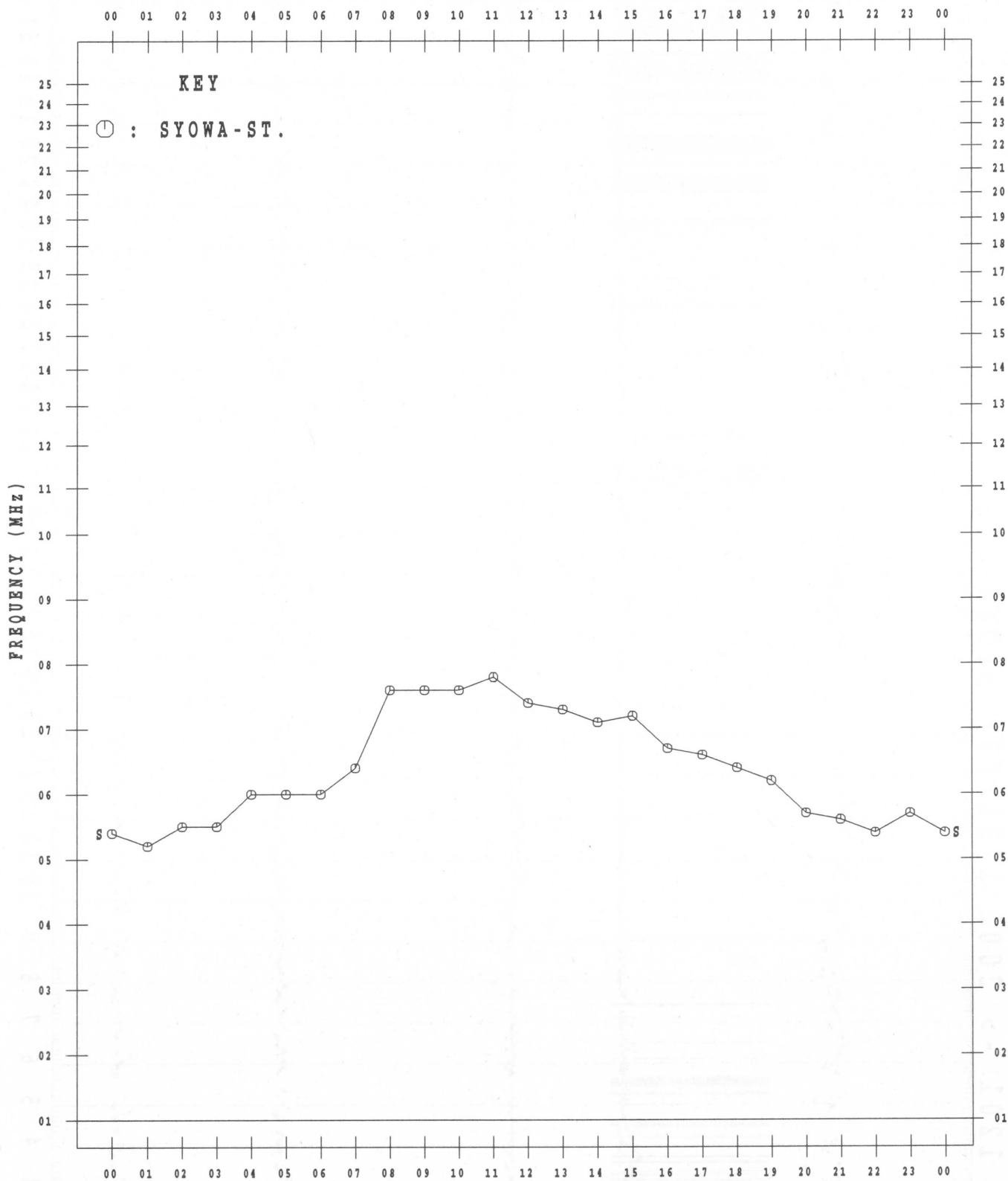
2002 1201 -> 2002 1231(99) SYOWA-ST.



MONTHLY MEDIAN VALUES OF f_oF_2

45° E MEAN TIME

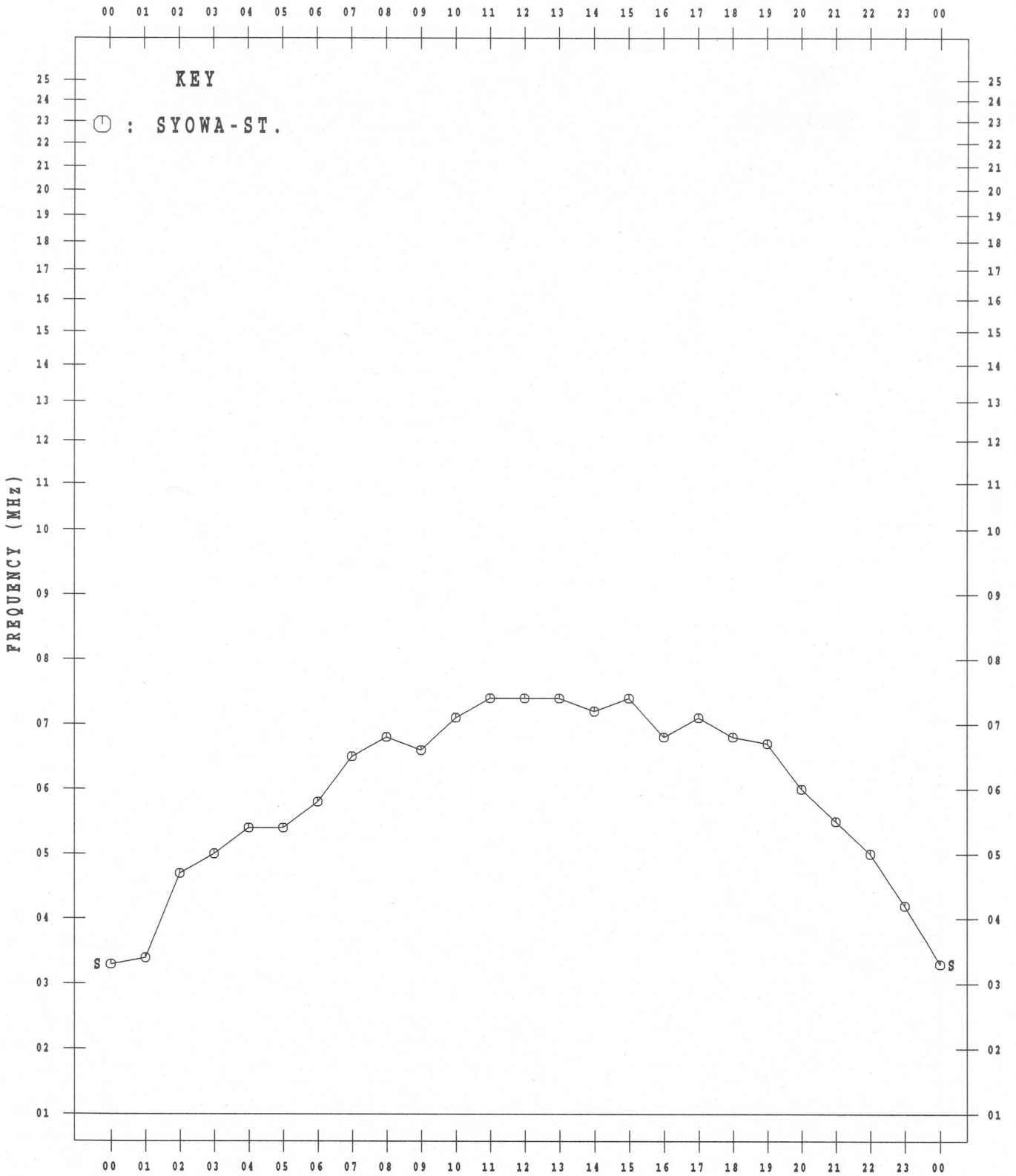
JAN. 2002



MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

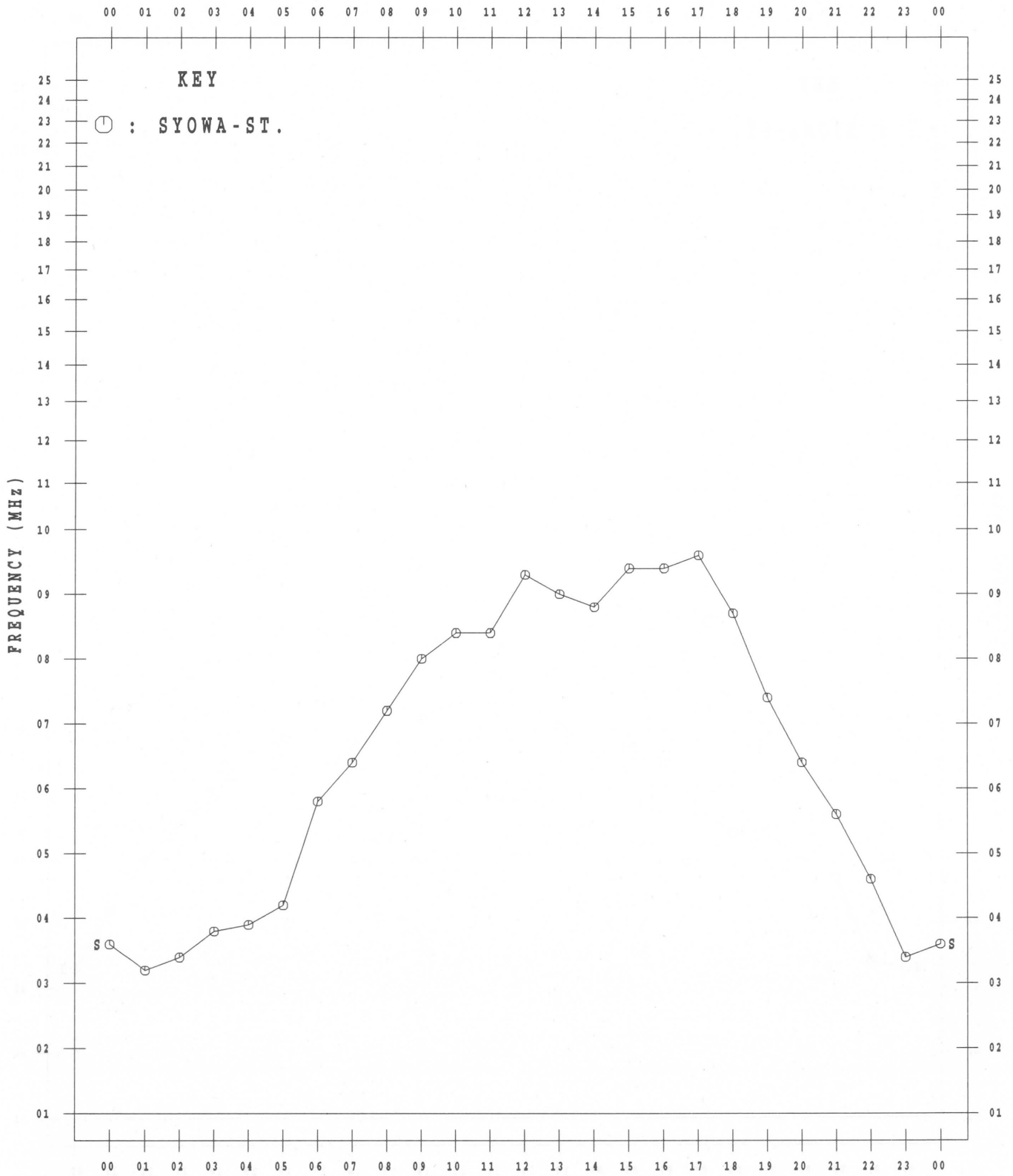
FEB. 2002



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

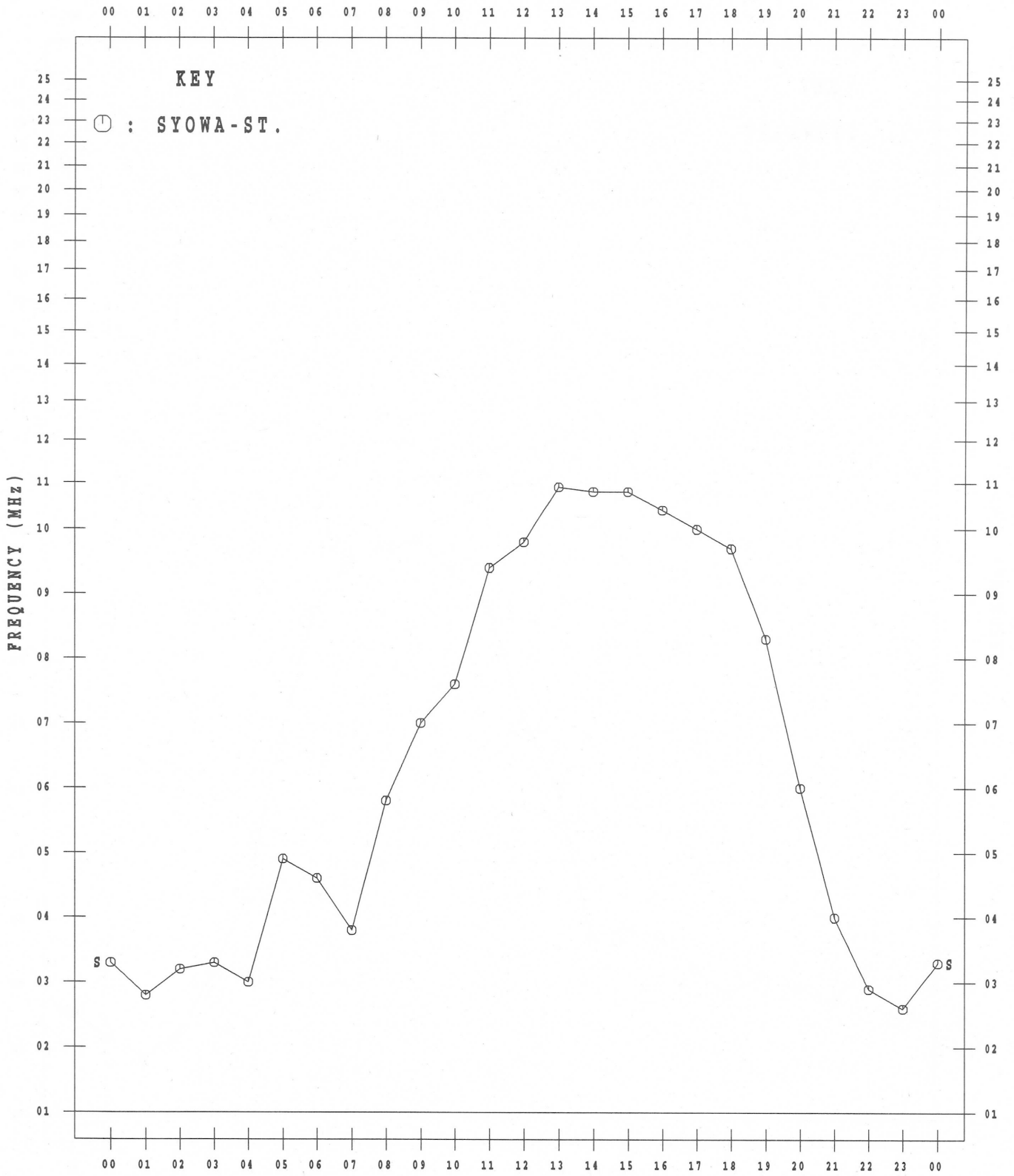
MAR. 2002



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

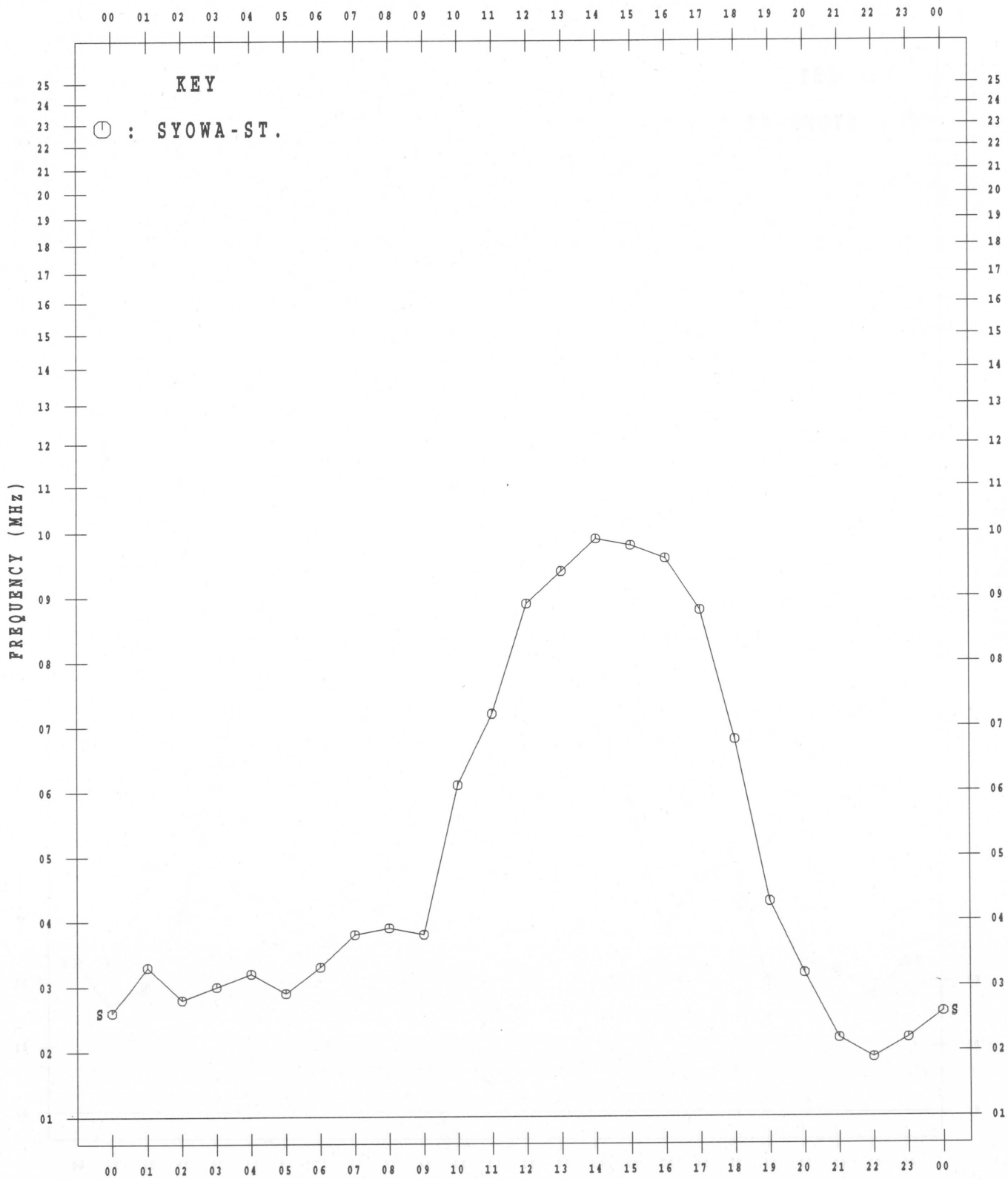
APR. 2002



MONTHLY MEDIAN VALUES OF foF2

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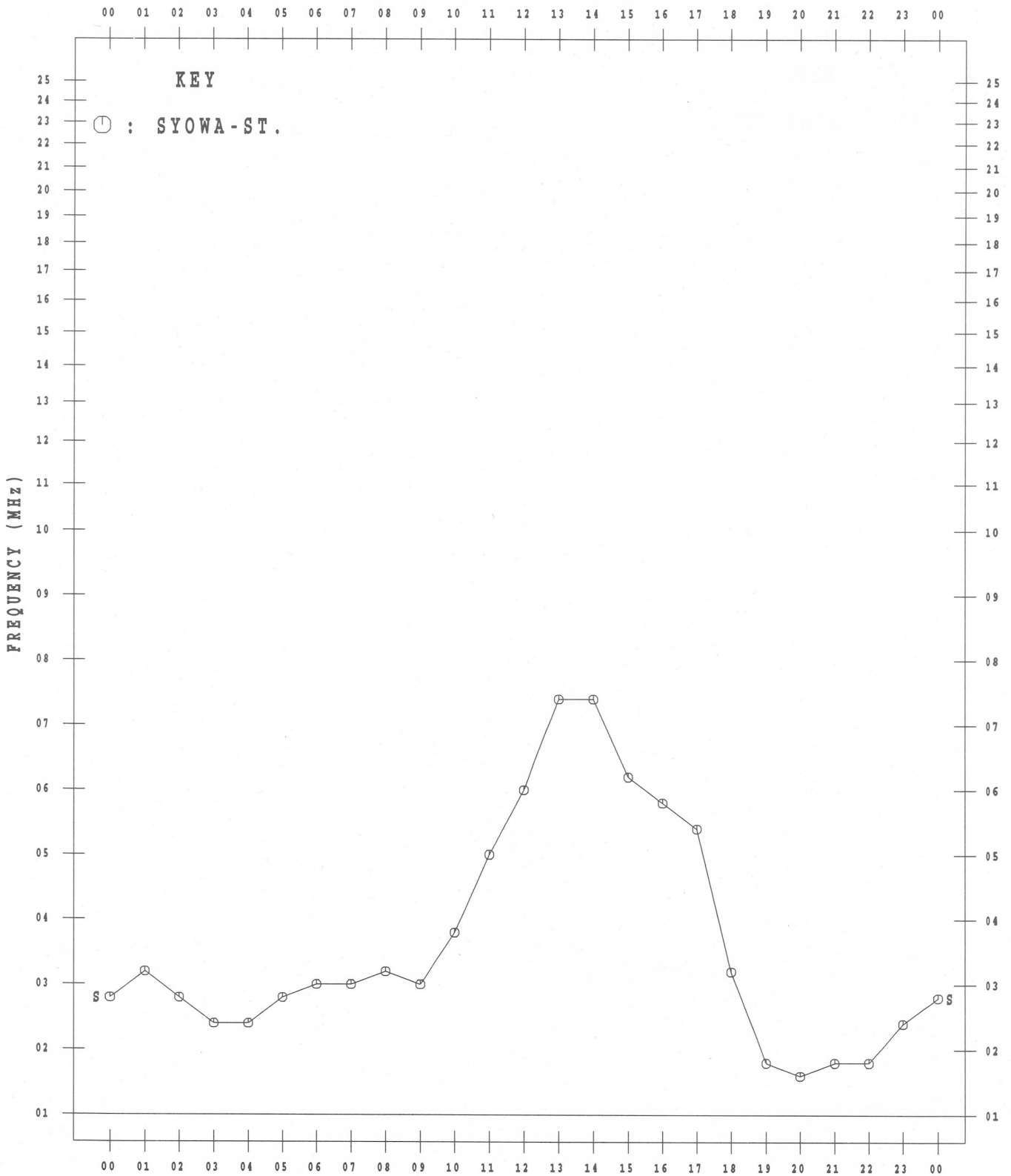
MAY 2002



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

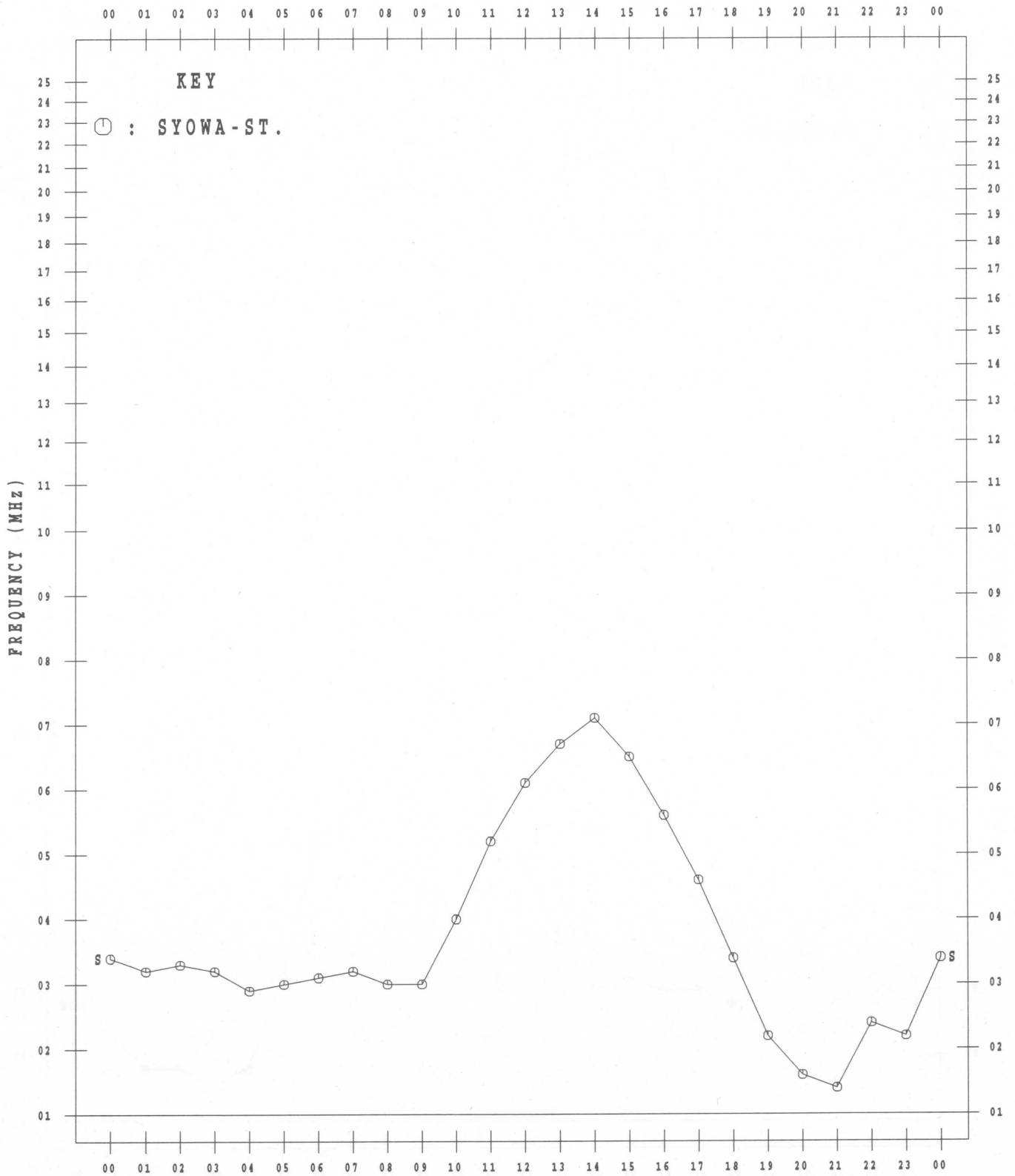
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MONTHLY MEDIAN VALUES OF foF2

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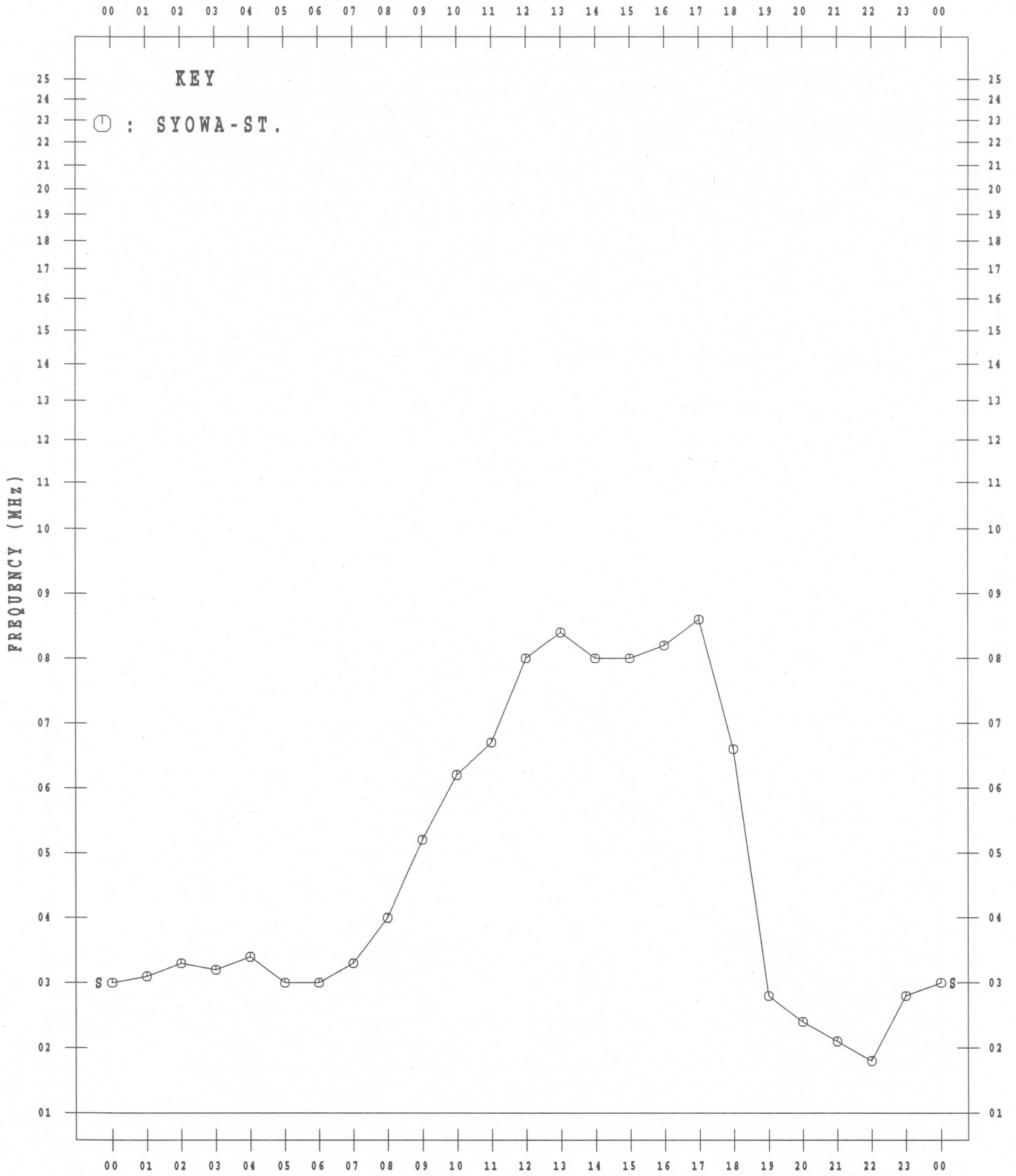
JUL. 2002



MONTHLY MEDIAN VALUES OF f_oF₂

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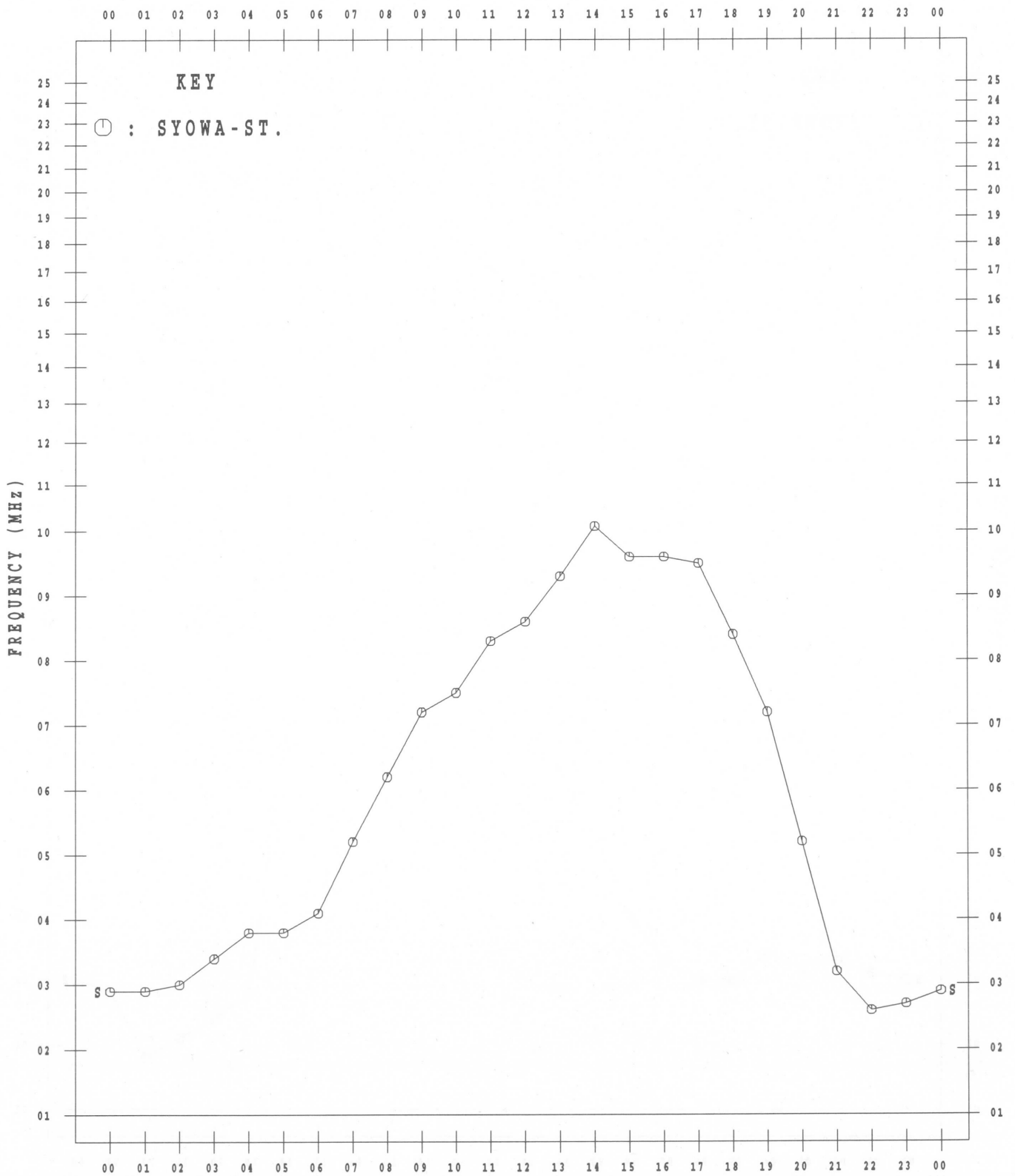
AUG. 2002



MONTHLY MEDIAN VALUES OF f_oF_2

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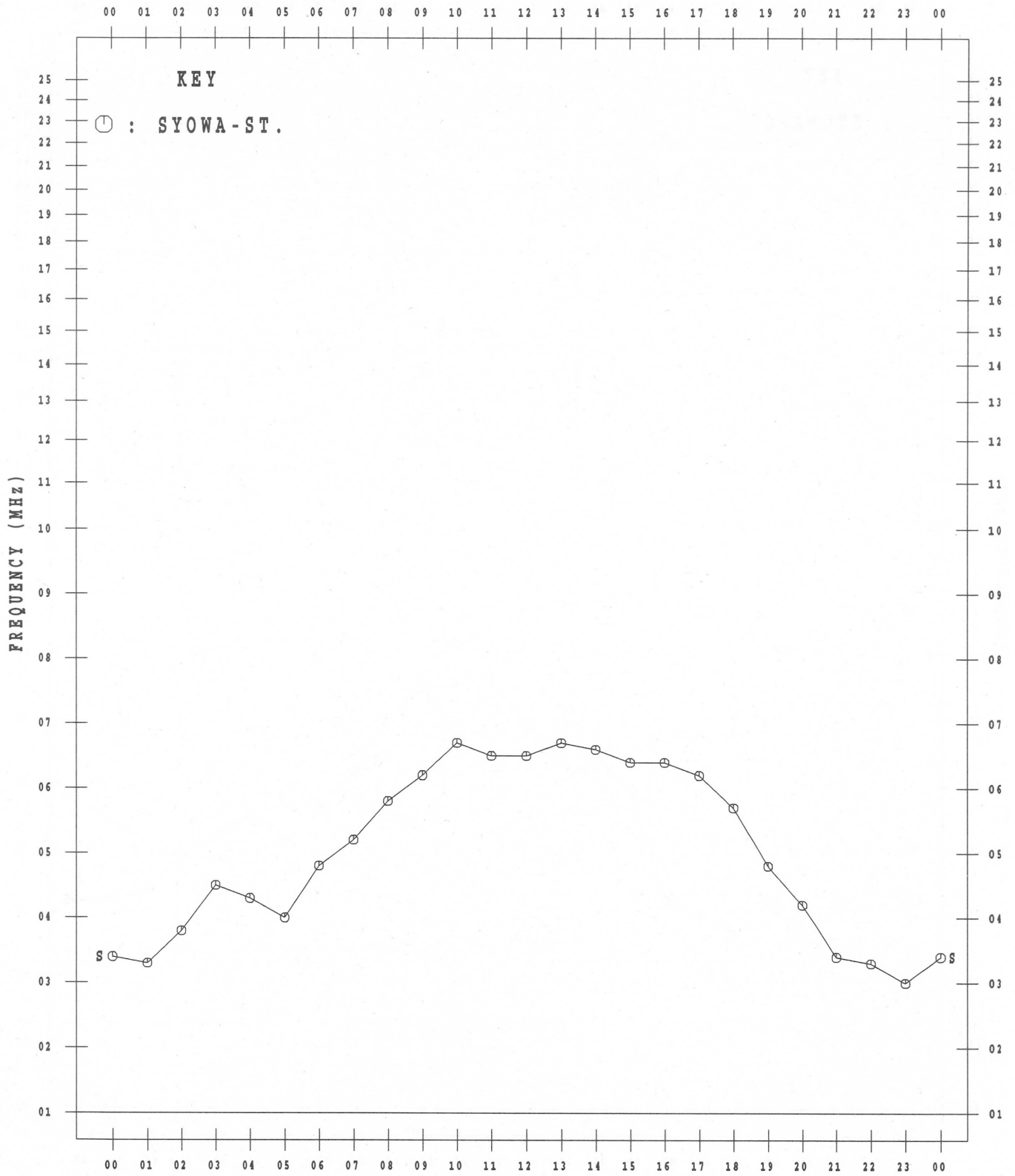
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MONTHLY MEDIAN VALUES OF foF2

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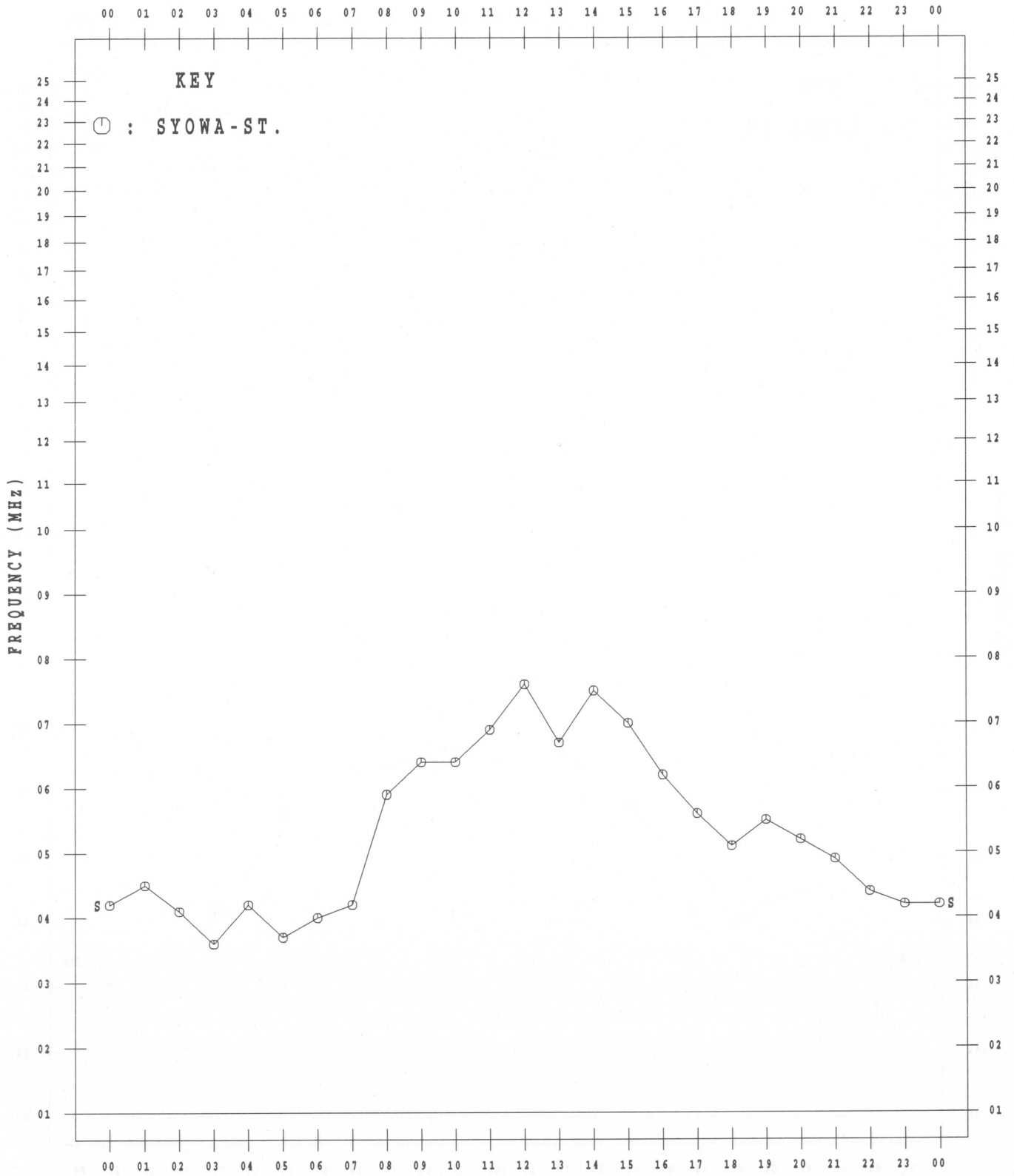
OCT. 2002



MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

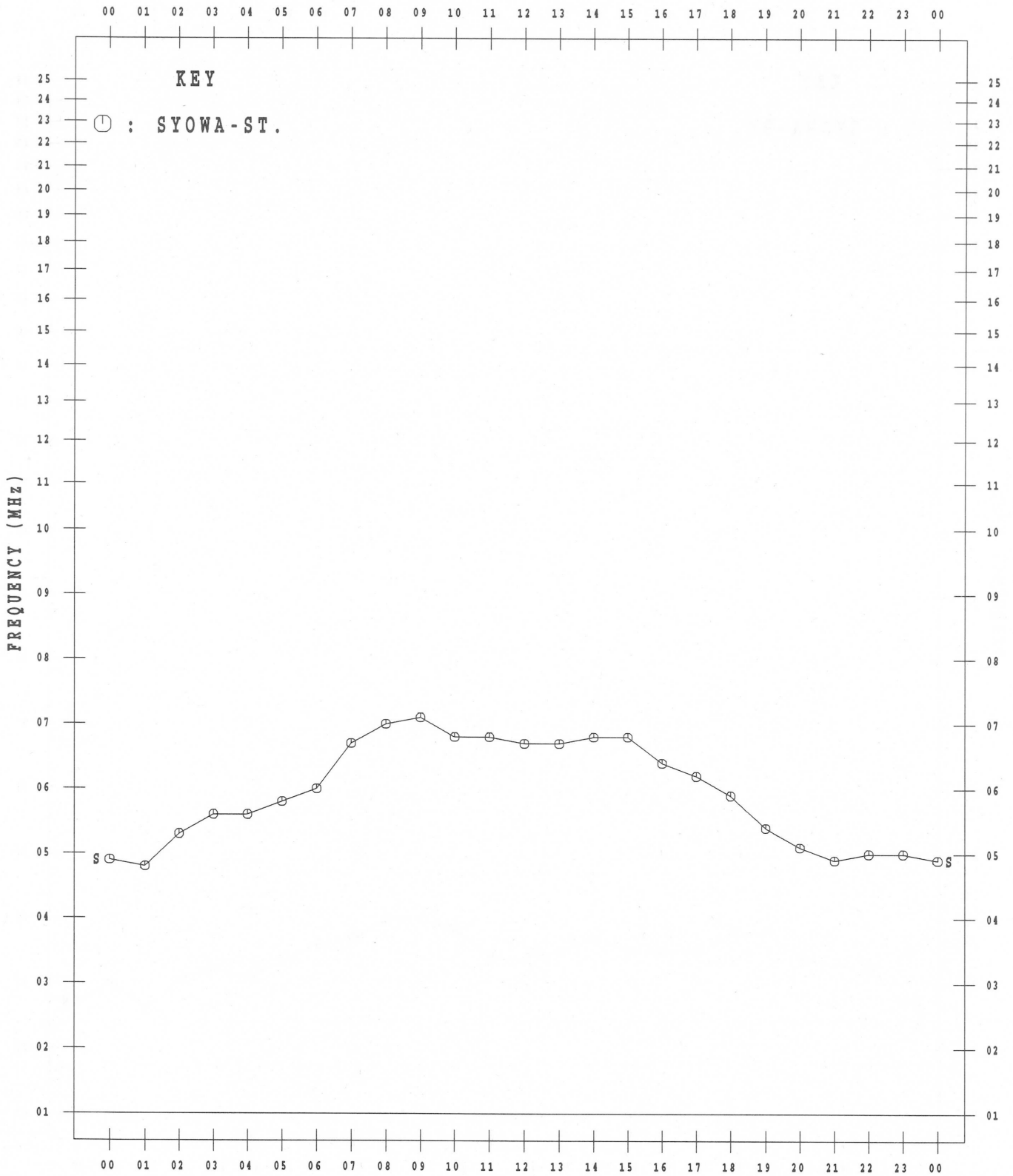
NOV. 2002



MONTHLY MEDIAN VALUES OF f_oF₂

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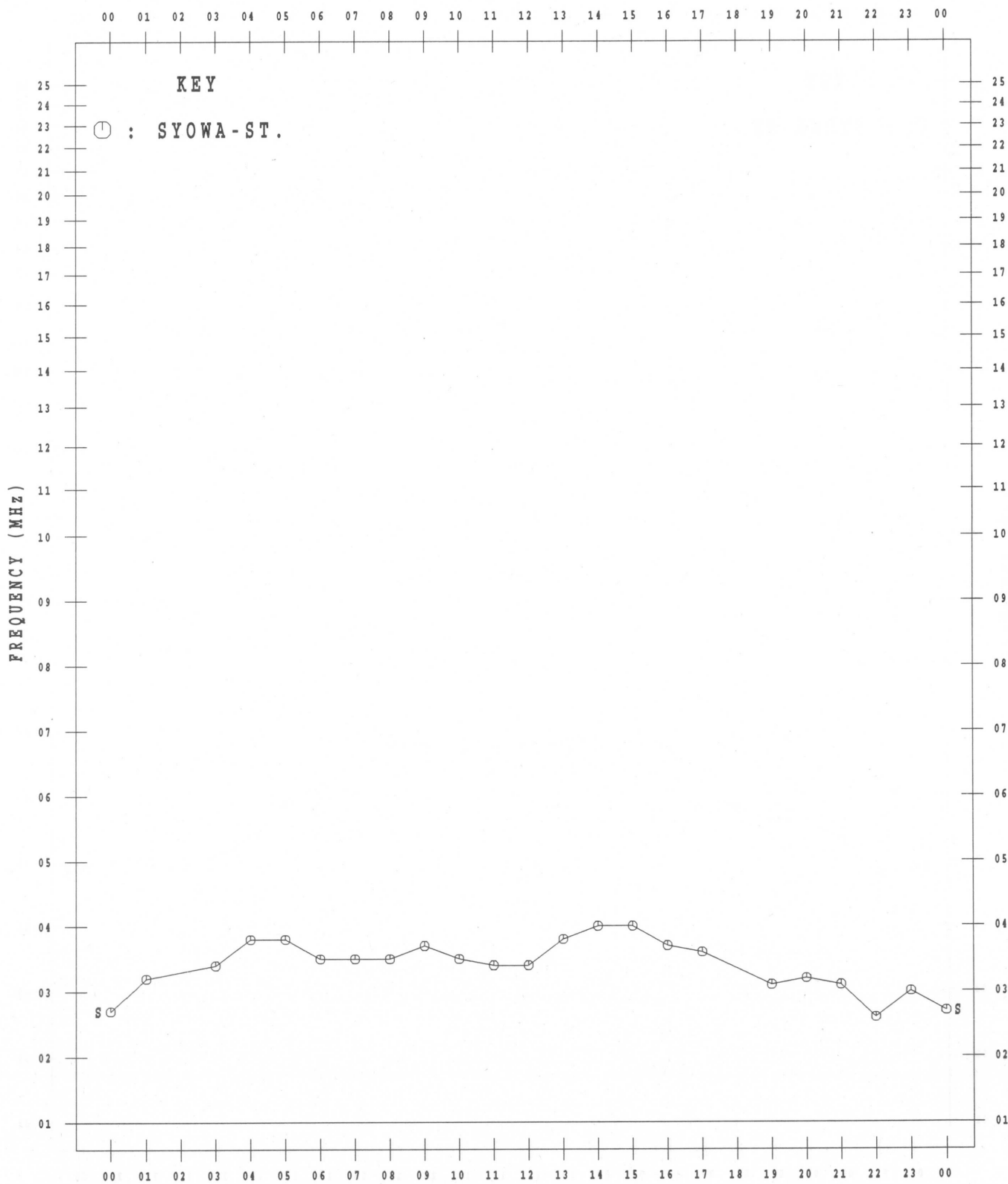
DEC. 2002



MONTHLY MEDIAN VALUES OF f_tE_s

45° E MEAN TIME

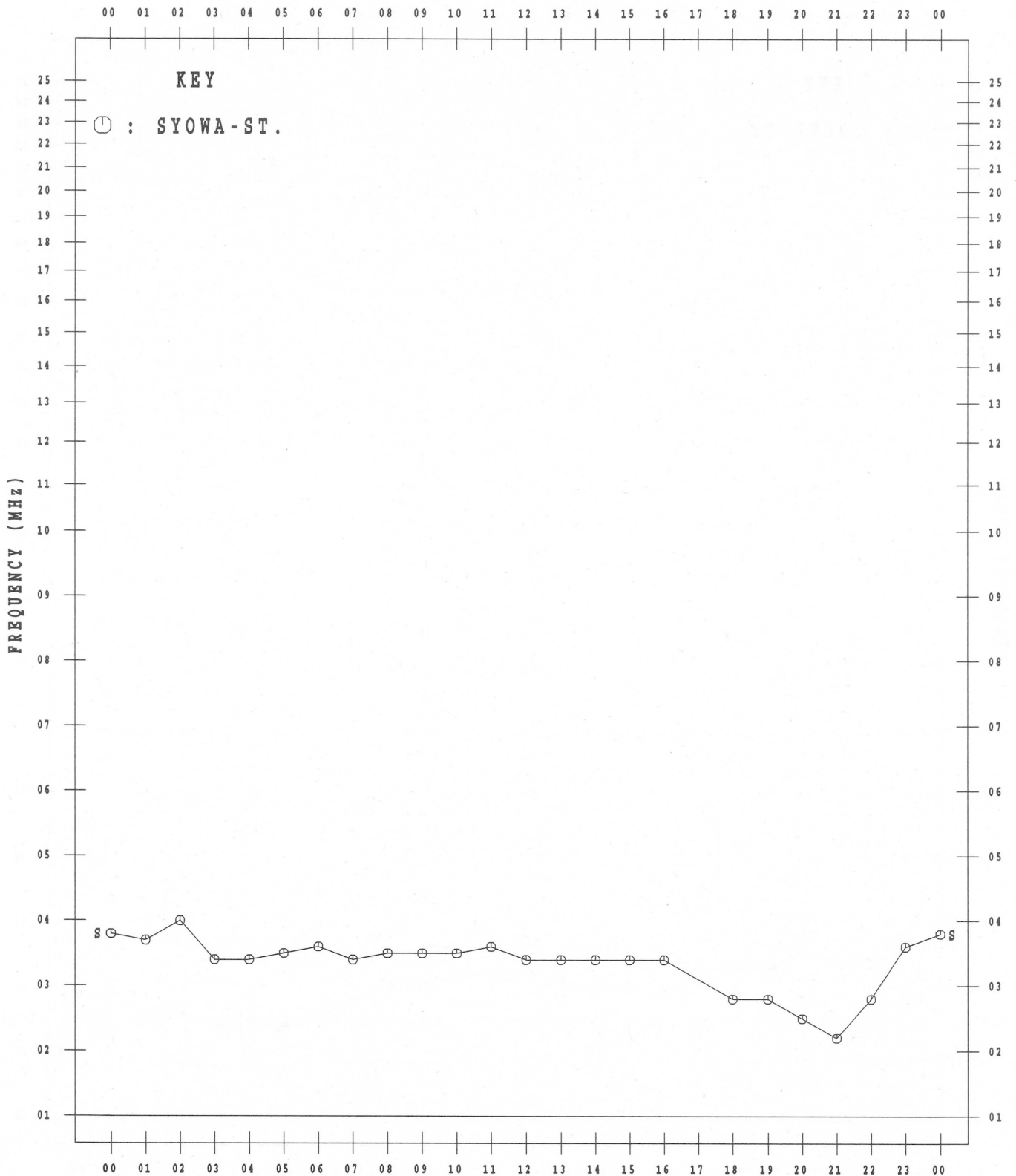
JAN. 2002



MONTHLY MEDIAN VALUES OF fteS

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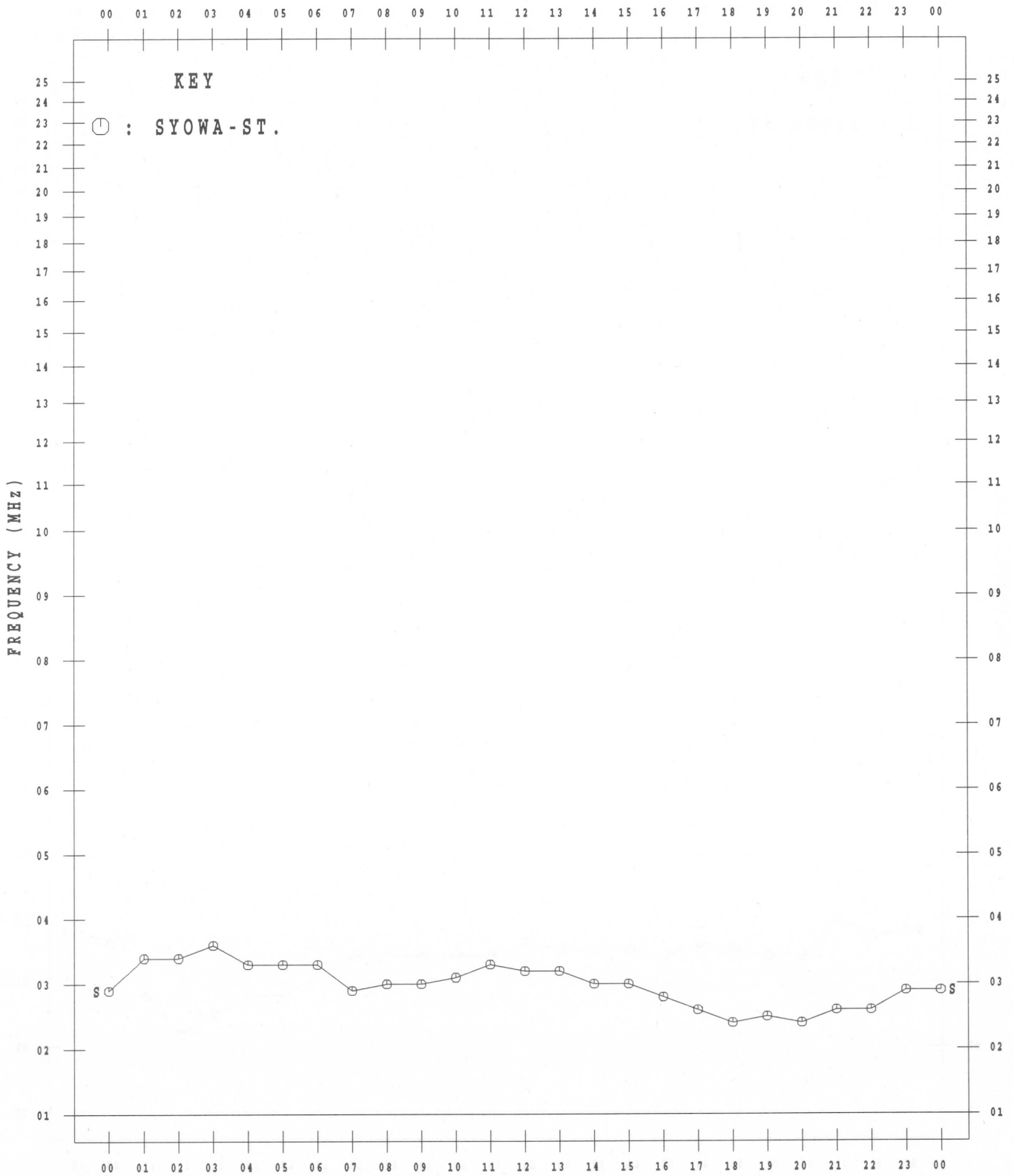
FEB. 2002



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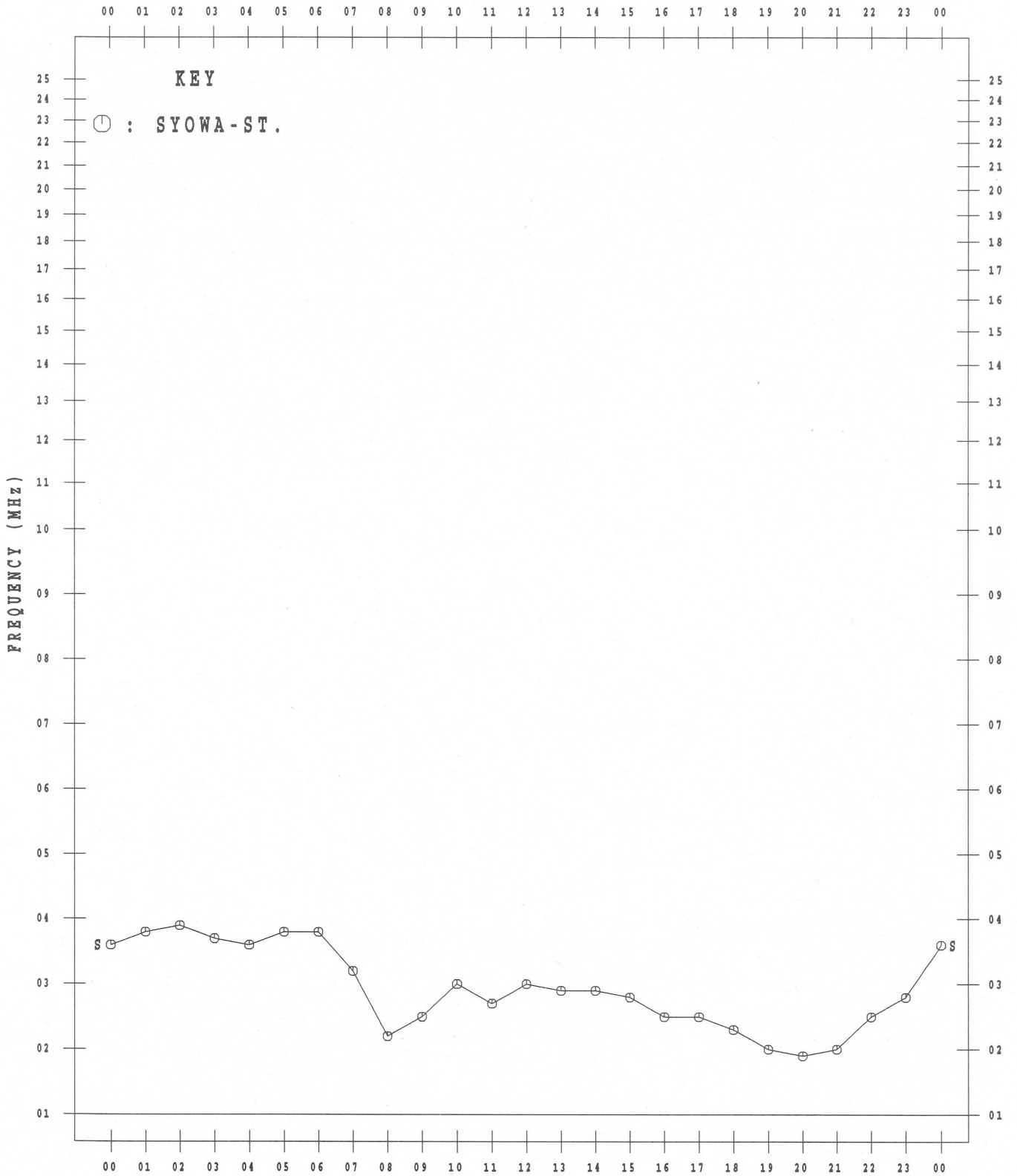
MAR. 2002



MONTHLY MEDIAN VALUES OF f_{TE}s

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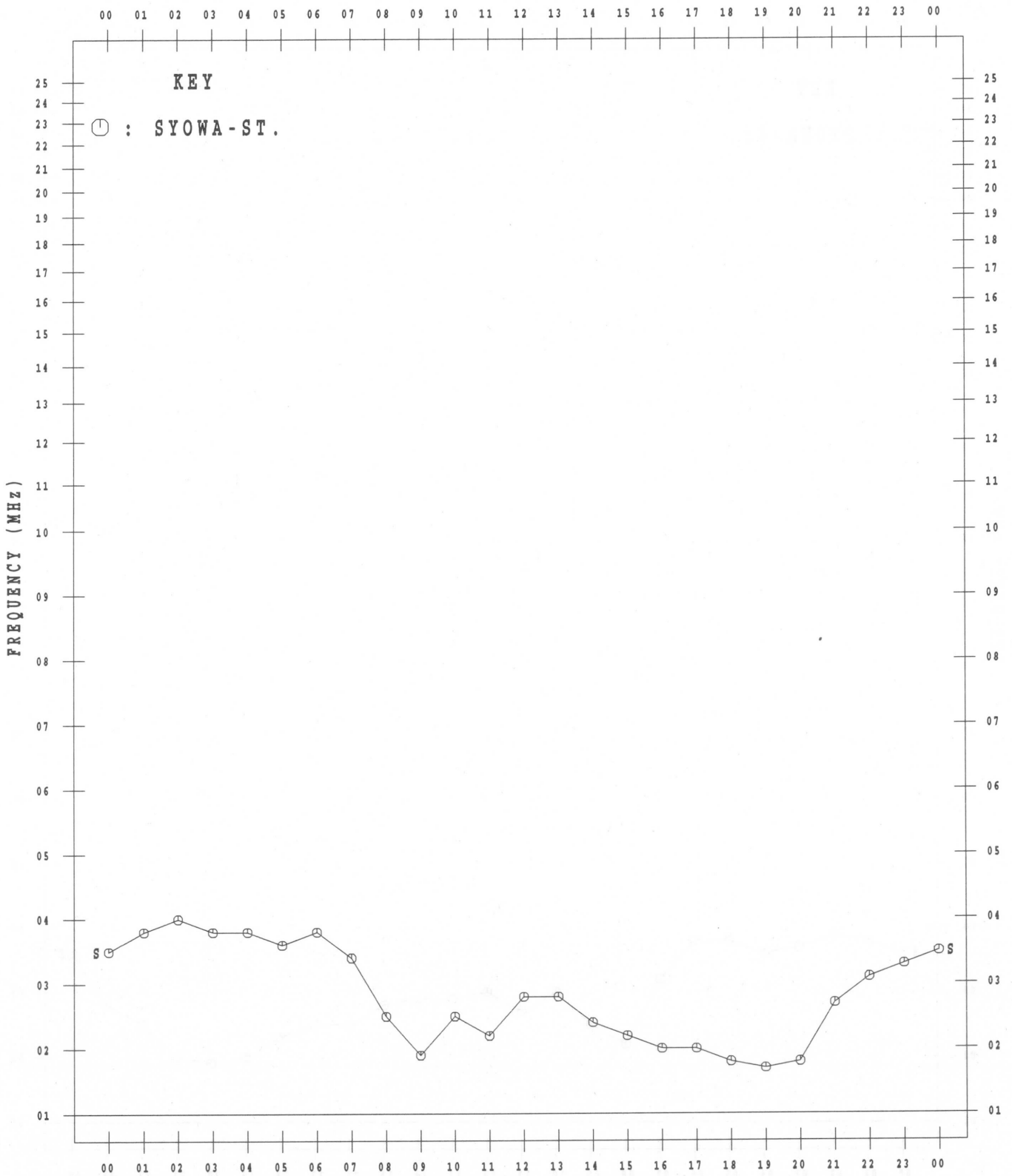
APR. 2002



MONTHLY MEDIAN VALUES OF f_tE_s

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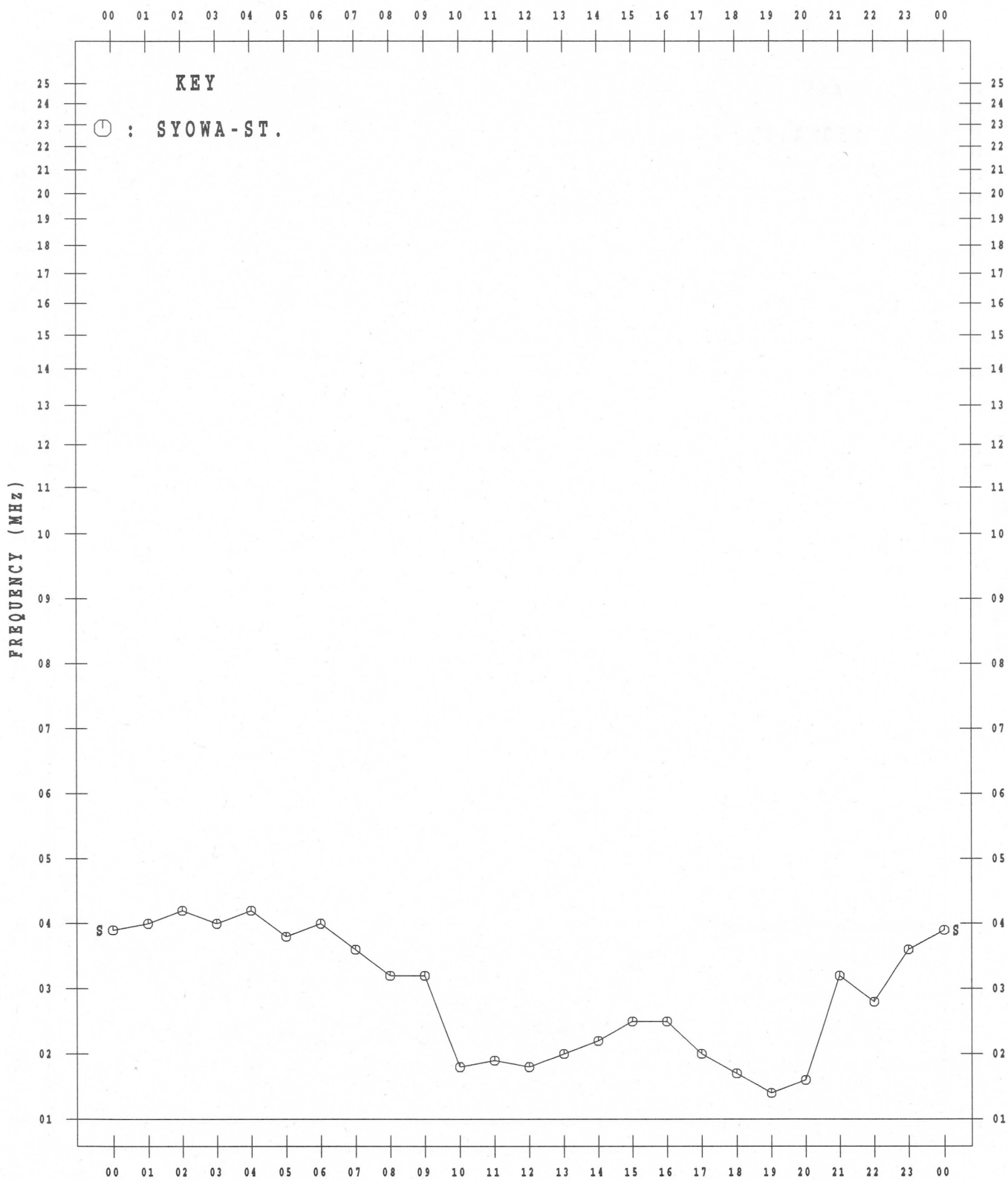
MAY 2002



MONTHLY MEDIAN VALUES OF fteS

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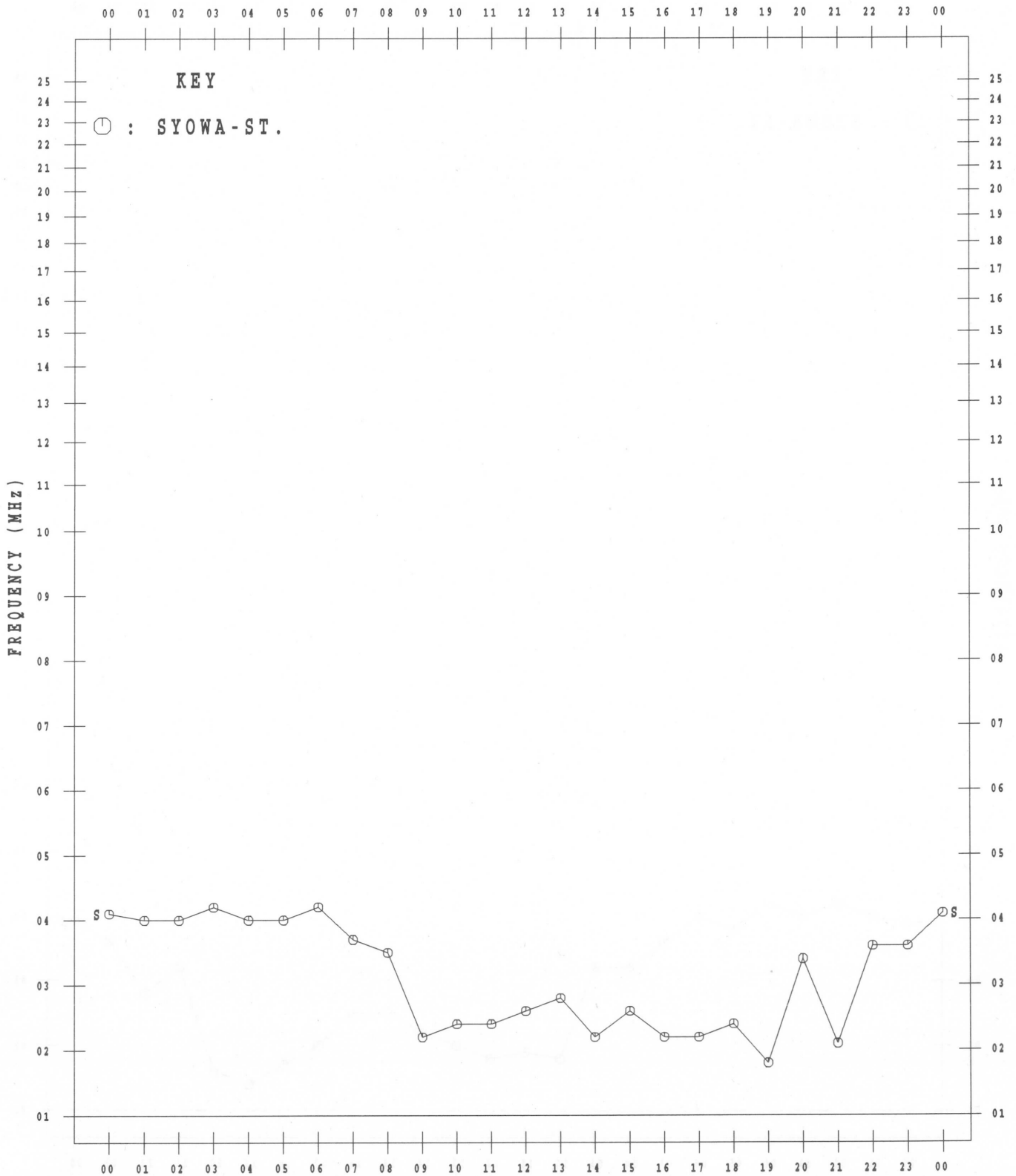
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MONTHLY MEDIAN VALUES OF ftes

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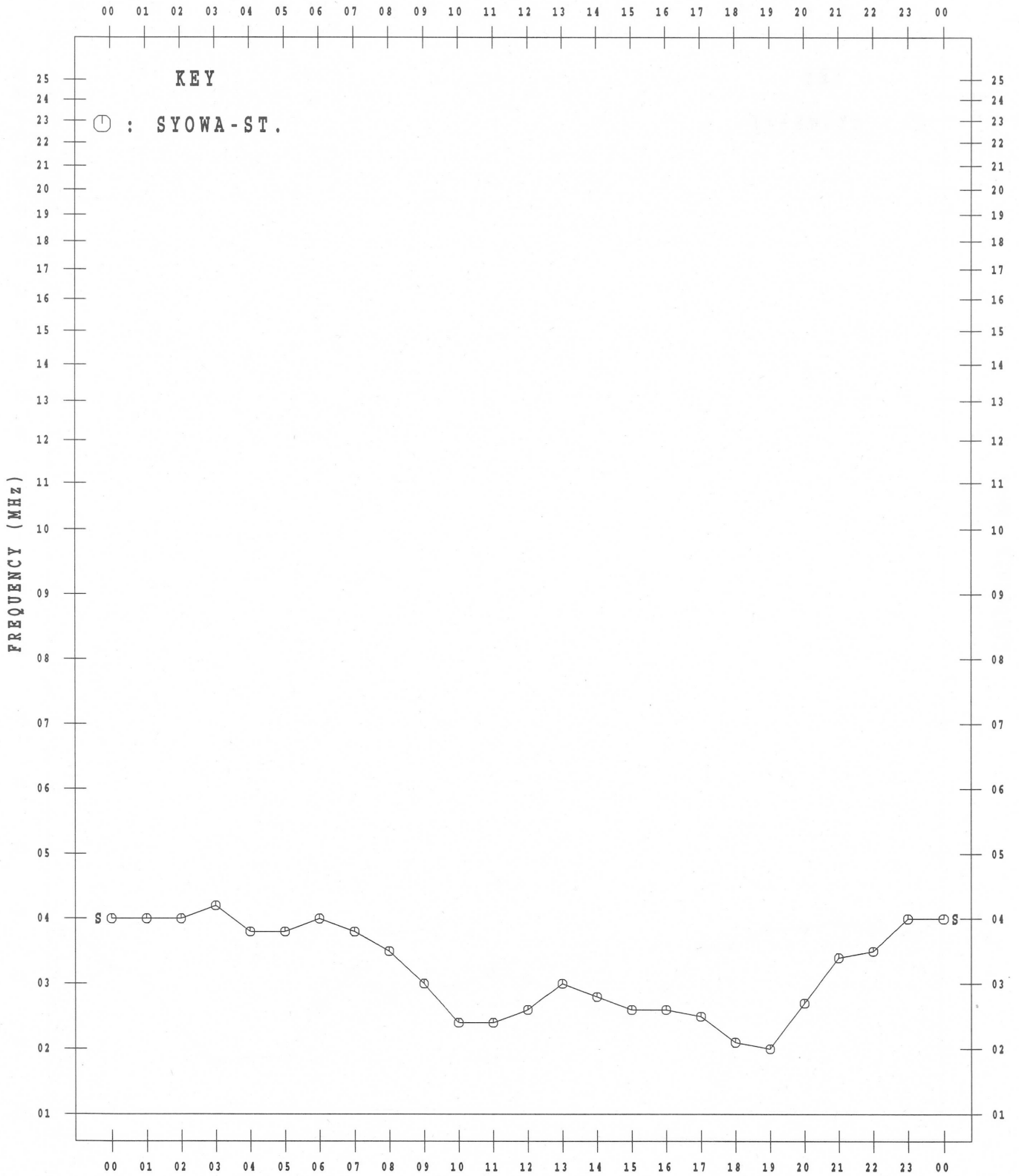
JUL. 2002



MONTHLY MEDIAN VALUES OF f_{TE}s

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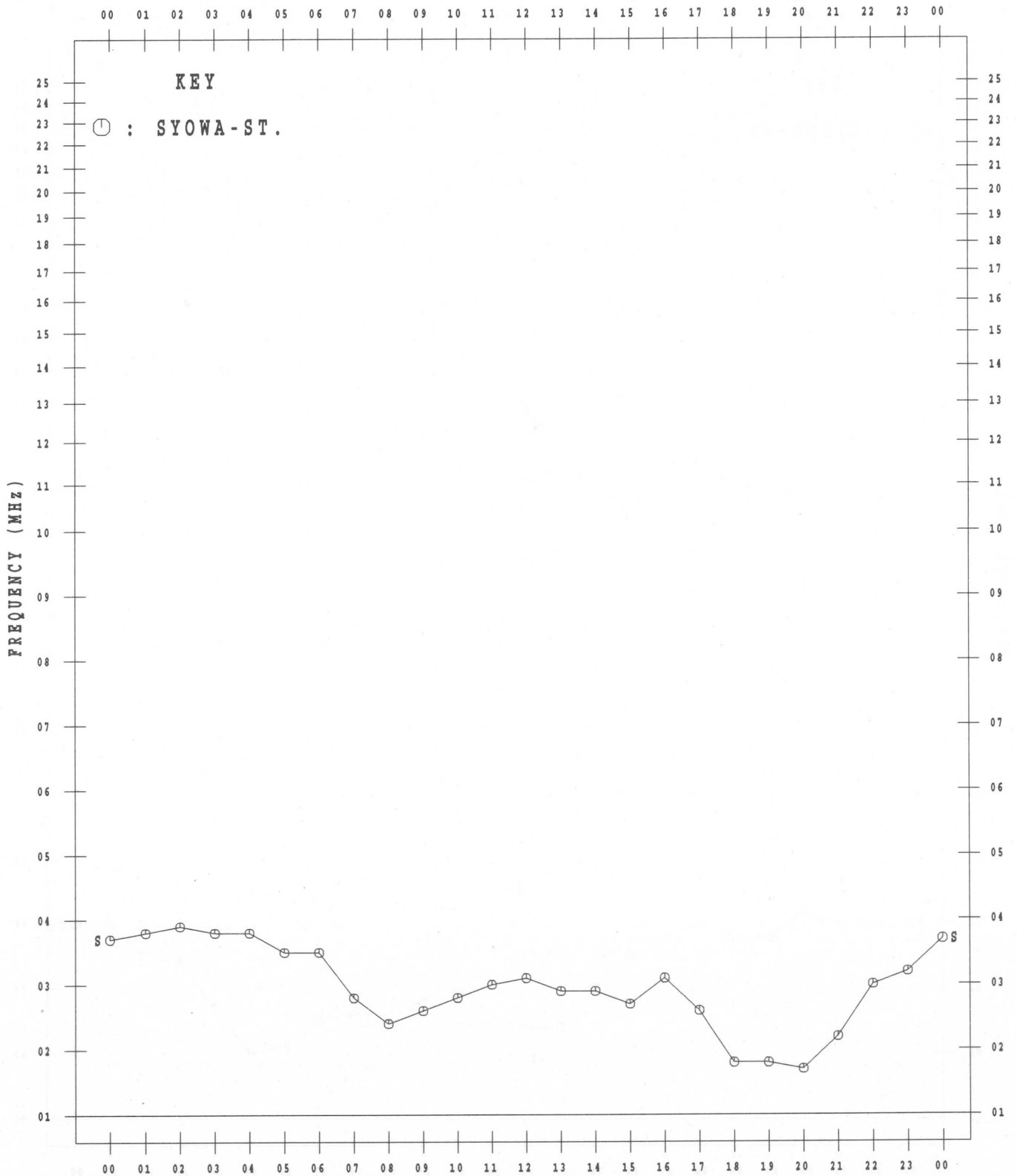
AUG. 2002



MONTHLY MEDIAN VALUES OF f_tE_s

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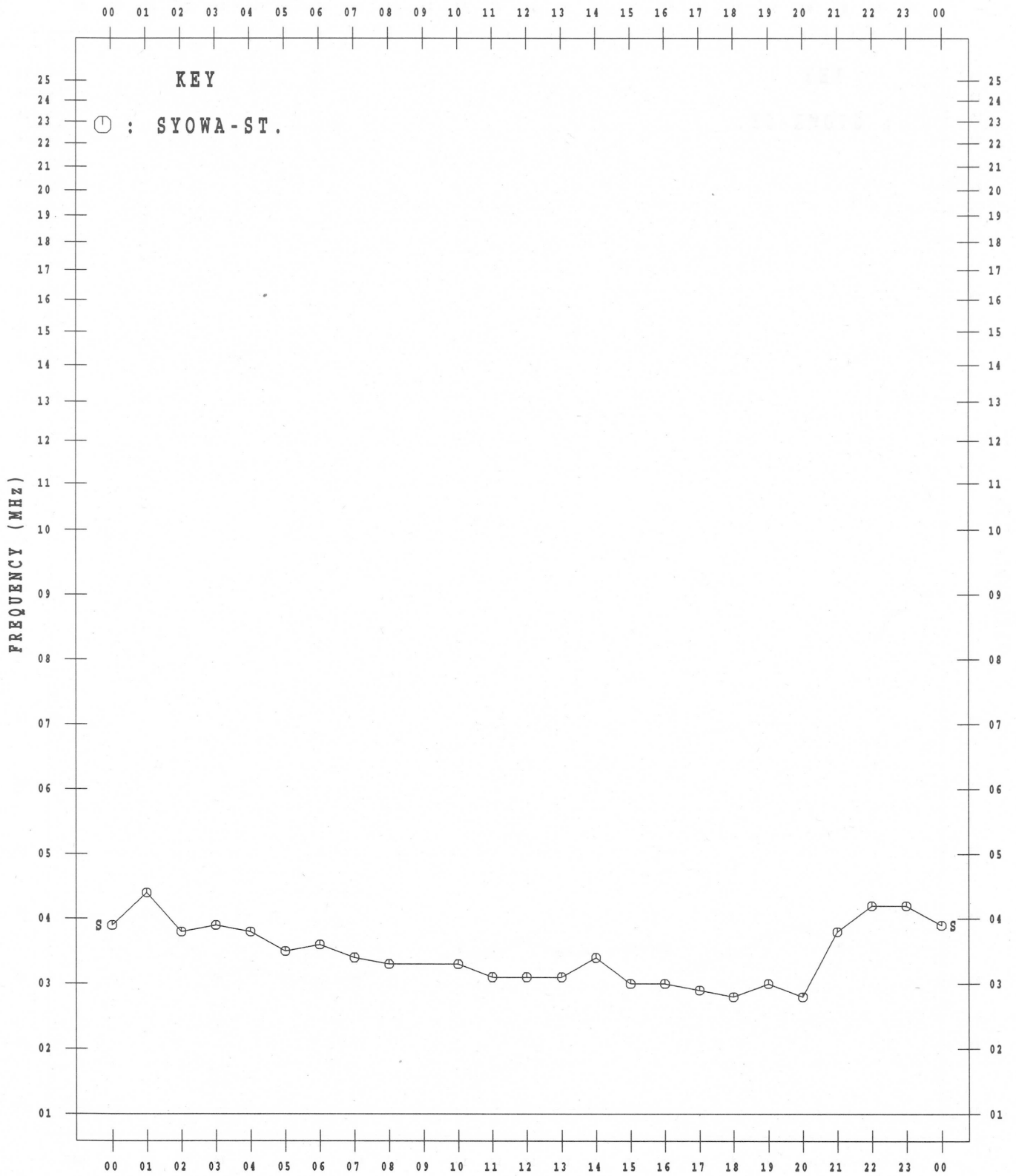
SEP. 2002



MONTHLY MEDIAN VALUES OF f_{tEs}

45° E MEAN TIME

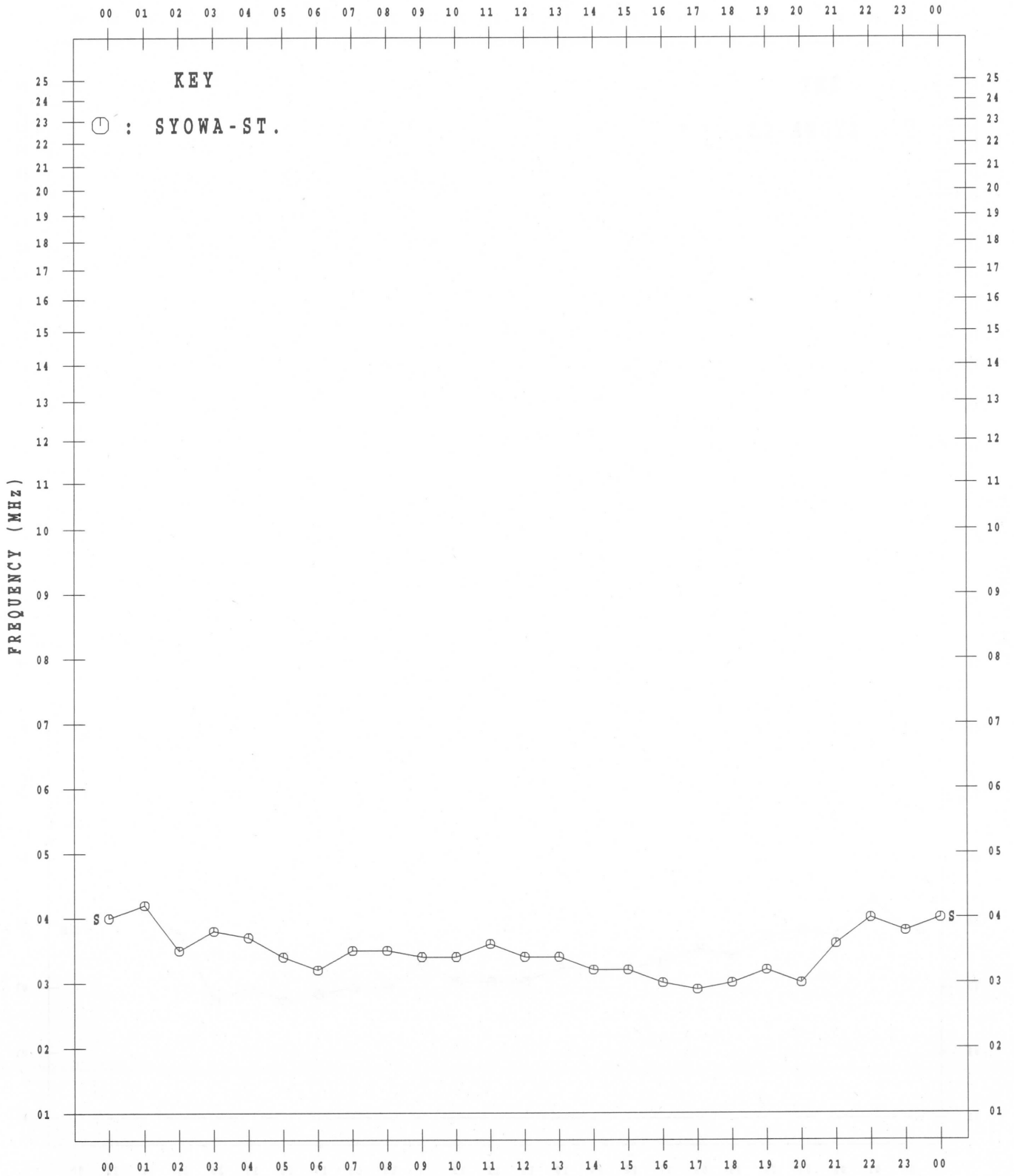
OCT. 2002



MONTHLY MEDIAN VALUES OF f_{TE}s

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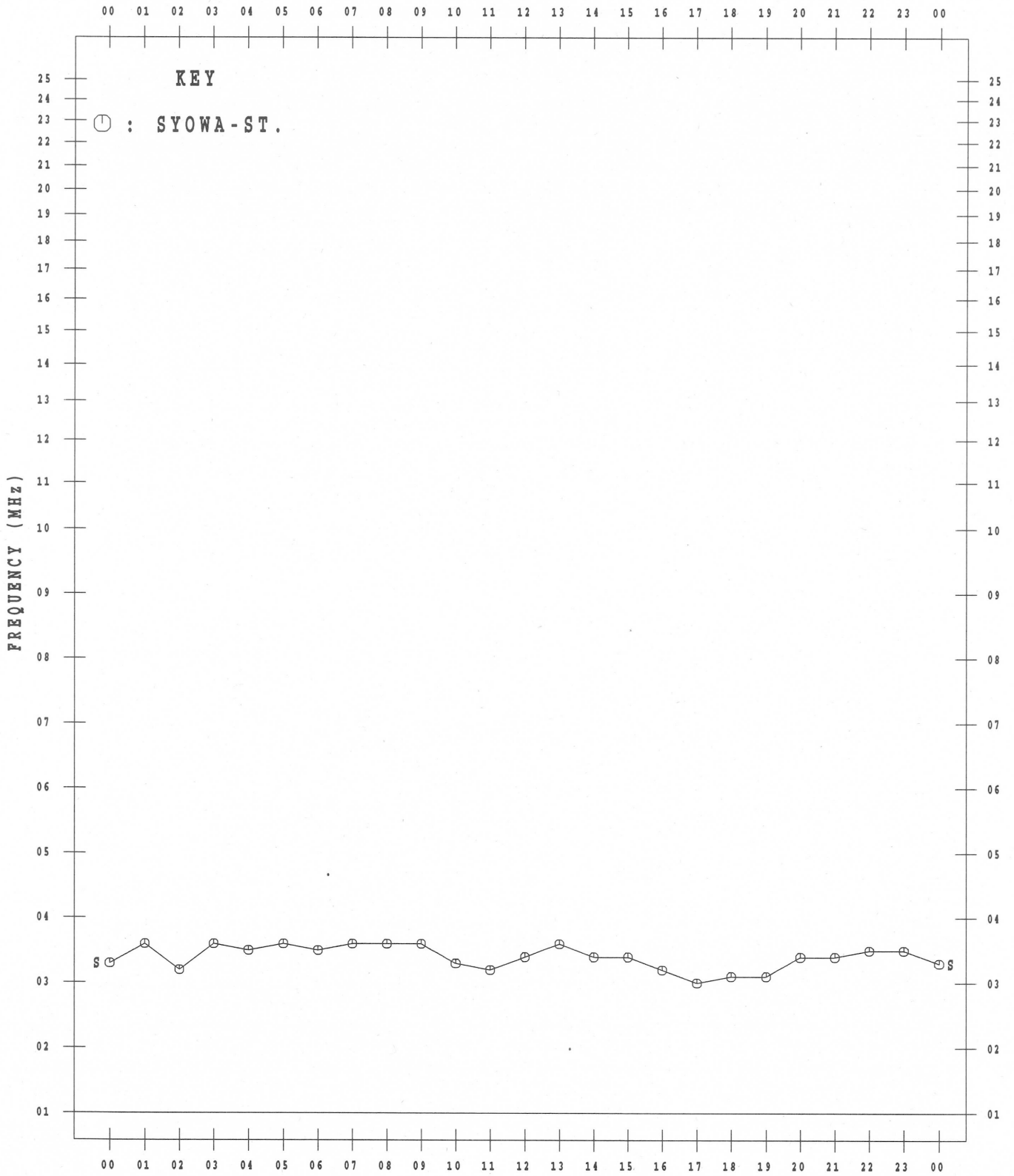
NOV. 2002



MONTHLY MEDIAN VALUES OF f_{TE}s

45° E MEAN TIME

DEC. 2002



IONOSPHERIC DATA AT SYOWA STATION (ANTARCTICA)
ION.ANT.—69 January 2002 — December 2002 (Not for Sale)

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