

ION.ANT.—68

IONOSPHERIC DATA AT SYOWA STATION (ANTARCTICA)

January 2001 — December 2001

CONTENTS

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



NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

This data book gives summarized results for vertical soundings of the ionosphere at Syowa Station, Antarctica in 2001. 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 Range	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: H. Kishida
 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 atmospherics.
- 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. 2001 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	X 71	C C	C C	C C	C C	C C	X 92	X 104	X 108	X 104	X 103	X 98	X 96	X 95	X 89	X 86	X 81	X 79	X 75	X 74	X 72	X 71	X 64	
2	X 65	X 63	B 81	83	68	69	103	100	98	102	83	90	85	81	77	74	74	71	72	65	68	63	69	
3	X 72	R 71	O 78	X 64	X 63	X 60	B Y	Y Y	R R	X B	X O	X O	X 66	X 66	X 66	X 67	X 70	X 69	X 64	X 64	X 65	X 66	X 64	
4	X 66	62	86	68	B R	X 66	X 70	80	85	84	B B	X 78	X 77	X 73	X 72	X 70	X 61	X 60	X 53	X 52	X 56	X 55	X 0	
5	0 49	X 56	X 50	X 47	X 55	R 56	X 66	X 66	X 71	X 76	X 70	Y Y	Y 70	X 68	R R	X 70	X 65	X 68	X 64	X 60	X 58	X X	X X	
6	X 62	R R	R R	R 50	R R	R R	R R	R R	R R	X 72	X 72	X 70	X 72	X 65	R R	X R	X 68	X 65	X 66	X 63	X 60	X X		
7	X 62	X 62	X 58	R 62	R R	R R	R Y	R R	R R	Y 63	X 66	R R	X 69	X 65	X 64	X 62	X 59	X 56	X X	X X	X X	A		
8	51	64	52	56	X 0	X X	X X	X X	X X	X X	X X	Y 68	X 70	X 70	R R	R R	X 66	X 62	X 56	X 56	X 49	X X	X X	
9	A Y	56	53	56	67	62	69	72	72	74	77	R R	R R	R 70	R R	X 68	X 65	X 52	X 54	X 55	X 54	X 56	X X	
10	X 56	B 64	O 64	X R	X R	O 68	X 72	X 95	X 91	X 95	X 89	X 81	X 86	R R	R R	R R	X 68	X 64	X 54	X 48	X 53	X 53	X X	
11	0 59	X 62	R 49	B R	X R	X R	X 74	X 73	X 79	X 80	X 81	X 79	X 79	X 78	X 76	X 76	X 67	X 48	X 46	X 53	X 54	X 55	X X	
12	B 12	B B	R B	B R	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 71	B 66	B 58	B 62	B X		
13	X 62	X 66	X 72	X 70	X 78	85	92	96	99	91	91	Y Y	Y 86	X 82	X 79	X 73	X 76	X 72	X 68	X 60	X 57	X 64	X X	
14	X 56	X 53	R A	A 63	R R	R 63	R 63	R R	R Y	B B	Y 69	Y 71	X 71	X 70	X 66	X 72	X 68	X 64	X 61	X 60	X 50	X X		
15	58	B 60	R 67	O 69	X 68	X 78	X 78	X 78	X 87	X 84	R 82	X 80	X 81	R 77	X 75	X 71	X 61	X 48	X 43	X 55	X 54	X X		
16	52	B 69	B B	B R	X 80	X 80	X 79	X 80	X 80	R R	Y 76	R 72	X 66	R 62	X 54	X 48	A A	A A	A A	A A	A A	X X		
17	X 56	X 57	X 56	B R	A A	R 88	O 103	X 98	X 95	X 88	R 88	X 79	X 72	X 71	R 64	X 62	X 64	X 64	X 62	X 50	X 41	X X		
18	0 47	X 52	X A	C 66	74	85	85	88	86	94	93	R 88	X 78	R 64	X 71	X 71	X 69	X 66	X 66	X 62	X 62	X X		
19	X 64	64	R 69	A 72	80	88	89	90	90	R 88	X 78	X 70	X 73	X 75	X 73	X 72	X 72	X 67	X 68	X 44	X X			
20	0 46	X 58	X R	R 65	X 68	X 76	X 87	X 96	X 91	X 86	R 81	X 86	X 79	X 73	X 74	X 70	X 62	R AO	X X	X 57	X 68	X X		
21	0 61	X 50	B 68	R 109	X 68	R 68	R 66	R 70	R 71	R 85	B B	B B	B B	B 78	Y 48	Y 47	R R	R R	A A	A A	A A	X X		
22	A AO	X 46	57	59	A A	A A	R R	R R	R R	R R	R B	R B	R B	R B	C C	C C	B B	X 50	X 46	X 43	X 42	X X		
23	0 47	X 45	X 50	A R	R R	R R	R 64	X 65	X 70	X 71	X 67	B B	B B	B 64	R R	X 44	X 48	R R	R R	R R	R R	R R		
24	R 71	X 71	A 46	B R	O R	X B	R R	R R	R X	B BO	X 68	X 67	X 71	R B	B B	B B	B B	B 54	B 47	B R	B R	B R		
25	A 45	X 47	X 53	X 50	X 57	X 69	X 72	X 74	R R	R R	X 73	X 72	X 68	X 72	X 66	X 66	X 66	X 63	X 60	X 54	X 46	X 50	X X	
26	54	54	54	71	X 71	R R	B B	B B	R R	B B	B B	B B	B B	B B	B 73	X 73	X 62	X 58	X 55	X 57	X 49	X X		
27	0 43	X 49	60	49	A R	R R	R B	R B	R B	R B	B B	B B	B B	B B	B B	B B	B B	X X	X X	X X	X X	X X		
28	X 42	63	54	53	64	62	R 62	X 72	X 74	X 80	X 82	X 81	X 84	R B	B B	B B	B B	B 64	R R	R R	R 52	R R		
29	R R	R B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B			
30	B B	B B	B B	B B	B B	B B	B 74	B 80	B 84	B 82	R 68	R 68	R 68	R 72	X 69	X 64	X 72	X 70	X 71	X 68	X 68	X X		
31	X 56	56	70	71	78	75	77	104	98	81	0 104	X 96	X 103	X 66	X 60	R A								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	20	14	15	20	14	11	17	18	22	22	21	14	19	19	17	18	23	20	22	27	25	24	25
MED	X 56	X 58	X 56	X 59	X 64	X 68	X 69	X 80	X 84	X 79	X 82	X 80	X 79	X 77	X 72	X 70	X 68	X 64	X 62	X 60	X 58	X 55	X X	
U Q	X 62	X 63	X 70	X 70	X 68	X 74	X 80	X 94	X 98	X 95	X 91	X 85	X 88	X 85	X 81	X 78	X 74	X 71	X 68	X 65	X 66	X 63	X 63	
L Q	0 50	51	54	53	52	63	62	70	72	72	74	70	72	71	68	69	67	66	63	62	54	50	54	50

JAN. 2001 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2001 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	65	C	C	C	C	C	Z	84	98	102	98	97	92	90	89	J	R	R	J	R	J	R	68	66	65	58				
2	59	57	B	F	R	62	63	97	94	89	96	77	84	79	75	71	68	68	65	66	59	62	57	63						
3	66	R	S	R	R	58	57	54	B	Y	Y	R	60	61	60	61	64	63	58	58	59	59	59	58						
4	59	56	64	60	R	60	64	74	79	78	R	J	R	B	B	J	R	R	R	J	R	R	47	46	50	49				
5	43	50	44	41	49	50	60	60	65	70	64	Y	Y	R	R	R	R	R	R	R	R	R	R	54	52					
6	56	R	R	R	F	A	A	R	R	R	R	R	R	R	R	Y	R	Y	R	R	R	R	R	R	J	R	R			
7	56	56	52	R	R	R	R	R	Y	R	R	R	Y	R	R	57	60	R	R	J	R	J	R	J	56	53	50			
8	40	53	46	50	R	R	R	R	R	R	62	64	64	R	R	Y	Y	R	R	R	R	R	R	50	50	43				
9	A	Y	R	F	50	55	56	63	66	66	68	71	J	R	R	R	R	R	R	B	R	R	R	46	48	49	48			
10	50	58	B	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	J	R	R				
11	53	51	F	R	B	R	R	J	F	R	J	R	74	75	73	73	J	R	J	R	R	J	R	R	42	40	47	49		
12	B	B	R	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	J	R	56			
13	56	60	66	64	J	R	J	R	R	R	R	R	Y	Y	R	R	R	R	R	B	R	R	R	66	62	54	51	58		
14	50	47	R	R	B	A	F	R	R	R	Y	B	Y	R	R	R	R	R	R	R	R	R	R	R	66	62	58	55	44	
15	F	B	R	R	F	R	J	R	J	R	81	78	Y	J	R	J	R	R	R	J	R	R	R	R	42	37	49	48		
16	42	F	B	B	B	B	R	J	R	74	74	73	74	74	J	R	R	Y	U	R	R	R	R	R	R	A	A			
17	50	51	50	R	B	R	A	R	R	R	J	R	J	R	R	R	R	R	R	R	R	R	R	S	J	S	R			
18	41	46	R	A	C	F	F	J	R	J	R	R	J	R	J	R	R	R	J	R	R	R	R	R	60	60	56			
19	58	54	F	R	A	F	J	R	F	F	J	R	J	R	R	R	R	R	J	R	R	R	R	R	R	R	F			
20	40	52	R	J	R	R	J	R	J	R	J	R	R	R	R	R	R	J	R	R	R	J	R	R	66	61	62	32		
21	55	32	R	F	B	R	R	R	R	R	R	R	R	R	R	R	R	R	75	80	73	67	68	64	56	R	A	R		
22	A	R	F	F	A	A	R	R	R	R	R	R	R	R	R	Y	B	B	R	R	C	C	C	B	R	R	44	40	37	36
23	R	R	A	R	R	R	R	R	R	R	58	59	64	65	79	R	B	B	B	J	R	Y	Y	R	R	R	R	38	42	
24	R	A	B	R	R	R	R	R	R	R	62	61	65	R	B	B	B	B	B	B	B	B	B	B	B	F	B	R		
25	65	A	R	R	R	J	R	J	R	R	63	66	68	R	R	R	R	67	66	62	66	60	60	60	57	54	48	40	44	
26	42	48	R	R	R	65	R	B	B	R	R	B	R	B	B	B	B	B	B	B	67	67	56	52	49	51	43			
27	34	43	R	54	43	R	A	R	R	B	B	U	R	R	R	R	65	62	63	61	62	62	59	56	62	60	56	52	40	
28	36	50	48	47	R	58	56	R	56	66	68	74	76	75	78	B	B	B	B	B	B	B	B	B	B	B	58			
29	R	R	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			
30	B	B	B	B	B	B	B	B	B	B	68	74	78	76	R	R	R	R	R	R	R	R	J	R	R	R	R			
31	J	R	F	F	F	F	R	F	96	92	94	98	93	F	Y	J	R	J	R	B	R	R	A	R	A	F	36			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	23	20	14	15	19	14	11	17	18	22	22	21	14	19	19	17	18	23	20	22	27	25	24	25						
MED	50	50	49	50	56	62	63	74	78	73	76	74	76	73	71	66	66	64	62	58	56	54	52	49						
U Q	56	55	59	60	62	65	71	86	92	89	85	79	82	79	75	72	68	68	65	62	59	60	57	57						
L Q	41	44	46	47	44	56	56	64	66	66	68	64	66	65	62	63	61	60	57	56	48	44	48	44						

JAN. 2001 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2001 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	C	C	C	C	C	C	G	G	G	G	40	35	43	66	44	65	61	43	40	34	35	23				
2	22	36	B	Q	40	33	35	G	39	33	32	G	36	34	37	48	50	38	66	38	32	28	28				
3	28	36	43	34	31	34	38	B	31	44	40	36	B	33	33	32	31	31	31	28	34	42	26	23			
4	42	33	41	37	B	40	41	38	39	33	34	B	33	33	34	32	36	32	22	34	35	35	34				
5	94	36	37	34	41	40	38	33	33	32	36	34	38	40	41	36	35	34	31	44	35	35	28	31			
6	27	41	43	36	28	38	40	38	34	28	32	35	36	35	37	32	22	35	36	33	40	31	22	20			
7	26	32	40	41	42	43	44	40	28	47	37	34	34	36	34	33	36	36	36	28	23	26	24	22			
8	37	36	40	69	40	42	40	45	43	33	31	35	31	34	35	43	40	27	28	32	26	40	42	44			
9	38	23	39	37	35	34	32	37	29	34	32	34	36	37	35	39	38	33	32	29	31	32	39	E B			
10	45	B	33	37	32	42	28	28	31	32	34	39	35	46	34	34	33	23	21	32	22	33	32	32			
11	41	36	41	B	56	42	40	36	23	32	30	34	32	32	36	32	32	36	36	30	36	41	40	29			
12	B	B	B	36	B	32	35	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B				
13	20	31	32	40	30	49	34	36	30	31	37	29	36	34	35	33	32	Q	B	30	34	32	27	27			
14	34	37	43	B	40	36	37	39	37	33	G	B	30	33	33	32	55	56	24	34	36	24	26	24			
15	38	33	24	B	42	29	34	31	G	32	33	33	38	39	46	38	59	28	30	32	36	37	33	G			
16	34	B	B	B	G	B	37	31	25	27	G	G	33	32	30	35	37	34	32	28	34	40	40	40			
17	38	37	34	B	40	49	35	32	24	38	34	36	35	35	31	38	38	43	34	41	32	34	34	44			
18	43	36	54	C	32	33	31	22	34	39	38	39	40	47	61	40	38	35	46	48	66	40	36	28			
19	21	33	36	49	40	35	27	32	36	32	32	34	35	34	32	35	36	35	38	39	40	37	29	20			
20	38	39	49	48	45	39	38	35	35	34	32	37	34	42	39	36	32	38	32	34	44	41	44	43			
21	43	94	B	40	38	54	36	45	40	40	28	58	56	G	B	B	B	B	B	36	22	22	39	40	31	32	43
22	45	41	32	32	40	40	G	36	38	39	35	30	G	B	B	B	B	B	27	33	C	C	C	G	G	35	
23	30	26	72	31	41	36	36	33	32	31	35	38	33	G	B	B	B	B	B	28	30	32	19	31	38	35	G
24	41	42	40	B	27	31	32	36	37	34	55	33	G	B	B	B	B	B	27	40	23	36	B				
25	34	34	34	33	28	24	29	38	22	31	27	28	61	39	39	34	39	36	40	38	23	35	36	38			
26	36	36	33	32	37	40	41	B	37	40	B	B	B	B	B	B	B	57	G	29	34	36	40	34			
27	28	34	31	29	31	60	41	42	B	B	33	34	33	28	G	G	G	G	32	31	27	32	26	22	32		
28	34	38	49	41	32	38	33	44	30	32	32	30	34	38	B	B	B	B	B	B	32	37	40	36			
29	38	34	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
30	B	B	B	B	B	B	B	B	G	B	E	E	B	55	56	34	38	36	31	32	35	22	G	E	B	E	B
31	E	B	E	B	18	17	29	22	21	34	40	34	21	32	38	29	23	G	B	33	37	127	41	45	42		
	00	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	25	25	21	27	25	28	26	26	28	27	27	24	26	24	24	25	27	22	25	30	30	29	30			
MED	37	36	39	37	35	39	36	G	G	33	34	35	34	35	35	34	34	33	32	34	34	32	33				
U Q	41	38	43	40	40	42	40	39	36	37	35	37	38	38	38	38	40	36	36	39	40	37	39	38			
L Q	28	33	33	32	31	34	34	32	29	32	G	G	34	33	G	33	32	28	30	30	26	31	26	24			

JAN. 2001 fTEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2001 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	00	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	C	C	C	C	C	C	10	10	15	13	14	20	30	20	18	16	13	10	11	9	9	9	9	
2	17	12	12	21	16	18	14	10	12	12	30	14	12	12	11	11	12	10	10	12	12	8	9		
3	9	26	13	28	20	17	9	B	24	20	16	25	B	10	10	15	11	12	31	12	10	10	16	16	
4	10	15	14	15		B	16	12	12	10	12	26	B	15	20	22	12	13	10	10	10	10	11	10	
5	16	10	13	11	9	18	11	11	11	12	13	14	21	20	15	11	10	13	12	13	12	11	10	10	
6	13	30	20	15	10	18	21	15	17	14	18	16	16	15	15	13	15	15	15	13	11	14	10	10	
7	13	12	14	12	10	11	11	12	15	16	14	13	16	12	13	12	12	12	11	10	11	10	10	16	
8	12	9	8	10	16	14	12	15	17	13	11	10	11	15	27	16	14	15	17	15	11	10	13	16	
9	11	12	12	11	11	13	10	14	11	12	16	15	18	14	12	12	11	33	B	29	16	14	13	11	
10	14	B	26	16	14	12	12	13	13	11	15	13	12	10	14	15	11	10	10	11	12	10	10	32	
11	11	12	16	B	16	24	13	11	11	10	12	10	10	10	10	13	13	10	10	10	10	10	10	15	
12	B	B	B	20	14	26		B	B	B	B	B	B	B	B	B	62	56	B	B	30	33	19	17	
13	13	16	18	22	B	30	20	26	27	15	18	22	25	21	21	19	11	13	15	20	14	14	13	10	
14	14	14	20	B	16	15	24	27	15	14	B	25	20	10	26	55	56	21	21	19	17	15	20	15	
15	10	B	20	12	11	15	12	10	11	10	12	13	18	21	18	13	59	18	30	14	14	19	16	26	
16	11	B	B	B	12	20	10	11	12	12	20	16	26	29	16	10	21	B	14	12	12	16	20		
17	15	14	14	B	25	16	20	11	12	12	12	11	15	19	16	12	13	11	12	13	11	12	10	10	
18	12	10	15	C	12	10	12	11	10	11	11	12	12	12	14	16	13	10	10	11	11	11	10		
19	9	11	26	12	12	12	12	10	10	10	11	12	15	14	12	15	11	10	12	11	12	10	10	10	
20	10	12	14	16	10	12	12	14	12	11	12	12	13	13	18	30	15	16	12	11	14	13	10	11	
21	11	13	B	21	14	14	16	13	10	12	14	58	56	B	B	B	16	14	18	11	10	12	11	11	
22	10	15	12	12	16	14	16	14	12	21	31	24	B	B	12	16	C	C	C	B	22	18	18	24	
23	25	26	20	19	26	26	32	29	27	19	16	21	35	21	B	B	B	19	15	32	13	15	20	20	
24	14	15	19	B	20	18	20	29	26	26	55	B	15	B	B	B	B	B	B	18	19	18	28		
25	18	15	18	18	13	14	12	14	16	14	15	14	61	15	12	16	12	12	12	14	11	10	12	14	
26	16	31	10	14	24	14	20	B	15	25	B	B	B	B	B	B	57	26	14	14	16	16	16		
27	13	16	18	17	16	26	20	22	B	30	30	30	14	18	15	12	15	12	32	26	14	13	14		
28	10	15	16	19	26	20	26	25	16	11	11	15	19	25	B	B	B	B	B	B	B	11	14	15	15
29	26	26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
30	B	B	B	B	B	B	B	B	30	B	55	56	26	18	15	18	15	16	18	18	27	20	21		
31	18	14	29	17	18	22	19	14	12	12	13	15	24	20	12	B	20	16	13	15	12	12	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	30	30	29	30	30	30	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	
MED	13	15	18	17	16	16	17	14	13	13	15	16	20	15	18	16	14	15	15	14	12	12	13	15	
U Q	16	26	26	B	24	24	21	27	24	19	26	30	61	26	29	62	56	19	32	16	15	16	20		
L Q	10	12	14	12	12	14	12	11	11	12	12	13	15	13	13	13	11	12	12	11	11	10	10	10	

JAN. 2001 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2001 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	258	C	C	C	C	C	C	A	232	202	222	Y	196	Y	Y	Y	A	A	A	A	A	224	236	244	270				
2	288	290	B	A	R	218	Y	Y	194	200	Y	Y	Y	206	196	E	A	A	A	A	Q	Q	Q	246					
3	A	A	A	A	A	A	A	B	Y	A	A	Y	B	Y	234	204	222	230	226	230	226	266	254						
4	250	324	256	254	B	A	A	190	200	Y	Y	Y	B	Y	234	198	216	206	208	214	248	264							
5	298	190	A	A	A	A	A	234	208	Y	Y	Y	A	A	204	206	216	252	260	246	264	248							
6	268	A	A	A	A	A	A	A	226	214	232	Y	A	Y	Y	216	200	220	218	222	234	248	264						
7	252	294	296	294	A	A	A	A	Y	A	A	A	Y	Y	A	228	228	202	208	216	226	238	242						
8	A	232	226	A	A	A	A	A	196	Y	Y	Y	Y	Y	A	A	206	228	228	216	A	A	242						
9	A	Y	A	216	278	A	244	Y	202	188	Y	Y	A	A	192	214	228	214	222	228	228	204							
10	A	B	Y	A	A	E	A	272	214	202	Y	Y	A	A	234	212	202	214	202	196	A	E	B						
11	266	232	A	B	A	A	A	204	242	200	198	Y	Y	Y	198	216	188	194	232	252	212	240							
12	B	B	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	BE	BE	BE						
13	248	A	A	A	E	B	A	284	244	220	206	218	220	Y	Y	Y	Y	220	222	222	224	242	248	262	266				
14	280	236	A	B	A	Y	A	A	220	Y	B	Y	Y	Y	220	B	B	210	224	238	220	232	242	260					
15	226	B	A	Q	E	A	180	190	236	282	212	208	198	218	Y	A	Y	Y	Y	B	218	196	220						
16	A	B	B	BE	A	B	A	284	200	202	202	202	Y	Y	Y	Y	212	202	208	B	222	260	254						
17	E	A	A	B	A	A	A	244	210	188	192	Y	Y	Y	Y	234	A	A	A	A	214	224	220	196	202	238			
18	264	266	A	A	A	C	266	248	240	216	194	208	212	Y	Y	A	212	216	228	220	220	A	E	A	A				
19	248	254	A	A	A	310	220	198	188	174	Y	Y	A	Y	Y	Y	218	200	202	246	232	226	208						
20	226	226	A	A	A	A	226	200	214	A	Y	Y	218	224	202	212	194	206	212	256	A	E	A	266	238				
21	242	244	B	A	A	A	A	A	A	Y	Y	B	B	B	B	B	Y	Y	Y	210	200	A	A	A					
22	A	A	202	A	A	A	A	A	A	A	Y	B	B	B	B	210	A	C	C	C	B	230	274						
23	E	A	304	282	A	A	A	A	A	A	230	212	Y	Y	Y	210	236	304	E	B	266	300	A	A					
24	A	A	A	B	A	B	252	A	A	A	Y	B	B	Y	B	B	B	A	B	B	202	214	B	A					
25	A	A	A	A	E	A	270	262	244	A	A	226	212	204	A	B	Y	E	A	A	204	222	224	222	226	236	198	188	304
26	A	A	A	A	A	Y	A	B	B	A	A	B	B	B	B	B	B	B	B	224	242	264	302	282					
27	298	366	352	286	E	A	A	A	A	B	B	Y	Y	Y	218	208	230	220	250	242	246	246	250						
28	252	326	A	282	302	220	8	A	A	Y	208	208	Y	254	B	Y	B	B	B	B	246	A	A	A					
29	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
30	B	B	B	B	B	B	B	B	B	Y	B	BE	B	Y	A	214	196	206	228	230	230	244	240	230					
31	E	B	E	BE	E	AE	AA	EE	A	YE	A	Y	206	182	244	Y	Y	B	Y	A	B	A	A	244					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	19	15	7	7	12	8	9	13	15	16	12	3	3	2	7	12	17	22	21	24	25	22	22	22					
MED	254	266	241	252	273	230	242	214	206	207	206	232	236	229	210	212	209	218	220	224	227	234	241	246					
U Q	280	294	304	286	289	267	248	233	220	216	213	244	364	234	217	218	228	229	240	251	248	248	264						
L Q	248	236	226	216	266	219	227	201	200	200	195	196	218	202	204	200	206	214	216	218	226	238	238						

JAN. 2001 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2001 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	A0 46	X0 42	X 54	60	38	58	X	R	B	B	B	B	R	Y	R	BO	X0	X	X	X	X	X0	X		
2	0 42	X 44	O 43	X 64	A	R	B0	X 66	X0 75	X 84	74	74	85	86	72	85	72	71	68	68	65	56	58		
3	X 59	X 58	X 62	X 58	72	89	92	103	108	106	109	107	100	92	C	C	X	X	X0	X0	X	X	X		
4	X0 72	X 76	X 75	X 81	91	98	113	115	116	111	112	113	105	97	RO	X 93	82	76	72	72	68	68	70		
5	67	68	69	73	86	92	100	99	99	96	102	108	108	92	105	94	92	80	85	91	82	72	74	77	
6	X 76	X 72	B B	R R	A	R	R	X	X	B	BO	X 98	93	94	R	X	X	X	X	X	X	X	X		
7	A 40	X0 61	X 40	B 44	X 62	A	B0	X 71	C	C0	X0 88	X 91	87	78	76	73	71	71	69	56	46	45	45		
8	X 51	X 44	57	60	62	66	77	65	65	72	77	80	90	88	87	80	81	75	68	62	60	X	48		
9	X 50	A 60	A0 68	X 79	89	92	92	100	92	97	100	106	98	103	88	86	78	78	73	50	45	X	X		
10	A 67	A 66	X 70	RO	X0	X0	X 81	X 80	X 74	X 80	X 98	X 97	X 87	X 88	91	X0	X	X	X	X0	X0	X	X		
11	X 53	X 54	65	70	R	RO	X 70	B	X 81	X0 83	X 98	X 96	B	B	B	B	BO	X 71	X 66	X 72	X 65	X 58	X		
12	46	52	68	59	62	62	68	93	98	103	103	100	103	94	92	82	84	80	81	77	68	52	39	X	
13	A 63	A 40	A 66	A 64	A 66	B	B	B	Y0	X 64	B	B	80	70	80	B	X0	X	A	X	B	A	44		
14	A 48	R 44	X0 46	X B	B	B	B	B	B	R	BO	X 71	R	RO	X0	X	X0	X	X	X	X	X	A		
15	A0 46	X R	B B	R	X 64	X 72	X 74	85	B	BO	X 84	B	X 80	74	74	74	75	70	66	62	60	X	X		
16	X 63	58	50	68	73	66	77	82	89	100	93	96	96	100	100	93	93	83	79	78	71	71	59	46	
17	48	44	50	55	64	R	X0	X 67	X 74	86	102	92	100	90	91	89	76	78	80	76	74	68	59	46	38
18	34	31	47	52	52	63	69	81	87	88	96	96	87	74	74	73	75	69	71	68	59	53	44	X	
19	34	R A	A A	X X	X 62	66	80	81	71	104	66	74	81	76	74	72	72	78	79	76	68	62	48	A	
20	0 34	O 43	X 53	X 48	X 56	69	R	R	74	81	82	85	85	90	91	80	79	71	70	66	56	58	X		
21		O 55	X 50	X 48	A0 61	X 62	93	R	X 68	X0 68	X 73	74	79	78	76	72	69	70	68	66	63	50	41		
22	O 36	X 44	A 49	O 54	X 62	69	85	91	96	98	105	100	96	85	79	74	74	73	64	37	A	A	A		
23	A 50	X 62	A 54	A 0	X R	B	R	B	B	BO	X 73	80	74	72	74	63	56	48	40	41	41				
24	A0 39	X0 46	X 44	55	41	R	BO	X0	X0	X0	X 55	68	65	72	77	80	83	81	83	73	80	72	68	62	57
25	59	66	66	70	71	80	80	99	106	110	101	100	95	91	89	84	79	75	68	61	51	30	X	X0	
26	30	37	50	55		X 69	A 85	85	97	100	101	104		98	88	82	82	78	70	44					
27	0 46	X 36	A 43			68	B	B	B	B	B	B	B	B	B	69	65	66	62	56	46	42	34		
28	42	43	43	38	44	48	63	68	81	80	86	87	RO	X 89	X 91	X 90	92	72	66	63	62	40	68	A	
29																									
30																									
31																									
CNT	20	22	21	22	19	18	23	20	19	22	20	20	21	17	21	19	24	25	28	26	26	28	23	22	
MED	49	47	51	55	62	62	69	82	86	90	97	96	90	89	91	87	80	76	74	70	68	60	53	47	
U Q	59	58	66	66	71	68	80	93	98	102	100	100	102	96	96	91	88	82	78	75	72	68	62	58	
L Q	39	43	45	48	55	48	64	70	74	80	79	81	84	82	80	76	73	72	69	67	62	47	46	41	

FEB. 2001 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2001 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	R	R	F	F	F	J	R	R	B	B	B	B	R	Y	R	B	56	57	57	56	44	40	39			
2	36	32	37	58		A	R	B	R	J	R	R	J	R	R	R	R	R	66	65	62	62	59	50	52		
3	53	52	56	52	F	F	J	R		R	R	R	R	C	C	C	70	66	62	67	67	65	62				
4	66	70	65	75	S	J	R		97	102	100	103	101	94	86		R	87	76	70	66	66	62	62	64		
5	55	60	58	67	F	F	R	J	R	J	R	J	R	J	R	R	R	J	R	J	R	J	R	J			
6	66	66	63	F	F	B	B	A	R	F	A	R	R	J	R	R	J	R	67	65	63	62	58	42	42		
7	A		R	F		B			38	56	A	B	R	C	C	R	J	R	R	J	R	67		F			
8	45	38	47	44	F	F	R	R	R	R	R	R	J	R	R	R	R	R	82	85	81	72	70	67	65		
9	44		A	A	A		R	J	R	R	R	R	R	R	R	R	R	R	J	R	J	R	Z	F			
10	A	A	F	F	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R			
11	F	F	F	R	R	R	B		75	77	92	90	R	R	B	B	B	B	B	R	65	60	66	66	59	52	
12	F	F	F	R	R	R			64	75	77	92	90	R	R	R	R	R	R	R	R	R	R	R	R		
13	A	A	A	A	F	F	A		54	62	73	83	86	86	94	86	91	94	100	92	97	82	80	72	72	67	40
14	A	F	R		R	B	B	B	B	B	B	B	B	B	B	R	R	R	R	R	R	R	R	A			
15	A	R	R	B	B	R		58	66	68	79	B	B	R	B	J	R	B	68	68	68	69	64	60	56	54	
16	F	F	F	F	F	F	J	F	R	J	R	R	J	R	J	R	J	R	J	R	J	R	F	F			
17	37	30	38	42	F	F	R		61	68	80	96	86	94	84	85	83	70	72	74	70	68	62	53	36	26	
18	21	19	34	42	F	F	J	R		63	75	81	82	90	90	81	68		67	69	63	65	62	53	47	33	
19	24		R	A	A		F	F	R	R	R	R	J	R	R	R	R	J	R	J	R	J	R	F			
20	R	F	F	R	J	R	R	F	R	R	65	71	65	98	60	68	75	70	68	66	66	72	73	70	62	56	32
21	28	26	38	42	50			61		66	75	76	79	79	84	85	74	67	65	60	57	50	44				
22	F	F	F	R	A	R	J	R	R	R	62	62	67	68	73	72	70	66	63	64	62	60	57	44	26		
23	R	A	F	F		32	37	48	56	63	79	85	90	92	92	99	94	90	79	73	68	68	67	58	29		
24	A	R			F	F	R	B	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				
25	33	40	38	43	F	F	J	R	F	R	R	B	B	95	94	89	85	83	78	73	69	62	55	45	24		
26	22	22	38	49	F	F		60	79	79	91	94	95	98	R	R	R	R	R	R	R	R	F	A	A		
27	40	26	30		R	A	F	F	A	Y	B	F	B	B	B	B	B	B	B	R	R	R	R	F			
28	32	30	34	29	F	F	F	R	F	R	53	62	75	74	80	81	R	R	J	R	R	86	66	60	57	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	20	22	21	22	19	18	23	19	19	22	20	20	21	17	21	19	24	25	28	26	26	28	22	22			
MED	F	F	F	F	40	43	55	56	63	75	80	84	91	90	84	83	85	81	74	69	68	64	62	54	46	40	
U Q	50	48	54	55	58	60	73	87	92	96	94	94	96	90	90	85	82	76	72	69	66	62	56	52			
L Q	F	F	F	F	F	F	F	F	R	R	R	R	R	R	R	R	R	R	R	R	R	R	F	F			

FEB. 2001 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

11

FEB. 2001 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	45	35	76	34	24	28	33	36	B	B	B	B	B	G	G	B	28	G	30	32	23	30	39		
2	36	35	36	30	88	38	B	38	35	39	36	38	38	35	36	36	32	48	40	37	34	26	17	36	
3	15	29	32	35	22	28	23	47	35	35	38	33	43	40	C	C	C	42	37	34	32	36	33	32	
4	28	44	32	14	26	26	23	28	36	34	30	37	47	78	42	36	38	34	28	37	43	57	65	29	
5	16	22	21	24	20	32	34	42	37	38	42	38	39	79	44	42	41	31	38	31	32	49	31		
6	29	28	B	44	37	41	62	40	44	37	54	E	B	B	BE	BE	B	G	55	53	36	43	39	59	
7	72	56	40	44	B	32	36	57	B	C	C	36	38	38	59	35	30	28	26	34	34	18	33	36	
8	43	35	33	35	36	31	37	38	38	37	33	34	33	34	38	30	31	32	46	26	26	32	38		
9	59	48	41	50	32	24	28	26	23	30	36	34	48	33	29	31	28	29	E	B	24	21	12	25	
10	41	40	43	32	36	38	40	54	35	36	32	36	37	34	32	33	30	33	26	23	41	40	20	22	
11	23	27	29	35	40	36	33	B	37	28	60	34	B	B	B	B	B	G	E	E	E	E	B	27	
12	21	33	25	32	68	37	34	39	36	28	31	49	47	36	33	30	45	35	34	33	23	29	13	27	
13	45	43	43	76	32	41	36	53	E	B	B	B	34	32	B	B	E	B	E	B	37	32	B	39	
14	42	40	28	33	33	B	B	B	B	B	B	B	36	B	E	B	37	28	35	20	33	41	36	34	
15	41	44	38	B	B	34	31	27	30	32	B	B	38	63	B	E	B	G	E	B	E	16	14		
16	23	22	19	14	E	B	27	37	34	28	27	28	38	34	36	37	40	70	39	28	24	26	49	23	16
17	E	S	14	29	21	24	18	36	32	28	27	27	33	35	35	40	38	35	29	26	23	33	29	13	27
18	27	32	22	33	20	26	22	32	28	31	33	32	34	38	36	58	41	28	34	42	40	14	28	16	
19	31	28	42	71	37	41	39	39	38	42	45	34	31	33	32	32	30	27	23	27	25	26	30	39	
20	38	26	31	33	36	38	39	48	41	39	32	33	32	32	34	29	29	26	23	E	B	E	B	21	
21	38	37	38	43	56	34	39	38	44	38	30	36	34	34	33	57	32	28	58	27	33	22	28	29	
22	43	43	34	26	30	30	33	30	33	30	33	B	B	B	E	B	E	B	27	28	26	30	25	27	
23	41	41	34	35	37	22	35	36	B	B	B	42	35	56	30	53	29	30	24	26	20	25	45		
24	39	39	39	34	34	34	28	B	E	B	B	28	52	34	34	35	36	31	33	27	B	G	E	B	
25	21	20	22	18	18	17	22	27	54	53	B	42	40	39	30	23	26	21	22	20	15	10	31		
26	22	23	37	60	95	38	42	24	23	32	30	28	G	34	34	34	28	26	28	22	26	35	23	48	
27	49	45	40	39	50	22	B	27	B	B	B	B	B	B	E	B	32	26	24	26	21	23	26		
28	22	32	38	33	34	32	22	23	E	BE	28	31	35	48	23	34	44	36							
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	27	26	26	27	25	25	22	24	20	21	22	23	22	23	25	26	28	26	28	28	27	28	
MED	37	35	34	34	34	34	34	34	35	33	32	34	36	36	34	34	30	28	26	29	30	23	28	32	
U Q	42	42	40	39	40	37	38	44	38	39	38	38	38	38	40	42	38	35	34	34	37	36	30	33	
L Q	22	28	28	30	26	28	26	28	28	29	32	34	34	34	33	30	28	28	24	24	24	18	16	26	

FEB. 2001 fTES (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2001 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	10	10	13	11	10	15	15	26	B	B	B	B	B	15	26	11	B	13	21	14	13	11	14	12
2	10	10	14	16	22	19	B	19	15	12	17	16	16	16	16	15	18	13	11	12	12	10	12	10
3	11	10	11	16	14	12	11	14	12	11	13	12	14	13	C	C	C	12	12	11	12	11	10	10
4	10	10	11	10	10	12	12	15	12	13	13	13	15	19	15	14	12	12	12	14	12	12	13	10
5	10	11	10	11	11	11	12	11	12	16	21	20	19	19	16	20	14	12	10	11	13	12	11	10
6	11	10		15	28	12	12	12	20	12	54				55	53	15	27	15	15	14	13	10	11
7	11	10	10	11	B	12	12	24	25	C	C	20	34	59	22	B	28	14	16	12	13	12	12	11
8	11	12	11	14	16	15	15	20	20	11	12	11	13	18		38	19	19	14	14	14	13	18	10
9	16	15	20	25	18	12	16	17	12	12	16	26	16	11	12	12	10	13	29	11	11	12	9	8
10	15	25	11	11	14	20	19	54	16	12	12	11	15	16	14	13	19	17	14	13	14	17	13	11
11	10	9	9	10	27	25	33	B	11	12	60	12	B	B	B	B	B	25	27	29	25	26	12	
12	10	10	8	32	12	13	22	14	14	20	15	16	14	12	15	12	18	11	12	13	16	12	10	10
13	10	20	12	10	10	12	28	53	B	B	B	B	B	B	B	B	32	16	54	B	10	11	16	
14	15	10	13	12	12	B	B	B	B	B	B	B	B	B	B	20	37	14	16	16	29	12	10	12
15	12	15	25			15	12	12	8	14	B	B	B	34	63	B	24	18	16	18	24	16	9	8
16	10	8	10	14	10	16	12	9	15	15	21	16	19	14	12	16	14	11	13	13	12	12	6	6
E S	14	8	10	8	10	18	15	13	10	11	11	17	20	22	30	25	18	12	12	10	11	10	10	8
18	8	8	8	9	11	12	15	12	12	11	13	13	21	30	20	20	16	17	12	10	9	7	8	10
19	7	14	20	14	11	16	9	11	15	18	15	20	12	15	11	10	10	12	8	9	14	9	7	8
20	10	11	10	11	11	14	14	18	22	9	11	11	13	14	13	11	11	14	14	B	12	18	17	10
21	9	10	11	16	9	11	16	12	12	14	15	12	11	15	14	57	12	28	58	12	14	22	9	8
22	12	12	10	10	10	10	8	8	9	14	12	25	34	54	16	21	24	28	11	10	14	10	9	11
23	9	10	18	16	26	10	12	19	B	20	B	B	B	30	56	26	53	19	26	18	26	10	10	10
24	11	8	9	9	12	14	18	B	18	52	34	13	15	15	25	16	19	B	17	14	19	14	12	8
25	9	10	8	12	10	10	18	18	54	53	B	B	30	24	20	16	13	10	14	13	20	15	8	10
26	10	9	11	18	16	20	14	13	13	12	14	16	21	26	34	21	15	28	14	15	19	12	11	15
27	16	18	11	11	13	14	B	14	B	B	B	B	B	B	B	B	32	20	26	10	26	10	11	9
28	10	10	9	10	10	12	13	18	28	31	55	56	56	28	15	10	14	11	12	48	14	6	15	29
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	27	27	28	28	27	27	27	28	28	28	28	28	28	28
MED	10	10	11	12	12	14	15	16	15	14	16	17	20	20	20	20	18	15	14	13	14	12	11	10
U Q	12	12	13	16	16	17	18	22	41	28	56	45	32	59	38	24	20	19	16	18	14	13	11	
L Q	10	10	10	10	10	12	12	12	12	12	13	13	15	15	15	13	14	12	12	11	12	10	9	8

FEB. 2001 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

13

FEB. 2001 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	A	276	236	A	B	B	B	B	A	Y	220	B	220	226	238	254	258	288	A						
2	E	A	A	A	326	A	A	B	Y	212	Y	Y	Y	224	228	198	198	198	198	190	192	242	238	226	252					
3	248	248	A	A	AE	A	250	228	252	220	200	196	Y	Y	C	C	C	194	202	222	222	234	23	226						
4	232	242	258	292	272	242	220	220	208	208	212	210	A	AE	A	214	256	206	212	216	220	238	282	218						
5	236	248	256	270	268	234	230	226	226	202	210	258	Y	Y	A	Y	198	210	216	232	218	208	212	222						
6	Q	Q	B	B	A	A	A	A	A	A	Y	B	B	B	B	A	A	A	A	A	A	AE	A	262						
7	220	228	232	232	A	222	B	AE	A	A	B	Y	C	C	Y	Y	B	218	220	220	230	230	234	242	340	326				
8	298	218	226	264	342	A	A	Y	Y	Y	Y	Y	226	220	Y	208	228	240	234	248	Q	A	A							
9	370	A	A	A	A	A	264	254	216	220	216	206	Y	206	224	212	216	214	218	228	224	204	244	296						
10	A	A	Q	Q	A	292	B	Y	Y	Y	212	212	208	222	216	218	218	228	230	244	A	Q	272	238						
11	Q	Q	Q	Q	A	A	B	B	206	208	200	B	B	B	B	B	B	218	238	246	238	254	238	Q						
12	240	330	A	256	A	A	200	244	218	198	A	218	218	216	202	208	208	220	234	226	236	268								
13	A	A	A	A	188	A	A	B	B	B	B	A	Y	B	B	224	240	A	B	B	A	A	B	A	290					
14	A	A	A	A	216	B	B	B	B	B	B	B	B	A	B	B	242	214	A	Y	A	A	A	A	278					
15	A	226	A	B	B	A	266	230	218	206	B	B	Y	B	B	220	220	220	226	226	216	236	230							
16	258	288	288	292	334	A	272	238	216	206	206	206	210	218	218	206	198	194	A	Q	220	228	228	222	226					
17	E	S	A	Q	Q	A	A	298	228	196	198	196	196	Y	Y	Y	198	202	218	226	234	228	236	240	260					
18	S	304	A	262	210	A	A	244	228	224	224	224	224	Y	A	206	222	220	218	234	224	218	222	240	Q					
19	A	288	A	A	A	332	A	A	A	Y	Y	A	Y	218	212	212	212	212	218	232	244	216	226	246	Q	A				
20	A	F	A	324	A	A	A	A	276	246	208	204	216	196	214	214	214	214	214	214	B	Q	Q	226	244	266	276			
21	224	216	218	A	A	YE	A	250	234	A	220	196	228	228	228	228	346	208	216	B	244	244	236	222	292	Q				
22	228	A	A	A	310	320	254	226	218	208	208	228	210	B	212	204	212	212	218	230	242	248	326	A	A					
23	A	A	A	A	A	A	A	B	A	B	B	B	Y	B	220	B	E	A	E	B	272	272	272	276	320	320				
24	A	218	218	346	362	A	A	B	260	222	224	220	208	208	216	214	226	226	222	218	218	218	218	218						
25	Q	Q	Q	Q	A	250	262	229	029	230	4	286	266	230	B	B	B	Y	A	226	220	208	212	226	226	216	212	212	212	240
26	A	A	A	A	A	A	222	226	232	222	208	192	214	214	Y	226	210	210	228	228	252	A	Q	A	A	274				
27	A	A	A	238	218	202	A	B	B	B	B	B	B	B	B	226	226	260	254	250	290	28	226							
28	A	A	A	A	A	E	280	252	214	220	388	368	E	B	B	214	214	214	222	222	268	328	230	302						
29																														
30																														
31																														
CNT	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
MED	19	15	14	15	13	6	18	16	15	15	14	14	9	13	14	20	23	25	24	25	26	26	20	19						
U Q	239	248	257	288	304	263	259	231	218	208	208	212	216	214	216	214	214	218	226	233	231	236	238	240	A					
L Q	288	288	288	324	333	286	276	251	224	220	216	228	219	225	224	220	220	224	230	243	246	282	269	268						

FEB. 2001 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2001 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	XO	X	44	54	A	A	B	BO	X	XO	XO	XO	XO	XO	XO	X	X	X	X	XO	X	66	55	42				
2	41	40	40	44	R	X	R	X	X	X	B	X	X	XO	XO	XO	X	X	X	X	R	A0	X	44				
3	O	X	B	B	B	A	X	R	BO	X	BO	X	X	X	X	B	B	B	X	X	62	42	39	64				
4	O	X	50	53	B	B	B	A	A	B	B	BO	X	X	B	B	X	B	79	68	64	41	27	95				
5	Y	B	X	R	A0	X	A	RO	X	B	B	BO	X	X	B	BO	X	X	X	62	60	64	54	44	39			
6	A	A			B			X	X	BO	X	X	XO	XO	X	X			X	X	X	X		A				
7	A0	X	0	X	A	X	X	XO	X	BO	X	X	X	X	X	X	BO	X	X	X	76	74	73	44	45	46		
8	43	44	42	39	43	A	X	X	B	B	B	B	B	B	B	B	X	B	X	X	X	A	A					
9	A	A0	X	BO	X	X	X	X	X	X	X	X	XO	XO	XO	XO	X	X	X	X	X	X	X					
10	40	40	37	37	60	60	68	73	77	79	84	104	108	110	108	104	100				80	75	57	43				
11	O	X	43	52	41	42	60	O	X	B	XO	XO	X	O	X	X	XO	XO	X	X	74	62	54	58				
12	60	45	53	65	70	55	72	64	80	81	97	103					114	114	120	128	108	82	67	71				
13	O	X	58	50	60	A	A	B	RO	XO	X	B	BO	XO	X	B	B	BO	XO	X	82	78	55	46	38			
14	A	48	54		B	F	A	A	B	BO	X	B	XO	X	X	X	BO	X	X									
15	A	A	A		X	33	37	39	44	O	X	XO	X	X	X	XO	XO	X	X	X	X	X	X	X	55	42		
16	XO	XO	X	34	46	43	56	70	43	61	68	75	87	RO	X	XO	XO	X	X	X	X	X	X	X	X	38		
17	A	32	53	58	60	43	43	62	67	72	85	82	96	99	98	95	96	92	89	80	64	58	43	A				
18	A	35	A	A0	X	A	R	R	R	B	R					72	73	86	96	101	96	98	83	80	68	44	30	25
19	54	A	A	B	A0	X	A	A	R	R	RO	X	XO	X	X	X	X	X	X	X	X	X	X	X	A			
20	87	58	A0	X	A	B	B	BO	XO	XO	XO	XO	XO	XO	XO	O	XO	XO	X	36	36	32	35	A				
21	A	A	A	A	A	A	A	R	RO	X	B	BO	XO	X	X	XO	X	XO	X	O	XO	X	X	50	46	41		
22	X	34	33	33	28	28	40	49	67	77	86	87	98	106	104	101	94	86	78	68	62	46	42					
23	A	A	X	41	60	52		B	A	B	R	R	R	B	B	R	X	B	B	R	95	72						
24	A	A	O	X	41	38	44	44	36	42	57			BO	X	XO	XO	X	B	B	XO	X	X	X	X	36		
25	X	34	40	40	50	62	60		RO	X	X	XO	X	BO	X	B	B	B	X	RO	XO	X	66	54	36	62		
26	56	41	57	50	56	63	69	46	70	80	96	87	99	106	104	109	106	104	100	89	70	54	33					
27	33	43	52	41		O	X	A	B	B	X	XO	X	RO	XO	X	XO	X	X	X	X	X	X	A				
28	B	A	58	68	A0	X	35	40	39	49	69	79	79				71	46	53	A	68	39	37					
29	41	59	A	B	B	B	B	B	B	B	B	B	B	B	B	105	110	110	110	106	96	50	28	30	28			
30	A	A	B	A	B	A	R	B	B	B	B	B	B	B	B	BO	X	X	X	X	X	X	X	B				
31	A	B	O	X	B	B	B	B	B	B	B	B	B	B	B	BO	X	B	R	RO	X	A	Y	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	18	19	22	21	14	17	16	16	17	17	17	19	18	25	23	25	23	23	26	28	29	25	28	18				
MED	42	41	50	44	56	60	55	65	68	77	84	84	89	92	96	95	94	86	82	76	66	54	41	42				
U Q	56	45	53	59	60	62	68	72	80	82	90	88	98	102	110	104	104	104	93	80	68	60	46	55				
L Q	X	34	38	41	38	43	41	43	55	61	68	78	79	79	82	86	84	80	76	74	66	54	44	34	37			

MAR. 2001 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2001 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	35	38	36	A	A	B	B	R	64	74	78	78	82	81	81	79	74	73	68	70	69	54	38	26	
2	30	26	30	31	F	F	F	R	54	74	84	88	93	92	90	83	80	88	76	76	68	60	R	38	
3	41	R	B	B	B	A	F	R	56	31	60	80	74	78	80	86	B	B	B	56	36	28	50	46	
4	34	F	R	F	B	B	B	A	A	B	B	B	R	64	74	B	B	J	B	F	F	F	R	32	
5	Y	B	R	A	R	A	R	R	35	38	B	B	B	R	R	R	B	R	R	R	56	54	58	48	33
6	A	A	F	F	R	B	F			B	R	RJ	R	R			F	F					F	A	
7	A	27	34	38	56	68	79		78	81	89	82	80	78	70	66	62	61	57	51	31				
8	32	50	33	60	55	62	66		R	B	U	R	R	J	R	B	R	70	68	67	33	36	27		
9	A	F	F	F	F	A		57	60	B	B	B	B	B	B	B	B	J	R	B	J	R			
10	26	26	22	32	34					75	90	92	97	93	93	85	82	83	76	68	60	63	50	45	40
11	27	57	68	61	72					75	90	92	97	93	93	85	82	83	76	68	60	63	50	45	40
12	30	26	25	24	48	48	56	59		67	73	78	98	102	104	102	98	94	J	R	R	74	62	46	
13	26	31	40	24	30	33	58		R	B	R	R	R	R	R	R	R	R	R	R	R	R	R		
14	A	F	F	F	B	F	A	A	A	B	B	R	B	J	R	RJ	R	B	R	R	F	F	F		
15	A	A	A	F	F	R			R	J	R	J	R	R	R	R	R	J	R	R	R	R	R		
16	27	30	33	34	56	60	67	73	76	84	98	105	94	94	91	91	91	80	73	62	53	44	31		
17	22	28	40	28	42	56	37	55	R	R	R	R	R	R	R	R	R	J	R	74	70	61	48	31	
18	A	F	F	F	F	F	R	R	J	R	J	R	R	R	R	R	R	J	R	R	J	F	F	A	
19	21	26	27	48	26	31	48	57	66	79	76	90	93	92	89	90	86	83	74	58	52	20			
20	A	F	A	A	R	A	R	R	R	B	R	F	F	J	R	R	R	R	R	R	R	R	R		
21	19	50								62	65	78	90	95	90	92	77	74	60	34	24	19			
22	A	A	A	B	A	R	A	A	R	R	R	R	R	R	R	R	R	J	R	F	F	F	A		
23	35	32	36							78	93	102	102	84	98	86	60	41	J	R	R	R	R	R	
24	A	A	F	R	F	F	R	R	R	B	B	B	R	R	R	R	R	R	J	R	B	J	R		
25	31	32	28	30	30	36	51																		
26	F	R	J	R	F	R	R	R	FJ	R	R	R	R	R	R	R	R	J	R	J	R	F	A		
27	28	30	34	44	56	48	60	59	62	68	69	82	94						J	R	R	R	R	R	
28	A	F	F	F	A	R	R	R	FJ	R	J	R	R	R	R	R	R	J	R	R	R	R	R		
29	20	32	32	38	48	54	40	61	74	90	81	93	100	98	102	104	98	94	83	64	48	27	A		
30	F	A	A	B	B	F	B	B	B	B	B	B	B	B	B	B	B	J	R	R	J	R	R		
31	33	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	R	R	R	A	Y	F		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	14	18	22	20	14	17	15	16	17	17	17	19	18	25	23	25	23	23	26	27	28	24	26	17	
MED	30	28	35	32	38	37	54	58	61	69	78	78	83	86	90	89	88	80	76	68	58	47	30	31	
U Q	35	32	40	34	48	55	57	63	74	76	84	82	92	96	104	97	98	98	87	74	61	52	38	36	
L Q	26	25	30	27	30	32	34	46	54	61	72	73	73	76	80	78	74	70	68	58	42	33	25	26	

MAR. 2001 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2001 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	40	E B 20	36	67	39	B	B	36	26	26	32	33	34	32	32	30	28	24	24	27	26	26	28	28							
2	34	32	31	39	42	42	40	37	24	28	B E B 35	34	34	31	29	27	24	28	23	18	41	42	34								
3	49	B B B	58	26	23	34	32	B B B B B	32	33	30	30	27	B B B B B	B B B B B	22	25	15	39	41											
4	43	43	36	B B	B B	B B	41	43	B B B B B	54	32	B B B B B	54	B B B B B	27	27	16	22	23	68											
5	19	44	22	63	28	49	21	32	B B B B B	56	62	B B B B B	33	27	25	20	22	30	36												
6	39	39	26	72	42	45	33	32	B E B B B	30	34	32	33	30	32	26	24	22	19	16	16	30	60								
7	34	36	32	32	49	34	42	42	54	E B B B B	55	58	28	34	33	B E B B B	32	30	20	23	20	16									
8	21	32	32	27	34	35	26	24	B B	B B B B B	B B B B B	B B B B B	B B B B B	56	28	25	16	15	36	38											
9	58	95	42	37	36	22	23	24	24	G B G B	23	25	31	31	33	28	26	22	27	23	25	40	30	15							
10	31	32	29	27	24	26	31	23	B B	32	73	34	31	30	26	26	53	26	21	11	37	38									
11	31	31	30	24	26	36	36	B E S	31	32	29	32	35	30	34	34	27	22	20	16	14	12	20	16							
12	19	14	10	30	14	12	16	20	18	E B B B B	30	31	55	54	B B B B B	31	34	23	26	27	20	34	45	46	49						
13	45	43	49	44	40	44	42	41	E B	B B B B B	49	54	56	B B B B B	B B B B B	26	52	18	22	29	39										
14	33	54	42	34	38	44	37	42	B B	B B B B B	32	56	54	55	34	B B B B B	58	30	25	31	33	35									
15	33	40	46	37	32	38	27	20	17	G E B E B E B E B	34	27	29	30	30	E B B B B B B B	30	27	23	35	24	35	22	27	13						
16	35	40	44	28	24	17	20	25	25	E B E B E B E B B	32	30	30	26	29	29	28	23	21	28	27	25	16	15	13						
17	41	38	18	17	16	14	18	17	22	E B E B B B	28	29	28	30	28	E B B B B B	28	27	22	28	24	17	31	70							
18	34	17	36	38	30	66	44	39	34	B B	36	32	31	27	18	E B B B B	62	29	28	34	26	20	27	18	29						
19	38	42	46	B B	41	42	37	45	38	39	48	36	32	30	57	31	G E B B B	32	52	26	13	56	58	94							
20	79	36	40	40	36	B B	B B	B B	24	31	27	30	27	24	24	22	22	20	14	50	62	150	69								
21	133	140	98	38	59	41	40	31	20	E B E B E B B B	35	30	B B B B B B B B	56	35	34	24	26	24	25	22	21	14	36							
22	40	26	26	22	20	19	20	21	27	E B E B B B B B	29	31	33	55	42	26	26	25	21	23	34	48	47	34							
23	94	50	39	35	32	B B	44	34	47	E B E B E B B B	39	B B B B B B B B	30	58	B B B B B B B B	37	42	46	46	67											
24	42	36	35	32	34	29	28	19	24	B B	B B B B B	B B	B B B B B	60	36	31	28	26	B B B B B B B B	22	40	41	29								
25	34	35	28	46	28	30	38	54	30	E B E B E B B B	32	16	31	31	34	E B E B E B B B	54	54	30	17	19	34									
26	35	23	28	28	24	16	17	26	22	E B E B E B B B	27	23	54	60	57	30	22	24	31	30	25	22	22	17	32						
27	24	23	24	25	94	B B	41	56	31	E B E B E B B B	34	31	31	60	56	E B E B E B B B	27	23	25	21	22	22	58								
28	B 43	44	16	55	49	38	30	30	30	B B B B B B B B	26	28	B B B B B B B B	31	33	37	41	48	41	34	34										
29	28	39	35	B B	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 B B B B B B	33	53	29	26	24	54	19	21	22	24	38						
30	36	32	46	B B	46	35	B B	B B	B B	B B B B B B B B	B B	B B	B B	B B B B B B B B	B B B B B B B B	56	28	27	25	15	17										
31	27	30	B B	B B	B B	B B	B B	B B	B B	B B B B B B B B	B B	B B	B B	B B B B B B B B	B B B B B B B B	30	32	28	22	32	23	27	20								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
CNT	30	28	29	26	25	23	25	25	23	20	20	21	20	25	24	25	23	24	29	30	31	29	31	29							
MED	35	36	35	33	34	35	35	30	28	31	30	30	31	31	30	28	27	25	28	24	22	22	30	35							
U Q	42	42	43	39	46	42	41	40	34	34	34	34	44	56	39	34	28	32	36	27	30	40	39	45							
L Q	31	32	28	27	25	26	22	22	28	28	30	30	30	30	30	28	26	24	24	22	20	16	20	28							

MAR. 2001 fTEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

17

MAR. 2001 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	23	20	9	25	26	B	B	19	16	11	16	17	15	17	17	20	15	12	10	10	10	8	7	8			
2	7	10	9	8	18	25	30	12	10	12	B	35	11	12	25	12	16	17	28	10	13	17	9	11			
3	13	B	B	B	20	15	14	29	B	32	21	20	15	21	20	B	B	B	B	14	15	7	11	11			
4	10	8	8	B	B	B	B	19	24	B	B	B	54	18	B	B	54	14	16	13	10	16	11				
5	10	B	11	14	9	15	14	11	19	B	B	B	56	62	B	B	33	24	25	14	9	8	10				
6	10	10	14	11	15	B	B	18	14	17	B	30	34	27	29	24	16	15	11	14	19	16	9	9	13		
7	24	11	15	29	22	16	16	17	54	B	55	58	24	34	19	33	B	32	30	15	12	B	11	7			
8	11	8	8	15	12	23	17	16	B	B	B	B	B	B	B	B	B	56	28	25	11	8	10	9			
9	17	13	15	21	B	17	14	17	16	20	19	18	26	18	20	19	15	12	10	14	25	13	10	10			
10	8	9	7	7	9	9	15	16	B	20	21	22	73	29	27	20	18	26	53	26	14	8	8	12			
11	8	9	8	8	9	10	21	B	18	26	14	15	24	16	14	14	14	19	12	11	8	8	7	8			
12	10	9	10	9	8	12	9	12	14	30	31	55	54	B	B	19	11	13	15	27	13	9	8	9	10		
13	12	14	8	16	20	19	B	18	16	49	B	B	54	56	B	B	B	B	26	52	18	10	10	10			
14	24	10	13	15	B	20	25	30	16	B	B	32	B	56	54	55	34	B	58	29	25	8	12	9			
15	25	9	11	11	10	9	14	14	11	11	12	15	21	17	14	30	16	16	15	14	26	12	9	9			
16	8	12	11	10	8	10	20	25	25	32	30	30	20	18	14	14	11	10	12	8	25	8	15	8			
17	10	10	10	9	8	8	7	9	12	28	29	21	30	16	14	15	10	9	8	7	7	10	10	12			
18	E 10	S 11	13	16	15	26	31	20	27	B	29	19	22	15	16	62	29	28	34	26	10	7	11	10			
19	11	18	19	B	24	15	21	20	9	21	20	25	27	18	57	31	19	12	52	12	10	8	12	12			
20	12	9	24	15	9	B	B	B	B	19	24	20	14	17	16	20	18	19	20	10	8	8	8	8			
21	10	12	8	19	16	8	9	24	16	16	30	B	B	56	35	20	20	26	24	25	18	17	10	8			
22	12	8	12	16	15	19	20	21	17	18	24	18	20	20	20	18	16	25	13	8	9	11	10	8			
23	15	16	11	11	11	B	18	B	26	24	31	B	B	B	B	30	58	B	B	20	29	9	11	9			
24	26	16	11	9	8	8	12	10	8	B	B	B	B	B	60	36	31	20	20	B	B	11	8	8	11		
25	9	10	12	15	19	15	16	54	30	32	14	31	B	B	31	34	B	B	54	54	30	17	19	10			
26	9	9	9	10	9	9	10	26	18	27	20	54	60	57	30	16	19	31	30	25	10	10	10	13			
27	11	12	12	18	26	B	B	28	B	56	31	34	21	31	60	56	27	20	25	21	22	B	16	26			
28	B	26	13	11	15	12	10	16	19	21	20	11	B	B	B	B	31	30	14	11	12	13	11	17			
29	11	19	26	B	18	B	B	B	B	B	B	B	33	53	29	26	24	54	19	11	16	15	12	B			
30	12	14	28	B	26	30	B	B	B	B	B	B	B	B	B	B	56	27	27	25	15	17	B				
31	21	25	B	B	B	B	B	B	B	B	B	B	B	B	B	30	B	27	24	22	15	14	14	11			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31			
MED	11	11	11	15	15	17	18	20	19	32	30	34	54	31	30	30	20	26	25	19	13	10	10	10			
U Q	17	16	15	25	26	B	B	30	30	B	B	B	B	B	B	B	57	62	58	56	34	26	18	14	12	12	
L Q	10	9	9	10	9	10	14	16	16	20	20	20	21	17	19	18	16	16	14	11	10	8	9	9			

MAR. 2001 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2001 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 194	194		A	A	B	B	A	212	192	206	214	228	206	230	216	214	226	226	222	226	216	216	326				
2	298	282	292	A	A	A	A	A	326	212	212	B	E	B	236	224	224	226	218	218	222	238	214	246				
3	A	B	B	B	A	A	A	A	296		238	B	224	228	234	216	224	B	B	B	252	A	A	F				
4	220		216	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	298	248	260	282	A					
5	Y	B	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	242	252	274	238	248				
6	A	A	A	A	A	B		222	190	270	B	E	B	E	B		Y	224	218	218	226	234	232	224	242			
7	A 242		A 314	E	A	A	A	A	300	B	B	B	B	214	230	230	228	B	240	236	226	206	B	A	284			
8	F 260	216	218	A	A	E	A	A	308	246	B	B	B	B	B	B	B	B	256	222	222	234	236	A	A			
9	A	A	A	A	B	Y	A	252	226	232	238	210	236	216	226	230	228	234	250	232	208	228	230	240				
10	A 222		222	A	A	A	A	B	320	350	194	232	220	236	B	218	228	214	222	216	248	212	212	212				
11	E 344	A 340	A	A	A	A	B	340	256		Y	212	212	212	212	226	226	212	212	212	206	206	206	214	244			
12	Q 258	Q 266	S 322	S 330	S 334	298	258	218	226	226	226	226	282	292	220	220	220	220	216	214	218	260	Q	A	A			
13	A 244	246	A	A	A	B	A	A	A	B	B	B	B	B	B	B	B	E	B	256	300	258	234	316				
14	A 388	332	A	B	A	A	A	B	B		220	B	B	E	B		B	E	B	264	274	252	268	228	230	276		
15	A 204	194	238	246	A	262	246	232	216	216	208	202	216	220	228	224	218	216	228	230	226	238	Q	F				
16	A 232	230	240	242	A	A	E	B	308	248	228	232	218	224	212	208	228	218	220	224	212	206	234	236	238	230		
17	A 280	F	A	A	A	A	Q	218	216	232	222	222	216	224	218	230	230	222	221	210	198	202	234	266	226			
18	A 384	E	A	A	A	A	A	A	332	A	A	A	B	A	240	226	220	226	284	224	226	236	224	224	274	304	328	
19	A 24	A	A	B	A	A	A	A	A	A	A	A	Y	A	242	254	240	240	246	266	244	154	E	A	A			
20	F 192	A 242	A	A	A	B	B	B	E	A	262	252	276	266	260	296	290	262	274	358	242	212	A	A	A			
21	A 268	A	A	A	A	A	A	A	A	E	B	B	B	B	B	B	B	E	B	254	238	248	252	240	246	254	244	272
22	E 332	A 370	E 398	A 440	A	B	E	B	338	260	260	238	234	226	216	266	240	234	226	212	218	212	218	254	208	272		
23	A 238	A 252	F	188	B	A	B	A	A	A	A	B	B	B	B	B	B	B	B	A	A	A	A	216				
24	A 252	A	A	A	A	A	A	158	204	B	B	B	B	B	B	B	B	B	246	232	244	220	B	B	Q			
25	A 248	A	A	A	A	A	B	B	268	234	238	B	240	B	242	B	B	B	266	266	232	240	274	A				
26	A 188	A	A	A	A	F	Q	314	264	234	234	228	268	278	280	236	236	226	220	226	226	220	232	278				
27	A 24	A	A	A	A	B	B	A	B	B	B	E	B	244	256	240	240	282	244	224	226	216	232	240				
28	B 296	A 204	Q	A 294	E	A	F	A	172	274	258	258	B	B	B	B	B	A	A	A	210	218	192					
29	218	A A	A	B	B	B	B	B	266	B	B	B	B	B	238	266	236	230	216	296	324	E	B	B	322	240		
30	A 31	A	A	B	A	B	A	B	B	B	B	B	B	B	B	B	B	B	254	222	232	282	328	302				
31	A 318	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E	B	B	A	A	B	A	Y	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	13	15	9	4	5	11	14	12	14	16	19	16	19	23	24	22	21	26	27	26	19	17	12				
MED	U 233	237	246	269	285	298	281	232	227	232	226	223	223	224	224	229	226	226	225	231	227	229	236	230	241			
U E	A 298	E 311	A 318	A 331	A 333	A 330	A 314	A 262	A 251	A 238	A 242	A 256	A 238	A 240	A 254	A 241	A 244	A 241	A 252	A 246	A 240	A 254	A 294	A 278				
L Q	220	223	218	232	213	225	266	194	214	232	219	216	215	212	224	220	222	220	218	218	212	230	217	234				

MAR. 2001 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

19

APR. 2001 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	R 49	X 37	O	X	B	A	A	O	X	X	B	B	B	B	B	B	B	O	X	X	O	X	A	A					
2	O 45	X B	B	A	B	B	B	O	X 72	B	B	B	B	B	B	B	O	X 79	X	X	X	A	A	R					
3	A	B	A	A	A	A	O	X 44	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B					
4	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	X 79	B	B	B	B	B					
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	X 68	X 63	B	R	R							
6	O 51	X 50	O	X	A	R	A	O	X 56	X	B	B	B	B	B	X 88	X 104	B	O	X 116	X 97	X 72	O	X 48	X 30	A	R		
7	A	A	Y	R	B	B	X 56	B	B	B	B	B	B	B	B	X 103	X 108	X 108	X 103	X 80	B	B	B	B	B				
8	B	B	R	R	O	X 52	X	B	R	B	B	B	B	B	B	B	B	B	X 90	B	O	X 40	A	A	X 59				
9	A	A	80	60	50	A	O	X 39	X	B	B	B	B	B	B	X 79	X 80	X 108	X 102	X 84	B	O	X 40	A	A				
10	A	B	R	B	B	B	B	B	X 68	X 62	X 74	X 72	B	B	B	B	B	B	B	B	X 55	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	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X 42	R	A	A	A				
13	A	B	Y	A	A	A	O	X 40	B	B	B	B	B	B	B	B	O	X 99	X 76	X 61	X 38	A	A	A	O	X 39			
14	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	X 89	B	B	B	O	X 37	X 28	X 29	X 25			
15	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	O	X 100	O	X 103	B	O	X 51	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	B				
17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X 106	X 89	X 80	X 62	R	R	A	A	
18	O 50	X B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R	O	X 51				
19	A	B	B	A	B	B	O	X 46	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X 42	O	X 33	B	B		
20	A	A	A	A	A	B	A	A	B	B	B	B	B	B	B	O	X 69	B	O	X 89	X 98	X 91	X 78	B	R	B	B	O	X 24
21	A	A	O	X 38	A	A	A	X 39	B	O	X 42	X 67	82	91	100	108	120	108	108	100	80	69	39	23	O	X A	A		
22	72	73	A	A	O	X 62	46	A	B	A	B	B	B	B	B	B	O	X 44	106	74	48	30	36	47	A	A			
23	A	A	A	44	56	A	A	B	B	B	B	B	B	B	B	B	X 47	59	56	41	B	B	O	X 28	A				
24	39	A	O	X 41	A	O	X 29	34	36	38	48	O	X	R	O	X	O	X	X	X	O	X 0	O	X 28	O	X 28			
25	O	X 27	X 30	O	X 29	X 28	O	X 31	47	55	60	62	71	83	105	105	112	119	124	106	98	81	36	28	45	41	X O	X X	
26	A	O	X 29	A	A	A	X 50	53	53	70	R	O	X	X	X	X	X	X	X	X	X	X	O	X 71	B	B	A		
27	A	39	32	31	34	32	34	54	57	66	86	93	110	114	124	124	105	108	101	80	55	34	27	X O	X B				
28	B	26	28	32	40	71	61	B	B	X	X	O	X	X	X	O	X	X	X	R	42	R	A	A					
29	A	O	X 37	A	A	B	A	A	B	B	B	O	X	X	X	X	X	X	X	X	X	X	O	X 37	O	X 24	X 22	X 23	
30	O	X 26	X 27	38	44	40	39	43	42	45	66	79	84	X 96	102	107	106	106	82	68	44	28	24	24	B				
31																													
CNT	7	8	8	6	9	8	12	11	9	5	7	8	7	9	12	14	16	19	17	21	16	9	9	6					
MED	O 45	X 38	38	38	40	43	44	53	57	67	79	87	100	108	108	104	106	90	80	55	39	28	28	40	X 0	X 0	X 0		
UQ	O 51	X 50	40	44	54	48	53	68	62	72	83	92	105	112	120	111	108	106	98	72	48	32	37	51	X 0	X 0	X X		
LQ	O 27	X 30	30	28	32	36	38	42	44	66	68	72	80	94	84	98	90	78	57	43	36	24	24	25	X 0	X 0	X 0		

APR. 2001 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2001 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	R	R	R	B	A	A	R	R	R	B	B	B	B	B	B	B	R	44	43	30	R	A	A	A						
2	R	B	A	B	B	B	B	U	R	B	B	B	B	B	B	B	R	73	63	55	29	A	A	R						
3	A	B	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B						
4	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	J	R	73	B	B	B						
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	J	R	62	57	R	R						
6	R	R	A	R	A	R	R	50	47	B	B	B	B	B	B	B	R	110	91	66	42	24	R	A	R					
7	A	A	Y	R	B	B	J	R	50	B	B	B	B	B	B	B	R	97	102	102	97	71	F	B	B					
8	B	B	R	R	R	B	R	B	B	B	B	B	B	B	B	B	B	J	R	B	R	R	A	A	53					
9	A	A	F	F	A	R	R	33	45	B	B	B	B	B	B	B	J	73	74	102	96	78	R	B	B					
10	A	B	R	B	B	B	F	J	R	J	R	R	B	B	B	B	B	B	B	J	R	49	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	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	36	R	A	A					
13	A	B	Y	A	A	A	A	R	34	B	B	B	B	B	B	B	R	93	70	55	32	R	A	A	A					
14	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	83	B	B	B	31	22	23	19					
15	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	S	F	B	U	R	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	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	100	83	67	56	R	R	A	A					
18	R	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R	R	45					
19	A	B	B	A	B	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	R	36	27	B	B					
20	A	A	A	A	A	B	A	B	B	B	R	63	B	B	R	J	R	J	R	B	R	B	B	R	18					
21	A	A	R	A	A	A	B	R	J	R	R	94	102	114	102	102	J	R	S	74	60	30	17	R	A	A				
22	A	F	A	A	R	F	A	B	A	B	B	B	B	B	B	R	F	38	97	64	35	16	30	27	30	F	A			
23	A	A	A	F	A	A	A	B	B	B	B	B	B	B	B	B	J	R	B	41	53	50	35	F	B	R	A			
24	A	A	R	A	R	F	R	R	R	R	R	62	70	94	100	90	F	F	F	80	79	71	48	33	22	22	R	B		
25	R	R	21	24	23	22	25	41	49	46	56	65	77	99	96	102	113	118	100	100	92	75	30	22	39	26	R	U	F	
26	A	R	A	A	A	F	F	R	R	F	R	62	79	97	98	120	110	F	J	R	F	99	102	97	65	33	R	B	A	
27	A	F	26	21	21	25	20	26	38	41	60	80	87	104	108	118	118	R	J	R	J	R	99	102	95	74	41	28	21	R
28	B	B	16	22	26	34	60	R	R	F	B	B	63	74	105	106	105	106	98	60	R	F	R	A	A	35	R	B		
29	A	R	A	A	B	A	A	B	B	B	B	R	68	79	74	71	74	68	52	38	28	18	16	17	R	F	B			
30	R	20	21	21	21	26	23	28	28	34	56	73	78	R	J	R	90	96	101	100	100	67	55	38	22	18	13	R	F	
31																														
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	5	8	8	6	8	8	12	11	8	5	7	8	7	9	12	14	16	19	17	21	16	9	9	6						
MED	R	R	39	28	27	22	26	33	36	39	42	61	73	78	94	98	100	97	99	84	67	49	30	22	22	30	R	R		
UQ	R	R	R	44	44	34	34	42	42	44	57	56	66	77	86	97	104	114	105	101	100	92	66	38	26	26	45	R	R	
LQ	R	R	F	20	24	21	21	25	24	29	34	35	58	62	66	74	88	78	90	82	68	51	37	28	18	17	19	R	R	

APR. 2001 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

21

APR. 2001 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	34	21	22		B	42	34	23	E 27	G	B	B	B	B	B	B	B	BE 30	BE 17	30	36	42	78					
2	74		B	B	B	B	E 39	B	B	B	B	B	B	B	B	BE 37	BE 20	23	22	35	34	40						
3	37		B	27	34	33	42	33	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B					
4		B	B	B	B	B	B	38	B	B	B	B	B	B	B	B	BE 22	B	B	B	B	B	B					
5		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	BE 54	BE 24	B	36	29							
6	33	32	38	33	73	26	31		B	B	B	B	B	BE 31	BE 55	B	BE 55	BE 21	14	26	18	35	46					
7	79	47	36	42		B	B	30	B	B	B	B	B	BE 54	BE 55	BE 63	BE 54	BE 32	B	B	B	B	B	B				
8		B	BE	B	30	33	34	34	B	B	B	B	B	B	B	B	BE 53	B	30	35	37	39	43					
9	98	38	37	22	33	42	37	31		B	B	B	B	BE 31	BE 31	BE 29	BE 29	BE 20	B	32	75	60						
10	38		B	B	B	B	B	22	E 25	E 30	E 56	B	B	B	B	B	B	BE 30	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				
12		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	BE 26	30	34	56	60							
13	31		B	28	32	32	34	32	22	B	B	B	B	BE 89	BE 52	BE 30	BE 25	BE 33	35	34	39	61						
14	40		B	B	B	32			B	B	B	B	B	BE 54	B	B	B	24	23	22	20							
15	27	29	35		B	B	37		B	B	B	B	B	BE 72	BE 24	B	BE 25	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				
17		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	BE 60	BE 56	BE 32	18	17	30	37	79				
18	36		B	37	38				B	B	B	B	B	B	B	B	B	B	B	B	30	32	44					
19	58		B	B	103				B	BE	B	B	B	B	B	B	BE 26	BE 17	B	B	B	B	B	B	B			
20	24	68	37	34	38	43	38		B	B	BE	B	B	BE 56	BE 58	31	BE 25	34	29	B	BE	S	12					
21	20	32	28	36	36	36	28		BE 29	BE 31	BE 28	BE 27	BE 24	BE 25	BE 26	BE 24	BE 21	BE 19	BE 21	26	13	14	33	51				
22	60	40	44	41	33	32	46		B	B	B	B	B	BE 29	BE 53	BE 26	BE 27	BE 14	34	128	130	120	154					
23	67	68	50	57	40	38	49		B	B	B	B	B	BE 30	BE 24	BE 31	BE 29	B	B	30	34							
24	33	28	40	30	32	20	21	20	44	43	35	52		BE 58	BE 54	BE 53	BE 19	BE 18	BE 12	BE 22	12	16	19		B			
25	23	33	28	27	31	39	43	41	32	28	52	32	34	26	58	29	22	27	17	28	20	17	30	36				
26	41	35	34	61	40	32	21	20	39	34	54	26	58	29	26	28	57	37	26	19	19		31		B			
27	94	30	27	35	26	28	34	39	17	17	25	32	32	23	23	21	21	26	21	10	12	12	18					
28		B	B	16	14	13	20	39	23	18	E 23	E 23	54	25	30	56	58	28	32	23	26	35	35					
29	38	74	71	44		B	48	36	78		B	B	BE	B	56	24	24	19	18	16	14	14	12	11	12	14		
30	29	38	28	21	17	18	18	16	17	13	18	22	24	22	23	22	17	19	19	50	18	16	27	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	22	15	22	19	17	17	19	13	10	7	7	8	7	9	12	14	16	19	17	24	19	18	21	18				
MED	38	35	35	34	33	34	33	25	24	29	35	30	24	29	28	30	28	29	21	26	21	28	34	44				
U Q	60	47	37	42	39	38	39	39	39	34	54	42	56	43	54	53	56	53	30	30	34	39	60					
L Q	31	30	28	30	32	27	28	21	17	17	25	24	23	24	24	24	21	24	18	18	16	17	20	34				

APR. 2001 fTES (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2001 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	30	19	16	B	18	18	17	27	24	B	B	B	B	B	B	B	B	30	17	16	10	11	11	
2	17	B	19	B	B	B	B	39	B	B	B	B	B	B	B	B	37	20	10	8	10	29	26	
3	26	B	14	27	30	25	25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
4	B	B	B	B	B	B	32	B	B	B	B	B	B	B	B	B	B	B	22	B	B	B	B	
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	54	24	B	24	20		
6	22	22	20	19	26	26	22	B	B	B	B	B	B	31	55	B	55	21	14	17	15	18	18	
7	30	18	29	27	B	B	27	B	B	B	B	B	B	54	55	63	54	32	B	B	B	B	B	
8	B	B	30	25	24	29	B	B	B	B	B	B	B	B	B	B	53	18	21	24	16	15		
9	25	24	11	10	13	18	15	15	B	B	B	B	B	31	31	29	29	20	B	B	11	14	12	
10	12	B	24	B	B	B	15	25	30	56	B	B	B	B	B	B	B	30	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	
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	26	17	21	20	25		
13	20	B	24	25	20	20	20	19	B	B	B	B	B	B	89	52	30	24	19	25	20	19	14	
14	15	B	B	B	24	B	B	B	B	B	B	B	B	B	B	54	B	B	B	11	10	9	11	
15	12	13	22	B	B	24	B	B	B	B	B	B	B	B	B	72	24	B	25	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	
17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	60	56	32	18	14	15	18	18	
18	21	B	29	20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	25	25	26	B	
19	28	B	B	29	31	B	B	B	B	B	B	B	B	B	B	B	B	26	17	B	E	S	B	
20	11	18	15	19	18	16	26	B	B	B	56	B	B	58	31	25	34	B	29	B	E	12		
21	12	9	14	16	10	12	11	30	31	28	27	24	25	26	20	21	19	21	26	10	11	10	14	
22	15	9	16	8	10	11	13	B	B	B	B	B	B	29	52	26	7	9	7	9	11	12	10	
23	11	9	12	11	12	21	16	B	B	B	B	B	B	B	30	24	9	13	B	B	9	7		
24	9	8	10	11	11	10	9	10	11	24	28	52	B	58	54	53	19	10	12	11	12	10	14	
25	11	9	9	10	9	11	10	9	15	19	52	32	26	26	58	29	15	8	10	28	20	9	9	8
26	8	8	10	10	12	10	10	8	12	28	54	26	58	29	26	28	57	37	26	19	19	8	B	
27	14	8	9	8	11	10	11	11	9	10	26	22	18	17	18	16	10	10	10	10	12	9	12	
28	B	B	9	9	9	20	19	9	18	B	B	20	20	54	26	30	56	58	28	24	14	13	15	13
29	15	11	20	19	B	17	25	24	B	B	B	56	17	17	13	10	10	8	8	8	6	10	9	B
30	11	8	9	8	10	8	10	7	8	8	8	10	9	13	15	15	9	8	19	11	16	7	8	
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	20	B	20	25	25	26	25	B	B	B	B	B	B	B	B	B	66	54	31	24	20	20	18	22
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	
L Q	12	9	12	11	12	17	15	15	24	B	B	56	B	54	31	30	26	24	20	14	14	10	12	12

APR. 2001 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2001 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	A	A	E	B	224	218	B	B	B	B	B	B	B	B	Q	A	A	A	
2	214	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	260	232	286	A	A	A	
3	A	B	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
4	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	254	B	B	B	B	B	
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E	E	B	B	A	A	
6	E	A	A	A	A	Q	A	B	B	B	B	B	B	B	B	E	B	246	220	220	A	B	A	
7	340	308	258													242	256						204	
8	A	A	A	A	B	B	A	B	B	B	B	B	B	B	B	E	B	274	268	266	268	254	B	
9	B	B	A	A	210	B	A	B	B	B	B	B	B	B	B	E	B	B	328	E	B	B	A	
10	A	A	A	A	268	268	254	228	206	B	B	B	B	B	B	E	B	272	260	248	234	272	B	
11	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	E	B	322	278	254	310	272	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	
13	A	B	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	
14	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	264	B	B	A	A	A	
15	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	274	210	234	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	
17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	238	238	222	214	A	A	
18	A	268	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	194	
19	196	B	B	A	B	B	E	B	B	B	B	B	B	B	B	B	B	258	B	E	B	226	B	
20	A	198	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	254	224	210	238	232	S	
21	A	E	A	A	A	A	B	290	256	232	222	230	214	226	208	206	196	216	216	216	216	Q	A	A
22	A	216	A	A	A	A	B	A	B	B	B	B	B	B	B	F	322	288	228	222	A	A	A	
23	A	A	A	208	A	A	A	B	B	B	B	B	B	B	B	B	264	B	288	238	280	B	A	
24	A	A	222	A	236	A	A	A	A	Y	264	B	E	B	270	246	246	204	222	226	226	232	282	338
25	A	234	220	A	A	A	224	220	276	250	268	228	238	218	218	210	204	204	224	224	234	A	A	210
26	A	A	A	A	A	A	A	F	A	A	B	316	230	264	236	220	220	244	248	250	210	224	B	B
27	A	286	F	A	A	A	A	A	Q	270	226	222	210	230	214	202	208	196	194	194	194	208	224	
28	B	B	A	A	A	B	A	Q	Q	B	B	228	228	276	246	212	266	320	E	B	B	A	A	286
29	A	280	A	A	A	B	A	A	B	B	B	250	224	214	224	210	208	214	Q	Q	Q	E	A	A
30	A	A	A	A	A	A	A	E	A	Q	310	266	224	212	212	204	208	208	210	196	184	206	192	252
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	7	5	1	4	2	4	8	8	5	6	7	6	9	11	12	15	18	15	21	10	5	3	6
MED	241	226	245	208	230	256	234	274	260	250	238	228	230	227	223	215	231	227	225	226	227	226	274	207
U Q	304	286	272	252	329	338	277	255	310	230	238	260	254	253	266	266	250	276	252	256	338	232		
L Q	205	216	221	217	226	222	239	225	222	212	228	214	218	210	204	210	216	215	216	217	236	194		

APR. 2001 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2001 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	0 22	X 23	O 33	0 37	2 42	0 32	0 28	0 30	0 45	X 65	X 98	X 96	R	B	X	R	R	X 82	X 72	X 75	X 37	X 28	X 23	B
2	0 23	X 30	O 29	X 38	2 24	0 26	0 27	2 28	4 42	X 66	X 78	R	X	X	X	X	X	X	X	X	X	X	X	X
3	0 25	X 53	3 39	3 35	5 54	A	R	5 58	6 66	7 71	8 80	9 98	10 108	12 120	11 119	11 116	10 106	11 112	12 102	10 104	7 78	4 45	O 0	B 42
4	5 54	A	A 43	O 40	X 49	6 64	6 66	6 66	9 94	10 105	9 98	11 112	11 119	13 136	13 132	11 110	10 105	8 83	5 54	3 37	2 25	4 42	A	
5	A 39	O 40	X 36	3 38	4 41	4 47	4 45	4 46	5 57	7 71	8 85	9 96	11 114	10 107	11 110	9 94	7 78	5 58	5 57	4 41	2 23	A	A	
6	0 35	X A	A	4 47	4 48	5 51	4 49	5 55	5 57	6 64	7 76	9 96	10 100	11 110	10 108	10 104	9 95	9 92	6 69	6 61	4 44	3 32	2 28	2 24
7	4 44	A	8 0	A	A	B	B	B	R	6 60	B	B	B	B	B	B	X	X	X X	X O	X A	A	B	
8	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	11 116	12 120	10 101	R	R	A	B	
9	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	X 62	B	B	A AO	X 66	A A	A	
10	0 48	X A	A	A	A	A	B	R	B	B	B	B	B	B	B	B	X 55	X 63	B 72	A	A	A	5 53	
11	B	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B 69	B 0	B B	A	A AO	X 41	A	
12	0 49	X 43	A	A	B	B	A	A	A	B	B	B	B	B	B	B	11 110	7 74	C	C	C	C	C	
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	X 58	X 40	X 29	B	X 18	X 22	X 44	
19	0 21	X 46	X 57	4 43	9 92	B	B	B	B	B 53	X 68	8 82	10 107	11 113	9 96	8 82	6 60	5 50	3 32	B	B	R	5 52	
20	0 29	2 28	2 29	2 24	2 27	3 31	2 29	O A	5 55	5 55	6 67	8 80	10 101	10 108	10 103	9 91	6 64	5 52	4 47	B	B	B B 0	X 21	
21	0 23	2 25	4 44	5 52	3 36	4 43	5 54	6 63	4 48	5 58	6 68	8 81	10 100	10 105	10 108	8 88	7 78	6 64	4 44	O R	X 0	B	B	
22	R 24	X 28	4 41	4 46	5 57	5 57	6 61	X 70	8 84	8 88	10 100	9 96	7 73	7 70	6 66	3 39	3 30	X 0	X A	A	A			
23	0 48	A	A	A	6 68	7 70	7 71	7 73	7 72	7 74	7 74	8 80	10 107	10 100	10 102	10 107	8 86	7 76	6 69	5 54	3 35	2 26	4 48	3 34
24	0 45	X 36	A 32	A	5 58	5 58	6 60	7 71	8 87	9 92	9 90	10 101	8 83	7 76	7 79	5 56	4 40	2 26	2 22	X 0	X B	A	A	
25	B 60	A 24	X 29	A 32	3 34	3 36	4 41	6 60	7 76	9 94	10 102	10 104	7 78	X 76	7 74	B X	X B	B B	B B	A	A			
26	X 22	X 22	X 22	X 23	3 38	4 40	2 27	A	5 58	43	6 62	7 71	8 86	9 99	10 104	9 94	8 89	7 72	3 34	B	B	B	B	R
27	A 24	3 34	4 42	3 39	4 46	4 48	5 54	5 50	4 46	6 66	7 79	8 80	8 84	9 92	8 88	6 61	6 62	3 30	B	B	B	B	Y	
28	A 28	X 26	6 65	3 38	4 44	4 44	O 56	6 61	7 72	7 76	9 90	7 79	X 89	B 110	O 88	6 68	5 58	A 61	X A					
29	A 92	O 56	X B	A	A	A	R 51	4 48	5 52	6 65	7 70	8 81	8 87	8 80	7 77	7 71	5 57	3 30	2 22	X 24	B 0	X 24		
30	A 26	O 25	X 26	X 27	2 28	3 30	4 42	5 55	7 71	9 90	8 85	7 74	6 64	5 57	4 46	4 41	1 18	2 22	B 0	X 0	X B	B	B	
31	0 23	X 24	X 21	2 21	2 24	3 32	3 35	4 41	3 38	4 42	6 65	7 76	8 81	8 82	8 87	7 71	4 46	4 48	4 42	2 28	O 0	X B	B	B
	0 0	0 0	1 0	2 0	3 0	4 0	5 0	6 0	7 0	8 0	9 0	10 11	12 12	13 13	14 14	15 15	16 16	17 17	18 18	19 19	20 20	21 21	22 22	23 23
CNT	16	15	15	15	16	15	15	14	17	18	18	18	18	19	19	20	20	23	21	17	14	12	9	9
MED	0 32	X 28	3 34	3 37	3 38	4 41	4 44	5 54	5 51	5 59	7 70	8 80	9 93	10 102	10 104	9 92	8 80	7 76	6 66	4 40	3 39	2 27	3 33	3 34
U Q	4 48	3 39	5 56	4 43	4 45	4 46	5 54	5 58	5 58	6 65	7 76	8 87	10 100	11 112	11 113	10 108	9 94	10 108	8 81	7 72	5 58	4 40	5 50	4 43
L Q	0 23	X 24	2 29	2 24	3 32	3 31	2 28	3 34	4 44	4 46	6 62	7 71	8 84	8 85	9 92	7 79	7 71	6 62	4 47	3 30	2 28	2 22	2 24	2 24

MAY 2001 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

25

MAY 2001 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	16	17	15	23	26	18	16	20	39	59	92	90	R	R	B	J	R	R	D	R	R	J	R	B
2			F	F	F	F	F		R	D	R	J	R	J	R	J	R	F	F		F			
3	17	22	23	24	18	16	18	22	36	60	72	78	96	120	124	125	108	98	96	79	60	37	27	20
4	R	F	F	F	A	R	F	F	F	F	J	R	R	J	R	R	J	S	F	F	R	B	A	
5	19	40	28	26	23			40	42	59	74	92	102	114	113	110	100	98	96	89	68	39		
6	R	A	A	R	R	F	F	F	R	F	F	F	F	F	F	F	F	F	F	R	R	R	A	
7	44			37	34	33	55	59	60	81	96	92	102	106	128	126	98	94	70	48	31	19		
8	A	R			F	F	F	F			J	R	R	J	R	R	J	R	F	A	A	A		
9	33	34	30	29	30	35	30	36	51	65	79	90	108	101	104	104	88	72	52	51	30	17		
10	R	A	A	F	F	F	F	F	F	F	J	S	J	R	F	J	R	F	F	F	R	R	R	
11	29		33	36	39	28	32	32	53	70	90	94	104	102	98	89	86	62	55	33	22	16	18	
12	F	A	F	A	A	B	B	B	R	F	B	B	B	B	B	B	B	R	A	R	A	B		
13	46								32									96	104	66	23	37		
14	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	F	F	R	R	A	B	
15																		101	89					
16	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	R	A	A	A	
17	42																		56		60			
18	B	A	A	A	B	B	A	A	A	B	B	B	B	B	B	B	B	R	B	B	A	A	R	
19																		63					35	
20	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	F	C	C	C	C	C	
21	35	37	A	A	B	B	A	A	A	A	B	B	B	B	B	B	B	98	63					
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	52	34	23	B	12	R	
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	16	38					
27	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
28	18	17	16	17	19	23			39	41	61	74	92	98	93	80	58	46	40	20				
29	19	35	31	25	29	40	50	27	47	54	69	91	95	97	76	66	56	38		22				
30	17	19	35	31	25	29	40	50	27	47	54	69	91	95	97	76	66	56	38		R	A	A	
31	23	18	17	16	17	19	23																	
	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
CNT	14	15	14	15	16	15	15	14	16	18	18	19	18	19	19	19	20	21	23	20	17	14	12	8
MED	21	20	24	24	28	30	27	32	38	47	56	70	88	95	96	85	72	66	54	33	30	20	20	19
U Q	39	33	35	30	31	37	40	50	44	56	70	81	92	104	106	100	88	98	67	62	48	34	31	28
L Q	17	18	17	18	21	19	21	22	28	35	53	64	76	79	86	70	63	56	37	23	22	16	16	18

MAY 2001 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2001 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	21	17	15	11	12	13	E 9	E 9	B 10	15	21	20	E 54	B 36	B 31	B 26	B 21	B 17	B 19	B 11	B 11	B 10			
2	E 14	S 14	S 11	14	9	10	E 28	E 11	E 10	18	20	54	E 28	E 23	E 23	E 26	E 19	E 18	E 15	E 13	E 14	E 20	E 23	12	
3	20	32	28	26	29	49	46	26	19	26	26	23	21	22	59	25	55	27	27	28	16	19		34	
4	38	47	42	48	40	44	36	35	41	40	28	23	G 29	E 47	E 24	E 21	E 14	E 13	E 15	E 16	E 23	E 18	E 21	40	
5	48	40	42	41	35	28	22	13	12	13	16	34	34	E 24	E 22	E 18	E 17	E 19	E 17	E 24	E 13	E 9	E 34	34	
6	44	38	44	48	20	16	14	10	9	14	21	20	E 21	E 20	E 21	E 16	E 22	E 15	E 27	E 28	E 17	E 16	E 21	22	
7	F 36	70	41	46	41								B 34	B 41	B 34	B 41	B 25	B 63	B 25	B 22	B 30	B 42	B 42		
8	38	32	32	32	38	39	36	37					B 91	B 91	B 91	B 91	B 60	B 27	B 35	B 28	B 38				
9	32																				100	90	68	72	92
10	44	80	37	97	38	34							B 26	B 26	B 26	B 26	E 30	E 30	E 32						
11	B	34	40	39									B 40	B 37	B 44	B 40	B 52	B 52	B 42	B 38	B 44	B 42			
12	37	40	35	94									B 43	B 36	B 34	B 35	B 31	B 36	C 31	C 36	C 31	C 36	C 31	C 36	C 31
13	C 32																								
14	C 32																								
15	C 32																								
16	C 32																								
17	C 32																								
18	C 32																								
19	28	120	72	45	90								B 22	E 30	E 52	E 32	E 21	E 19	E 14	E 26	E 26	E 16			
20	24	20	16	22	18	27	20	42	44	38	32	34	28	25	21	25	24	22	12	23					
21	31	18	30	31	43	44	21	17	18	27	19	32	42	32	21	16	14	17	26	20	15				
22	18	26	18	20	29	37	23	29	18				B 31	B 30	B 24	B 18	B 18	B 19	B 19	B 19	B 15	B 16	B 34	B 29	B 38
23	40	49	50	62	44	44	45	60	20	13	16	18	E 18	E 44	E 35	E 50	E 30	E 40	E 26	E 14	E 23	E 29	E 34	E 35	
24	44	34	37	43	71	40	44	33	26	26	30	22	20	20	18	16	20	16	13	12	12	11		20	
25	B 26	26	22	35	31	33	16	26	24	19	20	32	30	20	20	29	16								
26	14	23	28	24	16	24	43	48	36	42	30	24	19	32	31	30	18	14	17						22
27	61	31	24	68	30	41	46	30	35	33	40	18	20	E 21	E 32	E 21	E 21	E 26	E 10						19
28	33	28	26	24	42	46	44		B 38	31	17	26	22	54											
29	37	74	95		42	42	43	32	24	30	20	28	22	20	18	16	20	13	18	17	18	17		42	
30	37	18	42	23	31	29	30	47	28	22	34	18	28	34	34	24	21	18	13	9	36				
31	E S	23	12	17	28	35	34	57	36	23	16	23	31	34	29	28	17	20	16	19	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	23	24	24	23	23	20	21	21	19	18	19	19	19	19	21	21	23	21	20	18	18	15	19		
MED	36	32	34	32	35	36	36	32	26	26	22	22	U 24	U 26	E 23	E 21	E 21	E 19	E 18	E 17	E 17	E 24	E 29	E 34	
U Q	40	44	42	48	42	43	44	37	36	35	30	31	34	34	32	30	28	29	26	26	30	38	42	41	
L Q	23	22	25	23	29	28	22	16	18	16	19	20	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	19	

MAY 2001 fTEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

27

MAY 2001 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	8	7	8	8	9	9	10	11	12	15	54	B	36	31	26	21	17	19	11	11	10	B	
2	9	14	E S 11	8	9	10	12	11	11	12	14	54	28	16	8	26	19	18	15	10	8	9	8	8	
3	10	8	8	7	7	14	16	10	10	8	8	15	14	10	59	25	55	27	16	8	10	19	11	B	
4	10	12	11	11	11	11	12	12	23	17	13	19	29	47	24	21	12	13	15	12	23	18	8	10	
5	12	16	13	12	10	10	9	10	9	10	14	17	17	24	14	14	10	10	8	7	8	9	8	12	
6	9	14	9	10	8	10	8	10	9	10	10	14	21	16	18	12	8	10	7	11	10	6	7	8	
7	10	24	16	10	16	B	B	B	27	15	B	B	B	B	B	25	63	25	12	15	11	20	B	B	
8	22	19	15	19	26	24	20	21	B	B	B	B	B	B	B	91	60	27	17	22	19	B	B	B	
9	25	B	B	B	25	B	B	B	B	B	B	B	B	B	B	29	B	B	B	15	11	9	10	29	
10	15	12	12	12	18	18	B	17	B	B	B	B	B	B	B	30	30	B	32	B	B	8	12	14	29
11	B	25	25	28	B	B	25	24	13	B	B	B	B	B	B	B	52	B	B	B	9	10	10	10	B
12	10	14	30	73	B	B	16	18	20	25	B	B	B	B	B	26	14	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	12	12	13	B	9	7	8	B	
19	8	20	13	12	15	B	B	B	B	18	30	52	32	21	19	13	26	26	16	B	B	10	7	B	B
20	9	10	6	9	9	9	11	20	13	11	32	34	28	25	21	25	24	22	12	12	B	B	B	10	B
21	10	11	14	8	10	10	8	8	8	9	11	17	12	10	21	16	14	17	26	20	15	B	B	B	
22	10	10	11	8	10	10	7	10	13	B	B	31	30	24	18	18	19	19	19	15	12	14	9	10	B
23	11	10	14	14	12	9	12	11	8	9	10	14	18	12	15	11	10	9	9	8	8	8	8	8	B
24	8	8	8	10	10	29	18	9	9	10	10	15	15	13	9	12	10	10	9	9	12	11	12	B	B
25	B	8	10	11	11	9	12	8	8	7	11	12	18	16	20	21	29	16	B	B	B	9	10	B	B
26	8	8	10	10	8	10	14	21	18	14	14	16	18	32	31	10	18	10	17	B	B	B	B	15	B
27	9	8	8	10	8	8	8	8	8	8	10	9	20	21	25	21	21	26	10	B	B	B	9	B	B
28	9	10	8	8	12	13	12	B	17	13	16	17	12	54	B	B	57	55	19	13	13	9	11	14	B
29	10	9	9	B	22	16	15	26	16	9	11	9	16	14	10	13	20	13	18	17	8	12	B	10	B
30	9	10	8	8	8	9	8	8	8	9	9	9	10	10	8	9	21	18	9	9	12	B	B	B	B
31	E S	10	12	9	10	7	7	5	8	8	9	9	10	11	8	8	9	6	8	19	13	B	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	
MED	10	10	11	10	10	10	12	11	13	11	14	17	21	24	21	21	20	19	17	13	12	12	11	11	
U Q	12	15	14	13	17	26	19	22	22	B	B	B	B	B	B	B	30	54	30	26	20	B	B	B	B
L Q	9	8	8	8	8	9	8	9	8	9	10	14	16	14	14	12	12	11	12	10	9	9	8	10	

MAY 2001 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2001 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 E	A E	A E	A E	A E	A E	B	Q	2 5 6	2 1 6	2 2 0	2 2 0	2 2 0	B	2 1 2	2 1 0	1 8 6	1 8 6	2 0 2	1 9 8	1 9 6	2 1 6	2 1 2	B			
2	S	S	S	A	B E	B E	B E	B	3 5 0	3 4 2	3 2 4	2 1 8	2 2 4	2 3 6	2 3 0	2 1 2	2 1 2	2 1 2	2 1 8	1 9 2	1 9 4	2 0 6	2 0 0	2 0 0	2 1 4	2 4 0	2 3 8
3	A	Q	A	A	A	A	F	Q	2 2 8	2 2 6	2 5 6	2 4 8	2 2 0	2 3 0	2 1 6	2 3 4	2 3 2	2 4 4	2 7 4	2 3 8	2 2 6	2 2 6	2 1 2	2 1 2	A		
4	2 2 6	A	A	2 2 2	2 2 4	A	A	A	A	Q	Q	2 4 6	2 4 6	2 1 2	2 4 4	2 2 2	2 1 6	1 9 6	2 1 2	2 1 6	2 1 2	2 1 2	2 3 6	A	A	A	
5	A	2 5 8	2 2 4	2 2 6	2 0 8	1 9 4	2 3 2	2 7 2	2 0 0	2 1 8	2 3 4	2 1 2	2 1 6	2 0 2	1 9 8	2 0 6	2 0 6	1 9 2	2 1 4	2 0 6	2 1 2						
6	A	2 3 0	2 2 8	2 3 8	3 3 2	3 1 4	2 8 4	2 5 8	2 3 4	2 2 6	2 2 0	2 0 8	2 1 2	1 9 8	1 9 2	1 7 8	1 9 8	1 9 8	1 9 6	1 9 6	2 0 2	2 4 0		A			
7	F	A	A	A	A	B	B	B	A	F	B	B	B	B	B	B	2 3 0	2 4 8	2 2 4	A	A	2 2 4					
8	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	2 6 8	2 4 0	2 2 0	A	A	A	B	B			
9	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	3 0 0	B	B	A	A	A	A	A			
10	2 4 6	A	A	A	A	A	B	A	B	B	B	B	B	B	E	B	2 9 4	2 6 0	B	E	B	B	A	A	A		
11	B	A	A	A	B	B	A	A	B	B	B	B	B	B	B	E	B	B	B	A	A	A	A	2 4 2			
12	2 3 2	2 3 2	A	A	B	B	A	A	A	A	B	B	B	B	B	E	B	2 7 0	2 7 6	C	C	C	C	C	C		
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	1 8 8	2 1 8	2 1 8	B	2 4 4	2 5 2	2 9 0			
19	A	1 9 8	A	2 2 0	A	B	B	B	B	2 4 4	2 2 0	2 6 6	2 2 8	2 1 0	2 0 4	1 9 4	2 2 4	2 2 4	2 2 8	E	B	B	A	A	A		
20	2 1 4	A	A	2 1 6	2 0 4	2 4 2	A	A	A	Q	B	3 4 6	2 8 4	2 2 6	2 2 0	2 1 6	2 0 0	1 9 6	2 0 8	2 3 2	2 2 2	2 2 8	E	A	B	2 3 4	
21	A	A	3 0 0	A	A	Q	A	F	Q	Q	3 6 2	3 0 2	2 8 6	2 3 6	2 0 8	2 0 2	2 2 0	2 1 4	2 0 4	1 9 6	2 1 4	2 4 2	2 3 4	2 5 0			
22	A	A	2 5 0	A	A	A	A	Y	B	B	2 2 8	2 2 2	2 1 1	2 1 2	2 0 2	2 0 2	2 0 2	2 0 2	2 0 2	2 0 2	2 1 4	2 1 8	2 4 0				
23	A	A	A	A	F	Q	Q	Q	Q	Q	2 3 8	2 3 2	2 2 4	3 1 4	2 5 2	2 2 8	2 2 2	2 1 8	2 1 8	1 9 2	1 9 6	2 0 4	2 1 4	2 2 0	2 0 0		
24	2 1 0	A	A	A	A	A	A	A	Q	Q	3 4 6	2 9 6	2 4 0	2 1 4	2 1 6	2 0 8	2 0 8	1 9 2	2 0 0	2 0 8	2 2 2	2 0 2	2 2 4	2 9 6			
25	B	A	A	A	A	A	A	Q	A	Q	3 3 4	3 1 2	2 4 8	2 1 4	2 0 6	2 0 6	2 0 6	2 1 0	2 0 0	B	2 3 8	2 1 4	B	B	A	A	
26	A	A E	A	A	A	A	A	A	Q	Q	2 5 8	2 6 2	2 3 4	2 0 8	2 1 8	2 0 0	2 0 8	2 0 2	2 1 0	B	B	B	B	B	1 9 6		
27	A	A	2 0 6	A	A	A	A	A	Q	2 5 8	2 1 2	2 0 6	1 9 2	2 0 4	2 1 6	2 0 4	1 9 6	2 4 8	2 3 8								
28	A	2 3 8	2 3 8	A	2 2 0	2 2 4	B	A	Q	Q	2 9 2	2 2 6	2 1 6	2 2 6	3 1 4	Q	E	B	B	E	B	A	2 1 4				
29	A	A	A	B	A	A	A	Q	Q	3 1 0	2 7 0	2 4 6	2 3 0	2 1 8	2 1 8	2 0 2	2 0 2	2 0 8	2 1 2	2 0 6	2 9 8	1 9 2					
30	A	A	A	A	A	A	A	A	Q	Q	2 3 8	2 0 6	1 9 8	1 9 8	1 9 0	1 9 0	1 8 6	2 4 2	2 2 2	1 9 4	2 5 4	2 6 8					
31	S E	S	A	A	A	A	A	A	Q	Q	3 0 8	2 5 2	2 3 6	2 1 6	1 8 4	1 9 8	2 0 2	1 9 6	1 8 6	1 8 2	2 0 4	2 2 2	2 2 6				
	0 0	0 1	0 2	0 3	0 4	0 5	0 6	0 7	0 8	0 9	1 0	1 1	1 2	1 3	1 4	1 5	1 6	1 7	1 8	1 9	2 0	2 1	2 2	2 3			
CNT	7	7	8	7	5	7	8	9	11	16	18	19	19	19	19	21	21	23	20	17	13	12	6	4			
MED	2 3 0	2 3 7	2 3 6	2 2 4	2 3 1	2 3 7	2 4 8	2 9 3	2 7 2	2 4 8	2 2 6	2 2 0	2 1 6	2 1 3	2 0 9	2 0 2	2 0 0	2 1 3	2 1 7	2 0 9	2 0 9	2 1 6	2 4 0	2 3 6			
U Q	2 4 6	2 7 6	2 9 1	2 5 4	2 9 2	3 5 0	3 4 9	3 1 7	3 1 2	2 7 0	2 4 4	2 3 0	2 2 0	2 2 8	2 1 6	2 1 7	2 3 6	2 3 8	2 2 2	2 2 8	2 4 5	2 4 0	2 4 2	2 6 4			
L Q	2 1 4	2 3 2	2 2 6	2 2 0	2 1 4	2 2 0	2 2 4	2 3 2	2 5 6	2 3 5	2 1 6	2 0 6	2 0 8	2 0 8	2 0 0	1 9 6	1 9 5	2 0 4	2 0 6	2 0 0	2 0 3	2 1 2	2 1 4	2 1 5			

MAY 2001 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2001 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	O X O X R	24 23	39 42	52 60	64 68	40 54	80 77	X X X X X	90 92	74 74	74 81	56 X	Y O X A A	24											
2	X 41	68 70	50 32	B A B	B B B	B O X 38	62 63	B B X	68 73	65 61	B	R A A													
3	A	B A B R R	R B B B B	B O X	72 86	81 64	50	O X R B	B Y Y	59															
4	X 48	X 33	A A A B A	X 46 50 46	X B 66	X O X X X	80 62	56 50	23	O X B B B	B B B B	B B B B	B B B B	B B B B	B B B B	B B B 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		
5	O X 30	A A A A A	A A A B	B O X 40	57 72	76 73	91 82	40 46	28	X X X X X	X X X X X	X X X X X	X X X X X	X X X X X	X X X X X	X X X X X	X X X X X	X X X X X	X X X X X	X X X X X	X X X X X	X X X X X	X X X X X		
6	A	A A B B A A	B A A A A	B O X 42	53 64	82 79	84 74	57 60	40	O X B	B B B A	55													
7	65	A A A A A A	A A A A A A	B O X 35	B O X 63	76 81	86 67	B B B B	B B B B	B B B B	B B B B	R A R A A	A A A A A	100											
8	A	A A A A X	40 43 56 45	42 42 52	66 77	77 88	70 57	70 52	31	B R Y	B R Y	38													
9	A 68	A A A A O X 44	55 59	R B B 55	X X 66	O X X 88	104 100	104 97	49	R A A A A	R A A A A	100													
10	A A A A A R B B B	B B B B B	B O X 72	B B B B B	B O X B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B		
11	45	B R A A A B B	R X 39	X 47 63	X X 72	X X 80	X X 79	X X 65	26	B B O X B	B B B B	A A A A A	24												
12	A 39	A O X 32	A A B A X R	35 46	65 76	80 82	76 47	43 32	X X X X X	R O X B R A	A A A A A	24													
13	A A A A A A B	A A A A A A B	A B A A B	B O X 89	X O X 99	X O X 108	X O X 95	X O X 40	R A R A A	R A R A A	R A R A A	R A R A A	R A R A A	R A R A A	R A R A A	R A R A A	R A R A A	R A R A A	R A R A A	R A R A A	R A R A A	R A R A A	R A R A A		
14	A A B A B A X	28 36 35 38	46 61 80 84	82 96	65 50	36	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B	B B B B B		
15	77	A A A A A 55	B B B A	62 58				95 77																	
16	B B R R A A O X 36	41 41 46 61	72 89 101	80 84	68 68	56 30	X X X X X	X A B B B																	
17	O X 39 R	50 69 36 54	69 68 59 57	57 57 76	80 82	86 88	89 89	80 42	27	O X O X 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 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 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 A	A A A A A A		
18	A A A A A A A B	A A A A A A A B	B A B B B A	92	108 102	66 66	37	41 42 50	74																
19	50 63 91 40	B O X A A B O X 39	X O X 40 42	X X 61 78	97 84	82 82	65 66	46 22	X X X X X	O X B A A A	A A A A A A	22													
20	41 58	X A A A B 42 48	B B B A	B O X 51 46	B B R B	104 90	76 76	O X B B B	B B R R A	B B R R A	B B R R A	B B R R A	B B R R A	B B R R A	B B R R A	B B R R A	B B R R A	B B R R A	B B R R A	B B R R A	B B R R A	B B R R A	B B R R A		
21	A A A A A O X 37	36 A A A 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	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B	B B B B B B B		
22	A A A A A A 51	R A 37 36	37 36 51 64	85 97 96	67 67	61 56	38 29	X O X B B B	O X B B B	O X B B B	O X B B B	O X B B B	O X B B B	O X B B B	O X B B B	O X B B B	O X B B B	O X B B B	O X B B B	O X B B B	O X B B B	O X B B B	O X B B B		
23	R O X O X 24 24 R	A A O X 26 29	X O X 34 35	38 49 67	76 88	74 68	34	B A O X B B B	B B B B B B	B B B B B B	B B B B B B	B B B B B B	B B B B B B	B B B B B B	B B B B B B	B B B B B B	B B B B B B	B B B B B B	B B B B B B	B B B B B B	B B B B B B	B B B B B B	B B B B B B		
24	O X 28 B 26 26	X O X A A A A 58	O X B 58 50	66 80	B B B B B	82 66 66	50 35	X X X X X	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B		
25	A X O X 29 37	68 A A O X 45 58	B B B B B	68 78 79 85	73 66	55 50	36	X X X X X	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B	O X B B B B			
26	B B A 27	38 42 56 56	65 71 54 69	B B B B B	103 92	70 72	71 22	X X X X X	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 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 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 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 A A A A	A A A A A A A A			
27	A A A A A B B B	B B B B B A R	36	B B O X X 77	83 89	69 48	41 28	O X O X B B B	B B R R R	B B R R R	B B R R R	B B R R R	B B R R R	B B R R R	B B R R R	B B R R R	B B R R R	B B R R R	B B R R R	B B R R R	B B R R R	B B R R R	B B R R R		
28	A O X O X O X O X 25 24	27 29 29 26	57 40 42 47	69 89 76	80 62	45 45	41 25	X X X X X	R B B B B	R B B B B	R B B B B	R B B B B	R B B B B	R B B B B	R B B B B	R B B B B	R B B B B	R B B B B	R B B B B	R B B B B	R B B B B	R B B B B	R B B B B		
29	53 62 40 40	49 45 43 49	44 40 45 64	80 76 69	57 40	36 32	B B B B B	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R		
30	A O X 33 40	33 31 41	A O X 50 46	50 65 69 73	87 98 98 75	70 70	81	X X X X X	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R R R	R B R 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 11 10 9	10 12 12 16	14 19 21 22	21 24 22 27	26 26 22 14	4 3 1 8																			
MED	43 33 40 39	38 44 44 50	43 42 51 66	78 80 84 82	66 66 48 30	27 42 50 57																			
U Q	52 63 50 59	40 52 56 58	58 58 50 56	69 80 88 91	92 74 72 56	35 36 54 78																			
L Q	0 X 0 X 0 X 0 X 34	25 26 27 32	38 32 43	39 39 46	63 74 76 82	74 61 50 40	26 23 24 41																		

JUN. 2001 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2001 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	R 18	R 17	A 30	F 27	F 27	F 41	F 52	F 29	F 48	F 74	J 71	R 78	J 84	R 86	R 68	R 68	R 66	R 50	Y 18	R 18	A A	A A		
2	F 35	F 39	R 32	F 20	B A	B B	B B	R 32	F 42	F 48	B B	B B	B B	F 62	F 65	F 59	F 51	B R	R A	A A	A A			
3	A A	B A	A B	A A	R A	B B	F 66	F 75	F 72	F 57	F 44	B B	B B	Y Y	Y A	A A								
4	42	27	A A	A A	B A	A 40	F 36	F 40	B 56	F 75	J 72	R 77	R 74	R 56	R 50	R 28	R 17	F F	R B	B B	B B	B B		
5	24	R A	A A	A A	A A	B B	B B	R 34	F 43	F 60	F 64	F 66	F 75	F 67	F 34	F 36	F 20	F F	B B	B B	B B	Y Y		
6	A A	A A	B B	A A	A A	A A	B B	R 36	F 47	F 52	F 69	F 73	F 78	F 68	F 51	F 51	F 34	F R	B B	B B	A A	A A		
7	A A	B 29	R 57	R 70	F 67	F 80	B 60	B F	B B	B B	B B	R A	R A	A A	A A									
8	A A	A A	A A	F 34	F 31	F 50	F 30	F 30	F 30	F 38	F 57	F 69	F 64	F 76	F 61	F 46	F 58	F 42	F 21	B A	A A	R 17		
9	A 54	F A	A A	R 38	F 44	F 44	R B	R B	R B	R 49	R 60	R 78	R 98	R 94	R 95	R 86	R 41	R F	A A	A A	A A	A A		
10	A A	A A	A A	A A	B B	B 66	B B	B B	B B	B B	B B	A A	A A	A A										
11	F 36	B R	A A	A A	B B	B R	B R	33	41	F 54	F 66	F 73	F 73	F 72	F 58	F B	F B	R 20	B B	B B	A A	A A		
12	A 33	A A	R A	A A	B A	26	A F	F 28	F 36	F 53	F 70	F 74	F 76	F 65	F 38	F 37	F 26	R 18	R B	R A	R A	A A		
13	A A	A A	A A	A A	A B	A A	A A	B A	B B	B B	B B	R 83	R 93	R 102	R 89	R 90	R 34	R R	R R	R A	R A	A A		
14	A A	A B	A B	A A	F 22	F 25	F 26	F 28	F 40	F 55	F 74	F 78	F 72	F 53	F 36	F 25	F F	B B	B B	B B	B B	A A		
15	R 52	A A	A A	A A	F 35	B B	B A	F 51	F 47	B B	B B	B B	B B	B 89	B 71	B B	B B	B B	B B	B B	B B	B B		
16	B B	B R	R A	A A	F 30	F 32	F 34	F 36	F 54	F 64	F 83	F 95	F 74	F 78	F 62	F 56	F 44	F 24	A A	B B	B B	B B		
17	R 33	R 34	R 26	R 20	R 24	F 56	F 54	F 40	F 37	F 42	F 62	F 74	F 76	F 79	F 80	F 83	F 69	F 36	F 21	A A	A A	A A		
18	A A	A A	A A	A A	A A	A B	A B	B B	B B	B B	A A	F 32	F 95	F 92	F 34	A 31	F 20	F 33	F 44	F 65	R R	R A		
19	F 22	35	F 46	R 34	B 34	A A	A B	R 33	R 34	R 36	R 55	F 65	F 91	F 74	F 72	F 55	F 55	F 40	B B	F A	A A	A A		
20	F 30	52	A A	A A	A B	F 33	F 36	B B	B B	R 45	R 40	B B	B D	R 69	B 93	R 80	R 70	R B	B B	R R	R A	A A		
21	A A	A A	A A	R 31	F 26	A A	A A	B B	B B	B B	B 70	B R	A A	A A	A A									
22	A A	A A	A A	A A	R 27	A A	R A	F 27	F 25	F 38	F 55	F 79	F 91	F 90	F 61	F 55	F 50	F 30	F 23	B B	B B	B B		
23	R 18	R 18	R R	R A	F 17	R 23	R 28	R 26	R 28	R 38	R 56	R 70	R 82	R 68	R 58	R B	R A	R R	B B	B B	B B	R 17		
24	R 22	21	20	A A	A A	F 38	F 50	F 44	B 56	F 69	B 76	R 76	R 60	R 60	R 60	R 44	R 24	R 24	B B	B B	B B	B B		
25	A 23	31	R A	A A	F 39	F 41	B B	B B	B B	F 58	F 64	F 66	F 79	F 67	F 56	F 41	F 41	F 30	R B	R B	R B	R A		
26	B B	A 18	F 25	F 26	F 40	F 40	F 49	F 40	F 54	F F	B B	J 97	R 86	R 60	R 61	R 65	R 14	F A	A A	A A	A A			
27	A A	A A	A A	B B	B B	B B	A A	R 30	F B	B B	R 71	R 77	R 75	R 49	R 37	R 35	R 22	R R	R R	R R	R A			
28	A 19	R 18	21	R 23	R 23	R 22	R 23	R 22	R 26	R 38	R 56	R 72	R 62	R 72	R 52	R 39	R 34	R 30	R 16	F F	R B	R B		
29	R 17	R R	F 20	F 27	F 26	F 26	F 27	F 36	F 54	F 64	F 70	F 61	F 51	F 31	F 27	F 21	F B	B B	A B	A B	A B			
30	A 27	R 20	F 20	F 20	F 44	F 40	F 38	F 38	F 55	F 60	F 81	F 92	F 92	F 63	F 64	F R	R R	R B	R A	R A	R A			
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	10	8	7	10	10	10	16	14	19	21	22	21	24	23	26	26	26	22	14	3	2	1	3
MED	30	27	26	21	24	26	32	37	34	34	38	55	69	73	76	73	58	56	38	22	20	26	44	17
U Q	36	39	34	30	31	31	44	41	40	38	44	57	73	80	84	86	65	64	44	28	24			65
L Q	22	19	19	20	20	24	23	27	26	28	36	54	64	66	73	67	51	37	30	20	18			17

JUN. 2001 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2001 fT_{ES} (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	16	23	34	31	39	26	31	27	36	18	14	21	15	25	32	13	24	25	26	26	22	23	41	31			
2	35	41	44	43	41		B	B	B	E	B	K		B	B	E	E	E	E	B	B	18	57	40	40		
3	48		41		35	39	34		B	B	B	B	B	E	B	E	E	E	B	B	B	16	18	31			
4	36	32	38	60	59		40	34	32	28	21	21	17	15	14	13	23	23	16		B	B	B	B			
5	35	42	37	41	55	45	62		B	B	E	B		14	15	16	19	16	20	21	18	19	16		17		
6	42	42	46			59	62	51	B	32	33	30	22	18	19	15	22	20	27		B	B	B	32	39		
7	66	44	46	59	58	63	46	39	44	B	E	B	E	E	E	E	B	B	E	B	B	B	20	38	34		
8	40	38	42	43	34	24	26	31	26	32	18	20	20	20	20	35	23	18	15	18	17		B	17	15	24	
9	34	50	55	50	50	44	30	19	39	B	B	E	B	E	B	E	B	E	E	B	B	B	48	46	73	64	
10	58	42	66	39	38		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	33	31	38		
11	42		38	35	36	42	B	B	35	32	34	26	19	18	18	15	20	E	B	B	B	B	B	28			
12	36	36	36	38	48		B	38	29	34	33	22	18	15	16	21	14	15	14	16	22	E	B	B	14	38	
13	39	43	39	38	52	62	48		B	35	54		B	B	E	E	E	E	E	E	B	B	B	37	23	41	59
14	44	40		38	B	34	24	14	13	13	18	15	16	18	21	22	26	17	17		B	B	B	B	36		
15	57	42	42	46	41	39		B	B	52	20	13		E	B	B	B	E	B	B	B	B	B	B	22		
16	B	B		24	23	40	42	32	20	18	14	14	18	18	20	14	12	14	15	11	40		B	B	B		
17	24	22	28	18	13	16	35	34	66	44	42	21	15	16	18	20	30	20	20	25	15	32	33	45	45		
18	40	42	34	43	33	44	56		B	57		B	B	E	B	E	B	E	K		B	K	J	A	42		
19	96	39	61		B	K	39	54	50	B	38	34	34	27	27	28	30	28	29	15	40		14	23	78	41	
20	81	42	40	54	100		B	40	20		B	B	E	B	B	E	B	E	E	B	B	B	17	23	34		
21	49	50	56	43	40	36	48	32	40	B	B	B	B	B	B	B	B	B	B	B	B	B	23	34	70	39	
22	38	50	72	66	42	43	39	39	23	19	24	19	22	28	21	20	18	25	16	18		B	B	B	B		
23	20	30	24	20	28	19	34	39	28	20	16	17	20	17	58	20	25	53	25		E	B	B	B	17		
24	B	17	19	33	38	46	42	37	40	33		B	B	E	B	E	B	E	B	E	B	B	B	B			
25	69	34	38	44	36	41	39	34		B	B	B	B	E	B	E	B	E	B	E	B	B	B	B			
26	B	B		36	35	28	23	23	28	42	42	20	14		E	B	B	E	B	E	B	B	42	68	56	41	
27	44	68	76	69		B	B	B	B	57	35	24		E	B	B	E	B	E	B	B	16	17	32			
28	37	38	21	20	17	18	16	18	14	22	16	15	34	39	28	36	50	31	28	20	15	B	B	18			
29	28	26	24	30	38	21	24	27	17	32	14	23	28	22	16	15	19	14	14		B	29	B	22			
30	51	54	56	56	38	34	42	34	30	18	28	18	22	13	25	40	67	30	41	34		B	34	40	43		
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	25	29	27	27	24	26	20	23	21	21	22	22	24	24	27	26	26	26	18	13	17	18	25			
MED	40	42	39	41	39	40	38	32	35	32	19	19	20	U	E	B	E	B	E	B	23	29	39	36			
U Q	50	44	50	50	48	44	46	36	42	34	30	26	28	29	32	36	32	30	31	26	36	36	45	41			
L Q	35	35	34	33	35	25	31	24	26	18	16	17	18	18	18	15	19	17	18	15	14	18	23	26			

JUN. 2001 fT_{ES} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2001 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	12	9	8	8	8	7	8	7	8	9	9	11	15	25	10	13	24	25	26	16	16	10	12	10	
2	9	9	10	10	10	25	B	B	B	25	9	14	B	B	28	28	55	25	B	9	8	8	9		
3	30	B	16	24	18	18	B	B	B	B	B	45	10	25	24	29	27	B	B	11	12	9	B		
4	9	6	29	16	27	30	14	15	28	B	21	13	10	15	14	13	9	10	B	B	B	B	B		
5	10	11	18	14	18	29	18	B	B	8	15	13	14	13	20	21	18	19	16	B	B	B	B	8	
6	10	10	19		15	13	13	B	22	21	18	14	13	19	15	8	20	27	B	B	B	10	8		
7	11	14	16	30	26	14	26	17	31	B	25	39	30	33	29	B	50		B	B	B	12	10	10	
8	9	8	7	6	7	8	12	10	18	B	9	14	14	14	20	10	13	11	8	8	9	B	12	7	7
9	7	15	14	14	13	14	9	9	29	B	24	52	26	55	36	25	25	19	18	9	9	10	10		
10	16	11	46	26	14	B	B	B	B	B	B	53	B	B	B	B	B	B	B	10	8	11	B		
11	14	B	30	17	17	25	B	22	14	15	14	11	12	11	11	20	B	B	10	B	B	B	B	9	
12	8	12	12	30	25	B	15	16	28	18	16	11	10	10	21	9	10	14	9	12	9	B	10	10	
13	11	14	24	26	11	19	26	B	24	28	B	54	27	69	52	41	21	18	15	11	9	10	B		
14	13	24	B	14	16	14	14	B	9	10	13	11	12	18	21	22	26	16	14	B	B	B	B	9	
15	21	20	22	25	29	14	B	24	11	13	B	B	B	B	54	56	B	B	B	B	B	B	10		
16	B	B	15	16	22	21	19	20	18	10	14	10	13	12	12	12	9	11	11	12	12	E	S		
17	14	12	14	12	10	12	10	10	10	9	12	12	10	9	12	20	30	20	25	15	10	12	11	13	
18	26	14	16	16	16	18	20	B	26	B	B	B	16	25	60	29	19	20	16	9	14	13	10	B	
19	7	11	7	B	15	27	18	B	14	15	14	19	27	28	30	9	11	15	25	B	9	8	9	9	
20	11	14	14	18	37	B	12	11	B	B	B	B	32	27	54	46	30	57	B	10	12	11	B		
21	10	8	9	16	11	11	15	21	15	B	B	B	B	B	B	B	B	25	15	7	9	12	B		
22	12	10	11	17	18	25	28	19	12	10	12	11	11	11	13	20	18	25	16	18	B	B	B	B	
23	8	7	8	10	10	8	11	11	10	10	11	12	12	14	58	20	25	36	25	B	B	B	B	8	
24	9	B	10	9	25	29	13	12	15	22	B	30	16	B	B	60	54	26	18	10	12	B	B	B	
25	12	10	11	11	18	15	12	8	B	B	B	51	27	25	15	11	32	25	25	21	B	B	B	B	
26	B	B	12	8	6	8	8	7	10	9	9	14	B	B	31	16	20	14	31	9	9	11	16	22	
27	8	15	14	52	B	B	B	B	24	29	24	B	52	29	15	10	14	20	14	B	10	10	11	B	
28	12	10	8	7	10	14	12	12	14	10	16	12	10	16	10	10	12	14	11	11	10	B	B	9	
29	8	8	8	8	7	10	8	9	7	7	9	9	10	10	16	15	18	11	10	B	8	10	B		
30	10	8	9	8	8	9	20	28	15	14	9	10	7	9	25	25	45	30	22	26	9	9	9	9	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	11	12	14	16	16	17	16	16	20	16	16	16	14	25	23	20	24	25	24	20	B	12	12	10	
U Q	B	14	15	18	26	25	29	26	B	B	B	B	B	53	55	36	45	41	27	B	B	B	B	12	
L Q	9	9	9	10	10	12	12	11	14	10	13	11	12	12	13	13	13	14	16	12	10	10	10	9	

JUN. 2001 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2001 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	00	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 218	A 302	A 324	A 330	A 320	A 324	A 248	210	198	192	210	210	204	242	234	234	220	Q A	A A	A A	A A	A A		
2	218 256	256 256	A A	B A	A B	B B	B B	B B	Q 296	Q 306	B B	B B	276	264	286	238	E B	Q B	A A	A A	A A	A A		
3	A A	B A	A B	A A	A A	B B	B B	B B	B B	B B	Q 236	194	212	234	234	256	Q B	B B	Y Y	Y A	A B	B B	B B	
4	A A	A A	A A	A A	B B	A E	A A	E 314	B 306	B 216	210	210	200	194	202	216	210	Q Q	Q Q	A A	B B	B B	B B	
5	214	A A	A A	A A	A A	B B	B B	Q 222	Q 238	214	204	218	198	206	228	246	220	Q Q	Q Q	B B	B B	B B	A A	
6	A A	A A	B B	B A	A A	B A	A A	250	208	204	208	184	184	186	222	242	E B	E B	B B	B B	B B	A A	A A	
7	A A	A A	A A	A A	A A	A A	A B	B B	B B	278	244	242	226	248	B B	B B	B B	B B	A A	A A	A A	A A	A A	
8	A A	A A	A A	A A	330	330	304	A A	Q 258	Q 218	206	198	202	194	226	230	198	212	B A	A A	A A	A A	212	
9	A 242	A A	A A	Q 218	214	310	A B	B 346	B 248	B 258	218	244	238	272	A A									
10	A A	A A	A A	A B	B B	B B	B B	B B	B B	B 310	E B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	A A	218	
11	230	B A	A A	A A	B B	A A	A A	282	224	204	202	204	204	194	B B	A A	A A							
12	A 226	A A	A A	B A	A A	A A	Q 274	224	212	198	204	192	206	208	208	208	208	A E	B B	A A	A A	A A	A A	
13	A A	A A	A A	A A	A B	A A	A A	B B	B B	B B	B B	B B	B B	Q 280	244	286	260	234	266	A A	A A	A A	A A	A A
14	A A	B A	B A	A E	B 332	Q 270	254	244	188	216	206	230	224	224	252	228	Q E	B B	B B	B B	B B	B B	B B	A A
15	A A	A A	A A	A B	B B	A Q	Q 216	230	B B	B B	B B	B B	B B	256	234	B Q	B B	B B	B B	B B	B B	B B	A A	A A
16	B B	A A	A A	A A	E A	E B	E 342	308	270	240	214	216	204	196	194	196	206	210	232	A A	B B	B B	B B	B B
17	A A	Q 276	A 326	A A	A A	Q 322	Q 292	260	A A	244	226	196	196	230	214	232	192	238	268	A A	A A	A A	A A	A A
18	A A	A A	A A	A A	A B	A A	A A	B B	B B	A B	E B	B B	442	278	250	348	A A	A A	A A	A A	A A	300	262	
19	A 262	A B	244	A A	A B	A A	A A	342	230	226	222	218	194	210	246	238	B E	A A	A A	A A	A A	A A	248	
20	256 224	A A	A A	A B	E 332	EE 304	A B	B 292	B 288	E B	B B	B B	B 266	256	220	290	E B	B B	A A	A A	A A	A A	A A	
21	A A	A A	A A	A A	A 224	A A	A A	A B	B B	B B	B B	B B	B B	Q 230	B B	A A								
22	A A	A A	A A	A A	A A	A A	Q 314	252	236	212	204	198	190	208	194	230	240	E B	B B	B B	B B	B B	B B	
23	A 270	A 192	A A	A A	A 220	A A	A A	Q 256	234	214	216	240	206	250	Q Q	Q B	A A	B B	B B	B B	B B	B B	A A	A A
24	A B	A 226	A A	A A	A F	A 310	A A	B 250	226	Q B	B B	E B	266	326	224	214	228	244	E B	B B	B B	B B	B B	B B
25	A A	218 218	A A	A A	Q 334	B B	B B	Q 312	228	204	224	218	256	218	240	260	B Q	B B						
26	B B	A A	A A	A A	A A	Q 312	324	258	222	202	Q B	B B	222	208	250	224	276	306	A A	A A	A A	A A	A A	A A
27	A A	A A	A A	B B	B B	A A	A AE	B B	B B	B B	B B	B B	Q 268	226	214	188	212	250	Q E	B B	B A	A A	A A	A A
28	A 298	A A	A A	A A	A A	AE 288	BE 268	246	208	208	208	208	208	208	208	258	220	210	208	A A	B B	A A	A A	A A
29	A 268	A 242	A A	AE 316	A AE	AE 286	A 244	188	214	198	198	182	198	254	198	234	Q B	Q B	Q B	B B	A A	B B	A A	A A
30	A 222	A A	A A	A A	A A	A A	Q 294	232	232	218	226	238	202	220	206	Q A	A A	B A	A A	A A	A A	A A	A A	A A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	8	4	5	3	3	6	11	9	11	18	22	20	24	24	27	26	26	23	11	3	1	3	
MED	230	249	241	226	244	324	322	307	308	253	244	221	212	207	209	204	228	222	232	226	244	300	218	
U Q	262	266	266	284	302	330	330	332	319	294	268	250	222	240	234	224	254	238	250	268	248	262		
L Q	216	223	222	205	224	218	316	292	265	244	232	214	205	204	201	194	208	212	214	220	222	212		

JUN. 2001 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2001 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	A	B	60	A	R	B	A	A	90		B O X O X	X	X	X	X	65	58	39	29		A	A	A	56				
2	A	A	A	A	A	A	A	A		45	53	58	70	81	88	81	57	54	32	22	B	B	B O X	26				
3	39	46	A O X O X	41	38	40	48	58	32	35	43	64	68	78	B	0 X O X O X	B O X	A	A	A								
4	A	B	X	BO X	B	A	A	A	41	50	69	84	90	88	70	70	56	40	27	24	25	O X	A	A				
5	A	A	60	50	58	A	A	A	41		B	B	B	X	X	X	0 X O X	A	A	A			70					
6	A	A	B	A	A	A	A	A	B O X		X					0 X O X O X	B	A	A	A O X		46						
7	A	A	A	A	A	50	56	72	59	57	54	64	68	76	74	51	58	38	44	24	B	B	B	A				
8	A	A	44	A	B	A	A	A	B	B O X	B	B O X	X	O X O X		B	35	A	A									
9	0 X	A	B	B	61	B	B	B	A	A	56	62	59	67	75	76	42	B	B	B	B O X O X	24	23	30				
10	0 X	A	A	A O X O X	A	A	A	B	B	0 X	B	0 X	B	X				A	A	A	A							
11	A	A	A	A	A	B	B	A	A	R	X		X	X	X	X O X	B	B	B	R O X		23						
12	A	X	A O X	28	42	42	57	A	R	67	70		B	B O X	X	X	X O X O X	X	A O X		25							
13	0 X O X	A	A	A	41	40	41	B	40	51	72	70	75	81		50	42	37	27	B	B	B	A					
14	A	A	A	A	A	63	46	B	B O X	X	X	X	X	X O X O X	X	B	A	A	Y	B	R							
15	A	A	A	A O X	37	34	38	40	40	40	47		B	B	R		78	74	55	40	A	A	A O X	42				
16	A	A	A	A	A	B	A	A	B O X	B O X	0 X	B	0 X	B	X	78	53	48	42	R	R	A	A					
17	A	A	A	A	A	A	A	B	B	B	B	B O X	B	B O X	B	69	61	62		B	B	R O X	X 28 27					
18	A	A	A	A	A	A	A	B	A	B	B	B	B	B	B		55	57		B	B	B	B					
19	B	B	A	A	A O X	42	36	35	36	36	B	X	X O X	X O X	B	B	B O X	B	B	B	B	B	B					
20	R	R	R O X	31	37	38	38	39	50	X	B	X	X	X	X	65	54	40		B	B	B O X	24					
21	R	O X	41	30	28	28	28	33	B	61	46	68	65	81	75	74	67	56	46	41	B	B	B	B				
22	B	R	O X O X	41	37	42	53	A	A	A	B	B	B	B	B	80	75	81		B	B	A	A					
23	A	A	A	A	A	A	A	A	B O X	X	X O X	B O X	B O X	X	X O X O X		R	B	B O X	32								
24	A O X	36	40	41	O X	A	A	A	47	40	45		B	B	X		X	B	B	B	R		X A	54 42				
25	A	A	A	A	A	R	R	A	A	B	B	B	B O X	B	B	50	68	B	A O X	A	38	56						
26	0 X	A	B	A	A	B	B	B	B	A O X	X	B	B	B O X	B	75			B	B	B	R	A					
27	A O X O X	40	40	A	A	A	A	B	B	39	48	B	B	B	B O X	64	56	39	38	O X	B	B	B O X	23				
28	A	A	A	A	A	A	A	A	41	42	42	52	69	79	82	75	68	72	42	41	34	B	B	B	B			
29	R	R	83	A	32	40	A	A	43	B	B	B	0 X	81	79	68	72	42	40	B	B O X	A A	24					
30	A O X O X	49	41	46	X O X O X	47	48	62	A	R	X O X	67	70	84	76	70	58	44	34	31	B	A O X	A 64					
31	A	O X	70	42	74	B	B	A	60	A	A	40	55	57	58	59	63	57	54	39	39	45	O X O X	42				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	5	8	11	10	12	11	10	10	12	15	21	18	24	23	24	25	26	26	24	16	5	7	6	13				
MED	0 X	X	X	X	34	42	41	40	42	41	44	44	42	40	48	63	70	76	78	75	64	54	40	32	24	35	44	30
U Q	41	48	60	46	52	48	57	58	53	45	52	65	75	81	81	78	72	58	44	38	32	39	64	44				
L Q	0 X O X	X O X	X O X	27	38	40	31	36	37	37	40	39	37	45	58	66	73	74	69	57	42	38	28	24	24	28	24	

JUL. 2001 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

35

JUL. 2001 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	B	F	A	R	B	A	A	A	B	R	R	J	R	70	71	66	54	44	30	18	A	A	A
2	A	A	A	A	A	A	A	A	F	F	36	58	68	70	71	66	54	44	30	18	B	B	B	
3	R	F	A	R	R	F	F	F	J	R	F	33	36	52	64	75	82	70	46	48	21	16	R	20
4	A	B	B	R	B	A	A	A	A	F	F	F	F	F	J	R	J	F	F	F	F	R	A	
5	A	A	F	F	A	A	A	A	F	B	B	30	32	39	59	75	84	82	62	64	44	28	16	15 19
6	A	A	B	A	A	A	A	F	F	B	R	F	37	29	39	52	72	60	84	65	39	34	34	27
7	A	A	A	A	A	F	F	F	F	F	F	F	F	F	F	F	F	F	F	R	B	B	A	
8	A	A	F	A	B	A	A	B	B	R	B	R	B	R	J	R	F	F	R	F	B	A	A	
9	R	A	B	B	F	B	B	B	A	A	38	56	53	61	66	70	36	F	B	B	B	R	R	A
10	R	A	A	R	R	A	A	A	B	B	F	R	B	F	44	62	60	66	B	F	F	A	A	A
11	A	A	A	F	A	A	B	B	A	A	R	30	45	57	67	57	59	56	32	29	B	B	B	
12	A	R	F	F	F	F	A	R	F	F	B	B	22	30	27	48	26	34	71	68	68	66	67	57
13	R	R	A	A	A	F	F	F	B	F	F	F	18	25	29	31	29	30	37	62	56	69	75	44
14	A	A	A	A	R	A	A	F	B	B	R	34	33	35	52	64	73	74	70	64	56	B	A	Y
15	A	A	A	A	R	F	F	F	F	F	B	B	31	23	26	28	28	26	38	R	F	F	A	A
16	A	A	A	A	A	B	A	A	B	B	39	B	58	69	65	B	F	62	47	42	36	R	R	A
17	A	A	A	A	A	A	B	B	B	B	B	52	R	B	B	R	B	J	R	F	B	B	R	
18	A	A	A	A	A	A	A	B	A	B	B	B	B	B	B	B	B	49	45	B	B	B	B	
19	B	B	A	A	A	R	F	F	F	F	B	J	R	R	J	R	R	B	B	B	R	B	B	
20	R	R	R	R	A	R	F	F	F	F	B	25	36	27	25	26	28	44	65	70	76	75	59	40
21	R	F	R	F	F	F	F	B	F	F	F	24	26	19	19	20	21	55	74	64	64	56	46	40
22	B	R	R	R	A	A	A	A	A	B	B	8	31	36	12	31	34	60	74	69	73	B	A	A
23	A	A	A	A	A	A	A	A	B	R	31	43	55	68	R	B	R	F	J	R	R	R	26	
24	A	R	A	R	A	A	A	A	F	34	34	39	30	34	B	B	F	77	61	69	66	B	B	
25	A	A	A	A	A	R	R	A	A	B	B	44	A	R	R	B	B	F	B	A	R	A	A	
26	R	A	B	A	A	B	B	B	B	A	R	28	26	26	28	28	44	46	61	R	69	B	B	
27	A	R	R	A	A	A	A	B	B	F	F	34	34	34	30	40	B	B	B	R	58	44	32	
28	A	A	A	A	A	A	A	F	F	F	31	26	32	46	63	73	76	69	53	F	F	F	B	
29	R	R	A	F	F	A	A	A	F	B	39	22	26	34	67	79	66	66	62	36	26	R	18	
30	A	R	R	R	R	F	F	A	R	R	43	40	41	42	54	29	42	57	56	78	66	60	46	
31	A	F	R	F	B	B	A	F	A	A	60	36	36	36	28	30	49	51	52	53	57	46	48	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	8	10	9	12	11	9	10	11	15	21	18	24	23	24	25	26	26	24	16	5	6	6	10
MED	24	34	34	31	32	27	30	30	29	30	39	56	62	69	68	65	57	44	32	24	18	24	38	20
U Q	32	40	36	36	35	32	43	37	34	33	42	57	68	75	74	69	64	52	38	32	26	31	58	36
L Q	20	28	31	24	30	23	26	28	26	28	36	52	56	64	64	60	46	36	28	19	16	18	22	18

JUL. 2001 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2001 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	B	43	80	37	B	67	58	52	B E	B E	B E	B E	B E	B E	B E	E B											
2	44	77	49	50	44	30	40	54	50	40	34	19	17	16	14	16	16	17	17	16	B	B	B	28				
3	32	43	61	51	36	38	21	13	15	21	18	30	18	26	E B	B E	B E	B E	B E	B E	16	34	46	43				
4	50	B	44	B	37	B	36	46	35	24	20	17	16	20	18	18	E B	E B	E B	E B	13	23	37	32	50			
5	51	41	60	68	54	52	63	51	41	B	B	B E	B E	38	20	19	14	13	13	16	28	20	32	47	41			
6	39	47	B	41	44	59	55	34	23	B	E B	32	25	18	21	15	18	18	26	25	18	32	44	49				
7	44	78	48	50	38	27	17	16	16	15	14	22	21	20	26	30	18	15	19	12	B	B	B	28				
8	31	39	40	48	B	40	50	40	B	B	34	B	B E	B E	53	26	18	E B	E B	E B	20	20	16	14	23	38	50	
9	81	68	B	B	36	B	B	41	42	36	22	26	25	21	27	21	B E	B E	B E	B E	B	B	B	18	28	24		
10	49	39	51	45	36	35	43	39	37	B	B	32	39	29	52	33	17	36	40	55	45	44						
11	43	38	63	37	118	74	B	B	48	48	45	35	31	50	20	15	22	22	25	E B	B	B	B	16	22			
12	34	40	76	31	28	29	40	39	32	23	23	B	B E	B E	54	25	32	25	38	58	22	12	28	35	26			
13	37	34	44	63	46	40	31	23	B	26	20	42	41	23	41	E B	E B	E B	E B	B	B	B	42					
14	48	50	44	42	56	55	48	68	B	B	42	26	18	22	22	59	32	32	34	40	28			38				
15	36	44	53	42	36	23	22	14	9	9	14	E B	E B	B	B	54	16	14	16	19	36	44	49	46	43			
16	82	33	32	67	B	40	44	43	B	E B	B	40	50	59	B	E B	E B	E B	E B	E B	26	18	16	14	31	28	34	46
17	37	78	41	55	108	92	B	B	B	B	B	B E	B	35	B	B E	B	50	31	20	B	B	B	B	22	31	32	
18	34	34	30	40	38	42	37	B	37	B	B	B	B	B	B	B	B	B	B	11	14	B	B	B	B	B		
19	B	B	31	47	36	42	34	22	17	16	E B	B E	B E	B E	32	19	33	32	16	B	B	B	B	33				
20	24	17	22	36	40	40	35	30	15	14	22	B	B E	B E	20	22	25	26	30	22	28	B	B	B	B	28		
21	23	29	17	26	36	24	37	B	40	27	31	22	22	20	18	16	14	25	29	E B	E B	E B	B	B	B	B		
22	B	24	40	40	44	53	60	65	41	B	B	28	56	54	33	E B	E B	E B	E B	E B	E B	E B	B	32	43	40		
23	48	57	64	42	98	67	63	40	B	39	E B	21	20	56	54	28	16	22	32	18	19	B			33			
24	30	36	31	68	42	61	45	51	44	64	38	B	B E	B	33	22	18	18					30	60	44	60		
25	55	47	51	43	36	26	24	58	66	B	B	B	B E	B	34	B	B E	B	B E	B	18	42	34	46	122	39		
26	41	48	B	46	101	B	B	B	B	44	33	21	B	B	B	B	B E	B E	B E	B E	B	B	B	20	34			
27	30	39	44	48	48	44	40	B	26	23	B	B	B	B	B	B	B E	B E	B E	B E	21	16	16	21		22		
28	37	38	41	38	37	44	43	21	14	16	19	20	18	18	24	31	21	22	16	B	B	B	B	B				
29	23	24	21	46	58	46	34	46	39	B	B	BE	BE	BE	34	53	22	28	26	25	18	B	29	26	23			
30	31	37	41	39	40	34	43	71	35	33	22	36	30	27	30	25	18	19	12	33	44	46	54					
31	107	104	42	37	B	B	53	34	69	57	57	36	42	24	25	32	32	37	38	50	78	36	48	42				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	28	28	28	29	29	25	27	24	24	18	23	18	24	23	25	25	26	26	24	20	13	19	20	27				
MED	38	40	44	43	40	42	40	40	38	26	23	26	21	24	25	25	21	22	18	18	30	32	40	39				
U Q	48	54	51	50	55	54	50	52	44	40	36	33	36	34	31	32	30	26	25	34	40	44	46	44				
L Q	32	36	36	38	36	32	34	26	20	16	20	22	19	20	18	17	17	17	16	14	20	28	32	28				

JUL. 2001 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2001 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	10	B	10	21	30	B	22	10	21	B	21	29	19	18	18	20	16	9	10	9	9	8	8	7	
2	10	12	15	19	25	15	28	20	12	13	12	10	9	9	9	12	10	11	11	12	B	B	B	7	
3	8	8	9	12	13	8	8	8	15	10	18	20	15	26	B	52	25	26	20	16	8	8	9	9	
4	9	B	12	25	B	25	16	23	18	14	13	11	16	14	18	12	11	12	7	8	8	15	10		
5	9	7	8	19	8	8	14	28	16	B	B	B	38	13	19	11	13	8	9	13	9	11	9	9	
6	B	10	18	21	16	20	16	7	8	B	18	26	14	10	15	18	18	26	25	18	B	10	10	10	
7	9	10	13	11	10	11	9	7	16	10	14	9	11	14	26	30	18	15	19	12	B	B	B	7	
8	8	8	12	24	B	26	20	18	B	B	B	19	B	B	54	26	14	20	20	16	8	B	8	10	
9	14	11	B	B	10	B	B	B	21	19	11	14	15	25	21	27	21	B	B	B	B	9	8	7	
10	8	10	11	13	12	10	9	26	24	B	B	20	39	29	52	B	33	17	11	B	B	B	10	17	18
11	17	10	25	12	13	26	B	B	19	20	18	16	15	50	10	10	14	15	25	B	B	B	10	10	
12	8	8	9	8	8	8	9	15	16	16	12	B	B	54	25	32	25	25	18	16	10	9	9	8	
13	9	10	15	25	26	9	12	10	B	B	13	11	12	12	11	14	38	20	18	15	B	B	B	9	
14	19	8	26	20	10	25	13	18	B	B	26	26	12	18	22	59	32	32	B	10	7	16	B	8	
15	8	8	19	18	12	10	9	9	9	10	B	B	B	54	16	10	16	19	8	10	13	12	13		
16	B	11	25	24	59	18	22	26	B	B	29	40	50	59	B	26	18	16	14	25	18	8	10		
17	9	12	25	12	24	10	B	B	B	B	B	35	B	B	50	B	31	20	B	B	11	8	9		
18	10	8	9	10	29	15	12	B	14	B	B	B	B	B	B	B	11	8	B	B	B	B	B		
19	B	B	10	9	15	14	12	9	9	16	B	32	19	33	32	10	B	B	B	33	B	B	B	B	
20	16	9	10	10	15	16	12	9	8	9	12	B	20	21	25	26	30	22	28	B	B	B	B	8	
21	12	10	9	8	8	8	8	B	17	15	9	9	15	20	10	11	14	25	29	B	B	B	B		
22	B	9	8	12	10	12	12	26	29	B	B	B	26	56	54	33	B	B	B	B	9	10	15	B	
23	10	12	14	19	30	19	25	25	B	16	21	16	56	B	54	28	16	22	32	18	11	B	B	8	
24	8	10	18	10	10	20	16	12	10	15	18	B	B	33	11	10	18	B	B	B	9	10	12	13	
25	20	21	10	30	20	14	9	16	46	B	B	B	33	B	B	B	B	18	B	9	12	8	18	15	
26	10	13	27	20	B	B	B	B	B	26	20	19	B	B	B	57	B	B	B	B	11	B	B		
27	8	8	10	16	16	10	12	B	10	17	B	B	B	B	B	21	16	16	21	B	B	B	15		
28	8	11	15	14	25	11	15	9	6	14	9	14	15	15	13	8	9	10	12	11	B	B	B	B	
29	9	10	8	8	8	8	22	15	12	B	B	B	34	53	22	28	26	25	18	B	11	8	14		
30	20	8	16	13	11	25	13	15	9	14	22	20	30	27	24	25	12	19	12	10	B	15	8	10	
31	14	10	9	11	B	16	11	12	22	11	19	21	19	25	14	9	9	8	8	9	8	10	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	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	10	10	12	14	15	15	14	16	17	19	18	26	21	33	25	27	21	20	19	16	B	13	12	10	
U Q	14	12	19	21	25	26	22	28	46	B	B	B	B	56	56	54	33	31	32	B	B	B	B	15	
L Q	8	8	9	11	10	10	12	10	12	14	12	16	15	18	15	14	14	15	12	10	10	9	8	8	

JUL. 2001 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2001 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	B	A	A	A	B	A	A	B	E	B	292	252	208	200	212	206	220	200	230	206	A	206	A	A
2	A	A	A	A	A	A	A	A	220	248	234	212	200	198	208	212	196	232	268	B	B	B	230		
3	222	A	A	A	Q	Q	B	E	B	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	B	E	B	A	A	
210	324	308	334	308	334	290	248	206	236	262	250	224	260	234	234	234	234	234	234	234	A	A	A	A	
4	A	B	A	B	E	A	B	A	A	E	A	Q	Q	Q	Q	E	B	Q	Q	Q	Q	Q	232		
328	294	226	218	214	212	204	212	204	212	192	210	198	232	232	232	232	232	232	232	232	232	232	232		
5	A	A	A	A	A	A	A	A	B	B	B	E	B	Q	Q	Q	Q	Q	Q	A	A	A	318		
6	A	A	B	A	A	A	E	E	A	B	A	Q	Q	Q	Q	E	B	E	B	B	B	A	A	210	
330	302	302	310	226	208	206	226	198	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232		
7	A	A	A	A	A	A	Q	Q	Q	Q	Q	E	B	Q	Q	E	B	E	B	B	B	B	B	A	
314	292	294	282	282	212	204	202	210	196	216	232	218	232	218	232	224	232	224	224	224	224	224	224		
8	A	A	A	A	B	A	A	B	B	E	A	370	238	212	192	192	202	223	206	B	A	A	A		
220	220	B	B	B	A	A	E	A	278	248	228	292	228	246	224	224	224	224	224	224	224	224			
9	A	A	B	B	220	B	B	A	286	206	198	214	214	220	198	B	B	B	B	B	A	A	A		
302	222	216	A	A	A	B	B	A	208	306	240	254	202	214	214	226	226	226	226	226	282	254			
10	232	A	A	A	204	A	A	A	278	248	228	292	228	246	224	224	224	224	224	224	A	A	A	A	
11	A	A	A	A	204	A	A	B	A	208	306	240	254	202	214	214	226	226	226	226	226	260			
214	214	214	214	234	A	A	A	E	A	264	272	248	256	238	220	232	220	226	258	A	A	A	A		
12	260	214	214	214	234	A	A	A	314	234	216	210	196	196	196	196	196	196	196	196	196	196	196		
218	218	A	A	A	378	314	234	216	210	196	196	196	196	196	196	196	196	196	196	196	196	196	196		
13	256	208	218	218	218	A	E	A	314	256	210	222	222	214	250	222	222	220	220	220	220	220	220		
252	204	204	204	204	204	A	Q	B	344	292	270	228	228	228	228	270	202	224	212	280	A	A	A	236	
14	A	A	A	A	A	A	B	B	E	A	314	256	210	222	222	214	250	222	222	220	B	A	A	A	
224	344	292	270	270	228	228	228	228	Q	B	B	B	B	B	B	270	202	224	212	280	A	A	A		
16	A	A	A	A	A	B	A	A	B	E	B	306	276	248	266	B	B	Q	Q	Q	A	A	A	A	
278	278	B	B	B	B	B	B	B	B	B	B	B	B	B	B	270	212	Q	B	B	A	A	A		
17	A	A	A	A	A	A	A	B	A	B	B	B	B	B	B	B	B	Q	Q	Q	Q	Q	Q		
212	A	A	A	A	A	A	A	A	212	220	224	328	272	284	254	198	246	226	198	B	250				
20	A	A	A	A	A	A	A	A	218	222	222	270	238	230	202	216	198	222	232	232	232	232	202		
216	A	A	A	A	A	A	A	A	216	268	220	212	226	188	200	186	190	248	266	B	B	B	B		
22	B	196	200	194	206	206	A	A	A	B	B	B	286	298	288	226	B	B	B	B	B	A	A	A	
23	A	A	A	A	A	A	A	A	B	A	324	256	246	262	256	214	192	230	278	278	A	B	B	214	
212	212	220	A	A	A	A	A	A	214	320	324	214	324	214	208	208	202	214	208	208	214	226			
25	A	A	A	A	A	A	A	A	290	290	290	290	290	290	290	290	290	290	290	290	324				
272	A	B	A	A	B	B	B	B	234	234	224	224	224	224	224	224	224	224	224	224	224	224			
302	A	A	A	A	A	A	A	A	272	272	266	266	266	266	266	266	266	266	266	266	266	266			
28	A	A	A	A	A	A	A	A	334	284	246	214	216	208	200	194	186	182	204	258	218				
29	A	A	A	A	A	A	A	A	212	212	212	212	212	212	212	212	212	212	212	212	212				
30	A	A	222	222	222	222	222	222	A	A	A	E	S	Q	Q	Q	Q	Q	Q	E	B	B	A		
224	226	336	318	254	332	289	314	292	254	255	255	238	242	230	229	240	206	214	228	206	B	210	214		
31	A	198	222	F	B	B	A	A	188	222	312	286	234	280	268	294	216	206	208	198	212	198	212		
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	5	7	3	10	8	8	4	9	8	15	22	18	24	23	25	24	25	26	24	16	6	6	6	8	
MED	256	212	222	222	215	222	221	319	256	270	271	242	236	212	212	208	210	213	223	230	226	231	218	220	216
U Q																									
U Q	287	260	226	220	285	228	334	332	289	314	292	254	255	238	242	230	229	240	262	246	258	250	254	248	
L Q	227	198	200	210	217	217	269	248	242	246	226	216	208	206	201	200	201	212	223	218	208	210	212	211	

JUL. 2001 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2001 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	O X 44	54	68	A	B	B	A	A	R	B	B	X 59	X 67	X 73	X 78	R	B	B	B	O X 19	R	A	A		
2	A	A	Y	A	A	A	A	40	48	49	40	X 66	B O X 80	X 94	X 77	79	66	51	30	29	X 23	A	B	B	
3	A	A	A	A	A	A	A	B	X 34	B	B	B	B	79	81	70	64	62	40	O X 26	28	A			
4	64	51	A	A	A	A	B	32	X 36	42	0	X 56	72	75	80	81	86	69	65	70	A A	A	B O X 42		
5	O X 40	X 34	A	59	B	B	A	40	35	39	B	B O X 55	B	B	B	B O X 97	O X 67	A O X 40	X O X 43	X O X 36	X O X 37	42			
6	O X 77	X 47	40	36	R	A	R	B	A O X 44	X	B O X 72	B	B	115	B O X 48	X O X 34	A	A O X 42	44						
7	A	A	A	A	B	B	B	A	B	B	B	X 73	X 76	B O X 88	B	B	X 42	B	B	B	B	A			
8	O X 35	A	A O X 41	40	A	A	51	58	56	55	B	X 78	X O X 78	X O X 86	X O X 88	B O X 74	68	34	X	B	B	B	R		
9	X 30	A	A O X 34	X	38	40	48	35	B O X 54	0	X O X 70	82	76	89	75	80	83	76	75	B	B	B	R	R	
10	O X 38	A	A	54	A O X 40	46	69	58	48	58	76	86	92	83	76	68	56	50	31	X O X X O X B	B	B	B		
11	A	A	B	A	B	B	X	34	40	45	57	68	78	84	80	82	95	X O X 64	55	40	36	24	23	B O X 24	
12	A O X 33	A	A	A	A O X 48	53	62	78	81	90	80	82	78	73	43	36	A	A	A	100					
13	A	F	A	A	A	A	B	A	R O X 56	B	X	X O X 65	64	61	72	75	85	62	48	X O X O X B	R	A	R		
14	A	A	A O X 42	R	A	A	B O X 50	68	78	87	84	81	B	B	B	106	33	Y	Y O X 27						
15	A	A O X 39	56	B	A	A	41	B	B	X	X O X 64	73	77	91	90	74	66	62	48	33	B	A	A		
16	A	A O X 44	A	32	40	45	41	41	O X B	B	B	B	B	B	B	B O X 68	70	40	B	B	B	B			
17	B	B O X 49	0 X 36	A	34	57	57	B	B	B O X 90	B O X O X 76	89	81	109	91	72	B	Y	A	60					
18	A	O X 43	35	40	47	34	32	35	44	46	44	54	R	R	R O X 53	R O X 50	47	38	24	28	64	O X O X 64			
19	58	56	35	58	48	51	50	58	69	66	76	79	X 88	X 94	X 92	X 86	82	73	52	46	32	27	28	22	
20	O X 36	56	42	60	44	46	42	56	72	66	81	87	X 92	X 94	X 93	80	72	67	57	40	30	X B	Y		
21	A	O X 73	72	48	52	44	71	66	64	65	69	86	87	98	104	118	92	102	68	40	25	42	40		
22	A O X O X 45	A	X	X	A	B	B	X O X O X 64	80	83	91	102	B O X O X 104	106	48	R	A	A	A						
23	47	B	B	B	A	A	B	A O X 43	B	B	B	B O X 70	X	X	X	X	X	X	X O X 62	27	B	B	A		
24	A	26	27	28	36	39	35	48	61	69	76	85	B	X	X	88	83	81	70	55	55	35	30	27	24
25	B	B	B	A	A O X 35	Y	R	B	B	84	90	93	96	103	101	102	70	66	52	35	A	65	70		
26	A	A	A	A O X 63	48	69	70	82	71	74	93	93	108	88	93	74	44	35	A O X 25						
27	O X 40	A	A O X 42	0 X	A O X 46	45	64	B	B	X 62	X 65	75	X O X 88	X O X 90	X O X 86	X O X 92	86	80	77	28	R	A	A		
28	A	A	57	A	A	R	A	A	R	B O X O X 43	47	58	B O X 58	64	47	44									
29	A	A	A	A O X 34	32	40	39	47	66	70	83	91	106	102	105	85	68	59	48	X O X O X B	B	B	B		
30	B	R O X O X 32	34	29	41	44	45	49	X	B	B	X 72	81	92	107	105	99	104	63	O X R	B	B	A		
31	O X 35	A O X O X 36	53	B	B	B	B	B	A	R	B	B O X X 79	103	77	68	51	B O X 24	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	12	12	13	16	12	14	15	19	18	17	20	20	26	21	24	25	22	29	28	24	16	9	10	10	
MED	O X 40	O X O X 49	42	42	41	40	42	48	48	54	66	77	80	90	84	86	81	72	62	44	30	28	40	42	
U Q	52	56	53	55	46	44	48	58	58	66	70	81	87	94	94	98	92	86	68	52	35	33	60	51	
L Q	O X 36	O X O X 38	36	36	33	35	39	40	43	45	57	69	74	80	78	80	74	64	48	37	24	26	27	24	

AUG. 2001 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2001 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	R 38	F 38	F 44	A	B	B	A	R	B	B	53	61	64	72	101	FJ	RD	R	B	B	B	R 13	R	A A	
2	A	A	Y	A	A	A	F	F	F	27	29	28	34	60	74	88	71	68	54	45	24	23	17	A	B B
3	A	A	A	A	A	A	A	B	B	B	B	B	B	66	75	61	52	52	26	20	18	F	A A	A A	
4	F 28	F 40	A	A	A	A	F	B	21	30	32	50	66	64	74	75	80	58	54	56	F	A A	B R 36	A A	
5	R 34	R 28	A	A	B	B	A	F	F	F	B	B	R	R	B	B	R	R	R	R	R 34	37	30	31 36	
6	A	R	R	R	A	A	A	B	A	R	B	R	B	B	F	B	R	R	R	A A	R 36	38	A A		
7	A	A	A	A	B	B	B	A	B	B	B	62	70	82	82	82	B	R	B	B	B	B	B	A A	
8	R 29	A	A	R	F	A	A	F	F	F	R	B	72	72	80	82	R	R	B	R	F 68	59	28	B B	B R
9	J 24	R 28	A	A	R	35	26	27	29	26	43	40	46	49	70	83	69	74	74	69	68	F F	F B	B B	R R
10	R 32	A	A	A	A	R	F	F	F	R	F	R	FJ	R	RJ	R	RJ	R	R	R	B B	B B	B B	B B	
11	A	A	B	A	B	B	F	F	28	32	36	51	62	72	78	74	76	89	58	49	34	30	18	R 17	R 18
12	A 27	R	A	A	A	A	A	R	B	42	47	56	72	75	84	70	73	72	67	32	25	F A	A A	A A	
13	A	F	A	A	A	A	A	B	A	R	R	R	50	59	58	55	66	64	79	56	42	R R	R B	R A	R
14	A	A	AU	R	D	R	A	A	A	B	R	FJ	R	R	R	R	B	B	F	B	Y 94	Y 22	Y 21	A A	
15	A	A	R	F	B	A	A	F	B	B	33	48	31	58	67	71	85	84	68	56	56	36	22	F B	A A
16	A	A	R	A	F	F	F	F	R	B	B	B	B	B	B	B	B	R	F	F	B	B	B B		
17	B 43	B 30	R 23	A	F	A	F	F	B	B	B	R	84	70	83	75	103	85	56	J R	F	B	Y 38	A A	
18	A 30	F 29	R 26	40	25	17	25	38	40	38	48	J R	R	RD	RD	R	R	R	44	38	25	18 22	A 54	F F	
19	F 47	F 32	R 29	27	26	41	36	41	54	55	59	67	82	88	86	80	76	67	46	36	19	17	22	16	F F
20	R 30	F 46	F 31	26	40	27	35	54	58	73	81	J R	R	R	R	R	R	70	66	58	51	26	23	B Y	
21	A	A	F 48	R 42	38	32	51	52	54	54	63	80	81	92	98	112	86	96	56	31	19	R 36	R 34	R R	
22	A 39	R 41	A	J 36	R 34	31	A	R	B	B	58	74	77	85	96	98	100	42	R R	R R	R A	A A	A A		
23	A	B	B	B	A	A	B	A	R	B	B	B	B	B	R	64	60	68	58	56	40	R 21	B B	A A	
24	A 16	F 18	A 18	26	26	21	42	56	63	70	79	R B	R	82	77	72	61	49	43	26	24	21	18	F F	
25	B 29	B A	B A	R Y	R	B	B	F	J	R	R	R	78	80	87	90	97	95	94	64	60	38	27	F A 57	
26	A 48	F 42	A	A	A	A	R	F	F	F	B	FJ	R	R	R	R	J R	F	F	F	F	A 19	R A		
27	R 34	A 36	R 31	F 39	R 58	A	R	B	B	56	59	69	82	84	80	86	80	74	71	22	R R	R A	A A		
28	A 26	A 26	F A	A	R	A	A	R	B	R	R	37	41	52	52	58	41	38	R B	R B	B Y	A B			
29	A 28	A 22	A 22	R 31	F 33	41	R	F	F	58	61	77	81	96	96	R	94	73	62	53	42	R B	B B	B B	
30	B 26	R 28	R 23	22	26	30	43	R	B	B	66	69	86	101	99	88	89	57	F F	R R	R B	B A	A A		
31	R 29	A 30	R 30	R 47	B	B	B	A	R	B	B	B	B	B	URJR	R	73	97	71	62	39	F F	R A	A A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	10	11	13	13	13	14	15	19	18	17	20	20	26	22	25	26	22	29	28	24	16	9	8	8	
MED	R 31	F 38	R 33	R 30	28	30	29	33	38	47	58	70	73	83	78	81	73	66	56	35	22	22	26	35	
U Q	R 34	F 41	R 42	R 39	37	34	31	43	43	56	62	75	81	88	88	95	86	80	60	41	26	27	37	45	
L Q	R 29	R 28	R 29	R 28	24	25	26	30	35	39	51	63	66	72	70	73	64	55	42	27	18	18	21	18	

AUG. 2001 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2001 fTSS (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	42	52	67	63	B	B	51	61	38	B	B	E	E	E	E	E	B	B	B	B	20	20	40	40				
2	50	43	21	39	40	42	36	31	17	22	B	E	E	E	E	E	B	E	E	E	E	B	B	B				
3	40	34	37	76	62	36	38	40	B	B	B	B	E	E	E	E	B	E	E	E	E	B	37	37				
4	86	42	40	75	41	40	31	B	36	38	33	34	30	25	20	21	44	12	24	49	36	37	B	41				
5	62	48	55	43	B	B	39	46	38	36	B	B	B	B	B	E	B	29	22	49	43	45	54	38	42			
6	57	50	46	43	40	42	37	B	45	30	25	29	B	B	B	B	B	24	40	36	36	45	44	79	79			
7	92	48	48	40	B	B	B	B	48	B	B	E	E	E	E	E	B	B	E	B	B	B	B	31				
8	32	35	44	52	45	42	48	41	22	19	25	B	E	E	E	E	E	E	E	E	E	B	B	B	21			
9	68	70	36	34	36	31	29	50	B	34	32	31	53	50	55	25	20	15	24	B	B	30	46	46				
10	42	49	50	74	42	50	28	16	15	18	22	22	23	24	31	29	21	17	15	15	B	B	B	B				
11	42	45	B	76	B	B	E	E	E	E	E	E	B	B	B	B	E	B	E	E	E	B	B	17				
12	20	36	74	40	60	55	57	48	B	32	22	23	31	26	23	22	16	17	31	26	31	48	51	50				
13	50	69	60	61	50	50	62	B	39	36	38	B	51	26	29	30	25	27	29	26	B	20	40	29				
14	32	43	106	40	50	54	64	44	B	33	28	31	28	26	22	B	B	B	B	12	24	20	28	65				
15	48	41	54	42	B	40	40	39	B	B	E	E	E	B	B	E	E	E	E	E	B	B	36					
16	30	36	45	44	34	22	15	15	26	E	B	E	B	B	B	B	B	30	20	12	B	B	B					
17	B	B	23	33	36	19	35	33	18	B	B	B	E	B	E	E	E	E	E	E	B	26	60	44				
18	56	66	42	40	69	33	19	18	22	E	B	E	E	B	E	E	E	E	E	E	E	12	22	42	42			
19	34	31	59	34	35	42	39	36	23	K	19	22	24	21	24	20	22	18	13	16	13	9	12	14	14			
20	26	29	27	27	27	51	48	32	16	17	23	23	26	26	33	24	34	36	62	32	41	38	B	17				
21	42	41	37	58	31	43	39	36	19	18	23	23	34	34	23	56	30	35	24	14	28	18	42	41				
22	51	49	57	46	42	45	48	58	B	B	E	E	E	E	E	B	B	E	E	E	E	B	57	35	73			
23	K	B	B	B	33	36	B	48	56	B	B	B	E	E	E	E	E	E	E	E	E	B	B	16				
24	32	16	29	18	16	15	15	11	12	E	B	G	E	E	B	B	28	23	21	30	24	18	12	15	14	14		
25	B	B	B	19	16	21	19	27	B	B	E	E	B	38	28	26	28	28	23	25	32	22	15	16	18	45	63	
26	52	41	60	58	42	41	46	52	44	E	B	B	E	B	35	25	34	30	55	26	30	54	25	20	20	22	28	34
27	82	51	42	45	46	43	56	23	B	B	E	B	31	28	29	33	26	23	22	17	25	30	15	16	41	113	113	
28	68	49	35	56	36	28	39	42	46	35	B	B	32	30	B	B	E	E	E	E	E	E	E	20	32			
29	36	39	39	35	32	20	50	44	26	E	B	E	E	B	32	32	30	26	46	29	25	27	26	19	E	B	B	
30	B	27	38	31	33	31	23	22	21	B	B	E	E	E	B	48	36	52	55	54	26	26	31	44	B	B	40	44
31	43	38	39	37	B	B	B	B	48	36	B	B	B	B	B	53	72	54	40	25	30	34	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	28	28	28	30	25	26	28	25	23	20	21	20	27	22	25	26	23	29	29	28	21	21	21	27				
MED	42	42	43	42	40	40	39	36	26	29	27	28	29	26	28	26	25	25	25	19	19	22	38	40				
U Q	56	49	56	58	46	43	48	47	40	35	32	32	34	30	50	54	30	34	32	29	34	38	42	46				
L Q	35	36	37	35	33	31	28	22	18	18	22	24	26	25	23	23	21	16	18	14	12	18	28	29				

AUG. 2001 fTSS (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2001 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	14	8	10	22	B	B	11	11	26	B	B	25	28	20	25	47	B	B	B	B	8	10	12	8		
2	9	10	15	28	22	8	9	7	8	9	B	25	22	24	18	16	10	15	14	9	12	8	B	B		
3	7	7	26	29	16	25	16	B	13	B	B	B	30	33	14	16	17	10	14	9	10	10	B			
4	11	11	10	26	12	10	9	10	10	33	34	30	25	20	12	14	12	24	9	15	8	10	10			
5	10	9	14	30	B	B	24	10	10	12	B	B	B	21	B	B	B	29	9	11	14	11	9	8	9	
6	8	10	14	9	26	25	20	B	27	25	25	B	29	30	B	20	10	12	8	11	6	7				
7	8	21	14	18	B	B	B	B	20	B	B	B	24	29	62	B	B	B	B	B	B	B	B	8		
8	9	7	10	11	10	22	16	11	8	13	25	B	25	25	25	54	B	56	32	26	B	B	B	10		
9	8	9	9	8	9	8	7	8	22	32	31	53	50	55	25	20	15	24	B	B	B	B	B	8	8	
10	9	12	9	56	20	15	13	10	15	18	22	18	19	24	30	29	20	16	15	15	B					
11	21	26	B	30	B	B	25	18	16	18	20	25	24	22	18	16	14	12	14	12	12	9	B	10		
12	8	12	20	24	29	18	16	12	B	11	13	21	31	16	16	16	15	17	13	9	9	11	11	11		
13	10	10	20	26	11	12	18	B	24	32	24	B	51	25	29	30	25	27	29	26	B	13	6	8		
14	9	13	10	11	15	15	8	10	B	33	18	17	18	19	16	B	36	8	14	10	8	6	B			
15	8	11	11	25	B	20	19	12	B	33	27	58	B	58	55	31	26	33	14	11	B	8	8	8		
16	10	9	12	16	13	11	10	15	26	B	B	B	B	B	B	B	30	20	12	B	B	B	B			
17	B	B	12	15	13	11	26	10	13	B	B	B	B	74	B	56	58	58	30	32	16	13	16	15		
18	16	11	11	12	12	10	9	11	13	26	29	25	24	29	30	29	26	16	8	8	8	10	11	11		
19	9	9	12	8	8	10	11	10	8	15	16	16	16	18	16	18	14	9	7	8	9	7	7	9		
20	8	8	8	10	9	11	8	8	10	13	16	18	19	16	15	13	11	8	8	7	7	8	9	9		
21	9	9	10	14	10	8	6	8	10	15	20	19	16	15	18	56	30	24	10	8	10	9	12	11		
22	20	12	12	15	10	10	15	15	B	28	54	59	31	28	B	60	47	19	15	8	8	16	10			
23	11	B	B	B	26	13	18	15	B	B	B	B	B	B	25	26	26	15	10	12	11	B	10			
24	8	9	10	11	11	9	8	11	8	12	17	28	30	B	20	15	15	12	24	18	12	15	14	14		
25	B	B	B	11	8	8	10	14	B	38	28	20	18	10	10	25	32	22	15	16	8	9	15			
26	16	10	18	22	26	12	16	9	15	19	25	B	34	19	55	25	30	54	25	12	20	9	9	9		
27	9	16	12	13	12	12	16	11	B	31	22	19	19	18	19	16	14	25	30	15	10	12	19			
28	15	15	11	19	14	17	15	21	25	24	B	18	27	B	25	26	30	26	B	B	10	14	B	B		
29	13	12	12	12	12	11	12	20	26	29	22	32	30	22	46	B	29	25	27	26	19	B	B			
30	B	15	13	14	15	8	7	7	10	B	B	B	B	B	48	36	52	55	54	26	26	31	10	B	8	11
31	9	12	9	12	B	22	30	B	B	53	72	B	54	40	25	B	8	9	8	B						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
MED	9	11	12	15	14	12	15	11	16	25	30	31	29	25	29	30	26	24	24	14	14	10	12	10		
U Q	15	15	15	26	26	22	19	20	B	B	B	B	B	53	56	58	32	30	26	B	B	B	14			
L Q	8	9	10	11	11	10	9	10	10	15	22	22	21	19	18	18	15	15	13	9	10	9	8	8		

AUG. 2001 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2001 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	256	240	A	A	B	B	A	A	A	B	B	232	236	206	230	280	B	B	B	B	220	A	A	A			
2	A	A	A	A	A	A	E	A	Q		B	224	204	226	204	192	182	206	240	228	226	E	B	A	B		
3	A	A	A	A	A	A	A	B	A	B	B	B	B	B	226	210	210	214	226	208	314	268	QE	BE	A	A	A
4	A	A	A	A	A	A	A	B	AE	AE	E	B	410	306	240	240	206	192	202	200	194	222	234	A	A	B	
5	210	248	A	A	B	B	A	A	210	A	B	B	B	B	266	252	236	216	210	204	208		A				
6	A	A	A	A	A	A	B	A	A	A	B	346	228	242	242	230	B	262	196		A	A	A	A			
7	A	A	A	A	B	B	B	A	B	B	B	222	220	256	BE	B	B	B	B	B	B	B	B	A			
8	196	200	A	208	216	A	A	A	Q	Q	B	218	206	214	244		BE	BE	282	240	246	B	B	B	A		
9	A	A	A	208	208	208	A	A	B	300	242	210	242	234	254	216	202	230	214		Q	B	B	A	A		
10	A	A	A	A	E	A	Q			222	384	318	272	274	240	234	222	232	202	208	208	208	208	222			
11	A	A	B	A	B	B	B	314	272	228	220	220	214	208	212	212	190	232	208	216	224	212	BE	A	260		
12	A	216	A	A	A	A	A	204		B	Q		218	212	218	206	188	198	216	222	220	238	Q	A	A	A	
13	A	F	A	A	A	A	A	204		A	A	328	400	236	252	232	230	220	246	256		QE	B	B	A	A	
14	A	A	A	A	A	A	A	B	E	B	Q	300	254	210	224	204	220	B	B	Q	BE	A	A	A	A		
15	A	A	208	A	B	A	A	B	B	Y		224	248	252	240	194	194	194	224	210	224	Q	B	A	226		
16	A	A	A	A	A	A	E	BE	B	B	B	322	306	206	212	212	B	B	212	206	212	B	B	B	B		
17	B	B	E	A	A	A	A	Q	B	B	B	262	312	256	264		B	232	248	308	Q	B	A	A	A		
18	A	234	268	270	202	244	212	A	E	BE	BE	B	184	254	296	230	258	254	244	252	220	260	204	220	220	206	
19	AE	AE	A	246	214	408	206	204	222	222	238	264	246	220	208	212	208	204	204	192	192	219	204	188	206	272	
20	A	A	318	274	246	226	F	F	A	220	202	228	202	210	202	200	212	180	196	208	214	200	200	B	A		
21	A	A	226	210	232	224	222	200	256	222	216	226	214	218	226	230	200	212	200	212	200	AE	A	A	338		
22	A	218	224		212		A	A	A	B	B	256	240	244	232	254	240	248		A	A	A	A	A	A		
23	242	B	B	B	A	A	B	A	A	B	B	B	B	B	B	220	212	222	198	202	208	220	B	B	A		
24	220	A	A	A	AE	A	A	390	360	306	254	232	216	216	228	B	Q	Q	Q	QE	B	Q	E	BE	BE	B	
25	B	B	B	A	A	A	A	B	B	B	222	220	204	222	222	202	214	206	210	212	228	A	A	200			
26	A	198	A	A	A	A	A	AE	A	QE	B	BE	B	390	306	248	238	242	242	246	214	216	240	218	222	270	
27	A	AE	A	256	234	226	A	236	B	BE	BE	A	268	228	220	228	212	216	208	220	226	226	230	QE	B	A	A
28	A	A	232	A	A	A	A	A	A	BE	AE	A	300	298	254	254	234	248	248	256		B	B	A	A	A	
29	A	A	A	A	A	A	A	AE	BE	B	Q	E	332	286	218	240	228	226	232	204	206	220	212	216	B	B	B
30	B	AE	A	238	A	A	A	Q	Q	B	BE	B	266	234	248	248	242	236	222	240	Q	Q	A	B	B	A	A
31	A	A	226	218		B	B	B	B	A	A	B	B	BE	B	320	270	250	258	232	Q	B	A	A	220	220	
	00	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	11	11	11	8	9	7	12	16	16	20	19	27	22	25	26	22	29	27	23	16	8	5	9			
MED	231	218	229	220	212	215	222	269	262	238	226	219	224	222	217	214	207	218	214	218	217	207	216	222			
U Q	251	248	274	256	229	235	360	320	301	293	248	240	244	232	250	244	220	235	240	238	229	242	267	272			
L Q	212	200	226	208	203	210	212	229	255	226	220	212	214	206	208	208	194	206	208	212	215	205	202	217			

AUG. 2001 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2001 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	40	0	X	A	B	A	O	X	A	A	X	B	X	X	X	X	B	O	X	0	X	B	B	
2		A	R	B	RO	X	R	B		X	X	X	X	X	X		107	100	89	69		A	A	
3	A	X	59	62	67	68	59	60	B	X	X	X	X	X	X	X	0	X	O	X	A	O	X	
4	O	X	X	A	A	B	O	X	B	B	B	B	B	B	B	X	O	X	B	O	X	A	O	
5	A	O	X	O	X	A	A		B	X		X	X	X	X	X					A	A	O	
6	A	X	O	X	A	A			70	68	69	72	78	92		B	O	X	O	X	X	X		
7	A	A	52	58	65	68	67	58	67	74	87	98	98	114	110	102	104	92	75	75	58	45	40	
8	X	O	X	A	A	A	B	R	R	X	X	X	X	X	X	O	X	X	X	A	X			
9	A	R	A	43	58	72	68	71	56	67	80	94	81	90	95	94	92	104	95	92	74	64	48	36
10	O	X	O	X	B	B	B	O	X	X	X	X	X	X	X	X	X	X	X		Y	Y		
11	A	O	X	42	65	65	66	72	70	75	82	102	99	116	112	117	113	111	114	98	55		A	75
12	54	65		A	90	65		R	RO	X	R	BO	X	B	B	B	BO	X	X	BO	X	A	O	
13	A	O	X	55	68	66	68	66	B	BO	X	B	B	B	B	B	BO	X	X	O	X	R	A	
14	A	A	41	38	50	58	69	72	67	82	114	113	120	125	119	118	116	112	93	80	71	48	36	
15	X	46	54	59	51		62	65	74	82	101	104	102	104	108	107	115	66	21	48	90		B	
16	A	A	X	R	R	R	A	X	B	X	X	X	X	X	X	X	X	X	X	X	A	A	36	
17	O	X	O	X	A	A	X	65	40	68	67	B	68	74	85	102	110	111	111	115	114	106	94	90
18	O	X	O	X	0	X	O	68	84	40	40	66	74	68	67	75	79	93	108	105	108	97	112	109
19	O	X	46	64	59	58	62	61	57	43		B	B	B	B	73	81	90	100	100	102	105	102	
20	O	X	0	X	0	X	0	X	76	68	66	86	70	79	80	96	100	104	110	109	110	108	95	
21	O	X	A	26	71	71	49	71	69	69	74	80	87	94	98	98	98	100	105	94	97	92	86	
22	69	63	53	80			A		68	70	76	81	95	98	104	114	113	116	89	105	127	112	100	
23	49	42	52	68	77	70	66	77	65	78		B	X	B	X	X	X	X	X	X	X	X	B	
24	76	70	A	B	RO	X	41	62	59	72	78	80	79	82	82	76	B	B	B	B	B	B	B	
25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	B	B	B	B	A	81		
30	B	R	B	R	X	B	B	B	B	B	B	B	B	B	B	BO	X	O	X	B	B	B	112	
31					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	15	17	17	15	15	17	16	19	16	19	20	21	18	22	21	23	22	24	22	23	20	18	16	15
MED	46	54	52	65	65	66	68	65	67	75	80	92	102	101	108	104	106	102	96	77	61	46	45	36
U Q	68	64	59	70	66	69	70	70	73	80	89	100	108	110	112	110	108	108	102	86	70	57	62	39
L Q	40	40	42	43	58	51	64	55	64	70	76	80	89	90	98	96	102	95	86	60	40	44	38	29

SEP. 2001 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2001 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 34	R	A	B	A	R	A	A	41	BJ	R	R	70	75	81	82	R	B	R	F	R	F	F	B	
2	A 2	R	B	R	R	R	B	F	30	J	R	R	RJ	RJ	R	F	F	F	F	A	A	R	R		
3	AJ 53	R 53	F 53	F 49	F 51	F 50	B	F	58	58	63	74	83	82	98	103	102	99	93	35	33	R	A	F 40	
4	R 39	F 38	F 66	A	A	B	B	B	B	B	B	B	B	B	B	J	R	R	B	F	R	A	A		
5	A 33	R 31	R	A	A	F	B	F	49	57	62	74	84	102	88	106	95	97	86	81	68	30		23	
6	A 30	F 40	R	A	A	A	F	F	F	F	F	F	J	R	B	R	R	J	R	F	F	F	F		
7	A 40	A 45	F 48	F 54	F 51	F 44	F 56	F 68	81	92	92	108	104	96	98	86	69	65	47	35	29	21			
8	F 18	R 17	A 44	A	A	A	A	B	R	R	68	75	84	83	88	86	98	89	86	60	54	21		30	
9	A R	R	A	R	F	F	F	R	36	55	30	55	50	61	74	88	B	B	R	J	R	J	F	F	
10	R 18	R 16	R 16	F 13	B	B	B	R	41	63	73	82	99	110	120	114	112	105	103	80	67	43	27	Y	Y
11	A 36	A 53	R 50	F 56	F 60	F 59	F 69	F 75	96	93	110	104	111	107	105	108	R	J	R	F	A	A	F	A	
12	R 30	F 27	A 32	F 55	R 56	R 64	R 77	R 86	R	R	R	R	R	R	R	R	R	R	R	R	B	27	A	R	
13	A 49	R 62	A 55	F 54	F 41	B 57	B 74	B 83	B	B	B	B	B	B	B	B	R	R	R	R	R	R	A	R	
14	A 25	A 27	F 36	F 48	F 57	F 56	F 56	F 76	R	108	107	114	119	113	112	110	106	106	107	106	106	106	59	40	
15	F 40	F 36	F 48	A 31	F 53	F 55	F 68	F 76	R	R	R	R	R	R	R	R	R	R	R	R	R	R	A	B	
16	A 50	A R	R R	R A	B 36	B 56	B 66	B 70	R	J	R	J	R	J	R	R	F	F	A	A	36	30			
17	R 34	A 37	A 48	A 34	F 55	F 56	F 61	F 65	F 75	96	104	105	105	109	109	108	100	R	R	R	R	R	B		
18	R 62	A 34	R 34	R 53	F 64	F 54	F 56	F 55	F 60	68	87	97	99	102	91	106	103	J	S	J	R	R	F	A	
19	R 40	F 54	F 44	F 47	R 42	F 47	R 39	F 37	B	B	B	F	F	F	F	F	F	F	F	F	F	F	F	F	
20	F 59	F 53	R 38	A 52	R 53	R 73	R 61	R 62	F 68	F 86	F 92	98	104	103	104	R	B	B	B	F	F	F	F	F	
21	R 20	A A	A 43	A 54	A 54	F 56	F 68	F 74	R	81	88	92	92	94	99	88	91	92	89	79	70	36			
22	A 33	F A	A 60	F 55	F 67	F 71	F 81	F 89	F 97	108	104	110	83	99	121	110	R	J	R	J	R	J	R	F	
23	F 33	F 30	F 39	F 56	F 71	F 59	F 57	F 61	F 59	F 62	B	66	94	88	101	100	R	R	R	F	F	F	F	B	
24	F 62	F 42	A 35	A 43	A 46	R 66	R 66	F 74	F 73	F 76	F 76	J	R	B	J	R	B	B	B	B	B	R	B	B	
25	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B		
26	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B		
27	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B		
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	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B		
29	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	R B	R B	R B	R B	A R	A A			
30	B B	R B	B A	B 60	B B	B B	B B	B B	B B	B B	R 69	R 66	R B	R B	R B	Y A	A A								
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	12	16	14	12	15	17	16	19	16	19	20	21	18	22	21	23	22	24	22	23	20	17	13	15	
MED	36	35	40	46	49	53	54	55	58	66	74	86	96	95	98	98	98	94	88	66	50	38	30	27	
U Q	50	46	44	54	55	56	57	56	64	73	83	92	102	104	106	104	102	102	93	77	60	44	42	33	
L Q	25	30	34	32	42	42	42	44	56	61	68	74	83	82	88	90	91	89	79	54	32	28	26	19	

SEP. 2001 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2001 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	36	40	42	B	38	47	40	35	32	54	36	31	32	27	56	E	BE	BE	BE	BE	53	26	26	20	12	B	B											
2	27	17	20	16	22	B	BE	BE	BE	20	26	25	30	31	33	33	28	28	27	23	13	11	42	41	43	49												
3	40	49	50	43	46	49	40	B	E	BE	B	30	32	30	29	28	28	30	53	22	32	48	38	41	36	48	62											
4	56	90	80	38	35	B	B	B	B	B	BE	BE	B	36	55	28	52	60	17	27	35	21	37															
5	42	39	44	85	58	78	B	40	23	26	29	31	52	58	29	27	26	22	30	25	15	36	37	28														
6	39	31	32	36	67	38	34	16	21	24	27	32	B	E	B	B	E	BE																				
7	38	42	35	18	17	16	15	38	22	24	28	28	31	32	30	26	26	22	16	26	10	10	10	10	12													
8	22	30	33	37	57	40	41	B	36	41	34	27	36	33	30	27	57	38	16	13	14	32	32	50														
9	31	29	32	33	41	28	18	26	26	26	38	30	B	BE	BE	B	BE																					
10	13	27	18	15	B	B	BE	BE	BE	BE	BE	BE	E	BE	BE	B	E	BE																				
11	31	66	57	40	40	62	42	39	32	31	30	34	35	34	38	33	28	21	17	34	49	54	79	42														
12	39	72	105	75	58	38	36	35	46	B	34	B	BE	BE	B	34	53	23	53	52	27	31	30	41														
13	42	71	62	43	42	38	33	B	BE	B	29	B	B	B	B	BE	BE	B	G	53	51	29	40	18	40	54												
14	46	45	41	34	33	33	38	22	28	26	34	32	38	38	34	36	27	34	33	28	15	12	28	11	E	B												
15	22	24	36	32	54	54	37	42	B	EB	38	30	33	31	32	B	EB	BE	BE	28	29	27	58	23	23	24	40											
16	34	40	E	38	42	38	40	44	36	EB	31	28	35	34	33	28	28	26	24	20	12	41	39	35	39													
17	43	46	47	39	34	40	22	20	B	EB	38	31	30	30	31	29	30	27	25	54	35	30	26															
18	31	74	44	38	29	28	32	51	44	33	34	33	36	34	32	37	27	19	14	12	16	69	56															
19	42	44	39	38	37	32	23	39	B	B	B	32	34	31	30	29	28	26	18	14	15	21	11	19														
20	41	47	42	40	42	39	48	34	35	32	30	33	36	29	31	54	E	BE	B	BE	BE	33	31	13	14	28	14	16										
21	E	B	14	31	41	47	54	33	18	21	30	32	35	35	36	36	35	37	34	29	18	12	9	10	9	27												
22	54	38	34	46	56	44	45	28	B	G	35	38	31	38	37	55	59	31	26	18	37	38	31	34	B													
23	26	35	38	35	40	39	44	45	K	51	59	B	36	32	35	23	39	35	42	31	39	46	40															
24	40	43	72	B	48	41	24	33	37	32	35	37	32	33	33	B	B	B	B	B	B	B	B	B	30													
25	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											
26	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											
27	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											
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	B	B	B											
29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E	BE	B	B	B	B	B	B	B	B	71	37	45								
30	B	37	BE	B	24	36	B	B	B	B	B	B	B	B	B	E	BE	B	B	B	46	30	B	B	B	35	40	56										
31																																						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23														
CNT	24	25	23	23	24	22	21	20	18	20	20	21	18	22	21	23	22	25	22	23	22	26	23	21														
MED	38	40	41	38	40	39	37	34	G	31	30	32	33	32	30	30	27	30	20	22	19	28	32	37														
U Q	42	48	50	43	54	44	42	39	36	32	34	35	36	36	35	53	39	36	33	28	39	36	40	50														
L Q	29	31	35	33	36	33	24	24	26	26	30	30	31	32	30	28	27	24	18	14	14	18	14	14	24													

SEP. 2001 fTEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

47

SEP. 2001 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	15	14	B	15	14	13	15	15	B	54	36	31	32	21	56	B	53	26	26	17	12	B	B
2	12	11	B	12	10	18	B	20	26	25	25	21	25	22	19	20	17	15	13	11	12	13	8	10
3	9	10	9	7	9	12	12	B	19	32	30	25	25	25	30	53	18	13	48	11	8	8	8	8
4	10	8	10	28	30	B	17	B	B	B	B	B	B	B	36	55	21	52	60	17	9	7	10	8
5	8	11	12	16	14	19	B	19	17	12	29	27	52	58	26	24	17	13	10	25	15	9	8	9
6	8	9	7	10	19	14	12	10	14	19	17	32	B	26	33	53	29	31	20	25	20	19	14	9
7	16	20	13	9	10	10	9	11	16	16	18	20	20	25	20	20	13	14	8	8	10	10	10	8
8	8	8	8	16	26	25	22	B	28	20	20	24	36	21	16	18	57	38	11	13	14	9	8	8
9	8	10	9	9	11	10	8	8	26	26	38	25	B	B	46	54	30	26	20	13	13	8	6	10
10	8	8	10	10	B	B	B	25	25	30	31	29	34	59	31	27	24	25	18	17	15	11	11	10
11	12	12	15	16	19	14	16	13	20	17	30	22	26	18	20	18	17	13	10	15	10	11	9	8
12	7	8	10	7	16	9	20	29	28	B	B	B	B	B	34	53	17	53	52	13	14	8	10	
13	10	10	16	22	16	10	14	B	29	B	B	B	B	B	20	53	51	13	14	16	10	11	12	
14	17	24	9	15	15	12	14	15	15	16	16	17	16	15	17	15	14	9	9	10	15	12	8	11
15	8	11	11	10	22	16	24	18	B	38	22	24	21	18	B	25	29	27	58	19	15	10	17	B
16	28	14	38	29	29	18	14	17	B	31	20	20	19	20	24	19	16	15	12	12	9	8	10	8
17	9	12	18	20	12	14	12	12	B	38	31	24	25	21	19	30	27	25	54	35	30	26	B	B
18	22	14	14	10	11	10	10	14	16	16	16	18	24	18	29	37	22	20	19	14	12	8	8	8
19	15	16	13	12	11	9	11	16	B	B	B	20	18	18	17	14	28	14	12	8	15	10	11	11
20	7	19	20	19	16	12	16	14	12	20	14	14	15	21	31	54	B	33	31	8	10	10	9	10
21	14	11	24	16	13	8	8	10	11	12	12	13	15	15	15	11	11	10	9	8	9	6	9	7
22	10	8	22	14	13	13	10	9	12	10	11	12	17	16	15	55	59	31	26	15	12	14	10	8
23	8	7	8	10	9	8	14	14	15	14	B	25	B	15	17	16	13	22	25	8	9	8	9	
24	8	9	27	25	9	11	19	19	20	11	10	17	21	B	25	B	B	B	B	B	B	B	B	B
25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	61	B	B	B	32	22	28	
30	B	29	24	28	B	B	B	B	B	B	B	B	B	B	B	B	46	30	B	B	B	24	17	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	10	12	14	16	16	14	15	18	26	30	30	25	32	24	30	34	29	28	26	15	15	11	10	10
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	
L Q	8	9	10	10	12	10	12	14	16	17	18	20	20	18	19	20	17	15	12	11	10	9	8	8

SEP. 2001 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2001 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00'.4"S LON. 039°35'.4"E SWEEP 0.4 MHz TO 15.0 MHz IN 20.0 SEC 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 240	A 222	A 288	B 306	E 244	E 238	E 234	E 238	B 234	E 234	B 238	E 234	B 234	E 234	B 234	B 246	B 246	B 232	B 232	B 232	B 232	B 232									
2	A 222	A 282	A 250	E 224	E 226	E 206	E 222	E 222	E 222	E 222	E 222	E 210	E 202	E 212	E 212	F 192	Q 202														
3	A 238	F 236	A 234	B 216	E 408	B 296	E 262	E 248	B 260	E 222	E 222	E 244	E 244	E 244	E 244	E 230	E 222	E 244	E 290	E 264	E 264	E 264	E 264								
4	250	226	226	F 226	A B	B B	B 234	B 260	B 230	B 246	B 246	B 200	B 200	B 200																	
5	A 228	A 246	A A	A A	B A												Q 252	Q 240	Q 220	Q 206	Q 206	Q 210	Q 222	Q 222							
6	A 240	A 240	A A	A A	Q 354	Q 282	E 236	E 226	E 234	E 244	E 236	E 236	E 232	E 232	E 232	E 232	E 236	E 236	E 236	E 214	E 216	E 204	E 214	E 248							
7	A A	A A	A A	A A	Q 338	Q 340	Q 316	Q 278	Q 238	Q 220	Q 218	Q 232	Q 230	Q 220	Q 208	Q 210	Q 208	Q 200	Q 190	Q 194	Q 188	Q 184	Q 212	Q 220							
8	E 316	A A	A A	A A	A A	A A	B A	A A	H 246	E 238	E 248	E 248	E 248	E 248	E 248	E 250	E 232	E 216	E 222	E 266	E 266	E 266	E 266								
9	A A	A A	A A	A A	Q 244	Q 370	Q 276	Q 258	Q 248	Q 248	Q 226	Q 270	Q 276	Q 230	Q 212	Q 204	Q 208	Q 202	Q 202	Q 204	Q 236	Q 244	Q 244	Q 244							
10	A 304	A A	A A	A B	B B	B B	Q 262	Q 246	Q 232	Q 220	Q 220	Q 228	Q 228	Q 240	Q 224	Q 224	Q 206	Q 208	Q 200	Q 184	Q 200	Q 220	Q 220	Q 220							
11	A A	E 244	A 320	A A	E 354	E 386	E 292	E 272	E 230	E 232	E 216	E 222	E 210	E 224	E 216	E 196	E 214	E 198	E 290	E 290	E A	E A	E A	F A							
12	208	248	A A	A A	232	A A	A A	A A	B E	E A	B B	B B	B B	B B	B B	B 246	B 282	B 240	B 256	B 264	B 248	B 338	B 338	B 338							
13	A 280	A A	A A	A A	276	A A	A A	B B	B E	B B	B B	B B	B B	B B	B B	B 284	B 242	B 240	B 324	B 308	B A	B A	B A	B A							
14	A 252	E 280	A A	A A	A A	Q 254	Q 248	Q 248	Q 214	Q 218	Q 232	Q 220	Q 214	Q 218	Q 216	Q 216	Q 198	Q 208	Q 192	Q 204	Q 218	Q 250	Q 274	Q 274	Q 274						
15	A 266	H 256	A A	A A	A A	A A	A A	B E	B B	Q 328	Q 238	Q 238	Q 232	Q 222	Q 232	Q 232	Q 234	Q 198	Q 282	Q 308	Q 304	Q A	Q A	Q B	Q A						
16	A A	B A	A A	A A	A A	A A	A A	B E	B E	A 240	A 210	A 250	A 226	A 222	A 214	A 214	A 208	A 206	A 196	A 200	A 218	A B	A B	A B	A B						
17	204	230	A A	A A	A 230	A 336	A 254	B 260	B 218	B 222	B 228	B 228	B 226	B 234	B 222	B 214	B 242	B 222	B 214	B 242	B 222	B 214	B 244	B B	B B	B B	B B				
18	A 244	A A	E 244	A A	A A	A 216	A 336	A 226	A 210	A 222	A 222	A 206	A 208	A 218	A 222	A 212	A 214	A 214	A 204	A 204	A 204	A F	A A	A A	A A	A A					
19	A 248	A 248	A 212	A A	A A	A A	A A	B B	B 226	B 226	B 226	B 226	B 224	B 232	B 204	B 204	B 204	B 230	B 230	B 230	B 230										
20	A 254	E 378	A A	A Q	A Q	A Q	A Q	Q 300	Q 238	Q 238	Q 216	Q 218	Q 212	Q 212	Q 232	Q 232	Q 254	Q B	Q 220	Q 204	Q 192	Q 206	Q 220	Q 220	Q 220	Q 220	Q 220				
21	B A	A A	A A	A A	Q 354	Q 304	Q 260	Q 236	Q 236	Q 234	Q 222	Q 214	Q 222	Q 222	Q 222	Q 222	Q 220	Q 208	Q 206	Q 192	Q 198	Q 192	Q 210	Q 222	Q 222	Q 222	Q 222				
22	238	A A	A A	A A	A A	Q 338	Q 258	Q 248	Q 234	Q 228	Q 220	Q 226	Q 210	Q 222	Q 268	Q 264	Q 244	Q 216	Q 224	Q 238	Q 266	Q 248	Q A	Q A	Q A	Q A	Q A				
23	A 216	A A	A B	A A	A B	A B	A B	A B	A B	Q 262	Q 222	Q 238	Q 228	Q 310	Q 284	Q 286	Q 224	Q A	Q B	Q B	Q B	Q B									
24	246	346	A A	A B	A A	A A	A A	A A	A A	A A	A B	A B	A B	A B	A B	A B	E 236	E 202	E 294	E 256	E 236	E 244	E 242	E 242	E 256	E 300	E B	E B	E B	E B	
25	B B																														
26	B B																														
27	B B																														
28	B B																														
29	B B																														
30	B A	B A	B A	A B	B B	Q 284	Q 264	Q B	Q B	Q B	Q A	Q A	Q A	Q A																	
31																															
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
CNT	7	10	8	5	4	8	11	13	15	18	20	21	18	22	21	23	22	25	21	23	16	16	11	10							
MED	242	239	244	274	239	256	326	262	247	234	226	229	226	222	225	225	224	213	207	215	205	217	230	232							
U Q	304	266	253	300	291	354	370	282	288	252	242	244	232	236	237	244	246	245	231	248	251	255	250	252							
L Q	208	228	242	242	233	219	276	251	238	226	218	221	222	220	219	216	208	208	200	200	203	209	220	220							

SEP. 2001 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2001 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	54	0	X	55	44	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
2		A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B		
3	B		B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	36		
4		A	A	A	A	B	B	B	B	B	B	B	B	B	B	O	X	71	B	BO	X	X	A	A	
5	A	A	A	B	A	A	B	BO	X	O	X	X	X	O	X	X	O	X	X	X	X	X	X	42	
6	X		B	O	X			BO	X	X	BO	X	X			X	X	X	X	X	X	X	X		
7	44	38	67	64	70	73		75	89	109	106	106	106	106	106	108	109	104	96	82	76	65	71		
8	0	X	53	68	74	76	66	58	X	B	X	X	O	X	BO	X	X	X	X	X	X	X	X	X	
9	29								78	86	88	90			111	108	107	104	101	98	91	84	76	69	64
10		O	X	A					B	B	A	X	B	X	X	X	X	X	X	X	X	X	X	A	
11	0	40	88	72		78		R	RO	X	R	B	B	B	B	BO	X	X	X	X	X	X	X	R	
12	48	36	48	70	67	64		77	84	84	84	84	103	108	113	103	80	83	81	51	68				
13	X	60	38	49	68	67	64	RO	X	B	B	B	X	O	X	X	X	X	X	X	B	BO	X	R	
14	54	38		34	40	46		R	B	B	B	R	R	B	BO	X	O	X	X	X	B	A	A	0	
15		A	A	B	B	A	B	B	B	A	B	B	B	B	B	X	X	X	X	X	X	X	X	36	
16	56	66	60	68	75	81	74	O	X	R	X	BO	X	X	X	X	X	X	X	X	X	X	X		
17	68	A	92	48	56	42	49			75	84	71	73	79	73	78	79	79	82	78	72				
18	54	66	68	95	A	BO	X	X	X	X	O	X	B	X	X	X	X	X	X	X	81	73	70	62	
19		55	60	79	68	87	65		B	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
20		50	46	65	76	80	90	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
21		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
22		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
23		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
24		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
25		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
26		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
27		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
28		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
29		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
30		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
31		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
	00	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	12	10	13	10	10	5	5	8	7	5	10	9	10	11	13	13	13	12	14	12	10	9	9	
MED	54	50	66	68	68	66	67	64	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
U Q	57	66	79	73	76	78	74	76	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
L Q	0	X	46	38	60	48	64	64	54	44	74	83	86	71	78	84	78	75	75	73	60	64	50	41	37

OCT. 2001 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2001 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 34	R 35	F 33	F 32	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
2	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B		
3	B 60	F	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	F 27		
4	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	R 65	B	B	R 59	R 43	22	A	A	
5	A	A	A	B	A	A	B	B	R 68	R 86	R 89	R 82	R 82	R 99	R 108	R 100	99	83	79	74	58	23	F 19	F 22
6	F 38	B 26	F 54	F 58	F 63	F 63	R 69	R 83	103	100	97	97	100	102	103	98	90	76	60	52	31	F F	F F	
7	F 23	F 40	F 54	F 63	F 60	F 57	F 52	R 72	R 80	R 82	R 84	R 105	R 102	R 101	R 98	R 95	R 92	R 85	R 78	R 70	R 63	R 58	A	A
8	F 48	F 32	F 52	F 43	F 54	R 58	R 88	R 88	R 80	R 82	R 102	R 93	R 99	R 99	R 51	R 46	R 32	R 35	R F	R R	A	A	R	
9	R 34	A	A	F	R 56	R 69	R 48	R 57	R B	R B	R B	R 66	R 65	R 57	R 42	R 58	R 43	R 37	R F	R A	R	R		
10	R 42	F 26	A	F 36	F 56	F 61	R 58	R 71	R 78	R 78	R 78	R 97	R 102	R 107	R 97	R 74	R 77	R 75	R 45	R 58	R F	R R	R	
11	F 54	F 31	F 38	F 50	F 55	F 56	R 76	R 76	R 72	R 79	R 78	R 72	R 77	R 78	R 76	R 68	R 46	R F	R B	R 44	R R	R	R	
12	R 31	F 30	R 28	F 30	F 36	R A	R B	R B	R B	R A	R B	R B	R B	R J	R S	R J	R R	R 42	R B	A	A	R 30	R	
13	A	A	B	B	A	B	B	B	B	A	B	B	B	B	82	94	94	96	83	73	68	44	35	22
14	F 40	F 54	F 33	F 53	F 55	F 70	F 68	R 69	F 74	R 65	F 67	F 66	F 67	F 72	J 73	R 73	R 76	R 72	R 60	R F	R F	R F	R	
15	A A	A	A	R 42	R 41	R 30	R 43	R A	R B	R B	R B	R 64	R 61	R 61	R 60	R 60	R 61	R 58	R 57	R 57	R 40	R 32	R	
16	F 27	F 46	F 53	A	A	B	R 61	J 63	R 72	R 77	R 80	R 89	R 91	R 94	R 80	R 79	R 83	R 75	R 67	R 60	R 44	R 31	R	
17	F 32	F 49	F 67	F 61	F 67	F 55	R 24	R 78	R 76	R 80	R 85	R 97	R 95	R 90	R 87	R 88	R 86	R 82	R 82	R 81	R 72	R 66	R 60	
18	F 39	F 26	F 47	F 62	F 67	F 79	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
	00	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	12	8	12	10	10	5	5	8	7	5	10	9	10	11	13	13	13	12	14	12	10	9	9
MED	36	34	50	52	56	59	61	58	70	78	82	80	80	93	94	87	88	83	76	72	59	50	44	31
U Q	41	48	54	58	60	69	66	70	72	83	88	85	93	97	102	100	98	96	82	75	72	60	60	45
L Q	32	28	36	39	54	55	48	36	68	76	80	65	72	78	72	69	69	67	54	57	44	35	38	24

OCT. 2001 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2001 fTSS (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	40	46	40	27	44	38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B							
2	64	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	78								
3	B	99	B	B	58	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	37	39	29						
4	60	77	70	42	45	B	B	B	B	B	B	B	B	B	B	E	B	54	B	BE	B	52	28	18	32	40					
5	41	39	32	B	39	36	B	BE	BE	BE	BE	E	B	57	53	73	55	37	40	35	38	28	E	B	E	B					
6	23	30	B	E	B	E	B	BE	BE	B	B	E	BE	B	53	56	49	32	32	32	29	90	32	30	16	16	34				
7	26	22	23	21	17	20	25	E	E	B	BE	B	29	28	55	46	54	32	30	29	24	19	20	17	16	31	12				
8	E	B	10	37	44	64	42	B	B	64	40	B	G	E	BE	BE	B	59	55	35	32	30	29	37	31	40	36	40	56	43	
9	40	91	42	22	36	43	34	36	36	36	30	B	B	B	30	54	28	22	34	40	44	43	40	38							
10	38	39	74	24	38	36	40	39	31	E	B	B	54	30	53	54	54	34	32	53	54	29	26	25	32	33					
11	57	65	47	94	19	34	42	36	E	B	G	B	B	54	54	33	33	30	27	30	53	25	B	B	46	41					
12	32	89	28	48	24	24	E	B	B	B	B	B	B	34	38	B	B	BE	31	33	34	28	41	B	77	42	36				
13	91	40	B	B	39	B	B	B	B	B	B	B	B	48	B	B	BE	55	29	26	24	25	25	27	18	19					
14	23	30	23	21	20	26	54	38	38	36	B	B	B	55	36	34	57	56	30	57	38	29	22	B	68	68					
15	66	59	41	36	56	58	36	58	B	B	B	B	B	39	34	35	32	31	28	24	32	23	14	29	32						
16	34	35	26	44	44	B	40	47	41	E	BE	B	55	59	34	33	32	32	24	26	GE	B	B	22	21	26	34	35	G		
17	39	41	69	104	58	29	E	B	B	37	37	37	33	G	G	33	32	32	32	33	28	E	B	E	B	E	B	26	12	11	27
18	13	22	33	22	27	23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
	00	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	17	14	14	17	12	8	8	9	7	6	11	9	10	11	13	14	13	12	14	12	14	15	15							
MED	39	40	40	32	39	34	36	38	37	38	44	46	37	34	32	32	28	28	28	28	24	25	26	32	34						
U Q	58	71	47	48	44	37	41	52	47	54	59	55	54	40	54	36	32	36	46	40	29	40	42	40							
L Q	24	32	28	22	26	25	32	36	34	36	G	30	34	33	32	30	28	25	25	22	20	16	18	27							

OCT. 2001 fTSS (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2001 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	17	13	11	16	22	31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	33	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	54
3	B	B	B	28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	20	20	14
4	19	20	19	25	22	B	B	B	B	B	B	B	B	B	B	B	54	B	B	52	24	14	15	21
5	14	18	26	22	25	B	B	57	53	73	55	26	23	24	26	18	28	20	20	20	9	14	13	
6	13	10	14	29	25	29	B	53	50	B	56	49	26	19	32	32	29	90	32	30	16	10	10	
7	10	9	10	10	11	20	25	B	29	21	55	46	54	23	26	24	20	13	11	10	9	7	7	
8	10	9	13	16	18	B	B	24	24	B	29	59	55	35	15	16	29	37	31	20	16	10	12	10
9	12	25	15	20	26	25	19	26	30	B	B	25	B	B	54	20	18	26	16	12	12	11	11	
10	14	10	17	13	12	26	21	25	24	54	B	25	53	54	54	34	31	53	54	29	26	25	25	26
11	25	16	15	15	19	25	30	30	B	B	B	54	54	20	22	18	16	30	53	25	B	B	25	16
12	15	15	25	15	24	19	B	B	B	B	31	26	B	B	B	31	20	16	20	21	B	15	17	12
13	13	19	B	B	25	B	B	B	18	B	B	B	55	24	20	17	18	25	25	10	18	8	B	
14	10	9	12	11	13	16	54	28	20	17	B	55	36	25	57	56	30	57	38	29	11	B	25	13
15	18	22	25	21	12	9	11	20	B	B	B	27	30	28	24	20	24	13	16	12	8	14	10	8
16	9	9	11	20	19	B	21	16	20	55	59	B	30	18	13	25	17	26	B	18	14	9	10	8
17	12	9	11	22	10	29	B	23	18	18	16	18	20	25	18	17	33	25	26	18	15	12	11	6
18	8	10	9	10	10	11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	18	18	18	18	18	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
MED	14	14	16	18	20	26	B	B	57	B	B	55	55	54	54	31	29	29	38	25	24	14	15	12
U Q	18	20	26	25	25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	40	
L Q	10	9	11	14	12	20	23	24	24	36	57	26	33	25	20	22	20	19	20	18	13	10	10	8

OCT. 2001 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

53

OCT. 2001 h'F (KM)

45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00'.4"S LON. 039°35'.4"E SWEEP 0.4 MHz TO 15.0 MHz IN 20.0 SEC IN MANUAL SCALING

OCT. 2001 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2001 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	B	B	X	46	50	64	79	A0	X	46	49
2	46	57	57	60	66	67	72	79	87	88	89	86	75	79	78	78	84	79	79	80	75	78	73		
3	X	76	76	77	72	77	74	87	95	102	105	108	105	99	100	107	107	106	103	100	89	84	78	73	68
4	70	73	80	84	95	105	107	108	120	95	123	111	110	114	93	103	106	82	81	82	81			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	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
7	B	B	B	B	B	B	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	
9	X	66	B	B	B	B	B	B	B	B	B	B	BO	X	B	B	B	BO	X	X	X	X	X	X	X
10	X	56	B	B	B	B	B	B	BO	X	X	X	Y	X	X	X	X	X	O	X	X	X	X	X	X
11	B	B	B	B	R	BO	X	X	X	X	X	X	YO	X	B	BO	X	X	X	X	X	X	X	X	
12	X	X	62	57	66	B	A	R	RO	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13	X	X	64	68	70	70	74	79	79	86	102	99	89	94	89	88	78	76	72	70	74	72	66	50	65
14	X	70	65	63	76	83	76	88	101	104	98	98	81	97	88	90	85	81	75	73	70	71	71	68	57
15	64	69	71	75	82	86	89	82	101	103	106	107	95	95	101	96	88	82	78	78	67	70	70		A
16	62	66	65	69	70	49	46	50	69	65	64	62	67	71	69	72	68	62	59	63	64	66	70		
17	O	X	70	59	69	76	66	67	A	A	R	Y	BO	X	Y	X	X	X	X	X	X	X	X	X	X
18	B	65	64	R	B	B	B	R	R	BO	X	X	BO	X	X	BO	X	X	X	BO	X	X	Y	R	
19	O	X	47	51	X	B	R	B	B	B	B	B	BO	X	B	B	B	B	B	B	B	B	B	B	B
20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
21	B	B	BO	X	64	B	BO	X	B	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
22	O	X	70	63	68	63	65	72	80	74	97	96	106	98	88	102	BO	X	X	X	X	X	X	X	X
23	RO	X	51	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	BO	X	BO	X	X	
27	BO	X	69	71	70	B	B	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
28	O	X	66	64	X	74	X	X	X	BO	X	X	R	RO	X	X	X	X	X	X	X	X	X	X	
29	X	68	69	68	X	71	71	80	88	91	88	87	88	84	76	75	73	69	69	70	70	67	66	X	X
30	X	65	70	77	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	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	16	17	15	12	13	11	11	13	14	16	18	17	15	16	15	16	19	19	20	18	21	18	20	19	
MED	66	65	68	70	70	74	79	80	88	94	88	87	92	88	88	85	82	76	75	72	72	68	66	66	
U Q	70	69	71	76	80	81	88	98	102	102	100	98	97	91	94	90	86	82	78	75	76	71	68	68	
L Q	XO	X	62	58	64	64	66	67	71	79	74	84	80	75	79	83	86	78	75	73	70	68	66	64	

NOV. 2001 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2001 f₀f₂ (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	B	B	R	R	F	R	A	40	38			
2	F 33	F 44	F 46	F 54	F 58	F 60	F 69	F 80	F 82	F 83	F 80	F 69	F 73	F 72	F 72	F 78	F 73	F 73	F 73	F 74	F 65	F 66	F 66			
3	F 70	F 60	F 57	F 66	F 61	F 64	F 81	F 85	F 92	F 99	F 102	F 99	F 93	F 94	F 101	F 101	F 100	F 97	F 94	SJ 83	RJ 78	F 70	F 67	F 59		
4	F 59	F 64	F 69	F 70	F 80	F 93	F 96	F 98	F 114	F 89	F 117	F 105	F 102	F 108	F 87	F 97	F 100	F 76	F 72	F 72	F 75	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			
6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
7	B	B	B	B	B	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	R 66			
9	J 60	R 60	B	B	B	B	B	B	B	B	R 70	B	B	B	B	RJ 69	RJ 70	RJ 72	RJ 67	RJ 71	RU 65	S 59	R 42			
10	J 50	R 50	B	B	B	B	B	B	R 76	R 74	R 74	R 73	J 74	R 72	R 71	R 71	R 69	R 67	R 67	R 62	R 60	R 58	R R			
11	B	B	B	B	B	R 65	R 62	R 66	R 68	R 61	RJ 76	R 76	R Y	R R	R B	RJ 64	RJ 68	R 70	R 68	R 67	R 63	R 62	R 62			
12	56	51	58	F B	A A	R R	R 64	R 73	R 77	R 81	RJ 88	R 84	R 80	R 81	R 77	RJ 73	R 68	R 72	R 69	R 67	R 62	R 60	R F			
13	58	62	61	62	68	73	68	79	88	88	83	88	83	82	72	RJ 70	R 66	R 64	R 65	R 66	R 57	R 44	R 55	R F		
14	64	55	57	65	73	66	82	95	94	92	92	75	91	82	84	79	75	69	67	64	65	65	62	R 42		
15	52	56	59	64	70	75	83	76	95	97	100	101	89	89	89	95	90	82	76	72	72	61	56	59		
16	53	57	58	63	59	43	40	44	57	59	58	56	61	R Y	R 64	R 72	R 83	R 80	R 55	R 63	R 62	R 56	R 53	R 57	R 60	R 64
17	60	53	58	59	54	56	F F	F J	F J	R F	R J	R J	R R	R R	R R	R J	R J	R J	R J	R J	R J	R J	R 50	R 56		
18	B 54	F 56	R B	B	B	R	R	R	B 59	R 64	R 71	R B	R B	R B	R B	R 82	R 84	R 91	R 85	R 70	R 46	R 57	R Y			
19	R 41	R 45	B	R	B	B	B	B	B	B	B	B	B	B	B	R 62	R B	R B	R B	R B	R B	R B	R B			
20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 60			
21	B 58	B 68	B 73	R 79	R 80	R 80	R 82	R 84	R 82	R 88	R 83	R 79	R 82	R 78	R 69	R 62	R 58	R 60	R 60	R R	R R	R R	R R			
22	R 64	R 57	R 62	R 57	R 59	R 66	R 74	R 68	R 91	R 90	R 100	R 92	R 82	R 96	R 80	R 74	R 69	R 66	R 59	R 53	R 53	R 42	R R			
23	R 45	R B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 64	R 61			
27	B 63	R 65	B 64	R B	B	B	RJ 99	R 100	R 97	R 84	R 86	R 82	R 82	R 78	R 76	R 70	R 72	R 66	R 68	R 68	R 60	R 64	R R			
28	S 60	S 58	B 62	J 68	R 75	R 79	R 94	R 98	R 94	R R	R 86	R 80	R 79	R 68	R 65	R 63	R 64	R 67	R 62	R 60	R 61	J R	R			
29	62	59	62	60	62	65	65	74	82	85	82	81	82	78	70	69	67	63	63	64	64	61	60	R		
30	59	59	67	57	60	59	59	76	82	88	80	80	81	80	82	73	73	68	65	64	62	61	62	F		
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	16	16	15	12	13	11	11	13	14	16	18	17	15	16	15	16	19	19	20	18	20	18	20	19		
MED	59	57	58	62	62	65	73	74	81	88	82	81	86	82	82	79	76	70	69	66	66	62	60	60		
U Q	61	60	62	64	69	75	82	90	94	94	94	94	92	91	85	88	84	80	76	72	69	68	65	62		
L Q	52	54	57	58	59	58	60	68	68	78	74	69	73	77	80	72	69	67	64	64	62	58	59	55		

NOV. 2001 f₀f₂ (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2001 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	B	B	31	22	44	48	47	40	40	
2	34	35	43	29	34	40	36	35	34	35	70	37	37	37	34	39	29	35	34	28	21	16	16	
3	G	31	34	38	30	32	41	46	38	33	57	G	33	34	35	32	32	34	36	26	21	20	17	
4	14	13	28	31	26	32	35	36	35	38	35	36	34	35	35	59	38	35	37	36	38	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		
6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
7	B	B	B	B	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		
9	E B 29	B	B	B	B	B	B	B	B	E B 60	B	B	B	B	G E B 56	B E B 38	B E B 31	B E B 34	B E B 31	B E B 29	B E B 30			
10	E B 34	B	B	B	B	B	B	B	B	E B E B 55	E B E B 55	E B E B 59	32	32	32	55	33	31	28	34	32	29	25	26
11	B	B	B	B	B	B	B	B	B	G G 39	41	36	36	35	33	35	56	E B B 30	26	26	22	24	23	
12	26	30	30	60	42	37	36	31	31	34	72	42	45	36	39	33	32	33	28	24	32	28	18	
13	E B 16	G	16	22	26	36	B	41	36	33	35	34	36	38	37	36	35	34	30	26	22	21	29	33
14	48	46	41	55	28	30	35	37	32	33	35	42	40	57	60	47	40	37	33	27	22	28	20	17
15	14	21	34	35	26	34	35	34	39	38	40	36	35	36	48	40	37	34	34	26	31	64	58	47
16	43	40	32	34	32	36	40	42	37	35	36	34	54	34	54	34	33	30	24	32	27	33	33	26
17	30	62	61	46	45	59	51	59	43	40	B	36	32	34	35	34	32	34	34	30	38	33	38	32
18	B	38	93	39	B	B	B	46	41	B	36	34	53	E B B 36	33	32	34	31	31	40	33	35		
19	32	31	38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B E B 55	E B E B 47			
21	B	B	E B 53	B	B	E B	B	B	E B	B	B	B	B	B	B	E B E B 33	56	33	38	30	30	34	28	
22	E B 30	E B E B 31	E B E B 27	29	40	36	G	40	57	33	40	37	34	31	35	B	G E B 33	30	31	22	22	71		
23	41	29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
27	B E B 56	B E B 56	B E B 58	B	B	B	B	E B	E B	55	34	36	37	56	38	35	34	G E B E B 31	31	33	29	31		
28	E B E B 30	E B E B 29	E B E B 56	32	32	35	60	B	44	39	80	38	47	38	60	60	35	63	30	25	28	27		
29	E B E B 26	E B E B 26	39	34	34	35	30	34	32	32	35	38	39	49	34	55	32	37	38	35	39	26	36	43
30	42	G	30	36	33	32	34	38	48	44	34	42	62	84	59	40	36	33	44	34	33	26	23	20
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	17	15	14	14	14	13	16	16	17	18	18	18	18	17	16	19	20	20	18	21	20	21	21
MED	30	30	33	35	33	35	35	38	36	34	36	36	36	36	36	36	33	34	33	30	30	28	28	28
U Q	38	39	53	39	40	40	40	46	46	39	55	42	42	45	51	44	36	36	36	35	36	33	37	38
L Q	21	24	30	31	30	32	34	36	34	33	35	34	34	34	34	34	32	31	G	27	24	26	24	19

NOV. 2001 fTEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

57

NOV. 2001 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	B	B	20	20	14	10	8	8	12		
2	10	9	7	8	6	12	8	16	11	20	70	26	25	25	19	20	10	11	10	B	18	14	11	9	
3	8	7	12	25	10	18	13	15	19	30	57	26	26	28	17	16	16	13	12	12	15	12	12	7	
4	8	10	9	8	8	10	14	14	14	14	24	26	25	20	31	59	16	13	12	16	16	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		
6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
7	B	B	B	B	B	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		
9	B	B	B	B	B	B	B	B	B	B	60	B	B	B	B	B	29	56	38	31	34	31	29	30	
10	B	B	B	B	B	B	B	B	55	55	59	28	25	26	55	27	31	24	34	32	29	25	25		
11	B	B	B	B	B	B	B	29	29	28	32	29	28	25	56	B	B	26	24	19	14	20	18	25	14
12	15	15	30	B	51	26	26	20	19	18	19	72	26	21	25	16	20	15	12	14	14	10	10	11	
13	16	13	15	20	26	B	17	22	16	20	20	29	17	25	18	17	15	20	14	14	10	18	15	14	
14	11	22	24	12	16	26	15	12	15	15	18	19	20	22	25	17	16	13	10	11	12	11	8	10	
15	10	9	10	10	10	9	12	12	12	13	15	14	20	16	19	17	16	12	12	8	8	10	11	9	
16	10	17	22	18	8	20	14	14	16	20	24	19	54	30	54	23	18	19	10	21	18	17	10	10	
17	10	26	11	13	9	11	20	26	23	29	B	26	24	24	28	22	17	14	18	20	15	20	15	25	
18	B	14	16	22	B	B	B	26	24	B	26	28	53	B	26	24	25	34	31	B	31	28	26	29	
19	21	19	30	B	B	B	B	B	B	B	B	B	B	B	B	30	B	B	B	B	B	B	B		
20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
21	B	B	B	B	B	B	B	61	55	57	64	58	56	29	24	26	24	25	56	32	38	30	30	34	28
22	30	26	27	29	24	27	30	24	57	29	30	22	18	25	29	B	27	25	30	27	18	18	15	28	
23	21	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
27	B	56	56	B	58	B	B	73	27	55	27	30	26	56	32	26	27	27	31	31	32	29	31		
28	30	29	B	56	32	32	35	60	B	36	30	27	30	28	23	18	21	26	24	18	19	25	28	27	
29	26	26	24	24	17	16	25	34	26	17	29	26	25	30	30	55	20	19	14	20	21	19	16	16	
30	15	12	14	18	18	18	15	17	15	15	16	14	15	17	16	14	18	14	14	11	11	10	15	14	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	29	28	29	29	29	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	
MED	30	26	B	B	B	B	B	55	57	36	57	29	30	30	31	57	26	26	26	31	26	28	27	28	
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		
L Q	13	14	16	19	16	19	16	18	18	20	25	26	25	24	25	20	18	15	14	14	15	17	15	14	

NOV. 2001 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2001 h'F (KM)

45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69° 00'.4" S LON. 039° 35'.4" E SWEEP 0.4 MHz TO 15.0 MHz IN 20.0 SEC 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	B	B	Y	Y	A	A	A	Q	A			
2	E	A	F	FE	A	A	A	242	226	242	B	Y	Y	A	242	218	222	216	240	230	Q	Q	Q	Q		
3	274	208	232	218	Q	Q	Q	218	244	228	Y	B	AE	AA	214	248	218	218	224	222	222	218	220	228	238	254
4	266	292	316	234	238	Q	Q	Q	218	244	228	Y	B	YE	YE	Y	B	256	256	220	224	250	236	250	242	242
5	250	260	272	300	278	252	238	216	220	220	220	256	256	256	220	224	220	224	250	236	250	244	244	244	244	244
6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
7	B	B	B	B	B	B	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		
9	E	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E	B	E	B		
10	260	E	B	B	B	B	B	B	B	B	B	Y	Y	Y	B	256	230	236	246	258	250	244	244	262	262	
11	348	B	B	B	B	BE	A	B	Y	A	Y	Y	Y	B	B	222	232	242	242	250	254	264	262	262	262	
12	290	A	Q	B	A	A	A	A	Y	A	Y	B	Y	A	218	200	228	230	240	244	250	258	256	250	250	
13	320	320	Q	Y	B	A	A	288	216	216	Y	Y	Y	Y	Y	230	222	222	232	238	252	Q	Q	Q	312	220
14	320	A	A	A	A	294	260	234	222	222	Y	Y	Y	A	A	222	228	228	228	246	252	260	274	274	274	
15	320	Q	Q	Q	A	Q	Q	268	250	236	210	A	Y	Y	214	204	230	212	228	222	236	260	256	296	296	
16	320	A	Q	306	218	272	248	272	246	212	Y	222	B	Y	B	234	224	240	238	252	270	270	270	270	278	
17	292	Q	A	276	248	278	268	236	A	A	A	A	B	A	Y	Y	226	230	264	260	238	A	A	A	A	A
18	262	Q	Q	332	A	B	B	B	A	A	B	Y	Y	B	Y	238	Y	224	220	242	318	280	Y	A	A	A
19	312	A	Q	278	B	A	B	B	B	B	B	B	B	B	Y	B	B	B	B	B	B	B	B	B	B	
20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
21	B	B	B	B	B	B	B	B	B	B	400	Y	Y	Y	Y	216	226	252	268	286	270	258	258	258	258	
22	266	E	B	E	B	Y	A	A	Y	BE	A	Y	212	234	Y	234	B	Y	AE	B	242	210	226	240	280	268
23	284	286	288	220	Y	A	A	244	Y	212	234	Y	234	Y	214	308	212	230	246	258	246	242	242	242	242	242
24	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	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
27	B	E	B	B	B	B	B	B	B	YE	B	Y	Y	Y	B	Y	214	308	212	230	246	258	246	242	242	242
28	350	E	B	E	B	B	E	B	E	B	E	Y	Y	A	Y	A	A	A	A	A	A	A	A	A	A	
29	256	266	B	276	264	252	386	390	B	BE	Y	Y	A	Y	A	228	242	248	242	250	254	254	254	254	254	254
30	274	274	358	Y	E	A	E	B	Y	A	A	A	A	Y	B	A	214	218	232	242	236	254	254	254	278	278
31	A	Q	Q	A	A	E	A	A	Y	294	268	242	232	204	234	A	226	220	214	228	230	242	254	258	258	258

NOV. 2001 b'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2001 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	X	X	0	X	0	X	X	81	91	86	83	88	82	84	86	79	80	76	71	68	67	67	70	69	
2	X	X	82	76	80	89	93	99	100	100	97	88	84	83	82	81	78	77	74	76	74	79	74	68	
3	X	X	68	68	76	81	86	92	103	92	93	88	84	82	79	84	75	71	72	72	68	60		67	
4	66	54	63	56	48	R	A	R	R	Y	Y	O	X	B	R	R	X	X	X	X	X	X	X	R	
5	X	X	A	O	X	O	X	X	R	B	R	R	B	O	X	R	O	X	X	X	X	X	X		
6	55	60	56	63	68	70	67	79	79	80	79	75	72	72	72	71	69	60	54	50	64	68			
7	A		A	X				X	O	X	X	R	O	X	O	X	O	X	O	X	O	X	O	X	
8	X	X	O	X	R	X	B		X	O	X	B	X	X	O	X	O	X	X	O	X	X	X	X	
9	63	68	72	75	69	70	84	86	86	85	90	83	81	80	80	79	78	74	75	71	70	68			
10	70	66	68	A	72	72	72	79	84	87	88	83	86	77	73	72	70	74	70	71	66	63	64		
11	B		A	74	76	80	80	84	87	81	84	84	80	81	86	83	76	71	70	68	60	56	73		
12	B	X	Y	A	R	R	X		X	X	R	X	X	R	O	X	B	B	B	Y		97	R	X	
13	R	62	68	62	64				R	R	R	R	R	R	O	X	B	B	R	R	O	X	X	X	
14	X	65	68	72	76	77	87	98	99	102	98	91	88	80			X	X	X	X	X	X	X	X	
15	0	X	68	64	66	64	70	69	67		0	X	R	R	O	X	O	X	O	X	O	X	X	X	
16	67	67	70	64	66	A	O	X	X	R	R	R	R	R	R	O	X	O	X	X	X	X	X	X	
17	0	X	X	X	O	X	X	A	R	R	R	B	B	B	Y	B	X	R	R	R	R	O	X	B	
18	56	47	60	64	A	O	X	B	R	X	X	X	O	X	X	O	X	X	X	X	X	X	X	X	
19	X	0	X	0	X	O	X	B	X	X	X	O	X	B	X	X	B	X	O	X	X	B	X	X	
20	X	X	B	X	X	X	X	X	X	X	X	O	X	X	R	X	R	B	B	X	X	X	X	X	
21	0	X	X	R					X	X	B	B	R	R	B	O	X	X	B	O	X	R	X	R	
22	0	X	48	64	58	53	67	59		O	X	X	X	R	R	R	Y	Y	O	X	O	X	X	X	
23	67	68	66	68	67				R	O	X	X	X			X	R	X	O	X	X	X	X	X	
24	X	X	X	X	R	X	X	X	O	X	A	R	R	R	R	R	B	X	B	R	R	O	X	X	
25	0	X	R	R	X	O	X	R	R	O	X	X	O	X	O	X	R	O	X	B	O	X	X	X	
26	A	A	R	63	63	67	65	62	O	X	X	X	B	B	B	B	B	B	B	B	B	B	B	B	
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
28	B	B	B	B	B	B	B	B	B	O	X	X	X	B	R	R	O	X	R	A	R	O	X	X	
29	O	X	65	74	68	66	74	B	X	X	X	O	X	X	Y	O	X	X	X	O	X	X	X	O	
30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	O	
31	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	23	24	23	23	19	21	19	20	20	19	17	16	14	17	19	18	20	22	24	23	25	24	26	24	
MED	X	X	65	64	66	67	69	72	76	82	86	83	82	82	80	74	72	71	71	69	66	65	63	62	64
U Q	67	67	69	68	74	80	84	86	93	88	91	88	84	82	81	80	76	76	72	70	70	66	67	68	
L Q	X	X	58	58	60	62	64	60	66	66	71	75	76	72	74	73	68	70	70	69	66	61	61	60	58

DEC. 2001 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2001 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	60	57	59	66	66	73	62	69	80	80	77	82	76	78	80	73	74	70	65	62	61	61	64	63				
2	66	68	70	65	67	76	87	93	94	94	91	82	78	77	76	75	72	71	68	70	68	73	68	57				
3	56	60	60	62	63	75	80	86	97	86	87	82	78	76	73	78	69	65	66	66	62	54	A	56				
4	48	36	46	38	38	F	A	A	R	A	Y	Y	R	B	R	B	58	60	60	55	58	57	49	F				
5	48	J	R	F	A	R	R	42	72	58	R	B	R	R	R	R	R	R	R	J	R	F	F					
6	49	49	50		57	62	64	58	69	73	74	73	B	69	66	66	65	63	54	46	44	58	R	62				
7	A	F	F	F	A	F		56	56	53	58	64	R	R	R	R	R	R	R	R	R	R	R	R				
8	57	58	56	53	R	F	RJ	R	B	F	R	B	J	R	R	R	R	R	R	R	R	R	R	55				
9	J	R	R	R	R	F	R	R	J	R	A	R	83	77	75	74	J	R	J	R	73	72	68	69	65	64	62	
10	F	F	F	A	F	F	R	64	60	66	72	78	81	82	77	77	80	71	67	66	64	68	64	65	56	54	54	Q
11	F	B	F	A	F	F	R	R	R	R	R	R	RJ	R	R	R	R	R	R	R	R	R	R	F	52			
12	B		Y	A	R	RJ	R	69	61	74	71	RJ	RJ	R	R	R	R	B	B	B	Y	R	R	54	44			
13	R	F	F	F	R	R	R	R	R	R	R	R	50	R	B	B	R	R	R	R	J	R	R	58				
14	59	59	58	64	67	74	89	88	96	92	85	82	R	B	U	R	R	D	J	R	J	R	R	F	58			
15	F	R	F	F	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	F				
16	F	F	F	F	A	R	R	R	R	R	R	R	R	R	R	R	R	R	R	J	R	R	R	50				
17	R	57	53	50	50	58	57	A	R	R	R	B	B	B	Y	B	64	R	R	R	R	R	R	R	64			
18	F	F	R	F	A	R	B	R	67	69	69	66	68	64	64	64	RJ	R	R	R	R	R	R	R	59			
19	40	37	54	51		42			60	68	77	79	79	R	B			BJ	R	R	R	R	R	R	J	59		
20	60	56	52	59	67		B	R	60	68	77	79	79	RJ	51													
21	50	61	B	60	62	72	79	92	95	97	100	100	80	76	64	B	B	65	62	67	71	61	57	57				
22	F	R	F	R	F	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	F				
23	56	58	60	58	56	58	60	63	62	66	75	RJ	R	R	R	R	R	R	R	R	R	R	R	62				
24	56	51	53	62	R	66	72	61	63	R	A	R	R	R	R	R	R	R	R	R	R	R	R	48				
25	48	R	R	R	56	42	42	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	58				
26	A	A	R	F	R	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B				
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B				
28	B	B	B	B	B	B	B	B	76	80	74	RJ	R	R	R	R	R	A	R	R	R	R	R	R				
29	U	S	R	68	62	60	68	R	BJ	R	89	82	85	82	R	B	R	Y	R	R	R	R	R	R	B			
30	59	59	68	62	60	68	72											67	64	67	67	58	R	R	50			
31	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	23	24	23	23	19	21	19	20	20	19	17	16	15	17	20	19	20	22	24	23	24	24	26	24				
MED	56	56	56	56	60	61	66	68	76	80	77	76	77	74	68	66	65	65	63	60	58	56	54	56				
U Q	59	58	60	62	64	71	78	80	84	82	85	82	79	76	74	74	70	70	66	64	62	59	58	58				
L Q	49	52	52	53	54	54	60	59	65	69	68	66	68	67	63	64	64	63	60	55	55	54	51	52				

DEC. 2001 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

61

DEC. 2001 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	22	23	37	36	38	49	41	32	81	51	E B 56	37	64	35	46	47	48	54	50	33	30	37	32	42			
2	26	18	20	32	32	32	64	40	36	33	47	62	41	44	42	39	38	43	38	36	40	40	40	21			
3	39	50	49	44	35	34	34	38	38	36	38	34	44	43	58	38	45	55	39	41	37	28	47	54			
4	34	31	36	39	32	32	39	28	37	34	33	34	B 40	45	B 33	B 33	E B 32	36	40	36	32	40					
5	40	46	41	87	80	78	39	37	32		35		36		38	43	34	34	30	37	35	30	31	38			
6	38	33	34	89	67	40	38	43	32	37	36	38		39	56	36	34	34	36	32	38	23	33	34			
7	95	66	44	32	56	43	38	49	40	35	36	45	46	46	62	43	34	34	36	37	36	35	32	39			
8	38	38	35	67	46	38		39	34	36		36	35	36	33	38	36	33	29	32	30	32	50	29			
9	39	31	32	38	40	40	36	39	38	42	47	97	64	40	47	42	36	35	35	33	44	34	27	33			
10	28	32	42	44	42	40	36	34	39	39	40	46	35	38	37	35	34	30	28	32	30	27	22	24			
11		B 36	43	67	41	35	36	38	32	37	34	35	37	36	35	36	38	35	34	29	28	35	40	38			
12		B 34	38	60	42	36	38	34	34	39	38	36	35	35	34	62	B B B	B B	B B	23	41	42	40	72			
13	41	30	24	22	31	36	42	45	37	42	36	34	33				34	36	32	32	34	36	42	23	23		
14	24	23	34	38	29	37	35	36	35	34	36	40		60	56	34	34	31	29	36	35	40	47	42			
15	68	68	46	38	36	55	38	35	39	37	37	35	57	59	36	32	28	32	33	36	40	32	32	32			
16	29	33	36	36	39	55	48	34	34	38	35	35	38	40	37	34	32	30	31	40	29	37	38	42			
17	37	88	41	43	46	42	48	40	47	61				35		31	34	31	29	23	35	34	38				
18	28	33	58	33	50	66		40	34	37	35	59	58	32	36	33	32	32	32	38	38	34	34	34			
19	44	31	33	35	37		40	37	35	38	56		34	33		58	40	40	38	22		27	30	34			
20	40	44		39	28	28	36	41	38	36	37	35	36	35	33		34	34	39	28	25	28	24				
21	48	36	34	36	36	37	34	35			B B				B B B B	B E	B E	B E	B E	B E	58	32	35	38	35	56	37
22	40	56	29	91	89	34	39	48	45	43	42	33	37	34	35	33	36				38	38	59	45	35	41	
23	39	34	26	36	34	43	77	41	41	35	35	33	32	57	57		E B E B G	E B E B G	56	55	32	36	32	33	23		
24		E 33	28	57	50	60	41	33	52	46	72	36	39	39	37	40		B G	B G	27	28	36	39	57	44	36	
25	77	39	37	36	32	61	28	36	40	35	36	34	60	47	36		34	38	37	38	38	38	38	38			
26	61	46	39	38	36	48	38	36			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			
27		B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B				
28		B B	B B	B B	B B	B B	B B	B B	E 37	B 54	B 62		36	34	38	49	120	36	G	39	43	45	E B B B	28	30		
29	E 31	B 53	E 38	B 53	E 55	B 55	G	B B	E B	E B	B B	B B	B B	B B	B B	B B	B B	B B	B B	E B B B	32	33	32	E B B B			
30		B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B				
31		B 37	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B	B B				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	26	27	26	27	27	26	24	27	26	25	25	24	22	24	24	23	24	24	26	27	26	27	27	26			
MED	38	34	36	38	38	40	38	38	38	37	36	35	36	37	38	35	34	34	32	36	36	35	33	35			
U Q	41	46	42	53	50	48	40	41	40	42	41	40	46	45	52	43	38	40	36	38	40	40	40	40			
L Q	31	31	34	36	34	35	36	35	34	35	35	34	35	35	36	34	34	32	30	32	32	32	30	29			

DEC. 2001 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2001 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	14	15	17	14	14	16	14	14	17	14	56	16	17	30	18	20	13	14	16	24	14	9	10	9
2	9	9	10	10	11	14	15	12	14	18	20	16	15	16	17	18	16	15	24	11	10	10	10	10
3	10	14	15	12	12	11	13	11	13	12	12	12	12	19	13	10	12	12	10	10	20	12	11	
4	10	10	9	13	8	7	13	13	15	20	14	14	B	22	15	21	33	16	20	15	16	10	12	12
5	12	14	14	8	16	12	14	10	15	B	29	25	25	16	14	16	15	12	10	12	11	9	9	
6	12	12	27	26	11	13	14	10	10	16	16	16	B	20	55	22	14	16	10	12	9	9	11	10
7	21	7	11	10	19	12	14	10	10	12	15	12	15	16	18	15	15	12	13	11	10	9	13	14
8	9	13	35	15	16	24	B	20	12	10	B	20	22	32	26	17	12	12	13	16	25	10	8	8
9	15	20	17	20	14	11	10	13	11	10	11	11	13	15	11	14	19	16	14	13	10	10	10	8
10	10	7	16	29	26	17	14	13	11	13	9	14	17	16	17	12	12	12	13	15	13	16	19	16
11	13	B	13	25	20	13	13	12	14	29	15	11	18	16	15	22	13	12	16	12	11	10	12	15
12	B	16	24	20	19	28	21	20	24	25	26	17	20	15	25	62	B	B	B	16	21	16	15	24
13	18	18	18	16	16	20	19	20	19	20	31	25	28	B	29	20	14	24	15	15	12	11	11	
14	12	12	9	18	14	10	8	11	15	21	21	17	B	59	22	15	20	20	13	13	20	10	9	16
15	16	13	15	9	9	14	10	16	25	18	17	16	57	59	25	18	25	16	33	14	12	8	8	10
16	8	7	10	9	8	13	11	13	17	16	13	18	11	12	14	20	25	19	15	16	15	16	16	B
17	16	12	13	12	15	9	15	23	20	21	B	B	B	B	B	26	24	12	16	14	13	17	11	14
18	10	8	16	10	26	9	B	19	15	14	20	59	58	25	24	13	16	15	12	12	10	11	10	11
19	11	19	18	19	25	B	15	16	13	18	56	B	25	30	B	58	20	26	19	16	B	12	14	12
20	10	11	B	18	16	13	10	13	16	18	14	14	24	16	28	B	13	15	12	14	13	9	15	
21	13	16	20	16	26	14	11	12	B	B	24	24	B	57	58	60	B	58	22	14	14	12	10	26
22	11	8	9	12	9	10	29	12	18	18	20	29	13	18	19	19	14	B	25	30	21	13	14	9
23	9	16	18	6	16	19	20	16	9	11	15	20	28	57	57	29	56	55	14	11	10	10	10	
24	8	18	25	17	18	25	9	16	12	15	20	19	26	26	20	B	17	16	12	10	8	8	8	
25	10	10	16	9	10	10	9	11	16	22	16	15	16	21	18	B	18	15	12	13	10	7	8	9
26	15	16	14	12	11	10	10	10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
28	B	B	B	B	B	B	B	B	32	54	62	B	25	21	18	24	25	26	26	32	29	26	28	30
29	31	53	38	53	55	28	B	55	56	20	26	22	27	27	29	21	19	19	19	19	32	B	B	B
30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	29	30	29	
31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	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	12	14	17	16	16	14	14	13	16	18	20	19	25	26	24	24	20	16	16	14	14	12	11	12
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	
L Q	10	10	13	10	11	11	11	12	13	14	15	15	17	16	18	17	14	14	13	12	10	10	10	10

DEC. 2001 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

63

DEC. 2001 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

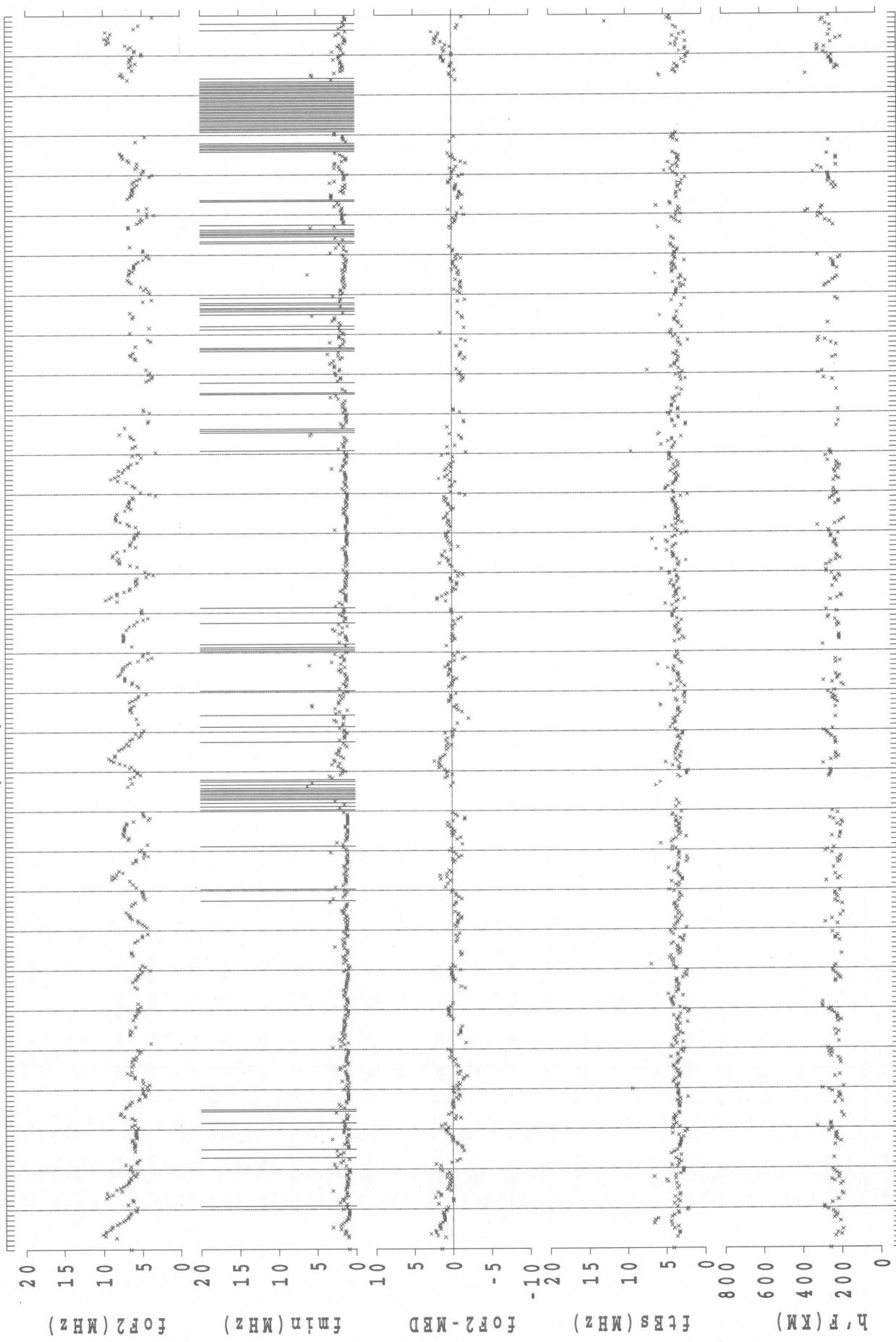
LAT. 69°00'.4"S LON. 039°35'.4"E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

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	258	280	330	258	294	A	A	AE	A	368	226	A	A	B	214	A	Y	Y	A	A	A	A	E	A				
2	272	226	216	276	248	238	238	240	226		Y	A	A	A	A	236	234	194	222	242	236	248	238	266				
3	260		A	A	A	A	A	A	278	234	220	220	220	394	A	A	A	232	284	236	214	218	236	316	248			
4	274	Q	A	A	224	A	A	A	A	A	A	A	A	B	254	A	B	228	232	234	244	258	266	274	A			
5		A	A	A	A	A	A	A	A	B	A	A	B	A	244	A	A	224	224	224	240	240	262	270	264			
6	A	A	A	A	A	A	A	A	A	A	A	Y	E	A	B	Y	B	A	Q	A	A	A	A	264				
7	A	254	A	278	A	AE	A	A	204	300	224	214	216	A	A	A	A	232	238	238	234	256	264	244	276			
8	A	232	308	304	348	A	A	B	A	234	266	Y	E	A	B	Y	Y	Y	Y	230	230	220	224	256	264	262	256	
9	A	306	324	336	A	A	336	258	246	214	248	Y	A	A	A	A	A	236	228	190	216	224	236	238	244	238	248	262
10	Q	310	302		A	AE	A	Y	Y	A	Y	Y	A	Y	Y	230	216	224	218	238	244	250	262	282	Q	Q	Q	
11	Q	272	238	A	A	284	278	220	220	Y	224	A	Y	Y	E	Y	A	222	248	234	212	228	238	258	282	318	260	
12	B	344	A	A	A	A	Y	216	Y	Y	R	A	Y	R	Y	B	B	B	B	Y	222	A	A	A				
13	A	304	294	290	Q	AE	A	A	A	AE	A	A	A	A	238	B	B	A	224	226	226	242	246	266	262	270		
14	A	280	302	288	270	260	240	230	236	218	222	Y	B	B	A	Y	Y	A	A	A	AE	A	A	256				
15	A	A	A	254	284	352	226	A	Q	A	A	A	A	B	Y	Y	E	B	E	A	Q	A	Q	258				
16	Q	282	292	284	240	A	A	190	192	Y	A	A	A	A	A	222	222	234	238	220	258	A	AE	A	268	254		
17	A	298	364	AE	A	A	A	A	A	A	A	B	B	B	Y	B	A	246	236	252	A	A	A	Y	B			
18	A	A	A	272	294	282	318	A	A	B	A	Y	Y	Y	B	B	Y	YE	A	A	224	224	230	250	282	254	248	278
19	268	278	320	A	AE	Y	B	AE	A	292	218	Y	B	BE	A	Y	B	BE	A	A	264	244	244	250	258	258		
20	E	A	310	326	B	A	260	248	224	192	244	226	A	Y	Y	Y	B	B	228	238	238	244	244	276	276	E	A	
21	A	262	A	A	A	AE	A	A	316	220	230	B	B	A	A	B	B	B	B	B	A	A	A	A	A			
22	A	244	228	226	266	A	A	A	A	A	A	A	A	A	Y	Y	Y	236	230	228	B	A	A	Q	A	224		
23	A	254	228	228	A	A	A	276	258	232	A	A	A	A	Y	A	B	B	246	B	B	A	E	A	Q	Q	282	
24	E	258	A	A	A	A	A	200	A	A	A	A	A	A	240	B	234	234	234	B	A	A	A	A	200			
25	A	A	A	206	208	A	A	246	246	300	A	A	A	A	280	Y	BE	A	220	218	242	234	256	264	A	A	256	
26	A	A	A	306	A	264	242	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
27	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			
28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	Y	Y	A	AE	B			
29	B	B	E	B	B	B	B	Y	B	B	Y	Y	A	Y	B	A	Y	Y	Y	230	250	B	B	B	274	296		
30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	AE	B			
31	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	16	14	13	14	12	11	16	14	13	8	5	6	2	3	5	12	19	17	21	21	20	20	21	22				
MED	271	282	294	245	264	272	237	230	222	222	226	228	243	236	236	233	229	226	232	240	249	257	255	261				
U	Q	290	308	333	278	292	318	277	242	251	234	247	280	254	242	246	236	233	237	249	258	266	274	276				
L	Q	259	256	261	228	254	240	225	220	218	217	220	222	230	225	227	224	219	221	233	242	250	246	256				

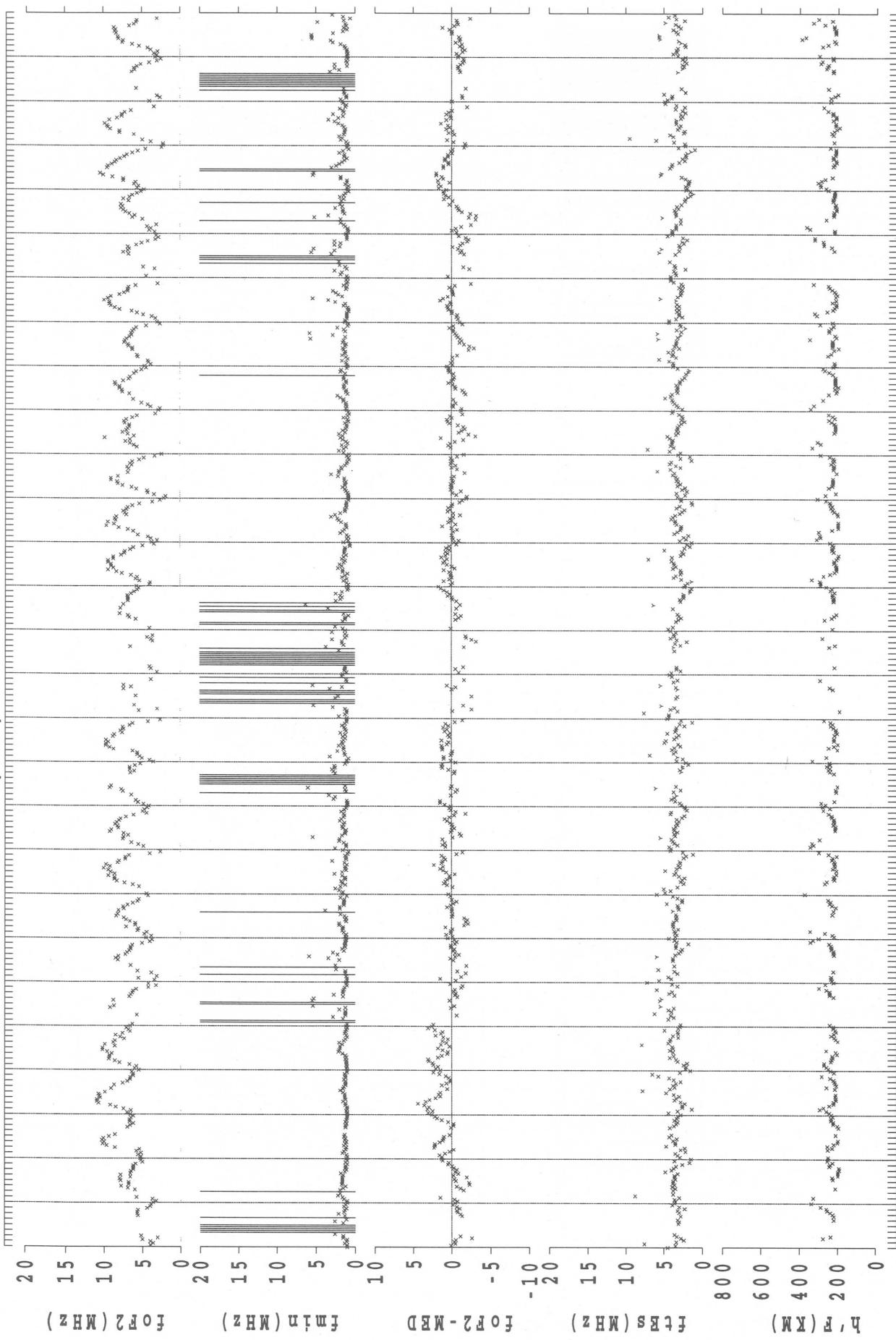
DEC. 2001 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

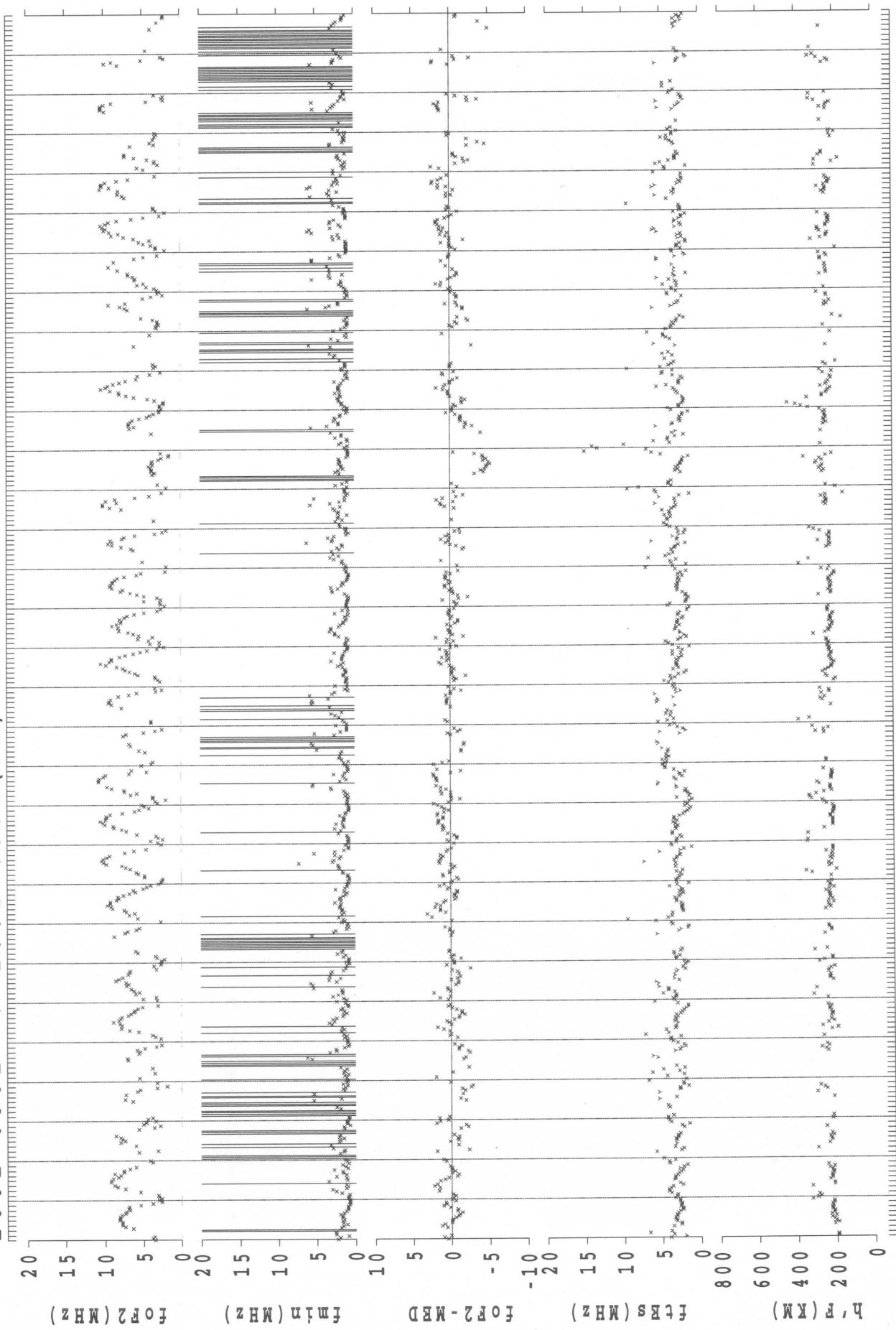
2001 0101 -> 2001 0131 (99) SYOWA-ST.



2001 0201 -> 2001 0228 (99) SYOWA-ST.

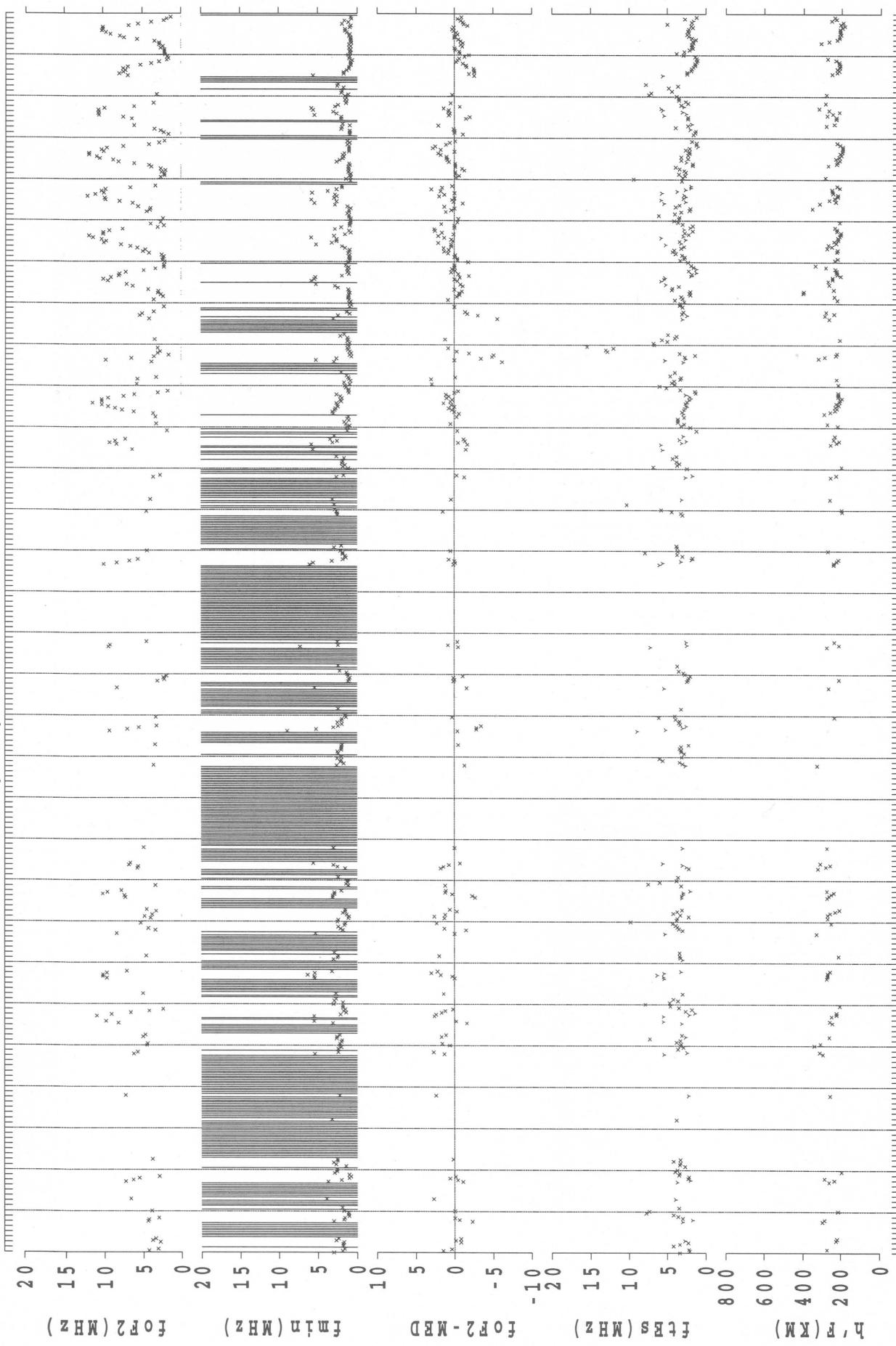


2001 03 01 -> 2001 03 31 (99) SYOWA-ST.

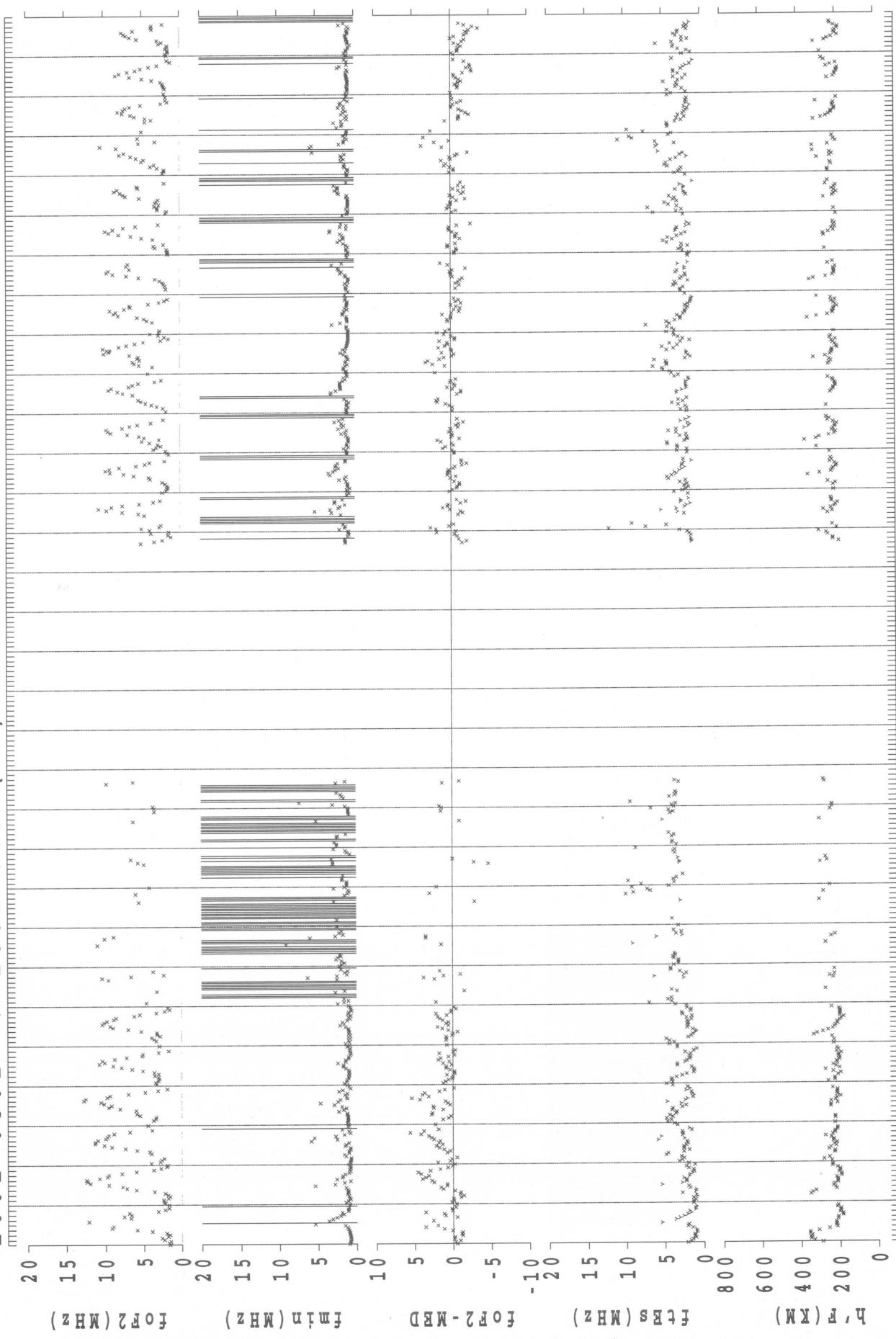


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY / 45° EMT

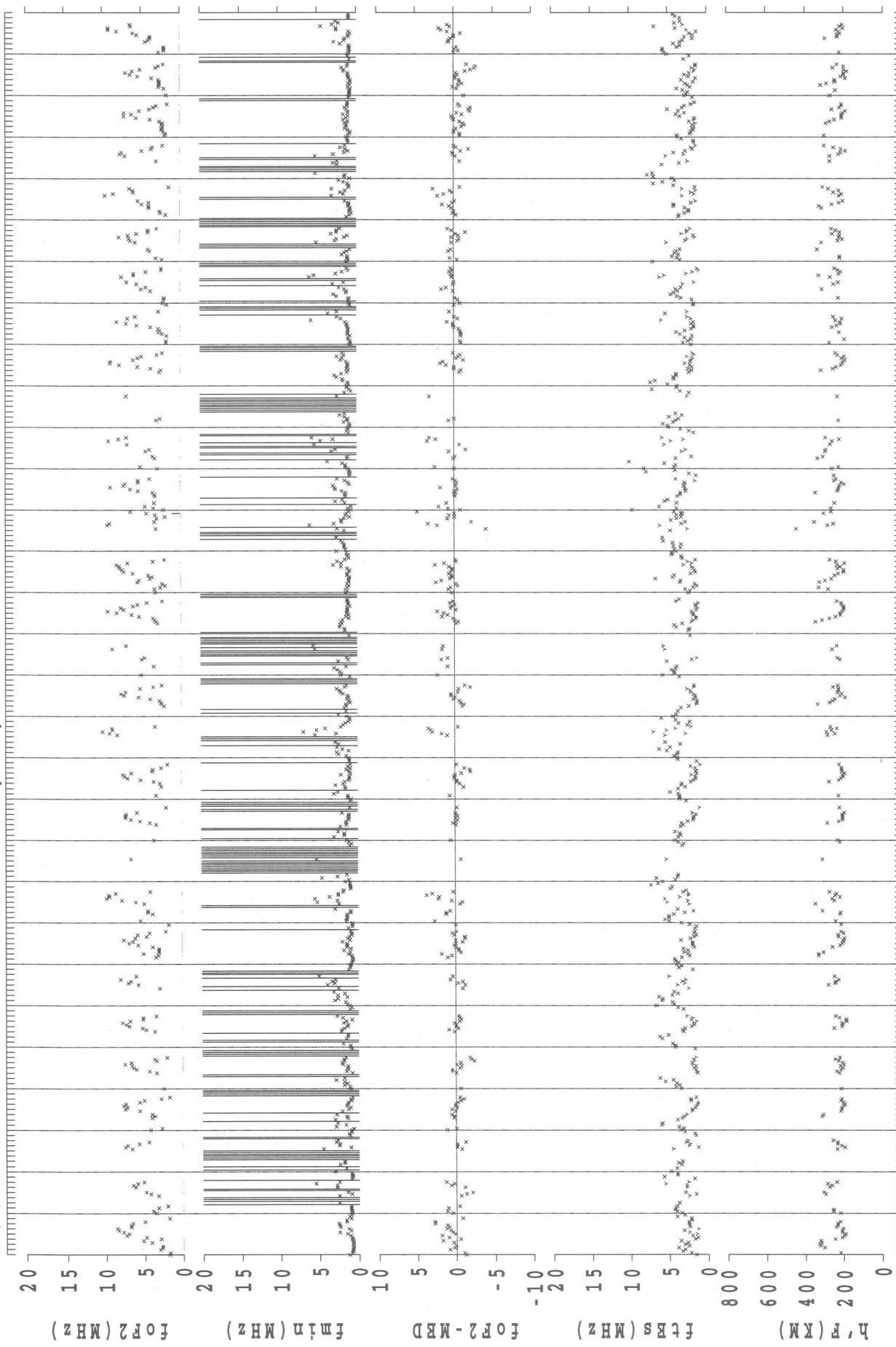
2001 0401 -> 2001 0430 (99) SYOWA-ST.



2001 0501 -> 2001 0531 (99) SYOWA-ST.

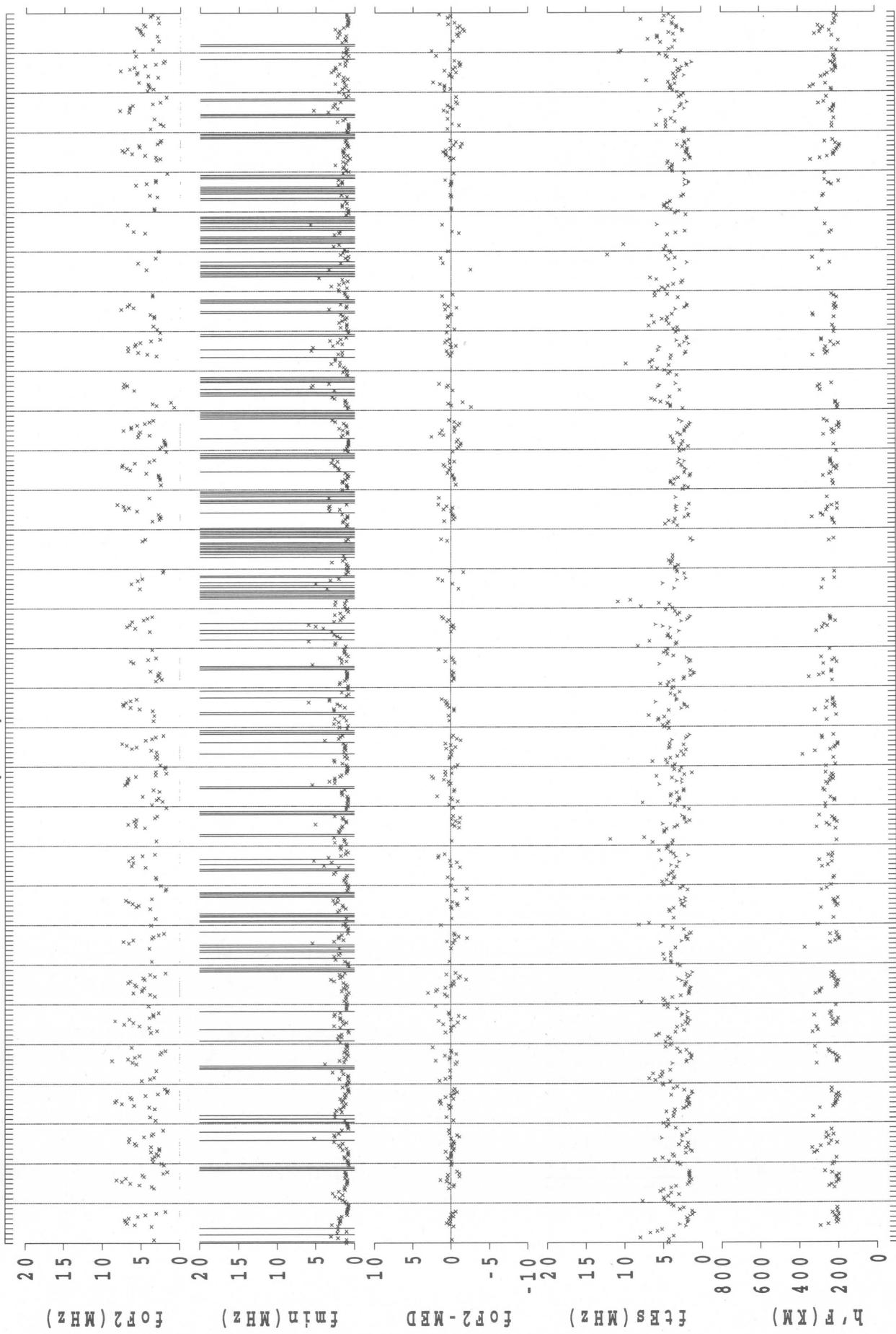


2001 0601 -> 2001 0630 (99) SYOWA-ST.

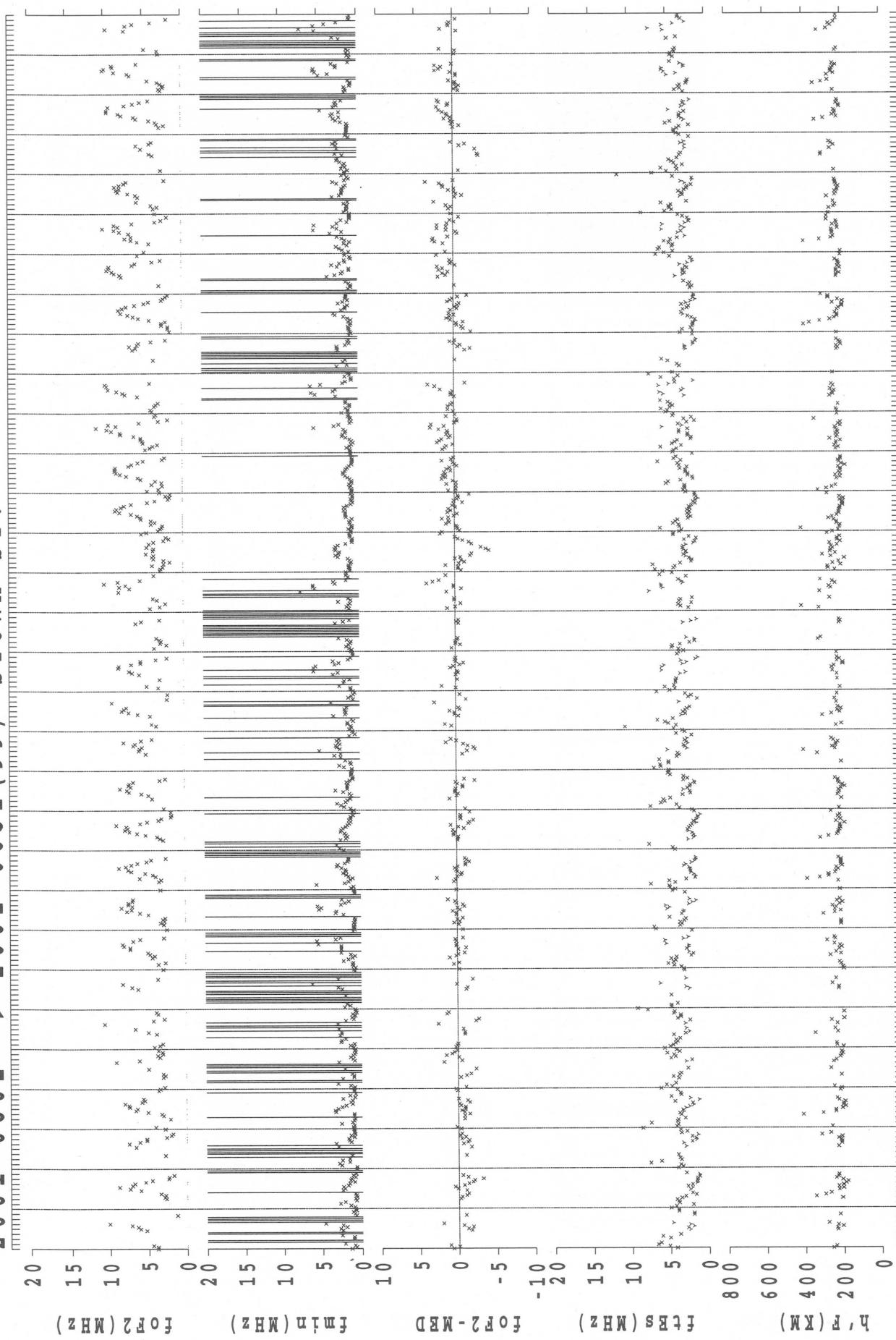


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 DAY / 45° EMT

2001 0701 -> 2001 0731 (99) SYOWA-ST.

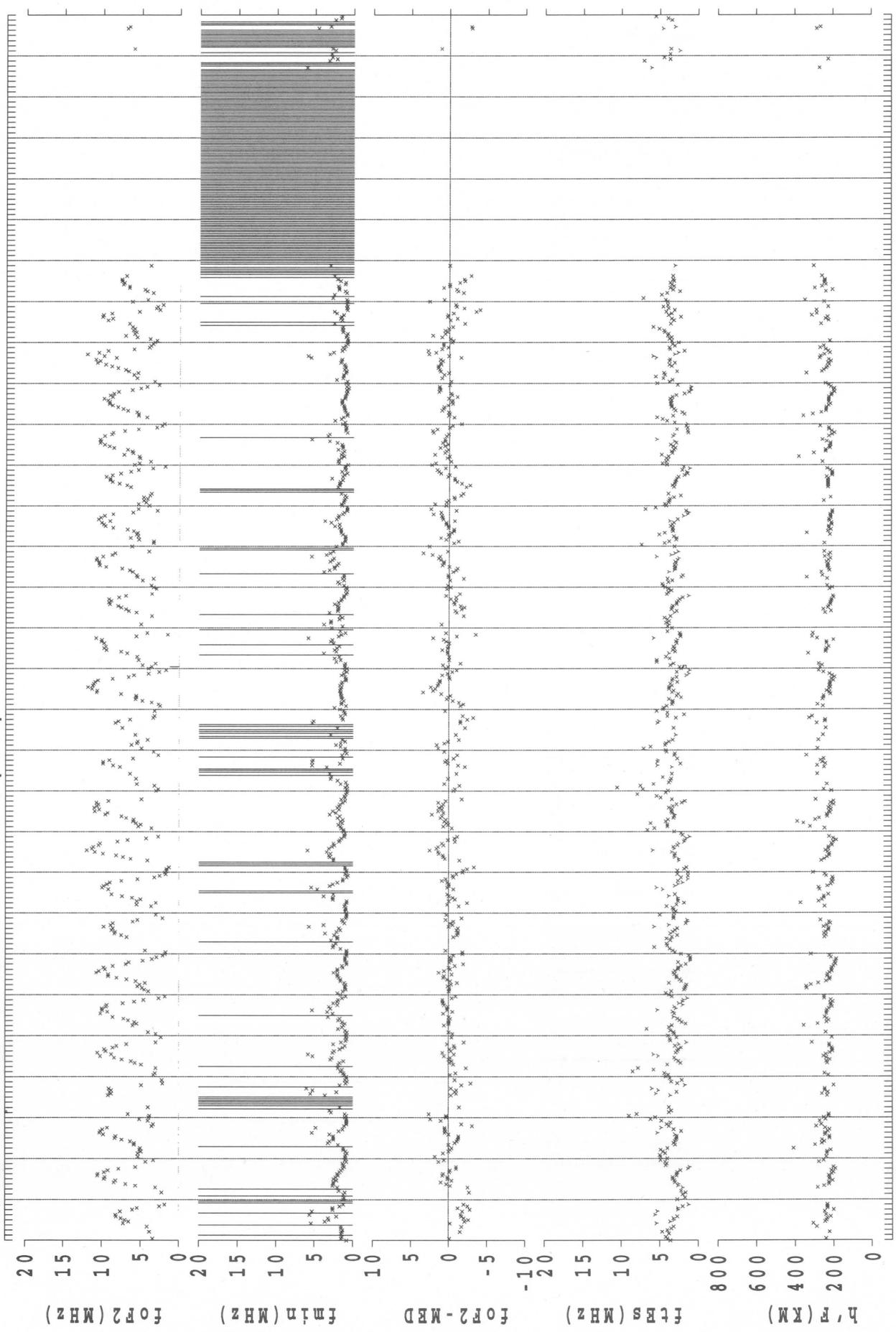


2001 0801 -> 2001 0831 (99) SYOWA-ST.



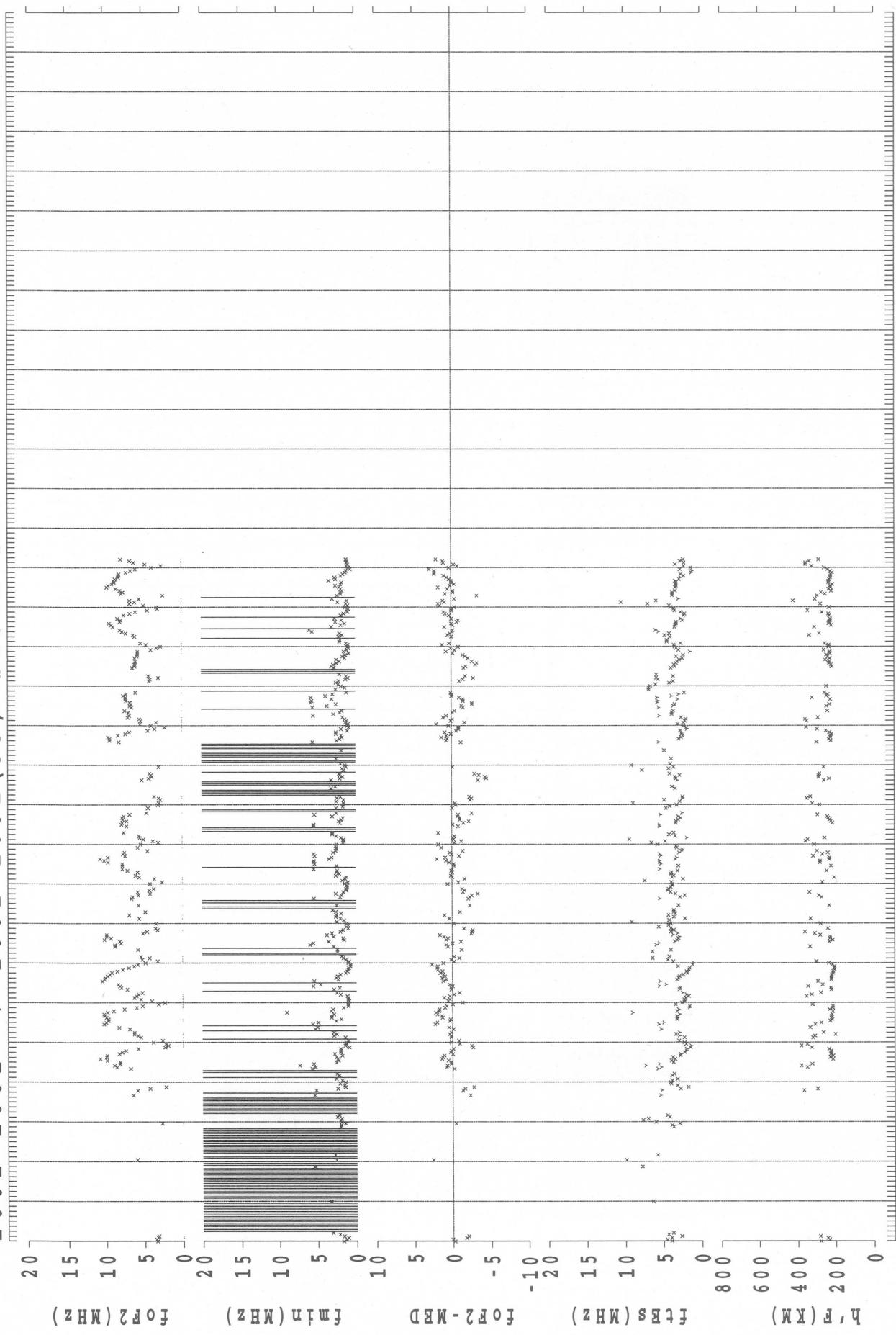
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45° EMT

2001 0901 -> 2001 0930 (99) SYOWA-ST.



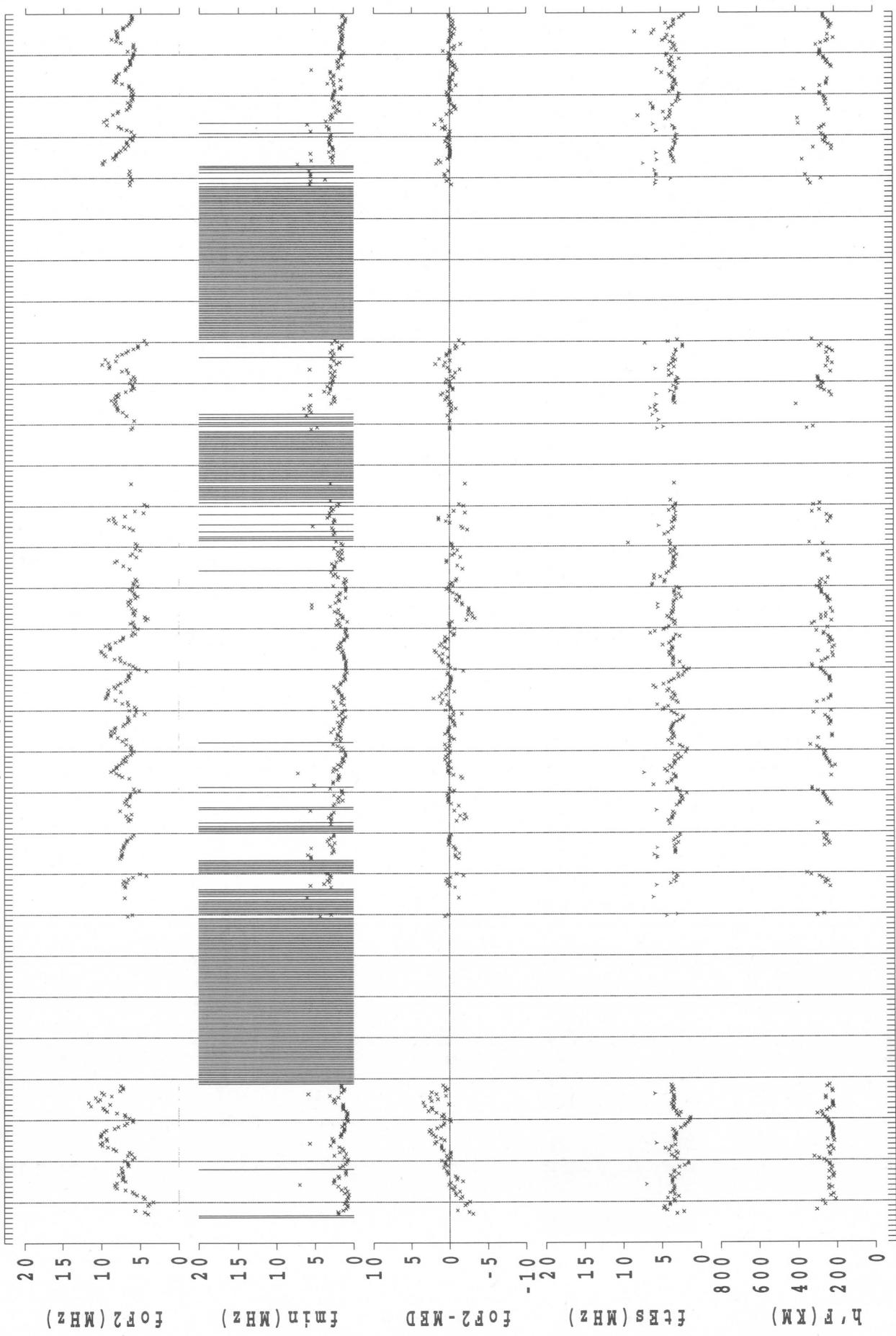
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 DAY / 45° EMT

2001 1001 -> 2001 1031 (99) SYOWA-ST.

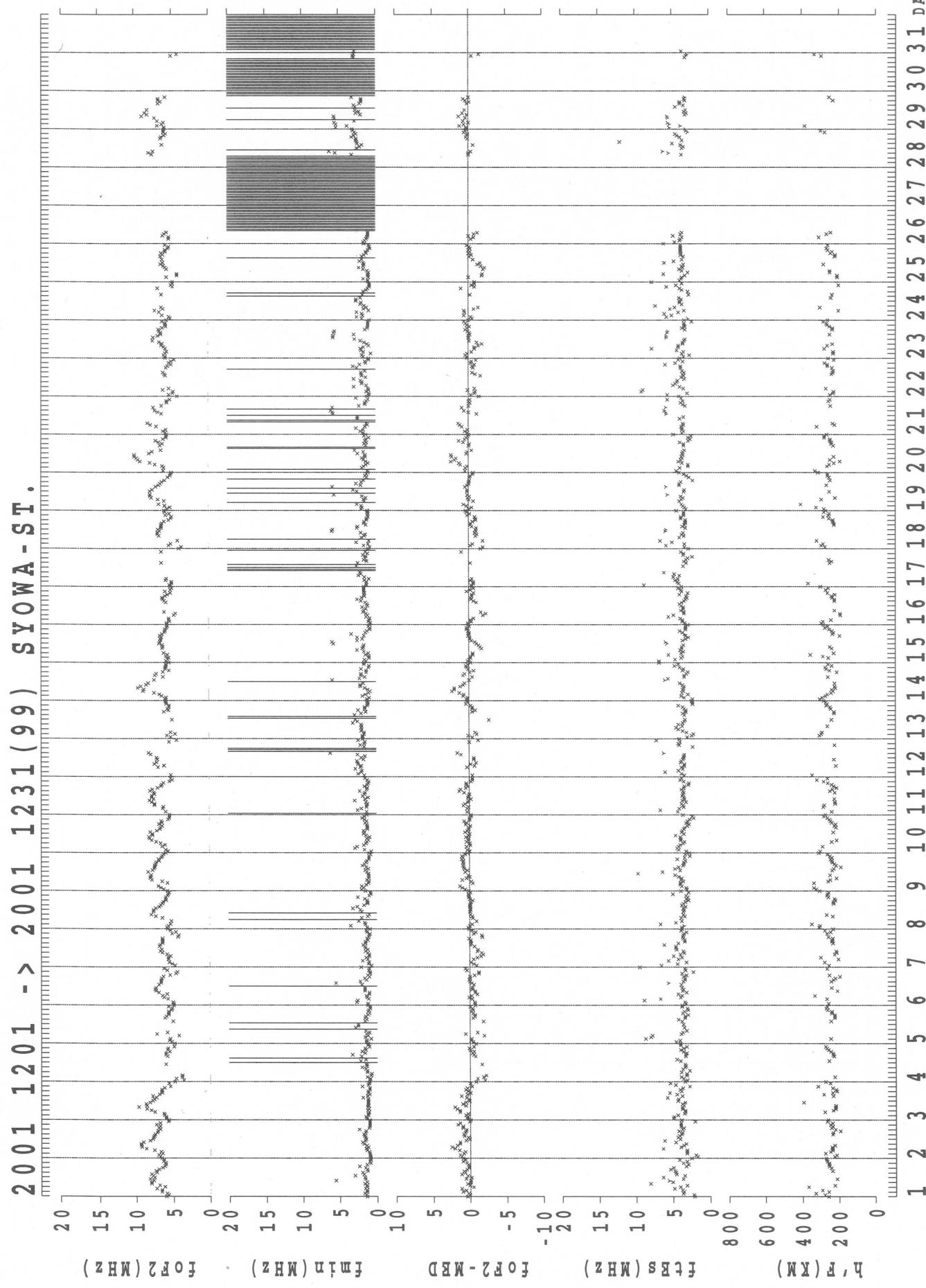


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45° EMT

2001 1101 -> 2001 1130 (99) SYOWA - ST.



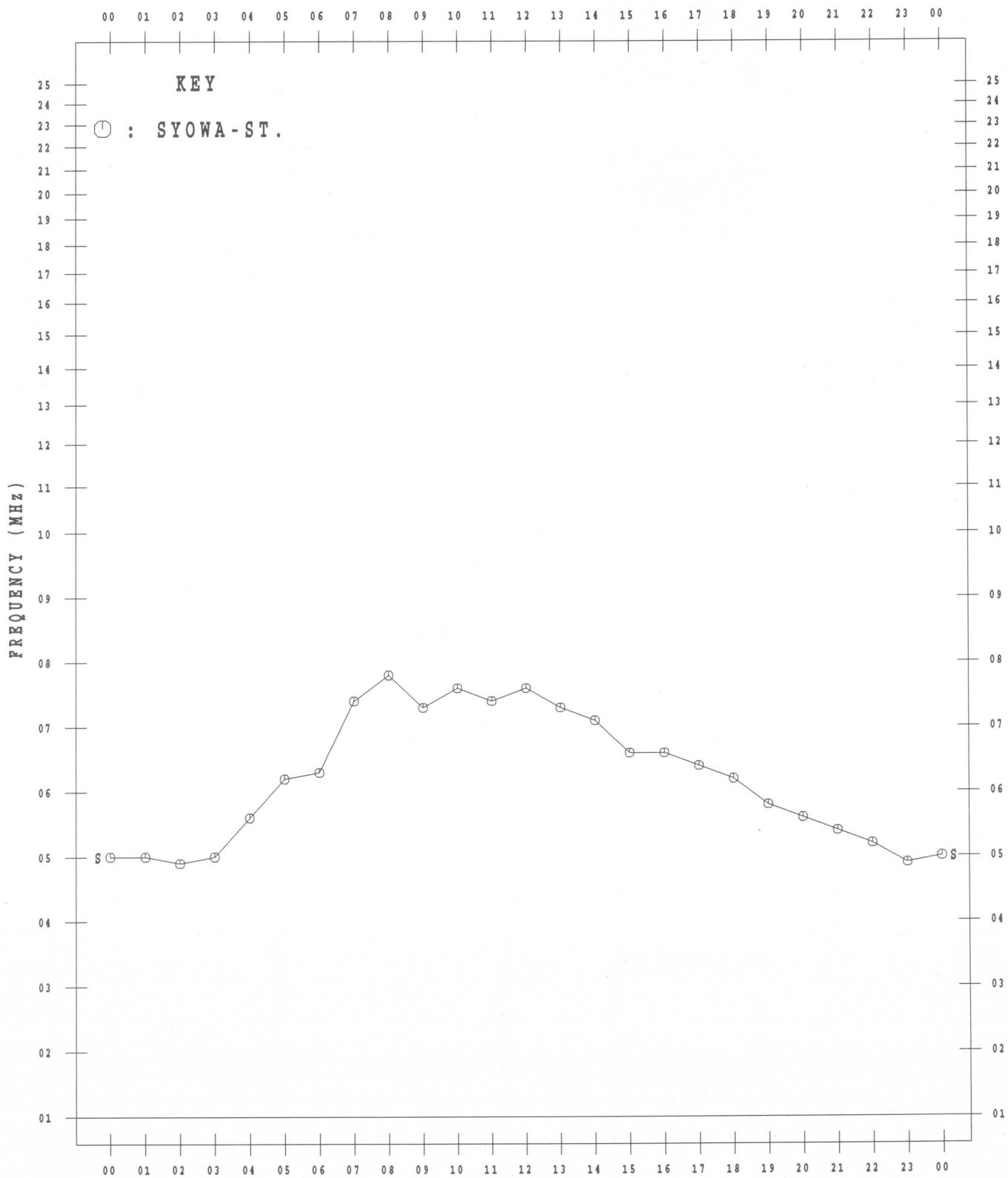
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 DAY/45° EMT



MONTHLY MEDIAN VALUES OF f_{oF2}

45° E MEAN TIME

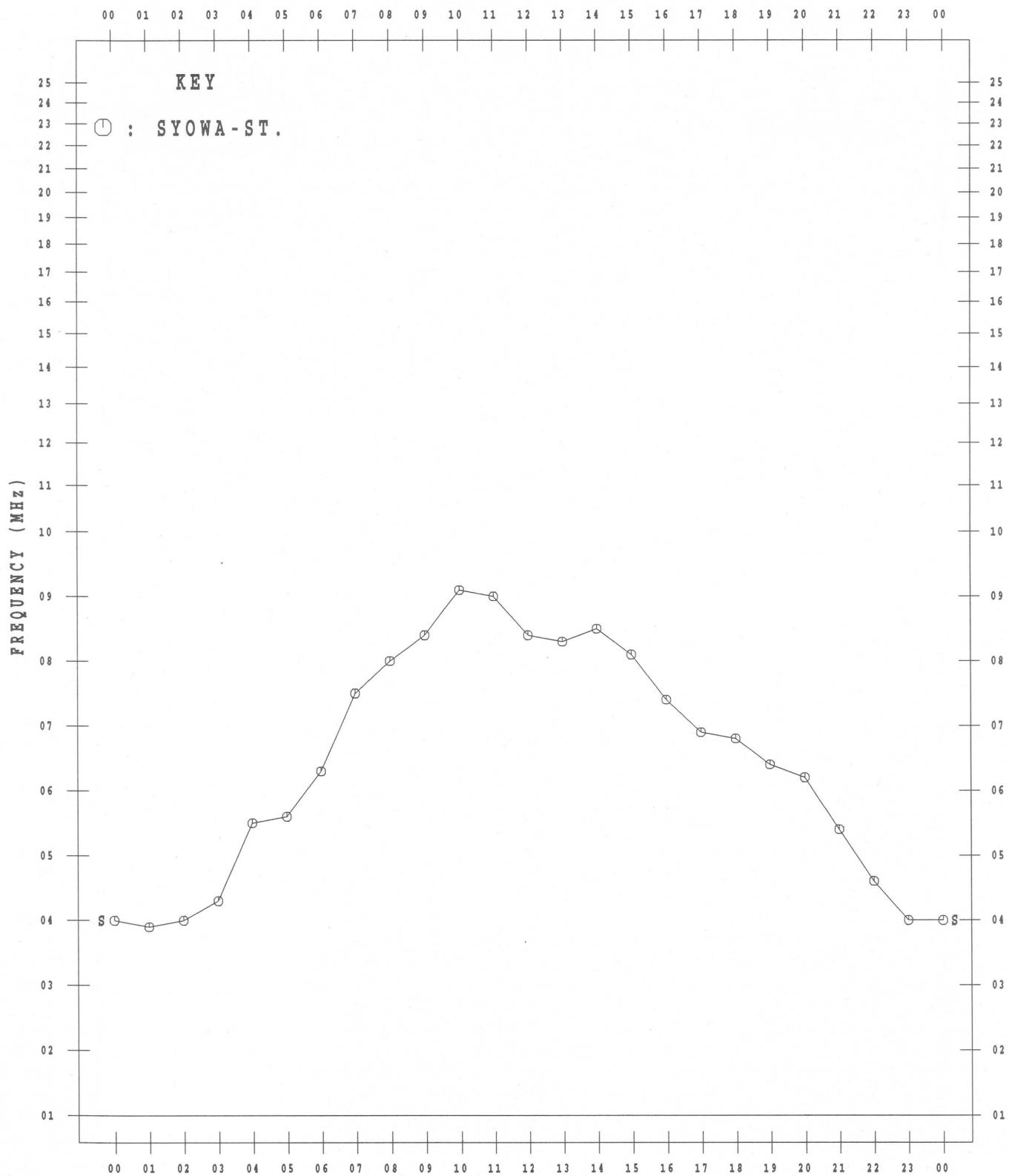
JAN. 2001



MONTHLY MEDIAN VALUES OF f_{oF2}

45° E MEAN TIME

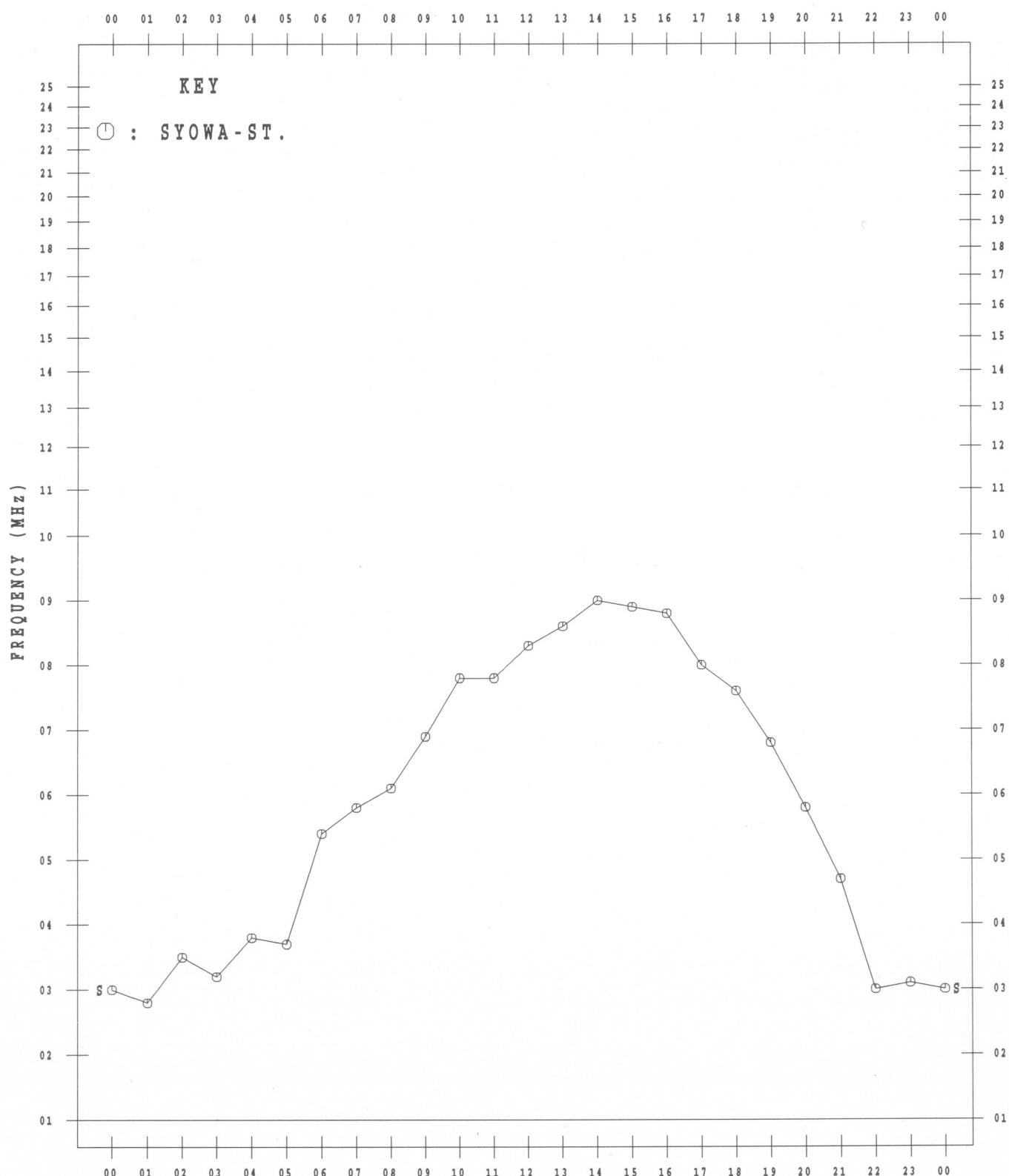
FEB. 2001



MONTHLY MEDIAN VALUES OF f_{oF2}

45° E MEAN TIME

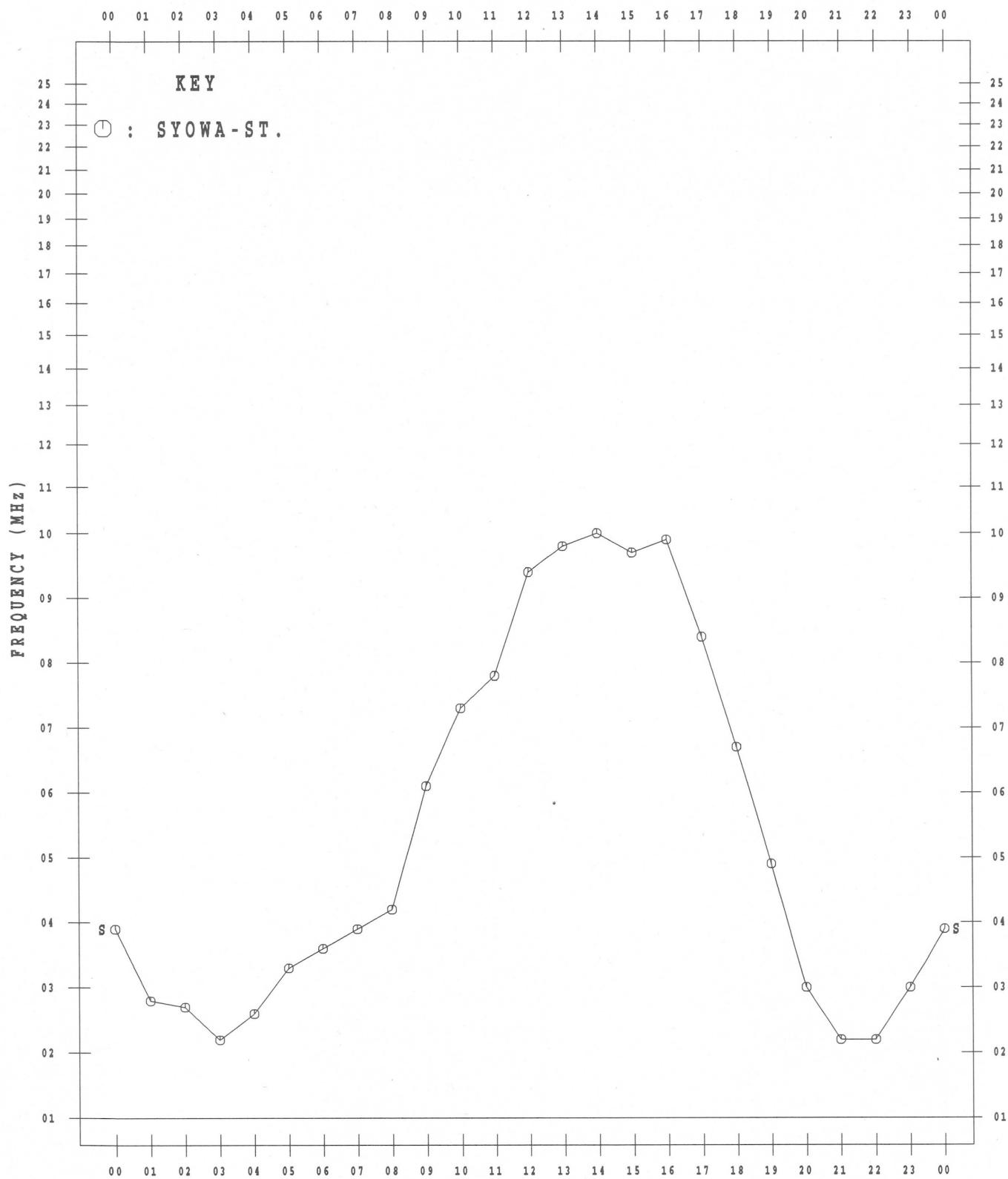
MAR. 2001



MONTHLY MEDIAN VALUES OF f_{oF2}

45° E MEAN TIME

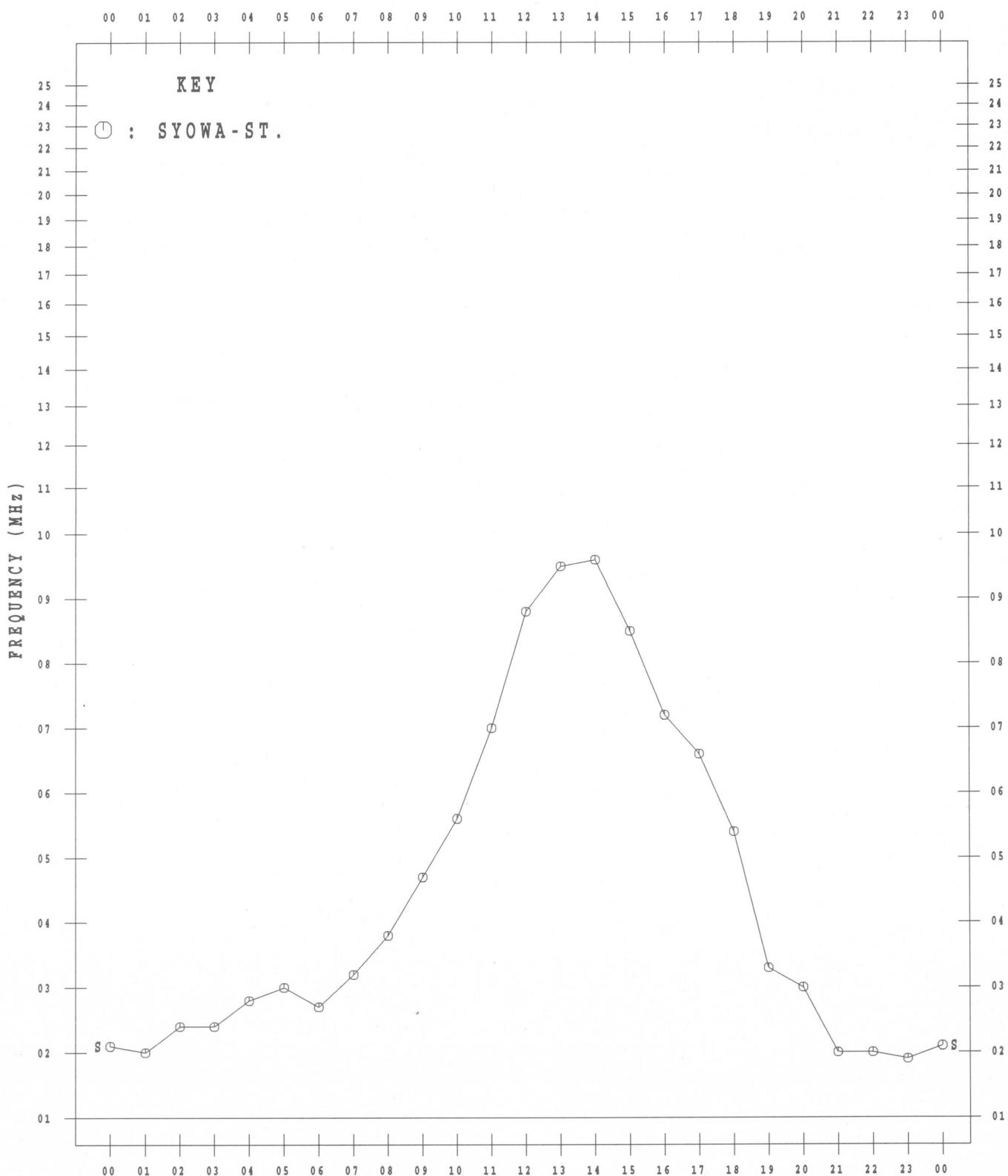
APR. 2001



MONTHLY MEDIAN VALUES OF f_{oF2}

45° E MEAN TIME

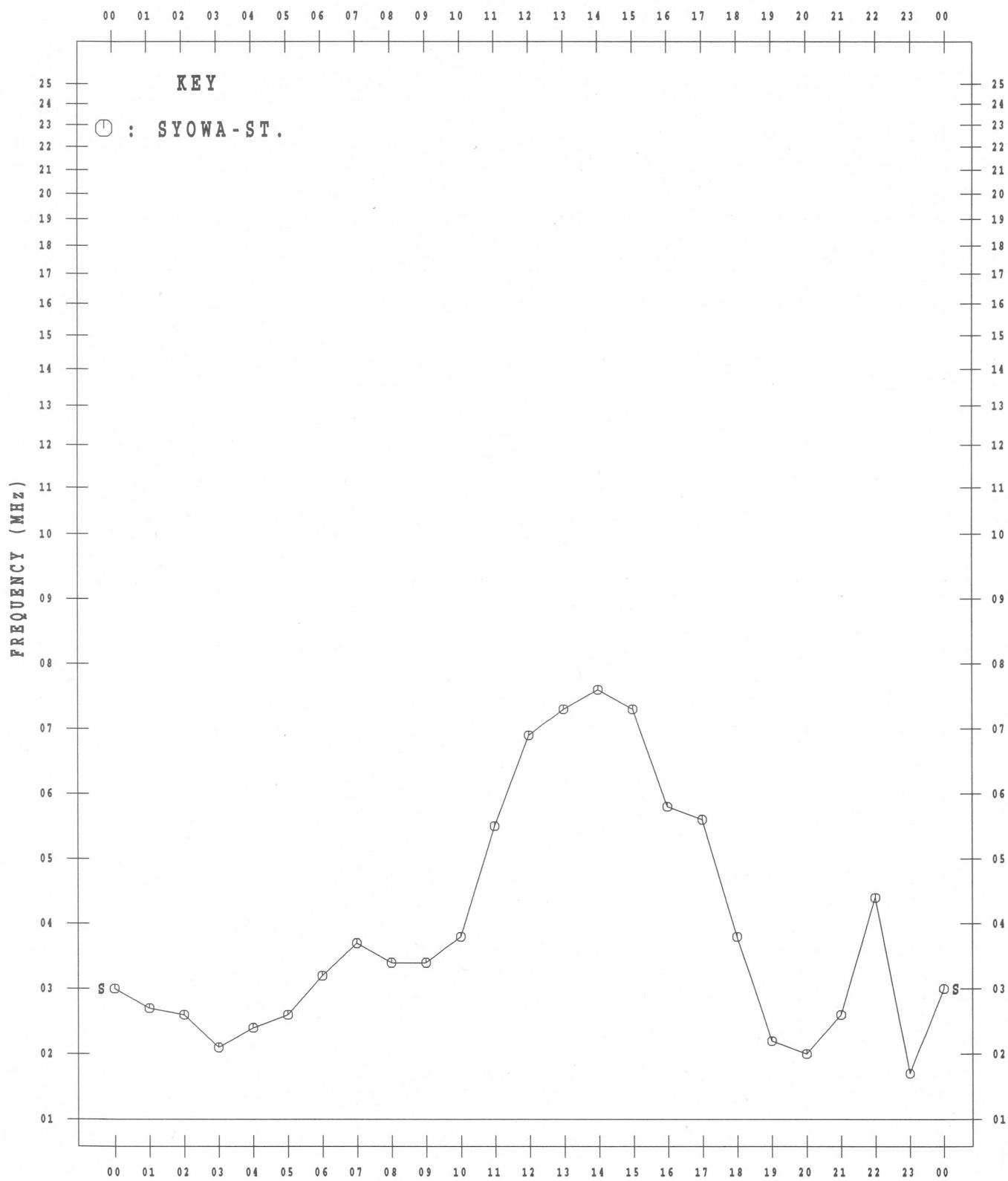
MAY 2001



MONTHLY MEDIAN VALUES OF f_{oF2}

45° E MEAN TIME

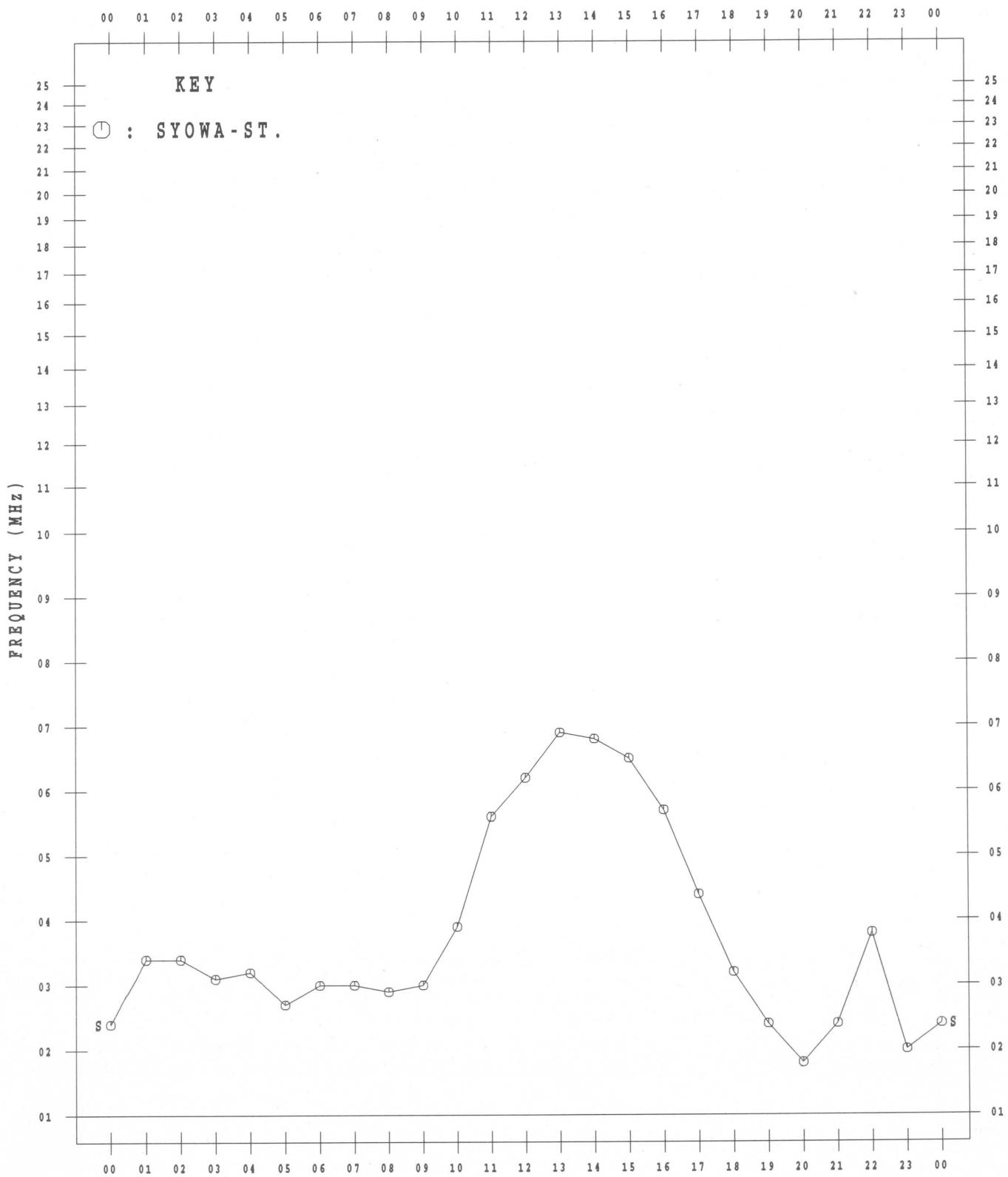
JUN. 2001



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

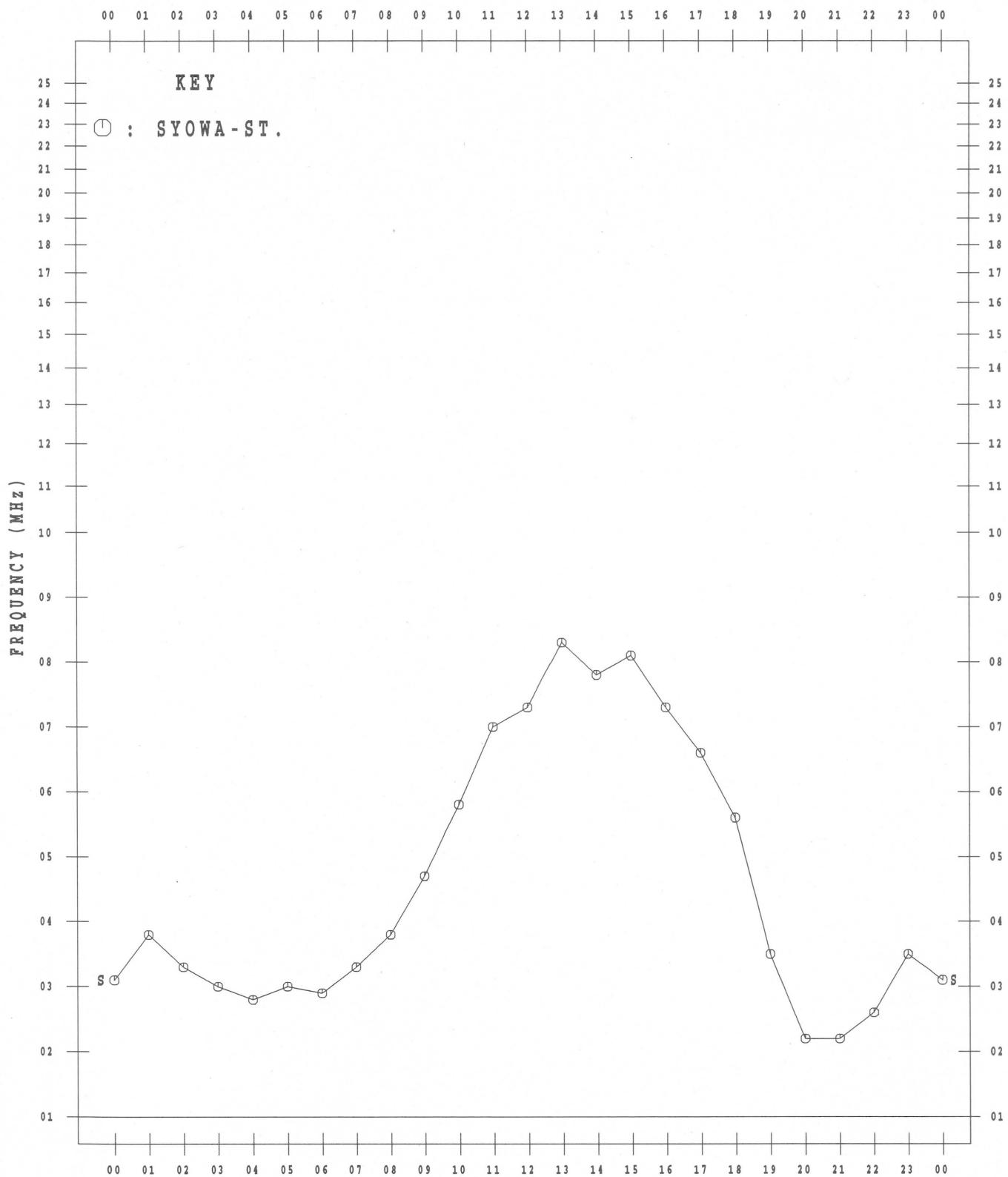
JUL. 2001



MONTHLY MEDIAN VALUES OF f_{oF2}

45° E MEAN TIME

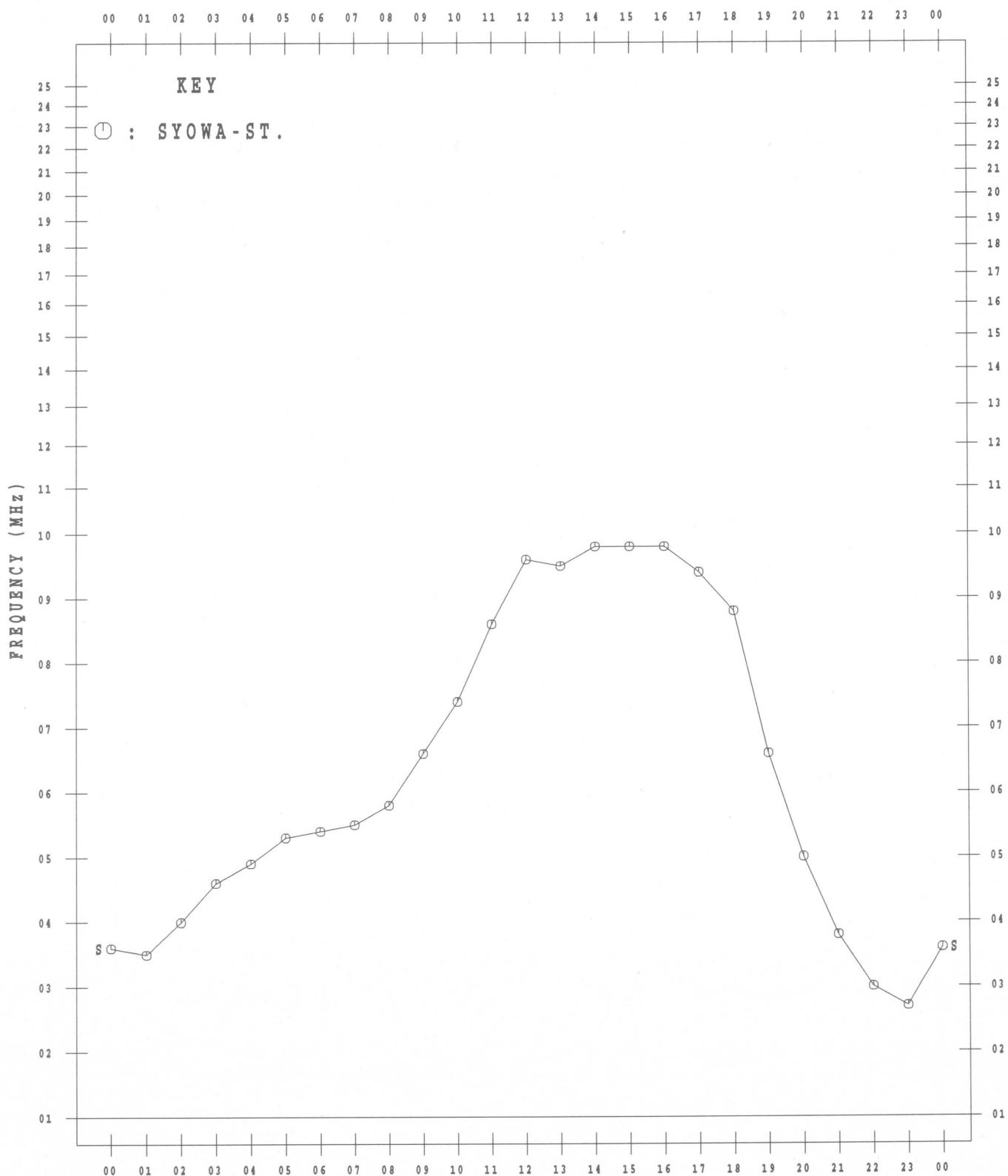
AUG. 2001



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

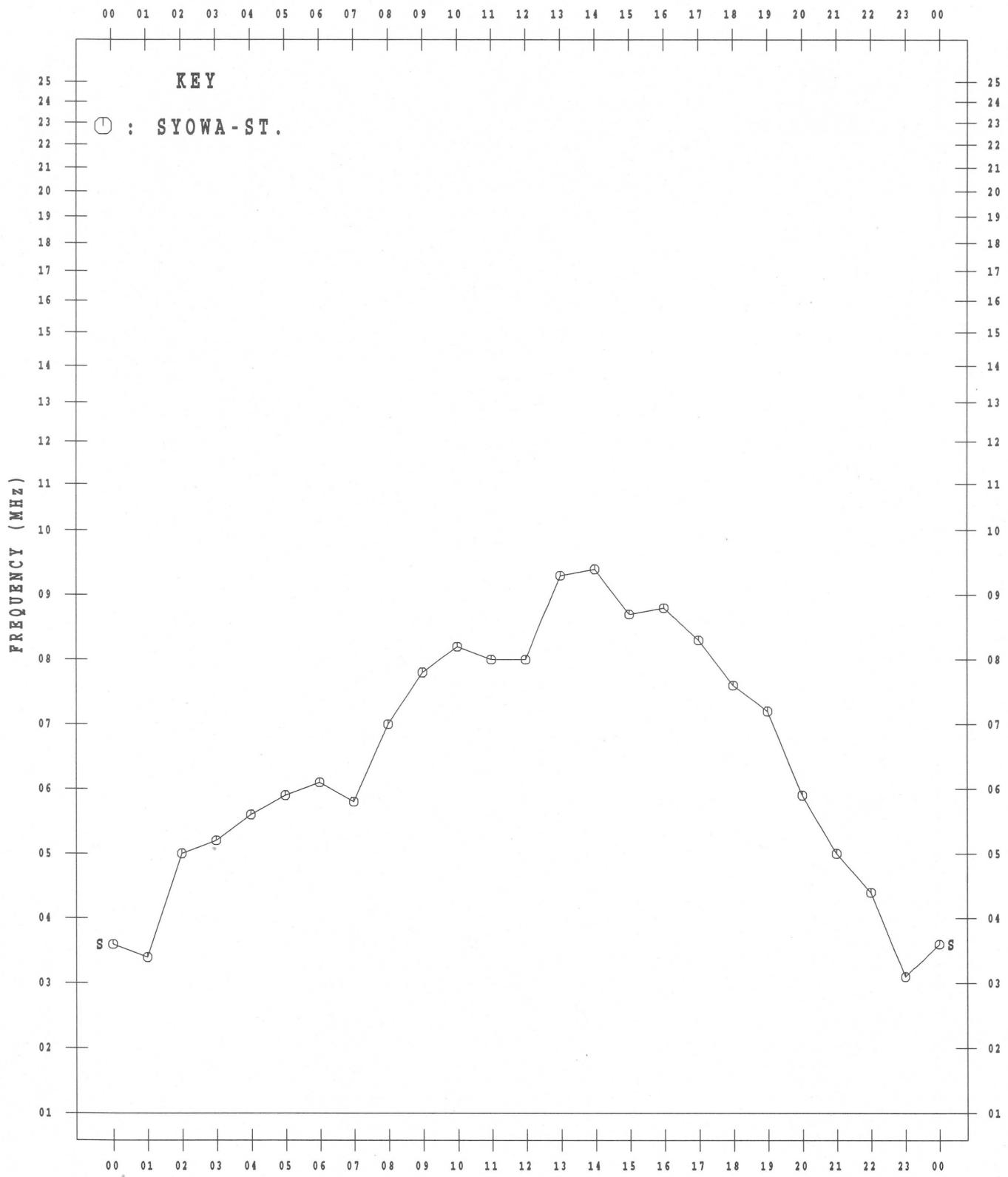
SEP. 2001



MONTHLY MEDIAN VALUES OF f_{oF2}

45° E MEAN TIME

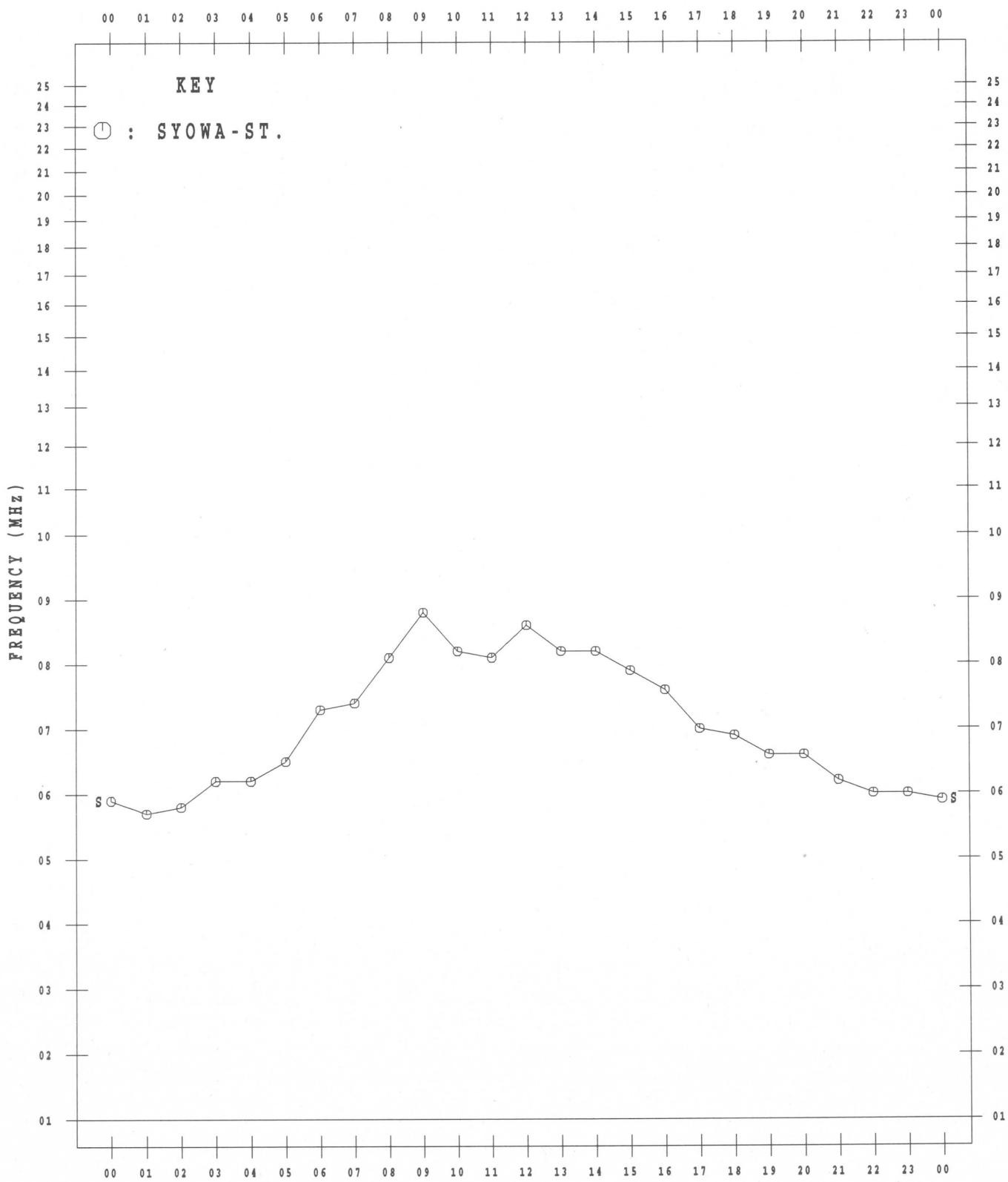
OCT. 2001



MONTHLY MEDIAN VALUES OF f_{oF2}

45° E MEAN TIME

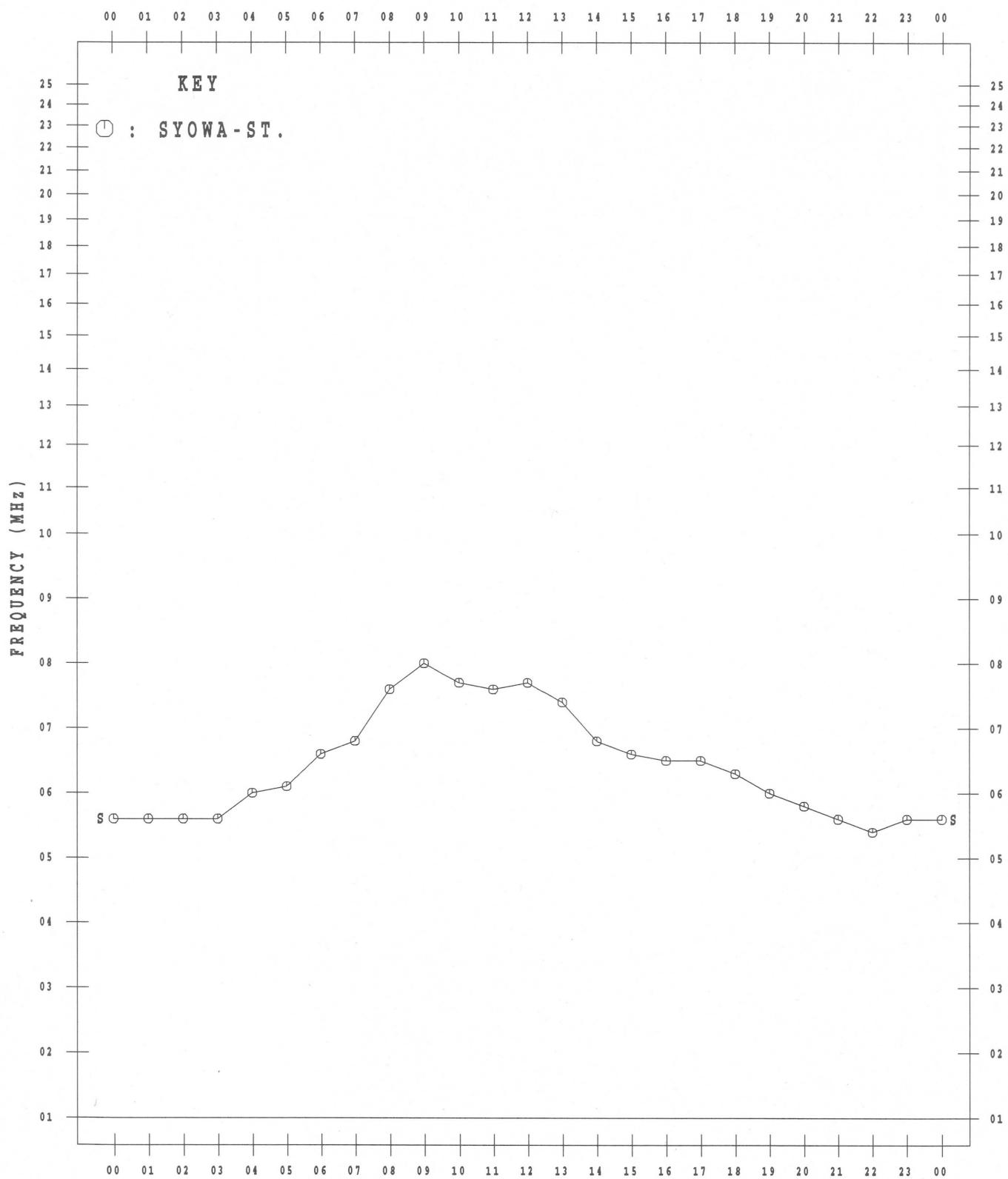
NOV. 2001



MONTHLY MEDIAN VALUES OF f_oF2

45° E MEAN TIME

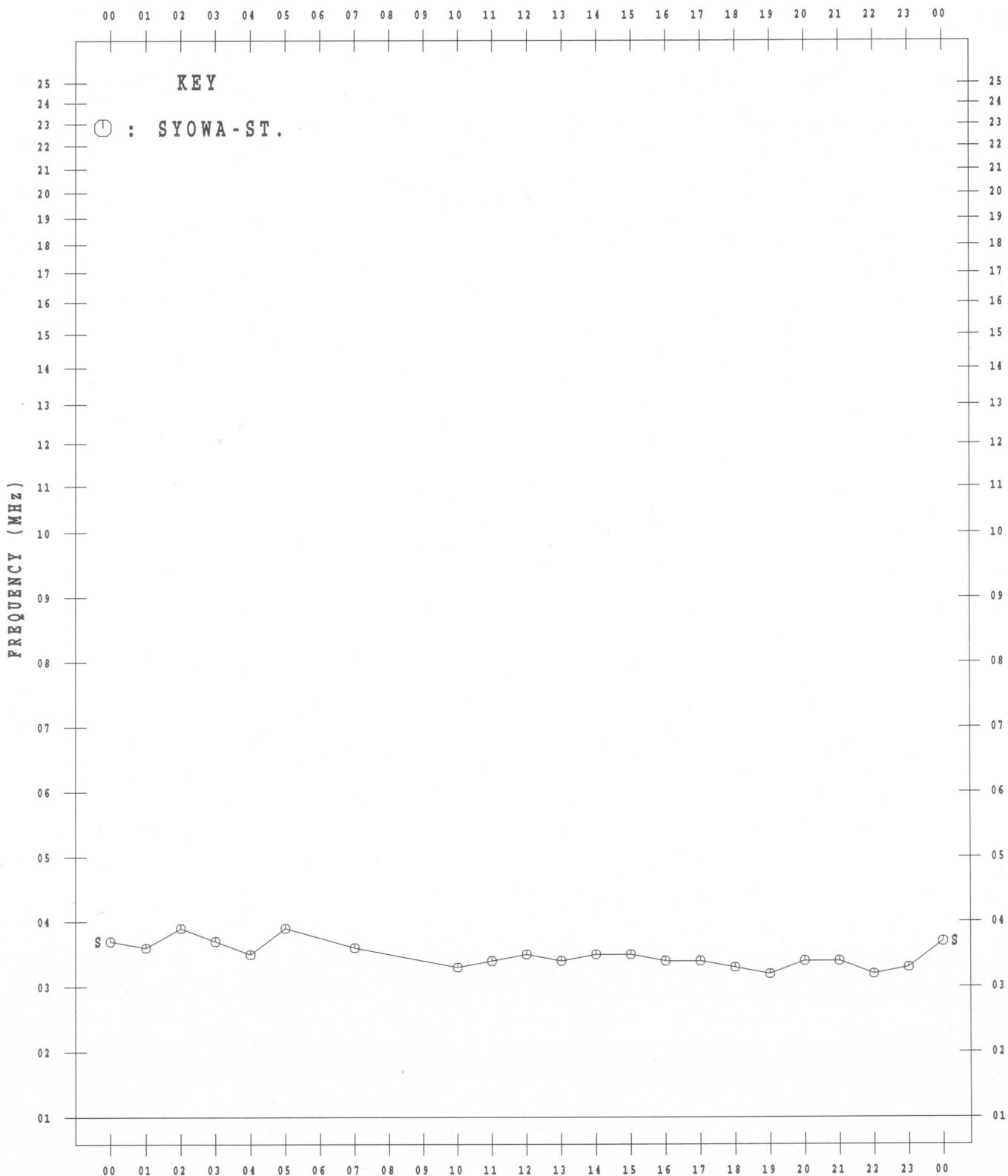
DEC. 2001



MONTHLY MEDIAN VALUES OF f_TE'S

45° E MEAN TIME

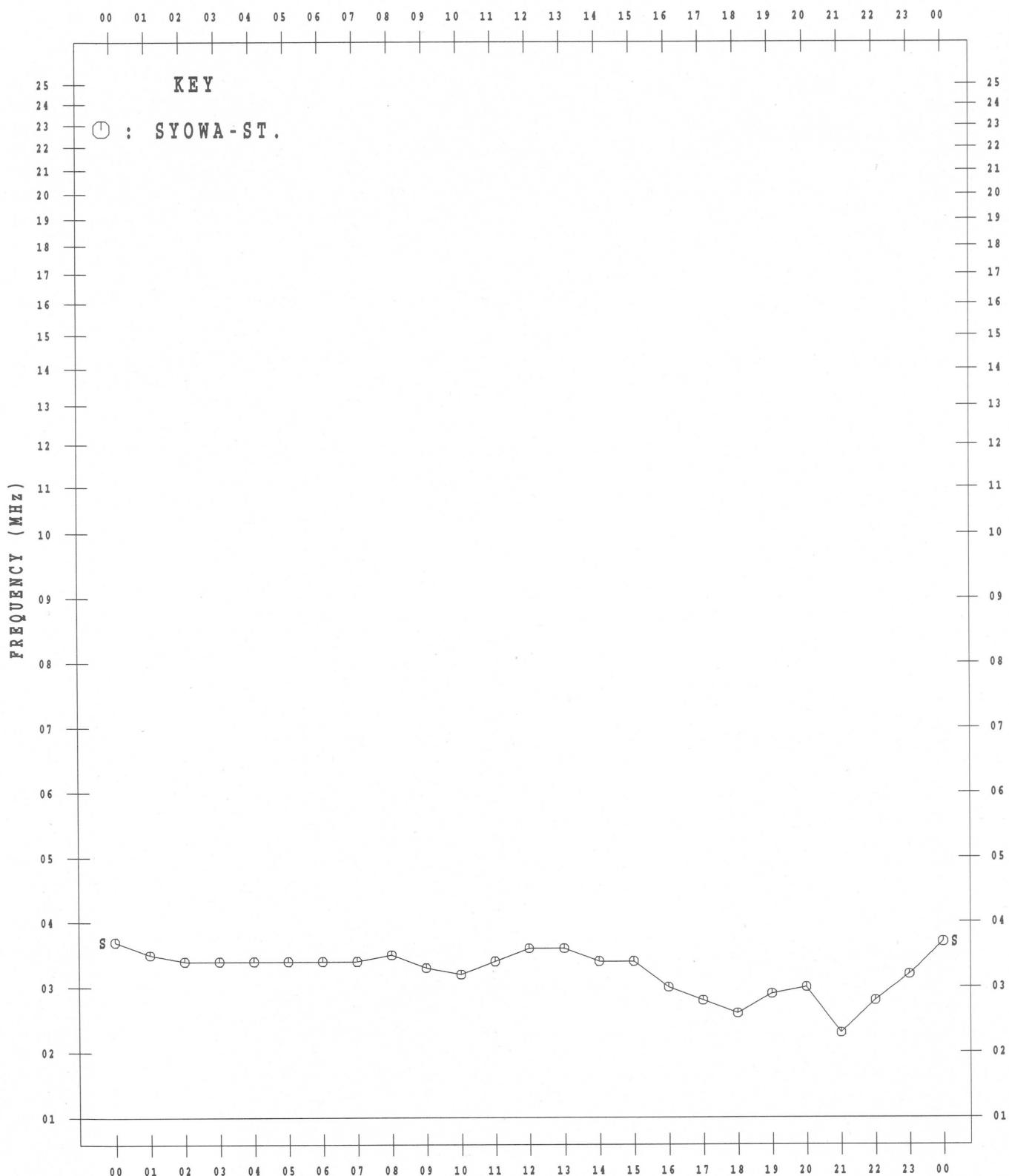
JAN. 2001



MONTHLY MEDIAN VALUES OF f_{TE}

45° E MEAN TIME

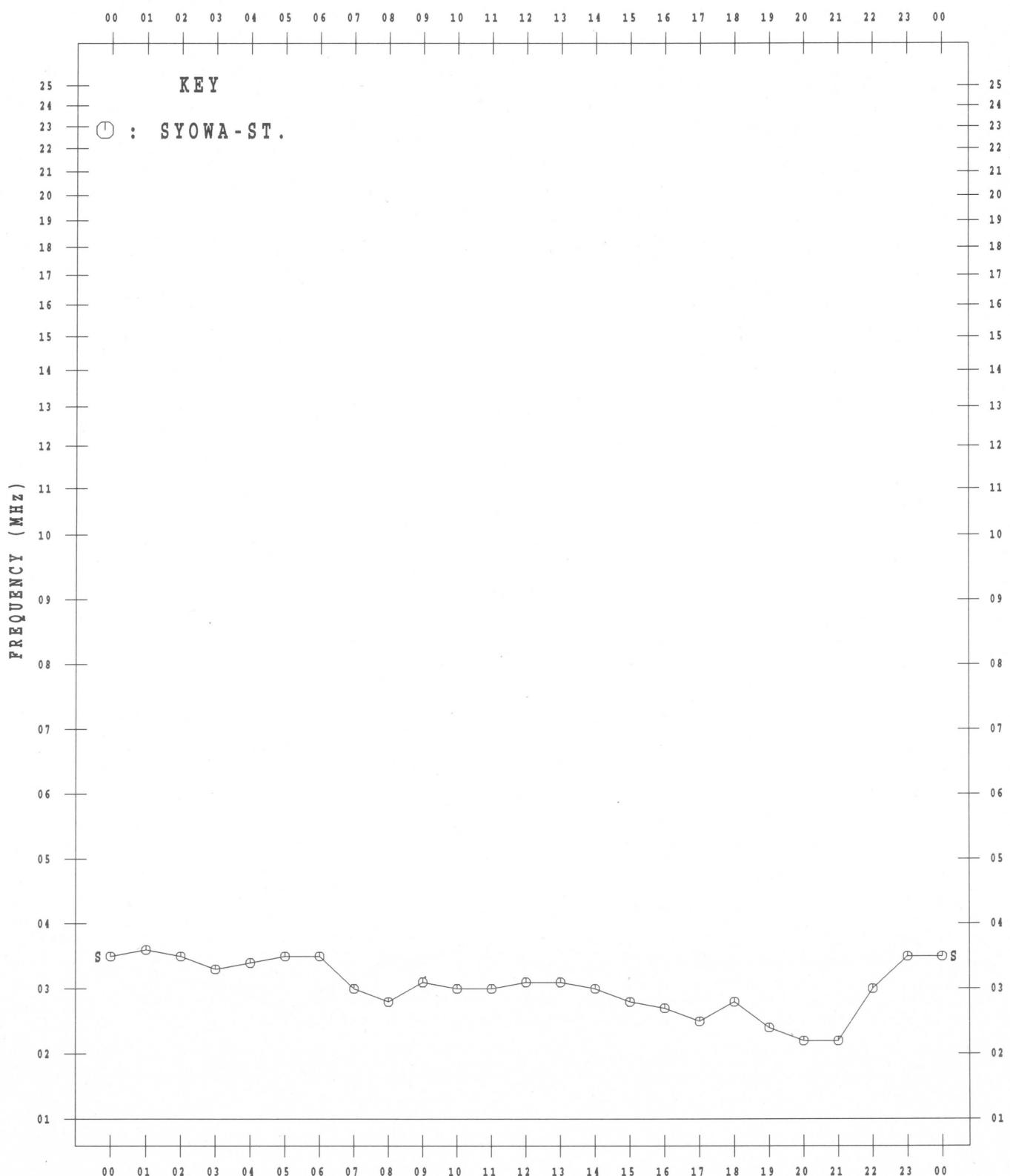
FEB. 2001



MONTHLY MEDIAN VALUES OF fTEs

45° E MEAN TIME

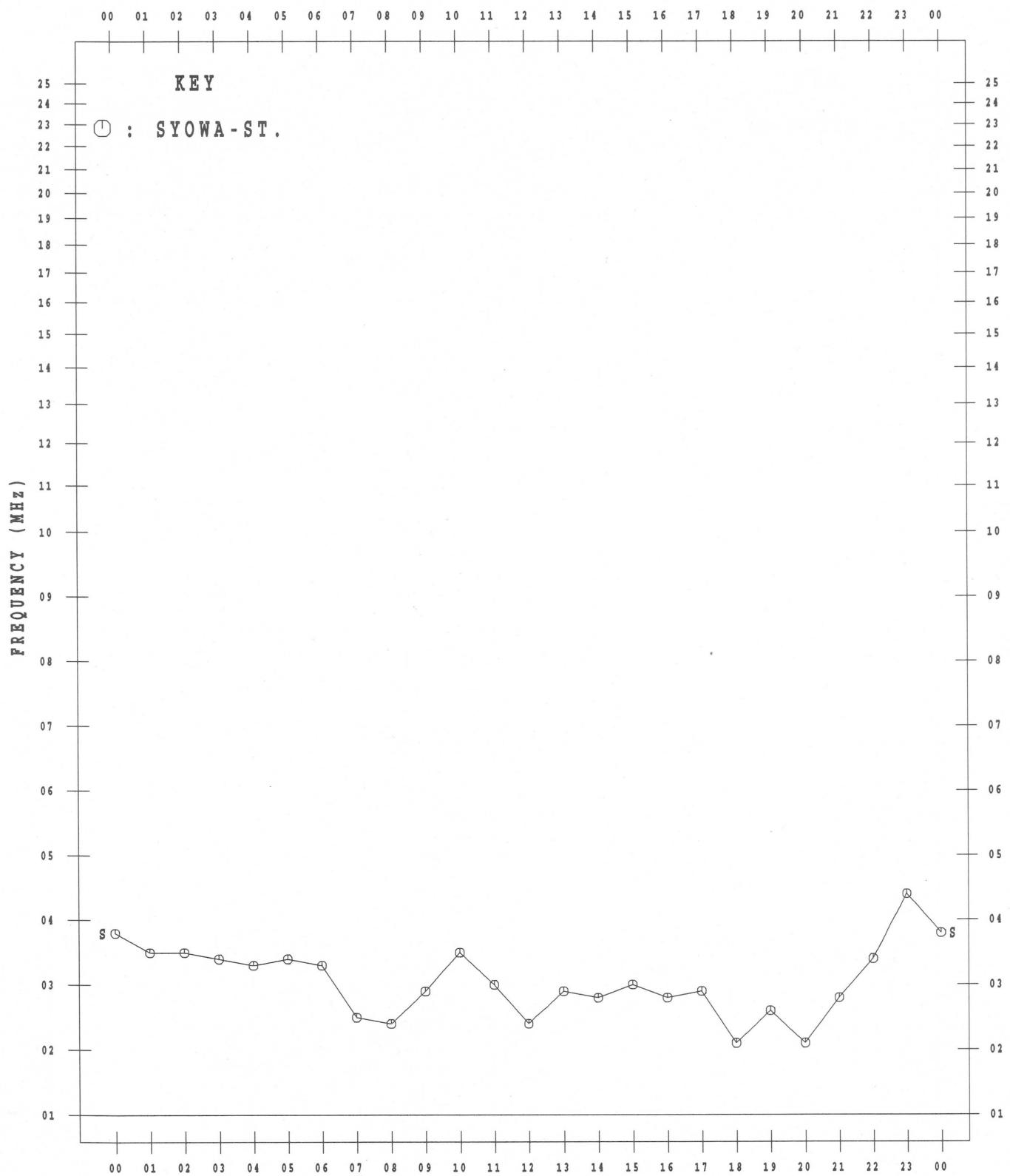
MAR. 2001



MONTHLY MEDIAN VALUES OF fTEs

45° E MEAN TIME

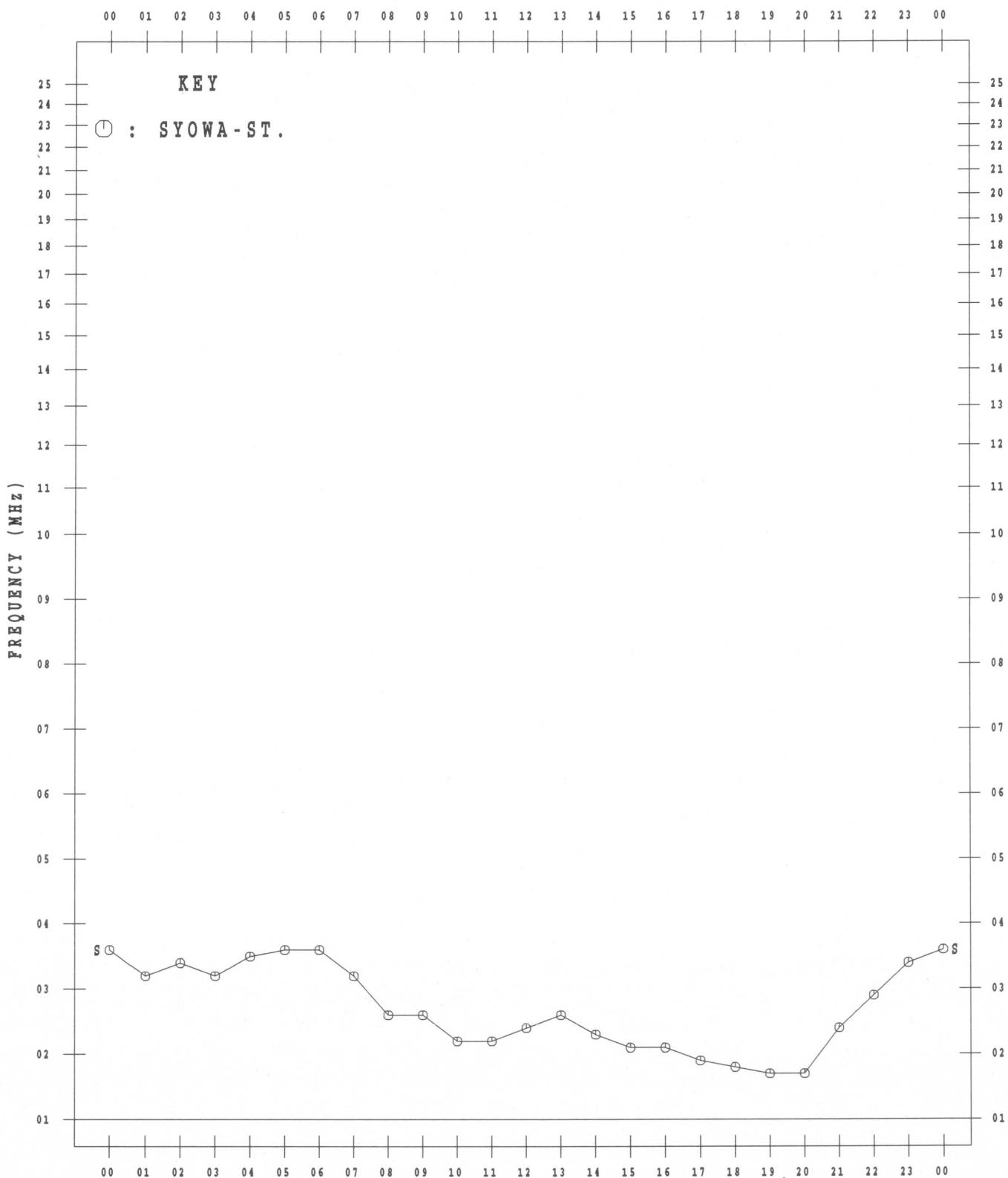
APR. 2001



MONTHLY MEDIAN VALUES OF f_TE'S

45° E MEAN TIME

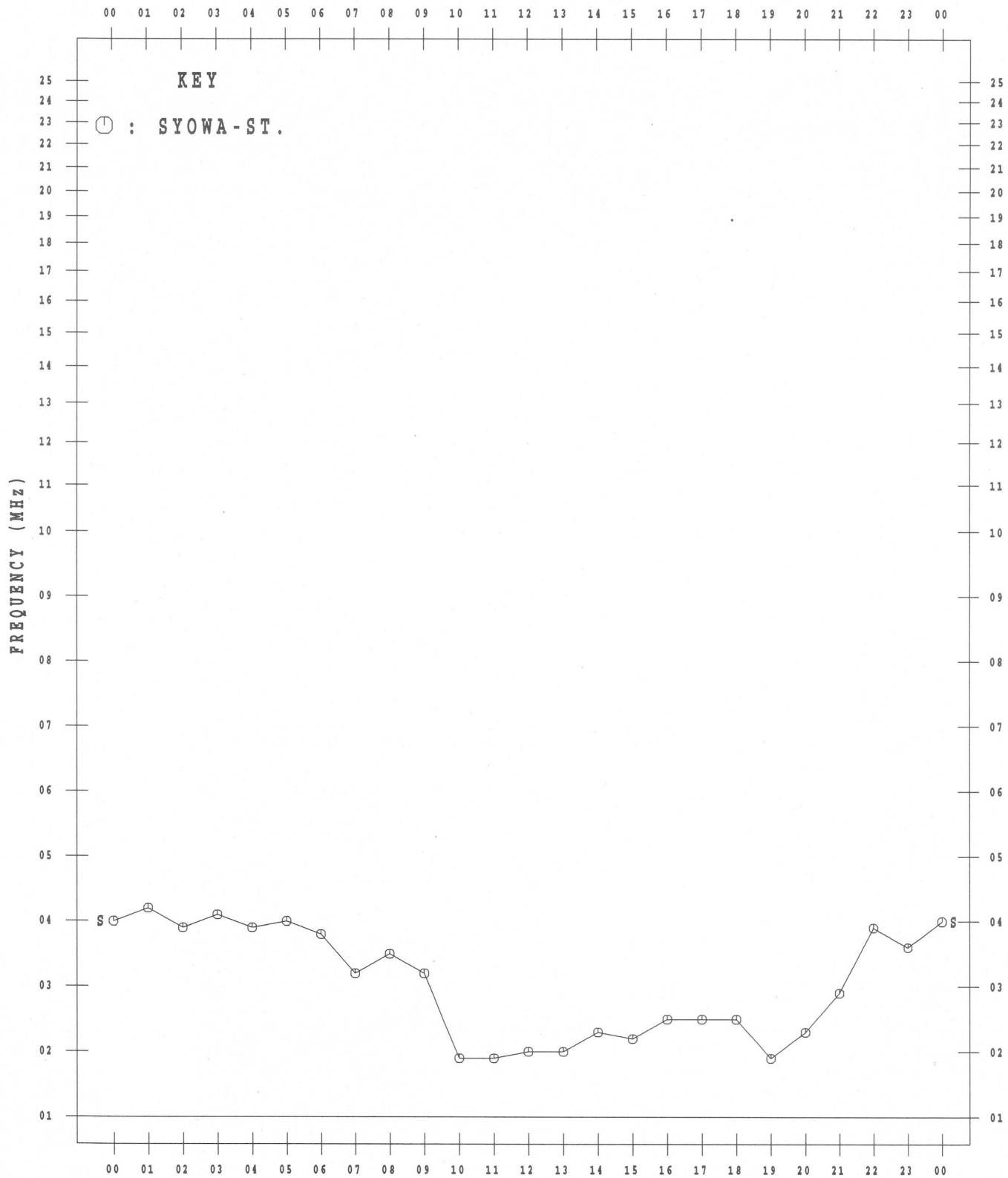
MAY 2001



MONTHLY MEDIAN VALUES OF f_TE'S

45° E MEAN TIME

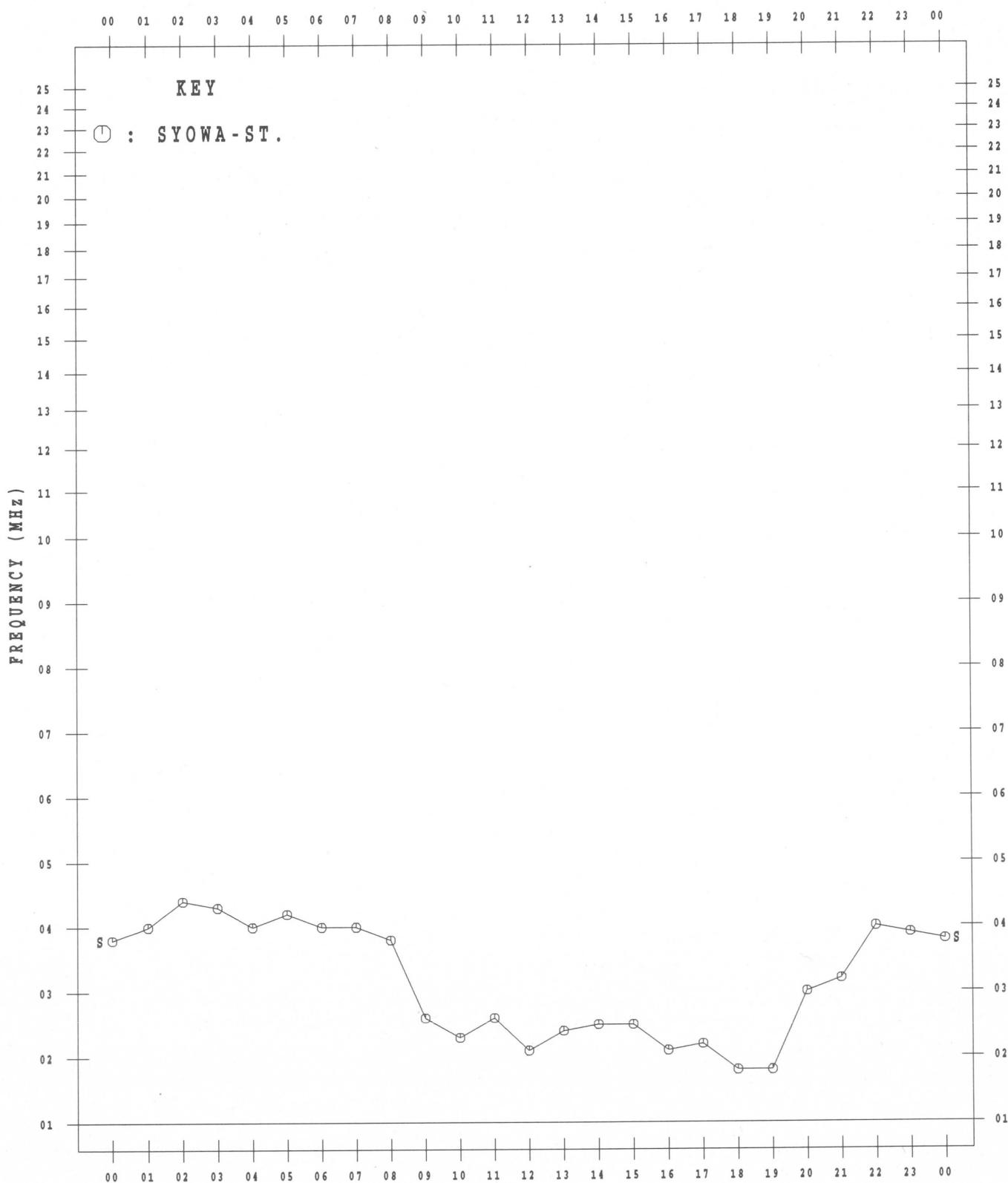
JUN. 2001



MONTHLY MEDIAN VALUES OF f_TE'S

45° E MEAN TIME

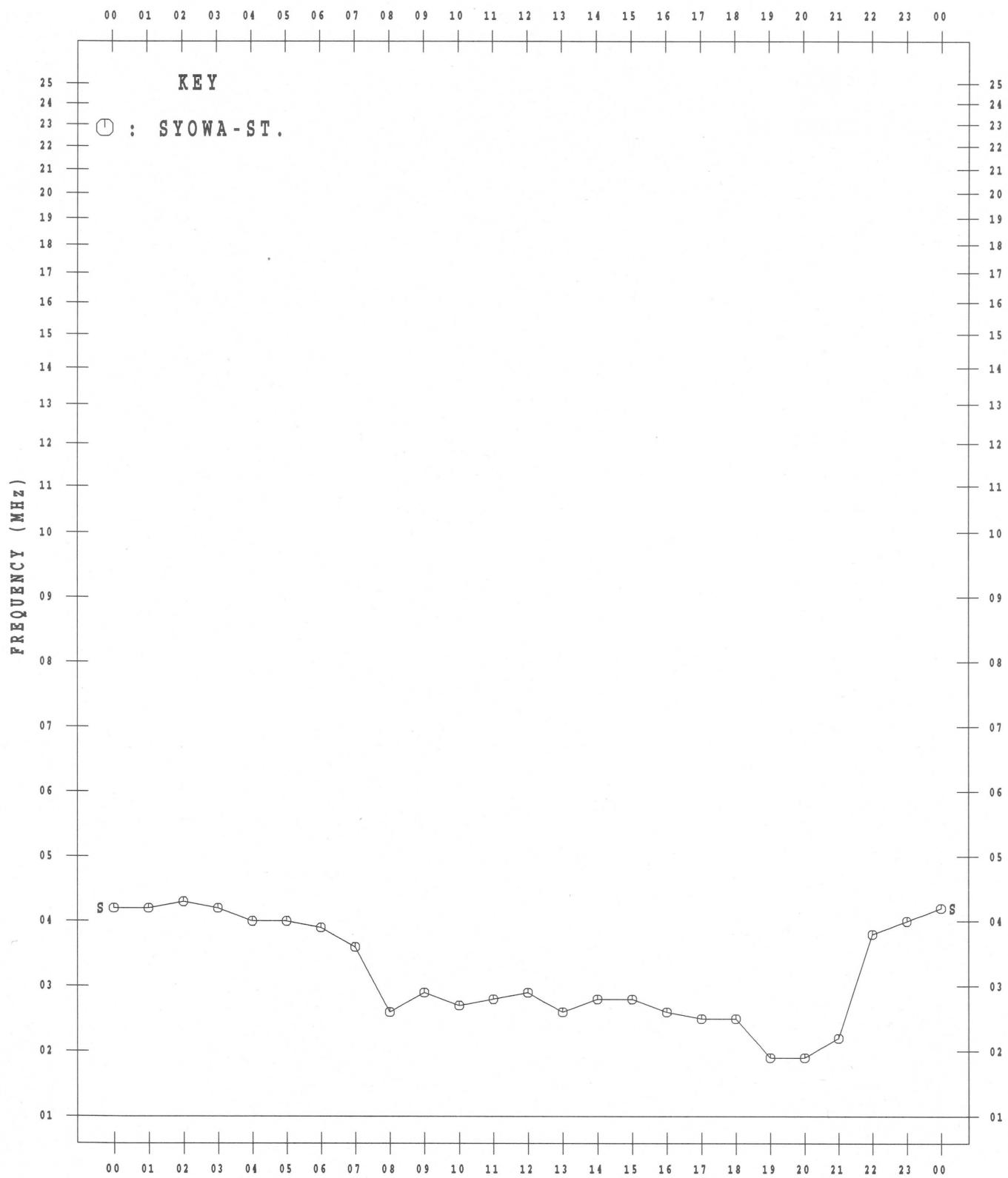
JUL. 2001



MONTHLY MEDIAN VALUES OF f_TE'S

45° E MEAN TIME

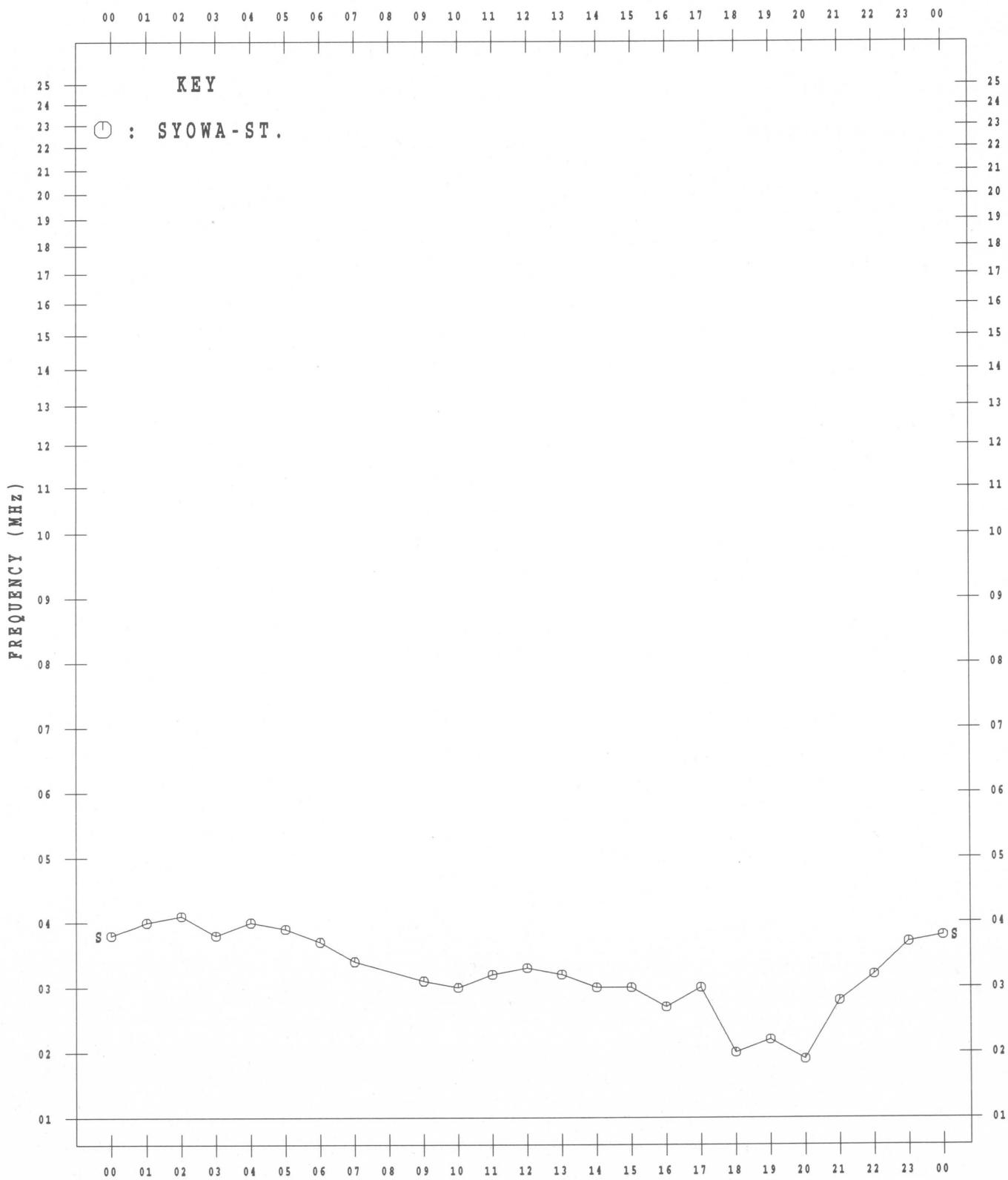
AUG. 2001



MONTHLY MEDIAN VALUES OF fTES

45° E MEAN TIME

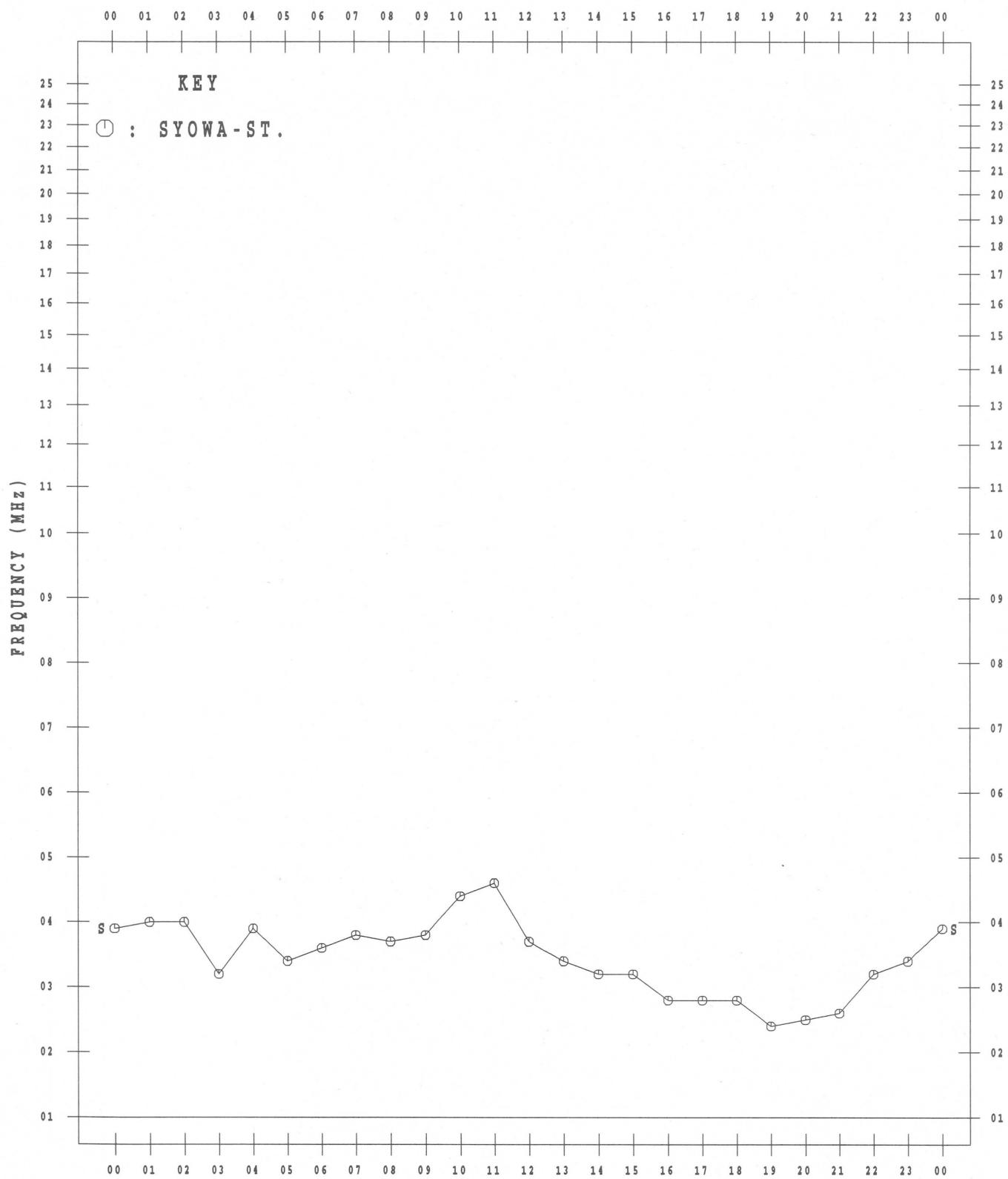
SEP. 2001



MONTHLY MEDIAN VALUES OF f_TE'S

45° E MEAN TIME

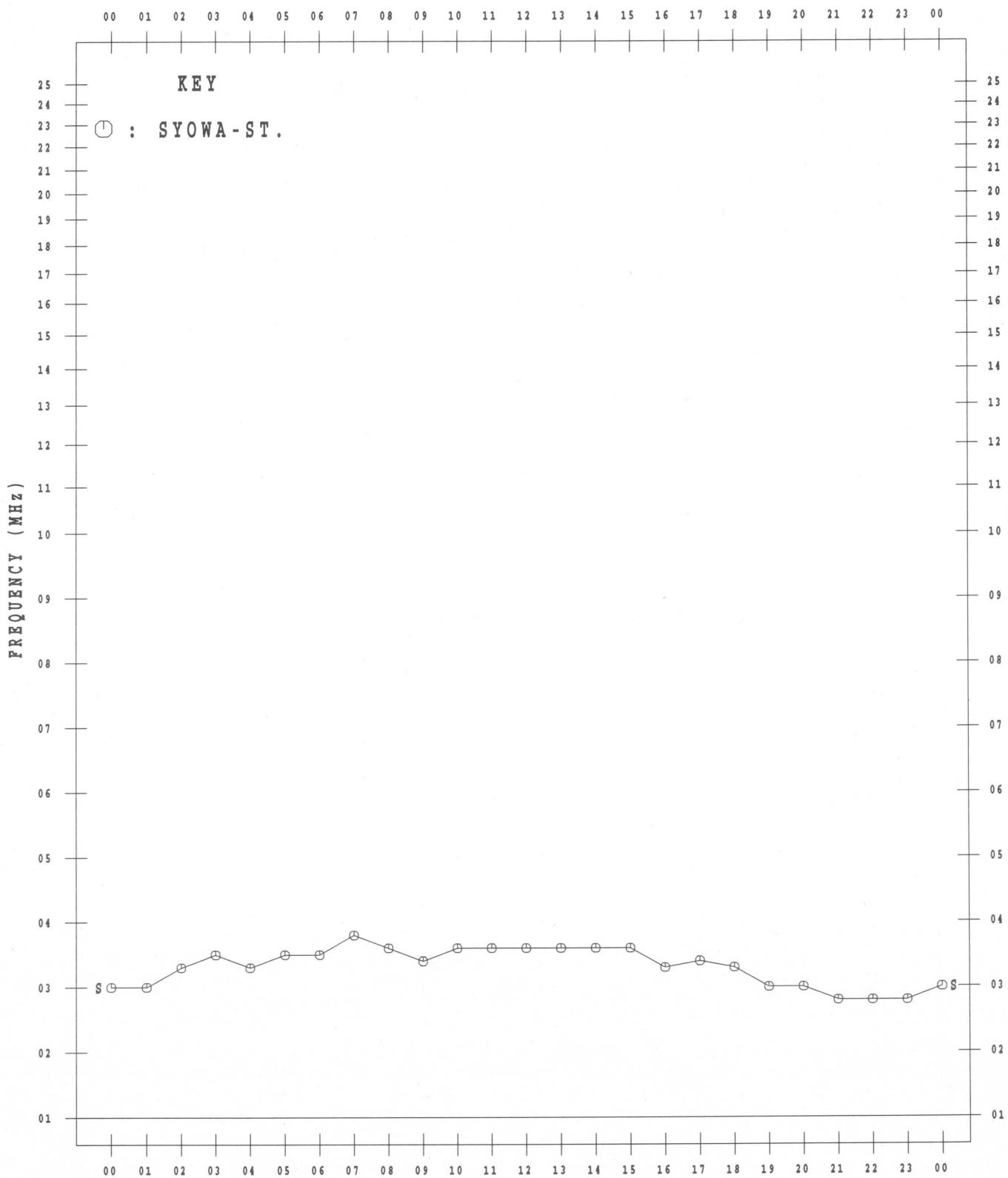
OCT. 2001



MONTHLY MEDIAN VALUES OF fTEs

45° E MEAN TIME

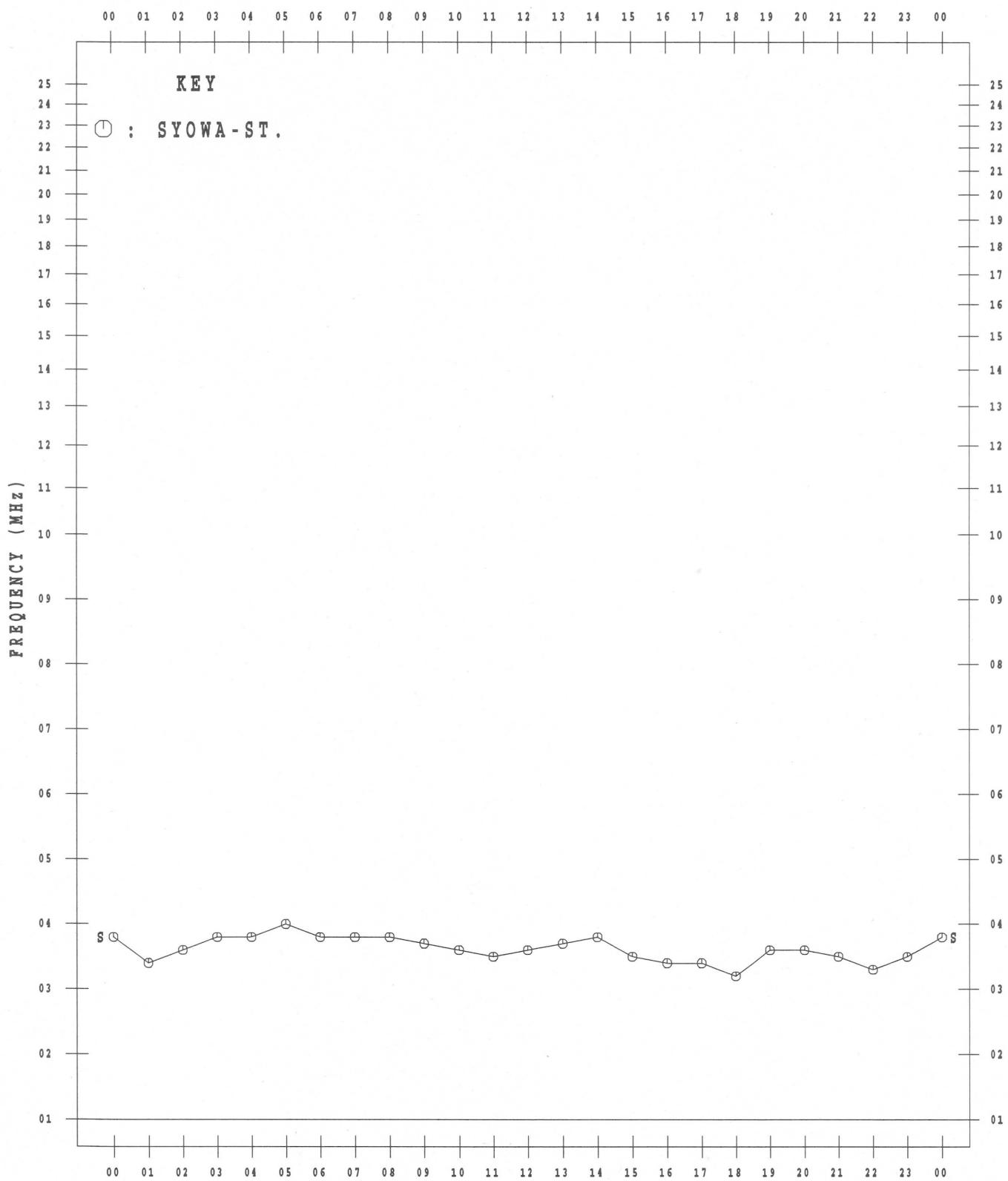
NOV. 2001



MONTHLY MEDIAN VALUES OF fTEs

45° E MEAN TIME

DEC. 2001



IONOSPHERIC DATA AT SYOWA STATION (ANTARCTICA)
ION.ANT.-68 January 2001 — December 2001 (Not for Sale)

昭和基地電離層資料(南極)

(2001年1月—2001年12月)

2005年7月11日 印刷
(非売品)
2005年7月15日 発行

編集兼発行所

独立行政法人 情報通信研究機構

〒184-8795 東京都小金井市貫井北町4丁目2-1

☎ 042 (327) 6911 (直通)