

ION. ANT.—63

IONOSPHERIC DATA AT SYOWA STATION (ANTARCTICA)

January 1996—December 1996

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INTRODUCTION

This data book gives summarized results for vertical soundings of the ionosphere at Syowa Station, Antarctica in 1996. The observations were conducted by the Communications Research Laboratory 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 SYOWA STATION

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

SPECIFICATIONS OF THE IONOSONDE USED AT SYOWA STATION

Items	Specifications
Frequency Rang	400 k Hz - 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	35 mm film
Power Supply	100-V-AC, 2.0kVA
Transmitting Antenna and Receiving Antenna	30-m-high vertical delta antennas terminated by 600 Ω

OBSERVERS

Observer: I. Yumisashi
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

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

Symbols

(i) Descriptive Letters.

The following letters are entered after, or used to replace, a numerical value on the monthly tabulation sheets.

A	Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example, Es
B	Measurement influenced by, or impossible because of, absorption in the vicinity of fmin.
C	Measurement influenced by, or impossible because of, any non-ionospheric reason.
D	Measurement influenced by, or impossible because of, the upper limit of the normal frequency range.
E	Measurement influenced by, or impossible because of, the lower limit of the normal frequency range.
F	Measurement influenced by, or impossible because of, the presence of spread echoes.
G	Measurement influenced or impossible because the ionization density of the layer is too small to enable it to be made accurately.
H	Measurement influenced by, or impossible because of, the presence of stratification.
K	Presence of particle E layer
L	Measurement influenced by or impossible because the trace has no sufficiently definite cusp between layers.
M	Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.
N	Conditions are such that the measurement cannot be interpreted.
O	Measurement refers to the ordinary component.
P	Man-made perturbation of parameters - Presence of polar spur traces
Q	Range spread present.
R	Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.
S	Measurement influenced by, or impossible because of, interference or atmospheric.
T	Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
V	Forked trace which may influence the measurement.
W	Measurement influenced or impossible because the echo lies outside the height range recorded.
X	Measurement refers to the extraordinary component.
Y	Lacuna phenomena, severe layer tilt .
Z	Third magneto- electronic component present.

(ii) Qualifying Letters

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

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

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

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

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1996 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 42	X 46		XO 46	X 55	X 58	X 59	X 59	X 59	X 58	X 59	X 50	X 63	X 59	X 60	XO 67	XO 51	XO 54	XO 50	XO 51	XO 49	XO 50	X 48	X 48	B
2	O 40	X 43	B	A	A	A	X 46	X 58	XO 60	X 60	X 63	X 59	X 63	X 68	X 57	XO 55	XO 57	X 52	X 54	X 49	X 48	X 41	X 43	X 43	
3	X 52	A		A		B	AO 44	X 52	O 52	XO 52	XO 51	XO 47	XO 46	XO 46	XO 60		B	XO 53	X 52	XO 52	XO 50	X 47	X 50	X 48	
4	O 48	XO 48	X Y		X 49	X 53	X 59	X 60	X 60	X 69	X 72	X 67	X 59	X 58	X 58	X 59	X 58	X 56	X 52	X 51	XO 50	X 49	X 49	X 50	
5	B		XO 47	X 47	B	B		X 58	X 59	X 71	X 69	X 64	B	B	X 59	X 61	X 60	XO 53	X 53	X 53	X 53	XO 51	X 47	X 46	
6	O 44	X Y	B	B	B	AO 49	X A		B		C	C		X 63	X 59	X 58	X 56	XO 53	X 54	X 55	X 53	X 51	X 54	XO 45	
7	X 47	S	S	B	O 51	XO 51	X 68	X 78	X 75	XO 75	X 73	X 70	X 70	X 70	XO 63	XO 65	X 58	XO 59	X 53	XO 55	X 52	X 52	X 53	X 42	
8	XO 43	XO 49	XO 43	X 48	S 54	X 64	X 63	X 70	X 70	XO 80	XO 71	X 67	X 66	X 62	X 58	X 60	S	XO 60	X 59	X 51	X 50	A	XO 52	X A	
9	X 43	XO 43	XO 55	XO 52	XO 60	XO 61	XO 60	XO 62	XO 72	XO 70	XO 62	XO 65	XO 68	XO 58	XO 60		XO 60	XO 59	X 51	X 50		X 52	X A	X A	
10	X 62	XO 62	XO 60	XO 59	XO 60	XO 62	A	A	A	X 51	X 48	X 49	A	X 45	X 61	X 56	X 60	X 58	X 66	X 64	X 67	X 68	X 68	X 60	
11	A		X 45	X 61	X 56	X 60	X 58	X 66	X 64	X 67	X 68	X 60	X 59	X 60	X 60	X 60	X 59	X 51	X 53	X 53	X 52	X 58	X 53	X 53	
12	O 47	X Y	X 49	B	B	O 49	X 58	X 58	X 62	X 59	X 60	X 59	X 60	X 57	X 59	X 48	X 47	X 48	XO 50	X 53	XO 53	XO 42	XO 40	X 41	
13	X 48	X 45	A	A	A	A	X 46	X 44		B	B	B	B	B	B	B	A	A	X 41				A	A	
14	X 43	A	A	X 42	B	A	X 49	X 53	X 53	X 52	B	B	O 45	X 45	X 43		B	B	B	AO 43	X 42	X 44	A	A	
15	A	AO 40	X 40	B	O 44	X B	B	A	B	C	O 49	X S	S	O 50	X 55		B	B	B	B	O 45	X 40	A	B	
16	B	B	B	B	A	B	B	O 42	XO 42	X 42	X 42	X 46	B	B	B	B	B	O 44	X 44	X 43	X 47	B	O 46	S	
17	S	B	S	B	S	B	A	A	XO 43	X 45	X 44	X 48	B	B	B	B	B	O 45	X 45	X 46	X 44	B	B	B	
18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O 49	X B	X B	X 53	B	X 36	
19	O 39	X A	B	A	A	B	B	X 47	X 49	XO 52	X 55	X 54	B	B	B	B	B	X 44	XO 45	XO 47	XO 48	X 48	X 48	X A	
20	A	A	B	S		X 44	X 53	X 53	XO 56	X 53			B	B	B	B	B	X 46	XO 44	X 43	X 41	X 38	XO 44	X 47	
21	S	B	B	A	B	A	B	X 58	X 59	X 61	X 58	X 58	XO 56	XO 54	XO 54	XO 50	XO 49	XO 49	X 46	X 47	X 47	XO 47	XO 47	X 42	
22	B	B	B	B	B	B	X 51	X 52	X 52	X 52	XO 52	XO 53	X 53	X 53	X 52	X 53	X 53	X 53	X 49	X 48	X 46	X 43	XO 41	XO 38	
23	B	A	A	A	A	AO 47	XO 47	XO 49	X 53	X 52	XO 55	XO 57	XO 60	XO 60	XO 55	XO 53	XO 53	XO 53	XO 53	XO 48	XO 46	XO 47	XO 47	XO 37	
24	X 36	X 37	X 36	X 45	O 47	X 56	X 59	X 64	X 70	X 57	X 56	XO 56	XO 52	XO 55	XO 56	XO 58	XO 55	XO 53	XO 53	XO 49	XO 45	XO 45	XO 45	XO A	
25	A	A	A	X 45	X 42	X 42	X 43	X 58	X 59	X 56	X 58	X 59	X 62	X 61	X 60	X 54	X 53	X 53	X 55	X 53	X 49	X 48	X 46	X 42	
26	A	A	AO 52	X A	A	A	Y		X 47	XO 53	XO 50	XO 53	XO 55	XO 52	XO 47	XO 48	XO 48	XO 48	XO 53	XO 49	XO 49	XO 50	XO 34	XO A	
27	O 38	XO 37	A	A	A	A	A	X 51	XO 50	XO 50	XO 50	XO 58	XO 53	XO 52	XO 52	XO 53	XO 52	XO 52	XO 52	XO 52	XO 45	XO 49	XO 48	XO 34	
28	A		A	A	B	A	A	A	B	B	B	X 46	X 53	X 56	XO 47	XO 48	XO 46	XO 47	XO 47	XO 47	XO 49	XO 46	XO 46	XO A	
29	A	A	B	A	B	A	A	AO 47	X 47	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
30	AO 35	X B	B	A	B	B	B	B	X 49	C	XO 52	XO 55	XO 46	XO 46	XO 48	XO 45	XO 47	XO 46	XO 46	XO 46	XO 46	XO 43	XO 43	XO 32	
31	X 33	X B	A	B	B	B	AO 48	X 52	X 53	R	B	B	B	R	O 48	X 48	X 48	X B	X B	X 49	X 44	X 43	X 41	X 38	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	16	13	10	11	13	13	17	22	24	24	22	21	20	23	23	21	23	25	27	29	27	24	23	17	
MED	X 43	X 45	X 48	X 49	X 48	X 54	X 58	X 58	X 56	X 56	X 58	X 55	X 58	X 56	X 58	X 55	X 53	X 53	X 50	X 49	X 49	X 47	X 46	X 42	
UQ	X 48	X 48	X 55	X 52	X 58	X 58	X 60	X 60	X 68	X 67	X 63	X 59	X 63	X 59	X 60	X 58	X 58	X 54	X 53	X 53	X 51	X 51	X 49	X 46	
LQ	X 40	X 38	X 42	X 45	X 44	X 48	XO 48	X 49	X 52	X 52	X 52	XO 50	XO 52	XO 47	XO 52	XO 48	XO 47	XO 48	XO 47	XO 46	X 46	X 44	X 41	X 38	

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1996 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	36	S	F	40	49	RJ	S	53	53	J	R	53	54	57	53	53	61	R	R	44	RJ	S	U	R	B					
2	F	R	B	A	A	A	J	S	52	54	R	57	53	57	61	J	R	51	49	51	46	48	43	42	35	37	F			
3	46	A	F	A	F	B	A	R	F	38	42	46	46	45	41	R	R	40	40	54	B	47	46	46	44	41	44	42		
4	U	R	Y	F	40	47	53	52	54	63	66	61	53	52	J	R	J	R	52	53	52	50	45	45	44	43	43	44		
5	B	F	J	S	44	B	B	F	F	48	50	60	58	58	B	B	53	55	54	47	47	47	47	45	41	40	38			
6	R	Y	B	B	B	A	R	A	B	F	C	C	F	J	F	J	F	J	R	J	U	R	47	48	49	47	45	48	43	39
7	J	R	S	S	B	R	F	J	F	69	69	67	64	61	64	57	59	52	53	47	49	46	46	47	47	36	R			
8	37	43	37	42	D	S	R	F	J	F	F	F	F	61	61	60	56	52	A	49	47	47	J	S	J	R	U	R		
9	F	F	F	46	54	55	54	56	66	64	56	59	62	52	54	S	54	53	45	44	A	A	A	46	A	A	R			
10	46	D	S	B	A	A	A	53	53	53	53	52	56	56	54	53	54	56	R	A	A	A	45	42	43	R				
11	A	F	F	F	F	J	F	F	F	J	F	F	53	53	52	50	53	53	52	50	47	48	49	47	45	48	43	39		
12	R	Y	J	R	B	B	R	J	R	43	52	52	56	53	54	53	42	41	42	44	47	47	36	34	35	A				
13	42	F	A	A	A	F	F	B	B	B	B	B	B	B	B	B	B	A	A	R	A	A	F	A	A	A				
14	38	A	A	R	B	R	B	A	B	C	R	D	S	D	S	R	R	B	B	B	B	39	37	36	38	32	F	A	B	
15	B	B	B	B	A	B	B	R	R	B	J	R	J	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	
16	D	S	B	S	B	D	S	B	A	A	R	37	39	38	42	B	B	B	B	U	R	B	R	J	R	R	B	B		
17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	B	B	B	B	B	B	B	B	
18	S	B	A	A	B	B	41	43	46	49	48	B	B	B	B	B	B	B	B	38	39	41	42	42	B	A	A	A		
19	A	A	B	S	F	J	F	J	F	J	F	R	B	B	B	B	B	B	B	J	S	38	37	35	32	38	41	37	A	
20	S	B	B	A	B	A	B	J	R	F	52	53	51	52	52	50	48	48	44	43	43	40	41	41	41	41	36	R	R	A
21	B	B	B	B	B	B	45	46	46	46	46	46	47	47	47	46	46	47	47	47	43	42	40	37	35	32	R	R	A	
22	B	A	A	A	F	A	A	R	R	J	R	J	R	R	R	R	R	R	R	J	R	47	47	47	42	39	41	41	31	F
23	30	31	26	F	R	50	53	60	51	50	50	46	49	50	52	J	R	52	52	49	47	43	39	B	A	A	R	R	A	
24	A	A	A	39	36	32	37	52	53	50	52	53	56	55	53	48	47	47	49	47	43	43	42	40	42	40	36	40	36	A
25	A	A	A	46	41	43	44	47	49	46	41	42	42	42	42	42	42	42	42	47	43	43	44	44	44	44	44	28	F	A
26	R	R	A	A	A	A	A	45	44	44	52	47	49	46	46	47	46	46	46	46	46	40	38	41	42	32	28	F	A	A
27	A	F	A	A	B	A	A	A	B	B	B	B	40	47	50	43	41	42	40	41	41	41	43	40	40	40	40	40	40	A
28	A	A	B	A	F	B	A	A	R	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
29	A	R	B	A	B	F	B	B	B	B	C	U	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
30	29	B	A	B	B	B	A	42	46	47	38	B	B	B	D	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
31	27																													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	17	13	9	11	14	12	17	23	25	24	23	22	22	24	24	21	23	25	27	28	26	24	23	17						
MED	38	36	F	42	40	48	48	52	53	51	52	52	52	51	52	49	47	47	44	42	42	41	40	36						
U Q	42	39	F	44	44	47	52	53	53	58	56	57	53	56	54	54	53	52	48	47	46	45	44	43	40					
L Q	32	31	F	32	39	36	38	42	43	44	46	46	46	46	44	44	42	41	42	40	40	40	36	34	32					

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1996 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	32	37	32	32	22	22	21	31	31	38	35	18	39	38	36	36	37	40	31	27	23	20	21	B		
2	30	28	B	41	43	39	37	26	32	32	38	30	38	39	28	37	32	30	27	27	23	21	27	48		
3	41	51	42	44	40	B	44	38	27	26	32	47	29	30	29	29	B ^E	B ^E	B ^B	30	29	27	22	22	21	18
4	E ^B	B	31	37	32	27	21	32	33	28	34	35	36	34	46	E ^B	31	40	54	37	36	28	40	22	29	19
5	B	39	40	37	B	B	33	26	27	31	24	B	B	31	33	37	30	27	26	47	27	22	40	31		
6	39	41	B	B	B	40	46	46	B	C	C	38	31	32	30	49	43	38	42	39	19	19	19	17		
7	28	41	29	B	39	31	25	27	26	27	31	27	32	36	37	42	38	31	26	31	27	27	18	30		
8	30	35	30	21	29	41	32	27	34	31	42	39	37	35	35	35	61	48	43	21	23	38	E ^B	B		
9	33	28	17	19	20	28	32	24	25	28	26	31	34	42	43	46	49	43	37	39	59	46	57	50		
10	27	E ^B	B	B	31	51	43	36	32	32	28	39	31	42	31	33	39	38	31	51	52	70	49	30	38	
11	52	26	18	27	31	19	29	30	32	39	37	31	43	79	51	33	38	31	39	49	90	37	30	31		
12	44	39	42	B	B	45	52	36	31	42	33	32	47	29	28	32	32	39	29	30	30	E ^B	E ^B	E ^B	B	
13	31	39	116	44	51	37	27	B	B	B	B	B	B	B	B	B	48	52	44	89	49	52	51	92		
14	30	42	71	46	B	43	42	29	32	40	B	B	28	29	B ^E	B ^B	28	28	43	27	39	45	71	77		
15	56	47	47	B	33	B	B	41	B	C	31	27	31	30	31	B	B	B	B ^E	B ^B	24	B ^E	B ^B	40		
16	B	B	B	B	39	B	B	39	26	B	27	38	B	B	B	B	24	B	26	24	E ^B	B ^B	27	38		
17	E ^B	B	B	B	B	B	B	42	38	43	31	31	32	B	B	B	B ^E	B ^B	B	30	23	35	24	B	B	
18	B	B	B	B	B	B	B	B	B	B	B	B	B ^E	B ^B	B	B	B	28	B	B ^E	B ^B	22	B ^E	B ^E	B	
19	36	B	40	38	B	B	27	31	27	27	27	B	B	B	B	B	26	23	28	30	9	B	37	41		
20	60	58	B	S	32	32	33	39	27	B	B	B	B	B ^E	B ^B	B ^E	B ^E	B ^B	22	27	E ^B	50	E ^B	E ^B	B	
21	37	B	B	56	B	39	B	38	24	27	32	30	30	31	32	33	38	38	26	38	E ^B	21	37	33	40	
22	B	B	B	B	B	B ^E	B ^B	24	26	38	38	37	31	29	32	32	27	32	24	24	E ^B	26	31	31	38	
23	B	38	37	34	24	41	68	31	24	34	33	32	38	37	34	27	26	24	26	22	22	26	16	E ^B	B	
24	14	32	29	31	27	40	26	40	26	31	37	32	44	52	37	31	32	26	22	26	28	B	42	42		
25	52	43	41	37	34	36	50	25	27	26	27	33	33	41	37	27	28	31	27	22	17	26	31	E ^B	B	
26	38	36	39	37	51	51	39	37	37	26	26	32	E ^B	B ^B	26	26	26	26	27	24	16	30	33	29	38	
27	31	27	37	41	42	43	43	33	27	26	27	27	32	30	39	27	26	37	E ^B	B ^B	21	26	32	46	17	
28	42	32	42	41	B	42	44	38	B	B	B	31	31	30	30	28	27	28	27	26	42	32	27	39		
29	41	51	B	42	32	B	42	41	37	44	B	B	B	B	B	B	B	B ^E	B ^B	25	32	E ^B	19	34	42	38
30	41	33	B	40	B	27	B	B	B	C	36	31	33	32	29	26	E ^B	27	34	E ^B	34	46	E ^B	20	16	18
31	30	B	41	B	B	B	39	33	26	26	26	B	B ^E	B ^B	33	29	27	B	B	29	30	25	E ^B	E ^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	24	21	21	20	21	26	28	25	25	23	22	22	25	24	23	25	26	29	30	30	26	30	27		
MED	34	38	39	37	34	39	36	33	27	31	32	32	34	32	32	31	32	30	28	28	26	28	29	31		
UQ	41	42	42	42	41	42	43	38	32	38	37	33	38	38	36	37	38	38	36	35	40	37	40	40		
LQ	30	32	31	32	28	30	29	28	26	27	27	30	31	30	30	27	26	27	26	24	22	22	21	E ^B	B	

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1996 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1996 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	215	200	205	200	200	200	210	200	200	200	215	210	230	200	205	200	205	240	A	S	B				
2	A	A	B	A	A	A	A	205	200	200	200	200	200	205	200	200	200	200	220	200	230	240	240	235					
3	230	AE	A	A	210	B	A	220	200	200	210	220	205	200	205	205	B	205	210	225	200	215	245	220					
4	E	B	A	AE	AE	A	230	205	220	210	200	200	A	200	230	200	205	200	210	245	250	230	215	220	240				
5	B	A	A	A	B	B	A	240	225	200	210	200	B	B	215	215	200	200	210	215	220	230	210	A	A				
6	A	A	B	B	B	A	A	220	A	B	A	C	C	180	180	185	215	205	200	205	E	A	E	A	220				
7	E	A	A	S	B	A	A	200	200	200	200	220	200	200	205	200	200	195	200	235	A	205	215	230	230				
8	A	A	AE	AE	AE	A	A	115	215	200	200	240	205	205	210	190	200	A	200	215	200	210	E	AE	B	B			
9	AE	AE	A	A	E	A	A	205	200	200	200	205	220	220	200	A	A	230	210	215	A	A	A	A	A				
10	240	E	B	B	A	A	A	230	200	200	200	200	215	210	200	205	200	205	A	A	A	A	A	A	A				
11	A	AE	A	A	205	220	220	205	200	200	200	180	205	A	200	200	200	200	210	230	A	A	E	A	245				
12	A	A	205	B	B	A	A	220	190	200	A	A	A	205	210	210	190	230	205	210	200	215	250	260	A				
13	240	A	A	A	A	A	A	205	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	A	A				
14	A	A	A	A	B	A	A	225	200	200	B	B	200	230	225	B	225	225	A	230	A	A	A	A	A				
15	A	A	A	B	A	B	B	A	B	C	S	195	S	210	215	200	B	B	B	BE	B	B	B	A	B				
16	B	B	B	B	A	B	B	A	A	B	200	200	B	B	B	B	225	BE	A	250	220	215	B	255	A				
17	B	B	A	B	A	B	A	A	250	215	200	200	B	B	B	B	205	B	200	215	230	B	B	B	B				
18	B	B	B	B	B	B	B	B	B	B	B	B	BE	B	B	B	B	210	B	B	B	B	BE	BE	B				
19	225	B	A	A	B	B	A	200	225	205	205	B	B	B	B	B	200	205	200	E	B	250	200	B	A	A			
20	A	A	B	S	E	A	225	215	A	B	B	B	B	B	B	215	205	220	215	260	E	B	AE	BE	BE	A			
21	A	B	B	A	B	A	B	A	185	210	205	205	200	200	210	200	200	200	200	240	E	B	A	A	A				
22	B	B	B	B	B	BE	B	220	180	230	225	215	200	200	200	225	195	H	H	200	210	200	220	215	250	A	A		
23	B	A	A	AE	A	A	A	215	180	H	220	210	200	200	200	205	205	H	200	200	215	200	200	240	240	250	AE	B	
24	250	AE	A	A	230	230	205	210	200	215	200	210	200	200	195	195	205	200	200	220	205	B	A	A	A				
25	A	A	A	A	A	A	A	220	200	230	200	205	200	E	A	240	200	200	200	205	200	205	200	210	240	245	A	A	A
26	A	A	A	A	A	A	AE	AE	AE	A	250	250	200	200	225	240	205	200	205	210	200	210	225	240	A	A	A		
27	A	A	A	A	A	A	A	250	200	200	200	200	200	200	215	205	200	200	210	220	200	215	240	240	255	E	A	E	A
28	A	A	A	A	B	A	A	A	B	B	B	220	225	200	205	200	200	215	225	215	225	230	250	E	A	A	E	A	
29	A	A	B	A	A	B	A	A	A	A	B	B	B	B	B	B	B	B	B	170	230	160	170	A	A	A	A	A	
30	A	A	B	A	B	A	B	B	B	A	C	230	200	200	200	200	205	200	220	B	A	240	260	295	E	AE	B	B	
31	A	B	A	B	B	B	AE	A	280	230	200	200	B	BE	B	220	205	200	B	B	205	280	230	270	260	250	E	BE	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	7	3	5	4	9	6	14	21	22	22	22	20	21	24	24	22	22	25	26	27	23	19	19	14					
MED	235	E	AE	A	220	220	208	210	200	200	200	200	200	202	202	200	200	205	209	218	215	228	240	234	U	U			
U Q	E	E	BE	A	AE	AE	A	220	225	225	210	205	215	212	215	208	205	205	210	215	E	240	230	240	250	255	E	BE	B
L Q	230	255	228	235	212	220	205	200	200	200	200	200	200	200	200	200	200	200	200	200	210	200	215	240	235				

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1996 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

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

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1996 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1996 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	37	37		B	74	41	39	37	33	24	25	27	27	29	32	27	26	23	E	B	E	B	21	22		B	27	34		
2	35	34	34		B		58		B	44	39	26	26	27	28	27		B	E	B	E	B	E	B	B		S	17	37	
3	38	31	38	35	33	27	22	32	32	30	33	31	32	38	29	32	38	32	46	22	58	20	16	26						
4	26	27	E	B	16	17	26	22	25	25		B	E	B	36	26	39	23	42	37	40	32	32	22	28	16	16		B	
5	36	41	42	41	35	37		B		37	26	23	28	32	16	30	26	27	25	24	27	E	B	20	32	16	36			
6	33	36	46	32	37	42	48	51	37	E	B	29	26	32	32	32	31	27	26	42	40	40	46	59	58	32				
7	37	46	32	30	40	54	43	51	26	28	26	26	31	26	27	54	46	38	21	22	27	27	32	37						
8	32	46	42	42	39	43	43	42	33	29	31	27	26	26	26	27	25	26	31	19	17	17	32	28						
9	30	32	38	46	41	44	38	26	32	27	32	24	32	25	E	B	29	31	27	26	27	E	B	E	B	E	B	17	36	
10	39	42	42	40	E	B	21	20	23	43	42	31	25	21	26	27	31	29	26	23	23	33	85	80	42					
11	46	36	38		B		58		43				30	31	31			B	E	B										
12	42	44	39	42		B		34			26	27	E	B		B	B	E	B		B	B	B	B	B	E	B	38	38	
13	37		B	42	38	40	40	32	39	37	31																			
14	44		B	36		B		B			38	36	32				31		B	E	B	E	B	E	B	E	B	18	29	35
15	37	32	39		B			39		37						29	29	29			B	E	B	E	B	E	B	40	41	
16	41	43	59	46	70	37		35	44	42	26		26				B	E	B		27	24	24	27	E	B	E	B	29	
17	39	26	46	53		B		48		41			38	36		26	26	30	30											
18	31	30	44	42	41	42	48	40	22	22	31	26			26	24	26	38	26	33	32	E	B							
19	51	59	105	70	38	31	37	50	57		31	32	26				33		B	E	B									
20	26	32	41	44		B		36		38	31	38	26								24	23	B	E	B	E	B	E	B	34
21	39	42		B	E	B	23	27	18	21	27										E	B	E	B						
22	26	33	45	40	39		B		B				29	32	31	30	26	26	24	31	24	17	18	27	32					
23	30	39	40	29		B		37		B																				
24	39	39	36	41	47		B	B	B																					
25	69	46	42	27	46	44	41	42	42	41																				
26	80	38		B	59	42	38	41		44	33	28																		
27	80	59		B	41	38	43		B																					
28	46	44	44	45	37	27		B	B																					
29	37	38	36	35	22	25	27		B																					
30																														
31																														
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	29	27	25	25	22	23	18	18	23	20	22	19	18	19	20	20	23	22	22	26	26	28	28	26						
MED	37	38	41	41	38	38	38	40	34	30	29	27	29	26	30	30	28	26	28	24	22	26	30	36						
U Q	43	44	44	46	41	43	43	42	42	38	31	30	32	31	30	31	30	30	32	29	36	40	40	41						
L Q	32	32	37	35	35	27	27	32	27	26	26	26	26	26	27	26	26	25	26	22	E	B	20	20	16	32				

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1996 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	13	19		B	19	24	19	16	19	14	19	19	16	16	16	21	19	16	29	28	16	13		B	16	14		
2	14	12	9		B	B		B	23	21	19	20	16	16	19		31	29	30		B	19	13	15	13	13		
3	11	13	14	19	19	16	13	13	15	13	21	20	20	16	14	15	14	14	21	19	19	19	14	14	8			
4	9	8	27	9	13	14	13	13	17		B	36	16	16	19	14	21	21	15	14	14	14	13	10	B			
5	14	14	20	19	16	20		B	B	23	25	21	20	20	13	20	19	15	16	14	13	20	13	9	13			
6	12	20	23	24	13	18	19	16	16	29	19	16	15	16	15	14	13	16	14	13	13	8	8	8	21			
7	9	11	4	9	24	19	20	15	14	14	15	16	13	15	16	16	14	15	16	16	14	14	9	19				
8	15	24	30	22	19	13	25	16	25	19	20	14	17	14	19	16	16	13	15	14	14	14	13	9				
9	13	14	19	23	23	16	16	16	11	16	15	20	15	14	29	20	20	15	23	23	23	23	9	14				
10	15	21	20	19	9	21	15	16	30	21	16	15	19	20	16	15	18	15	14	13	22	19	24	18				
11	19	26	14		B	B		B		B	B		24	19	20		B	B	B	23	22	16	13	15	9	13		
12	13	20	19	14		B	B		24		B	B		21	23	30		B	B	B	B		24	12	13			
13	13		B	23	23	23	24	19	20	14	24			B	B		B		B			14	18		19			
14	18		B	23		B	B	B	B		B		24	24	32		B	B		30	30	27	19		13	13	10	
15	15	15	19		B	B		B		24		B		B	B		27	13	29		B		29	31	22	12	14	18
16	15	14	9	22	19	23		B	29	24	20	20		24		B	30	18	19	14	21	29	14	14	9			
17	10	9	16	29		B	B		24		B		26	23		B		B	B		19	19	24	19	13			
18	9	10	19	23	21	20	14	15	16	14	16	16		B	21	20	18	17	22	33	16	20	14	13	21			
19	20	9	19	16	18	22	22	19	20		B	29	32	24		33		31	24	23	21	21	29	8	18			
20	18	18	14	18		B	B		24		B	23	18	16	21		B	B	B		16	14		29	13	20	14	8
21	14	18		B	20	23	14	14	14	18		B		B	B		29	24	21	23	29	30		24	18	21	17	10
22	7	9	13	19	21		B	B		B	B		20	15	16	14	16	16	13	31	24	13	18	9	8			
23	10	13	14	20		B	B	B		19	17	16		B	39	30	28	13	19	22	22	24	15	9	14	11		
24	11	13	13	26	23		B	B	B		B	B		30		B	B		26	23	24	14	13	25	19	14		
25	14	14	20	9	8	19	24	24	24	24		B		B	B		30	28	30		B	24	15	16	12	14		
26	8	21		B	18	20	24	24		B	24	22	22		B	B		29	22	37	21	20	13	12	13			
27	9	23		B	24	24	30		B	24	24		B	B		B		30	30	30	28	31		9	13	B		
28	14	16	14	25	22	20		B	B	B	B		22	30	24		B	B	B		35	30	19	23	19	14	B	
29	9	14	20	14	17	19	16		B		16	19	19	21	29	21	30	22	19		B	31	23	18	11	13	14	
30																												
31																												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29			
MED	13	14	19	20	23	21	24	24	23	24	22	29	24	21	30	29	21	23	28	19	18	15	13	14				
U Q	15	20	23	24		B	B	B		B	B	B		B	B		B	B	B		24	22	20	14	18			
L Q	10	12	14	18	18	19	16	16	16	19	19	16	16	16	18	17	16	15	18	16	14	13	10	10				

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1996 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	B	A	A	A	A	240	200	195	200	200	200	230	205	200	200	200	205	200	205	B	A	A								
2	A	A	A	B	B	A	B	A	A	220	200	200	190	190	B	235	220	220	B	H	A	E	A	A								
3	A	A	A	A	A	A	A	230	230	200	200	205	190	200	H	200	215	220	205	230	240	215	245	B								
4	E A	260	290	260	240	235	205	200	200	B	E	B	230	200	195	A	205	215	205	210	200	200	220	240	250							
5	A	A	A	A	A	A	B	B	A	215	200	200	200	240	E A	210	205	200	200	210	220	200	250	280	A							
6	A	E A	A	A	A	A	A	A	A	200	200	200	200	215	205	200	200	H	200	220	250	200	A	250	240							
7	E A	260	A	E A	A	A	A	A	A	200	205	200	205	200	200	200	A	A	E A	A	230	205	200	230	250	275						
8	A	A	A	A	A	A	A	A	A	230	200	235	200	200	235	200	205	200	200	195	195	205	250	A	A							
9	A	A	A	A	A	A	A	E A	A	230	245	210	220	205	200	200	200	E A	215	220	235	210	240	250	255							
10	A	A	A	A	A	E B	240	235	215	A	A	200	200	200	200	200	H	H	225	205	205	230	A	A	A							
11	A	A	A	B	A	B	A	B	A	B	B	200	250	225	B	B	B	B	B	B	B	B	A	A	225	A						
12	205	A	A	A	B	B	E A	A	B	B	200	230	200	B	B	225	B	B	B	B	B	B	B	B	255	210	230					
13	E A	B	A	A	A	A	E A	A	A	245	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	245	A	B	A			
14	A	B	A	B	B	B	B	B	B	A	A	220	B	B	E B	B	B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B			
15	A	S	A	B	B	B	A	B	A	B	B	B	B	B	200	215	200	B	B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B			
16	A	A	A	A	A	A	B	A	A	A	205	B	E S	250	B	B	210	205	200	240	A	E B	E B	E B	E B	E B	E B	E B	E B	E B		
17	A	F	A	A	B	A	B	A	B	A	A	B	200	230	E B	E B	E B	B	B	B	B	240	245	275	B	B	B	B	B			
18	A	A	A	A	A	A	A	A	A	205	200	200	200	200	B	215	205	200	240	205	255	A	E B	E B	E B	E B	E B	E B	E B	E B		
19	A	225	A	A	E A	A	A	245	A	B	A	230	200	B	E B	B	B	220	215	240	230	230	240	260	E S	B	B	B	B			
20	A	A	A	A	B	A	B	A	215	215	200	B	B	B	B	B	B	200	200	B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B		
21	A	A	B	A	B	E A	270	240	200	210	B	B	205	200	205	200	205	230	B	B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B		
22	A	A	A	A	A	B	B	B	B	B	B	220	E A	230	220	220	215	200	200	255	250	235	240	255	E B	E B	E B	E B	E B	E B		
23	A	A	A	A	B	A	B	B	A	225	205	B	B	E B	B	220	215	200	215	215	A	A	A	A	A	A	A	A	A	A		
24	A	A	235	A	A	B	B	B	B	B	B	200	B	B	B	B	B	220	250	235	A	E A	A	A	A	A	A	A	A	A		
25	A	A	A	E A	A	A	A	A	A	A	A	B	B	B	B	200	210	260	E B	B	B	A	A	A	A	A	A	A	A	A		
26	A	A	B	A	A	A	A	B	A	E A	E A	A	B	B	B	B	B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B		
27	A	A	B	A	A	A	B	A	A	B	B	B	B	B	B	200	230	235	235	285	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B		
28	A	A	A	A	A	A	B	B	B	B	200	230	240	B	B	B	B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B		
29	A	A	A	A	A	A	B	A	A	H	280	245	210	200	220	205	215	215	215	200	H	B	E B	E B	E B	E B	E B	E B	E B	E B		
30																																
31																																
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
CNT	6	3	4	2	4	4	9	7	10	15	19	19	18	18	20	19	22	22	21	20	21	18	15	5								
MED	242	255	246	242	245	238	232	222	205	208	200	200	200	208	204	205	208	210	220	211	220	250	255	240								
U Q	E A	260	260	275	E A	E A	272	245	215	220	205	220	205	225	218	215	230	230	255	240	250	255	275	272								
L Q	240	225	240		240	235	218	200	200	200	200	200	200	200	200	200	200	200	208	202	225	240	240	235								

FEB. 1996 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1996 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	A	A	A	A	A	A	A	S	O	X	X	X	X	B	B	B	O	X	X	X	X	X	A	A				
2	A	A	A	A	B	A	A	A	X	O	X	O	X	O	X	X	X	X	X	X	X	X	X	A	A				
3	A	A	A	A	A	A	A	A	X	X	X	X	X	B	X	X	X	X	O	X	X	X	A	A					
4	A	53	44	45	37	44	A	B	A	A	A	51	50	47	49	45	48	46	39	42	30	A	43	A					
5	A	B	A	A	A	A	A	B	B	Y	B	B	B	X	X	O	X	B	B	O	X	X	A	A					
6	A	A	A	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	O	X	X	A				
7	X	X	O	X	O	X	33	41	40	47	46	42	49	49	56	63	67	56	51	47	42	34	32	42	27				
8	A	A	A	A	A	A	B	O	X	A	B	B	O	X	O	X	B	O	X	X	X	X	X	X	B				
9	A	A	A	X	A	A	B	A	A	B	B	O	X	O	X	X	O	X	O	X	X	X	V	A	A				
10	A	A	B	B	A	A	A	X	X	X	O	X	O	X	X	O	X	B	X	O	X	X	X	S	A				
11	A	A	A	A	B	B	A	B	A	B	B	B	B	B	B	B	O	X	B	O	X	X	S	A					
12	A	A	B	A	A	X	B	B	B	B	B	B	B	B	B	B	O	X	O	X	X	B	Y	Y	Y	S			
13	A	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	R	X	A	S	Y	A	A				
14	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	36	33	24	A			
15	A	A	A	A	A	A	B	A	B	B	B	B	O	X	O	X	O	X	O	X	X	X	O	X	O	X	A		
16	A	A	A	S	S	A	B	A	A	B	B	B	B	B	B	B	B	O	X	X	X	X	X	X	X	X			
17	X	A	A	S	41	B	B	B	B	B	O	X	B	O	X	X	B	B	B	X	X	B	B	A	A	A			
18	A	A	O	X	B	A	B	A	A	B	B	C	C	C	C	C	C	C	C	C	C	C	B	B	A	A			
19	A	A	A	A	A	A	A	A	B	O	X	O	X	B	B	B	O	X	O	X	B	B	B	O	X	A	B	A	A
20	A	A	B	A	A	A	S	A	B	B	B	B	B	B	B	B	O	X	B	O	X	B	A	A	A	F	B		
21	B	A	A	B	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	A	A	A	A		
22	A	B	A	A	B	Y	A	B	B	B	B	B	B	B	B	B	B	B	O	X	X	B	A	A	A	A	A		
23	A	A	A	B	B	B	B	B	B	B	B	O	X	O	X	B	B	B	O	X	X	O	X	A	A	A	A		
24	A	B	A	A	B	B	B	B	O	X	X	O	X	X	O	X	B	O	X	X	X	X	B	A	A	A	A		
25	A	B	A	A	B	B	A	B	B	B	B	B	B	B	B	B	O	X	O	X	X	B	A	A	A	A	A		
26	A	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	O	X	O	X	O	X	B	B	B	A	Y		
27	A	A	A	A	A	B	B	B	B	B	B	B	X	B	B	B	B	O	X	X	O	X	B	B	B	B	B		
28	A	46	A	A	A	A	A	A	B	B	B	B	O	X	X	B	B	B	B	O	X	O	B	A	A	A	A		
29	A	A	A	A	A	A	A	A	O	X	X	O	X	X	X	X	X	X	X	X	X	X	B	A	A	A	A		
30	S	A	A	A	A	A	A	B	O	X	O	X	O	X	X	X	X	X	X	X	X	X	B	B	B	B			
31	A	X	A	A	A	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	A	S	Y	Y			
	28	30	30	30	36	36	40	41	42	42	44	44	44	48	48	48	47	45	41	37	32	33	28						
CNT	2	4	3	4	4	4	3	7	9	11	12	14	17	15	16	19	18	23	23	22	16	7	6	2					
MED	X	24	38	40	34	34	42	38	44	43	45	45	49	49	52	53	49	48	47	45	41	36	33	32	26				
U Q		50	44	42	39	48	41	47	48	49	48	51	52	56	58	53	52	49	46	44	38	39	42						
L Q	X	28	O	X	X	O	X	O	X	X	O	X	O	X	X	O	X	O	X	X	X	X	X	X					

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1996 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1996 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	52	39	44	39	57	53	46	42	32	22	23	23	26	32			B	B	E	B	26	23	27	27	13	41	43												
2	41	44	41	43		B	46	39	27	22	28	27	27	27	28	27	26	26	22	30	22	38	46	48	46														
3	40	41	70	42	46	41	46	36	31	27	33	33		B	26	26	40	37	E	B	E	B	E	B	E	B	42	39	70	70									
4	56	46	51	35	32	27	37		B	52	58	50	26	27	E	B	26	26	22	19	20	36	E	B	21	32	39	42											
5	39		B	46	52	58	43	44		B		B	B	B			E	B	E	B	B		B	E	B	24	36	14	31	32	37								
6	59	41	36	32	27	17	17	23	27	38	27	27	41	30	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	22	22							
7	26	31	31	25	16	E	B	28	45	37	21	24	26	26	26	27	26	26	26	25		25		24		24		36											
8	32	32	32	33	42	33		B	E	B	26	51		B	B	26	16		E	B	E	B	E	B	E	B	E	B	E	B	E	B							
9	38	32	36	34	46	48		B	69	42		B	B	30	32	29	31	22	30	24	21	22	13	39	26	38													
10	71	58			B	B	43	42	37	22	19	21	E	B	30	26	29	31	31		E	B	E	B	E	B	E	B	E	B	30	43	35						
11	39	47	43	52		B	94		B	41		B	B	B	B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	17	42	46					
12	70	38		B	42	55	40		B	B	B	B	B	B	B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	26	28	27	32				
13	41		B	56	41	42		B	B	B	B	B	B	B	B	B	B	B	B	30	32	41	27	16	42	35													
14	34	38	37	59		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19	14	14	26		
15	30	37	38	42	42	38		B	41		B	B	B	B	B	B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
16	32	35	36	23	23	38		B	53	61		B	B	B	B	B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
17	30	31	31	31	31		B	B	B	B	36		30	28	25																								
18	46	42	32		B	33		B	39	46		B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
19	44	70	58	42	37	47	41	52		B	32	24		B	B	B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
20	68	59		B	41	32	31	26	46		B	B	B	B	B	B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
21		B	37	104		B	47	33	37	41		B	B	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	75		B	70	45		B	27	33		B	B	B	B	B	B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
23	37	70	42		B	B	B	B		B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
24	32		B	36	37		B	B	B		B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
25	42		B	38	59		B	B		B	34	24	27	24	32		B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
26	44	37	37	39		B	B	41		B	B	B	B	B	B	B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
27	26	36	38	42	46		B	B		B	B	B	B	B	B	B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
28	23	E	B	24	42	49	49	42	40	39		B	B	B	B	B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
29	36	69	47	37	60	43	42	37	27	27	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
30	27	35	38	37	37	38	34		B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
31	29	37	34	39	43	40	31	17	E	B	19	20	22	26	23	22	38	21	22	20	16	21	12	31	25	16													
	00	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	26	28	27	23	21	20	17	15	13	13	14	17	15	16	19	18	24	23	25	25	24	28	27															
MED	39	38	38	41	42	40	39	39	31	24	26	26	26	28	27	E	B	E	B	E	B	E	B	E	B														
U Q	46	46	46	43	47	43	43	46	42	34	32	30	31	30	30	30	26	29	24	27	38	38	42	43															
L Q	32	35	36	35	32	32	36	26	22	22	24	26	26	26	26	24	23	22	19	20	14	18	28	32															

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1996 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	21	20	20	23	21	26	23	16	14	15	14	16	17	18	B	B	B	24	23	24	14	13	10	13
2	29	15	15	14	B	19	21	16	16	14	14	21	14	16	16	19	15	16	14	18	13	9	9	13
3	9	9	12	13	20	25	24	14	14	16	16	15	B	23	19	16	16	24	23	24	13	9	19	15
4	22	14	13	24	13	14	25	B	22	20	23	23	16	21	14	15	16	16	15	14	21	8	14	24
5	20	B	14	15	22	31	22	B	B	29	B	B	B	21	28	29	B	B	24	24	9	8	13	9
6	22	14	9	13	10	9	14	20	16	21	24	19	19	23	29	30	25	22	15	19	19	13	14	9
7	9	9	9	10	13	28	13	13	21	15	19	20	24	24	22	26	26	25	B	25	B	24	B	9
8	9	13	12	13	13	19	B	26	23	B	B	24	14	B	28	24	20	26	21	24	18	16	13	B
9	14	14	10	16	19	14	B	21	30	B	B	26	22	13	21	19	30	24	21	22	13	18	14	11
10	14	16	B	B	21	22	14	14	13	13	30	24	29	20	24	B	23	23	15	17	18	7	13	20
11	28	21	24	14	B	B	24	B	14	B	B	B	B	B	B	30	B	30	31	22	22	10	9	9
12	20	22	B	21	20	30	B	B	B	B	B	B	B	B	B	30	23	21	B	22	22	9	9	16
13	15	B	18	24	19	B	B	B	B	B	B	B	B	B	B	B	B	30	19	20	10	9	8	9
14	13	20	20	20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19	14	14	9
15	16	12	24	24	15	30	B	30	B	B	B	B	31	23	27	24	25	30	22	23	16	18	9	9
16	11	14	15	11	13	22	B	24	33	B	B	B	B	B	B	B	B	31	20	20	14	9	12	13
17	11	13	9	9	13	B	B	B	B	36	B	B	30	26	25	B	B	B	22	20	B	B	8	9
18	18	24	23	B	19	B	23	23	B	B	C	C	C	C	C	C	C	C	C	C	B	B	9	9
19	13	14	19	24	13	21	19	20	B	24	24	B	B	B	31	30	B	B	B	24	13	B	14	20
20	13	19	B	24	24	15	24	24	B	B	B	B	B	B	B	36	B	31	B	21	13	13	13	B
21	B	18	40	B	13	13	21	29	B	B	B	B	B	B	B	B	B	B	B	B	18	16	10	16
22	14	B	35	24	B	14	20	B	B	B	B	B	B	B	B	B	B	30	24	B	13	9	10	13
23	13	23	16	B	B	B	B	B	B	B	B	30	31	B	B	B	30	24	22	16	14	9	13	14
24	16	B	24	29	B	B	B	B	19	24	27	24	32	B	23	23	24	13	19	B	13	13	14	14
25	14	B	24	24	B	B	20	B	B	B	B	B	B	B	B	24	24	23	B	19	11	9	5	10
26	13	14	25	22	B	B	30	B	B	B	B	B	B	B	B	30	25	23	23	23	B	B	10	10
27	11	10	24	18	29	B	B	B	B	B	B	B	24	B	B	B	34	22	24	B	B	B	B	B
28	13	24	23	20	19	13	13	25	B	B	B	B	23	29	B	B	B	B	30	23	B	18	9	9
29	13	23	24	23	23	20	23	24	21	23	23	26	20	22	24	22	20	18	14	13	14	B	9	11
30	9	13	23	24	20	20	24	B	23	23	29	30	24	21	24	24	20	16	15	13	10	B	B	B
31	14	10	16	21	24	24	13	14	19	15	14	15	16	20	21	21	22	20	14	7	9	13	10	9
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	30	30	30	30	30	30	30	31	31	31	31
MED	14	16	20	22	20	25	24	29	B	B	B	B	31	B	30	30	28	24	22	22	14	13	12	13
U Q	20	23	24	24	B	B	B	B	B	B	B	B	B	B	B	B	B	31	31	24	22	24	14	16
L Q	13	13	14	14	13	19	20	20	19	21	24	24	22	21	24	24	23	22	19	19	13	9	9	9

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1996 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	A	A	E A 280	A	215	200	220	H 220	HE A 245	B	B	BE A 230	AE B 240	B	235	240	E B 265	A	A
2	A	A	A	A	B	A	A	A	250	205	250	210	210	200	215	215	200	220	210	230	230	E A 250	A	A	A
3	A	A	A	A	A	A	A	A	A	A	220	225	200	B	215	200	215	200	230	230	230	A	A	A	A
4	A	A	A	A	E A 250	AE A 260	A	B	A	A	A	230	200	210	230	200	200	240	225	E B 250	B	A	250	A	
5	A	B	A	A	A	A	A	B	B	A	B	B	B	240	205	235	B	B	240	E A 250	230	A	A	A	
6	A	A	A	A	A	A	E A 245	A	235	230	225	205	205	220	215	220	235	230	205	215	E A 250	AE B 240	BE A 250	AE B 260	
7	A	A	A	A	A	B	A	A	240	210	200	200	200	200	210	200	200	215	220	B	245	BE B 265	B	A	
8	A	A	A	A	A	A	BE B 255	B	A	B	B	230	230	B	235	200	200	240	235	240	250	235	255	E B 255	
9	A	A	A	A	A	A	B	A	A	B	B	E A 260	A	245	225	205	210	E B 245	235	240	240	240	225	A	A
10	A	A	B	B	A	A	A	200	240	210	E B 250	210	230	215	210	B	205	240	230	240	240	A	A	A	
11	A	A	A	A	B	B	A	B	A	B	B	B	B	B	B	BE B 265	B	BE B 280	B	BE B 280	B	B	230	A	A
12	A	A	B	A	A	A	B	B	B	B	B	B	B	B	B	235	205	235	B	B	B	A	A	A	A
13	A	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	BE B 260	B	240	A	A	Y	A	A	
14	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	BE B 255	240	B	A	A	
15	A	A	A	A	A	A	B	A	B	B	B	BE B 250	235	225	205	215	E B 255	240	235	240	240	245	B	A	
16	A	A	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	BE B 240	230	235	230	B	210	A	
17	A	A	A	A	B	B	B	B	B	B	B	BE B 250	230	200	B	B	BE B 250	B	B	B	B	A	A	A	
18	A	A	B	A	B	A	A	B	B	C	C	C	C	C	C	C	C	C	C	C	C	B	B	A	A
19	A	A	A	A	A	A	A	A	B	A	B	B	B	B	BE B 250	240	B	B	B	B	B	A	B	A	A
20	A	A	B	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	AE A 250	AE A 285	B	
21	B	A	A	B	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
22	A	B	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	BE B 270	B	B	B	A	A	A	A
23	A	A	A	B	B	B	B	B	B	B	BE B 260	B	B	B	B	B	BE B 280	240	240	250	E B 250	B	A	A	A
24	A	B	A	A	B	B	B	B	A	E B 230	E B 240	205	280	B	BE A 280	AE A 280	235	230	250	B	A	A	A	A	
25	A	B	A	A	B	B	A	B	B	B	B	B	B	B	B	230	A	A	B	A	A	A	A	A	
26	A	A	A	A	B	B	A	B	B	B	B	B	B	B	B	BE B 280	240	250	250	B	B	B	B	A	S
27	A	A	A	A	A	B	B	B	B	B	B	BE A 250	B	B	B	BE B 270	BE B 250	BE B 250	B	B	B	B	B	B	B
28	A	210	A	A	A	A	A	A	B	B	B	B	235	E B 250	B	B	B	BE B 260	BE B 250	B	B	A	A	A	
29	A	A	A	A	A	A	A	A	A	235	230	235	240	AE A 245	220	205	225	210	210	215	240	B	B	A	A
30	A	A	A	A	A	A	A	B	BE B 240	BE B 270	BE B 250	BE B 245	BE B 200	BE B 210	BE B 230	210	210	205	225	235	B	B	B	B	
31	A	A	A	A	A	A	A	A	220	210	205	240	215	230	200	200	215	200	200	220	220	A	A	Y	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		3	1	1	2	2	1	5	6	10	11	14	16	15	16	18	17	20	22	18	13	10	5	1	
MED		A 240	230	240	242	235	E A 245	238	220	220	210	216	225	220	210	214	212	225	235	235	240	234	E 255	210	
U Q		A 240						252	240	235	240	240	E B 248	E B 240	E B 228	E B 235	238	245	250	250	245	250	E B 272		
L Q		210						218	210	210	205	205	218	215	202	200	205	215	230	230	235	230	248		

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1996 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	A	A	A	B	B	B	B	O	X	X	X	O	X	X	O	X	O	X	X		A	S	Y	A			
2	A	A	B	B	A	A	O	X	X	X	X	X	X	X	X	X	C	X	X	X	O	X	B	B	B			
3	A	A	A	A					O	X	X	X	X	X	X	X	X	X	X	X	O	X		B	B			
4	A	A	A	A	A	B	A	A	A	X	X	B	O	X	O	X	X	X	O	X	A	Y	A	A	A			
5	A	A	A	B	A	B	B	O	X	X	X	O	X	B	B	B	B	X	X	X	X	O	X	B	B	B		
6	B	A	A	A	A	A	A	O	X	O	X	X	X	X	X	X	X	X	X	O	X	O	X	B	B	B		
7	B	B	B	B	B	B	S		O	X	X	X	X	X	X	X	O	X	X	B	B	B	B	B	B			
8	B	A	A	A	X	B	B	B	O	X	X	X	X	X	X	X	X	X	X	X	O	X	O	X	B	B		
9	Y	42	A	A	B	A	B	A	A	A	B	B	B	B	55	58	53	59	51	43	37	34	35	A	A	A		
10	A	A	A	A	A	A	B	B	S	X	X	O	X	B	B	B	B	O	X	O	X	B	B	S	B	B		
11	B	A	Y	A	B	A	A	A	B	B	B	O	X	O	X	X	X	X	X	X	X	B	B	B	B	B		
12	A	A	F	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A			
13	B	B	B	A	A	A	B	B	B	B	B	B	B	B	O	X	O	X	X	O	X	O	X	B	A	A	A	
14	A	A	A	B	A	A	B	A	B	B	B	B	B	B	B	B	B	X	B	B	B	Y	A	A	A			
15	A	A	B	B	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	A			
16	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X	32		
17	A	A	A	B	B	O	X	B	B	B	B	B	B	B	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	C	C	C	C	C	C	C	C	C		
19	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	B	B	B	A	B	A	C	A			
20	A	A	O	X	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	B			
21	B	A	B	B	B	B	B	A	A	B	B	B	B	B	B	C	C	B	B	B	B	A	B	A	O	X	39	
22	A	A	A	B	A	B	B	B	B	O	X	O	X	O	X	O	X	B	B	B	B	B	B	B	S	Y		
23	A	A	A	A	B	B	B	B	B	B	B	B	B	B	O	X	O	X	B	B	B	B	B	B	B	A		
24	A	A	A	A	A	A	B	B	B	X	O	X	X	X	X	X	X	O	X	O	X	O	X	B	A	A	A	
25	A	A	A	A	B	A	A	B	B	O	X	X	O	X	O	X	O	X	X	X	B	B	B	B	B	A		
26	A	A	A	A	B	B	A	B	B	X	O	X	O	X	O	X	X	X	X	B	O	X	B	B	B	B		
27	B	A	A	Y	A	A	A	X		O	X	X	O	X	O	X	X	X	O	X	O	X	B	B	B	A		
28	A	B	A	A	B	A	A			X	O	X	O	X	B	X	X	X	X	X	O	X	O	X	B	B	A	B
29	B	B	A	A	A	B	A	A		B	O	X	O	X	X	X	X	O	X	X	B	B	B	B	B	B	B	
30	B	B	B		A	A	A	A		X	X	X	X	X	X	X	X	X	B	Y	B	B	B	B	B	B		
31				47						38	44	51	52	55	52	52	41											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT		1	1	1	2	2	2	7	9	17	17	16	17	18	20	20	19	18	14	13	6	2			2			
MED		42	37	47	36	26	28	33	40	43	46	48	51	52	52	50	50	44	37	32	26	24			36			
U Q								36	43	45	48	52	56	57	54	56	51	48	40	34	32							
L Q								31	39	38	42	44	48	49	50	48	41	35	33	25	23							

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1996 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1996 ftEs (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		37	38	38	41	B	B	B	B	E	B	B	B	B	B	B	B	B	B	B	B	B	37	24	17	38	
2		68	45	B	B	43	38	25	E	B	E	B	E	B	24	21	26	21	23	C	16	26	13	B	B	B	
3		41	70	119	38	E	B	B	E	B	E	B	E	B	24	24	31	21	26	E	B	B	B	E	B	B	
4		38	72	47	37	38	B	32	60	46	33	24	E	B	B	B	B	B	B	E	B	B	16	23	25	41	
5		41	39	47	B	45	B	B	E	B	B	B	B	B	B	B	B	B	B	E	B	B	B	B	B	B	
6		B	36	37	48	41	27	26	14	17	17	22	21	21	26	22	41	E	B	B	B	B	B	B	B	B	
7		B	B	B	B	B	B	31	32	29	E	B	B	29	28	24	26	22	E	B	B	B	B	B	B	B	
8		B	31	28	27	31	B	B	B	E	B	B	B	26	24	27	24	22	19	13	17	12	E	B	B	B	
9		12	71	105	40	B	59	B	41	46	45	B	B	E	B	B	B	B	B	B	B	E	B	B	B	B	
10		70	36	41	42	42	45	B	B	E	B	B	B	B	B	B	B	B	E	B	B	B	B	B	B	B	
11		B	29	17	31	B	37	51	47	B	B	B	B	30	31	24	24	21	24	17	19	13	B	B	B	B	
12		26	38	59	B	49	42	42	B	B	B	B	B	B	B	B	B	B	B	B	43	37	41	42	41	44	
13		B	B	B	43	34	33	B	B	B	B	B	B	B	B	B	B	B	E	B	E	B	B	B	B	B	
14		38	43	42	B	38	43	B	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
15		41	61	B	B	46	B	50	32	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
16		34	37	45	B	46	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
17		38	43	34	B	27	B	B	B	B	B	B	B	B	B	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	C	C	C	C	C	C	C	C	
19		C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	B	B	B	B	B	B	B	B	B	
20		33	38	38	51	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
21		B	39	B	B	B	B	B	43	46	B	B	B	B	B	B	B	C	C	B	B	B	B	B	B	B	
22		38	39	38	B	46	B	B	B	B	E	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
23		33	32	41	74	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
24		39	40	36	40	33	38	B	B	B	E	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
25		38	38	43	26	B	70	46	B	B	E	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
26		32	29	36	59	B	B	37	B	B	E	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
27		B	42	32	17	70	41	41	28	16	E	B	B	B	B	B	B	B	B	B	B	E	B	B	B	B	
28		30	B	42	33	B	43	44	27	27	E	B	B	B	B	B	B	E	B	B	B	B	B	B	B	B	
29		B	B	26	29	28	B	46	46	B	E	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
30		B	B	B	32	42	43	47	44	34	E	B	B	G	17	17	26	21	26	B	16	B	B	B	B	B	
31																											
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT		19	23	22	18	16	17	13	15	15	18	17	16	17	18	20	20	19	18	16	16	10	13	12	15		
MED		38	39	40	39	42	41	41	41	27	E	B	B	B	B	B	B	B	B	B	B	E	B	B	B	B	
UQ		41	43	45	43	46	44	46	46	34	24	24	28	30	30	26	24	25	23	25	18	37	41	42	44		
LQ		33	36	36	31	34	35	31	24	19	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1996 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1996 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
1	A	A	A	A	B	B	B	B	B	B	240	190	230	E	B	B	H	250	240	240	240	A	A	Y	A								
2	A	A	B	B	A	A	A	B	E	Y	250	235	215	215	205	205	H	205	200	210	230	B	B	B									
3	A	A	A	A	B	B	A	Y	B	245	210	240	200	210	200	215	230	220	200	205	E	B	E	B	B								
4	A	A	A	A	A	B	A	A	A	A	230	B	B	B	B	B	B	E	B	A	A	A	A	A	A								
5	A	A	A	B	A	B	B	B	E	B	250	230	230	B	B	B	B	230	240	220	210	220	215	B	B	B	B						
6	B	A	A	A	A	A	A	A	A	A	240	240	240	200	H	200	220	230	220	215	210	215	E	B	A	B	B	B					
7	B	B	B	B	B	B	A	A	E	A	250	230	245	240	A	E	A	250	215	220	215	210	215	B	B	B	B	B					
8	B	A	A	A	A	B	B	B	B	230	210	230	240	A	205	200	230	205	205	200	210	E	A	B	B	B	B						
9	200	E	A	A	A	B	A	B	A	A	A	B	B	220	205	210	220	205	210	220	B	E	A	A	A	A							
10	A	A	A	A	A	A	B	B	A	E	B	E	B	E	B	E	B	210	225	250	E	B	B	A	B	B							
11	B	A	Y	A	B	A	A	A	B	B	B	B	B	E	B	E	A	E	B	270	255	245	215	230	230	205	245	250	B	B	B	B	
12	A	A	F	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	A	A	A	A			
13	B	B	B	A	A	A	B	B	B	B	B	B	B	B	E	A	A	A	E	B	B	B	A	A	A	A	A	A	A	A			
14	A	A	A	B	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	A			
15	235	A	B	B	B	A	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	A	A	A	A	A	A			
16	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
17	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	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	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	B	B	B	B	B	B	B	B	A	B	A	C	A	A	A	A	A	A		
20	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	B	B	B	B	B	B	
21	B	A	B	B	B	B	B	A	A	A	B	B	B	B	B	B	C	C	B	B	B	B	A	B	A	E	A	A	A	A	A		
22	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	E	B	E	B	E	B	B	B	B	B	B	B	B	B	B	B	B	
23	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	E	B	E	B	E	B	B	B	B	B	B	B	B	B	B	B	B	
24	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	E	B	E	B	E	B	B	A	A	A	A	A	A		
25	A	A	A	A	B	A	A	B	B	E	B	E	B	B	E	B	E	B	215	215	210	200	200	210	B	B	B	B	B	B	B	B	
26	A	A	A	A	B	B	A	B	B	B	E	B	B	240	250	220	215	215	210	200	200	210	B	B	B	B	B	B	B	B	B	B	
27	B	A	A	A	A	A	A	300	300	E	B	250	230	200	205	200	205	200	200	290	300	E	A	E	A	E	B	B	B	B	B	A	
28	A	B	A	A	B	A	A	A	A	A	E	B	B	250	255	215	210	215	210	200	245	250	250	B	B	B	B	B	B	B	B	B	
29	B	B	A	A	A	B	A	A	B	E	A	E	B	240	250	220	210	210	205	200	200	215	B	B	B	B	B	B	B	B	B	B	
30	B	B	B	230	A	A	A	A	A	E	B	255	225	225	170	200	205	200	210	B	Y	B	B	B	B	B	B	B	B	B	B	B	
31																																	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
CNT	2	1	1	1				1	7	15	17	15	15	17	20	20	18	18	13	10	3	2		2									
MED	218	E	A	A				300	250	235	232	222	210	210	214	219	210	212	225	250	250	252		E	250								
U Q									E	B	B	B	E	B	E	B	B	E	B	E	B	250											
L Q									240	230	230	215	205	202	208	208	200	210	212	240	230												

APR. 1996 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1996 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	00	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	X 36	A	A	A	A	A	A	B		33	33	O X 44	B	B	B	B O X 34	Y	B	B	B	B	B	B	A			
2	O X 38	Y	B	Y	Y	A	B	B	B	X	39	43	46	O X 55	X O X 59	59	51	44	B	B	B	B	B	B				
3	B	A O X 33	A O X 45	O X 39	A	A	A	X	33	B	B	X	52	57	63	50	44	35	O X 28	27	B	B	A	A O X 39				
4	A	A	A	A	A O X 32	B	B	A O X 34	X	X	X	X	X	X	X	O X 49	X	X	X	33	21	B	B	A	A			
5	A	A	A	B	B	A	A	B	B	B	X	39	B	B	B	B	O X 43	39	B	B	B	B	B	B	B			
6	A	B O X 29	O X 34	B	A	A	A	A	A	A	X	44	X	X	X	B	X	X	49	47	33	B	B	Y	B	B		
7	A	X 24	A O X 35	A	B	B	B O X 38	X O X 43	O X 56	O X 56	O X 65	X	X	X	X	X	X	X	R	B	B	S	A	B	B			
8	A	A	A O X 45	A	A	A	A	A O X 40	X O X 43	X O X 49	X O X 55	66	52	49	46	30					B	B	B	B	A			
9	A	A	A	B	A	A	A	B	B	B	X	46	52	63	61	53	51	42	30		B	B	B	B	A			
10	A	A	A	A O X 42	A	A	A	A O X 44	X	X	60	68	59	53	52	51	30				B	B	B	B	A			
11	A	A	A O X 25	X 42	41	A	A	A	A	X	48	53	53	51	49	52	34	28	23	22	X O X	B	B	B	B			
12	A	B	Y O X 33	O X 37	33	A	A	Y	X	X	X	X	X	X	X	X	X	Y	B	B	A	B	B	B				
13	A	A	A	A	A	B	A	A	A	A	B	B	B O X 55	X O X 57	X O X 52	X O X 40					B	B	B	A	A	A		
14	X 39	A	B	B	B	B	B	B	B	B	X	37	B	B	X O X 66	X O X 61	X O X 48	X O X 40	37						B			
15	A	A	A	B	Y	A	A	X 36	31	33	X	B	B	B	X	53	49	43	34		B	B	B	A	B	A		
16	A	A	A	A	A	A	A	A	A	B	B O X 45	X O X 55	X O X 57	X O X 59	B	B	B	B	B	B	B	B	B	B	A	A		
17	A	A	A	A	B	A O X 35	Y	Y O X 45	A	B	B	X	X	X	B	B	B	B	B	B	B	B	B	B	B	B		
18	A	A	A	A	A	A	A	B	B	B	X	43	50	50	50	49	360				Y	Y	B	Y	Y	Y	B	
19	B	Y	B	A	Y	A	B	B	B	B O X 39	X O X 53	X O X 54	X O X 53	X O X 35	B	B O X 42	X O X 33				B	B	B	B	B	Y	A	
20	A	A	A	B	B	B	A O X 37	X O X 28	X O X 30	X O X 38	X O X 44	X O X 47	X	B	B O X 42	X O X 33					B	B	B	B	B	B	A	
21	A	A	A	A	B	B	B	B	B	A	B	X O X 39	X O X 44	B	B	B	B	B	B	B	B	B	B	B	B	A		
22	A	A	A	Y	A	A	A	B	Y O X 27	X O X 35	X O X 48	X O X 44	X O X 51	X O X 49	X O X 49	X O X 46					B	Y	Y	Y	A	A	A	
23	A	A O X 35	A	A	A	A	A	Y	A	Y	X	C	C	C	C	C	C	C	Y	Y	B	A	B	B	Y			
24	A	A	A	A	A O X 43	X O X 40	X O X 34	A	A	A	42	40	48	51	X	B	B	B	B	B	B	B	B	B	B	A		
25	A	A	A	A	A	A	A	A	B	B	X	43	46	49	49	48					B	Y	B	Y	B	B	A	A
26	A	A	A	A	A	A	A	A	A	B	B O X 39	X O X 42	X O X 42	X O X 38	X O X 38						B	B	B	B	B	B	B	B
27	B O X 42	A O X 42	B	B	B	B	B	B	B	B	B O X 48	X O X 46	B O X 46	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
28	A	A	A	A	A	A	A	A	A	B	B O X 40	X O X 47	X O X 41	X O X 36	X O X 33						B	S	B	B	B	B	B	A
29	A	A	A	A	A	A	A	A	A	B O X 35	X O X 45	X O X 50	X O X 57	X O X 48	X O X 39	X O X 48					A	A	A	A	Y	A	A	A
30	A	A	A O X 46	A	42	38	47	38	B	B	B O X 46	X O X 44	X O X 44								B	B	B	B	B	A	B	Y
31	A	A	X 33	A	A	A	A	A	Y	B	B O X 40	X O X 48	X O X 47	X O X 41	X O X 34	X O X 33					B	Y	Y	B	A	Y	B	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	2	3	4	7	4	6	3	4	5	11	19	22	24	24	23	23	19	8	3	1					1			
MED	X 38	X O X 36	X O X 33	X O X 35	X O X 42	X O X 40	X O X 38	X O X 36	X O X 33	X O X 34	X O X 42	X O X 46	X O X 50	X O X 54	X O X 50	X O X 49	X O X 40	X O X 30	X O X 23	X O X 22					O X 39			
U Q		O X 42	X O X 34	X O X 45	X O X 44	X O X 42	X O X 40	X O X 42	X O X 38	X O X 43	X O X 46	X O X 52	X O X 55	X O X 60	X O X 57	X O X 51	X O X 46	X O X 33	X O X 27									
L Q		X 24	X O X 31	X O X 33	X O X 40	X O X 33	X O X 35	X O X 35	X O X 30	X O X 33	X O X 37	X O X 43	X O X 47	X O X 50	X O X 48	X O X 42	X O X 34	X O X 34	X O X 29	X O X 21								

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1996 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	J R 30	A	A	A	A	A	A	B	F J F 27 27 38	R	B	B	B	B	R	Y	B	B	B	B	B	B	A		
2	R	Y	B	Y	Y	A	B	B	B	33	37	40	49	53	53	41	38	B	B	B	B	B	B	B		
3	B	A	R	A	R	R	A	A	27	B	B	46	51	57	44	38	R	F	R	B	B	A	A	R		
4	A	A	A	A	A	R	B	B	A	R	36	39	42	41	F	43	J R	F	F	B	B	A	A	A		
5	A	A	A	B	B	A	A	A	B	B	B	B	B	B	B	F	37	33	B	B	B	B	B	B		
6	A	B	R	R	B	A	A	A	A	A	38	47	46	J R	B	J R	F	B	B	B	B	Y	B	B		
7	A	R	A	R	A	B	B	B	R	32	37	50	50	59	48	62	43	D R	B	B	S	A	B	B		
8	A	A	A	R	A	A	A	A	A	R	34	37	43	49	55	46	43	40	22	F	B	B	B	B	A	
9	A	A	A	B	A	A	A	B	B	B	40	46	49	51	44	45	36	21	F	B	B	B	B	B	A	
10	A	A	A	A	36	A	A	A	A	R	38	41	48	62	53	47	46	R	F	B	B	B	B	B	A	
11	A	A	A	R	F	F	A	A	A	A	J F	42	47	47	45	43	46	U R	22	17	16	R	B	B	B	B
12	A	B	Y	R	R	F	A	A	Y	27	41	54	54	61	61	46	26	Y	B	B	A	B	B	B	B	
13	A	A	A	A	A	B	A	A	A	A	B	B	B	49	51	46	34	B	B	B	A	A	A	A	A	
14	R	A	B	B	B	B	B	B	B	B	31	B	B	60	45	42	R	F	B	B	B	A	A	B		
15	A	A	A	B	Y	A	A	F	30	25	27	B	B	47	43	37	28	R	B	B	A	B	A	A	A	
16	A	A	A	A	A	A	A	A	A	B	B	R	R	R	51	53	B	B	B	B	A	B	B	A	A	
17	A	A	A	A	B	A	R	Y	Y	R	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
18	A	A	A	A	A	A	A	B	B	B	37	44	44	44	R	R	Y	Y	B	B	Y	Y	Y	B	B	
19	B	Y	B	A	Y	A	B	B	B	B	R	B	R	47	48	47	U S	B	B	B	B	B	B	Y	A	
20	A	A	A	B	B	B	A	R	R	31	22	24	32	38	41	B	36	27	B	B	B	B	B	B	A	
21	A	A	A	A	B	B	B	B	B	A	B	33	38	B	B	B	B	B	B	B	B	B	B	B	A	
22	A	A	A	Y	A	A	A	B	Y	R	21	29	42	38	45	43	J R	J R	B	Y	Y	Y	A	A	A	
23	A	A	R	A	A	A	A	Y	A	Y	27	C	C	C	C	C	C	Y	Y	B	A	B	B	Y	Y	
24	A	A	A	A	A	R	R	R	A	A	F	F	J R	J R	B	B	B	B	B	B	B	B	B	B	A	
25	A	A	A	A	A	A	A	A	B	B	37	40	43	43	42	J R	B	Y	B	Y	B	B	A	A	A	
26	A	A	A	A	A	A	A	A	A	B	B	R	33	36	36	R	R	B	B	B	B	B	B	B	B	
27	B	R	A	R	B	B	B	B	B	B	B	B	B	R	B	B	B	B	B	B	B	A	A	A	A	
28	A	A	A	A	A	A	A	A	A	B	U R	34	41	35	30	R	B	S	B	B	B	B	B	B	A	
29	A	A	A	A	A	A	A	A	A	B	R	29	39	44	51	42	33	F	A	A	A	A	Y	A	A	
30	A	A	A	R	A	F	F	F	F	B	B	B	R	F	38	B	B	B	B	B	B	B	A	B	Y	
31	A	A	26	A	A	A	A	A	Y	B	B	R	34	42	41	30	28	27	B	Y	Y	B	A	Y	B	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	2	3	4	7	4	6	3	4	5	11	19	22	24	24	23	23	19	9	3	1				1		
MED	R	R	R	R	34	30	32	30	26	28	36	40	44	48	43	42	34	F	17	R				R		
U Q		36	28	39	38	33	34	36	30	37	40	46	49	53	47	43	39	27	21							
L Q		R	24	R	24	27	R	29	24	27	31	37	41	44	42	33	28	F	F							

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1996 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	32	27	44	38	48	50	58	59		BE	BE	BE	B	B	B	BE	B		B	B	B	B	B	32			
2	31	26		17	14	32				BE	BE	BE	BE	B	B	26	26		B	B	B	B	B	B			
3		33	33	41	40	41	31	51	32			BE	BE	BE	BE	BE	B		E	B	B	B	38	33	38		
4	46	46	70	41	46	48			34	23	19	19	20	20	21	16		9	11	13		B	21	42	42		
5	48	41	41			46	37	35			BE	B	B	B	B	BE	BE	B	B	B	B	B	B	B	B		
6	26		17	33		43	42	37	37	33	29	24	16	20		BE	B	E	B	B	B	B	B	B	B		
7	32	17	37	26	A				26	31	26	32	26	42	17	22	26	24		E	B	B	B	26	40	B	B
8	29	41	42	42	59	59	45	48	37	26	24	24	31	26	19	16	19	14		E	B	B	B	B	B	B	37
9	37	38	48		49	48	41			BE	BE	BE	B	B	B	B	E	B		B	B	B	B	B	B	29	
10	32	33	45	36	33	46	43	39	37	47	26	22	36	22	27	14	29	16		B	B	B	B	B	B	32	
11	42	46	51	51	26	28	46	43	41	37	32	23	19	13	32	16	8	12	9	11		B	B	B	B		
12	26		12	20	E	B	26	31	31	16	10	14	17	16	19	17	32	27	26		B	B	B	28	B	B	B
13	46	70	48	44	34		47	57	71	42				31	37	31	27						31	32	33	41	
14	41	48												35	30	30	25	16						40	40	B	
15	58	42	38		29	46	32	17	18	16				27	19	19	23						26	39	42		
16	32	33	51	38	41	49	34	41	41			31	24	24	23							59		51	70		
17	37	32	32	38		46	22	16	19	41	42															B	
18	35	51	40	41	33	32	32				BE	BE	B	E	BE	BE	B	26	26		B	B	11	12	11	B	
19		16		50	26	52				BE	B	BE	BE	BE	B	B	B	B	B	B	B	B	B	B	15	42	
20	51	42	42				51	31	32	13	23	19	23			BE	BE	B	B	B	B	B	B	B	B	31	
21	70	80	51	32			41				31	25	30										26		38		
22	37	33	32	23	39	36	31		13	16	19	20	19	37	43	13	34			B	13	22	10	27	40	41	
23	58	51	39	44	42	52	41	17	30	16	15			C	C	C	C			17	16		32		17		
24	28	32	41	50	49	32	46	53	47	32	19	27	E	BE	B	B	B	B	B	B	B	B	B	B	B	31	
25	35	34	48	49	41	32	42	42				27	26	17	26	17			16		17			38	32		
26	50	47	43	42	38	41	48	48	51			BE	BE	BE	B	E	B			B	B	B	B	B	B	B	
27		30	24	34								BE	B	BE	B	BE	B							40	90	42	46
28	43	59	105	43	45	48	43	47	31			BE	B	29	40	16	27	20			26					29	
29	32	29	34	39	41	88	48	47	47			37	36	51	38	26	32	17	43	42	51	42	16	32	31		
30	42	46	40	46	53	42	27	31	27			BE	BE	BE	B	B	B	B	B	B	B	B	B	32		17	
31	27	37	51	39	43	43	31	31	18			BE	BE	B	24	24	17	36	16	19		17	12		32	16	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	28	29	28	26	23	25	25	21	21	17	19	22	24	24	23	23	20	16	7	6	10	12	13	20			
MED	37	38	42	40	41	46	41	41	32	28	23	24	24	22	26	22	22	16	16	20	27	32	38	34			
U Q	46	46	48	44	46	48	46	48	41	35	26	27	28	28	31	25	26	26	17	51	32	39	41	42			
L Q	32	32	36	34	33	34	32	31	22	16	E	BE	BE	B	E	B			E	BE	B		26	18	24	31	

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1996 fmin (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	13	13	13	15	17	23	9	15	B	24	24	25	B	B	B	B	24	23	B	B	B	B	B	9
2	9	9	B	10	8	8	B	B	B	33	19	23	24	24	16	18	14	B	B	B	B	B	B	B
3	B	15	14	19	13	13	12	13	13	B	B	23	25	24	23	24	16	14	16	B	B	16	19	14
4	10	10	23	19	19	18	B	B	24	23	19	19	20	20	21	14	7	11	13	B	B	10	14	14
5	18	24	23	B	B	36	16	14	B	B	B	B	B	B	B	24	26	B	B	B	B	B	B	B
6	23	B	13	13	B	23	22	19	22	19	29	21	14	19	B	20	14	14	B	B	B	9	B	B
7	9	9	9	9	A	B	B	B	16	13	9	15	19	16	17	22	24	24	B	B	24	31	B	B
8	14	9	14	13	23	23	24	23	22	17	24	24	31	24	19	14	19	14	B	B	B	B	B	10
9	13	14	24	B	24	14	14	B	B	B	20	19	19	14	16	14	13	9	B	B	B	B	B	13
10	10	14	14	8	9	14	14	11	24	20	11	15	16	18	14	9	8	9	B	B	B	B	B	9
11	11	13	9	14	8	7	9	25	16	16	8	23	19	11	23	11	8	8	9	9	B	B	B	B
12	9	B	8	8	23	8	9	7	8	8	9	14	14	14	14	7	14	19	B	B	14	B	B	B
13	10	14	10	18	15	24	24	24	29	B	B	B	B	31	37	31	23	B	B	B	14	14	24	9
14	14	19	B	B	B	B	B	B	B	B	B	B	B	35	30	30	25	16	B	B	B	8	9	B
15	9	26	24	B	19	23	14	9	7	7	B	B	B	23	19	19	23	B	B	B	24	B	15	10
16	12	21	22	24	25	26	22	22	24	B	B	31	24	24	23	B	B	B	B	50	B	B	11	24
17	25	23	19	16	B	14	15	14	15	15	21	B	B	B	B	B	B	B	B	B	B	B	B	B
18	19	15	22	19	16	14	14	B	B	B	20	23	18	23	31	23	22	15	B	B	9	10	9	B
19	B	8	B	24	24	20	B	B	B	B	23	B	31	24	31	25	B	B	B	B	B	B	9	19
20	15	23	21	B	B	B	24	14	13	11	23	19	23	B	B	23	16	B	B	B	B	B	B	15
21	13	15	22	24	B	B	30	B	B	23	15	30	B	B	B	B	B	B	B	B	9	B	B	9
22	9	9	16	10	15	14	13	B	9	16	19	20	19	16	14	9	9	B	8	9	8	8	9	20
23	15	10	9	23	24	16	15	9	13	9	15	C	C	C	C	C	C	9	9	B	9	B	B	9
24	9	10	8	14	14	9	9	22	21	15	9	23	24	30	B	B	B	B	B	B	B	B	B	10
25	11	9	9	15	14	13	10	24	B	B	16	16	15	13	15	B	11	B	14	B	B	10	9	9
26	14	23	19	24	23	24	23	21	24	B	B	23	22	23	24	23	B	B	B	B	B	B	B	B
27	B	19	14	16	B	B	B	B	B	B	B	B	19	B	24	B	B	B	B	B	11	19	16	15
28	14	9	13	14	9	14	24	14	14	B	B	29	19	13	20	20	B	16	B	B	B	B	B	10
29	9	13	13	8	9	14	10	10	13	B	13	15	16	14	14	14	9	9	19	9	9	9	9	9
30	9	14	12	16	13	9	9	7	8	B	B	B	25	20	24	B	B	B	B	B	B	9	B	13
31	9	9	8	15	23	23	24	16	14	B	B	24	24	15	16	16	19	B	10	9	B	24	9	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	30	31	31	31	31	31	30	30	30	30	30	30	30	31	31	31	31	31	31	31
MED	13	14	14	16	21	18	16	22	22	29	23	23	24	23	23	22	23	24	B	B	B	B	B	15
U Q	15	21	22	24	B	B	B	B	B	B	B	B	31	31	37	31	B	B	B	B	B	B	B	B
L Q	9	9	10	13	14	14	12	14	13	16	19	19	19	16	16	14	14	14	B	B	14	14	11	10

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1996 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	200	A	A	A	A	A	A	B	E	B	E	B	B	B	B	B	A	B	B	B	B	B	A					
2	215	A	B	Y	Y	A	B	B	B	E	B	B	245	215	205	205	205	B	B	B	B	B	B	B					
3	B	A	B	A	230	230	A	A	A	B	B	210	220	205	200	205	220	225	240	B	B	A	A	200					
4	A	A	A	A	A	B	B	B	A	E	B	B	220	205	215	205	200	210	B	B	B	A	A	A					
5	A	A	A	B	B	A	A	A	B	B	E	B	B	B	B	B	210	210	B	B	B	B	B	B	B				
6	A	B	A	E	A	B	A	A	A	A	E	B	210	220	215	B	210	210	215	B	B	B	Y	B	B				
7	A	A	A	A	A	B	B	B	E	A	250	240	220	200	210	200	205	200	210	E	B	B	A	A	B	B			
8	A	A	A	220	A	A	A	A	A	A	305	250	250	E	B	215	205	210	230	E	B	B	B	B	A				
9	A	A	A	B	A	A	A	B	B	B	240	215	225	225	205	200	200	240	B	B	B	B	B	B	A				
10	A	A	A	A	250	240	A	A	A	A	255	215	230	200	200	210	200	210	220	B	B	B	B	B	A				
11	A	A	A	A	E	A	A	A	A	A	255	230	205	205	205	200	170	H	E	A	A	B	B	A	B	B	B		
12	A	B	A	A	B	A	A	A	A	A	25	220	215	205	210	200	200	240	A	A	B	B	A	B	B	B			
13	A	A	A	A	A	B	A	A	A	A	A	B	B	B	E	B	235	250	220	240	A	B	B	B	A	A	A	A	
14	255	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	220	245	240	250	240	E	B	B	B	A	B	A	A
15	A	A	A	B	A	A	A	A	A	A	340	340	290	B	B	B	205	205	215	270	E	B	B	B	B	A	B	A	A
16	A	A	A	A	A	A	A	A	A	B	B	E	B	255	220	215	205	B	B	B	B	A	B	B	A	A	A	A	
17	A	A	A	A	B	A	Y	Y	Y	Y	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
18	A	A	A	A	A	A	A	B	B	B	215	205	200	200	215	205	A	A	B	B	Y	Y	Y	Y	B	B	B	B	
19	B	A	B	A	A	A	B	B	B	B	E	B	B	230	215	230	200	B	B	B	B	B	B	Y	A	A	A	A	
20	A	A	A	B	B	B	A	E	A	350	315	280	280	240	240	B	B	215	215	B	B	B	B	B	B	B	B	B	A
21	A	A	A	A	B	B	B	B	B	B	255	275	E	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
22	A	A	A	A	A	A	A	B	Y	Y	290	250	215	200	200	205	200	215	B	Y	A	Y	A	A	A	A	A	A	
23	A	A	A	A	A	A	A	A	A	A	A	A	C	C	C	C	C	C	Y	Y	B	A	B	B	Y	B	B	Y	
24	A	A	A	A	A	E	A	E	A	A	250	255	210	215	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
25	A	A	A	A	A	A	A	A	B	B	210	205	200	180	210	B	Y	B	Y	B	B	A	A	A	A	A	A	A	A
26	A	A	A	A	A	A	A	A	A	B	B	255	240	215	210	205	B	B	B	B	B	B	B	B	B	B	B	B	B
27	B	275	A	230	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A
28	A	A	A	A	A	A	A	A	A	B	B	E	B	290	235	215	250	245	B	A	B	B	B	B	B	B	B	B	A
29	A	A	A	A	A	A	A	A	A	B	260	230	215	215	200	200	240	A	A	A	A	A	A	A	A	A	A	A	A
30	A	A	A	A	A	A	A	A	A	B	B	B	E	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y
31	A	A	250	A	A	A	A	A	Y	B	B	250	205	215	205	200	240	B	Y	Y	B	A	Y	B	B	Y	B	B	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	2	3	3	5	3	5	3	4	4	11	18	22	24	24	23	23	19	9	2										1
MED	235	275	250	240	235	278	210	306	312	258	245	228	215	215	205	205	215	228	238									200	
U Q	300	260	260	360	350	240	345	328	290	255	255	238	215	215	210	240	250												
L Q	200	250	225	230	235	200	280	280	240	220	215	205	205	205	200	210	218												

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1996 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	A	A	A	A	A	B	A	B	O	X	O	X	O	X	X	A	B	B	B	B	B	B	B
2	A	A	A	A	A	A	A	B	B	S	X	X	X	X	X	X	B	Y	B	B	B	B	Y	B	
3	A	A	A	A	A	A	A	A	A	X	X	X	X	X	X	B	B	B	B	B	B	B	B	B	
4	A	A	O	X	X	A	A	A	S	X	B	X	X	X	X	O	X	B	B	B	B	B	B	B	
5	A	O	X	A	A	A	A	A	A	B	B	B	B	B	B	Y	Y	A	B	A	A	B	B	B	
6	A	A	A	A	Y	O	X	A	O	X	A	A	X	O	X	B	X	O	X	B	B	B	B	A	A
7	A	A	A	A	A	Y	Y	Y	B	O	X	X	X	X	X	X	A	A	B	B	A	Y	A	B	B
8	B	Y	A	A	Y	Y	A	O	X	Y	B	O	X	S	X	B	B	A	A	B	B	B	B	A	
9	A	A	A	A	A	A	A	X	O	X	A	X	X	X	X	A	A	A	A	A	A	B	A	A	
10	A	A	A	A	O	X	A	A	A	A	A	A	A	X	X	X	Y	B	B	Y	A	B	B	A	
11	A	A	A	A	A	A	B	B	B	B	B	O	X	X	X	O	X	X	A	A	B	B	Y	A	A
12	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	X	B	B	B	B	B	Y	B	
13	B	B	A	A	A	B	B	B	A	A	A	A	A	O	X	O	X	B	B	B	A	B	B	B	
14	B	A	A	A	A	A	O	X	A	A	O	X	X	X	X	X	Y	B	A	A	A	A	Y	A	
15	B	A	A	A	A	A	A	Y	B	A	B	X	X	X	X	X	B	B	Y	Y	B	A	A	A	
16	A	A	A	A	A	A	B	A	A	A	X	X	X	X	X	Y	B	Y	B	B	B	B	A	B	
17	Y	A	A	A	A	A	B	B	A	B	B	O	X	X	B	B	B	B	B	B	B	B	B	A	
18	A	A	A	A	A	S	Y	Y	A	O	X	X	X	X	X	X	Y	B	B	A	B	Y	A	Y	
19	A	A	A	B	B	A	A	B	B	A	B	B	B	B	O	X	B	B	B	B	Y	A	B	B	
20	A	A	B	B	B	A	A	A	B	A	B	X	O	X	X	O	X	B	B	B	B	B	B	A	
21	Y	A	A	A	A	O	X	S	O	X	B	O	X	X	X	O	X	Y	B	B	B	A	B	B	
22	A	X	A	A	A	A	A	B	A	Y	Y	Y	X	X	X	X	O	B	B	Y	B	B	B	B	
23	B	B	B	B	B	A	A	A	Y	B	O	X	X	X	X	X	A	B	B	B	B	B	Y	Y	
24	A	A	A	A	A	A	A	A	A	Y	X	X	X	X	X	X	X	O	Y	Y	Y	O	X	A	
25	A	A	A	A	A	S	Y	Y	O	X	O	X	X	X	X	X	O	B	B	B	B	B	B	B	
26	Y	O	X	A	A	A	O	X	X	O	X	X	X	B	X	X	O	A	B	Y	B	B	B	B	
27	B	A	A	A	A	A	B	B	B	A	B	O	X	O	X	B	B	B	B	B	B	B	A	A	
28	A	A	A	A	A	B	A	A	A	B	B	B	B	O	X	O	X	X	B	B	B	B	B	A	
29	A	A	A	A	A	A	B	A	O	X	B	X	X	X	X	X	O	B	B	B	B	A	A	A	
30	A	A	A	A	B	A	A	A	A	B	B	B	B	B	B	X	O	B	B	B	B	B	B	B	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	1	3	1	2	1	3	3	5	4	8	16	25	25	26	27	21	9	4				1			
MED	28	34	40	42	38	24	29	28	24	24	31	38	43	46	41	33	25	26				O	X		
U Q		X				O	X	O	X	O	X	O	X	X	X	X	O	X							
L Q	O	X				O	X	O	X	X	X	X	X	X	X	X	O	O	X						

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1996 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1996 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D ^H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	27	51	45	41	32	38	37		B	38		27	26	E B	16	16	16	E B	15	26		B	B	B	B	B	B	B	
2	41	32	50	40	40	39	38		B	B	27	16	26	16	26	17	33		B	20	B	B	B	B	13	B	B		
3	70	46	46	34	31	22	32	48	32	33	33	14	16	17	E B	16		B	B	B	B	B	B	B	B	B	B		
4	31	48	42	45	45	32	46	32	27	14		B	17	16	17	16	E B	E B	B	B	B	B	B	B	B	B	B		
5	37	31	42	41	51	51	38	26	30		B	B	B	B	E B	E B	B		B	B	B	B	B	B	B	B	B		
6	45	51	31	27	17	27	24	35	52	51	27	17	E B	B	E B	E B	B		B	B	B	B	B	B	27	32	31		
7	36	39	37	36	37	14	12	13		B	12	27	39	E B	15	42	32	48	46		B	B	27	16	27	B	B		
8	B	17	42	51	21	11	31	E B	24	17		B	E B	24	17	24		B	B		B	B	B	B	B	B	27		
9	38	32	30	26	38	41	22	19	12	32	15	22	12	26	26	33	32	39	38	46	32		B	28	32	32			
10	26	37	27	27	26	47	39	52	51	31	16	17	20	17	E B	14	13	12		B	B	12	35	B	31	31			
11	31	32	40	32	27	26	30		B	B	B	E B	E B	E B	E B		14	31	34	B	B	B	20	30	38	B			
12	46	54	40		42	43	28	32	32	32	32	32	26	31	16	19	16		B	B	B	B	B	12	B	B			
13	B	B		38	46	39		B		48	38	46	E B	19	39	20	19	E B	15		B	B	B	B	B	B	B		
14	B	27	36	39	51	45	38	39	51	26	27	30	30	31	13	12	16		B		27	33	19	40	13	26			
15	B	33	70	53	31	58	31	12		B	26		15	20	12	12	41		B	B	12	16	B	33	41	42			
16	51	52	51	47	39	39		B	48	46	20	12	11	E B	14	15	14	13	16		B	B	B	B	39	B			
17	17	32	33	53	52	49		B		27		B	E B	E B	E B	B	B	B		B	B	B	B	B	B	B	38		
18	45	47	46	46	37	20	14	13	30	E B	11	26	40	13	13	16	13	16		B	B	41	B	11	32	16			
19	37	39	70		B	B		B	B		34		B	B	B	E B	B	B		B	B	B	16	29	B	34	B		
20	50	55		B	B	B		B		32	B		E B	20	19	27	E B	16		B	B	B	B	B	B	B	33		
21	16	29	28	32	41	39	30	16		B	E B	E B	B		E B	E B	B		B	B	B	40	B	B	B	B	B		
22	29	28	32	27	41	37	32		B	32	16	14	E B	21	14	29	16	E B	E B	B	B	15	B	B	B	B	B		
23	B	B	B	B	B						B																		
24	26	32	32	45	47	47	39	54	38	17	16	16	16	18	16	15	15	E B	B		E B	11	10	11	E B	9	32	48	
25	47	37	49	32	46	21	14	17	13	12	12	14	34	16	12	11	11	16		B	B	B	B	B	B	B	B		
26	16	46	39	51	31	21	31	30	15	46	12	26		E B	B	E B		E B		B	B	12	B	B	B	B	B		
27	B	32	32	38	60	58		B		32		B	E B	E B	E B	B	B		B	B	B	B	B	B	B	B	28	39	
28	31	38	53	40	55		37	37	37		B	B	B		E B	E B	E B	E B	E B	E B	B	B	B	B	B	B	B	33	
29	47	49	48	58	52	38		B		38	25		B		E B	E B	E B	E B	E B	E B	B	B	B	B	B	B	32	42	52
30	52	43	37	37		41	39	40	32		B	B	B		B	E B	E B	E B	E B	E B	B	B	B	B	B	B	B	B	
31																													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	24	28	28	26	26	28	25	22	22	21	20	26	25	26	27	25	19	10	6	13	7	8	14	16					
MED	37	38	40	40	40	39	32	32	32	27	21	20	18	19	16	16	16	23	20	27	26	27	30	33					
U Q	46	48	47	46	47	46	39	40	38	32	30	26	25	26	24	26	27	32	27	39	32	32	32	38					
L Q	28	32	32	32	31	26	29	19	27	15	13	17	16	17	E B	16	14	E B	E B	B									

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1996 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	15	14	24	25	19	20	B	21	B	23	24	16	9	9	15	15	B	B	B	B	B	B	B
2	10	9	9	14	14	14	15	B	B	15	14	15	14	24	14	11	B	10	B	B	B	B	9	B
3	23	15	13	23	9	9	10	14	10	8	9	9	9	14	16	B	B	B	B	B	B	B	B	B
4	10	14	11	15	16	10	14	14	10	9	B	15	13	13	15	14	14	B	B	B	B	B	B	B
5	9	9	9	9	9	9	8	9	9	B	B	B	B	24	23	23	15	15	B	10	14	B	B	B
6	13	9	15	10	9	9	20	10	23	23	23	13	24	B	24	24	B	B	B	B	B	8	8	9
7	9	9	13	14	13	9	9	9	B	9	10	9	15	14	9	10	10	B	B	9	10	9	B	B
8	B	10	9	9	9	9	9	24	9	B	9	24	16	24	B	B	B	23	24	B	B	B	B	23
9	10	14	9	13	19	14	9	8	8	23	9	9	9	10	10	9	9	9	9	9	9	9	9	8
10	7	8	8	9	9	10	10	14	23	10	10	9	8	18	14	9	8	B	B	9	19	B	8	8
11	9	12	8	9	10	9	7	B	B	B	B	24	23	23	23	9	8	9	B	B	B	16	9	11
12	9	24	24	B	16	14	9	10	13	24	14	14	14	13	11	14	14	B	B	B	B	B	8	B
13	B	B	14	14	14	B	B	B	22	24	10	19	11	10	9	15	B	B	B	14	B	B	B	B
14	B	11	10	9	15	9	12	10	7	7	7	8	8	9	9	8	13	B	15	23	14	9	10	9
15	B	14	14	21	115	9	10	9	B	14	14	10	10	10	12	9	B	B	9	9	B	10	10	11
16	14	20	23	15	14	14	B	14	14	14	10	9	14	9	10	9	9	B	9	B	B	B	9	B
17	9	9	9	14	15	13	B	B	24	B	B	20	23	B	B	B	B	B	B	B	B	B	B	11
18	23	15	23	14	14	14	11	10	9	11	8	9	10	10	9	9	14	B	B	9	B	9	10	9
19	10	21	19	B	B	23	18	B	B	14	B	B	B	B	24	B	B	B	B	9	20	B	B	9
20	9	15	B	B	B	22	23	23	B	23	B	14	20	15	19	16	B	B	B	B	B	B	B	24
21	8	11	19	9	23	13	14	10	B	14	10	13	24	24	24	24	B	B	B	24	B	B	B	B
22	9	10	14	10	23	23	15	B	14	14	10	21	11	13	10	13	14	B	B	14	B	B	B	B
23	B	B	B	B	B	9	23	24	23	B	9	14	14	12	14	13	14	B	B	B	B	B	13	9
24	9	9	8	11	19	24	23	14	14	10	8	14	10	14	14	9	9	14	9	10	9	9	8	9
25	13	10	11	13	9	9	10	9	9	7	8	8	9	9	8	9	8	8	B	B	B	B	B	B
26	14	10	9	21	14	9	10	11	9	9	9	24	B	22	14	15	14	14	B	9	B	B	B	B
27	B	13	9	9	9	9	B	B	B	23	B	24	23	19	B	B	B	B	B	B	B	B	9	10
28	6	10	14	23	23	B	24	30	19	B	B	B	B	31	23	23	14	14	B	B	B	B	B	10
29	13	14	14	24	24	24	B	14	14	B	9	10	14	19	14	13	9	14	B	B	B	14	14	11
30	24	14	22	25	B	31	14	13	15	B	B	B	B	B	26	24	19	B	B	B	B	B	B	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	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	14	15	13	14	14	17	19	10	14	14	14	14	14	14	B	B	B	B	B	B	24
U Q	B	15	19	23	23	22	23	B	B	B	B	24	23	24	23	24	B	B	B	B	B	B	B	B
L Q	9	10	9	10	10	9	10	10	10	10	9	9	10	10	10	9	10	14	B	10	B	16	9	9

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1996 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	A	B	A	B	310	240	200	215	200	230	A	B	B	B	B	B	B	B
2	A	A	A	A	A	A	A	B	B	A	260	230	200	210	200	220	B	A	B	B	B	B	Y	B
3	A	A	A	A	A	A	A	A	A	A	300	265	215	215	210	210	B	B	B	B	B	B	B	B
4	A	A	240	250	A	A	A	A	A	A	295	B	240	240	205	200	240	230	B	B	B	B	B	B
5	A	250	A	A	A	A	A	A	A	A	B	B	B	B	245	200	A	A	A	B	A	A	B	B
6	A	A	A	A	Y	225	A	210	A	A	A	A	240	B	230	215	B	B	B	B	B	A	A	A
7	A	A	A	A	A	Y	Y	Y	B	300	250	230	210	230	220	A	A	B	B	A	Y	A	B	B
8	B	Y	A	A	A	Y	A	215	A	B	255	245	200	200	B	B	B	A	A	B	B	B	B	A
9	A	A	A	A	A	A	A	300	350	A	250	215	200	205	200	A	A	A	A	A	A	B	A	A
10	260	A	A	A	A	A	A	A	A	A	290	235	210	200	230	200	Y	B	B	Y	A	B	B	A
11	A	A	A	A	A	A	A	B	B	B	250	200	200	240	200	A	A	B	B	B	B	A	A	A
12	A	A	A	B	A	A	A	A	A	A	250	215	190	215	200	200	B	B	B	B	B	B	Y	B
13	B	B	A	A	A	B	B	B	A	A	235	220	205	200	200	B	B	B	A	B	B	B	B	B
14	B	A	A	A	A	A	235	A	A	290	250	200	210	200	200	190	Y	B	A	A	A	A	Y	A
15	B	A	A	A	A	A	A	Y	B	A	B	210	200	210	200	215	B	B	Y	Y	B	A	A	A
16	A	A	240	A	A	B	A	A	A	300	260	240	230	210	200	215	Y	B	Y	B	B	B	A	B
17	Y	A	A	A	A	A	B	B	A	B	255	240	B	B	B	B	B	B	B	B	B	B	B	A
18	A	A	A	A	A	A	Y	Y	A	230	250	205	200	205	205	200	Y	B	B	A	B	Y	A	Y
19	A	A	A	B	B	A	A	B	B	A	B	B	B	255	200	200	B	B	B	Y	A	B	B	A
20	A	A	B	B	B	A	A	A	B	A	B	245	240	215	280	210	B	B	B	B	B	B	B	A
21	Y	A	A	A	A	205	A	170	B	240	225	250	215	235	215	A	B	B	B	A	B	B	B	B
22	A	A	A	A	A	A	A	B	A	Y	Y	250	170	200	200	210	220	B	B	Y	B	B	B	B
23	B	B	B	B	B	A	A	A	A	B	A	215	200	205	220	230	A	B	B	B	B	B	Y	Y
24	A	A	A	A	A	A	A	A	A	A	260	200	225	230	205	205	250	230	Y	Y	Y	205	A	A
25	A	A	A	A	A	200	Y	Y	300	300	250	200	195	200	190	200	290	220	B	B	B	B	B	B
26	Y	A	A	A	A	230	A	A	A	A	250	240	B	205	205	210	210	A	B	Y	B	B	B	B
27	B	A	A	A	A	A	B	B	B	A	B	255	245	220	B	B	B	B	B	B	B	B	A	A
28	A	A	A	A	A	B	A	A	A	B	B	B	B	240	200	230	245	215	B	B	B	B	B	A
29	A	A	A	A	A	A	B	A	B	340	255	240	200	220	215	200	200	245	B	B	B	A	A	A
30	A	A	A	A	B	A	A	A	A	B	B	B	B	B	230	250	250	B	B	B	B	B	B	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1	1	1	2		4	1	4	3	8	15	25	25	26	27	21	9	4				1		
MED	260	250	240	245		215	235	212	340	298	255	238	210	208	205	210	230	225				205		
U Q						228		258	350	300	260	248	228	220	220	225	250	238						
L Q						202		190	300	265	250	215	200	200	200	200	205	218						

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 1996 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 1996 foF2 (0.1MHz)

45'E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 1996 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	33	38	47	46	50	B	41	41	42	37	19	18	31	16	E B 14 17	17	17	B	B	B	B	16	47	
2	51	51	70	B	B	B	C	C	C	C	C	C	C	C	E B 19 14	B	B E B 15	B	B	B	30	17	16	17
3	21	31	29	52	53	52	47	B	B	37	33	20	B	B	E B 24	B	B	B	B	B	B	B	37	37
4	40	39	39	38	47	51	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	17	34
5	52	52	52	44	43	40	37	B	B	38	32	32	E B 32	B	B	B	B	B	B	B	B	B	34	34
6	27	45	46	31	31	31	37	38	B	B	19	20	27	E B 23 46	B	B	B	B	B	B	B	B	34	25
7	29	31	38	46	37	38	32	19	31	B	B E B 24 24 25	24	24	25	24	23	14	B	B	14	19	B	B	16
8	46	51	40	16	31	48	39	37	37	B	B	B	B	B	E B 24	B	B	B	32	B	B	B	38	33
9	42	70	52	48	47	41	32	32	B	B	17	24	23	24	17	15	B	16	B	B	26	B	B	47
10	16	26	36	43	46	32	26	B	B	B	B	B	E B 24 37 23	20	E B 23 20	B	B	B	B	B	B	B	B	B
11	B	B	16	31	31	31	B	B	B	12	32	16	34	23	23	15	27	21	B	B	B	B	B	B
12	40	43	100	49	39	32	46	37	B	B	B	B	37	26	26	15	E B 15	B	B	B	38	40	46	59
13	37	41	45	B	46	46	48	29	12	17	15	17	17	20	E B 24 16	13	11	B	B	B	B	16	26	
14	38	41	44	32	27	32	33	46	37	B	B	33	26	26	14	17	26	32	16	B	B	B	33	
15	42	45	46	48	48	47	57	49	33	25	14	24	26	15	31	24	E B 24	B	B	B	B	41	45	41
16	59	48	53	32	27	46	32	27	17	16	16	16	31	16	E B 14 27	14	14	B	32	26	B	B	30	34
17	32	51	38	40	B	50	B	37	38	46	38	B	B E B 32	B	B	25	B	14	31	B	B	B	17	
18	52	48	44	42	51	48	38	70	53	15	26	41	51	38	E B 23 23	B	16	B	B	12	17	16	31	
19	46	39	39	43	42	B	36	27	34	B	B	26	20	22	16	14	21	B	B	B	B	B	12	
20	15	46	43	39	46	33	B	B	36	B	B	B E B 24 23	16	23	E B 16 23	B	B	B E B 15	B	B	B	32	31	
21	35	52	52	46	43	32	51	44	34	B	E B 27 23	22	31	16	14	E B 14	B	26	26	B	B	B	26	38
22	53	48	48	76	71	B	48	37	31	B	B E B 24 23	26	16	42	16	11	13	26	46	B	B	B	16	34
23	37	35	49	41	37	46	37	B	B	B	B	B E B 23 17	21	16	15	15	B	B	B	B	B	B	15	
24	B	26	37	42	70	32	32	34	32	28	16	37	E B 23	B	B E B 24 23	B	B	B	B	B	B	B	16	
25	33	43	46	42	27	30	32	14	27	12	27	19	16	26	17	16	17	33	38	B	B	B	31	44
26	39	27	29	26	31	53	46	51	38	16	13	E B 19 23	19	23	19	23	14	B	14	30	B	B	B	B
27	29	27	28	42	32	17	16	18	B	B E B 24 23	16	17	E B 18 14	12	16	14	12	16	20	53	B	B	B	
28	B	B	12	16	17	33	38	34	32	32	26	17	23	37	E B 22 17	17	13	E B 13	B	B	B	80	36	48
29	108	80	43	70	47	40	37	32	37	B	B	42	32	B	E B 27 22	14	14	13	B	27	26	B	26	
30	26	33	37	33	27	32	47	42	32	32	24	E B 24	B	B	B E B 24 24	B	B	B	B	B	B	B	28	42
31	42	31	43	71	B	51	37	46	33	16	16	E B 23 23	B	B E B 24 24	B	B	E B 24	B	B	36	46	20	32	32
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	31	29	28	27	26	23	20	15	19	21	25	22	26	27	15	16	12	5	7	7	19	27
MED	38	43	43	42	42	40	37	37	34	25	24	22	24	24	E B 22 17	16	16	23	26	30	26	31	33	
U Q	46	50	48	47	47	48	46	44	38	32	27	25	31	26	24	E B 24	21	22	32	44	46	41	36	41
L Q	30	32	37	32	31	32	32	29	32	16	16	18	23	19	16	E B 15	14	14	14	22	26	17	16	25

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 1996 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	7	14	13	15	B	24	24	23	20	15	15	13	13	14	14	14	13	B	B	B	B	11	14
2	14	14	12	B	B	B	C	C	C	C	C	C	C	C	19	14	B	15	B	B	13	15	9	9
3	9	8	9	22	19	24	23	B	B	23	15	14	B	B	B	B	B	B	B	B	B	B	23	22
4	14	9	13	14	23	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	11	9
5	11	9	14	19	23	31	24	B	24	B	24	B	32	B	B	B	B	B	B	B	B	B	14	7
6	9	9	8	14	21	15	13	B	B	14	15	23	23	24	B	B	B	B	B	B	B	B	12	9
7	9	10	9	23	15	14	14	14	9	B	B	24	24	25	24	23	14	B	14	13	B	B	14	
8	23	17	9	8	10	23	11	13	14	B	B	B	B	B	B	24	B	B	10	B	B	B	23	14
9	14	23	22	23	23	17	13	11	B	B	14	24	23	24	14	15	B	14	B	B	24	B	B	14
10	14	14	15	10	14	13	14	B	B	B	B	B	24	23	23	15	B	B	B	B	B	B	B	B
11	B	B	13	9	9	8	B	B	B	9	15	14	13	23	23	14	15	8	B	B	B	B	B	B
12	13	12	19	13	10	9	14	24	B	B	B	B	23	23	14	13	15	B	B	B	19	14	9	24
13	25	24	18	B	24	23	11	12	9	13	9	9	8	11	24	15	9	9	B	B	B	B	9	9
14	10	10	9	9	9	9	10	19	22	B	B	23	23	8	14	13	14	14	9	B	B	B	B	23
15	10	23	24	22	22	23	22	13	9	9	14	14	23	13	14	24	B	B	B	B	B	9	14	9
16	13	14	14	14	15	14	14	11	11	14	10	9	10	9	14	9	14	B	24	15	B	B	9	9
17	10	11	25	31	B	30	24	22	14	21	B	B	32	B	25	B	B	14	10	B	B	B	B	14
18	9	12	20	14	23	10	10	10	9	8	13	23	23	25	23	23	B	14	B	B	9	9	10	11
19	9	9	19	14	15	B	24	14	24	B	B	15	20	22	13	9	14	B	B	B	B	B	B	10
20	9	9	21	10	14	23	B	B	24	B	B	B	24	23	14	23	B	B	15	B	B	B	23	10
21	10	14	10	13	14	11	21	24	23	B	14	23	19	21	14	14	B	24	14	B	B	B	15	10
22	30	14	21	14	30	B	23	22	B	23	24	23	22	14	10	10	10	11	13	15	25	B	10	14
23	9	10	9	10	7	9	13	B	B	B	B	B	23	15	21	15	15	B	B	B	B	B	B	9
24	B	9	9	8	8	7	24	24	23	25	14	11	23	B	B	24	23	B	B	B	B	B	B	9
25	9	9	9	15	9	9	10	9	9	8	11	14	14	14	14	11	14	15	12	B	B	B	9	10
26	10	9	10	9	11	15	19	24	13	11	9	19	23	19	23	14	B	14	14	B	B	B	B	B
27	10	9	9	14	13	9	9	13	B	B	24	23	14	14	18	14	10	9	8	15	B	B	B	B
28	B	B	9	9	9	9	9	9	8	11	9	14	14	15	22	13	14	13	B	B	B	22	13	13
29	9	14	12	24	13	16	12	12	13	B	B	24	23	B	17	22	13	13	13	B	24	24	B	24
30	11	9	9	10	9	10	23	24	14	14	24	B	B	B	24	24	B	B	B	B	B	B	15	13
31	9	14	14	15	B	24	25	15	14	14	14	23	23	B	24	24	B	24	B	23	14	16	14	10
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	31	31	31	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31
MED	10	12	13	14	14	16	17	20	23	B	18	23	23	23	22	15	B	24	B	B	B	B	15	13
U Q	14	14	19	22	23	24	24	24	B	B	B	B	24	B	B	B	B	B	B	B	B	B	B	22
L Q	9	9	9	10	10	9	12	13	13	14	14	14	19	15	14	14	14	14	14	B	B	B	11	9

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 1996 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	A	A	B	A	A	A	A	290	220	210	200	200	280	240	255	B	B	B	B	Y	A
2	A	A	A	B	B	B	C	C	C	C	C	C	C	C	230	215	B	245	B	B	A	A	A	A
3	A	A	A	A	A	A	A	B	B	A	285	250	B	B	B	B	B	B	B	B	B	B	A	A
4	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
5	A	A	A	A	A	A	A	B	A	B	A	B	E B	B	B	B	B	B	B	B	B	B	A	A
6	A	A	A	A	A	A	260	A	B	B	280	240	205	205	A	B	B	B	B	B	B	B	260	A
7	A	250	240	A	A	A	260	A	A	B	B	240	235	210	215	200	220	B	250	A	B	B	B	Y
8	A	A	A	A	A	A	230	A	A	B	B	B	B	B	B	230	B	B	A	B	B	B	A	A
9	A	A	A	A	A	A	A	A	B	B	A	255	240	220	210	200	B	Y	B	B	A	B	B	A
10	Y	A	A	A	A	A	A	B	B	B	B	B	230	200	215	275	B	B	B	B	B	B	B	B
11	B	B	Y	A	305	A	B	B	B	Y	240	205	200	220	215	215	220	A	B	B	B	B	B	B
12	A	A	A	A	A	A	A	A	B	B	B	B	A	265	205	240	285	B	B	B	A	A	A	A
13	A	A	A	B	A	A	A	A	Y	Y	230	250	230	230	205	215	240	250	B	B	B	B	Y	Y
14	A	A	A	A	A	A	A	A	A	B	B	A	250	220	200	210	250	A	Y	B	B	B	B	A
15	A	A	A	A	A	A	A	A	A	A	A	A	245	280	240	235	240	245	B	B	B	B	A	A
16	A	A	A	A	A	A	A	A	A	Y	205	240	230	215	215	205	200	B	A	A	B	B	A	A
17	A	A	A	A	B	A	B	A	A	A	A	A	B	B	240	240	B	250	200	B	B	B	B	Y
18	A	A	A	A	A	A	A	A	A	Y	250	250	A	220	230	250	B	Y	B	B	Y	Y	Y	A
19	A	A	A	A	A	B	A	A	A	B	B	240	210	200	210	200	255	B	B	B	B	B	B	Y
20	Y	A	A	A	A	A	B	B	A	B	B	B	225	220	240	200	B	B	250	B	B	B	A	A
21	A	A	A	A	A	A	A	A	A	B	S	230	235	215	210	225	B	A	A	B	B	B	A	A
22	A	A	A	A	A	B	A	A	B	A	B	230	210	220	205	A E A	350	220	240	A	A	B	A	A
23	A	A	A	A	A	A	B	B	B	B	B	B	210	200	215	210	200	B	B	B	B	B	B	A
24	B	A	A	A	A	A	A	A	A	A	245	220	210	B	B	210	240	A	A	B	B	B	A	A
25	A	A	A	240	A	A	A	A	Y	230	205	210	200	215	200	200	B	A	A	B	B	B	A	A
26	A	A	A	200	A	A	A	A	A	A	300	230	230	210	200	205	200	270	A	B	B	B	B	B
27	215	A	A	A	230	230	A	A	B	B	250	215	205	210	205	200	200	240	210	A	B	B	B	B
28	B	B	Y	Y	Y	A	A	A	A	A	210	210	215	235	205	200	Y	250	B	B	B	A	A	A
29	A	A	A	A	A	A	A	A	A	B	B	A	280	B	230	210	235	210	240	B	A	A	B	A
30	A	A	A	A	A	A	A	A	A	A	235	B	B	B	205	230	B	B	B	B	B	B	A	A
31	A	A	A	245	B	A	A	A	A	300	270	280	265	B	270	270	B	250	A	A	A	A	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1	1	1	3	2	2	3	1		2	15	19	23	22	25	26	14	10	6				1	
MED	215	250	240	240	268	250	260	240		300	245	240	220	218	215	211	229	250	240				260	
U Q				245			260				270	250	240	220	230	240	250	250	250					
L Q				200			230				230	220	210	200	205	200	200	240	210					

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 1996 f_{XI} (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	A	49	A	A	A	B	A	A	B	B	B	B	B	B	S	X	X	B	B	B	B	B	B	B				
2	A	A	A	B	B	B	A	A	Y	B	Y	O	X	B	B	B	B	B	B	B	B	B	B	A	A			
3	A	A	A	A	B	A	A	A	B	B	B	O	X	X	B	O	X	B	B	B	S	B	B	B	A	A		
4	A	A	A	A	O	X	A	A	O	X	B	B	B	B	B	B	B	B	B	B	32	B	B	B	A	A		
5	A	A	A	A	A	A	A	A	A	B	B	O	X	B	B	B	X	O	X	B	B	B	B	B	B	A		
6	A	A	A	B	A	A	A	A	A	X	X	X	X	B	B	O	X	B	B	X	O	X	B	A	A	A		
7	A	A	A	O	X	A	O	X	A	S	B	O	X	X	X	X	O	X	O	X	O	X	O	X	A	B	A	A
8	B	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B		
9	X	A	A	A	A	A	X			X	X	X	X	O	X	O	X					A	B	A	A	A		
10	A	B	A	A	A	A	A	A	A	A	O	X	O	X	X	X	X	X	O	X	B	B	B	B	B	B		
11	Y	A		X		A	A	O	X	X	X	X	O	X	O	X	X	X	X	A	B	A	Y	B	A	A		
12	A	A	A	A	A	C	C	C	C	O	X	X	X	X	X	X	X	X	X	X	B	B	B	B	B	B		
13	B	A	A	A	A	A	A	A	O	X	O	X	X	X	X	X	X	X	O	X	O	X	B	B	A	B	B	
14	A	B	A	A	A	A	A	A	O	X	S	O	X	O	X	X	X	X	X	X	B	A	A	A	A	A		
15	A	A		B	A	A	A	A	A	X	O	X	B	O	X	X	B	B	O	X	O	X	B	B	B	B		
16	A	A	O	X	A	A	A	B	A	A	X	X	X	X	X	X	X	X			B	B	S	A	A			
17	A	A	A	A	A	A	A	B	B	O	X	O	X	O	X	B	B	B	B	B	B	B	B	B	B	B		
18	A	A	A	Y	A	Y	Y	B	X	X	X	X	X	X	X	X	X	X	X	Y	B	B	B	B	B	B		
19	A	A	A	A	A	A	A	A	C	X	X	O	X	O	X	B	B	B	B	B	B	B	B	B	B	B		
20	A	A	A	A	A	A	A	B	B	X	X	O	X	X	B	B	B	B	O	X	O	X	B	B	B	A	A	
21	A	A	A	A	A			A	B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	A	A		
22	A	A	A	A	Y	A	A	A	A	X	X	X	O	X	O	X	X	X	X	X	S	A	B	A	A	A		
23	A	A	B	A	A			A	A	A	B	B	B	O	X	O	X	B	B	B	A	A	A	A	A	A		
24	A	A	A	B	B	A	A	A	B	A	O	X	B	B	B	B	O	X	O	X	B	B	B	B	A	A		
25	A		A		B	A	A	A	B	B	O	X	B	B	B	B	B	B	B	A	B	A	O	X	A			
26	A	44	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X	B	B	A	A	
27	A	A	B	B	B	B	B	B	A	A	O	X	X	B	B	O	X	B	B	B	B	O	X	A	A	B	Y	
28	A	Y	A	B	B	A	A	A	B	O	X	B	B	B	B	B	B	B	B	X	B	B	A	A	A	A	A	
29	A		A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	A	
30	A	A	A	B	A	A	A	A	B	B	B	B	B	B	B	B	B	O	X	O	X	X	B	A	A	A	A	
31	O	X	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X	B	B	A	A	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	2	4	3	3	2	3	2	3	6	14	17	19	17	13	12	14	16	15	13	8					1			
MED	X			X				O	X	X	X	X	X	X	X	X	X	O	X	X	O	X			O	X		
U Q		47	49	O	X			O	X	O	X	X	X	X	X	X	X	X	X	X	O	X						
L Q		O	X	X																								

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 1996 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	F 34	A	A	A	B	A	A	B	B	B	B	B	B	D S 37 38	R 35		B	B	B	B	B	B	B
2	A	A	A	B	B	B	A	A	Y	B	Y	R 33	B	B	B	B	B	B	B	B	B	B	A	A
3	A	A	A	A	B	A	A	A	B	B	B	R 44 44		B	U R 50	B	B	B	S	B	B	B	A	A
4	A	A	A	A	R 33	A	A	U R 37	B	B	B	B	B	B	B	B	B	B	F 21	B	B	B	A	A
5	A	A	A	A	A	A	A	A	A	B	B	R 48	B	B	B		R 42	B	B	B	B	B	B	A
6	A	A	A	B	A	A	A	A	A					B	B		B	B			R 32 31	B	A	A
7	A	A	A	R 38	A	R 28	A	S	B	R 30	36	39	43	F 43	J F 45	38	29	R 33	R 29	R 29	R	A	B	A
8	B	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B
9	R 28	A	A	A	A	A		F 24	F 24	J R 17	R 30	R 40	R 39	41	R 49	R 48	F 40	F 28	F 24	F 23	A	B	A	A
10	A	B	A	A	A	A	A	A	A	A	R 37	R 39	40	43	43	43	33	30	B	B	B	B	B	B
11	Y	A	F 36	32	F 36	A	A	R 28	27	27	34	37	43	43	38	37	37		A	B	A	Y	B	A
12	A	A	A	A	A	C	C	C	C	R 29	40	43	F 45	45	50	46	35	31	F 18	B	B	B	B	B
13	B	A	A	A	A	A	A	U R 33	R 33	R 33	37	40	40	45	40	39	27	18	R	R	B	B	A	B
14	A	B	A	A	A	A	A	A	R 32		38	40	J R 40	42	45	42	38	41	39	B	A	A	A	A
15	A	A		B	A	A	A	A		R 21	29	B	R 38	41	44		42	28	R 21	F 18	B	B	B	B
16	A	A	R 31	A	A	A	B	A	A		J R 31	34	41	48	53	42	45	F 41	F 40	F 32	B	B	S	A
17	A	A	A	A	A	A	A	B	B	R 28	R 33	38	38	B	B	B	B	J F 38	B	B	B	B	B	B
18	A	A	A	Y	A	Y	Y	B		22	28	35	37	F 34	45	44	37	R 37	R 29	Y	B	B	B	B
19	A	A	A	A	A	A	A	A	C		J S 37	R 37	42	46	46	B	B	B	B	B	B	B	B	B
20	A	A	A	A	A	A	A	B	B	J Y 34	40	44	R 48	B	B	B	B	U R 39	R 34		B	B	B	A
21	A	A	A	A	A	J F 27	F 27	A	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	A
22	A	A	A	A	Y	A	A	A	A	J R 28	41	43	R 45	49	49	45	J R 43	F 29	F 28		S	A	B	A
23	A	A	B	A	A	A	A	A	A	B	B	B	B	R 39	R 40	B	B	B	R 32	A	S	A	A	A
24	A	A	A	B	B	A	A	A	B	A	R 39	B	B	B	B	B	U R 38	R 38	R 33	27	B	B	B	A
25	A	F 32	A		B	A	A	A	B	B	B	R 33	B	B	B	B	B	B	B	B	A	B	A	U R 29
26	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	R 28	B	B	A
27	A	A	B	B	B	B	B	B	A	A	R 33	36	B	B	R 39	B	B	B	B	R 17	A	A	B	Y
28	A	Y	A	B	B	A	A	A	B	R 39	B	B	B	B	B	B	B	B	J S 53	B	B	A	A	A
29	A	F 28	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
30	A	A	A	B	A	A	A	A	B	B	B	B	B	B	B	B	R 38	R 33	27	F 18	B	A	A	A
31	R 34	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 29	B	B	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	2	3	3	3	2	2	2	3	6	14	17	19	17	13	13	14	16	15	13	8				1
MED	R 31	F 32	31	36	34	28	26	R 28	24	R 30	37	39	43	44	45	41	38	R 32	27	R 27			U R 29	
U Q		F 34	F 36	R 38				U R 37	R 32	33	40	43	46	48	48	45	38	39	32	29	R			
L Q		F 28	28	32				F 24	21	28	34	37	40	42	40	38	34	29	21	18				

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 1996 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	37	65	37	38	55	B	28	37	B	B	B	B	B	B	31	33	24	B	B	B	B	B	B	B		
2	54	39	48	B	B	B	39	37	26	B	27	E B	24	B	B	B	B	B	B	B	B	B	39	36		
3	30	32	37	37	B	49	37	23	B	B	B	E B	23	31	24	B	B	B	34	B	B	B	30	41		
4	39	46	44	47	34	48	39	29	B	B	B	B	B	B	B	B	B	E B	14	B	B	B	30	27		
5	34	33	56	47	47	48	42	31	37	B	B	E B	24	B	B	B	19	15	B	B	B	B	B	33		
6	38	45	37	B	48	38	59	54	31	E B	19	26	23	24	B	E B	24	B	E B	E B	E B	34	41	57		
7	58	54	38	41	39	38	46	27	B	E B	24	19	26	19	19	26	24	24	24	23	16	33	B	38	52	
8	B	40	34	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	
9	17	30	33	45	46	32	11	12	29	26	31	20	23	27	26	22	19	17	14	31	B	40	32	27		
10	38	B	48	51	39	48	37	45	37	33	24	E B	23	23	20	22	16	16	36	B	B	B	B	B		
11	16	31	39	32	47	39	41	33	12	E B	14	17	23	24	23	23	15	16	26	B	40	16	27	23		
12	31	32	41	43	49	C	C	C	C	33	31	26	16	E B	23	24	23	27	11	13	B	B	B	B		
13	B	47	51	51	46	38	47	48	39	19	21	E B	23	23	16	20	16	16	22	14	B	26	B	B		
14	32	B	31	48	71	40	38	39	30	32	26	E B	23	19	23	24	23	16	22	23	B	32	44	46	46	
15	48	48	38	B	48	33	31	27	12	E B	23	B	E B	24	24	24	B	E B	24	23	13	28	B	B	B	
16	34	33	43	46	32	43	B	43	33	E B	19	17	22	22	32	31	16	E B	E B	E B	B	B	31	46	70	
17	47	47	48	51	54	53	37	B	B	E B	23	23	24	30	B	B	E B	24	B	B	B	B	B	B	B	
18	32	32	32	17	26	17	11	B	E B	9	14	17	17	26	34	41	24	23	17	27	B	B	B	B		
19	32	42	41	48	34	32	27	32	C	E B	20	19	24	22	23	B	B	B	B	B	B	B	B	B	B	
20	27	32	32	32	42	33	32	B	B	E B	23	24	30	24	B	B	B	E B	E B	E B	B	B	B	35	22	
21	26	23	22	31	47	26	E B	23	33	B	B	B	B	B	B	B	B	B	B	33	B	B	B	E B	23	
22	26	33	33	27	17	31	46	27	27	E B	24	24	24	26	27	24	20	16	26	15	14	24	27	B	26	
23	33	36	B	44	57	47	48	32	32	B	B	B	E B	24	25	B	B	E B	24	33	27	41	31	39	27	
24	34	32	38	B	B	33	39	41	B	B	E B	24	B	B	B	B	E B	24	24	23	20	B	B	B	33	
25	42	71	42	41	B	34	26	43	B	B	B	33	B	B	B	B	B	B	B	B	B	B	34	33	41	
26	45	32	33	B	B	37	43	B	B	B	B	B	B	B	B	B	B	B	B	E B	24	B	B	40	41	
27	41	45	B	B	B	B	B	B	41	31	E B	25	33	B	E B	31	B	B	B	E B	13	28	40	B	17	
28	27	17	38	B	B	33	38	34	B	27	B	B	B	B	B	B	B	E B	23	B	B	26	33	41	51	
29	41	45	50	B	B	B	36	B	B	B	B	B	B	B	B	B	B	B	B	B	34	27	23	41	46	
30	37	51	42	B	38	42	39	58	B	B	B	B	B	B	B	B	E B	E B	E B	E B	E B	B	B	27	26	27
31	40	90	51	43	44	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B	24	B	B	32	27	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	29	29	29	21	22	24	26	22	14	18	18	19	17	13	13	14	16	16	17	13	8	12	17	22		
MED	34	39	38	43	46	38	38	34	30	E B	24	24	24	24	23	24	22	23	23	20	24	28	32	38	33	
U Q	41	47	46	48	48	45	42	43	37	31	26	24	E B	25	27	31	24	24	24	25	32	32	37	41	46	
L Q	30	32	34	34	38	33	31	29	26	E B	19	19	23	22	22	E B	16	16	22	E B	14	15	25	27	31	27

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 1996 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	14	31	24	15	B	23	23	B	B	B	B	B	B	31	33	24	B	B	B	B	B	B	B	
2	9	23	14	B	B	B	24	23	14	B	24	24	B	B	B	B	B	B	B	B	B	B	14	24	
3	9	10	11	23	B	22	22	14	B	B	B	B	31	B	24	B	B	B	24	B	B	B	9	9	
4	15	14	15	23	14	14	14	14	B	B	B	B	B	B	B	B	B	B	14	B	B	B	9	9	
5	9	9	23	23	23	23	14	23	24	B	B	24	B	B	B	15	15	B	B	B	B	B	B	9	
6	9	11	14	B	15	22	19	14	14	19	23	23	24	B	B	24	B	B	23	23	B	9	9	15	
7	14	14	14	14	23	23	10	23	B	24	14	15	14	14	24	24	24	24	23	14	23	14	14	14	
8	B	23	23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	
9	12	9	7	23	14	8	9	8	8	8	14	16	19	19	23	22	14	9	14	23	B	14	9	9	
10	14	B	14	14	14	23	15	23	23	23	23	23	23	14	22	14	9	14	B	B	B	B	B	B	
11	9	14	14	14	13	10	9	9	8	14	14	23	24	23	23	14	14	18	15	14	B	9	10	10	
12	8	10	10	16	13	C	C	C	C	23	16	15	14	23	24	23	14	8	13	B	B	B	B	B	
13	B	14	18	23	15	14	23	15	14	14	15	23	23	14	14	14	10	22	14	B	24	B	B	B	
14	9	B	23	9	9	22	23	23	23	23	14	23	19	23	24	23	14	22	23	B	14	9	13	10	
15	18	14	9	B	23	16	9	9	9	23	B	24	24	24	B	B	24	23	13	8	B	B	14	9	16
16	9	10	14	13	13	14	B	13	13	19	13	13	13	13	10	12	23	22	13	B	B	14	9	16	
17	13	13	13	19	13	15	24	B	B	23	23	24	30	B	B	B	24	B	B	B	B	B	B	B	B
18	9	17	14	14	8	9	9	B	9	14	15	14	14	15	23	24	23	15	23	B	B	B	B	B	
19	9	14	14	15	14	13	9	14	C	20	19	24	22	23	B	B	B	B	B	B	B	B	B	B	
20	13	9	9	13	24	15	14	B	B	23	24	30	24	B	B	B	B	24	23	B	B	B	10	9	
21	9	9	9	10	9	9	23	9	B	B	B	B	B	B	B	B	B	B	23	B	B	B	B	23	
22	13	9	19	13	9	15	20	23	15	24	24	22	22	15	21	14	14	10	15	14	14	23	B	14	
23	11	14	B	23	10	23	15	14	14	B	B	B	24	25	B	B	B	24	23	23	9	10	14	9	
24	9	9	10	B	B	23	24	26	B	23	24	B	B	B	B	24	24	23	20	B	B	B	9	9	
25	13	13	14	14	B	23	16	23	B	B	B	B	B	B	B	B	B	B	B	23	B	13	10	14	
26	13	23	22	B	B	23	20	B	B	B	B	B	B	B	B	B	B	B	B	24	B	B	9	9	
27	23	30	B	B	B	B	B	B	24	15	25	22	B	B	31	B	B	B	B	13	9	8	B	13	
28	13	9	20	B	B	18	14	18	B	23	B	B	B	B	B	B	B	23	B	B	24	9	9	14	
29	23	10	24	B	B	B	24	B	B	B	B	B	B	B	B	B	B	B	B	9	18	9	10	20	
30	23	10	9	B	24	22	23	26	B	B	B	B	B	B	B	B	24	24	14	9	B	10	13	14	
31	20	14	24	20	22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	24	B	B	8	8	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	30	30	29	29	29	28	30	30	30	30	30	30	30	30	30	30	30	30	30	30	31	
MED	13	14	14	23	15	22	20	23	B	23	24	24	27	B	B	B	24	24	23	B	B	B	14	14	
U Q	15	14	23	B	B	B	23	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
L Q	9	10	11	14	13	14	14	14	14	20	16	23	22	23	24	23	15	22	15	23	24	13	9	9	

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 1996 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	340	A	A	A	B	A	A	B	B	B	B	B	B	B	240	255	245	B	B	B	B	B	B	B
2	A	A	A	B	B	B	A	A	A	B	A	E	B	B	B	B	B	B	B	B	B	B	B	A	A
3	A	A	A	A	B	A	A	A	B	B	B	B	E	B	B	B	B	B	A	B	B	B	A	A	
4	A	A	A	A	215	A	A	A	B	B	B	B	B	B	B	B	B	B	B	245	B	B	B	A	A
5	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	205	215	B	B	B	B	B	B	A
6	A	A	A	B	A	A	A	A	A	E	B	250	230	225	205	B	B	205	B	B	280	270	B	A	A
7	A	A	A	A	43	180	A	A	B	B	280	240	240	230	230	235	215	250	250	295	290	A	B	A	A
8	B	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B
9	A	A	A	A	A	A	330	300	300	300	225	235	210	200	210	205	200	205	200	205	A	B	A	A	A
10	A	B	A	A	A	A	A	A	A	A	A	A	245	225	230	230	210	200	200	B	B	B	B	B	
11	A	A	200	210	235	A	A	A	A	A	250	250	235	220	205	220	200	230	A	B	A	A	B	A	A
12	A	A	A	A	A	C	C	C	C	C	A	E	A	270	230	205	200	215	200	205	200	210	B	B	B
13	B	A	A	A	A	A	A	A	A	E	A	E	A	225	270	265	215	230	210	200	205	200	250	250	B
14	A	B	A	A	A	A	A	A	A	A	A	250	235	200	230	210	210	220	220	255	B	A	A	A	A
15	A	A	250	B	A	A	A	A	E	A	E	B	B	E	B	B	B	215	250	235	260	E	A	B	B
16	A	A	250	A	A	A	B	A	A	E	B	250	200	240	225	215	200	200	215	210	240	B	B	A	A
17	A	A	A	A	A	A	A	B	B	E	B	E	B	E	B	B	B	225	B	B	B	B	B	B	B
18	A	A	A	Y	A	Y	Y	B	205	200	205	205	210	200	220	205	210	235	Y	B	B	B	B	B	B
19	A	A	A	A	A	A	A	A	C	205	200	215	200	215	B	B	B	B	B	B	B	B	B	B	B
20	A	A	A	A	A	A	A	B	B	240	220	225	240	B	B	B	B	E	B	260	240	B	B	B	A
21	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	A
22	A	A	A	A	Y	A	A	A	A	E	B	265	220	240	210	225	210	215	210	230	220	255	A	A	B
23	A	A	B	A	A	A	A	A	A	B	B	B	E	B	B	B	B	B	E	B	A	A	A	A	A
24	A	A	A	B	B	A	A	A	B	A	E	B	245	B	B	B	220	210	235	260	B	B	B	B	A
25	A	245	A	245	B	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	A	B	A	240	A
26	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	250	B	B	B	A
27	A	A	B	B	B	B	B	B	A	A	B	285	220	B	B	E	B	B	B	B	245	B	A	A	B
28	A	Y	A	B	B	A	A	A	B	E	S	255	B	B	B	B	B	B	205	B	B	A	A	A	A
29	A	A	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A
30	A	A	A	B	A	A	A	A	B	B	B	B	B	B	B	B	B	240	235	230	210	B	A	A	A
31	A	245	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E	B	265	B	A
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		1	2	3	3	2	1	1	1	4	13	15	19	17	13	13	14	16	15	13	8			1	
MED		245	292	250	210	225	180	330	300	U	E	250	230	232	215	215	218	205	215	228	240	253		240	
U Q			250	245						300	260	250	240	E	B	242	230	232	215	228	250	258	268		
L Q			200	43							215	232	220	215	205	208	208	200	208	205	225	248			

AUG. 1996 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1996 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	A	A	A	A	B	A	XO	XO	X	X	XO	X	X	X	X	B	B		O	X	B	A	O	X
2	A	A	A	A	A	A	B	B	B	X	B	B	BO	XO	X	X	B	B	B	B	B	B	B	Y	A	
3	A	A	A	A	O	X	YO	X	B	X	X	B	BO	X	B	R	B	B	B	BO	X	X	B	B	B	
4	B	A	A	O	X	Y	B	X	BO	XO	X	XO	X	XO	X	X	X	XO	XO	XO	XO	X	S	B	B	
5	A	A	A	A	B	A	A	B	A	O	XO	XO	XO	XO	XO	X	X	X	XO	XO	X	B	B	B	Y	
6		A	A	B	A	A	Y	X	X	XO	X	X	XO	X	B	X	X	X	X	X	XO	X	B	B	B	
7	B	A	A	A	A	A	A	B	A	A	B	B	B	B	X	BO	X	B	B	B	B	B	B	B	B	
8	A	A	A	A	A	A	A	B	BO	X	XO	XO	X	X	XO	XO	XO	XO	X	XO	XO	X	B	B	B	
9	A	A	A	O	XO	XO	XO	X	XO	X	X	X	XO	X	B	BO	XO	XO	XO	X	B	A	B	Y	A	
10	A		O	X	A	A	B	B	A	B	B	BO	X	B	B	B	Y	B	B	A	A	A	A	A	A	
11	A	A	A	B	A	O	X	B	B	B	B	B	B	B	B	B	B	B	A	A	B	A	A	A	A	
12	A	B	B	A	B	B	A	BU	R		O	X	B	B	B	B	BO	X	B	B	B	B	A	A	A	
13	A	A	B	A	B	B	B	A	B	B	B	B	B	BO	X	BO	X	BO	XO	X	B	B	B	B	A	
14	B	A		B	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	Y
15	A	A	A	A	A	R	BO	X	X	B	B	B	BO	X	B	X	B	B	B	B	BO	X	B	B	A	
16	B	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	X	Y	B	Y	A	A	
17	A	A	A	A	B	B	A	B	A	YO	XO	XO	XO	X	X	X	X	XO	XO	X		A	B	A	A	
18	A	A	A	A	B	B	A	X	X	X	X	X	B	B	B	B	B	B	B	B		A	A	A	A	
19	A	A	A	B	A	A	O	X	X	XO	XO	X	B	B	B	B	XO	X	X	X	B	A	A	A	A	
20	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	X	B	B	A	A	A	A	A	A	
21	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	X	B	B	A	B	A	A	A	
22	A	A	B	B	B	B	Y	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	
23	B	A	A	A	B	A	O	X	B	B	B	B	B	B	B	B	B	BO	X	B	A	A	A	A	A	
24	B	A	B	B	B	B	A	A	O	X	B	B	B	B	B	BO	XO	X	B	B	B	Y	Y	A	A	
25	A	A	A	A	A	X	B	BO	XO	X	B	B	B	B	B	X	B	BO	X	A	Y	Y	S			
26	A	A	A	A	A	A	B	B	B	S	B	B	B	B	B	B	B	B	B	A	A	A	X	A	A	
27	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	Y	
28	A	B	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	A	A	
29	A	A		A	A	X	B	A	X	B	B	B	B	B	B	BO	X	X	X	X	X	XO	X	A	A	
30	O	X	Y	Y	Y	X	X	X	X	X	BO	XO	XO	XO	XO	X	X	X	X	X	X	O	X	B	B	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	2	1	3	2	3	6	7	6	11	11	12	10	10	10	9	10	15	12	12	12	9	2	2	1		
MED	38	69	48	38	23	38	32	36	39	42	42	46	50	52	51	50	49	46	42	37	33	26	38	23		
U Q			58		38	42	39	39	40	43	48	47	51	57	52	52	52	49	44	40	36					
L Q			34		X	O	X	X	XO	XO	XO	XO	XO	XO	X	X	X	XO	XO	XO	XO	X				

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1996 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	A	A	A	B	A		R		J R J R		J R J R				B	B	F	R	B	A	R
2	A	A	A	A	A	A	B	B		B		B			51	51	52	B	B	B	B	B	Y	A
3	A	A	A	A		Y		B		B		B		51		41		B	B	B	U	R	B	B
4	B	A	A	R	Y	B	R	B		R	R	R		46	46	44	45	43	39	33	F	R	S	B
5	A	A	A	A	B	A	A	B		A	R	R	S		38	38	39	39	40	J	S	S	B	Y
6	A	A	A	B	A	A	A		26	28	31	32	J R				J R J R			J R	R	B	B	B
7	B	A	A	A	A	A	A	B		A	A	B	B					36	34	40	R	B	B	B
8	A	A	A	A	A	A	A	B		B	R	R	U R					49	34	40	R	B	B	B
9	A	A	A	U S	R	R	R		S										R	R	B	A	B	Y
10	A	A	R	A	A	A	B	B		A	B	B	B					46	49	39	B	A	A	F
11	A	A	A	B	A	R	B	B		B	B	B	B								A	A	A	A
12	A	B	B	A	B	B	A	B											30		B	B	A	A
13	A	A	B	A	B	B	B	A		B	B	B	B								R	B	B	A
14	B	A	A	B	A	A	B	A		B	B	B	B								B	B	B	Y
15	A	A	A	A	A	D R	B	R		B	B	B	B								B	B	B	A
16	B	A	A	A	B	B	A	B		B	B	B	B								B	Y	A	A
17	A	A	A	A	B	B	A	B		A	Y		R		J R						R	R	F	B
18	A	A	A	A	B	B	A														B	B	A	A
19	A	A	A	B	A	A															B	A	A	A
20	A	A	A	B	B	A	A	B		B	B	B	B								B	B	A	A
21	A	A	B	B	B	B	B	B		B	B	B	B								B	B	A	A
22	A	A	B	B	B	B	Y	A		A	B	B	B								B	B	A	A
23	B	A	A	A	B	A	R	B		B	B	B	B								R	B	A	A
24	B	A	B	B	B	B	A	A		R	B	B	B								R	B	Y	Y
25	A	A	A	A	A	F		B		R	R	B	B								B	B	A	Y
26	A	A	A	A	A	A	B	B		B	S	B	B								B	B	A	A
27	A	A	A	B	B	B	B	B		B	B	B	B								B	B	B	S
28	A	B	A	A	A	A	A	B		B	B	B	B								B	B	Y	A
29	A	A	J F	A	A		B	A		B	B	B	B								44	41	43	A
30	R	Y	Y	Y	J R					B	R	R									R		F	R
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1		2	2	3	6	7	6	11	11	12	10	10	10	10	10	15	12	12	12	9	2	2	1
MED	18		35	32	17	31	26	30	33	36	36	40	44	46	45	44	43	40	36	30	27	20	32	17
U Q					32	32	30	33	34	37	40	41	46	51	46	46	46	43	38	34	28			
L Q					J R	27	23	27	32	33	32	38	40	43	42	44	40	36	33	28	22			

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1996 ftEs (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		39	40	53	47	48	47		B	42	26	23	26	26	26	24	24	30	24		B	13	14		51	27	
2		34	33	41	33	26	27		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	26	
3		41	47	35	26	26	21	14		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
4		B	30	31	33	32			B	26	23	23	26	24	24	27	25	23	23	23	14	32	27		B	B	
5		39	73	33	33		43	42		B	32	27	27	24	25	26	24	27	32	23	31	27		B	B	12	
6		32	72	90		47	52	27	16	16	20	17	16	26	40		24	24	16	26	15	16		B	B	B	
7		B	31	43	41	42	45	51		B	35	36		B	B		26		24		B	B	B	B	B	B	
8		34	52	43	47	38	39	47		B	27	24	24	23	27	24	23	23	23	14	19	16		B	B	B	
9		27	32	27	27	28	28	27	29	31	21	24	33	28	26			30	24	24		33		16	27		
10		26	52	49	51	48	38		B	43		B	B	B	B	B	B	31		B	B	52	31	41	29	46	
11		43	43	46		47	32		B	B	B	B	B	B	B	B	B	B	B	34	33		33	29	33		
12		50		B	37		B	41		B	B	B	B	B	B	B	B	B	19		B	B	B	39	47	70	
13		70	34		50		B		42		B	B	B	B	B	B	B	31		22	16		B	B	B	70	
14			33	40		33	41		42		B	B	B	B	B	B	B	B	B	B	B	B	B	B	32	16	
15		26	33	32	37	33	33		B	25	16		B	B	B	36		28				27		B	B	59	
16		B	43	37	41		B	46		B	B	B	B	B	B	B	B	B	B	26	26		27	41	50		
17		69	60	37	33		B	43		41	33	26	26	27	26	27	24	24	24	24	17	27	37		41		
18		43	43	51	70		B	41	25	23	26	22	26		B	B	B	B	B	B		26	41	38	32	46	
19		46	33	41		31	33	18	18	19	23	24	27		B	B	B	B	30	41	38		47	112	91	68	
20		51	50	46		B	B	46	37		B	B	B	B	B	B	B	B	B	B	B	41	34	41	31	41	
21		71	46		B	B	B	74			B	B	B	B	B	B	B	B	B	26		53		33	70		
22		41	42		B	B	B		27	41	41		B	B	B	B	B	B	B	B	B	B	B	42	32	40	
23		B	41	47	41		B	43	27		B	B	B	B	B	B	B	B	B	24		41	42	38	42		
24			116				B	33	32	27		B	B	B	B	B	B	B	24	24		17	15	28			
25		29	39	71	51	31	15	16		B	B	26	26		B	B	B	B	23		32	40	14	17	23		
26		41	71	68	41	43	38		B	B	B	32		B	B	B	B	B	B	B	B	26	53	43	50	46	
27		42	125	41		B	B		B	B	B	B	B	B	B	B	B	B	B	B	B	27		24	17		
28		33		37	43	52	33	37		B	B	B	B	B	B	B	B	B	B	B	B	B	12	46	40		
29		39	71	53	41	31	24		B	36	27		B	B	B	B	B	26	23	23	18	15	13	27	31	44	
30		16	12	12	14	12	12	15	19	22		B	B	24	27	27	27	24	26	26	24	23	14	13	13	B	B
31																											
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT		24	28	25	21	18	21	19	12	16	14	12	10	10	10	10	10	16	12	13	17	19	17	20	24		
MED		40	43	41	41	33	38	33	30	26	24	24	26	26	26	25	25	24	24	24	23	31	37	32	41		
U Q		44	56	50	47	47	44	42	42	34	27	26	27	27	27	27	27	30	24	28	30	41	42	44	48		
L Q		32	33	36	33	31	28	18	22	21	23	24	24	25	26	24	24	24	24	23	22	15	16	22	26	27	

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1996 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D	H																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	9	12	24	23	15	23	B	16	15	23	15	23	16	24	24	30	24	B	B	13	14	B	8	10	
2	13	13	13	15	19	23	B	B	B	23	B	B	B	26	30	24	B	B	B	B	B	B	9	13	
3	11	13	13	10	9	9	B	B	20	23	B	B	35	B	30	B	B	B	B	23	15	B	B	B	
4	B	110	9	14	14	B	10	B	E S	24	23	23	24	24	24	23	21	23	23	23	14	10	23	B	B
5	13	24	23	20	B	16	17	B	16	23	24	24	23	24	24	19	19	23	15	10	B	B	B	9	
6	9	9	23	B	23	21	13	13	15	20	15	13	23	40	B	24	24	15	16	15	14	B	B	B	
7	B	10	14	19	22	23	23	B	24	24	B	B	B	B	23	B	24	B	B	B	B	B	B	B	
8	11	15	20	19	20	23	14	B	B	23	24	19	23	19	22	23	23	23	14	19	14	B	B	B	
9	10	9	10	13	10	11	25	24	22	15	18	16	24	23	B	B	30	24	24	B	14	B	14	11	
10	11	14	19	13	23	14	B	B	24	B	B	B	26	B	B	B	25	B	B	14	14	9	9	11	
11	18	19	24	B	24	18	B	B	B	B	B	B	B	B	B	B	B	B	23	30	B	13	10	10	
12	9	B	B	23	B	B	24	B	B	24	B	B	B	B	B	B	B	19	B	B	B	9	23	23	
13	9	24	B	14	B	B	B	23	B	B	B	B	B	B	B	B	31	B	22	16	B	B	B	23	
14	B	25	23	B	24	24	B	26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	9	8	
15	9	13	24	21	15	15	B	25	15	B	B	B	B	36	B	24	B	B	B	B	13	B	B	23	
16	B	23	23	18	B	B	31	B	B	B	B	B	B	B	B	B	B	B	26	23	B	11	9	23	
17	14	23	31	24	B	B	25	B	23	24	16	14	15	24	25	24	24	24	24	9	16	9	B	9	
18	13	16	23	13	B	B	24	21	23	15	16	24	B	B	B	B	B	B	B	9	10	9	11	24	
19	24	25	22	B	21	12	13	16	16	13	13	23	B	B	B	B	30	23	15	B	8	14	14	13	
20	9	12	39	B	B	22	24	B	B	B	B	B	B	B	B	B	26	B	B	19	8	8	7	9	
21	16	21	B	B	B	66	B	B	B	B	B	B	B	B	B	B	B	26	B	B	15	B	10	16	
22	24	25	B	B	B	B	23	23	24	B	B	B	B	B	B	B	B	B	B	B	B	9	9	9	
23	B	21	22	24	B	23	15	B	B	B	B	B	B	B	B	B	B	B	24	B	9	23	13	19	
24	B	14	B	B	B	B	24	20	24	B	B	B	B	B	B	B	24	24	B	B	B	9	8	8	
25	14	15	15	14	10	15	12	B	B	34	24	B	B	B	B	B	23	B	B	14	14	9	9	8	
26	11	23	13	16	24	24	B	B	B	30	B	B	B	B	B	B	B	B	B	23	14	15	9	9	
27	23	30	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	15	B	11	9		
28	13	B	23	15	48	24	23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	9	14	14	
29	9	23	14	24	19	24	B	24	16	B	B	B	B	B	B	24	23	23	18	15	13	9	8	13	
30	8	8	9	9	10	11	14	19	22	B	24	18	20	24	24	16	15	24	23	14	13	13	B	B	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	13	20	23	20	24	23	24	B	24	B	B	B	B	B	B	B	30	B	B	23	14	19	12	13	
U Q	B	24	24	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
L Q	9	13	14	14	19	16	15	23	22	23	24	24	24	26	25	24	24	24	23	14	13	9	9	9	

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1996 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	B	A	E	A	E	B						B	B				B	A	A		
2	A	A	A	A	A	A	B	B	B									B	B	B	B	B	B	Y	A		
3	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
4	B	A	A	E	A	A	B	B	E	S													A	B	B		
5	A	A	A	A	A	B	A	A	B	A	A							E	A	E	A			B	B	Y	
6	A	A	A	B	A	A	A	A																B	B	B	
7	B	A	A	A	A	A	A	B	A	A	B	B	B										B	B	B		
8	A	A	A	A	A	A	A	B	B	A													B	B	B		
9	A	A	A		E	A	E	A	E	B													B	A	B	Y	A
10	A	A	250	A	A	A	B	B	A	B	B	B	B	B	B	B	A	B	B	A	A	A	A	A	A	A	
11	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	B	A	A	A	A		
12	A	B	B	A	B	B	A	B	B	E	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A		
13	A	A	B	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	
14	B	A	A	B	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	
15	A	A	A	A	A		B	B															A	B	B	A	
16	B	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A	A	
17	A	A	A	A	B	B	A	B	A	A														A	B	A	
18	A	A	A	A	B	B	A	A															A	A	A	A	
19	A	A	A	B	A	A																		A	A	A	
20	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	
21	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A	
22	A	A	B	B	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	
23	B	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A	A	A	A	
24	B	A	B	B	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	A	A	
25	A	A	A	A	A		B	B	E	E	B	B	B	B	B	B	B	B	B	B	B	B	A	Y	Y	A	
26	A	A	A	A	A	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	
27	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A	
28	A	B	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	A	A	A	
29	A	A	A	A	A	B	B	A																A	A	A	
30	A	Y	Y	Y	B																			B	B	B	
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT			1	2	1	4	4	3	10	9	12	10	10	8	10	10	15	11	11	11	8	2					
MED			250	310	E	A	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U		
U Q					355	325	260	245	248	240	230	215	230	230	250	250	255	250	255	250							
L Q					260	245	240	205	215	208	210	205	200	205	200	210	215	220	235	225							

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 1996 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	Y	S	C	O X 30	C	C	C	C	C	C	C	C	C	C	C	O X 44	C	C	C	C	C	C	C	C	
2	C	C	S	C	C	A	X 35	C	C	C	C	C	C	C	O X 55	X 51	C	C	C	C	C	A	A	C	
3	C	A	C	C	A	C	A	C	C	B	C	C	C	C	C	B	C	O X 43	X 38	X 34	X	A	S	C	C
4	C	A	B	B	A	A	O X 34	X 37	X 39	X 43	C	O X 43	X 45	X 47	X 48	X 48	X 47	X 49	X 45	X 46	X 36	B	Y	Y	
5	A	A	A	A	A	A	S	A	O X 37	X 39	X 39	X 42	X 47	X 53	X 51	X 50	X 50	X 48	X 45	X 41	X 38	X 33	X 28	A	
6	A	A	A	O X 32	X 33	A	B	B	O X 44	X 48	X 49	X 52	X 53	X 54	X 53	X 53	X 53	X 52	X 45	X 45	X 43	X 39	X 33		
7	X 30	X 30	X 31	X 36	X 46	X 43	X 51	X 50	X 46	X 51	X 56	X 58	X 58	X 58	X 62	X 59	X 58	X 57	X 52	X 48	X 50	X 39	X 32	X 24	
8	A	O X 56	X 44	S	O X 55	X 42	X 49	X 50	X 49	X 49	X 51	X 53	X 54	X 58	X 58	X 56	S	X	X	O X 49	X	A	A	A	
9	A	A	A	A	A	A	O X 38	A	B	B	O X 44	X 41	B	B	B	B	O X 48	X 44	X 44	X 44	X 35	X 27	O X 48	A	
10	A	A	B	B	A	Y	B	B	B	A	X 39	X 51	X 50	X 48	X 47	X 47	B	O X 45	X 42	B	X 27	B	Y	A	
11	A	B	A	A	B	A	A	A	B	O X 46	X 50	X 49	X 49	X 49	X 49	X 49	X	X	X	X	X	A	A	A	
12	A	A	A	A	B	A	B	B	B	B	B	B	O X 47	X 49	X 46	X	B	B	Y	Y	32	A	Y	A	
13	A	A	B	A	A	70	B	B	B	B	O X 41	B	B	B	B	B	B	B	B	X 40	X 37	A	A	A	
14	51	A	A	A	B	B	B	B	A	B	B	B	B	O X 36	B	B	B	B	O X 44	X 32	X 32	X 24	S	S	
15	Y	Y	A	B	B	B	A	B	B	O X 41	X 44	S	B	B	O X 51	X 44	X 43	X	B	X 43	X 43	X 38	X 33	A	
16	A	A	A	O X 33	B	B	A	X 43	X 44	X 43	X 47	B	X 51	X 52	X 59	X 53	X 52	X 54	X 41	X 38	S	S	A	A	
17	A	A	A	A	A	O X 37	X 42	X 41	X 42	X 42	Y	O X 45	X 46	X 47	X 48	X 51	X 51	X 48	X 47	X 45	X 44	X 33	A	51	
18	46	A	A	O X 34	X 48	B	B	B	B	A	B	B	B	B	B	B	B	B	B	O X 39	X 39	S	A	A	
19	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	B	
20	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	B	X 33	X 25	A	A
21	A	A	A	A	A	A	B	B	O X 39	X 43	B	B	B	B	B	B	B	B	B	B	X 43	A	27	Y	A
22	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A	A	
23	A	50	B	B	B	O X 40	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 43	X 38	X 34	Y	A	A
24	B	B	A	A	Y	B	A	S	B	B	B	B	B	B	B	B	B	B	O X 48	X 45	B	A	A	A	A
25	A	A	S	A	A	A	O X 45	A	B	B	B	B	B	B	B	B	B	B	B	B	X 47	X 46	X 41	X 32	X 32
26	A	S	S	A	A	B	A	O X 39	X 42	S	B	X 43	B	B	O X 48	X 48	X 47	X 48	X 45	X 33	B	O X 38	X 37	X 36	
27	A	O X 48	X 32	X 36	X 35	A	X 44	X 47	X 48	X 48	X 50	X 50	X 50	X 55	X 56	X 51	X 49	X 47	X 48	X 47	X 47	X 47	X 45	X 41	
28	48	A	A	A	A	A	A	A	A	A	B	B	B	O X 43	X 37	B	B	B	O X 47	X 45	X 43	A	A	A	A
29	A	A	A	B	B	B	B	B	S	X 40	X 41	O X 42	X 43	O X 43	X 43	B	B	B	O X 39	X 39	X 34	X 32	A	A	A
30	A	B	B	B	B	A	B	A	O X 40	X 41	X 43	X 43	R	O X 43	X 43	B	B	B	O X 45	X 42	A	A	A	A	B
31	A	A	B	B	B	B	B	B	O X 40	X 43	X 43	B	B	B	B	B	B	B	O X 43	B	B	O X 38	X 32	X 29	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	4	4	3	6	5	5	8	7	12	13	15	13	12	13	16	16	11	16	20	21	20	13	8	5	
MED	47	49	O X 32	X 34	X 46	X 42	X 43	X 43	X 42	X 43	X 44	X 45	X 50	X 49	X 50	X 50	X 49	X 48	X 45	X 43	X 38	X 33	X 34	X 36	
U Q	50	53	O X 44	X 36	X 52	X 56	X 47	X 50	X 45	X 48	X 50	X 52	X 52	X 54	X 56	X 52	X 52	X 52	X 47	X 46	X 42	X 38	X 42	X 46	
L Q	38	39	X 31	X 32	X 34	X 38	X 36	X 39	X 40	X 41	X 41	X 42	X 46	X 45	X 48	X 48	X 47	X 45	X 42	X 38	X 34	X 30	X 30	X 28	

OCT. 1996 fxI (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 1996 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	Y	S	C	S 24	C	C	C	C	C	C	C	C	C	C	C	R 38	C	C	C	C	C	C	C	C
2	C	C	S	C	C	A		C	C	C	C	C	C	C		49 45	C	C	C	C	C	A	A	C
3	C	A	C	C	A	C	A	C	C	B	C	C	C	C	C	B	C		37 32	R 28		A	S	C
4	C	A	B	B	A	A		28 31	33 37	D C	R		39 41	42 42	41 43	39 40	30				B	Y	Y	
5	A	A	A	A	A	A	S	A	R				V U R	41 47	45 44	44 42	39 35	32 27			F	F	A	
6	A	A	A		26 27	A	B	B	R		R J R	R J R	R J R	R J R	R J R	J R	J R	47 47	46 39	F	F	F	F	
7	24	24	24	24	33 29	37 41	40 45	50 52	52 52	J R	R	R	48 47	52 56	53 52	51 46	42 44	44 33	26 18			U S		
8	A	R	R	S	R	R	R	R	43 43	45 47	48 52	52 50	D S	45 48	47 43	R	R	R	R	R	A	A	A	
9	A	A	A	A	A	A	A	A	B	B	R		B	B	B	R	R	R	R	R	A	R	A	
10	A	A	B	B	A	Y	B	B	B	A		33 44	44 42	41 41		B	39 36				B	Y	A	
11	A	B	A	A	B	A	A	A	B	R U R	R	R	40 44	43 43	43 43	41 44	J F	B	37 33		A	A	A	
12	A	A	A	A	B	A	B	B	B	B	B	B	41 37	43 40	J R	B	B	Y	Y	F	A	Y	A	
13	A	A	B	A	A	A	B	B	B	B	R	B	B	B	B	B	B	B	B	34 31		A	A	A
14	F	A	A	A	B	B	B	B	A	B	B	B	B	R	B	B	B	B	R	26 18		S	S	
15	Y	Y	A	B	B	B	A	B	B U R	R D S	B	B	B	R J R	J R	B J R	B J R	B J R	R	R	R	F	A	A
16	A	A	A	R	B	B	A		37 38	37 41	J R	B	45 46	53 47	J R	46 48	35 30	R	F	S	S	A	A	
17	A	A	A	A	A	31 36	33 36	36 36	R	Y		39 40	41 42	42 45	42 42	41 39	J R	F	J R	F	F	A	R	
18	F	A	A	R	A	B	B	B	B	A	B	B	B	B	B	B	B	B	B	R	S	A	A	
19	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	33 33	A	A	A	B
20	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	B		A	A	
21	A	A	A	A	A	A	B	B	33	37		B	B	B	B	B	B	B	B	37	A	F	Y	A
22	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A	A
23	A	A	B	B	B	R	B	B	B	B	B	B	B	B	B	B	B	B		37 32	28	Y	A	A
24	B	B	A	A	Y	B	A	S	B	B	B	B	B	B	B	B	B	B	42 39	R	B	A	A	A
25	A	A	S	A	A	A	R	A	B	B	B	B	B	B	B	B	B	B	41 40	J S	F J F	A	A	
26	A	S	S	A	A	B	A		33 36	S	B	B	R	42 42	41 42	39 27	B			B	R	F J R		
27	A	A		R	A		38 41	42 42	44 44	44 44	44 49	50 45	43 41	42 41	41 41	41 39	J R	F	J R	F	A	A	F	
28	28	A	A	A	A	A	A	A	A	A	B	B	B	37 31	R	B	B	B	40 37	R	R	A	A	A
29	A	A	A	B	B	B	B	B	S		R		B	R	B	B	B	B	33 33	R	28 26	A	A	A
30	A	B	B	B	B	A	B	A	F	R U R	R		37 37	B	B	B	B	39 36	A	A	A	A	B	
31	A	A	B	B	B	B	B	B	34 37	37	B	B	B	B	B	B	B	37	B	R	32 26	23	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	2	3	6	4	4	8	7	12	13	16	14	12	14	16	16	12	16	20	21	20	13	8	5
MED	28	30	26	26	31	32	36	37	36	37	38	38	44	43	44	44	42	42	39	37	32	26	26	30
U Q	30		38	28	41	35	38	41	39	42	44	44	46	48	50	46	46	46	41	40	34	31	34	32
L Q	26		24	24	28	30	30	33	34	35	35	37	40	37	42	42	41	39	36	31	28	21	24	21

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 1996 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	12	27	C	12	C	C	C	C	C	C	C	C	C	C	C	E B 24	C	C	C	C	C	C	C	C	
2	C	C	37	C	C	51	50	C	C	C	C	C	C	C	C	26	26	C	C	C	C	C	41	32	C
3	C	51	C	C	39	C	46	C	C	B	C	C	C	C	C	B	C	E B 24	E B 23	27	33	27	C	C	
4	C	33	B	B	44	31	21	16	20	22	26	27	26	26	26	23	E B 24	17	26	E B 19	E B 14	B	17	28	
5	42	46	48	44	37	46	30	37	22	23	24	25	27	29	29	32	29	26	17	14	27	26	10	27	
6	28	31	31	31	27	33	B	B	33	36	26	27	33	26	26	29	26	20	E B 23	16	E B 13	E B 14	E B 23	E B 14	
7	E B 14	27	12	21	17	16	27	27	27	27	30	27	37	29	31	29	E B 29	E B 20	E B 23	16	E B 16	E B 13	E B 12	E B 10	
8	59	37	31	30	32	42	46	37	28	27	32	32	30	33	28	26	E B 24	23	26	33	32	80	41	70	
9	34	54	54	59	33	35	22	43	B	B	E B 26	25	B	B	E B 30	24	E B 24	E B 25	E B 24	E B 24	12	71	90	70	
10	56	71	B	B	32	27	B	B	B	E B 32	E B 26	E B 30	27	27	24	24	E B 23	E B 23	E B 24	B	11	B	16	40	
11	32	B	56	34	B	38	32	37	B	34	25	26	26	27	26	23	27	17	B	E B 20	17	39	45	43	
12	59	59	59	43	43	43	43	41	B	B	B	B	27	24	E B 30	E B 30	B	B	33	27	16	27	17	41	
13	37	43	B	58	44	52	B	B	B	B	31	B	B	B	B	B	B	B	B	B	28	32	33	33	42
14	59	59	90	55	B	B	B	B	40	B	B	B	B	E B 30	B	B	B	B	E B 31	32	17	16	16	16	
15	16	14	42	B	B	B	43	B	E B 31	E B 30	26	B	B	E B 30	E B 29	25	B	27	E B 23	E B 16	12	37	31	31	
16	27	30	40	41	B	B	51	33	23	24	29	B	27	26	29	27	23	23	E B 24	26	33	27	40	41	
17	46	41	47	37	31	33	27	23	23	24	26	27	28	26	27	27	27	26	26	28	16	E B 12	29	46	
18	104	93	46	40	37	B	B	B	B	45	B	B	B	B	B	B	B	B	B	E B 24	E B 21	32	36	33	
19	70	44	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	32	44	43	44	B
20	42	41	31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	17	17	32	71
21	37	41	33	29	33	37	B	B	28	B	26	B	B	B	B	B	B	B	B	E B 24	33	12	17	43	
22	27	36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A 47	B	48	40	50
23	47	34	B	B	B	67	B	B	B	B	B	B	B	B	B	B	B	B	E B 24	26	17	20	33	49	
24	B	B	37	42	20	39	32	B	B	B	B	B	B	B	B	B	B	E B 30	E B 24	B	33	80	39	39	
25	39	38	E B 23	36	40	34	37	45	B	B	B	B	B	B	B	B	B	B	E B 23	E B 23	24	17	26	40	
26	38	28	32	50	41	B	39	37	36	27	B	E B 31	B	B	27	25	18	E B 30	E B 23	E B 23	B	E B 24	18	29	
27	32	31	31	26	34	38	36	32	31	26	30	31	32	26	33	29	27	23	E B 22	20	17	E B 14	13	18	
28	33	51	47	41	57	46	44	44	42	44	B	B	B	27	26	B	B	B	E B 30	35	E B 23	42	44	38	
29	71	70	43	B	B	B	B	B	32	26	28	26	26	26	27	B	B	B	B	23	30	18	28	38	52
30	42	B	B	B	B	41	B	42	28	26	26	26	26	26	26	B	B	E B 30	24	70	92	68	34	B	
31	90	32	B	B	B	B	B	B	27	36	26	B	B	B	B	B	B	E B 26	B	E B 24	17	E B 14	33	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	27	27	21	19	17	18	16	15	16	17	17	14	13	14	16	16	12	16	22	25	27	28	29	26	
MED	39	41	40	40	34	38	38	37	28	27	26	26	27	26	26	26	25	22	E B 24	26	18	27	32	40	
U Q	59	51	48	44	40	46	45	43	34	35	30	30	31	29	30	29	27	E B 26	26	31	32	42	40	46	
L Q	32	31	31	30	32	33	28	32	25	25	26	26	26	26	26	24	24	22	E B 23	22	E B 16	16	17	29	

OCT. 1996 ftEs (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 1996 fmin (0.1MHz) 45'E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 1996 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		Y	A	C	S	C	C	C	C	C	C	C	C	C	C	C		C	C	C	C	C	C	C	C	
2		C	C	A	C	C	A	A	C	C	C	C	C	C	C		205	C	C	C	C	C	C	A	A	C
3		C	A	C	C	A	C	A	C	C	B	C	C	C	C			C	E	B	E	A	A	A	C	C
4		C	A	B	B	A	A	A											240	260	250			B	Y	A
5		A	A	A	A	A	A	A	A																	A
6		A	A	A	A	A	A	B	B															B	B	
7		E A																								
8		270	290	280	300	300	250	240	215	200	230	210	225	200	200	200	220	230	210	215	210	235	215	220	265	
9		A	A	A	A	A	A	A	A																	
10		A	A	B	B	A	Y	B	B	B	A	E B														
11		A	B	A	A	B	A	A	A	B																
12		A	A	A	A	B	A	B	B	B	B	B	E B													
13		A	A	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B					
14		A	A	A	A	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B					
15		A	Y	A	B	B	B	A	B	E B	B															
16		A	A	A	A	B	B	A E A	A																	
17		A	A	A	A	A	A E A	A	A																	
18		A	A	A		A	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B					
19		A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B					
20		A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B					
21		A	A	A	A	A	A	B	E B	B	B	B	B	B	B	B	B	B	B	B	B					
22		A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B					
23		A	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B					
24		B	B	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B					
25		A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B					
26		A	A	A	A	A	B	A																		
27		A	A	A		A	A																			
28		A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B					
29		A	A	A	B	B	B	B	B	A																
30		A	B	B	B	B	A	B	A																	
31		A	A	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		2	1	1	3	1	1	5	7	12	13	17	14	13	14	16	16	12	16	20	20	19	11	7	5	
MED		270	290	280	250	300	250	242	235	215	202	200	210	210	210	210	211	208	228	234	244	260	270	250	265	
U Q					300			255	250	232	228	220	225	235	220	220	225	222	245	252	262	280	290	270	278	
L Q					240			220	215	205	200	200	200	200	200	202	205	200	210	225	228	240	245	230	250	

OCT. 1996 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1996 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	B	A	B	A	A	A	XO	XO	XO	XO	XO	XO	XO	XO	YO	XO	XO	R	X	X	X	X	X	X	X	
2	O	X		A	A	X		X	YO	XO	XO	S	O	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	
3	38	37		YO	XO	X	O	XO	X	Y	Y	Y	Y	S	R	R	X	X	X	X	X	X	XO	X	Y	
4	Y	A	O	X	A		S	A	O	XO	XO	XO	XO	X	B	B	B	B	Y	X	X	X	A	A	A	
5	A	B	A	B	B	A	A	B	O	X	Y	B	B	B	B	O	X	B	B	O	X	X	X	O	X	A
6	A		A	A	A		B	B	YO	X	X	YO	X	B	B	B	B	B	B	O	X	X	X	X	A	
7	B	B	A	A	A	B	O	X	B	B	YO	XO	X	B	B	Y	B	O	XO	XO	X	X	XO	X	X	
8	Y	YO	X	YO	X		O	X	Y	B	XO	XO	XO	X	B	Y	Y	Y	XO	X	X	X	X	X	X	
9		X		X		B		B	B	O	XO	XO	X	R	O	X	X	XO	X	B	B	B	S	A	B	
10	A	A		B	Y	A	B	Y	Y	A	O	X	XO	XO	XO	XO	X	X	X	X	X	X	X	X	X	
11	X	X	X	YO	X	X	XO	XO	X	XO	X	R	YO	XO	X	X	XO	X	X	X	X	X	X	A	O	X
12	O	X	XO	X	B	B	B	B		X	O	XO	X	B	O	X	X	X	XO	X	X	X	X	X	X	X
13	X	Y	A	A	X	X	X	X	X	X	XO	X	B	X	XO	X	X	X	XO	X	X	X	X	X	A	
14	A	A		58	47	A	A	A	YO	XO	XO	XO	XO	XO	XO	X	B	B	X	A	A	A	A	O	X	A
15	A	A	A	B	B	A	A	O	X	43	48	B	B	B	B	B	B	O	X	B	B	X	XO	X	A	A
16	A	O	XO	X	A	X	XO	X	XO	XO	XO	XO	XO	X	B	O	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO
17	O	X		B	A	A	A	A	A	O	X	Y	B	O	X	B		O	XO	X	XO	X	X	X	XO	X
18	44	O	X		B	B	B	B	B	B	B	B	B	B	B	B	B	B	O	XO	X	X	X	XO	X	
19	X	X	X	X	X	B	B	Y	YO	XO	X	B	B	B	B	B	S	O	X	B	B	O	X	O	X	A
20	A	A	A	B	A	YO	X	XO	X	XO	X	B	B	B	B	O	X	R	O	XO	XO	XO	X	X	A	B
21	B	B	X	A	B	B	A	A	Y	B	B	O	XO	X	Y	B	O	XO	XO	X	X	X	X	X	X	X
22	O	X	B	A	A	B	YO	X	X	X	XO	X	X	X	YO	X	YO	XO	XO	X	X	X	XO	XO	XO	X
23	X	X	X	X	X	X	X	X	X	X	XO	X	B	B	O	XO	XO	X	X	X	X	X	X	YO	X	X
24	O	X	X	A	O	X	X		X	X	XO	X	X	XO	X	X	B	B	O	XO	X	A	O	X	O	X
25	43	46		B	A	O	XO	X	B	B	B	YO	XO	XO	XO	XO	X	XO	XO	XO	XO	XO	X	X	X	X
26	O	X	A		47	56	48	49	YO	XO	XO	X	X	X	X	XO	XO	XO	X	X	X	X	X	X	Y	
27	44	O	X	A	A	Y	A	Y	YO	XO	XO	X	YO	X	Y	B	O	XO	XO	XO	XO	XO	XO	XO	X	X
28	YO	X		S	Y	Y	A	YO	XO	X	R	Y	Y	YO	X	B	X	X	X	Y	Y			XO	X	X
29	X	A	A	A	A	A	YO	XO	X	X	X	XO	XO	XO	XO	X	X	XO	X	Y	YO	XO	X	X	X	X
30	B	A	A	A	A	A		56	62	59	58	55	54	53	54	51	49	49	48	48	48	48	49	48	48	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	16	15	14	7	13	11	12	15	17	21	21	18	16	17	17	19	21	24	25	25	25	27	24	19		
MED	X	X	X	X	X	X	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	X	X	X	X	X
UQ	44	44	48	48	49	52	53	56	56	57	57	55	58	58	58	55	55	50	50	50	50	48	48	46	44	
LQ	X	X	X	X	X	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	X	X	XO	X	X
	38	37	42	46	42	47	43	46	46	46	46	49	46	50	49	50	48	47	46	44	42	39	40	39		

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1996 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1996 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	B	41	B	41	37	41	31	23	24	26	27	28	27	26	26	27	26	20	19	20	17	13	10	E B 13		
2	E B 13	29	45	38	26	19	29	30	30	26	E B 31	E B 30	26	28	28	36	25	E B 26	E B 24	19	17	17	13	E B 13		
3	E B 10	12	32	27	26	30	20	21	23	31	32	28	26	32	28	33	32	24	16	21	16	16	18	26		
4	26	32	26	38	32	35	37	32	26	33	32	32	B	B	B	B	B	41	21	31	27	41	41	41		
5	59	B	41	B	B	41	43	B	41	37	B	B	B	B	E B 31	B	B	B	E B 24	27	17	24	16	38		
6	70	33	59	36	31	32	B	B	26	33	27	33	27	B	B	B	B	B	B	E B 24	22	27	14	32		
7	B	B	38	43	42	B	34	B	B	32	27	36	B	B	26	B	26	E B 30	E B 24	E B 23	17	16	E B 24	31		
8	27	33	37	27	32	34	33	33	26	B	26	34	37	B	37	37	26	32	E B 24	17	16	17	E B 14	27		
9	11	23	27	30	32	B	43	B	B	37	34	27	27	31	31	32	25	B	B	B	B	37	67	B		
10	37	51	70	B	39	42	B	27	37	50	37	31	26	41	28	26	33	27	E B 24	22	19	32	25	13		
11	19	32	33	34	41	38	29	31	31	33	32	33	28	36	43	39	37	30	37	23	26	27	34	20		
12	E B 18	26	34	B	B	B	B	B	35	42	37	30	31	B	27	30	27	26	26	E B 25	35	26	33	E B 18	47	
13	32	34	56	43	37	31	27	29	26	27	43	B	29	29	26	E B 30	23	26	26	21	26	33	33	42		
14	43	46	42	57	45	46	43	33	27	27	26	27	27	E B 29	27	B	B	B	B	27	43	41	38	51	46	71
15	41	37	37	B	B	45	51	32	51	29	B	B	B	B	B	B	E B 31	B	B	B	27	32	26	40	42	
16	34	37	34	37	34	31	27	31	30	27	27	31	26	E B 31	B	26	37	36	26	E B 30	42	27	27	31		
17	32	33	B	45	42	46	42	42	42	30	27	B	27	B	26	27	17	25	E B 25	E B 24	17	43	26	31		
18	45	41	33	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 30	41	34	22	25	32	38		
19	34	17	26	26	36	B	B	28	29	27	26	B	B	B	B	B	E B 30	27	B	B	32	32	38	52		
20	38	48	70	B	42	33	27	24	E B 31	B	B	B	B	36	26	27	27	28	E B 31	E B 24	16	30	69	B		
21	B	B	27	62	B	B	46	46	33	B	B	27	26	34	B	29	26	24	E B 25	23	21	17	17	26		
22	34	B	43	37	42	B	33	27	27	32	26	32	32	33	41	31	27	26	26	E B 24	27	28	E B 24	24		
23	E B 21	36	25	27	39	32	39	26	31	28	E B 31	B	B	27	41	27	27	27	21	26	E B 23	21	33	38		
24	32	31	46	37	51	47	24	27	32	27	32	33	48	42	E B 32	28	G	B	B	26	33	42	41	38	34	
25	38	43	B	46	32	33	B	B	B	42	32	32	30	G	33	29	G	G	E B 29	26	56	27	27	21		
26	37	56	37	47	32	56	43	33	33	27	33	34	42	33	27	31	33	25	31	47	33	32	31	32		
27	32	38	48	A	41	47	40	26	B	28	28	32	32	31	36	B	E B 30	E B 44	E B 29	E B 30	25	21	26	26		
28	32	31	47	37	44	43	46	41	35	27	32	31	27	36	35	B	38	35	26	33	36	32	38	36		
29	32	46	41	42	44	42	33	34	31	33	32	33	41	36	33	30	39	27	26	E B 24	E B 25	43	23	27		
30	B	57	45	46	47	44	47	32	32	33	32	34	35	34	36	27	27	27	23	24	23	20	16	17		
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	26	26	27	23	25	23	24	24	25	26	25	22	21	21	23	20	24	25	26	28	29	30	30	28		
MED	32	35	38	38	39	41	36	31	31	30	31	32	27	32	30	28	26	26	25	24	25	27	26	31		
U Q	38	43	46	45	42	45	43	33	34	33	32	33	34	36	36	32	32	30	29	30	32	33	38	38		
L Q	E B 26	31	33	34	32	32	29	27	26	27	27	30	26	28	27	27	26	26	24	23	17	21	18	25		

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1996 fmin (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1996 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	B	A	B	A	A	A	E A																	
2	250	270		A	A	A	250	240	225	220	200	200	210	230	225	220	215	205	215	235	240	235	245	245
3	245	250		A	A	235	215	220	200	200	205	210	205	210	200	205	205	200	200	220	230	235	250	
4	A	A	A	A	A	E A	245	A		A			B	B	B	B	B	A		225	230	250	A	A
5	A	B	A	B	B	A	A	B	A	E A	B	B	B	B		215		B	B	230	240	255	A	A
6	A	A	A	A	A		B	B	Y			A		B	B	B	B	B	B		240	245	250	260
7	B	B	A	A	A	B	A	B	B					B	B	Y	B	E B		245	220	215	240	240
8	Y	Y		Y	A							B		A	B	A	A	Y		235	200	215	225	240
9	290	290	280	A	E B	B		B	B	E A	A								B	B	B	B	A	A
10	A	A	A	B	A	A	B	Y	A	A			215	200	200	200	220	200	205	200	200	240	285	260
11	290		215	A	A																			A
12	275	280		A	B	B	B	E A	A	A				B										A
13	A	250		A	A	A	250	215	220	200	200	230	200											A
14	A	A	A	A	A	A	A	A			250	200	210	210	210	225	245			200				E A
15	A	A	A	B	B	A	A		A		B	B	B	B	B	B								A
16	A	A	A	A	A	A																		A
17	300	235		B	A	A	A	A	A		215	200		195		225	215	215	235	205	230	240	255	240
18	230		A	A	B	B	B	B	B	B	B	B	B	B	B	B								A
19	340		A	A	A	A	B	B	Y		230	230	205											A
20	A	A	A	B	A	A					B	B	B	B										A
21	B	B	A	A	B	B	A	A	A	B	B			S	A	B								A
22	245		B	A	A	A	B	A					200											A
23	250	255	250	250	240	235	205	205	200	200	200													A
24	A	A	A	A		A	205	205	205	200	200													A
25	A	A	B	A	A			B	B	B	A													A
26	265		A	A	A	A	A	A																A
27	235	240		A	A	A	A	Y	B															A
28	A	A	A	A	A	A	A	A																A
29	A	A	A	A	A	A	A																	A
30	B	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	12	9	4	2	6	8	11	16	17	22	25	20	19	18	20	19	23	23	25	26	26	23	21	15
MED	258	255	235	235	235	232	220	216	205	201	205	200	205	200	205	208	210	218	215	232	239	242	250	250
U Q	290	285	265		250	245	235	232	220	230	215	208	210	210	225	220	215	230	230	245	250	255	255	255
L Q	245	245	218		230	215	205	205	200	200	200	200	200	200	200	200	205	205	205	220	230	240	245	240

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 1996 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	X	X		S	X	X	X	X	X	X	X	Y	X	X	X	X	X	X	X	X	X		X	X		
2	X	X	X	X	X	X			O	X	B	B	O	X	X	Y	R	O	X	X	X	X	B	A	A	
3	O	X	X	O	X				A	B	X	O	X	R	R		R	O	X	X	X	X	X	X	X	
4	A	X	B	B	A		A	S	X	X	X	X	X	X	A	X	X	X	X	X	Y	Y	O	X	A	
5	A	A	A	S	X	X	X	X	X	X	X	X	R	R	A	A	O	X	X	X	X	X	X	X	X	
6	O	X	X	X	X	X	X	X	X	X	Y	X	B	X	A	O	X	X	X	X	X	X	X	X	X	
7	X	X	X	X	X	X	X	X	X	X	Y	B	B	R	O	X	X	X	X	X	X	X	X	X	X	
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	R	O	X	X	X	A	X	X	X	
9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	C	C	C	C	C	C	C	C	
10	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	
11	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	
12	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	
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	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	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	C	
16	C	B	B	B	A	Y	O	X	R	B	B	B	Y	Y	B	B	B	O	X	X	X	X	X	O	X	
17	X	X	B	X	Y	Y	O	X	S	X	S	X	R	R	B	B	B	O	X	X	X	B	X	X	X	
18	O	X	X	X	O	X	X	X	X	B	B	O	X	R	Y	A	A	B	B	X	X	X	X	X	X	
19	X	X	X	X	X	X	X	X	X	X	X	X	X	R	R	R	O	X	X	X	X	X	X	X	X	
20	X	X	X	X	X	X	X	X	X	X	X	X	X	Y	X	X	R	R	O	X	X	X	X	X	X	
21	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	
22	S	A	A	A	O	X	A	S	X	X	X	X	O	X	X	X	X	X	X	B	O	X	B	X	A	A
23	A	A	A	O	X	S	A	A	B	S	A	R	O	X	B	B	B	R	O	X	X	X	X	X	X	
24	X	X	X	S	R	O	X	X	X	X	R	R	O	X	Y	O	X	A	A	A	O	X	X	Y	X	X
25	O	X	X	O	X	X	X	X	X	B	B	O	X	R	R		O	X	X	X	X	X	X	X	X	
26	X	X	A	A	R	O	X	X	X	X	X	R	R	R	O	X	X	X	X	X	X	X	X	X	X	
27	X	X	A	S	O	X	X	X	X	X	X	X	X	R	R	O	X	X	X	X	X	X	X	X	X	
28	X	X	A	A	A	X	X	X	X	X	X	X	X	X	X	A	X	O	X	X	X	X	X	X	X	
29	X	X	X	X	X	X	X	X	X	X	X	X	X	R	R	R	O	X	X	X	A	X	X	X	X	
30	O	X	X	X	A	Y	A	S	A	A	X	O	X	X	X	X	R	O	X	X	X	B	B	O	X	X
31	X	X	A	O	X	X	A	O	X	X	Y	X	R	O	X	X	X	O	X	X	X	X	X	X	X	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	20	20	15	15	17	19	20	21	16	17	15	19	11	12	10	17	19	20	21	19	22	23	21	20		
MED	X	X	X	O	X	X	X	X	X	X	X	X	O	X	X	O	X	O	X	X	X	X	X	X	X	
UQ	X	X	X	X	X	X	X	X	X	X	X	X	O	X	X	X	X	X	X	X	X	X	X	X	X	
LQ	X	X	X	X	X	X	X	X	X	X	X	X	O	X	X	X	X	X	X	X	X	X	X	X	X	

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 1996 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	J 41	R 36	F 31	F	S 40	45	R 49	52	62	62	55	Y	54	52	52	52	R 52	52	R 45	43	42	F 37	40	40	
2	42	42	R 46	46	R 47	R 51	F 58	F 60	67	B	B	R 58	R 58	J 59	Y D	R 43	U 49	R 46	R 46	46	40	B	A	A	
3	R 38	R 39	R 37	U 37	R 37	R 39	A	A	A	B	J 46	R 47	R	R	R	R	R	R	R	43	37	37	36	36	36
4	A	34	B	B	A	F 40	A	S	45	46	44	42	46	51	A	53	53	R 48	42	Y	Y	R 29	R 33	A	
5	A	A	A	S	R 42	46	53	53	53	48	49	R	R	A	A	R	R	R	43	43	40	38	39	41	43
6	45	F 43	45	44	47	J 52	R 53	F 49	J 53	S 52	Y	J 54	R	B	J 51	A	R	45	45	R 42	39	41	40	37	38
7	F 32	35	36	40	43	48	53	58	61	53	Y	B	B	R	R	50	47	47	46	46	43	39	39	33	R
8	A	A	R 39	40	42	45	47	52	R	56	51	J 52	R	54	54	51	R	49	45	R 42	A	41	39	37	F 35
9	36	39	35	42	43	49	50	50	54	C	56	58	54	51	49	51	R	C	C	C	C	C	C	C	C
10	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
11	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
12	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
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	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	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	C
16	C	B	B	B	A	Y	R 40	R 46	R 41	B	B	B	Y	Y	B	B	B	R 43	46	48	42	F 42	35	34	
17	38	39	B 42	J 42	Y	Y	49	54	S	45	S	J 45	R	R	B	B	B	Y	R 50	B	37	37	42	R 42	
18	R 43	38	40	47	F 43	R 43	J 52	R 53	53	B	B	55	R	Y	A	A	B	B	J 47	R 46	45	40	40	F 35	
19	36	38	42	47	51	57	57	59	59	60	56	55	J 53	R	R	R	R	45	45	45	J 45	R 47	48	51	45
20	46	46	48	52	F 52	F 62	F 70	F 73	80	80	77	J 73	R	64	Y	57	55	D 42	R 41	R 56	55	J 50	R 51	52	
21	43	F 44	43	F 43	45	49	53	53	B	J 54	J 54	R	62	A	A	A	54	54	J 53	J 52	52	51	37	B	F 36
22	S	A	A	A	R 43	A	S	F 46	50	53	53	53	56	J 53	J 52	52	52	48	R 39	B	40	A	A	A	
23	A	A	A	32	S	A	A	B	S	A	R	40	R	B	B	B	R	39	39	47	45	45	43	43	41
24	41	J 42	S 43	S	R	R 48	J 54	R 60	64	B	B	60	R	R	Y	R	A	A	U 46	R 46	Y 46	J 47	R 46	42	
25	R 43	43	44	43	R 37	F 46	F 47	F 53	B	B	46	R	R	R	R	60	J 57	F 57	Y	47	R 43	J 41	37	F 40	F 38
26	J 40	R 37	R	A	A	R 44	J 45	R 44	44	44	U 44	R	R	R	50	48	46	46	46	45	44	44	46	41	40
27	49	46	R	A	S	47	46	43	44	46	47	47	47	R	D 42	47	47	44	41	41	45	J 50	R 44	40	37
28	F 33	37	A	A	A	44	47	50	J 53	R 54	J 53	R 53	54	55	R	R	52	49	49	44	46	51	50	44	42
29	45	42	F 34	F 34	46	52	58	58	59	59	58	58	R	R	R	58	58	56	48	A	48	J 48	J 48	R 46	R 39
30	R 37	38	47	A	Y	A	S	A	A	52	52	53	53	56	R	48	48	50	B	B	45	33	43	40	
31	37	F 34	A	R	R	A	R	44	45	Y	45	R	46	43	44	48	46	44	J 44	R 44	45	47	44	35	F 32
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	19	20	15	15	17	19	20	21	17	17	15	19	11	13	10	18	20	21	21	19	22	23	21	20	
MED	41	39	42	42	43	46	51	53	54	53	53	53	54	52	50	51	48	46	45	45	44	40	40	40	
U Q	43	42	45	46	47	51	54	58	62	58	56	58	56	56	52	53	52	48	47	46	47	46	44	42	
L Q	37	37	36	40	41	44	47	48	48	46	47	47	53	50	48	47	45	44	43	43	41	37	36	36	

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 1996 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	16	16	38	39	23	28	41	41	32	32	42	43	51	47	44	39	38	47	41	38	28	21	17	E B 19
2	18	18	31	32	27	23	33	34	33		B	52	62	42	46	30	28	30	43	26	31		B	47 42
3	42	43	43	46	47	44	44	45	45		B	34	34	33	41	34	42	27	27	26	23	26	28	17 41
4	39	27		B	43	35	56	44	34	32	31	34	37	33	56	39	36	31	26	27	39	E B E B	24 24	38
5	40	39	34	32	26	E B 24	25	27	32	32		G	28	33	50	58	29	27	27	E B E B 25 25	16	23	39	32
6	32	38	41	40	37	31	33	33	32	27	36	37		B	31	60	41	37	32	51	38	33	34	32 31
7	25	31	26	40	34	34	26	35	37	32	27		B		28	29	36	27	32	27	27	32	27	37
8	37	52	27	41	41	32	29	38	28	34	38	32	34	27	32	36	32	32	33	59	31	26	34	21
9	24	33	31	30	31	31	32	32	30		C	32	33	31	32	32	41		C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	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	B	B	B		41	36	32	32	32		B	B	B		30	26		B	B	BE BE B 31 31	27	25	31 32 27
17	33	38		B	41	40	40	38	30	39	41	37	37	32	28		B	B	BE BE B 32 29		B	36	37	41 40
18	32	36	32	33	37	37	31	32	27		B	B		27	26	32	62	80		B	B	33	27	30 21 17 25
19	16	17	16	42	31	27	33	29	27	33	32	31	27	37	33	32	32	31	26	31	31	32	36	35
20	30	7	46	26	39	37	32	31	27	33	39	36	27	28	33	36	30	37	23	33	26	27	21	31
21	41	37	30	104	31	25	27	E B 30		BE B 36	17	32	71	85	47	27	32	27	26	30	29	28		B 32
22	33	68	58	46	44	46	41	38	33	30	31	34	52	42	42	33	28	32		BE B 31		B	41	48 80
23	37	59	37	52	33	40	68		B	42	41	32	32		B		26	26	E B 32	27	E B 31	26	E B 23	26 36
24	30	33	21	42	16	37	33	33	33	33	27	27	38	41	46	68	90	73	27	32	42	39	42	36 46
25	51	37	31	31	26	27	27	32		B	B		33	27	33	27	24	27	35	37	37	32	33	27 27 27
26	36	40	43	44	38	41	33	27	26	32	27	33	43	32	40	27	27	37	37	26	34	34	26	16
27	26	36	58	47	44	37	26	32	33	27	32	41	45	43	33	33	34	27	28	43	30	26	29	26
28	32	37	41	58	47	37	32	26	26	32	33	37	43	71	71	66	47	32	27	24	33	69	70	53
29	27	33	30	38	32	16	36	43	49	37	37	26	31	42	42	43	43	39	58	42	37	36	38	41
30	40	66	68	51	32	52	39	52	50	33	33	41	47	47	46	33	27	E B 31		B	B	37	37	45 30
31	52	47	47	41	42	44	44	45	37	32	32	35	32	33	32	27	27	37	32	26	25	34	18	40
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	24	22	23	25	25	25	24	23	19	22	23	22	24	22	23	21	23	22	22	23	23	23	23
MED	32	37	36	41	37	36	33	32	33	32	32	34	34	35	42	36	32	32	29	28	31	28	32	32
U Q	40	42	43	46	42	40	40	40	37	34	36	37	45	44	56	41	36	37	37	38	34	36	39	41
L Q	26	32	30	33	31	28	30	30	28	32	31	32	31	30	33	29	27	30	26	26	26	26	24	27

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 1996 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	7	13	13	14	13	14	10	20	16	15	20	16	19	16	16	13	16	14	18	14	14	15	19
2	15	13	8	14	14	9	11	14	13	B	B	24	24	25	21	19	19	24	19	14	10	B	23	23
3	15	11	14	11	16	14	23	15	15	B	15	24	15	16	16	16	24	14	14	14	15	10	14	13
4	13	13	B	B	26	16	20	13	13	13	13	13	13	13	12	13	13	13	9	24	15	24	24	10
5	17	25	16	15	14	24	14	14	13	14	23	24	15	14	14	23	22	19	25	25	14	14	10	8
6	9	8	11	5	9	10	13	16	15	23	23	23	B	23	15	23	14	14	7	10	14	9	11	9
7	10	16	11	12	15	10	14	9	9	14	23	B	B	15	15	14	23	21	14	14	14	12	13	
8	23	24	15	14	14	12	10	10	14	14	16	14	14	15	14	14	14	14	14	14	14	10	14	10
9	8	13	23	9	10	9	14	10	14	C	24	11	13	15	15	15	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	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	B	B	B	24	20	15	16	14	B	B	B	15	23	B	B	B	31	31	24	23	15	9	11
17	10	16	B	24	23	24	23	14	24	24	24	24	15	23	B	B	B	32	29	B	15	16	15	15
18	15	14	14	14	23	10	14	14	11	B	B	24	24	14	25	32	B	B	24	9	11	14	13	14
19	11	14	14	14	13	14	9	11	15	10	14	15	15	15	23	14	16	14	14	14	10	10	10	10
20	11	9	10	10	9	14	10	10	14	9	15	14	14	24	15	16	20	15	14	13	10	10	14	14
21	11	9	11	13	14	14	15	30	B	36	14	14	15	14	14	14	14	14	15	13	13	14	13	13
22	24	23	14	21	14	21	16	10	14	14	14	19	16	13	15	14	14	14	B	31	B	10	14	23
23	10	15	23	13	14	24	22	B	24	14	14	15	B	B	B	25	24	32	15	31	24	23	14	14
24	10	12	19	25	14	15	14	11	14	16	24	24	24	23	23	23	22	14	14	14	14	10	10	10
25	11	14	13	10	14	14	9	14	B	B	24	44	15	24	23	15	14	24	24	16	9	11	13	14
26	13	14	19	14	13	14	14	14	14	10	14	14	14	15	24	23	16	14	14	10	10	14	10	14
27	10	11	14	14	16	14	10	10	14	14	14	14	14	14	15	13	14	10	10	9	9	14	11	10
28	10	14	25	14	20	14	10	14	10	14	11	15	14	15	14	23	14	23	14	14	9	9	9	9
29	10	10	11	13	14	14	10	14	14	14	14	15	23	14	14	15	15	14	14	14	10	9	9	23
30	14	15	15	19	16	23	14	14	14	11	14	14	14	15	15	16	15	31	B	B	24	23	14	11
31	13	14	14	14	14	15	14	16	14	13	15	14	11	13	13	14	15	16	14	13	14	14	8	9
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	25	25	25	25	25	25	25	25	24	25	25	25	25	25	25	24	24	24	24	24	24	24	23
MED	11	14	14	14	14	14	14	14	14	14	15	15	15	15	15	16	16	16	14	14	14	14	13	13
U Q	14	16	21	17	16	18	15	14	15	B	24	24	24	23	23	23	22	24	24	24	15	14	14	14
L Q	10	11	12	12	14	12	10	10	14	14	14	14	14	14	14	14	14	14	14	14	13	10	10	10

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 1996 h'F (KM)

45'E MEAN TIME (G.M.T. + 3 H)

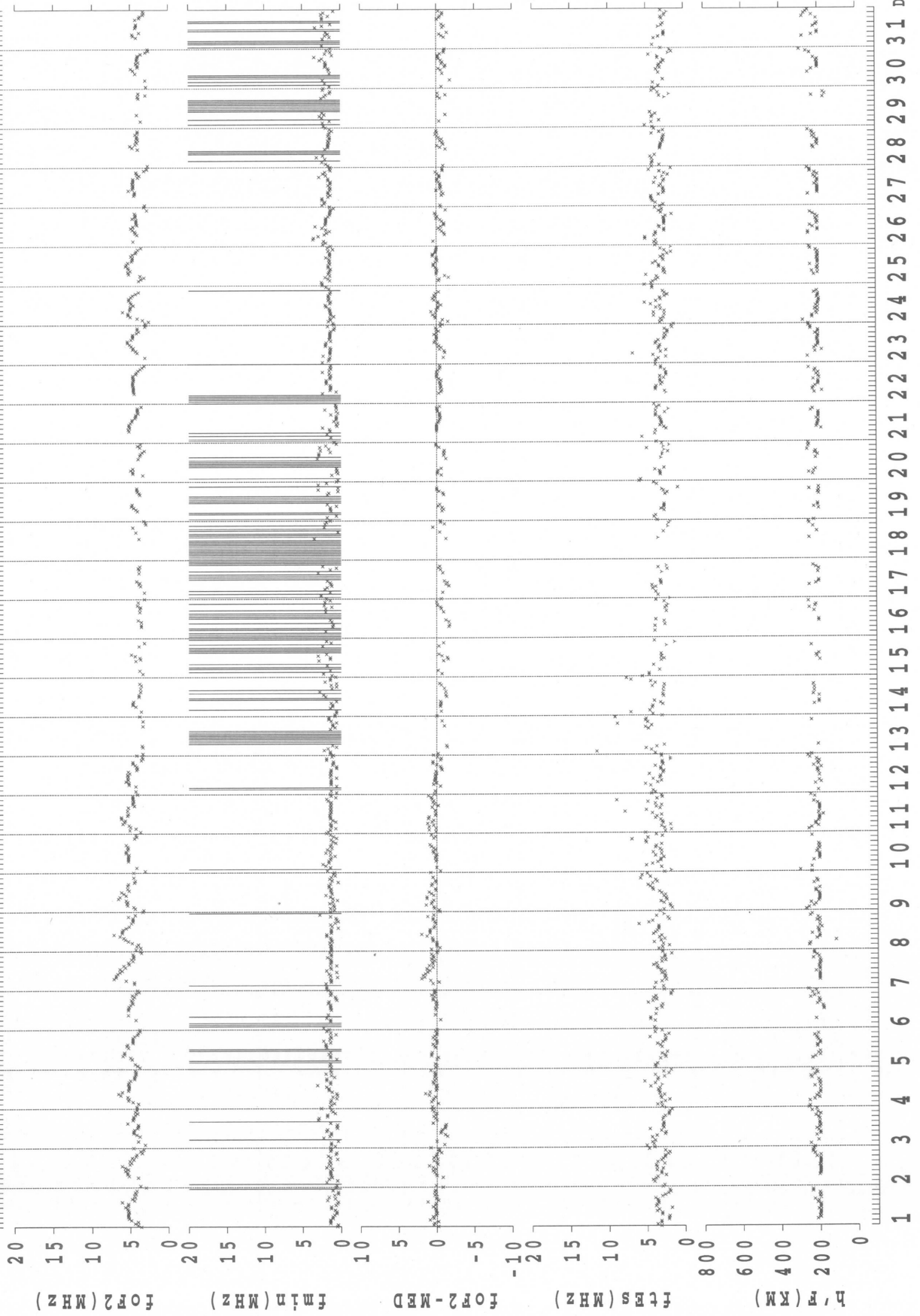
LAT. 69'00.4'S LON. 039'35.4'E SWEEP 0.4MHZ TO 15.0MHZ IN 20.0SEC IN MANUAL SCALING

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	245	255	A	A	A	E A	A	A	215	205	250	240	A	A	A	200	200	A	E A	265	230	215	225	230	250
2	245	235	A	A	250	230	205	210	210	200	B	B	A	A	A	215	205	210	225	230	E A	B	A	A	
3	A	E A	A	A	A	A	A	A	A	B	E A	245	205	200	220	205	220	215	210	225	210	H	A	E A	E A
4	A	A	B	B	A	A	A	A	210	200	215	240	200	220	A	225	205	205	205	Y	A	B	B	A	
5	A	A	A	A	A	235	205	205	205	200	200	215	200	A	A	200	205	215	230	205	205	240	A	E A	
6	245	245	E A	E A	A	230	200	200	225	200	220	A	B	200	A	225	200	200	220	200	215	220	A	245	
7	E A	A	E A	E A	E A	205	215	215	200	200	Y	B	B	200	200	200	200	205	210	215	225	230	A		
8	A	A	A	225	A	215	200	200	H	200	205	200	200	200	200	200	200	200	200	A	220	200	245	225	
9	E A	A	E A	E A	235	200	210	200	200	C	200	200	200	200	200	200	C	C	C	C	C	C	C	C	
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	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	B	B	B	A	A	240	245	210	B	B	B	S	B	B	B	B	200	200	E B	230	235	250	E A	
17	A	A	B	A	A	A	A	A	A	A	A	A	200	245	B	B	B	200	200	B	215	A	A	A	
18	A	A	A	A	A	A	225	205	200	B	B	205	E B	Y	A	A	B	B	205	210	240	225	220	240	
19	E Y	E Y	250	250	240	240	225	205	200	200	200	200	215	200	205	200	215	230	205	210	205	210	A	200	
20	A	A	240	240	230	250	225	205	200	200	200	225	200	235	200	195	200	E A	240	200	215	200	215	205	200
21	E A	250	250	245	230	230	210	210	B	205	195	200	A	A	A	200	200	195	205	200	200	A	B	A	
22	A	A	A	A	A	A	220	230	200	200	195	220	215	200	225	210	200	205	B	B	250	B	A	A	
23	A	A	A	A	A	A	225	B	A	A	E A	B	B	B	225	225	245	215	235	220	230	255	E A	A	
24	A	245	240	A	240	A	210	215	200	200	204	A	A	205	A	A	A	230	200	A	E A	E A	E A	A	
25	A	E A	E A	E A	270	250	230	200	200	200	B	B	210	200	200	200	205	245	A	A	200	225	205	260	
26	225	A	A	A	A	A	E A	255	225	200	200	210	230	A	220	200	200	205	200	200	220	230	250	230	
27	250	240	A	A	205	A	220	200	A	200	215	210	220	210	205	195	210	210	215	215	230	240	240	240	
28	E A	E A	265	255	A	A	230	210	200	200	205	200	225	220	44	200	205	205	220	210	215	250	E A	A	
29	E A	E A	245	265	215	250	230	200	200	200	200	205	200	205	200	200	200	225	A	E A	230	230	215	A	
30	A	E A	E A	E A	A	A	A	A	A	A	230	240	205	200	230	215	220	240	E B	B	B	E A	E A	E A	
31	A	A	A	A	E A	A	A	A	A	A	200	200	200	210	205	225	200	205	200	200	200	215	225	230	
	00	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	11	13	14	19	20	17	17	20	18	16	18	12	21	19	21	20	19	22	20	14	14	
MED	240	245	240	E A	250	230	215	210	202	200	200	200	208	200	202	202	200	205	208	205	212	218	225	236	
U Q	E	E	E A	E A	A	A	242	230	225	215	208	205	212	230	212	220	208	222	205	228	220	230	230	240	
L Q	245	240	240	240	228	205	200	200	200	200	200	200	200	200	200	200	200	200	200	200	205	215	215	230	

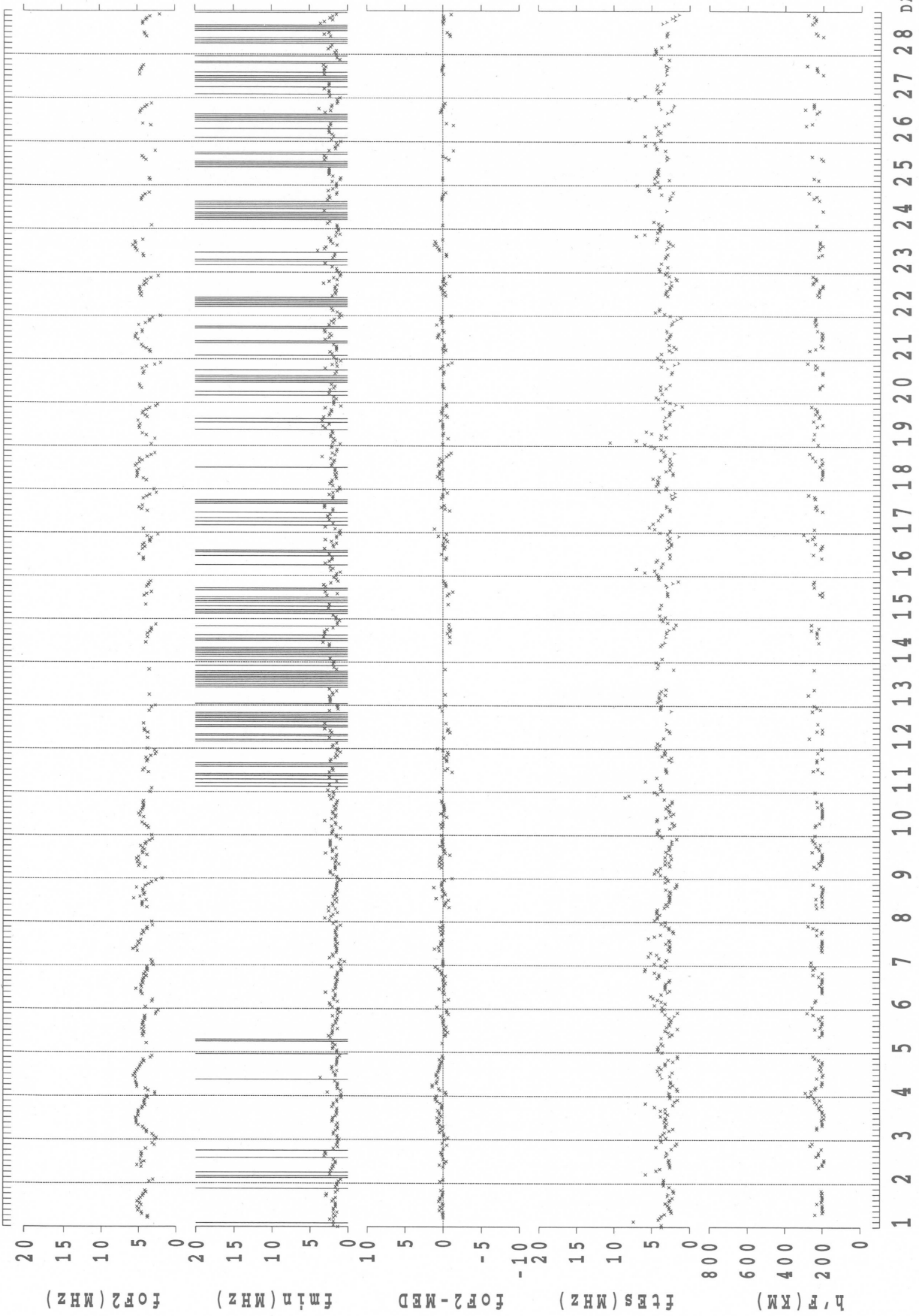
DEC. 1996 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

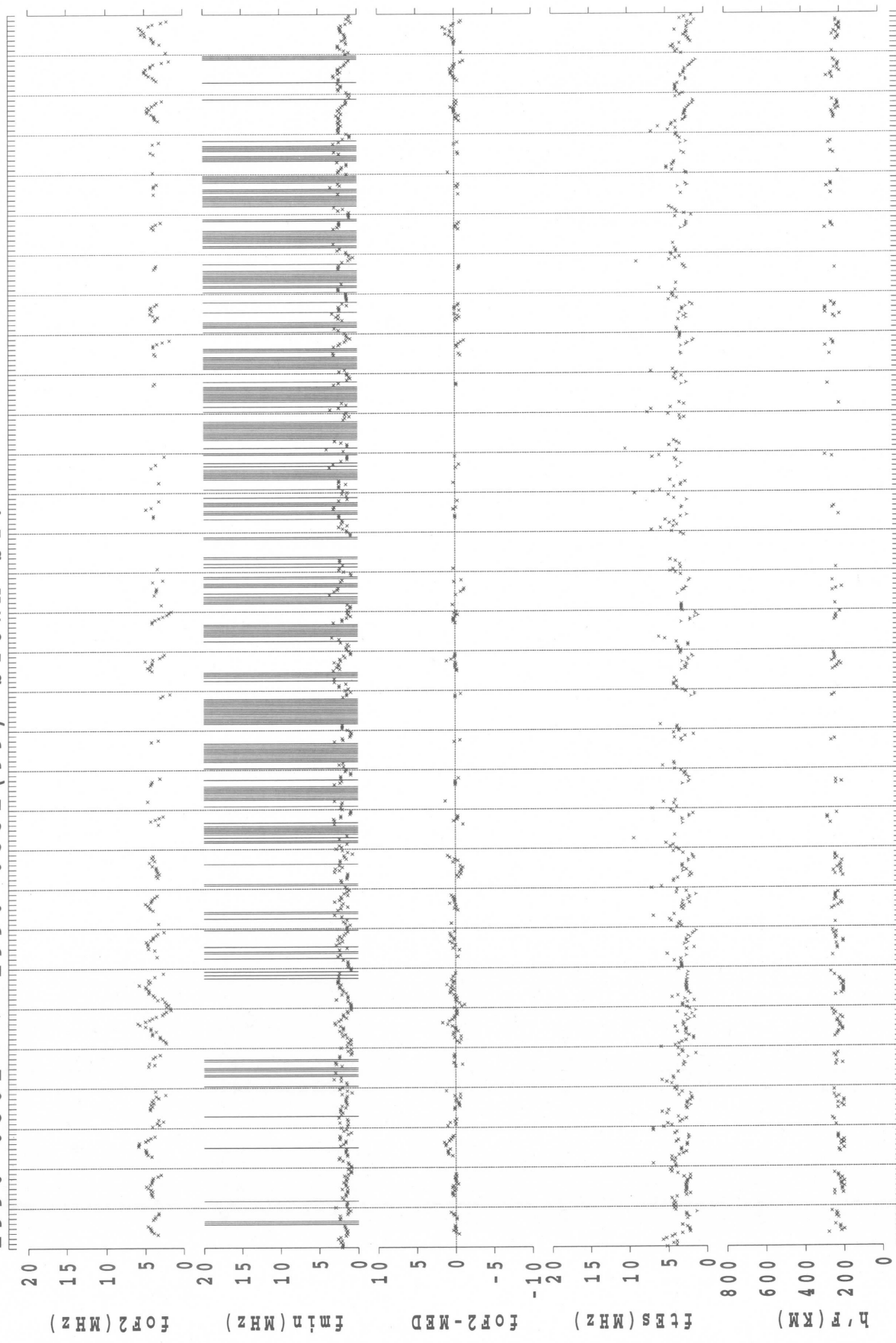
1996 0101 -> 1996 0131(99) SYOWA-ST.



1996 0201 -> 1996 0228 (99) SYOWA-ST.

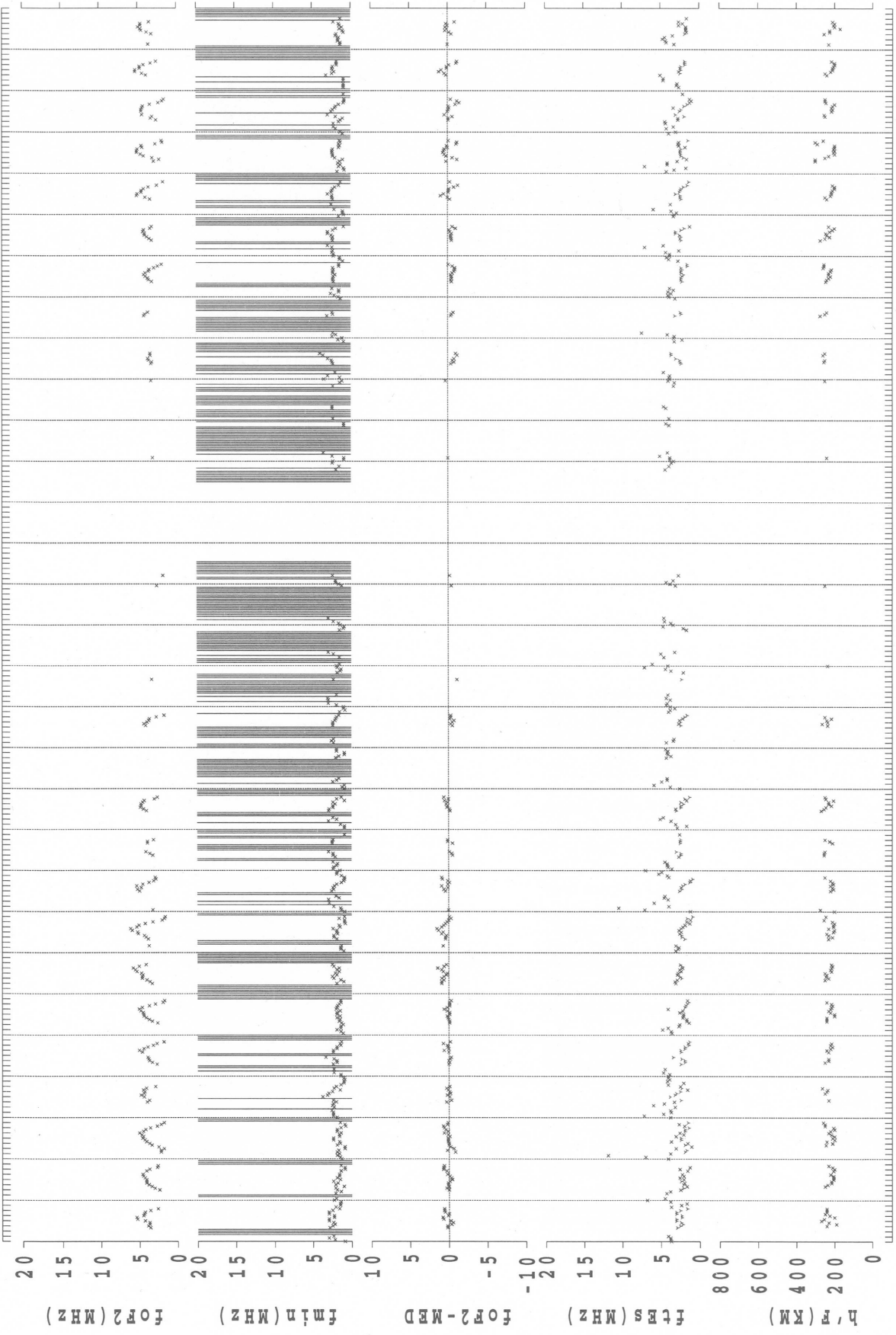


1996 0301 -> 1996 0331 (99) SYOWA-ST.



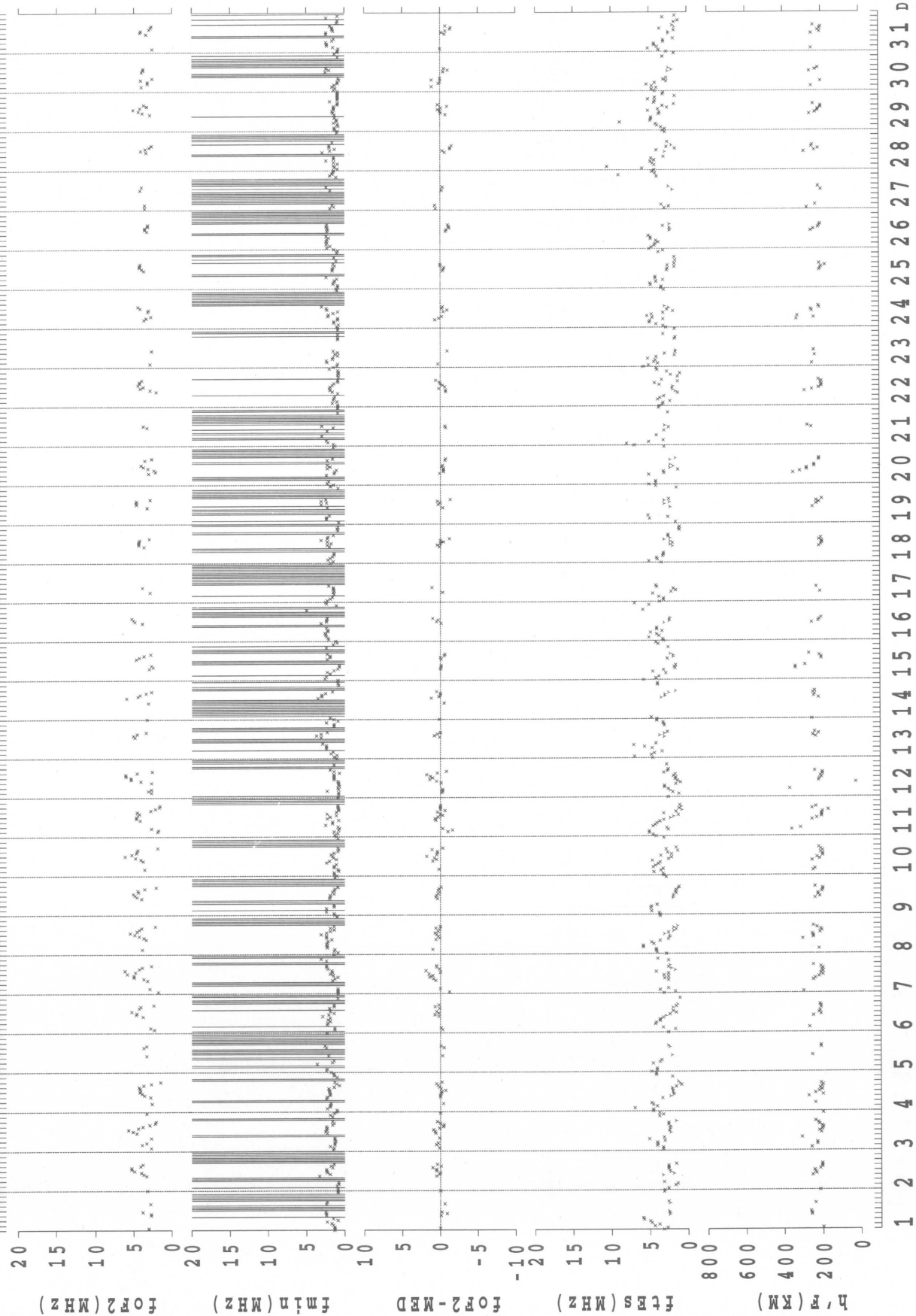
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45' EMT

1996 0401 -> 1996 0430 (99) SYOWA-ST.

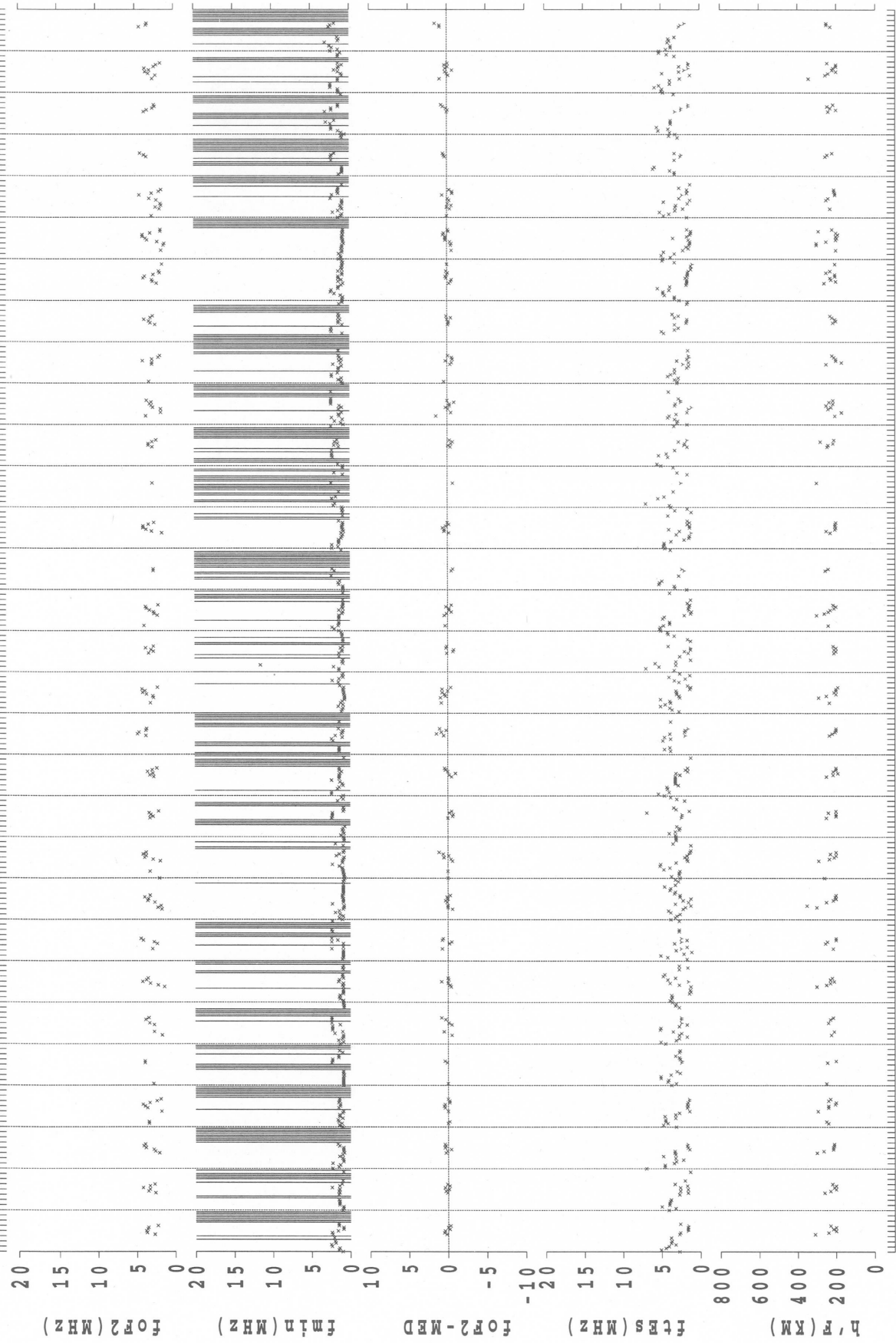


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 DAY/45' EMT

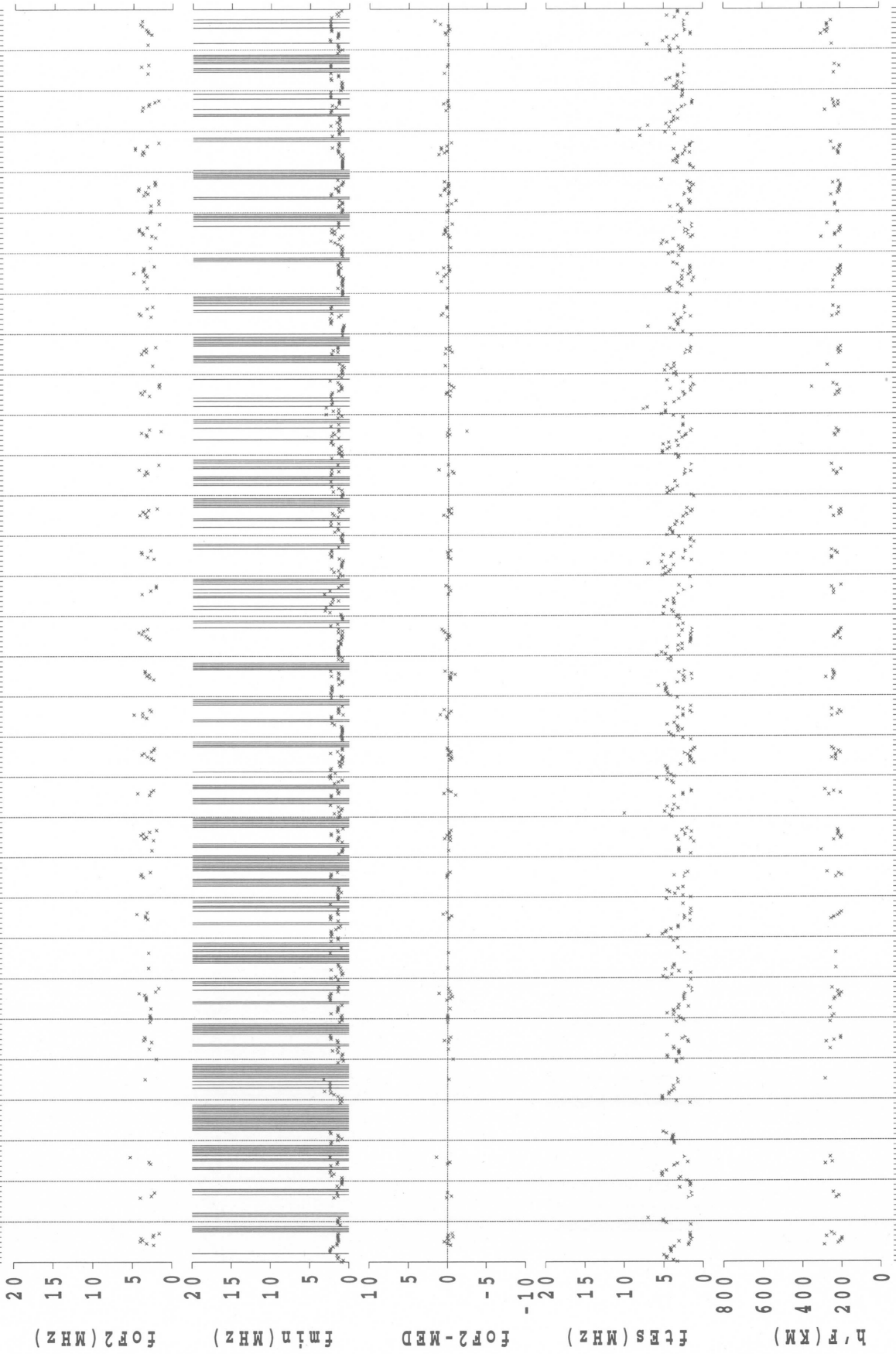
1996 0501 -> 1996 0531(99) SYOWA-ST.



1996 0601 -> 1996 0630 (99) SYOWA-ST.

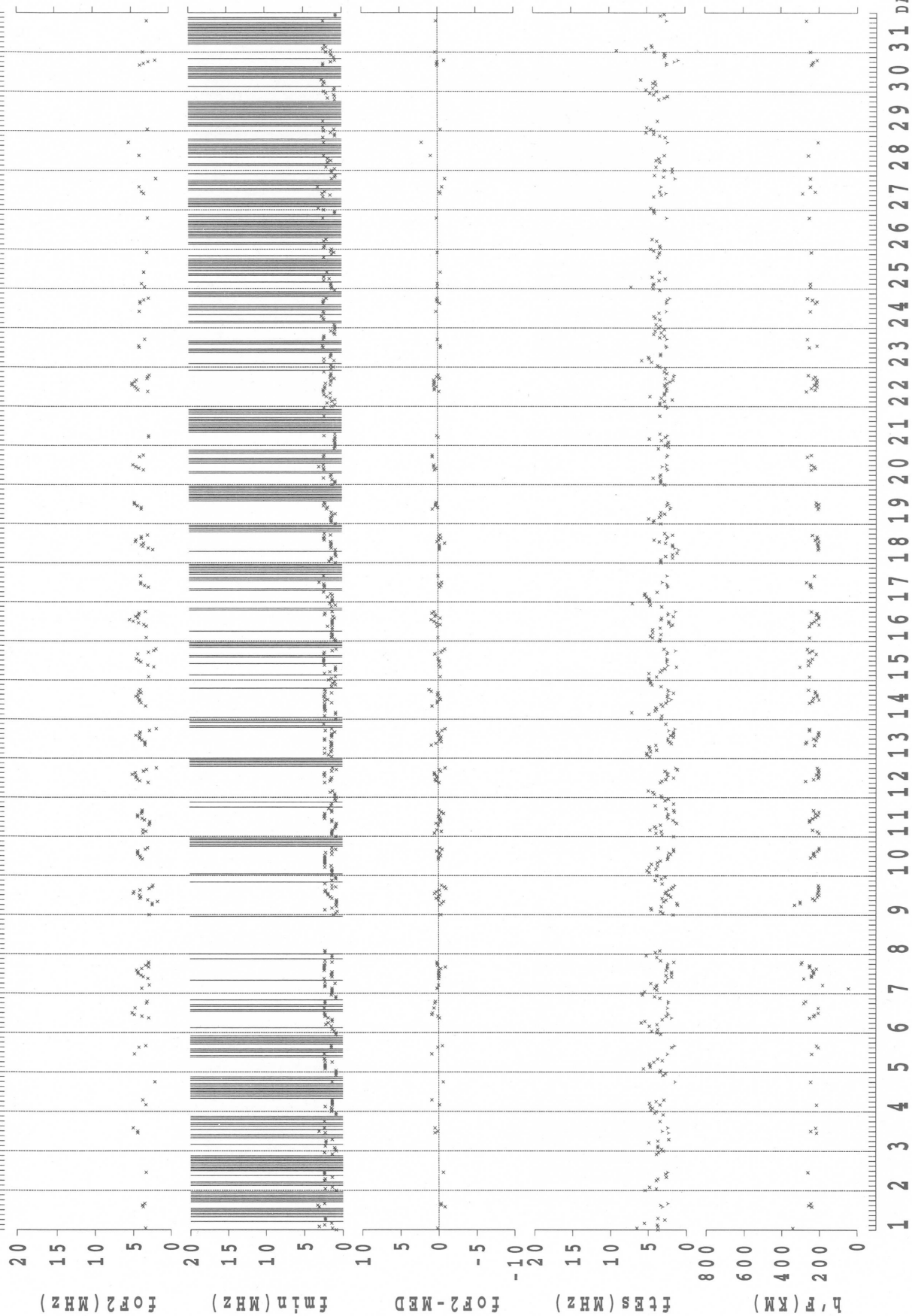


1996 0701 -> 1996 0731 (99) SYOWA-ST.

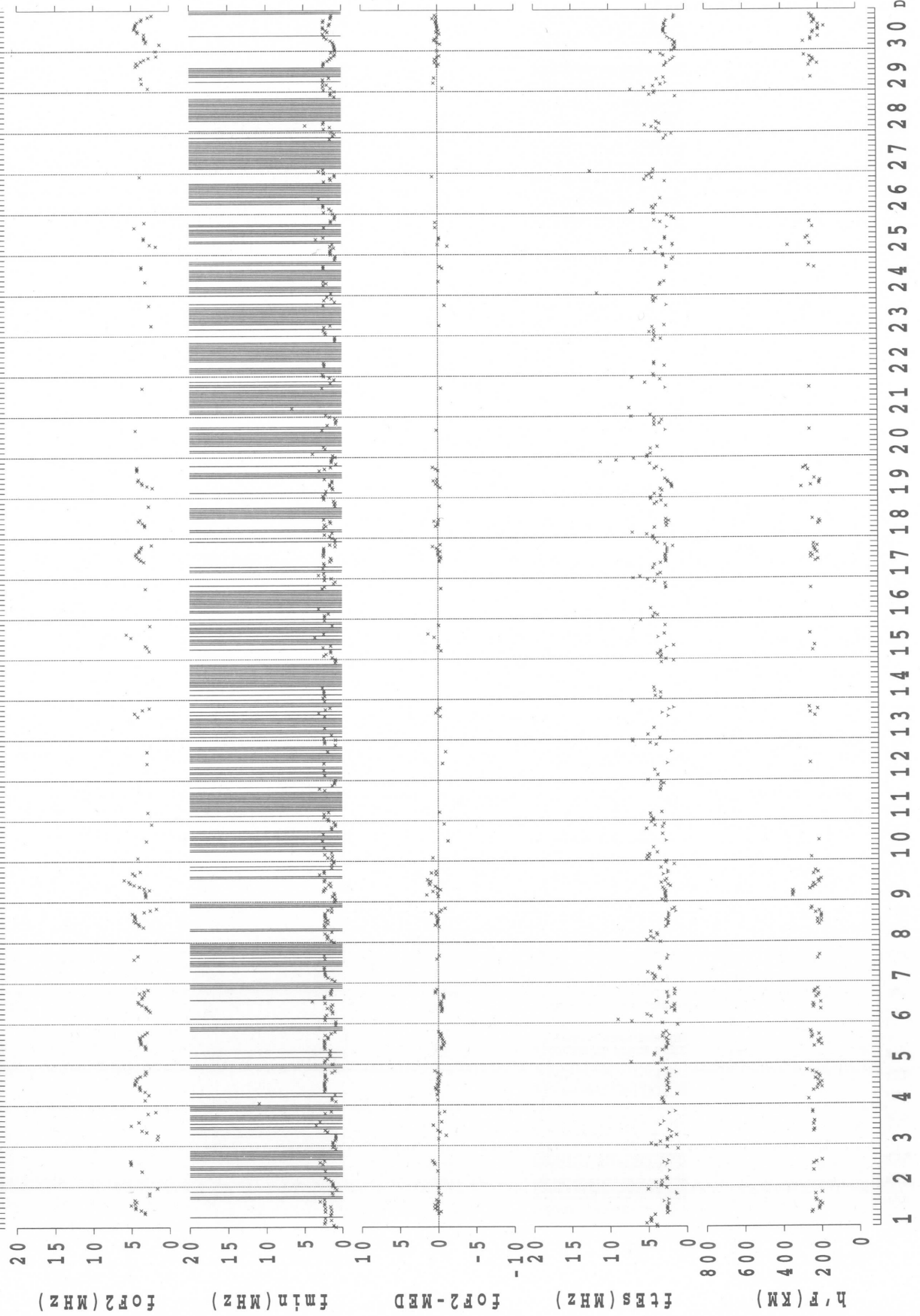


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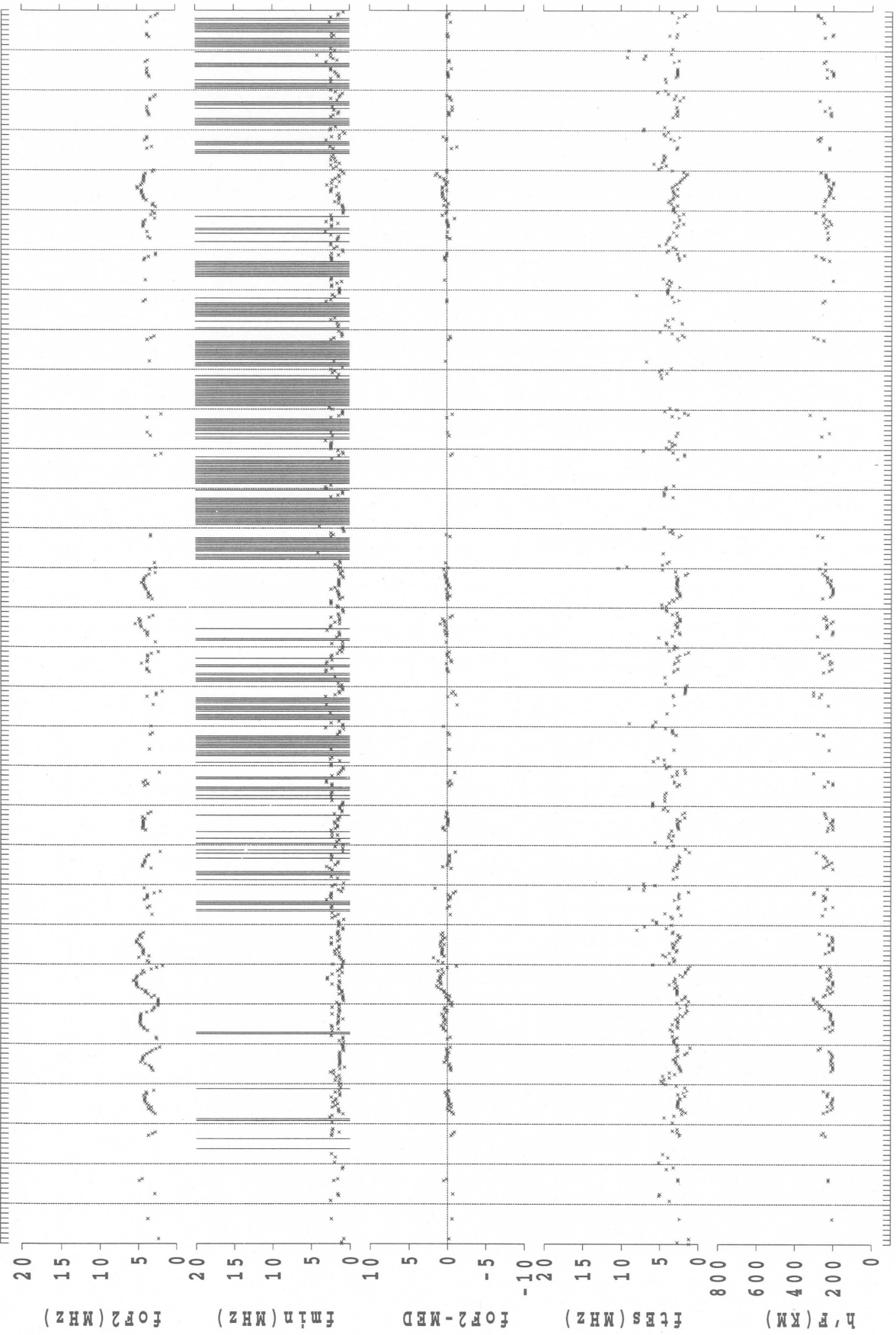
1996 0801 -> 1996 0831(99) SYOWA-ST.



1996 0901 -> 1996 0930 (99) SYOWA-ST.

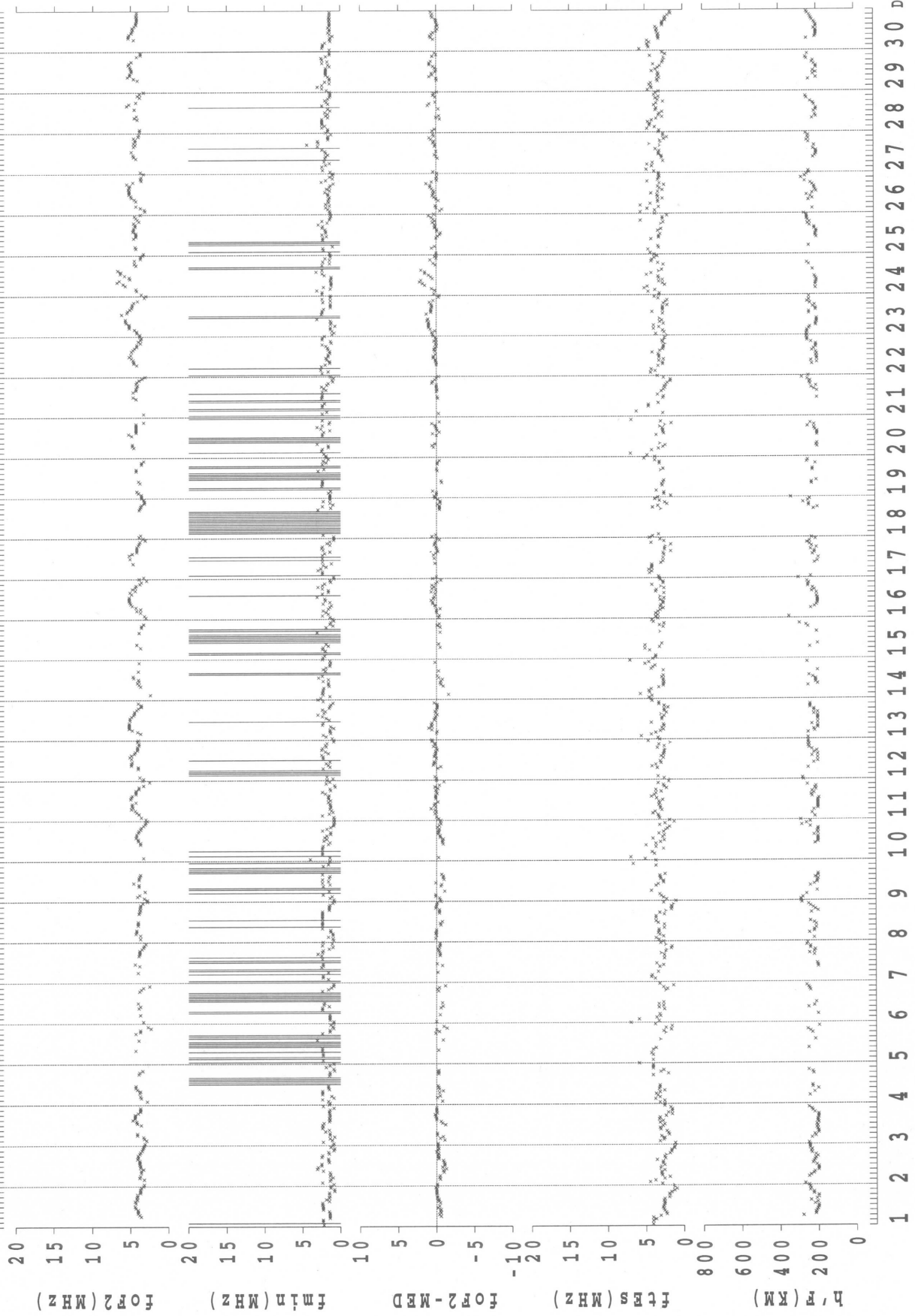


1996 1001 -> 1996 1031(99) SYOWA-ST.

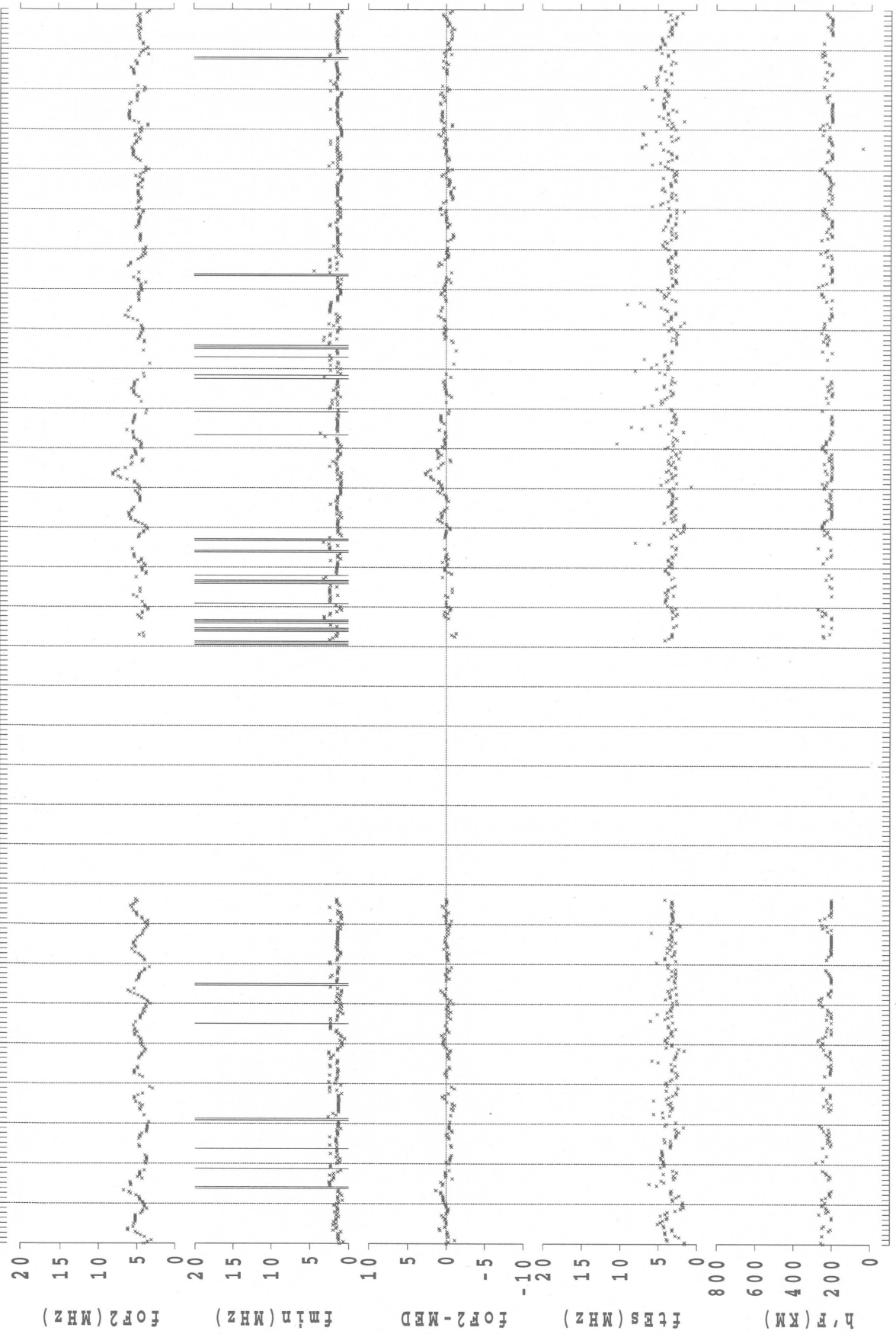


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45' GMT

1996 1101 -> 1996 1130 (99) SYOWA-ST.



1996 1201 -> 1996 1231(99) SYOWA-ST.

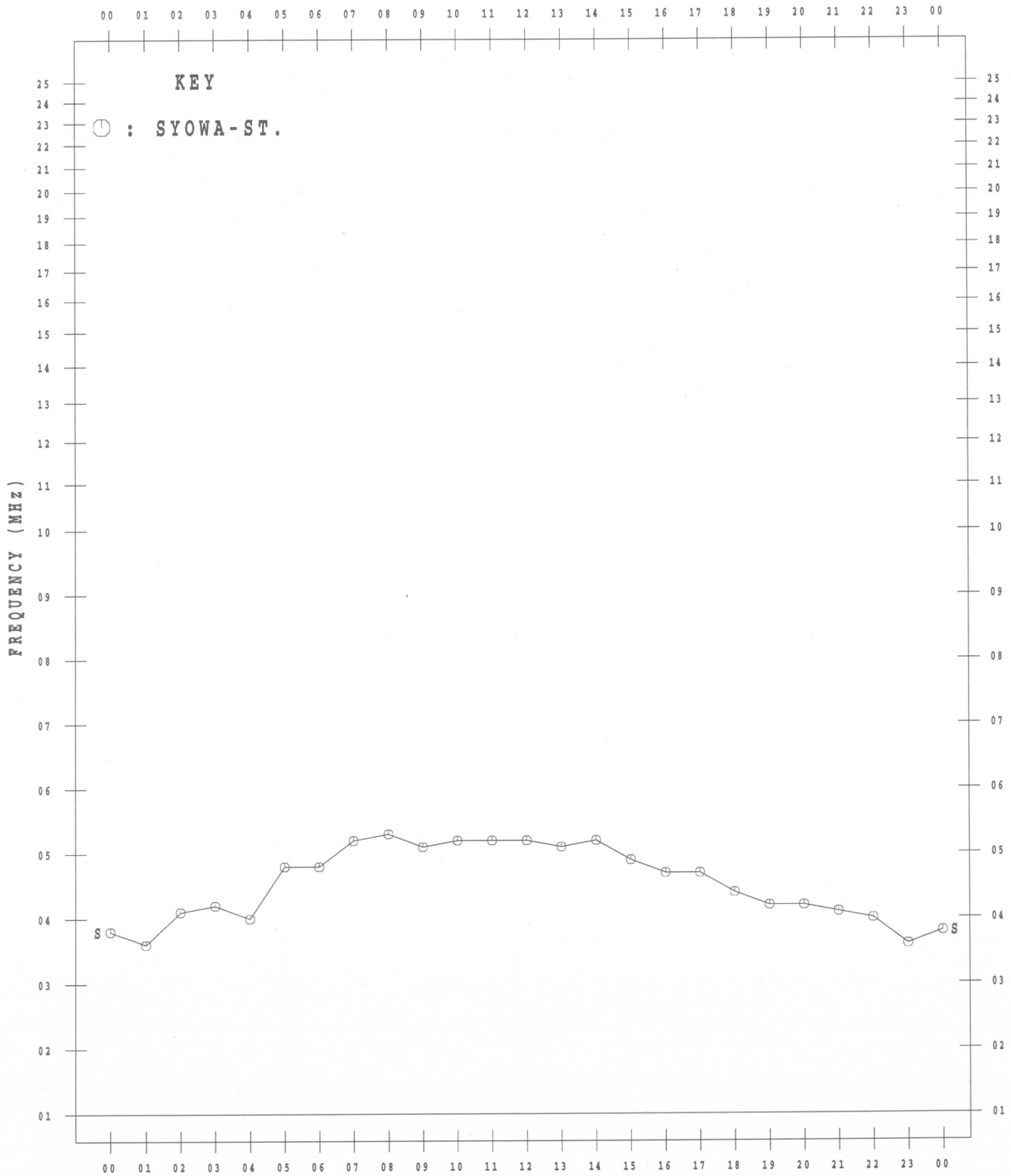


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45' GMT

MONTHLY MEDIAN VALUES OF f_oF_2

45° E MEAN TIME

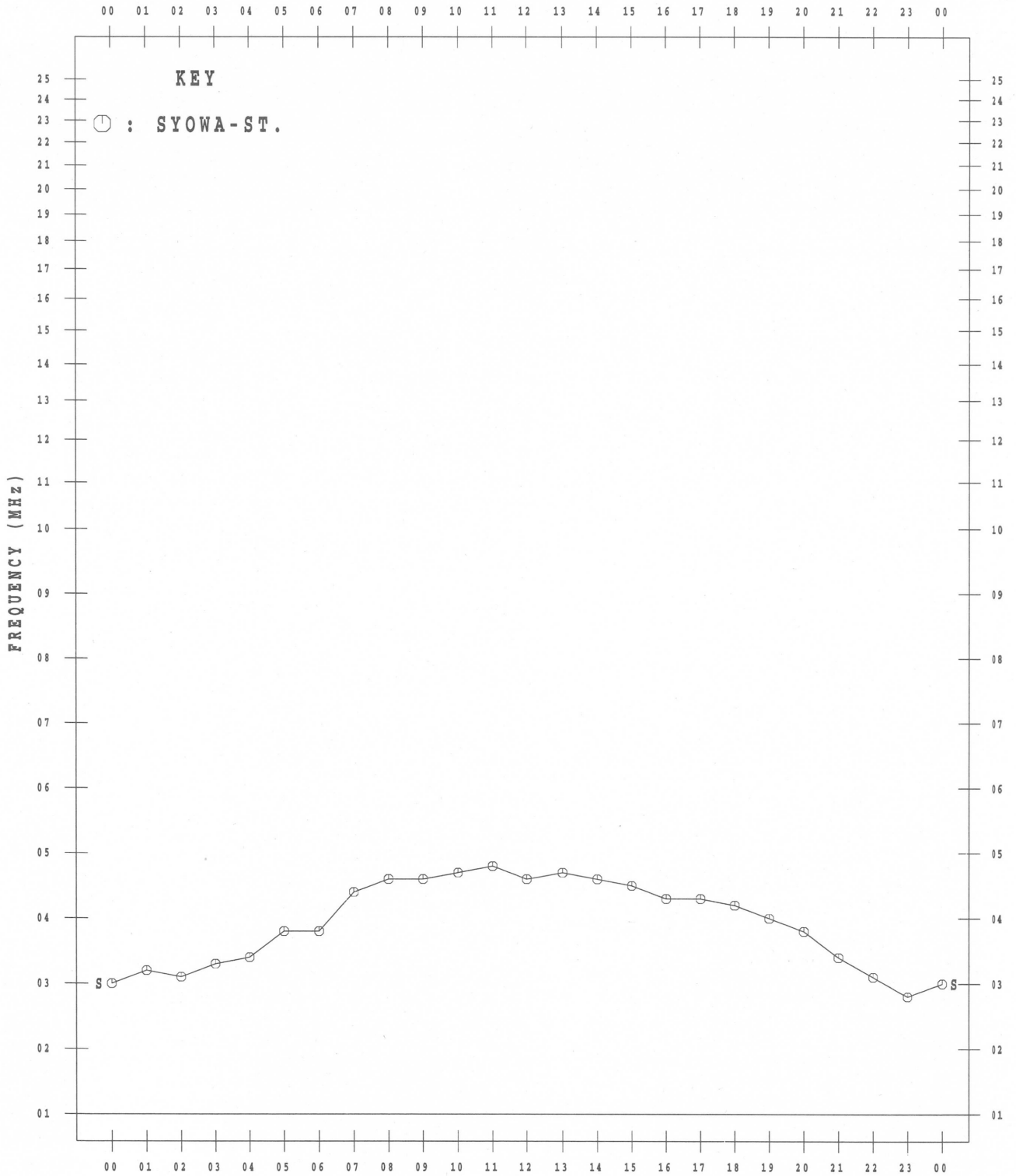
JAN. 1996



MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

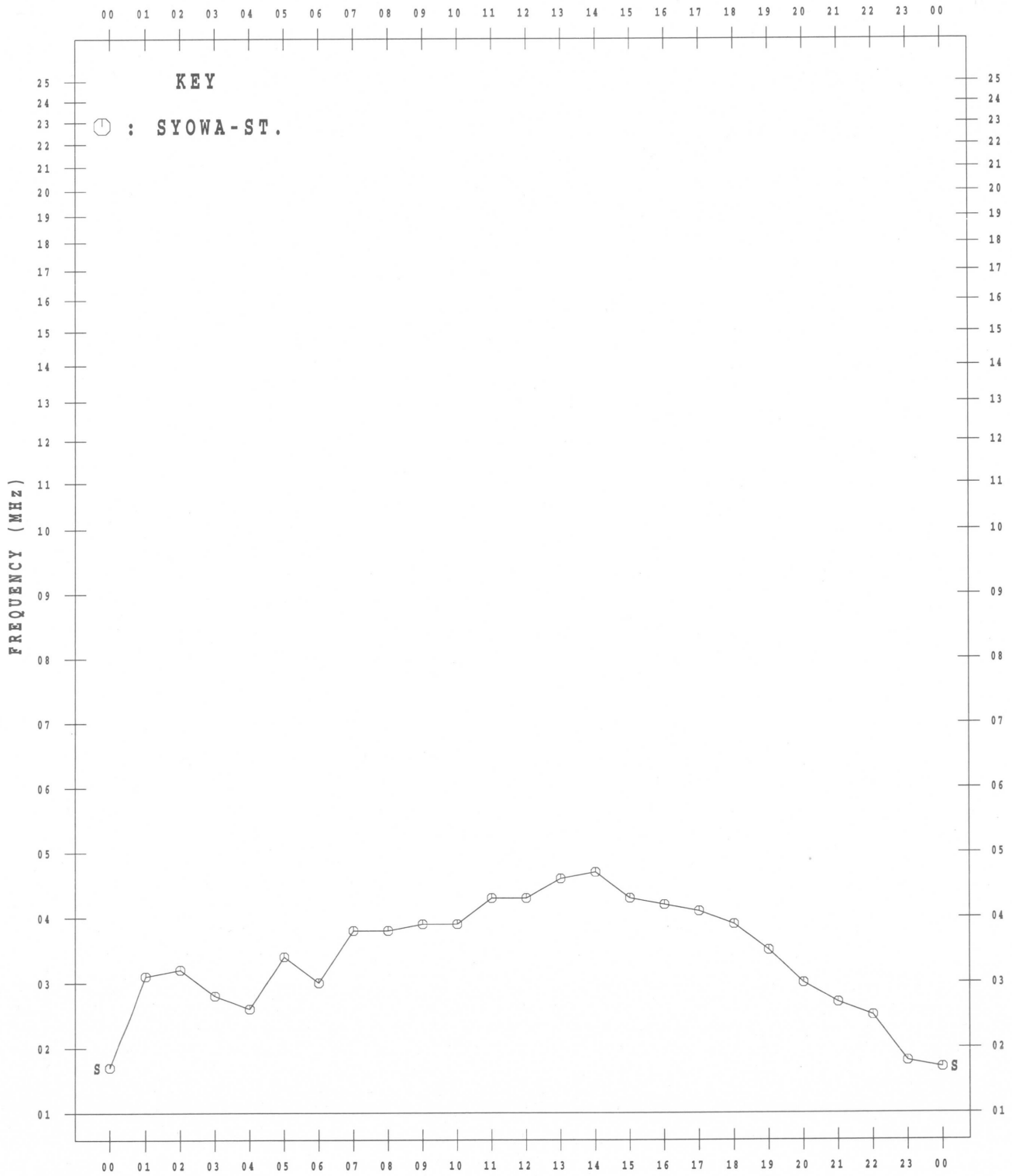
FEB. 1996



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

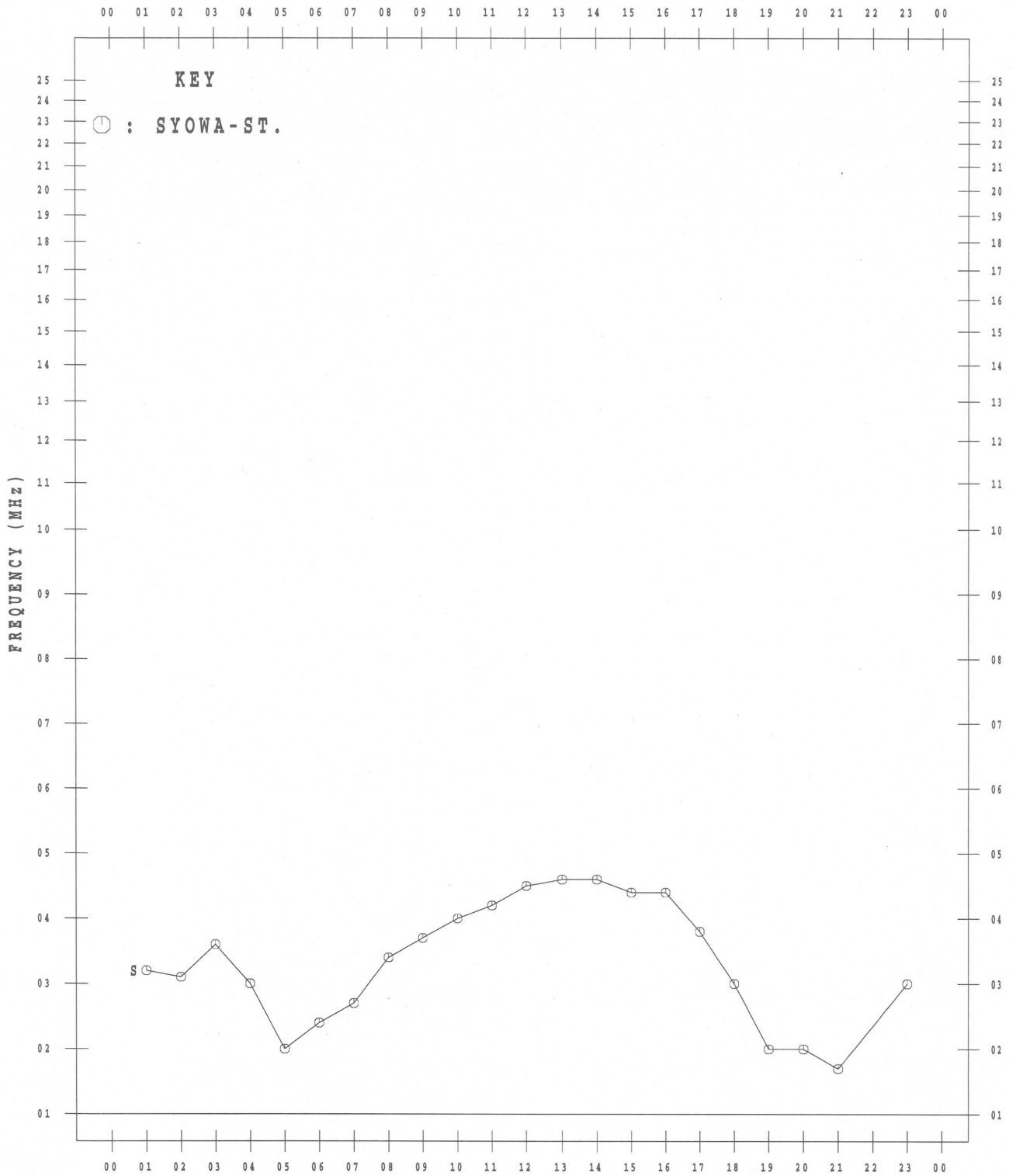
MAR. 1996



MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

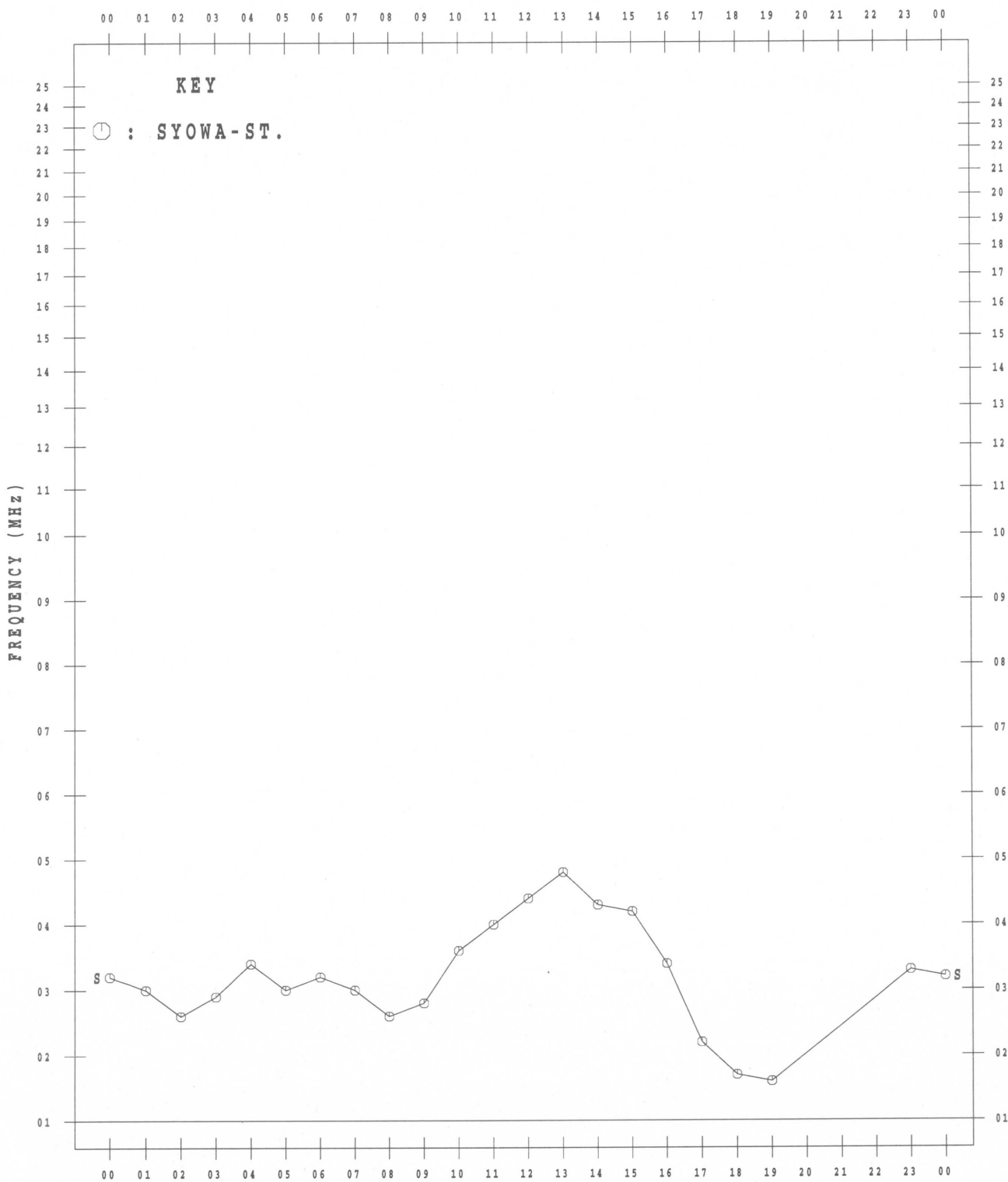
APR. 1996



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

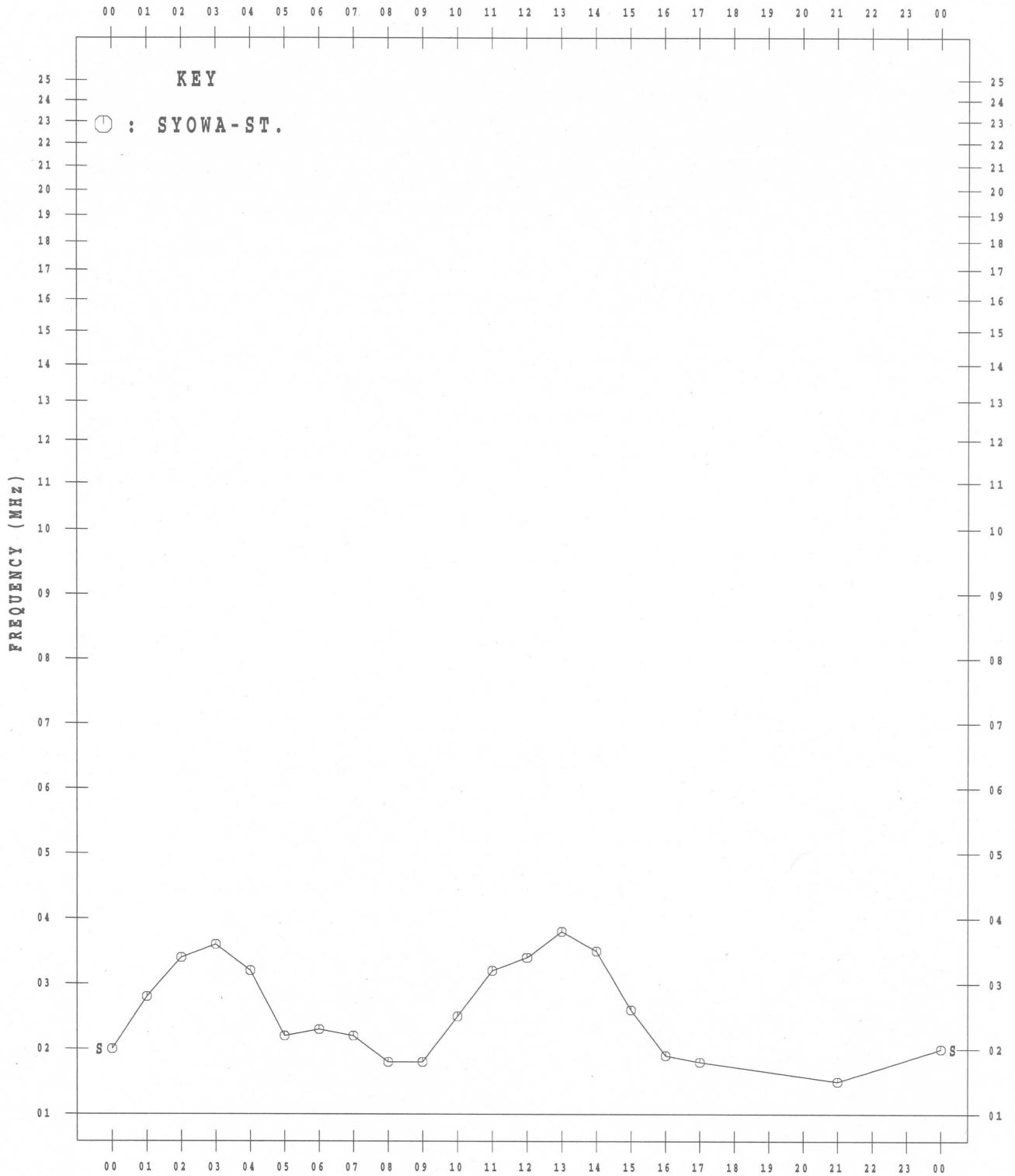
MAY 1996



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

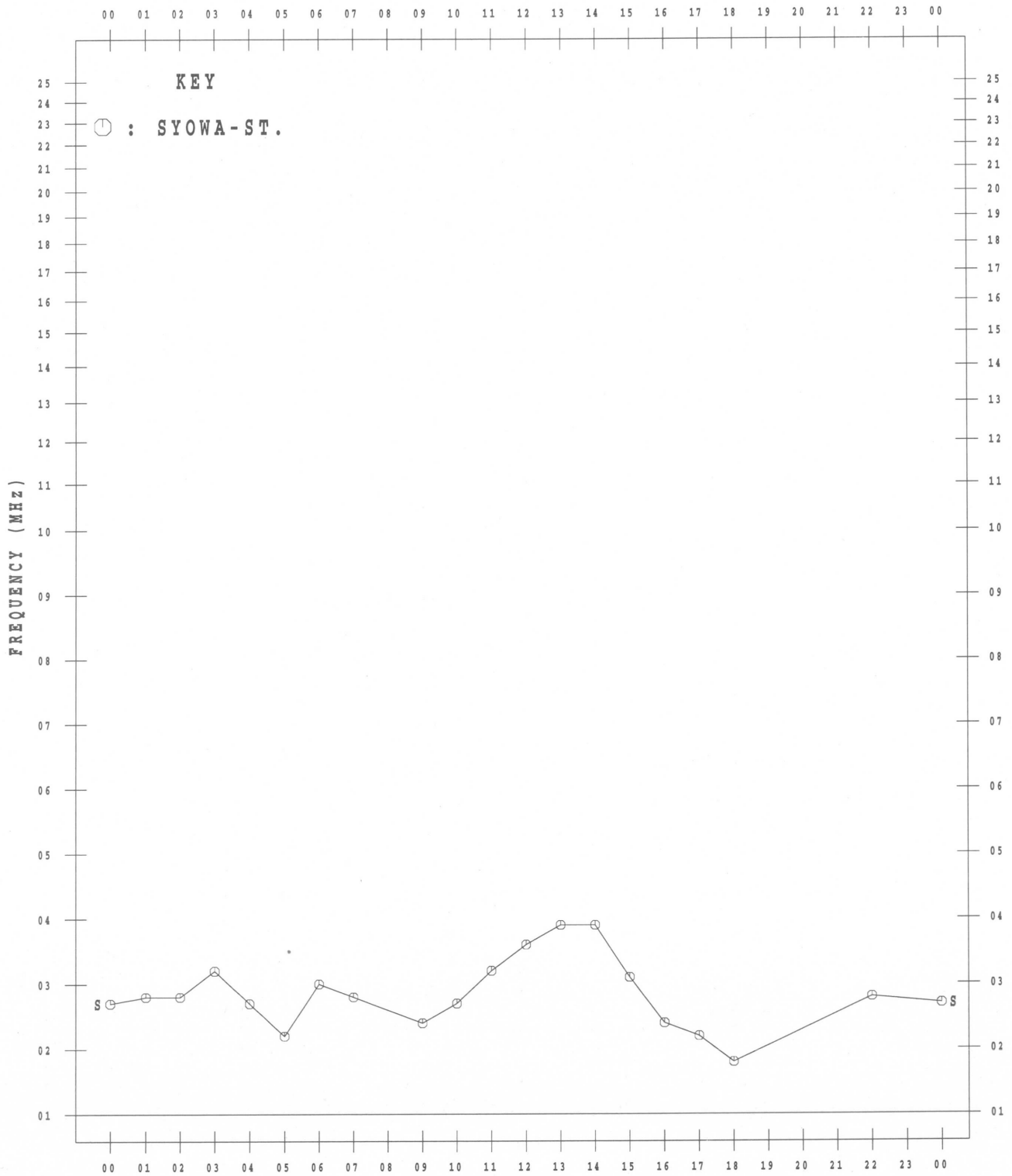
JUN. 1996



MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

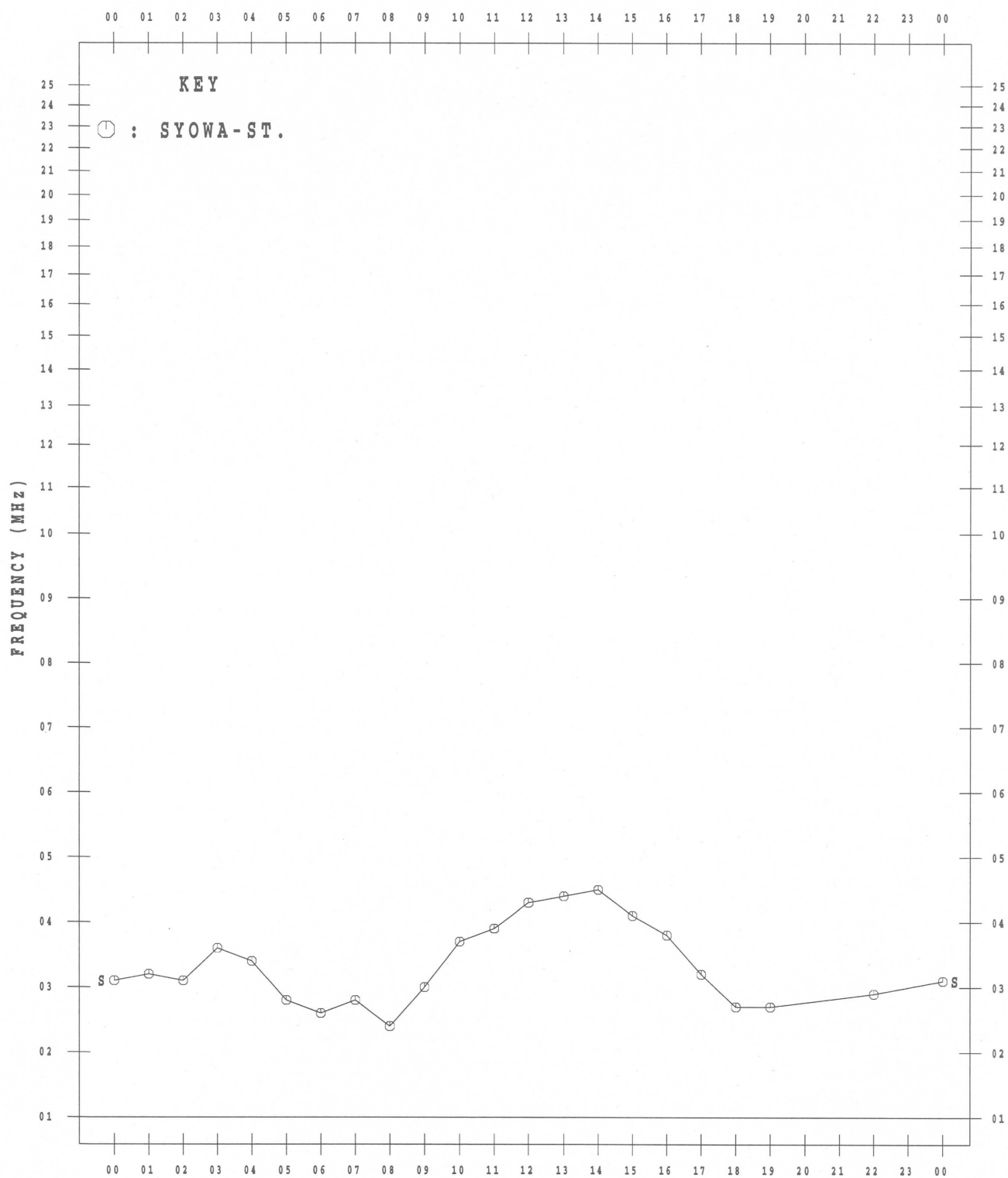
JUL. 1996



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

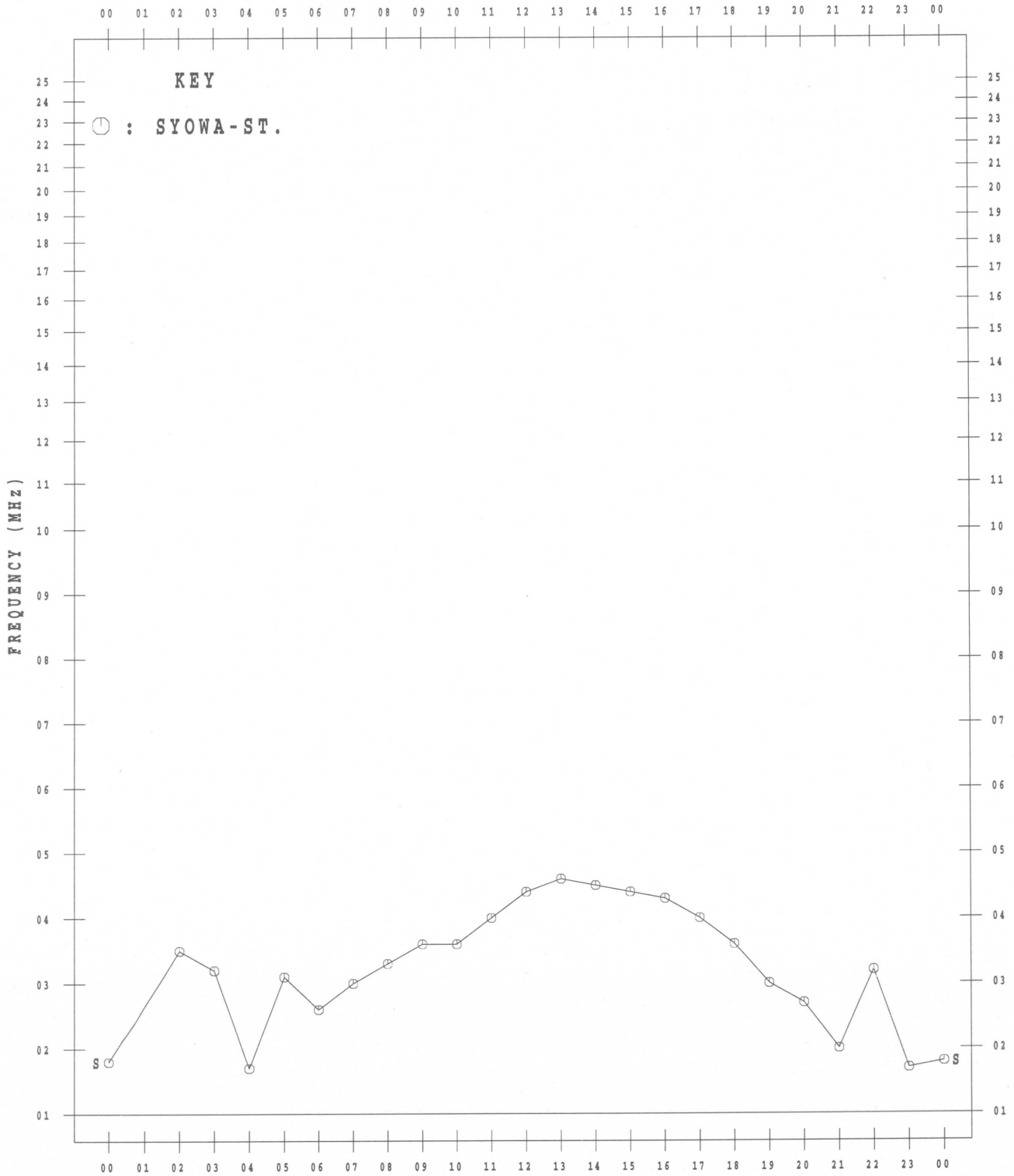
AUG. 1996



MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

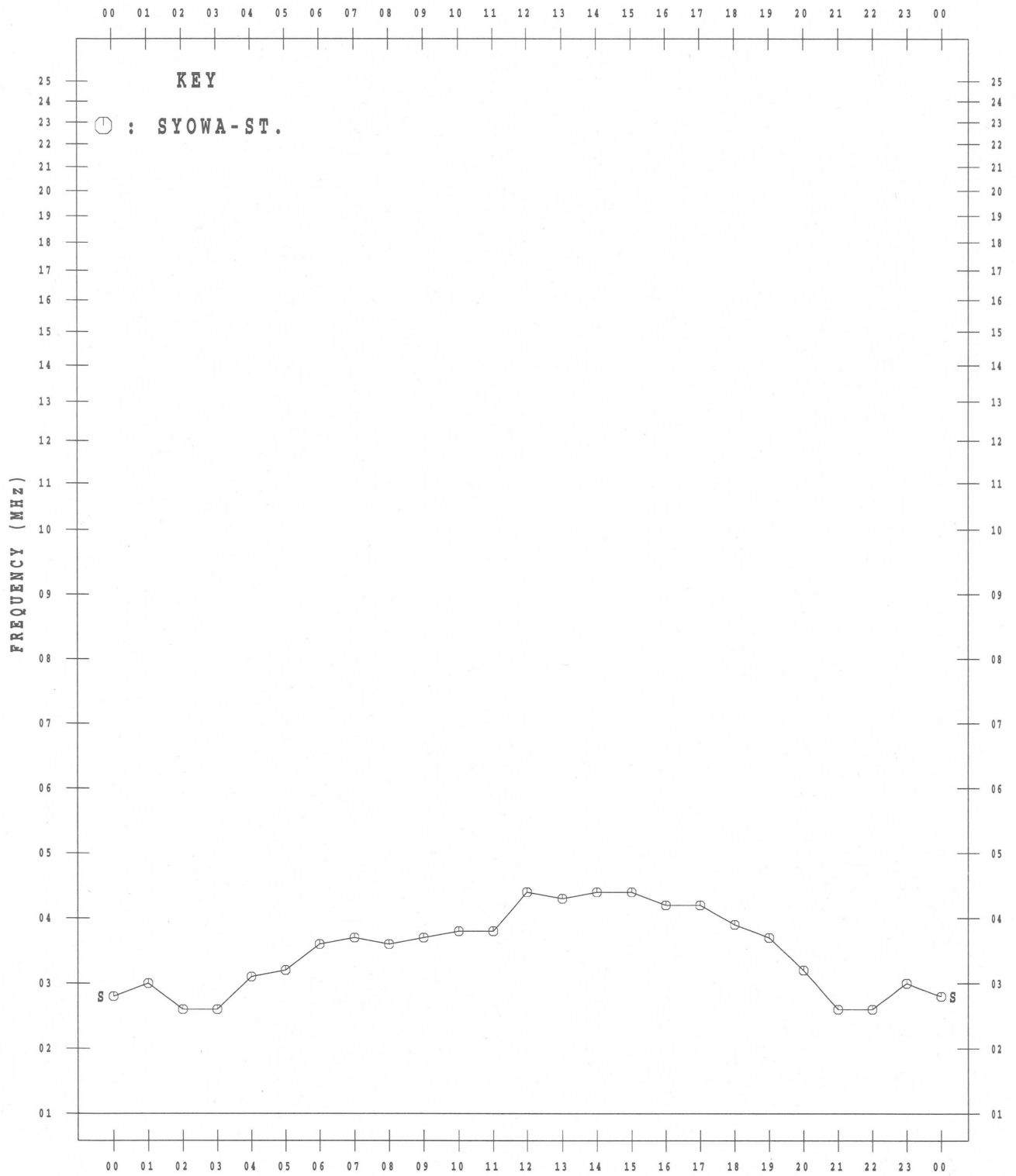
SEP. 1996



MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

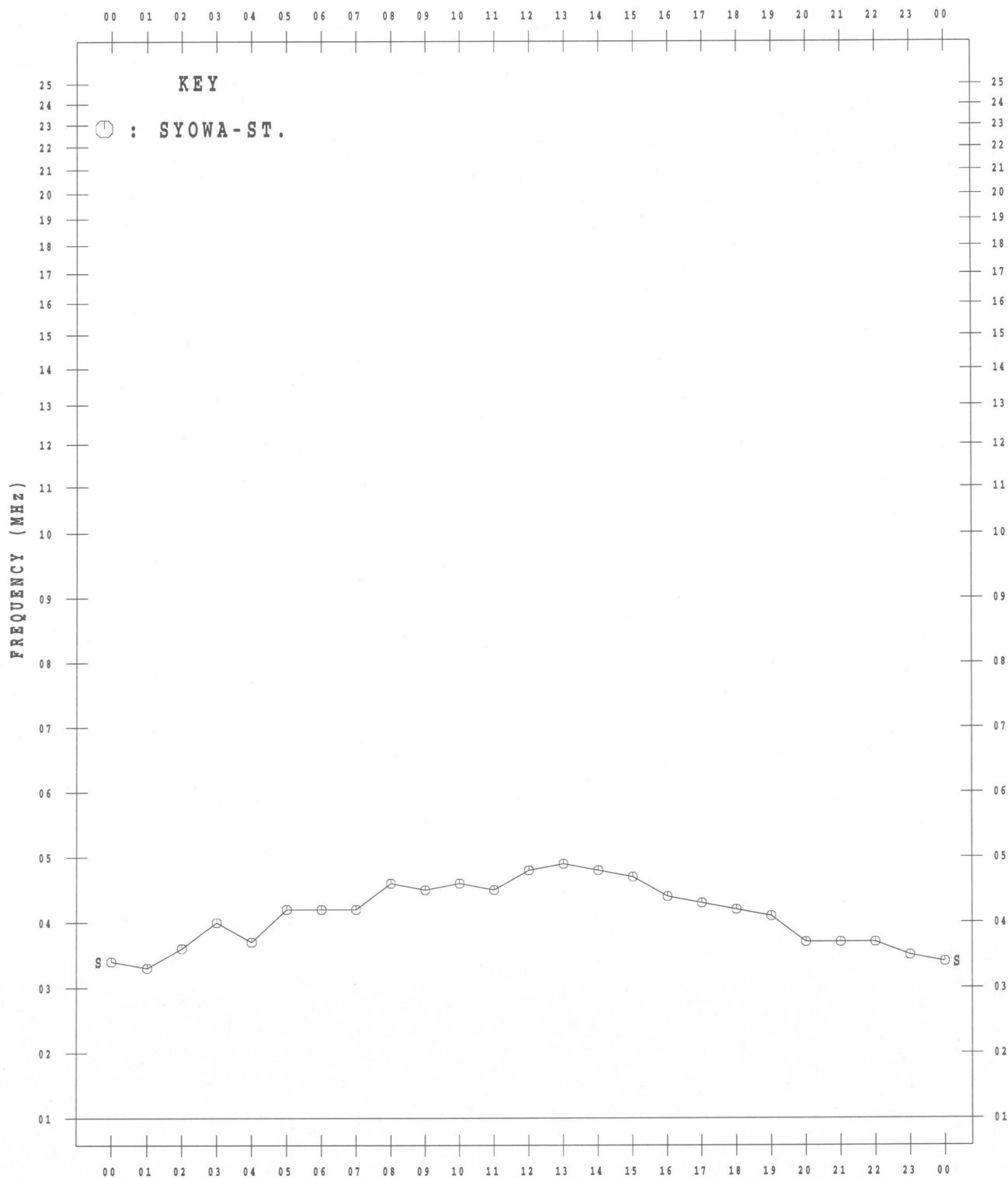
OCT. 1996



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

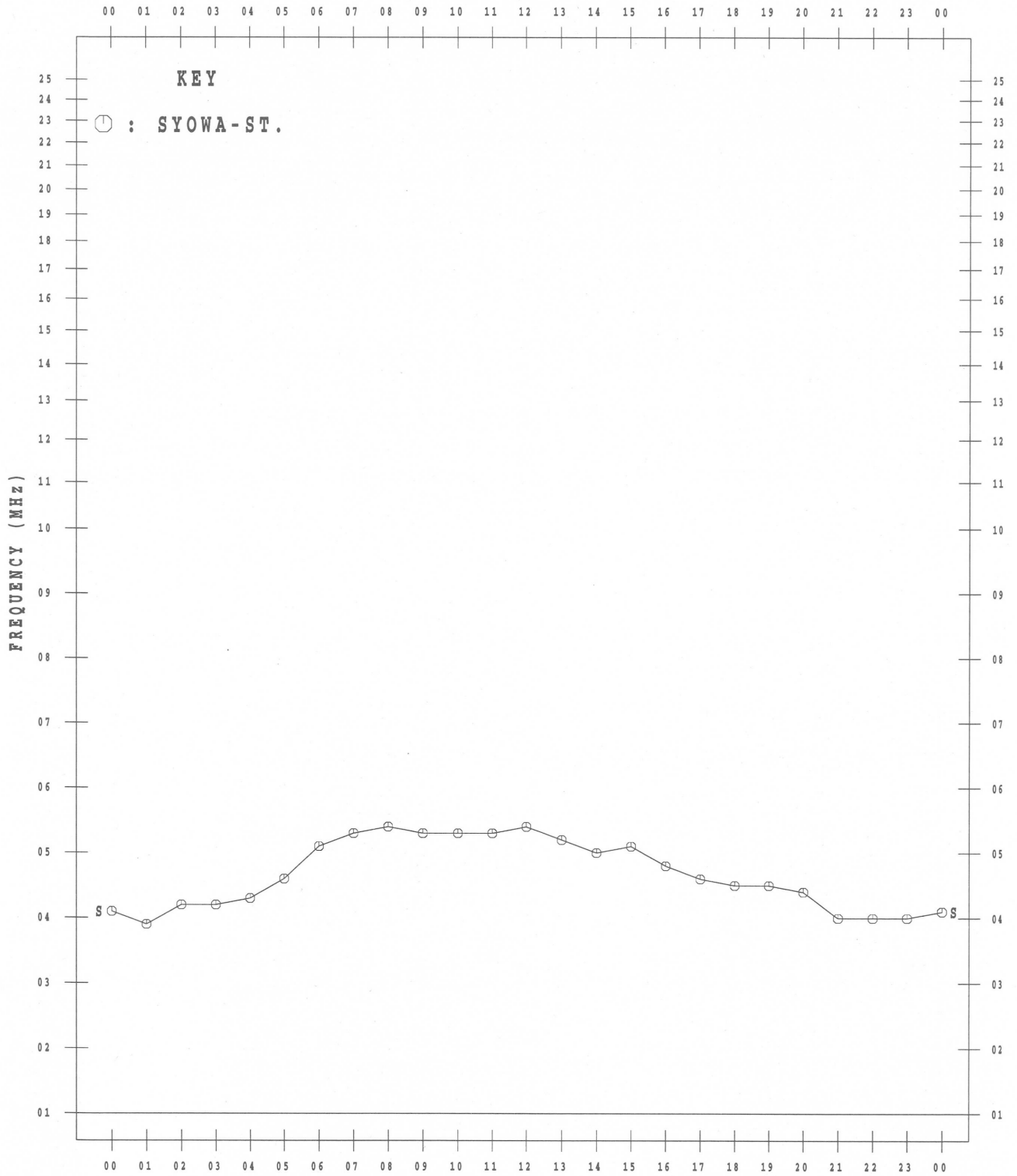
NOV. 1996



MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

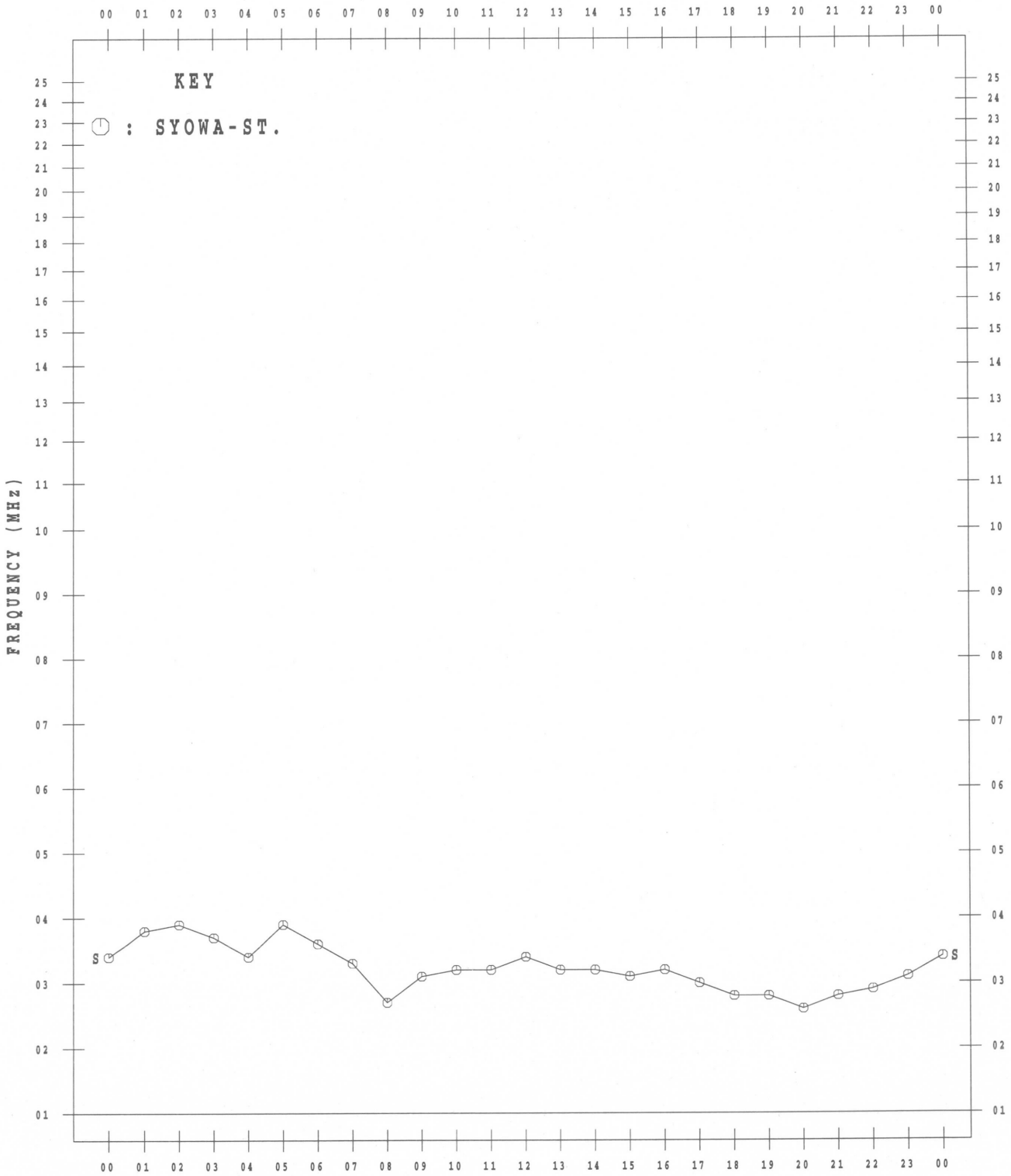
DEC. 1996



MONTHLY MEDIAN VALUES OF f_{TE}s

45° E MEAN TIME

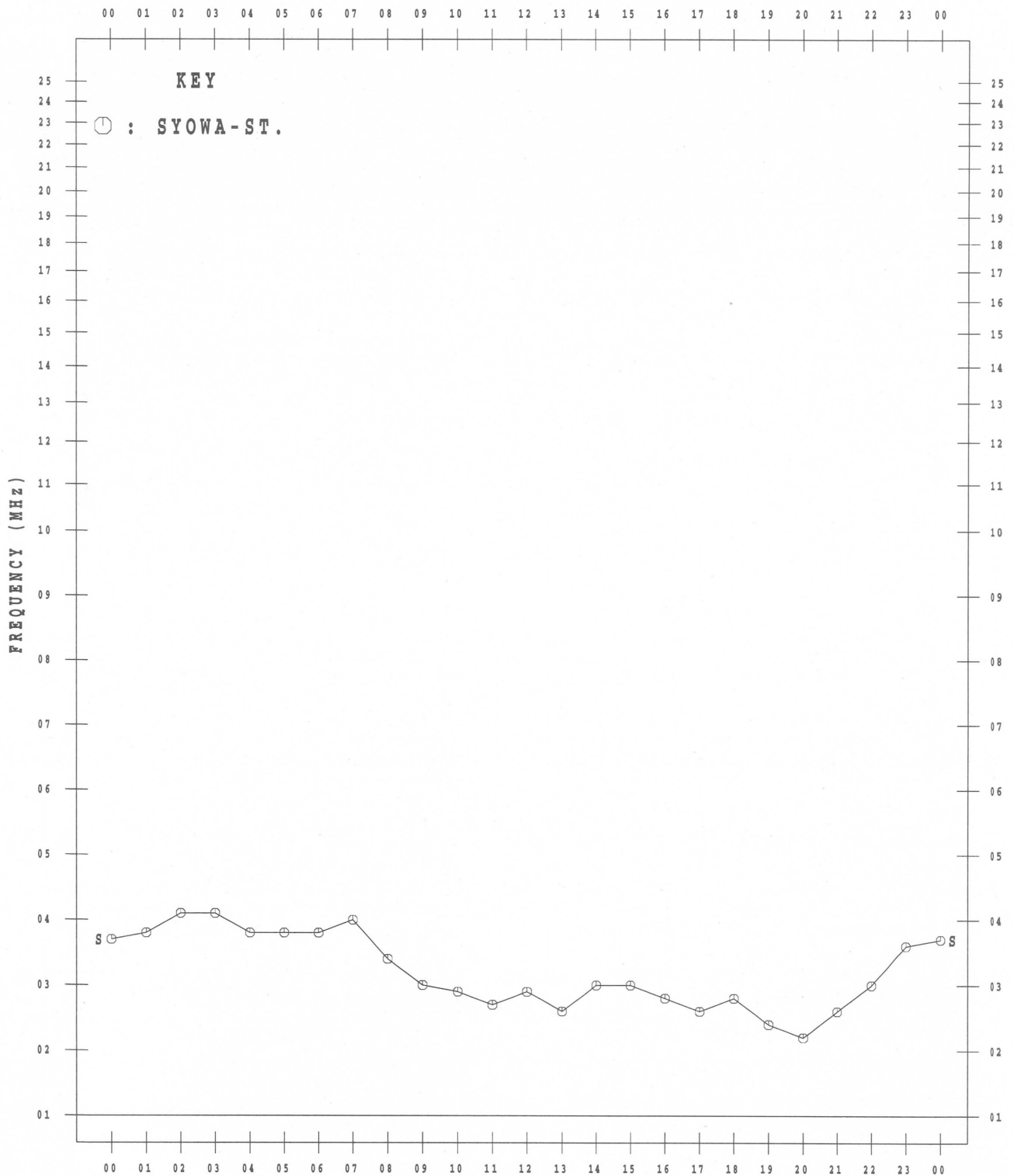
JAN. 1996



MONTHLY MEDIAN VALUES OF f_{TE}s

45° E MEAN TIME

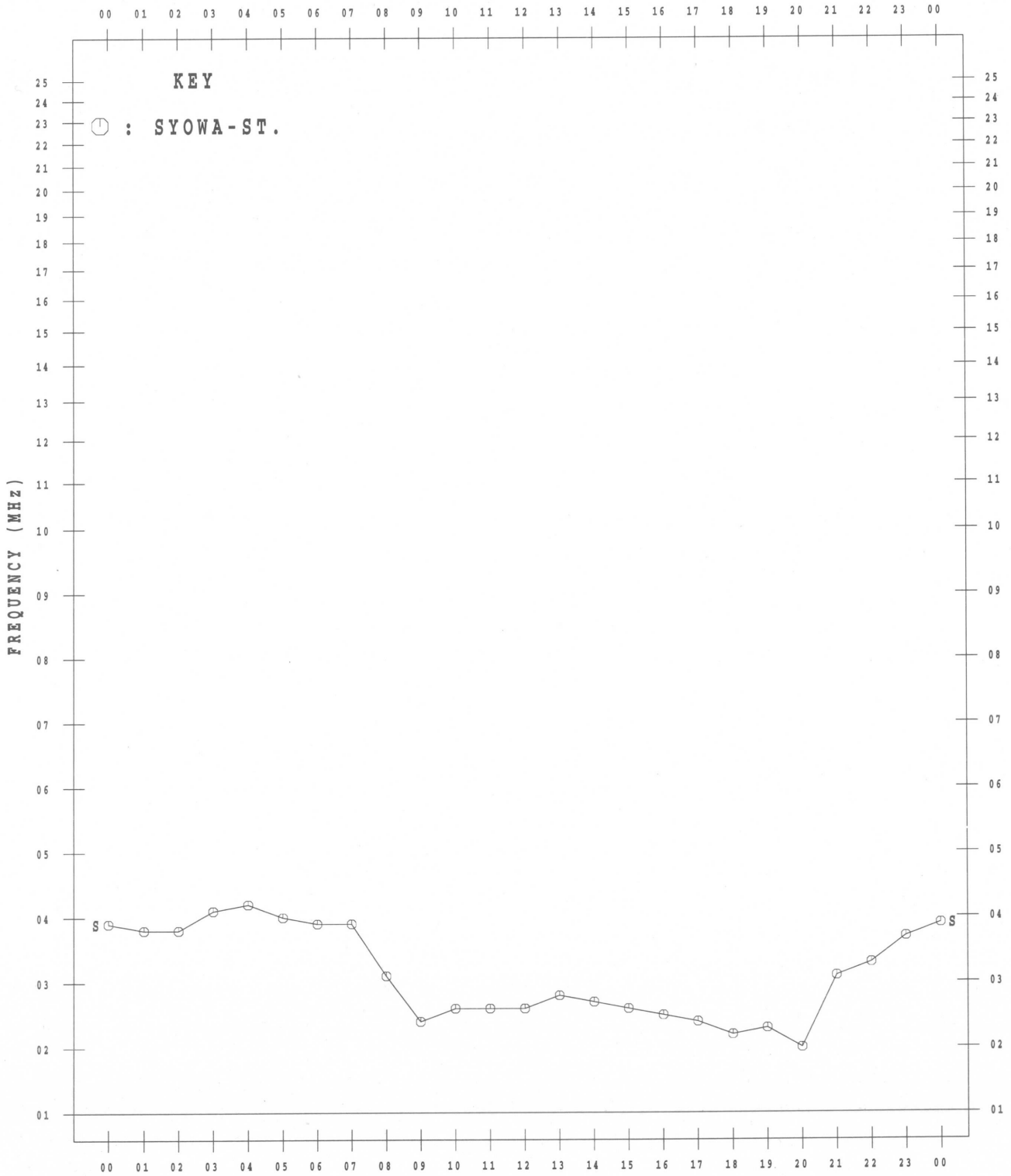
FEB. 1996



MONTHLY MEDIAN VALUES OF ftes

45° E MEAN TIME

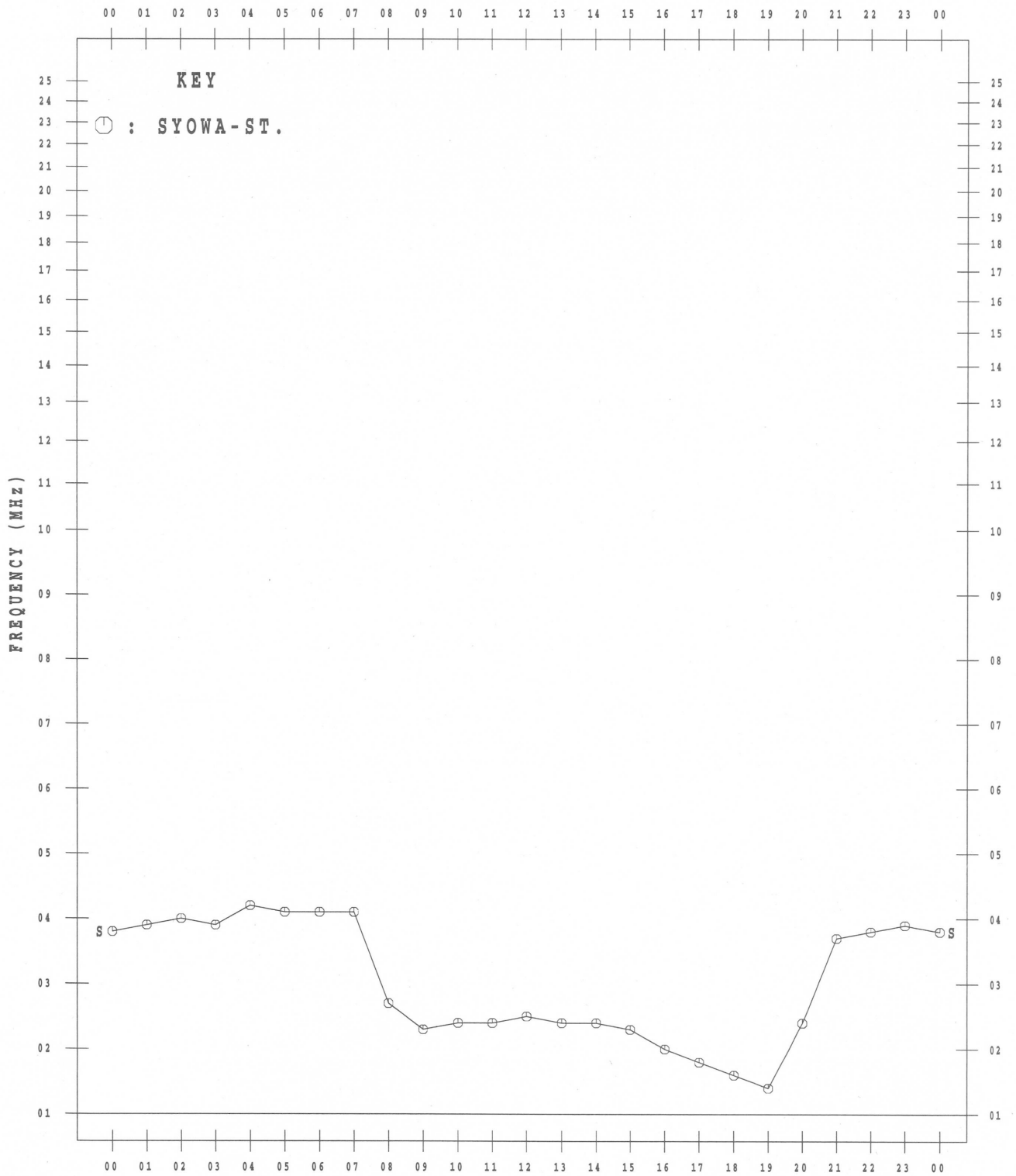
MAR. 1996



MONTHLY MEDIAN VALUES OF f_tE_s

45° E MEAN TIME

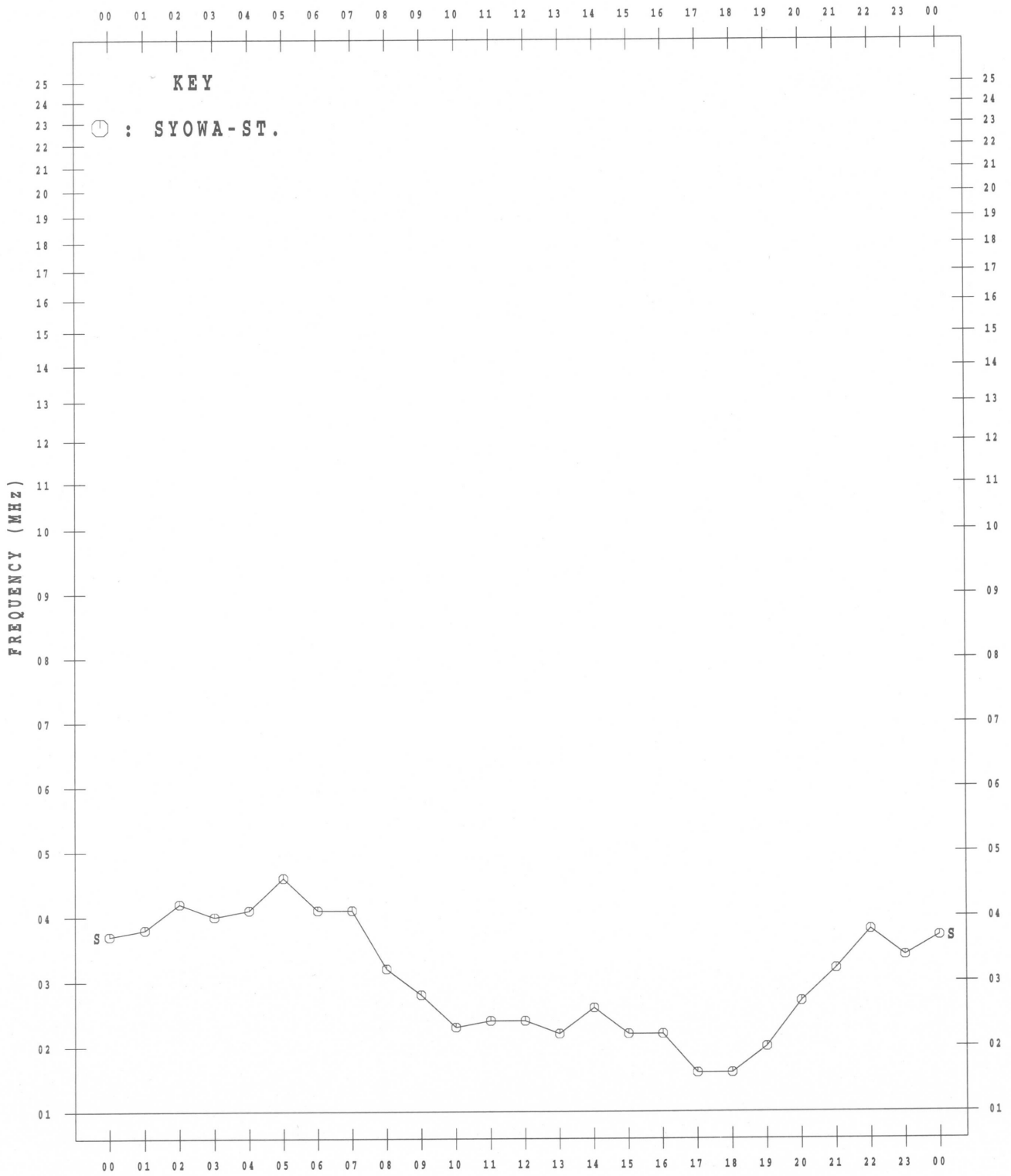
APR. 1996



MONTHLY MEDIAN VALUES OF ftes

45° E MEAN TIME

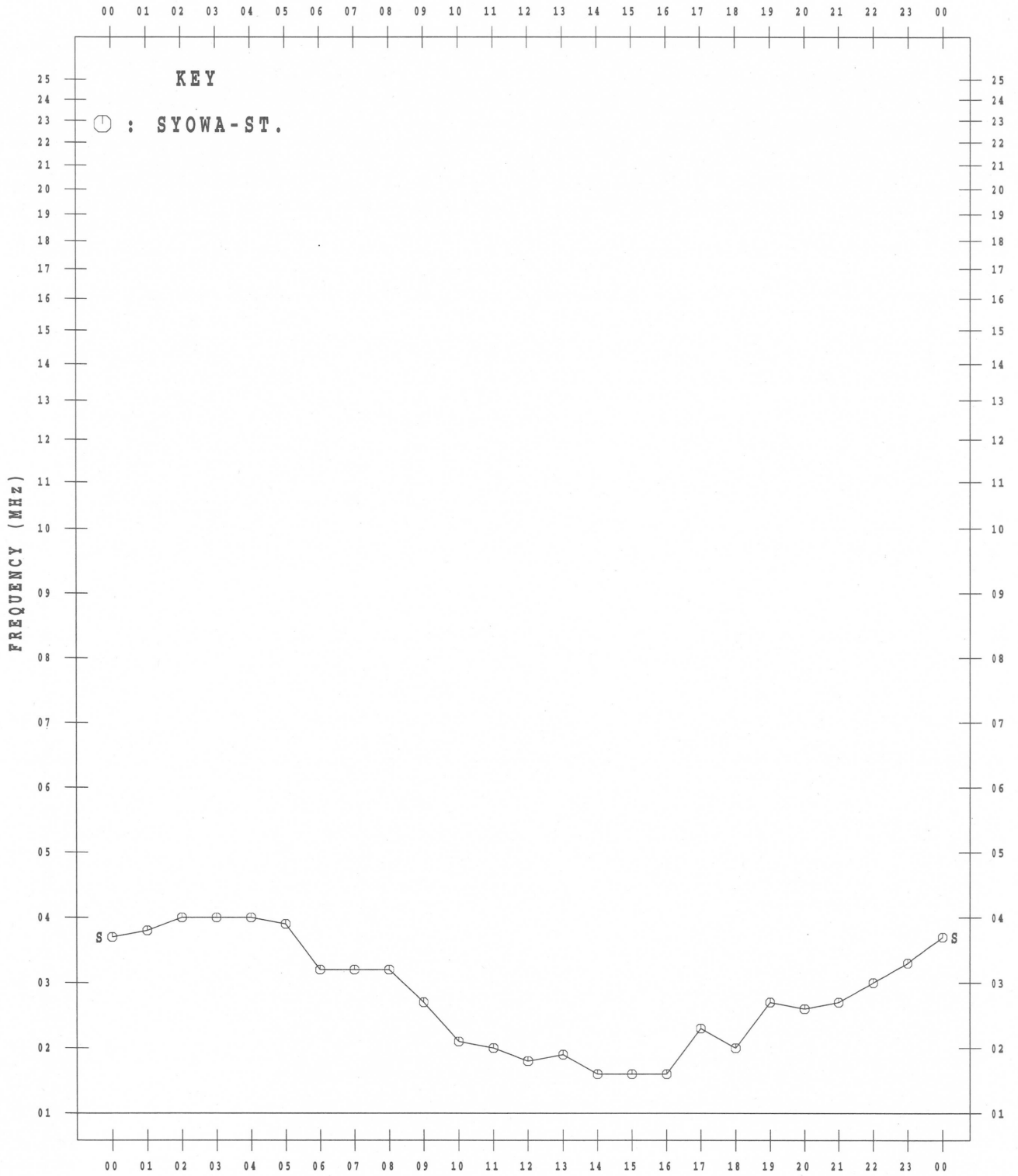
MAY 1996



MONTHLY MEDIAN VALUES OF ftes

45° E MEAN TIME

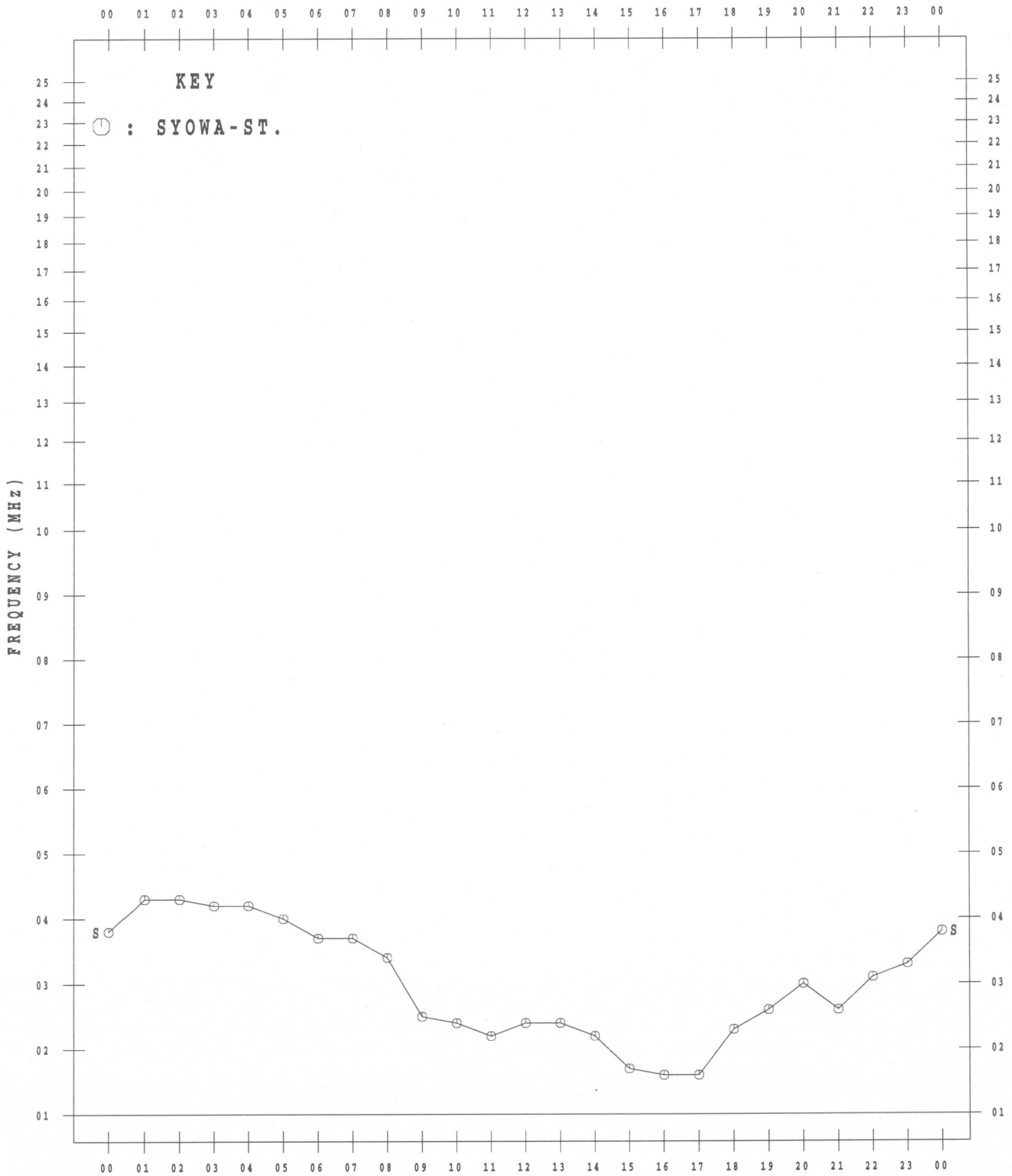
JUN. 1996



MONTHLY MEDIAN VALUES OF f_{TE}s

45° E MEAN TIME

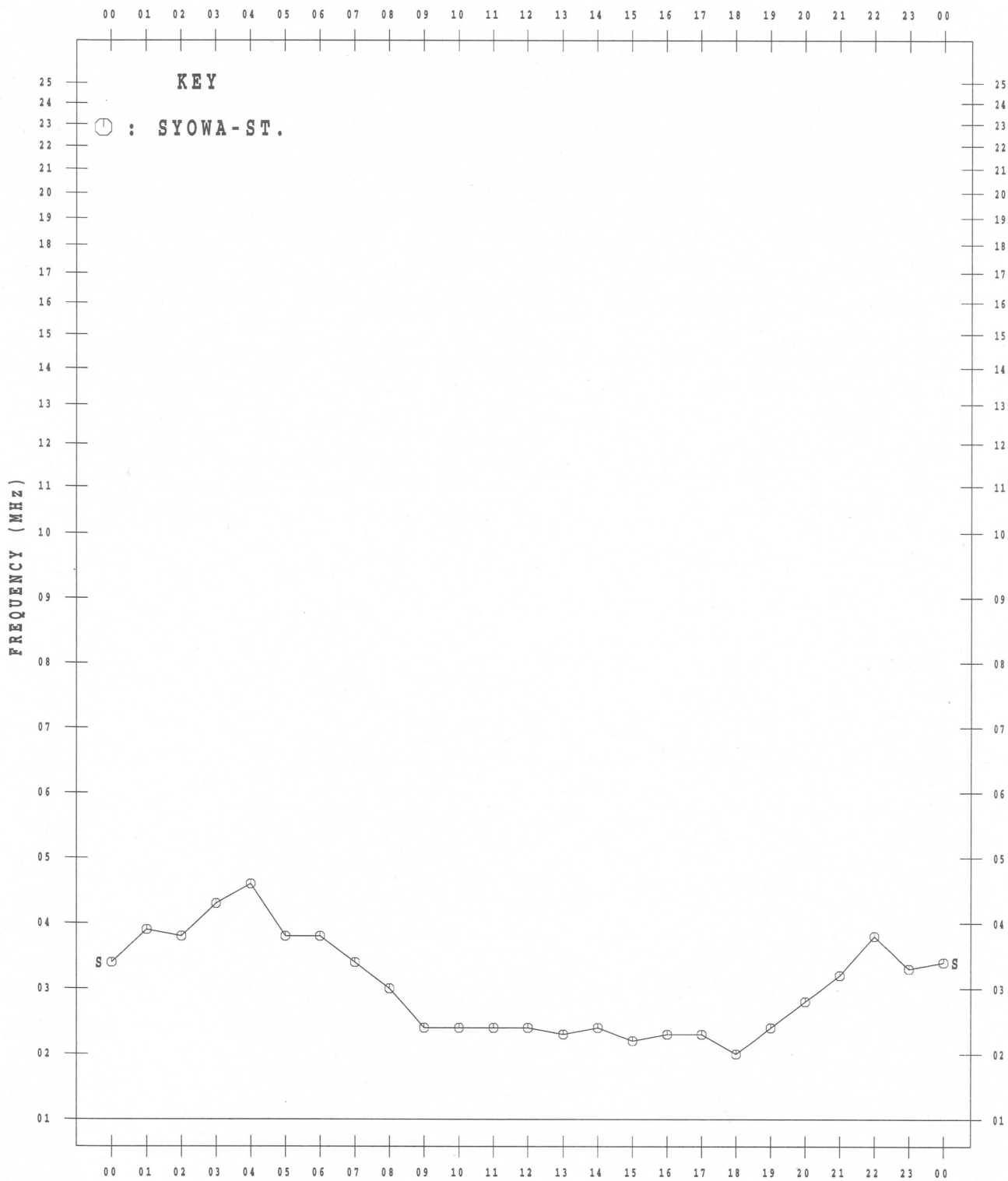
JUL. 1996



MONTHLY MEDIAN VALUES OF f_tE_s

45° E MEAN TIME

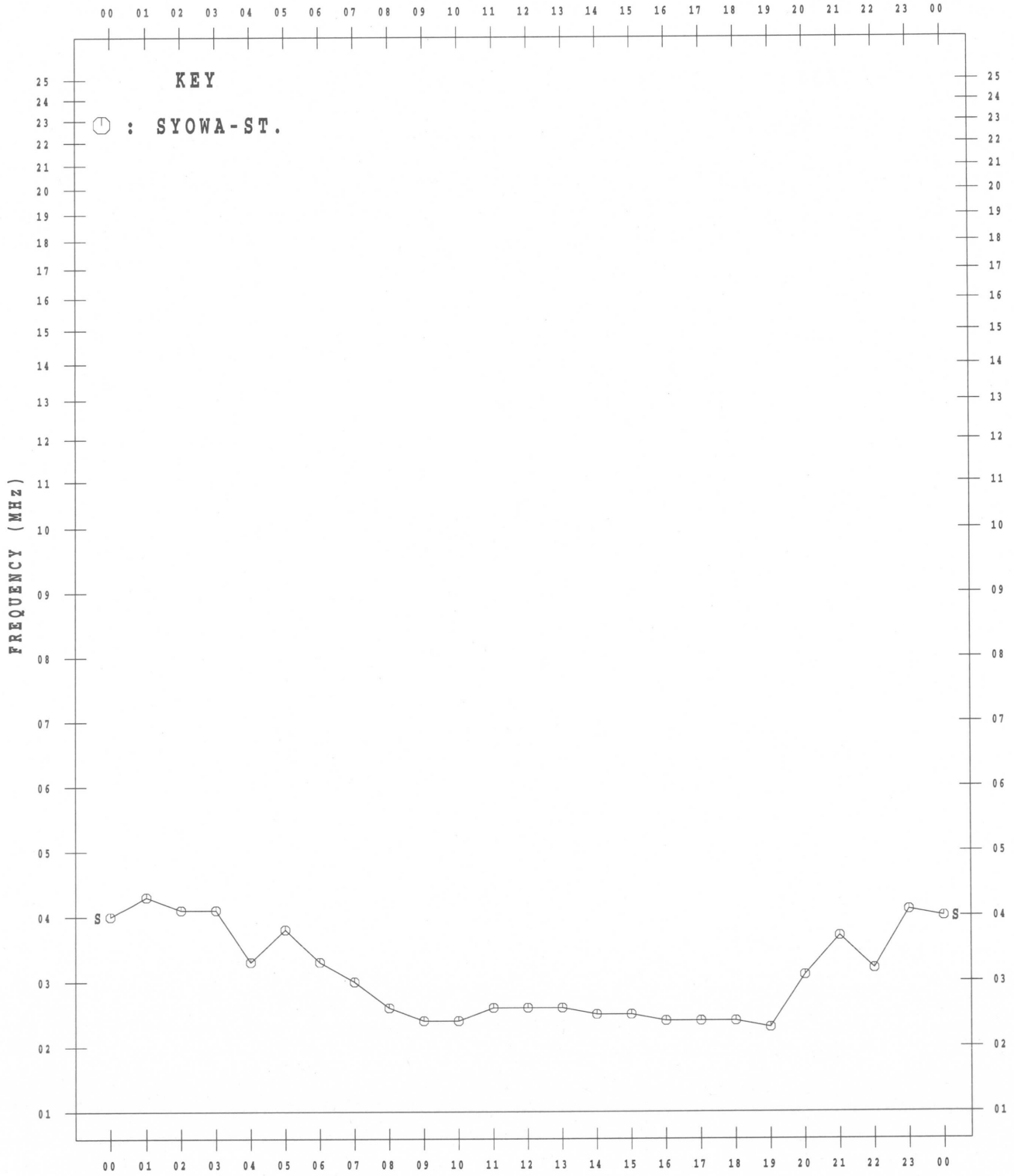
AUG. 1996



MONTHLY MEDIAN VALUES OF ftes

45° E MEAN TIME

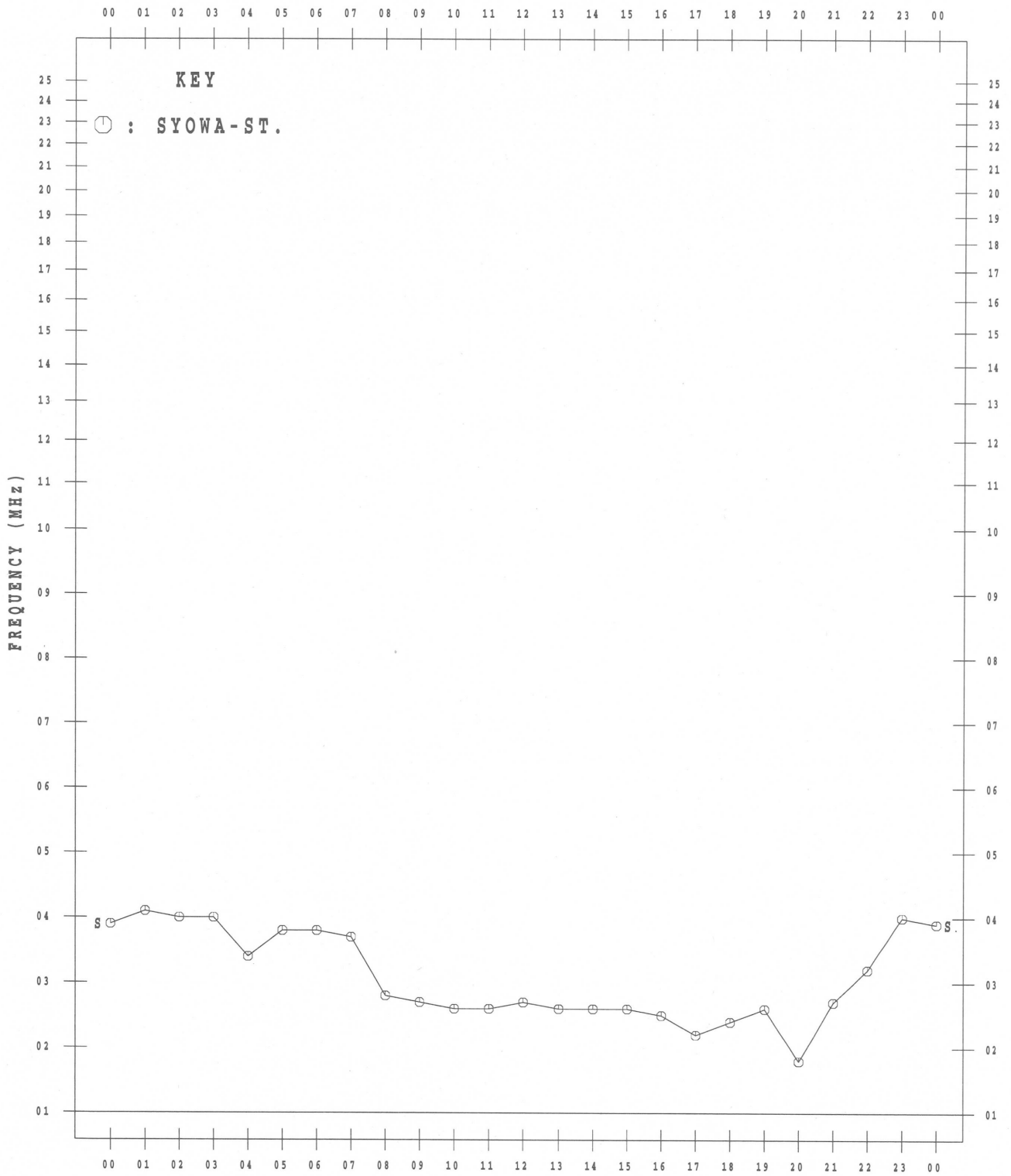
SEP. 1996



MONTHLY MEDIAN VALUES OF f_tE_s

45° E MEAN TIME

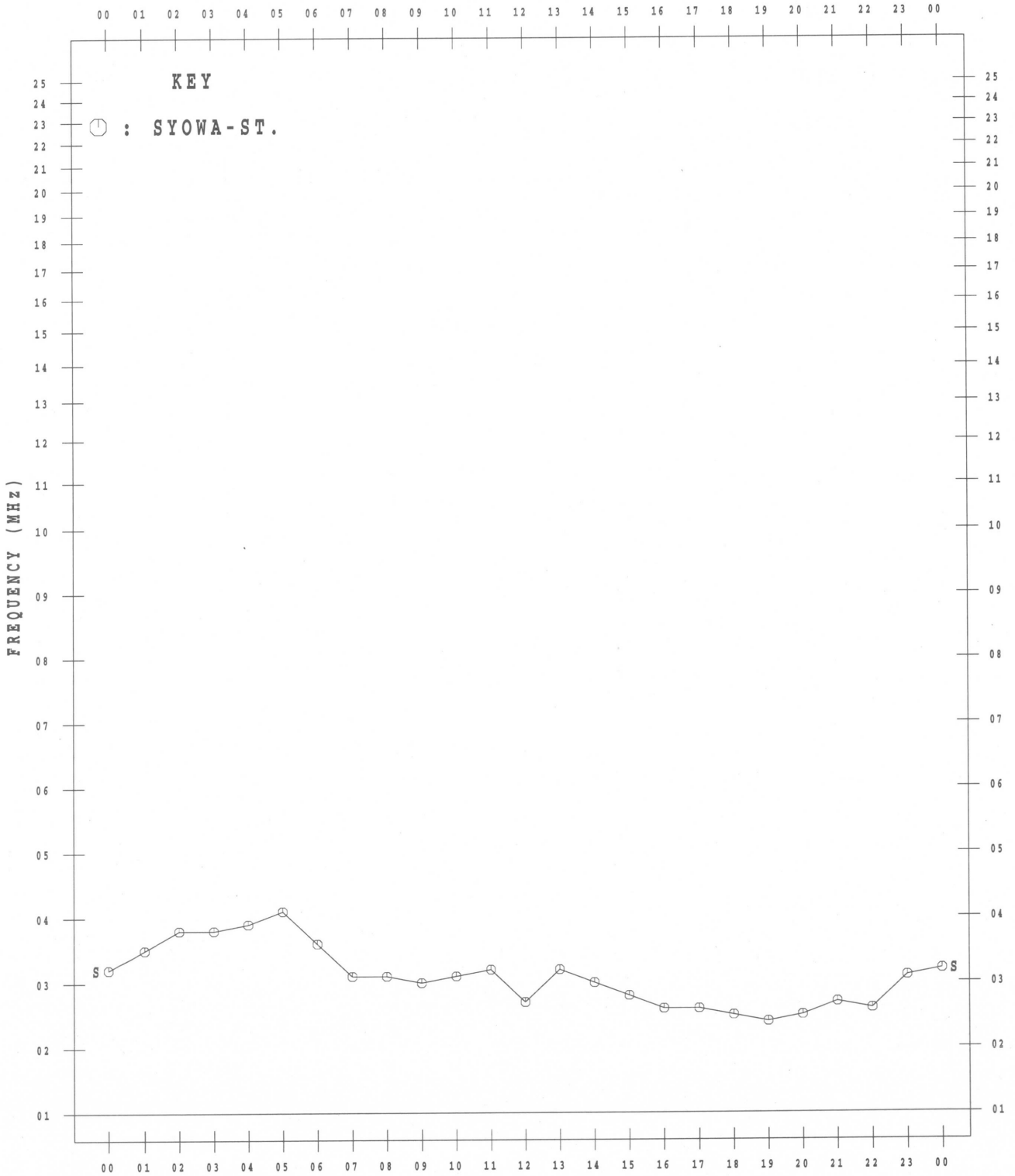
OCT. 1996



MONTHLY MEDIAN VALUES OF f_{TE}s

45° E MEAN TIME

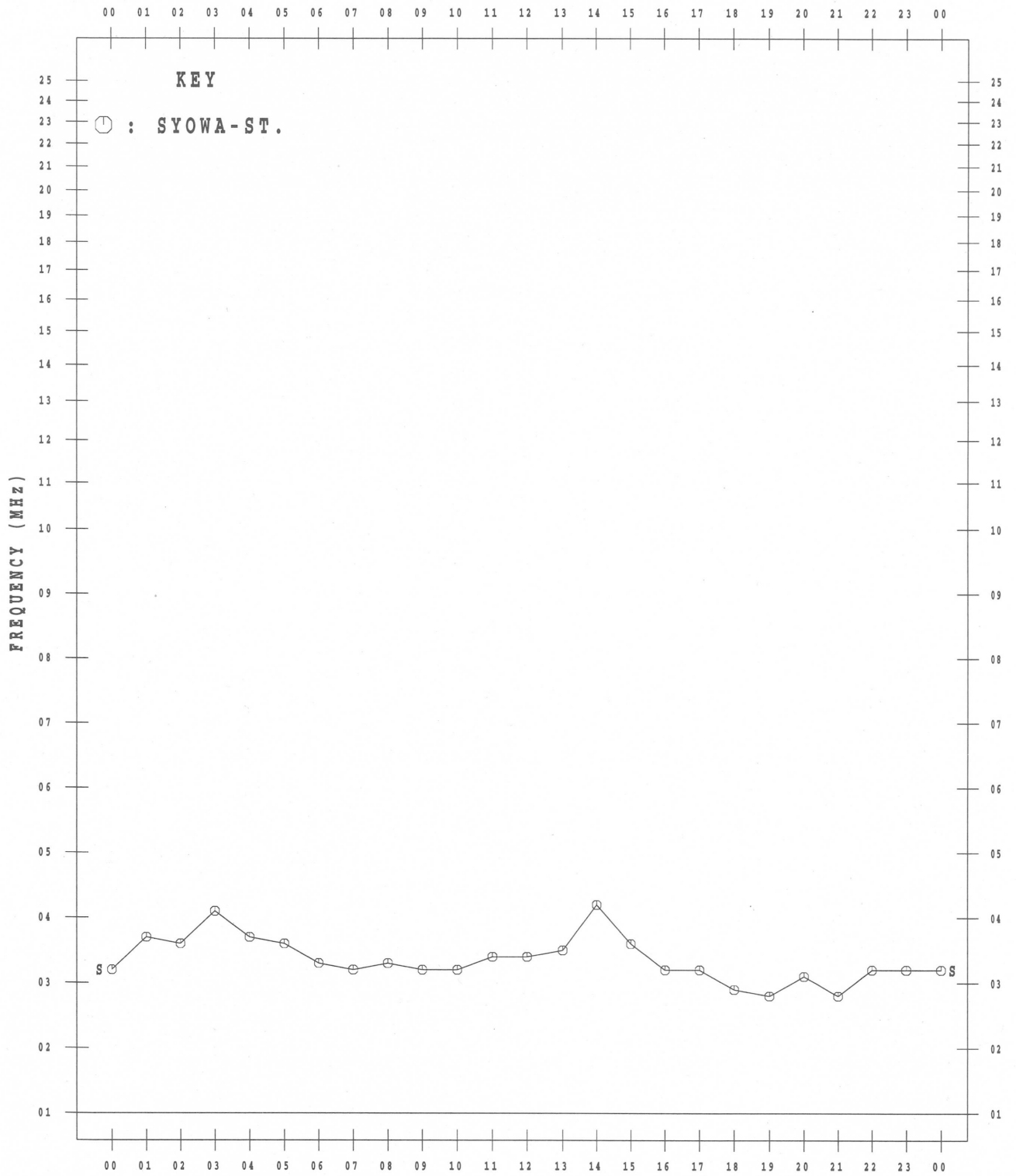
NOV. 1996



MONTHLY MEDIAN VALUES OF ftEs

45° E MEAN TIME

DEC. 1996



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