

ION. ANT.—61

**IONOSPHERIC DATA AT SYOWA STATION  
(ANTARCTICA)**

January 1994—December 1994

**CONTENTS**

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

**COMMUNICATIONS RESEARCH LABORATORY**

**MINISTRY OF POSTS AND TELECOMMUNICATIONS**

**TOKYO, JAPAN**

## INTRODUCTION

This data book gives summarized results for vertical soundings of the ionosphere at Syowa Station, Antarctica in 1994. 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 OF SYOWA STATION

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

### SPECIFICATIONS OF THE IONOSONDE USED AT SYOWA STATION

Items	Specifications
Frequency Range	400 kHz - 15 MHz
Transmitting Power	10 kW (peak value)
Duration of Sweep	20 s
Transmitted Pulse Width	80 $\mu$ s
Pulse Repetition Frequency	50 Hz
Frequency Marker	every 1 MHz
Height Range	0 - 900 km
Height Marker	every 50 km
Recording Media	35 mm film
Power Supply	100-V-AC, 2.0 kVA
Transmitting Antenna and Receiving Antenna	30-m-high vertical delta antennas terminated by 600 $\Omega$

### OBSERVERS

Observer: K. Iwasaki

Scaler: K. Fukushima

### DESCRIPTION

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

## b. Characteristics of Ionosphere

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

## Symbols

## (i) Descriptive Letters.

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

- A Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example, Es.  
 B Measurement influenced by, or impossible because of, absorption in the vicinity of fmin.  
 C Measurement influenced by, or impossible because of, any non-ionospheric reason.  
 D Measurement influenced by, or impossible because of, the upper limit of the normal frequency range.  
 E Measurement influenced by, or impossible because of, the lower limit of the normal frequency range.  
 F Measurement influenced by, or impossible because of, the presence of spread echoes.  
 G Measurement influenced or impossible because the ionization density of the layer is too small to enable it to be made accurately.  
 H Measurement influenced by, or impossible because of, the presence of stratification.  
 K Presence of particle E layer.  
 L Measurement influenced by or impossible because the trace has no sufficiently definite cusp between layers.  
 M Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.  
 N Conditions are such that the measurement cannot be interpreted.  
 O Measurement refers to the ordinary component.  
 P Man-made perturbation of parameters - Presence of polar spur traces.  
 Q Range spread present.  
 R Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.  
 S Measurement influenced by, or impossible because of, interference or atmospheric effects.  
 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. 1994 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	S	A	O	X		Y	Y	O	X	S	S	B	O	X	B	B	B	O	X	B	O	X	O	X	O	X	S	
2	S		B		60	63		B	B	B	S	S	B	B	B	B	B	B	B	O	X	O	X	O	X	O	X	S	
3	Y	B		53		Y	Y	X	X	V	V	B	B	O	X	B	B	B	B	O	X	B	O	X	A	B			
4	B	B	S	Y	B	B	B	Y	B	X	B	71	72	72	B	B	B	B	X	X	V	X	O	X	X	X	X		
5	O	X	X	S	X		X	X	X	O	X	O	X	O	X	X	X	X	X	X	X	X	X	X	O	X	O	X	
6	O	X	S	B	S	S	A	B	S	A		O	X	B	O	X	O	X	X	X	X	B	S	S	S	O	X	O	X
7	S	B	O	X	O	X		X	O	X	X	X	X	X	Y	X	X	X	X	O	X	X	X	X	X	X	X	S	
8	A	S	B	X	S	S	S		67	67	B	B	Y	70	72	B	X	X	X	X	X	X	X	X	X	X	X		
9	O	X	B	O	X	X		X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10	X	O	X	O	X		O	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
11	64	61	63	70	70	70	84	96		S	O	X	B	O	X	O	X	X	X	X	X	X	X	X	X	X	X	A	
12	A	B	S	S	S	A	S	B	A	S	B	B	B	B	B	B	O	X	B	B	B	O	X	S	S	S	A	A	
13	S	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	O	X	B	B	B	B	B	Y	S	S	S		
14	S	S	B	B	O	X	O	X	A	B	B	B	B	B	B	B	B	B	B	S	O	X	S	O	X	O	X	S	
15	A	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	A	B	B		
16	B	B	B	S	B	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	B	A	A		
17	A	S	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	O	X	O	X	S
18	S	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	S	S	S	
19	B	B	S	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
20	A	A	B	B	B	B	Y	O	X	O	X	B	B	B	B	B	B	B	B	B	B	B	B	S	S	S	S	S	
21	B	B	B	B	B	S	B	B	B	B	Y	B	B	Y	Y	Y	Y	Y	Y	Y	X	O	X	B	S	Y	S	S	
22	B	B	B	S	S	A	S	S	Y	S	Y	S	B	B	B	B	B	B	B	S	S	S	S	S	S	S	S	S	
23	B	O	X	S	B	S	B		X	X	X	X	O	X	O	X	O	X	X	X	A	X	X	X	X	X	X	X	
24	S	B	O	X	S	B	Y	X	X	X	X	O	X	X	X	O	X	B	X	X	X	X	X	X	X	X	X	X	
25	X	X	56	57	59	Y	Y	O	X	X	B	Y	O	X	X	O	X	O	X	O	X	X	X	X	X	X	X	X	
26	S	B	S	S	B	S		B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
27	Y	Y	S	S	B	B	S	B	B	S	O	X	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
28	S	A	B	S	A	A	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
29	B	A	S	S	B	O	X	Y	B	B	O	X	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
30	S	O	X	S	B	B	B		X	O	X	O	X	X	O	X	O	X	O	X	X	X	B	O	X	O	X	O	X
31	A	S	S	S	O	X	B	B	S	C	X	X	C	C	X	O	X	S	X	X	X	X	B	S	S	S	S	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	6	7	7	8	8	8	10	13	10	14	12	10	12	12	13	16	17	17	16	16	19	22	17	12					
MED	58	54	56	60	62	69	66	67	70	72	75	76	74	68	66	66	64	62	62	60	58	51	50	52					
UQ	59	59	61	64	66	70	80	86	86	82	79	81	76	74	68	71	69	67	64	62	60	58	59	58					
LQ	O	X	X	X	O	X	X	X	X	X	X	X	X	O	X	O	X	X	X	X	O	X	O	X	O	X	O	X	
	54	47	48	56	50	58	58	60	66	69	62	72	69	66	63	63	60	60	58	52	50	48	44	45					

# IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1994 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	AD S	AU S	F	Y	YU S	S	S	BU S	B	S	B	B	BU S	B	S	B	BU S	B	S	S	S	S	S	S
2	S	F	B	F	B	B	B	S	S	B	B	B	B	B	B	F	F	B	BU S	D	S	J	S	S
3	Y	B	F	B	Y	YJ F	V	V	B	B	U S	B	F	62	59	B	B	BU S	B	U S	B	U S	A	B
4	B	B	S	Y	B	B	B	Y	B	J F	F	B	B	B	B	57	58	63	63	S	J	S	J	S
5	S	D	S	F	J	S	J	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	S
6	U	S	D	S	B	D	S	S	A	B	S	A	F	F	B	R	66	66	72	75	74	J	S	S
7	S	BU S	S	S	R	F	71	79	80	76	71	68	66	Y	J	S	57	61	61	64	60	J	S	S
8	AD S	B	J	S	S	S	S	F	55	61	B	B	Y	F	F	B	J	S	55	54	59	58	57	58
9	U	S	BU S	S	F	J	F	F	J	S	J	S	J	R	R	R	R	R	R	R	R	R	R	S
10	J	S	U	X	X	F	S	J	R	79	79	74	76	74	69	60	58	J	S	F	57	54	51	53
11	F	U	S	S	F	F	F	J	S	D	S	U	S	B	S	80	81	74	61	64	74	63	62	S
12	A	B	S	D	S	S	A	S	B	A	S	B	B	B	B	B	40	B	B	B	S	S	S	S
13	D	S	B	B	S	B	B	B	B	B	B	B	B	B	B	B	40	B	B	B	B	B	B	S
14	S	S	B	BU S	U	S	S	A	B	B	B	B	B	B	BU S	41	B	BD	S	U	D	S	U	S
15	A	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	40	B	B	B	BD	S	S	A
16	B	B	B	S	B	S	S	B	B	B	B	B	B	B	B	B	40	B	B	BD	S	S	S	B
17	A	S	A	A	B	B	B	B	B	B	B	B	B	B	BU S	B	B	B	J	S	D	S	S	S
18	S	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	S	B	B	S	U	S	S
19	B	B	S	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	J	S
20	A	A	B	B	B	B	Y	S	S	B	B	B	B	B	B	B	B	B	B	BD	S	U	S	S
21	B	B	B	B	B	S	B	B	B	Y	B	B	Y	Y	Y	Y	Y	Y	J	S	U	S	S	Y
22	B	B	B	S	S	A	S	S	Y	S	Y	S	B	B	B	B	BD	S	D	S	S	J	S	J
23	B	R	S	B	S	B	F	F	J	R	J	R	R	R	R	R	R	R	R	R	R	R	R	S
24	D	S	BU S	D	S	B	B	Y	55	57	63	70	67	62	60	59	B	J	R	J	S	J	R	J
25	J	S	R	F	Y	Y	F	R	B	Y	52	56	B	59	59	57	59	60	59	53	58	52	53	55
26	S	B	S	S	B	S	F	F	B	B	S	B	B	B	B	Y	U	R	B	B	Y	R	Y	S
27	Y	Y	S	S	B	B	S	B	B	S	R	B	B	B	B	B	57	B	J	S	J	S	S	A
28	S	A	B	S	A	A	B	S	B	B	B	B	B	B	B	B	B	S	59	55	B	B	F	S
29	B	A	S	S	B	R	Y	B	B	R	B	B	B	B	B	BU S	S	70	70	54	53	53	53	37
30	D	S	U	S	S	B	B	B	F	67	64	70	72	J	S	R	B	57	61	63	J	R	B	Y
31	A	S	S	S	U	S	B	S	C	59	54	C	C	60	58	52	52	54	57	BD	S	D	S	U
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	9	10	8	11	8	8	10	13	11	14	12	10	12	12	13	17	17	19	18	20	23	23	18	13
MED	S	U	S	S	52	58	60	57	64	66	69	70	68	62	60	60	58	58	55	53	52	45	45	47
U Q	54	51	52	57	58	62	71	80	80	76	73	75	70	68	60	63	62	59	57	55	54	52	52	52
L Q	D	S	D	S	D	S	U	S	F	50	47	52	60	61	56	62	61	60	57	56	54	49	48	43

### IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1994 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	47	40	50	34	70	43	43	37	32	47	B	37	B	32	B	B	B	37	B	39	43	37	52	43					
2	39	41	B	33	B	B	B	42	42	B	B	B	B	B	B	30	33	B	B	38	42	36	27	39					
3	45	B	31	B	28	37	38	27	27	32	B	B	B	B	B	B	B	B	B	23	B	42	62	B					
4	B	B	39	37	B	B	B	37	B	B	B	B	B	B	B	32	27	27	B	31	27	E	30	23	31	17			
5	20	22	31	27	32	32	27	32	30	32	27	32	37	31	27	28	32	30	24	23	E	26	23	20	19				
6	23	E	B	B	38	37	70	58	61	33	E	B	B	S	50	32	27	26	E	B	33	32	26	26	26	38			
7	37	B	33	32	26	26	27	32	37	41	26	32	32	17	27	36	32	30	56	33	38	26	20	41					
8	57	37	B	31	33	32	42	40	37	B	B	32	28	33	B	32	18	27	26	E	S	37	32	27	19				
9	37	B	42	41	37	26	26	32	32	27	32	29	37	27	27	33	32	27	26	20	27	24	32	17					
10	26	26	27	23	22	23	26	31	32	32	36	38	32	37	43	36	64	33	39	41	28	36	59	33					
11	22	26	27	26	26	37	23	26	E	S	B	B	B	B	B	B	41	32	33	27	32	28	57	59					
12	91	B	37	32	41	59	40	B	59	41	B	B	B	B	B	B	B	B	B	B	B	30	40	32	27	32			
13	32	B	B	32	B	B	B	B	B	B	B	B	B	B	B	26	B	B	B	B	B	B	37	42	38				
14	41	41	B	B	32	22	26	41	B	B	B	B	B	B	B	27	B	B	25	27	26	E	30	26	37	42			
15	41	38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	28	B	B	B	B	27	32	71	B				
16	B	B	B	32	B	39	32	B	B	B	B	B	B	B	B	B	B	B	B	B	20	E	25	38	93				
17	58	36	41	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	41	26	26	23	23	32				
18	90	B	B	B	B	32	B	B	B	B	B	B	B	B	B	B	B	B	B	31	B	33	33	37	33				
19	B	B	47	B	B	37	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	26	21	38	32				
20	70	69	B	B	B	B	33	27	E	B	B	B	B	B	B	B	B	B	B	B	E	B	24	22	37	35			
21	B	B	B	B	B	38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	38	37	38				
22	B	B	B	47	32	71	39	26	38	38	26	33	B	B	B	B	B	B	E	S	31	32	24	25	27	E	B	18	37
23	B	54	52	B	33	B	34	27	27	32	27	37	37	39	33	33	39	48	58	24	23	26	19	22					
24	37	B	28	33	B	B	32	26	27	33	32	26	32	33	34	B	E	B	B	E	S	26	20	22	22	12			
25	13	26	28	38	37	27	33	B	37	37	32	B	37	37	39	34	27	26	26	26	26	26	22	30	69				
26	E	B	B	B	B	32	32	27	B	B	36	B	B	B	B	B	26	E	S	B	B	36	32	24	39	46			
27	39	39	32	26	B	B	26	B	B	37	33	B	B	B	B	B	B	B	E	B	31	26	32	39	47	44	40		
28	40	57	B	32	70	59	B	40	B	B	B	B	B	B	B	B	B	B	E	B	31	32	B	E	B	22	33		
29	B	70	40	39	B	32	33	B	33	B	B	B	B	B	B	B	52	55	52	22	27	33	B	E	B	20	18		
30	40	28	33	B	B	B	B	26	41	27	E	B	32	E	B	B	B	B	E	B	B	E	B	23	B	33	S		
31	70	37	37	37	39	B	B	38	C	26	27	C	C	E	B	54	26	32	27	26	26	B	E	B	21	27	26		
	00	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	18	19	22	16	20	19	20	17	18	15	12	12	14	14	19	18	20	19	25	27	29	30	28					
MED	40	38	37	33	33	34	32	32	34	33	30	32	34	32	30	32	31	28	28	26	26	26	32	34					
U Q	52	41	41	38	38	41	38	39	42	37	E	B	36	38	44	37	35	34	36	32	33	32	33	36	39	40			
L Q	29	26	31	32	30	30	26	27	31	32	27	32	32	31	27	27	27	26	26	24	26	23	23	24					

# IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1994 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	7	9	7	8	9	13	19	16	15	19	B	16	B	19	B	B	B	19	B	10	10	18	19	18		
2	19	14	B	14	B	B	B	35	24	B	B	B	B	B	B	23	20	B	B	15	15	15	9	16		
3	19	B	10	B	19	15	15	16	15	20	B	B	57	B	35	51	B	B	B	19	B	15	15	B		
4	B	B	30	19	B	B	B	15	B	33	50	50	B	B	B	19	16	18	31	15	30	15	10	9		
5	9	8	14	16	20	10	14	14	16	16	20	19	20	19	23	20	18	18	16	13	26	15	8	13		
6	18	22	B	18	7	19	B	31	19	25	51	B	E S	50	30	19	20	E S	36	B	19	19	24	21	16	14
7	16	B	20	16	14	18	15	13	16	19	19	20	19	13	19	19	20	19	19	16	16	19	13	14		
8	20	18	B	15	14	8	15	16	18	B	B	20	19	19	B	20	19	18	15	E S	E S	E S	24	19	7	
9	13	B	15	16	14	10	7	13	15	16	17	19	15	15	15	19	18	19	19	16	9	9	14	14		
10	13	9	9	8	10	9	10	10	E S	16	14	18	15	19	15	15	15	16	14	14	9	10	9	8	10	
11	7	7	9	7	9	20	16	20	E S	57	20	B	E S	55	18	18	19	18	16	16	15	14	7	19	7	9
12	14	B	11	14	19	19	24	B	20	19	B	B	B	B	B	E S	32	B	B	B	E S	30	16	20	19	19
13	20	B	B	16	B	B	B	B	B	B	B	B	B	B	B	15	B	B	B	B	B	B	24	19	16	
14	19	13	B	B	18	19	14	25	B	B	B	B	B	B	24	B	B	16	20	16	E S	30	14	19	18	
15	20	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	18	B	B	B	B	19	14	23	B	
16	B	B	B	18	B	25	24	B	B	B	B	B	B	B	B	B	B	B	B	19	25	19	B	30		
17	30	18	11	31	B	B	B	B	B	B	B	B	B	B	E S	35	B	B	B	18	24	16	19	14	18	
18	51	B	B	B	B	19	B	B	B	B	B	B	B	B	B	B	B	31	B	B	22	19	18	14		
19	B	B	24	B	B	18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19	18	9	16		
20	30	19	B	B	B	B	19	18	40	B	B	B	B	B	B	B	B	B	B	30	24	10	10	19		
21	B	B	B	B	B	31	B	B	B	B	B	B	B	20	19	19	20	19	18	18	B	19	18	24		
22	B	B	B	19	19	18	25	19	11	19	20	20	B	B	B	B	B	31	30	19	19	9	18	8		
23	B	8	19	B	20	B	19	18	10	9	16	18	19	18	19	18	18	15	19	14	10	10	12	11		
24	16	B	19	18	B	B	18	15	18	18	24	19	18	24	19	B	32	19	E S	30	24	18	18	18	9	
25	8	10	18	19	20	19	18	B	19	19	31	B	19	10	19	18	19	19	18	16	16	18	30	24		
26	20	B	20	24	B	19	18	22	B	B	20	B	B	B	B	19	31	B	B	19	19	17	19	13		
27	9	7	11	9	B	B	19	B	B	19	19	B	B	B	B	B	B	31	19	19	19	7	17	24		
28	18	30	B	8	9	19	B	20	B	B	B	B	B	B	B	B	B	31	19	B	B	23	18	18		
29	B	19	20	19	B	30	20	B	B	19	B	B	B	B	B	B	52	55	52	19	18	24	B	20	7	
30	10	7	9	B	B	B	B	18	18	18	53	20	57	36	B	24	19	56	B	35	11	B	20	S		
31	18	20	20	18	9	B	B	20	C	17	20	C	C	54	20	27	20	18	18	B	26	19	23	13		
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	31	31	31	31	31	31	30	31	31	30	30	31	31	31	31	31	31	31	31	31	31	30		
MED	19	22	20	18	20	19	20	20	U	27	20	B	B	B	B	26	32	31	20	19	19	18	18	15		
U Q	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	31	26	19	19	19
L Q	13	10	11	15	14	18	16	16	16	19	20	20	19	19	19	19	19	18	18	16	16	14	12	11		



IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1994 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	E A E A	A	A E A	A	A	A	A	A	A	A	B E A	B	B	B	B	B	B	A	B	A E A	A	A	A	A		
2	A	A	B	230	B	B	B	S	A	B	B	B	B	B	B	B	230	240	B	B	A	215	A E S	A		
3	A	B	A	B	A	A E A	A	A	S	B	B	B	B	B	B	220	B	B	B	B E S	265	B E A	A	B		
4	B	B	S	A	B	B	B	S	B	205	B	B	B	B	B	B E S	240	220	200	225	220	E B	E A E S			
5	245	E S	A	S E S	300	235	205	200	210	205	E S	240	200	S	S	S	205	200	200	200	205	E B	240	230		
6	275	245	B	A	A	A	B	S	A	S	B	B	S	S	215	240	220	B	B	A	240	250	240	240		
7	A	B	A	A	A E S	270	240	215	220	215	210	200	205	S	225	200	210	200	A	235	250	215	E A	230		
8	A	A	B	S E A	225	255	A	A	A	A	B	B	S	200	215	B	S	205	210	235	240	290	255	240	215	
9	E A	B	A	220	A	225	200	240	245	200	200	200	200	205	210	200	200	200	250	E S	235	240	225	235	200	
10	230	250	E A E A	E A	260	245	220	210	200	210	210	205	245	200	235	200	200	205	225	250	E A	215	245	245	250	
11	245	250	E A	E S E A	270	250	200	200	S	215	B	S	S	A	200	230	240	220	240	S	240	S	A	A		
12	A	B	A	215	A	A	A	B	A	A	B	B	B	B	B	B E B	230	B	B	B	250	S	235	S	S	
13	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B E S	210	B	B	B	B	B	S	A	S	
14	A	S	B	B	A E S	280	215	A	B	B	B	B	B	B	B	B	210	B	215	E S E S	305	295	255	230	215	
15	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	220	B	B	B	B	E A	A	A	B	
16	B	B	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B E S	220	260	A	B	A	
17	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B E B	250	B	B	B E S	250	240	230	250	240	
18	S	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	210	B	B	S E S	A	A		
19	B	B	S	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	240	240	A	A	
20	A	A	B	B	B	B	S	250	B	B	B	B	B	B	B	B	B	B	B	B	B	250	225	245	A	A
21	B	B	B	B	B	S	B	B	B	B	B	B	B	B	B E S E A	230	240	210	200	205	225	240	A	A	A	
22	B	B	B	A	A	A	A	S	A	A	205	S	B	B	B	B	B	B	B	200	200	S	250	235	220	A
23	B E A	A	B	S	B E A E S	270	280	200	240	220	250	S	S	A	A	200	200	205	A	A	215	200	260	245	250	
24	240	B	A	A	B	B	A	220	205	200	210	240	210	S	200	B	200	215	215	230	S	250	245	245	245	
25	255	275	A	A	A	A	280	B	A	205	S	B	S	S	S	S	205	215	220	250	250	240	250	A	B	
26	E B	B	A	S	B	A E S	275	245	B	B	A	B	B	B	B	B	200	220	B	B	A	275	255	A	A	
27	A	A	A	S	B	B	230	B	B	A E A	B	B	B	B	B	B	B	B	B E B	240	225	S	A	A	A	A
28	A	A	B	S	A	A	B	A	B	B	B	B	B	B	B	B	B	B	220	235	B	B	240	265	A	
29	B	A	A	A	B	S	S	B	B	S	B	B	B	B	B	B	B	B	B	B	220	245	250	B	280	280
30	220	A	A	B	B	B	B	220	A	200	B	230	B	220	B	215	200	B	B	B E S	275	245	B	S	S	
31	A	A	A	A	A	B	B	A	C	200	235	S	C	C	B	200	210	210	210	225	B E B E B E B E	245	255	265	280	
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		10	7	2	6	5	6	11	12	8	12	10	8	5	7	12	15	17	17	17	18	24	21	17	12	
MED		244	255	E A	225	E A	248	U	218	223	206	205	209	209	202	215	208	208	205	210	222	E	238	242	242	236
U Q		270	270	240	285	270	270	242	225	212	235	245	228	220	230	230	220	218	235	250	E S E	250	255	E	260	250
L Q		240	250	220	258	235	205	212	202	200	205	200	200	200	205	200	200	200	200	200	220	230	235	238	240	222

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1994 f<sub>XI</sub> (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1994 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	S 34	B	A	B	J S 52	B	F J F 53 54	F	F	F	F	65 66	66	B U R 64	B	B	R 57	R 59	56	R U S 59 58	52	53	47		
2	J S 41	S	F	42	44	F	F	F	B	B	C	B	57	B	B	B	75	U S D 49 47	43	43	S	Y	S		
3	U S 40	S	U S	46	44	J S	S	S	R	B	F	58	B	F	F	R	64	B J S 54	B D S U S 34 36	A	S				
4	B	A	S U S 41	B	A	S	S	F	F	B	Y	64	60	57	57	J S 53	R J S D 58 52	S U S 33	S	B	C				
5	S	S	A	B	B	B	B	B	57	58	61	66	B	R	70	73	B	B	B	B	A D S D 58 46	S	A		
6	S	Y	S	A	A	B	S	B	B	B	B	B	B	B	B	B	B	B	S	34	31	S	S	A	
7	A	S	S	B	B	J S 30	S	B	B	C	B	B	B	B	B	B	B	B	B	U S 35	B	S	S	A	
8	S	S	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	C	U S 38	S D S 43	C	A	A	
9	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	D S 33	C	C	B	A	A	B	A	
10	A	B	B	B	B	B	B	B	B	U S 38	B	B	B	B	B	B	B	B	Y U S 40	B	A	F	A	B	
11	A	A	B	B	B	S	Y	B	B	B	B	B	B	B	B	B	B	B	U R 49	B	A	A U R 31	B		
12	B	S	S	S	B	B	B	B	B	B	B	B	B	B	U S U S 38 38	B	B	B	S U S 38	A	S	A	A		
13	A	A U R 37	B	S	B	B	B	A	B	B	B	B	B	B	B	B	B	B	U S 40	B	F	S	B	B	
14	A	A	S	B	B	B	B	B	S	B	B	B	B	B	B	S	S	47	47	Y	A	B D S 33	S	S	
15	A	B	Y	B	S	B	B	A	B	B	B	B	B	U S 41	B	B	B	B	U S 39	Y	Y	B	Y		
16	Y	B	A	B	B	B	Y	B	B	B	B	B	B	B	B	B	B	U R 39	S 38	B	S	A U S 28	A		
17	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B J S 51	S	R	S U S 33	S	A	
18	A	A	S	S	S U S 38	S	S	A J S 62	F	F J R 59 64 65	B	B	B	B	B	B	B	B	B	B	B	S	S	S	
19	42	S	A	A	A	A U S 33	B	B	B	B	B	B	B	B	B	B	B	S	U S 40	41	B	R	A	Y	Y
20	S	S	A	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
21	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	
22	A	S	S	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	S	B	B
23	Y	A	B	B	B	B	B	B	U S 37	B	B	B	B	B	B	B	B	B	B	B	A D S J S 42 32	S	S	S	
24	A	A	A	S	B	S D S 43	41	59	64	66	70	70	69	67	61	54	55	57	57	61	48	46	40	39	
25	J F 41	A	S	Y	B	B	B	S	B	S	B	B	B	B	B	B	B	B	S	U S 40	41	B	R	Y	Y
26	S	A	A	A	B U S 38	B	S	R	R J S 52	52	52	52	56	59	60	56	62	63	B	R	B D S J S 40 40	S	F		
27	F	27	22	33	37	51	54	B	B	R	F J S 64 62	63	71	73	73	74	65	62	51	F J S 50	43	46	47		
28	J F 36	F	A	S	S	F	S J S 40 55	63	68	69	68	75	73	75	83	72	70	63	58	50	J S J S 54 52	39	Y		
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	7	4	4	5	4	8	8	6	8	10	8	8	8	9	11	9	11	10	15	12	14	15	10	5	
MED	40	32	37	41	44	40	54	58	58	61	62	65	64	65	64	57	60	58	52	47	42	42	40	43	
U Q	41	42	40	44	48	47	56	63	64	66	66	68	68	70	73	68	70	63	56	58	48	47	46	47	
L Q	34	25	30	29	40	38	38	57	54	58	56	60	60	59	59	46	47	49	40	36	37	33	33	38	

# IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1994 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	39	B	42	B	26	B	37	36	27	27	26	26	27	B	B	B	26	E	B	E	B	E	B	21	42	42		
2	39	38	37	25	26	21	23	25	B	B	C	B	E	B	B	B	26	31	31	31	26	C	37	40				
3	38	32	36	26	28	27	23	26	26	23	B	27	B	E	B	39	27	B	B	B	26	20	42	33				
4	B	42	32	32	B	51	42	39	32	E	B	B	27	27	37	26	31	33	26	22	23	22	26	B	C			
5	39	S	71	B	B	B	B	B	27	26	26	25	B	E	B	E	B	B	B	B	B	46	26	46	71			
6	32	28	47	52	70	B	40	B	B	B	B	B	B	B	B	B	B	B	B	23	19	21	39	58	60			
7	110	36	37	B	B	23	32	B	B	C	B	B	B	B	B	B	B	B	B	B	22	B	38	37	76			
8	33	37	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	C	B	16	70	C	90	63			
9	35	38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E	B	C	C	B	70	90	B	10			
10	60	B	B	B	B	B	B	B	B	E	B	B	B	B	B	B	B	30	B	B	B	70	23	70	B			
11	71	71	B	B	B	38	37	B	B	B	B	B	B	B	B	B	B	B	E	B	B	80	70	33	B			
12	B	33	33	27	B	B	B	B	B	B	B	B	B	B	33	31	B	B	B	32	E	B	40	38	42	106		
13	70	59	52	B	34	B	B	B	72	B	B	B	B	B	B	B	B	B	B	22	B	27	70	B	B			
14	71	69	33	B	B	B	B	B	E	B	B	B	B	B	B	E	B	31	27	25	31	72	22	33	40			
15	62	B	13	B	31	B	B	71	B	B	B	B	B	E	B	B	B	B	B	B	32	33	26	B	32			
16	33	B	70	B	B	B	26	B	B	B	B	B	B	B	B	B	B	B	23	E	S	23	39	33	40			
17	32	40	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	27	37	22	E	B	40	40		
18	42	40	37	37	33	26	33	40	43	33	50	55	57	55	51	B	B	B	B	B	B	B	E	B	30	31	13	
19	24	39	46	76	71	43	32	B	B	B	B	B	B	B	B	B	E	B	31	27	B	20	110	26	20			
20	32	41	66	40	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
21	B	38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	33		
22	86	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
23	22	74	B	B	B	B	B	B	B	E	B	B	B	B	B	B	B	B	B	B	60	27	17	26	17			
24	37	43	41	36	B	E	B	21	21	22	E	B	E	B	27	31	38	27	40	23	21	E	B	E	B			
25	38	33	32	27	B	B	B	40	B	E	B	B	B	B	B	E	B	B	B	E	B	41	27	32	16	7	33	41
26	33	59	59	60	B	37	B	34	27	26	26	27	26	26	26	27	26	E	B	B	E	B	B	E	B	B		
27	26	29	32	28	32	33	21	B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B		
28	13	28	33	32	37	26	27	22	31	25	26	28	E	B	E	B	55	51	41	38	E	S	E	S	E	S		
29																												
30																												
31																												
CNT	25	22	20	13	10	11	13	10	10	10	9	9	9	9	11	9	11	11	17	16	21	24	21	22				
MED	38	38	37	32	32	27	32	35	28	25	30	26	22	37	32	31	28	26	24	30	26	27	37	40				
U Q	61	43	50	46	37	38	37	40	32	E	B	E	B	E	B	E	B	E	B	E	B	43	39	42	60			
L Q	32	33	33	27	28	26	24	25	27	25	26	26	26	32	31	29	27	24	23	23	22	21	28	20				

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1994 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	8		B	24		B	19		B	20	30	20	19	21	19	20		B	52		B	20	31	31	31	26	18	18	13		
2	7	9	8	9	8	13	18	16						56					51	19	24	31	20				C	9	9		
3	7	8	10	19	18	18	11	11	13	19			B	18		14	56	19	19		19		20	17	9	20					
4		B	9	15	9		B	19	20	20	10	31		19	19	15	19	31	19	19	16	16	19	19				B	C		
5	31		S	10		B	B	B	B	B																					
6	30	18	18	20	7			16		B	B	B	B	B	B	B	B	B	B	B	B	B	B	8	9	7	18	11	7		
7	18	10	9		B	B	10	7		B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	19		B	13	19	24	
8	10	7		B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	C	B						C				
9	8	18		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	B									
10	9		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	30											
11	23	11		B	B	B			B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	30						
12		B	18	14	18		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	30						
13	8	7	7		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	30					
14	55	8	8		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	30					
15	8		B	9		B	B	B	31																						
16	18		B	11		B	B	B	11		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	20	31				
17	18	23		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
18	18	13	19	18	19	19	23	31	20	31	50	55	57	55	51																
19	9	7	20	19	31	19	13		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	31					
20	12	36	24	19		B	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	30		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
22	54		S	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	
23	18	20		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
24	10	9	19	20		B	B	B	24	11	20	19	34	37	20	20	23	20	19	19	19	30	19	18	18	8					
25	9	7	18	18		B	B	B	24		B	51		16		31	21														
26	19	12	9	19		B		B	19	9	24	20	20	20	18	21	22	19	30												
27	20	9	9	7	9	11	16		B	B			56	56	56	60	31	50	57	50	30	19	19	19	9	10					
28	8	8	8	9	31	11	11	10	10	15	18	19	55	51	20	20															
29																															
30																															
31																															
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT		28	26	27	28	28	28	28	28	28	26	27	28	28	28	28	28	28	28	26	27	28	28	26	28	27					
MED		18	12	18		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	31	31	20	19	18	15					
U Q		26		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B					
L Q		8	8	9	18	19	19	17	27	20	31	50	46	56	56	41	31	30	30	19	20	18	13	10	9						

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1994 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	245	B	A	B	S	B	A	A	210	200	200	205	200	B	B	B	220	215	215	240	BE B	250	250	245	255
2	E A	280	275	255	A	A	250	220	220	B	B	C	B	B	B	B	B	220	A	A	280	280	235	A	
3	A	A	A	A	A	S	245	225	220	S	B	205	B	S	B	A	215	B	215	B	S	275	A	S	
4	B	A	A	A	B	A	A	A	200	205	B	A	200	E A	215	200	200	230	230	215	230	A	B	C	
5	A	S	A	B	B	B	B	B	235	200	E S	240	200	B	B	B	B	B	B	B	A	255	220	A	
6	A	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	250	245	S	A	A	
7	A	A	A	B	B	A E A	285	B	B	C	B	B	B	B	B	B	B	B	B	S	B	A	A	A	
8	A	A	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	C	B	S	A	C	A	A	
9	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	235	C	C	B	A	A	B	A	
10	A	B	B	B	B	B	B	B	B	B	215	B	B	B	B	B	B	B	Y E B	B	A	A	A	B	
11	A	A	B	B	B	S	A	B	B	B	B	B	B	B	B	B	B	B	E B	B	B	A	A	A	
12	B	A	A	S	B	B	B	B	B	B	B	B	B	B	E S	245	215	B	B	A	B	A	A	A	
13	A	A	A	B	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	B	
14	A	A	A	B	B	B	B	B	E B	245	B	B	B	B	B	B	205	240	250	E B	A	B	S	S	
15	A	B	Y	B	A	B	B	A	B	B	B	B	B	B	B	B	230	B	B	B	A	A	A	B	
16	A	B	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	225	E B	B	A	A	A	
17	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	250	A	A	260	220	A	
18	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	E B	245	
19	E S	280	A	A	A	A	260	B	B	B	B	B	B	B	B	B	S	245	B E S	280	B E A	A	Y	Y	
20	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
21	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	
22	A	S	S	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	A	B	
23	Y	A	B	B	B	B	B	B	B	E B	230	B	B	B	B	B	B	B	B	B	260	260	280	A	
24	A	A	A	A	B	A	B	230	230	240	220	E B	250	S	S	230	200	205	245	240	240	240	E A	E A	
25	A	A	S	S	B	B	B	A	B	B	B	B	B	B	B	B	240	225	240	B	B E A	A	A	A	
26	A	A	A	A	B	A	B	A	250	240	200	200	240	200	215	220	225	240	B	245	B	250	E B	250	
27	A	A	A	A	A	A	250	B	B	B	B	B	B	B	B	B	B	E B	B	B	230	230	235	240	250
28	A	A	A	A	A	A	A	215	225	210	200	210	B	B	250	205	E S E B	220	230	215	E S E A	240	230	250	
29																									
30																									
31																									
CNT	3	1	1			1	5	4	8	7	6	6	4	4	6	7	10	9	15	10	11	13	9	5	
MED	280	275	255			250	248	222	225	208	204	204	220	228	218	205	226	230	U	232	240	240	250	240	250
U Q	E S	280				272	228	240	240	220	210	240	230	245	220	245	245	E	265	245	260	268	E B	265	
L Q	245					232	218	215	200	200	200	200	212	215	205	220	222	230	230	230	230	245	228	248	

# IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1994 f<sub>XI</sub> (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	S	S	A	S	S	B	Y	Y		71	X	X	B		73	73	72	O	X	O	X	X	X	S	S	O	X	
2	A	A	A	A	S	C	C	Y	X	66	68	69	71	72	68	68	71	74	75	61	45	34	A	S	S			
3	A	A	B	B	Y	S	B	B	S	B	B	B	B	B	B	B	O	X	B	B	B	B	B	O	X	S	O	X
4	A	A	B	A					O	X	B	B	B	B	O	X	X	X	X	X	O	X	O	X	X	X	X	X
5	X	O	X	S	A	X	S	O	X	S	X	X	B	X	X	X	O	X	O	X	X	O	X	X	X	X	Y	
6	A	S	B	S	Y	O	X	B	S	S	B	S	B	B	B	B	O	X	S	O	X	O	X	X	X	S	S	
7	A	A	S	B	S	A	S	B	C	B	B	B	B	B	B	B	B	Y	Y	B	Y	A	A	A	A	S		
8	A	B	S	S	S			B	A	B	B	B	B	B	B	B	B	B	B	B	Y	Y	A	B	A	A		
9	S	B	A	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X	A	B	B	A	A		
10	B	A	A	B	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	S	S	S	S		
11	O	X	B	B	B	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	S	S	A	A		
12	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X	Y	A	B	
13	S	A	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	B	B	B	B	B	B	B	B	B	B	O	X	A	A	A	A	S	
15	A	B	B	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	B	
16	S	B	A	S	S	B	B	B	B	B	B	B	B	B	B	B	B	S	B	B	O	X	A	S	S	S		
17	A	A	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	O	X	O	X	A	A	A	A	
18	S	B	B	B	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	B	Y	Y		
19	S	S	A	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	O	X	X	S	S	A	A		
20	S	S	S	B	A	A	S	B	B	B	O	X	Y	B	B	X	B	B	B	B	S	O	X	B	Y	A	A	
21	S	B	A	S	Y	B	A	B	B	B	B	B	B	B	B	B	B	B	O	X	X	Y	S	S	A	B		
22	S	S	A	B	B	S	S	B	B	B	B	B	B	O	X	O	X	B	X	B	B	B	O	X	S	S	A	
23	S	A	S	S	B	B	B	B	B	B	B	B	B	B	O	X	X	O	X	X	O	X	X	Y	Y	S	O	X
24	S	S	A	A	A	S	B	B	B	B	X	O	X	X	B	B	S						S	B	Y	S	S	
25	A	A	B	A	O	X	B	S	O	X	O	X	X	B	B	X	O	X	O	X	X	B	A	A	A	S	A	
26	B	S	S	B	S	S	B	Y	O	X	B	B	B	B	B	B	B	B	O	X	X	X	O	X	O	X	A	
27	A	S	S	S	S	B	B	S	O	X	X	O	X	O	X	X	X	X	X	B	B	B	X	X	O	X	A	
28	A	A	A	A	S	S	S	O	X	B	A	S	S	S	X	X	X	X	X	B	B	X	Y	Y	A	A	A	
29	S	A	S	B	S	S	B	Y	O	X	O	X	O	X	X	X	X	X	X	X	X	X	X	X	O	X	A	
30	O	X	A	S	A	A	A	A	O	X	O	X	S	X	X	X	X	X	S	B	S	S	Y	A	A	A	A	
31	A	A	S	Y	A	S	S	S	B	B	B	B	S	X	X	B	X	B	B	S	B	S	O	X	Y	O	X	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	3	1		1	2	4	1	4	7	7	7	5	12	13	11	14	8	11	16	11	11	8	4	5				
MED	O	X	O	X			O	X	O	X	X	X	O	X	X	X	X	X	O	X	X	X	O	X	O	X	X	
UQ	X						O	X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
LQ	O	X					O	X	O	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1994 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S ION. 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	S	S	A	S	S	B	Y	Y	F	61	70	52	B	F	F	F	Z	U	S	J	S	C	D	S	D	S	U	S				
2	A	A	A	A	S	C	C	Y	F	59	58	62	65	66	62	62	J	R	65	68	69	55	J	S	U	S	A	S	S			
3	A	A	B	B	Y	D	S	B	B	S	B	B	B	B	B	B	S	B	B	B	B	B	C	S	U	S	S	S	S			
4	A	A	B	A	F	F	U	S	B	B	B	B	B	U	S	R	J	R	J	S	J	S	S	S	S	S	J	S	S			
5	J	S	S	S	F	A	S	R	S	J	S	B	B	59	55	56	53	53	49	47	45	45	44	42	40	33	Y	S	Y			
6	A	S	B	S	Y	U	S	B	S	S	B	S	B	B	B	B	U	R	D	S	U	S	J	S	J	S	J	S	S	D	S	S
7	A	A	S	B	S	A	S	B	C	B	B	B	B	B	B	B	B	Y	Y	B	Y	A	A	A	A	S	S	S	S	S	S	
8	A	B	S	S	S	F	B	A	B	B	B	B	B	B	B	B	B	B	B	Y	Y	A	B	A	A	A	A	A	A	A	A	
9	S	B	A	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	A	B	B	A	A	A	A	A	A	A	A	
10	B	A	A	B	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	F	D	S	S	S	S	S	S	S	S	
11	S	B	B	B	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	S	S	A	A	A	A	A	A	A	A	
12	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	U	S	Y	A	B	B	B	B	B	B	B	
13	S	A	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	
14	C	C	C	C	C	C	C	C	C	B	B	B	B	B	B	B	B	B	B	U	S	A	A	A	A	A	A	A	A	A	A	
15	A	B	B	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	A	A	
16	S	B	A	S	S	B	B	B	B	B	B	B	B	B	B	B	D	S	B	U	S	A	S	S	S	S	S	S	S	S	S	
17	A	A	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	U	S	S	A	A	A	A	A	A	A	A	A	
18	S	B	B	B	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	D	S	S	B	Y	Y	Y	Y	Y	Y	Y	
19	S	S	A	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	U	S	S	S	D	S	A	A	A	A	A	A		
20	S	S	S	B	A	A	S	B	B	B	B	S	Y	B	B	J	S	B	B	D	S	U	S	B	Y	A	A	A	A	A		
21	S	B	A	S	Y	B	A	B	B	B	B	B	B	B	B	B	B	B	S	S	Y	S	S	A	B	B	B	B	B	B	B	
22	S	S	A	B	B	B	S	S	B	B	B	B	B	S	S	B	J	S	B	B	B	U	S	S	D	S	A	A	A	A		
23	S	A	S	D	S	B	B	B	B	B	B	B	B	B	B	B	S	B	B	B	U	S	S	D	S	A	A	A	A	A		
24	S	S	A	A	A	S	B	B	B	B	J	S	S	B	B	S	F	B	B	D	S	B	Y	S	S	S	S	S	S	S	S	
25	A	A	B	A	U	S	B	S	S	40	47	53	B	B	B	B	R	R	R	R	B	F	J	S	B	A	A	S	A	A		
26	B	S	S	B	S	S	B	Y	S	43	S	B	B	B	62	63	B	B	B	S	47	41	41	34	27	24	24	24	24	24		
27	A	S	S	S	S	B	B	S	R	J	S	F	F	R	R	R	R	R	J	R	B	B	B	40	J	F	U	S	A	A		
28	A	A	A	A	S	S	S	U	S	34	S	B	A	S	S	59	66	65	65	B	F	J	S	B	Y	Y	A	A	A	A		
29	S	A	S	B	S	D	S	B	Y	U	S	S	S	S	S	B	59	55	59	59	54	46	37	32	29	22	A	A	A	A		
30	R	A	D	S	A	A	A	A	R	R	U	S	D	S	J	S	59	68	75	87	74	65	33	S	Y	A	A	A	A	A		
31	A	A	S	Y	A	S	S	S	B	B	B	D	S	41	57	60	B	J	S	B	D	S	B	D	S	U	R	Y	U	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	3	1	1	2	2	6	1	4	7	7	8	6	12	13	11	14	11	11	18	14	12	11	7	6								
MED	S	S	D	S	S	U	S	S	S	S	U	S	S	J	62	65	U	64	54	47	41	35	33	30	S	S	S	S	S	S		
U Q	J	S				38		42	59	58	60	65	66	68	69	72	72	58	J	S	S	S	S	S	S	S	S	S	S	S	S	
L Q	R					33		33	38	42	43	41	59	57	56	59	D	S	S	U	S	S	S	S	S	S	S	S	S	S	S	S



### IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1994 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	S	59	37	26	B	41	42	36	28	E B	42	31	31	32	32	51	40	30	27	E C E B	20	19	13	27			
2	35	77	52	68	39	37	C	42	34	26	28	26	27	38	33	27	26	E B	30	25	32	32	38	31	37			
3	91	80	B	B	28	39	B	B	33	B	B	B	B	B	B	50	B	B	B	B	B	B	E B	24	28	32		
4	26	29	B	32	24	20	E B	B	B	B	B	B	E B	36	32	31	32	41	21	21	31	21	27	19	27			
5	29	28	46	33	51	32	36	E B	E B	E B	E B	B	E B	31	26	31	28	26	24	E B	E B	22	15	12	41			
6	68	33	B	37	37	26	B	32	46	B	33	B	B	B	B	B	56	32	32	24	21	E B	23	12	40	71		
7	70	80	42	B	S	79	39	B	43	B	B	B	B	B	B	B	33	28	B	B	22	70	71	58	41			
8	69	B	40	38	26	29	B	38	B	B	B	B	B	B	B	B	B	B	B	B	26	38	91	B	42			
9	33	B	78	44	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B	E B	24	72	B	B	90	42		
10	B	58	81	B	37	28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	39	28	41	37	37			
11	88	B	B	B	33	33	B	B	B	B	B	B	B	B	B	B	B	B	B	B	37	26	31	42	58			
12	B	B	B	B	35	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B	19	17	46	B			
13	40	59	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	B	B	B	B	B	B	B	B	B	E B	E B	24	34	39	39	80	36		
15	57	B	B	33	60	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	118	100	78	B		
16	37	B	47	27	32	B	B	B	B	B	B	B	B	B	B	B	E B	26	B	E B	19	41	21	32	32			
17	70	83	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B	27	25	11	40	51	37	39	
18	33	B	B	B	32	27	B	B	B	B	B	B	B	B	B	B	B	B	B	E B	E B	26	32	B	14	13		
19	33	27	60	B	B	B	27	B	B	B	B	B	B	B	B	B	B	B	E B	E B	31	18	33	33	40	39		
20	32	34	32	B	39	47	37	B	B	E B	30	26	B	B	E B	32	B	B	E B	E B	32	19	B	27	93	80		
21	43	B	57	34	27	49	B	B	B	B	B	B	B	B	B	B	B	B	E B	E B	21	33	32	32	47	58		
22	S	41	49	B	B	B	32	40	B	B	B	B	E B	31	30	B	E B	24	B	B	B	B	26	22	34	39		
23	39	41	33	34	B	B	B	B	B	B	B	B	B	E B	E B	E B	E B	E B	E B	E B	31	B	17	17	26	32		
24	41	41	49	42	42	27	B	B	B	E B	E B	S	30	32	27	B	E B	E B	E B	E B	62	24	32	B	23	17	38	
25	71	47	B	35	32	B	35	22	70	24	B	B	E B	51	54	53	53	B	B	E B	E B	32	18	80	43	37	80	
26	B	34	32	B	37	39	B	27	23	B	B	B	E S	51	16	B	B	B	E B	E B	19	20	20	24	18	12	32	
27	33	32	32	32	34	B	B	33	32	27	26	30	E B	52	55	30	30	56	B	B	B	B	B	20	25	37	51	
28	46	105	41	34	32	32	32	33	B	43	38	24	E B	54	30	24	22	B	E B	E B	22	18	B	39	32	40	39	
29	36	58	37	B	38	25	B	32	21	21	23	23	B	E B	29	23	21	E	E B	E B	E B	E B	15	24	11	28		
30	32	39	32	30	39	37	68	33	26	E B	E B	E B	B	E B	26	26	55	30	55	B	B	33	18	33	34	80	80	
31	59	80	43	33	70	32	40	41	B	B	E B	E B	30	23	22	B	E B	E B	E B	E B	B	24	B	23	19	16	14	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	26	21	20	17	23	17	12	13	11	8	10	8	12	13	11	15	12	13	18	21	26	28	29	27				
MED	40	41	44	34	35	32	36	33	33	26	30	28	E B	E B	E B	E B	E B	E B	E B	E B	29	25	24	26	30	27	37	39
U Q	68	78	54	38	39	38	40	40	43	30	33	30	E B	E B	E B	E S	E B	E B	E B	E B	E B	33	18	33	34	80	80	
L Q	33	34	35	32	32	27	32	30	E B	E B	E B	24	24	28	25	27	26	30	27	E B	E B	E B	E B	22	20	18	32	

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1994 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	S	19	25	20	B	24	20	14	16	42	B	31	31	32	E C	E C	E C	E C	13	E C	19	11	8	
2	9	C	C	C	30	21	C	30	25	18	18	E C	21	19	19	24	20	30	12	14	9	9	9	20	
3	9	44	B	B	19	18	B	B	20	B	B	B	B	B	B	50	B	B	B	B	B	24	22	12	
4	20	9	B	8	8	12	20	B	B	B	B	B	36	32	31	E S	20	19	20	19	10	9	7	7	
5	7	7	9	9	7	9	20	26	24	E S	E S	B E S	31	20	19	20	20	18	24	20	18	8	7	18	
6	8	24	B	30	22	18	B	19	24	B	24	B	B	B	B	56	32	32	24	19	23	7	12	8	
7	9	11	31	B	S	24	12	B	19	B	B	B	B	B	B	B	31	20	B	10	10	20	18	8	
8	10	B	11	21	20	8	B	24	B	B	B	B	B	B	B	B	B	B	B	13	12	51	B	18	
9	19	B	19	7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	24	22	B	B	19	8	
10	B	10	14	B	23	19	B	B	B	B	B	B	B	B	B	B	B	B	B	21	10	10	31	30	
11	11	B	B	B	11	21	B	B	B	B	B	B	B	B	B	B	B	B	B	19	19	19	13	7	
12	B	B	B	B	8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19	10	7	B	
13	19	7	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	B	B	B	B	B	B	B	B	B	24	19	9	15	16	7	
15	20	B	B	31	20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	24	13	50	B	
16	24	B	9	10	9	B	B	B	B	B	B	B	B	B	B	B	26	B	B	19	18	13	20	30	
17	15	20	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	14	25	8	19	19	15	9	
18	10	B	B	B	30	13	B	B	B	B	B	B	B	B	B	B	B	B	B	26	8	B	8	7	
19	8	10	18	B	B	B	10	B	B	B	B	B	B	B	B	B	B	B	E S	31	18	8	7	8	
20	14	20	19	B	24	20	24	B	B	B	30	24	B	B	E S	B	B	B	E S	32	19	20	20	51	
21	14	B	24	24	8	20	B	B	B	B	B	B	B	B	B	B	B	21	17	12	14	18	17	B	
22	S	10	10	B	B	B	24	24	B	B	B	B	31	30	B	24	B	B	B	B	14	8	7	8	
23	14	20	23	10	B	B	B	B	B	B	B	B	B	E S	E S	E S	24	25	20	B	8	9	16	19	
24	18	16	20	20	24	20	B	B	B	B	30	E S	20	32	20	62	24	B	B	24	15	13	9		
25	9	8	B	24	16	B	20	18	20	24	B	B	51	E S	E S	53	B	B	E S	32	18	13	11	19	20
26	B	21	19	B	23	19	B	20	23	B	B	B	E S	51	14	B	B	19	20	20	24	18	8	11	
27	7	11	11	10	19	B	B	24	20	19	24	30	52	55	30	30	56	B	B	B	E S	20	25	10	20
28	13	13	23	20	30	30	19	19	B	20	19	20	54	30	20	19	B	22	18	B	10	E C	9	9	
29	19	19	31	B	20	C	B	19	15	16	19	19	B	29	18	18	14	20	18	18	10	24	8	14	
30	7	10	16	13	13	11	19	19	16	25	30	30	16	18	55	30	55	B	23	18	7	14	8	9	
31	13	15	18	13	31	20	21	20	B	B	B	30	20	20	B	55	B	B	B	24	E S	23	19	10	10
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	29	29	29	27	29	28	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	13	19	20	25	20	21	B	B	B	B	B	B	B	B	B	B	B	B	26	20	15	15	12	10	
U Q	19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	23	20	19	20	
L Q	9	10	15	13	13	18	20	20	22	31	30	32	36	30	32	32	31	22	20	18	10	10	8	8	

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1994 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	S	A	A	S	B	A	A	A	210	B	B	230	230	220	220	C	C	C	A	E	C	B	C	
2		A	A	A	A	A	C	C	A	S	210	190	235	225	220	220	230	235	B	240	275	A	A	A	A	
3		A	A	B	B	Y	235	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
4		A	A	B	A	A	A	270	B	B	B	B	B	240	225	205	235	240	210	235	240	245	245	240	250	
5		A	A	S	260	A	250	A	265	210	E	B	B	B	B	B	225	210	E	S	205	235	230	240	230	250
6		A	A	B	A	A	A	B	A	A	B	S	B	B	B	B	340	245	250	240	255	250	245	A	220	
7		A	A	S	B	S	A	A	B	C	B	B	B	B	B	B	B	Y	A	B	Y	A	A	A	A	
8		A	B	A	A	A	S	B	A	B	B	B	B	B	B	B	B	B	B	B	Y	A	A	B	A	
9		A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	250	A	B	B	A	A	
10		B	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	230	A	A	
11		A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	
12		B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	A	B	
13		A	A	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	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	
15		A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	B	
16		A	B	A	S	S	B	B	B	B	B	B	B	B	B	B	B	E	B	B	B	275	A	S	A	A
17		A	A	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	E	S	B	S	A	A	A	A
18		A	B	B	B	A	S	B	B	B	B	B	B	B	B	B	B	B	B	B	250	A	B	Y	Y	
19		A	A	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	E	B	B	A	A	A
20		A	A	A	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	250	260	240	Y	A	A
21		A	B	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	220	250	A	A	A	A	B
22		S	A	A	B	B	B	S	A	B	B	B	B	E	B	B	B	B	B	B	B	E	A	S	A	
23		A	A	A	E	A	B	B	B	B	B	B	B	B	B	S	E	S	E	B	B	Y	Y	S	E	A
24		A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	245	B	B	260	B	S	S	A	
25		A	A	B	A	A	B	A	A	280	255	230	B	B	B	S	S	265	B	225	250	B	A	A	A	A
26		B	A	A	B	S	A	B	A	250	B	B	B	S	235	B	B	B	225	225	230	E	B	E	A	A
27		A	A	A	A	A	B	B	A	A	240	250	240	B	E	B	270	230	235	250	B	B	B	E	A	A
28		A	A	A	A	A	A	A	A	B	A	A	S	B	235	E	S	230	B	250	260	B	A	A	A	A
29		A	A	A	B	S	B	A	270	230	200	240	B	245	240	235	235	215	200	230	235	240	270	A	A	A
30		E	A	A	A	A	A	A	E	A	E	A	E	B	E	B	S	225	B	255	250	B	Y	A	A	A
31		A	A	A	A	A	A	A	A	B	B	B	B	250	240	240	280	B	B	205	B	E	B	Y	A	A
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		2	1	1	2		3	1	3	5	7	7	8	12	8	13	10	11	16	13	9	10	6	4		
MED		270	E	A	250	268	235	270	280	250	220	245	240	233	232	224	232	242	220	242	250	242	242	244	225	
UQ						250		280	262	240	250	250	245	245	240	272	250	255	250	260	265	255	270	252		
LQ						200		265	230	210	200	240	228	225	220	230	235	215	232	232	242	240	240	215		

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1994 f<sub>XI</sub> (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	S	S	S	S	S	O X 38	S	B	B	B	B	X O X 62 71	B	B	X 84 84	X 82	B	71	S O X 47	S	Y	S	S		
2	S	A O X 49	S	A	B	S	B	B	B	B	B	B	B	B	B	B	B O X 52	S	S	A	A	A	A		
3	O X 40	S	S	S	Y	B	S	B	B	B	B	B	B	B	B	B	B O X 47	S	A	S	S	S	B	A	
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	B	B	S	S	S	
5	B	B	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	B	S	S	S	S	
6	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	S	S	Y	A	A	
7	B	S	A	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	B	S	S	
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	S	S	
9	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	A	S	A	B	
10	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	S	A	
11	B	B	B	B	B	B	S	S	B	C	C	B	B	B	B	B	B	B	S	Y	Y	S	S	A	
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B O X 39	B	S	B	S	S	S	
13	B	B	S	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B O X 40	S	A	S	S	S	A	
14	S	B	B	B	B	A	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	Y O X 39 44	X O X 44	Y		
15	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	S	A	S	
16	S	B	A	B	B	S	B	B	B	B	B	B	B	B	B	B	B O X 49 44 40	A	S	Y	S	A			
17	B	A O X 37	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	Y	Y	Y	S	S	
18	A	Y O X 34	S	A	S	S	B	B	B	B	B	B	B	B	B	B	B	B	X	Y	B	B	Y	Y	S
19	S	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
20	S	A	S	A	A	S	A	B	B O X 46	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	
21	S O X 34	A	A	S	A	A	B O X 39	S	B	B	B	B	B	B	X O X 63 53 54 53 46	X O X 26	B O X	S	A	A					
22	O X 41	A	S	S	A	S	27 33	O X O X 41 49 57	S	X	X	X	X	X	S O X O X 63 75 79 71 58	42 33	S	S O X	A						
23	S	A	A	S	S	Y O X 39 34	O X O X 44 58	A O X O X 44 58	S	X	X	X	X	X	Y	S	S	Y	S	S	Y	S	S		
24	A	S	S	S	A	S O X 39 49	42	B	B	B O X 72 62 62	X	X	X	X	S O X O X 47 44 38	S	B	B	B	B	B	B	B		
25	Y	S	S	B	A	S	S	A O X 53 52 53 59 59 73 64 56 40 35 28	X O X 24 24	X	X	X	X	X O X 49 49 34 31	X O X 49 34 31	B	B	B	B	B	B	B	B		
26	Y O X 34	A	A	A O X 24 28 27 33	X O X 39 43	B	X	X	X	X O X 68 73 75 61 49 49 34 31	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
27	Y	S	S	Y	B	B	B	S	B	O X O X 65 84 83 91 84 70 55 49 33 32 28	X O X 61 49 34 31	X	X	X	X	X	X	X	X	X	X	X	X	X	
28	A O X 31	S	A	A	A	S	32 39 43	O X O X 53 65 66 67 61 58 44 34 33 26	S	X O X 61 58 44 34 33 26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
29	S	S	Y	Y	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	Y	A	A	X 43 46 34 33 34	X 34 33 34	X 34 33 34	X O X 52 56 60 60 59 59 58 34 30 37	B	S O X 52 56 60 60 59 59 58 34 30 37	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	2	3	3	1	1	3	5	6	5	6	7	5	8	9	11	10	12	15	9	7	4	2	2		
MED	O X 40	X O X 34 37 43	X 46	X O X 34 33 34	O X O X 39 45 57	X 56	X 66	X 73	X 75	X 62	X 54	X 44	X 35	X 33	X 26	X 32	X 33	X 26	X 32	X 33					
U Q		O X O X 34 49		O X O X 38 39	34	42	49	62	78	72	80	79	71	58	53	41	37	27							
L Q		O X O X 31 34		O X 24	28	32	36	43	52	53	62	61	63	59	48	40	34	31	25						

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1994 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	D S 28	S S	S S	S	S U 32	S D 28	S	B	B	B J R	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	S	A U 43	S S	S	A	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	S 34	S S	S	S	Y	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	B	B	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	B	S	S	S
6	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	S	S	Y	A
7	B	S	A	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	B	S
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	S
9	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	A	S	A
10	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	S
11	B	B	B	B	B	B	S	S	B	C	C	B	B	B	B	B	B	B	B	S	Y	Y	S	S
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	S	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	S	B	B	B	B	A	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	S	B	A	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17	B	A U 31	S S	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
18	A	Y U 28	S S	S	A D 31	S S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	S	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
20	S	A D 26	S S	A	A	S	A	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B
21	S U 28	S S	A	A	S	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
22	S 35	A	S	S	A	S	F	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
23	D S 27	A	A	S	S	Y U 33	S S	R	A U 38	S U 52	S D 41	S S 65	J R 67	J R 67	J R 69	J R 60	J R 66	J R 66	J R 66	J R 66	J R 66	J R 66	J R 66	J R 66
24	A	S	S	S	A	S U 33	S S	F	F	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
25	Y	S D 27	S S	B	A	S	S	S	A	S	J S 47	J S 46	J S 47	J S 53	J S 53	J S 67	J S 58	J S 50	J S 34	J S 29	J S 22	J S 18	J S 18	J S 18
26	Y	S 28	A	A	A	S J 18	S S 22	S S 21	S S 27	S S 33	S S 37	S S 37	S S 62	S S 67	S S 69	S S 55	S S 43	S S 43	S S 43	S S 43	S S 43	S S 43	S S 43	S S 43
27	Y	S D 27	S S	Y	B	B	B	B	S	B	S	S	S	S	S	S	S	S	S	S	S	S	S	S
28	A U 25	S D 28	S S	A	A	A D 27	S S 21	F U 33	S S 37	S D 41	S S 47	S S 59	S S 60	S S 61	S S 55	S S 52	S S 38	S S 28	S S 27	S S 27	S S 20	S S 20	S S 20	S S 20
29	D S 26	S D 26	S S	Y	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	Y	A	A	J S 37	J S 40	J S 28	J S 27	J S 28	B	D S 33	S U 46	S J 50	S J 54	S J 54	S J 53	S J 53	S J 52	S U 28	S U 24	S U 31				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	4	7	1	1	4	7	6	5	8	8	7	8	9	11	11	12	16	11	8	4	5	2	
MED	U 32	S 28	S U 36	J S 37	J S 40	S S 30	S S 27	S S 28	S S 33	S S 38	S U 50	S U 56	S S 60	S S 67	S S 67	S S 56	S S 48	S S 38	S S 30	S S 27	S U 20	S U 26	S U 27	
U Q	S 34	S 28	S U 31			S U 32	S S 33	S S 28	S S 34	S S 42	S S 54	S S 65	S S 66	S S 72	S S 73	S S 65	S S 52	S S 46	S S 36	S S 32	S S 21	S S 33		
L Q	D S 26	S D 26	S D 27			S S 23	S S 22	S S 21	S S 30	S S 35	S D 44	S S 46	S S 56	S S 55	S S 57	S S 52	S S 42	S S 35	S S 27	S S 26	S S 19	S S 18		

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1994 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	25	15	26	23	28	26	21	B	B	BE	BE	B	BE	BE	BE	B	BE	BE	BE	BE	B	S	12	37	32	
2	37	52	80	39	67	B	37	B	B	B	B	B	B	B	B	B	BE	BE	30	34	43	80	70	72	74	
3	53	59	33	31	37	B	33	B	B	B	B	B	B	B	B	B	27	39	89	39	38	S	B	60		
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	26	B	B	39	38	34		
5	B	B	26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	21	B	39	32	32	27		
6	33	37	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	34	40	34	32	89	78		
7	B	33	76	33	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	42	B	37	41		
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	17	22	33	37		
9	B	B	34	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	26	39	78	43	87	B		
10	80	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	90	33	70		
11	B	B	B	B	B	B	37	37	B	C	C	B	B	B	B	B	B	B	32	26	29	35	38	71		
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	BE	B	25	B	33	40	36	37		
13	B	B	33	34	33	B	B	B	B	B	B	B	B	B	B	B	BE	B	24	28	41	33	37	38	74	
14	38	B	B	B	B	76	28	B	B	B	B	B	B	B	B	B	B	B	B	B	21	35	39	28		
15	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	22	33	66	33		
16	33	B	39	B	B	31	B	B	B	B	B	B	B	B	B	B	BE	B	31	26	19	40	33	26	38	52
17	B	77	33	28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	33	27	20	32	29	31	38	
18	78	26	31	37	75	38	31	B	B	B	B	B	B	B	B	B	BE	B	20	39	B	B	14	37	43	
19	41	B	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	32	
20	30	41	33	43	37	33	37	B	BE	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	22	
21	32	33	34	41	32	38	40	BE	BE	B	B	B	B	B	37	25	23	24	17	BE	B	13	11	28	41	
22	37	50	37	33	37	27	16	27	14	20	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	26	
23	53	52	37	32	32	24	26	29	33	28	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	43	
24	70	39	28	37	42	33	33	27	13	B	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	B	B	B	
25	14	31	35	B	69	35	33	37	53	31	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	
26	17	34	59	43	31	13	12	11	14	20	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	
27	13	33	15	17	B	B	B	B	33	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	
28	35	41	46	47	32	40	34	21	24	29	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	
29	E	BE	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
30	14	71	37	33	29	32	20	11	BE	BE	BE	BE	BE	BE	B	E	B	14	33	24	E	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	21	18	22	17	15	13	15	8	8	8	8	7	8	9	11	11	12	18	22	18	18	20	21	23		
MED	35	38	34	33	33	33	33	27	24	25	24	24	24	24	31	23	20	24	24	26	32	32	37	38		
U Q	47	52	39	40	42	38	37	33	33	28	28	31	28	30	36	27	24	30	32	39	38	38	38	60		
L Q	21	33	31	30	31	26	21	16	14	E	BE	BE	BE	BE	B	E	B	E	BE	BE	BE	BE	BE	BE	32	

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1994 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	7	8	7	9	9	9	13	B	B	B	31	50	B	31	31	30	B	30	25	30	S	7	8	8	
2	8	9	15	8	10	B	24	B	B	B	B	B	B	B	B	B	B	30	16	18	14	9	19	30	
3	17	16	24	25	30	B	25	B	B	B	B	B	B	B	B	B	22	13	17	18	18	S	B	18	
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	17	B	B	17	24	20	
5	B	B	18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19	B	10	18	23	21	
6	24	15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	22	16	30	25	17	17	
7	B	25	20	30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	20	B	12	23	
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	10	9	17	29	
9	B	B	19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19	18	13	12	17	B	
10	23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	24	21	17	
11	B	B	B	B	B	B	24	25	B	C	C	B	B	B	B	B	B	B	30	12	9	13	9	16	
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	25	18	B	9	18	34	
13	B	B	9	9	13	B	B	B	B	B	B	B	B	B	B	B	B	24	18	12	13	17	13	18	
14	31	B	B	B	B	61	16	B	B	B	B	B	B	B	B	B	B	B	B	B	9	9	16	18	
15	22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	13	9	19	12	
16	17	B	18	B	B	21	B	B	B	B	B	B	B	B	B	B	31	22	9	12	21	18	11	8	
17	B	7	17	19	B	B	B	B	B	B	B	B	B	B	B	B	B	19	22	18	B	9	17	11	9
18	9	7	8	24	23	13	24	B	B	B	B	B	B	B	B	B	B	20	13	B	B	9	25	16	
19	22	B	9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	8
20	8	24	18	30	24	26	23	B	B	26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	18
21	9	9	10	17	18	18	16	B	23	24	B	B	B	B	24	25	23	24	17	B	13	9	19	15	
22	10	23	30	24	30	23	16	9	12	20	25	26	30	50	36	22	23	24	18	18	S	8	7	9	
23	12	13	19	19	19	18	16	16	19	23	24	31	31	30	31	23	18	9	24	17	18	8	9	9	
24	9	30	18	25	24	24	9	22	9	B	B	B	26	24	31	32	24	18	22	15	B	B	B	B	
25	12	12	15	B	51	18	20	19	24	16	E	S	21	24	23	22	23	18	17	16	16	13	13	12	
26	13	9	17	15	11	11	9	8	E	S	20	24	B	23	24	24	23	22	12	16	17	B	B	B	
27	9	9	9	11	B	B	B	B	30	B	31	23	24	22	30	23	17	16	15	12	12	B	B	9	
28	9	9	9	13	18	12	8	9	9	9	22	23	22	22	17	18	11	8	7	9	9	B	B	B	
29	8	10	8	9	7	B	B	B	B	B	B	B	B	B	50	22	17	17	18	B	B	B	B	B	
30	9	17	16	12	9	9	9	8	B	24	21	22	22	20	17	18	8	13	17	19	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	29	29	30	30	30	30	30	30	30	30	30	28	29	30	30	
MED	17	24	18	28	B	B	B	B	B	B	B	B	B	B	B	B	B	24	19	18	18	17	19	18	
UQ	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
LQ	9	9	10	15	18	18	16	25	30	25	31	B	31	31	31	23	22	17	17	16	12	9	12	12	

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1994 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	E A 310	S	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	220	215	E B 270	S	Y	A	A	
2	A	A E A 230	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	
3	A E A 250	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	290	A	A	A	A	A	S	B	A
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B	A	A	A
5	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A	A	A	S
6	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A
7	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	A	A	
9	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	A	A	A	A	B	
10	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
11	B	B	B	B	B	B	A	A	B	C	C	B	B	B	B	B	B	B	S	Y	Y	A	A	A	A
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 270	B	A	B	235	A	A	
13	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A
14	A	B	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	235	235	A
15	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	A	A	A	
16	A	B	A	B	B	A	B	B	B	B	B	B	B	B	B	B	E B 260	A	A	A	A	A	A	A	A
17	B	A	240	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	Y	Y	A	A	A	A
18	A	A	A	S	240	A	B	B	B	B	B	B	B	B	B	B	B	240	B	A	B	B	Y	A	A
19	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
20	A	A	250	A	A	A	A	B	B	270	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y
21	A	220	A	A	A	A	A	B	B	E B 270	B	B	B	B	240	205	210	200	200	B	250	255	S	A	A
22	220	A	A	A	A	A	B	A	E S 275	205	245	240	245	E B 250	210	200	210	235	205	E B 255	S	240	E A 275	A	
23	A	A	A	A	A	A	A	A	A	E A 280	A	E B 250	B	E B 240	235	225	220	205	235	A	225	A	S	A	A
24	A	A	A	A	A	A	A	E A E S 240	320	300	B	B	B	E B 250	235	220	225	220	215	245	A	B	B	B	B
25	Y	A	245	B	A	A	A	A	A	A	E B 250	240	235	235	240	220	200	205	E B E B 235	250	240	235	A	B	
26	A	220	A	A	A	E A 330	A	E A E S 310	280	255	245	B	235	235	205	200	205	205	E B E B 230	250	B	B	B	B	
27	Y	A	A	A	B	B	B	B	A	B	E B 240	230	215	225	205	200	200	200	200	240	215	B	B	A	
28	A E A 250	215	A	A	A	220	A	A	A	255	240	240	220	230	200	205	200	200	220	215	B	B	B	B	
29	E B 280	285	Y	A	Y	B	B	B	B	B	B	B	B	B	230	205	205	215	230	E B 230	B	B	B	B	
30	Y	A	A	A	E A E A E A E S 300	320	325	300	B	260	225	220	215	200	205	200	200	E A 300	270	250	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	4	5	5		1	3	3	3	3	6	8	7	8	9	11	11	12	13	10	8	4	5	2		
MED	250	250	240		300	320	230	310	280	248	248	235	232	230	222	202	205	210	211	241	222	235	255		
U Q	295	268	248			330	325	320	300	270	252	250	242	238	240	220	215	238	235	252	245	248			
L Q	235	220	222			240	220	300	275	255	242	230	225	222	205	200	202	202	200	232	215	235			

APR. 1994 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN



IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1994 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 O X	S	S	S	56	Y	X	B	B	B	B	B	B	74	76	76	B	A	X	Y	S	A	S	
2	B	S	S	B	S	B	Y	B	B	Y	B	B	B	B	B	B	S	B	B	S	S	A	S	S	
3	B	A	B	S	B	B	B	B	B	B	B	B	B	B	B	B O X	40	S	B	A	S	A	A	S	
4	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	B	Y	S O X	43	S	
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	S O X	44	A	B	
6	B	S	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	S	B	
7	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	A	
8	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	A	B	B	
9	B	A	B	B	A	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	Y	S	Y	
10	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	B	S	S	S	B	
11	A	B	A	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	B	S	
12	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
13	B	S	A	Y	B	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	
14	A	B	S	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	S	
15	S	A	S	S	S	S	B	B	S	B	B	B	B	B	B	B	B	B	S	B	S	S	A	S	
16	S	B	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	S	B	B O X	44	S	
17	S	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	B O X	39	
18	S	S	A	S	B	B	Y	B	B	B	B	B	B	Y	B	B O X	47	B	B	B	B	B	S	S	
19	S	B	B	B	S	Y	B	B	B	B	B	S	B	B	B O X	54	B	B	B	B	B	B	B	Y	
20	Y	S	S	Y	S	S	B	B	B	B O X	44	X	47	60	S	S	B	B	B O X	26	B	B	B	S	
21	A	A O X	A	S	S	X	X	X	X	X	X	S	X O X	X	X	X O X	X O X	X O X	X O X	X O X	B	B	B	Y	Y
22	Y	Y	S	S	A	A O X	X	X	X O X	X	X	S	S O X	X O X	X O X	X O X	X O X	X O X	X O X	B	B	B	B	S	
23	A	S	S	S	S	S	Y	Y	B	B O X	43	S	X	X	X	X	46	B	B	B	Y	B	Y	S	
24	S	S	A	A	S	A	B	B	B	A	B	B	B	B	B	B	B O X	34	X	33	B	B	A O X	A	
25	A	S	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	
26	X	A	B	A	A	A	S	S	B	A	B	B	B	B	B	B	B	B	B	S	S	S	Y	S	
27	A	S	A	A	B	B	A	B	B	A O X	X	S	S O X	X O X	X O X	X	B	X O X	X	B	B	B	B	S	
28	S	A	A	A	S	S	B	S	B O X	24	38	46	60	X	B	B	B	B	A	A	A	A	A	A	
29	A O X	S	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	A	A	A	A	A	
30	A	B	A	B	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	Y	S	S	
31	A	B	S	S	B O X	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	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	1	1	2		1	3	2	3	3	3	6	3	3	5	5	6	6	4	5	1		1	3	1	
MED	X O X	X O X	X		O X	X	X	X	X O X	X O X	X O X	X O X	X O X	X O X	X	X O X	X O X	X O X	X O X	X		O X O X O X	O X	X	
U Q	33	47	32		38	37	34	34	34	33	44	47	62	60	69	54	43	34	33	65		44	43	39	
L Q						56		72	38	44	47	68	65	74	57	47	38	34					44		
						O X		X O X	X O X	O X	X O X	X O X	X O X	X O X	X O X	X O X	X O X	X O X					O X	X	
						33		32	24	38	46	60	54	52	50	39	30	26					43		



IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1994 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	29	27	27	27	26	14	13	E B	B	B	B	B	B	E B	E B	E B	E B	B	77	34	46	33	71	39	
2		B	34	33	B	41	B	23	B	B	28	B	B	B	B	B	B	E B	E B	B	B	18	32	90	34	42	
3		B	74	B	33	B	B	B	B	B	B	B	B	B	B	B	B	E B	E B	B	B	39	27	43	91	34	
4		B	26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	34	B	41	34	39	34	
5		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	75	40	41	47	B	
6		B	33	B	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	47	46	41	B	
7	80	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	33	40	80
8		B	71	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	28	26	97	B	B	
9		B	68	B	B	65	33	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	43	32	33	33	
10	34	62	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19	B	39	39	42	B	
11	63	B	103	B	B	37	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	40	B	40	37	
12		91	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
13		B	27	53	28	B	32	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	38	
14	70	B	38	B	B	B	B	52	B	B	B	B	B	B	B	B	B	B	B	B	B	B	28	S	37	38	
15	47	70	37	39	27	28	B	B	33	B	B	B	B	B	B	B	B	B	B	B	36	B	23	37	42	51	
16	52	B	B	B	B	B	B	36	B	B	B	B	B	B	B	B	B	B	B	B	B	36	B	B	40	41	
17	36	B	68	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	14	B	34	
18	37	37	71	28	B	B	36	B	B	B	B	B	B	17	B	B	E B	18	B	B	B	B	B	B	37	39	
19	40	B	B	B	38	26	B	B	B	B	B	E B	25	B	B	E B	30	B	B	B	B	B	B	B	B	21	
20	19	31	40	20	36	40	B	B	B	B	E B	E B	E B	E B	21	30	30	B	B	E B	12	B	B	B	B	34	
21	29	33	35	33	27	26	19	54	18	24	33	27	E B	22	24	19	17	16	E B	E B	E B	B	B	B	B	11	14
22	13	22	36	34	36	37	31	16	13	E B	16	14	E B	E B	E B	E B	E B	14	E B	E B	15	15	B	B	B	29	
23	51	39	37	37	27	26	13	14	B	B	27	19	20	18	19	13	13	B	B	B	B	14	B	25	36		
24	39	34	53	51	41	41	B	B	B	80	B	B	B	B	B	B	B	B	E B	23	18	B	B	39	41	71	
25	70	32	45	40	40	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	21	
26	33	82	B	41	41	36	28	26	B	37	B	B	B	B	B	B	B	B	B	B	B	27	S	S	11	24	
27	34	34	34	37	B	B	37	B	B	37	19	18	E B	E B	18	18	21	19	B	B	19	10	B	B	B	24	
28	23	35	41	41	25	18	B	13	B	E B	E B	E B	E B	E B	24	18	B	B	B	B	37	40	53	51	65	56	
29	43	37	40	B	34	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	26	40	36	36	37	41	
30	67	B	63	B	28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	39	43	43	52	33	27	
31	67	B	40	37	E B	B	24	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	34	
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT		22	21	20	16	15	14	11	6	4	7	6	7	6	7	6	6	7	5	12	10	16	16	22	25		
MED		40	34	40	37	36	30	31	15	U	21	28	19	22	E B	E B	E B	E B	E B	E B	24	38	40	39	40	36	
U Q		63	65	58	40	41	37	37	26	39	37	27	25	23	24	30	30	26	24	36	40	43	48	42	41		
L Q		33	32	36	30	27	26	19	13	E B	16	17	19	E B	20	18	19	16	14	17	E B	28	28	34	34	28	

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1994 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	8	9	7	7	7	8	7	8	45	B	B	B	B	B	E S	31	25	B	9	19	9	10	9	12
2	B	26	9	B	25	B	16	B	B	18	B	B	B	B	B	B	30	B	B	13	9	12	8	22
3	B	30	B	23	B	B	B	B	B	B	B	B	B	B	B	B	26	18	B	16	16	12	18	30
4	B	16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	17	B	9	13	9	19
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	17	12	9	18	B
6	B	12	B	18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	12	13	B
7	23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	9	12	16
8	B	B	17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	17	15	9	B	B
9	B	16	B	B	19	17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	18	14	24
10	31	9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	16	B	17	9	16	B
11	27	B	30	B	B	19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	9	B	17	17
12	B	23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	13	17	24	B	30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	13
14	11	B	24	B	B	B	30	B	B	B	B	B	B	B	B	B	B	B	B	B	20	S	8	12
15	13	9	9	9	9	18	B	B	24	B	B	B	B	B	B	B	B	B	22	B	17	22	12	16
16	12	B	B	B	B	B	22	B	B	B	B	B	B	B	B	B	B	B	B	9	B	B	12	13
17	25	B	11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	9	B	9
18	9	12	14	9	B	B	23	B	B	B	B	B	B	16	B	B	18	B	B	B	B	B	8	8
19	16	B	B	B	23	22	B	B	B	B	B	25	B	B	B	30	B	B	B	B	B	B	B	17
20	12	7	13	12	18	19	B	B	B	B	25	22	21	30	30	B	B	B	12	B	B	B	B	24
21	9	8	8	9	20	17	8	9	8	9	9	18	22	24	16	17	13	22	22	B	B	B	8	7
22	9	9	10	13	16	17	9	9	9	16	9	25	23	22	22	16	12	15	15	B	B	B	B	8
23	8	16	18	23	16	13	11	9	B	B	27	19	20	18	19	9	9	B	B	B	9	B	8	9
24	8	9	12	9	13	27	B	B	B	30	B	B	B	B	B	B	B	23	18	B	B	19	12	9
25	17	9	11	11	20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	9
26	8	9	B	29	22	17	12	13	B	30	B	B	B	B	B	B	B	B	B	17	S	S	8	8
27	8	15	23	23	B	B	13	B	B	18	13	16	18	18	12	12	B	8	8	B	B	B	B	9
28	9	8	9	15	9	8	B	8	B	16	17	E S	20	24	18	B	B	B	9	16	12	22	9	31
29	24	17	22	B	9	B	B	B	B	B	B	B	B	B	B	B	B	B	20	9	21	12	30	30
30	17	B	57	B	18	B	B	B	B	B	B	B	B	B	B	B	B	B	16	9	16	29	23	19
31	12	B	30	23	B	24	30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	16	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	29	31	31
MED	17	16	23	29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	20	22	16	17
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	9	11	13	18	18	22	B	B	B	B	B	B	B	B	B	B	B	17	17	12	12	9	9

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1994 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	AE A	A	A	A	A	A	A	Y	B	B	B	B	B	B	B	B	E B	B	AE S	S	A	A	A	S		
		340															240	270		255							
2	B	S	S	B	S	B	S	B	B	S	B	B	B	B	B	B	B	B	B	B	S	A	A	A	A		
																		300									
3	B	A	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A	A	A	A		
4	B		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A		A		
		200																						210			
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A			B		
																						210					
6	B	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	B		
7	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A		
8	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	A	B	B		
9	B	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	S	S	S		
10	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	B	A	A	A	B		
11	A	B	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A		
12	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		
13	B	A	A	A	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
																									240		
14	A	B	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	S				
																							220	215			
15	A	A	A				A	B	B	A	B	B	B	B	B	B	B	B	B	A	B	S					
				245	215																		230		215		
16	A	B	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B		A		
																							240				
17	S	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	B			
																								225			
18	220	225		A		B	B	S	B	B	B	B	B	B	Y	B	B			B	B	B	B	B	A		
				230														240						220			
19	A	B	B	B	S	Y	B	B	B	B	B	BE B	B	B	B	B	250								Y		
												280															
20	Y	S	A	Y	A	A	B	B	B	B	B	255	225	235	210	230					240						
21	A	A		A	A	AE AE	AE SE	AE AE	A			205	205	200	200	215	200	255	260	250			B	B	B	Y	Y
			205			340	320	275	250																		
22	Y	Y		A	A	A	A	AE AE	AE B			300	295	230	205	215	215	205	200	200	250	210		B	B	B	A
			235																								
23	A	A	A	A	A	A	Y	Y	B			BE B	B	B	B	B	B	B	B	B	B	B	Y	B	Y	A	
												290	205	210	205	200	205	245									
24	A	A	A	A		A	B	B	B	A	B	B	B	B	B	B	B	B	BE B	B	B	B	A		A		
					250														270					235			
25	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y		
26	220		A	B	A	A	A	A	S	B	A	B	B	B	B	B	B	B	B	B	B	S	S	S	Y	A	
27	A	A	A	A	B	B	A	B	B	A		235	210	200	200	205	200		265	205			B	B	B	A	
28	A	A	A	A	A	S	B	S		BE BE	BE B	310	240	225	210	210					A	A	A	A	A		
29	AE A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A		
	255																										
30	A	B	A	B	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	Y	A	S	
31	A	B	A	A	B		A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	
					200																						
		00	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	2	2	1	1	1	2	3	6	7	6	6	5	6	6	3	5	1		2	5	4		
MED	220	U	U	220	238	232	200	E AE SE	AE AE B	288	295	228	208	210	208	205	202	U	235	260	U	E S		220	220	220	
U Q		E AE A	255	340							E B	310	255	225	215	210	222	240	E B	270	265	260			238	232	
L Q		200	205								E A	250	230	205	200	200	202	200	240	250	208				215	215	

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1994 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	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	Y	S	
2	B	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	S	B	B	
3	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	S	B	
4	B	B	B	Y	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 39	B	B	A	A	
5	A	A	S	B	B	B	B	S	B	B	B	B	B	B	B	O X 46	B	B	B	B	B	A	S	A	
6	B	A	S	B	B	Y	B	B	B	B	C	B	B	B	B	B	B	B	S	B	B	B	S	A	
7	S	B	B	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	S	B	S	S	
8	A	B	B	B	B	B	B	A	Y	S	Y	O X 39	B	B	B	B	B	B	B	B	B	S	Y	Y	
9	O X 40	B	S	B	S	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
10	Y	S	A	A	B	S	S	B	B	B	B	B	O X 37 45	S	B	B	B	B	B	B	S	S	S	S	
11	A	A	A	A	B	S	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	A	
12	S	S	S	B	B	B	S	B	B	B	B	B	B	B	B	B	B	O X 49	B	B	B	S	S	S	
13	A	A	B	A	S	A	B	B	S	A	O X 30	O X 36	O X 49	B	B	B	B	B	B	B	B	S	S	A	
14	S	A	B	B	B	A	S	B	B	B	B	B	B	B	B	B	B	B	O X 27	B	B	A	S	A	
15	A	A	A	A	A	A	B	B	S	A	X 31	B	B	B	B	B	B	B	B	B	B	B	B	B	
16	A	S	S	A	B	B	A	Y	B	B	O X 34	O X 41	O X 42	S	O X 46	O X 39	B	Y	S	B	B	B	B	B	
17	B	B	B	S	S	A	A	O X 38	33	32	32	40	X 40	B	B	B	B	B	B	B	B	B	B	B	
18	A	S	A	A	A	A	A	S	S	B	B	B	B	B	B	B	B	B	B	S	B	Y	A	S	
19	S	S	S	A	A	A	A	A	S	S	B	B	B	B	B	B	B	B	S	A	A	B	O X 43 45	O X	
20	A	S	A	B	B	S	S	B	B	B	B	B	B	B	B	B	B	O X 30	B	B	B	B	S	B	S
21	S	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	
22	S	A	S	S	S	B	S	B	B	B	Y	B	B	B	O X 64	B	B	B	B	B	B	B	S	S	
23	Y	S	Y	Y	S	A	S	B	B	Y	O X 29	O X 43	O X 44	S	O X 43	O X 33	B	B	S	B	B	B	B	B	
24	S	S	A	A	S	A	S	S	B	B	A	O X 43	O X 45	O X 45	O X 36	O X 29	S	Y	B	Y	B	B	B	B	
25	B	B	B	S	A	A	A	B	Y	B	S	O X 35	X 34	X 46	X 49	B	B	B	B	B	B	B	Y	Y	
26	A	A	S	S	A	A	A	S	B	S	B	B	B	B	O X 33	O X 37	B	B	B	A	A	A	A	A	
27	S	S	A	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	
28	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	O X 43	B	B	B	B	B	B	A	A	S
29	B	S	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	Y	O X 19	B	A	A	A	
30	B	A	B	B	B	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 39	S	S	
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	1	5	8	6	3	7	4	1	1	1	2		1	1	1	
MED	O X 40							O X 38	33	32	31	40	44	45	43	36	30	49	27	29		O X 39	O X 43	O X 45	
U Q											33	O X 42	O X 45	X 46	X 49	O X 42									
L Q											30	O X 36	X 42	O X 33	O X 37	X 31									

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1994 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1994 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		59	64	B	B	37	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	38	21	38			
2		B	38	76	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	36	42	33	B	B			
3		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	39	47	26	B			
4		B	B	B	28	27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	37	B	B	41	36			
5		71	40	35	B	B	B	B	33	B	B	B	B	B	B	B	B	B	B	B	B	B	40	27	74			
6		B	47	33	B	B	28	B	B	B	B	C	B	B	B	B	B	B	B	25	B	B	B	37	41			
7		31	B	B	B	B	B	B	40	B	B	B	B	B	B	B	B	B	B	B	B	33	B	27	37			
8		70	B	B	B	B	B	B	41	20	28	20	E	B	B	B	B	B	B	B	B	B	20	13	12			
9		37	B	B	B	29	26	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
10		14	33	35	41	B	37	38	B	B	B	B	E	B	B	B	B	B	B	B	B	36	33	41	40			
11		39	41	41	46	B	34	B	40	B	B	B	B	B	B	B	B	B	B	B	B	B	B	26	43			
12		43	41	39	B	B	B	41	B	B	B	B	B	B	B	B	B	B	B	E	B	B	41	23	37			
13		53	41	B	40	39	42	B	B	33	37	18	E	B	B	B	B	B	B	B	B	B	33	22	39			
14		39	38	B	B	B	38	38	B	B	B	B	B	B	B	B	B	B	B	B	E	S	33	23	41			
15		36	36	40	40	37	52	B	B	32	34	16	E	B	B	B	B	B	B	B	B	B	B	B	B			
16		34	33	41	41	B	B	30	22	B	B	E	B	B	B	B	B	B	B	B	B	B	B	B	B			
17		B	B	B	29	28	34	34	30	17	17	14	E	B	B	B	B	B	B	B	B	B	B	B	B			
18		37	33	38	40	40	37	70	34	33	B	B	B	B	B	B	B	B	B	B	30	B	21	30	28			
19		29	41	39	40	40	41	41	41	33	32	B	B	B	B	B	B	B	B	B	26	41	41	34	43			
20		43	35	59	B	B	40	50	B	B	B	B	B	B	B	B	B	B	B	E	B	B	B	B	B			
21		41	B	B	B	37	B	B	B	B	B	B	B	B	B	B	B	B	B	B	17	B	B	B	34			
22		28	41	41	41	41	B	40	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	21	19		
23		21	29	14	18	32	34	32	B	B	E	B	B	B	B	B	B	B	B	B	30	B	B	B	B			
24		27	29	58	39	31	39	26	33	B	B	E	B	B	B	B	B	B	B	B	B	B	B	B	B			
25		B	B	B	17	37	60	35	B	20	B	E	B	B	B	B	B	B	B	B	B	B	B	B	14	21		
26		91	71	33	80	90	70	52	41	B	34	B	B	B	E	B	B	B	B	B	41	51	48	39	48	43		
27		52	79	40	34	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	41	37		
28		B	B	B	39	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	40	47	35	
29		B	40	B	B	B	B	35	B	B	B	B	B	B	B	B	B	B	B	B	11	13	B	41	42	40		
30		B	38	B	B	B	33	36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	37	32	38		
31																												
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT		21	21	18	16	14	16	16	10	7	7	9	8	6	6	7	4	2	3	7	7	6	15	22	22			
MED		39	40	39	40	37	38	38	37	32	32	19	E	B	B	B	B	B	B	B	17	23	26	36	40	37	27	38
U Q		52	41	41	41	40	42	41	41	33	34	21	E	B	B	B	E	B	B	B	23	30	41	42	40	41	41	
L Q		30	34	35	32	31	34	34	33	20	19	E	B	B	B	B	B	B	B	10	16	13	36	33	22	34		



IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1994 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	23	12	B	B	30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	9	10	16	
2	B	31	14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	8	16	16	B	B	
3	B	B	25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	9	22	B	
4	B	B	B	25	16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	10	B	B	9	23	
5	9	31	17	B	B	B	B	17	B	B	B	B	B	B	B	30	B	B	B	B	B	9	20	30	
6	B	26	22	B	B	23	B	B	B	B	C	B	B	B	B	B	B	B	19	B	B	B	9	9	
7	18	B	B	B	B	B	B	26	B	B	B	B	B	B	B	B	B	B	B	B	9	B	12	14	
8	22	B	B	B	B	B	B	23	16	18	16	23	B	B	B	B	B	B	B	B	B	9	9	9	
9	9	B	17	B	27	18	20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
10	9	9	13	30	B	23	22	B	B	B	B	17	17	E S	21	B	B	B	B	B	9	12	8	8	
11	10	16	16	17	B	30	B	17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	8	9	
12	9	17	9	B	B	B	31	B	B	B	B	B	B	B	B	B	B	23	B	B	B	8	17	23	
13	16	22	B	30	19	17	B	B	19	21	16	20	26	B	B	B	B	B	E S	B	B	9	16	15	
14	16	17	B	B	B	19	23	B	B	B	B	B	B	B	B	B	B	B	16	B	B	17	12	9	
15	28	17	18	30	33	29	B	B	24	14	16	B	B	B	B	B	B	B	B	B	B	B	B	B	
16	16	9	12	21	B	B	21	18	B	B E S	19	19	22	24	30	19	B	18	16	B	B	B	B	B	
17	B	B	B	9	8	8	19	9	8	9	9	16	B	B	B	B	B	B	B	B	B	B	B	B	
18	9	8	13	17	18	9	17	21	26	B	B	B	B	B	B	B	B	B	B	11	B	16	9	8	
19	9	10	19	18	9	13	16	9	30	17	B	B	B	B	B	B	B	B	20	20	22	B	9	9	
20	9	9	8	B	B	30	30	B	B	B	B	B	B	B	B	B	17	B	B	B	B	20	B	9	
21	17	B	B	B	23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	8	9	
22	9	12	17	22	16	B	24	B	B	B	7	B	B	B	30	B	B	B	B	B	B	B	9	9	
23	16	9	9	9	9	12	9	B	B	13	17	12	14	16	16	17	B	B	15	B	B	B	B	B	
24	6	7	8	8	16	16	13	9	B	B	6	18	18	17	10	8	9	8	B	8	B	B	B	B	
25	B	B	B	9	22	18	12	B	18	B	11	20	18	17	13	B	B	B	B	B	B	B	9	12	
26	12	9	9	9	16	17	12	18	B	22	B	B	B	B	23	18	B	B	B	16	9	12	11	16	8
27	9	61	9	18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	8	8	
28	B	B	B	25	B	B	B	B	B	B	B	B	B	B	18	B	B	B	B	B	B	9	16	18	
29	B	17	B	B	B	B	22	B	B	B	B	B	B	B	B	B	B	B	B	9	9	9	9	31	
30	B	19	B	B	B	22	27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	8	12	18	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	
MED	16	18	18	30	B	30	30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	16	
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	13	18	18	18	20	21	B	B	17	22	B	B	B	B	B	B	B	B	B	9	9	9	

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1994 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	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	A	
2	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	B	B	
3	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	B	
4	B	B	B	Y	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	210	B	B	A	A	
5	A	A	A	B	B	B	B	A	B	B	B	B	B	B	B	EE	B	B	B	B	B	A	A	A	
6	B	A	S	B	B	Y	B	B	B	B	B	C	B	B	B	B	B	B	S	B	B	B	A	A	
7	A	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	225	
8	A	B	B	B	B	B	B	A	Y	A	AE	B	B	B	B	B	B	B	B	B	B	S	Y	Y	
9	210	B	A	B	A	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
10	YE	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	S	A	A	
11	A	A	A	A	B	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	
12	205	A	A	B	B	B	S	B	B	B	B	B	B	B	B	B	B	EE	B	B	B	B	A	S	A
13	A	A	B	A	A	A	B	B	A	AE	AE	B	B	B	B	B	B	B	B	B	B	A	S	A	
14	215	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	EE	S	B	B	A	S	A
15	A	A	A	A	A	A	B	B	A	AE	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	A	220	220	A	B	B	A	Y	B	EE	B	B	EE	B	B	B	B	Y	S	B	B	B	B	B	
17	B	B	B	A	A	A	A	AE	SE	S	250	210	240	210	250	210	B	B	B	B	B	B	B	B	
18	205	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	A	B	Y	A	A	
19	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	S	A	A	BE	AE	A	
20	A	S	A	B	B	A	A	B	B	B	B	B	B	B	B	B	EE	B	B	B	B	A	B	A	
21	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	
22	A	A	A	A	A	B	A	B	B	Y	B	B	B	B	B	B	B	B	B	B	B	B	S	S	
23	S	S	Y	Y	A	A	A	B	B	YE	B	240	200	200	200	205	B	B	A	B	B	B	B	B	
24	A	A	A	A	A	A	A	B	B	A	205	205	210	200	200	A	Y	B	Y	B	B	B	B	B	
25	B	B	B	A	A	A	A	B	Y	BE	A	300	225	225	210	200	B	B	B	B	B	B	Y	A	
26	A	A	S	230	A	A	A	A	B	S	B	B	BE	SE	SE	S	B	B	B	A	A	A	A	A	
27	A	S	A	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	
28	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	
29	B	A	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	YE	A	B	A	A	A	
30	B	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	250	A	225	
31																									
CNT	4	3	1	1				2	1	1	6	8	6	6	7	4	1	1	1	2		2	1	3	
MED	212	212	220	230				220	300	270	252	218	222	208	212	205	300	265	305	255		232	265	225	
U Q	225	EA									E	270	240	235	235	250	232							EA	250
L Q	208	205									E	250	208	205	210	200	202								225

JUN. 1994 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 1994 f<sub>XI</sub> (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		S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	B				
2		B	S	B	B	S	B	S	B	B	B	B	B	B	B	B	B	B	B	B	S	B	S	S	S				
3		B	B	B	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S				
4		S	X	B	B	A	S	S	S	B	B	B	B	B	X	S	X			Y	Y	S	B	Y	S	X	X		
5		S	S	S	S	S	B	B	B	S	X	X	X	X	X	B	B	X	B	B	B	B	X	Y	Y	B	X		
6		S	A	A	A	A	A	A		41	33	32	35		B	B	B	B	B	B	B	B	B	B	B	B	B		
7		X	A	A	A	S	S	B	B	B	B	X	B	B	B	B	X	B	B	B	B	B	S	S	A	A			
8		A	A	A	A	A	A	B	B	B	B																		
9		Y	Y	S	S	B	B	B	B	B	B																		
10		Y	Y	S	A	S	S	S	S	Y	X	X	S	X	S	S	S			Y	A	S	B	B	B	Y	Y		
11		Y	A	S	S	A	A	S	S	X	A	X	X	X	X	X	S	S	Y	Y	Y	B	S	B	Y	Y			
12		Y	Y	B	X	A	S	S	S	X																			
13		S	Y	S	S	Y	X	S	Y	S	A	X	X	X	X	X													
14		S	S	S	S	A	A	A	S	S	S	S	X	X	X	X	B	B	B	B	B	S	S	X	S	A	A		
15		A	A	S	A	B	B	B	B	S	S	B	B	B	B	B	S	X	X	Y	Y	B	Y	S	S	S	S		
16		A	A	A	A	S	S	S	A	B	B	B	B	B	B	B	B	B	B	S	A	S	Y	A	A	A	A		
17		A	A	B	S	S	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	S	S		
18		B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	S	B	A	A		
19		S	S	S	S	S	S	B	S	S	B	B	B	B	X	S	B	B	B	B	B	B	B	B	S	S	S		
20		X	S	A	A	A	A	A	S	B	B	X	S	X	S	X	X	X	X	B	B	B	B	B	B	B	B	B	
21		Y	A	A	X	A	B	A	A	A	B	B	X	B	B	B	S	X	B	B	B	B	B	B	B	S	X	X	
22		X	A	S	A	S	S	S	S	B	B	B	S	X	X	S	B	B	B	B	B	B	B	B	Y	Y	Y	Y	
23		B	S	A	A	A	A	A	B	B	B	X	X	X	X	S	B	B	B	B	B	B	B	B	B	S	X	X	
24		S	X	S	S	A	S	A	S	A	X	X	Y	S	X	S													
25		A	S	A	A	X	B	A	A	A	S	B	X	B	B	X	X	S	B	B	B	B	B	B	B	B	S	S	
26		A	A	A	A	S	Y	Y	S	B	B	B	X	X	X	X	X	S	B	B	B	B	B	B	B	Y	Y	Y	
27		Y	Y	B	S	B	B	B	B	B	S	S	X	X	X	S	B	B	B	B	B	B	B	B	B	Y	S	S	
28		S	S	B	B	S	S	B	S	S	B	B	B	X	X	B	B	B	B	B	B	B	B	B	A	S	A	A	
29		S	B	B	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	A	S	B	Y	S	S	S	
30		X	S	B	B	S	B	B	S	B	B	B	B	B	B	X	S	X	B	B	B	B	B	Y	B	S	S	S	
31		A	B	B	B	B	S	S	S	B	B	B	X	X	S	X	B	X	B	B	B	B	B	B	B	B	S	S	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		4	2		2	1	1		1	3	5	11	14	14	13	11	8	8	3			1	1	1				3	
MED		X	X		X	X	X		41	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
UQ		X								33	32	37	47	46	52	54	46	43	35									X	
LQ		X								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 1994 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	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
2	BD	S	B	B	S	B	S	B	B	B	B	B	B	B	B	B	B	B	B	S	B	S	SD	S		
3	B	B	B	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S		
4	D	S	S	B	B	A	S	S	S	B	B	B	B	BU	SD	SU	S	F	Y	Y	S	B	Y	SU	S	
5	S	S	S	S	S	B	B	B	SU	SU	RU	RU	S	B	B	B	S	B	B	B	B	12	Y	Y	B	
6	S	A	A	A	A	A	A	F	F	F	F	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
7	U	S	A	A	A	S	S	B	B	B	B	B	B	B	B	BU	S	B	B	B	B	S	S	A	A	
8	A	A	A	A	A	A	B	B	B	B	B	F	U	S	R	R	B	B	B	B	B	B	B	B	B	
9	Y	Y	S	S	B	B	B	B	B	B	B	F	SD	SU	SJ	S	B	B	B	B	B	B	B	B	Y	
10	Y	Y	S	A	S	S	S	S	Y	SU	SD	SU	RD	SU	SD	SD	S	F	Y	A	S	B	B	B	Y	
11	Y	A	S	S	A	A	S	S	S	A	21	36	39	40	48	32	S	Y	Y	Y	B	S	B	Y		
12	Y	Y	B		A	S	S	S	R	F	D	SU	SJ	SJ	SU	S	A	S	S	S	Y	B	Y	Y	Y	
13	S	Y	S	S	Y	U	S	S	Y	S	A	27	35	37	52	48	30	Y	U	SD	S	S	B	Y	Y	S
14	S	SD	S	S	A	A	AD	S	SD	SD	SU	SJ	SJ	S	B	B	B	B	B	B	S	SU	S	S	A	
15	A	A	S	A	B	B	B	B	S	S	B	B	B	B	B	BU	S	37	36	29	Y	Y	B	Y	S	S
16	A	A	A	A	S	S	S	A	B	B	B	B	B	B	B	B	B	B	BD	S	A	S	Y	A	A	
17	A	A	B	S	S	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	SD	S
18	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	S	B	A
19	S	SD	S	S	S	S	B	S	S	B	B	B	B	BU	SD	S	B	B	B	B	B	B	B	B	S	S
20	U	S	S	A	A	A	A	S	B	B	B	SD	S	SD	SU	S	F	U	S	B	B	B	B	B	B	B
21	Y	A	A	U	S	A	B	A	A	A	B	B	B	B	B	BD	SU	S	B	B	B	B	B	B	SU	S
22	U	S	A	S	A	S	S	S	B	B	BD	S	SU	S	SD	S	B	B	B	B	B	B	B	B	Y	Y
23	B	S	A	A	A	A	A	B	B	BU	RU	SU	SJ	SD	S	B	B	B	B	B	B	B	B	B	SU	S
24	S	U	S	S	A	S	A	S	AU	SJ	F	S	Y	D	S	SD	SJ	F	F	S	B	B	B	Y	S	
25	A	S	A	A	U	S	B	A	A	A	S	B	B	B	B	S	SD	S	B	B	B	B	B	B	B	S
26	A	A	A	AD	S	Y	Y	S	B	B	B	39	41	42	41	41	27	B	B	B	B	B	B	B	B	Y
27	Y	Y	B	S	B	B	B	B	S	S	34	38	37	38	38	38	B	B	B	B	B	B	B	B	Y	S
28	S	S	B	B	S	S	B	S	S	B	B	B	S	40	41	B	B	B	B	B	B	B	B	A	S	A
29	S	B	B	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	BD	S	A	S	B	Y	S	
30	35	S	B	B	S	B	B	S	B	B	B	B	B	BU	SD	S	S	B	B	B	B	B	Y	B	S	
31	A	B	B	B	B	S	S	S	B	B	BU	S	SD	SU	S	B	S	B	B	B	B	B	B	B	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	5	3	2	2	2	1		2	3	6	13	17	15	17	17	14	10	3	3	1	1	1	1	5		
MED	U	S	U	SD		U	S		S	S	S	S	S	U	44	38	31	20	U	24	S	U	SD	SU	S	
U Q	35	43							F	S	S	40	41	46	46	39	36	29	D	S				U	S	
L Q	U	SD	S						S	S	26	34	37	40	38	32	24	17	14					S	S	

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 1994 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	40	B		
2	B	37	B	B	33	B	37	B	B	B	B	B	B	B	B	B	B	B	B	35	B	21	24	41		
3	B	B	B	B	B	B	B	33	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	28		
4	39	33	B	B	37	33	40	37	B	B	B	B	BE	BE	BE	BE	24	20	12	26	B	13	38	37		
5	22	38	36	37	37	B	B	B	E S	22	13	13	19	21	B	BE	B	B	B	BE	B	8	13	14		
6	22	33	33	37	41	41	38	31	26	19	23	B	B	B	B	B	B	B	B	B	B	B	B	B		
7	39	71	71	49	32	33	B	B	B	B	27	B	B	B	BE	B	B	B	B	B	B	29	26	39	41	
8	41	41	41	51	41	37	B	B	B	B	15	18	20	18	18	19	24	B	B	B	B	B	B	B		
9	20	14	26	25	B	B	B	B	B	BE	BE	BE	BE	BE	BE	BE	B	B	B	B	B	B	B	14		
10	13	14	32	38	28	32	23	26	E	BE	BE	BE	BE	BE	BE	BE	13	14	47	17	B	B	B	14		
11	14	33	26	27	51	39	31	19	20	30	11	14	15	19	19	14	14	17	13	11	B	13	B	13		
12	13	14	B	27	56	41	32	32	32	28	13	14	27	18	19	51	33	27	27	13	B	14	14	14		
13	30	15	26	38	13	31	31	13	30	62	E	B	9	18	28	37	14	12	13	13	14	14	13	12	23	
14	32	32	24	27	52	41	51	29	29	30	41	28	26	11	B	B	BE	BE	BE	BE	B	46	43	39	32	68
15	104	80	40	79	B	B	B	B	37	27	B	B	B	B	B	B	23	17	21	19	18	B	11	29	43	
16	64	55	59	80	41	39	40	53	B	B	B	B	B	B	B	B	B	B	B	18	42	20	13	39	39	
17	38	78	B	40	36	B	B	38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	33	33	38	
18	B	B	B	B	B	38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	16	37	B	47	
19	28	37	42	41	40	41	B	41	41	B	B	B	BE	BE	BE	B	B	B	B	B	B	B	B	42	17	
20	34	32	40	38	39	34	37	26	B	B	14	30	30	24	30	17	23	B	B	B	B	B	B	B	B	
21	20	34	33	37	38	B	41	35	36	B	BE	BE	BE	BE	BE	BE	23	21	B	B	B	B	B	33	37	
22	41	42	39	41	41	40	37	39	B	B	28	24	18	30	B	B	B	B	B	B	B	B	B	17	14	
23	B	29	41	49	59	40	41	B	B	BE	BE	BE	BE	BE	BE	B	B	B	B	B	B	B	B	28	41	
24	38	58	41	39	63	41	52	41	32	25	23	27	20	27	28	25	E	BE	B	S	B	B	B	13	22	
25	37	41	75	39	34	B	41	59	41	36	BE	B	19	B	BE	BE	BE	BE	B	B	B	B	B	B	30	
26	41	41	39	41	34	20	14	24	B	B	B	21	19	19	18	19	19	B	B	B	B	B	B	B	13	
27	19	20	B	34	B	B	B	B	B	37	33	23	20	20	21	B	B	B	B	B	B	B	B	13	41	
28	37	52	B	B	33	37	B	B	41	36	B	B	BE	BE	BE	B	B	B	B	B	B	B	46	38	51	
29	41	B	B	38	37	B	B	B	B	B	B	B	B	B	B	B	B	B	BE	B	9	36	30	19	30	
30	51	41	B	B	32	B	B	41	B	B	B	B	B	BE	BE	BE	BE	B	B	B	B	B	13	B	32	
31	52	B	B	B	B	37	40	37	B	B	BE	BE	BE	BE	B	B	B	B	B	B	B	B	B	B	17	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	27	26	19	23	24	19	17	20	13	11	14	17	16	17	17	15	13	7	8	10	6	14	19	26		
MED	37	37	39	38	38	38	38	36	32	28	17	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	
U Q	41	42	41	41	41	41	41	41	36	36	23	28	26	28	29	23	24	21	23	36	30	33	38	41		
L Q	22	32	32	37	34	33	32	28	E	24	19	13	18	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 1994 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	30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	16	B
2	B	18	B	B	15	B	30	B	B	B	B	B	B	B	B	B	B	B	30	B	B	9	13	12
3	B	B	B	B	B	B	B	18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12
4	9	27	B	B	18	18	18	31	B	B	B	B	B	30	31	22	11	9	7	18	B	9	8	16
5	18	12	30	30	17	B	B	B	16	13	11	16	21	B	B	22	B	B	B	B	8	8	12	B
6	9	9	22	13	19	25	18	8	12	9	9	B	B	B	B	B	B	B	B	B	B	B	B	B
7	9	14	23	9	18	9	B	B	B	B	19	B	B	B	B	22	B	B	B	B	21	12	9	8
8	8	17	27	20	19	29	B	B	B	B	13	18	20	18	19	24	B	B	B	B	B	B	B	B
9	19	9	12	18	B	B	B	B	B	B	20	18	19	18	16	B	B	B	B	B	B	B	B	9
10	8	8	8	5	8	8	8	9	9	12	18	25	23	24	21	23	9	8	9	9	B	B	B	9
11	9	9	9	8	19	12	9	6	9	11	8	12	15	9	12	9	9	9	9	9	B	9	B	7
12	9	9	B	8	15	17	9	18	8	9	7	9	11	11	9	9	9	9	9	9	B	9	9	9
13	9	9	6	8	9	7	9	9	9	9	9	9	9	12	12	9	9	9	9	9	B	9	9	9
14	8	9	9	8	8	8	9	6	6	7	8	16	17	9	B	B	B	B	B	16	9	12	9	9
15	18	9	9	24	B	B	B	B	19	23	B	B	B	B	B	23	17	21	13	10	B	8	6	10
16	8	9	9	19	25	19	27	17	B	B	B	B	B	B	B	B	B	B	11	13	16	9	12	16
17	20	9	B	18	16	B	B	24	B	B	B	B	B	B	B	B	B	B	B	B	B	15	18	9
18	B	B	B	B	B	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	14	26	B	9
19	8	9	9	24	22	24	B	17	8	B	B	B	B	22	30	B	B	B	B	B	B	B	9	9
20	9	16	18	21	18	19	17	11	B	B	11	30	30	24	30	17	23	B	B	B	B	B	B	B
21	12	9	9	9	14	B	9	9	9	B	B	31	B	B	B	23	21	B	B	B	B	B	20	9
22	9	12	12	20	16	18	31	16	B	B	B	22	24	18	30	B	B	B	B	B	B	B	9	9
23	B	9	9	9	11	12	19	B	B	B	18	22	17	30	26	B	B	B	B	B	B	B	18	9
24	16	16	18	23	25	17	11	12	7	9	9	12	17	20	18	17	16	16	S	B	B	B	11	18
25	9	9	9	12	12	B	22	19	21	30	B	19	B	B	21	21	21	B	B	B	B	B	B	9
26	10	35	18	22	16	9	9	9	B	B	B	16	19	17	18	19	19	B	B	B	B	B	B	9
27	9	9	B	9	B	B	B	B	B	31	17	23	20	20	21	B	B	B	B	B	B	B	8	9
28	30	30	B	B	17	30	B	13	15	B	B	B	30	30	B	B	B	B	B	B	B	9	8	16
29	9	B	B	24	27	B	B	B	B	B	B	B	B	B	B	B	B	B	9	9	9	B	11	9
30	9	21	B	B	17	B	B	22	B	B	B	B	B	B	21	19	16	B	B	B	B	9	B	8
31	30	B	B	B	B	26	30	18	B	B	B	30	E S 24	22	18	B	18	B	B	B	B	B	B	9
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31
MED	9	12	22	20	18	25	30	18	B	B	B	30	30	30	30	B	B	B	B	B	B	B	16	9
U Q	20	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	9	9	9	15	17	11	11	9	13	11	18	19	18	19	21	17	B	13	16	B	9	9	9

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 1994 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	205	B			
2	B	230	B	B	S	B	A	B	B	B	B	B	B	B	B	B	B	B	B	A	B	S	S	220			
3	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S			
4	210	245	B	B	A	A	A	A	B	B	B	B	BE	B	225	220	255	205	A	Y	A	B	Y	A	235		
5	S	A	A	A	A	B	B	B	SE	SE	S	285	255	200	205	B	B	235	B	B	B	B	220	A	A	B	
6	S	A	A	A	A	A	A	A	A	AE	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
7	235	A	A	A	AE	A	B	B	B	BE	A	B	B	B	B	BE	S	B	B	B	B	A	S	A	A		
8	A	A	A	A	A	A	B	B	B	BE	AE	B	255	240	225	200	205	230	B	B	B	B	B	B	B		
9	Y	Y	S	S	B	B	B	B	B	BE	BE	B	270	240	200	215	200	B	B	B	B	B	B	B	Y		
10	S	Y	S	A	S	S	S	S	S	BE	B	240	230	240	225	205	205	270	ES	Y	A	S	B	B	Y		
11	Y	A	A	S	A	A	A	S	A	A	240	220	200	220	200	205	A	S	Y	S	Y	B	S	B	Y		
12	Y	Y	BE	S	A	A	S	S	A	270	220	200	230	205	200	A	A	S	A	Y	B	Y	Y	Y			
13	A	Y	A	A	Y	240	220	Y	A	A	200	205	225	205	200	200	Y	EA	270	245	240	B	Y	Y	S		
14	A	A	200	A	A	A	A	A	A	A	260	250	240	ES	B	B	B	B	B	B	A	240	S	A			
15	A	A	A	A	B	B	B	B	A	S	B	B	B	B	B	260	205	235	EB	Y	Y	B	Y	S	A		
16	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	BE	A	A	S	Y	A	A		
17	A	A	B	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	270	B	B	B	A	A	205		
18	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	A	B	A		
19	S	A	225	A	A	A	B	A	A	B	B	B	B	205	220	B	B	B	B	B	B	B	B	A	S		
20	205	A	A	A	A	A	A	A	B	B	240	215	EB	B	250	205	245	205	225	B	B	B	B	B	B		
21	A	A	A	210	A	B	A	A	A	B	B	B	B	B	B	220	265	EB	B	B	B	B	B	S	220		
22	240	A	A	A	S	A	A	A	B	B	BE	AE	B	280	245	205	230	B	B	B	B	B	B	Y	Y		
23	B	S	A	A	A	A	A	B	B	BE	B	245	220	205	205	210	B	B	B	B	B	B	A	215			
24	A	225	A	A	A	S	A	A	AE	A	250	230	205	205	200	250	210	EB	BE	B	S	B	B	Y	S		
25	A	S	A	A	250	B	A	A	A	A	BE	B	250	B	B	205	230	ES	B	B	B	B	B	B	A		
26	A	A	A	A	255	Y	Y	A	B	B	B	235	205	205	200	200	200	B	B	B	B	B	B	Y	Y		
27	Y	A	B	A	B	B	B	B	B	A	AE	B	250	230	220	220	B	B	B	B	B	B	B	Y	A		
28	A	A	B	B	A	S	B	A	A	B	B	B	250	280	EB	B	B	B	B	B	B	B	A	A	A		
29	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	200	A	A	B	Y	A		
30	225	A	B	B	S	B	B	A	B	B	B	B	B	B	B	200	205	205	B	B	B	B	Y	B	A		
31	A	B	B	B	B	A	A	A	B	B	BE	BE	BE	B	250	210	225	200	B	B	B	B	B	B	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	5	3	2	2	2	2	1			3	13	16	16	17	17	14	10	3	3	1	1	1	1	5			
MED	225	230	212	245	252	250	220			E	U	270	245	217	215	205	205	210	U	E	BU	222	240	220	240	205	220
U Q	238	245								E	SE	E	BE	BE	B			E	BE	EA	EA					228	
L Q	208	225								E	A	250	235	210	205	205	200	205	E	B						210	

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 1994 fxI (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	O X 44	B	B	S	S	S	B	B	B	O X 29	X O 39	X O 46	B	B	S	S	33	B	B	B	O X 19	B	S	A	
2	X 33	S	A	B	B	A	A	S	S	O X 34	X 41	S	O X 46	Y	O X 45	X O 45	X O 42	B	A	B	B	B	B	Y	
3	Y	S	S	B	A	S	Y	Y	B	X 33	42	S	S	S	B	S	B	Y	B	B	B	B	B	Y	
4	S	Y	S	Y	Y	Y	Y	B	B	X O 32	X 44	S	S	S	S	X 58	X 38	Y	B	Y	B	B	B	B	
5	B	Y	S	Y	Y	B	B	Y	Y	O X 36	X O 46	X 46	S	O X 46	X 52	S	S	O X 33	B	Y	B	S	Y		
6	A	A	A	S	A	A	A	B	A	37	47	S	O X 48	S	68	S	X 40	34	Y	S	S	B	A	S	
7	O X 36	A	X O 38	X 37	S O 34	X 31	26	27	27	X O 34	X 45	X 56	X 54	S	X 66	X O 43	X 43	S O 29	B	B	B	B	B		
8	S	Y	S	A O 36	X 31	27	B	27	38	46	52	48	52	51	S	29	33	30	Y	Y	Y	Y	Y		
9	A	S	Y	S	Y	Y	A	A	A	X 37	X 45	X 47	S	X 59	X 59	50	S	S	28	26	Y	S	A	A	
10	A	A	S	A	A	A	A	A	A	X O 34	X 40	S	O X 51	S	S	O X 46	B	B	S	A	S	A	A	A	
11	A	S	A	A	A	A	B	A	A	A	S	B	B	S O 44	X O 40	X O 42	B	B	B	B	A O 35	X 35	A	A	
12	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	
13	A	B	B	A	A	B	B	A	S	B	B	B	B	B O 56	X 42	B	B	X 42	41	S	S	A	S	S	
14	S	S	B	B	A	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	A	A	40	
15	S	S	A	B	B	A	B	A	B O 33	X 33	B	B	B	B	B	B	B	B	B	S	B	S	Y	A	
16	A	A	A	A	A	A	S	A	A	33	S O 33	X 64	B	B	B	B	S	B	B	B	B O 33	Y	S	Y	Y
17	A	S	A	S	A	S O 27	X 27	B	B	B	B	B	B	B	S	B	B	B	B	B O 33	X 33	Y	S	Y	Y
18	Y	Y O 38	X 38	S	A	A	S	S	Y	B	S	S	O X 85	B	B	S	B	B	B	B	S	B	S	S	
19	A	A	A	A	A	A	S	A	S O 44	X 44	B	B	B O 70	X 70	S	S O 43	X O 36	X 31	X O 30	B	B	Y	Y		
20	S	A	A	S	A	A	A	B	A	B O 53	X 53	S	B	B O 52	X 52	S	B	B	B	28	A	S	A	A	
21	A	A	A	B	B	A	A	A O 45	X 45	S	S O 51	X O 48	S O 51	X 51	S O 46	X O 44	X 35	S	B	B	Y	A			
22	O X 43	A	A	S	A	S	S	S	V 38	B	B	S	S	S	S	X 56	X 44	49	40	27	B	B	B	S	
23	S	73	S	A	A	S	B	A	B	B	B	B	B	B	B	B O 50	X O 46	X O 39	S	B	B	B	S		
24	A	A	A	S	S	Y	O X 31	X O 34	X 31	B	B	B	S	S	B	S	S	Y	S	A	B	B	B	Y	
25	S	S	S O 33	X 33	A	A	A	A	B	B O 53	X 53	S	S	X 55	X 70	B	B	B	B	B O 33	X 33	A	A	A	
26	O X 37	A O 37	X O 33	X O 42	S	A	S	A	A O 47	X 47	B	B	B O 65	X 65	B	S	S	Y	S	35	30	Y	B	B	
27	Y O 45	X O 45	X O 65	S	46	B	A	B	A	B	B	B O 45	X 48	X O 51	X O 47	X O 43	X 43	34	B	B	B	S	S		
28	S O 43	X O 43	X O 45	S	S	S	A	B	B	B	B	B	S	S	S	S	S O 39	X O 39	X O 36	B	B	B	Y		
29	B	A	S	Y	S	A	B	B	B	B	S	B	B	70	61	X 64	S O 64	X 64	B	B	B	B	B	B	
30	B O 33	X 33	A	A	A	A O 27	X 30	X O 39	X O 44	X 51	X 50	X 59	X 60	X 60	X 60	S	S	S	B	B	B	B O 33	X 33	S	B
31	A	S	S	S O 43	X 43	S	Y	B O 34	X O 48	S	S	X 66	S O 66	X 62	C	C	C	C	C	C	C	C	S	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	5	4	5	3	3	2	5	3	7	16	13	8	10	9	14	8	13	10	11	7	3	1	1	1	
MED	O X 37	O X 44	O X 38	O X 37	O X 43	32	27	30	X 34	O X 35	X 45	50	50	59	54	46	43	40	35	30	O X 30	O X 33	O X 35	O X 40	
U Q	O X 44	59	O X 55	O X 42	X 46	31	O X 34	X O 39	X O 41	X O 49	X 54	X O 59	X O 68	X 62	X O 53	X O 45	X O 44	X 39	X 35	O X 33					
L Q	X O 34	X 38	X O 36	X O 33	X 36	27	26	27	X 33	X O 42	X O 46	X O 48	X O 50	X O 51	X O 44	X 39	X 34	X 30	X 27	O X 19					



IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 1994 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	U S 38	B B S	S S S	B B B	B B B	B B B	B B B	B B B	B B B	23 33 40	S S S	B B B	B D S D S	41 33 26	F B B	B U S	B U S	B U S	B U S	B U S	13	B B S	B B S	A
2	J S 27	S A B	B A A	A A S	S S S	S S S	S S S	S S S	S S S	28 35 41	40	D S U S	Y S U S	39 39 36	B A B	B A B	B A B	B A B	B A B	B A B	B A B	B A B	B A B	Y
3	Y S S	S B A	S Y Y	B A S	Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y	27 33 40	42 40	F D S D S	S D S	B D S	B Y B	B Y B	B Y B	B Y B	B Y B	B Y B	B Y B	B Y B	B Y B	Y
4	S Y S	Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y	26 38 41	41 41 41	D S D S	S D S	S D S	41 52 32	F U S	F U S	F U S	F U S	F U S	F U S	F U S	F U S	Y
5	B Y S	Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y	26 40 40	41 40 46	F S D S	S U S	S U S	46 41 28	26 29	26 29	26 29	26 29	26 29	26 29	26 29	26 29	Y
6	A A A	A D S	A A A	A A A	A A A	A A A	A A A	A A A	A A A	27 41 40	42 41 58	F J S D S	S U S	S U S	40 40 34	23	23	23	23	23	23	23	23	S
7	S 30	A J S	S U S	S D S	S R F	S F F	S F F	S F F	S F F	28 39 50	48 37 60	J S J S	S D S	S J S	37 37 39	23	23	23	23	23	23	23	23	B
8	S Y U	S 28	A U S	A S 30	F F 21	F F 17	F F 17	F F 17	F F 17	18 32 40	46 42 46	J S J S	S D S	S J S	45 42 23	27	27	27	27	27	27	27	27	Y
9	A S Y	S Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y	31 39 41	41 53 53	J S J S	S D S	S J S	40 43 34	21	21	21	21	21	21	21	21	A
10	A A A	A D S	A A A	A A A	A A A	A A A	A A A	A A A	A A A	28 34 37	45 40 41	D S U S	S D S	S D S	40 40 40	B B S	B B S	B B S	B B S	B B S	B B S	B B S	B B S	A
11	A S A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	B D S	S U S	41 38 34	36	36	36	36	36	36	36	36	A
12	A A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	A
13	A B B	B A A	A B B	A B B	A B B	A B B	A B B	A B B	A B B	A B B	A B B	A B B	B B B	B U S	50	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	S
14	D S 33	S B B	A S B	B A B	A S B	B A B	B A B	B A B	B A B	B A B	B A B	B A B	B A B	B A B	B A B	B A B	B A B	B A B	B A B	B A B	B A B	B A B	B A B	F
15	D S 34	S 33	A B B	B A B	A B B	B A B	B A B	B A B	B A B	27	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	A
16	A A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	27 41 58	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	S
17	A S A	S A S	A S U	S 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 D S	53	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	Y
18	Y Y U	S 32	S A A	A D S	S S 25	S S 25	S S 25	S S 25	S S 25	41 40 79	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	S
19	A A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	38	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	Y
20	S A A	S A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	47 37	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	A
21	A A A	B B A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	39 37 36	45 42 41	D S U S	S D S	S U S	41 45 41	40 38 29	29	29	29	29	29	29	29	Y
22	37	A A S	A S S	S S S	S S S	S S S	S S S	S S S	S S S	32	B D S	S D S	S D S	S J S	38 40 50	38 38 30	20	20	20	20	20	20	20	S
23	S F 63	S A A	A S 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	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	S
24	A A A	S S Y	F U S	25 28	25	B B B	B D S	41	S B D	S B D	S B D	S B D	S B D	S B D	41 33	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	Y
25	S S D	S U S	A A A	A A A	A A A	A A A	A A A	A A A	A A A	47 41 40	49 64	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	B B B	A
26	U R 31	A U R	U S 36	S A S	A A S	A A S	A A S	A A S	A A S	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 B	B B B	B B B	B B B	B B B	B
27	Y U 39	S U S	S D S	F B A	B A B	A B B	A B B	A B B	A B B	B B B	B U S	J S U S	39 42 45	41 37 37	27	27	27	27	27	27	27	27	27	S
28	D S 26	S U S	S S S	S S S	A B B	B B B	B B B	B B B	B B B	38 39 41	40 41 33	B D S	S D S	S D S	S D S	S D S	S D S	S D S	S D S	S D S	S D S	S D S	S D S	Y
29	B A S	Y S A	B B B	B D S	B B B	B B B	B B B	B B B	B B B	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 B	B B B	B B B	B B B	B B B	B
30	B U S 27	A A A	A A A	A A A	A A A	A A A	A A A	A A A	A A A	21 24 33	38 45 44	53 54 41	40 41 40	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 B	B
31	A S D	S S 41	D S 37	27	Y B	28 42	41 41	60 51 56	D S R	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 C C	C C C	C C C	C C C	S
H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	8	5	9	5	4	3	6	3	7	17	18	18	17	19	22	21	21	12	12	9	4	1	2	1
MED	S 33	S 37	S 32	S 31	35	27	22	24	28	28	40	44	48	47	50	41	36	36	29	25	24	27	33	34
U Q	S 36	S 51	S 40	S 46	36	28	25	28	33	38	41	44	46	53	53	41	40	38	32	32	27			
L Q	S 28	S 30	S 28	S 23	31	21	21	18	19	27	36	40	40	40	41	40	33	28	24	19	16			

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 1994 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	39	B	B	37	38	38		B	B	BE	BE	BE	B	B	BE	BE	BE	B	B	B	14	B	13	34	
2	39	27	36	B	B	36	35	27	22	E	BE	B	70	14	13	E	B	60	E	B	18	B	B	13	
3	14	33	33	B	40	31	13	11	B	E	BE	BE	BE	BE	B	BE	B	B	23	B	B	B	B	14	
4	31	27	27	14	21	13	23	B	B	14	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	14	B	B	B	
5	B	21	21	14	19	B	B	10	13	11	E	BE	BE	BE	BE	BE	BE	BE	B	E	S	B	B	13	
6	33	38	37	37	41	41	41	B	37	38	20	24	23	23	20	21	18	26	21	14	26	28	B	36	
7	37	48	46	47	50	14	13	E	BE	B	11	21	19	28	32	22	E	B	33	20	13	B	B	B	
8	29	13	54	41	34	23	11	B	E	B	11	16	28	32	30	28	14	21	14	E	B	13	11	12	
9	26	24	21	21	20	21	64	34	35	31	22	29	20	28	20	41	12	12	11	11	10	21	28	51	
10	51	66	38	59	81	66	38	37	41	18	21	E	BE	B	30	21	E	BE	B	B	S	33	39	37	
11	80	40	69	38	41	41	B	37	37	34	34	B	B	B	E	BE	S	E	B	B	B	B	33	31	
12	38	79	56	77	B	39	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	42	41	
13	41	B	B	40	37	B	B	37	31	B	B	B	B	B	BE	B	B	B	B	14	31	38	33	39	
14	39	35	B	B	41	37	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	31	41	36	
15	39	34	37	B	B	40	B	40	BE	B	B	B	B	B	B	B	B	B	B	B	B	B	14	21	
16	63	80	37	39	37	37	33	39	E	B	20	13	21	B	B	B	BE	B	31	B	B	B	24	26	
17	71	34	40	32	41	37	18	B	B	B	B	B	B	B	BE	B	B	B	B	BE	B	S	11	15	
18	14	26	33	34	38	35	31	28	22	BE	BE	B	33	B	BE	B	B	B	B	B	B	B	32	33	
19	36	37	37	37	38	51	37	37	E	B	B	B	B	B	E	BE	BE	BE	BE	B	E	B	13	14	
20	27	33	38	28	38	35	32	B	37	BE	BE	B	B	B	BE	B	BE	B	B	B	B	13	40	25	
21	79	39	90	B	B	40	41	51	E	BE	BE	BE	BE	BE	BE	BE	B	B	E	B	B	B	16	36	
22	41	71	52	41	64	40	37	34	E	B	B	BE	S	SE	BE	BE	BE	SE	E	B	E	BE	B	B	
23	51	69	36	41	40	24	B	41	B	B	B	B	B	B	B	B	B	BE	BE	B	B	B	B	B	
24	33	41	41	29	28	22	37	21	E	B	B	B	B	28	37	B	27	29	27	E	B	17	33	20	
25	29	33	35	31	48	53	52	41	B	BE	B	26	26	20	E	BE	B	B	B	B	B	26	34	41	
26	36	34	34	37	38	41	31	41	E	B	B	B	B	B	37	BE	B	28	26	31	34	20	23	13	
27	27	41	58	33	36	B	50	B	B	B	B	BE	B	BE	B	E	B	19	E	BE	BE	B	B	27	
28	27	38	39	41	41	36	59	B	B	B	B	BE	BE	BE	BE	BE	BE	BE	B	E	BE	B	B	B	
29	B	38	33	25	33	37	B	B	B	BE	B	B	B	BE	BE	B	B	B	B	B	B	B	B	B	
30	B	29	38	40	37	36	14	14	E	BE	B	20	24	26	25	24	32	E	B	B	B	B	28	27	
31	37	31	41	38	39	35	17	B	16	21	25	27	27	28	24	C	C	C	C	C	C	C	C	33	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	29	28	26	27	28	23	19	20	18	19	18	17	21	22	21	21	16	15	16	13	13	21	26	
MED	37	35	38	37	38	37	35	37	28	18	E	BE	B	24	26	E	BE	BE	BE	B	19	14	19	26	
U Q	41	41	44	41	41	40	41	40	36	23	E	B	30	28	E	B	30	28	26	21	28	33	38	34	
L Q	29	30	34	31	36	33	18	21	E	B	E	BE	B	22	E	BE	B	E	B	E	B	12	18	18	20

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 1994 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	B	B	30	18	23	B	B	B	18	E S 18 22	B	B	25	31	18	B	B	B	9	B	9	9		
2	9	9	12	B	B	17	15	12	10	16	E S 19 16	12	9	20	18	18	B	15	B	B	B	B	9		
3	9	9	9	B	12	9	9	9	B	9	E S 17 22	23	31	B	26	B	19	B	B	B	B	B	9		
4	18 B	10	9	9	8	8	7	B	B	9	E S 18 24	20	20	18	18	18	12	B	B	9	B	B	B		
5	B	9	8	9	8	B	B	9	9	8	31	24	23	24	30	23	19	15	E S 17	B	9	B	11	9	
6	9	8	12	9	18	9	12	B	16	9	13	24	23	23	E S 20 10	9	9	9	12	21	22	B	9	12	
7	9	19	16	15	16	9	9	12	11	9	12	17	17	16	15	16	9	9	9	B	B	B	B	B	
8	13	9	15	11	9	9	9	B	11	9	9	12	12	11	11	12	9	9	12	9	9	10	9	18	
9	9	8	9	9	9	9	9	19	13	9	9	9	12	11	11	14	9	9	7	7	7	5	5	9	
10	9	8	12	17	19	9	24	18	16	13	12	16	30	19	22	16	B	B	S	18	9	10	8	22	
11	9	9	9	15	19	12	B	22	24	24	21	B	B	18	22	E S 30 20	B	B	B	B	B	9	9	8	
12	18	18	19	9	B	18	23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	9	9	12	
13	13	B	B	21	13	B	B	30	24	B	B	B	B	B	B	B	B	B	6	12	17	11	8	9	25
14	16	21	B	B	21	30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	9	9	12	9	
15	9	9	17	B	B	22	B	22	B	E S 23	B	B	B	B	B	B	B	B	B	9	B	9	9	9	
16	11	12	30	20	20	31	30	13	12	20	9	21	B	B	B	B	E S 31	B	B	B	B	12	7	9	
17	27	17	26	24	17	20	10	B	B	B	B	B	B	B	22	B	B	B	B	17	9	S	9	8	
18	9	9	9	22	18	17	13	12	9	B	30	32	30	B	B	29	B	B	B	B	9	B	9	9	
19	9	9	30	23	19	19	17	17	21	22	B	B	B	25	23	24	20	9	9	18	B	9	7		
20	9	9	10	18	30	18	10	B	30	B	30	27	B	B	30	B	26	B	B	9	10	18	10	11	
21	11	18	22	B	B	27	24	18	15	19	30	26	32	24	28	22	9	9	E S 11 10	B	B	11	9		
22	9	18	18	18	22	17	12	13	18	B	B	E S 30	B	B	27	23	E S 23	18	13	E S 15 16	B	B	B	12	
23	16	18	26	18	25	18	B	31	B	B	B	B	B	B	B	B	30	30	19	16	B	B	B	10	
24	8	10	10	11	9	9	9	9	18	B	B	B	24	24	B	18	24	23	17	16	B	B	B	9	
25	11	9	10	11	16	19	18	19	B	B	26	18	18	26	30	B	B	B	B	B	15	16	10	9	
26	9	9	9	12	16	15	11	16	16	25	B	B	B	30	B	28	23	21	15	9	9	9	B	B	
27	9	16	19	13	9	B	39	B	17	B	B	B	26	18	23	17	17	17	13	B	B	B	13	9	
28	9	17	18	24	20	17	23	B	B	B	B	B	30	29	31	26	30	16	21	22	B	B	B	9	
29	B	12	12	18	24	18	B	B	B	B	22	B	B	30	25	17	16	B	B	B	B	B	B	B	
30	B	9	16	18	16	9	9	9	17	19	18	17	17	18	21	24	25	B	B	B	B	7	6	B	
31	9	11	17	21	11	12	12	B	13	16	17	22	17	18	18	C	C	C	C	C	C	C	C	21	9
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	30	30	30	29	30	30	29	31	31	
MED	9	10	16	18	18	17	17	22	18	23	30	26	30	26	25	24	23	26	21	22	B	B	10	9	
U Q	16	18	22	24	22	22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
L Q	9	9	10	11	12	9	10	13	13	13	17	21	20	18	21	18	18	12	12	16	9	9	9	9	

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 1994 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	235	B	B	A	A	A	B	B	B	E	E	E	B	B	B	E	B	B	B	B	E	S	B	S	A	
2	265	A	A	B	B	A	A	A	S	E	B	B	200	Y	205	230	205	B	A	B	B	B	B	Y		
3	Y	A	A	B	A	S	Y	Y	B	E	A	B	200	210	B	205	B	Y	B	B	B	B	B	Y		
4	A	A	A	Y	Y	Y	Y	B	B	245	210	200	210	200	215	225	200	Y	B	Y	B	B	B	B		
5	B	A	A	Y	A	B	B	Y	Y	215	E	B	200	230	E	B	200	230	E	A	E	S	B	Y		
6	A	A	A	220	A	A	A	B	A	255	220	235	225	220	210	200	200	225	Y	A	A	B	A	A		
7	E	A	A	210	225	230	E	A	A	E	B	E	B	200	200	200	200	205	210	200	B	B	B	B		
8	S	Y	230	A	205	210	E	A	B	E	B	B	200	210	205	200	200	220	205	Y	Y	Y	Y	Y		
9	A	235	Y	S	Y	Y	A	A	A	255	240	200	220	210	205	200	205	200	230	205	Y	A	A	A		
10	A	E	A	A	A	A	A	A	A	E	A	A	E	B	E	B	B	B	S	A	215	A	A	A		
11	A	A	A	A	A	A	B	A	A	A	A	B	B	E	A	E	S	E	B	B	B	B	A	A		
12	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A		
13	A	B	B	A	A	B	B	A	A	B	B	B	B	B	240	B	B	E	A	A	A	A	205	A		
14	205	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	215		
15	210	215	A	B	B	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	A	B	S	Y		
16	A	A	A	A	A	A	A	A	A	220	240	230	B	B	B	B	E	B	B	B	B	B	A	A		
17	A	A	A	A	A	A	A	B	B	B	B	B	B	B	200	B	B	B	B	B	E	B	Y	S		
18	Y	A	210	A	A	A	235	A	Y	B	205	220	210	B	B	E	B	B	B	B	B	A	B	A		
19	A	A	A	A	A	A	A	A	A	235	B	B	B	215	205	200	200	200	240	E	B	B	B	Y		
20	A	A	A	A	A	A	A	B	A	B	E	B	B	B	B	205	B	B	B	E	S	A	S	A		
21	A	A	A	B	B	A	A	A	A	E	B	E	B	E	B	210	210	205	200	200	E	B	A	B		
22	240	A	A	A	A	A	A	A	250	B	B	E	S	S	E	B	E	B	205	200	210	200	250	B		
23	A	210	A	A	A	S	B	A	B	B	B	B	B	B	B	B	B	E	B	275	245	250	250	B		
24	A	A	A	A	A	A	A	E	B	B	B	B	220	A	B	200	215	A	200	A	B	B	B	Y		
25	A	E	A	E	A	A	A	A	B	B	E	B	E	A	205	235	250	B	B	B	B	E	A	A		
26	230	A	225	220	A	A	A	A	E	B	B	B	B	230	B	200	235	A	A	250	235	Y	B	B		
27	Y	E	A	E	A	E	A	B	A	B	B	B	230	200	220	215	205	205	215	B	B	B	A	S		
28	220	215	220	A	A	220	A	B	B	B	B	B	E	B	250	235	215	210	215	S	E	B	B	Y		
29	B	A	A	Y	A	A	B	B	B	B	B	B	B	B	205	225	220	200	B	B	B	B	B	B		
30	B	220	A	A	A	A	A	A	225	235	225	210	230	205	205	205	200	B	B	B	B	200	A	B		
31	A	A	200	A	205	225	Y	B	E	S	S	245	225	240	230	200	205	205	C	C	C	C	C	A		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	8	6	9	5	4	4	2		6	16	18	18	17	19	22	21	21	11	11	9	4	1	2	1		
MED	230	216	215	222	212	218	278		245	E	242	232	222	212	210	208	202	202	208	218	E	250	250	200	212	215
U Q	238	235	E	A	E	A			270	E	255	240	E	B	E	B	E	B	E	A	E	255	E	272		
L Q	215	215	205	220	205	215			245	E	228	220	210	200	205	205	200	200	200	200	218	225				

AUG. 1994 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1994 f<sub>XI</sub> (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	S	A	A	A	S	B	B	A	X	B	S	O	X	S	B	B	B	O	X	X	X	B	B	A	A		
2	A	A	S	O	X	S	B	B	S	A	B	O	X	X	X	X	X	X	49	43	43	B	Y	Y	C	S		
3	S	A	A	A	O	X	S	A	B	O	X	X	X	X	O	X	61	53	52	56	43	X	29	A	S	A		
4	A	A	S	A	A	A	A	O	X	O	X	X	X	X	O	X	O	X	O	X	X	X	33	Y	Y	C		
5	S	S	S	S	S	S	A	A	50	49	59	68	67	X	B	B	76	65	54	50	44	X	24	35	A	A		
6	A	O	X	A	A	A	S	S	A	S	B	B	S	X	V	B	O	X	80	71	55	S	O	X	S	A	A	
7	A	A	A	S	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	Y	S	A	A		
8	B	S	S	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X	B	A	Y	S		
9	S	S	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	B		
10	A	S	S	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	A	B			
11	S	S	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	B	S			
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
14	B	B	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	O	X	B	B	Y	Y	
18	Y	S	A	S	A	A	S	B	O	X	O	X	O	X	S	X	B	B	S	S	S	B	B	B	B	B		
19	Y	A	A	A	B	B	B	O	X	O	X	O	X	O	S	S	S	S	X	X	X	X	O	X	B	B	B	
20	Y	S	A	A	A	A	A	S	O	X	S	O	X	S	S	S	O	X	O	X	O	X	O	X	B	Y		
21	Y	A	A	A	B	S	O	X	S	O	X	X	X	X	S	X	S	X	X	X	O	X	O	X	X	A		
22	S	S	A	B	S	A	S	S	S	O	X	O	X	S	S	S	S	S	54	51	49	44	36	34	Y	A		
23	A	S	A	S	S	A	B	B	O	X	O	X	X	X	X	X	X	X	X	X	X	X	X	40	30	Y	B	
24	Y	A	S	S	S	S	A	B	S	S	O	X	S	B	X	X	S	X	O	X	X	X	X	X	O	X	Y	
25	Y	S	S	A	S	S	S	S	X	O	X	X	O	X	X	X	X	X	X	X	S	S	O	X	Y	A		
26	A	A	S	A	S	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	Y	Y	Y	S		
27	S	O	X	A	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X	A	Y	A	A	
28	A	A	S	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X	X	B	B	B	Y	
29	A	A	S	S	A	S	B	S	O	X	O	X	X	B	B	B	B	B	S	B	O	X	S	X	X	S		
30	S	S	S	A	S	O	X	O	X	O	X	B	O	X	O	X	B	S	S	S	S	O	X	X	O	X	O	X
31																												
CNT		2		1	1	1	2	3	10	12	13	10	10	10	8	7	12	13	13	15	13	8	5	1				
MED		O	X	O	X	O	X	O	X	O	X	O	X	X	X	X	X	X	X	X	O	X	X	X	O	X	X	
U Q		48		49	54	36	44	40	44	45	45	54	59	58	62	58	59	54	50	44	36	33	35	32				
L Q								O	X	X	X	X	X	X	X	X	X	X	X	X	O	X	X	X	X	X	X	
								36	42	42	42	46	57	56	58	57	55	52	44	43	32	30	26					

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1994 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 D S 34	A	A	A	S	B	B	A U S 39	B D S 41	R D S 53	B	B	B	R	J S 37	B	B	A	A						
2	A	A	S	R 43	S	B	B	S	A	B	R 36	F 40	45	41	50	51	50	42	36	B	Y	Y	C	S	
3	D S 19	A	A	A U S 48	S D S 29	A	B	36	41	45	52	51	52	56	51	43	41	46	37	F	A	S	A		
4	A	A	S	A	A	A	A U S 30	S J R 38	44	47	49	J R U R 53	52	57	51	54	38	38	J S 39	F	Y	Y	C		
5	S	S	S D	S D	S D	S	A	A	F 41	F 40	F U S 49	S J S 62	61	B	B	F 61	59	48	44	R 38	R J S 18	S J S 29	A	A	
6	A U R 54	A	A	A	S D S 31	A	S	B	B	B	B	B	51	59	B	B	69	70	60	42	S U S 38	S D S 37	A	A	
7	A	A	A D S 38	S D S 41	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	Y	S	A	A
8	B	S D S 30	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 27	B	A	Y	S
9	S	S	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	B
10	A	S	S	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	A	B
11	S	S	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	B	S
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B D S U S 37	B	B	Y	Y
18	Y	S	A	S	A	A	S	B	R 33	35	U S U S 41	S D S 40	41	59	B	B	S	S D S 37	B	B	B	B	B	B	
19	Y	A	A	A	B	B	B	34	37	32	33	36	41	41	38	41	53	58	47	38	25	S U S	B	B	B
20	Y	S	A	A	A	A	A	S	S D S 37	S D S 37	39	D S D S 40	60	53	60	D S U S 52	60	55	40	38	26	19	B	Y	
21	Y	A	A	A	B	S	D S U S 39	S J S 41	40	41	51	65	59	68	59	41	56	60	54	49	F U S 29	S J S 25	18	S	A
22	S D S 51	A	B	S	A	S	S	S U S 33	S D S 37	41	S D S 41	S D S 41	41	41	41	41	48	45	43	38	J F J 30	F 28	Y	A	
23	A D S 30	A	S	S	A	B	B U S 35	S S 39	39	48	56	59	56	51	50	46	46	40	29	21	F	F	Y	B	
24	Y	A	S	S	S	A	B	S D S 41	36	40	B J S 53	S J S 52	41	41	41	41	47	49	41	36	J F J 32	F 26	21	Y	
25	Y	S	S	A D S 30	S	S	S J S 46	40	49	47	52	50	53	52	53	50	50	50	40	49	Y	F	A		
26	A	A	S	A D S 37	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	A	Y	Y	Y	S	
27	D S U S 30	S 30	A	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S 33	A	Y	A	A
28	A	A	S	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	
29	A	A D S 33	S	A	S	B	S	S	41	38	37	B	B	B	B	B D S 41	B U S 44	S D S 41	35	42	33	F	S		
30	S D S 26	S	A D S 28	S U S 30	R 38	38	B	37	B	S U S 37	38	38	B D S 40	S	S D S 41	S	S D S 41	40	34	33	29	26	S		
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	6	2	3	6	3	3	4	10	14	13	14	14	14	10	13	13	13	18	17	13	9	5	1	
MED	D 24	U 42	D 32	D 42	S D 39	U 42	38	36	38	40	39	44	53	54	55	56	53	48	44	38	29	28	29	26	
U Q		51		43	48	55	39	40	41	41	48	49	56	59	57	52	58	56	46	40	34	35	46		
L Q		S 30		D 38	S D 30	S D 29	S D 31	32	36	37	36	40	41	41	50	41	48	42	37	36	25	23	20		

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1994 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		40	41	40	85	78	37	B	B		51	37	B	32	26	29		B	B	E	E	E	E	B	B				48	48			
2		51	39	34	44	44	B	B		35	52	B	E	B	28	31	26	27	27	23	20	17	20		29	27		C	37				
3		28	35	37	56	51	57	55		36	36	21	26	27	24	E	B	E	B	19	19	22	18	14	14	32	26		30				
4		31	35	39	51	48	44	37	26	16	20	26	26	27	E	B		B		27	27	23	25	16	13	16	14	12	19	C			
5		29	38	44	42	42	55	58	54	51	25	26	E	B	27	37		B		25	24	20	38	25	E	B		17	37	44	43		
6		44	44	80	81	54	41	31	59	43		B		28	34	25		B	E	B	E	S	E	B	E	B		18	39	42	79	70	
7		71	43	43	38	52	54		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		32	18	36	41	67			
8		B	36	37	34	66		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		18		41	17	32		B		
9		41	37	63	60		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		43	44	43	43					
10		40	36	33		B	45		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		B		30	40			B		
11		38	39	35	37		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		B		B	B	B	B			
12		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		34	33			27				
13		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		B	B	B	B	B	B			
14		B	B	B	B	B	B		35		B	B	B	B	B	B	B	B	B	B	B	B	B		B	B	B	B	B	B			
15		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		B	B	B	B	B	B			
16		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		B	B	B	B	B	B			
17		B	B	B	B	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		14	37	40	37	40	41	29		B	E	B		E	S	E	B		B	E	B		31	11				23	17				
19		13	34	53	36		B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B		E	B	E	B	E	B	B	B	
20		16	27	41	41	51	58	51	36	19	E	S	24	26	33	28	27	25	24	19		E	B	E	B	E	B		B		13		
21		27	61	52	59		B	33	35	26	20	22	27	26	37	34	31	26	24	21		E	B	E	B	E	B		E	B	31		
22		32	40	64		42	52	37	37	36	24	23	30	26	26	26	23	22	19	14		E	B	E	B	E	B		9	13	36		
23		40	37	41	32	28	47		B		37	34	33	29	28	27	27	32	21	16		E	B	E	B	E	B		15	14			
24		13	59	37	27	29	38	51		33	26	24	23		B	28	27	25	23	21		E	B	E	B	E	B		11	10	11	12	
25		14	28	31	60	40	40	39	36	26	26	24	31	28	31	24	24	21	19	18		E	B	E	B	E	B		E	B	37	70	
26		70	52	33	80	40	38	37		B	B	B	B	B	B	B	B	B	B	B	B	B		B	B		33	14	11	20	34		
27		38	35	37		41		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		B	B		32	41	22	37	70		
28		49	66	33	38	35		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		B	B		22	18				23	
29		41	40	39	41	52	41		B	38	33	24	20		B	B	B	B	B	E	B		B	E	B	E	B		E	B	11	29	36
30		38	32	33	39	37	22	E	B		B	E	B		B	E	B		B	S		S	E	B	E	B	E	B		E	B	11	12
31																																	
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
CNT		23	24	24	21	19	17	13	11	15	14	13	15	14	14	10	13	14	14	18	21	19	20	19	19								
MED		38	38	39	41	42	41	37	36	33	24	24	28	28	27	27	24	24	19	E	B	E	B	16	20	26	34						
UQ		41	42	44	60	52	53	51	38	43	28	27	30	33	29	E	B	24	E	B	E	B	24	29	34	41	48						
LQ		27	35	34	37	40	38	33	26	20	24	22	26	27	25	27	23	21	17	17	E	B	E	B	12	14	23						

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1994 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	17	9	9	16	19	B	B	18	23	B	16	18	26	B	B	B	27	20	22	B	B	9	9	
2	15	17	21	16	28	B	B	18	18	B	28	15	15	18	18	12	16	E S	17	18	B	17	17	C	9
3	9	8	8	15	16	9	15	B	17	17	9	9	16	16	31	16	19	12	12	9	8	9	9	9	
4	9	8	8	24	9	16	9	11	11	12	12	15	18	27	22	17	16	16	9	9	8	9	9	C	
5	9	8	9	9	9	9	9	17	14	9	12	27	17	B	B	21	24	14	24	18	17	9	9	9	
6	13	17	9	8	9	9	8	9	24	B	B	23	12	15	B	50	23	23	E S	18	7	8	16	9	20
7	6	16	14	17	18	18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	9	9	16	10	8
8	B	20	9	17	9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	18	9	9	9	
9	22	22	12	9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	8	8	9	15	B
10	27	9	8	B	B	15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19	8	B
11	17	16	9	17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19	19	B	24
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
18	11	9	17	21	16	16	15	B	22	18	19	E S	30	27	21	B	B	24	16	30	B	B	B	B	B
19	9	30	21	25	B	B	B	E S	19	19	24	17	23	27	31	29	30	18	22	9	19	17	B	B	B
20	9	9	9	15	22	18	18	15	E S	9	28	17	17	15	17	14	16	13	16	17	E S	17	20	10	8
21	9	19	9	9	B	22	15	12	12	13	13	13	13	13	15	16	14	9	12	18	16	11	12	12	18
22	9	9	27	B	9	9	24	19	18	16	15	16	13	16	12	14	12	16	12	9	8	9	9	9	
23	15	17	9	8	9	8	B	B	17	16	12	10	11	14	16	12	16	12	16	17	15	13	9	B	
24	9	9	17	17	12	16	21	B	16	12	13	12	B	16	17	18	12	16	18	7	11	10	9	9	
25	9	9	11	18	16	12	16	16	12	9	11	12	11	15	17	16	12	15	18	12	18	11	12	18	
26	30	22	12	27	17	17	22	B	B	B	B	B	B	B	B	B	B	B	B	B	9	7	7	13	9
27	9	9	31	B	19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	15	9	9	17	17
28	6	22	30	30	18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	22	18	B	B	B	9
29	9	15	17	22	16	24	B	19	18	20	18	B	B	B	B	B	24	B	30	22	E S	16	9	7	9
30	9	9	9	19	16	15	22	9	B	25	B	29	27	17	B	21	S	S	21	18	16	17	9	12	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	30	30	30	30	29	29	
MED	10	17	13	20	18	20	B	B	B	B	B	B	B	B	B	B	B	B	27	18	17	16	12	17	
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	9	9	9	15	16	15	18	18	17	17	15	16	16	17	22	17	16	16	18	9	9	9	9	9	



IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1994 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	A	E A	A	A	A	A	B	B	A		B			E A	B	B	B		230	220	230	B	B	A	A		
2	A	A	A	E A	A	B	B	A	A		B		250	225	265				230	220	230	B	Y	Y	C	A	
3		A	A	A											E B									A	A	A	
4	250	A	A	A	A	A	A	A															Y	Y	C		
5	A	A	A		220	235	220		A	A	A				B	B		220	220	205	250	240	E B		A	A	
6	A		A	A	A	A	A	A	A	B	B	S										S	A	E A	A	A	
7	A	205	A	E A	E A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	Y	A	A	A	
8	B	A		A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	Y	A	A	A
9	A	S	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	B	
10	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	B	
11	A	A	A	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	B	S	
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
14	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	Y	
18	Y	A	A	A	A	A	A	B																			
19	Y	A	A	A	B	B	E	E	E	E	S																
20	Y	A	A	A	A	A	A	A																			
21	Y	A	A	A	B	A	E	A	E	A	A																
22	A	E	A	A	B	A	A	S	A	A	E	A															
23	A	E	A	A	A	A	B	B	A	E	A	A															
24	Y	A	S	E	A		A	A	B	A																	
25	Y	A	A	A																							
26	A	A	A	A																							
27	225	205		A	B																						
28	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	Y	
29	A	A		S	A	A	B	A	A																		
30	A	210	A	A	210	A	E	B		B																	
31																											
CNT	2	6	2	4	7	2	3	3	7	14	13	14	14	14	10	13	14	14	18	15	12	10	4	1			
MED	238	228	220	E A	255	230	218	E	E	250	208	211	202	222	216	211	208	208	211	209	208	205	212	233	248	E B	
U Q		E A		E A	275	235		E	A	E	A		E	E													
L Q		205		230	210			220	205	200	200	200	205	205	205	200	200	205	205	205	200	208	225	232			

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 1994 fxI (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 1994 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	R 18	A	A	A	A	A	R 34	R 37	S 41	36	37	38	U S 38	35	J S 50	J S 50	J S 45	J S 45	U S 45	S 37	33	J S 28	F 26	S	
2	U R 19	S	A	A	A	A	A U 38	S J 41	S U 41	S J 38	S J 46	S 39	S 60	61	J S 58	60	J S 62	J S 60	J S 50	J S 41	A	A	S	S	
3	A	A	A	S	A	A	B	B	B	B	B	B	B	B	B	33	B	B	B	A	A	A	D S 33	D S 27	
4	A	S	S	Y	Y	B	S	B	B	B	B	B	B	B	B	B	B	B	U S 33	S 30	S	S	A	S	
5	S	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	A	A	A	A	
6	A	S	A	S	S	B	B	B	B	B	B	B	B	B	B	B	B	R 32	B	B	D S 28	Y	A	D S 51	
7	A	S	S	S	S	S	B	B	B	B	B	B	B	B	B	B	B	R 37	B	A	A	S	A	A	
8	S	A	A	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	R 38	R 38	R 33	A	Y	A	
9	S	S	S	S	S	S	B	B	B	B	B	B	B	B	B	B	B	51	48	U R 37	S	S	A	A	
10	Y	S	S	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	42	B	B	S	D S 32	S	
11	S	A	F 34	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	36	28	F	S	A	A	
12	S	A	A	A	A	B	B	A	B	B	B	D S 34	B	B	B	B	B	B	J S 37	43	43	38	S	A	
13	R 49	S	A	Y	F 34	Y D 34	S	B	A	S	R D 48	D S 42	D S 44	B	B	B	B	B	R 42	U R 40	U R 45	D S 36	S	S	
14	A	A	A	S	A	F 28	B	B	U S 35	R U 39	S U 39	S U 39	B	R D 39	R D 37	R D 39	R D 41	S J 45	J S 46	37	Y	S	Y	S	
15	S	A	S	A	S	F 32	B	B	B	B	B	R U 36	R U 35	B	D S 36	B	U R 43	B	B	U R 40	U S 38	F 29	F 28	Y	
16	A	R 42	S	S	S	B	B	33	34	35	37	39	B	B	53	57	56	B	47	U S 43	49	34	31	30	
17	S	S	38	B	A	37	43	45	R J 48	S U 48	R 47	62	R J 68	S 72	63	55	60	49	50	50	48	F 42	F 37	F 32	
18	F 23	S 24	S D 37	S D 38	S R 42	S R 43	S 46	U R 46	R J 37	R J 38	39	41	42	53	53	53	53	J R 51	47	43	39	J S 37	Y	A	
19	A	S	A	A	A	B	B	B	B	B	B	B	Y	Y	55	54	55	50	48	50	46	41	40	41	
20	A	S	A	A	B	B	B	B	B	B	B	B	Y D 42	Y	Y	Y	Y	U H 41	U H 42	U H 40	R J 29	J S 28	S	A	
21	S	A	A	A	A	A	A	37	U H 41	R 37	R 38	Y	J R 48	J R 50	J R 50	J S 50	48	51	50	44	42	40	37	F 35	
22	F 30	F 30	S	S	F 26	F 33	39	Y	Y	J R 52	J R 53	54	58	J R 53	56	64	69	74	62	58	A	A	A	A	
23	J F 47	S	S	S D 33	S 33	Y U 47	R 43	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	A	A	
24	Y	S	Y	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	40	B	A	A	A	S 38	
25	A	S	S	S D 30	S 30	B	B	B	B	B	B	B	B	B	B	B	B	B	55	R 41	B	R 34	F U 30	S	
26	S 32	32	30	J S 32	A 44	B	R 52	R 57	B	B	B	B	B	B	B	B	B	55	B	R D 47	S 41	R J 50	A	A	
27	A	A	A	A	R 37	D S 42	S 41	52	52	Y	B	B	62	B	B	R 62	B	B	B	B	B	R 42	40	36	35
28	Y J 31	S	S	R 37	A	A U 49	R J 58	R 59	D S 53	R 61	Y U 61	R J 58	S 58	S U 61	60	60	60	60	B	B	B	J S 39	40	38	
29	A	A	A	S	B	B	Y	Y	Y	Y	Y	B	B	Y	R 78	Y	Y	Y	Y	Y	A	A	R 37	A U 29	
30	U S 37	A	F 38	F 37	F 37	S 41	S	S	A	Y	B	B	B	B	Y	B	B	B	B	B	U R 32	33	A	A	
31	S	F 39	B	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	A	S 38	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	8	6	4	6	9	8	10	11	12	10	11	10	10	10	11	12	12	17	18	18	17	15	12	7	
MED	31	32	36	37	36	38	42	44	46	38	46	39	U 53	54	U 56	55	55	45	46	41	39	37	36	34	
U Q	42	39	41	38	37	42	43	52	52	48	48	42	60	58	63	60	60	J 51	50	43	42	40	38	35	
L Q	R 21	S 29	32	32	F 32	F 30	S 38	37	41	37	38	38	U S 41	R D 42	S 50	50	46	38	42	37	J S 33	S 28	30	29	

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 1994 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 <sup>H</sup>	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	23	33	51	40	41	37	33	18	20	22	26	28	27	27	27	26	27	21	E	BE	BE	BE	B	13	E	B	9
2	E	B	13	52	40	41	36	19	20	23	27	28	29	26	29	29	31	27	26	29	17	51	76	29	42		
3	47	70	71	37	79	80		B	B	B	B	B	B	B	B	B	B	B	B	B		39	58	51	37	38	
4	79	S	S	19	19	B	37	B	B	B	B	B	B	B	B	B	B	BE	BE	BE	B	S	S	42	38	27	
5	S	B	B	B	37	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	25	23					
6	40	S	S	S	S	B	B	B	B	B	B	B	B	B	B	B	B	BE	B	B	B	BE	B	22	45	41	
7	90	S	S	S	S	30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	25	B	35	43	S	91	52
8	35	34	80	S	33	B	B	B	B	B	B	B	B	B	B	B	B	B	BE	BE	BE	BE	B	35	23	60	
9	S	S	S	S	S	S	B	B	B	B	B	B	B	B	B	B	B	B	BE	BE	BE	BE	B	27	34	48	43
10	30	33	34	41	41	B	B	B	B	B	B	B	B	B	B	B	B	B	BE	BE	B	B	B	35	40	S	
11	S	70	51	45	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	42	23	18	34	44	81	79
12	S	54	42	43	80	B	B	43	B	B	B	19	B	B	B	B	B	BE	BE	BE	BE	BE	B	S	51	70	
13	59	44	54	37	27	32	28	B	B	44	39	26	30	27	B	B	B	BE	BE	BE	B	E	B	29	31	35	
14	69	67	80	S	62	26	B	B	27	24	25	E	B	B	24	26	27	31	23	21	23	27	S	20	32		
15	31	80	S	42	37	33	B	B	B	B	BE	BE	B	BE	B	BE	B	BE	B	B	BE	BE	B	E	S	17	17
16	53	43	43	38	37	B	B	26	23	27	28	28	B	BE	B	BE	B	E	B	BE	BE	BE	BE	B	27	18	
17	31	32	30	B	41	34	30	22	26	27	27	28	27	32	31	29	27	26	23	23	20	14	E	BE	BE	B	
18	14	36	38	42	42	36	35	26	26	31	34	32	33	28	32	27	27	23	21	21	21	11	28	69			
19	44	S	51	38	29	19	27	29	30	31	34	27	29	33	29	28	24	23	21	19	14	13	30	44			
20	68	43	70	93	B	B	B	B	B	B	B	BE	B	32	27	30	28	E	SE	SE	SE	SE	SE	SE	S	34	
21	32	38	41	41	43	40	35	42	25	26	27	27	27	29	27	28	29	24	23	19	19	E	SE	SE	SE	S	
22	E	BE	S	SE	SE	SE	S	E	S	29	26	26	27	28	33	32	E	B	27	23	42	50	46	48	52	52	
23	40	27	43	S	27	33	27	26	B	B	B	B	B	B	B	B	B	B	B	B	42	45	70	64	S		
24	36	42	35	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	31	105	38	33	70	51	
25	56	S	34	S	25	B	B	B	B	B	B	B	B	B	B	B	B	BE	B	BE	BE	SE	SE	S	35	31	
26	18	17	E	S	41	E	S	B	25	26	B	B	B	B	B	B	BE	S	29	BE	BE	BE	BE	SE	SE	S	
27	35	37	38	36	34	29	20	21	24	29	E	B	B	B	B	BE	B	B	B	B	29	31	30	22	33	39	
28	13	13	28	32	41	41	31	26	26	27	32	31	E	SE	SE	SE	B	31	49	34	41	51	27	B	B	BE	B
29	46	66	54	S	B	B	46	43	44	43	37	B	B	B	B	B	27	27	41	24	26	24	63	42	42	43	44
30	38	41	32	36	34	41	33	S	S	58	44	B	B	B	B	B	31	B	B	B	B	31	25	43	71	S	
31	S	28	B	S	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	36	38	42	40	70	80	
	00	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	24	20	24	17	14	14	14	14	13	13	12	11	13	15	14	20	21	26	29	28	30	28			
MED	37	38	43	39	39	34	32	26	26	27	28	28	28	29	30	28	26	25	E	BU	26	24	34	36	40		
U Q	53	49	53	42	41	38	35	41	29	31	34	30	32	33	32	31	E	B	31	29	29	38	42	42	52	52	
L Q	30	30	34	36	31	30	27	22	24	26	26	27	27	27	27	27	27	24	E	B	22	23	21	18	23	25	

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 1994 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	26	18	25	22	18	12	16	17	17	16	18	16	16	20	17	16	17	18	15	14	10	9	9		
2	13	9	17	17	17	16	9	12	13	18	22	27	21	17	21	16	16	16	10	9	18	9	9	16		
3	9	16	22	22	16	50										27				12	7	17	9	13		
4	24	S	S	13	13		30											25	23		S	S	11	15	17	
5	S	B	B	B	22													24	22	17	16	17	16	24		
6	27	S	17	S	S	B	B	B	B	B	B	B	B	B	B	B	B	25		B	B	23	18	9	15	
7	12	S	S	S	S	24												20		18	12		S	23	16	
8	31	17	18		30															31	31	21	9	17	17	
9	S	S	S	S	S	S	B	B	B	B	B	B	B	B	B	B	B		25	21	25	9	11	13	16	
10	23	22	19	31	23															B	B	10	11		S	
11	S	12	16	22															16	21	18	19	21	16	24	
12	S	14	30	9	20			30				12							30	23	23	24		S	17	8
13	9	9	19	22	15	17	16			24	23	21	19	20					30	24	17	20	8	9	8	
14	8	18	14		23	14				19	18	19	30		18	18	27	31	23	21	19	17		9	8	
15	18	22	S	23	17	21						30	30		30		31			30	22	7	17	7		
16	31	18	9	9	23			17	18	16	19	22			30	9	31			31	30	23	18	18	12	
17	12	9	22	B	30	18	16	17	16	16	23	17	22	13	18	23	22	26	23	23	20	8	17	12		
18	8	9	22	18	18	16	12	12	11	17	19	18	18	17	17	17	19	15	13	13	19	9	19	16		
19	18	S	21	16	15	9	9	9	12	13	15	21	18	17	17	16	16	9	11	9	9	7	9	9		
20	9	13	16	17										32	23	22	19	31	27	27	25	22	26	23		
21	20	17	22	25	24	21	23	23	17	22	16	17	16	16	17	16	14	12	20	17	17	17	17	17		
22	17	E S	S	20	17	16	17	29	29	17	17	23	17	17	16	53	20	17	21	16	16	17	20	20		
23	20	8	16		20	17	17	17													30	22	17	8		
24	8	16	17	24															23		22	17	7	8	8	
25	8	S	17		17														28		25	22	18	16	12	
26	12	12	E S	18	15	29	21		22	23							29		29	31	E S	30	22	9	9	
27	9	20	29	19	21	23	16	18	17	29			29			30						20	20	17	7	
28	8	9	9	22	16	15	11	17	17	17	E S	31	49	23	23	23	17				27	22	9	17		
29	12	10	22	S	B		23	17	17	36	29			22	21	19	16	16	9	10	9	12	21	15		
30	11	16	8	9	7	12	21		S	S	30	24				19					21	17	19	17		
31	S	9	B	S	23																17	23	17	16	17	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	26	25	26	22	28	30	31	30	30	31	31	31	31	31	31	31	31	31	31	31	30	30	28	30	28	
MED	12	16	18	21	22	24													26	24	22	18	14	15	13	
U Q	20	18	22	24	26																30	22	18	17	17	
L Q	9	9	16	16	17	17	16	17	17	18	21	22	22	18	21	19	20	17	21	17	16	9	9	8		

## IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 1994 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		225	225	205	200	200	200	205	205	200	215	220	215	215	215	E	A	E	B	
2	E	B	A	A	A	A	E	A		240	205	200	220	215	200	235	215	205	230	215	200	205	220	A	A	A	A
3	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	E	A	A	240
4	A	S	S	Y	Y	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	A	A	A	A	
5	S	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	A	A	A	A	A	
6	A	S	A	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	200	Y	A	A	A		
7	A	S	S	S	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A	S	A	A	
8	A	A	A	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	260	A	Y	A	A		
9	S	S	S	S	S	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	A	A	A	A		
10	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	S		
11	S	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A	A	A		
12	S	A	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	S	A	A	A		
13	A	A	Y		A	A	B	A	A																		
14	A	A	A	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	S	Y	A		
15	A	A	S	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	Y	Y		
16	A	A	A	A	A	B	B	A																			
17	S	A	A	A	A	A	A																				
18	A	A	A	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	S	Y	A		
19	A	S	A		A	S																					
20	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S	S	S	A		
21	S	A	A	A	A	A	A	A	H																		
22	E	B	S	S	S	S	A	A																			
23	A	S	A	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	S	
24	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	
25	A	S	A	S		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	
26	A	A	A	A	A	A	A	A																			
27	A	A	A	A	A	A	A																				
28	Y	S	S	B	A	A	A																				
29	A	A	A	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	S	
30	A	A	E	S	S	A	A	S	S	A	A	B	B	B	B	B	B	B	B	B	B	A	A	A	A	S	
31	S	B	S	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	3	5	2	4	4	4	7	9	12	11	10	13	11	11	12	12	13	17	19	16	17	13	9	8			
MED	E	B	235	235	230	213	246	255	220	216	202	211	205	210	205	209	218	215	218	230	234	235	238	250	245		
UQ	E	B	262		240	240	260	270	228	235	215	220	215	225	225	235	235	245	250	250	260	258	252	270	260		
LQ	245	228		222	208	238	240	208	202	200	205	200	200	200	205	208	208	208	220	222	218	225	240	238			

OCT. 1994 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1994 f<sub>XI</sub> (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	A	A	A	B	O	X	B	B	B	B	B	B	B	B	B	B	B	B	O	X	O	X	O	X	B		
2	A	O	X	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	X	B	X	X	A	A			
3	A	B	S	A	O	X	O	X	B	Y	B	B	Y	O	X	Y	B	B	B	S	O	X	Y	Y	A		
4	S	S	A	A	B	B	B	B	B	B	B	O	X	O	X	B	O	X	B	O	X	B	S	A	A		
5	A	S	S	O	X	B	B	B	A	S	S	C	S	Y	S	B	B	B	B	O	X	O	X	Y	A		
6	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	S		
7	O	X	O	Y	B	B	Y	B	Y	Y	S	Y	B	B	B	B	S	O	X	X	X	O	X	A	A		
8	A	O	X	A	O	X	B	S	Y	S	X	O	X	X	X	X	O	X	X	X	X	X	X	Y	O	X	
9	Y	A	A	Y	Y	X	O	X	O	X	S	Y	B	B	B	O	X	X	Y	X	Y	O	X	X	S	A	
10	A	A	Y	A	A	Y	Y	B	B	B	B	B	O	X	B	B	B	B	B	O	X	O	X	B	X	A	
11	A	A	S	B	S	S	Y	Y	Y	B	B	B	B	B	B	B	B	B	O	X	O	X	O	X	O	X	
12	Y	S	S	Y	Y	Y	Y	O	X	Y	O	X	O	X	X	B	B	X	X	X	X	X	X	O	X	X	
13	S	X	A	A	A	X	O	X	X	X	X	X	Y	O	X	X	X	S	X	X	X	X	O	X	X	X	
14	A	50	X	O	X	S	O	X	Y	O	X	B	O	X	X	X	O	X	X	X	X	X	X	X	A	A	
15	S	A	A	Y	A	S	S	Y	X	X	O	X	O	X	O	X	S	Y	Y	X	X	O	X	X	O	X	
16	A	B	A	O	X	B	B	S	O	X	X	O	X	Y	Y	O	X	O	X	X	X	X	X	X	X	X	
17	X	O	X	O	X	X	Y	B	B	B	Y	O	X	Y	Y	O	X	X	X	X	X	X	X	X	O	X	
18	Y	O	X	O	X	Y	X	O	X	X	X	O	X	X	X	O	X	X	X	X	X	O	X	X	S	A	A
19	O	X	O	X	X	S	A	Y	S	S	B	B	B	Y	Y	Y	X	X	O	X	X	X	A	A	S	S	
20	A	S	A	A	X	Y	Y	B	Y	B	B	B	B	B	B	O	X	B	B	O	X	Y	S	A	X	A	
21	A	A	Y	B	B	B	X	B	S	O	X	B	B	B	B	X	B	B	B	O	X	X	X	X	O	X	
22	X	S	A	A	B	Y	Y	B	Y	64	57	58	59	59	B	67	B	B	X	X	X	X	X	X	O	X	
23	O	X	S	B	O	X	X	X	X	O	X	X	O	X	X	O	X	X	X	X	X	X	X	X	X	O	X
24	A	O	X	O	X	X	X	X	X	O	X	X	X	X	X	O	X	X	X	X	X	X	X	X	X	O	X
25	S	Y	A	57	56	61	62	S	Y	X	X	X	X	X	A	S	60	56	56	56	56	52	51	50	50		
26	X	A	O	X	O	X	A	A	A	A	B	S	O	X	O	X	X	B	B	Y	Y	X	S	O	X	A	
27	S	X	47	46	52	S	S	A	A	S	B	B	B	O	X	B	Y	B	S	X	O	X	X	S	X	A	
28	A	A	B	B	B	B	Y	Y	X	O	X	O	X	X	B	B	O	X	B	O	X	O	X	B	X	O	X
29	41	42	A	O	X	58	69	59	68	B	B	B	O	X	X	O	X	O	X	S	B	X	O	X	O	X	
30	B	B	41	Y	B	B	B	B	S	B	Y	B	B	B	B	B	O	X	B	X	X	X	O	X	O	X	
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	7	12	9	12	8	11	9	10	7	13	12	16	11	13	13	15	13	18	25	25	25	19	19	14			
MED	X	O	X	O	X	X	X	X	X	O	X	O	X	O	X	O	X	X	X	X	X	X	X	X	X	X	
UQ	44	47	48	52	54	62	65	68	75	66	67	66	69	66	64	67	63	58	56	54	50	47	48	44			
LQ	41	42	42	46	42	48	54	53	63	58	59	57	59	60	60	58	56	52	51	44	44	41	40	40			

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1994 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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



# IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1994 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	53	78	54	B	37	38	B	B	B	B	B	B	B	B	B	B	B	B	25	25	38	26	37	B				
2	34	41	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	30	B	14	22	38	35	70			
3	65	B	37	37	31	33	B	37	B	B	28	29	31	B	B	B	B	B	B	27	24	32	33	57	38			
4	S	S	70	71	B	B	B	B	B	B	B	B	B	B	27	B	B	B	24	25	B	33	90	41				
5	40	35	31	25	B	B	B	40	36	33	C	26	31	36	B	B	B	B	B	B	26	22	27	37	51			
6	40	40	B	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	44	80	51	43	33			
7	51	37	27	B	B	36	B	34	33	37	33	B	B	B	B	26	26	27	27	26	21	38	38	43				
8	40	31	70	32	B	40	37	31	22	25	26	27	27	29	29	34	E	29	28	29	23	24	32	33	47			
9	39	47	71	41	41	41	27	25	S	32	B	B	B	B	32	27	27	38	21	40	40	46	41	40	81			
10	63	71	28	53	54	42	32	43	B	B	B	B	B	B	B	B	B	B	B	30	28	33	B	39	38			
11	37	57	38	B	34	37	37	42	41	B	B	B	B	B	B	B	B	B	B	31	28	26	37	19	13	27		
12	33	37	37	41	41	41	41	34	26	28	27	29	B	B	40	30	E	39	28	27	E	24	20	27	28	29		
13	34	27	37	37	41	41	26	24	27	33	26	32	32	36	32	31	37	26	23	25	26	31	13	18				
14	35	33	26	37	27	38	37	34	B	33	31	E	B	B	31	31	24	24	24	25	18	22	34	37	51			
15	S	44	38	34	64	29	33	37	29	25	24	27	27	E	B	B	B	25	24	E	B	27	23	39	42			
16	45	B	41	31	B	B	41	37	33	25	31	34	32	29	28	27	27	24	22	22	21	19	E	B	E	S		
17	13	12	30	31	28	34	37	B	B	B	27	E	S	31	29	35	28	27	26	23	21	24	34	30	14	31		
18	28	41	20	24	38	43	29	24	27	32	27	27	26	34	33	30	37	E	B	30	19	E	S	37	39	43	51	
19	41	41	41	32	42	51	37	S	S	B	B	B	B	E	B	27	25	E	S	E	B	41	33	47	43	36	37	
20	41	42	51	80	32	36	41	B	41	B	B	B	B	B	B	B	32	B	B	B	19	43	43	56	43	70		
21	44	41	37	B	B	B	28	B	46	30	B	B	B	B	29	B	B	B	B	E	B	31	20	14	29	17	E	S
22	32	33	45	40	B	37	35	B	33	34	33	E	B	B	E	B	B	32	B	B	E	B	E	S	20	27	37	
23	34	35	40	32	B	36	24	24	29	30	26	27	33	32	33	65	38	36	39	20	24	20	31	28				
24	37	39	38	48	27	23	24	33	37	36	32	26	41	39	39	27	35	E	B	E	B	27	27	20	41	42		
25	38	31	45	40	29	33	43	42	30	41	33	41	52	42	70	42	36	29	34	27	23	29	52	43				
26	43	41	43	43	39	41	45	51	48	B	30	27	27	28	B	B	27	38	33	42	43	48	40	38				
27	43	35	44	34	24	42	50	51	40	B	B	B	27	B	B	37	B	34	28	25	34	38	40	42				
28	43	48	B	B	B	B	33	41	31	31	E	B	34	26	B	B	B	E	B	32	31	29	B	22	34	27	32	
29	31	30	70	31	24	31	27	27	B	B	B	E	B	B	E	B	30	B	B	E	B	31	25	30	20	32	32	
30	B	B	32	31	B	B	B	B	36	B	37	B	B	B	B	B	33	B	33	34	24	23	36	27				
31																												
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	27	26	27	24	18	22	22	20	19	16	17	18	17	17	16	19	17	21	26	29	29	29	30	29				
MED	40	40	38	37	36	38	36	36	33	32	29	28	31	32	30	28	30	27	27	25	27	31	37	38				
U Q	43	42	45	41	41	41	41	42	40	34	33	31	32	36	34	34	37	31	31	28	37	38	40	45				
L Q	34	33	32	32	28	34	28	29	29	29	26	27	27	31	28	27	26	25	24	24	22	24	28	30				

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1994 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	33	23	B	17	22	B	B	B	B	B	B	B	B	B	B	B	B	16	19	12	16	22	B	
2	9	9	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	30	B <sup>E</sup>	S <sup>E</sup>	S <sup>E</sup>	18	17	12	
3	19	B	11	23	17	21	B	32	B	B	21	21	24	B	B	B	B	27	B	16	17	22	18	22	
4	S	S	17	17	B	B	B	B	B	B	B	31	31	B	21	B	B	B	18	23	B	26	23	24	
5	30	23	17	18	B	B	B	21	21	18	C	E <sup>S</sup>	S <sup>E</sup>	31	36	B	B	B	B	26	22	22	19	17	
6	21	20	B	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	21	18	17	12	21	
7	8	8	23	B	B	24	B	24	21	20	23	B	B	B	B	22	17	17	17	19	8	8	9	17	
8	17	17	20	17	B	16	9	17	16	9	18	21	17	22	17	17	29	17	16	21	16	9	13	9	
9	19	17	17	22	17	20	17	9	S	21	B	B	B	32	23	17	21	17	31	27	17	10	8	22	
10	19	17	8	31	17	7	9	25	B	B	B	B	B	B	B	B	B	B	30	21	17	B	9	32	
11	16	23	30	B	26	30	24	24	31	B	B	B	B	B	B	B	B	B	31	28	21	22	17	13	8
12	24	32	19	21	24	30	22	19	23	21	22	21	B	B	30	23	39	19	17	24	E <sup>S</sup>	12	9	12	
13	10	9	24	23	24	20	9	12	16	16	12	21	24	17	23	22	22	17	13	19	10	12	8	7	
14	9	9	10	17	22	17	22	16	B	24	25	31	B	31	31	21	22	17	17	16	12	11	21	24	
15	S	21	25	26	22	13	17	17	17	12	17	17	18	33	30	30	17	17	27	12	21	10	9	9	
16	17	B	24	23	B	B	24	17	26	17	20	24	24	24	24	22	21	17	17	17	17	12	E <sup>S</sup>	S <sup>E</sup>	S
17	8	10	14	15	12	11	17	B	B	B	23	31	25	15	17	16	20	17	19	17	16	11	9	8	
18	22	16	17	17	20	17	17	12	16	17	16	17	17	17	12	16	23	30	17	E <sup>S</sup>	22	17	16	20	
19	22	17	12	9	24	18	21	S	S	B	B	B	22	33	13	22	E <sup>S</sup>	S <sup>E</sup>	31	17	12	22	17	16	13
20	17	17	11	9	15	23	22	B	24	B	B	B	B	B	B	32	B	B	B	11	17	12	7	9	9
21	16	24	30	B	B	B	20	B	24	19	B	B	B	B	24	B	B	B	31	17	12	11	11	E <sup>S</sup>	23
22	11	13	19	25	B	12	21	B	24	21	21	31	31	32	B	32	B	28	24	17	E <sup>S</sup>	17	11	16	
23	17	17	18	25	B	17	7	11	19	23	23	24	20	20	23	17	22	19	16	15	16	11	12	9	
24	18	17	20	18	18	14	12	12	16	9	17	20	23	31	29	23	22	31	31	22	17	16	16	12	
25	17	16	8	9	24	16	16	24	24	24	17	17	18	17	17	17	17	21	17	13	12	9	9	10	
26	9	11	9	9	21	24	17	19	24	B	20	17	19	24	B	B	17	17	17	9	9	15	12	7	
27	8	12	7	8	9	31	17	17	22	B	B	B	17	B	B	17	B	27	16	11	12	12	17	16	
28	17	19	B	B	B	B	25	26	17	19	34	23	B	B	B	32	B	17	15	B	11	17	16	12	
29	17	25	30	21	17	17	17	12	B	B	B	31	31	28	24	48	28	B	31	23	18	18	9	10	
30	B	B	21	27	B	B	B	B	23	B	23	B	B	B	B	B	29	B	26	20	20	17	16	16	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	29	29	30	30	30	30	29	28	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	17	17	19	22	24	22	21	24	24	24	23	31	31	33	30	31	29	28	18	18	16	16	12	13	
U Q	19	24	24	27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	31	22	21	17	16	21	
L Q	10	12	12	17	17	17	17	16	20	19	20	21	22	24	23	21	22	17	17	16	12	11	9	9	

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1994 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	H	250	270	250	285	S	B				
2	A	A	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	H	240	BE	SE	SE	A	A	A				
3	A	B	A	A	A	A	B	A	B	B	200	210	200		B	B	B	B	B	250	285		A	A	Y	A			
4	S	S	A	A	B	B	B	B	B	B	B	B	200	200		220	B	B	B	205	S	B	A	A	A				
5	A	A	A	A	B	B	B	A	A		C		215	205	E	B	B	B	B	BE	BE	BE	Y	A	A				
6	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	S				
7	E	AE	A	A	B	B	A	B	A			B	B	B	B		200	210	205	205	250	265	235	225	A				
8	A	220	A	A	B	A	A	A	S				200	205	205	210	210	215	215	210	230	E	A	A	240				
9	A	A	A	A	A	A	H		S		B	B	B	B	235	220	225	A	205		245	225		A	A				
10	A	A	Y	A	A	Y		Y	B	B	B	B	B	210	B	B	B	B	B	255	255	250	B	230	A				
11	A	A	A	B	A	A	A	A	A	B	B	B	B	B	B	B	B	B	230	220	240	E	A	245	260	290			
12	A	A	A	A	A	A	A	A		235	200	200	215		B	B	A	H	215	205	200	220	210	215	215	290	280		
13	240		A	A	A	AE	S		A	B			205	200	200	200	250	215	220	210	220	E	AE	SE	EA	EA			
14	A	A	A	AE	S	A	A	A		210	255	200		B	200	200	210	200	205	220	215	215	A	A	A	A			
15	S	A	A	A	AE	A		A		245	200	225	210	205	240	205	205	210	220	245	230	235	265	220	A				
16	A	B	A	A	B	B	A	A		250	200	210	205	200	200	240	205	210	210	205	240	250	220	E	BE	EA	EA		
17	255	250		A	AE	A		E	A	B	B		210	200	200	230	200	210	205	215	220	235	245	225	250	200			
18	Y	A	300	A	A	AE	A	260	205	205	200	200	200	205	200	215	250	220	210	250	E	S	A	255	A	A			
19	E	A	AE	S	A	A	A	S	S	B	B	B	BE	S		H	E	SE	B	A	245		A	A	A	A			
20	A	235	A	A	A	200	A	B	A	B	B	B	B	B	B	B	235	B	B	B	240	A	240	AE	A	A			
21	A	A	Y	B	B	B		225		205	B	B	B	B	235		B	B	BE	B	H	240	230	240	275	255	280		
22	E	A	S	A	A	B	A	A	B		205	215	200	205	240	200	205	B	200	200	215	E	SE	SE	250	E	A		
23	A	250	A	S	B		250	215	205	200	215	200	195	215	200	200		AE	A	E	A	220	230	245	225	230	240	245	300
24	A	225	A	255	250	215	200	205	200	200	200	200		A	AE	A	245	200	200	220	240	230	245	250	235	280	E	A	
25	A	A	A	230	250	260	205	215		240	200			A	A	A	225	200	205	215	205	220	235	240	245	A	A	A	
26	245		A	250	250	220		A	A	A	B		210	200	200	230	B	B	Y	YE	A	A	215	A	A	A	A		
27	E	AE	A	AE	AE	A	A	A	A	A	B	B	B	200	B	B	A	B	A	240	205	250	240		235	A	A		
28	A	A	B	B	B	B	Y	AE	A		E	B	200	B	B	B	225	B	205	245	B	240	240		A	A	A		
29	A	A	A	A	A	200	200	205	B	B	B	A	205		A	HE	B	225	325	215	220	215	285	280	260	245	A		
30	B	B	A	A	B	B	B	B	A	B	A	B	B	B	B	B	B	220		BE	AE	AE	AE	235	250	250	235	230	280
31																													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	7	8	3	4	6	7	11	8	11	16	16	16	15	14	15	17	15	20	24	24	25	19	17	12					
MED	E	A	239	255	246	241	208	220	205	210	205	202	200	200	206	205	210	205	215	216	232	235	242	240	254				
U Q	E	AE	A	A	300	265	E	AE	A	260	260	260	225	240	212	210	208	205	230	225	225	220	230	242	250	250	280	252	285
L Q	245	230	250	240	245	200	205	205	205	200	200	200	200	200	200	200	205	200	205	210	215	220	235	232	245				

# IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 1994 fxI (0.1MHz)

45° E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	A	B	S	S	B	B	B	B	S	O	X	O	X	B	B	B	B	B	O	X	O	X	O	X	X	S	
2	B	B	A	S	Y	O	X	O	X	Y	Y	B	B	B	B	B	O	X	O	X	O	X	Y	Y	O	X	
3	A	B	B	B	O	X	B	S	A	B	B	B	B	B	O	X	X	X	B	O	X	O	X	X	O	X	
4	S	B	B	A	B	B	A	O	X	O	X	S	Y	O	X	O	X	X	B	B	B	S	O	X	O	X	
5	O	X	O	X	Y	O	X	S	S	O	X	X	O	X	X	B	B	B	O	X	X	B	O	X	X	X	
6	O	X	S	Y	A	O	X	Y	O	X	O	X	O	X	B	B	B	B	Y	Y	B	B	Y	Y	A	Y	
7	A	A	A	O	X	B	B	B	A	B	B	B	B	B	B	B	O	X	O	X	B	O	X	S	O	X	
8	Y	Y	B	O	X	B	B	Y	O	X	B	B	B	B	B	B	B	B	O	X	O	X	Y	O	X	X	
9	B	B	Y	B	B	B	B	Y	Y	O	X	Y	O	X	O	X	O	X	B	B	B	O	X	B	S	S	
10	B	B	S	B	B	B	B	B	S	O	X	Y	Y	O	X	O	X	O	X	O	X	X	X	Y	Y	X	
11	B	Y	Y	B	B	S	Y	B	S	O	X	X	O	X	O	X	O	X	X	X	O	X	S	O	X	Y	
12	Y	Y	A	A	S	Y	B	Y	S	Y	B	O	X	X	X	X	X	X	S	S	O	X	X	X	S		
13	O	X	B	B	Y	Y	B	B	B	S	B	B	B	B	B	O	X	O	X	O	X	S	B	B	O	X	
14	S	O	X	O	X	A	A	B	A	X	S	X	O	X	X	Y	B	B	S	X	O	X	X	X	S	O	X
15	45	Y	B	B	S	B	S	B	O	X	O	X	B	B	B	B	O	X	B	X	Y	Y	Y	Y	Y	Y	
16	A	O	X	B	B	B	B	S	B	O	X	B	B	B	B	B	O	X	B	O	X	B	B	X	X	X	
17	O	X	B	Y	B	S	46	60	59	70	70	71	B	B	B	O	X	O	X	X	X	B	X	O	X	X	
18	O	X	B	B	B	B	O	X	X	Y	O	X	S	B	B	B	O	X	O	X	X	X	O	X	O	X	
19	B	A	Y	Y	Y	A	A	O	X	B	S	O	X	O	X	O	X	X	O	X	O	X	B	O	X	X	
20	X	59	48	55	49	53	48	S	X	A	S	71	59	58	63	64	69	B	X	O	X	X	X	O	X	X	
21	X	45	S	S	B	S	A	S	S	B	X	X	O	X	Y	Y	O	X	Y	O	X	X	S	X	O	X	
22	47	47	47	53	B	O	X	Y	Y	X	X	X	Y	X	Y	O	X	Y	O	X	O	X	X	X	X	X	
23	X	X	O	X	X	O	X	B	Y	Y	X	X	X	X	X	X	X	X	X	X	X	X	O	X	X	Y	
24	A	A	A	Y	48	54	44	X	A	A	B	B	B	B	O	X	O	X	B	Y	Y	Y	Y	Y	S	Y	
25	O	X	B	Y	B	S	B	B	B	B	B	B	B	B	B	B	B	B	S	O	X	B	O	X	X	Y	
26	A	A	B	B	B	B	B	B	B	B	O	X	B	B	B	B	B	B	O	X	O	X	O	X	O	X	
27	A	B	B	B	B	B	B	B	O	X	O	X	X	O	X	B	Y	Y	Y	O	X	Y	O	X	O	X	
28	A	B	B	B	B	B	Y	O	X	B	O	X	O	X	X	X	X	X	B	B	B	O	X	S	O	X	
29	X	S	O	X	A	A	S	Y	O	X	Y	S	S	O	X	S	B	B	B	O	X	Y	B	S	S	O	X
30	X	O	X	O	X	Y	Y	O	X	A	X	Y	B	S	S	O	X	Y	O	X	O	X	O	X	O	X	X
31	44	47	48	Y	O	X	X	X	O	X	Y	X	O	X	O	X	O	X	O	X	O	X	X	X	X	Y	V
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	14	8	11	8	7	8	7	12	10	16	13	12	13	12	17	16	18	20	17	18	20	24	22	19			
MED	X	45	47	O	X	48	52	55	52	58	58	58	58	58	60	59	57	58	58	52	53	50	45	46	45		
U Q	X	48	48	O	X	53	53	57	60	59	64	62	60	60	64	67	63	60	60	56	56	52	49	50	48		
L Q	O	X	O	X	O	X	O	X	O	X	O	X	O	X	O	X	O	X	O	X	O	X	X	X	X	X	

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 1994 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 1994 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	42	B	38	38	B	B	B	B	30	27	28	B	B	B	B	B	B	25	21	E B E S	24	23	21	19	41		
2	B	B	43	37	28	33	37	44	44	42	B	B	B	B	B	B	29	B E B	30	43	42	43	29	41			
3	60	B	B	B	51	B	37	40	B	B	B	B	B	B E B	34	27	27	B	B E B E B	32	28	27	24	31			
4	33	B	B	42	B	B	41	41	36	S	26	27	29	26	30	B	B	B	B E B E B	31	25	22	19	E S			
5	E S	20	19	22	25	26	37	38	33	34	27	26	27	30	B	B	B	B E B	29	27	B	33	31	32	28		
6	30	39	42	38	50	42	40	34	37	27	B	B	B	B	B	28	26	B	B	33	39	70	39	44	B		
7	42	41	41	27	30	B	B	B	51	B	B	B	B	B	B	B	B	B E B	31	26	B E B	28	33	23	34	40	
8	38	45	B	25	B	B	40	36	B	B	B	B	B	B	B	B	B	B	B E B	30	43	E B	27	22	35	38	
9	B	B	38	33	B	B	B	B	40	E B E B E B E B	35	32	34	33	32	37	B	B	B	B E B	B E S	25	40	E S	23		
10	B	B	41	B	B	B	B	B	28	29	28	27	30	32	30	29	26	E B E B	31	29	26	22	39	40	35		
11	B	38	39	B	B	35	38	B	38	28	27	29	E B	31	32	37	37	29	26	31	21	28	44	42	37		
12	42	41	20	44	51	43	37	B	39	41	30	B	27	34	29	E B	31	29	27	27	E S E S	27	27	29	22	21	
13	37	B	B	27	41	B	B	B	37	B	B	B	B	B	B	E B E B	31	32	S	B	B	36	28	22	24		
14	28	33	31	43	42	B	42	35	27	27	26	33	37	B	B	30	36	26	28	27	30	32	37	42			
15	35	38	B	B	40	B	41	B	38	29	B	B	B	B	B	B E B	B	B	B	36	34	37	42	42	41	44	
16	50	38	B	B	B	B	42	B	27	B	B	B	B	B	B	B E B	33	B E B	31	B	B	27	23	29	33		
17	33	B	34	B	41	50	35	26	28	28	29	B	B	B	30	E B	49	27	27	B	27	34	28	31	43		
18	42	B	33	B	B	36	30	44	29	E B	30	B	B	B E B	33	30	29	28	27	28	E B	26	20	38	41	41	
19	B	77	41	37	38	59	51	34	B	33	28	28	30	33	39	39	38	E B	B	B	34	49	59	27	E B	23	
20	32	37	30	44	40	47	46	52	44	30	29	29	34	62	57	B	40	27	70	25	33	42	30	40			
21	42	41	S	B	38	41	37	41	B	41	29	28	31	32	30	28	27	E S E S	31	28	S E S	24	23	31	33		
22	33	33	37	26	B	37	42	42	20	32	32	42	37	43	28	50	45	27	24	23	20	19	27	17			
23	19	14	19	32	37	B	37	37	28	27	34	34	27	E B E B	50	34	28	33	E B	30	24	23	33	E S	25	35	41
24	51	69	81	42	27	60	29	43	47	B	B	B	B	B	E B	B	37	E B	33	27	37	45	51	41	41		
25	45	B	44	B	29	B	B	B	B	B	B	B	B	B	B	B	B	B E B	B E B	B	B	24	23	34	44		
26	51	78	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B E B	B E B	B E B	B	30	33	37	58		
27	58	B	B	B	B	B	B	B	32	29	28	28	B	29	27	28	31	34	32	30	B	24	25	28	33		
28	66	B	B	B	B	B	41	37	B	26	27	27	28	28	E B	32	27	B	B	B E S	27	S E S	E S	E S	23		
29	30	S	59	46	60	44	42	42	41	S	37	E B	33	S	B	B	B E B	B E B	B	B	23	21	E B	32	37	34	
30	31	36	40	38	37	33	51	37	36	B E B	34	S	28	25	27	28	34	25	B	19	B	26	28	26			
31	31	31	38	26	27	25	33	39	43	E B E B E B	31	34	34	36	33	51	38	26	42	30	25	26	28	33	34		
CNT	26	18	21	19	19	15	23	21	24	20	20	14	16	16	19	19	20	23	21	24	29	31	31	30			
MED	38	38	38	37	38	41	40	39	36	28	28	28	30	32	30	30	30	28	30	26	28	28	31	34			
U Q	45	41	42	42	42	47	42	42	40	32	34	33	33	36	34	37	35	E B	32	30	34	34	39	37	41		
L Q	31	33	32	27	29	35	37	34	28	27	28	27	28	28	29	28	28	27	27	24	24	23	27	26			

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 1994 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 <sup>H</sup>	00	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	B	31	23	B	B	B	B	21	17	16	B	B	B	B	B	B	22	17	24	E S	23	17	17	16
2	B	B	23	23	19	17	24	17	30	27	B	B	B	B	B	B	17	B	30	16	24	17	16	17	
3	17	B	B	B	21	B	24	26	B	B	B	B	B	B	34	23	17	B	B	32	28	23	13	17	
4	22	B	B	21	B	B	21	22	18	S	18	22	24	23	24	B	B	B	B	31	25	E S	22	17	E S
5	E S	20	17	17	17	9	31	27	21	17	17	22	18	24	B	B	B	29	17	B	17	12	9	7	
6	7	17	9	8	16	9	9	17	17	16	B	B	B	B	17	18	B	B	23	12	19	24	23	B	
7	23	29	28	11	11	B	B	B	24	B	B	B	B	B	B	B	31	24	B	28	21	17	16	12	
8	30	17	B	16	B	B	31	22	B	B	B	B	B	B	B	B	B	B	30	23	27	20	20	17	
9	B	B	18	15	B	B	B	B	28	24	32	34	33	32	31	B	B	B	30	B E S	25	9	E S	23	16
10	B	B	16	B	B	B	B	B	20	22	17	19	21	17	17	23	21	31	29	19	17	18	27	16	
11	B	19	22	B	B	23	17	B	24	17	21	21	31	23	23	18	17	17	18	17	22	17	23	27	
12	12	17	13	22	18	17	23	B	16	21	23	B	23	23	21	31	22	21	21	E S	27	27	9	9	8
13	19	B	B	23	30	B	B	B	31	B	B	B	B	B	B	B	22	31	32	S	B	21	28	17	17
14	17	17	21	22	16	B	21	21	20	16	17	23	23	B	B	22	17	21	22	17	27	22	13	12	
15	12	16	B	B	20	B	24	B	24	17	B	B	B	B	B	31	B	29	23	31	17	21	21	19	
16	9	20	B	B	B	B	30	B	20	B	B	B	B	B	B	33	B	31	B	B	21	16	13	12	
17	10	B	22	B	23	16	17	17	16	16	17	B	B	B	24	49	23	24	B	16	12	17	13	17	
18	21	B	17	B	B	22	24	20	25	30	B	B	B	33	21	23	21	20	17	26	11	12	16	17	
19	B	17	23	10	22	17	19	10	B	19	17	17	9	22	18	22	16	31	B	27	23	11	24	23	
20	15	17	9	23	9	20	16	19	20	17	17	19	17	21	17	B	18	17	16	22	9	17	9	10	
21	15	16	S	B	23	21	16	30	B	21	17	21	19	20	21	17	19	31	28	S E S	24	18	19	12	
22	12	17	20	9	B	28	29	17	13	16	17	23	19	19	21	20	17	20	12	12	9	12	12	13	
23	9	9	9	9	18	B	21	18	14	17	16	21	20	50	34	25	25	30	21	17	12	E S	25	20	21
24	22	18	16	30	22	16	24	22	23	B	B	B	B	25	34	B	23	33	17	23	12	17	25	24	
25	8	B	27	B	20	B	B	B	B	B	B	B	B	B	B	B	B	31	30	B	22	20	24	22	
26	19	31	B	B	B	B	B	B	B	B	31	B	B	B	B	B	B	32	32	34	27	13	28	25	
27	19	B	B	B	B	B	B	17	20	21	23	B	23	20	20	31	34	32	30	B	24	25	17	17	
28	17	B	B	B	B	B	24	22	B	17	21	23	20	25	32	23	B	B	B E S	27	S E S	24	31	17	
29	16	S	8	12	25	31	26	23	30	S	30	33	S	B	B	B	31	32	B	16	17	32	7	9	
30	16	15	17	16	18	15	16	16	16	B	34	S	17	17	17	17	17	16	B	17	B	17	10	11	
31	8	10	9	17	13	15	9	16	17	31	34	34	20	26	23	21	17	17	17	17	15	22	18	13	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	30	30	31	31	31	31	31	31	29	31	30	30	31	31	31	31	30	31	31	30	30	31	31	31
MED	17	20	22	23	23	B	24	22	23	21	30	B	32	50	32	31	25	31	30	24	20	17	17	17	
U Q	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	25	22	23	21
L Q	22								31									33		32					
L Q	12	17	16	16	18	17	19	17	17	17	17	22	20	23	21	22	17	21	18	17	17	16	13	12	

## IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 1994 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

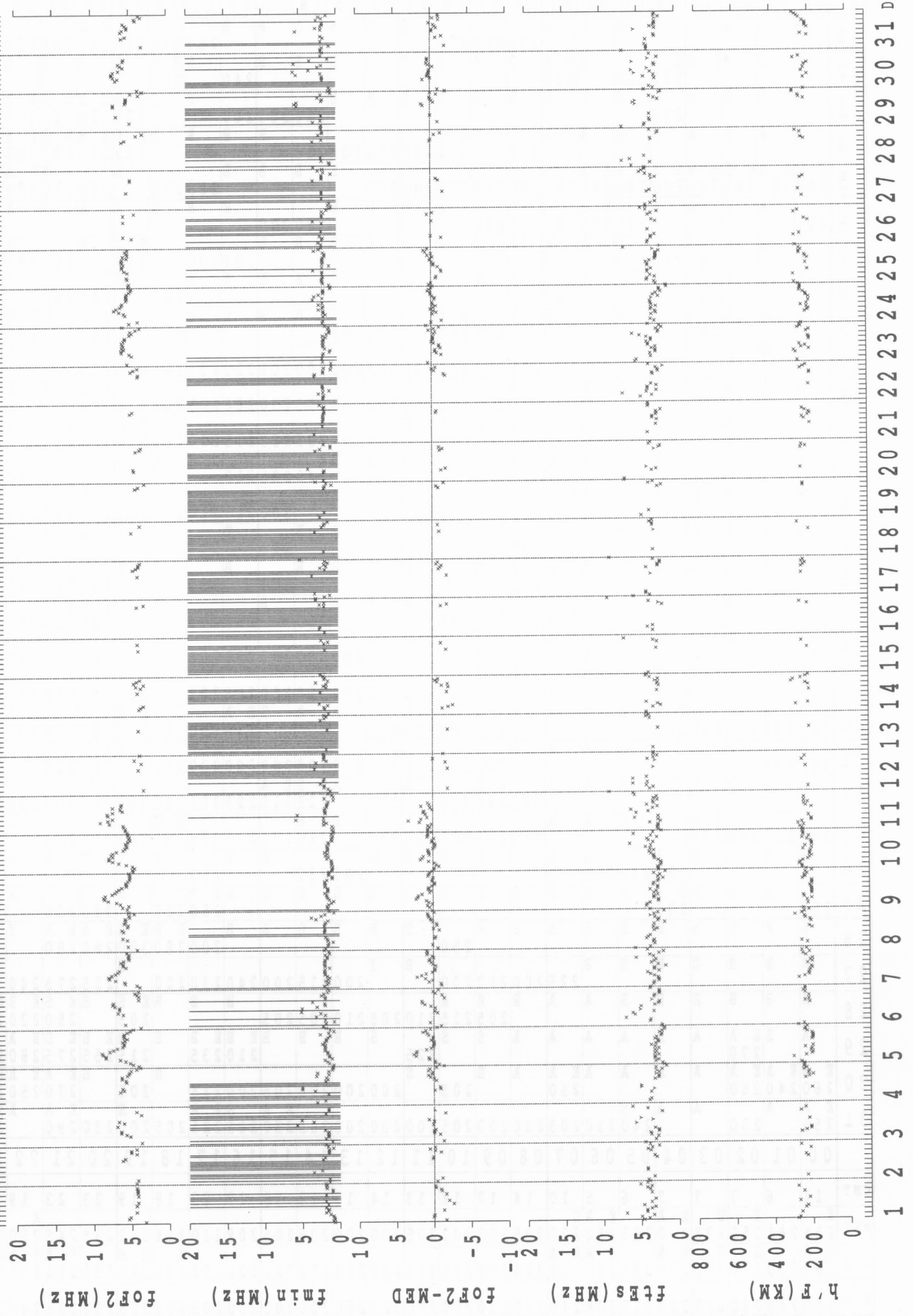
D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		A	B	A	A	B	B	B	B																	
2		B	B	A	AE A			AE A	A	A	B	B	B	B	B	B	B									
3		A	B	B	B			A	A	B	B	B	B	B	B											
4		A	B	B	A	B	B	A	A																	
5		E S	E S	E S	E S	E S	E S	AE A	A																	
6		260	300	285	305	280	250	265	250	200	200	205	200	200												
7		255	A	A	A	A		E A	200	205	205		B	B	B	B										
8		A	A	A				B	B	B	B	B	B	B	B	B										
9		Y	A	B		B	B	Y		B	B	B	B	B	B	B										
10		B	B	A	B	B	B	B	A	Y	E B															
11		B	A	A	B	B	A	A	B	A																
12		A	AE A	A	A			A	B	A	A	Y	B													
13		A	B	B	Y	A	B	B	B	A	B	B	B													
14		E A		A	A	A	B	AE A																		
15		300	290					240	200	205	200	200														
16		A	A	B	B	B	B	A	B	H	B	B	B	B	B	B										
17		255		B	A	B	A	A	A	215	200	205	200													
18		230	B	A	B	B	A		A	200	200		B	B	B											
19		B	A	AE A	A	A	A		A	B	A															
20		E S	S			E A	A	A	A	A	H															
21		E A		S	B	A	A	A	A	B																
22		A	A	A	A	B	A	A	A	E A																
23		245	240	240	E A	A	B	A	A	205	240	200														
24		A	A	A	AE A	E A	E A	A	A	B	B	B	B													
25		250		B	A	BE A	B	B	B	B	B	B	B													
26		A	A	B	B	B	B	B	B	B	B	B	B													
27		A	B	B	B	B	B	B																		
28		A	B	B	B	B	B	A	A	B	H	H														
29		A	SE A	A	A	A	A	A	A	A	S	S														
30		E AE AE A	A	A	A	A	AE A	A	B																	
31		E 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		11	6	7	7	7	6	5	10	14	17	18	13	14	13	18	18	19	23	18	19	23	23	19	19	
MED		E	255	241	E	U	E A	E A	U	270	235	250	220	205	200	202	205	200	200	206	205	208	210	214	212	
U Q		E S	E	E	E	E A	E A	E A	E A	220	205	205	215	205	205	210	220	220	230	235	240	250	270	265	285	
L Q		250	240	230	220	220	215	208	210	200	200	200	200	200	200	200	200	200	205	205	205	230	235	240	240	

DEC. 1994 h'F (KM)

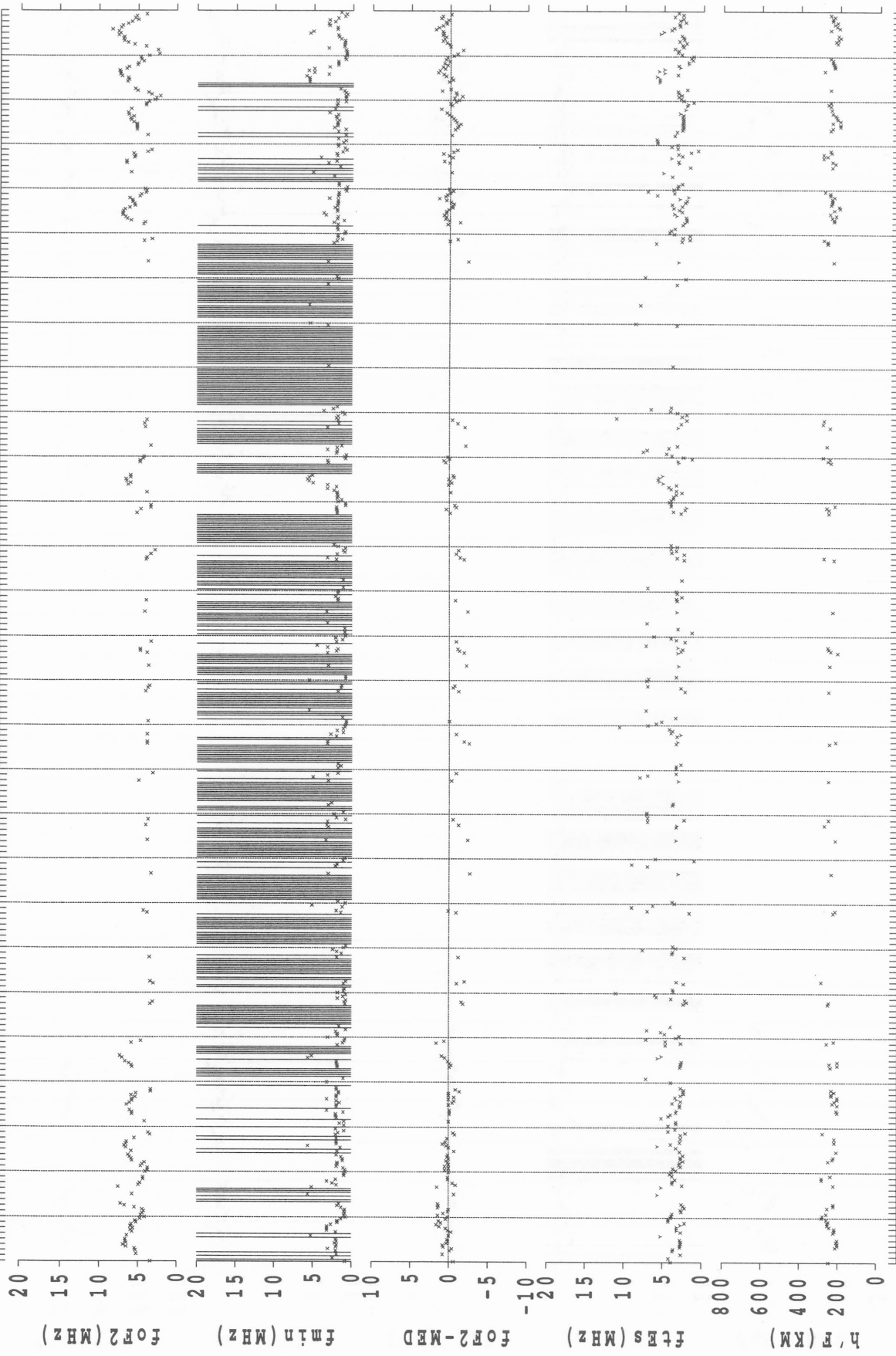
COMMUNICATIONS RESEARCH LABORATORY, JAPAN



1994 0101 -> 1994 0131 (99) SYOWA-ST.

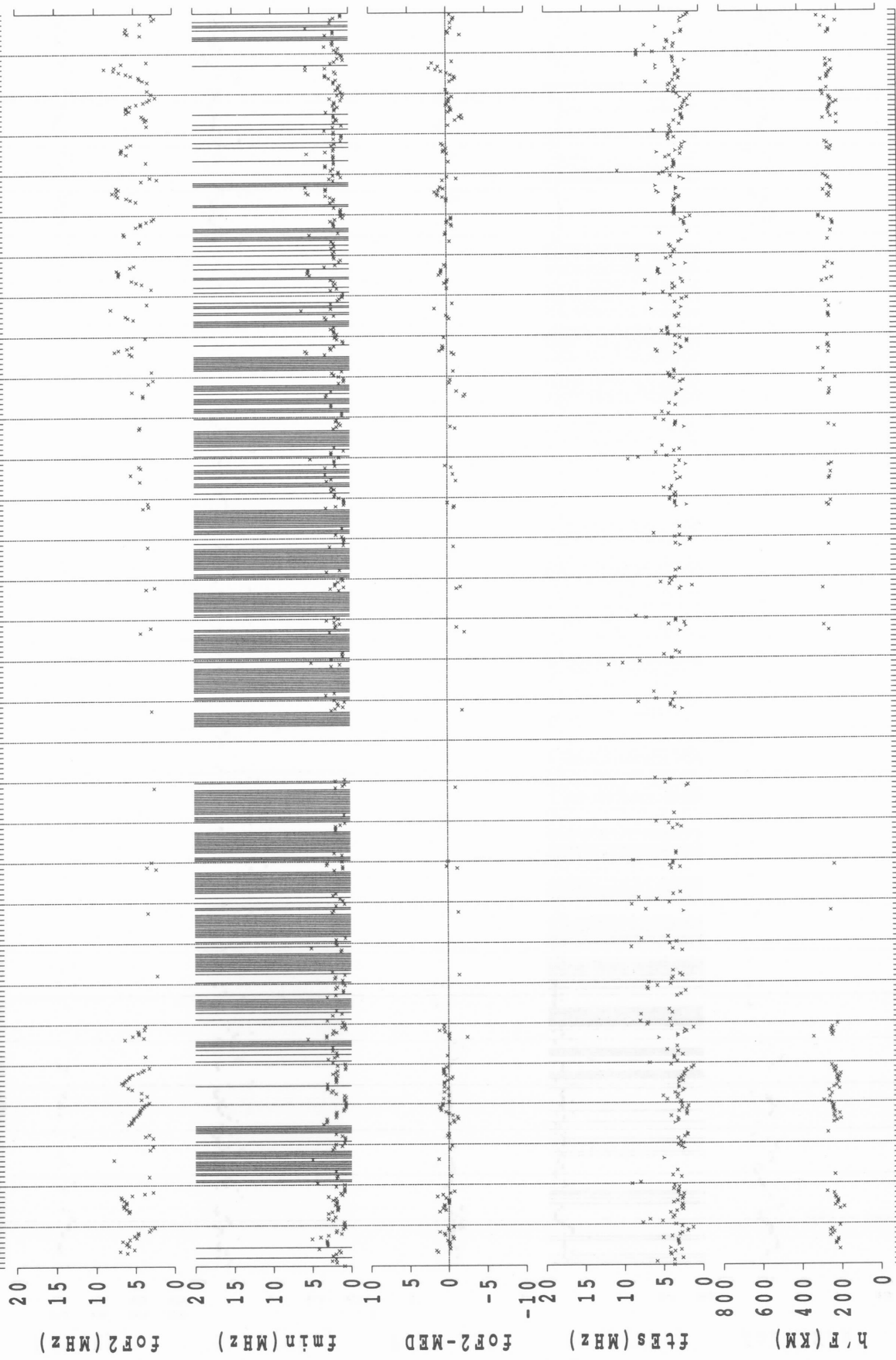


1994 0201 -> 1994 0228 (99) SYOWA-ST.



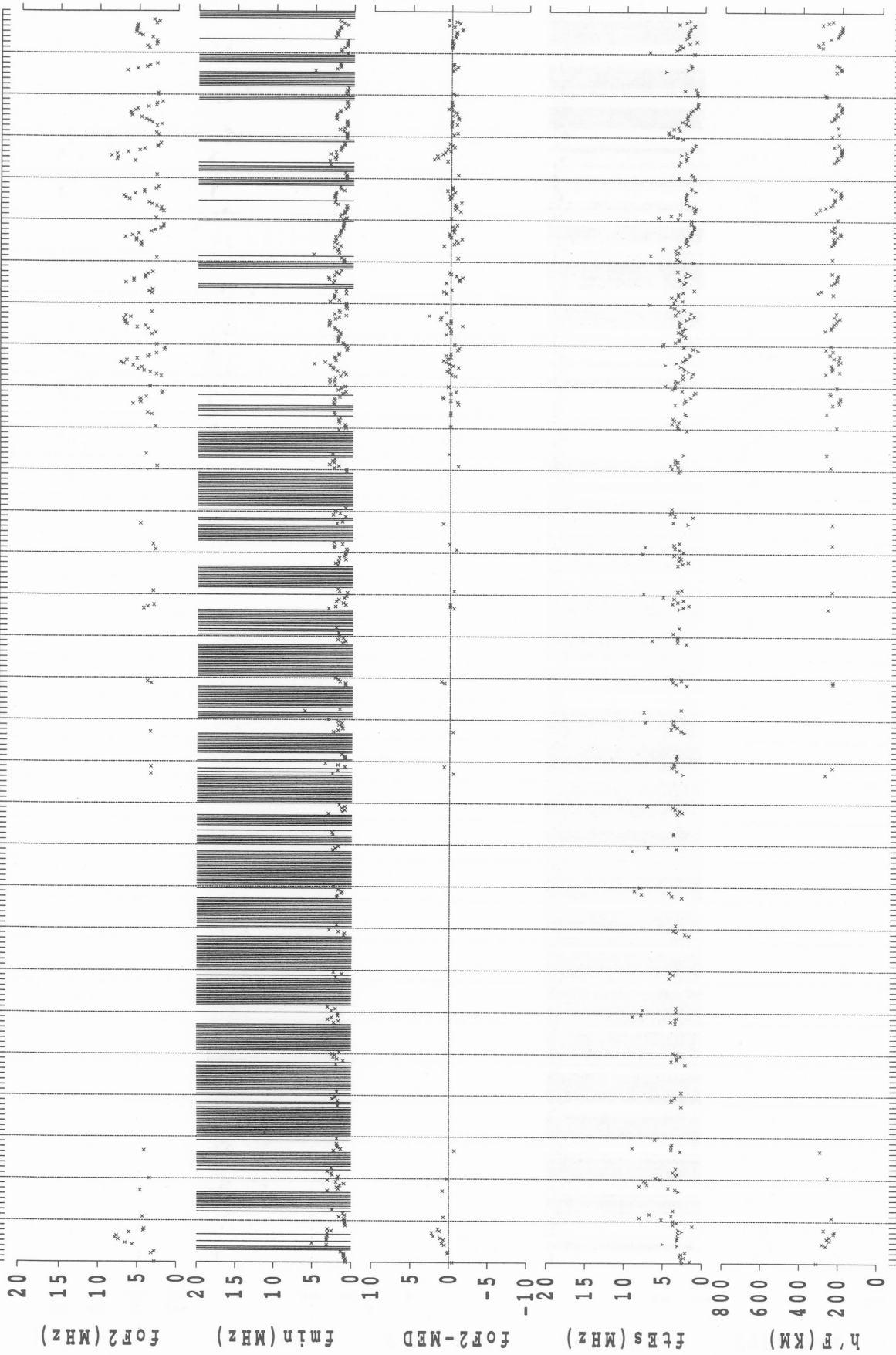
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 DAY/45 EMT

1994 0301 -> 1994 0331 (99) SYOWA-ST.



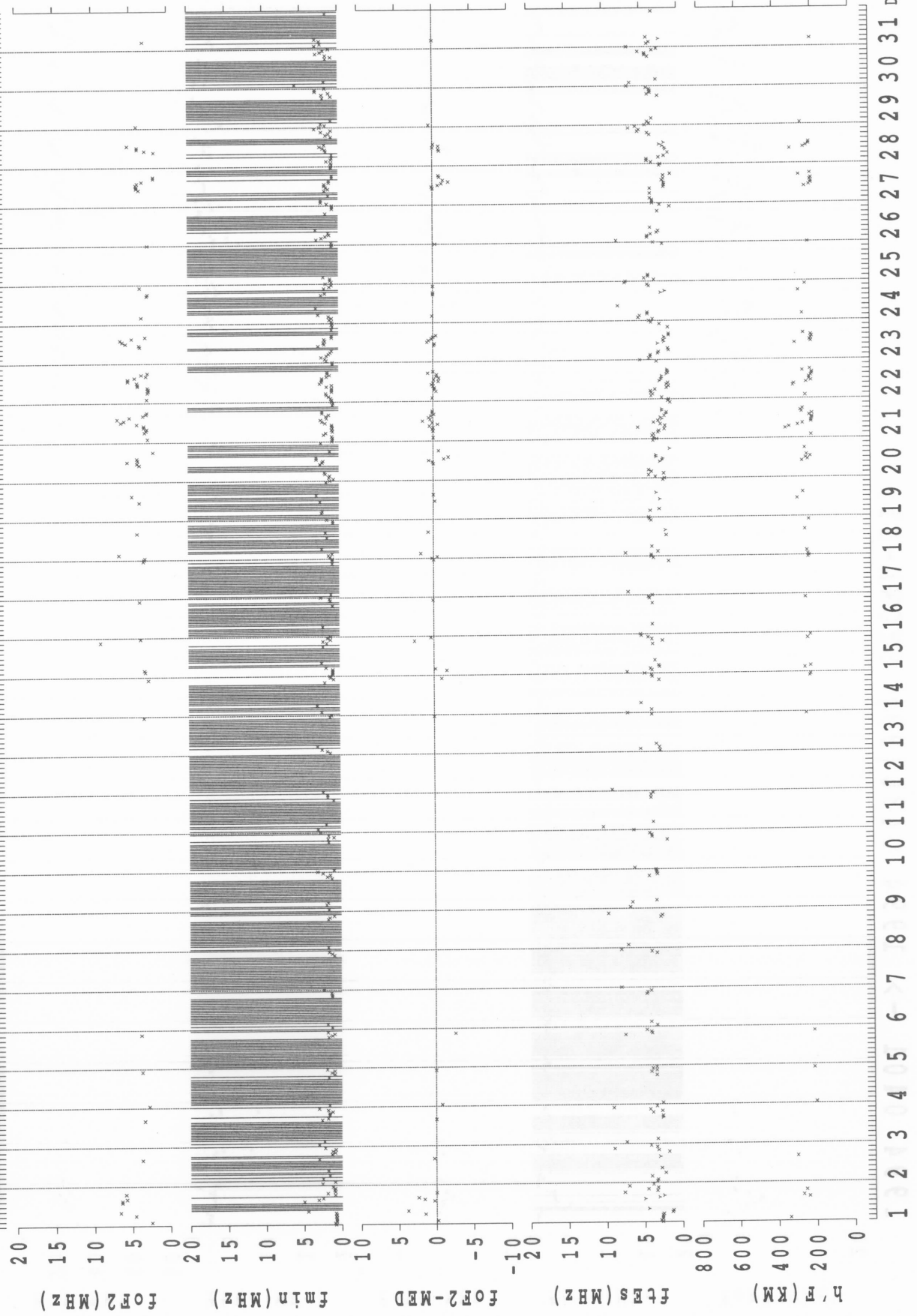
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45° EMT

1994 0401 -> 1994 0430 (99) SYOWA-ST.



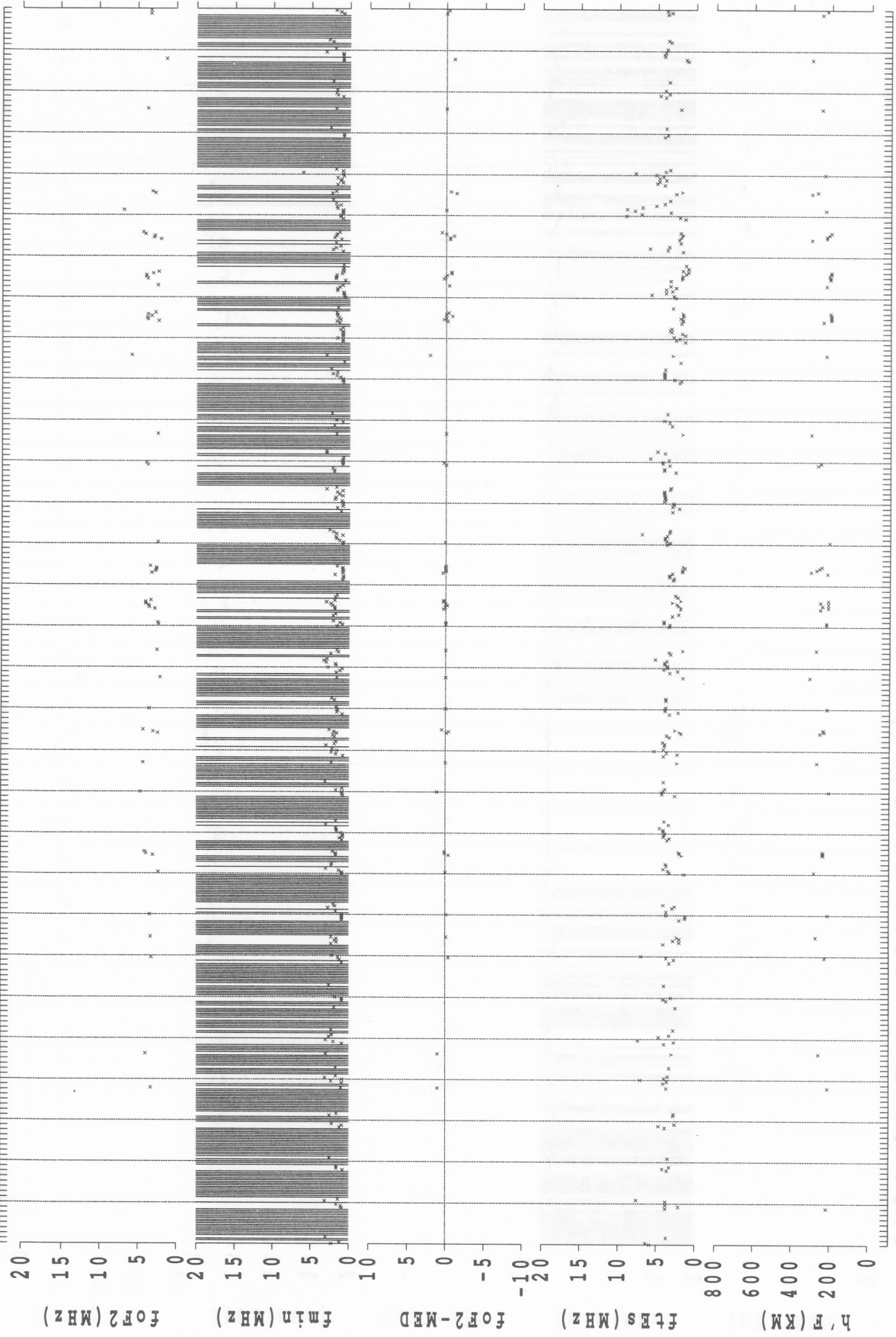
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1994 0501 -> 1994 0531 (99) SYOWA-ST.



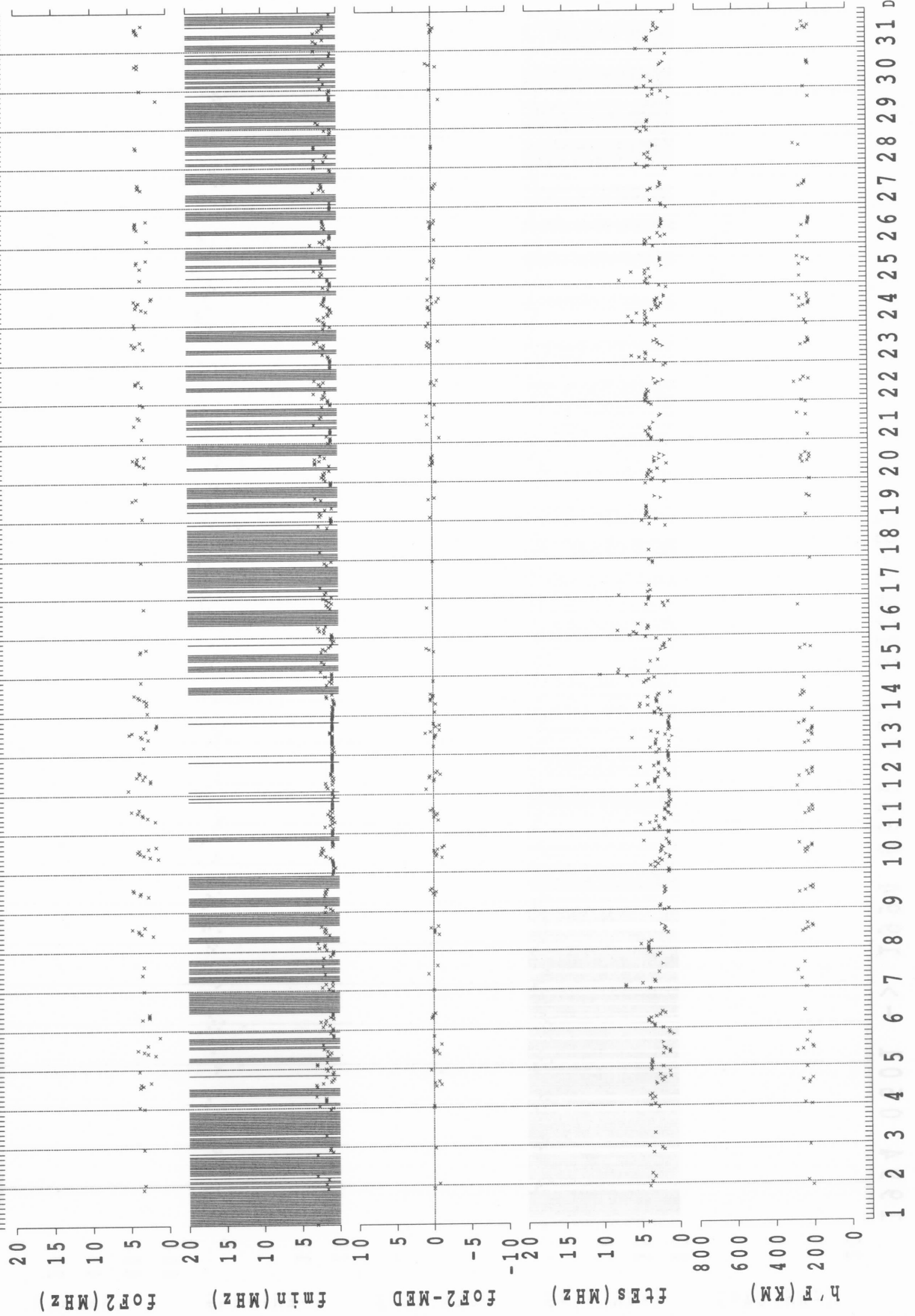
DAY/45 GMT

1994 0601 -> 1994 0630 (99) SYOWA-ST.



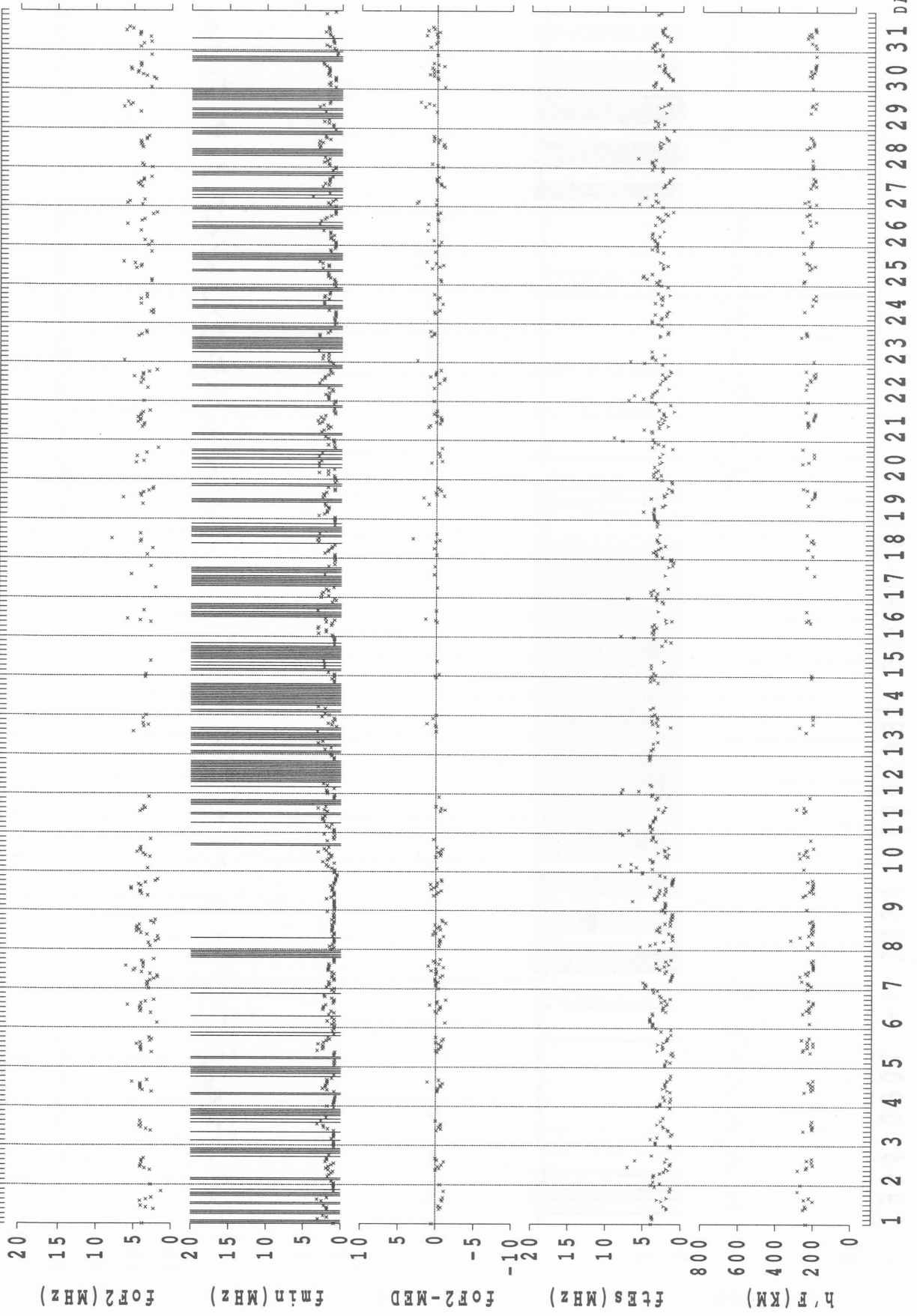
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 DAY/45' EMT

1994 0701 -> 1994 0731 (99) SYOWA-ST.



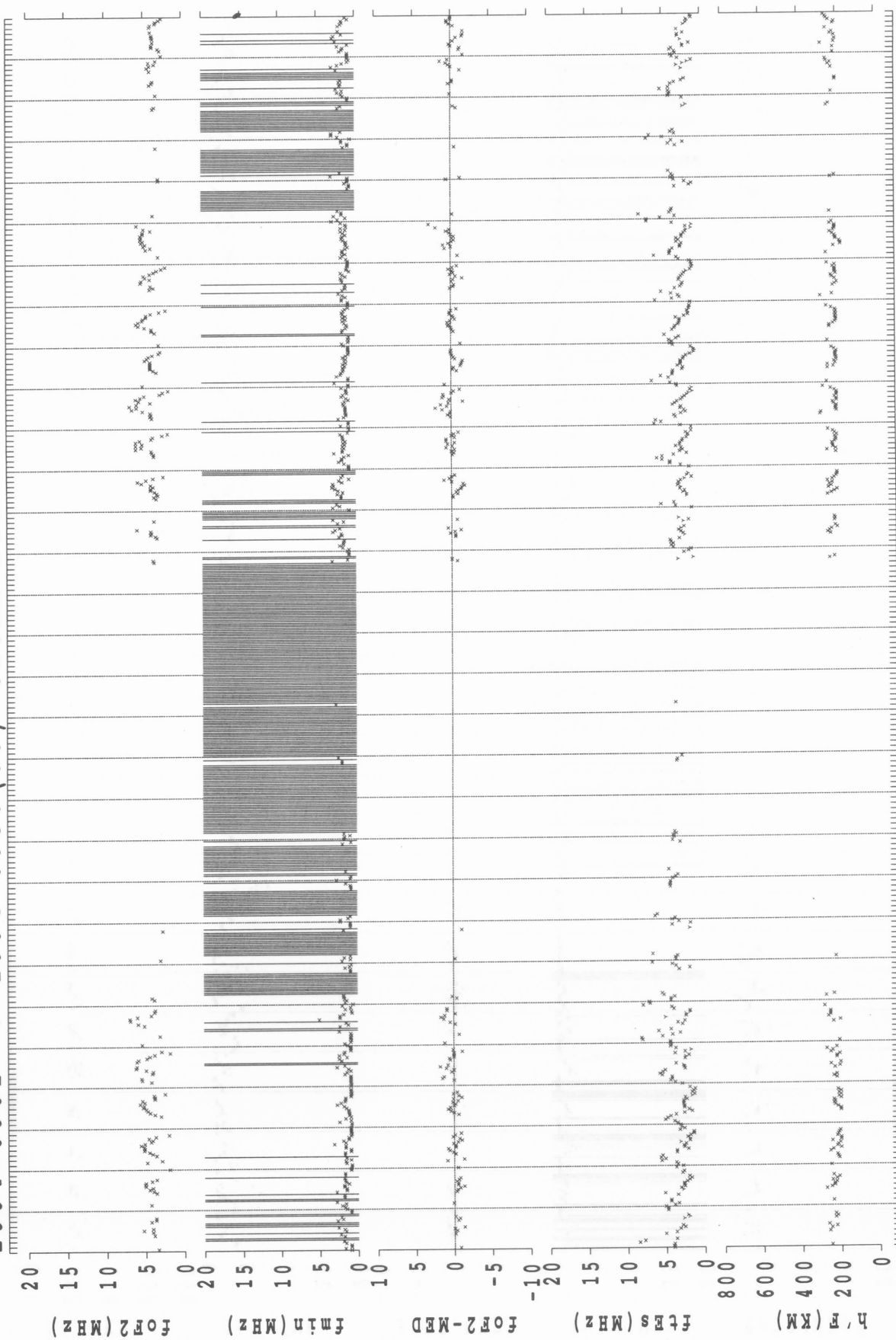
DAY/45' EMT

1994 0801 -> 1994 0831 (99) SYOWA-ST.



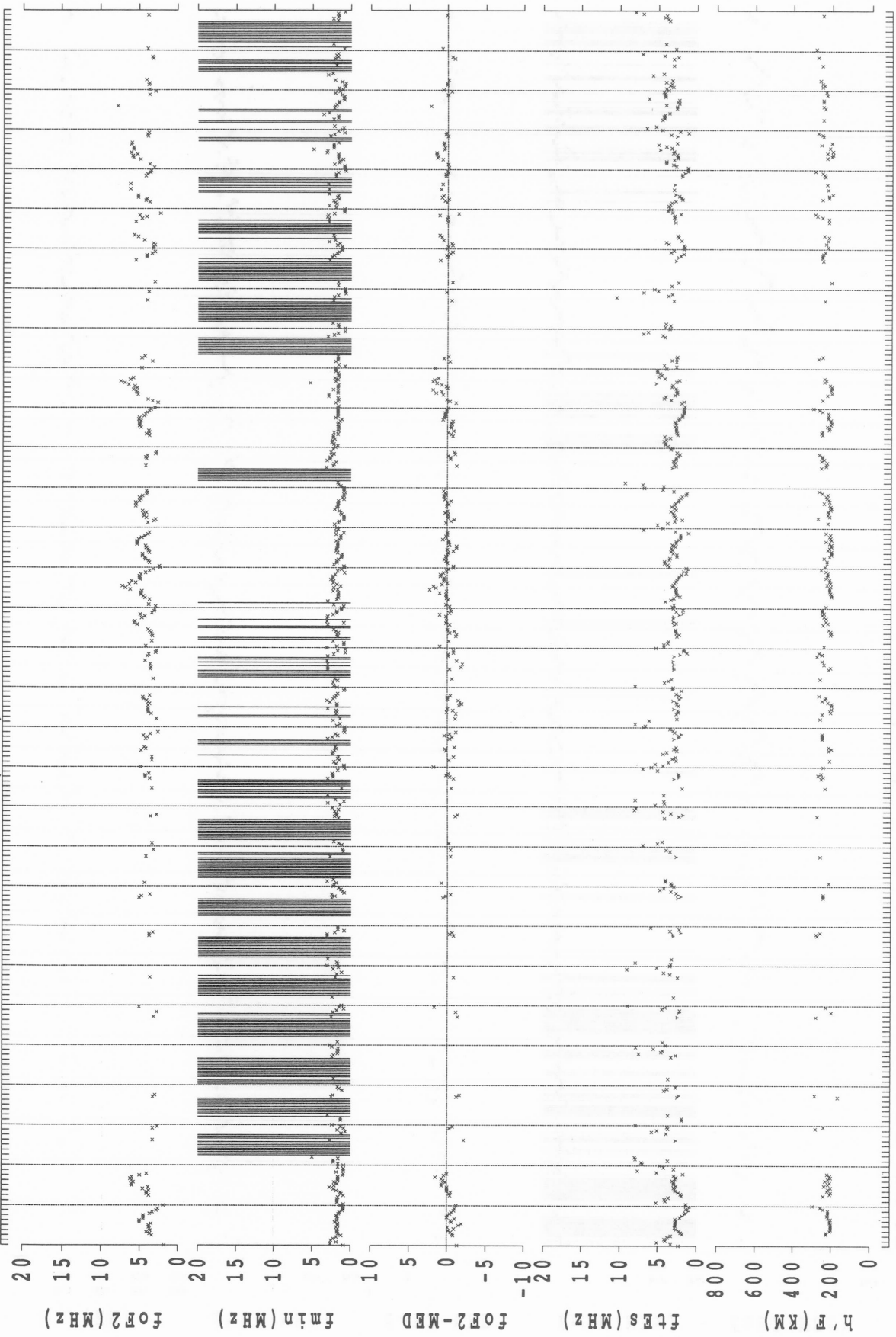


1994 0901 -> 1994 0930 (99) SYOWA-ST.



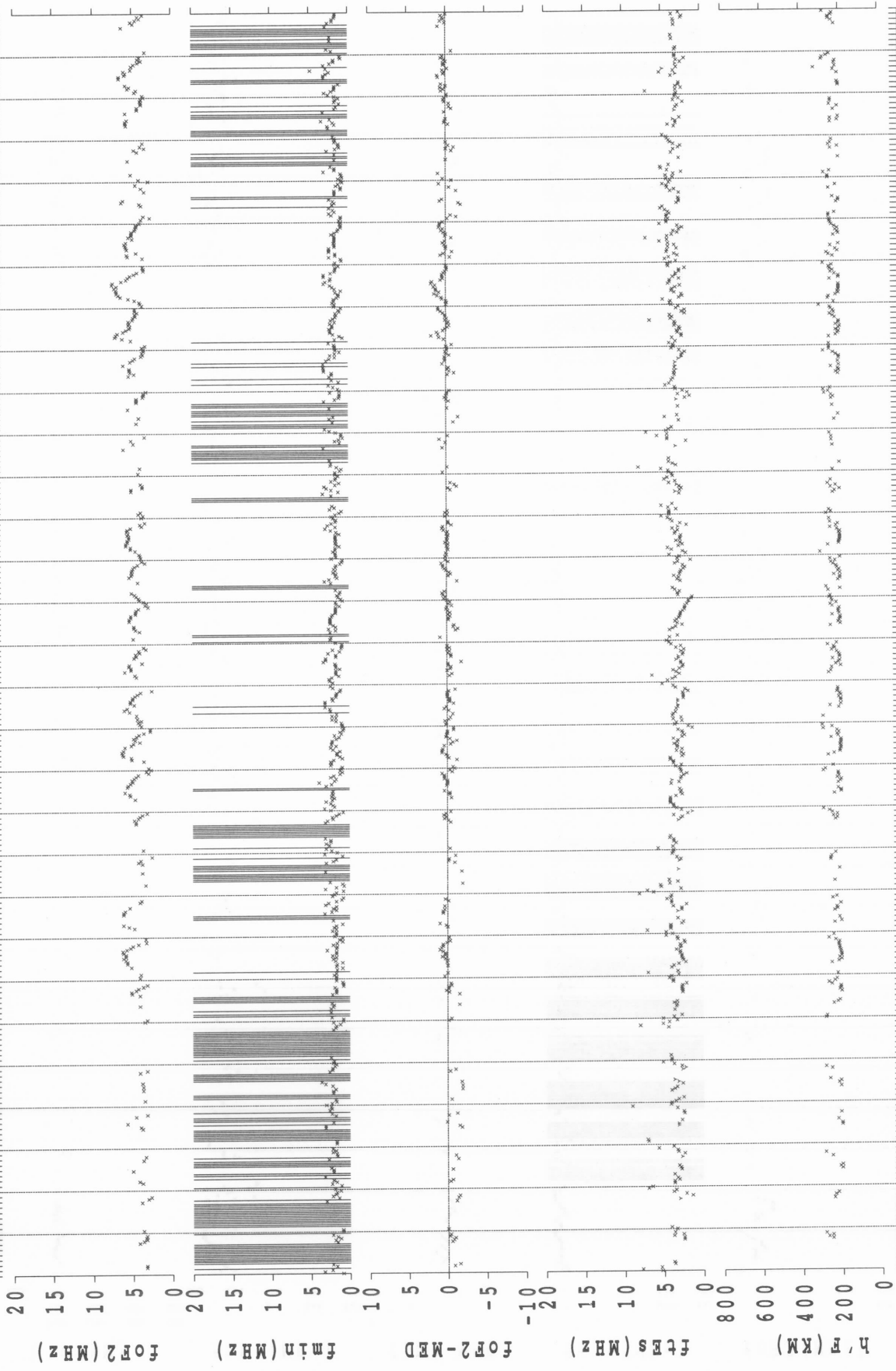
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 DAY/45' EMT

1994 1001 -> 1994 1031 (99) SYOWA-ST.



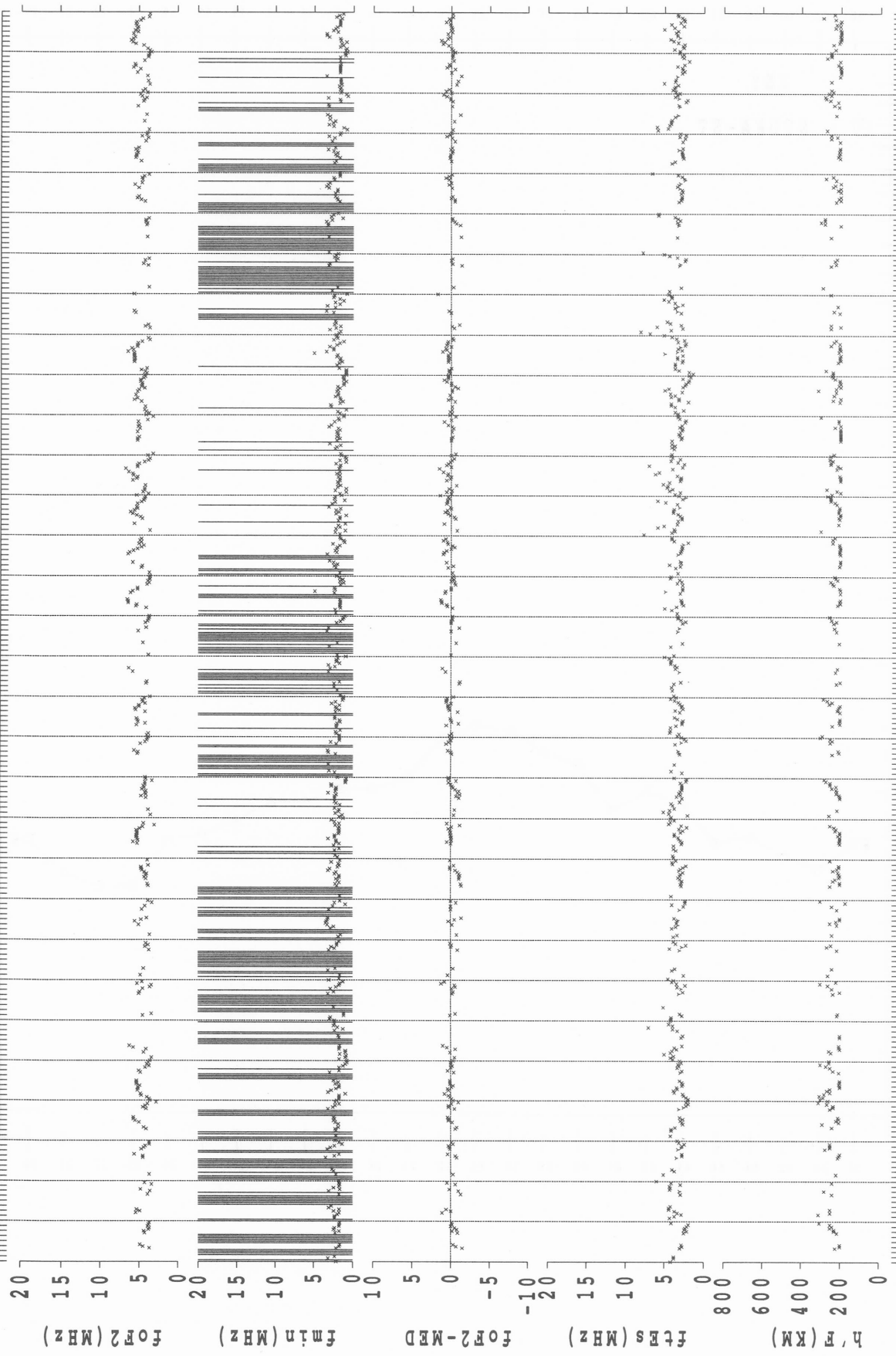
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45' EMT

1994 1101 -> 1994 1130 (99) SYOWA-ST.



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

1994 1201 -> 1994 1231 (99) SYOWA-ST.

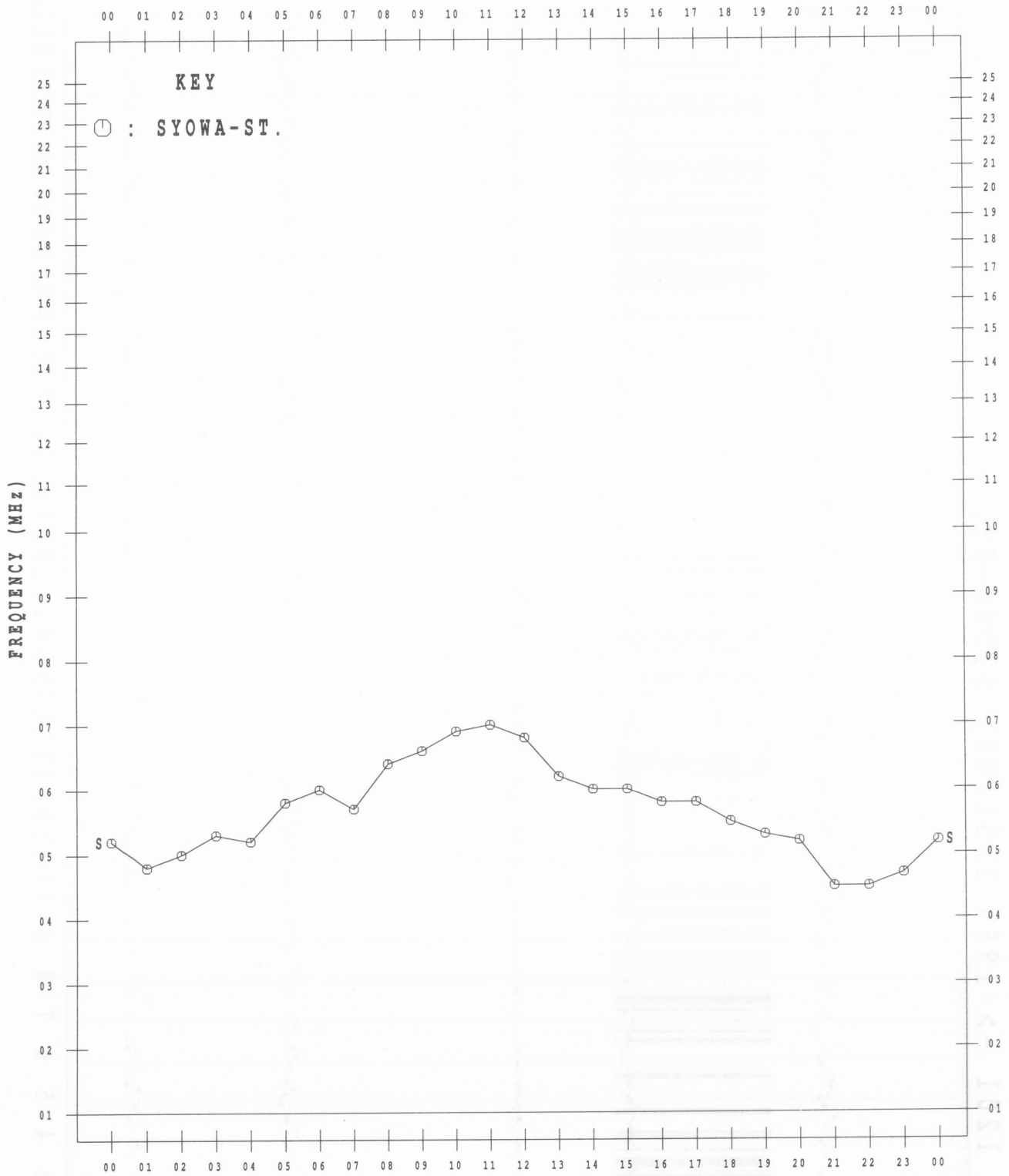


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45' EMT

# MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

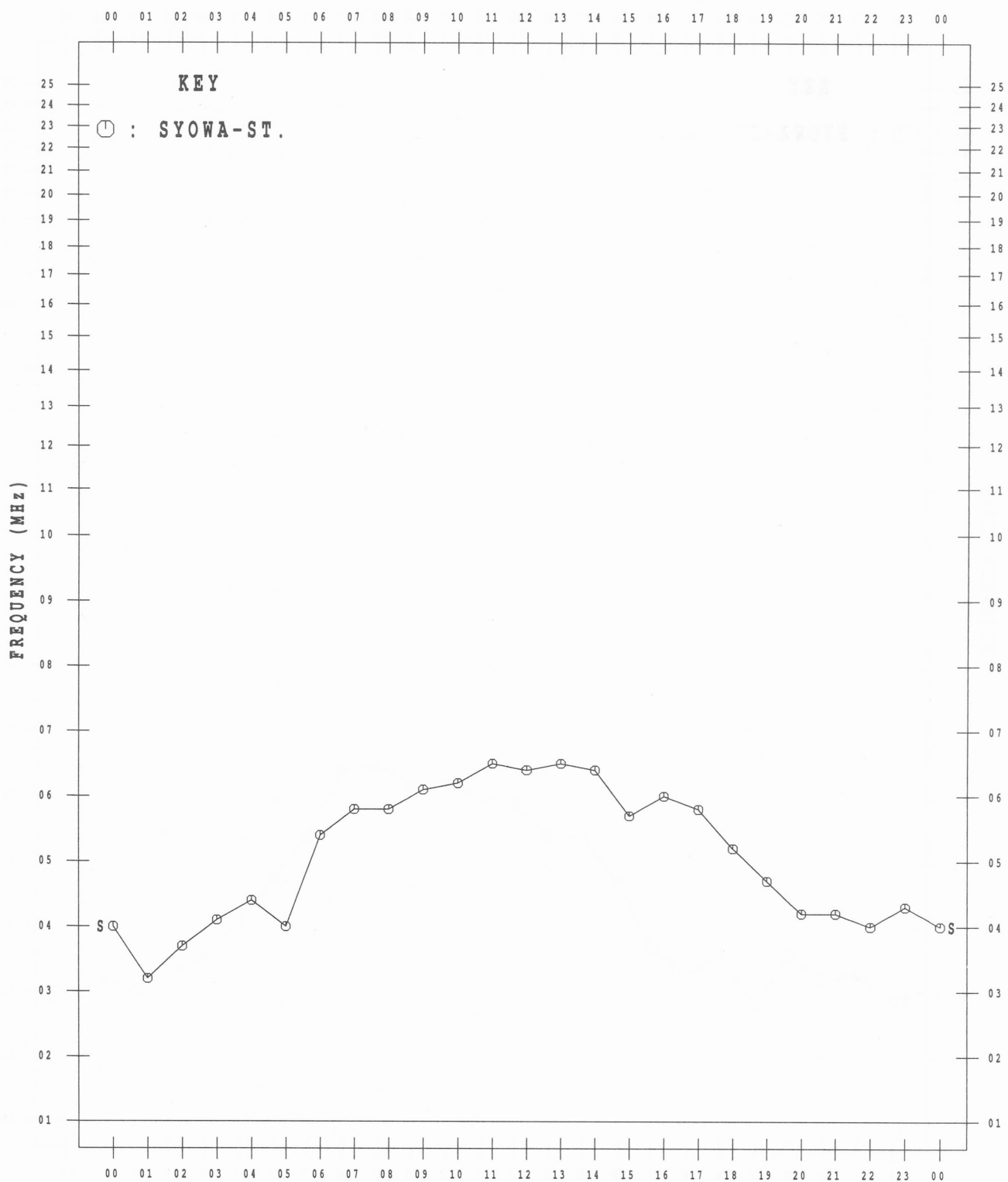
JAN. 1994



## MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

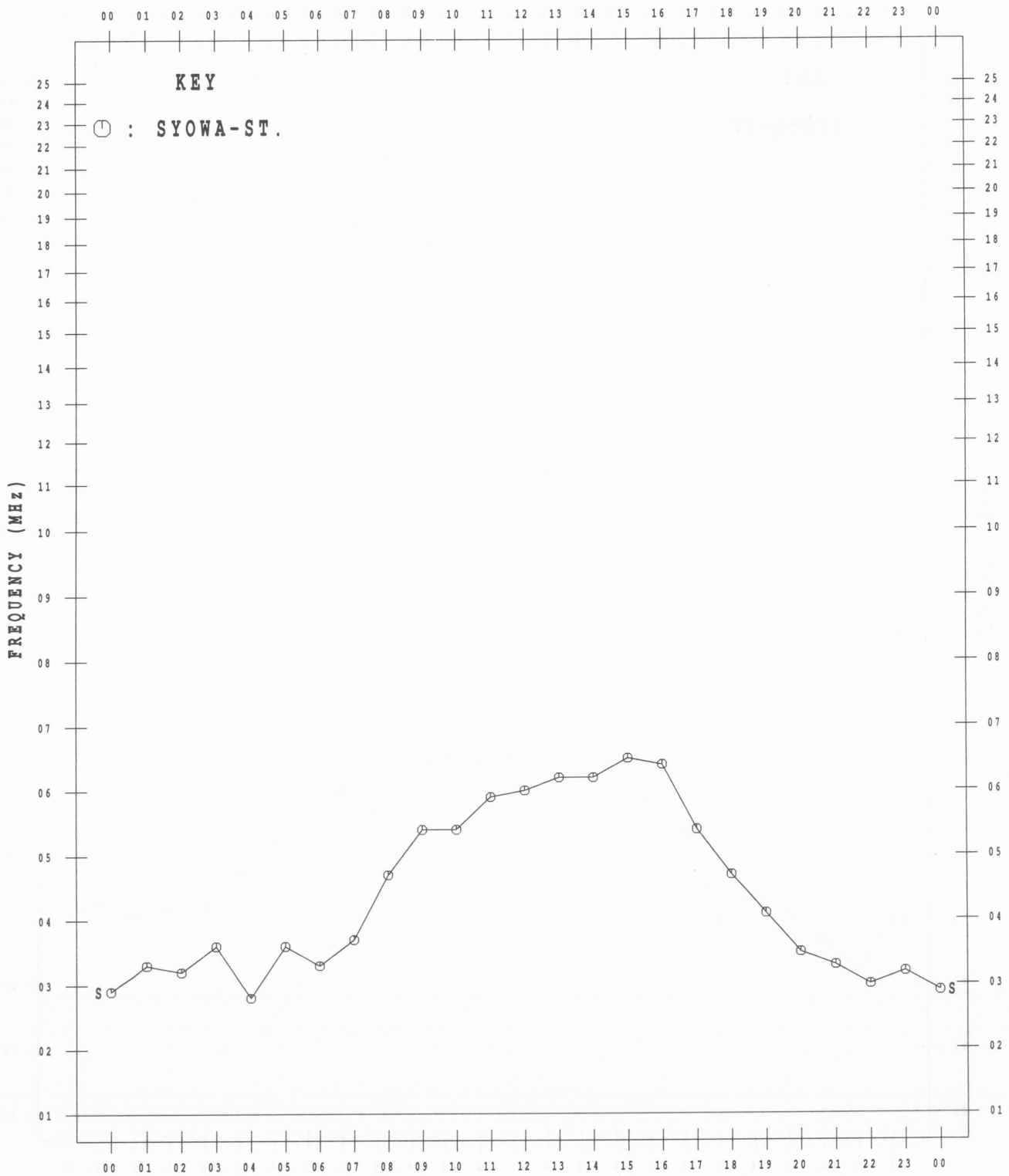
FEB. 1994



# MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

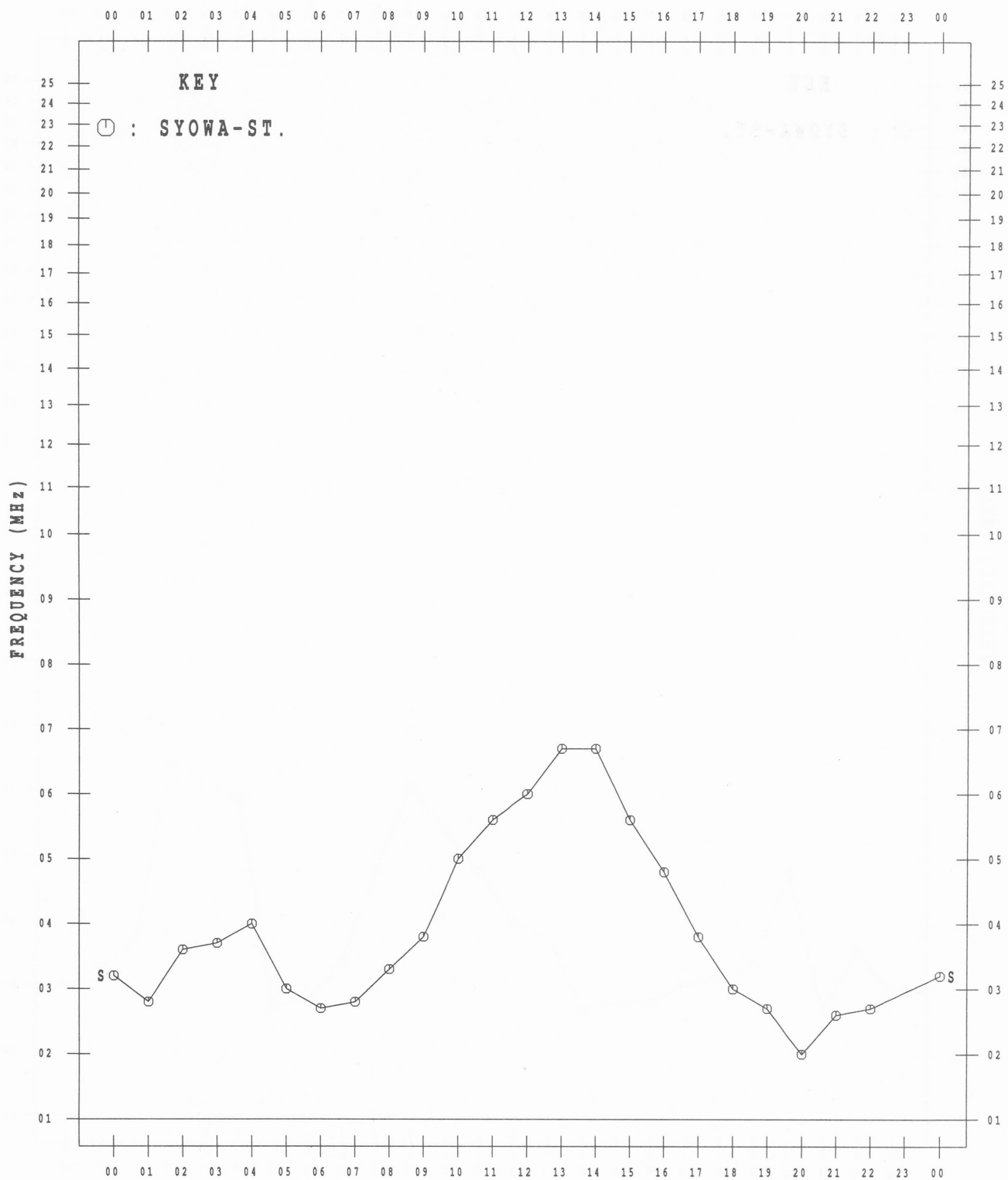
MAR. 1994



## MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

APR. 1994

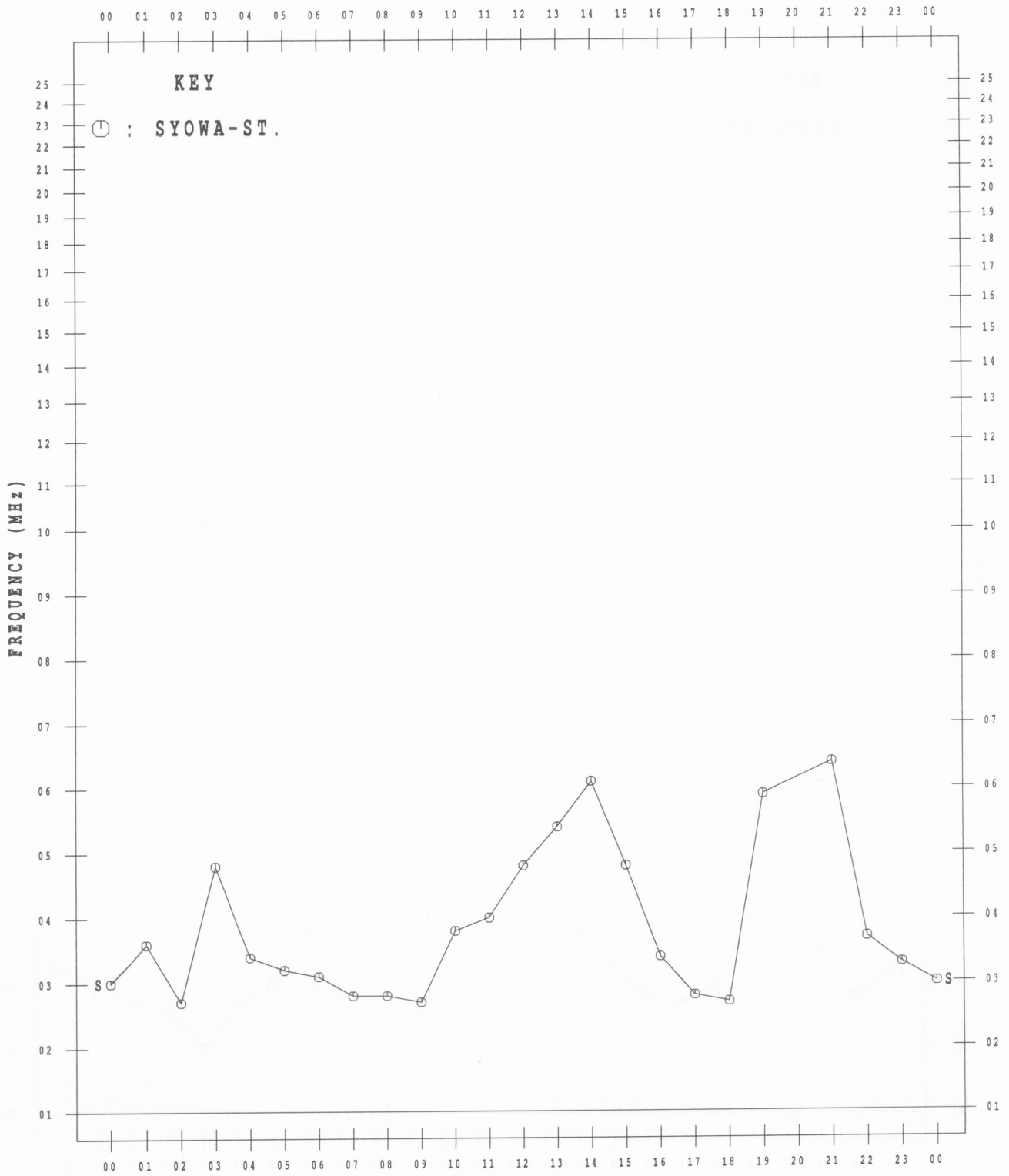




# MONTHLY MEDIAN VALUES OF f<sub>o</sub>F<sub>2</sub>

45° E MEAN TIME

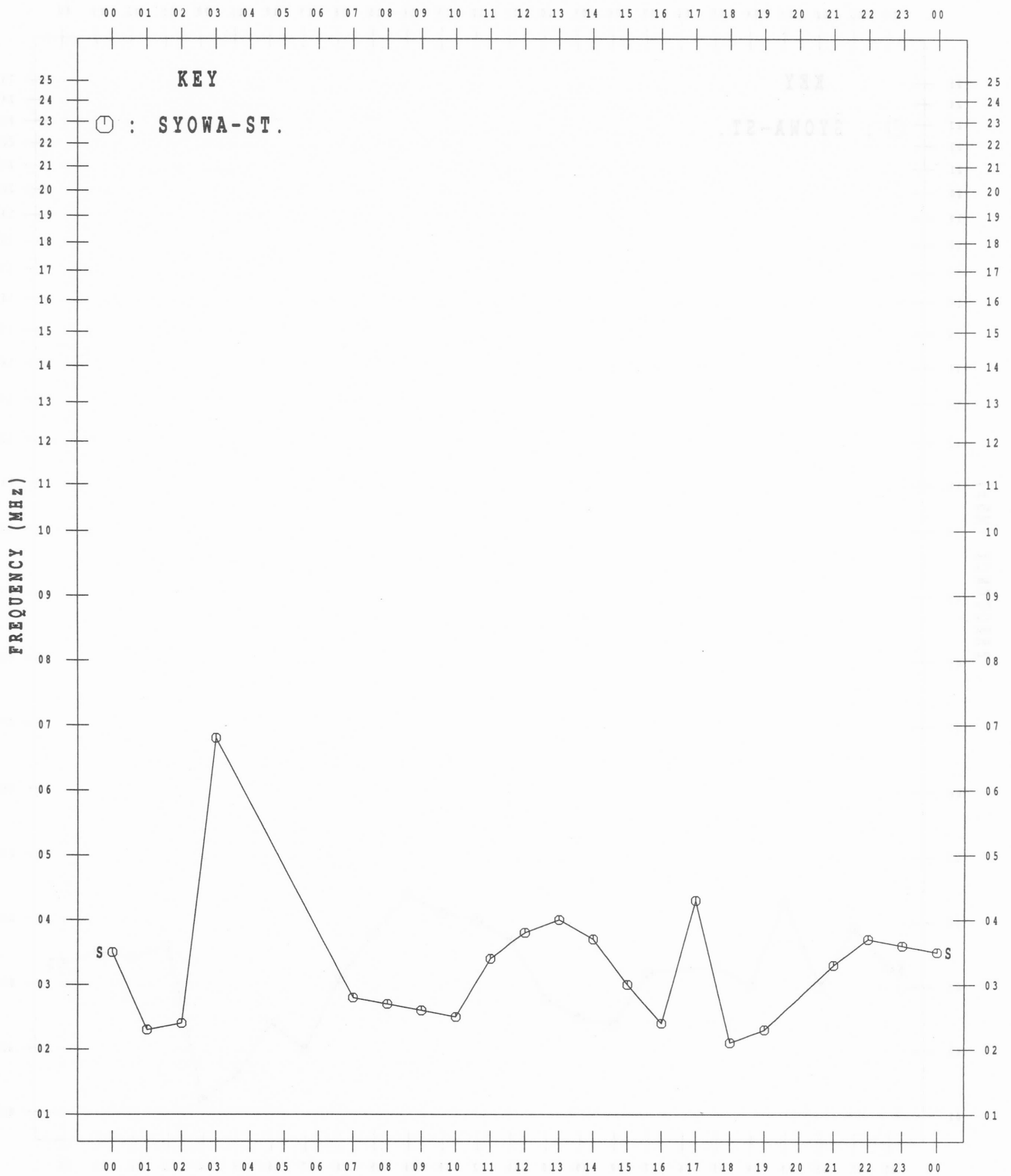
MAY 1994



# MONTHLY MEDIAN VALUES OF f<sub>o</sub>F<sub>2</sub>

45° E MEAN TIME

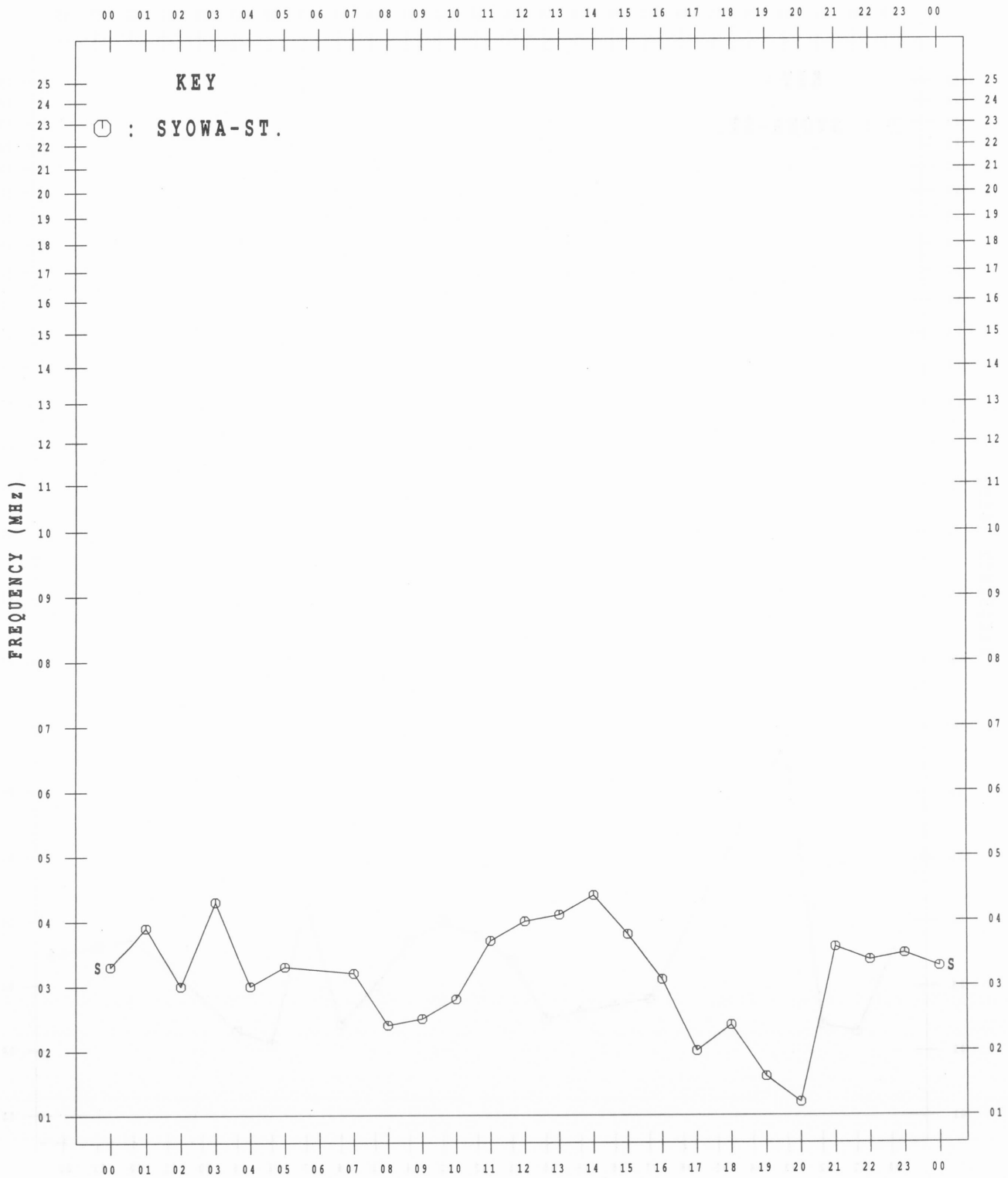
JUN. 1994



# MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

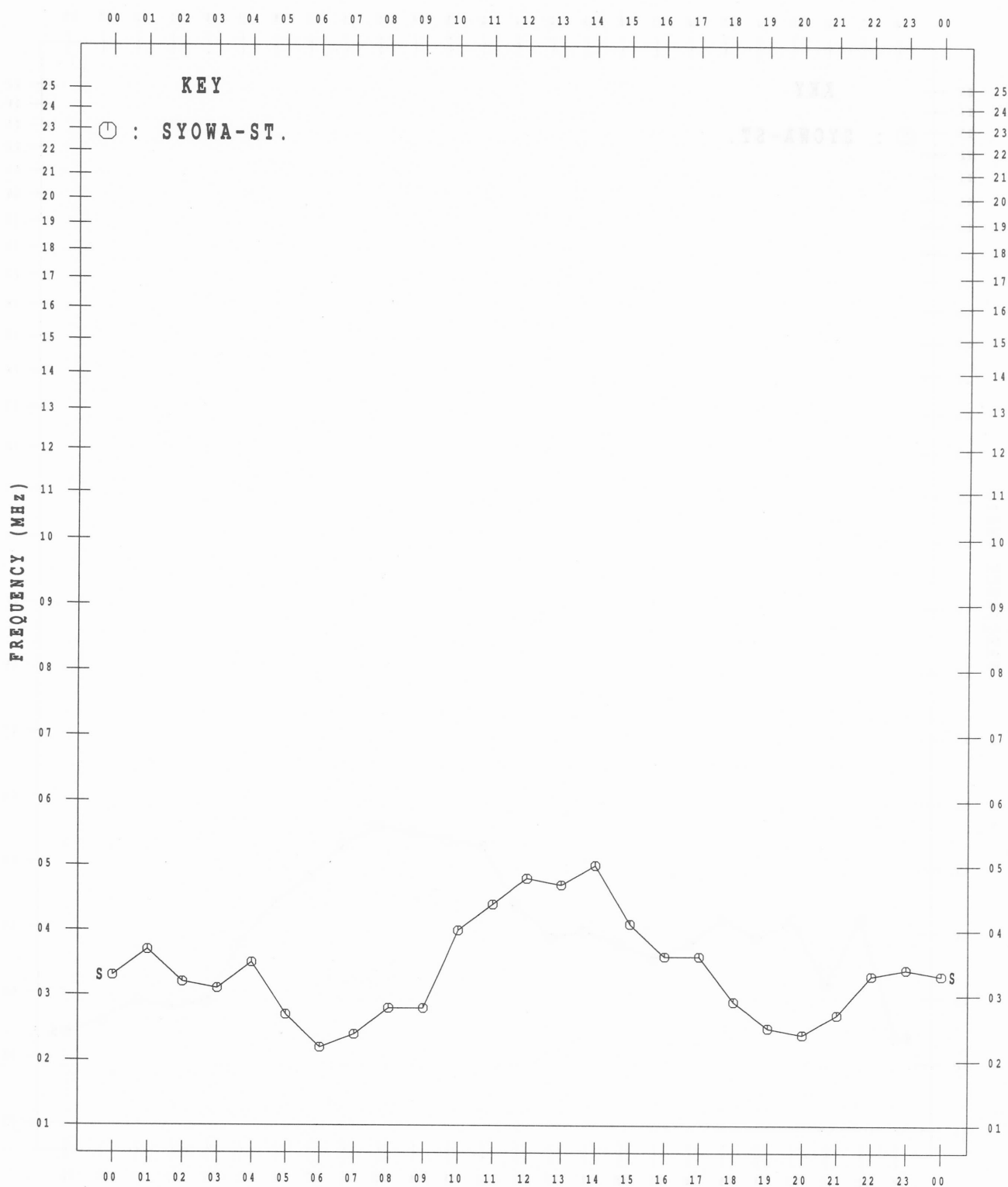
JUL. 1994



## MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

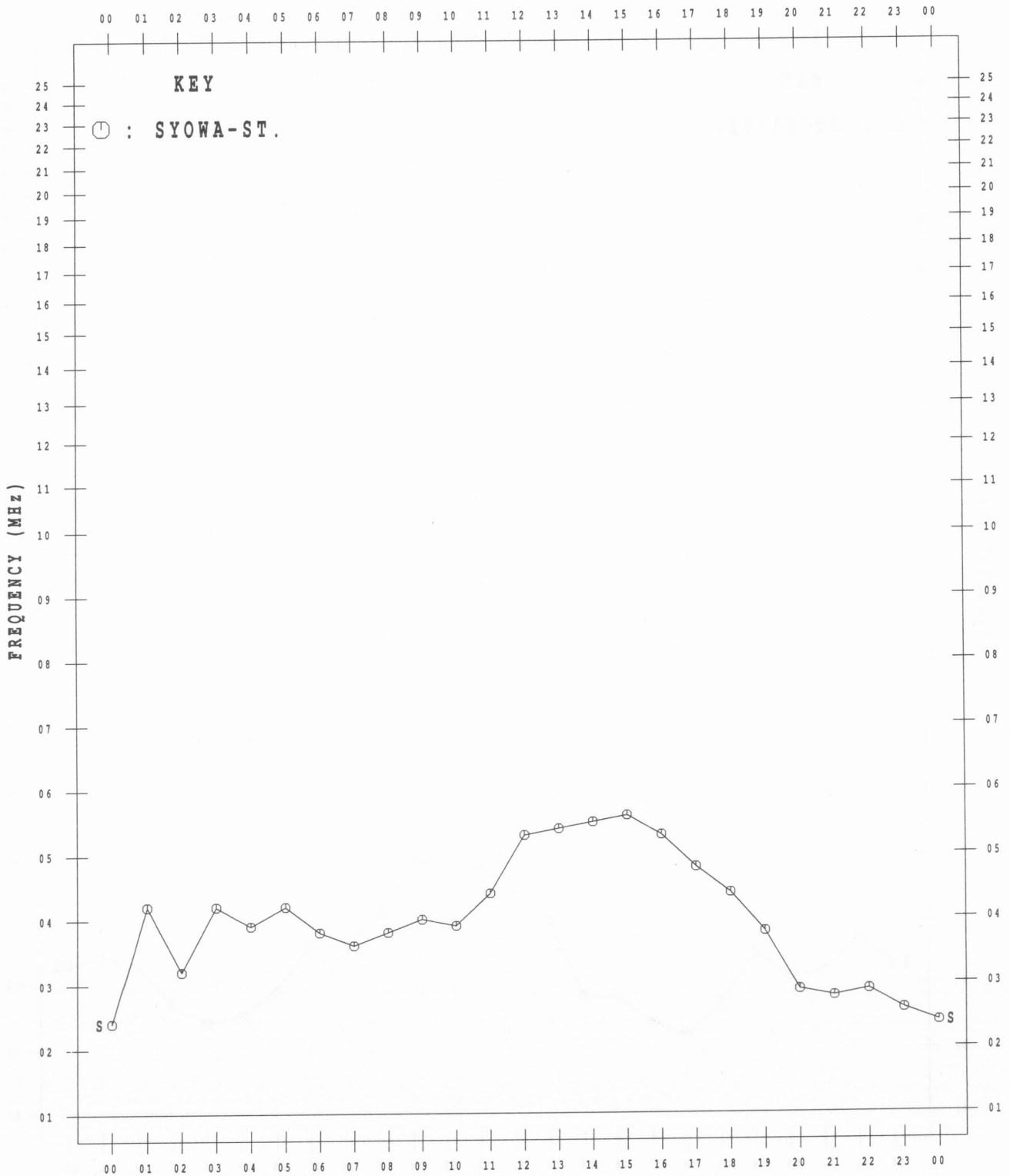
AUG. 1994



# MONTHLY MEDIAN VALUES OF foF2

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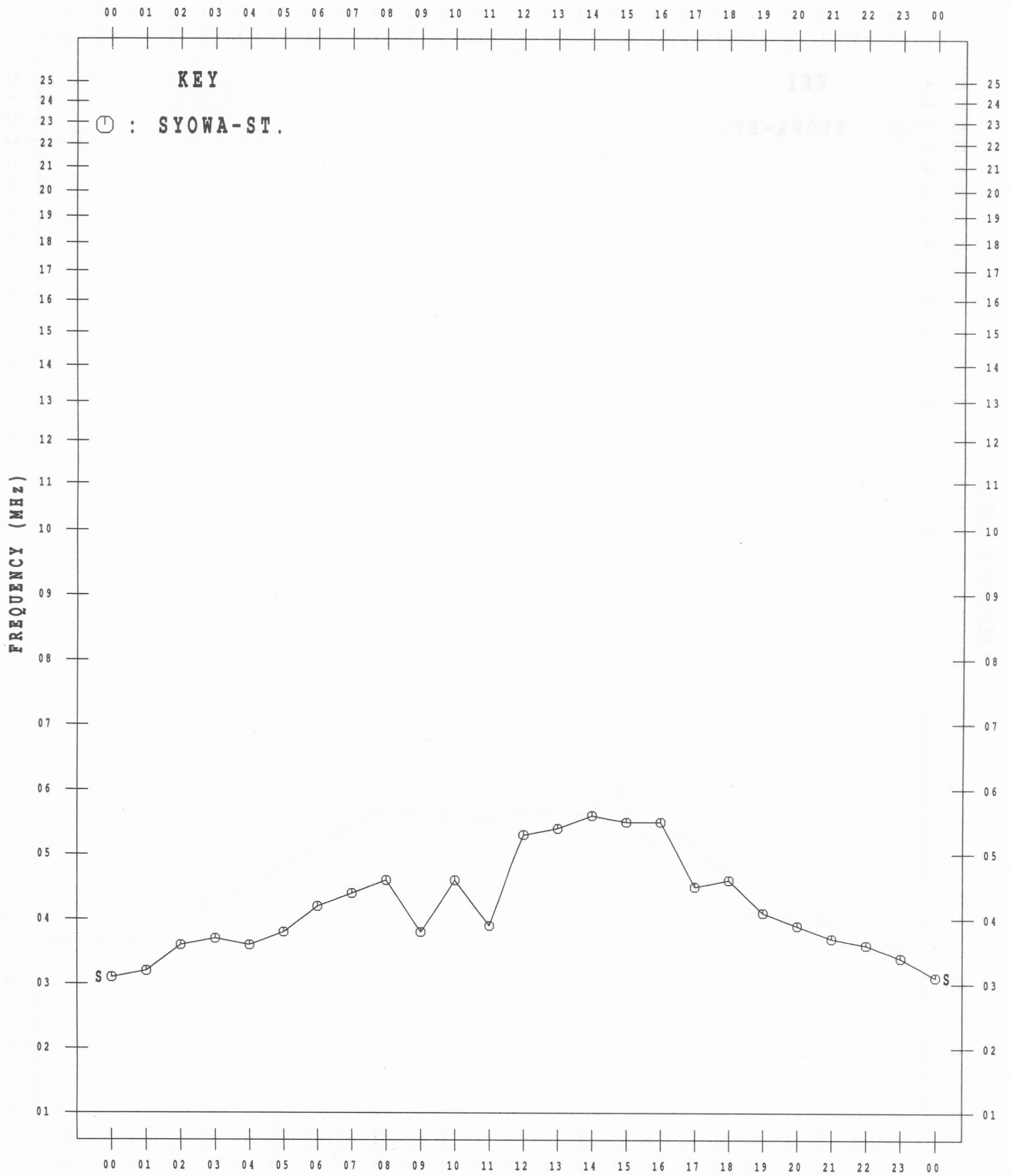
SEP. 1994



# MONTHLY MEDIAN VALUES OF f<sub>o</sub>F<sub>2</sub>

45° E MEAN TIME

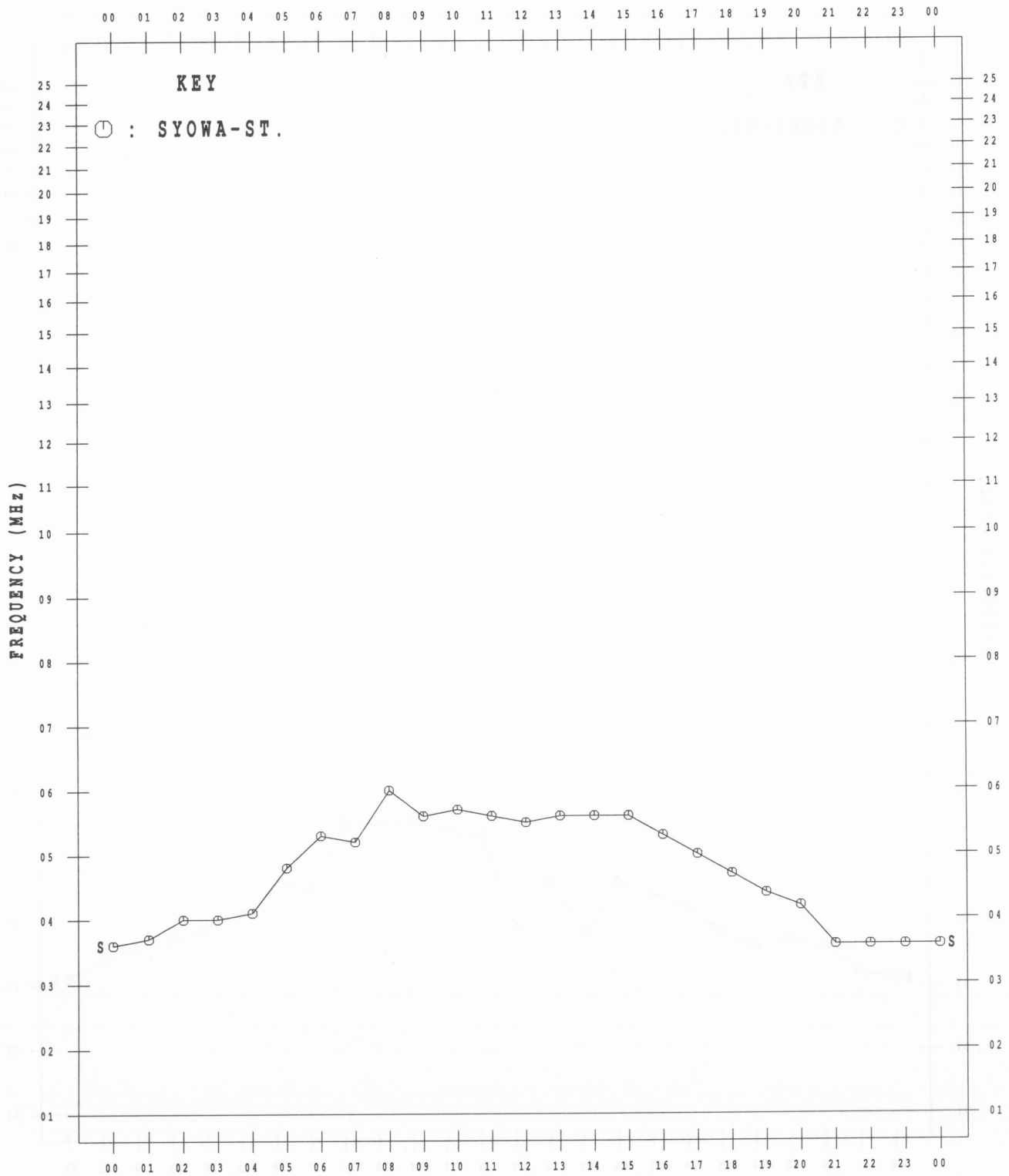
OCT. 1994



# MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

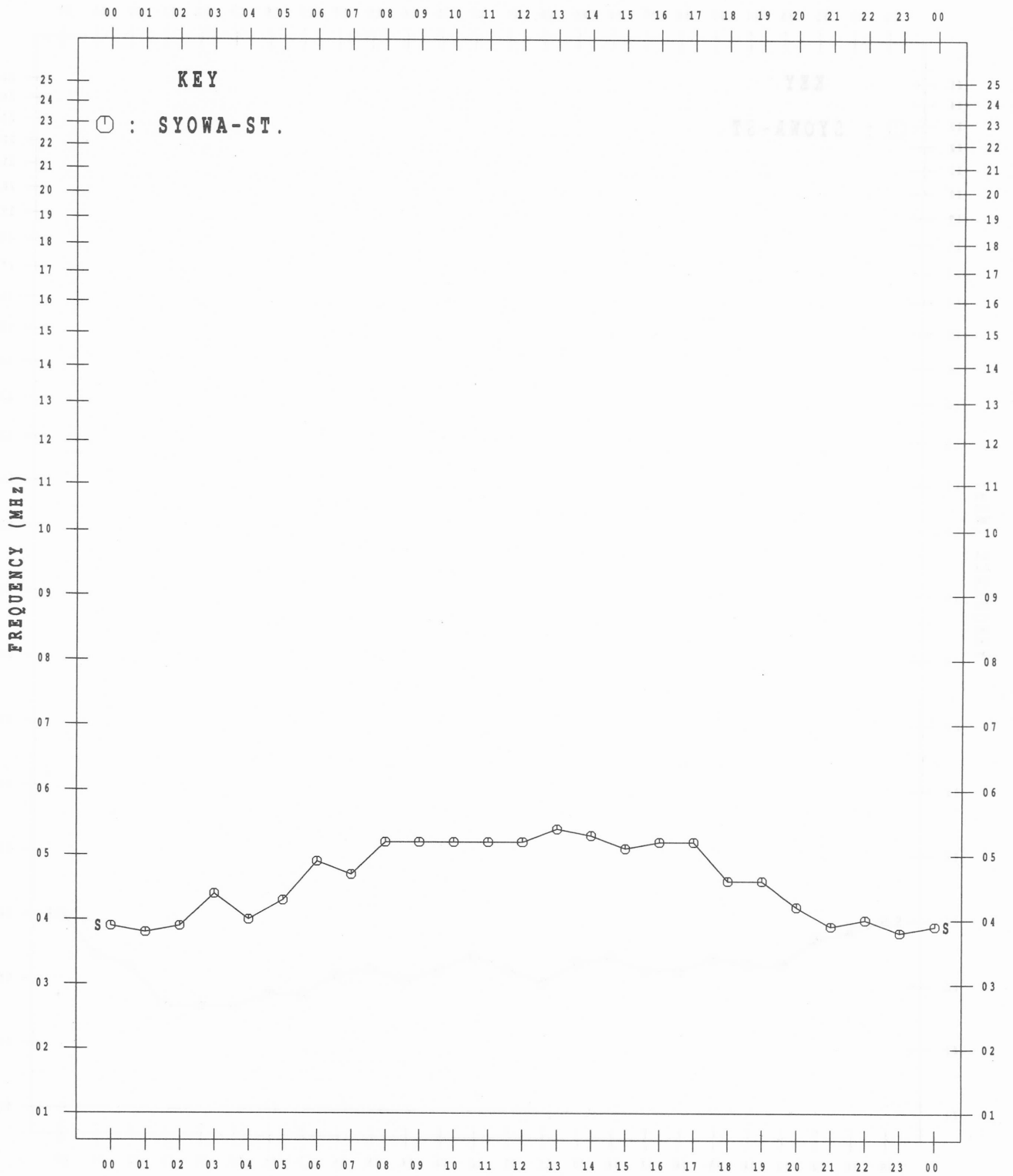
NOV. 1994



# MONTHLY MEDIAN VALUES OF f<sub>o</sub>F<sub>2</sub>

45° E MEAN TIME

DEC. 1994

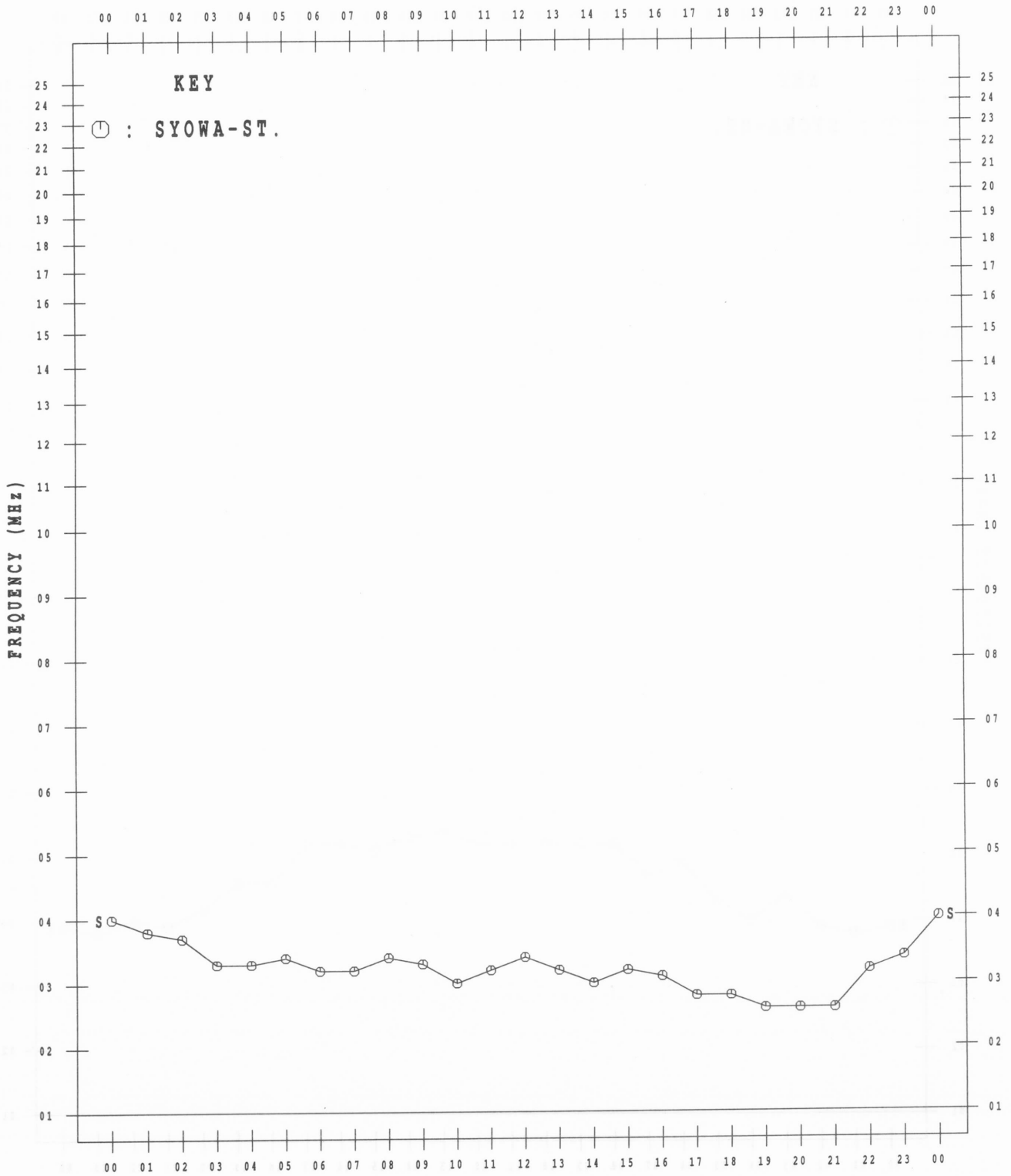




# MONTHLY MEDIAN VALUES OF ftEs

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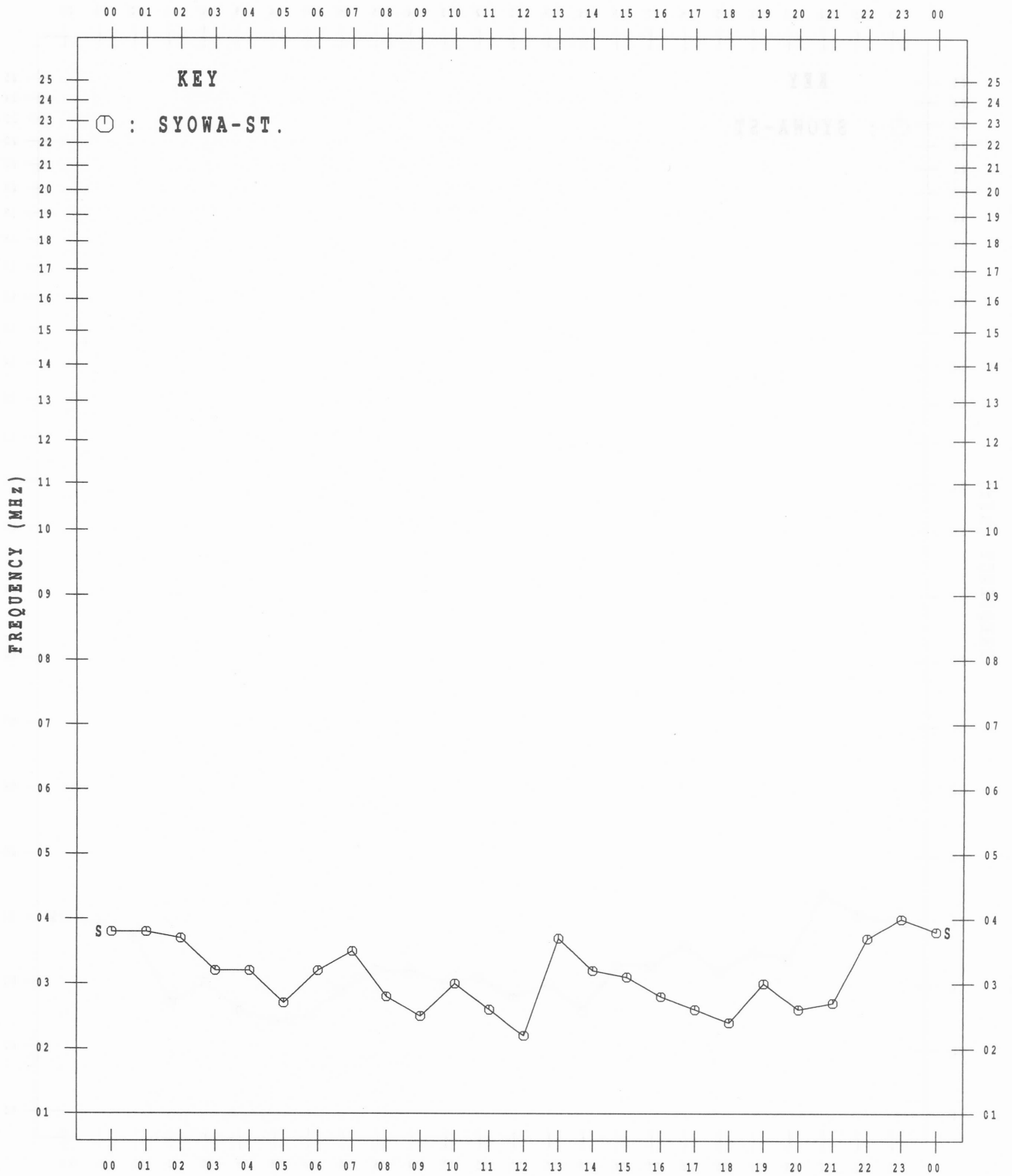
JAN. 1994



# MONTHLY MEDIAN VALUES OF ftes

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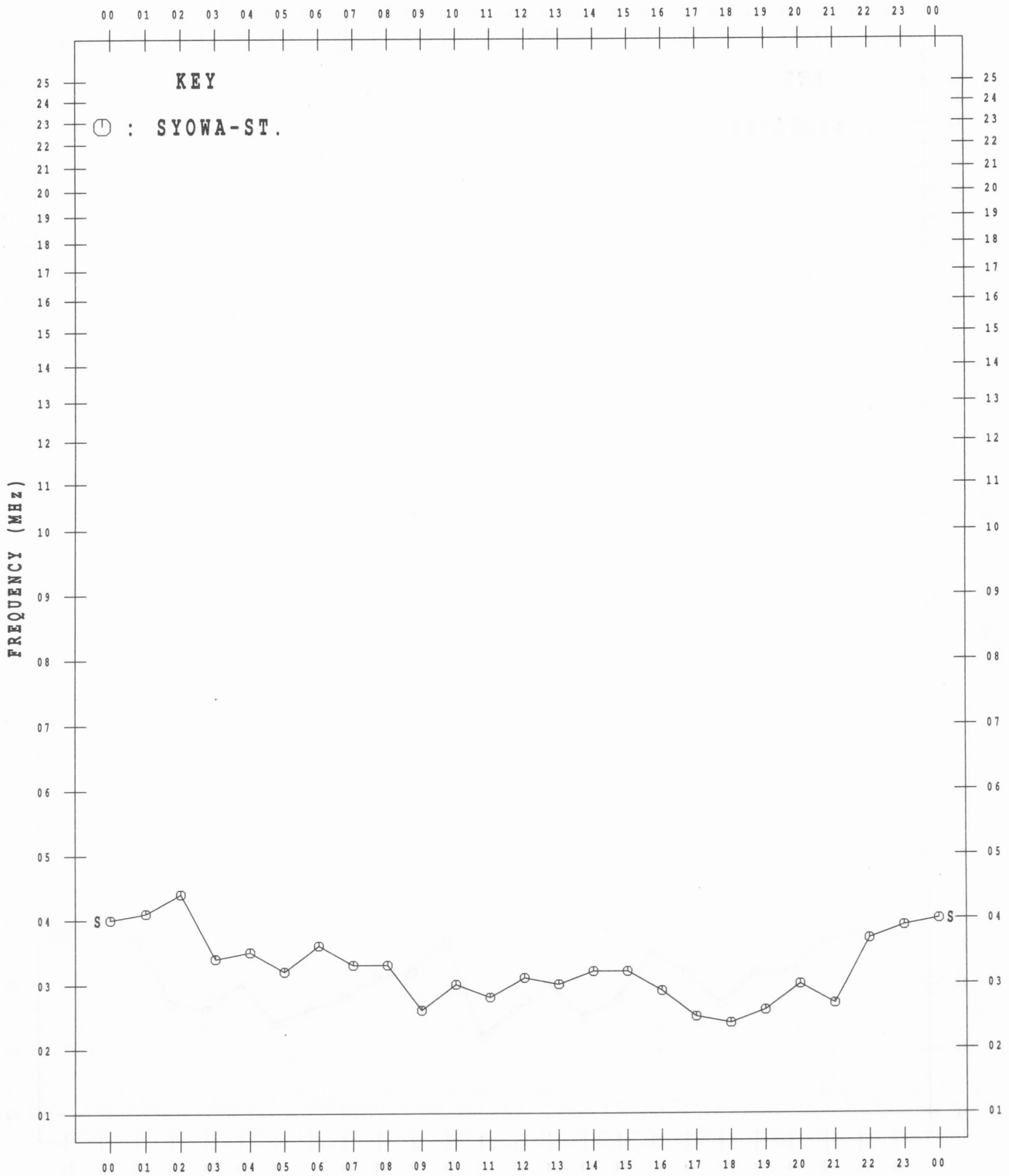
FEB. 1994



# MONTHLY MEDIAN VALUES OF f<sub>TE</sub>s

45° E MEAN TIME

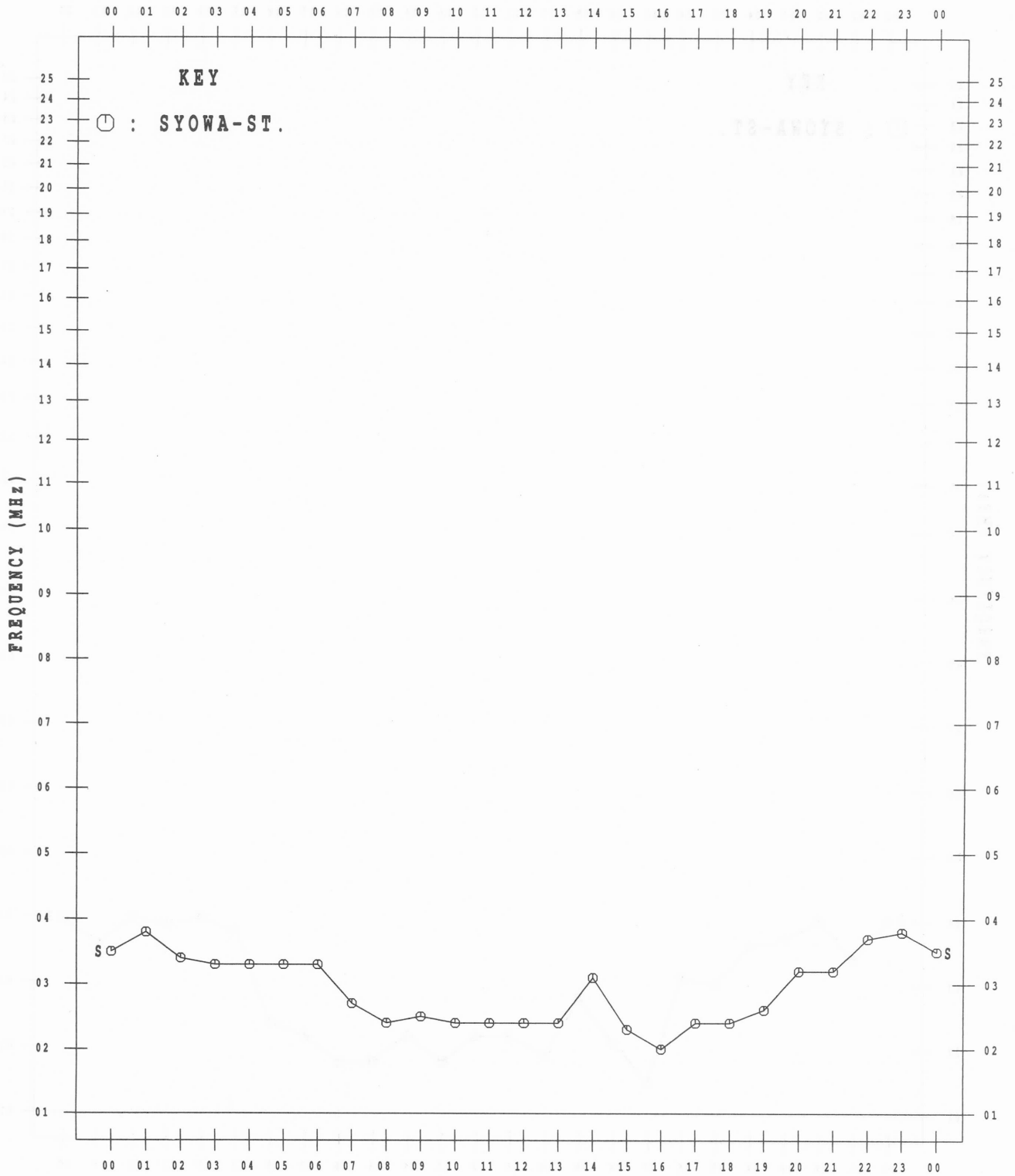
MAR. 1994



# MONTHLY MEDIAN VALUES OF fteS

45° E MEAN TIME

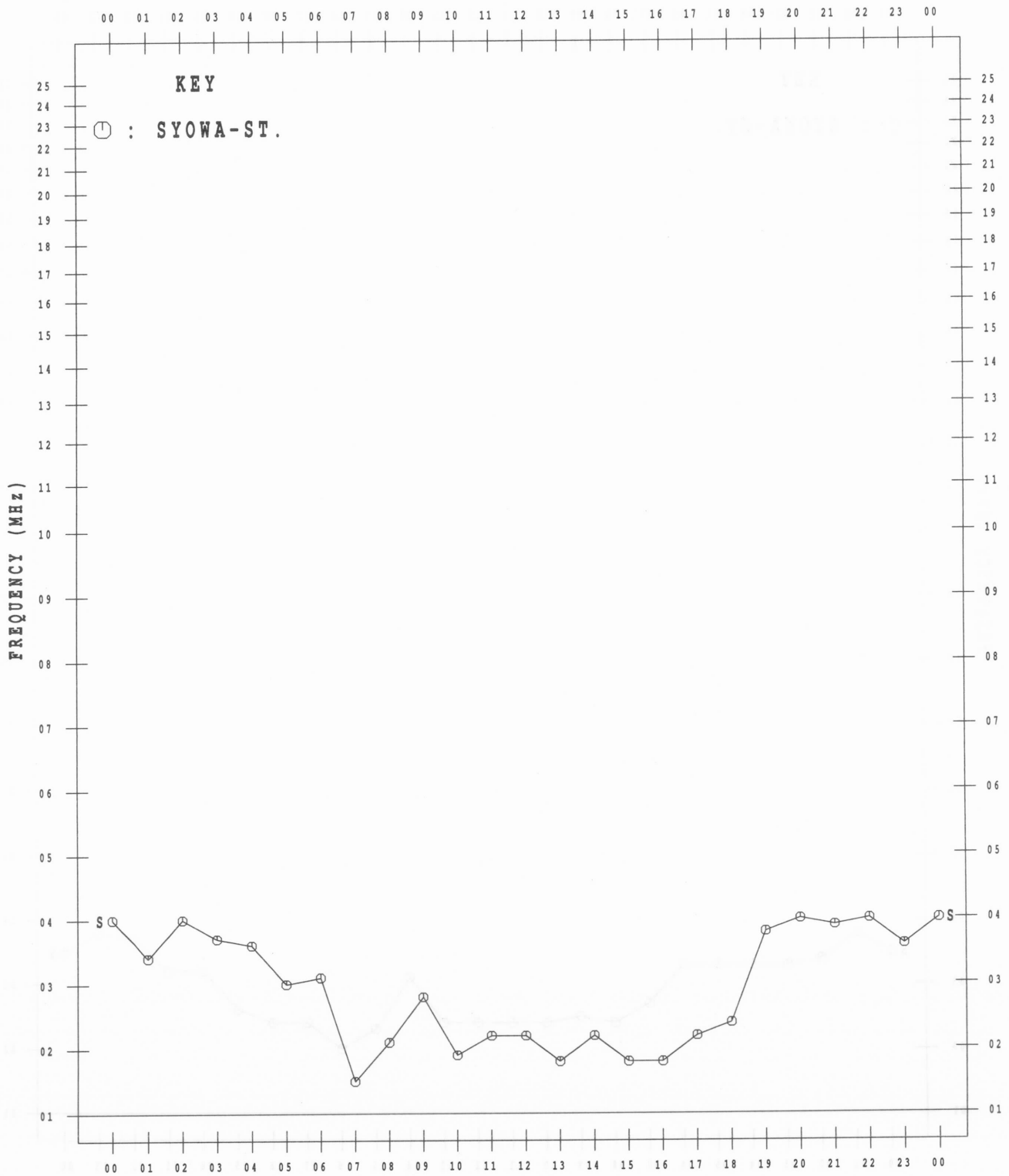
APR. 1994



# MONTHLY MEDIAN VALUES OF ftEs

45° E MEAN TIME

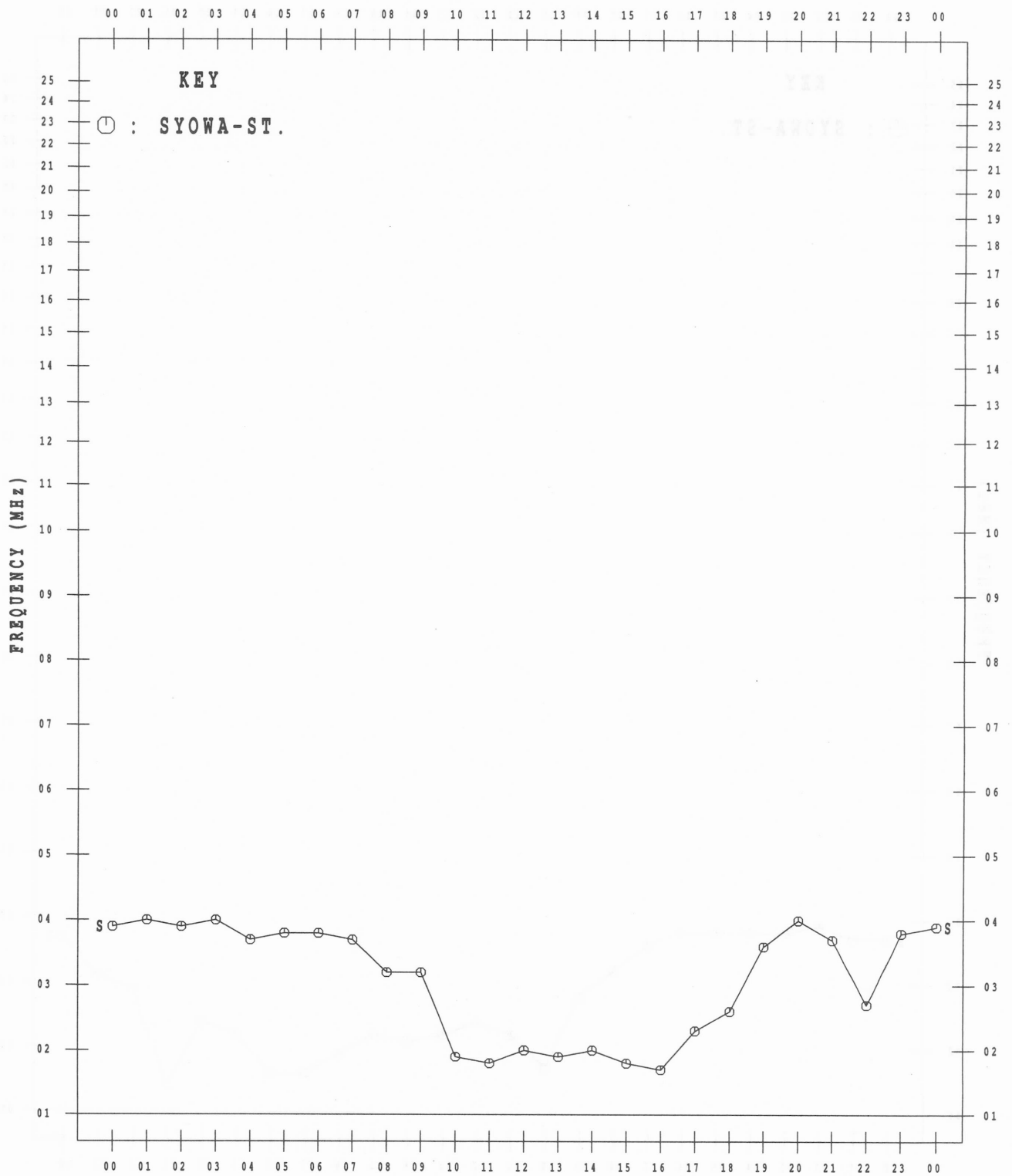
MAY 1994



# MONTHLY MEDIAN VALUES OF ftes

45° E MEAN TIME

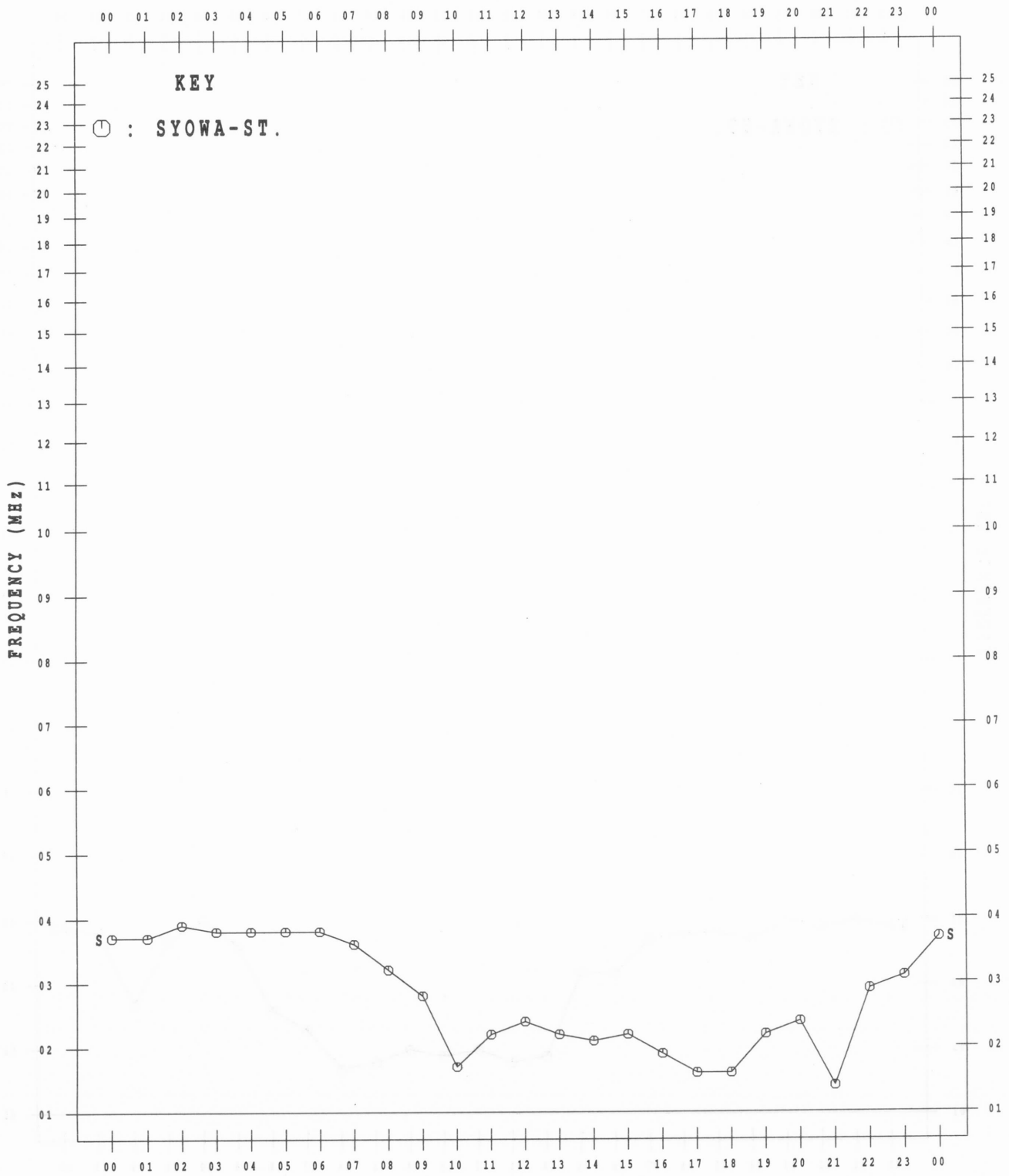
JUN. 1994



# MONTHLY MEDIAN VALUES OF ftEs

45° E MEAN TIME

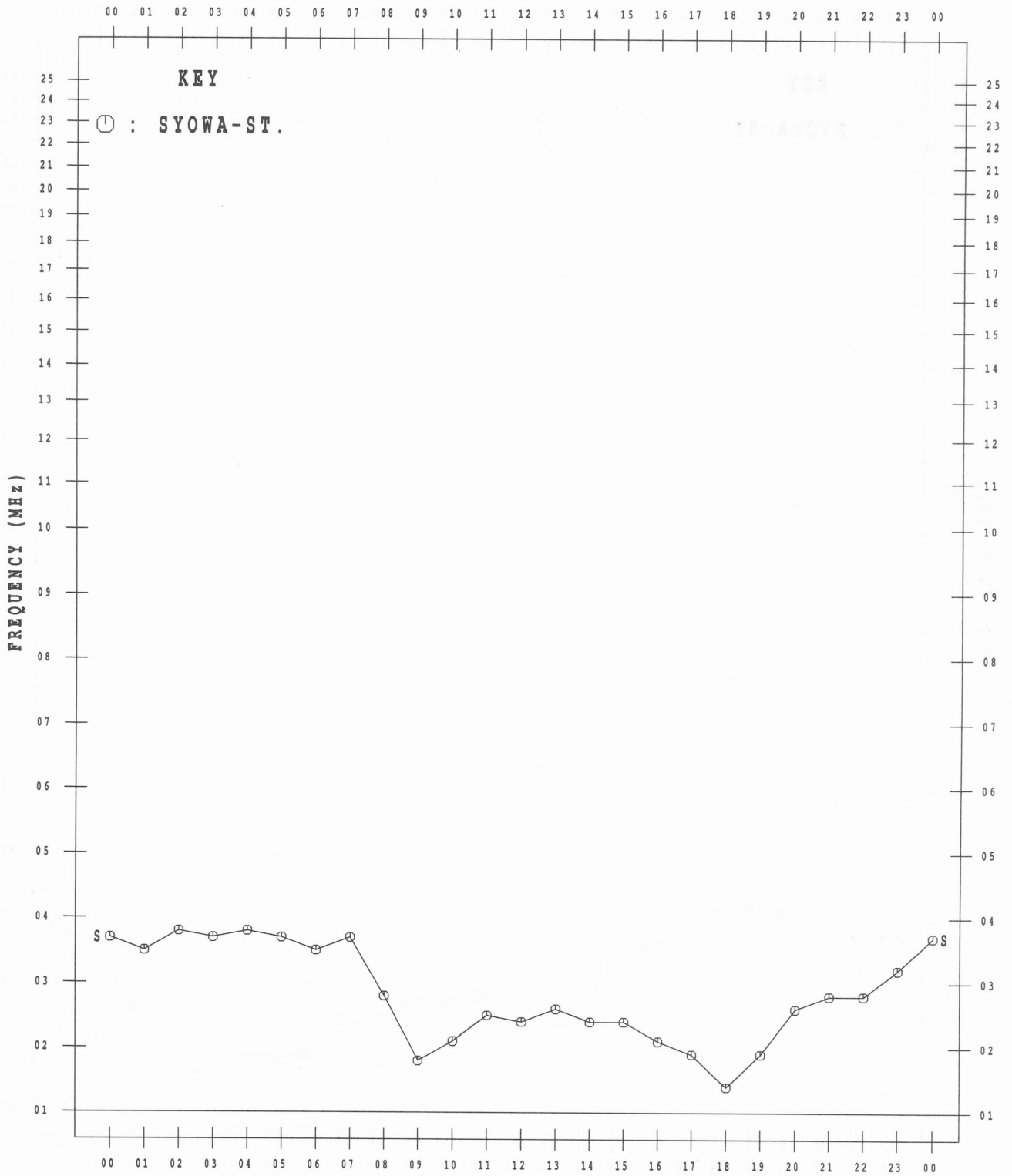
JUL. 1994



# MONTHLY MEDIAN VALUES OF fteS

45° E MEAN TIME

AUG. 1994

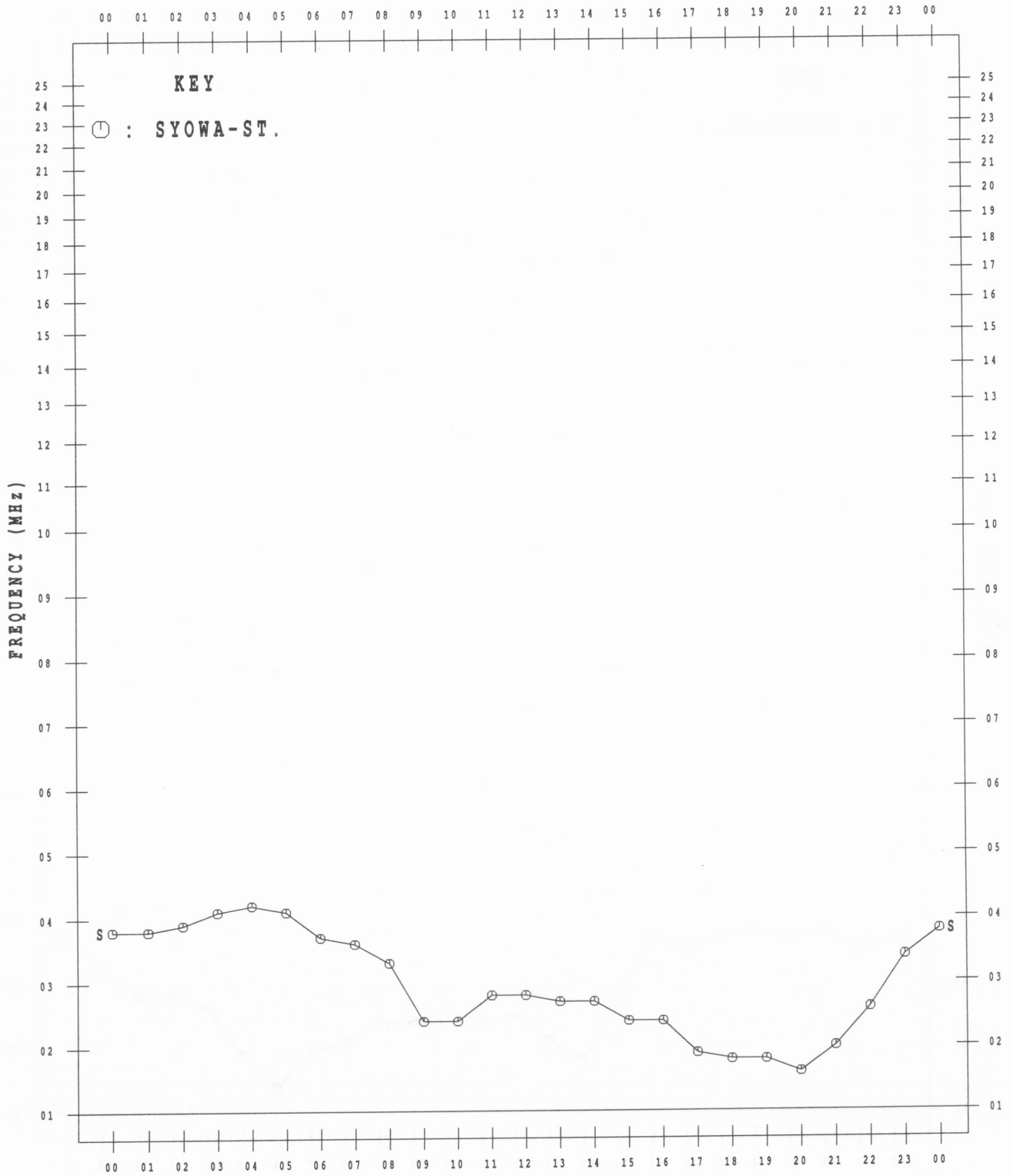




# MONTHLY MEDIAN VALUES OF f<sub>TE</sub>s

45° E MEAN TIME

SEP. 1994

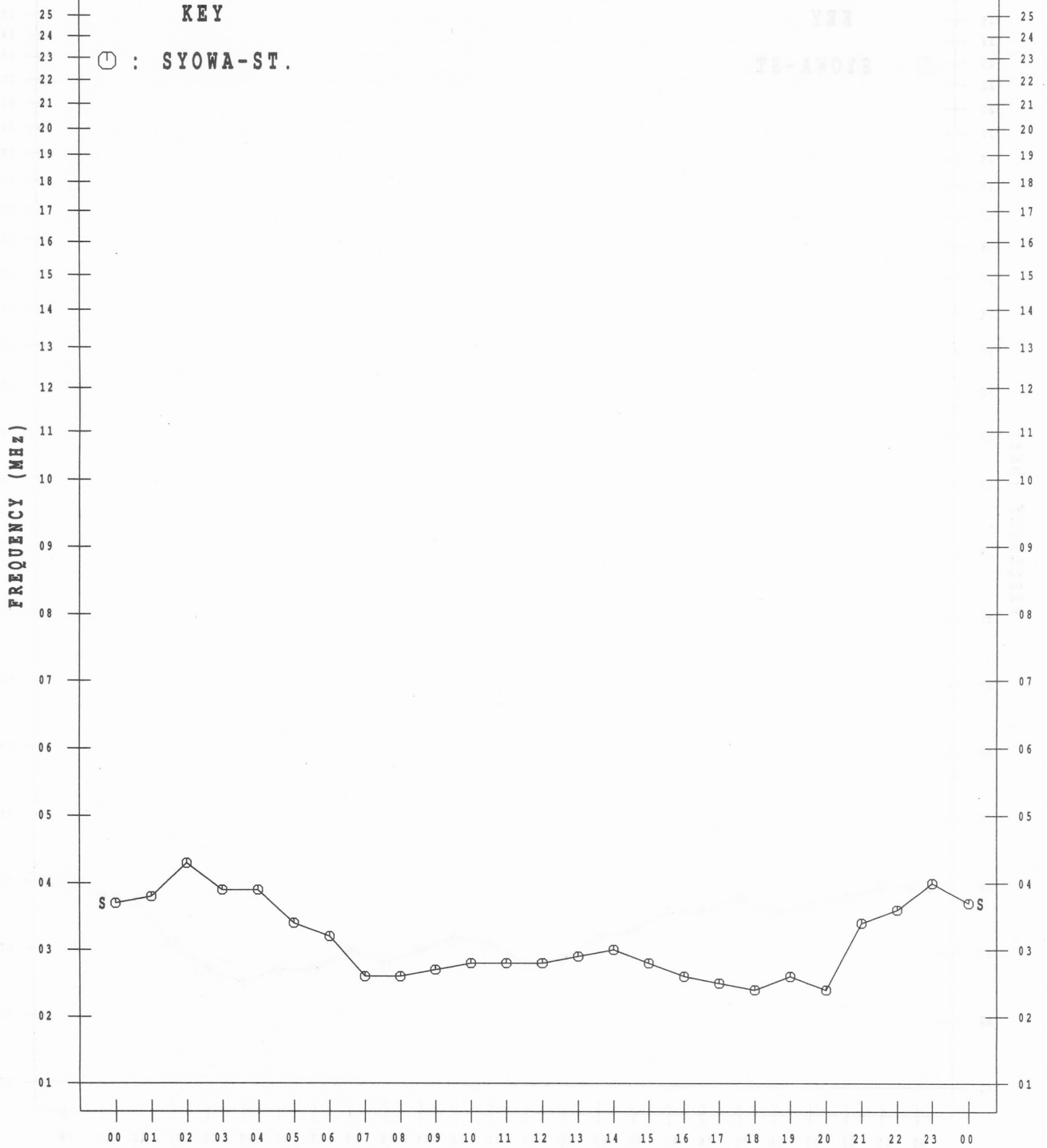


# MONTHLY MEDIAN VALUES OF ftes

45° E MEAN TIME

OCT. 1994

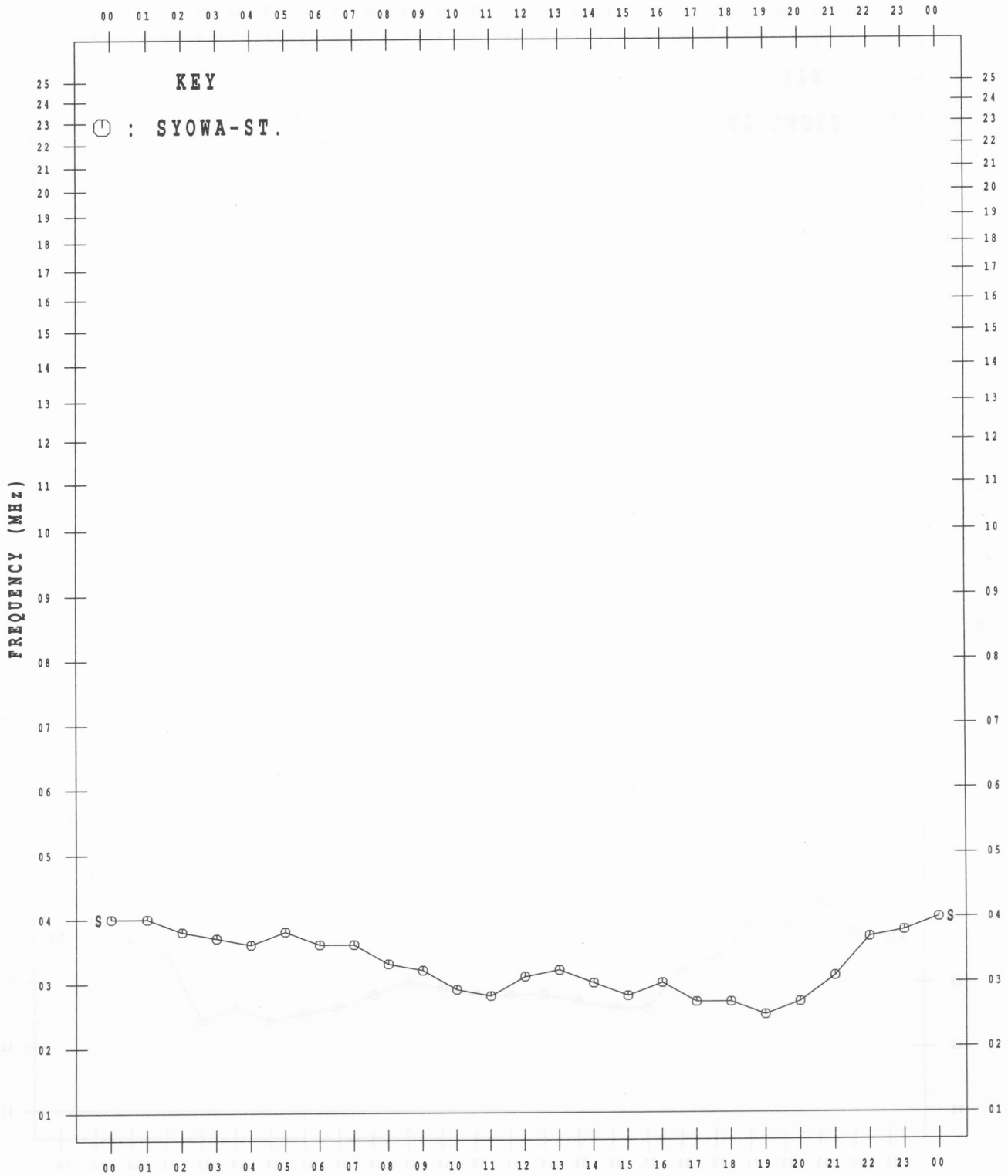
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 00



# MONTHLY MEDIAN VALUES OF f<sub>t</sub>E<sub>s</sub>

45° E MEAN TIME

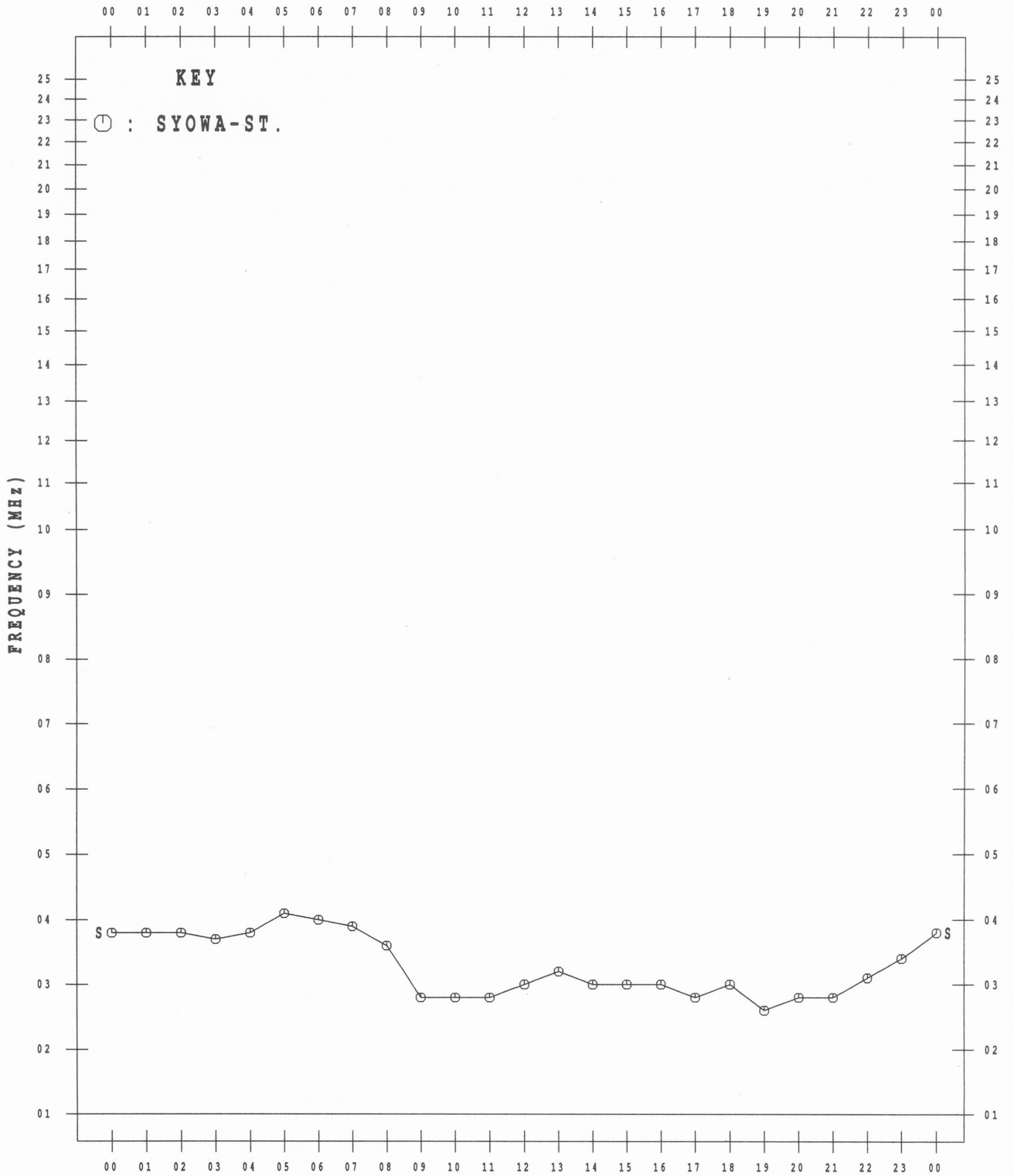
NOV. 1994



# MONTHLY MEDIAN VALUES OF f<sub>t</sub>E<sub>s</sub>

45° E MEAN TIME

DEC. 1994



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IONOSPHERIC DATA AT SYOWA STATION (ANTARCTICA)  
ION. ANT.—61 January 1994—December 1994 (Not for Sale)

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昭和基地電離層資料(南極)

(1994年1月—1994年12月)

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〒184-8795 東京都小金井市貫井北町4丁目2-1

☎ 042 (327) 6911 (直通)

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Queries about "Ionospheric Data at Syowa Station" should be forwarded to: The Communications Research Laboratory,  
Ministry of Posts and Telecommunications, 2-1 Nukui-Kitamachi 4-chome, Koganei-shi, Tokyo 184-8795 JAPAN.