

ION. ANT.—64

IONOSPHERIC DATA AT SYOWA STATION (ANTARCTICA)

January 1997—December 1997

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TOKYO, JAPAN

INTRODUCTION

This data book gives summarized results for vertical soundings of the ionosphere at Syowa Station, Antarctica in 1997. The observations were conducted by the Communications Research Laboratory under the sponsorship of the National Institute of Polar Research of Japan. The location of the station, specifications of the ionosonde, and the symbols used in this data book are as follows:

LOCATION SYOWA STATION

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

SPECIFICATIONS OF THE IONOSONDE USED AT SYOWA STATION

Items	Specifications
Frequency Rang	400 k Hz - 15MHz
Transmitting Power	10kW (peak value)
Duration of Sweep	20 s
Transmitted Pulse Width	80 μ s
Pulse Repetition Frequency	50 Hz
Frequency Marker	every 1 MHz
Height Range	0 - 900km
Height Marker	every 50km
Recording Media	35 mm film, 8mm digital tape
Power Supply	100-V-AC, 2.0kVA
Transmitting Antenna and Receiving Antenna	30-m-high vertical delta antennas terminated by 600 Ω

OBSERVERS

Observer: J. Ozeki
Scaler: K. Fukushima

DESCRIPTION

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

b. Characteristics of Ionosphere

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

Symbols

(i) Descriptive Letters.

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

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

(ii) Qualifying Letters

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

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

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

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

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

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

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1997 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

D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X	X	X	A	X	A	X	X	X	X	X	R	R	R	A	X	A	A	A	X	X	X	X	X
2	X	X	X	A	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
3	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
4	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
7	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
9	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
10	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
11	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
12	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
13	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
14	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
15	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
16	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
17	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
18	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
19	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
20	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
21	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
22	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
23	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
24	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
25	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
26	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
27	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
28	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
29	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
30	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
31	X	X	X	X	X	X	X	X	X	X	X	R	R	R	R	X	X	X	X	X	X	X	X	X
CNT	17	15	17	17	16	16	15	17	17	18	14	12	9	5	6	8	11	16	19	21	20	22	21	19
MED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
UQ	45	43	43	46	46	52	52	57	58	56	56	58	57	58	51	54	49	49	49	50	48	46	44	44
LQ	48	45	46	48	50	52	54	60	60	59	59	60	60	58	61	55	57	52	52	52	52	49	48	47
	40	40	41	44	45	48	49	50	54	50	52	48	50	54	55	48	49	48	48	48	46	47	43	40

JAN. 1997 fxI (0.1MHz)

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IONOSPHERIC DATA STATION SHOWA-ST.

JAN.1997 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	32	34	37	A	R	A	37	44	44	44	45	R	R	R	A	R	A	A	A	44	J	R	41	40	38		
2	40	37	32	41	A	41	43	S	R	F	49	49	R	R	R	R	46	43	43	43	44	J	49	46	41	37	
3	U	S	31	34	R	46	46	43	44	J	R	R	R	R	R	R	R	R	R	42	42	42	43	36	36		
4	R	F	A	40	F	F	F	44	48	R	50	46	R	J	R	R	A	A	R	R	J	R	J	R	R		
5	43	36	A	R	Y	46	48	51	51	52	R	52	R	R	R	R	R	43	41	R	R	J	R	U	R		
6	42	39	39	44	F	F	R	52	54	55	55	R	54	54	54	Y	A	Y	U	R	J	R	R	A	43	44	44
7	43	36	F	J	F	J	F	S	B	B	S	R	R	R	R	R	R	J	R	A	B	37	37	A	A		
8	35	34	39	42	37	F	Y	A	B	R	39	43	46	R	R	R	R	D	R	R	B	37	41	39	35		
9	34	A	36	37	R	B	A	43	45	J	R	J	R	R	B	B	B	R	D	R	U	R	J	R	R	43	35
10	A	37	37	40	42	J	R	R	R	B	R	B	Y	B	B	B	B	B	B	B	R	A	A	R	A		
11	A	A	R	R	A	Y	Y	R	R	R	R	R	R	B	J	R	R	B	B	R	R	A	37	37	34		
12	A	R	F	A	F	R	R	R	B	B	B	B	B	B	B	B	B	B	B	B	R	Y	A	R			
13	A	B	A	A	B	B	B	B	Y	R	D	R	R	R	R	R	R	R	B	D	R	R	40	41	37	38	
14	36	39	40	38	39	41	46	48	52	42	R	B	B	R	R	A	A	B	B	B	B	47	43	37	31		
15	31	28	38	39	43	A	46	46	54	R	R	54	54	R	R	54	53	53	53	J	R	53	48	50	52	56	
16	44	39	39	41	42	43	44	52	55	53	53	R	53	R	R	R	R	45	R	48	45	41	41	41			
17	39	37	36	37	38	R	J	R	54	54	59	53	55	R	R	R	A	A	A	A	U	R	R	J	R	R	
18	34	A	R	R	A	A	R	C	C	C	F	48	R	C	C	C	C	C	S	R	U	R	C	R	C		
19	C	C	C	C	C	C	C	C	C	C	R	R	R	R	A	R	R	55	45	45	43	Y	S	A	A		
20	A	A	A	B	R	42	C	C	C	R	48	R	R	R	48	R	R	R	D	R	R	J	R	B	F	A	
21	A	A	33	37	F	R	A	F	A	A	R	46	48	R	B	B	Y	48	R	R	R	A	A	J	R	A	
22	R	34	35	A	A	A	B	A	A	B	B	D	R	R	R	R	R	42	43	42	40	A	49	33	36	32	
23	A	B	A	A	A	A	Y	44	49	47	R	R	D	R	D	R	R	R	R	R	R	R	R	R	R	R	
24	41	37	42	Y	F	F	R	F	J	R	52	52	53	54	58	R	J	R	50	50	51	R	42	42	43	39	
25	R	A	Y	Y	F	R	J	R	J	R	52	53	53	54	52	B	R	R	D	R	R	42	42	42	42	Y	
26	A	A	A	F	F	F	Y	A	R	R	52	52	52	49	R	R	49	44	48	47	46	42	R	A	A	Y	
27	Y	Y	A	Y	B	J	R	R	B	B	R	B	R	44	R	R	B	B	B	B	B	B	R	B	A	B	
28	A	B	A	B	B	B	R	B	B	B	R	R	44	R	B	B	R	B	R	B	R	R	Y	Y	B		
29	B	B	B	B	B	B	Y	36	B	B	R	B	B	B	R	R	Y	R	R	R	R	D	R	Y	A		
30	A	Y	B	Y	Y	B	B	B	B	R	R	R	R	42	R	R	B	R	B	R	B	36	B	A			
31	A	B	A	A	B	R	B	B	A	R	R	R	R	R	B	B	R	R	R	41		39	39	32	31		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	17	15	17	17	16	16	15	16	17	19	15	14	10	5	6	11	12	17	20	21	21	22	21	19			
MED	36	36	37	39	39	43	43	47	52	50	48	51	50	51	52	46	47	43	43	43	44	42	40	38			
U Q	42	37	39	42	42	46	46	52	53	53	53	54	J	R	R	R	R	48	46	J	R	R	46	43	41		
L Q	34	34	34	37	38	39	42	44	48	43	46	42	44	48	49	42	43	42	42	42	40	41	37	34			

JAN.1997 foF2 (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1997 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	18	17	39	70	26	45	43	28	37	32	33	27	34	34	59	33	68	71	59	31	27	27	28	27	
2	17	32	32	29	59	37	42	37	36	27	27	29	41	42	27	41	43	36	33	23	21	29	27	27	
3	34	27	29	29	46	37	26	26	34	32	27	33	38	43	51	38	32	37	28	31	44	37	30	30	
4	36	36	37	38	37	23	30	30	35	32	37	26	33	35	32	84	100	46	30	34	22	26	52	90	
5	32	32	46	48	38	32	27	24	26	36	32	33	32	32	38	41	43	41	41	41	42	37	31	16	
6	16	16	27	23	32	51	29	31	31	27	34	33	32	40	43	61	46	52	37	43	51	39	27	21	
7	37	31	41	42	34	33	34			42	37	31	31	32	30	31	26	26	62		41	33	42	41	
8	37	32	37	32	37	27	46		37	29	28	27	26	27	32	27	33	31	26		42	68	37	32	
9	32	39	41	37		41	26	26	33	34	31	32			31		31	31	27	26	36	17	27	32	
10	39	37	30	25	19	33	37	34		41		26									37	59	41	38	42
11	43	42	37	43	44	37	36	31	26	28	27			26	31	27			31	39	69	31	29	31	
12	38	32	33	41	40	37	37	33													31	22	26	39	36
13	38		37	39					37	33	25	26	26	32	30	32	28				26	32	26	33	
14	17	29	31	31	34	23	37	30	30	26			33	32	81	50					16	16	30	17	
15	31	26	32	31	31	53	34	27	27	32	32	32	37	34	30	36	41	26	30	24	17	23	17	17	
16	17	42	27	20	21	50	34	31	27	33	32	26	32	33	41	41	32	41	42	28	26	30	41	43	
17	30	32	15	17	24	27	33	33	37	59	41	33	35	37	51	61	68	66	42	38	33	26	16	23	
18	31	38	43	43	38	41	37				41	38													
19																									
20	41	41	43		37	35				30	27	27	35	37	41	42	42	32	27	29					
21	71	43	70	37	41	77	20	41	41	36	31	26	31												
22	36	38	58	51	58	42		52	48			32	31	37											
23	39		43	41	41	41	32	32	41	29	32	27	37	32	28	27									
24	32	31	33	37	32	41	70	30	36	41	31	41	41	37	34	27	26	26	41	26	59	23	32	26	
25	30	70	38	33	34	32	42	46	42	28	26	31	32												
26	46	48	59	36	33	26	41	52	40	27	26	30	31	33	41	72	42	31	41	37	41	46	71	41	
27	31	38	51	38		36	37																		
28	42		41				41																		
29																									
30	71	36		33	33																				
31	39		37	37		32			42	31	29	26	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	29	25	28	27	24	26	25	21	21	26	26	28	25	23	23	26	23	25	25	26	30	28	31	28	
MED	36	36	37	37	36	37	36	31	36	32	32	31	32	33	34	32	32	31	31	31	32	31	31	32	
U Q	39	40	43	41	40	41	41	36	40	34	33	33	36	37	43	41	43	41	41	37	42	38	41	41	
L Q	30	31	32	31	32	32	31	29	30	28	27	27	31	32	30	30	28	28	28	26	23	25	26	26	

JAN. 1997 ftes (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1997 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	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	9	14	11	14	24	20	15	15	14	14	14	14	13	13	15	23	16	14	13	13	14	13	14	14
2	9	13	14	9	9	14	14	10	9	14	14	14	14	16	14	14	14	16	14	14	14	10	9	11
3	14	9	10	10	14	14	14	14	14	13	14	13	14	14	14	14	18	14	11	10	14	7	11	10
4	14	11	14	14	13	14	11	10	14	10	14	14	14	10	16	14	14	13	14	14	14	14	13	10
5	13	13	14	14	21	13	9	10	10	14	24	16	14	14	16	14	14	15	14	10	10	14	13	9
6	9	14	14	14	10	10	14	23	24	14	14	15	14	16	14	14	16	15	16	14	13	14	14	15
7	14	15	14	12	14	14	16	B	B	23	15	14	14	13	15	24	23	18	16	B	13	15	14	14
8	14	14	14	16	9	23	16	B	15	14	16	16	15	15	24	15	33	31	23	B	13	23	14	14
9	14	14	14	23	B	16	14	15	14	16	10	14	B	B	19	B	16	31	23	16	15	14	14	11
10	15	14	14	13	14	16	25	24	B	23	B	24	B	B	B	B	B	B	B	B	14	14	15	24
11	16	14	14	14	13	16	22	14	16	21	15	31	B	24	14	14	B	B	25	24	10	14	14	14
12	14	11	13	14	14	24	14	16	B	B	B	B	B	B	B	B	B	B	B	31	8	23	14	24
13	15	B	23	14	B	B	B	B	22	15	16	15	15	14	23	15	24	B	24	24	14	16	14	15
14	14	10	14	23	13	14	11	14	14	14	B	B	24	23	23	15	B	B	B	B	14	14	14	14
15	14	14	14	22	12	14	19	14	13	15	16	14	15	16	15	14	14	14	14	14	15	14	14	13
16	14	12	14	15	15	15	14	15	15	14	14	15	15	24	23	25	24	24	23	15	20	14	14	13
17	13	14	9	11	13	10	14	14	14	14	14	14	14	15	16	15	14	14	14	14	16	14	13	23
18	14	30	14	15	24	16	14	C	C	C	14	14	C	C	C	C	C	24	24	16	23	C	15	C
19	C	C	C	C	C	C	C	C	C	14	14	14	14	14	14	14	16	14	14	14	23	14	14	14
20	14	23	23	B	23	23	C	C	C	14	23	14	23	23	23	15	23	14	13	25	B	24	14	14
21	10	14	14	23	15	9	14	25	23	16	16	16	24	B	B	31	31	30	14	24	14	25	19	14
22	14	14	16	24	19	14	B	24	24	B	B	23	24	16	30	30	24	24	24	24	16	13	14	10
23	13	B	16	23	23	16	16	16	14	16	14	14	23	23	19	15	29	15	16	23	16	14	12	10
24	10	11	12	16	14	13	15	14	14	15	14	23	23	16	16	15	23	24	25	14	15	15	14	8
25	10	16	17	23	14	16	16	16	15	16	24	24	24	B	33	24	15	31	29	26	25	30	23	14
26	16	15	18	19	14	15	17	25	11	16	15	14	14	14	14	16	15	11	24	14	14	13	11	25
27	14	16	25	24	B	23	15	B	B	25	B	32	31	31	B	B	B	B	B	B	13	B	31	B
28	23	B	24	B	B	B	24	B	B	B	32	24	15	B	B	24	B	23	B	23	23	15	31	B
29	B	B	B	B	B	B	24	24	B	B	31	B	B	31	34	30	30	24	29	26	31	31	11	16
30	13	24	B	15	16	B	B	B	B	22	23	24	26	32	B	34	B	B	B	B	24	B	15	15
31	13	B	16	17	B	B	B	B	24	31	26	24	24	B	B	25	30	30	31	14	14	16	14	9
CNT	30	30	30	30	30	30	29	28	28	30	31	31	30	30	30	30	30	31	31	31	31	30	31	30
MED	14	14	14	16	14	16	15	16	15	16	16	15	19	20	21	16	24	24	23	16	14	14	14	14
U Q	14	23	17	23	24	23	23	B	B	23	26	24	24	32	34	30	33	31	29	26	20	23	14	15
L Q	13	13	14	14	13	14	14	14	14	14	14	14	14	14	15	14	16	14	14	14	14	14	13	11

JAN. 1997 fmin (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1997 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	210	E A 255	A 240	A	A	A	A	240	200	200	250	200	200	205	A	205	A	A	A	200	205	210	235	240	
2	E A 255	A	A	A	A	A	E A 275	A 245	A	220	205	195	215	210	200	200	220	200	205	220	210	210	230	E A 250	240
3	A	A	A	A	A	A	230	215	195	195	180	205	A	A	A	200	200	220	220	E A 250	A	A	240	200	
4	A	A	A	A	A	200	200	200	200	200	200	185	230	240	200	A	A	200	205	200	215	230	A	A	
5	A	A	E A 260	A	A	230	205	200	180	200	225	240	205	220	200	205	205	210	205	205	E A 275	230	225	210	
6	240	215	E A 260	E S 270	S 240	A	210	220	220	200	195	200	185	195	A	A	A	230	200	A	E B 255	240	245	A	
7	230	250	A	A	A	A	A	B	B	A	215	200	200	205	240	200	205	210	A	B	240	A	A	A	
8	E A 250	A	230	A	230	A	A	B	240	200	200	200	200	200	200	200	220	205	210	B	200	230	240	E A 240	
9	A	A	A	A	B	A	250	205	200	180	190	200	B	B	200	B	200	210	200	200	230	210	230	E A 270	
10	A	250	A	250	240	220	A	A	B	A	B	Y	B	B	B	B	B	B	B	A	A	A	A	A	
11	A	A	240	240	230	A	250	260	240	200	210	B	200	215	210	B	B	E A 255	A	A	240	E A 270	A	A	
12	A	A	A	E A 260	A	A	A	B	B	B	B	B	B	B	B	B	B	B	E B 260	245	Y	A	A	A	
13	A	B	A	A	B	B	B	B	A	210	200	195	205	225	200	220	200	B	225	225	220	250	240	245	
14	270	250	270	A	280	230	220	205	200	230	B	B	200	245	A	A	B	B	B	B	200	220	220	250	
15	A	A	A	A	A	A	190	240	205	195	210	200	210	200	210	220	200	205	240	200	205	220	240	240	
16	230	240	245	E A 250	250	225	240	215	200	220	200	200	210	215	A	A	215	200	A	230	230	210	E A 250	225	
17	E A 250	E A 255	E A 250	E A 240	240	200	225	215	205	200	200	200	210	A	A	A	A	A	A	240	225	230	235	245	
18	A	A	A	A	A	A	A	C	C	C	235	A	C	C	C	C	C	200	240	200	215	C	A	C	
19	C	C	C	C	C	C	C	C	C	210	230	200	A	200	220	215	210	200	200	200	A	A	A	A	
20	A	A	A	B	A	A	C	C	C	200	200	230	220	225	230	210	A	E A 245	230	A	B	240	E A 260	A	
21	E A 255	A	A	A	A	A	205	A	A	230	200	215	210	B	B	220	220	200	245	A	A	A	E A 250	A	
22	E A 255	A	A	A	A	A	B	A	A	B	B	200	215	E A 250	215	240	210	230	A	A	240	E B 260	245	A	
23	A	B	A	A	A	A	A	220	200	200	215	210	210	210	200	200	200	205	200	245	235	E B 270	E A 245	E A 250	
24	250	255	A	A	240	200	A	220	205	205	205	215	A	200	190	200	205	220	210	225	A	A	235	235	235
25	270	A	A	E A 255	E A 260	E A 270	240	200	205	200	215	205	B	210	240	210	235	240	A	A	250	250	A	A	
26	A	A	A	A	205	200	A	A	240	200	200	200	200	235	205	200	240	220	220	A	A	A	A	A	
27	A	A	A	A	B	E A 245	B	B	215	205	200	200	B	B	B	B	B	B	B	B	A	B	A	B	
28	A	B	A	B	B	B	A	B	B	B	E B 250	200	200	B	B	210	B	A	B	E A 250	220	A	A	B	
29	B	B	B	B	B	B	A	A	B	B	E B 240	B	B	215	240	205	E A 270	245	260	245	B	E B 255	A	A	
30	A	A	B	A	A	B	B	B	B	235	220	215	200	210	B	E B 330	B	210	B	B	E B 260	B	E A 270	A	
31	A	B	A	A	B	A	B	B	A	210	200	200	200	B	B	200	200	215	250	240	240	240	255	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	10	11	7	7	11	9	13	16	17	24	26	26	22	21	17	21	18	22	20	18	19	21	20	15	
MED	248	245	242	245	240	210	215	218	200	202	200	200	205	208	205	208	205	210	218	212	220	232	238	240	
U Q	E A 255	E A 255	E A 260	E A 260	E A 255	230	E A 248	240	220	212	220	215	210	225	218	220	215	220	240	E A 245	240	E B 250	E A 250	E A 250	
L Q	230	245	240	240	230	200	205	205	200	200	200	200	200	200	200	200	200	205	205	200	210	225	235	235	

JAN. 1997 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1997 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

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	Y	B	Y	Y	O	X	O	X	O	X	R	B	Y	R	R	R	O	X	X	O	X	A	O	X	O	X	
2	X ₄₁	X ₄₂	B	B	A	O	X	X	B	Y	B	B	B	B	B	R	R	O	X	R	X	R	B	A	B			
3	A	A	B	B	B	X	O	X	A	O	X	X	R	R	R	O	X	O	R	X	X	X	X	X	X	36		
4	A	Y		A	A	X	X	X	X	X	O	X	B	R	R	X	O	X	R	O	X	X	X	X	S			
5	A	A	A		A		X	X	X	X	X	A	A	A	A	X	X	S	X	X	X	O	X	A	A			
6	Y	A	A		A	R	S	R	B	B	O	X	R	B	B	R	R	B	B	B	B	R	O	X	X			
7	O	X	A	R	R	R	A	X	O	X	X	O	X	R	X	R	X	O	X	O	X	O	X	X	O	X		
8	A	R		B	A	A	O	X	X	X	X	R	X	X	X	X	X	O	X	R	R	R	A	R	A			
9	Y	Y	B	S	B	S	B	R	O	X	O	X	B	B	Y	B	R	R	R	B	O	X	B	O	X	A	B	
10	Y	Y	B	B	B	B	S	B	B	B	B	B	B	B	B	B	O	X	B	B	B	A	A	A	A	A		
11	A	B	B	B	B	B	Y	Y	Y	B	B	B	B	B	B	B	B	B	O	X	X	O	X	O	X	A		
12	A	A	A	A	A	A	R	O	X	O	X	B	B	B	B	O	X	B	O	X	B	O	X	O	X	X	X	
13	X ₃₈	X ₃₈		O	X	R	X	X	X	X	X	R	R	R	X	O	X	O	X	B	B	R	R	X	X	X		
14	R	O	X	A	R	B	C	C	B	Y	B	Y	Y	B	R	Y	R	O	X	R	B	O	X	O	X	O	X	
15	O	X	O	X	R	R	X	O	X	O	X	R	R	B	B	R	O	X	R	O	X	X	X	O	X	O	X	
16	O	X		O	X	X	R	O	X	O	X	X	R	B	B	B	X	X	B	B	B	B	O	X	X	O	X	
17	A	A	A	A	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	Y	B	B	S		
18	A	A	A	Y	Y	B	Y	Y	S	R	R	B	B	B	B	B	B	B	B	R	O	X	X	O	X	O	X	
19	S	47	A	A	A	B	A	O	X	O	X	O	X	X	O	X	X	O	X	O	X	X	X	X	X	X	X	
20	O	X		O	X		O	X	O	X	X	X	O	X	O	X	X	R	X	O	X	B	O	X	O	X	X	
21	O	X	Y	O	X		O	X	X	O	X	R	R	B	B	B	O	X	X		A	O	X	X	O	X	X	
22	O	X		R	O	X	A	B	A	Y	B	B	B	B	X	52	B	O	X	R	R	R	X	O	X	O	X	
23	R	R	A	A	S	A	B	B	B	Y	B	B	B	B	B	B	B	B	O	X	O	X	X	X	X	X	X	
24	R	A	R	R	O	X	O	X	B	C	B	B	B	B	O	X	B	B	X	B	B	B	O	X	O	X	O	X
25	R	A	A	B	A	B	B	B	R	R	B	O	X	O	X	O	X	X	R	O	X	X	X	O	X	A	A	
26	A	S	A	A	S	B	B	B	A	R	X	R	R	B	B	O	X	B	R	A	B	A						
27	A	A	A	A	B	A	B	A	A	Y	R	B	B	B	Y	S	O	X	O	X	B	O	X	B	S	A	A	
28	70	58	Y	B	A	B	B	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X	A	O	X	
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	9	8	7	6	5	11	12	11	12	12	9	5	6	8	8	14	10	14	12	19	18	19	18	14				
MED	O	X			X	X	O	X	X	X	X	O	X	X	X	X	O	X	O	X	O	X	O	X	X	X	X	
U Q	O	X			X	O	X	X	X	X	X	X	X	X	X	X	O	X	O	X	X	O	X	O	X	X	X	
L Q	O	X			X	X	O	X	O	X	O	X	O	X	X	O	X	O	X	O	X	O	X	X	X	X	X	

FEB. 1997 fxI (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1997 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	Y	B	Y	Y	R	R		R	R	R	B	Y	R	R	D	R	R	J	R	R	A		
2	35	36		B	B	A	R		B	Y	B	B	B	B	B	R	R	R	R		R	B	A	B
3	A	A	B	B	B	34	37		38	45	43		R	R	R	U	R	R		40	40	41	39	36
4	A	Y	F	A	A	J	S	V	47	48	48		R	B	R	J	R	R	U	R	B		R	F
5	A	A	A	A	A	F			J	R	A	A	A	A			D	S			41	40	A	A
6	Y	A	A	F	A	R	S	R	B	B		R	B	B	D	R	R	B	B	B	B	R	R	F
7	R	A	R	R	R	A		U	R		R	R	R	J	R	R	J	R	R	R	R	41	42	39
8	A	R	F	B	A	A	R	J	R	J	R	R	J	R		J	R	J	R	R	R	A	R	A
9	Y	Y	B	F	B	S	B	R	R	R	R	B	B	Y	B	R	R	R	B	U	R	B	A	B
10	Y	Y	B	B	B	B	S	B	B	B	B	B	B	B	B	R	B	B	B	A	A	A	A	A
11	A	B	B	B	B	B	Y	Y	Y	B	B	B	B	B	B	B	B	B	R	J	R	R	A	A
12	A	A	A	A	A	A	R	R	R	B	B	B	B	R	B	R	B		R	R	R	R		
13	J	R		R	R	R	R		R		J	R	R	J	R	R	R	B	B	R	R		J	R
14	R	R	A	R	B	C	C	B	Y	B	Y	Y	B	R	Y	R	R	R	B		41	40	37	28
15	R	35	36		R	F			R	R	R	R	B	B	R	R	D	R		J	R	R	R	S
16	R	F	F		F	R			J	R	R	B	B	B		46	41	46	44	42	32	30	36	34
17	A	A	A	A	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	Y	B	B	S
18	A	A	A	Y	Y	B	Y	Y	S	R	R	B	B	B	B	B	B	B	R		38	42	40	36
19	S	A	A	A	A	B	A	S	R	R	R	J	R	U	R		R	R			R	R	J	R
20		F	R	R				40	44	47	47	47	48	46	46	45	43	42	38	38	37	37	37	34
21	34	32	33	37	37	43	45	49	53	57	60	57		55		48		B		45	43	39	37	33
22	R	Y		F	S	R		R	R	B	B	B		59	57	57		46	50		39	39	37	32
23	R	R	A	A	B	A	Y	B	B	B		B	R	R	R	R	J	R	R	R	A	A	A	A
24	R	A	R	R	R	42	46	46		B	C	B	B	B	B	B	J	R	B	B	U	R	U	S
25	R	A	A	B	A	B	B	B	R	R	B	R	R	R	R	D	R	R	J	S	R		A	A
26	A	S	A	A	S	B	B	B	A	D	R	J	R	R	D	R	B	B	R	A	B	A	F	A
27	A	A	A	A	B	A	B	A	A	Y	R	B	B	B	Y	S	R		B	R	B	B	S	A
28	A	A	Y	B	A	B	B	B	R	B	B	B	B	B	B	B	B	B	B	B	39	A	U	R
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	8	6	7	6	5	11	12	11	12	13	9	5	7	8	9	16	12	14	12	19	18	19	16	13
MED	34	34	33	36	37	39	45	46	46	47	47	47	48	50	52	47	46	44	42	39	40	37	36	33
U Q	36	36	35	37	41	41	46	49	50	51	50	54	57	56	54	50	48	46	44	42	41	39	37	38
L Q	33	32	28	26	35	34	42	43	43	46	44	46	42	46	46	42	43	42	40	38	37	34	34	31

FEB. 1997 foF2 (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1997 ftes (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	37	30	B	35	34	26	E B	23	17	25	30	30	B	30	33	29	28	30	27	26	26	35	37	15	41		
2	32	32	B	B	80	32	31	B	41	B	B	B	B	B	B	E B	31	29	E B	30	36	21	34	B	40		
3	40	43	B	B	B	37	36	43	38	29	27	30	33	32	32	32	E B	27	32	26	E B	24	20	17	17	13	
4	37	32	31	37	37	37	34	24	21	37	31	E B	B	E B	E B	33	33	E B	E B	B	E B	25	110	59	36	31	
5	37	38	53	38	45	38	37	38	40	51	88	53	46	47	37	28	38	33	29	36	33	43	51	48			
6	35	46	38	31	70	39	38	39	B	B	26	27	B	B	27	27	B	B	B	B	E B	31	32	E B	27		
7	34	40	36	37	43	38	38	31	31	27	32	41	37	32	33	32	37	32	26	37	32	16	28	26			
8	70	38	41	B	41	37	41	22	26	26	27	32	32	33	31	28	26	38	39	27	27	47	36	68			
9	38	41	B	31	B	37	B	37	38	33	16	B	B	E B	B	26	E B	E B	B	B	B	27	71	B			
10	37	37	B	B	B	B	26	B	B	B	B	B	B	B	B	26	B	B	B	52	81	112	66	71			
11	70	B	B	B	B	B	38	30	30	B	B	B	B	B	B	B	B	B	37	37	20	38	47	58			
12	58	42	91	70	A	A	37	30	26	B	B	B	B	27	B	25	B	27	E B	E B	E B	E B	23	23	29	15	
13	17	14	32	32	32	43	33	33	E B	E B	27	27	33	37	37	37	40	37	B	B	E B	E B	16	E B	E B		
14	32	71	47	34	B	C	C	B	40	B	37	36	B	E B	33	28	26	26	E B	B	E B	36	29	31	34	39	
15	41	39	32	33	24	17	24	20	25	E B	26	E B	30	B	B	26	27	27	E B	24	27	24	23	23	16	16	
16	26	28	30	16	17	18	40	46	31	26	29	B	B	B	30	28	B	B	B	B	34	38	38	45			
17	70	39	37	55	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	34	B	B	39			
18	80	66	59	36	37	B	36	37	32	27	27	B	B	B	B	B	B	B	E B	E B	E B	34	23	23	32	13	14
19	31	36	70	78	42	B	48	32	24	30	26	34	28	31	31	28	24	17	16	31	34	34	42	16			
20	28	18	32	34	26	41	21	21	31	24	33	32	32	27	27	32	B	E B	B	30	40	36	37	41			
21	27	20	17	17	36	20	32	36	38	B	B	B	30	26	E B	B	36	37	45	26	37	37	28	27			
22	26	32	36	43	B	42	31	B	B	B	34	B	29	26	32	25	26	E B	24	17	32	37	42	37	37		
23	32	31	42	51	37	58	B	B	B	32	B	B	B	B	B	B	B	E B	E B	B	26	26	19	28	16	13	13
24	32	36	34	32	27	16	20	B	C	B	B	B	26	B	B	26	B	B	B	E B	25	41	23	32	19		
25	E B	22	39	52	B	43	B	B	B	36	31	27	E B	30	E B	29	E B	30	27	E B	E B	E B	E B	E B	32	38	
26	34	31	42	41	32	B	B	B	41	28	26	23	27	B	B	24	E B	25	37	B	43	27	37	38			
27	48	43	40	70	B	42	B	61	42	36	26	B	B	B	27	47	26	E B	B	E B	B	B	32	82			
28	40	44	26	B	59	B	B	B	41	B	B	B	B	B	B	B	B	B	B	B	E B	25	42	38	37		
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	27	22	21	19	18	20	18	22	17	18	12	14	15	17	22	16	18	17	22	26	25	27	26			
MED	36	38	38	36	37	37	35	32	32	29	27	32	30	31	30	28	28	27	26	26	32	32	34	37			
U Q	40	42	47	47	43	41	38	38	40	32	32	35	33	33	32	32	34	32	36	33	37	40	38	41			
L Q	32	31	32	32	32	26	28	24	26	26	26	28	28	27	28	26	26	E B	E B	E B	E B	24	23	E B	16		

FEB. 1997 ftes (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1997 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	22	22	B	30	24	24	23	11	15	23	25	B	24	24	14	14	19	13	18	23	19	19	13	10	
2	11	14	B	B	14	14	24	B	24	B	B	B	B	B	B	31	26	30	23	12	23	B	14	B	
3	20	13	B	B	B	23	24	23	16	24	24	25	23	31	30	24	27	24	14	24	14	12	13	9	
4	19	14	14	23	26	25	18	14	11	14	31	B	33	33	14	25	33	31	B	25	25	14	11	25	
5	12	13	19	23	19	12	14	14	19	14	14	13	13	13	14	23	23	13	14	11	11	14	24	13	
6	24	14	14	10	23	13	14	15	B	B	14	16	B	B	24	24	B	B	B	B	31	24	24	20	
7	10	24	23	23	23	23	10	15	14	19	24	24	24	20	16	14	14	15	16	21	16	10	10	10	
8	23	24	10	B	23	23	16	19	14	14	14	14	14	14	19	12	15	24	23	16	14	14	31	14	
9	23	20	B	14	B	44	B	23	20	23	13	B	B	34	B	24	31	32	B	21	B	24	24	B	
10	24	24	B	B	B	B	23	B	B	B	B	B	B	B	B	19	B	B	B	32	27	26	24	23	
11	13	B	B	B	B	B	26	25	24	B	B	B	B	B	B	B	B	B	24	23	17	25	10	25	
12	14	30	23	52	A	A	24	15	24	B	B	B	B	24	B	23	B	24	24	23	23	23	14	10	
13	9	9	9	14	23	23	15	24	25	27	24	24	24	24	24	20	23	B	B	24	24	14	14	13	
14	8	15	22	24	B	C	C	B	26	B	24	24	B	33	26	23	24	32	B	36	24	22	12	13	
15	13	14	9	9	11	13	14	19	23	26	24	30	B	B	B	23	22	15	24	15	24	23	23	16	16
16	12	10	8	10	14	14	23	22	24	23	29	B	B	B	B	23	24	B	B	B	24	11	14	15	
17	13	22	23	22	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	24	B	B	15	
18	14	9	23	24	22	B	23	24	15	22	14	B	B	B	B	B	B	B	B	34	23	23	24	13	9
19	9	10	15	13	13	B	14	13	18	15	14	15	15	23	22	14	14	15	15	14	14	9	8	9	
20	24	9	8	14	24	19	14	9	13	18	15	26	24	24	24	24	B	B	30	B	24	23	14	10	
21	9	9	9	9	9	14	24	24	24	B	B	B	24	16	32	B	13	24	24	17	14	14	9	10	
22	8	8	9	24	B	23	24	B	B	B	24	B	18	24	24	23	24	24	10	16	15	15	15	13	
23	24	8	16	14	9	24	B	B	B	24	B	B	B	B	B	B	B	26	26	16	14	9	9	13	
24	12	10	9	9	9	9	18	B	C	B	B	B	23	B	B	23	B	B	B	25	24	15	14	19	
25	22	9	21	B	24	B	B	B	24	23	B	25	27	15	29	23	30	25	24	24	15	15	12	10	
26	9	23	23	24	16	B	B	B	23	14	24	14	22	B	B	24	B	25	10	B	15	9	8	9	
27	9	12	9	13	B	10	B	56	24	18	14	B	B	B	24	23	24	23	B	22	B	12	14		
28	16	15	16	B	40	B	B	B	24	B	B	B	B	B	B	B	B	B	B	B	25	15	11	16	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	27	26	27	28	27	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	
MED	13	14	18	23	23	23	23	24	24	24	24	B	B	34	28	24	30	28	25	24	23	15	14	13	
U Q	22	22	23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	34	24	24	16	18
L Q	10	10	9	14	14	14	15	15	16	18	14	24	24	24	23	22	23	24	17	19	15	14	11	10	

FEB. 1997 fmin (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1997 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	B	A	AE A	275	210	215	200	200	210	B	Y	210	200	200	200	220	205	225	245	A	240	240
2	250	A	B	B	A	220	A	B	A	B	B	B	B	B	B	200	220	205	A	230	A	B	A	B
3	A	A	B	B	B	A	A	A	270	215	210	200	235	240	220	220	210	200	225	225	240	240	240	255
4	A	A	A	A	A	A	A	A	200	200	220	205	B	200	225	215	210	245	E B	240	220	A	A	A
5	A	A	A	A	A	A	AE A	A	A	A	A	A	A	A	A	235	205	205	200	230	225	250	A	A
6	AE A	AE A	AE A	A	A	A	A	A	B	B	230	200	B	B	215	200	B	B	B	BE	BE	BE	AE A	AE A
7	A	A	A	A	A	AE A	250	200	200	220	200	A	A	200	200	200	230	205	200	250	240	245	230	250
8	A	A	A	B	A	A	A	200	200	200	215	200	E A	240	205	200	220	205	A	A	A	A	A	A
9	A	A	B	A	B	A	B	AE A	270	220	200	B	B	B	B	210	210	E B	B	245	B	A	A	B
10	A	A	B	B	B	BE B	250	B	B	B	B	B	B	B	B	255	B	B	B	A	A	A	A	A
11	A	B	B	B	B	B	Y	Y	A	B	B	B	B	B	B	B	B	B	A	A	250	245	A	A
12	A	A	A	A	A	A	A	A	24	B	B	B	B	205	220	225	220	230	245	245	240	250		
13	255	280	A	A	A	A	A	A	210	200	200	200	200	200	225	A	A	B	B	240	240	230	250	230
14	A	A	A	A	B	C	C	B	A	B	A	A	BE B	240	230	205	340	E B	BE	BE	AE A	A	A	A
15	220	230	255	230	A	A	255	235	210	210	210	205	B	B	240	205	200	205	210	225	245	260	240	230
16	255	250	A	A	AE A	250	AE A	250	240	200	205	B	B	B	205	220	B	B	B	B	A	A	A	A
17	A	A	A	A	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	A	B	B	A
18	A	A	A	A	A	B	A	AE A	255	200	225	B	B	B	B	B	B	B	205	255	250	230	245	
19	A	A	A	A	A	B	A	A	215	200	200	200	200	200	205	200	200	210	200	235	250	245	240	
20	250	250	A	A	A	AE A	240	210	200	220	200	200	200	200	220	210	B	B	240	BE	AE	AE	AE	AE
21	A	A	A	A	A	A	A	A	A	B	B	B	205	230	B	B	235	A	AE A	260	250	250	270	A
22	A	A	A	A	B	A	A	B	B	220	B	235	210	220	220	215	215	210	A	A	A	A	A	
23	A	A	A	A	A	A	B	B	B	A	B	B	B	B	B	B	240	240	245	255	255	255	260	
24	A	A	A	A	A	A	260	250	B	C	B	B	B	210	B	220	B	B	B	230	E A	280	E AE B	
25	B	A	A	B	A	B	B	B	A	240	B	205	200	225	200	200	E B	230	240	220	220	200	270	A
26	A	A	A	A	A	B	B	B	A	A	240	200	200	B	B	200	BE	B	250	A	B	A	A	A
27	A	A	A	A	B	A	B	A	A	A	200	B	B	B	Y	A	230	215	BE	B	B	BE	A	A
28	A	A	A	B	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	BE	B	A	AE A	250
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	5	5	2	2	1	6	6	8	14	13	16	9	11	14	14	20	15	16	11	18	18	15	13	13
MED	250	250	258	248	240	251	234	205	205	210	208	200	200	209	215	210	210	212	220	228	249	248	242	248
U Q	255	268				260	250	232	240	220	218	202	235	230	220	220	230	240	230	245	250	260	255	258
L Q	235	240				250	235	200	200	200	200	200	200	200	200	200	205	205	205	225	245	245	240	240

FEB. 1997 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1997 fXI (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	B	B	B	B	B	B	B	B	B	B	B	R	B	B	B	B	B	B	B	A	R
2	A	A	B	Y	A	A	R	B	B	B	B	B	B	B	B	B	BO	X	BO	X	A	Y	Y	Y
3	Y	A	A	R	R		XO	XO	XO	C	C	C	C	CO	X	CO	XO	X	BO	X	B	Y	A	A
4	B	A	A	R	A	B	BO	X	XO	XO	X	RO	X	XO	X	B	A	AO	XO	XO	X	S	X	A
5	B	R	B	BO	XO	XO	X	RO	XO	XO	XO	X	XO	X	X	R	Y	YO	XO	XO	X	A		A
6	A	A		A	A	A	B	B	B	B	B	B	B	B	R	B	B	X	S	B	SO	X		
7	O	X		S	Y	XO	XO	XO	X	B	B	B	B	B	B	X	B	BO	X	RO	XO	X	A	A
8	A	A	A	B	A	XO	X	Y	BO	XO	X	R	RO	XO	X	XO	X		X	SO	X		O	X
9	O	X	A	A	S	S	X	XO	XO	X	X	XO	X	R	X	X	XO	XO	XO	X	XO	X	X	XO
10	36	36	O	X		O	X	X	XO	XO	X	R	RO	XO	X	XO	X	RO	XO	X	X	S	A	
11	A	A	A	A	AO	X	X	X	X	X	XO	X	X	X	X	R	X	X	X	RO	X	A	X	
12	O	X	S	R	A	A	A	R	R	R	B	B	B	X	X	X	B	B	B	BO	X	A	S	A
13	58	A	A	A	A	B	B	B	A	S	B	B	B	B	B	B	B	BO	XO	X	B	B	A	A
14	A	A	A	A	A	A	AO	X	B	BO	XO	XO	XO	X	B	BO	XO	XO	XO	XO	XO	XO	X	A
15	A	A	A	A	B	B	B	AO	X	SO	X	RO	XO	X	B	BO	XO	XO	XO	XO	X		A	A
16	A	A	S		B	A	B	AO	X	S	B	B	BO	X	B	B	BO	XO	XO	X	S	B	A	A
17	A	A	A	A	A	A	A	A	XO	XO	X	BO	X	B	BO	XO	X	B	XO	X	SO	X	A	A
18	A	A	A	B	A	B	B	B	S	RO	XO	X	XO	X	XO	XO	XO	XO	XO	X	B	B	A	A
19	Y	70	A	Y	B	X	B	B	B	XO	XO	X	B	BO	X	B	B	B	B	B	B	B	B	B
20	B	B	Y	S	X	RO	XO	XO	X	BO	XO	X	X	X	R	X	XO	XO	X		X	X	B	
21	B	B	A	A	B	B	O	XO	XO	XO	X	B	X	X	B	B	B	B	B	B	B	B	B	B
22	O	X	A	A	Y	A	A	B	B	A	SO	XO	XO	XO	X	X	B	X	X	B	A	B	B	
23	Y	A	Y	B	B	B	BO	X	BO	X	BO	X	B	B	BO	X	RO	X	B	B	B	Y	R	
24	Y	Y	S	SO	XO	X	R	B	B	BO	X	R	XO	X	B	BO	XO	X	R	Y	R	A	A	
25	A	A	B	A	B	A	B	B	B	BO	X	B	B	B	B	X	X	X	B	S	A	A	A	A
26	A	A	B	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A
27	A	A	A	B	B	A	B	RO	XO	XO	XO	X	R	R	XO	X	B	B	B	B	B	B	B	Y
28	B	B	B	A	A	B	B	RO	X	RO	X	B	R	B	X	R	X	RO	X		S	Y		A
29	B	A	A	A	A	B	A	B	B	B	B	B	R	B	B	B	B	BO	X	B	S	A	A	A
30	A	A	B	B	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	Y	A
31	B	B	A	B	A	B	Y	B	S	SO	X	X	RO	X	X	RO	XO	X	B	B	B	B	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	3	2	2	6	9	9	9	14	11	16	11	11	16	17	12	14	15	18	17	10	10	8	4
MED	O	X			X	X	XO	XO	XO	XO	XO	XO	XO	X	X	XO	XO	XO	XO	XO	XO	X	X	X
U Q	38	70			34	42	46	46	49	52	54	59	56	62	62	63	56	52	50	47	44	38	53	37
L Q	O	X			O	X	X	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO	XO
	29	33			33	32	40	38	43	44	46	49	49	50	52	51	50	46	45	42	36	31	34	34

MAR. 1997 fXI (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1997 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

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

MAR. 1997 foF2 (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1997 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	37	39	B	B	B	B	B	B	B	B	B	B	B	BE	B	B	B	B	B	B	B	40	27			
2	33	35	B	29	41	43	37		B	B	B	B	B	B	B	B	B	BE	B	BE	B	37	30	16	16		
3	26	62	37	35	33	19	20	17	BE	B	C	C	C	C	C	35	CE	BE	B	BE	B	B	33	39	32		
4	B	50	43	29	31	B	BE	B	BE	B	BE	B	B				B	63	50	24	36	23	26	17	34		
5	B	32	B	BE	BE	B	19	23	17	16	BE	BE	B	29	21	24	31	29	24	27	24	24	15	70	44	41	
6	37	37	29	40		41	41	B	B	B	B	B	B	B	BE	B	B	BE	B	BE	B	BE	BE	BE	BE	B	
7	17	32	32	17	17	BE	BE	BE	B	B	B	B	B	B	B	BE	B	B	BE	B	BE	BE	BE	BE	BE	B	
8	92	71	38	B	36	19	23	37		24	27	28	25	28	25	30	24	24	23	25	24	26	23	25	BE	B	
9	26	33	37	33	32	16	16	16	30	30	32	37	31	26	28	32	26	30	33	38	33	17	38	BE	B	25	
10	21	BE	B	15	20	36	31	31	14	27	16	26	27	28	27	37	38	29	33	37	32	24	20	26	32	33	
11	38	37	30	37	41	32	27	18	18	31	58	60	18	41	31	33	35	37	31	31	32	38	55	56			
12	BE	B	15	32	32	37	45	41	39	37	35			32	23	27	26				61	48	56	28	30		
13	34	37	37	42	34				46	32		B	B	B	B	B	B	B	BE	BE	BE	B	B	37	38		
14	34	41	37	37	37	44	41	30	22				33	32	30	26		33	24	22	23	28	26	16	27		
15	32	42	38	59	B	B	B	36	30	24	24	31	27	31	B	B	27	24	23	24	20	14	32	37			
16	36	36	27	41		37	B	40	33	33	B	B	B	27		B	B	BE	B	26	25	23	32	38	37		
17	37	32	34	46	56	55	41	35	27	26	32		31			BE	BE	BE	B	BE	BE	BE	BE	BE	BE	BE	B
18	41	38	41	B	41	B	B	B	B		32	24	32	27	27	27	24	23	31	24	24			26	28		
19	16	30	37	17	B	10	B	B	BE	B	BE	B	BE	B	B	BE	B	B	B	B	B	B	B	B	B	B	
20	B	B		16	26	17	17	12	23	24		23	26	27	27	26	26	26	24	32	19	27	16	16			
21	B	B	29	32	B	B		17	18	23	23	24		30	28		BE	B	B	B	B	B	B	B	B	B	
22	27	27	53	70	17	36	37	B	B		37	36	27	27	25	30	23	24		23	40		37		B	B	
23	20	29	17	B	B	B	BE	B	BE	B	B			B	B	BE	BE	BE	BE	B	B	B		16	30		
24	11	14	24	26	17	24	26	B	B	B	BE	B	BE	B	B	BE	B	B	BE	BE	BE	BE	BE	BE	BE	BE	
25	57	67	B	36	B	35	B	B	B	BE	B	B	BE	B	BE	B	BE	BE	BE	BE	B	34	41	43	41	40	
26	38	51	B	40	47	B	47	37	B	B	B	B	B	B	B	B	B	B	B		40	40	39	47	36		
27	37	31	54	B	B	27	BE	B	24	27	24	24	26	24	31	24	24		B	B	B	B	B	B	B	17	
28	B	B	B	27	38	B	B	35	26	23	24			26		24	24	24	30	30	31	31	27	51	51		
29	B	41	60	36	34	B	46	B	B	B	B	B	BE	B	B	B	B	B	BE	B		30	37	39	70		
30	80	35	B	B	B	B	37	B	B	B	B	B	B	B	B	B	B	B	B	B	B		32	26	42		
31	B	B		B	34	B		BE	BE	BE	BE	BE	B			BE	B	BE	B	B	B	B		37	37		
	00	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	27	25	23	21	19	20	19	17	18	18	16	19	18	19	17	17	19	19	22	20	22	27	27			
MED	34	36	37	36	34	31	27	25	24	26	BE	B	27	27	28	27	26	26	24	24	24	28	26	37	36		
U Q	38	41	38	40	41	41	40	36	30	31	29	32	31	32	30	BE	B	31	30	31	36	32	37	39	40		
L Q	24	32	28	29	25	19	18	18	23	BE	BE	B	26	26	27	25	24	24	24	23	23	23	24	23	27		

MAR. 1997 ftes (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1997 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	20	24	23	B	B	B	B	B	B	B	B	B	B	B	34	B	B	B	B	B	B	B	10	16
2	8	31	B	10	23	23	23	B	B	B	B	B	B	B	B	B	B	24	B	23	19	23	9	9
3	8	26	13	10	10	14	20	15	24	C	C	C	C	C	24	C	26	24	B	23	B	23	10	10
4	B	15	19	14	23	B	B	25	24	24	26	10	22	24	25	B	24	23	24	23	23	24	10	9
5	B	16	B	B	19	23	13	9	23	26	26	15	14	23	23	10	24	24	24	24	15	23	14	14
6	16	18	8	23	B	23	23	B	B	B	B	B	B	B	30	B	B	24	23	B	24	22	23	14
7	10	9	15	14	14	23	23	21	B	B	B	B	B	B	B	32	B	B	23	24	23	24	19	11
8	14	22	30	B	24	10	23	24	B	15	23	24	16	15	23	30	24	24	23	25	24	20	23	23
9	12	17	23	13	11	14	10	9	9	16	15	20	21	22	14	15	14	14	14	12	14	9	13	25
10	13	15	10	10	9	8	14	14	14	23	23	15	23	22	23	24	23	23	24	24	13	8	9	9
11	10	12	10	23	13	14	10	14	10	16	15	15	14	15	14	7	15	23	14	14	8	9	14	10
12	15	14	12	12	7	24	24	23	23	B	B	B	25	23	22	24	B	B	B	23	8	9	9	9
13	14	17	23	23	20	B	B	B	23	22	B	B	B	B	B	B	B	B	32	23	B	B	9	9
14	13	12	14	23	23	26	23	18	9	B	B	23	32	30	26	B	33	24	22	23	10	14	16	18
15	11	18	24	24	B	B	B	24	23	24	24	24	15	31	B	B	27	24	23	24	20	14	9	11
16	10	9	22	23	B	23	B	30	23	23	B	B	B	24	B	B	B	26	23	23	12	B	19	9
17	11	9	16	19	15	23	24	24	19	24	24	B	24	B	B	32	29	B	24	26	25	15	12	14
18	24	23	24	B	24	B	B	B	B	23	24	24	24	25	25	24	23	31	24	24	B	B	10	9
19	9	11	23	14	B	8	B	B	B	23	24	30	B	B	30	B	B	B	B	B	B	B	B	B
20	B	B	9	14	9	11	9	23	24	B	23	24	16	24	25	24	26	24	22	15	10	12	14	B
21	B	B	14	14	B	B	10	14	23	23	24	B	30	24	B	26	B	B	B	B	B	B	B	B
22	10	22	23	19	13	24	24	B	23	24	25	27	25	30	23	24	B	23	18	B	23	B	B	B
23	9	18	9	B	B	B	B	24	B	25	B	17	B	B	B	30	24	24	B	B	B	B	9	8
24	7	9	7	8	10	9	11	B	B	B	24	31	27	26	24	B	24	24	24	15	15	14	10	
25	10	23	B	24	B	25	B	B	B	B	26	B	B	34	B	33	24	23	B	25	14	22	23	19
26	24	24	B	26	33	B	24	31	B	B	B	B	B	B	B	B	B	B	B	23	14	10	11	24
27	31	24	23	B	B	24	B	24	25	24	24	26	24	31	24	24	B	B	B	B	B	B	B	9
28	B	B	B	24	23	B	24	26	23	24	B	24	24	24	24	24	30	14	24	24	24	9	15	
29	B	24	12	24	22	B	14	B	B	B	B	B	28	B	B	B	B	B	24	B	15	9	23	16
30	24	23	B	B	B	B	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	24	24	24
31	B	B	B	B	B	B	B	B	24	24	24	24	23	23	24	23	24	23	B	B	B	B	9	24
	00	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	30	30	30	30	30	31	30	31	31	31	31	31	31	31	31
MED	14	18	23	23	23	24	24	24	25	24	25	30	27	30	30	32	29	24	24	24	23	23	14	14
U Q	B	31	24	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	23	24
L Q	10	14	12	14	13	14	14	21	23	23	24	24	23	24	24	24	24	24	23	23	14	14	9	

MAR. 1997 fmin (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1997 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	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A		
2	A	A	B	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	Y	Y		
3	A	A	A	A	A	A	E	B			C	C	C	C	C	C	C	215		260		B	A	A		
4	B	A	A	A	A	B												A	A	E	A	E	A	A		
5	B	A	B	B	B	B																				
6	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
7	A	A	A	A	A	B	E	B		B	B	B	B	B	B	B	B	B	B	B	A					
8	A	A	A	B	A	A																				
9	A	A	A	A	A	A	E	S																		
10	250	255	285	A	A	A	E	B																		
11	A	A	A	A	A	E	A	A																		
12	E	B	A		A	A																				
13	A	A	A	A	A	B	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	A	A		
14	A	A	A	A	A	A	A	A		B	B	E	A	E	B	B	B	B	B	B	E	A	A	E	B	
15	A	A	A	A	B	B	B	A	A																	
16	A	A	A	A	B	A	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A		
17	A	A	A	A	A	A	A	A		A	B	B	B	B	B	B	B	B	B	B	B	B	A	A		
18	A	A	A	B	A	B	B	B	B	A																
19	Y	A	A	Y	B	B	B	B	B																	
20	B	B	Y	A	A																					
21	B	B	A	A	B	B	E	A	B																	
22	A	A	A	A	A	A	A	B	B	A	A															
23	A	A	A	B	B	B	B	E	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	210		
24	Y	Y	A	A	A	A	A	B	B	B																
25	A	A	B	A	B	A	B	B	B	B																
26	A	A	B	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A		
27	A	A	A	B	B	A	B	B	E	A	E	B														
28	B	B	B	A	A	B	A	B																		
29	B	A	A	A	A	B	A	B	B	B	B	B	E	B	B	B	B	B	B	B	B	A	A	A		
30	A	A	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A		
31	B	B	A	B	A	B	A	B	E	B	E	B														
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	2	1	2	1	1	2	7	11	12	12	17	15	18	16	19	16	16	16	17	17	12	7	4	4		
MED	255	255	242	240	A	250	225	E	U	U	219	208	200	220	223	212	218	226	225	224	228	238	241	260	265	241
U Q						E	E	B		B			E	B	E	B	B	B	B	B	E	E	B	E	B	
L Q																										

MAR. 1997 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1997 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	62	A	A	A	A	B	O	X	O	X	O	X	X	X	O	X	X	O	X	X	Y	A		
2	A	A	70	A	A	B	Y	B	B	B	O	X	B	R	O	X	X	X	X	B	B	A	A	A		
3	A	A	B	B	B	A	A	B	B	B	B	O	X	O	X	X	B	O	X	O	X	Y	Y	R	B	A
4	B	S	S	B	B	B	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
5	A	B	A	B	B	B	A	B	B	B	R	R	O	X	B	B	B	B	B	B	X	B	B	B	Y	
6	X 43	B	A	B	B	A	A	S	R	O	X	O	X	C	B	B		B	B	B	B	R	B	Y	S	
7	S	A	B	A	B	B	B	B	R	R	O	X	B	B	O	X	X	X	X	R	B	B	B	A	B	B
8	Y	A	R	A	A	A	A	S	A	O	X	O	X	O	X	X	X	X	B	O	X	B	B	R	A	A
9	A	B	B	A	A	A	A	A	B	B	B	O	X	O	X	O	X	X	X	O	X	B	B	R	A	A
10	A	A	A	A	B	A	A	X	X	X	O	X	O	X	X	X	X	O	X	X	X	B	Y	A	A	
11	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	X	O	X	X	O	X	S	A	
12	X 47	S	A		S	B	B	B	R	R	O	X	R	O	X	B	B	O	X	B	R	B	B	B	Y	
13	R	A	A	O	X	A	R	A	B	A	O	X	O	X	O	X	O	X	X	S	O	X	B	B	B	A
14	A	A	B	A	A	B	R		B	B	O	X	O	X	X	X	X	X	X	X	B	B	B	B	B	
15	B	Y	Y	Y	Y	Y	B	B	O	X	O	X	R	O	X	O	X	X	O	X	B	B	B	B	B	
16	B	B	B	B	B	B	B	B	X	O	X	O	X	X	X	X	X	X	X	B	Y	A	A	A	A	
17	A	B	A	B	B	A	A	A	B	R	B	B	B	B	B	B	B	B	B	R	R	A	B	A	A	
18	A	B	B	A	B	B	B	A	R	B	B	B	B	B	B	B	B	B	B	Y	Y	A	A	A	A	
19	B	A	S	Y	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	S	Y	Y	A	A	
20	A	A	A	A	S	A	A	B	B	C	C	C	C	C	C	C	X	X	O	X	B	B	C	C	C	C
21	C	C	C	C	C	C	C	C	C	X	X	X	X	X	X	X	X	X	O	X	A	A	A	A	A	
22	A	A	O	X	S		S	B	A	B	B	B	B	B	B	O	X	O	X	B	O	R	Y	Y	A	
23	O	X	F	A	S	O	X	R	R	O	X	X	X	X	X	A	X	X	X	X	B	A	A	A	A	
24	A	A	A	B	B	B	B	A	A	B	B	R	B	B	B	B	B	O	X	O	X	B	B	B	A	
25	B	A	A	A	A	A	A	X	B	B	O	X	X	O	X	X	X	X	X	B	B	A	B	A	A	
26	58	A	A	A	A	A	O	X	B	O	X	O	X	R	X	O	X	O	X	O	X	O	X	O	X	A
27	A	A	A	A	O	X	B	B	B	O	X	X	X	X	X	O	X	X	O	X	B	B	B	A	A	
28	A	A	A	A	A	O	X	O	X	O	X	X	X	X	X	X	X	O	X	X	B	B	O	X	B	B
29	A	53	A	A	A	A	O	X	O	X	X	X	X	X	X	X	X	X	X	X	O	X	B	A	S	
30	A	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A		
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	4	1	4	2	2	2	3	5	8	13	17	15	18	18	16	21	20	21	13	10	5	2	1	1		
MED	X 45	53	56	65	37	O	X	X	X	O	X	O	X	O	X	X	X	X	X	X	O	X	O	X	X	
U Q	52		66			O	X		X	X	O	X	X	X	X	X	X	X	X	X	O	X	X	X		
L Q	X 42		46					X	O	X	X	O	X	O	X	X	X	X	X	X	O	X	O	X		

APR. 1997 f_{XI} (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1997 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	A	A	A	A	A	B	R	39	40	40	45	45	50	50	47	49	49	27	27	22	14	R	Y	A
2	A	A	A	A	A	B	Y	B	B	B	R	B	U	R	51	52	53	48	43	B	B	A	A	A	A	
3	A	A	B	B	B	A	A	B	B	B	B	B	45	46	46	U	R	B	U	R	S	Y	Y	R	B	A
4	B	S	S	B	B	B	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	A	B	A	B	B	B	A	B	B	B	R	R	41	B	B	B	B	B	B	B	23	B	B	B	Y	
6	37	B	A	B	B	A	A	S	R	39	41	U	R	C	B	B	B	J	R	53	B	B	B	Y	S	
7	S	A	B	A	B	B	B	B	R	R	R	B	B	B	44	46	53	51	R	B	B	B	A	B	B	
8	Y	A	R	A	A	A	A	S	A	37	39	41	45	52	57	54	42	F	B	B	B	B	R	A	A	
9	A	B	B	A	A	A	A	A	B	B	B	41	46	46	44	46	46	43	40	B	B	R	A	A	A	
10	A	A	A	A	B	A	A	32	33	35	39	41	44	46	53	48	42	37	31	27	B	Y	A	A	A	
11	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	45	45	40	40	38	23	R	S	A	
12	41	S	A	A	S	B	B	B	R	U	R	R	R	B	B	U	R	B	R	B	B	B	B	B	Y	
13	R	A	A	R	A	R	A	B	A	39	43	44	44	47	54	52	44	41	S	U	S	B	B	B	A	
14	A	A	B	A	A	B	R	F	B	B	R	R	J	R	56	56	51	47	40	34	B	B	B	B	B	
15	B	Y	Y	Y	Y	Y	B	B	R	31	40	42	50	46	46	41	41	41	33	26	23	B	B	B	B	
16	B	B	B	B	B	B	B	B	34	43	47	53	58	65	62	60	60	54	J	R	B	Y	A	A	A	
17	A	B	A	B	B	A	A	A	B	R	B	B	B	B	B	B	B	B	B	R	R	A	B	A	A	
18	A	B	B	A	B	B	B	A	R	B	B	B	B	B	B	B	B	B	B	Y	Y	A	A	A	A	
19	B	A	S	Y	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	S	Y	Y	A	A	
20	A	A	A	A	S	A	A	B	B	C	C	C	C	C	C	40	35	27	S	B	B	C	C	C	C	
21	C	C	C	C	C	C	C	C	C	40	42	45	51	56	70	J	F	76	66	48	43	R	A	A	A	
22	A	A	U	R	S	A	S	B	A	B	B	B	B	B	U	R	39	36	B	R	F	R	Y	Y	A	
23	U	S	F	A	A	S	R	R	R	S	32	36	40	39	41	A	J	R	45	37	30	22	17	B	A	
24	A	A	A	B	B	B	B	A	A	B	B	R	B	B	B	B	U	R	U	R	R	B	B	B	A	
25	B	A	A	A	A	A	A	26	B	B	R	42	42	45	45	52	48	35	27	B	B	A	B	A	A	
26	A	A	A	A	A	A	R	B	R	27	32	41	R	62	55	55	47	38	23	20	R	U	R	B	U	
27	A	A	A	A	R	B	B	B	R	23	33	42	52	59	60	73	59	43	29	R	B	B	B	A	A	
28	A	A	A	A	A	R	F	R	R	S	36	44	51	58	70	64	61	35	30	B	B	14	B	B	B	
29	A	S	A	A	A	U	R	R	B	S	37	44	51	J	R	F	58	47	43	36	22	J	R	U	R	
30	A	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	3	1	1	1	1	2	3	5	8	13	18	15	18	18	17	22	20	21	13	10	5	2	1			
MED	37	36	36	39	17	29	27	32	30	37	42	45	46	50	54	49	44	37	29	23	17	18	17			
U Q	41						U	R	28	36	34	40	43	51	52	56	60	53	48	43	37	27	30			
L Q	U	S					F	R	21	26	27	34	39	41	45	46	48	46	38	30	24	17	14			

APR. 1997 foF2 (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1997 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	38	47	41	42	49	41	99	B	30	26	E B	23	32	E B	E B	E B	E B	E B	E B	E B	14	14	12	12	27				
2	39	71	41	41	47		28	B	B		E B	B		E B	E B	E B	E B	E B	E B	B		27	32	38	33				
3	32	37		B	B		36	37	B	B	B	E B	E B	E B	E B		E B	E B	E B	E B	E B	E B	E B	B	27				
4		B			B	B	B		B		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B				
5	38		B	70	B	B	B		B	B	B		E B	B	B	B	B	B	B	E B	B	B	B	B	14				
6	32		B	77		B	46	47	26	E B	E B	E B	B	C	B	B	E B	B	B	B	B		27		17	27			
7	26	36		B	47		B	B	B		28	24	24			25	24	24	24	24			37		B				
8	26	46	37	49	42	39	52	32	42	29	24	24	24	24	25	25	24		E B	E B	B	B	B		22	41			
9	46		B	B		41	67	59	51	41			25	35	25	24	24	24	18	14		B	B	27	32	32			
10	32	42	110	37		42	59	32	E B	B	E B		B	B	B	B	E B	E B	E B	E B	B		12	37	48				
11	120	71	59	51	59	52		B	B		B	B	B	B	B	B		E B	E B	E B		23	24	26	35	33	37	30	33
12	29	31	67	48	33			B			E B	E B	E B	E B	B	E B	B		E B	E B	B	B	B	B					16
13	32	31	32	33	41	32	59		B	37	24	24	24	23	24	31	30	20	16	24	24		B	B	B				32
14	32	33		B	59	71		31	30		B	E S	38	24	23	26	24	23	23	15	15		B	B	B	B			B
15		B						B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	B	B	B	B				B
16	B	13	16	17	16	16		B	18	20	25	25	24	25	25	25	24	24	25	23	26								
17		B		B	B	B	B		E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	B		12	59	59	59	70			
18	44		B	41		B	36	48	51		37	B	B	B	B	B	B	B	B	23	16	32		35	90				
19	42		B		35			B	69	34		B	B	B	B	B	B	B	B	B		16	16	31	42	50			
20		B	41	37	28			B	41		B	B	C	C	C	C	C	C	E B			30	17	16	42				C
21	38	32	40	46	28	32	27		B	B	C	C	C	C	C	C	E B	23	17	14			C	C	C	C			
22	C	C	C	C	C	C	C	C	C	C		E B	E B	E B	E B	E B	E B	E B	E B	E B									
23											14	23	22	24	26	24	26	24	38	24	34	89	81	59	92				
24	46	51	38	37	31	34		B		B	B	B	B	B	E B	E B	E B	E B	E B	E B	24	14	17	41	39				
25	37	39	34	46	25	32	41	36	29	29	17	34	58	32	46	20	38	34	E B	11	13	B	26	34	45				
26	59	38	37		B	B	B	46	38		B	26			B	B	B	E B	25	24	12	12		B					31
27		B									E B	E B	E B	E B	E B	E B	E B	E B	E B	B	B		B	27	41				
28		41	41	39	40	46	37	17			34	23	25	23	24	17	16	27				33		27	41				
29	36	49	44	46	41	30	E B	26	E B	E B	E B	E B	17	20	24	19	23	27	15	13	E B	9	E B	E B	9	31			
30	42	46	35	32	14		B	B	E B	13	14	17	19	19	18	19	E B	19	E B	B	B	B	B	B	30	24			
31	27	68	45	46	37	21	17	E B	11	13	16	23	20	20	19	27	E B	E B	E B	E B	B	B		B	B	B			
32	27	68	45	46	37	21	17	E B	11	13	16	23	20	20	19	27	E B	E B	E B	E B	B	B		B	B	B			
33	45	38	38	44	34	32	16	31		E B	B	E B		E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	B	39	16			
34		B		B			B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	27	33			
35	27		26		37	38																							
36																													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	24	22	23	21	18	18	18	14	16	16	19	19	19	18	18	22	20	23	15	16	15	13	19	24					
MED	38	40	40	42	38	36	41	34	24	24	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	14	27	27	32	33				
U Q	43	47	45	46	47	42	51	41	36	28	E B	25	27	25	25	24	24	24	E B		23	33	37	39	44				
L Q	32	33	35	36	31	32	28	30	E B	18	18	23	E B	23	23	23	24	19	20	18	14	13	13	14	22	27			

APR. 1997 ftes (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1997 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	14	13	23	24	17	24	23	B	23	19	23	18	25	24	24	24	24	23	14	14	10	9	8	11
2	9	15	21	23	14	B	24	B	B	B	31	B	29	25	24	24	24	24	B	B	23	10	9	13
3	14	16	B	B	B	23	24	B	B	B	B	24	26	25	B	24	24	23	19	16	13	11	B	12
4	B	14	23	B	B	B	21	B	23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	9	B	19	B	B	B	23	B	B	B	24	23	24	B	B	B	B	B	B	14	B	B	B	9
6	12	B	19	B	B	24	21	16	20	23	24	C	B	B	B	39	B	B	B	B	16	B	13	12
7	12	12	B	20	B	B	B	B	20	24	24	B	B	23	24	24	24	24	B	B	B	10	B	B
8	11	19	35	23	35	24	23	15	18	24	24	24	19	25	25	24	24	24	B	B	B	14	10	
9	11	B	B	30	24	23	16	14	B	B	B	25	35	25	24	24	24	18	14	B	B	16	11	9
10	24	19	24	23	B	24	15	14	18	14	24	18	18	15	24	14	24	14	14	13	B	9	8	15
11	11	14	24	24	23	24	B	B	B	B	B	B	B	B	B	B	23	24	15	8	8	8	9	11
12	19	7	23	15	16	B	B	B	15	19	24	24	27	B	B	39	B	24	B	B	B	B	B	9
13	9	9	12	15	15	24	19	B	24	24	24	22	23	24	31	30	20	14	24	24	B	B	B	7
14	24	23	B	23	23	23	23	15	B	B	38	23	23	20	24	23	23	15	15	B	B	B	B	B
15	B	9	14	9	14	14	B	B	18	20	25	25	24	25	25	24	24	25	23	26	B	B	B	B
16	B	B	B	B	B	B	B	B	19	23	23	24	24	24	24	19	14	15	B	9	14	15	10	30
17	21	B	23	B	B	24	24	35	B	24	B	B	B	B	B	B	B	B	23	12	12	B	12	24
18	23	B	B	14	B	B	B	25	24	B	B	B	B	B	B	B	B	B	B	14	11	9	10	15
19	B	23	24	24	B	B	B	24	B	B	B	B	B	B	B	B	B	B	B	B	15	13	9	9
20	15	21	24	23	16	16	12	B	B	C	C	C	C	C	C	23	11	12	B	B	C	C	C	C
21	C	C	C	C	C	C	C	C	C	12	23	22	24	26	24	20	24	38	24	13	16	16	15	19
22	18	21	16	23	12	16	B	24	B	B	B	B	B	B	25	26	B	24	23	13	13	7	13	14
23	19	11	12	21	12	16	19	7	13	12	15	19	16	16	15	15	14	12	11	12	B	9	12	16
24	15	19	19	B	B	B	B	24	30	B	B	24	B	B	B	B	25	24	12	12	B	B	B	8
25	B	23	23	30	31	16	24	13	B	B	34	23	25	23	24	15	15	15	B	B	9	11	12	
26	15	24	24	21	19	13	26	B	20	24	23	23	13	16	16	19	23	12	12	12	9	B	9	6
27	8	12	12	11	12	B	B	B	13	12	15	14	14	7	17	18	7	23	B	B	B	B	9	6
28	12	14	17	12	10	12	9	11	7	12	23	20	14	15	15	17	16	14	B	B	7	B	B	B
29	9	10	11	8	9	9	9	24	B	23	17	23	23	23	23	18	15	18	13	11	11	B	15	9
30	9	B	19	B	30	30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	20	26
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	29	28	29	29	29	30	30	30	30	30	29	29	29	29
MED	15	19	23	23	24	24	24	B	24	24	24	24	25	25	25	24	24	24	B	25	23	B	13	12
U Q	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
L Q	24	30															38							25
	11	12	18	18	14	16	20	16	18	20	23	22	23	23	24	19	20	15	15	13	12	10	10	9

APR. 1997 fmin (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1997 h'F (KM)

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

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

D\H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	A	A	A	A	A	E A 250	B	A	E A 255	215	245	220	220	230	235	245	230	220	220	240	300		Y	A
2	A	A	A	A	A	B	A	B	B	B	E B 300	B	E B 245	210	225	240	240	E B 270	B	B	B	A	A	A	A
3	A	A	B	B	B	A	A	B	B	B	B		200	220	215		240	240	230	225	240	E B 255	E B 275	B	A
4	B	A	A	B	B	B	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	A	B	A	B	B	B	A	B	B	B	A	A			B	B	B	B	B	E B 250	B	B	B	B	Y
6	E B 260	B	A	B	B	A	A	A	E B 270	245	240		C	B	B	E B 270	B	B	B	B	A	B	Y	A	A
7	A	A	B	A	B	B	B	B	A	E B 250	E B 250	B	B	E B 250	E B 235	235	230		B	B	B	A	B	B	B
8	A	A	A	A	A	A	A	A	A	B	B		E A 240	225	245	230	235	235		220		B	B	A	A
9	A	B	B	A	A	A	A	A	B	B	B		240	280	240	240	240	230	210	220		B	A	A	A
10	A	A	A	A	B	A	A	A	E A 250	270	250	240	215	230	215	245	215	210	215	230	210		Y	A	A
11	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	E B 270	275	255	255		A	A	A
12	250	A	A	A	A	B	B	B		E A 255	260	240	240	250		E B 250	B	E B 255	B	B	B	B	B	B	Y
13	A	A	A	E A 255	A	A	A	B		A	E B 260	230	240	200	205	255	240	215	240	255	270		B	B	A
14	A	A	B	A	A	B	A	A	B	B	S		230	220	215	230	225	210	205	205		B	B	B	B
15	B	Y	Y	Y	Y	Y	B		E B 250	B 240	B 240	B 240	B 240	B 225	E B 250	225	205	230		230		B	B	B	B
16	B	B	B	B	B	B	B	B		240	240	220	220	230	230	205	210	205	210		Y	A	A	A	A
17	A	B	A	B	B	A	A	A	B	A	B	B	B	B	B	B	B	B	E B 280	A	A	B	A	A	A
18	A	B	B	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	Y	Y	A	A	A	A
19	B	A	A	Y	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	A	Y	Y	A	A
20	A	A	A	A	A	A	A	B	B	C	C	C	C	C	C		205	205	200		B	B	C	C	C
21	C	C	C	C	C	C	C	C	C		235	230	205	210	240	245	230	230	E B 280	205	A	A	A	A	A
22	A	A		A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	A	Y	Y	A	A
23	E A 260	A	A	A	A	A		A	A	A	E A 255	E A 250	A	A	A		230	235	E A 250	225	E B 250	B	A	A	A
24	A	A	A	B	B	B	B	A	A	B	B	A	B	B	B		BE 245	BE 280	BE 235	E B 270	B	B	B	B	A
25	B	A	A	A	A	A	A	A	B	BE 255	B 225	230	220	210	205	205	230		B	B	A	B	A	A	A
26	A	A	A	A	A	A	B	B	BE 255	B 235	210	215	210	205	200	200		A	205	235	200	B	245	A	A
27	A	A	A	A	A	B	B	B	255	200	230	220	210	205	205	200	200	220		B	B	B	A	A	A
28	A	A	A	A	A	A	A	BE 270	B 235	235	220	220	220	210	200	200	200		B	B		245	B	B	B
29	A	250	A	A	A	A	A	A	BE 250	B 235	225	210	220	200	200	205	200	210	225	220		B	A	A	A
30	A	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	3	1	1	1			2	1	7	13	17	17	18	18	16	21	19	21	13	11	6	2	1		
MED	E 260	250	200	E A 255			188	250	A 255	242	235	222	216	220	220	228	210	220	222	230	236	288	245		
U Q	E B 260								E B 270	E B 255	E B 245	240	E B 240	BE 230	BE 245	240		E B 235	E B 252	E B 245	E B 255	255			
L Q	250								250	238	230	218	210	215	208	205	205	210	208	225	220				

APR. 1997 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1997 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A
2		A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3		B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
4		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B
5		A	A	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
6		A	B	B	B	B	B	B	B	B	O	X	B	B	A	A	B	B	B	B	B	B	B	B	B
7		B	B	B	B	B	B	B	B	B	B	B	X	62	X	X	O	X	B	B	B	B	B	B	B
8		B	B	B	B	A	B	B	B	B	B	B	B	O	X	X	X	O	X	B	B	B	B	B	B
9		B	B	A	B	B	B	B	B	B	B	B	B	O	X	O	X	O	X	B	B	B	B	B	B
10		B	B	O	X	B	Y	B		B	B	B	B	B	O	X	X	X	X	B	B	B	B	B	B
11		A	A	B	B	B	B	B	Y	X	B	B	B	B	B	B	B	X	X	B	B	B	B	B	B
12		B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13		B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B
14		B	B	B	B	B	B	B	B	B	B	X	O	X	X	O	X	O	X	B	B	B	B	A	A
15		A	A	B	B	B	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16		A	B	B	B	B	B	B	B	B	B	B	B	B	B	X	B	B	B	B	B	A	B	A	A
17		O	X	X	B	B	B	B	B	B	B	Y	B	S	B	R	B	B	B	B	B	B	A	A	O
18		A	B	B	B	B	B	B	B	B	B	Y	O	X	B	B	B	B	B	B	B	B	B	B	B
19		B	B	A	B	B	S	B	B	B	B	O	X	R	R	B	R	B	B	B	B	B	B	B	B
20		B	B	B	B	B	B	B	B	B	B	B	B	B	X	B	X	B	R	B	B	B	B	B	B
21		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
22		A	B	B	B	B	B	B	B	B	B	O	X	O	X	O	X	X	29	Y	Y	B	B	Y	Y
23		Y	A	A	X	A	Y	B	B	A	B	O	X	O	X	X	O	X	Y	Y	B	B	B	B	B
24		B	B	B	Y	Y	B	B	B	B	B	39	48	51	53	53	49	38	B	B	B	Y	A	A	A
25		A	A	A		R	B	B	B	B	B	B	B	O	X	X	B	39	B	B	B	B	B	B	B
26		Y	R	R	S	Y	O	X	Y	Y	R	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29		C	C	C	C	C	C	C	C	C	C	C	C	O	X	O	X	O	X	B	B	B	B	B	B
30		A	A	A	A	A	A	A	A	A	33	42	47	49	48	48	43	B	B	B	B	B	B	Y	Y
31		A	A	A	A	B	A	A	O	X	O	X	B	S	O	X	O	X	B	Y	B	B	B	R	Y
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		1	1	1	2		1	1	1	2	2	7	8	11	13	12	12	4						1	1
MED		O	X	X	O	X	O	X	O	X	X	O	X	O	X	O	X	X	X					O	X
U Q		49	54	59	54		35	39	35	35	30	O	X	O	X	O	X	X	X					81	45
L Q												O	X	O	X	O	X	O	X						

MAY 1997 f_{XI} (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1997 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	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A
2	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B
5	A	A	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
6	A	B	B	B	B	B	B	B	B	B	R	B	B	A	A	B	B	B	B	B	B	B	B	B
7	B	B	B	B	B	B	B	B	B	B	B	B	56	58	56	55	B	B	B	B	B	B	B	B
8	B	B	B	B	A	B	B	B	B	B	B	B	57	57	52	52	B	B	B	B	B	B	B	B
9	B	B	A	B	B	B	B	B	B	B	B	B	57	58	57	B	B	B	B	B	B	B	B	B
10	B	B	D	R	B	Y	B	F	B	B	B	B	B	R	J	R	J	R	B	B	B	B	B	B
11	A	A	B	B	B	B	B	Y	34	B	B	B	B	B	B	B	43	37	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	B	B	J	R	R	R	B	B	B	B	B	A	A	A
15	A	A	B	B	B	B	B	B	A	A	B	B	35	49	50	40	37	39	B	B	B	B	B	B
16	A	B	B	B	B	B	B	B	B	B	B	B	B	B	J	R	B	B	B	B	B	A	B	A
17	R	J	R	B	B	B	B	B	B	B	Y	B	S	B	D	R	40	B	B	B	B	B	A	A
18	A	B	B	B	B	B	B	B	B	B	Y	B	B	B	B	B	B	B	B	B	B	B	B	B
19	B	B	A	B	B	S	B	B	B	B	R	R	R	R	B	R	B	B	B	B	B	B	B	B
20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	J	R	R	B	B	B	B	B
21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
22	A	B	B	B	B	B	B	B	B	B	U	R	R	R	R	J	R	F	Y	Y	B	B	Y	Y
23	Y	A	A	A	A	Y	B	B	A	F	R	R	41	43	47	46	44	40	Y	Y	B	B	B	B
24	B	B	B	Y	Y	B	B	B	B	B	F	R	40	40	49	47	42	38	R	B	B	B	Y	A
25	A	A	A	S	R	B	B	B	B	B	B	B	29	42	45	47	47	43	32	B	B	B	B	B
26	Y	R	R	S	Y	R	Y	Y	R	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	F	U	R	R	R	B	B	B	B	B	B
30	A	A	A	A	A	A	A	A	A	F	R	R	U	R	R	R	R	B	B	B	B	B	B	Y
31	A	A	A	A	B	A	A	R	29	24	B	S	R	43	45	U	R	J	R	B	Y	B	B	R
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1	1	1	1		1	1	1	2	2	7	8	11	13	13	12	4							1
MED	43	48	53	30		29	29	29	29	16	40	42	47	47	46	40	34							39
U Q											46	46	57	56	54	44	36							
L Q											33	40	43	46	40	38	26							

MAY 1997 foF2 (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1997 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	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	37	B	37	53	
2	56		B	B	B	53	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
3	B	56		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	27	26	26	
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	27	B	B	
5	56	52		B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	33	
6	31		B	B	B	B	B	B	B	B	BE	B	B		57	60		B	B	B	B	B	B	B	
7	B	B	B	B	B	B	B	B	B	B	B	BE	BE	BE	BE	B	B	B	B	B	B	B	B	B	
8	B	B	B	B		36	B	B	B	B	B	B	BE	BE	BE	BE	B	B	B	B	B	B	B	B	
9	B	B		B	B	B	B	B	B	B	B	B	BE	BE	BE	BE	B	B	B	B	B	B	B	B	
10	B	B		B		BE	B	B	B	B	B	B	B	BE	BE	BE	BE	B	B	B	B	B	B	B	
11	35	36		B	B	B	B		31	36		B	B	B	B	BE	BE	B	B	B	B	B	B	B	
12	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
13	B	B	B	B	B	B	B	B	B	B	B			B	B	B	B	B	B	B	B	B	B	B	
14	B	B	B	B	B	B	B	B	B	B	BE	BE	BE	BE	BE	BE	B	B	B	B	B	BE	B		
15	37	38		B	B	B	B	B		56	36		B	B	B	B	B	B	B	B	B	B		32	
16	56		B	B	B	B	B	B	B	B	B	B			33						33		32	54	
17	31	34		B	B	B	B	B	B	B	BE	B	BE	B	BE	B	B	B	B	B	B	B	34	37	26
18	31		B	B	B	B	B	B	B	B	B	26	30		B	B	B	B	B	B	B	B	B	B	
19	B	B		B	B		B	B	B	B	BE	BE	BE	B	BE	B	B	B	B	B	B	B	B	B	
20	B	B	B	B	B	B	B	B	B	B	B	B	B	BE	B	BE	BE	B	B	B	B	B	B	B	
21	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		B	B	B	B	B	B	B	B	B	BE	BE	B		BE	BE	B				B	B		B	
23	34										24	24	36	30	24	11	12	12	13		B	B	12	11	B
24	14	32	31	31	68	12			41	22	16	19	19	16	20	16	15	13							
25	42	41	69	41	33		B	B	B	B	B	B	BE	BE	B	BE	B	B	B	B	B	B	B	B	17
26	16	30	26	26	16	BE	24	16	17	29		C	C	C	C	C	C	C	C	C	C	C	C	C	
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
29	C	C	C	C	C	C	C	C	C	C	C	C	CE	BE	B	BE	B	B	B	B	B	B	B	B	
30	31	30	52	41	42	42	41	39	34	25	17	BE	BE	BE	BE	BE	B		B	B	B	B	B	16	34
31	41	41	42	41		41	31	25	13		B	BE	BE	BE	BE	BE	B	B		B	B	B	25	17	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	14	10	8	6	8	5	4	4	6	3	10	10	13	14	15	12	6	3	1		3	7	10	10	
MED	34	37	36	36	36	27	28	28	35	25	24	25	24	28	24	22	16	13	13		33	27	32	32	
U Q	42	41	47	41	48	42	36	35	41	36	25	30	42	49	49	24	24	17				37	34	37	52
L Q	31	32	31	26	24	18	20	21	29	22	17	BE	24	24	19	19	16	14	12			20	24	17	26

MAY 1997 ftEs (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1997 fmin (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

D\H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19	B	30	24
2	24		B	B	B	51	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	24	13	24
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	16	B	B
5	34	24		B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	14
6	24		B	B	B	B	B	B	B	B	25		B	51	24		B	B	B	B	B	B	B	B
7	B	B	B	B	B	B	B	B	B	B	B	36	50	49	50		B	B	B	B	B	B	B	B
8	B	B	B	B	25	B	B	B	B	B	B	B	49	49	49	24		B	B	B	B	B	B	B
9	B	B	24	B	B	B	B	B	B	B	B	B	50	50	50		B	B	B	B	B	B	B	B
10	B	B	24	B	26	B	24	B	B	B	B	B	B	25	24	24	24		B	B	B	B	B	B
11	14	24		B	B	B	B	24	26		B	B	B	B	B	23	24		B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	B	B	B	B	10		B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	24	26	26	26	24	24		B	B	B	B	24	18	24
15	24	24		B	B	B	B	B	34	24		B	B	B	B	B	B	B	B	B	B	B	24	B
16	24		B	B	B	B	B	B	B	B	B	B		33		B	B	B	B	B	15	24	24	
17	25	25		B	B	B	B	B	B	B	24		24	B	37		B	B	B	B	B	24	25	24
18	24		B	B	B	B	B	B	B	B	25	30		B	B	B	B	B	B	B	B	B	B	B
19	B	B	33	B	B	24		B	B	B	24	24	36		23		B	B	B	B	B	B	B	B
20	B	B	B	B	B	B	B	B	B	B	B	B	B	33		21	17		B	B	B	B	B	B
21	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	14		B	B	B	B	B	B	B	B	24	24	27	30	24	9	9	9	10		B	10	8	B
23	9	9	7	8	8	7		B	B	24	7	13	19	14	14	14	16	13	11		B	B	B	B
24	B	B	B		9	9	B	B	B	B	10	16	14	14	14	24	14		B	B	7	9	9	10
25	14	24	9	24	24		B	B	B	B	B	B	24	33		21		B	B	B	B	B	B	14
26	14	9	9	9	9	24	9	14	7		C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C		24	23	15	22		B	B	B	B	B	B
30	11	10	25	15	24	23	14	19	10	9	9	24	23	19	14	9		B	B	B	B	B	9	24
31	14	24	24	23	B	13	13	16	10		B	24	26	24	19	19	16		B		B	B	15	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	28	28	28	28	28	28	28	28	27	26	27	27	28	28	28	28	28	28	28	28	28	28	28	28
MED	B	B	B	B	B	B	B	B	B	B	B	B	B	B	50	B	B	B	B	B	B	B	B	B
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	19	24	29		38		B	B	B	B	24	26	25	28	24	22		B	B	B	B	B	24	24

MAY 1997 fmin (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1997 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

D ^H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	A
2	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B
5	A	A	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
6	A	B	B	B	B	B	B	B	B	B	210	B	B	A	A	B	B	B	B	B	B	B	B	B
7	B	B	B	B	B	B	B	B	B	B	B	245	250	240	245	B	B	B	B	B	B	B	B	B
8	B	B	B	B	A	B	B	B	B	B	B	B	255	240	245	200	B	B	B	B	B	B	B	B
9	B	B	A	B	B	B	B	B	B	B	B	B	280	250	260	B	B	B	B	B	B	B	B	B
10	B	B	240	B	A	B	B	B	B	B	B	B	210	210	205	205	B	B	B	B	B	B	B	B
11	A	A	B	B	B	B	B	A	A	B	B	B	B	B	B	205	205	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	210	215	200	215	200	200	B	B	B	B	B	37	A	A
15	A	A	B	B	B	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	B
16	A	B	B	B	B	B	B	B	B	B	B	B	B	B	230	B	B	B	B	B	B	A	B	A
17	A	A	B	B	B	B	B	B	B	B	260	B	A	B	260	B	B	B	B	B	B	A	A	A
18	A	B	B	B	B	B	B	B	B	B	A	245	B	B	B	B	B	B	B	B	B	B	B	B
19	B	B	A	B	B	A	B	B	B	B	250	210	215	205	B	B	B	B	B	B	B	B	B	B
20	B	B	B	B	B	B	B	B	B	B	B	B	210	200	205	B	B	B	B	B	B	B	B	B
21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
22	A	B	B	B	B	B	B	B	B	B	250	210	230	220	205	200	200	Y	Y	B	B	Y	Y	B
23	Y	A	A	A	A	Y	B	B	A	E	255	225	230	215	205	200	200	Y	Y	B	B	B	B	B
24	B	B	B	Y	Y	B	B	B	B	B	210	205	205	225	205	210	200	B	B	B	Y	A	A	A
25	A	A	A	S	A	B	B	B	B	B	B	B	245	230	250	B	B	B	B	B	B	B	B	Y
26	Y	A	A	A	Y	B	Y	Y	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	215	200	205	230	B	B	B	B	B	B	B	B
30	A	A	A	A	A	A	A	A	A	A	250	230	205	210	200	215	B	B	B	B	B	B	Y	A
31	A	A	A	A	B	A	A	A	S	B	250	240	210	215	200	B	Y	B	B	B	B	A	Y	Y
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT			1							1	8	9	12	13	14	12	5					1		
MED			240							E	255	238	222	216	212	206	201	205				37		
U Q										E	250	245	248	235	245	212	205							
L Q											210	210	210	210	205	200	200							

MAY 1997 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1997 f_{xi} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

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

JUN. 1997 f_{xi} (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN.1997 foF2 (0.1MHz)

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

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

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

JUN.1997 foF2 (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1997 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	82	B	41	B	57	B	42	41	27	13		B	B	B	E	B	B	B	B	B	B	14	41	41
2		B	41	B	37	41	39		31	18	17	26	17	41	16	13	13	10		B	B	B	B	35
3	32	41		B	41	42	B	B	42	41		B	B	B	B	B	B	B	B	B	B	B	B	30
4	34	41	20	20		B	37	52	40				B	E	B	E	B	B	B	B	B	13	31	31
5	36	41	46	51	51	40	30		B	B	B	28	26		B	B	B	B	B	28	29	53	33	34
6	32	36	41		B	42		51	41	37	16	26	20		B	E	B	E	B	B	B	B	B	32
7	38	70	41	40	41	42		B	B	B		B	B	E	B	E	B	E	B	B	B	37	31	41
8	41	39	41	38	17	14	14	16	17	26		B	B	B	B	B	B	B	B	42	42	51	51	42
9	59	59	101		B	34	B	B	29		B	B	B	B	B	B	B	B		B	42	42	41	51
10	51	51	42	42	34	30	41	41		41		B	B	B	B	27	21	31		B	B	26	16	26
11	26	17	31	42	41	40	31	30	30	16		B	E	B	E	B	19	19	36	29	40	41	31	B
12		B	36	34	41		B	39	29	15	16	25	13	13	16	17	26	13		B	B	B	B	B
13		B	41	18	32	34	29	E	B	17	27	13	59	13	17	51	17	37	53	41		42	38	20
14	27	36	32	41	33	20	16		B	27	34	17	27	41	41	16	26	26	41	59	36	B	B	B
15	30	14	30		B	36	53		41	42	42	31	21	17	17	11	13	E	B	B	B	B	B	26
16	40	34	42	36	41	32	32	52	32	31	26	16	14	14	19	30		B	B	B	16	14	42	41
17	35	51	57	32	24	30	31	19	11		B	E	B	E	B	E	B	B	B	B	B	B	B	B
18	31	41	23	31	70	58	41		B	78	87	70	40	17	24	29	B	B	B	B	B	B	B	B
19		B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C
20		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B
24		B	B		B	B	B	B	B	B	B	B	B	C	C	C	C	B	B	B	B	B	B	B
25		B	B	B		B	33	34	41		B	E	B	E	B	B	B	B	B	B	B	B	B	30
26																								
27																								
28																								
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	16	18	18	16	17	16	14	15	13	13	10	13	11	15	15	12	6	5	4	5	6	10	9	13
MED	36	41	38	38	41	35	32	40	27	30	26	19	20	19	22	17	28	40	38	30	42	31	41	35
U Q	41	41	42	41	42	40	41	41	39	42	28	26	41	26	29	28	31	41	50	39	42	38	42	42
L Q	32	36	31	32	34	30	29	27	16	16	17	17	17	17	15	13	13	17	31	22	41	14	30	28

JUN. 1997 ftEs (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1997 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	19	B	25	B	19	B	19	23	14	9	B	B	B	24	20	23	B	B	B	B	B	11	7	19
2	B	24	B	16	16	13	B	24	14	12	13	15	19	16	10	7	7	B	B	B	B	B	B	9
3	10	24	B	24	24	B	B	25	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	9
4	8	10	14	14	B	24	16	14	B	B	B	24	24	19	15	10	B	B	B	B	B	7	8	9
5	11	15	14	23	15	14	27	B	B	B	16	24	B	B	B	B	B	B	21	17	12	24	15	B
6	9	10	16	B	23	B	23	14	11	10	20	20	B	26	23	11	11	10	B	B	B	B	B	9
7	16	14	24	13	14	30	B	B	B	24	B	B	23	21	24	B	B	B	B	B	19	14	9	11
8	26	24	24	15	14	9	7	9	9	10	B	B	B	B	B	B	B	B	B	15	8	14	19	23
9	15	16	16	B	24	B	B	26	B	B	B	B	B	B	B	B	B	23	24	B	9	8	9	11
10	13	15	24	19	13	14	20	19	B	36	B	B	B	B	23	15	28	B	B	B	B	8	11	8
11	14	11	13	12	23	25	14	14	10	13	B	19	19	14	13	14	B	19	16	14	14	8	B	B
12	B	9	8	19	B	14	14	8	9	9	13	11	8	9	7	13	B	B	B	B	B	B	B	B
13	B	12	12	12	13	9	17	13	11	14	13	13	14	14	9	9	9	B	B	B	9	9	B	9
14	9	9	8	9	8	8	9	B	10	9	9	7	8	8	8	8	9	8	8	13	B	B	B	B
15	9	11	8	B	10	24	B	25	24	18	15	14	11	12	9	13	B	B	B	B	B	B	B	10
16	9	14	15	9	11	8	9	24	14	16	9	13	8	9	19	14	B	B	B	13	B	8	9	12
17	23	11	11	7	8	9	9	9	9	B	B	26	26	12	15	16	14	13	B	B	B	B	B	B
18	11	12	7	9	12	12	9	B	24	21	15	12	13	24	26	B	B	B	B	B	B	B	B	B
19	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B
24	B	B	21	20	B	B	B	B	B	B	B	B	C	C	C	C	B	B	B	B	B	B	B	B
25	B	B	B	21	B	21	21	22	B	B	22	22	B	23	21	B	B	B	B	B	B	B	23	21
26	21	21	23	B	24	21	B	B	B	B	B	B	B	23	B	B	B	B	B	B	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	22	22	22	22	22	22	22	22	22	22	21	20	20	20	21	22	22	21	20	20	21	21	21
MED	18	14	16	19	18	21	20	24	24	22	B	24	25	22	20	16	B	B	B	B	B	B	B	19
U Q	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
L Q	10	11	12	12	13	12	14	14	11	12	15	14	14	13	12	12	28	B	B	B	16	8	10	9

JUN. 1997 fmin (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1997 h'F (KM)

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A	B	A	B	A	B	A	A	A	A	B	B	BE	B	A		B	B	B	B	B	Y	A	A	
2	B	A	B	A	A	A	B	A	A	AE	A							B	B	B	B	B	B	A	
3	A	A	B	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	
4	A	A	A	A	B	A	A	A	B	B	BE	B					B	B	B	B	B	Y	A	A	
5	210	240	A	A	A	A	A	B	B	B	A		B	B	B	B	B	B	A	A	A	A	A	B	
6	A	245	A	B	A	B	A	A	A	A	AE	B		B			E	BE	B	B	B	B	B	A	
7	A	A	A	A	A	A	B	B	B	A	B	B					B	B	B	B	B	A	A	A	
8	A	A	A	A	A	Y	Y	Y	Y	A	B	B	B	B	B	B	B	B	B	A	A	A	A	A	
9	A	A	A	B	A	B	B	A	B	B	B	B	B	B	B	B	B	AE	A	B	A	A	A	A	
10	A	A	A	A	A		A	A	B	A	B	B	B	B		E	A	A	B	B	B	A	A	A	
11	A	Y	A	A	A	A	A	A	A	Y	B		220	215	235	235	A	B	A	A	A	A	A	B	B
12	B	A	A	A	B	A	A	A	A	A		250	220	225	215	200	215	B	B	B	B	B	B	B	
13	B	A	Y	A	A	A	B	A	Y	AE	B						A	A	B	B	B	A	A	B	
14	A	A	A	A	A	A	A	B	A	AE	A							A	A	A	A	B	B	B	
15	A	Y	A	B	A	A	B	A	A	A	AE	A					B	B	B	B	B	B	B	A	
16	A	A	A	A	A	A	A	A	A	A	A		200	220	200	210	200	B	B	B	Y	B	Y	A	
17	A	A	A	A	A	A	A	Y	Y	B	BE	BE	B				A	A	B	B	B	B	B	B	
18	A	A	A	A	A	A	A	B	A	A	A		290	255	230	215	245	B	B	B	B	B	B	B	
19	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	
24	B	B	A	A	B	B	B	B	B	B	B	B	C	C	C	C	B	B	B	B	B	B	B	B	
25	B	B	B	A	B	A	A	A	B	B	BE	B	BE	B			B	B	B	B	B	B	B	A	
26	A	A	A	B	A	A	B	B	B	B	B	B	B	A	B	B	B	B	B	C	C	C	C	C	
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	1	2				1					4	13	11	14	14	10	2	1	1						
MED	210	242				200					E	252	222	220	212	208	211	230	E	BE	A				
U Q											E	E	262	245	235	235	215	220							
L Q											250	220	210	205	200	205									

JUN. 1997 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 1997 fXI (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	A	A	A	A	A	A	A	B	B	B	B	B	R	A	B	B	B	B	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	Y	B	B	B	B	B	A	B	B	B	B	B	R	B	O	X	B	B	B	B	B	B	B	B
9	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	R	B	A
10	B	R	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
11	A	B	A	B	A	A	A	R	B	B	B	R	X	A	R	B	B	A	B	B	B	B	B	B
12	B	B	A	A	B	B	R	B	B	B	B	O	X	O	X	B	B	B	B	B	B	B	B	B
13	B	B	A	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	A	A	A	A	B	B	A	A	A	B	B	O	X	O	X	B	B	B	B	B	B	B	B
15	B	B	B	B	B	A	B	A	B	B	B	O	X	B	B	B	B	B	B	B	B	B	B	B
16	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
18	B	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	B	B	A	B	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
20	A	A	A	B	B	B	A	R	B	B	B	B	B	B	R	B	B	B	B	B	B	B	B	B
21	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
22	A	B	B	B	B	B	B	B	B	B	O	X	R	O	X	O	X	B	B	B	B	B	A	B
23	B	B	A	A	A	A	A	A	B	B	O	X	B	O	X	O	X	B	B	B	B	A	B	B
24	A	A	A	A	A	A	A	B	B	B	B	O	X	B	B	B	B	B	B	B	B	B	A	X
25	B	A	B	A	B	A	A	B	B	B	B	O	X	O	X	O	X	R	O	X	B	B	B	B
26	A	A	A	A	B	B	B	B	B	B	B	B	O	X	B	O	X	O	X	B	B	B	B	B
27	A	A	A	A	A	A	A	B	B	B	B	O	X	O	X	O	X	B	O	X	B	B	B	B
28	B	A	A	A	A	A	B	B	B	B	R	B	B	B	B	B	O	X	B	B	B	B	B	B
29	B	B	A	A	B	A	B	B	B	B	B	B	O	X	B	A	O	X	O	X	B	B	B	B
30	A	A	A	A	A	A	B	B	B	B	O	X	O	X	R	X	O	X	X	X	B	B	B	B
31	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT												3	7	8	6	7	8	2	1					1
MED												0	X	O	X	O	X	X	X					X
U Q												35	40	45	43	41	41	38	35					31
L Q												0	X	O	X	O	X	X	X					
												34	37	43	42	39	40							

JUL. 1997 fXI (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL.1997 foF2 (0.1MHz)

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

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

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

JUL.1997 foF2 (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL.1997 ftEs (0.1MHz)

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	32	31	33	34	40	41	35																	
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	23	B	B	B	B	B		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9	B	B		31	40			B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
10	B	25	41		B	B	36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11	32	B	36		41	39	37	24		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	32	32		B	31		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B			B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	27	29	31	37		37	29	37	34		B	B	B	B	B	B	B	B	B	B	B	B	B
15	B	B	B			31		33																
16	33	71	41	70	33	41	37	32		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17	B	B	32		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
18	B	43	47	41	41	58		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	B	B			36	37			38		B	B	B	B	B	B	B	B	B	B	B	B	B	B
20	40	41	32		B	B	34	27		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
21	B	B	B		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
22	30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
23	B		27	26	36	31	29	29		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
24	30	51	41	37	34	29	28		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
25	B	30		41		31	36		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
26	27	31	27	40		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
27	31	36	36	36	30	36	35		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
28	B	31	25	41	40	32		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
29	B	B			B	37		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	29	32	30	31	34	41		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31	28	79	39	41		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
CNT	11	13	20	16	11	14	11	6	2	1	4	9	11	10	11	8	2	2		1	3	4	7	8
MED	30	32	32	36	36	36	35	29	38	34	22	23	24	24	24	23	22	27		28	32	34	32	36
U Q	32	47	38	41	40	41	37	32			23	26	29	36	28	26					36	56	42	39
L Q	28	30	30	32	34	31	29	27			22	22	23	23	23	22					28	26	30	32

JUL.1997 ftEs (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL.1997 fmin (0.1MHz)

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

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

D\H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
3	C	C	C	C	C	C	C	C	C	C	C	C	23	23	23	22	23	B	B	B	B	B	B	B	B
4	23	20	21	21	21	22	23		B	B	B	B	B	24	21		B	B	C	C	C	C	C	C	
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B				
8		B	B	B	B	B		B	B	B	B	B		B		B	B	B	B	B	21	22	21	22	
9	B	B			B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B					
10	B		20	21	B	B		B	B	B	B	B	B	B	B	B	B	B	B	B	29	23		21	
		23	23			31															B	B		21	
11		B		B					B	B	B					B	B		B	B	B	B	B	B	
12	22	B	22		30	21	23	21		B	B	B	24	30	21	25		21	B	B	B	B	B	B	
13	B	B	23	21	B	B	20		B	B	B	B	22	23	19		B	B	B	B	B	B	B	B	
14	B		23		B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
15		B	22	16	16	16		17	22	21	24			24	24		B	B	B	B	B	B	B	B	
16	B	B	B	B	B		23		22			22		B	B	B	B	B	B	B	B	30	56	23	
17	23	21	22	23	22	23	22	21		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
18	B	B			B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	23	
19	B	15	20	20	23	25																			
20		B			24	23			23													22	21		
21	23	21	21		B	B		21	22							26									
22	B	B	B		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
23		B	B	24		B	B	B	B	B	B						B	B	B	B	B	B		B	
24	B											22	23	23	21	23	22						19		
25			16	18	21	20	21	21		B	B	23		23	28		B	B	B	22					
26	20	20	21	21	21	15	21		B	B	B	B	24										18	21	
27	B	25	B	24	B	21	21		B	B	B	B	23	27	24	21	23		B	B	B	B	B	B	
28	24	15	23	21		B	B	B	B	B	B	B		29		28	21	B	B	B	B	B	B	B	
29	19	22	23	22	21	18	24		B	B	B	B	29	24	26		24		B	B	B	B	B	B	
30	B																								
31	B	B			B		B	B	B	B	B	B		B	B		23		B	B	B	B	B	B	
32			24	21		24							23		24	21	22		B	B	B	B	B	B	
33	20	19	20	22	22	23		B	B	B	B	21	22	23	22	23	21	21	22						
34	21	22	23	22			B	B	B	B	B	B	B	B	B	B	B	B	B	B		25	24	23	
35		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	25	25	25	25	25	25	25	25	25	24	25	26	26	26	26	26	26	27	26	26	26	26	26	26
MED	B		25	23	22		25		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
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	22	20	21	21	22	22	22		B	B	B	B	24	24	23	24	23		B	B	B	B		56	23

JUL.1997 fmin (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 1997 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		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4		A	A	A	A	A	A	A	B	B	B	B	B	B	B	A	B	B	B	C	C	C	C	C	C
5		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	A	A	A	A
8		A	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9		B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	B	A
10		B	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
11		A	B	A	B	A	A	A	A	B	B	B	B	B	A	A	B	B	A	B	B	B	B	B	B
12		B	B	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13		B	B	A	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14		B	A	A	A	A	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15		B	B	B	B	B	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16		A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17		B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
18		B	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19		B	B	A	B	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
20		A	A	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
21		B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
22		A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B
23		B	B	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B
24		A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B
25		B	A	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
26		A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
27		A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
28		B	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
29		B	B	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30		A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31		A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
CNT												4	9	10	8	10	8	2	1						2
MED												250	240	215	212	213	208	218	235						252
U Q												250	265	240	222	245	235								
L Q												240	238	205	202	205	205								

JUL. 1997 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 1997 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

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

AUG. 1997 fXI (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 1997 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	B	A	A	A	A	A	B	B	B	A	28	R	B	B	B	B	R	30	30	B	B	B	B	A	A
2	A	B	A	B	A	B	B	A	B	BU	RU	R	B	RU	R	32	B	B	B	B	B	B	B	B	B
3	B	R	S	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
4	C	A	B	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	B	A	A	A	A	A	B	B	B	26	35	41	41	41	40	36	34	R	B	B	B	A	B	B	B
6	A	A	A	A	B	A	A	R	B	B	B	BD	R	B	BU	R	B	B	B	B	B	B	B	B	B
7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	36	R	B	B	B	B	B	B	B
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	A
10	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
11	B	B	A	A	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	45	R	B	B	B	B	B	B	B	B	B	B	B
13	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
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C
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	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	A	B	B	B	B	B	B
19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	R	36	B	B	B	B	B
20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
21	A	Y	A	A	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	J	R	F	R	46	40	46	42	35	Y
23	A	A	A	A	A	A	A	S	31	39	44	44	46	46	44	47	40	31	31	30	28	R	B	B	Y
24	S	A	A	A	A	B	B	A	30	37	42	46	R	48	44	44	52	45	F	J	F	J	S	B	S
25	A	A	A	A	A	A	B	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	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	5	4	5	4	4	6	6	4	4	3	1				
MED									30	37	35	42	R	46	42	43	41	38	34	39	34	R			
U Q										39	43	45	47	45	44	47	40	41	42	R	35				
L Q										26	30	38	R	42	40	38	36	34	30	34	30				

AUG. 1997 foF2 (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG.1997 ftEs (0.1MHz)

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

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

D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	37	31	39	38	37	B	B	B	31	26	30	B	B	B	B	22	24	B	B	B	B	31	36
2	38	B	41	B	32	B	B	34	B	BE	BE	B	BE	BE	BE	B	B	B	B	B	B	B	B	B
3	B	28	28	36	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	69	B	41	40	39	35	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	B	32	37	40	39	34	B	B	BE	BE	BE	BE	BE	BE	BE	BE	B	B	B	B	27	B	B	B
6	26	40	27	27	B	40	39	26	B	B	B	BE	B	B	BE	B	B	B	B	B	B	B	B	B
7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	28	B	B	B	B	B	B	B
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	35	B	B	B	B	B	B	35
10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	34
11	B	B	35	36	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	BE	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	B	B	B	B	B	33	B	B	B	B	B	B	B	B	B	B	B
14	B	34	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17	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	B	B	34	B	B	31	B	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B
19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	CE	18	B	B	B	B	B	B
20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
21	35	26	30	34	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	21	20	24	17	17	10	36	36	42
23	42	49	41	46	39	40	32	20	15	17	22	30	26	26	24	22	19	19	17	14	16	B	B	17
24	26	32	70	46	42	B	B	32	24	20	19	26	26	27	25	26	17	15	18	27	30	17	B	B
25	44	41	45	36	30	44	B	42	38	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	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	10	11	10	7	7	3	5	3	4	5	5	5	4	4	6	7	4	5	3	3	2	3	5
MED	36	36	35	38	39	39	35	32	24	20	24	26	29	26	24	23	20	22	18	17	16	33	31	35
U Q	42	41	41	41	40	40	39	38	38	27	27	30	32	28	27	29	28	24	26	27	27		36	39
L Q	26	32	30	36	32	34	32	23	15	18	20	24	26	25	24	22	19	17	17	14	10		17	26

AUG.1997 ftEs (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 1997 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 \ E	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	24	29	21	24	24	B	B	B	22	26	21	B	B	B	B	22	24	B	B	B	B	21	21
2	16	B	22	B	24	B	B	20	B	B	28	24	B	24	29	23	B	B	B	B	B	B	B	B
3	B	16	19	20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	23	B	23	27	23	31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	B	16	25	34	24	23	B	B	B	23	24	24	30	28	24	29	24	B	B	B	22	B	B	B
6	15	16	23	23	B	30	23	24	B	B	B	B	29	B	B	30	B	B	B	B	B	B	B	B
7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	28	B	B	B	B	B	B	B
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	17	B	B	B	B	B	B	29
10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	23
11	B	B	21	22	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	33	B	B	B	B	B	B	B	B	B	B	B
13	B	32	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17	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	B	B	29	B	B	28	B	B	B	B	B	B	B	B	B	B	B	C	32	B	B	B	B	B
19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	18	B	B	B	B	B
20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
21	17	18	24	29	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	16	14	24	14	8	8	6	7
23	14	16	14	14	38	14	13	13	13	13	14	17	16	14	17	14	15	14	12	14	16	B	10	
24	9	8	12	24	13	B	B	17	24	17	14	14	15	16	17	17	14	15	6	13	B	14	14	
25	9	12	12	13	8	12	B	17	16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	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	24	23	23	23	23	23	22	22	22	22	22	21	23	22	19	21	21	21	21	21	21
MED	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
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	17	17	22	23	27	28	B	B	B	B	B	B	B	B	B	30	24	B	B	B	B	B	B	B

AUG. 1997 fmin (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 1997 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

D\H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	B	A	A	A	A	A	B	B	B	B	A	E	B	A	B	B	B	245	240	B	B	B	B	A	A
2	A	B	A	B	A	B	B	A	B	B	E	B	B	B	E	B	B	B	B	B	B	B	B	B	B
3	B	A	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
4	C	A	B	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	B	A	A	A	A	A	B	B	B	B	240	215	215	220	210	225	220	B	B	B	A	B	B	B	B
6	A	A	A	A	B	A	A	A	B	B	B	B	215	B	B	230	B	B	B	B	B	B	B	B	B
7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	200	B	B	B	B	B	B	B	B
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	A
10	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
11	B	B	A	A	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	E	B	B	B	B	B	B	B	B	B	B	B	B
13	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
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C
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	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	A	B	B	B	B	B	B
19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	210	B	B	B	B	B	B
20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
21	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	230	200	250	230	260	Y	A	A	A	A
23	A	A	A	A	A	A	A	A	245	240	210	200	225	210	215	215	200	210	225	240	240	B	B	Y	Y
24	A	A	A	A	A	B	B	A	270	210	200	235	230	200	230	235	205	210	210	200	B	A	Y	B	B
25	A	A	A	A	A	A	B	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									2	2	5	4	5	4	4	6	6	4	4	3	1				
MED									258	225	220	216	220	210	217	228	202	225	218	240	240				
U Q											E	B	265	240	240	215	238	230	220	245	228	260			
L Q											205	208	215	205	212	215	200	210	210	200					

AUG. 1997 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1997 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

D\H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	Y	Y	Y	Y	B	A	A	B	O	X	O	X	R	O	X	O	X	R	X	X		X	O	X	A
2	Y	Y	R	B	A	A	A	A	A	O	X	O	X	R	O	X	X	O	X	X		O	X	Y	Y
3	B	Y	Y	Y	A	A	A	O	X	O	X	O	X	O	X	O	X	X	X	X		O	X	A	A
4	A	A	O	X		A	A	B	B	A	B	B	B	B	O	X	B	B	B	B		B	R	A	A
5	A	A	B	A		A	X	X	X	O	X	O	X	O	X	R	R	R	X	O	X		B	Y	
6	O	X	A	A		32	31	34	33	40		B	B	O	X	X	O	X	B	B	O	X	O	X	
7	X	A		A	O	X	O	X	X	X	O	X	O	X	R	O	X	R	X	X	X	X		O	X
8	O	X	A		O	X		X		X	O	X	X	X	R	O	X	O	X	R	X	X		A	A
9	48	50		56	53	60			A	A	A	O	X	B	B	B	B	B	B	O	X	O	X		A
10	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	O	X			A	A	A	
11	A	A	B	A	A	B	A	A	O	X	B	O	X	O	X	X	O	X	O	X	B	B		O	X
12	A	A	A	B	A	O	X	B	B	X	X	B	B	B	B	B	X	B	Y	B		A	A	O	X
13	A	A	A	A	A	B	B	B	A	O	X	B	B	B	B	O	X	O	X	O	X	B		A	O
14	X		A	A		A	Y	B	B	B	B	X	B	B	B	B	O	X	X	B		R	O	X	
15	A	O	X	O	X	R	A	A	B	B	A	B	B	B	B	B	O	X	B	O	X		A	O	X
16	A	A		A	A	A	A	A	A	B	O	X	O	X	B	B	B	O	X	O	X	X	X	O	X
17	A	O	X	O	X	A	A	O	X	A	X	X	O	X	O	X	X	B	B	B	X	O	X	O	X
18	O	X	B		A	A	B	B	A	B	B	B	B	B	B	O	X	O	X	O	X	B		A	A
19	O	X	A	A	A	Y	O	X	X	X	X	O	X	O	X	O	X	X	X	X	X	X		X	A
20	57		A			A	A	A	A	O	X	B	B	B	B	X	B	B	B	B	B		B	Y	B
21	O	X		A	A	A		X	A	O	X	X		B	O	X	B	B	B	O	X	O	X		A
22	B		88	44	53		A		45	B	B	O	X	R	O	X	O	X	X	O	X	X	X	X	O
23	A	A	A	A	A			X	X	X	O	X	O	X	X	X	X	O	X	X	X	X		O	X
24	79	71	52		A	A		B	X	O	X	X	O	X	O	X	X	O	X	X	X	X			
25	52	66	60	58	43	46	43	51	51	57	61	63	66	69	67	66	62	59	52	47	38	24		19	
26	26	30	26	25	26	50	42	49	58	62	44	75	77	80	86	80	68	65	54	45	36	30	27	31	
27	A	O	X		O	X	A	O	X	X	X	X	O	X	X	Y	B		71	74	59	54		89	70
28	A	A		38	34		A	A	B	A	B	B	B	B	B	B	B	B	B	X		O	X	B	A
29	A	A	A	A	A	A	A	A	O	X	O	X	O	X	B	B	B	B	B	B	B	O	X	O	X
30	A		O	X	R					45	50	48					X	X	X	O	X	X		A	A
31		57	41		34	40						48	52	53			63	62	62	60	53	54	46		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	12	13	13	9	10	12	11	14	16	22	17	17	13	13	17	20	18	23	23	22	23	11	12	12	
MED	38	45	45	52	34	38	34	42	44	48	52	56	59	65	62	62	56	54	48	43	34	26	26	32	
U Q	52	62	54	57	43	46	43	46	50	50	54	60	66	69	67	66	62	59	54	49	46	34	37	44	
L Q	34	O	X		X	X	X	X	X	O	X	O	X	O	X	O	X	O	X	X	X		O	X	O
	34	36	40	34	32	30	30	33	40	46	48	46	50	55	48	52	53	51	46	38	30	24	19	21	

SEP. 1997 f_{XI} (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1997 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	Y	Y	Y	Y	B	A	A	B	R	35	42	45	R	R	R	R	R	43	31	30	F	17	16	12	A	
2	Y	Y	R	B	A	A	A	A	A	40	45	54	R	R	R	R	44	54	54	47	31	F	R	Y	Y	
3	B	Y	Y	Y	A	A	A	38	43	43	50	59	60	B	R	R	R	49	56	43	20	A	A	A		
4	A	A	R	F	A	A	B	B	A	B	B	B	B	B	B	R	B	B	B	B	B	B	R	A	A	
5	A	A	B	A	A	J	R	21	20	26	34	41	46	46	R	R	R	J	R	R	F	F	B	Y	33	
6	F	23	18	A	A	F	F	A	R	F	B	B	F	R	R	R	B	B	B	R	R	B	B	B	27	
7	J	R	A	A	A	R	18	16	17	26	34	38	42	R	R	R	J	R	R	F	V	V	F	R	Y	
8	R	13	A	A	R	F	F	F	26	22	25	25	38	44	52	53	R	J	R	F	A	A	A	A	A	
9	F	38	29	A	F	F	F	A	A	A	R	B	B	B	B	B	B	R	R	B	A	A	A	A	A	
10	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	F	43	42	A	A	A	A	A	
11	A	A	B	A	A	B	A	A	R	33	38	39	43	48	56	56	R	R	R	B	B	F	R	R	A	
12	A	A	A	B	A	R	B	B	J	R	37	36	B	B	B	B	B	Y	B	F	21	A	A	A	43	
13	A	A	A	A	A	B	B	B	A	R	41	B	B	B	B	B	R	J	R	B	F	A	R	A	A	
14	32	34	A	A	A	A	Y	B	B	B	B	B	B	B	B	B	R	47	42	51	21	A	29	A	A	
15	A	R	R	R	A	A	B	B	A	B	B	B	B	B	B	B	R	B	R	B	R	A	R	A	A	
16	A	A	A	A	A	A	A	A	B	40	41	R	B	B	B	R	R	48	48	42	50	42	30	R	A	
17	A	R	27	27	A	A	R	A	39	36	43	48	48	50	55	58	B	B	B	S	62	57	42	A	A	
18	R	30	B	R	A	A	B	B	A	B	B	B	B	B	B	R	R	R	R	B	F	19	54	A	A	
19	F	R	A	A	A	Y	R	23	27	31	32	38	39	40	39	42	42	42	42	40	39	28	15	F	A	
20	A	A	A	A	V	A	A	A	A	R	37	B	B	B	F	B	J	R	B	B	B	B	Y	B	B	
21	A	R	A	A	A	A	F	29	36	44	48	51	F	B	R	B	B	B	R	R	R	F	A	F	F	
22	B	A	F	F	A	A	F	B	B	33	35	42	42	42	42	41	40	40	37	32	28	20	14	16	R	
23	A	A	A	A	A	F	28	26	34	37	43	43	53	53	52	56	46	49	45	48	43	40	22	16	14	R
24	A	A	A	A	A	F	26	40	43	47	46	48	47	63	57	62	54	53	48	45	40	21	21	20	F	
25	F	A	17	18	26	25	25	39	47	51	55	57	61	63	61	59	56	53	46	41	29	16	12	12	F	
26	F	F	F	F	F	F	F	32	44	52	56	38	68	71	74	80	74	62	59	48	39	25	21	21	25	R
27	A	R	F	R	A	R	37	45	44	46	48	54	60	Y	B	F	F	64	62	52	47	A	65	A	A	A
28	A	A	F	F	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	F	42	30	26	B	B	A
29	A	A	A	A	A	A	A	R	39	44	42	B	B	B	B	B	B	B	B	R	40	35	29	20	14	R
30	A	A	R	R	F	F	A	B	B	42	46	47	U	R	R	R	J	R	J	R	F	F	A	A	A	A
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	9	9	9	8	9	12	10	14	16	22	17	17	14	14	17	20	18	23	23	21	22	10	12	10		
MED	F	R	32	27	F	F	26	36	38	42	46	50	52	56	56	56	50	48	42	36	26	18	20	20		
U Q	31	37	38	38	28	28	32	39	44	44	48	54	60	63	61	60	56	52	48	42	33	21	26	27		
L Q	F	22	22	F	F	21	23	27	34	40	42	40	43	48	42	46	47	43	38	30	20	16	13	14		

SEP. 1997 foF2 (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1997 ftes (0.1MHz)

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

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

D\H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	29	24	23	15	B	48	40	B	25	20	30	29	27	24	24	37	E	B	E	B	E	B	9	10	12	26		
2	23	27	32	B	36	38	39	43	35	20	28	24	23	24	24	22	18	14	11	15	30	12	17	13				
3	B	23	16	26	35	42	42	41	34	28	26	28	E	B	B	29	26	E	B	E	B	E	B	12	30	83	64	
4	39	40	31	63	49	50	B	B	40	B	B	B	B	B	E	B	B	B	B	B	B	E	B	10	39	43		
5	31	38	B	42	41	37	25	16	25	E	B	E	B	E	B	25	25	23	22	22	27	18	E	B	E	B	18	40
6	33	28	34	32	27	24	30	31	38	B	B	27	25	26	29	B	B	B	E	B	E	B	B	B	B	B	36	
7	36	44	42	23	13	13	12	14	18	21	24	26	36	26	26	24	22	E	B	19	13	12	9	10	7	11		
8	14	30	25	22	26	14	E	B	16	24	25	32	30	32	27	22	22	17	14	14	37	24	31	36				
9	110	50	57	39	35	32	50	40	58	39	B	B	B	B	B	B	B	E	B	E	S	B	36	44	41	42		
10	42	36	71	66	B	B	B	B	B	B	B	B	B	B	B	E	B	B	B	7	24	36	44	41	42			
11	41	52	B	39	36	46	42	20	B	29	26	30	25	37	30	37	25	B	B	16	18	12	24					
12	27	37	72	B	42	11	B	B	41	36	B	B	B	B	E	B	B	E	B	7	16	41	42	43	90			
13	44	44	34	73	40	B	B	B	48	34	B	B	B	E	B	27	29	10	E	B	E	B	9	46	38	47		
14	54	45	86	56	41	37	12	B	B	B	29	B	B	B	B	E	B	31	23	B	37	38	44	45	33			
15	51	46	45	38	125	44	B	B	42	B	B	B	B	B	B	E	B	8	E	B	B	B	35	30	34	38		
16	32	44	46	46	64	91	42	58	B	27	24	B	B	B	E	B	26	25	34	20	20	23	15	27	26			
17	47	32	44	39	38	44	42	35	E	B	27	25	24	30	27	30	B	B	19	E	B	E	45	122	70	89		
18	41	B	27	67	30	B	B	43	B	B	B	B	B	B	E	B	29	26	11	30	27	51	61	45	83			
19	62	50	44	45	40	25	15	34	20	23	33	35	28	27	26	25	26	22	17	26	13	E	B	42	45			
20	47	47	58	47	44	49	44	38	38	32	B	B	B	E	B	29	34	B	B	B	B	B	18	B				
21	38	47	39	72	50	46	41	24	36	39	30	30	B	E	B	55	B	B	E	B	E	B	41	94	88	60		
22	B	52	87	51	69	44	90	B	B	26	32	28	30	30	26	21	23	22	18	24	16	11	14	15				
23	23	23	24	25	49	22	24	19	25	31	26	28	28	27	26	26	E	B	23	20	17	13	E	B	E	B	11	14
24	41	41	34	42	39	34	B	E	B	22	23	28	31	32	27	33	28	27	E	B	23	22	18	12	10	8	13	
25	31	36	34	29	34	27	16	24	23	29	25	32	33	27	32	33	28	21	17	14	12	16	23	11				
26	40	E	B	E	B	9	19	10	14	15	21	26	33	29	28	29	31	28	E	B	E	B	E	B	22	20	42	36
27	44	76	44	41	74	60	44	28	22	31	30	36	31	26	B	25	26	22	18	39	70	44	53	44				
28	41	74	97	83	42	43	B	37	B	B	B	B	B	B	B	B	B	B	E	B	33	24	17	B	31			
29	34	53	39	42	43	48	44	31	25	25	B	B	B	B	B	B	B	B	B	E	B	E	B	E	B	35	15	
30	32	34	41	40	26	34	36	B	B	33	29	32	30	27	28	26	24	E	B	E	B	28	11	14	35	70		
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	28	28	28	26	22	21	23	22	18	19	17	18	19	21	20	24	23	24	27	25	28	29				
MED	40	41	40	42	40	38	40	31	26	28	27	29	28	26	26	26	23	E	B	22	18	17	24	35	36			
U Q	44	48	52	54	46	46	44	40	38	33	30	32	30	30	29	29	E	B	E	B	E	B	38	44	44	46		
L Q	32	31	32	30	34	25	16	22	23	25	25	27	26	26	E	B	26	23	22	19	17	14	11	11	18	20		

SEP. 1997 ftes (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1997 fmin (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	12	10	9	10	B	14	21	B	21	17	30	29	27	24	21	20	32	19	11	10	10	10	8	12
2	9	9	7	B	27	20	14	15	22	15	20	19	12	24	24	18	15	14	10	10	8	9	8	8
3	B	12	10	10	26	22	20	12	14	16	17	19	24	B	22	22	28	17	15	17	12	13	11	19
4	22	26	11	12	12	11	B	B	23	B	B	B	B	B	25	B	B	B	B	B	B	10	9	22
5	25	23	B	32	21	14	9	10	14	26	22	27	11	20	18	18	16	14	11	11	10	B	9	9
6	9	10	8	8	9	9	10	14	13	B	B	21	11	18	22	B	B	B	25	30	B	B	B	9
7	11	20	18	11	10	10	8	9	12	11	15	14	16	18	15	14	15	19	8	12	9	10	7	7
8	7	7	6	8	8	8	13	9	11	18	22	19	21	16	17	22	22	11	11	8	18	12	10	10
9	10	7	7	7	6	14	16	20	20	21	B	B	B	B	B	B	B	7	24	B	8	11	22	18
10	18	18	10	59	B	B	B	B	B	B	B	B	B	B	B	21	B	19	11	21	12	11	16	10
11	12	14	B	18	24	B	17	17	10	B	17	17	17	17	37	30	37	25	B	B	8	7	6	8
12	8	8	11	B	21	6	B	B	23	17	B	B	B	B	B	25	B	7	B	16	7	7	10	10
13	8	18	15	21	21	B	B	B	14	21	B	B	B	B	27	24	6	26	21	B	9	9	8	10
14	8	10	16	16	21	22	7	B	B	B	21	B	B	B	B	B	31	7	11	10	8	8	8	
15	12	7	16	19	25	8	B	B	24	B	B	B	B	B	B	B	8	B	22	B	11	7	7	9
16	18	15	6	24	10	17	23	22	B	20	10	B	B	B	26	10	34	20	20	23	15	B	7	9
17	10	10	10	17	11	14	14	16	27	16	14	18	22	23	B	B	B	14	23	23	8	10	8	9
18	11	B	14	21	11	B	B	30	B	B	B	B	B	B	29	26	11	29	B	11	10	10	10	20
19	11	16	18	13	12	7	10	10	12	14	12	12	12	14	17	16	15	13	9	6	9	10	9	12
20	13	9	11	11	8	11	19	15	16	21	B	B	B	29	B	34	B	B	B	B	B	B	14	B
21	10	11	10	6	17	14	11	12	21	13	14	14	B	55	B	B	B	31	26	22	8	11	8	7
22	B	11	11	7	17	11	10	B	B	20	16	19	18	17	17	12	18	12	10	9	8	9	9	8
23	7	8	8	9	9	7	9	10	9	11	10	18	18	16	16	27	10	10	11	10	10	10	7	6
24	8	16	11	28	23	13	B	22	11	11	12	7	17	11	12	22	23	17	16	12	10	8	8	7
25	7	10	8	8	12	8	8	9	10	10	9	10	11	10	10	10	11	11	10	10	8	9	9	8
26	8	10	9	6	8	8	9	10	10	12	29	28	29	31	19	29	24	22	20	18	8	8	10	9
27	10	11	14	11	12	22	8	13	10	10	11	11	21	21	B	20	17	20	10	16	10	10	14	14
28	18	30	8	8	22	28	B	28	B	B	B	B	B	B	B	B	B	B	33	12	17	B	B	9
29	11	21	8	13	20	14	10	21	20	20	B	B	B	B	B	B	B	B	B	28	7	14	10	10
30	7	9	16	12	10	8	29	B	B	23	20	8	21	20	20	22	11	30	22	9	9	22	9	22
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	10	11	10	12	14	14	15	18	20	20	22	21	26	26	26	24	26	19	20	16	10	10	9	9
U Q	13	18	15	21	22	22	B	B	27	B	B	B	B	B	B	B	B	30	33	28	12	13	10	12
L Q	8	9	8	8	10	8	10	12	12	14	14	17	17	18	18	20	15	13	11	10	8	9	8	8

SEP. 1997 fmin (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 1997 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	Y	Y	Y	Y	B	A	A	B	A	226	E B E B	250	220	214	224	222	206	204	210	210	E B	254	206	E A	A	
2	A	A	A	B	A	A	A	A	A	236	222	232	216	214	208	214	208	208	198	224	222	Y	Y	Y		
3	B	A	A	A	A	A	A	220	A	A	200	224	226	B	260	218	218	226	224	218	E B	A	A	A		
4	A	A	212	A	A	230	B	B	A	B	B	B	B	B	E B	B	B	B	B	B	B	A	A	A		
5	A	A	B	A	A	228	A	A	234	248	252	220	E B	234	222	208	216	220	214	206	200	212	236	B	Y	224
6	A E A	234	A	A E A	A	A	A	A	A	B	B	236	206	220	220	B	B	B	252	246	E B	B	B	B	216	
7	214	A	A	A	A	238	230	228	220	222	216	228	220	206	226	212	210	198	206	204	256	300	E B	Y		
8	A	A	A	A	A	210	A E A	234	212	226	204	204	220	204	226	200	234	214	206	200	A	A	A	A		
9	234	226	Q	A	Q	Q	A	A	A	A	B	B	B	B	B	B	B	E S	B	A	A	A	A	A		
10	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	E B	232	252	A	A	A	A	A	A		
11	A	A	B	A	A	B	A	A	A	E B	E B	E A E B	245	250	215	B	B	218	B	B	A	A	A	222		
12	A	A	A	B	A	A	B	B	A	242	B	B	B	B	E B	230	E B	206	E B	260	A	A	A	210		
13	A	A	A	A	A	B	B	B	A	A	B	B	B	B	E A	200	246	238	240	258	236	A	226	A		
14	216	E A	A	A	A	A	Y	B	B	B	B	B	B	B	B	B	E B	272	252	B	226	216	A	210	A	
15	A	222	232	218	A	A	B	B	A	B	B	B	B	B	B	B	B	B	280	B	236	220	214	A		
16	A	A	212	A	A	A	A	A	B	242	202	B	B	B	220	204	E B	244	210	210	E B E B	B	A	A		
17	A	238	226	A	A	218	222	250	224	212	226	216	216	B	B	B	B	214	212	228	A	A	A	A		
18	226	B	218	A	222	B	B	A	B	B	B	B	B	E B	246	252	252	B	B	A	212	216	A	A		
19	E B	A	A	A	A	A	222	252	248	246	232	216	226	222	218	214	E A	242	226	214	220	230	E B	A	A	
20	A	A	A	A	Q	A	A	A	A	A	B	B	E B	254	B	B	B	B	B	B	B	B	A	B		
21	A	222	A	A	A	A	A	222	A E A	242	216	208	Q	B	B	B	B	E B E B	210	232	A	Q	A	F	F	
22	B	A	260	A	A	A	228	B	B	A	A E A	E A	272	262	212	232	228	228	236	230	232	220	266	A E A	266	
23	A	A	A	A	A	A E A	276	220	224	210	198	220	222	204	204	204	202	206	208	214	216	200	256	Q	A	
24	A	A	A	A	A	A	B E B	260	212	206	200	206	200	204	218	224	210	210	210	206	212	222	226	256	Q	
25	A	A	A	A	A	Q	336	214	230	204	218	212	214	214	200	210	210	222	216	210	210	220	250	Q	A	
26	E A E B E B	274	270	284	A	Q	268	226	238	214	214	216	216	212	226	218	230	230	220	212	218	236	234	228	Q	
27	A	228	258	256	242	A	200	256	220	216	214	196	210	E A	Y	B	222	202	210	238	220	A	A	A	A	
28	A	A	Q	234	232	A	A	B	A	B	B	B	B	B	B	B	B	B	E B	264	A E B	298	B	B	A	
29	A	A	A	A	A	A	A	A	A E A	238	216	B	B	B	B	B	B	B	B	B	E B E B	E A E B	E A	E A	A	
30	A	A	228	218	232	E B	260	B	E A	266	226	254	242	222	222	214	210	234	220	234	268	Q	A	A	A	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	7	8	11	5	6	9	6	12	11	18	17	19	17	16	18	20	18	23	22	19	21	10	9	7		
MED	230	226	230	232	228	229	221	227	219	222	214	218	218	212	218	218	214	214	212	216	228	216	222	223		
U Q	A E	254	260	304	232	264	228	245	248	242	224	236	227	E B	222	226	229	E B	238	226	238	234	252	256	E A	
L Q	216	224	218	218	222	220	214	222	212	216	203	208	213	206	210	214	210	210	210	210	218	216	220	216		

SEP. 1997 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT.1997 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

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	O	X	B	B	A	B	A	A	X	R	B		B	B		B	B	B				A	O	X	O	X			
2	A			X			A	A	X	X	X	X	O	X	X	X	X	X	X	X	34	30	32			A	O	X	O	X
3		42	28	56	52				47	52	54	46	53	50	51	51	51	52	54	50	51	54	44	40	35					
4					A		X	X	O	X	O	X	O	X		R	B	X	X	X										
5	32	30	28		44	36	42	56	50	55	64				68	70	72	63	X	B	X	54	53	47						
6	A	O	X			B	A		46	51	56	55	57	66	62	66	68	70	70	61	56	48	39	38	32					
7	28			39		38	44	46	51	43	44	57	52		72	72	77	68	65	59	X	O	X	X	45	34	27			
8	42	33	32	38	45	44	49	52	56	62	63	69	69	69	74	73	72	69	60	51	50	45	43	34						
9	O	X	A			O	X	R	O	X	O	X		X	X	X	X	X	X	X	X	A	A	A						
10	36			68	41	41	49	45	48	54	60	63	66	70	68	66	70	67	62	48										
11	X	A	A	A	A	A		45	42	49	48	51		O	X	X	X	X	B	O	X	R	O	X	A	R	A			
12	40													56	61	58	58			54	41									
13	X	A	R	A	A	O	X		B	B	B	B	B	B	B	O	X	B	O	X	O	X	X	A	A					
14	39						38	60									50		49	48	46	42	26							
15	A			A	X	B	B	B	X	B	B	B	B	B	B	O	X	B	B	O	X	O	X	R						
16		68		36					40								63				48	47		58	56					
17	O	X	A	B	X	A	A	B	B	B	B	R	R	B	B	B	O	X	B	B	B	O	X	O	X	32	31	29		
18	26																													
19																														
20	O	X	A	A	B	B	A	A	B	R	O	X	B	X	B	B	X	X	B	B	X	X	A	A						
21	32	28															70	61		56	55	44								
22	A																													
23																														
24																														
25																														
26																														
27																														
28																														
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	18	16	16	18	14	13	16	18	21	20	22	19	20	22	23	27	22	22	29	28	27	23	22	22						
MED	40	40	39	38	44	44	48	51	53	56	61	63	66	66	68	65	66	65	56	52	48	44	40	34						
U Q	45	45	48	41	56	50	53	56	60	63	64	68	68	71	74	72	70	69	62	56	52	51	45	44						
L Q	36	31	33	36	40	40	45	47	48	47	49	53	54	61	58	51	61	50	48	46	42	36	34	28						

OCT.1997 fXI (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 1997 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	34	B	B	A	B	A	A		R	B	F	B	B	F	B	B	B	F	15	F	A	R	R			
2	A	A		F	F	A	A		44		J	R	R		75				20	F	F	F	F	F			
3	F	18	F	A	F	F		41	46	48	40	47	44	45	45	45	46	48	44	41	40	30	28	23			
4	A	R	R	F	B	A	A	F	44	49	58			62	64	62	57		48	44	37	F	A	A			
5	F	A	F	A	F	F	F	F	38	45	50	49	51	60	56	60	62	60	59	55	50	36	29	23	20		
6	F	F	F	F	F	F	F	F	J	R	J	R		66	66	71	61	57	53	48		F	F	F	F		
7	R	A	F	F	F	R	R		50	56	57	63	63	63	68	66	66	63	J	R		A	A	A	F		
8	34	A	A	A	A	A		39	42	48	50	52	60	59	62	60	64	61	56	42		R	A	R	34		
9	33	A	R	A	A	R	R	B	B	B	B	B	B	B	B	R	B		R	R	40	36	18	A	A		
10	A	R	A		B	B	B	B		B	B	B	B	B	B	44	B	43	42	40	36	F	F	A			
11	R	A	B		A	A	B	B	B	B	R	R	B	B	B	R	B	B	B	R	30	22	21	20			
12	F	A	A	R	F	F			B	B	J	R				F		U	R	R	F	F	R	R			
13	F	R	A	A	B	B	A	A	B	R	R	B		B	B	J	R	B		50	49	F	A	A	A		
14	A	F	F	F	F	F	F			R	B	B			V			S	J	R	F	F	F	F	F		
15	F	30	32	30	33	41	47	44	53		63	66	67	65	68	74	72	76	62	46		28	27	29	F		
16	F	V	F	A	F	F	F		F		F			V							R	F	F	F	F		
17	F	F	F	F	F	F	F	S	V	62	64	68	67	69	75	82	84	72	68	62		46	34	24	22		
18	R	A	A	A	B	A	R		J	R	F		R					J	S	R	F		F	F	F		
19	S	R	A	F	F	R	F	F	F	F	V						V				F	F	F	F	F		
20	F	F	F	F	A	A	R		46	52	57	58	55	54		R	J	R	F		F	F	F	F	F		
21	A	A	R	A	A	A		40	50	54	54	55	57	61	58	60	58	58	55	51	50	46	45	39	36		
22	F	S	F		F	R	B	A		51	60	71	58	55	58	58	57	56	53	50	42	42	35	18	22		
23	A	21	28	22	30	42	47	46	50	56	55	55	56	57	63	62	57	59	51	48	46	40	35	38	R		
24	F	A	A	R	A	A	B	B	B	R	B	B	B	R	B	B		A	R	R	F	F	A	R	38		
25	35	A	F	B	B	R	B	R	R	B	B	B	B	R	R	R	R	J	R		R	F	A	A	A		
26	A	R	A	B	A		B	B	R	F	R	R	R	R	R	R	R	R	R	43	43	42	38	A	A	A	
27	A	A	A	F	B	B	B	B	B	B	B	B	B	B	B	B	R	R	38	40	40	39	37	35	A	A	A
28	A	R	R	R	B	R	R	R		R	R	R	R	R	R	R	B	R		A	F	A	A	A	A		
29	A	A	A	F	R	B	B	A	A	B	B	B	B	B	B	B	B	B	R	42	38	39	34	32	A	A	
30	B	B	A	B	A	A		39	45	47	51	39		R	R	40	53	B	B	B	J	R	R	R	R	F	
31	A	A	F	R	R	A	R		Y	Y		R	C	C	C	C	C	C		52	43	45	25	22	17	F	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	18	14	14	18	14	13	16	18	21	20	22	19	20	22	23	27	22	22	29	27	27	22	22	21			
MED	F	24	22	28	30	34	38	44	47	50	55	55	60	58	62	59	60	59	50	44	38	32	31	22			
U Q	35	34	28	31	33	42	46	50	54	56	58	61	62	65	68	66	62	62	56	49	43	35	34	35			
L Q	F	F	F	F	F	F	F		R	R	R	R	R	R	R	R	R	R	R	R	F	F	F	F			
	22	21	20	24	24	28	36	41	42	41	43	47	48	55	52	45	55	44	42	40	35	27	22	20			

OCT. 1997 foF2 (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 1997 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	44	39	B	B	47	B	43	44	50	39	B	30	B	B	B	B	B	B	18	20	30	61	44	37			
2	37	36	33	31	42	39	38	36	24	34	34	38	42	36	34	34	26	28	18	16	16	13	12	12			
3	13	13	14	31	25	14	21	20	22	24	32	28	B	28	32	27	29	B	19	18	28	41	38	43			
4	39	75	34	21	B	45	47	35	24	31	34	37	36	30	27	32	25	23	24	21	12	15	14	18			
5	20	29	31	45	40	34	41	28	29	30	27	27	28	38	27	26	33	28	21	16	10	13	26	24			
6	37	30	26	25	30	24	27	30	30	30	27	30	36	32	32	32	31	28	20	18	8	11	26	32			
7	44	39	59	44	30	45	47	44	39	31	33	33	30	32	29	29	25	22	29	23	44	32	47	46			
8	50	70	63	39	43	40	29	24	30	32	33	B	29	28	28	26	B	B	21	44	43	41	25	34			
9	38	44	38	32	43	58	22	B	B	B	B	B	B	B	B	31	B	B	28	29	27	28	32	94	93		
10	54	34	88	35	B	B	B	B	30	B	B	B	B	B	B	44	B	B	28	29	39	88	58	50			
11	58	40	B	42	70	43	B	B	B	B	36	42	B	B	B	31	B	B	B	27	20	14	15	30			
12	27	30	28	28	27	36	21	23	B	B	28	28	28	28	28	24	27	30	26	25	25	15	24	27			
13	24	34	74	43	B	B	42	42	B	37	33	B	B	B	B	29	25	B	21	18	29	31	33	44			
14	33	26	24	14	27	16	25	27	28	30	B	B	32	29	30	27	31	34	22	18	16	15	13	14			
15	14	15	22	42	30	18	12	22	25	29	30	27	31	32	31	38	26	24	19	22	B	28	23	10			
16	B	B	B	13	16	38	50	35	36	32	32	31	33	32	32	30	36	32	28	41	38	22	23	17	11	12	33
17	35	36	23	24	23	28	24	24	32	33	35	38	31	34	30	28	32	26	23	B	27	40	32	40			
18	90	36	41	66	B	51	39	46	50	38	29	32	32	33	30	28	30	25	27	19	15	33	16	44			
19	58	60	72	95	31	45	44	36	31	32	33	34	32	38	35	33	32	31	23	24	26	17	23	21			
20	23	19	83	36	62	59	45	34	32	33	38	33	33	32	30	28	28	27	21	18	22	38	40	36			
21	46	36	35	62	46	42	42	33	32	34	32	34	34	36	34	34	26	25	22	19	20	24	9	15			
22	34	32	47	33	68	28	B	52	50	32	33	32	34	36	35	34	32	30	26	24	26	25	26	35			
23	45	33	30	18	16	24	27	31	32	34	36	35	36	36	34	32	31	32	34	26	19	30	44	36			
24	81	50	79	38	70	67	B	B	B	39	B	B	31	B	B	B	26	49	54	48	48	43	37	45	54		
25	43	39	30	B	B	36	B	42	39	B	B	B	B	B	28	32	30	25	24	34	30	27	40	40	40		
26	68	81	56	B	39	31	B	B	35	34	32	27	30	25	27	26	33	26	36	26	116	43	94	39			
27	72	44	47	30	B	B	B	B	B	B	B	B	B	B	B	B	25	25	23	24	21	25	36	82	41		
28	43	96	37	65	B	30	40	34	30	30	27	29	27	28	32	B	30	34	26	40	30	36	92	105			
29	82	42	44	44	31	B	B	47	42	B	B	B	B	B	B	B	B	B	32	24	25	29	42	59			
30	B	B	43	B	42	44	24	30	31	34	28	B	32	33	29	28	B	B	B	27	22	21	21	33			
31	52	45	38	36	43	44	66	36	29	33	30	33	C	C	C	C	C	C	26	20	26	31	12	12			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	30	30	29	27	24	26	23	25	25	24	23	21	22	22	23	27	23	22	29	30	30	31	31	31			
MED	43	36	38	36	40	38	38	34	31	33	32	32	32	32	30	28	30	27	23	22	26	31	26	36			
U Q	54	44	58	44	44	45	43	42	37	34	34	34	34	36	32	32	32	31	28	27	29	38	44	44			
L Q	33	30	30	30	30	28	24	28	29	30	29	28	30	28	28	27	26	25	21	19	19	15	16	24			

OCT. 1997 ftEs (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 1997 fmin (0.1MHz)

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	14	12	B	B	16	B	23	16	11	34	B	17	B	B	28	B	B	B	10	14	7	10	12	12	
2	22	10	9	7	10	17	20	15	10	10	12	13	13	11	11	10	14	16	12	11	10	9	8	7	
3	8	8	7	9	10	12	21	10	12	14	12	28	B	12	11	20	29	B	19	13	7	8	9	9	
4	10	14	8	21	B	22	16	14	12	12	12	12	11	14	14	11	10	15	24	21	10	9	8	8	
5	7	7	9	11	14	9	8	11	10	11	15	18	19	17	19	12	10	11	12	10	10	9	9	5	
6	11	6	7	7	6	8	10	9	11	12	13	10	11	14	11	11	10	8	11	11	8	8	7	7	
7	11	8	8	12	10	11	15	12	10	11	14	11	20	20	12	20	12	10	28	23	16	13	10	12	
8	9	7	13	18	19	14	10	13	10	10	14	B	20	16	11	19	B	B	10	11	10	9	6	7	
9	10	15	28	15	18	18	14	B	B	B	B	B	B	B	B	31	B	28	29	16	15	9	14	10	
10	15	9	15	12	B	B	B	B	12	B	B	B	B	B	B	44	B	B	28	29	16	8	9	9	
11	7	14	B	11	12	22	B	B	B	B	23	16	B	B	B	31	B	B	B	27	20	14	10	10	
12	9	11	7	7	8	10	21	12	B	B	28	13	18	19	21	21	27	30	20	20	10	15	8	8	
13	8	7	16	18	B	B	21	34	B	25	21	B	31	B	B	29	22	B	21	18	11	10	7	11	
14	8	8	9	8	8	9	11	10	16	30	B	B	32	22	20	16	18	34	22	18	16	15	13	10	
15	10	12	12	9	10	18	7	22	22	29	22	21	20	19	15	18	14	16	10	11	B	12	12	10	
16	13	16	13	12	10	11	14	10	9	14	11	11	15	14	18	19	22	13	22	23	16	11	12	8	
17	6	10	8	7	9	10	13	10	10	10	11	12	22	12	14	22	12	13	11	B	10	11	8	7	
18	11	30	24	12	B	21	19	14	14	12	14	24	22	21	24	16	12	12	12	10	8	10	10	7	
19	12	6	12	11	14	13	9	9	7	10	11	10	12	10	13	12	10	10	10	8	10	7	7	7	
20	6	7	7	14	28	12	14	11	10	11	14	20	22	22	12	14	21	17	21	14	13	11	7	6	
21	10	14	11	16	22	18	12	12	13	10	10	11	10	14	11	13	15	16	15	11	10	10	9	8	
22	9	22	12	15	12	22	B	23	14	10	10	10	10	10	10	10	9	11	9	8	7	7	6	7	
23	8	9	9	10	8	9	10	8	9	10	10	10	10	10	10	10	10	9	9	8	8	6	10	9	
24	9	15	30	29	22	16	B	B	B	20	B	B	31	B	B	21	14	22	17	10	9	7	8	9	
25	9	12	8	B	B	23	B	20	14	B	B	B	B	22	32	30	20	22	10	18	15	9	7	8	
26	16	9	8	B	21	21	B	B	23	14	24	14	20	23	18	16	13	9	11	14	17	11	15	8	
27	9	19	10	10	B	B	B	B	B	B	B	B	B	B	B	22	25	15	14	12	14	8	12	17	
28	20	10	18	12	B	16	22	18	14	16	10	11	17	15	21	B	19	10	8	8	10	26	16	12	
29	40	22	15	12	10	B	B	23	15	B	B	B	B	B	B	B	B	B	B	32	24	21	10	10	19
30	B	B	21	B	18	13	14	11	10	18	16	B	32	33	22	22	B	B	B	27	22	21	21	9	
31	10	10	10	13	28	19	15	11	22	24	15	11	C	C	C	C	C	C	15	11	8	10	9	12	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	31	31	31	31	31	31	30	30	30	30	30	30	31	31	31	31	31	31	
MED	10	10	11	12	16	17	16	14	13	14	15	17	21	20	18	20	18	16	15	14	10	10	9	9	
U Q	13	15	16	18	B	B	B	B	B	B	B	B	B	B	B	32	29	29	B	B	22	21	16	11	10
L Q	8	8	8	10	10	11	12	11	10	11	12	11	15	14	12	13	12	11	10	11	9	8	8	7	

OCT. 1997 fmin (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 1997 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	224	B	B	A	B	A	A	218	A	B	208	B	B	E	B	B	B	B	E	A	210	238	228	A	212	232	
2	A	A	232	A	A	A	A	A	242	212	216	230	222	238	212	220	220	220	228	216	220	218	220	228	240			
3	232	E	A	E	A	A	A	E	B	262	210	212	198	222	216	B	210	210	210	E	B	B	234	218	222	A	A	A
4	A	226	228	E	B	B	A	A	232	218	218	204	212	214	208	214	200	216	Q	Q	218	210	200	226	226	244		
5	238	A	226	A	226	310	Q	Q	214	214	214	214	214	222	222	196	232	218	202	210	210	208	218	232	Q	232		
6	224	Q	202	204	222	240	Q	228	210	206	196	212	206	190	200	196	208	214	212	202	202	202	208	222	240	A		
7	240	A	222	222	210	210	A	A	208	206	204	204	222	216	208	222	232	220	226	E	S	A	A	A	A	A		
8	226	A	A	A	A	A	224	218	200	196	214	B	210	198	200	198	B	B	250	A	224	A	218	A	A	A		
9	222	A	A	A	A	A	A	B	B	B	B	B	B	B	B	E	B	B	E	B	E	B	230	260	272	246	322	
10	A	E	A	A	B	B	B	B	A	B	B	B	B	B	B	B	B	B	E	B	E	B	E	B	A	A	A	
11	226	A	B	224	226	A	B	B	B	B	A	A	B	B	B	B	B	B	B	E	B	E	B	E	B	A	A	
12	258	A	A	A	E	A	E	A	E	B	B	B	224	214	206	206	212	226	232	262	236	230	238	258	268	242		
13	236	216	A	A	B	B	A	A	B	A	250	B	222	B	B	B	242	212	B	240	224	236	A	A	A	A		
14	228	224	224	E	A	A	E	A	264	228	210	214	226	B	B	226	218	218	218	208	236	220	216	216	232	244	248	
15	E	A	E	A	E	A	A	A	E	B	254	228	214	234	226	222	234	224	224	214	212	212	220	200	214	A	E	B
16	E	B	B	A	A	A	A	A	220	208	204	208	206	200	216	206	206	214	216	E	B	E	B	E	B	Q	274	
17	282	248	A	A	A	248	230	216	216	202	200	200	220	204	228	210	210	212	Q	212	212	226	B	240	A	248	A	
18	A	A	A	A	B	A	A	A	E	A	276	214	196	224	218	216	204	210	210	210	216	224	218	246	266	236	Q	
19	232	E	A	A	Q	A	A	220	214	206	202	194	210	212	200	210	202	214	204	220	222	196	208	220	Q	224	Q	
20	Q	228	220	A	A	A	A	228	196	200	206	198	A	212	212	212	198	216	216	226	216	218	218	220	Q	224	F	
21	A	A	220	A	A	A	216	220	218	216	216	216	208	208	208	214	214	212	212	222	Q	Q	218	218	Q	230	Q	
22	Q	A	A	A	A	B	A	B	218	212	220	208	196	216	206	206	210	212	216	206	198	206	Q	F	206	Q		
23	A	206	A	200	200	226	216	212	206	208	208	206	204	204	210	212	210	206	200	200	200	204	222	222	222	222		
24	228	A	A	A	A	A	B	B	B	A	B	B	E	B	B	B	212	216	226	226	230	258	228	220	214	A		
25	214	A	210	B	B	A	B	A	A	B	B	B	B	B	E	B	E	B	230	238	238	198	234	230	272	252	230	
26	A	228	Q	B	A	A	B	B	A	Q	194	228	236	206	196	210	212	214	216	224	A	A	A	A	A	A		
27	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	226	212	206	E	A	252	240	252	A	A	A	
28	A	208	A	216	B	A	A	A	E	A	E	A	260	260	204	200	200	216	266	B	212	220	226	A	230	A	A	
29	A	A	A	A	A	B	B	A	A	A	B	B	B	B	B	B	B	B	E	B	E	B	E	B	E	A	A	
30	B	B	A	B	A	A	222	208	202	216	200	B	224	240	228	228	B	B	B	238	250	250	282	270	E	B	A	
31	A	A	A	A	A	A	210	A	A	A	192	204	C	C	C	C	C	C	208	218	236	240	298	A	E	A	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	18	13	12	9	8	9	14	16	20	20	22	20	21	22	23	25	23	22	29	27	28	19	22	18				
MED	232	222	222	219	225	227	222	215	210	208	210	211	210	213	210	212	213	216	218	221	222	224	224	234				
U Q	258	E	A	230	E	A	E	A	242	274	228	224	218	216	222	218	223	218	218	226	216	226	235	240	248	250	248	244
L Q	226	220	220	210	216	220	216	211	206	200	204	206	204	206	206	209	210	212	214	216	212	218	220	224				

OCT. 1997 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1997 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

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

NOV. 1997 fXI (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1997 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

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

NOV. 1997 foF2 (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1997 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	25	35	29	28	33	40	51	B	B	38	30	34	28	34	35	34	26	24	23	21	17	33	40	41
2	36	42	35	40	44	36	25	32	32	36	34	35	30	30	35	35	31	34	32	26	22	25	34	23
3	22	17	20	23	22	26	30	32	34	29	38	35	40	36	32	30	28	32	28	36	26	18	B	34
4	41	50	50	46	40	32	27	28	59	B	B	B	B	B	B	B	B	B	8	10	B	B	B	38
5	41	36	33	B	B	B	B	B	B	B	B	33	32	30	B	B	B	B	B	B	36	33	30	32
6	51	42	38	40	36	32	30	34	B	35	34	30	29	30	29	B	27	B	B	B	B	B	B	B
7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9	E B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
10	89	36	68	39	41	39	B	34	28	41	B	B	B	B	31	25	25	30	23	43	38	34	38	34
11	40	32	28	38	43	40	40	30	B	34	36	B	B	28	32	27	B	27	26	24	20	24	19	14
12	28	30	35	78	43	49	41	36	28	28	34	30	34	29	33	28	26	25	26	23	27	25	16	16
13	17	16	25	18	34	26	31	30	27	30	32	41	35	32	E B	36	28	28	24	E B	33	28	22	31
14	16	34	41	44	41	41	33	26	27	32	32	32	28	51	B	30	30	E B	35	36	30	51	40	42
15	105	40	41	B	36	35	44	B	34	52	36	B	B	B	B	B	B	B	B	25	34	41	75	43
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	13	12	12	11	11	11	10	9	9	11	12	9	10	10	10	11	10	11	11	11	11	11	11	13
MED	36	36	35	39	40	36	32	31	31	34	34	32	31	30	32	30	28	26	26	28	27	30	32	34
U Q	46	41	41	44	43	40	41	34	34	41	36	35	34	34	35	34	31	32	32	36	41	34	40	46
L Q	22	31	28	23	34	32	30	29	28	30	32	30	29	30	32	28	26	24	23	24	22	24	21	20

NOV. 1997 ftes (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1997 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	00	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	10	9	9	10	19	16	B	B	21	21	17	8	11	12	11	10	12	12	10	9	7	8	10
2	22	21	10	21	8	9	11	9	9	11	13	11	12	13	10	12	10	10	9	10	9	9	8	7
3	8	7	10	6	8	8	9	9	11	12	12	12	14	14	16	16	19	11	12	9	6	8	B	10
4	10	9	21	22	18	11	16	21	17	B	33	B	B	B	B	B	B	8	7	B	B	B	24	20
5	22	20	21	B	B	B	B	B	B	B	30	22	22	B	B	59	B	B	B	25	22	27	8	18
6	21	17	20	20	22	20	23	34	B	22	24	16	21	21	20	B	20	B	B	B	B	B	B	B
7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8	B	B	B	B	B	B	B	B	B	B	B	B	B	32	30	21	31	31	B	B	B	B	B	7
9	22	B	B	7	B	B	B	B	31	56	59	8	20	18	18	21	13	23	26	25	20	21	21	18
10	16	17	17	23	7	19	B	23	21	22	B	B	B	B	24	21	21	8	12	17	14	12	12	11
11	12	10	10	18	15	14	16	18	B	21	13	B	B	16	22	22	B	16	21	8	11	11	12	8
12	8	8	9	16	11	14	20	10	12	10	12	15	15	16	13	16	13	12	11	10	11	10	9	6
13	7	8	9	10	9	8	8	9	20	15	15	12	12	22	36	22	17	20	33	28	15	10	6	9
14	8	10	32	12	21	12	11	11	14	12	16	18	14	18	B	20	8	35	27	13	20	11	10	11
15	15	21	20	B	20	10	30	B	21	16	23	B	34	B	B	B	B	B	21	21	10	18	11	7
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
MED	15	17	20	20	18	14	20	23	21	21	23	18	21	21	24	21	20	20	21	21	15	12	12	10
U Q	22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	18
L Q	8	9	10	10	9	10	11	10	14	12	13	12	14	16	16	16	13	11	12	10	10	10	8	7

NOV. 1997 fmin (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 1997 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	A	A	A	A	B	B	A	212	204	198	198	204	204	212	228	226	208	226	A	222	222
2	A	A	Q	A	206	220	220	218	210	210	220	210	202	202	204	204	208	222	218	216	226	Q	Q	Q
3	Q	A	E	A	220	202	212	224	210	210	210	214	214	214	208	202	212	212	206	224	218	Q	B	A
4	252	242	262	276	A	260	248	E	A	A	B	B	B	B	B	B	B	B	A	B	B	B	E	A
5	A	A	A	B	B	B	B	B	B	B	A	E	A	B	B	B	B	B	A	A	A	A	A	A
6	A	A	A	A	A	A	E	B	B	A	A	208	200	208	196	B	224	B	B	B	B	B	B	B
7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8	B	B	B	B	B	B	B	B	B	B	B	B	214	A	224	224	224	B	B	B	B	B	B	R
9	E	B	B	R	B	B	B	E	B	B	B	E	A	214	242	200	210	214	214	202	224	234	A	Q
10	A	A	E	A	A	A	E	A	A	A	B	B	B	B	E	B	230	226	208	248	E	A	E	A
11	232	202	208	214	248	250	A	222	212	208	B	B	212	224	230	B	222	226	226	226	A	E	A	232
12	260	256	232	A	A	A	A	238	210	200	206	198	208	202	220	210	210	210	206	216	224	216	238	234
13	216	216	260	248	214	212	224	202	214	216	204	198	198	212	220	220	202	206	250	228	218	232	236	224
14	250	E	A	A	Q	A	E	A	238	206	210	208	200	202	198	A	B	226	214	248	260	A	E	A
15	A	A	A	B	A	A	A	B	A	A	A	B	230	B	B	B	B	B	212	A	E	A	A	A
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31																								
CNT	7	5	6	4	4	5	6	9	6	6	9	9	10	9	9	10	10	11	9	9	8	6	8	8
MED	241	229	226	242	214	220	226	215	210	210	208	208	202	208	210	214	212	217	218	225	224	228	233	232
U Q	260	276	262	266	234	255	248	242	214	212	216	212	230	213	222	226	214	232	238	247	238	236	241	245
L Q	224	209	208	231	210	207	220	212	210	208	204	200	198	201	204	204	208	210	209	216	221	224	230	228

NOV. 1997 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.1997 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

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	50	58	50	58	69	70	X	86	X	O	X	X	X	X	77	74	69	64	64	64	64	59	A	52	50			
2	45	51		A	O	X	O	66	74	84	82	79	75	77	74	70	64	67	65	65	60	60	62	58	55			
3		O	X		56	58	64	110	76	86	89	84	79	81	80	86	81	79	72	68	64	56	59	58	O	X	45	
4	47	65		A	O	X	O		X	X	X				X	X			X	X				O	X	O	X	
5	X		A	O	X	O	X	R		68	75	85	81	74	74	73	75		B	B	X	O	X	O	X	X	46	
6	A	A		R		A	R		R	X	X	X	B	O	X	X	O	X	X	X	X	O	X	X	X	O	X	
7	X	X	O	X				X	O	X	X	X	X	O	X	X	A	X	A	R	X	X	C	C	C	C		
8	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		
9	C	C	C	C	C	C	C	C	C	C	C	X	78	76	71	67	66	66	60	65	X	O	X	X	X	57		
10	47	51	62	O	X	X	O	X	X	X	X	X	X	O	X	X	X	X	O	X	R		74	84	A	A	A	
11	66	42		R	R	R	R	B	R	R	B	R	B	B	B	B	B	B	B	B	B	O	X	B	O	X	45	
12	A	B	B	O	X	R	X	X	X	R	O	X	B	Y	Y	R	Y	R	O	X	R	O	X	O	X	O	X	
13	X	X		X	X	X			X	O	X			O	X	O	X		Y	X	X	X	X	O	X	O	X	X
14	X		O	X		O	X	X		X	O	X	R	O	X	X	R	R	X	X	X	X	O	X	X	X	X	
15	O	X							X	O	X	O	X	X	X	X	X	O	X	X	X	O	X	X	O	X	X	
16	48	47	50	57	O	X	X	X	R	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	O	X	
17	50		A		A	O	X	O	X	R	X	X	X	O	X	O	X	X	X	X	X	X	X	X	X	X	X	
18	O	X		A	X	O	X	Y	Y	Y	B	B	R	R	R	R	R	R	O	X	R	X	X	X	X	X	X	
19	41	52	56		A	Y	Y	R	X	X	O	X	O	X	X	A	O	X	R	X	X	X	X	X	X	X	X	
20	51	56	49	53	66	O	X		O	X	X	X	X	X	X	X	A	O	X	X	X	X	X	X	X	X	X	
21		O	X	O	X	A	A	O	X		X	X	X	X	X	X	R	R	X	X	X	X	X	X	X	X	X	
22	O	X																										
23	42	46	49	54		56		68	71	71	72	69	66	66	64	64	60	62	66	60	54	61	62	56	54	X	O	X
24	46	52		A	A	Y	X	X	Y	Y		75	71	72	68	62	62	64	58	62	68	62	61	55	52	46	X	
25	X	X																									X	
26	44	51	58	51	54	68	68	74	90	86	80	73	62	61		56	64	60	60	60	57	60	55	57	55	X	X	
27	58	62	66	68	70		A	O	X	53	71	82	87	86	93	84	74	66	68	64	60	56	56	60	60	60	56	
28	X	X																									X	
29	56	62	64	58	69	76	76	78	86	98	96	81	80	69		62	62	60	60	60	57	57	57	59	58	X	X	
30	X	O	X	X	O	X			X	X	X	O	X	X	O	X	X	X	X	X	X	X	X	X	X	X	X	
31	54	54	58	62	70	79	80	82	76	92	88	84	78	72	68	60	65	60	60	60	59	58	62	65	63	X	X	
29	58	51	52	52	107	70	82	90	96	88	86	88	81	83	75	69	64	61	62	66	62	61	56	60				
30	57	X	O	X	O	X	X	Y	Y	Y	B	Y	X	X	X	X	O	X	X	X	Y	Y			A	X	X	
31		X			R	R	O	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	42	43	51	51				53	56	62	68	64	65	67	65	64	66	64	58	57	56	58	58	55	52			
	00	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	25	21	24	19	24	23	23	25	25	27	25	25	25	19	23	26	27	25	29	29	26	27	28				
MED	50	51	52	54	65	68	71	74	80	80	75	73	74	69	67	66	64	62	61	59	59	56	54	50				
U Q	56	56	58	58	69	74	76	85	86	88	83	81	79	74	74	69	68	66	63	62	61	60	58	54				
L Q	46	46	50	52	O	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	O	X	X	X	X	

DEC.1997 fXI (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 1997 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	F43	F43	F39	F42	F57	F59	6675	F82	R83	89	J85	R82	71	68	63	58	58	58	58	53	A	F46	44		
2	F33	F40	A	A	R50	R50	F56	F64	F78	F76	F73	69	J71	68	R64	58	61	59	59	J54	54	56	52	49	
3	F28	F40	F40	52	F52	R60	F72	F72	F73	F68	F75	74	J80	J75	73	J66	62	58	50	53	52	S44	39		
4	F37	F55	A	R49	R50	F58	F67	F81	R80	R82	F79	F76	F80	J75	72	F67	F67	62	55	F60	F59	F58	S52	48	
5	47	A	S46	R48	R58	F60	F75	F60	F60	F60	F61	F65	B	B	J81	R67	R65	R47	R47	R50	R48	F40			
6	A	A	R	F41	A	R	R	R	J42	R54	R58	B	U	R	67	67	R56	R56	61	57	56	J56	R52	S52	48
7	J50	R52	S58	F56	F59	F68	77	R84	R86	R83	R77	R70	R64	R63	A	J60	A	R	56	55	C	C	C	C	
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
9	C	C	C	C	C	C	C	C	C	C	J72	R70	R65	61	60	60	J54	59	58	S57	58	56	F50	F39	
10	F37	F42	F50	S56	U51	R49	F56	U71	72	74	69	74	70	67	69	69	F70	F48	R	A	F60	A	A	A	
11	S22	F	R	R	R	R	R	B	R	R	B	D40	R	B	B	B	B	B	B	B	R48	B	39	F35	
12	A	B	B	R42	R	44	50	U56	58	R	R	59	B	Y	Y	R	Y	U50	R	R45	R44	R46	R44	45	
13	44	43	F40	46	J51	S61	F62	F66	74	R76	F72	F58	R62	R58	R	Y	J54	R53	J55	56	R41	R46	R43	40	
14	41	42	F37	48	R53	R56	59	F64	F61	59	64	R	R	57	57	R	62	61	J55	R54	R48	44	46	45	
15	S48	F41	F40	F49	F58	F65	68	F78	R78	R74	68	65	R68	68	58	61	R60	R62	J53	R50	R48	36	41	40	
16	F38	F38	F39	48	S60	F65	70	F68	J75	R71	70	72	71	73	65	60	64	66	67	52	51	46	45	44	
17	F42	A	A	F44	A50	R46	R	R	60	F58	57	59	R59	R63	62	61	J54	R54	J51	51	51	47	42	37	
18	S52	F29	A	J53	R43	R38	Y	Y	Y	B	B	R	R	R	R	R	R	49	R48	R50	R45	R42	34		
19	F31	F40	F30	A	Y	Y	R	52	56	R60	R59	R56	57	A59	R	R	J51	R56	J54	55	J55	50	48	43	
20	F39	F38	F39	F42	F55	R53	F56	R60	F57	F62	F61	F59	F60	R57	A	R	J52	R51	R52	56	56	52	48	34	
21	F32	S40	R40	A	A	46	59	F56	R61	66	66	J67	R69	62	R	R	52	J50	R55	56	53	48	40	37	
22	S44	F39	F40	48	F54	F57	F68	F65	F63	66	61	60	A	60	60	56	60	58	J54	R52	51	54	46	32	
23	F32	F40	S43	S48	A50	S	F57	F59	F65	62	61	F60	F58	J58	R54	56	J56	R54	48	J55	56	50	48		
24	F33	F36	A	A	Y	J40	R53	R	Y	Y	F60	F61	F60	F59	F56	56	58	J52	R56	J56	55	49	42	39	
25	38	45	F47	F42	F39	F58	F58	F64	F67	F80	74	67	J56	R55	R	50	58	J54	R54	51	J54	49	48	49	
26	F48	F52	F56	F56	F57	F47	R57	F68	F76	F72	82	78	R68	60	R62	R58	R54	R50	R50	54	54	54	54	50	
27	50	56	F54	F46	F55	F58	F60	F67	F73	88	73	F74	R63	A56	R56	R56	J54	R54	51	51	J51	53	F52		
28	48	48	52	56	F56	F68	69	76	42	86	82	78	J72	R66	62	R54	59	J54	R54	53	52	56	54	49	
29	F47	F39	F39	F31	F64	F57	F72	F84	F86	82	76	82	75	77	69	63	J58	R55	R56	60	56	55	46	50	
30	F47	F47	S48	S46	48	59	Y	Y	Y	B	Y	51	R	R	60	61	J75	Y79	Y	Y	F34	F38	F33	A	F30
31	F32	J37	F28	F37	R	40	R47	50	56	57	58	59	61	59	R58	60	58	52	51	50	52	52	49	46	
	00	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	21	24	19	24	23	23	25	25	26	26	25	25	19	23	26	27	25	28	29	26	27	28	
MED	F42	F40	F40	F48	F54	F57	F60	F66	67	73	68	68	67	63	61	60	58	56	55	52	53	50	46	44	
U Q	47	46	49	50	F57	F59	68	75	76	81	73	74	73	68	68	63	62	60	57	56	55	54	50	48	
L Q	F33	F38	F39	F42	R50	R50	R56	57	58	60	61	59	60	58	58	56	R54	R53	R54	50	R49	46	43	38	

DEC. 1997 foF2 (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.1997 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	33	40	35	34	28	28	27	32	35	33	32	33	34	36	30	43	33	28	35	30	42	77	46	20			
2	40	43	46	44	34	44	39	32	33	32	37	38	34	34	43	42	37	32	27	25	20	50	43	26			
3	29	24	33	31	36	45	51	44	34	34	32	38	33	32	30	36	42	30	30	44	48	36	33	32			
4	44	38	56	44	43	35	30	30	30	32	33	40	37	36	40	42	64	27	30	28	30	31	44	37			
5	37	70	43	41	37	34	42	38	42	37	35	32	36	B	B	32	35	E B	59	27	38	33	30	32	40		
6	71	42	39	30	60	41	41	49	31	28	33	B E	B E	B E	B	56	35	32	30	31	38	32	40	30	25	31	26
7	68	38	26	39	24	23	25	27	28	28	36	35	108	45	102	38	76	27	27	32	C	C	C	C			
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
10	23	26	27	28	44	35	32	35	36	35	33	34	32	32	36	36	36	28	27	57	52	48	53	46			
11	48	32	39	42	43	43	39	B	35	38	B	30	B	B	B	B	B	B	B	B E	B	B	37	41			
12	42	B	B	36	38	36	27	46	32	31	36	B	34	41	42	42	33	29	33	24	22	21	30	25			
13	18	19	20	30	33	42	67	48	37	32	42	35	44	68	40	48	38	36	30	41	63	27	36	36			
14	42	44	34	34	50	45	62	69	38	37	38	40	47	33	39	43	38	46	30	32	44	68	40	40			
15	49	32	26	27	27	25	26	26	28	30	33	46	44	41	42	38	44	30	33	48	32	33	42	29			
16	37	36	43	43	30	38	34	36	31	33	30	66	66	76	45	38	29	28	27	29	33	28	37	43			
17	45	47	43	34	46	44	46	47	41	34	34	33	35	36	30	31	32	30	44	36	32	32	37	36			
18	40	87	46	43	44	36	54	27	34	B	B	34	34	37	33	41	48	29	32	46	38	28	38	53			
19	41	70	34	51	44	42	51	31	71	38	34	35	39	68	41	45	32	41	44	72	35	36	42	27			
20	31	36	33	50	34	36	44	29	29	29	41	43	46	41	71	36	32	28	45	33	25	34	28	40			
21	26	36	56	44	46	41	35	34	29	31	35	35	37	40	34	32	36	35	30	25	27	26	34	38			
22	40	48	35	34	41	27	25	34	60	44	38	41	75	44	39	38	38	34	32	34	42	30	29	32			
23	34	41	39	47	66	103	45	36	34	35	35	38	41	42	42	46	54	70	38	39	27	30	37	36			
24	39	36	50	45	40	40	44	38	37	36	34	32	31	36	32	42	36	32	27	29	26	26	40	22			
25	E B E B	22	27	32	33	42	42	40	39	33	33	28	34	38	44	43	42	36	30	29	38	39	59	91	70		
26	69	58	36	39	40	58	40	34	48	37	36	44	35	36	42	33	45	43	48	46	37	32	32	58			
27	26	26	37	41	29	37	32	35	60	34	33	35	37	39	83	43	38	33	42	33	34	32	18	44			
28	30	46	33	30	29	28	27	25	30	34	40	31	39	41	57	36	43	67	45	36	40	42	89	52			
29	27	36	34	39	40	48	34	35	36	36	39	38	44	32	41	36	38	32	37	43	49	53	52	69			
30	91	52	46	50	37	34	44	39	28	B	39	30	38	27	E B E B	37	35	33	41	42	24	81	92	86	39		
31	42	38	31	29	38	38	35	38	44	37	32	32	37	74	40	46	46	42	44	36	44	56	66	30			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	29	28	28	29	29	29	29	28	29	27	28	28	29	28	28	29	29	29	29	29	29	28	29	29			
MED	40	38	36	39	40	38	39	35	34	34	35	35	38	40	40	38	38	32	32	36	34	32	37	37			
U Q	44	46	43	44	44	44	44	39	40	37	38	39	44	43	43	43	44	41	42	42	43	49	45	44			
L Q	30	34	33	32	34	34	31	32	30	32	33	33	34	36	35	36	33	29	30	30	28	28	32	28			

DEC.1997 ftes (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 1997 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 \ E	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	11	17	10	10	9	9	9	9	10	10	10	11	14	16	14	10	12	11	9	11	13	10	10	13	
2	13	13	11	10	10	13	10	9	10	10	10	11	10	10	11	10	11	9	14	15	11	8	7	11	
3	10	12	10	10	10	14	11	11	9	9	10	22	22	17	17	17	15	16	11	10	12	12	19	11	
4	10	10	18	13	9	8	10	9	10	12	10	14	14	11	11	11	14	17	11	10	9	10	12	14	
5	20	10	12	13	12	10	10	13	13	8	10	11	16	B	B	28	26	59	12	14	21	20	11	12	
6	22	8	29	12	12	22	15	12	11	11	14	B	56	35	21	21	16	16	15	14	12	15	11	10	
7	8	9	8	10	9	10	8	10	11	14	12	17	14	13	21	15	15	20	10	9	C	C	C	C	
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
9	C	C	C	C	C	C	C	C	C	C	C	14	18	19	21	13	11	13	10	10	10	11	11	10	10
10	10	10	8	10	8	9	8	9	8	10	11	11	10	11	12	10	10	10	10	10	9	9	9	8	
11	9	9	10	9	16	11	11	B	22	19	B	19	B	B	B	B	B	B	B	B	41	B	11	11	
12	13	B	B	14	14	11	12	9	12	11	13	B	22	25	21	16	11	10	12	10	10	9	7	8	
13	9	10	10	10	9	9	8	9	10	9	10	10	14	12	12	12	11	12	16	26	14	12	14	10	
14	9	9	9	9	9	10	9	10	10	10	10	12	10	12	12	14	19	16	13	12	10	13	10	11	
15	8	8	10	10	9	8	10	20	16	13	11	14	14	11	11	12	22	21	16	9	10	12	10	10	
16	10	10	9	9	9	8	9	9	11	14	12	12	13	15	11	10	13	11	9	11	20	11	10	14	
17	11	11	12	10	19	9	11	11	10	9	10	10	10	10	10	10	10	11	10	9	10	10	9	8	
18	9	10	12	23	17	13	10	12	14	B	B	14	10	10	10	10	13	12	11	9	9	10	11	11	
19	10	12	14	13	13	10	8	9	9	10	10	10	10	10	10	10	8	11	12	9	19	10	11	10	
20	8	10	8	10	8	9	8	12	9	14	12	10	16	20	18	10	10	10	10	10	10	7	11	11	
21	10	13	15	16	15	11	10	13	13	12	12	11	14	12	12	11	9	12	10	10	11	10	9	10	
22	12	9	11	10	9	8	11	14	12	10	10	11	12	11	11	10	10	9	9	11	9	9	10	9	
23	9	12	13	16	21	10	10	10	9	10	10	9	10	10	10	9	10	11	10	9	8	8	10	9	
24	11	11	10	10	10	12	14	15	22	13	10	10	10	10	10	9	11	10	10	11	9	9	10	12	
25	22	27	11	8	9	10	14	14	13	14	20	17	20	12	12	12	10	12	10	10	10	10	11	9	
26	8	8	8	8	8	12	7	8	9	10	9	10	10	8	11	11	11	10	11	10	10	10	11	11	
27	8	8	10	11	10	10	9	8	10	10	9	12	11	10	11	12	12	10	10	9	11	10	10	7	
28	8	10	9	8	9	9	10	9	9	10	10	11	9	10	11	10	11	10	10	12	10	10	10	9	
29	9	10	12	9	16	9	10	10	10	12	10	9	11	12	12	10	8	8	9	11	10	10	9	9	
30	8	8	9	7	7	8	15	10	17	B	21	13	10	12	37	35	31	14	11	10	10	9	8	10	
31	14	13	9	7	18	9	10	8	10	10	10	12	11	15	11	11	14	12	15	13	10	10	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	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	29	29	29	29	
MED	10	10	10	10	10	10	10	10	10	10	10	12	12	12	12	11	12	11	10	10	10	10	10	10	
U Q	12	12	12	12	14	11	11	12	13	14	12	14	16	16	17	14	15	16	12	12	12	12	11	11	
L Q	8	9	9	9	9	9	9	9	10	10	10	10	10	10	11	10	10	10	10	10	10	9	10	9	

DEC. 1997 fmin (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.1997 h'F (KM)

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

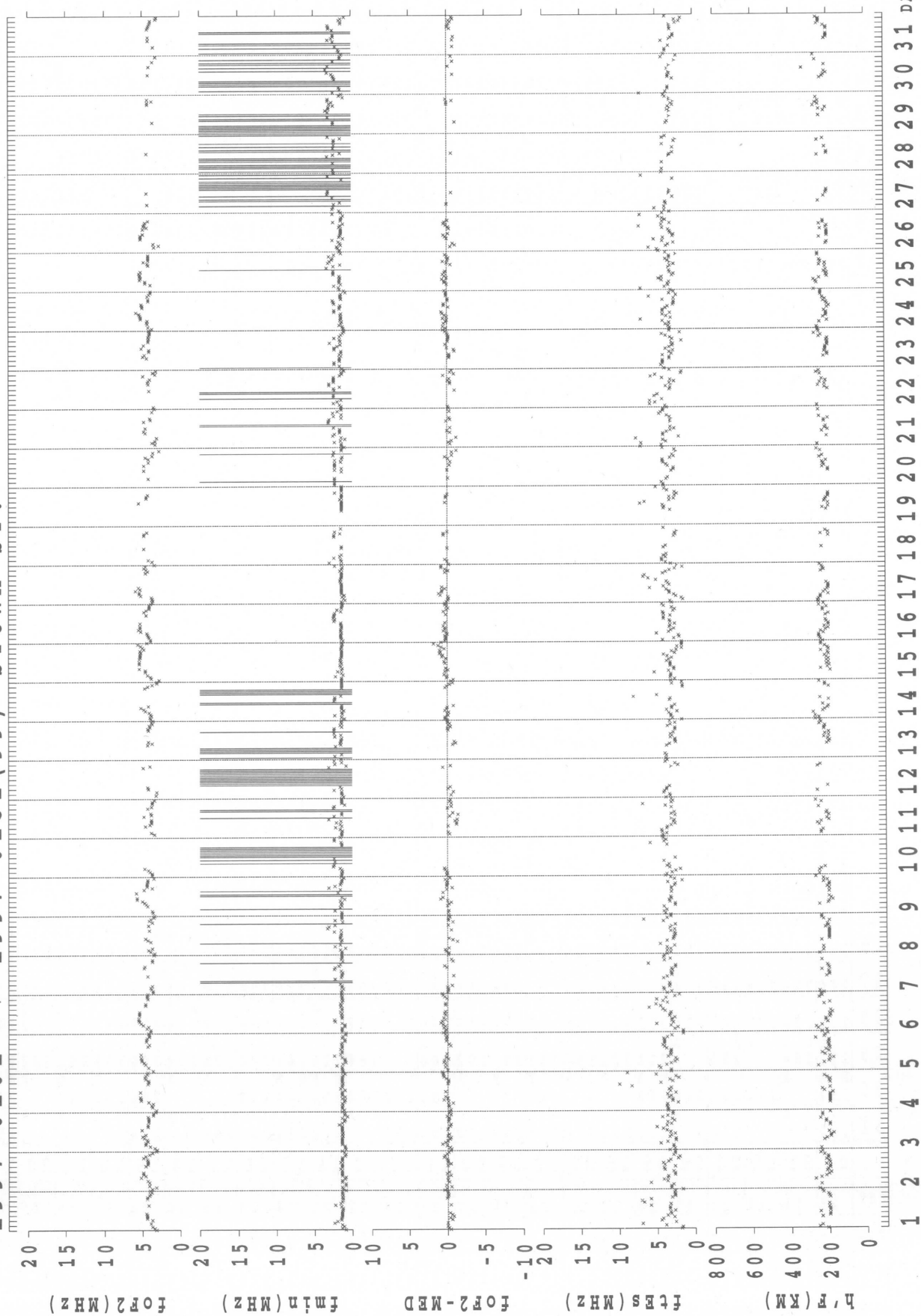
LAT.69'00.4'S LON.039'35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

D\H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	258	276	Q	A	214	202	212	220	214	206	208	202	196	206	200	200	200	208	216	210	210	234	A	228	238			
2	A	A	A	A	222		228	210	198	198	206	206	206	198		A	202	202	202	204	198	200	230	Q	E	A	242	246
3	E	A	E	A	E	A	Q	A	E	A	E	A		A	230	210	210	216	204	212	228	220	A	256	270	308	A	Q
4	274	232		A	A		222	200	210	204	204	204	242	200	210	200	200	204	204	198	206	230	218			A		A
5	E	A	A	A	A			A		212	200	200	214	208		B	B	A	A	B		A	A					A
6	A	A	A	Q	A	A		A				B	B					E	A	E	B							
7	E	A		E	A	E	A	226	232	224	200	204	204	214	198		A	226	A	212		A	196	206	214			
8		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
9	C	C	C	C	C	C	C	C	C	C	C	E	A	A	A	A	A									Q		
10	228	236	242	226	226	214	208	208	208	200	204	206	202	208	220	220	202	208				206		204				
11	E	A	A	A	A	A	A	B	A	A	B		B	B	B	B	B	B	B	B	B	E	B	B	B	E	B	
12	A	B	B		A	A						204	B	Y	A		A											
13	254	276	276	244	228	240		218	226	204	204	204		A	E	A	224	A			E	A						
14	238	246	238	250					202	222	204	236	218	200	202	202	206		216	202	202	236	214	238	230	226		
15		A	A	Q								A	204	230	220	204		212	220		E	A	Q					
16	242		276	250	238	220	202	216	216	216	214		A	A	A		214	204	196	212	212	212	244	222	204	240		
17	E	A	A	A	A	A	A	A														E	A					
18	244	202	Q	A	218	194	232		A	Y	Y	B	B		216	208	A	202	222		222	216	226	214	240	240	232	
19	E	A	A	A	A	A	A						A	A							A	A				E	A	
20	Q			Q	Q				220	204	200	204	208	230		200	206	224	244	242		224	212	230	242			
21	262	256	214	224	210	210	194	200	200	200	246	226		214		212	204	204	212	212	212	212	218	224	240			
22	218	234				226	236	220	204	214	212	216		206	202	202	196	202	202	216	216	228	236	248				
23	214	240		218	218	210	208	210		202	218	258		214	206	208	196	244	214	212	216	212	232	256				
24	E	A		A	A	A	A	A	214	198	208	198		A	A					202	212	216	220	224	220	226		
25	246	250		A	A	A	A	A	A	A	A	A	228	206	212	208	208	216	212	206	218	222	222	234	256	236		
26	E	B	E	B	Q	Q	E	A																			A	
27	260	260	228	240	240	224	236	210	216	200	206	204	202	210	232	208	200	202	202	216	216	220	236	236				
28	E	A			A	A	A		A				A							E	A	E	A			E	A	
29	268	258	250	228	250		234	206		198	214	234	212	198	210	202	232	242	246	256	202	224	220	248				
30	H			Q					A																			
31	240	226	238	246	214	222	206	206		196	198	210	200	200		200	204	210	194	214	234	226	236	232				
32	232	258	244	240	230	210	220	208	200	198	216	200	198	208		200	196	204	284	208	232	226	222	220				
33	Q	E	A	AE	A	A							A	A														
34	212	264		280		214	202	196	208	208	202	206		196	216	204	204	204	204	200	234	224	228	236				
35	E	A	A		E	A	A	A	Y	B	A		190	202	200	254	244	218		A	A	206	202	210	AE	A		
36	254		212	204	226	254										A									A			
37		A	A		A															A		A	A	A				
38	232			216		220	204	204	206	200	200	200	208		208	232	200	204		234						256		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	25	18	14	21	17	18	20	21	22	25	27	24	18	22	21	24	23	26	26	26	27	25	26	26				
MED	237	247	240	237	225	220	208	210	204	204	204	206	207	208	208	204	204	207	214	214	221	223	236	238				
U Q	E	A	E	E	A							A								E	A							
L Q	263	260	262	250	234	226	227	217	208	214	214	221	212	214	218	214	210	216	226	226	234	236	244	248				
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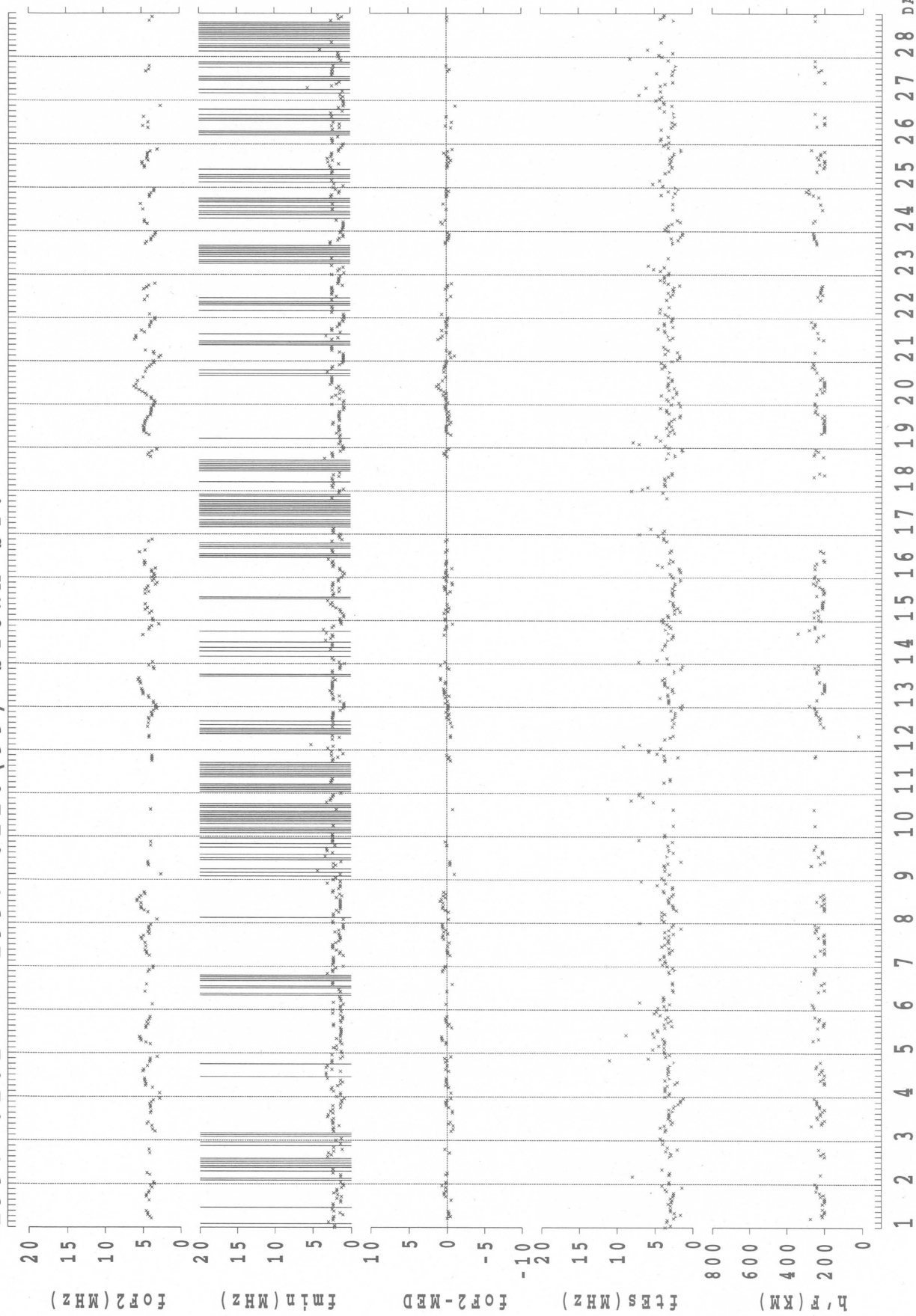
DEC.1997 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

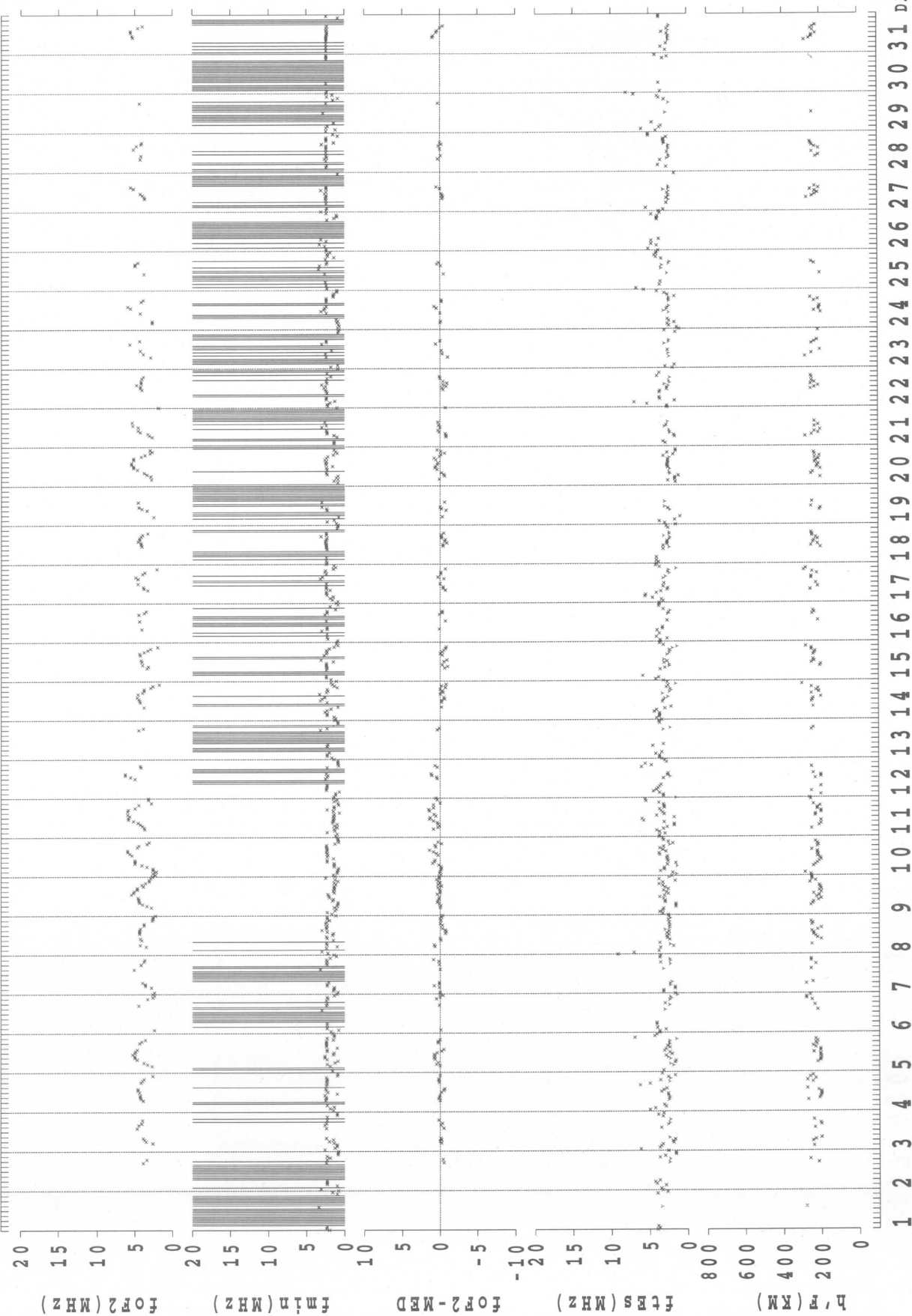
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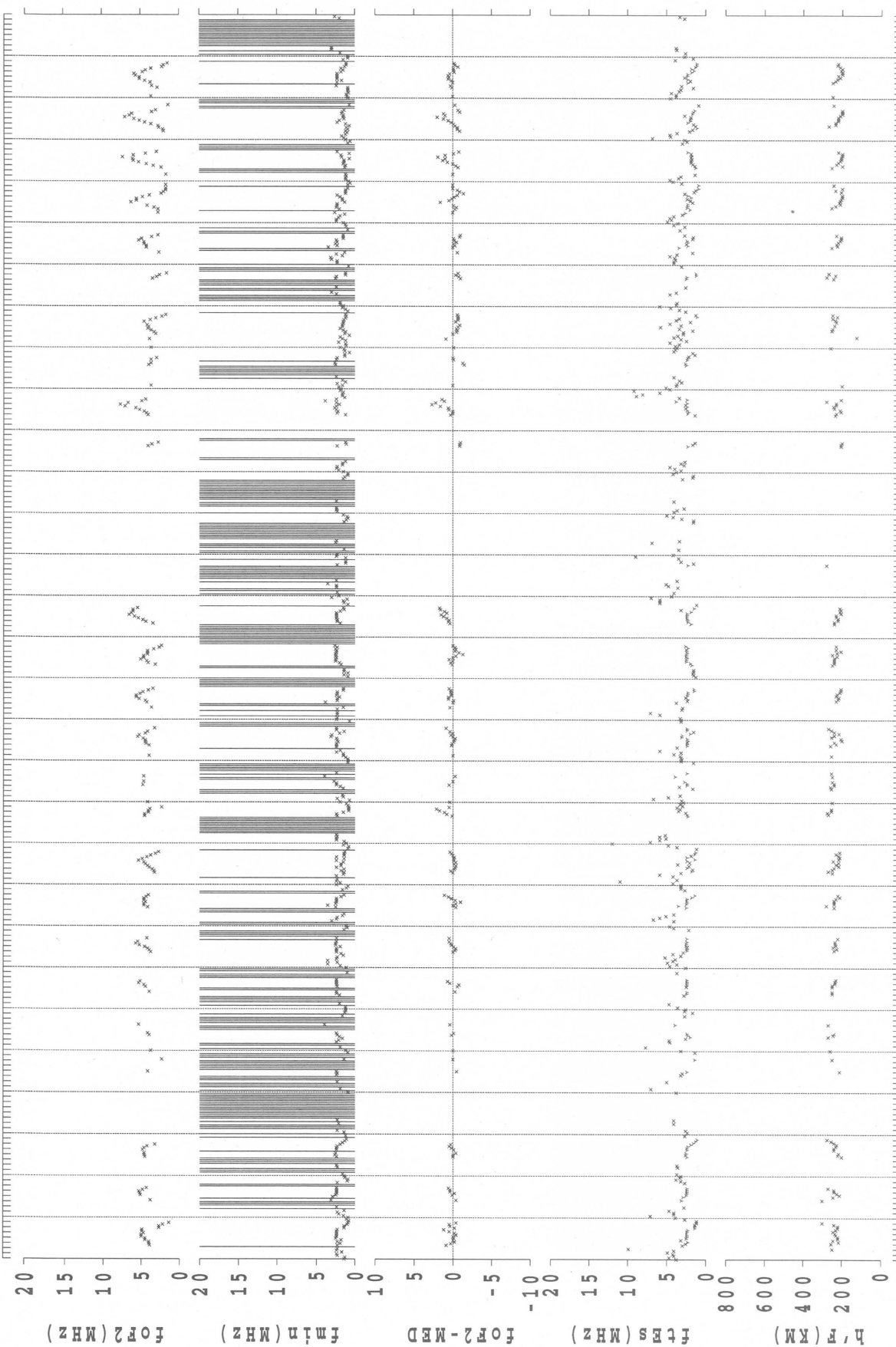
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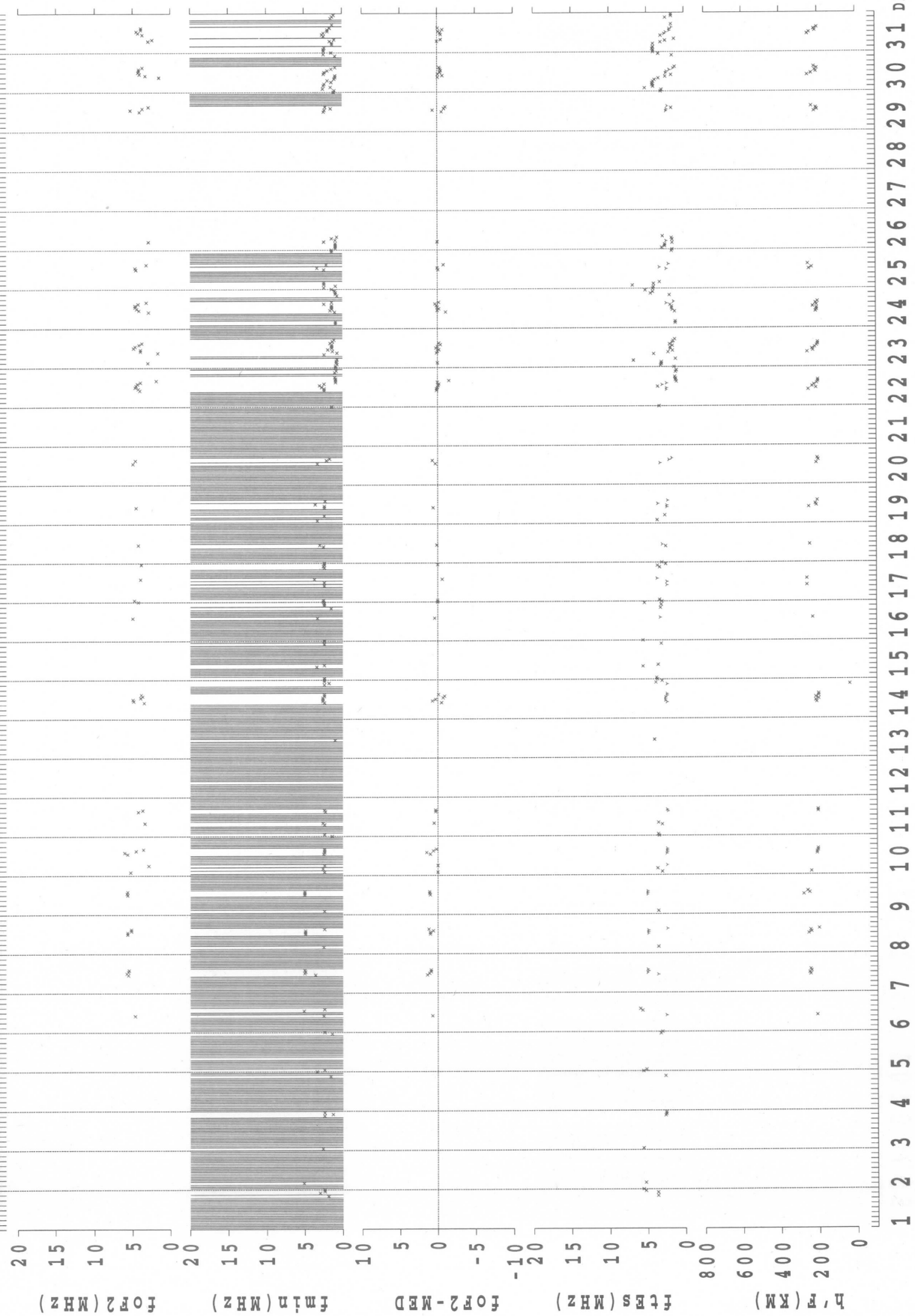


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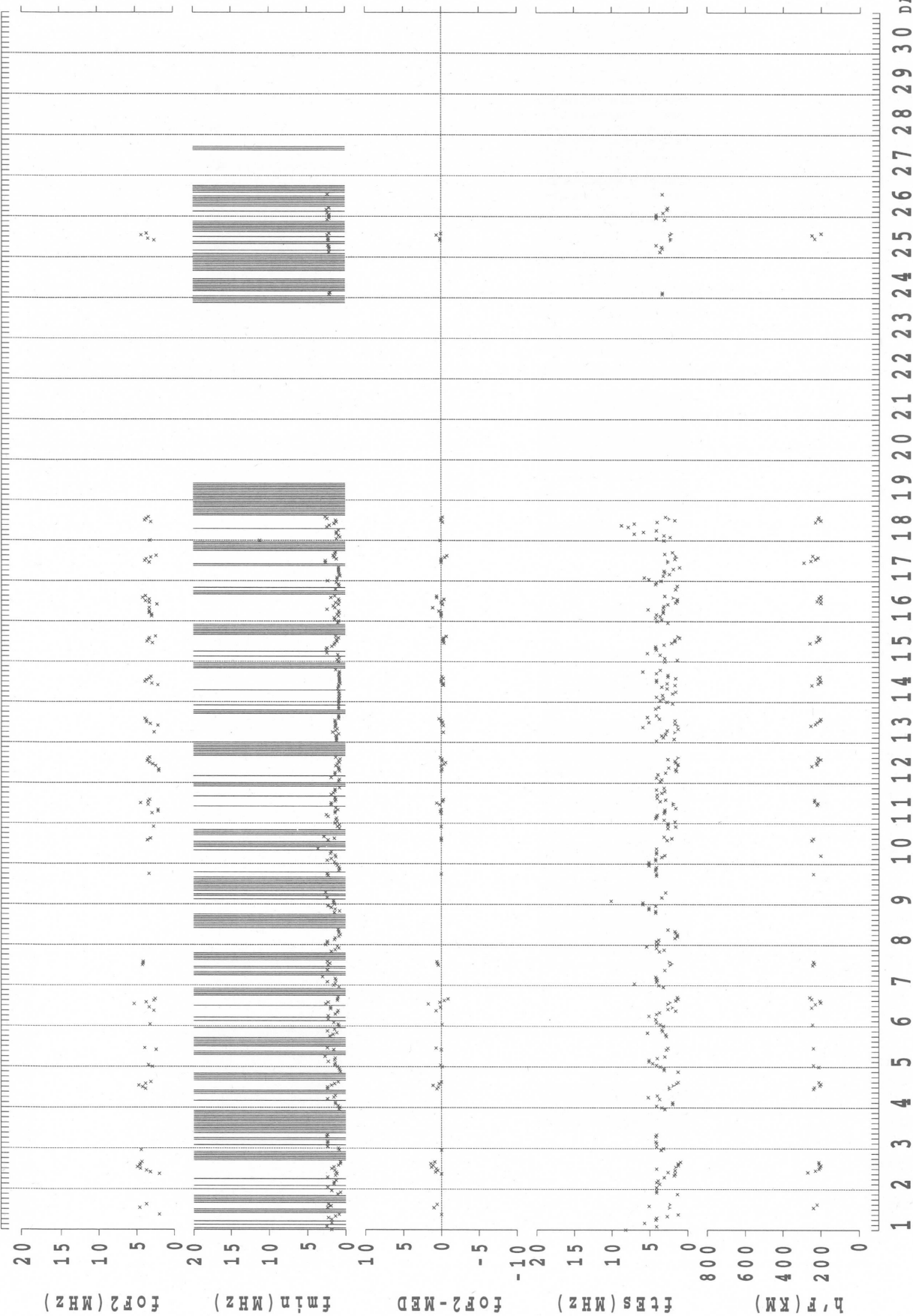


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 DAY/45' EMT

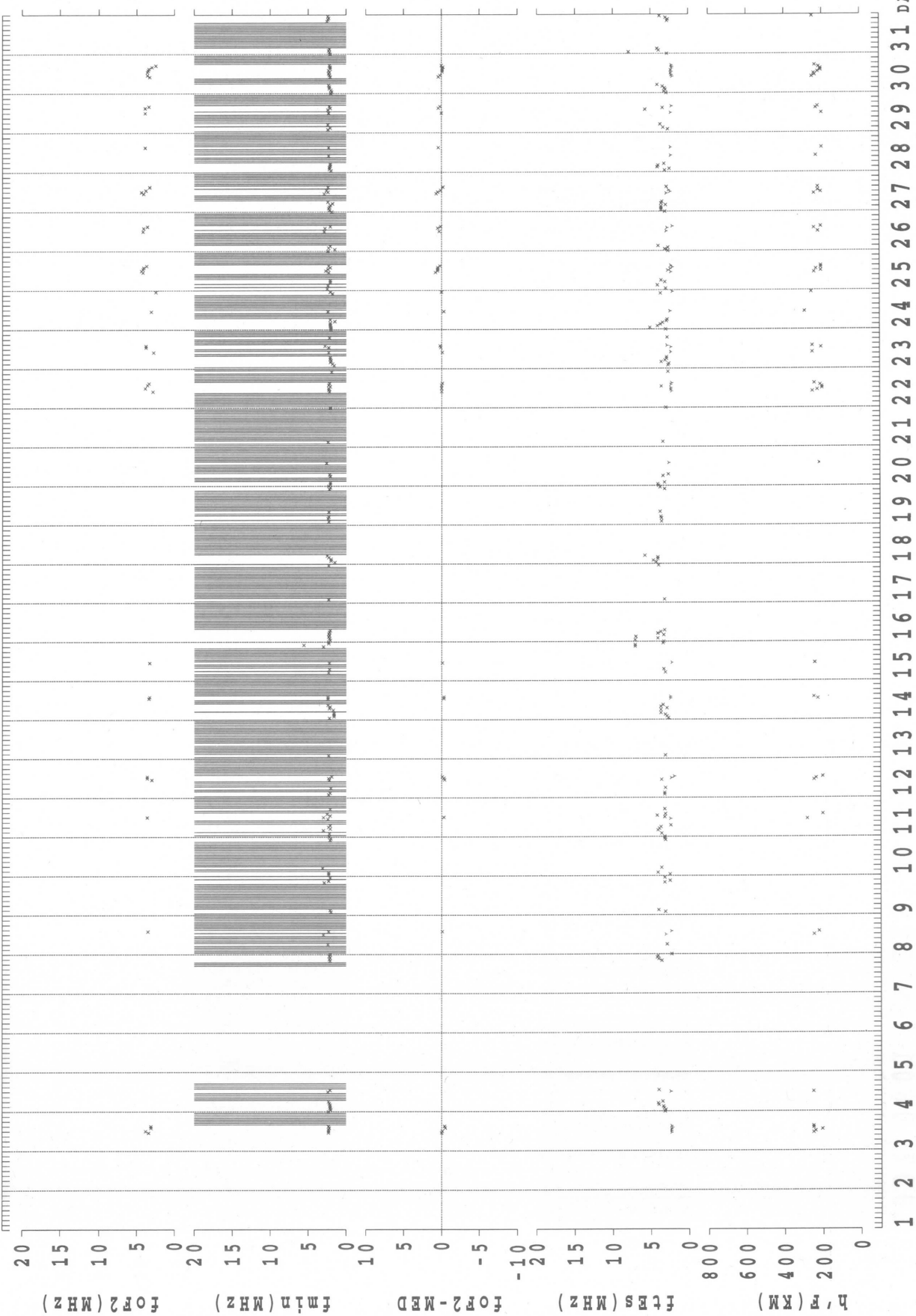
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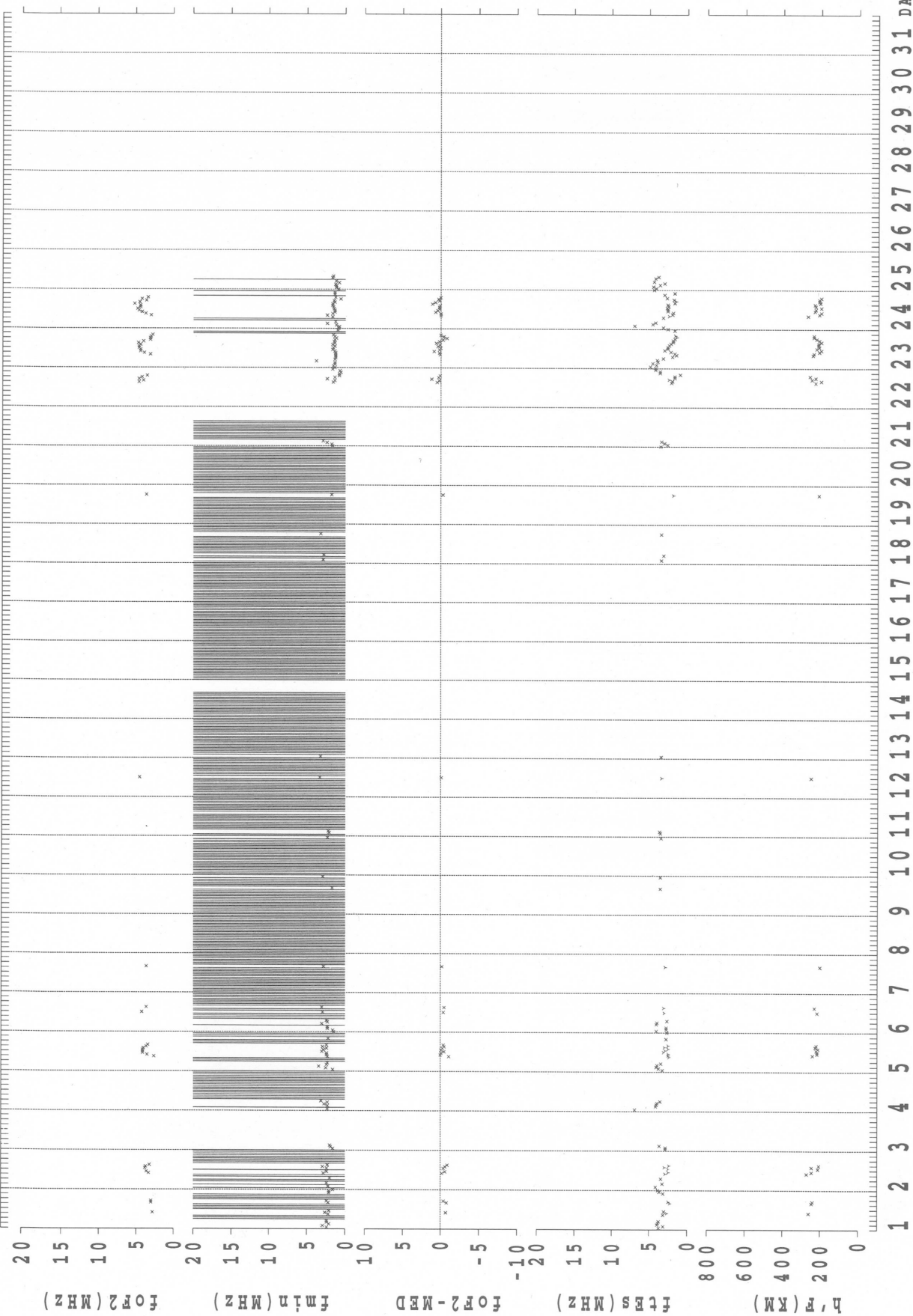
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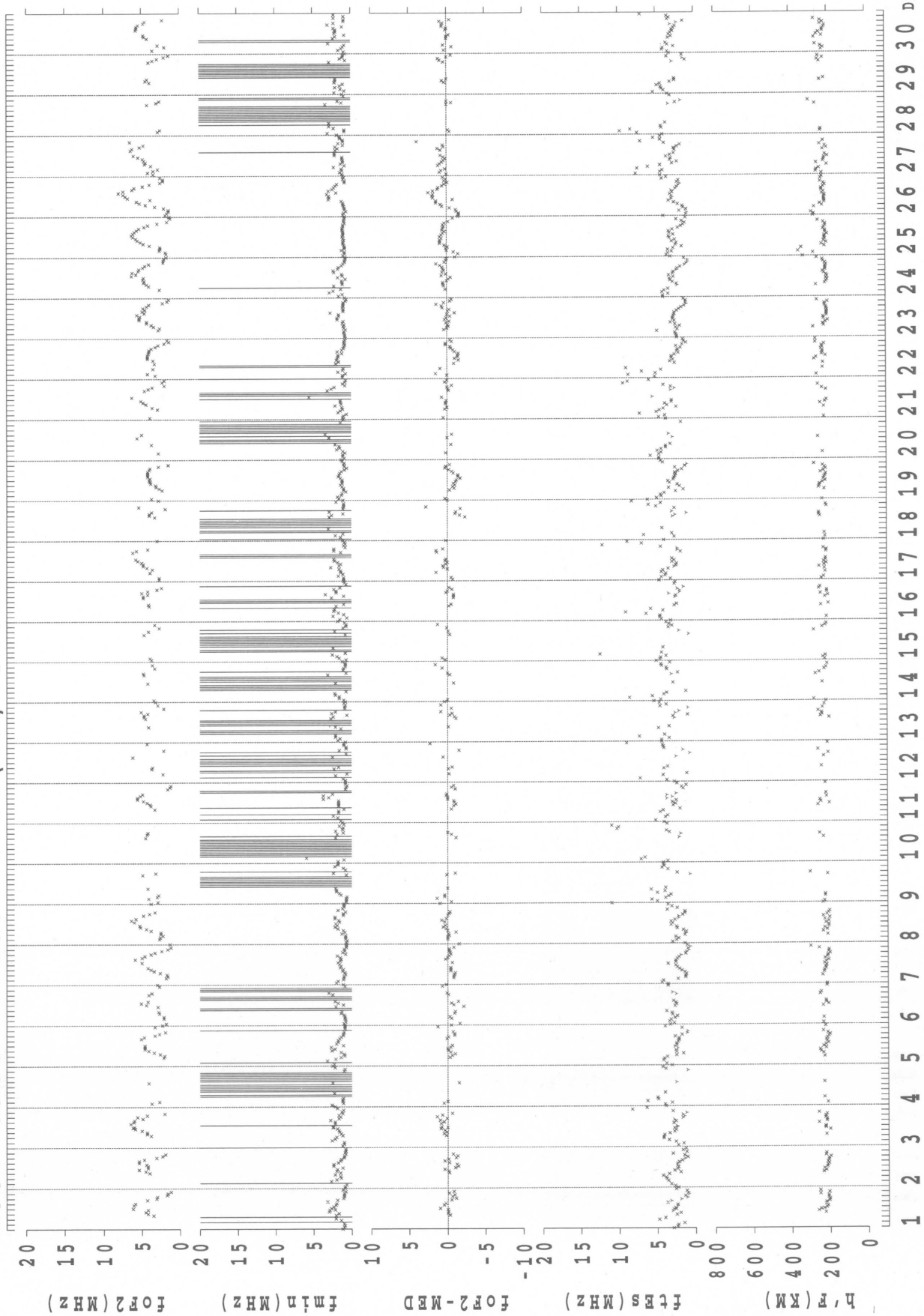
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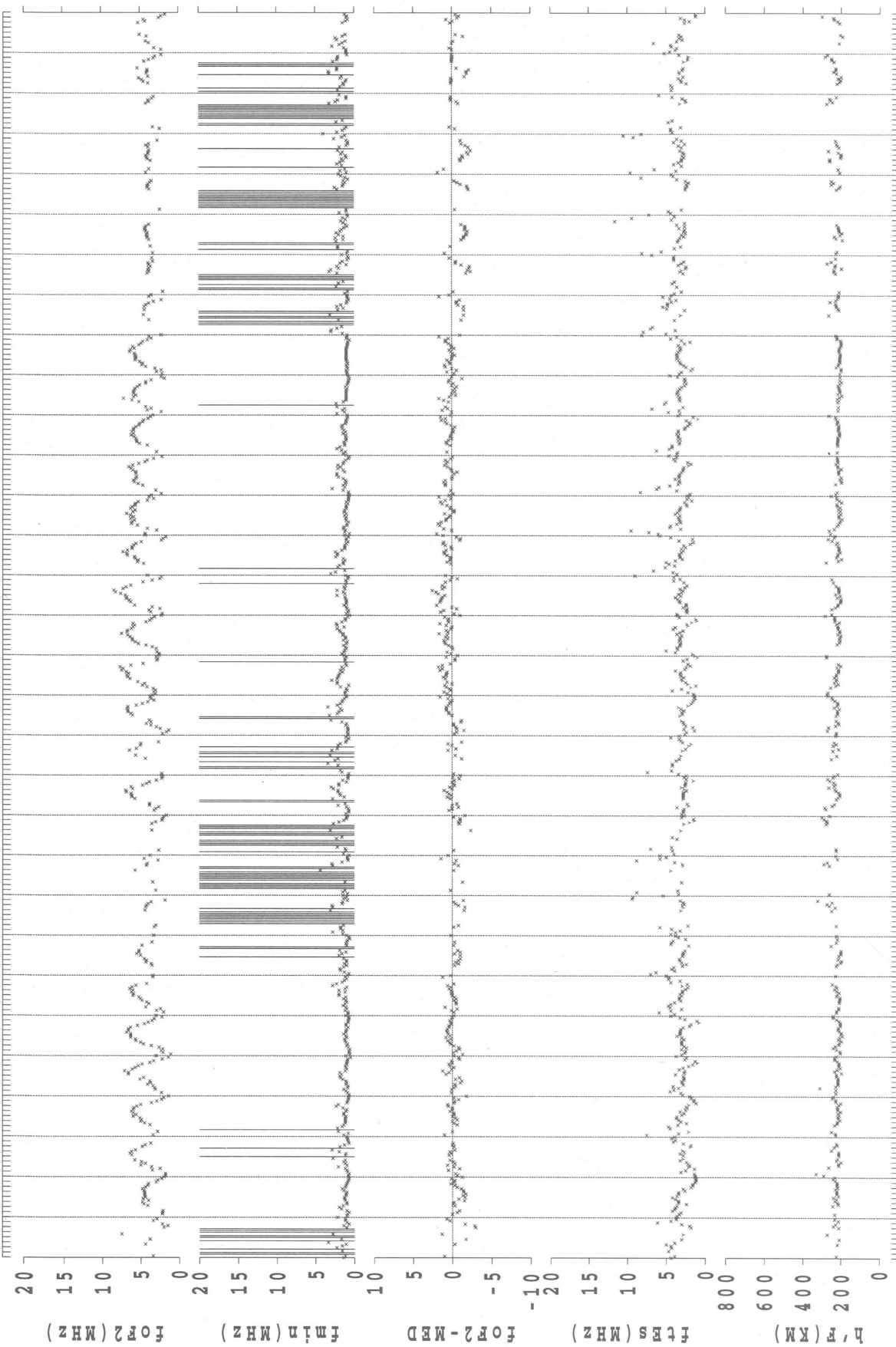
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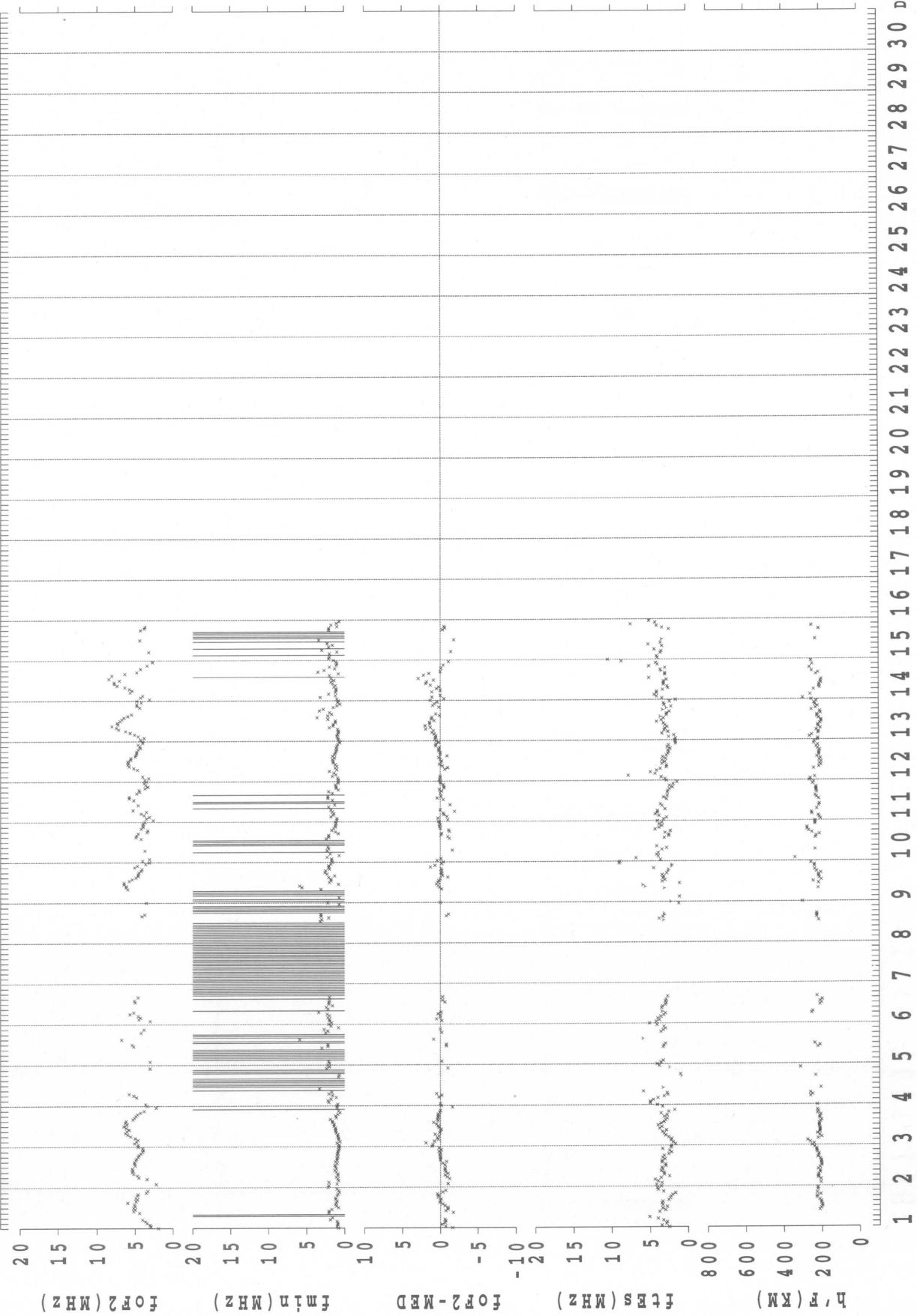


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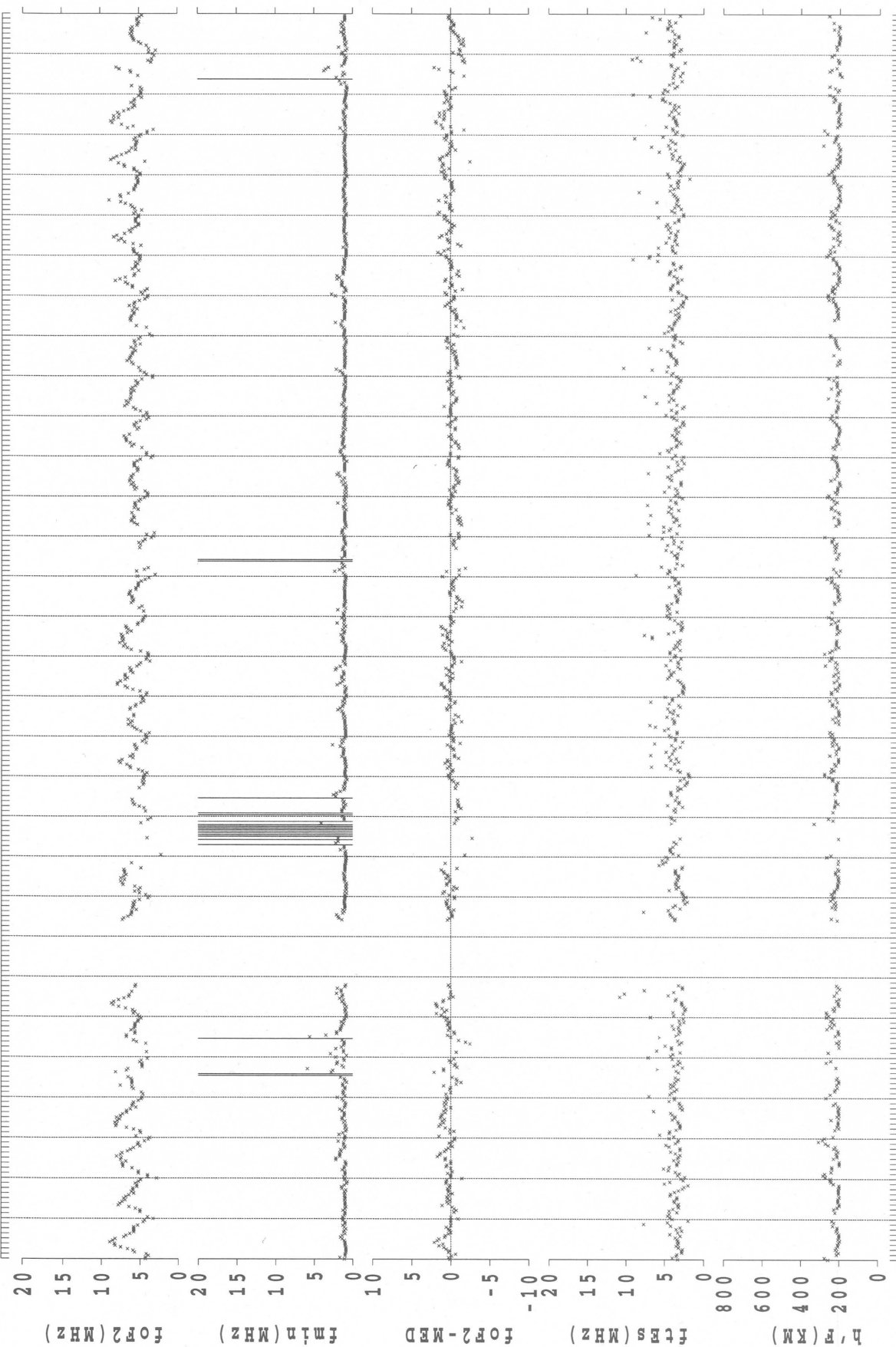


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1997 1101 -> 1997 1130(99) SYOWA-ST.



1997 1201 -> 1997 1231(99) SYOWA-ST.

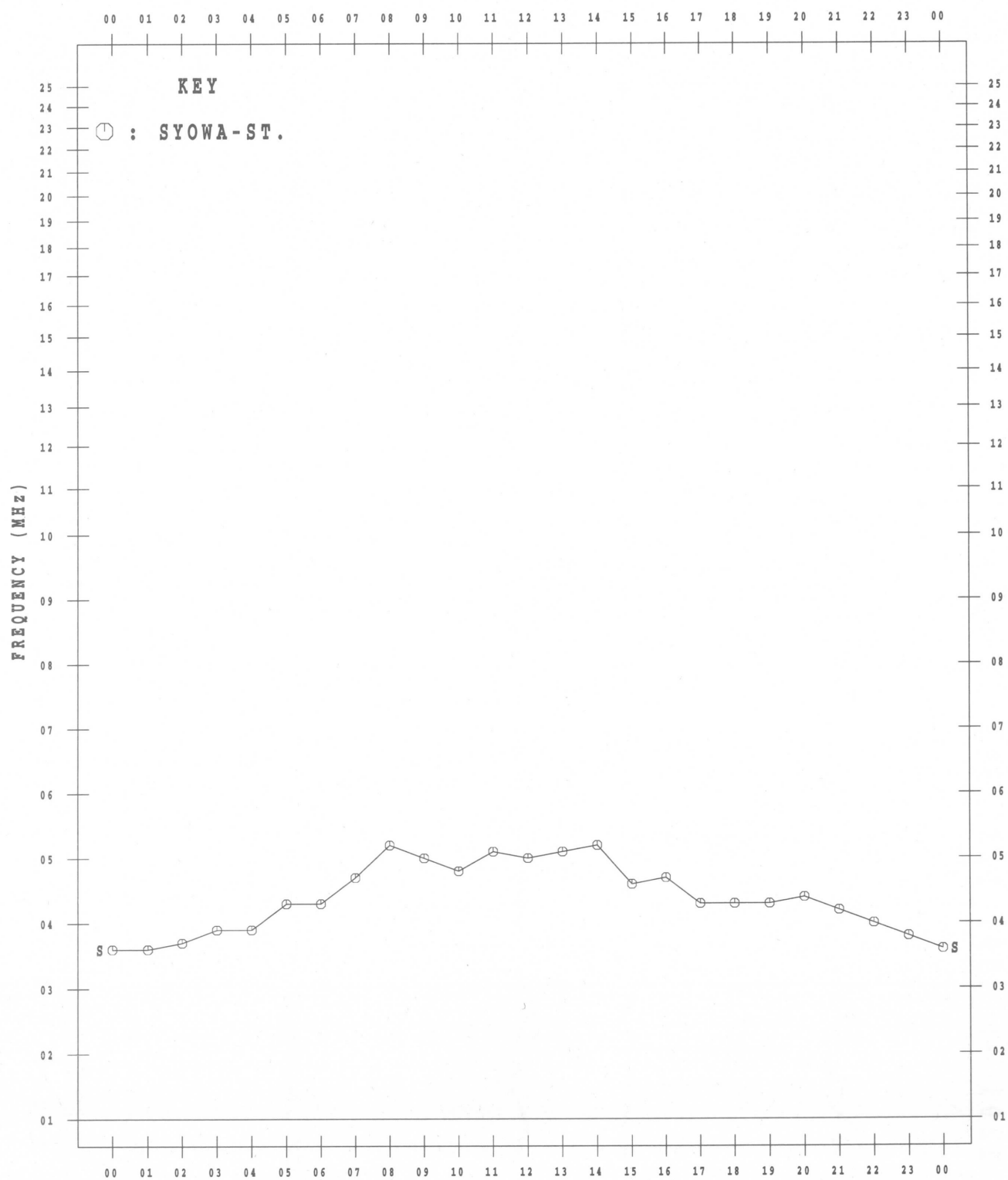


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45' EMT

MONTHLY MEDIAN VALUES OF f_oF_2

45° E MEAN TIME

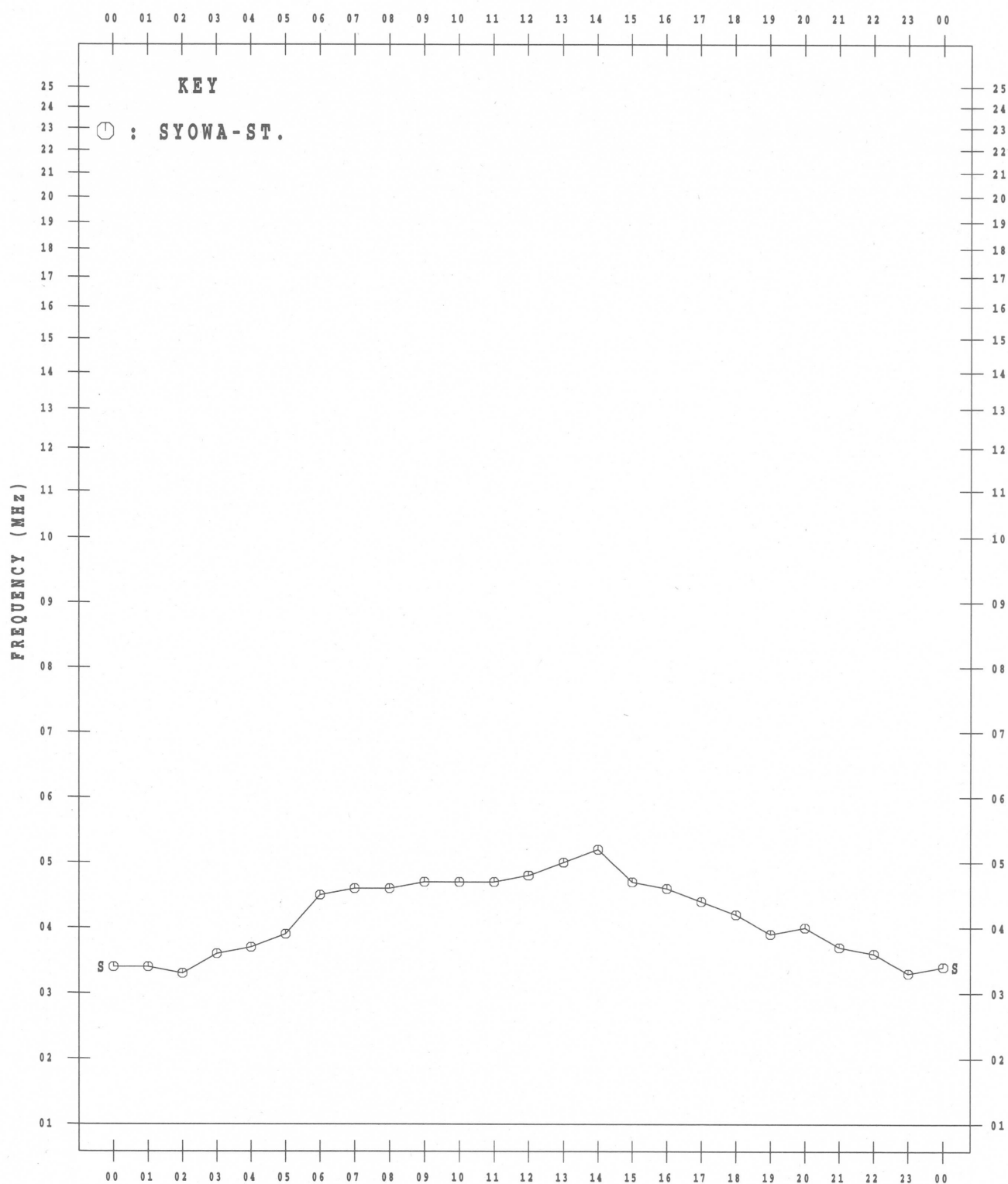
JAN. 1997



MONTHLY MEDIAN VALUES OF f_oF_2

45°E MEAN TIME

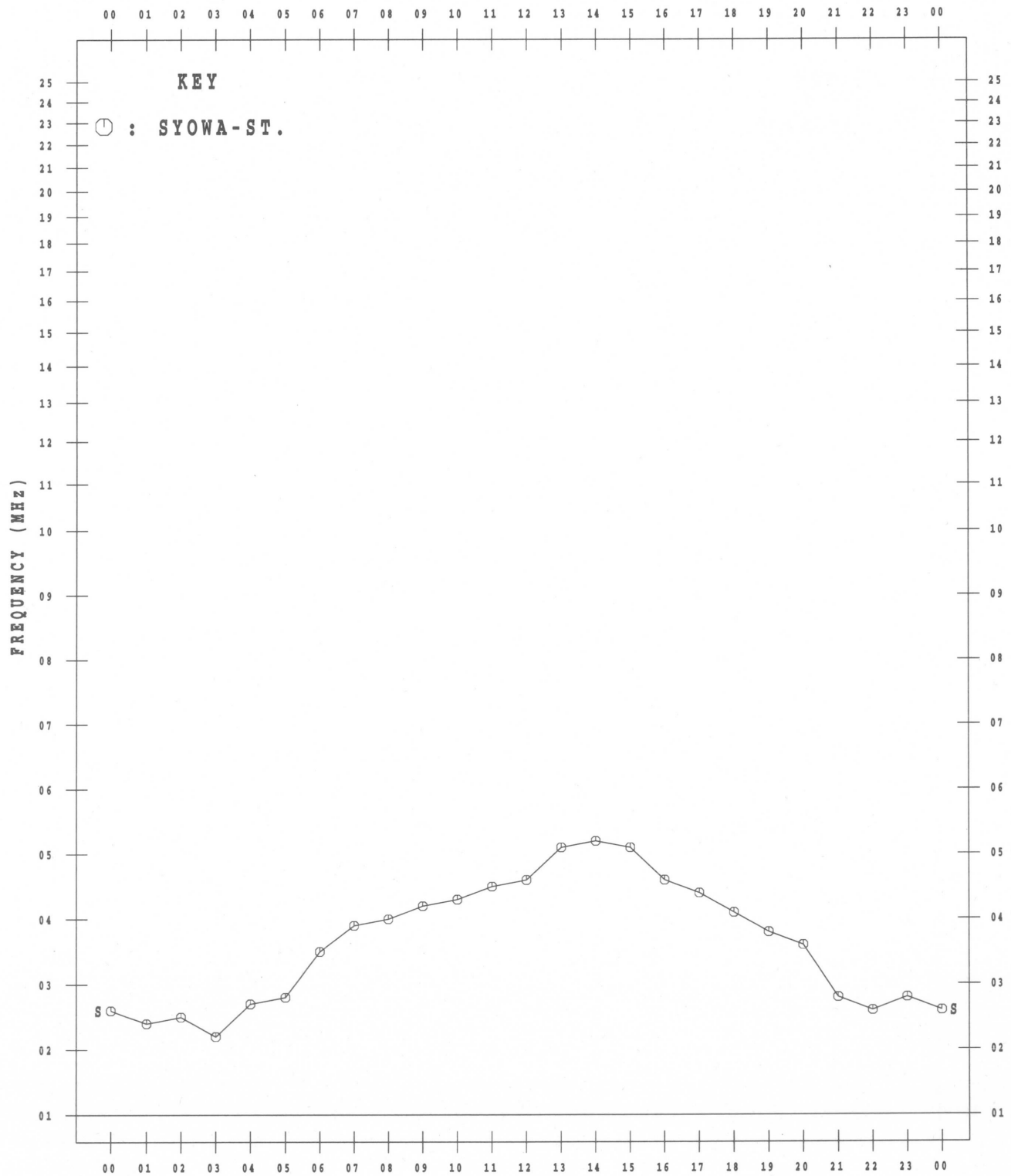
FEB. 1997



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

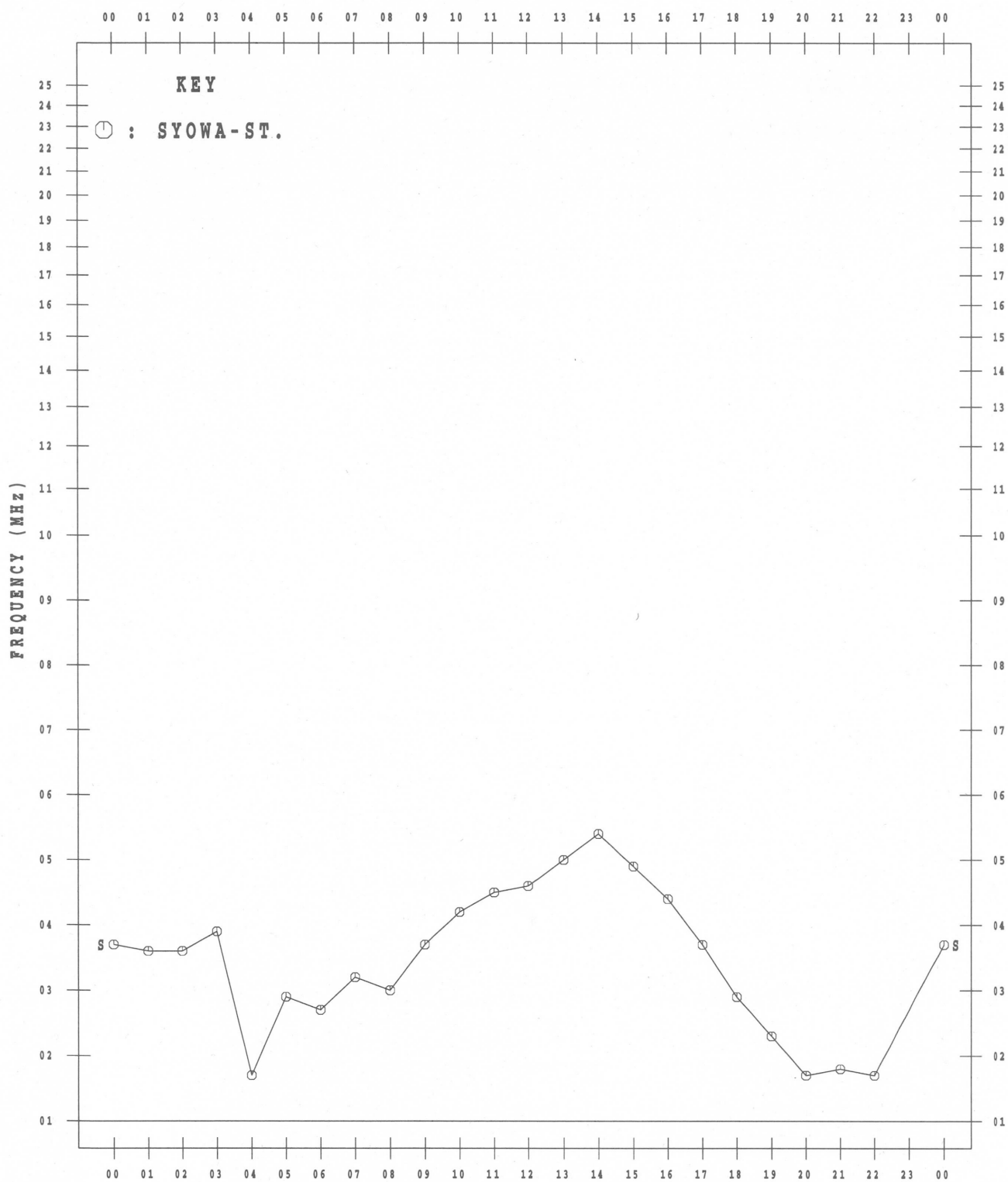
MAR. 1997



MONTHLY MEDIAN VALUES OF f_oF_2

45°E MEAN TIME

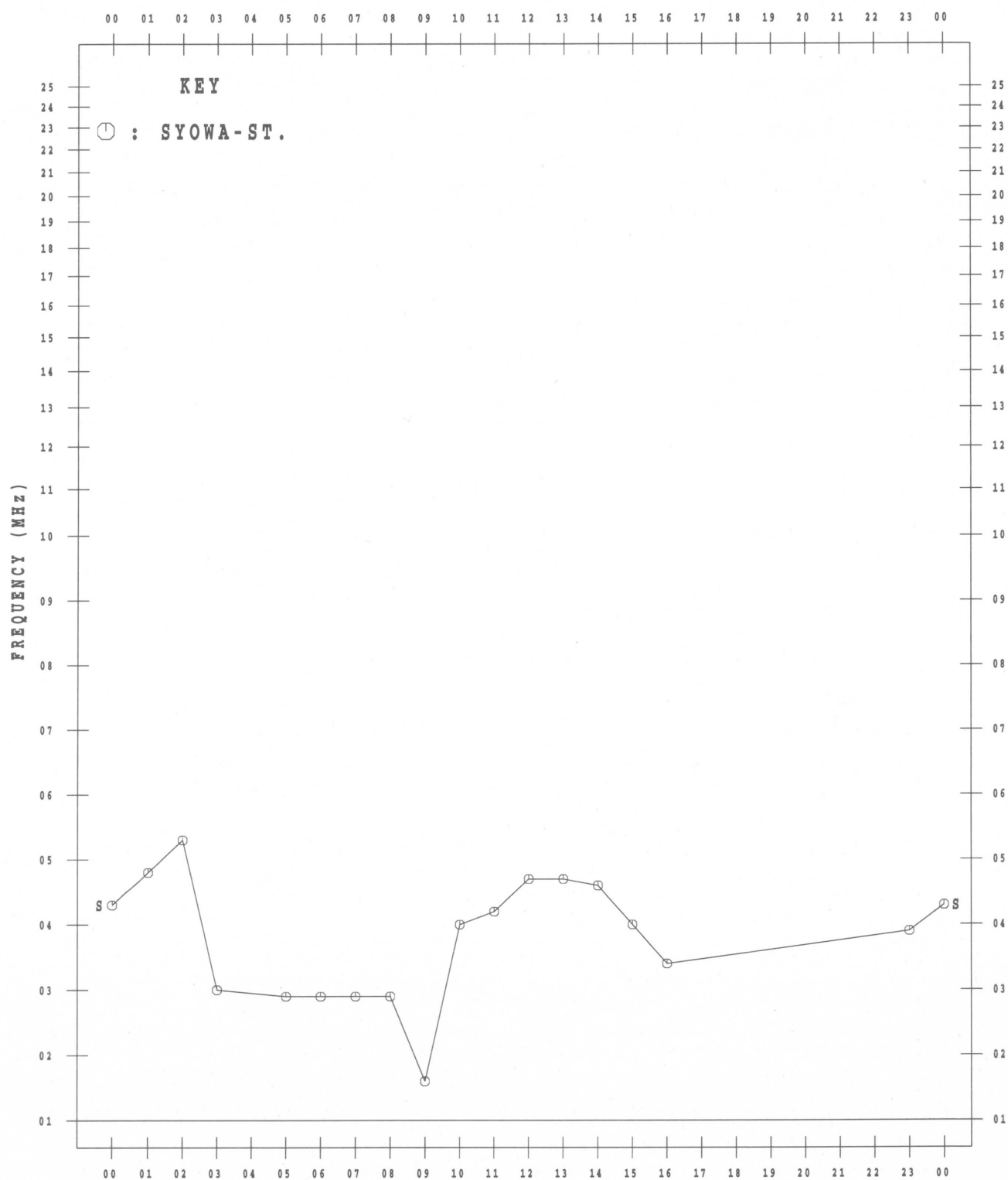
APR. 1997



MONTHLY MEDIAN VALUES OF f_oF_2

45° E MEAN TIME

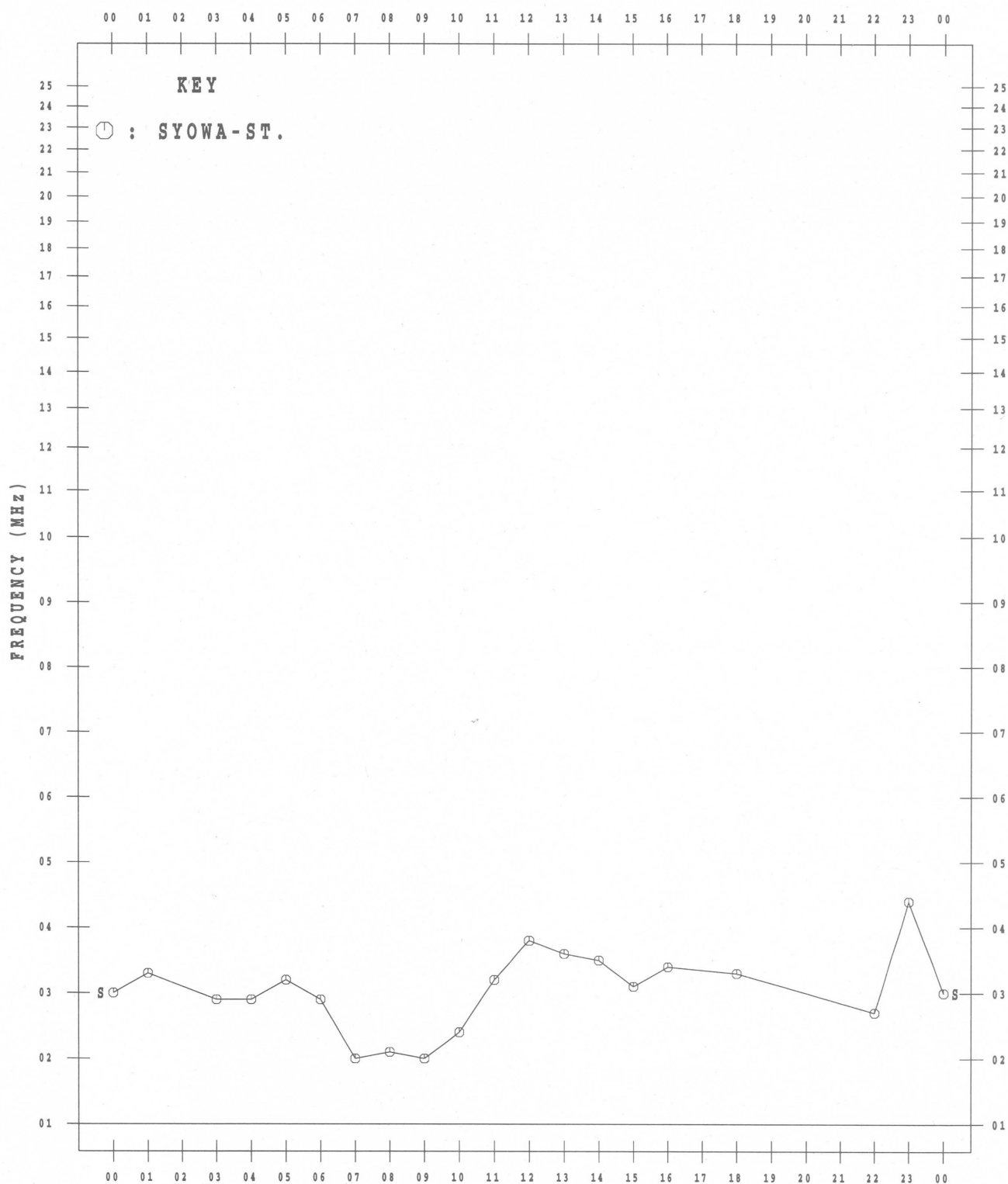
MAY 1997



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

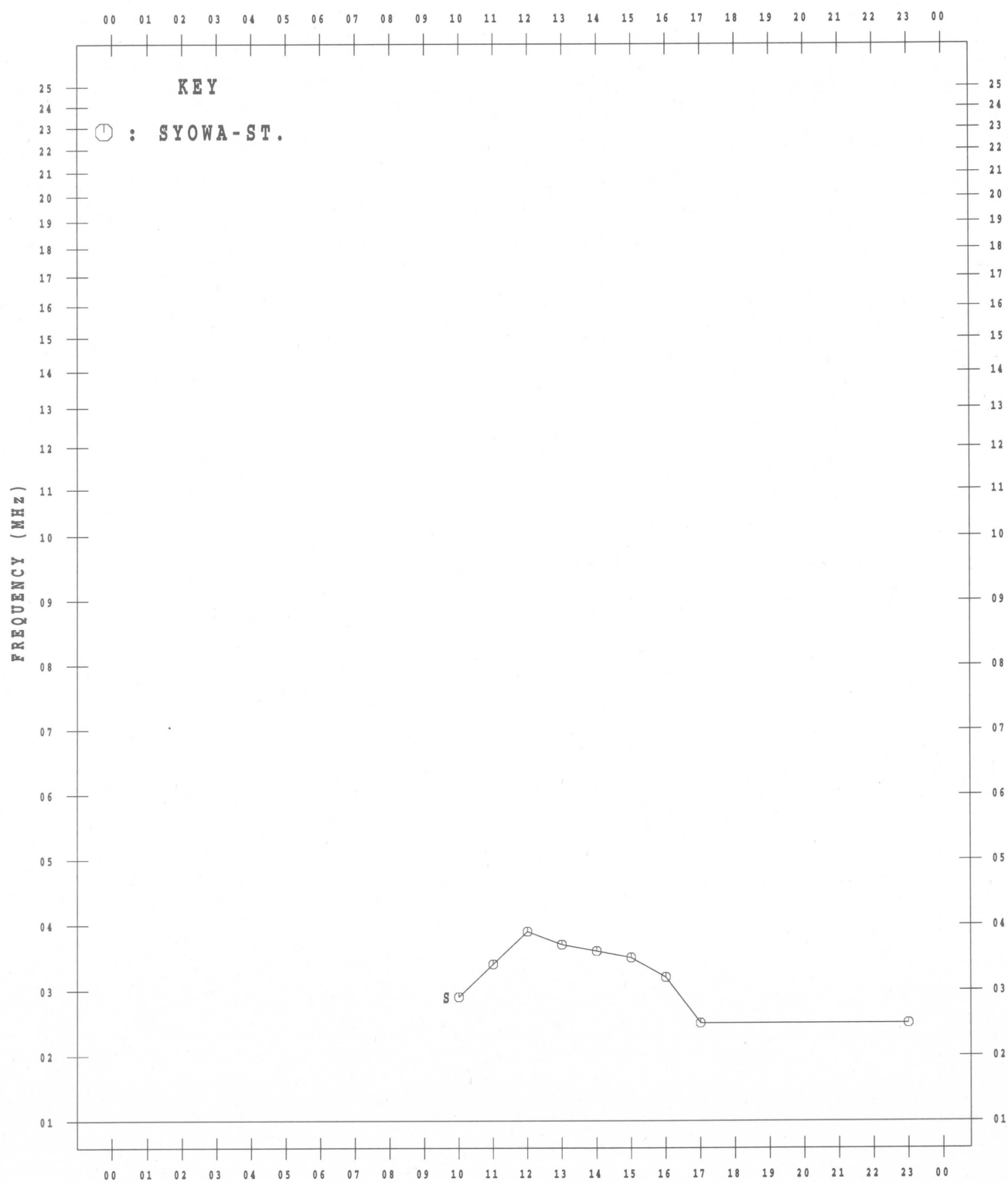
JUN. 1997



MONTHLY MEDIAN VALUES OF f_oF_2

45° E MEAN TIME

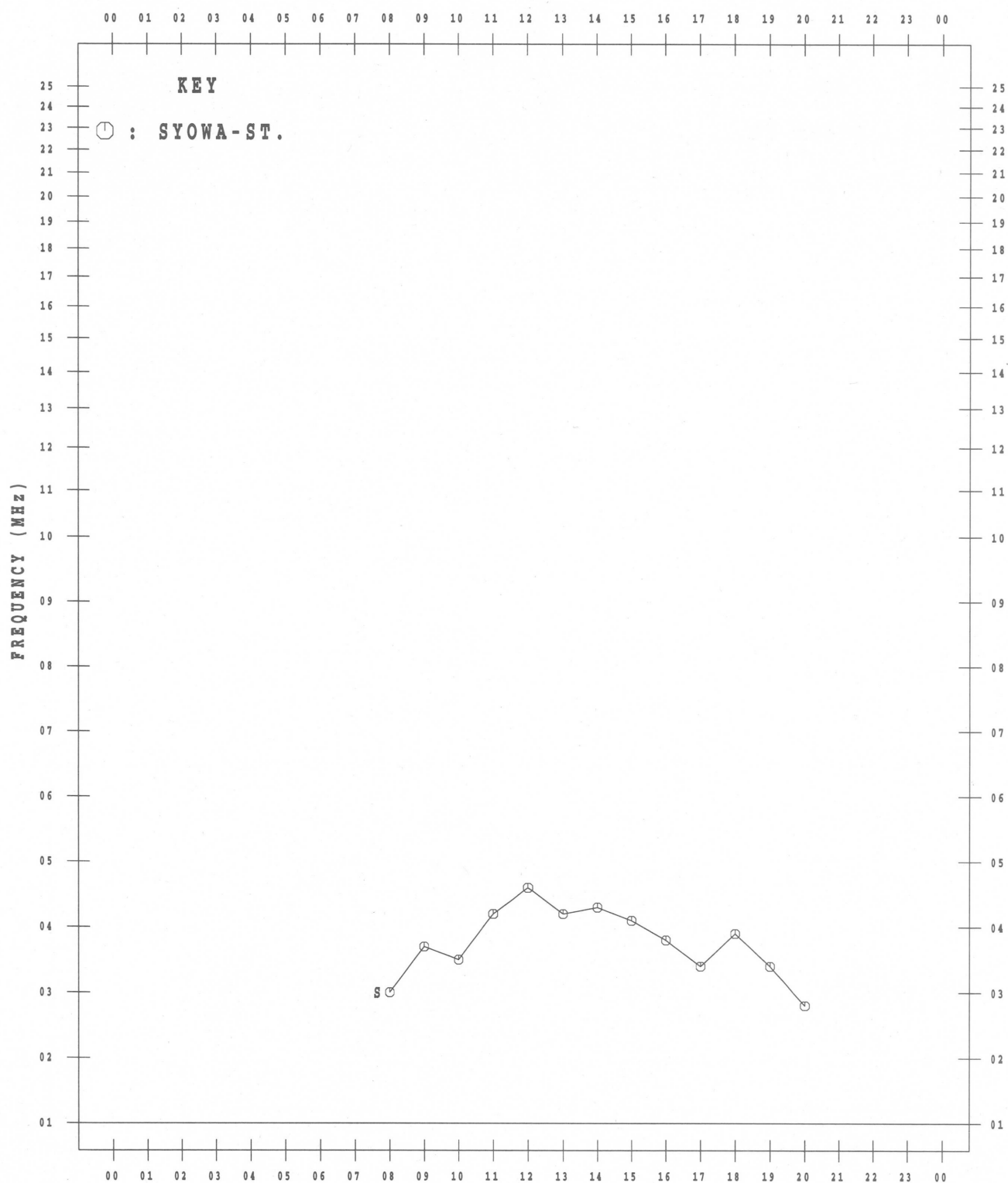
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MONTHLY MEDIAN VALUES OF f_oF₂

45°E MEAN TIME

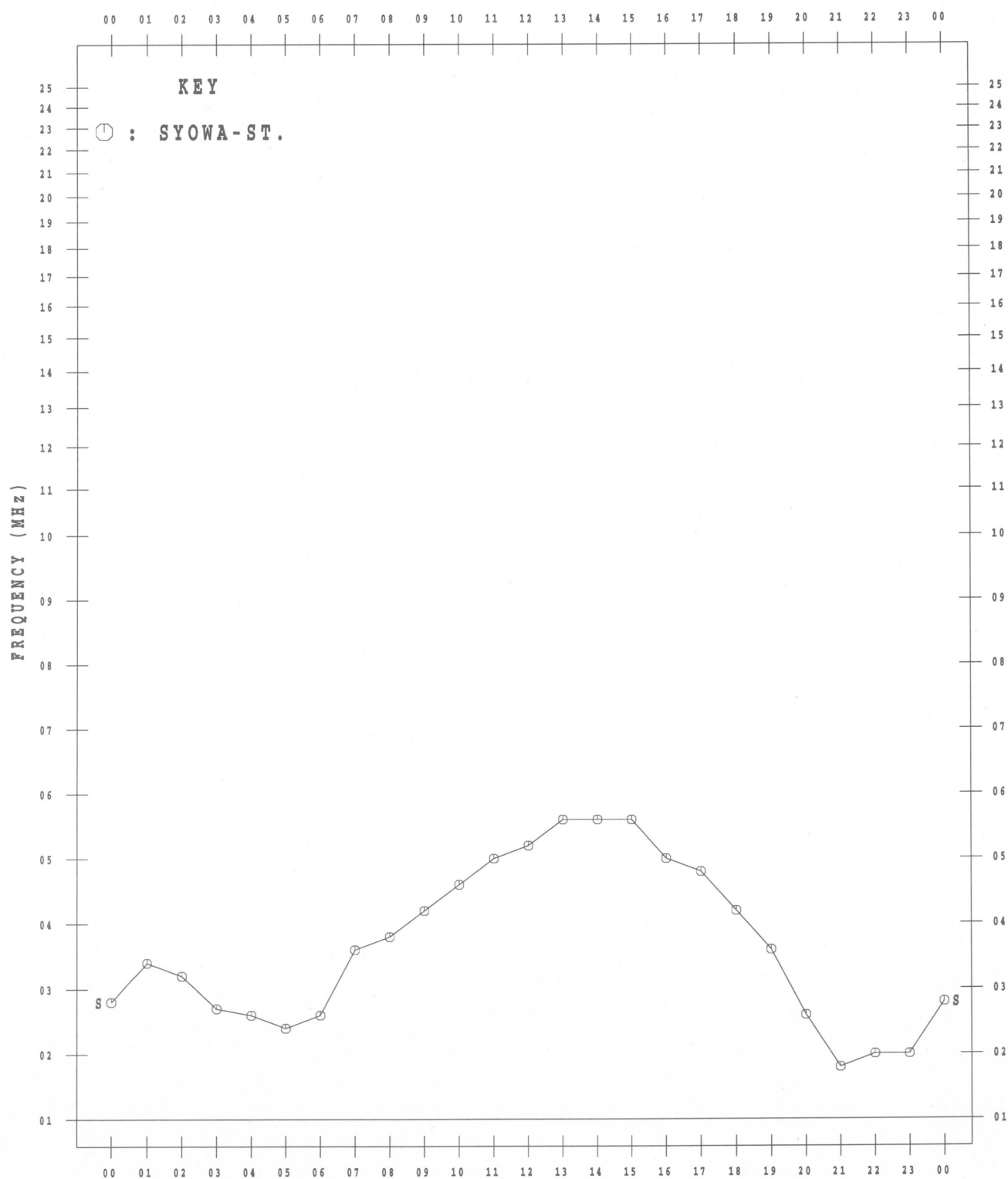
AUG. 1997



MONTHLY MEDIAN VALUES OF f_oF_2

45°E MEAN TIME

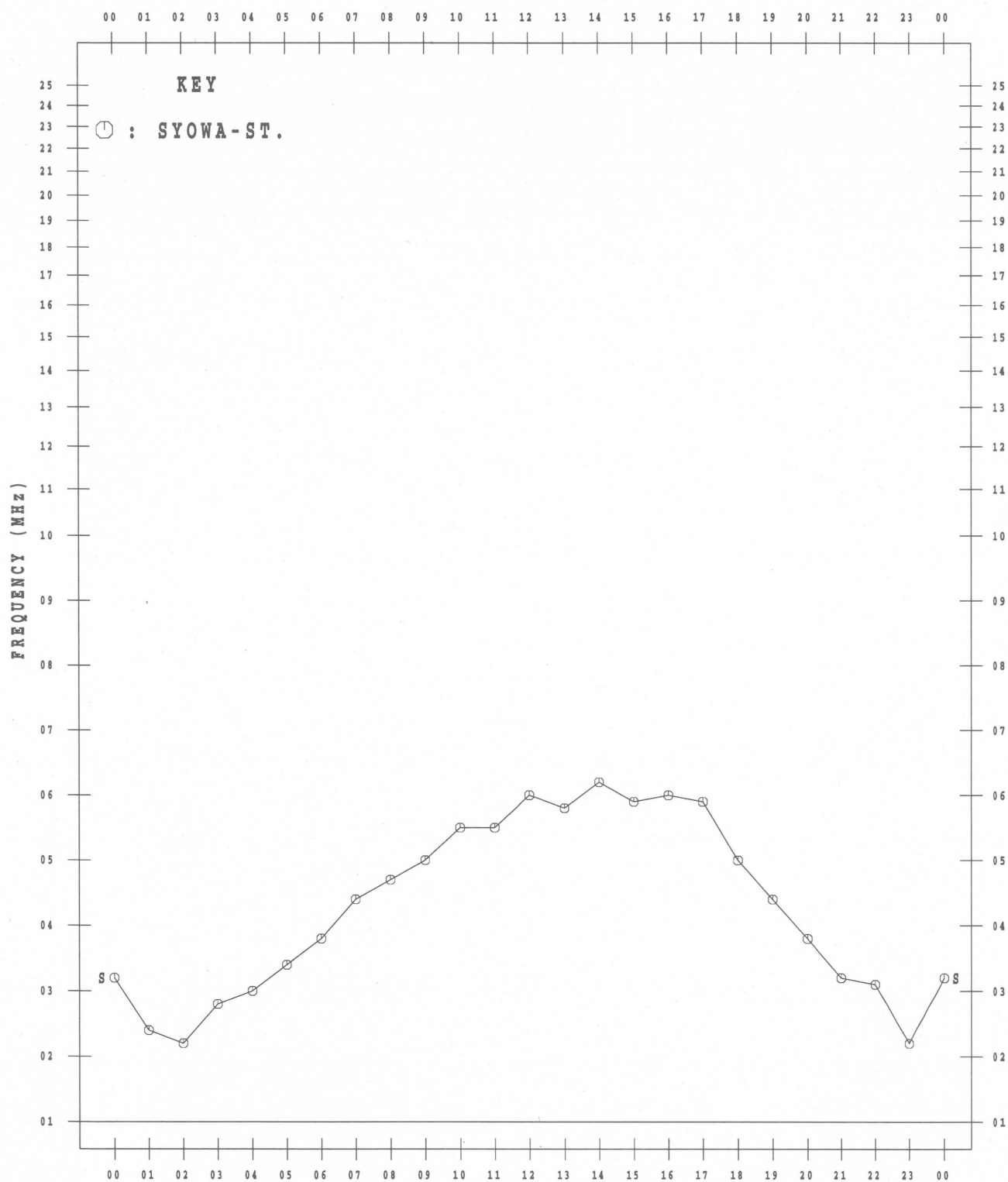
SEP. 1997



MONTHLY MEDIAN VALUES OF f_oF_2

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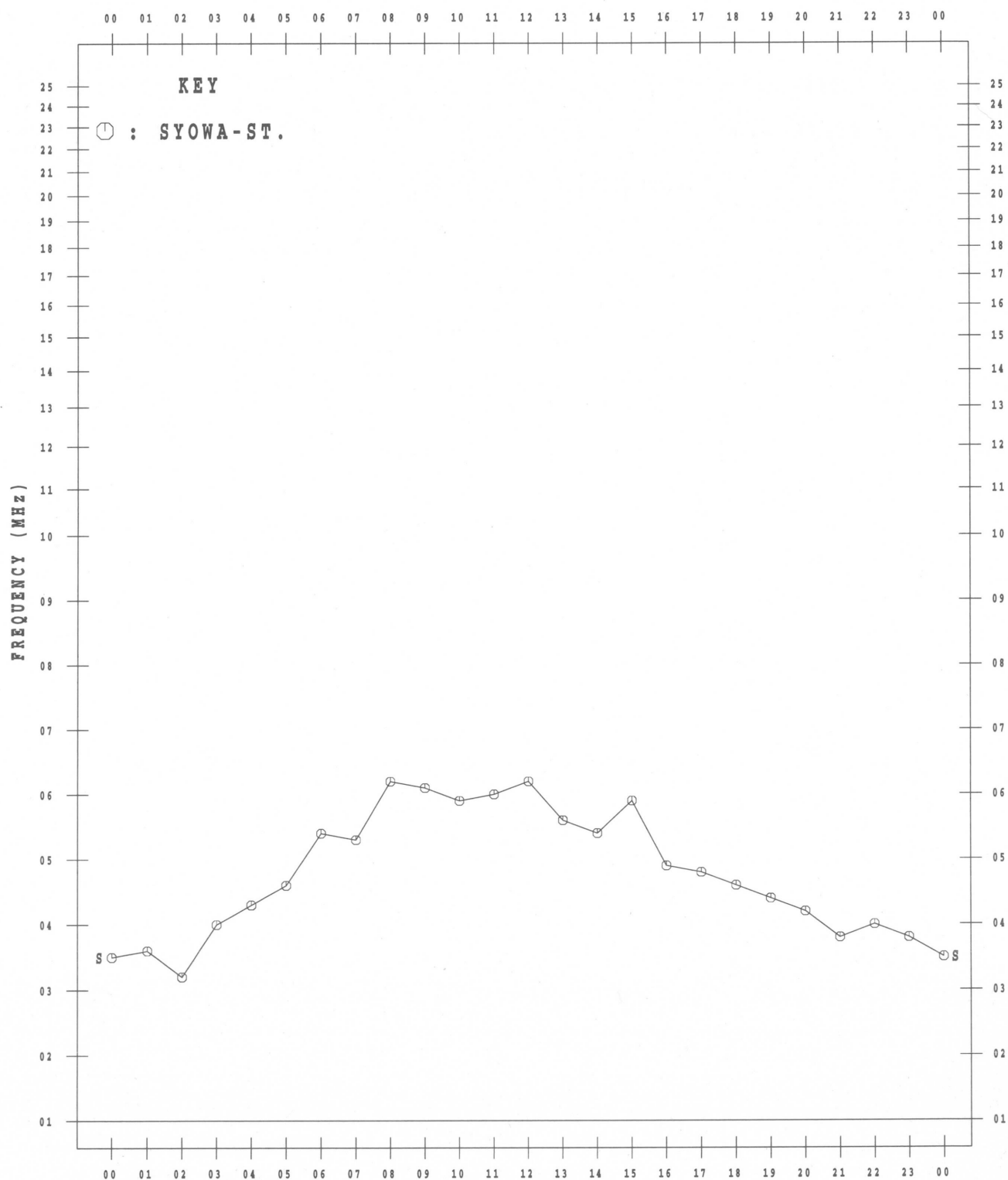
OCT. 1997



MONTHLY MEDIAN VALUES OF f_oF_2

45° E MEAN TIME

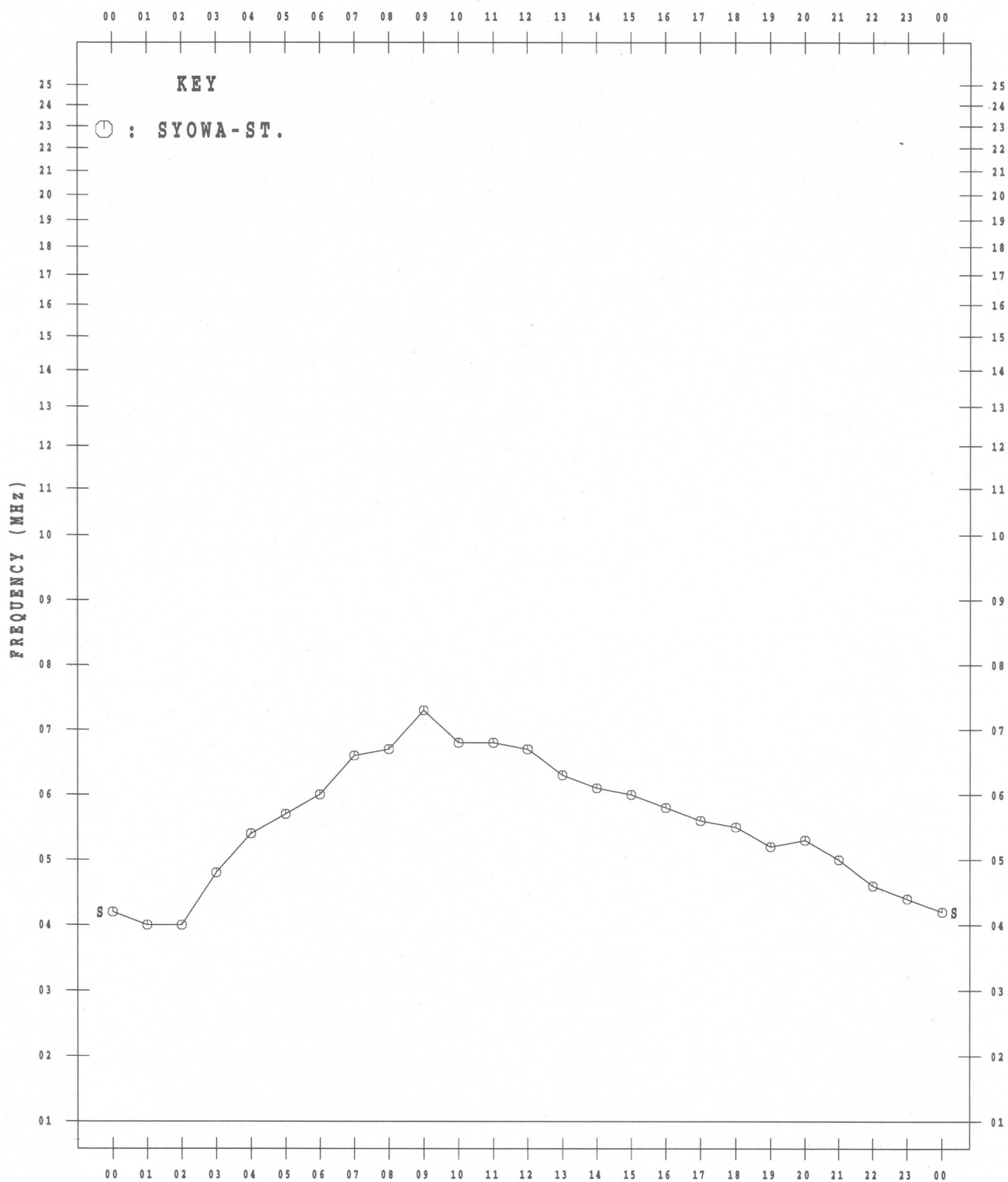
NOV. 1997



MONTHLY MEDIAN VALUES OF f_oF₂

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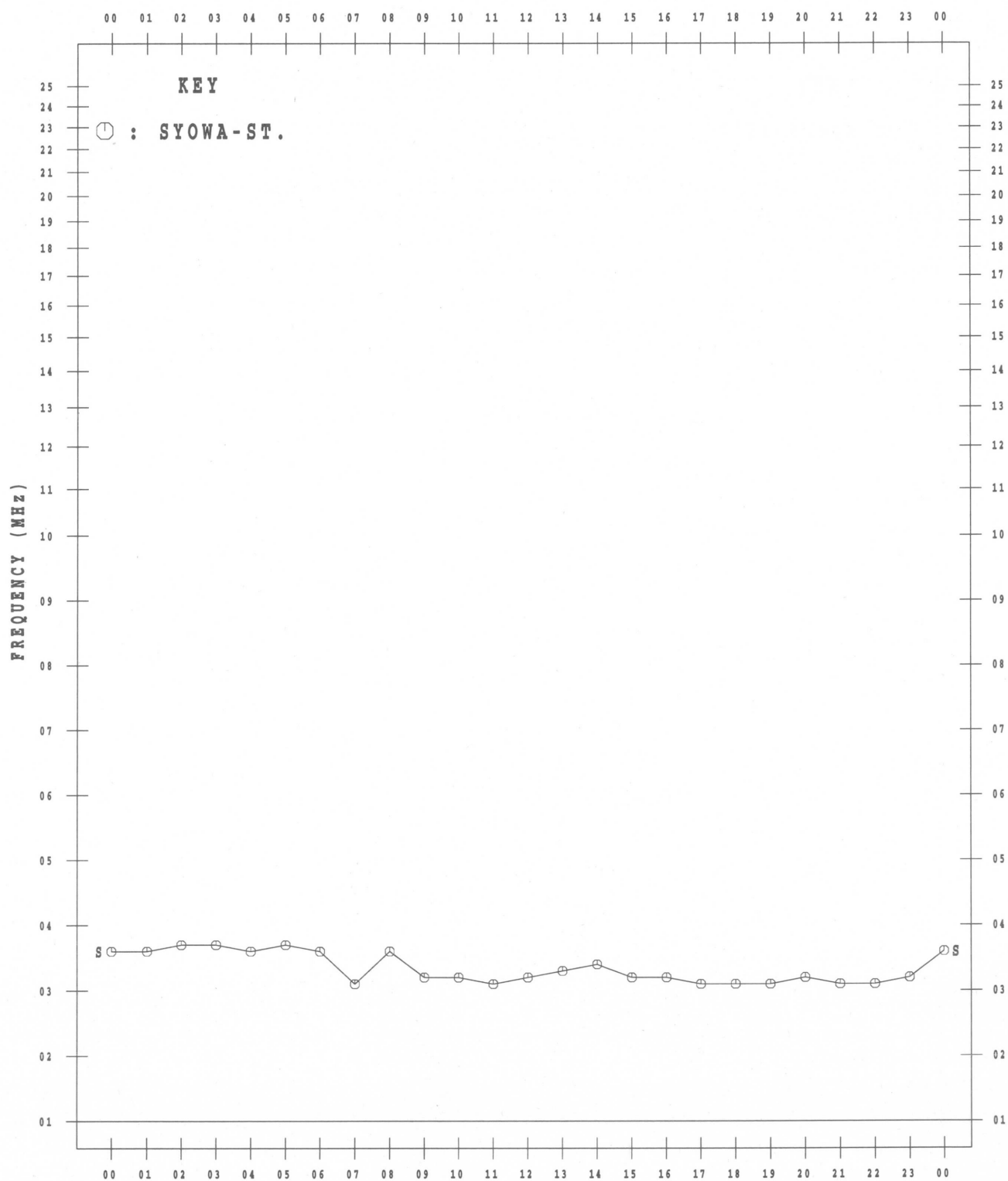
DEC. 1997



MONTHLY MEDIAN VALUES OF ftes

45° E MEAN TIME

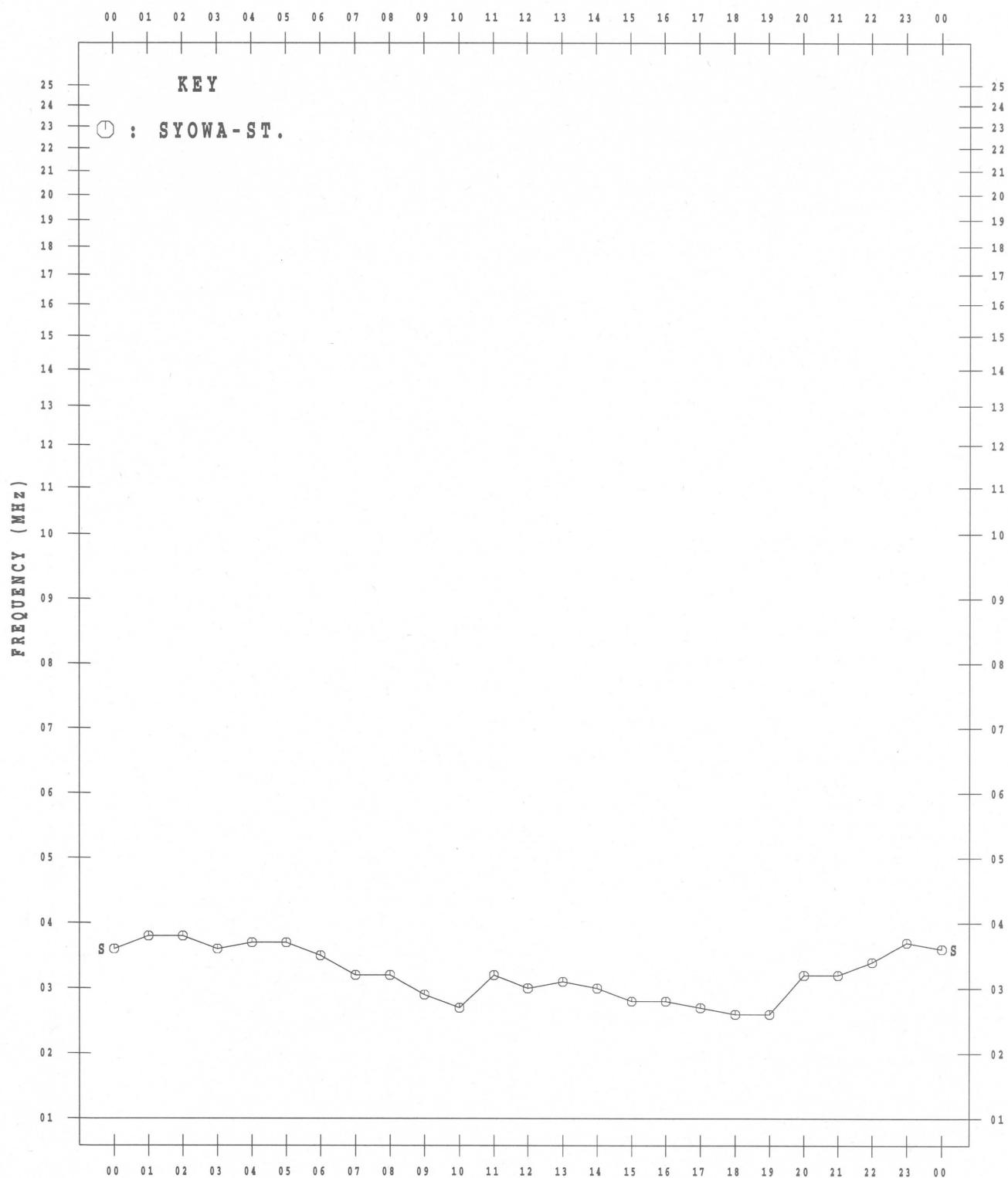
JAN. 1997



MONTHLY MEDIAN VALUES OF ftes

45° E MEAN TIME

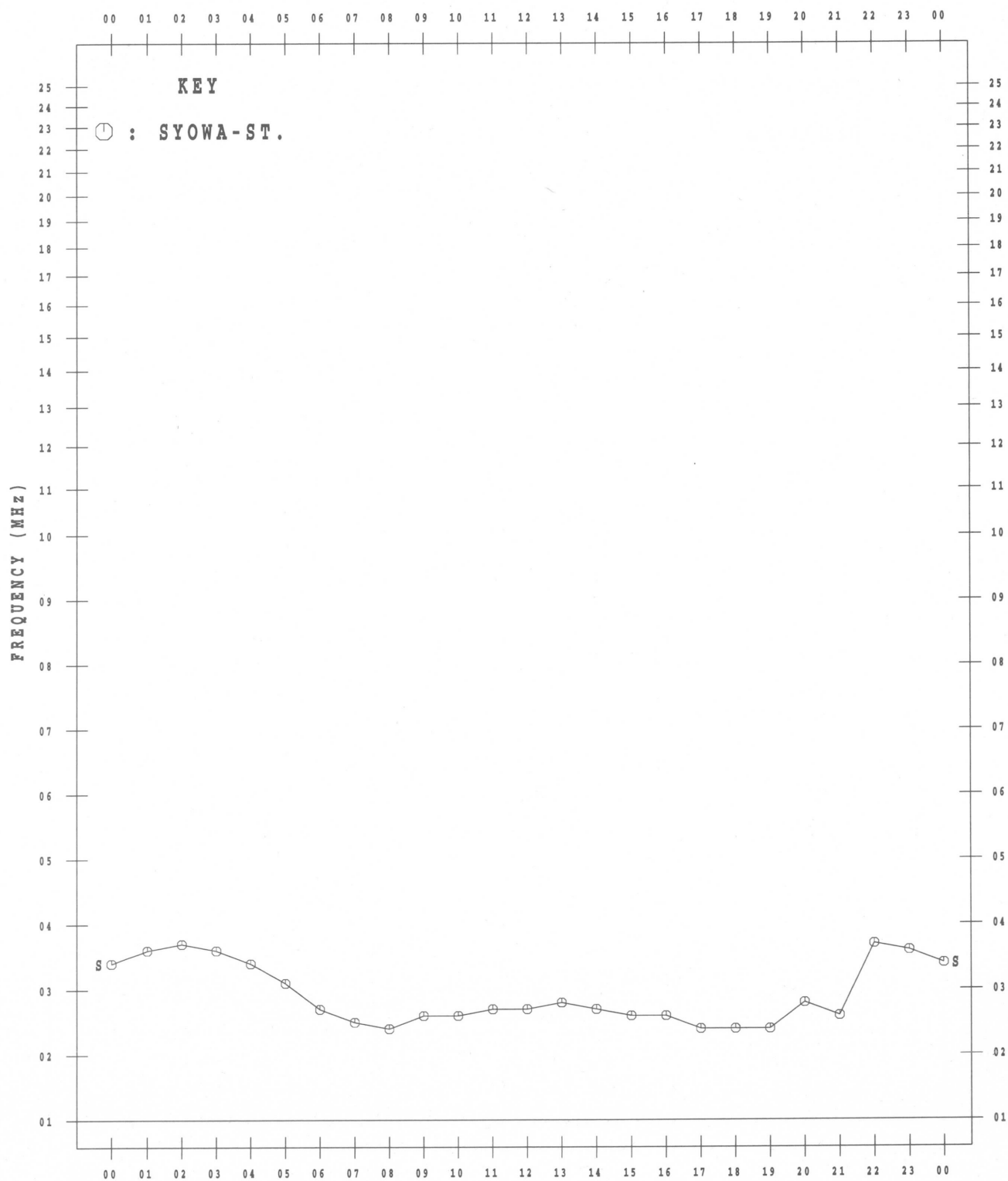
FEB. 1997



MONTHLY MEDIAN VALUES OF f_{TE}s

45° E MEAN TIME

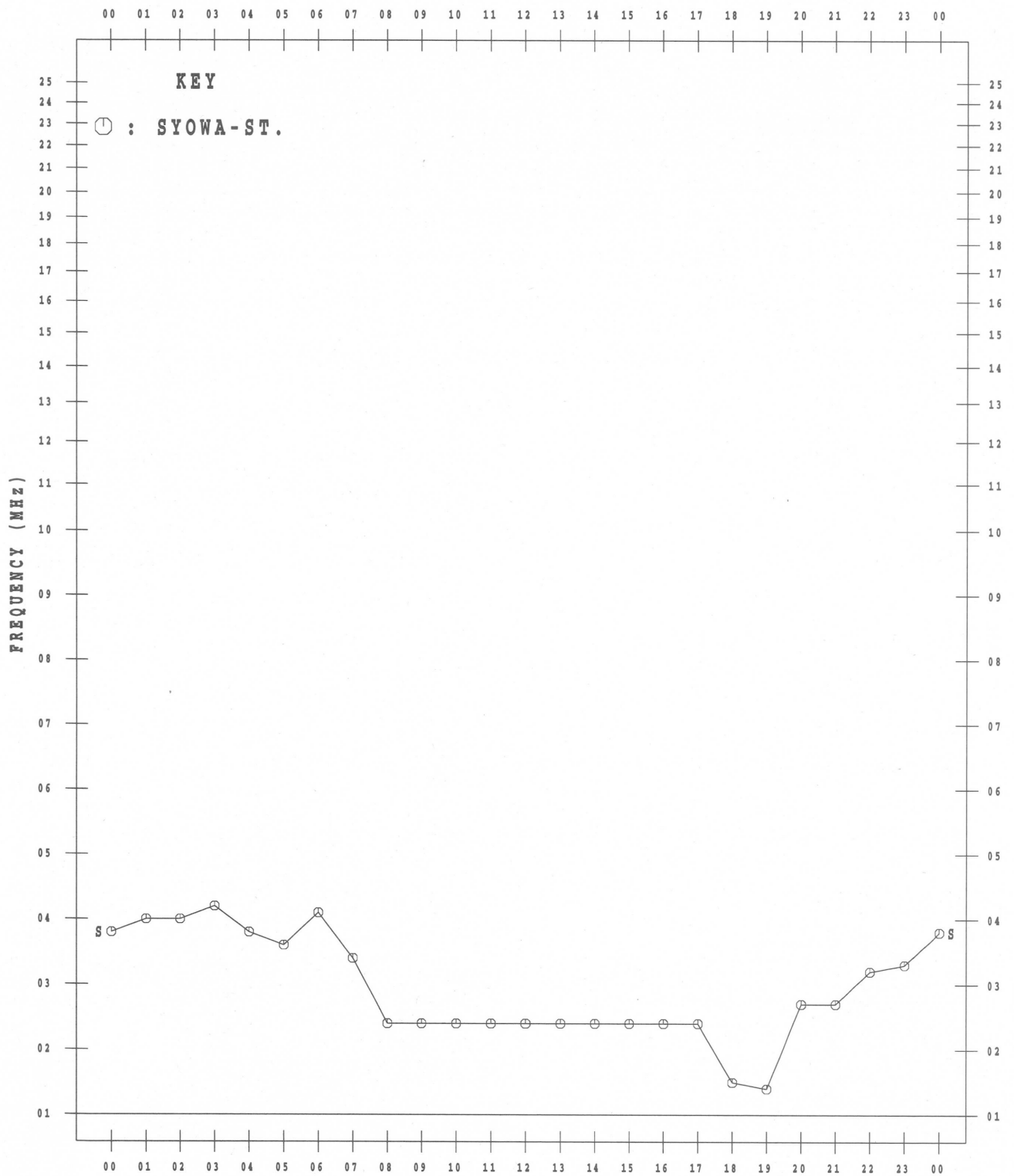
MAR. 1997



MONTHLY MEDIAN VALUES OF ftes

45°E MEAN TIME

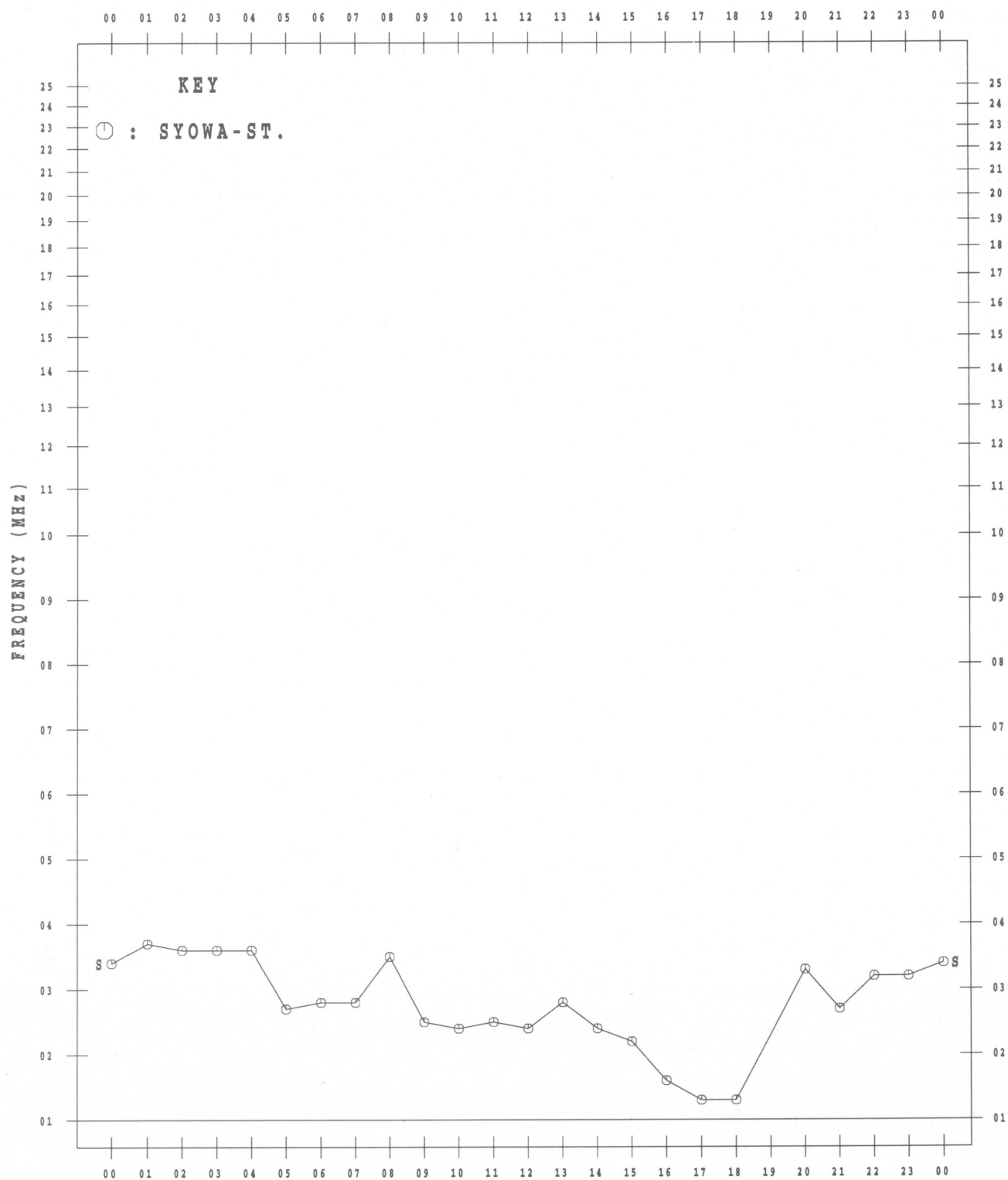
APR. 1997



MONTHLY MEDIAN VALUES OF f_{TE}s

45° E MEAN TIME

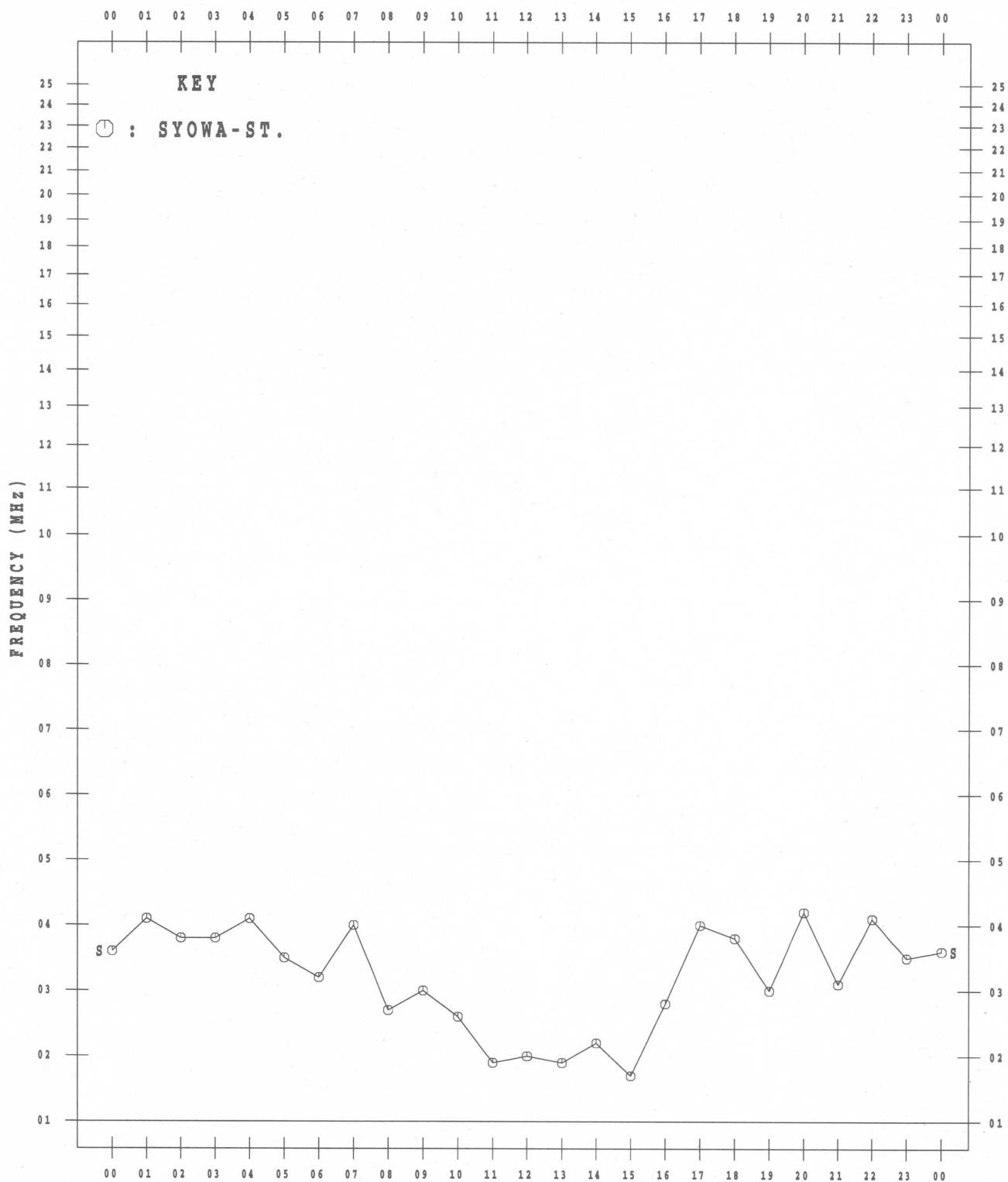
MAY 1997



MONTHLY MEDIAN VALUES OF fteS

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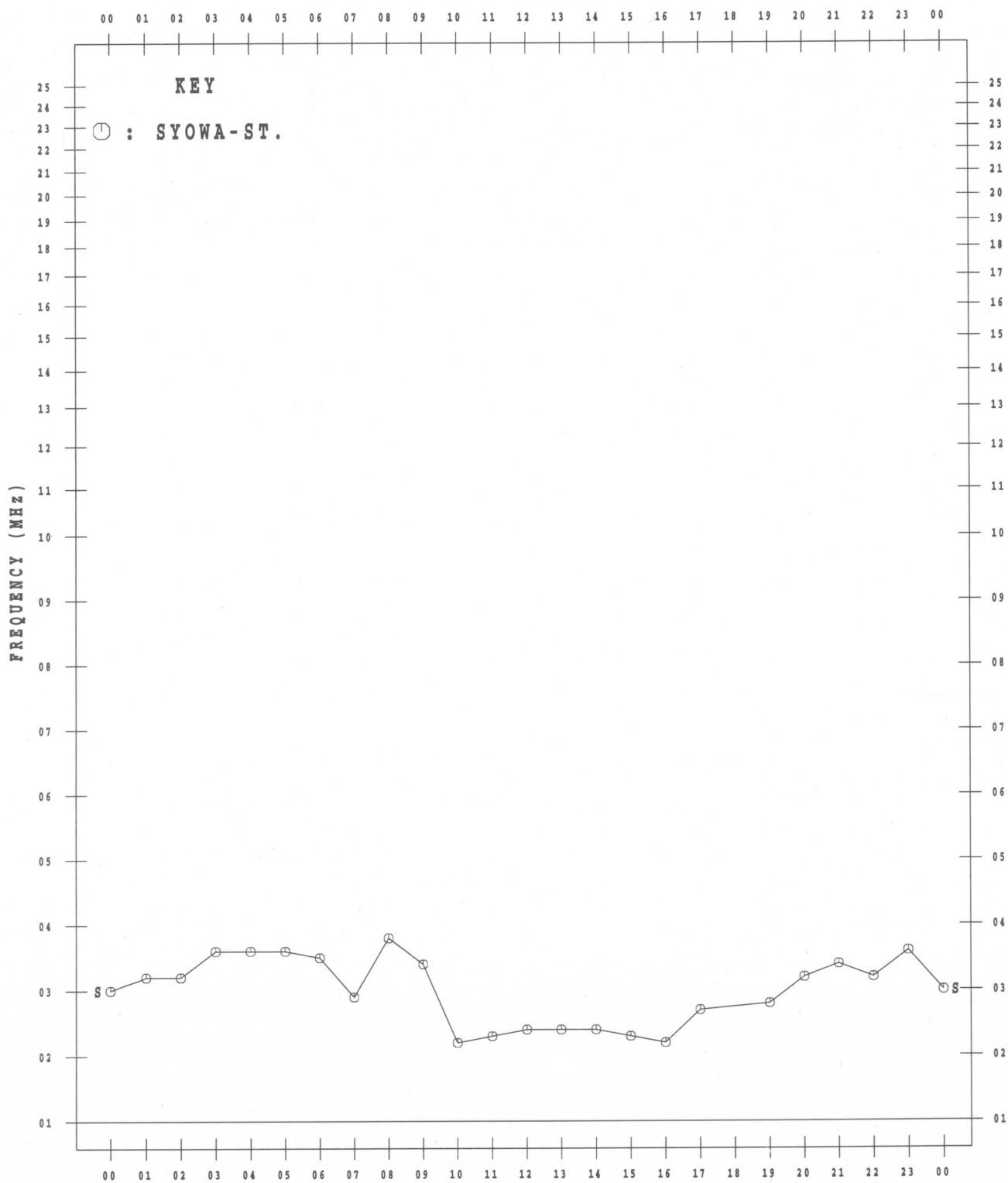
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MONTHLY MEDIAN VALUES OF fteS

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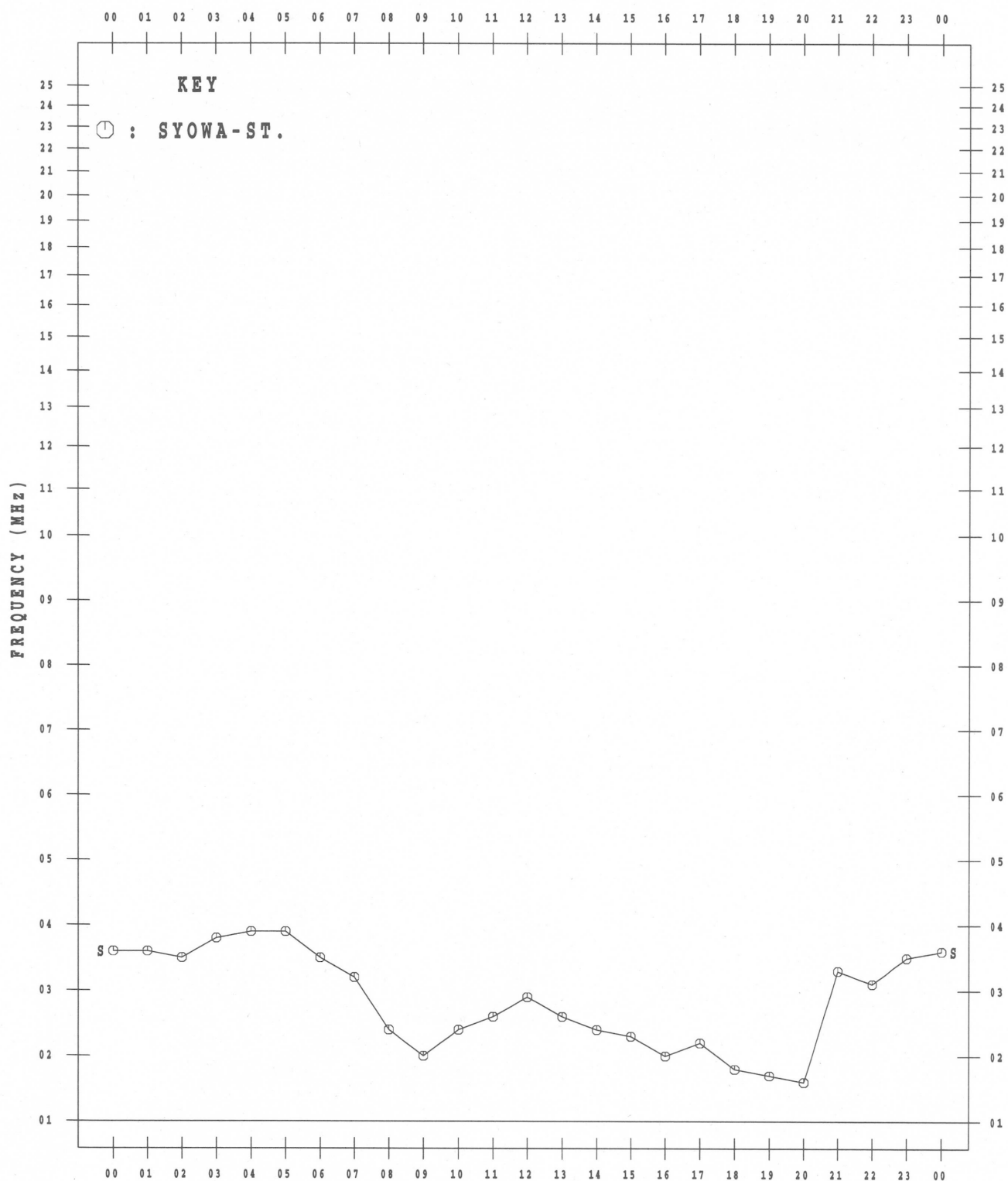
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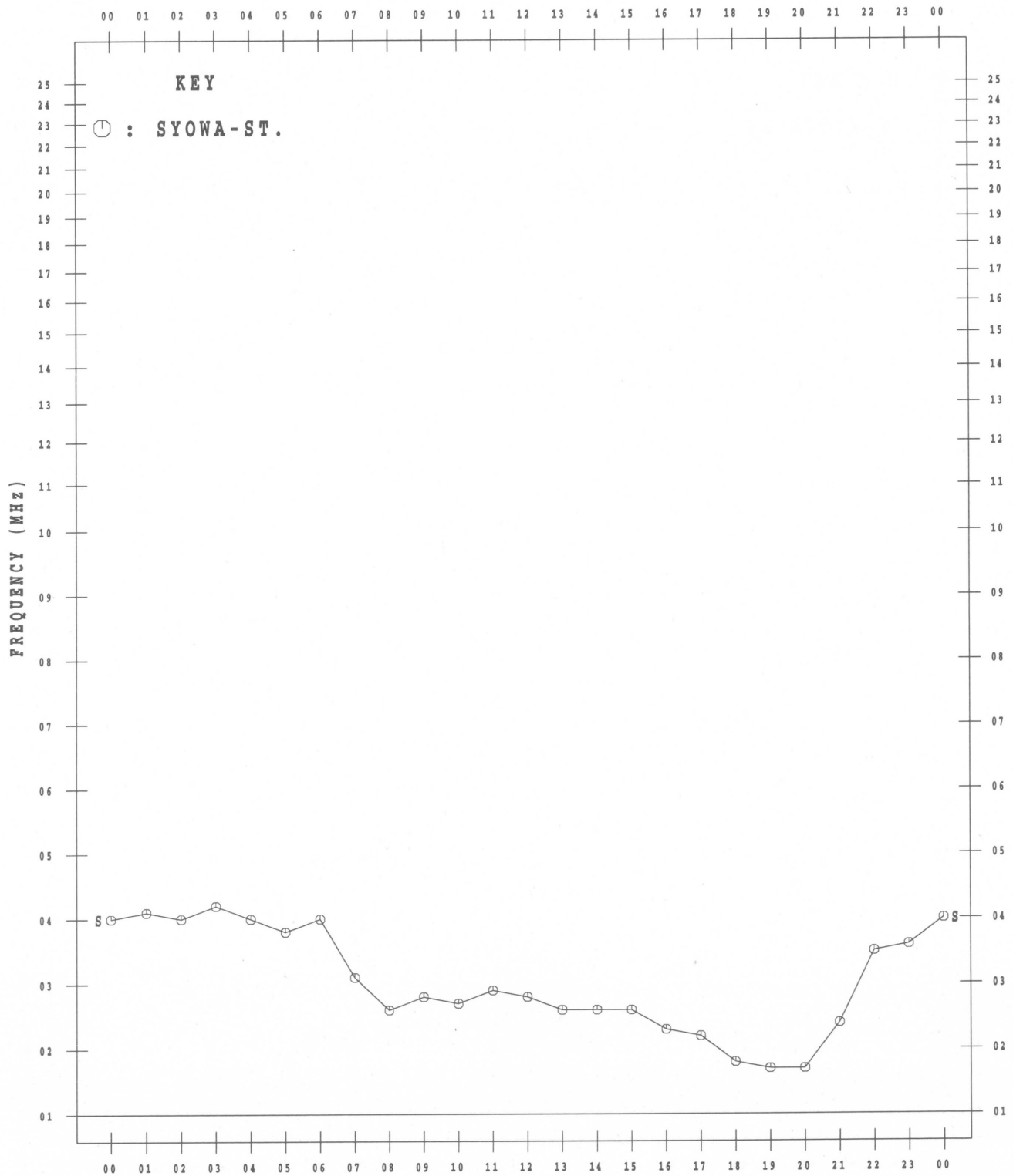
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MONTHLY MEDIAN VALUES OF ftes

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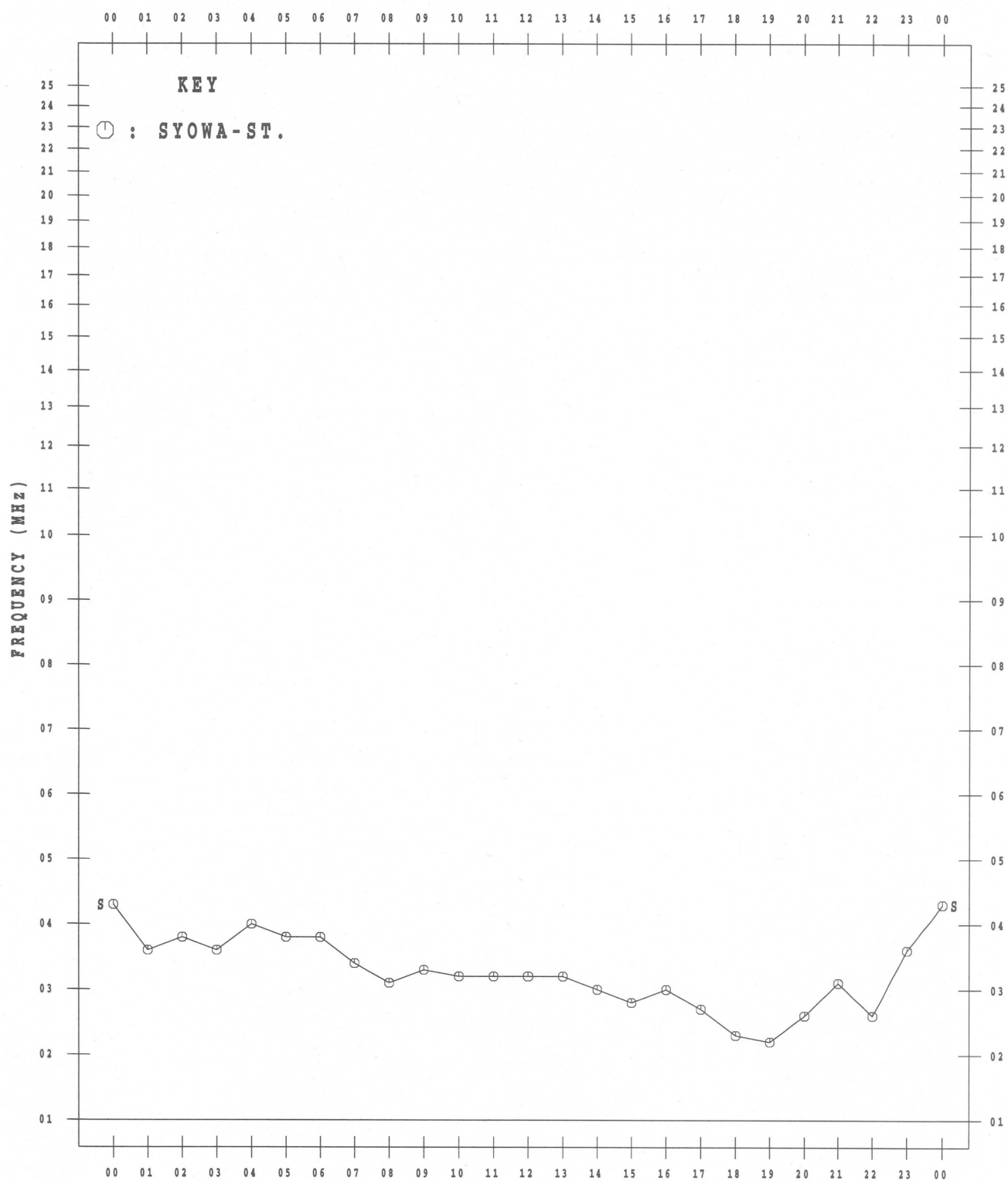
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MONTHLY MEDIAN VALUES OF fteS

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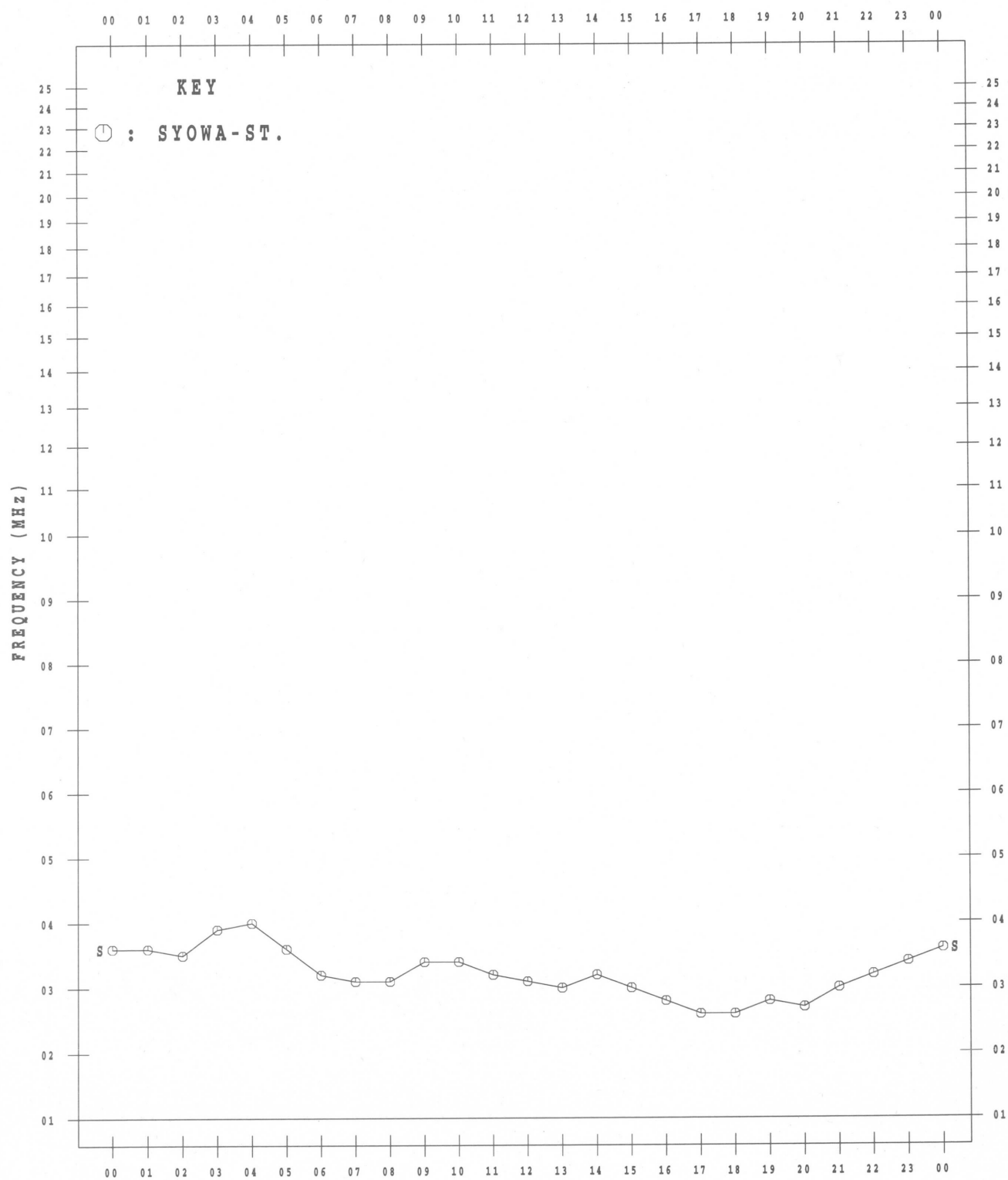
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MONTHLY MEDIAN VALUES OF fteS

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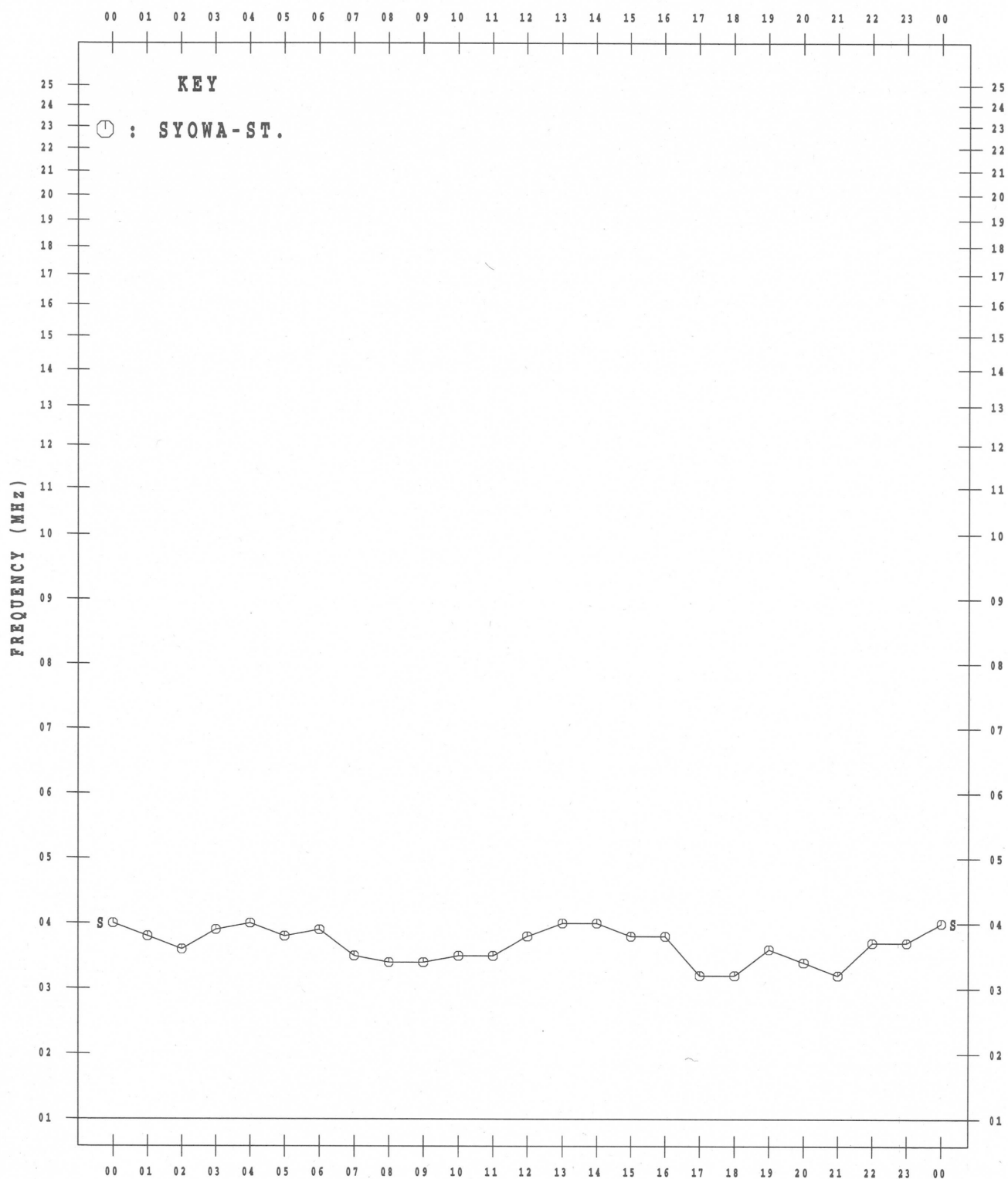
NOV. 1997



MONTHLY MEDIAN VALUES OF f_{TE}s

45° E MEAN TIME

DEC. 1997



IONOSPHERIC DATA AT SYOWA STATION (ANTARCTICA)
ION. ANT.—64 January 1997—December 1997 (Not for Sale)

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