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ION.ANT.—70

IONOSPHERIC DATA AT SYOWA STATION

(ANTARCTICA)

January 2003 — December 2003

CONTENTS

NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

This data book gives summarized results for vertical soundings of the ionosphere at Syowa Station, Antarctica in 2003. The observations were conducted by the National Institute of Information and Communications Technology under the sponsorship of the National Institute of Polar Research of Japan. The location of the station, specifications of the ionosonde, and the symbols used in this data book are as follows:

LOCATION of SYOWA STATION

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

SPECIFICATIONS OF THE IONOSONDE USED AT SYOWA STATION

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

OBSERVERS

Observer: M. Oku

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. 2003 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	X 59	58	X 56	X 62	X 71	X 80	X 80	R	O X 70	X 75	X 80	O X 85	B	X 79	O X 76	O X 73	X 76	X 79	X 79	X 74	O X 70	O X 64	X 66	X 60
2	66	R	B	A	65	O X 64	R	X 73	78	O X 84	X 81	O X 84	O X 84	X 74	O X 72	X 77	O X 70	O X 69	O X 71	B	X 68	X 52	O X 51	R
3	X 47	A	X 54	60	63	X 64	R	67	74	X 78	X 81	X 79	X 79	O X 74	O X 74	O X 66	O X 71	O X 72	X 67	B	Y	A	A	49
4	A	A	A	43	R	A	R	R	R	R	B	B	B	B	R	R	B	B	R	O X 58	O X 54	O X 52	56	O X 51
5	O X 47	B	B	B	R	R	R	B	R	B	B	X 59	X 62	B	B	O X 69	O X 70	X 66	O X 68	O X 50	X 60	X 49	O X 48	O X 47
6	O X 51	R	R	R	O X 57	X 64	A	X 80	X 77	X 80	X 80	O X 74	Y	O X 64	R	O X 62	X 61	R	R	X 64	X 62	X 63	X 58	X 53
7	B	R	R	R	R	R	R	O X 66	O X 67	X 81	B	B	B	O X 73	B	B	B	O X 68	O X 67	X 65	X 53	R	X 51	R
8	B	A	O X 53	O X 47	60	O X 68	O X 71	R	O X 70	O X 71	O X 72	O X 70	R	O X 72	B	Y	O X 67	O X 67	X 66	X 63	X 62	X 63	X 54	X 47
9	X 57	X 56	X 60	O X 65	O X 62	X 68	O X 54	R	R	X 79	R	X 80	R	R	A	O X 70	O X 69	A	O X 68	X 66	X 65	X 58	O X 47	X 50
10	A	A	X 57	76	63	60	R	R	R	R	X 67	O X 67	R	R	R	X 79	O X 70	O X 66	B	O X 52	O X 48	R	O X 76	R
11	A	43	A	100	A	O X 46	R	B	R	R	R	Y	Y	Y	B	R	R	O X 66	X 62	O X 68	X 57	X 52	X 48	X 56
12	R	R	A	R	O X 42	A	O X 48	R	R	R	B	B	R	B	B	B	O X 65	B	X 65	A	X 58	A	O X 45	X 54
13	X 46	O X 46	X 52	R	X 49	B	R	R	R	R	X 62	O X 65	Y	R	O X 66	B	B	O X 68	O X 65	R	O X 52	X 58	X 58	X 58
14	X 56	X 53	R	A	A	A	R	R	R	R	R	R	B	B	B	R	X 63	X 63	R	X 60	X 56	X 58	X 58	X 56
15	X 50	R	R	A	49	R	R	R	R	R	B	Y	R	Y	Y	X 76	X 81	X 78	X 75	O X 67	X 61	X 57	O X 51	X 50
16	53	X 51	R	A	R	A	A	R	X 65	R	X 76	O X 71	O X 72	O X 73	O X 72	O X 71	B	O X 67	O X 65	X 61	X 62	X 62	O X 50	R
17	B	B	B	B	R	O X 60	R	R	R	A	X 65	O X 71	R	R	B	B	B	B	X 66	X 65	X 62	X 55	X 45	X 47
18	X 46	O X 46	A	57	60	45	A	62	X 64	X 65	B	B	O X 69	O X 75	O X 71	O X 70	X 76	B	B	O X 54	X 54	X 53	X 54	A
19	A	56	57	A	X 54	O X 51	R	X 62	65	R	R	R	R	B	B	B	B	B	R	R	96	R	A	O X 49
20	41	A	44	39	44	A	B	B	A	B	B	B	B	B	O X 63	B	O X 65	X 67	R	O X 50	B	O X 51	O X 48	46
21	O X 48	B	O X 43	B	A	B	B	B	B	A	B	B	B	B	B	B	X 60	B	B	R	R	O X 50	X 48	O X 50
22	X 53	O X 50	A	B	R	B	O X 64	R	R	B	B	B	B	C	C	C	C	B	B	B	O X 48	42	A	A
23	A	A	60	B	B	R	B	B	R	R	R	R	R	R	B	R	B	B	X 55	B	R	B	X 44	X 46
24	O X 46	59	55	38	R	B	B	R	O X 58	X 60	Y	X 64	B	B	B	O X 72	B	B	O X 58	R	B	R	R	A
25	B	B	45	R	B	O X 48	B	R	B	B	B	B	B	B	B	B	B	B	R	R	X 64	O X 52	X 53	X 48
26	A	A	65	51	B	B	B	R	B	R	B	B	B	B	B	B	B	B	B	B	R	X 45	A	X 44
27	B	A	53	A	46	R	R	R	O X 63	65	O X 71	O X 71	R	O X 68	O X 70	R	R	O X 63	X 62	X 62	B	X 49	X 52	50
28	52	50	45	O X 56	B	R	O X 61	B	B	B	R	B	B	B	B	B	R	O X 53	X 58	X 60	X 57	X 56	X 59	47
29	O X 45	A	53	55	A	O X 54	R	O X 57	X 65	X 69	O X 74	O X 75	O X 71	B	O X 71	O X 68	B	X 77	O X 72	O X 48	R	A	A	B
30	A	A	O X 38	A	40	B	Y	Y	B	Y	B	B	B	B	B	B	B	B	R	B	72	A	A	A
31	A	O X 40	X 44	B	B	O X 41	R	R	B	R	R	B	B	B	B	B	B	B	B	O X 40	O X 46	O X 44	B	O X 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	17	12	18	13	15	14	6	7	12	11	11	14	6	9	9	12	14	16	18	19	23	22	23	22
MED	X 50	X 50	53	56	57	O X 60	O X 62	X 66	X 66	X 75	X 74	O X 71	O X 72	O X 73	O X 71	O X 70	O X 70	O X 67	X 66	X 61	X 60	X 52	X 51	X 50
U Q	X 54	56	57	64	63	X 64	X 71	X 73	72	X 80	X 80	X 79	X 79	O X 74	O X 73	X 74	X 71	X 70	O X 68	X 65	X 64	X 58	X 58	X 53
L Q	X 46	O X 46	X 45	45	46	O X 48	O X 54	62	X 64	X 65	X 67	X 67	X 69	O X 70	O X 68	O X 68	X 65	O X 66	X 62	O X 52	O X 54	X 50	X 48	X 47

JAN. 2003 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2003 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	J R 53	F 47	50	56	65	J R 74	74	R	R 64	J R 69	74	R 79	B	J R 73	R 70	R 67	70	J R 73	J R 73	68	R 64	58	60	54
2	F 56	R	B	A	F 55	R 58	R	J R 67	F 67	R 78	75	R 78	R 78	68	R 66	J R 71	R 64	R 63	65	B	62	46	R 45	R
3	41	A	48	F 47	F 54	58	R	F 58	F 64	72	75	J R 73	J R 73	R 68	R 68	60	R 65	66	61	B	Y	A	A	F 39
4	A	A	A	F 32	R	A	R	R	R	R	B	B	B	B	R	R	B	B	R	U R 52	R 48	46	R 44	R 45
5	R 41	B	B	B	R	R	R	B	R	B	B	J R 53	J R 56	B	B	63	64	60	R 62	U R 44	J R 54	43	42	R 41
6	R 45	R	R	R	R 51	58	A	74	J R 71	J R 74	J R 74	R 68	Y	R 58	R	R 56	J R 55	R	R	58	J R 56	57	J R 52	47
7	B	R	R	R	R	R	R	60	R 61	J R 75	B	B	B	R 67	B	B	B	R 62	R 61	59	47	R	J R 45	R
8	B	A	47	R 41	F 46	R 62	R 65	R	R 64	U R 65	66	R 64	R	R 66	B	Y	R 61	R 61	60	57	J R 56	57	48	41
9	J R 51	J R 50	54	R 59	R 56	J R 62	R 48	R	R	J R 73	R	J R 74	R	R	A	R 64	R 63	A	62	J R 60	59	52	R 41	44
10	A	A	J R 51	A	F 53	F 46	R	R	R	R	61	61	R	R	R	J R 73	R 64	R 60	B	R 46	R 42	R	R 70	R
11	A	F 31	A	A	A	R 40	R	B	R	R	R	Y	Y	Y	B	R	R	R 60	J R 56	R 62	51	46	42	J R 50
12	R	R	A	R	R 36	A	U R 42	R	R	R	B	B	R	B	B	B	58	B	59	A	J R 52	A	R 39	48
13	40	40	46	R	43	B	R	R	R	R	J R 56	R 59	Y	R	R 60	B	B	R 62	R 59	R	U R 46	52	J R 52	J R 52
14	50	47	R	A	A	A	R	A	R	R	R	R	B	B	B	R	J R 57	J R 57	R	54	J R 50	J R 52	52	50
15	44	R	R	A	F 38	R	R	R	R	R	B	Y	R	Y	Y	J R 70	J R 75	J R 72	J R 69	61	55	J R 51	R 45	44
16	F 43	45	R	A	R	A	A	R	J R 59	R	J R 70	R 65	R 66	R 67	R 66	65	B	R 61	R 59	J R 55	56	56	R 44	R
17	B	B	B	B	R	R 54	R	R	R	A	59	R 65	R	R	B	B	B	B	60	59	56	49	39	41
18	40	40	A	F 47	F 49	F 37	A	F 53	58	59	B	B	R 63	R 69	R 65	R 64	J R 70	B	B	R 48	48	47	48	A
19	A	F 26	F 43	A	48	R 45	R	56	F 55	R	R	R	R	B	B	B	B	B	R	R	F	R	A	R 43
20	F 30	A	F 33	F 29	F 34	A	B	B	A	B	B	B	B	B	R 57	B	R 59	61	R	R 44	B	R 45	R 42	F 38
21	42	B	37	B	A	B	B	B	B	A	B	B	B	B	B	B	J R 54	B	B	R	R	R 44	42	44
22	J R 47	R 44	A	B	R	B	R 58	R	R	B	B	B	B	C	C	C	C	B	B	B	R 42	A	A	A
23	A	A	A	B	B	R	B	B	R	R	R	R	R	R	B	R	B	B	J R 49	B	R	B	38	40
24	R 40	F 48	F 38	F 30	R	B	B	R	R 52	54	Y	58	B	B	B	R 66	B	B	R 52	R	B	R	R	A
25	B	B	F 36	R	B	R 42	B	R	B	B	B	B	B	B	B	B	B	B	R	R	58	R 46	47	42
26	A	A	F 35	F 40	B	B	B	R	B	R	B	B	B	B	B	B	B	B	B	B	R	39	A	38
27	B	A	F 38	A	F 38	R	R	R	R 57	F 56	R 65	R 65	R	R 62	64	R	R	57	56	56	B	43	46	F 37
28	F 34	F 36	F 37	R 50	B	R	55	B	B	B	R	B	B	B	B	B	R	R 47	J R 52	54	51	50	53	F 38
29	R 39	A	F 38	F	A	48	R	R 51	59	63	U R 68	U R 69	65	B	R 65	62	B	J R 71	R 66	R 42	R	A	A	B
30	A	A	R 32	A	F 30	B	Y	Y	B	Y	B	B	B	B	B	B	B	B	R	B	R	A	A	A
31	A	34	38	B	B	35	R	R	B	R	R	B	B	B	B	B	B	B	B	36	42	38	B	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	17	12	17	10	15	14	6	7	12	11	11	14	6	9	9	12	14	16	18	19	21	21	23	22
MED	42	42	38	F 44	F 48	R 51	R 56	58	R 60	R 69	68	R 65	R 66	R 67	R 65	R 64	R 64	R 61	R 60	55	52	47	45	42
U Q	J R 48	47	48	R 50	54	R 58	65	67	R 64	J R 74	74	R 73	R 73	R 68	R 67	J R 68	R 65	J R 64	R 62	59	56	52	52	47
L Q	40	F 35	F 36	F 32	F 38	42	R 48	53	58	59	61	61	R 63	R 64	R 62	62	J R 58	R 60	J R 56	R 46	48	44	42	F 39

JAN. 2003 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2003 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	30	23	24	32	29	31	30	40	38	30	29	E B 54	B	E B 46	E B 55	E B 36	30	E B 35	E B 54	E B 55	31	E B 34	36	38
2	35	38	B	68	64	32	36	44	32	37	34	27	36	37	E B 53	E B 60	E B 54	40	28	B	G	32	G 24	E B 26
3	36	41	44	34	41	36	32	32	27	31	31	34	31	E B 54	E B 58	36	30	27	E B 32	B	22	44	41	41
4	92	46	36	32	36	40	22	30	30	34	B	B	B	B	29	23	B	B	27	22	22	32	38	33
5	36	B	B	B	38	36	36	B	42	B	B	38	E B 55	B	B	38	30	30	G 24	E B 34	26	33	40	31
6	38	38	37	G 29	30	41	79	38	31	31	31	E B 57	33	30	57	36	37	29	29	26	24	23	22	18
7	B	39	36	36	29	33	40	40	39	39	B	B	B	E B 58	B	B	B	E B 55	26	31	26	34	31	36
8	B	44	38	35	28	35	31	34	37	33	34	36	E B 58	58	B	28	33	41	31	34	24	24	28	31
9	35	33	32	28	33	32	33	40	35	32	33	32	32	43	62	57	66	76	41	33	38	27	36	42
10	48	45	44	44	39	32	30	36	34	32	32	33	32	33	33	48	G	G	B	25	22	36	42	45
11	42	36	46	50	38	35	34	B	40	34	31	31	30	29	B	32	36	29	24	24	22	G	34	49
12	29	33	40	35	35	48	35	32	31	32	B	B	32	B	B	B	E B 48	B	40	80	42	34	33	39
13	38	55	32	46	34	B	40	40	34	38	G 32	28	29	31	31	B	B	35	32	E B 36	G	27	30	22
14	30	32	43	40	35	35	40	42	44	37	35	38	B	B	B	38	35	37	44	34	23	46	48	37
15	41	31	40	55	36	35	36	37	40	40	B	27	32	28	34	E B 56	E B 57	35	48	E B 35	E B 28	23	22	28
16	26	38	40	41	34	42	42	37	38	37	32	36	31	41	36	34	B	30	31	22	27	23	36	G 32
17	B	B	B	B	34	33	30	28	38	78	39	38	59	38	B	B	B	B	38	48	34	G 19	22	29
18	32	34	64	38	42	31	54	28	27	33	B	B	34	E B 55	30	E B 55	E B 33	B	B	33	45	44	44	57
19	67	34	45	91	49	38	47	38	33	32	37	34	32	B	B	B	B	B	G 24	39	37	40	37	42
20	44	58	G 38	40	38	41	B	B	40	B	B	B	B	B	38	B	28	E B 50	32	29	B	24	31	31
21	32	B	31	B	40	B	B	B	B	40	B	B	B	B	B	B	E B 34	B	B	32	27	28	21	24
22	31	40	40	B	33	B	32	29	39	B	B	B	B	C	C	C	C	B	B	B	G	41	44	43
23	50	42	40	B	B	30	B	B	31	33	32	37	38	30	B	G 28	B	B	30	B	35	B	G 21	43
24	39	33	64	34	40	B	B	38	33	30	31	35	B	B	B	E B 58	B	B	G 24	38	B	40	42	44
25	B	B	38	32	B	29	B	34	B	B	B	B	B	B	B	B	B	B	34	G	41	43	42	33
26	66	56	50	34	B	B	B	36	B	30	B	B	B	B	B	B	B	B	B	B	40	23	40	28
27	B	39	38	42	22	35	33	34	32	27	27	32	28	31	30	28	G 27	23	32	40	B	20	18	38
28	32	31	28	40	B	36	28	B	B	B	36	B	B	B	B	B	E B 33	30	30	27	24	22	20	39
29	78	42	39	44	39	39	40	35	G	G 28	E B 56	E B 55	28	B	32	30	B	E B 30	E B 30	31	38	54	60	B
30	44	40	31	39	23	B	18	22	B	31	B	B	B	B	B	B	B	B	31	B	E B 48	38	44	38
31	36	34	32	B	B	37	38	37	B	37	38	B	B	B	B	B	B	B	B	22	39	37	B	28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	27	28	25	26	25	25	25	25	26	19	19	18	16	14	18	17	18	25	25	28	30	30	30
MED	37	38	38	39	36	35	35	36	34	33	32	34	32	U 34	34	U 34	32	31	30	31	26	32	36	36
U Q	44	42	44	44	39	38	40	39	39	37	36	E B 38	36	E B 50	55	E B 55	E B 42	40	36	37	38	40	42	42
L Q	32	33	34	34	33	32	30	32	31	31	31	32	31	30	31	30	30	29	28	26	22	23	24	29

JAN. 2003 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2003 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	10	12	11	14	11	11	10	15	12	11	10	54	B	46	55	36	12	35	54	55	28	34	15	10
2	16	24	B	20	11	13	19	24	10	10	12	15	20	15	53	60	54	32	14	B	19	10	15	26
3	15	18	10	10	11	12	13	16	11	14	10	18	14	54	58	15	11	16	32	B	11	36	12	14
4	18	10	11	10	28	25	10	19	10	29	B	B	B	B	19	14	B	B	15	20	18	12	11	11
5	18	B	B	B	20	19	20	B	16	B	B	20	55	B	B	26	16	14	12	34	9	11	10	19
6	12	26	14	16	13	10	8	11	11	11	16	57	28	20	20	15	15	11	10	10	10	11	11	12
7	B	28	30	28	14	14	28	15	17	14	B	B	B	58	B	B	B	55	15	12	10	30	9	19
8	B	16	11	12	11	12	11	14	20	26	15	14	58	25	B	25	15	12	12	12	9	10	13	10
9	12	12	15	16	16	16	10	25	16	28	16	18	13	12	13	13	14	17	15	15	10	10	10	10
10	19	15	11	10	11	10	11	15	14	11	12	10	14	13	14	12	11	18	B	14	12	12	11	12
11	9	10	25	15	10	10	18	B	11	11	12	19	14	17	B	15	17	25	16	12	9	10	10	10
12	14	24	14	20	10	15	10	14	25	20	B	B	17	B	B	B	48	B	31	19	14	19	17	11
13	14	14	10	15	10	B	12	16	11	12	14	20	12	20	17	B	B	19	30	36	19	10	13	18
14	11	14	12	12	18	16	12	10	13	28	25	26	B	B	B	20	20	16	11	15	14	12	9	15
15	11	25	11	11	10	26	12	12	11	20	B	20	18	15	16	56	57	16	25	35	28	15	15	9
16	9	10	14	15	28	12	18	24	12	27	11	10	15	17	11	16	B	27	27	17	14	11	11	29
17	B	B	B	B	20	16	12	11	28	24	16	26	19	18	B	B	B	B	16	11	10	12	15	10
18	11	12	10	11	11	12	10	8	10	14	B	B	12	55	21	55	33	B	B	18	15	13	10	10
19	10	12	11	12	10	14	13	10	10	16	15	16	14	B	B	B	B	B	14	14	12	10	15	12
20	10	10	11	10	12	20	B	B	27	B	B	B	B	B	27	B	24	50	14	21	B	15	12	15
21	16	B	18	B	28	B	B	B	B	19	B	B	B	B	B	B	34	B	B	28	15	13	15	12
22	11	12	26	B	25	B	14	18	26	B	B	B	B	C	C	C	C	B	B	B	25	10	14	12
23	14	22	10	B	B	18	B	B	20	20	20	20	22	18	B	15	B	B	15	B	13	B	11	10
24	16	12	10	11	12	B	B	25	28	20	25	24	B	B	B	58	B	B	16	14	B	16	11	16
25	B	B	10	9	B	12	B	18	B	B	B	B	B	B	B	B	B	B	15	15	13	13	11	20
26	14	12	12	11	B	B	B	23	B	20	B	B	B	B	B	B	B	B	B	B	14	10	8	9
27	B	9	8	12	12	28	14	23	11	9	12	12	12	13	15	15	14	15	12	15	B	14	9	10
28	12	11	12	16	B	26	9	B	B	B	26	B	B	B	B	B	33	16	14	16	18	12	12	13
29	20	18	8	8	29	16	16	15	12	12	56	55	19	B	19	15	B	30	30	14	14	11	12	B
30	13	28	18	18	11	B	11	16	B	26	B	B	B	B	B	B	B	B	26	B	48	14	7	19
31	16	13	14	B	B	10	10	14	B	20	27	B	B	B	B	B	B	B	B	10	8	14	B	17
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	30	30	31	31	31	31	31	31	31
MED	14	14	12	15	13	16	13	16	16	20	25	26	28	56	B	56	51	35	16	17	14	12	11	12
U Q	B 18	25	18	B 20	B 28	B 26	B 20	B 25	B 28	B 28	B	B	B	B	B	B	B	B	B 32	B 36	19	15	15	18
L Q	11	12	10	11	11	12	10	14	11	12	14	18	14	18	19	15	16	16	14	14	10	10	10	10

JAN. 2003 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2003 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	254	256	E A 270	E A 276	E A 232	224	208	A	A	194	194	B	B	B	B	198	212	220	B	B	224	240	230	218
2	338	A	B	A	E A 264	210	A	A	178	202	204	Y	Y	Y	B	B	B	A	226	B	224	218	E A 268	236
3	284	A	216	E A 254	F 248	E A 264	220	192	226	200	198	206	Y	B	B	176	202	226	226	B	A	A	A	E A 274
4	A	A	A	E A 246	A	A	A	A	206	A	B	B	B	B	A	218	B	B	206	194	222	E A 282	E A 278	E A 286
5	A	B	B	B	A	A	A	B	A	B	B	A	B	B	B	Y	212	212	216	E B 236	236	E A 264	A 242	A
6	E A 250	A	A	A	E A 284	E A 282	A	232	Y	Y	Y	B	Y	Y	A	A	A 232	204	216	192	218	232	240	278
7	B	A	A	A	A	E A 290	A	A	A	196	B	B	B	B	B	B	B	B	218	224	E A 224	A	234	A
8	B	A	A	A	E A 246	252	246	220	A	Y	Y	Y	B	A	B	Y	208	202	230	230	240	240	240	266
9	A	A	A	Y	A	Y	A 238	A	Y	Y	A	Y	A	A	A	A	A	A	202	216	204	240	244	240
10	A	A	220	220	246	266	234	A	A 234	A	208	190	A	208	A	A	A 232	Y	B	234	A	A	A	A
11	A	A	A	A	A	A	A	B	A	A 222	A	Y	Y	Y	B	A	A 222	E A 222	216	214	232	232	A	A
12	A	A	A	A	242	A	A	A	A	A	B	B	A	B	B	B	B	B	A	A	A	A	A	228
13	E A 270	266	A 280	A	E A 250	B	A	A	232	A	200	Y	Y	Y	Y	B	B	Y	204	E B 244	E B 250	234	242	248
14	282	A	A	A	A	A	A	A	A	A	A	A	B	B	B	A	Y	Y	A	216	222	E A 274	E A 270	242
15	A	A	A	A	E A 262	A	A	A	A	A	B	Y	A	Y	A	B	B	Y	E A 276	238	228	228	A 252	E A 270
16	E A 260	238	A	A	A	A	A	A	A	A	202	Y	Y	222	Y	200	B	Y	E A 236	208	228	240	A	A
17	B	B	B	B	A	A	228	218	A	A	A	234	A	A	B	B	B	B	E A 248	E A 256	220	246	242	266
18	240	240	A	208	A	A 232	A	192	200	Y	B	B	212	B	198	B	208	B	B	A 238	A	222	248	A
19	A	A	254	A	A	244	A	E A 240	A 230	232	230	A	A	B	B	B	B	B	A	A	A	A	A	A
20	A	224	A	A	A	A	B	B	A	B	B	B	B	B	A	B	224	B	232	210	B	A	240	A
21	A	B	A	B	A	B	B	B	B	A	B	B	B	B	B	B	B 220	B	B	238	224	256	232	278
22	272	B	A	B	A	B	258	A 214	A	B	B	B	B	C	C	C	C	B	B	B	A	A	A	A
23	A	A	A	B	B	A	B	B	A	A	A	A	A	A	B	212	B	B	A 260	B	A	B	274	246
24	A	A	A	A	A	B	B	A	Y	210	Y	218	B	B	B	B	B	B	206	A	B	A	A	A
25	B	B	A	A	B	A	B	220	B	B	B	B	B	B	B	B	B	B	A	260	A	A	A	A
26	A	A	A	A	B	B	B	A	B	230	B	B	B	B	B	B	B	B	B	B	A	272	A	260
27	B	A	A 256	A	A	A	A	A	E A 252	198	218	A 218	A	218	206	208	200	212	220	A	B	E A 244	244	296
28	A	244	278	A	B	A	230	B	B	B	A	B	B	B	B	B	B 210	A 220	218	208	A 236	242	Q 254	A
29	274	A	E A 288	A	A	A	A	E A 294	202	194	B	B	Y	B	Y	Y	B	206	E B 232	A 228	A	A	A	B
30	A	A	A	A	A	B	Y	Y	B	Y	B	B	B	B	B	B	B	B	A	B	206	A	A	A
31	A	A	A	B	B	A	A	A	B	A	A	B	B	B	B	B	B	B	B	Y	A	E A 266	B	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	6	8	5	9	9	8	9	9	10	8	5	1	3	2	6	12	9	19	19	17	19	18	16
MED	271	242	U 250	E A 246	E A 248	U 238	232	217	216	201	203	218	212	218	202	204	212	212	218	222	224	236	242	254
U Q	282	256	A 279	E A 265	E A 263	E A 274	242	E A 236	A 233	222	213	226		222		212	A 223	A 221	E A 232	238	234	E A 264	E A 254	276
L Q	254	238	237	214	E A 244	228	224	203	201	196	199	198		208		198	208	205	216	210	221	232	240	241

JAN. 2003 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2003 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	A	44	A	67	X 38	R	R	R	R	R	R	B	R	R	B	B	R	R	B	B	X 44	O X 43	44
2	B	64	B	A	Y	B	B	Y	R	B	B	B	B	B	B	B	B	B	O X 41	A	A	X 48	B	A
3	A	B	X 32	R	B	A	R	O X 43	B	R	B	B	B	B	B	B	B	R	R	B	O X 38	A	O X 43	A
4	O X 46	A	A	43	34	56	R	R	R	R	R	B	B	B	B	B	B	B	R	O X 54	O X 51	X 43	A	37
5	A	B	B	A	B	B	A	B	B	B	B	B	B	B	B	R	X 66	R	R	O X 49	R	O X 43	X 42	O X 37
6	O X 40	X 42	B	B	58	55	R	X 76	X 78	B	C	C	C	C	C	C	C	B	B	X 42	R	A	A	A
7	44	43	45	R	B	B	O X 41	Y	R	R	R	R	B	B	B	B	O X 70	B	B	O X 52	O X 50	O X 45	A	B
8	Y	B	B	A	B	B	Y	R	B	R	X 62	R	B	B	B	R	R	X 63	B	B	X 54	X 46	R	A
9	B	41	A	58	R	B	B	R	R	R	R	B	B	B	B	O X 63	X 63	B	O X 49	O X 50	Y	B	86	A
10	41	38	A	44	O X 41	A	B	O X 44	R	B	B	B	B	B	B	B	R	R	B	B	O X 49	O X 44	A	A
11	A	A	A	A	A	A	A	R	B	B	B	B	B	B	B	B	O X 64	B	B	B	B	B	X 47	X 44
12	X 37	40	43	50	O X 55	55	R	R	B	B	R	B	X 64	X 63	X 64	O X 70	O X 69	X 68	X 66	X 58	O X 48	O X 46	A	O X 42
13	56	A	A	56	B	62	62	R	R	R	X 72	78	X 78	X 78	X 72	X 72	X 66	X 64	X 66	X 64	X 61	X 55	X 55	X 52
14	X 52	42	A	X 51	X 62	R	62	64	B	B	R	O X 63	O X 62	O X 64	X 76	X 73	X 73	X 61	X 57	X 55	O X 40	A	A	A
15	A	A	36	86	A	R	X 58	A	R	R	B	B	R	B	B	R	X 78	O X 63	R	R	R	X 48	R	R
16	A	B	51	59	A	R	R	A	A	B	R	B	B	O X 65	O X 71	B	B	R	O X 50	O X 52	X 44	X 38	40	A
17	O X 40	A	A	B	B	B	R	X 72	X 73	B	B	X 79	B	X 78	O X 74	B	O X 74	X 75	B	O X 49	B	44	38	A
18	A	A	A	A	44	58	R	R	R	B	R	X 66	X 72	O X 71	X 78	X 73	X 74	X 70	75	X 62	X 48	41	A	A
19	50	A	A	A	A	O X 55	X 53	63	69	O X 73	B	O X 76	X 74	O X 70	O X 70	O X 66	O X 69	X 68	X 62	X 49	X 46	48	A	48
20	54	54	A	46	72	B	R	X 66	X 66	B	B	X 65	R	O X 70	B	O X 70	O X 70	X 73	O X 64	X 54	O X 46	A	X 31	A
21	A	Y	A	A	O X 46	X 48	B	B	B	R	O X 64	B	B	B	O X 74	O X 73	O X 66	O X 68	X 66	X 48	O X 42	O X 43	O X 34	A
22	A	A	A	B	B	B	B	B	X 62	X 65	X 68	X 72	O X 84	B	B	X 72	B	O X 69	O X 56	O X 47	B	O X 49	X 44	42
23	A	A	A	A	A	59	B	B	B	B	B	B	O X 74	X 78	X 75	X 71	X 65	O X 65	O X 65	X 64	O X 46	X 36	39	34
24	A	43	O X 41	B	B	B	Y	R	X 64	X 73	X 77	76	X 76	X 74	X 76	O X 72	B	69	X 64	X 60	X 55	X 54	60	58
25	A	A	A	A	54	B	B	X 72	X 79	X 83	X 83	O X 86	O X 87	O X 89	X 95	X 88	X 83	X 74	O X 70	X 67	65	61	50	39
26	46	44	38	65	46	O X 50	X 62	73	82	O X 75	B	B	X 67	76	O X 86	B	X 78	66	B	X 56	48	O X 42	36	46
27	A	62	Y	A	A	A	39	R	R	B	B	B	B	B	O X 73	X 61	X 47	B	O X 42	O X 38	66	A	A	A
28	A	A	A	R	O X 40	R	B	O X 51	X 60	O X 66	O X 70	O X 68	B	B	B	B	B	B	X 58	B	A	A	A	A
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	11	11	8	10	12	10	7	10	9	6	7	10	10	12	13	13	17	15	16	20	18	20	15	12
MED	46	43	42	54	50	55	X 58	X 65	X 69	X 73	X 70	X 74	X 74	X 72	X 74	X 72	X 69	X 68	X 63	X 53	X 48	X 44	X 43	43
U Q	52	54	44	59	60	58	62	X 72	X 78	X 75	X 77	X 78	O X 78	X 78	X 77	X 73	X 74	X 70	X 66	X 59	X 54	X 48	50	47
L Q	O X 40	41	37	46	42	X 50	41	O X 51	X 63	X 66	X 64	X 66	X 67	O X 68	X 72	O X 68	X 66	X 64	O X 53	X 49	O X 46	X 43	38	38

FEB. 2003 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2003 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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

FEB. 2003 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2003 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	72	58	34	38	40	23	31	31	G 35	34	33	32	B	34	30	B	B	19	E B 29	B	B	22	19	21
2	B	33	B	41	20	B	B	20	35	B	B	B	B	B	B	B	B	B	22	38	35	46	B	37
3	40	B	73	27	B	43	23	34	B	34	B	B	B	B	B	B	B	33	32	B	25	70	40	39
4	56	70	41	32	21	30	34	34	33	33	36	B	B	B	B	B	B	B	E B 30	40	45	G	91	71
5	48	B	B	32	B	B	38	B	B	B	B	B	B	B	B	28	30	29	23	G	40	22	23	35
6	37	23	B	B	40	31	35	G	29	B	C	C	C	C	C	C	C	B	B	E B 26	31	74	33	44
7	69	41	32	41	B	B	30	27	34	G 29	34	34	B	B	B	B	E B 48	B	B	E B 30	E B 25	40	72	B
8	G 26	B	B	90	B	B	24	39	B	38	38	33	B	B	B	28	22	30	B	B	28	28	39	34
9	B	41	44	35	34	B	B	30	42	38	38	B	B	B	B	31	31	B	27	28	23	B	20	41
10	47	93	39	33	33	38	B	32	36	B	B	B	B	B	B	B	28	E B 30	B	B	E B 26	29	42	43
11	38	38	82	38	42	60	38	37	B	B	B	B	B	B	B	B	G 30	B	B	B	B	B	33	35
12	35	36	41	39	30	38	30	38	B	B	33	B	31	30	40	34	33	64	29	30	28	23	42	101
13	56	42	46	20	B	22	G	42	42	39	33	29	34	30	33	29	28	26	27	30	26	22	30	25
14	29	30	38	22	20	36	35	34	B	B	32	26	31	31	34	31	28	27	32	27	26	44	36	74
15	68	42	41	60	44	37	35	71	39	39	B	B	32	B	B	E B 55	E B 52	32	33	36	39	30	40	39
16	40	B	36	64	40	34	37	42	44	B	37	B	B	E B 53	34	B	B	22	35	E B 28	32	26	26	44
17	38	57	60	B	B	B	G	34	E B 54	B	B	E B 58	B	36	E B 54	B	E B 56	27	B	E B 29	B	23	23	43
18	44	42	49	49	39	31	33	43	37	B	27	28	28	32	35	36	27	28	30	35	40	38	42	41
19	42	73	59	46	40	32	32	38	36	34	B	E B 54	E B 54	E B 54	35	31	28	23	G 22	23	21	23	41	41
20	68	39	102	57	31	B	36	46	31	B	B	32	E B 32	27	B	E B 31	E B 32	31	E B 30	35	33	40	23	32
21	57	20	38	39	E B 30	22	B	B	B	E B 52	B	B	B	B	30	E B 55	E B 53	E B 26	20	G	28	E B 24	37	35
22	34	38	32	B	B	B	B	B	28	G 22	28	31	33	B	B	28	B	E B 29	E B 26	E B 26	B	E B 26	39	17
23	36	49	40	66	41	43	B	B	B	B	B	B	E B 54	32	32	27	26	E B 30	E B 29	E B 24	22	20	17	16
24	37	33	42	B	B	B	26	32	23	28	31	34	40	43	36	E B 54	B	E B 29	26	E B 25	21	19	E B 12	13
25	38	46	46	44	33	B	B	36	G 20	30	24	24	32	37	40	39	E B 30	E B 29	E B 30	21	22	20	36	23
26	20	30	30	35	32	30	26	28	25	E B 59	B	B	29	E B 31	E B 54	B	E B 30	34	B	50	18	23	34	40
27	59	37	18	39	48	48	40	39	39	B	B	B	B	B	E B 54	E B 30	26	B	27	30	37	37	77	62
28	58	35	58	28	40	38	B	31	22	26	28	27	B	B	B	B	B	B	27	B	37	42	66	73
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	26	24	24	24	20	18	20	24	20	15	15	13	12	13	14	16	19	20	21	22	24	26	27	27
MED	41	40	41	39	36	35	32	34	34	34	33	30	32	32	34	30	29	28	28	28	28	26	36	39
U Q	57	48	54	48	40	38	36	39	39	38	37	34	37	40	E B 40	E B 38	E B 33	30	30	35	36	40	42	44
L Q	37	34	37	32	30	30	26	31	28	29	28	28	31	30	33	28	28	26	26	25	24	22	23	32

FEB. 2003 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2003 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	11	15	11	27	10	10	18	11	11	10	10	12	B	11	15	B	B	13	29	B	B	15	13	11
2	B	14	B	12	11	B	B	15	25	B	B	B	B	B	B	B	B	B	14	29	25	10	B	14
3	8	B	10	9	B	14	10	17	B	18	B	B	B	B	B	B	B	18	26	B	13	12	12	20
4	10	10	10	12	15	10	24	28	29	19	26	B	B	B	B	B	B	B	30	15	16	10	12	12
5	26	B	B	21	B	B	16	B	B	B	B	B	B	B	B	16	18	11	12	16	12	18	14	10
6	15	12	B	B	16	9	21	10	10	B	C	C	C	C	C	C	C	B	B	26	15	13	12	10
7	14	10	11	30	B	B	12	19	25	16	16	15	B	B	B	B	48	B	B	30	25	16	15	B
8	14	B	B	26	B	B	17	25	B	20	15	25	B	B	B	17	18	12	B	B	17	14	10	12
9	B	15	25	12	18	B	B	18	19	15	29	B	B	B	B	18	14	B	16	14	14	B	16	10
10	11	15	11	10	14	14	B	20	19	B	B	B	B	B	B	B	24	30	B	B	26	19	10	12
11	26	15	53	14	27	18	18	28	B	B	B	B	B	B	B	B	14	B	B	B	B	B	10	11
12	11	12	9	15	20	15	17	18	B	B	19	B	12	14	12	21	25	21	16	11	17	18	11	16
13	10	22	11	10	B	16	16	13	14	13	10	15	12	14	11	11	15	12	12	19	19	13	10	9
14	9	9	26	12	10	14	14	21	B	B	15	19	21	12	15	14	19	15	13	15	19	11	9	9
15	12	14	11	14	10	10	15	19	20	16	B	B	16	B	B	55	52	11	10	11	10	10	10	16
16	10	B	10	11	20	24	22	15	15	B	16	B	B	53	19	B	B	12	10	28	10	11	10	15
17	11	8	12	B	B	B	28	12	54	B	B	58	B	30	54	B	56	15	B	29	B	15	12	10
18	10	10	17	28	9	12	21	16	17	B	10	10	14	12	11	18	14	11	13	12	12	11	9	9
19	11	20	16	13	14	14	11	15	16	29	B	54	54	54	27	24	25	18	13	10	14	11	9	10
20	11	18	12	9	14	B	18	15	12	B	B	24	32	14	B	31	32	12	30	14	14	11	16	24
21	10	13	11	11	30	14	B	B	B	20	52	B	B	B	19	55	53	26	13	16	16	24	10	9
22	20	15	18	B	B	B	B	B	15	13	19	16	19	B	B	19	B	29	26	26	B	26	10	10
23	9	12	18	15	17	10	B	B	B	B	B	B	54	20	16	20	12	30	29	24	14	10	9	8
24	9	12	16	B	B	B	19	15	15	14	18	21	14	13	16	54	B	29	14	26	17	15	12	10
25	13	12	16	21	13	B	B	13	11	15	16	12	16	15	16	24	30	29	30	15	15	8	10	10
26	11	11	10	10	10	14	11	13	11	59	B	B	18	31	54	B	30	19	B	13	11	10	11	10
27	9	10	13	22	19	12	16	17	25	B	B	B	B	B	54	30	20	B	24	19	11	14	24	14
28	12	25	26	14	16	25	B	21	14	15	19	19	B	B	B	B	B	B	18	B	10	33	10	9
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27	27	27	28	28	28	28	28	28	28
MED	11	14	14	14	18	16	18	18	20	44	29	B	B	B	54	54	30	24	25	22	16	14	10	10
U Q	14	19	26	26	B	B	B	23	B	B	B	B	B	B	B	B	B	B	B	B 30	22	18	12	14
L Q	10	12	11	12	14	13	16	15	14	16	16	19	18	14	16	19	18	12	13	14	12	11	10	10

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2003 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 250	A	E A 288	E A 278	A 240	194	A 194	B	A	A	B	B	222	E B 230	B	B	254	276	A
2	B	A	B	A	Y	B	B	Y	A	B	B	B	B	B	B	B	B	B	Y 214	A	A	A 216	B	A
3	A	B	A	A	B	A	A	A 238	B	A	B	B	B	B	B	B	B	A 240	A 238	B	E A 272	A	A	A
4	A	A	A	E A 304	188	210	A	A	A	A	A	B	B	B	B	B	B	B	E B 234	E A 240	E A 266	E A 300	A	A
5	A	B	B	A	B	B	A	B	B	B	B	B	B	B	B	210	226	220	252	242	218	236	278	238
6	A	A	B	B	A	A	A	268	230	B	C	C	C	C	C	C	C	B	B	E B 264	A	A	A	A
7	A	A	A	A	B	B	A	A	A	E A 224	A	A	B	B	B	B	B	B	B	E B 252	B	A	A	B
8	A	B	B	A	B	B	Y	A	B	A	A 252	A	B	B	B	224	210	238	B	B	E A 252	268	232	A
9	B	A	A	A	A	B	B	A	A	A	A	B	B	B	B	A 218	212	B	E A 250	A 228	Y	B	Y	A
10	222	A	A	A	A	A	B	A	A	B	B	B	B	B	B	B	E A 230	222	B	B	E A 262	A	A	A
11	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	214	B	B	B	B	B	A	A 226
12	A	A	A	A 214		A	A	A	B	B	A	B	A 228	216	204	212	212	A	192	A	A	E A 296	A	E A 264
13	A	A	A	236	B	A	222	A	A	A 224	198	206	212	Y	204	218	204	210	232	E A 240	E A 244	236	230	258
14	Q 258	230	A	Q 288	302	A	A	A 230	B	B	A	Y	224	210	Y	210	214	214	A 218	252	A	A	A	A
15	218	A	A	A	A	A	202	A	A	A	B	B	E A 236	B	B	B	B	244	240	A	A	E A 278	A	A
16	A	B	A	A	A	A	A	A	A	B	A 226	B	B	B	212	B	B	238	A 228	E B 260	A	E A 282	E A 260	A
17	A 222	A	A	B	B	B	A	A	B	B	B	B	B	Y	B	B	B	A 224	B	E B 236	B	A	A	A
18	A	A	A	A	A	A	A	A	A 226	B	200	200	222	216	228	228	218	226	230	E A 260	A	A	A	A
19	E A 240	A	A	A	A	A	232	228	Y	Y	B	B	B	B	226	206	216	A 232	234	240	E A 244	256	A	A
20	224	202	A	A	A	B	A	A	242	B	B	A	E B 208	202	B	222	226	250	E B 244	A	236	A	A	A
21	A	Y	A	A	B	A	B	B	B	E A 254	B	B	B	B	214	B	B	222	242	A	A	B	E A 256	A
22	A	A	A	B	B	B	B	B	220	196	218	208	208	B	B	208	B	E B 230	234	234	B	E B 244	Q 256	A 276
23	A	A	A	A	A	A	B	B	B	B	B	B	B	232	224	216	210	B 228	E B 238	E B 240	272	278	A 294	294
24	A	A 260	228	B	B	B	A	A	216	208	222	A 228	A 246	204	204	B	B	220	218	E B 230	A 230	228	230	Q 230
25	A	A	A	A	A	B	B	284	208	216	210	206	E A 228	196	194	E A 246	B 218	E B 224	224	228	224	232	F 270	E A 306
26	284	E A 308	E A 326	A	A	E A 344	E A 344	220	220	B	B	B	206	248	B	B	216	E A 242	B	E A 238	E A 262	A	E A 270	A
27	A	248	Y	A	A	A	A	A	A	B	B	B	B	B	B	230	E A 236	B	E A 298	A	A	A	A	A
28	A	A	A	A	E A 250	A	B	A	256	260	234	A 230	B	B	B	B	B	B	274	B	A	A	A	A
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	7	5	2	3	4	3	4	7	9	8	9	7	10	8	9	13	15	19	21	16	12	14	11	8
MED	223	239	277	U 262	U 216	U 230	220	234	223	222	218	206	216	213	212	217	215	225	232	E 240	E A 248	U 244	258	U 248
U Q	258	A 284		E A 304	276	E A 344	288	284	249	A 247	A 230	A 228	A 228	224	225	226	226	238	243	E B 252	E B E A 264	E A 278	276	A 285
L Q	222	216		236	201	210	212	228	218	212	199	200	208	203	204	210	212	222	226	235	233	236	232	234

FEB. 2003 h'F (KM)

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2003 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	A 51	R	B	O X 40	R	R	R	X 62	O X 67	R	R	B	O X 69	B	B	X 63	X 54	X 60	X 47	X 39	A	84
2	A	A	A	R 44	A	B	R	A	B	B	B	B	B	B	O X 66	O X 72	X 78	X 69	B	X 60	X 49	32	A	A
3	A 39	A	B	A	A	A	A	R	R	X 64	X 65	O X 65	B	B	B	O X 68	X 64	X 66	X 63	O X 42	A	60	A	A
4	O X 28	A	B	A 41	B	A	A	Y	R	B	B	B	B	B	B	B	B	B	O X 48	O X 36	X 35	X 34	A	A
5	A	Y	B	A	B	O X 37	R	R	R	R	R	B	B	B	B	B	X 62	B	B	X 51	R	O X 42	A	A
6	A	A	B	B	A 33	B	B	B	B	R	B	B	B	B	B	B	B	O X 43	B	A 95	A	A	A
7	A	A	A	X 31	B	B	B	B	R	R	B	B	B	B	B	B	B	X 60	B	B	O X 50	O X 44	42	49
8	B	A	B	A	O X 44	O X 46	O X 62	X 65	O X 69	X 78	X 78	X 80	X 80	O X 86	O X 82	X 82	O X 94	X 90	X 78	B	A	A	66	A
9	A	X 28	A	A 35	B	B	B	B	B	B	B	B	B	B	X 60	O X 62	X 66	X 61	X 63	X 62	X 55	36	A	A
10	A	B	Y	B	A	A	B	O X 45	B	B	B	B	B	B	X 80	X 78	O X 75	70	O X 64	O X 49	A	A	A	X 37
11	47	B	B	49	Y	B	B	Y	R	R	R	B	B	B	B	B	O X 57	X 64	X 66	X 64	O X 52	A	O X 28	A
12	A	A	X 32	A	A	A	A	O X 54	X 62	X 64	X 66	X 74	B	X 86	X 88	X 86	O X 85	O X 86	X 72	O X 68	X 62	X 60	47	41
13	X 35	60	60	58	A	B	B	R	R	B	R	X 66	X 72	X 75	X 74	X 75	X 78	X 81	O X 71	O X 51	X 53	X 44	30	O X 39
14	58	53	44	53	48	44	49	A	A	X 62	X 70	X 67	X 73	B	X 75	O X 83	X 63	B	B	X 55	X 47	A	64	A
15	A	A	B	A	B	B	R	B	B	B	B	B	B	B	B	B	X 65	B	B	O X 44	A	A	A	A
16	56	A	B	O X 39	56	52	R	B	R	X 61	X 62	X 65	B	B	X 81	B	X 104	X 62	O X 43	B	39	A	A	A
17	B	66	A	B	32	42	O X 48	O X 50	B	B	B	B	B	B	B	B	O X 69	B	B	A	A	O X 29	A	A
18	A	B	A	B	B	A	O X 44	B	B	B	B	B	B	B	B	B	B	O X 52	O X 43	O X 46	X 36	O X 22	A	A
19	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	O X 76	B	B	B	B	X 33	X 34	R	O X 26
20	O X 45	35	A	49	O X 35	42	54	X 49	O X 56	X 56	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	B	B	B	A	B	B	O X 39	B	B	B	B	B	B	B	B	X 62	B	B	B	B	R	A	O X 38
22	A	A	A	B	B	O X 34	A	B	B	B	B	B	B	B	B	B	B	B	B	O X 51	O X 46	X 41	X 28	O X 23
23	93	A	B	A	A	B	B	R	X 46	B	B	B	B	B	B	B	B	B	X 63	B	X 55	A	44	A
24	A	A	A	A	A	B	O X 43	B	B	O X 53	R	B	B	B	B	R	O X 73	B	B	O X 47	X 42	36	O X 27	B
25	B	R	R	A	A	O X 40	O X 40	X 52	O X 66	O X 67	O X 68	O X 68	O X 72	X 79	O X 87	X 86	X 81	X 65	X 59	X 53	53	40	37	32
26	A	A 42	A	48	51	A	B	B	O X 45	X 68	72	X 80	X 96	X 94	X 94	B	B	O X 75	O X 67	X 43	O X 37	A	A
27	A 44	A	B	B	A	A	A	O X 54	R	B	B	B	B	B	B	O X 73	B	O X 56	O X 50	85	90	A	A	A
28	A	A	B	A	A	B	O X 40	B	B	B	B	B	B	B	B	B	O X 66	X 65	X 60	X 34	A	A	A	A
29	A	A	A	A 59	B	B	B	B	B	B	R	B	B	B	B	R	O X 59	O X 54	B	A	F	79	A	A
30	A	A O X 42	A	B	56	40	41	B	R	B	B	B	B	B	B	R	X 60	O X 51	X 38	A	A	A	O X 38	A
31	B	A	B	A	67	X 38	O X 31	B	B	R	R	O X 53	B	B	B	B	B	B	37	B	69	A	56	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	7	7	6	6	11	13	10	8	6	10	8	9	5	5	11	12	19	18	18	19	20	17	12	9
MED	47	44	43	49	44	42	O X 44	X 50	O X 59	X 62	X 68	X 67	X 73	X 86	X 80	X 77	X 66	X 64	X 62	O X 51	X 50	X 39	40	X 38
U Q	58	60	51	53	56	48	49	X 53	O X 66	X 64	X 69	X 73	X 80	X 91	X 87	X 84	X 78	X 69	X 66	X 62	55	X 44	52	45
L Q	X 35	35	42	X 39	35	X 38	O X 40	O X 43	X 54	O X 56	X 66	O X 65	X 72	X 77	O X 69	O X 72	X 62	O X 56	O X 48	O X 46	X 42	X 34	X 29	O X 29

MAR. 2003 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2003 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	F 29	A	B	R 34	R	R	R	56	61	R	R	B	63	B	B	57	48	J R 54	41	33	A	A
2	A	A	A	R	F 31	A	B	R	A	B	B	B	B	B	60	R 66	J R 72	63	B	54	43	F 20	A	A
3	A	F 28	A	B	A	A	A	R	R	58	59	59	B	B	B	R 62	58	60	57	R 36	A	F	A	A
4	R 22	A	B	A	F 31	B	A	A	Y	R	B	B	B	B	B	B	B	B	42	30	29	28	A	A
5	A	Y	B	A	B	31	R	R	R	R	R	B	B	B	B	B	56	B	B	45	R	R 36	A	A
6	A	A	B	B	A	F 22	B	B	B	R	B	B	B	B	B	B	B	R 37	B	A	A	A	A	A
7	A	A	A	25	B	B	B	B	R	A	B	B	B	B	B	B	B	54	B	B	R 44	R 38	F 31	F 26
8	B	A	B	A	R 38	R 40	R 56	59	63	J R 72	J R 72	74	J R 74	R 80	76	76	88	J R 84	72	B	A	A	A	A
9	A	22	A	A	F 25	B	B	B	B	B	B	B	B	B	J R 54	56	60	55	57	56	49	F 22	A	A
10	A	B	Y	B	A	A	B	R 39	B	B	B	B	B	B	74	72	R 69	F 59	R 58	R 43	A	A	A	31
11	F 28	B	B	F 26	Y	B	B	Y	R	R	R	B	B	B	B	B	R 51	58	60	J R 58	R 46	A	22	A
12	A	A	26	A	A	A	A	R 48	56	58	60	68	B	80	82	80	79	80	66	62	56	54	F 37	F 25
13	29	F	F 31	F 41	A	B	B	R	R	B	R	60	66	69	68	J R 69	J R 72	J R 75	65	R 45	47	38	F 19	33
14	F 48	F 33	F	F	F 30	F 28	40	A	A	56	64	61	67	B	J R 69	77	57	B	B	49	41	A	F 41	A
15	A	A	B	A	B	B	R	B	B	B	B	B	B	B	B	B	J R 59	B	B	R 38	A	A	A	A
16	F 40	A	B	R 33	F 34	F 37	A	B	R	55	J R 56	J R 59	B	B	J R 75	B	98	56	R 37	B	F 31	A	A	A
17	B	A	A	B	F 21	F 28	R 42	R 44	B	B	B	B	B	B	B	B	63	B	B	A	A	R 23	A	A
18	A	B	A	B	B	A	R 38	B	B	B	B	B	B	B	B	B	B	R 46	R 37	R 40	30	16	A	A
19	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	U R 70	B	B	B	B	J R 27	28	R	20
20	R 39	F 26	A	F 38	29	F 30	F 37	43	50	J R 50	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	B	B	B	A	B	B	33	B	B	B	B	B	B	B	B	J R 56	B	B	B	B	A	A	R 32
22	A	A	A	B	B	28	A	B	B	B	B	B	B	B	B	B	B	B	B	R 45	40	35	22	R 17
23	A	A	B	A	A	B	B	R	40	B	B	B	B	B	B	B	B	B	57	B	49	A	F 30	A
24	A	A	A	A	A	B	R 37	B	B	R 47	R	B	B	B	B	R	R 67	B	B	R 41	36	F 26	R 21	B
25	B	R	R	A	A	R 34	R 34	46	R 60	61	R 62	R 62	R 66	73	R 81	80	75	59	53	47	F 42	F 31	F 26	F 22
26	A	A	A	A	F 34	F 40	A	B	B	R 39	62	66	J R 74	J R 90	J R 88	J R 88	B	B	R 69	R 61	37	R 31	A	A
27	A	F 31	A	B	B	A	A	A	R 48	R	B	B	B	B	B	R 67	B	R 50	R 44	F 26	A	A	A	A
28	A	A	B	A	A	B	R 34	B	B	B	B	B	B	B	B	B	R 60	59	54	J R 28	A	A	A	A
29	A	A	A	A	F 50	B	B	B	B	B	R	B	B	B	B	R	U R 53	R 48	B	A	F	F	A	A
30	A	A	R 36	A	B	F 32	F 28	F 28	B	R	B	B	B	B	B	R	54	R 45	32	A	A	A	R 32	A
31	B	A	B	A	R	32	R 25	B	B	D R 40	R	R 47	B	B	B	B	B	B	F 27	B	26	A	J F 50	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	5	4	5	10	13	10	8	6	11	8	9	5	5	11	12	19	18	18	19	18	15	11	8
MED	34	F 28	30	F 33	F 31	F 32	R 37	44	53	56	62	61	R 67	80	74	71	60	58	56	R 45	41	31	F 30	26
U Q	F 40	F 32	34	F 40	F 34	36	R 40	47	60	58	R 63	67	J R 74	R 85	R 81	78	72	60	60	R 54	46	36	F 37	32
L Q	28	24	28	26	F 29	F 28	R 34	36	48	R 47	60	R 59	66	71	63	R 66	R 56	R 50	42	R 38	31	23	22	21

MAR. 2003 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2003 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	35	32	34	30	B	33	30	34	30	27	26	27	G	B	E B 55	B	B	E B 27	28	27	20	E B 19	39	69
2	44	40	40	27	40	96	B	38	48	B	B	B	B	B	36	E B 52	28	E B 29	B	35	19	28	74	88
3	38	62	34	B	38	38	41	36	40	34	G	G	B	B	B	36	28	31	26	23	41	29	34	46
4	56	65	B	38	33	B	42	60	23	40	B	B	B	B	B	B	B	B	26	17	22	32	42	38
5	43	22	B	32	B	28	28	40	31	36	35	B	B	B	B	B	22	B	B	30	31	42	44	70
6	67	41	B	B	32	31	B	B	B	34	B	B	B	B	B	B	B	E B 30	B	38	G	37	36	47
7	67	59	41	34	B	B	B	B	34	40	B	B	B	B	B	B	B	G	B	B	E B 28	E B 24	E B 12	57
8	B	30	B	36	34	26	21	23	23	26	E B 29	E B 32	E B 54	33	29	28	26	E B 25	E B 26	B	40	114	K 42	36
9	49	54	67	33	31	B	B	B	B	B	B	B	B	B	G	28	23	22	23	E B 24	E B 25	33	64	68
10	56	B	18	B	40	35	B	26	B	B	B	B	B	B	29	E B 54	E B 54	E B 28	E B 30	28	34	42	38	42
11	77	B	B	45	22	B	B	32	36	35	31	B	B	B	B	B	E B 29	E B 31	29	E B 53	E B 19	38	32	36
12	35	34	28	46	93	40	42	40	32	31	G 24	31	B	32	32	27	E B 27	E B 55	E B 24	E B 25	E B 16	16	14	28
13	62	43	60	34	49	B	B	41	42	B	37	G	32	27	26	28	G	30	E B 34	27	34	30	32	44
14	37	30	K 22	40	36	38	K 33	47	47	34	G	28	E B 38	B	E B 52	E B 55	E B 56	B	B	23	28	K 33	49	88
15	58	68	B	38	B	B	36	B	B	B	B	B	B	B	B	B	E B 55	B	B	26	33	38	42	42
16	33	37	B	40	34	32	33	B	33	28	E B 29	E B 28	B	B	E B 27	B	E B 27	27	E B 30	B	25	64	60	73
17	B	34	36	B	74	35	E B 26	E B 30	B	B	B	B	B	B	B	B	E B 54	B	B	47	34	34	34	46
18	30	B	37	B	B	40	36	B	B	B	B	B	B	B	B	B	B	E B 26	E B 30	20	21	22	24	37
19	46	38	41	B	B	B	B	B	B	B	B	B	B	B	E B 59	B	B	B	B	E B 18	26	22	19
20	43	67	90	35	34	33	25	28	21	27	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	B	B	B	47	B	B	E B 28	B	B	B	B	B	B	B	B	E B 38	B	B	B	B	19	34	39
22	40	71	43	B	B	31	34	B	B	B	B	B	B	B	B	B	B	B	B	E B 29	E B 19	15	17	27
23	57	38	B	34	39	B	B	39	28	B	B	B	B	B	B	B	B	B	E B 35	B	E B 19	38	53	41
24	37	57	41	42	41	B	26	B	B	34	E B 29	B	B	B	B	E B 61	E B 56	B	B	E B 30	E B 15	16	E B 14	B
25	B	20	22	33	57	47	41	30	26	21	E B 32	E B 35	E B 52	E B 28	E B 53	23	24	E 20	B E 18	B E 13	B E 12	B E 12	E S 13	17
26	28	24	34	66	30	22	33	B	B	E B 32	E B 27	23	26	28	26	E B 30	B	B	E B 47	E B 46	E B 25	E B 25	24	48
27	48	49	42	B	B	35	40	42	35	40	B	B	B	B	B	E B 27	B	E B 29	37	40	35	41	43	72
28	41	40	B	40	36	B	27	B	B	B	B	B	B	B	B	B	E B 45	E B 22	E B 25	E B 19	35	44	68	63
29	45	39	43	32	34	B	B	B	B	B	36	B	B	B	B	E B 27	E B 27	29	B	72	86	Q 68	91	92
30	J A 42	64	43	38	B	17	K 22	E B 20	B	33	B	B	B	B	B	E B 27	E B 28	E B 25	23	35	68	33	94	40
31	B	82	B	34	E B 36	19	26	B	B	E B 29	E B 28	E B 30	B	B	B	B	B	B	24	B	68	95	66	65
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	27	20	22	22	19	20	18	16	18	14	10	6	5	11	15	19	18	18	23	29	30	30	29
MED	44	40	40	36	36	33	33	35	32	34	28	E G 28	35	28	28	E B 28	E B 28	E B 28	E B 27	26	25	33	38	46
U Q	56	62	43	40	41	38	38	40	38	35	32	E B 31	E B 52	32	E B 52	E B 54	E B 54	E B 30	E B 30	38	34	41	53	68
L Q	37	34	34	33	34	28	26	28	27	28	G 26	G 23	26	28	26	E B 27	26	E B 25	24	23	G	24	24	38

MAR. 2003 ftEs (0.1MHz)

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2003 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	10	12	9	9	B	17	25	21	18	12	14	15	18	B	55	B	B	27	15	14	12	19	9	20
2	9	19	14	18	8	34	B	30	15	B	B	B	B	B	16	52	15	29	B	12	14	9	11	11
3	11	14	19	B	24	20	16	16	22	19	15	17	B	B	B	28	14	17	15	13	13	9	12	12
4	10	17	B	16	14	B	16	17	18	26	B	B	B	B	B	B	B	B	17	13	16	10	10	15
5	10	19	B	16	B	12	16	20	20	18	22	B	B	B	B	B	12	B	B	17	16	10	15	10
6	22	14	B	B	12	10	B	B	B	22	B	B	B	B	B	B	B	30	B	14	30	10	25	10
7	11	15	25	10	B	B	B	B	28	20	B	B	B	B	B	B	B	25	B	B	28	24	12	12
8	B	16	B	25	20	16	17	18	17	15	29	32	54	30	19	15	20	25	26	B	10	12	15	12
9	9	11	18	22	12	B	B	B	B	B	B	B	B	B	20	24	17	15	15	24	25	10	13	11
10	10	B	13	B	23	15	B	21	B	B	B	B	B	B	20	54	54	28	30	19	11	16	11	9
11	11	B	B	10	17	B	B	28	19	30	26	B	B	B	B	B	29	31	17	53	19	10	10	10
12	10	10	12	10	13	15	18	20	17	25	16	20	B	29	20	25	27	55	24	25	16	9	9	10
13	14	11	12	13	20	B	B	33	26	B	26	20	18	14	16	14	17	25	34	20	11	10	10	12
14	11	9	10	11	12	9	15	15	17	15	16	16	38	B	52	55	56	B	B	14	10	10	12	17
15	12	58	B	30	B	B	23	B	B	B	B	B	B	B	B	B	55	B	B	21	14	11	11	16
16	15	26	B	12	10	14	22	B	26	24	29	28	B	B	27	B	27	22	30	B	16	12	25	13
17	B	9	26	B	11	11	26	30	B	B	B	B	B	B	B	B	54	B	B	11	18	9	9	10
18	16	B	14	B	B	24	14	B	B	B	B	B	B	B	B	B	B	26	30	16	14	11	12	11
19	19	24	20	B	B	B	B	B	B	B	B	B	B	B	B	59	B	B	B	B	18	11	12	12
20	19	12	13	11	11	13	10	13	16	16	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	B	B	B	16	B	B	28	B	B	B	B	B	B	B	B	38	B	B	B	B	12	12	12
22	15	30	20	B	B	12	25	B	B	B	B	B	B	B	B	B	B	B	B	29	19	13	9	7
23	20	26	B	28	18	B	B	21	17	B	B	B	B	B	B	B	B	B	35	B	19	10	12	17
24	12	12	28	20	24	B	16	B	B	20	29	B	B	B	B	60	56	B	B	30	15	12	14	B
25	B	12	13	13	13	14	15	18	16	16	32	35	52	28	53	18	15	20	18	13	12	12	13	12
26	13	13	16	16	12	13	18	B	B	32	27	20	18	20	21	30	B	B	47	46	25	25	13	12
27	12	14	19	B	B	13	16	28	18	29	B	B	B	B	B	27	B	29	16	12	15	13	17	18
28	106	26	B	32	29	B	18	B	B	B	B	B	B	B	B	B	45	22	25	19	13	12	15	12
29	11	25	30	18	15	B	B	B	B	B	27	B	B	B	B	27	27	21	B	20	12	12	19	10
30	14	14	8	10	B	10	7	20	B	30	B	B	B	B	B	27	28	25	13	12	16	20	15	14
31	B	52	B	15	36	11	16	B	B	29	28	30	B	B	B	B	B	B	11	B	12	21	12	11
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	31	31	31	31	31	31	31	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	12	16	20	18	20	17	22	30	28	30	B	B	B	B	B	B	54	30	32	20	16	12	12	12
U Q	19	26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B 53	19	13	15	14
L Q	11	12	13	12	12	13	16	20	18	20	27	30	B	B	27	27	27	25	17	14	12	10	11	10

MAR. 2003 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2003 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	232	A	B	A	A	A	A	226	216	210	218	B	B	B	B	E B 234	E A 242	240	262	E B 268	A	A
2	A	A	A	A	A	A	B	A	208	B	B	B	B	B	A	B	244	E B 246	B	E A 278	242	E A 320	A	A
3	A	238	A	B	A	A	A	A	A	208	E A 238	230	B	B	B	Y	230	A 252	E A 240	A 236	A	F	A	A
4	260	A	B	A	A	B	A	A	Y	A	B	B	B	B	B	B	B	B	E A 272	A	A	E A 326	A	A
5	A	Y	B	A	B	A	A	A	A	A	A	B	B	B	B	B	E A 230	B	B	E A 252	A	222	A	A
6	A	A	B	B	A	A	B	B	B	A	B	B	B	B	B	B	B	B	B	A	A	A	A	A
7	A	A	A	A	B	B	B	B	A	A	B	B	B	B	B	B	B	250	B	B	262	E B 284	266	F
8	B	A	B	A	A	A	E A 300	282	238	232	214	234	B	Y	218	222	222	238	E B 220	B	A	A	A	A
9	A	202	A	A	A	B	B	B	B	B	B	B	B	B	218	230	236	E A 234	E A 248	234	E B 244	224	A	A
10	A	B	Y	B	A	A	B	E A 266	B	B	B	B	B	B	228	B	B	E B 268	E B 248	A	A	A	A	A
11	E A 274	B	B	A 248	Y	B	B	A	A	A	A	B	B	B	B	B	E B 244	E B 258	E A 266	E B 266	232	A	A 240	A
12	A	A	A	A	A	A	A	A	A	A	236	232	B	232	222	218	E B 236	E B 244	216	B 230	220	A 220	228	E A 270
13	E A 266	F	246	A	A	B	B	A	A	B	A	E A 278	232	220	226	224	240	E A 246	238	232	238	264	A	236
14	308	A	254	F	F	280	166	A	A	A 230	220	208	B	B	B	B	B	B	B	250	264	A	F	A
15	A	A	B	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	264	A	A	A	A
16	A	A	B	E A 254	A 268	A	A	B	A	A 278	E B 258	230	B	B	232	B	E B 256	E A 256	B	B	282	A	A	A
17	B	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	222	A	A
18	A	B	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	252	A	A	A	A
19	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B 286	A 304	A	A
20	212	Q 186	A	A	A	A	A 318	E A 258	240	A 236	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	246
22	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B 244	E B 240	A 240	276	A
23	A	A	B	A	A	B	B	A	E A 274	B	B	B	B	B	B	B	B	B	E B 266	B	E B 244	A	F	A
24	A	A	A	A	A	B	E A 350	B	B	A	E B 236	B	B	B	B	E B 248	E B 248	B	B	E B 242	218	A 248	E B 264	B
25	B	A	A	A	A	A 234	236	A	236	220	B 242	E B 256	B	198	E B 280	224	218	204	210	Q 208	Q 218	Q 228	E S 246	E S 274
26	A	A	A	A	A	A	A	B	B	E B 264	B 222	222	212	234	232	E B 242	B	B	250	E B 250	B 230	E B 254	A	A
27	A	244	A	B	B	A	A	A	A	A	B	B	B	B	B	E B 246	B	228	A	F	A	A	A	A
28	A	A	B	A	A	B	328	B	B	B	B	B	B	B	B	B	E B 272	234	234	B 246	A	A	A	A
29	A	A	A	A	A	B	B	B	B	B	A	B	B	B	B	240	E B 264	A	B	A	228	F	A	A
30	A	A	A	A	B	186	306	180	B	A	B	B	B	B	B	E B 246	E B 266	B	A	A	A	A	E A 294	A
31	B	A	B	A	212	196	210	B	B	B	E B 266	E B 254	B	B	B	B	B	B	A	B	F	A	A 270	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	4	3	2	2	4	8	4	5	8	10	10	3	4	8	10	14	14	13	16	16	14	8	4
MED	263	220	246	251	240	215	U 286	U 240	237	230	227	224	218	226	226	228	E 242	E 245	E 242	240	238	U 236	260	258
U Q	291	241	254			257	A 323	A 274	257	A 250	E B 242	E B 254	232	233	232	E B 246	E B 256	E 252	E 258	E 252	262	E A 284	A 273	E 272
L Q	236	194	232			191	223	219	222	223	220	222	212	209	220	224	230	234	227	235	229	224	243	241

MAR. 2003 h'F (KM)

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2003 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	X 27	B	B	B	B	B	R	R	O X 49	B	R	B	B	B	B	B	O X 55	O X 44	R	A	A	A
2	A 32		B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	67	63	A	A	A	A
3	A	A	B	B	B	B	B	A	O X 53	B	B	B	B	B	B	O X 68	B 72		X 68	X 54	O X 23	A	A	A
4	A	X 32	B	B	B	B	A	B	A	B	B	B	B	B	B	X 77	O X 70	O X 47	X 46	O X 42	A	A	A	A
5	A	B	A	A	A 41		B	B	B	B	B	B	B	B	R	X 59	O X 65	B	B	B	A	58	38	61
6	62	38	B	A	47	49	A	B	B	B	B	B	X 60	B	B	B	B	O X 64	O X 60	X 49	A	Y	B	O X 23
7	A	O X 38	B	A	A	A	A	A	X 42	O X 48	R	R	O X 70	O X 84	O X 86	O X 87	X 89	O X 100	86	62	57	A	R	A
8	A	O X 36	O X 36	A	40	X 43	51	X 56	B	B	O X 45	B	B	O X 66	O X 66	X 75	O X 70	B	R	R	R	O X 42	O X 40	A
9	O X 41	40	X 29	O X 28	B	O X 45	A	B	B	B	B	B	B	B	X 65	O X 70	X 70	B	O X 42	B	O X 25	A	O X 28	A
10	X 42	43	58	58	42	38	48	A	B	B	B	B	B	B	B	B	O X 71	66	65	34	A	A	A	X 32
11	A	A	A	A	B	A	R	B	B	B	B	B	B	B	B	B	B	B	B	44	B	A	A	A
12	B	A	B	B	B	B	B	B	B	B	B	B	B	O X 71	X 67	O X 70	X 64	X 66	X 59	B	B	31	Y	O X 24
13	R	A	A	66	A	A	B	B	B	O X 48	X 58	X 69	O X 72	O X 74	B	X 80	B	O X 74	B	B	B	Y	O X 28	A
14	B	R	O X 37	A	A	A	A	A	B	O X 50	O X 64	O X 74	X 84	X 79	O X 85	X 89	B	93	68	A	O X 29	X 28	A	A
15	O X 39	A	45	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	X 32	A	A	A
16	A	41	B	A	B	B	113	A	B	B	B	B	B	B	B	B	B	B	68	Y	A	Y	A	A
17	A	B	B	39	B	A	R	B	B	B	B	B	B	B	B	B	B	B	X 31	B	A	O X 30	A	A
18	B	A	A	A	58	A	A	A	B	A	B	B	B	B	O X 73	B	B	74	78	B	O X 24	O X 28	A	O X 28
19	A	A	A	A	B	A	A	X 47	B	B	B	B	O X 74	O X 74	X 78	X 79	X 78	B	X 44	B	B	O X 23	A	33
20	A	A	42	B	B	B	B	B	B	B	B	B	B	O X 72	O X 71	B	O X 66	X 56	O X 52	45	X 22	X 26	A	A
21	X 34	62	A	B	B	B	A	B	A	B	B	B	B	X 47	O X 49	B	B	O X 49	B	R	Y	A	A	B
22	B	A	B	B	B	B	A	B	B	B	B	B	B	B	X 93	O X 97	B	X 88	65	A	A	A	A	A
23	A	B	B	B	B	B	A	34	B	B	B	B	B	B	B	X 74	O X 72	74	X 40	A	O X 30	O X 28	A	B
24	B	B	A	A	B	B	A	A	A	B	B	B	B	B	B	B	82	X 89	A	A	A	X 48	A	57
25	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	O X 38	A	A
26	A	B	A	B	A	A	X 35	A	B	B	B	B	B	B	B	B	O X 108	B	R	B	A	A	A	O X 39
27	B	A	A	B	B	A	B	B	B	B	B	O X 56	B	B	B	B	O X 68	B	B	X 27	B	R	A	A
28	A	B	B	B	B	B	B	B	B	B	B	B	B	B	R	O X 84	O X 74	B	X 49	O X 40	B	B	B	Y
29	A	A	A	O X 40	A	A	O X 32	X 30	39	B	O X 46	O X 51	O X 56	O X 68	X 71	X 74	74	81	B	O X 30	A	34	41	B
30	A	46	A	B	A	96	B	A	B	O X 46	B	B	B	B	B	B	B	56	O X 41	86	A	X 42	B	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	10	7	5	4	6	5	4	3	4	5	4	6	9	11	14	15	16	19	13	8	13	5	8
MED	X 41	39	X 37	40	44	44	48	X 40	X 42	O X 48	O X 49	O X 62	O X 71	O X 72	O X 71	X 76	O X 71	X 73	X 59	X 44	O X 27	X 31	O X 38	X 32
U Q	52	43	45	62	52	49	82	X 52	O X 53	O X 49	X 61	X 72	X 74	O X 76	O X 85	O X 84	X 78	X 84	68	58	X 31	X 42	40	48
L Q	X 36	X 36	X 29	34	41	41	X 34	32	39	O X 47	O X 46	O X 54	X 60	O X 67	O X 66	O X 70	O X 68	O X 60	X 44	X 37	O X 24	X 28	O X 28	O X 26

APR. 2003 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2003 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 21	B	B	B	B	B	B	R	R	R 43	B	R	B	B	B	B	B	R 49	R 38	R	A	A	A
2	A	F	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	F 57	F 52	A	A	A	A
3	A	A	B	B	B	B	B	A	R 47	B	B	B	B	B	B	R 62	B	F 64	62	48	17	A	A	A
4	A 26		B	B	B	B	A	B	A	B	B	B	B	B	B	J R 71	R 64	R 41	40	R 36	A	A	A	A
5	A	B	A	A	A	F 30	B	B	B	B	B	B	B	B	R	53	59	B	B	B	A	F 39	F 26	F 19
6	R 40	F 30	B	A	R 33	F 38	A	B	B	B	B	B	J R 54	B	B	B	B	R 58	54	43	A	Y	B	R 17
7	A	R 32	B	A	A	A	A	A	36	R 42	R	R	R 64	78	80	81	J R 83	S 94	F 77	F 53	F 47	A	R	A
8	A	R 30	R 30	A	F 30	37	F 39	J R 50	B	B	R 39	B	B	R 60	R 60	J R 69	64	B	R	R	R	R 36	R 34	A
9	R 35	F 30	23	R 22	B	R 39	A	B	B	B	B	B	B	B	59	R 64	64	B	36	B	R 19	A	R 22	A
10	36	F	F 20	F 26	F 26	F 22	F 22	A	B	B	B	B	B	B	B	B	R 65	F 59	F 52	F 24	A	A	A	26
11	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	F 33	B	A	A	A
12	B	A	B	B	B	B	B	B	B	B	B	B	B	65	61	64	58	60	J R 53	B	B	F 16	Y	R 18
13	A	A	A	F 34	A	A	B	B	B	R 42	J R 52	63	R 66	R 68	B	74	B	R 68	B	B	B	Y	R 22	A
14	B	A	R 31	A	A	A	A	A	B	R 44	R 58	R 68	78	73	79	J R 83	B	F 61	42	A	R 23	22	A	A
15	R 33	A	F 28	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	J R 26	A	A	A
16	A	F 29	B	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	F 59	Y	A	Y	A	A
17	A	B	B	F 26	B	A	R	B	B	B	B	B	B	B	B	B	B	B	25	B	A	R 24	A	A
18	B	A	A	A	A	A	A	A	B	A	B	B	B	B	R 67	B	B	F 62	F	B	R 18	R 22	A	R 22
19	A	A	A	A	B	A	A	41	B	B	B	B	R 68	R 68	J R 72	73	J R 72	B	J R 38	B	B	R 17	A	F 22
20	A	A	F 29	B	B	B	B	B	B	B	B	B	B	R 66	R 65	B	R 60	50	R 46	F 36	16	J R 20	A	A
21	J R 28	F 36	A	B	B	B	A	B	A	B	B	B	B	J R 41	R 43	B	B	R 43	B	R	Y	A	A	B
22	B	A	B	B	B	B	A	B	B	B	B	B	B	B	J R 87	R 91	B	82	F 56	A	A	A	A	A
23	A	B	B	B	B	B	A	F 25	B	B	B	B	B	B	B	J R 68	R 66	F 61	34	A	R 24	R 22	A	B
24	B	B	A	A	B	B	A	A	A	B	B	B	B	B	B	B	F 72	J R 83	A	A	A	42	A	F 40
25	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	R 32	A	A
26	A	B	A	B	A	A	29	A	B	B	B	B	B	B	B	B	102	B	R	B	A	A	A	R 33
27	B	A	A	B	B	A	B	B	B	B	B	50	B	B	B	B	R 62	B	B	21	B	A	A	A
28	A	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R 78	R 68	B	43	R 34	B	B	B	Y
29	A	A	A	34	A	A	26	24	F 29	B	U R 40	R 45	R 50	R 62	65	68	F 65	F 72	B	R 24	A	F 21	F 19	B
30	A	F 27	A	B	A	A	B	A	B	40	B	B	B	B	B	B	B	F 47	R 35	A	A	36	B	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	8	7	5	3	5	4	4	3	4	5	4	6	9	11	14	15	16	18	12	8	13	5	8
MED	R 35	F 30	28	F 26	F 30	F 37	28	33	36	R 42	R 43	56	R 65	R 66	R 65	R 70	R 65	61	48	36	R 21	R 22	R 22	22
U Q	38	R 31	R 30	34	R 33	38	34	46	R 47	R 43	R 55	66	68	70	79	R 78	72	70	F 56	46	R 25	36	30	30
L Q	R 30	F 28	21	24	F 26	F 26	24	24	F 29	41	R 40	48	R 54	R 61	R 60	64	62	R 54	38	28	18	20	20	R 18

APR. 2003 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2003 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 69	40 32	48 B	B	B	B	B	B	37	38	39	B	E B 29	B	B	B	B	B	E B 21	E B 21	31	37	58	90
2	B 87	42	B	B	B	B	37	B	B	B	B	B	B	B	B	B	B	B	E B 24	32	38	38	94	57
3	B 81	20	B	B	B	B	B	40	30	B	B	B	B	B	B	E B 56	B	E B 25	19	22	E S 13	40	36	33
4	B 36	B 59	B	36	35	30	37	B	35	B	B	B	B	B	B	E B 30	E B 55	26	E B 26	42	37	42	40	60
5	B 48	37	59	70	34	60	B 40	B	B	B	B	B	B	B	E B 28	E B 28	E B 29	B	B	B	39	44	65	20
6	B 28	37	B	70	34	60	40	B	B	B	B	B	E B 29	B	B	B	B	E B 41	E B 16	E S 14	36	19	B	17
7	B 35	36	B	32	40	38	36	38	26	E B 24	E B 27	E B 29	E B 27	E B 27	E B 26	E B 46	E B 25	E B 26	E S 14	E S 13	16	39	29	38
8	B 39	37	36	29	30	31	30	23	B	B	E B 30	B	B	E B 30	E B 30	E B 29	E B 28	B	34	38	48	42	40	37
9	K 46	37	46	23	B	38	39	B	B	B	B	B	B	B	E B 26	E B 54	E B 29	B	34	B	23	33	24	38
10	B 38	43	60	66	34	22	28	50	B	B	B	B	B	B	B	B	E B 28	24	E B 21	34	33	43	49	42
11	B 80	65	64	39	B	30	22	B	B	B	B	B	B	B	B	B	B	B	B	18	B	32	37	40
12	B	B 45	B	B	B	B	B	B	B	B	B	B	B	E B 26	E B 25	E B 25	E B 24	E B 17	E B 27	B	B	18	14	16
13	B 18	29	36	36	40	42	B	B	B	E B 31	E B 24	E B 24	E B 55	E B 57	B	E B 36	B	E B 58	B	B	B	20	23	26
14	B	22	32	33	41	67	41	40	B	E B 31	E B 31	E B 36	E B 29	E B 26	E B 26	E B 26	B	E B 17	E B 26	36	23	31	36	40
15	B 44	35	49	49	38	36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	48	31	40	36
16	B 46	69	B	38	B	B	40	38	B	B	B	B	B	B	B	B	B	B	23	26	37	23	41	43
17	B 62	B	B	31	B	59	22	B	B	B	B	B	B	B	B	B	B	B	18	B	40	33	117	38
18	B	45	39	36	33	38	48	46	B	115	B	B	B	B	E B 58	B	B	E B 25	22	B	K 18	20	30	30
19	B 59	46	55	38	B	34	34	23	B	B	B	B	E B 56	E B 55	E B 30	21	E B 25	B	E B 30	B	B	16	38	33
20	B 36	35	32	B	B	B	B	B	B	B	B	B	B	E B 56	E B 31	B	E B 32	34	26	16	21	35	35	40
21	B 59	67	65	B	B	B	31	B	34	B	B	B	B	E B 28	E B 29	B	B	E B 26	B	33	20	40	44	B
22	B	B 40	B	B	B	B	35	B	B	B	B	B	B	B	E B 73	E B 56	B	21	E B 24	34	35	40	76	41
23	B 60	B	B	B	B	B	43	27	B	B	B	B	B	B	B	E B 55	E B 31	22	E B 22	40	18	34	39	B
24	B	B	56	61	B	B	40	35	36	B	B	B	B	B	B	B	E B 26	E B 30	32	40	41	68	42	45
25	B 34	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	30	36	39	40	40
26	B 40	B	84	B	35	30	28	28	B	B	B	B	B	B	B	B	E B 57	B	E B 28	B	35	36	40	50
27	B	B 37	38	B	B	38	B	B	B	B	B	E B 28	B	B	B	B	E B 34	B	B	22	B	22	44	40
28	B 35	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 29	E B 47	E B 30	B	33	E B 28	B	B	B	21
29	B 30	36	32	32	36	34	23	18	18	B	E B 28	E B 31	E B 31	E B 54	E B 32	E B 24	17	20	B	20	84	93	53	B
30	B 47	32	40	B	40	27	B	36	B	E B 33	B	B	B	B	B	B	B	21	29	32	47	82	B	56
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	23	18	16	12	17	19	13	7	6	6	5	7	9	13	14	15	16	22	21	24	29	27	27
MED	44	37	47	36	36	36	36	36	34	32	E B 29	E B 29	E B 29	E B 30	E B 29	E B 33	E B 29	E B 25	E 25	30	36	36	40	40
U Q	60	45	59	44	40	40	40	40	36	38	31	E B 34	E B 55	E B 56	E B 32	E B 54	E B 32	E B 28	29	35	40	41	49	43
L Q	35	35	36	32	34	30	28	25	26	E B 31	E B 27	E B 26	E B 29	E B 26	E B 26	E B 26	E B 25	21	E 21	20	22	27	36	33

APR. 2003 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2003 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	18	12	B	B	B	B	B	26	25	25	B	29	B	B	B	B	B	21	21	12	16	26	12
2	20	12	B	B	B	B	20	B	B	B	B	B	B	B	B	B	B	B	24	12	10	16	12	12
3	19	13	B	B	B	B	B	18	18	B	B	B	B	B	B	56	B	25	14	12	13	14	14	13
4	20	14	B	B	B	B	21	B	26	B	B	B	B	B	B	30	55	22	26	14	13	12	14	13
5	24	B	16	24	14	11	B	B	B	B	B	B	B	B	28	28	29	B	B	B	14	12	14	14
6	13	13	B	14	15	14	26	B	B	B	B	B	29	B	B	B	B	41	16	E S 14	13	13	B	13
7	14	13	B	26	15	15	17	13	18	24	27	29	27	27	26	46	25	26	E S 14	13	14	12	12	12
8	13	12	15	18	22	26	18	18	B	B	30	B	B	30	30	30	28	B	23	17	14	14	13	19
9	14	15	14	14	B	16	29	B	B	B	B	B	B	B	26	54	29	B	16	B	15	14	14	14
10	16	11	12	14	13	14	E S 14	16	B	B	B	B	B	B	B	B	28	16	21	14	13	13	13	14
11	13	18	13	14	B	24	15	B	B	B	B	B	B	B	B	B	B	B	B	12	B	11	17	20
12	B	12	B	B	B	B	B	B	B	B	B	B	B	26	25	25	24	17	27	B	B	12	11	10
13	11	10	11	11	16	16	B	B	B	25	24	24	55	57	B	36	B	58	B	B	B	15	15	16
14	B	11	16	11	15	21	15	12	B	31	31	36	29	26	26	26	B	17	26	22	16	12	10	13
15	12	20	11	14	15	29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	15	12	12	13
16	12	12	B	20	B	B	31	14	B	B	B	B	B	B	B	B	B	B	12	13	11	11	12	22
17	16	B	B	11	B	18	18	B	B	B	B	B	B	B	B	B	B	B	12	B	12	12	11	23
18	B	11	11	28	29	14	21	28	B	16	B	B	B	B	58	B	B	25	11	B	10	10	11	12
19	12	16	12	24	B	18	20	11	B	B	B	B	56	55	30	16	25	B	30	B	B	10	12	12
20	13	11	12	B	B	B	B	B	B	B	B	B	B	56	31	B	32	19	13	10	10	11	11	10
21	15	12	25	B	B	B	25	B	25	B	B	B	B	28	29	B	B	26	B	10	15	11	10	B
22	B	22	B	B	B	B	24	B	B	B	B	B	B	B	73	56	B	15	24	11	10	14	11	12
23	16	B	B	B	B	B	19	10	B	B	B	B	B	B	B	55	31	18	22	11	10	10	14	B
24	B	B	20	33	B	B	25	17	14	B	B	B	B	B	B	B	26	30	19	10	10	10	12	10
25	30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	20	11	10	11	11
26	30	B	29	B	26	17	11	16	B	B	B	B	B	B	B	B	57	B	28	B	10	10	12	12
27	B	19	30	B	B	20	B	B	B	B	B	28	B	B	B	B	34	B	B	12	B	14	9	18
28	26	B	B	B	B	B	B	B	B	B	B	B	B	B	29	47	30	B	15	28	B	B	B	10
29	10	10	10	10	20	16	10	12	10	B	28	31	31	54	32	24	14	10	B	10	20	11	10	B
30	11	11	12	B	18	16	B	26	B	33	B	B	B	B	B	B	B	13	15	10	12	11	B	10
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	14	22	30	B	25	25	B	B	B	B	B	B	B	B	B	B	50	24	14	13	12	12	13
U Q	B 30	B 22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B 16	14	14	18
L Q	13	12	12	14	18	16	18	16	B	B	B	B	B	56	30	36	29	19	15	12	11	11	11	12

APR. 2003 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2003 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 260	A 260	B	B	B	B	B	A	A	A	B	E B 240	B	B	B	B	B	234	B 246	A	A	A	A
2	A	F	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	266	Q 256	A	A	A	A 256
3	A	A	B	B	B	B	B	A	A	B	B	B	B	B	B	B	B	236	228	222	E S 310	A	A	A
4	A	A	B	B	B	B	A	B	A	B	B	B	B	B	B	E B 280	B	E A 292	B	E A 292	A	A	A	A
5	A	B	A	A	A	A	B	B	B	B	B	B	B	B	244	E B 266	B	B	B	B	A	258	212	A
6	A	A 220	B	A	A	F	A	B	B	B	B	B	254	B	B	B	B	E B 248	216	216	A	A	B	S
7	A	A 238	B	A	A	A	A	A	A	B 238	E B 242	234	B 234	238	234	E B 240	230	230	Q 206	218	226	A	A	A
8	A	236	A 240	A	A	266	A	Q 276	B	B	E B 254	B	B	E B 242	E B 240	E B 244	E B 286	B	R	A	E A 292	240	234	A
9	268	A 254	248	248	B	218	A	B	B	B	B	B	B	B	260	B	B	B	E A 284	B	S	A	A 248	A
10	264	F	F	F	226	A 226	A 252	A	B	B	B	B	B	B	B	B	E B 270	272	Q 236	A	A	A	A	A 242
11	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	266	B	A	A	A
12	B	A	B	B	B	B	B	B	B	B	B	B	B	E B 252	E B 240	218	208	224	250	B	B	A 244	A	A
13	A	A	A	204	A	A	B	B	B	A	244	230	B	B	B	E B 252	B	E B 260	B	B	B	Y	A	A
14	B	A	192	220	A	A	A	A	B	B	E B 258	E B 234	232	204	230	E B 246	B	282	B 308	A	A	A 256	A	A
15	226	A	196	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	266	A	A	A
16	A	252	B	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	Q 258	A	A	A	A	A
17	A	B	B	256	B	A	222	B	B	B	B	B	B	B	B	B	B	B	A	B	A	222	A	A
18	B	A	A	A	A	A	A	A	B	A	B	B	B	B	B	B	B	252	Q 246	B	206	A	A	216
19	A	A	A	A	B	A	A	A	B	B	B	B	E B 274	E B 260	220	208	206	B 216		B	B	A	A	206
20	A	A	266	B	B	B	B	B	B	B	B	B	B	E B 276	236	B	236	258	258	230	E A 262	228	232	A
21	E A 260	252	A	B	B	B	A	B	A	B	B	B	B	E B 272	B	B	B	254	B	A	A	A	A	B
22	B	A	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	236	236	A	A	A	A	A
23	A	B	B	B	B	B	A	224	B	B	B	B	B	B	B	E B 262	244	240	B 272	A	A	A	A	B
24	B	B	A	A	B	B	A	A	A	B	B	B	B	B	B	B	260	240	A	A	A	232	A	212
25	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	212	A	A
26	A	B	A	B	A	A	A 258	A	B	B	B	B	B	B	B	B	238	B	278	B	A	A	A	E A 282
27	B	A	A	B	B	A	B	B	B	B	B	E B 262	B	B	B	B	B 230	B	B	A	B	A	A	A
28	A	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 278	E B 264	258	B	246	E B 312	B	B	B	A
29	A	A	A	E A 298	A	A	A	A	A 310	B	E B 294	E B 272	E B 246	B	E B 234	218	Q 240	Q 218	B	196	A	A 218	F	B
30	A	212	A	B	A	A	B	A	B	B	B	B	B	B	B	B	B	236	A	A	A	E A 252	B	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	7	6	5	1	3	3	2	1	1	5	5	6	7	10	11	12	16	17	10	6	10	4	6
MED	262	238	244	U 234	226	226	A 252	250	A 310	B 238	E B 254	E B 234	B 238	E B 252	235	E B 246	236	240	246	229	U 240	233	233	222
U Q	266	252	260	277		266	A 258				E B 276	E B 267	254	E B 272	244	E B 264	259	259	269	E 266	E 292	A 252	241	A 256
L Q	243	220	196	212		218	222				243	232	234	238	234	218	230	236	231	218	226	222	222	212

APR. 2003 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2003 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	B	B	B	B	A	A	A	B	B	B	B	B	B	B	B	X 47	A	B	Y	B	A	B	A
2	A	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	O X 50	Y	B	Y	A	X 41
3	A	B	A	A	B	Y	B	B	B	A	B	B	B	B	B	B	X 76	X 70	B	B	X 23	B	A	A
4	A	A	A	R	B	B	A	A	B	B	B	X 78	B	B	B	B	B	B	B	B	B	B	B	B
5	B	A	A	45	48	X 54	X 55	69	B	44	R	X 77	X 81	X 98	103	X 94	X 76	X 80	X 65	X 31	B	29	A	A
6	61	A	64	A	43	65	X 41	A	O X 45	X 56	B	O X 57	X 63	X 65	X 63	X 61	X 62	X 42	B	A	A	A	87	B
7	92	A	B	B	A	B	B	A	B	B	B	B	B	B	B	B	B	B	A	B	A	B	A	A
8	A	A	43	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
9	A	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	108	B	B	Y	A	Y	Y	A
10	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	A	O X 43	B
11	A	B	B	B	B	B	B	A	A	O X 39	B	B	B	B	B	B	B	B	37	A	O X 27	A	O X 42	59
12	A	X 29	A	A	46	O X 36	Y	B	B	B	B	B	B	B	B	75	X 72	B	B	Y	Y	A	O X 38	B
13	A	A	A	43	B	B	B	O X 30	A	B	B	B	B	B	B	O X 79	B	A	B	Y	A	A	A	A
14	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	Y	B	A	B
15	B	B	B	A	A	B	R	B	B	B	B	B	B	B	B	B	B	X 55	B	A	A	A	A	A
16	O X 40	A	B	B	A	B	B	B	B	36	O X 44	B	B	B	B	O X 55	B	B	B	B	B	B	R	A
17	A	B	B	A	B	A	R	O X 28	B	B	B	O X 62	O X 67	X 84	X 77	X 68	R	B	B	B	B	B	A	A
18	39	X 33	O X 33	A	A	B	A	B	B	B	B	X 66	76	X 71	O X 66	X 58	X 46	41	40	O X 28	B	B	54	O X 43
19	A	A	44	A	A	B	A	A	A	A	B	B	67	X 71	X 71	73	O X 47	41	X 38	B	A	O X 43	A	A
20	O X 39	40	A	A	B	A	B	A	A	B	B	B	B	B	X 78	R	B	B	R	A	A	A	A	A
21	61	X 36	A	A	B	A	B	A	B	B	B	O X 46	O X 68	X 69	X 68	69	X 66	X 56	X 48	O X 31	68	A	O X 38	A
22	A	B	A	A	B	B	B	B	A	B	A	B	B	B	B	B	B	34	A	A	B	A	A	B
23	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	O X 47	B	61	R	R	A
24	A	B	O X 33	B	A	A	A	A	B	B	B	B	B	B	O X 73	B	B	B	B	A	A	A	56	A
25	O X 41	O X 42	B	B	B	B	B	B	R	B	B	B	B	B	B	B	B	O X 45	B	O X 24	A	A	B	A
26	A	A	B	B	B	A	A	B	A	B	O X 42	B	B	B	B	B	B	B	B	B	B	B	O X 34	70
27	58	A	A	A	B	A	A	A	B	B	B	B	B	B	B	B	72	O X 40	34	B	O X 38	A	A	A
28	B	A	A	B	B	B	B	B	B	88	B	B	B	B	O X 74	X 94	B	B	B	A	A	A	A	A
29	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	A	B	A	O X 40	B	O X 48	O X 45	O X 48	X 47	39	O X 30	B	B	B	A	A	B
31	A	A	B	B	B	B	B	A	B	B	B	B	O X 42	O X 44	B	B	B	B	B	B	B	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	8	5	5	2	3	3	2	3	1	5	3	6	8	8	10	11	11	11	8	4	5	2	8	4
MED	50	X 36	43	44	46	X 54	X 48	O X 30	O X 45	44	O X 42	X 64	X 67	X 70	X 72	X 69	X 66	X 42	X 44	O X 30	X 38	36	O X 42	51
U Q	61	41	54		48	65		69		72	O X 44	X 77	X 72	X 78	X 77	X 79	X 76	X 56	X 49	X 31	64		55	64
L Q	O X 40	X 31	O X 33		43	O X 36		O X 28		38	O X 40	O X 57	O X 56	O X 55	O X 66	X 58	X 47	O X 40	38	O X 26	X 25		O X 38	X 42

MAY 2003 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2003 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	B	B	B	B	A	A	A	B	B	B	B	B	B	B	B	J R 41	A	B	Y	B	A	B	A
2	A	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	R 44	Y	B	Y	A	35
3	A	B	A	A	B	Y	B	B	B	A	B	B	B	B	B	B	J R 70	64	B	B	17	B	A	A
4	A	A	A	R	B	B	A	A	B	B	B	J R 72	B	B	B	B	B	B	B	B	B	B	B	B
5	B	A	A	F 32	F 38	48	49	F 58	B	F 33	D R 42	71	J R 75	J R 92	F 93	88	70	J R 74	59	25	B	F 20	A	A
6	F	A	F 34	A	F 32	41	J R 35	A	R 39	J R 50	B	U R 51	57	59	57	55	56	J R 36	B	A	A	A	A	B
7	A	A	B	B	A	B	B	A	B	B	B	B	B	B	B	B	B	B	A	B	A	B	A	A
8	A	A	F 31	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
9	A	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	F 98	B	B	Y	A	Y	Y	A
10	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	A	R 37	B
11	A	B	B	B	B	B	B	A	A	33	B	B	B	B	B	B	B	B	F 29	A	R 21	A	R 36	A
12	A	23	A	A	F 24	R 30	Y	B	B	B	B	B	B	B	B	F 64	66	B	B	Y	Y	A	32	B
13	A	A	A	F 28	B	B	B	24	A	B	B	B	B	B	B	U R 73	B	A	B	Y	A	A	A	A
14	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	Y	B	A	B
15	B	B	B	A	A	B	R	B	B	B	B	B	B	B	B	B	B	J R 49	B	A	A	A	A	A
16	R 34	A	B	B	A	B	B	B	B	F 27	R 38	B	B	B	B	R 49	B	B	B	B	B	B	R	A
17	A	B	B	A	B	A	R	R 22	B	B	B	R 56	R 61	78	J R 71	62	D R 41	B	B	B	B	B	A	A
18	F 29	27	R 27	A	A	B	A	B	B	B	B	60	F 66	J R 65	R 60	52	40	F 30	F 28	R 22	B	B	A	37
19	A	A	F 25	A	A	B	A	A	A	A	B	B	F 58	65	65	F 63	R 41	F 28	32	B	A	R 37	A	A
20	R 33	F 21	A	A	B	A	B	A	A	B	B	B	B	B	72	D R 67	B	B	R	A	A	A	A	A
21	33	30	A	A	B	A	B	A	B	B	B	R 40	62	63	62	F 58	J R 60	50	42	R 25	F 55	A	32	A
22	A	B	A	A	B	B	B	B	A	B	A	B	B	B	B	B	B	F 23	A	A	B	A	A	B
23	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	R 41	B	A	R	R	A
24	A	B	27	B	A	A	A	A	B	B	B	B	B	B	R 67	B	B	B	B	A	A	A	A	A
25	R 35	R 36	B	B	B	B	B	B	R	B	B	B	B	B	B	B	B	R 39	B	R 18	A	A	B	A
26	A	A	B	B	B	A	A	B	A	B	R 36	B	B	B	B	B	B	B	B	B	B	B	R 28	A
27	F 40	A	A	A	B	A	A	A	B	B	B	B	B	B	B	B	F 64	R 34	F	B	R 32	A	A	A
28	B	A	A	B	B	B	B	B	B	R 60	B	B	B	B	R 68	J S 88	B	B	B	A	A	A	A	A
29	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	A	B	A	R 34	B	R 42	R 39	42	41	F 30	R 24	B	B	B	A	A	B
31	A	A	B	B	B	B	B	A	B	B	B	B	R 36	R 38	B	B	B	B	B	B	B	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	5	5	2	3	3	2	3	1	5	4	6	8	8	10	12	12	11	7	4	4	2	5	2
MED	34	27	F 27	F 30	F 32	41	42	24	R 39	33	R 37	R 58	60	64	66	62	60	R 36	41	R 24	26	28	R 32	36
U Q	35	33	F 32		F 38	48		F 58		R 55	R 40	71	64	J R 72	71	70	68	50	44	25	44		R 36	
L Q	33	22	26		F 24	R 30		R 22		30	R 35	R 51	R 50	R 49	60	54	41	F 28	F 29	R 20	19		30	

MAY 2003 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2003 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	68	35	30	B	B	B	B	B	B	B	B	E B 24	35	B	19	B	47	B	50
2	76	99	44	33	B	B	32	B	B	B	B	B	B	B	B	B	B	B	E B 25	24	B	23	36	40
3	72	B	40	37	B	17	B	B	B	34	B	B	B	B	B	B	E B 28	E B 26	B	B	15	B	36	40
4	34	43	40	K 24	B	B	36	41	B	B	B	E B 35	B	B	B	B	B	B	B	B	B	B	B	B
5	B	24	34	43	31	44	44	30	B	18	21	E B 28	E B 24	E B 25	E B 20	18	23	E B 35	22	19	B	27	48	58
6	38	88	52	91	38	40	43	42	49	E B 26	B	E B 30	E B 28	E B 27	E B 25	E B 21	E B 26	32	B	37	44	39	33	B
7	36	59	B	B	31	B	B	38	B	B	B	B	B	B	B	B	B	B	43	B	38	B	34	40
8	39	43	42	89	B	32	38	B	B	B	B	B	B	B	B	B	B	B	B	B	33	37	35	36
9	58	33	42	37	B	B	36	B	B	B	B	B	B	B	B	B	24	B	B	23	28	24	22	40
10	B	B	88	39	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	23	21	41	34	B
11	38	B	B	B	B	B	B	34	38	E B 22	B	B	B	B	B	B	B	B	31	43	K 20	42	42	41
12	69	61	66	47	K 34	37	24	B	B	B	B	B	B	B	B	E B 21	20	B	B	21	20	43	93	B
13	39	39	40	38	B	B	B	19	53	B	B	B	B	B	B	E B 54	B	30	B	20	31	41	80	35
14	38	B	B	43	B	B	B	B	B	B	B	B	B	B	B	B	B	B	30	B	22	B	38	B
15	B	B	B	33	38	B	33	B	B	B	B	B	B	B	B	B	B	E B 26	B	32	42	41	38	40
16	40	40	B	B	37	B	B	B	B	27	18	B	B	B	B	E B 20	B	B	B	B	B	B	23	54
17	73	B	B	66	B	41	24	17	B	B	B	32	E B 54	E B 25	E B 21	E B 16	E B 16	B	B	B	B	B	34	42
18	33	33	34	44	42	B	31	B	B	B	B	E B 31	E B 29	E B 26	E B 29	E B 16	E B 16	E B 14	14	E B 15	B	B	46	37
19	47	40	36	45	64	B	36	39	41	36	B	B	E B 29	E B 25	E B 30	E B 18	E B 24	E B 15	E B 20	B	40	42	46	41
20	40	55	34	34	B	38	B	48	41	B	B	B	B	B	E B 59	E B 57	B	B	26	32	28	28	27	41
21	50	39	53	35	B	35	B	34	B	B	B	E B 30	E B 29	E B 25	E B 20	E B 21	28	23	29	36	60	71	73	70
22	47	B	40	94	B	B	B	B	38	B	36	B	B	B	B	B	B	22	43	30	B	31	39	B
23	34	38	36	37	B	43	B	B	B	B	B	B	B	B	B	B	B	B	E B 29	B	36	21	24	38
24	33	B	32	B	38	38	41	34	B	B	B	B	B	B	E B 54	B	B	B	B	26	37	46	47	42
25	40	44	B	B	B	B	B	B	35	B	B	B	B	B	B	B	B	E B 30	B	E B 14	42	41	B	34
26	33	31	B	B	B	26	39	B	39	B	E B 19	B	B	B	B	B	B	B	B	B	B	B	34	38
27	40	37	38	36	B	40	38	30	B	B	B	B	B	B	B	B	E B 26	E B 28	21	B	41	41	72	69
28	B	42	42	B	B	B	B	B	B	E B 50	B	B	B	B	E B 57	E B 56	B	B	B	32	34	35	38	39
29	33	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	38	B	37	22	B	E B 26	E B 26	E B 19	16	17	29	B	B	B	34	30	B
31	70	65	B	B	B	B	B	36	B	B	B	B	E B 25	E B 30	B	B	B	B	B	B	B	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	20	19	20	9	13	15	15	8	8	5	6	8	8	10	12	12	13	12	17	19	21	26	22
MED	40	41	40	38	38	38	36	34	40	28	21	E B 30	E B 28	E B 26	E B 27	E B 20	E B 24	E B 28	27	24	34	41	37	40
U Q	54	57	44	46	40	42	39	39	45	36	29	32	E B 29	E B 26	E B 54	E B 38	E B 26	31	30	32	41	42	46	42
L Q	35	38	36	36	32	34	32	30	38	E B 24	18	E B 30	E B 26	E B 25	E B 20	E B 17	18	22	22	20	22	30	34	38

MAY 2003 ftEs (0.1MHz)

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2003 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	18	20	24	B	B	B	B	B	B	B	B	24	14	B	11	B	10	B	17
2	11	10	12	28	B	B	20	B	B	B	B	B	B	B	B	B	B	B	25	14	B	10	11	10
3	20	B	25	20	B	10	B	B	B	24	B	B	B	B	B	B	28	26	B	B	11	B	11	10
4	21	26	12	10	B	B	28	21	B	B	B	35	B	B	B	B	B	B	B	B	B	B	B	B
5	B	11	11	13	14	11	11	18	B	15	17	28	24	25	20	14	12	35	18	11	B	13	18	19
6	12	12	11	13	10	11	12	16	11	26	B	30	28	27	25	21	26	16	B	11	11	11	25	B
7	15	12	B	B	16	B	B	30	B	B	B	B	B	B	B	B	B	B	11	B	12	B	16	21
8	14	11	12	11	B	15	14	B	B	B	B	B	B	B	B	B	B	B	B	B	10	25	26	19
9	26	25	24	20	B	B	20	B	B	B	B	B	B	B	B	B	12	B	B	18	12	15	11	12
10	B	B	29	25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	14	11	18	B
11	20	B	B	B	B	B	B	20	20	22	B	B	B	B	B	B	B	B	16	13	12	12	11	18
12	12	12	11	12	12	12	16	B	B	B	B	B	B	B	B	21	11	B	B	16	12	11	11	B
13	30	26	12	12	B	B	B	15	18	B	B	B	B	B	B	54	B	25	B	12	10	11	13	21
14	14	B	B	12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	17	B	11	B	16	B
15	B	B	B	21	24	B	26	B	B	B	B	B	B	B	B	B	B	26	B	15	13	12	12	12
16	14	14	B	B	30	B	B	B	B	16	15	B	B	B	B	20	B	B	B	B	B	B	12	17
17	12	B	B	28	B	27	18	14	B	B	B	25	54	25	21	16	16	B	B	B	B	B	9	10
18	11	11	9	12	15	B	26	B	B	B	B	31	29	26	29	16	16	14	11	15	B	B	10	12
19	14	11	10	14	30	B	25	26	24	25	B	B	29	25	30	18	24	15	20	B	12	12	13	12
20	13	11	24	18	B	29	B	16	18	B	B	B	B	B	59	57	B	B	18	25	12	12	13	13
21	14	14	20	25	B	27	B	28	B	B	B	30	29	25	20	21	12	12	11	12	13	12	12	13
22	19	B	30	15	B	B	B	B	19	B	31	B	B	B	B	B	B	14	14	22	B	12	12	B
23	26	17	30	29	B	28	B	B	B	B	B	B	B	B	B	B	B	B	29	B	14	13	15	13
24	15	B	12	B	20	25	20	24	B	B	B	B	B	B	54	B	B	B	B	15	12	13	13	18
25	10	13	B	B	B	B	B	B	23	B	B	B	B	B	B	B	B	30	B	14	11	10	B	10
26	19	15	B	B	B	15	13	B	15	B	19	B	B	B	B	B	B	B	B	B	B	B	11	11
27	10	27	14	20	B	19	17	19	B	B	B	B	B	B	B	B	26	28	15	B	12	10	14	11
28	B	28	26	B	B	B	B	B	B	50	B	B	B	B	57	56	B	B	B	25	18	24	25	26
29	29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	30	B	25	17	B	26	26	19	10	12	12	B	B	B	24	20	B
31	56	55	B	B	B	B	B	18	B	B	B	B	25	30	B	B	B	B	B	B	B	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	19	26	26	25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	25	13	13	13	18
U Q	B 30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B 25	B
L Q	13	12	12	13	30	19	20	20	24	50	B	B	54	30	54	21	24	25	18	14	12	11	11	12

MAY 2003 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2003 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	A	A	A	B	B	B	B	B	B	B	B	276	A	B	Y	B	A	B	A
2	A	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	E B 246	A	B	A	A	A 240
3	A	B	A	A	B	Y	B	B	B	A	B	B	B	B	B	B	230	210	B	B	E A 266	B	A	A
4	A	A	A	200	B	B	A	A	B	B	B	E B 246	B	B	B	B	B	B	B	B	B	B	B	B
5	B	A	A	220	A	A 220	212	A	B	252	246	224	214	220	Q 220	Q 198	Q 188	228	202	E A 304	B	E A 322	A	A
6	230	A	200	A	A	238	A 240	A	A 220	B	B	E B 286	E B 268	E B 250	E B 254	E B 242	E B 262	A	B	A	A	A	A	B
7	A	A	B	B	A	B	B	A	B	B	B	B	B	B	B	B	B	B	A	B	210	B	A	A
8	A	A	222	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
9	A	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	216	B	B	A	A	A	A	216
10	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	188	B
11	A	B	B	B	B	B	B	A	A	E B 284	B	B	B	B	B	B	B	B	A 312	A	222	A	246	A
12	A 260	A	A	230	E A 266	E A 236	A	B	B	B	B	B	B	B	B	218	256	B	B	Y	Y	A	252	B
13	A	A	A	A	B	B	B	E A 376	A	B	B	B	B	B	B	E B 252	B	A	B	A	A	A	A	A
14	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	B	A	B
15	B	B	B	A	A	B	A	B	B	B	B	B	B	B	B	B	B	256	B	A	A	A	A	A
16	216	A	B	B	A	B	B	B	B	E A 306	256	B	B	B	B	210	B	B	B	B	B	B	A	A
17	210	B	B	A	B	A	A	A	B	B	B	246	E B 302	214	206	200	198	B	B	B	B	B	A	A
18	240	A 244	220	A	A	B	A	B	B	B	B	220	206	202	202	190	202	256	214	202	B	B	210	200
19	A	A	194	A	A	B	A	A	A	A	B	B	234	226	232	202	226	252	E B 256	B	A	230	A	A
20	258	250	A	A	B	A	B	A	A	B	B	B	B	B	E B 272	234	B	B	A	A	A	A	A	A
21	224	E A 250	A	A	B	A	B	A	B	B	B	E B 270	236	212	200	212	E A 246	214	220	232	A 232	A	224	220
22	A	B	A	A	B	B	B	B	A	B	A	B	B	B	B	B	B	A 284	A	A	B	A	A	B
23	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	232	B	A	A	A	A
24	A	B	226	B	A	A	A	A	B	B	B	B	B	B	262	B	B	B	B	A	A	A	A	A
25	254	252	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	212	B	B 280	A	A	B	A
26	A	A	B	B	B	A	220	B	A	B	256	B	B	B	B	B	B	B	B	B	B	B	226	A
27	212	A	A	A	B	A	A	A	B	B	B	B	B	B	B	B	208	E B 272	E A 238	B	234	A	A	A
28	B	A	A	B	B	B	B	B	B	B 288	B	B	B	B	B	B 292	B	B	B	A	A	A	A	A
29	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	A	B	A	A	B	B 308	E B 294	276	236	256	A 256	B	B	B	A	A	B
31	A	A	B	B	B	B	B	A	B	B	B	B	252	E B 258	B	B	B	B	B	B	B	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	9	4	5	3	1	3	3	1	1	4	3	6	8	8	9	12	12	10	8	4	5	2	6	4
MED	230	250	220	220	E A 266	A 236	220	E A 376	A 220	277	256	U 234	234	215	U 219	210	220	247	U 222	U 236	227	276	225	218
U Q	256	251	224	230		238	A 240			297	256	E B 270	E B 285	E B 254	267	B 239	256	A 256	E B 251	292	250		246	230
L Q	214	A 247	197	200		A 220	212			268	246	224	224	213	204	201	205	214	217	217	216		210	208

MAY 2003 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2003 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	B	B	B	B	B	B	B	X 47	B	B	B	B	B	A	A
2	A	A 34		B	B	A	O X 59	B	B	B	B	B	B	B	O X 62	B	B	B	O X 28	A	A	A	A	A
3	A	43	O X 36	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
4	B	B	B	B	A	A	A	B	B	B	O X 38	B	B	B	B	B	X 67	B	A	B	O X 26	A	A	B
5	A	B	B	B	B	B	B	B	B	B	B	O X 46	B	B	B	B	B	B	B	B	B	B	A	B
6	Y	A	R	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
7	X 36	61		B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	A	O X 27	O X 29	A
8	O X 45	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	O X 50	42	93	A	68	A	A
9	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	O X 41	B	B	B	B	A	A	A
10	B	B	A	B	B	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	A	A	A
11	O X 41	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	O X 36	B	B	B	B	A
12	O X 32	A	O X 33	O X 40	A	A	O X 30	B	B	O X 37	B	B	B	B	B	O X 72	X 44	O X 32	B	B	B	B	B	B
13	A	O X 38	39	A	A	A	A	38	O X 43	B	B	58	O X 64	X 65	X 61	X 58	X 41	O X 31	O X 35	O X 30	B	B	B	O X 22
14	A	42	A	B	B	B	A	42	B	B	B	B	B	B	B	B	B	X 54	B	R	O X 42	X 54	A	A
15	O X 32	A	52	B	A	Y	B	B	B	B	B	A	B	B	B	B	B	B	B	B	O X 36	A	A	A
16	O X 42	A	B	A	O X 37	A	B	B	B	R	B	O X 38	O X 46	O X 44	B	B	76	B	A	51	60	A	B	A
17	A	A	B	B	B	55	B	B	B	B	B	B	X 28	B	B	B	B	X 29	A	O X 43	R	A	B	O X 38
18	A	X 44	45	B	A	B	B	B	B	B	B	B	X 32	B	B	B	R	R	A	A	79	A	A	A
19	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	R
20	A	A	A	A	B	A	A	O X 38	A	O X 38	B	B	B	X 63	X 59	B	X 46	X 43	44	A	B	B	R	A
21	A	O X 39	A	A	B	B	B	B	B	65	A	B	B	B	B	B	B	X 36	B	R	A	A	O X 43	A
22	B	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	R	A	A	A
23	B	O X 37	A	B	B	B	R	R	B	B	B	O X 40	O X 43	B	B	B	B	B	B	B	B	A	A	A
24	A	A	B	A	A	B	B	R	B	B	B	B	B	B	B	X 73	X 69	X 66	A	A	A	A	A	A
25	40	A	A	B	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	A	A	A	A
26	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	A	A
27	A	A	A	A	40	A	A	A	A	B	B	B	B	B	B	O X 62	B	67	R	O X 44	A	A	A	A
28	A	A	B	B	R	B	B	B	B	B	B	B	B	B	B	B	B	68	B	O X 37	A	A	A	A
29	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	R	R	A	A
30	A	O X 33	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 24	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	6	1	2	1	2	3	1	3	1	4	5	3	3	4	8	10	5	6	5	4	2	2
MED	O X 40	X 40	38	O X 40	38	55	O X 44	38	O X 43	O X 38	O X 38	O X 43	O X 43	X 63	X 61	X 67	X 46	X 46	O X 36	O X 44	O X 42	X 40	O X 36	O X 30
U Q	O X 42	44	45					42		65		52	O X 55	X 65	O X 62	X 72	X 68	66	43	51	70	61		
L Q	O X 32	O X 38	34					38		O X 37		O X 39	X 30	O X 44	X 59	X 60	X 42	O X 32	O X 32	O X 37	O X 31	O X 26		

JUN. 2003 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2003 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	B	B	B	B	B	B	B	41	B	B	B	B	B	A	A
2	A	A	F 24	B	B	A	R 53	B	B	B	B	B	B	B	56	B	B	B	22	A	A	A	A	A
3	A	F 30	R 30	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
4	B	B	B	B	A	A	A	B	B	B	32	B	B	B	B	B	61	B	A	B	R 20	A	A	B
5	A	B	B	B	B	B	B	B	B	B	B	R 40	B	B	B	B	B	B	B	B	B	B	A	B
6	Y	A	R	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
7	J R 30	A	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	R 21	R 23	A
8	R 39	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	R 44	20	A	A	A	A	A
9	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	R 35	B	B	B	B	A	A	A
10	B	B	A	B	B	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	A	A	A
11	R 35	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	R 30	B	B	B	B	A
12	R 26	A	R 27	R 34	A	A	R 24	B	B	R 31	B	B	B	B	B	66	38	26	B	B	B	B	B	B
13	A	R 32	F 26	A	A	A	A	J F 32	37	B	B	F 47	R 58	59	55	52	35	R 25	29	R 24	B	B	B	R 16
14	A	F 30	A	B	B	B	A	F 32	B	B	B	B	B	B	B	B	B	J R 48	B	R	R 36	J R 48	A	A
15	26	A	A	B	A	Y	B	B	B	B	B	A	B	B	B	B	B	B	B	B	R 30	A	A	A
16	R 36	A	B	A	R 31	A	B	B	B	R	B	32	R 40	R 38	B	B	F 68	B	A	A	A	A	B	A
17	A	A	B	B	B	A	B	B	B	B	B	B	22	B	B	B	B	23	A	R 37	R	A	B	R 32
18	A	38	F 34	B	A	B	B	B	B	B	B	B	26	B	B	B	A	A	A	A	A	A	A	A
19	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
20	A	A	A	A	B	A	A	R 32	A	32	B	B	B	57	53	B	40	37	F 33	A	B	B	R	A
21	A	R 33	A	A	B	B	B	B	B	R 28	A	B	B	B	B	B	B	30	B	R	A	A	R 37	A
22	B	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	R	A	A	A
23	B	R 31	A	B	B	B	A	R	B	B	B	R 34	R 37	B	B	B	B	B	B	B	B	A	A	A
24	A	A	B	A	A	B	B	A	B	B	B	B	B	B	B	67	63	60	A	A	A	A	A	A
25	F 29	A	A	B	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	A	A	A	A
26	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	A	A
27	A	A	A	A	F 30	A	A	A	A	B	B	B	B	B	B	R 56	B	F 55	R	R 38	A	A	A	A
28	A	A	B	B	R	B	B	B	B	B	B	B	B	B	B	B	B	F 58	B	R 31	A	A	A	A
29	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	R	R	A	A
30	A	R 27	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 18	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	7	5	1	2		2	3	1	3	1	4	5	3	3	4	8	10	5	4	3	3	2	2
MED	R 30	R 31	F 27	R 34	30		R 38	F 32	37	R 31	32	37	R 37	57	55	61	40	40	29	R 34	R 30	R 21	R 30	R 24
U Q	R 36	33	32					J F 32		32		44	R 49	59	56	66	62	F 55	32	R 38	R 36	J R 48		
L Q	26	30	F 25					F 32		R 28		33	24	R 38	53	54	36	26	21	R 28	R 20	R 18		

JUN. 2003 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2003 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 59	30 61	34 48	34 B	31 B	40 44	B 67	B	B	B	B	B	B	B	B	B	E S 13 B	B	B	B	B	B	96	77
2	37	43	52	B	B	43	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	31	43	49
3	B 37	B 43	B 52	B	B	43	B	B	B	B	B	B	B	B	E B 28	B	B	B	27	30	31	40	38	43
4	B	B	B	B	31	34	72	B	B	B	28	B	B	B	B	B	E B 25	B	35	B	20	41	33	B
5	36	B	B	B	B	B	B	B	B	B	B	E B 28	B	B	B	B	B	B	B	B	B	B	41	B
6	18	30	22	39	43	39	107	44	44	B	B	B	B	B	B	B	B	B	B	B	B	35	42	45
7	60	49	B	B	B	B	37	B	B	B	B	B	B	B	B	B	B	B	B	B	34	21	32	34
8	71	40	40	42	34	B	B	B	B	B	B	B	B	B	B	B	B	E B 25	20	48	35	39	40	83
9	B	48	35	38	B	B	B	B	B	B	B	B	B	B	B	B	E B 29	B	B	B	B	40	40	42
10	B	B	40	B	B	32	35	31	B	32	B	B	B	B	B	B	B	B	B	B	B	38	40	38
11	40	42	42	37	B	40	56	B	B	B	B	B	B	B	B	B	B	B	E B 20	B	B	B	B	38
12	32	32	36	41	40	41	43	B	B	E B 29	B	B	B	B	B	E B 26	22	E B 21	B	B	B	B	B	B
13	30	39	36	38	49	44	35	40	E B 30	B	B	E B 27	E B 25	E B 18	17	19	26	E B 14	E B 16	E B 17	B	B	B	18
14	43	36	41	B	B	B	40	39	B	B	B	B	B	B	B	B	B	E B 20	B	32	40	42	48	42
15	38	37	35	B	34	16	B	B	B	B	B	32	B	B	B	B	B	B	B	B	37	48	48	47
16	43	43	B	39	41	68	B	B	B	26	B	E B 25	E B 26	18	B	B	E B 24	B	42	38	48	73	B	37
17	32	33	B	B	B	45	B	B	B	B	B	B	22	B	B	B	B	29	39	39	30	39	B	38
18	93	77	66	B	42	B	B	B	B	B	B	B	18	B	B	B	34	28	43	30	37	38	38	38
19	54	B	B	B	33	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	32	32
20	32	32	33	32	B	37	37	E B 27	38	32	B	B	B	E B 30	E B 19	B	E B 18	16	E B 15	34	B	B	24	39
21	40	50	36	40	B	B	B	B	B	36	64	B	B	B	B	B	B	E B 24	B	18	42	44	41	42
22	B	40	33	38	B	B	39	42	B	B	B	B	B	B	B	B	B	B	B	B	23	95	40	44
23	B	35	60	B	B	B	36	33	B	B	B	E B 25	E B 28	B	B	B	B	B	B	B	B	41	36	41
24	34	48	B	36	40	B	B	34	B	B	B	B	B	B	B	E B 39	37	24	39	33	37	40	K 42	43
25	67	38	40	B	41	43	46	39	B	40	B	B	B	B	B	B	B	B	B	B	35	43	41	47
26	42	60	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	23	27	40
27	43	48	82	95	48	38	46	37	37	B	B	B	B	B	B	E B 26	B	E B 17	34	43	46	35	39	88
28	41	49	B	B	28	B	B	B	B	B	B	B	B	B	B	B	B	E B 16	B	36	108	40	46	44
29	39	60	B	47	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	36	23	21	42	41
30	46	36	B	40	41	78	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	29	42	38
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	26	19	15	15	16	14	10	4	6	2	5	5	3	3	4	9	11	11	13	16	23	25	27
MED	40	41	40	39	40	40	42	38	38	32	46	E B 27	E B 25	E B 18	E B 19	E B 26	E 25	E B 21	34	34	36	40	40	42
U Q	50	49	48	41	42	44	56	40	41	36		30	E B 27	E B 30	E B 28	E B 32	32	25	39	38	41	42	42	45
L Q	35	36	35	37	33	38	37	33	34	29		E B 25	20	E B 18	17	22	E 20	E B 16	E B 20	30	30	35	37	38

JUN. 2003 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2003 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	15	14	16	17	20	B	B	B	B	B	B	B	B	B	B	E S 13	B	B	B	B	B	12	12
2	12	12	14	B	B	13	29	B	B	B	B	B	B	B	28	B	B	B	13	14	12	12	12	12
3	20	12	12	B	B	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	12	12
4	B	B	B	B	14	28	22	B	B	B	14	B	B	B	B	B	25	B	13	B	12	14	12	B
5	26	B	B	B	B	B	B	B	B	B	B	28	B	B	B	B	B	B	B	B	B	B	12	B
6	13	13	16	25	25	25	65	19	15	B	B	B	B	B	B	B	B	B	B	B	B	12	12	15
7	12	12	B	B	B	B	12	B	B	B	B	B	B	B	B	B	B	B	B	B	12	12	12	20
8	11	16	13	13	19	B	B	B	B	B	B	B	B	B	B	B	B	25	12	12	16	13	12	21
9	B	13	12	22	B	B	B	B	B	B	B	B	B	B	B	B	29	B	B	B	B	10	11	11
10	B	B	12	B	B	26	20	18	B	19	B	B	B	B	B	B	B	B	B	B	B	12	12	13
11	12	24	12	20	B	27	14	B	B	B	B	B	B	B	B	B	B	B	21	B	B	B	B	12
12	12	11	12	13	14	12	12	B	B	29	B	B	B	B	B	26	16	21	B	B	B	B	B	B
13	13	12	14	19	18	25	29	15	30	B	B	27	25	18	10	12	10	14	16	17	B	B	B	10
14	14	11	26	B	B	B	18	10	B	B	B	B	B	B	B	B	B	20	B	17	10	10	13	10
15	8	20	16	B	13	12	B	B	B	B	B	22	B	B	B	B	B	B	B	B	11	9	9	11
16	11	26	B	11	10	55	B	B	B	18	B	25	26	15	B	B	24	B	10	17	9	11	B	18
17	22	25	B	B	B	14	B	B	B	B	B	B	12	B	B	B	B	14	9	13	20	20	B	14
18	24	9	11	B	17	B	B	B	B	B	B	B	11	B	B	B	16	16	11	15	14	16	13	15
19	16	B	B	B	25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19	20
20	20	21	21	25	B	22	20	27	18	15	B	B	B	30	19	B	18	13	15	16	B	B	14	12
21	15	14	15	17	B	B	B	B	B	16	32	B	B	B	B	B	B	24	B	10	12	12	15	12
22	B	25	25	29	B	B	20	26	B	B	B	B	B	B	B	B	B	B	B	B	12	12	15	15
23	B	11	13	B	B	B	28	18	B	B	B	25	28	B	B	B	B	B	B	B	B	10	10	11
24	15	14	B	25	20	B	B	29	B	B	B	B	B	B	B	39	15	19	16	10	10	10	9	19
25	9	25	9	B	27	18	18	22	B	19	B	B	B	B	B	B	B	B	B	B	10	8	9	20
26	14	8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	10	17	9
27	10	9	9	10	9	26	21	28	27	B	B	B	B	B	B	26	B	17	15	14	9	9	10	19
28	22	9	B	B	11	B	B	B	B	B	B	B	B	B	B	B	B	16	B	11	13	12	9	10
29	24	11	B	16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	15	12	8	15
30	14	9	B	16	10	26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	8	8	14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	15	14	16	B	B	42	B	B	B	B	B	B	B	B	B	B	B	B	B	B	18	12	12	14
U Q	B 24	25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B 20	B 15	19
L Q	12	11	12	17	17	24	20	27	B	B	B	B	B	B	B	B	25	20	15	14	12	10	10	12

JUN. 2003 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2003 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	B	B	B	B	B	B	E S 246	B	B	B	B	B	A	A
2	A	A	A 260	B	B	A	A	B	B	B	B	B	B	B	B 334	B	B	B	E A 394	A	A	A	A	A
3	A	194	222	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
4	B	B	B	B	A	A	A	B	B	B	E A 322	B	B	B	B	B	224	B	A	B	214	A	A	B
5	A	B	B	B	B	B	B	B	B	B	B	E B 272	B	B	B	B	B	B	B	B	B	B	A	B
6	Y	A	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
7	212	A	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	206	A 242	A
8	212	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	E B 266	A	A	A	A	A	A
9	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	E B 284	B	B	B	B	A	A	A
10	B	B	A	B	B	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	A	A	A
11	216	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	E B 278	B	B	B	B	A
12	212	A	A 220	220	A	A	220	B	B	E B 332	B	B	B	B	B	218	A 228	E B 244	B	B	B	B	B	B
13	A	214	214	A	A	A	A	E A 362	E B 382	B	B	234	220	226	184	200	218	E B 230	246	238	B	B	B	A 248
14	A 246	A 250	A	B	B	B	A	E A	B	B	B	B	B	B	B	B	B	226	B	A	212	202	A	A
15	210	A	E A 230	B	A	A	B	B	B	B	B	A	B	B	B	B	B	B	B	B	220	A	A	A
16	228	A	B	A	224	A	B	B	B	A	B	E B 300	236	236	B	B	Q 268	B	A	A	A	A	B	A
17	A	A	B	B	B	A	B	B	B	B	B	B	E A 338	B	B	B	B	E A 342	A	214	A	A	B	212
18	A	202	210	B	A	B	B	B	B	B	B	B	A 284	B	B	B	A	A	A	A	A	A	A	A
19	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
20	A	A	A	A	B	A	A	B	A	A 326	B	B	B	218	218	B	238	226	232	A	B	B	A	A
21	220	224	A	A	B	B	B	B	B	E A 230	A	B	B	B	B	B	B	230	B	A	A	A	216	A
22	B	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
23	B	A 264	A	B	B	B	A	A	B	B	B	E B 284	E B 284	B	B	B	B	B	B	B	B	A	A	A
24	A	A	B	A	A	B	B	A	B	B	B	B	B	B	B	268	294	Y	A	A	A	A	A	A
25	A	A	A	B	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	A	A	A	A
26	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	200	A	A
27	A	A	A	A	204	A	A	A	A	B	B	B	B	B	B	E B 278	B	266	A	208	A	A	A	A
28	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	284	B	216	A	A	A	A
29	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	280	A	A	A	A
30	A	214	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A 222	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	8	7	6	1	2		1	1	1	3	1	4	5	3	3	4	8	9	4	5	3	4	2	2
MED	214	214	219	220	214		220	E A 362	E B 382	E A 326	E A 322	E B 278	U 260	226	218	U 226	234	237	262	216	214	204	229	230
U Q	224	A 250	A 230							E B 332		E B 292	A 311	236	B 334	273	276	275	E 336	259	220	214		
L Q	212	202	214							E A 230		253	228	218	184	209	226	228	239	211	212	201		

JUN. 2003 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2003 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	A	A	O X 45	O X 43	R	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	A
2	O X 30	A	A	A	A	A	A	A	B	B	A	O X 42	B	B	X 66	B	B	B	B	B	B	A	A	A
3	39	33	38	A	A	A	B	B	B	B	O X 37	B	X 48	B	B	B	O X 46	50	O X 44	X 23	O X 30	B	A	A
4	O X 46	A	O X 35	A	A	B	R	B	O X 45	B	B	O X 45	B	B	B	B	B	X 63	X 39	A	B	R	A	A
5	O X 43	X 46	A	B	B	81	B	B	R	B	B	B	B	B	B	B	B	B	X 33	O X 27	A	A	A	O X 42
6	R	A	O X 40	A	B	A	A	A	A	B	B	O X 51	O X 55	B	B	B	B	B	34	B	B	B	B	B
7	A	R	O X 48	O X 36	A	A	B	O X 33	32	A	B	B	B	B	69	65	B	B	B	B	B	A	R	O X 31
8	O X 28	O X 31	R	R	R	O X 22	O X 22	X 23	O X 25	X 29	O X 44	O X 52	X 59	71	X 62	X 60	X 42	X 37	36	B	B	B	B	B
9	B	B	A	A	O X 23	26	29	35	34	B	B	O X 54	O X 64	66	X 56	52	X 39	X 32	O X 29	O X 26	B	B	B	B
10	A	O X 30	A	A	A	114	X 35	X 48	50	54	47	X 52	X 70	X 66	B	X 62	O X 39	B	B	B	B	B	B	A
11	O X 40	O X 49	O X 40	X 59	A	A	O X 36	A	B	R	B	B	B	B	B	68	75	O X 44	A	A	A	62	A	51
12	A	O X 40	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	R	O X 33	A	X 32
13	O X 42	48	R	B	R	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	O X 31	B	O X 38	A
14	A	A	B	B	B	B	B	A	B	B	B	B	B	B	B	B	O X 47	O X 47	43	B	O X 18	A	A	A
15	A	O X 46	82	B	B	A	A	B	B	B	B	B	B	O X 48	B	B	B	B	B	B	B	R	A	A
16	A	A	O X 44	B	B	B	O X 45	49	B	B	B	O X 34	B	B	X 86	B	A	A	A	O X 45	O X 42	A	A	A
17	A	A	A	96	B	A	A	B	Y	R	B	B	B	B	X 76	B	B	O X 44	O X 35	R	B	A	A	A
18	A	A	B	A	A	A	B	B	A	B	B	B	B	B	X 65	S	B	B	B	B	B	A	X 42	X 40
19	A	94	A	A	C	C	A	A	A	B	B	B	O X 52	B	90	B	B	B	A	B	A	72	64	52
20	44	R	B	B	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
21	A	A	A	A	B	B	B	B	A	B	B	B	B	O X 70	X 60	X 60	O X 53	B	B	B	B	B	B	O X 27
22	X 43	35	X 40	36	40	A	A	O X 30	31	34	X 44	X 50	O X 55	O X 72	78	X 62	O X 50	O X 40	41	29	X 23	A	A	A
23	A	A	A	A	A	A	A	A	A	B	B	64	X 59	X 72	B	B	B	B	O X 37	30	A	O X 34	O X 34	A
24	A	A	60	A	A	O X 38	A	A	B	O X 37	46	X 54	X 67	72	62	71	X 42	X 37	B	B	B	B	B	B
25	60	40	B	B	A	A	X 47	45	X 43	A	B	B	B	B	X 72	X 88	B	B	B	B	A	R	O X 28	O X 34
26	X 34	36	O X 37	66	O X 43	O X 40	39	42	A	B	O X 40	X 42	B	B	B	O X 72	43	B	38	38	A	75	58	A
27	A	O X 47	O X 44	A	A	81	A	A	A	67	B	B	B	B	B	B	B	B	B	R	A	R	A	O X 44
28	A	A	A	A	B	B	B	B	B	B	X 43	B	B	B	B	B	B	B	A	A	O X 30	A	O X 27	A
29	B	A	A	A	A	R	B	B	B	B	B	B	B	B	B	B	B	O X 49	A	B	A	A	O X 47	B
30	A	O X 39	B	A	A	A	R	A	R	B	B	B	B	B	B	B	B	B	B	R	A	A	A	A
31	A	A	B	A	B	B	B	B	R	B	B	B	B	B	B	B	S	S	S	A	O X 32	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	11	14	11	6	4	7	7	8	7	5	7	11	9	8	12	10	10	10	11	7	7	5	8	9
MED	O X 42	X 40	O X 40	52	O X 42	40	X 36	38	34	37	X 44	O X 51	X 59	X 70	X 68	X 64	X 44	X 44	X 37	X 29	O X 30	62	O X 40	O X 40
U Q	44	47	48	66	O X 43	81	X 45	46	45	60	46	X 54	X 66	X 72	77	X 71	O X 50	X 49	41	38	O X 32	74	52	48
L Q	O X 34	35	O X 38	36	32	26	29	O X 32	31	32	O X 40	O X 42	O X 54	X 66	X 62	X 60	X 42	X 37	X 34	X 26	X 23	O X 34	O X 31	O X 32

JUL. 2003 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2003 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	R 39	R 37	R	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	A
2	R 24	A	A	A	A	A	A	A	B	B	A	R 36	B	B	60	B	B	B	B	B	B	A	A	A
3	F 27	F 27	F 27	A	A	A	B	B	B	B	R 31	B	42	B	B	B	R 40	F 39	38	17	R 24	B	A	A
4	R 40	A	R 29	A	A	B	R	B	R 39	B	B	R 39	B	B	B	B	B	57	32	A	B	R	A	A
5	R 37	40	A	B	B	A	B	B	R	B	B	B	B	B	B	B	B	B	27	R 21	A	A	A	R 36
6	R	A	R 34	A	B	A	A	A	A	B	B	R 45	R 49	B	B	B	B	B	F 25	B	B	B	B	B
7	A	R	R 42	R 30	A	A	B	R 27	F 24	A	B	B	B	B	F 58	F 56	B	B	B	B	B	A	R	R 25
8	R 22	R 25	A	R	R	R 16	16	17	19	23	38	46	53	F 60	56	54	36	31	F 26	B	B	B	B	B
9	B	B	A	A	R 17	F 17	F 19	F 17	F 22	B	B	R 48	58	F 56	J R 50	F 42	F 33	26	R 23	R 20	B	B	B	B
10	A	R 24	A	A	A	A	29	42	F 31	F 32	F 38	46	64	60	B	56	R 33	B	B	B	B	B	B	A
11	R 34	R 43	R 34	F 53	A	A	R 30	A	B	R	B	B	B	B	B	R 48	60	R 38	A	A	A	A	A	R 33
12	A	R 34	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R 27	A	26
13	R 36	F 32	R	B	R	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	R 25	B	R 32	A
14	A	A	B	B	B	B	B	A	B	B	B	B	B	B	B	B	R 41	R 41	F 35	B	R 12	A	A	A
15	A	R 40	A	B	B	A	A	B	B	B	B	B	B	R 42	B	B	B	B	B	B	B	R	A	A
16	A	A	R 38	B	B	B	R 39	F 22	B	B	B	R 28	B	B	J R 80	B	A	A	A	R 39	R 36	A	A	A
17	A	A	A	A	B	A	A	B	Y	R	B	B	B	B	J R 70	B	B	R 38	R 29	R	B	A	A	A
18	A	A	B	A	A	A	B	B	A	B	B	B	B	B	59	S	B	B	B	B	B	A	36	34
19	A	A	A	A	C	C	A	A	A	B	B	B	46	B	R 74	B	B	B	A	B	A	A	34	A 32
20	F 27	R	B	B	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
21	A	A	A	A	B	B	B	B	A	B	B	B	B	R 64	J R 54	54	47	B	B	B	B	B	B	R 21
22	38	F 26	34	F 26	F 30	A	A	24	F 21	F 24	38	44	R 49	66	F 66	56	44	R 34	F 34	F 20	17	A	A	A
23	A	A	A	A	A	A	A	A	A	B	B	F 55	J R 53	66	B	B	B	B	R 31	F 17	A	R 28	R 28	A
24	A	A	A	A	A	R 32	A	A	B	31	F 36	48	61	F 62	F 48	F 60	36	31	B	B	B	B	B	B
25	A	F 31	B	B	A	A	41	F 32	37	A	B	B	B	B	66	82	B	B	B	B	A	R	R 22	R 28
26	28	F 29	R 31	R 45	R 37	R 34	F 29	F 27	A	B	R 34	36	B	B	B	R 66	F 36	B	F 30	F 29	A	F 46	F 32	A
27	A	R 41	R 38	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	R	A	R	A	R 38
28	A	A	A	A	B	B	B	B	B	B	37	B	B	B	B	B	B	B	A	A	R 24	A	R 21	A
29	B	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	R 43	A	B	A	A	R 41	B
30	A	R 33	B	A	A	A	R	A	R	B	B	B	B	B	B	B	B	B	B	R	A	A	A	A
31	A	A	B	A	B	B	B	B	R	B	B	B	B	B	B	B	S	S	S	A	R 26	A	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	13	9	5	4	4	7	8	7	4	7	11	9	8	12	10	10	10	11	7	7	3	8	9
MED	R 31	R 32	R 34	R 39	R 34	R 24	29	26	F 24	28	37	45	53	61	60	56	38	38	30	20	R 24	R 28	R 32	R 32
U Q	R 37	R 40	R 38	49	R 37	R 33	39	30	37	32	38	48	60	65	R 68	60	44	R 41	F 34	29	R 26	F 46	35	R 35
L Q	R 27	26	R 30	28	24	16	19	F 20	21	24	R 34	R 36	48	58	55	54	36	31	F 26	17	17	R 27	R 25	R 26

JUL. 2003 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2003 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H / D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	40	41	47	44	42	33	B	33	B	B	B	B	B	B	B	B	B	B	B	B	B	16	22	35
2	38	44	47	40	42	42	45	41	B	B	37	28	B	B	E B 30	B	B	B	B	B	B	45	40	31
3	55	48	79	45	44	37	B	B	B	B	E B 25	B	27	B	B	B	E B 19	23	E B 25	E B 13	30	B	49	48
4	46	40	41	61	61	B	37	B	E B 25	B	B	31	B	B	B	B	B	E B 21	E B 21	45	B	21	60	43
5	43	51	39	B	B	34	B	B	34	B	B	B	B	B	B	B	B	B	E B 18	23	45	37	40	59
6	32	40	38	37	B	39	35	40	36	B	B	18	E B 26	B	B	B	B	B	13	B	B	B	B	B
7	34	16	37	35	41	82	B	23	19	34	B	B	B	B	E B 34	E B 19	B	B	B	B	B	21	14	27
8	23	31	20	17	26	22	18	14	16	16	E B 12	E B 15	21	21	32	23	18	E B 12	39	B	B	B	B	B
9	B	B	38	32	27	23	31	E S 12	29	B	B	E B 25	E B 21	E B 16	E B 21	E B 14	E B 16	E B 19	E B 18	24	B	B	B	B
10	29	30	43	48	67	62	56	39	32	30	31	19	18	E B 52	B	E B 21	E B 26	B	B	B	B	B	B	30
11	42	41	44	52	55	52	45	53	B	38	B	B	B	B	B	E B 25	29	E B 25	36	34	53	48	54	38
12	95	42	37	B	B	35	32	B	B	B	B	B	B	B	B	B	B	B	B	B	29	36	41	40
13	43	69	22	B	17	34	37	B	34	36	B	B	B	B	B	B	B	B	B	B	34	B	K 38	34
14	47	68	B	B	B	B	B	31	B	B	B	B	B	B	B	B	E B 37	E B 21	23	B	14	34	38	41
15	40	41	45	B	B	35	32	B	B	B	B	B	B	E B 34	B	B	B	B	B	B	B	23	33	38
16	95	41	43	B	B	B	42	34	B	B	B	E B 20	B	B	E B 52	B	39	39	47	49	47	45	48	50
17	39	44	38	E B 62	B	37	33	B	22	27	B	B	B	B	E B 34	B	B	E B 30	E B 18	27	B	31	38	51
18	34	40	B	38	32	54	B	B	41	B	B	B	B	B	E B 34	S	B	B	B	B	B	37	36	43
19	38	38	81	39	C	C	74	33	59	B	B	B	E B 29	B	E B 25	B	B	B	41	B	35	38	48	39
20	44	26	B	B	38	B	B	B	38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	41
21	43	41	52	46	B	B	B	B	37	B	B	B	B	E B 55	E B 26	E B 19	E B 22	B	B	B	B	B	B	28
22	35	34	46	34	36	41	44	32	15	15	19	E B 20	E B 26	E B 28	20	E B 20	E B 16	E B 16	E B 16	E B 13	E S 12	30	28	30
23	44	38	33	44	47	49	49	39	36	B	B	26	E B 18	E B 21	B	B	B	B	E B 18	E B 12	46	34	36	45
24	46	40	52	42	40	40	49	38	B	26	22	22	24	18	18	22	24	18	B	B	B	B	B	B
25	38	76	B	B	47	42	38	34	44	34	B	B	B	B	E B 31	E B 29	B	B	B	B	35	23	30	38
26	37	42	39	42	46	41	41	32	37	B	32	32	B	B	B	E B 34	E B 14	B	34	E B 23	46	50	56	70
27	38	48	48	101	46	54	54	43	37	41	B	B	B	B	B	B	B	B	B	25	38	22	38	44
28	43	37	54	39	B	B	B	B	B	B	31	B	B	B	B	B	B	B	41	32	30	44	28	44
29	B	59	52	43	72	32	B	B	B	B	B	B	B	B	B	B	B	E B 26	35	B	39	100	88	B
30	40	49	B	35	32	31	26	35	36	B	B	B	B	B	B	B	B	B	B	32	46	33	40	37
31	77	59	B	31	B	B	B	B	20	B	B	B	B	B	B	B	S	S	S	35	35	34	40	43
	00	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	30	25	23	20	23	20	18	20	10	8	11	9	8	12	10	11	11	16	14	17	22	24	26
MED	40	41	43	41	42	39	40	34	35	32	28	21	E B 24	E B 24	E B 30	E B 22	E B 22	E B 21	23	26	35	34	39	40
U Q	45	48	50	46	47	49	47	39	37	36	32	28	E B 26	E B 43	E B 34	E B 25	29	E B 26	38	34	46	44	48	44
L Q	38	38	38	35	34	34	32	32	24	26	20	19	E B 20	E B 20	23	E B 19	E B 16	E B 18	E B 18	E B 23	30	23	34	35

JUL. 2003 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2003 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	10	14	12	16	13	20	B	15	B	B	B	B	B	B	B	B	B	B	B	B	B	11	8	7
2	8	9	11	17	22	20	12	13	B	B	12	21	B	B	30	B	B	B	B	B	B	8	8	24
3	10	10	11	18	18	8	B	B	B	B	25	B	15	B	B	B	19	12	25	13	11	B	10	16
4	12	16	9	29	30	B	19	B	25	B	B	21	B	B	B	B	B	21	21	10	B	10	9	9
5	10	14	18	B	B	15	B	B	22	B	B	B	B	B	B	B	B	B	18	10	10	10	10	12
6	25	10	13	20	B	22	27	19	12	B	B	13	26	B	B	B	B	B	9	B	B	B	B	B
7	10	10	10	12	12	12	B	18	14	30	B	B	B	B	34	19	B	B	B	B	B	10	11	10
8	7	9	10	10	9	9	9	10	9	10	12	15	12	12	13	12	10	12	12	B	B	B	B	B
9	B	B	13	12	12	12	10	E S 12	11	B	B	25	21	16	21	14	16	19	18	12	B	B	B	B
10	13	12	12	13	14	19	12	5	7	5	12	12	14	52	B	21	26	B	B	B	B	B	B	12
11	10	13	10	8	15	12	10	16	B	28	B	B	B	B	B	25	26	25	10	10	10	9	8	7
12	10	9	22	B	B	18	10	B	B	B	B	B	B	B	B	B	B	B	B	B	13	9	10	10
13	10	10	11	B	12	21	26	B	30	31	B	B	B	B	B	B	B	B	B	B	7	B	9	16
14	17	10	B	B	B	B	B	17	B	B	B	B	B	B	B	B	37	21	19	B	8	8	9	8
15	10	10	15	B	B	25	13	B	B	B	B	B	B		B	B	B	B	B	B	B	13	12	13
16	34	12	12	B	B	B	12	12	B	B	B	20	B	B	52	B	15	11	11	12	12	12	12	12
17	28	20	22	62	B	26	22	B	18	18	B	B	B	B	34	B	B	30	18	11	B	10	10	11
18	15	25	B	19	15	30	B	B	20	B	B	B	B	B	34	S	B	B	B	B	B	11	10	11
19	16	12	21	20	C	C	19	25	18	B	B	B	29	B	25	B	B	B	15	B	19	18	12	8
20	8	19	B	B	14	B	B	B	19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	10
21	8	24	19	12	B	B	B	B	31	B	B	B	B	55	26	19	22	B	B	B	B	B	B	12
22	13	12	13	13	13	18	12	12	12	10	12	20	26	28	16	20	16	16	16	13	E S 12	E S 13	11	14
23	11	12	12	12	13	14	25	13	12	B	B	15	18	21	B	B	B	B	18	12	11	12	12	12
24	12	12	13	11	12	14	18	21	B	19	16	15	17	12	12	11	20	12	B	B	B	B	B	B
25	26	14	B	B	22	18	12	12	14	21	B	B	B	B	31	29	B	B	B	B	16	16	11	11
26	11	12	12	18	12	12	12	11	17	B	16	20	B	B	B	34	14	B	12	23	12	12	12	12
27	21	12	13	13	12	16	26	12	15	16	B	B	B	B	B	B	B	B	B	13	12	15	13	14
28	15	20	14	25	B	B	B	B	B	B	14	B	B	B	B	B	B	B	14	24	11	12	12	12
29	B	12	15	15	16	16	B	B	B	B	B	B	B	B	B	B	B	26	12	B	11	15	16	B
30	19	12	B	26	16	16	17	24	28	B	B	B	B	B	B	B	B	B	B	14	12	13	16	14
31	13	12	B	12	B	B	B	B	15	B	B	B	B	B	B	B	S	S	S	12	12	10	15	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	31	31	31	31	30	30	31	31	31	31	31	31	31	30	31	30	30	30	30	31	31	31	31	31
MED	12	12	13	18	16	18	22	21	22	B	B	B	B	B	B	B	B	B	23	B	16	13	12	12
U Q	19	14	B 22	B	B	B 30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B 16	B 16
L Q	10	10	12	12	13	14	12	12	14	28	25	20	26	B	31	25	22	21	15	12	11	10	10	10

JUL. 2003 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2003 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	208	208	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	A	A
2	196	A	A	A	A	A	206	A	B	B	A	274	B	B	232	B	B	B	B	B	B	A	A	A
3	218	222	222	A	A	A	B	B	B	B	E B 280	B	232	B	B	B	246	272	E B 236	E B 236	E A 234	B	A	A
4	E A 216	A	232	A	A	B	A	B	234	B	B	E A 282	B	B	B	B	B	Q 272	E B 316	208	B	A	A	A
5	206	188	A	B	B	A	B	B	A	B	B	B	B	B	B	B	B	B	268	A	A	A	A	224
6	A	A	E A 238	A	B	A	A	A	A	B	B	212	218	B	B	B	B	B	A 278	B	B	B	B	B
7	244	A	212	204	A	A	B	A	A	A	B	B	B	B	E B 218	218	B	B	B	B	B	A	A	A 228
8	E A 204	A 242	A	A	A	A	A 224	A	E A 298	A 264	238	226	Q 220	Q 202	198	212	186	218	210	B	B	B	B	B
9	B	B	A	A	210	S	S	S	E S 304	B	B	E B 224	222	Q 200	210	Q 204	222	208	E B 298	E A 250	B	B	B	B
10	A	252	A	A	A	A	226	A	E A 348	306	Q 228	Q 242	Q 228	E B 284	B	220	B	B	B	B	B	B	B	A
11	216	A 262	A 238	210	A	A	196	A	B	A	B	B	B	B	B	B	A 274	E B 304	A	A	A	A	198	198
12	A	220	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	206	A	208
13	214	182	A	B	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	202	B	E A 312	A
14	A	A	B	B	B	B	B	A	B	B	B	B	B	B	B	B	A	238	220	B	A 218	A	A	A
15	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
16	A	A	E A 226	B	B	B	224	A 260	B	B	B	E B 266	B	B	B	B	A	A	A	206	232	A	A	A
17	A	A	A	A	B	A	A	B	A	A	B	B	B	B	236	B	B	B	268	A	B	A	A	A
18	A	A	B	A	A	A	B	B	A	B	B	B	B	B	E B 238	S	B	B	B	B	B	A	A	A
19	A	A	A	A	C	C	A	A	A	B	B	B	E B 270	B	242	B	B	B	A	B	A	A	220	214
20	214	A	B	B	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
21	A	A	A	A	B	B	B	B	A	B	B	B	B	B	206	194	202	B	B	B	B	B	B	E B 274
22	230	214	272	226	220	A	A	198	E S 316	E S 248	232	E B 230	E B 254	230	200	190	190	214	E B 228	220	S	A	A	A
23	A	A	A	A	A	A	A	A	A	B	B	212	230	220	B	B	B	B	E B 264	E B 270	A	212	200	A
24	A	A	A	A	212	244	A	A	B	A	E A 268	218	206	186	194	Q 212	208	258	B	B	B	B	B	B
25	A	E A 270	B	B	A	A	A	A 258	A	A	B	B	B	B	E B 238	238	B	B	B	B	A	A	A	230
26	A	A 234	A 240	E A 256	A 244	E A 260	A	E A 340	A	B	A	E A 292	B	B	B	E B 242	Q 184	B	A	E B 266	A	A	266	A
27	A	210	216	A	A	A	A	A	A	216	B	B	B	B	B	B	B	B	B	A	A	A	A	216
28	A	A	A	A	B	B	B	B	B	B	A 250	B	B	B	B	B	B	B	A	A	212	A	A 250	A
29	B	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	248	A	B	A	A	A 220	B
30	A	186	B	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A
31	A	A	B	A	B	B	B	B	A	B	B	B	B	B	B	B	S	S	S	A	A 214	A	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	12	9	5	5	2	5	4	5	4	6	11	9	6	11	9	8	9	10	7	6	2	7	8
MED	214	219	229	209	212	252	224	U 244	E 304	256	237	224	224	206	212	212	205	243	U 249	E 236	214	209	220	218
U Q	218	A 247	A 239	241	232		225	A 300	E 332	285	E 268	E A 274	E B 243	230	E B 238	229	234	Q 272	E B 278	E B 266	232		266	229
L Q	206	199	219	206	209		201	228	266	232	232	218	219	200	200	199	188	216	228	208	212		200	211

JUL. 2003 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2003 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	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	B	O X 41
2	A	A	O X 45	B	A	B	B	B	R	B	B	B	B	B	B	B	O X 50	X 61	B	A	A	Y	Y	O X 44
3	B	A	A	B	B	B	B	B	B	B	B	O X 46	B	B	B	B	B	B	B	B	B	A	A	A
4	47	O X 44	B	B	B	B	A	O X 30	A	A	B	B	B	B	B	B	B	B	B	B	O X 24	B	A	A
5	A	A	A	52	O X 48	41	43	47	55	47	X 57	R	O X 72	O X 84	68	67	X 48	50	O X 35	B	Y	B	Y	Y
6	O X 65	A	A	R	A	B	A	A	A	A	B	B	B	O X 42	B	B	B	B	41	R	O X 27	R	A	A
7	A	A	A	A	A	A	A	A	27	A	O X 46	X 62	X 67	O X 63	X 68	69	70	49	X 50	O X 25	A	O X 41	X 67	B
8	91	A	B	R	B	R	B	B	B	B	B	B	B	B	B	O X 48	O X 45	B	43	O X 26	A	A	A	O X 39
9	68	X 48	34	B	B	A	A	O X 35	A	B	B	B	B	B	B	B	72	X 68	X 68	B	Y	R	R	O X 38
10	A	A	A	B	A	B	B	B	R	O X 42	B	B	B	B	B	B	B	B	O X 49	32	B	B	A	A
11	A	A	A	A	O X 35	O X 36	R	B	R	R	B	X 68	X 78	80	X 82	74	74	60	62	44	R	A	A	A
12	A	O X 39	B	B	B	A	R	B	B	B	B	B	B	B	B	B	B	B	R	B	A	R	A	O X 47
13	A	A	B	B	R	56	B	B	B	O X 44	B	B	B	B	B	B	64	B	O X 59	B	B	B	A	A
14	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 23	A	A	A
15	A	B	B	B	B	B	B	34	34	B	B	O X 48	B	B	O X 68	O X 52	O X 56	X 48	X 53	O X 33	B	A	A	Y
16	O X 42	A	B	A	B	A	B	B	B	B	O X 44	O X 61	B	B	O X 76	O X 73	B	B	63	O X 39	B	B	A	A
17	O X 41	A	54	50	A	A	35	32	X 37	O X 50	X 63	X 70	X 69	X 71	79	69	60	50	X 42	36	A	O X 35	71	A
18	A	A	A	B	A	A	A	A	A	B	B	O X 35	O X 33	O X 36	O X 36	B	O X 32	X 29	X 42	56	A	X 38	A	A
19	A	X 46	A	R	A	A	69	32	A	A	B	R	B	O X 45	O X 44	O X 45	X 42	39	X 30	O X 35	B	Y	O X 24	O X 27
20	38	A	61	41	40	42	44	93	A	A	B	B	B	B	B	X 68	B	O X 46	B	O X 28	A	R	A	A
21	A	A	A	86	A	A	57	A	B	Y	B	B	B	B	B	O X 46	X 51	46	R	A	65	56	O X 44	35
22	A	A	41	B	B	A	A	A	B	B	B	B	B	B	B	B	O X 47	X 42	A	Y	A	A	O X 39	X 40
23	B	A	A	O X 33	B	B	B	B	B	B	B	B	B	B	B	O X 66	B	B	B	Y	Y	A	A	O X 40
24	A	O X 38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	68	X 60	O X 38	B	Y	A	84
25	O X 45	A	O X 40	A	B	A	R	B	B	B	B	B	B	B	B	B	B	B	X 47	40	B	Y	R	O X 28
26	X 29	A	A	B	A	A	A	O X 36	O X 41	O X 46	O X 48	X 64	X 73	X 77	R	B	O X 77	B	O X 75	B	A	A	O X 27	X 32
27	A	A	B	A	A	A	A	A	O X 42	B	B	B	B	B	B	B	74	B	B	B	R	A	A	88
28	A	A	A	A	94	R	B	R	B	B	B	B	B	B	B	O X 66	O X 66	B	X 56	O X 34	A	A 66	A	A
29	A	A	98	O X 44	R	A	A	X 41	O X 52	O X 41	B	B	O X 72	X 79	B	X 91	X 82	90	B	X 40	O X 41	O X 66	A	A
30	A	A	X 37	R	47	A	B	B	B	B	B	B	B	B	B	B	O X 76	X 80	78	57	X 40	A	A	A
31	A	A	A	A	R	R	O X 40	A	B	B	B	O X 71	B	B	B	O X 71	O X 72	X 64	B	B	O X 34	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	9	5	8	6	5	4	6	9	7	6	5	9	7	9	8	14	19	16	18	15	7	6	6	13
MED	X 45	O X 44	43	47	47	42	44	35	X 41	O X 45	O X 48	O X 62	X 72	O X 71	X 68	O X 68	X 64	50	X 52	O X 36	O X 34	X 48	O X 42	O X 40
U Q	66	X 47	58	52	71	49	57	44	52	47	X 60	X 69	X 73	X 80	X 78	X 71	X 74	X 66	62	40	41	66	67	46
L Q	X 40	O X 38	X 38	41	38	38	40	32	34	O X 42	O X 45	O X 47	X 67	O X 44	O X 56	O X 52	O X 48	X 46	X 42	O X 32	O X 24	X 38	O X 27	X 34

AUG. 2003 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2003 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	B	R 35
2	A	A	R 39	B	A	B	B	B	A	B	B	B	B	B	B	B	44	55	B	A	A	Y	Y	R 38
3	B	A	A	B	B	B	B	B	B	B	B	R 40	B	B	B	B	B	B	B	B	B	A	A	A
4	F 38	R 38	B	B	B	B	A	R 24	A	A	B	B	B	B	B	B	B	B	B	B	R 18	B	A	A
5	A	A	A	F 37	R 42	F 30	F 32	F 34	F 34	F 38	J R 51	D R 41	R 66	78	F 58	F 57	42	F 36	29	B	Y	B	Y	Y
6	R 59	A	A	R	A	B	A	A	A	A	B	B	B	R 36	B	B	B	B	F 31	R	R 21	R	A	A
7	A	A	A	A	A	A	A	A	F 19	A	R 40	56	61	57	62	F 61	F 60	F 39	44	R 19	A	R 35	61	B
8	Y	A	B	A	B	A	B	B	B	B	B	B	B	B	B	42	R 39	B	F 34	R 20	A	A	A	R 33
9	A	42	F 19	B	B	A	A	R 29	A	B	B	B	B	B	B	B	F 60	62	62	B	Y	R	R	R 32
10	A	A	A	B	A	B	B	B	A	36	B	B	B	B	B	B	B	B	R 43	F 24	B	B	A	A
11	A	A	A	A	R 29	R 30	A	B	R	A	B	62	J R 72	F 69	76	F 65	F 62	F 47	F	F 31	R	A	A	A
12	A	R 33	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	A	B	A	R	A	R 41
13	A	A	B	B	R	A	B	B	B	38	B	B	B	B	B	B	F 54	B	R 53	B	B	B	A	A
14	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	17	A	A	A
15	A	B	B	B	B	B	B	F 25	F 24	B	B	R 42	B	B	R 62	R 46	R 50	42	47	27	B	A	A	Y
16	R 36	A	B	A	B	A	B	B	B	B	R 38	55	B	B	R 70	R 67	B	B	F 54	R 33	B	B	A	A
17	R 35	A	A	A	A	A	F 19	F 20	31	44	57	64	J R 63	65	F 69	F 60	F 47	F 38	36	F 25	A	R 29	F	A
18	A	A	A	B	A	A	A	A	A	B	B	R 29	27	30	30	B	26	23	36	F 26	A	R 32	A	A
19	A	R 40	A	R	A	A	A	F 22	A	A	B	R	B	R 39	R 38	R 39	36	F 28	24	R 29	B	Y	R 18	R 21
20	A	A	R 38	F 22	F 23	F 31	F 30	F 29	A	A	B	B	B	B	B	62	B	R 40	B	R 22	A	R	A	A
21	A	A	A	A	A	A	F 30	A	B	Y	B	B	B	B	B	R 40	45	F 35	A	A	F 22	23	R 38	F
22	A	A	F 26	B	B	A	A	A	B	B	B	B	B	B	B	B	R 41	36	A	Y	A	A	R 33	34
23	B	A	A	R 27	B	B	B	B	B	B	B	B	B	B	B	60	B	B	B	Y	Y	A	A	R 34
24	A	R 32	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	F 58	54	R 32	B	Y	A	34
25	R 39	A	R 34	A	B	A	R	B	B	B	B	B	B	B	B	B	B	B	41	F 27	B	Y	A	R 22
26	23	A	A	B	A	A	A	R 30	R 35	R 40	R 42	58	J R 67	J R 71	D R 80	B	R 71	B	U R 69	B	A	A	R 21	J R 26
27	A	A	B	A	A	A	A	A	R 36	B	B	B	B	B	B	B	F 64	B	B	B	R	A	A	F
28	A	A	A	A	A	R	B	R	B	B	B	B	B	B	B	R 60	R 60	B	J R 50	R 28	A	A	A	A
29	A	A	A	R 38	A	A	A	35	R 46	R 35	B	B	R 66	J R 73	B	J R 85	76	F 82	B	J R 34	R 35	U S 60	A	A
30	A	A	31	R	F 23	A	B	B	B	B	B	B	B	B	B	B	R 70	J R 74	F 62	F 47	J R 34	A	A	A
31	A	A	A	A	A	A	R 34	A	B	B	B	R 65	B	B	B	U R 65	R 66	58	B	B	28	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	5	6	4	4	3	5	9	7	6	5	10	7	9	9	14	19	16	17	15	7	5	5	11
MED	R 37	R 38	32	32	26	F 30	F 30	F 29	34	38	R 42	56	R 66	65	62	60	54	41	44	R 27	R 22	R 32	R 33	R 34
U Q	R 39	41	R 38	38	R 36	F 31	33	32	R 36	40	54	62	J R 67	J R 72	R 73	R 65	R 64	58	54	R 32	R 34	48	50	R 35
L Q	35	R 32	F 26	24	F 23	F 30	F 24	F 23	F 24	36	R 39	R 41	61	R 38	48	R 46	42	F 36	35	R 24	18	26	R 20	R 26

AUG. 2003 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2003 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	42	41	42	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	B	43
2	48	78	45	B	39	B	B	B	38	B	B	B	B	B	B	B	E B 20	E B 26	B	39	30	24	19	42
3	B	37	36	B	B	B	B	B	B	B	B	E B 34	B	B	B	B	B	B	B	B	B	41	44	43
4	60	42	B	B	B	B	38	37	40	36	B	B	B	B	B	B	B	B	B	B	E S 14	B	42	52
5	52	41	42	36	38	40	31	17	18	16	E B 22	E B 25	E B 25	E B 26	E B 21	20	18	16	E B 15	B	17	B	16	16
6	39	64	57	36	67	B	65	50	34	38	B	B	B	E B 30	B	B	B	B	32	27	21	22	31	31
7	40	36	44	39	37	42	42	39	35	38	37	E B 21	E B 28	E S 29	E B 25	38	18	14	38	E B 14	22	42	38	B
8	23	41	B	31	B	37	B	B	B	B	B	B	B	B	B	E B 35	E B 26	B	20	34	41	44	41	42
9	35	58	29	B	B	49	51	41	48	B	B	B	B	B	B	B	20	E B 27	E B 20	B	19	22	21	42
10	100	41	37	B	36	B	B	B	31	38	B	B	B	B	B	B	B	B	E B 26	E B 21	B	B	37	34
11	34	44	49	44	40	39	35	B	30	32	B	E B 26	E B 26	E B 26	22	E B 21	24	15	E B 16	23	20	28	37	48
12	67	39	B	B	B	39	36	B	B	B	B	B	B	B	B	B	B	B	33	B	44	18	39	56
13	40	36	B	B	33	37	B	B	B	21	B	B	B	B	B	B	E B 16	B	E B 29	B	B	B	40	44
14	44	B	B	B	67	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	18	22	39	46
15	36	B	B	B	B	B	B	34	26	B	B	E B 29	B	B	E B 52	E B 29	E B 29	E B 18	17	E B 15	B	35	38	22
16	42	38	B	39	B	44	B	B	B	B	E B 29	E B 28	B	B	E B 57	E B 55	B	B	E B 26	E B 28	B	B	37	42
17	40	42	33	41	43	39	28	18	13	18	22	24	37	26	27	22	27	18	22	27	32	38	70	44
18	82	38	42	B	35	33	35	48	62	B	B	23	E B	E B 25	E B 25	B	22	29	30	28	114	46	49	48
19	42	69	44	37	47	36	31	69	38	32	B	28	B	22	24	27	22	18	27	28	B	20	20	36
20	34	69	69	35	31	35	33	33	33	37	B	B	B	B	B	E B 35	B	E B 28	B	30	38	22	27	54
21	74	80	58	52	78	111	42	46	B	18	B	B	B	B	B	E B 30	22	27	32	49	58	131	72	63
22	43	47	34	B	B	39	36	38	B	B	B	B	B	B	B	B	E B 31	38	38	21	39	98	44	56
23	B	43	41	41	B	B	B	B	B	B	B	B	B	B	B	E B 32	B	B	B	19	23	31	40	48
24	37	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 32	23	E B 26	B	18	93	44
25	84	43	40	49	B	49	28	B	B	B	B	B	B	B	B	B	B	B	E B 15	E B 18	B	18	26	28
26	38	32	42	B	38	41	41	30	28	20	24	26	22	24	19	B	E B 54	B	E B 57	B	32	35	31	42
27	74	67	B	37	45	37	36	43	36	B	B	B	B	B	B	B	E B 19	B	B	B	23	40	40	59
28	42	40	68	40	40	32	B	26	B	B	B	B	B	B	B	E B 35	E B 55	B	E B 16	E B 20	42	42	35	49
29	48	43	91	43	36	40	42	36	E B 38	32	B	B	E B 29	E B 28	B	E B 56	E B 21	E B 18	B	E B 25	41	45	73	75
30	40	39	36	32	43	78	B	B	B	B	B	B	B	B	B	B	E B 58	E B 26	24	24	E B 16	34	38	37
31	41	48	32	57	33	35	39	40	B	B	B	E B 58	B	B	B	E B 54	E B 31	E B 21	B	B	E B 17	B	35	38
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	22	17	19	22	18	17	16	13	5	11	6	9	9	14	19	16	21	20	22	24	30	30
MED	42	42	42	39	39	39	36	38	34	32	23	E B 26	E B 27	E B 26	E B 25	E B 34	E B U 22	20	24	25	26	34	38	44
U Q	56	53	49	44	45	42	42	44	38	38	33	E B 29	29	E B 28	E B 40	E B 38	E B 31	28	32	28	41	42	42	49
L Q	38	39	36	36	36	37	33	32	29	19	22	24	25	24	22	27	E B 20	18	E B 18	E B 20	19	22	31	38

AUG. 2003 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2003 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	23	12	16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	B	14
2	13	14	12	B	26	B	B	B	28	B	B	B	B	B	B	B	20	26	B	10	12	19	10	14
3	B	28	10	B	B	B	B	B	B	B	B	34	B	B	B	B	B	B	B	B	B	10	12	14
4	12	15	B	B	B	B	16	12	28	13	B	B	B	B	B	B	B	B	B	B	E S 14	B	12	16
5	15	12	29	11	26	12	11	10	11	11	22	25	25	26	21	16	10	10	15	B	13	B	12	13
6	12	12	22	15	21	B	15	11	16	21	B	B	B	30	B	B	B	B	12	16	11	19	14	12
7	10	12	13	12	12	14	11	10	11	15	15	21	28	29	25	14	10	10	12	14	11	10	10	B
8	11	30	B	12	B	25	B	B	B	B	B	B	B	B	B	35	25	B	12	11	11	10	10	11
9	25	10	11	B	B	20	12	10	12	B	B	B	B	B	B	B	12	27	20	B	14	10	9	11
10	13	18	20	B	27	B	B	B	14	19	B	B	B	B	B	B	B	B	26	21	B	B	13	12
11	13	13	14	21	13	12	14	B	20	28	B	26	26	26	19	21	10	11	16	11	15	13	12	12
12	12	12	B	B	B	26	21	B	B	B	B	B	B	B	B	B	B	B	14	B	12	12	12	15
13	25	17	B	B	20	21	B	B	B	16	B	B	B	B	B	B	16	B	29	B	B	B	10	10
14	14	B	B	B	10	29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	10	12	11	12
15	26	B	B	B	B	B	B	10	12	B	B	29	B	B	52	29	29	18	11	15	B	12	11	18
16	12	15	B	24	B	20	B	B	B	B	29	28	B	B	57	55	B	B	26	28	B	B	8	8
17	9	25	20	20	16	12	10	9	8	12	15	19	18	17	17	15	11	10	12	11	13	12	13	11
18	18	32	16	B	14	29	13	19	25	B	B	19	23	25	25	B	10	12	11	13	12	12	12	17
19	18	13	13	12	12	15	12	12	15	26	B	17	B	20	20	20	13	12	12	13	B	12	11	13
20	13	12	12	12	12	12	12	12	16	18	B	B	B	B	B	35	B	28	B	12	12	12	11	12
21	12	12	17	15	14	13	12	16	B	B	B	B	B	B	B	30	14	12	29	14	12	13	12	14
22	20	14	12	B	B	14	18	16	B	B	B	B	B	B	B	B	31	16	12	12	12	13	13	13
23	B	16	14	14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	14	12	12	12	15
24	19	12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	32	11	26	B	12	13	12
25	12	13	13	13	B	16	20	B	B	B	B	B	B	B	B	B	B	B	15	18	B	14	12	13
26	14	14	25	B	26	28	24	13	14	18	16	22	20	19	14	B	54	B	57	B	13	12	13	14
27	12	12	B	12	14	19	20	13	14	B	B	B	B	B	B	B	19	B	B	B	16	14	13	12
28	13	12	17	16	28	26	B	16	B	B	B	B	B	B	B	35	55	B	16	20	12	12	13	14
29	16	12	16	10	20	14	16	12	38	28	B	B	29	28	B	56	21	18	B	25	12	16	13	21
30	28	14	10	28	12	37	B	B	B	B	B	B	B	B	B	B	58	26	12	13	16	12	12	12
31	16	17	23	50	25	12	13	12	B	B	B	58	B	B	B	54	31	21	B	B	17	B	11	13
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	30	31	31	30	30	30	30	31	31
MED	14	14	17	28	26	25	20	16	38	B	B	B	B	B	B	B	31	32	18	19	13	12	12	13
U Q	20	17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B 19	13	14
L Q	12	12	13	13	14	14	13	12	14	19	B	28	B	29	52	35	14	16	12	13	12	12	11	12

AUG. 2003 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2003 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	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	B	214
2	A	A	232	B	A	B	B	B	A	B	B	B	B	B	B	B	216	Q 244	B	A	A	A	A	E A 248
3	B	A	A	B	B	B	B	B	B	B	B	E B 282	B	B	B	B	B	B	B	B	B	A	A	A
4	198	A 242	B	B	B	B	A	220	A	A	B	B	B	B	B	B	B	B	B	B	S	B	A	A
5	A	A	A	A 234	186	A	A 244	E A 286	278	248	238	196	212	220	208	190	Q 198	216	222	B	Y	B	Y	Y
6	210	A	A	A	A	B	A	A	A	A	B	B	B	B	B	B	B	B	E A 244	A	A	A	A	A
7	A	A	A	A	A	A	A	A	202	A	A 228	228	238	214	210	230	Q 208	E A 254	E A 254	E B 256	A	208	180	B
8	Y	A	B	A	B	A	B	B	B	B	B	B	B	B	B	E B 280	250	B	Q 250	226	A	A	A	210
9	A	208	212	B	B	A	A	210	A	B	B	B	B	B	B	B	Q 206	244	206	B	A	A	A	210
10	A	A	A	B	A	B	B	B	A	262	B	B	B	B	B	B	B	B	242	E B 218	B	B	A	A
11	A	A	A	A	204	204	A	B	A	A	B	226	226	212	218	196	Q 206	184	Q 210	Q 214	E A 260	A	A	A
12	A	204	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	A	B	A	204	A	172
13	A	A	B	B	A	A	B	B	B	E A 266	B	B	B	B	B	B	218	B	E B 230	B	B	B	A	A
14	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	S 254	A	A	A
15	A	B	B	B	B	B	B	A	A	B	B	E B 242	B	B	E B 264	218	226	198	216	E B 254	B	A	A	A
16	220	A	B	A	B	A	B	B	B	B	E B 238	E B 252	B	B	E B 236	E B 264	B	B	Q 224	E B 266	B	B	A	A
17	206	A	A	A	A	A	220	218	E A 264	E A 242	A 214	E A 224	198	198	Q 208	Q 192	Q 192	Q 216	Q 206	206	A	206	198	A
18	A	A	A	B	A	A	A	A	A	B	B	278	E B 286	E B 322	E B 342	B	E A 336	232	E A 228	Q 172	A	214	A	A
19	A	204	A	A	A	A	A	226	A	A	B	A	B	E A 258	E A 240	E A 252	236	240	E A 256	E A 244	B	A	264	256
20	A	A	194	Q 192	Q 162	188	212	220	A	A	B	B	B	B	B	224	B	E B 278	B	200	A	A	A	A
21	A	A	A	A	A	A	226	A	B	A	B	B	B	B	B	E B 256	196	210	A	A	Q	E A 228	A 266	190
22	A	A	200	B	B	A	A	A	B	B	B	B	B	B	B	B	B	A 220	A	A	A	A	214	214
23	B	A	A	194	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	E A
24	A	218	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 214	Q 224	E B 274	B	Y	A	210
25	240	A	210	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	230	E B 264	B	Y	A	212
26	214	A	A	B	A	A	A	A	204	220	206	E A 222	A 224	A 218	E A 230	B	E B 236	B	E B 246	B	A	A	222	236
27	A	A	B	A	A	A	A	A	A	B	B	B	B	B	B	B	220	B	B	B	A	A	A	192
28	A	A	A	A 230	A	A	B	A	B	B	B	B	B	B	B	E B 260	B	B	226	E B 250	A	A	A	A
29	A	A	A	E A 236	A	A	A	234	B	E A 300	B	B	E B 226	232	B	E B 234	228	Q 220	B	E B 314	232	A	A	A
30	A	A	A	A	220	A	B	B	B	B	B	B	B	B	B	B	E B 260	204	Q 216	Q 232	E B 288	A	A	A
31	A	A	A	A	A	A	214	A	B	B	B	B	B	B	B	E B 234	B 220	240	B	B	246	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	5	5	5	4	2	5	7	4	6	5	9	7	8	9	13	17	16	18	15	5	5	6	12
MED	212	208	210	U 212	195	196	220	220	U 218	U 243	221	E 228	225	216	E 230	E 234	214	218	220	E B 244	U 243	207	218	210
U Q	220	230	222	A 235	212		235	234	271	E A 266	238	E B 265	238	E 245	E B 252	E B 258	E 236	242	E A 244	E B 264	E 274	221	264	225
L Q	206	204	197	193	174		213	218	203	242	210	E A 223	212	213	209	207	Q 206	212	Q 216	214	239	205	198	201

AUG. 2003 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2003 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	O X 40	A	A	A	A	A	A	A	A	B	B	X 63	O X 68	O X 84	X 80	X 73	B	76	X 62	49	43	A	A	B
2	A	B	R	O X 46	B	A	R	A	40	X 48	O X 49	O X 50	X 60	X 63	R	O X 71	X 68	X O 60	O X 46	B	B	O X 24	O X 29	A
3	A	54	R	B	B	B	B	R	R	B	B	B	O X 52	B	B	B	B	X 62	O X 62	B	34	A	X 31	X 31
4	O X 40	A	O X 39	B	B	A	B	B	B	B	B	B	B	B	B	B	B	X 55	58	B	A	X 35	X 38	A
5	O X 33	B	A	A	A	B	R	B	A	B	B	O X 42	B	B	B	B	B	X 58	X 56	X 32	B	B	B	A
6	A	A	B	A	A	B	Y	A	A	O X 43	B	B	B	B	B	X 69	X 74	B	X 62	53	X 34	B	B	R
7	A	A	A	A	B	A	A	A	B	B	B	X 74	X 78	X 80	O X 74	X 79	X 65	X 62	65	X 49	40	29	X 22	B
8	B	B	54	R	42	45	49	44	X 50	R	X 68	X 84	X 80	X 78	X 79	X 78	81	63	50	53	41	28	B	A
9	O X 40	A	A	A	42	40	42	44	X 44	O X 48	B	R	76	X 74	X 77	X 78	X 72	X 79	X 60	41	A	A	A	A
10	A	A	A	B	A	B	A	O X 38	X 41	O X 44	B	B	B	B	B	B	B	B	O X 53	O X 50	O X 30	A	A	61
11	A	B	B	B	A	B	A	B	B	B	B	O X 49	O X 50	O X 46	B	B	O X 56	O X 50	O X 46	X 42	X 23	A	X 37	54
12	A	A	A	A	B	R	R	R	B	B	B	O X 52	O X 56	X 59	X 58	B	B	B	B	X 38	X 33	O X 27	B	O X 28
13	60	O X 37	A	39	B	B	B	B	R	B	B	B	B	B	O X 76	B	B	B	O X 49	48	33	B	B	O X 24
14	X 29	B	A	A	A	B	A	X 40	O X 48	R	O X 53	X 60	X 62	R	X 62	O X 66	X 63	X 57	X 54	X 44	X 33	24	B	B
15	A	B	A	A	A	A	A	O X 47	O X 49	O X 51	X 62	O X 70	O X 72	X 74	X 78	X 73	X 71	O X 64	O X 53	X 44	X 38	X 26	B	A
16	X 37	A	A	78	64	B	A	A	B	B	B	B	B	B	B	B	B	O X 49	B	O X 29	A	48	A	A
17	54	79	A	A	68	A	A	A	R	B	B	B	B	B	B	B	B	41	B	Y	A	A	A	A
18	B	B	B	A	O X 38	X 38	B	B	B	B	B	B	B	B	B	B	B	B	O X 38	A	A	97	O X 40	A
19	B	O X 40	X 34	B	A	A	X 36	B	B	B	B	B	B	B	B	B	O X 48	44	O X 45	A	A	O X 40	A	A
20	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 42	B	O X 36	Y	R	R
21	A	A	A	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	R	70	O X 35	O X 27	O X 39	A
22	O X 37	A	A	O X 38	O X 38	A	B	B	B	B	B	B	B	B	B	O X 72	B	B	B	X 37	A	O X 36	O X 42	R
23	R	R	O X 36	A	A	B	B	B	B	B	B	B	B	B	B	B	B	R	X 62	X 57	X 40	X 28	O X 41	A
24	A	88	54	B	A	Y	B	B	B	B	B	B	B	B	B	B	O X 48	O X 49	A	26	A	111	A	B
25	90	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	X 59	O X 49	O X 44	A	O X 35	A	46	A
26	A	A	B	B	B	B	B	O X 48	O X 49	B	B	B	B	B	B	B	B	X 68	X 61	O X 38	O X 23	O X 40	A	B
27	A	R	B	B	R	46	A	O X 51	O X 54	X 62	O X 66	O X 70	X 72	O X 73	X 78	77	X 74	X 70	71	64	51	42	33	23
28	52	57	O X 38	R	50	50	49	X 63	R	X 74	X 79	O X 85	X 94	B	X 102	X 98	X 99	O X 95	X 92	74	61	32	X 22	X 29
29	O X 27	O X 34	R	R	X 57	R	B	X 63	B	78	O X 82	X 88	X 94	X 101	X 100	O X 93	X 99	X 83	X 82	X 69	X 65	45	33	A
30	O X 48	54	A	43	46	56	O X 49	B	B	B	B	B	B	B	X 91	X 95	X 88	X 85	X 74	B	O X 42	X 41	A	36
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	8	6	5	9	6	5	9	8	8	7	12	13	10	12	13	15	21	24	21	20	19	13	8
MED	O X 40	54	X 38	43	46	46	49	X 47	X 48	X 50	O X 66	O X 66	X 72	X 74	X 78	X 77	X 71	X 62	X 57	X 48	X 36	X 35	X 37	30
U Q	53	68	54	62	60	50	49	X 57	O X 50	X 68	X 79	X 79	X 79	X 80	X 86	X 86	X 81	X 73	X 62	55	42	42	O X 40	45
L Q	X 35	O X 38	X 36	38	O X 40	40	39	X 42	X 42	O X 46	O X 53	O X 51	O X 58	X 63	X 75	O X 72	O X 59	O X 50	O X 48	X 38	X 33	O X 27	X 30	O X 26

SEP. 2003 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2003 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	R 34	A	A	A	A	A	A	A	A	B	B	57	R 62	78	J R 74	67	B	F 68	56	F 38	F 26	A	A	B
2	A	B	A	R 40	B	A	A	A	F 30	42	R 43	R 44	J R 54	57	D R 40	R 65	62	54	R 40	B	B	R 18	R 23	A
3	A	A	R	B	B	B	B	R	A	B	B	B	46	B	B	B	B	56	56	B	F 26	A	25	25
4	34	A	R 33	B	B	A	B	B	B	B	B	B	B	B	B	B	B	49	F 46	B	A	29	J R 32	A
5	27	B	A	A	A	B	A	B	A	B	B	R 36	B	B	B	B	B	52	50	26	B	B	B	A
6	A	A	B	A	A	B	Y	A	A	37	B	B	B	B	B	63	J R 68	B	56	F 42	28	B	B	D R 23
7	A	A	A	A	B	A	A	A	B	B	B	68	72	J R 74	U R 68	J R 73	J R 59	56	F 56	43	F 30	F 18	16	B
8	B	B	Y	R	F 32	F 27	F 26	F 31	44	R	62	78	J R 74	72	73	72	F 70	F 52	F 40	J F 47	F 31	F 16	B	A
9	R 34	A	A	A	F 34	F 30	F 26	F 36	38	R 42	B	R	F 65	68	J R 71	72	66	73	54	F 30	A	A	A	A
10	A	A	A	B	A	B	A	R 32	35	R 38	B	B	B	B	B	B	B	B	R 47	R 44	R 24	A	A	F 28
11	A	B	B	B	A	B	A	B	B	B	B	R 43	R 44	R 40	B	B	R 50	R 44	R 40	36	17	A	31	A
12	A	A	A	A	B	A	A	A	B	B	B	R 46	R 50	J R 53	J R 52	B	B	B	B	32	27	R 21	B	R 22
13	32	R 31	A	F 26	B	B	B	B	R	B	B	B	B	B	R 70	B	B	B	R 43	F 41	F 22	B	B	R 18
14	23	B	A	A	A	B	A	34	42	R	R 47	J R 54	56	R	56	R 60	57	51	48	38	27	F	B	B
15	A	B	A	A	A	A	A	R 41	R 43	R 45	56	R 64	R 66	J R 68	J R 72	67	65	R 58	47	38	32	22	B	A
16	31	A	A	F 48	F 30	B	A	A	B	B	B	B	B	B	B	B	B	R 43	B	R 23	A	F 20	A	A
17	F 25	A	A	A	F 30	A	A	A	R	B	B	B	B	B	B	B	B	F 27	B	Y	A	A	A	A
18	B	B	B	A	R 32	32	B	B	B	B	B	B	B	B	B	B	B	B	R 32	A	A	R 73	R 34	A
19	B	R 34	28	B	A	A	30	B	B	B	B	B	B	B	B	B	R 42	F 35	R 39	A	A	R 34	A	A
20	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 36	B	R 30	Y	A	A
21	A	A	A	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	R	A	R 29	R 21	R 33	A
22	R 31	A	A	R 32	R 32	A	B	B	B	B	B	B	B	B	B	R 66	B	B	B	31	A	R 30	R 36	R
23	R	A	R 30	A	A	B	B	B	B	B	B	B	B	B	B	B	B	D R 55	56	51	34	22	R 35	A
24	A	A	37	B	A	Y	B	B	B	B	B	B	B	B	B	B	R 42	R 43	A	F 19	A	A	A	B
25	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	53	R 43	R 38	A	R 29	A	F 26	A
26	A	A	B	B	B	B	B	R 42	R 43	B	B	B	B	B	B	B	B	62	55	R 32	R 17	R 34	A	B
27	A	R	B	B	A	F 36	A	R 45	R 48	56	R 60	R 64	66	R 67	J R 72	F 67	68	64	F 60	F 54	F 41	F 32	F 22	F 15
28	A	A	R 32	R	F 40	F 41	F 38	57	R	68	73	R 79	88	B	96	92	93	R 89	J R 86	F 63	F 48	F 21	16	23
29	R 21	R 28	A	R	J R 51	R	B	57	B	F 62	76	J R 82	88	95	94	U R 87	93	77	J R 76	63	59	F 37	F 21	A
30	R 42	F 35	A	F 33	F 36	F 34	R 43	B	B	B	B	B	B	B	J R 85	J R 89	J R 82	79	68	B	R 36	35	A	F 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	11	4	5	5	9	6	5	9	8	8	7	12	13	10	13	13	15	22	24	20	20	17	13	8
MED	31	R 32	R 32	F 33	F 32	F 33	F 30	41	42	44	60	R 60	65	68	72	67	65	54	49	38	29	22	26	23
U Q	R 34	34	35	44	F 38	F 36	40	51	R 44	59	73	73	73	74	80	R 80	70	64	56	46	33	R 34	R 34	F 26
L Q	25	R 30	29	29	F 31	F 30	F 26	33	36	40	R 47	R 45	R 52	R 57	R 62	R 66	R 53	R 44	R 40	32	26	F 20	22	R 20

SEP. 2003 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2003 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	42	59	45	40	49	44	43	64	42	B	B	E B 26	E B 36	E B 28	E B 26	E B 25	B	E B 26	E B 20	E B 12	13	41	58	B
2	40	B	33	38	B	42	35	45	27	20	E B 29	20	E B 28	E B 26	23	E B 29	21	29	E B 22	B	B	20	36	42
3	40	32	34	B	B	B	B	38	32	B	B	B	23	B	B	B	B	E B 28	E B 27	B	E B 16	44	40	39
4	56	70	55	B	B	82	B	B	B	B	B	B	B	B	B	B	B	E B 19	32	B	31	43	48	45
5	42	B	35	36	34	B	30	B	41	B	B	E B 30	B	B	B	B	B	E B 19	E B 25	16	B	B	B	31
6	38	33	B	35	34	B	22	51	38	22	B	B	B	B	B	E B 26	E B 56	B	E B 26	17	16	B	B	23
7	54	36	37	42	B	37	47	40	B	B	B	28	26	24	28	22	22	E B 18	E B 16	E S 13	E S 13	E S 13	E B 14	B
8	B	B	20	23	22	23	E S 16	E S 16	18	24	28	28	34	28	28	26	23	18	E B 16	E B 13	E S 13	E S 13	B	30
9	38	95	45	44	39	42	23	E B 15	19	24	B	E B 30	28	26	E B 59	23	E B 36	E B 25	E B 30	E B 19	43	53	48	59
10	72	42	74	B	40	B	40	42	26	22	B	B	B	B	B	B	B	B	E B 29	32	33	44	92	61
11	68	B	B	B	37	B	36	B	B	B	B	22	24	22	B	B	E B 27	E B 25	E B 19	E B 15	22	35	42	43
12	68	40	42	40	B	41	39	38	B	B	B	E B 30	E B 28	21	E B 28	B	B	B	B	E B 20	E B 12	E S 13	B	36
13	41	36	80	60	B	B	B	B	35	B	B	B	B	B	E B 55	B	B	B	E B 32	E B 15	E B 14	B	B	37
14	36	B	32	40	49	B	37	22	19	22	22	E B 26	28	E B 27	E B 27	E B 29	20	18	E B 18	E B 14	E S 13	E S 13	B	B
15	23	B	42	39	24	32	37	18	E B 26	22	26	23	30	29	29	26	26	20	18	14	15	17	B	40
16	43	59	47	34	39	B	48	39	B	B	B	B	B	B	B	B	B	24	B	22	90	27	58	49
17	42	25	38	44	40	66	47	42	35	B	B	B	B	B	B	B	B	E B 18	B	20	41	64	38	96
18	B	B	B	41	38	66	B	B	B	B	B	B	B	B	B	B	B	B	22	113	42	E B 63	65	42
19	B	47	90	B	36	35	35	B	B	B	B	B	B	B	B	B	E B 32	23	34	34	40	38	36	36
20	36	73	39	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 29	B	42	22	29	32
21	40	49	34	B	B	31	36	36	B	B	B	B	B	B	B	B	B	B	32	40	36	28	38	37
22	42	33	39	42	39	38	B	B	B	B	B	B	B	B	B	E B 59	B	B	B	15	35	36	94	37
23	32	34	39	40	39	B	B	B	B	B	B	B	B	B	B	B	B	E B 29	26	26	22	28	46	42
24	47	46	66	B	35	22	B	B	B	B	B	B	B	B	B	B	E B 30	32	40	E B 14	42	31	72	B
25	49	B	59	B	B	B	B	B	B	B	B	B	B	B	B	B	22	30	E B 30	42	35	90	90	92
26	66	46	B	B	B	B	B	23	E B 26	B	B	B	B	B	B	B	B	E B 55	26	30	15	40	42	B
27	40	33	B	B	34	34	39	24	E B 25	22	28	27	27	28	E B 30	24	23	21	26	E B 15	E B S 13	E S 13	E S 13	29
28	33	35	36	32	30	26	26	25	24	24	27	30	29	B	27	E B 58	E B 54	E B 30	21	E B 20	28	E S 13	22	16
29	28	35	35	38	36	40	B	34	B	34	29	30	31	31	30	E B 35	26	22	19	E S 16	E B 16	E S 12	33	40
30	43	40	37	37	45	29	E B 22	B	B	B	B	B	B	B	E B 55	27	E B 29	23	20	B	44	49	42	36
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	27	22	25	19	20	18	19	18	15	10	7	13	13	11	13	13	15	22	26	25	28	27	23	25
MED	42	40	39	40	38	38	36	37	26	22	28	27	28	26	E B 28	E B 26	U 23	U 21	E B 26	16	25	30	42	39
U Q	49	49	51	42	40	42	40	42	35	24	29	30	30	28	E B 42	E B 32	E B 32	29	30	28	40	44	58	44
L Q	38	34	35	36	34	31	26	23	24	22	26	24	26	24	27	24	22	E B 19	E B 20	E B 14	E 14	E S 13	36	34

SEP. 2003 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2003 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	12	13	13	37	16	25	21	29	26	B	B	26	36	28	26	25	B	26	20	12	11	13	15	B
2	29	B	20	12	B	16	29	15	16	18	29	11	28	26	18	29	16	11	22	B	B	13	11	13
3	12	30	26	B	B	B	B	25	25	B	B	B	20	B	B	B	B	28	27	B	16	11	10	10
4	14	29	15	B	B	15	B	B	B	B	B	B	B	B	B	B	B	19	11	B	12	11	12	13
5	13	B	24	25	15	B	12	B	21	B	B	30	B	B	B	B	B	19	25	12	B	B	B	12
6	13	16	B	21	14	B	16	16	26	15	B	B	B	B	B	26	56	B	26	12	12	B	B	13
7	13	25	28	26	B	17	13	16	B	B	B	19	19	18	15	19	16	18	16	E S 13	E S 13	E S 13	14	B
8	B	B	13	14	13	15	E S 16	E S 16	12	12	15	15	14	14	14	14	14	14	16	13	E S 13	E S 13	B	13
9	14	17	13	20	13	14	12	15	14	16	B	30	26	21	59	20	36	25	30	19	13	13	12	12
10	14	10	21	B	21	B	28	14	16	17	B	B	B	B	B	B	B	B	29	13	13	13	15	12
11	24	B	B	B	14	B	14	B	B	B	B	19	16	15	B	B	27	25	19	15	11	11	11	12
12	37	16	19	26	B	20	15	15	B	B	B	30	28	17	28	B	B	B	B	20	12	E S 13	B	13
13	14	12	13	14	B	B	B	B	26	B	B	B	B	B	55	B	B	B	32	15	14	B	B	13
14	12	B	25	25	19	B	19	15	15	16	20	26	20	27	27	29	19	15	18	14	E S 13	E S 13	B	B
15	12	B	16	15	15	14	12	15	26	16	20	19	20	15	20	18	13	17	13	10	11	11	B	12
16	13	11	15	12	10	B	16	25	B	B	B	B	B	B	B	B	B	20	B	11	12	10	10	10
17	11	10	21	10	10	21	20	16	20	B	B	B	B	B	B	B	B	18	B	15	11	11	25	10
18	B	B	B	16	14	13	B	B	B	B	B	B	B	B	B	B	B	B	15	12	20	63	13	12
19	B	12	15	B	25	29	14	B	B	B	B	B	B	B	B	B	32	17	17	10	11	13	25	25
20	22	12	14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	29	B	10	14	10	16
21	16	12	10	B	B	13	25	21	B	B	B	B	B	B	B	B	B	B	25	11	12	13	12	12
22	12	14	19	12	21	29	B	B	B	B	B	B	B	B	B	59	B	B	B	12	12	12	13	26
23	15	14	12	14	15	B	B	B	B	B	B	B	B	B	B	B	B	29	14	12	12	12	13	12
24	16	13	14	B	16	16	B	B	B	B	B	B	B	B	B	B	30	18	15	14	13	18	13	B
25	18	B	17	B	B	B	B	B	B	B	B	B	B	B	B	B	19	25	30	15	13	14	13	26
26	29	16	B	B	B	B	B	20	26	B	B	B	B	B	B	B	B	55	15	13	12	12	14	B
27	18	29	B	B	21	17	23	21	25	19	16	18	20	25	30	18	15	16	16	15	E S 13	E S 13	E S 13	14
28	13	13	14	24	14	15	13	15	13	18	22	20	19	B	25	58	54	30	18	20	17	E S 13	13	12
29	13	13	20	25	20	25	B	17	B	16	19	17	19	18	26	35	19	15	13	16	16	E S 12	E S 13	22
30	12	12	18	15	13	12	22	B	B	B	B	B	B	B	55	25	29	12	13	B	12	12	12	12
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	14	16	18	25	20	25	22	23	B	B	B	B	B	B	B	B	B	25	20	14	12	13	13	13
U Q	22	B	B 25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	29	B 19	13	13	B 25	B 25
L Q	13	12	14	15	14	15	15	16	21	18	B	20	20	25	27	26	19	17	15	12	12	12	12	12

SEP. 2003 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2003 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	218	A	A	A	A	A	A	A	A	B	B	174	E B 256	218	E B 230	214	B	E B 234	206	200	S 252	A	A	B
2	A	B	A	252	B	A	A	A	A	248	E B 262	200	E B 222	E B 208	212	224	226	A	E B 278	B	B	A 282	A 216	A
3	A	A	A	B	B	B	B	204	A	B	B	B	224	B	B	B	B	228	214	B	242	A	202	222
4	254	A 246	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	256	Q 268	B	276	216	230	A
5	240	B	A	A	A	B	A	B	A	B	B	E B 254	B	B	B	B	B	210	236	272	B	B	B	A
6	A	A	B	A	E A 264	B	Y	A	A	E A 266	B	B	B	B	B	234	E B 268	B	224	Q 218	S 248	B	B	208
7	A	A	A	A	B	A	A	A	B	B	B	E A 226	198	186	200	E B 222	198	202	210	E S 206	202	E S 238	E B 318	B
8	B	B	Y	A	Q 302	S 338	E S 282	244	192	216	E A 224	210	210	198	206	Q 216	Q 214	194	212	214	202	S 246	B	A
9	232	A	A	A	A	220	262	F 274	214	E A 220	B	216	224	202	B	216	E B 250	220	240	Q 230	240	A	A	A
10	A	A	A	B	A	B	A	216	A	E B 264	B	B	B	B	B	B	B	B	226	264	A 258	A	A	A
11	A	B	B	B	A	B	A	B	B	B	B	E Y 234	214	214	B	B	E B 242	B 208	212	206	A	A	204	A
12	A	A	A	A	B	A	A	A	B	B	B	E B 228	216	198	224	B	B	B	B	212	202	E S 232	B	226
13	244	242	A	196	B	B	B	B	A	B	B	B	B	B	E B 256	B	B	B	B 214	198	198	B	B	194
14	226	B	A	A	A	B	A	Y	254	230	208	E B 224	218	212	220	E B 228	E B 220	206	208	198	E S 198	E S 236	B	B
15	A	B	A	A	A	A	A	E A 266	E B 244	A 220	E A 230	190	204	E A 226	220	186	Q 214	186	194	188	A 206	186	B	212
16	E A 246	A	A	E A 250	F	B	A	A	B	B	B	B	B	B	B	B	B	A	B	210	A	202	A	A
17	190	A	A	A	196	A	A	A	A	B	B	B	B	B	B	B	B	E B 238	B	Y	A	A	A	A
18	B	B	B	A	230	234	B	B	B	B	B	B	B	B	B	B	B	B	E A 308	A	A	E B 244	A 218	A
19	B	216	A	B	A	A	224	B	B	B	B	B	B	B	B	B	E B 256	E A 254	E A 264	A	A	A 226	A	A
20	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 328	B	E A 304	Y	A	A
21	A	A	A	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	A	216	194	190	204	A
22	196	A	A	E A 224	198	A	B	B	B	B	B	B	B	B	B	B	B	B	B	260	A	222	184	A
23	A	A	214	A	A	B	B	B	B	B	B	B	B	B	B	B	B	228	E A 238	Q 224	240	204	E A 228	A
24	A	A	196	B	A	Y	B	B	B	B	B	B	B	B	B	B	E B 300	A	A	B	A	A	A	B
25	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	250	A	E B 278	A	210	A	198	A
26	A	A	B	B	B	B	B	Y	E B 254	B	B	B	B	B	B	B	B	E B 268	224	214	196	196	A	B
27	A	A	B	B	A	E A 300	A	E A 290	E B 228	226	E A 206	206	206	222	E B 228	188	E A 226	Q 220	Q 220	Q 196	192	Q 204	E S 220	E S 312
28	A	A	E A 226	A	A	A 342	274	A 230	202	218	216	214	196	B	204	E B 258	226	208	Q 210	Q 210	234	E S 262	A	A
29	A	236	A	A	E A 304	A	B	Y	B	204	206	216	210	210	206	E B 228	Q 196	A 214	216	184	200	Q 210	320	A
30	262	260	A	A	A	Q 332	E B 304	B	B	B	B	B	B	B	E B 244	A 224	E B 230	Q 230	220	B	222	A 234	A	240
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	4	4	4	6	6	5	7	7	10	7	13	13	11	12	12	15	18	24	20	21	18	12	7
MED	232	239	212	U 224	U 222	316	U 249	U 230	U 215	221	E 216	U 203	212	209	212	219	E 226	214	217	211	208	U 214	210	217
U Q	246	251	236	251	302	338	E 293	274	254	E 248	E 230	E 227	223	218	E B 229	E B 228	E B 250	E B 234	E B 252	221	245	E S 238	229	240
L Q	218	226	205	210	198	234	243	216	202	218	206	203	205	198	206	215	Q 214	208	212	199	199	204	203	208

SEP. 2003 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2003 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	38	O X 40	A	A	43	R	R	R	R	68	R	O X 62	O X 71	X 71	X 72	X 73	X 73	X 73	O X 68	X 61	X 55	44	36	O X 44
2	41	A	O X 44	A	94	39	A	R	O X 40	X 55	X 57	X 59	O X 66	O X 69	X 64	X 61	R	X 63	X 58	X 50	58	X 45	32	A
3	A	B	A	R	Y	A	60	A	B	B	B	O X 43	R	B	B	B	O X 48	O X 50	O X 51	X 46	33	A	A	A
4	A	35	A	A	A	A	A	X 41	X 54	X 54	B	B	B	B	O X 66	X 65	O X 70	B	X 59	X 61	X 55	X 44	42	35
5	35	36	39	40	38	46	O X 45	B	B	B	O X 71	X 78	X 80	O X 88	X 87	X 83	X 81	X 77	X 69	X 66	X 54	X 39	36	34
6	56	52	R	A	O X 43	R	A	O X 54	X 57	X 56	X 57	X 62	X 65	X 69	X 66	X 66	X 70	X 69	X 67	X 65	X 52	32	A	48
7	A	A	A	A	A	B	B	R	O X 48	O X 54	O X 60	R	R	B	X 57	B	B	R	O X 56	X 52	40	B	29	A
8	B	38	B	A	B	A	O X 49	X 56	X 58	X 67	O X 69	X 75	X 80	B	O X 90	R	X 76	O X 72	X 70	X 63	O X 52	X 47	43	32
9	A	B	R	B	A	B	B	X 50	O X 55	B	B	X 60	X 60	X 60	X 64	X 60	X 60	X 68	X 63	O X 58	O X 52	X 49	X 50	42
10	41	40	38	48	55	53	59	O X 66	X 67	O X 70	X 79	O X 86	O X 86	X 82	X 80	X 82	X 78	X 72	X 73	X 61	X 62	X 51	50	48
11	40	39	A	O X 39	X 43	O X 44	X 48	X 58	X 63	X 66	X 72	X 78	O X 84	X 83	X 78	X 75	X 71	X 69	X 66	64	X 52	52	43	36
12	31	36	35	41	47	55	62	68	78	X 78	X 77	X 78	X 81	80	X 74	X 71	X 74	72	X 66	X 66	X 53	47	33	30
13	A	42	44	A	A	53	A	R	A	X 68	O X 71	X 72	X 72	O X 70	X 75	X 74	X 68	X 64	X 64	68	66	O X 47	O X 44	62
14	44	O X 40	A	B	B	O X 50	R	R	B	B	B	B	B	B	B	B	B	R	O X 49	O X 36	A	55	B	A
15	32	O X 43	B	A	O X 41	32	38	56	B	B	B	B	B	B	B	B	B	R	R	120	93	A	A	A
16	A	B	B	B	B	B	B	R	B	B	O X 45	B	B	B	B	B	B	O X 50	O X 44	O X 43	R	A	A	A
17	A	B	A	B	B	X 41	B	B	B	B	B	B	B	B	B	R	B	B	O X 49	X 45	O X 40	37	A	O X 37
18	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	X 55	B	O X 47	X 38	A	A	A	O X 41
19	A	X 40	A	A	B	O X 49	B	B	B	B	B	B	B	B	B	B	B	O X 42	90	X 38	66	33	A	X 36
20	A	B	A	A	52	O X 47	O X 45	R	R	B	B	B	B	B	B	B	O X 46	O X 41	B	92	X 44	O X 44	A	X 62
21	40	A	A	X 38	B	B	B	B	B	B	B	B	B	B	O X 67	O X 46	B	B	O X 40	R	X 37	48	B	A
22	A	B	A	X 32	X 42	A	B	B	B	B	B	B	B	B	B	B	B	R	O X 49	B	B	R	R	R
23	X 48	71	42	41	X 40	B	B	B	R	B	B	B	B	B	B	O X 64	X 60	R	O X 54	O X 50	O X 46	O X 46	O X 45	O X 48
24	O X 49	O X 48	O X 38	B	B	B	B	B	O X 76	B	O X 78	B	B	B	B	X 84	B	B	B	B	B	B	B	B
25	R	R	O X 39	O X 39	38	A	R	O X 43	R	B	B	R	R	R	R	X 50	O X 54	O X 44	R	O X 36	O X 34	38	O X 37	O X 34
26	58	O X 36	36	38	R	A	O X 40	50	X 58	O X 55	B	B	B	B	B	O X 47	O X 48	O X 54	X 56	O X 54	O X 50	X 48	B	B
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 39
28	O X 40	O X 34	O X 45	O X 40	O X 45	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	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	14	16	10	10	13	11	9	10	11	11	11	11	10	9	13	15	16	16	22	23	21	19	13	17
MED	40	40	39	40	43	47	X 48	X 55	X 58	X 66	O X 71	X 72	X 76	X 71	X 72	X 66	X 69	X 66	X 58	X 58	X 52	X 46	42	39
U Q	48	42	O X 44	41	50	53	60	X 58	X 67	X 68	X 77	X 78	O X 81	X 82	X 79	X 75	X 74	X 72	X 67	65	56	X 48	X 44	48
L Q	38	36	38	X 38	40	41	O X 42	X 50	O X 54	X 55	X 57	X 60	X 66	X 69	X 65	X 60	O X 54	O X 50	O X 49	X 45	X 42	39	34	34

OCT. 2003 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2003 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 26	R 34	A	A	F	R	R	R	R	F 58	R	56	R 65	65	66	67	67	67	R 62	55	49	F 36	F 26	R 38
2	F 26	A	R 38	A	40	F 28	A	R	R 34	49	51	J R 53	60	63	58	J R 55	R	57	52	44	F 48	39	F 19	A
3	A	B	A	R	Y	A	F 26	A	B	B	B	R 37	R	B	B	B	R 42	44	45	40	F 26	A	A	A
4	A	F 26	A	A	A	A	A	35	48	48	B	B	B	B	R 60	59	R 64	B	53	55	49	38	F 32	F 25
5	F 26	F 26	F 26	F 27	F 27	F 36	R 39	B	B	B	R 65	J R 72	J R 74	R 82	81	77	75	J R 71	63	60	48	33	F 28	F 25
6	F 27	F 26	R	A	R 37	R	A	48	J R 51	J R 50	51	56	59	63	60	60	64	63	61	59	46	F 22	A	F 26
7	A	A	A	A	A	B	B	A	R 42	R 48	R 54	R	R	B	J R 51	B	B	R	R 50	46	F 30	B	F 20	A
8	B	F 28	B	A	B	A	43	50	J R 52	61	63	J R 69	J R 74	B	R 84	D R 68	J R 70	R 66	64	57	R 46	41	F 31	F 19
9	A	B	R	B	A	B	B	44	R 49	B	B	J R 54	J R 54	54	58	54	J R 54	62	57	R 52	R 46	43	44	F 34
10	F 31	F 29	F 25	F 40	F 35	F 36	F 46	U S 60	61	R 64	J R 73	R 80	R 80	76	J R 74	76	J R 72	J R 66	67	55	56	45	F 41	F 37
11	F 26	F 26	A	R 33	37	U R 38	42	52	57	60	66	72	78	77	J R 72	69	65	63	60	F 54	46	F 40	F 31	F 26
12	F 21	F 25	F 20	F 31	F 34	F 44	F 48	F 55	F 66	J R 72	71	72	75	F 67	J R 68	65	68	F 62	60	60	47	F 38	F 22	F 19
13	A	R 34	F 31	A	A	F 40	A	R	A	62	R 65	66	66	R 64	J R 69	68	62	58	58	A	A	R 41	R 38	36
14	F 26	R 34	A	B	B	R 44	R	R	B	B	B	B	B	B	B	B	B	R	R 43	R 30	A	F 26	B	A
15	F 20	R 37	B	A	R 35	F 24	F 29	34	B	B	B	B	B	B	B	B	B	R	R	F 69	F 88	A	A	A
16	A	B	B	B	B	B	B	R	B	B	R 39	B	B	B	B	B	B	R 44	R 38	R 37	A	A	A	A
17	A	B	A	B	B	35	B	B	B	B	B	B	B	B	B	R	B	B	43	39	R 34	F 28	A	R 31
18	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	J R 49	B	R 41	32	A	A	A	R 35
19	A	J R 34	A	A	B	R 43	B	B	B	B	B	B	B	B	B	B	B	R 36	F 50	32	F 22	F 18	A	30
20	A	B	A	A	F 39	R 41	R 39	R	R	B	B	B	B	B	B	B	R 40	R 35	B	R	38	R 38	A	56
21	F 32	A	A	32	B	B	B	B	B	B	B	B	B	B	R 61	R 40	B	B	R 34	A	31	F 26	B	A
22	A	B	A	J R 26	J R 36	A	B	B	B	B	B	B	B	B	B	B	B	R	R 43	B	B	R	R	R
23	42	F 26	F 26	F 25	34	B	B	B	R	B	B	B	B	B	B	R 58	J R 54	R	R 48	R 44	R 40	R 40	R 39	R 42
24	R 43	R 42	R 32	B	B	B	B	B	R 70	B	R 72	B	B	B	B	J R 78	B	B	B	B	B	B	B	B
25	R	R	R 33	R 33	F 28	A	R	R 37	R	B	B	R	R	R	R	J R 44	R 48	R 38	R	R 30	R 28	F 29	R 31	R 28
26	R 38	R 30	F 25	F 28	A	A	R 34	F 40	J R 52	R 49	B	B	B	B	B	R 41	R 42	R 48	J R 50	R 48	44	42	B	B
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 33
28	R 34	R 28	R 39	R 34	R 39	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	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	14	16	10	10	12	11	9	10	11	11	11	11	10	9	13	16	16	16	22	21	20	19	13	17
MED	F 26	28	F 28	32	36	F 38	39	46	R 52	58	R 65	R 66	70	65	R 66	62	R 63	60	51	48	46	38	F 31	31
U Q	R 34	R 34	R 33	R 33	38	R 43	F 44	52	61	R 62	R 71	R 72	75	76	R 73	68	68	R 64	60	56	48	41	38	36
L Q	F 26	F 26	F 25	F 27	F 34	F 35	F 32	37	R 48	49	51	J R 54	60	63	59	R 54	R 48	R 44	R 43	38	32	F 28	F 24	F 26

OCT. 2003 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2003 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	32	36	88	79	49	35	41	42	42	46	41	36	34	29	27	E B 32	E B 57	E B 26	E B 27	E B 18	E B 15	E S 12	E B 16	45
2	37	70	33	64	43	36	38	21	35	38	27	30	28	38	28	26	27	27	22	E B 16	E B 14	E B 14	32	37
3	48	B	39	23	20	47	36	36	B	B	B	21	E B 30	B	B	B	23	26	22	23	31	37	38	27
4	36	69	34	39	44	34	40	36	29	34	B	B	B	B	E B 30	27	E B 31	B	E B 26	E B 18	17	17	E B 15	E B 16
5	E B 14	17	23	29	E B 16	E B 15	E B 24	B	B	B	E B 31	E B 30	37	E B 35	E B 33	E B 30	39	23	18	E B 26	E B 16	E B 18	E B 15	31
6	42	48	41	50	40	36	42	35	26	27	34	32	30	39	36	32	31	29	31	23	E B 15	33	43	70
7	48	79	41	44	38	B	B	37	28	26	27	28	30	B	28	B	B	E B 30	E B 27	19	34	B	23	42
8	B	43	B	47	B	36	36	29	24	26	30	31	31	B	E B 73	E B 55	23	E B 34	E B 25	E B 20	E B 25	E B 14	E S 13	23
9	39	B	31	B	37	B	B	27	27	B	B	30	30	31	28	27	27	26	21	E B 26	E B 19	16	14	14
10	14	26	22	24	24	26	26	32	29	E B 31	E B 32	E B 33	40	29	30	39	26	E B 24	E B 25	18	E B 15	E B 16	E B 12	E B 13
11	E S 12	32	45	39	44	39	32	29	24	32	34	E B 58	E B 54	E B 33	28	28	26	27	26	18	E B 16	E B 13	E B 13	E S 13
12	18	23	22	39	31	21	21	28	31	31	29	31	30	32	28	31	26	24	23	20	16	16	28	33
13	42	39	54	67	44	32	41	39	56	37	32	34	30	30	28	34	25	24	28	44	44	50	48	48
14	39	98	76	B	B	35	31	31	B	B	B	B	B	B	B	B	B	36	40	E B 15	44	44	B	50
15	48	68	B	35	38	29	28	23	B	B	B	B	B	B	B	B	B	E B 28	26	74	49	60	56	44
16	71	B	B	B	B	B	B	41	B	B	E B 30	B	B	B	B	B	B	23	E B 29	E B 28	40	42	42	44
17	44	B	41	B	B	28	B	B	B	B	B	B	B	B	B	27	B	B	26	22	32	20	40	39
18	37	63	B	B	B	B	B	B	B	B	B	B	B	B	B	B	26	B	22	G 14	41	92	39	44
19	71	49	68	41	B	27	B	B	B	B	B	B	B	B	B	B	B	E B 30	E B 37	20	46	24	41	52
20	42	B	39	37	37	31	29	33	38	B	B	B	B	B	B	B	G 24	E B 29	B	27	37	46	50	60
21	40	66	35	56	B	B	B	B	B	B	B	B	B	B	E B 55	27	B	B	E B 30	36	40	75	B	40
22	39	B	41	32	78	59	B	B	B	B	B	B	B	B	B	B	B	33	26	B	B	33	36	36
23	32	70	62	38	E B 24	B	B	B	E B 31	B	B	B	B	B	B	34	G	E B 29	32	E B 30	E B 30	E B 28	E B 26	E B 22
24	E B 24	E B 25	E B 30	B	B	B	B	B	E B 56	B	E B 61	B	B	B	B	E B 57	B	B	B	B	B	B	B	B
25	31	29	26	42	26	44	36	33	G 28	B	B	35	36	35	33	31	29	27	32	G	24	22	22	20
26	37	31	G	27	32	73	35	26	29	30	B	B	B	B	B	33	32	28	24	23	19	17	B	B
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 25
28	22	24	33	E B 30	E B 30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	34	70
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	21	23	21	19	19	16	18	16	11	12	13	13	10	14	17	17	21	24	24	24	24	23	26
MED	38	43	39	39	37	35	36	32	28	31	31	30	30	31	28	30	26	26	25	20	26	22	32	38
U Q	42	68	45	48	44	39	39	36	36	37	34	34	36	35	33	34	31	30	30	26	40	43	41	45
L Q	31	28	30	31	26	28	28	28	28	27	30	30	30	30	28	27	G	25	24	E B 18	E B 16	E B 16	E B 15	E B 23

OCT. 2003 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2003 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	13	13	13	17	14	24	31	19	19	17	18	21	15	15	18	32	57	26	27	18	15	E S 12	16	13
2	14	18	31	36	13	10	12	13	14	13	17	14	14	15	13	15	15	13	16	16	14	14	13	12
3	15	B	20	14	15	14	12	15	B	B	B	19	30	B	B	B	17	13	15	14	13	13	11	13
4	12	12	28	24	14	22	15	14	16	14	B	B	B	B	30	16	31	B	26	18	13	12	15	16
5	14	E S 13	E S 13	12	16	15	24	B	B	B	31	30	25	35	33	30	16	14	16	26	16	18	15	11
6	12	11	16	14	13	20	17	16	15	13	13	13	14	13	15	13	12	12	12	12	15	15	13	11
7	12	20	28	18	15	B	B	19	16	14	15	16	22	B	21	B	B	30	27	12	12	B	12	15
8	B	12	B	16	B	21	15	13	14	13	13	16	15	B	73	55	20	34	25	20	25	14	E S 13	13
9	13	B	26	B	19	B	B	19	14	B	B	20	13	19	14	19	13	14	16	26	19	10	10	8
10	8	7	8	8	8	8	14	14	14	31	32	33	19	25	16	19	18	24	25	14	15	16	12	13
11	E S 12	12	14	14	12	12	13	13	14	14	14	58	54	33	14	14	17	15	12	10	16	13	13	E S 13
12	14	14	12	12	12	12	12	13	12	12	12	15	16	12	12	18	22	14	13	12	11	13	13	12
13	12	14	12	16	21	12	26	29	15	13	14	12	15	13	14	13	14	14	12	15	12	13	13	13
14	12	13	20	B	B	15	20	25	B	B	B	B	B	B	B	B	B	15	15	15	14	12	B	18
15	12	12	B	26	13	14	15	15	B	B	B	B	B	B	B	B	B	28	16	52	14	16	12	20
16	31	B	B	B	B	B	B	25	B	B	30	B	B	B	B	B	B	20	29	28	13	13	16	16
17	30	B	29	B	B	15	B	B	B	B	B	B	B	B	B	24	B	B	17	15	17	11	14	11
18	20	56	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	B	19	12	10	12	10	10
19	10	11	21	21	B	11	B	B	B	B	B	B	B	B	B	B	B	30	37	15	12	10	13	12
20	12	B	18	12	16	12	26	24	28	B	B	B	B	B	B	B	20	29	B	15	14	12	26	20
21	18	11	16	17	B	B	B	B	B	B	B	B	B	B	55	24	B	B	30	14	12	12	B	14
22	11	B	16	13	12	28	B	B	B	B	B	B	B	B	B	B	B	28	14	B	B	20	25	16
23	15	12	12	12	24	B	B	B	31	B	B	B	B	B	B	24	25	29	21	30	30	28	26	22
24	24	25	30	B	B	B	B	B	56	B	61	B	B	B	B	57	B	B	B	B	B	B	B	B
25	21	19	12	12	16	25	22	21	21	B	B	20	20	20	27	17	16	16	19	21	19	15	12	14
26	12	15	19	16	15	18	14	17	21	18	B	B	B	B	B	30	20	14	15	13	14	10	B	B
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	25
28	15	16	20	30	30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	29	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	14	16	20	18	19	22	31	25	56	B	B	B	B	B	B	55	31	28	21	18	15	14	15	14
U Q	B 24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B 37	B 52	B 30	B 28	B	B 22
L Q	12	12	14	14	14	14	15	15	15	14	18	20	19	25	18	19	17	14	15	14	13	12	13	12

OCT. 2003 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2003 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	230	E A 242	A	A	A	A	A	A	A	A	A	E A 270	232	222	222	E B 228	E B 282	E B 224	E B 230	214	208	S 208	E B 234	224
2	A 224	A	A	A	220	222	A	A	E A 242	216	210	260	226	222	214	222	A 238	E A 238	232	234	222	E B 280	A	A
3	A	B	A	A	A	A	A	A	B	B	B	Y	E B 228	B	B	B	E A 234	E A 254	E A 250	258	268	A	A	A
4	A	E A 270	A	A	A	A	E A 236	E A 292	240	272	B	B	B	B	232	216	B 240	B	220	220	208	224	220	E B 272
5	E B 284	E S 280	E S 286	E S 286	E B 330	298	E B 284	B	B	B	E B 254	B 214	E A 238	212	E B 212	228	220	216	Q 212	212	204	216	E B 244	E A 296
6	A	246	242	A	E A 246	A	A	A	236	218	204	204	202	210	210	A 218	196	222	218	Q 212	216	E A 292	A	E A 228
7	A	A	A	A	A	B	B	A	264	A 216	222	222	A 228	B	E A 226	B	B	E B 246	E B 244	Q 234	A	B	A	E A 244
8	B	A	B	202	B	A	A	E A 310	220	214	228	224	216	B	B	240	E A 232	E B 220	218	204	218	220	E S 234	A
9	A	B	A	B	A	B	B	294	Q 220	B	B	A 220	216	216	206	218	Q 218	220	222	212	220	Q 230	Q 226	Q 236
10	E A 266	288	316	340	318	248	Q 224	Q 226	196	B 228	214	212	Y	228	204	196	222	218	212	206	206	220	Q 218	Q 226
11	S 246	A	A	210	A	232	238	234	222	218	202	B	B	198	218	210	E A 218	232	218	212	216	Q 212	Q 230	Q 230
12	E S 276	E S 322	E S 310	E A 228	E A 302	Q 300	246	232	210	202	224	204	194	210	198	218	214	Q 216	Q 222	218	Q 222	234	E S 258	S 258
13	A	E A 260	238	A	A	208	A	A	A	216	208	212	226	216	210	230	206	230	244	A	A	226	222	222
14	192	194	A	B	B	A	A	A	B	B	B	B	B	B	B	B	B	A	A 290	E B 188	A	182	B	A
15	196	190	B	A	A	188	A 242	202	B	B	B	B	B	B	B	B	B	B 274	A	222	220	A	A	A
16	A	B	B	B	B	B	B	A	B	B	E B 210	B	B	B	B	B	B	242	E B 300	E B 298	A	A	A	A
17	A	B	A	B	B	E A 306	B	B	B	B	B	B	B	B	B	Y	B	B	E A 252	288	E A 310	E A 284	A	E A 258
18	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	232	B	Y 262	A 222	A	A	A	198
19	A	218	A	A	B	E A 296	B	B	B	B	B	B	B	B	B	B	B	B	E B 220	202	198	F	A	A
20	A	B	A	A	A	210	A	A	A	B	B	B	B	B	B	B	204	E B 270	B	A	A	234	A	E A 266
21	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	E A 262	B	B	B	A	E A 304	A	B	A
22	A	B	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	A	E A 254	B	B	A	A	A
23	A	F	A	202	E B 364	B	B	B	E B 248	B	B	B	B	B	B	A 248	244	E B 242	E A 238	E B 228	B 240	E B 254	E B 264	B 260
24	E B 272	E B 302	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
25	A	A	A 246	228	A	A	A	A 220	222	B	B	A	A	A 244	A	A 246	228	E A 280	A	A	A	A	E A 324	E A 332
26	218	210	A	222	A	A	A	E A 272	254	222	B	B	B	B	B	A 240	E A 236	E A 238	E A 248	E A 244	230	260	B	B
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 332
28	E A 386	A	E A 354	E B 340	E B 394	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	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	11	12	7	9	7	10	6	9	12	10	10	10	10	10	11	15	17	18	21	20	17	16	11	16
MED	U 219	U 222	U 264	219	E 318	U 228	238	227	225	217	211	215	221	216	211	225	223	226	225	216	218	223	E 234	U 237
U Q	E 276	E 284	316	E 313	E B 364	298	246	E A 293	245	222	224	224	A 228	222	222	A 240	237	E B 246	E A 251	234	235	E 257	E 258	E A 269
L Q	218	214	242	206	246	210	236	223	220	216	208	212	216	210	206	218	216	220	219	212	208	218	222	227

OCT. 2003 h'F (KM)

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2003 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	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 46	B	A	B
2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
7	A	A	B	B	B	B	B	B	B	B	B	O X 67	B	O X 69	O X 69	B	B	B	R	O X 46	B	O X 42	R	R
8	B	O X 43	B	R	B	B	B	B	B	O X 71	O X 70	O X 70	O X 72	O X 70	O X 68	O X 64	X 57	O X 54	O X 50	R	O X 46	O X 38	O X 63	R
9	A	R	R	O X 45	R	R	B	R	B	O X 45	R	B	B	B	B	B	B	B	B	O X 45	O X 47	A	A	A
10	O X 40	A	B	O X 42	O X 45	B	X 43	B	B	B	B	B	B	B	B	B	B	B	R	R	X	A	A	A
11	56	X 36	A 30	A	A	O X 38	A	R	B	B	B	B	B	B	X 79	B	B	B	B	B	R	O X 60	A	A
12	B	O X 41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 46	O X 48	96	O X 45	A	B	B
13	B	O X 41	B	B	B	B	B	B	B	B	B	B	B	B	B	R	B	B	B	R	55	X 41	X 38	A
14	O X 42	B	B	B	B	R	B	B	B	B	B	B	B	B	O X 66	B	B	R	O X 48	O X 47	O X 44	O X 43	B	B
15	O X 38	B	A	B	R	R	B	B	B	B	B	B	B	B	B	B	R	Y	O X 56	A	R	O X 41	A	A
16	B	A	B	B	B	R	65	B	B	B	B	B	B	B	B	O X 58	B	R	91	B	R	B	94	A
17	68	B	A	B	B	A	B	B	R	B	B	B	B	B	B	B	R	B	B	R	A	A	B	A
18	B	A	B	B	R	B	R	B	B	B	B	B	B	B	B	O X 70	R	B	R	X 56	O X 46	R	R	B
19	B	B	B	B	B	B	R	R	R	B	B	B	B	O X 72	O X 67	B	B	X 66	B	O X 50	X 48	O X 48	O X 45	A
20	A	A	X 52	B	49	B	O X 47	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
21	B	B	B	B	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	X 51	B	B	B	B
22	B	B	B	B	B	B	B	B	B	B	B	X 78	B	B	B	B	B	B	B	B	B	B	B	B
23	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R	O X 50	B	B	O X 49	O X 47	O X 48	R
25	B	O X 44	48	R	B	R	R	R	R	B	R	R	R	R	B	R	B	B	B	Y	X 44	X 45	X 45	X 47
26	X 48	R	X 40	42	R	R	A	A	R	R	R	R	R	B	Y	R	O X 69	X 59	B	O X 52	X 55	X 54	R	O X 47
27	O X 51	B	B	R	R	R	O X 55	R	B	B	B	B	O X 70	X 74	O X 70	O X 71	O X 69	O X 69	O X 64	R	X 65	X 62	X 61	X 42
28	48	X 46	X 57	X 58	O X 62	B	B	R	X 70	X 74	O X 72	O X 74	X 77	O X 72	R	X 78	X 80	X 76	B	B	R	X 60	X 64	X 64
29	X 59	X 64	O X 50	A	X 62	B	B	R	R	R	O X 70	O X 67	R	R	R	R	O X 70	B	O X 70	X 66	X 62	X 63	X 61	X 58
30	X 53	62	58	B	65	X 46	O X 46	R	X 65	O X 75	O X 67	O X 72	O X 70	O X 70	O X 72	X 72	X 72	X 74	X 65	R	R	82	60	R
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	8	7	4	5	2	5		2	4	4	6	4	6	7	6	6	8	8	9	13	14	10	5
MED	X 50	X 44	X 50	X 44	X 62	X 42	O X 47		X 68	O X 72	O X 70	O X 71	O X 71	O X 71	O X 69	O X 70	X 70	X 62	O X 60	O X 51	O X 47	X 48	X 60	X 47
U Q	56	X 54	57	X 52	64		60			X 74	O X 71	X 74	X 74	X 72	X 72	X 72	X 72	X 72	X 68	X 61	X 55	X 60	X 63	X 61
L Q	O X 42	O X 41	40	42	47		X 44			O X 58	O X 68	O X 67	O X 70	O X 70	O X 67	O X 64	X 69	O X 52	O X 49	O X 46	O X 46	O X 42	X 45	X 44

NOV. 2003 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2003 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 40	B	A	B
2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
7	A	A	B	B	B	B	B	B	B	B	B	R 61	B	R 63	R 63	B	B	B	D R 40	R 40	B	R 36	A	A
8	B	R 37	B	R	B	B	B	B	B	R 65	R 64	R 64	R 66	R 64	R 62	R 58	J R 51	R 48	R 44	R	R 40	R 32	R 57	R
9	A	R	R	R 39	R	R	B	R	B	R 39	R	B	B	B	B	B	B	B	B	R 39	R 41	A	A	A
10	34	A	B	R 36	R 39	B	37	B	B	B	B	B	B	B	B	B	B	B	R	R	A	A	A	A
11	J F 50	30	A	A	A	R 32	A	R	B	B	B	B	B	B	J R 73	B	B	B	B	B	R	R 54	A	A
12	B	R 35	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	40	R 42	R	R 39	A	B	B
13	B	R 35	B	B	B	B	B	B	B	B	B	B	B	B	B	R	B	B	B	R	F 31	35	32	A
14	R 36	B	B	B	B	R	B	B	B	B	B	B	B	B	R 60	B	B	R	R 42	R 41	38	R 37	B	B
15	R 32	B	A	B	R	R	B	B	B	B	B	B	B	B	B	B	R	Y	R 50	A	R	R 35	A	A
16	B	A	B	B	B	R	R 56	B	B	B	B	B	B	B	B	R 52	B	R	F 64	B	R	B	A	A
17	A	B	A	B	B	A	B	B	R	B	B	B	B	B	B	B	R	B	B	R	A	A	B	A
18	B	A	B	B	R	B	R	B	B	B	B	B	B	B	B	64	R	B	R	50	R 40	A	R	B
19	B	B	B	B	B	B	R	R	R	B	B	B	B	R 66	R 61	B	B	60	B	R 44	42	R 42	R 39	A
20	A	A	J R 46	B	F 36	B	R 41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
21	B	B	B	B	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	J R 45	B	B	B	B
22	B	B	B	B	B	B	B	B	B	B	B	J R 72	B	B	B	B	B	B	B	B	B	B	B	B
23	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R	R 44	B	B	R 43	R 41	R 42	R
25	B	R 38	F 40	R	B	R	R	R	R	B	R	R	R	R	B	R	B	B	B	Y	38	J R 39	J R 39	41
26	42	R	J R 34	F 32	A	R	A	A	A	R	R	R	R	B	Y	R	R 63	J R 53	B	R 46	49	48	R	R 41
27	45	B	B	R	R	R	R 49	R	B	B	B	B	R 64	68	R 64	R 65	R 63	R 63	R 58	R	59	56	55	36
28	F 38	40	51	J R 52	R 56	B	B	R	64	J R 68	R 66	R 68	J R 71	R 66	R	J R 72	J R 74	J R 70	B	B	R	J R 54	58	58
29	J R 53	58	R 44	A	56	B	B	R	R	R	64	R 61	R	A	R	R	R 64	B	R 64	60	56	57	55	52
30	47	F 51	F 48	B	F 56	40	R 40	R	59	R 69	61	R 66	R 64	R 64	R 66	66	66	68	59	R	R	Y	38	R
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	9	8	6	4	5	2	5		2	4	4	6	4	6	7	6	6	8	9	8	13	13	9	5
MED	42	38	45	R 38	56	36	R 41		62	R 66	64	R 65	R 65	R 65	R 63	R 64	R 64	R 56	U 54	R 44	40	R 41	42	41
U Q	J 48	46	48	R 46	56		R 52			R 68	R 65	R 68	R 68	66	R 66	66	66	R 66	62	48	46	54	56	55
L Q	R 35	R 35	40	34	38		38			R 52	62	R 61	R 64	R 64	R 61	R 58	R 63	R 46	R 42	R 40	38	R 36	38	38

NOV. 2003 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2003 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	77	B	34	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 31	B	35	B
2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
7	40	32	B	B	B	B	B	B	B	B	B	E B 55	B	E B 57	E B 54	B	B	B	E B 31	E B 30	B	E B 26	30	34
8	B	32	B	34	B	B	B	B	B	E G 27	28	34	28	32	G 22	34	34	23	22	36	21	30	35	35
9	39	33	35	54	32	40	B	32	B	E B 30	27	B	B	B	B	B	B	B	B	36	40	47	60	79
10	42	96	B	32	E B 28	B	E B 29	B	B	B	B	B	B	B	B	B	B	B	28	36	44	73	79	44
11	34	24	32	34	34	28	36	30	B	B	B	B	B	B	E B 54	B	B	B	B	B	35	66	88	78
12	B	31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 28	E B 29	34	34	93	B	B
13	B	32	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 33	B	B	B	E B 34	23	41	32	47
14	32	B	B	B	B	32	B	B	B	B	B	B	B	B	E B 36	B	B	33	30	29	24	29	B	B
15	66	B	33	B	23	32	B	B	B	B	B	B	B	B	B	B	33	19	E B 31	80	32	81	72	35
16	B	43	B	B	B	36	44	B	B	B	B	B	B	B	B	32	B	E B 33	62	B	42	B	38	43
17	40	B	39	B	B	56	B	B	25	B	B	B	B	B	B	B	E B 33	B	B	36	41	93	B	47
18	B	95	B	B	33	B	G	B	B	B	B	B	B	B	B	E B 57	29	B	37	29	38	40	33	B
19	B	B	B	B	B	B	37	38	35	B	B	B	B	E B 58	E B 56	B	B	E B 30	B	36	E B 25	G 34	30	60
20	57	48	22	B	26	B	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	38
21	B	B	B	B	34	35	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 30	B	B	B	B
22	B	B	B	B	B	B	B	B	B	B	B	26	B	B	B	B	B	B	B	B	B	B	B	B
23	B	47	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 36	24	33	B	B	E B 38	G	E B 36	33
25	B	28	32	33	B	34	27	38	34	B	38	33	31	28	B	28	B	B	B	26	29	38	43	24
26	37	41	30	29	36	30	44	40	40	G 35	30	29	39	B	23	31	31	28	B	23	24	23	28	35
27	35	B	B	35	30	32	35	35	B	B	B	B	30	E B 54	32	33	35	32	38	39	41	22	22	36
28	23	23	22	38	40	B	B	37	34	35	32	30	33	35	35	33	32	30	B	B	E B 30	39	33	E B 26
29	24	32	35	60	41	B	B	35	38	30	33	E G 32	38	60	32	32	32	B	37	31	E B 29	27	35	47
30	35	36	33	B	36	40	47	42	37	34	34	48	38	38	47	58	31	29	32	E B 30	20	21	46	41
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	14	16	11	9	12	11	10	9	7	6	7	8	7	8	10	11	10	11	11	17	20	19	18	18
MED	38	32	33	34	34	34	36	37	35	32	32	32	33	U 38	U 32	32	32	30	31	34	31	38	35	40
U Q	42	45	35	46	36	40	44	39	38	35	34	41	38	E B 58	E B 54	E B 36	33	33	37	36	39	66	46	47
L Q	34	32	30	32	29	32	G 27	34	34	E 30	28	30	30	34	32	32	31	28	29	30	24	27	32	35

NOV. 2003 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2003 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	21	B	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	31	B	20	B
2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
7	31	28	B	B	B	B	B	B	B	B	B	55	B	57	54	B	B	B	31	30	B	26	26	24
8	B	24	B	30	B	B	B	B	B	24	21	25	19	18	20	22	20	15	13	23	18	20	30	16
9	15	16	29	25	22	20	B	28	B	30	22	B	B	B	B	B	B	B	B	15	14	17	20	25
10	13	16	B	19	28	B	29	B	B	B	B	B	B	B	B	B	B	B	18	15	18	16	20	10
11	15	12	19	28	20	16	20	24	B	B	B	B	B	B	54	B	B	B	B	B	15	16	29	17
12	B	14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	28	29	15	15	40	B	B
13	B	14	B	B	B	B	B	B	B	B	B	B	B	B	B	33	B	B	B	34	20	15	18	25
14	20	B	B	B	B	22	B	B	B	B	B	B	B	B	36	B	B	19	24	26	13	21	B	B
15	13	B	19	B	14	21	B	B	B	B	B	B	B	B	B	B	28	15	31	52	25	15	14	20
16	B	12	B	B	B	25	19	B	B	B	B	B	B	B	B	18	B	33	25	B	14	B	13	12
17	20	B	19	B	B	32	B	B	15	B	B	B	B	B	B	B	33	B	B	20	16	20	B	14
18	B	54	B	B	20	B	29	B	B	B	B	B	B	B	B	57	25	B	18	20	16	20	27	B
19	B	B	B	B	B	B	26	27	28	B	B	B	B	58	56	B	B	30	B	17	25	16	16	15
20	18	16	13	B	16	B	25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	28
21	B	B	B	B	28	29	B	B	B	B	B	B	B	B	B	B	B	B	B	30	B	B	B	B
22	B	B	B	B	B	B	B	B	B	B	B	24	B	B	B	B	B	B	B	B	B	B	B	B
23	B	32	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	36	19	29	B	B	38	25	36	28
25	B	24	21	28	B	20	20	16	25	B	16	17	14	22	B	20	B	B	B	20	13	15	16	18
26	15	19	13	15	14	14	14	14	15	18	16	17	20	B	20	15	16	12	B	15	12	15	24	13
27	12	B	B	19	16	14	16	26	B	B	B	B	22	54	20	15	25	20	31	25	11	18	12	12
28	10	16	10	14	15	B	B	22	12	16	12	13	12	18	13	14	14	12	B	B	30	15	12	26
29	20	12	12	11	16	B	B	31	18	18	16	15	14	30	28	20	11	B	26	26	29	17	15	13
30	12	12	12	B	14	12	12	14	14	11	14	11	11	14	12	15	12	12	12	30	12	12	11	12
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	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	B	43	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	32	25	20	28	26
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	15	16	19	28	20	22	26	28	B	B	B	55	B	58	54	22	25	28	29	20	15	16	16	15

NOV. 2003 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2003 h'F (KM) 45°E MEAN TIME (G.M.T. + 3 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 288	B	A	B
2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
7	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 254	E B 254	B	E B 252	A	A
8	B	B	B	A	B	B	B	B	B	Y	Y	E A 294	206	238	212	A 270	A 234	210	236	A	E A 256	A	Y	A
9	A	A	A	E A 260	A	A	B	A	B	204	208	B	B	B	B	B	B	B	B	E A 262	A	A	E A 262	A
10	A	A	B	E A 298	A	B	E B 270	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A
11	324	E A 322	A	A	A	E A 270	A	222	B	B	B	B	B	B	B	B	B	B	B	B	A	E A 286	A	A
12	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	236	E B 238	A	216	A	B	B
13	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 254	B	B	B	E B 296	196	234	242	A
14	A	B	B	B	B	A	B	B	B	B	B	B	B	B	E B 254	B	B	A	E A 248	E A 266	266	E A 274	B	B
15	A	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	A 240	Y	E B 236	A	A	E A 304	A	A
16	B	A	B	B	B	A	A	B	B	B	B	B	B	B	B	218	B	E B 252	216	B	A	B	A	A
17	A	B	A	B	B	A	B	B	A	B	B	B	B	B	B	B	226	B	B	A	A	A	B	A
18	B	A	B	B	A	B	A	B	B	B	B	B	B	B	B	B	Y	B	A	232	A	A	A	B
19	B	B	B	B	B	B	A	A	A	B	B	B	B	B	B	B	B	242	B	A	E B 280	A	A 270	A
20	A	A	E A 290	B	E A 272	B	202	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
21	B	B	B	B	224	A	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 254	B	B	B	B
22	B	B	B	B	B	B	B	B	B	B	B	E B 398	B	B	B	B	B	B	B	B	B	B	B	B
23	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	222	212	E A 262	B	B	B	E A 268	B	A
25	B	E B 314	E A 326	A	B	A	A	A	E A 228	B	A	A 226	214	A	B	A	B	B	B	Y	E A 254	A	234	E A 270
26	A	A	A	A	A	A	A	A	A	A	A	A	A	B	Y	202	212	226	B	188	E A 228	234	A	A
27	226	B	B	A	A	A	A	A	B	B	B	B	Y	B	Y	E Y 228	Y	234	E A 258	A	236	244	E A 244	E A 246
28	A	228	A	A	E A 278	B	B	A	Y	Y	204	Y	Y	204	A 222	214	214	216	B	B	E B 246	268	258	270
29	270	210	E A 256	A	A	B	B	A	E A 236	A	A 208	Y	232	A	A	A	218	B	E A 266	E A 234	E B 238	E A 254	E A 240	244
30	252	A	A	B	262	A 208	208	A	E A 246	224	A 212	A	A 234	Y	Y	A	214	218	214	E B 240	196	Y	A 262	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	4	3	2	4	2	3	1	3	2	4	3	4	2	3	7	8	9	9	9	12	10	8	4
MED	261	271	E A 290	E A 279	267	239	205	222	E A 236	214	208	E A 294	223	221	217	218	216	226	E 238	E 254	E 242	E 261	A 247	252
U Q	297	E 318	E A 326		E A 275		E B 270		E A 246		A 210	E B 398	233		E B 254	254	A 230	E 247	E A 256	E A 264	E 261	E A 274	A 262	270
L Q	239	219	E A 256		243		202		E A 228		206	A 226	210		212	214	213	217	226	233	222	244	241	245

NOV. 2003 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2003 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	46	X 47	B	R	R	R	R	B	R	B	B	B	B	R	B	R	O X 64	B	O X 57	X 56	X 50	X 50	X 48
2	X 50	X 57	A	R	R	X 61	X 68	R	R	B	B	R	R	B	R	R	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	B	O X 68	O X 68	B	O X 71	R	O X 71	O X 70	R	B	R	O X 66	B	O X 53	O X 51	O X 45
5	R	O X 50	A	A	R	X 48	R	B	B	B	B	B	B	B	B	B	R	Y	B	B	R	R	O X 48	X 43
6	O X 44	B	B	B	R	R	B	B	R	R	B	B	B	B	R	B	R	O X 47	O X 51	R	O X 63	A	A	A
7	X 44	X 54	A	R	R	O X 41	O X 47	R	O X 54	O X 54	O X 56	X 57	B	B	B	R	O X 66	R	B	R	R	Y	43	A
8	41	48	48	A	R	X 39	R	B	B	B	R	R	B	B	B	X 66	R	X 58	O X 57	O X 50	O X 48	R	X 42	B
9	A	A	A	B	R	B	B	B	B	B	B	B	B	B	B	B	R	R	R	O X 54	O X 51	O X 50	R	R
10	47	B	40	B	O X 43	B	B	B	B	B	B	B	B	B	B	O X 73	R	R	R	R	A	45	52	A
11	B	A	A	X 36	B	R	B	B	R	B	B	B	B	B	B	B	B	R	O X 46	O X 50	A	O X 49	A	A
12	R	41	B	B	B	49	B	B	B	B	B	B	B	B	B	B	B	B	O X 47	O X 52	O X 50	O X 51	O X 47	R
13	B	A	R	R	A	B	B	B	B	B	B	B	B	B	B	X 74	B	B	R	Y	R	O X 48	R	R
14	B	B	B	O X 40	B	B	B	B	B	R	R	Y	B	B	B	O X 74	Y	B	B	R	O X 48	92	55	B
15	B	O X 46	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 68	R	Y	R	O X 48	O X 52	X 43	O X 45	O X 45
16	R	R	B	B	B	B	R	B	O X 51	X 66	O X 66	O X 67	O X 68	O X 68	B	B	B	B	R	O X 44	O X 45	O X 46	O X 50	X 47
17	O X 44	O X 45	B	B	B	R	R	B	B	B	B	X 66	B	B	R	R	R	O X 67	X 60	O X 64	O X 55	B	49	X 50
18	X 48	O X 48	X 47	X 48	O X 50	R	X 64	X 68	B	B	X 66	O X 71	O X 69	O X 71	O X 70	O X 70	O X 70	O X 67	X 66	X 64	X 61	O X 54	X 56	X 58
19	X 56	X 58	62	X 64	X 69	79	94	X 94	X 98	X 92	O X 86	X 82	R	B	B	X 76	R	O X 67	R	A	X 64	X 65	X 63	X 59
20	X 62	X 58	B	X 58	X 58	X 69	X 80	X 92	O X 93	X 98	X 95	O X 86	X 91	X 90	O X 85	X 78	X 77	O X 64	X 58	R	O X 69	R	A	X 40
21	A	48	56	79	A	A	R	R	O X 50	R	B	B	B	B	B	R	O X 65	B	O X 48	Y	R	O X 52	O X 49	A
22	B	B	X 47	O X 42	R	B	B	B	R	A	R	R	B	B	O X 70	B	B	B	B	O X 52	R	O X 50	O X 53	A
23	54	B	B	B	R	B	B	R	O X 69	X 63	O X 70	X 67	R	O X 68	O X 68	O X 68	X 51	B	O X 50	X 49	X 50	O X 52	O X 54	X 55
24	R	B	R	R	R	R	O X 66	R	68	X 80	X 78	O X 71	O X 69	R	R	R	R	O X 65	X 60	O X 55	R	O X 53	O X 49	O X 53
25	O X 56	B	A	X 56	R	B	X 70	X 81	X 90	X 90	O X 87	O X 90	B	Y	X 79	X 80	X 78	O X 70	X 64	O X 54	X 57	X 62	B	X 56
26	X 58	X 63	X 63	O X 63	R	R	R	R	B	R	R	X 62	O X 62	R	O X 68	O X 69	O X 68	O X 67	O X 68	X 62	X 56	X 55	X 52	X 52
27	X 53	X 61	44	A	X 62	X 58	R	R	R	O X 56	R	O X 62	R	Y	O X 62	X 68	O X 66	O X 66	X 64	X 57	R	X 63	X 50	O X 51
28	O X 66	117	B	R	O X 54	X 58	R	R	R	R	B	R	R	R	B	B	O X 62	B	R	O X 52	R	A	R	R
29	X 44	B	R	R	O X 46	O X 51	X 64	O X 71	O X 64	X 65	O X 66	R	R	O X 64	O X 68	O X 71	X 66	X 65	X 65	R	O X 51	O X 53	X 50	X 47
30	X 51	X 52	X 50	R	R	R	R	X 62	X 70	X 77	X 77	O X 70	O X 71	O X 70	X 67	X 71	O X 68	O X 63	O X 70	X 66	R 64	X 48	O X 48	48
31	R	X 58	50	B	O X 47	B	R	X 59	66	X 65	X 68	O X 65	X 62	O X 67	B	B	B	X 71	O X 53	R	115	A	B	60
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	16	17	11	9	8	10	8	7	11	12	12	13	8	7	10	15	11	14	16	18	18	21	21	17
MED	X 50	X 52	48	X 56	O X 52	X 54	X 67	X 71	O X 68	X 67	O X 69	O X 67	O X 69	O X 68	O X 69	O X 71	O X 66	O X 66	O X 59	O X 54	O X 56	O X 52	X 50	X 50
U Q	X 56	X 58	56	X 64	X 60	X 61	X 75	X 92	X 90	X 85	X 82	O X 76	O X 71	X 71	O X 71	X 74	X 70	O X 67	X 64	X 62	X 63	X 54	X 52	X 56
L Q	X 44	47	47	O X 41	O X 46	X 48	X 64	X 62	O X 54	X 64	O X 66	X 64	O X 65	O X 67	O X 68	X 68	O X 65	O X 64	O X 50	O X 50	O X 50	X 48	O X 48	X 46

DEC. 2003 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2003 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	F 37	41	B	R	R	R	R	B	R	B	B	B	B	R	B	R	R 58	B	U R 51	50	44	44	42
2	44	J R 51	A	R	R	J R 55	62	R	R	B	B	R	R	B	R	R	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	B	R 62	R 62	B	R 65	R	R 65	R 64	R	B	R	R 60	B	R 47	R 45	R 39
5	A	R 44	A	A	R	42	R	B	B	B	B	B	B	B	B	B	R	Y	B	B	R	R	R 42	37
6	R 38	B	B	B	R	R	B	B	R	R	B	B	B	B	R	B	R	R 41	R 45	R	R 57	A	A	A
7	38	48	A	R	R	R 35	R 41	R	R 48	R 48	R 50	J R 51	B	B	B	R	R 60	R	B	R	R	Y	F 33	A
8	F 30	F 29	F 38	A	R	33	R	B	B	B	R	R	B	B	B	J R 60	R	52	R 51	R 44	R 42	A	36	B
9	A	A	A	B	R	B	B	B	B	B	B	B	B	B	B	B	R	R	A	R 48	U R 45	44	R	R
10	F 34	B	F 30	B	R 37	B	B	B	B	B	B	B	B	B	B	R 67	R	R	R	R	A	F 35	F 39	A
11	B	A	A	J R 30	B	A	B	B	R	B	B	B	B	B	B	B	B	R	R 40	R 44	A	R 43	A	A
12	R	F 29	B	B	B	F 38	B	B	B	B	B	B	B	B	B	B	B	B	R 41	R 46	R 44	R 45	R 41	R
13	B	A	R	R	A	B	B	B	B	B	B	B	B	B	B	68	B	B	R	Y	R	R 42	R	A
14	B	B	B	R 34	B	B	B	B	B	R	R	Y	B	B	B	R 68	Y	B	B	R	R 42	A	F 30	B
15	B	R 40	B	B	B	B	B	B	B	B	B	B	B	B	B	R 62	D R 39	Y	R	U R 42	R 46	37	R 39	R 39
16	A	A	B	B	B	B	R	B	R 45	60	60	R 61	R 62	R 62	B	B	B	B	R	R 38	R 39	40	R 44	41
17	R 38	R 39	B	B	B	R	R	B	B	B	B	60	B	B	R	R	R	R 61	J R 54	58	R 49	B	F 39	44
18	42	R 42	41	42	R 44	R	J R 58	62	B	B	60	R 65	63	R 65	R 64	R 64	64	61	60	58	J R 55	R 48	50	J R 52
19	50	J R 52	F 54	58	63	F 67	F 77	88	92	J R 86	R 80	J R 76	D R 60	B	B	J R 70	D R 61	R 61	R	A	58	59	57	53
20	56	52	B	J R 52	J R 52	63	J R 74	J R 86	R 87	92	89	R 80	J R 85	J R 84	R 79	72	J R 71	R 58	52	R	R 63	R	A	34
21	A	F 34	F 44	R 40	A	A	R	R	R 44	R	B	B	B	B	B	R	R 59	B	R 42	Y	A	R 46	R 43	A
22	B	B	41	34	A	B	B	B	R	A	R	R	B	B	R 64	B	B	B	B	R 46	R	R 44	R 47	A
23	F 32	B	B	B	R	B	B	A	R 63	J R 57	R 64	61	R	R 62	R 62	62	J R 45	B	R 44	J R 43	44	R 46	R 48	49
24	R	B	R	R	R	R	R 60	R	F 58	74	J R 72	R 65	R 63	R	R	R	R	59	J R 54	R 49	R	R 47	R 43	R 47
25	U R 50	B	A	50	R	B	64	75	84	84	R 81	R 84	B	Y	J R 73	J R 74	J R 72	64	58	R 48	J R 51	56	B	50
26	52	57	57	R 57	R	R	R	R	B	R	R	56	R 56	R	R 62	R 63	R 62	R 61	R 62	56	50	49	46	46
27	47	55	F 34	A	J R 56	52	R	R	R	R 50	R	R 56	R	Y	56	62	R 60	R 60	58	J R 51	R	57	44	R 45
28	U S 60	A	B	R	R 48	J R 52	R	R	R	R	B	R	R	R	B	B	R 56	B	R	U R 46	R	A	R	R
29	38	B	R	R	R 40	R 45	J R 58	R 65	R 58	59	R 60	R	R	R 58	R 62	64	60	59	59	R	R 45	R 47	J R 44	41
30	45	46	44	R	R	R	R	56	64	J R 71	J R 71	R 64	R 65	R 64	61	65	R 62	R 57	64	60	58	42	42	F 40
31	R	52	F 40	B	R 41	B	R	53	F 56	59	62	R 59	56	R 61	B	B	B	65	R 47	R	A	A	B	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	16	16	11	9	8	10	8	7	11	12	12	13	9	7	10	15	13	14	16	18	17	20	21	16
MED	43	45	F 41	R 42	R 46	48	R 61	65	R 58	61	R 63	R 61	63	R 62	R 63	R 64	R 60	R 60	R 53	R 48	R 49	46	43	43
U Q	50	52	F 44	R 54	J R 54	55	69	86	84	79	R 76	R 70	R 65	R 65	R 65	R 68	R 63	61	58	56	R 56	48	46	48
L Q	F 38	F 38	F 38	R 34	R 40	38	J R 58	56	R 48	R 58	60	R 58	R 58	R 61	62	62	R 58	R 58	R 44	R 44	R 44	42	F 39	40

DEC. 2003 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2003 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	43	36	66	B	35	34	31	32	B	36	B	B	B	B	31	B	30	28	B	27	30	23	27	27
2	22	32	95	42	39	38	32	39	41	B	B	36	31	B	32	31	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	B	E B 56	31	B	34	36	36	38	36	B	32	E B 44	B	E B 26	E B 26	32
5	39	39	58	41	34	E B 26	40	B	B	B	B	B	B	B	B	B	35	24	B	B	34	40	49	36
6	36	B	B	B	36	30	B	B	42	37	B	B	B	B	32	B	E B 37	26	36	40	60	39	38	36
7	41	79	119	38	30	33	34	39	38	33	32	30	B	B	B	29	24	E B 36	B	42	38	22	40	48
8	46	86	40	43	38	31	30	B	B	B	31	30	B	B	B	32	36	35	32	23	34	47	57	B
9	38	49	36	B	31	B	B	B	B	B	B	B	B	B	B	B	31	29	39	28	39	40	40	33
10	71	B	50	B	36	B	B	B	B	B	B	B	B	B	B	E B 35	30	32	18	37	101	32	31	61
11	B	39	42	30	B	37	B	B	28	B	B	B	B	B	B	B	B	34	E B 34	41	48	35	52	62
12	36	31	B	B	B	G 30	B	B	B	B	B	B	B	B	B	B	B	B	42	30	43	38	41	34
13	B	43	31	32	58	B	B	B	B	B	B	B	B	B	B	26	B	B	31	22	39	35	34	37
14	B	B	B	34	B	B	B	B	B	G	26	27	B	B	B	E B 32	27	B	B	40	G 18	73	34	B
15	B	34	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 56	32	24	30	35	42	G 24	36	31
16	39	37	B	B	B	B	38	B	E B 36	E B 38	27	E B 56	G 28	E B 39	B	B	B	B	G	E B 30	E B 26	26	26	33
17	33	35	B	B	B	37	38	B	B	B	B	E B 54	B	B	33	32	32	26	27	27	G	B	22	21
18	21	30	25	30	36	34	32	29	B	B	32	28	34	33	34	33	28	24	33	27	23	26	30	31
19	26	38	26	23	94	44	42	G 23	30	32	33	31	39	B	B	32	30	32	34	58	36	26	30	28
20	32	35	B	30	33	40	34	30	33	36	32	36	59	43	40	40	33	28	30	35	43	48	43	41
21	46	36	35	39	42	58	34	32	43	38	B	B	B	B	B	E B 34	30	B	28	23	G	42	47	95
22	B	B	37	94	39	B	B	B	32	42	37	33	B	B	E B 54	B	B	B	B	42	32	38	45	42
23	47	B	B	B	38	B	B	34	32	32	32	31	29	40	34	34	29	B	31	30	30	40	31	34
24	36	B	38	48	36	39	38	36	32	32	33	32	32	32	36	35	29	30	E B 31	27	34	24	22	E B 30
25	33	B	47	38	33	B	38	30	31	32	35	33	B	33	33	35	36	32	28	29	32	33	B	38
26	40	28	36	72	42	42	34	39	B	43	33	32	32	32	31	32	26	E B 54	32	33	26	33	30	28
27	31	37	61	42	67	36	33	34	32	43	29	33	31	22	33	29	E B 40	E B 32	27	28	27	28	35	22
28	45	72	B	39	40	40	33	32	27	37	B	E B 38	32	36	B	B	27	B	E B 33	33	29	92	42	40
29	33	B	35	36	24	34	G 24	29	32	27	36	37	G 24	37	36	38	43	53	30	28	37	23	24	35
30	34	43	33	32	36	41	37	33	28	36	24	32	34	39	42	38	44	42	48	62	58	32	77	48
31	37	35	60	B	37	B	42	42	30	32	30	31	31	33	B	B	B	E B 45	31	32	51	46	B	41
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	21	20	19	23	19	19	16	17	19	17	19	14	13	15	20	23	20	24	28	28	28	27	27
MED	36	37	39	38	36	37	34	32	32	34	32	32	32	34	34	33	30	30	31	30	34	34	35	35
U Q	42	43	59	42	40	40	38	38	37	38	33	E B 36	34	39	36	36	36	36	34	40	42	40	43	41
L Q	33	34	35	32	34	33	32	30	30	32	30	31	31	32	32	32	29	27	29	28	28	26	30	31

DEC. 2003 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2003 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	12	12	29	B	12	14	12	21	B	30	B	B	B	B	20	B	14	26	B	12	13	12	12	10
2	13	10	26	20	16	14	10	14	16	B	B	30	25	B	20	22	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	B	56	24	B	30	28	26	26	17	B	28	44	B	26	26	28
5	19	22	31	20	18	26	26	B	B	B	B	B	B	B	B	B	30	19	B	B	19	16	18	14
6	16	B	B	B	25	20	B	B	18	19	B	B	B	B	15	B	37	15	14	15	21	15	25	20
7	10	12	51	18	25	19	14	14	13	13	14	12	B	B	B	21	12	36	B	13	12	18	14	10
8	11	12	14	12	16	14	16	B	B	B	26	18	B	B	B	10	32	11	16	11	9	11	12	B
9	25	14	13	B	26	B	B	B	B	B	B	B	B	B	B	B	19	15	12	12	14	12	22	24
10	15	B	15	B	12	B	B	B	B	B	B	B	B	B	B	35	16	30	12	10	19	12	12	13
11	B	14	16	10	B	30	B	B	20	B	B	B	B	B	B	B	B	12	34	10	12	12	11	12
12	27	10	B	B	B	11	B	B	B	B	B	B	B	B	B	B	B	B	11	11	12	12	12	22
13	B	26	14	19	21	B	B	B	B	B	B	B	B	B	B	19	B	B	19	12	13	13	18	20
14	B	B	B	11	B	B	B	B	B	18	15	20	B	B	B	32	15	B	B	12	12	19	12	B
15	B	11	B	B	B	B	B	B	B	B	B	B	B	B	B	56	19	18	21	18	11	11	12	25
16	28	20	B	B	B	B	28	B	36	38	14	56	16	39	B	B	B	B	22	30	26	16	16	11
17	20	10	B	B	B	27	29	B	B	B	B	54	B	B	21	25	12	12	12	15	19	B	10	16
18	11	20	12	15	18	16	16	12	B	B	12	15	19	31	16	13	18	14	12	15	14	15	12	10
19	13	14	12	17	16	14	12	13	11	11	14	14	22	B	B	16	17	15	16	27	16	14	12	9
20	10	12	B	19	15	17	12	15	10	12	11	14	11	11	13	18	12	14	11	12	11	12	16	10
21	12	10	9	11	16	17	14	13	12	19	B	B	B	B	B	34	18	B	10	13	15	12	15	15
22	B	B	10	13	12	B	B	B	13	16	16	15	B	B	53	B	B	B	B	14	12	10	14	21
23	10	B	B	B	26	B	B	30	14	10	10	11	18	18	22	14	13	B	11	11	10	12	11	9
24	17	B	24	16	23	25	26	15	15	12	12	12	13	22	20	15	12	9	32	14	11	14	18	30
25	14	B	12	10	22	B	15	11	10	16	20	21	B	28	18	12	20	11	12	16	13	14	B	16
26	10	10	10	13	19	12	20	22	B	16	11	12	12	12	16	15	19	54	25	17	11	11	15	13
27	11	10	17	16	13	11	12	26	28	18	14	14	15	16	13	10	40	32	15	11	21	14	15	19
28	12	12	B	27	11	12	11	14	11	15	B	38	14	15	B	B	22	B	33	20	25	13	11	18
29	12	B	27	14	12	13	10	10	10	10	14	12	16	16	15	11	12	11	12	15	12	14	10	12
30	11	10	12	18	19	16	21	11	11	12	13	22	29	29	16	17	16	16	12	12	10	14	11	16
31	18	17	12	B	10	B	25	15	10	11	10	12	12	16	B	B	B	45	16	14	12	11	B	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	15	14	26	19	19	25	26	30	28	19	24	30	B	B	B	26	19	30	16	14	13	14	14	16
U Q	B 28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B 34	18	19	16	18	24
L Q	11	11	12	14	15	14	14	14	12	13	14	14	16	22	18	15	15	14	12	12	12	12	12	12

DEC. 2003 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2003 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	312	E A 318	B	A	A	A	A	B	A	B	B	B	B	A	B	200	E A 238	B	212	262	E A 240	E A 258	E A 258
2	E A 294	E A 266	A	A	A	E A 364	A	A	A	B	B	A	A	B	A	A	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	B	B	A 226	B	Y	A	A	Y	A	B	A 220	E B 282	B	238	E B 248	A
5	A	A	A	A	A	E B 246	A	B	B	B	B	B	B	B	B	B	200	Y	B	B	Y	A	A	212
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U Q	E A 262	274	E A 278	290	A 260	E A 318	232	230	E 247	222	204	210	216	216	266	225	E 221	E A 250	228	E 238	257	E A 250	254	E 250
L Q	226	236	242	217	188	234	218	208	198	199	188	188	204	208	221	206	202	210	206	210	210	214	208	227

DEC. 2003 h'F (KM)

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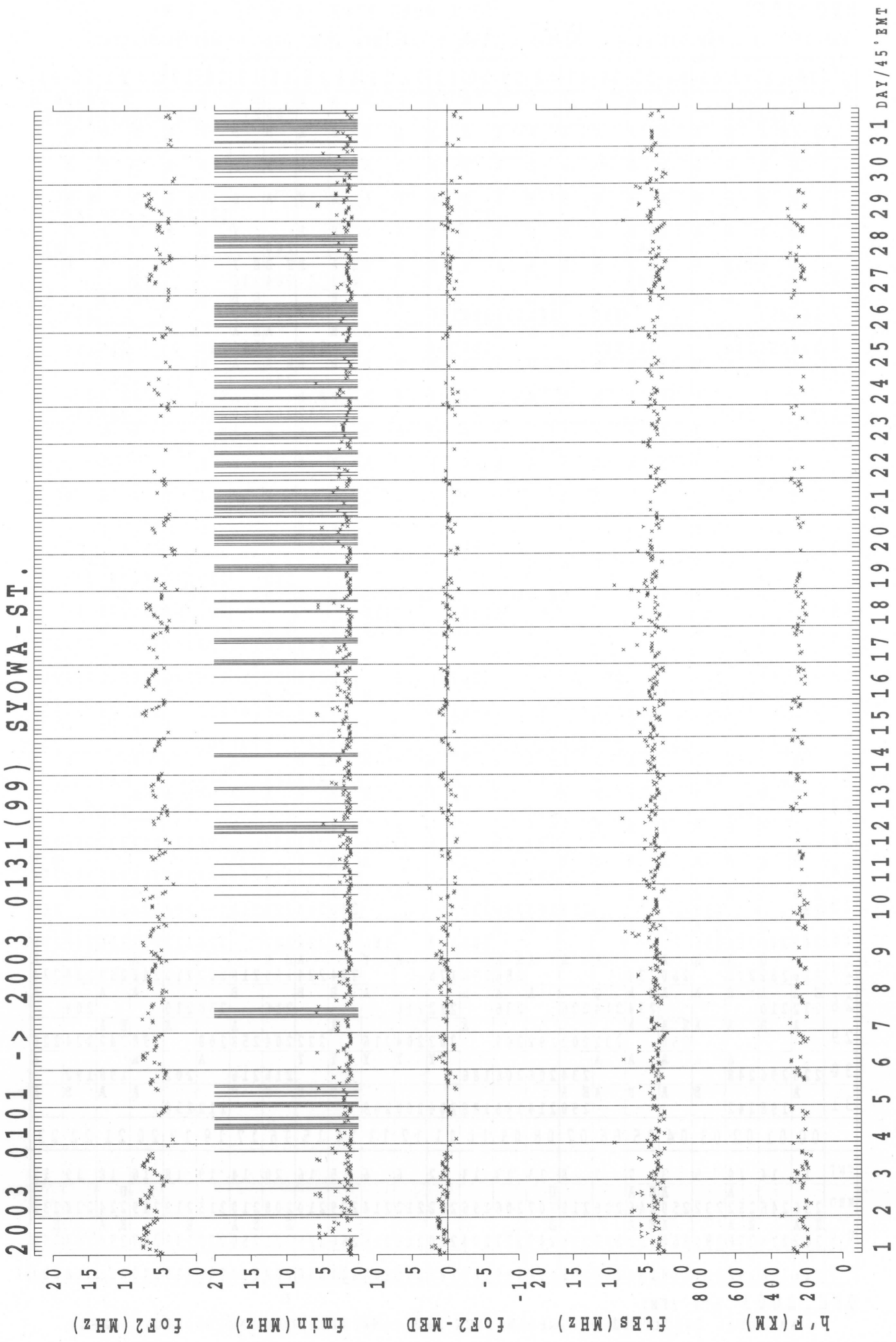
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fmin (MHz)
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ftEs (MHz)
h'F (KM)
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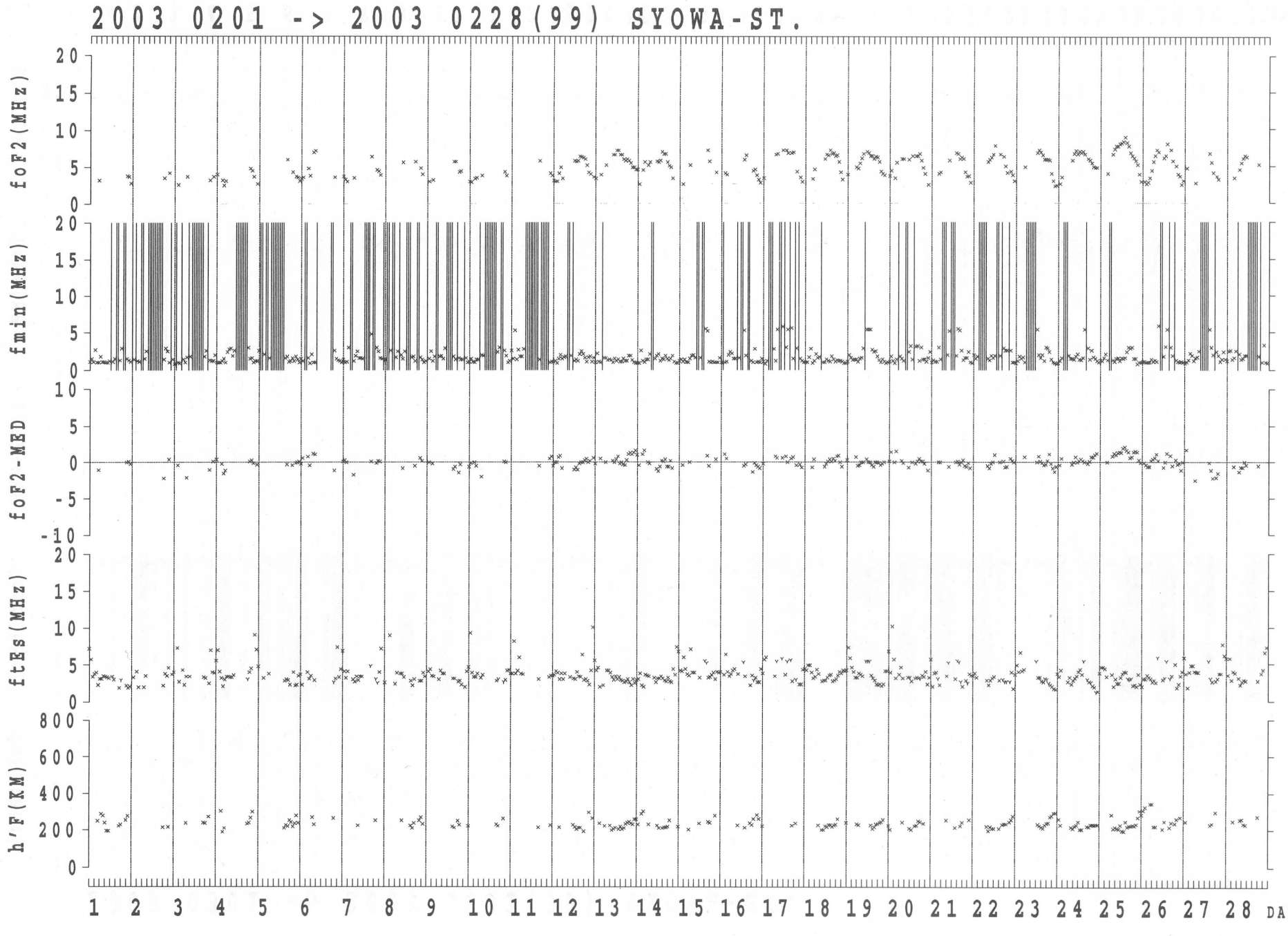
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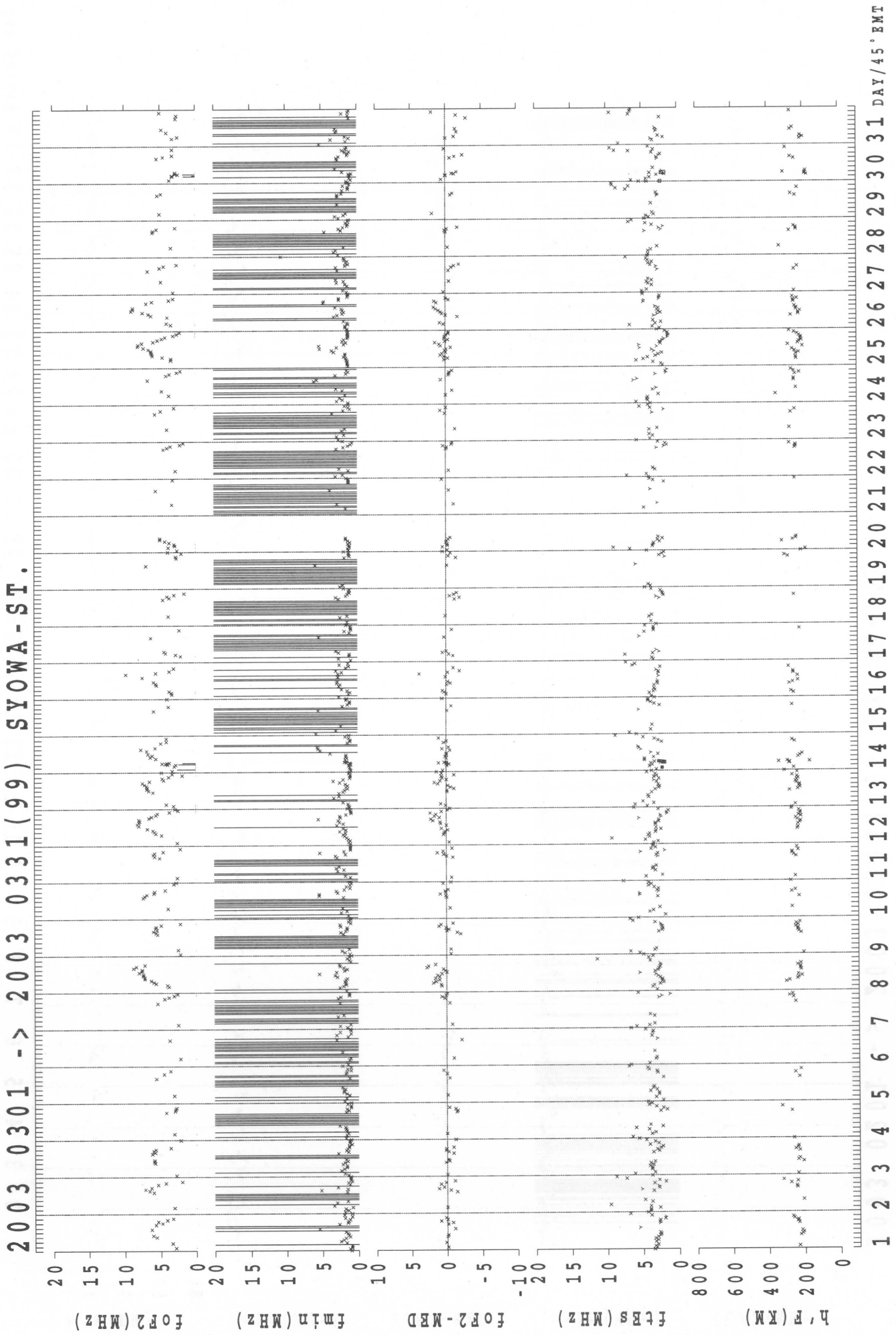
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2003 0401 -> 2003 0430(99) SYOWA-ST.
h'F(KM)
ftEs(MHz)
foF2-MED
fmin(MHz)
foF2(MHz)
DAY/45'EMT
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

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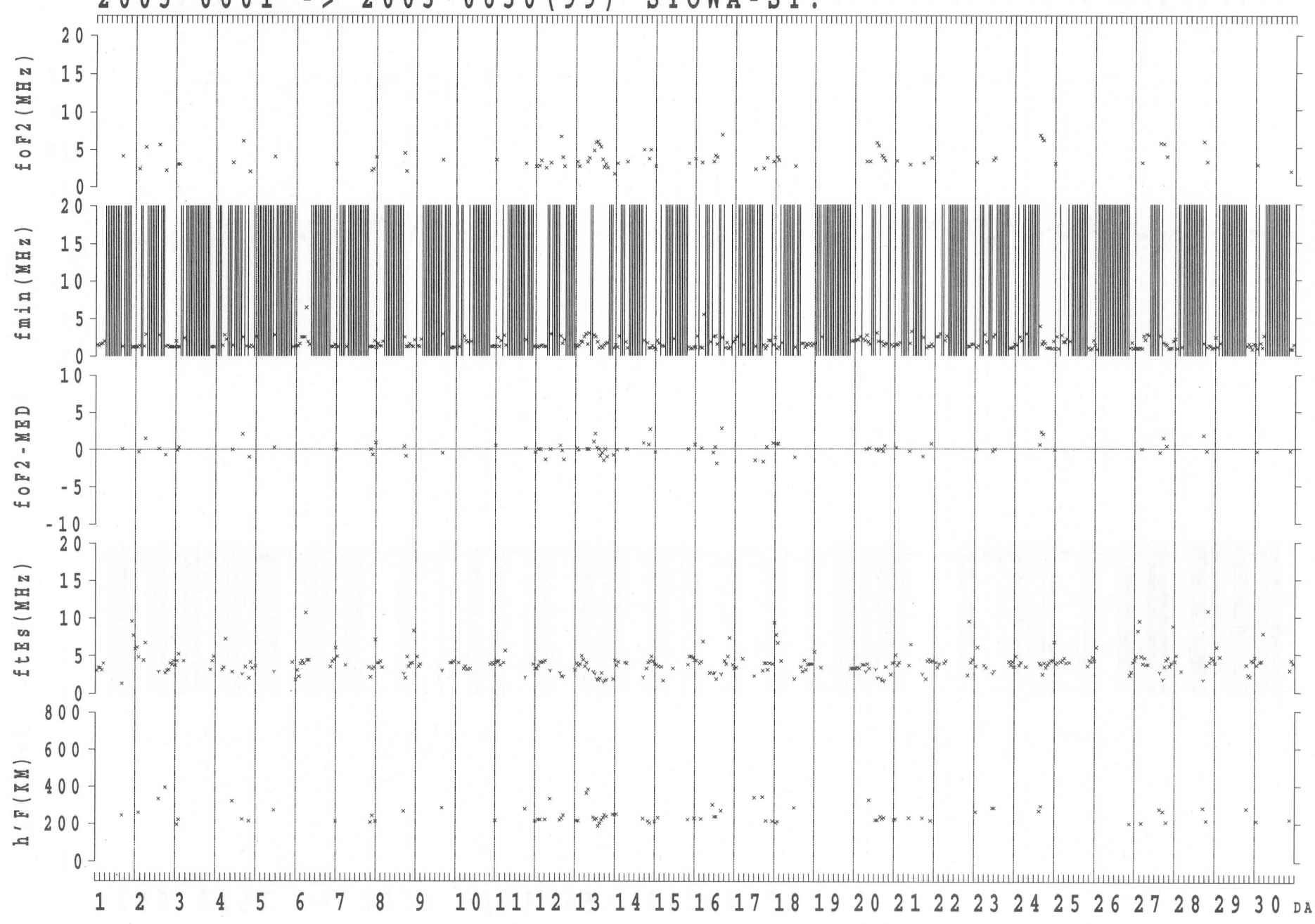
DAY/45'EMT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h'F(KM)
DAY/45°EMT

2003 0701 -> 2003 0731(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT

2003 0801 -> 2003 0831(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45'EMT
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
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10 5 0 -5 -10
20 15 10 5 0
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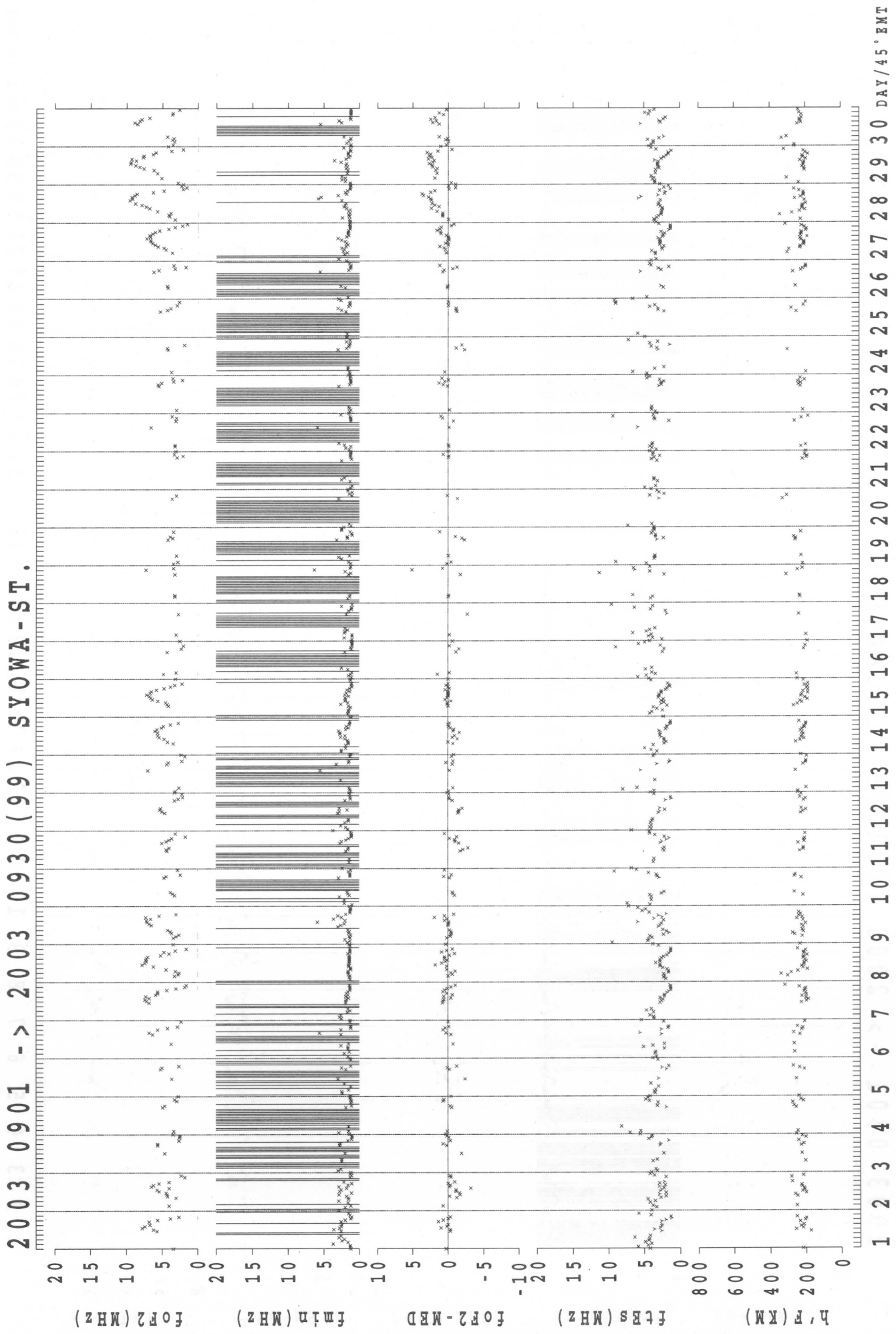
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DAY/45'EMT

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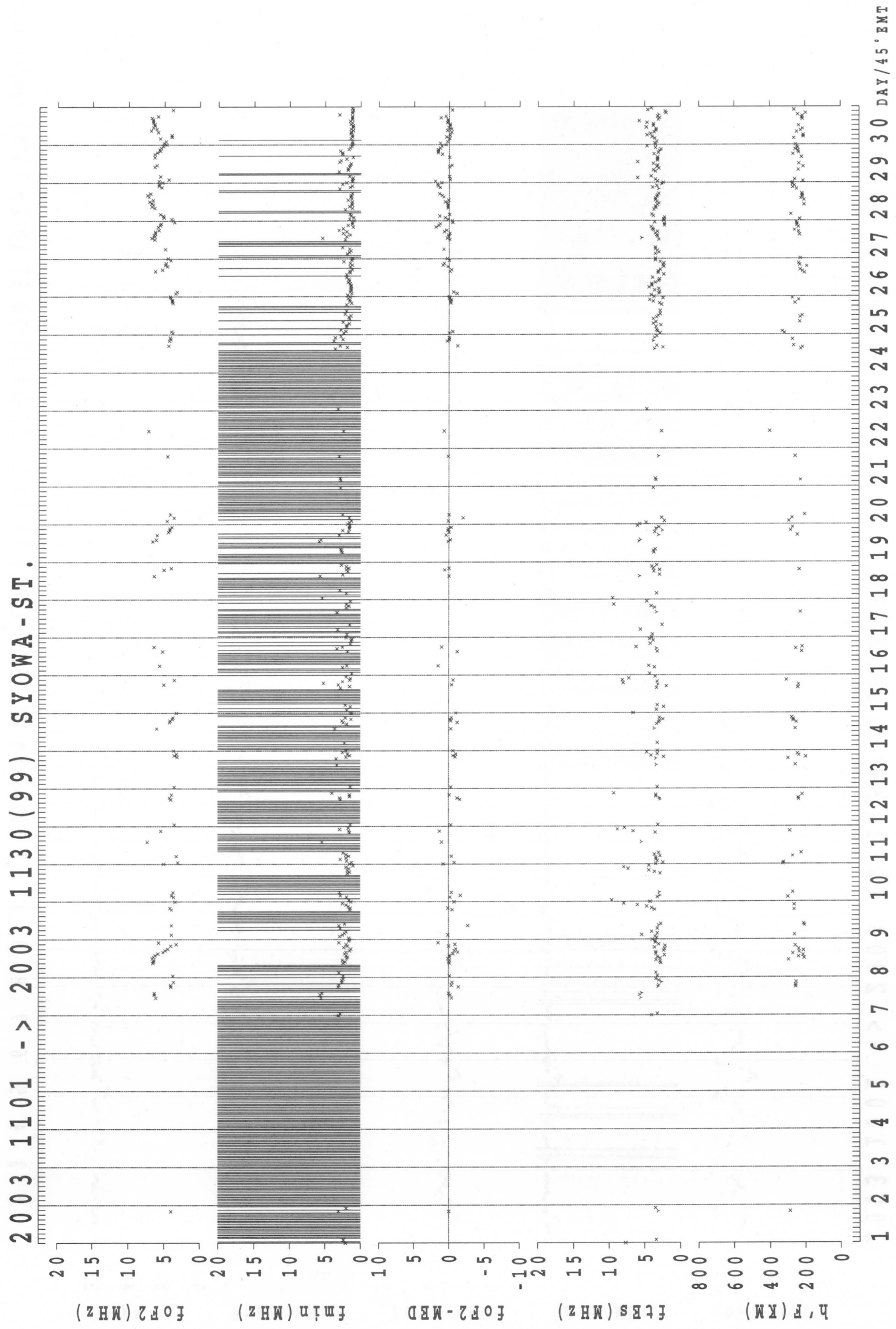
DAY/45'EMT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foF2-MED
fmin(MHz)
foF2(MHz)
DAY/45'EMT

2003 1201 -> 2003 1231(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
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DAY/45'EMT
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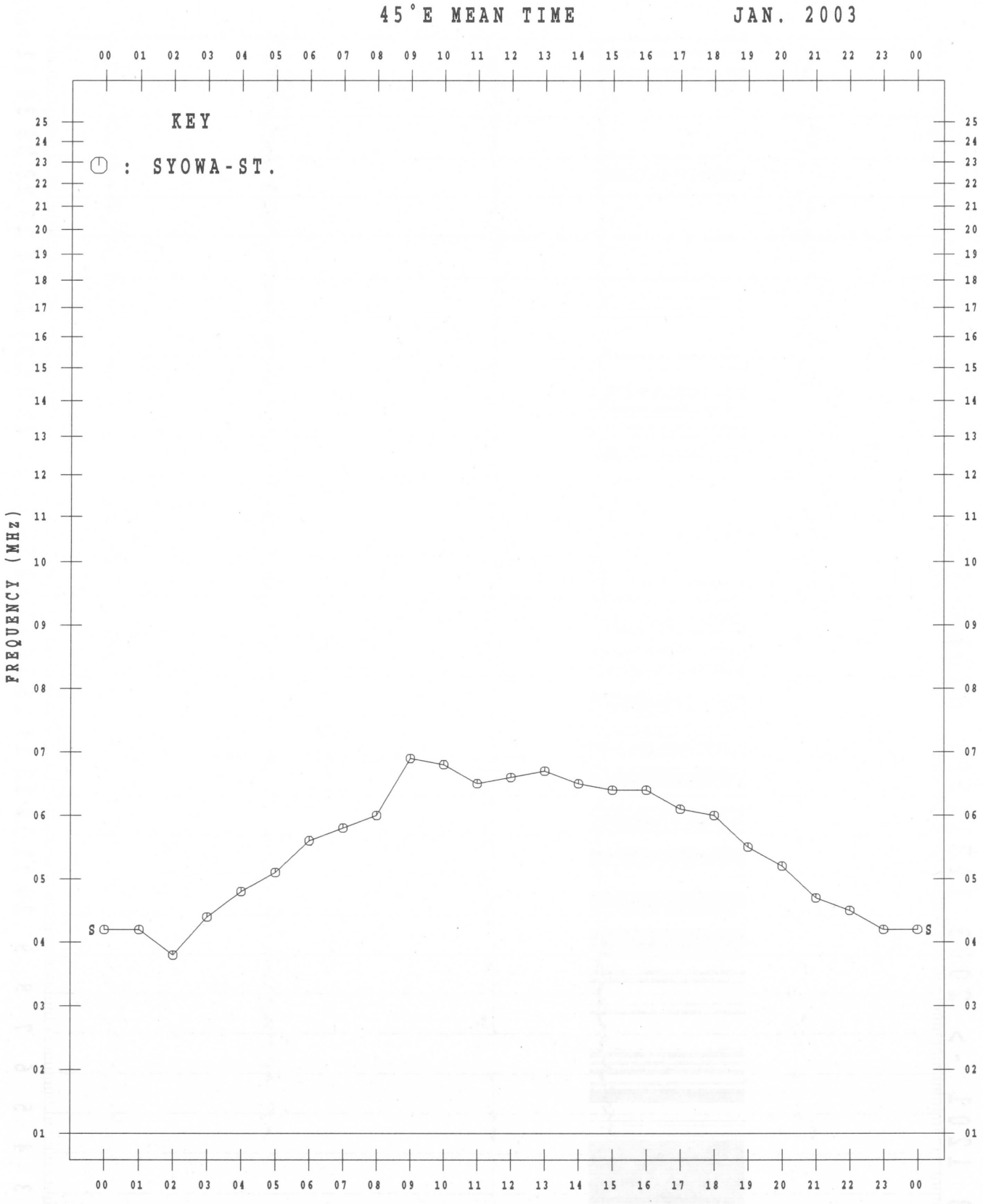
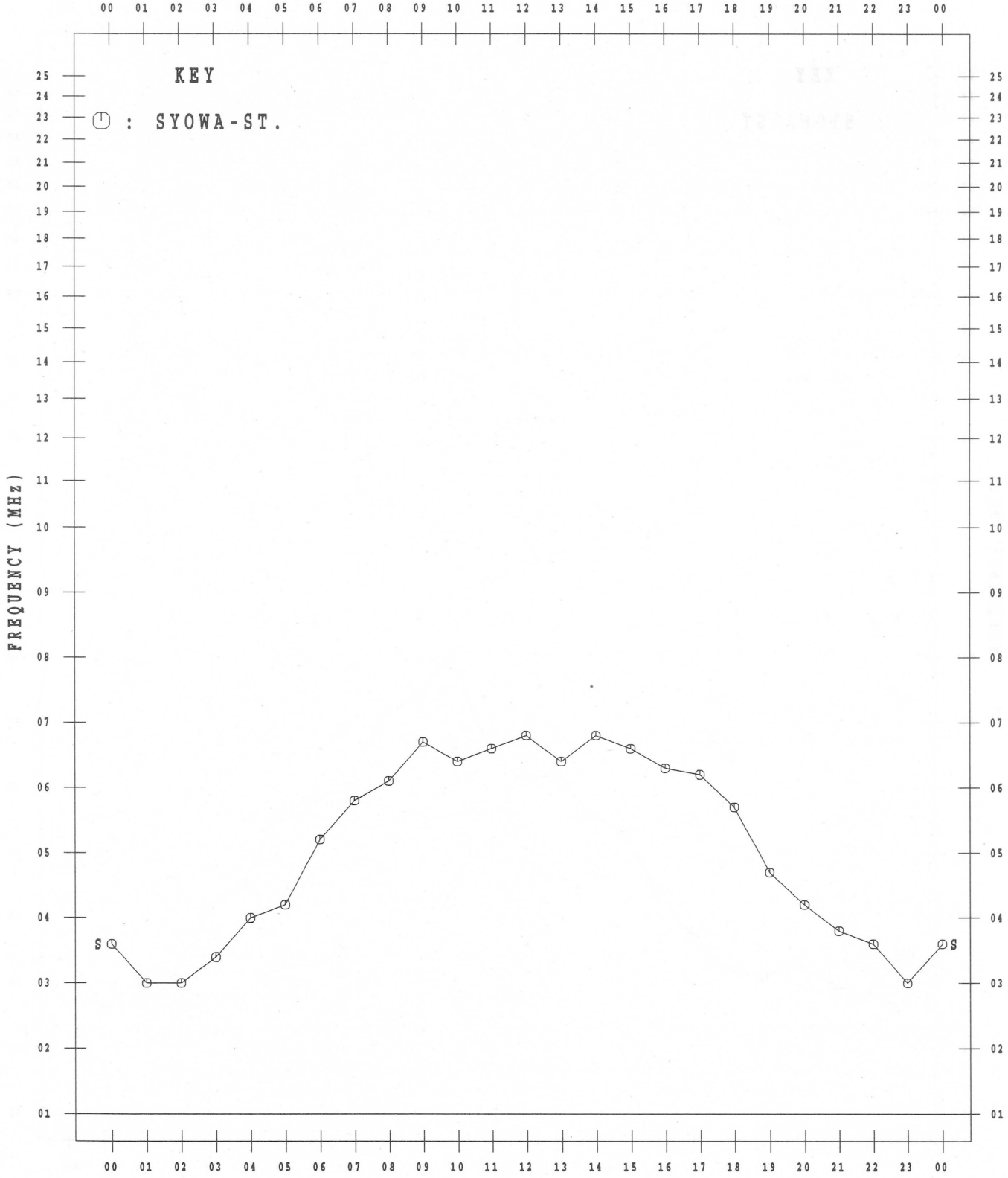
MONTHLY MEDIAN VALUES OF foF2



MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME FEB. 2003



MONTHLY MEDIAN VALUES OF foF2

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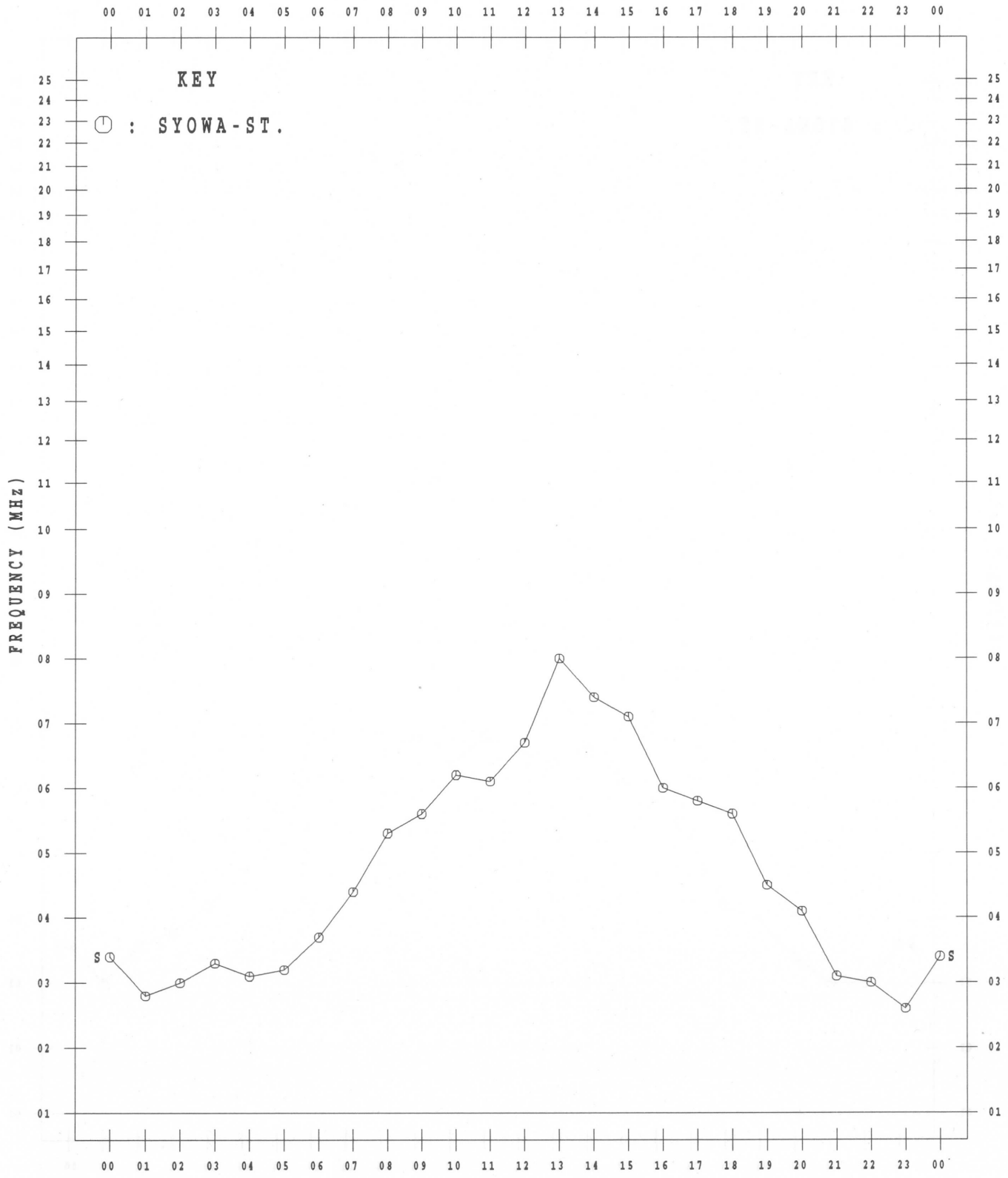
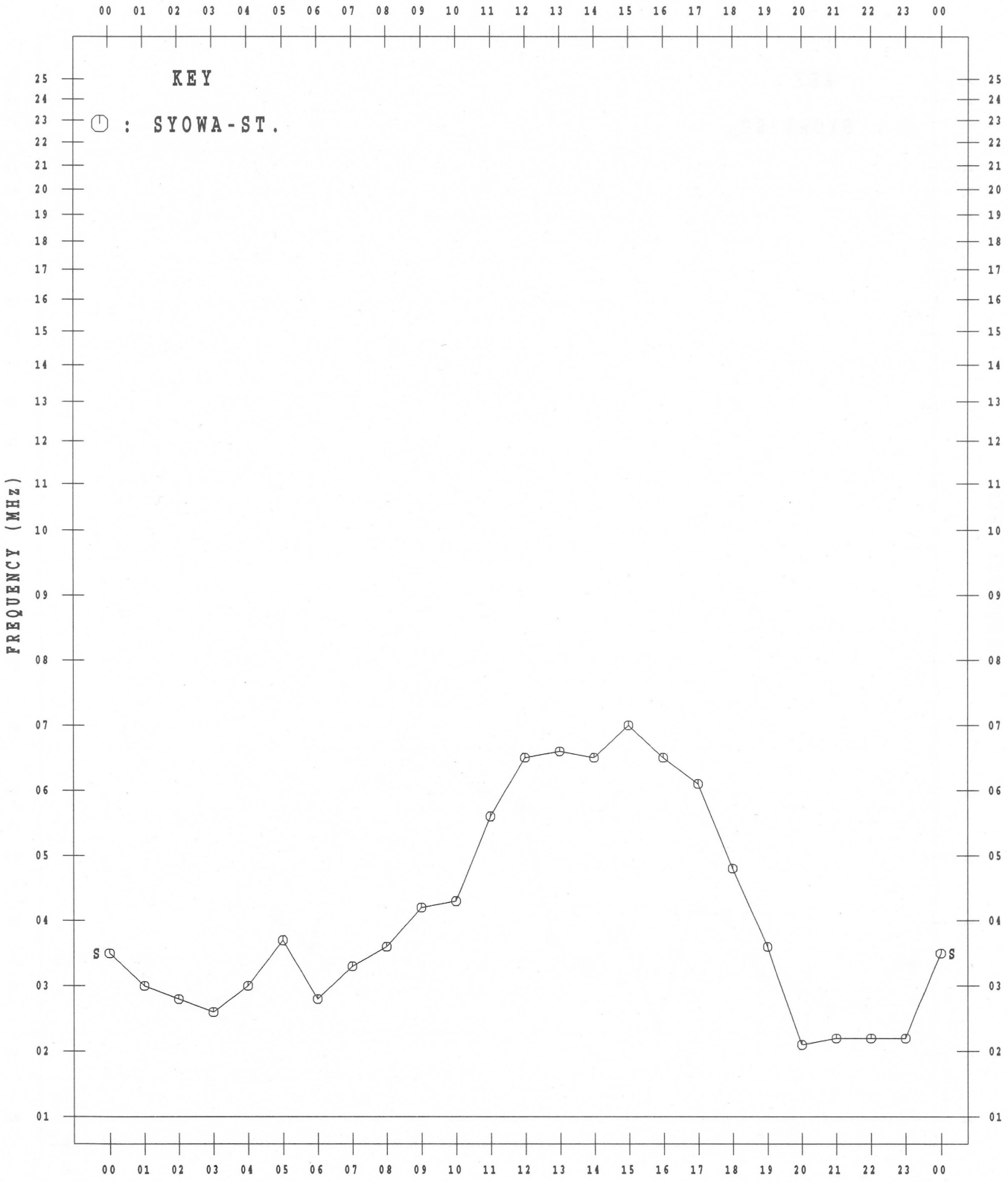


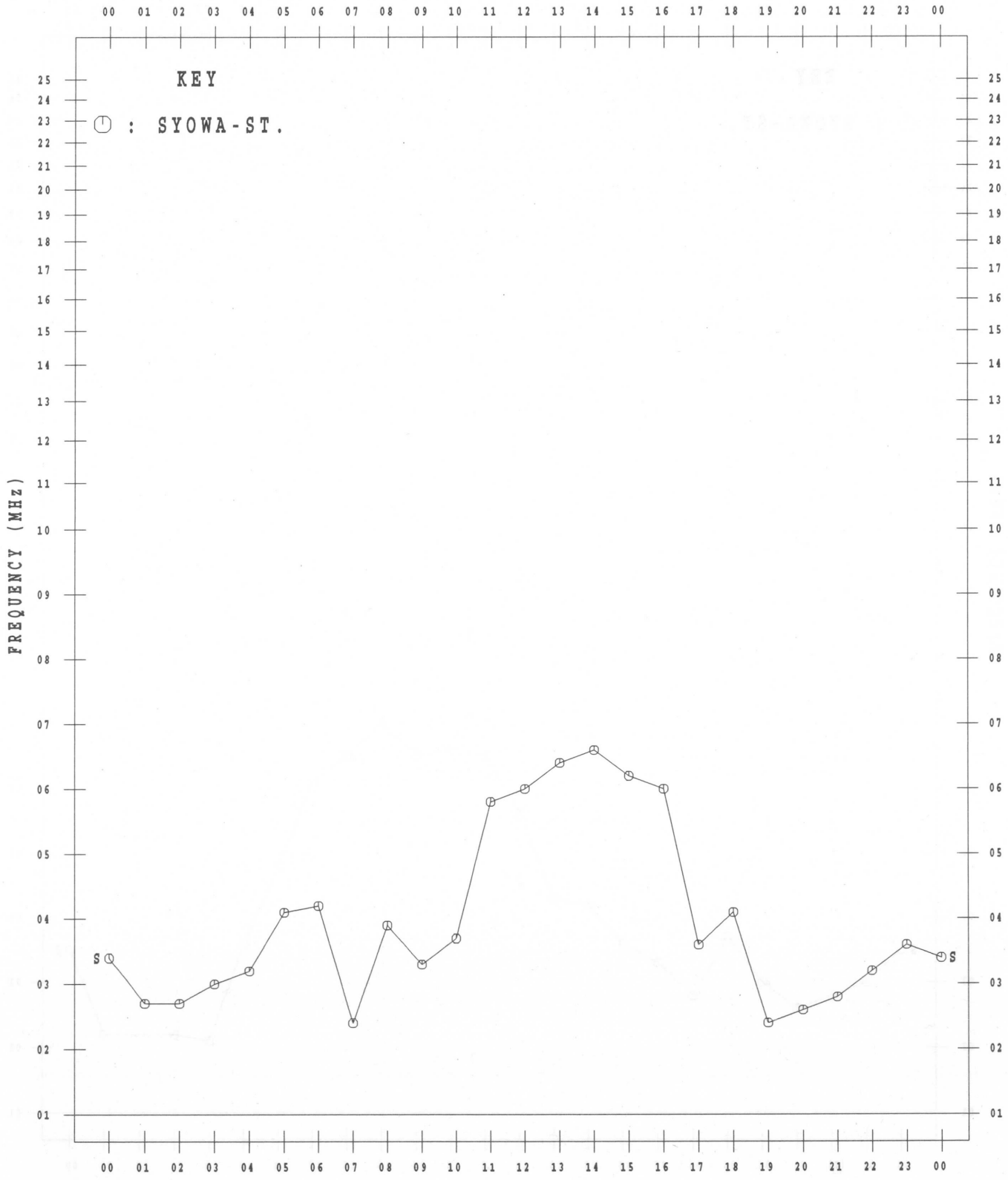
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME APR. 2003



MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME MAY 2003



MONTHLY MEDIAN VALUES OF foF2

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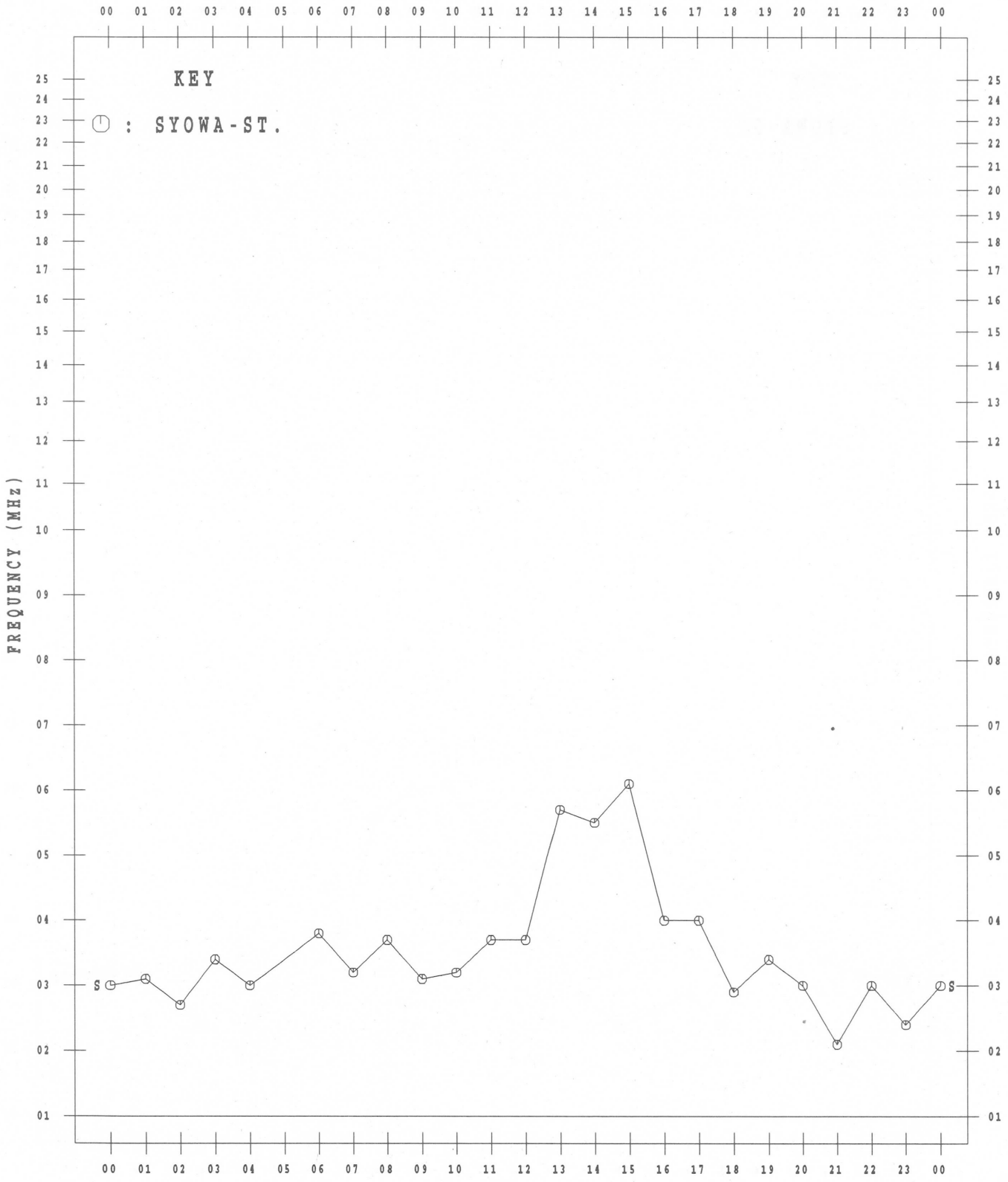

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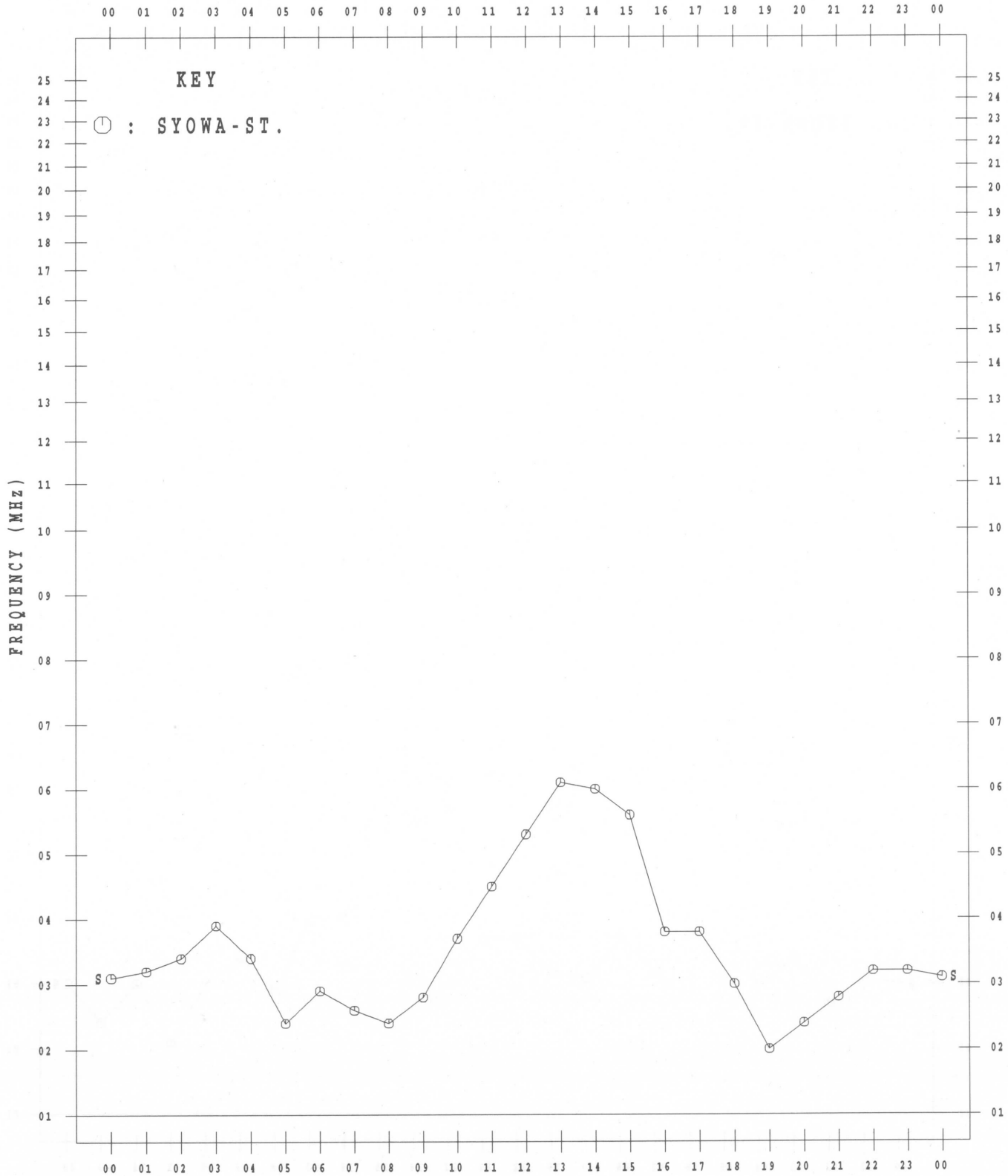
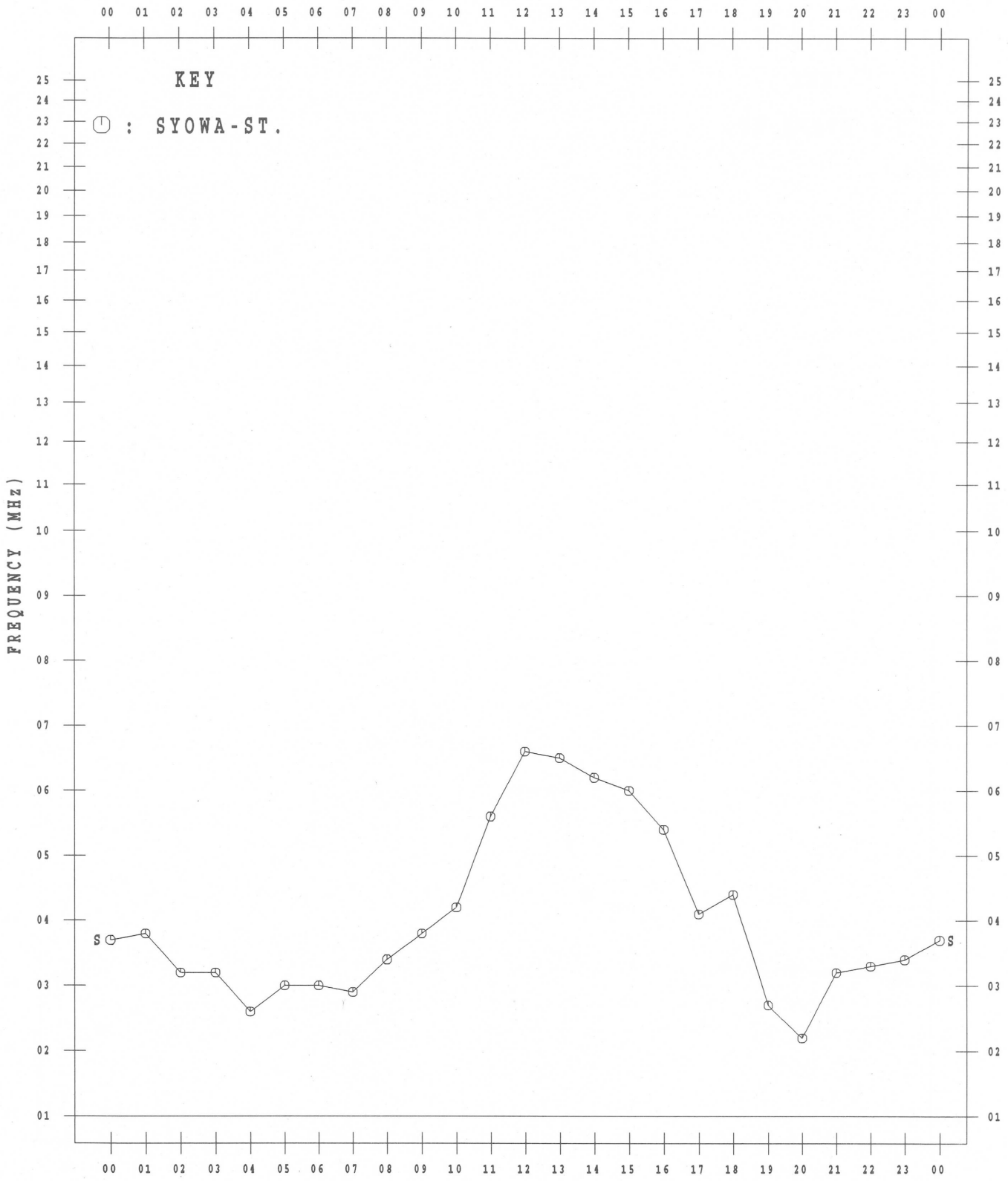


MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME AUG. 2003



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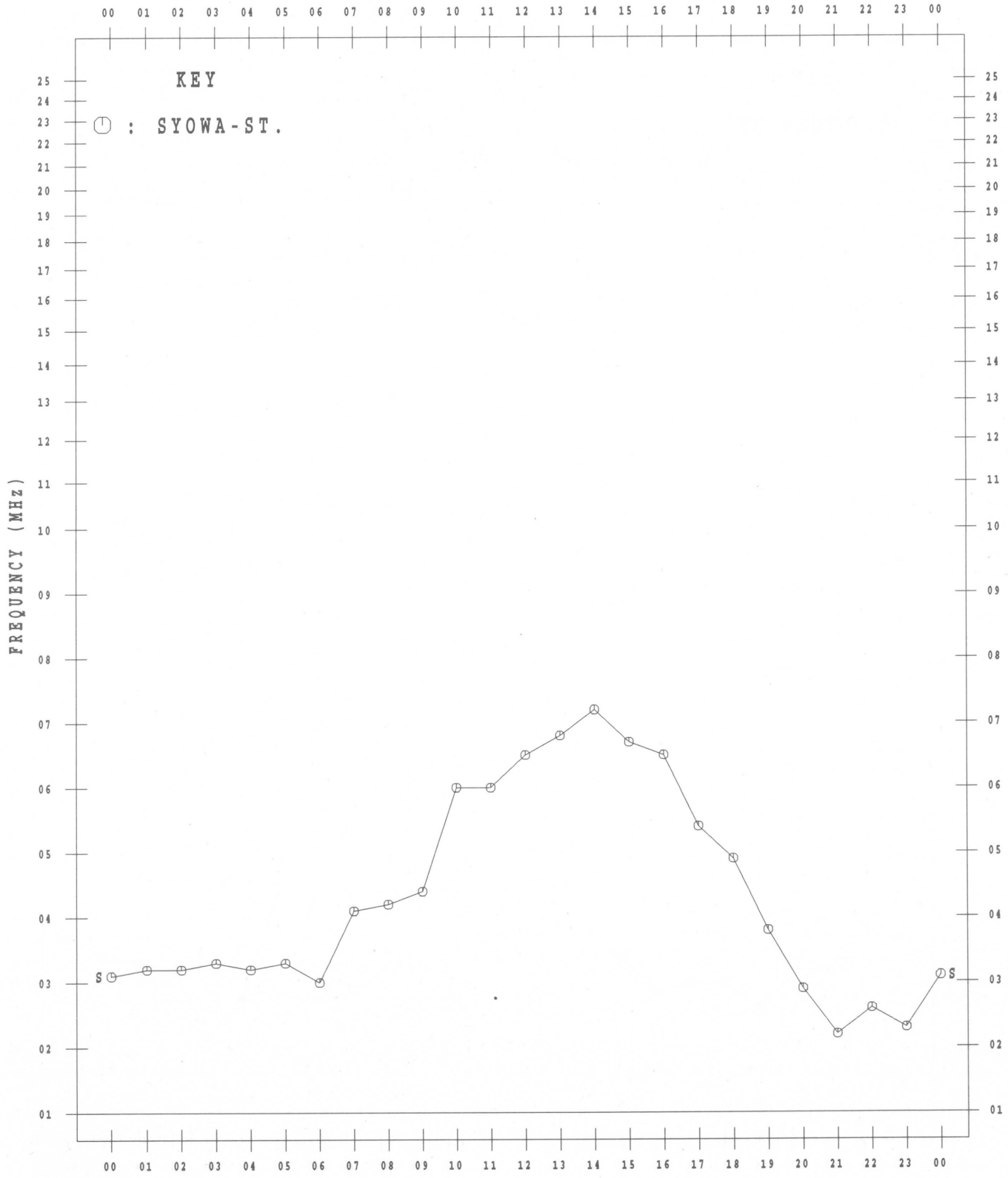
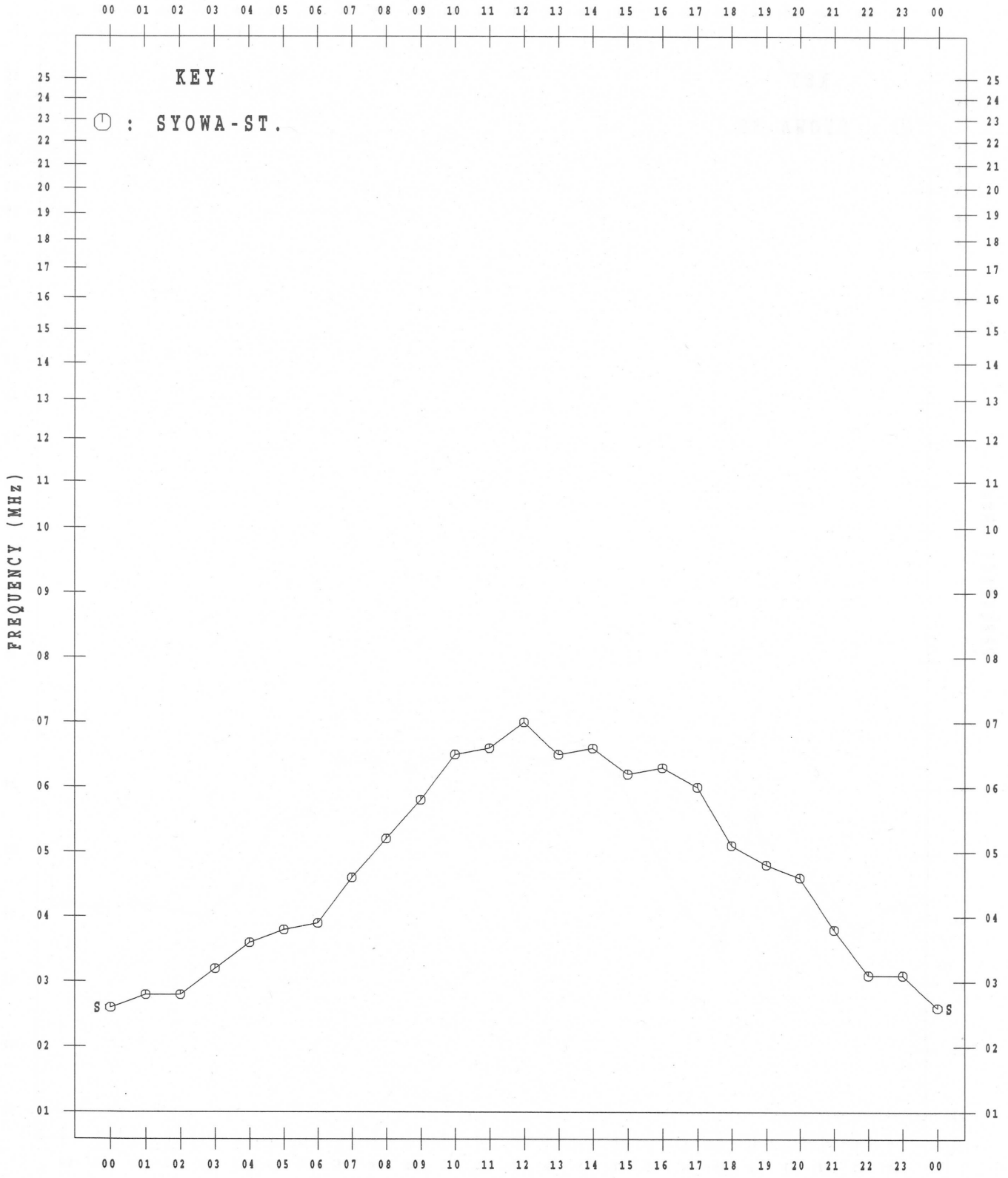


MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME OCT. 2003



MONTHLY MEDIAN VALUES OF foF2

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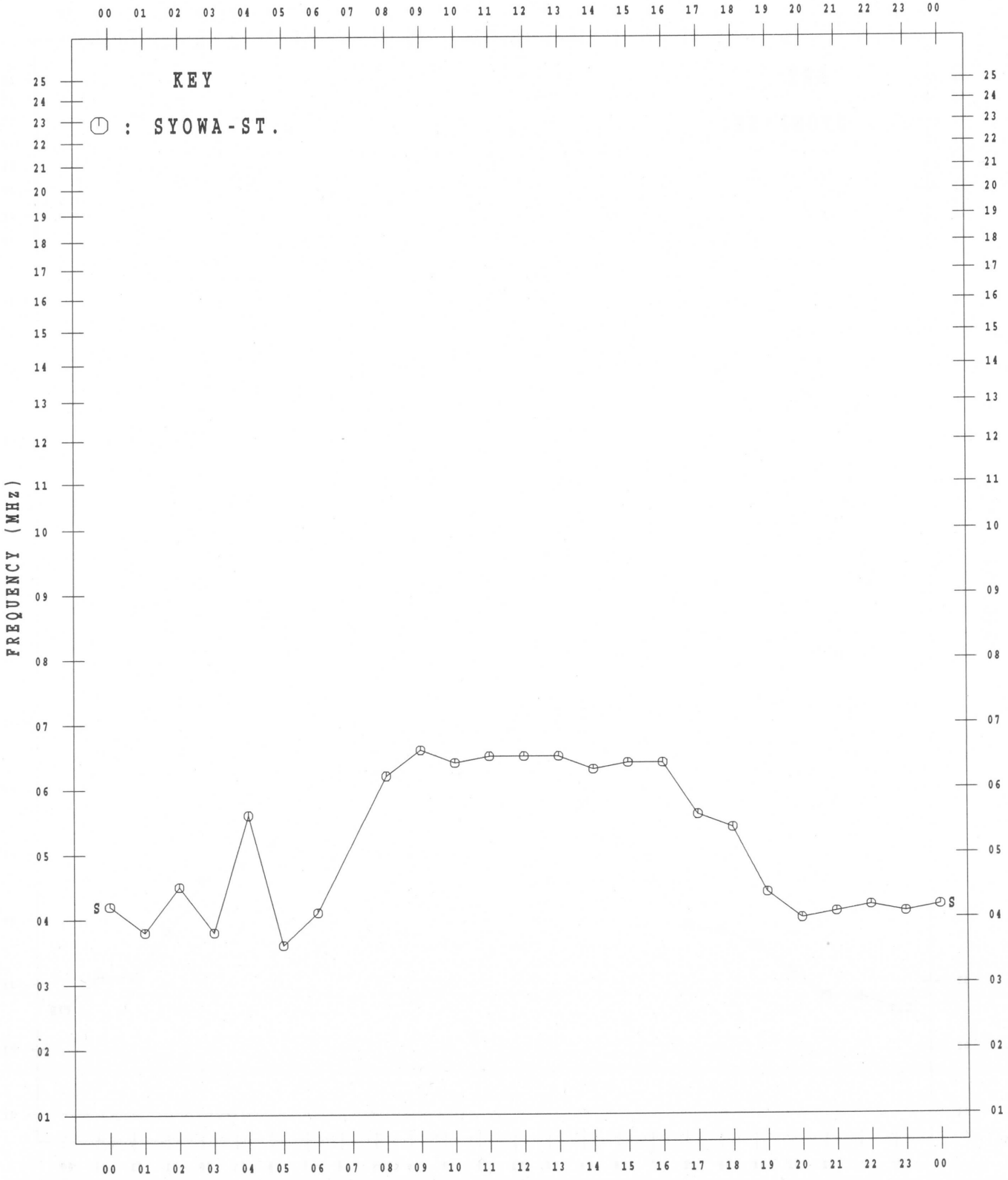
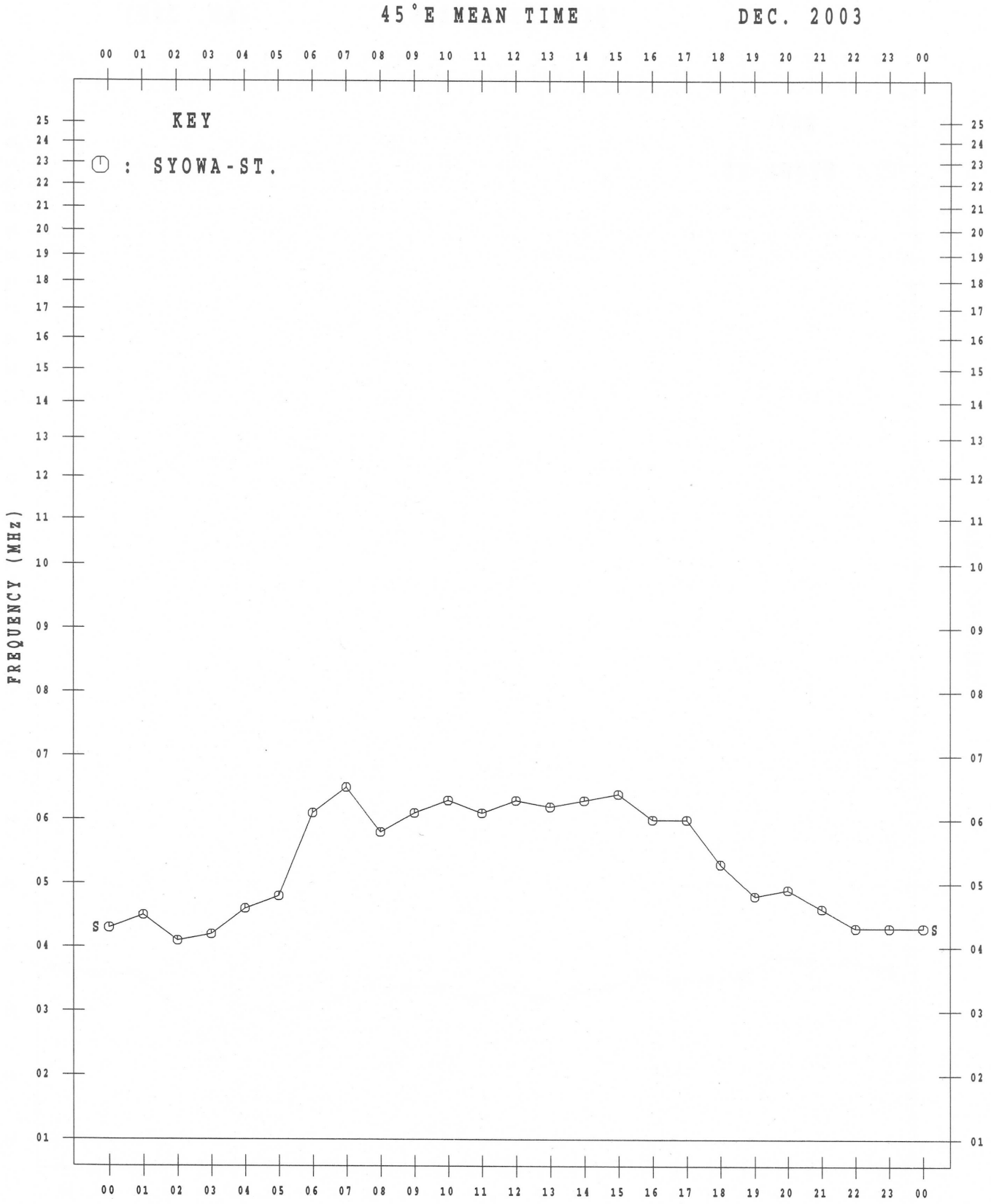


MONTHLY MEDIAN VALUES OF foF2



MONTHLY MEDIAN VALUES OF ftEs

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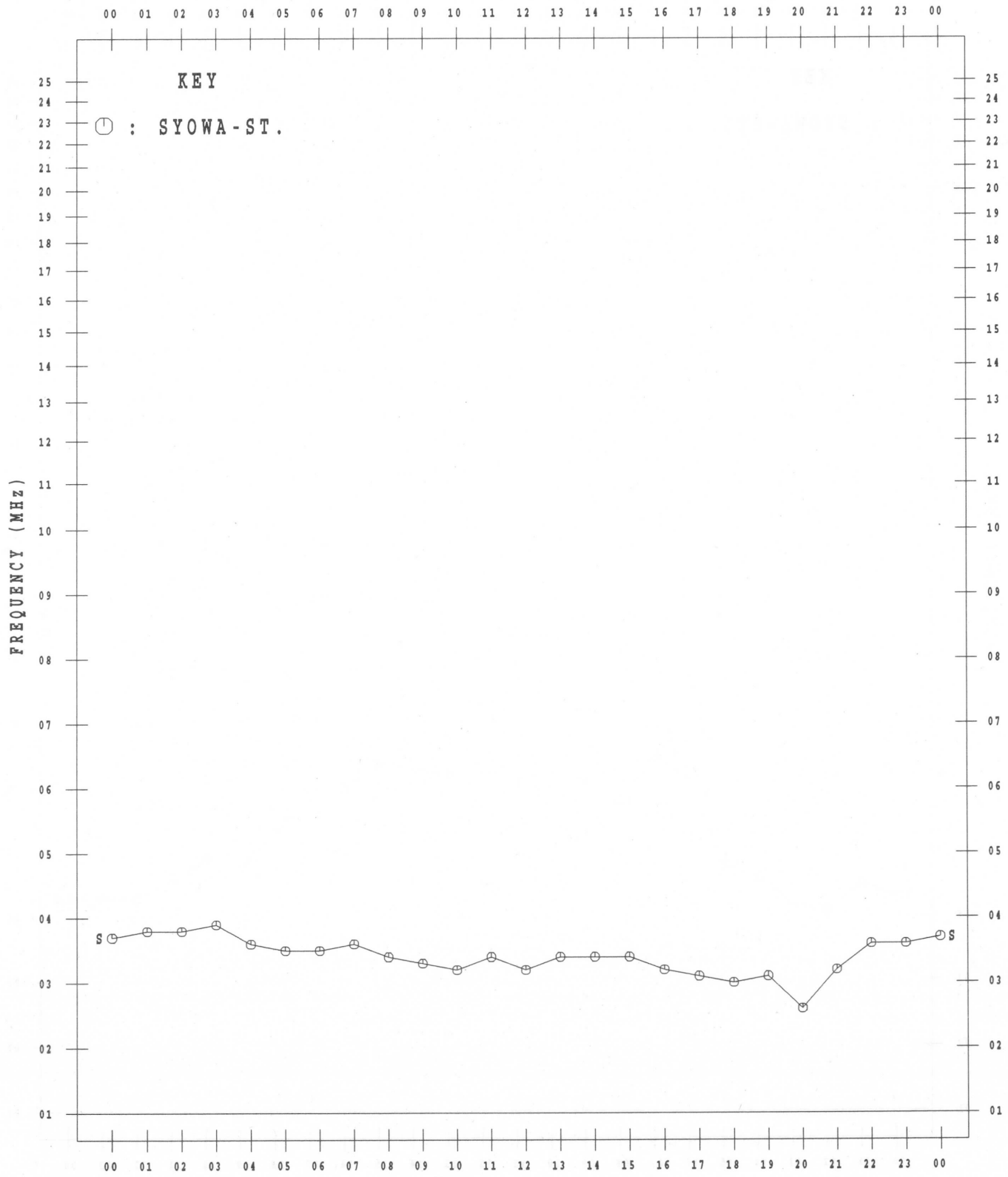

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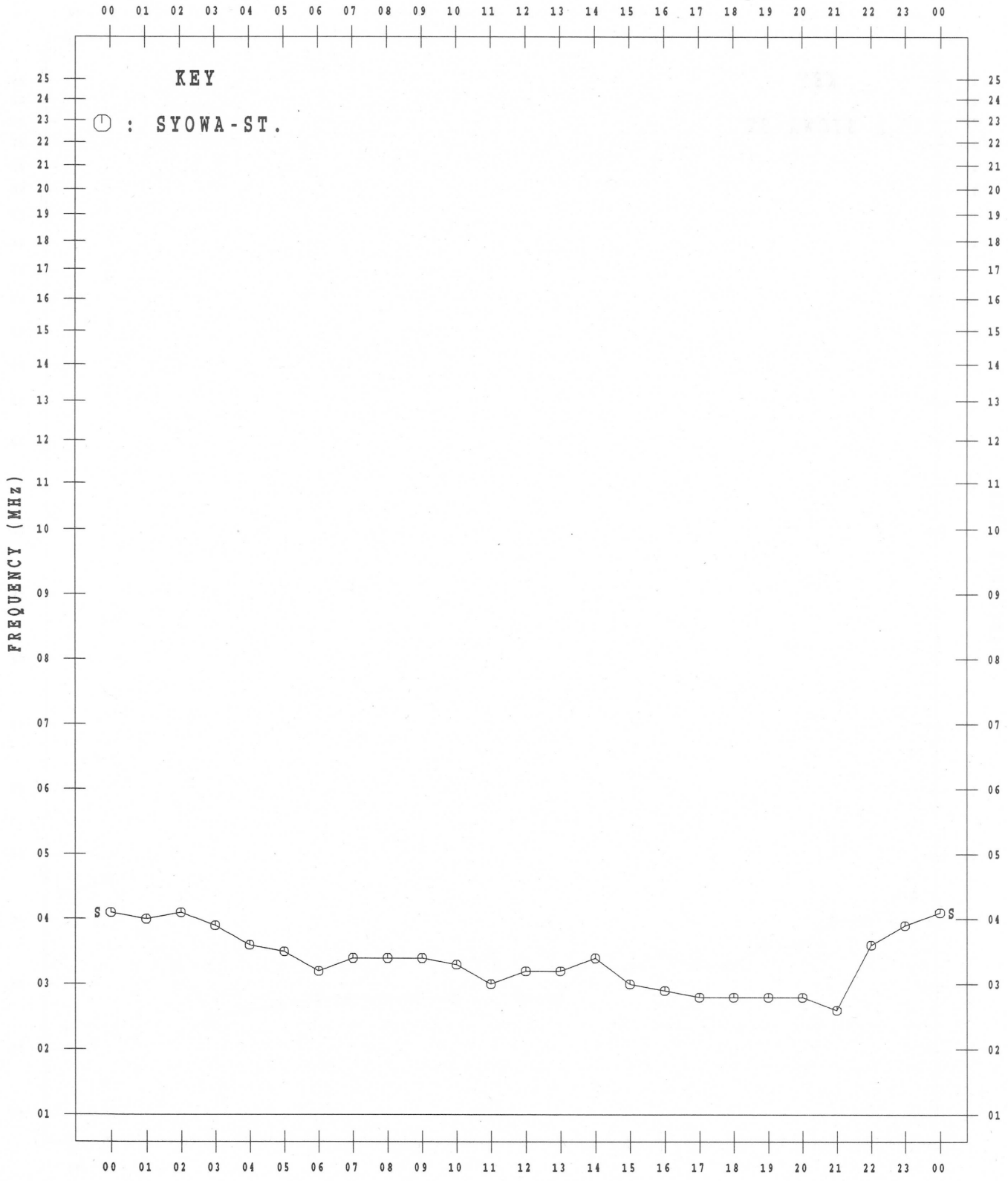

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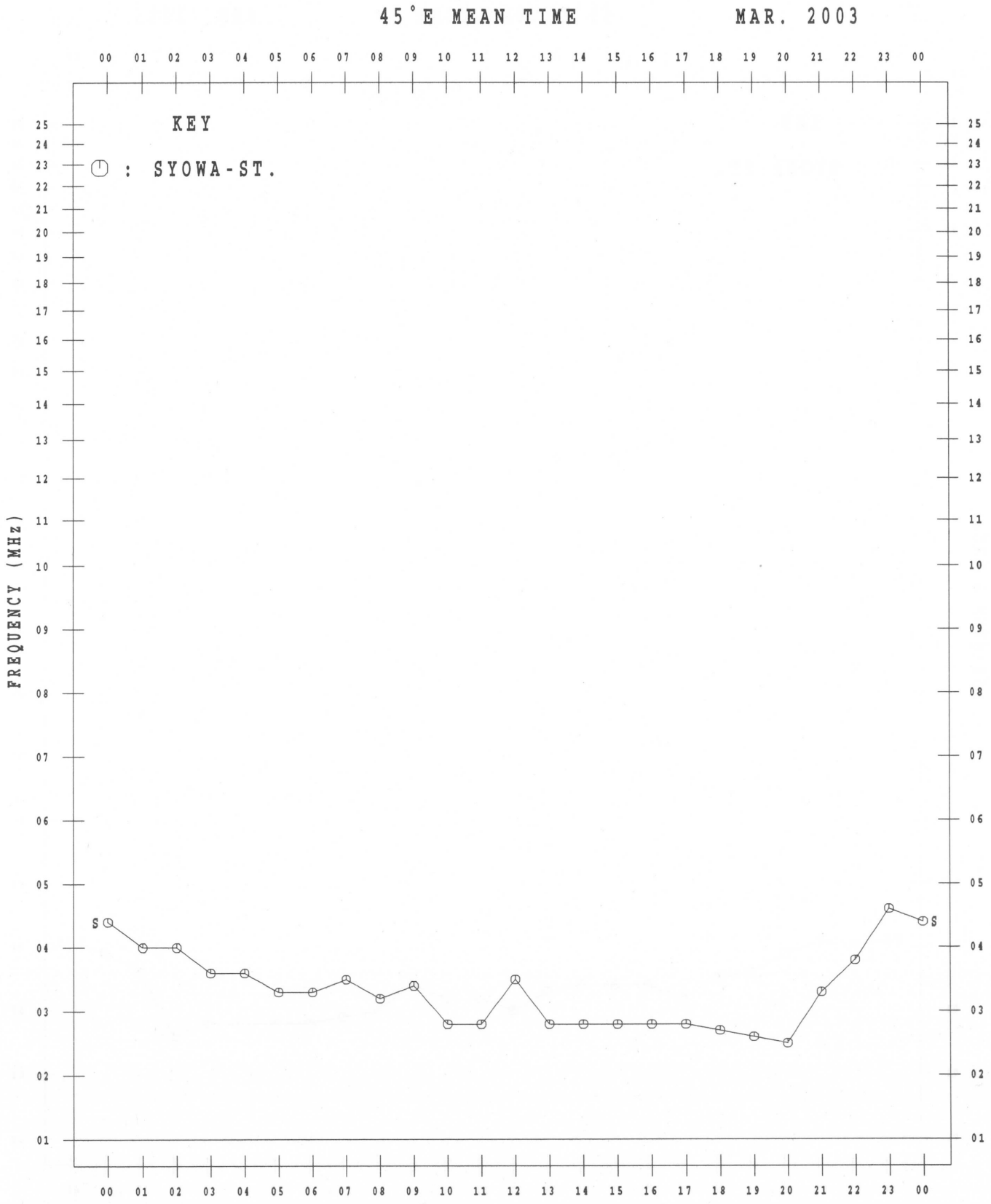

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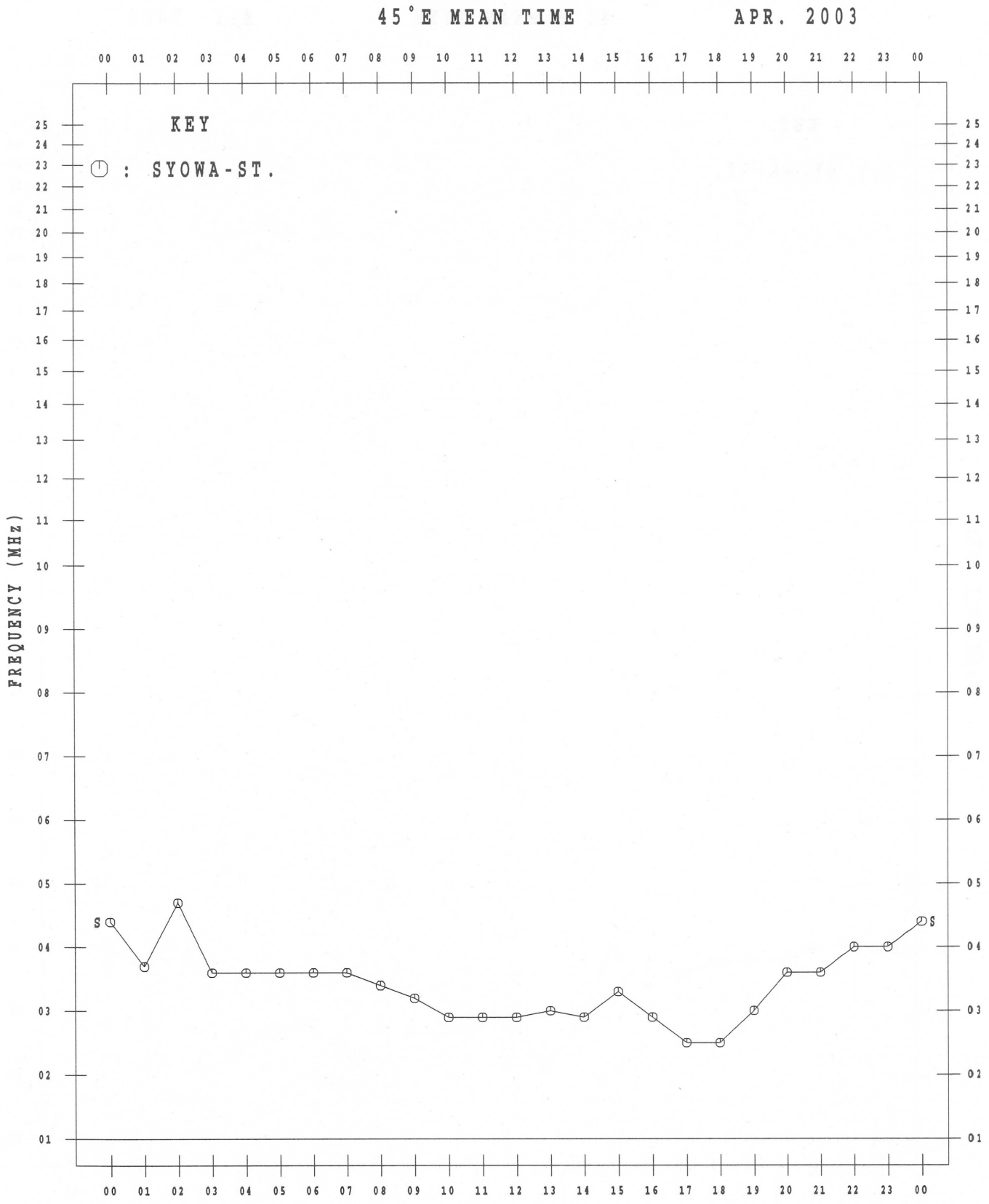

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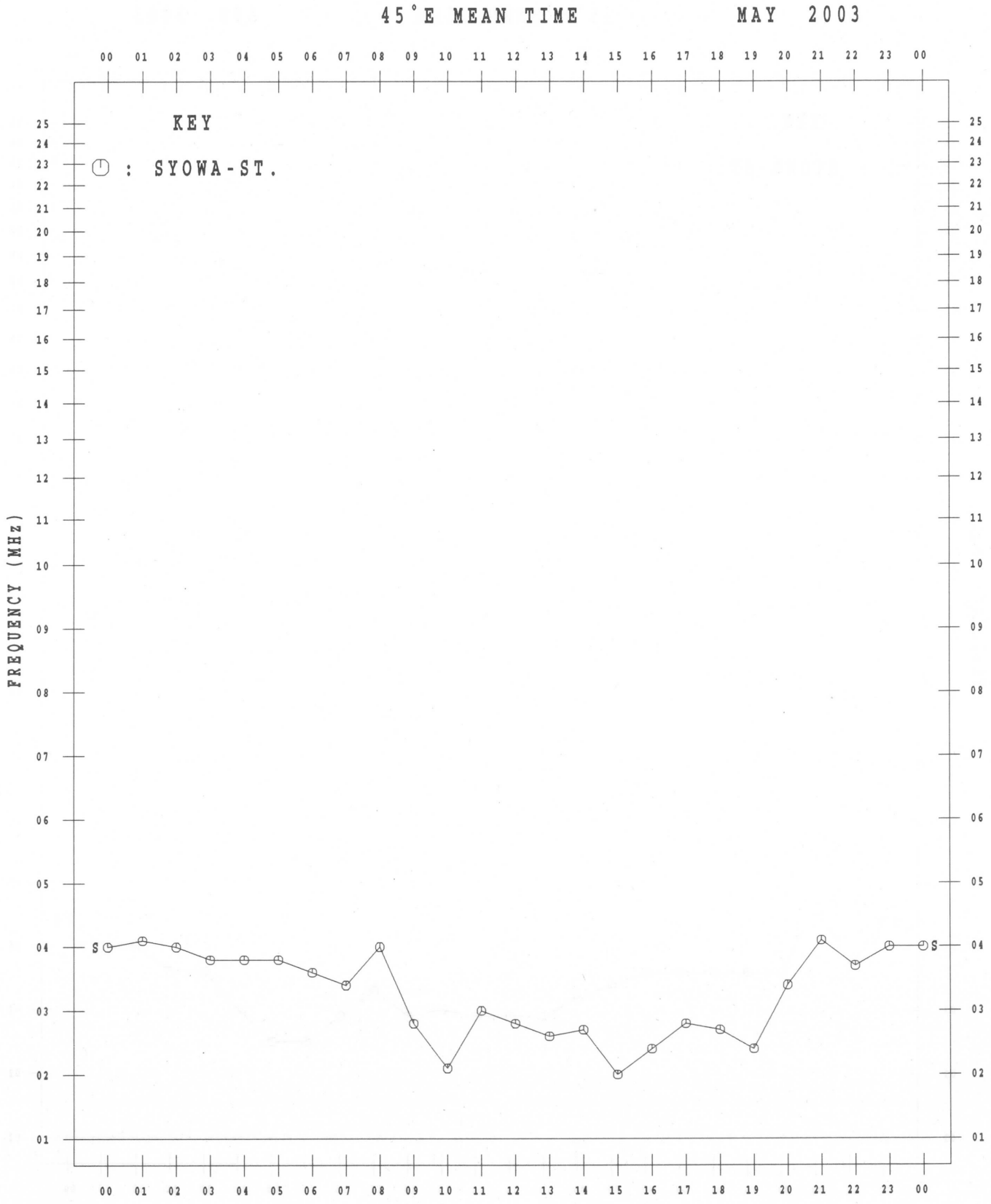

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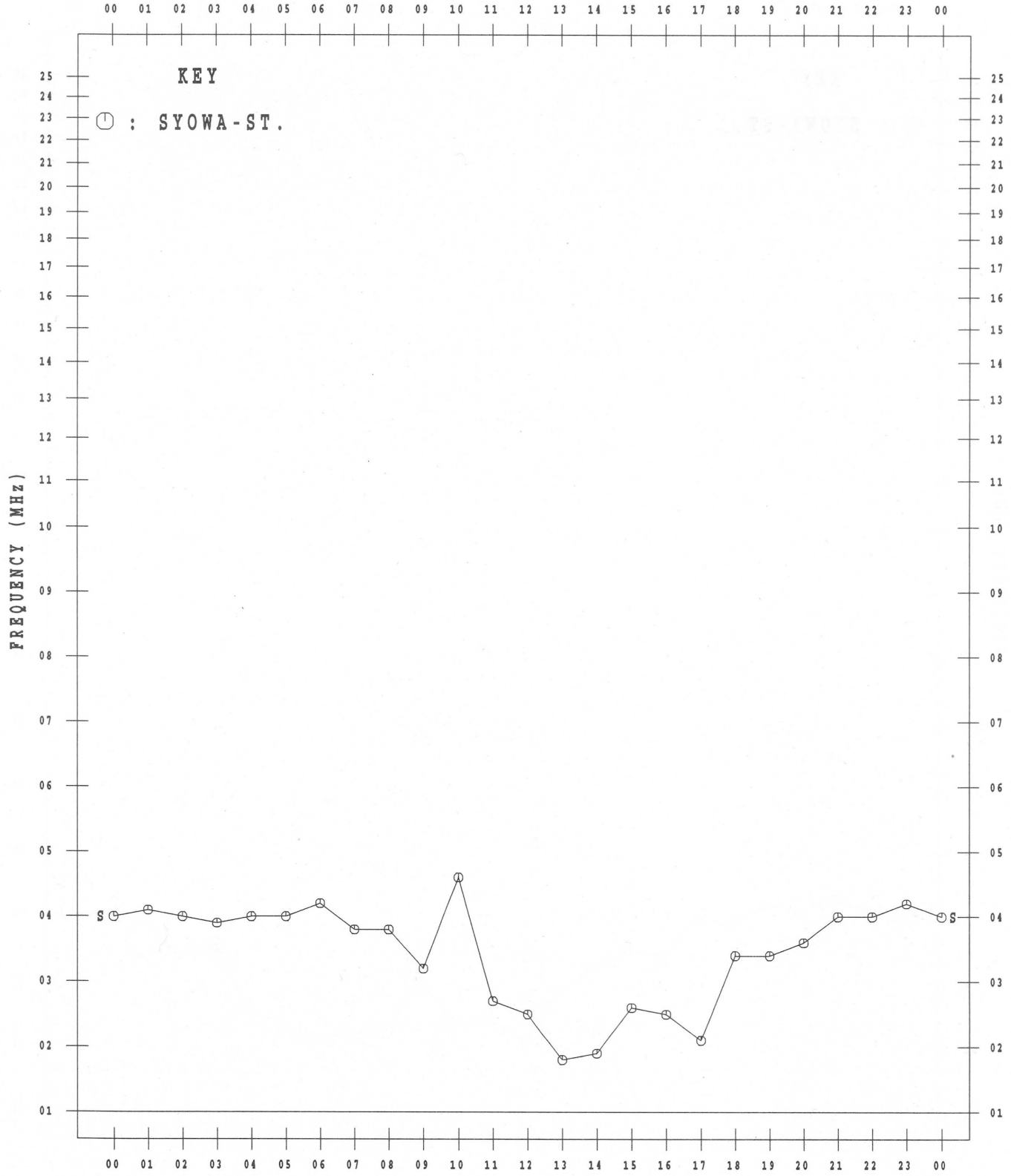

MONTHLY MEDIAN VALUES OF ftEs

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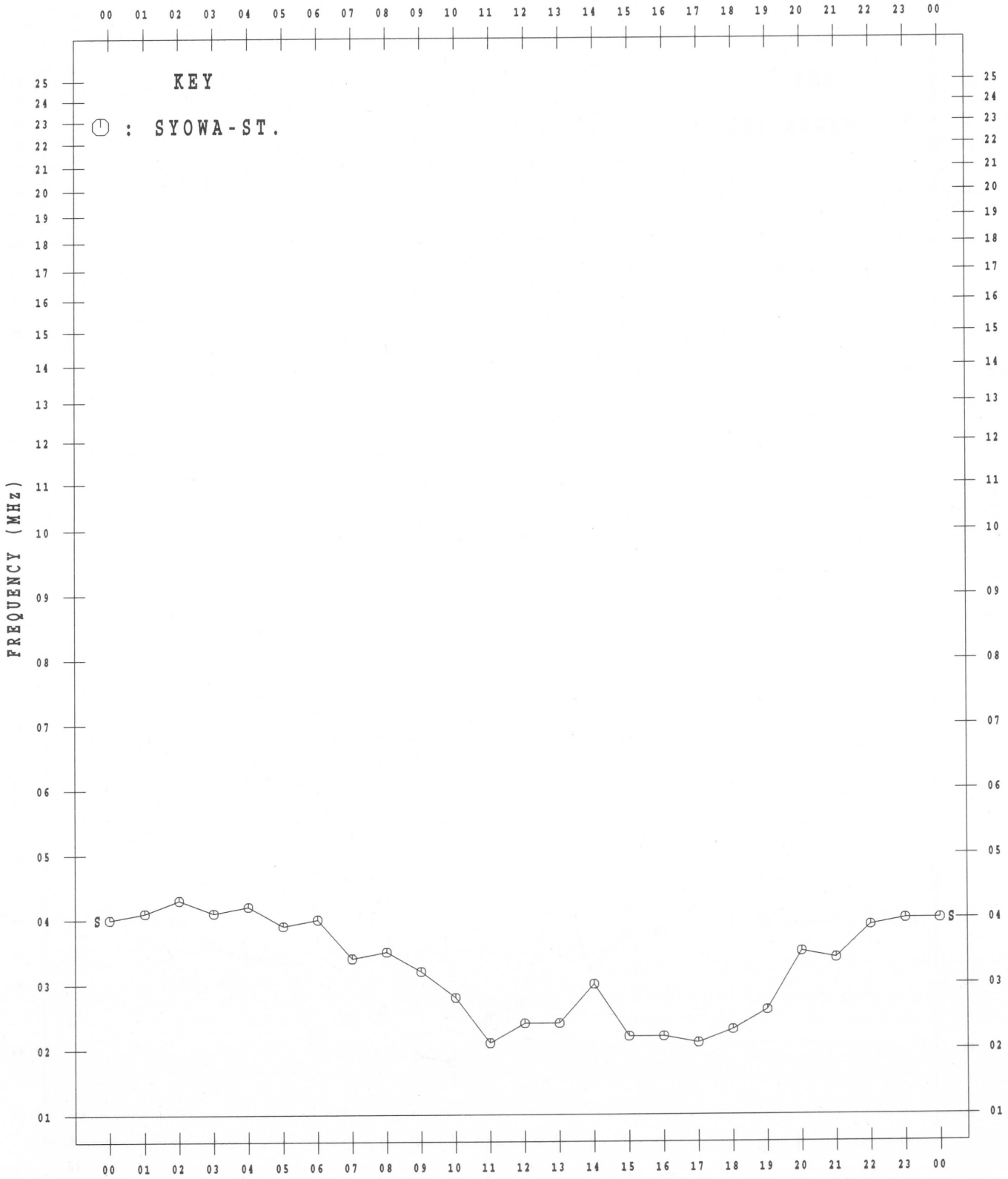

MONTHLY MEDIAN VALUES OF ftEs

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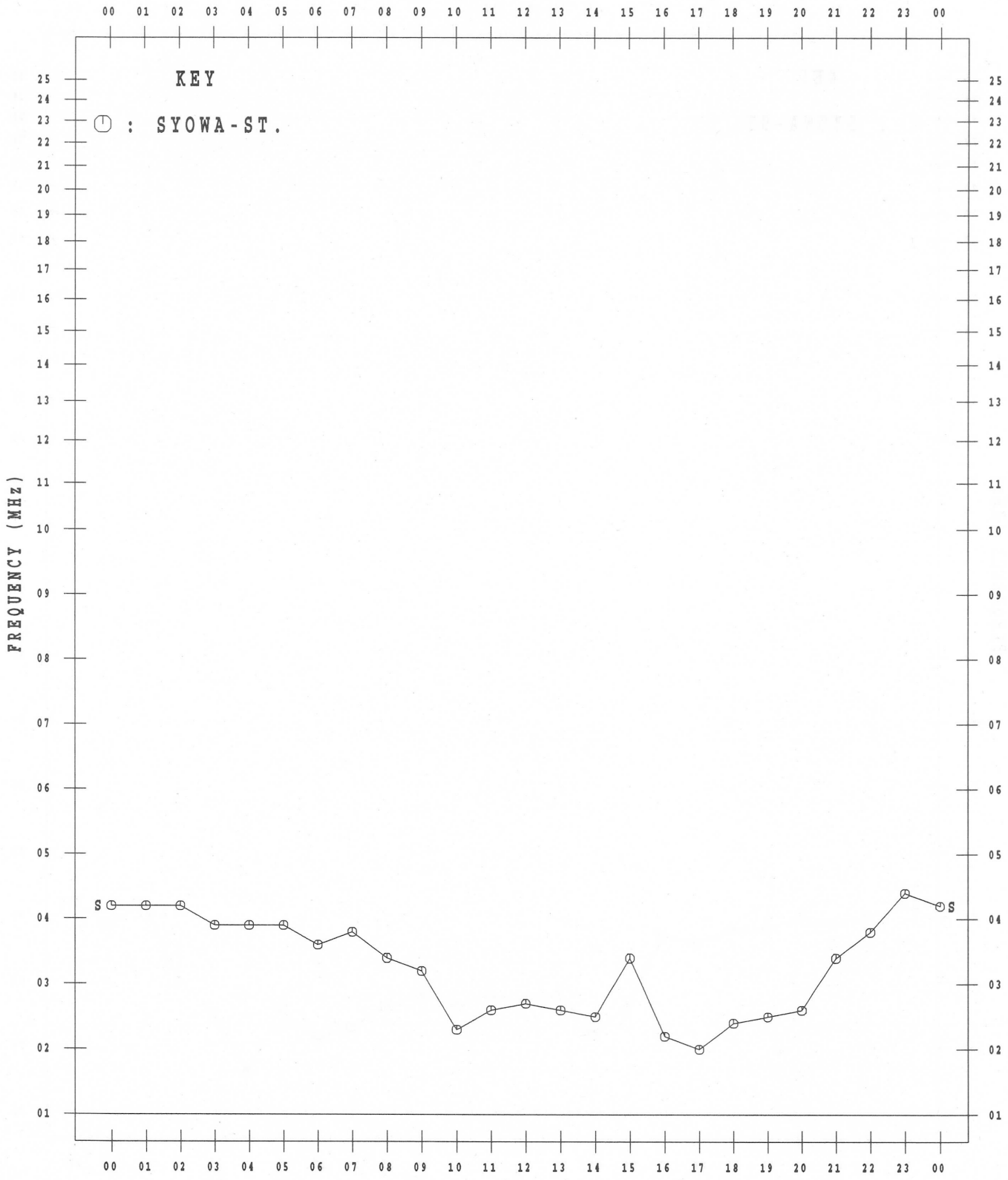

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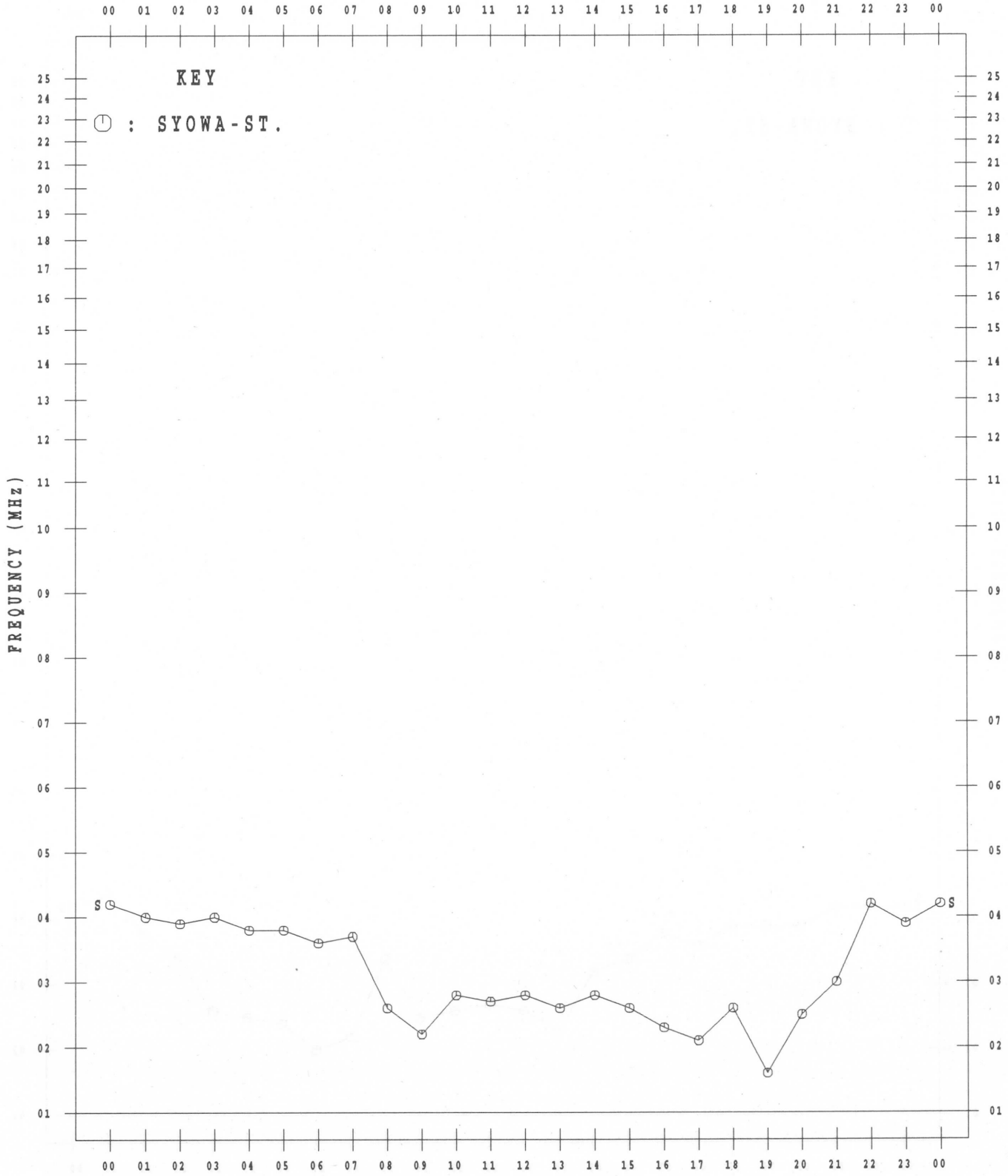

MONTHLY MEDIAN VALUES OF ftEs

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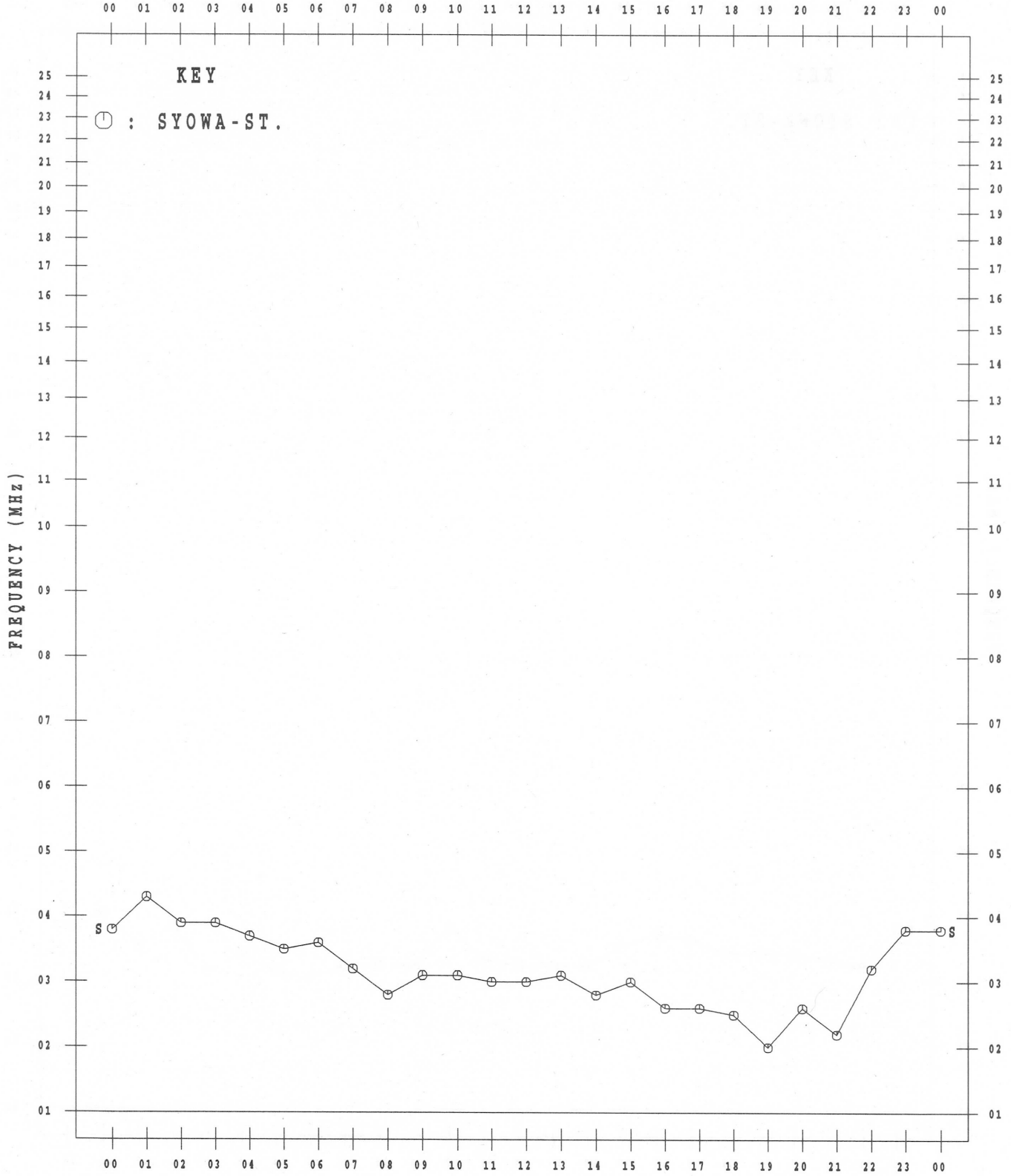

MONTHLY MEDIAN VALUES OF ftEs

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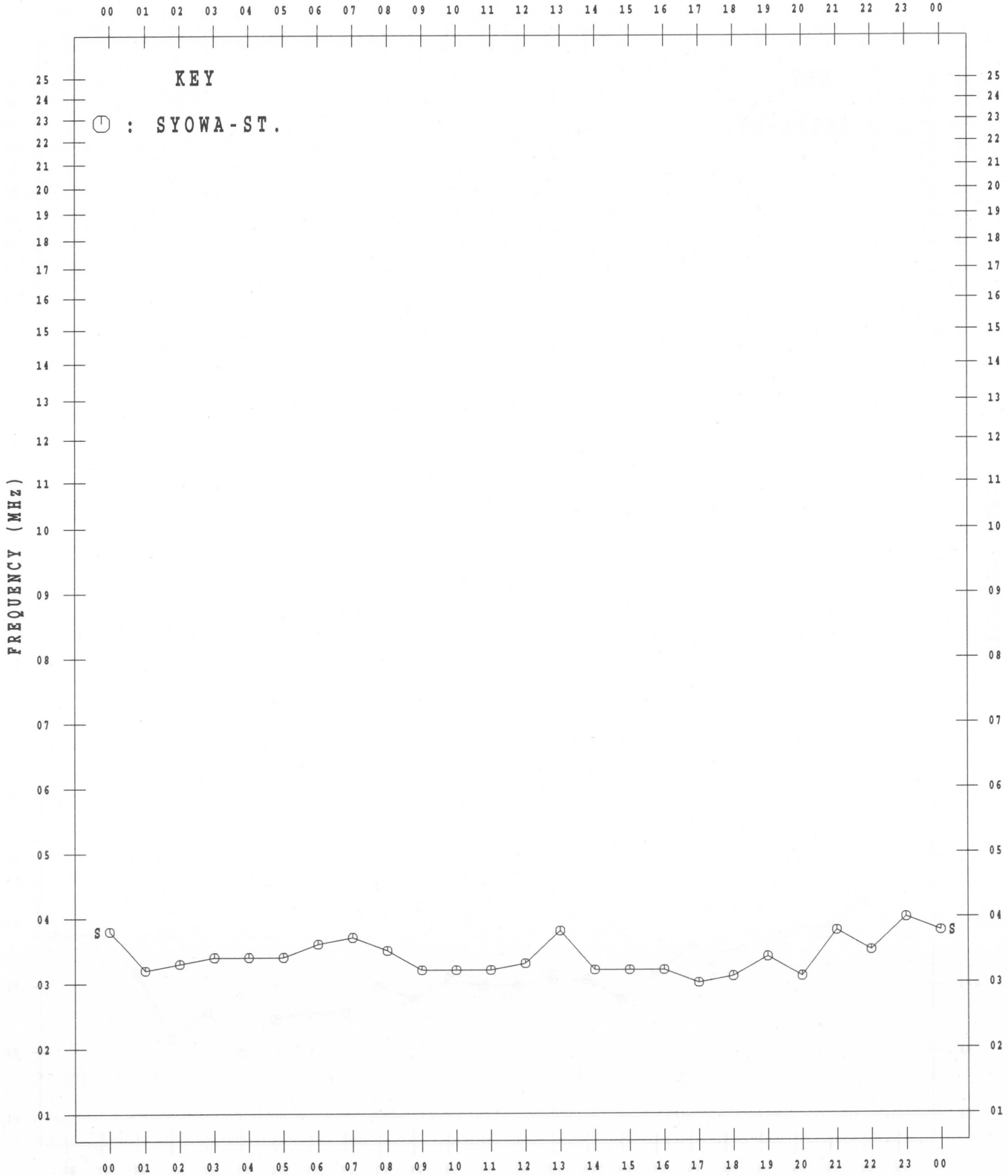

MONTHLY MEDIAN VALUES OF ftEs

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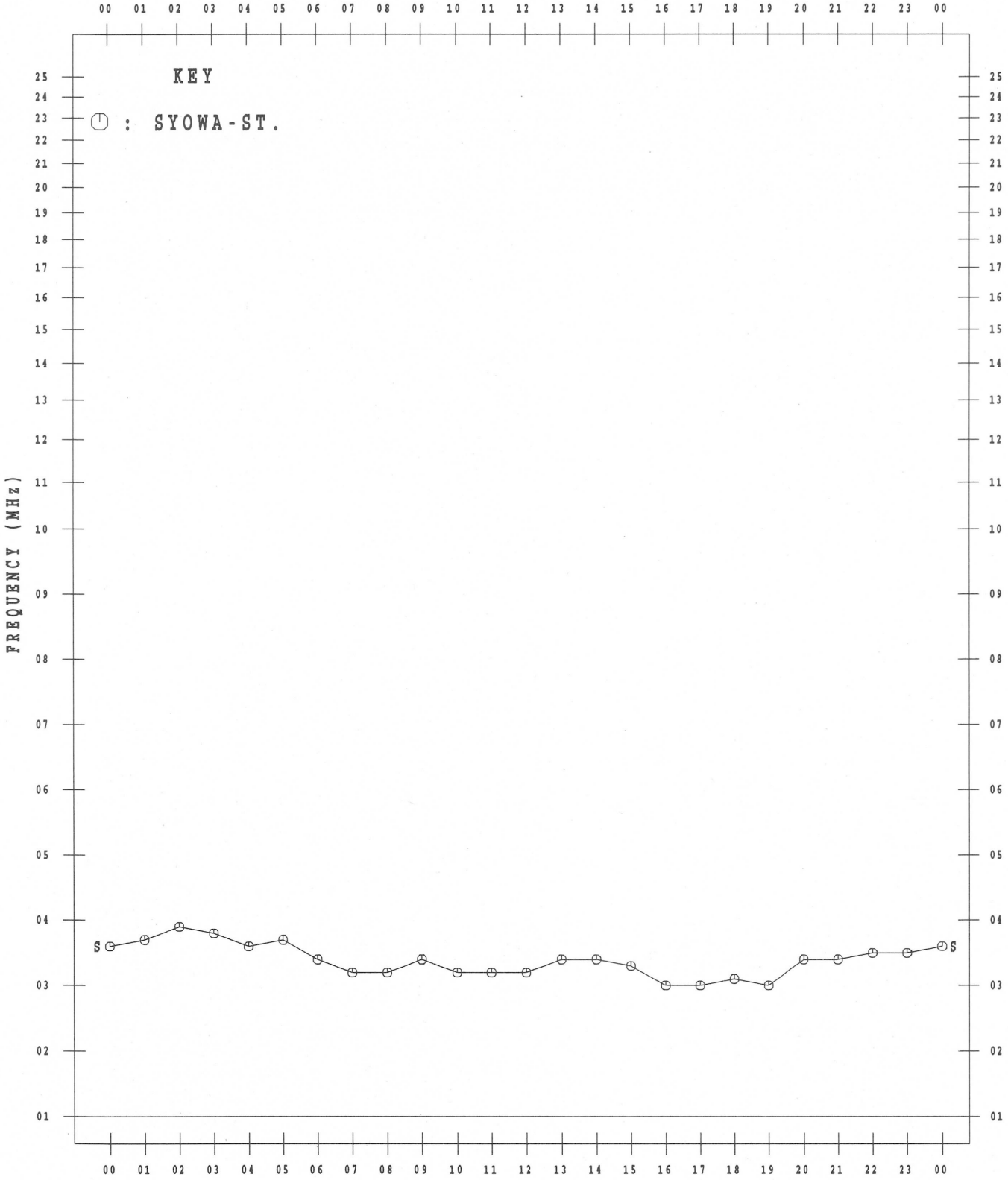

IONOSPHERIC DATA AT SYOWA STATION (ANTARCTICA)
ION.ANT.—70 January 2003 — December 2003 (Not for Sale)

昭和基地電離層資料（南極）
（2003年1月—2003年12月）

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☎　042（327）6911（直通）

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