

ION.ANT.—58

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

January 1992—June 1992

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**COMMUNICATIONS RESEARCH LABORATORY**

**MINISTRY OF POSTS AND TELECOMMUNICATIONS**

**TOKYO, JAPAN**

## INTRODUCTION

This data book gives summarized results for vertical soundings of the ionosphere at Syowa Station, Antarctica in 1992. The observations were conducted by the Communications Research Laboratory under the sponsorship of the National Institute of Polar Research of Japan. The location of the station, specifications of the ionosonde and symbols used in this data book are as follows:

### LOCATION OF SYOWA STATION

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

### SPECIFICATIONS OF THE IONOSONDE USED AT SYOWA STATION

Items	Specifications
Frequency Range	400 kHz–15 MHz
Transmitting Power	10 kW (peak value)
Duration of Sweep	20 sec
Transmitted Pulse Width	80 $\mu$ sec
Recurrence Frequency of Transmitted Pulse	50 Hz (by power source frequency)
Frequency Scale	every 1 MHz
Height Range	900 km
Height Scale	every 50 km
Total Receiver Gain	120 dB
Recording Method	35 mm film and video fax for ionograms
Power Supply	1000 volt AC, 2.0 kVA
Transmitting Antenna and Receiving Antenna	30 m height vertical delta terminated by 600 $\Omega$ respectively

## 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. Ionograms data are printed in the quarter hourly of every days.
- c. 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

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

## (ii) Qualifying Letters

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

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

## 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 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. 1992 f<sub>XI</sub> (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 58	60	60	A	A	S	A	70	X 74	X 79	X 79	77	A	O 72	X 71	68	67	H 66	59	62	X 65	55	60	65	
2	69	69	52	46	O 50	X B	B	B	A	A	B	B	A	S	B	B	B	S	O 53	X 59	H R		55	55	59
3	60	X 69	X 60	60	S	A	A	A	A	A	B	A	B	A	B	65	70	65	55	60	A	X 55	49	70	
4	S	A	A	60	O 59	X 57	S	50	S	S	A	B	B	B	S	A	S	B	64	61	H 55	55	55	67	
5	O 50	X A	60	A	S	70	S	60	A	A	A	A	S	A	A	S	S	64	60	H 60	A	O 53	X A	S	
6	54	O 51	X S	60	59	A	O 50	X 51	A	A	R		O 63	X 71	70	S	69	69	X 69	58	H 62	X 60	X 59	59	
7	A	B	60	70	60	X S	A	60	A	A	70	70	75	78	74	75	74	71	74	71	H 65	X 62	X 53	O 59	X 50
8	A	S	60	60	61	A	O 51	X 49	A	A	S	O 54	X A	58	S	70	75	68	51	S	S	S	A	O 48	X
9	56	60	A	50	52	A	A	A	A	A	O 70	X 67	S	O 66	X 69	X 74	70	69	65	H 65	H 63	X 60	O 65	X 66	
10	68	S	69	60	A	A	A	A	79	O 85	85	S	R	B	O 81	X 80	81	74	68	H 60	60	70	59	59	
11	S	60	58	S	70	59	A	S	A	A	B	A	B	S	X 70	78	A	A	O 50	X A	X 50	60	52	O 50	X
12	45	70	62	44	42	43	A	S	S	A	A	B	A	B	S	X 66	75	71	67	H 59	S	H 49	S	S	
13	A	A	S	47	40	55	57	47	B	B	B	A	A	S	O 51	X 69	X 50	X 51	X 68	O 51	X 54	X 58	X 53	A	
14	50	50	A	55	63	52	70	X	S	S	B	B	B	70	70	65	70	68	O 55	X	S	O 55	X	60	
15	A	45	A	46	50	A	A	A	S	O 50	X 51	A	O 45	X	B	80	80	80	A	B	O 59	X 55	X 59	X 52	
16	S	59	A	61	B	69	69	69	B	69	69	S	B	B	O 75	X 79	79	79	79	69	68	59	X	B	
17	B	B	A	B	A	A	A	A	X	X	O	S	B	81	78	74	73	69	70	H 61	O 53	R	59	59	
18	B	B	A	B	B	B	A	S	70	O 70	X 80	83	90	O 86	X 90	88	B	80	75	81	X 83	X 73	71	68	
19	70	71	80	80	80	90	84	A	85	90	100	92	O 86	X	90	90	86	79	X 63	X 70	X 74	X 65	X 58		
20	58	60	59	79	B	B	R	C	C	A	B	80	72	80	90	90	X	S	B	X 59	A	O 54	X 61	O 59	
21	A	O 60	X A	X 60	O 58	X 71	69	79	X 100	X 90	X 89	88	85	81	75	75	71	68	H 66	H 57	B	O 53	X 49	S	
22	O 58	X 45	A	70	72	71	73	A	S	S	71	76	83	84	O 85	X 89	84	S	63	54	56	O 62	X 54	X 60	
23	59	60	65	O 78	X 77	70	75	76	85	90	B	S	91	90	86	82	78	72	73	X 70	X 65	X 55	X 55		
24	49	69	70	B	B	80	81	97	O 96	X 105	X 106	X 105	X 100	97	96	90	86	82	X 79	X 79	X 79	X 76	X 70	X 69	
25	X 68	X 69	70	70	60	A	A	A	69	78	79	74	80	81	86	85	82	82	X 80	X 79	X 80	X 70	X 65	64	
26	60	68	60	70	70	75	89	91	100	99	100	100	90	80	79	79	78	75	74	X 66	X 70	X 70	69	60	
27	70	60	65	S	O 61	X 45	A	A	A	A	A	A	S	S	S	S	S	S	67	64	62	60	58	A	
28	A	A	A	42	40	A	A	A	O 47	X	A	R	B	A	A	A	O 53	X 66	S	59	59	53	45	47	48
29	48	A	49	S	S	A	A	O 54	X 58	A	B	B	B	B	B	B	A	O 56	X 62	X 59	H 64	62	59	A	
30	A	A	A	67	S	47	A	A	S	A	B	A	A	B	B	B	X 60	B	X 58	O 45	X 48	S	A	O 52	
31	B	O 63	X 57	S	B	A	A	A	68	A	A	A	A	A	B	A	B	65	B	61	60	59	55	O 44	X S
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	18	20	18	21	19	15	12	15	12	14	14	15	11	15	19	23	24	22	30	26	24	27	24	23	
MED	58	60	60	60	59	69	70	68	76	78	79	80	83	80	79	75	72	69	64	61	60	58	59	59	
UQ	68	69	65	70	70	71	78	76	90	90	89	90	90	84	90	85	80	78	70	65	68	65	63	65	
LQ	50	60	59	48	50	55	54	51	64	70	70	74	O 72	X 70	O 71	X 69	X 68	67	59	59	55	55	54	52	



IONOSPHERIC DATA STATION SHOWA-ST.  
 JAN. 1992 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)  
 LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	J S	Z J	F A	A S	A U	S W	A 63	68	70	71	70	A	66	65	63	62	61	H	H	F	H	V			
2	F	F	U F	U F	B B	B B	A A	A B	A B	A B	A B	A S	B B	B B	B S	H	H	H	R	H	H	47	54		
3	55	61	J F	F S	A A	A A	A A	A A	A B	A B	A B	A B	A S	A S	A S	59	61	55	49	54	A	49	44		
4	S	A	A	F U	R S	51	S	45	S	S	A B	B B	B S	A S	S B	S	B	F	H	H	H	49	49	49	
5	F	A U	F A	S	S	F	S	F	A	A	A A	A S	A A	A S	S S	S S	F	H	H	A	A	A	S		
6	49	45	S	J F	A U	R U	R A	A A	R J	F	57	65	F	S	F	61	62	62	62	52	58	55	51	J S	
7	A	B	F	50	60	54	S	A J	F A	F	60	62	70	70	69	70	69	64	68	65	60	58	47	50	44
8	A	51	49	45	45	A	45	43	A	A	S	S	A U	S S	S F	65	69	F	F	S	S	S	A	F	
9	F	F	A	F	F	A	A	S	A	A	65	61	S	60	63	68	65	62	59	59	57	56	59	60	
10	59	S U	S F	F A	A A	A A	A A	F	70	79	79	F	S	R	B	75	74	75	65	59	52	J F	F	F	
11	S	F	F	S	F E	G A	S	A	A	A	B	A	B	S	F	69	72	A	A	A	44	44	F	F	U W
12	F	F	F	F	35	36	37	A	S	A	A	B	A	B	S	60	69	65	60	H	S	51	43	S	S
13	A	A	S	40	F	F	39	40	B	B	B	A	A	S	46	63	44	45	55	45	S	S	A	F	
14	43	F	S	A	F	F	J S	S	S	B	B	B	F	F	F	60	60	60	63	49	S	49	A	F	
15	A	F	A	F	F	A	A	A	S	44	45	A	S	B	F	70	74	70	A	B	52	49	53	53	45
16	S	53	A	F	B	F U	F U	F B	F U	F S	B	B	B	B	69	71	71	71	55	59	51	S	54	B	
17	B	B	A	B	A	A	F	A	64	68	70	78	B	72	70	69	69	61	65	53	47	R J	F	F	
18	B	B	A	B	B	B	A	S U	F	60	70	70	75	84	80	F	B	F	F	67	67	66	65	59	
19	F	F	70	F	F H	H A	A	69	70	78	80	80	B	F	B	F	F	77	73	57	J F	64	66	59	50
20	F	F	50	F	B	B	R C	C	A	B U	F	60	F	F	F J	F S	B	S	53	A	A	H	48	56	53
21	A	54	A	F	H	S	F	70	80	80	81	80	J F	79	74	69	71	65	62	59	49	B D	S D	S D	S
22	J F	39	A	F	F	F	A	S	S	60	65	F	71	79	79	82	77	D S	U S	58	50	49	56	48	J F
23	50	54	57	72	70	F	59	68	79	80	B	81	S	85	80	79	75	70	67	69	64	59	59	45	
24	44	45	F	F	B	F J	S	90	90	99	99	99	95	91	90	84	80	75	70	73	70	70	64	60	
25	59	59	60	F	F	A	A	A	62	70	71	69	74	76	80	80	79	74	74	72	71	62	59	59	
26	52	58	49	58	64	F	J F	F	80	85	90	90	90	84	74	70	70	70	69	F	60	64	64	60	F
27	F	F	F	S	55	39	A	A	A	64	A	A	S	S	S	S	S	60	58	56	55	50	A	A	
28	A	A	A	F	F	A	A	A U	S	41	A	R	B	A	A	A	47	60	S	48	52	47	40	41	41
29	42	A	F	S	S	A	A U	R	48	51	A	B	B	B	B	A	50	56	52	56	54	49	S	A	
30	A	A	A	59	S	F	A	A	S	A	B	A	A	B	B	B	54	B J	S	39	40	41	A	46	
31	B	57	42	S	B	A	A	F	A	A	A	A	A	B	A	B	59	B	55	54	52	47	38	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	16	15	15	14	12	11	9	15	12	14	14	15	11	14	18	23	23	22	30	26	23	26	23	20	
MED	51	53	50	52	54	54	60	55	68	70	70	70	74	73	70	70	65	63	58	54	54	51	53	52	
U Q	57	58	57	58	60	65	72	68	80	80	79	80	84	79	79	79	71	70	65	59	64	56	59	56	
L Q	44	45	49	45	45	39	52	45	61	64	62	61	65	66	69	63	60	60	52	52	49	47	47	44	

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1992 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	43	29	47	60	45	38	37	33	33	35	41	39	40	37	41	37	33	33	27	35	40	28	26	25					
2	51	42	28	25	33	B	B	B	65	36	B	B	27	E B	B	B	B	E B	B	E B	31	34	26	31					
3	29	30	37	45	40	32	43	43	42	41	B	38	B	B	B	36	34	45	55	35	40	39	26	45					
4	45	42	46	45	45	40	36	35	45	40	41	B	B	B	34	38	39	B	30	32	27	26	21	42					
5	45	42	47	70	38	35	37	35	43	37	36	35	38	38	34	33	34	32	31	35	26	44	40	38					
6	60	60	39	34	37	44	41	45	42	40	36	37	40	37	35	33	37	39	E B	31	35	27	35	38	47				
7	60	B	30	28	26	32	28	36	45	41	34	34	43	36	34	34	42	33	33	35	27	E B	40	46	45				
8	45	45	41	34	37	47	46	38	50	30	37	46	36	38	36	35	34	29	36	37	48	48	44	47					
9	45	27	70	35	35	45	45	39	45	41	38	35	34	40	36	41	52	40	38	70	51	33	30	28					
10	27	31	27	31	70	45	60	42	43	35	42	36	E B	B	E B	B	36	35	31	32	36	35	41	41	43	46			
11	44	31	70	60	55	60	45	41	46	43	B	40	B	B	37	35	35	31	28	27	66	40	70	68	101				
12	69	52	40	32	32	29	45	45	45	55	35	B	36	B	34	34	38	56	56	61	48	36	43	41					
13	43	70	49	41	38	39	50	36	B	B	B	40	40	35	35	35	39	40	40	30	42	43	45	45					
14	49	60	59	70	39	49	37	50	38	32	B	E B	B	44	35	33	38	37	36	26	26	36	48	52	41				
15	48	38	91	50	33	43	37	45	41	35	37	36	43	E B	B	40	34	51	34	B	23	30	38	43	50				
16	39	37	37	35	B	33	38	36	B	32	32	51	E B	B	B	E B	E B	E B	E B	E B	55	51	51	54	28	33	28	33	41
17	B	B	28	B	41	33	27	35	35	36	37	43	B	B	55	60	55	55	27	28	29	35	27	27	27				
18	B	B	37	B	B	B	40	60	35	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	55	55	52	30	70	94	41	27	
19	33	26	34	26	26	27	35	26	36	37	35	42	60	E B	B	59	B	55	55	27	26	28	22	19	20				
20	20	38	34	35	B	B	40	C	C	26	B	32	E B	E B	E B	E B	E B	E B	B	27	35	41	35	33	39				
21	59	32	90	36	35	36	32	31	32	32	39	42	73	71	35	35	33	28	27	28	B	38	34	35					
22	33	39	43	35	32	38	33	44	43	33	36	35	32	32	37	34	33	26	34	39	39	36	23	30					
23	32	32	35	34	35	32	34	37	35	33	B	E B	E B	E B	E B	B	56	54	56	36	26	32	27	32	23	26	27	14	33
24	18	24	26	B	B	42	36	36	30	34	31	30	40	40	99	36	33	32	38	31	26	32	26	27					
25	20	16	34	25	41	41	45	34	47	38	E S	51	41	80	40	36	35	39	35	29	27	27	26	20	19				
26	23	27	90	27	27	27	29	31	27	33	34	35	35	60	62	43	36	41	30	30	27	23	21	20					
27	29	35	29	35	40	35	100	28	70	71	60	36	35	42	40	38	34	34	28	27	26	34	48	54					
28	60	48	48	32	33	59	39	35	37	40	32	B	35	32	41	39	32	33	36	45	27	44	31	22					
29	35	70	90	42	40	50	32	44	36	43	B	B	B	B	B	33	34	32	29	33	27	32	27	41					
30	45	40	42	21	35	27	37	45	33	40	B	33	32	B	B	B	36	B	E B	B	34	33	35	34	41	45			
31	B	59	37	78	B	33	37	33	42	46	60	37	32	B	32	B	32	B	E B	B	36	28	33	33	38	38			
CNT	28	28	31	28	26	28	30	29	28	30	22	25	25	22	27	27	29	27	30	31	30	31	31	30					
MED	44	38	40	35	37	38	37	36	42	36	36	36	U	38	38	36	35	35	33	31	33	32	34	34	38				
U Q	48	46	49	45	40	44	45	44	45	41	41	42	E B	E B	E B	E B	E B	E B	B	40	40	36	35	40	41	43	45		
L Q	30	30	34	32	33	32	35	34	35	33	35	35	35	36	35	34	33	32	28	28	27	32	26	27					

IONOSPHERIC DATA STATION SHOWA-ST.  
 JAN. 1992 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)  
 LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	18	19	19	19	15	15	20	21	16	20	16	19	30	18	15	20	19	15	15	19	19	15	18	18	
2	15	19	16	15	14				20	24			22	40				38	20	15	31	15	19	16	
3	10	9	10	16	20	20	30	25	25	20		20		25		29	19	15	15	15	30	13	13	16	
4	8	30	8	15	15	15	13	13	13	21	25				20	24	20		20	19	19	15	19	19	
5	19	15	29	17	16	15	19	17	19	19	24	19	19	20	19	23	30	19	19	15	17	21	15	24	
6	19	15	20	16	14	15	15	19	20	25	25	20	30	20	24	19	15	19	31	11	15	15	16	15	
7	20		19	17	11	19	19	16	19	19	15	19	19	34	25	24	19	15	19	15	10	40	15	16	
8	20	15	8	8	8	16	15	15	19	15	19	19	30	19	20	20	19	20	19	16	10	9	9	8	
9	9	8	15	9	9	20	15	19	20	20	19	20	19	19	19	20	30	19	15	11	15	18	7	8	
10	8	7	24	10	19	35	30	24	19	18	19	19	57			36	19	19	19	12	15	10	14	16	19
11	25	7	8	8	7	9	19	19	19	19		20		24	19	30	20	19	9	11	8	9	9	8	
12	10	8	8	8	6	7	19	15	15	15	25		30		19	20	18	50	20	30	10	19	18	20	
13	19	8	17	10	7	8	19	8				20	20	18	18	20	20	18	15	10	10	10	19	17	
14	15	7	19	19	9	8	15	14	19	19			44	25	20	19	15	15	15	15	9	15	14	9	
15	7	8	19	8	7	18	15	16	19	19	18	25	43		40	21	51	15		17	15	8	8	16	
16	8	18	20	13		16	25	16		20	20	51			55	51	51	54	16	15	19	7	10		
17			19		20	19	15	13	15	15	16	19		55	60	55	55	25	19	9	15	14	13	11	
18			25				25	25	18	55	54	55	55	54	45	55		55	52	30	29	23	19	19	
19	14	14	15	15	15	15	15	16	15	15	21	20	60		59		55	55	23	19	24	19	16	15	
20	14	9	9	9			32			19		29	54	55	30	60	55		19	8	9	19	15	25	
21	14	8	19	15	11	15	16	15	18	19	15	16	8	14	15	18	14	14	15	13		14	7	8	
22	7	14	23	18	8	16	15	19	17	19	21	21	17	20	24	19	15	20	20	15	7	7	17	11	
23	8	8	10	8	11	16	16	15	15	9		56	54	56	36	20	20	15	16	14	10	8	10	8	
24	8	19	19			19	8	15	14	15	19	19	16	19	16	20	19	15	15	15	15	14	9	8	
25	8	8	10	16	16	19	19	18	19	19	<sup>E</sup> 51	25	26	19	19	15	20	19	19	18	13	19	15	10	
26	18	14	14	15	16	7	16	15	19	20	19	20	20	20	20	19	20	19	19	19	14	13	10	8	
27	14	16	8	18	8	14	20	23	15	19	19	20	19	20	19	19	16	14	18	24	10	10	7	13	
28	7	9	9	9	8	19	14	15	19	20	15		20	20	19	19	15	19	14	15	9	9	8	7	
29	12	14	9	20	19	10	19	18	19	25						20	19	15	16	15	19	9	19	9	
30	15	10	20	15	15	15	15	20	19	25		19	30				19		34	18	10	12	33	11	
31		9	19	16		16	20	16	25	20	10	25	29		14		20		36	18	10	7	8	8	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	14	14	17	15	15	16	19	16	19	19	21	20	30	25	20	20	20	19	19	15	14	14	15	13	
U Q	19	18	19	18	19	19	20	19	19	20		55	57		45	51	30	50	20	18	19	18	18	18	
L Q	8	8	9	9	8	15	15	15	16	19	19	19	20	20	19	19	19	15	15	14	10	9	9	8	



IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 1992 (h'F (KM) M.D) ENIT 45'E MEAN TIME (G.M.T.) + 3 H) SERRI MAT

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

H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	265	305						255	240	240	240	240			235		235	245	250	260	260	280	310		
2	330		AE	AE	AE	AE	B	B	B	A	A	B	B	A	B	B	B	B	245	250		290	300	300	
3	300	310	300	360												245	240	250	250	250		275	320	245	
4									EA	EA	A	B	B	B											
5			Y	A	S	EA	EA																		
6	EA	EA	S	A																					
7		B	EA	EA																					
8				EA	EA																				
9	EA	EA																							
10	300	320	320	260																					
11	EA	EA	EA		EA	EA																			
12		EA	EA	EA																					
13																									
14	330	300																							
15																									
16		350		300	B	Y	Y	B	Y	Y	S	B	B	B	B	B	B	B	250	250	250	290	300		
17	B	B	A	B	B	B	A	A	Y	B	B	B	B	B	B	B	B	B	240	240	245	270	300	270	300
18																									
19	280	300	300	300	300	260	270																		
20	300	320	350	360																					
21	EA	EA	A	A																					
22	290																								
23	290	285	300	330	330																				
24	335	300	310																						
25	260	240	300	280																					
26	295	310	330	340	330	250	240	230	230																
27	200	260	230																						
28																									
29	250																								
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	15	16	13	12	11	13	9	16	14	11	9	7	5	3	11	15	20	21	28	26	24	26	21	22
MED	292	301	300	298	300	280	270	248	235	240	230	225	232	230	232	240	240	240	248	250	268	265	275	300
UQ	330	320	325	345	300	310	300	262	260	250	240	240	355	260	240	270	242	250	250	260	285	290	310	300
LQ	265	292	295	290	265	255	250	240	230	220	210	220	220	230	220	230	235	230	240	248	250	250	250	250

IONOSPHERIC DATA STATION SHOWA-ST.  
 FEB. 1992 f<sub>x</sub>I (0.1MHz) SWEEP 45°E MEAN TIME (G.M.T. + 3 H)  
 LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	O X 49	A	55	60	60	A	A	A	A	B	B	B	B	B	A	B	B O X 51	B	B	A	A	A	A	A	
2	44	A	A	B	A	S	A	A	A	A	A	A	B	B	B	B	A O X 48	A	A	A	A	A	42	46	
3	A	A	A	S	O X 60	53	B	B	A	A	B	B	B	A	B	A O X 50	A	A	58	S O X 46	O X 51	O X 41			
4	A	B	A	59	59	58	A	B	A	B	A	S	A	A	B	B	S	H 65	H 66	H 60	H 56	A	59	58	
5	60	A	A	60	A O X 61	O X 63	73	79	72	85	80	85	84	83	B	B O X 76	H 79	H 81	H 84	H 79	H 80	H 80	H 80	H 70	
6	X 69	68	70	68	71	70	80	93	95	99	99	100	96	O X 100	B	96	95	90	H 73	H 63	H 61	H 69	H 65	H 49	
7	43	60	S	S	80	B	B	B O X 75	O X 75	O X 74	O X 86	O X 84	S	B	B	B	B	B	B	B	B	B	B	B	
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
9	B	B	A	A O X 41	B	A O X 47	A	B	A	A	A	A	A	A	A	B	B	B	B	B	B	A	A	A	
10	A	A	A	A	A	A	A	A	B	A	A	A	B	B	B	A	S	A	B	A		46	53	46	
11	A	A	66	60	A	60	70	80	83	85	84	90	91	90	95	95	H 85	X 80	85	O X 77	O X 60	O X 51	O X 48		
12	O X 48	48	78	A	60	70	B	A	A	A	80	80	80	81	82	80	O X 80	O S 76	69	65	60	60	65	62	
13	70	60	A	A	A	A	S	80	A	B	74	80	O X 76	O X 80	O X 84	O X 81	O X 80	S	75	71	75	78	82	73	65
14	60	46	59	60	S	S	70	79	84	90	90	98	X 96	X 90	O X 99	O X 99	O X 85	S	80	80	79	65	52	49	
15	A	59	60	61	A	A	80	80	95	100	100	105	99	99	90	81	80	80	76	72	X 73	70	68	70	
16	X 68	72	X O X 70	X 77	75	75	84	84	100	106	105	109	109	109	100	100	90	80	89	89	O X 83	O X 76	71	69	
17	68	60	S	A	70	C	C	C		108	107	105	104	100	110	109	89	73	70	X 66	X 65	60	52	48	
18	A	48	A	58	49	B	B	B	B	A	B	B	B	B	B	68	70	X 70	X 67	X 65		50	42		
19	S	A O S 54	A	A	70	A O X 75	86	82	90	90	95	94	94	91	95	98	88	O X 93	O X 79	X 73	X 43	S	A		
20	A	A	S	A	A	B	B	B	B	A	72	80	A	B	80	O X 99	A	B	70	A	46	33	A	A	
21	A	A	A	A	A O X 41	B	B	A	A O X 47	B	A	A	B	B	B	B	O X 63	O X 60	X 63	48	52	O X 48	O X 44	O X 46	
22	48	A	A O X 45	A	A	B	A	B	B	A	B	B	B	B	B	68	B	70	58	58	O X 46	O X 45	O X 47	A	
23	A	A	A O X 49	A	A	A	B	A	A	A	A	B	B	B	B	69	70	75	72	X 72	X 71	O S 60	A	A	
24	A	59	B	46	56	69	B	A	A	A	B	B	B	B	B	73	80	X 78	X 71	H 80	X 59	A	A	60	
25	A	A	A	58	B	A	A	A	A	A	A	B	B	B	B O X 49	B	64	60	H 55	H 40	A	A	A	A	
26	A	A	A	A	A	O X 60	45	A	B O X 46	A	S	B	B	B	B	B	65	70	B	B	B	B	B	B	
27	A	A	B	B	A O X 40	A	A	A	A	A	B	B	B	B	B	B	B O X 47	B O X 51	B O X 51	B	B	B	A	B	
28	A	60	48	59	58	O X 51	B	70	78	80	S	80	O X 75	O X 77	X 75	X 74	X 75	X 71	X 70	X 68	O X 64	O X 65	O X 49	A	
29	A	A	42	47	B	B	65	B	B	70	79	78	85	X 90	X 95	X 100	X 90	H 70	B	A	B	A	40	A	
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	11	11	10	16	12	12	9	10	9	12	14	14	13	12	14	16	19	22	19	20	19	17	18	15	
MED	60	60	60	59	60	60	70	80	82	86	85	85	90	90	87	88	80	72	71	68	64	60	52	49	
U Q	X 68	60	70	60	70	70	80	84	95	100	99	100	98	100	95	99	90	79	80	80	77	70	65	65	
L Q	48	48	54	48	O X 57	O X 54	O X 58	70	78	74	74	80	82	82	80	74	O X 70	O X 65	69	59	56	47	47	46	

# IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1992 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	43	A	48	F	F	A	A	A	A	A	B	B	B	B	B	A	B	B	45	B	B	A	A	A	A
2	39	F	A	A	B	A	S	A	A	A	A	A	A	B	B	B	B	A	42	A	A	A	A	F	F
3		A	A	A	F	S	F		B	B	A	A	B	B	A	B	A		44	A	A	J	F	S	SD
4		A	B	A	F	F	F	A	B	A	B	A	S	A	A	B	B	S	F	H	H	H	H	A	F
5	47	F	A	A	F	A	R	U	R	F	F	F	A	J	F		F	B	H	H	H	H	46		51
6	60	F	F	F	F	F	F	70		F	F	F	A	J	F		F	B	H	H	H	H	46		51
7	38	F	S	S	F	B	B			F	F	F	A	J	F		F	B	H	H	H	H	46		51
8		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9		B	B	A	A	R	B	A	R	A	B	A	A	A	A	A	B	B	B	B	B	B	A	A	A
10		A	A	A	A	A	A	A	A	B	A	A	A	B	B	B	A	S	A	B	A		U	R	A
11		A	A	F	F	A	F	A		Z					J	F	H			F	J	F			
12	42	S	F	F	A	J	F	J	F	B	A	A	A				J	F	J	F	F				
13		F	Z	A	A	A	A	D	S	F	A	B		F	U	S	F								
14	54	J	F	F	F	F	S	S		F	F								D	S	F				
15		A	F	F	F	A	A	J	F	F									U	R					
16	60	J	F	J	F	Z	J	F	J	F	F	F	F	F	F	F	F	U	R			J	F		
17	60	U	R	S	A	F	C	C	C	C													U	R	J
18	42	A	F	A	F		B	B	B	B	A	B	B	B	B	B	F	60	62	62	60	60	58		
19		S	A		A	F	A			F				J	F				J	F					
20		A	A	S	A	A	B	B	B	B	A			F	A	B	F		A	B	F	A	F	A	A
21		A	A	A	A	A		B	B	A	A			B	A	A	B	B	J	F	U	R			
22		F	A	A	F	A	B	B	A	B	B	A	B	B	B	B	U	S	B	J	F	U	R		
23		A	A	A	U	S	A	A	A	B	A	A	B	B	B	B	F						U	R	
24		A	F	B	F	F	F	B	A	A	A	B	B	B	B	B			F						
25		A	A	A	F	B	A	A	A	A	A	B	B	B	U	S	B		F	H	H	S	A	A	A
26		A	A	A	A	A		B	S	A	S	B	B	B	B	B									
27		A	A	B	B	A	S	A	A	A	A	B	B	B	B	B	B	60	62	B	S	B	S	B	B
28		A		F	F		B	F		S															
29		A	A	U	F	B	B		B	B							E	G	H	F	B	A	B	A	F
30																									
31																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		9	7	7	12	8	10	10	6	7	12	14	13	13	12	14	16	19	23	18	20	19	16	15	10
MED		47	51	48	44	50	49	64	60	73	76	72	80	82	84	79	78	71	68	68	60	58	56	46	54
UQ		60	56	56	52	64	55	70	64	80	86	80	96	90	92	85	92	82	72	70	70	70	62	60	60
LQ		40	42	40	40	46	45	57	59	69	67	68	72	76	74	71	69	62	58	60	53	48	44	45	43



IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1992 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23														
1		39	28	43	40	33	38	40	61	43		B	B	B	B	34	B	B	32	B	B	59	70	41	82														
2		118	91	60	B	69	33	70	69	40	32	33	36	B	B	B	B	34	33	31	33	35	45	41	33														
3		70	42	59	28	34	31	33		B	B			B		B	34	33	28	27	45	38	33	43	33														
4		54	B	35	26	17	17	34		B		B				B	B	33	33	34	32	33	43	33	33														
5		91	43	41	33	33	26	34	31	33	32	32	E B	41	33	35	34	B E B	56	27	28	E B	50	32	32	36	27												
6		34	40	33	23	21	21	35	32	32	35	E B E B	60	50	56	59		32	69	34	31	27	32	30	32	35													
7		37	38	41	26	32		B	B	B E	B E	B E	B E	B E	B E	B	B	B	B	B	B	B	B	B	B	B													
8		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B													
9		B	B				B				B						B	B	B	B	B																		
10		42	42	60	40	35	33	35	37		B						B	B																					
11		37	42	32	26	57	27	40	32	29	30	33	43	75	34	70	38	35	E B	34	30	60	70	23	18	34													
12		39	39	36	42	60	25		B	48	60	45	42	33	33	35	34	28	34	30	27	E B	40	30	19	30	30												
13		39	30	71	41	41	40	40	33	40		B E	B		E B E	B E	B E	B E	B E	B E	B E	E B	32	24	32	58	29												
14		17	E B	20	27	30	32	42	41	39	46	31	32	30	26	35	57	38	28	30	26	25	27	21	18	25													
15		37	23	36	32	25	34	39	43	30	33	31	34	31	32	31	32	27	38	28	33	21	E B	29	13	33													
16		17	25	29	28	22	21	E B	27	37	40	30	30	E B E	55	56	55	50	52	38	E B	30	31	30	26	70	27												
17		27	32	41	42	33		C		C		C			E B					E B E	B E	30	27	40	27	20													
18		42	41	40	30	E B	B	B	B	B		B	B	B	B	B	B E	B	48	31	29	31	28	27		43	35												
19		47	70	18	45	43	42	46	39	30	30	27	30	23	26	31	39	39	27	26	26	21	26	34	46														
20		41	92	70	30	41		B	B	B		B							B																				
21		43	70	60	28	26	26		B	B	71	35	33		32	32			34	33	29	28	26	29	41	39													
22		47	46	80	31	46		B	B		B				B	B			B E	B																			
23		80	27	41	26	41	38	34		B				B	B	B			E B	B	31	28	28	27	E B	23	29	38	40										
24		44	34		B	36	26	21		B	40	42	41		B	B	B		B E	B	35	27	28	28	32	29	59	59	39										
25		35	58	48	27		B	42	42	29	41	26	31		B	B	B		28		34	44	38	17	40	70	59	51											
26		48	41	33	25	37	32	27	33		B	30	40	E B	51				B E	B E	B	B	B	B	B	B	B	B	B										
27		33	41		B	41	26	57	40	38	44			B	B	B	B		B		25		B E	B	B	B	B	B	B										
28		33	32	22	17	27	E B	27	B E	B E	B E	B E	B E	B E	B E	B			E B E	B E	31	31		B	B	B	B	B	B										
29		70	35	33	34		B	B E	B	B		B		E B E	B E	B			33	50	37	41	32	27	32	26	30		33		27	51	47						
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		27	26	26	26	26	21	19	19	20	23	24	19	17	17	16	18	23	25	21	24	24	24	26	25														
MED		41	40	40	30	33	31	38	37	40	32	33	U	34	32	34	33	34	32	29	28	30	29	30	36	35													
U Q		48	43	59	36	41	38	42	43	42	35	E B E	B E	B E	B E	B E	B E	B	35	34	32	33	34	39	43	42													
L Q		35	32	33	26	26	26	34	32	30	30	32	32	32	32	31	32	28	28	28	27	26	26	32	30														

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 1992 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

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	19	19	15	14	20	25	25	20		B	B	B	B	B	25	B	B	19	B	B	9	20	9	9
2		8	10	19	B	18	9	19	20	20	19	20	30	B	B	B	B	19	19	19	9	11	11	19	8	
3		20	25	9	8	20	11	9	B	B	21	30	B	B	30	B	25	24	19	16	14	10	9	9	8	
4		18	B	19	10	8	10	19	B	20	25	20	25	30	B	B	B	20	20	19	30	20	9	7	9	
5		19	25	10	10	20	19	9	8	10	19	20	41	25	25	19	B	56	20	19	50	8	30	9	7	
6		8	7	13	19	19	19	30	19	19	25	60	50	56	59	B	30	20	25	16	18	16	19	16	10	
7		10	11	20	20	20	B	B	B	55	56	56	55	56	56	B	B	B	B	B	B	B	B	B	B	
8		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
9		B	B			B				B							B	B	B	B	B					
10		19	19	16	25	19	20	19	25	B	19	20	20	B	B	B	19	18	19	B	18	19	19	10	15	
11		13	18	9	8	21	19	20	19	20	19	19	19	19	19	20	19	19	34	12	19	19	19	9	10	
12		9	8	8	20	9	16	B	40	19	18	19	19	19	19	24	20	21	16	14	40	13	17	9	9	
13		7	25	7	25	20	30	29	11	24	B	51	24	55	55	55	35	35	21	50	11	8	9	8	7	
14		6	20	8	9	25	22	20	15	10	20	19	20	20	20	57	25	23	25	20	9	10	18	9	8	
15		9	9	9	10	20	23	21	40	20	20	19	20	23	25	24	21	25	26	19	9	9	29	9	8	
16		9	8	8	9	9	11	27	25	20	24	20	55	55	56	55	50	52	24	30	20	9	15	11	7	
17		7	7	11	20	20	C	C	C	C	19	19	19	53	19	23	21	23	56	51	24	19	14	9	9	
18		12	8	11	14	21	B	B	B	B	21	B	B	B	B	B	48	25	19	19	18	19	B	18	11	
19		19	11	9	24	19	20	19	23	19	16	25	23	18	19	20	30	19	24	15	14	18	15	18	17	
20		18	19	18	26	19	B	B	B	B	19	19	20	19	B	20	15	15	B	10	9	14	16	11	10	
21		30	13	8	10	14	9	B	B	25	19	20	B	25	19	B	B	19	17	19	19	18	9	13	10	
22		13	8	9	8	8	B	B	14	B	B	21	B	B	B	B	25	B	31	26	19	18	13	10	11	
23		19	9	9	19	30	20	20	B	20	30	25	B	B	B	B	24	35	20	18	16	16	23	11	10	9
24		9	14	B	14	25	11	B	20	20	20	B	B	B	B	B	35	15	16	9	8	19	20	14	8	
25		14	16	9	16	B	20	19	20	19	20	20	B	B	B	B	25	B	19	14	15	15	10	10	10	10
26		15	13	14	14	20	18	21	25	B	21	30	51	B	B	B	B	31	31	B	B	B	B	B	B	
27		24	30	B	B	14	17	19	20	19	19	B	B	B	B	B	B	B	19	B	40	B	B	19	B	
28		19	19	13	14	18	27	B	51	30	31	40	39	20	32	31	54	32	21	19	24	25	19	18	18	
29		17	24	17	18	B	B	B	50	B	31	50	37	20	19	20	25	20	20	B	20	B	19	18	20	
30																										
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		29	29	29	29	29	28	28	28	28	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
MED		14	16	11	16	20	20	26	25	20	21	25	41	55	56	55	35	23	21	19	19	18	19	11	10	
U Q		19	24	19	22	23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
L Q		9	9	9	10	16	16	19	20	19	19	20	20	22	20	24	25	19	19	16	14	10	12	9	8	

IONOSPHERIC DATA STATION SHOWA-ST.  
 FEB. 1992 h'F (KM) 45'E MEAN TIME (G.M.T. + 3 H)  
 LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	E A 250	A	A	A	A	320	A	A	A	A	B	B	B	B	A	B	B	250	B	B	A	A	A	A		
2	A	A	A	B	A	A	A	A	A	A	A	A	B	B	B	B	A	A	A	A	A	A	A	A		
3	A	A	A	A	S	270	A	B	B	A	A	B	B	A	B	A	250	A	A	280	AE A	330	275	320		
4	A	B	A	330	340	320	A	B	A	B	A	230	A	A	B	B	240	245	250	260	300	AE A	AE A	AE A		
5	A	A	A	370	A	310	260	250	270	250	250	250	AE B	A	AE S	B	B	230	250	B	250	260	260	260		
6	295	300	E AE S 310	340	310	290	A	250	250	Y	B	B	B	B	B	Y	Y	260	260	260	H	280	280	260		
7	A	AE S 250	A	330	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
9	B	B	A	A	B	B	A	B	A	B	A	A	A	A	A	B	B	B	B	B	A	A	A	A		
10	A	A	A	A	A	A	A	A	B	A	A	A	B	B	B	A	250	A	B	AE A	300	300	A	A		
11	A	A	350	340	AE A 310	AE A 250	260	235	240	Y	Y	Y	E A	H	H	200	290	220	220	240	240	250	250	310	280	325
12	310	300	A 305	A	H 300	A	B	A	A	A	230	245	E A	A	A	230	250	245	245	270	245	250	255	270	280	
13	295	B	A	A	A	A	S	A	A	B	BE A	230	B	B	B	230	240	240	340	E B	250	260	250	260	250	
14	290	350	A	A	A	A	A	YE A 270	220	210	240	H	A	Y	BE S	310	240	340	250	260	250	255	265	265		
15	A	A	350	345	A	A	A	Y	245	240	240	Y	S	S	S	240	245	245	245	250	250	250	250	250	250	
16	260	240	310	330	330	300	270	300	250	240	230	B	B	B	B	B	B	B	250	250	250	240	240	240	250	
17	260	295	A	A	A	C	C	C	240	240	235	B	E A	245	250	235	Y	B	250	250	270	270	270	280		
18	A	A	A	A	280	B	B	B	B	A	B	B	B	B	B	250	250	250	250	280	270	BE A	340	A		
19	A	A	300	A	A	A	A	Y	270	250	240	Y	245	240	240	245	245	250	250	260	260	350	E A	A	A	
20	A	A	A	A	A	B	B	B	B	A	Y	260	A	BE AE A	250	250	A	B	A	AE A	350	A	A	A	A	
21	A	A	A	A	AE A 380	B	B	A	A	A	A	B	A	A	B	B	A	300	280	270	275	A	A	A	350	
22	A	A	A	A	A	B	B	A	B	B	A	B	B	B	B	250	B	250	290	300	H	370	360	A	A	
23	A	A	A	A	A	A	A	B	A	A	A	B	B	B	250	260	245	270	250	300	300	300	A	A	A	
24	A	A	B	310	B	300	B	A	A	A	B	B	B	B	B	240	250	260	300	290	310	A	A	260		
25	A	A	A	A	B	A	A	A	A	A	A	B	B	B	B	290	250	280	300	A	A	A	A	A	A	
26	A	A	A	A	A	350	330	A	B	240	A	B	B	B	B	B	250	260	B	B	B	B	B	B	B	
27	A	A	B	B	A	A	A	A	A	A	B	B	B	B	B	B	240	B	B	B	B	B	B	A	B	
28	A	A	A	AE A 350	B	B	B	B	250	B	B	240	B	A	B	240	250	260	260	260	250	250	275	A		
29	A	A	Y	Y	B	B	B	B	B	B	B	B	250	250	250	270	250	290	B	A	B	A	A	A	A	
30																										
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	7	5	7	7	8	9	3	4	7	9	8	8	4	4	9	13	16	21	18	17	19	15	13	12		
MED	290	300	310	340	320	305	270	250	255	240	240	236	242	242	250	248	245	250	250	260	265	262	265	267		
U Q	295	325	350	345	335	335	330	275	270	250	245	248	248	248	270	255	250	265	280	280	300	310	278	305		
L Q	260	268	300	330	305	295	260	250	250	238	230	232	235	220	235	238	240	245	250	250	250	250	260	255		



IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1992 fxI (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	47	61	53	68	70	S	75	72	B	B	B	B	80	84	90	88	89	90	81	80	58	34	A		
2	A	A	B	A	S	80	A	A	62	79	81	86	99	103	100	98	98	94	82	74	80	59	A	44		
3	S	S	A	O X	59	54	A	O X	73	79	84	94	90	86	89	95	97	96	105	90	82	69	A	42		
4	40	S	A	A	O X	O X	A	A	80	90	100	96	100	105	100	O X	96	94	104	96	85	68	39	S		
5	S	A	O X	60	66	A	80	80	80	80	85	80	80	85	92	91	96	94	85	58	A	38	32			
6	A	A	A	59	70	82	92	98	100	106	O X	O X	100	95	86	80	87	78	80	80	67	52	45			
7	42	A	A	O X	70	70	70	82	94	94	95	100	100	95	104	101	100	80	80	72	59	A	O X	49		
8	55	59	O X	51	71	A	O X	B	A	A	80	90	93	90	91	84	79	76	80	80	70	57	46	A		
9	A	S	60	60	60	S	A	A	O X	54	72	81	81	81	81	B	B	B	81	80	59	53	38	45		
10	A	O X	51	48	60	60	A	60	70	B	B	70	79	75	80	85	80	81	80	78	71	70	28	A		
11	A	A	60	60	41	B	O X	B	B	B	B	B	B	90	90	80	90	81	71	59	47	A	A	A		
12	A	A	A	B	58	A	B	B	B	B	B	X	B	B	S	O X	S	S	S	89	71	71	60	47		
13	32	S	A	O X	44	70	70	B	B	B	O X	B	O X	96	109	105	110	120	106	96	100	77	70	60		
14	40	B	48	70	47	B	O X	O X	55	77	90	93	108	116	120	120	120	110	110	91	84	74	55	46		
15	S	47	47	A	A	81	90	90	92	92	100	108	110	118	120	120	111	105	94	79	70	47	A			
16	A	O X	53	A	C	C	C	C	76	82	90	101	115	O X	B	116	120	130	112	100	B	A	A	B		
17	A	A	S	47	A	A	B	A	A	B	79	80	85	90	90	98	105	120	95	86	70	A	A	A		
18	A	A	A	A	A	O X	59	51	54	S	64	71	70	71	75	79	81	78	69	70	61	53	48	47		
19	32	34	O X	40	S	34	35	59	70	69	79	90	96	111	111	107	98	96	87	89	85	71	69	49		
20	40	35	34	32	48	70	60	57	70	80	89	106	109	114	118	114	98	100	98	96	81	74	59	48		
21	X	38	42	46	52	58	58	60	59	74	89	99	110	117	118	B	133	130	105	53	70	A	A	43		
22	S	A	A	A	A	59	A	B	B	A	B	B	B	B	B	O X	66	69	68	68	61	53	A	A		
23	B	A	A	A	A	B	B	B	B	A	B	B	B	B	B	65	72	78	69	74	70	43	A	A		
24	A	50	A	B	B	A	A	B	B	B	B	B	B	B	B	O X	O X	68	89	95	110	100	A	A		
25	A	B	A	A	A	B	B	B	B	B	B	B	B	O X	B	66	69	77	100	110	80	70	A	A		
26	A	A	A	A	S	B	B	B	B	70	71	79	92	105	120	B	130	120	99	70	71	A	A	S		
27	B	B	A	A	A	A	A	A	S	62	B	O X	76	80	86	90	98	100	100	100	89	46	A	50		
28	A	A	O X	54	A	B	B	B	B	A	B	B	B	O X	79	86	100	110	110	105	90	70	43	A		
29	S	A	A	A	A	B	A	B	B	B	B	A	B	B	B	O X	80	89	101	99	A	A	A	A		
30	B	A	50	A	A	A	A	C	A	B	B	B	B	B	B	S	62	69	60	52	47	25	S	A		
31	A	A	A	B	A	A	B	B	B	B	61	65	68	69	72	71	72	72	73	69	80	41	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	8	9	13	12	15	12	9	13	15	16	21	20	22	24	26	27	29	30	30	28	25	17	13	12		
MED	40	47	50	59	60	63	60	73	77	81	89	90	92	90	93	96	96	98	90	77	70	58	47	46		
U Q	41	O X	52	60	60	70	70	70	81	90	91	94	100	108	105	107	105	108	110	99	85	80	70	54	48	
L Q	35	38	46	50	48	58	O X	54	58	70	76	77	80	80	80	85	80	80	80	80	78	70	56	40	44	43



IONOSPHERIC DATA STATION SHOWA-ST.  
 MAR. 1992 (ftEs (0.1MHz) SWEEP 45°E MEAN TIME (G.M.T.) + 3 H)  
 LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	36	36	28	27	22	34	30	22	28		B	B	B	BE	B	37	33	30	28	E	B	26	26	58	15	32	41		
2	40	60		38	42	71	28	37	27	29	E	BE	BE	BE	B	31	28	33	30	27	26	E	BE	BE	B	31	45	26	
3	34	38	59	46	33	30	42	55	42	36	37	29	27	35	32	32	31	31	38	21	19	32	31	35					
4	33	59	59	41	31	31	33	34	26	27	26		33	37	40	30	34	27	E	B	30	32	18	28	51	40			
5	48	41	41	31	41	31	42	41	43		B		E	BE	BE	BE	BE	BE	B	51	25	26	31	33	38	34	33		
6	33	33	60	40	50	40	48	27	24	30	E	BE	BE	BE	BE	BE	B		27	27	23	27	28	27	23	21			
7	25	40	41	48	59	31	39	48	26	27	27	29	30	30	29	32	26	26	26	27	41	51	47	43					
8	42	38	90	40	32	33	30		41	42	37	39	41	29	30	28	26	23	24	23	E	B	30	27	28	45			
9	36	33	32	31	41	40	43	52	33	34	28	36	33	31					26	27	28	31	20	85	41				
10	40	41	32	28	43	70	31	32			B	B	E	BE	BE	BE	B	E	BE	BE	B	32	24	37	40	42			
11	33	70	42	71	53		34		B	B	B	B	BE	B	B	E	BE	BE	BE	B	E	B	20	45	28	34			
12	41	38	27		26	33			BE	B	56		BE	BE	BE	BE	BE	BE	BE	BE	B	E	B	30	37	20	18		
13	20	36	25	24	41	32	46		31	28	58	55		50	50	55	30	36	25	28	25	16	18	14					
14	36		12	20	13	18		40	30	27	50	36	50	51	35	31	26	23	20	19	15	15	11	30					
15	40	39	38	36	39	41	22	22	23	26	27	40	29	52	50	27	25	22	23	29	15	32	33	39					
16	35	45	39		C	C	C	C	C	E	B	26	26	32	32		55	58	30	42	30		35	40		38			
17	70	110	40	110	90	43		38	34		BE	BE	BE	BE	B				25	28	22	25	32	26	21	32			
18	32	47	90	70	60	41	28	21	27	40	E	B	30	29	34	33	40	28	39	31	20	22	13	25	31	24			
19	28	27	30	32	27	13	12	16	26	25	27	41	36	42	31	32	32	31	13	20	34	37	27	22					
20	E	B	14	26	27	26	12	15	17	19	21	26	40	38	33	41	38	28	26	20	E	BE	BE	B	20	19	26	20	
21	E	B	13	20	16	21	13	14	13	19	24	31	33	33	41	34		BE	B	39	25	32	27	21	26	90	60	41	
22	70	100	41	33	32	30	60			35					28		BE	B	30	26	31	30	30		34	44	60		
23		41	42	40	48					32							BE	BE	BE	BE	BE	BE	B		34	38	80	72	
24	38	28	66		40	28											BE	BE	BE	BE	BE	BE	B	33	33	28	60	39	
25	110		33	32	32												E	B		E	B								
26	44	40	34	26	27				BE	B	30	27	29	28	27	27		BE	BE	B	E	B	33	40	42	116			
27			33	41	27	33	31	32	40	33	BE	BE	BE	BE	B		E	B	31	21	20	16	E	BE	BE	B	70	60	
28	105	41	48	100					41				BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE
29	51	60	55	65		40						70					BE	BE	B	56	31	24	13	34	26	41	49	115	
30		43	33	45	29	32	34		38								BE	BE	B	31	25	24	22	E	BE	BE	BE	B	
31	70	72	70		42	42							E	B			E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	
	00	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	30	27	27	25	21	17	21	19	21	21	22	25	25	29	30	31	30	30	30	30	31	30	31				
MED	37	40	40	38	33	33	31	30	29	30	U	30	32	31	32	30	29	28	25	23	26	U	26	32	37	39			
U Q	46	53	55	46	43	40	42	40	39	34	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	
L Q	33	36	32	28	27	E	B	28	22	26	27	27	30	30	30	30	28	26	24	21	E	BE	BE	B	21	20	21	28	30



IONOSPHERIC DATA STATION SHOWA-ST.  
 MAR. 1992 (fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)  
 LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

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



IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 1992 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	395	A	380	330	A	260	250		B	B	B	B	B	250	250	250	250	250	250	250	280	A	A				
2	A	A	B	A	A	A	A	A	250	260		B	B	B	B	240	240	230	240	280	270	300	A	A	A				
3	A	A	A	A	A	S	A	S	Y	Y	Y		250	250	240	250	250	245	250	250	250	280	A	A	A				
4	A	A	A	A	A	A	A	A	310	260	250	250		240	250	250	235	240	245	250	270	240	360	A	A				
5	A	A	A	A	A	A	A	A	E	A	A	B	E	S	E	S	B	B	B	B	B	250	240	250	350	A	350	350	
6	A	A	A	A	A	A	A	A	290	240	230			320	300	235	250	250	240	240	250	240	240	270	300				
7	340	A	A	A	A	B	A	Y	250	230	240	240		235	250	235	240	240	245	245	270		A	A	A	E	A	300	
8	270	300	A	A	350	A	A	A	A	A	260	270		250	250	245	240	250	250	250	260	250	245	310	A	A	A		
9	A	350	340	300	350	A	A	A	240	240	245	245		250	260			B	B	B	260	260	240	280	270	A	A	A	
10	A	A	A	350	350	A	Y	B	B	B	A			230	B	B	B	240	240	260	240	270	300	A	A	A	A	A	
11	A	A	350	A	A	B	A	B	B	B	B	B	B		250	250	250	350	300	290	280	340	A	A	A	A	A	A	
12	A	A	A	B	340	A	B	B	B	B	B	B	B		B	S	S	E	S	S	B	E	B	260	250	260	300	300	
13	350	350	A	A	400	400	A	B			B	B	B		250	260	240	250	240	230	240	230	240	230	240	250	260	260	
14	300	360	B	B	370	350	B	275	260	250	270	240		260	250	230	240	240	230	230	210	220	240	240	320	A	A	A	
15	A	A	260	A	A	A	E	A	350	275	250	240	240	230	240	250	240	240	240	220	220	210	250	310	300	A	A	A	
16	A	250	A	C	C	C	C	C	270	250	240	240		250		290	260	240	250	260		B	A	A	B	A	A	A	
17	A	A	A	A	A	A	B	A	A	B	B	E	B	350	340	250	250	240	250	250	230	240	A	A	A	A	A	A	
18	A	A	A	A	A	240	200	270	210	330	250	250		250	250	230	250	250	250	250	245	240	240	250	270	250	270	270	
19	340	A	A	A	A	A	320	270	260	250	250	250		240	230	240	240	240	245	240	230	220	240	240	250	250	250	250	
20	300	350	E	A	A	A	350	330	250	250	245	250	240		240	250	240	230	235	220	220	230	230	210	240	210	A	A	A
21	300	300	335	350	350	350	215	270	250	250	250	245	240		250	250	310	300	350			A	A	A	A	A	A	A	
22	300	A	A	A	A	250	A	B	B	A	B	B	B		245	260	260		300	300		B	A	A	A	A	A	A	
23	B	A	A	A	A	B	B	B	B	A	B	B	B		B	260	270	260	300	300	270	370	A	A	A	A	A	A	
24	A	350	A	B	B	A	A	B	B	B	B	B	B		B	250	250	250	250			A	A	A	A	A	A	A	
25	A	B	A	A	A	B	B	B	B	B	B	B	B		B	270	250	260	290	250		B	250	300	A	A	A	A	
26	A	A	A	A	A	B	B	B	B	250	250	260		250	250	250		B	250	240	240	250	310	A	A	280	280		
27	B	B	A	A	A	A	A	A	300	A	B	B	B		250	250	245	245	240	240	235	210	250	245	A	270	A	270	
28	A	A	A	A	B	B	B	B	A	B	B	B	B		250	250	290	250	240	260		B	250	A	A	A	A	A	
29	250	A	A	A	B	A	B	B	B	B	B	B	A		B	B	B		260	260	250	A	A	A	A	A	A	A	
30	B	A	A	A	A	A	A	C	A	B	B	B	B		B	270	260	250	250	250		A	250	320	310	A	A	A	
31	A	A	A	B	A	A	B	B	B	B	B	B	B		250	250	260	250	250	300	300	250	230	250	250	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	7	7	3	8	7	5	11	15	14	14	15	18	20	22	27	28	30	30	26	24	15	12	12					
MED	300	350	345	350	350	350	268	270	250	249	250	242	250	250	250	250	250	250	250	250	250	250	250	245	265	280			
U Q	340	350	395	350	375	350	340	290	260	250	250	260	250	250	250	260	255	260	260	270	300	280	305	310					
L Q	300	300	335	300	350	250	208	260	250	240	245	240	240	250	240	240	240	240	240	240	240	240	240	240	245	265			

MAR. 1992 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1992 f<sub>XI</sub> (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		58	<sup>O</sup> X 53	S	A	A	A	48	A	B	B	B	B	B	69	B	80	90	96	99	82	72	60	48	45	
2		43	38	<sup>O</sup> X 35	A	24	A	40	51	60	70	<sup>O</sup> X 96	112	110	120	110	110	111	109	92	78	48	S	70	A	
3		A	A	60	70	51	48	A	69	70	59	<sup>O</sup> X 51	B	70	80	82	129	98	<sup>O</sup> X 49	43	34	52	A	A	62	
4		A	41	A	35	S	54	45	44	70	70	<sup>X</sup> 71	<sup>X</sup> 71	<sup>X</sup> 75	98	110	B	B	B	B	65	49	A	A	A	
5		A	A	48	38	A	78	60	70	80	92	96	94	91	98	<sup>O</sup> X 104	<sup>O</sup> X 105	100	120	99	78	73	S	A	A	
6		A	A	A	A	60	A	A	A	B	B	B	B	B	<sup>O</sup> X 76	B	80	83	79	80	62	49	32	A	A	
7		A	A	A	45	40	A	A	54	B	B	B	B	B	B	<sup>O</sup> X 86	<sup>O</sup> X 110	110	105	98	80	A	<sup>O</sup> X 35	A	A	
8		A	A	A	A	B	B	A	B	B	<sup>O</sup> X 71	69	<sup>O</sup> X 76	<sup>O</sup> X 86	B	110	S	120	110	85	41	S	B	B		
9		A	S	A	A	B	B	A	A	B	B	89	91	99	B	<sup>O</sup> S 106	110	109	108	99	89	79	62	B	B	
10		A	A	A	B	A	B	A	69	B	B	90	97	96	<sup>O</sup> X 98	99	98	93	86	82	75	70	S	34	31	
11		29	28	A	48	A	A	70	75	82	88	93	100	109	109	<sup>X</sup> 109	110	109	97	72	60	53	44	26	27	
12		29	24	26	S	A	A	31	70	70	79	91	116	120	124	C	129	120	111	99	93	89	79	50	39	
13		35	34	42	32	27	S	80	81	71	81	89	110	B	131	130	121	<sup>X</sup> 120	140	140	110	80	<sup>O</sup> X 53	B	B	
14		B	A	S	A	<sup>O</sup> X 53	S	70	80	90	110	120	120	130	125	130	119	<sup>O</sup> X 116	<sup>O</sup> X 104	86	60	36	29	28	S	
15		A	A	A	S	A	A	60	70	90	96	110	118	120	119	120	120	120	<sup>O</sup> S 98	79	68	48	32	S	S	
16		31	35	34	48	51	60	70	60	70	74	82	<sup>O</sup> X 99	<sup>X</sup> 108	<sup>X</sup> 104	119	116	<sup>X</sup> 110	<sup>O</sup> X 90	<sup>O</sup> X 116	99	80	<sup>O</sup> X 54	28	S	
17		<sup>O</sup> X 22	26	29	<sup>O</sup> X 50	73	65	70	70	80	100	120	120	120	130	132	126	118	99	71	60	48	32	<sup>O</sup> X 22	A	
18		20	27	A	B	24	40	29	47	58	70	85	103	129	130	120	125	130	134	45	S	71	70	60	A	
19		A	51	47	A	60	B	A	B	A	A	A	B	B	B	72	69	85	80	71	60	<sup>O</sup> X 32	A	A	B	
20		A	51	49	A	A	34	A	A	B	A	A	63	B	B	B	99	110	105	99	70	S	A	A	A	
21		S	S	A	A	A	A	A	B	A	B	60	60	70	85	90	76	80	91	81	66	S	S	S	S	
22		A	A	A	A	28	B	B	B	A	A	<sup>O</sup> X 54	<sup>X</sup> 70	81	B	131	130	130	120	78	S	A	S	S	S	
23		A	A	A	A	A	A	S	A	52	60	70	80	93	110	120	120	110	100	89	70	A	A	A	A	
24		<sup>O</sup> X 42	A	B	A	S	B	B	B	B	A	<sup>O</sup> X 65	69	70	78	84	90	<sup>O</sup> X 96	<sup>O</sup> X 86	79	42	A	A	A	48	
25		A	A	A	B	B	B	A	B	B	70	80	70	B	90	80	82	<sup>O</sup> X 84	<sup>O</sup> X 106	<sup>O</sup> X 86	65	66	42	B	A	
26		S	61	A	A	A	A	A	A	B	51	48	71	<sup>O</sup> X 97	<sup>O</sup> X 91	<sup>O</sup> X 111	<sup>O</sup> X 90	<sup>O</sup> X 96	80	49	S	B	A	A	A	
27		A	A	A	B	B	<sup>O</sup> X 44	60	70	60	60	78	90	<sup>O</sup> X 86	<sup>O</sup> X 109	120	86	84	94	76	B	A	A	A	A	
28		A	A	S	A	B	B	A	59	61	B	70	81	<sup>O</sup> X 91	B	120	<sup>O</sup> X 114	B	<sup>O</sup> X 126	110	B	B	A	A	A	
29		A	32	A	A	38	40	50	44	49	70	<sup>O</sup> X 76	<sup>O</sup> X 85	120	120	110	110	<sup>O</sup> X 116	<sup>O</sup> X 105	96	73	58	S	A	70	
30		S	S	A	60	A	A	60	70	<sup>X</sup> 72	80	90	84	<sup>O</sup> X 100	103	100	109	110	120	<sup>O</sup> X 66	63	34	36	A	S	
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		8	14	9	8	11	9	13	18	17	18	24	25	22	25	23	29	27	28	29	29	21	14	10	9	
MED		30	36	42	46	40	53	50	64	70	72	84	85	98	98	109	110	110	105	96	75	60	48	33	39	
U <sub>Q</sub>		39	51	48	54	51	66	68	70	72	81	92	106	118	120	120	120	119	119	99	84	72	60	50	55	
L <sub>Q</sub>		26	28	32	36	27	40	42	54	60	70	70	70	76	86	91	94	90	90	80	64	49	36	29	28	

APR. 1992 f<sub>XI</sub> (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

# IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1992 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
1	F	47	S	A	A	A	F	A	B	B	B	B	B	62	B	F	Z	Z	Z				F	J	F	F						
2	F	F	29	A	F	A	33	F	F	F	90	92	100	110	J	F	U	R	109	99	88	64	43		S	F	A					
3	A	A	F	F	F	F	A	F	F	F	42	48	46	B	F	F	F	F	F	F	F	F	F	A	A	F						
4	A	F	A	S	F	S	34	40	52	58	63	65	69	90	100		B	B	B	B	F	Z	A	A	A							
5	A	A	F	F	A	F	S	F	F	F	52	61	69	69	90	90	90	90	98	99	95	105	J	F	J	F	F	F	F	S	A	A
6	A	A	A	A	F	A	A	A	B	B	B	B	B	70	B	F	F	F	72	70	72	52	F	F	A	A	A					
7	A	A	A	F	F	A	A	F	B	B	B	B	B	B	B	D	S	F	80	98	98	80	F	A	S	A	A					
8	A	A	A	A	B	B	A	B	B	U	S	65	60	70	80	B	100	S	110	104	F	F	F	F	S	B	B					
9	A	S	A	A	B	B	A	A	B	B	Z	80	89	90	B	100	105	100	94	90	83	70	59		B	B						
10	A	A	A	B	A	B	A	F	B	B	F	80	90	90	90	90	89	80	U	R	77	69	57	S	29	25						
11	F	F	A	F	A	A	F	F	F	F	54	70	82	94	98	100	100	102	97	90	69	53	49	F	F	F						
12	F	18	F	S	A	A	F	F	F	U	R	U	R	U	R	C	110	110	105	93	85	Z	Z	46	33							
13	U	R	F	F	F	S	F	F	F	U	R	U	R	U	R	U	R	U	R	Z	R	F	F	47	B	B						
14	B	A	S	A	B	S	D	S	F	F	F	60	80	110	F	120	120	U	R	U	R	U	R	F	F	F						
15	A	A	A	S	A	A	S	48	F	F	U	R	68	85	100	110	110	110	110	110	90	70	60	41	25	S						
16	28	F	F	F	F	F	F	F	F	F	48	60	78	93	99	98	110	110	104	F	110	F	F	48	20	S						
17	16	F	F	A	F	F	F	F	F	J	F	F	53	74	90	109	110	113	124	126	120	108	90	68	53	35	F	F	F	16		
18	F	F	A	B	F	F	F	F	F	J	F	F	49	60	79	95	119	120	114	103	114	128	F	S	F	F	F	F	A			
19	A	F	F	A	F	B	A	B	A	A	A	B	B	B	B	F	F	60	69	75	73	68	51	26	A	A	B					
20	A	F	F	A	A	F	A	A	B	A	A	48	B	B	B	U	S	Z	90	105	95	89	50	33	A	A	A					
21	S	S	A	A	A	A	A	B	A	B	F	J	F	F	F	Z	Z	70	80	70	71	85	75	60	S	S	S	S				
22	A	A	A	A	F	B	B	B	A	A	B	48	60	70	B	F	F	98	110	115	F	56	S	A	S	S						
23	A	A	A	A	A	A	S	A	47	53	62	71	87	101	103	110	99	93	80	60	A	A	A	A								
24	A	S	A	B	A	S	B	B	B	A	59	63	64	70	78	80	90	80	F	U	R	36	A	A	A	F						
25	A	A	A	B	B	B	A	B	B	F	F	F	B	80	76	78	78	100	D	S	S	U	S	F	F	B	A					
26	S	F	A	A	A	A	A	A	B	F	46	60	61	B	J	S	J	S	85	105	84	90	70	40	S	B	A	A				
27	A	A	A	B	B	A	38	38	F	F	J	F	50	54	71	80	80	103	100	80	79	72	69	B	A	A	A					
28	A	A	S	A	B	B	A	Z	F	B	49	50	64	75	85	110	99	F	B	U	R	120	90	B	B	A	A					
29	A	F	A	A	F	F	F	F	F	Z	53	70	79	101	110	104	104	110	99	U	R	80	55	38	F	S	A	F				
30	S	S	A	A	A	F	F	F	F	F	F	F	S	J	R	94	99	90	95	Z	F	90	60	47	30	30	F	A	S			
31																																
CNT	5	9	3	4	3	1	7	9	13	18	24	25	20	25	23	29	26	27	25	25	16	10	7	4								
MED	22	26	27	28	44	47	36	48	50	60	74	79	90	91	100	101	100	95	88	60	48	38	25	22								
U Q	28	34	29	37	48		52	55	54	68	81	94	100	110	110	110	110	108	93	76	58	48	42	29								
L Q	18	19	27	24	18		32	39	48	50	62	62	75	75	85	85	85	85	74	50	36	29	23	18								

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1992 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1		33	84	49	48	45	38	22	23		B	B	B	B	BE	B	B	E	B	24	22	27	21	27	E	B	14	19	28
2		28	31	32	34	23	41	48	19	20	25	27	25	26	28	25	23	23	20	E	BE	BE	B	22	47	84	48		
3		46	41	34	34	32	38	40	32	23	23	34		28	26	E	BE	B	27	32	31	25	90	40	40	40			
4		60	145	52	71	28	21	26	28	23	28	30	43	40	27	E	B	B	B	B	B		32	26	36	38	42		
5		40	41	34	39	63	42	45	48	25	23	23	25	24	25	26	22	33	28	15	28	30	25	35	42				
6		48	71	60	35	42	43	45	33		B	B	B	B	BE	B	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE
7		43	32	32	28	34	47	46	54		B	B	B	B	B		BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE
8		37	33	41	42		B	B	41		B	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE
9		26	34	37	46		B	B	38	41		B	B	E	BE	B	E	B	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE
10		32	47	40		31		B	44	32		B	B	E	BE	BE	BE	BE	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE
11		19	32	35	35	45	44	44	26	12	20	22	23	34	24	22	23	11	12		E	BE	BE	BE	BE	BE	BE	BE	BE
12	E	BE	BE	B		14	15	13	13	13	14	E	BE	BE	B		C	22	21	18	11	15	17	15	14	21			
13		13	12	13	13	15	50	45	26	21	22	21	30		55	40	22	30	56	50	30	20	25						
14		B		27	27	25		B	110	20	47	33	28	51	40	30	57	51	31	30	40	24	19	16	11	11	27		
15		31	33	31	45	35	60	44	43	27	21	22	26	25	25	22	35	26	12	12	11	E	B	10	12	11	28		
16		32	32	31	31	21	13	12	12	25	28	21	25	24	27	24	31	18	15	11	E	B	11	16	16	11			
17		12	26	27	29	41	29	26	12	20	31	33	32	31	27	25	23	19	21	22	27	10	10	E	BE	B	9	13	
18		11	E	B		14	21	11	11	16	21	23	24	40	60	57	25	23	38	E	B	20	26	29	28	33	47		
19		51	37	45	51	33		B	60		48	45	39		B	BE	BE	BE	BE	BE	E	BE	BE	BE	BE	BE	BE	B	
20		40	70	48	70	30	51	60	45		48	40	35		B	B	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	
21		40	70	56	75	43	40	37		42	BE	BE	BE	BE	BE	BE	E	BE	B		11	12	32	27	20	21			
22		32	32	33	27	30		B	B		60	48		32	38	30		40	31	22	21	45	48	41	42	75			
23		25	60	80	27	44	36	40	33	19	20	22	50	33	21	24	27	47	28	26	11	35	35	38	39				
24		45	33	41		32	47		B		43	39	50	39	30	30	30	30	30	30	20	13	36	40	53	70			
25		42	60	47		B	B		B	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	
26		34	75	40	49	40	60	52	55		38	42	33		50	54	30	52	40	30	20	20		38	47				
27		41	35	37		B	B		E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	E	B		40	34	55			
28		45	35	33	40		B		43	35	35	BE	BE	BE	BE	BE	BE	BE	BE	B		BE	BE	BE	BE	BE	BE	BE	BE
29		33	30	27	31	32	17	26	26	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE
30		62	48	18	35	110	56	47	50	45	29	40	41	30	30	30	23	20	30	25	25	20	30	34	33				
31																													
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT		29	30	30	25	24	23	28	24	20	22	26	25	22	25	23	29	28	28	29	30	28	28	26	26				
MED		34	34	34	35	32	42	42	32	23	24	25	28	30	30	30	27	30	22	21	20	21	30	34	38				
U Q		44	60	45	47	42	50	46	44	34	31	39	40	34	50	40	31	31	30	29	30	32	40	38	42				
L Q		27	32	31	28	29	29	26	22	19	21	22	25	28	25	24	23	23	19	15	13	16	17	17	21				



IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1992 fmin (0.1MHz) 45'E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	9	14	19	21	20	11	15	19	B	B	B	B	B	50	B	20	24	18	17	14	10	14	9	9		
2	9	9	8	9	9	10	10	16	19	19	19	17	19	19	19	17	19	18	17	10	8	13	10	9		
3	9	9	15	9	9	13	15	9	19	19	19	B	20	20	40	27	23	25	10	7	9	10	17	10		
4	9	8	8	9	8	9	15	14	18	19	25	17	16	17	60		B	B	B	B	20	18	7	11	10	
5	11	17	7	7	17	15	10	12	18	18	19	16	20	18	19	20	19	17	9	9	15	9	9	9		
6	9	57	19	19	10	25	20	30	B	B	B	B	B	52	B	25	31	25	28	18	9	10	14	13		
7	13	25	9	8	9	14	15	14	B	B	B	B	B	B	B	60	57	40	16	30	9	9	9	8		
8	15	19	30	27	B	B	20	B	B	B	53	58	60	60	B	60	60	26	39	14	14	9	B	B		
9	18	14	14	20	B	B	25	31	B	B	25	30	30	B	20	31	30	30	16	14	19	30	B	B		
10	10	21	19	B	14	B	16	13	B	B	22	30	30	30	19	19	24	19	15	31	14	30	12	14		
11	11	10	9	8	19	19	12	9	10	14	18	15	19	19	19	19	9	9	13	11	11	11	17	10		
12	10	10	9	9	10	9	9	9	16	20	19	19	19	19	C	19	19	11	9	9	10	15	9	9		
13	9	8	9	10	13	20	11	18	9	19	19	30	B	55	40	18	30	56	50	30	20	25	B	B		
14	B	18	10	23	B	18	20	14	13	28	51	40	30	57	51	31	30	20	24	19	16	11	9	9		
15	18	14	15	16	10	9	16	14	11	16	15	13	18	17	14	13	10	9	9	9	10	9	9	8		
16	9	9	9	9	9	7	9	10	9	13	13	16	13	14	14	14	13	13	9	10	9	10	11	11		
17	8	9	8	8	9	7	8	9	10	13	15	15	15	17	15	14	12	9	8	9	7	7	9	13		
18	8	10	10	B	9	7	9	8	10	15	15	19	40	60	57	25	23	14	20	20	9	8	8	16		
19	8	8	15	14	8	B	10	B	20	19	22	B	B	B	30	30	30	19	15	18	9	10	30	B		
20	11	10	9	25	17	9	25	25	B	17	18	20	B	B	B	58	30	24	9	9	7	7	9	7		
21	10	9	9	30	18	14	20	B	30	B	25	25	34	30	20	30	20	9	8	8	8	8	9	8		
22	8	8	9	16	10	B	B	B	30	17	19	38	30	B	40	31	22	13	10	10	18	9	11			
23	9	19	15	20	31	31	17	13	10	15	18	19	19	19	24	16	9	8	8	9	7	9	9	9		
24	10	18	19	B	19	31	B	B	B	31	39	50	39	30	30	30	30	30	20	10	6	11	26	9		
25	18	24	19	B	B	B	19	B	B	23	9	24	B	30	30	24	30	19	58	30	19	19	B	19		
26	9	9	19	20	19	25	20	15	B	38	42	14	B	50	54	30	52	40	30	20	20	B	9	19		
27	19	19	15	B	B	20	15	22	19	22	22	31	30	25	25	24	25	12	12	20	B	12	19	12		
28	19	18	18	31	B	B	20	16	15	B	38	55	30	B	40	30	B	B	50	38	B	B	12	10		
29	18	12	18	13	12	12	10	19	19	19	21	30	30	25	20	21	30	19	15	13	12	18	9	10		
30	11	8	18	13	19	20	9	16	30	20	40	41	30	30	30	23	20	30	25	25	20	12	11	9		
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30		
MED	10	11	14	18	16	18	15	16	19	20	22	28	30	30	30	24	28	19	16	14	10	11	10	10		
U Q	15	18	18	27	B	B	B	B	B	B	40	50	B	B	B	57	58	30	30	30	25	20	18	18	17	14
L Q	9	9	9	9	9	10	10	13	13	17	18	17	19	19	20	19	19	19	13	9	9	9	9	9		

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 1992 h'F (KM) 45°E MEAN TIME (G.M.T. + 3 H)

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

H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	250	E A 350	A	A	A	A	A	A	B	B	B	B	B E B 350	B	B	250	250	260	250	230	240	250	300	300
2	350	350	A	A	A	A	A E S 340	240	250	240	250	240	240	230	240	220	210	210	210	250	300	A	A	A
3	A	A	A	300	A	A	A	A	240	260	300	B	250	260	E B 330	260	300	A	A	A	A	A	A	A
4	A	A	A	A	A	A	A	210	B	A	280	290	260	250	B	B	B	B	B	270	290	A	A	A
5	A	A	A	A	A	A	A	A	S	260	250	240	245	260	250	260	240	230	240	270	280	A	A	A
6	A	A	A	A	350	A	A	A	B	B	B	B	B	B	B	B	260	250	250	260	250	A	A	A
7	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	270	260	250	290	A	A	A	A
8	A	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	210	230	260	300	A	B	B
9	A E A 300	A	A	A	B	B	A	A	B	B	260	250	250	B	240	240	210	240	220	240	240	260	B	B
10	A	A	A	B	A	B	A	340	B	B	260	250	250	240	250	250	230	240	210	250	220	280	250	290
11	310	A	A	380	A	A	390	300	220	230	240	240	240	230	220	220	200	210	210	210	210	220	270	270
12	260	280	360	S	A	A	380	300	250	240	240	230	220	220	C	210	210	210	200	210	210	200	210	260
13	290	300	310	370	A	A	A	350	250	220	240	230	B	240	235	240	210	250	230	220	230	230	B	B
14	B	A E A 350	A	A	B	A	200	370	300	250	260	240	235	240	240	210	210	230	210	210	220	245	240	260
15	A	A	A	A	A	A	A	A E A 350	280	250	240	230	250	230	210	210	200	200	200	210	230	250	A	A
16	A	A	A	A	A	A	A	320	250	240	245	240	235	230	230	200	210	200	210	200	200	220	230	B
17	A	A	A	A	350	A	330	280	245	240	220	230	210	210	210	210	200	210	200	200	210	200	240	230
18	270	E B 310	A	B	A	A	B	350	250	250	250	245	250	250	270	220	240	280	310	300	260	290	240	A
19	A	A	A	A	A	B	A	B	A	A	A	B	B	B E B 300	270	250	250	230	280	E A 350	A	A	A	B
20	A	A	290	A	A	A	A	A	B	A	A	330	B	B	B	B	250	250	260	345	A	A	A	A
21	330	A	A	A	A	A	A	B	A	B	270	270	300	280	250	260	250	250	220	248	A	A	A	A
22	A	A	A	A	A	B	B	B	A	A	B	A	B	275	B	250	260	250	270	350	E A 340	A	A	A
23	A	A	A	A	A	A	A	A	300	250	250	250	230	230	210	210	220	240	220	A	A	A	A	A
24	A	230	A	B	A	A	B	B	B	A	B	B	B	280	250	250	245	230	240	270	A	A	A	210
25	A	A	A	B	B	B	A	B	B	320	270	250	B	210	250	250	B	245	B	B	250	250	B	A
26	E A 330	A 230	A	A	A	A	A	A	B	B	B	240	B	B	B	240	B	B	230	250	230	B	A	A
27	A	A	A	B	B	A	A	B	300	270	250	B	250	210	230	220	210	210	240	245	B	A	A	A
28	A	A	A	A	B	B	A E A 350	A	B	280	250	B	250	240	B	B	B	B	235	B	B	320	A	A
29	A	A	A	A	A	A	A	A	A	280	240	220	240	200	220	220	210	220	220	200	200	200	220	200
30	A	S 350	A	280	A	A	A	A	A	350	290	250	250	245	250	210	230	245	240	250	260	260	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	9	5	4	2	1	4	12	12	16	21	21	19	22	21	26	25	26	26	28	21	15	10	8
MED	290	290	300	335	350	400	355	325	250	250	250	245	250	240	238	240	230	235	230	246	235	245	245	260
U Q	330	350	355	375			385	350	290	275	270	250	250	260	250	250	250	250	240	270	270	260	270	280
L Q	265	255	265	290			265	300	242	240	240	240	235	230	230	210	210	210	210	210	210	220	240	220

TE-AR002 HOITAT IONOSPHERIC DATA STATION SHOWA-ST.  
 MAY 1992 fXI (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)  
 LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	S	S	O X 48	60	A	60	60	67	69	60	B	70	90	100	110	90	89	90	60	48	40	S	A	A	
2	A	A	A	A	A	A	A	47	52	B	O X 53	62	O X 75	80	80	80	O X 76	O X 74	51	29	O X 30	B	A	A	
3	S	S	A	S	A	50	A	53	60	52	B	S	S	100	110	99	91	O X 96	90	72	B	A	A	A	
4	A	A	A	A	B	A	A	B	C	B	B	B	B	B	B	O X 86	O X 96	90	70	A	A	A	A	A	
5	A	A	O X 40	A	A	A	O X 45	A	A	48	63	72	88	90	90	95	O X 86	S	O X 86	B	B	S	B	B	A
6	A	A	28	52	51	B	B	S	O X 34	48	73	90	O X 95	O X 100	O X 106	87	62	70	57	O X 36	B	B	B	B	
7	B	B	54	80	A	74	80	80	79	80	77	80	O X 96	O X 106	105	86	O X 90	80	78	71	49	A	A	70	
8	A	A	A	A	A	S	A	B	A	B	B	B	B	B	60	80	79	S	B	A	A	A	B	51	B
9	A	A	B	A	A	A	B	A	B	B	B	B	O X 54	S	71	80	S	B	O X 51	A	A	B	B	B	
10	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 65	B	B	B	B	B	B	B	A	A
13	B	A	B	B	B	B	B	B	B	B	B	B	B	B	72	90	B	B	B	A	A	A	A	A	A
14	A	B	B	B	A	A	A	S	A	A	60	72	O X 80	O X 81	93	88	60	B	O X 39	B	B	B	B	B	
15	B	A	A	A	A	B	B	B	O X 33	45	69	86	90	100	104	100	S	S	B	B	B	A	A	A	
16	A	A	A	A	B	B	45	60	65	60	62	90	92	110	O X 98	80	70	61	47	B	B	B	A	A	
17	S	A	A	38	40	53	50	48	B	O X 47	67	90	90	95	90	80	58	59	O X 39	27	B	A	A	A	A
18	A	S	S	49	A	A	A	O X 53	80	B	S	80	85	93	97	99	O X 105	90	49	B	A	A	A	A	
19	A	A	A	A	A	B	A	B	B	A	53	69	64	65	70	O S 64	69	65	54	O X 31	S	B	A	A	A
20	A	A	A	A	A	A	A	A	A	B	B	59	63	77	89	89	79	60	47	S	B	A	A	A	
21	A	A	32	A	A	A	40	45	43	41	O X 53	69	82	92	97	B	S	O X 50	B	B	B	B	A	A	A
22	A	A	B	A	B	B	B	B	B	B	B	B	A	B	B	99	O X 96	B	B	72	A	A	A	A	A
23	A	A	34	34	34	52	A	A	A	60	67	82	100	105	98	81	70	60	A	B	A	A	A	A	
24	A	A	A	A	B	A	B	B	A	A	S	B	B	85	89	O X 80	70	S	S	S	B	B	B	B	B
25	B	A	A	B	A	B	A	A	40	50	49	B	B	90	98	80	79	84	O X 77	B	B	A	A	A	
26	A	A	A	B	B	A	50	52	50	48	O X 53	75	85	85	85	75	79	O X 61	48	B	B	B	A	A	
27	A	A	A	A	B	B	A	A	O X 54	50	70	70	B	B	B	B	B	70	S	B	B	A	A	A	
28	A	A	O S 50	A	B	A	A	42	48	45	49	B	B	90	B	B	O X 73	O X 86	70	B	B	B	A	A	A
29	A	A	A	A	A	B	A	A	B	B	S	B	70	71	B	B	59	B	O X 38	A	A	A	A	A	
30	A	A	A	A	A	A	A	B	B	B	B	60	B	75	B	B	B	B	B	B	B	B	B	A	A
31	B	A	A	A	A	A	A	A	B	B	O X 58	72	75	77	51	42	39	O X 38	31	A	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			7	6	3	4	8	10	13	14	15	18	17	23	23	24	20	19	17	10	3		1	1	
MED			40	50	40	56	50	52	52	49	62	72	85	90	90	84	74	70	51	37	40		51	70	
U Q			50	60	51	67	56	60	67	60	69	82	91	100	98	90	90	86	70	71	49				
L Q			32	38	34	52	45	47	42	47	53	69	74	77	80	80	66	60	O X 47	O X 31	30				

IONOSPHERIC DATA STATION SHOWA-ST.  
 MAY 1992 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

R	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	A	A	U S	F	A	F	F	F	F	F	B	F	F	U R	100	80	79	75	46	41	33	S	A	A					
2	A	A	A	A	A	A	A	F	F	F	U S	F	U R	U R	U R	U R	70	68	47	23	24	F	S	B	A	A			
3	S	S	A	S	A	F	A	F	F	F	B	S	S	U R	U R	U R	87	90	80	64	B	A	A	A	A				
4	A	A	A	A	B	A	A	B	C	B	B	B	B	B	B	80	90	80	60	F	A	A	A	A	A				
5	A	A	H	A	A	S		A	A	A	A	F	F	F	84	89	S	80	B	B	S	B	B	A					
6	A	A	F	F	F	B	B	S	U R	F	F	U R	U S	U R	U R	U R	F	62	48	D	S	B	B	B	B				
7	B	B	F	F	A	F	F	F	F	F	70	47	71	71	90	100	99	80	80	70	69	65	39	A	A	F	48		
8	A	A	A	A	A	A	A	B	A	B	B	B	B	F	F	F	S	B	A	A	A	B	F	B					
9	A	A	B	A	A	A	B	A	B	B	B	B	S	S	65	74	S	B	S	A	A	B	B	B					
10	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
11	C	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A				
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	F	B	B	B	B	B	B	B	A	A				
13	B	A	B	B	B	B	B	B	B	B	B	B	B	B	F	59	B	B	B	B	A	A	A	A	A				
14	A	B	B	B	A	A	A	S	A	A	F	F	U R	J	F	F	F	B	S	B	B	B	B	B					
15	B	A	A	A	A	B	B	B	F	S	F	Z	F	U S	F	F	J	F	S	D	S	B	B	A	A				
16	A	A	A	A	B	B	32	32	F	F	F	58	80	U R	85	99	92	70	64	48	38	B	B	B	A	A			
17	S	A	A	D	S	F	F	F	F	B	F	Z	F	F	U S	F	F	F	F	F	F	F	B	B	B	A			
18	A	S	S	F	A	A	A	F	F	B	S	F	F	F	F	80	89	90	99	80	43	B	A	A	A	A			
19	A	A	A	A	A	B	A	B	B	A		45	59	59	59	64	59	59	58	48	Z	D	S	A	A	A	A		
20	A	A	A	A	A	A	A	A	A	A	B	B	51	58	64	79	80	70	J	F	F	F	S	B	A	A	A		
21	A	A	F	A	A	A	F	F	F	F	F	U R	74	85	91	B	S	U S	B	B	B	B	B	A	A	A			
22	A	A	B	A	B	B	B	B	B	B	B	B	A	B	B	F	B	B	F	A	A	A	A	A	A	A			
23	A	A	F	F	F	A	F	A	A	F	U R	J	F	96	90	74	61	45	A	B	A	A	A	A	A	A			
24	A	A	A	A	B	A	B	B	A	A	S	B	B	F	F	F	F	S	S	S	S	B	B	B	B	B			
25	B	A	A	B	A	B	A	A	F	F	B	B	B	F	80	84	74	71	75	71	B	B	A	A	A	A			
26	A	A	A	B	B	A	F	F	F	40	40	38	40	49	68	79	79	72	65	60	55	34	U	S	B	B	B	A	A
27	A	A	A	A	B	B	A	A	48	38	59	69	B	B	B	B	B	B	B	60	S	B	B	A	A	A	A		
28	A	A	A	A	B	A	A	F	F	F	F	B	B	J	F	B	B	S	F	B	B	B	A	A	A	A			
29	A	A	A	A	A	A	B	A	A	A	B	B	S	B	F	63	65	B	51	B	U	S	A	A	A	A	A		
30	A	A	A	A	A	A	A	B	B	B	B	U	S	B	B	B	B	B	B	B	B	B	B	A	A	A	A		
31	B	A	A	A	A	A	A	A	B	B	B	B	51	F	68	69	69	47	36	33	32	24	A	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			4	1		6	7	8	13	15	17	17	23	22	24	19	20	15	9	3				1					
MED			38	D S		40	39	36	39	49	61	70	80	84	74	69	63	46	31	33				48					
U Q			45			47	40	42	40	61	73	U R	82	90	92	80	80	78	60	52	39								
L Q			30			32	32	30	38	47	57	64	69	71	70	59	49	34	24	24									



IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1992 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	34	34	37	35	50	33	32	30	25	E 19	B	B	47	30	30	40	30	31	18	20	73	32	E 20	16	60	
2	70	40	30	70	60	50	45	39	35		BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B		13	29
3	33	34	33	32	30	40	40	36	15	33		BE	55	55	30	30	25	19	30	20	19		41	70	47	
4	40	49	70	42		48	46		58	BE	B	B	B	B	B	BE	BE	BE	BE	BE	BE	B				
5	35	33	55	41	29	34	34	47	35	E 20	21	31	31	50	30	30	50	38				15			17	
6	18	25	28	28	26			14	26	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	B	B	B	
7	B	BE	B	17	27	55	50	32	30	E	BE	BE	BE	B	E	B										
8	35	70	70	42	47	60	32		32	B	B	B	BE	BE	BE	BE	BE	B								
9	78	41	B	80	41	60		45	B	B	B	B	BE	BE	BE	BE	B									
10	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
11	C	B		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		34	32	80	70
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	BE	B										
13	B		B	B	B	B	B	B	B	B	B	B	B	BE	BE	B										
14	40	B	B	B	32	64	42	46	50	35	E	BE	BE	BE	BE	BE	B									
15	B		27	27	47	41			19	30	31	30	21	30	25	24	40	40								
16	42	32	30	30		BE	BE	BE	BE	BE	BE	BE	B													
17	25	32	18	31	11	E	BE	B		BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	B	B	B	
18	26	26	35	33	70	40	50	53	30	E	B	BE	BE	BE	BE	BE	B									
19	65	54	65	45	32		45		B	B		47	39	29	23	24	23	30	30	19	17	29	71	50	60	60
20	28	24	32	32	20	41	42	44	33		BE	BE	BE	BE	BE	B										
21	33	40	45	60	45	49	26	25	15	15	19	19	30	20	19											
22	38	40		40		B	B	B	B	B	B	B														
23	45	39	45	30	19	26	39	41	80	15	29	24	E	B	B	BE	BE	BE	BE	BE	BE	BE	B	B	B	
24	40	44	30	33		40			40	40	25		BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	B	B	
25	B		21	40	B		B		E	B	B	B	B	BE	BE	BE	BE	BE	BE	BE	BE	B	B	B	B	
26	45	44	48		B	B	50	29	13	E	BE	B	15	16	15	19	19	20	18	17	18	15	15		19	38
27	70	70	49	45		B	49	40	28	21	E	B	19	17												
28	40	46	51	52		B	52	51	32	E	B	B	19	29	29											
29	38	44	70	70	38	40		45	51	B	BE	B	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	B	B	B	
30	42	59	49	39	39	49	34		B	B	B	BE	B	BE	BE	B										
31	B		39	49	70	39	38	32	44	B	B	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	B	B	B	
ES	00	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	26	25	24	20	20	21	20	21	17	17	20	19	24	23	24	25	21	21	16	15	15	23	24		
MED	40	40	40	40	38	44	39	40	29	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	B	B	B	
UQ	45	44	50	50	46	50	46	45	38	32	30	30	31	30	30	29	36	25	22	34	34	41	41	54		
LQ	33	32	30	32	30	39	32	28	E	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	BE	B	B	B	B	

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1992 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		9	9	10	9	10	9	10	10	10	19	B	40	30	30	40	30	31	18	20	40	19	20	12	9	
2		16	8	8	9	30	19	15	12	15	B	30	25	30	31	25	21	19	19	18	17	19	B	11	9	
3		8	10	10	9	8	9	10	10	9	19	B	55	55	30	30	25	19	30	20	19	B	9	9	19	
4		25	15	8	30	B	20	30	B	58	B	B	B	B	B	B	40	37	25	19	12	19	9	9	11	
5		12	19	11	19	19	15	13	15	19	20	21	31	31	50	30	30	50	38	B	B	15	B	12		
6		9	8	9	9	9	B	B		9	19	20	20	23	24	56	20	22	30	19	20	19	B	B	B	
7		B	B		17	9	12	9	19	17	17	19	19	22	8	21	19	15	9	9	12	9	9	9	17	
8		15	19	20	17	21	19	19	B	20	B	B	B	B	23	35	30	38	B	15	15	18	B	10	B	
9		20	18	B	25	30	19	B	19	B	B	B	B	30	30	30	25	54	B	25	23	30	B	B	B	
10		B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
11		C	B		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	20	26	23	50
12		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	25	B	B	B	B	B	B	16	17	
13		B		B	B	B	B	B	B	B	B	B	B	B	B	40	37	B	B	B	18	9	19	11	11	
14		19	B	B	B	19	19	30	20	20	20	31	26	20	22	20	20	14	B	24	B	B	B	B	B	
15		B				B	B	B	B	19	30	31	30	21	30	25	24	40	40	B	B	B	10	11	11	
16		10	10	10	11	B	B	19	19	19	13	22	24	19	20	20	19	10	11	10	B	B	B	19	10	
17		10	9	11	18	9	10	10	9	B	19	19	20	24	24	20	17	19	10	11	10	B	B	B	10	
18		12	12	20	11	20	20	19	16	30	B	40	21	25	20	19	19	15	15	19	B	19	9	9	9	
19		15	9	30	17	10	B	20	B	B	30	19	23	23	24	19	30	30	19	17	8	16	20	31	19	
20		18	15	9	9	10	20	16	12	20	B	B	30	26	30	19	13	12	19	19	15	B	10	11	11	
21		24	20	13	19	19	14	13	8	15	9	19	19	30	20	19	B	30	25	B	B	B	B	9	10	
22		17	19	B	20	B	B	B	B	B	B	B	B	20	B	B	19	20	B	B	19	17	15	16	16	
23		10	9	9	9	10	15	14	15	19	9	9	17	19	18	14	15	10	9	8	B	9	9	15	20	
24		23	20	20	17	B	19	B	B	20	20	25	B	B	30	28	19	18	17	18	25	B	B	B	B	
25		B	18	16	B	19	B	20	14	12	17	10	B	B	18	19	23	17	24	16	B	B	17	9	11	
26		11	12	15	B	B	16	15	11	15	16	8	13	14	20	18	17	18	15	15	B	B	B	13	11	
27		20	35	20	19	B	26	19	16	12	19	13	B	B	B	B	B	25	20	B	B	19	16	9		
28		10	14	17	20	B	30	20	17	19	19	14	B	B	30	B	B	42	30	20	B	B	9	9		
29		9	9	9	6	7	9	B	15	19	B	B	29	B	45	50	B	18	B	B	19	9	9	7	7	
30		9	20	25	20	19	20	25	B	B	B	B	30	B	50	B	B	B	B	B	B	B	B	7	7	
31		B	19	20	19	24	20	20	18	B	B	B	25	20	19	19	23	18	19	18	9	8	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		30	31	31	31	31	31	31	31	31	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED		16	18	17	19	20	20	20	18	20	25	31	30	30	30	26	24	25	25	20	32	B	B	12	11	
U Q		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
L Q		25	20	25	30									50	50	37	42							31	20	
L Q		10	10	10	9	10	15	15	12	17	19	19	23	21	21	19	19	18	18	17	17	17	10	9	10	

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 1992 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	A	240	E A E A	A	210	A E A E	A E B	B E B	290	250	240	230	210	230	230	210	290	300			B	A	A				
2	A	A	A	A	A	A	A	Y	Y	B	B	250	250	240	220	240	210	230	220	230	250		B	A	A		
3	A E A	A	A	A	A	A	A	A	320	310	B	B	B	210	240	210	220	245	230	220		B	A	A	A		
4	A	A	A	A	B	A	A	B	C	B	B	B	B	B	B	290	250	250	280		A	A	A	A	A		
5	A	A	A	A	A	A	A	A	A	290	260	250	240		240	230	E B E B	B	B	B E B	B	B	B	B	A		
6	A	A	A	A	A	B	B	A	310	260	260	260	250		210	200	200	220	230	210		B	B	B	B		
7	B	B	B	270	A	A	A	A	350	350	310	250	230	220	240	210	210	200	200	200	230	220	240		200		
8	A	A	A	A	A	A	A	B	A	B	B	B	B	E B	B	E B	B	B	A	A	A	A	B	240	B		
9	A	A	B	A	A	A	B	A	B	B	B	B	260	260	260	260		B	B		A	A	B	B	B		
10	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
11	C	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A		
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	220		B	B	B	B	B	B	B	A	A	
13	B	A	B	B	B	B	B	B	B	B	B	B	B	B		300	330				A	A	A	A	A		
14	A	B	B	B	A	A	A	A	A	A	250	240	210	210	210	210		A	B	250		B	B	B	B		
15	B	A	A	A	A	B	B	B	350	290	230	230	230	240	220	200	E S	290	210		B	B	A	A	A		
16	A	A	A	A	B	B	B	E B	350	300	210	230	240	220	210	210	200	210	200	220		B	B	B	A	A	
17	A	A	A	A	A E B	B	B	B	350	340	300	250	240	210	200	210	210	210	210	200	220		B	B	B	A	
18	A	A	A	240	A	A	A	A	B	B	B	245	250	240	240	230	210	220	240		B	A	A	A	A		
19	A	A	A	A	A	B	A	B	B	A	H	240	270	240	240	260	230	250	245	250		A	A	A	A	A	
20	A	A	A	A	A	A	A	A	A	A	B	B	250	245	210	240	210	220	245	240		B	A	A	A	A	
21	A	A	A	A	A	A	Y E A	A	330	250	250	250	230	210	200	230		240	230		B	B	B	A	A	A	
22	A	A	B	A	B	B	B	B	B	B	B	B	A	B	B	290	295		B	E A	250	A	A	A	A	A	
23	A	A	A	A	A	A	A	A	A	290	240	240	200	210	200	200	200	200		A	B	A	A	A	A	A	
24	A	A	A	A	B	A	B	B	A	A	B	B	B	240	245	210	210	210	210		B	B	B	B	B	B	
25	B	A	A	B	A	B	A	A	A	240	245		B	B	220	210	230	235	235	230		B	B	A	A	A	
26	A	A	A	B	B	A	A	310	260	260	240	210	230	200	200	210	240	200	235		B	B	B	A	A	A	
27	A	A	A	A	B	B	A	A E A E	A	320	290	250	245		B	B	B	B	260	245		B	B	A	A	A	
28	A	A	220	A	B	A	A	350	300	300	300		B	B	190	B	B	B	240		B	B	B	A	A	A	
29	A	A	A	A	A	A	B	A	A	B	B	B	B	B	E B	B	B	240		B	B	265	A	A	A	A	
30	A	A	A	A	A	A	A	B	B	B	B	255		250	B	B	B	B	B	B	B	B	B	B	A	A	A
31	B	A	A	A	A	A	A	A	B	B	B	230	240	200	200	220	210	245	220	260		A	B	B	B	B	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT		2	3	4		2	3	7	10	14	14	17	17	21	22	24	21	20	19	10		4		1	1		
MED		265	245	250		280	340	350	305	265	242	240	240	215	218	218	215	222	230	230	245		240	200			
U Q		E A	300	260		350	350	320	290	250	252	250	240	240	240	245	245	245	260	275							
L Q		220	245			250	310	300	250	240	230	215	210	210	210	210	210	210	220	220	235						

MAY 1992 h'F (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.  
 JUN. 1992 f<sub>XI</sub> (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)  
 LAT. 69°00.4'S LON. 039°35.4'E SWEEP 0.4MHz TO 15.0MHz IN 20.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
1	B	A	A	A	O X 35 45		B	A	A	A	B	B	B	B		71 54	B	B	B	B	B	B	B	B						
2	A	S		A	A	A		30	32	32	40	O X 66	69	70	67		B	B	B	B	B	B	A	A						
3	A	A	A	A	A																	A	A	B	A					
4	A	S	A	A	A				A		O X 32 49	51	69	72	76	X 46	O X 35	S	O X 33	A	A	B	B	B						
5	A	A	A	A	A												X 70	50	36	B	B	B	B	A						
6	A	A			A	A	B	B	A					X		O X 72	X 45	X 42	X 43	S	B	B	B	A	A					
7	A		30	40	A	O X 37	A	A		49	45	46	59	65	80	80	54	58	33	B	B	A	A	A	A					
8	A	A	A	A	B	B	B	B	B	B	A	B	B	B	B	B		67	70		46	A	B	A	A					
9	A	A	A	B	B	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A					
10	A	A	A	A	A	A	A	O X 44	B	B	B	B							B	S	B	A	A	A	A	A				
11	A	A			A	A	A	B	A	A											A	A	A	A	A	B				
12	A	B	B		A	B	B	B	A	B							O X 55	52		A	A	A	A	A	A	A				
13	A	A	A	S	A	A	A				A	S	B	B						B	B	B	A	A	A	A				
14	A	A	A	A	A	B	A	A						S	X 71	75			S	B	B	B	B	B	A	A				
15	A	A	A	A	A	B	B	B	A	B	B	B	B	O S 65	68	60		X 46	X 50		S	A	A	A	A	A				
16	A	A	A	A	A	A	B	B	A	A	B	B					O X 46	O X 39		A	A	B	B	B	A	A				
17	A	A	A	A	A				S		O X 60 51	S		S									B	A	A	A				
18	A	A	A	A	A	A	A	A	A	O X 39	S		X 53	X 60	X 74	70	70		B	B	S	A	A		A	A				
19	A	A	A	A	A	A	A	A	A	A											B	B	B	A	A	A	A			
20	A	A	A	A	A																									
21	A	A	A	B	B	A	A													O X 51	O X 40	S	A	B	B	A	A			
22	A	B	A	A	A	A	A	A	B	B										O X 41	O X 32	B	B	B	B	A	A			
23	A	A	A	A	A	A	A	A	A	A	A	A	B	B	B					O X 64	O X 48	S	B	B	B	A	A	A	A	
24	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	O X 54	X 52		B	B	B	B	A	A	A	A	A		
25	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A		
26	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
27	B	B	A	A	B	B	B	B	B	B	S	S	S	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	
28	A	A	A	A	A	A	A	A																						
29	A	B	A	A	B	B	B	A	40	A	A	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	S	S	S	
30	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31																														
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT		1	4	3	2	7	5	9	10	10	13	12	14	18	20	21	18	12	5	3	1			1						
MED		30	41	64	52	37	49	47	43	36	43	54	66	71	72	64	46	40	38	33	30			70						
U Q			48	70		42	64	70	70	43	47	60	70	80	76	70	52	44	45	46										
L Q			36	43		33	32	32	32	32	40	51	59	68	68	53	42	34	O X 33	27										



IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1992 foF2 (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

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

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

# IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1992 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	B	40	32	35	36	21	B	39	38	32	B	B	B	B	E	E	B	B	B	B	B	B	B	B					
2	21	31	26	32	40	40	31	26	15	26	19	20	19	20	15	B	B	B	B	B	B	B	B	16	15				
3	29	45	45	38	31	17	22	25	10	15	12	16	25	16	11	14	11	11	E	B	9	11	11	26	25				
4	30	32	32	32	31	40	29	59	26	12	14	16	21	26	60	14	19	18	E	B	14	29	26	B	B				
5	15	27	70	47	33	27	20	11	13	11	27	39	20	18	20	11	29	17	E	B	B	B	B	B	15				
6	22	20	40	57	32	14	B	B	26	15	11	25	26	20	31	31	22	20	20	B	B	B	B	26	28				
7	35	25	30	31	45	47	49	48	28	25	11	13	19	20	27	21	26	18	E	B	B	B	16	38	43	60			
8	51	47	43	42	B	B	B	B	B	B	60	B	B	B	B	E	B	E	B	B	30	25	35	21	32	90	64	47	
9	70	70	39	B	B	36	B	B	41	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	33	39			
10	60	80	85	46	71	33	42	42	B	B	B	B	29	11	23	19	E	B	E	B	B	B	90	33	31	31	29		
11	59	46	46	31	31	33	32	B	39	47	45	21	20	19	24	25	24	19	32	43	43	42	41	B	B				
12	70	B	B	40	90	B	B	B	46	E	B	B	B	B	B	E	B	E	B	B	30	28	40	32	70	51	45	45	44
13	42	80	42	40	55	26	38	48	40	31	31	B	B	E	B	E	B	B	E	B	B	B	B	27	41	49	41		
14	35	40	61	71	32	B	47	43	34	18	B	B	B	30	18	25	B	E	B	B	B	B	B	B	B	B	B	39	
15	70	35	34	39	51	B	B	B	41	B	B	B	B	E	B	E	B	E	B	E	B	E	B	25	37	40	40	46	
16	33	35	45	42	46	31	B	B	68	42	B	B	E	B	E	B	E	B	E	B	E	B	E	B	B	B	B	16	
17	27	18	23	39	40	17	13	14	13	17	19	20	55	25	19	19	16	19	17	15	28	B	B	27	27	B	B		
18	32	28	38	34	80	48	47	35	33	33	40	16	20	27	26	16	E	B	B	B	B	45	42	59	34	72			
19	48	80	90	78	41	39	50	51	48	31	27	51	30	24	26	20	21	25	B	B	B	B	34	43	34	B			
20	39	39	40	40	40	34	26	25	17	13	16	17	25	26	19	22	E	B	B	B	B	15	B	B	B	B	32		
21	30	33	33	B	B	40	60	39	41	31	33	21	20	16	21	16	E	B	E	B	E	B	B	B	B	B	38		
22	44	B	40	71	39	48	47	80	B	B	E	B	28	19	16	18	E	B	E	B	B	B	B	B	B	B	16		
23	21	34	60	105	68	27	26	38	58	61	38	B	B	B	B	E	B	E	B	B	30	20	22	B	B	25	41	48	
24	46	46	46	45	40	31	70	B	B	B	B	B	B	B	E	B	E	B	B	B	B	B	B	26	41	48	51		
25	70	44	B	B	70	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	32		
26	40	40	39	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
27	B	B	40	70	B	B	B	B	B	B	E	B	E	B	E	B	B	B	B	B	B	B	B	B	B	B	22	32	
28	41	33	60	30	40	42	45	45	46	40	B	B	B	B	B	B	B	B	B	B	B	B	B	32	26	24	25		
29	36	B	60	33	B	B	B	32	46	45	B	B	B	B	B	B	B	B	B	B	B	B	34	60	46	58	50		
30	40	33	60	40	B	40	95	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
31																													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	28	26	28	26	23	22	19	18	22	19	18	14	17	18	20	21	18	18	10	12	15	14	18	25					
MED	40	37	41	40	40	34	42	39	38	31	25	20	20	19	24	19	20	19	18	30	32	39	40	34					
U Q	50	46	60	47	55	40	49	48	46	40	33	25	28	26	26	24	25	24	21	44	43	42	45	46					
L Q	30	32	36	34	33	27	26	26	26	15	16	16	E	B	E	B	E	B	E	B	E	B	E	B	20	26	26	27	26

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1992 (fmin (0.1MHz) SWEEP 45'E MEAN TIME (G.M.T.) + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	9	9	8	8	9	B	25	20	20	B	B	B	B	30	19	B	B	B	B	B	B	B	B
2	18	10	9	8	18	9	10	10	8	9	10	20	19	14	15	B	B	B	B	B	B	B	9	9
3	9	9	15	13	19	9	8	9	8	7	8	8	7	9	8	7	8	9	9	8	8	13	B	9
4	7	8	8	8	8	8	8	8	12	8	8	13	17	17	14	14	19	18	14	8	8	B	B	B
5	8	8	14	9	7	7	7	8	8	8	8	8	7	18	7	8	8	17	B	B	B	B	B	11
6	12	9	9	14	14	11	B	B	10	10	9	14	11	20	31	15	14	9	14	B	B	B	9	8
7	6	8	8	8	13	14	10	19	14	7	8	9	19	20	18	14	9	18	B	B	9	10	9	9
8	14	20	20	19	B	B	B	B	B	B	20	B	B	B	B	30	25	14	13	9	24	B	10	19
9	19	18	14	B	B	19	B	B	19	B	B	B	B	B	B	B	B	B	B	B	B	B	13	9
10	12	7	9	8	14	20	14	14	B	B	B	B	18	16	19	19	B	24	B	15	10	9	8	8
11	7	9	9	8	9	11	8	B	20	14	10	19	15	19	24	25	24	19	8	9	19	8	10	B
12	16	B	B	10	19	B	B	B	18	B	23	B	B	B	B	30	28	10	10	9	8	10	10	10
13	9	7	10	8	8	9	16	18	18	20	31	B	B	50	25	20	24	B	B	B	9	9	8	24
14	19	15	19	19	20	B	17	11	15	9	B	B	30	15	25	B	B	26	B	B	B	B	B	9
15	24	24	19	10	19	B	B	B	19	B	B	B	23	18	20	15	14	10	14	9	14	10	18	B
16	19	9	19	19	20	20	B	B	25	20	B	B	20	30	26	19	19	19	19	19	B	B	B	13
17	10	9	10	10	9	9	9	14	13	17	19	20	55	25	19	19	16	19	17	9	11	10	16	B
18	15	10	11	9	10	16	17	19	15	14	15	16	13	11	17	10	30	B	B	10	19	16	9	19
19	9	10	13	11	9	9	13	19	24	19	17	19	10	19	14	20	14	15	B	B	B	8	9	8
20	10	9	13	12	10	9	9	9	8	8	9	8	15	19	19	15	11	10	B	B	B	10	B	9
21	9	9	9	B	B	20	19	14	11	14	13	14	13	16	14	10	19	15	10	8	15	B	10	B
22	7	B	8	50	19	19	19	15	B	B	19	19	16	14	14	14	15	19	B	B	B	B	B	10
23	7	8	14	19	19	17	19	18	19	20	19	B	B	B	B	30	20	22	B	B	B	19	8	10
24	8	17	14	19	19	19	20	B	B	B	B	B	B	B	24	15	B	B	B	B	9	10	14	19
25	13	19	B	B	15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	10
26	14	14	19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
27	B	B	30	26	B	B	B	B	B	B	24	31	19	B	B	B	B	B	B	B	B	B	19	16
28	20	15	19	19	15	31	20	20	15	13	B	B	B	B	B	B	B	B	B	B	19	19	16	19
29	15	B	19	20	B	B	B	19	19	30	B	B	B	B	B	B	B	B	B	15	11	12	9	16
30	15	19	16	20	B	31	46	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	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	12	10	14	14	18	19	19	19	19	20	22	B	25	24	24	20	24	20	B	B	B	B	14	12
UQ	18	19	19	20	20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19
LQ	9	9	9	9	10	9	10	14	13	10	10	16	15	17	17	15	15	15	14	10	10	10	9	9

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 1992 h'F (KM)

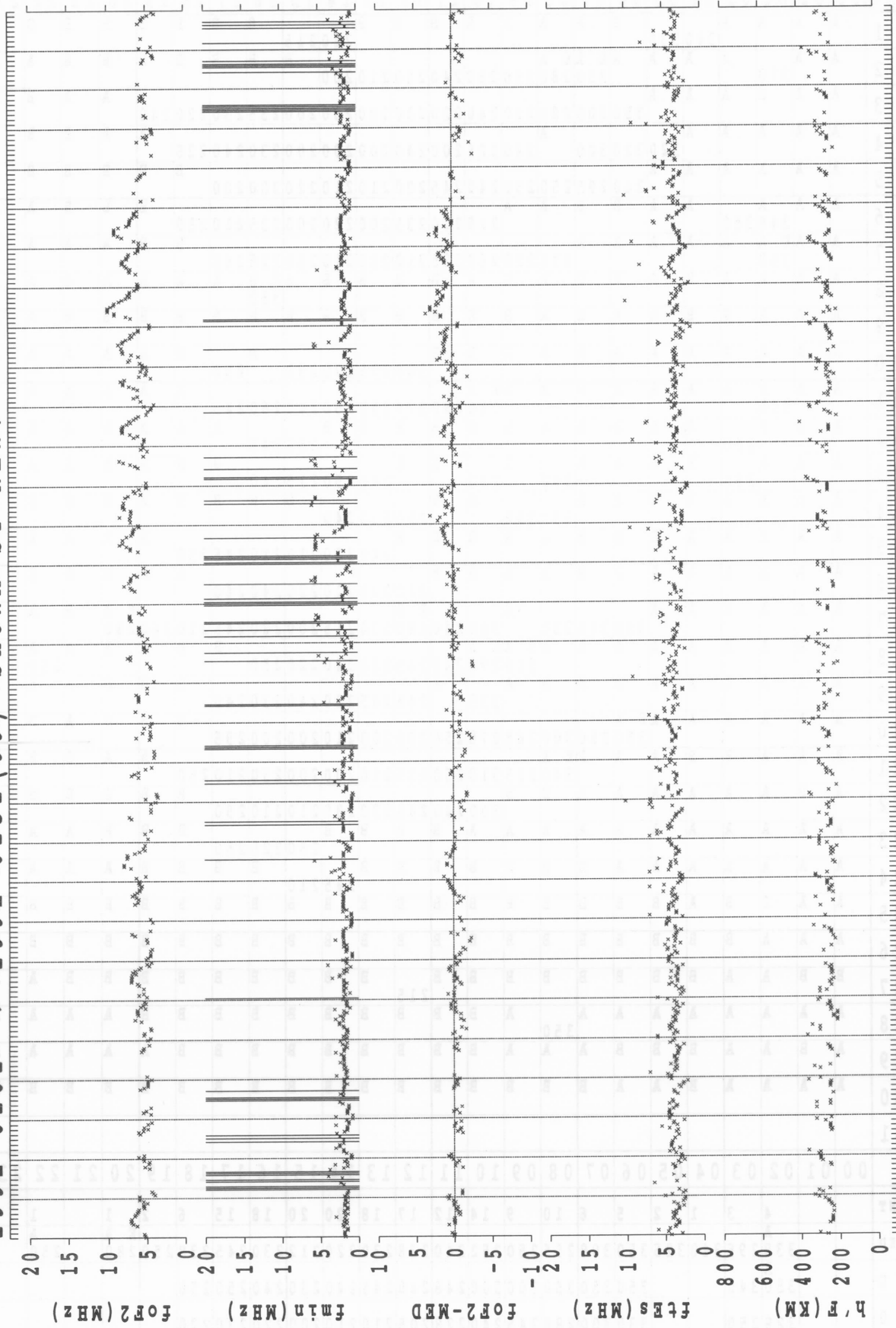
45°E MEAN TIME (G.M.T. + 3 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	B	A	A	A	340	330		B	A	A	A	B	B			220	215	B	B	B	B	B	B	B	B				
2	A	A	310	A	A	A		AE	AE	A							B	B	B	B	B	B	A	A					
3	A	A	A	A	A	A		350	300	280	250	240	220	200	200	200	235	230	220	240		A	A	B	A				
4	A	A	A	A	A		320	320	300		240	225	200	240	200	200	230	240	225		A	A	B	B	B				
5	A	A	A	A	A		340	295	250	250	240	245	200	210	210	220	200	200		B	B	B	B	B	A				
6	A	A	A	345	340		A	A	B	B	A	A			215	210	235	200	220	200	235	210	250		B	B	B	A	A
7	A	AE	A	A	A	A		A	A											B	B	A	A	A	A				
8	A	A	A	A	B	B	B	B	B		270	220	250	235	210	230	210	200	225	245		B	B	A	A	A	A	A	
9	A	A	A	B	B	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A			
10	A	A	A	A	A	A	A	A	A	B	B	B	B				300	275	270	250		B	250	B	A	A	A	A	A
11	A	A	A	A	A	A	A	B	A	AE	A																		
12	A	B	B		250		A	B	B	B	A	B	B	B	B	B													
13	A	A	A		295		A	A	A	A		A																	
14	A	A	A	A	A	B	A	A																					
15	A	A	A	A	A	B	B	B	A	B	B	B																	
16	A	A	A	A	A	A	B	B	A	A	B	B																	
17	A	A	A	A	A	A																							
18	A	A	A	A	A	A	A	A	AE	AE	AE	A																	
19	A	A	A	A	A	A	A	A	A	A	A																		
20	A	A	A	A	A	AE	A																						
21	A	A	A	B	B	A	A	AE	A																				
22	A	B	A	A	A	A	A	A	B	B																			
23	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B														
24	A	A	A	A	A	A	A	B	B	B	B	B	B	B															
25	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
26	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
27	B	B	A	A	B	B	B	B	B	B	B	B																	
28	A	A	A	A	A	A	A	A																					
29	A	B	A	A	B	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
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	3	1	2	5	6	10	9	14	12	17	18	20	20	18	15	6	2	1			1					
MED			338	295	340	325	350	308	295	250	252	240	238	230	220	212	230	245	238	250	280			250					
U Q			350	340			350	350	350	300	300	248	248	245	240	230	240	250	250										
L Q			328	250			330	300	280	245	240	228	205	210	210	200	220	230	220										

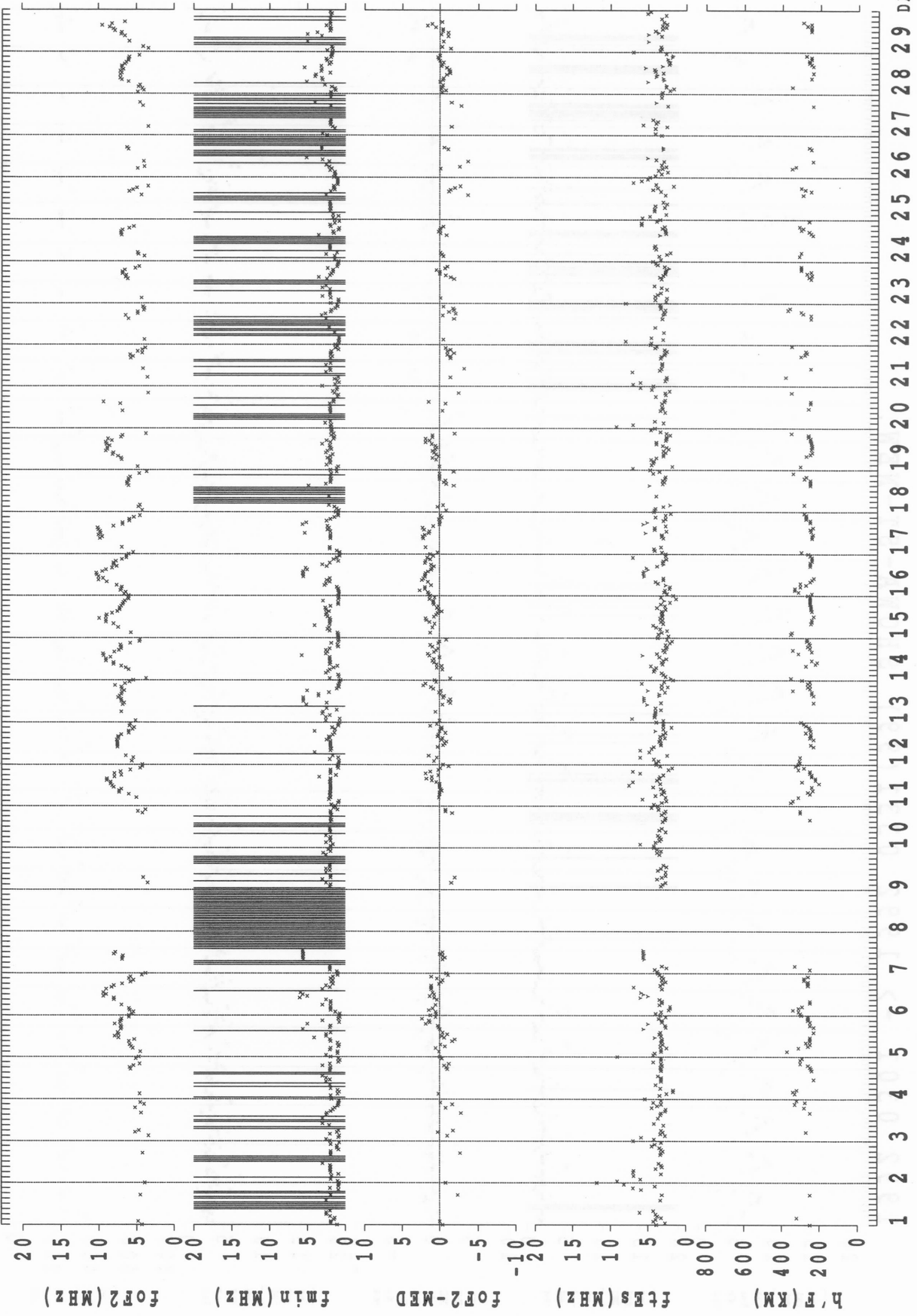


1992 0101 -> 1992 0131 (99) SHOWA-ST-NEW.

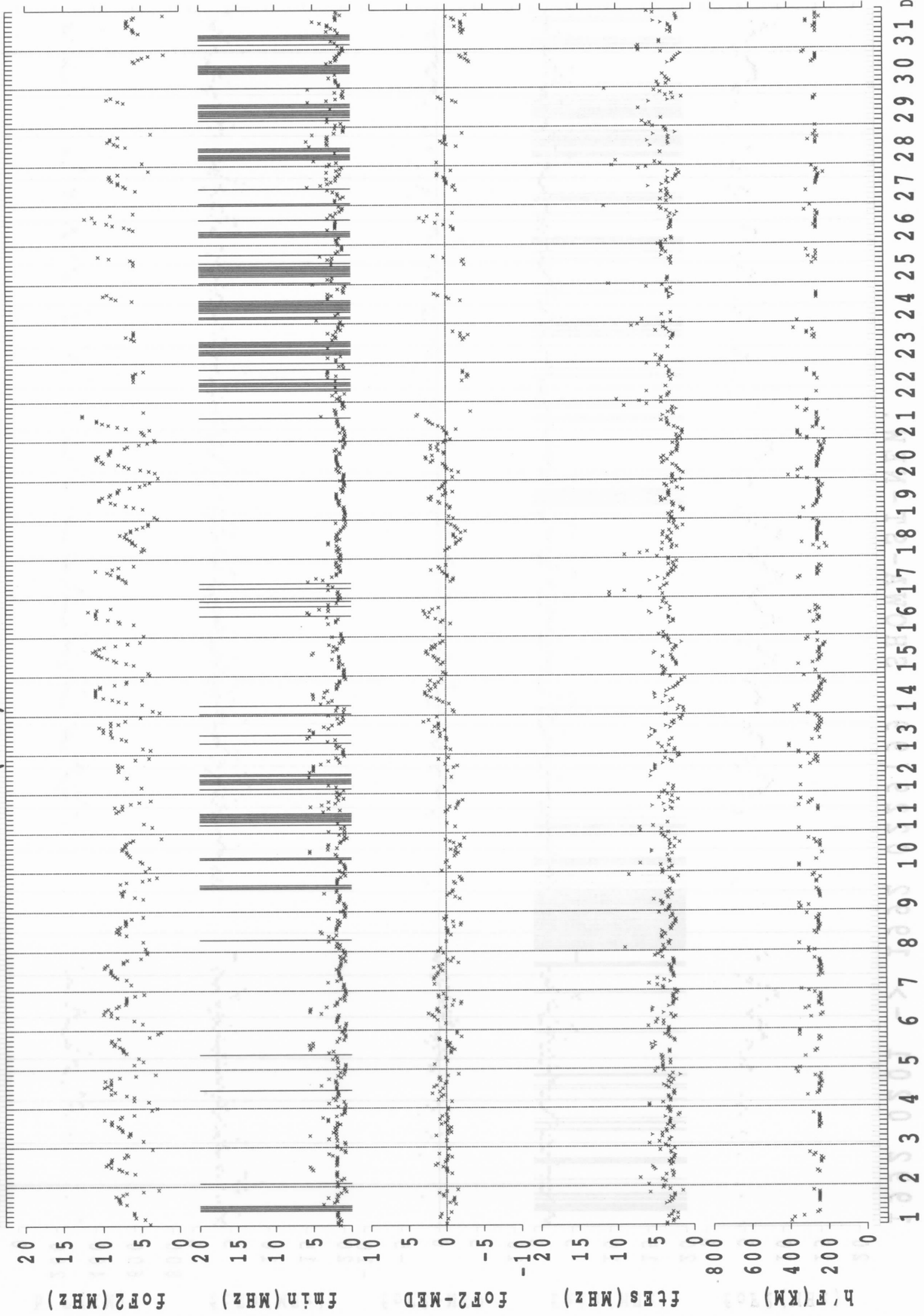


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45' EMT

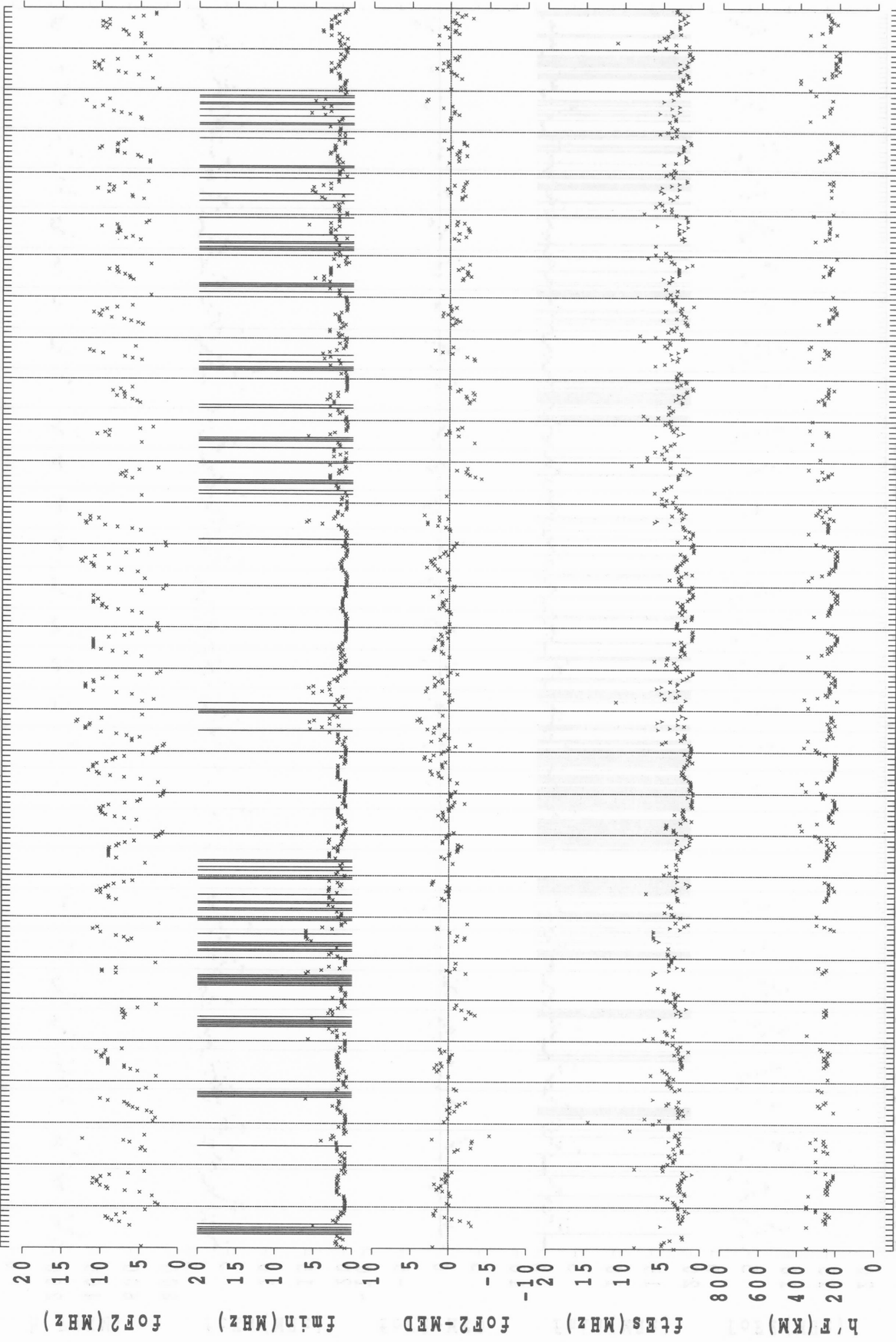
1992 0201 -> 1992 0229 (99) SHOWA-ST-NEW.



1992 0301 -> 1992 0331 (99) SHOWA-ST-NEW.



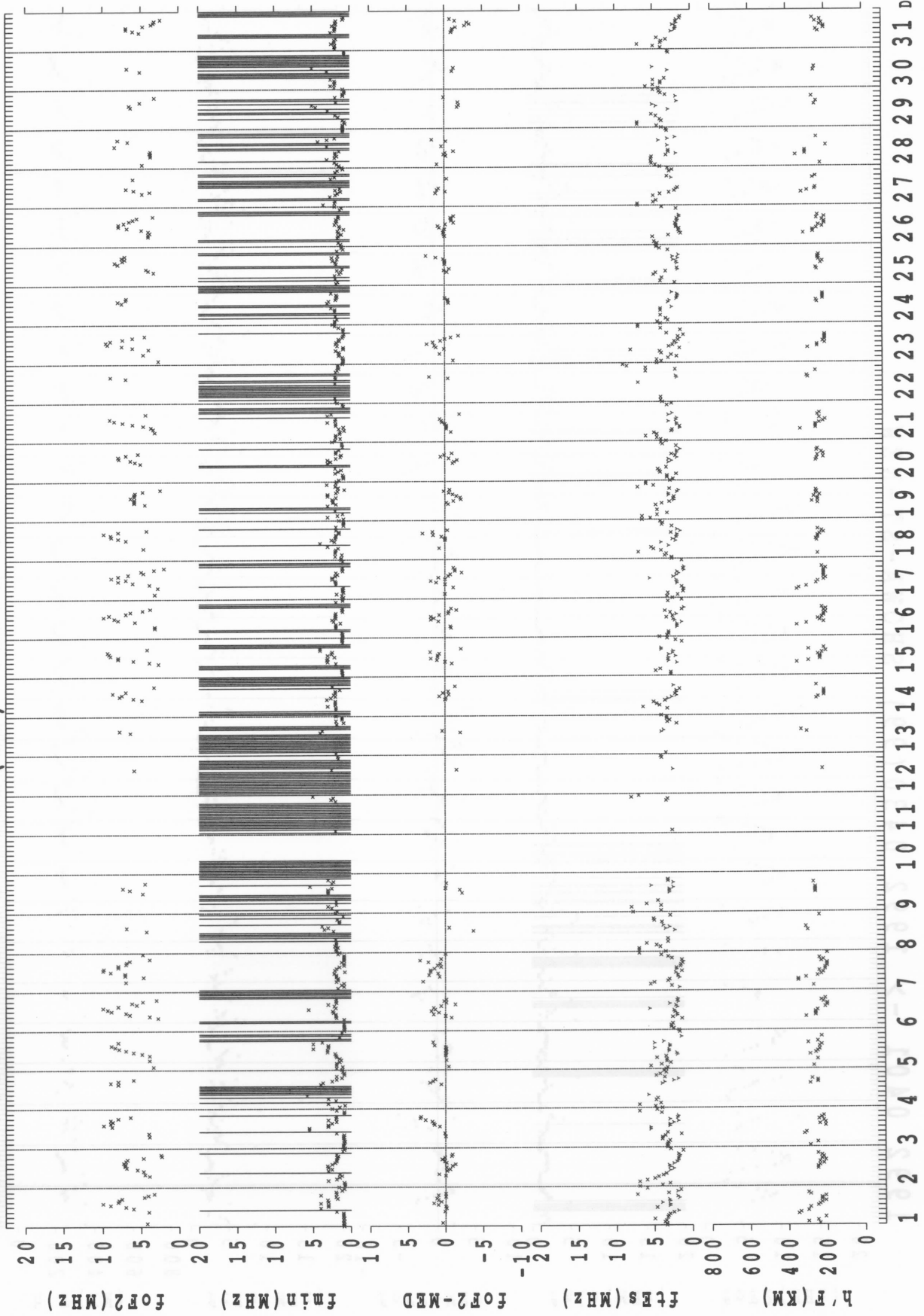
1992 0401 -> 1992 0430 (99) SHOWA-ST-NEW.



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

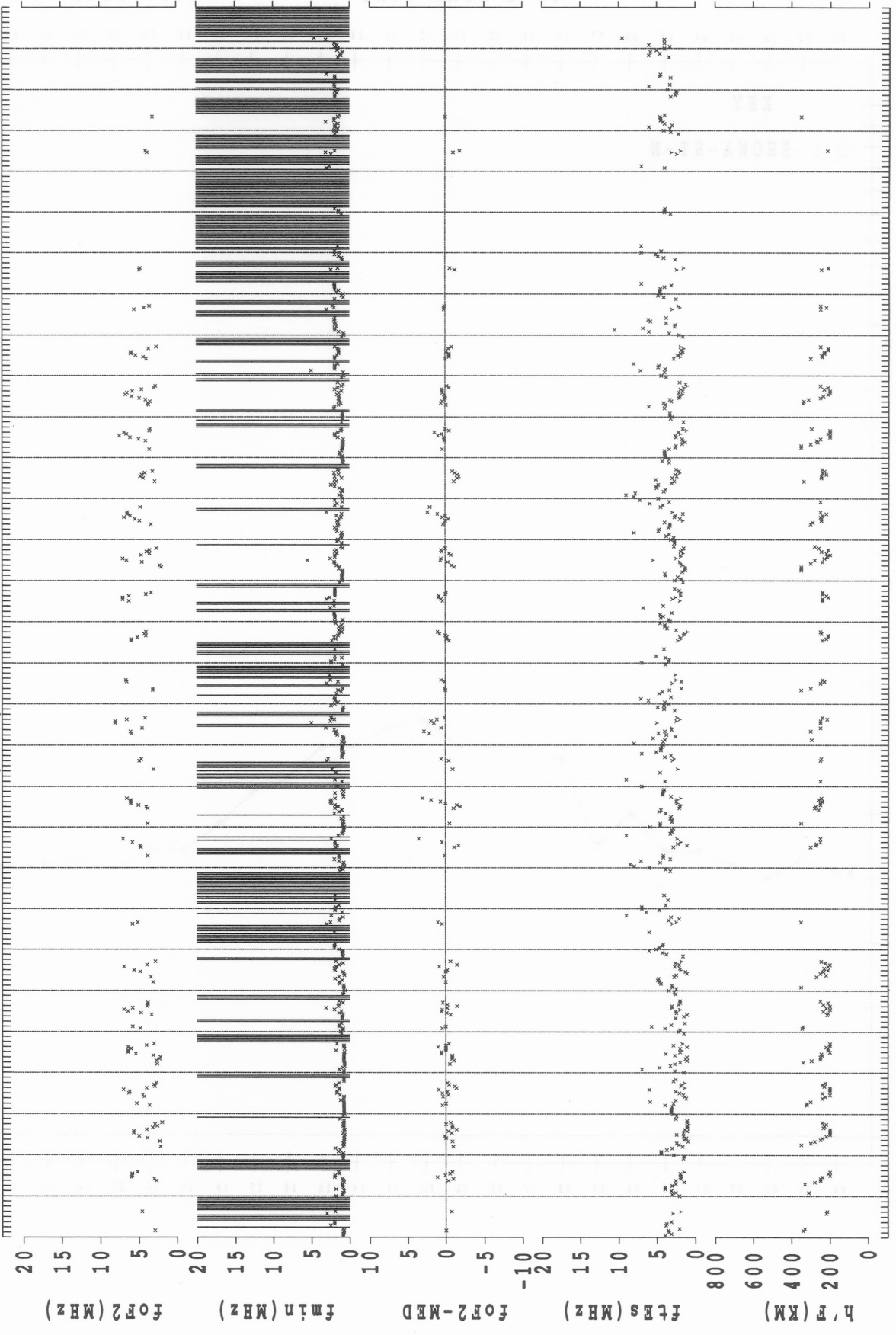


1992 0501 -> 1992 0531 (99) SHOWA-ST-NEW.



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

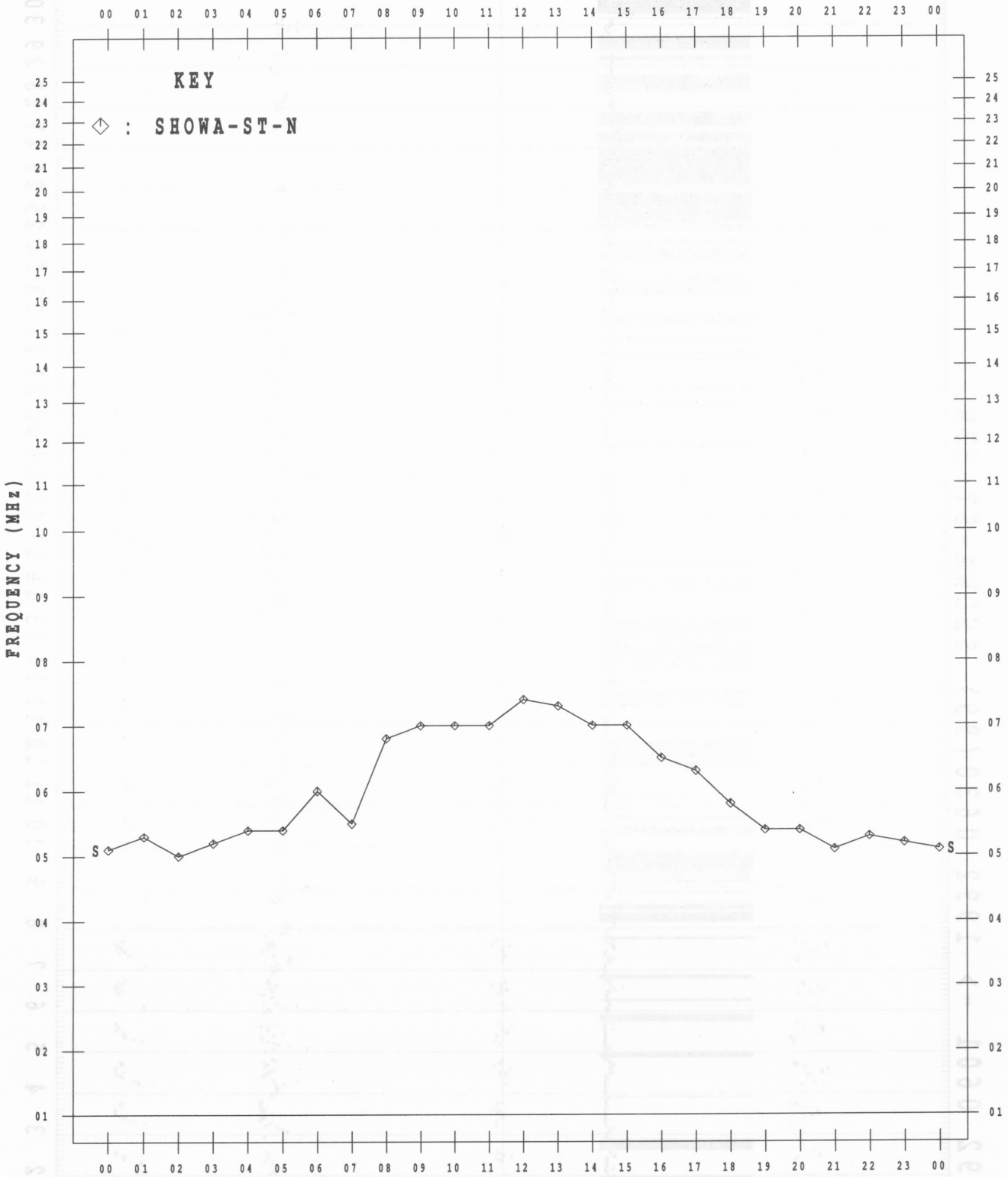
1992 0601 -> 1992 0630 (99) SHOWA-ST-NEW.



# MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

JAN. 1992

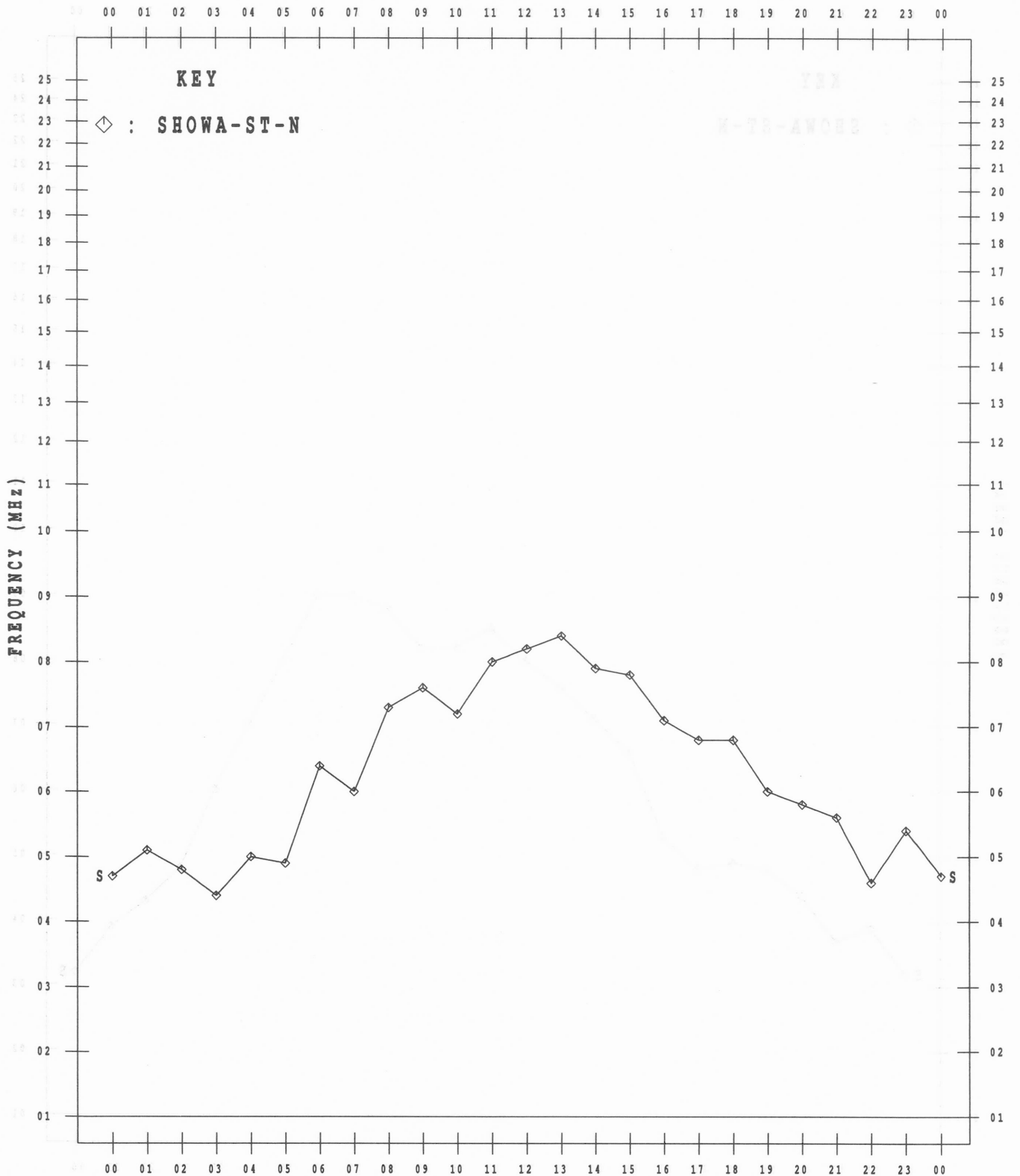


# MONTHLY MEDIAN VALUES OF $f_oF_2$

1991 JAN

45° E MEAN TIME

FEB. 1992

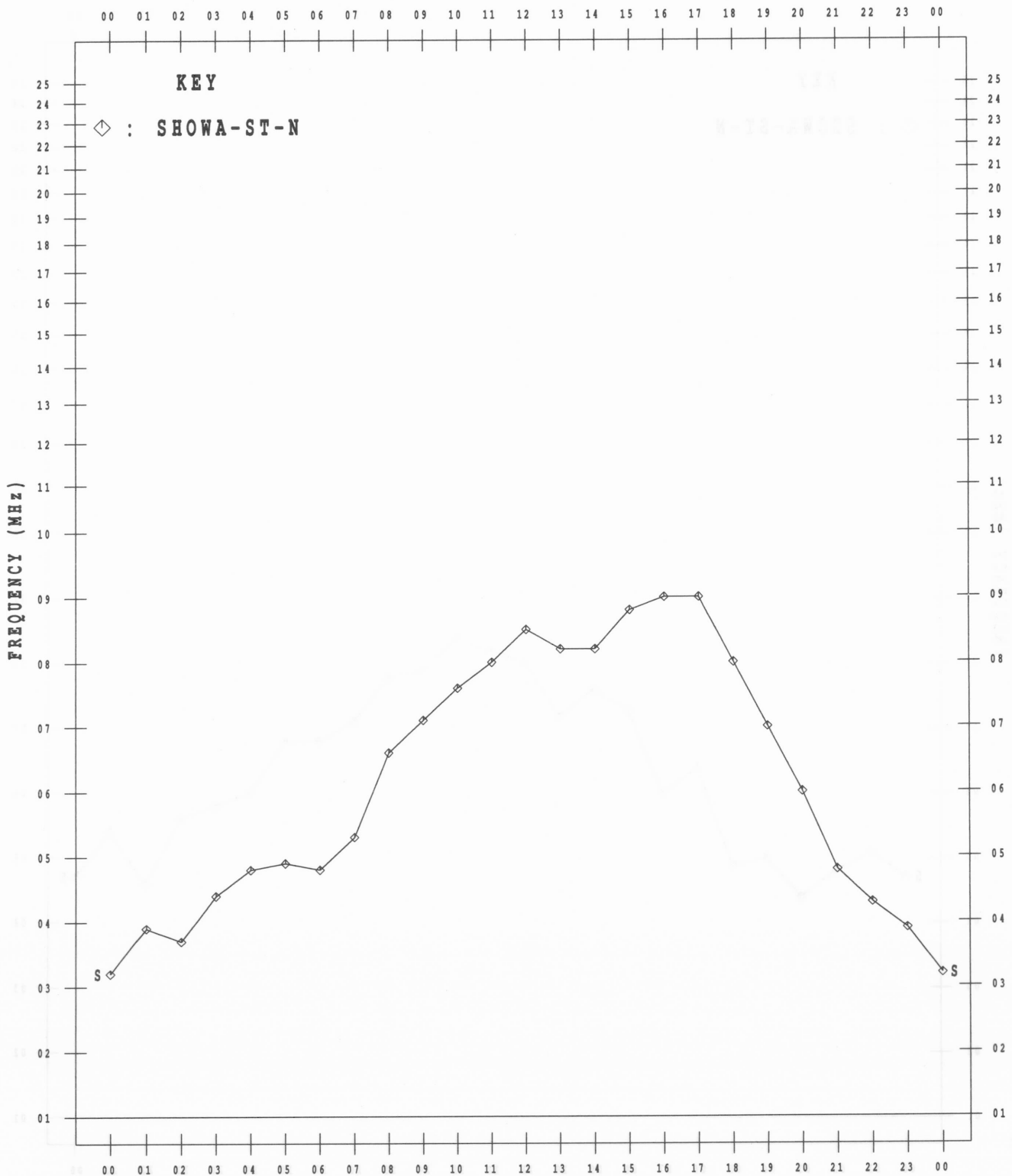




## MONTHLY MEDIAN VALUES OF foF2

45° E MEAN TIME

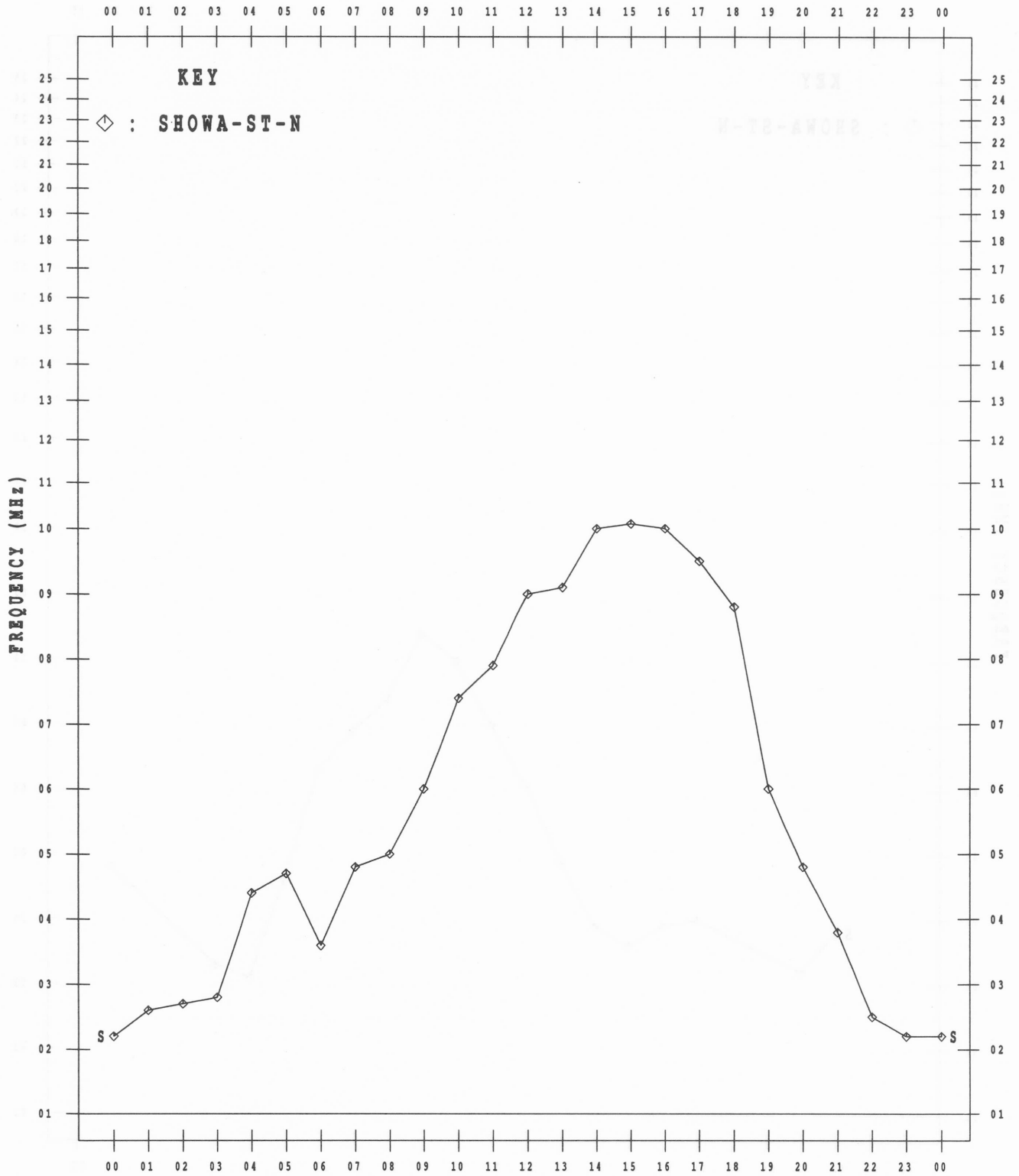
MAR. 1992



# MONTHLY MEDIAN VALUES OF $f_oF_2$

45° E MEAN TIME

APR. 1992

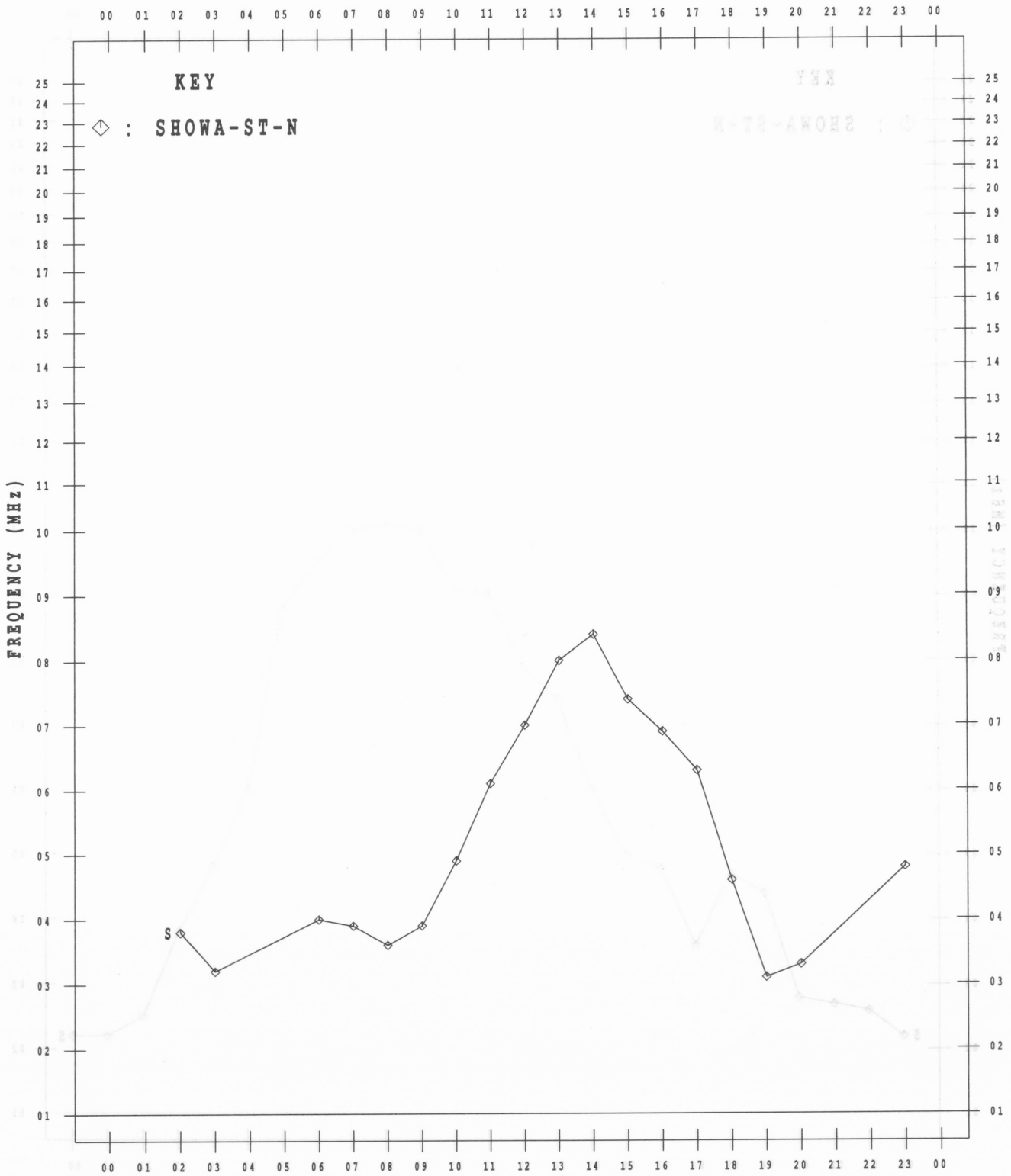


# MONTHLY MEDIAN VALUES OF $f_oF_2$

0001 794

45° E MEAN TIME

MAY. 1992

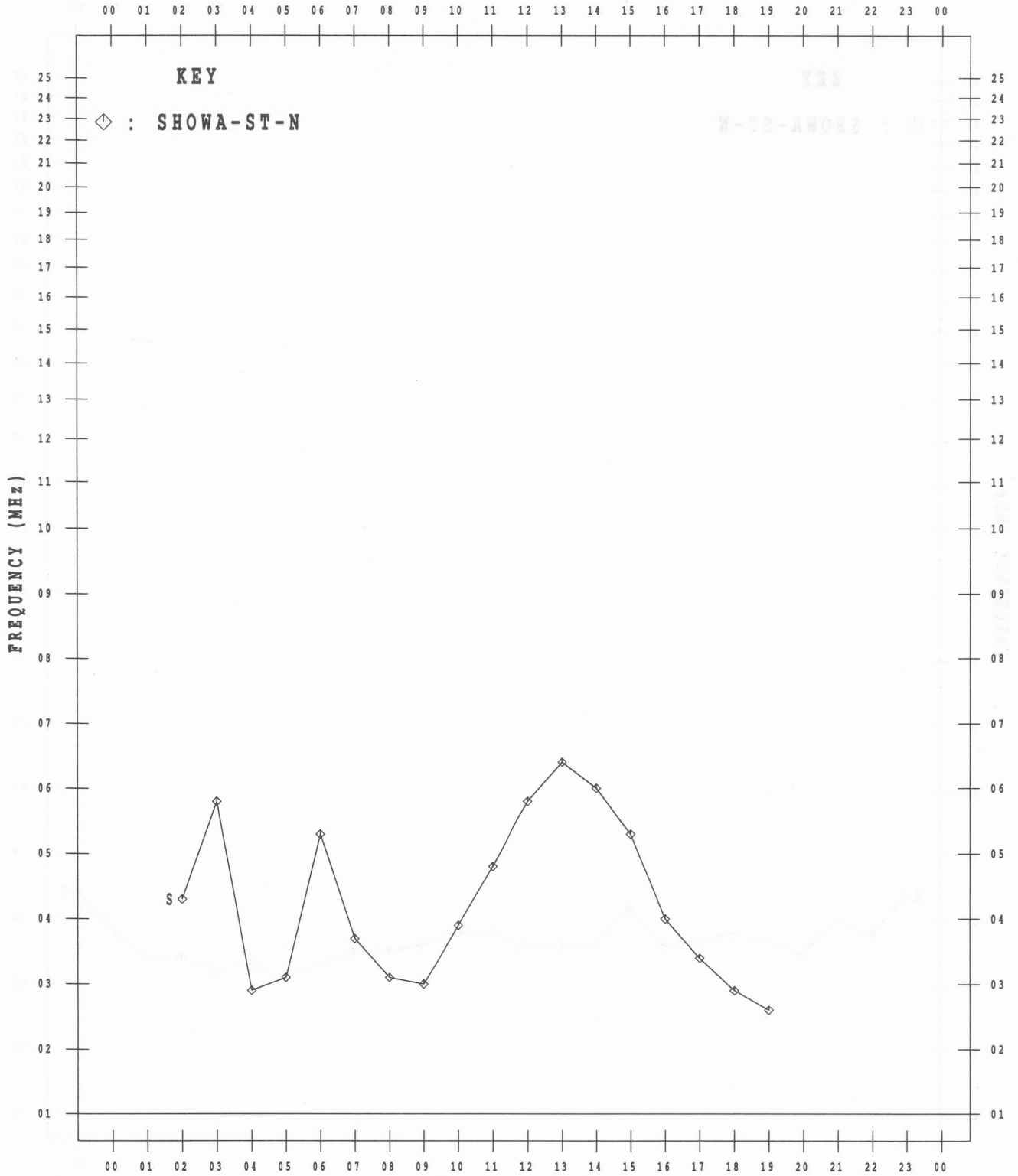


# MONTHLY MEDIAN VALUES OF $f_oF_2$

1992 JUN

45° E MEAN TIME

JUN. 1992

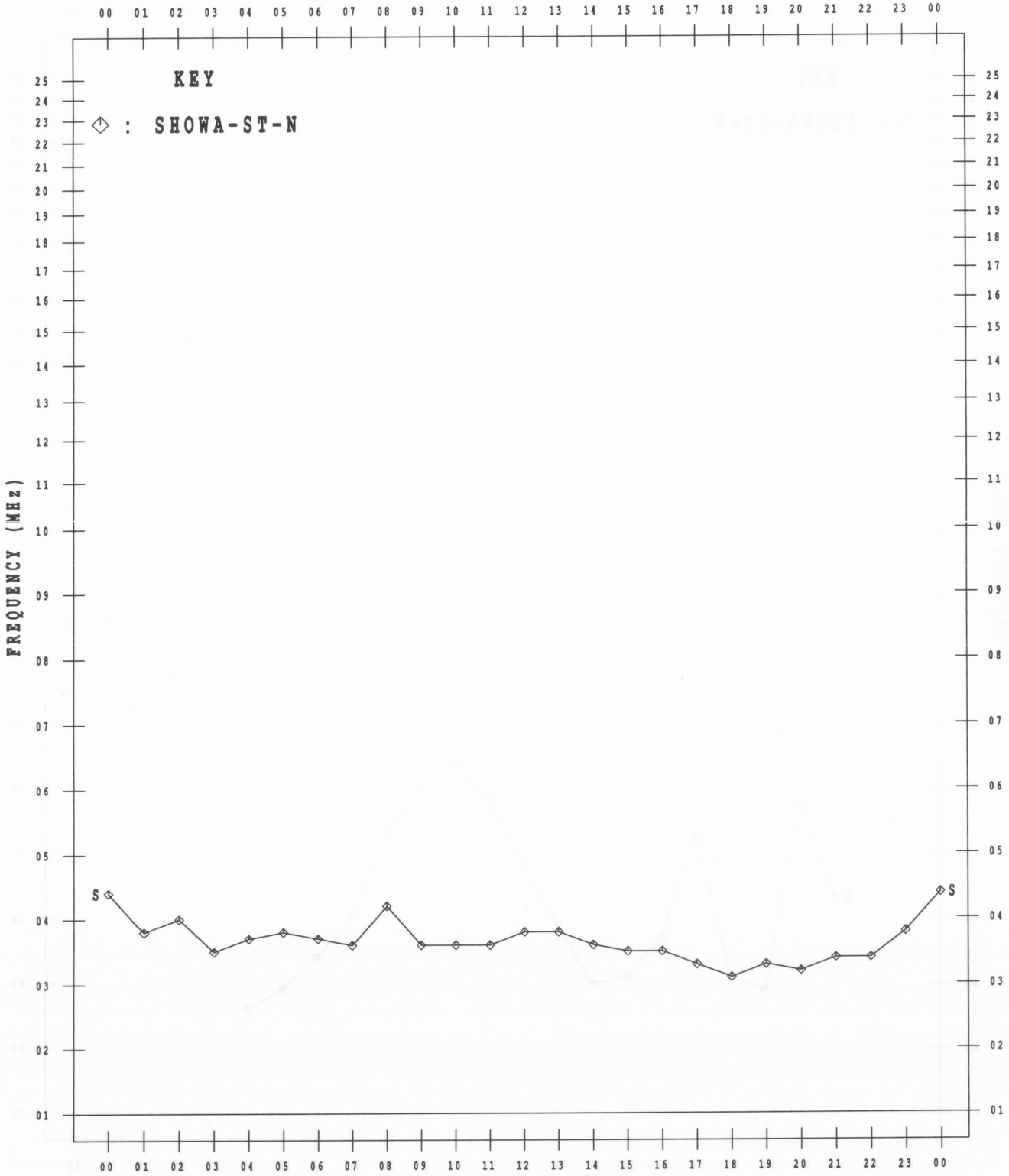




# MONTHLY MEDIAN VALUES OF ftes

45° E MEAN TIME

JAN. 1992

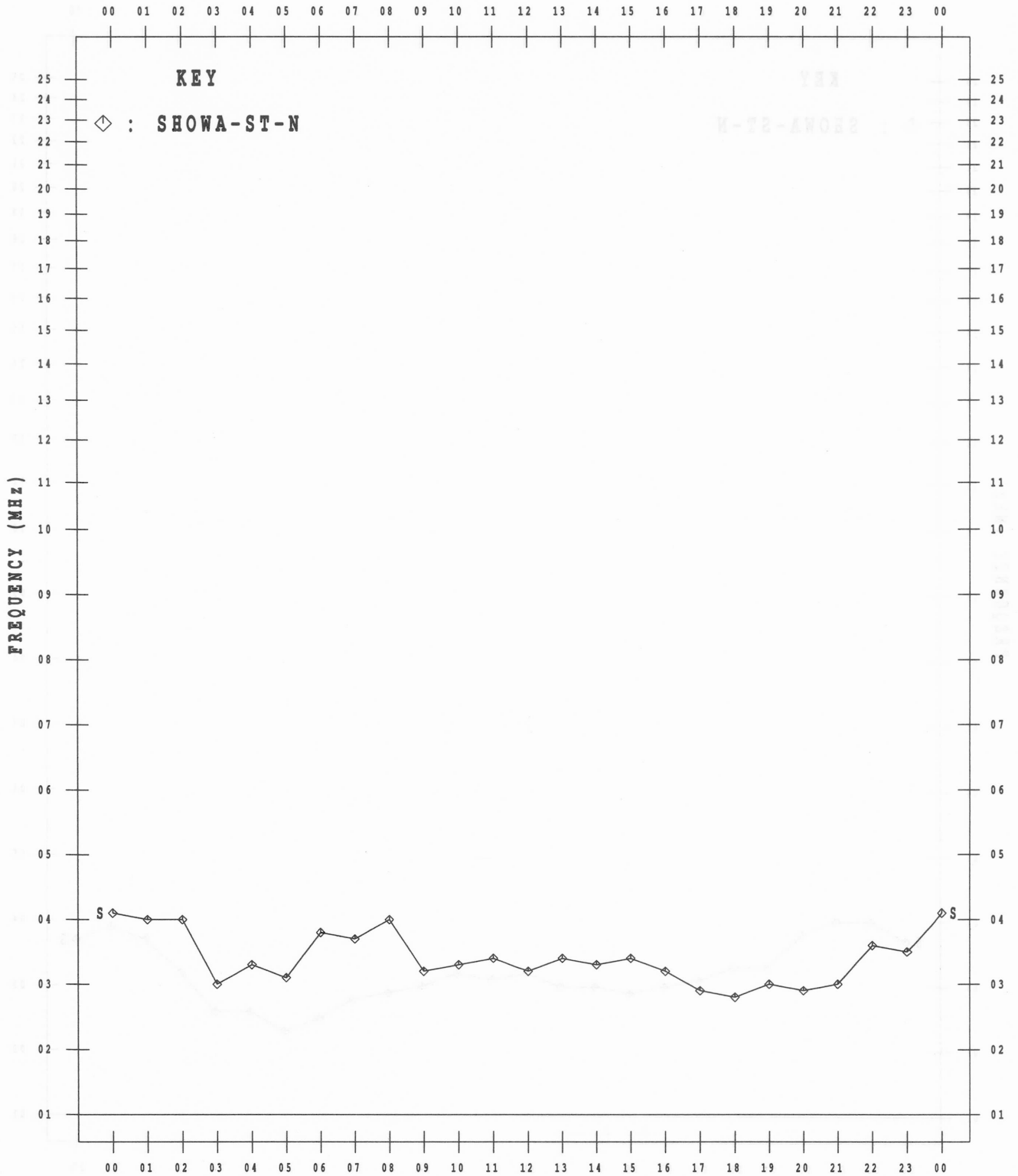


# MONTHLY MEDIAN VALUES OF $f_{TE}$ s

1992 JAN

45° E MEAN TIME

FEB. 1992

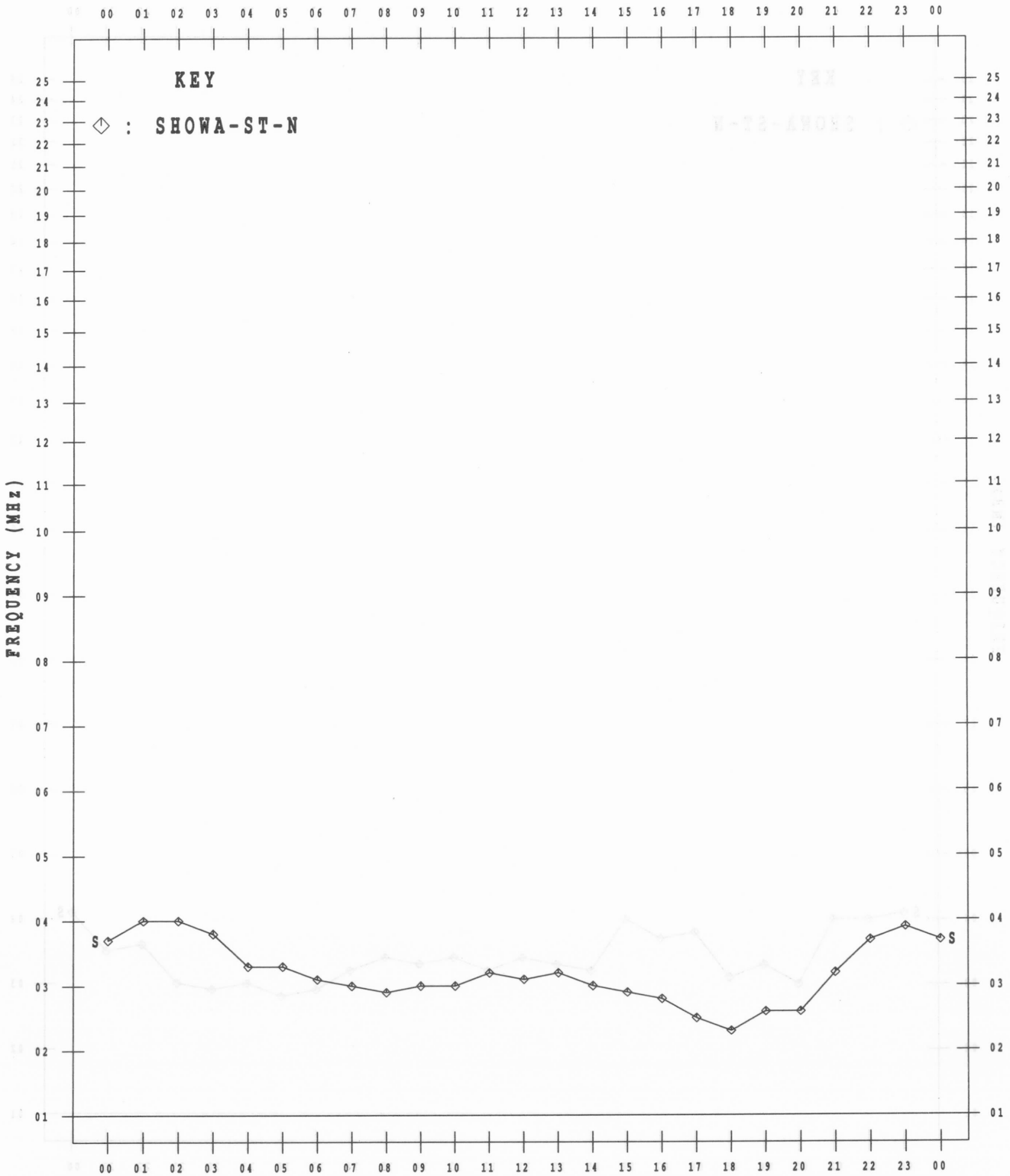


# MONTHLY MEDIAN VALUES OF HfEs

SEP 1988

45° E MEAN TIME

MAR. 1992

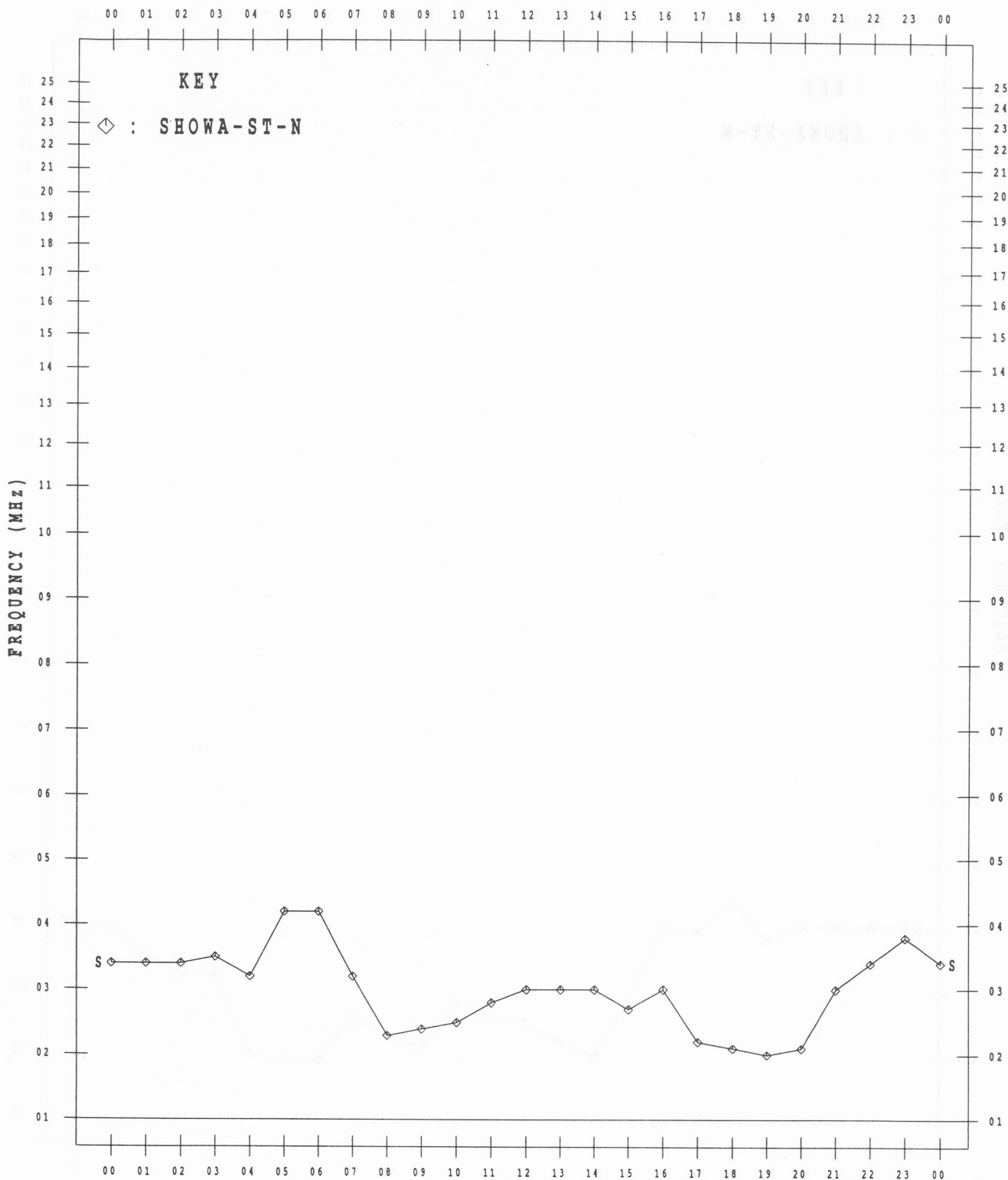


# MONTHLY MEDIAN VALUES OF $f_{TE}$ s

0001 JAN

45° E MEAN TIME

APR. 1992



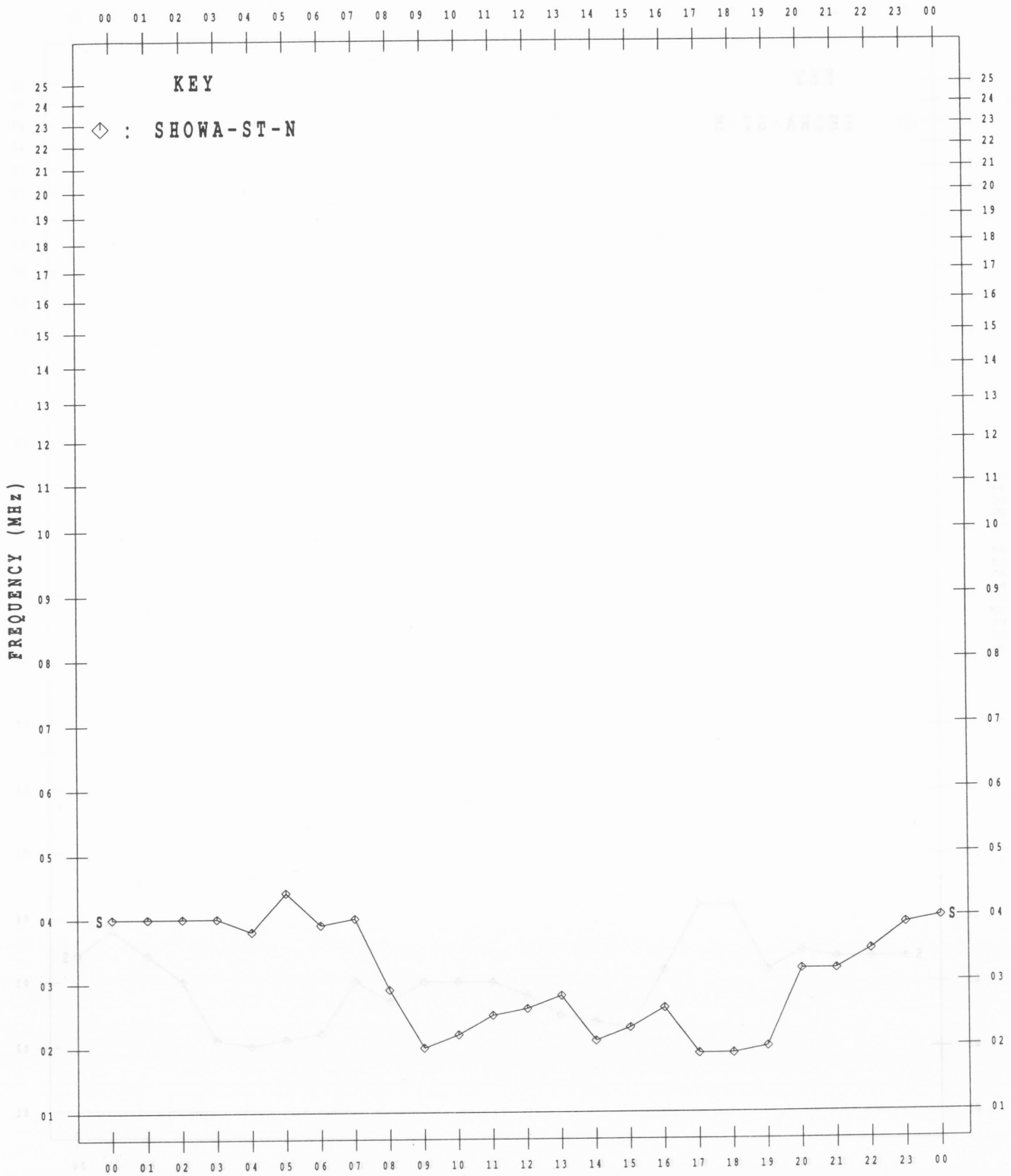


# MONTHLY MEDIAN VALUES OF ftEs

SSA

45° E MEAN TIME

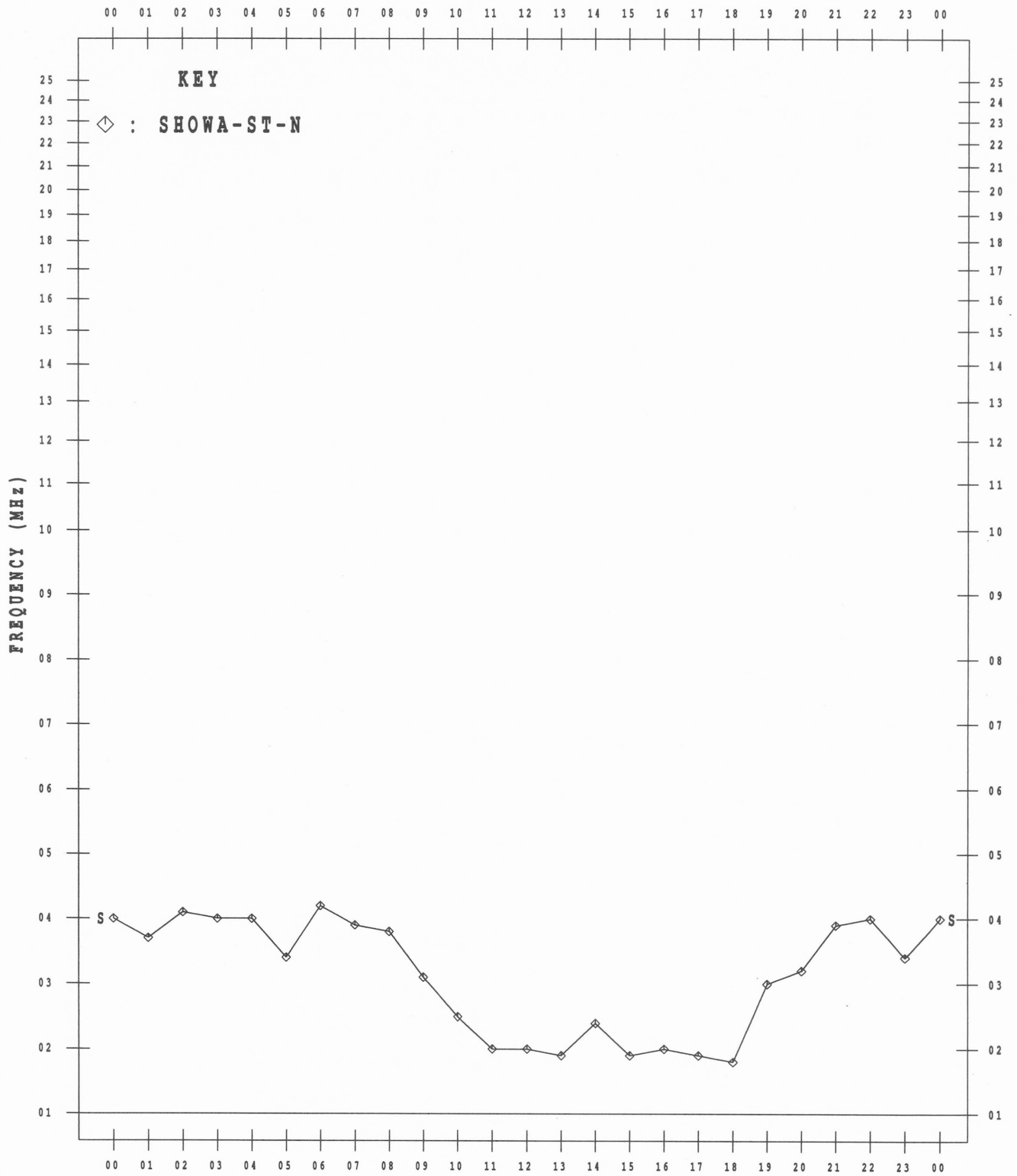
MAY. 1992



# MONTHLY MEDIAN VALUES OF fteS

45° E MEAN TIME

JUN. 1992



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IONOSPHERIC DATA AT SYOWA STATION (ANTARCTICA)  
ION.ANT.—58 January 1992—June 1992 (Not for Sale)

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〒184 東京都小金井市貫井北町4丁目2-1

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