

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

July 1977—December 1977

C O N T E N T S

	Page
Introduction	1
Location of Syowa Station	1
Specifications of the Ionosonde used at Syowa Station	1
Symbols and Terminology	1
Ionospheric Data	5
Graph of Monthly Median Values	5
Tables of Hourly Values	9
<i>f</i> -plots (Regular World Days)	81

**RADIO RESEARCH LABORATORIES
MINISTRY OF POSTS AND TELECOMMUNICATIONS
TOKYO, JAPAN**



INTRODUCTION

Vertical soundings of ionosphere at Syowa Station, Antarctica, have been carried out by the Radio Research Laboratories through the sponsorship of the National Institute of Polar Research of Japan.

LOCATION OF SYOWA STATION

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

SPECIFICATIONS OF THE IONOSONDE USED AT SYOWA STATION

Items	Specifications
Frequency Range	500 kHz—15 MHz
Transmitting Power	10 kW (peak value)
Duration of Sweep	30 sec
Transmitted Pulse Width	100 μ 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	100 volt AC, 2.5 kVA
Transmitting Antenna and Receiving Antenna	30 m height vertical delta terminated by 600 Ω respectively

SYMBOLS AND TERMINOLOGY

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)".

a. Characteristics of Ionosphere

f_xI	Top frequency of spread F trace
f_oF2	} Ordinary wave critical frequency for the $F2$, $F1$, E and Es including particle E layers respectively
f_oF1	
f_oE	
f_oEs	
$fbEs$	Blanketing frequency of the Es layer, e.g. the lowest ordinary wave frequency visible through Es
$fmin$	Lowest frequency which shows vertical ionospheric reflections
$M(3000)F2$	Maximum usable frequency factor for a path of 3000 km for transmission by $F2$ layer.
$h'F2$	} Minimum virtual height on the ordinary wave for the $F2$, whole F and Es layers respectively.
$h'F$	
$h'Es$	
Types of Es	See below b. (iii)

b. 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 *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 effects.
- T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
- V Forked trace which may influence the measurement.
- W Measurement influenced or impossible because the echo lies outside the height range recorded.
- X Measurement refers to the extraordinary component.
- Y Lacuna phenomena, severe layer tilt.
- Z Third magneto-electronic component present.

(ii) Qualifying Letters

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

- A Less than. Used only when *f_bEs* is deduced from *f_oEs* because total blanketing of higher layer is present.
- D Greater than.
- E Less than.
- I Missing value has been replaced by an interpolated value.
- 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) Description of Type of *Es*

When more than one type of *Es* trace is present on the ionogram, the type for the trace used to determine f_oEs must be written first. The number of multiple traces is indicated after the type letter.

The types are :

f	An <i>Es</i> trace which shows no appreciable increase of height with frequency.
l	A flat <i>Es</i> trace at or below normal <i>E</i> layer minimum virtual height or below the particle <i>E</i> layer minimum virtual height.
c	An <i>Es</i> trace showing a relatively symmetrical cusp at or below f_oE .
h	An <i>Es</i> trace showing a discontinuity in height with the normal <i>E</i> layer trace at or above f_oE . The cusp is not symmetrical, the lower frequency end of the <i>Es</i> trace lying clearly above the high frequency end of the normal <i>E</i> trace.
q	An <i>Es</i> trace which is diffuse and non-blaketing over a wide frequency range.
r	An <i>Es</i> trace showing an increase in virtual height at the high frequency end similar to group retardation.
a	An <i>Es</i> trace having a well-defined fiat or gradually rising lower edge with stratified and diffuse traces present above it.
s	A diffuse <i>Es</i> trace which rises steadily with frequency and usually emerges from another type <i>Es</i> trace.
d	A weak diffuse trace at heights below 95 km associated with high absorption and large f_{min} .
n	The designation 'n' is used to denote an <i>Es</i> trace which cannot be classified into one of the standard types.
k	The designation k is used to show the presence of particle <i>E</i> . When $f_oEs > f_oE$ (particle <i>E</i>) the <i>Es</i> type precedes k.

c. 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.

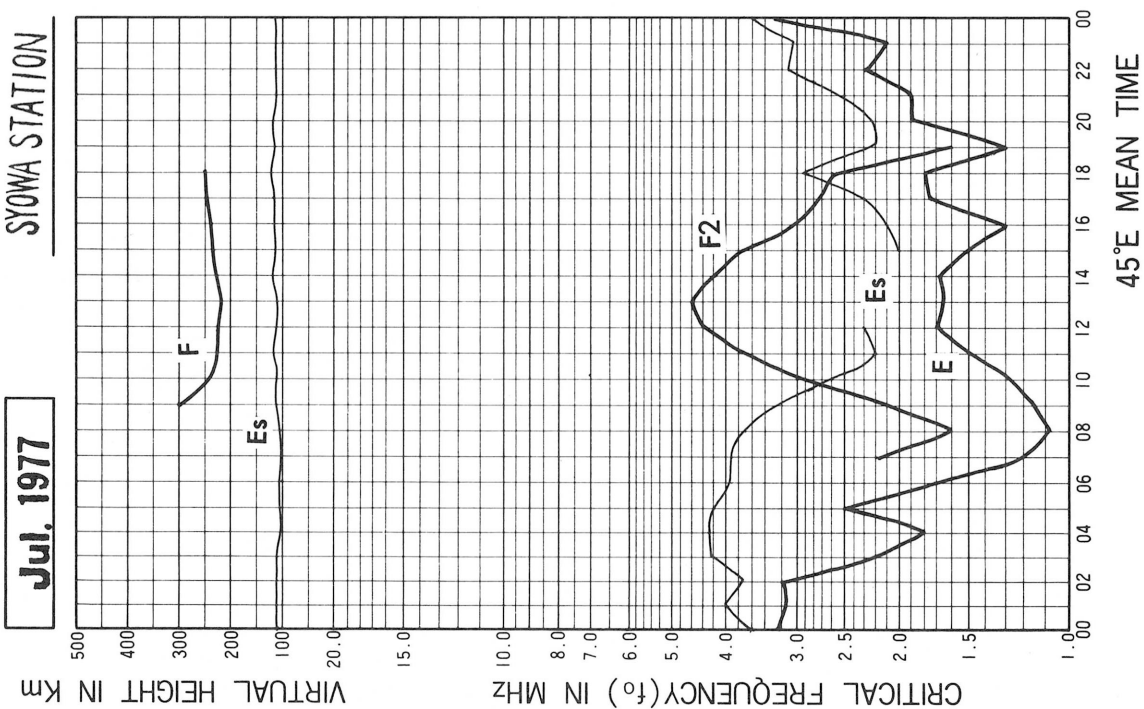
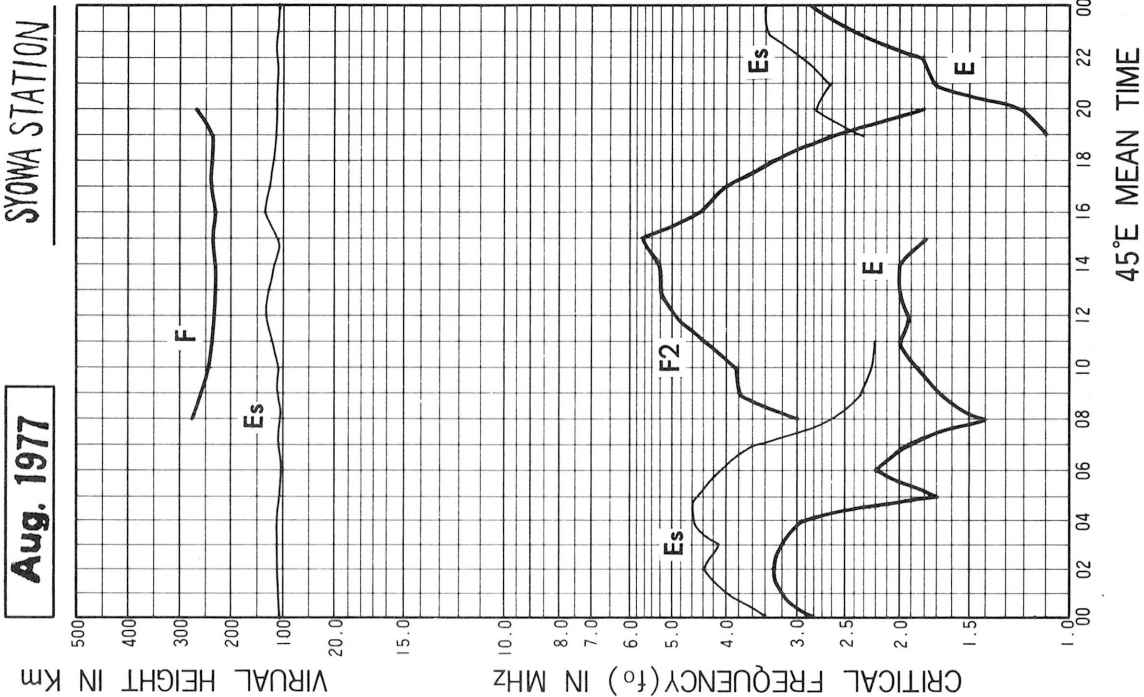
Median (MED) of a set of numbers is the middle value when the numbers are arranged in order of magnitude, or the average of the two middle values if there is an even number of values.

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.

d. *f*-plot.

f-plots of ionospheric data are illustrated only the periods of the Regular World Days of every month.

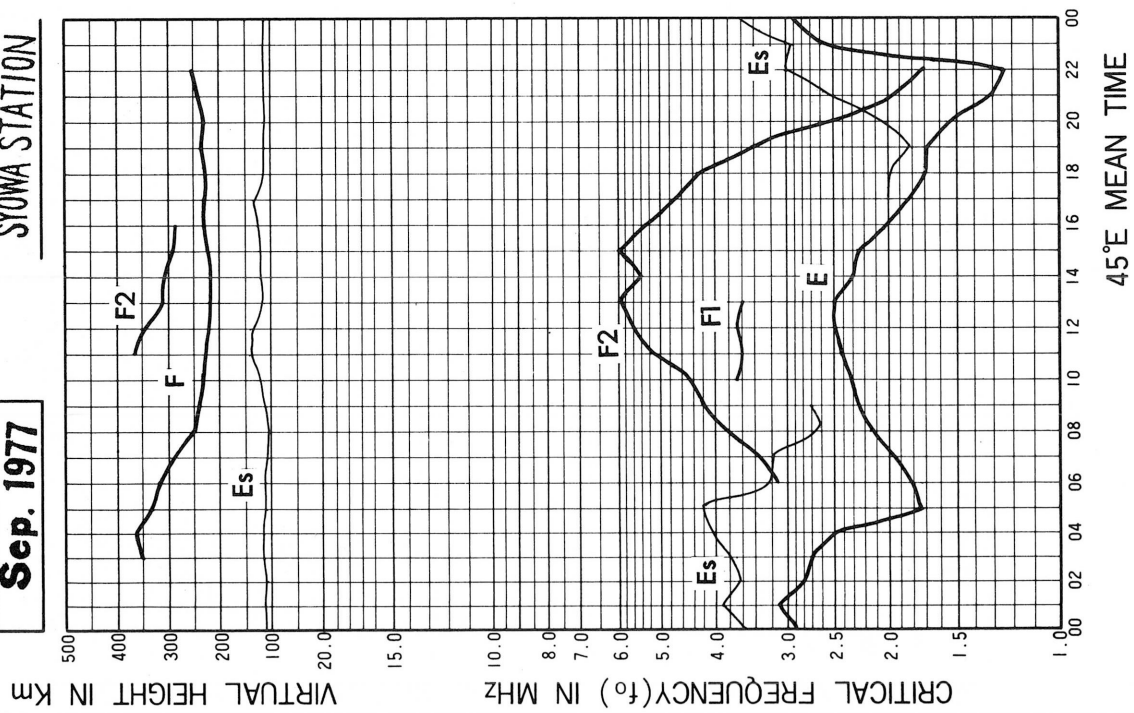
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS



IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS

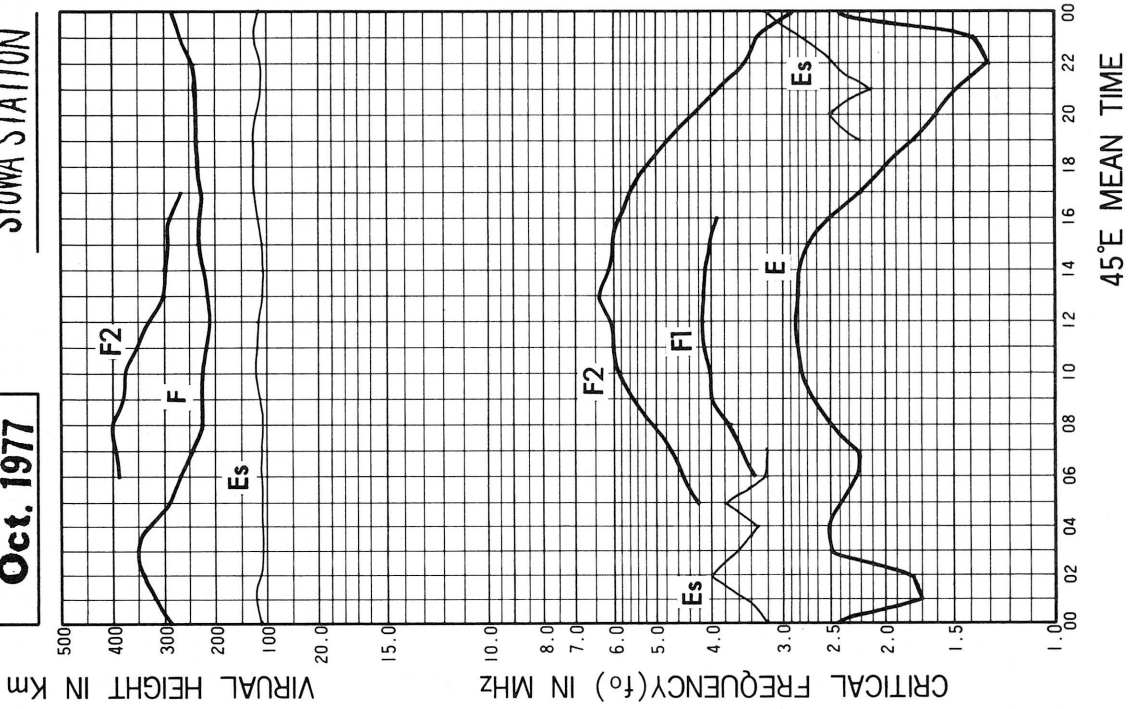
Sep. 1977

SYOWA STATION



Oct. 1977

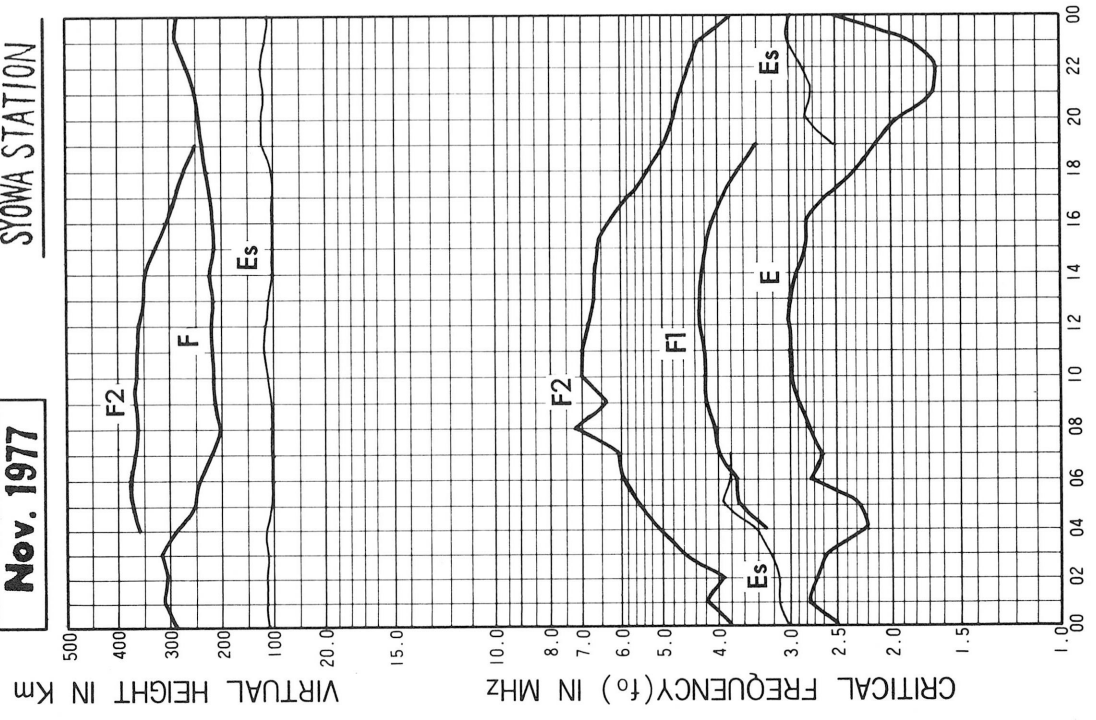
SYOWA STATION



IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS

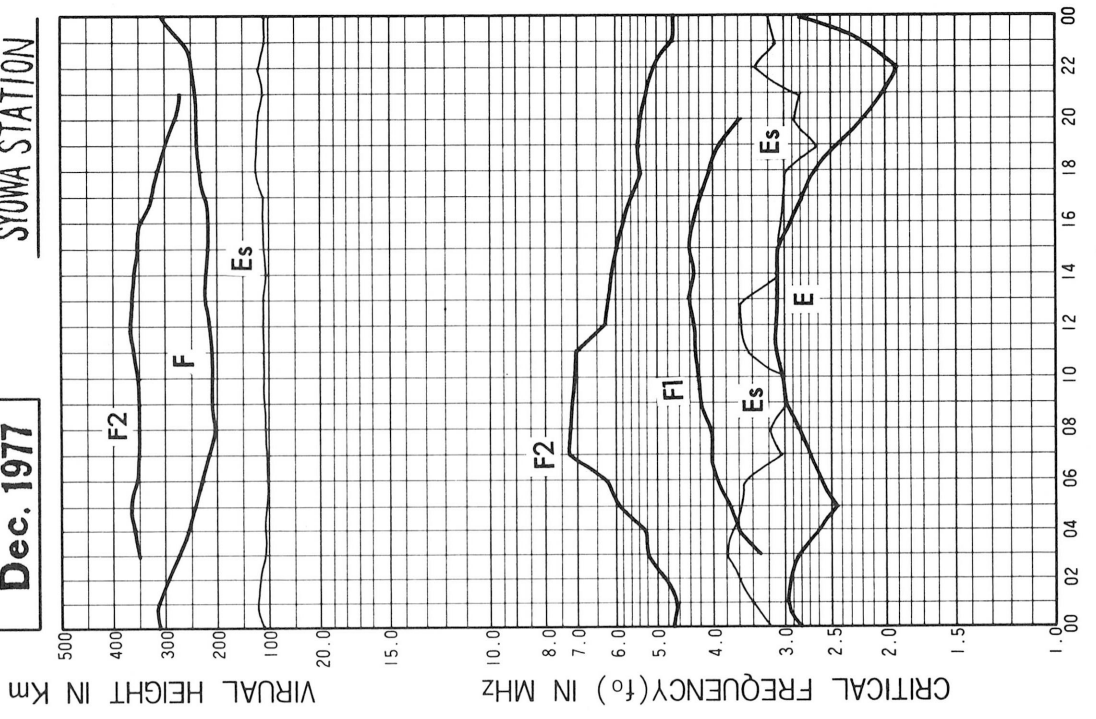
Nov. 1977

SYOWA STATION



Dec. 1977

SYOWA STATION



45°E MEAN TIME

45°E MEAN TIME

IONOSPHERIC DATA

JUL. 1977

FXI (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69 00.4 S, Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	A	A	A	A	A	A	B	B	70	B	72	60	O R 34	O R 21	A	A	A	A	A
2	A	A	A	A	B	B	A	A	A	O R 27	O R 36	B	O R 54	B	45	43	39	O R 38	B	23	O R 19	A	A	A
3	A	B	B	A	A	A	A	A	28	29	31	42	54	53	50	O R 46	39	46	O R 39	Y	42	A	A	A
4	A	A	O R 28	A	A	A	B	A	A	A	B	B	55	O R 48	53	B	R	O R 28	B	B	A	A	B	A
5	A	S 65	A	A	A	A	O R 31	26	A	O R 26	36	R 47	49	X 55	43	O R 39	O R 29	33	O R 39	B	B	A	A	A
6	A	A	A	39	A	A	A	30	24	29	33	X 41	X 49	53	50	45	33	44	46	30	32	A	A	A
7	B	A	A	A	A	A	A	70	A	A	B	B	B	B	O R 40	41	O R 37	34	B	B	B	B	B	A
8	A	S 45	B	B	B	B	A	B	B	A	B	B	43	44	51	O R 56	R	B	B	R	B	B	A	A
9	A	Y	A	A	B	A	B	B	B	B	O R 36	41	48	B	B	B	R	O R 29	O R 21	B	Y	A	A	84
10	A	A	B	B	B	B	B	B	B	B	A	O R 41	B	O R 52	O R 51	B	R	B	O R 26	B	B	A	A	B
11	B	B	B	B	B	B	A	B	B	A	R	B	B	B	O R 52	O R 36	O R 38	O R 35	B	B	B	B	A	A
12	A	B	B	B	A	A	B	A	O R 25	O R 28	O R 36	X 42	56	54	46	O R 38	36	O R 37	Y	Y	B	A	A	A
13	A	A	A	Y	A	A	A	A	B	A	B	43	O R 46	50	O R 46	O R 41	35	30	25	B	B	A	A	88
14	A	A	A	B	B	A	A	B	B	A	O R 36	O R 36	B	B	O R 49	B	B	B	B	B	R	A	A	41
15	A	A	A	A	A	B	B	B	B	A	A	O R 37	B	O R 48	O R 44	B	R	O R 26	B	B	A	A	A	A
16	A	A	A	A	68	A	68	A	A	A	B	B	B	B	B	B	48	A	A	A	A	A	A	A
17	A	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	R	B	B	B	B	45	A	51
18	A	A	B	B	B	B	A	A	B	A	A	39	O R 48	B	B	O R 55	40	B	B	B	A	A	B	A
19	A	A	A	A	A	B	A	A	O R 24	A	B	B	B	B	B	O R 58	64	65	O R 36	B	A	A	A	A
20	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	R	67	O R 43	Y	A	A	A	A
21	A	B	B	B	A	A	B	B	A	B	B	B	B	66	R	O R 46	O R 37	B	O R 36	O R 20	B	B	B	A
22	A	A	A	B	A	A	A	A	B	B	B	B	B	B	B	B	O R	B	B	B	B	B	A	A
23	A	A	B	A	A	A	B	B	Y	A	O R 41	O R 49	O R 52	R	52	O R 50	44	O R 35	B	R	R	A	B	A
24	A	A	A	83	A	A	31	X 30	S 29	30	40	X 47	53	B	B	B	R	B	B	B	B	A	A	A
25	A	A	A	A	B	A	A	29	O R 23	O R 27	42	50	59	53	50	42	43	43	47	O R 22	B	B	A	A
26	A	A	A	25	A	26	34	A	40	41	O R 42	52	60	X 58	49	46	O R 38	B	O R 28	O R 21	A	A	A	B
27	A	U 30	A	O R 26	28	28	43	53	B	B	O R 43	O R 48	54	65	46	53	X 49	O R 30	A	B	A	A	A	A
28	A	A	60	A	A	46	S 42	44	49	O R 27	45	57	60	70	53	X 50	40	34	O R 25	C	S	S	S	A
29	O R 22	S	70	A	A	A	71	A	51	90	A	B	O R 46	O R 43	O R 42	51	40	68	32	B	B	B	A	A
30	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	R	B	B	A	22	A	A	A
31	A	A	B	A	A	B	A	B	B	B	Y	X 46	O R 51	X 50	47	R	R	B	O R 36	A	B	B	O R 19	29
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1	3	3	4	2	3	7	7	9	10	13	17	18	17	20	19	19	19	15	5	4	1	1	5
MED	O R 22	S 45	60	32	48	28	42	30	28	28	O R 36	43	52	53	49	O R 46	39	35	O R 36	O R 22	27	45	O R 19	51
UQ	S 55	65	61		37	56	48	40	30	O R 42	48	55	58	51	O R 52	44	44	O R 39	23	37				84
LQ		38	44	26		27	32	30	O R 24	O R 27	O R 36	41	O R 48	50	46	42	37	O R 32	O R 26	O R 21	20			41

JUL. 1977

FXI (0.1 MHz)

IONOSPHERIC DATA

JUL. 1977

FOF2 (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station **SYOWA STATION** Lat. 69 00.4 S, Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

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

The Radio Research Laboratories, Japan

JUL. 1977

FOF2 (0.1 MHz)

IONOSPHERIC DATA

JUL. 1977

FOF1 (0.01 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations YOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4																								
5																								
6																								
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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																								
MED																								
UQ																								
LQ																								

JUL. 1977

FOF1 (0.01 MHz)

IONOSPHERIC DATA

JUL. 1977

FOE (0.01 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station **SYOWA STATION** Lat. 69 00.4 S Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	K 360	K 360								B	A	B	B	B	B	B		U 190	K 125	K 130	J 330	K 280	J 310		
2		K 360								A	B	B	B	B	U 200	A	U 160	U 180							
3	K 360						K 330	J 260	K 165	A	125	190	120	120		B	B			K 180	J 210	K 215	U 180	U 120	
4	K 340	K 340	U 170	U 250	K 120	K 350				A	B	B	A	B	B	B								U 140	
5	K 170	U 260	U 200			K 360	U 145	U 100		B	110	U 120	A	A	B	B		U 120	U 120						
6	U 230	U 300	K 370	U 160				U 120	K 100	U 95	95	120	A	U 120	B	A			U 90	K 80	U 90				
7			J 360							B	B	B	B	B	B	195	K 160							U 150	
8	K 330	U 280								B	B	B	B	145	B	B				K 160			K 255	K 210	
9	J 340									B	B	U 150	F 180	U 180	B	B	B					U 150	K 160	K 400	
10										B	B	K 210		B	B	B	B					J 410			
11										B	A	B	B	B	B	B							K 140	K 210	
12	K 260				K 260			U 190	U 120	U 110	U 115	U 150	U 170	170	U 125	200	K 130							K 145	
13	K 100	K 125	U 120							B	B	U 145		B	B	B	B	A	U 110	U 110	U 110		K 130	K 120	K 340
14		K 270					K 330			B	U 180	A	B	B	B	B					K 165	K 120	K 230	K 160	
15	J 240	J 270	U 170							B	B	B	B	B	B	B							K 120		
16	K 330			U 310						B	B	B	B	B	B	B	B	K 400	K 340		K 190	J 330	J 410	U 330	
17										B	B	B	B	B	B	B	B						K 190	K 310	
18									B 220	K 220	A	A	B	B	B	B	B						U 170		
19	K 370	J 390	K 340	K 310	K 320			K 270	110	130	B	B	B	B	B	B	B		U 120	U 210			K 350	U 330	
20										B	B	B	B	B	B	B	B	B		U 230	U 230		J 260		
21						U 120				B	B	B	B	B	B	B	B	B							
22		K 340								B	B	B	B	B	B	B	B	B						U 200	
23	U 320								Y	A	A	B	B	B	B	B	B	A	U 170					U 130	
24		K 110		K 300					U 100	U 105	A	U 150	U 150		B	B	B	B					K 140	K 390	
25			U 325					K 120	105	B	A	200	170	165	R 155	U 150	A							U 140	
26	J 170			U 130		K 110	U 100		B	U 120	150	U 150	F 165	F 165	175	135	R								
27			U 120	U 140	U 120				B	B	B	B	A	170	A	A	U 125								
28						U 250	U 180	U 120		A	B	150	A	U 175	U 160	U 160	120	B							
29			K 320	U 190			U 160		B	A	B	B	U 290	U 200	B	B	B		U 240					K 250	U 280
30	J 330	U 360	J 360							B	B	B	B	B	B	B	B	B				U 180	J 250	J 360	U 330
31	K 320	K 330			K 180					B	B	B	A 200	K 280	A 200	A 195	B	B						K 90	U 195
	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	14	11	8	5	5	6	7	6	6	7	11	9	10	6	5	5	8	9	3	7	13	15	15	
MED	K 325	K 315	K 320	U 220	K 180	K 250	K 170	U 120	108	U 115	125	U 150	U 170	165	168	150	130	U 175	U 180	130	190	190	230	U 210	
UQ	K 340	K 360	K 350	K 305	K 260	K 350	K 330	K 225	120	130	150	195	U 180	170	195	195	K 160	U 210	230	145	U 235	K 280	K 310	U 330	
LQ	K 235	K 270	U 170	U 150	K 120	U 120	U 145	U 120	100	U 105	112	U 138	165	145	U 155	135	125	U 120	U 120	105	K 172	K 140	K 150	U 148	

The Radio Research Laboratories, Japan

JUL. 1977

FOE (0.01 MHz)

IONOSPHERIC DATA

JUL. 1977

FOES (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations SYOWA STATION Lat. 69 00.4 S. Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	K 36	K 36	J 40	J A 53	B	43	J 39	J A 48	J A 49	J A 44	52	B	B	E B 31	B	E B 30	E B 27	J A 36	J A 30	J A 28	J K 33	36	J K 31	J A 41
2	J A 47	K 36	J A 51	J A 29	B	48	J A 45	50	J A 46	J A 39	33	B	E B 36	B	22	15	18	20	B	J A 20	19	20	J A 37	J A 49
3	K 36	41	80	42	51	42	K 33	J K 26	18	J A 19	32	25	17	J A 26	E B 26	30	30	J A 26	18	Y	J K 21	K 21	J A 25	22
4	K 34	J A 41	J A 32	J A 101	37	J A 41	40	J A 39	J A 39	J A 39	B	B	J A 37	E B 36	E B 20	B	B	E B 20	35	24	19	23	B	19
5	22	U K 26	85	50	J A 44	K 36	20	J A 24	33	J A 22	13	25	J A 21	J A 24	E B 17	40	J A 37	J A 24	J A 31	B	B	20	J A 36	J A 33
6	70	J A 40	K 37	24	53	J A 42	28	J A 25	J A 25	12	12	31	35	J A 31	16	J A 27	J A 40	J A 24	J A 26	J A 31	J A 23	J A 25	J A 52	J A 36
7	J A 42	J A 51	J K 36	J A 31	J A 58	J A 54	J A 64	J A 41	65	J A 47	B	B	B	B	27	25	16	K E 12	B	B	B	B	B	18
8	K 33	J A 41	47	49	B	31	J A 41	B	47	47	B	B	E B 17	G E 17	E B 35	B	B	B	B	K 16	B	B	K 25	25
9	J A 44	70	J A 51	51	33	30	B	B	46	B	J A 23	17	23	B	B	B	B	E B 17	E B 12	B	Y	23	16	K 40
10	38	J A 41	B	B	B	B	60	B	B	B	32	K 21	B	E B 29	E B 29	B	B	B	E B 17	B	B	J K 41	J A 41	40
11	J A 41	41	B	42	J A 44	46	J A 40	B	B	J A 40	26	B	B	B	E B 27	E B 22	12	F B 12	B	B	B	B	23	27
12	33	36	B	B	J A 36	35	31	J A 39	22	17	18	19	22	G	15	K 20	25	J A 21	25	15	B	21	19	21
13	21	23	J A 27	Y	28	J A 52	48	J A 39	55	J A 33	B	20	E B 17	E B 16	E B 17	31	J A 26	J A 26	J A 38	B	B	18	J A 24	K 34
14	J A 54	J A 36	J A 42	B	43	J A 41	37	50	B	32	23	J A 29	B	B	E B 30	B	B	B	B	B	K 16	20	28	J A 25
15	J A 31	J A 27	J A 27	J A 41	J A 42	58	84	B	B	42	41	24	B	E B 29	E B 26	B	B	E B 16	B	B	J A 20	J A 30	J A 35	20
16	66	J A 50	42	J A 77	J A 99	J A 97	J A 59	J A 57	J A 43	J A 42	B	B	B	B	B	B	E B 27	K 40	K 34	J A 36	K 19	J K 33	J K 41	J A 87
17	J A 99	85	B	B	27	40	50	J A 53	45	B	B	B	B	B	B	B	B	B	B	B	B	25	31	Y
18	J A 49	J A 71	32	45	B	47	32	J A 39	B	J A 26	J A 27	32	33	B	B	E B 23	E B 25	B	B	B	25	J A 51	125	24
19	K 37	J K 39	34	K A 42	J A 44	57	40	31	20	20	B	B	B	B	B	E B 36	E B 24	32	40	B	40	35	J A 35	J A 40
20	46	J A 53	J A 43	J A 81	B	50	49	B	B	B	B	B	B	B	B	B	B	J A 26	31	Y	J K 26	J A 38	J A 36	J A 44
21	J A 36	48	46	47	J A 36	38	B	39	37	B	B	B	B	E B 22	E B 36	E B 27	E B 24	B	E B 10	E B 10	B	B	B	J A 35
22	J A 39	39	J A 61	B	J A 41	43	J A 34	J A 36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	26	J A 29
23	J A 36	J A 53	36	J A 41	44	55	49	B	Y	J A 27	32	E B 23	E B 32	E B 40	32	32	20	26	B	15	17	32	B	18
24	20	J A 26	J A 33	30	J A 44	J A 37	J A 31	J A 20	15	18	18	20	41	B	B	B	B	B	B	B	B	19	39	J A 41
25	33	J A 41	39	J A 53	50	46	J A 27	J A 36	19	E B 17	20	G	20	G	20	G	20	20	15	19	B	30	15	J A 24
26	23	J A 33	J A 25	22	J A 32	J A 25	J A 24	33	32	28	20	20	G	G	G	G	E B 13	B	15	20	16	J A 24	J A 21	B
27	J A 27	J A 26	J A 36	75	J A 24	23	19	Y	B	B	E B 25	E B 25	J A 26	J A 65	J A 30	J A 29	15	37	J A 34	B	J A 32	20	J A 23	15
28	J A 35	J A 32	29	36	J A 27	26	J A 24	J A 24	J A 22	J A 42	J A 21	21	23	J A 23	19	12	28	20	28	C	S	S	S	J A 25
29	20	S	32	J A 100	60	57	J A 50	J A 44	31	42	50	B	E B 29	G	42	20	28	E B 32	29	36	34	B	25	K 39
30	J K 33	J A 40	J K 36	J A 36	J A 30	27	J A 33	30	B	B	B	B	B	B	B	B	B	B	B	J A 26	27	J A 33	J K 36	K 33
31	J A 38	J A 39	41	J A 38	J A 44	J A 57	37	50	50	B	31	27	28	19	22	E B 39	B	B	29	26	B	B	33	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	31	30	27	25	25	30	29	23	21	22	20	17	18	18	21	20	19	20	19	14	16	23	26	29
MED	36	J A 40	J 37	J A 42	J A 43	42	39	J A 39	37	J A 32	26	22	23	E G 24	E G 22	U 20	U 21	23	29	22	22	25	J 31	30
UQ	J A 43	J A 48	44	53	J A 44	52	49	J A 46	46	J A 42	32	25	U 30	E B 31	E B 29	U 30	28	28	32	J A 28	30	J 33	J A 36	J A 40
LQ	33	J 36	J 32	J A 36	J A 33	36	31	J A 30	22	20	20	20	20	G	16	U 16	U 16	20	18	16	19	20	24	24

The Radio Research Laboratories, Japan

JUL. 1977

FOES (0.1 MHz)

IONOSPHERIC DATA

JUL. 1977

FBES (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations YOWA STATION Lat. 69 00.4 S. Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	K36	K36	A40	B	B	A43	A39	A48	A49	A44	A52	B	B	E31	B	E30	E27	U19	K12	A28	J33	A36	J31	A41	
2	A47	K36	A51	A29	B	B	A45	A50	A46	17	22	B	E36	B	U20	13	U16	20	B	E10	11	A20	A37	A49	
3	K36	B	B	A42	A51	A42	K33	J26	K16	13	G	11	15	11	E26	E24	11	E10	K18	Y	J21	K21	A25	A22	
4	K34	A41	19	A101	A37	A41	B	A39	A39	A39	B	B	24	E36	E20	B	R	E20	B	B	A19	A23	B	A19	
5	A22	U26	A85	A50	A44	K36	19	12	A33	10	10	G	15	14	E17	20	19	U12	U12	B	B	A20	A36	A33	
6	A70	A40	37	A24	A53	A42	A28	U12	K10	11	11	12	13	13	15	18	U18	U18	18	10	U9	A25	A52	A36	
7	B	A51	J36	A31	A58	A54	A64	A41	A65	A47	B	B	B	B	27	K19	K16	E12	B	B	B	B	B	A18	
8	K33	U28	B	B	B	B	A41	B	B	A47	B	B	E17	G	E17	E35	B	B	B	K16	B	B	K25	A25	
9	A44	Y	A51	A51	B	A30	B	B	B	B	20	G	18	B	B	B	B	E17	E12	B	Y	A23	K16	K40	
10	A38	A41	B	B	B	B	B	B	B	B	A32	K21	B	E29	E29	B	B	B	E17	B	B	K40	A41	B	
11	B	B	B	B	B	B	A40	B	B	A40	A26	B	B	B	E27	E22	11	E12	B	B	B	B	A23	A27	
12	A33	B	B	B	A36	A35	B	A39	U12	14	G	G	G	G	G	K20	17	14	E25	E15	B	A21	A19	A21	
13	A21	A23	A27	Y	A28	A52	A48	A39	B	A33	B	14	E17	E16	E17	15	12	U11	U11	B	B	A18	A24	K34	
14	A54	A36	A42	B	B	A41	A37	B	B	A32	U18	20	B	B	E30	B	B	B	B	B	K16	A20	A28	K16	
15	A31	J27	A27	A41	A42	B	B	B	B	A42	A41	21	B	E29	E26	B	B	E16	B	B	A20	A30	A35	A20	
16	K33	A50	A42	A77	A99	A97	A59	A57	A43	A42	B	B	B	B	B	B	E27	K40	K34	A36	K19	J33	J41	A87	
17	A99	B	B	B	B	B	B	A53	B	B	B	B	B	B	B	B	B	B	B	B	B	20	K31	Y	
18	A49	A71	B	B	B	B	A32	A39	B	A26	A27	22	33	B	B	E23	E25	B	B	B	A25	A51	B	A24	
19	37	J39	K34	A42	A44	B	A40	A31	15	A20	B	B	B	B	B	E36	E24	U12	U21	B	A40	K35	A35	A40	
20	A46	A53	A43	B	B	B	B	B	B	B	B	B	B	B	B	B	B	U23	K23	Y	J26	A38	A36	A44	
21	A36	B	B	B	A36	A38	B	B	A37	B	B	B	B	E22	E36	E27	E24	B	E10	E10	B	B	B	A35	
22	A39	A39	A61	B	A41	A43	A34	A36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A26	A29	
23	A36	A53	B	B	A44	A55	B	B	Y	A27	30	E23	E32	E40	23	E17	12	U17	B	A15	A17	A32	B	A18	
24	A20	A26	A33	K30	A44	A37	21	14	G	G	14	19	18	B	B	B	B	B	B	B	B	A19	A39	A41	
25	A33	A41	A39	A53	B	A46	A27	K12	12	E17	20	G	19	G	15	G	18	10	11	14	B	B	A15	A24	
26	A23	A33	A25	U16	A32	11	U10	A33	20	G	G	18	G	G	G	G	E13	B	13	12	A16	A24	A21	B	
27	A27	A26	A36	U14	U12	U23	E19	Y	B	B	E25	E25	20	G	22	16	G	15	A34	B	A32	A20	A23	A15	
28	A35	A32	A29	A36	A27	U25	U18	U12	17	E17	G	18	17	G	17	11	E11	13	12	C	S	S	S	A25	
29	10	S	K32	A100	A60	A57	U16	A44	30	A42	A50	B	E29	G	E20	U15	U28	E32	U24	B	B	B	K25	A39	
30	J33	A40	J36	A36	A30	A27	A33	A30	B	B	B	B	B	B	B	B	B	B	B	B	A26	U18	A33	J36	K33
31	A38	A39	B	A38	A44	B	A37	B	B	B	E31	G	K28	21	G	E39	B	B	21	A26	B	B	10	U19	
	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	24	21	18	20	21	22	20	16	22	20	17	18	18	21	20	19	20	18	12	15	22	25	28	
MED	A36	A39	A36	A40	A43	A41	A34	A38	25	A26	20	U15	16	E14	E20	E20	U14	U14	U15	15	19	A24	A28	A28	
UQ	A39	A41	A42	A51	A48	A46	A40	A42	A41	A42	A29	20	U24	E29	E26	E26	U20	19	22	K26	A26	A26	A33	A36	A40
LQ	A33	A30	A32	A30	A34	A35	21	20	12	12	10	G	14	G	E17	14	17	12	12	10	16	A20	A23	A20	

JUL. 1977

FBES (0.1 MHz)

IONOSPHERIC DATA

JUL. 1977

F-MIN (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations YOWA STATION Lat. 69 00.4 S. Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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 S 11	E S 16	15	21	B	18	10	10	11	11	10	B	B	31	B	30	22	16	10	10	8	7	E S 7	7	
2	10	10	8	8	B	38	13	17	13	10	19	B	36	B	15	12	13	18	B	10	10	9	10	11	
3	12	19	29	17	15	13	10	10	10	10	12	9	10	10	26	24	10	10	15	Y	14	11	8	5	
4	10	E S 11	10	11	10	11	26	12	10	10	B	B	13	36	20	B	B	20	28	21	12	15	B	10	
5	6	6	19	16	12	13	10	10	9	9	9	E C 11	11	13	17	18	14	10	10	B	B	10	10	10	
6	10	10	13	10	16	11	11	10	9	8	9	9	9	9	13	9	8	10	6	E	9	6	10	10	
7	18	12	E S 9	6	13	13	13	12	E C 13	17	B	B	B	B	21	15	12	12	B	B	B	B	B	10	
8	9	8	29	27	B	25	18	B	31	21	B	B	17	14	17	35	B	B	B	10	B	B	11	10	
9	10	30	16	15	27	18	B	B	24	B	15	12	11	B	B	B	B	17	12	B	Y	11	12	10	
10	10	13	B	B	B	B	46	B	B	B	21	18	B	29	29	B	B	B	17	B	B	9	E C 13	25	
11	17	25	B	36	20	19	12	B	B	18	12	B	B	B	27	22	10	12	B	B	B	B	10	E C 9	
12	10	30	B	B	13	12	25	12	11	11	10	10	11	15	12	13	12	12	16	12	B	11	12	12	
13	9	10	9	Y	15	13	11	10	28	12	B	12	17	16	17	21	10	9	10	B	B	10	10	9	
14	9	10	13	B	28	16	20	24	B	22	12	10	B	B	30	B	B	B	B	B	15	11	10	10	
15	9	10	10	11	12	20	30	B	B	18	14	18	B	29	26	B	B	16	B	B	11	11	10	7	
16	10	E S 13	10	E	12	10	10	14	10	11	B	B	B	B	B	B	27	19	18	10	11	9	12	10	
17	12	29	B	B	18	37	20	12	24	B	B	B	B	B	B	B	B	B	B	B	B	5	11	Y	
18	11	12	21	25	B	30	18	15	B	13	14	15	29	B	B	23	25	B	B	B	15	12	27	12	
19	10	10	12	11	10	30	17	13	9	10	B	B	B	B	B	36	24	8	13	B	19	10	8	8	
20	13	14	12	20	B	36	22	B	B	B	B	B	B	B	B	B	B	17	12	Y	10	9	9	13	
21	E C 10	19	23	40	11	10	B	29	12	B	B	B	B	22	36	27	24	B	10	10	B	B	B	E C 13	
22	10	11	12	B	12	12	12	10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	8	
23	10	16	25	18	12	14	46	B	Y	13	12	23	32	40	20	17	10	14	B	13	10	10	B	13	
24	10	10	10	10	13	10	10	10	9	10	9	10	12	B	B	B	B	B	B	B	B	9	10	12	
25	13	10	10	18	24	11	10	10	10	17	13	14	16	13	14	12	10	8	10	13	B	21	12	10	
26	10	9	9	9	10	9	10	12	12	10	13	12	14	16	16	13	13	B	12	10	12	12	12	B	
27	10	10	10	9	5	10	16	Y	B	B	25	25	16	15	E C 16	10	12	10	11	B	13	11	12	10	
28	10	9	11	13	14	11	9	10	9	17	10	12	14	13	13	10	11	10	10	C	S	S	S	11	
29	9	S	15	19	18	22	16	14	14	12	27	B	29	21	20	14	25	32	20	30	20	B	17	9	
30	7	11	10	9	11	17	13	15	B	B	B	B	B	B	B	B	B	B	B	B	15	9	8	9	10
31	E C 13	11	20	14	15	20	18	27	33	B	20	18	17	13	19	39	B	B	20	16	B	B	8	10	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	30	31	30	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	28	29	30	30	30	
MED	10	10	13	16	15	14	16	14	14	17	19	23	29	31	26	27	24	17	18	D B 30	19	11	10	10	
UQ	10	16	22	27	26	21	21	29	B	B	B	B	B	B	B	B	B	B	B	B	B	21	12	12	
LQ	10	10	10	10	12	11	10	10	10	10	12	12	14	15	17	14	12	11	12	11	11	9	10	9	

JUL. 1977

F-MIN (0.1 MHz)

IONOSPHERIC DATA

JUL. 1977

M(3000)F2 (0.01)

45° E Mean Time (G. M. T. + 3 h)

Station **SYOWA STATION** Lat. 69 00.4 S, Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	A	A	A	A	A	A	B	B	F	B	F	F	F	F		A	A	A	A
2	A	A	A	A	B	B	A	A	A	F	F	B	F	B	F	F	F	F	F	F	F	A	A	A
3	A	B	B	A	A	A	A	A	F	F	F	F	F	F	F	F	F	F	F	F	Y	A	A	A
4	A	A	F	A	A	A	B	A	A	A	B	B	J	F	F	F	R		F	B	B	A	A	B
5	A	A	A	A	A	A	U	U	A	U	F	F	F	F	F	F	F	F	F	F	F	B	B	A
6	A	A	A	A	A	A	A	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	A	A
7	B	A	A	A	A	A	A	A	A	A	B	B	B	B	F	F	F	F	F	F	F	B	B	B
8	A	F	B	B	B	B	A	B	B	A	B	B	F	F	F	F	B	B	B	B	R	B	B	A
9	A	Y	A	A	B	A	B	B	B	B	U	F	F	F	B	B	B		F	F	B	Y	A	A
10	A	A	B	B	B	B	B	B	B	B	A	F	B	B	F	B	B	B	B	B	B	B	A	A
11	B	B	B	B	B	B	A	B	B	A	A	B	B	B	F	F	F	F	F	F	B	B	B	A
12	A	B	B	B	A	A	B	A	F	F	F	F	F	F	F	F	F	F	F	F	Y	Y	B	A
13	A	A	A	Y	A	A	A	A	B	A	B	F	F	F	F	F	F	F	F	F	F	B	B	A
14	A	A	A	B	B	A	A	B	B	A	F	U	B	B	F	B	R	B	B	B	B	R	A	A
15	A	A	A	A	A	B	B	B	B	A	A	F	B	F	F	B	B	B	B	B	B	A	A	A
16	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	F	A	A	A	A	A	A	A
17	A	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	F	A
18	A	A	B	B	B	B	A	A	B	A	A	F	R	B	B	F	F	B	B	B	A	A	B	A
19	A	A	A	A	A	B	A	A	U	F	A	B	B	B	B	B	R	F	F	F	F	B	A	A
20	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	R	F	F	F	Y	A	A	A
21	A	B	B	B	A	A	B	B	A	B	B	B	B	F	R	F	F	B	F	F	B	B	B	A
22	A	A	A	B	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
23	A	A	B	B	A	A	B	B	Y	A	F	F	F	R	F	F	F	F	F	B	A	A	A	B
24	A	A	A	A	A	A	F	F	F	F	F	F	F	B	B	B	B	B	B	B	B	B	A	A
25	A	A	A	A	B	A	A	F	F	F	F	F	F	F	F	F	F	F	F	F	F	B	B	A
26	A	A	A	F	A	F	F	A	F	F	U	F	F	F	F	F	F	B	F	F	F	A	A	A
27	A	A	A	F	F	F	Y	Y	B	B	F	F	F	F	F	F	F	F	F	F	A	B	A	A
28	A	A	A	A	A	J	F	F	U	F	F	F	F	F	F	F	U	F	F	F	C	S	S	S
29	F	S	R	A	A	A	F	A	F	A	A	B	F	F	F	F	R	F	F	F	B	B	B	A
30	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	A	F	A	A
31	A	A	B	A	A	B	A	B	B	B	Y	F	F	F	F	R	B	B	F	A	B	B	F	F
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		1	1			1	2	5	4	8	12	16	15	14	17	15	16	16	12	5				1
MED		350	275			300	275	300	315	305	320	345	345	345	340	350	340	332	330	335				320
UQ							F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
LQ							295	305	280	310	335	330	335	330	340	340	325	308	315	315				

JUL. 1977

M(3000)F2 (0.01)

IONOSPHERIC DATA

JUL. 1977

H¹F₂ (KM)

45° E Mean Time (G. M. T. + 3 h)

Stations YOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
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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																								
MED																								
UQ																								
LQ																								

JUL. 1977

H¹F₂ (KM)

IONOSPHERIC DATA

JUL. 1977

H'F (KM)

45° E Mean Time (G. M. T. + 3 h)

Stations YOWA STATION Lat. 69 00.4 S, Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	A	A	A	A	A	A	B	B	250	B	230	235	270	220	A	A	A	A	A
2	A	A	A	A	B	B	A	B	A	A	A	B	260	B	230	210	260	250	B	360	B	B	A	A
3	A	B	B	B	A	A	A	A	A	A	300	260	275	225	200	275	250	200	240	250	Y	A	A	A
4	A	A	430	A	A	A	B	A	A	A	B	B	220	250	220	B	B	B	B	B	A	B	B	A
5	A	A	A	A	A	A	A	A	A	A	245	200	205	210	230	245	A	250	285	B	B	A	A	A
6	A	A	A	A	B	A	A	290	Y	300	245	215	220	205	220	210	305	270	290	220	F	A	A	A
7	B	A	A	A	A	A	A	A	A	A	B	B	B	B	E A 280	250	300	250	B	B	B	B	B	A
8	A	255	B	B	B	B	A	B	B	A	B	B	230	270	250	240	B	B	B	R	B	B	A	A
9	A	Y	A	A	B	B	B	B	B	B	E A 270	245	250	B	B	B	B	B	B	B	Y	A	A	A
10	A	A	B	B	B	B	B	B	B	B	A	250	B	295	300	B	B	B	B	B	B	A	A	B
11	B	B	B	B	B	B	A	B	B	A	A	B	B	B	225	B	240	270	B	B	B	B	A	A
12	A	B	B	B	A	A	B	A	280	A	225	200	U H 210	200	200	215	245	225	A	Y	B	A	A	A
13	A	A	A	Y	B	A	A	A	B	A	B	245	210	200	195	250	210	220	270	B	B	A	A	A
14	A	A	A	B	B	A	A	B	B	A	280	275	B	B	B	B	B	B	B	B	R	A	A	U H 250
15	A	A	A	A	A	B	B	B	B	A	A	255	B	255	250	B	B	B	B	B	A	A	A	A
16	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	A	A	A	A	A	A	A
17	A	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	Y
18	A	A	B	B	B	B	B	A	B	A	A	240	A	B	B	245	250	B	B	B	B	A	B	A
19	A	A	A	A	A	B	B	A	A	A	B	B	B	B	B	255	230	250	380	B	A	A	A	A
20	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	H	310	290	Y	A	A	A
21	A	B	B	B	A	A	B	B	A	B	B	B	B	215	275	245	225	B	240	B	B	B	B	A
22	A	A	A	B	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
23	A	B	B	B	A	A	B	B	Y	A	A	240	240	E B 250	270	230	205	250	B	A	A	A	B	A
24	A	A	A	A	A	A	A	320	270	255	240	275	205	B	B	B	B	B	B	B	B	A	A	A
25	A	A	A	A	B	A	A	290	330	325	230	225	225	210	200	205	250	225	200	A	B	B	A	A
26	A	A	A	A	A	325	330	A	A	255	255	210	225	205	200	220	205	B	230	A	A	A	A	B
27	A	A	A	405	430	A	A	Y	B	B	225	270	200	225	U H 195	275	200	240	A	B	A	A	A	A
28	A	A	A	A	A	340	295	320	280	B	225	210	215	225	200	210	195	215	250	C	S	S	S	A
29	250	S	R	A	A	A	A	A	A	A	B	B	280	255	275	A	B	300	300	B	B	B	A	A
30	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A
31	A	A	B	A	A	B	A	B	B	B	Y	220	245	215	230	B	B	B	E A 250	A	B	B	A	330
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1	1	1	1	1	2	2	4	4	5	11	17	17	18	20	17	16	16	13	2				2
MED	250	255	430	405	430	332	312	305	280	300	242	225	225	216	224	230	232	250	250	290				290
UQ								320	305	300	254	245	240	250	235	245	250	270	290					
LQ								290	275	255	228	215	210	205	200	215	205	232	235					

The Radio Research Laboratories, Japan

JUL. 1977

H'F (KM)

IONOSPHERIC DATA

JUL. 1977

H^oES (KM)

45° E Mean Time (G. M. T. + 3 h)

Stations SYOWA STATION Lat. 69° 00.4' S. Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	105 ^K	125 ^K	115	100	B	125	100	100	95	100	100	B	B	B	B	B	R	160	125 ^K	140 ^K	110 ^K	145 ^K	105 ^K	105	
2	100	100 ^K	100	105	B	125	100	100	100	105	115	B	B	B	115 ^K	125	110 ^K	135 ^K	B	90	150 ^B	105	105	100	
3	100 ^K	110	100	110	100	100	100 ^K	105 ^K	130 ^K	150	100	100	145	105	B	160	100	130	160 ^K	Y	125 ^K	140 ^K	150 ^K	105 ^K	
4	110 ^K	110 ^K	110 ^K	125 ^K	110 ^K	140 ^K	100	100	100	100	B	B	140	B	B	B	R	B	125	120	125	110	B	150 ^K	
5	110 ^K	105 ^K	100 ^K	100	100	105 ^K	115 ^K	115 ^K	100	105	140	100	100	105	B	105	150	150 ^K	110 ^K	B	B	150	110	100	
6	120 ^K	145 ^K	100 ^K	100 ^K	100	100	110	100 ^K	95 ^K	155	140	95	100	100	105	115	125	150	110 ^K	110 ^K	95 ^K	95	105	105	
7	110	105	100 ^K	125	100	100	100	100	100	100	B	B	B	B	170	110 ^K	R	B	B	B	B	B	B	130 ^K	
8	105 ^K	120 ^K	100	100	B	105	105	B	100	100	B	B	B	G	B	B	R	B	B	155 ^K	B	B	120 ^K	155 ^K	
9	140 ^K	140	105	100	100	115	B	B	100	B	110	130	110	B	B	B	R	B	B	B	Y	150 ^K	140 ^K	110 ^K	
10	120	105	B	B	B	B	100	B	B	B	105	120 ^K	B	B	B	B	R	B	B	B	B	100 ^K	100	115	
11	110	100	B	100	100	105	100	B	B	100	100	B	B	B	B	B	140	B	B	B	B	B	150 ^K	110 ^K	
12	115 ^K	150	B	B	105 ^K	100	110	100 ^K	115 ^K	110	110	105	100	G	130	125 ^K	125 ^K	115	125	120	B	105	110	130 ^K	
13	125 ^K	120 ^K	125 ^K	Y	100	105	100	105	105	95	B	140	B	B	B	100	100	100	110 ^K	B	B	195 ^K	100 ^K	100 ^K	
14	115	135 ^K	110	B	100	100	145 ^K	100	B	100	105 ^K	105	B	B	B	B	R	B	B	B	B	130 ^K	145 ^K	125 ^K	
15	105 ^K	100 ^K	105 ^K	100	95	100	130	B	B	100	100	110	B	B	B	B	R	B	B	B	B	100	130 ^K	110	
16	180 ^K	105	95	100 ^K	125	100	100	100	100	105	B	B	B	B	B	B	R	115	125 ^K	100	150 ^K	100 ^K	100 ^K	125 ^K	
17	130	130	B	B	95	100	100	100	105	B	B	B	B	B	B	B	R	B	B	B	B	110 ^K	105 ^K	Y	
18	100	100	130	115	B	100	100	100	B	130 ^K	105	105	110	B	B	B	R	B	B	B	B	120	155 ^K	170	105
19	100 ^K	110 ^K	110 ^K	110 ^K	130 ^K	115	100	100 ^K	100	115	B	B	B	B	B	B	R	95	120 ^K	B	120	110 ^K	110 ^K	110 ^K	
20	100	100	100	100	B	100	105	B	B	B	B	B	B	B	B	B	R	110 ^K	150 ^K	Y	105 ^K	105	100	105	
21	100	100	110	105	100	120 ^K	B	100	105	B	B	B	B	B	B	B	R	B	B	B	B	B	B	100	
22	100	140 ^K	110	B	100	105	110	110	B	B	B	B	B	B	B	B	R	B	B	B	B	B	150 ^K	105	
23	110 ^K	100	100	100	100	100	150 ^B	B	Y	100	100	B	B	B	120	110	110	110 ^K	B	100	100	100	B	140 ^K	
24	120	110 ^K	105	105 ^K	105	105	100	100	125	130	150	130	105	B	B	B	R	B	B	B	B	195 ^K	100 ^K	100	
25	100	100	140 ^K	100	100	100	100	100 ^K	100	B	100	G	140	G	125	G	155	125	125	105	B	100	145 ^K	100	
26	125 ^K	110	110	135	120	105 ^K	150 ^K	110	110	120	125	110	G	G	G	G	R	B	120	100	105	100	100	B	
27	100	95	170 ^K	120 ^K	95 ^K	95	175	Y	B	B	B	B	125	120	120	120	100	100	100	B	95	105	100	140	
28	115	110	125	120	100	100 ^K	120 ^K	120 ^K	95	125	110	130	130	120	125	100	95	105	105	C	S	S	S	100	
29	140	S	115 ^K	120 ^K	100	100	100 ^K	115	110	100	100	B	B	G	180	100	120	B	130 ^K	150	115	B	110 ^K	125 ^K	
30	100 ^K	110 ^K	100 ^K	100	100	95	105	110	B	B	B	B	B	B	B	B	R	B	B	B	120	125 ^K	150 ^K	110 ^K	105 ^K
31	145 ^K	115 ^K	115	110	115 ^K	100	100	100	100	B	100	125	105 ^K	100	150 ^E	B	B	B	100	100	B	B	105 ^K	130 ^K	
CNT	31	30	27	25	25	30	29	23	21	21	19	14	12	6	10	11	12	14	16	13	15	23	26	29	
MED	110 ^K	110	110	105	100	100	100	100	100	105	105	110	110	105	121	110	115	115 ^K	122 ^K	110	115	110 ^K	110 ^K	110 ^K	
UQ	120 ^K	120 ^K	115	115	105	105	110	108	105	120	112	130	135	120	128	122	132	135	125 ^K	120	125	148 ^K	140 ^K	125 ^K	
LQ	100	100	100	100	100	100	100	100	100	100	100	105	102	100	120	102	100	105 ^K	110	100	102	102	100	105	

JUL. 1977

H^oES (KM)

IONOSPHERIC DATA

JUL. 1977

TYPES OF ES

45° E Mean Time (G. M. T. + 3 h)

Station **SYOWA STATION** Lat. **69 00.4 S**, Long. **39 35.4 E** Sweep **0.5 MHz to 15 MHz** in **30 sec** in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	K6	KA11	R2	R1		R1	R3	R5	R1	R2	R1							AK11	CK11	HK11	KA41	HK13	K6	K7	
2	R3	KS31	R4	R5		R1	R3	R2	R1	R1	C1				RK11	C1	CHK11	HK11		F1	RA11	RA11	RA41	R2	
3	KA11	R1	F1	R1	R2	R2	K3	K3	HK11	HR11	L1	L1	H1	L1		H1	FH11	R1	K1		K1	K1	RKA11	RK11	
4	K6	RKS17	RK31	CK43	CK61	HK15	R1	R2	R3	R3			HR11						F1	F1	F1	F1		HK11	
5	CHK11	K5	CK11	R2	R2	K2	RK11	CK31	FA41	C3	R1	L1	C1	C1		C1	FF11	HCK11	RK21			R1	RA61	RA21	
6	RK11	HK12	K2	RLK11	R1	R3	RA11	LHK11	LK11	HC11	H1	C1	C3	C1	L1	CC12	RL21	RA11	CK31	CK11	LHK11	FR11	RA11	R4	
7	RS11	R3	K5	F6	R2	R1	R2	RS31	R1	R1					R1	RK11	K1							HK11	
8	K6	RK26	F1	F1		RS11	R1		F1	R1										K1			K2	HK11	
9	RK16	A1	R2	R1	F1	FS11			R1		R1	H1	C1									RKA11	KA11	KA71	
10	R2	R2					R1				R1	K1										KS71	RS51	R1	
11	R2	F1		F1	R1	R2	R2			R1	R2							F1					RA11	CK14	
12	CK33	R1			RK11	R1	F1	LHK11	RK11	C1	R1	C1	L1		C1	K1	HK11	F1	F1	F1		F1	F1	HK11	
13	CK31	CK11	CRK11		R1	R2	R3	R3	R1	R1		HC11			L1		C1	CK11	CHK11			HK11	LK11	K4	
14	FR11	CK23	R3		R1	RS11	HK11	RA11		LC11	RK11	C2									K1	HK11	HK11	RK12	
15	RK14	K5	RK13	R1	R1	F1	RR11			R1	R1	C1									FF11	RK11	F2	R3	
16	AK11	R4	R2	RRK31	RR11	RA21	RA31	R1	R3	LR11								K2	K2	RS31	K1	K6	K3	RK11	
17	RR11	F1			F1	F1	R2	R2	R1													CK13	K3		
18	R5	R1	R1	R1		R1	R1	R1		HK11	C1	R1	R1								F1	HK11	A1	RA11	
19	KS11	K6	K4	CK31	RK13	R1	R1	RK22	CH11	C1								LK11	RK11		R1	KS51	R5	RKS77	
20	R3	R1	RS21	RA11		R1	RR11											RK11	HK11		K4	RS41	RA51	RA11	
21	RA31	RA11	FR11	F1	RA21	RAK41		F1	RLA11															R2	
22	R2	HK12	R2		R2	R2	R2	R3															RKA11	RA31	
23	RK16	R1	F1	R1	R2	R2	R1			R1	R2				C1	C1	C1	CK11		F1	F1	F1		HK11	
24	F1	CKA42	R4	K4	R3	R4	R3	R1	R1	HR11	RC11	HC11	CH11									HK11	K6	RS11	
25	R1	R3	RK14	R2	F1	R2	R3	LRK11	LC11		R1		H1		C1		R1	RF11	F1	F1		F1	HK11	F3	
26	CK21	RS41	RA31	HK11	F3	CK11	RK11	RA11	R1	RLA11	C1	C1							F1	F1	F1	F1	F1		
27	F2	F1	HA11	CK11	LK11	F1	F1						C1	C1	C1	CL11	C1	F3	F2		F1	RR11	F1	F1	
28	R1	R1	RA11	R1	R1	RAK11	RLK11	RK11	L1	A1	CH11	H1	C1	C1	C1	L1	L1	F1	R1					F1	
29	FF11		K2	CAK11	R1	F1	RK11	R3	C1	RA21	R1		K1		H1	L1	R1		CK11	F1	R1	K1	CK14		
30	K4	CK44	K4	R4	RS21	F1	R1	RA11													R1	CKA12	HK15	KA51	K4
31	HKS16	RKS44	R1	R2	RK31	R1	F1	R1	L1		L1	C1	K1	LC11	HC11					F1	F1		LRK11	RK11	
	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																									
MED																									
UQ																									
LQ																									

The Radio Research Laboratories, Japan

JUL. 1977

TYPES OF ES

IONOSPHERIC DATA

AUG. 1977
FXI (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations Y J W A STATION Lat. 69 00 4 S Long. 39 35 4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	76	A	A	A	A	O R 36	O R 42	B	O R 52	B	O R 56	58	60	65	O R 41	B	B	B	A	A	
2	A	A	A	A	A	A	A	A	32	34	42	48	52	52	55	55	52	50	39	20	A	A	O R 18	O R 18	
3	R	A	A	A	A	A	A	O R 36	A	42	46	53	68	69	62	53	46	32	31	A	O R 19	A	A	B	
4	A	A	A	A	A	A	A	A	A	43	43	45	45	X 50	50	50	45	50	41	26	A	O R 18	80	70	
5	A	A	A		72	A	A	A	A	B	B		B	B	B		O R 42	46		A	A	A	A	A	
6	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O R 38	32	33	B	A		41	A	
7	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O R 35		B	A	O R 26	R	A	
8	A	A	A	B	A	B	A	A	B	B	B	B	O R 49	O R 52	O R 56	50	O R 44	O R 41	39	26	O R 18	A	A	A	
9	S	A	C	B	B	B	A	A	B	R	B	B		52	62	B	B	B	40	R		54	A	A	A
10	B	A	B	A	B	A	Y	Y	B	B	A	O R 41	O R 47	B	B	O R 54	O R 51	B	B	B	B	A	A	A	
11	O R 31	A	B	B	B	A	Y	A	A	B	B	B	B	B	B	B	O R 40	O R 41	B	B	B	B	A	A	
12	A	A	A	A	A	A	A	A	B	A	X 41	B	O R 52	B	B	B	B	B	O R 39	B	B	A	Y	A	
13	A	A	B	B	B	Y	B	B	A	B	B	B			63	B	B	B	B	B	A	A	A	A	
14	A	A	A	A	A	A		28	27	29	X 37	X 43	O R 47	X 57	O R 57	X 58	X 58	69	B	B	B	B	A	A	A
15	A	A	A	A	A	B	A	A	B	B	O R 39	B	B	B	B	B	B	B	40	B	B	A	A	A	
16	A	A	A	A	A	A	A	O R 25	B	O R 45	50	5R	X 64	75	X 64	65	70	A	B	B	Y	A	A	A	
17	A	A	A	C	B	A	A	A	A	45	R	B	B	B	B	B	111	65	A	A	A	A	A	A	
18	A	A	B	A	B	B	B	A	B	B	B	B	O R 51	55	55	58	55	52	O R 37	B	O R 26	A	A	53	
19	A	A	A	A	U A 55	B	B	B	B	B		45	54	O R 52	B	B	B	B	R	B	B	A	A	A	
20	A	A	A	B	A	A	A	A		32	39	O R 47	B	B	B	B	B	B	O R 36	O R 33	O R 26	B	O R 17	A	
21	A	A	A	A	B	34	39	39	36	45	B	B	61	62	B	68	65	47	40	30	26	25	21	18	
22	A	A	A	A	30	29	A	45	50	49	B	B	75	71	O R 56	B	65	O R 48	38	31	O R 27	O R 22	A	A	
23	A	A	A	A	A	A	A	A	40	X 48	O R 48	O R 56	57	58	O R 64	65	56	46	42	44	32	A	A	A	
24	A	A	A	A	A	A	A	A	A	A	46	50	O R 50	X 52	57	B	B	O R 63	59	47	29	A	A	A	
25	A	A	A	A	32	36	37	45	39	43	B	B	60	O R 58	69	O R 71	B	B	45	A	A	A	A	A	
26	A	A	A	B	A	A	A	A	B	B	B	50	O R 56	O R 59	B	64	B	86	61	31	37	A	A	A	
27	A	A	A	A	A	A	A	B	A	B	B	B	O R 58	B	B	O R 55	B	B	42	49	35	A	A	A	
28	B	A	A	A	A	A	A	A	Y	B	B		55	60	61	62	65	O R 56	O R 44	O R 43	O R 33	B	A	A	A
29	A	A	A	A	B	A	A	O R 35	A	O R 50	X 52	65	62	68	62	67		R	B	B	R	B	B	Y	A
30	A	A	A	A	A	A	A	O R 36	42	46	52	B	68	70	69	66	70	69	70	46	A	A	A	A	
31	A	A	A	A	A	A	A	S	43	X 45	52	O R 51	63	63	60	C	60	51	47	39	30	O R 23	O R 21	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	1			1	4	3	3	9	9	15	15	14	22	18	18	19	18	18	22	14	12	5	6	4	
MED	O R 31			72	44	34	37	36	39	45	46	50	57	58	61	58	56	49	40	33	28	O R 23	21	36	
UQ					56	35	38	45	42	46	49	55	62	68	63	66	65	63	43	44	34	O R 25	41	62	
LQ					31	32	32	O R 35	32	40	42	48	O R 52	52	56	54	O R 46	O R 44	38	30	O R 26	O R 22	O R 18	18	

AUG. 1977
FXI (0.1 MHz)

IONOSPHERIC DATA

AUG. 1977

F2F2 (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations γ DWA STATION Lat. 69° 00' 4" S Long. 39° 35' 4" E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

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

AUG. 1977

F2F2 (0.1 MHz)

IONOSPHERIC DATA

AUG. 1977

FJF1 (0.01 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations YJWA STATION Lat. 69 00 .4 S Long. 39 35 .4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
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15																								
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																								
24													L	L										
25													L		320									
26																								
27													L											
28													L	L	300									
29												L	L											
30																								
31											L		L											
	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									
MED															310									
UQ																								
LQ																								

AUG. 1977

FJF1 (0.01 MHz)

IONOSPHERIC DATA

AUG. 1977

FJE (0.01 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations **YOWA STATION** Lat. 69 00.4 S Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
1	340							B	B	U K 205	B	B	B	B	B	B	B	U K 170												
2	225	290	350					J K 310	A	U A 120	140	160	F 165	160	A	U K 200	A	B			U K 120									
3	U K 190	150						125	A	150	195	A 150	155	160	A	150								K 110						
4								B	B	U K 210	U F 160	150	U A 150	150	165	160	U A 130	B	U K 120	U K 140	120	K 110	U K 340							
5		400	330					370	A	B	B	215	B	B	B	B	B	A				U K 300								
6		360						B	B	B	B	B	B	B	B	B	B	B			U K 110			U K 225						
7								B	B	B	B	B	B	B	B	B	B	B						K 150	K 190	K 350				
8	K 360				K 320			B	B	B	B	B	B	B	B	B	B	B							K 160	K 270	K 250			
9	K 280							A	B	K 320	B	B	B	B	B	B	B	B									K 250			
10								Y	B	B	B	B	B	B	B	B	B	B								K 350	K 350			
11		J K 380						B	A	B	B	B	B	B	B	B	B	B								K 150	K 270			
12								B	B	B	185	A	B	B	B	B	B	B									K 150	K 220		
13		K 320	K 310					B	B	B	B	B	B	B	B	B	B	B									K 155	K 170		
14	K 320				K 310	U K 170	K 150	U A 120	125	140	180	195		B	B	B	170	B	B							K 140	J K 340			
15	U K 355	K 340						A	B	B	B	B	B	B	B	B	B	B									K 140	K 205	U K 230	
16	J K 310	K 340			K 290	K 320	K 220	A	B	U K 260	B	U F 200	190	U A 200	U A 200	U R 170	U R 130	B				K 160	K 210	K 105	K 180			U K 180		
17	K 350	J K 340	J K 390					B	B	A 170	B	B	B	B	B	B	B	B	J K 350	K 290							K 160	K 200		
18		U K 155			J K 300			B	B	B	B	B	B	A	190	250											J K 300	K 250		
19	290	U K 350			U K 230			B	B	B	B	B	U R 200	B	B	B	B	B	B								U K 250	K 350		
20										K 170	F 140	Y 180	B	B	B	B	B	B	B								K 145	K 150		
21								A	U A 115	U A 110	120	A	B	B	B	B	B	B	B	B	K 90	U K 100	U K 70	U K 100	U K 100			U K 100		
22	K 120	K 320		U K 320	K 165	U K 160	A	U K 270	A	A	B	B	B	B	B	B	B	B	B	U K 150	K 105	125	U K 140	U K 105	U K 100			K 100		
23	K 240	K 110	K 330			K 300	K 240	A	K 230	K 240	210	B	B	B	B	160	160	A	B	A	K 105	U K 100						K 100		
24		330	K 420	445				B	B	B	B	250	210	H	B	220	195	B	B	B	320					K 95	K 400	J K 270	K 220	
25	J K 270	J K 290	K 300	U K 250	U K 200	U K 140		A	A	120	F 150	B	B	B	B	210	B	B	B	A									K 250	
26			280					U K 270	B	B	B	B	B	B	B	B	250	B	B	B	U K 150						K 190	K 350	J K 340	
27	K 280	K 320	U K 250	U K 110	K 300			B	B	B	B	B	B	B	B	B	B	B	B									U K 325		
28								A	A	A	B	B	A	255	210	200	200	185	B	B	B							K 185	K 290	K 370
29	U K 170	K 300	K 310					B	U K 215	A	B	B	B	230	U B 230	230	B	B	B	B								K 120	K 120	
30	U K 190	K 235						A	A	160	155	B	B	B	H 220	210	225	R	B	B	B							U K 190	K 180	J K 300
31								B	A	U B 150	150	185	B	F 220	220	230	C	A	A	A								U K 95		
	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	18	9	5	8	5	5	8	7	13	8	9	7	9	9	10	3	1	4	7	9	14	21	20						
MED	240	K 320	330	U K 320	295	U K 170	220	K 192	140	170	185	200	190	200	200	178	U A 130	U K 170	235	K 110	120	K 172	180	K 240						
UQ	320	K 340	350	K 330	305	K 300	240	K 290	155	K 210	202	210	215	220	210	225	145	A	335	K 145	145	K 210	270	K 340						
LQ	225	290	300	U K 250	215	U K 160	150	K 122	122	150	170	160	160	160	195	160	U 130		U K 135	K 105	U K 100	K 140	K 120	K 175						

The Radio Research Laboratories, Japan

AUG. 1977

FJE (0.01 MHz)

IONOSPHERIC DATA

AUG. 1977

FJES (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION		Lat. 69° 00' 45" S		Long. 39° 35' 45" E		Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation																			
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		K 34	45	J 42	J 45	54	J 52	44	J 39	26	24	E 23	B	E 29	B	E 34	E 24	J 25	21	E 23	B	B	B	23	22
2		29	K 29	J 44	J 44	J 49	J 47	52	J 31	20	19	J 24	20	24	J 32	J 36	J 62	J 99	J 39	24	J 24	J 24	J 25	30	28
3		24	38	36	48	50	J 47	47	J 30	40	20	20	20	21	J 38	28	24	21	20	J 32	30	E 10	J 31	J 34	J 56
4		52	60	J 64	71	J 100	46	J 70	J 64	46	J 31	29	22	22	25	G	29	16	J 26	22	J 21	17	J 24	J 34	J 40
5		J 51	K 40	K 33	J 37	J 79	J 62	J 51	K 37	56	B	B	30	B	B	B	E 32	F 24	30	J 45	J 44	J 30	J 38	J 74	J 46
6		J 74	K 36	B	B	B	44	B	B	B	B	B	B	B	B	B	B	B	E 15	E 12	54	B	J 39	J 34	J 38
7		J 62	70	33	B	B	31	B	B	B	B	B	B	B	B	B	B	B	B	E 23	B	J 34	J 21	K 19	K 35
8		K 56	J 59	J 60	B	K 52	B	J 32	J 32	B	B	B	B	E 30	F 28	E 34	E 25	F 19	F 23	E 16	E 10	J 29	19	K 27	K 25
9		28	J 58	C	49	B	B	36	J 29	B	K 32	B	B	B	E 30	E 30	B	B	B	E 13	E 20	J 36	J 40	25	J 40
10		J 52	J 52	49	K 33	B	46	Y	Y	B	B	B	35	31	E 27	B	B	E 31	E 39	B	B	B	J 39	K 35	K 35
11		J 53	J 38	52	B	43	51	Y	48	49	B	B	B	B	B	B	B	E 22	F 23	B	B	B	B	J 39	K 27
12		J 53	J 68	42	J 41	J 40	J 64	J 47	J 63	B	38	25	B	E 34	B	B	B	B	B	F 28	B	B	28	15	K 22
13		K 52	K 31	43	J 43	44	Y	B	B	33	B	B	B	B	B	E 30	B	B	B	B	B	15	19	25	J 27
14		K 52	J 47	46	43	K 51	19	K 15	13	16	G	G	G	E 21	E 25	E 24	G	E 34	B	B	B	B	20	J 36	J 34
15		J 44	K 34	J 44	J 51	J 40	49	41	60	B	B	B	B	B	B	B	B	B	B	E 28	B	B	19	28	J 30
16		J 31	K 34	J 44	J 27	K 29	K 32	J 38	33	B	24	24	21	J 25	22	28	J 29	G	38	B	B	K 16	K 21	J 22	J 32
17		K 35	J 34	J 39	C	56	J 50	J 53	39	47	28	E 35	B	B	B	B	B	Y	E 21	J 35	K 29	J 33	J 39	26	47
18		J 57	J 60	B	J 48	105	30	58	J 60	B	B	B	B	E 36	27	G	K 25	E 18	E 24	E 18	B	E 10	28	J 30	K 25
19		K 29	J 50	J 46	40	35	B	B	B	B	B	E 23	G	E 39	B	B	B	B	B	E 37	B	B	U 25	30	K 35
20		J 39	J 37	J 39	B	J 46	J 49	32	24	19	G	E 34	B	B	B	B	E 23	B	B	E 22	E 16	K 14	B	E 10	J 25
21		J 32	J 29	J 34	J 36	39	J 38	20	16	13	20	B	B	E 29	E 25	B	E 27	E 19	E 16	E 20	70	J 52	J 24	17	J 33
22		23	K 32	J 42	J 40	J 21	J 98	50	70	20	J 45	B	B	39	40	E 36	B	E 30	E 27	J 25	J 25	18	19	19	J 24
23		29	J 34	70	J 40	J 41	K 30	K 24	J 29	23	24	25	E 26	25	E 25	25	J 64	J 49	17	19	11	70	J 33	J 41	70
24		J 59	40	47	49	50	J 54	60	J 61	J 61	53	50	27	E 24	G	22	B	B	E 26	K 32	J 37	J 33	K 40	J 27	J 34
25		J 51	J 36	K 30	J 33	K 20	20	J 19	14	17	19	B	B	27	E 45	27	E 47	B	B	J 37	70	J 45	40	J 51	J 110
26		J 48	J 40	K 28	44	50	J 54	34	50	B	B	B	24	E 36	E 47	B	30	B	E 36	E 20	20	21	J 46	K 35	K 34
27		J 56	J 62	47	J 53	J 38	46	46	B	62	B	B	B	E 28	B	B	E 45	B	B	E 22	E 15	Y	U 32	J 34	43
28		B	J 79	J 84	J 40	J 46	J 42	J 36	J 36	26	B	B	29	G	G	G	J 24	E 29	E 33	E 20	19	B	24	29	K 37
29		J 37	37	K 31	41	50	J 36	J 35	27	44	E 42	E 31	E 26	G	G	G	E 35	E 39	B	B	E 25	B	B	K 12	27
30		25	K 23	J 25	22	40	J 43	J 41	31	21	G	E 23	B	E 28	26	24	G	E 23	E 22	E 15	E 13	J 37	25	J 24	J 30
31		J 34	J 47	46	J 36	J 51	J 59	J 56	J 49	G	G	G	E 23	G	G	21	C	J 36	27	20	30	J 27	J 26	30	J 29
		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	28	25	27	27	25	25	20	18	17	14	22	18	18	19	18	19	25	20	20	27	31	31
MED		J 54	J 40	44	J 41	46	J 46	41	36	26	23	U 22	U 22	E 27	E 26	E 26	E 29	E 24	E 24	E 22	23	J 28	26	29	J 34
UQ		J 48	J 55	47	J 48	52	J 53	51	50	46	32	28	27	E 30	U 32	E 30	U 32	E 36	27	U 26	34	J 35	J 38	J 34	J 39
LQ		31	K 34	35	J 37	40	37	34	29	20	19	23	20	E 22	E 22	E 21	E 24	E 19	E 21	E 20	E 18	16	22	24	27

AUG. 1977

FJES (0.1 MHz)

IONOSPHERIC DATA

AUG. 1977

FBES (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations YOWA STATION Lat. 69 00 4 S Long. 39 35 4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	K34	A45	A42	A45	B	A52	A44	A39	A26	U20	E23	B	E29	R	E34	E24	17	U17	E23	B	R	R	A23	A22
2	A29	A29	K44	A44	A49	A47	A52	J31	14	G	13	G	19	20	22	U20	20	E18	14	14	A24	A25	E11	12
3	17	A38	A36	A48	50	47	47	22	40	18	G	17	20	22	20	14	13	12	14	30	10	31	34	B
4	A52	A60	A64	A71	A35	A46	A50	A54	A46	U21	G	20	20	20	G	G	G	12	U12	U14	A17	11	K34	A40
5	A51	40	K33	A37	A79	A62	A51	K37	A56	B	B	22	B	B	B	E32	E24	17	A45	A44	J30	A38	A74	A46
6	A74	36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E15	E12	U11	R	A39	U22	A38
7	A62	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E23	B	A34	12	19	K35
8	K36	A59	A60	B	K32	B	A32	A32	B	B	B	B	E30	E28	E34	E23	E19	E23	E16	E10	E11	A19	K27	K25
9	K28	A58	C	B	B	B	A36	A29	B	K32	B	B	B	E30	E30	B	B	B	E13	E20	A36	A40	A25	A40
10	B	A52	B	K33	B	A46	Y	Y	B	B	A35	31	E27	B	B	E31	E39	B	B	B	B	A39	K35	K35
11	23	J38	B	B	B	B	Y	A48	A49	B	B	B	B	B	B	B	E22	E23	B	B	R	R	A39	K29
12	A29	A68	A42	A41	A40	A44	A47	A53	B	A58	22	B	E34	B	B	B	B	B	E28	B	B	B	K15	K22
13	K32	K31	B	B	B	Y	B	B	A33	B	B	B	B	E30	B	B	B	B	B	B	A15	A19	A25	A27
14	K32	A28	A46	A43	31	A19	K15	G	11	G	G	G	E21	E25	E24	G	E34	B	B	B	H	A20	A36	J34
15	A44	K34	A44	A51	A40	B	A41	A50	B	B	24	B	B	B	B	B	R	R	E28	B	R	A19	K20	A30
16	J31	K34	A44	A27	29	K32	A38	17	B	U24	24	G	22	21	20	G	G	A38	B	B	K16	K22	A32	
17	K35	J34	J39	C	B	A50	A53	B	A47	G	E33	B	B	B	B	B	Y	E21	J35	K29	A33	A39	A26	A47
18	A57	A60	B	A48	B	B	B	A50	B	B	B	B	E36	24	G	K25	E18	E24	E18	B	E10	A28	30	25
19	K29	A50	A46	A40	U23	B	B	B	B	B	E23	G	E39	B	B	B	B	B	E37	B	B	U25	A30	K35
20	A39	A37	A39	B	A46	A49	A32	A24	17	G	E34	B	B	B	B	E23	B	B	E22	E16	K14	R	E10	A25
21	A32	A29	A34	A36	B	22	G	G	G	19	B	B	E29	E25	B	E27	E19	E16	E20	K9	U10	16	U10	U10
22	A23	K32	A42	A40	15	U16	A50	U27	19	21	B	B	31	24	E36	B	E30	E27	16	16	K12	U14	A19	A24
23	A29	A34	A39	A40	A41	A30	K24	A29	23	K24	23	E26	25	E25	25	22	G	15	10	10	K10	A33	37	70
24	A39	A40	A47	A49	A50	A54	A60	A51	A61	A53	G	19	E24	G	G	B	B	E26	K32	A37	U20	40	J27	A34
25	A31	A36	K30	A33	K20	J14	15	12	G	18	B	B	U27	E45	G	E47	B	B	U28	A46	A45	A40	A51	A110
26	A48	A40	K28	B	A50	A54	A34	A50	B	B	B	24	E36	E47	B	16	B	E36	E20	15	U10	A46	35	J34
27	A36	A62	A47	A53	A35	A46	A46	B	A62	B	B	B	E28	B	B	E45	B	B	E22	E13	Y	U32	A34	A43
28	B	A79	A84	A40	A46	A42	A36	A36	E26	B	B	G	G	G	G	18	E29	E33	E20	E19	B	U9	K29	K37
29	A57	A37	K31	A41	B	A36	A35	24	A44	E42	E31	E26	G	G	G	E35	E39	B	B	E25	B	B	12	A27
30	A25	A25	A25	A22	A40	A43	A41	27	G	G	E23	B	E28	24	23	G	E23	E22	E15	E13	A37	A25	A24	J30
31	A34	A47	A46	A36	A51	A59	A56	29	G	G	G	E23	G	G	21	C	20	14	11	12	15	10	U9	A29
	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	24	22	20	22	24	24	20	18	17	14	22	18	18	19	18	19	25	20	20	26	31	30
MED	A34	A38	A42	A40	A40	A46	A41	A30	26	19	E23	E20	E27	E24	E22	E23	E20	E21	E20	14	16	A25	26	A33
UQ	A39	A52	A46	A48	A50	A50	A50	A49	A46	24	E24	22	E30	E28	E30	E29	E29	E25	E28	27	A32	A39	A34	A38
LQ	A29	K34	A35	A36	32	A32	A33	24	12	G	G	G	E20	20	G	14	E17	U14	E14	11	10	19	20	A25

The Radio Research Laboratories, Japan

AUG. 1977

FBES (0.1 MHz)

IONOSPHERIC DATA

AJG. 1977

F-MIN (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations		YQWA STATION			Lat. 69 00 .4 S				Long. 39 35 .4 E				Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation														
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		9	12	12	11	34	12	13	11	11	6	23	B	29	B	34	24	16	17	23	B	B	B	11	11		
2		9	6	10	13	13	16	12	11	10	10	11	12	12	12	13	12	13	18	11	11	12	12	11	11		
3		11	10	10	10	16	12	10	12	11	13	12	10	11	14	13	12	11	10	E C	12	11	10	10	6	15	
4		7	10	7	6	10	11	11	14	12	10	11	11	12	12	15	11	11	11	E C	12	10	8	9	10		
5		11	11	18	11	16	18	12	11	12	B	B	20	B	B	B	32	24	10	10	10	10	7	10	12		
6		12	7	B	B	B	25	B	B	B	B	B	B	B	B	B	B	B	15	12	11	B	10	10	17		
7		11	15	27	B	B	25	B	B	B	B	B	B	B	B	B	B	B	B	23	B	E C	9	11	9		
8		9	7	11	B	21	B	14	11	B	B	B	B	30	28	34	23	19	23	16	10	11	11	11	11		
9		10	11	C	36	B	B	15	11	B	28	B	B	B	30	30	B	B	B	13	20	8	8	7	10		
10		17	12	29	10	B	11	Y	Y	B	B	25	25	27	B	B	31	39	B	B	B	B	8	7	7		
11		10	10	23	B	35	23	Y	21	13	B	B	B	B	B	B	B	22	23	B	B	B	B	11	8		
12		8	12	17	E C	13	12	10	20	B	26	18	B	34	B	B	B	B	B	28	B	B	18	11	8		
13		7	8	31	19	26	Y	B	B	21	B	B	B	B	B	B	B	B	B	B	B	10	10	10	8		
14		8	10	14	14	13	11	9	10	8	12	16	17	21	25	24	16	34	B	B	B	B	8	8	9		
15		10	10	9	9	10	26	10	11	B	B	22	B	B	B	B	B	B	B	28	B	B	11	10	6		
16		9	9	10	10	12	13	9	10	B	22	17	17	17	18	19	10	13	30	B	B	10	8	E C	6		
17		8	8	10	C	23	14	12	24	18	13	33	B	B	B	B	B	Y	21	8	10	8	7	7	8		
18		15	6	B	11	25	21	34	17	B	B	B	B	36	20	15	19	18	24	18	B	10	7	5	8		
19	E C	9	21	14	17	13	B	B	B	B	B	23	19	39	B	B	B	B	B	37	B	B	5	5	10		
20		11	11	E C	11	16	17	13	13	11	16	34	B	B	B	B	23	B	B	22	16	10	B	10	7		
21		5	E C	10	10	22	11	10	10	9	11	B	B	29	25	B	27	19	16	20	8	8	7	7	8		
22		10	10	9	10	8	E C	15	11	10	10	16	B	B	25	23	36	30	27	13	10	10	10	10	5		
23		10	10	15	11	11	15	11	10	15	19	20	26	22	25	20	15	15	14	9	10	5	7	10	10		
24		9	13	19	23	19	22	21	20	20	27	20	16	24	20	18	B	B	26	24	E C	10	6	11	10	8	
25		8	7	6	8	10	8	8	8	10	12	B	B	25	45	17	47	B	B	8	Y	12	5	7	8		
26		12	15	5	29	13	15	15	16	B	B	B	23	36	47	B	10	B	36	20	8	7	6	7	8		
27		5	9	6	7	20	14	22	B	20	B	B	B	28	B	B	45	B	B	22	13	Y	6	10	13		
28		B	10	8	13	14	11	10	13	16	B	B	21	20	15	14	12	29	33	20	19	B	7	10	6		
29		8	8	8	11	20	11	13	10	12	42	31	26	20	23	22	35	39	B	B	25	B	B	9	11		
30		12	9	10	6	11	12	8	11	12	15	23	B	28	19	18	20	23	22	15	13	8	6	8	7		
31		9	10	11	11	15	12	17	10	10	15	17	23	16	15	17	C	13	11	10	10	8	6	7	7		
		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	30	30	31	30	29	30	31	31	31	31	31	31	31	31	30	30	31	31	31	30	31	31	31	
MED		9	10	11	12	16	14	12	12	16	27	33	B	29	30	34	32	32	27	20	13	10	8	10	8		
UQ		11	11	18	23	24	22	17	20	B	B	B	B	B	B	B	B	B	B	28	B	B	11	10	10		
LQ		8	8	9	10	13	12	10	10	11	14	20	20	22	20	18	16	18	18	12	10	8	7	7	8		

AJG. 1977

F-MIN (0.1 MHz)

IONOSPHERIC DATA

AUG. 1977

M(3000)F2 (0.01)

45° E Mean Time (G. M. T. + 3 h)

Stations YJWA STATION Lat. 69 00 4 S Long. 39 35 4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
1	A	A	A	A	B	A	A	A	A	U	F	B	B	B	U	F	J	F	F	U	R	B	B	B	A	A						
2	A	A	A	A	A	A	A	A	A	315	F	310	F	335	355	E	365	355	F	F	F	F	A	A	335	365	R					
3	R	A	A	A	A	A	A	A	A	F	A	F	U	F	F	F	F	U	F	F	U	F	A	F	A	A	B					
4	A	A	A	A	A	A	A	A	A	A	F	330	F	335	350	F	340	F	360	F	330	335	F	350	390	A	335	A	A			
5	A	A	A	A	A	A	A	A	A	A	B	B	F	B	B	B	F	F	290	290	A	A	A	A	A	A	A					
6	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	F	J	F	F	F	B	A	F	A	A					
7	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	310	B	A	F	A	A	A	A	A					
8	A	A	A	B	A	B	A	A	B	B	B	B	B	345	335	F	360	365	F	F	U	F	F	A	A	A	A	A				
9	R	A	C	B	B	B	A	A	B	R	B	B	B	325	F	345	B	B	B	340	R	A	A	A	A	A	A	A				
10	B	A	B	A	B	A	Y	Y	B	B	A	B	B	325	340	B	B	355	R	B	B	R	R	A	A	A	A	A				
11	F	A	B	B	B	B	Y	A	A	B	B	B	B	B	B	B	B	320	305	F	B	B	B	B	A	A	A	A				
12	A	A	A	A	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	360	B	R	B	Y	A	A	A	A				
13	A	A	B	B	B	Y	B	B	A	B	B	B	B	B	F	B	B	B	B	B	B	B	A	A	A	A	A	A				
14	A	A	A	A	A	A	A	A	285	280	F	310	F	330	330	U	H	355	335	F	370	320	F	B	B	B	R	A	A	A		
15	A	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	F	B	R	A	A	A	A	A	A				
16	A	A	A	A	A	A	A	A	280	B	F	355	F	355	310	U	F	360	385	360	345	F	J	F	A	B	B	Y	A	A	A	
17	A	A	A	C	B	A	A	A	A	J	F	R	B	B	B	B	B	B	Y	F	A	A	A	A	A	A	A	A	A	A		
18	A	A	B	A	B	B	B	A	B	B	B	B	B	340	340	F	345	365	F	J	F	U	F	F	B	F	A	A	A	A		
19	A	A	A	A	F	B	B	B	B	B	B	F	U	E	295	B	B	B	B	B	R	B	R	A	A	A	A	A	A	A		
20	A	A	A	B	A	A	A	A	A	F	305	F	315	340	B	B	B	B	F	B	B	U	F	F	F	B	B	A	A	A		
21	A	A	A	A	B	F	F	F	F	320	340	B	B	U	F	U	F	B	F	F	F	F	F	F	F	F	F	F	F	F		
22	A	A	A	A	F	F	A	F	U	F	F	B	B	F	F	R	B	F	U	R	F	J	F	F	F	F	F	A	A	A		
23	A	A	A	A	A	A	A	A	A	F	320	340	330	U	V	U	V	R	U	H	360	J	F	J	F	F	F	F	A	A	A	A
24	A	A	A	A	A	A	A	A	A	A	F	340	F	335	350	F	330	F	B	B	F	U	F	A	F	A	A	A	A	A	A	
25	A	A	A	A	295	J	F	295	F	300	F	325	B	B	310	F	315	U	F	325	B	B	F	A	A	A	A	A	A	A	A	
26	A	A	A	B	A	A	A	A	B	B	B	F	F	335	330	340	B	315	B	F	F	F	F	F	A	A	A	A	A	A	A	
27	A	A	A	A	A	A	A	B	A	B	B	B	B	330	F	B	B	325	B	B	F	F	Y	A	A	A	A	A	A	A	A	
28	B	A	A	A	A	A	A	A	Y	B	B	F	F	F	F	365	350	365	340	340	330	325	325	B	A	A	A	A	A	A	A	
29	A	A	A	A	B	A	A	F	A	B	340	U	F	320	345	350	F	F	F	R	B	B	R	B	B	Y	A	A	A	A	A	
30	A	A	A	A	A	A	A	F	F	F	F	F	U	F	J	F	F	F	F	F	F	J	F	F	F	A	A	A	A	A	A	
31	A	A	A	A	A	A	A	S	F	320	325	340	F	F	F	F	335	C	F	J	F	J	F	J	F	F	F	F	A	A	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
CNT					1	2	2	3	8	12	12	12	20	15	15	15	12	11	16	9	7	3	3	1								
MED					295	288	290	280	318	325	338	330	345	340	360	345	340	335	330	335	335	335	315	335	365							
UQ								282	320	338	340	338	352	350	360	358	358	348	360	350	340	325	335									
LQ								280	308	318	330	316	332	330	345	328	330	322	322	325	318	315	335									

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M(3000)F2 (0.01)

IONOSPHERIC DATA

AUG. 1977

H'F2 (KM)

45° E Mean Time (G. M. T. + 3 h)

Station	YOWA STATION			Lat. 69 00' S	Long. 39 35' E	Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation																		
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																								
24														270	L									
25														L		270								
26																								
27														L										
28															240	245	230							
29															250	240								
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											1	1	4	1	2									
MED											U H 280	250	242	245	250									
UQ													258											
LQ													240											

AUG. 1977

H'F2 (KM)

IONOSPHERIC DATA

AUG. 1977

H¹F (KM)

45° E Mean Time (G. M. T. + 3 h)

Stations **YDWA** STATION Lat. 69 00 4 S Long. 39 35 4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	A	A	A	A	B	A	A	A	A	360	240	B	240	B	235	205	240	220	255	B	B	B	A	A			
2	A	A	A	A	A	A	A	A	A	290	290	245	220	225	230	250	250	245	240	235	A	A	A	B	B		
3	A	A	A	A	A	A	A	A	A	395	295	245	230	225	200	230	190	200	240	200	A	B	A	A	B		
4	A	A	A	A	A	A	A	A	A	295	250	240	230	230	225	230	210	230	220	210	A	A	A	A	A		
5	A	A	A	A	A	A	A	A	A	B	B	320	B	B	B	B	270	285	325	A	A	A	A	A	A		
6	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	245	250	250	B	A	A	A	B		
7	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	310	B	A	U	Q	A	A		
8	A	A	A	B	A	B	A	A	B	B	B	B	240	240	230	205	210	230	230	250	B	A	A	A	A		
9	255	A	C	B	B	B	A	A	B	R	B	B	B	270	245	B	B	B	225	B	A	A	A	A	A		
10	B	A	B	A	B	A	Y	Y	B	B	A	B	250	B	B	230	E	B	B	B	B	A	A	A	A		
11	A	A	B	B	B	B	Y	A	A	B	B	B	B	B	B	B	B	250	290	B	B	B	B	A	A		
12	A	A	B	A	A	A	A	A	B	A	255	B	250	B	B	B	B	B	250	B	B	B	Y	A	A		
13	A	A	B	B	B	Y	B	B	A	B	B	B	B	B	245	B	B	B	B	B	B	A	A	A	A		
14	A	A	A	A	A	A	415	370	275	230	230	240	235	220	225	200	285	B	B	B	B	A	A	A	A		
15	A	A	A	A	A	B	A	A	B	B	A	B	B	B	B	B	B	B	B	260	B	B	A	A	A		
16	A	A	A	A	A	A	A	A	B	290	240	210	215	200	210	240	230	A	B	B	Y	A	A	A	A		
17	A	A	A	C	B	A	A	B	A	255	B	B	B	B	B	B	Y	245	A	A	A	A	A	A	A		
18	A	A	B	A	B	B	B	A	B	B	B	B	B	270	225	230	215	245	245	265	B	B	A	A	A		
19	A	A	A	A	A	B	B	B	B	B	245	250	B	B	B	B	B	B	E	R	270	B	B	A	A	A	
20	A	A	A	B	A	A	A	A	295	285	255	B	B	B	B	225	R	B	B	225	290	B	B	A	A		
21	A	A	A	B	B	A	U	Q	310	310	255	225	B	B	230	225	B	240	200	230	225	220	270	A	250	A	
22	A	A	A	A	405	390	A	U	Q	390	275	230	B	B	240	230	225	B	B	220	250	230	245	270	300	A	A
23	A	A	A	A	A	A	A	A	300	260	250	230	225	220	230	225	200	200	225	225	285	A	A	A	A	A	
24	A	A	A	A	A	A	A	A	A	A	280	240	225	240	245	B	B	250	280	A	A	A	A	A	A	A	
25	A	A	A	A	350	300	325	310	260	240	B	B	250	Y	B	200	245	B	B	A	A	A	A	A	A	A	
26	A	A	A	B	A	A	A	A	B	B	B	250	260	B	B	B	260	B	230	270	A	A	A	A	A	A	
27	A	A	A	A	A	A	A	B	A	B	B	B	E	B	B	B	B	B	B	270	255	Y	A	A	A	A	
28	B	A	A	A	A	A	A	A	A	B	B	225	225	205	205	230	240	B	240	255	B	A	A	A	A	A	
29	A	A	A	A	B	A	A	A	A	B	245	240	225	225	215	250	B	B	B	230	B	B	Y	A	A	A	
30	A	A	A	A	A	A	A	A	250	U	H	225	B	225	210	200	225	220	220	210	230	A	A	A	A	A	
31	A	A	A	A	A	A	A	A	250	230	225	225	220	200	220	C	220	200	205	200	E	A	Q	300	A		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	1				2	2	3	5	9	14	15	13	21	16	18	18	17	17	21	12	6	3	2				
MED	255				378	345	325	370	275	258	245	240	230	225	228	230	225	235	235	230	270	260	275				
UQ							370	390	290	290	252	240	250	230	235	245	242	245	260	250	285	280					
LQ							318	310	255	250	240	225	225	208	215	215	210	230	225	222	E	250	255				

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H¹F (KM)

IONOSPHERIC DATA

AUG. 1977

H'ES (KM)

45° E Mean Time (G. M. T. + 3 h)

Stations ϕ MVA STATION Lat. 69 00 S Long. 39 35 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	K 110	K 100	K 105	K 100	K 110	K 100	K 100	K 100	K 105	K 95	B	B	B	B	B	B	K 140	K 140	B	B	B	B	K 120	K 140	
2	K 120	K 100	K 105	K 105	K 100	K 100	K 100	K 110	K 140	K 125	K 100	K 100	K 140	K 130	K 105	K 125	K 145	K 145	K 100	K 90	K 135	K 105	K 120	K 150	
3	K 145	K 165	K 110	K 110	K 105	K 100	K 100	K 115	K 100	K 105	K 105	K 130	K 140	K 120	K 120	K 115	K 115	K 130	K 110	K 110	B	K 115	K 120	K 100	
4	K 100	K 100	K 100	K 100	K 130	K 110	K 180	K 100	K 100	K 105	K 100	K 150	K 140	K 130	G	K 100	K 130	K 150	K 160	K 100	K 105	K 110	K 105	K 105	
5	K 105	K 105	K 120	K 105	K 100	K 100	K 100	K 100	K 100	B	B	K 150	B	B	B	B	B	K 105	K 100	K 105	K 105	K 100	K 105	K 105	
6	K 100	K 105	B	B	B	K 100	B	B	B	B	B	B	B	B	B	B	B	B	B	B	K 120	R	K 100	K 105	K 105
7	K 110	K 100	K 145	B	B	K 100	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	K 110	K 105	K 150	K 105
8	K 105	K 110	K 100	B	K 130	B	K 95	K 100	B	B	B	B	B	B	B	B	B	B	B	B	B	K 100	K 180	K 105	K 105
9	K 100	K 100	C	K 105	B	B	K 100	K 100	B	K 130	B	B	B	B	B	B	B	B	B	B	B	K 105	K 105	K 100	K 105
10	K 115	K 100	K 120	K 100	B	K 100	Y	Y	B	B	K 100	K 105	B	B	B	B	B	B	B	B	R	K 105	K 105	K 105	
11	K 110	K 115	K 100	B	K 120	K 105	Y	K 115	K 100	B	B	B	B	B	B	B	B	B	B	B	B	B	K 105	K 100	K 100
12	K 170	K 100	K 105	K 100	K 105	K 155	K 105	K 100	B	K 100	K 125	B	B	B	B	B	B	B	B	B	B	B	K 170	K 145	K 105
13	K 105	K 110	K 115	K 100	K 105	Y	B	B	K 105	B	B	B	B	B	B	B	B	B	B	B	B	K 100	K 150	K 150	K 105
14	K 105	K 150	K 100	K 100	K 110	K 120	K 120	K 110	K 105	G	G	G	B	B	B	G	B	B	B	B	B	B	K 140	K 100	K 105
15	K 115	K 100	K 100	K 100	K 100	K 115	K 95	K 100	B	B	K 105	B	B	B	B	B	B	B	B	B	B	R	K 120	K 160	K 125
16	K 115	K 105	K 100	K 110	K 110	K 110	K 100	K 105	B	K 100	K 115	K 120	K 125	K 125	K 115	K 125	G	K 110	B	B	K 130	K 105	K 100	K 120	
17	K 105	K 105	K 110	C	K 100	K 105	K 100	K 115	K 100	K 155	B	B	B	B	B	B	Y	B	K 100	K 100	K 105	K 100	K 125	K 115	
18	K 110	K 125	B	K 100	K 105	K 95	K 100	K 100	B	B	B	B	B	B	G	K 100	B	B	B	B	B	B	K 100	K 100	K 100
19	K 100	K 125	K 105	K 110	K 110	B	B	B	B	B	B	G	B	B	B	B	B	B	B	B	B	B	K 105	K 100	K 120
20	K 100	K 100	K 100	B	K 100	K 100	K 110	K 150	K 140	G	B	B	B	B	B	B	B	B	B	B	B	K 140	B	B	K 120
21	K 105	K 140	K 110	K 130	K 100	K 100	K 110	K 130	K 110	K 95	B	B	B	B	B	B	B	B	B	B	K 115	K 130	K 130	K 110	K 190
22	K 155	K 110	K 110	K 105	K 110	K 190	K 140	K 150	K 100	K 105	B	B	K 130	K 115	B	B	B	B	B	K 125	K 100	K 115	K 120	K 150	K 145
23	K 120	K 110	K 150	K 95	K 100	K 105	K 105	K 100	K 110	K 115	K 175	B	K 135	B	K 120	K 120	K 150	K 120	K 115	B	K 95	K 105	K 150	K 100	
24	K 100	K 145	K 105	K 110	K 105	K 100	K 100	K 100	K 100	K 105	K 170	K 150	B	G	K 130	B	B	B	B	K 120	K 100	K 120	K 115	K 120	K 120
25	K 105	K 100	K 100	K 105	K 130	K 125	K 110	K 105	K 100	K 145	B	B	K 110	B	K 125	B	B	B	B	B	K 110	K 150	K 100	K 100	K 100
26	K 100	K 100	K 110	K 100	K 100	K 100	K 105	K 100	B	B	B	K 125	B	B	B	K 95	B	B	B	B	K 130	K 110	K 100	K 110	K 105
27	K 100	K 105	K 110	K 105	K 125	K 100	K 110	B	K 135	B	B	B	B	B	B	B	B	B	B	B	Y	K 100	K 105	K 100	K 100
28	B	K 100	K 100	K 105	K 105	K 105	K 100	K 95	K 95	B	B	K 120	G	G	G	K 100	B	B	B	B	B	K 175	K 110	K 105	
29	K 120	K 105	K 100	K 100	K 100	K 100	K 105	K 105	K 100	B	B	B	G	G	G	B	B	B	B	B	B	B	K 125	K 145	K 100
30	K 150	K 105	K 100	K 100	K 105	K 100	K 100	K 105	K 140	G	B	B	B	G	K 150	K 145	G	B	B	B	B	K 110	K 150	K 145	K 110
31	K 105	K 100	K 105	K 115	K 100	K 100	K 100	K 120	G	G	G	B	G	G	K 110	C	K 105	K 105	K 110	K 105	K 105	K 105	K 105	K 105	
CNT	30	31	28	25	27	27	25	25	19	13	9	9	7	7	8	8	6	8	10	12	18	27	30	31	
MED	K 105	K 105	K 105	K 105	K 105	K 100	K 100	K 105	K 100	K 105	K 105	K 125	K 135	K 125	K 120	K 108	K 135	K 125	K 110	K 105	K 108	K 105	K 110	K 105	
UQ	K 115	K 110	K 110	K 105	K 110	K 108	K 110	K 115	K 110	K 125	K 125	K 150	K 140	K 130	K 128	K 122	K 145	K 142	K 120	K 118	K 120	K 125	K 125	K 120	
LQ	K 100	K 100	K 100	K 100	K 100	K 100	K 100	K 100	K 100	K 100	K 100	K 120	K 128	K 118	K 112	K 100	K 115	K 108	K 100	K 100	K 105	K 102	K 105	K 105	

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AUG. 1977

H'ES (KM)

IONOSPHERIC DATA

AUG. 1977

TYPES OF ES

45° E Mean Time (G. M. T. + 3 h)

Stations YDWA STATION Lat. 69 00 4 S Long. 39 35 4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	KL 71	R 3	RS 31	R 3	F 1	R 2	R 1	R 3	R 2	RK 41							H 1	HK 11					R 1	R 1	
2	CK 14	KA 51	BKS 55	R 3	RA 21	B 2	R 2	K 3	R 1	C 1	C 1	L 1	H 1	H 1	RA 11	AK 11	ARL 11	R 1	FF 11	F 1	HK 11	R 1	FFR 11	F 1	
3	HK 11	HCK 11	RA 31	R 4	RA 21	RA 11	R 4	R 1	R 1	C 1	C 1	HL 11	H 1	C 1	C 2	C 1	C 1	H 1	F 2	F 3		RA 11	RKS 51	RA 21	
4	AS 21	B 2	AB 13	RA 41	AR 14	B 5	AR 11	R 1	R 2	RAK 11	C 1	R 1	HC 11	H 2		R 1	C 1	AH 11	ACK 11	LHK 11	CK 11	CK 11	RA 61	R 3	
5	R 4	K 4	K 1	R 3	R 1	R 1	R 2	KA 31	RA 21			AHK 11						RA 11	R 4	RA 61	KA 41	RA 51	RA 11	R 3	
6	RA 21	KA 41				F 1															CK 11		RA 51	RK 41	R 1
7	RA 21	R 2	R 1			F 1																R 2	RA 11	K 5	K 5
8	K 5	RA 31	BS 31		K 1		R 1	R 2														FF 11	HK 11	KA 11	KA 11
9	K 5	RA 21		R 1			R 2	R 2		K 1												RA 41	RS 51	RA 21	RS 51
10	R 1	R 1	R 1	K 4		B 2					R 1	C 1										BS 71	K 7	KA 51	
11	R 2	K 4	RS 11		F 1	R 1	S 1	RA 11	R 1														RA 21	KA 31	
12	AR 13	RA 21	RA 11	R 3	RA 21	AR 11	R 3	RS 11		R 1	C 1											F 1	K 1	KA 11	
13	K 7	K 4	R 1	R 1	R 1				R 1												F 1	R 1	RK 11	RK 11	
14	K 4	AR 11	R 2	R 2	K 3	CK 21	K 4	C 1	C 1													RK 11	RS 21	K 3	
15	RK 44	K 1	R 2	RA 21	R 2	R 1	R 1	R 2				C 1											RK 11	AK 11	RK 34
16	K 4	KS 71	R 3	R 2	K 2	K 1	LK 11	R 2		LK 11	C 1	C 1	C 1	C 1	C 1	H 1		R 1			K 1	KA 21	LCK 13	CK 22	
17	K 6	KS 51	KA 41		R 1	R 2	R 2	R 1	R 1	HC 11									KA 51	K 3	RS 41	RS 31	CK 62	CK 32	
18	R 3	RAK 11		R 2	ACK 11	F 1	R 1	R 1					L 1		K 1							R 2	K 3	KA 31	
19	K 4	CKA 11	R 2	R 2	CK 11																		K 3	RS 21	K 2
20	R 2	R 2	R 2		F 1	R 1	R 2	HK 11	H 1													K 1			RRK 11
21	RS 61	RR 13	R 3	R 1	R 1	RA 11	RA 11	R 1	C 1	R 1											CK 11	ACK 11	HK 21	RK 11	HAK 11
22	HK 11	K 4	RA 21	CK 44	CK 31	ACK 11	HRA 11	ARK 11	RA 11	C 1			H 1	C 1						CK 11	RK 21	CK 11	CK 11	HK 11	RAK 11
23	CK 11	RK 31	AHK 11	R 1	R 2	K 1	R 3	R 1	K 2	K 1	H 1		H 1	C 1	CH 11	AC 11	C 1	CL 11	K 1	LK 11	RS 31	RS 11	ARS 11	RA 11	
24	RA 11	HKA 11	RK 22	RK 11	R 1	R 1	R 1	R 1	R 1	AC 11	HC 11			H 1					K 1	RA 31	RK 21	K 3	KA 41	RK 13	
25	RK 14	RK 16	K 6	CK 24	KAK 11	RLK 11	R 2	C 1	L 1	HL 11			C 1	H 1					R 3	AR 11	RS 21	RS 31	RS 31	RA 21	
26	RS 21	RS 21	KA 51	R 1	R 2	R 2	RK 11	R 1				R 1				L 1					RK 11	RA 11	KL 51	K 7	K 4
27	RK 15	CK 46	CK 77	CK 63	AHK 11	R 2	RA 11		HR 11														K 5	RA 41	R 3
28		R 3	R 4	R 2	R 2	R 4	R 1	R 1	R 1			C 1				L 1							ACK 11	K 2	KS 71
29	CK 22	CK 35	K 5	R 3	R 1	R 2	R 3	RK 21	R 2															K 1	RRK 11
30	HKR 11	K 2	FA 11	R 2	RA 11	R 2	R 3	R 2	H 1				H 1	H 1								R 3	HKA 11	HKA 11	K 7
31	R 5	R 3	R 4	RA 31	R 1	R 3	R 2	RA 11							L 1		C 1	C 1	C 1	FA 11	F 3	R 2	CK 21	R 2	
CNT																									
MED																									
UQ																									
LQ																									

AUG. 1977

TYPES OF ES

IONOSPHERIC DATA

SEP. 1977

FXI (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations: JWA STATION Lat. 69 00.4 S Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	U A 69	A	A	38	39	45	50	48	53	54	67	62	67	60	47	47	40	30	28	25	U S 51
2	42	44	U S 75	47	A	U S 52	U S 65	67	68	58	55	64	71	72	62	X 68	0 R 64	46	41	40	32	30	A	A
3	A	A	A	U S 67	A	A	Y	Y	A	0 R 38	41	42	45	48	48	46	45	43	36	39	30	22	20	A
4	R	A	U A 58	A	A	A	40	X 38	Y	0 R 45	46	52	59	B	67	0 R 60	0 R 56	0 R 52	0 R 41	0 R 32	0 R 24	0 R 21	A	A
5	A	A	U A 66	40	0 R 54	31	35	36	45	50	54	65	62	70	62	67	X 59	53	45	45	35	S 30	S 28	S
6	U A 65	A	A	26	32	32	40	0 R 38	46	61	55	67	66	68	60	65	64	50	40	41	33	S 26	18	15
7	U A 83	A	0 R 27	32	31	39	40	B	0 R 46	57	60	60	64	70	69	68	60	53	43	43	39	37	20	R
8	A	A	A	A	A	A	A	A	42	47	50	B	0 R 57	60	60	55	60	50	49	37	30	27	0 R 26	30
9	A	A	A	A	A	A	A	A	0 R 47	52	51	53	59	64	70	76	65	74	61	R	A	A	A	A
10	A	A	J A 54	B	B	B	B	B	A	B	B	0 R 46	B	0 R 50	X 51	B	B	B	0 R 51	42	32	A	A	A
11	A	B	B	A	A	Y	A	Y	A	A	B	B	B	B	B	B	B	X 50	X 50	46	A	A	A	A
12	A	A	A	A	A	R	A	B	B	0 R 42	44	45	50	50	53	50	54	52	49	40	38	28	0 R 26	A
13	A	42	A	A	B	B	A	A	0 R 46	0 R 46	0 R 45	B	B	0 R 63	61	B	B	65	0 R 42	U A 87	A	U A 37	A	B
14	A	A	U A 41	53	A	Y	B	B	B	A	0 R 44	0 R 46	X 52	X 50	X 54	56	X 54	54	55	40	30	30	0 R 19	A
15	A	A	A	A	A	A	A	A	B	B	B	0 R 64	65	B	B	B	69	70	63	50	0 R 36	B	B	B
16	A	A	A	A	U S 55	0 R 37	U S 45	0 R 39	52	X 51	58	67	64	72	74	69	63	S 62	70	S 69	53	A	A	46
17	A	A	A	41	A	A	A	B	B	0 R 54	B	B	67	69	78	70	67	62	59	0 R 42	30	0 R 27	B	A
18	A	A	A	A	0 R 40	A	A	A	A	0 R 53	53	59	68	67	68	63	60	63	58	X 50	41	34	27	0 R 23
19	A	A	A	A	45	50	40	45	51	X 53	60	67	75	72	0 R 75	67	67	77	Y	Y	A	Y	Y	B
20	B	A	Y	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
21	B	A	A	0 R 40	A	B	B	B	B	B	B	B	B	B	B	B	40	R	37	40	0 R 31	A	A	A
22	A	A	A	B	A	A	Y	A	B	B	B	B	B	B	B	B	0 R 48	B	Y	Y	A	28	Y	B
23	B	A	B	A	A	A	0 R 38	0 R 40	43	44	47	49	55	52	55	59	0 R 69	65	49	A	A	A	Y	Y
24	A	A	A	Y	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A
25	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	0 R 60	0 R 54	B	0 R 50	0 R 45	X 29	B	B	A
26	A	A	A	A	0 R 53	40	0 R 46	45	B	B	B	0 R 59	64	70	76	87	82	70	52	A	A	A	A	43
27	A	47	77	A	A	A	B	B	B	B	A	R	B	B	0 R 50	B	0 R 50	B	0 R 44	0 R 38	0 R 36	0 R 27	R	A
28	Y	U A 60	46	43	S 48	41	48	B	0 R 45	0 R 45	0 R 47	X 50	R	B	B	67	74	60	U A 71	46	0 R 34	R	A	A
29	U A 46	B	Y	A	33	43	40	47	62	51	60	B	74	X 67	69	67	67	60	56	60	50	S 45	31	30
30	S 42	48	A	A	40	A	57	50	75	75	63	66	72	72	72	X 73	0 R 73	X 66	61	57	0 R 49	39	31	A
31																								
CNT	5	5	8	10	10	9	13	11	14	19	19	19	20	20	22	21	25	23	26	23	21	17	11	7
MED	U A 46	47	U 56	42	37	40	40	40	46	51	51	59	64	67	62	67	60	60	50	42	33	28	26	30
UQ	U A 65	48	U 70	53	45	43	46	46	52	54	56	64	68	70	70	68	67	65	58	48	38	34	28	44
LQ	S 42	44	44	40	33	37	40	38	45	46	46	50	56	X 56	55	60	54	51	43	40	30	27	20	26

SEP. 1977

FXI (0.1 MHz)

IONOSPHERIC DATA

SEP. 1977

F2F2 (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations YJWA STATION Lat. 49 00.4 S Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

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

SEP. 1977

F2F2 (0.1 MHz)

IONOSPHERIC DATA

SEP. 1977

FJF1 (0.01 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations **YJWA** STATION Lat. 69 00.4 S Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1												L	L											
2															L									
3												F	U	L	U	L								
4												330	340	340	L									
5												L	350	B	L									
6											L	L		L	L									
7													L		L									
8								L	L	L	B	B	B	L										
9												370	B	370	L	L								
10											B	360	B	350	L									
11											B	B	B	B	B									
12											L	330	L		L									
13								L	L	F	350	B	B	B	B	B	B	B	L					
14											L	340	L		U	L								
15											B	B	L	B	B	B	L							
16									L	370	L	L	L	L										
17											B	B	B	B	L	L								
18											L	L	400	L	L	L								
19											L	L	L	L	B		370							
20											B	B	B	B	B	B								
21											B	B	B	B	B	B								
22											B	B	B	B	B	B	F							
23										350	L	380	380	L	L	U	L							
24											B	B	B	B	B	B	B							
25											B	B	B	B	B	B	B							
26								L	B	B	B	L	L	410	B	L								
27											A	350	B	B	R	B	L							
28									330	L	F	370	F	370	370	B	B	L	350	L				
29								L	F	390		B	L	L	L		L							
30								L			L	U	L	L	L	L	L							
31											L	400	L	L	L	L	L							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	2	3	9	5	4	2	1	3							
MED									330	370	F	360	370	360	355	U	L	350						
UQ										370	370	380	390				360							
LQ											F	360	340	350	345		355							

The Radio Research Laboratories, Japan

SEP. 1977

FJF1 (0.01 MHz)

IONOSPHERIC DATA

SEP. 1977

FJE (0.01 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations YJWA STATION Lat. 69 00.4 S, Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	300	300	295				U200	U200	270	U150	205	H190	225	H200	U200	U170	150	155	A	90	80	U85	U90			
2	K100	K120	J200	U230			A	A	U120	U170	U190	225	U220	U240	220	U190	170	130	A	C	U90		410	U250		
3				U220			Y	Y	B	U250	205	210	220	220	210	H190	175	130	120	100		U80	80			
4	K120	K180	K250				A	A	A	A	U210	210		B	B	B	B	B	B	B			K120		K120	
5	K120		J300				A	A	150	H190	205	240	250	225	U210		A	185	130	100	U100	U110			K75	
6			120	K100	U100	U95	A	U100	140	H200	205	U220	250	U250	270	230	A	U150	A	100						
7	160			U170	U150	K155	A	B	A	A	U220	230	230	230	230	200	195	U150	105	A					K160	
8				K400			B	B	K260	A	220	B	B	230	230	220	R195	H160	U110	B	U85		K90	K100		
9				K320			B	B	A	U270	235	B	B	B	A	220	200	B	B	B	400	J390			K390	
10	J360	J390					B	B	B	B	B	A	B	B	B	B	B	R	B	B	150	K330	K330	K280		
11	K380					Y	B	Y	B	B	B	B	B	B	B	B	B	H190	B	U200	320	K310			K590	
12	K370			K420	K300	K210	B	B	B	U280	230	245	255	250	240	210	300	200	120	B		U100	U120		K320	
13	J330	U285	K360				B	B	B	A	225	235	B	B	B	B	B	B	B	230	B		U200			
14						Y	B	B	B	A	260	250	250	230	230	260	K260	K260	K260	U220		U90	100		K340	
15	U300	K300	U210				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
16	K240	K330	K375	K300	250	K230	K180	140	210	200	U230	260	255	300	270	225	200	195	U140	A		250	240	U330		
17		J360					B	B	B	B	B	B	H	B	B	250	B	B	B	B	B				K220	
18	K270	K330					B	B	B	B	B		260	250	260	250	245	230	195	200	140	100		U105		
19					K180	B	130	H170	195	225	230	250	270	270	B	250	215	200		B	Y					
20						B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	320			K330	
21				K270		B	B	B	B	B	B	B	B	B	B	B	B	K270	B	B	U190	160	K290	K340		
22						B	K190	B	B	B	B	B	B	B	B	B	B	B	B	B	Y					
23			K320		K350	K320	K275	200	220	200	240	240	240	260	260	300		B	H	B	A	U270				
24						B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B					K300
25						B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B					K380
26	K320				A	K190	B	B	B	B	B	B	B	265	B	B	B	B	B	A	B	A		U260		
27	K280	U370			250	B	B	B	B	B	A	300	B	B	U300	B	R	B	B	B	B	B	U125	U120		
28	K150	K215	J270	K260	U200	A	A	B	B	B	270	255	260	B	B	B	B	H180	B	U210	B	K130			K220	
29	K300	U370		K370	U200	U150	160	195	220	U260	A	B	270	250	F270	250	230	205	B	140	R	U115			K100	
30		U220	K290	U360	K325	120	125	200	230	230	250	260	265	U250	U220	250	230		B	B	A	A			J310	
31																										
CNT	16	14	10	11	11	8	7	7	10	13	18	16	15	16	16	15	15	16	9	10	10	15	11	19		
MED	K290	K310	K280	K270	250	K172	K180	195	215	225	230	242	250	250	230	225	200	185	120	120	155	U130	125	K260		
UQ	K345	K360	K300	K340	K312	K220	K195	200	230	U250	240	252	260	255	255	250	230	200	140	U200	K320	K300	K330	K325		
LQ	K135	K220	K210	K225	U120	135	145	155	150	200	205	222	235	230	220	205	190	150	110	100	U90	U102	95	K140		

SEP. 1977

FJE (0.01 MHz)

IONOSPHERIC DATA

SEP. 1977

FOES (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Hour Day		Stations		YJWA		STATION	Lat.	69 00 4 S		Long.	39 35 4 E		Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation														
		00	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	K	J A	J A	J A	48	47	J A	28	27	19	G	G	25	25	25	22	G	J A	J A	J A	J A	9	30	J A		
2	10	K	J A	J A	J A	J A	J A	J A	29	16	G	G	31	34	G	J A	18	35	16	15	16	E S	K	U K			
3	40	J A	J A	J A	J A	50	55	Y	65	J A	53	32	27	G	26	G	25	23	G	17	19	J A	15	10	K		
4	12	K	K	K	J A	J A	J A	J A	22	24	37	J A	27	26	E B	E B	E B	E B	E B	E B	E B	E B	F H	J A	J A		
5	J A	J A	J A	J A	J A	J A	J A	J A	30	J A	G	G	G	27	26	23	23	G	17	J A	26	16	20	E B	9		
6	J A	J A	23	17	18	17	16	G	15	G	25	28	32	18	35	J A	21	42	20	G	10	J A	25	22	13		
7	23	J A	J A	J A	J A	17	22	19	B	57	J A	40	26	29	G	27	25	23	G	17	10	11	J A	J A	J A		
8	J A	100	J A	38	40	68	37	40	26	K	26	G	B	E B	G	G	G	G	G	G	12	E B	E B	E B	K		
9	J A	J A	J A	K	J A	52	45	J A	J A	J A	G	E B	E B	E B	27	25	G	E B	E B	E B	E B	K	J K	J A	K		
10	J K	J K	Y	57	B	79	B	B	46	B	B	29	B	E B	E B	B	B	B	E B	E B	E B	J A	J K	J K	J K		
11	K	42	55	32	46	Y	56	Y	78	48	B	B	B	B	B	B	B	G	E B	19	32	K	J A	J A	K		
12	K	J A	J A	50	K	K	J A	B	B	K	G	G	G	G	30	26	G	K	G	15	E B	10	16	E B	K		
13	J A	J A	J A	57	B	B	51	41	29	G	G	B	B	E B	E B	B	B	E B	20	28	34	37	J A	J A	100		
14	41	33	30	25	57	60	B	B	B	43	G	G	G	G	G	28	29	K	K	26	28	13	E B	9	16		
15	J A	K	J A	J A	J A	J A	J A	44	B	B	E B	E B	E B	B	B	B	E B	E B	E B	E B	E B	E B	E B	B	B		
16	K	K	K	37	J A	J A	K	35	30	G	G	G	28	K	31	31	J A	39	46	16	19	J A	K	J A	J A		
17	J A	J K	J A	28	J A	42	49	40	B	B	E B	B	B	E B	E B	G	E B	E B	E B	E B	E B	E B	E B	B	K		
18	K	K	J A	36	J A	40	48	J A	J A	39	34	G	G	G	G	G	G	G	G	G	G	E B	10	27	E B		
19	28	J A	J A	32	K	15	G	G	G	26	G	30	31	G	E B	G	G	G	23	32	Y	44	112	113	B		
20	B	33	30	77	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	K	32	27	33	J A	
21	B	39	46	K	46	B	B	B	B	B	B	B	B	B	B	B	B	30	28	28	30	23	K	29	K	J A	
22	50	J A	71	B	45	46	19	40	B	B	B	B	B	B	B	B	E B	B	32	110	85	20	47	64			
23	41	K	B	39	K	K	J A	32	20	28	25	G	77	G	G	30	E B	43	25	E B	19	34	33	J A	87	40	
24	67	44	46	100	52	45	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	K	
25	82	42	80	59	52	B	B	B	B	B	B	B	B	B	B	E B	E B	B	E B	E B	E B	E B	F H	B	B	50	
26	J A	44	44	38	39	26	K	E B	E B	B	B	B	E B	E B	G	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	J A	
27	J A	J A	Y	40	J A	42	B	58	B	B	48	G	B	B	G	B	G	B	E B	E B	E B	E B	E B	E B	E B	E B	
28	20	28	J K	K	J A	20	20	B	E B	E B	G	30	G	B	B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	J A	
29	37	43	J A	K	J A	30	J A	G	G	G	30	42	B	G	27	G	30	G	G	E B	10	G	E B	11	15	20	J A
30	J A	J A	K	J A	K	32	36	32	G	G	G	G	28	29	28	G	G	E B	E B	E B	E B	E B	E B	E B	E B	J K	
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	30	27	29	27	25	22	19	19	21	20	20	21	20	22	21	25	24	28	27	29	27	26	28			
MED	36	39	J	36	40	42	32	32	26	27	G	E G	E G	E G	E G	22	E G	U	U	U	U	20	25	30	29		
UQ	42	J A	52	50	49	49	J A	42	42	33	26	28	30	28	26	U	E B	U	U	U	U	32	31	40	40		
LQ	26	33	J	30	31	23	19	23	18	G	G	G	G	G	G	16	G	E G	U	E G	U	U	U	10	22	22	

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SEP. 1977

FOES (0.1 MHz)

IONOSPHERIC DATA

SEP. 1977

FBES (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations JWA STATION Lat. 69 00 4 S Long. 39 35 4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	K30	A39	A36	A29	A48	A47	U20	U20	K27	15	G	G	25	25	23	22	G	15	12	G	11	U85	U9	11	
2	K10	A27	A33	U23	A32	A34	24	29	12	G	19	27	26	G	G	19	14	12	10	E10	U9	E11	K41	U25	
3	A40	A62	A74	U22	A50	A55	Y	Y	A53	30	G	G	26	G	23	21	13	G	10	G	10	K8	K8	A19	
4	K12	K18	K25	A41	A36	A42	U19	22	E24	27	27	26	E25	B25	E43	E45	E36	E26	E17	E16	K12	A25	A22		
5	A21	A42	J30	22	23	20	13	11	G	G	G	G	27	25	22	22	G	17	G	G	U11	E9	B	U10	
6	A26	A33	A23	13	U10	U9	9	G	G	G	24	24	G	G	G	20	21	17	13	G	10	9	B	U11	
7	A23	A34	19	U17	U15	K15	12	B	29	21	G	29	G	26	G	22	G	15	G	11	11	10	U20	K16	
8	A26	B	A31	A38	K40	B	A37	A40	K26	26	G	B	E36	G	G	G	G	G	E9	E8	E9	K9	K10		
9	A34	A46	A36	K32	A52	A52	A45	A53	34	U27	G	E26	E45	E31	23	G	G	E18	E22	E28	K40	J39	A37	A39	
10	J36	J39	Y	B	B	B	B	B	A46	B	B	B	B	E26	E25	B	B	B	E34	E14	13	J33	K33	J28	
11	K38	B	B	A32	A46	Y	B	Y	A78	A48	B	B	B	B	B	B	B	G	E19	U20	32	U31	A40	K39	
12	K37	A72	A88	A50	K30	K21	A36	B	B	U28	G	G	G	G	23	G	K30	G	G	E10	11	E10	14	K32	
13	J33	U28	K36	A57	B	B	A51	A41	25	G	G	B	B	E51	E39	B	B	E20	28	A34	A37	U20	A44	B	
14	B	A33	25	23	A57	Y	B	B	B	A43	G	G	G	G	G	K26	K26	K26	K26	U22	E10	E9	10	J34	
15	U30	K30	A50	A73	A53	A54	A64	A44	B	B	B	E51	E29	B	B	B	E25	F41	E28	E22	F21	B	B	B	
16	K24	K33	K37	K37	K26	K23	K18	G	G	G	G	G	G	G	30	29	G	22	G	G	10	16	25	A36	J33
17	A35	J36	A45	U27	A42	A35	A40	B	B	E35	B	B	E45	E43	G	E16	E34	E33	E36	F23	E18	19	B	K22	
18	K27	K33	A36	A36	32	A48	A52	A58	A49	U34	G	G	G	G	G	G	G	G	G	G	E10	10	10	10	11
19	A28	A28	A31	A32	K18	13	G	G	G	G	G	G	30	30	G	E45	G	G	22	E32	Y	A44	Y	Y	B
20	B	A33	E30	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	K32	A27	K33	A63
21	B	A39	A46	K27	A46	B	B	B	B	B	B	B	B	B	B	B	29	U28	24	20	23	29	K34	A74	
22	A50	A72	A71	B	A45	A46	19	40	B	B	B	B	B	B	B	B	E24	B	E32	Y	A42	11	Y	B	
23	B	K32	B	A39	K35	K32	K27	G	19	25	25	G	G	G	G	K30	E43	G	E19	A34	A33	A33	Y	Y	
24	A67	A44	A46	Y	A52	A45	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	K30
25	A82	A42	A80	A59	B	B	B	B	B	B	B	B	B	B	B	B	E44	E46	32	E20	F16	F16	R	B	A50
26	A44	A44	B	A39	22	K19	E19	E25	B	B	B	E36	E29	G	E55	E36	E45	F20	23	A38	A40	K33	A46	U26	
27	K28	U37	Y	A40	K25	A42	B	B	B	B	A48	G	B	B	G	B	G	B	E33	E20	E15	E18	19	A25	
28	E20	E28	J27	K26	U20	U20	17	B	E28	E26	G	28	G	B	B	E30	E23	24	F31	U21	14	17	30	K22	
29	A37	B	Y	K20	U20	16	G	G	G	G	30	H	G	Y	G	G	G	G	E10	G	E11	11	10	K10	
30	12	A28	K29	U36	K32	A36	30	G	G	G	G	G	G	G	G	G	G	E22	E21	15	11	11	10	J31	
31																									
CNT	26	27	24	26	26	22	21	17	19	21	20	20	21	20	22	21	25	24	28	26	29	26	23	25	
MED	30	A34	A36	A34	34	34	20	21	U22	U20	G	E22	E25	G	E22	E20	E21	E17	E16	U13	13	20	25	K	
UQ	A37	A42	A46	A39	A46	A46	A37	A40	32	28	22	27	E29	26	24	24	E29	E23	E30	21	32	29	35	K33	
LQ	24	31	30	26	K23	K20	U15	G	E12	G	G	G	G	G	G	G	G	G	E10	E9	10	10	10	16	

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SEP. 1977

FBES (0.1 MHz)

IONOSPHERIC DATA

SEP. 1977

F-MIN (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Stations Y J W A		STATION		Lat. 69° 00' 4" S				Long. 39° 35' 4" E				Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation														
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	6	9	10	7	12	10	8	8	11	13	13	13	12	15	15	14	13	10	10	8	7	6	6	E S 10		
2	6	6	7	7	10	10	8	7	10	13	13	15	15	12	12	11	11	9	7	E C 10	6	E S 11	11	10		
3	6	6	7	9	E C 8	10	Y	40	19	18	11	10	11	12	12	10	10	7	8	9	8	6	5	7		
4	6	7	9	11	9	10	8	7	15	15	12	11	25	B	25	43	45	36	26	17	16	10	10	8		
5	8	10	8	E C 11	12	10	9	9	9	13	13	13	12	10	12	12	13	12	6	8	8	9	7	7		
6	E S 9	11	8	7	6	5	6	9	12	11	18	22	16	14	15	15	11	11	10	8	7	8	5	E S 8		
7	10	5	6	6	5	7	7	B	19	11	10	10	11	12	10	10	10	8	8	6	8	7	5	10		
8	6	20	12	11	19	31	26	20	10	13	E C 12	B	36	19	20	22	10	11	10	9	8	9	7	8		
9	10	12	10	9	10	10	12	14	11	14	15	26	45	31	11	10	18	18	22	28	10	10	10	9		
10	7	10	Y	24	B	51	B	B	20	B	B	24	B	26	25	B	B	B	34	14	10	10	8	9		
11	10	26	29	20	25	Y	33	Y	22	25	B	B	B	B	B	B	B	15	19	11	10	10	11	14		
12	16	17	10	21	11	11	17	B	B	24	18	19	11	10	15	15	15	13	10	10	10	10	10	10		
13	11	11	13	17	B	B	23	20	20	17	19	B	B	51	39	B	B	20	16	14	12	12	11	21		
14	20	12	11	11	26	55	B	B	B	19	20	24	15	15	15	15	18	17	13	10	10	9	8	10		
15	13	10	10	10	11	15	14	25	B	B	B	51	29	B	B	B	25	41	28	22	21	B	B	B		
16	10	10	10	10	10	8	9	10	19	12	15	15	16	20	21	13	13	11	9	7	11	8	10			
17	10	10	11	10	13	13	28	B	B	35	B	B	45	45	20	16	34	33	36	23	18	17	B	10		
18	10	10	10	12	13	19	20	17	20	23	20	13	14	11	11	12	15	11	11	E C 9	10	7	10	E S 11		
19	10	10	10	11	9	10	10	11	11	12	14	13	13	12	45	19	20	12	21	Y	14	20	25	B		
20	B	19	23	45	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	23	15	15	12		
21	B	20	20	18	36	B	B	B	B	B	B	B	B	B	B	B	22	24	18	10	10	10	11	13		
22	13	19	10	B	28	20	12	24	B	B	B	B	B	B	B	B	24	B	20	22	11	7	22	20		
23	28	20	B	16	20	13	10	10	12	14	15	14	20	15	15	21	43	13	19	13	10	10	75	27		
24	10	E C 10	10	86	23	24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	10		
25	14	18	16	22	31	B	B	B	B	B	B	B	B	B	B	44	46	B	32	20	16	B	B	20		
26	10	10	25	22	13	12	19	25	B	B	B	36	29	18	55	36	45	20	15	23	11	10	12	10		
27	10	12	Y	17	11	19	B	58	B	B	21	25	B	B	28	B	19	B	33	20	15	18	12	12		
28	8	8	7	7	8	10	10	B	28	26	25	23	24	B	B	30	23	11	15	10	10	6	7	7		
29	20	34	14	14	10	10	8	11	11	17	25	B	13	15	12	12	15	15	10	12	11	9	8	6		
30	6	6	14	16	14	10	10	10	10	20	21	13	11	11	11	11	11	22	21	13	10	7	8	9		
31																										
CNT	50	30	28	30	30	29	29	29	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30		
MED	10	10	10	12	12	12	14	24	20	20	20	24	24	20	20	20	20	16	17	12	10	10	10	10		
UQ	13	18	14	20	25	24	33	B	B	B	B	B	B	B	B	B	45	36	26	20	14	12	15	13		
LQ	8	10	10	10	10	10	9	10	11	13	14	13	13	12	12	12	13	11	10	9	8	8	8	8		

SEP. 1977

F-MIN (0.1 MHz)

IONOSPHERIC DATA

SEP. 1977

M(3000)F2 (1.01)

45 E Mean Time (G. M. T. + 3 h)

Stations Y JWA STATION Lat. 69 00 4 S Long. 39 35 4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	280	U F	F	310	310	315	315	350	J F	J F	J F	J F	J F	J F	335	315	315	295	
2	F	A	A	S	A	F	S	F	F	325	320	340	330	355	H	355	U H	U F	F	F	315	300	A	A	
3	A	A	A	F	A	A	Y	Y	A	U R	U F	F	285	325	335	335	335	350	340	320	315	335	325	A	
4	R	A	A	A	A	A	F	R	Y	F	U F	285	F	B	F	335	320	345	355	320	280	325	A	A	
5	A	A	U B	U F	F	F	E	J F	J F	F	F	J F	F	J F	J F	J F	J S	F	J F	J F	F	F	F	S	
6	A	A	A	F	U F	F	U F	U F	J F	U F	345	340	330	325	F	355	J F	F	350	F	F	U F	F	F	
7	A	A	F	F	U F	U F	J E	B	290	F	J F	J E	J F	F	J F	J F	F	U F	J F	F	J F	U F	F	R	
8	A	B	A	A	A	B	A	A	F	F	330	B	315	340	345	350	355	325	335	335	335	U F	310	315	
9	A	A	A	A	A	A	A	A	F	290	295	280	310	310	H	J F	F	U F	F	R	A	A	A	A	
10	A	A	Y	B	B	B	B	B	A	R	B	290	B	290	290	B	R	R	R	F	F	A	A	A	
11	A	B	B	A	A	Y	B	Y	A	A	B	B	B	B	B	B	B	315	320	F	A	A	A	A	
12	A	A	A	A	A	R	A	B	B	325	320	290	325	325	340	330	335	340	365	355	320	300	U F	A	
13	A	F	A	A	B	B	A	A	F	F	F	B	B	F	F	B	B	F	305	A	A	F	A	B	
14	B	A	F	F	A	Y	B	B	B	A	270	300	310	310	330	330	335	340	F	F	335	305	275	A	
15	A	A	A	A	A	A	A	A	B	B	B	315	F	B	B	B	F	F	F	F	F	R	B	B	
16	A	A	A	A	A	U F	F	F	F	315	275	300	330	F	295	F	J F	J F	F	F	F	F	A	A	F
17	A	A	A	F	A	A	A	B	B	285	B	R	F	F	J F	J F	U F	F	F	F	F	U R	B	A	
18	A	A	A	A	F	A	A	A	A	300	310	310	315	330	340	350	350	355	355	350	345	350	350	305	
19	A	A	A	A	F	F	F	F	F	320	320	F	J F	F	J R	F	U F	F	Y	Y	A	Y	Y	B	
20	B	A	Y	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	
21	B	A	A	F	A	B	B	B	B	B	B	B	B	B	B	R	F	R	U F	F	F	A	A	A	
22	A	A	A	B	A	A	Y	A	B	B	B	B	B	B	B	B	F	B	Y	Y	A	F	Y	B	
23	B	A	B	A	A	A	F	F	F	F	250	300	295	250	300	290	325	325	295	290	325	F	340	Y	Y
24	A	A	A	Y	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	B	B	A	
25	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	345	325	305				
26	A	A	B	A	290	285	295	U F	B	B	B	305	295	280	295	F	F	F	325	305	A	A	A	A	F
27	A	F	Y	A	A	A	B	B	B	B	A	R	B	B	260	B	290	B	320	330	310	275	A	A	
28	Y	Y	F	F	F	F	F	B	275	290	305	270	R	B	B	295	250	280	R	F	285	F	R	A	A
29	A	B	Y	A	F	F	F	U F	J H	F	F	B	J F	320	J F	J F	J F	F	F	F	325	345	F	U F	285
30	F	A	A	A	F	A	F	F	F	F	F	F	J F	F	F	F	U F	F	F	F	U F	J F	J F	A	
31																									
CNT	1	1	1	4	3	3	8	9	11	16	17	18	16	18	19	19	19	17	24	18	19	15	8	4	
MED	250	330	295	285	265	270	285	290	295	302	310	308	315	325	325	335	335	340	340	335	320	320	312	300	
UQ				F	F	F	F	U F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
LQ				F	U F	U F	F	F	275	288	300	290	300	310	310	330	F	F	F	F	312	305	282	290	

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SEP. 1977

M(3000)F2 (1.01)

IONOSPHERIC DATA

SEP. 1977

H'F2 (KM)

45° E Mean Time (G. M. T. + 3 h)

Stations **SYQWA** STATION Lat. 69 00.4 S Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1												L	L											
2															225									
3												L	L	300	L									
4												L	F	B	L									
5													L	350										
6												L	245	250	L									
7													L		L									
8									L	L	L	B	275	250										
9												380	310	340	270	L								
10											B	400	B	370	L									
11											B	B	B	B	B									
12											L	L	L		L									
13									L	L	500	B	B	B	350	B	B	L						
14											L	345	L		290									
15											B	B	300	B	B	B	235							
16									L		340	270	L	L	255									
17											B	B	B	B	295	L								
18											L	L	295	260	250	L								
19											L	L	250	245	250	330								
20											B	B	B	B	B	B								
21											B	B	B	B	B	B								
22											B	B	B	B	B	B	330							
23											L	390	300	L	L	370	270	260						
24											B	B	B	B	B	B	B							
25											B	B	B	B	B	E B 290	B							
26								L	B	B	B	L	330	350	E B 320	300								
27											A	R	B	B	445	B	L							
28									420	L	360	450	R	B	B	300	H 300	300						
29									L	F 410		B	295	260	L	240								
30									L		L	290	290	L	250	260	L							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	2	3	8	11	12	11	6	6	2						
MED									420	455	360	362	300	260	262	295	285	280						
UQ											450	395	320	332	300	300	350							
LQ											350	280	292	248	250	U 238	240							

SEP. 1977

H'F2 (KM)

IONOSPHERIC DATA

SEP. 1977

H^oF (KM)

45° E Mean Time (G. M. T. + 3 h)

Stations YJWA STATION Lat. 49 00.4 S Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	370	340	360	240	H	240	240	H	215	225	H	215	200	220	200	225	240	245	S		
2	230	A	A	250	A	A	350	290	A	245	230	245	230	250	215	200	230	200	195	200	H	215	230	245	A		
3	A	A	A	U F 245	A	A	Y	Y	A	A	250	245	225	H	H	220	220	240	230	225	240	220	245	250	A		
4	R	A	A	A	A	A	A	355	A	A	A	245	230	B	220	E B 270	B	E B 250	230	250	B	290	A	A	A		
5	A	A	A	Q 300	A	A	Q 315	295	240	230	200	H	215	215	220	200	205	210	200	195	245	230	240	250	S		
6	A	A	A	360	345	330	325	250	225	H	200	220	220	230	220	195	225	220	205	190	H	225	210	200	280	A	
7	A	A	A	350	U Q 345	375	Q 325	B	A	H	H	220	210	H	220	200	210	215	200	190	H	230	210	230	A	S	
8	A	B	A	A	A	B	B	A	305	240	240	B	B	220	220	225	230	215	215	200	245	245	240	290	A		
9	A	A	A	A	A	A	A	A	A	270	230	230	B	B	250	215	210	225	255	250	260	A	A	A	A	A	
10	A	A	Y	B	B	B	B	B	A	B	B	A	B	230	250	B	B	B	B	B	255	250	310	A	A	A	
11	A	B	B	B	B	Y	B	Y	A	A	B	B	B	B	B	B	B	255	250	375	Q	A	A	A	A	A	
12	A	A	A	A	A	R	A	B	B	290	230	205	H	215	H	230	210	250	225	215	200	230	250	A	A	A	
13	A	Q 300	A	A	B	B	A	A	305	H	230	B	B	B	B	B	B	260	320	A	A	F	A	B	A	B	
14	B	A	A	A	B	Y	B	B	B	A	280	245	290	240	220	250	250	245	235	250	200	240	Q	A	A	A	
15	A	A	A	A	A	A	A	A	B	B	B	B	H	230	B	B	B	B	E B 225	E B 250	230	240	E R 260	B	B	B	
16	A	A	A	A	A	Q 395	300	295	Q 250	230	H	210	230	210	Q 250	225	H	220	225	Q 220	225	240	A	A	Q 350	A	
17	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	220	230	245	240	240	B	B	E B 310	B	B	A	
18	A	A	A	A	A	A	A	A	A	A	240	245	220	205	H	220	210	225	220	220	205	200	230	250	S	S	
19	A	A	A	A	Q 380	Q 325	Q 270	225	H	225	230	195	245	230	210	B	240	250	250	Q	Y	Y	A	Y	Y	B	
20	B	A	B	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	
21	B	A	A	Q 425	A	B	B	B	B	B	B	B	B	B	B	B	B	A	Y	E A 285	295	A	A	A	A	A	
22	A	A	A	B	B	A	Y	A	B	B	B	B	B	B	B	B	250	B	Y	Y	A	A	Y	B	A	A	
23	B	A	B	A	A	A	500	285	250	240	230	H	210	205	200	200	295	B	250	225	A	A	A	Y	Y	Y	
24	A	A	A	Y	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
25	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	250	R	B	305	B	B	A	
26	A	A	B	B	A	Q 325	275	B	B	B	B	E B 275	230	230	B	B	250	245	H	Q 275	A	A	A	A	A	A	
27	A	F	Y	A	A	A	B	B	B	B	A	Y	320	B	B	R	B	270	B	B	B	250	B	A	A	A	
28	A	A	Q 345	Q 350	Q 340	Q 340	Q 310	B	B	240	230	H	205	205	B	B	E B 250	Q 245	255	A	Q 290	Q 330	R	A	A	A	
29	A	B	Y	A	Q 410	Q 300	260	245	225	250	250	B	205	240	275	220	205	Q 225	H	210	225	205	210	240	H	Q 270	
30	345	A	A	A	U Q 400	A	350	200	200	H	210	230	205	200	200	200	200	210	225	215	205	205	245	280	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	2	1	1	7	6	7	12	10	12	16	19	19	18	18	18	19	22	23	24	23	19	13	B	3			
MED	288	300	345	350	352	330	320	288	248	235	230	230	222	220	220	222	228	228	224	240	228	240	250	290	Q		
UQ			355	400	358	350	295	302	245	242	245	230	240	220	232	250	250	248	250	248	245	265	320				
LQ			275	345	325	288	245	225	230	215	218	210	215	200	210	215	218	215	220	210	230	242	280				

The Radio Research Laboratories, Japan

SEP. 1977

H^oF (KM)

IONOSPHERIC DATA

SEP. 1977

H⁺ES (KM)

45° E Mean Time (G. M. T. + 3 h)

Stations Y JWA STATION Lat. 69 00 4 S Long. 39 35 4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	105 ^K	105 ^K	100 ^K	100	95	105	100 ^K	140 ^K	105 ^K	140	G	G	155	125	140	125	G	100	95	110	105 ^K	100 ^K	100 ^K	100
2	105 ^K	100 ^K	160 ^K	100 ^K	100	100	105	110	100	G	110	115	110	105	G	100	100	100	100	100	100 ^K	S	110 ^K	115 ^K
3	115	110	100	100 ^K	100	95	Y	170	100	105 ^K	120	G	140	G	125	130	100	95	100	140	100	100 ^K	100 ^K	150
4	100 ^K	125 ^K	115 ^K	100	105	105	110	100	110	105	110	150	B	B	B	B	B	B	B	B	B	170 ^K	140	135 ^K
5	130 ^K	110	105 ^K	110	110	100	115	95	100	G	G	G	145	150	120	115	G	130	95	115	95 ^K	B	120	125 ^K
6	120	120	115	125 ^K	110 ^K	105 ^K	105	G	105	G	145	145	125	115	115	115	125	105	100	G	120	100	100	110
7	150 ^K	110	125	100 ^K	100 ^K	120 ^K	105	B	140	105	105	170	G	110	135	120	G	110	105	105	100	100	145	145 ^K
8	120	130	90	105	110 ^K	130	100	100	100 ^K	125	G	B	B	G	G	G	G	G	130	B	B	B	105	110 ^K
9	105	110	105	100 ^K	105	105	100	100	100	110	G	B	B	B	100	100	G	B	B	B	100 ^K	110	110	105 ^K
10	100 ^K	110 ^K	Y	130	B	110	B	B	100	B	B	125	B	B	B	B	B	B	B	B	145	110	105	100 ^K
11	115 ^K	110	100	120	120	Y	150	Y	110	100	B	B	B	B	B	B	B	G	B	125	110	140	100	100 ^K
12	100 ^K	130	100	130 ^K	115 ^K	115 ^K	115	B	B	130	G	G	G	125	110	G	115	120	180	B	130	B	110	120 ^K
13	160 ^K	110 ^K	160 ^K	105	B	B	100	100	130	G	G	B	B	B	B	B	B	B	150	115	105	140	120	100
14	100	110	110	125	135	150	B	B	B	100	G	G	G	G	G	145	130	130	125	120	100	B	150	120 ^K
15	150 ^K	110 ^K	120 ^K	100	100	100	100	115	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	145 ^K	105 ^K	105 ^K	100 ^K	150 ^K	100 ^K	120 ^K	105	150	G	G	G	150	110	145	100	130	140	120	105	130	135	120	110 ^K
17	110	110	100	130	110	130	100	B	B	B	B	B	B	B	G	B	B	B	B	B	B	110	B	130 ^K
18	110 ^K	120 ^K	115	105	115	110	110	100	100	100	G	G	G	G	G	G	G	G	G	G	B	95	B	S
19	110	125	105	100	120 ^K	130	G	G	G	150	G	180	150	G	B	G	G	175	135	Y	110	150	130	B
20	B	120	120	175	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	125	110	115	125
21	B	100	100	125 ^K	130	B	B	B	B	B	B	B	B	B	B	B	170 ^K	145	130	130	150 ^K	105 ^K	120 ^K	110
22	100	100	100	B	140	100	100	110	B	B	B	B	B	B	B	B	B	B	110	105	130	105	120	170
23	105	110 ^K	B	105	120 ^K	120 ^K	100 ^K	95	100	120	125	G	115	G	G	120	B	130	B	105	155 ^K	115	130	100
24	100	100	100	165	100	105	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	110 ^K
25	105	100	145	100	100	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	150 ^K
26	155 ^K	105	110	130	130	140	B	B	B	B	B	B	B	G	B	B	B	B	125	125	105	110 ^K	100	120 ^K
27	150 ^K	180 ^K	Y	125	130	100	B	150	B	B	100	G	B	B	G	B	G	B	B	B	B	B	150	135 ^K
28	130 ^K	115 ^K	100 ^K	100 ^K	100 ^K	110	100	B	B	B	G	120	G	B	B	B	B	150	110	110	145	130 ^K	105	105 ^K
29	120 ^K	175 ^K	125	120 ^K	105 ^K	120	G	G	G	130	125	B	G	120	G	145	G	G	B	G	B	100 ^K	100	155 ^K
30	175	100 ^K	140	155	115	100	130	G	100	G	G	G	130	110	105	G	G	B	B	105	100	145	140	115 ^K
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	30	27	29	27	25	19	14	16	13	8	7	9	9	9	11	7	13	16	15	21	21	25	27
MED	112 ^K	110	105	110	110	105	105	102	100	105	115	145	140	115	120	120	125	130	115	110	110	110 ^K	115	115 ^K
UQ	138 ^K	120	120	130	120 ^K	120	112	115	110	130	125	160	150	125	135	128	130	140	130	122	130	135 ^K	130	132 ^K
LQ	105	105 ^K	100	100	100	100	100	100	100	105	108	122	125	110	110	108	108	105	100	105	100	100 ^K	105	108 ^K

SEP. 1977

H⁺ES (KM)

IONOSPHERIC DATA

SEP. 1977

TYPES OF ES

45° E Mean Time (G. M. T. + 3 h)

Stations YJWA STATION Lat. 69 00.4 S Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	K	RK	RK	RA	R	B	BK	HK	KA	HC			H	C	HC	C		R	C	C	SK	TK	TK	F	
2	K	AK	RAK	RK	R	R	B	C	C		C	C	C	C		L	C	L	L	A	LK		K	K	
3	R	RA	AR	RK	RA	R	S	A	R	RK	H		CR	C	H	L	C	L	H	F	K	CK	R		
4	K	KA	K	BA	BA	B	B	RA	C	R	RA	H									AHK	RA	BK		
5	HK	FA	K	RA	RF	RA	RA	AC	C				H	H	C	R		H	L	R	LK		R	HKA	
6	R	R	CK	RK	RK	RK	C		L		H	H	CH	R	C	C	RL	CR	C		F	R	F	F	
7	RKA	RA	RA	LK	BK	HK	B		AR	RA	RA	R		R	H	C		C	L	CH	F	R	RA	K	
8	R	A	R	R	KA	RRA	L	R	K	R									C		K		CK	K	
9	R	RA	R	K	R	RA	B	R	R	RK				R	R						K	K	RS	KS	
10	K	K		RA		R			R			C									RRK	KS	K	K	
11	K	R	R	R	R	A	HCA	A	R	RR										RAK	K	AK	RS	K	
12	KS	R	R	CK	K	K	RA			HK			C	R			K	C	H		R	K	RKA	K	
13	AK	RK	AK	R		R	LA	R											HK	R	RS	AK	RA	R	
14	R	R	RA	R	R	H			R						HKC	RK	K	K	RKL	F	K	RK	KS		
15	AK	K	RK	RA	R	R	R	R							HKC	RK	K	K	RKL	F	K	RK	KS		
16	K	K	K	HK	AK	K	L	R	C				H	K	H	H	C	H	H	AC	RF	K	CK	RK	
17	RA	K	RA	RAF	RA	AR	R															FF		K	
18	KA	KA	R	R	RF	R	R	R	R	C												LK			
19	R	R	R	R	K	H			H		H	H					H	R	S		R	A	A		
20		RA	R	A																	K	R	K	RA	
21		F	R	K	F												HK	R	H	CK	HK	K	K	R	
22	R	RS	RA		RR	R	K	R											CA	A	AR	RA	FA	AR	
23	R	K		R	K	K	LH	C	C	C		C			K		H		RS	HKS	RSA	A	R		
24	R	R	R	A	R	R																		K	
25	R	R	HR	R	R																			RK	
26	RKA	R	R	R	RL	K												R	R	RS	K	RS	RKA		
27	AK	ARK		RF	AK	R		H			C												HK	HK	
28	HK	CK	K	KA	KA	RA	R					C					R	R	RK	H	HK	R	K		
29	RKA	HK	A	KSA	RK	R			H	R			C		H						LK	F	HK		
30	AR	RKA	KA	AK	K	RA	RA		L				H	C	C					C	R	R	RA	K	
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																									
MED																									
UQ																									
LQ																									

SEP. 1977

TYPES OF ES

IONOSPHERIC DATA

OCT. 1977

FxI (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	35	U ₅₀ S	50	S	53	57	60	X ₆₈	X ₇₇	X ₈₄	83	79	70	66	X ₇₀	X ₆₉	65	68	58	U ₅₂ S	40	
2	57	47	A	O ₄₇ R	A	A	U ₅₅ S	60	U ₆₅ S	61	70	70	76	81	B	84	76	70	65	67	69	55	46	S	42	
3	40	U ₇₈ A	A	Y	50	41	O ₄₃ S	70	77	76	76	69	70	81	89	90	90	70	60	S	59	58	40	A	37	
4	A	A	30	S	A	A	A	A	51	56	61	O ₅₉ R	66	66	63	62	65	65	60	50	46	47	40	U ₄₅ S		
5	O ₂₈ R	A	A	52	A	A	X ₄₉	53	58	61	63	61	63	62	65	61	63	60	53	52	47	42	U ₃₂ S	28		
6	S	O ₃₇ R	O ₃₄ R	O ₄₁ R	O ₄₃ S	68	A	57	60	66	72	73	74	75	X ₆₉	69	X ₆₇	63	70	X ₅₈	S	39	O ₂₆ R	30		
7	R	A	U ₇₀ A	S	U ₅₈ A	57	60	57	60	62	64	65	69	X ₇₃	X ₇₀	70	68	65	60	X ₅₈	X ₅₄	47	42	U ₄₆ S		
8	39	35	41	42	U ₈₀ A	57	58	70	O ₅₈ R	O ₆₃ R	70	X ₇₆	X ₈₃	X ₈₅	X ₈₃	X ₇₆	X ₅₉	X ₇₅	O ₇₅ S	X ₆₅	X ₅₅	X ₅₁	A	A		
9	A	A	35	38	S	U ₅₆ S	60	59	67	69	65	65	X ₆₆	X ₆₇	X ₆₆	X ₆₆	X ₆₉	65	62	X ₅₉	60	50	58	U ₄₅ S		
10	39	32	S	40	U ₄₅ S	U ₅₆ S	50	54	60	X ₆₃	X ₇₁	X ₇₅	X ₅₁	X ₇₃	X ₇₇	X ₇₈	X ₇₄	X ₆₆	X ₆₄	X ₆₁	X ₅₃	X ₄₆	X ₃₉	38		
11	A	A	A	A	57	S	53	60	60	65	67	72	76	72	77	78	S	68	65	O ₆₆ R	O ₆₂ S	59	48	U ₄₅ S		
12	U ₅₈ S	A	A	S	A	A	A	A	B	B	R	B	B	B	64	B	B	O ₅₇ R	55	48	O ₃₄ R	O ₃₄ R	A	A		
13	A	A	A	A	50	U ₆₅ S	60	64	B	B	48	61	73	71	73	X ₇₃	X ₇₃	R	X ₇₂	70	O ₅₁ R	48	U ₅₄ S	30		
14	36	A	A	A	A	55	U ₆₄ S	70	68	70	X ₇₀	73	X ₇₇	X ₈₄	X ₈₁	X ₇₈	78	77	70	70	65	S	S	A		
15	A	A	A	52	48	B	65	66	60	56	64	B	B	B	B	X ₅₇	O ₅₄ R	B	60	55	54	46	A	A		
16	46	42	B	Y	44	U ₄₄ A	45	A	R	B	50	57	59	63	69	X ₇₁	63	63	O ₆₀ R	O ₅₅ R	O ₄₉ R	42	38	32		
17	A	A	A	B	B	A	56	A	A	R	B	X ₆₃	62	X ₆₁	X ₅₈	X ₆₀	X ₆₄	X ₆₅	X ₅₇	47	A	A	A	A		
18	A	A	A	U ₇₀ A	S	66	54	B	B	A	B	B	B	B	B	B	58	51	O ₅₄ R	60	A	52	A	B		
19	A	B	70	40	Y	A	Y	B	B	B	B	B	B	B	O ₅₆ R	56	O ₅₄ R	O ₄₄ R	U ₈₄ A	42	37	R	A	20		
20	22	40	60	45	47	49	50	55	58	X ₅₆	O ₅₆ R	B	O ₅₇ R	X ₆₁	X ₆₁	65	O ₆₄ R	O ₅₆ R	X ₅₁	X ₄₂	39	37	40	40		
21	27	40	A	B	57	O ₅₄ R	58	65	66	70	73	76	X ₇₆	X ₈₄	X ₈₄	88	78	X ₇₆	X ₇₀	60	45	40	A	A		
22	A	A	45	48	B	A	B	B	B	B	B	B	B	B	92	78	59	B	O ₅₆ R	62	A	R	A	A		
23	A	B	A	B	37	O ₄₄ R	A	Y	B	R	52	59	61	B	O ₆₆ R	O ₆₄ R	X ₆₄	X ₆₁	X ₆₁	X ₆₀	X ₅₆	X ₅₈	X ₅₆	X ₄₇		
24	A	39	46	42	O ₄₇ R	B	R	53	55	56	X ₅₆	60	X ₆₅	X ₆₇	X ₇₀	X ₇₂	X ₆₅	O ₅₆ R	59	59	60	46	56	60		
25	59	58	A	A	A	O ₅₁ R	59	60	62	X ₆₃	X ₆₇	X ₇₁	X ₇₈	X ₇₂	X ₇₀	70	66	62	X ₆₃	58	58	R	57	R		
26	A	40	A	S	O ₃₇ R	X ₄₈	55	60	58	B	60	60	64	58	59	60	58	53	52	X ₅₀	X ₅₁	50	52	S	47	
27	46	U ₄₀ S	A	A	A	A	U ₇₀ S	60	66	67	60	60	60	B	98	89	84	C	Y	A	U ₆₀ S	A	A	A		
28	40	46	O ₄₀ R	A	A	A	B	Y	A	R	B	Y	B	O ₄₃ R	O ₄₇ R	59	47	56	54	X ₄₀	R	40	A	A		
29	Y	Y	66	A	A	A	Y	75	X ₅₆	B	B	R	O ₅₉ R	R	B	O ₅₆ R	O ₅₇ R	60	X ₅₅	X ₅₄	52	38	41	40		
30	37	A	A	A	U ₅₉ S	A	46	Y	63	61	X ₅₉	O ₅₉ R	X ₆₄	63	63	66	X ₆₀	64	60	O ₅₁ R	R	O ₃₉ R	A	A		
31	Y	A	A	A	A	Y	B	O ₄₈ R	54	59	62	B	63	X ₆₁	61	X ₆₂	X ₆₀	C	X ₅₂	X ₅₂	X ₅₀	45	43	40		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	15	13	12	14	17	16	19	21	22	20	24	22	25	23	27	29	30	26	30	30	25	25	18	19		
MED	39	40	42	42	48	54	55	60	60	62	64	65	66	71	69	70	64	64	60	58	54	46	44	40		
UQ	46	46	65	48	57	S	60	66	63	66	70	73	76	78	X	78	73	68	65	61	60	50	S	45		
LQ	36	39	36	40	44	48	50	55	58	60	60	60	62	62	63	62	59	57	55	51	49	40	40	34		

OCT. 1977

FxI (0.1 MHz)

IONOSPHERIC DATA

OCT. 1977

FOF2 (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	S	J	S	47	50	54	62	70	78	76	U	63	J	59	63	62	U	48	F	F	F									
2	J	B	F	A	F	39	A	A	42	F	U	50	54	U	60	62	65	U	70	B	F	U	60	57	U	50	U	48	U	42	F	U	33	J	33
3	F	24	A	Y	F	J	27	37	F	F	58	J	59	U	60	63	U	75	U	81	F	F	61	U	50	50	F	F	F	F	F	A	F		
4	A	A	F	A	A	A	A	A	F	43	F	J	53	53	58	58	55	53	57	F	F	F	F	J	38	J	39	32	U	26					
5	U	F	A	A	A	A	A	S	F	43	46	52	55	57	55	J	56	U	54	U	57	55	55	54	46	J	46	U	38	J	36	A	U	21	
6	F	F	27	F	U	S	F	A	46	52	J	59	62	J	66	66	U	65	62	62	60	57	53	51	S	F	F	F	F						
7	R	A	U	30	29	U	S	F	F	F	52	55	57	59	62	67	64	64	J	62	J	58	52	J	52	J	48	J	41	F	J	35			
8	U	F	U	26	21	F	S	F	F	F	52	57	64	70	77	80	77	70	53	69	69	59	49	45	A	A									
9	A	A	F	J	27	S	F	U	46	U	47	F	F	58	59	60	60	60	63	59	56	53	44	40	U	36	F								
10	J	F	F	R	F	F	F	F	F	52	57	65	69	65	67	70	72	68	60	58	55	S	S	47	40	32	U	23							
11	A	A	A	A	S	S	F	U	48	50	55	60	64	67	65	69	70	66	60	58	U	57	U	56	F	F	F								
12	A	A	A	S	A	A	A	A	B	B	R	B	B	B	B	F	B	B	U	R	51	49	U	42	F	27	F	28	A	A					
13	A	A	A	A	F	39	U	F	F	B	B	F	F	F	66	64	U	67	67	66	R	66	F	F	44	U	F	F	F	F					
14	F	A	A	A	A	U	S	U	47	52	60	60	62	63	67	70	78	75	71	J	F	71	J	66	U	59	U	59	U	52	S	S	A		
15	A	A	A	F	A	B	U	F	F	F	48	U	52	B	B	B	B	50	48	B	F	F	47	47	U	46	F	A	A						
16	F	F	B	Y	F	F	F	A	R	B	F	48	51	57	62	65	57	56	54	48	43	34	F	U	21										
17	A	A	A	B	B	A	F	A	A	R	B	57	56	55	52	54	58	58	50	F	A	A	A	A											
18	A	A	A	Y	F	F	B	B	A	B	B	B	B	B	B	B	F	F	52	45	48	U	45	A	A	A	B								
19	A	B	F	F	Y	A	Y	B	B	B	B	B	B	B	50	F	48	U	38	38	35	30	A	A	F										
20	F	22	U	25	35	F	J	F	U	43	41	46	50	50	50	B	51	55	55	59	58	50	45	36	32	F	30	J	F	33	F	32			
21	F	F	A	B	U	44	48	U	51	J	56	F	62	U	62	69	70	78	78	71	U	68	70	64	54	R	R	A	A						
22	A	A	A	F	B	A	B	B	B	B	B	B	B	B	B	F	F	F	51	B	F	48	F	45	A	A	A	A							
23	A	B	A	B	F	38	A	Y	B	R	F	F	44	50	53	B	60	58	58	55	55	54	50	52	50	41									
24	A	U	F	F	F	B	R	46	48	49	50	54	59	61	64	66	59	50	51	51	44	39	F	U	50										
25	U	F	F	A	A	A	F	U	43	U	51	53	55	57	60	65	71	65	63	62	U	58	54	57	J	F	F	R	F	R					
26	A	F	A	S	U	31	42	46	F	52	50	B	53	F	J	56	F	52	53	J	53	51	47	46	44	45	43	J	44	J	39				
27	U	F	F	A	A	A	A	F	F	J	59	U	57	52	F	53	B	F	F	F	C	Y	A	F	A	A	A								
28	F	F	34	A	A	A	B	Y	A	A	B	Y	B	E	G	37	41	U	43	41	U	44	40	34	R	F	A	A							
29	Y	Y	F	A	A	A	Y	46	50	B	B	R	53	R	B	50	51	52	48	47	F	32	35	34											
30	F	A	A	A	F	A	F	Y	F	56	55	53	53	58	F	56	59	54	56	F	54	45	R	F	A	A									
31	Y	A	A	A	A	Y	B	F	41	48	52	53	B	56	55	55	56	54	I	C	50	46	46	44	F	39	35	F							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23											
CNT	8	4	4	4	4	8	12	14	17	18	22	20	25	23	24	25	28	26	29	27	20	16	9	11											
MED	29	23	28	32	U	34	42	U	45	47	50	55	58	60	60	64	62	60	58	56	51	48	44	39	35	33									
UQ	36	28	32	37	U	40	45	U	51	52	52	58	62	66	66	68	70	66	61	60	57	54	48	40	36	37									
LQ	23	22	26	28	U	30	38	42	46	50	54	53	54	56	56	55	54	52	50	48	45	40	33	33	U	24									

OCT. 1977

FOF2 (0.1 MHz)

IONOSPHERIC DATA

OCT. 1977

FOF1 (0.01 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	U L	L	400	410	410	U L	L	L	L							
2							300	F 340	F 370	390	390	L	L	U L	B	L	L							
3								F 320	U F	F 370	U F	410	410	L	L	L								
4								A	340	350	F 370	390	410	F 400	U L	L	L							
5								360	370	F 390	F 390	400	410	F 400	L	L	L							
6								A	380	390	400	400	420	L	L	U L	L							
7								F 350	370	400	400	410	420	420	L	L	L							
8					L	F	F	F	B	B	L	420	430	L		L		L						
9							L	F 360	F	F 400	F 400	420	410	420	L	L	L							
10							L	L	390	400	400	410	400	420	420	L	L							
11								A	U F	L	L	L	400	430	U L	L	L	L	L					
12								A	A	B	B	370	B	B	B	390	B	B	B	L				
13								U H	F	B	B	F	L	B	440	L	L	L	B					
14								330	U L	390	400	420	430	430	420	L	L	L						
15								A	380	L	410	F 390	B	B	B	B	L	L	B					
16								U F	A	R	B	Y	410	420	420	410	400	L	L					
17								A	A	A	R	B	390	400	410	410	U L	390	L	L				
18								B	B	A	B	B	B	B	B	B	B	L						
19								Y	B	B	B	B	B	B	B	B	F 400	390	U F	340				
20						F	L	F	350	370	F 400	U R	400	B	B	400	B	F 400	B	B	L			
21							L	400	L	U L	400	420	330	430	L	B	B	B	L	L	B			
22							B	B	B	B	B	B	B	B	B	B	390	390	B	B				
23								A	A	B	A	390	410	430	B	B	B	L	B					
24								A	F	360	390	390	400	400	420	420	410	U L	410	L	B	L		
25								F 360	370	380	400	410	420	410	420	U L	410	400	L	L				
26						310	F 340	F 350	360	B	F 400	F 400	F 400	410	400	400	380	L	L					
27								A	F	370	F 380	380	390	400	B	Y	Y	390	F	C				
28								B	Y	A	A	B	A	B	370	380	370	F 360	F 360					
29								A	A	360	B	B	390	400	400	B	390	370	L	L				
30								A	A	400	400	410	I R	410	F 410	F 420	F 410	L	L					
31								B	360	370	380	400	B	B	410	410	410	400	C					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	6	16	18	18	23	21	21	20	12	13	8	2						
MED						300	335	355	370	400	400	410	410	410	410	400	390	350						
UQ						350	365	390	400	405	410	420	420	415	400	390								
LQ						310	350	370	390	390	400	410	405	400	390	375								

OCT. 1977

FOF1 (0.01 MHz)

IONOSPHERIC DATA

OCT. 1977

FOE (0.01 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station **SYOWA STATION** Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	300	310		J K 360	A	U K 240	150	190	220	235	255	270	260	265	260	250	230	210	190	U A 125	C	U A 95		U K 75	
2	U K 90	U K 120		U K 320	B	A	U K 220	A	240	270	275	A 295	280	280	B	260	250	H 205	175	H	B	B		100	
3	90	140			270	A	150	200	220	240	270	275	275		R	B	B	290	210	U F 200	A	A			
4	U K 280	320		U K 215	B	A	B	A	A	U F 270	270	B	295	280	U F 265	260	250	B	B	B	C				
5	U K 150				B	A	A	220	230	250	255	275	280	280	270	H 255	250	220	180	A	A				
6	U K 140	230		U K 250	B	U K 200	B	A	A	250	B	295	U A 290	290	285	270	240	215	180	H	H	A			
7	180	J K 340	175	U K 170	100	U A 130	180	B	230	265	270	275	275	H 280	B	B	250	210	H	200	120	U A 105	A		
8		U K 100	90	75	100	130	140	230	B	B	Y	290	290	300	295	275	260	220	H	200	150	130	U R 100	J K 360	
9	360	330		A	A	A	190	215	U 255	270	290	280	H 290	290	280	260	240	200	180	150	H	120	B	70	
10	U K 80	U K 70	55	U A 65	80	100	U F 180	220	245	260	270	290	290	280	A 280	H 270	250	220	200	A	U A 100	U A 85	U S 80		
11				A	U K 300	250	A	A	255	255	270	280	280	280	280	270	250	225	200	H	175	115	A	A	
12	J K 360			C	B	A	B	B	B	B	305	B	B	B	280	B	B	B	180	330	U R 165	A	270	230	
13		U K 300	U K 300	U K 250	U K 250	270	175	220	B	B	280	290	B	290	280	260	235	B	B	B	B	A	100	150	
14	U K 210		B	B	A	260	195	220	240	240	275	280	275	280	290	260	260	U A 220	180	A	100	U A 80	A	U K 370	
15			B	290	A	B	340	U K 270	250	H 280	300	H	B	B	B	260	B	B	B	275	U K 230	U F 155	A	310	
16	K 155	U K 110	B	B	B	U K 230	U K 270	A	B	B	U Y 280	290	285	285	270	260	250	215	B	B	B	B	95	100	
17	J K 320		B	B	B	B	240	A	A	A	B	B	B	B	Y	275	250	240	220	210	H 200	U F 310	A	350	390
18	U K 390		B	320	U K 250	U K 280	B	B	B	B	B	B	B	B	B	B	U B 260	225	B	150	U K 350	A	95		
19			U K 245	U K 250	Y	B	B	B	B	B	B	B	B	B	B	A	B	U K 270	280	K 280	U K 220	250	U K 220	120	
20	U K 150	160	160	180	180	200	220	U A 230	250	H	B	B	B	B	270	B	U A 270	B	B	225	200	H 180	U A 150	100	U K 125
21	A	170	B	B	U K 270	B	A	A	250	270	275	270	285	B	B	B	A	B	B	160	A	J K 260	310	J K 320	
22	310	A	B	U K 210	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	180	160	A	300	K 290	
23		B	B	B	250	A	A	A	B	A	300	295	280	B	B	B	260	A	B	B	H 200	A	A	A	S 90
24	K 310	K 145	U A 120	260	260	B	K 370	300	260	265	275	280	280	280	U A 280	270	250	B	U A 200	170	F 150	F 110	90	100	
25	110	A	B	B	B	A	235	230	245	260	280	295	290	A 300	295	270	R 240	240	215	U A 175	A	A	A	330	
26	B	A	A	U K 290	K 320	U K 295	230	230	250	B	300	280	285	280	280	275	260	U A 215	210	180	160	A	A	A	
27	U A 95	A	A	B	A	A	A	A	A	245	250	280	275	B	275	Y	290	K 290	C	210	A	U K 370	220	A	B
28	U K 240	340	245	A	A	A	B	Y	A	A	B	B	B	285	280	270	255	A	220	170	320	U K 320	A	B	
29	290	Y	A	A	B	A	390	A	260	B	B	280	U B 300	B	B	300	B	U R 230	230	180	300	200	U A 130	A	
30	U K 260	B	A	A	B	A	A	A	U A 250	270	275	280	290	300	295	270	250	230	215	170	A	K 230	K 345	K 330	
31	K 300	B	K 330	B	B	B	B	A	U R 260	270	290	B	B	295	270	280	R	I C 240	U R 220	200	B	150	120	U R 100	

	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	15	9	15	12	12	17	13	18	18	22	21	21	20	20	22	23	20	24	22	18	13	15	18
MED	240	170	175	250	250	235	220	220	250	262	275	280	285	280	280	270	250	220	200	175	160	150	130	138
UQ	K 305	K 315	K 245	290	270	K 265	240	230	255	270	290	290	290	290	282	270	260	228	218	200	300	K 230	K 305	K 330
LQ	U K 145	130	120	U K 195	140	165	180	220	240	250	270	280	280	280	272	260	245	212	185	160	120	U A 100	98	100

OCT. 1977

FOE (0.01 MHz)

IONOSPHERIC DATA

OCT. 1977

FOES (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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 90	J 80	J 51	J 36	42	26	20	21	G	G	G	30	G	G	G	J 39	G	25	21	18	12	13	20	J 23
2	19	J 24	29	39	J 53	39	29	J 31	G	33	29	G	G	30	B	G 25	16	23	J 24	E 17	E 11	E 12	E 11	K 10
3	J 25	J 26	27	J 26	K 27	J 42	47	33	G	G	G	G	G	G	E 28	E 30	K 29	23	35	J 25	J 31	J 31	J 35	27
4	J 28	K 32	81	J 26	32	J 28	51	39	39	32	30	E 30	G	G	78	G	26	27	E 20	E 25	E 19	E 12	E 11	J 24
5	J 26	J 28	J 74	J 30	J 61	J 44	27	G	G	G	G	G	G	J 34	J 34	G	G	G	G	11	J 24	J 27	J 24	J 26
6	18	K 23	30	35	39	J 23	40	J 36	29	G	E 28	G	30	G	G	G	G	G	G	G	J 21	24	16	19
7	K 18	J 34	25	J 25	20	20	21	E 26	G	G	G	31	30	G	E 36	E 39	G	24	G	15	12	12	E 10	15
8	17	12	17	J 24	J 24	G	20	24	E 44	E 43	G	G	G	31	G	G	19	G	13	G	G	J 34	J 36	
9	K 36	K 33	J 37	31	J 25	J 23	22	J 34	50	31	G	G	31	G	G	G	G	G	G	G	G	E 11	17	12
10	J 25	J 24	J 24	25	15	18	20	G	G	G	G	G	31	30	35	78	G	G	G	20	15	9	J 20	27
11	J 33	J 34	J 36	45	J 34	J 46	40	J 44	G	G	G	G	G	G	G	G	J 28	G	G	J 23	J 23	20	J 22	18
12	J 36	J 47	39	D 48	65	J 54	56	43	B	B	G	B	B	B	G	B	B	E 44	26	K 33	26	21	32	31
13	J 62	J 74	J 74	34	31	K 27	28	G	B	B	G	33	E 44	G	G	G	G	E 50	E 21	E 20	30	J 53	J 34	22
14	58	42	J 44	47	46	29	G	G	G	G	G	J 46	30	35	G	31	G	J 26	25	28	16	17	18	J 46
15	J 64	89	60	32	J 79	B	K 34	29	G	G	G	B	B	B	B	G	E 34	B	K 28	29	J 25	J 24	K 31	J 10
16	J 41	J 58	67	37	31	41	31	48	35	B	36	G	G	G	G	G	G	E 48	E 32	E 23	E 15	15	J 21	
17	J 32	J 49	60	B	B	53	46	J 49	54	36	B	E 31	E 31	G	G	G	G	G	G	23	39	J 39	K 35	K 39
18	42	44	J 41	K 32	36	30	B	B	J 52	B	B	B	B	B	B	B	G	28	E 34	25	J 39	J 34	50	66
19	40	128	J 40	J 77	Y	39	32	B	B	B	B	B	B	B	E 44	30	E 30	U 27	K 28	30	25	25	K 30	28
20	21	25	J 26	G	G	21	26	28	30	E 31	E 36	B	E 45	31	E 45	29	E 39	E 40	G	J 23	G	19	J 25	J 27
21	J 30	K 17	40	B	31	E 45	35	38	G	G	32	29	G	E 52	E 49	E 40	30	E 34	E 36	G	27	J 26	K 31	J 32
22	K 31	J 46	38	J 79	B	J 43	B	B	B	B	B	B	B	B	E 53	E 30	E 29	B	E 32	J 33	J 34	28	70	32
23	J 35	54	47	B	30	39	114	40	B	38	G	G	G	B	E 44	E 43	30	E 35	E 23	G	28	21	19	17
24	K 31	27	24	K 26	30	B	44	K 30	81	28	G	G	35	G	30	32	G	E 36	22	24	G	20	20	15
25	16	23	57	J 46	44	38	G	G	G	G	G	G	30	34	G	G	30	J 53	26	J 29	30	J 23	J 25	K 33
26	J 49	J 45	J 47	40	32	34	G	G	G	B	G	G	G	G	G	G	G	23	G	G	G	18	30	18
27	20	J 24	J 50	J 53	50	J 55	J 44	40	37	40	G	G	32	B	G	G	J 36	C	J 44	J 65	70	34	J 53	45
28	J 89	K 34	24	43	52	52	105	J 53	49	B	40	G	B	G	G	30	G	32	29	G	K 32	J 37	51	28
29	K 29	39	25	J 78	38	46	K 39	35	G	B	B	G	G	E 34	B	G	E 26	G	G	25	K 30	K 20	20	21
30	33	36	45	41	32	46	35	40	28	G	G	G	G	G	G	G	G	G	G	G	34	27	K 34	J 49
31	66	34	45	42	46	37	B	29	G	G	G	B	E 42	G	39	G	G	C	G	21	E 25	G	G	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	28	28	29	27	28	26	23	25	24	25	24	27	29	30	27	31	31	31	31	31	31
MED	32	34	40	36	33	38	32	32	G	G	G	G	G	G	G	G	G	E 24	E 21	22	25	21	25	27
UQ	J 42	J 46	50	46	46	44	42	40	38	32	G	30	30	30	U 28	U 24	U 28	U 26	26	30	J 27	34	32	
LQ	25	26	28	28	30	27	22	22	G	G	G	G	G	G	G	G	G	G	G	E 11	E 14	13	18	18

OCT. 1977

FOES (0.1 MHz)

IONOSPHERIC DATA

OCT. 1977

FBES (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station **SYOWA STATION** Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	K30	K31	A51	J36	A42	U24	G	G	G	G	G	29	G	G	G	G	G	23	G	12	E10	10	17	U7	
2	U9	K14	A29	U32	A53	A39	U22	20	G	G	G	G	G	G	B	21	16	16	14	E17	E11	E12	E11	K10	
3	10	K14	A27	E26	K27	U20	G	24	G	G	G	G	G	G	E28	E30	29	G	22	13	U20	13	A35	20	
4	J28	K32	22	A26	A32	A28	A51	A39	26	26	G	E30	G	G	G	G	21	E24	E20	E25	E19	E12	E11	14	
5	U15	A28	A74	A30	A61	A44	25	G	G	G	G	G	G	G	G	G	G	G	G	G	11	11	12	A24	17
6	U14	K23	24	U25	34	U20	A40	35	27	G	E28	G	G	G	G	G	G	G	G	G	15	E16	12	9	
7	K18	J34	K17	U17	11	G	G	E26	G	G	G	29	29	G	E16	E39	G	G	G	G	G	10	E10	9	
8	10	U10	11	U11	G	G	19	G	E44	E43	G	G	G	G	G	G	18	G	13	G	G	A34	J36	K	
9	K36	K33	U20	U16	12	16	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	E11	E10	K7	
10	U8	U7	7	G	G	12	20	G	G	G	G	G	31	30	30	G	G	G	G	G	20	14	G	G	10
11	A33	A34	A36	A45	U30	37	40	U32	G	G	G	G	G	G	G	G	G	G	G	G	9	16	11	13	
12	J36	A47	A39	22	A65	A54	A56	A43	B	B	G	B	B	B	G	B	B	E44	23	K33	20	18	A32	A31	
13	A62	A41	U30	A34	U25	U27	28	G	B	B	G	30	E44	G	G	G	G	E50	E21	E20	20	U20	12	K15	
14	U28	A42	A44	A47	A46	K26	G	G	G	G	G	G	30	33	G	G	G	22	25	20	12	10	11	A46	
15	A64	A89	A60	K29	A79	B	K34	U27	G	G	G	B	B	B	B	G	E34	B	K27	U23	U15	19	K31	A100	
16	K15	U11	B	Y	29	U23	U27	A48	E35	B	U36	G	G	G	G	G	G	G	E48	E32	E23	E15	G	G	
17	J32	A49	A60	B	B	A53	31	A49	A54	E36	B	E31	E31	G	G	G	G	G	G	G	22	A39	A39	K39	K39
18	A42	A44	A41	K32	U25	U28	B	B	A52	B	B	B	B	B	B	B	G	G	E34	21	A39	A34	A43	B	
19	A40	B	U24	U25	Y	A39	E32	B	B	B	B	B	B	B	E44	19	E30	U27	K28	28	U22	25	A30	16	
20	17	K16	20	G	G	21	G	25	G	E31	E36	B	E45	30	E45	27	E39	E40	G	G	G	G	15	15	
21	23	K17	A40	B	29	E43	33	33	G	G	30	29	G	E52	E49	E40	U30	E34	E36	G	20	J26	K31	J32	
22	K31	A46	A38	U21	B	A43	B	B	B	B	B	B	B	B	E53	E30	E29	B	E32	22	A34	A28	30	K32	A32
23	A35	B	A47	B	K25	30	A114	E40	B	34	G	G	G	B	E44	E43	27	E35	E23	G	16	15	19	14	
24	K31	K14	13	K26	30	B	42	K30	G	26	G	G	30	G	G	G	G	E36	G	21	G	14	U12	12	
25	G	15	A57	A46	A44	37	G	G	G	G	G	G	30	G	G	G	29	29	G	G	18	15	13	K33	
26	A49	29	A47	U29	K32	U29	G	G	G	B	G	G	G	G	G	G	G	21	G	G	G	11	12	9	
27	G	U20	A50	A53	A50	A55	A44	35	30	G	G	G	31	B	G	G	K29	C	G	A65	U37	A34	A53	A45	
28	U24	K34	K24	A43	A52	A52	B	Y	A53	A49	B	E40	B	G	G	G	G	28	25	G	K32	U32	A51	A28	
29	K29	Y	U20	A78	A38	A46	K39	35	G	B	B	G	G	E34	B	G	E26	G	G	23	K20	K20	G	18	
30	U26	A36	A45	A41	U32	A46	U35	E40	25	G	G	G	G	G	G	G	G	G	G	G	A34	25	K34	A49	
31	K30	A34	A45	A42	A46	E37	B	28	G	G	G	B	E42	G	34	G	G	C	G	21	E25	G	G	G	
CNT	31	28	30	27	28	29	27	27	26	23	25	24	25	24	27	29	30	27	31	31	31	31	31	30	
MED	K28	32	A37	29	32	29	28	26	G	G	G	G	G	G	G	G	G	E16	G	E17	16	14	15	16	
UQ	K34	A38	A47	A42	A46	A45	40	34	26	E26	G	E29	E30	G	G	E19	U22	U22	U18	22	22	22	32	32	
LQ	K15	K16	22	23	25	23	G	G	G	G	G	G	G	G	G	G	G	G	G	G	10	10	11	10	

OCT. 1977

FBES (0.1 MHz)

IONOSPHERIC DATA

OCT. 1977

F-MIN (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	8	10	13	10	8	9	9	9	11	11	10	11	11	11	11	11	8	10	10	10	E ₁₀ C ₁₀	8	6	7
2	6	6	7	12	16	12	7	11	12	23	15	14	11	11	B	14	13	11	7	17	11	12	11	9
3	8	9	8	E ₁₅ C ₁₅	12	10	13	16	11	21	12	12	15	14	28	30	20	12	12	10	E ₁₁ C ₁₁	9	6	6
4	7	10	10	6	12	9	37	18	11	13	11	30	17	18	13	11	13	24	20	25	E ₁₉ C ₁₉	12	11	8
5	6	9	10	E ₁₂ C ₁₂	13	10	10	10	10	10	10	10	12	13	10	12	12	17	14	7	5	6	5	E ₆ C ₆
6	6	8	10	12	15	15	20	E ₁₀ C ₁₀	11	10	28	20	17	16	15	10	12	12	8	E ₆ C ₆	E ₁₀ C ₁₀	16	E ₁₁ C ₁₁	7
7	E ₁₂ C ₁₂	8	9	8	6	8	14	26	16	18	25	E ₁₇ C ₁₇	12	18	36	39	23	14	13	11	7	9	10	6
8	6	9	6	7	7	10	10	13	44	43	23	19	15	14	12	11	10	9	10	12	11	11	7	10
9	10	9	8	6	6	9	13	13	23	13	13	17	12	11	13	12	10	10	9	9	10	11	10	6
10	7	5	5	5	6	8	13	12	11	12	15	19	12	11	12	10	10	10	10	8	7	6	6	7
11	10	9	10	10	9	10	11	8	9	E ₁₁ C ₁₁	10	8	9	10	10	8	8	6	8	6	6	8	9	7
12	10	9	9	E ₁₇ C ₁₇	27	16	22	22	B	B	20	B	B	B	26	B	B	44	16	14	15	11	11	11
13	11	10	17	20	11	16	13	11	B	B	23	18	44	17	20	13	12	50	21	20	15	10	7	8
14	14	16	11	15	13	10	10	11	11	12	12	11	10	10	10	13	10	10	10	E ₁₁ C ₁₁	E ₈ C ₈	5	7	9
15	9	22	21	13	11	B	20	16	14	14	15	B	B	B	B	23	34	B	12	12	10	6	6	11
16	E ₉ C ₉	7	34	26	19	10	12	21	26	B	25	20	15	18	17	18	18	14	48	32	23	15	6	E ₈ C ₈
17	9	13	22	B	B	29	17	15	22	25	B	31	31	24	11	15	9	8	10	10	8	10	15	15
18	10	28	19	22	12	12	B	B	23	B	B	B	B	B	B	B	26	15	34	11	10	8	5	38
19	10	33	11	11	Y	24	21	B	B	B	B	B	B	B	44	19	30	16	8	8	10	7	6	9
20	10	10	10	10	10	12	11	10	10	31	36	B	45	20	45	13	39	40	21	10	8	10	8	8
21	7	6	22	B	17	43	18	12	15	14	16	18	22	52	49	40	23	34	36	13	8	E ₁₅ C ₁₅	9	E ₁₃ C ₁₃
22	13	10	16	6	B	18	B	B	B	B	B	B	B	B	53	30	29	B	32	13	9	8	20	19
23	5	33	17	B	15	18	13	22	B	20	21	14	15	B	44	43	20	35	23	12	11	8	10	7
24	E ₁₂ C ₁₂	8	8	10	13	B	16	11	10	12	11	11	11	13	11	12	18	36	13	13	13	E ₈ C ₈	7	8
25	10	8	17	17	20	16	11	10	10	10	10	12	10	E ₁₁ C ₁₁	11	11	12	10	10	9	10	8	7	18
26	9	10	10	10	15	10	9	9	10	B	21	12	12	12	11	11	14	10	10	15	10	9	8	7
27	8	6	11	19	18	10	14	E ₁₂ C ₁₂	E ₁₄ C ₁₄	10	10	11	10	B	15	23	10	C	9	10	8	7	12	35
28	15	10	23	10	8	15	B	50	17	15	B	23	B	20	19	11	10	10	11	8	10	11	12	20
29	17	25	8	13	28	11	21	14	24	B	B	20	30	34	B	21	26	15	22	13	7	9	8	10
30	10	25	13	13	25	14	14	16	13	11	13	20	13	12	10	13	11	10	11	15	11	14	10	21
31	15	13	13	21	24	25	B	16	12	14	23	B	42	26	23	23	24	C	20	15	25	13	17	8
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	29	31	31	31	31	31	31
MED	10	10	11	12	13	12	14	13	14	15	20	19	15	18	17	13	13	14	12	11	10	9	8	8
UQ	10	13	17	18	19	17	20	20	24	D ₄₃ B ₄₃	26	30	43	43	44	23	24	34	20	14	11	11	11	12
LQ	8	8	9	10	10	10	11	10	11	12	12	12	12	12	11	11	10	10	10	10	8	8	6	7

OCT. 1977

F-MIN (0.1 MHz)

IONOSPHERIC DATA

OCT. 1977

M(3000)F2 (0.01)

45° E Mean Time (G. M. T. + 3 h)

Station SYUWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	S	J	S	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
2	J	R	F	A	F	A	A	F	F	F	F	F	F	F	B	F	F	F	F	F	F	F	F	F
3	F	F	A	Y	F	J	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
4	A	A	F	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
5	U	F	A	A	A	A	A	S	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
6	285	F	260	F	U	255	F	A	270	F	285	270	290	295	290	315	330	345	335	335	360	335	S	F
7	R	A	U	F	260	U	285	F	F	F	275	305	285	290	F	305	305	305	330	F	335	335	345	345
8	F	F	F	S	S	F	F	F	F	260	280	280	305	300	290	310	330	375	335	340	340	325	315	A
9	A	A	F	J	S	F	U	F	F	F	F	285	290	F	290	300	310	310	345	340	340	330	F	F
10	U	F	F	R	F	F	F	F	F	F	275	290	265	275	295	290	300	375	335	350	345	350	355	S
11	A	A	A	A	S	S	F	U	F	265	280	285	295	295	F	295	295	305	320	F	335	345	340	F
12	A	A	A	S	A	A	A	A	B	B	R	B	B	B	F	B	B	U	R	300	F	U	F	F
13	A	A	A	A	F	250	U	F	F	B	B	F	F	F	310	320	U	F	315	315	320	R	325	F
14	F	A	A	A	A	U	S	F	F	260	285	265	275	270	280	F	285	295	315	325	J	F	J	F
15	A	A	A	F	A	B	F	F	F	F	250	F	B	B	B	B	B	B	B	375	300	B	315	320
16	F	F	B	Y	F	F	F	A	R	B	F	290	F	300	280	F	305	330	310	320	315	335	F	F
17	A	A	A	B	B	A	F	A	A	R	B	260	295	F	305	305	285	295	330	305	F	A	A	A
18	A	A	A	Y	F	F	B	B	A	B	B	B	B	B	B	B	F	F	F	310	U	F	A	A
19	A	B	F	F	Y	A	Y	B	B	B	B	B	B	B	B	260	260	F	270	F	285	285	F	F
20	F	265	U	F	275	F	U	F	260	F	280	265	260	B	R	260	265	275	270	F	295	295	300	320
21	F	F	A	B	F	270	U	F	J	F	285	F	285	F	290	F	285	310	305	310	F	U	F	F
22	A	A	A	F	B	A	B	B	B	B	B	B	B	B	F	F	F	F	F	320	B	F	F	F
23	A	B	A	B	F	260	A	Y	B	R	F	260	280	F	295	B	370	340	340	325	345	335	335	335
24	A	U	F	F	F	B	R	275	F	270	270	265	280	F	280	285	310	305	325	340	335	335	F	F
25	U	F	F	A	A	A	245	F	U	F	275	285	275	275	270	275	295	310	315	330	F	F	345	350
26	A	F	A	S	F	260	260	275	F	255	B	280	F	J	F	F	285	J	F	285	335	340	325	320
27	U	F	F	A	A	A	A	F	F	J	F	F	260	F	255	B	F	F	F	F	C	Y	A	F
28	F	F	275	A	A	A	B	Y	A	A	B	Y	B	G	220	R	F	F	F	F	F	295	325	
29	Y	Y	F	A	A	A	Y	255	F	265	B	B	R	285	R	B	280	260	290	F	315	320	F	F
30	F	A	A	A	F	A	F	Y	255	F	275	270	265	285	290	F	270	295	300	320	F	315	310	R
31	Y	A	A	A	A	Y	B	F	260	F	250	F	285	B	285	F	290	290	300	305	320	325	340	320
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	7	3	4	4	2	8	10	12	17	18	18	19	25	20	21	24	25	24	27	23	14	15	7	9
MED	285	270	270	270	F	270	275	275	270	275	280	285	290	298	305	312	320	335	325	325	F	330	315	315
UQ	292	280	278	278		265	285	280	280	280	285	292	295	308	315	330	335	340	345	335	335	335	325	325
LQ	278	268	262	262		255	U	F	F	260	F	265	260	F	265	270	280	285	290	290	F	295	300	320

OCT. 1977

M(3000)F2 (0.01)

IONOSPHERIC DATA

OCT. 1977

H'F2 (KM)

45° E Mean Time (G. M. T. + 3 h)

Station SYUWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L	L	345	320	280	260	245	250	L							
2							375	360	430	365	315	305	320	300	B	240	240							
3								305	340	325	325	330	350	290	290	280								
4								A	465	445	400	370	350	295	295	L	L							
5								400	390	370	350	360	345	300	L	L	L							
6								395	355	350	335	320	325	L	280	260	L							
7								425	375	350	350	335	310	295	L	275	245							
8					L	F	400	415	B	375	320	300	305	270		L		L						
9							L	360	F	355	350	330	330	320	L	295	250							
10							L	L	360	400	330	305	300	300	280	240	240							
11							A	U H	350	370	355	300	325	305	300	285	L	245	230					
12							A	A	B	B	R	B	B	B	430	B	B	B	L					
13							U H	440	390	B	B	U F	525	L	300	295	325	280	270	B	280			
14							330	350	350	350	375	370	330	295	270	290	250	240						
15							300	355	375	485	450	B	B	B	B	290	L	B						
16							550	A	R	B	Y	390	350	375	300	275	L	L						
17							300	A	A	R	B	400	350	320	345	U Y	355	320	270	L				
18							B	B	A	B	B	B	B	B	B	B	L							
19							Y	B	B	B	B	B	B	B	430	430	420	U F	590					
20					340		L	400	400	420	450	B	E B	450	405	395	375	325	B	L				
21							L	355	L	300	330	300	315	300	295	270	295	265	250					
22							B	B	B	B	B	B	B	B	410	350	305	B	300					
23							A	A	B	R	480	410	360	B	290	265	250	250						
24							A	400	405	400	425	385	355	345	300	300	270	B	250	250				
25							390	380	380	390	375	350	300	295	275	275	L	L						
26					430	430	385	450	B	380	480	340	370	375	380	C	290	L						
27							A	F	400	440	400	450	450	B	475	445	375	C						
28							B	Y	A	A	B	Y	B	G	650	U F	560	625	450					
29							A	450	420	B	B	R	395	380	B	400	435	L	L					
30							Y	Y	450	370	420	430	375	H	360	U H	355	U H	300	L	L			
31							B	R	435	445	370	B	375	350	365	340	305	C						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	8	17	19	19	23	21	25	23	23	25	19	9	3					
MED						385	382	385	400	370	370	350	335	300	300	290	290	265	250					
UQ						435	400	425	410	410	390	352	355	385	355	322	280	275						
LQ						315	355	372	352	332	320	310	295	288	275	250	250	250						

The Radio Research Laboratories, Japan

OCT. 1977

H'F2 (KM)

IONOSPHERIC DATA

OCT. 1977

H'F (KM)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	350	280	230	200	230	200	230	225	U	200	210	200	205	225	210	215	210	215	230	250					
2	265	315	A	370	A	A	350	250	240	220	200	205	240	205	B	230	225	225	210	230	225	210	245	240						
3	245	325	A	A	U	300	A	280	270	215	230	225	200	195	200	220	E	240	255	230	235	250	250	U	350	A	A			
4	A	A	A	A	A	A	A	A	A	300	240	225	225	220	210	205	220	250	240	230	230	250	235	230	E	300	A	A		
5	U	A	A	A	A	A	A	320	230	230	220	230	225	205	220	205	230	210	225	225	220	230	280	A	A	A	A			
6	350	400	A	390	A	280	A	A	A	230	240	245	230	225	205	H	240	210	220	225	220	230	250	E	340	C	A			
7	R	A	380	385	330	280	255	250	235	225	225	220	200	240	250	B	B	205	230	215	210	205	230	220	225	A	A			
8	250	280	305	S	315	280	250	245	B	B	230	200	200	275	230	230	230	220	230	230	220	230	A	A	A	A				
9	A	A	A	370	U	340	280	250	210	240	200	210	205	215	205	H	225	205	230	220	H	230	210	210	225	230	235			
10	275	260	U	H	H	340	330	275	270	245	225	200	225	240	220	205	220	220	220	220	220	215	225	210	225	225	280			
11	A	A	A	A	365	A	A	A	270	255	235	205	215	205	205	230	220	225	230	230	215	230	240	250	A	A	A			
12	A	A	A	320	A	A	A	A	B	B	270	B	B	B	230	B	B	B	290	335	355	E	305	A	A	A	A			
13	A	A	A	A	A	Y	350	250	B	B	230	225	B	230	220	230	230	B	230	225	225	E	270	250	370	Q	A			
14	A	A	A	A	A	350	255	225	210	220	230	U	H	220	200	230	230	200	200	225	230	235	210	230	275	A	A			
15	A	A	A	330	A	B	A	270	205	245	240	B	B	B	B	240	B	B	295	260	250	330	A	A	A	A				
16	F	275	Q	B	Y	A	U	370	350	A	R	B	A	225	U	H	195	250	230	230	230	245	B	250	240	255	310	U	340	Q
17	A	A	B	B	B	B	A	A	A	A	A	B	240	240	275	220	260	225	230	240	U	330	A	A	A	A	A			
18	A	B	A	Y	U	275	290	Q	B	B	A	B	B	B	B	B	B	250	250	295	280	Q	A	A	A	A	B			
19	A	B	320	330	Y	A	A	B	B	B	B	B	B	B	B	B	250	250	A	345	380	335	A	A	A	A	A			
20	A	365	400	350	320	290	280	230	200	225	B	B	B	B	225	B	H	230	B	B	250	275	295	260	260	285	A	A		
21	A	A	B	B	330	B	A	255	230	220	225	225	H	230	B	B	B	255	R	B	B	245	330	H	R	A	A	A		
22	A	A	A	300	B	A	B	B	B	B	B	B	B	B	B	B	250	250	B	B	250	A	A	B	A	A	A	A		
23	A	B	A	B	A	B	A	A	B	A	240	200	255	B	B	B	220	B	235	230	230	225	240	275	A	A	A	A		
24	A	395	325	355	380	B	A	255	250	235	225	210	200	200	H	225	220	220	B	225	230	H	230	275	285	255	Q	255		
25	245	260	A	A	A	A	200	240	215	240	205	225	225	200	205	230	225	225	230	H	215	H	230	240	300	A	A	A		
26	A	A	A	A	375	A	200	225	210	B	205	205	195	200	H	220	215	220	225	225	220	H	245	240	245	250	Q	250		
27	280	A	A	A	A	A	A	A	A	200	190	H	230	235	B	Y	Y	300	C	Y	A	U	350	A	A	A	Y	A		
28	U	450	415	395	A	A	A	B	Y	A	A	B	A	B	230	250	250	250	270	275	255	R	A	A	A	B	A	B		
29	Y	Y	A	A	A	A	A	A	240	B	B	220	205	250	B	B	Y	255	230	240	250	Q	310	300	260	290	A	A		
30	400	A	A	A	A	A	A	A	220	H	210	215	200	200	230	205	200	220	245	225	275	H	A	325	A	A	A	A		
31	Y	A	A	A	A	A	B	E	250	210	205	200	B	B	250	210	230	230	I	220	230	235	245	245	275	290	A	A		
CNT	10	10	7	11	11	10	14	17	20	19	23	23	22	23	21	24	28	21	27	30	26	24	17	15						
MED	278	320	340	350	330	285	268	242	225	225	225	220	210	220	220	230	228	225	230	232	235	237	245	265						
UQ	400	395	388	370	352	350	320	250	240	238	232	225	225	230	230	232	250	230	240	255	250	279	275	289						
LQ	250	275	322	330	308	280	250	230	210	220	208	205	200	205	210	218	220	225	225	225	220	230	230	250						

The Radio Research Laboratories, Japan

OCT. 1977

H'F (KM)

IONOSPHERIC DATA

OCT. 1977

H'ES (KM)

45° E Mean Time (G.M.T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	170 ^K	140 ^K	100	105 ^K	105	120 ^K	140	140	G	G	G	150	G	G	G	105	G	150	135	125	130	115	100	100 ^K	
2	95 ^K	130 ^K	120	125 ^K	100	100	110 ^K	120	G	125	105	G	G	155	B	100	100	100	95	B	B	B	B	140 ^K	
3	170 ^K	115 ^K	110	140	125 ^K	120	130	120	G	G	G	G	G	G	B	B	130 ^K	100	125	130	125	130	105	105	
4	110 ^K	110 ^K	100	130 ^K	120	110	105	120	100	105	130	B	G	G	105	G	120	130	B	B	C	B	B	130	
5	135 ^K	110	105	120	100	105	105	G	G	G	G	G	G	100	110	G	G	G	G	100	95	135	135	100	
6	130 ^K	110 ^K	120	120 ^K	115	110 ^K	100	100	105	G	B	G	110	G	G	G	G	G	G	G	95	155	175	125	
7	120 ^K	105 ^K	140 ^K	105 ^K	110	105	120	B	G	G	G	160	155	G	B	B	G	135	G	105	95	100	B	95	
8	95	100 ^K	125 ^K	120	170	G	125	120	B	B	G	G	G	105	G	G	95	G	95	G	G	G	130	115 ^K	
9	115 ^K	120 ^K	115	110	100	105	125	110	170	135	G	G	100	G	G	G	G	G	G	G	G	B	100	125 ^K	
10	145 ^K	150 ^K	145	145	130	130	130	G	G	G	G	G	130	E 130	120	130	G	G	G	105	140	100	120	140	
11	120	120	110	100	105 ^K	100 ^K	100	100	G	G	G	G	G	G	G	G	95	G	G	120	105	100	100	140	
12	105 ^K	100	100	150	110	100	110	110	B	B	G	B	B	B	G	B	B	B	155	110 ^K	150	135	130 ^K	125 ^K	
13	105	130 ^K	135 ^K	130 ^K	115 ^K	125 ^K	130	G	B	B	G	125	B	G	G	G	G	B	B	B	130	125	125	130 ^K	
14	125 ^K	120	105	100	100	105 ^K	G	G	G	G	G	100	120	115	G	120	G	105	155	100	125	125	140	105 ^K	
15	100	110	100	145 ^K	105	B	110 ^K	105 ^K	G	G	G	B	B	B	B	G	B	B	115 ^K	125 ^K	135	110	100 ^K	110	
16	150 ^K	140 ^K	105	120	110	150 ^K	105 ^K	100	115	B	115	G	G	G	G	G	G	G	B	B	B	B	150	130	
17	115 ^K	105	100	B	B	105	145 ^K	105	100	115	B	B	B	B	G	G	G	G	G	G	130	95 ^K	110	115 ^K	115 ^K
18	100 ^K	125	100	105 ^K	105 ^K	100 ^K	B	B	100	B	B	B	B	B	B	B	G	170	B	140	110 ^K	110	150	100	
19	95	100	110 ^K	100 ^K	Y	125	110	B	B	B	B	B	B	B	B	110	B	115 ^K	100 ^K	100 ^K	105 ^K	105 ^K	105 ^K	130 ^K	
20	125 ^K	120 ^K	105	G	G	105	100	150	95	B	B	B	B	115	B	105	B	B	G	100	G	125	110	100 ^K	
21	100	100 ^K	125	B	110 ^K	B	105	100	G	G	120	110	G	B	B	B	120	B	B	G	100	120	110	110 ^K	
22	120 ^K	100	100	125 ^K	B	100	B	B	B	B	B	B	B	B	B	B	B	B	B	B	140	110	105	180 ^K	155
23	100	100	100	B	155 ^K	125	100	100	B	100	G	G	G	B	B	B	110	B	B	G	100	100	110	130	
24	110 ^K	150 ^K	110	105 ^K	105 ^K	B	130 ^K	100 ^K	105	100	G	G	120	G	100	115	G	B	110	130	G	150	140	120	
25	100	145	150	100	100	110	G	G	G	G	G	G	105	105	G	G	150	125	125	120	120	160	100	140 ^K	
26	105	100	100	105 ^K	120 ^K	100 ^K	G	G	G	B	G	G	G	G	G	G	G	100	G	G	G	100	100	145	
27	150	120	105	100	105	95	105	100	105	150	G	G	115	B	G	G	150 ^K	C	145	150	140 ^K	130 ^K	100	110	
28	145 ^K	100 ^K	B	105	100	105	B	155	150	100	B	115	B	G	G	100	G	150	145	G	100	105 ^K	105 ^K	100	
29	120 ^K	120	105	100	100	100	105 ^K	100	G	B	B	G	G	B	B	G	B	G	G	150	100 ^K	105 ^K	130	120	
30	115 ^K	130	110	110	130	110	105	105	100	G	G	G	G	G	G	G	G	G	G	G	105	110 ^K	110 ^K	150 ^K	
31	140 ^K	130	145 ^K	105	105	100	B	100	G	G	G	B	B	G	105	G	G	C	G	145	B	G	G	155	
	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	30	27	27	27	24	21	11	8	4	6	8	7	5	8	9	11	12	19	22	25	27	31	
MED	115 ^K	120	108	110	105	105	110	105	105	110	118	120	118	110	105	108	120	125	125	125	108	110	110	125	
UQ	132 ^K	130	120	125	118	115	128	120	110	130	125	150	125	118	110	118	130	142	145	135	130	130	132	135	
LQ	102	102	100	105	102	100	105	100	100	100	110	110	108	105	105	102	100	102	105	105	100	105	102	108	

OCT. 1977

H'ES (KM)

IONOSPHERIC DATA

OCT. 1977

TYPES OF ES

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	AK 13	AAK 11	R 2	K 3	R 3	RK 21	H 1	H 1				H 1			L 1		H 1	C 1	C 1	H 1	CL 1	F 1	LK 21		
2	LR 11	RK 21	RA 11	RKA 21	R 2	R 1	RLK 21	R 1		C 1	R 1			H 1	L 1	L 1	L 1	L 1						K 1	
3	HK 11	RK 31	R 4	RA 11	K 1	R 1	AR 11	R 1									K 1	R 1	R 2	RA 11	RL 11	R 2	R 6	R 7	
4	K 6	K 6	AR 12	CK 11	RA 21	RA 11	R 1	R 1	RL 21	R 2	HL 11				R 1		L 1	C 1						RA 11	
5	RK 23	RA 41	AR 13	RA 31	R 2	AR 13	RA 11							L 1	C 1					L 1	L 1	RF 11	R 2	FRA 11	
6	CK 21	K 7	R 4	RK 21	R 2	RAK 11	R 1	R 2	R 2				R 1								LR 11	R 1	R 1	R 1	
7	K 1	KA 41	RKA 11	RKA 21	R 1	R 1	R 1					H 1	H 1					R 1		C 1	R 1	C 1		F 1	
8	F 1	LK 11	RK 11	AR 11	A 1		C 2	C 2						R 1			L 1		L 1				R 2	K 6	
9	K 7	K 5	R 3	RS 21	RA 21	CA 11	R 1	C 1	AC 11	H 1				C 1									L 1	RK 11	
10	RAK 11	RAK 11	CA 11	AHL 11	HA 11	HR 11							H 1	H 1	C 1	H 1				R 1	R 1	C 1	C 1	R 1	
11	R 3	R 4	RA 31	R 3	RK 31	RKA 11	RA 11	R 3									L 1			C 1	C 1	C 1	C 1	RA 11	
12	KA 41	RA 31	RA 11	ARC 11	CA 11	R 1	R 1	R 1											H 1	K 1	R 1	H 1	CK 22	CK 22	
13	AR 12	ARK 11	AK 11	RKA 11	RKA 21	K 1	H 1						H 1								H 1	C 2	C 2	HKA 12	
14	ACK 11	R 2	R 2	R 1	R 2	RK 12							LC 11	C 1	C 2	C 1		C 3	HA 11	LR 11	RL 11	HL 11	RA 11	RKA 11	
15	RA 31	RA 11	R 1	HK 11	CA 11		K 1	RK 11											K 1	RAK 11	AR 12	RA 11	KA 51	RA 11	
16	ARK 11	AK 11	R 1	A 1	R 1	AK 11	RK 12	R 1	R 1			C 1											RA 11	C 1	
17	K 4	R 2	R 1			R 1	AHK 11	R 1	RR 11	R 1										R 2	LKA 12	RA 31	KA 11	K 2	
18	RK 22	R 1	R 1	K 1	KA 11	RK 11			R 1									A 1		H 2	RK 13	R 4	AH 11	F 1	
19	R 1	FA 11	RAK 11	RAK 11		R 1	C 1									R 1		KA 11	K 2	RK 13	RK 12	K 3	RK 55	HK 21	
20	CK 21	CK 11	C 1		C 1	L 1	HL 11	L 2													L 1	C 1	C 2	RK 11	
21	R 3	K 3	R 1		RK 11		R 1	R 2									R 1					R 1	K 3	KS 21	K 4
22	K 2	RA 21	R 1	CAK 21		C 1															C 1	R 3	R 3	AK 11	HA 11
23	RA 31	R 1	R 1		HLK 11	RL 11	LR 21	R 1		R 1							C 1					L 1	C 1	C 1	R 1
24	K 6	RR 11	R 1	K 3	RK 11		HK 11	K 2	C 1	R 1													RA 11	RA 11	C 1
25	LH 11	HR 11	R 1	R 1	R 1	R 2																		RA 11	K 1
26	RA 41	AR 12	R 3	RKA 13	K 1	RK 13												R 1					L 2	LH 21	HC 11
27	RC 11	RA 11	R 3	R 1	R 1	RA 11	R 2	R 3	R 2	H 1							RK 11		A 1	RAK 11	AK 11	CKA 43	RA 11	R 1	
28	ARK 12	KA 21	K 1	RL 11	RL 11	R 1		A 1	HR 11	R 1						R 1		HR 12	R 1		K 2	RAK 11	R 2	R 1	
29	K 1	A 1	RA 21	R 2	R 1	R 1	K 1	R 1												H 1	K 2	K 1	HC 11	C 2	
30	CK 41	RA 11	R 2	R 1	R 1	R 1	K 1	R 1	R 1												R 1	RK 11	K 4	RK 11	
31	AK 11	R 1	HK 11	R 1	C 1	L 1		R 1																	H 1
	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																									
MED																									
UQ																									
LQ																									

OCT. 1977

TYPES OF ES

IONOSPHERIC DATA

NOV. 1977

FXI (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	46 ^S	56	57	68	72	81	86	86	83 ^X	81	80 ^X	75 ^X	74	73	71	70	64	63	60	68	68	59
2	54 ^S	5	5	53 ^X	59	54	69	68	73	84	80	78	73 ^X	73	70	70	66 ^X	60 ^X	58 ^X	57	55 ^X	51 ^X	52	5
3	42	5	47	52	59	69	77	83	83	85	87	78	70 ^X	68 ^X	68	64 ^X	63 ^X	67 ^X	63 ^X	58 ^X	56 ^X	53 ^X	52	56 ^S
4	U57	57	58 ^S	60 ^X	67	68	78	87	90	90	87	82	77 ^X	72 ^X	73	73	73 ^X	74 ^X	69 ^X	56 ^X	046	R	A	A
5	049	046	U68	U57	A	B	B	Y	A	63	65	65	66	67	65	066	64	62	57 ^X	55 ^X	52	56 ^X	47	37
6	Y	038	Y	A	A	63	A	67	70	76	72 ^X	72	75	76	75	74	76	72 ^S	67	60	51	49	047	46
7	47	46	52	55	55	A	57	62	70	74	75	75	75	81	81	74	66	56	50	48	50	50	55	51
8	40	45	56	67 ^U	70	80	76	76	77	82	82	79	81	81	80	75	68	65	63	60	60	59	55	42
9	44	50	52 ^S	58 ^S	58	U74	77	82	86	78	85	86	83	82 ^X	79 ^X	72 ^X	72 ^X	69 ^X	69 ^X	63 ^X	59	55 ^S	55	47
10	46	53	60	52 ^X	67 ^S	U76	81	83	90	90 ^X	86 ^X	88 ^X	86 ^X	90 ^X	87 ^X	80 ^X	70 ^X	66 ^X	59	65	58	53	52 ^X	5
11	Y	U5A	60	A	U50	U65	67	70	69	66	65	70 ^X	70 ^X	72 ^X	70 ^X	71 ^X	70 ^X	64 ^X	C	58	55	54 ^X	55 ^X	58 ^X
12	S	55	52 ^S	050	54	U70	Y	Y	A	R	55	57	052	57	65	65	062	62	51	52	46 ^X	43	A	U51
13	050	Y	51	Y	B	56	54	B	B	R	Y	052	57	B	80	80	72	65	U70	U66	A	A	A	A
14	A	55	50	A	Y	060	Y	57	R	048	48	67	057	81	77	62	056	051	U90	46	51	A	A	A
15	043	A	55	B	B	Y	057	Y	A	058	B	58	61	62	B	73	063	53	U50	52	U67	U57	Y	046
16	53	B	U46	B	B	B	B	75	82	82	B	081	80	B	87	085	85	B	55	56 ^X	54 ^X	47 ^X	42	40
17	045	66	43	48	60	B	64	64	67	65	70	68	67	67	069	68	065	061	58 ^X	60	56 ^X	59	60	58
18	60	A	A	55	60	84	80	70	069	78	80	80	79	80	80	82	75	67	63 ^X	56 ^X	45	46	47	051
19	Y	Y	B	U50	052	R	A	Y	70	70	75	77	80	76	57	75	71	65	60 ^X	58	53 ^X	52 ^X	40	R
20	44	B	46	A	70	56	56	67	71	67	64	71	76 ^X	79 ^X	76 ^X	73 ^X	69 ^X	68 ^X	63 ^X	58	57 ^X	59 ^X	60 ^X	58
21	46	U46	A	Y	A	68	70	76	75	74	77	80	76 ^X	73 ^X	69 ^X	67	65	60 ^X	60 ^X	60 ^X	59	60	59	60
22	53 ^S	60	055	U56	56	U80	85	92	94	91	88	88 ^X	84 ^X	80 ^X	73 ^X	B	B	B	B	B	B	B	B	B
23	B	B	B	B	B	B	B	B	R	090	086	82 ^X	82 ^X	83 ^X	80 ^X	76 ^X	69 ^X	65 ^X	60 ^X	058	056	057	057	062
24	063	B	B	B	B	78	84	B	089	85	85	88	090	87 ^X	77 ^X	71 ^X	67 ^X	65 ^X	62 ^X	60 ^X	58	56 ^X	063	64 ^X
25	68 ^X	69	075	80 ^X	85	85	93	96	101	101	96	91	88 ^X	87 ^X	91 ^X	73 ^X	71 ^X	69 ^X	67 ^X	62 ^X	60	66	U70	R
26	70	70	A	Y	60	74	Y	59	Y	Y	053	52	056	056	58	62	62	62	055	55	48	50	49	50
27	46	48	57	U63	R	R	70	70	69	71	69	77	72	67 ^X	66 ^X	64	64 ^X	54 ^X	52 ^X	52 ^X	53 ^X	53 ^X	050	46
28	43	S	048	R	A	R	57	69	65	68	68	68	68	65	66	63	62	59	56 ^X	55 ^X	52 ^X	53 ^X	57 ^X	56 ^X
29	54	047	52	U60	U67	69	76	81	80	75	71	67 ^X	67 ^X	67 ^X	71 ^X	69 ^X	71 ^X	72 ^X	59	60	56 ^X	54 ^X	48	47
30	R	050	57	U57	50	R	57	66	67	66	B	066	66	65	57	64	69 ^X	65	59	57	53	46	46 ^X	45 ^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	23	19	22	18	19	20	22	23	23	27	26	30	30	28	29	29	29	28	28	29	28	26	24	22
MED	47	50	52	56	59	69	71	70	75	76	76	77	75	74	73	72	69	65	60 ^X	58	55	54	54	51
UQ	54	56	57	U60	67	77	78	82	86	85	85	81	80 ^X	81	80	74	71 ^X	68 ^X	64 ^X	60	58	57	58	58
LQ	44	46	48	52	56	64	57	67	70	68	68	67	67	67	68	66	64	60	56	55 ^X	52	50	48	46

NOV. 1977

FXI (0.1 MHz)

IONOSPHERIC DATA

NOV. 1977

FOF2 (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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 ₃₁	J ₃₄	F ₃₇	F ₄₈	J ₅₀	J ₆₂	F	F	F ₇₅	F ₇₆	F ₇₇	F ₇₄	F ₇₃	F ₆₉	F ₆₇	F ₆₅	U ₆₃	U ₆₃	J ₅₈	F ₅₆	U ₅₃	F ₅₀	U ₄₈	F	
2	F ₄₆	S	S	F ₄₇	U ₅₃	F	F ₅₅	F ₆₀	F ₅₉	F ₇₄	F ₇₀	F ₇₀	F ₆₇	F ₆₆	U ₆₄	F ₆₃	F ₆₀	F ₅₄	F ₅₂	F ₅₀	F ₄₈	F ₄₅	F	S	
3	J ₃₆	S	F	U ₄₅	F	F	J ₆₉	J ₇₅	F ₇₆	F ₇₅	F ₇₈	F ₇₀	F ₆₃	F ₆₁	F ₆₁	F ₅₈	F ₅₇	F ₆₀	F ₅₇	F ₅₂	S	F ₄₇	F	F	
4	U ₃₇	J ₄₂	F ₄₈	F ₅₃	F ₅₇	F ₆₁	U ₆₅	F	U ₈₀	F ₈₃	F ₈₀	F ₇₅	F ₇₀	F ₆₆	F ₆₇	F ₆₇	F ₆₇	F ₆₈	F ₆₂	F ₄₉	F ₄₀	A	A	A	
5	U ₄₀	F	F	F	A	B	B	Y	A	U ₅₂	U ₅₅	F ₅₆	F ₅₇	F ₆₀	F ₅₇	F ₅₈	F ₅₈	F ₅₆	F ₅₁	F ₄₉	F ₄₅	F ₄₉	U ₄₀	F	
6	Y	U ₃₂	Y	A	A	U ₄₃	A	U ₆₀	U ₆₂	F ₆₃	F ₆₆	U ₆₅	F ₆₉	U ₆₈	F ₆₈	F ₆₇	F ₆₈	F ₆₆	F ₅₃	U ₄₇	F ₄₄	F ₄₁	F ₄₀	F ₃₇	
7	U ₃₈	J ₃₉	U ₃₇	F	F	A	Y	F ₅₅	F	F	F	F	F ₆₈	F	J ₇₆	F ₆₇	F ₅₉	U ₄₇	F ₄₃	F ₄₁	F ₄₃	J ₄₂	F	F	
8	F ₃₄	F ₃₅	F	F	F	F	F	F	F	F	U ₇₀	U ₇₀	U ₇₂	F ₇₄	F ₇₁	F ₆₆	U ₆₀	F ₅₈	F ₅₆	F ₅₁	F ₅₃	U ₄₇	F	F	
9	J ₃₇	F ₄₄	F	F	F	F	F	F	J ₇₉	F	F ₇₈	F ₈₀	F ₇₇	F ₇₆	F ₇₃	F ₆₇	F ₆₇	F ₆₃	F ₆₂	F ₅₇	F ₅₂	J ₄₆	F	U ₃₃	
10	F ₃₈	F	U ₄₀	S	F	F	J ₇₄	J ₇₆	F ₈₁	F ₈₄	F ₈₀	F ₈₁	F ₈₀	F ₈₄	F ₈₀	F ₇₄	F ₆₄	F ₆₀	J ₅₂	F ₄₂	F ₄₄	J ₄₆	J ₄₆	S	
11	Y	A	J ₃₂	A	U ₄₀	F	F ₆₀	F ₅₉	F ₆₀	F ₅₈	F ₅₉	F ₆₄	F ₆₄	F ₆₇	F ₆₄	F ₆₆	F ₆₄	F ₅₈	I ₅₆	F ₅₂	F ₄₉	F ₄₈	F ₄₉	F ₅₂	
12	S	F ₄₈	S	U ₄₄	F ₄₇	F	Y	Y	A	R	U ₄₉	F ₅₀	F ₄₆	F ₅₁	F ₅₉	F ₅₉	F ₅₆	F ₅₆	U ₄₄	F ₄₄	F ₄₀	F ₃₄	A	R	
13	F ₄₄	Y	F	Y	B	F ₄₈	U ₄₈	B	B	R	Y	F ₄₆	F ₄₉	B	F	U ₇₂	F ₆₆	U ₅₃	F	A	A	A	A	A	
14	A	F	U ₄₄	A	Y	F ₄₉	Y	U ₄₅	R	E	G	F ₄₂	F ₄₅	U ₅₁	F	F	F ₅₅	F ₄₉	U ₄₂	U ₄₀	F ₄₀	F ₄₃	A	A	
15	F	A	F	B	B	Y	U ₄₉	Y	A	U ₅₂	B	F ₅₂	F ₅₃	F ₅₇	B	F	F ₅₇	F ₄₆	F ₄₂	F ₄₆	F ₅₀	F ₄₀	Y	F ₄₀	
16	F	B	F ₃₈	B	B	B	B	F	U ₇₂	F	B	U ₇₅	F	B	U ₈₀	F ₇₉	U ₆₄	B	F ₄₉	F ₅₁	F ₄₈	F ₄₂	F ₃₆	F ₃₄	
17	F ₃₇	F	F	F ₄₁	U ₅₀	B	F	F	F	F ₅₂	U ₅₄	F	F	U ₅₇	U ₅₇	F ₆₃	U ₆₂	F ₅₈	F ₅₅	F ₅₁	F ₅₂	F ₅₀	F ₅₂	U ₅₃	F ₅₂
18	U ₄₉	A	A	U ₄₉	F	F	F	F	F	F	F	F	F	F	F	F	F ₇₅	U ₆₆	F ₆₀	F ₅₇	F ₅₀	F ₃₉	F ₄₀	U ₄₀	F ₄₅
19	Y	Y	B	Y	U ₄₅	A	A	Y	F	F	F	F	U ₇₀	F ₆₇	F ₆₈	F ₆₈	U ₆₃	F ₅₉	F ₅₄	F ₅₁	F ₄₇	F ₄₆	F ₃₄	R	
20	J ₃₈	B	U ₃₈	A	F	F	Y	U ₅₆	F ₆₅	U ₅₅	F ₅₇	F ₆₅	F ₇₀	F ₇₃	F ₇₀	F ₆₈	F ₆₃	F ₆₁	F ₅₇	F ₅₂	F ₅₁	F ₅₃	F ₅₄	F ₅₁	
21	F ₄₀	F	A	Y	A	U ₄₆	U ₅₄	U ₆₀	U ₆₄	U ₆₄	J ₇₀	U ₆₉	F ₇₀	F ₆₇	F ₆₃	F ₆₀	F ₅₉	F ₅₃	F ₅₄	F ₅₄	F ₅₂	F ₅₄	F ₅₂	J ₅₄	
22	U ₃₃	Y	F ₄₇	Y	U ₅₀	F	J ₇₅	F	F ₈₆	F ₈₄	F ₈₁	F ₈₁	F ₇₈	F ₇₃	F ₆₇	B	B	B	B	B	B	B	B	B	B
23	B	B	B	B	B	B	B	B	R	U ₈₄	F ₈₀	F ₇₆	F ₇₆	F ₇₇	F ₇₃	F ₇₀	F ₆₃	F ₅₉	F ₅₄	F ₅₂	F ₅₀	F ₅₁	F ₅₁	F ₅₆	
24	F ₅₇	B	B	B	B	F ₇₂	F	B	F ₈₂	F ₇₈	F ₇₉	F ₈₂	F ₈₄	F ₈₁	F ₇₀	F ₆₅	F ₆₀	F ₅₉	F ₅₆	F ₅₄	F ₅₁	F ₅₀	F ₅₇	F ₅₇	
25	J ₆₂	J ₆₃	F ₆₇	S	F ₇₃	F ₇₉	F ₇₉	F ₈₇	F ₉₀	F ₉₄	F ₉₄	F ₉₀	F ₈₅	F ₈₂	F ₈₁	F ₈₅	F ₆₇	F ₆₆	F ₆₃	F ₆₀	F ₅₅	F ₅₂	F ₄₈	F	R
26	F	U ₄₇	A	Y	F	Y	Y	F ₅₁	Y	Y	F ₄₇	F ₄₆	F ₄₉	F ₅₀	F ₅₁	F ₅₆	F ₅₆	F ₅₆	U ₄₇	F ₄₈	F ₄₂	F ₄₂	F ₄₂	F ₄₂	
27	J ₃₈	U ₄₂	F	U ₃₆	R	R	F ₅₅	U ₆₀	F ₆₂	F ₅₉	F ₆₂	F ₇₀	F ₆₆	F ₆₀	F ₆₀	F ₅₈	F ₅₈	F ₄₈	F ₄₇	F ₄₆	F ₄₇	F ₄₇	F ₄₄	F ₄₀	
28	F	S	U ₄₂	R	A	A	F	F	U ₅₀	F ₅₇	U ₅₅	U ₅₇	F ₆₀	F ₅₈	F ₅₈	F ₅₅	F ₅₆	F ₅₂	F ₅₀	F ₄₉	F ₄₆	F ₄₇	F ₅₁	F ₅₀	
29	F ₄₇	F ₄₀	F	F	F	F	F	F	F	U ₆₃	U ₅₈	F ₆₁	F ₆₀	F ₆₁	F ₆₅	F ₆₃	F ₆₅	F ₆₆	F ₅₂	F ₅₂	F ₅₀	F ₄₈	U ₄₀	F ₄₁	
30	A	U ₄₄	F	F	F	R	F	R	F ₅₄	F ₅₉	B	F ₅₉	U ₆₀	F ₅₉	F ₅₀	F ₅₇	F ₆₃	F ₅₈	U ₅₃	U ₅₀	F ₄₂	F ₄₀	F ₄₀	F 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	19	12	12	11	9	8	11	12	17	21	23	26	28	25	26	29	29	28	28	28	28	26	18	16	
MED	F ₃₈	F ₄₂	F ₃₉	F ₄₆	U ₅₀	F ₅₅	F ₆₀	F ₆₀	F ₇₂	F ₆₃	F ₇₀	F ₇₀	F ₆₈	F ₆₇	F ₆₇	F ₆₆	F ₆₃	F ₅₈	F ₅₃	F ₅₀	F ₄₈	F ₄₇	F ₄₅	F ₄₄	
UQ	F ₄₅	F ₄₆	F ₄₆	F ₄₈	F ₅₃	F ₆₇	F ₇₂	F ₆₈	F ₈₀	F ₇₈	F ₇₈	F ₇₅	F ₇₂	F ₇₃	F ₇₁	F ₆₇	F ₆₄	F ₆₀	F ₅₆	F ₅₂	F ₅₀	F ₄₉	F ₅₁	F ₅₂	
LQ	F ₃₇	F ₃₇	F ₃₈	F ₄₄	U ₄₇	F ₄₇	F ₅₄	F ₅₆	F ₆₂	F ₅₇	F ₅₆	F ₅₇	F ₅₈	F ₆₀	F ₆₁	F ₅₉	F ₅₈	F ₅₄	F ₅₀	F ₄₈	F ₄₄	F ₄₂	F ₄₀	F ₃₉	

NOV. 1977

FOF2 (0.1 MHz)

IONOSPHERIC DATA

NOV. 1977

FOF1 (0.01 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1					L	360	390	F	400	420	H	420	430	430	430	F	U	F	U	L	L							
2					A	370	F	370	F	380	400	410	410	430	430	430	F	400	400	360	L							
3					320	F	350	F	360	F	380	F	400	410	410	420	440	440	420	F	U	L	L	L				
4					300	360	L	360	F	390	400	F	420	430	440	440	U	440	430	A	L	L	L					
5					A	B	B	Y	A	A	400	420	420	420	420	U	420	U	420	U	390	L	L					
6					A	370	A	400	F	410	H	410	410	420	U	420	430	420	400	400	L	L						
7					U	F	A	Y	A	380	400	F	410	410	410	410	410	400	400	390	F	L						
8				U	L	320	U	F	F	370	F	400	U	F	410	F	430	430	U	R	430	430	430	410	390	L	320	L
9					340	A	410	F	400	410	F	420	420	440	440	440	440	L	400	U	400	L						
10					U	320	U	F	370	F	400	F	400	410	440	430	440	430	430	420	L	410	L	F				
11					U	F	320	U	F	370	F	380	400	400	400	410	420	430	430	H	440	420	410	L	C			
12						A	A	A	Y	420	420	400	420	Y	400	410	420	410	400	L	L	L						
13					B	A	B	B	B	420	Y	410	410		B	B	400	400	400	F	F	Y	A					
14					Y	Y	Y	400	F	A	420	410	400	I	B	410	R	400	400	400	Y	360	F	340				
15					B	Y	A	A	A	A	B	B	410	420	420	B	410	420	R	400	F	Y						
16					B	B	B	B	400	Y	B	B	B	B	B	430	I	B	420	410	B	L						
17					U	F	B	A	B	Y	400	I	B	420	430	430	I	B	430	L	B	L	L					
18					330	370	F	370	400	I	B	430	430	430	440	440	440	R	430	U	420	U	400	L				
19					A	A	A	A	B	420	420	R	420	430	450	430	430	L	400	U	370	L						
20					F	A	A	U	F	380	400	410	410	430	440	440	440	440	U	420	L	L						
21					A	360	360	F	400	410	420	430	430	440	440	430	420	U	H	410	L	L						
22					A	370	410	F	400	410	430	430	430	440	450	H	440	B	B	B	B	B						
23					B	B	B	B	B	B	B	B	U	Y	440	440	440	A	A	A	U	L	L	B				
24					B	B	B	B	410	430	430	430	440	H	440	440	440	420	U	400	L	L						
25				L	330	360	400	H	390	400	420	440	450	U	490	440	440	430	H	420	L	U	L	380				
26				A	F	F	F	U	F	F	A	U	Y	400	400	410	400	400	400	B	L							
27					A	A	A	380	F	390	390	400	400	410	410	400	410	410	F	L	L	L	L					
28					A	A	370	410	F	400	400	400	400	410	420	420	410	390	F	U	L	L	L	L				
29				U	F	320	370	U	390	U	390	400	410	F	420	420	440	440	440	430	420	F	400	L	U	L	340	
30					A	A	A	U	F	400	400	B	400	I	B	410	420	420	410	410	F	U	F	U	F	L		
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	12	12	14	20	22	25	25	29	29	28	27	26	24	17	5	4									
MED			300	330	370	370	400	400	420	420	420	430	430	430	420	410	400	U	F	370	340							
UQ			335	370	390	400	400	400	400	410	420	420	410	410	420	420	410	390	F	U	L	380	355					
LQ			320	360	360	385	400	400	410	410	420	420	420	410	400	400	L	F	370	330								

NOV. 1977

FOF1 (0.01 MHz)

IONOSPHERIC DATA

NOV. 1977

F0E (0.01 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	110	125	F 125	U A 150	155	195	A	300	U Y 290	U Y 290	290	U H 300	295	290	285	275	260	260	230	U H 200	U F 160	B	U R 110	U B 80	
2	U A 120	175	U K 270	280	A	A	310	250	260	285	290	300	300	H 290	U A 270	A	270	250	225	200	180	H 160	U F 120	340	
3	A	A	170	270	C	U A 195	225	250	265	A	280	285	285	270	A	285	260	245	215	195	U A 160	U F 140	U R 100	U F 95	
4	120	U A 120	A	A	170	H 200	230	A	270	A	U A 310	A	300	R 300	295	H 270	A	A	A	U H 220	310	A	A	A	
5	360	K 340	U K 310	U F 160	B	B	B	B	A	A	300	300	310	300	300	290	R 280	250	R 225	190	175	H 145	A	U K 220	
6	K 290	K 295	Y	B	B	A	A	295	255	270	270	295	310	Y	300	280	270	260	215	A	F 200	B	B	120	
7	U K 260	U K 210	A	265	240	A	B	A	275	A	280	A	U A 300	A	U A 295	275	A	U A 265	240	F 180	A	A	125	A	
8	U K 200	U K 295	U K 260	140	A	190	A	A	270	295	275	290	B	B	Y	A	275	245	200	170	U A 140	U A 140	110		
9	U F 110	115	U A 130	150	200	A	300	250	275	330	300	300	305	A	A	A	270	250	230	H 210	170	R 165	U F 165	A	
10	A	A	150	A	U A 190	200	230	F 250	280	290	310	A	A	B	U A 280	A	U A 290	250	230	200	A	A	U K 200	290	
11	A	U A 150	A	A	A	350	K 275	260	270	290	300	300	300	300	A 300	290	280	250	I C 230	200	H 180	140	A	120	
12	305	K 375	310	U K 320	375	A	A	A	U K 390	370	310	270	B	300	U R 315	280	B	B	220	200	U K 330	270	K 320	U K 340	
13	K 365	B	150	U K 380	B	350	B	B	B	A	A	315	280	B	B	B	275	B	A	A	B	A	A	A	
14	B	U K 380	235	B	360	A	Y	A	A	B	320	U R 320	B	B	B	325	B	A	A	220	U K 340	A	A	A	
15	U K 340	A	190	H	B	B	A	B	A	B	B	B	290	270	A	B	B	250	A	U K 310	350	305	Y	300	
16	K 320	B	U K 290	B	B	B	B	B	280	A	B	B	B	B	B	B	B	B	230	200	250	190	K 190	K 200	
17	K 300	U K 250	U K 280	U K 290	A	B	B	B	R	A	B	B	300	H 300	B	Y	B	B	B	U B 225	175	B	U B 125	120	
18	170	B	B	280	A	280	260	255	B	A	U R 305	300	300	B	B	Y	B	B	R 250	B	K 280	U K 230	K 320	K 320	
19	U K 320	B	B	Y	B	B	A	A	B	B	A	330	290	H 300	H 290	B	270	U 250	230	210	H 180	150	160	300	
20	200	K 310	U K 310	B	A	A	A	U F 265	H 260	270	290	300	300	290	280	U H 275	290	H 270	250	H 220	190	U A 150	A	U A 140	
21	U K 240	U K 260	B	B	B	U K 310	275	250	270	285	290	300	305	R 300	R 290	285	U A 290	280	H 265	H 230	A	170	130	F 130	
22	200	K 295	260	K	A	225	295	255	280	295	300	300	A	340	H	Y	B	B	B	B	B	B	B	B	
23	B	B	B	B	B	B	B	B	B	B	B	B	B	U Y 300	A	A	A	B	B	B	B	B	B	B	
24	B	B	B	B	B	B	B	B	U B 285	U R 290	300	300	295	A	A	280	270	250	255	230	195	155	155	H B	
25	B	B	F 150	U A 170	190	210	240	A	U Y 290	290	300	310	U Y 320	U A 320	R	A	280	270	250	210	H 200	A	K 220	B	
26	U K 300	295	B	A	275	U K 280	U K 300	F 260	340	A	B	290	305	340	285	270	290	270	R 230	F 230	170	175	140	170	
27	U A 160	U A 185	U K 290	A	A	A	A	260	270	290	R	Y	295	R 300	U R 300	290	290	U A 290	260	H 230	220	U H 225	U H 200	U K 320	U A 180
28	U K 275	U K 320	U K 300	A	A	A	320	350	260	310	310	300	300	305	280	300	U R 290	270	H 240	220	195	U H 140	170	140	
29	130	300	U K 300	U K 260	U K 295	U K 330	325	330	280	290	290	290	U R 310	300	U Y 300	U A 280	290	U A 280	250	A	200	170	200	330	
30	A	365	U K 250	250	A	A	A	A	300	290	B	B	B	B	U A 280	A	B	260	R 250	R 220	240	K 300	K 290	K 305	
31																									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	22	18	20	15	10	13	13	15	22	17	21	22	22	19	18	16	18	21	22	24	24	18	20	21	
MED	250	278	U K 265	260	220	225	275	260	275	290	300	300	300	300	290	280	280	260	230	210	195	165	162	180	
UQ	305	320	U K 298	280	295	310	300	280	285	295	305	300	305	300	300	290	290	270	250	220	245	200	K 210	K 300	
LQ	160	175	160	165	190	200	230	250	270	290	290	295	295	295	280	275	270	250	230	200	175	U 145	128	120	

NOV. 1977

F0E (0.01 MHz)

IONOSPHERIC DATA

NOV. 1977

FOES (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	G	G	17	J A 24	30	G	J A 40	39	G	G	G	G	G	G	G	G	G	G	G	G	21	E B 19	16	11	
2	20	J A 26	31	36	40	J A 47	K 31	35	G	31	G	35	38	46	J A 40	J A 37	G	26	G	J A 26	G	G	J A 24	K 34	
3	J A 28	24	27	27	28	24	J A 25	J A 31	J A 30	32	27	32	35	47	32	G	J A 42	G	24	G	30	J A 23	16	13	12
4	17	15	20	J A 27	G	G	42	J A 47	33	33	31	36	34	37	J A 54	J A 71	J A 44	J A 34	27	G	31	35	42	43	
5	41	J A 39	42	22	107	B	B	50	J A 54	47	G	G	G	G	G	G	G	G	G	G	G	G	26	25	
6	29	K 30	J A 61	50	45	55	59	46	G	G	G	G	G	G	G	G	G	G	G	J A 35	J A 38	28	E B 22	27	
7	35	J A 26	20	K 26	K 24	47	36	J A 42	70	J A 47	G	30	33	33	31	J A 29	38	27	30	47	30	30	30	J A 34	
8	32	32	31	25	26	G	45	J A 50	G	G	G	G	33	E B 32	G	G	28	G	G	G	G	21	30	29	J A 25
9	19	22	23	J A 33	40	47	K 30	33	G	G	G	G	G	31	J A 38	J A 31	G	G	G	G	22	20	J A 39	20	
10	21	23	J A 24	23	20	22	25	J A 24	G	30	G	J A 38	35	38	J A 39	J A 31	J A 34	G	G	G	26	42	24	J A 33	K 29
11	J A 53	J A 37	26	J A 59	J A 34	K 35	31	G	29	30	33	35	64	33	G	35	G	G	G	33	31	24	J A 26	15	
12	K 30	K 37	J A 46	J A 42	J A 41	70	50	50	62	K 37	G	G	E B 37	G	G	G	E B 36	E B 30	30	26	37	34	39	37	
13	K 36	34	26	95	B	40	E B 43	B	B	50	37	G	G	B	E B 50	E B 32	31	E B 28	30	J A 38	40	40	J A 36	J A 40	
14	J A 87	40	J A 89	51	K 36	29	Y	31	40	E B 33	G	G	E B 45	E B 37	E B 38	G	E B 30	36	28	G	94	J A 45	J A 38	J A 54	
15	J A 42	J A 67	30	B	B	36	36	43	60	E B 45	B	E B 35	32	36	B	E B 31	E B 33	G	35	33	35	K 30	Y	K 30	
16	K 32	82	J A 43	B	B	B	B	E B 46	G	38	B	E B 57	E B 53	B	E B 33	E B 61	E B 34	B	G	25	25	K 19	K 19	28	
17	K 30	27	U K 28	32	32	B	39	E B 55	G	37	E B 46	E B 32	G	G	E B 50	G	E B 38	E B 45	E B 34	25	23	20	21	30	
18	20	70	43	28	J A 29	K 28	31	38	E B 46	32	G	G	G	E B 32	E B 34	G	E B 29	E B 28	G	E B 25	K 28	30	K 32	36	
19	39	40	B	Y	36	45	51	41	E B 48	E B 36	39	G	G	G	G	E B 30	G	G	G	24	G	G	G	K 30	
20	26	B	33	48	J A 33	40	42	37	G	G	G	G	29	34	75	G	G	G	G	30	27	20	32	17	
21	J K 24	J K 26	47	34	43	J A 34	G	G	G	G	G	G	G	G	G	G	J A 35	J A 31	31	J A 29	J A 32	J A 28	29	G	
22	23	E B 40	K 29	K 26	44	J A 44	38	G 24	31	33	37	32	J A 59	G	G	B	B	B	B	B	B	B	B	B	
23	B	B	B	B	B	B	B	B	E B 57	E B 45	E B 48	40	40	45	J A 55	49	50	E B 31	E B 30	E B 34	E B 32	E B 30	E B 27	E B 32	
24	E B 37	B	B	B	B	E B 47	E B 42	B	G	32	35	37	33	37	30	G	G	G	G	25	25	22	G	E B 13	
25	E B 15	E B 14	G	18	G	G	G	31	G	G	32	G	G	34	G	30	G	G	G	G	25	30	31	32	45
26	43	35	J A 64	40	30	J A 54	75	60	42	40	E B 35	31	G	G	G	G	G	G	E B 42	25	23	25	25	J A 64	
27	J A 34	25	30	30	42	45	41	G	G	G	G	G	G	G	30	G	29	G	G	25	30	26	35	26	
28	41	K 32	J A 36	J A 40	55	44	45	39	35	G	G	G	G	G	32	G	G	G	G	G	28	J A 40	18	15	
29	20	K 30	32	U K 26	32	35	K 32	42	G	G	G	G	G	G	G	29	J A 31	J A 31	J A 27	27	25	J A 53	J A 26	K 33	
30	40	K 36	37	58	43	47	J A 44	30	35	G	B	E B 37	E B 44	33	31	32	E B 32	G	30	27	K 24	K 30	K 29	K 30	
31																									
CNT	29	27	27	25	25	26	26	27	29	30	27	30	30	28	29	29	29	28	28	29	29	29	28	29	
MED	30	31	31	32	34	39	38	38	E G 29	31	G	G	E G 30	E G 32	E G 31	G	E G 29	G	G	25	28	27	28	30	
UQ	39	38	42	42	42	47	44	44	U 38	U 35	U 32	34	U 35	36	U 35	30	32	U 26	29	30	32	30	32	34	
LQ	21	26	26	26	29	28	31	31	G	G	G	G	G	G	G	G	G	G	G	E G 24	23	20	U 20	20	

NOV. 1977

FOES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1977

FBES (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station **SYOWA STATION** Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	G	G	14	15	G	G	33	30	G	G	G	G	G	G	G	G	G	G	G	G	G	E ₁₉	G	10	
2	G	K ₁₇	U ₂₇	K ₃₀	40	43	K ₃₁	G	G	30	G	34	34	36	31	29	G	24	G	16	G	G	G	K ₃₄	
3	22	22	16	27	E ₂₂	19	22	24	25	31	G	31	34	41	32	G	25	24	G	G	20	11	11	G	
4	G	G	15	21	G	G	G	37	25	30	31	36	33	31	35	43	36	28	24	G	31	A ₃₅	A ₄₂	A ₄₃	
5	K ₃₆	36	U ₃₁	K ₃₁	A ₁₀	A ₇	B	B	Y	A ₅₄	43	G	G	G	G	G	G	G	G	G	G	G	14	U ₂₂	
6	K ₂₉	29	Y	A ₅₀	A ₄₅	35	A ₅₉	29	G	G	G	G	G	G	G	G	G	G	G	G	24	22	22	E ₂₂	17
7	29	U ₂₁	U ₁₈	K ₂₆	24	A ₄₇	U ₃₆	40	G	34	G	30	30	31	G	G	31	27	G	22	20	19	27	20	
8	U ₂₀	U ₂₉	U ₂₆	24	22	G	23	27	G	G	G	G	U ₃₃	E ₃₂	G	G	27	G	G	G	20	G	16	G	
9	G	10	G	29	G	40	K ₃₀	G	G	G	G	G	G	30	35	30	G	G	G	G	20	U ₁₆	16	18	
10	17	17	G	16	U ₂₀	13	G	G	G	30	G	33	35	38	36	30	G	G	G	G	23	40	U ₂₀	U ₂₀	K ₂₉
11	Y	A ₃₇	16	A ₅₉	U ₃₀	35	K ₂₇	G	27	G	32	32	G	31	G	33	G	G	C	G	G	13	19	G	
12	30	37	35	U ₃₂	K ₃₇	35	E ₅₀	E ₅₀	A ₆₂	K ₃₇	G	G	E ₃₇	G	G	G	E ₃₆	E ₃₀	25	23	U ₃₃	27	A ₃₉	A ₃₇	
13	K ₃₆	U ₃₄	U ₂₁	U ₃₈	B	K ₃₅	E ₄₃	B	B	U ₃₉	E ₃₇	G	G	B	E ₅₀	E ₃₂	29	E ₂₈	U ₃₀	A ₃₈	A ₄₀	A ₄₀	A ₃₆	A ₄₀	
14	A ₈	U ₃₈	23	A ₅₁	36	U ₂₉	Y	30	E ₄₀	E ₃₃	G	G	E ₄₅	E ₃₇	E ₃₈	G	E ₃₀	U ₃₆	U ₂₈	G	U ₃₄	A ₄₅	A ₃₈	A ₅₄	
15	U ₃₄	A ₄₀	20	B	B	E ₃₆	U ₃₆	E ₄₃	A ₆₀	E ₄₅	B	E ₃₅	32	34	B	E ₃₁	E ₃₃	G	U ₃₅	U ₃₁	35	30	Y	30	
16	32	B	30	B	B	B	B	E ₄₆	G	U ₃₈	B	E ₅₇	E ₅₃	B	E ₃₃	E ₆₁	E ₃₄	B	G	25	25	19	19	21	
17	30	U ₂₅	U ₂₈	U ₂₉	30	B	U ₃₉	E ₅₅	G	31	E ₄₆	E ₃₂	G	G	E ₅₀	G	E ₃₈	E ₄₅	E ₃₄	24	G	20	15	20	
18	G	A ₇₀	A ₄₃	K ₂₈	26	K ₂₈	G	G	E ₄₆	Y ₃₂	G	G	G	E ₃₂	E ₃₄	G	E ₂₉	E ₂₈	G	E ₂₅	K ₂₈	U ₂₃	K ₃₂	K ₃₂	
19	E ₃₉	E ₄₀	B	Y	36	A ₄₅	A ₅₁	E ₄₁	E ₄₈	E ₃₆	39	G	G	G	G	E ₃₀	G	G	G	24	G	G	G	K ₃₀	
20	25	B	U ₃₁	A ₄₈	33	U ₄₀	U ₄₂	G	G	G	G	G	28	34	U ₃₆	G	G	G	G	19	26	20	22	13	
21	J ₂₄	J ₂₆	A ₄₇	E ₃₄	A ₄₃	U ₃₁	G	G	G	G	G	G	G	G	G	G	29	27	23	21	27	15	12	G	
22	22	E ₄₀	K ₂₉	K ₂₆	44	Y	20	29	K ₂₄	30	32	32	32	30	G	G	B	B	B	B	B	B	B	B	B
23	B	B	B	B	B	B	B	B	E ₅₇	E ₄₅	E ₄₈	U ₄₀	40	39	49	45	46	E ₃₁	E ₃₀	E ₃₄	E ₃₂	E ₃₀	E ₂₇	E ₃₂	
24	E ₃₇	B	B	B	B	E ₄₇	E ₄₂	B	G	32	35	37	33	35	U ₃₀	G	G	G	G	23	20	G	E ₁₃	13	
25	E ₁₅	E ₁₄	G	G	G	G	G	29	G	G	32	G	G	34	G	30	G	G	G	25	25	24	K ₂₂	U ₄₅	
26	U ₃₀	31	A ₆₄	E ₄₀	30	U ₂₈	U ₃₀	G	K ₃₄	E ₄₀	E ₃₅	31	G	G	G	G	G	G	E ₄₂	G	G	21	18	G	
27	G	20	U ₂₉	U ₂₅	E ₄₂	E ₄₅	40	G	G	G	G	G	G	G	G	G	G	G	G	24	G	22	U ₃₂	G	
28	26	U ₃₂	K ₃₀	35	A ₅₅	A ₄₄	K ₃₂	K ₃₅	31	G	G	G	G	G	30	G	G	G	G	G	27	U ₂₁	15	13	
29	18	K ₃₀	U ₃₀	U ₂₆	U ₂₉	U ₃₃	K ₃₂	U ₃₃	G	G	G	G	G	G	G	G	G	28	23	25	G	42	18	K ₃₃	
30	A ₄₀	K ₃₆	U ₂₅	K ₂₅	43	U ₄₇	37	U ₃₀	G	G	B	E ₃₇	E ₄₄	U ₃₃	31	31	E ₃₂	G	27	24	K ₂₄	K ₃₀	K ₂₉	K ₃₀	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	26	26	25	25	26	26	26	29	30	27	30	30	28	29	29	29	28	28	29	29	29	28	29	
MED	24	29	26	27	30	U ₃₂	31	E ₂₉	G	E ₃₀	G	G	E ₂₈	E ₃₁	E ₃₀	G	G	G	G	20	22	20	18	20	
UQ	K ₃₂	36	K ₃₀	34	42	42	U ₃₈	U ₃₄	U ₃₀	U ₃₄	E ₃₂	32	33	34	U ₃₃	30	E ₃₁	U ₂₆	24	24	28	26	28	K ₃₂	
LQ	16	20	16	25	22	20	23	G	G	G	G	G	G	G	G	G	G	G	G	G	G	16	14	13	

NOV. 1977

FBES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1977

F-MIN (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	9	7	7	E ₁₂ ^C	9	9	19	15	16	20	19	13	15	19	10	10	10	7	E ₁₈ ^C	12	13	19	9	8
2	7	8	10	22	14	14	10	9	E ₁₀ ^C	9	10	12	12	12	10	10	10	9	9	10	E ₁₃ ^C	7	8	11
3	7	6	8	9	E ₂₂ ^C	10	10	10	10	22	10	9	9	E ₁₉ ^C	12	10	11	13	10	10	8	7	6	7
4	7	8	7	7	8	9	10	8	10	12	15	14	13	12	13	10	10	10	12	9	18	13	10	10
5	6	10	12	7	23	B	B	34	14	12	16	10	17	20	19	19	17	24	12	8	12	14	10	9
6	6	12	6	20	20	22	15	11	10	11	11	25	16	27	17	15	10	21	10	8	16	21	22	11
7	9	8	7	6	23	18	30	11	12	14	10	12	29	20	10	10	23	20	15	14	10	11	12	6
8	7	9	10	7	7	10	13	13	12	11	10	12	30	32	11	22	15	21	12	13	8	7	7	7
9	8	6	7	6	14	10	10	10	12	E ₁₉ ^C	11	7	10	13	9	12	11	10	7	7	9	7	6	7
10	8	10	7	7	7	6	6	6	7	11	10	12	26	32	13	11	13	10	9	10	15	8	7	12
11	7	7	5	9	11	13	10	7	10	10	10	9	10	10	10	10	8	8	C	8	8	7	7	7
12	5	7	10	10	8	10	13	13	27	15	13	13	37	20	22	17	36	30	16	10	16	8	10	10
13	16	25	10	35	B	8	43	B	B	25	24	22	12	B	50	32	20	28	10	10	20	12	10	7
14	18	20	8	34	32	20	Y	10	25	33	27	20	45	37	38	26	30	12	11	10	14	8	10	10
15	13	12	10	B	B	33	23	33	25	45	B	35	22	12	B	31	33	13	18	13	11	12	Y	13
16	11	42	23	B	B	B	B	46	12	24	B	57	53	B	33	61	34	B	13	15	15	11	10	9
17	12	9	17	11	11	B	24	55	22	16	46	32	14	13	50	25	38	45	34	22	12	17	13	10
18	5	23	30	18	14	12	14	10	46	12	14	20	21	32	34	22	29	28	16	25	13	11	12	22
19	22	25	B	Y	23	26	20	24	48	36	21	21	14	11	10	30	23	18	12	11	10	10	10	16
20	10	B	12	22	8	19	12	11	10	10	10	11	15	13	12	14	20	12	11	10	10	8	8	6
21	14	13	25	29	22	11	10	8	10	10	10	10	10	12	10	12	10	10	10	8	9	7	6	7
22	8	40	16	20	15	10	6	6	10	10	10	11	10	15	25	B	B	B	B	B	B	B	B	B
23	B	B	B	B	B	B	B	B	57	45	48	34	33	25	22	24	22	31	30	34	32	30	27	32
24	37	B	B	B	B	47	42	B	28	15	15	13	14	13	14	18	14	15	12	20	18	14	13	13
25	15	14	12	13	15	14	18	12	12	13	15	12	12	21	22	16	12	10	11	12	10	14	12	19
26	16	18	20	10	9	11	13	10	15	20	35	13	29	23	16	14	19	26	42	13	15	15	13	13
27	10	10	14	10	13	10	10	11	10	10	25	11	11	10	9	10	12	11	10	8	17	10	7	8
28	10	24	22	13	15	12	10	10	9	10	10	10	10	10	12	10	10	12	10	10	10	10	10	10
29	9	10	14	8	10	13	13	12	10	10	8	10	10	10	10	10	10	11	10	15	12	10	6	10
30	13	7	8	15	12	10	10	10	10	10	B	37	44	32	15	14	32	17	20	15	15	10	6	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	29	30	30	29	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	29	30
MED	10	11	11	13	14	12	13	11	12	12	14	12	14	19	14	14	16	14	12	10	13	10	10	10
UQ	14	24	20	22	23	22	23	24	25	20	25	21	29	27	22	24	29	26	16	15	16	14	12	13
LQ	7	8	8	8	10	10	10	10	10	10	10	11	11	12	10	10	10	10	10	10	10	8	7	7

NOV. 1977

F-MIN (0.1 MHz)

IONOSPHERIC DATA

NOV. 1977

M(3000)F2 (0.01)

45° E Mean Time (G. M. T. + 3 h)

Station **SYOWA STATION** Lat. $69^{\circ} 00.4' S$, Long. $39^{\circ} 35.4' E$ Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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 310	J 280	F 280	F 290	J 290	J 265	F	F	F 265	F 270	F 275	F 280	F 295	F 295	F 305	F 310	F	F	J 335	U 330	F	F 320	F	F
2	F 300	S	S	F 295	U 255	F	F 275	F 275	F 305	F 265	F 270	F 280	F 285	F 280	F	F 300	F 315	F 330	F 340	F 335	F 330	F 310	F	S
3	J 300	S	F	F	F	F	J 255	J 265	F 260	F 270	F 285	F 290	F 285	F 285	F 305	F 295	F 300	F 310	F 325	F 345	F 325	S 330	F	F
4	U 285	J 305	F 290	F 295	F 280	F 275	F 270	F	F	F 275	F 275	F 290	F 300	F 290	F 300	F 310	F 300	F 310	F 340	F 320	F 290	A	A	A
5	U 285	F	F 260	F	A	B	B	Y	A	U 265	F 275	U 270	F 275	F 280	F 265	F 260	F 285	F 315	F 310	F 300	F 300	F 315	U 315	F
6	Y	F	Y	A	A	U 275	A	U 265	F	F 275	F 250	U 235	F 270	U 280	F 265	F 265	F 280	F 280	F 300	F	F 295	F 320	F 280	F 295
7	U 295	J 280	F	F	F	A	Y	F 245	F	F	F	F	F 255	F	J 270	F 270	F 280	F	F 315	F 310	F 300	J 300	F	F
8	F 290	F 270	F	F	F	F	F	F	F	F	F	F	U 265	F 285	F 280	F 305	F	F 310	F 320	F 325	F 320	F	F	F
9	J 305	F 300	F	F	F	F	F	F	U 255	F	F 265	F 275	F 275	F 275	F 295	F 280	F 300	F 315	F 320	F 320	F 335	J 305	F	U 305
10	F 315	F	F	S 265	F	F	J 270	J 255	F 270	F 270	F 265	F 270	F 265	F 275	F 290	F 295	F 310	F 290	J 275	F 280	F 275	J 320	J 300	S
11	Y	A	J 290	A	F	F	F 265	F 255	F 255	F 250	F 250	F 250	F 260	F 280	F 280	F 285	F 300	F 310	I 315	C 315	F 325	F 320	F 305	F 310
12	S	F 290	S	F	F 265	F	Y	Y	A	R	F	F 260	F 215	F 235	F 270	F 270	F 280	F 305	F	F 270	F 305	F 295	A	R
13	F 205	Y	F	Y	B	F 270	U 290	B	B	R	Y	F 230	F 225	F	B	F	F	F	F	F	A	A	A	A
14	A	F	F	A	Y	F 275	Y	F	R	G	R	F 210	R	F	F	F 235	F 255	U 260	F	F 290	F 315	A	A	A
15	F	A	F	B	B	Y	U 240	Y	A	U 220	B	F 250	F 255	F 245	B	F 255	F 295	F 250	Y	F 300	F 320	F 305	Y	F 285
16	F	B	F 250	B	B	B	B	F	F	F	B	F	F	B	F	F 255	U 265	B	F 322	F 315	F 320	F 310	F 325	F 275
17	F 250	F	F	F 295	U 250	B	F	F	F	F 255	U 265	F	F	U 265	F 280	U 290	F 295	F 300	F 295	F 325	F 320	F 315	F	F 305
18	F	A	A	U 260	F	F	F	F	F	F	F	F	F	F	F	F	F 285	U 305	F 300	F 310	F 305	F 325	F 295	F 310
19	Y	Y	B	Y	F	A	A	Y	F	F	F	F	F	F 265	F 280	F 275	F	F 320	F 330	F 305	F 320	F 315	F 315	R
20	J 285	B	F	A	F	F	Y	U 250	F 270	U 280	F 270	F 260	F 260	F 280	F 300	F 285	F 295	F 325	F 330	F 325	F 315	F 315	F 325	F 335
21	F 270	F	A	Y	A	F	U 280	U 285	F	F	F 265	F	F 280	F 295	F 285	F 300	F 330	F 310	F 330	F 325	F 320	F 335	F 310	F 295
22	U 315	Y	F 270	Y	F	F	J 260	F	F 280	F 275	F 265	F 285	F 280	F 300	F 290	B	B	B	B	B	B	B	B	B
23	B	B	B	B	B	B	B	B	R	U 295	F 285	F 275	F 275	F 280	F 300	F 315	F 315	F 330	F 335	F 325	F 340	F 320	F 315	F 305
24	F 310	B	B	B	B	F 255	F	B	F 280	F 270	F 270	F 270	F 275	F 285	F 295	F 305	F 320	F 320	F 320	F 335	F 335	F 320	F 315	F 315
25	J 305	J 300	F 285	F 275	F 290	F 270	F 250	F 265	F 265	F 270	F 280	F 270	F 270	F 290	F 265	F 295	F 305	F 310	F 315	F 325	F 325	F 310	F	R
26	F	U 310	A	Y	F	Y	Y	F 275	Y	Y	F 235	F	F 240	F 260	F 265	F 275	F 270	F 295	U 320	F 315	F 310	F 325	F 310	F 300
27	J 280	U 260	F	F	R	R	F 265	F	F 255	F 235	F 240	F 270	F 270	F 270	F 270	F 285	F 305	F 315	F 305	F 295	F 320	F 300	F 320	F 305
28	F	S	U 275	R	A	A	F	F	U 245	F 260	F	F 265	F 275	F 270	F 275	F 285	F 300	F 300	F 320	F 320	F 325	F 315	F 335	F 320
29	F 315	F 300	F	F	F	F	F	F	F	F	F 275	F 280	F 280	F 260	F 285	F 295	F 305	F 335	F 310	F 325	F 320	F 345	F	F 340
30	A	U 290	F	F 340	F	R	F	R	F 270	F 255	B	F 255	U 260	F 305	F 250	F 265	F 285	F 290	U 290	F	F 330	F 310	F 315	F 295
31																								
CNT	18	11	8	8	6	7	11	10	13	19	19	22	25	25	24	28	26	25	25	26	27	25	15	16
MED	F 295	F 290	F 275	F 292	F 272	F 270	F 265	F 265	F 265	F 270	F 270	F 270	F 270	F 280	F 280	F 285	F 300	F 310	F 320	F 320	F 320	F 315	F 315	F 305
UQ	F 310	F 300	F 288	F 295	F 290	F 275	F 272	F 275	F 270	F 272	F 275	F 280	F 280	F 285	F 295	F 298	F 305	F 315	F 330	F 325	F 325	F 320	F 318	F 312
LQ	F 285	F 280	F 265	F 270	U 255	F 268	F 258	F 255	F 255	F 255	F 265	F 255	F 260	F 270	F 270	F 270	F 280	F 300	F 310	F 305	F 312	F 310	F 310	F 295

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NOV. 1977

M(3000)F2 (0.01)

IONOSPHERIC DATA

Nov. 1977
H^oF₂ (KM)
45° E Mean Time (G. M. T. + 3 h)

Station SYDWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						L	370	360	320	330	330	330	305	310	300	290	285	250		L				
2						A	400	375	370	350	345	340	345	350	330	320	290	265						
3						345	365	350	350	360	335	305	330	345	350	310	300		L	L	250			
4						300	340	345	350	340	305	310	300	320	315	310	285	300	270	245				
5						A	B	B	Y	A	405	400	395	400	370	395	400	325	300	290		L		
6						A	425	A	390	355	370	400	U _H 400	370	350	370	350	320	320		L	L		
7						U _F 430	A	Y	430	405	400	400	405	395	360	350	350	340		L				
8						345	330	350	350	380	380	350	340	355	350	335	340	305	300	280	275	250	245	
9						400	390	400	340	350	315	350	330	340	350	300		L	300	295	275			
10						F	330	345	365	335	320	350	350	350	325	300	290	290	325	380				
11						A	F	380	395	400	400	430	430	360	350	355	345	300	275		C			
12							F	A	A	Y	R	540	450	605	510	390	375	370	295		L	L		
13						B	370	390		B	B	R	Y	600	550		U _F 450	390	420	350		Y	A	
14						Y	395	Y	U _F 450	R	G	R	U _F 620	U _B 570	400	400	500	450		Y	450	390		
15						B	Y	450	Y	A	480	B	B	460	450	470		B	400	325	460		Y	
16						B	B	B	370	355	370		B	B	380	B	385	400	380	B		L		
17						440	B	Y	B	U _F 430	415	420	U _F 430	380	410	350	315		L	B	L	L		
18						360	355	380	360	400	400	350	360	350	360	335	315	300	280	280				
19						350	A	A	Y	B	400	395	395	330	355	350	345	310	280	270				
20						U _F 380	A	Y	430	370	400	400	375	360	340	320	330	310	290		L			
21						A	440	390	350	345	355	360	340	350	330	330	330	280			L	L		
22						A	380	355	320	310	330	340	315	330	325	330		B	B	B	B	B		
23						B	B	B	B	B	325	300	325	345	345	310	305	300	295	270		L	250	
24						B	350	320	B	325	330	350	330	320	310	300	300	280	290	255	250			
25						280	295	320	350	340	335	330	305	325	330	310	300	300	310	295	270			
26						A	F	Y	Y	420	Y	Y	550	550	490	450	440	395	390	335		B	L	
27						A	A	405	355	400	450	440	360	380	395	380	350	300		L		L	L	
28						A	A	425	U _F 480	450	410	420	400	380	380	375	350	330	300		L	L	L	L
29						F	430	390	420	340	355	345	325	375	330	370	400	350	320	300	265	280	255	
30						A	A	F	R	430	400	B	410	405	310	500	400	350	340	350	300		L	
31																								
CNT					3	11	14	18	21	23	27	25	29	30	28	29	28	27	22	13	6	1		
MED					345	360	368	375	365	355	370	360	360	360	350	350	338	310	292	275	252	245		
UQ					388	395	395	400	395	400	400	400	410	395	388	380	382	335	320	290	300			
LQ					312	338	350	350	350	338	330	340	330	345	325	310	302	300	275	270	250			

Nov. 1977
H^oF₂ (KM)
The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1977

H'F (KM)

45° E Mean Time (G. M. T. + 3 h)

Station **SYOWA STATION** Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	255	285	300	300	280	220 ^H	A	250	240 ^Y	225	210	200 ^H	200 ^H	200	200	210	210	205	245	230	230	240	245					
2	255 ^U	300 ^H	330	325	A	A	360	240	200 ^H	215	220 ^H	210	200 ^U	A	250	240	205	220	220	200 ^H	200 ^H	240	255	270 ^Q	300 ^U			
3	265	320	300 ^Q	320	300	250	230	220	200	225	210	200	210	A	205	225	220	205	240	240	230	245	275	270				
4	260	250	255	280	250	245	225	A	220	200	200	E ³ A	215	205	270 ^A	A	A	225	225	245	370	A	A	A				
5	395	A	430 ^Q	F	A	B	B	Y	A	A	250	240 ^H	225	205 ^H	215	235	230	230	240	250	250	250	205 ^Q	435 ^U				
6	Y	A	Y	A	A	A	A	260	200	230 ^H	200	220	210	Y	225	225	230	245	245	290	275	260	280 ^B	280				
7	330 ^Q	305	310 ^Q	390	280	A	A	A	215	E ² A	200 ^Q	210	255	250	230	225	240 ^A	230	220 ^H	230 ^H	275	300	325 ^Q	320 ^Q				
8	320 ^Q	400 ^Q	375	A	290	250	240	220	200	200	200	195 ^H	245	230	210	230	220	230	225	225	240	240	255 ^Q	350 ^Q				
9	255 ^Q	275 ^Q	275 ^U	345 ^H	U ³ F	300	A	270 ^H	200	220	250	250	230	210	200 ^H	230	220	205	220	220	225 ^H	235	260 ^H	295 ^Q	280			
10	250	285	300 ^Q	300	Y	230	220	210	200	200	210	200	225 ^A	250 ^A	230 ^A	210	205	200	225	250	A	250	300	S				
11	Y	A	U ³ Q	A	A	A	290	210 ^H	200 ^H	215	210	205 ^H	225	210	230	240	230	210	I ³ C	230	240	240	245	250	250			
12	S	360	380	425 ^Q	445	A	A	A	Y	270	210 ^H	220	B	215	230	225	E ² B	250	240	210	245	320	340	A	A			
13	440	Y	A	Y	B	A	B	B	B	A	A	230	200 ^H	B	B	B	250	235	220	A	A	A	A	A	A			
14	A	470 ^Q	350 ^Q	A	Y	Y	Y	250	A	240	225	220	B	E ² B	B	B	240	A	Y	250	310 ^Q	A	A	A				
15	A	A	280 ^Q	B	B	Y	A	A	A	B	B	230	220	220	B	230	225	230	A	305	300	315	Y	370 ^Q				
16	360 ^Q	B	405 ^A	B	B	B	B	B	225	A	B	B	B	B	230	B	E ² B	255	B	260	250 ^H	245	255	250	340			
17	445 ^Q	350 ^Q	U ³ F	350	A	B	A	B	Y	200	B	220 ^H	220	225	B	220	B	B	E ² B	260	235	245	255	250	255			
18	255	A	B	420	E ² A	350	295	255	210	B	220	200	240	210	200 ^H	225	230	220	220	225	235 ^H	275	320 ^Q	320	295			
19	A	A	B	Y	A	A	A	A	B	250	A	220 ^H	200	225	220 ^H	215	220	220	225	210 ^H	250	250	270	R				
20	340 ^Q	B	505	A	A	A	A	U ³ H	210	200	U ³ H	200 ^H	220	250	220	210	200	225	210	225	250	250	245	245	235			
21	380 ^Q	Y	A	Y	A	225	225	U ³ H	200	U ³ H	195	200	195	210	275	195	205	U ³ H	205	U ³ H	205	260	245	230	240	240	250 ^Q	250
22	305	B	350	Y	A	300	280	195 ^H	205	210	210	200	215	205	220	Y	B	B	B	B	B	B	B	B	B	B		
23	B	B	B	B	B	B	B	B	B	B	B	B	A	E ² A	E ² A	A	A	A	220 ^B	220 ^B	B	245 ^B	245	245	255			
24	270 ^B	B	B	B	B	B	B	B	225	230	205 ^A	230 ^A	200	210	225	205	U ³ H	U ³ H	200	230	220	225	240	245	245			
25	250	250	250	200	245	245	240	225	U ³ H	195	210	220	220	250	210	225	225	205	U ³ H	200	225	U ³ H	210	225	295 ^H	F	A	
26	290 ^Q	275 ^Q	A	A	A	Y	230	F	230	A	B	250	I ³ R	U ³ R	225	220	245	230	B	245	250	280	280	275				
27	285 ^Q	350	280 ^U	270 ^Q	A	A	A	225	200	220	Y	240	225	225	210	210	220	205	230	230	250	250	300	290				
28	A	F	365	A	A	A	315	U ³ H	350	U ³ H	205	255	200 ^H	200	200	205	U ³ H	210	200	205	200	205	220	245	240	240	245 ^H	230 ^U
29	250	330	300 ^Q	A	300	350	275	275	U ³ H	190	200	U ³ H	225	230	U ³ H	250 ^H	220	U ³ H	200	255	205	230	240	A	290 ^H	295		
30	A	370 ^U	280 ^Q	250 ^Q	A	A	A	220	U ³ H	230	200	B	E ² B	B	250	210	210	220 ^B	210	U ³ H	220	240	255	310	300	350		
31																												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	21	16	22	13	10	10	14	18	21	24	21	28	26	26	25	25	26	26	25	27	27	25	23	22				
MED	285	312	305	320	290	248	248	220	200	216	210	220	218	216	225	270	220	220	225	240	245	250	270	280				
UQ	340 ^Q	355	375	350	300	295	280	250	220	232	210	230	235	235	230	225	230	230	230	248	265	280	292	320 ^Q				
LQ	255	280	280	280	280	230	230	210	200	200	200	208	210	205	210	210	205	210	220	230	240	245	248	250				

NOV. 1977

H'F (KM)

IONOSPHERIC DATA

NOV. 1977

H¹ES (KM)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	G	G	105	160	115	G	105	105 ^K	G	G	G	G	G	G	G	G	G	G	G	G	140	B	130	130	
2	130	140 ^K	105 ^K	130 ^K	100	100	100 ^K	155	G	95	G	140	120	110	105	100	G	100	G	100	G	G	140	115 ^K	
3	105	100	105	105 ^K	150 ^C	100	100	100	95	100	95	120	110	105	100	G	100	100	G	120	100	100	150	140	
4	100	105	110	105	G	G	100	100	100	100	100	100	130	120	105	105	100	100	100	G	120 ^K	105	100	100	
5	100 ^K	100 ^K	100 ^K	100	110	B	B	145	100	100	G	G	G	G	G	G	G	G	G	G	G	G	145	110 ^K	
6	105 ^K	125 ^K	105	110	110	120	100	100 ^K	G	G	G	G	G	G	G	G	G	G	G	100	140	125	B	130	
7	110 ^K	115 ^K	110	100 ^K	150 ^K	120	130	100	120	100	G	100	125	100	100	100	100	100	150	115	100	140	125	120	
8	105 ^K	110 ^K	115 ^K	120	100	G	100	100	G	G	G	G	130	B	B	G	G	95	G	G	G	150	100	135	145
9	125	100	105	95	115	100	100 ^K	100	G	G	G	G	G	100	100	100	G	G	G	G	140	140	135	125	
10	105	100	120	95	95	150	100	95	G	125	G	105	105	110	100	100	100	G	G	145	120	115	100 ^K	135 ^K	
11	100	110	95	100	100	110	100 ^K	G	100	100	130	135	130	110	G	125	G	G	C	125	125	125	120	105	
12	100 ^K	100 ^K	100 ^K	100 ^K	100 ^K	155	95	95	180 ^K	100 ^K	G	G	B	G	G	G	B	B	155	145	115 ^K	100 ^K	150 ^K	95 ^K	
13	110 ^K	105	125	170 ^K	B	95 ^K	B	B	B	145	100	G	G	B	B	B	170	B	100	100	100	100	100	100	
14	170	150 ^K	180 ^K	100	140 ^K	100	Y	110	110	B	G	G	B	B	B	G	B	100	100	G	160 ^K	100	100	100	
15	100 ^K	170	115	B	B	135	110	110	105	B	B	B	120	105	B	B	B	G	105	105 ^K	100 ^K	105 ^K	Y	120 ^K	
16	110 ^K	140	130	B	B	B	B	B	G	100	B	B	B	B	B	B	B	B	B	G	140	B	140 ^K	145 ^K	100 ^K
17	110 ^K	100 ^K	B	130 ^K	100	B	100	B	G	95	B	B	G	G	B	G	B	B	B	B	150	135	140	125	120
18	100	130	100	110 ^K	100	100 ^K	140	130	B	95	G	G	G	B	B	G	B	B	G	B	125 ^K	125 ^K	120 ^K	120 ^K	
19	120 ^K	145	B	Y	120	105	100	105	B	B	100	G	G	G	G	B	G	G	G	125	G	G	G	110 ^K	
20	180 ^K	B	100 ^K	100	120	100	95	100	G	G	G	G	110	110	100	G	G	G	G	120	115	125	100	100	
21	120 ^K	125 ^K	175	130	125	100 ^K	G	G	G	G	G	G	G	G	G	G	100	100	100	100	95	95	100	G	
22	150 ^K	B	120 ^K	150 ^K	120	100	100 ^K	95	125	125	110	110	110	G	G	B	B	B	B	B	B	B	B	B	
23	B	B	B	B	B	B	B	B	B	B	B	120	110	105	100	100	100	B	B	B	B	B	B	B	
24	B	B	B	B	B	B	B	B	G	120	115	105	105	100	100	G	G	G	G	130	110	115	G	B	
25	B	B	G	130	G	G	G	95	G	G	125	G	G	110	G	100	G	G	G	135	135	150	150 ^K	110	
26	125 ^K	130 ^K	120	95	95 ^K	125 ^K	150 ^K	180	100 ^K	100	B	120	G	G	G	G	G	G	B	145	150	140	125	150	
27	125	110	130 ^K	105	100	100	100	G	G	G	G	G	G	G	110	G	100	G	G	145	135	140	100 ^K	105	
28	100 ^K	150 ^K	120 ^K	100	100	100	100 ^K	100 ^K	100	G	G	G	G	G	120	G	G	G	G	G	125	110	105	105	
29	160	110 ^K	130 ^K	100 ^K	150 ^K	105 ^K	100 ^K	100 ^K	G	G	G	G	G	G	G	100	100	100	100	105	135	130	100 ^K	115 ^K	
30	115	100 ^K	100 ^K	130 ^K	95	100	100	100	140	G	B	B	B	110	110	105	B	G	145	145 ^E	120 ^K	110 ^K	100 ^K	110 ^K	
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	25	25	23	21	22	22	12	15	8	10	12	13	12	10	10	7	9	20	24	24	24	26	
MED	110 ^K	110 ^K	110	105	110	100	100	100	102	100	105	115	115	110	100	100	100	100	100	124	125	120	122	112	
UQ	125 ^K	135 ^K	120 ^K	130 ^K	120	120	100	110	122	110	120	120	128	110	108	105	100	100	145	145	138	140	138	125	
LQ	100 ^K	100	105	100	100	100	100	100	100	100	100	105	110	105	100	100	100	100	100	105	112	102	100	105	

NOV. 1977

H¹ES (KM)

IONOSPHERIC DATA

NOV. 1977

TYPES OF ES

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1			C2	HRA11	CH11		R1	RK11													A1		H1	H1		
2	HL11	AK11	RK22	RK11	R2	R1	KL21	HC11		L1		H1	C1	C2	C2	C2		L2		C1			RA11	K3		
3	CR21	R2	R2	K2	R1	C2	C2	L3	L2	C1	L2	C1	C2	C2	C2		L2	L1		C1	L2	L2	H1	H1		
4	C2	C2	C3	C3			C	C4	C2	L2	C	L2	H1	C1	C2	C2	C3	C3	L2		K1	RA11	RA21	RA21		
5	RK12	RKA12	RAK11	R1	AR11			A1	C1	R1													RA11	RK33		
6	KC31	RK11	A1	R2	R1	C1	R1	RK21												R2	CA11	C1		H1		
7	RK51	RK21	C1	K4	K1	R1	R1	R1	AC11	RA11		R1	R1	R1	C1	C1	C1	C1	H1	C1	LA11	RA11	R1	C1		
8	CAK31	RK51	RK31	R2	R2		R1	RA11	A1				R1							R1			H1	C1	RL11	RA11
9	R1	R1	R1	LR2	R1	R2	K2	L1						C2	C3	L3					HL11	H1	H1	CC11		
10	R2	R2	R2	LRA21	LA11	HL12	R2	L2		C1		C1	C1	C1	C2	C2	C3			R1	R3	RA11	RK31	KA31		
11	AR11	RLA11	LA11	R2	RA11	KA11	RK12		R2	R2	H1	H1	H1	C1		C2				C1	C1	C1	C5	C1		
12	KA31	K6	RK31	RK21	RK13	AR11	R1	R1	HK11	K1									H1	R1	RK11	RK11	HK11	RK11		
13	K1	C1	RA11	AK11			RK11			HC11	R1						H1		RS11	RS11	R1	R1	RA21	R2		
14	RRA11	RK11	HRK11	L1	K1	C1	A1	RL11	R1									R1	R1		AK11	RA11	CS21	RA21		
15	CK11	AR11	C1			R1	R1	R1	R1				C1	C1					R1	RK11	K3	K2	A1	K1		
16	K2	H1	RK11							R1										H1	K1	K1	K1	RK11		
17	K2	RKA11	K1	HLK11	R1		LR11			R										H1	H1	H1	C1	C2		
18	R2	AH11	R1	K1	R1	K1	H1	H1		R1											K1	RK11	K1	RK11		
19	RK11	R1			R1	R1	K1	R1			R1										C1			K1		
20	RK11		RAK11	R1	CL11	R1	R1	R1					C2	C1	C2						CL12	CL22	CL11	C2	C1	
21	K1	K1	R1	R1	RL11	RK22											L2	C2	LH11	L2	L2	L1	L1			
22	RK11		K1	K1	RSL11	R1	RK12	R1	C1	H1	C1	C2	C1													
23												C1	C1	C1	C1	C1										
24										C1	C1	C1	C1	C1	C1						C1	C1	C1			
25				C1				L1			H1			C1		C1				H1	C1	RA11	AK11	R1		
26	RKA11	CK11	ARL11	RLA11	LK11	AK11	AK11	A1	RKA11	R1		C1								A1	A1	H1	C1	HC11		
27	C1	C1	CKA11	RA11	RL11	R1	R1								C1		C1			H1	H1	H1	RK31	R1		
28	CK21	K1	RK11	RS11	R1	R1	RK11	RK21	R1						C1						H2	C2	C2	C2		
29	H1	K2	RK11	KA31	RKA12	RK11	K1	RK11							C1	C1	L2	L2	C1	H1	H3	RK21	KA21			
30	RS21	K1	AKL12	CKA11	R1	R1	CS11	R1	H1					C1	C1	C1				H1	H1	K1	K2	KL21	K4	
31																										
CNT																										
MED																										
UQ																										
LQ																										

NOV. 1977

TYPES OF ES

IONOSPHERIC DATA

DEC. 1977

FXI (0.1 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	O R	S	59	60	66	70	79	X	X	X	X	X	X	X	X	61	60	X	X	X	X	43	45	47
2	R	O R	A	B	58	Y	B	B	B	B	A	Y	O R	O R	O R	R	54	62	66	47	69	A	A	A	
3	59	48	A	47	45	U A	Y	Y	O R	O R	O R	O R	O R	O R	X	X	58	55	54	X	X	X	52	52	
4	48	53	Y	Y	70	70	71	75	73	90	87	82	72	69	X	X	76	X	X	X	56	52	A	U A	59
5	58	70	S	55	46	O R	A	A	Y	B	R	B	B	B	O R	61	60	64	59	57	57	56	57	63	
6	U S	S	70	Y	55	49	Y	60	70	73	76	68	65	O R	X	X	60	X	X	X	X	X	X	X	X
7	55	48	S	R	58	70	71	78	80	79	X	X	X	X	X	X	X	X	X	X	X	X	X	X	S
8	57	R	O S	56	60	64	70	75	X	X	78	77	X	X	70	X	60	X	X	X	60	X	X	X	X
9	59	67	69	63	67	80	88	91	86	90	O R	86	89	82	76	71	71	68	66	72	63	60	59	60	
10	63	67	U S	70	81	S	92	92	92	X	X	X	X	X	X	X	X	X	X	X	65	63	60	57	
11	S	58	55	60	70	U A	A	58	Y	65	Y	Y	Y	84	75	X	Y	68	53	C	U A	50	50	U A	66
12	40	R	R	54	U A	Y	O R	R	A	A	Y	B	O R	O R	O R	O R	60	62	59	60	52	X	48	46	
13	50	55	A	R	50	Y	Y	R	O R	O R	O R	62	62	60	59	O R	O R	60	62	48	50	57	51	55	
14	O R	50	58	52	Y	Y	B	53	61	B	B	70	67	62	X	X	70	69	R	X	56	57	X	51	
15	S	X	57	54	55	60	68	88	93	90	X	90	X	X	X	X	X	X	X	X	69	70	65	59	
16	60	66	70	S	83	90	95	90	85	87	90	91	90	62	X	74	66	63	X	X	54	U A	60	52	
17	O R	65	59	A	52	A	U A	U A	Y	Y	X	X	X	52	X	X	56	X	X	X	59	58	58	64	
18	R	R	47	O R	59	67	70	70	73	70	70	66	62	X	X	X	58	60	X	X	57	63	O S	X	60
19	X	O S	O S	68	75	83	X	X	X	89	X	X	X	X	X	X	61	62	61	X	60	X	59	60	61
20	59	62	61	70	76	83	89	90	97	X	X	X	X	X	X	X	R	O R	X	X	70	62	55	S	52
21	U S	58	54	58	U S	72	82	88	89	88	90	85	73	70	68	63	64	65	66	X	71	63	57	48	
22	44	U S	U S	U S	70	80	87	82	78	82	81	70	68	X	X	64	65	X	X	X	62	60	O S	S	58
23	O S	57	54	Y	Y	60	70	72	82	88	76	77	75	X	X	71	68	X	X	58	60	O R	65	70	
24	O S	X	54	A	58	60	76	90	92	93	90	88	82	81	82	X	68	60	55	65	68	S	59	O S	52
25	53	57	57	60	70	72	80	82	83	87	86	80	76	75	68	62	61	61	58	60	64	64	59	55	
26	48	64	57	67	60	60	U A	68	60	76	68	63	65	X	X	X	51	61	64	X	58	58	54	58	58
27	53	59	A	A	A	R	R	60	66	69	78	70	61	X	X	X	X	X	X	X	S	60	O R	58	
28	S	55	57	60	60	S	70	77	87	90	85	85	76	75	X	76	68	X	X	60	66	60	67	U A	78
29	A	70	70	59	R	U A	R	A	Y	60	60	64	67	X	X	X	65	67	70	X	64	X	O S	60	59
30	C	58	O R	52	A	57	65	70	81	77	72	64	61	X	X	X	X	X	X	X	59	X	X	X	X
31	44	54	58	S	67	70	U S	85	84	80	81	78	X	X	X	X	69	X	X	X	65	X	60	46	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	26	28	24	22	26	25	22	25	25	26	26	27	29	30	31	30	30	31	31	30	31	29	30	30	
MED	55	58	58	59	60	68	74	78	81	81	81	77	72	70	X	X	64	X	X	X	60	60	58	58	
UQ	59	64	62	65	70	80	88	88	87	90	87	86	81	X	X	X	X	X	X	X	65	63	60	60	
LQ	50	54	54	54	58	60	70	70	73	70	70	66	62	62	X	X	X	X	X	X	57	57	55	52	

DEC. 1977

FXI (0.1 MHz)

IONOSPHERIC DATA

DEC. 1977

FOF2 (0.1 MHz)

45° E Mean Time (G. M. T. + 3h)

Station **SYOWA STATION** Lat. 69 00.4 S. Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	F	F ₄₃ U ₄₉	F	F	F	F	U ₆₈	69	60	57	59	62	62	62	58	55	52	53	50	44	37	F	F ₄₀	
2	R	U ₃₈	A	B	F	Y	B	B	B	B	A	Y	E ₄₀	E ₄₀	E ₄₀	R	F ₄₈ U ₅₃	F	F	F	F	A	A	A	
3	F	F	A	F ₄₀	F	Y	Y	Y	43	42	E ₄₀	42	43	45	49	49	51	49	48	45	42	44	46	46	
4	F	U ₄₆	Y	Y	52	U ₅₉	F	F	F	F	F	U ₇₂	63	63	65	68	70	70	61	F ₄₈	41	A	A	F	
5	F	F	F	F	F	F	A	A	Y	B	R	B	B	B	U ₄₉	F ₅₃	53	U ₅₆	52	F ₄₉	50	F ₄₈	J ₄₉	J ₄₅	
6	F	F	49	Y	F	F	Y	F	F	65	68	U ₆₀	59	57	54	56	53	51	51	52	52	53	51	51	
7	F ₄₈	F ₄₂	S	R	F	F ₆₁	F	J ₆₆	F	71	71	78	80	76	70	65	59	58	57	55	54	54	54	S ₄₅	
8	F	R	F	F ₄₈	53	56	63	68	70	69	70	70	74	68	63	60	54	52	52	54	52	52	53	57	
9	51	F	F	F	F	U ₇₁	F	F	F	F	81	80	F	F	F	F	F	U ₆₀	59	F ₅₆	57	53	51	53	
10	F ₅₇	J ₆₀	F	F	F	U ₈₀	J ₈₅	U ₈₄	84	84	80	82	81	73	67	67	67	64	63	60	58	U ₅₆	53	U ₄₇	
11	J ₅₀	F	F	F	F	F	A	F	Y	F	Y	Y	Y	F	F	61	Y	R ₄₃	F ₄₇	C	F	U ₄₂	F ₄₀	F	
12	F ₃₂	R	A	U ₄₃	F	Y	F	A	A	A	Y	B	E ₄₃	U ₄₆	F ₄₈	F	F	52	F ₅₆	51	50	46	43	41	F ₃₈
13	F	F	A	A	42	Y	Y	R	44	48	50	56	U ₅₅	54	52	45	58	53	45	41	40	50	44	47	
14	F	F	F	F	Y	Y	B	F	53	B	B	F	62	59	56	60	61	64	63	52	52	49	50	47	44
15	F ₄₄	48	48	48	U ₄₈	F	U ₆₀	U ₈₉	83	83	83	83	82	77	69	69	62	62	60	60	57	58	U ₅₇	U ₅₁	
16	F ₅₃	U ₅₈	U ₆₃	U ₆₈	J ₇₅	U ₇₈	81	U ₈₃	F	U ₈₀	U ₈₁	84	82	75	72	67	60	57	53	53	46	U ₄₈	F	F	
17	F ₄₃	F	F	A	U ₃₉	A	Y	Y	Y	Y	E ₄₂	E ₄₂	E ₄₂	46	52	50	50	47	51	53	52	50	50	F ₄₈	
18	R	R	F	U ₄₁	F	F	U ₅₈	J ₆₄	J ₆₄	F ₆₃	F ₆₃	59	56	53	55	56	52	53	51	51	51	57	U ₅₆	53	
19	52	55	58	60	68	J ₇₇	81	83	86	83	78	78	75	68	62	61	55	56	55	54	54	52	54	55	
20	F ₅₃	F ₅₆	J ₅₅	J ₆₂	J ₇₀	J ₇₆	J ₈₃	U ₈₁	86	84	81	80	75	68	67	65	U ₆₄	R	65	62	63	64	56	48	U ₄₆
21	U ₄₅	51	47	J ₅₂	J ₅₅	F ₆₆	U ₇₅	U ₈₀	J ₈₃	81	U ₈₂	U ₇₇	67	U ₆₂	60	56	58	F	F	60	61	64	57	49	42
22	U ₃₈	U ₄₆	F	F	F	F	F	U ₇₀	U ₇₂	F	U ₆₆	64	60	59	58	58	58	55	55	58	55	53	56	51	
23	U ₅₄	49	48	Y	Y	49	U ₅₆	66	73	71	69	68	67	62	61	64	61	60	56	51	52	54	U ₅₇	U ₆₄	
24	56	41	45	A	44	54	F	U ₇₈	83	83	83	80	76	73	75	70	U ₅₈	52	49	58	60	55	52	44	
25	F ₄₆	46	U ₄₇	U ₅₃	J ₆₄	J ₆₆	F	J ₇₄	F	U ₇₅	U ₇₉	72	U ₇₀	66	60	U ₅₅	55	U ₅₄	50	F	54	57	57	46	U ₄₆
26	41	F	F	F	F	52	50	F	U ₅₂	F	57	56	58	68	62	68	65	55	57	52	52	46	40	F	
27	U ₄₀	U ₄₄	A	A	A	R	R	54	U ₄₈	U ₅₆	71	58	55	58	62	56	53	53	50	52	56	53	42	51	
28	54	47	49	52	52	J ₅₅	U ₆₀	F	F	U ₇₃	U ₇₀	U ₇₀	U ₆₆	68	70	67	60	60	52	54	60	F	40	F	
29	A	F	F	F	R	F	R	A	Y	50	53	55	59	62	60	57	59	60	63	58	56	U ₅₅	53	U ₅₂	
30	C	U ₄₀	42	F	A	50	F	F	U ₇₀	70	64	58	56	55	54	56	56	54	54	55	53	53	51	48	
31	F ₃₈	F	U ₅₀	U ₅₂	F	U ₅₆	F	F ₇₃	77	73	74	72	71	67	62	65	63	61	65	63	59	60	52	F ₄₀	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	20	18	14	13	12	16	12	17	19	21	25	27	28	28	29	29	29	31	30	29	29	28	27	25	
MED	47	46	48	52	52	60	62	73	71	71	70	70	62	62	61	59	58	56	53	54	55	53	51	47	
UQ	53	51	50	53	J ₆₆	74	81	U ₈₁	83	81	80	79	74	68	65	65	61	60	59	58	57	56	53	51	
LQ	41	U ₄₂	47	U ₄₈	46	54	U ₅₇	66	58	63	63	58	56	56	54	56	53	53	51	51	50	49	46	45	

The Radio Research Laboratories, Japan

DEC. 1977

FOF2 (0.1 MHz)

IONOSPHERIC DATA

DEC. 1977

F_oF₁ (0.01 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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 330	F 380	F 360	F 380	410	410	410	420	420	420	430	430	420	L	370	L	L															
2					F	Y	B	B	B	B	A	Y	400	400	400	400	400	F	F	F	F															
3						F	A	A	390	400	400	400	410	410	410	420	410	400	390																	
4					A	U	F	A	A	A	F	420	430	430	440	430	440	420	U	L	400	370	370													
5						Y	A	A	A	B	F	B	B	B	420	420	410	F	F	400																
6						F	Y	F	400	400	400	410	410	430	430	440	420	L	L	L	L	L	L	L												
7					A	U	F	400	420	420	430	430	420	450	450	460	440	430	410	U	L	L	L													
8				A	360	U	H	410	400	420	420	430	430	440	440	450	460	430	H	L	L	L	L													
9			L	L	U	F	U	F	380	F	390	F	420	F	420	B	Y	460	F	450	Y	450	430	U	L	U	L	400	L	L						
10			L	F	U	F	U	F	380	F	390	F	410	430	440	450	450	450	F	F	460	460	460	450	F	460	460	460	450	440	L	U	L	L	L	
11				A	L	A	A	R	A	F	400	Y	Y	F	410	420	400	Y	Y	U	Y	390	400	C												
12						A	A	A	A	A	A	A	B	430	410	430	430	420	F	F	L	L	L	L												
13					F	A	A	400	400	410	420	420	430	430	430	430	430	430	430	430	400	380														
14				F	A	A	B	400	420	B	B	430	440	F	H	440	U	Y	430	400	B	400	400													
15					U	H	U	F	400	410	410	440	450	430	450	A	A	A	430	420	410	L	U	L	350											
16			L	U	L	F	350	370	400	400	A	440	420	430	440	450	440	450	440	A	L	L	390	F	360											
17					A	A	F	U	F	400	A	F	400	420	420	420	430	420	420	420	L	L	400	L	L	L	L									
18				A	A	380	380	390	400	410	420	430	440	440	430	430	430	430	L	L	L	L	L	L	L	L										
19			L	U	F	340	370	400	400	420	420	A	H	430	R	440	450	450	L	410	L	U	390	L	L											
20			L	U	F	350	360	400	400	430	H	430	440	430	450	A	440	440	A	L	U	L	420	L	L	L										
21				F	360	F	360	390	400	F	400	420	420	430	440	440	430	440	430	F	F	410	390	U	L	L	L									
22				A	A	F	360	F	390	F	A	410	R	420	420	450	450	430	F	440	420	F	L	L	L	L	L	L	L	L	L	L	L	L	L	
23				A	A	370	400	400	400	410	420	420	430	450	430	420	420	420	400	L	L	L	L	L	L	L										
24				A	A	F	380	U	F	400	400	420	420	430	430	430	420	430	420	L	L	U	380	L	L	L										
25				L	F	U	F	380	390	F	400	F	420	U	Y	420	430	430	430	U	F	440	430	F	U	L	L	L	L	L	L	L	L	L	L	
26				U	F	360	A	A	A	U	F	420	400	410	420	420	420	430	H	440	420	420	L	U	L	L	L									
27				A	A	360	370	F	A	400	400	U	H	430	430	430	440	440	440	410	A	390	L	L	L	L	L									
28				L	F	360	370	F	400	F	430	400	420	430	A	440	440	450	440	430	410	A	L	A	A	A										
29				A	F	F	F	A	Y	400	F	430	440	460	430	440	450	430	430	400	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	
30				F	A	360	380	F	400	400	420	F	440	440	A	440	450	U	H	450	450	430	U	L	U	L	L	L	L	L	L	L	L	L	L	
31				A	F	390	400	420	420	440	450	470	470	480	450	460	460	L	420	390	A	L														
	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	11	20	20	23	22	27	25	25	29	28	29	29	27	21	18	13	4															
MED				U	F	330	360	370	390	400	400	420	420	430	430	440	430	440	430	420	400	390	355													
UQ				U	F	340	360	380	400	405	420	420	430	430	450	445	440	450	430	420	410	390	365													
LQ				U	F	320	345	365	380	400	400	410	420	420	430	430	430	430	420	410	400	380	345													

DEC. 1977

F_oF₁ (0.01 MHz)

IONOSPHERIC DATA

DEC. 1977

FOE (0.01 MHz)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69 00.4 S, Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	K 380	K 340	K 280	K 300	K 290	K 275	K 240	K 260	R 270	R 290	R 300	R 305	R 300	U 290	U 300	U 295	R 290	A 260	A 230	F 210	H 215	A 360	K 320	
2	K 320	U 300	A	B	A	A	B	B	B	B	A	A	315	310	U 320	U 280	270	280	250	250	F 200	A	A	A
3	U 300	K 145	A	U 300	A	K 280	A	K 380	K 360	U 290	U 300	U 300	U 300	U 300	U 300	B	300	270	245	230	205	H 200	U 190	U 310
4	K 280	U 320	B	A	A	K 350	A	A	A	290	320	Y	305	U 300	300	280	280	270	265	210	K 270	B	A	U 300
5	U 325	U 290	K 380	U 190	A	A	A	A	A	B	330	B	B	B	B	R 290	280	275	U 250	U 230	220	U 170	U 150	K 300
6	K 250	U 310	K 300	B	U 320	K 350	A	K 300	270	R 300	300	300	300	315	310	A	A	270	250	250	220	A	H 180	A
7	K 200	K 260	A	A	A	K 290	260	270	270	280	310	H 315	315	R 320	320	310	290	285	260	255	210	U 200	H 160	H 230
8	K 315	K 320	A	U 350	K 310	230	245	260	270	290	320	R 315	300	300	315	310	300	H 280	255	250	215	H 190	H 170	H 180
9	H 170	H 180	H 150	200	U 220	H 230	260	290	U 300	A 310	B	Y	320	A	A	315	A	A	U 270	H 270	230	A	A	A
10	A	A	A	U 200	H 220	H 230	255	270	300	R 300	320	H	A	A	325	320	315	295	280	A 275	230	H 230	H 205	F 175
11	K 350	K 370	A	K 400	K 260	A	A	U 360	A	Y	A	A	A	310	320	U 320	290	Y	295	C	U 380	A	K 350	K 320
12	U 300	A	A	U 290	K 250	A	A	A	A	A	B	B	320	R 320	315	310	280	A 275	260	230	220	230	A 350	K 305
13	K 270	A	A	A	U 270	A	A	325	285	Y	Y	Y	320	H 310	310	B	290	280	230	340	205	U 300	K 330	K 380
14	K 350	K 310	K 320	K 270	B	B	B	A	K 380	B	B	Y	300	310	300	A	U 300	B	B	230	210	185	A	160
15	A	A	300	K 325	U 290	A	310	U 275	A	295	300	305	305	305	300	Y	B	U 300	290	270	240	U 220	210	A
16	150	R 170	B	B	U 230	R 230	A	B	B	A	Y	U 310	U 310	310	A	A	A	A	F 260	220	A	U 360	K 405	A
17	U 360	K 300	K 130	A	A	A	250	270	Y	A	340	350	300	305	305	300	R 300	R 290	270	260	260	B	B	200
18	K 315	K 340	U 300	A	A	U 320	270	260	270	295	300	310	315	300	A	A	A	250	A	U 270	200	175	140	H 140
19	U 160	H 170	U 150	A	210	H 220	225	260	275	300	300	310	H 300	A	A	300	290	270	250	225	205	190	U 150	H 170
20	H 180	H 170	150	A	195	240	A 260	U 260	240	275	290	A	U 280	A	A	U 290	280	280	270	240	210	200	K 280	U 290
21	K 200	U 190	K 280	U 190	U 210	U 210	A	U 270	280	280	280	315	U 310	A	A	A	300	A 310	H 280	230	210	180	U 170	145
22	K 330	U 300	A	A	A	U 245	250	H 270	A	300	U 300	U 315	U 320	300	300	R 300	280	270	255	235	220	R 210	U 180	H 160
23	U 160	U 200	K 300	A	A	A	290	H 275	295	H 300	300	300	305	305	295	Y	U 300	U 290	260	225	205	A	A	A
24	A	300	K 300	A	385	K 330	280	260	275	H	A	A	A	U 320	U 310	A	A	U 300	290	270	260	A	A	150
25	U 170	H 280	K 300	A	230	220	250	275	U 285	300	305	U 320	U 310	320	310	305	U 290	280	260	230	210	A 180	U 180	K 400
26	A	K 280	A	A	A	K 410	K 390	K 350	A	300	305	305	300	U 300	310	310	295	270	265	250	225	H 240	K 340	K 330
27	K 320	K 320	K 230	A	A	A	265	A	A	320	300	U 305	U 310	305	315	280	U 300	U 275	A	240	205	200	R 170	B 170
28	H 180	H 175	H 180	H 200	F 215	230	240	275	290	300	310	315	315	330	300	A	U 300	A	270	250	235	F 200	U 380	U 300
29	B	U 320	A	A	U 320	U 300	A	A	A	320	A	320	320	320	310	U 320	280	290	A	A	U 250	200	U 200	F 180
30	C	U 270	A	U 270	A	A	270	270	290	290	310	315	U 320	330	320	310	U 310	A	U 270	255	215	H 190	210	H 180
31	F	A	A	K 380	K 270	H 230	260	280	300	315	310	320	325	320	310	310	U 305	295	280	250	U 240	A	H 200	K 220
	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	26	16	14	18	20	19	23	19	23	22	20	28	26	23	20	27	24	27	29	28	22	25	25
MED	K 280	K 295	K 290	K 280	K 255	K 242	K 260	K 270	K 285	K 300	K 302	K 310	K 310	K 310	K 310	K 308	K 290	K 280	K 260	K 240	K 215	K 200	K 190	K 220
UQ	K 320	K 320	K 300	K 325	K 290	K 310	K 270	K 285	K 298	K 300	K 310	K 315	K 320	K 320	K 315	K 310	U 300	288	270	250	228	210	K 330	K 305
LQ	180	190	165	U 200	220	230	250	265	270	290	300	305	300	300	300	292	285	270	255	230	208	190	U 170	170

The Radio Research Laboratories, Japan

DEC. 1977

FOE (0.01 MHz)

IONOSPHERIC DATA

DEC. 1977

FOES (0.1 MHz)

45° E Mean Time (G. M. T. + 3h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	K 38	K 34	K 28	K 30	K 29	K 27	G	28	G	G	58	J A 51	41	33	G	G	G	J A 32	27	26	G	G	K 36	J A 35	
2	42	J A 41	J A 51	B	J A 33	29	B	B	B	B	49	39	G	G	G	G	G	35	J A 37	28	31	J A 70	J A 61	J A 64	
3	J A 34	J A 68	35	31	J A 29	J A 37	38	41	K 36	G	G	G	G	G	G	E B 32	G	G	G	G	26	G	31	U K 31	
4	K 28	40	39	42	37	40	46	44	42	G	G	G	G	32	G	35	30	G	G	G	37	J A 56	J A 53	J A 36	
5	39	34	42	88	67	33	46	57	39	B	G	B	B	B	E B 34	G	G	31	28	30	52	85	J A 37	K 30	
6	K 25	J A 43	40	60	J A 40	K 35	37	K 30	G	G	G	39	G	39	G	J A 36	J A 37	36	G	G	G	22	G	23	
7	K 20	29	39	43	45	32	G	G	G	31	G	38	40	35	G	G	G	36	29	36	26	G	G	36	
8	K 31	34	47	39	K 31	G	G	G	G	G	G	G	32	36	30	G	G	G	G	G	G	G	J A 35	G	
9	G	19	20	26	G	J A 24	G	G	32	G	E B 56	G	37	41	38	G	34	40	30	G	31	35	J A 61	J A 52	
10	J A 42	J A 26	31	J A 24	J A 30	36	G	G	30	G	G	35	36	G	G	33	35	30	G	G	G	23	G	20	
11	K 35	K 37	J A 50	K 40	35	43	J A 64	K 36	48	G	35	39	37	G	G	G	G	G	G	G	U K 38	43	K 35	35	
12	J A 34	J A 37	42	30	46	40	42	46	J A 76	48	40	B	37	36	G	G	30	G	31	31	29	27	K 35	J A 64	
13	30	J A 133	45	J A 42	J A 29	42	41	J A 37	G	G	G	G	G	G	G	E B 35	G	G	G	G	K 33	27	35	41	K 38
14	K 35	K 31	K 32	K 27	42	49	B	44	K 38	B	B	G	G	G	G	30	G	E B 34	E B 45	G	27	J A 34	J A 34	22	
15	23	41	40	J A 44	J A 39	J A 50	37	J A 31	35	33	35	34	44	136	97	60	G	G	G	J A 44	J A 29	28	J A 31	J A 34	
16	57	J A 22	E B 23	E B 25	G	26	30	E B 30	44	44	G	36	40	33	35	33	69	J A 51	G	G	36	42	40	J A 40	
17	46	35	J A 24	50	50	48	32	G	J A 45	42	45	G	G	36	G	40	35	32	G	G	E B 29	28	G	J A 30	
18	K 31	K 34	J A 36	36	J A 43	45	J A 40	G	31	G	G	33	J A 44	38	37	31	41	28	30	J A 26	32	35	21	18	
19	17	G	J A 28	22	G	G	30	30	30	G	J A 48	35	45	32	32	G	32	32	30	25	26	J A 42	J A 37	G	
20	G	15	20	J A 35	J A 24	27	39	J A 31	30	30	33	35	48	45	J A 54	40	33	J A 54	J A 54	34	G	G	G	U K 29	
21	27	J A 33	J A 38	27	J A 23	J A 24	J A 40	J A 30	G	36	35	40	33	35	J A 46	J A 34	53	32	37	G	G	21	24	21	
22	K 33	J A 65	J A 83	J A 71	40	33	G	G	42	G	40	G	34	31	G	G	G	G	G	G	26	25	J A 21	G	
23	20	30	J A 42	45	J A 39	35	G	J A 35	G	G	G	37	39	J A 39	35	36	J A 32	35	G	30	J A 40	J A 57	J A 53	J A 50	
24	J A 64	35	U K 30	J A 51	K 38	40	35	G	G	J A 35	J A 36	52	38	J A 38	J A 56	J A 56	32	G	J A 42	J A 30	J A 37	J A 52	J A 28	G	
25	J A 25	35	K 30	27	29	G	G	G	42	34	G	36	32	37	42	J A 46	32	J A 36	37	J A 42	J A 49	J A 26	J A 34	J A 62	
26	J A 40	70	32	J A 72	J A 54	K 41	K 39	K 35	J A 47	G	G	G	35	G	G	G	G	G	31	31	32	K 24	K 34	K 33	
27	K 32	K 32	50	47	52	40	35	42	39	G	G	G	G	35	35	39	G	G	J A 44	G	G	G	E B 20	G	
28	G	G	G	G	28	27	G	40	G	35	G	J A 50	J A 53	50	46	J A 35	J A 37	J A 54	J A 55	J A 40	J A 65	28	43	35	
29	51	J A 36	23	105	J A 44	33	76	55	38	G	37	38	J A 51	38	G	G	35	G	J A 39	35	J A 50	G	21	24	
30	C	28	J A 47	30	52	48	G	G	G	G	G	G	J A 62	43	G	G	G	J A 38	32	29	30	27	G	J A 34	
31	21	J A 26	25	K 38	K 27	G	G	G	G	G	G	G	35	39	G	35	J A 33	G	30	G	J A 41	J A 54	G	30	
CNT	30	31	31	30	31	31	29	30	30	28	30	29	30	30	31	31	31	31	31	30	31	31	31	31	31
MED	32	34	36	38	37	35	35	30	32	G	G	35	36	36	G	31	30	30	30	26	29	28	34	31	
UQ	39	38	42	47	44	40	40	40	42	34	36	39	41	39	36	35	35	36	34	31	37	42	J A 37	J A 36	
LQ	23	28	29	27	29	27	G	G	G	G	G	G	G	31	G	G	G	G	G	G	26	22	21	22	

DEC. 1977

FOES (0.1 MHz)

IONOSPHERIC DATA

DEC. 1977

FBES (0.1 MHz)

45° E Mean Time (G. M. T. + 3h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	K38	K34	K28	K30	K29	K27	G	G	G	G	G	33	39	32	33	G	G	G	28	26	G	G	K36	U32	
2	K32	K30	A51	B	40	E29	B	B	B	B	A49	E39	G	G	G	G	G	32	G	G	G	A70	A61	A64	
3	U30	G	A35	U30	19	K28	E38	E41	K36	G	G	G	G	G	G	E32	G	G	G	G	G	G	G	U31	
4	K28	U32	E39	E42	37	K35	46	44	U42	G	G	G	G	32	G	33	G	G	G	G	24	A56	A53	U30	
5	U32	U29	K38	G	U31	U35	A46	A57	E39	B	G	B	B	B	E34	G	G	G	G	25	G	22	20	K30	
6	K25	U31	32	Y	U32	K35	E37	K30	G	G	G	G	G	G	G	31	31	G	G	G	G	22	G	20	
7	K20	K26	39	E43	40	K29	G	G	G	G	G	33	39	35	G	G	G	35	29	31	G	G	G	20	
8	K31	K32	43	U35	K31	G	G	G	G	G	G	G	32	32	30	G	G	G	G	G	G	G	G	G	
9	G	19	20	G	G	G	G	G	19	G	E56	G	G	38	35	G	31	30	G	G	G	28	34	U35	
10	25	20	19	G	20	G	G	G	G	G	G	35	35	G	G	33	32	30	G	G	G	G	G	20	
11	K35	K37	47	K40	K26	40	A64	K36	E48	G	E35	E39	35	G	G	G	G	G	G	G	U38	40	K35	U32	
12	U30	E37	A42	U29	K25	E40	U42	A46	A76	A48	E40	B	G	G	G	G	G	G	29	27	27	G	K35	U30	
13	K27	46	A45	A42	U27	E42	E41	G	G	G	G	G	G	G	G	E35	G	G	G	K33	G	33	K33	K38	
14	K35	K31	K32	K27	E42	E49	B	38	K38	B	B	G	G	G	G	U30	G	E34	E45	G	G	G	22	G	
15	20	29	K30	K32	U29	29	26	26	30	26	35	34	43	54	53	47	G	G	G	37	24	23	20	22	
16	29	20	E23	E25	G	22	30	E30	U44	35	G	36	40	33	35	33	39	46	G	G	30	40	K40	U40	
17	40	30	K20	A50	31	A48	29	G	E45	G	G	G	G	35	G	34	G	30	G	G	E29	23	G	20	
18	K31	K34	U30	36	U43	U32	20	G	31	G	G	G	40	34	33	31	33	28	27	G	G	16	20	17	
19	G	G	20	22	G	G	30	30	30	G	46	35	40	U32	U32	G	32	32	28	G	25	23	20	G	
20	G	G	20	20	G	G	G	29	30	32	31	33	35	51	32	33	44	38	32	G	G	G	K28	U29	
21	26	21	31	24	21	21	27	G	G	32	36	39	32	32	32	30	G	31	30	G	G	21	21	20	
22	K33	U30	U25	F	U40	25	G	G	U42	G	31	G	G	31	G	G	G	G	G	G	25	G	18	G	
23	G	U20	31	E45	E39	33	G	G	G	G	G	37	36	35	35	31	30	G	G	29	G	22	25	20	
24	19	31	U30	A51	K38	U33	G	G	G	34	33	34	G	33	32	39	G	G	29	G	25	23	U24	G	
25	G	K28	K30	24	28	G	G	G	30	31	G	34	32	36	G	C	G	30	29	G	G	U22	C	39	
26	35	K28	29	21	42	K41	K39	K35	39	G	G	G	34	G	G	G	G	G	30	29	G	K24	K34	K33	
27	K32	K32	A50	A47	A52	29	G	40	35	G	G	G	G	35	34	39	G	G	44	G	G	E20	U	G	
28	G	G	G	G	G	G	G	25	34	G	46	34	39	32	30	G	35	50	29	38	24	U38	U30		
29	A51	U32	20	U38	U32	U30	34	A55	U38	G	37	37	35	34	G	G	33	G	35	30	25	G	G	20	
30	C	U27	38	U27	A52	33	G	G	G	G	G	G	49	36	G	G	G	30	G	G	26	G	G	25	
31	G	20	25	K38	K27	G	G	G	G	G	G	G	G	36	G	35	31	G	G	G	35	29	G	K22	
	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	28	31	31	29	30	30	28	30	29	30	30	31	31	31	31	31	31	30	31	31	31	31
MED	28	29	30	28	30	28	E20	E25	U24	G	G	E33	32	33	G	30	G	G	G	G	G	22	21	22	
UQ	32	32	38	U39	39	34	U34	36	38	28	U33	36	35	35	32	33	31	30	29	27	25	24	34	U32	
LQ	19	20	23	22	23	E21	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	20	

The Radio Research Laboratories, Japan

DEC. 1977

FBES (0.1 MHz)

IONOSPHERIC DATA

DEC. 1977

F-MIN (0.1 MHz)

45° E Mean Time (G. M. T. + 3h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	10	10	9	10	9	10	10	10	10	11	10	14	15	12	12	10	10	10	10	8	8	13	9
2	22	10	10	B	10	12	B	B	B	B	14	12	19	20	25	10	10	10	9	7	10	11	10	10
3	8	8	8	10	10	11	10	9	14	10	10	10	10	11	16	32	20	13	12	18	10	9	8	8
4	6	13	21	12	13	12	19	16	14	10	20	25	14	10	13	12	10	10	16	10	15	17	8	8
5	6	13	16	8	10	10	12	10	19	B	12	B	B	B	34	16	17	10	25	17	20	8	9	7
6	6	15	6	47	11	20	17	13	10	10	10	11	10	12	10	10	10	9	9	10	8	9	8	6
7	11	12	15	14	13	10	10	9	9	10	9	10	10	14	11	11	10	10	10	11	9	8	7	12
8	21	17	11	10	10	10	10	10	10	10	10	10	10	10	10	11	13	14	15	17	12	10	7	8
9	9	9	8	6	7	8	10	10	10	12	56	22	12	20	30	14	15	10	14	20	16	16	13	10
10	9	8	10	8	8	8	8	10	8	19	16	22	14	13	10	11	13	11	19	15	10	10	11	10
11	14	5	8	10	10	12	11	25	13	10	10	10	13	13	10	10	10	10	10	C	10	13	14	10
12	8	7	7	9	10	23	18	13	18	12	37	B	14	11	12	11	10	20	9	10	10	8	7	8
13	6	11	12	18	8	20	14	11	10	13	22	28	15	11	14	35	21	19	14	10	13	10	11	15
14	11	10	12	10	24	25	B	16	10	B	B	23	12	10	12	24	17	34	45	10	13	12	10	6
15	10	6	7	9	11	10	11	10	14	10	10	20	20	21	24	32	11	15	14	10	11	10	8	6
16	9	14	23	25	21	15	22	30	33	26	21	18	22	19	23	29	20	15	10	10	10	12	10	7
17	10	6	6	10	16	11	12	12	13	10	17	12	9	10	10	11	10	12	15	15	29	22	17	7
18	15	26	8	8	11	10	8	10	9	9	10	10	13	20	13	15	19	18	12	10	6	6	7	8
19	6	9	6	7	6	7	10	10	10	11	12	15	21	27	23	20	15	20	18	13	10	11	12	7
20	9	10	7	8	7	11	11	13	9	10	10	10	10	11	10	21	21	20	13	11	8	8	13	10
21	10	5	10	7	7	8	7	9	10	10	9	10	10	8	10	10	10	10	8	9	6	9	9	12
22	12	10	6	10	10	8	10	10	22	21	10	10	10	10	10	10	10	8	11	13	13	14	11	9
23	10	10	12	19	18	9	10	9	10	10	10	10	10	10	10	9	10	12	10	10	11	10	10	10
24	7	17	11	16	13	10	8	10	10	10	9	8	10	10	9	19	13	12	12	10	10	9	7	8
25	12	12	8	8	7	7	8	8	13	13	22	18	24	15	12	11	11	11	10	8	6	8	10	11
26	6	10	6	7	10	11	11	15	11	10	11	10	10	10	10	10	10	10	10	9	8	8	7	12
27	8	10	13	15	12	13	10	10	12	10	9	7	9	10	19	10	10	11	11	10	12	12	20	15
28	11	11	10	12	10	11	10	10	10	10	10	10	10	22	12	10	10	10	10	9	10	10	14	10
29	33	10	10	19	8	10	10	15	12	12	25	12	14	12	12	10	10	12	13	20	11	9	8	7
30	C	15	13	12	10	11	9	8	9	9	10	9	10	10	10	10	11	9	10	8	7	7	7	8
31	6	9	5	8	7	7	8	9	10	10	10	10	10	10	10	10	8	10	10	11	10	8	9	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	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31
MED	10	10	10	10	10	10	10	10	10	10	10	10	12	11	12	11	10	11	11	10	10	10	10	8
UQ	11	12	12	14	12	12	12	13	14	12	18	19	14	17	15	18	15	14	14	13	12	12	12	10
LQ	7	9	7	8	8	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	8	8	8

DEC. 1977

F-MIN (0.1 MHz)

IONOSPHERIC DATA

DEC. 1977

M(3000)F2 (0.01)

45° E Mean Time (G. M. T. + 3h)

Station SYDWA STATION Lat. 69° 00.4' S. Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	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	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
2	R	F	A	B	F	Y	B	B	B	B	A	Y	G	G	G	R	F	F	F	F	F	A	A	A
3	F	F	A	F	F	Y	Y	Y	260	235	G	F	270	210	250	255	275	285	315	325	320	315	310	285
4	F	F	Y	Y	270	260	F	F	F	F	F	F	285	280	275	270	305	295	310	280	F	A	A	F
5	F	F	F	F	F	F	A	A	Y	B	R	B	B	B	U	F	280	F	F	F	F	F	F	F
6	F	F	325	Y	F	F	Y	F	F	270	300	U	280	275	275	300	295	305	290	325	310	315	315	300
7	F	F	S	R	F	F	F	F	F	270	250	265	270	275	285	290	290	305	310	310	320	330	300	330
8	F	R	F	F	300	300	280	260	265	260	265	270	280	290	285	295	330	310	320	315	320	315	305	310
9	295	F	F	F	F	U	F	F	F	F	F	270	275	F	F	F	F	F	U	F	320	320	335	320
10	280	F	F	F	F	U	F	F	F	F	275	265	270	285	290	290	280	300	310	325	325	320	U	F
11	295	280	F	F	F	F	A	F	Y	F	Y	Y	Y	F	F	215	Y	235	290	G	F	F	290	F
12	265	R	A	F	F	Y	A	A	A	A	Y	B	G	F	235	215	275	270	280	275	345	300	305	295
13	F	F	A	A	250	Y	Y	R	210	230	240	250	F	260	250	350	275	265	245	230	300	305	310	300
14	270	275	260	F	Y	Y	B	F	280	B	B	275	260	270	260	280	295	315	310	290	295	320	330	285
15	320	290	290	295	F	F	F	U	275	270	270	265	265	275	260	290	275	290	295	315	315	310	F	F
16	300	295	U	F	275	F	265	U	F	F	U	265	275	280	270	290	300	300	310	295	290	270	F	F
17	270	F	F	A	F	A	Y	Y	Y	Y	G	G	G	230	285	280	280	290	275	300	310	320	310	300
18	R	R	F	F	F	F	F	J	250	J	F	270	265	285	270	285	285	295	300	300	315	320	310	320
19	315	290	280	270	280	265	270	265	265	270	270	270	290	280	280	305	305	300	290	315	325	325	335	320
20	300	285	J	F	J	F	J	F	280	285	270	290	305	280	295	290	U	290	305	290	300	320	305	315
21	U	310	330	270	F	265	J	F	J	F	270	F	F	285	F	300	285	295	290	280	290	330	300	335
22	F	U	F	F	F	F	F	F	U	250	F	F	280	275	285	305	300	305	310	310	330	325	320	305
23	F	305	275	Y	Y	260	U	F	290	290	275	295	285	290	290	295	285	300	320	315	325	315	U	F
24	295	310	305	A	275	255	F	F	275	270	275	280	290	285	285	290	F	310	295	305	330	325	310	330
25	300	305	U	F	J	F	J	F	F	F	U	F	F	295	300	F	305	U	320	290	295	315	310	305
26	290	F	F	F	F	270	250	F	F	F	270	285	255	275	270	290	300	290	300	295	310	305	285	F
27	F	U	S	A	A	A	R	R	230	F	F	270	275	255	285	290	295	285	300	310	290	300	300	335
28	335	300	295	290	270	F	U	F	F	F	F	F	F	280	280	300	300	325	300	315	315	F	290	F
29	A	F	F	F	R	F	R	A	Y	250	275	265	285	290	295	280	285	295	310	330	320	F	300	S
30	C	U	F	285	F	A	250	F	255	U	255	270	265	275	275	285	255	275	300	310	300	310	330	320
31	305	F	U	F	F	F	F	F	275	280	260	270	270	280	270	275	290	270	275	310	325	305	335	325
	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	17	14	9	10	13	9	13	17	17	22	25	25	26	29	28	28	29	30	28	29	25	25	21
MED	300	295	285	275	270	265	275	265	265	270	270	275	280	280	285	290	295	300	300	315	320	315	310	310
UQ	310	305	300	290	275	275	280	275	275	270	270	280	285	285	290	298	302	310	310	320	325	320	330	325
LQ	290	285	275	270	265	260	265	255	260	260	265	270	260	270	260	280	280	290	290	292	310	305	305	300

DEC. 1977

M(3000)F2 (0.01)

IONOSPHERIC DATA

DEC. 1977

H¹F² (KM)

45° E Mean Time (G. M. T. + 3h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					350	U ^H 390	U ^H 355	345	340	380	410	390	350	355	330	330	340	L	295	L	L			
2					380	Y	B	B	B	B	A	Y	G	G	G	R	630	550	400	F				
3						Y	Y	A	480	580	G	600	680	680	485	470	400	375	330					
4					375	410	425	450	450	380	330	320	350	350	355	355	300	305	300	340	U ^F 400			
5						590	A	A	Y	B	R	B	B	B	520	400	400	310	335					
6						F	Y	U ^F 370	420	370	355	400	365	400	400	350	L	335	L	270	L	265	L	
7					455	330	300	375	350	405	370	350	325	340	345	325	320	300	285	285	L			
8				400	335	340	U ^H 360	350	375	360	380	365	390	325	345	390	300	L	L	300	L			
9			280	U ^H 310	350	350	340	U ^H 320	395	340	B	340	350	325	355	350	300	300	290	L	260			
10			L	325	350	335	300	300	350	325	350	350	320	340	345	350	310	310	275	270	L	L		
11				450	L	U ^F 330	A	510	A	Y	Y	Y	Y	U ^F 650	U ^F 600	Y	Y	Y	375	C				
12						Y	A	A	A	A	Y	B	G	600	580	630	430	400	L	L	L			
13					480	A	A	R	670	550	525	450	440	450	485	390	380	430	510	580				
14				F	A	A	B	A	420	B	B	375	420	420	430	390	340	290	315	340				
15					430	450	395	350	300	335	350	340	360	340	390	320	350	330	310	285	250			
16			300	300	340	315	340	325	300	350	335	330	325	345	325	300	320	305	L	345	U ^H 350			
17					355	A	Y	Y	A	Y	G	G	G	625	400	420	400	L	390	320	300	280		
18				U ^F 500	A	U ^F 450	385	390	400	385	390	360	400	395	375	350	360	L	280	L	L	L	245	
19			L	350	330	320	340	340	345	320	335	340	325	340	350	335	L	315	L	295	L			
20				295	320	355	320	315	325	305	310	330	310	300	345	325	345	350	300	300	290	270		
21				350	370	350	350	340	335	345	320	305	340	350	315	370	350	340	350	330	255	L		
22				F	395	350	340	360	400	345	310	355	375	360	345	350	320	L	L	260	L	L	L	L
23				A	A	425	380	360	320	325	350	325	350	350	350	340	335	305	295	L	L	L		
24				A	405	U ^H 450	U ^H 360	330	315	320	340	330	325	345	330	330	300	L	L	300	275	L		
25				350	345	350	330	350	350	345	335	340	340	330	310	350	350	320	L	L	280	270		
26				355	U ^F 350	400	480	F	500	350	400	370	440	360	370	345	330	L	305	L				
27				A	A	R	650	500	540	450	355	380	450	370	345	355	370	345	325	A	350	300	L	
28				L	350	375	330	390	345	325	345	375	365	355	335	305	325	290	A	L	290			
29				A	R	F	R	A	Y	U ^H 460	445	420	370	350	350	395	370	350	400	270	L	270	L	
30				F	A	450	400	395	375	350	355	400	400	395	480	395	350	325	325	300	265	265	L	
31				350	F	380	350	350	325	360	340	350	330	360	370	350	380	320	300	275	270	250		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT			3	12	19	22	21	22	25	25	25	27	29	30	31	29	28	23	22	19	13	6	1	
MED			295	350	355	362	350	350	350	350	350	355	365	355	355	350	350	320	312	300	275	268	245	
UQ			298	378	388	425	385	390	420	380	390	385	420	400	415	390	375	342	350	335	300	270		
LQ			288	322	350	335	340	340	335	335	335	340	340	345	345	340	320	305	295	280	265	265		

DEC. 1977

H¹F² (KM)

IONOSPHERIC DATA

DEC. 1977

H'F (KM)

45° E Mean Time (G. M. T. + 3 h)

Station **SYOWA STATION** Lat. **69 00.4 S**, Long. **39 35.4 E** Sweep **0.5 MHz to 15 MHz** in **30 sec** in automatic operation

Hour Day	00	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	U	F	380	340	330	255	230	210	205	200	210	E	A	220	205	215	U	H	210	H	225	220	240	220	250	U	F	400	F	345						
2		305	345		A	B	A	Y	B	B	B	A	A		250	U	H	230	230	230	265	255	265	U	F	225	A	A	A								
3	U	Q	F	A	Q			A	A	R		215	200	200	U	H	190	220	215	230	250	225	230	U	H	225	225	245	U	H	250	315					
4	330	300		A	A	A	335	A	A	A	210	210	200	U	H	205	205	225	220	215	265	U	H	240	290	A	A	U	Q	305							
5	U	Q	U	U	U	Q		A	A	A	A	B	200		B	B		220	275	220	230	230	230	260	H	250	U	H	270	330							
6	320	280	Q	260	Y	250	Q	U	F	A	230	200	U	H	195	205	200	230	205	205	210	225	220	U	H	240	225	H	245	240	250						
7	250	320		A	A	A	U	H	250	230	200	250	250	240	210	260	U	H	195	200	200	205	240	205	250	245	H	245	250	305							
8	U	Q	310		A	A	335	255	U	H	220	U	H	200	U	H	195	U	H	200	U	H	200	200	215	U	H	210	210	U	H	240	230	230	250	250	260
9	250	260	250	265	U	H	220	205	240	210	200	200		B	Y	245	230	A	A	215	U	H	200	225	235	225	250	250	E	A	250	E	A	295			
10	265	265	280	Q	250	240	220	210	210	200	200	200	215	220	U	H	205	230	205	220	210	240	230	230	240	240	240	250									
11	360	350		A	A	220	Q	A	A	A	250	F	A	Y	A	A	230	250	255		Y	Y	Y	210	C	F	A	400	F								
12	U	F	A	A	370	U	Q	A	A	A	A	A	A	B	B		210	210	255	240	230	225	230	H	250	240	265	350	350								
13	375	Q	A	A	A	310	A	A	A	275	205	225	230	225	200	H	220	220	220	210	240	235	H	350	270	300	315	320									
14	450	425	400	U	280	A	A	B	A	300	B	B	200	U	H	200	205	245	240	215	220	B	B	U	H	240	H	245	250	250							
15	250	300	300	U	340	U	H	E	A	350	A	210	225	200	200	205	A	A	A	A	210	230	225	E	A	265	230	U	H	245	250						
16	E	A	275	H	260	290	250	255	230	225	200	B	A	215	205	205	E	A	255	240	200	205	E	A	240	A	240	230	A	370	305	A					
17	A	U	Q	260	Q	A	A	A	295	Y	A	E	A	270	210	U	H	245	U	H	180	230	250	230	220	205	240	265	280	250	260	295					
18	U	H	305	360	U	350	A	A	300	U	200	250	210	U	H	195	U	H	205	200	A	245	200	H	240	275	U	H	215	220	225	255	240	240			
19	250	250	260	260	255	225	U	H	220	210	U	H	200	U	H	200	A	U	H	200	A	220	220	U	H	200	205	200	225	210	U	H	240	250	240		
20	240	245	245	Q	255	235	210	200	200	U	H	190	220	210	220	U	H	190	A	U	H	220	A	225	225	210	230	290	270								
21	285	275	H	350	U	300	250	U	H	240	210	200	200	210	215	A	U	H	195	U	H	195	205	U	200	200	220	230	U	H	205	220	230	255			
22	400	330		F	A	A	A	250	210	200	A	225	240	U	H	195	U	H	190	275	200	U	H	205	205	200	H	U	H	240	240	210	245	245			
23	250	255	340		A	A	A	250	U	H	200	U	H	200	215	200	220	U	H	200	U	H	210	205	210	220	220	205	U	H	215	230	250	240			
24	250	350	295		A	A	U	H	300	295	205	U	H	200	205	200	200	205	205	210	A	205	200	230	U	H	210	250	220	250	230						
25	260	290	300	Q	290	A	250	R	205	200	200	200	220	220	220	210	205	200	200	H	U	H	195	205	230	250	U	A	230	310	380						
26	375	350	250	U	H	240	A	A	A	245	Y	A	U	H	195	225	230	U	H	205	235	U	H	260	205	H	215	235	230	245	250	360	U	F	300		
27	U	H	350	345		A	A	305	350	A	U	H	260	205	205	205	U	H	200	U	H	210	U	H	210	E	A	225	U	H	A	230	245	230	245	245	
28	240	240	270	240	235	210	U	H	200	U	H	195	210	200	A	245	230	210	205	200	H	240	A	230	A	240	A	H	240	395	250						
29	A	330	U	Q	A	F	U	H	225	A	A	A	U	H	200	U	H	250	225	U	H	220	225	220	200	220	225	E	A	240	240	235	230	250			
30	C	350	A	U	300	A	A	245	235	210	240	U	H	205	225	A	215	U	H	200	200	H	205	200	230	240	250	250	250								
31	240	275	300		A	260	225	220	H	235	U	H	200	205	U	H	195	U	H	225	U	H	210	245	200	200	U	H	205	210	230	A	A	240	300		
	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	28	20	16	16	21	20	22	20	26	25	24	26	28	29	28	29	28	28	30	27	27	29	28													
MED	305	308	290	272	250	250	222	210	200	205	205	206	206	H	218	210	209	210	220	229	230	240	245	250	255												
UQ	355	345	320	320	278	300	248	235	210	215	215	224	225	230	220	229	220	225	236	240	248	250	305	305													
LQ	250	270	260	252	235	225	208	200	U	H	200	200	200	U	H	200	205	205	202	205	205	212	225	225	230	245	250										

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H'F (KM)

IONOSPHERIC DATA

DEC. 1977

H^oES (KM)

45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	100 ^K	110 ^K	105 ^K	100 ^K	140 ^K	100 ^K	G	135	G	G	120	115	110	110	G	G	G	100	100	100	G	G	120 ^K	100 ^K	
2	100 ^K	100 ^K	95	B	100	95	B	B	B	B	100	95	G	G	G	G	G	150	140	130	145	100	100	100	
3	125 ^K	120 ^K	100	100 ^K	100	150 ^K	95	140 ^K	100 ^K	G	G	G	G	G	G	B	G	G	G	G	160	G	140 ^K	100 ^K	
4	100 ^K	105 ^K	105	100	100	140 ^K	100	100	100	G	G	G	G	100	G	105	120	G	G	G	110 ^K	100	100	100 ^K	
5	130 ^K	125 ^K	160 ^K	140	160	95	95	100	100	B	G	B	B	B	B	G	G	160	170	150	125	105	120	100 ^K	
6	100 ^K	130 ^K	170 ^K	125	140 ^K	120 ^K	100	100 ^K	G	G	G	125	G	100	G	100	100	100	G	G	G	105	G	100	
7	145 ^K	120 ^K	120	100	100	100 ^K	G	G	G	105	G	110	110	125	G	G	G	125	140	125	125	G	G	125 ^K	
8	140 ^K	125 ^K	105	100 ^K	100 ^K	G	G	G	G	G	G	G	120	105	100	G	G	G	G	G	G	G	130	G	
9	G	145	145	140	G	100	G	G	105	G	B	G	120	95	100	G	100	100	E 150 ^G	G	120	100	100	100	
10	100	100	120	110	100	100	G	G	95	G	G	105	100	G	G	120	110	105	G	G	G	170	G	140	
11	110 ^K	100 ^K	100	100 ^K	100 ^K	100	100	110 ^K	95	G	95	95	95	G	G	G	G	G	G	G	G	100 ^K	105	120 ^K	100 ^K
12	100 ^K	95	95	100 ^K	155 ^K	95	100	100	100	100	105	B	160	100	G	G	100	G	180	145	140	100	100 ^K	100 ^K	
13	100 ^K	100	100	105	100 ^K	95	95	100	G	G	G	G	G	G	G	B	G	G	G	K	100	150	110	115	105 ^K
14	105 ^K	105 ^K	105 ^K	100 ^K	100	100	B	100	100 ^K	B	B	G	G	G	G	105	G	B	B	G	145	125	115	130	
15	120	100	150 ^K	110 ^K	100 ^K	100	100 ^K	100	100	100	110	110	105	110	105	105	G	G	G	125	100	110	100	120	
16	115	120	B	B	G	100	100	B	100	100	G	120	110	110	105	100	100	100	G	G	100	100	100 ^K	100 ^K	
17	100 ^K	140 ^K	115	100	100	95	150	G	100	100	120	G	G	145	G	130	130	120	G	G	B	155	G	150	
18	125 ^K	145 ^K	100 ^K	100	100	100 ^K	140	G	130	G	G	130	105	105	100	100	100	110	100	100	100	95	110	145	
19	140	G	125	120	G	G	110	115	100	G	115	110	105	100	100	G	130	125	120	120	140	115	125	G	
20	100	125	100	100	150	105	135	105	105	105	105	100	100	100	100	110	110	120	130	G	G	G	120 ^K	105 ^K	
21	110 ^K	125	125 ^K	120	110	100	100	110	G	105	105	110	110	100	100	100	130	100	130	G	G	140	130	150	
22	115 ^K	145 ^K	135	110	100	100	G	G	100	G	100	G	105	105	G	G	G	G	G	G	E 145 ^G	125	120	G	
23	140	145 ^K	130 ^K	100	100	100	G	100	G	G	G	120	115	110	105	105	100	100	G	125	115	105	100	100	
24	100	140 ^K	105 ^K	105	100 ^K	100 ^K	145	G	G	100	100	100	100	100	125	100	110	G	110	105	100	100	130	G	
25	140	120 ^K	100 ^K	110	130	G	G	G	100	130	G	100	100	120	110	105	105	125	135	130	115	100	125	110 ^K	
26	100 ^K	135 ^K	100	150	100	100 ^K	100 ^K	100 ^K	100	G	G	G	130	G	G	G	G	G	150	135	125	105	100 ^K	110 ^K	
27	100 ^K	100 ^K	100 ^K	95	100	100	100	100	100	G	G	G	G	115	110	100	G	G	100	G	G	G	B	G	
28	G	G	G	G	125	140	G	100	G	115	G	120	120	110	100	105	105	100	125	130	125	105	105 ^K	130 ^K	
29	130	100 ^K	130	100	140 ^K	100 ^K	130	100	95	G	105	140	125	125	G	G	110	G	105	105	100	G	120	160	
30	G	145 ^K	100	140 ^K	100 ^K	100	G	G	G	G	G	G	125	130	G	G	G	100	100	125	110	115	G	135	
31	135	100	100	100 ^K	100 ^K	G	G	G	G	G	G	G	125	105	G	105	100	G	E 140 ^G	G	120	100	G	100 ^K	
CNT	28	29	29	28	28	27	18	18	19	10	12	17	22	23	13	16	17	17	18	16	23	24	24	26	
MED	110 ^K	120 ^K	105	100	100	100	100	100	100	102	105	110	110	105	100	105	105	105	126	125	120	105	118	105	
UQ	130	135	125	115	128	100	130	110	100	105	112	120	120	112	105	105	110	125	140	130	136	115	122	130	
LQ	100 ^K	100 ^K	100	100	100	100	100	100	100	100	100	100	105	100	100	100	100	100	105	105	105	100	100	100 ^K	

DEC. 1977

H^oES (KM)

IONOSPHERIC DATA

DEC. 1977

TYPES OF ES

45° E Mean Time (G. M. T. + 3 h)

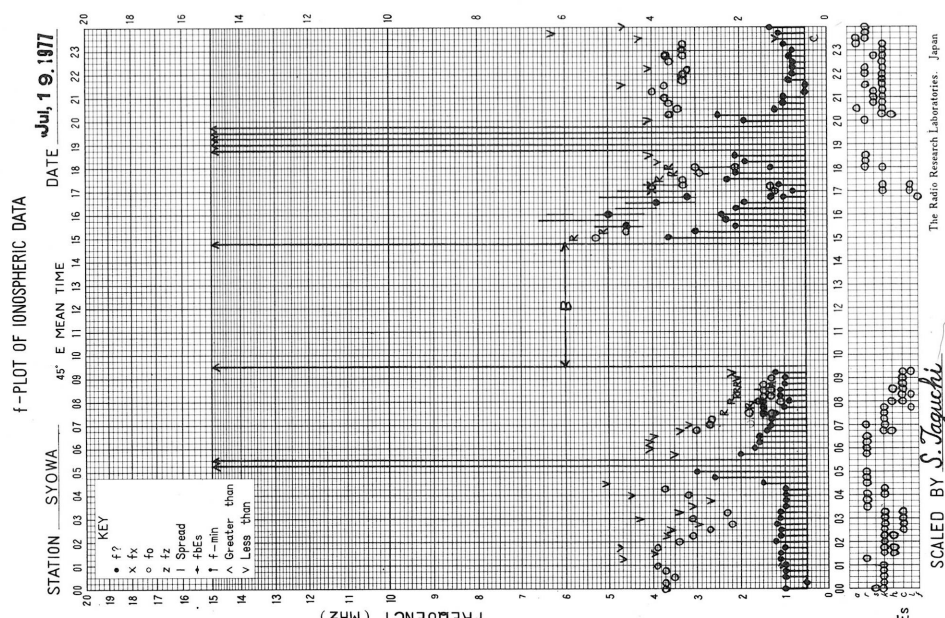
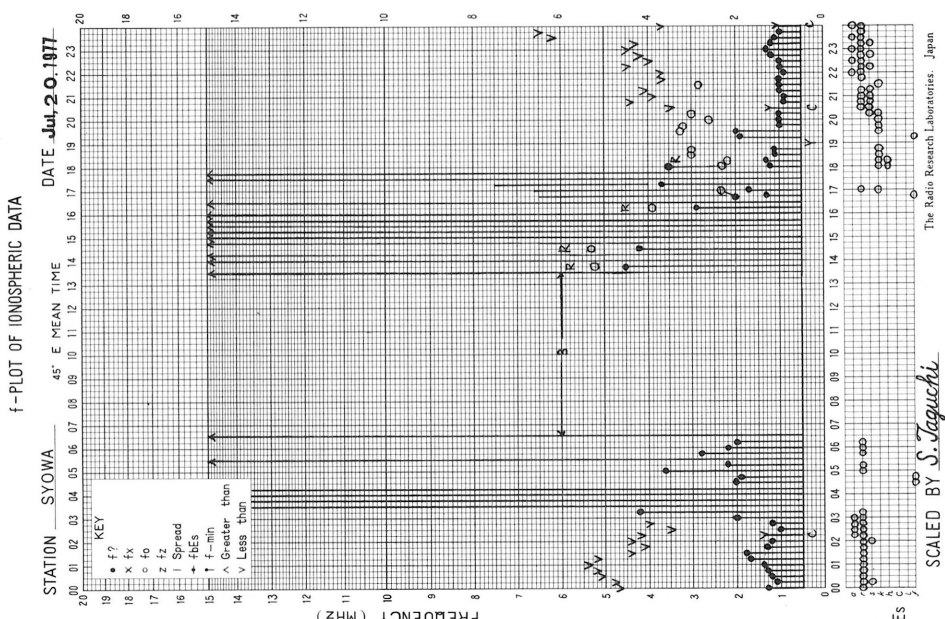
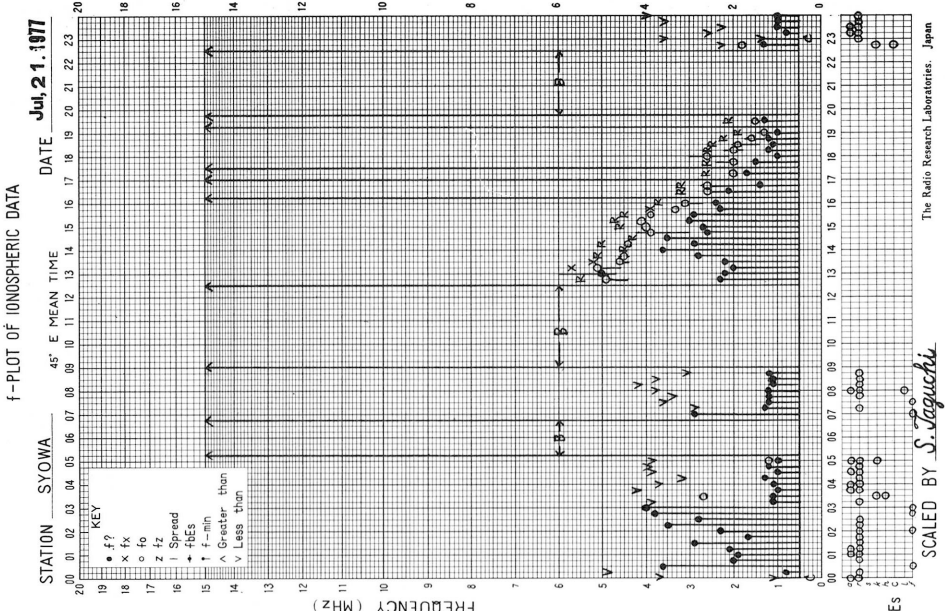
Station **SYOWA STATION** Lat. 69 00.4 S, Long. 39 35.4 E Sweep 0.5 MHz to 15 MHz in 30 sec in automatic operation

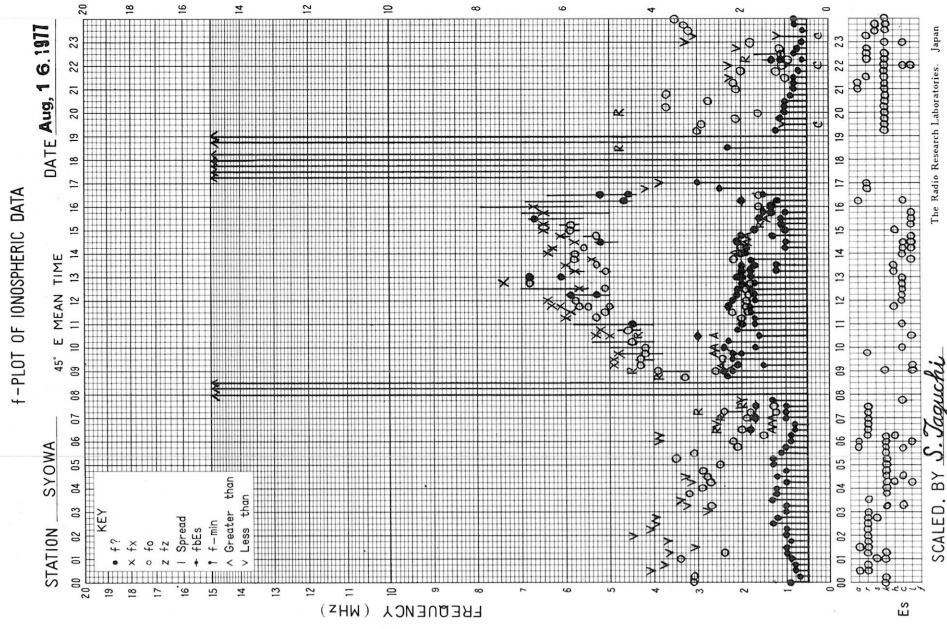
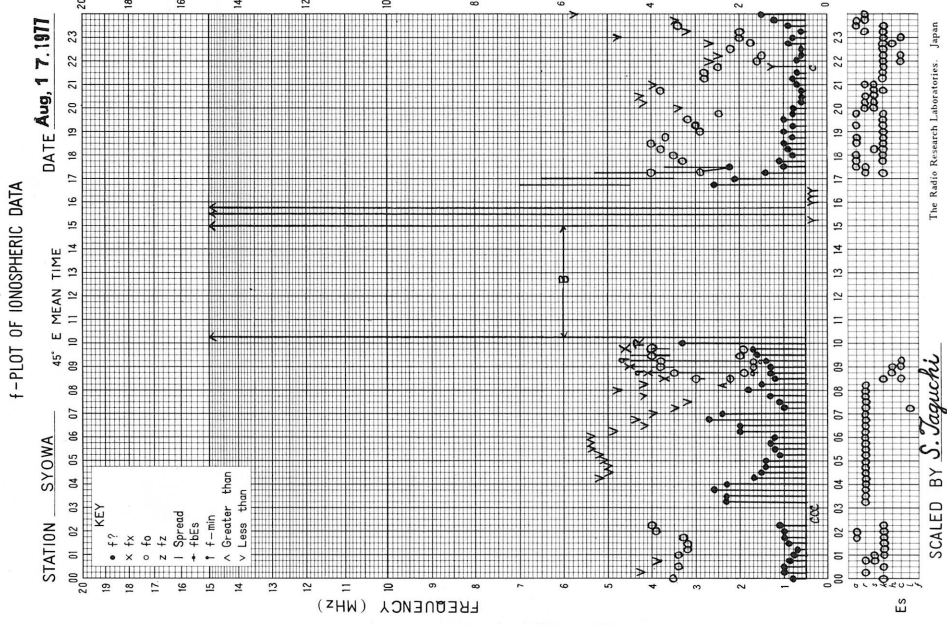
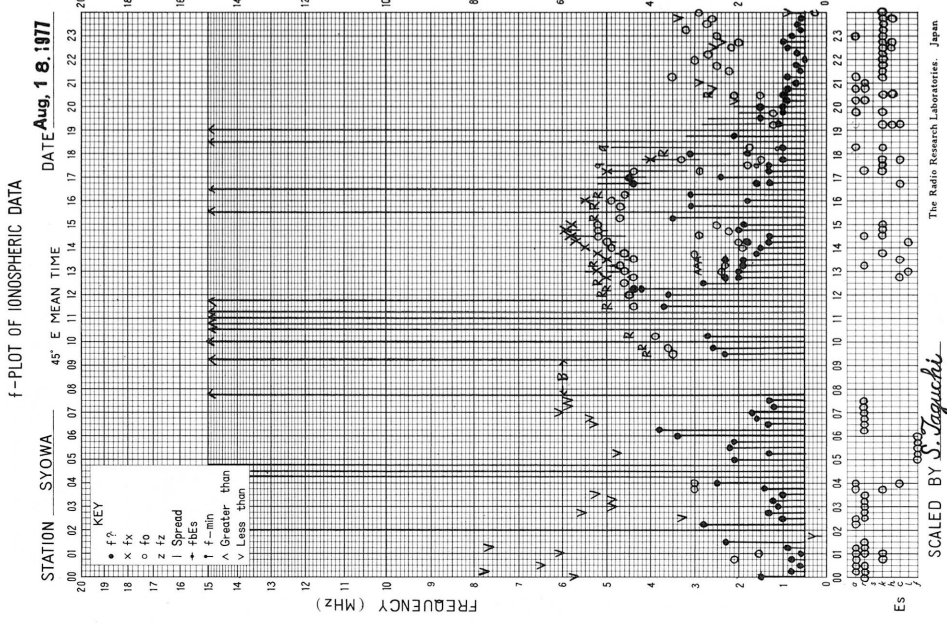
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	KA 21	K 2	K 2	K 3	KC 12	K 2		H 1			C 2	C 2	C 1	C 1				C 2	C 3	R 2			K 1	AK 11	
2	LK 11	RKA 11	L 1		RA 21	L 1					RA 11	R 1						R 1	H 1	C 1	H 1	R 2	RA 21	AR 11	
3	RKL 11	AL 11	RA 21	CKA 21	L 2	HK 11	R 1	RLK 11	K 1												H 1		H 1	K 3	
4	K 3	RK 11	R 1	R 1	R 1	HK 11	R 1	R 1	R 1				C 1		C 1		C 1				RK 11	R 1	AR 12	RK 12	
5	CKR 13	CKL 11	HK 11	A 1	ABS 12	R 1	R 1	R 2	R 1									H 1	H 1	H 1	C 1	C 3	CL 21	K 3	
6	K 3	RKA 21	HK 11	A 1	CKC 11	K 1	R 1	K 1				C 1		C 1		L 1	L 2	L 2					C 2		C 2
7	K 1	RK 12	R 1	R 1	R 2	RK 12				C 1		C 1	C 2	C 1				C 2	H 1	C 3	C 1				RK 11
8	K 1	CK 11	R 2	RK 21	K 2								H 1	C 1	L 1									H 2	
9		HC 11	HC 12	H 1		L 1			C 1				C 1	L 1	C 1		C 1	C 2	H 1		C 1	C 2	C 3	L 3	
10	L 2	CA 11	C 2	C 1	L 2	L 2			L 1			C 1	L 1			C 1	C 1	C 1				H 1		H 1	
11	K 1	K 3	R 2	KA 11	RK 11	R 1	RA 11	K 1	L 1		C 1	L 1	L 1								KA 11	R 2	K 3	KA 21	
12	RKA 31	R 1	R 1	RK 21	RLK 11	L 1	R 1	R 1	RA 11	R 1	R 1		H 1	R 1			R 1		H 1	H 1	H 1	R 2	K 4	RK 12	
13	RK 31	LA 11	R 1	R 1	RK 21	L 1	R 1	R 2													K 1	H 1	RK 22	RK 13	K 2
14	K 2	K 2	K 2	KA 11	L 1	R 1		R 1	K 2							C 1					H 1	C 2	C 2	H 1	
15	C 1	C 3	HK 11	CK 31	CK 21	L 3	RK 11	L 2	L 1	L 1	C 1	C 1	C 1	AC 12	C 1	C 1					C 2	C 2	C 2	R 2	CL 33
16	CL 31	C 1				R 1	L 1		L 1	L 1		C 1	C 1	C 1	C 1	C 1	CA 21	L 2			R 1	RK 11	K 1	R 1	
17	RKS 11	HK 11	C 3	RA 11	R 1	C 1	H 1		R 1	R 2	C 1			H 1		H 1	H 1	C 1				H 1		RA 11	
18	K 1	KA 11	RKA 21	LA 11	R 2	RK 21	RL 12		H 1			H 1	C 2	C 1	C 1	C 1	L 1	C 1	C 1	L 1	L 2	LC 24	CL 21	H 1	
19	H 1		RL 11	C 2			C 3	C 1	LC 11		C 2	C 1	C 1	L 1	C 1		H 1	C 1	C 1	C 1	H 2	C 2	C 2		
20	L 1	CL 11	LH 11	LR 11	HC 11	C 1	H 1	C 1	C 1	C 2	C 1	C 2	C 2	C 3	R 2	C 1	C 1	C 1	H 1				RK 11	K 2	
21	RK 11	CC 21	CK 22	C 2	C 2	C 2	C 2	R 1		C 2	C 2	C 2	C 1	C 1	L 2	L 2	HL 12	R 2	H 2			H 1	H 1	H 1	
22	KA 31	AK 11	AR 13	RA 11	R 1	R 1			R 1		L 1		C 1	C 1							H 1	C 1	C 1		
23	C 1	CK 11	CK 11	R 1	H 1	R 2		L 1				H 1	C 1	C 1	C 1	C 2	C 2	C 1		H 1	C 2	C 2	C 2	C 2	
24	AR 13	RK 12	KA 21	R 1	K 2	RK 11	R 1			C 2	C 2	L 2	C 1	C 2	CC 11	C 1	C 1		C 1		C 1	C 2	L 2	RAC 11	
25	C 1	RKA 11	KA 11	C 2	CA 11				RS 11	H 1		R 1	R 1	C 1	C 1	C 1	C 1	H 1	HL 11	C 1	C 2	LH 11	RA 11	GR 13	
26	RKS 11	ARK 11	CA 31	AR 11	R 3	K 1	K 1	K 1	R 1				H 1							H 1	H 1	C 1	K 2	K 3	K 2
27	K 3	K 2	RK 11	R 1	R 1	R 1	R 1	R 1	R 1					C 1	C 1	C 2					C 1				
28					C 1	H 1		L 1		C 1		C 1	C 1	C 1	C 1	C 1	C 1	C 2	H 4	H 3	C 3	RA 11	RK 11	CKA 11	
29	R 1	RK 12	HL 11	AR 11	AK 12	RK 21	AR 11	RA 11	L 1		R 1	H 1	H 1	H 1			C 1		C 2	C 1	L 2		C 1	HC 11	
30		RK 11	R 2	HK 11	R 2	R 2							CL 21	H 1				C 2	C 2	C 1	C 2	C 1		H 3	
31	H 1	RA 11	RA 11	K 3	K 2								H 1	C 2		C 2	R 1		H 1		C 3	C 3		RK 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																									
MED																									
UQ																									
LQ																									

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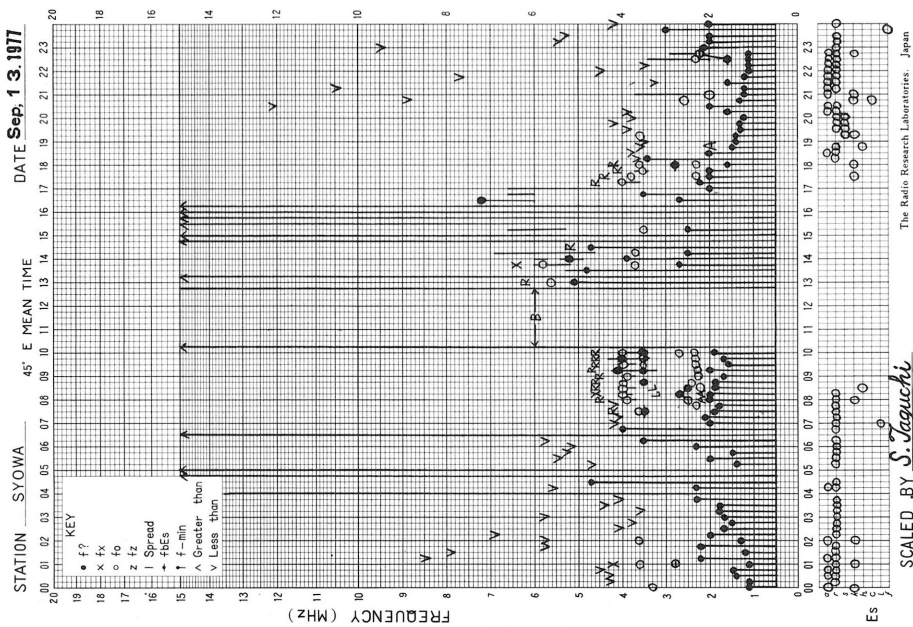
DEC. 1977

TYPES OF ES

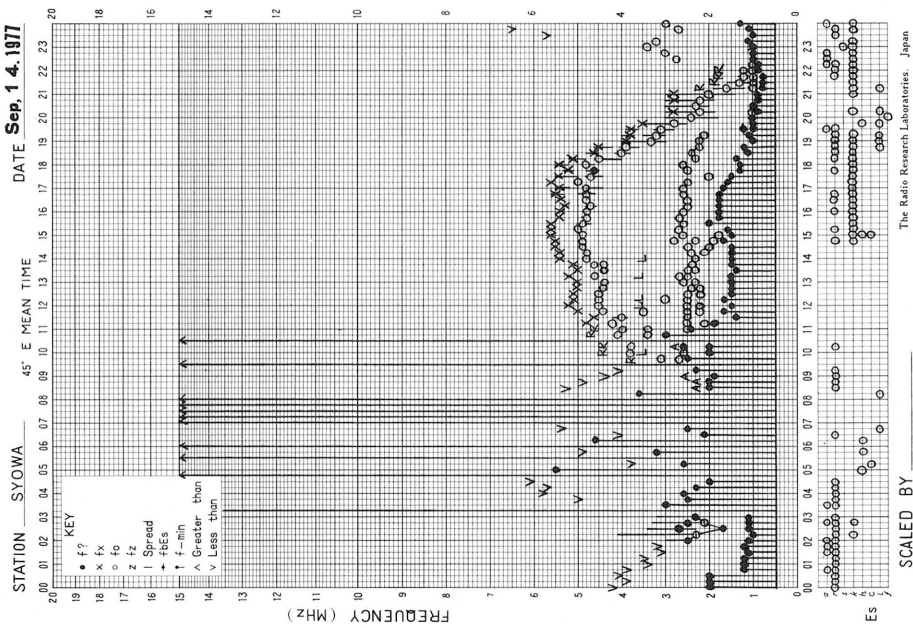




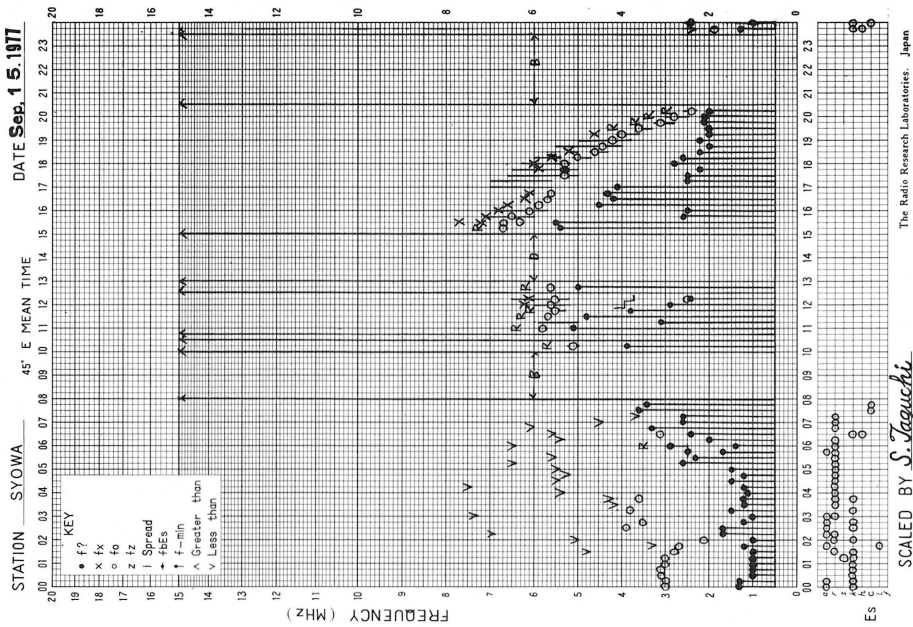
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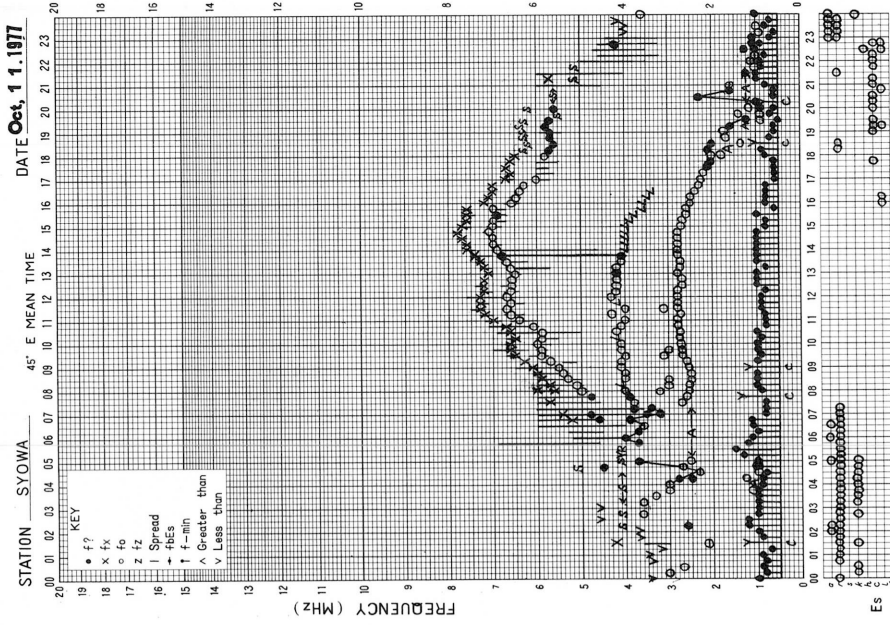
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f-PLOT OF IONOSPHERIC DATA



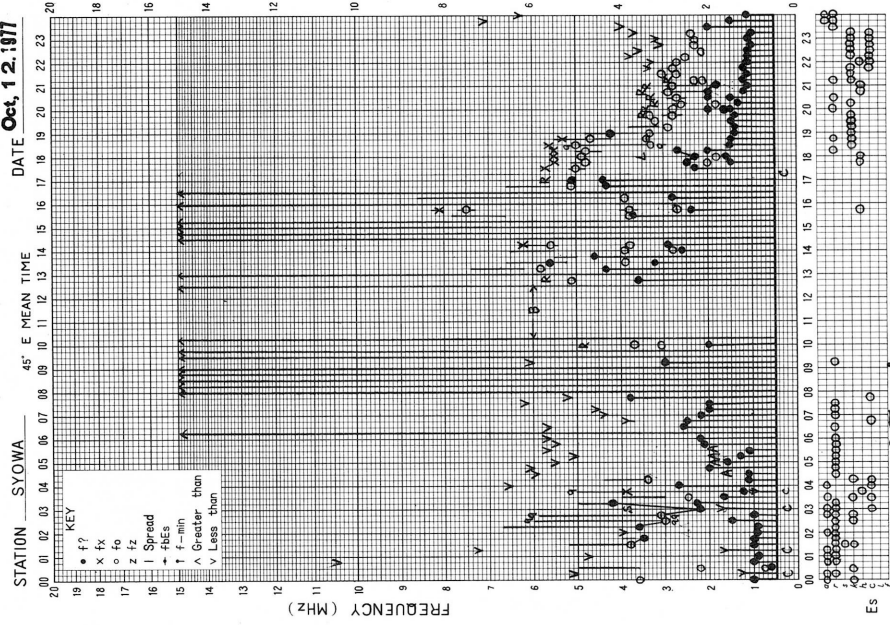
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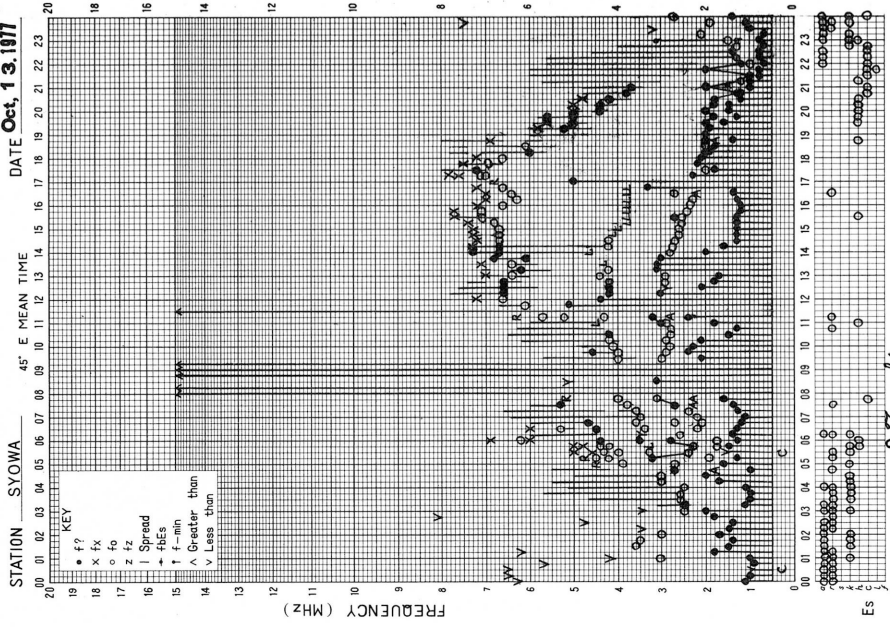
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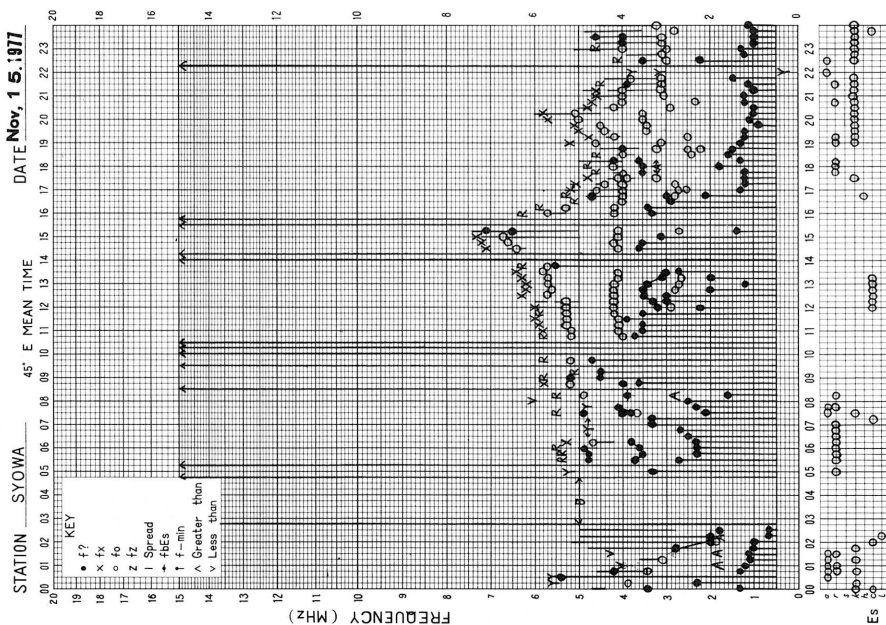
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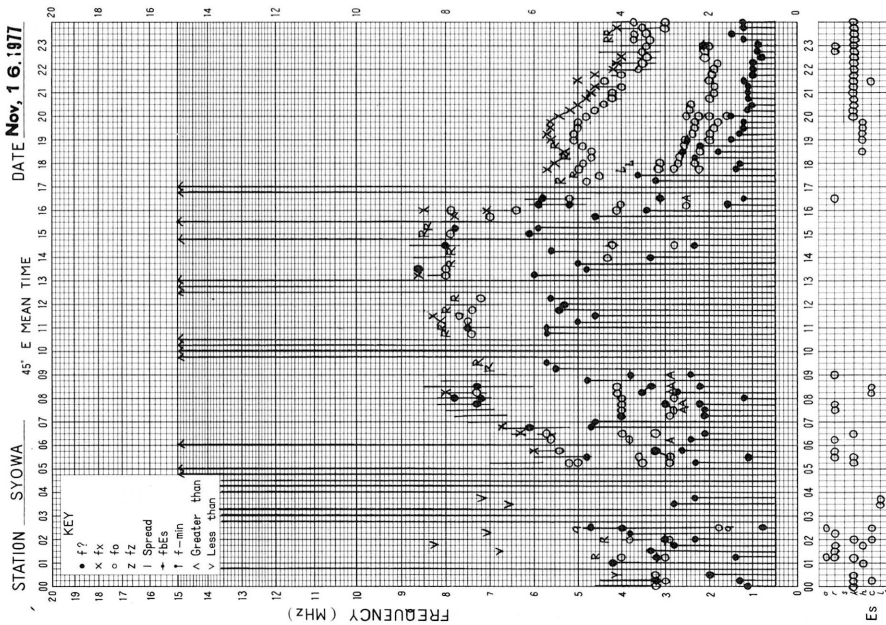
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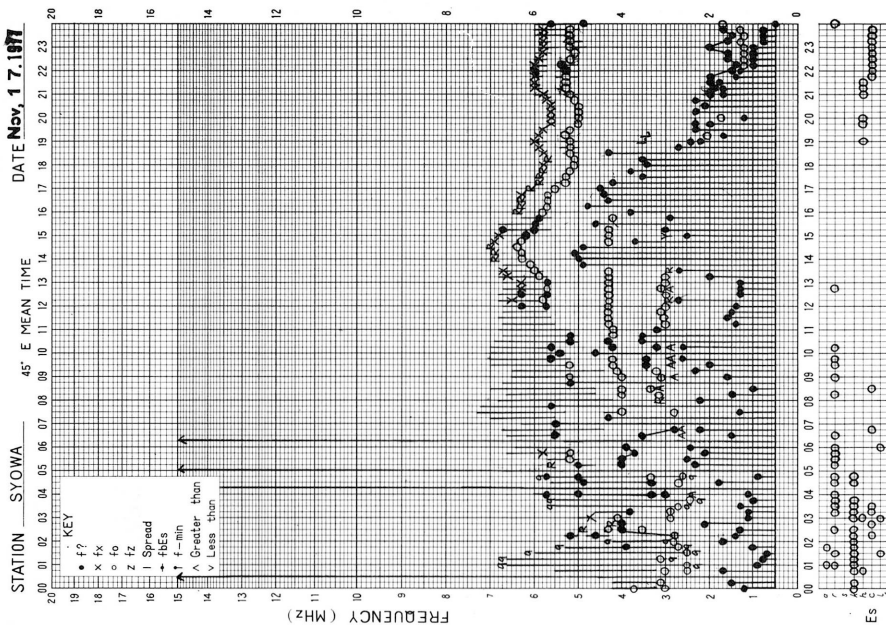
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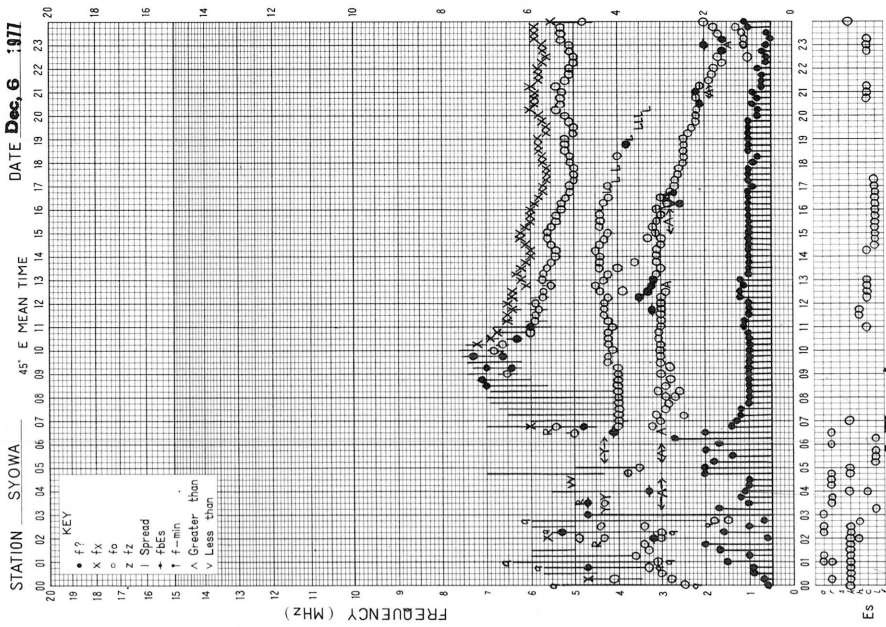
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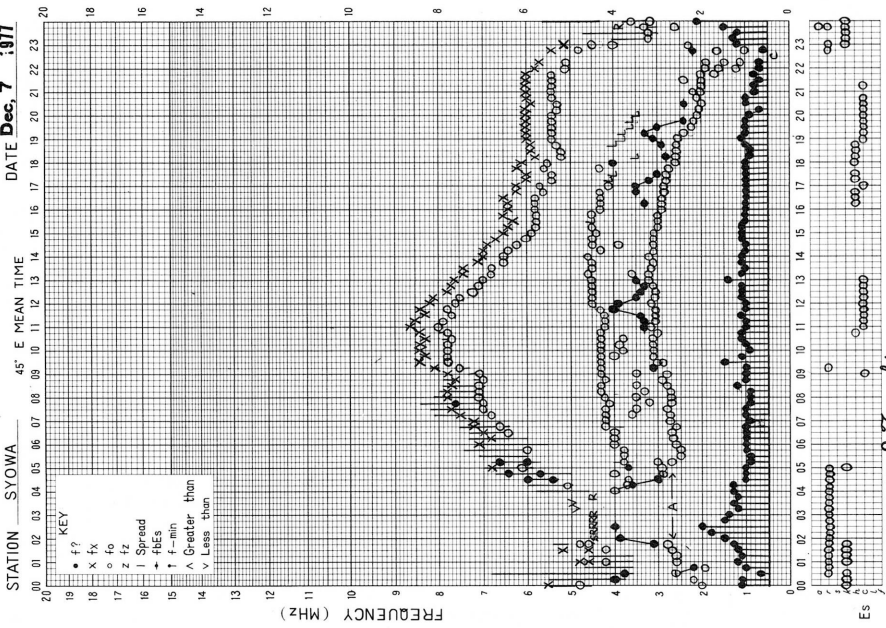
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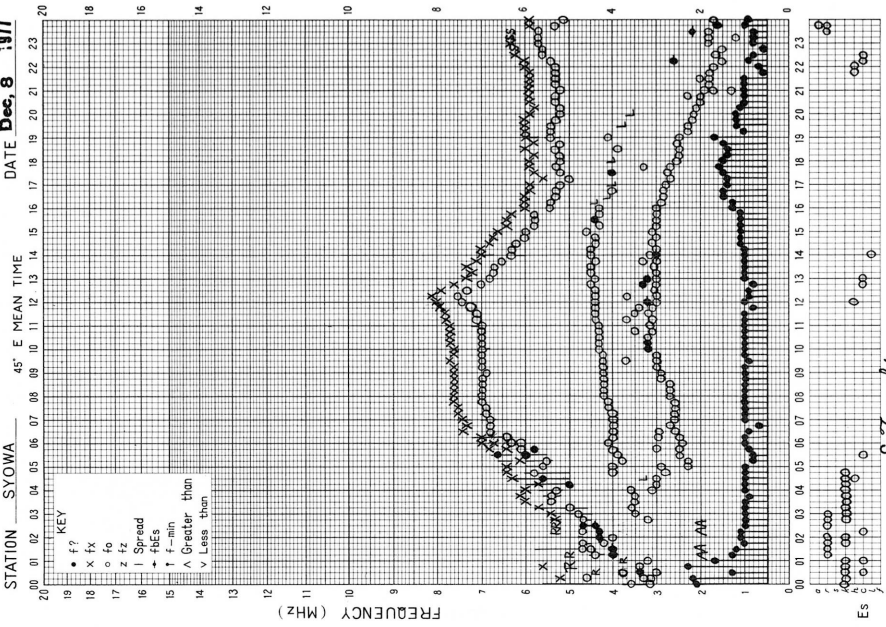
f-PLOT OF IONOSPHERIC DATA



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