ION.ANT.—28

IONOSPHERIC DATA AT SYOWA STATION

(ANTARCTICA)

January 1977—June 1977

CONTENTS

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	Specificatons
Frequency Range	500 kHz—15 MHz
Transmitting Power	10 kW (peak value)
Duration of Sweep	30 sec
Transmitted Pulse Width	100 μsec
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, f_oF1, f_oE, f_oEs — Ordinary wave critical frequency for the $F2$, $F1$, E and Es including particle E layers respectively

$fbEs$ — 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.

$h'F2$, $h'F$, $h'Es$ — Minimum virtual height on the ordinary wave for the $F2$, whole F and Es layers respectively.

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 *fmin*.

C Measurement influenced by, or impossible because of, any non-ionospheric reason.

D Measurement influenced by, or impossible because of, the upper limit of the normal frequency range.

E Measurement influenced by, or impossible because of, the lower limit of the normal frequency range.

F Measurement influenced by, or impossible because of, the presence of spread echoes.

G Measurement influenced or impossible because the ionization density of the layer is too small to enable it to 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 infuenced by, or impossible because of, attenuation in the vicinity of a critical frequency.

S Measurement influenced by, or impossible because of, interference or atmospherics.

T Volue 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 tabuation sheets.

A Less than. Uused only when $fbEs$ is deduced from f_0Es 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 extra-ordinary component.

M Mode interpretation uncertain.

O Extraordinary component characterisitic 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 *Es* trace which shows no appreciable increase of height with frequency.

l A flat *Es* trace at or below normal *E* layer minimum virtual height or below the particle *E* layer minimum virtual height.

c An *Es* trace showing a relatively symmetrical cusp at or below f_oE.

h An *Es* trace showing a discontinuity in height with the normal *E* layer trace at or above f_oE. The cusp is not symmetrical, the lower frequency end of the *Es* trace laying clearly above the high frequency end of the normal *E* trace.

q An *Es* trace which is diffuse and non-blaketing over a wide frequency range.

r An *Es* trace showing an increase in virtual height at the high frequency end similar to group retardation.

a An *Es* trace having a well-defined fiat or gradually rising lower edge with stratified and diffuse tracedpresent above it.

s A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace.

d A weak diffuse trace at heights below 95 km associated with high absorption and large *fmin.*

n The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.

k The designation k is used to show the presence of particle *E*. When $f_oEs > f_oE$ (particle *E*) the *Es* 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.

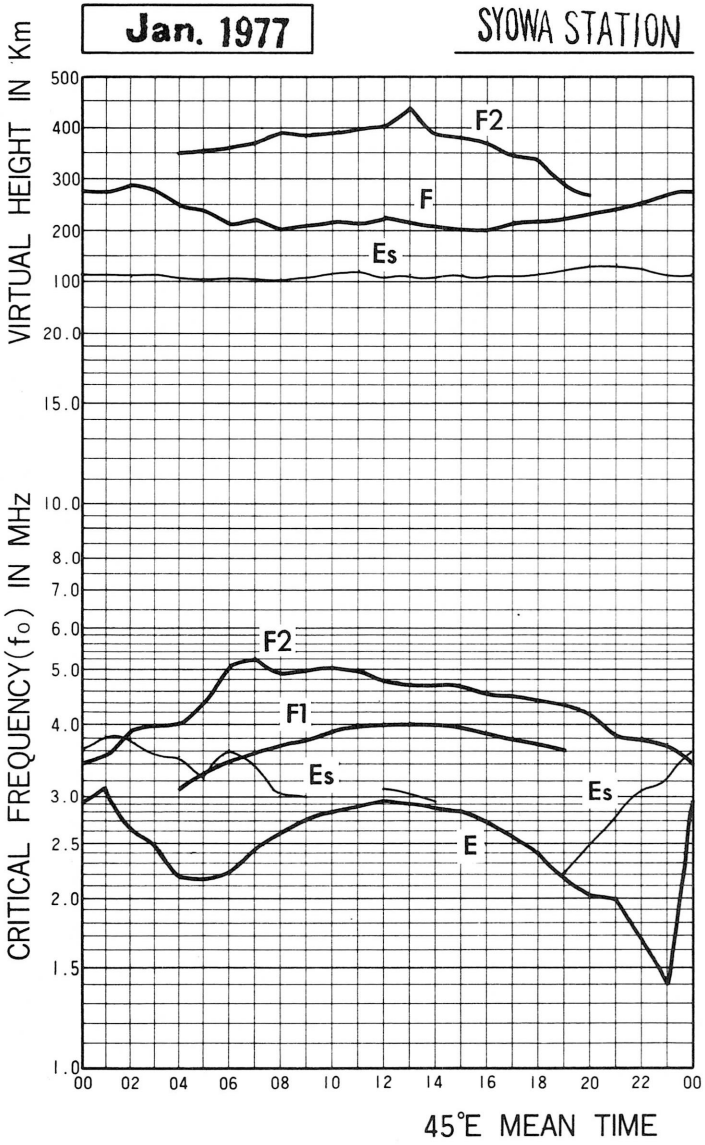
Median (MED) of a set of numbers is the middle value when the numbers are arranged in order of magnitude, or the average of the two middle values if there is an even number of values.

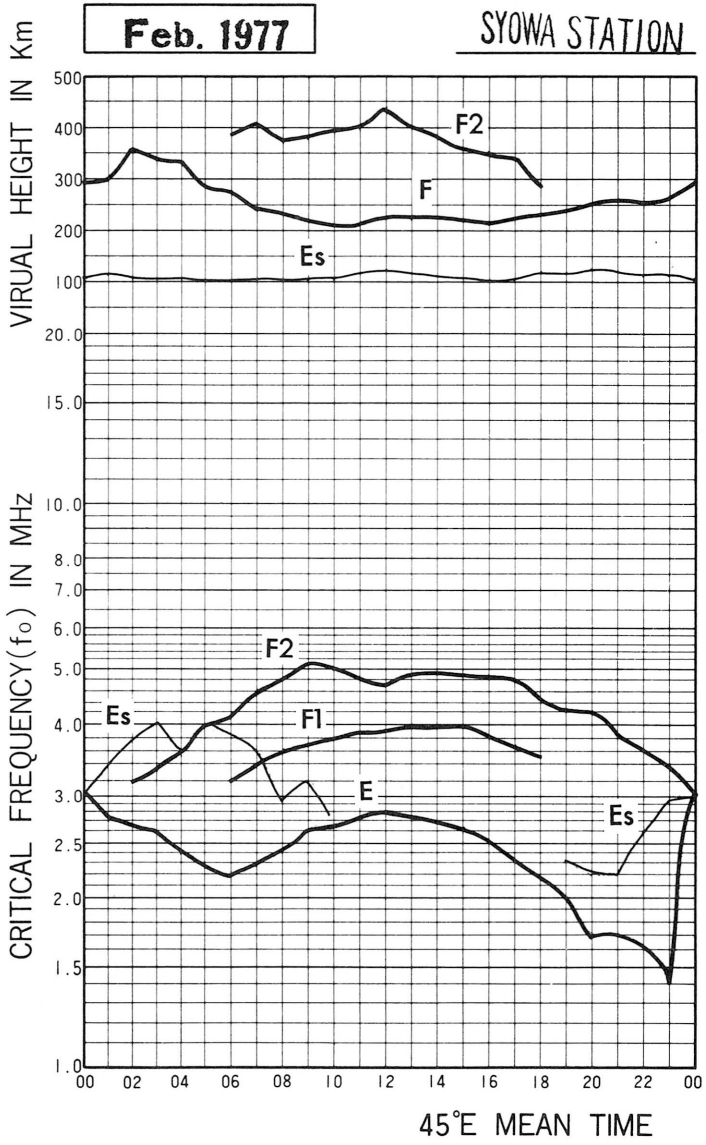
Upper quartile (UQ) is the median value the upper half of the values when they are ranked accrding to magnitude ; the lower quartile (LQ) is the median value of the lower half.

d. *f*-plot.

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

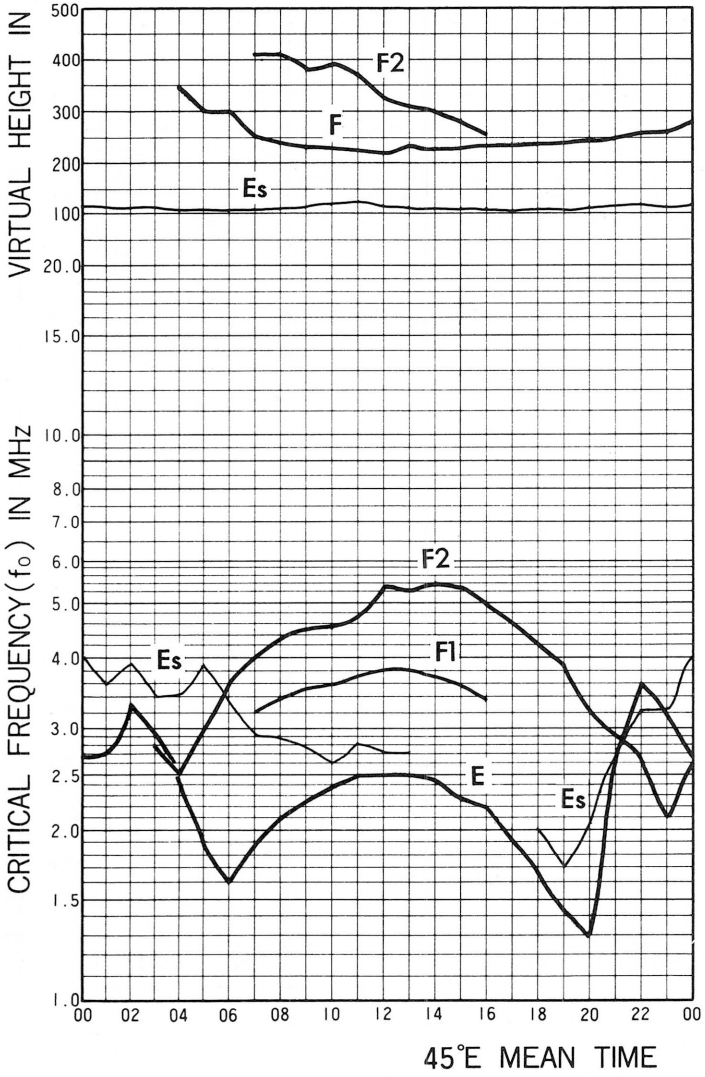
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS

Mar. 1977 SYOWA STATION



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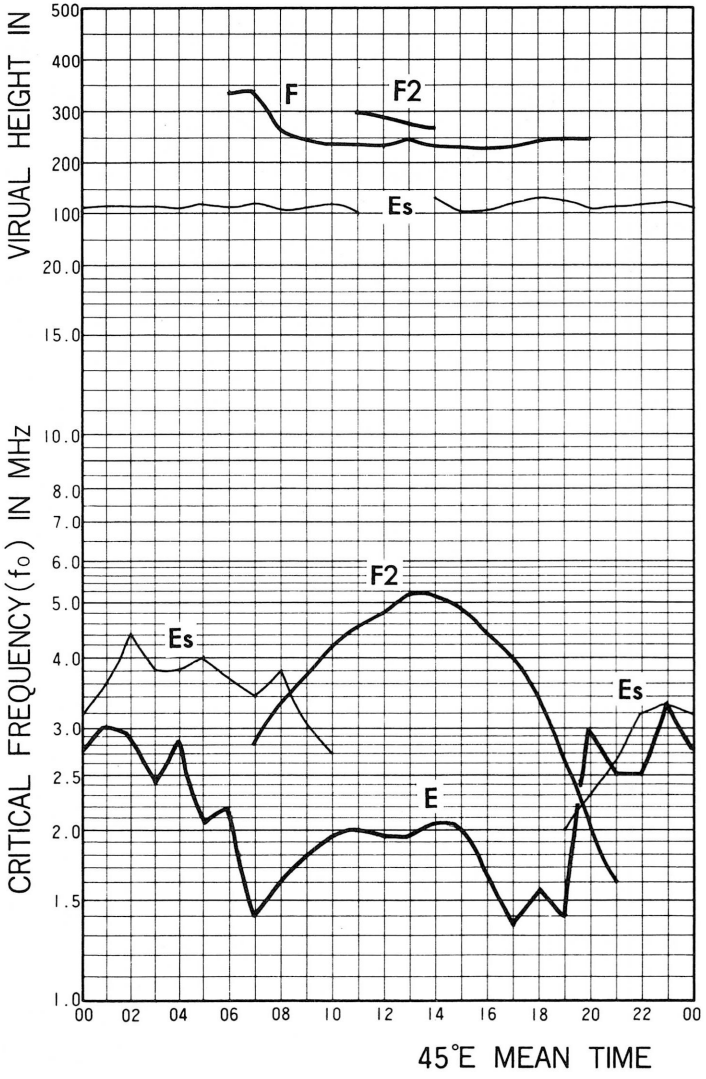
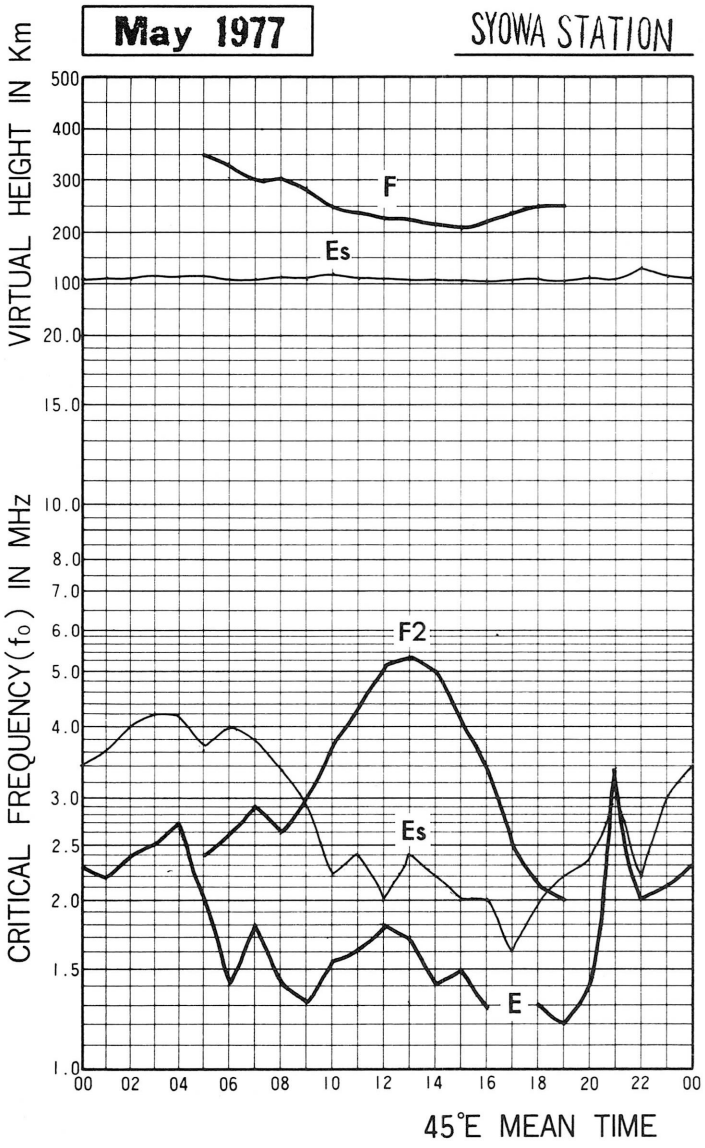
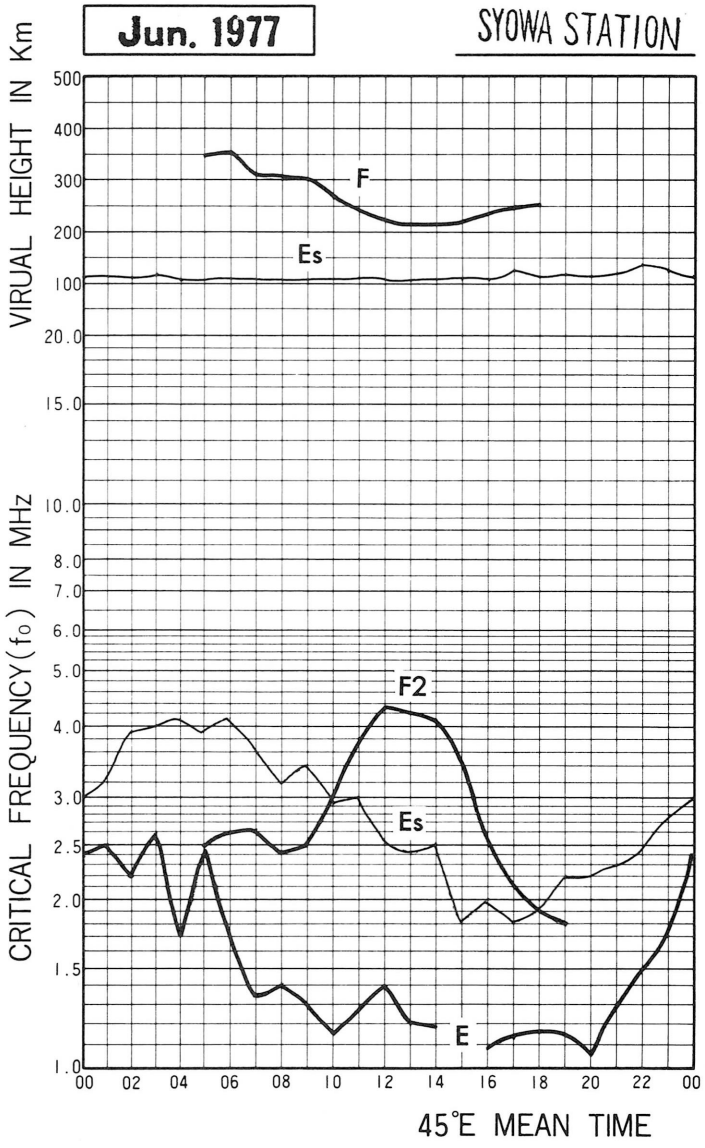


IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA

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

IONOSPHERIC DATA

JAN. 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	F 32	A	A	A	F 38	A	A	Y	A	F	F 46	F 46	B	B	F 51	50	B	45	R	F 42	U F 40	C	C	C
2	C	A	R	F	R	A	A	A	U F 46	F 51	52	47	47	45	43	E G 41	E G 39	41	45	43	45	42	B	S
3	A	F	J F 40	F	R	U F 45	R	A	F	F 45	F 51	50	48	44	46	45	E G 40	45	50	50	F 45	F 35	R	F 37
4	F 41	A	A	Y	A	A	A	A	F 42	F 48	F 53	50	46	44	47	52	55	F 52	F 51	Y	F	R	F 35	A
5	A	A	A	F	A	A	A	R	B	B	F	B	E G 40	E G 40	E G 40	E G 39	40	41	45	43	F 35	F 34	A	A
6	F	A	R	F	F	Y	Y	A	E G 39	F 42	F 42	F 45	45	R	F 52	50	53	U F 56	F 51	F 47	F 38	A	U F 36	R
7	A	F	F 36	F	F	A	A	E G 37	E G 37	F 41	F 46	49	52	Y	F 49	44	44	45	44	44	46	B	38	F 36
8	U F 25	H 34	F	R	J F 40	F	F	F 52	54	F 56	F 57	F 61	F 57	F 53	52	B	F 50	50	F 48	F 50	50	F 43	J F 43	J F 40
9	U F 39	J S 48	U F 40	J F 41	F	R	F 55	F 61	F	F 56	F 53	F 52	B	R	46	50	51	46	43	F 43	F 42	R	F 34	F 29
10	31	J F 34	R	S	F	F	U F 51	J F 52	F 49	F 51	53	54	53	48	49	F 49	F 45	U F 42	F 46	F 50	51	R	F 38	39
11	U F 40	40	S	U F 40	F 49	J F 54	F 57	F 52	U F 56	F 57	F 59	58	F 48	F 49	55	55	57	R	F 53	A	B	F	A	A
12	F	F 30	A	F	F	Y	A	A	B	E G 38	R	F 41	41	42	B	E G 39	40	43	42	37	F 32	F 37	F 37	A
13	A	A	A	A	A	R 41	R	A	A	43	F 45	F 41	R	E G 40	R 43	46	46	42	41	I R 44	47	38	35	U F 28
14	U F 27	A	A	F	F	B	F	R	A	A	B	R	R	F 42	44	47	48	45	41	U F 39	A	A	A	A
15	F	A	A	R	B	F	B	F	Y	B	R	B	B	B	B	F 44	R	44	44	41	U F 35	H 33	F 30	B
16	F 34	F 31	F 35	F 35	40	F	U F 41	F 44	F 45	B	B	42	B	B	R	48	45	44	41	39	39	31	32	F 32
17	F 33	36	B	B	B	41	B	F 47	I R 49	F 52	52	50	F 48	B	45	46	44	43	40	44	F 44	F	F 39	F 39
18	S 42	J S 44	J S 42	B	A	A	B	F	A	A	R	R	E G 38	E G 40	F 42	F 44	F 50	41	41	39	F 38	38	41	42
19	U S 41	40	U S 38	F	A	A	A	F 43	F 49	50	51	F 53	F 53	F 51	50	46	41	41	41	44	F 40	F 35	R	A
20	F	A	R	A	Y	F	U R 51	R	Y	Y	B	B	R	44	47	B	F 45	42	42	F 40	39	40	42	R
21	A	A	A	R	A	C	C	C	F 51	F 50	49	49	50	49	54	55	B	53	R	41	44	B	F 40	39
22	38	B	J S 45	47	50	F 55	F 50	U F 55	U F 51	50	52	B	B	49	B	52	55	60	59	F 49	F 42	F 39	F 36	F
23	A	A	F	A	37	U F 42	U F 50	F 56	F 53	F 50	I C 46	46	49	54	55	B	58	52	F 47	45	46	F 44	A	A
24	B	A	B	F	F	B	Y	F 42	B	F 49	F 50	F 50	F 49	48	F 47	49	50	F 55	F 51	F 51	F 44	F 41	F	F 31
25	A	F	A	F	F	U F 57	U F 59	F	J F 61	U F 54	F 52	F 52	F 52	F 50	51	46	F 46	52	F 56	F 45	F 43	F 42	F 34	A
26	B	A	F	A	A	A	F 42	F 42	F 48	F 50	F 42	41	46	45	45	48	48	48	46	43	40	38	37	S
27	J F 32	S	U S 36	F 40	S 41	F	F 53	F 58	F 60	F 59	57	52	49	F 47	F 46	47	46	46	46	J F 44	46	42	J R 41	F 29
28	F 29	F 28	F 39	F 38	J F 45	F 44	F	F 52	F 57	F 57	F 51	F 49	51	49	F 51	F 49	F 53	F 50	F 49	J F 47	F 44	J R 41	J S 40	A
29	A	A	F	A	Y	F	F	U F 38	F 41	A	U R 46	B	B	B	B	B	F 46	47	F 41	F 40	F 35	F 27	A	A
30	A	A	F	F	B	F	B	R	B	B	B	B	B	B	B	U F 49	F 51	Y	Y	F	A	A	A	A
31	A	F	A	F	A	R	B	Y	A	A	A	R	B	B	42	F 47	F 46	B	U F 43	F	J F 42	F	J F 40	J 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	14	10	9	6	8	8	10	15	18	21	22	22	20	21	25	27	28	28	28	27	27	19	20	13
MED	F 34	35	F 39	F 40	40	F 44	F 51	F 52	F 49	F 50	F 51	50	48	47	47	47	46	45	45	F 44	F 42	F 38	F 38	F 37
UQ	F 40	40	J F 40	F 41	47	F 54	F 55	F 54	F 54	F 54	F 53	52	52	F 49	51	50	51	51	F 50	F 46	45	42	40	F 39
LQ	F 31	F 31	F 36	F 38	39	42	U F 50	F 42	F 45	F 48	F 46	46	46	44	45	46	44	42	42	41	F 39	35	F 35	F 31

The Radio Research Laboratories, Japan

JAN. 1977 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

JAN. 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					A	A	A	F	A	380	390	H 390	B	B	R 400	410	B	400	B	L				
2					B	A	A	A	370	370	F 380	390	400	400	400	410	390	L	380	360	350	L		
3					F 340	F 340	F	A	A	380	390	400	400	410	400	400	400	370	380	350	L			
4					A	A	A	A	A	390	F 390	F 390	F 400	400	400	400	390	F 380	F 350	Y				
5					A	A	A	F	B	B	F 390	B	400	400	400	390	380	370	380	360				
6						Y	Y	A	F 390	380	390	390	400	400	380	400	390	F 380	380	L				
7						A	A	F 370	370	380	380	I B 390	400	Y 400	400	400	390	380	370	360	L			
8					310	F 340	350	360	F 370	F 390	F 390	400	F 400	F 400	400	B	400	390	380	360	Y	L		
9				Y	F 320	F 320	F 340	F 360	F 380	390	400	390	B	400	400	F 400	390	L 380	L	L				
10				F 280	U F 300	F 320	340	F 360	370	380	390	F 390	F 400	410	400	F 400	L	F 390	F 380	U L 350	L			
11				L 280	F 310	340	F 360	F 370	F 380	F 400	F 400	400	410	410	400	400	400	380	F 370	A				
12				A	A	Y	A	A	B	380	380	380	390	390	B	390	370	F 370	L	L				
13					A	L	380	A	A	380	380	F 390	400	400	400	F 370	390	380	F 360	I R 360	L	L		
14					A	B	F	R	A	A	B	400	400	400	400	F 380	F 380	370	U L 360					
15					B	Y	B	U F 320	Y	B	370	B	B	B	B	390	390	U R 370	U F 370	L				
16					A	310	F 340	F 360	F 360	B	B	390	B	B	400	390	390	380	L		L			
17					B	Y	B	370	360	380	390	400	390	B	400	400	390	380	380	U L 360	L			
18					A	A	B	Y	A	A	R	410	F 380	400	390	390	380	L	350					
19					A	A	A	F 360	370	380	400	400	400	400	400	400		L	L	L 350				
20					A	F 330	B	B	Y	A	B	B	400	F 400	B	B	390	L	U L 360	L				
21					A	C	C	C	380	380	390	400	400	400	390	B	B	380		L	L			
22				B	290	320	F 350	F 380	F 400	U R 400	R	B	R	410	B	400	390	380	360	350	L			
23					A	310	F 340	360	390	380	I C 410	400	410	410	400	B	390	390	L	L				
24						B	A	F 380	B	F 380	Y 400	400	R 400	410	400	400	390	380	U L 380	L				
25					F	F 350	F 350	F 350	F 380	F 390	F 390	F 400	400	400	400	400	F 380	F 380	380		L			
26					A	A	330	370	F 370	370	380	390	400	400	400	400	390	380	U L 370	L	L			
27					F 310	340	360	360	370	390	400	400	F 400	410	400	400	400	L 390	L	L	L			
28					U F 310	F 330	F 330	F 350	F 370	F 380	400	400	410	410	F 400	F 400	400	U L 390	L	L				
29					Y	F	F	F	A	A	Y	B	B	B	B	B	380	370	L	C				
30					B	F	B	R	B	B	B	B	B	B	B	370	370	Y	Y	F 330	A			
31					A	F	B	A	A	A	A	380	B	B	400	F 390	390	B		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	8	12	12	16	17	22	23	25	23	24	25	26	27	25	19	11	1			
MED				280	F 310	F 330	F 345	F 360	F 370	380	390	400	400	400	400	400	390	380	370	360	350			
UQ					F 315	F 340	F 355	F 370	F 380	F 390	400	400	400	410	400	400	390	380	380	360				
LQ					F 305	F 320	F 340	F 360	370	380	385	390	400	400	400	390	385	380	360	350				

JAN. 1977 | FOF1 (0.01 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

JAN. 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 230	K 340	A	A	A	A	A	A	A	285	280	270	B	B	B	B	B	B	B	A	200	C	C	C
2	C	B	A	A	B	A	A	A	290	260	270	280	280	290	290	280	A	240	U A 250	230	U A 200	170	B	K 320
3	B	U K 300	U K 260	U K 250	A	240	A	A	K 390	275	270	300	290	290	285	285	280	270	H 250	225	195	K 280	K 340	K 290
4	U K 320	B	A	A	A	B	A	A	H 280	C	280	290	I C 295	285	280	B	B	255	250	Y	U K 380	U K 350	U K 300	A
5	A	K 310	A	K 255	A	A	A	A	B	B	270	B	A 270	280	280	265	245	250	240	210	190	U K 230	B	A
6	A	A	A 155	150	A	Y	A	A	K 340	H 275	H 275	280	A	U R 290	280	H 280	H 275	H 250	240	240	200	A	U K 320	U K 360
7	U K 395	U K 330	U K 290	U K 240	A	A	A	K 305	265	265	280	B	310	290	280	270	A 250	250	230	200	200	B	165	A
8	A	K 190	K 245	A	220	240	220	230	260	270	280	295	Y 300	280	280	B	A 250	250	230	210	I B 200	180	F 145	U A 130
9	115	A	170	A	U A 190	U A 200	H 225	240	A	Y	B	290	B	290	285	280	260	B	245	A	190	215	170	A
10	A	U A 130	Y	U F 170	A	A	220	235	255	260	280	290	A	295	280	275	A	A 245	240	H 220	190	B	130	U A 140
11	110	A	A	A	A 170	200	210	240	260	280	295	300	295	A	H 300	A 290	U A 270	U A 260	230	A	B	U K 270	B	U K 390
12	U K 295	A	A	A	U K 330	A	A	A	B	A	A	A	260	A	B	R	250	255	B	205	A	A	120	K 320
13	A	A	B	B	A	U K 310	H 260	A	A	A	285	280	290	290	280	280	265	235	240	230	200	H 185	140	120
14	A	B	A	A	A	B	A	A	A	A	B	A 310	300	300	U Y 300	290	260	250	225	U K 320	A	A	B	B
15	A	B	A	K 320	B	Y	B	230	A	B	310	B	B	B	B	280	B	B	B	210	180	K 200	K 195	B
16	K 190	155	K 320	A	A	245	U H 270	H 270	270	B	B	285	B	B	H 310	280	265	260	230	210	K 260	K 220	U F 155	U K 205
17	U K 300	K 310	B	B	B	K 310	B	250	U R 250	270	275	R 280	U Y 310	B	A	R 280	265	250	240	220	U R 200	150	135	A
18	A	A	A	B	A	A	B	A	A	A	K 380	A 330	310	H 285	A	290	260	260	240	215	180	155	A	110
19	A 110	A	A	A	A	A	A	245	245	260	270	270	A	300	280	270	H 270	260	230	220	205	H 200	U K 330	A
20	A	A	A	B	B	A	B	B	A	B	B	B	300	290	B	B	270	270	R 240	215	195	A 160	A	R 130
21	B	A	B	A	A	C	C	C	C	B	Y 290	H 280	300	290	290	B	B	C	235	220	200	B	125	C
22	A	B	B	B	170	200	220	I B 240	250	B	A	B	B	H 300	B	U R 280	270	245	I B 225	190	190	A	B	105
23	K 360	A	U K 290	A	A	A	235	240	250	265	I C 280	285	290	U A 280	300	B	H 280	270	240	H 210	B	A	K 360	110
24	B	A	B	A	U K 280	B	A	A 310	B	285	I B 295	300	300	305	H 280	275	270	250	225	220	200	180	U K 260	A
25	U K 360	U K 320	A	A	215	210	220	240	270	280	280	280	280	275	A	U A 290	A	245	H 220	U A 200	H 190	C	B	A
26	B	B	U K 310	A	B	A	A	U A 270	260	A	280	290	290	280	A	280	275	H 255	220	H 220	H 200	170	U A 150	A
27	100	K 310	B	K 260	U K 220	190	215	230	255	270	A 285	290	A 290	U A 290	A 285	A	U A 280	U A 265	U A 240	200	180	180	A	A
28	A	A	K 230	K 270	A	A	220	240	260	270	H 280	280	300	295	285	A 270	H 270	H 260	H 230	210	200	A	A	140
29	B	A	A	A	A	200	U F 235	240	A	K 350	Y	B	B	B	B	B	B	B	235	C	155	K 200	K 360	K 350
30	A	A	B	A	B	220	B	A	B	B	B	B	B	B	B	B	A	K 380	B	K 275	A	A	A	B
31	U K 360	U K 300	A	U K 240	A	A	B	A	A	A	A	B	B	B	B	B	B	B	F 250	J F 220	210	200	H 160	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	13	11	9	9	8	12	12	17	17	16	22	22	20	22	19	20	21	25	27	26	26	19	19	15
MED	K 295	K 310	K 260	K 250	218	215	220	240	260	270	280	288	295	290	285	280	270	255	240	218	200	200	165	140
UQ	U K 360	K 315	U K 290	K 260	U K 250	242	235	250	270	280	285	295	300	295	290	282	270	260	240	220	200	K 218	K 310	K 320
LQ	115	K 245	K 230	U K 240	180	200	220	240	255	265	275	280	290	285	280	275	260	250	230	210	190	175	142	125

The Radio Research Laboratories, Japan

JAN. 1977 | FOE (0.01 MHZ)

IONOSPHERIC DATA

JAN. 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	29	39	JA 62	44	35	38	JA 42	41	39	31	G	31	B	B	EB 35	EB 31	B	EB 30	EB 40	JA 52	24	C	C	C
2	C	46	JA 38	JA 52	B	JA 42	42	45	G	JA 27	G	G	G	G	G	30	30	27	JA 29	30	57	42	B	K 32
3	44	35	34	JA 35	JA 63	G	39	JA 48	45	30	G	G	G	32	G	39	33	29	G	G	25	K 28	K 34	K 29
4	38	47	40	32	41	40	44	46	46	G	G	G	JA 82	G	34	EB 33	EB 36	27	G	Y	JA 39	JA 79	JA 34	38
5	JA 52	JA 52	JA 46	K 25	36	44	40	45	98	B	30	B	32	31	34	32	G	G	G	G	G	31	70	45
6	JA 41	JA 64	JA 57	JA 82	JA 68	Y	35	50	38	G	G	G	30	G	G	G	G	G	G	G	JA 120	JA 41	JA 36	JA 52
7	54	JA 36	32	JA 27	35	46	JA 41	34	G	G	G	EB 41	G	G	G	G	32	G	G	G	G	B	G	20
8	22	23	K 24	22	G	G	G	G	G	31	G	32	G	31	31	B	28	G	27	G	EB 24	70	JA 36	17
9	19	20	25	21	20	21	JA 24	G	27	G	EB 33	G	B	34	40	30	32	36	G 24	24	22	25	G	20
10	16	22	G	38	24	25	28	30	30	32	31	G	32	G	G	30	JA 29	G	G	G	JA 25	EB 20	21	20
11	18	20	17	19	21	23	JA 36	27	31	38	33	33	44	32	G	JA 34	JA 31	31	G	JA 46	B	JA 35	44	43
12	JA 35	JA 41	51	JA 79	JA 65	30	50	44	B	33	38	30	30	30	B	G	G	G	EB 37	G	26	JA 36	20	38
13	JA 36	57	47	42	42	JA 38	36	48	40	35	G	G	G	G	G	G	32	29	28	G	G	G	G	18
14	JA 31	41	JA 43	38	35	B	JA 32	32	46	44	B	35	G	36	G	JA 34	JA 76	G	G	36	32	37	JA 39	JA 86
15	JA 84	JA 61	40	K 32	B	G	B	JA 61	30	B	G	B	B	B	B	31	EB 37	EB 29	27	28	G	K 20	K 19	B
16	K 19	22	K 32	32	37	32	35	JA 35	30	B	B	G	B	B	27	35	32	G	G	G	K 26	K 22	19	JA 29
17	37	K 31	B	B	B	K 31	B	G	G	27	30	G	G	B	30	G	G 25	G	G	G	30	JA 34	JA 39	26
18	JA 43	JA 32	JA 32	B	46	47	B	32	JA 52	50	K 38	40	G	G	JA 36	31	28	30	27	JA 34	JA 61	JA 44	JA 37	JA 22
19	JA 30	JA 24	JA 25	31	57	48	43	G	G	G	G 26	32	31	37	G	G	G	G	G	JA 32	G	G	JA 40	JA 40
20	46	JA 64	JA 72	52	35	30	74	EB 45	31	42	B	B	32	G	83	B	G	G	G	DC 32	24	21	19	20
21	JA 115	JA 42	50	30	47	C	C	C	32	EB 30	G	G	67	G	G	EC 45	B	G	G	G	G	B	G	JA 24
22	12	B	EB 25	EB 26	13	23	26	EB 27	G	EB 36	33	B	B	G	B	G	G	G	EB 36	27	25	23	28	JA 34
23	K 36	JA 37	JA 47	38	34	JA 41	30	G	G	G	C	G	32	32	32	B	G	G	G 19	G	EB 37	21	K 36	36
24	B	JA 36	B	JA 34	JA 34	B	39	48	B	29	EB 35	33	32	39	G	G	G	26	G	G	JA 34	26	JA 30	JA 36
25	K 36	47	47	38	JA 33	28	G	33	G	G	32	31	G	G	30	JA 32	JA 30	34	G	25	30	EC 24	JA 25	JA 41
26	B	JA 39	JA 34	JA 41	JA 46	42	40	35	G	37	G	35	39	38	JA 60	G	G	G	G	JA 22	G	G	20	20
27	JA 21	K 31	32	JA 35	30	G	G	G	G	G	31	33	JA 36	32	JA 54	JA 35	JA 28	JA 32	30	22	22	JA 21	JA 25	21
28	29	28	JA 30	K 27	JA 26	JA 40	31	G	G	G	G	G	38	JA 69	JA 64	JA 34	G	27	G	26	JA 31	29	31	JA 52
29	109	50	54	50	30	28	JA 28	33	JA 38	41	G	B	B	B	B	B	EB 31	EB 28	G	EC 34	21	K 20	K 36	K 35
30	JA 40	34	83	JA 31	B	JA 74	B	31	B	B	B	B	B	B	B	EB 30	35	K 38	39	K 27	JA 39	JA 87	80	JA 79
31	K 36	JA 77	JA 38	35	JA 88	71	B	37	45	42	44	EB 34	B	B	EB 34	EB 35	EB 34	B	JA 44	JA 32	46	45	JA 33	JA 24
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	30	29	29	27	27	25	30	28	27	26	25	23	24	26	27	29	30	31	30	30	28	29	29
MED	36	38	38	35	35	32	36	34	30	30	EG 26	EG 30	31	30	28	EG 31	UG 27	EG 26	G	22	25	27	31	32
UQ	44	JA 47	47	41	46	42	41	45	40	36	32	32	34	33	35	33	32	29	27	31	33	39	JA 36	JA 40
LQ	26	31	32	30	30	24	28	27	G	G	G	G	G	G	G	G	G	G	G	G	EG 21	20	20	21

JAN. 1977 | FOES (0.1 MHZ)

IONOSPHERIC DATA

JAN. 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	K 23	A A 39	A A 62	A A 44	35	A A 38	A A 42	36	A A 39	G	G	30	B	B	E B 35	E B 31	B	E B 30	E B 40	30	23	C	C	C
2	C	A A 46	35	31	B	A A 42	A A 42	A A 45	G	G	G	G	G	G	G	30	30	27	29	27	G	G	B	K 32
3	A A 44	U K 30	U K 26	U K 25	26	G	39	A A 48	K 39	G	G	G	G	32	G	37	32	29	G	G	22	K 28	K 34	K 29
4	U K 32	A A 47	A A 40	E Y 32	A A 41	A A 40	A A 44	A A 46	38	G	G	G	37	G	34	E B 33	E B 36	G	G	Y	U K 38	U K 35	U K 30	A A 38
5	A A 52	A A 52	A A 46	K 25	A A 36	A A 44	A A 40	34	E B 54	B	G	B	31	31	34	30	G	G	G	G	G	U K 23	A A 45	A A 45
6	U F 27	A A 64	21	U F 18	25	Y	E Y 35	A A 50	K 34	G	G	G	30	G	G	G	G	G	G	G	30	A A 41	K 33	U K 36
7	A A 54	U K 33	U K 29	U K 24	29	A A 46	A A 41	K 30	G	G	G	E B 41	G	G	G	G	G	G	G	G	G	B	G	16
8	15	K 19	K 24	U Y 22	G	G	G	G	G	30	G	32	G	G	31	B	G	G	G	G	E B 24	G	18	15
9	15	16	G	20	G	G	G	G	27	G	E B 33	G	B	34	31	G	28	33	G 22	22	22	23	G	19
10	15	G	G	G	21	22	G	G	G	30	31	G	30	G	G	30	29	G	G	G	17	E B 20	17	14
11	G	19	16	15	19	22	24	26	27	31	G	32	38	31	G	G	G	27	G	A A 46	B	U K 27	A A 44	A A 43
12	U K 29	27	A A 51	35	U K 33	E Y 30	A A 50	A A 44	B	33	33	30	30	30	B	G	G	G	F B 37	G	25	31	19	A A 38
13	A A 36	A A 57	A A 47	A A 42	A A 42	U K 31	29	A A 48	A A 40	31	G	G	G	G	G	G	G	27	28	G	G	G	G	14
14	21	A A 41	A A 43	36	34	B	30	E R 32	A A 46	A A 44	B	U Y 35	G	32	G	32	G	G	G	U K 32	A A 32	A A 37	A A 39	A A 50
15	31	A A 61	A A 40	K 32	B	G	B	G	E Y 30	B	G	B	B	B	B	31	E B 37	E B 29	27	24	G	K 20	K 19	B
16	K 19	21	K 32	32	32	G	G	G	G	B	B	G	B	B	32	33	31	G	G	G	K 26	K 22	G	U K 20
17	U K 30	K 31	B	B	B	K 31	B	G	G	25	G	G	G	B	29	G	G 25	G	G	G	25	22	19	27
18	19	19	20	B	A A 46	A A 47	B	U Y 32	A A 52	A A 50	K 38	G	G	G	30	27	G	29	26	24	G	21	21	18
19	14	19	19	29	A A 57	A A 48	A A 43	G	G	G	G 25	30	30	29	G	G	G	G	G	23	G	G	U K 33	A A 40
20	28	A A 64	32	A A 52	E Y 35	26	Y 43	E B 45	E Y 31	E Y 42	B	B	G	G	G	B	G	G	G	D C 32	22	20	17	20
21	A A 40	A A 42	A A 50	E R 30	A A 47	C	C	C	G	E B 30	G	G	G	G	G	E C 45	B	G	G	G	G	B	G	14
22	12	B	E B 25	E B 26	11	G	12	F B 27	G	E B 36	29	B	B	G	B	G	G	G	E B 36	G	23	21	21	24
23	K 36	A A 37	U K 29	A A 38	34	28	G	G	G	G	C	G	31	32	G	B	G	G	G 18	G	E B 37	21	K 36	A A 36
24	B	A A 36	B	30	U K 28	B	E Y 39	G	B	G	E B 35	32	32	35	G	G	G	G	G	G	23	22	U K 26	24
25	K 36	U K 32	A A 47	34	20	22	G	22	G	G	30	30	G	G	30	G	22	G	G	24	25	E C 24	22	A A 41
26	B	A A 39	U K 31	A A 41	A A 46	A A 42	38	G	G	27	G	35	38	32	30	G	G	G	G	G	G	G	17	16
27	15	K 31	32	K 33	U K 22	G	G	G	G	G	30	32	32	30	30	29	G	G	27	22	20	19	17	16
28	21	17	K 23	K 27	22	22	G	G	G	G	G	G	32	33	31	31	G	G	G	G	22	22	16	A A 52
29	A A 109	A A 50	U F 18	A A 50	U Y 30	29	27	34	37	A A 41	G	B	B	B	B	B	E B 31	E B 28	G	E C 34	21	K 20	K 36	K 35
30	A A 40	A A 34	35	27	B	G	B	E R 31	B	B	B	B	B	B	B	E B 30	35	K 38	E Y 39	K 27	A A 39	A A 33	A A 80	A A 79
31	U K 36	U K 30	A A 38	U K 24	A A 88	25	B	E Y 37	A A 45	A A 42	A A 44	E B 34	B	B	E B 34	E B 35	E B 34	B	G	37	G	21	G	19
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	30	29	29	27	27	25	30	28	27	26	25	23	24	26	27	29	30	31	30	30	28	29	29
MED	28	34	32	30	31	26	28	E G 28	E G 27	E G 25	G	G	30	E G 29	E G 29	E G 29	G	G	G	G	22	22	19	27
UQ	36	A A 46	A A 40	35	A A 38	A A 39	A A 41	36	38	31	30	31	32	32	30	30	U 26	E G 27	E G 26	26	25	26	33	A A 38
LQ	17	21	22	24	22	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	20	17	18

The Radio Research Laboratories, Japan

JAN. 1977 | FBES (0.1 MHZ)

IONOSPHERIC DATA

JAN. 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	10	13	12	19	13	13	10	19	19	10	10	11	B	B	35	31	B	30	40	15	E C 11	C	C	C
2	C	17	10	19	B	14	13	16	13	10	8	10	15	20	14	12	15	15	12	10	10	9	B	11
3	38	11	9	10	10	10	20	13	11	10	10	10	11	12	10	10	12	13	15	13	E C 15	9	11	11
4	19	25	16	17	17	23	13	13	10	10	13	10	10	11	10	33	36	23	15	Y	12	12	12	12
5	10	8	12	11	13	13	20	12	54	B	15	B	10	15	13	13	13	10	15	12	10	12	20	10
6	9	10	10	9	14	Y	19	21	11	10	12	13	21	26	16	14	12	17	18	20	12	11	9	10
7	10	12	14	9	13	18	11	13	11	11	10	41	20	11	13	13	11	12	13	12	14	B	10	9
8	11	10	10	10	10	10	10	10	10	10	13	13	17	11	11	B	15	12	10	E C 14	24	12	10	10
9	9	8	10	10	10	9	10	21	16	25	33	20	B	20	17	13	13	29	18	15	11	9	10	10
10	9	10	12	9	9	9	10	9	10	10	12	11	10	10	12	10	9	10	11	10	9	20	8	8
11	8	9	10	9	9	9	9	10	10	10	11	19	13	14	13	11	10	10	9	13	B	10	17	10
12	9	8	13	11	19	22	20	16	B	12	25	15	22	20	B	18	13	15	37	12	10	10	11	12
13	12	15	21	35	18	11	12	25	18	11	11	11	12	14	12	11	11	11	12	10	16	14	10	10
14	9	19	15	12	17	B	13	26	21	13	B	25	14	12	14	16	13	13	17	10	14	11	15	17
15	14	20	10	10	B	20	B	10	21	B	21	B	B	B	B	21	37	29	14	15	12	16	10	B
16	10	10	13	21	18	10	12	12	14	B	B	24	B	B	12	18	11	11	16	12	12	12	11	10
17	18	13	B	B	B	12	B	10	13	10	11	20	22	B	11	11	10	10	10	18	17	14	12	10
18	9	9	10	B	18	11	B	18	17	14	15	15	18	11	14	18	15	12	13	10	10	11	9	9
19	9	11	10	11	18	22	13	15	10	E C 12	9	12	10	10	10	10	11	10	11	11	10	10	10	12
20	11	10	16	36	23	10	39	45	18	32	B	B	16	15	41	B	22	19	22	10	10	12	10	11
21	15	10	21	17	16	C	C	C	E C 30	30	12	12	14	14	20	E C 45	B	21	17	14	11	B	10	E C 13
22	9	B	25	26	9	10	10	27	E C 18	36	28	B	B	15	B	16	11	17	36	19	13	11	18	7
23	10	15	12	11	10	10	11	11	10	12	C	11	10	9	10	B	13	10	10	10	37	7	10	8
24	B	13	B	10	12	B	16	11	B	11	35	18	23	18	13	12	13	10	12	12	10	16	10	11
25	12	10	15	13	11	9	9	10	10	10	11	12	10	12	10	10	9	10	12	11	13	E C 24	15	11
26	B	21	12	18	20	12	12	10	10	8	10	10	12	12	11	12	14	15	12	12	10	10	10	8
27	8	10	19	13	12	10	10	10	10	11	11	10	12	10	10	10	10	10	9	8	9	10	10	9
28	9	8	8	9	9	12	10	10	11	10	11	10	10	11	10	11	9	9	15	14	15	11	10	10
29	23	13	8	15	8	10	9	11	10	12	23	B	B	B	B	B	31	28	22	E C 34	12	10	10	17
30	12	E C 10	20	14	B	10	B	22	B	B	B	B	B	B	B	30	21	26	35	11	11	17	12	18
31	8	11	11	14	11	11	B	22	14	22	23	34	B	B	34	35	34	B	16	14	12	15	9	9
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	31	31	29	30	30	31	31	30	31	31	31	31	31	31	31	31	30	31	30	30	30
MED	10	11	12	13	13	11	12	13	12	11	12	15	16	14	13	14	13	13	15	12	12	12	10	10
UQ	14	14	16	18	18	14	20	21	18	24	25	30	D R 23	23	27	U 28	18	20	18	14	14	14	12	12
LQ	9	10	10	10	10	10	10	10	10	10	11	11	12	11	11	11	11	10	12	10	10	10	10	9

JAN. 1977 | F-MIN (0.1 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

JAN. 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	F 280	A	A	A	F 275	A	A	Y	A	F	F 260	F 245	B	B	F 295	260	B	265	R	F 320	U F 330	C	C	C
2	C	A	R	F	B	A	A	A	U F 260	F 270	290	260	270	250	255	G	G	245	310	300	305	390	B	S
3	A	F	J F 325	F	R	F	R	A	F	F 265	F 260	275	275	270	300	315	G	275	300	330	F 345	F 295	R	F 320
4	F 325	A	A	Y	A	A	A	A	F 235	F 275	F 265	295	285	220	265	280	305	F 290	F 265	Y	F	R	F 315	A
5	A	A	A	F	A	A	A	R	B	B	F	B	G	G	G	G	240	255	305	325	F 320	F 295	A	A
6	F	A	R	F	F	Y	Y	A	G	F 255	F 255	F 275	265	R	F 290	270	275	U F 315	F 305	F 310	F 345	A	F	R
7	A	F	F 270	F	F	A	A	G	G	U F 235	F 260	265	290	Y	F 305	270	285	295	295	320	340	B	F 325	F 325
8	U F 310	H 275	F	R	J F 275	F	F	F 280	290	F 280	F 290	F 300	F 290	F 320	305	B	F 290	300	F 285	F 320	285	F 325	J F 325	J F 340
9	F	J S 315	U F 320	J F 285	F	R	F 290	F 280	F	F 285	F 285	F 290	R	R	260	320	305	325	335	F 300	F 310	R	F 340	F 330
10	325	F	R	S	F	F	F	J F 300	F 270	F 280	285	300	285	285	295	F 340	F 310	F	F 305	F 315	335	R	F 330	335
11	U F 300	310	S	F	F 305	J F 335	F 300	F 290	U F 285	F 290	F 290	325	F 285	F 265	305	285	300	R	F 290	A	B	F	A	A
12	F	F 285	A	F	F	Y	A	A	B	G	R	F 255	245	260	B	G	245	295	300	295	F 310	F 255	F 315	A
13	A	A	A	A	A	R 295	R	A	A	255	F 275	F	R	G	R 280	280	310	300	300	R	335	330	325	F
14	U F 275	A	A	F	F	B	F	R	A	A	B	R	R	F	270	295	295	300	325	F	A	A	A	A
15	F	A	A	R	B	F	B	F	Y	B	R	B	B	B	B	F 295	R	280	290	340	F	H 320	F 320	B
16	F 325	F 275	F 285	F 285	250	F	U F 260	F 285	F 275	B	B	245	B	B	R	290	290	295	340	335	280	340	330	F 315
17	F 340	335	B	B	B	265	B	F 270	R	F 280	285	275	F 260	B	280	290	285	280	250	290	F 340	F	F 335	F 305
18	S 310	J S 320	J S 310	B	A	A	B	F	A	A	R	R	G	G	F 240	F 270	F 320	295	315	F 320	F 300	295	315	330
19	S	300	U S 290	F	A	A	A	F 265	F 265	270	275	F 285	F 300	F 300	305	280	350	270	310	325	F 325	F 315	R	A
20	F	A	R	A	Y	F	U R 315	R	Y	Y	B	B	R	260	270	B	F 295	300	320	F 325	335	330	315	R
21	A	A	A	R	A	C	C	C	F 270	F 265	265	275	270	255	290	310	B	320	R	305	335	B	F 325	320
22	315	B	J S 290	290	300	F 315	F 295	U F 300	F	275	295	B	B	275	B	285	290	285	315	F 325	F 350	F 335	F 300	F
23	A	A	F	A	A	U F 260	U F 280	F 305	F 290	F 290	I C 250	250	230	275	290	B	310	325	F 330	310	330	F 340	A	A
24	B	A	B	F	F	B	Y	F 260	B	F 270	F 270	F 270	F 280	280	F 260	280	285	295	F 315	F 335	F 330	F 340	F	F 300
25	A	F	A	F	F	U F 290	F	F	J F 275	U F 290	F 285	F 300	F 285	F 295	300	305	255	270	F 290	F 310	F 300	F 355	F 340	A
26	B	A	F	A	A	A	F 260	F 230	F 270	F 280	F 260	220	260	265	240	290	290	290	325	325	345	325	305	S
27	J F 300	S	U S 275	F 270	S 280	F	F 280	F 285	F 285	F 290	290	310	285	F 275	F 280	F 295	300	305	315	J F 315	335	335	J R 290	F 310
28	F 305	F 305	F 290	F 285	J F 280	F 285	F	F 280	F 275	F 290	F 275	F 265	295	295	F 300	F 280	F 320	F 320	F 315	J F 330	F 320	J R 315	J S 300	A
29	A	A	F	A	Y	F	F	F	F 325	R	U R 235	B	B	B	B	B	F 280	300	F 285	F	F 320	F 320	A	A
30	A	A	F	F	B	F	B	R	B	B	B	B	B	B	B	U F 235	F 240	Y	Y	F	A	A	A	A
31	A	F	A	F	A	R	B	Y	A	R	A	R	B	B	245	F 270	F 290	B	F	F	J F 310	F	J F 300	J F 265
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	12	9	9	5	7	7	8	14	16	21	22	21	20	20	25	27	28	27	27	24	26	19	19	12
MED	F 310	305	F 290	F 285	F 280	F 290	F 285	F 280	F 272	F 275	F 275	275	278	268	280	280	290	295	305	320	F 330	F 325	F 320	F 320
UQ	F 325	315	J S 310	F 285	290	F 305	F 298	F 290	F 285	F 285	F 285	295	285	282	300	295	305	300	315	325	335	338	F 328	F 330
LQ	F 300	F 285	F 285	F 285	F 275	F 275	F 270	F 265	F 262	F 265	F 260	260	260	252	260	270	278	280	292	F 310	F 310	F 315	310	F 308

The Radio Research Laboratories, Japan

JAN. 1977 | M(3000)F2 (0.01)

IONOSPHERIC DATA

JAN. 1977 | H'F2 (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	Y	A	F	450	480	B	B	365	405	B	450	420	L				
2					B	A	A	A	425	400	350	450	445	500	505	G	G	L	340	350	325	L		
3					R	F 495	R	A	A	430	420	370	400	Y 470	370	340	G	410	335	275	L			
4					A	A	A	A	540	400	390	370	400	605	445	380	325	350	415	Y				
5					A	A	A	R	B	B	F 500	B	G	G	G	G	575	500	345	300				
6						Y	Y	A	G	490	480	430	450	R	360	395	370	325	325	L				
7						A	A	G	G	550	450	415	355	Y	350	440	410	350	370	320	275			
8					H 390	F 395	400	370	340	355	390	325	345	320	330	B	360	340	350	290	270	L		
9				Y	350	350	340	330	295	345	355	350	R	R	425	320	330	300	L	L				
10				350	340	320	300	325	400	370	350	330	350	380	350	280	L	470	350	300	255			
11				310	300	295	310	345	355	350	330	295	380	425	325	350	315	R	340	A				
12				A	F	Y	A	A	B	G	R	505	L	475	B	G	520	375	L	L				
13					A	350	R	A	A	475	420	U F 580	R	G	R	410	350	380	350	R	270	L		
14					325	B	F	R	A	A	B	R	R	R	450	350	350	355	300					
15					B	U F 260	B	F	Y	B	R	B	B	B	B	380	R	415	350	L				
16					430	U H 375	445	375	400	B	B	U R 540	B	B	R	370	395	375	L		L			
17					B	Y	B	400	I R 390	370	360	395	Y	B	425	390	415	430	500	360	L			
18					A	A	B	Y	A	A	R	R	G	G	540	425	310	L	350					
19					A	A	A	410	400	390	390	375	350	350	350	370		L	L	280				
20					Y	F 450	A	B	Y	A	B	B	R	480	425	B	370	L	315	L				
21					A	C	C	C	395	400	420	400	420	450	350	320	B	300		L	L			
22				310	305	275	U F 350	325	U F 320	E R 420	R 350	B	B	400	B	375	350	340	290	270	L			
23					A	410	355	305	350	355	I C 490	180	450	380	350	B	295	280	L	L				
24						B	Y	455	B	390	400	405	400	400	460	395	375	330	280	260				
25					380	325	320	325	345	360	380	350	375	350	340	345	475	395	320		L			
26					A	A	450	550	395	360	480	650	450	465	530	375	350	345	300	L	L			
27					380	F 320	355	330	330	330	340	330	375	410	405	355	355	340	L	L	L			
28					350	375	415	360	350	345	380	420	355	350	350	395	300	300	305	L				
29					Y	F	F	F	320	A	U R 550	B	B	B	B	B	405	340	L	C				
30					B	F	B	R	B	B	B	B	B	B	B	480	475	Y	Y	L	A			
31					A	R	B	Y	A	A	A	R	B	B	490	435	390	B		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				3	10	14	11	15	19	21	23	22	18	20	24	27	26	24	21	10	5			
MED				310	350	350	355	360	390	380	390	398	400	438	388	380	370	350	340	295	270			
UQ				330	380	395	408	405	400	420	450	450	450	490	455	418	415	402	350	320	275			
LQ				310	325	320	330	328	342	355	358	350	355	380	350	352	350	335	315	275	270			

JAN. 1977 | H'F2 (KM)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

JAN. 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	315	A	A	A	A	A	A	A	A	195	195	210	B	B	B 225	210	B	H 200	B	280	H 200	C	C	C
2	C	A	A	A	B	A	A	A	250	195	220	H 200	195	225	205	215	200	225	U H 210	225	220	230	B	S
3	B	310	260	250	245	240	A	A	A	205	220	H 180	200	230	220	A	200	240	H 225	210	205	330	R	295
4	300	A	A	Y	A	A	A	A	A	250	220	200	C 250	195	200	240	B	210	230	Y	F 250	R	320	A
5	A	A	A	U F 505	A	A	A	A	B	B	U H 220	B	210	225	210	200	200	250	220	240	H 200	315	A	A
6	U F 400	A	280	F	250	Y	A	A	270	H 195	270	215	210	H 215	230	210	205	200	225	230	A 240	A	A	315
7	A	A	400	U F 280	Q 295	A	A	230	230	245	H 195	B	H 240	215	200	200	H 195	200	200	H 200	230	B	250	240
8	275	250	U H 305	Y 260	250	250	215	200	200	210	200	200	H 200	205	200	B	205	200	220	225	250	230	240	230
9	245	245	255	255	240	H 210	220	200	195	H 195	215	210	B	225	210	H 190	H 190	A 225	200	220	230	240	230	245
10	230	265	Y 270	250	240	230	205	220	200	205	200	200	205	H 190	200	200	195	195	225	200	235	225	210	230
11	H 210	245	250	225	210	205	195	200	200	A 230	200	215	A 210	190	210	H 200	215	210	250	A	B	300	A	A
12	U F 330	A	A	A	A	A	A	A	B	A 260	240	H 230	225	210	B	200	200	220	215	230	300	A	250	A
13	A	A	A	B	A	340	240	A	A	240	190	250	220	215	225	190	225	200	225	205	225	225	H 245	F 290
14	A	A	A	A	A	B	U F 265	R	A	A	B	A	230	210	220	210	H 200	200	210	U F 305	A	A	A	A
15	A	A	A	A	B	Y	B	F 240	Y	B	240	B	B	B	B	200	B	250	H 220	220	245	230	255	B
16	280	355	395	A	A	300	255	245	210	B	B	230	B	B	250	255	225	200	210	230	225	250	250	290
17	320	305	B	B	B	Y	B	200	195	250	H 200	245	U Y 270	B	205	200	205	215	225	205	220	A 250	230	255
18	265	255	275	B	A	A	B	A	A	A	R	250	250	255	200	220	200	215	225	215	210	230	A 250	H 240
19	245	255	300	A	A	A	A	220	195	U H 190	230	H 200	H 200	195	190	190	H 190	H 190	210	H 205	220	H 200	F	A
20	A	A	A	B	A	250	B	B	Y	A	B	B	240	275	B	B	220	H 200	220	225	H 205	220	250	270
21	A	A	A	A	A	C	C	C	225	200	235	220	245	C 245	200	B	B	200	200	220	H 205	B	230	230
22	240	B	275	B	240	215	200	245	200	B 205	200	B	B	210	B	210	H 200	215	I B 215	210	265	H 220	285	350
23	A	A	U F 455	A	A	A	215	200	U H 195	225	I C 210	205	240	H 210	200	B	205	200	200	245	B	240	A	A
24	B	A	B	325	280	B	A	H 230	B	245	B 240	205	200	225	215	210	230	H 200	220	220	240	245	300	330
25	A	U F 360	A	A	H 210	200	205	205	205	200	190	H 190	220	205	200	200	195	220	220	235	A 250	250	250	A
26	B	A	Q 375	A	A	A	320	245	195	200	210	220	A	250	210	200	210	H 220	220	210	210	245	240	270
27	250	S	A	380	300	225	H 210	200	H 195	230	205	200	200	H 200	H 195	H 195	200	H 200	210	225	205	225	275	300
28	A 280	290	330	355	A 395	A 245	210	205	200	200	200	215	250	220	200	200	H 200	220	200	225	245	245	260	A
29	A	A	A	A	Y	A	220	A	A	A	Y	B	B	B	B	B	240	230	H 220	C	H 245	270	A	A
30	A	A	A	A	B	U F 270	B	R	B	B	B	B	B	B	B	255	A	Y	Y	275	A	A	A	A
31	A	U H 280	A	350	A	U F 325	B	A	A	A	A	290	B	B	250	255	B	B	230	F 260	250	275	260	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	15	12	14	11	12	14	14	16	17	22	24	23	22	24	25	25	25	29	29	28	27	23	20	17
MED	275	272	290	280	248	242	215	212	200	205	210	210	220	215	205	200	200	210	220	225	230	240	250	270
UQ	308	308	375	352	288	270	240	235	210	240	225	225	240	225	220	210	210	220	225	232	245	250	260	300
LQ	245	252	270	252	240	215	205	200	195	200	200	200	200	205	200	200	200	200	210	210	210	228	240	240

The Radio Research Laboratories, Japan

JAN. 1977 | H'F (KM)

IONOSPHERIC DATA

JAN. 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	K 100	K 130	100	100	100	100	95	100	100	E G 150	G	105	B	B	B	B	B	B	B	130	165	C	C	C
2	C	100	100	130	B	100	100	100	G	100	G	G	G	G	G	110	100	110	105	105	140	100	B	K 105
3	180	K 100	K 100	K 100	100	G	100	100	K 170	100	G	G	G	110	G	130	130	125	G	G	125	K 110	K 115	K 120
4	K 120	100	100	120	110	125	100	100	125	G	G	G	100	G	125	B	B	120	G	Y	K 100	K 150	K 100	100
5	100	K 95	100	K 105	95	90	90	100	160	B	125	B	100	120	120	105	G	G	G	G	G	K 115	150	100
6	100	105	120	130	100	Y	100	105	K 150	G	G	G	105	G	G	G	G	G	G	G	150	110	K 100	K 125
7	K 125	K 125	K 125	K 100	110	95	100	K 100	G	G	G	B	G	G	G	G	105	G	G	G	G	B	G	105
8	120	K 180	K 105	105	G	G	G	G	G	150	G	125	G	E G 120	120	B	120	G	100	G	B	125	110	100
9	130	130	130	120	100	100	105	G	100	G	B	G	B	120	110	115	105	100	100	105	140	140	G	150
10	125	115	G	110	145	100	125	115	105	110	120	G	105	G	G	125	105	G	G	G	95	B	130	120
11	100	100	125	125	150	150	105	130	125	120	130	120	105	110	G	105	100	100	G	100	B	K 110	K 105	K 100
12	K 110	120	100	110	K 150	90	100	100	B	100	100	100	105	105	B	G	G	G	B	G	100	100	135	K 110
13	115	115	100	130	95	K 100	100	100	100	100	G	G	G	G	G	G	110	110	170	G	G	G	G	160
14	115	105	110	100	115	B	100	100	100	95	B	110	G	100	G	125	150	G	G	K 150	110	100	100	180
15	175	100	100	K 100	B	G	B	135	90	B	G	B	B	B	B	150	B	B	125	125	G	K 155	K 150	B
16	K 100	125	K 110	120	110	100	100	100	100	B	B	G	B	B	130	125	115	G	G	G	K 150	K 140	140	K 110
17	K 110	K 110	B	B	B	K 110	B	G	G	100	100	G	G	B	95	G	100	G	G	G	145	140	130	110
18	120	115	115	B	100	95	B	105	100	90	K 95	100	G	G	100	95	100	140	140	120	125	120	115	110
19	110	115	105	110	100	95	100	G	G	G	100	105	100	100	G	G	G	G	G	100	G	G	K 110	100
20	100	100	100	110	130	100	145	B	90	120	B	B	E G 145	G	105	B	G	G	G	C	130	130	105	145
21	180	105	100	100	100	C	C	C	100	B	G	G	130	G	G	C	B	G	G	G	G	B	G	105
22	100	B	B	B	100	145	95	B	G	B	125	B	B	G	B	G	G	G	B	110	160	140	130	120
23	K 100	100	K 125	95	95	100	95	G	G	G	C	G	120	100	100	B	G	G	95	G	B	95	K 110	110
24	B	120	B	115	K 120	B	100	100	B	100	B	130	125	115	G	G	G	100	G	G	130	130	K 130	115
25	K 125	K 105	100	110	110	110	G	100	G	G	125	130	G	G	100	100	100	110	G	120	150	C	130	110
26	B	120	K 105	100	100	100	100	100	G	95	G	130	120	110	100	G	G	G	G	125	G	G	130	140
27	100	K 110	125	K 115	K 110	G	G	G	G	G	100	120	110	100	105	105	110	100	100	130	125	100	130	140
28	125	120	K 95	K 110	100	130	145	G	G	G	G	G	130	115	115	105	G	120	G	100	130	140	140	120
29	130	95	130	100	95	130	100	130	100	K 100	G	B	B	B	B	B	B	B	G	C	145	K 150	K 110	K 115
30	100	100	120	110	B	170	B	95	B	B	B	B	B	B	B	B	110	K 170	170	K 100	110	180	100	100
31	K 100	K 110	100	K 130	125	110	B	100	100	105	115	B	B	B	B	B	B	B	140	135	130	130	125	110
	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	28	26	23	22	21	17	16	11	11	14	13	13	13	15	12	10	15	21	23	25	29
MED	112	110	105	110	100	100	100	100	100	100	115	120	106	110	105	110	105	110	115	120	130	130	125	110
UQ	125	120	120	120	115	118	100	105	125	112	125	128	122	115	120	125	112	122	140	128	145	140	130	120
LQ	100	100	100	100	100	100	100	100	100	100	100	105	105	100	100	105	100	100	100	102	125	110	110	105

IONOSPHERIC DATA

JAN. 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	RK 21	HK 11	C 2	R 1	R 1	R 1	C 1	R 1	R 1	H 1		C 1								C 1	H 1			
2		R 1	R 2	RC 11		R 2	R 2	R 1		L 1						C 1	R 1	C 1	C 1	C 3	AC 11	L 1		K 3
3	R 1	RKA 11	RK 12	RK 12	RA 11		CR 11	R 2	RK 11	C 1				CL 11		H 2	H 1	C 1			C 1	KS 21	K 2	K 2
4	RK 11	R 1	R 1	CL 11	R 1	R 1	R 2	R 2	C 2				L 1		C 1			C 1		S 1	RK 11	AK 12	RAK 11	R 1
5	R 2	LK 12	R 2	KL 21	R 1	R 1	L 1	RAS 11	A 1		H 1		C 1	C 1	C 1	C 1						RK 11	AR 11	R 2
6	RA 11	R 2	CA 11	HA 11	AC 11		R 1	RR 11	RK 12				C 1								AH 11	R 2	RK 31	CK 23
7	CK 34	RK 13	RAK 11	RAK 11	R 1	R 1	R 1	RK 21									C 1							R 1
8	RA 11	HK 11	K 2	R 1						H 1		C 1		H 1	C 1		C 1		C 1			CH 11	C 1	C 1
9	H 1	HL 11	C 1	C 1	R 1	C 1	C 1		L 1					C 1	C 1	C 1	C 1	L 1	L 1	C 1	H 1	HA 11		RA 11
10	CL 11	R 1		R 1	HC 12	R 2	C 1	C 1	C 1	C 2	C 1		C 1			C 1	C 1				LC 11		CL 11	CL 11
11	L 1	LR 11	R 1	CL 11	CH 11	H 1	C 1	H 1	C 1	C 2	H 1	C 1	C 1	C 1		C 1	C 1	C 1		RS 11		RK 13	RA 11	RK 14
12	RA 41	CLA 11	RA 11	RLA 11	AK 11	L 1	R 1	R 1		R 2	C 1	R 1	C 1	C 1							R 1	R 3	H 1	RK 22
13	R 2	C 1	R 1	H 1	L 1	RK 21	R 2	R 1	R 1	R 2							C 1	C 1	H 1					H 1
14	R 2	R 1	R 2	R 1	RA 11		RA 11	L 1	R 1	R 1		C 1		L 2		H 1	H 1			RK 12	R 1	RA 11	R 2	AR 11
15	AR 11	R 1	R 1	KA 11				H 1	L 1							H 1			C 1	C 1		K 1	KC 11	
16	K 1	C 1	K 2	R 1	R 1	R 1	R 1	R 1	R 1						H 1	H 1	C 2				KR 11	K 1	R 1	RK 21
17	RK 11	K 2				K 1				C 1	C 1				L 1		L 1				H 1	HA 11	H 1	R 1
18	RAL 11	RL 12	RL 21		R 1	R 2		R 1	R 1	R 1	K 1	R 1			L 2	L 1	L 1	H 1	H 1	C 1	C 2	C 2	C 3	C 3
19	C 2	C 1	RL 11	RA 31	R 2	L 1	R 1				L 1	C 1	C 1	L 2						LC 11			RKA 21	RS 21
20	RA 11	RA 21	R 2	RA 11	R 1	R 1	H 1		L 1	R 1					L 1					H 1	C 1	R 1	C 3	H 1
21	AR 11	R 3	RA 11	L 1	R 2				L 1				H 1											C 2
22	L 2				L 1	H 1	L 1				R 1									C 1	H 1	C 1	R 1	R 3
23	KS 21	R 1	RK 21	R 1	R 2	RL 22	L 1						C 1	C 1	C 2				L 2			LR 11	K 3	R 3
24		RA 21		R 3	RAK 31		R 1	R 2		L 1		H 1	C 1	C 1				L 1			C 1	C 1	RK 11	R 3
25	K 3	RK 21	R 2	R 2	R 1	C 1		R 2			H 1	H 1			C 1	C 1	C 2	C 1		C 1	R 1		H 1	R 2
26		R 1	RK 21	R 1	R 2	R 2	R 1	R 2		L 2		H 1	C 3	C 2	RA 11					C 1			C 1	R 1
27	LC 11	K 5	R 1	RK 21	RK 21						R 2	H 2	C 1	R 1	C 1	C 1	C 1	C 1	C 1	H 1	C 2	LH 11	R 1	R 1
28	R 1	C 2	LK 12	K 2	RA 21	RC 11	H 1						C 1	C 2	CA 11	C 1		C 1		L 1	CC 11	C 1	RA 11	R 4
29	HAR 11	R 1	RAL 11	R 1	C 1	H 2	RA 11	R 2	R 2	RK 11											H 2	K 2	K 3	K 1
30	RS 11	R 1	CA 11	R 1		AHC 11		L 1									R 1	HK 11	HA 11	K 1	RS 21	AR 11	RA 11	RA 11
31	KA 21	CAK 21	LRA 21	RK 11	RAL 11	RL 11		R 1	R 1	R 1	R 1								H 1	C 1	C 1	C 1	C 1	R 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																								

The Radio Research Laboratories, Japan

JAN. 1977 | TYPES OF ES

IONOSPHERIC DATA

FEB. 1977 | FXI (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 of 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	56	U S 42	40	44	O R 45	X 47	54	U A 62	A	R	50	57	52	51	50	O R 50	50	50	X 49	X 48	X 48	47	49	U S 52
2	U S 57	53	A	B	65	65	57	R	B	R	B	50	O R 50	51	O R 57	66	O R 63	56	50	X 48	50	44	43	O R 43
3	R	S	A	B	B	47	48	Y	R	54	57	53	53	X 54	X 52	X 51	X 53	X 51	50	X 51	X 49	X 48	X 48	X 46
4	S	S	40	A	A	O R 42	O R 49	52	60	X 60	X 60	57	X 55	X 54	X 60	X 59	X 51	X 51	X 53	X 50	X 47	X 50	X 48	X 48
5	S 55	S 57	54	57	50	U S 66	S 66	60	X 61	X 61	X 64	X 70	O R 73	B	O R 73	O R 61	X 54	59	X 57	53	50	X 55	53	X 54
6	O S 47	S	U S 45	O R 46	O S 46	47	55	60	60	61	X 57	X 56	X 54	X 59	X 61	64	68	70	57	X 45	B	R	O R 46	A
7	45	A	A	B	A	A	A	A	R	X 51	65	54	O R 58	X 48	R	O R 56	X 57	X 51	O R 49	O R 47	42	40	R	R
8	R	42	Y	43	A	B	B	O R 47	52	51	X 53	X 51	B	X 55	57	O R 56	X 55	X 54	X 50	45	O R 43	U A 87	U A 52	A
9	A	A	A	A	64	B	B	A	B	R	B	B	R	B	O R 48	B	B	B	O R 38	O R 45	41	40	A	A
10	A	A	A	B	R	A	46	46	R	O R 51	O R 52	O R 53	O R 53	B	B	B	O R 57	O R 58	55	O R 46	O R 44	45	46	39
11	O R 35	A	A	A	A	B	A	A	B	R	B	B	B	R	B	B	O R 50	B	O R 43	44	42	X 38	33	30
12	R	A	A	A	A	A	A	A	X 41	46	X 47	O R 47	X 47	O R 49	O R 52	O R 50	O R 51	O R 48	O R 47	O R 48	X 48	X 40	45	40
13	A	27	32	O R 36	Y	B	A	A	B	50	56	53	O R 52	B	O R 53	O R 50	O R 48	X 53	X 53	51	52	R	A	A
14	A	U A 88	A	A	51	A	R	A	A	Y	59	O R 50	O R 49	X 46	X 48	47	X 50	X 53	X 54	45	O R 40	A	A	A
15	A	A	A	R	R	R	R	R	O R 42	R	49	O R 50	52	X 55	53	50	X 52	X 50	X 50	X 51	50	39	29	A
16	A	A	A	A	A	A	A	A	O R 48	48	49	Y	O R 47	50	O R 50	X 50	X 48	X 50	X 50	X 47	X 47	X 45	S 42	X 42
17	32	30	S 37	40	40	A	A	R	O R 50	56	60	60	53	X 57	X 53	X 52	X 62	65	55	68	60	R	R	A
18	54	A	A	45	50	50	60	S 62	B	O R 55	47	47	47	O R 46	X 48	X 47	49	O R 48	48	X 48	40	44	S 38	O R 27
19	A	R	37	S	A	A	O R 46	64	58	60	59	63	X 62	X 60	X 57	X 57	X 56	60	56	52	51	S	O R 33	28
20	U S 39	30	A	A	O R 42	58	50	65	66	68	65	63	62	60	56	X 55	55	58	55	56	S 51	X 48	48	U S 53
21	S 38	A	R	A	S 58	U S 65	U S 77	S 79	80	72	67	X 65	X 67	X 61	X 60	X 60	60	71	71	61	S 47	S 42	S 41	O R 42
22	U S 44	28	O R 31	40	39	45	47	O R 56	60	63	60	45	55	57	58	58	59	60	59	X 56	50	R	39	A
23	A	A	A	A	A	A	B	49	53	O R 56	O R 52	O R 52	60	64	X 61	55	X 55	X 56	X 58	58	R	26	A	A
24	A	A	A	51	B	A	44	50	53	X 55	53	X 54	O R 54	X 58	X 57	X 54	56	61	50	49	O R 43	31	A	R
25	R	R	R	A	A	A	B	R	54	60	62	X 53	X 49	O R 50	O R 51	X 54	X 50	O R 50	X 50	X 46	X 42	A	30	A
26	A	A	A	A	A	A	R	A	B	53	52	O R 46	O R 49	O R 48	O R 51	O R 52	O R 49	O R 48	O R 46	X 43	O R 43	O R 39	31	30
27	R	R	30	37	S 46	S 44	50	53	58	X 60	X 58	X 56	X 55	X 58	X 60	X 57	56	56	X 57	X 53	X 50	44	38	31
28	30	O R 30	A	R	A	A	A	A	A	60	57	O R 62	71	70	70	65	58	X 54	X 51	X 49	X 51	46	41	R
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	12	10	9	10	12	11	14	14	16	22	25	25	25	23	25	25	27	26	28	28	26	21	21	15
MED	44	36	37	44	48	47	50	58	56	56	57	53	53	X 55	56	55	55	54	50	48	48	44	42	42
UQ	54	53	40	46	54	62	57	62	60	60	60	57	58	X 58	X 60	58	57	59	56	52	50	X 47	48	47
LQ	36	30	32	40	44	46	47	50	51	51	52	50	50	50	51	50	X 50	X 50	50	46	43	40	38	30

FEB. 1977 | FXI (0.1 MHZ)

IONOSPHERIC DATA

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

The Radio Research Laboratories, Japan

FEB. 1977 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

FEB. 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 of 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						310	F 330	U F	A	370	F 380	400	400	400	F 400	F 400	F 390	L	L		L			
2								A	B	A	B	H 380	400	390	380	380	B	L 380		L				
3						L	A	A	370	370	F 380	F 400	400	400	L 410	400	400	L	L	L	L	L		
4							R	F 370	370	380	390	Y 400	400	400	400	400	L	L	L	L				
5					L 260	U F 310	F 350	370	370	380	390	400	R	B	B	R 400	L 400	F 390	U L 370	L				
6					300	A	F 340	F 360	F 360	370	400	400	400	400	F 400	400	400	F 390	L					
7						A	A	A	A	F 370	F 370	390	380	390	370	I B 390	390	370						
8						B	B	U Y 340	F 350	360	370	370	R	390	400	F 400	380	380	350	L				
9						B	B	A	B	A	B	B	R	B	380	B	B	B						
10						A	310	340	330	F 370	F 370	380	380	B	B	B	370	B	F 330					
11						B	A	A	B	A	B	B	B	370	B	B	370	B						
12						A	A	A	340	360	H 370	380	390	400	390	380	380	L						
13						B	B	B	B	F 370	F 380	390	R 380	B	390	H 400	390	370	L	L				
14						A	A	A	A	A	U Y 390	F 400	390	400	400	F 390	370	370	350	L				
15						A	A	A	A	A	370	370	390	400	390	L	F 370	L 370	L 340	L				
16							A	A	U F 390	F 380	F 380	Y	390	390	400	F 390	L	L	L					
17							A	A	A	380	380	390	400	400	400	410	F 380	L						
18								F	B	350	U F 360	380	370	390	F 380	L	U F 380		L					
19							A	F 350	F 360	380	380	H 390	400	410	410	L 400	L	L	L					
20							F 330	U F 350	F 360	380	F 400	F 390	F 400	F 410	L	U F 400	400	L	L					
21							F 350	L 340	380	370	F 390	400	400	L 400	400	L	F 370	U F 360	L	L				
22						290	F 300	A	F 370	F 390	F 390	F 390	F 390	F 400	F 400	400	F 380	U F 350	L					
23							B	310	F 350	R 370	370	R 380	380	390	390	380	L	370	L					
24						A	F 280	300	330	350	380	380	380	380	380	370	F 380	F 350	L					
25							B	R	340	F 350	360	380	380	390	380	370	L							
26							B	A	B	F 350	F 360	370	380	370	370	370	L	L						
27						L	300	320	350	370	380	390	390	390	400	U L 400	L							
28							A	A	A	F 370	380	B	390	390	390	380	L	L						
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					2	3	8	12	16	23	25	24	24	24	24	22	18	12	5					
MED					280	310	F 320	340	360	370	380	390	390	395	395	400	380	370	350					
UQ						310	F 345	F 355	370	380	F 390	400	400	400	400	400	390	380	350					
LQ						300	300	325	345	365	370	380	380	390	380	380	F 370	365	340					

The Radio Research Laboratories, Japan

FEB. 1977 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

FEB. 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	A	K 280	UK 270	K 260	K 295	K 285	B	UA 225	A	A	300	295	290	280	290	F 280	UA 270	UA 230	220	200	165	140	UB 120	UA 120
2	A	A	B	B	K 220	K 250	K 290	A	B	A	B	280	290	290	R	UY 280	B	250	230	A 195	170	A	A 120	130
3	K 300	UK 310	B	B	B	A	A	A	295	A 290	270	280	270	270	270	H 270	265	240	F 230	R 205	195	150	H 120	K 190
4	K 300	UK 300	A	B	B	A	UF 250	UH 250	250	285	A	305	280	H 285	UA 290	270	UA 240	A	240	UA 220	200	UH 160	160	125
5	A	UA 140	UA 145	A	A	180	190	H 230	H 250	250	265	290	R	B	B	B	B	UA 260	R 235	UF 205	A	A	A	UF 120
6	A	UK 300	UK 310	A	A	A	UA 230	H 240	240	255	280	285	H 285	275	A 280	255	250	A	UR 215	185	B	K 390	UK 380	A
7	A	B	K 380	B	B	B	B	A	A	A 290	260	Y 280	270	270	B	B	B	220	B	200	K 230	K 250	K 350	K 350
8	A	UK 250	A	UK 270	A	B	B	A	250	250	265	UY 270	R	R 270	IB 270	270	265	K 290	K 260	K 255	UK 260	A	A	B
9	B	A	A	B	UK 210	B	B	A	B	A	B	B	B	B	B	B	B	B	B	UK 290	UK 220	UK 210	K 350	K 340
10	B	K 360	B	B	A	B	A	240	B	300	295	295	R	B	B	B	B	B	A	B	B	UF 180	F 130	UA 140
11	UK 250	B	A	A	B	B	A	A	B	A	B	B	B	B	B	B	B	B	205	220	145	180	A	140
12	K 310	A	A	B	A	A	A	A	220	260	260	265	265	260	UA 270	B	B	B	B	B	UR 195	A	A 120	K 180
13	A	A	A 120	A	B	B	B	B	B	K 330	UA 280	300	R	B	B	265	265	250	A 220	A	160	A	A	B
14	A	UK 270	A	A	UK 240	A	A	A	A	A	A	280	270	270	H 265	260	230	R 230	B	170	A	K 350	A	B
15	A	A	A	A	B	A	A	A	A	B	UA 260	B	R 280	280	280	UR 280	265	240	215	UF 210	K 250	UK 200	UK 170	B
16	A	A	A	UK 250	A	A	A	A	UK 370	K 320	280	Y	290	290	280	270	250	230	220	200	165	H 130	A	A
17	A	A	A	A	K 250	A	A	A	A	UK 320	290	270	280	300	305	280	255	240	215	200	A	A	A	A
18	A	A	A	UK 310	UK 350	UA 200	UA 200	220	B	B	UF 270	260	260	270	270	250	UA 240	230	210	180	140	140	UF 120	A
19	K 340	K 250	K 260	UK 240	A	A	A	F 260	240	240	255	260	275	260	255	225	F 240	225	205	170	160	A	A	UF 110
20	UK 200	UK 270	K 300	A	A	B	F 190	210	225	260	260	265	UA 260	A 260	A 225	UA 260	250	A	220	180	UF 150	A	A	100
21	A	A	B	A	K 330	K 350	H 225	210	225	240	260	260	280	280	270	A 250	230	UA 220	200	A	A	A	B	B
22	B	125	A	A	UF 150	UF 190	A	A	A	260	260	270	270	285	A	A	UF 250	220	205	A	A	A	K 240	K 400
23	A	A	A	A	A	A	B	A	240	B	B	B	280	275	UR 270	250	250	230	B	B	A	UF 130	K 320	K 350
24	UK 375	B	B	Y	B	B	F 210	UR 205	H 210	235	H 240	255	250	260	B	240	235	B	180	F 190	UF 170	130	A	UK 270
25	K 260	K 280	K 260	K 380	B	B	B	A	UF 230	240	H 240	240	290	270	R 260	245	230	B	B	H 180	UR 165	B	A	K 350
26	B	A	B	A	A	A	B	A	B	UF 255	250	250	260	250	A 230	B	B	B	B	165	B	B	B	B
27	K 220	K 200	100	100	S 150	A	A	A	UA 210	220	250	245	245	250	A 240	260	240	215	200	A 165	UA 130	A	B	US 95
28	A	A	K 320	B	A	B	A	A	A	UK 310	UR 280	B	H 300	275	UR 270	270	250	220	195	A	A	C	B	A
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	9	13	10	7	9	6	8	10	14	20	22	22	22	23	19	20	20	18	20	21	18	14	13	17
MED	300	UK 270	265	UK 260	K 240	225	218	228	240	260	262	270	278	270	270	262	250	230	215	200	168	170	160	140
UQ	K 310	UK 300	K 310	K 290	K 295	K 285	240	H 240	250	295	280	285	285	280	280	270	260	240	225	205	200	K 210	K 320	K 340
LQ	K 250	UK 250	145	K 245	UK 210	U 190	195	210	225	245	260	260	265	265	262	250	240	220	205	180	160	140	120	U 120

The Radio Research Laboratories, Japan

FEB. 1977 | FOE (0.01 MHZ)

IONOSPHERIC DATA

FEB. 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	22	K 28	J A 33	K 26	K 29	K 28	E B 35	28	66	45	G	G	G	G	29	J A 32	32	31	G	G	22	20	34	J A 23
2	J A 36	J A 34	44	B	K 22	28	K 29	J A 40	B	40	B	G	G	30	G	G	E B 42	G	32	115	J A 82	J A 53	28	J A 29
3	K 30	J A 62	50	B	B	40	44	42	G	J A 34	G	G	36	G	G	G	G 24	G	G	24	G	17	G	22
4	K 30	J A 33	52	38	44	46	J A 39	32	G	G	32	G	32	G	30	G	33	J A 46	28	24	G	32	G	18
5	J A 22	J A 31	31	31	28	25	G	G	G	G	G	G	E B 51	B	E B 49	E B 39	32	30	G	22	21	J A 52	J A 52	23
6	J A 29	K 30	K 31	42	J A 31	J A 36	25	G	G	G	G	G	31	36	38	J A 66	32	29	G	G	B	K 39	90	52
7	J A 26	51	K 38	51	44	39	48	J A 47	42	43	G	G	G	G	E B 35	E B 44	E B 30	G	E B 27	J A 26	J A 41	33	K 35	K 35
8	J A 36	J A 29	33	90	42	B	B	31	G	G	G	G	B	29	E B 31	G	G	K 29	K 26	K 25	27	70	80	47
9	40	J A 80	J A 51	50	22	B	B	47	B	45	B	B	B	B	E B 30	B	B	B	E B 28	U K 29	K 22	K 21	K 35	42
10	J A 81	K 36	44	B	32	41	28	G	30	35	G	38	E B 36	B	B	B	E B 30	E B 42	28	48	J A 99	G	J A 35	J A 28
11	30	35	47	J A 36	59	B	49	42	B	40	B	B	B	E B 36	B	B	E B 29	B	G	G	21	20	19	20
12	K 31	J A 42	39	43	J A 52	43	48	43	30	G	J A 30	34	31	30	30	E B 37	E B 34	E B 29	E B 25	25	J A 53	23	J A 23	J A 31
13	J A 26	22	20	29	29	B	50	49	B	K 33	30	G	E B 32	B	E B 37	31	29	G	23	26	27	J A 33	46	J A 41
14	J A 53	J A 47	J A 53	44	30	37	36	J A 49	43	40	30	G	G	29	G	33	G	G	E B 23	22	36	K 35	J A 37	J A 64
15	30	J A 41	J A 62	J A 37	37	38	38	J A 41	37	36	27	E B 30	31	34	G	G	G 23	G	G	G	K 25	22	J A 32	J A 47
16	J A 46	88	J A 61	J A 50	41	44	44	52	39	K 32	30	Y	G	G	G	30	28	26	G	G	J A 62	G	17	J A 24
17	J A 27	J A 25	J A 24	19	J A 36	40	J A 52	J A 46	J A 47	37	G	G	G	G	G	G	J A 37	G	32	29	20	39	J A 34	J A 41
18	J A 61	J A 57	J A 74	70	K 35	31	J A 30	28	B	32	35	30	G	G	30	31	28	29	J A 24	G	G	20	17	J A 24
19	K 34	K 25	K 26	U K 24	J A 40	43	37	31	G	G	G	G	G	33	G	27	30	G	24	G	G	20	15	20
20	J A 25	K 27	K 30	43	J A 35	43	32	G	28	G	29	29	45	30	J A 44	J A 29	27	J A 25	J A 25	21	19	18	25	15
21	J A 31	J A 36	32	J A 43	J A 36	K 35	30	G	G	G	30	31	40	32	37	J A 59	J A 32	J A 29	G	J A 25	20	J A 30	E B 18	32
22	30	J A 33	J A 35	J A 29	30	29	J A 48	J A 48	37	G	G	G	35	37	45	J A 44	J A 27	G	G	J A 34	J A 21	J A 38	K 24	K 40
23	J A 38	J A 97	J A 52	J A 44	J A 44	45	B	31	J A 31	E B 35	E B 35	E B 36	38	G	31	32	G	G	E B 26	E B 20	37	G	K 32	K 35
24	K 37	58	52	Y	B	40	G	G	G	G	26	G	G	28	E B 29	G	G	E B 21	23	27	27	F 19	38	K 27
25	K 26	K 28	K 26	K 38	46	55	B	30	28	G	G	G	G	29	28	G	G	E B 23	E B 22	G	J A 25	40	20	K 35
26	45	67	40	45	J A 53	37	39	49	B	G	G	29	29	31	27	E B 33	E B 25	E B 24	E B 21	G	E B 17	E B 13	19	22
27	27	K 20	J A 26	15	G	J A 24	41	J A 29	23	G	27	29	66	30	29	G	G	J A 35	23	J A 22	J A 21	J A 24	10	30
28	J A 35	J A 24	K 32	27	47	50	43	55	J A 61	32	G	E B 47	G	G	G	G	G	G	G	32	33	15	12	J A 24
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	24	26	24	24	28	22	28	25	25	25	24	26	25	27	26	28	28	27	28	28	28
MED	J A 30	J A 34	38	40	36	40	38	36	29	32	G	G	E G 31	29	E G 30	E G 30	U 26	E G 24	E G 25	23	22	22	26	30
UQ	J A 38	J A 54	52	44	44	43	46	47	39	36	30	30	U 34	31	U 32	32	31	29	25	26	34	36	35	40
LQ	27	28	31	29	30	33	30	28	G	G	G	G	G	G	G	G	E G 23	G	G	G	20	18	18	23

IONOSPHERIC DATA

FEB. 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	19	K 28	U K 27	K 26	K 29	K 28	E B 35	23	A A 56	35	G	G	G	G	G	26	22	25	G	G	22	19	17	13
2	13	20	A A 44	B	K 22	K 25	K 29	A A 40	B	A A 40	B	G	G	G	G	G	E B 42	G	27	23	22	23	20	24
3	K 30	35	A A 50	B	B	27	34	A A 42	G	G	G	G	30	G	G	G	G 24	G	G	G 23	G	17	G	17
4	K 30	U K 30	30	A A 38	A A 44	35	G	G	G	G	31	G	G	G	G	G	29	28	23	G	G	27	G	12
5	13	17	17	22	20	20	G	G	G	G	G	G	E B 51	B	E B 49	E B 39	30	G	G	22	21	45	20	13
6	22	K 30	U K 31	38	29	33	22	G	G	G	G	G	30	32	G	29	G	28	G	G	B	K 39	U K 38	A A 52
7	13	A A 51	K 38	E B 47	A A 44	A A 39	A A 48	A A 47	A A 42	G	G	G	G	G	E B 35	E B 44	E B 30	G	E B 27	24	K 23	K 25	K 35	K 35
8	A A 36	U K 25	A A 33	U K 27	A A 42	B	B	U Y 31	G	G	G	G	B	29	E B 31	G	G	K 29	K 26	K 25	U Y 27	30	15	A A 47
9	A A 40	A A 80	A A 51	A A 50	U K 21	B	B	A A 47	B	A A 45	B	B	B	B	E B 30	B	B	B	E B 28	U K 29	U K 22	U K 21	K 35	A A 42
10	A A 81	K 36	A A 44	B	A A 32	A A 41	25	G	30	32	G	32	E B 36	B	B	B	E B 30	E B 42	U Y 28	E B 35	23	G	16	G
11	U K 25	A A 35	A A 47	A A 36	A A 59	B	A A 49	A A 42	B	A A 40	B	B	B	E B 36	B	B	E B 29	B	G	G	20	G	18	18
12	K 31	A A 42	A A 39	E B 38	A A 52	A A 43	A A 48	A A 43	27	G	G	29	30	29	29	E B 37	E B 34	E B 29	E B 25	25	G	20	14	K 18
13	A A 26	16	G	27	E Y 29	B	A A 50	A A 49	B	K 33	G	G	E B 32	B	E B 37	28	28	G	G	22	20	E B 33	A A 46	A A 41
14	A A 53	U K 27	A A 53	A A 44	U K 24	A A 37	A A 36	A A 49	A A 43	E Y 40	U Y 30	G	G	G	G	G	G	G	E B 23	21	32	K 35	A A 37	A A 64
15	A A 30	A A 41	A A 62	A A 37	A A 37	A A 38	A A 38	A A 41	37	E R 36	G	E B 30	31	32	G	G	G 23	G	G	G	K 25	U K 20	U K 17	A A 47
16	A A 46	A A 88	A A 61	A A 50	A A 41	A A 44	A A 44	A A 52	U K 37	K 32	G	Y	G	G	G	29	G	G	G	G	G	G	15	10
17	U F 16	10	17	15	K 25	A A 40	A A 52	A A 46	41	U K 32	G	G	G	G	G	G	G	G	G	G	19	A A 39	A A 34	A A 41
18	21	A A 57	A A 74	U K 31	U K 35	U F 21	U F 25	U F 28	B	32	G	G	G	G	G	28	G	25	G	G	G	17	G	16
19	K 34	K 25	K 26	U K 24	A A 40	A A 43	37	G	G	G	G	G	G	32	G	27	G	G	G	G	G	15	12	G
20	A A 25	U K 27	K 30	A A 43	33	A A 43	28	G	G	G	28	G	29	28	34	G	G	25	G	19	G	12	10	11
21	19	A A 36	A A 32	A A 43	K 33	K 35	G	G	G	G	G	30	39	G	36	24	G	G	G	22	19	23	E B 18	18
22	15	19	21	25	G	G	U F 19	41	30	G	G	G	30	34	29	C 30	24	G	G	22	19	A A 38	K 24	K 40
23	A A 38	A A 97	A A 52	A A 44	A A 44	A A 45	B	26	23	E B 35	E B 35	E B 36	29	G	31	28	G	G	E B 26	E B 26	A A 37	G	K 32	K 35
24	U K 37	A A 58	A A 52	Y	B	A A 40	G	G	G	G	G	G	G	28	E B 29	G	G	E B 21	22	G	G	G	A A 38	U K 27
25	K 26	K 28	K 26	K 38	E B 37	A A 55	B	27	G	G	G	G	G	29	G	G	G	E B 23	E B 22	G	G	E B 34	12	K 35
26	A A 45	A A 67	A A 40	A A 45	A A 53	A A 37	A A 39	A A 49	B	G	G	29	28	U A 31	27	E B 33	E B 25	E B 24	E B 21	G	E B 17	E B 13	G	U S 11
27	A A 27	K 20	G	12	G	17	25	23	G	G	27	29	29	29	27	G	G	20	21	15	12	12	19	G
28	11	17	K 32	E R 27	A A 47	A A 50	A A 43	A A 55	A A 61	U K 31	G	E B 47	G	G	G	G	G	G	G	28	20	G	11	A A 24
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	24	26	24	24	28	22	28	25	25	25	24	26	25	27	26	28	28	27	28	28	28
MED	26	30	A A 36	U 36	34	A A 38	33	36	E G 23	G	G	G	E G 28	E G 28	E G 27	E G 24	G	G	G	U 18	19	19	18	21
UQ	A A 36	A A 46	A A 50	A A 44	A A 44	A A 43	A A 44	A A 46	37	33	G	E G 29	30	30	U 29	28	U 25	U 22		23	22	U 29	33	A A 40
LQ	19	K 22	26	26	24	28	24	G	G	G	G	G	G	G	G	G	G	G	G	G	G	12	12	12

The Radio Research Laboratories, Japan

FEB. 1977 | FBES (0.1 MHZ)

IONOSPHERIC DATA

FEB. 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	9	10	7	15	35	13	17	23	13	20	17	12	13	11	10	15	12	11	12	11	12	9
2	8	8	17	B	12	12	14	19	B	24	B	13	17	14	26	27	42	20	12	15	15	12	9	8
3	8	12	17	B	B	10	9	20	18	16	11	10	11	10	11	11	11	24	13	16	11	10	9	8
4	10	12	12	21	19	16	11	10	8	10	14	22	15	15	13	15	13	10	15	19	19	12	11	8
5	7	8	6	7	11	8	10	13	15	15	13	27	51	B	49	39	26	15	22	12	15	12	11	6
6	10	10	10	15	12	12	9	9	10	10	11	10	10	10	9	11	10	12	19	13	B	11	9	15
7	11	23	22	47	36	22	23	16	20	14	11	22	14	13	35	44	30	13	27	17	10	9	9	12
8	10	8	14	14	18	B	B	12	13	12	13	24	B	21	31	13	18	13	9	13	21	12	10	24
9	23	11	13	20	11	B	B	25	B	25	B	B	B	B	30	B	B	B	28	20	15	13	9	11
10	28	13	23	B	15	23	13	13	28	18	22	18	36	B	B	B	30	42	13	35	18	16	10	10
11	10	21	13	9	22	B	11	12	B	23	B	B	B	36	B	B	29	B	19	21	12	13	11	9
12	8	14	13	38	12	15	22	12	11	11	14	11	13	13	16	37	34	29	25	22	18	15	10	9
13	8	9	8	11	12	B	37	40	B	12	18	20	32	B	37	20	14	25	17	14	14	8	10	13
14	7	7	12	9	9	12	10	13	16	21	21	23	24	16	13	13	11	16	23	16	15	7	15	12
15	11	11	12	11	23	11	11	10	13	27	12	30	17	15	13	15	16	16	12	10	11	10	8	17
16	7	9	13	10	10	13	12	12	17	12	12	Y	24	15	12	15	13	13	12	12	10	9	8	8
17	7	7	9	9	10	22	12	13	12	11	10	10	10	17	18	14	12	11	12	15	11	12	11	10
18	11	E C 10	10	19	10	9	6	10	B	30	14	12	13	12	11	11	10	11	10	10	8	10	7	7
19	8	8	7	7	12	16	14	10	9	E C 12	8	11	11	11	11	11	11	9	11	16	12	9	10	8
20	7	8	E S 13	12	12	22	14	9	10	8	9	11	11	10	10	9	9	10	10	9	10	18	9	5
21	6	10	15	11	15	12	10	10	10	9	10	11	10	11	10	12	E C 12	10	10	8	10	11	18	15
22	12	10	11	10	10	11	10	15	11	10	10	10	10	11	9	10	11	10	8	8	10	12	11	10
23	9	10	10	E C 15	11	15	B	15	12	35	35	36	24	18	26	18	20	12	26	20	13	10	9	9
24	12	22	20	Y	B	23	9	13	12	11	11	12	12	17	29	20	19	21	15	12	13	8	15	16
25	12	10	17	20	37	22	B	21	12	15	13	13	21	20	22	14	16	23	22	12	13	34	9	E C 10
26	19	10	18	13	12	14	36	21	B	17	17	15	14	14	22	33	25	24	21	14	17	13	11	9
27	16	11	9	7	11	9	8	10	10	9	13	15	13	13	13	14	11	10	11	8	9	8	8	8
28	8	10	12	20	14	35	18	18	12	15	23	47	28	24	25	15	13	15	18	13	12	E C 13	10	6
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	27	28	28	28	28	28	28	28	27	28	28	28	28	28	28	28	28	28	28	28	28
MED	10	10	12	12	12	15	12	13	13	14	13	15	16	15	17	15	14	15	14	14	12	12	10	9
UQ	12	12	16	20	18	22	29	17	24	22	20	24	26	20	30	30	26	24	22	16	15	13	11	12
LQ	8	8	10	10	11	12	10	10	11	10	11	11	12	12	12	12	11	11	12	12	10	10	9	8

FEB. 1977 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

FEB. 1977 | M(3000)F2 (0.01) | 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	F	F	F	F	275	R	F	F	A	R	F	F 270	F 250	F 280	F	F 275	F	F 315	285	F 305	320	F 330	J F 315	J F 315
2	F	F	A	B	F	U F 340	F	A	B	A	B	F 245	F 215	F 235	F 265	U F 260	285	305	F 315	R 270	F 315	F 330	J F 275	F 280
3	A	S	A	B	B	F 315	F	A	R	F	F	F 255	F 280	F 285	280	255	305	315	F 325	310	315	315	310	J R 285
4	S	S	F 265	A	A	R	F 270	F 255	F 235	275	285	275	F 265	260	290	325	305	290	325	335	315	320	320	320
5	U F 310	F 290	F 285	J F 295	F 280	U F 280	J F 275	F 275	270	270	265	275	255	B	R 305	330	270	F 305	F 315	F 330	F 315	325	F 315	J S 310
6	U S 295	S	U S 280	F	285	F 275	F 275	F 285	F 255	F 285	280	275	265	290	290	F 295	J F 290	F 285	F 335	325	B	A	A	A
7	F 330	A	A	B	A	A	A	A	A	F 240	F 275	F 260	275	235	R	260	285	265	U R 295	F 315	F 285	F 310	A	A
8	A	F 305	A	F 280	A	B	B	270	F 255	F 245	270	F 250	B	285	F 295	F 275	290	275	280	F 280	F 300	F	F	A
9	A	A	A	A	F 310	B	B	A	B	A	B	B	B	B	240	B	B	B	345	F 340	F 310	J F 335	A	A
10	A	A	A	B	A	A	F 290	F 255	R	F	F 255	F	250	B	B	B	F 260	275	F	R 285	F 330	F	F	F 290
11	F 275	A	A	A	A	B	A	A	B	A	B	B	B	R	B	B	265	B	F 330	F 295	F 330	325	F 305	F 285
12	A	A	A	B	A	A	A	A	G	F	265	F 225	225	255	F 255	270	295	310	315	305	325	325	F 315	J F 300
13	A	F	F 280	265	Y	B	A	A	B	F	F	F 275	F 255	B	290	255	240	290	295	F	F 325	R	A	A
14	A	F	A	A	F 295	A	A	A	A	Y	F 275	270	255	G	F	F 250	260	275	285	F 300	315	A	A	A
15	A	A	A	A	A	A	A	A	F	R	F 255	265	F 280	275	F 290	F 260	305	295	300	320	F 335	F 335	F 315	A
16	A	A	A	A	A	A	A	A	240	F 230	F 230	Y	245	265	250	280	240	295	325	315	325	305	F 305	J F 295
17	F	F	F 275	J F 270	F 270	A	A	A	230	U F 255	F 260	U F 270	F 260	290	F 265	255	295	F 290	F 305	F 315	J F 305	A	A	A
18	F	A	A	F 310	F	F	F	F	B	F 245	F 240	F	F	F 210	270	F 285	F	F 325	F 320	330	F 310	F 305	F 270	U F 250
19	A	R	U F 280	S	A	A	F	F	J F 275	F 280	F 275	F 300	295	305	295	320	300	335	F 320	F 325	F 335	F	F	F 285
20	A	A	A	A	285	A	F 260	J F 275	U F 270	F 275	J F 285	F 280	F 285	F 305	J F 285	F 285	J F 305	J F 320	F 325	F 330	F 350	F 335	J F 290	F
21	F	A	A	A	F	F	F	F	F	F 275	F 280	280	305	300	285	300	F 275	J F 305	J F 310	F 290	J F 320	F	U F 305	U F 315
22	U F 290	F	F	F	F 280	F 270	F 255	F	J F 300	J F 265	F 290	F 285	F 280	F 295	F 320	F 300	J F 305	U F 315	F 335	J S 340	F 305	A	F	A
23	A	A	A	A	A	A	B	F 270	F 270	270	F	265	F 270	F 300	310	F 320	285	270	320	F	A	F	A	A
24	A	A	A	Y	B	A	F 270	F 270	F 295	F 280	F 275	310	260	260	300	290	F 285	F 300	F 315	F 335	F 325	F	A	A
25	R	R	R	A	B	A	B	R	F	J F 295	F 280	F 295	265	U F 265	F 280	310	310	310	325	325	315	B	U F 280	A
26	A	A	A	A	A	A	A	A	B	F 275	F 290	250	F	240	290	R 295	325	335	340	325	325	F 320	F	F
27	A	R	F	F 275	U F 270	F	J F 290	F 280	F 295	310	295	300	310	305	325	325	F 315	F 335	360	F 340	F 340	F 340	J F 305	F
28	U F 255	F	A	R	A	A	A	A	A	F 285	F 270	280	F 290	F 300	F 310	F 325	F 325	335	335	325	335	F 305	F 310	A
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	2	6	6	9	5	8	9	13	18	21	23	23	23	23	25	25	26	27	26	26	16	15	12
MED	U F 292	F 298	F 280	F 278	F 280	F 280	F 272	F 270	F 270	F 275	F 275	F 275	265	280	290	285	290	305	320	322	F 320	F 325	F 305	F 292
UQ	U F 310		F 280	F 295	F 285	U F 315	F 282	F 275	F 275	F 280	F 280	F 280	F 280	F 298	298	310	305	F 315	328	330	F 330	F 332	F 315	U F 312
LQ	U F 275		F 275	F 270	F 275	F 275	F 265	F 270	F 240	F 255	F 265	F 262	255	258	275	F 260	275	290	308	F 305	F 315	312	F 298	F 285

The Radio Research Laboratories, Japan

FEB. 1977 | M(3000)F2 (0.01)

IONOSPHERIC DATA

FEB. 1977 | H'F2 (KM) | 45° E Mean Time (G. M. T. + 3 h)

Station SYOWA STATION Lat. 69° 00.4' S, Long. 39° 35.4' E Sweep 2 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	A	R	500	400	450	420	480	440	U F 380	L	L		L			
2								A	B	A	B	525	650	505	420	400	305	310		L				
3						310	A	A	R	Y	400	470	415	400	395	475	330	L	L	L	L	L		
4							425	450	390	380	370	Y 380	430	445	350	300	L	L	L	L				
5					330	F 325	350	350	350	370	370	345	B 395	B	300	280	400	330	290	L				
6					375	400	350	355	330	345	380	400	445	350	335	330	325	335	250					
7						A	A	A	A	480	390	450	Y	560	U R 480	B 420	360	420						
8						B	B	410	450	475	400	475	B	390	350	400	350	380	375	L				
9						B	B	A	B	A	B	B	B	B	560	B	B	B						
10						A	380	450	R	U F 480	440	F 450	500	B	B	B	400	365	U F 445					
11						B	A	A	B	A	B	B	B	R	B	B	450	B						
12						A	A	A	G	U F 570	460	630	645	525	495	450	375	L						
13						B	A	A	B	F	425	435	450	B	380	445	540	340	L	L				
14						A	A	A	A	Y	375	C 450	480	G	F	F 540	450	395	350	L				
15						A	A	A	A	R	530	470	420	390	385	L	340	365	340	L				
16							A	A	520	U F 580	540	Y	550	H 460	500	420	L	L	L					
17							A	A	A	455	405	375	450	360	450	475	345	L						
18								F	B	530	530	540	F 560	740	465	L	F		L					
19							A	415	375	350	395	330	330	330	350	295	295	270	250					
20							430	430	350	345	360	360	350	320	L	350	330	L	L					
21							345	285	325	340	370	345	320	305	350	L	385	280	260	285				
22						395	410	400	325	370	340	375	390	350	325	345	310	285	255					
23							B	425	445	390	F 380	435	370	330	330	300	330	390	265					
24						A	405	395	365	370	385	310	440	415	330	355	355	310	L					
25							B	R	400	350	370	380	455	U F 450	400	325	L							
26							B	A	B	415	360	L	525	545	380	355	L	L						
27						L	360	350	330	300	330	345	325	320	295	280	L							
28							A	A	A	350	410	B 360	320	300	295	270	280	L						
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					2	4	9	12	14	20	25	24	24	23	24	22	21	14	10	1				
MED					352	360	380	405	370	375	390	400	442	400	380	355	350	338	278	285				
UQ						398	410	428	445	478	425	460	490	482	458	440	385	380	350					
LQ						318	350	352	330	350	370	360	380	340	332	300	330	310	255					

FEB. 1977 | H'F2 (KM)

IONOSPHERIC DATA

FEB. 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	295	340	355	375	380	U H 250	B	220	A	A	240	H 220	230	250	205	220	200	220	225	H 230	225	240	250	250
2	250	275	A	B	295	280	275	A	B	A	B	220	250	240	240	230	I B 235	220	240	255	255	260	280	350
3	A	A	A	B	B	305	A	A	240	220	230	230	220	210	215	200	H 200	240	220	U H 210	230	245	250	285
4	S	S	A	A	A	A	290	245	205	220	240	240	200	H 220	240	225	210	210	220	230	250	255	245	245
5	245	260	Q 275	295	A 290	230	230	230	210	235	200	230	B	B	B	B	200	200	245	230	A 230	A 255	250	250
6	300	S	355	A	A	A	250	240	195	210	220	205	H 195	215	200	215	205	245	225	H 225	B	A	A	A
7	240	A	A	B	B	A	A	A	A	210	H 190	215	240	225	E B 240	I B 240	230	230	E B 250	255	300	310	A	A
8	A	320	A	390	A	B	B	A	205	220	210	225	B	215	225	240	225	255	245	270	E Y 300	A	A	A
9	A	A	A	A	340	B	B	A	B	A	B	B	B	B	230	B	B	B	E B 250	260	295	260	A	A
10	A	A	A	B	A	A	295	H 250	E A 270	245	230	H 230	B	B	B	B	230	B	A	B	260	275	250	260
11	390	A	A	A	A	B	A	A	B	A	B	B	B	B	B	B	B 225	B	240	250	H 250	255	295	320
12	A	A	A	B	A	A	A	A	240	200	225	200	225	225	H 205	B	B	225	245	250	255	250	250	300
13	A	A	325	A	A	B	B	B	B	250	H 200	225	260	B	B	220	220	225	230	225	255	A	A	A
14	A	U F 230	A	A	Q 325	A	A	A	A	A	Y	H 210	220	220	230	205	260	H 220	230	235	A	A	A	A
15	A	A	A	A	A	A	A	A	A	A	210	B 210	225	230	230	220	210	245	220	230	255	280	390	A
16	A	A	A	A	A	A	A	A	A	240	200	Y	240	230	230	210	220	225	245	240	245	255	250	245
17	355	U F 375	345	320	390	A	A	A	A	A 340	H 220	190	270	220	220	220	205	230	H 210	H 250	250	A	A	A
18	A	A	A	350	390	U F 255	U F 230	A	B	A	210	200	200	200	225	H 205	230	H 230	225	H 230	H 245	290	350	A
19	A	R	375	S	A	A	A	255	230	200	220	H 200	215	205	200	220	215	225	220	240	240	300	315	350
20	A	A	A	A	A	A	A	U H 215	230	200	H 195	195	230	230	A 250	H 195	200	225	210	235	225	230	H 250	H 260
21	A	A	A	A	400	Q 345	275	210	H 200	220	210	225	A	210	E A 240	220	U H 190	225	215	250	250	A	260	245
22	275	A	A	A	Q 310	300	220	A	F 280	H 210	H 190	205	200	A 250	200	225	200	225	200	235	275	A	U F 340	A
23	A	A	A	A	A	A	B	A 270	240	B	B	B	225	H 200	220	230	H 215	225	255	B 245	A	375	A	A
24	A	A	A	Y	B	A	340	245	225	210	H 215	210	205	240	225	210	225	225	230	240	240	270	A	A
25	R	R	R	A	B	A	B	A	225	225	200	H 205	225	H 225	240	210	210	H 215	U H 220	250	250	B	300	A
26	A	A	A	A	A	A	B	A	B	230	200	225	220	120	200	I B 220	225	220	240	240	245	250	A	S
27	A	R	400	315	315	275	E A 275	230	230	240	215	210	U H 190	U H 200	230	225	200	235	230	230	230	220	230	290
28	A 370	A	A	A	A	A	A	A	A	255	275	B	240	215	230	Y 240	205	220	H 225	250	240	230	245	A
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	9	6	7	6	10	8	10	11	15	20	23	23	22	23	24	23	26	25	27	27	25	20	18	13
MED	295	298	355	335	332	278	275	240	228	220	210	210	225	220	226	220	212	225	228	240	250	255	250	260
UQ	355	340	365	375	390	302	290	248	238	240	222	225	240	230	232	225	225	230	241	250	255	278	300	300
LQ	250	260	335	315	310	252	230	225	208	210	200	205	205	210	210	210	200	220	220	230	240	248	250	250

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FEB. 1977 | H'F (KM)

IONOSPHERIC DATA

FEB. 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 2.5 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	K 115	K 105	K 100	K 130	K 115	B	105	145	100	G	G	G	G	100	100	95	105	G	G	130	120	110	100
2	100	100	105	B	K 105	K 150	K 105	95	B	95	B	G	G	125	G	G	B	G	135	125	120	120	120	115
3	K 105	K 120	100	B	B	100	100	110	G	105	G	G	120	G	G	G	100	G	G	145	G	145	G	K 110
4	K 115	K 125	110	95	100	110	100	160	G	G	100	G	150	G	105	G	105	100	100	110	G	120	G	100
5	95	95	95	95	100	150	G	G	G	G	G	G	B	B	B	B	115	110	G	110	100	100	110	100
6	125	K 110	K 115	100	100	100	100	G	G	G	G	G	130	110	120	110	120	100	G	G	B	K 110	K 100	110
7	100	100	K 100	160	130	95	95	100	100	100	G	G	G	G	B	B	B	G	B	150	K 110	K 105	K 100	K 120
8	100	K 100	95	K 100	105	B	B	100	G	G	G	G	B	115	B	G	G	K 100	K 155	K 115	K 150	110	110	100
9	110	100	100	100	K 100	B	B	105	B	100	B	B	B	B	B	B	B	B	B	K 120	K 150	K 145	K 100	K 110
10	110	K 105	120	B	95	100	100	G	130	100	G	95	B	B	B	B	B	B	105	150	130	G	130	130
11	K 110	130	95	110	95	B	95	120	B	105	B	B	B	B	B	B	B	B	G	G	140	140	125	125
12	K 100	105	100	100	95	100	100	95	110	G	100	115	120	110	100	B	B	B	B	105	130	120	110	K 110
13	110	110	120	110	105	B	100	120	B	K 100	105	G	B	B	B	120	130	G	120	130	130	100	100	110
14	100	K 110	95	100	K 100	100	100	100	100	100	100	G	G	125	G	100	G	G	B	150	120	K 105	100	100
15	90	95	95	100	125	100	100	100	100	110	100	B	145	130	G	G	100	G	G	G	K 120	K 120	K 110	125
16	100	95	100	K 110	100	100	105	100	K 115	K 100	140	Y	G	G	G	140	130	120	G	G	120	G	130	100
17	120	125	125	110	K 160	125	95	100	100	K 100	G	G	G	G	G	G	100	G	100	140	140	105	110	110
18	100	100	105	K 125	K 100	125	130	125	B	125	100	125	G	G	120	115	100	140	110	G	G	140	160	105
19	K 105	K 105	K 100	K 100	100	100	100	100	G	G	G	G	G	110	G	100	100	G	150	G	G	140	145	120
20	K 100	K 105	K 120	105	105	120	140	G	155	G	110	110	105	110	100	100	95	95	95	95	95	95	95	130
21	100	120	120	100	K 115	K 105	105	G	G	G	130	115	125	125	110	105	110	105	G	100	150	120	B	110
22	150	125	150	110	110	115	115	100	100	G	G	G	125	115	100	100	100	G	G	100	150	115	K 140	K 110
23	100	115	125	100	100	105	B	100	105	B	B	B	100	G	130	120	G	G	B	B	105	G	K 110	K 110
24	K 100	100	95	Y	B	95	G	G	G	G	95	G	G	120	B	G	G	B	150	150	145	170	90	K 120
25	K 110	K 105	K 120	K 120	120	100	B	95	100	G	G	G	G	135	120	G	G	B	B	G	110	B 130	130	K 105
26	110	130	100	100	95	100	120	100	B	G	G	125	125	110	110	B	B	B	B	G	B	B	165	100
27	K 150	K 145	95	125	G	95	95	95	90	G	125	115	130	110	110	G	G	95	150	95	95	120	100	125
28	125	110	K 130	90	95	110	120	105	100	K 105	G	B	G	G	G	G	G	G	G	95	95	130	160	130
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	24	25	24	21	22	14	14	11	7	11	14	12	11	14	10	11	18	22	24	25	28
MED	105	108	102	100	100	100	100	100	100	100	100	115	125	115	110	105	100	102	120	118	125	120	110	110
UQ	110	120	120	110	110	115	105	105	115	105	118	120	130	125	120	118	115	110	150	145	140	135	130	120
LQ	100	100	98	100	100	100	100	100	100	100	100	112	120	110	100	100	100	100	102	100	110	108	100	102

FEB. 1977 | H'ES (KM)

IONOSPHERIC DATA

FEB. 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	C 2	K 4	RK 31	KA 11	K 1	K 2		R 1	ARS 11	RR 11					L 1	L 2	L 1	C 1			H 1	C 1	C 2	C 2
2	L 2	LR 13	RA 11		K 1	HK 12	K 1	RS 11		L 1				H 1					H 1	C 1	C 2	C 2	C 2	C 3
3	K 4	RK 11	R 1			R 1	RS 21	R 1		C 1			C 1				L 1			H 1		H 1		K 1
4	K 4	RK 13	RA 11	L 1	R 1	RR 11	R 1	RH 11			R 1		H 1		C 1		C 2	C 2	C 1	C 1		C 3		L 1
5	R 1	LA 21	LR 21	LRA 21	R 1	H 1											C 1	C 1		C 1	L 1	L 2	CL 12	LRA 21
6	RA 21	KA 31	K 4	LR 11	R 1	R 3	R 2						H 1	C 2	C 1	C 1	C 1	R 1				KS 11	ARK 11	R 1
7	LHA 11	R 1	K 1	R 1	R 1	L 1	L 1	R 1	R 1	R 1										H 1	RKA 11	K 3	K 5	KA 11
8	R 2	RKA 21	L 1	RA 11	R 1			R 1						C 1				K 1	KR 11	K 1	HRK 11	RA 11	AC 11	R 1
9	R 1	RA 11	R 2	R 1	CKA 11			R 1		R 1										K 1	K 1	K 1	K 4	KH 31
10	R 1	K 2	RS 11		L 1	R 1	R 1		R 1	R 1		L 1							R 1	H 1	H 1		H 1	CA 11
11	RK 13	R 1	R 1	RL 21	L 1		RA 11	C 1		C 1											R 1	H 1	C 1	C 4
12	K 4	C 1	R 1	L 1	R 1	R 1	L 1	R 2	C 1		C 1	C 1	C 1	C 1	C 1					C 1	H 1	C 1	C 2	RLK 21
13	R 3	R 2	C 2	R 2	RA 11		L 1	R 1		K 1	R 1					C 1	H 1		CL 11	RC 11	C 1	R 2	RA 21	R 2
14	R 2	RLK 11	R 2	RA 31	RKA 21	R 1	RS 11	R 2	RR 11	R 1	C 1			C 1		C 1				H 1	R 1	KS 31	RA 11	RA 11
15	LA 11	R 1	RA 11	R 1	RA 11	R 1	RA 21	RS 11	R 1	R 1	R 1		H 1	H 1			L 1				K 1	CK 11	RAS 11	R 1
16	RA 31	RA 11	RA 11	RKA 13	RA 11	R 1	R 2	RA 11	RK 21	K 1	H 1					H 1	H 1	C 1			CL 11		C 4	CH 11
17	R 1	RL 11	CA 11	C 2	AK 11	RA 11	R 2	R 2	R 2	RLK 21							L 1		L 1	H 1	R 1	RS 11	R 2	R 6
18	CA 11	R 3	RA 21	AK 11	K 4	RL 11	R 1	C 2		R 1	R 1	H 1			C 2	C 1	R 2	R 1	C 1			R 1	R 1	R 2
19	KS 61	K 2	K 3	K 3	R 2	R 1	R 1	R 1						C 3		C 3	L 1		H 1			RA 11	HA 11	R 1
20	LRK 11	K 3	K 4	R 3	R 2	R 1	RA 11		H 1		C 2	C 1	C 1	C 2	C 3	C 3	L 1	LR 12	L 1	LH 21	L 1	L 2	LR 11	R 1
21	R 2	R 4	RA 31	R 3	RK 12	K 1	LA 11				H 1	C 1	C 2	C 1	C 2	C 2	C 1	C 2		LR 21	R 1	R 1		C 1
22	HC 11	H 3	HCL 11	R 3	R 2	R 2	RA 11	RA 11	RA 21				H 2	C 2	C 2	C 2	C 2			L 2	RCA 11	R 3	K 2	K 6
23	RA 21	CRL 11	RCA 11	R 2	R 2	R 1		R 1	R 2				L 1		H 1	C 1					R 1		K 5	KS 61
24	KA 21	R 1	L 1			L 1					L 1			C 1					H 1	H 1	C 1	H 1	R 1	K 1
25	K 2	K 3	K 4	K 1	R 1	R 1		L 1	R 1					H 1	C 1						C 1	R 1	RA 21	K 6
26	R 1	RCA 11	R 1	R 2	R 1	RL 11	R 1	R 1				C 1	C 1	C 2	C 1								H 1	C 1
27	HK 11	KC 21	L 1	H 2		L 2	L 2	C 2	L 2		C 1	C 1	HC 11	C 1	C 1			L 2	HL 11	L 2	C 1	CL 11	L 1	C 1
28	CR 11	R 2	KA 21	L 1	R 1	R 1	C 1	R 1	R 2	RK 21										L 2	L 1	HL 11	H 1	R 2
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

FEB. 1977 | TYPES OF ES

IONOSPHERIC DATA

MAR. 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	30	31	A	A	R	A	S 46	50	52	54	58	X 55	X 55	X 53	A	X 58	X 52	X 51	X 48	X 47	X 47	R	A	A
2	A	A	A	O R 34	35	46	S 53	X 46	X 51	X 52	X 55	X 53	X 56	X 55	X 55	R	O R 57	55	R 50	X 54	O R 51	S 47	40	40
3	31	A	A	A	O R 38	S 49	48	48	X 52	X 58	X 54	X 55	X 58	X 59	X 63	X 60	X 60	60	57	X 51	X 48	S 47	S 47	S 47
4	U S 46	34	33	U S 37	53	U S 59	46	51	X 57	59	X 61	X 61	X 61	65	62	62	59	56	54	X 46	46	47	U S 46	40
5	36	X 42	A	A	R	U S 58	60	S 66	70	O R 55	60	69	65	68	X 61	X 61	X 62	X 56	X 53	X 50	S 48	S 66	S 58	S 52
6	U S 46	S 41	S 40	38	33	44	S 51	U S 58	U S 67	X 57	59	X 62	X 66	62	X 64	X 60	X 56	X 64	X 60	X 59	66	37	A	A
7	A	A	A	A	A	A	O R 42	46	O R 52	60	58	63	61	X 60	X 62	X 60	X 58	X 58	X 58	X 51	X 52	S 51	47	S 39
8	O R 36	A	A	A	30	30	A	51	56	60	57	60	60	57	61	59	X 55	S 60	55	58	S 49	A	A	A
9	A	45	56	A	A	A	O R 41	B	B	Y	B	B	B	B	O R 58	O R 48	O R 48	B	R	45	A	A	A	A
10	A	B	A	R	B	B	A	A	R	B	B	B	B	B	O R 54	B	O R 48	O R 48	O R 44	O R 41	O R 33	A	A	A
11	A	A	A	A	A	A	A	R	O R 41	46	O R 46	X 48	B	O R 48	O R 52	B	O R 53	X 51	55	X 42	A	R	A	B
12	A	A	A	A	A	B	R	Y	A	B	O R 47	B	B	B	B	O R 51	B	O R 48	O R 44	X 41	O R 36	R	A	A
13	A	A	O R 36	R	B	A	A	O R 42	43	B	R	R	B	O R 51	O R 51	O R 51	O R 51	O R 49	O R 48	X 45	X 37	A	R	A
14	A	A	A	Y	A	A	B	B	A	R	B	B	B	O R 54	51	X 53	X 51	O R 50	O R 46	O R 42	O R 38	32	29	28
15	23	A	A	A	A	38	60	47	X 52	X 54	X 54	X 58	X 63	68	X 68	X 66	64	O R 61	51	45	45	45	37	36
16	31	30	O R 28	36	A	33	A	O R 45	50	53	B	B	76	82	X 66	65	X 61	54	54	46	45	48	S 45	A
17	A	A	A	S 45	O R 45	A	A	A	A	O R 47	X 50	X 50	X 52	X 54	X 58	X 60	X 59	61	71	X 34	A	A	A	A
18	B	A	A	A	A	A	A	B	B	O R 41	46	X 48	X 47	X 53	X 55	X 59	O R 53	O R 51	47	46	43	40	22	O R 23
19	A	A	A	O R 43	40	45	51	52	46	O R 45	B	O R 54	58	X 59	60	X 56	57	X 52	X 48	X 46	X 38	33	O R 31	O R 24
20	A	A	A	A	A	A	A	O R 46	50	45	X 50	X 57	X 63	X 62	X 62	X 63	X 61	X 56	X 43	45	35	28	A	A
21	A	A	A	B	A	O R 38	40	S 42	44	X 45	X 51	X 51	X 59	X 66	X 69	X 64	57	57	53	46	O R 36	A	A	A
22	A	A	A	A	A	A	B	A	A	B	O R 42	O R 49	O R 54	55	X 54	O R 55	O R 52	O R 51	X 46	43	39	O R 32	O R 21	A
23	A	A	A	A	O R 31	A	A	45	49	52	X 52	B	R	70	79	75	69	O R 55	O R 52	O R 49	46	A	A	A
24	A	A	A	B	Y	Y	A	A	A	A	B	O R 51	X 55	X 51	X 50	X 50	54	X 49	X 46	55	B	B	R	A
25	A	A	A	A	A	B	A	A	O R 39	42	X 46	X 49	X 52	X 54	X 55	O R 53	X 51	52	X 45	55	38	27	A	A
26	B	B	A	A	Y	A	B	B	B	B	O R 47	B	B	B	B	O R 46	O R 47	48	X 48	30	A	A	A	A
27	A	A	A	A	O R 29	30	41	58	51	53	O R 51	O R 54	O R 60	62	73	64	56	55	S 52	42	45	39	28	A
28	A	A	B	A	A	A	A	Y	B	R	42	X 44	B	B	O R 48	O R 54	51	50	49	S 52	A	A	A	A
29	A	B	A	46	U S 72	38	B	B	40	44	44	X 43	X 45	X 48	X 48	X 46	X 50	X 45	44	42	O R 33	O R 27	O R 26	A
30	A	A	O R 24	A	R	36	45	O R 36	O R 41	X 48	X 53	R	60	62	66	66	57	59	48	41	38	O R 29	Y	27
31	20	A	A	A	A	R	38	S 60	44	50	56	58	65	65	69	65	60	56	51	46	45	32	29	28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	9	6	6	7	10	13	14	18	21	22	24	22	22	26	28	28	30	30	30	31	25	18	14	11
MED	31	38	34	38	36	38	46	48	50	52	52	X 54	X 60	59	X 60	60	56	54	50	46	45	38	34	36
UQ	36	42	40	44	45	46	51	52	52	55	56	X 58	63	65	X 65	X 64	59	57	54	50	47	47	S 46	40
LQ	30	31	O R 28	36	31	36	41	45	44	45	46	X 49	X 55	X 54	54	53	51	50	46	42	38	32	28	28

MAR. 1977 | FXI (0.1 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

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

The Radio Research Laboratories, Japan

MAR. 1977 | FOF2 (0.1 MHz)

IONOSPHERIC DATA

MAR. 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							310	310	340	F 350	370	380	380	U H 410	A	380	L	L						
2							280	320	330	350	370	390	390	390	L 400	B	U L 370	L						
3							L	350	340	360	390	390	390	L	390	U L 370	L	L						
4								340	360	380	390	F 380	400	400	L	L	L							
5						L	L	F 330	U L 350	B	F 400	400	400	F 400	L 400	U L 390	L	L						
6								R	350	370	390	400	400	390	A	A	L	L						
7							A	U F 350	A	F 370	F 390	F 380	390	U L 400	390	370	U L 340	L						
8							A	F 320	F 350	F 360	F 380	F 390	F 380	U L 400	390	L	L							
9								B	B	Y	B	B	B	B	380	350	Y							
10								A	A	B	B	B	B	B	370	B	L	L						
11								A	310	340	350	360	B	B	B	B	L	L						
12								A	A	B	B	B	B	B	B	B	B							
13								F 280	F 340	B	350	R	B	380	370	L	L							
14								B	B	A	B	B	B	370	U L 380	360	L							
15								L	L	L	L	380	390	380	U L 370	L	U L 330							
16									A	350	B	B	B	390	B	U L 350	L							
17									A	A	360	370	U L 370	370	370	L	L 330	L						
18									B	320	330	360	360	360	360	U L 350	B							
19									F 320	B	B	370	370	370	U L 360	L								
20									L		350	360	U L 380	L	L	L	L							
21								260	310	L	350	370	360	360	350	L								
22										B	360	360	360	U L 360	U L 350	B								
23										350	U L 360	B	B	360	I B 360	U L 340	L							
24										A	B	340	360	L		L 350								
25									300	F 320	340	350	350	360	L	L								
26										B	F 330	B	B	B	B	B								
27										U L 330	A	A	370	L	L	L								
28										290	310	340	B	B	L	L	L							
29										310	340	340	L	340	L									
30											L	350		L										
31										L	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							2	9	12	15	20	21	18	19	16	10	4							
MED							295	320	340	350	360	370	380	380	370	L 355	U L 335							
UQ								340	350	360	385	380	390	395	390	370	U L 355							
LQ								310	315	325	345	360	360	360	360	U L 350	L 330							

MAR. 1977 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

MAR. 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 0.4 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	U K 175	U K 170	B	A	B	A	K 260	200	210	235	H 240	250	260	255	225	220	A	A	A	A	A	K 270	B	340
2	B	B	K 350	A	K 190	155	170	190	210	230	240	260	250	250	U R 250	B	B	220	195	170	R 120	B	A	B
3	B	K 320	A	A	A	U A 140	180	195	220	225	240	255	250	H 250	U A 270	A 240	U A 210	U A 230	A 175	J A 160	120	A	C	B
4	C	S	A	A	100	A	160	200	215	235	250	260	265	260	260	H 255	245	210	H 200	140	U A 130	120	U A 90	U S 75
5	A	U K 270	A	A	A	S	A	A 180	220	B	A 255	A	U A 280	U A 280	275	260	220	220	A	A	A	B	B	B
6	U K 140	U S 110	100	A	100	A	140	H 180	210	A 250	245	260	260	255	240	A	225	210	K 340	A 165	A	A	K 380	A
7		B	A	A	A	A	A	A	U K 325	A	A	275	250	U A 240	250	250	230	A	170	145	U A 130	B	A	B
8	S 80	A	J K 330	K 290	A	A	A	U A 210	A 200	F 225	A 245	250	255	250	245	A 250	U A 240	220	200	A	A	A	A	J K 320
9		K 350	K 265	B	A	B	U K 270	B	B	A	B	B	B	B	B	B	B	B	B	F 180	B	K 370	K 240	B
10		B	B	K 300	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	K 360	U K 270
11	U K 320	A	B	A	A	B	A	A	K 255	230	I B 240	245	B	B	B	B	B	U B 195	160	140	A	U K 280	K 360	K 370
12		B	U K 360	A	A	B	R	B	A	B	B	B	B	B	B	B	B	B	B	140	A	A	B	U K 320
13		B	U K 230	U K 260	B	K 370	K 320	K 230	A	B	B	290	B	B	B	B	B	B	B	B	130	A	K 285	U K 350
14	U K 280	B	A	B	B	A	B	B	B	B	B	B	B	B	250	240	B	B	B	B	B	105	B	B
15		K 320	K 330	A	A	A 130	A 140	R 170	200	205	220	H 250	U R 250	245	250	230	220	B	R 170	B	B	B	A	
16	K 105		A	K 210	A	A	A	U K 310	220	A	B	B	B	A	B	B	B	A	A	A	B	A	U A 110	
17			A	U K 250	U K 270	B	A	A	A	A	245	H 260	260	240	230	215	210	185	A	B	A	A	B	U K 360
18			B	A	A	A	A	B	B	220	230	230	260	240	230	220	B	B	A	140	B	A	B	
19	U K 255	K 265	U K 300	K 290	K 280	K 220	U F 140	A 160	185	B	B	B	240	A 230	A	220	A	A	A	B	B	B	B	
20			A	A	A	B	A	A	K 240	200	220	H 250	U A 240	A 230	230	220	A	A	H 150	A	B	A	U K 360	
21			B	B	K 370	A	160	H 160	180	200	210	210	230	U R 250	230	A	205	A	U R 140	B	B	B	B	
22			A	B	B	B	B	A	A	B	A	U B 250	B	250	250	B	B	B	B	A	A	B	B	
23		U K 200	K 140	120	A	A	A	U K 280	U F 220	U A 230	220	B	B	B	B	B	B	B	B	C	A	B		
24		K 270		B	A	Y	B	A	A	A	B	B	B	250	K 305	K 280	K 290	B	170	B	B	B		U K 320
25	U K 290	U K 370	K 390	K 390	B	B	B	A	A	U A 260	250	250	245	230	240	B	195	190	A	A 110	B	A	U K 360	
26			K 390	K 300	Y	B	B	B	B	B	270	B	B	B	B	B	B	190	K 200	K 185	U K 380	J K 340	K 320	K 310
27	K 290	K 260	J K 290	U K 310	A	A	A	150	A	220	B	B	A	A	A 225	220	H 195	170	U A 120	B	B	B		
28	U K 360	U K 320		A	B	B	B	Y	B	A	230	240	B	B	B	B	B	175	140	120	B	B	U K 360	
29				A	U K 295	U K 195	B	B	210	220	H 220	220	H 240	H 225	210	R	U K 240	U A 180	U F 130	B	B	B		K 280
30				K 230	U K 220	A	A	B	B	B	U A 230	B	B	A	A	U F 220	B	B	B	B	C	B		
31		U K 280	K 340	B	B	K 270	120	U F 150	155	180	220	220	230	F 230	220	R 210	180	170	130	A	A	B		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	13	13	11	8	7	11	15	17	16	20	19	17	19	20	16	14	14	16	12	6	6	11	11
MED	U K 268	U K 270	K 330	K 290	K 245	K 195	160	190	210	225	240	250	250	250	242	225	220	192	170	142	130	K 275	K 360	U K 320
UQ	U K 290	U K 320	K 350	K 300	K 288	K 245	220	205	220	232	245	260	260	250	250	250	240	220	198	168	U A 130	K 340	K 360	K 345
LQ	U K 140	U K 260	K 265	K 240	145	148	140	165	200	212	220	242	240	235	230	220	205	180	140	140	120	120	K 262	U K 295

The Radio Research Laboratories, Japan

MAR. 1977 | FOE (0.01 MHZ)

IONOSPHERIC DATA

MAR. 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	JA 21	26	132	JA 50	31	JA 44	K 26	JA 23	G	G	G	G	28	JA 36	JA 66	31	JA 45	42	JA 44	JA 31	20	32	JA 41	K 34
2	JA 62	JA 41	K 35	30	K 19	JA 25	JA 25	G	G	G	G	32	JA 55	41	G	EB 39	EB 26	G	G	G	G	EB 11	15	JA 30
3	JA 25	K 32	JA 45	JA 46	32	JA 22	G	G	G	G	30	28	30	33	48	38	JA 34	28	30	21	20	27	EC 14	EB 9
4	EC 14	20	JA 26	27	G	37	30	23	G	G	G	30	G	G	G	G	G	G	G	G	18	13	32	9
5	JA 24	JA 30	JA 41	JA 35	JA 30	JA 32	JA 26	21	G	EB 39	29	31	30	29	G	G	G	G	30	33	23	24	32	20
6	19	JA 24	JA 24	JA 25	JA 20	JA 23	31	G	25	30	43	45	43	JA 39	JA 55	JA 53	G	59	K 34	18	JA 28	27	K 38	JA 38
7	JA 41	47	JA 51	JA 35	JA 49	52	38	42	41	JA 42	JA 32	30	27	JA 52	35	27	26	25	JA 21	G	30	20	26	JA 22
8	JA 24	JA 29	JK 33	K 29	JA 26	JA 41	JA 44	JA 39	JA 36	30	40	30	40	35	JA 40	JA 56	JA 26	G	JA 23	18	JA 41	JA 40	JA 32	JK 32
9	JA 58	JA 46	K 26	JA 49	37	42	JA 34	B	B	124	B	B	B	B	EB 30	EB 24	31	B	30	21	81	K 37	36	JA 61
10	JA 75	B	48	K 30	B	B	39	48	38	B	B	B	B	B	EB 30	B	EB 25	EB 22	EB 32	21	19	JA 34	K 36	JA 33
11	JA 38	JA 76	45	40	50	39	37	35	34	G	EB 32	31	B	EB 39	EB 43	B	EB 31	G	G	G	JA 39	UK 28	47	40
12	40	44	K 36	JA 46	67	B	G	32	56	B	EB 38	B	B	B	B	EB 37	B	EB 31	EB 22	G	JA 34	28	JA 92	JA 102
13	JA 41	43	JA 34	K 26	B	40	40	29	29	B	31	G	B	EB 32	EB 26	EB 34	EB 25	EB 30	EB 26	EB 20	G	JA 34	K 28	37
14	JA 69	JA 58	JA 81	26	JA 40	JA 36	B	B	47	42	B	B	B	EB 30	G	G	EB 23	EB 32	EB 24	EB 26	20	G	19	JA 24
15	20	K 32	K 33	44	JA 30	30	15	G	G	23	G	G	G	25	G	G	G	EB 33	G	EB 18	18	16	17	JA 24
16	JA 32	JA 24	JA 30	K 21	48	JA 44	JA 48	38	JA 34	32	B	B	EB 55	38	EB 47	EB 28	EB 24	JA 26	42	21	EB 18	18	JA 32	JA 31
17	JA 40	JA 53	JA 39	50	33	53	47	JA 60	54	34	30	JA 33	JA 27	G	JA 25	G	G	G	21	EB 20	JA 35	JA 38	JA 42	JA 40
18	39	JA 36	JA 41	S 34	27	JA 39	JA 35	B	B	36	25	25	G	G	G	30	EB 33	EB 25	20	G	EB 14	20	17	JA 24
19	31	JA 31	40	K 29	JA 35	K 22	19	20	G	EB 36	B	30	28	30	38	20	35	19	20	20	18	18	JA 21	15
20	JA 52	JA 37	JA 52	33	JA 58	47	50	50	K 24	23	28	G	JA 26	27	JA 45	19	JA 39	22	20	17	EB 10	JA 25	JA 41	JA 41
21	83	52	43	B	K 37	29	30	G	30	G	G	G	G	G	20	24	20	20	20	EB 14	EB 20	JA 36	104	100
22	JA 62	32	JA 72	38	JA 37	JA 40	B	52	52	B	38	27	EB 34	G	G	EB 35	EB 35	EB 30	EB 18	16	JA 21	JA 33	JA 26	JA 21
23	24	26	21	30	JA 30	52	JA 42	33	32	30	27	B	EB 45	EB 26	EB 40	EB 24	EB 23	EB 34	EB 39	JA 24	27	JA 36	JA 124	JA 54
24	JA 44	39	JA 101	52	20	Y	53	JA 43	47	43	B	EB 26	EB 26	G	K 30	K 28	K 29	EB 22	G	EB 13	B	B	20	UK 32
25	58	JA 73	K 39	K 39	46	B	44	43	33	27	21	G	26	G	G	EB 27	G	G	19	15	13	12	JA 40	JA 64
26	109	47	K 39	K 30	Y	JA 60	B	B	B	B	G	B	B	B	B	EB 34	EB 24	G	K 20	JA 30	UK 38	JA 34	K 32	K 31
27	K 29	JA 34	JK 29	K 31	JA 36	40	28	G	JA 24	G	35	38	H 36	32	22	G	25	37	17	27	JA 25	JA 32	JA 23	JA 35
28	JA 41	K 32	JA 47	JA 51	50	38	52	Y	B	35	G	G	B	B	EB 26	EB 27	EB 21	G	G	JA 29	JA 36	JA 42	UK 36	42
29	104	53	37	JA 37	JA 33	33	B	B	JA 23	31	G	G	G	G	G	G	27	20	JA 81	EB 11	27	EB 11	22	K 28
30	21	JA 21	18	K 23	JA 25	20	19	EB 20	EB 22	EB 22	24	EB 28	EB 32	28	29	25	EB 21	EB 17	EB 14	EB 12	EC 12	22	Y	JA 25
31	JA 24	37	70	JA 41	JA 38	K 27	JA 24	G	G	JA 24	17	G	G	27	G	G	G	JA 24	JA 30	JA 26	JA 25	JA 23	JA 25	EB 11
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	30	28	27	27	25	27	26	25	24	23	26	29	29	30	30	31	31	30	30	30	31
MED	JA 40	36	J 39	34	34	39	34	29	29	U 28	26	28	27	27	EG 26	EG 27	EG 25	EG 22	20	17	20	27	32	JA 32
UQ	JA 58	47	JA 48	JA 44	43	43	43	42	37	35	31	30	U 32	34	U 35	EB 34	U 28	U 26	U 28	22	JA 30	JA 34	40	JA 40
LQ	24	JA 30	33	K 29	28	30	26	G	G	G	G	G	EG 26	G	G	G	EG 20	G	18	EG 12	U 16	18	22	24

MAR. 1977 | FOES (0.1 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAR. 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 2.5 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	U K 17	U K 17	A A 132	A A 50	A A 31	A A 44	K 26	16	G	G	G	G	28	28	A A 66	29	34	27	34	21	16	A A 32	A A 41	K 34
2	A A 62	A A 41	K 35	22	K 19	17	G	G	G	G	G	31	27	27	G	E B 39	E B 26	G	G	G	G	E B 11	15	16
3	U F 19	K 32	A A 45	A A 46	30	G	G	G	G	G	28	28	29	33	G	U A 30	27	22	G	18	17	9	E C 14	E B 9
4	E C 14	G	10	11	G	12	19	22	G	G	G	29	G	G	G	G	G	G	G	G	G	G	10	G
5	10	U K 27	A A 41	A A 35	22	17	18	19	G	E B 39	G	30	27	G	G	G	G	G	30	27	21	19	18	17
6	U K 14	G	11	15	11	15	20	G	G	G	30	32	36	38	56	48	G	G	K 34	G	15	12	K 38	A A 38
7	A A 41	A A 47	A A 51	A A 35	A A 49	A A 52	36	34	38	31	29	G	G	30	28	G	22	21	G	G	G	12	12	12
8	18	A A 29	J K 33	K 29	17	20	A A 44	G	G	25	28	G	28	G	30	28	G	G	G	17	20	A A 40	A A 32	J K 32
9	A A 58	K 35	K 26	A A 49	A A 37	A A 42	U K 27	B	B	E Y 30	B	B	B	B	E B 30	E B 24	U Y 31	B	E R 30	G	A A 81	K 37	A A 36	A A 61
10	A A 75	B	A A 48	K 30	B	B	A A 39	A A 48	A A 38	B	B	B	B	B	E B 30	B	E B 25	E B 22	E B 32	20	19	A A 34	K 36	A A 33
11	A A 38	A A 76	A A 45	A A 40	A A 50	A A 39	A A 37	A A 35	29	G	E B 32	27	B	E B 39	E B 43	B	E B 31	G	G	G	A A 39	U K 28	A A 47	B
12	A A 40	A A 44	U K 36	A A 46	A A 67	B	G	E Y 32	A A 56	B	E B 38	B	B	B	B	E B 37	B	E B 31	E B 22	G	U A 25	A A 28	A A 92	A A 102
13	A A 41	A A 43	U K 23	U K 26	B	A A 40	A A 40	27	23	B	U Y 31	G	B	E B 32	E B 26	E B 34	E B 25	E B 30	E B 26	E B 20	G	A A 34	K 28	A A 37
14	A A 69	A A 58	A A 81	E Y 26	A A 40	A A 36	B	B	A A 47	A A 42	B	B	B	E B 30	G	G	E B 23	E B 32	E B 24	E B 26	18	G	14	12
15	12	K 32	K 33	A A 44	A A 30	G	G	G	G	G	G	G	G	G	G	G	G	E B 33	G	E B 18	12	13	12	11
16	K 10	E C 21	13	K 21	A A 48	20	A A 48	U K 31	G	30	B	B	E B 55	29	E B 47	E B 28	E B 24	23	32	18	E B 18	12	14	A A 31
17	A A 40	A A 53	A A 39	U K 25	U K 27	A A 53	A A 47	A A 60	A A 54	U Y 34	G	25	25	G	22	G	G	G	20	E B 20	A A 35	A A 38	A A 42	A A 40
18	E B 26	A A 36	A A 41	A A 34	A A 27	A A 39	A A 35	B	B	G	25	19	G	G	G	21	E B 33	E B 25	19	G	E B 14	18	12	12
19	A A 31	A A 31	A A 40	K 29	K 28	K 22	G	G	G	E B 36	B	30	G	25	29	20	27	19	20	20	17	14	14	E
20	A A 52	A A 37	A A 52	A A 33	A A 58	A A 47	A A 50	35	K 24	22	25	G	G	G	G	19	22	20	13	12	E B 10	12	A A 41	A A 41
21	A A 83	A A 52	A A 43	B	K 37	24	G	G	G	G	G	G	G	G	20	24	19	18	18	E B 14	E B 20	A A 36	A A 30	A A 100
22	A A 62	A A 32	A A 72	A A 38	A A 37	A A 40	B	A A 52	A A 52	B	32	G	E B 34	G	G	E B 35	E B 35	E B 30	E B 18	16	13	14	12	A A 21
23	A A 24	A A 26	A A 21	A A 30	20	A A 52	A A 42	U K 28	G	G	18	B	E B 45	E B 26	E B 40	E B 24	E B 23	E B 34	E B 39	23	20	A A 36	A A 124	A A 54
24	A A 44	A A 39	A A 101	E B 28	E Y 20	Y	A A 53	A A 43	A A 47	A A 43	B	E B 26	E B 26	G	K 30	K 28	K 29	E B 22	G	E B 13	B	B	A A 20	U K 32
25	A A 58	A A 73	K 39	K 39	A A 46	B	A A 44	A A 43	26	G	21	G	23	G	G	E B 27	G	G	15	G	10	10	A A 40	A A 64
26	B	B	K 39	K 30	Y	A A 60	B	B	B	B	G	B	B	B	B	E B 34	E B 24	G	K 20	A A 30	U K 38	A A 34	K 32	K 31
27	K 29	A A 34	K 29	U K 31	21	20	25	G	18	G	Y 35	U Y 38	35	28	22	G	16	G	G	G	G	10	14	A A 35
28	A A 41	U K 32	E B 29	A A 51	A A 50	A A 38	A A 52	Y	B	27	G	G	B	B	E B 26	E B 27	E B 21	G	G	G	A A 36	A A 42	U K 36	A A 42
29	A A 104	B	A A 37	32	U K 29	U K 19	B	B	G	G	G	G	G	G	G	G	U K 24	G	G	E B 11	G	E B 11	E	K 28
30	A A 21	A A 21	16	K 23	A A 25	13	12	E B 20	E B 22	E B 22	22	E B 28	E B 32	25	28	21	E B 21	E B 17	E B 14	E B 12	E C 12	S 15	Y	S 10
31	E	A A 37	A A 70	A A 41	A A 38	K 27	G	G	G	17	17	G	G	G	G	G	G	G	12	18	12	12	11	E B 11
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	28	31	30	28	27	27	25	27	26	25	24	23	26	29	29	30	30	31	31	30	30	30	30
MED	A A 39	A A 34	A A 39	32	A A 30	27	27	20	G	E G 17	U 19	E G 19	E G 26	E G 25	E G 22	E G 24	E G 23	E G 18	E G 18	E G 14	15	14	24	32
UQ	A A 58	A A 44	A A 46	A A 40	A A 43	A A 41	A A 43	35	34	U 28	28	28	28	28	U 26	E B 29	E B 27	E B 25	U 22	19	20	A A 34	A A 38	A A 40
LQ	18	28	K 29	K 26	22	18	E G 12	G	G	G	G	G	G	G	G	G	G	G	G	G	E G 10	12	14	12

The Radio Research Laboratories, Japan

MAR. 1977 | FBES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 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	8	16	10	21	13	12	10	11	10	10	11	11	11	11	11	10	9	10	9	10	13	11	8
2	18	16	18	11	8	9	7	11	10	10	11	13	10	12	14	39	26	15	19	16	11	11	8	9
3	8	10	9	10	14	9	8	10	10	10	11	11	10	11	11	11	8	11	9	8	7	7	E C 14	9
4	E C 14	8	8	7	7	8	10	10	11	13	19	17	15	13	11	11	13	11	11	11	11	11	8	7
5	8	8	11	10	10	E S 16	10	9	14	39	12	20	15	13	12	11	13	12	14	14	14	13	12	10
6	9	6	10	10	8	9	10	8	10	10	16	15	15	16	12	11	13	10	13	13	11	9	10	E C 9
7	9	13	9	16	12	13	11	12	18	14	14	13	13	13	13	21	15	12	10	10	11	11	9	10
8	7	9	7	11	8	10	15	11	11	10	11	12	12	11	12	10	11	11	13	8	8	11	8	10
9	13	10	15	20	9	20	11	B	B	21	B	B	B	B	30	24	23	B	27	13	22	8	11	10
10	8	B	26	14	B	B	27	27	26	B	B	B	B	B	30	B	25	22	32	11	15	8	9	8
11	10	10	26	14	14	35	14	19	15	15	32	15	B	39	43	B	31	19	15	13	12	10	20	36
12	12	20	10	14	12	B	15	25	24	B	38	B	B	B	B	37	B	31	22	10	6	11	15	13
13	18	21	12	15	B	23	18	18	18	B	29	24	B	32	26	34	25	30	26	20	10	9	12	8
14	14	14	11	18	20	11	B	B	35	25	B	B	B	30	20	19	23	32	24	26	17	10	8	8
15	7	9	10	16	13	12	9	10	16	14	12	10	21	20	20	14	18	33	15	18	11	12	9	9
16	8	E C 21	8	6	14	E C 12	13	15	14	16	B	B	55	22	47	28	24	15	15	15	18	11	10	10
17	8	10	13	15	12	18	14	21	18	20	12	13	14	13	12	13	14	15	17	20	10	8	12	10
18	26	10	13	11	12	11	15	B	B	17	12	12	14	14	13	12	33	25	13	12	14	10	10	8
19	8	8	11	12	11	7	10	11	16	36	B	27	23	17	18	17	12	15	14	16	15	12	12	11
20	10	8	9	9	15	35	9	14	13	12	12	13	13	12	12	12	11	11	10	8	10	9	10	10
21	15	17	12	B	12	12	10	13	13	13	12	13	15	18	14	14	16	12	12	14	20	12	10	11
22	11	12	11	24	14	18	B	18	19	B	18	25	34	21	24	35	35	30	18	13	11	10	9	9
23	10	10	7	10	E C 10	12	15	12	12	12	10	B	45	26	40	24	23	34	39	E C 17	13	11	8	10
24	8	11	21	28	13	Y	26	13	16	21	B	26	26	20	20	13	25	22	15	13	B	B	12	10
25	17	13	16	22	17	B	21	13	13	11	14	8	12	16	9	27	14	16	11	10	9	7	10	8
26	22	22	17	12	Y	18	B	B	B	B	19	B	B	B	B	34	24	18	15	10	10	10	10	10
27	10	10	10	10	12	12	10	10	E C 13	18	28	26	24	23	18	15	14	12	10	10	10	9	10	10
28	10	11	29	11	20	15	18	Y	B	20	18	23	B	B	26	27	21	17	13	10	10	11	10	16
29	34	33	21	13	12	10	B	B	17	17	15	19	12	12	11	13	18	13	11	11	9	11	11	10
30	8	10	10	10	10	9	10	20	22	22	20	28	32	22	13	20	21	17	14	12	E C 12	10	Y	S 9
31	E S 10	10	21	13	12	11	10	11	15	14	11	14	15	15	14	16	17	12	10	9	10	10	9	11
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	30	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31
MED	10	10	11	12	12	12	13	13	16	17	16	19	21	18	14	17	18	15	14	12	11	10	10	10
UQ	14	14	16	16	14	18	18	21	20	24	30	28	D B 55	28	26	28	24	24	18	14	14	11	12	10
LQ	8	10	10	10	10	10	10	11	13	12	12	13	14	13	12	12	14	12	11	10	10	9	9	9

MAR. 1977 | F-MIN (0.1 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAR. 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	F	F	A	A	A	A	U F 265	F 290	F 265	F 270	F 300	280	305	280	A	320	F 335	335	340	330	315	A	A	A
2	A	A	A	F	F 275	F 290	F 265	265	285	285	300	295	320	310	285	R	320	F 345	350	345	F 340	U F 350	J F 300	F
3	F	A	A	A	F	F	J F 295	F 275	280	300	285	290	305	295	330	335	335	F 345	F 345	345	J S 345	J F 320	F	F
4	F	J F 280	J F 275	J F 290	F	J F 295	J F 295	J F 295	295	F 305	305	305	320	J F 330	J F 310	F 340	F 350	F 360	S 360	350	F 335	U F 325	F	F
5	J F 315	350	A	A	R	F	F	F	F	275	F	F	F 300	F 320	320	320	340	340	335	340	U F 335	F	F	F
6	J F 310	J S 295	J R 275	J F 285	F 280	F	F	F	F 305	310	F 290	295	305	F 320	A	330	335	330	335	340	J F 340	F 325	A	A
7	A	A	A	A	A	A	A	F 260	F 275	F	U F 270	J F 305	F 305	305	310	325	325	330	345	335	F 320	J F 295	J F 320	F
8	F	A	A	A	F 265	F	A	F	J F 290	J F 285	F 275	J F 290	F 315	F 320	F 320	F 345	320	F 345	F 345	340	J R 290	A	A	A
9	A	F	F	A	A	A	F	B	B	Y	B	B	B	B	F 325	F 235	U R 220	B	R	F 335	A	A	A	A
10	A	B	A	R	B	B	A	A	A	B	B	B	B	B	R 290	B	310	300	315	F 290	305	A	A	A
11	A	A	A	A	A	A	A	A	245	F 260	265	275	B	260	R 285	B	300	310	F	285	A	A	A	B
12	A	A	A	A	A	B	R	Y	A	B	255	B	B	B	B	315	B	335	340	310	R	A	A	A
13	A	A	F	R	B	A	A	F 265	F 235	B	R	R	B	285	300	310	325	335	335	330	J R 310	A	A	A
14	A	A	A	Y	A	A	B	B	A	A	B	B	B	305	F 290	310	315	330	F 345	330	R 330	J F 295	F 295	U F 270
15	F	A	A	A	A	F 295	J F 295	F 290	295	300	285	290	300	F 295	320	315	F 325	370	F 345	F 335	F 325	F 315	J F 320	J F 320
16	U F 280	F	F	F 290	A	F	A	F 250	F 270	F 280	B	B	F	F	325	F 345	345	F 350	F 355	F 340	F 325	J F 335	J F 310	A
17	A	A	A	F	F	A	A	A	A	F 265	300	290	295	290	305	335	340	F 330	F	335	A	A	A	A
18	B	A	A	A	A	A	A	B	B	F	F 250	295	270	310	305	305	340	350	F 360	F 330	F 315	U F 285	F	F
19	A	A	A	F	F 270	F 275	F	F 310	F	270	B	295	F 315	305	F 335	340	F 335	350	340	335	330	U F 330	F 305	F 270
20	A	A	A	A	A	A	A	260	J F 315	F 315	285	305	F 300	320	300	320	330	360	350	F 335	F 295	F	A	A
21	A	A	A	B	A	F 270	F 295	F 280	F 250	F 255	310	280	290	305	335	355	F 350	F 350	J F 345	330	J F 265	A	A	A
22	A	A	A	A	A	A	B	A	A	B	G	F 275	300	F 310	F 310	325	340	340	325	F 330	F 330	F 295	285	A
23	A	A	A	A	F 290	A	A	F 285	F 335	F 290	F 295	B	R	F 290	F	U F 320	F	U F 345	R 360	U F 305	U F 280	A	A	A
24	A	A	A	B	Y	Y	A	A	A	A	B	280	F 305	F 300	320	295	F 320	335	335	F 315	B	B	A	A
25	A	A	A	A	A	B	A	A	265	F 250	275	295	305	310	305	335	330	F 355	335	F 330	F 330	F	A	A
26	B	B	A	A	Y	A	B	B	B	B	F	B	B	B	B	305	330	F 315	325	A	A	A	A	A
27	A	A	A	A	305	F	F 290	F	F	F	320	290	F 300	F	J F 315	F 340	F 350	J F 345	F 355	J F 325	F	J F 305	F	A
28	A	A	B	A	A	A	A	Y	B	A	F 265	275	B	B	300	F 320	F 335	F 340	J F 330	F	A	A	A	A
29	A	B	A	F	F	F	B	B	F 280	F 280	F 265	255	295	315	305	325	320	335	F 335	F 315	F 290	F	F	A
30	A	A	F	A	A	F	F	F 325	F 315	F 310	310	R	F 315	F	U F 340	F	F	F	F 355	F 335	F 330	F	Y	F
31	F	A	A	A	A	A	F 285	F 310	F 315	F 320	F 345	F 330	F 335	F 330	F	F 355	F 360	F 365	J F 335	F	F	F 315	F 320	F 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	3	3	2	3	6	5	8	14	18	19	22	21	21	23	25	27	28	29	28	28	22	13	8	4
MED	J F 310	J 295	J 275	J F 290	F 278	F 290	F 292	F 282	F 282	F 285	285	290	305	305	310	325	332	340	342	332	F 325	F 315	F 308	F 295
UQ	J F 312	322		F 290	F 290	F 295	J F 295	F 295	F 305	F 302	300	295	F 315	318	320	338	340	F 350	F 350	338	F 330	F 325	J F 320	F 322
LQ	F 295	J 288		F 288	F 270	F 275	F 275	F 265	F 265	F 270	265	280	300	295	300	315	320	335	335	F 328	F 305	F 295	F 298	F 270

The Radio Research Laboratories, Japan

MAR. 1977 | M(3000)F2 (0.01)

IONOSPHERIC DATA

MAR. 1977 | H'F2 (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							415	345	420	390	330	355	340	380	A 295		L	L						
2							390	410	355	370	345	375	300	325	350	290	295	L						
3							L 425		365	305	375	370	340	L 280	270	260	245							
4								350	330	310	300	325	295	285	290	255	240							
5						375	280	320	F	380	340	320	310	290	300	285	250	250						
6								L	300	320	360	320	300	290	A	A 300	L	265						
7							A	460	410	360	395	310	325	325	300	290	260	L						
8							A	410	340	350	390	395	300	305	295	L	L							
9								B	B	Y	B	B	B	B	320	570	Y							
10								A	A	B	B	B	B	B	U R 380	B	L	L						
11								A	550	455	R 500	440	B	495	B 400	B	315	L						
12								Y	A	B	505	B	B	B	B	320	B							
13								430	555	B	U F 550	R	B	400	355	L	L							
14								B	A	A	B	B	B	335	350	320	L							
15								L	L	L	L	330	320	285	285	260	255							
16									405	U H 390	B	B	B 280	280	B 270	250	245							
17									A	450	355	365	340	350	320	260	255	250						
18									B	F	495	380	445	335	310	290	255							
19									U F 440	450	B	340	300	300	260	250								
20									290		390	320	305	L	L	L	245							
21								380	490	L	330	395	340	300	255	250								
22										B	G	405	350	300	305	280								
23										350	350	B	E B 300	340	270	250	240							
24										A	B	385	320	L		H 325								
25									480	500	410	370	335	315	L	270								
26										B	410	B	B	B	B	B								
27										280	310	355	330	305	260	240								
28										A	455	445	B	B	L	290	250							
29										380	450	490	L	330	L									
30											295	R		L										
31										L	L	315	255	250	230									
	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	9	14	16	23	22	21	22	21	22	13	4						
MED						325	390	410	408	375	390	368	320	310	300	282	255	250						
UQ							402	425	480	420	452	395	340	335	320	295	260	258						
LQ							335	350	340	335	342	325	300	290	270	255	245	248						

MAR. 1977 | H'F2 (KM)

IONOSPHERIC DATA

MAR. 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	U F 475	U F 475	A	A	A	A	U H 350	250	225	210	200	210	200	205	A	A 220	A	220	A	250	250	A	A	A
2	A	A	A	A	350	295	275	245	230	210	200	H 210	H 200	200	225	B	210	220	240	230	230	215	A 275	410
3	A	A	A	A	A	Q 280	230	215	240	220	215	240	205	240	A 220	225	225	230	230	225	225	225	C 245	H 260
4	E C 275	Q 270	275	275	280	260	240	240	230	215	220	200	200	H 195	210	210	215	H 205	220	210	215	225	230	245
5	250	270	A	A	345	300	250	200	220	B	200	220	H 200	200	225	220	220	225	245	230	230	245	250	250
6	250	255	280	290	320	295	245	240	230	205	210	255	A	A	A	A	205	240	260	215	220	Q 255	A	A
7	A	A	A	A	A	A	A	A	A	280	240	200	U H 275	245	230	210	220	225	H 230	240	Q 245	Q 255	Q 260	325
8	375	A	A	A	A 400	A	A	260	240	H 210	A 230	210	215	225	245	205	200	225	230	240	300	A	A	A
9	A	F	U Q 360	A	A	A	F	B	B	Y	B	B	B	B	B 230	220	A	B	R	220	A	A	A	A
10	A	B	B	R	B	B	A	A	A	B	B	B	B	B	B 220	B	240	240	B	340	310	A	A	A
11	A	A	A	A	A	A	A	A	E A 305	H 225	B	230	B	B	B	B	E B 260	230	260	290	A	A	A	B
12	A	A	A	A	A	B	R	A	A	B	B	B	B	B	B	B	B	280	250	270	A	A	A	A
13	A	B	F	R	B	A	A	A	250	B	A	R	B	B	225	I B 235	225	255	255	250	265	A	A	A
14	A	A	A	A	A	A	B	B	B	A	B	B	B	250	225	210	235	B 250	240	B 255	250	260	A 300	E A 325
15	A	A	A	A	A	F 375	305	250	245	225	220	H 200	245	210	210	205	230	220	230	230	240	240	240	250
16	275	C	A	345	A	Q 400	A	455	A	A	B	B	B	230	B	B 230	240	215	230	230	245	240	260	A
17	A	A	A	F	280	A	A	A	A	A	245	230	220	210	235	230	230	230	Q 215	255	A	A	A	A
18	B	A	A	A	A	A	A	B	B	240	245	240	245	240	220	225	B	245	225	240	255	340	E A 350	A
19	A	A	A	H 380	410	370	H 300	H 245	H 210	B	B	A 230	H 205	200	A 220	225	245	230	235	230	240	250	E A 275	B
20	A	A	A	A	A	B	A	A	230	210	245	225	H 205	H 200	230	220	230	230	220	225	245	U F 400	A	A
21	A	A	A	B	A	A	330	260	240	240	230	H 210	220	H 240	220	225	240	230	225	220	275	A	A	A
22	A	A	A	A	A	A	B	A	A	B	A	240	B	245	230	B	250	245	240	240	225	E A 255	A	A
23	A	A	A	A	A	A	A	330	250	240	220	B	B	H 250	B	225	240	B 240	B	A 245	Q 320	A	A	A
24	A	A	A	B	A	Y	B	A	A	A	B	250	250	230	300	270	270	250	230	250	B	B	A	A
25	A	A	A	A	A	B	A	A	A	275	255	220	220	210	235	240	230	230	230	230	225	A	A	A
26	B	B	A	A	Y	A	B	B	B	B	270	B	B	B	B	B	240	260	260	A	A	A	A	A
27	A	A	A	A	A	A	350	270	240	250	A	A	A	250	230	230	H 220	230	220	220	240	245	A	A
28	A	A	B	A	A	A	A	Y	B	A	230	240	B	B	240	E B 250	245	250	240	300	A	A	A	A
29	A	B	B	A	F	F	B	B	290	260	225	200	220	240	225	230	275	240	225	240	A 300	B	B	A
30	A	A	A	A	A	U F 440	325	270	245	240	230	B 225	250	260	250	230	220	220	220	230	250	A	Y	A
31	S	A	A	A	A	A	340	255	250	230	215	250	H 195	195	205	H 230	220	210	215	220	H 215	A 240	250	B 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	6	4	3	4	7	9	12	15	18	18	20	22	18	23	24	24	27	30	27	30	24	15	11	8
MED	275	270	280	318	345	300	302	250	240	228	228	225	218	230	225	225	230	230	230	235	245	245	255	252
UQ	375	372	320	362	375	375	335	265	248	240	242	240	245	242	232	230	240	245	240	250	260	255	A 268	325
LQ	250	262	278	282	300	295	248	242	230	210	215	210	H 200	202	220	220	220	225	225	225	228	240	248	250

The Radio Research Laboratories, Japan

MAR. 1977 | H'F (KM)

IONOSPHERIC DATA

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

MAR. 1977 | H'Es (km)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAR. 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	RK 21	CK 31	AR 11	R 4	C 1	R 2	K 2	C 1					H 1	C 1	C 3	C 3	L 4	L 3	L 4	LS 21	HC 11	RK 11	RS 31	K 1
2	CC 11	C 1	K 1	R 2	K 1	L 1	AL 11					C 2	C 1	C 1									RA 11	R 3
3	RF 11	KS 51	RL 11	R 3	R 3	LR 11					C 1	C 2	C 2	C 2	C 2	C 3	C 2	C 3	C 1	C 3	C 2	CL 11		
4		H 1	LH 11	C 2		C 1	LH 11	R 1				H 1									C 1	H 1	LC 11	C 1
5	R 1	RK 41	RA 61	R 4	R 2	CL 11	L 2	RL 12			R 2	CH 11	R 1	R 1					L 1	L 2	C 1	L 2	L 2	F 2
6	LK 21	HA 11	HAC 11	R 1	RA 11	H 1	LA 11		H 1	C 1	C 2	C 2	C 2	C 2	C 3	C 3		C 1	K 2	R 1	L 1	R 1	K 6	RA 21
7	RA 11	RA 11	RA 11	R 1	R 2	R 2	R 2	R 3	RK 11	RA 11	R 1	H 1	C 1	C 2	C 1	C 1	C 2	C 2	C 2		HR 11	AL 11	RR 11	RL 11
8	R 1	RL 11	KL 61	K 4	RLA 31	RA 11	R 1	RA 11	AH 11	HA 11	C 2	C 1	C 2	C 3	C 2	C 2	C 1		L 1	RL 11	RA 11	R 2	R 4	K 6
9	RA 31	RAK 11	K 2	RA 21	R 1	R 1	RAK 11			AL 11							R 1		H 1	R 1	RA 11	KS 41	HK 22	RA 41
10	RA 31		R 1	KA 21			HR 11	R 1	C 1											R 1	H 1	RS 41	KS 61	RK 14
11	RKA 14	RA 11	L 1	R 2	R 1	R 1	R 1	R 1	RK 11			H 1									RA 11	K 2	HK 11	HK 11
12	RF 11	R 1	KR 11	RS 11	HAL 11			R 1	R 1												RS 41	R 2	RA 11	LCK 11
13	RA 11	R 1	CK 21	K 1		HK 11	RK 11	RK 11	R 1		H 1											RA 31	K 2	RKS 14
14	RK 11	C 2	AR 13	L 1	R 1	RA 11			L 1	R 1											H 1		C 1	RA 11
15	CA 21	K 5	KA 51	R 1	RA 21	LRH 11	C 1			C 1				C 1							C 1	C 1	CL 11	FF 12
16	LK 11	FA 11	R 3	KA 21	RA 11	RA 11	B 2	RK 21	R 1	RL 11				C 1				C 1	L 2	L 1		HC 11	C 2	R 4
17	RA 31	RF 22	R 3	RLK 11	RK 21	R 1	R 2	R 1	R 1	R 2	L 1	C 2	C 2		C 1				C 1		RS 21	RA 21	RS 21	RKS 15
18	R 1	RF 11	R 3	RL 11	L 1	R 1	RAL 21			LC 11	C 1	CL 11				LR 11			H 1			RA 21	RL 11	RAF 11
19	HKL 11	HK 11	RK 14	KA 41	CK 14	K 2	R 1	C 1				C 1	C 1	C 1	C 2	C 1	L 2	L 1	L 1	L 1	L 1	CL 11	L 1	R 1
20	RA 21	RA 41	RA 41	RA 11	R 1	H 1	R 1	R 2	K 1	H 1	H 2		R 1	C 2	L 1	L 1	L 2	L 2	L 2	L 3		RL 11	RK 16	R 3
21	RA 11	R 1	RS 21		K 4	R 3	L 1		L 1						L 1	L 1	L 1	HL 11	H 1			R 1	AR 11	RFA 11
22	RA 11	RA 11	RA 11	R 1	R 2	RR 11		C 1	C 1		R 1	H 1								L 1	L 1	L 1	L 1	F 1
23	RA 11	HK 11	HK 11	RA 21	RA 11	CA 21	R 1	RK 21	L 2	C 1	L 2									C 1	RL 11	RS 31	RA 11	RA 11
24	RA 41	HKA 11	RA 11	R 1	LA 11	A 1	R 1	RL 21	R 2	R 1					K 1	K 2	K 1						R 1	RKL 16
25	RK 22	RK 31	K 2	K 1	R 1		R 1	R 2	R 1	R 2	L 1		C 1						L 1	L 1	L 1	R 1	RK 16	ARF 14
26	R 1	R 1	K 2	KA 11	A 1	R 1													K 1	RSK 11	KS 51	KS 51	KS 61	K 6
27	KA 41	LKA 16	KLA 61	K 6	LRA 11	RA 11	RA 11		L 1		R 1	R 1	R 1	R 1	C 1		L 1	C 3	L 1	L 1	L 1	LL 11	FR 11	R 4
28	RK 16	K 2	RA 11	R 1	R 1	RA 11	R 1	A 1		R 1										RS 11	RSA 41	RSA 21	K 4	R 1
29	FA 11	F 1	F 1	RS 21	LKA 13	HAK 11			HL 11	H 1							RK 11	HL 11	C 1		LRA 11		R 1	K 6
30	RA 31	R 2	R 1	KLA 31	LK 11	RA 11	H 1				C 1			R 1	R 1	C 1						RA 11		F 1
31	FA 11	RAK 11	RK 11	R 1	R 3	K 3	C 1			C 1	L 1			C 1				C 1	L 1	C 3	C 2	L 1	F 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																								

The Radio Research Laboratories, Japan

MAR. 1977 | TYPES OF ES

IONOSPHERIC DATA

APR. 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	25	A	A	41	32	32	47	42	S 50	54	O R 48	R	77	76	81	72	70	71	67	45	B	R	R	A
2	A	A	S 50	S 31	U S 37	37	53	52	55	54	70	O R 58	70	77	81	71	70	70	66	66	U S 45	O R 31	R	B
3	R	A	A	A	A	40	A	A	O R 46	53	60	59	O R 59	58	59	X 51	B	O R 46	O R 39	B	O R 30	O R 25	58	S 85
4	58	58	R	A	B	A	B	A	A	B	B	B	B	B	B	O R 52	O R 53	B	O R 43	O R 39	O R 35	A	A	A
5	A	B	B	A	B	A	A	R	O R 37	42	48	X 51	O R 54	B	O R 61	O R 58	X 54	53	O R 46	O R 38	25	A	A	A
6	A	B	A	B	B	B	B	B	A	B	B	B	O R 53	O R 50	O R 55	X 60	52	X 49	45	A	A	54	40	43
7	B	A	B	A	B	B	A	B	B	B	B	B	B	O R 59	O R 55	O R 52	B	B	O R 38	30	26	O R 26	A	A
8	A	A	A	Y	A	B	A	A	A	B	B	B	B	B	B	B	B	B	56	A	A	A	A	A
9	B	A	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	O R 42	B	B	A	A	A	A
10	A	A	A	B	A	B	B	B	B	B	R	O R 44	B	B	B	O R 51	X 50	X 50	54	43	A	R	A	27
11	A	B	B	A	A	B	A	A	B	B	O R 40	O R 43	O R 49	B	O R 48	X 49	X 51	B	B	B	O R 24	A	A	A
12	A	B	A	A	A	A	O R 26	29	X 35	X 37	X 44	X 46	X 47	R 51	X 52	X 51	X 50	O R 43	S 59	45	28	A	A	A
13	A	A	B	A	A	A	28	38	39	44	X 46	X 48	O R 50	X 59	X 60	X 54	X 56	X 47	36	31	O R 26	O R 23	O R 26	O R 26
14	O R 21	A	A	B	B	B	A	A	51	X 44	X 45	52	B	B	53	58	52	O R 48	O R 41	O R 29	O R 23	O R 21	A	A
15	A	A	B	A	B	B	A	B	A	B	B	O R 46	B	O R 50	X 51	52	X 49	X 44	41	O R 36	B	R	R	R
16	R	A	A	A	A	29	A	51	A	O R 52	58	60	60	60	60	57	53	46	47	47	A	A	A	A
17	B	A	B	B	A	A	R	A	A	B	B	B	O R 49	50	B	B	O R 47	O R 48	O R 33	O R 34	B	B	30	B
18	A	A	A	A	R	B	A	O R 27	O R 42	47	X 52	X 51	X 58	X 58	B	68	58	O R 56	O R 44	O R 37	B	A	A	A
19	A	A	A	A	A	A	A	52	B	B	B	B	B	B	94	67	R	O R 38	46	47	A	A	A	A
20	A	A	A	B	B	B	A	B	A	B	B	B	B	B	B	B	B	B	37	31	O R 45	O R 30	A	B
21	A	A	A	A	Y	B	A	A	A	40	O R 40	B	B	B	B	B	B	O R 49	O R 35	O R 24	B	A	A	O R 24
22	A	A	A	A	A	A	A	A	B	O R 43	O R 53	55	B	B	B	O R 56	O R 48	60	60	43	30	43	A	29
23	A	A	R	R	36	34	A	41	B	41	51	52	B	O R 57	62	R	50	53	52	O R 38	B	B	B	A
24	A	A	B	A	A	33	A	O R 37	A	45	46	O R 49	61	72	84	69	67	49	54	47	R	A	A	A
25	A	A	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	O R 38	O R 33	O R 35	O R 23	A	A	A
26	A	A	A	O R 33	R	R	A	O R 32	37	B	B	66	73	59	60	70	52	39	33	30	23	O R 19	B	A
27	A	R	50	U S 53	A	47	46	55	53	50	70	68	74	73	73	69	67	O R 41	O R 31	O R 26	B	B	A	16
28	O R 17	A	A	A	R	30	34	41	53	47	C	X 59	X 56	X 58	57	X 57	52	45	46	41	28	O R 20	B	B
29	A	U A 45	50	56	S 40	55	58	60	U A 55	B	O R 44	O R 47	O R 51	R	83	R	83	68	A	A	A	A	A	O R 43
30	S 52	A	A	A	A	R	A	A	A	B	B	B	O R 53	O R 55	O R 54	51	44	X 42	B	B	B	B	R	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	2	3	5	4	9	7	13	12	15	16	18	17	17	20	22	22	25	26	23	14	10	4	8
MED	25	52	50	41	36	34	46	41	48	45	48	52	56	58	60	57	52	48	44	38	27	O R 26	35	28
UQ	52		50	53	S 38	40	50	52	53	51	56	59	61	60	77	68	58	53	54	44	30	O R 31	49	43
LQ	O R 21		50	33	34	32	31	37	38	42	44	O R 47	O R 51	R 55	54	52	50	O R 43	O R 37	O R 31	O R 24	O R 21	28	25

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

APR. 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	U F 19	A	A	F 33	F	F	J F 30	J F 34	J F 39	J F 46	U R 42	R	F	F	U F 65	U F 56	F 52	J F 54	F 44	F 38	B	R	A	A
2	A	A	U F 43	F	U F 30	U F 29	F	F	F	J F 46	J F 54	F 50	J F 61	J F 65	F	J F 64	J F 61	U F 46	F 41	U F 38	U F 32	U F 25	A	B
3	A	A	A	A	A	F	A	A	F 40	J F 46	J F 50	U F 50	F 52	F 51	F 51	45	B	40	33	B	F 24	F 16	B	A
4	F	F	R	A	B	A	B	A	A	B	B	B	B	B	B	46	R 47	B	F 37	F 32	F 25	A	A	A
5	A	B	B	A	B	A	A	R	31	F 36	F 42	44	48	B	55	52	48	F 47	40	U F 27	F	A	A	A
6	A	B	A	B	B	B	B	B	A	B	B	B	F 47	44	F 47	53	F 45	42	F 39	A	A	F	F	F
7	B	A	B	A	B	B	A	B	B	B	B	B	B	F 52	49	46	B	B	F 30	U F 24	F	U F 17	A	A
8	A	A	A	Y	A	B	A	A	A	B	B	B	B	B	B	B	B	B	F	A	A	A	A	A
9	B	B	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	36	B	B	A	A	A	A
10	A	A	A	B	A	B	B	B	B	B	R	F 36	B	B	B	45	44	43	U F 39	U F 25	A	R	A	F
11	A	B	B	B	B	B	A	A	B	B	34	37	43	B	42	43	44	B	B	B	F 16	A	A	A
12	A	B	A	A	A	A	F	F 23	30	31	38	40	41	45	46	45	43	37	U F 37	J F 31	J F 20	A	A	A
13	A	A	B	A	A	A	U F 22	F 29	F 33	F 38	40	42	44	53	53	48	50	41	F 29	F 24	F 19	U F 13	F 16	F 15
14	F	A	A	B	B	B	A	A	F 33	F 38	F 39	F 45	B	B	F	F 51	F 44	F 42	F 32	23	17	F	A	A
15	A	A	B	A	B	B	A	B	A	B	B	40	B	U R 44	F 45	F 46	42	F 38	F 35	F 29	B	A	A	A
16	A	A	A	A	A	F	A	U F 24	A	U F 43	U F 45	U F 48	F 51	J F 53	J F 52	J F 50	J F 47	J F 40	F 36	J F 40	A	A	A	A
17	B	A	B	B	B	B	A	A	A	B	B	B	F 42	F 44	B	B	41	F 41	27	F 26	B	B	F	B
18	A	A	A	A	A	B	A	21	F 34	J F 41	45	45	51	52	B	F	F	U F 49	U F 35	F	B	A	A	A
19	A	A	A	A	A	A	A	U F 33	B	B	B	B	B	B	F	F	R	R 32	F	F 26	A	A	A	A
20	A	A	A	B	B	B	A	B	A	B	B	B	B	B	B	B	B	B	F 30	J F 24	F	U R 24	A	B
21	A	A	A	A	Y	B	A	A	A	F 33	F 33	B	B	B	B	B	B	F 42	F 28	U F 17	B	A	A	U F 15
22	A	B	B	A	A	A	A	A	B	37	F 43	F 47	B	B	B	F 49	F 42	F 41	J F 34	F 36	U F 24	F	A	F 22
23	A	A	R	R	F 30	F 26	A	F	B	U F 33	F 43	F 46	B	51	U F 53	R	F 39	J F 44	U F 43	F 32	B	B	B	A
24	A	A	B	A	A	F	A	U F 26	A	F 36	F 40	43	U F 48	U F 57	F	U F 50	F 47	U F 33	U F 36	J F 41	R	A	A	A
25	A	A	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	32	27	F 23	F 17	A	A	A
26	A	A	A	F 27	A	R	A	F	F 28	B	B	J F 60	J F 62	J F 52	F 54	U F 54	U F 37	F 30	U F 24	F 24	U F 16	13	A	B
27	B	R	R	F	A	F	F	F	F	U F 34	F	J F 61	J F 64	J F 64	J F 66	F	U F 52	F 35	F 23	R 20	B	B	A	F
28	R 11	A	A	A	A	F	U F 26	F	F	U F 34	C	53	50	52	F 50	50	F 45	U F 32	J F 29	F 28	F 21	F 12	B	B
29	A	A	U F 41	F 35	F 32	F	J F 44	J F 43	F	B	F	F 40	U R 45	R	F	R	F	F	A	A	A	A	A	U F 37
30	F	A	A	A	A	R	A	A	A	B	B	B	47	F 48	F 48	F 45	F 38	36	B	B	B	B	R	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		2	3	3	2	4	8	8	15	14	18	16	16	15	19	20	24	24	22	11	7	1	4
MED	15		U F 42	F 33	F 30	F 28	F 28	F 28	F 33	F 37	F 42	F 45	48	F 52	F 51	49	F 44	F 40	F 34	F 26	F 20	U F 16	F 16	F 18
UQ				F 34	F 31		J F 37	F 34	F 36	F 42	F 45	F 50	F 52	F 53	F 54	F 52	F 48	F 42	F 38	F 32	F 24	U F 20		F 30
LQ				F 30	F 30		U F 24	F 24	30	F 34	F 39	40	44	46	F 48	46	42	36	F 29	F 24	F 17	F 13		F 15

The Radio Research Laboratories, Japan

APR. 1977 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

APR. 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 F 350	R	L	L								
2										330	L	L	L	L	L	L								
3										U F 300	350	U L 350	B	L	L 340									
4										B	B	B	B	B	B									
5										L	310	330	L	B	B									
6										B	B	B	B			L								
7										B	B	B	B	B	330	F 320								
8										B	B	B	B	B	B	B								
9										B	B	B	B	B	B	B								
10											320	L	B	B										
11											L	B	B	B										
12											L	L												
13												L	B	L										
14												U L 320	B	B										
15											B	B	B	B	L									
16												L	L	L	L									
17											B	B	340	L 320	B									
18													L	L										
19											B	B	B	B	U F 320	B								
20																								
21																								
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										2	3	3	2	1	3	1								
MED										315	320	U L 330	345	L 320	330	F 320								
UQ											335	340			335									
LQ											315	325			325									

APR. 1977 | FOF1 (0.01 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

APR. 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	U K 105		K 320	U K 230	A	B	A	120	150	U A 180	B	B	250	B	U A 220	210	175	B	B	B	B			
2	K 250	U K 300	U K 325		K 210	A	A	R 110	F 150	A	A	A	A 260	U F 220	220	210	A	130	120	B	A			
3					B	B	B	A	K 305	200	220	230	B	B	235	B	B	B	B	B	B			
4	K 160	K 350	K 390		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	K 360	K 320	K 330
5					B	B	B	K 285	K 240	200	200	220	B	B	B	B	B	B	B	B	U F 130	K 330	K 330	K 350
6					B	B	B	B	B	B	B	B	B	B	B	U B 200	195	160	130	B	B	U K 250	U K 210	U K 280
7					B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	U K 100		U K 300
8	U K 320	K 340		U K 300	K 350	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	K 340	K 340	K 220	K 350
9					B	B	K 340	B	B	B	B	B	B	B	B	B	B	B	B	B	K 290	J K 390	K 380	K 350
10	K 350				K 360	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	K 330	U K 170	K 330	U K 150
11						B	A	B	B	B	B	B	B	B	B	B	170	B	B	B				U K 350
12	J K 290		K 320			B	B	150	175	180	A	200	200	K 285	K 260	K 270	K 250	B	U K 190	A			K 195	K 330
13						B	A	130	140	U A 180	190	210	B	R 225	B	B	B	B	U R 120	A				
14	U K 100	K 280	K 320			B	A	A	185	180	185	195	B	B	B	B	U B 160	B	B	B			J K 250	
15						B	B	B	A	B	B	B	B	B	B	B	F 160	135	B	B				
16	K 180	K 210	U K 240	U K 260	U K 320	A	A	A	B	A	F 200	200	190	U A 200	U A 160	U A 170	145	120	B	U A 100				
17		U K 290				B	U K 210	B	B	B	B	B	B	B	B	B	B	B	B	110			U K 130	
18	K 230					B	K 230	B	A	K 230	U A 190	U A 190	H 195	A 190	B	B	B	B	B	B				U K 350
19	K 320	K 320				B	B	U K 230	B	B	B	B	B	B	A	B	U K 300	K 170	K 180	U K 150	K 330	J K 390		
20	K 390	U K 360	U K 280			B	B	B	B	B	B	B	B	B	B	B	B	B	B	U K 160	U K 340	K 220	U K 210	
21					U K 250		B	B	B	200	B	B	B	B	B	B	B	B	B					
22	U K 350						B	B	B	B	A	215				B	B	B	B	U K 140	U K 120	U K 120	J K 330	U K 160
23	K 220	K 190	K 220	K 240	K 200	U K 150	A	A	B	B	B	B	B	B	B	B	U A 160	B	B					
24	J K 320	K 300					B	A	A	A 170	B	B	B	B	B	B	A 165	B	B	U K 110	K 310		K 310	U K 290
25	K 340	U K 320					B	B	A	B	B	B	B	B	B	B	B	B	B		K 130		K 260	K 280
26	K 310	K 310	K 300	U K 230		K 260	A	A	F 130	B	B	B	U B 185	A 180	U R 180	165	A	B	B					
27		K 210	K 210	K 220			A	A	A	U F 130	195	U A 190	175	170	A 160	A	A	B	B					
28			U K 130		U K 170	U K 150	K 120	B	B	U B 120	C	180	180	170	190	130	120	A	A					
29	K 225	U K 330	K 230	K 290			A	A	B	B	B	A	B	B	B	B	B	B	K 260	K 225	K 155	U K 160	U K 245	U K 330
30	U K 260				K 350	K 280	B	B	B	B	B	B	B	B	B	A	140	A	B				U K 150	K 300
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	14	12	7	8	4	4	6	8	11	7	10	8	8	8	7	12	5	6	7	10	11	15	15
MED	K 275	K 305	K 290	U K 240	K 285	K 205	K 220	140	162	180	195	200	192	195	205	200	162	135	155	U K 140	K 300	K 250	K 250	U K 330
UQ	K 320	K 330	K 320	K 275	K 350	K 270	K 285	K 230	212	200	200	215	225	222	228	210	185	160	K 190	U K 155	K 330	K 350	K 325	K 350
LQ	K 220	K 280	K 225	K 230	K 205	U K 150	K 165	120	145	175	190	190	182	175	170	168	152	130	120	U 110	K 130	U K 165	U K 210	U K 285

The Radio Research Laboratories, Japan

APR. 1977 | FOE (0.01 MHZ)

IONOSPHERIC DATA

APR. 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 A 26	J A 26	K 32	J A 39	42	J A 31	30	G	G	25	E B 31	E B 37	G	E B 26	25	J A 24	22	E B 18	E B 15	E B 14	B	20	23	26
2	K 25	K 30	J A 45	J A 38	J A 39	J A 36	J A 35	J A 26	25	32	J A 38	J A 29	31	J A 24	G	15	J A 24	G	13	15	22	E B 18	19	B
3	20	J A 29	52	127	58	J A 51	41	J A 53	J A 63	24	32	G	E B 34	E B 27	G	E B 23	B	E B 27	E B 24	B	E B 17	E B 12	20	26
4	K 16	K 35	J A 110	56	B	69	B	38	61	B	B	B	B	B	B	E B 31	E B 36	B	E B 22	E B 15	E B 13	K 36	K 32	K 33
5	39	41	40	45	B	30	J A 43	K 28	K 24	G	25	G	E B 27	B	E B 49	E B 39	E B 22	E B 17	E B 29	E B 12	J A 24	K 33	J A 86	K 35
6	37	39	42	68	B	B	B	B	61	B	B	B	E B 39	E B 27	E B 25	G	G	32	G	J A 36	108	128	J A 58	80
7	B	107	B	36	B	B	80	B	B	B	B	B	B	E B 39	E B 29	E B 25	B	B	29	30	31	J A 26	24	37
8	U K 32	K 34	52	U K 30	K 35	B	J A 52	38	57	B	B	B	B	B	B	B	B	B	E B 17	40	K 34	K 34	K 22	39
9	80	43	J A 43	30	B	B	K 34	B	B	B	B	B	B	B	B	B	B	E B 21	B	B	K 29	J K 39	K 38	K 35
10	54	42	51	B	K 36	B	B	B	B	B	E B 29	E B 23	B	B	B	E B 29	E B 22	E B 20	E B 20	19	K 33	K 17	K 35	J A 24
11	40	37	B	39	42	B	J A 31	47	B	B	E B 29	E B 35	E B 33	B	E B 31	E B 21	30	B	B	B	E B 12	J A 34	J A 40	K 35
12	J K 29	B	50	37	47	J A 41	21	G	G	79	20	J A 25	G	K 28	J A 79	K 27	K 25	E B 30	23	J A 24	J A 21	J A 30	K 19	K 33
13	68	J A 49	B	32	27	40	23	G	19	J A 37	G	G	E B 35	G	E B 22	E B 23	E B 19	E B 13	14	15	E B 10	J A 24	30	J A 26
14	20	K 28	J A 96	B	B	B	31	31	37	G	G	G	B	B	E B 24	E B 20	G	E B 22	E B 20	E B 19	E B 13	26	J K 25	J A 62
15	J A 28	J A 48	B	33	50	72	J A 41	48	47	B	B	E B 34	B	E B 42	E B 22	E B 21	G	20	E B 11	E B 19	B	20	16	17
16	K 18	J A 31	30	J A 30	U K 32	J A 36	J A 36	35	43	45	27	G	G	43	22	18	29	G	22	J A 21	J A 40	J A 100	J A 94	J A 94
17	92	J A 83	B	B	38	44	26	52	43	B	B	B	E B 27	E B 28	B	B	B	E B 27	E B 24	J A 42	B	B	48	B
18	K 23	26	38	42	15	B	K 23	25	27	K 23	40	25	G	19	B	E B 50	27	E B 23	E B 19	33	B	J A 32	86	U K 35
19	K 32	K 32	J A 48	J A 62	49	54	54	82	B	B	B	B	B	B	30	E B 34	K 30	J A 80	J A 76	21	K 33	J K 39	J A 35	J A 36
20	K 39	J A 62	46	B	B	B	38	B	38	B	B	B	B	B	B	B	B	B	E B 11	21	U F 37	24	J A 36	68
21	40	45	44	31	J A 84	B	44	B	B	24	E B 23	B	B	B	B	B	B	B	B	20	B	22	J A 33	22
22	42	36	31	32	38	49	J A 57	31	B	E B 30	30	22	B	B	B	E B 35	E B 27	E B 17	E B 17	16	18	21	J K 33	20
23	K 22	25	K 22	K 24	K 20	19	J A 52	J A 47	B	30	29	E B 22	B	E B 39	E B 24	E B 22	21	21	E B 20	E B 20	B	B	B	J A 26
24	J K 32	K 30	B	35	34	J A 40	55	40	39	30	25	E B 27	E B 22	E B 26	E B 27	E B 26	19	E B 12	E B 10	26	K 31	33	K 31	36
25	K 34	100	44	J A 41	J A 28	B	B	43	51	B	B	B	B	B	B	B	B	E B 25	E B 21	E B 13	20	J A 25	K 26	K 28
26	K 31	K 31	K 30	38	30	K 26	J A 34	31	J A 19	B	B	E B 25	24	24	G	30	30	E B 11	E B 11	E B 11	10	E B 11	14	J A 22
27	19	K 21	K 21	K 22	45	J A 38	J A 28	J A 35	J A 29	J A 78	G	J A 24	20	26	26	J A 24	26	E B 17	E B 18	E B 16	B	B	20	12
28	19	17	19	18	20	41	J A 35	J A 26	E B 10	G	C	G	19	G	G	15	22	J A 23	J A 23	E B 9	19	E B 9	B	B
29	J A 26	J A 41	47	J A 39	47	24	J A 24	J A 32	41	B	32	28	E B 37	E B 35	E B 21	E B 46	E B 31	E B 16	J A 72	J A 62	J A 52	J A 99	J A 36	J A 40
30	J A 81	J A 48	45	42	K 35	32	43	27	37	B	B	B	E B 42	E B 32	E B 19	21	J A 29	20	B	B	B	B	17	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	29	29	24	26	23	19	26	24	22	15	17	19	17	18	20	24	22	24	26	26	22	26	28	27
MED	32	36	44	38	38	40	36	34	38	30	U 27	E G 24	E B 27	E B 27	E B 24	E B 24	23	E B 20	E B 20	20	23	26	32	33
UQ	40	45	49	42	46	46	44	45	47	34	31	U 26	E B 34	E B 35	E B 28	E B 30	28	E B 24	E B 23	26	33	J 34	J 37	36
LQ	K 23	K 30	32	31	31	32	30	26	24	24	E G 23	G	E G 19	E G 24			E G 21	E B 16	E B 14	E B 15	17	20	21	26

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

APR. 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	11	AA 26	K 32	UK 23	16	22	16	G	G	20	EB 31	EB 37	G	EB 26	G	24	20	EB 18	EB 15	EB 14	B	EB 20	AA 23	AA 26
2	K 25	UK 30	UK 32	17	K 21	UF 16	11	13	G	20	22	26	G	G	G	14	20	G	G	11	12	EB 18	AA 19	B
3	AA 20	AA 29	AA 52	AA 127	AA 58	30	AA 41	AA 53	K 30	23	23	G	EB 34	EB 27	G	EB 23	B	EB 27	EB 24	B	EB 17	EB 12	EB 17	AA 26
4	K 16	K 35	K 39	AA 56	B	AA 69	B	AA 38	AA 61	B	B	B	B	B	B	EB 31	EB 36	B	EB 22	EB 15	EB 13	K 36	K 32	K 33
5	AA 39	EB 25	EB 27	AA 45	B	AA 30	AA 43	K 28	K 24	G	24	G	EB 27	B	EB 49	EB 39	EB 22	EB 17	EB 29	EB 12	G	K 33	K 33	K 35
6	AA 37	EB 23	AA 42	EB 28	B	B	B	B	AA 61	B	B	B	EB 39	EB 27	EB 25	G	G	G	G	AA 36	AA 108	UK 25	UK 21	UK 28
7	B	AA 20	B	AA 36	B	B	AA 80	B	B	B	B	B	B	EB 39	EB 29	EB 25	B	B	22	15	12	11	AA 24	AA 37
8	UK 32	K 34	AA 52	UK 30	K 35	B	AA 52	AA 38	AA 57	B	B	B	B	B	B	B	B	B	EB 17	AA 40	K 34	K 34	K 22	AA 39
9	EB 27	EB 19	AA 43	AA 30	B	B	K 34	B	B	B	B	B	B	B	B	B	B	EB 21	B	B	K 29	AA 40	K 38	K 35
10	K 35	AA 42	AA 51	B	K 36	B	B	B	B	B	EB 29	EB 23	B	B	B	EB 29	EB 22	EB 20	EB 20	12	K 33	UK 17	K 33	18
11	AA 40	EB 30	B	EB 22	EB 24	B	AA 31	AA 47	B	B	EB 29	EB 35	EB 33	B	EB 31	EB 21	G	B	B	B	EB 12	AA 34	AA 40	UK 35
12	JK 29	B	AA 50	AA 37	AA 47	AA 41	15	G	G	G	20	17	G	K 28	21	K 27	K 25	EB 30	UK 19	12	10	AA 30	K 19	K 33
13	AA 68	AA 49	B	AA 32	AA 27	AA 40	17	G	16	G	G	G	EB 35	G	EB 22	EB 23	EB 19	EB 13	G	10	EB 10	11	EB 10	10
14	UK 10	K 28	K 32	B	B	B	AA 31	AA 31	20	G	G	G	B	B	EB 24	EB 20	G	EB 22	EB 20	EB 19	EB 13	12	AA 25	AA 62
15	AA 28	AA 48	B	AA 33	EB 32	EB 40	AA 41	EB 35	AA 47	B	B	EB 34	B	EB 42	EB 22	EB 21	G	17	EB 11	EB 19	B	AA 20	AA 16	AA 17
16	K 18	AA 31	AA 30	AA 30	UK 32	19	AA 36	17	AA 43	35	25	G	G	26	22	17	G	G	11	10	AA 40	AA 100	AA 94	AA 94
17	EB 24	AA 83	B	B	EB 23	EB 25	AA 26	AA 52	AA 43	B	B	B	EB 27	EB 28	B	B	B	EB 27	EB 24	G	B	B	UK 13	B
18	K 23	AA 26	AA 38	AA 42	AA 15	B	K 23	19	24	K 23	19	G	G	19	B	EB 50	G	EB 23	EB 19	24	B	AA 32	AA 86	UK 35
19	K 32	K 32	AA 48	AA 62	AA 49	AA 54	AA 54	UK 23	B	B	B	B	B	B	23	EB 34	UK 30	27	21	UK 15	K 33	JK 39	AA 35	AA 36
20	K 39	AA 62	UK 28	B	B	B	AA 38	B	AA 38	B	B	B	B	B	B	B	B	B	EB 11	UK 16	33	20	AA 36	EB 25
21	AA 40	AA 45	AA 44	AA 31	UK 25	B	AA 44	B	B	G	EB 23	B	B	B	B	B	B	B	B	14	B	AA 22	AA 33	14
22	AA 42	EB 19	EB 18	AA 32	AA 38	AA 49	AA 57	AA 31	B	EB 30	24	20	B	B	B	EB 35	EB 27	EB 17	EB 17	UK 14	UK 12	UK 12	JK 33	UK 16
23	K 22	AA 25	K 22	K 24	K 20	UK 15	AA 52	35	B	22	26	EB 22	B	EB 39	EB 24	EB 22	G	EB 12	EB 20	EB 20	B	B	B	AA 26
24	JK 32	K 30	B	AA 35	AA 34	23	AA 55	13	AA 39	G	22	EB 27	EB 22	EB 26	EB 27	EB 26	17	EB 12	EB 10	UK 11	K 31	EA 33	K 31	AA 36
25	K 34	AA 100	AA 44	AA 41	AA 28	B	B	AA 43	AA 51	B	B	B	B	B	B	B	B	EB 25	EB 21	EB 13	K 13	AA 25	K 26	K 28
26	K 31	K 31	K 30	UK 23	AA 30	K 26	AA 34	15	G	B	B	EB 25	21	G	G	G	13	EB 11	EB 11	EB 11	10	EB 11	AA 14	EB 13
27	EB 13	K 21	K 21	K 22	AA 45	30	UF 13	UF 18	UF 16	15	G	16	19	20	18	18	17	EB 17	EB 18	EB 16	B	B	AA 20	EC 10
28	EB 10	AA 17	AA 19	AA 18	AA 20	21	UY 20	EB 10	EB 10	G	C	G	G	G	G	G	G	12	11	EB 9	11	EB 9	B	B
29	AA 26	AA 41	35	29	27	EB 15	17	16	34	B	UY 32	UY 28	EB 37	EB 35	EB 21	EB 46	EB 31	EB 16	AA 72	AA 62	AA 52	AA 99	AA 36	36
30	UK 26	AA 48	AA 45	AA 42	K 35	K 28	AA 43	AA 27	AA 37	B	B	B	EB 42	EB 32	EB 19	18	12	16	B	B	B	B	ER 17	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	29	29	24	26	23	19	26	24	22	15	17	19	17	18	20	24	22	24	26	26	22	26	28	27
MED	K 28	AA 30	AA 36	AA 32	29	27	AA 35	U 23	32	EG 15	22	EG 20	EB 22	EB 26	EB 22	EB 23	EG 17	EB 17	EB 18	U 12	12	22	26	30
UQ	K 35	AA 42	AA 44	AA 41	AA 36	AA 40	AA 44	AA 36	AA 43	22	25	EB 26	EB 34	EB 32	EB 24	EB 30	EB 22	EB 22	EB 21	U 17	K 33	AA 34	34	36
LQ	U 20	U 23	K 29	24	24	21	20	14	16	G	20	G	G	EG 19	EG 18	EG 18	G	EB 12	EB 11	10	11	12	19	U 20

The Radio Research Laboratories, Japan

APR. 1977 | FBES (0.1 MHZ)

IONOSPHERIC DATA

APR. 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	E S 10	10	11	10	10	12	10	11	10	10	31	37	22	26	20	11	15	18	15	14	B	18	16	15
2	10	10	12	12	11	10	9	10	11	13	12	20	16	12	13	12	16	11	10	10	8	18	13	B
3	17	12	10	16	20	12	15	13	15	8	12	22	34	27	23	23	B	27	24	B	17	12	17	10
4	9	E S 12	25	22	B	22	B	28	23	B	B	B	B	B	B	31	36	B	22	15	13	10	10	10
5	18	25	27	20	B	23	19	12	16	17	14	15	27	B	49	39	22	17	29	12	10	10	18	12
6	16	23	20	28	B	B	B	B	28	B	B	B	39	27	25	20	19	15	10	10	16	11	10	16
7	B	20	B	16	B	B	24	B	B	B	B	B	B	39	29	25	B	B	16	10	9	10	10	18
8	10	10	11	10	20	B	17	20	21	B	B	B	B	B	B	B	B	B	17	12	12	10	12	12
9	27	19	12	16	B	B	16	B	B	B	B	B	B	B	B	B	B	21	B	B	10	9	10	11
10	15	18	22	B	20	B	B	B	B	B	29	23	B	B	B	29	22	20	20	10	10	12	10	10
11	18	30	B	22	24	B	12	21	B	B	29	35	33	B	31	21	12	B	B	B	12	6	12	9
12	12	B	26	17	21	14	12	11	12	13	15	14	15	22	16	16	17	30	11	6	5	9	7	7
13	10	10	B	14	17	17	11	10	11	13	15	17	35	22	22	23	19	13	11	8	10	10	10	9
14	E C 9	8	11	B	B	B	12	12	11	15	17	15	B	B	24	20	16	22	20	19	13	8	8	E C 10
15	10	12	B	10	32	40	17	35	15	B	B	34	B	42	22	21	12	12	11	19	B	13	13	12
16	10	13	10	12	11	10	11	12	21	15	12	12	11	13	11	10	11	11	10	8	10	10	9	9
17	24	17	B	B	23	25	20	21	22	B	B	B	27	28	B	B	31	27	24	10	B	B	9	B
18	10	10	16	20	11	B	13	15	12	17	12	11	15	10	B	50	23	23	19	16	B	11	13	10
19	10	18	18	11	25	15	15	12	B	B	B	B	B	B	13	34	26	14	12	10	6	12	11	12
20	17	10	8	B	B	B	15	B	20	B	B	B	B	B	B	B	B	B	11	13	11	12	12	25
21	15	15	17	12	14	B	20	B	B	15	23	B	B	B	B	B	B	33	23	13	B	6	6	10
22	17	19	18	15	14	22	17	20	B	30	20	12	B	B	B	35	27	17	17	11	10	6	10	11
23	9	7	8	8	9	9	10	11	B	19	25	22	B	39	24	22	14	12	20	20	B	B	B	9
24	9	8	B	14	21	12	11	11	11	6	20	27	22	26	27	26	15	12	10	10	13	13	18	10
25	14	12	14	10	9	B	B	27	11	B	B	B	B	B	B	B	B	25	21	13	11	8	15	18
26	11	11	10	15	15	17	10	11	11	B	B	25	19	10	11	16	10	11	11	11	8	11	11	13
27	13	10	10	9	10	10	9	8	10	10	18	15	17	15	16	12	14	17	18	16	B	B	11	E C 10
28	10	10	10	11	15	10	11	10	10	12	C	15	15	15	15	13	11	10	9	9	10	9	B	B
29	11	9	6	10	11	7	6	9	19	B	22	15	37	35	21	46	31	16	20	15	13	11	11	17
30	12	17	16	23	24	20	14	17	30	B	B	B	42	32	19	14	10	12	B	B	B	B	15	9
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	12	12	16	15	20	22	14	14	20	D B 30	29	26	38	37	24	24	20	18	18	12	12	11	11	11
UQ	17	18	26	22	32	B	19	28	B	B	B	B	B	B	B	46	36	27	22	16	B	13	15	16
LQ	10	10	10	11	11	12	11	11	11	13	17	15	22	22	19	16	14	12	11	10	10	9	10	10

APR. 1977 | F-MIN (0.1 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

APR. 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	U F 300	A	A	F 295	F	F	J F 275	J F 300	J F 325	J F 310	U R 300	R	F	F	F	F	F 340	J F 350	F 340	F 330	B	R	A	A
2	A	A	U F 340	F	F	F	F	F	F	J F 285	J F 305	F 280	J F 315	J F 325	F	J F 345	J F 345	F	F 340	F	U F 310	U F 280	A	B
3	A	A	A	A	A	F	A	A	F 235	J F 295	J F 280	U F 300	F 290	F 305	F 325	335	B	340	345	B	F 335	F 310	B	A
4	F	F	R	A	B	A	B	A	A	B	B	B	B	B	B	305	R 310	B	F 315	F 315	F 310	A	A	A
5	A	B	B	A	B	A	A	R	275	F 275	F 300	320	310	B	345	355	335	F 345	345	U F 295	F	A	A	A
6	A	B	A	B	B	B	B	B	A	B	B	B	F 330	315	F 315	335	F 345	355	F 325	A	A	F	F	F
7	B	A	B	A	B	B	A	B	B	B	B	B	B	F 305	280	255	B	B	F 335	F	F	F	A	A
8	A	A	A	Y	A	B	A	A	A	B	B	B	B	B	B	B	B	B	F	A	A	A	A	A
9	B	B	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	325	B	B	A	A	A	A
10	A	A	A	B	A	B	B	B	B	B	R	F 265	B	B	B	350	355	350	U F 320	F	A	R	A	F
11	A	B	B	B	B	B	A	A	B	B	310	300	325	B	340	340	345	B	B	B	F 310	A	A	A
12	A	B	A	A	A	A	F	F 270	290	320	335	310	320	330	345	345	365	325	F	J F 340	F	A	A	A
13	A	A	B	A	A	A	U F 260	F 295	F 320	F 315	315	325	330	330	355	355	360	360	F 340	F 340	F 310	F	F 335	F 335
14	F	A	A	B	B	B	A	A	F 280	F 305	F 285	F 310	B	B	F	F 350	F 340	F 335	F 330	335	330	F	A	A
15	A	A	B	A	B	B	A	B	A	B	B	325	B	U R 340	F 310	F 335	345	F 330	F 340	F 300	B	A	A	A
16	A	A	A	A	A	F	A	U F 270	A	F	F	F	F 325	J F 320	J F 325	J F 330	J F 340	J F 335	F 300	J F 320	A	A	A	A
17	B	A	B	B	B	B	A	A	A	B	B	B	F 290	F 340	B	B	350	F 355	F 330	F 300	B	B	F	B
18	A	A	A	A	A	B	A	270	F 315	J F 320	345	310	335	325	B	F	F	U F 325	U F 330	F	B	A	A	A
19	A	A	A	A	A	A	A	U F 270	B	B	B	B	B	B	F	F	R	R 320	F	F 295	A	A	A	A
20	A	A	A	B	B	B	A	B	A	B	B	B	B	B	B	B	B	B	F 285	J F 285	F	A	A	B
21	A	A	A	A	Y	B	A	A	A	F 305	F 325	B	B	B	B	B	B	F 315	F 321	U F 295	B	A	A	F
22	A	B	B	A	A	A	A	A	B	325	F 325	F 330	B	B	B	F 360	F 333	F 340	F	F 340	F	F	A	F 320
23	A	A	R	R	F 290	F 290	A	F	B	F	F 325	F 330	B	315	U F 340	R	F 335	J F 335	U F 325	F 335	B	B	B	A
24	A	A	B	A	A	F	A	U F 270	A	F 295	F 310	320	F	F	F	F	F 380	U F 345	F	J F 285	R	A	A	A
25	A	A	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	345	295	F 330	F 295	A	A	A
26	A	A	A	F 315	A	R	A	F	F 305	B	B	J F 350	J F 355	J F 335	F 350	F	F	F 360	F	F 325	U F 345	355	A	B
27	B	B	R	F	A	F	F	F	F	F	F	J F 345	J F 335	J F 345	J F 350	F	F	F 330	F 345	R 350	B	B	A	F
28	R 310	A	A	A	A	F	F	F	F	U F 340	C	350	360	365	F 365	380	F 355	F	J F 345	F 355	F 365	F 375	B	B
29	A	A	U F 330	F 295	F 270	F	J F 270	J F 270	F	B	F	F 265	U R 290	R	F	R	F	F	A	A	A	A	A	F
30	F	A	A	A	A	R	A	A	A	B	B	B	340	F 335	F 355	F 355	F 340	320	B	B	B	B	R	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		2	3	2	1	3	8	8	12	13	17	15	15	14	16	18	22	20	19	9	4	1	2
MED	305		U F 335	F 295	F 280	F 290	J F 270	F 270	F 298	F 308	F 310	F 320	325	F 330	F 342	345	F 345	F 338	F 330	F 325	F 310	F 332	F 335	F 328
UQ				F 305			J F 272	F 282	F 318	F 320	325	330	335	338	F 350	355	355	F 350	F 340	F 338	F 335	365		
LQ				F 295			F 265	F 270	278	F 295	F 300	F 300	312	318	F 325	335	F 340	F 325	F 320	F 298	F 310	F 295		

The Radio Research Laboratories, Japan

APR. 1977 | M(3000)F2 (0.01)

IONOSPHERIC DATA

APR. 1977 | H'F2 (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										L			275	260	230	L								
2										320	265	L	290	250	245	230								
3										395	350	315	310	300	295									
4										B	B	B	B	B	B									
5										L	305	300	290	B	E B 270									
6										B	B	B	290			255								
7										B	B	B	B	310	350	405								
8										B	B	B	B	B	B	B								
9										B	B	B	B	B	B	B								
10											R	L	B	B										
11											L	B	300	B										
12											L	L												
13												L	E B 275	255										
14												300	B	B										
15											B	B 340	B	B	L									
16												250	L	L	240									
17											B	B	350	280	B									
18													245	L										
19											B	B	B	B	375	450								
20																								
21																								
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										2	3	5	9	6	7	4								
MED										358	305	300	290	270	270	330								
UQ											328	315	300	300	322	428								
LQ											285	300	275	255	238	242								

APR. 1977 | H'F2 (KM)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

APR. 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	280	A	A	355	330	A	345	290	225	250	B	B	240	B	225	220	220	220	220	245	B	B	B	A
2	A	A	280	A	325	U Q 345	H 300	H 230	Q 230	225	Q 230	250	230	Q 200	Q 200	215	220	215	210	225	230	B	A	B
3	B	A	A	A	A	F	A	A	505	Q 280	210	250	B	250	225	230	B	245	250	B	255	B	B	A
4	U F 395	R	R	A	B	A	B	B	A	B	B	B	B	B	B	305	B 305	B	250	245	275	A	A	A
5	A	B	B	A	B	A	A	R	330	280	250	235	B 230	B	B	240	235	230	B 230	260	A	A	A	A
6	B	B	B	B	B	B	B	B	A	B	B	B	B	B 290	290	250	230	230	230	A	A	Q 350	A	300
7	B	A	B	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	290	290	E A 330	310	A	A
8	A	A	A	Y	A	B	A	A	A	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A
9	B	B	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	255	B	B	A	A	A	A
10	A	A	A	B	A	B	B	B	B	B	B	240	B	B	B	250	230	240	Q 225	255	A	R	A	A
11	B	B	B	B	B	B	A	A	B	B	B	B	B	B	255	235	245	B	B	B	E B 260	A	A	A
12	A	B	A	A	B	A	A	350	260	245	245	215	245	270	H 250	245	230	B 255	240	210	245	A	A	A
13	A	A	B	B	B	B	Q 420	U H 245	250	245	220	225	B	250	230	215	220	215	200	220	240	A	B 245	250
14	S	A	A	B	B	B	A	A	305	250	240	240	B	B	240	240	230	230	E B 250	B	E B 270	A	A	A
15	A	A	B	A	B	B	A	B	A	B	B	B	B	B	245	250	240	235	235	B 280	B	B	B	B
16	A	A	A	A	A	A	A	A	A	E A 350	240	245	H 205	230	225	230	230	230	250	230	A	A	A	A
17	B	A	B	B	B	B	A	A	A	B	B	B	290	E B 250	B	B	B 245	235	B	240	B	B	A	B
18	A	A	A	A	A	B	A	A	300	250	240	H 210	225	205	B	B	250	230	250	A 300	B	A	A	A
19	A	A	A	A	A	A	A	Q 375	B	B	B	B	B	B	300	B	R	A	300	310	A	A	A	A
20	A	A	A	B	B	B	A	B	A	B	B	B	B	B	B	B	B	B	295	300	U F 320	A	A	B
21	A	A	A	A	Y	B	A	A	A	280	255	B	B	B	B	B	B	B	B	A	B	A	A	A
22	A	B	B	B	A	A	A	A	B	B 280	270	240	B	B	B	B 220	B 250	225	245	230	250	F	A	295
23	A	A	R	R	360	370	A	A	B	H 300	265	240	B	B 290	230	230	225	230	250	260	B	B	B	A
24	A	A	B	A	A	A	A	Q 340	A	280	270	255	230	230	220	215	205	220	240	280	R	A	A	A
25	A	A	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	260	B	255	330	A	A	A
26	A	A	A	335	A	R	A	A	295	B	B	230	205	210	205	205	200	200	235	240	A 230	B	A	B
27	B	R	R	F	A	A	U F 340	U F 290	U F 250	240	240	225	Q 215	205	200	210	200	225	B 240	E B 240	B	B	A	C
28	B	A	A	A	A	A	A	U Q 350	255	230	C	225	H 200	220	210	205	200	210	215	210	230	E B 240	B	B
29	A	A	295	350	E A 400	350	Q 325	Q 340	A	B	A	A	B 390	B 325	305	B	265	260	A	A	A	A	A	A
30	Q 250	A	A	B	A	R	A	A	B	B	B	B	E B 280	290	225	230	225	240	B	B	B	B	R	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	3		2	3	4	3	5	9	11	15	13	15	13	15	18	20	22	23	22	21	13	3	1	3
MED	280		288	350	336	350	340	340	260	250	240	240	230	250	228	230	230	230	240	245	248	310	B 245	295
UQ	338			352	370	360	345	Q 350	302	280	255	242	242	280	250	242	245	240	250	280	265	330		298
LQ	265			342	328	348	325	290	250	245	240	225	215	212	220	215	220	222	230	230	240	275		272

The Radio Research Laboratories, Japan

APR. 1977 | H'F (KM)

IONOSPHERIC DATA

APR. 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	K 140	120	K 125	K 120	120	120	100	G	G	130	B	B	G	B	130	95	160	B	B	B	B	100	100	100
2	K 110	K 105	K 115	120	K 120	110	115	130	110	100	120	130	115	115	G	100	170	G	130	100	90	B	100	B
3	105	125	135	105	100	140	100	100	K 100	140	105	G	B	B	G	B	B	B	B	B	B	B	100	105
4	K 150	K 105	K 175	100	B	120	B	130	100	B	B	B	B	B	B	B	B	B	B	B	B	K 110	K 110	K 110
5	105	105	105	100	B	90	100	K 100	K 110	G	130	G	B	B	B	B	B	B	B	B	105	K 115	K 110	K 115
6	100	130	105	110	B	B	B	B	100	B	B	B	B	B	B	G	G	120	G	110	100	K 100	K 105	K 130
7	B	100	B	115	B	B	140	B	B	B	B	B	B	B	B	B	B	B	130	125	120	K 110	140	K 150
8	K 110	K 115	105	K 95	K 115	B	100	110	100	B	B	B	B	B	B	B	B	B	B	110	K 105	K 105	K 110	K 130
9	110	110	90	90	B	B	K 120	B	B	B	B	B	B	B	B	B	B	B	B	B	K 100	K 110	K 105	K 105
10	K 190	105	100	B	K 100	B	B	B	B	B	B	B	B	B	B	B	B	B	B	130	K 105	B	K 110	K 110
11	130	135	B	105	105	B	90	105	B	B	B	B	B	B	B	B	90	B	B	B	B	100	110	K 120
12	K 120	B	K 135	90	105	115	180	G	G	105	115	95	G	K 125	K 130	K 100	K 125	B	K 120	95	95	110	K 110	K 110
13	105	100	B	110	120	120	120	G	120	105	G	G	B	G	B	B	B	B	150	100	B	100	110	95
14	K 120	K 110	K 180	B	B	B	100	100	100	G	G	G	B	B	B	B	G	B	B	B	B	130	K 115	120
15	110	105	B	100	110	100	110	130	100	B	B	B	B	B	B	B	G	160	B	B	B	130	120	120
16	K 130	K 100	K 110	K 110	K 115	115	110	150	115	100	130	G	G	100	145	100	140	G	160	105	105	100	100	100
17	100	K 105	B	B	110	110	K 140	100	105	B	B	B	B	B	B	B	B	B	B	130	B	B	K 120	B
18	K 110	110	105	110	90	B	K 115	120	100	K 110	100	95	G	111	B	B	105	B	B	125	B	120	130	K 110
19	K 110	K 120	115	115	100	100	100	K 150	B	B	B	B	B	B	90	B	B	K 125	K 130	K 145	K 100	K 115	100	110
20	K 110	K 165	K 160	B	B	B	120	B	105	B	B	B	B	B	B	B	B	B	B	K 145	K 100	K 120	K 105	110
21	115	100	105	100	K 165	B	100	B	B	125	B	B	B	B	B	B	B	B	B	130	B	120	100	110
22	K 120	100	100	110	105	110	100	120	B	B	120	120	B	B	B	B	B	B	B	K 100	K 150	K 110	K 110	K 125
23	K 110	K 120	K 105	K 105	K 105	K 120	110	100	B	105	120	B	B	B	B	B	100	140	B	B	B	B	B	115
24	K 110	K 110	B	120	100	100	105	100	100	95	100	B	B	B	B	B	105	B	B	K 170	K 125	130	K 130	K 120
25	K 130	K 110	100	100	120	B	B	125	100	B	B	B	B	B	B	B	B	B	B	B	K 140	120	K 125	K 130
26	K 115	K 115	K 115	K 100	100	K 100	105	125	130	B	B	B	120	110	G	100	100	B	B	B	100	B	125	120
27	110	K 150	K 130	K 125	100	110	125	125	130	100	G	100	135	150	100	100	100	B	B	B	B	B	125	120
28	175	140	K 130	130	K 160	K 130	K 155	190	B	G	C	G	125	G	G	100	100	100	100	B	100	B	B	B
29	K 100	K 115	K 100	K 110	105	125	100	110	100	B	100	95	B	B	B	B	B	B	K 140	K 125	K 130	K 125	K 130	K 125
30	K 120	105	100	115	K 135	K 150	100	90	120	B	B	B	B	B	B	100	100	100	B	B	B	B	K 120	K 110
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	24	26	23	19	26	21	19	11	10	6	4	6	5	8	12	6	8	16	17	21	28	27
MED	K 110	110	108	110	105	115	108	120	100	105	118	98	122	113	130	100	102	122	130	125	K 105	110	K 110	K 115
UQ	K 120	K 120	K 130	115	120	120	120	130	112	118	120	120	130	125	130	100	132	140	145	130	K 120	120	K 122	K 120
LQ	110	105	102	100	100	105	100	100	100	100	100	95	118	110	100	100	100	100	125	102	100	K 105	105	110

The Radio Research Laboratories, Japan

APR. 1977 | H'ES (KM)

IONOSPHERIC DATA

APR. 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	RAK 11	RA 11	KA 31	RKS 31	RL 21	RL 11	LA 11			CL 11					R 1	LH 11	H 1					F 1	R 1	F 1
2	KA 21	KA 31	RKA 21	RS 21	RK 21	RA 11	RA 11	RLA 11	RA 11	CA 11	C 1	R 1	R 1	R 1		L 1	HHC 11		H 1	L 1	L 2		F 1	
3	R 1	R 1	RA 21	AR 12	R 1	ACS 11	RA 11	RA 21	LK 11	R 1	L 1												F 1	FRA 11
4	KA 11	KA 31	AK 11	R 1		RS 11		H 1	R 1													K 7	K 6	K 6
5	R 1	R 1	R 1	R 1		L 1	L 1	K 1	K 1		H 1										LRA 11	KS 41	AK 11	K 4
6	R 1	RA 11	R 1	F 1					R 1									C 1		RLA 11	RA 11	LAK 11	RAK 11	ARK 11
7		FA 11		R 1			AR 11												H 1	C 2	C 2	CK 11	RA 11	RKA 11
8	KA 61	KA 31	RA 41	KSA 11	K 1		R 1	RA 11	RA 11											RA 11	K 1	KS 51	K 1	CK 11
9	R 1	R 1	F 1	F 1			KL 11														K 3	KS 71	KS 51	K 2
10	AK 12	R 2	R 1		K 1															R 1	KS 31	K 2	KS 61	RK 21
11	ARS 11	R 1		R 1	R 1		L 1	C 1									LA 11					RSA 31	RS 21	K 1
12	KA 11		HK 11	F 1	R 1	R 3	HC 11			L 1	C 1	L 1		K 1	HLK 11	K 1	K 1		RK 11	L 1	F 1	R 4	KA 11	K 6
13	RA 11	RA 11		R 1	RA 11	RH 11	RA 21		C 1	C 1									H 1	L 1		F 1	F 1	FF 11
14	RK 11	KA 41	AK 14				R 2	R 2	LC 12													RA 11	K 3	FR 11
15	R 3	RA 11		R 1	RS 11	R 1	R 2	RA 11	RA 11									H 1				R 1	F 1	R 1
16	K 1	LK 11	RKL 12	RKA 12	KA 41	RA 31	RA 11	AR 11	R 1	RA 11	HA 11			C 1	HL 11	L 1	H 1			LH 11	RS 51	AR 11	AR 11	AR 11
17	F 1	RK 21			RA 11	R 1	HK 11	R 1	R 1											H 1			CK 11	
18	KA 11	R 1	R 2	R 1	F 1		RK 11	RA 11	R 1	K 1	LC 11	C 1		CL 11			C 1			R 1		RA 11	FRS 11	KS 71
19	K 7	KC 31	R 2	R 3	F 1	R 1	R 2	ARK 11							L 1		K 1	CK 11	HKA 11	RK 11	KS 41	KS 31	RA 21	RA 21
20	K 2	RKA 11	AK 13				R 1		R 1											HKC 11	RKS 21	RK 11	LK 11	FR 11
21	R 2	R 2	R 2	R 2	AK 11		R 1			C 1										F 1		RA 11	RS 51	RA 11
22	K 1	R 1	R 1	R 1	R 2	RS 11	R 1	R 1			R 1	CL 11								CK 11	HKA 11	RAK 11	K 4	CK 11
23	KA 31	CK 14	KA 41	K 3	K 1	RK 11	R 1	RA 21		C 1	C 1						C 1	H 1						RS 21
24	KS 71	K 4	A 1	R 1	R 1	RA 11	R 2	RA 21	R 2	LH 11	LR 11						C 1			RAK 11	K 2	RA 11	K 1	KL 31
25	K 2	RAK 11	R 2	RS 31	RF 11			R 1	R 3												RK 11	RA 31	K 1	K 1
26	K 4	K 4	K 6	RKA 11	FRA 11	K 1	RA 11	RA 11	A 1				C 1	C 1		L 1	C 1				F 1		R 1	F 1
27	F 1	KA 11	K 1	K 3	RA 21	R 3	RA 11	RA 11	RA 11	L 1		L 1	H 1	HCA 11	C 1	C 1	L 1						F 1	F 1
28	RF 11	R 1	HK 11	F 1	HK 11	CK 11	ACK 11	A 1					C 1			C 1	C 1	L 1	L 1		F 1			
29	RKA 11	RK 13	RAK 11	RK 13	RA 31	A 1	LCA 11	RA 11	R 1		R 1	L 1							HK 11	CK 11	HKA 11	CK 21	CKA 32	RK 11
30	RK 11	R 1	R 2	R 1	K 1	RK 11	R 2	L 1	C 1							C 1	C 1	L 1					CK 11	K 6
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																								

The Radio Research Laboratories, Japan

APR. 1977 | TYPES OF ES

IONOSPHERIC DATA

MAY. 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	A	A	A	B	A	O R 41	50	53	57	65	X 56	X 51	51	32	O R 31	37	R	B	A	A
2	A	A	A	A	B	B	B	A	A	B	B	B	B	B	B	B	B	A	R	A	A	B	A	A
3	A	A	A	O R 37	A	56	A	A	A	B	B	A	O R 41	B	B	B	B	B	B	B	B	B	B	A
4	A	A	A	A	A	A	A	A	O R 26	36	50	51	64	68	65	55	47	O R 42	43	O R 28	O R 24	43	A	A
5	A	A	A	A	A	B	A	A	35	29	B	B	B	B	B	O R 45	O R 40	B	B	B	B	B	A	A
6	48	B	B	B	B	A	B	B	A	36	X 50	O R 46	59	X 59	B	B	65	53	43	46	U A 49	A	O R 26	A
7	A	R	R	A	A	A	A	A	A	O R 36	O R 39	B	B	61	O R 56	X 53	O R 36	O R 28	O R 28	O R 28	O R 19	A	A	A
8	A	A	B	B	A	A	A	S 32	O R 31	R	48	62	X 74	73	75	60	O R 50	O R 34	42	36	R	B	B	A
9	A	A	40	A	A	A	A	O R 43	43	46	49	59	70	64	R	68	68	53	42	28	A	A	R	A
10	27	27	29	35	O R 32	X 30	37	Y	B	O R 36	O R 46	B	B	B	139	107	75	42	30	B	R	A	A	A
11	O R 43	A	A	A	A	A	A	48	41	40	B	O R 47	B	B	B	B	O R 48	O R 38	O R 38	A	A	A	A	B
12	A	A	A	A	R	A	A	A	Y	B	B	B	B	B	O R 34	B	B	O R 34	O R 26	A	A	A	A	A
13	A	A	A	A	A	A	A	B	A	O R 33	45	48	50	56	O R 51	O R 43	O R 33	B	O R 26	O R 26	23	B	B	A
14	A	A	A	A	A	A	A	A	O R 35	50	X 46	57	63	80	60	58	43	35	32	20	B	B	A	A
15	A	A	A	42	54	Y	B	A	46	58	42	X 48	X 49	B	B	85	B	75	R	A	A	A	A	A
16	B	B	B	A	B	A	B	A	A	B	B	O R 38	B	B	B	O R 41	B	B	B	B	B	A	A	A
17	B	B	B	A	A	B	B	B	R	B	B	B	B	B	B	B	B	B	B	O R 44	R	A	46	A
18	A	A	A	A	B	A	A	A	B	B	B	B	B	B	O R 59	X 58	B	B	B	B	B	A	R	O R 18
19	A	A	A	A	A	A	A	A	O R 30	34	X 43	X 50	X 59	X 64	X 56	56	46	O R 28	O R 18	R	B	O R 19	B	A
20	A	A	A	A	A	A	A	A	A	A	40	X 44	53	54	54	47	42	O R 42	O R 37	O R 29	O R 22	A	A	A
21	A	A	A	A	A	X 32	32	42	42	36	43	X 58	X 64	X 60	57	52	40	28	B	O R 26	R	O R 20	O R 19	O R 19
22	O R 21	O R 20	O R 22	40	42	X 48	U S 65	68	64	65	B	B	75	81	72	46	37	O R 34	O R 23	B	B	B	O R 24	O R 21
23	R	A	A	A	A	A	41	41	S 40	38	42	51	X 56	60	S 62	52	U S 52	30	30	28	A	B	B	65
24	38	O R 30	A	A	R	O R 36	A	R	A	A	O R 43	50	70	75	70	46	46	32	O R 26	B	O R 19	21	38	47
25	A	A	A	B	A	A	A	O R 37	35	33	38	48	X 64	66	70	53	36	O R 30	28	O R 26	A	B	B	B
26	A	A	A	A	A	37	A	A	A	B	43	61	61	50	55	41	O R 26	O R 22	O R 27	A	R	B	R	O R 26
27	31	28	A	U S 32	A	31	32	A	40	35	54	70	70	66	45	45	34	O R 25	O R 22	A	A	A	A	A
28	A	19	A	O S 38	U S 37	S	U S 52	60	55	S 52	64	S 52	56	58	59	C	B	B	43	A	A	B	A	A
29	A	A	28	30	30	40	32	38	35	33	40	57	60	66	X 50	45	32	27	17	17	16	O R 20	O R 19	30
30	38	37	37	42	U S 42	50	59	60	60	54	57	52	67	70	54	56	47	O R 24	A	A	B	B	A	A
31	A	A	68	46	S	66	A	U S 80	A	55	54	S 65	75	69	68	50	53	35	A	B	B	B	B	R
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	7	6	6	9	6	10	8	11	16	21	22	22	22	21	22	24	23	23	21	14	7	5	6	7
MED	38	28	33	38	40	38	39	43	40	36	46	52	62	65	58	52	46	O R 34	O R 30	28	O R 22	O R 20	O R 25	O R 26
UQ	40	30	40	42	42	50	56	60	44	50	50	58	70	69	68	57	50	40	38	O R 36	24	21	38	38
LQ	29	20	28	35	32	32	32	40	35	35	42	48	56	60	54	46	36	O R 28	O R 26	26	O R 19	O R 20	O R 19	O R 20

MAY. 1977 | FXI (0.1 MHZ)

IONOSPHERIC DATA

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

The Radio Research Laboratories, Japan

MAY. 1977 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

MAY. 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
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	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

MAY. 1977 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

MAY. 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							B	B	A	A 165	A	U A 190	H 190	U A 180	A	130	A					K 210	
2								B	B	B	B	B	B	B	B	B	B	B	K 270					
3				U K 250		K 270		B	B	B	B	B	260	B	B	B	B	B						U K 210
4	K 205	K 215	K 150					B	U A 125	A	A	A	H 200	B	U A 175	A 150	B	B	U K 160					
5								B	A	120	B	B	B	B	B	B	B	B					K 300	K 380
6								B	B	K 200	H 170	B	K 265	B	B	B	B	B			K 290	K 300	K 175	K 200
7	K 290	U K 300	K 340					B	A	A 170	R 180	B	B	B	A	B	A	B						
8	K 340							A	A	B	150	H 185	190	B	180	U K 190	U K 270	A		U K 120	K 130			K 230
9		U K 280	U K 250					A	B	A	U A 180	U A 200	200	H 240	B	B	B	B					K 150	U K 100
10	U K 165	U K 120	U K 160	K 220	U K 230	U K 190	U K 140	Y	B	B	B	B	B	B	B	B	B	B					K 200	K 250
11	K 270	U K 180						U K 340	K 290	K 220	B	B	B	B	B	B	B	B				U K 370		
12	J K 400	J K 370	J K 390	K 320	K 220		K 370	A	Y	B	B	B	B	B	B	B	B	B		U K 100		K 320	K 190	K 170
13	J K 290	U K 330	J K 360	K 320	K 280			B	B	A	F 180	170	U K 290	U K 230	B	B	B	B	K 130	U K 150				K 300
14				K 390	U K 330			B	K 210	125	A 155	U A 175	B	B	A	K 180	U K 190	B	U K 105				K 155	K 350
15				K 280	K 250			B	A	130	U A 150	160	U A 165	B	B	B	B	B	U K 180	K 210	J K 240	K 350	J K 300	
16									B	B	B	B	B	B	B	B							U K 290	K 380
17					U K 350				K 290	B	B	B	B	B	B	B	B			K 220	K 140	K 320	K 200	K 300
18	K 290	K 350	K 410						B	B	B	B	B	B	B	B	B						K 180	U K 110
19	K 110	K 130	K 200	U K 250					B	115	150	B	B	B	U R 170	120	B	U R 110						K 210
20	K 245	K 240	K 280	K 345	U K 350				A	B	U K 240	170	190	180	170	U A 150	B					K 390	K 370	
21	K 430		K 320		K 330	U K 195	U K 130	K 110	A	R 100	130	U A 170	U A 180	A	A	B	B			K 110				
22	K 100	K 110	U K 110	U K 220	U K 160	K 100	U K 170		130	A	B	B	B	B	B	B	B							
23	K 110	U K 220	J K 220			U K 310	U K 220	U K 140	A 110	U A 120	F 140	150	150	A 155	A 125	A	A		U K 100					J K 280
24	U K 110				K 300	U K 260		K 320	U K 320	B	K 280	180	U A 160	160	U A 140	U B 100	A						U K 240	U K 190
25		J K 360			K 330			K 220	K 140	A 130	150	A 150	A 130	150	A	A	U A 125	U A 100	K 110					
26		U K 120	U K 115			U K 180	K 125		B	B	U A 170	A	A	B	A 125	B	B						K 160	K 180
27	U K 150	K 150	K 90	U K 190			U K 100		U F 100	C	A	130	A	A	U A 130	A	U A 110							U K 130
28	U K 100			U K 230			U K 200		A	B	100	120	U A 140	130	B	C	B			U K 120	U K 110			
29					U K 140	U K 150	U K 120	U K 100	A	A	U A 100	H 120	A 125	U A 125	U B 100	U F 115	110							
30					K 100					B	U B 105	U F 120	U A 150	A	A	A								
31	J K 210	K 100	U K 240	K 220	U K 260					U K 240	K 240	155	A 150	190	125	A								U K 210
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	16	15	12	14	8	9	6	9	11	19	15	17	10	11	7	6	2	7	7	5	6	14	18
MED	K 228	K 218	K 240	K 250	K 270	U K 192	U K 140	K 180	K 140	130	155	160	A 180	170	U A 140	U 150	U 128	U 105	U K 130	U K 120	K 140	K 335	K 200	K 210
UQ	K 290	K 315	K 330	K 320	K 330	U K 265	U K 200	K 320	K 290	185	180	172	200	190	U 172	165	U K 190		K 170	K 180	K 240	K 370	K 290	K 300
LQ	K 110	K 125	K 155	U K 220	U K 220	U K 165	U K 125	U K 110	125	120	145	140	U A 150	150	A 125	U 118	U A 110		K 108	U K 115	K 130	K 320	K 175	U K 180

MAY. 1977 | FOE (0.01 MHZ)

IONOSPHERIC DATA

MAY. 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	K 36	46	46	J A 37	30	68	35	B	37	30	24	27	23	25	22	32	18	19	16	20	19	B	K 21	J A 71
2	52	45	50	47	102	B	B	38	42	B	B	B	B	B	B	B	B	30	K 27	J A 60	J A 78	42	108	J A 59
3	J A 122	38	J A 74	82	42	K 27	50	65	50	B	B	42	G	B	B	B	B	B	B	B	B	B	B	30
4	J A 84	36	J A 84	J A 73	36	J A 49	38	45	20	J A 139	25	J A 32	20	25	20	J A 25	22	E B 15	J A 25	13	20	30	J A 53	J A 53
5	J A 39	J A 34	57	54	48	B	41	36	J A 39	27	B	B	B	B	B	E B 34	20	B	B	B	B	B	K 30	67
6	E B 35	B	B	B	47	46	B	B	37	27	G	E B 20	K 26	E B 18	B	B	E B 25	E B 14	23	15	K 29	K 30	K 17	28
7	33	35	K 34	63	55	35	27	37	J A 34	21	22	B	B	28	20	24	25	16	E B 15	E B 15	17	20	J A 22	J A 24
8	K 34	J A 47	44	48	J A 51	45	J A 40	J A 24	29	30	19	G	G	26	20	25	30	J A 40	20	25	J A 24	B	B	K 23
9	J A 38	38	J A 36	46	49	55	J A 51	J A 39	J A 34	31	21	30	G	G	E B 46	E B 28	E B 16	E B 13	E B 12	E B 11	32	J A 29	K 15	J A 39
10	J A 34	J A 24	19	K 22	25	J A 25	20	Y	B	32	E B 21	B	B	B	E B 29	E B 20	E B 20	E B 27	E B 16	B	22	J A 24	K 20	K 25
11	J A 44	47	J A 63	J A 73	50	J A 38	42	J A 42	K 29	28	B	E B 32	B	B	B	B	E B 16	E B 16	19	J A 41	J A 76	J A 42	J A 82	J A 44
12	J K 40	J K 37	J K 39	K 32	K 22	J A 32	K 37	J A 34	Y	46	B	B	B	B	E B 23	B	B	30	J A 32	20	J A 31	K 32	K 19	23
13	J K 29	U K 33	J K 36	K 32	32	J A 37	J A 32	28	27	23	42	29	30	27	E B 28	E B 23	E B 23	B	20	30	20	B	B	K 30
14	J A 41	J A 39	51	K 39	J A 44	45	J A 50	J A 54	36	19	18	26	E B 21	E B 23	20	K 18	23	E B 13	20	E B 13	B	B	J A 22	U K 35
15	J A 27	J A 62	45	K 28	K 25	75	B	41	25	G	J A 23	G	23	B	B	E B 18	B	E B 25	25	K 21	J K 24	K 35	J K 30	J A 41
16	40	44	B	46	52	J A 30	B	64	47	B	B	31	B	B	B	E B 23	B	B	B	B	B	J A 42	J A 37	K 38
17	90	40	42	41	51	B	B	65	K 29	B	B	B	B	B	B	B	B	B	B	K 22	K 14	K 32	26	K 30
18	K 29	K 35	K 41	44	B	35	J A 40	40	B	B	B	B	B	B	E B 42	E B 23	B	B	B	B	B	30	K 18	18
19	20	J A 24	29	J A 39	J A 42	J A 51	J A 42	28	17	J A 17	16	E B 18	E B 20	E B 20	19	17	22	G	E B 10	25	B	E B 12	B	K 21
20	K 24	K 24	K 28	40	41	J A 42	60	54	45	45	29	G	G	G	G	32	E B 16	26	E B 13	20	J A 26	K 39	K 37	J A 64
21	K 43	J A 44	40	42	K 33	30	26	26	14	G	15	18	19	20	20	E B 14	J A 24	15	B	12	20	J A 24	18	12
22	13	20	31	J A 24	21	J A 36	23	E B 9	32	45	B	B	E B 32	E B 26	31	32	E B 14	E B 17	E B 16	B	B	B	16	E B 11
23	15	K 22	J A 25	37	42	J A 38	J A 31	21	27	14	J A 24	22	G	27	50	47	19	E B 12	J A 24	22	27	B	B	J K 28
24	32	J A 42	J A 76	J A 44	K 30	J A 32	J A 52	K 32	45	J A 37	31	G	20	J A 24	30	G	30	36	20	29	E B 10	J A 26	J A 31	26
25	J A 42	J K 36	J A 64	B	J A 70	40	J A 36	30	20	J A 26	J A 20	18	J A 34	27	26	19	19	J A 24	19	E B 10	24	B	B	B
26	J A 31	J A 25	J A 40	85	J A 34	E B 18	68	85	105	B	25	30	27	39	45	14	E B 14	E B 13	E B 12	J A 32	E B 10	B	K 16	25
27	J A 29	30	J A 26	47	J A 36	26	J A 75	94	67	J A 36	29	J A 24	J A 31	J A 25	J A 30	17	46	J A 26	20	J A 29	27	J A 30	J A 28	J A 33
28	16	15	J A 41	29	J A 76	J A 31	J A 24	30	59	J A 31	G	J A 25	30	J A 24	E B 18	C	B	B	E B 16	J A 23	20	B	20	J A 36
29	J A 36	J A 34	J A 32	J A 51	20	J A 77	J A 61	J A 19	22	J A 36	36	35	J A 30	21	J A 21	J A 27	J A 24	15	J A 25	18	20	12	J A 14	20
30	J A 34	15	J A 26	J A 31	17	J A 26	20	20	30	30	13	J A 23	20	20	J A 24	J A 24	24	E B 15	25	30	B	B	20	20
31	J K 21	J A 32	J A 40	K 22	J A 30	J A 36	50	J A 46	J A 54	J A 40	35	22	17	G	18	16	15	15	25	B	B	B	B	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	31	30	29	29	30	28	26	28	28	25	22	23	22	21	23	24	23	24	25	24	22	18	24	30
MED	J 34	36	J 40	42	42	J A 36	40	38	34	30	22	24	20	24	22	U 20	20	16	20	22	23	30	22	30
UQ	J 40	42	50	48	50	46	J A 50	50	45	36	29	30	28	26	U 28	26	24	26	25	29	J 27	K 35	J A 30	J A 40
LQ	29	25	J 32	32	30	J A 30	31	28	27	23	17	18	E G 17	E G 20	20	U 16	16	E B 14	E B 16	15	20	J A 24	K 18	23

The Radio Research Laboratories, Japan

MAY. 1977 | FOES (0.1 MHZ)

IONOSPHERIC DATA

MAY. 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	K 36	A A 46	A A 46	A A 37	A A 30	A A 68	A A 35	B	A A 37	27	16	20	19	18	18	18	12	14	15	E B 11	A A 19	B	K 21	A A 71
2	B	A A 45	A A 50	A A 47	B	B	B	A A 38	A A 42	B	B	B	B	B	B	B	B	A A 30	K 27	A A 60	A A 78	B	A A 108	A A 59
3	A A 48	A A 38	A A 74	U K 25	A A 42	K 27	A A 50	A A 65	A A 50	B	B	A A 42	G	B	B	B	B	B	B	B	B	B	B	A A 30
4	A A 84	A A 36	A A 84	A A 73	A A 36	A A 49	A A 38	A A 45	16	17	17	20	18	22	18	15	18	E B 15	U K 16	13	E B 13	10	A A 53	A A 53
5	A A 39	A A 34	A A 57	A A 54	A A 48	B	A A 41	A A 36	16	14	B	B	B	B	B	E B 34	20	B	B	B	B	B	K 30	A A 67
6	E B 35	B	B	B	B	A A 46	B	B	A A 37	K 20	G	E B 20	K 26	E B 18	B	B	E B 25	E B 14	17	14	K 29	K 30	K 17	A A 28
7	A A 33	U K 30	K 34	A A 63	A A 55	A A 35	A A 27	A A 37	A A 34	19	21	B	B	28	20	24	17	15	E B 15	E B 15	E B 12	A A 20	A A 22	A A 24
8	K 34	A A 47	A A 44	A A 48	A A 51	A A 45	A A 40	19	15	A A 30	G	G	G	21	G	U K 19	U K 27	20	15	U K 12	K 13	B	B	K 23
9	A A 38	A A 38	U K 25	A A 46	A A 49	A A 55	A A 51	S 35	17	26	21	19	G	G	E B 46	E B 28	E B 16	E B 13	E B 12	E B 11	A A 32	A A 29	K 15	A A 39
10	U K 16	U K 12	U K 16	U K 22	U K 23	U K 19	U K 14	Y	B	E B 17	E B 21	B	B	B	E B 29	E B 20	E B 20	E B 27	E B 16	B	A A 22	A A 24	K 20	K 25
11	K 27	A A 47	A A 63	A A 73	A A 50	A A 38	A A 42	U K 34	K 29	K 22	B	E B 32	B	B	B	B	E B 16	E B 16	15	A A 41	A A 76	U K 37	A A 82	B
12	K 40	K 37	K 39	K 32	K 22	A A 32	K 37	A A 34	Y	B	B	B	B	B	E B 23	B	B	14	14	A A 20	A A 31	K 32	K 19	A A 23
13	K 29	U K 33	K 36	K 32	A A 32	A A 37	A A 32	B	A A 27	21	20	20	U K 29	U K 23	E B 28	E B 23	E B 23	B	15	18	15	B	B	K 30
14	A A 41	A A 39	A A 51	K 39	A A 44	A A 45	A A 50	A A 54	24	16	G	18	E B 21	E B 23	20	K 18	U K 19	E B 13	U K 10	E B 13	B	B	A A 22	K 35
15	A A 27	A A 62	A A 45	K 28	K 25	Y	B	A A 41	19	G	13	G	G	B	B	E B 18	B	E B 25	E R 25	K 21	K 24	K 35	K 30	A A 40
16	B	B	B	A A 22	B	A A 30	B	A A 64	A A 47	B	B	25	B	B	B	E B 23	B	B	B	B	B	A A 42	A A 37	K 38
17	B	B	B	A A 41	A A 51	B	B	B	K 29	B	B	B	B	B	B	B	B	B	B	K 22	K 14	K 32	A A 26	K 30
18	K 29	K 35	K 41	A A 44	B	A A 35	A A 40	A A 40	B	B	B	B	B	B	E B 42	E B 23	B	B	B	B	B	A A 30	K 18	U K 11
19	A A 20	A A 24	A A 29	A A 39	A A 42	A A 51	A A 42	A A 28	13	G	G	E B 18	E B 20	E B 20	G	11	12	G	E B 10	A A 25	B	E B 12	B	K 21
20	K 24	K 24	K 28	A A 40	A A 41	A A 42	A A 60	A A 54	A A 45	A A 45	U K 24	G	G	G	G	G	E B 16	15	E B 13	11	12	K 39	K 37	A A 64
21	K 43	A A 44	A A 40	A A 42	K 33	U K 19	U K 13	K 11	11	G	G	G	G	18	17	E B 14	13	11	B	K 11	A A 20	10	10	10
22	K 10	K 11	12	U K 22	U K 16	K 10	U K 17	E B 9	G	U F 18	B	B	E B 32	E B 26	E B 21	21	E B 14	E B 17	E B 16	B	B	B	10	E B 11
23	A A 15	K 22	A A 25	A A 37	A A 42	A A 38	U K 22	U K 14	G	10	G	14	G	G	G	31	12	E B 12	U K 10	14	A A 27	B	B	K 28
24	U K 11	21	A A 76	A A 44	K 30	U K 26	A A 52	K 32	A A 45	A A 37	31	G	G	G	G	G	11	E B 11	E B 11	B	E B 10	E C 16	U K 24	U K 19
25	A A 42	K 36	A A 64	B	A A 70	A A 40	A A 36	21	K 14	G	G	G	G	20	21	18	G	G	K 11	E B 10	B	B	B	B
26	A A 31	A A 25	A A 40	A A 85	A A 34	E B 18	A A 68	A A 85	A A 50	B	16	20	19	G	G	G	E B 14	E B 13	E B 12	A A 32	E B 10	B	K 16	K 18
27	U K 15	K 15	A A 26	U K 19	A A 36	16	U K 10	A A 94	G	E C 11	10	12	16	16	G	12	G	10	11	A A 29	A A 27	A A 30	A A 28	A A 33
28	A A 16	U F 10	A A 41	U K 23	16	18	U K 20	12	10	G	G	G	G	G	E B 18	C	B	B	E B 16	A A 23	A A 20	B	A A 20	A A 36
29	A A 36	A A 34	18	18	U K 14	U K 15	U K 12	U K 10	16	11	G	34	G	G	11	G	G	11	10	11	11	E B 10	E B 9	9
30	A A 34	A A 15	A A 26	A A 31	K 10	10	9	8	10	E B 9	G	G	17	14	14	13	15	E B 15	A A 25	A A 30	B	B	B	A A 20
31	K 21	A A 32	A A 40	K 22	U K 26	A A 36	A A 50	U F 27	A A 54	U K 24	K 24	15	G	G	G	11	10	14	A A 25	B	B	B	B	U K 21
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	29	27	27	26	26	28	24	22	23	22	21	23	24	23	24	25	23	21	17	23	29
MED	31	A A 34	A A 40	A A 39	A A 36	A A 35	A A 38	A A 34	22	17	11	U 15	G	E G 18	E G 18	U 14	U 12		U 12	15	20	30	22	28
UQ	A A 38	A A 38	A A 50	A A 46	A A 46	A A 44	A A 50	A A 45	A A 40	23	21	20	18	20	E B 21	U 20	16	15	16	A A 24	A A 27	K 32	A A 30	A A 38
LQ	K 20	23	27	K 25	K 26	19	U K 20	19	14	E G 10	G	G	G	G	G	12	11		10	12	13	16	K 18	K 21

The Radio Research Laboratories, Japan

MAY. 1977 | FBES (0.1 MHZ)

IONOSPHERIC DATA

MAY. 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	E S 13	17	19	13	12	25	15	B	20	13	13	13	13	12	12	12	10	12	13	11	12	B	11	E S 12
2	24	16	15	16	65	B	B	21	19	B	B	B	B	B	B	B	B	12	22	10	7	23	7	7
3	14	11	17	15	14	11	20	16	14	B	B	23	18	B	B	B	B	B	B	B	B	B	B	21
4	11	11	10	10	11	11	9	10	12	11	13	13	17	20	16	12	15	15	8	12	13	6	8	15
5	11	10	17	13	12	B	12	12	10	10	B	B	B	B	B	34	17	B	B	B	B	B	10	22
6	35	B	B	B	30	22	B	B	18	13	14	20	20	18	B	B	25	14	10	11	12	16	10	9
7	18	28	28	25	23	17	10	20	11	11	13	B	B	26	15	22	13	14	15	15	12	10	6	11
8	10	12	15	21	12	13	12	9	12	28	13	12	13	19	17	12	14	12	12	11	11	B	B	11
9	9	10	10	18	12	13	13	11	15	11	16	10	18	18	46	28	16	13	12	11	12	11	11	9
10	9	7	7	8	8	8	10	Y	B	17	21	B	B	B	29	20	20	27	16	B	18	12	10	9
11	10	9	10	18	22	14	16	10	10	12	B	32	B	B	B	B	16	16	12	11	9	13	10	23
12	12	12	12	10	8	11	24	11	Y	36	B	B	B	B	23	B	B	12	11	9	8	11	10	6
13	7	11	12	14	12	10	10	25	20	12	14	15	20	21	28	23	23	B	11	12	13	B	B	10
14	11	E S 18	16	12	12	22	15	12	12	10	10	12	21	23	15	15	14	13	10	13	B	B	11	10
15	15	11	18	13	11	63	B	13	11	11	10	12	12	B	B	18	B	25	18	9	8	7	6	13
16	21	24	B	22	34	12	B	25	25	B	B	19	B	B	B	23	B	B	B	B	B	7	10	12
17	25	23	25	22	14	B	B	45	24	B	B	B	B	B	B	B	B	B	B	10	12	6	9	10
18	10	12	12	23	B	24	16	13	B	B	B	B	B	B	42	23	B	B	B	B	B	11	16	10
19	8	10	6	14	13	13	13	12	12	9	10	18	20	20	13	9	10	10	10	11	B	12	B	10
20	10	10	9	16	15	14	18	16	10	19	13	14	15	15	11	10	16	12	13	10	10	12	E C 9	10
21	16	13	13	21	12	11	10	7	10	9	11	11	12	11	15	14	12	10	B	10	9	8	9	9
22	7	8	6	6	7	6	7	9	10	12	B	B	32	26	21	15	14	17	16	B	B	B	8	11
23	9	10	10	9	13	10	11	9	8	6	8	10	10	12	12	9	9	12	E C 8	12	18	B	B	8
24	9	11	12	12	10	12	12	15	24	15	24	13	11	10	11	10	10	11	11	18	10	E C 16	10	11
25	10	12	E C 14	B	15	23	14	11	11	11	11	11	12	13	12	13	11	6	10	10	16	B	B	B
26	15	11	11	15	14	18	12	17	15	B	13	14	17	16	12	12	14	13	12	12	10	B	8	7
27	9	6	8	6	10	6	E C 7	6	6	E C 11	7	10	11	11	10	E C 10	10	8	9	13	10	13	12	12
28	8	8	7	8	6	10	8	8	7	8	9	11	13	10	18	C	B	B	16	12	11	B	9	9
29	10	10	7	9	8	7	6	5	6	6	6	7	10	12	10	7	E C 10	9	9	9	9	10	9	6
30	6	6	6	6	6	6	6	6	6	9	10	11	11	10	10	11	14	15	12	12	B	B	15	10
31	7	8	6	10	9	14	13	11	10	10	11	12	12	18	10	10	8	12	17	B	B	B	B	11
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31
MED	10	11	12	14	12	13	13	12	12	12	13	14	18	20	17	15	15	13	12	12	12	16	10	10
UQ	14	12	16	20	14	22	17	17	19	24	B	D B 32	B	B	D B 46	28	D B 25	26	18	16	B	B	16	12
LQ	9	10	8	10	10	10	10	9	10	10	10	12	12	12	12	11	12	12	10	10	10	10	9	9

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IONOSPHERIC DATA

MAY. 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	A	A	A	A	B	A	U F 305	F	J F 325	F 315	F 360	345	365	F 330	F 295	F 335	F 325	A	B	A	A
2	B	A	A	A	B	B	B	A	A	B	B	B	B	B	B	B	B	A	R	A	A	B	A	A
3	A	A	A	F	A	F	A	A	A	B	B	A	305	B	B	B	B	B	B	B	B	B	B	A
4	A	A	A	A	A	A	A	A	F 290	F 330	J F 350	J F 325	J F 355	F	F	F	F 350	F 330	J F 330	F	F	F	A	A
5	A	A	A	A	A	B	A	A	U F 270	F 295	B	B	B	B	B	U R 330	F 360	B	B	B	B	B	A	A
6	F	B	B	B	B	A	B	B	A	F 330	F 315	320	F 330	330	B	B	320	F 325	J F 310	F 275	A	A	R	A
7	A	A	A	A	A	A	A	A	A	F 315	335	B	B	F 370	F 355	F 360	F 350	F 350	F 360	F 365	330	A	A	A
8	A	A	A	A	A	A	A	U F 300	F 305	A	F 335	F 335	355	F 345	U F 305	J F 360	F 360	F 335	F	F	R	B	B	A
9	A	A	F 320	A	A	A	A	F	F	F	F	F 325	F	F	R	F	F	F	F	U F 335	A	A	R	A
10	F	U F 320	F	F	285	285	F 280	Y	B	F 315	F 330	B	B	B	F	F	F	F	F	B	A	A	A	A
11	F 325	A	A	A	A	A	A	U F 285	F 265	F 305	B	F 290	B	B	B	B	U F 325	F 310	F 275	A	A	A	A	B
12	A	A	A	A	R	A	A	A	Y	B	B	B	B	B	305	B	B	F 320	F	A	A	A	A	A
13	A	A	A	A	A	A	A	B	A	F 290	F 310	J F 350	F	F 340	F 350	F 335	320	B	F 315	F	F	B	B	A
14	A	A	A	A	A	A	A	A	275	J F 305	325	F 330	J F 330	F	F	F 360	F	F	F 360	F	B	B	A	A
15	A	A	A	F 355	F	Y	B	A	U F 310	F	J F 305	335	315	B	B	F	B	F	R	A	A	A	A	A
16	B	B	B	A	B	A	B	A	A	B	B	F 320	B	B	B	F 315	B	B	B	B	B	A	A	A
17	B	B	B	A	A	B	B	B	R	B	B	B	B	B	B	B	B	B	B	F	R	A	A	A
18	A	A	A	A	B	A	A	A	B	B	B	B	B	B	340	365	B	B	B	B	B	A	R	A
19	A	A	A	A	A	A	A	A	F 295	F 320	335	350	360	360	360	J F 350	F	F 380	F 315	A	B	330	B	A
20	A	A	A	A	A	A	A	A	A	A	F 320	F 320	F 335	F 345	F 360	F 350	F 310	F 340	U F 335	F 315	F 300	A	A	A
21	A	A	A	A	A	275	F 290	F 295	F 335	J F 325	J F 335	340	360	380	F	F 355	J F 355	F 355	B	F 355	A	U F 355	F 335	F
22	F	F	F	F 305	U F 305	J C 275	F	F	F	F	B	B	F	F	J F 360	F 375	F 355	F 360	325	B	B	B	F 325	F
23	A	A	A	A	A	A	F 295	J F 285	J F 305	F 290	F 315	F 350	340	U F 355	J F 355	J F 345	F 370	U F 325	F 300	U F 300	A	B	B	A
24	J F 330	R	A	A	R	F	A	R	A	A	F	J F 340	F 340	F 355	F 385	F 360	F 330	F 340	F 355	B	F 335	C	F	F
25	A	A	A	B	A	A	A	F 270	U F 295	F 310	U F 315	F 300	F 360	F 370	F	F 360	F 365	F	U F 350	F 345	B	B	B	B
26	A	A	A	A	A	R 260	A	A	A	B	F 340	F 350	F 370	F 365	J F 375	J F 365	F	F 315	F 335	A	R	B	R	F
27	F	F	A	F	A	J F 275	F 285	A	U F 285	J F 290	J F 300	F	J F 345	F 365	J F 355	J F 355	F 370	F	U F 300	A	A	A	A	A
28	A	F	A	U F 315	U H 300	S	J F 280	F	F	F	F	J F 340	J F 360	F 335	F 345	C	B	B	F	A	A	B	A	A
29	A	A	F	F	F 275	U F 280	F	F 280	F	J F 290	J F 310	J F 350	J F 330	J F 360	J R 360	F	F 360	F 340	F	F	F	F	U F 375	U S 350
30	A	A	A	A	F	F	F	F 300	F 300	F	J F 320	F	F	F	J F 340	J F 350	J F 350	F 310	A	A	B	B	B	A
31	A	A	A	S	S	A	A	F	A	U F 280	J F 300	F	F	J F 370	J F 370	J F 360	J F 310	F	A	B	B	B	B	R
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	2	1	1	3	4	6	5	7	12	16	18	19	17	16	17	19	18	16	15	8	3	2	3	1
MED	F 328	U F 320	F 320	F 315	292	275	F 285	F 285	F 295	F 305	F 320	F 335	F 340	F 360	F 355	F 360	F 350	F 332	F 330	F 330	F 330	342	F 335	U S 350
UQ				F 335	U 302	280	F 290	F 298	F 305	F 318	F 335	F 345	360	F 368	J F 360	F 360	F 360	F 345	F 342	F 350	332		F 355	
LQ				F 310	280	J 275	F 280	F 282	F 280	F 290	J F 310	F 322	F 330	F 345	F 345	F 350	F 325	F 318	F 312	F 308	315		F 330	

The Radio Research Laboratories, Japan

MAY. 1977 | M(3000)F2 (0.01)

IONOSPHERIC DATA

MAY. 1977 | H'F2 (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

Day \ Hour	00	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											
2																								
3																								
4																								
5																								
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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																								
MED																								
UQ																								
LQ																								

MAY. 1977 | H'F2 (KM)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAY. 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	B	A	A	B	A	B	A	340	H 265	250	240	220	220	205	205	250	250	250	A	B	A	A
2	B	A	A	A	B	B	B	A	A	B	B	B	B	B	B	B	B	A	R	A	A	B	A	A
3	A	A	A	U Q 530	A	F	A	A	A	B	B	A	325	B	B	B	B	B	B	B	B	B	B	A
4	A	A	A	A	A	A	A	A	A	260	245	Q 220	Q 220	Q 230	Q 200	215	220	200	250	A	B	A	A	B
5	A	A	B	A	A	B	A	A	355	310	B	B	B	B	B	B	230	B	B	B	B	B	A	A
6	B	B	B	B	B	A	B	B	A	280	255	255	250	230	B	B	240	240	255	Q 325	A	A	R 450	A
7	A	B	B	B	B	A	A	A	A	290	270	B	B	230	205	225	215	Q 255	B 240	225	B	A	A	A
8	A	A	B	B	A	A	A	U H 380	305	B	240	225	215	220	200	Q 205	230	A 260	Q 255	Q 250	A	B	B	A
9	A	A	300	A	A	A	A	A	305	A 310	235	245	220	230	B 240	230	230	210	230	250	A	A	R	A
10	Q 350	Q 300	Q 300	U F 390	U A 400	360	350	Y	B	255	240	B	B	B	250	240	210	B	B 275	B	B	A	A	A
11	275	A	A	A	B	A	A	395	Q 430	310	B	B	B	B	B	B	250	250	345	A	A	A	A	B
12	A	A	A	A	R	A	A	A	Y	B	B	B	B	B	E B 320	B	B	260	A	A	A	A	A	A
13	A	A	A	A	A	A	A	B	A	A 350	270	230	250	250	230	B 240	B	B	A 300	A	A	B	B	A
14	A	S	A	A	A	B	A	A	E A 360	275	245	235	240	225	220	210	205	220	205	B	B	B	A	A
15	A	A	B	Q 275	F	Y	B	A	300	245	290	245	250	B	B	Q 230	B	255	R	A	A	A	A	A
16	B	B	B	B	B	A	B	B	B	B	B	300	B	B	B	B 275	B	B	B	B	B	A	A	A
17	B	B	B	A	A	B	B	B	R	B	B	B	B	B	B	B	B	B	B	Q 340	R	A	A	A
18	A	A	A	B	B	B	A	A	B	B	B	B	B	B	E B 250	205	B	B	B	B	B	A	R	A
19	A	A	A	A	A	A	A	A	355	255	220	215	210	210	210	195	H 190	220	B	B	B	B	B	A
20	A	A	A	A	A	A	A	A	A	A	295	245	250	225	215	205	240	250	210	240	A	A	A	A
21	A	A	A	A	A	400	330	295	240	235	205	200	220	205	195	195	225	H 190	B	Q 230	A	240	A	A
22	Q 350	280	U F 290	340	H 350	Q 340	Q 350	B	325	A	B	B	215	220	205	200	230	240	B	B	B	B	E A 255	B
23	A	A	A	A	A	A	H 350	295	260	255	245	215	230	205	205	A 215	200	E B 235	250	E B 260	B	B	B	A
24	270	A	A	A	R	A	A	R	A	A	A	235	220	210	210	200	215	200	B 225	B	B	C	U Q 325	260
25	A	A	A	B	A	B	A	380	300	300	250	230	225	205	225	210	200	290	240	B 250	B	B	B	B
26	B	A	A	A	A	R 510	A	A	A	B	230	220	200	195	200	H 195	B	B	B 240	A	B	B	R	A
27	U Q 450	U Q 400	A	S	A	E A 345	320	A	290	265	230	205	200	200	200	195	200	A	A	B	A	A	A	A
28	A	A	A	290	A	350	H 325	270	255	275	230	215	200	220	230	C	B	B	250	A	A	B	A	A
29	A	A	A	A	375	345	330	300	A	A 255	250	240	205	200	195	200	220	235	B	A	A	B	B	A
30	A	A	A	A	F	A	A	A	A	280	235	210	210	220	210	245	225	B	A	A	B	B	B	B
31	A	A	A	280	300	A	A	A	A	Q 340	310	265	215	210	210	205	245	270	A	B	B	B	B	R
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	3	3	6	4	7	7	7	13	20	21	21	22	21	23	23	21	19	16	10		1	3	1
MED	Q 350	Q 300	300	315	362	350	330	300	302	278	245	230	220	220	210	205	220	240	250	250		240	325	260
UQ	Q 350	Q 350	300	U 390	388	380	350	380	340	310	265	245	240	225	224	228	230	255	255	Q 260			388	
LQ	275	290	295	280	325	345	328	295	290	255	235	215	210	205	202	200	205	218	235	240			290	

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MAY. 1977 | H'F (KM)

IONOSPHERIC DATA

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

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MAY. 1977 | H'ES (KM)

IONOSPHERIC DATA

MAY. 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	K 3	R 1	R 1	RF 21	RF 11	R 1	R 1		R 1	R 1	C 1	C 1	C 1	C 2	C 1	C 2	C 2	CH 11	F 1	F 1	F 1		KA 11	R 3
2	R 1	R 1	R 1	R 1	F 1			RS 11	RL 11									RS 11	K 1	AR 11	RA 11	FS 11	AR 11	RA 31
3	AR 12	FA 31	RA 11	RLK 11	R 1	K 4	RA 11	RA 21	R 2			R 1												HK 11
4	HK 12	CK 32	CK 51	HCA 11	R 2	F 1	F 2	C 3	C 1	L 1	C 1	C 1	C 1	C 1	C 1	LH 11	L 1		CK 21	F 1	F 1	FR 11	RA 11	R 1
5	RA 21	RS 21	R 1	R 2	RS 31		R 1	R 2	CL 11	C 2							L 1						K 6	CK 11
6					R 1	R 1			R 1	HK 11			K 1						F 1	F 1	K 2	K 1	K 1	HK 32
7	HK 11	HK 11	K 1	R 1	RR 11	R 1	F 1	R 1	R 2	HL 11	C 1			C 1	L 1	C 1	L 1	L 1			F 2	F 1	F 1	F 1
8	K 7	R 2	R 2	R 1	R 2	R 2	R 2	L 2	LC 11	C 1	H 1			C 1	C 1	RK 11	R 2	R 2	FF 11	CAK 11	HK 11			K 1
9	RSA 31	RKS 15	RKA 21	R 1	R 2	R 2	R 3	R 3	R	C 2	C 1	L 1									RA 31	RA 11	KA 11	CK 21
10	LK 11	CAK 11	RK 11	K 2	RKA 11	RK 11	HAK 11	A 1		C 1											F 1	R 1	K 2	K 6
11	RK 12	RK 41	R 2	RA 11	R 1	R 3	RS 11	RK 41	K 4	HKA 11									AF 11	RA 21	AR 14	AKS 11	RA 11	RS 11
12	KS 21	KA 21	K 3	K 3	KA 41	RA 31	K 1	RA 11		H 1								CC 11	FF 11	CAK 11	RA 31	K 4	KA 31	CK 12
13	K 5	KA 61	K 3	K 3	CK 22	R 1	R 3	H 1	R 1	LA 11	HC 11	HC 11	RK 11	RK 11					RKL 11	HKL 11	F 1			KA 61
14	R 3	R 2	R 1	K 2	RK 13	R 1	R 2	R 3	RK 21	HA 11	C 1	L 1			L 1	K 1	RK 11		CK 11				LK 11	K 5
15	RA 41	R 4	RA 11	K 2	KA 41	F 1		R 2	R 1		L 1		C 1						HK 11	KA 31	KA 41	KS 81	KS 61	R 2
16	RA 11	R 1		F 1	R 1	R 2		F 1	R 1			LR 11										R 7	RK 24	K 3
17	F 1	R 1	R 1	R 1	RK 11			R 1	K 1											KA 31	K 1	KS 61	KA 11	K 3
18	K 5	K 2	K 3	R 1		R 1	R 1	R 2														FA 11	K 1	CK 11
19	CK 32	CK 21	CK 51	RK 11	R 2	R 2	R 1	R 2	R 2	C 1	C 1				C 1	C 1	L 1			F 1				K 1
20	KC 11	K 1	KA 31	RK 21	RK 12	R 2	R 1	R 1	R 2	R 1	RK 11					LA 11		F 1		F 1	F 1	KS 31	KS 61	R 4
21	KS 31	R 4	CK 44	R 1	K 2	RCK 11	RAK 11	RAK 11	C 1		H 1	C 1	C 1	L 1	C 1		L 1	R 1		HLK 11	F 1	FR 11	R 1	R 1
22	HK 11	RAK 11	RAK 11	RK 13	RK 11	LK 11	CK 13		RA 11	RA 11					C 1	L 1							FA 11	
23	HK 11	K 1	RK 11	RFS 11	R 2	CK 44	RKL 31	RLK 11	C 1	LH 11	L 1	L 1		C 1	C 1	C 2	CR 11		HK 11	F 1	F 1			KA 31
24	RK 11	R 4	R 1	R 3	K 4	RK 22	R 3	KL 11	C 1	K 1	R 1	CK 11	L 1	C 1	L 1		L 1	F 1	F 1	F 1		R 1	RK 13	RK 11
25	R 7	K 4	R 1		RK 11	R 1	RA 11	RK 21	LRK 11	C 1	C 1	RL 11	C 1	C 1	C 1	C 1	C 1	CA 11	CK 11		F 1			
26	F 1	HLK 11	HAK 11	F 1	RFA 11	KA 11	HAK 11	FA 11	AC 11		RC 11	H 1	C 1	HA 11	C 1	C 1				F 1			K 1	RAK 11
27	CKA 11	LKA 11	RKL 11	RKA 11	R 3	RA 11	ACK 11	FA 51	A 1	RA 11	HC 11	C 1	LH 11	HC 11	CA 11	CL 11	CC 11	F 1	F 2	R 1	R 3	FF 11	F 1	CK 11
28	RK 11	FA 11	F 3	RKA 11	AF 11	R 1	RAK 11	FA 11	HC 11	L 1		C 1	C 1	CH 11						LK 11	CK 11		RA 11	R 5
29	R 4	R 6	RA 21	RR 13	RAK 11	AHK 11	HK 21	HCK 11	C 4	CA 31	LC 11	C 3	C 1	CH 11	C 1	C 1	CH 21	FF 11	F 1	FA 11	R 1	F 1	F 2	F 1
30	F 1	FFA 11	R 2	RF 21	CK 21	RF 11	F 1	F 1	FA 11	A 1	H 1	L 1	HL 11	LH 11	LH 11	L 1	FF 11		F 1	F 1			RA 11	RA 11
31	K 1	CK 62	AK 11	K 3	RK 13	RA 11	R 1	RA 21	R 2	RAK 11	RK 11	R 1	C 1		H 1	C 1	FA 11	F 1	F 1					AK 11
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

MAY. 1977 | TYPES OF ES

IONOSPHERIC DATA

JUN. 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	X 37	X 36	A	A	A	A	39	X 39	38	45	48	50	70	80	69	52	46	31	O R 25	B	A	A	A	A
2	A	A	A	A	B	B	A	A	A	B	B	O R 43	49	O R 48	B	58	53	36	B	27	A	A	A	A
3	A	A	B	A	A	A	R	O R 26	B	B	30	51	60	O R 55	60	O R 45	O R 36	B	B	R	B	B	A	Y
4	A	A	53	31	A	28	32	38	43	29	59	60	64	70	54	68	42	O R 25	B	B	B	R	R	37
5	A	A	A	A	O R 30	25	30	A	A	O R 36	40	67	58	70	63	59	O R 45	O R 35	O R 35	O R 33	A	A	A	B
6	R	O R 36	40	44	R	55	O R 50	O R 42	O R 45	30	S 52	49	52	O R 49	B	50	28	O R 30	R	B	B	B	B	A
7	R	31	33	25	A	20	S	U S 63	60	62	66	52	69	50	56	O R 37	A	B	B	B	B	A	A	A
8	A	A	28	26	A	21	37	52	S 42	50	52	43	55	53	41	42	31	42	29	B	B	O R 21	B	A
9	A	A	A	A	A	32	35	31	45	32	37	47	54	56	57	57	31	19	O R 18	B	B	B	A	A
10	30	A	A	A	A	A	A	A	R	B	B	Y	56	49	47	36	O R 31	O R 28	O R 24	A	O R 19	A	A	O R 25
11	A	A	A	A	A	A	A	B	B	A	49	66	52	52	46	52	31	O R 18	O R 24	O R 16	A	B	B	A
12	A	A	A	A	A	A	A	A	A	O R 33	37	43	50	46	44	40	30	23	O R 20	A	O R 16	Y	A	S 41
13	A	A	A	A	A	A	A	A	A	B	A	A	O R 43	70	53	47	40	O R 27	A	A	A	R	A	A
14	A	A	A	O R 45	B	A	B	A	A	A	A	O R 40	O R 45	X 48	O R 46	O R 42	B	B	B	B	B	A	A	A
15	A	A	A	A	A	29	31	30	O R 29	A	O R 29	44	67	56	65	38	25	O R 23	A	A	B	A	A	A
16	A	A	A	A	A	A	27	29	28	26	40	S 47	52	59	57	U S 45	40	A	O R 18	C	B	B	B	A
17	A	A	O S 42	A	A	O R 42	O R 41	A	A	A	A	40	57	55	48	47	B	B	A	A	A	B	B	A
18	A	A	A	A	32	38	38	43	O R 34	A	A	B	O R 46	60	B	O R 43	32	B	B	B	A	A	O R 31	A
19	A	A	A	B	A	A	A	A	A	B	B	B	B	B	B	B	O R 40	O R 38	O R 26	A	B	B	B	A
20	A	O R 23	U S 39	U S 67	A	A	A	A	A	A	A	B	O R 49	51	O R 51	O R 41	B	B	B	B	B	B	A	A
21	S	A	A	A	A	25	A	O S 38	O R 36	32	B	B	B	46	52	O R 43	30	O R 27	O R 26	B	B	B	B	A
22	A	A	A	42	A	S 47	U S 48	U S 57	U S 44	O R 35	37	O S 46	X 50	56	58	55	O R 23	O R 25	O R 29	B	B	A	A	A
23	C	A	A	C	A	A	B	A	O R 36	B	B	O R 40	45	47	47	X 57	31	31	B	15	B	A	Y	O R 26
24	A	A	28	A	A	A	A	B	O R 36	A	B	B	B	B	O R 42	O R 40	B	O R 24	O R 28	16	29	O R 17	A	A
25	A	A	29	A	A	A	S 33	S 42	O R 33	B	O R 38	47	48	42	68	45	42	30	A	B	B	B	B	B
26	B	A	A	40	A	A	31	39	X 35	X 33	U S 45	S 52	O R 61	54	58	43	45	32	33	24	B	B	B	A
27	A	A	A	A	A	A	A	A	A	54	57	48	52	57	53	47	46	31	26	O R 17	A	A	A	S
28	44	65	55	40	35	46	A	39	32	A	Y	O R 47	90	71	B	B	B	B	B	B	A	A	A	A
29	A	A	B	B	A	A	A	A	A	A	A	O R 43	59	X 51	B	O R 43	O R 36	O R 27	O R 23	O R 26	R	R	A	A
30	A	A	A	A	B	A	O R 27	O R 28	28	A	O R 36	50	52	70	66	O R 37	B	A	O R 22	A	B	B	A	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	3	5	9	9	3	12	14	16	17	13	17	23	27	28	24	28	23	21	16	8	3	2	1	4
MED	37	36	39	40	32	30	34	39	36	33	40	47	52	54	54	45	36	O R 28	O R 28	20	O R 19	O R 19	O R 31	32
UQ	40	36	42	44	34	44	39	42	43	45	52	50	60	60	59	52	42	31	O R 28	26	24			39
LQ	34	O R 31	29	31	31	25	31	30	O R 33	32	37	43	50	49	47	O R 42	31	O R 25	O R 22	16	O R 18			O R 26

JUN. 1977 | FXI (0.1 MHZ)

IONOSPHERIC DATA

JUN. 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	31	F 30	A	A	A	A	F 33	J R 33	U F 28	F 26	J F 30	J F 41	F	F	F	J F 41	F	J F 22	F 16	B	A	A	A	A
2	A	A	A	A	B	B	A	A	A	B	B	F 37	F	42	B	R	F	U F 29	B	J F 21	A	A	A	A
3	A	A	B	A	A	A	R	F	B	B	F	F 36	F 46	F 48	F	U F 36	F 26	B	B	A	B	B	A	Y
4	A	A	A	U F 24	A	F	F 26	F 26	U F 24	F 22	J F 34	J F 46	F	F	U F 41	U F 43	F 32	19	B	B	B	A	R	A
5	A	A	A	A	F	F	F	A	A	F	J F 30	U F 39	F 47	U F 46	F 50	J F 51	F 38	U F 29	F 28	U F 26	A	B	A	B
6	A	F	F 32	F	R	F	44	F 32	F 36	F	F	U F 40	U F 45	U F 42	B	F	F 22	F 22	A	B	B	B	B	A
7	A	F	F 27	F	A	F	S	F	F	F	J F 29	J F 40	U F 48	R 43	U F 42	F 30	A	B	B	B	B	A	A	A
8	A	A	F	F	A	F	U F 18	F 17	F 17	U F 18	J F 26	F 37	F 49	F 43	J F 34	F 33	F 23	U F 27	U F 21	B	B	F	B	B
9	A	A	A	A	A	A	F 27	F 25	F 22	J F 25	U F 26	J F 36	U F 39	U F 40	U F 35	U F 33	J F 25	F	12	B	B	B	A	A
10	F 20	A	A	A	A	A	A	A	R	B	B	Y	F 40	F 42	F 41	F 30	F 22	F 20	F 16	A	F	A	A	F
11	A	A	A	A	A	A	A	B	B	A	U F 31	J F 46	F 45	F 45	F 40	J F 33	F 23	12	U F 12	U R 10	B	B	B	A
12	A	A	A	A	A	A	A	A	A	U F 25	U F 30	F 37	J F 42	F 40	F 39	J F 32	F 23	F 17	F	A	R 10	Y	A	S
13	A	A	A	A	A	A	A	A	A	B	A	A	U F 34	J F 43	F 47	J F 41	F 33	F 20	A	A	A	A	A	A
14	A	A	A	U F 39	B	A	B	A	A	A	A	F 30	F 37	42	F 38	F 33	B	B	B	B	B	A	A	A
15	A	A	A	A	A	U F 21	F 24	F 22	F 19	A	23	U F 36	U F 42	U F 42	U F 38	U F 26	U F 19	F	A	A	B	A	A	A
16	A	A	A	A	A	A	F	F	F 22	U F 19	J F 26	J F 37	J F 42	U F 42	U F 41	J F 30	U F 26	A	12	C	B	B	B	A
17	A	A	36	A	A	S 36	F 34	A	A	A	A	F 34	F	F 39	U F 36	J F 36	B	B	A	A	A	B	B	A
18	A	A	A	A	U F 26	F 32	J F 31	J F 25	F	A	A	B	F 37	Y	B	U F 31	F	B	B	B	A	A	U R 25	A
19	A	A	A	B	A	A	A	A	A	B	B	B	B	B	B	B	U R 34	U F 31	R 20	A	B	B	B	A
20	A	17	F	U F 36	A	A	A	A	A	A	A	B	U R 43	F 45	F 43	F 34	B	B	B	B	B	B	A	A
21	S	A	A	A	A	J C 19	A	32	F	F	B	B	B	F 40	F 34	F 35	U F 23	F 20	F 19	B	B	B	B	A
22	A	A	A	F	A	S	S	S	S	F 29	U F 31	F 39	J R 44	F	J F 45	J F 40	U R 17	F 18	F 21	B	B	A	A	A
23	C	A	A	C	A	A	B	A	U F 30	B	B	F 33	F 39	U F 38	F 41	F 50	U F 25	J F 21	B	F	B	A	Y	U F 20
24	A	A	F	A	A	A	A	B	F	A	B	B	B	B	36	24	B	18	F 21	F	F 11	11	A	A
25	A	A	F	A	A	A	U H 22	26	F	B	F 31	J F 41	F 42	F 33	F	J F 37	F	F 23	A	B	B	B	B	B
26	B	A	A	F	A	A	F	J S 32	J R 29	J R 27	F	F	J F 55	J F 45	J F 45	J F 34	F 22	F 22	F 23	U F 18	B	B	B	A
27	A	A	A	A	A	A	A	A	A	J F 41	U F 36	U F 42	J F 46	J F 51	J F 45	J F 41	U F 27	F 25	F 20	U R 11	B	S	A	S
28	A	F	F	F	F	F 25	A	U F 30	U F 26	A	Y	U F 40	F	F	B	B	B	B	B	B	A	A	A	A
29	A	A	B	B	A	A	A	A	A	A	A	F 33	U F 49	45	B	F 34	F 26	U F 20	F 16	F 18	A	A	A	A
30	A	A	A	A	B	A	F 20	U F 20	F 21	A	F 29	U F 39	F	F 47	J F 59	31	B	A	16	A	B	B	A	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	2	2	3	3	1	5	10	12	11	9	14	22	21	23	21	26	19	19	15	6	2	1	1	1
MED	26	24	F 32	U F 36	U F 26	F 25	F 26	F 26	F 24	F 25	F 30	F 38	F 43	F 42	F 41	F 34	F 25	F 21	F 19	U F 18	10	11	U R 25	U F 20
UQ			34	U F 38		F 32	F 33	32	U F 28	J F 27	F 31	F 40	F 46	F 45	F 45	J F 40	F 26	F 24	F 21	U F 21				
LQ			F 30	U F 30		F 21	F 22	F 24	F 22	U F 22	F 26	F 36	F 40	F 41	F 38	F 31	F 22	F 20	F 16	U R 11				

The Radio Research Laboratories, Japan

JUN. 1977 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

JUN. 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																								
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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																								

JUN. 1977 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

JUN. 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 205	U K 250					U K 220	U K 170	U K 120	F 105	F 110	U F 140	A 160	U A 140	U A 110	A	U K 110	U K 95						
2				U K 270						B	B	B	A	B	B	B				U K 120	J K 380	J K 370	K 190	
3	J K 350	K 200					K 205	U K 175		B	B	C	150	B	B	B								K 120
4	K 120	K 220	K 320	U K 190		U K 250		U K 100	K 100	U A 100	U A 120	A	U A 140	A	U A 120	A						U K 120	U K 120	K 190
5	U K 95	K 240								A	F 155	U F 160	U A 190	A 130	A	B								
6	K 230	U K 225	U K 205	K 220	U K 320	K 350		U K 190		B	U A 130	A	B	B	B	B								K 170
7		U K 195	U K 200		U K 110		U K 290	K 100	U K 150	K 150	F 115	125	B	R 120	U A 110	B							K 180	J K 330
8	J K 350		U K 150		U K 120	K 100	U K 100	K 100	U K 90	A	U R 100	R 105	F 125	A 120	A	A	K 120		K 125			U K 105		
9	U K 240	J K 270	U K 230				U K 170	U K 120	U K 100	U R 90	110	C	A	120	F 110	100		U K 120					U K 160	K 180
10									K 300	B	B	B	B	A	U A 120	B								K 100
11	K 185	K 300								B	U B 110	120	U A 130	120	C	B	U B 95							K 150
12		K 320								U K 215	K 170	U F 130	130	A 120	120	U A 105	95							K 150
13						K 360			K 260	B	B	B	B	A	A	A	U K 215	U K 160		U K 170				
14	U K 350	U K 320	U K 350	U K 260						A	B	K 240	A 205	185	B	B							U K 120	
15			U K 270		U K 310	U K 125	U K 170	K 105		B	K 170	A	U F 140	130	A	A			U K 150	U K 110		U K 120		K 180
16			U K 105						U K 140	B	80	U A 120	U A 130	A 120	U A 110	A								U K 160
17	U K 320		K 290	U K 290	U K 250	K 250				A	A	A	K 240	170	U A 125	A								
18	K 190	K 290	U K 290	K 310	U K 170	U K 180	U K 110	K 95	U K 220	A	A	B	B	Y	B	B						K 290	U K 200	
19	U K 240	U K 350				K 320				B	B	B	B	B	B	B								K 250
20		K 170	K 230	U K 290						B	B	B	B	B	B	B							K 150	K 180
21	K 260	U K 220	U K 190	U K 260	J K 300			U K 220	U K 230	K 170	B	B	B	B	B	B	U K 100	U K 100						U K 160
22	U K 150	U K 100		U K 210			K 110	U K 150	U K 120	B	B	B	110	U A 115	A 100	B								
23		J K 350								B	B	B	140	120	115	B						U K 150	K 150	K 105
24	U K 250	K 300		U K 220	U K 170	K 240			K 220	B	B	B	B	B	B	B					K 90	K 90	U K 100	U K 210
25	U K 220	U K 295	U K 150				K 150	K 150		B	B	U A 120	A	125	U F 160	A	U K 100							
26		K 250	K 280	U K 280			U K 210	U K 110	K 100	U A 100	100	U A 120	A	A	U A 115	B	K 110	U K 105	K 100					K 110
27	K 105	U K 250	U K 200							U K 220	K 220	150	U A 130	A 120	120	100	U K 105	U K 100	U K 105	K 100			K 95	
28	K 270	U K 250	K 210	U K 150	K 110	U K 150		U K 220		A	Y	B	U A 130	B	B	B					U K 110	J K 310		K 350
29										A	A	B	A	B	B	B	U K 150	U K 165			U K 100	K 130	K 110	U K 150
30	J K 380	U K 320					U K 180			A	A	U F 150	150	130	130	B		U K 200						U K 360
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	22	16	12	9	10	11	14	13	8	13	12	16	16	14	3	10	8	4	4	4	9	11	19
MED	K 240	K 250	U K 220	U K 260	U K 170	K 245	U K 170	U K 135	U K 140	U 128	115	U 128	140	120	U A 118	100	U K 108	U K 112	K 115	U K 115	K 105	K 130	K 150	K 170
UQ	K 295	K 300	K 285	U K 285	U K 300	K 320	U K 208	U K 175	U K 220	K 192	155	U F 150	155	130	U 120	102	U K 120	U K 162	K 138	U K 145	K 245	K 290	K 170	K 200
LQ	K 188	U K 220	U K 195	U K 215	U K 120	U K 150	U K 130	K 100	U K 100	U 100	110	120	130	A 120	U A 110	100	U K 100	U K 100	K 102	K 105	K 95	U K 120	K 115	K 150

The Radio Research Laboratories, Japan

JUN. 1977 | FOE (0.01 MHZ)

IONOSPHERIC DATA

JUN. 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	K 20	26	39	75	J A 39	J A 44	J A 26	J A 26	32	30	J A 34	40	30	J A 49	22	J A 23	20	15	15	B	22	29	J A 37	J A 81
2	36	J A 41	J A 41	J A 31	B	B	41	42	J A 41	B	B	E B 30	28	E B 26	B	E B 35	E B 15	E B 19	B	23	J K 38	J K 37	J A 40	J A 36
3	J K 35	45	B	43	J A 41	J A 31	K 20	21	B	B	26	20	G	E B 24	E B 24	E B 21	E B 16	B	B	18	B	B	47	K 12
4	19	K 22	K 32	J A 34	J A 38	J A 32	25	23	J A 29	30	30	J A 30	22	J A 31	30	18	16	E B 16	B	B	B	17	K 12	K 19
5	27	K 24	26	J A 34	J A 31	31	J A 45	39	J A 44	30	29	20	22	23	17	21	E B 22	E B 23	E B 21	E B 21	J A 57	35	19	B
6	27	J A 27	27	29	35	41	J A 44	58	32	37	30	30	E B 18	E B 36	B	E B 18	J A 23	J A 23	23	B	B	B	B	K 17
7	J A 24	J A 24	J A 39	J A 52	J A 26	J A 42	J A 33	18	19	K 15	19	20	E B 16	G	J A 24	E B 19	25	B	B	B	B	23	K 18	J K 33
8	J K 35	J A 30	20	21	J A 31	J A 23	22	J A 24	J A 30	34	15	J A 30	23	30	25	20	J A 24	13	17	B	B	K 10	18	24
9	J A 29	K 27	76	J A 52	J A 49	J A 41	J A 34	16	27	G	21	J A 65	J A 26	J A 26	20	32	J A 34	K 12	E B 11	B	B	31	30	20
10	30	J A 74	J A 74	J A 52	J A 52	J A 46	J A 49	J A 54	K 30	B	B	32	20	16	J A 29	E B 21	16	E B 11	27	J A 31	22	J A 22	20	20
11	K 18	K 30	50	J A 48	J A 41	J A 39	J A 41	37	B	46	20	J A 26	30	J A 25	15	32	J A 24	18	J A 24	J A 25	J A 54	J A 64	J A 31	21
12	J A 32	J A 36	J A 41	44	57	J A 61	60	54	J A 46	J A 34	24	16	J A 32	18	18	12	J A 28	12	E B 9	30	E B 9	Y	J A 24	K 15
13	J A 24	J A 31	J A 45	J A 46	J A 46	K 36	J A 44	J A 33	31	B	38	34	37	23	J A 30	25	24	23	J A 22	35	J A 20	16	25	J A 26
14	J A 42	J A 41	J A 42	J A 107	84	J A 52	85	75	71	J A 53	41	J A 33	28	G	E B 24	E B 26	B	B	B	B	B	21	17	J A 30
15	32	J A 39	38	38	K 31	47	J A 25	J A 24	E B 10	41	25	26	26	20	J A 44	J A 24	J A 24	J A 25	19	25	B	23	19	J A 36
16	J A 32	J A 31	26	J A 34	J A 58	53	J A 41	J A 31	J A 25	20	J A 22	J A 22	23	J A 21	30	17	20	J A 28	19	C	17	B	B	18
17	J A 42	J A 45	J A 53	J A 44	J A 41	J A 60	J A 38	J A 40	40	J A 54	J A 46	30	K 24	J A 24	30	J A 21	B	B	28	22	20	B	B	J A 32
18	40	36	J A 34	K 31	34	26	J A 26	38	J A 40	45	31	B	E B 28	Y	B	30	E B 20	B	B	B	J A 30	K 29	33	J A 39
19	31	41	48	B	42	K 32	54	54	J A 53	B	B	B	B	B	B	B	E B 27	E B 17	E B 17	30	B	21	42	29
20	J A 34	J A 40	32	J A 36	J A 54	54	55	54	35	J A 44	38	B	E B 29	E B 21	E B 25	E B 21	B	B	B	B	B	B	18	K 18
21	K 26	28	J A 29	J A 34	J K 30	J A 29	J A 42	J A 36	J A 29	K 17	B	B	B	29	25	E B 20	19	23	E B 12	B	B	B	B	J A 31
22	30	J A 22	J A 52	J A 30	J A 31	J A 35	J A 29	J A 32	31	30	27	26	J A 26	J A 38	34	J A 33	J A 23	17	17	B	B	J A 31	J A 41	4 A 31
23	C	J K 35	J A 74	C	J A 58	J A 43	B	36	J A 27	B	B	E B 20	G	16	G	E B 10	E B 15	12	B	13	B	22	K 15	J A 24
24	U K 25	K 30	J A 27	30	30	J A 30	J A 44	42	J A 36	40	B	B	B	B	E B 25	E B 18	B	E B 26	E B 17	E B 10	26	K 9	J A 51	30
25	28	J A 32	J A 79	50	J A 41	31	22	20	29	B	E B 29	20	16	32	36	25	J A 24	20	J A 29	B	B	B	B	B
26	B	K 25	J A 36	47	52	J A 54	J A 31	J A 24	12	23	27	J A 31	J A 78	47	J A 52	32	20	J A 24	J A 24	20	B	B	B	25
27	80	J A 40	J A 41	J A 38	J A 64	J A 53	J A 50	J A 48	J A 47	J A 39	K 22	20	J A 31	19	G	9	19	17	J A 23	J A 24	22	J A 23	J A 24	J A 24
28	K 27	30	27	J A 38	37	19	47	J A 49	J A 40	33	Y	E B 28	26	26	B	B	B	B	B	B	J A 39	J K 31	J A 33	K 35
29	J A 33	36	21	58	33	32	J A 50	50	J A 53	42	42	30	24	E B 25	B	E B 20	E B 15	21	25	E B 14	14	19	17	J A 29
30	J K 38	J A 82	45	J A 52	B	J A 36	25	J A 28	J A 32	J A 36	36	30	18	J A 24	15	E B 26	B	30	18	J A 17	B	B	19	J A 51
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	29	28	28	29	29	30	28	23	23	25	27	27	24	28	24	23	21	16	14	20	24	28
MED	30	J A 32	J A 39	J A 40	J A 41	J A 39	J A 41	36	J A 32	34	29	30	25	24	25	U 18	20	18	19	22	22	23	24	28
UQ	J 35	J A 40	J A 48	J A 51	J A 52	J A 47	J A 47	49	J A 40	42	35	30	28	29	30	25	J A 24	23	24	28	J A 38	31	J A 35	J A 32
LQ	26	27	29	J A 34	J 32	J A 31	J A 26	J A 24	29	30	22	20	21	19	U 17	E B 18	17	U 14	17	16	20	20	18	20

JUN. 1977 | FOES (0.1 MHZ)

IONOSPHERIC DATA

JUN. 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	K 20	U K 25	A A 39	A A 40	A A 39	A A 44	U K 22	U K 17	U K 12	G	G	G	G	G	12	11	U K 11	U K 9	E B 11	B	A A 22	A A 29	A A 37	A A 81
2	A A 36	A A 41	A A 41	A A 31	B	B	A A 41	A A 42	A A 41	B	B	E B 30	21	E B 26	B	E B 35	E B 15	E B 19	B	U K 12	K 38	J K 37	A A 40	A A 36
3	K 35	A A 45	B	A A 43	A A 41	A A 31	K 20	K 17	B	B	17	E C 14	G	E B 24	E B 24	E B 21	E B 16	B	B	A A 18	B	B	A A 47	K 12
4	A A 19	K 22	K 32	U K 19	A A 38	U K 25	18	U K 10	K 10	G	G	14	18	16	G	11	13	E B 16	B	B	B	A A 17	U K 12	K 19
5	A A 27	K 24	A A 26	A A 34	20	U F 12	20	A A 39	A A 44	22	13	18	G	12	11	E B 11	E B 22	E B 23	E B 21	E B 21	A A 57	B	A A 19	B
6	A A 27	U K 22	U K 20	K 22	U K 32	K 35	36	21	20	18	G	13	E B 18	E B 36	B	E B 18	E B 12	13	A A 23	B	B	B	B	K 17
7	A A 24	U K 19	U K 20	U F 15	A A 26	S 15	U K 29	12	U K 15	K 15	G	17	E B 16	G	G	E B 19	A A 25	B	B	B	B	A A 23	K 18	K 33
8	K 35	A A 30	12	U S 17	U K 12	13	U K 10	K 10	U K 9	11	G	G	11	11	16	11	K 12	12	K 12	B	B	U K 10	B	B
9	A A 29	K 27	A A 76	A A 52	A A 49	A A 41	U K 17	U K 12	U K 10	G	13	E C 15	18	11	G	G	11	U K 12	E B 11	B	B	B	A A 30	A A 20
10	16	A A 74	A A 74	A A 52	A A 52	A A 46	A A 49	A A 54	K 30	B	B	E Y 32	19	13	G	E B 21	15	E B 11	E B 10	A A 31	E B 10	A A 22	A A 20	17
11	K 18	K 30	A A 50	A A 48	A A 41	A A 39	A A 41	B	B	A A 46	12	G	G	G	11	E B 10	11	11	11	E B 10	B	B	B	A A 21
12	A A 32	A A 36	A A 41	A A 44	A A 57	A A 61	A A 60	A A 54	A A 46	U K 21	K 17	G	12	G	G	G	G	10	E B 9	A A 30	E B 9	Y	A A 24	K 15
13	A A 24	A A 31	A A 45	A A 46	A A 46	K 36	A A 44	A A 33	A A 31	B	A A 38	A A 34	33	19	16	21	U K 21	U K 16	A A 22	A A 35	A A 20	A A 16	A A 25	A A 26
14	A A 42	A A 41	A A 42	24	B	A A 52	B	A A 75	A A 71	A A 53	A A 41	K 24	22	G	E B 24	E B 26	B	B	B	B	B	A A 21	A A 17	A A 30
15	A A 32	A A 39	A A 38	A A 38	U K 31	19	U K 17	K 11	E B 10	A A 41	18	21	G	12	13	13	U F 12	E B 13	A A 19	A A 25	B	A A 23	A A 19	A A 36
16	A A 32	A A 31	A A 26	A A 34	A A 58	A A 53	22	18	U K 14	16	11	G	12	G	G	10	U S 17	A A 28	11	C	B	B	B	A A 18
17	A A 42	A A 45	K 29	A A 44	A A 41	27	33	A A 40	A A 40	A A 54	A A 46	24	K 24	G	G	16	B	B	A A 28	A A 22	A A 20	B	B	A A 32
18	A A 40	A A 36	A A 34	K 31	U K 17	U K 18	U K 11	K 9	U K 22	A A 37	A A 31	B	E B 28	Y	B	E B 25	E B 20	B	B	B	A A 30	K 29	24	A A 39
19	A A 31	A A 41	A A 48	B	A A 42	K 32	A A 54	A A 54	A A 53	B	B	B	B	B	B	B	E B 27	E B 17	E B 17	A A 30	B	B	B	A A 29
20	A A 34	K 17	25	U K 29	A A 54	A A 54	A A 55	A A 54	A A 35	A A 44	A A 38	B	E B 29	E B 21	E B 25	E B 21	B	B	B	B	B	B	A A 18	K 18
21	U K 26	A A 28	A A 29	A A 34	K 30	E C 20	A A 42	U K 22	U K 23	K 17	B	B	B	18	16	E B 20	U K 10	U K 10	E B 12	B	B	B	B	A A 31
22	A A 30	A A 22	A A 52	U K 21	A A 31	17	17	U K 15	U K 12	23	16	E B 13	15	G	11	U A 20	16	12	15	B	B	A A 31	A A 41	A A 31
23	C	K 35	A A 74	C	A A 58	A A 43	B	A A 36	21	B	B	E B 20	G	G	G	E B 10	E B 15	E B 11	B	E B 10	B	A A 22	K 15	17
24	U K 25	K 30	24	A A 30	A A 30	23	A A 44	B	23	A A 40	B	B	B	B	E B 25	E B 18	B	E B 26	E B 17	E B 10	K 9	K 9	A A 23	A A 30
25	A A 28	A A 32	18	A A 50	A A 41	A A 31	13	K 15	22	B	E B 29	12	12	G	20	12	15	12	A A 29	B	B	B	B	B
26	B	K 25	A A 36	38	A A 52	A A 54	U K 21	U K 11	K 10	10	9	G	40	14	13	12	K 11	K 10	12	13	B	B	B	A A 25
27	A A 80	A A 40	A A 41	A A 38	A A 64	A A 53	A A 50	A A 48	A A 47	U K 22	K 22	K 15	G	10	G	9	K 10	K 10	U K 10	K 10	B	S	A A 24	S
28	K 27	U K 25	K 21	U K 15	16	U K 15	A A 47	U K 22	16	A A 33	Y	E B 28	12	16	B	B	B	B	B	B	A A 39	K 31	A A 33	K 35
29	A A 33	A A 36	B	B	A A 33	A A 32	A A 50	A A 50	A A 53	A A 42	A A 42	27	20	E B 25	B	E B 20	E B 15	U K 16	E B 13	E B 14	A A 14	A A 19	A A 17	A A 29
30	K 38	A A 82	A A 45	A A 52	B	A A 36	19	20	18	A A 36	20	G	18	G	G	E B 26	B	A A 30	E B 13	A A 17	B	B	A A 19	A A 51
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	28	27	27	29	28	28	28	23	23	25	27	27	24	28	24	23	21	16	11	15	21	26
MED	A A 30	A A 31	A A 37	A A 34	A A 41	A A 32	31	22	22	22	16	E G 15	U 14	E G 11	E G 11	E B 17	U 13	11	12	16	A A 20	A A 22	A A 23	A A 29
UQ	A A 35	A A 40	A A 45	A A 44	A A 50	A A 44	A A 46	A A 45	A A 40	A A 40	30	U 20	19	U 14	U 14	E B 21	16	U 14	U 17	A A 28	A A 34	A A 29	A A 30	A A 33
LQ	A A 26	K 25	26	26	30	20	K 18	K 14	K 13	16	10	G	E G 11	G	G	11	11	11	E B 11	10	12	A A 18	A A 18	18

The Radio Research Laboratories, Japan

JUN. 1977 | FBES (0.1 MHZ)

IONOSPHERIC DATA

JUN. 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	13	10	8	12	10	11	11	10	8	8	10	11	11	11	10	10	10	9	11	B	7	11	10	12
2	11	12	17	11	B	B	28	16	15	B	B	30	16	26	B	35	15	19	B	11	9	E C 11	E C 12	9
3	10	11	B	17	13	13	11	11	B	B	16	E C 14	13	24	24	21	16	B	B	12	B	B	12	10
4	10	10	9	10	11	12	10	8	6	7	10	9	7	6	10	10	12	16	B	B	B	10	9	8
5	6	6	6	6	11	8	E C 9	11	12	12	12	12	12	10	6	11	22	23	21	21	13	21	13	B
6	12	11	12	10	6	17	29	12	12	12	11	12	18	36	B	18	12	11	17	B	B	B	B	9
7	10	10	6	9	6	8	9	6	10	10	10	12	16	11	10	19	20	B	B	B	B	12	9	8
8	10	E S 8	10	10	6	9	8	6	6	7	6	10	10	9	10	9	7	11	12	B	B	8	11	17
9	E S 13	9	23	12	12	10	10	10	8	7	6	E C 15	6	8	9	9	8	10	11	B	B	14	E S 12	E S 12
10	10	10	14	10	16	15	13	17	24	B	B	21	17	12	10	21	13	11	10	11	10	11	12	9
11	10	6	12	13	E S 13	13	E S 13	29	B	13	11	10	10	11	E C 10	10	10	10	10	9	11	11	11	9
12	10	10	11	11	E S 15	21	13	12	11	10	10	11	9	8	10	10	8	8	9	12	9	Y	8	E
13	10	9	10	10	10	11	12	9	6	B	24	24	18	13	11	14	13	12	12	14	10	12	7	10
14	10	10	10	10	51	12	34	19	18	11	27	12	11	17	24	26	B	B	B	B	B	12	11	8
15	E S 12	10	11	10	10	10	10	10	10	14	14	15	11	11	10	10	10	13	12	11	B	12	10	9
16	7	E C 9	8	10	10	10	9	11	E S 10	10	6	5	5	6	10	9	8	8	10	C	15	B	B	12
17	10	11	10	10	10	10	10	11	11	11	12	13	13	12	10	11	B	B	21	13	15	B	B	14
18	10	10	10	10	11	11	10	7	11	12	14	B	28	Y	B	25	20	B	B	B	12	6	11	12
19	11	11	13	B	16	16	13	19	22	B	B	B	B	B	B	B	27	17	17	17	B	27	39	12
20	10	10	10	11	15	16	12	12	17	15	27	B	29	21	25	21	B	B	B	B	B	B	11	9
21	6	9	E C 10	10	12	E C 20	11	10	11	11	B	B	B	15	14	20	10	10	12	B	B	B	B	10
22	7	6	6	6	6	7	8	5	E C 7	13	13	13	9	8	6	10	13	11	11	B	B	11	9	E C 16
23	C	9	11	C	14	10	B	29	11	B	B	20	13	10	10	10	15	11	B	10	B	8	12	7
24	8	E S 8	10	10	11	12	11	26	18	30	B	B	B	B	25	18	B	16	17	10	6	7	8	8
25	10	10	6	21	16	12	10	10	13	B	29	11	11	11	9	8	6	11	14	B	B	B	B	B
26	B	11	11	10	14	12	10	9	8	6	6	E C 7	7	7	10	11	10	7	8	11	B	B	B	10
27	10	9	10	10	11	11	11	12	12	10	9	11	8	6	6	6	9	9	10	9	13	12	7	E S 16
28	8	E S 9	9	11	8	7	27	10	10	10	Y	28	7	15	B	B	B	B	B	B	11	E S 9	10	E S 16
29	11	15	19	28	15	11	14	11	10	10	13	26	17	25	B	20	15	13	13	14	10	12	10	9
30	10	10	16	17	B	11	10	11	10	8	14	11	11	10	E C 11	26	B	20	13	13	B	B	9	13
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	29	30	30	30	30	30	30	29	30	30	29	30	30	30	30	30	29	30	29	30	30
MED	10	10	10	10	12	11	11	11	11	12	13	12	12	11	10	12	13	12	14	17	B	12	11	10
UQ	10	10	12	12	15	13	13	12	15	30	27	26	17	17	25	21	22	23	B	B	B	B	13	12
LQ	10	9	9	10	10	10	10	10	10	10	10	11	9	9	10	10	10	10	11	11	11	11	9	9

JUN. 1977 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

JUN. 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	295	F 285	A	A	A	A	F 300	J R 305	U F 300	F 310	J F 315	J F 305	F	F	F	J F 365	F	J F 320	F 315	B	A	A	A	A
2	A	A	A	A	B	B	A	A	A	B	B	F 295	F	310	B	R	F	U F 310	B	J F 300	A	A	A	A
3	A	A	B	A	A	A	R	F	B	B	F	F 325	F 345	F 345	F	F	F 345	B	B	A	B	B	A	Y
4	A	A	A	F	A	F	F 290	F 305	U F 290	F 310	J F 295	J F 340	F	F	F	F	F 365	325	B	B	B	A	R	A
5	A	A	A	A	F	F	F	A	A	F	J F 295	U F 345	F 340	F	F 340	J F 325	F 290	U F 295	F 285	F	A	B	A	B
6	A	F	F 325	F	R	F	325	F 280	F 260	F	F	F	U F 345	F	B	F	F 345	F 340	A	B	B	B	B	A
7	A	F	F 330	F	A	F	S	F	F	F	J F 310	J F 315	F	R 355	F	U F 355	A	B	B	B	B	A	A	A
8	A	A	F	F	A	F	U F 255	F 295	F 310	U F 280	J F 320	F 345	F 345	F 370	J F 325	F 365	F 350	U F 335	U F 335	B	B	F	B	B
9	A	A	A	A	A	A	F 295	F 300	F 320	J F 320	U F 315	J F 325	F	F	F	F	J F 350	F	350	B	B	B	A	A
10	F 300	A	A	A	A	A	A	A	R	B	B	Y	F 335	F 335	F 330	F 335	F 315	F 330	F 315	A	F	A	A	F
11	A	A	A	A	A	A	A	B	B	A	F	J F 325	F 345	F 370	F 325	J F 350	F 355	325	F	A	B	B	B	A
12	A	A	A	A	A	A	A	A	A	U F 270	U F 300	F 345	J F 345	F 365	F 340	J F 360	F 350	F 325	F	A	R 390	Y	A	S
13	A	A	A	A	A	A	A	A	A	B	A	A	F	J F 345	F 340	J F 335	F 365	F 330	A	A	A	A	A	A
14	A	A	A	U F 335	B	A	B	A	A	A	A	F 300	F 315	355	F 360	F 335	B	B	B	B	B	A	A	A
15	A	A	A	A	A	U F 270	F 290	F 295	F 285	A	305	F	F	F	F	F	F	F	A	A	B	A	A	A
16	A	A	A	A	A	A	F	F	F 265	U F 265	J F 310	J F 315	J F 340	F	F	J F 355	F	A	A	C	B	B	B	A
17	A	A	305	A	A	S 270	A	A	A	A	A	F 320	F	F 340	F	J F 355	B	B	A	A	A	B	B	A
18	A	A	A	A	U F 295	F 295	J F 290	J F 295	F	A	A	B	F 325	Y	B	U F 355	F	B	B	B	A	A	A	A
19	A	A	A	B	A	A	A	A	A	B	B	B	B	B	B	B	U R 325	F	R 300	A	B	B	B	A
20	A	A	F	F	A	A	A	A	A	A	A	B	U R 320	F 335	F	F 355	B	B	B	B	B	B	A	A
21	S	A	A	A	A	J C 275	A	295	F	F	B	B	B	F 350	F 340	F 360	U F 315	F 345	F 315	B	B	B	B	A
22	A	A	A	F	A	S	S	S	S	F 285	U F 320	F 350	J R 340	F	J F 335	J F 340	U R 325	F 260	F 290	B	B	A	A	A
23	C	A	A	C	A	A	B	A	U F 265	B	B	F 350	F 335	U F 340	F 315	F 360	U F 320	J F 320	B	F	B	A	Y	F
24	A	A	F	A	A	A	A	B	F	A	B	B	B	B	335	395	B	305	F 345	F	F	410	A	A
25	A	A	F	A	A	A	U H 280	300	F	B	F 325	J F 340	F 350	F 350	F	J F 350	F	F 350	A	B	B	B	B	B
26	B	A	A	F	A	A	F	J S 280	J R 290	J R 280	F	F	J F 335	J F 345	J F 355	J F 340	345	F 315	F 325	F	B	B	B	A
27	A	A	A	A	A	A	A	A	A	J F 305	F	U F 315	J F 335	J F 355	J F 345	J F 345	F	F 340	F 365	R	B	S	A	S
28	A	F	F	F	F	F 295	A	F	F	A	Y	U F 275	F	F	B	B	B	B	B	B	A	A	A	A
29	A	A	B	B	A	A	A	A	A	A	A	F 295	U F 345	355	B	F 355	F 340	F	F 315	F 335	A	A	A	A
30	A	A	A	A	B	A	F 285	A	F 285	A	F 295	F	F	F 330	J F 325	320	B	A	305	A	B	B	A	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	2	1	3	1	1	5	9	10	10	9	12	19	17	18	14	22	16	17	13	2	1	1		
MED	298	285	F 325	U F 335	U F 295	F 275	F 290	F 295	F 288	F 285	F 310	F 325	F 340	F 348	F 338	F 355	F 345	F 325	F 315	F 318	R 390	410		
UQ			F 328			F 295	F 295	F 300	F 300	F 310	F 318	F 342	F 345	F 355	F 340	F 360	F 350	F 335	F 335					
LQ			315			270	F 285	F 295	F 265	U F 280	F 298	F 310	F 335	F 340	F 325	J F 340	F 322	F 315	F 305					

JUN. 1977 | M(3000)F2 (0.01)

IONOSPHERIC DATA

JUN. 1977 | H'F2 (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																								
2																								
3																								
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28																								
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

JUN. 1977 | H'F2 (KM)

IONOSPHERIC DATA

JUN. 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 2.5 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	400	A	A	A	A	350	300	265	285	250	230	Q 225	Q 200	200	200	U H 200	230	B	B	A	A	A	B
2	A	A	B	A	B	B	B	A	A	B	B	B	240	250	B	B	Q 230	255	B	Q 285	A	A	A	A
3	A	A	B	A	A	A	R	A	B	B	305	245	230	220	205	230	250	B	B	A	B	B	A	Y
4	A	A	A	A	A	A	345	295	270	300	240	A 220	200	200	220	225	215	B	B	B	B	A	R	A
5	A	A	A	A	A	A	A	A	A	A	295	230	220	220	225	215	E B 295	B	E B 320	B	A	B	A	B
6	A	315	Q 300	U Q 310	R	U Q 290	A 280	Q 340	Q 345	U Q 315	275	230	225	B	B	215	230	245	A	B	B	B	B	A
7	A	U Q 330	300	A	A	A	350	325	H 315	U Q 370	265	225	200	205	210	E B 250	B	B	B	B	B	A	A	A
8	A	A	S	S	A	A	350	305	280	E A 300	250	200	215	200	195	205	230	Q 250	Q 245	B	B	S	B	B
9	A	A	A	A	A	A	325	300	270	240	250	220	H 215	200	215	200	Q 185	325	B	B	B	B	A	A
10	E A 315	A	A	A	A	A	A	A	R	B	B	A	250	230	225	B 230	A 260	Q 270	E B 250	A	B	A	A	A
11	A	A	A	A	A	A	A	B	B	A	250	220	205	205	200	205	200	A	A	B	B	B	B	A
12	A	A	A	A	A	B	A	A	A	430	300	230	220	200	210	200	210	U Q 220	B	B	B	Y	A	S
13	A	A	A	A	A	A	A	A	A	B	A	A	A	230	220	235	240	280	A	A	A	A	A	A
14	A	A	A	U A 285	B	A	B	A	A	A	B	320	250	230	225	280	B	B	B	B	B	A	A	A
15	A	A	A	A	A	A	350	310	300	A	305	250	210	205	210	205	A	B	A	A	B	A	A	A
16	A	A	A	A	A	A	A	A	355	A	Q 275	230	205	210	210	180	A	A	A	C	B	B	B	A
17	A	A	375	A	A	400	A	A	A	A	A	A 300	275	225	210	205	B	B	B	A	B	B	B	B
18	A	A	A	A	350	345	290	290	Q 360	A	A	B	B 270	Y	B	B 230	310	B	B	B	A	A	A	A
19	A	A	A	B	A	A	A	A	B	B	B	B	B	B	B	B	E B 270	250	B	B	B	B	B	A
20	A	A	A	345	A	A	A	A	B	A	B	B	255	230	245	225	B	B	B	B	B	B	A	A
21	Y	A	A	A	A	C	A	350	415	350	B	B	B	225	225	230	225	250	E B 260	B	B	B	B	A
22	A	A	A	Q 405	A	350	315	U H 275	280	A	Q 250	Q 225	200	205	210	210	A	A	E B 300	B	B	A	A	A
23	C	A	A	C	A	A	B	B	365	B	B	295	230	205	220	215	E B 240	255	B	B	B	A	Y	A
24	A	A	A	A	A	A	A	B	A	B	B	B	B	B	230	B 220	B	B	E B 250	B	275	220	A	A
25	A	A	A	B	A	A	U H 355	310	A	B	270	210	205	H 195	Q 200	200	Q 270	Q 240	A	B	B	B	B	B
26	B	A	A	A	A	A	A	300	275	275	225	200	230	225	200	205	Q 245	H 250	260	A 250	B	B	B	A
27	A	A	A	A	A	A	A	A	A	280	250	220	205	200	H 250	200	230	205	Q 225	A	B	S	A	S
28	A	A	U A 320	Q 305	Q 350	340	A	U Q 375	E A 350	A	Y	E B 320	210	Q 225	B	B	B	B	B	B	A	A	A	A
29	A	A	B	B	A	A	A	A	A	A	A	E B 330	235	245	B	230	270	Q 300	B	E B 250	A	A	A	A
30	A	A	A	A	B	A	A	A	E A 360	A	A 300	245	200	215	205	B	B	A	B	A	B	B	A	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	2	3	4	5	2	5	10	13	15	10	17	22	26	26	24	26	20	15	8	3	1	1		
MED	332	330	310	Q 310	350	345	348	305	U 298	300	265	229	220	212	210	214	232	250	E B 255	250	275	220		
UQ		365	348	Q 345		350	350	325	354	350	295	248	235	225	225	230	256	262	E B 280	268				
LQ		322	300	U Q 305		340	315	300	278	278	250	220	205	200	205	205	220	242	236	250				

The Radio Research Laboratories, Japan

JUN. 1977 | H'F (KM)

IONOSPHERIC DATA

JUN. 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	K 125	K 125	120	180	120	100	K 105	K 115	K 115	100	120	100	100	100	115	100	K 180	K 100	130	B	140	115	110	100
2	105	105	105	K 110	B	B	100	100	105	B	B	B	115	B	B	B	B	B	B	K 160	K 110	K 110	K 100	100
3	K 105	K 130	B	100	105	110	K 120	K 120	B	B	105	120	G	B	B	B	B	B	B	150	B	B	115	K 110
4	K 140	K 105	K 105	K 100	100	K 100	110	K 105	K 100	120	120	105	100	100	100	100	100	B	B	B	B	K 130	K 155	K 145
5	K 120	K 105	105	110	110	100	120	95	100	100	105	115	120	130	105	110	B	B	B	B	115	115	145	B
6	K 160	K 105	K 120	K 130	K 120	K 125	120	K 125	100	105	100	105	B	B	B	B	100	95	165	B	B	B	B	K 150
7	140	K 140	K 100	110	K 100	105	K 110	K 130	K 105	K 110	105	145	B	G	100	B	100	B	B	B	B	120	K 150	K 100
8	K 110	110	K 120	110	K 100	K 95	K 100	K 100	K 100	100	150	100	125	100	100	100	K 100	140	K 135	B	B	K 130	190	160
9	K 135	K 105	K 105	100	100	100	K 110	K 130	K 100	G	100	105	100	110	150	100	100	K 165	B	B	B	115	K 95	K 180
10	100	115	100	100	100	105	105	130	K 150	B	B	105	115	110	100	B	100	B	105	105	125	110	130	K 125
11	K 105	K 100	100	100	100	100	100	115	B	130	105	135	105	100	105	100	175	160	95	95	110	130	105	K 170
12	120	K 100	100	100	100	100	95	100	100	K 100	K 110	110	100	100	130	130	100	130	B	95	B	Y	140	K 140
13	130	120	105	100	100	K 100	100	100	K 100	B	100	100	100	110	100	105	K 105	K 110	110	K 120	110	180	130	120
14	K 110	K 115	K 105	K 105	135	95	120	95	100	95	105	K 110	100	G	B	B	B	B	B	B	B	125	K 145	110
15	120	110	K 130	120	K 115	K 105	K 95	K 95	B	105	K 120	125	115	105	100	100	100	155	K 170	K 115	B	K 120	135	K 130
16	110	115	K 115	115	100	100	100	105	K 110	150	125	130	100	100	100	110	150	100	100	C	110	B	B	K 120
17	K 110	110	K 110	K 110	K 110	K 105	100	120	100	95	100	100	K 100	100	95	100	B	B	105	105	100	B	B	125
18	K 125	K 105	K 105	K 105	K 110	K 130	K 150	K 95	K 100	130	100	B	B	Y	B	125	B	B	B	B	120	K 110	K 130	105
19	K 100	K 100	105	B	100	K 105	100	100	100	B	B	B	B	B	B	B	B	B	B	125	B	140	175	K 150
20	110	K 110	K 105	K 100	100	100	100	100	100	100	120	B	B	B	B	B	B	B	B	B	B	B	K 190	K 125
21	K 105	K 115	K 105	K 110	K 110	110	100	K 105	K 110	K 110	B	B	B	105	105	B	K 110	K 120	B	B	B	B	B	K 100
22	K 110	K 125	115	K 115	100	100	K 105	K 100	K 100	110	115	120	120	110	100	100	100	105	110	B	B	130	105	105
23	C	K 105	105	C	100	100	B	100	105	B	B	B	G	130	G	B	B	125	B	125	B	K 180	K 165	K 130
24	K 105	K 105	110	K 150	K 125	K 100	100	100	K 130	100	B	B	B	B	B	B	B	B	B	B	K 100	B	K 140	K 105
25	K 145	K 105	K 140	100	100	100	K 120	K 120	95	B	B	100	105	100	100	100	K 100	110	115	B	B	B	B	B
26	B	K 110	K 140	K 130	100	100	K 105	K 105	K 105	100	130	115	100	100	100	120	K 105	K 150	K 100	100	B	B	B	K 145
27	K 160	K 190	K 105	K 100	100	100	100	100	110	K 100	K 100	155	100	125	G	100	K 145	K 130	K 125	K 95	115	150	K 95	110
28	K 105	K 115	K 130	K 160	K 100	K 115	120	K 130	110	100	Y	B	115	120	B	B	B	B	B	B	K 110	K 105	105	K 110
29	100	100	100	105	105	90	100	95	95	100	100	110	105	B	B	B	B	K 110	100	B	K 115	K 115	K 150	K 100
30	K 110	K 110	105	100	B	100	K 110	110	105	100	100	110	120	95	110	B	B	K 125	130	125	B	B	140	K 115
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	29	28	28	29	29	30	27	22	22	22	21	20	18	16	17	17	15	13	13	19	24	28
MED	K 110	K 110	K 105	108	100	100	105	102	100	100	105	110	105	102	100	100	100	125	110	115	110	120	138	K 120
UQ	K 128	K 115	K 115	K 115	K 110	105	K 110	K 120	K 108	110	120	120	115	110	105	110	K 110	140	130	125	115	130	K 150	K 142
LQ	K 105	K 105	105	100	100	100	100	100	100	100	100	105	100	100	100	100	100	K 110	102	100	110	115	108	K 105

JUN. 1977 | H'ES (KM)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

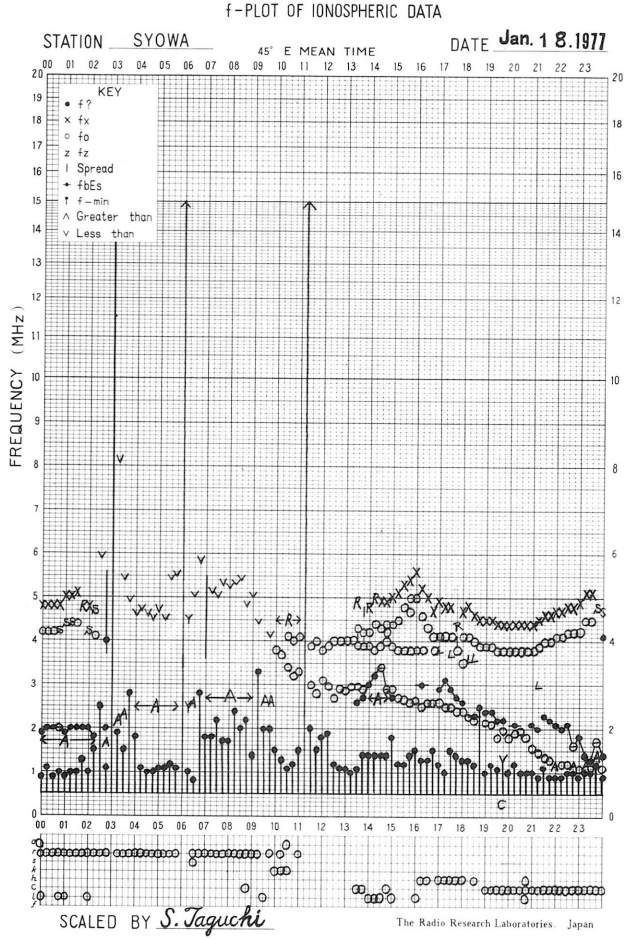
JUN. 1977 | TYPES OF ES | 45° E Mean Time (G. M. T. + 3 h)

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	K 1	CK 31	R 5	AR 12	RA 21	R 2	RK 13	RK 31	CK 21	LA 11	CL 11	RA 11	CA 11	RA 11	R 1	C 1	HK 11	CK 11	F 1		R 1	R 2	R 5	RA 11
2	RS 11	R 1	R 1	RK 13			F 1	RF 11	R 1				C 1							HAK 11	K 4	K 5	RK 53	R 5
3	K 5	RAK 11		R 1	R 2	R 2	K 1	RK 11			C 1	C 1								F 1			F 1	K 1
4	HK 11	K 2	K 4	RKA 12	RA 31	RK 33	RA 11	CK 11	LK 21	CL 11	CA 11	C 2	C 4	C 2	CH 11	L 2	F 1					CK 11	K 1	KA 11
5	CKA 11	KA 51	RA 11	F 3	R 2	FR 11	FF 41	F 1	R 1	R 2	R 1	C 1	CL 11	HC 11	R 1	C 1					FA 11	F 1	F 1	
6	HK 11	RK 11	RKL 11	HK 11	RKC 13	CK 11	F 1	ACK 11	RA 11	R 1	RA 11	C 1					F 1	F 1	F 1					K 1
7	RF 11	RCK 11	RK 11	F 2	RK 31	RA 11	RK 13	HAK 11	RAK 11	KA 11	CA 11	HA 11			C 1		F 1					F 1	K 1	KA 71
8	KS 61	RF 11	K 1	F 1	LK 21	LKA 11	LHK 11	LK 11	LCK 11	C 2	H 1	L 1	CC 11	C 1	LH 11	L 1	LK 11	F 1	HK 11			K 1	A 1	F 1
9	RK 13	K 6	CKA 11	R 2	R 3	R 4	RK 21	HKC 11	LHK 11		LR 11	C 1	C 1	C 1	RA 11	C 1	F 1	K 1				F 1	LK 11	HK 11
10	FR 11	F 4	R 1	R 3	R 1	RF 21	RA 21	RR 11	K 1			R 1	C 1	R 1	L 1		F 1		R 1	F 1	R 1	R 2	R 1	RK 11
11	K 1	K 7	R 2	R 3	R 3	R 3	R 2	R 1		HC 11	C 1	H 1	C 1	C 1	C 1	L 1	H 1	F 1	F 1	F 1	F 1	FF 13	F 2	HK 11
12	RA 31	RK 41	R 3	R 3	R 2	R 1	R 2	R 2	R 3	RK 31	CK 13	C 1	C 1	C 1	HC 11	R 1	L 1	R 1		F 1			RAF 11	K 1
13	RA 11	RA 11	R 3	R 3	R 4	K 4	R 3	R 3	LK 13		R 1	L 1	R 1	RL 11	L 1	R 2	RK 11	RK 11	F 1	CK 11	RF 11	F 1	RA 11	RA 11
14	RK 16	RK 16	RK 33	CK 34	F 1	R 1	F 1	R 1	R 1	R 3	R 1	RK 12	CH 11									F 1	HK 11	R 2
15	RA 11	R 2	RCK 12	R 2	K 3	LRK 12	LRK 12	LHK 11		R 1	RK 11	R 1	CA 11	RA 11	C 1	C 1	FA 11	A 1	HK 11	RK 21		CRK 11	RF 11	HK 11
16	RA 11	RA 11	RAK 11	R 3	R 5	R 3	R 3	R 3	RK 21	RA 11	CH 11	HC 11	L 2	LA 11	LA 11	C 1	RA 11	F 3	F 1		F 1			RK 11
17	RK 66	R 4	RK 22	RK 16	CK 55	CK 31	R 2	RF 11	R 1	R 1	R 1	L 1	K 1	L 1	LA 11	C 1			F 1	F 1	F 1			R 2
18	CK 53	CK 65	CK 77	K 6	RAK 11	RL 11	RCK 11	LRK 11	RAK 11	AR 11	C 1					C 1					RA 11	KS 71	RK 11	R 4
19	RK 22	RK 44	R 3		F 2	K 1	R 2	R 2	R 1											F 1		F 1	F 1	HK 11
20	RA 11	CK 32	CK 44	RK 31	R 2	R 2	R 2	R 3	R 1	RA 11	C 1												HK 11	K 1
21	K 5	CK 23	RK 33	CK 33	K 3	RA 11	RA 21	RK 11	RK 31	K 1				C 1	C 1		CK 11	CK 11						LK 11
22	CK 11	CRK 11	FF 11	CK 21	F 1	R 1	RK 21	LK 21	LK 21	C 1	C 1	C 1	R 1	C 1	C 1	C 1	F 1	R 1	F 2			RA 11	R 6	R 1
23		K 6	R 2		R 2	R 2		R 1	R 2					H 1				F 1		F 1		RKA 11	K 1	CKA 11
24	K 2	K 7	R 2	HK 11	RK 21	RK 21	R 2	R 1	HCK 11	R 1											LK 11	K 1	HRK 11	RK 11
25	RKC 11	RK 21	HRK 13	R 1	R 2	R 2	RK 11	RK 12	F 1			L 1	C 1	C 1	C 1	C 1	CAK 11	F 1	F 1					
26		K 1	RK 12	RK 13	R 2	R 2	RK 31	CCK 21	CAK 11	CA 11	HC 11	CA 11	L 5	C 4	C 2	R 1	CHK 11	HCK 11	CK 11	F 2				HK 11
27	HHK 11	HK 11	RK 43	F 2	R 3	R 3	R 3	R 1	RF 11	RK 21	K 4	R 1	LC 11	CL 11		L 1	HK 11	HK 11	CK 11	LK 11	F 1	F 1	LHK 11	F 1
28	KA 11	RK 31	HK 12	ALK 11	LAK 11	CAK 31	FS 11	ARK 11	RA 11	R 1			RL 11	C 1							CK 11	K 4	R 6	KA 11
29	RS 11	R 1	F 1	R 1	R 2	F 1	R 2	R 1	R 1	R 1	R 1	C 1	C 1				K 1	RK 11	F 1		CK 11	CK 11	HK 11	LHK 11
30	K 7	CK 17	R 1	R 1		R 2	RK 22	R 4	R 3	R 4	R 1	R 1	C 1	LC 11	C 1			CK 11	F 1	F 1			RA 11	RAK 31
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

JUN. 1977 | TYPES OF ES


f-PLOT OF IONOSPHERIC DATA
STATION SYOWA
45° E MEAN TIME
DATE Jan. 18.1977
KEY
• f?
× fx
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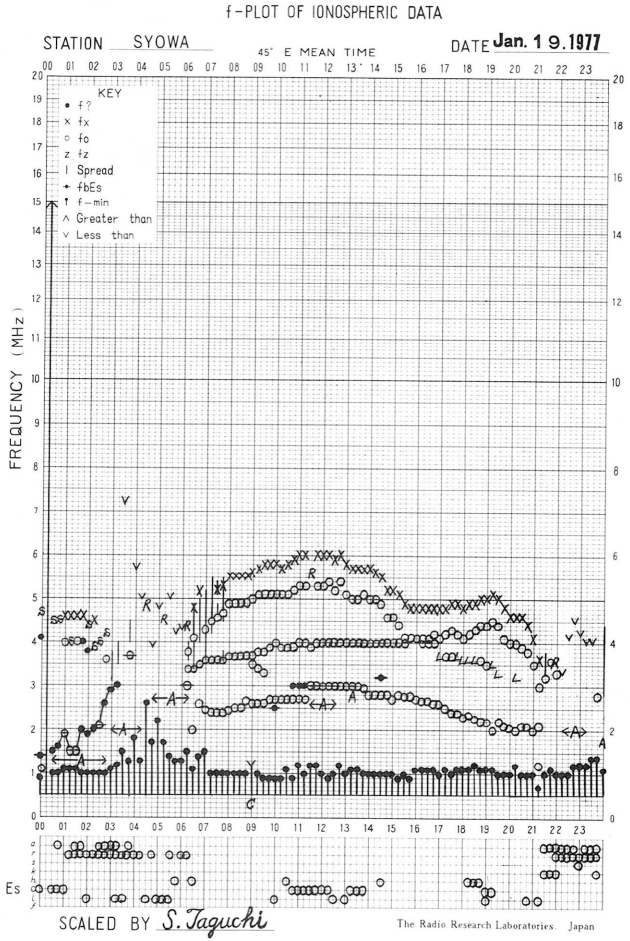
z fz
| Spread
+ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION SYOWA
45° E MEAN TIME
DATE Jan. 19.1977
KEY
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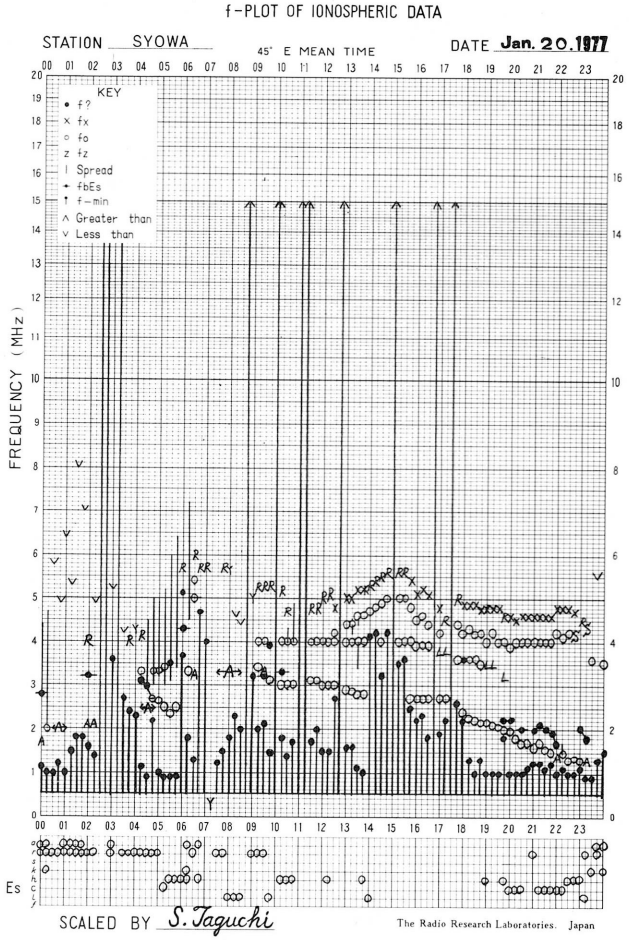
FREQUENCY (MHz)
Es
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan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KEY
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FREQUENCY (MHz)
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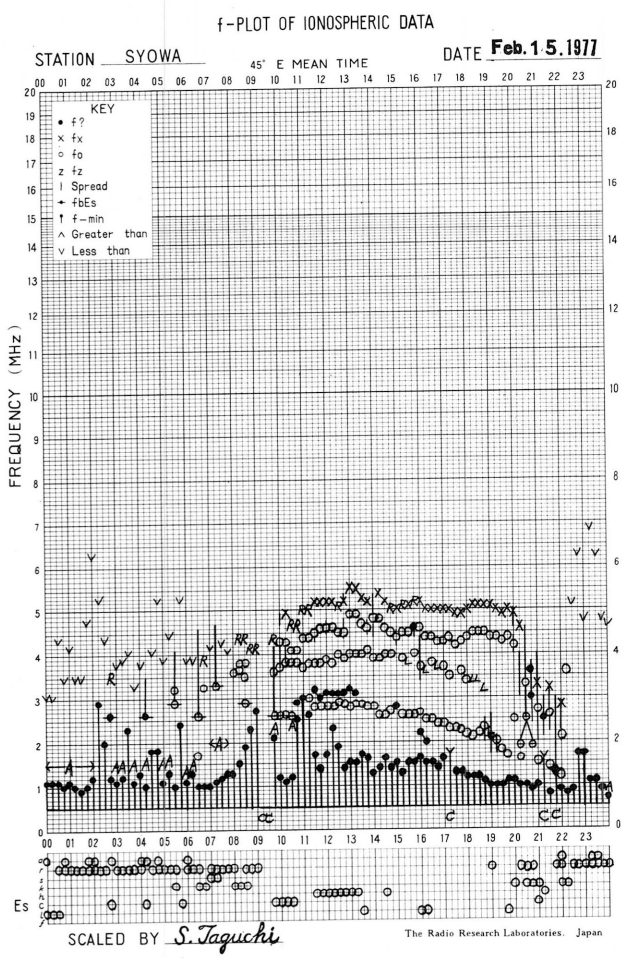
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION SYOWA
45° E MEAN TIME
DATE Feb. 15. 1977
KEY
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○ fo
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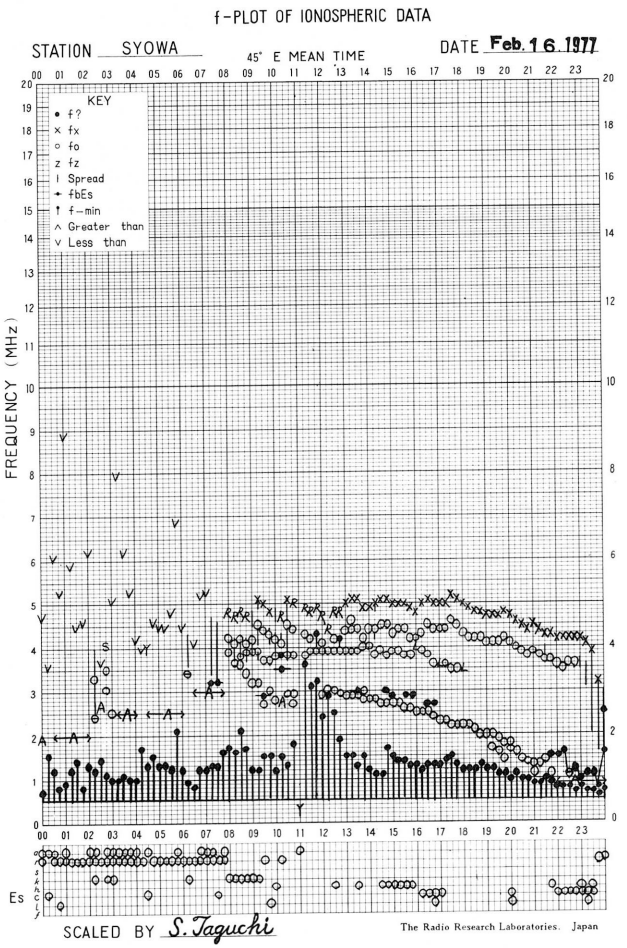
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan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DATE Feb. 16. 1977
KEY
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FREQUENCY (MHz)
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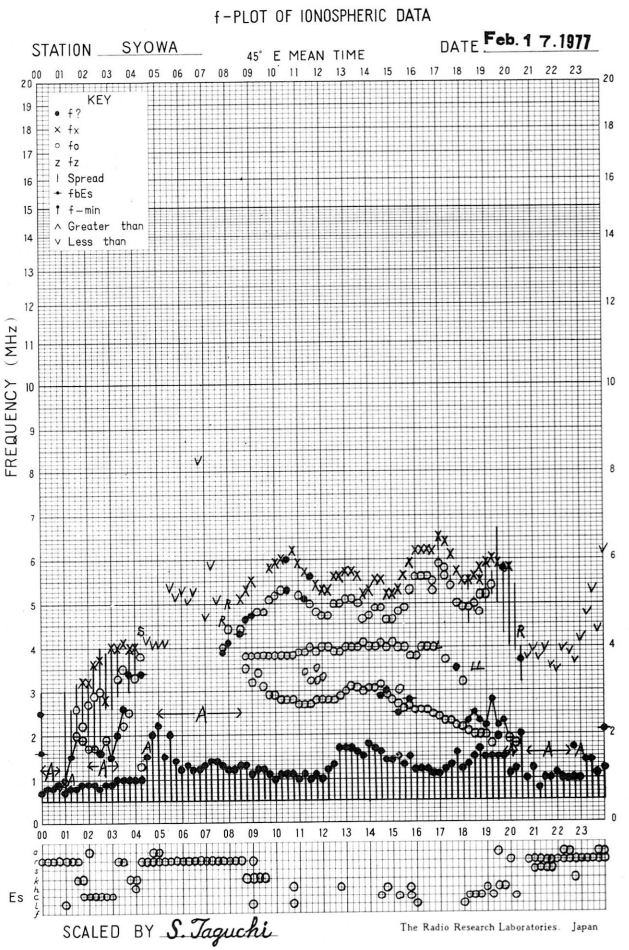
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan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DATE Feb. 17. 1977
KEY
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FREQUENCY (MHz)
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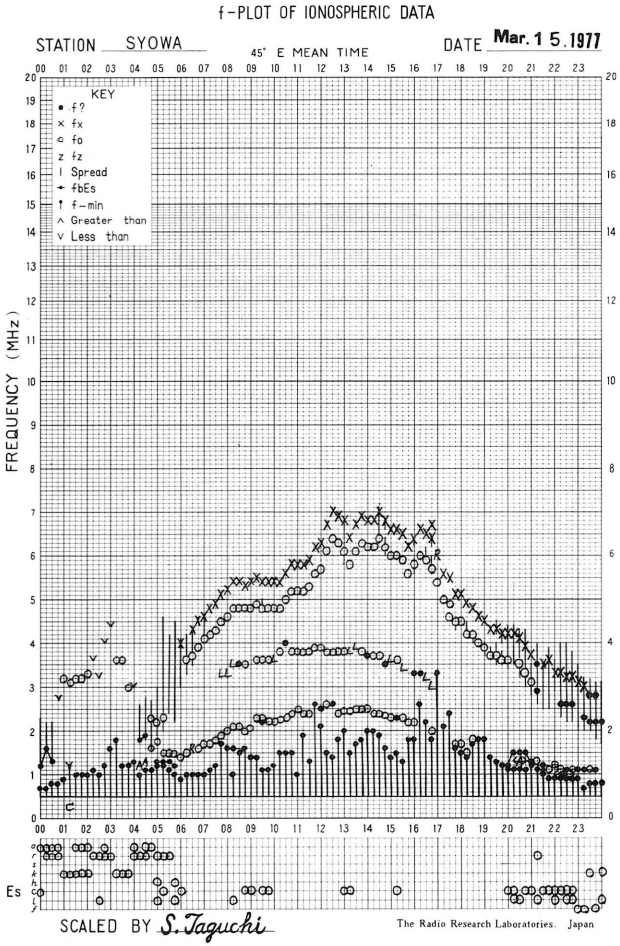
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION SYOWA
45° E MEAN TIME
DATE Mar. 15. 1977
KEY
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○ fo
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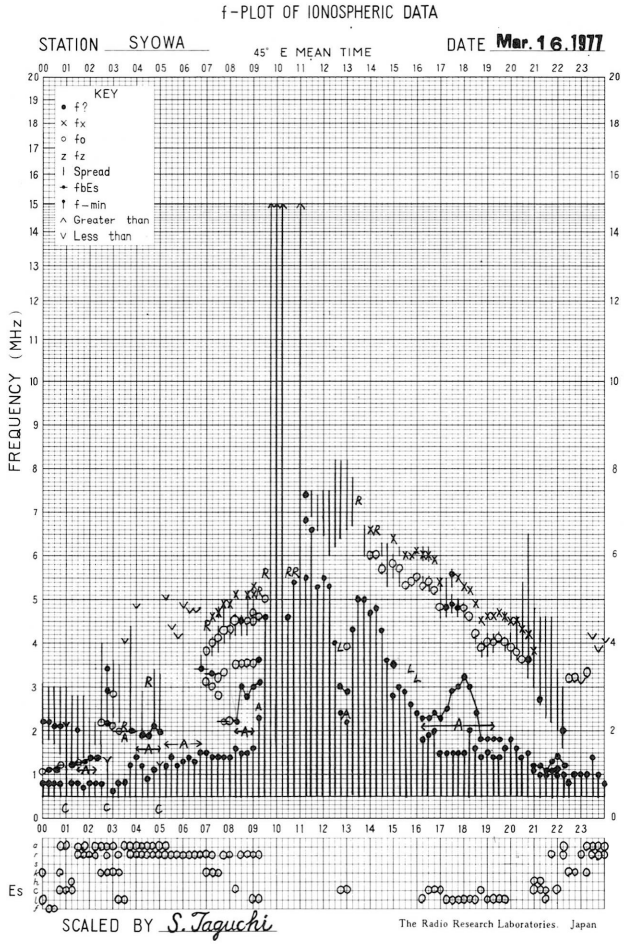
FREQUENCY (MHz)
Es
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION SYOWA
45° E MEAN TIME
DATE Mar. 16. 1977
KEY
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FREQUENCY (MHz)
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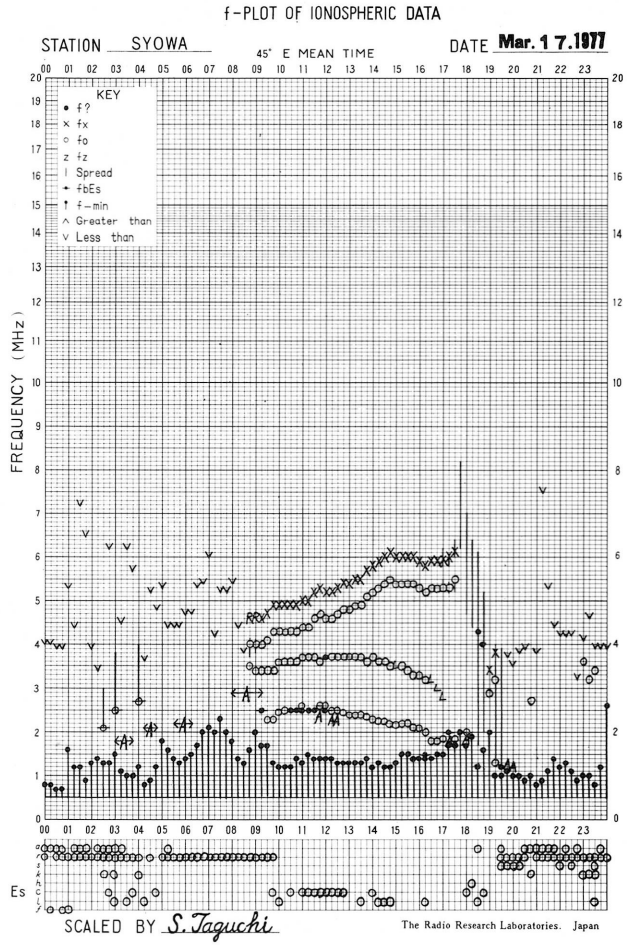
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan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KEY
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FREQUENCY (MHz)
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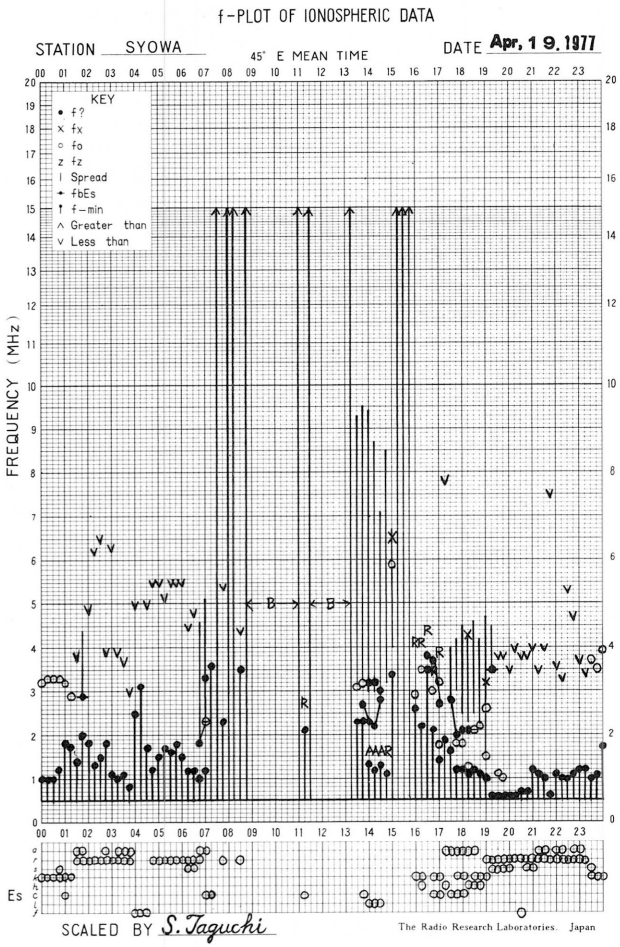
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION SYOWA
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DATE Apr, 19, 1977
KEY
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FREQUENCY (MHz)
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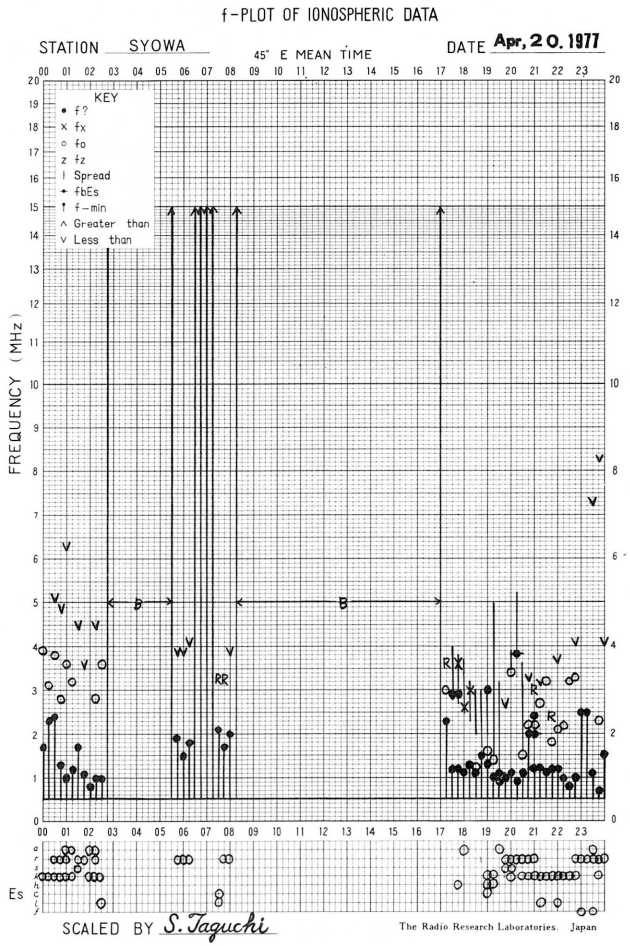
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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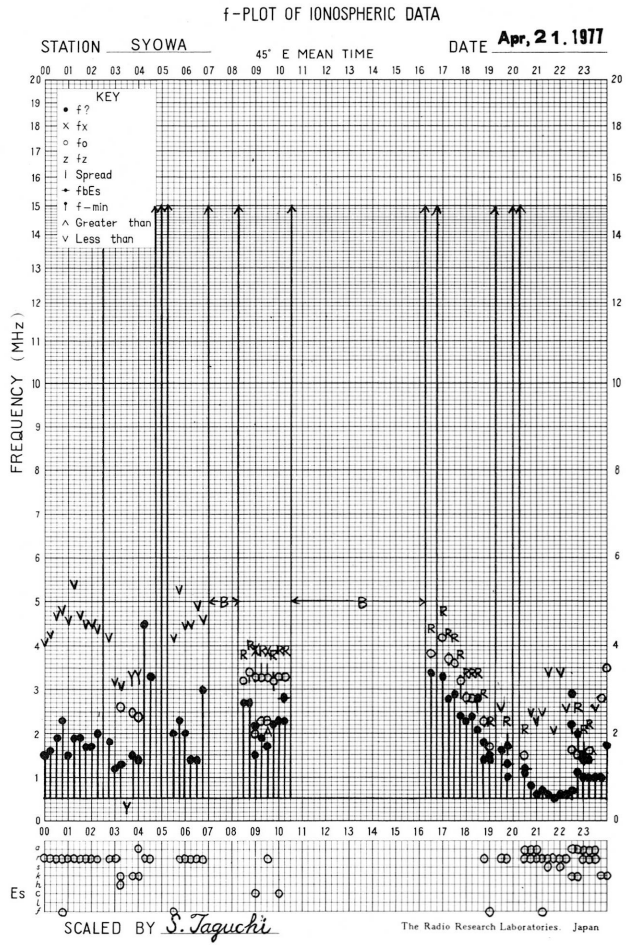
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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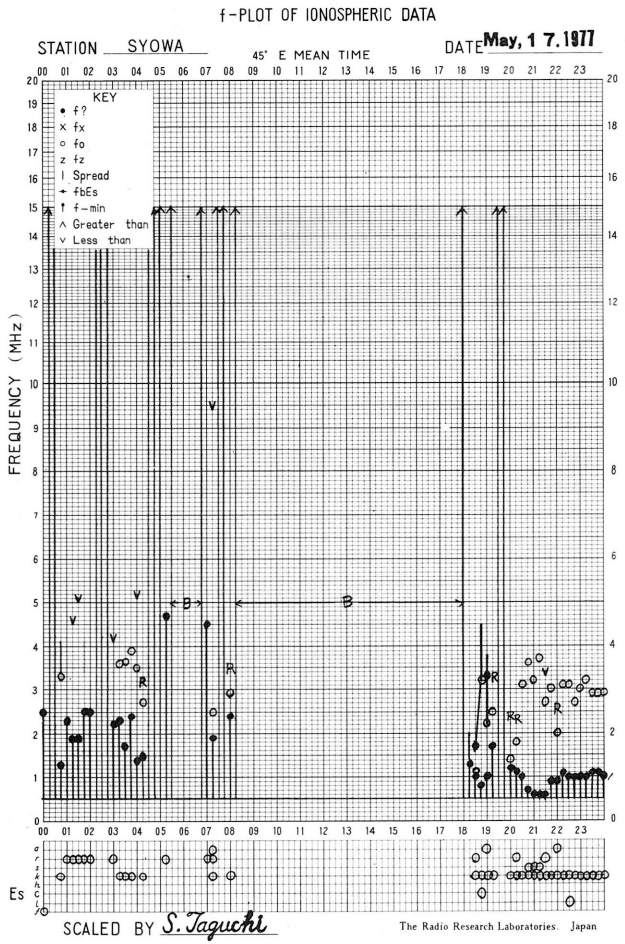
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION SYOWA
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DATE May, 17. 1977
KEY
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∧ Greater than
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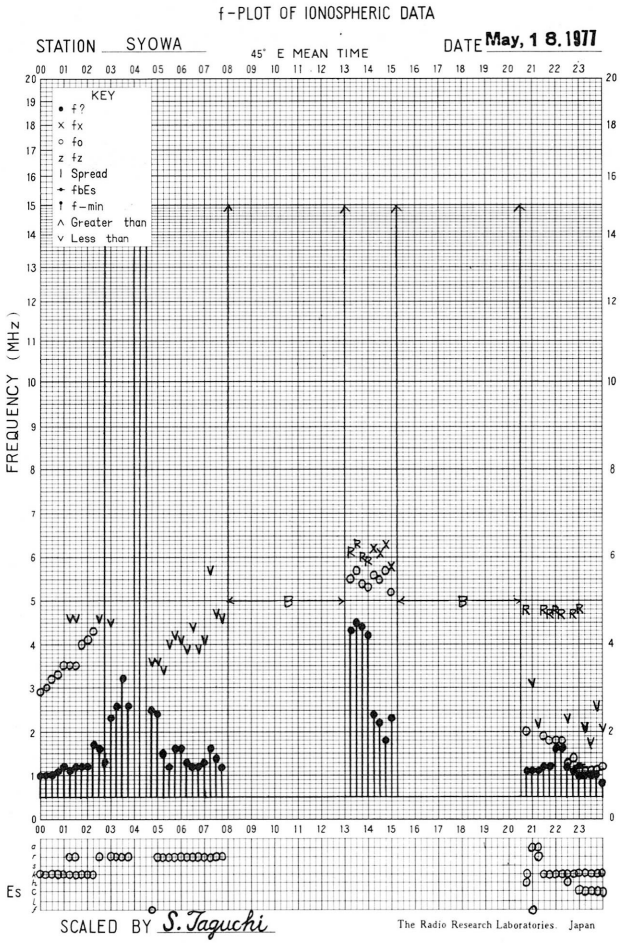
FREQUENCY (MHz)
Es
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan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KEY
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FREQUENCY (MHz)
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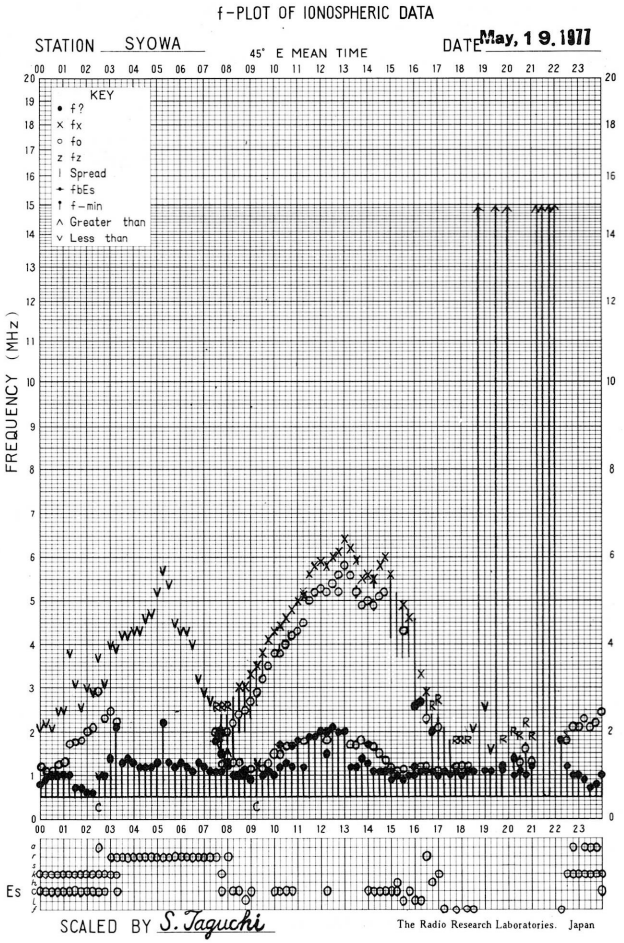
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan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STATION SYOWA
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FREQUENCY (MHz)
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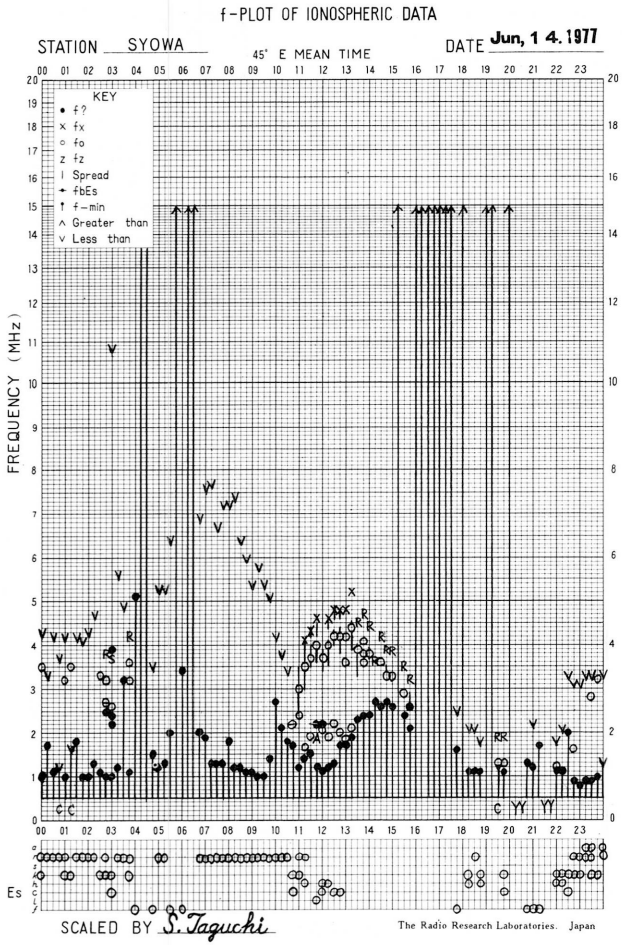
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan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STATION SYOWA
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DATE Jun, 1 4. 1977
KEY
• f?
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FREQUENCY (MHz)
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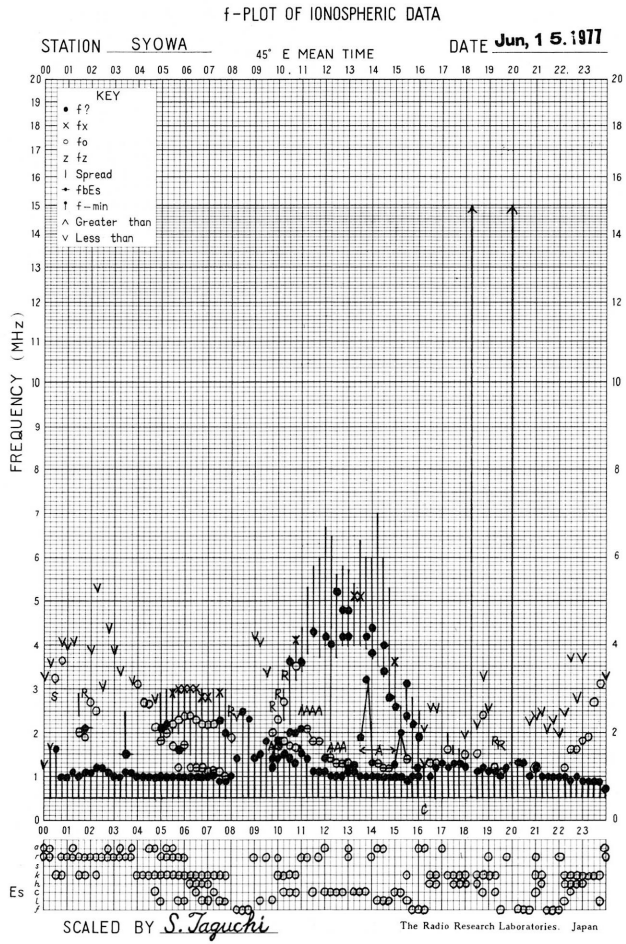
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION SYOWA
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DATE Jun, 1 5. 1977
KEY
• f?
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FREQUENCY (MHz)
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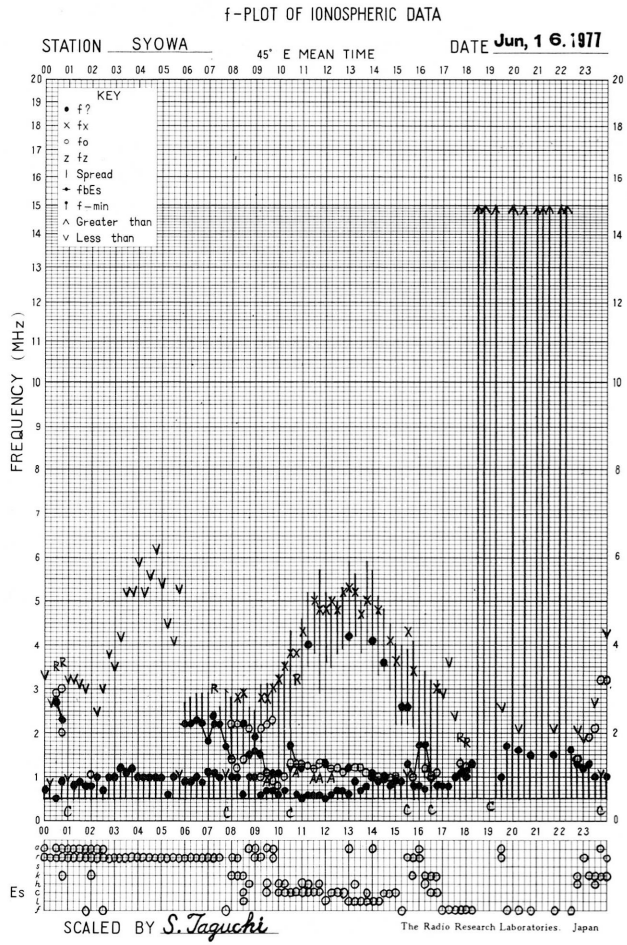
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan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DATE Jun, 1 6. 1977
KEY
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FREQUENCY (MHz)
Es
SCALED BY S. Taguchi
The Radio Research Laboratories. Japan