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IONOSPHERIC DATA IN JAPAN

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CONTENTS

COMMUNICATIONS RESEARCH LABORATORY
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BRIEFING

This Series contains data on ionosphere (I), solar radio emission (S) and radio propagation (P) obtained at the following stations under the Radio Research Laboratory, Ministry of Posts and Telecommunications of Japan.

Station	Geographic		Geomagnetic		Technical Method
	Latitude	Longitude	Latitude	Longitude	
Wakkanai	45°23.5'N	141°41.2'E	35.3°N	206.5°	Vertical Sounding (I)
Akita	39°43.5'N	140°08.0'E	29.5°N	205.9°	" (I)
Kokubunji	35°42.4'N	139°29.3'E	25.5°N	205.8°	" (I)
Yamagawa	31°12.1'N	130°37.1'E	20.4°N	198.3°	" (I)
Okinawa	26°16.9'N	127°48.4'E	15.3°N	196.0°	" (I)
Hiraiso	36°22.0'N	140°37.5'E	26.3°N	206.8°	Radio Receiving (S, P)
Inubo	35°42.2'N	140°51.5'E	25.6°N	207.0°	" (P)

A. IONOSPHERE

Ionospheric observations are carried out at five stations in Japan by means of vertical sounding method.

The published data consist of tabulations of hourly values of the ionospheric characteristics and figures of daily *f*-plot.

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" and its revision of chapters 1-4, published in July 1978.

a. Characteristics of Ionosphere

fxI	Top frequency of spread *F* trace
foF2 *foF1* *foE* *foEs*	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 *M(3000)F1*	Maximum usable frequency factor for a path of 3000 km for transmission by *F2* and *F1* layers respectively
h'F2 *h'F* *h'E* *h'Es*	Minimum virtual height on the ordinary wave for the *F2*, whole *F*, *E* and *Es* layers respectively
Types of *Es*	See below A. 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 in use.

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

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

G Measurement influenced or impossible because the ionization density of the layer is too small to enable it to be made accurately.

H Measurement influenced by, or impossible because of, the presence of a stratification.

K Presence of particle *E* layer.

L Measurement influenced 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 perturbations of the observed parameter; or spur type spread *F* present.

Q Range spread present.

R Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.

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

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

V Forked trace which may influence the measurement.

W Measurement influenced or impossible because the echo lies outside the height range recorded.

X Measurement refers to the extraordinary component.

Y Lacuna phenomena, severe layer tilt.

Z Third magneto-electronic component present.

(ii) Qualifying Letters

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

A Less than. Used only when *fbEs* is deduced from *foEs* because total blanketing of higher layer is present.

D Greater than.

E Less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

M Mode interpretation uncertain.

O Extraordinary component characteristic deduced from the ordinary component. (Used for x-characteristics only.)

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 Types of *Es*

When more than one type of *Es* trace are present on the ionogram, the type for the trace used to determine *foEs* 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 *foE*. (Usually a daytime type.)

h An *Es* trace showing a discontinuity in height with the normal *E* layer trace at or above *foE*. The cusp is not symmetrical, the low frequency end of the *Es* trace lying clearly above the high frequency end of the normal *E* trace. (Usually a daytime type.)

q An *Es* trace which is diffuse and non-blanketing 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 flat or gradually rising lower edge with stratified and diffuse traces

present 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 *foEs* > *foE* (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 of the upper half of the values when they are ranked according to magnitude; the *lower quartile* (LQ) is the median value of the lower half.

B. SOLAR RADIO EMISSION

Solar radio observations are carried out on 100, 200 and 500 MHz at Hiraiso. Observation equipments are: a pair of crossed doublet antennas with a 6-meter and a 10-meter parabolic reflectors for 500 MHz and for 100 and 200 MHz, respectively, and three appropriate receivers. Each pair of crossed doublet antennas is used as a polarimeter. Observations are feasible almost from sunrise to sunset.

Time is expressed in hours, minutes and tenths of minutes U.T. and the unit of flux density is 10^{-22} Wm^{-2} Hz^{-1} for both components of polarization.

All symbols and terminology in the table of data are used in accordance with the "Descriptive Text of Solar-Geophysical Data, NOAA" and "Instruction Manual for Monthly Report of Solar Radio Emission, WDC-C2".

a. Daily Data at Hiraiso

Flux density. The three-hourly and daily mean values are given.

Variability. The three-hourly and daily mean values are given at 200 MHz only.
Variability is expressed in the following four grades.

0 quiet or no burst,
1 a few bursts,
2 many bursts,
3 very many bursts.

The number of bursts exceeding the mean flux level is counted.

Daily data with parentheses mean that observation time does not exceed one third of the period.

b. Outstanding Occurrences at Hiraiso

The phenomena are picked up on the following criteria:
1. distinct from the prevailing kind of activity,
2. correlated with other known solar phenomena,
3. remarkable change-over from one situation to another.

Type is denoted by numerical code and letter symbol in parallel as follows:

SGD Cord	Letter Symbol	Morphological Classification
1	S	Simple 1
2	S/F	Simple 1F
3	S	Simple 2
4	S/F	Simple 2F
5	S	Simple
6	S	Minor
7	C	Minor+
8	S	Spike
20	GRF	Simple 3
21	GRF	Simple 3A
22	GRF	Simple 3F
23	GRF	Simple 3AF
24	R	Rise
25	R	Rise A
26	FAL	Fall
27	RF	Rise and Fall
28	PRE	Precursor
29	PBI	Post Burst Increase
30	PBI	Post Burst Increase A
31	ABS	Post Burst Decrease
32	ABS	Absorption
40	F	Fluctuations
41	F	Group of Bursts
42	SER	Series of Bursts
43	NS	Onset of Noise Storm
44	NS	Noise Storm in progress
45	C	Complex
46	C	Complex F
47	GB	Great Burst
48	C	Major
49	GB	Major+

Flux density is the increase of flux over the level at which daily flux is calculated, or the increase of flux over the underlying burst when the event is superposed on another burst of long duration.

Polarization is expressed by the polarization degree and sense as follows:

R or L	right- or left-handed polarization,
W, M or S	weak, moderate or strong polarization,
0	almost zero or unable to detect polarization due to small increase of flux,
00	polarization degree of less than 1 percent.

The following symbols may be attached after numerical values in table, if necessary.

D	greater than, or later than,
E	less than, or earlier than,
U	approximate, or uncertain.

C. RADIO PROPAGATION

a. H.F. Field Strength at Hiraiso

Field strength observation of 15 MHz standard waves transmitted from WWV and WWVH stations which are located respectively at Fort Collins, Colorado and Kauai, Hawaii, is carried out at Hiraiso. In order to avoid interference among the same frequency waves, the upper sideband of WWV or WWVH with the audio tone 660 Hz is picked up by the use of a narrow band pass filter with 80 Hz bandwidth. Particulars of the transmitters and the receiver are summarized in the following table.

Characteristics	Transmitter		Receiver
Station Call	WWV	WWVH	
Location	Fort Collins, Colorado	Kauai, Hawaii	Hiraiso, Ibaraki
latitude	40°41'N	22°00'N	36°22'N
longitude	105°02'W	159°46'W	140°38'E
Distance	9150 km	5910 km	–
Carrier Power	10 kW	10 kW	–
Power in each sideband	625 W	625 W	–
Modulation	50 %	50 %	–
Antenna	λ /2 vertical	λ /2 vertical	4.5 m vertical rod
Bandwidth	–	–	80 Hz for upper sideband
Calibration	–	–	Every an hour

The tabulated *field strength* in dB above one microvolt per meter is the peak average of the incident upper sideband field intensity in 45 seconds after the universal time indicated on the table. Abbreviated symbols are as follows:

CNT	number of observed values,
MED	median,
UD	value of the uppermost decile when they are ranked according to magnitude,
LD	value of the lowest decile when they ranked according to magnitude,
U	uncertain,
E	less than,
C	influenced by, or impossible because of, any artificial accident,
S	influenced by, or impossible because of, interferences or atmospherics.

b. Radio Propagation Quality Figures at Hiraiso

The tabulated six-hourly quality figures are calculated for standard waves WWV transmitted from Fort Collins and WWVH transmitted from Kauai.

Quality figures expressing radio propagation conditions are ranged over five grades as follows:

1	very poor (very disturbed),
2	poor (disturbed),
3	rather poor (unstable),
4	normal,
5	good.

Whole day quality figure ranged in grades of 1o, 1+, 2-, 2o, 2+, 3-, 3o, 3+, 4-, 4o, 4+, 5-, 5o stands for an average of six-hourly ones of the two circuits. Abbreviated symbols are as follows:

C	artificial accident,
S	propagational accident,
U	inaccurate.

Radio propagation conditions which can be described with a code in the following

N	normal,
U	unstable,
W	disturbed

are forecast 12 hours in advance and broadcast six times per hour from JJY station.

Data on a *geomagnetic storm* correlated with a radio propagation disturbance are tabulated from observation at Kakioka Magnetic Observatory, Japan Meteorological Agency. *Time* (U.T.) is expressed in unit of hour and minute (or tenth of hour), and *range* in nanotesla. When they are uncertain quantitatively, /'s are used to replace the numerical values. Continuation of a geomagnetic storm is denoted by - - -.

c. Phase Variations in OMEGA Radio Waves at Inubo

Variations in phase and in phase deviation are monthly depicted for four OMEGA radio waves received at Inubo. Particulars of transmitting stations concerned which relate to the measurement are given in the table below.

In each of the four figures, variations in phase (ϕ) and those in phase deviation ($\triangle\phi$) are shown in the lower part and the upper one, respectively. Variations in phase (ϕ) are expressed by relative values at intervals of 30 minutes within every day (U.T.) (48 dots). An increasing value in this case denotes a phase delay. On the other hand, variations in phase deviation ($\triangle\phi$) are expressed by values at intervals of 30 minutes within every day (U.T.) (48 dots), deviated from average values at the same time for the six quietest days within the month concerned. A negative value in this case denotes a phase advance.

When a polar cap phase anomaly (PCPA) is detected on the Aldra-Inubo and/or the North Dakota-Inubo circuit[s], PCPA's detected only on the Aldra-Inubo circuit are listed, in principle, below the four figures. The list mentions the start, the end, and the maximum times of a PCPA in a form of day/hour & minute in U.T. and its maximum phase deviation as a negative value.

The following letters may be attached to values, if necessary.

D	greater than,
E	less than,
U	uncertain or doubtful.

d. Sudden Ionospheric Disturbances

(i) Short Wave Fade-out (SWF) at Hiraiso

The table of short wave fade-out (SWF) is prepared from the record of field intensities measured at Hiraiso.

Drop-out intensities of the 10 MHz, the 20 MHz, and the 25 MHz waves are respectively distinguished by marks ', ", and "' from these of the 15 MHz wave for WWV and WWVH. Values of *start*, *duration*, *type*, and *importance* are obtained from data of the circuit whose drop-out intensity in dB is underlined as xx. When these quantities are not given correctly, they are accompanied by the following symbols.

D	greater than,
E	less than,
U	uncertain or doubtful.

Types of fade-out are as follows:

S	sudden drop-out and gradual recovery,
SL	slow drop-out taking 5 to 15 minutes and gradual recovery,
G	gradual and irregular in both drop-out and recovery.

Importance of fade-out is scaled according to its amplitude into nine ascending grades as 1-, 1, 1+, 2-, 2, 2+, 3-, 3, 3+.

Correspondence of solar optical flare, solar radio burst, and geomagnetic crochet to SWF is marked by X in accordance with interchange messages of IUWDS and observations at Hiraiso.

In table (i) SWF, *date* indicates the day to which *start-time* of event belongs.

(ii) Sudden Phase Anomaly (SPA) at Inubo

Data of sudden phase anomaly (SPA) are prepared from the records of phase measurement of VLF radio waves received at Inubo. The transmitting stations are listed in the following table.

Phase advance is shown in unit of degree at its maximum stage. No transmission or no reception during the period is indicated by —, and indistinguishable record is spaced out, and multi-peak event is marked by *.

Out of more than two circuits on which the same SPA event is observed, the *phase advance* on the circuit on which the SPA is the most remarkable or distinct is underlined. As for the underlined, *phase advance*, *start*, *end*, and *maximum times* are obtained.

In table (ii) SPA, *date* indicates the day to which *start-time* of event belongs.

The following letters may be attached to the value, if necessary.

D	greater than,
E	less than,
U	uncertain or doubtful.

Transmitting Stations						
Name	Location (Geographic Coordinate)		Call Sign	Frequency (kHz)	Radiation Power (kHz)	Arc Distance from Inubo (km)
Rugby	52°22'N	001°11'W	GBR	16.0	60	9550
North West Cape	21°49'S	114°10'E	NWC	22.3	1000	6990
Norway	66°25'N	013°08'E	Ω/N	13.6	10	7820
North Dakota	46°22'N	098°20'W	Ω/ND	13.6	10	9140
Hawaii	21°24'N	157°50'W	Ω/H	13.6	10	6100
La Reunion	20°58'S	055°17'E	Ω/LR	13.6	10	10970

IONOSPHERIC DATA

FEB. 1988 | FXI (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station WAKKANAI Lat. 45° 23.5 N, Long. 141° 41.2 E Sweep 1 MHz to 25 MHz in 24 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 33	X 41	X 40	X 41	X 41	X 41	X 30											X 62	X 43	X 36	X 40	X 37	X 38	X 37
2	X 33	X 40	X 39	X 42	X 43	X 43	X 33											X 57	X 38	X 33	X 33	X 38	X 33	X 40
3	C	X 33	X 39	X 40	X 42	X 40	X 30											X 53	X 47	X 44	X 37	X 37	X 38	X 38
4	X 40	X 41	X 41	X 43	X 50	X 49	X 43											X 46	X 43	X 42	X 39	X 43	X 40	X 47
5	48	43	X 43	X 47	X 43	X 41	X 32											X 70	X 57	X 51	X 35	X 36	X 39	X 38
6	43	X 43	X 44	X 42	X 43	X 41	X 42											X 56	X 48	X 38	X 38	X 41	X 41	X 41
7	X 42	X 42	X 42	X 42	X 43	X 40	X 33											X 59	X 44	X 38	X 41	X 34	X 37	X 38
8	X 41	X 42	X 41	X 42	X 44	X 42	X 32											X 57	X 42	X 40	X 41	X 40	X 41	X 42
9	X 43	X 44	X 43	X 42	X 43	X 45	X 44											X 58	X 46	X 47	X 44	X 41	X 39	X 39
10	X 39	X 41	X 39	X 42	X 43	X 42	X 33											X 61	X 53	X 52	X 42	X 36	X 37	X 36
11	X 38	X 38	X 39	X 38	X 35	X 33	X 31											X 52	X 43	X 43	X 41	X 42	X 41	X 41
12	X 41	X 38	X 39	X 37	X 36	X 35	X 36											X 68	X 53	X 49	X 37	X 33	X 38	X 41
13	X 42	X 43	X 44	X 45	X 43	X 35	X 34											X 79	X 59	X 41	X 37	X 34	X 37	X 39
14	X 39	X 40	X 42	X 42	X 35	X 42	X 47											X 65	X 48	X 48	X 39	X 38	X 40	X 41
15	X 42	X 43	X 42	X 46	X 47	X 41	X 41											X 70	X 59	X 57	X 55	X 47	X 47	X 45
16	X 47	X 45	X 46	X 42	X 43	X 41	X 41											X 66	X 43	X 43	X 39	X 36	X 37	X 37
17	X 36	X 37	X 36	X 41	X 35	X 34	X 34											X 65	X 43	X 43	X 40	X 38	X 39	X 39
18	X 40	X 42	X 39	X 39	X 41	X 37	X 39											X 71	X 51	X 46	X 44	X 39	X 38	X 40
19	X 41	X 43	X 44	X 42	X 43	X 43	X 39											X 72	X 55	X 55	X 40	X 37	X 39	X 38
20	X 39	X 41	X 40	X 40	X 43	X 41	X 42											X 71	X 48	X 48	X 48	X 47	X 48	X 50
21	X 51	X 52	X 54	X 57	X 60	X 51													X 60	X 42	X 44	X 45	X 43	52
22	55	X 56	X 51	X 52	X 44	X 32													X 38	X 40	X 41	X 43	X 41	X 39
23	X 37	X 38	X 36	X 38	X 35	X 34													X 53	X 51	X 50	X 48	X 47	X 46
24	X 48	X 41	43	42	40	42													X 41	X 38	X 40	X 35	X 37	X 36
25	X 37	X 36	X 35	36	X 36	X 33													X 51	X 40	X 40	X 41	X 41	X 41
26	X 42	X 43	X 43	X 42	X 41	X 39													X 56	X 50	X 47	X 41	X 41	X 42
27	X 42	X 42	X 42	X 41	X 42	X 43													X 59	X 51	X 52	X 47	X 48	X 45
28	X 49	X 51	X 50	X 50	X 49	X 55													X 55	X 51	X 52	X 50	56	56
29	56	55	53	57	X 47	X 43													X 51	X 46	X 41	X 44	X 48	X 45
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	29	29	29	29	29	20											20	29	29	29	29	29	29
MED	X 42	X 42	X 42	X 42	X 43	X 41	X 38											X 62	X 42	X 46	X 41	X 40	X 40	X 41
UQ	X 45	X 43	X 44	X 43	X 44	X 43	X 42											X 70	X 55	X 50	X 44	X 44	X 41	X 43
LQ	X 39	X 40	X 39	X 41	X 41	X 37	X 32											X 58	X 43	X 40	X 39	X 37	X 38	X 39

FEB. 1988 | FXI (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

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Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 24 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	31	34	33	34	34	34	23	45	58	69	68	77	83	68	67	61	63	55	36	29	33	30	31	30
2	31	33	32	35	36	36	31	45	59	70	70	83	77	Z 66	60	66	61	50	31	26	31	31	31	33
3	C	31	32	33	35	33	23	46	55	74	74	Z 63	78	71	74	73	61	46	40	37	30	30	31	31
4	33	34	34	36	43	42	36	47	61	60	H 63	H 67	82	68	60	69	60	39	36	35	32	F 41	F	30
5	F	F 35	36	F 36	41	34	25	44	57	60	71	78	73	74	71	79	H 55	53	50	44	28	31	32	31
6	F 35	36	37	35	36	34	35	55	64	69	H 75	H 77	H 86	74	74	77	59	49	41	31	31	34	34	34
7	35	35	35	35	36	33	26	42	64	63	81	80	86	H 67	62	77	66	52	37	31	34	27	30	31
8	34	35	34	35	37	35	25	44	56	61	84	81	73	74	67	78	68	50	35	33	34	33	34	35
9	36	37	36	35	36	38	37	50	67	65	68	77	73	70	74	70	H 70	51	39	40	37	34	32	32
10	32	34	32	35	36	35	31	53	61	72	83	77	82	H 67	70	H 71	68	54	46	45	35	29	30	29
11	31	31	32	31	28	26	24	51	78	71	88	73	86	71	77	71	64	52	36	36	34	35	34	34
12	34	31	32	30	29	28	29	46	74	75	91	73	82	82	H 71	76	H 68	61	51	42	30	26	31	34
13	35	36	37	38	36	28	27	54	62	72	H 83	87	74	77	74	84	76	72	52	34	30	27	30	32
14	32	33	35	35	28	35	40	51	Z 64	77	88	77	98	78	74	76	66	58	41	41	32	31	33	34
15	35	36	35	39	40	34	34	60	66	78	80	91	80	H 95	H 74	80	72	63	52	50	42	40	40	38
16	40	38	39	35	36	34	34	54	81	65	93	84	80	80	77	71	68	59	36	36	32	29	30	30
17	29	30	29	34	28	27	27	52	73	83	82	79	106	95	73	63	73	53	36	36	33	31	32	32
18	33	35	32	32	34	30	32	50	67	73	76	96	94	81	77	80	H 64	64	44	39	37	32	31	33
19	34	36	37	35	36	36	32	57	67	73	78	79	87	78	71	74	77	65	48	48	33	30	32	31
20	32	34	33	33	36	34	35	61	66	67	77	82	76	77	77	69	H 59	66	41	41	41	40	41	43
21	44	45	47	50	53	44	41	52	62	77	74	79	80	83	70	80	68	70	53	41	37	38	36	F
22	F	49	44	45	37	25	22	31	40	44	W	W	W	W	43	43	44	39	31	33	34	36	34	32
23	30	31	29	31	28	H 27	A	68	87	84	108	94	102	102	92	81	76	69	46	44	43	41	S 40	39
24	41	34	F 36	F 32	F	F 35	31	57	56	66	70	83	70	76	78	84	63	52	34	31	33	28	30	29
25	30	29	28	F 27	29	26	27	52	53	Z 56	70	65	73	75	70	71	76	65	44	33	33	34	34	34
26	35	36	36	35	34	32	34	53	64	60	73	71	74	74	76	73	74	71	49	43	40	34	34	35
27	35	35	35	34	35	36	31	67	62	66	64	78	91	76	74	86	71	66	52	44	45	40	41	33
28	42	44	43	43	42	43	39	60	67	74	67	83	86	81	75	83	75	68	48	44	45	43	F	F
29	F	F	F	F	40	36	40	63	64	67	69	81	81	87	80	79	71	61	44	39	34	37	41	38
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	25	28	28	28	28	29	28	29	29	29	28	28	28	28	29	29	29	29	29	29	29	29	27	27
MED	34	35	35	35	36	34	31	52	64	69	76	79	82	76	74	76	68	59	41	39	34	33	32	33
UQ	35	36	36	36	37	36	35	57	67	74	83	83	86	81	77	80	72	65	48	43	37	37	34	34
LQ	32	33	32	33	34	30	26	46	59	65	70	77	75	71	70	71	63	52	36	33	32	30	31	31

The Radio Research Laboratory, Japan

FEB. 1988 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

FEB. 1988 | FOF1 (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 24 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											450	L	L 420	L 410	L 350									
2											L	L	L 410	L 390										
3											L 380		H 430	L 410	L 395									
4												L	420	L										
5											L 510	L 430	430	L 410										
6											L 330	430	L	L 410	L 370	L 350								
7										L 330	L 430	L 430	430											
8												430	L 430	L 420	L 500									
9											L 410	H 430	L 430	L 420	L 410									
10										L 395	480	L 430	L	400	L 390									
11										L 360	L 430	H 410	L 430	L 410	L 390	L 350								
12										L	L 420	L 420	L 510	L 430	L	L								
13											L 420	A	L 430	L	L 390	L 380								
14											L 430	A	440	L	L 380	L								
15										L	L 420	390	430	L 410	L									
16										L 520	L 400	L 440	L 440	L 440	L 420	L 350								
17										A	L	L 430	L 440	L 430	L 370									
18											L 420	L 440	L 440	L 430	L	L 340								
19											L	L 440	L	L 440	L	L								
20										L 360	L	L 470	L 420	420	L 390	L								
21										L	L 410	L 440	L 430	L 430	L	L 350								
22									310	350	380	380	370	390	L 400	L 350								
23											L	L 440	L 440	L 440	L 430	L								
24										L 410	430	430	L 430	410	H 410	L								
25										L 400	L 440	L 430	L 430	L 440	L 425	L 380								
26											L 440	L 440	B	440	L 430	L 380								
27											L 400	L 440	L 440	L 430	L 430	L 400								
28										L	L 360	L 450	L 450	L 440	L 390	L 400								
29										L	L	L 440	H 430	L 440	L 430	L 380								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	8	21	23	25	25	20	12								
MED									310	L 370	L 420	L 430	L 430	L 420	L 395	L 365								
UQ										L 405	L 430	L 440	L 440	L 440	L 425	L 380								
LQ										L 355	L 400	430	L 430	L 410	L 385	L 350								

FEB. 1988 | FOF1 (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | FOE (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 24 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								S	220	260	290	300	305	300	290	250	175							
2								S	225	265	285	295	300	295	280	250	170							
3								S	210	H 260	285	300	305	300	285	235	S							
4								S	215	260	285	300	305	300	290	250	170							
5								S	220	260	275	300	300	290	275	230	S 175							
6								S	220	260	285	295	300	285	260	230	200							
7								S	205	260	285	U A 300	305	290	260	245	200							
8								S	210	260	285	305	310	300	H 285	250	200							
9								S	220	260	A	300	305	300	285	245	205							
10								S	220	265	290	300	305	300	270	240	205							
11								S	220	255	290	300	305	295	265	245	200							
12								S	225	265	295	305	305	300	270	250	200							
13								S	220	275	290	A	A	A	290	250	S							
14								S	H 220	270	295	300	305	300	290	260	215							
15								S	210	275	A	305	310	A	290	250	220							
16								175	235	265	295	305	310	305	A	170	210							
17								S	225	260	295	A	310	A	290	255	A							
18								S	215	260	295	310	310	305	290	255	200							
19								S	225	270	300	305	A	305	290	240	210							
20								S	225	H 265	295	305	310	305	305	250	H 210							
21							S	S	220	260	290	A	310	A	235	240	210	S						
22							S	S	220	255	285	A	H 300	290	275	250	200	S						
23							S	A	225	A	295	300	B	295	B	B	S	S						
24							S	S	230	270	295	B	300	B	265	235	A	S						
25							S	S	A	A	B	B	B	5	B	B	S	S						
26							S	220	B	B	B	B	B	B	295	B	S	S						
27							S	S	250	280	305	B	B	B	B	260	S	S						
28							S	S	240	275	295	305	310	B	B	B	S	S						
29							S	S	B	H 280	305	310	310	305	295	270	230	S						
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	26	26	25	21	23	20	24	25	20							
MED								198	220	262	290	300	305	300	285	250	200							
UQ									225	270	295	305	310	302	290	250	210							
LQ									220	260	285	300	305	295	272	240	200							

FEB. 1988 | FOE (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | FOES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 24 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 16	E S 17	E S 16	E S 15	E	E S 16	E S 17	20	25	G	G	35	G	G	G	G	G	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16
2	E S 16	E S 16	E S 17	E S 16	E S 16	E S 16	E S 16	E S 17	G	G 26	G	34	G	G	G	G	G	E S 16	E S 16	E S 17	E S 16	E S 16	E S 16	E S 16
3	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	26	G	G	G	G	G	G	G	E S 19	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
4	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 13	G	G	G	34	G	G	G	G	22	E S 16	J A 21	J A 21	E S 16	E S 16	E S 16	E S 16
5	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 19	E S 19	26	G	G	G	G	G	G	G	20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
6	E S 16	E S 16	E S 16	20	E S 16	E S 16	E S 16	E S 13	G	G	G	G	35	G	G	G	G	J A 34	J A 24	J A 23	20	J A 25	23	21
7	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	25	G	34	35	36	G	G 23	G	G	E S 16	26	26	E S 16	E S 16	E S 16	E S 16
8	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 13	26	32	33	35	35	G	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15
9	E S 16	23	23	E S 16	E S 16	E S 16	E S 16	E S 17	G	G	35	G	G	G	G	G	G	E S 16	E S 16	E S 17	E S 17	E S 15	E S 16	E S 16
10	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	G	G	G	G	34	G	G	G	25	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
11	E S 12	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 20	25	29	G 26	G 29	G 29	G	G	G	G	E S 16	F S 16	F S 16	E S 16	E S 16	E S 16	E S 16
12	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G 26	36	G	G	34	G	G 22	G 13	E S 17	26	26	E S 15	E S 15	E S 16	E S 13
13	21	23	E S 15	E S 15	E S 15	E S 16	E S 16	20	G	G	39	J A 43	J A 36	J A 35	G 25	27	23	E S 16	E S 16	E S 16	E S 15	E S 16	E S 15	J A 23
14	23	23	J A 21	31	25	E S 16	E S 16	E S 19	G	G	G	J A 45	33	33	G	G 23	G	E S 17	E S 17	E S 15	E S 15	E S 17	E S 15	E S 14
15	E S 15	23	E S 16	E S 15	E	E S 15	E S 16	E S 19	28	G	33	G	G 24	36	G	G 24	G	21	24	E S 15	E S 16	E S 16	E S 16	E S 16
16	E S 16	E S 13	F S 16	E	E S 16	E S 16	E S 17	G	G	G	G	33	G	32	J A 34	G	G 19	20	31	E S 17	E S 16	E S 16	E S 16	E S 16
17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	26	J A 53	33	34	33	32	G	G	21	E S 17	E S 17	E S 16	E S 15	E S 15	E S 16	E S 16
18	E S 15	E S 16	E S 13	E S 16	E S 16	E S 16	E S 16	E S 21	G	G	G	G	G	G	G	G	23	E S 17	E S 16	E S 16	E S 15	E S 16	E S 16	31
19	24	27	27	E S 16	23	E S 16	E S 15	E S 21	G	G	G	G	42	G 28	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
20	E S 16	E S 16	E S 15	E S 15	E S 16	E S 16	E S 16	E S 20	G	34	35	G	G	G 24	G	G 20	G	E S 16	E S 16	24	E S 16	E S 16	E S 16	21
21	J A 25	J A 23	24	26	22	J A 21	E S 16	23	26	31	32	31	G	32	G	G	G	E S 18	J A 36	J A 27	J A 25	J A 40	J A 28	J A 23
22	J A 24	23	E S 16	22	E	E S 16	E S 13	27	26	G	34	33	G	G	G	G	G	E S 13	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16
23	E S 16	E S 16	E S 17	E S 16	23	E S 16	46	22	G	32	G	G 26	E B 30	G	E B 30	E B 26	E S 22	E S 18	E S 16	J A 23	E S 16	E S 16	32	E S 16
24	E S 16	23	E S 16	E S 16	E S 16	E S 16	E S 16	24	G	31	G	E B 32	33	31	30	30	26	J A 34	J A 29	26	E S 16	E S 16	13	E S 16
25	E S 16	E S 16	E S 15	E S 16	26	26	J A 22	26	28	34	35	35	E B 35	33	E B 31	E B 29	E S 27	E S 13	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
26	E S 15	E S 15	E S 16	E S 16	E S 15	E S 16	E S 15	G	30	E B 34	34	35	E B 46	E B 32	G	E B 29	24	E S 21	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
27	E S 15	E S 16	E S 15	E S 16	E S 16	E S 15	E S 17	24	G	31	39	35	E B 34	E B 32	E B 31	G	E S 29	E S 20	E S 16	E S 17	E S 16	E S 11	E S 15	E S 16
28	E S 16	J A 20	E S 16	E S 16	E S 16	E S 17	E S 15	E S 20	G	G	G	G	G	E B 31	E B 31	E B 29	E S 25	E S 19	E S 16	E S 16	E S 16	E S 17	E S 16	E S 15
29	E S 16	E S 16	E S 16	E S 16	E	E S 16	E S 16	E S 23	E B 27	G	G	G	G	G	G	G	G	E S 13	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
MED	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 19	G	G	G	30	E G 24	G	G	G	E G 18	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
UQ	E S 16	23	E S 16	E S 16	E S 16	E S 16	E S 16	20	26	31	34	35	34	32	E G 23	E G 23	22	E S 18	21	21	E S 16	E S 16	E S 16	E S 16
LQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	G	G	G	G	G	G	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16

FEB. 1988 | FOES (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | FBES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 24 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 16	E S 17	E S 16	E S 15	E	E S 16	E S 17	19	25	G	G	35	G	G	G	G	G	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16
2	E S 16	E S 16	E S 17	E S 16	E S 16	E S 16	E S 16	E S 17	G	G 23	G	34	G	G	G	G	G	E S 16	E S 16	E S 17	E S 16	E S 16	E S 16	E S 16
3	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	26	G	G	G	G	G	G	G	E S 19	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 15
4	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	E S 15	G	G	G	34	G	G	G	G	21	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
5	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 19	19	G	G	G	G	G	G	G	G	20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
6	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	G	G	G	G	35	G	G	G	G	28	21	21	E S 16	22	E S 16	E S 16
7	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	25	G	34	G 30	35	G	G 23	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
8	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	26	G	G	35	G	G	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15
9	E S 16	E S 16	E S 17	E S 16	E S 16	E S 16	E S 16	E S 17	G	G	30	G	G	G	G	G	G	E S 16	E S 16	E S 17	E S 17	E S 15	E S 16	E S 16
10	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 13	G	G	G	G	34	G	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
11	E S 12	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 20	G	G	G 24	G 28	G 26	G	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
12	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G 23	G	G	G	34	G	G 22	G 18	E S 17	E S 16	17	E S 15	E S 15	E S 16	E S 13
13	E S 16	E S 15	E S 15	E S 15	E S 15	E S 16	E S 16	20	G	G	39	46	34	35	G 25	G	23	E S 16	E S 16	E S 16	E S 15	E S 16	E S 15	E S 15
14	E S 15	E S 16	E S 16	18	E S 15	E S 16	E S 16	E S 19	G	G	G	45	G	G	G	G 23	G	E S 17	E S 17	E S 15	E S 15	E S 17	E S 15	E S 14
15	E S 15	E S 16	E S 16	E S 15	E	E S 16	E S 16	E S 19	27	G	30	G	G 24	36	G	G 25	G	20	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16
16	E S 16	E S 13	E S 16	E	E S 16	E S 16	E S 17	G	G	G	G	37	G	G 23	32	G	G 19	20	23	E S 17	E S 16	E S 16	E S 16	E S 16
17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	26	46	31	33	G 27	32	G	G	21	E S 17	E S 17	E S 16	E S 15	E S 15	E S 16	E S 16
18	E S 15	E S 16	E S 13	E S 16	E S 16	E S 16	E S 16	E S 21	G	G	G	G	G	G	G	G	G 18	E S 17	E S 16	E S 16	E S 15	E S 16	E S 16	23
19	E S 17	E S 16	19	E S 16	E S 16	E S 16	E S 15	E S 21	G	G	G	G	36	G 25	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
20	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 20	G	34	35	G	G	G 24	G	G 24	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	F S 16
21	E S 17	E S 17	E S 16	E S 16	E S 16	20	E S 16	23	G	31	G	31	G	32	G	G	G	E S 18	E S 16	20	E S 17	26	24	25
22	19	E S 16	E S 16	E S 16	E	E S 16	E S 18	25	G	G	G	30	G	G	G	G	G	E S 18	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16
23	E S 16	E S 16	E S 17	E S 16	E S 16	E S 16	A A 41	22	G	29	G	G 26	E B 30	G	E B 30	E B 26	E S 22	E S 18	E S 16	21	E S 16	E S 16	30	E S 16
24	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	G	G	G	E B 32	33	31	G	29	26	29	20	E S 16	E S 16	E S 16	E S 18	E S 16
25	E S 16	E S 16	E S 16	E S 16	18	E S 17	20	20	27	34	35	35	E B 35	33	E B 31	E B 29	E S 27	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16
26	E S 15	E S 15	E S 16	E S 16	E S 15	E S 16	E S 15	G	30	E B 34	34	35	E B 46	E B 32	G	E B 29	24	E S 21	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
27	E S 15	E S 16	E S 15	E S 16	E S 16	E S 15	E S 17	24	G	31	39	35	E B 34	E B 32	E B 31	G	E S 29	E S 20	E S 16	E S 17	E S 16	E S 11	E S 15	E S 16
28	E S 16	E S 16	E S 16	E S 16	E S 16	E S 17	E S 15	E S 20	G	G	G	G	G	E B 31	E B 31	E B 29	E S 25	E S 19	E S 16	E S 16	E S 16	E S 17	E S 16	E S 16
29	E S 16	E S 16	E S 16	E S 16	E	E S 16	E S 15	E S 22	E B 27	G	G	G	G	G	G	G	G	E S 18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
MED	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 19	G	G	G	G 29	G	G	G	G	G	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
UQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	20	25	G 23	30	35	U 30	32	G	E G 22	20	E S 18	E S 16	E S 17	E S 16	E S 16	E S 16	E S 16
LQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	G	G	G	G	G	G	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16

The Radio Research Laboratory, Japan

FEB. 1988 | FBES (0.1 MHZ)

IONOSPHERIC DATA

FEB. 1988 | FMIN (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station WAKKANAI Lat. 45° 23·5 N, Long. 141° 41·2 E Sweep 1 MHz to 25 MHz in 24 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 16	E S 17	E S 16	E S 15	E	E S 16	E S 17	E S 16	17	19	23	22	23	21	12	19	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16
2	E S 16	E S 16	E S 17	E S 16	E S 16	E S 16	E S 16	E S 17	16	17	18	21	23	26	20	20	E S 16	E S 15	E S 16	E S 17	E S 16	E S 16	E S 16	E S 16
3	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	16	17	21	20	23	21	20	18	E S 19	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
4	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	17	18	20	22	20	21	25	20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
5	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 19	E S 19	16	19	18	22	22	20	18	20	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
6	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	18	20	24	22	23	24	22	20	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
7	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	17	20	25	20	22	23	20	18	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
8	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	16	19	24	25	26	25	21	20	E S 18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15
9	E S 16	E S 16	E S 17	E S 16	E S 16	E S 16	E S 16	E S 17	16	17	18	21	20	20	19	18	E S 16	E S 16	E S 16	E S 17	E S 17	E S 15	E S 16	E S 16
10	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 19	16	18	17	20	24	20	19	18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
11	E S 12	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 20	19	19	19	21	20	23	17	18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
12	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	16	16	17	19	20	19	18	18	E S 16	E S 17	E S 16	E	E S 15	E S 15	E S 16	E S 13
13	E S 16	E S 15	E S 15	E S 15	E S 15	E S 16	E S 16	E S 16	18	17	18	21	20	20	20	18	E S 18	E S 16	E S 16	E S 16	E S 15	E S 16	E S 15	E S 15
14	E S 15	E S 16	E S 16	E	E S 15	E S 16	E S 16	E S 19	18	18	18	19	19	21	19	18	E S 17	E S 17	E S 17	E S 15	E S 15	E S 17	E S 15	E S 14
15	E S 15	E S 16	E S 16	E S 15	E	E S 16	E S 16	E S 19	E S 18	19	17	19	21	20	20	17	E S 19	E S 17	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16
16	E S 16	E S 13	E S 16	E	E S 16	E S 16	E S 17	E S 15	17	13	20	22	20	18	19	18	E S 17	E S 17	E S 16	E S 17	E S 16	E S 16	E S 16	E S 16
17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	17	20	22	21	21	22	24	18	E S 18	E S 17	E S 17	E S 16	E S 15	E S 15	E S 16	E S 16
18	E S 15	E S 16	E S 13	E S 16	E S 16	E S 16	E S 16	E S 21	17	13	20	21	21	19	20	18	E S 17	E S 17	E S 16	E S 16	E S 15	E S 16	E S 16	E S 17
19	E S 17	E S 16	E S 17	E S 16	E S 16	E S 16	E S 15	E S 21	17	13	24	19	21	20	13	18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
20	E S 16	E S 16	E S 15	E S 16	E S 16	E S 15	E S 16	E S 23	16	13	22	24	29	21	24	16	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15
21	E S 17	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	16	17	19	20	20	20	20	18	E S 16	E S 18	E S 16	E S 16	E S 16	E S 16	E S 16	E
22	E S 16	E S 16	E S 16	E S 16	E	E S 16	E S 18	E S 17	17	19	25	24	25	23	24	19	E S 16	E S 18	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16
23	E S 16	E S 16	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	19	19	24	25	30	23	30	26	E S 22	E S 18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
24	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 20	20	23	27	32	25	29	22	22	E S 21	E S 20	E S 17	E S 16	E S 16	E S 16	E S 18	E S 16
25	E S 16	E S 16	E S 16	E S 16	E S 16	E S 17	E S 16	E S 20	22	25	31	31	35	31	31	29	E S 27	E S 15	E S 16	E S 16	E S 15	E S 15	E S 16	E S 16
26	E S 15	E S 15	E S 16	E S 16	E S 16	E S 16	E S 15	E S 18	24	34	30	32	46	32	26	29	E S 22	E S 21	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
27	E S 15	E S 16	E S 15	E S 16	E S 16	E S 15	E S 17	E S 20	22	25	28	31	34	32	31	24	E S 29	E S 20	E S 16	E S 17	E S 16	E S 11	E S 15	E S 16
28	E S 16	E S 16	E S 16	E S 16	E S 16	E S 17	E S 15	E S 20	22	24	26	26	25	31	31	29	E S 25	E S 19	E S 16	E S 16	E S 16	E S 17	E S 16	E S 16
29	E S 16	E S 16	E S 16	E S 16	E	E S 16	E S 16	E S 23	27	25	27	25	25	25	25	20	E S 19	E S 18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
MED	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	17	19	22	22	23	21	20	18	E S 17	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
UQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 20	19	20	25	25	25	25	24	20	E S 19	E S 18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
LQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 17	16	13	18	20	20	20	19	18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16

FEB. 1988 | FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | M(3000)F2 (0.01) | 135° E Mean Time (G.M.T. + 9 h)

Station WAKKANAI Lat. 45° 23'.5 N, Long. 141° 41'.2 E Sweep 1 MHz to 25 MHz in 24 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	290	305	295	310	330	350	305	355	360	360	325	335	365	325	330	345	340	350	325	295	335	300	320	275
2	305	305	310	310	305	310	350	355	360	350	370	340	330	320 Z	345	350	345	345	330	320	330	300	305	305
3	C	295	305	305	315	335	355	345	360	380	345	280 Z	330	330	340	355	350	335	310	330	305	300	295	290
4	295	300	290	305	300	335	345	335	360	340	315 H	320 H	325	370	320	335	350	335	335	350	325	295 F	F	300 F
5	F	310 F	300	305 F	340	335	400	325	340	340	300	355	330	325	325	345	305 H	335	305	345	260	220	305	265
6	280 F	285	300	310	305	280	315	355	365	340	310 H	290 H	350 H	345	345	340	355	325	320	295	285	300	300	280
7	300	295	290	310	325	335	345	360	330	335	350	340	350	320 H	320	350	355	335	295	330	325	320	285	305
8	295	300	300	310	315	335	325	355	360	350	360	320	345	350	315	345	350	335	310	295	325	280	300	290
9	285	290	285	295	305	305	325	360	345	355	350	335	340	350	350	340	320 H	270	300	310	315	315	305	300
10	295	295	280	295	310	320	330	360	350	355	315	355	355	325 H	315	325 H	350	320	310	335	340	275	280	275
11	285	295	310	345	305	300	290	345	335	340	330	345	350	340	320	345	345	365	285	320	300	300	285	295
12	295	295	310	305	305	290	310	320	335	345	340	385	370	400	330 H	340	315 H	335	320	320	335	275	290	300
13	290	295	295	300	335	285	290	360	345	340	350 H	325	335	310	335	320	330	335	335	285	315	290	265	270
14	280	280	280	310	315	300	350	350	305 Z	325	335	355	350	340	330	330	360	330	315	320	310	275	285	295
15	285	295	300	295	305	325	325	350	365	345	330	370	360	340 H	295 H	355	345	340	305	315	300	305	285	260
16	300	275	300	285	325	325	350	335	350	290	355	335	320	320	355	340	345	340	325	290	310	280	280	285
17	270	265	270	315	305	335	335	355	355	325	330	280	330	335	340	350	355	360	335	315	310	265	280	285
18	290	300	285	275	300	300	340	360	335	320	340	320	330	345	325	360	330 H	345	335	300	315	230	235	285
19	295	290	290	275	310	275	320	365	340	320	345	340	335	335	325	340	325	340	310	335	320	280	295	275
20	295	300	305	295	310	325	320	350	355	330	335	330	350	335	325	345	340 H	345	300	310	310	300	295	285
21	290	290	290	295	340	295	315	365	345	355	335	330	315	345	330	335	340	330	345	290	310	300	285	F
22	F	290	320	300	300	290	270	A	220	260	W	W	W	W	280	295	320	310	285	285	265	285	265	275
23	275	290	240	305	290	H 195	A	315	360	335	335	340	335	335	335	335	335	335	315	295	280	280	S 280	280
24	295	325	F 325	F 280	F	F 300	295	350	360	355	340	340	340	345	345	360	335	345	295	295	320	285	280	305
25	275	295	285	F 275	305	305	335	365	355	Z 330	315	340	330	325	340	340	340	355	320	310	310	285	295	295
26	285	300	305	300	325	295	330	350	345	335	330	340	330	390	325	320	340	345	315	320	320	300	295	285
27	290	285	290	295	305	320	300	345	345	325	330	310	330	330	325	340	325	345	340	315	310	310	295	295
28	280	285	290	285	310	335	335	335	350	340	330	325	335	335	335	330	345	340	310	305	290	300	F	F
29	F	F	F	F	300	315	325	350	360	330	335	325	335	340	340	345	355	345	335	320	295	290	295	315
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	25	28	28	28	28	29	28	28	29	29	29	29	29	29	29	29	29	29	29	29	29	29	27	27
MED	290	295	295	300	308	310	325	350	350	340	335	335	335	335	330	340	340	340	315	315	310	290	290	285
UQ	295	300	305	310	320	335	342	360	360	350	345	340	350	345	340	345	350	345	330	320	320	300	295	298
LQ	285	290	288	295	305	295	312	345	340	330	330	320	330	325	325	335	330	335	305	295	300	280	282	278

The Radio Research Laboratory, Japan

FEB. 1988 | M(3000)F2 (0.01)

IONOSPHERIC DATA

FEB. 1988 | M(3000)F1 (0.01) | 135° E Mean Time (G.M.T. + 9 h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 24 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											385	L	L 355	L 365	L 395									
2											L	L	L 390	L 380										
3											L 390		H 360	L 380	L 365									
4												L	360	L										
5											L 350	L 370	370	L 365										
6											L 395	370	L	L 355	L 350	L 335								
7										L 395	L 350	L 355	370											
8												375	L 360	L 350	L 335									
9											L 360	H 335	L 385	L 340	L 340									
10										L 355	345	L 365	L	380	375									
11										L 375	L 325	H 340	L 350	L 355	L 380	L 350								
12										L	380	L 380	L 315	L 360	L	L								
13											A	A	L 385	L	L 335	L 340								
14											L 370	A	340	L	L 395	L								
15										L	L 380	385	385	L 390	L									
16										L 350	L 360	L 385	L 365	L 365	L 390	L 400								
17										A	L	L 395	L 300	L 385	L 400									
18											L 380	L 365	L 385	L 395	L	L 380								
19											L	L 375	L	L 370	L	L								
20										A	L	L 390	L 405	385	L 365	L								
21										L	L 405	L 370	L 370	L 370	L	L 370								
22									360	350	370	370	380	335	L 325	L 355								
23											L	L 340	L 330	L 320	L 345	L								
24										L 345	350	370	L 385	415	H 365	L								
25										L 400	L 370	L 370	L 345	L 340	L 350	L 345								
26											L 345	L 370	B	340	L 340	L 375								
27											A	L 355	L 360	L 370	L 325	L 310								
28										L	L 415	L 335	L 355	L 365	L 385	L 350								
29										L	L	L 365	H 360	L 365	L 365	L 370								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	7	19	23	25	25	20	12								
MED									360	L 355	L 370	L 370	L 360	L 365	L 365	L 352								
UQ										L 385	L 382	L 375	L 385	L 380	L 382	L 372								
LQ										L 350	L 350	L 360	L 355	L 355	L 340	L 342								

FEB. 1988 | M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | H'F2 (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 24 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	245	235	240	245									
2											220	250	245	225										
3											245		275	250	235									
4												225	260	230										
5											310	230	250	250										
6											245	250	245	245	245	250								
7										230	245	255	255											
8												280	250	255	325									
9											240	255	270	255	255									
10										245	305	240	240	250	230									
11										230	255	230	250	245	250	240								
12										220	255	215	300	255	240	245								
13											230	275	240	275	250	265								
14											230	215	250	250	250	250								
15										235	230	230	235	H 235	225									
16										210	240	235	255	255	225	235								
17										250	265	240	250	250	240									
18											255	265	250	235	235	230								
19											225	255	245	255	245	245								
20										230	250	285	245	255	240	230								
21										240	245	275	250	245	230	250								
22									620	485	W	W	W	W	425	335								
23											250	250	255	260	250	225								
24										250	270	255	250	255	240	235								
25										240	290	250	255	275	255	250								
26											270	250	265	275	270	250								
27											245	275	255	255	265	255								
28										250	235	275	260	255	250	255								
29										235	250	270	255	255	255	245								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	14	27	28	29	23	25	18								
MED									620	238	250	250	250	255	245	248								
UQ										250	268	272	255	255	255	250								
LQ										230	240	238	245	245	240	235								

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FEB. 1988 | H'F2 (KM)

IONOSPHERIC DATA

FEB. 1988 | H'F (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	300	285	295	275	225	205	ES 260	225	210	225	H 205	A 245	225	205	205	230	225	205	220	230	230	255	255	300
2	295	275	290	290	260	245	230	215	220	225	225	255	215	215	230	235	215	205	245	250	255	260	290	280
3	295	300	300	275	255	230	ES 215	225	220	210	220	205	200	225	215	235	205	200	235	215	250	255	275	290
4	300	290	295	270	250	225	210	205	220	210	215	205	225	240	200	235	220	205	230	225	250	275	295	290
5	290	295	300	275	230	205	ES 200	225	210	H 220	H 200	225	205	220	240	H 250	225	205	245	205	S 325	300	280	305
6	300	300	275	275	280	300	250	215	220	225	220	210	A 250	200	225	225	205	245	235	A 300	270	305	255	315
7	290	280	295	275	245	240	S 225	200	235	205	A 250	230	A 245	225	215	230	225	220	200	225	245	S 250	295	290
8	295	235	280	285	255	215	ES 245	210	225	220	H 245	225	245	220	205	H 205	225	205	240	255	245	305	255	275
9	290	300	300	290	255	250	230	205	225	220	200	195	205	H 200	205	225	230	205	250	250	250	250	275	275
10	305	300	330	300	260	225	245	220	225	230	205	230	A 245	200	215	230	235	210	230	250	225	280	320	330
11	305	300	270	240	265	ES 265	ES 300	240	235	210	195	200	220	220	200	225	225	205	240	250	290	275	305	295
12	300	280	265	255	255	280	270	225	230	215	210	H 205	195	245	H 210	H 210	H 220	215	230	210	215	ES 300	305	275
13	285	290	270	255	220	300	ES 275	220	215	H 210	A	A	A 225	A 215	205	240	220	225	195	225	240	ES 300	325	315
14	300	310	250	285	240	275	215	210	H 195	225	220	A	225	210	205	225	220	220	215	230	240	285	290	260
15	300	300	295	270	240	235	235	225	220	215	205	200	215	A 220	215	H 200	220	210	240	240	250	230	280	295
16	275	260	265	265	250	235	210	220	235	H 205	215	A 220	210	210	225	215	220	210	215	235	265	290	300	305
17	330	325	325	260	230	ES 245	ES 240	220	230	A	220	205	210	210	200	220	210	210	220	255	255	305	290	300
18	300	270	280	305	260	260	225	220	230	220	220	215	220	230	205	225	210	225	215	255	230	270	265	A 340
19	290	280	295	320	260	240	220	220	H 220	H 210	H 205	205	A 245	230	230	220	230	215	220	225	225	290	285	305
20	305	230	225	290	255	245	225	220	H 205	A	A 235	210	205	200	220	220	210	220	205	225	240	250	260	300
21	300	295	270	270	230	235	235	225	H 205	245	225	200	225	205	230	220	235	230	225	270	250	A 275	A	A 345
22	295	265	230	275	220	260	ES 390	A	250	265	225	225	225	245	255	240	255	255	260	295	345	300	340	325
23	300	325	375	265	345	425	A	H 255	235	235	250	230	205	220	225	225	225	215	205	275	280	305	A	300
24	275	250	250	260	275	275	270	255	230	225	205	205	210	200	195	H 220	H 210	230	A 255	275	250	305	320	280
25	285	295	305	310	A 290	ES 275	A 260	220	215	A 210	225	A 240	240	230	210	225	235	205	225	230	270	305	300	300
26	300	275	275	280	245	295	235	230	240	240	225	235	B	225	220	215	240	225	215	235	235	275	295	295
27	305	325	300	305	290	245	250	240	H 200	225	A	225	250	210	H 205	H 200	230	225	205	250	240	240	270	265
28	300	295	285	280	250	230	200	H 200	H 220	225	205	220	225	225	210	225	230	210	205	240	265	250	285	290
29	300	250	255	250	235	230	225	220	220	215	235	220	H 200	230	225	220	225	220	210	235	255	305	255	245
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	28	28	29	27	27	27	28	29	29	29	29	29	29	29	29	29	27	29
MED	300	290	290	275	255	242	230	220	220	220	220	220	222	220	215	225	225	215	225	240	250	278	290	295
UQ	300	300	300	290	260	275	245	225	230	225	225	228	232	225	225	230	230	225	240	255	265	300	300	305
LQ	290	280	270	265	240	230	222	215	215	210	205	205	208	210	205	220	220	205	215	225	240	255	272	280

FEB. 1988 | H'F (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | H'E (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 24 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								S	135	125	130	120	125	125	120	125	S 150							
2								S	130	A 125	115	120	125	B 135	120	125	S 125							
3								S	130	125	H 120	120	125	115	120	125	S							
4								S	130	125	125	125	120	120	130	130	S 150							
5								S	125	125	120	H 125	120	120	120	125	S							
6								S	130	125	H 125	125	115	120	125	125	S 140							
7								S	125	120	125	A	125	125	125	120	S 125							
8								S	125	125	130	130	130	130	125	125	S 125							
9								S	125	125	120	H 120	120	120	120	120	125							
10								S	125	120	115	115	120	120	110	120	S 135							
11								S	135	120	125	A	A 130	125	120	125	S 135							
12								S	125	A 125	110	110	115	110	115	130	A							
13								S	135	120	120	120	A	A	A 125	125	S							
14								S	130	115	110	115	120	120	120	A 130	S 125							
15								S	S 130	125	120	110	A 130	A	115	A	S 140							
16								S 155	120	120	115	120	115	A	A	120	A							
17								S	130	120	120	120	A 125	A	125	120	A							
18								S	130	120	115	120	120	120	120	120	A 125							
19								S	125	125	125	115	115	A 125	125	120	125							
20								S	125	120	130	120	B 145	125	125	120	S 130							
21							S	S	125	120	120	120	H 115	110	120	120	S 130	S						
22							S	S	125	125	B 125	125	115	H 120	115	H 115	S 130	S						
23							S	A	125	120	125	A	B	B 145	B	B	S	S						
24							S	S	135	130	B 145	B	130	B	125	A	A	S						
25							S	S	A	A	B	B	B	B	B	B	S	S						
26							S	S 165	B	B	B	B	B	B	B 135	B	S	S						
27							S	S	B 150	B 140	B	B	B	B	B	B 125	S	S						
28							S	S	B 135	B 125	B 135	135	125	B	B	B	S	S						
29							S	S	B	B 140	B 135	125	125	125	125	125	S 130	S						
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	26	27	26	22	24	20	24	23	17							
MED								S 160	130	125	122	120	122	120	120	125	S 133							
UQ									130	125	125	125	125	125	125	125	S 133							
LQ									125	120	120	120	118	120	120	120	S 125							

The Radio Research Laboratory, Japan

FEB. 1988 | H'E (KM)

IONOSPHERIC DATA

FEB. 1988 | H'ES (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station WAKKANAI Lat. 45° 23·5 N, Long. 141° 41·2 E Sweep 1 MHz to 25 MHz in 24 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	S	S	S	S	E	S	S	150	170	G	G	160	G	G	G	G	G	S	S	S	S	S	S	S
2	S	S	S	S	S	S	S	S	G	110	G	175	G	G	G	G	G	S	S	S	S	S	S	S
3	S	S	S	S	S	S	S	S	180	G	G	G	G	G	G	G	S	S	S	S	S	S	S	S
4	S	S	S	S	S	S	S	S	G	G	G	180	G	G	G	G	155	S	100	105	S	S	S	S
5	S	S	S	S	S	S	S	S	175	G	G	G	G	G	G	G	145	S	S	S	S	S	S	S
6	S	S	S	110	S	S	S	S	G	G	G	G	130	G	G	G	G	100	100	100	110	105	110	110
7	S	S	S	S	S	S	S	S	170	G	170	180	130	G	105	G	G	S	120	105	S	S	S	S
8	S	S	S	S	S	S	S	S	175	130	155	140	140	G	G	G	G	S	S	S	S	S	S	S
9	S	105	105	S	S	S	S	S	G	G	115	G	G	G	G	G	G	S	S	S	S	S	S	S
10	S	S	S	S	S	S	S	S	G	G	G	G	170	G	G	G	135	S	S	S	S	S	S	S
11	S	S	S	S	S	S	S	S	155	130	110	105	105	G	G	G	G	S	S	S	S	S	S	S
12	S	S	S	S	S	S	S	S	G	110	135	G	G	180	G	120	115	S	110	110	S	S	S	S
13	115	110	S	S	S	S	S	150	G	G	120	115	110	110	110	135	145	S	S	S	S	S	S	105
14	105	105	105	105	105	S	S	S	G	G	G	125	125	125	G	110	G	S	S	S	S	S	S	S
15	S	110	S	S	E	S	S	S	130	G	120	G	110	100	G	100	G	105	100	S	S	S	S	S
16	S	S	S	E	S	S	S	G	G	G	G	115	G	105	105	G	110	100	100	S	S	S	S	S
17	S	S	S	S	S	S	S	S	130	115	125	115	110	105	G	G	105	S	S	S	S	S	S	S
18	S	S	S	S	S	S	S	S	G	G	G	G	G	G	G	G	155	S	S	S	S	S	S	105
19	105	105	105	S	105	S	S	S	G	G	G	G	105	105	G	G	G	S	S	S	S	S	S	S
20	S	S	S	S	S	S	S	S	G	185	130	G	G	105	G	105	G	S	S	105	S	S	S	115
21	110	110	110	105	105	105	S	130	120	120	115	125	G	110	G	G	G	S	105	105	105	105	105	105
22	105	115	S	105	E	S	S	135	140	G	125	125	G	G	G	G	G	S	S	S	S	S	S	S
23	S	S	S	S	130	S	110	115	G	120	G	110	B	G	B	9	S	S	S	105	S	S	105	S
24	S	105	S	S	S	S	S	145	G	140	G	B	125	125	125	115	110	105	105	115	S	S	S	S
25	S	S	S	S	105	105	105	110	110	180	180	175	B	150	B	B	S	S	S	S	S	S	S	S
26	S	S	S	S	S	S	S	G	150	B	155	150	B	B	G	D	135	S	S	S	S	S	S	S
27	S	S	S	S	S	S	S	155	G	150	135	130	B	B	B	G	S	S	S	S	S	S	S	S
28	S	105	S	S	S	S	S	S	G	G	G	G	G	B	B	B	S	S	S	S	S	S	S	S
29	S	S	S	S	E	S	S	S	B	G	G	G	G	G	G	G	G	S	S	S	S	S	S	S
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	9	4	4	5	2	2	8	12	11	14	16	11	11	4	6	10	4	8	8	2	2	3	5
MED	105	105	105	105	105	105	103	148	152	130	130	128	125	110	103	112	140	102	102	105	108	105	105	105
UQ	110	110	103	108	105			152	172	145	155	163	135	125	113	120	155	105	103	103			108	110
LQ	105	105	105	105	105			125	130	113	120	115	110	105	105	105	110	100	100	105			105	105

FEB. 1988 | H'ES (KM)

IONOSPHERIC DATA

FEB. 1938 | TYPES OF ES | 135° E Mean Time (G.M.T. + 9 h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 24 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 1	H 1			H 1												
2										L 1		H 1												
3									H 1															
4												H 1					C 1		F 2	F 2				
5									H 1								C 1							
6				F 1									H 1					F 3	F 3	F 3	F 1	F 2	F 2	F 1
7									H 1		H 1	HL 11	CL 11		L 1				F 1	F 2				
8									H 1	C 1	C 1	C 1	C 1											
9		F 2	F 1								C 1													
10													H 1				H 1							
11									C 1	C 1	L 1	L 1	L 2											
12										L 1	C 1			H 1		L 1	L 1		F 2	F 1				
13	F 1	F 2						C 1			C 3	C 3	L 2	L 2	L 1	H 1	C 1							F 2
14	F 2	F 2	F 2	F 5	F 2							C 3	C 1	C 1		L 2								
15		F 1							C 1		CL 12		L 2	L 2		L 2		F 1	F 1					
16												C 2		L 2	L 2		L 1	F 3	F 2					
17									C 2	C 2	C 1	C 1	L 1	L 2			L 1							
18																	C 1							F 3
19	F 1	F 2	F 2		F 1								C 2	L 1										
20										H 1	H 1			L 1		L 1				F 2				F 2
21	F 2	F 2	F 2	F 2	F 1	F 3		H 1	C 2	C 2	C 2	C 1		C 2					F 3	F 2	F 2	F 5	F 7	F 4
22	F 2	F 1		F 2				C 3	C 1		C 1	C 1												
23					F 2		L 3	L 1		C 1		L 1								F 3			F 4	
24		F 2						C 1		C 1			C 1	C 1	C 1	C 1	L 1	L 2	F 2	F 1				
25					F 2	F 2	L 3	L 1	L 1	HL 11	H 1	H 1		H 1										
26									C 1		H 1	H 1					C 1							
27								C 1		C 1	C 1	C 1												
28		F 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 Laboratory, Japan

FEB. 1938 | TYPES OF ES

IONOSPHERIC DATA

FEB. 1988 | FXI (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station AKITA Lat. 39° 43.5' N · Long. 140° 08.0' E Sweep 1 MHz to 25 MHz in 24 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 38	X 39	X 42	X 42	X 38	X 31												X 47	X 37	X 33	X 39	X 38	X 38
2	X 38	X 38	X 38	X 38	X 39	X 39	X 35												X 44	X 34	X 36	X 37	X 37	X 39
3	X 38	X 38	X 38	X 39	X 42	X 36	X 34												X 44	X 38	X 43	X 38	X 36	X 36
4	X 37	X 39	X 39	X 40	X 44	X 39	X 36												V 37	X 47	X 38	36	39	39
5	40	42	X 39	X 43	X 42	X 34	X 33												X 54	X 52	X 37	X 36	X 38	X 39
6	X 39	X 39	X 41	X 44	X 39	X 39	X 42												X 42	X 40	X 39	X 38	X 39	X 38
7	44	45	X 42	X 45	X 45	X 39	X 34												X 48	X 45	X 39	X 39	X 33	X 36
8	X 36	X 38	X 39	X 39	X 42	X 39	X 40												X 42	X 41	X 41	X 39	X 40	X 39
9	X 39	X 38	X 39	X 39	X 41	X 39	X 40												X 46	X 44	X 46	X 42	X 38	X 38
10	X 38	X 39	X 37	X 39	X 39	X 37	X 34												X 56	X 49	X 51	X 42	X 37	X 39
11	X 39	X 39	X 41	X 37	X 36	X 29	X 30												X 42	X 40	X 42	X 44	X 40	X 40
12	X 39	X 40	X 37	X 39	X 33	X 34	X 35												X 56	X 56	X 40	X 34	X 35	X 37
13	X 39	X 40	X 40	X 42	X 37	X 32	X 35												X 67	X 34	X 36	X 36	X 36	X 37
14	40	X 39	X 41	X 38	X 40	X 37	X 45												X 51	X 41	X 42	X 37	X 38	X 39
15	X 39	X 40	X 41	X 42	X 42	X 36	X 38												X 50	X 61	X 57	X 51	X 45	X 44
16	X 47	X 45	X 45	X 42	X 43	X 40	X 41												X 51	X 42	X 33	X 39	X 37	X 37
17	X 37	X 36	X 39	X 41	X 42	X 29	X 32												X 49	X 41	X 42	X 35	X 38	X 39
18	X 39	X 41	X 39	X 38	X 40	X 37	X 36												X 60	X 46	X 46	X 40	X 40	X 37
19	X 39	X 40	X 40	X 39	X 42	X 39	X 42												X 55	X 52	X 50	X 44	X 41	X 38
20	X 40	X 42	X 41	X 41	X 42	X 41	X 40												X 59	X 45	X 47	X 43	X 44	X 44
21	X 45	X 47	X 48	X 48	X 50	X 45	X 49												X 65	X 42	X 50	X 42	X 39	X 42
22	X 46	X 48	X 50	X 48	X 45	X 37	X 32												X 50	X 49	X 47	X 51	X 50	X 52
23	X 47	X 34	X 34	X 36	X 33	X 31	X 41												X 66	X 49	X 50	X 49	X 51	X 51
24	X 51	X 52	X 39	X 32	X 32	X 34	X 37												X 45	X 40	X 46	X 38	X 41	X 41
25	X 42	44	42	X 41	X 42	X 37	X 33												X 53	X 48	X 33	X 41	X 42	46
26	44	48	49	X 45	X 42	X 33	X 44												X 64	X 51	X 49	X 41	X 42	X 42
27	X 39	X 41	X 42	X 41	X 42	X 42	X 39												X 63	X 51	X 54	X 51	51	50
28	49	X 46	X 47	51	58	50	51												X 55	X 48	X 47	49	50	51
29	48	50	43	57	54	53	X 52												X 54	X 42	X 45	48	51	X 48
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29												29	29	29	29	29	29
MED	X 39	X 40	X 40	X 41	X 42	X 38	X 37												X 53	X 45	X 42	X 40	X 39	X 39
UQ	X 44	X 45	X 42	X 43	X 42	X 39	X 41												X 59	X 49	X 47	X 44	X 42	X 44
LQ	X 39	X 39	X 39	X 39	X 39	X 36	X 34												X 46	X 41	X 38	X 38	X 38	X 38

FEB. 1988 | FXI (0.1 MHZ)

IONOSPHERIC DATA

FEB. 1988 | FOF2 (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station AKITA | Lat. 39° 43.5' N | Long. 140° 08.0' E | Sweep 1 MHz to 25 MHz in 24 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	32	33	36	36	32	25	46	65	71	74	81	85	73	63	66	64	46	41	31	32	33	32	32
2	32	32	32	32	33	32	29	45	67	60	H 78	H 75	87	76	67	63	60	54	38	28	30	31	31	33
3	32	32	32	33	36	30	28	43	62	67	79	79	74	84	76	72	58	51	38	32	36	32	30	30
4	31	33	33	34	38	33	30	43	58	65	70	73	70	H 78	62	73	36	50	V 31	41	32	F	F	F
5	F 32	F 33	33	37	36	28	27	48	62	68	76	98	99	65	73	86	66	60	48	47	25	30	32	33
6	33	33	35	38	33	33	36	52	58	73	79	91	78	83	71	67	74	51	36	34	32	32	33	32
7	F 36	F	36	39	39	33	23	52	58	76	81	101	82	78	66	66	75	55	42	39	33	33	27	30
8	30	32	33	33	36	33	24	50	56	60	73	79	77	87	68	71	74	56	36	35	35	33	34	33
9	33	32	33	33	35	33	34	53	60	79	73	78	74	71	64	72	67	54	40	38	40	36	32	32
10	32	33	31	33	33	31	28	55	64	63	75	88	87	H 78	63	76	69	53	50	43	45	36	31	33
11	33	33	35	31	30	23	24	56	69	81	77	95	76	73	75	69	73	58	36	34	36	35	34	34
12	33	34	31	32	27	28	29	61	66	83	78	95	67	76	90	73	73	62	50	50	34	28	29	31
13	33	34	34	36	31	26	27	56	74	75	76	86	95	83	71	74	35	60	61	28	30	30	30	31
14	F	33	35	32	34	31	39	V 53	65	71	86	94	H 77	95	72	76	74	59	45	35	36	31	32	33
15	33	34	35	36	36	30	32	60	70	73	90	80	94	86	79	73	78	65	56	55	51	45	39	38
16	41	39	39	36	37	34	35	54	81	84	77	100	89	87	82	69	73	62	45	36	32	33	31	31
17	31	32	33	35	36	23	26	56	63	73	88	96	106	115	86	74	65	56	43	35	36	29	32	33
18	33	35	33	32	34	31	30	51	65	71	78	91	97	95	71	75	73	64	54	40	40	34	34	31
19	33	34	34	33	36	33	36	53	62	70	85	88	89	76	72	82	82	79	49	46	44	38	35	32
20	34	36	35	35	36	35	34	50	74	63	78	86	87	74	76	66	62	59	53	39	41	36	38	38
21	39	41	42	42	44	39	43	60	H 58	69	78	84	86	85	77	74	76	63	59	36	44	36	33	36
22	40	42	44	42	39	31	26	31	40	46	49	E C 41	46	45	43	49	51	46	44	43	41	45	44	46
23	41	28	28	30	27	25	35	66	80	100	100	114	105	98	106	84	79	71	60	43	44	43	45	45
24	45	46	33	26	26	28	31	50	71	71	85	89	95	74	75	86	68	56	39	34	40	32	35	35
25	36	F 36	F 35	35	36	31	32	49	H 62	H 66	61	73	76	80	84	74	76	74	47	39	32	35	36	F 36
26	F 37	F 40	F 42	39	36	32	38	52	66	65	70	89	73	79	85	72	77	71	58	45	43	35	36	36
27	33	35	36	35	36	36	33	58	83	72	68	78	84	93	80	83	82	67	57	45	48	45	F 44	F 43
28	F 41	40	41	F 42	F	F	F 44	56	69	67	81	74	94	94	82	81	79	64	49	42	41	F	F	F
29	F	F	F	F	F	F	46	59	64	66	70	73	90	97	90	81	73	62	48	36	39	F	F	42
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	28	28	27	27	29	29	29	29	29	29	29	29	27	29	29	29	29	29	29	26	26	27
MED	33	34	34	35	36	31	31	53	65	70	78	86	86	80	75	73	73	59	47	39	36	34	33	33
UQ	36	36	36	36	36	33	35	56	69	73	81	94	94	87	82	76	76	64	53	43	41	36	36	36
LQ	32	32	33	32	33	29	28	50	62	66	73	78	76	76	68	69	66	55	40	35	32	32	31	32

The Radio Research Laboratory, Japan

FEB. 1988 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

FEB. 1988 | FOF1 (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 03.0' E Sweep 1 MHz to 25 MHz in 24 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	L	L	L 430	L 430	L 410	L								
2										L	L	L	L	L	L	L								
3										L	L	L 450	L	L	L	L								
4										L	L	L	L 430	L	L	L								
5										L	L	470	L	L	440	L								
6										L	L	L	L	L	L 410	L								
7										L	L	L	L 450	L	L	L								
8											L	L	L	L	L	L								
9										L	L	L	L	L	L	L								
10										L	L	L	L	L	L	L	L							
11									L	L	L	450	L	L	L	L								
12									L	L	L 400	L	L	L	L 410	A	L							
13										L	L	L 440	440	L 430	L	L								
14										L 390	L	L	L	L	L									
15										L	L	L	L	L	L	L								
16									L	L	L	L	L 440	L 430	L	L	L							
17										L	L	L	L	L	L	L								
18										L	L	L	L 450	L	L	L								
19										L	L	L	L	L	A	L	L							
20										360	L	L	L 460	L	L 430	L								
21										380	L	L	L 430	L	L	L	L								
22									350	360	390	410	410	410	400	L 330	L							
23										L	L	L	L	L	L	L								
24									L	L	L	L 430	L	L 440	L	L 390	L							
25										L	L 420	430	L	L 460	L	L	L							
26										L	L	L 460	L	L 470	L	L								
27										L	L	L	L	L	L	L	L							
28									L	L	L	L 450	L 450	L 460	L	L	L							
29										L	L	L	L	L 450	430	L	L							
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	4	3	9	10	9	7	2								
MED									350	370	L 400	L 450	L 440	L 440	L 410	L 385								
UQ										385	L 410	460	L 450	L 460	430									
LQ										360	395	L 440	L 430	L 430	L 410									

FEB. 1988 | FOF1 (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | FOE (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station AKITA | Lat. 39° 43.5' N | Long. 140° 08.0' E | Sweep 1 MHz to 25 MHz in 24 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								200	225	280	305	320	320	320	305	290	230	S						
2								135	240	285	310	320	325	320	305	275	225	S						
3								120	235	290	A	320	330	320	290	260	220	S						
4								S	240	280	305	315	A	A	300	255	220	S						
5								120	240	285	305	315	320	310	300	A	230	S						
6								185	230	290	300	310	310	305	300	275	220	S						
7								S	235	A	310	320	330	320	300	265	230	S						
8								120	230	270	305	315	330	320	A	230	230	S						
9								125	245	285	A	320	330	330	305	230	225	S						
10								S	A	A	310	315	320	315	305	275	230	S						
11								S	235	290	A	A	A	A	300	230	235	S						
12								S	A	285	300	A	320	315	A	A	S	S						
13								S	A	A	A	A	A	A	310	275	220	S						
14								S	240	300	305	315	325	A	305	275	230	S						
15								120	240	A	310	320	325	320	310	295	A	S						
16								200	A	A	305	315	330	325	305	290	230	S						
17								135	A	A	A	320	335	330	305	255	215	S						
18								120	235	280	305	A	A	320	305	230	230	S						
19								200	A	A	A	A	A	A	A	270	230	S						
20								120	250	285	305	A	A	A	320	230	240	S						
21								S	250	290	305	A	A	A	A	A	225	S						
22								120	240	275	A	A	A	A	300	A	220	S						
23								A	A	255	A	A	A	A	300	A	230	S						
24								S	235	A	305	315	320	310	300	280	230	S						
25								S	B	A	305	325	330	320 R	305	285 S	240	S						
26								S	245	285	310	315	315	315	305	235	230	S						
27								S	B	300	305	310	315	315	310	A	250	S						
28								120	245	295	305	315	330	330	315	280	230	S						
29								125	255	290	310	325	335	335	320	235	245	S						
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								16	20	20	21	20	20	20	25	23	27							
MED								190	240	285	305	315	325	320	305	230	230							
UQ								195	245	290	310	320	330	322	305	282	230							
LQ								120	235	280	305	315	320	315	300	275	225							

The Radio Research Laboratory, Japan

FEB. 1988 | FOE (0.01 MHZ)

IONOSPHERIC DATA

FEB. 1988 | FOES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.0' E Sweep 1 MHz to 25 MHz in 24 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 16	E S 15	E S 15	E S 15	E S 16	J A 22	E S 16	G	G	G	G	G	G	G	G	G	G	19	E S 16	J A 18	J A 25	J A 24	J A 20	E S 15
2	E S 16	E S 15	E S 16	E S 15	E S 15	E S 15	E S 16	G	G	G	G	G	G	G	G	G	G	E S 17	E S 16	E S 15	E S 15	E S 16	E S 17	E S 16
3	E S 16	E S 15	E S 15	E S 16	E S 16	E S 16	E S 16	G	G	G	J A 34	G	G	G	G	G	G	E S 17	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
4	E S 17	E S 16	E S 15	E S 15	E S 16	E S 16	E S 15	E S 16	G	G	G	G	J A 44	36	G	G	G	E S 16	E S 17	J A 29	E S 16	J A 19	E S 15	E S 15
5	E S 16	E S 16	E S 15	E S 15	E S 15	E S 16	E S 16	J A 22	G	G	G	G	G	G	G	30	G	E S 16	J A 20	J A 21	E S 16	J A 24	E S 15	E S 15
6	E S 16	E S 16	E S 16	E S 15	E S 15	E S 16	E S 16	G	G	G	G	G	G	G	G	G	G	J A 25	J A 23	E S 16	J A 22	J A 20	J A 24	J A 20
7	J A 22	J A 20	J A 22	E S 15	E S 15	E S 15	E S 15	J A 21	J A 41	J A 29	G	G	G 32	G	G	G	G	J A 24	J A 24	E S 17	E S 15	E S 15	E S 15	E S 15
8	E S 16	E S 15	E S 16	E S 16	E S 15	E S 15	E S 17	G	G	G	G	35	G	G	34	32	J A 28	J A 28	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15
9	E S 16	E S 16	J A 29	J A 24	E S 16	J A 21	E S 16	G	G	G	J A 40	G	G	G	G	G	G	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
10	E S 16	E S 16	J A 20	J A 19	E S 15	E S 16	E S 16	E S 18	J A 29	J A 32	G	G	G	G	G	G	G	E S 18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
11	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	G	G	J A 33	J A 33	J A 54	J A 46	G	G	G	E S 13	E S 16	J A 22	E S 16	E S 17	E S 16	E S 16
12	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	24	G	G	J A 39	G	G	J A 43	J A 91	J A 05	J A 24	J A 25	E S 16	E S 16	E S 16	E S 16	E S 15
13	E S 16	J A 22	J A 24	E S 15	E S 16	E S 16	J A 20	22	30	35	J A 43	J A 54	J A 60	J A 63	J A 35	G	G	E S 16	E S 15	E S 15	E S 15	E S 15	E S 16	E S 15
14	J A 22	J A 22	J A 20	E S 16	E S 15	E S 15	E S 15	E S 17	G	G	34	34	35	34	G	G	G	J A 26	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15
15	E S 15	E S 15	E S 15	E S 15	J A 22	J A 30	J A 21	G	G	J A 36	J A 43	36	J G 23	J G 24	G	J A 30	J A 42	J A 30	J A 24	E S 16	E S 16	E S 15	E S 16	E S 16
16	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	J A 29	J A 30	32	G	G	G	J A 84	32	G 30	G	E S 17	J A 28	J A 23	E S 15	E S 15	E S 15	E S 15
17	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	G	29	33	32	G	G	G	G 30	G	G	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
18	E S 16	E S 16	F S 15	E S 16	E S 15	E S 16	E S 15	G	G	G	G	35	36	G	G	G	G	E S 17	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
19	E S 16	E S 16	J A 18	E S 15	E S 15	E S 16	E S 16	G	J A 29	33	34	J A 49	39	33	J A 61	G	G	E S 18	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15
20	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	G	G	G	G	33	33	34	J A 43	G	G	E S 16	J A 19	E S 15	E S 16	E S 15	E S 15	E S 15
21	E S 16	E S 15	J A 22	J A 18	E S 16	E S 16	E S 15	E S 18	G	G	G	40	36	35	J A 36	J A 32	G	J A 21	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
22	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	30	30	J A 65	J A 44	J A 52	J A 33	G	30	G	E S 18	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15
23	E S 15	E S 15	E S 15	E S 15	E S 15	J A 18	J A 25	J A 35	32	J A 40	35	32	J A 36	J A 32	G	32	G	E S 17	E S 16	E S 15	E S 15	E S 15	E S 16	E S 15
24	J A 29	J A 52	J A 26	J A 22	J A 24	E S 16	E S 16	21	28	35	G	G	G	G	G	G	G	E S 18	E S 16	E S 16	E S 16	E S 16	E S 44	E S 15
25	J A 23	J A 22	J A 24	J A 33	J A 53	J A 25	J A 36	E S 16	E B 25	J A 50	G	G	G	G	G	G	G	E S 18	J A 24	J A 24	E S 16	E S 15	E S 15	E S 15
26	E S 16	E S 15	E S 15	E S 15	E S 16	E S 16	E S 16	E S 20	G	G	G	G	G	G	G	G	G	E S 19	E S 16	E S 16	E S 16	E S 15	E S 16	J A 22
27	E S 16	E S 15	E S 15	E S 15	E S 16	J A 22	E S 16	E S 19	E B 25	G	33	38	35	36	G	30	G	E S 18	E S 16	E S 16	E S 17	E S 16	E S 16	E S 16
28	E S 16	J A 21	J A 20	E S 15	E S 15	E S 15	E S 16	G	G	G	G	G	G	G	G	G	G	E S 19	E S 15	E S 15	E S 15	J A 20	J A 23	J A 21
29	E S 16	E S 16	E S 15	E S 16	E S 15	E S 15	E S 16	G	G	G	G	G	G	G	G	G	G	E S 18	E S 15	J A 24	J A 26	J A 21	J A 20	E S 15
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
MED	E S 16	E S 16	E S 15	E S 15	E S 16	E S 16	E S 16	E G 16	G	G	G	G	G	G	G	G	G	E S 13	E S 16	E S 16	E S 15	E S 15	E S 15	E S 15
UQ	E S 16	E S 16	J A 23	E S 16	E S 16	E S 16	E S 16	E S 19	29	32	34	35	36	34	G 30	30	G	19	J A 19	E S 17	E S 16	E S 16	E S 16	E S 16
LQ	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	G	G	G	G	G	G	G	G	G	G	E S 17	E S 15	F S 15	E S 15	E S 15	E S 15	E S 15

FEB. 1988 | FOES (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | FBES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station AKITA | Lat. 39° 43.5' N, Long. 140° 08.0' E | Sweep 1 MHz to 25 MHz in 24 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 16 15	E S 15	E S 15	E S 15	E S 16 15	E S 15	E S 16	G	G	G	G	G	G	G	G	G	G	18	E S 16	F S 15	21	E S 15	E S 15	E S 15
2	E S 16 15	E S 15	E S 16	E S 15	E S 15	E S 15	E S 16	G	G	G	G	G	G	G	G	C	G	E S 17	E S 16	F S 15	E S 15	E S 16	E S 17	E S 16
3	E S 16 15	E S 15	E S 15	E S 16	E S 16	E S 16	E S 16	G	G	G	32	G	G	G	G	G	G	E S 17	E S 15	F S 15	E S 15	E S 15	F S 15	F S 15
4	E S 17 16	E S 15	E S 15	E S 15	E S 16	E S 16	E S 15	F S 16	G	G	G	G	36	34	G	G	G	E S 16	E S 17	29	E S 16	E S 15	E S 15	E S 15
5	E S 16 16	E S 15	E S 15	E S 15	E S 15	E S 16	E S 16	E S 16	G	G	G	G	G	G	G	29	G	E S 15	E S 15	F S 15	E S 15	E S 15	E S 15	E S 15
6	E S 16 16	E S 16	E S 16	E S 15	E S 15	E S 16	E S 16	G	G	G	G	G	G	G	G	G	G	22	E S 15	E S 16	E S 16	19	19	E S 16
7	E S 15 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 17	18	29	G	G	G 23	G	G	G	G	E S 16	E S 15	F S 17	E S 15	E S 15	E S 15	E S 15
8	E S 16 16	E S 15	E S 16	E S 16	E S 15	E S 15	E S 17	G	G	G	G	34	G	G	34	G 21	21	E S 16	E S 16	F S 15	E S 15	E S 15	E S 15	E S 15
9	E S 16 16	E S 16	E S 15	E S 15	E S 16	E S 16	E S 16	G	G	G	31	G	G	G	G	G	G	E S 15	E S 15	F S 15	E S 15	E S 15	E S 15	E S 15
10	E S 16 16	E S 16	E S 15	E S 16	E S 15	E S 16	E S 16	E S 18	25	23	G	G	G	G	G	G	G	E S 15	E S 16	F S 15	F S 15	E S 16	E S 16	E S 16
11	E S 16 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	G	G	32	33	40	32	G	G	G	E S 18	E S 16	E S 15	E S 16	E S 17	F S 16	F S 16
12	E S 16 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	24	G	G	38	G	G	33	40	23	18	18	E S 16	E S 16	E S 16	F S 16	F S 15
13	E S 16 16	E S 15	E S 15	E S 15	E S 16	E S 16	E S 16	22	28	29	32	33	34	34	25	G	G	E S 16	E S 15	E S 15	E S 15	E S 15	E S 16	E S 15
14	E S 16 15	E S 15	E S 16	E S 15	E S 15	E S 15	E S 17	G	G	33	34	34	34	G	G	G	G	E S 16	E S 16	F S 15	E S 15	E S 15	E S 15	E S 15
15	E S 15 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	G	G	30	G 22	G 23	G 20	G 27	G	G 25	24	23	E S 15	F S 16	E S 15	E S 15	E S 16	E S 16
16	E S 16 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	26	30	G	G	G	G 27	G 21	G 22	G	E S 17	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15
17	E S 15 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	G	26	30	32	G	G	G	G 26	G	G	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
18	E S 16 16	E S 16	E S 15	E S 16	E S 15	E S 16	E S 16	G	G	G	G	34	34	G	G	G	G	E S 17	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
19	E S 16 16	E S 16	E S 15	E S 15	E S 15	E S 16	E S 16	G	24	30	34	35	33	33	61	G	G	E S 13	E S 16	F S 15	E S 15	E S 15	E S 15	E S 15
20	E S 15 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	G	G	G	G	33	33	34	G 29	G	G	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
21	E S 16 16	E S 15	E S 15	E S 15	E S 16	E S 16	E S 15	E S 18	G	G	G	35	35	35	35	31	G	18	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
22	E S 16 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	25	30	36	32	35	32	G	28	G	E S 18	E S 16	F S 15	E S 15	E S 15	E S 15	E S 15
23	E S 15 15	E S 15	E S 15	E S 15	E S 15	E S 15	21	28	29	28	35	32	34	32	G	30	G	E S 17	E S 16	E S 15	E S 15	E S 15	E S 16	E S 15
24	24	34	E S 15	E S 15	E S 15	E S 16	E S 16	21	28	30	G	G	G	G	G	G	G	E S 13	E S 16	E S 16	E S 16	F S 16	E S 16	E S 15
25	E S 16 15	E S 15	E S 15	E S 15	20	E S 16	27	E S 16	E B 25	30	G	G	G	G	G	G	G	E S 15	E S 16	E S 15	E S 15	E S 16	E S 15	E S 15
26	E S 16 16	E S 15	E S 15	E S 15	E S 16	E S 16	E S 16	E S 20	G	G	G	G	G	G	G	G	G	E S 19	E S 16	E S 16	E S 16	E S 15	E S 16	17
27	E S 16 15	E S 15	E S 15	E S 15	E S 16	E S 16	E S 16	E S 19	E B 25	G	32	38	35	36	G	29	G	E S 18	E S 16	E S 16	E S 17	E S 16	E S 16	E S 16
28	E S 16 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	G	G	G	G	G	G	G	G	G	G	E S 19	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
29	E S 16 16	E S 16	E S 15	E S 16	E S 15	E S 15	E S 16	G	G	G	G	G	G	G	G	G	G	E S 18	E S 15	E S 15	24	E S 15	E S 15	E S 15
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
MED	E S 16 15	E S 15	E S 15	E S 15	E S 15	E S 16	E S 16	E G 16	G	G	G	G	G	G	G	G	G	E S 18	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15
UQ	E S 16 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 18	25	29	32	33	34	32	G 21	G 22	G	E S 13	E S 16	E S 16	E S 16	E S 15	E S 16	E S 15
LQ	E S 16 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	G	G	G	G	G	G	G	G	G	G	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15

The Radio Research Laboratory, Japan

FEB. 1988 | FBES (0.1 MHZ)

IONOSPHERIC DATA

FEB. 1988 | FMIN (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station AKITA Lat. 39° 43' N, Long. 140° 08' E Sweep 1 MHz to 25 MHz in 24 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 16	E S 15	E S 15	E S 15	E S 16	E S 15	E S 16	E S 16	16	13	18	20	18	13	20	18	18	E S 17	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15
2	E S 16	E S 15	E S 16	E S 15	E S 15	E S 15	E S 16	E S 16	E S 17	19	18	20	20	17	17	16	E S 16	E S 17	E S 16	E S 15	E S 15	E S 16	E S 17	E S 16
3	E S 16	E S 15	E S 15	E S 16	E S 16	E S 16	E S 16	E S 17	E S 16	17	18	17	20	18	E S 23	E S 22	16	E S 17	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
4	E S 17	E S 16	E S 15	E S 15	E S 16	E S 16	E S 15	E S 16	16	16	17	18	18	19	17	17	16	E S 16	E S 17	E S 15	E S 16	E S 15	E S 15	E S 15
5	E S 16	E S 16	E S 15	E S 15	E S 15	E S 16	E S 16	E S 16	16	17	16	17	17	17	17	16	E S 16	E S 16	E S 15	E S 15	E S 16	E S 15	E S 15	E S 15
6	E S 16	E S 16	E S 16	E S 15	E S 15	E S 16	E S 16	E S 16	E S 16	18	19	20	18	18	16	16	16	E S 16	E S 15	E S 16	E S 16	E S 15	E S 16	E S 16
7	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 17	16	16	17	18	17	17	17	16	17	E S 16	E S 15	E S 17	E S 15	E S 15	E S 15	E S 15
8	E S 16	E S 15	E S 16	E S 16	E S 15	E S 15	E S 17	E S 16	16	17	17	17	17	17	17	16	16	E S 16	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15
9	E S 16	E S 16	E S 15	E S 15	E S 16	E S 16	E S 16	E S 15	16	13	16	18	18	18	20	17	16	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
10	E S 16	E S 16	E S 15	E S 16	E S 15	E S 16	E S 16	E S 16	16	16	20	18	17	16	16	16	E S 16	E S 13	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
11	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 13	16	16	20	16	16	16	16	17	E S 16	E S 18	E S 16	E S 15	E S 16	E S 17	E S 16	E S 16
12	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 18	16	16	16	16	17	18	16	16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15
13	E S 16	E S 15	E S 15	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	17	16	17	17	17	17	17	16	E S 16	E S 15	E S 15	E S 15	E S 15	E S 16	E S 15
14	E S 16	E S 15	E S 15	E S 16	E S 15	E S 15	E S 15	E S 17	17	16	16	18	16	17	17	17	16	E S 13	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15
15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	15	16	16	16	16	16	19	16	16	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16
16	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	17	17	16	17	16	16	16	16	16	E S 17	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15
17	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	16	17	18	18	E S 22	19	17	16	E S 16	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
18	E S 16	E S 16	E S 15	E S 16	E S 15	E S 16	E S 16	E S 17	16	16	17	16	16	17	17	16	17	E S 17	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
19	E S 16	E S 16	E S 15	E S 15	E S 15	E S 16	E S 16	E S 16	17	17	17	18	17	20	19	16	17	E S 18	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15
20	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	16	17	17	18	17	17	20	17	16	E S 16	E S 15	E S 15	E S 16	E S 15	E S 15	E S 15
21	E S 16	E S 15	E S 15	E S 15	E S 16	E S 15	E S 15	E S 18	17	16	17	20	18	17	17	17	16	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
22	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	16	13	17	17	18	18	17	16	17	E S 18	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15
23	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	E S 16	17	17	E S 22	21	21	18	20	18	17	E S 17	E S 16	E S 15	E S 15	E S 15	E S 16	E S 15
24	E S 16	E S 15	E S 15	E S 15	E S 15	E S 16	E S 16	E S 18	16	16	19	20	24	22	20	17	17	E S 13	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15
25	E S 16	E S 15	E S 15	E S 15	E S 16	E S 16	E S 16	E S 16	25	21	26	30	25	25	21	21	21	E S 18	E S 16	E S 15	E S 16	E S 15	E S 15	E S 15
26	E S 16	E S 15	E S 15	E S 15	E S 16	E S 16	E S 16	E S 20	23	25	23	25	23	27	23	24	20	E S 19	E S 16	E S 16	E S 16	E S 15	E S 16	E S 15
27	E S 16	E S 15	E S 15	E S 15	E S 16	E S 16	E S 16	E S 19	25	20	20	22	24	22	19	19	18	E S 18	E S 16	E S 16	E S 17	E S 16	E S 16	E S 16
28	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	18	22	20	23	21	21	20	20	20	E S 19	E S 15	E S 15	F S 15	E S 15	E S 15	E S 15
29	E S 16	E S 16	E S 15	E S 16	E S 15	E S 15	E S 16	E S 16	18	20	22	23	21	20	21	19	17	E S 18	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
MED	E S 16	E S 15	E S 15	E S 15	E S 15	E S 16	E S 16	E S 16	16	17	17	18	18	18	17	17	16	E S 17	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15
UQ	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 17	17	18	20	20	20	19	20	18	17	E S 18	E S 16	E S 16	E S 16	E S 15	E S 15	E S 15
LQ	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	E S 16	16	16	17	17	17	17	17	16	16	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15

FEB. 1988 | FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | M(3000)F2 (0.01) | 135° E Mean Time (G.M.T. + 9 h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.0' E Sweep 1 MHz to 25 MHz in 24 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	285	295	295	310	335	345	305	330	370	370	365	325	360	340	360	365	350	350	360	320	295	305	300	295
2	285	300	295	305	305	310	340	355	370	385	H 345	H 300	345	340	350	350	355	350	350	330	300	305	290	305
3	285	285	295	295	335	325	355	335	370	315	340	345	350	355	335	355	370	350	320	320	365	305	275	300
4	270	285	295	300	325	340	320	360	360	350	345	355	340	H 335	340	335	355	360	V 295	340	370	F	F	F
5	F 305	F 295	285	325	335	295	320	330	345	325	310	310	360	345	320	350	340	335	295	375	275	270	225	315
6	285	270	280	300	295	285	305	365	335	370	340	340	345	360	325	330	350	370	305	300	305	305	305	285
7	F 290	F	275	300	325	340	320	355	370	350	315	350	325	345	345	330	340	330	310	325	310	350	280	285
8	285	285	300	305	305	335	300	360	355	325	365	320	330	345	370	340	350	350	350	320	315	335	295	295
9	290	285	275	280	315	295	335	360	365	360	350	350	355	330	355	335	345	345	325	305	320	315	285	300
10	280	295	285	280	295	290	335	365	375	340	345	325	345	H 330	350	355	360	330	315	300	330	320	290	270
11	280	280	310	315	325	285	285	325	360	350	340	335	355	335	345	345	355	345	315	295	305	305	280	295
12	285	295	310	350	295	285	295	365	365	340	335	370	330	330	345	340	355	355	305	350	325	285	255	295
13	305	295	280	315	355	270	305	350	365	325	340	315	335	345	340	325	335	340	350	290	280	290	295	285
14	F	285	315	295	350	280	330	V 360	340	340	330	345	H 300	355	335	340	360	355	340	305	325	305	290	295
15	280	270	290	310	330	305	285	350	360	340	335	320	350	335	365	335	320	340	325	320	305	310	260	260
16	295	285	280	295	300	310	335	335	335	355	330	350	330	335	340	365	355	360	350	310	315	315	300	290
17	275	280	295	320	375	280	305	355	345	335	330	320	320	340	340	335	340	355	345	290	325	280	285	280
18	290	315	280	280	285	310	300	350	365	330	320	320	330	350	340	335	355	345	335	315	315	320	295	295
19	280	295	280	295	295	295	335	375	350	330	335	340	350	340	335	335	325	350	340	295	320	320	290	290
20	275	285	290	300	335	335	325	345	365	350	345	350	345	345	345	350	350	350	340	305	320	320	290	285
21	275	285	290	305	320	300	330	370	H 360	320	335	335	325	330	345	340	345	340	330	275	335	295	285	275
22	280	280	295	280	315	275	275	305	230	245	285	G	250	260	310	305	330	330	320	280	270	275	250	280
23	280	250	290	270	270	315	295	335	315	320	325	325	320	335	340	330	330	330	340	290	295	265	280	290
24	315	340	305	275	255	285	310	355	350	345	350	335	335	330	330	350	365	355	340	290	320	280	275	285
25	290	F 305	F 310	290	315	315	330	335	H 320	H 305	335	330	330	325	345	350	335	345	340	305	280	285	225	F 290
26	F 280	F 300	F 295	295	305	270	315	345	340	345	315	350	330	315	340	345	335	350	360	310	320	300	295	290
27	295	275	275	285	280	295	305	310	375	365	340	320	305	335	315	320	340	335	345	300	300	310	F 295	F 275
28	F 275	F 295	305	F 300	F	F	F 340	370	345	330	330	310	325	325	335	330	335	350	330	300	310	F	F	F
29	F	F	F	F	F	F	335	365	345	330	320	315	315	335	350	340	355	365	345	300	300	F	F	305
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	28	28	27	27	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	26	26	27
MED	285	285	292	300	315	295	320	355	360	340	335	330	330	335	340	340	350	350	340	305	315	305	283	290
UQ	290	295	298	308	332	315	335	360	365	350	345	345	345	345	345	350	355	355	345	320	320	315	295	295
LQ	280	282	280	288	295	285	305	335	345	325	330	320	325	330	335	335	335	340	320	300	300	285	280	282

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FEB. 1988 | M(3000)F2 (0.01)

IONOSPHERIC DATA

FEB. 1988 | M(3000)F1 (0.01) | 135° E Mean Time (G.M.T. + 9 h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.0' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L 385	L 405	L 390	L								
2										L	L	L	L	L	L	L								
3										L	L	L 375	L	L	L	L								
4										L	L	L	L 405	L	L	L								
5										L	L	380	L	L	370	L								
6										L	L	L	L	L	L 420	L								
7										L	L	L	L 380	L	L	L								
8											L	L	L	L	L	L								
9										L	L	L	L	L	L	L								
10										L	L	L	L	L	L	L	L							
11									L	L	L	375	L	L	L	L								
12									L	L	L 425	L	L	L	L 365	A	L							
13										L	L	L 405	405	L 390	L	L								
14										L 415	L	L	L	L	L									
15										L	L	L	L	L	L	L								
16									L	L	L	L	L 390	L 400	L	L	L							
17										L	L	L	L	L	L	L								
18										L	L	L	L 385	L	L	L								
19										L	L	L	L	L	A	L	L							
20										425	L	L	L 385	L	L 395	L								
21										440	L	L	L 395	L	L	L	L								
22									340	355	A	370	375	385	370	L 370	L							
23										L	L	L	L	L	L	L								
24									L	L	L	L 405	L	L 395	L	L 335	L							
25										L	L 405	375	L	L 365	L	L	L							
26										L	L	L 365	L	L 360	L	L								
27										L	L	L	L	L	L	L	L							
28									L	L	L	L 375	L 380	L 365	L	L	L							
29										L	L	L	L	L 360	390	L	L							
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	4	2	9	10	9	7	2								
MED									340	420	L 415	L 375	L 385	L 385	L 390	L 378								
UQ										432		L 380	L 395	L 395	L 392									
LQ										385		375	L 380	L 365	370									

FEB. 1988 | M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | H'F2 (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.0' E Sweep 1 MHz to 25 MHz in 24 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										230	235	255	250	265	250	230								
2										215	230	230	260	245	240	230								
3										225	250	265	250	260	260	245								
4										250	275	250	250	250	245	230								
5										240	H 240	280	240	235	300	250								
6										230	270	255	240	250	H 240	230								
7										250	285	250	275	240	240	235								
8											240	280	270	235	245	275								
9										240	235	260	250	270	240	250								
10										235	245	230	235	270	235	245	230							
11									230	245	245	230	230	240	250	230								
12									225	245	240	240	245	265	250	245	230							
13										250	245	270	250	255	250	260								
14										230	250	245	245	240	245									
15										230	255	250	250	255	230	245								
16									255	240	250	250	265	245	260	225	240							
17										250	255	255	275	240	245	230								
18										240	245	260	260	250	240	240								
19										235	250	245	255	260	A	255	245							
20										230	250	245	255	245	250	230								
21										H 245	260	245	260	260	250	250	240							
22									630	525	400	G	510	490	355	320	265							
23										270	250	275	265	260	250	240								
24									245	290	250	260	250	250	255	245	220							
25										H 225	250	280	260	280	250	245	245							
26										260	255	260	275	280	250	240								
27										230	235	270	280	255	280	270	235							
28									230	245	270	275	270	255	245	260	240							
29										240	250	255	270	255	250	245	235							
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	28	29	29	29	29	28	11							
MED										238	240	250	260	255	255	250	245	240						
UQ										255	250	255	275	270	260	250	250	242						
LQ										230	230	245	250	250	245	242	232	232						

The Radio Research Laboratory, Japan

FEB. 1988 | H'F2 (KM)

IONOSPHERIC DATA

FEB. 1988 | H'F (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station AKITA Lat. 39° 43·5 N, Long. 140° 08·0 E Sweep 1 MHz to 25 MHz in 24 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	ES 310	290	290	250	230	210	260	235	225	230	225	210	200	200	220	225	225	210	220	230	A	250	260	260
2	295	275	285	280	250	250	210	225	225	205	230	205	230	220	230	220	220	210	210	225	250	255	ES 320	280
3	285	300	295	285	240	230	210	230	210	200	205	210	220	200	225	235	220	205	245	215	220	245	ES 280	ES 290
4	ES 320	295	280	265	240	235	210	200	220	240	235	200	215	200	230	240	230	210	ES 270	A	205	ES 345	ES 370	255
5	ES 305	ES 295	ES 295	255	225	ES 230	250	225	230	220	220	220	215	210	200	250	230	230	250	200	ES 270	ES 305	ES 300	250
6	295	ES 310	290	260	260	ES 310	240	210	H 200	H 220	255	245	220	235	200	215	235	200	225	245	265	265	A 230	ES 300
7	285	280	275	230	230	225	230	230	220	225	200	240	220	220	225	225	245	210	210	240	240	235	ES 325	ES 305
8	ES 300	ES 290	280	230	265	230	ES 275	215	220	225	240	200	225	235	200	195	230	205	205	240	260	225	275	270
9	285	295	300	295	255	255	230	215	H 225	200	205	240	220	205	200	200	230	210	205	265	235	255	ES 280	ES 270
10	225	290	ES 305	ES 300	255	260	230	230	225	215	215	200	245	230	215	H 210	225	225	235	235	235	235	220	ES 315
11	315	295	255	240	230	ES 285	300	240	215	235	220	210	A	210	220	210	H 240	220	220	280	285	260	290	280
12	285	270	245	230	285	290	280	235	225	200	205	A	H 200	195	225	A	230	220	240	210	230	265	335	ES 305
13	275	275	295	260	205	330	260	230	230	205	230	205	225	210	220	200	245	210	210	200	300	275	275	ES 320
14	ES 300	ES 290	260	270	220	ES 290	235	220	225	205	200	220	200	220	200	230	225	220	205	240	230	240	270	270
15	ES 295	ES 305	ES 290	255	230	ES 260	ES 270	230	220	200	205	200	210	220	245	215	240	215	230	240	240	235	290	305
16	270	260	285	270	260	235	235	225	230	230	210	230	210	210	230	210	225	210	205	A 250	230	250	ES 285	ES 305
17	ES 315	ES 320	280	250	205	ES 310	ES 280	220	235	215	220	225	200	H 200	200	220	220	200	210	255	255	240	ES 300	ES 310
18	290	255	280	ES 320	280	240	245	215	230	225	220	230	210	220	220	210	230	220	225	225	230	235	270	275
19	290	285	295	290	270	230	230	210	225	205	220	220	A	220	A	200	220	220	200	240	235	230	ES 280	ES 285
20	ES 310	ES 290	270	255	245	230	220	215	235	200	200	195	205	225	205	200	220	220	200	240	225	230	280	ES 295
21	300	285	285	250	235	235	220	210	200	200	210	235	200	230	225	230	210	225	220	260	225	240	270	ES 330
22	295	285	265	265	240	285	260	270	265	250	A	230	250	220	220	230	245	250	240	280	295	280	345	290
23	260	ES 370	270	340	345	275	A 275	245	225	A	235	225	225	200	215	215	240	230	210	270	260	315	295	270
24	A	A	240	ES 280	ES 350	295	250	225	230	215	200	200	H 200	205	195	200	225	225	205	275	245	275	300	290
25	270	275	275	270	A 230	245	A	225	230	200	205	H 200	245	210	210	225	220	225	220	225	ES 260	ES 300	280	275
26	ES 300	275	255	245	240	ES 300	250	225	240	230	220	210	200	225	230	225	245	235	200	240	230	245	255	295
27	300	310	295	285	280	260	255	240	H 235	230	210	H 215	215	220	210	210	235	225	210	245	240	235	250	285
28	305	275	255	250	245	220	230	210	200	210	220	200	200	225	220	200	220	210	220	235	230	ES 255	275	280
29	310	280	255	230	220	225	215	215	220	220	200	200	220	225	220	210	225	220	200	220	A	280	ES 295	255
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	23	28	29	29	29	29	28	29	29	28	28	28	27	29	23	28	29	29	29	28	27	29	29	29
MED	290	282	273	260	242	240	237	225	225	215	213	210	215	220	220	215	230	220	210	240	238	245	275	U 270
UQ	ES 305	292	283	275	262	U 270	256	230	230	223	222	228	222	225	225	225	235	225	225	252	256	268	290	ES 305
LQ	285	275	265	250	230	230	230	215	220	202	205	200	200	205	202	205	220	210	205	225	230	235	272	270

FEB. 1988 | H'F (KM)

IONOSPHERIC DATA

FEB. 1988 | H'E (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.0' E Sweep 1 MHz to 25 MHz in 24 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								S	115	110	110	110	110	105	110	115	120	S						
2								S	E S 120	115	105	110	110	110	110	110	E S 120	S						
3								S	E S 120	110	110	110	110	110	110	E S 125	120	S						
4								S	110	110	115	110	110	105	105	110	125	S						
5								S	110	110	110	105	105	105	110	A	E S 120	S						
6								S	E S 120	110	115	115	110	105	105	105	105	S						
7								S	110	105	105	110	110	105	105	110	120	S						
8								S	110	110	110	110	105	105	105	A	A	S						
9								S	115	110	110	110	110	110	110	105	120	S						
10								S	115	110	115	110	110	110	110	110	E S 120	S						
11								S	115	110	110	A	A	A	110	110	E S 120	S						
12								S	115	110	H 105	105	105	105	105	A	S	S						
13								S	E S 120	110	110	110	110	105	A	110	110	S						
14								S	120	110	105	105	105	105	110	115	110	S						
15								S	110	110	A	A	110	110	110	A	A	S						
16								S	115	110	105	105	105	A	110	A	115	S						
17								S	120	115	110	110	110	105	A	105	E S 120	S						
18								S	115	105	110	100	100	110	110	110	120	S						
19								S	115	110	110	110	110	110	A	105	110	S						
20								S	110	110	105	105	105	110	A	110	110	S						
21								S	120	110	110	110	105	110	105	A	110	S						
22								S	110	110	110	110	110	105	110	110	110	S						
23								S	115	110	E S 120	115	110	105	110	105	110	S						
24								S	110	110	110	110	E B 120	115	115	115	115	S						
25								S	B	105	E B 125	E B 130	E B 120	E B 125	3 120	110	E B 130	S						
26								S	E B 130	E B 125	E B 120	E B 120	E B 115	E B 115	E B 115	E B 130	E B 130	S						
27								S	B	115	115	E B 120	115	110	110	A	115	S						
28								S	115	E B 120	110	110	110	110	110	115	E B 130	S						
29								S	110	105	110	105	110	110	110	110	115	S						
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									27	29	28	27	28	27	25	22	26							
MED									112	110	110	110	110	108	110	110	115							
UQ									113	110	111	110	110	110	110	112	E E 120							
LQ									110	110	110	108	105	105	110	110	110							

FEB. 1988 | H'E (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1983 | H'ES (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station AKITA Lat. 39° 43.5 N, Long. 140° 08.0 E Sweep 1 MHz to 25 MHz in 24 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	S	S	S	S	S	100	S	G	G	G	G	G	G	G	G	G	G	105	S	100	105	100	110	S
2	S	S	S	S	S	S	S	G	G	G	G	G	G	G	G	G	G	S	S	S	S	S	S	S
3	S	S	S	S	S	S	S	G	G	G	120	G	G	G	G	G	G	S	S	S	S	S	S	S
4	S	S	S	S	S	S	S	S	G	G	G	G	120	115	G	G	G	S	S	105	S	105	S	S
5	S	S	S	S	S	S	S	105	G	G	G	G	G	G	G	130	G	S	120	100	S	105	S	S
6	S	S	S	S	S	S	S	G	G	G	G	G	G	G	G	G	G	95	105	S	100	95	95	95
7	105	105	100	S	S	S	S	105	105	110	G	G	100	G	G	G	G	100	100	S	S	S	S	S
8	S	S	S	S	S	S	S	G	G	G	G	140	G	G	125	100	100	100	S	S	S	S	S	S
9	S	S	100	100	S	105	S	G	G	G	120	G	G	G	G	G	G	S	S	S	S	S	S	S
10	S	S	100	100	S	S	S	S	120	125	G	G	G	G	G	G	G	S	S	S	S	S	S	S
11	S	S	S	S	S	S	S	S	G	G	110	105	100	100	G	G	G	S	S	100	S	S	S	S
12	S	S	S	S	S	S	S	S	130	G	G	115	G	G	110	105	100	105	100	S	S	S	S	S
13	S	110	105	S	S	S	100	145	130	120	120	115	110	115	105	G	G	S	S	S	S	S	S	S
14	105	105	100	S	S	S	S	S	G	G	140	145	135	125	G	G	G	105	S	S	S	S	S	S
15	S	S	S	S	105	105	105	G	G	125	105	100	100	100	G	100	100	95	100	S	S	S	S	S
16	S	S	S	S	S	S	S	105	125	115	G	G	G	105	100	100	G	S	100	100	S	S	S	S
17	S	S	S	S	S	S	S	G	130	120	120	G	G	G	100	G	G	S	S	S	S	S	S	S
18	S	S	S	S	S	S	S	G	G	G	G	125	120	G	G	G	G	S	S	S	S	S	S	S
19	S	S	105	S	S	S	S	G	120	130	150	125	115	110	100	G	G	S	S	S	S	S	S	S
20	S	S	S	S	S	S	S	G	G	G	G	120	115	110	105	G	G	S	105	S	S	S	S	S
21	S	S	110	105	S	S	S	S	G	G	G	120	120	115	105	105	G	105	S	S	S	S	S	S
22	S	S	S	S	S	S	S	G	135	145	120	120	110	120	G	110	G	S	S	S	S	S	S	S
23	S	S	S	S	S	140	120	115	115	115	120	125	115	110	G	120	G	S	S	S	S	S	S	S
24	105	100	105	105	105	S	S	150	145	125	G	G	G	G	G	G	G	S	S	S	S	S	110	S
25	115	110	110	105	100	105	100	S	B	110	G	G	G	G	G	G	G	S	105	105	S	S	S	S
26	S	S	S	S	S	S	S	S	G	G	G	G	G	G	G	G	G	S	S	S	S	S	S	100
27	S	S	S	S	S	100	S	S	B	G	145	120	130	130	G	105	G	S	S	S	S	S	S	S
28	S	105	100	S	S	S	S	G	G	G	G	G	G	G	G	G	G	S	S	S	S	105	100	100
29	S	S	S	S	S	S	S	G	G	G	G	G	G	G	G	G	G	S	S	105	100	100	100	S
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	4	6	10	5	3	6	4	6	10	11	11	13	13	12	8	9	3	8	8	7	3	6	5	3
MED	105	105	102	105	105	105	102	110	123	120	120	120	115	112	105	105	100	102	102	100	100	102	100	100
UQ	110	110	105	105	105	105	112	145	130	125	130	125	120	113	103	110	100	105	105	105	102	105	110	100
LQ	105	105	100	100	102	100	100	105	120	115	120	115	110	103	100	100	100	98	100	100	100	100	100	98

FEB. 1988 | H'ES (KM)

IONOSPHERIC DATA

FEB. 1988 | TYPES OF ES | 135° E Mean Time (G.M.T. + 9 h)

Station AKITA | Lat. 39° 43.5' N, Long. 140° 08.0' E | Sweep 1 MHz to 25 MHz in 24 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 1												L 1		F 2	F 2	F 2	F 1	
2																								
3											C 1													
4													C 1	C 1						F 2		F 2		
5								L 1								C L 1 1			F 1	F 1		F 2		
6																		L 2	F 2		F 2	F 2	F 2	F 1
7	F 2	F 1	F 2					L 1	L 1	C 1			L 1					L 1	F 2					
8												H 1			C 1	L 1	L 1	L 1						
9			F 1	F 1		F 1					C 1													
10			F 1	F 1					C 1	C 1														
11											C 1	L 1	L 2	L 1						F 1				
12									C 1			C 2			C 2	L 5	L 2	L 1	F 2					
13		F 3	F 2				F 2	H 2	C 1	C 1	C 1	C 2	C 2	C 2	L 2									
14	F 2	F 1	F 2								H 1	H 1	H 1	C 2				L 1						
15					F 2	F 3	F 2			C 1	L 1	L 1	L 1	L 1		L 1	L 2	L 2	F 1					
16								L 1	C 1	C 1				L 1	L 1	L 1			F 1	F 1				
17									C 1	C 2	C 1				L 2									
18												C 1	C 1											
19			F 1						C 1	C 1	H 1	C 1	C 2	C 1	L 6									
20												C 1	C 1	C 1	L 2				F 1					
21			F 3	F 2								C 1	C 1	C 1	C 2	L 3		L 2						
22									H 1	H 1	C 2	C 1	C 1	C 1		C 2								
23						F 1	F 3	C 3	C 2	C 2	C 1	C 1	C 1	C 1		C 1								
24	F 7	F 5	F 2	F 1	F 2			H 1	H 2	C 1													F 2	
25	F 2	F 3	F 2	F 2	F 3	F 5	F 3			C 1									F 1	F 2				
26																								F 1
27						F 2					H 1	C 1	C 1	C 1		L 2								
28		F 1	F 2																			F 1	F 2	F 2
29																				F 2	F 2	F 1	F 1	
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 Laboratory, Japan

FEB. 1988 | TYPES OF ES

IONOSPHERIC DATA

FEB. 1988 | FXI (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 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 36	X 37	X 39	X 42	X 41	X 30	X 31												X 43	X 44	X 40	X 39	X 39	X 37
2	X 38	X 39	X 33	X 38	X 38	X 40	X 33												X 50	X 40	X 37	X 38	X 40	X 40
3	X 40	X 39	X 39	X 40	X 45	X 32	X 33												X 42	X 43	X 42	X 37	X 35	X 36
4	X 36	X 37	X 37	X 41	X 42	X 33	X 30												X 41	X 41	X 43	X 27	X 31	X 34
5	X 35	X 36	X 38	X 42	X 36	X 30	X 31												C	X 57	X 31	X 34	X 37	X 39
6	X 39	X 40	X 42	X 43	X 36	X 38	X 40												U X 42	X 45	X 39	X 40	X 41	X 39
7	S	X 42	X 40	X 42	X 45	X 31	X 34												S	X 46	X 40	X 37	X 32	X 35
8	X 36	X 35	X 38	X 40	X 38	X 34	X 28												X 52	X 40	X 43	X 46	X 39	X 40
9	X 38	X 39	X 39	X 39	X 40	X 36	X 37												X 51	X 43	X 51	X 46	X 41	X 41
10	X 39	X 39	X 39	X 39	S	X 39	X 36												X 56	X 48	X 50	X 56	X 39	X 38
11	X 40	X 39	X 41	X 39	X 33	X 30	X 29												X 57	X 37	X 43	X 45	X 42	X 43
12	X 40	X 39	X 41	X 36	X 31	X 33	X 35												X 58	X 39	X 51	X 37	X 34	X 38
13	X 41	X 40	X 38	X 39	X 35	X 30	X 34												X 64	X 40	X 33	X 37	X 39	X 38
14	X 38	X 38	X 39	X 40	X 39	X 36	X 40												X 57	X 42	X 42	X 40	X 36	X 36
15	X 37	X 38	X 40	X 43	X 39	X 34	X 35												S	X 50	X 63	X 58	S	X 47
16	S 46	X 45	X 42	X 44	X 40	X 38	X 39												X 56	X 42	X 43	X 39	X 36	X 38
17	X 37	X 33	X 40	X 41	X 41	X 28	X 33												X 52	X 40	X 41	X 39	X 37	X 39
18	X 41	X 43	X 37	X 38	X 39	X 34	X 37												X 65	S	X 44	X 42	X 39	X 39
19	X 38	X 38	X 40	X 39	X 39	X 37	X 40												X 61	X 49	X 56	X 49	X 40	X 38
20	X 38	X 41	X 42	X 42	X 41	X 41	X 36												X 56	X 48	X 47	X 40	X 42	X 41
21	X 42	X 43	X 43	X 45	X 44	X 43	X 47												X 62	X 44	S	X 39	X 36	X 39
22	X 42	X 44	X 47	X 44	X 45	X 38	X 36												X 58	X 56	X 56	X 56	S	X 63
23	X 67	X 39	X 39	X 32	X 34	X 41	X 59												U X 77	X 44	S	X 48	X 50	X 49
24	X 52	X 57	X 50	X 27	X 32	X 32	X 37												X 48	X 39	X 46	X 38	X 39	X 38
25	X 41	X 41	X 43	X 41	X 45	X 40	X 38												X 61	X 45	X 40	X 40	X 42	X 42
26	X 42	X 44	X 46	X 45	X 35	X 36	X 42												X 70	X 53	X 49	X 46	X 39	X 39
27	X 40	X 38	X 40	X 43	X 41	X 41	X 43												X 60	X 49	S	X 49	X 40	X 43
28	X 41	X 42	X 43	S	X 43	X 41	X 47												X 55	X 49	X 44	X 40	X 37	46
29	41	43	X 44	X 44	X 38	X 37	X 41												X 58	X 45	X 42	X 44	X 45	42
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	29	29	28	28	29	29												26	28	26	29	27	29
MED	X 40	X 39	X 40	X 41	X 39	X 36	X 36												X 56	X 44	X 43	X 40	X 39	X 39
UQ	X 41	X 42	X 42	X 43	X 42	X 39	X 40												X 61	X 49	X 49	X 46	X 40	X 42
LQ	X 38	X 38	X 39	X 39	X 36	X 32	X 33												X 51	X 42	X 40	X 38	X 36	X 38

FEB. 1988 | FXI (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | FOF2 (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 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	33	36	35	24	25	48	69	72	76	S 82	I S 68	I S 73	72	67	55	54	37	S 38	34	33	33	31
2	32	33	32	32	32	34	27	S 50	65	69	76	S 79	I S 80	S	75	69	60	52	44	34	31	32	34	34
3	34	33	33	S 34	39	26	27	47	65	60	73	83	I S 73	I S 75	73	72	S 67	56	36	37	30	31	29	30
4	30	31	31	35	36	27	24	49	53	65	68	J S 82	S 77	J S 80	I S 80	66	I S 65	S 55	S 35	35	37	S 21	25	23
5	29	30	32	36	30	24	25	J S 52	57	J S 62	C	C	C	C	C	C	C	C	C	51	25	28	31	33
6	33	34	36	37	30	32	34	54	56	S 73	87	S 98	84	75	S 75	S 74	U S 67	67	U S 36	39	S 33	34	35	33
7	I S 34	S 36	S 34	S 36	39	25	28	55	67	64	J S 79	105	I S 91	S	69	I S 70	68	63	I S 46	40	34	31	26	29
8	30	29	32	34	32	28	22	49	61	60	74	82	88	86	67	65	S 74	66	46	34	37	40	33	34
9	32	33	33	33	S 35	30	31	53	I S 68	65	75	67	77	69	63	S 70	J S 70	62	45	37	45	40	35	35
10	33	33	33	33	I S 34	33	30	U S 62	68	68	69	72	29	R 72	J R 73	70	73	65	50	42	44	50	33	32
11	34	33	35	33	27	24	23	55	84	73	91	85	J R 85	75	64	77	68	64	51	31	37	39	36	37
12	34	33	35	30	25	27	29	56	78	J R 85	69	85	U S 88	76	R 74	I R 82	R 79	52	32	53	45	31	28	32
13	35	34	32	33	29	24	28	58	65	S 74	U S 76	J S 84	107	82	I S 82	69	S 73	J S 83	58	34	27	31	33	32
14	32	32	S 33	34	33	30	34	J S 65	67	S 76	85	97	79	82	U S 82	73	S	61	51	36	S 36	34	30	30
15	31	32	34	37	33	28	29	57	S 75	I S 70	S 85	95	96	92	J S 79	66	71	S 76	I S 56	54	57	52	I S 40	41
16	S 40	39	36	38	34	32	33	54	J S 78	95	89	96	93	92	91	J S 76	S 71	61	50	36	37	33	30	32
17	31	32	34	35	35	22	27	60	70	J S 85	94	111	104	120	32	J S 84	66	66	46	34	35	33	31	33
18	35	37	31	32	33	28	31	S 61	S 63	69	92	95	102	98	J S 81	75	I S 76	62	59	S	38	36	S 33	33
19	32	32	34	33	33	31	34	55	64	70	J R 84	94	J R 81	88	80	R 81	89	86	55	43	50	43	34	32
20	32	35	36	36	35	35	30	56	66	S 74	68	J R 82	84	R 76	75	69	70	57	50	42	41	34	36	35
21	36	37	37	39	38	37	41	61	75	63	78	89	81	90	I R 82	76	R 74	66	56	33	I S 42	33	30	33
22	36	38	41	38	39	32	30	29	38	46	52	R 44	R 45	50	50	58	61	52	52	50	50	S 50	I S 53	J S 57
23	S 61	33	S 33	26	28	35	53	S 76	S 64	96	S 114	114	122	106	111	I S 96	76	74	U S 71	38	I S 44	S 42	44	43
24	S 46	S 51	J S 44	21	26	26	31	56	S 71	S 82	93	95	92	I S 92	I S 72	74	S 77	55	42	33	40	32	V 33	S 32
25	35	35	37	35	S 39	34	32	53	65	65	68	S	86	84	85	S 76	73	V 67	55	39	34	34	36	36
26	36	38	40	39	J H 29	30	36	59	67	74	75	J S 76	85	J S 80	95	79	71	S 71	64	47	43	40	33	33
27	34	32	34	37	35	35	37	54	J S 81	J S 77	67	75	J S 82	93	J S 82	37	35	S 72	54	43	I S 44	43	S 34	37
28	35	J S 36	S 37	I S 40	37	35	41	S 62	60	68	J S 82	32	98	101	90	J S 78	S 78	73	49	43	32	34	S 31	39
29	F 35	F	38	38	32	S 31	35	54	60	66	72	75	96	102	92	75	76	S 63	52	39	36	38	S 39	F 35
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	28	29	29	29	29	29	29	29	29	28	27	28	26	23	28	27	28	28	28	29	29	29	29
MED	34	33	34	35	33	30	30	55	66	70	76	84	87	87	80	74	71	64	50	38	37	34	33	33
UQ	35	36	36	37	35	33	34	59	70	S 74	86	95	97	92	84	78	76	69	55	43	44	40	35	35
LQ	32	32	33	33	30	26	27	53	63	65	70	80	80	76	74	69	68	53	46	36	35	32	31	32

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FEB. 1988 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

FEB. 1988 | FOF1 (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4 N, Long. 139° 29.3 E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L	L	L	L							
2										L	L	L	L	L	L	L	L							
3									L	L	L	L	L	L	L	L	L							
4											L	L	L	L	L	L	L							
5										L	C	C	C	C	C	C	C	C						
6									L	L	L	L	L	L	L	L								
7									L	L	L	L	L	L	L	L								
8										L	L	L	470	480	L	L	L							
9										L	L	L	L	L	L	L	L							
10									L	L	L	L	U L 470	L	L	L	L							
11									L	L	L	L	L	L		L								
12									L	L	L	L	L	L	L	L	L							
13										350	L	L	460	L	L	L	L							
14										L	L	L	L	L	L	L	L							
15									L	L	L	L	L	L	L	L	310							
16									L	L	L	L	L	L	L	L								
17									L	L	L	L	450	L	L	L	L							
18										L	L	L	470	L	L	L	L							
19									L	L	L	L	L	L	L	L	L							
20									L	L	L	U L 450	U L 480	L	L	L	L							
21									L	L	L 470	L	L	L	L	L	L							
22									330	360	380	400	410	420	420	L	L							
23										L	L	L	A	L	L	L	L							
24									L	L	L	L	L	L	L	L	L							
25									L	L	A	L	460	L	L	L	L							
26									L	L	L	L	L	L	L	L	L							
27									L	L	L	L	L	L	L	L	L							
28										L	L	460	L	450	L	L	L							
29									L	L	L	L	L	L	L	L	L							
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	2	2	3	8	3	1		1							
MED									330	355	425	450	465	450	420		310							
UQ												455	470	465										
LQ												425	445	435										

FEB. 1988 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

FEB. 1988 | foE (0.01 MHz) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 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 R 165	235	285	R	335	A	R	315	A	A	B						
2								B	235	285	315	325	335	330	315	290	225	B						
3								B	250	285	A	A	330	A	305	275	215	S						
4								B	245	295	315	330	335	320	310	275	A	A						
5								B	S 250	290	C	C	C	C	C	C	C	C						
6								190	A	A	305	320	325	325	305	A	A	A						
7								A	245	A	A	330	330	325	320	290	240	B						
8								B	230	280	305	330	340	330	310	290	235	B						
9								170	235	280	315	A	A	335	A	290	245	B						
10								175	255	295	A	A	335	330	310	285	245	160						
11								170	255	300	315	325	335	325	310	290	260	A						
12								180	255	280	305	320	A	330	320	A	250	165						
13								H 215	275	300	A	A	A	A	A	295	R	B						
14								R	250	295	315	325	330	335	320	295	245	195						
15								190	245	285	315	A	A	320	315	290	235	R						
16								R	235	295	315	A	330	R	310	295	A	A						
17								U S 185	260	300	A	A	330	325	315	A	250	R						
18								150	240	280	H 310	330	R	A	320	300	255	R						
19								A	240	275	315	335	335	A	320	A	265	B						
20								170	260	285	310	315	325	A	A	A	250	175						
21								185	255	300	320	330	335	340	325	295	255	165						
22								195	245	285	305	315	A	A	A	A	A	A						
23								A	A	280	300	310	315	310	A	A	A	165						
24								R	260	285	A	A	330	325	315	275	230	B						
25								A	245	280	A	A	325	A	300	A	255	A						
26								B	260	295	315	320	A	310	A	235	245	S						
27								185	250	A	315	325	R	325	A	A	A	A						
28								185	A	A	320	325	R	A	A	A	A	B						
29								R	255	290	320	A	335	320	A	A	A	A						
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								15	26	25	20	18	18	18	19	16	18	6						
MED								185	250	285	315	325	330	325	315	290	245	165						
UQ								188	255	295	315	330	335	330	320	295	255	165						
LQ								170	240	280	308	320	330	320	310	285	235	160						

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FEB. 1988 | foE (0.01 MHz)

IONOSPHERIC DATA

FEB. 1988 | FOES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 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 B 12	E B 13	E B 12	E B 12	18	18	J A 18	G	G	31	33	36	37	37	33	33	27	E B 16	E B 15	22	J A 16	18	E B 16	20
2	E B 12	E B 16	E B 13	E B 12	E B 12	E B 14	E B 14	E B 16	G	31	G	G 24	G	G	G	G	G	E B 17	E B 14	E B 14	E B 15	E B 14	E B 15	E B 14
3	E B 12	E B 15	E B 14	E B 15	E B 14	E B 14	E B 15	E B 16	G	31	33	35	34	34	G	G	G	E B 16	E B 14	E B 16	E B 15	E B 14	E B 15	E B 14
4	E B 14	E B 15	E B 15	E B 15	E B 13	E B 15	E B 15	E B 16	G	G	33	G	G	G	G	G	24	21	28	J A 19	E B 15	E B 13	E B 15	E B 15
5	26	E B 15	E B 12	E B 13	E B 14	E B 15	E B 14	E B 18	J A 26	G	C	C	C	C	C	C	C	C	C	21	J A 22	18	E B 15	E B 15
6	E B 14	E B 14	19	E B 14	E B 15	E B 14	19	25	27	31	31	G	G	G	G	33	26	20	17	J A 18	J A 23	20	17	E B 15
7	E B 16	E B 15	E B 15	E B 14	19	E B 15	E B 15	24	G	30	32	G 31	G	G	G	G	G	E B 16	E B 16	E B 14	E B 15	E B 15	E B 16	17
8	E B 14	E B 14	E B 14	E B 12	17	E B 14	E B 14	E B 16	G	G	G	G	G	33	34	G	25	E B 17	E B 14	E B 15	E B 15	E B 15	E B 15	E B 12
9	E B 14	E B 14	E B 14	E B 13	E B 17	E B 15	18	G	G	G	32	33	34	G 33	34	G	G	E B 14	E B 15	E B 15	E B 15	E B 15	E B 17	E B 14
10	E B 15	E B 14	E B 15	E B 13	E B 14	E B 15	E B 15	23	G	G 27	36	37	G	35	G	30	G	G	E B 14	E B 14	E B 15	E B 15	E B 16	E S 16
11	E B 14	E B 14	E B 14	17	20	E B 16	E B 14	G	G	G	G	G 32	36	G	G 24	G 25	G 22	J A 26	J A 20	J A 17	E B 12	E B 14	J A 15	E B 14
12	E B 14	E B 14	E B 13	E B 15	E B 13	E B 13	E B 14	G	G	29	G	G	36	G	G	J A 33	G	G	J A 20	E B 12	E B 13	17	E B 12	E B 15
13	18	22	J A 25	E B 14	20	E B 14	J A 18	G	G	35	35	J A 40	33	33	33	G 28	G	E B 16	E B 14	E B 14	16	E B 17	E B 15	E B 14
14	J A 16	J A 21	J A 15	18	19	E B 15	E B 14	G	G	G	33	35	35	G	G	G	G	G	J A 21	20	J A 13	E B 15	E B 15	E B 13
15	E B 14	E B 14	E B 14	E B 12	E B 13	E B 14	E B 14	G	27	G 27	33	35	35	G	G	G	G	G	18	J A 16	13	E B 15	E B 15	E B 16
16	E B 15	E B 14	E B 13	E B 14	E B 15	E B 14	E B 14	G	25	G	35	34	G	G	G	36	J A 32	J A 36	J A 30	J A 25	20	17	E B 15	18
17	E B 15	17	E B 14	E B 12	E B 13	E B 14	E B 13	G	G	32	34	35	G	G	G	J A 32	G 22	G	J A 18	E B 15	E B 14	E B 14	E B 15	E B 15
18	E B 15	E B 13	E B 12	E B 13	E B 13	E B 14	E B 15	G	G	G	G	G	35	37	G	33	G	G	E B 14	E B 14	E B 14	17	17	E B 13
19	E B 13	E B 13	E B 13	E B 12	E B 14	E B 14	E B 14	J A 26	G	G	G	35	37	36	G 26	30	G	E B 15	19	20	19	18	E B 15	19
20	E B 14	E B 15	E B 13	E B 12	E B 12	E B 13	20	G	G	30	32	34	34	37	36	35	G 24	J A 20	J A 21	J A 13	J A 24	22	J A 31	J A 20
21	E B 13	14	E B 14	J A 20	E B 15	17	E B 14	J A 24	J A 32	32	37	35	36	G	G	G	G 23	G	J A 22	20	J A 29	E B 13	J A 20	E B 14
22	E B 14	17	E B 12	17	22	J A 13	17	G	28	31	32	39	43	37	35	J A 32	J A 27	J A 22	J A 23	J A 23	E B 12	E B 16	E B 14	E B 15
23	E B 14	E B 13	E B 16	E B 16	E B 14	E B 16	E B 15	23	28	34	32	39	49	38	32	33	J A 30	G	J A 16	E B 14	E B 16	J A 19	E B 15	18
24	18	J A 16	J A 16	J A 22	J A 16	E B 14	E B 14	23	G	30	34	34	G	G	G	G	G	E B 17	J A 18	E B 16	J A 24	E B 14	E B 14	E B 14
25	E B 14	J A 51	J A 32	J A 20	J A 28	J A 23	J A 25	J A 30	G 23	G 27	J A 58	32	33	32	31	28	G	23	E B 16	E B 13	J A 20	J A 23	E B 14	E B 13
26	E B 12	E B 12	31	19	J A 17	17	E B 15	E B 20	G	33	33	33	33	32	30	G	G	E S 27	J A 17	E B 15	E B 15	J A 18	E B 12	E B 15
27	E B 15	17	J A 16	J A 13	J A 20	E B 13	19	G	G	30	G	35	36	36	32	30	26	36	33	32	J A 21	E B 15	E B 16	E B 14
28	E B 13	E B 13	E B 14	E B 14	E B 13	E B 14	E B 14	G	J A 27	31	G	33	G	34	32	29	J A 35	E B 17	E B 15	E B 13	E B 15	E B 14	E B 14	E B 14
29	19	20	E B 14	J A 19	J A 17	18	17	G	G 25	G	G	33	35	35	35	35	J A 40	32	17	J A 24	J A 26	J A 29	J A 25	J A 25
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	28	28	23	28	23	28	28	28	28	29	29	29	29	29
MED	E B 14	E B 14	E B 14	E B 14	E B 15	E B 14	E B 15	G	G	30	32	34	34	32	E G 24	28	E G 22	E G 16	17	E B 16	E B 16	E B 16	E B 15	E B 15
UQ	E B 15	16	E B 15	17	18	E B 16	17	23	25	31	34	35	36	36	32	33	26	21	J A 20	J A 20	J A 20	18	E B 16	E 16
LQ	E B 14	E B 14	E B 13	E B 13	E B 13	E B 14	E B 14	G	G	G	G	G 32	G	G	G	G	G	G	E B 15	E B 14	E B 15	E B 14	E B 15	E B 14

FEB. 1988 | FOES (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | FBES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 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 B 12	E B 13	E B 12	E B 12	E B 12	17	E B 13	G	G	31	33	35	35	G 24	32	31	23	E B 16	E B 15	17	E B 15	E B 14	E B 16	E B 15
2	E B 12	E B 16	E B 13	E B 12	E B 12	E B 14	E B 14	E B 16	G	31	G	G 23	G	G	G	G	G	E B 17	E B 14	E B 14	E B 15	E B 14	E B 15	E B 14
3	E B 12	E B 15	E B 14	E B 15	E B 14	E B 14	E B 15	E B 16	G	31	33	35	G 33	33	G	G	G	E B 16	E B 14	E B 16	E B 15	E B 14	E B 15	E B 14
4	E B 14	E B 15	E B 15	E B 15	E B 13	E B 15	E B 15	E B 16	G	G	G 29	G	G	G	G	G	22	19	18	17	E B 15	E B 13	E B 15	E B 15
5	E B 15	E B 15	E B 12	E B 13	E B 14	E B 15	E B 14	E B 18	G 22	G	C	C	C	C	C	C	C	C	C	E B 15	19	E B 15	E B 15	E B 15
6	E B 14	E B 14	E B 14	E B 14	E B 15	E B 14	E B 15	G 16	24	29	G 29	G	G	G	G	27	24	16	15	E B 16	20	17	E B 15	E B 15
7	E B 16	E B 15	E B 15	E B 14	E B 13	E B 15	E B 15	19	G	29	31	G 31	G	G	G	G	G	E B 16	E B 16	E B 14	E B 15	E B 15	E B 16	E B 15
8	E B 14	E B 14	E B 14	E B 12	E B 14	E B 14	E B 14	E B 16	G	G	G	G	G	36	33	G	25	E B 17	E B 14	E B 15	E B 15	E B 15	E B 15	E B 12
9	E B 14	E B 14	E B 14	E B 13	E B 17	E B 15	E B 15	G	G	G	32	33	34	G 29	32	G	G	E B 14	E B 15	E B 15	E B 15	E B 17	E B 17	E B 14
10	E B 15	E B 14	E B 15	E B 13	E B 14	E B 15	E B 15	20	G	G 12	33	37	G	34	G	30	G	G	E B 14	E B 14	E B 15	E B 15	E B 14	E S 15
11	E B 14	E B 14	E B 14	E B 13	E B 12	E B 16	E B 14	G	G	G	G	G 29	G 30	G	G 20	G 18	G 20	17	17	E B 14	E B 12	E B 14	E B 14	E B 14
12	E B 14	E B 14	E B 13	E B 15	E B 13	E B 13	E B 14	G	G	G	G	G	34	G	G	30	G	G	18	E B 12	E B 13	E B 14	E B 12	E B 15
13	E B 14	18	17	E B 14	E B 12	E B 14	E B 13	G	G	31	33	37	35	33	32	G 27	G	E B 16	E B 14	E B 14	E B 14	E B 17	E B 15	E B 14
14	E B 15	E B 16	E B 14	E B 14	E B 14	E B 15	E B 14	G	G	G	33	G 29	34	G	G	G	G	G	17	E B 14	E B 15	E B 15	E B 15	E B 13
15	E B 14	E B 14	E B 14	E B 12	E B 13	E B 14	E B 14	G	25	G 26	G 27	33	33	G	G	G	G	G	E B 14	E B 14	E B 15	E B 15	E B 15	E B 16
16	E B 15	E B 14	E B 13	E B 14	E B 15	E B 14	E B 14	G	24	G	G 26	33	G	G	G	33	26	23	26	22	E B 15	E B 15	E B 15	E B 15
17	E B 15	E B 15	E B 14	E B 12	E B 13	E B 14	E B 13	G	G	31	32	35	G	G	G	29	G 20	G	E B 14	E B 15	E B 14	E B 14	E B 15	E B 15
18	E B 15	E B 13	E B 12	E B 13	E B 13	E B 14	E B 15	G	G	G	G	G	34	33	G	G 28	G	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 13
19	E B 13	E B 13	E B 13	E B 12	E B 14	E B 14	E B 14	16	G	G	G	35	37	36	G 26	28	G	E B 15	E B 13	E B 13	E B 14	E B 14	E B 15	17
20	E B 14	E B 15	E B 13	E B 12	E B 12	E B 13	E B 14	G	G	G	32	33	34	36	34	33	G 22	G 15	17	15	20	17	16	E B 12
21	E B 13	E B 14	E B 14	17	E B 15	E B 12	E B 14	G 16	G 19	G	33	U Y 34	35	G	G	G	G 21	G	18	E B 12	17	E B 13	E B 14	E B 14
22	E B 14	E B 14	E B 12	E B 13	E B 13	E B 13	E B 14	G	26	30	31	37	33	34	33	30	26	20	E B 13	16	E B 12	E B 16	E B 14	E B 15
23	E B 14	E B 13	E B 16	E B 16	E B 14	E B 16	E B 15	22	25	29	32	37	48	36	31	29	24	G	E B 15	E B 14	E B 16	17	E B 15	E B 14
24	E B 15	E B 14	E B 12	18	E B 13	E B 14	E B 14	21	G	G 25	31	33	G	G	G	G	G	E B 17	E B 15	E B 16	12	E B 14	E B 14	E B 14
25	E B 14	17	21	16	19	18	21	24	G 21	G 21	47	32	33	32	31	28	G	21	E B 16	E B 13	E B 15	16	E B 14	E B 13
26	E B 12	E B 12	E B 12	E B 14	E B 14	E B 15	E B 15	E B 20	G	32	33	33	33	32	30	G	G	E G 27	17	E B 15	E B 15	E B 14	E B 12	E B 15
27	E B 15	E B 13	E B 14	E B 13	16	E B 13	E B 14	G	G	29	G	34	35	35	32	30	26	34	22	19	E B 15	E B 15	E B 16	E B 14
28	E B 13	E B 13	E B 14	E B 14	E B 13	E B 14	E B 14	G	26	30	G	33	G	33	31	29	28	E B 17	E B 15	E B 13	E B 15	E B 14	E B 14	E B 14
29	E B 15	E B 13	E B 14	14	E B 12	E B 14	E B 15	G	G 23	G	G	32	34	34	34	29	26	22	17	18	16	17	E B 15	E B 14
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	28	28	28	28	28	28	28	28	28	29	29	29	29	29
MED	E B 14	E B 14	E B 14	E B 14	E B 13	E B 14	E B 14	G	G	G 21	31	33	33	30	E G 20	28	E G 20	E G 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14
UQ	E B 15	E B 15	E B 14	E B 14	E B 14	E B 15	E B 15	16	G 22	30	33	35	34	34	32	30	24	17	17	E B 16	E B 15	E B 16	E B 15	E B 15
LQ	E B 14	E B 13	E B 13	E B 13	E B 13	E B 14	E B 14	G	G	G	G	G 29	G	G	G	G	G	G	E B 14	E B 14	E B 15	E B 14	E B 14	E B 14

The Radio Research Laboratory, Japan

FEB. 1988 | FBES (0.1 MHZ)

IONOSPHERIC DATA

FEB. 1988 | FMIN (0.1 MHz) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42·4 N, Long. 139° 29·3 E Sweep 1 MHz to 25 MHz in 24 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	12	13	12	12	12	14	13	13	14	18	21	19	20	18	19	16	17	16	15	16	15	14	16	15
2	12	16	13	12	12	14	14	16	16	16	17	16	20	22	17	16	15	17	14	14	15	14	15	14
3	12	15	14	15	14	14	15	16	15	16	17	20	17	18	16	16	15	16	14	16	15	14	15	14
4	14	15	13	15	13	15	15	16	16	17	18	ES 24	18	17	19	17	13	14	16	13	15	13	15	15
5	15	15	12	13	14	15	14	18	16	17	C	C	C	C	C	C	C	C	C	15	14	14	15	15
6	14	14	14	14	15	14	15	14	15	17	18	18	19	13	17	17	13	13	13	16	15	16	15	15
7	16	15	15	14	13	15	15	15	15	16	16	17	18	18	17	17	16	16	16	14	15	15	16	15
8	14	14	14	12	14	14	14	16	15	15	17	18	17	17	16	18	15	17	14	15	15	15	15	12
9	14	14	14	13	17	15	15	15	16	14	17	18	18	18	18	17	14	14	15	15	15	17	17	14
10	15	14	15	13	14	15	15	15	13	14	17	17	17	17	16	15	14	13	14	14	15	15	14	ES 15
11	14	14	14	13	12	16	14	13	14	14	17	20	17	16	15	16	13	13	15	14	12	14	14	14
12	14	14	13	15	13	13	14	12	13	14	15	18	16	19	16	14	12	13	15	12	13	14	12	15
13	14	14	12	14	12	14	13	15	13	16	16	17	17	17	16	17	16	16	14	14	14	17	15	14
14	15	16	14	14	14	15	14	16	15	15	17	17	19	17	17	17	14	15	13	14	15	15	15	13
15	14	14	14	12	13	14	14	13	16	15	16	18	17	17	18	17	16	13	14	14	15	15	15	16
16	15	14	13	14	15	14	14	14	15	16	18	16	17	18	17	13	14	13	14	15	15	15	15	15
17	15	15	14	12	13	14	13	14	15	13	18	18	18	17	16	14	13	14	14	15	14	14	15	15
18	15	13	12	13	13	14	15	14	15	16	23	17	17	17	18	17	17	14	14	14	14	14	14	13
19	13	13	13	12	14	14	14	14	16	14	16	17	18	18	17	13	16	15	13	13	14	14	15	ES 16
20	14	15	13	12	12	13	14	13	14	13	16	16	18	17	18	16	14	13	14	13	15	14	13	12
21	13	14	14	14	15	12	14	14	13	17	17	16	17	17	17	16	16	12	15	12	12	13	14	14
22	14	14	12	13	13	13	14	16	13	17	17	17	17	13	17	17	15	13	13	12	12	16	14	15
23	14	13	16	16	14	16	15	14	17	17	19	19	19	18	17	16	15	13	15	14	16	14	15	14
24	15	14	12	13	13	14	14	15	13	17	ES 21	17	17	18	17	18	17	17	15	16	14	14	14	14
25	14	14	12	12	14	13	15	15	17	17	17	18	24	18	ES 25	21	18	17	16	13	15	13	14	13
26	12	12	12	14	14	15	15	20	ES 21	19	17	22	20	21	21	20	19	ES 27	15	15	15	14	12	15
27	15	13	14	13	13	13	14	16	18	20	20	20	21	20	19	18	18	17	15	15	15	15	16	14
28	13	13	14	14	13	14	14	17	16	13	19	21	20	20	18	17	16	17	15	13	15	14	14	14
29	15	13	14	12	12	14	15	16	16	13	19	15	19	20	20	18	17	13	13	15	13	14	15	14
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	28	28	28	28	23	28	28	23	28	29	29	29	29	29
MED	14	14	14	13	13	14	14	15	15	16	17	18	18	18	17	17	15	14	14	14	15	14	15	14
UQ	15	15	14	14	14	15	15	16	16	17	18	19	19	18	18	17	16	16	15	15	15	15	15	15
LQ	14	13	12	12	13	14	14	14	14	15	17	17	17	17	16	16	14	13	14	13	14	14	14	14

FEB. 1988 | FMIN (0.1 MHz)

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IONOSPHERIC DATA

FEB. 1988 | M(3000)F2 (0.01) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42·4′ N, Long. 139° 29·3′ E Sweep 1 MHz to 25 MHz in 24 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	290	315	330	360	305	320	325	335	315	330	S 320	S	S	330	335	335	335	330	S 320	315	325	305	300
2	300	305	295	310	320	325	345	S 320	345	325	285	S 315	S	S	315	325	325	330	335	320	330	305	300	295
3	300	290	295	S 295	335	325	315	330	330	325	310	315	I S 315	I S 320	335	320	S 340	335	350	320	315	335	300	290
4	290	295	305	315	325	350	350	330	330	335	325	J S 320	S 315	J S 330	S	320	S	S 335	S 340	305	340	S 355	275	280
5	280	290	300	315	340	320	310	J S 340	335	J S 315	C	C	C	C	C	C	C	C	C	330	315	290	275	285
6	280	290	295	320	315	285	315	340	350	S 300	295	S 305	315	315	S 320	S 305	U S 315	335	U S 335	320	S 305	310	290	305
7	S	S 290	S 300	S 295	320	365	300	335	335	295	J S 310	300	S	S	330	S	320	325	S	320	315	315	305	285
8	300	295	300	315	335	335	335	330	335	320	290	300	300	295	335	315	S 305	345	325	325	315	315	280	290
9	305	290	285	290	S 310	315	320	330	S	325	320	330	315	315	305	S 310	J S 320	325	315	310	310	320	325	300
10	310	295	300	285	I S 315	320	315	U S 320	335	340	325	310	320	R 325	J R 335	325	330	325	310	305	320	325	325	285
11	295	310	325	325	365	290	305	320	325	320	345	325	J R 330	320	325	320	325	350	360	320	310	325	310	315
12	325	325	335	350	320	300	320	335	320	J R 340	335	300	U S 335	295	R 330	I R 330	R 335	350	330	325	345	315	290	300
13	320	340	320	335	360	300	325	335	335	S 325	U S 300	J S 285	300	305	S	335	S 310	J S 325	330	345	290	290	300	305
14	270	295	S 310	300	325	285	300	J S 330	335	S 315	305	305	315	290	U S 320	315	S	330	315	325	S 320	315	300	285
15	285	285	295	305	340	315	295	320	S 320	I S 320	S 295	315	300	315	J S 315	335	305	S 320	I S 330	300	315	305	S	285
16	S 295	310	290	300	325	315	310	340	J S 295	315	315	290	310	305	305	J S 320	S 315	340	320	335	320	295	315	290
17	285	285	305	315	355	280	285	320	325	J S 305	290	295	290	300	325	J S 315	330	330	345	335	320	315	290	290
18	315	325	300	285	300	340	305	S 325	S 335	305	305	295	305	320	J S 320	300	I S 310	335	330	S	315	295	S 305	315
19	295	295	290	295	305	305	320	330	320	315	J R 320	325	J R 330	325	320	R 310	320	335	345	310	320	320	325	300
20	285	295	320	315	325	355	335	355	325	S 325	320	J R 320	315	R 325	320	345	330	345	335	335	325	320	305	295
21	295	295	310	325	335	320	330	345	345	330	315	315	320	320	I R 325	325	R 335	335	325	350	I S 320	330	320	285
22	295	300	310	315	320	305	315	325	205	225	275	R 210	R 240	280	280	305	310	345	300	290	305	S 275	S	J S 280
23	S 335	300	S 285	250	275	315	285	S 325	S 350	315	S 295	285	315	305	300	I S 310	315	335	U S 315	335	I S 290	S 295	290	295
24	S 300	S 315	J S 340	355	280	295	320	335	S 330	S 320	325	315	310	I S 315	S	315	S 325	350	330	305	305	340	V 285	S 295
25	305	295	320	315	S 310	340	315	325	330	325	300	S	315	300	315	S 320	330	V 330	340	335	335	280	290	300
26	300	300	315	335	J H 265	290	315	325	315	310	305	J S 285	315	J S 295	315	320	315	S 320	315	315	315	320	305	300
27	295	280	285	305	295	300	320	330	J S 310	J S 325	325	290	J S 285	300	J S 300	310	305	S 335	325	310	I S 310	305	S 305	280
28	275	J S 270	S 300	I S 305	325	305	315	S 325	330	315	J S 310	295	295	305	315	J S 310	S 320	335	310	320	310	315	S 270	305
29	F 300	F	315	325	335	S 325	320	340	325	330	305	300	295	305	320	330	330	S 330	315	320	310	295	S 285	F 285
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	29	29	29	29	29	29	28	29	28	27	25	25	25	27	26	28	27	28	29	29	27	29
MED	295	295	300	315	325	315	315	330	330	320	310	305	315	305	320	320	320	335	330	320	315	315	300	295
UQ	302	302	315	325	335	325	320	335	335	325	322	315	315	320	325	325	330	338	335	332	320	320	305	300
LQ	288	290	295	300	310	300	310	325	322	315	298	295	300	300	315	310	S 315	330	315	310	310	295	290	285

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FEB. 1988 | M(3000)F2 (0.01)

IONOSPHERIC DATA

FEB. 1988 | M(3000)F1 (0.01) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L	L	L	L							
2										L	L	L	L	L	L	L	L							
3									L	L	L	L	L	L	L	L	L							
4											L	L	L	L	L	L	L							
5										L	C	C	C	C	C	C	C	C						
6									L	L	L	L	L	L	L	L								
7									L	L	L	L	L	L	L	L								
8										L	L	L	375	355	L	L	L							
9										L	L	L	L	L	L	L	L							
10									L	L	L	L	U 420	L	L	L	L							
11									L	L	L	L	L	L		L								
12									L	L	L	L	L	L	L	L	L							
13										375	L	L	365	L	L	L	L							
14										L	L	L	L	L	L	L	L							
15									L	L	L	L	L	L	L	L	330							
16									L	L	L	L	L	L	L	L								
17									L	L	L	L	390	L	L	L	L							
18										L	L	L	370	L	L	L	L							
19									L	L	L	L	L	L	L	L	L							
20									L	L	L	U 405	U 415	L	L	L	L							
21									L	L	L 395	L	L	L	L	L	L							
22									350	355	360	365	380	345	385	L	L							
23										L	L	L	A	L	L	L	L							
24									L	L	L	L	L	L	L	L	L							
25									L	L	A	L	395	L	L	L	L							
26									L	L	L	L	L	L	L	L	L							
27									L	L	L	L	L	L	L	L	L							
28										L	L	395	L	415	L	L	L							
29									L	L	L	L	L	L	L	L	L							
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	2	2	3	8	3	1		1							
MED									350	365	378	395	385	355	385		330							
UQ												400	405	385										
LQ												380	372	350										

FEB. 1988 | M(3000)F1 (0.01)

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IONOSPHERIC DATA

FEB. 1988 | H'F2 (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4 N, Long. 139° 29.3 E Sweep 1 MHz to 25 MHz in 24 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										250	245	260	260H	250	245	240	225							
2										245	310	255	325	265	265	255	240							
3									235	240	270	255	270	260	235	250	230							
4											260	275	255	295	250	245	235							
5										260	C	C	C	C	C	C	C	C						
6									220	280	275	260	250	270	260	275								
7									230	245	260	270	235	265	245	255								
8										245	295	280	270	280	240	255	260							
9										240	260	250	260	265	275	265	250							
10									240	245	260	270	270	260	250	260	240							
11									250	260	240	255	260	265		260								
12									260	225	260	300	250	310	245	255	245							
13										240	275	300	275	270	260	245	260							
14										250	275	270	255	300	250	250	255							
15									240	250	285	255	280	255	255	235	260							
16									270	260	265	290	260	270	265	235								
17									245	275	300	275	260	260	235	250	235							
18										260	280	270	255	265	245	265	250							
19									245	275	270	260	255	265	270	265	255							
20									240	255	265	265	275	255	260	240	250							
21									235	265L	285	270	270	270	260	255	235							
22									775	540	385	680	660	385	370	230	265							
23										265	290	285	270	245	270	235	245							
24									245	255	260	270	265	240	255	245	235							
25									235	240	305	280	275	285	265	250	235							
26									270	270	285	280	260	285	270	250	250							
27									260	245	260	300	300	285	265	265	250							
28										255	285	275	290	270	265	255	245							
29									235	250	285	285	305	265	250	245	240							
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									18	28	28	28	28	28	27	29	24							
MED									242	252	275	270	268	265	260	252	245							
UQ									260	262	285	282	275	282	265	260	252							
LQ									235	245	260	260	258	260	248	245	235							

The Radio Research Laboratory, Japan

FEB. 1988 | H'F2 (KM)

IONOSPHERIC DATA

FEB. 1988 | H'F (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 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	310	325	280	245	215	E A 320	280	240	230	230	230	220	215	245	H 210	235	220	220	230	240	265	245	275	290
2	280	290	300	275	255	245	230	235	230	230	H 185	210	265	H 190	235	230	220	220	220	240	240	275	290	285
3	280	310	300	285	230	245	260	220	220	225	220	230	220	205	230	220	225	220	205	235	250	235	280	300
4	310	300	280	260	235	220	H 205	225	240	240	245	225	225	195	210	230	225	230	215	270	220	225	345	330
5	340	315	285	255	225	265	270	235	230	220	C	C	C	C	C	C	C	C	C	220	E A 290	290	315	300
6	315	285	280	240	260	310	250	220	210	240	H 190	220	235	215	205	205	245	220	225	255	270	265	290	265
7	295	290	285	265	240	215	270	230	225	195	H 185	235	230	220	225	205	230	225	210	235	235	255	E B 310	315
8	295	300	235	265	245	235	260	230	230	220	230	225	235	230	225	205	220	220	220	230	250	255	300	295
9	265	295	310	295	265	255	250	230	235	H 195	230	225	215	220	205	215	225	225	225	250	260	240	240	270
10	275	295	295	315	260	260	240	245	230	220	210	205	185	230	240	230	235	235	240	265	250	240	245	325
11	315	290	250	255	215	325	310	255	230	215	H 205	H 185	H 200	210	215	215	230	215	210	255	280	255	280	280
12	255	265	255	230	270	305	270	230	240	220	205	195	230	215	230	H 210	230	215	230	230	230	265	315	305
13	270	245	280	255	210	E D 335	265	230	230	235	225	240	220	230	225	230	220	230	210	205	280	310	285	265
14	330	310	265	280	240	305	270	225	230	230	220	225	220	215	H 200	230	H 205	220	230	240	250	255	280	290
15	310	315	290	255	220	260	285	235	200	H 175	205	235	215	220	215	215	200	230	215	250	240	240	260	305
16	275	250	285	275	245	250	255	225	H 215	240	230	230	230	220	260	230	235	225	235	250	250	280	275	305
17	310	325	270	240	210	E B 360	290	240	210	H 200	225	230	220	195	235	215	225	230	210	220	245	255	310	310
18	270	240	275	310	295	225	265	240	230	210	H 215	240	230	220	225	210	225	215	225	225	240	275	280	265
19	295	290	285	290	275	260	220	225	220	H 200	230	220	230	H 245	H 205	210	230	230	210	255	245	245	250	305
20	325	305	265	260	250	225	H 220	220	210	215	195	195	H 190	H 200	225	220	205	215	225	225	255	265	285	285
21	310	305	280	260	245	255	235	225	H 220	H 195	205	Y	210	220	225	220	225	225	240	215	255	240	270	335
22	305	300	275	265	255	285	285	295	265	260	255	E A 275	230	250	225	255	250	225	255	270	245	280	345	295
23	225	275	315	E B 430	345	275	290	235	235	225	225	235	A	230	220	215	240	225	225	225	300	300	300	270
24	270	245	225	E A 255	340	305	245	230	235	H 205	205	190	210	215	210	205	220	215	220	270	270	225	310	290
25	265	295	280	255	265	235	270	235	230	205	A	H 180	190	H 190	235	230	220	225	210	225	230	325	300	270
26	285	275	250	230	E B 270	300	250	235	245	235	240	215	H 200	240	250	230	215	240	230	220	240	240	260	280
27	295	320	310	265	290	275	215	230	245	235	220	210	H 215	230	220	225	225	235	235	255	255	255	250	300
28	320	320	270	255	230	255	235	235	H 200	H 180	205	210	195	H 195	250	215	235	225	205	240	250	250	345	265
29	305	310	255	240	225	235	240	220	205	H 195	210	245	215	220	220	220	230	235	230	240	260	300	310	315
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	27	27	27	28	28	28	28	28	28	29	29	29	29	29
MED	295	295	280	260	245	258	260	230	230	220	220	222	220	220	225	220	225	225	225	240	250	255	285	295
UQ	310	310	285	275	265	U 290	270	235	235	230	230	231	230	230	232	230	230	230	230	255	260	275	310	305
LQ	275	285	270	255	230	245	240	225	220	H 200	205	210	210	208	212	212	220	220	210	225	240	240	275	280

FEB. 1988 | H'F (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | H'E (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4 N, Long. 139° 29.3 E Sweep 1 MHz to 25 MHz in 24 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								E B 165	120	120	115	115	A	110	130	A	A	B						
2								B	125	115	115	125	115	125	120	115	120	B						
3								B	125	120	A	A	A 140	A	115	120	120	B						
4								B	125	120	A 135	125	120	115	115	120	A	A						
5								B	135	120	C	C	C	C	C	C	C	C						
6								E A 160	A	A	A 135	115	115	115	110	A	A	A						
7								A	120	A	A	E A 140	120	125	120	120	115	B						
8								B	120	115	115	110	110	115	120	120	130	B						
9								E B 155	120	115	115	120	A	E A 140	A	115	115	B						
10								E B 145	120	A 125	115	210	115	115	120	120	125	135						
11								135	120	115	110	E A 135	E A 140	115	E A 120	E A 125	E A 130	A						
12								135	120	115	115	115	110	115	115	A	115	125						
13								H 160	120	120	115	A	A	A	A	E A 135	120	B						
14								135	120	120	120	E A 140	120	115	115	120	120	115						
15								135	120	E A 130	E A 140	A	115	115	115	115	120	125						
16								E B 135	125	115	E A 135	A	110	110	110	115	A	A						
17								E B 145	120	120	A	A	115	110	110	A	E A 125	125						
18								120	120	120	120	115	110	A	115	E A 145	120	135						
19								A	115	115	115	115	110	A	E A 125	A	120	B						
20								125	120	115	115	110	115	110	A	A	E A 140	E A 140						
21								130	115	120	115	E A 135	115	115	110	115	E A 130	120						
22								E B 145	120	115	115	120	A	A	A	A	A	A						
23								A	A	115	115	115	120	110	A	A	A	125						
24								120	120	E A 140	A	A	115	115	115	120	115	B						
25								A	E A 135	E A 135	A	A	125	125	125	A	130	A						
26								B	135	120	120	120	120	120	120	120	125	S						
27								E B 135	125	A	120	120	120	120	A	A	A	A						
28								E B 130	A	A	115	120	115	115	A	A	A	B						
29								115	E A 140	110	115	A	120	120	115	A	A	A						
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								19	26	25	23	20	24	23	21	16	19	9						
MED								U 125	120	118	115	118	115	115	115	119	120	125						
UQ								E E 145	125	120	119	125	120	119	120	120	124	130						
LQ								125	120	115	115	115	115	115	115	115	120	125						

FEB. 1988 | H'E (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | H'ES (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4 N, Long. 139° 29.3 E Sweep 1 MHz to 25 MHz in 24 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	B	B	B	B	105	105	125	G	G	E G 175	135	135	115	E G 175	135	105	110	B	B	115	115	115	B	115
2	B	B	B	B	B	B	B	B	G	E G 180	G	105	G	G	G	G	G	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	G	145	120	120	120	115	G	G	G	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	G	G	115	G	G	G	G	G	110	115	115	115	B	B	B	B
5	110	B	B	B	B	B	B	B	115	G	C	C	C	C	C	C	C	C	C	110	110	105	B	B
6	B	B	105	B	B	B	115	120	115	115	115	G	G	G	G	105	105	105	105	105	100	100	100	B
7	B	B	B	B	105	B	B	115	G	115	115	115	G	G	G	G	G	B	B	B	B	B	B	105
8	B	B	B	B	100	B	B	B	G	G	G	G	G	140	140	G	E G 175	B	B	B	B	B	B	B
9	B	B	B	B	B	B	100	G	G	G	125	125	115	115	115	G	G	B	B	B	B	B	B	B
10	B	B	B	B	B	B	B	160	G	115	120	125	G	E G 175	G	145	G	G	B	B	B	B	B	S
11	B	B	B	105	130	B	B	G	G	G	G	110	105	G	105	110	105	105	105	100	B	B	120	B
12	B	B	B	B	B	B	B	G	G	E G 170	G	G	115	G	G	115	G	G	110	B	B	110	B	B
13	120	110	105	B	110	B	110	G	G	135	125	115	115	115	115	110	G	B	B	B	115	B	B	B
14	115	110	110	110	105	B	B	G	G	G	145	115	140	G	G	G	G	G	110	110	105	B	B	B
15	B	B	B	B	B	B	B	G	145	105	115	110	125	G	G	G	G	G	105	100	100	B	B	B
16	B	B	B	B	B	B	B	G	E G 165	G	115	110	G	G	G	130	110	105	105	100	105	100	B	105
17	B	100	B	B	B	B	B	G	G	130	115	115	G	G	G	105	105	G	110	B	B	B	B	B
18	B	B	B	B	B	B	B	G	G	G	G	G	130	115	G	115	G	G	B	B	B	105	100	B
19	B	B	B	B	B	B	B	120	G	G	G	150	125	115	115	105	G	B	105	100	100	105	B	105
20	B	B	B	B	B	B	105	G	G	140	135	130	130	115	115	110	110	110	105	105	115	115	110	110
21	B	B	B	110	B	115	B	125	120	145	120	135	140	G	G	G	110	G	115	110	115	B	110	B
22	B	110	B	110	110	110	115	G	155	E G 160	145	125	115	115	115	110	115	110	115	110	B	B	B	B
23	B	B	B	B	B	B	B	115	120	120	125	115	115	115	115	115	110	G	110	B	B	105	B	110
24	110	110	115	105	110	B	B	E G 165	G	115	115	110	G	G	G	G	G	B	105	B	120	B	B	B
25	B	110	110	110	110	110	110	110	105	105	100	105	130	125	130	120	G	100	B	B	110	115	B	B
26	B	B	115	105	105	110	B	B	G	E G 165	E G 175	135	125	130	125	G	G	S	115	B	B	115	B	B
27	B	110	110	105	105	B	110	G	G	120	G	145	140	125	120	115	110	110	110	110	110	B	B	B
28	B	B	B	B	B	B	B	G	115	120	G	130	G	125	110	110	110	B	B	B	B	B	B	B
29	120	110	B	115	115	120	105	G	110	G	G	110	E G 140	125	115	110	115	110	115	115	110	105	105	105
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	8	7	9	12	6	9	8	10	19	19	23	18	16	14	17	14	9	17	14	14	12	6	7
MED	115	110	110	110	108	110	110	119	116	U 122	120	115	124	118	115	110	110	110	110	110	110	105	108	105
UQ	120	110	112	110	110	115	115	U 132	U 132	U 141	128	130	130	126	125	115	110	110	115	110	115	115	110	110
LQ	110	110	108	105	105	110	105	115	115	115	115	110	115	115	115	110	110	105	105	100	105	105	100	105

FEB. 1988 | H'ES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | TYPES OF ES | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 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 1	F 1	FF 11			H 1	H 1	H 1	L 1	H 1	HL 11	L 2	L 1			F 1	F 2	F 2		F 1
2										H 1		L 1												
3										H 1	L 1	L 1	L 1	L 1										
4											L 1						L 1	L 2	F 1	F 2				
5	F 2								L 1											F 1	F 3	F 1		
6			F 1				F 1	L 1	L 2	L 2	L 1					L 2	L 2	L 2	F 1	F 3	F 2	F 2	F 1	
7					F 1			L 1		L 1	L 1	L 2												F 1
8					F 1									H 1	H 1		HL 11							
9							F 2				C 1	C 1	L 2	L 1	L 2									
10								H 2		L 1	C 2	C 1		H 1		H 1								
11				F 1	F 1							L 2	L 2		L 1	L 1	L 2	L 2	F 1	F 2			F 1	
12										H 1			C 1			L 2			F 2			F 1		
13	F 1	F 3	F 3		F 1		F 1			H 2	C 1	L 1	L 1	L 2	L 2	L 2					F 1			
14	F 2	F 3	F 1	F 2	F 2						H 1	L 1	H 1						F 3	F 3	F 1			
15									H 1	L 2	L 1	LH 11	C 1						F 1	F 1	F 2			
16									H 1		L 1	L 2				H 2	L 3	L 3	F 3	F 2	F 1	F 1		F 1
17		F 1								H 1	L 1	L 1				L 2	L 2		F 1					
18													H 1	L 1		L 2						F 2	F 2	
19								L 1				H 1	C 1	L 2	L 2	L 3			F 1	F 1	F 1	F 1		F 1
20							L 1			H 1	H 1	H 1	H 1	C 1	L 1	L 3	L 3	L 1	F 2	F 2	F 3	F 1	F 2	F 2
21				F 2		F 1		L 1	L 2	H 1	C 2	HL 12	H 1				L 2		F 2	F 1	F 3		F 1	
22		F 1		F 1	F 3	F 2	F 1		H 1	H 1	H 1	C 1	L 1	L 2	L 2	L 2	L 2	L 3	F 3	F 3				
23								L 2	L 1	C 1	C 1	C 1	C 2	C 2	L 2	L 2	L 2		F 1			F 2		F 1
24	F 1	F 1	F 1	F 5	F 3			H 1		L 1	L 1	L 1							F 1		F 4			
25		F 3	F 4	F 4	F 3	F 3	F 2	L 3	L 2	L 1	L 2	L 2	H 1	C 1	C 1	L 1		L 2			F 1	F 2		
26			F 1	F 1	F 2	F 1				H 1	H 1	H 1	C 1	H 1	C 1				F 1			F 1		
27		F 1	F 2	F 1	F 2		F 1			L 1		H 1	H 1	H 1	L 1	L 2	L 1	L 3	F 3	F 4	F 1			
28									L 1	L 1		H 1		C 1	L 1	L 2	L 2							
29	F 1	F 1		F 3	F 1	F 1	F 1		L 1			L 1	H 1	H 1	C 1	L 2	L 2	L 3	F 2	F 3	F 4	F 3	F 2	F 2
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 Laboratory, Japan

FEB. 1988 | TYPES OF ES

IONOSPHERIC DATA

FEB. 1988 | FXI (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 24 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 36	X 39	X 42	X 44	X 36	X 28	X 29													X 51	X 53	X 54	X 43	X 39
2	X 36	X 37	X 37	X 38	X 39	X 40	X 31													X 47	X 44	X 45	X 43	X 37
3	X 39	X 37	X 37	X 37	X 42	X 34	X 31													X 47	X 50	X 51	X 46	X 46
4	X 43	X 39	X 40	X 40	X 43	X 34	X 26													X 50	X 49	X 46	X 32	X 34
5	X 36	X 37	X 38	X 39	X 39	X 28	X 26													X 53	X 51	X 39	X 36	X 36
6	X 39	X 37	X 40	X 46	X 39	X 37	X 39													X 45	X 49	X 46	X 45	X 38
7	X 39	X 40	X 42	X 41	X 45	X 35	X 34													X 75	X 60	X 50	X 52	O X 50
8	X 39	X 37	X 36	X 37	X 39	X 37	X 28													X 66	X 60	X 55	X 48	X 36
9	X 38	X 36	X 35	X 39	X 39	X 40	X 35													X 80	X 59	X 64	X 59	X 39
10	X 39	X 38	X 38	X 37	X 38	X 34	X 34													X 61	X 60	X 69	X 42	X 38
11	X 39	X 40	X 41	X 39	X 34	X 30	X 31													71	X 58	U X 62	X 64	X 42
12	X 42	X 44	X 41	X 34	X 31	X 31	X 32													X 72	X 82	X 52	X 42	X 41
13	X 39	X 40	X 38	X 36	X 33	X 32	X 34													X 60	X 47	X 48	X 48	X 47
14	X 45	X 45	X 40	X 43	X 45	X 37	X 33													X 60	X 48	X 50	X 47	X 40
15	X 39	X 39	X 41	X 44	X 43	X 30	X 31													X 73	X 99	U X 117	96	68
16	X 45	X 44	X 39	X 42	X 43	X 32	X 31													X 64	X 51	X 47	X 42	X 37
17	X 39	X 37	X 41	X 39	X 35	X 27	X 29													X 45	X 44	X 47	X 40	X 41
18	X 44	X 44	X 35	X 35	X 38	X 33	X 30													X 95	X 70	X 58	X 46	X 42
19	X 39	X 35	X 36	X 38	X 37	X 37	X 30													U X 112	U X 111	X 104	U X 95	U X 75
20	X 60	X 50	X 47	X 43	X 39	X 37	X 34													X 59	X 47	X 50	X 48	X 42
21	X 39	X 39	X 40	X 40	X 41	X 40	X 37													X 65	X 53	X 43	X 35	X 36
22	X 38	X 41	X 43	X 43	X 41	X 39	X 38												X 76	X 87	X 79	X 63	X 66	X 72
23	X 95	80	72	87	X 74	X 84	80												X 103	X 86	X 53	X 54	X 52	X 49
24	X 45	X 49	X 42	X 34	X 35	X 36	X 35												X 68	X 53	X 46	X 46	X 37	X 38
25	X 37	X 37	X 33	X 42	X 39	X 38	X 34													X 59	X 44	X 43	X 44	X 44
26	X 44	X 45	X 46	X 45	X 34	X 36	X 37												X 84	X 69	X 60	X 59	X 40	X 39
27	X 39	X 37	X 39	X 40	X 39	X 41	X 42													X 62	X 55	X 49	X 39	X 39
28	X 39	X 39	X 40	X 44	X 43	X 38	X 36													X 51	X 50	X 42	X 39	X 39
29	X 39	X 39	52	48	X 47	X 32	X 32													X 56	X 43	X 42	X 41	X 42
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29												4	29	29	29	29	29
MED	X 39	X 39	X 40	X 40	X 39	X 36	X 34												X 30	X 61	X 53	X 50	X 44	X 40
UQ	X 43	X 44	X 42	X 43	X 43	X 38	X 36												X 94	X 72	X 60	X 58	X 48	X 44
LQ	X 39	X 37	X 38	X 38	X 37	X 32	X 31												X 72	X 53	X 43	X 46	X 40	X 38

FEB. 1988 | FXI (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | FOF2 (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station YAMAGAWA | Lat. 31° 12.1' N | Long. 130° 37.1' E | Sweep 1 MHz to 25 MHz in 24 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	33	36	38	30	22	23	31	69	73	78	83	75	80	85	84	68	65	53	45	47	48	36	33
2	30	31	31	32	33	34	25	37	56	66	69	76	86	100	92	81	69	66	57	41	38	39	36	31
3	33	31	31	31	36	28	25	35	59	65	69	81	79	95	79	82	85	79	57	S 41	44	45	40	S 40
4	37	33	34	34	37	28	20	34	56	63	H 80	82	98	93	111	H 109	U H 101	U H 94	69	S 44	S 43	40	26	28
5	30	S 31	S 32	33	33	22	20	34	61	63	75	95	111	87	U H 92	97	80	87	65	52	46	33	30	30
6	33	31	S 34	40	33	31	33	36	55	71	81	U H 94	96	82	82	67	74	82	56	39	S 43	S 40	39	32
7	S 33	34	36	35	39	29	28	39	68	75	81	103	119	110	J R 104	H 98	H 95	92	U H 85	69	54	S 44	S 46	S 44
8	33	31	30	31	33	31	22	36	55	68	72	86	89	103	109	91	78	85	77	60	U S 54	48	S 42	30
9	32	30	29	33	33	34	29	41	61	76	66	85	82	81	97	H 93	86	84	90	H 74	53	58	53	33
10	33	32	32	31	32	28	28	42	68	75	71	75	98	89	93	91	86	75	66	55	56	63	35	32
11	33	34	35	33	28	24	25	34	69	93	90	H 82	100	93	79	86	76	85	S 74	U S 65	J S 52	56	58	36
12	36	38	35	28	25	26	26	40	68	92	75	80	85	H 35	91	89	85	U H 75	66	66	H 75	46	36	35
13	33	34	32	30	27	26	28	41	62	70	75	94	126	H 111	102	110	85	91	81	S 54	S 43	S 42	42	41
14	39	39	34	36	39	31	32	47	69	74	89	91	106	83	102	99	88	87	67	54	S 42	44	41	34
15	33	33	35	38	37	24	25	40	69	74	77	83	93	103	H 37	H 76	77	89	87	S 67	S 93	U S 111	F	F
16	39	38	33	36	37	27	26	38	74	90	94	104	113	109	113	111	H 89	H 84	74	H 58	45	40	36	31
17	33	32	35	33	30	22	23	41	69	77	93	126	122	111	124	96	H 79	76	69	42	39	41	34	36
18	38	38	29	30	32	27	24	43	57	68	96	103	104	103	104	109	H 120	H 114	S 97	H 89	H 64	H 52	H 40	36
19	33	29	31	32	31	30	25	46	60	71	89	86	83	93	92	116	126	113	H 114	U S 108	U H 105	S 98	U H 89	U H 69
20	H 54	44	41	36	33	31	28	42	H 65	63	68	74	90	87	75	76	73	64	62	53	41	44	42	36
21	33	33	34	34	35	34	31	51	64	H 63	74	H 81	82	103	H 93	H 104	102	87	69	59	47	37	30	30
22	32	35	37	37	35	33	32	40	E G 36	43	52	46	50	65	66	75	78	H 86	70	81	73	57	60	66
23	89	F	F	F	H 68	S 78	F	106	S 87	89	H 107	122	123	121	112	118	100	113	97	80	47	48	S 46	43
24	39	43	36	28	29	30	29	47	70	77	91	102	110	113	103	H 93	79	83	62	47	40	40	31	32
25	31	31	32	36	33	32	28	42	66	59	69	80	88	86	92	94	74	68	66	53	33	37	38	S 38
26	38	39	40	39	28	30	31	50	67	71	80	87	86	87	94	91	69	74	78	63	54	53	34	33
27	33	31	33	34	33	35	36	46	69	H 74	70	76	80	93	99	98	82	70	66	56	49	43	33	33
28	33	33	34	38	37	32	30	46	61	62	76	81	93	103	101	93	84	90	71	45	44	36	33	33
29	33	33	F	F	41	26	26	46	62	63	67	83	97	114	93	91	71	75	63	50	42	36	S 35	S 34
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	28	27	27	29	29	28	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	28
MED	33	33	34	34	33	30	27	41	65	71	76	83	93	93	97	93	84	84	69	55	47	44	37	34
UQ	37	36	35	36	37	32	30	46	69	75	89	94	106	103	103	99	90	89	78	66	54	52	42	37
LQ	33	31	32	32	31	26	25	37	60	65	70	81	85	87	92	86	77	75	65	47	42	40	34	32

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FEB. 1988 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

FEB. 1988 | FOF1 (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 24 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	L	L	U L 460	U L 480	L 460	L	L	250						
2										L	L	L 460	L 500	L 490	460	L	L	L						
3										L	L	L 470	U L 470	L 480	L 460	L 450	L							
4										L	L	L 470	L 470	L 490	440	U L 410	L							
5										L	U L 470	L 470	L 470	L 470	L 490	L 450	L	L						
6										L	U L 410	L	L	480	U L 460	L	L 410							
7										L	L	L 510	L 500	L 490	U L 490	L	L	L						
8										L	L	L 490	L 490	L 490	L 490	460	U L 400							
9											L	L 480	L 480	L 500	L 480	L	U L 420	L						
10										L	U L 420	U L 460	L 490	U L 490	L 490	U L 460	U L 390							
11										L	U L 460	460	L	U L 470	L 450	L 460	U L 440							
12										L	L	U L 480	U L 490	U L 500	U L 490	U L 450	L							
13										L	U L 490	U L 520	U L 480	U L 490	L 490	U L 450	L	L 260						
14										L	L	U L 520	U L 490	L 460	U L 490	U L 450	L							
15									L	L	L 440	L 480	U L 480	490	U L 460	L	L	L						
16										L	L 480	L	L 500	L 480	L 500	L	L	L						
17										L	L	L 500	490	480	L	L 450	L	L						
18											L	L 500	L 490	L 510	L 470	L 450	L							
19										L	U L 480	L	L 490	L 490	L 510	U L 460	L	L						
20									L		U L 460	L 480	H 470	L 490	L 470	L 460	U L 400	L 280						
21										390	U L 460	L	L 490	L 500	L	L 420	A							
22									360	370	410	A	440	450	L 450	U L 430	A							
23										A	L	A	L	L 470	L 450	L 460	L 380							
24										L	L 440	L 470	L 470	L 480	L 470	L 440	L							
25										330	U L 450	L 490	L 470	L 470	L 470	L	L 400	L 310						
26										L	L 450	L 490	L 480	L 480	L 470	L 450	U L 400	L						
27										L	U L 430	L	L 480	L 480	L 470	U L 450	L	L						
28											U L 480	U L 470	L 490	U L 470	L 450	L 450	L	L						
29										L	L	L 480	L 470	L 480	U L 460	L 450	L	L						
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	3	16	21	26	29	27	21	9	4						
MED									360	370	U L 455	L 480	L 480	L 480	L 470	L 450	U L 400	L 270						
UQ										380	U L 475	L 490	L 490	L 490	L 495	L 460	U L 410	L 295						
LQ										350	L 435	L 470	L 470	L 480	L 460	L 450	U L 400	255						

FEB. 1988 | FOF1 (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | FOE (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 24 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								S	210	270	305	A	335	A	A	315	285	A	S					
2								S	200	260	H 305	330	340	340	330	310	290	220	S					
3								S	205	H 270	A	320	335	A	A 320	A	275	220	S					
4								S	230	270	305	U A 320	U A 335	340	330	300	A	220	S					
5								S	230	A	310	330	340	350	340	315	A	A	S					
6								S	205	275	U A 310	U A 325	340	340	325	310	275	H 230	S					
7								S	A	A	A	335	A	A	A	320	235	220	S					
8								S	210	H 260	290	H 320	340	345	335	320	290	230	S					
9								S	225	270	305	325	A	A	A	315	230	210	S					
10								S	A	A	310	335	A	345	325	305	270	225	S					
11								S	H 215	280	305	325	A	A	335	305	235	A	S					
12								S	225	270	H 305	320	330	A	A	A	220	225	S					
13								S	220	290	310	A 330	A	A	340	A	A	220	S					
14								S	215	275	310	330	H 340	A	A	310	230	220	S					
15								S	205	260	300	340	345	345	335	H 305	H 220	210	S					
16								S	H 220	270	H 300	320	A	A	A	310	235	245	S					
17								S	220	290	310	330	340	345	330	315	290	230	S					
18								S	210	260	305	330	350	350	A	A	A	A	S					
19								S	205	260	300	330	340	330	A	320	A	235	S					
20								S	230	280	310	320	340	355	A	A	A	A	S					
21								S	230	300	330	335	350	340	A	305	275	A	S					
22								S	200	280	310	325	R 340	A	A	A	A	A	S					
23								S	205	260	300	A	A	A	A	A	230	225	S					
24								S	215	270	290	A	A	A	A	A	A	220	S					
25								S	A	280	315	330	340	340	325	300	A	R	S					
26								S	230	280	315	325	330	330	325	A	A	240	S					
27								S	H 230	275	310	330	345	340	330	A	A	A	A					
28								S	245	A	315	330	345	330	325	320	A	A	S					
29								S	230	280	310	340	350	335	325	A	A	A	S					
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									26	25	27	26	21	17	16	18	16	13						
MED									218	270	310	330	340	340	330	310	285	222						
UQ									230	280	310	330	345	345	335	315	290	230						
LQ									205	270	305	325	340	340	325	305	278	220						

The Radio Research Laboratory, Japan

FEB. 1988 | FOE (0.01 MHZ)

IONOSPHERIC DATA

FEB. 1988 | FOES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long 130° 37.1' E Sweep 1 MHz to 25 MHz in 24 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	ES 16	ES 16	ES 16	ES 15	JA 20	JA 18	ES 16	ES 16	G	G 21	G 24	JA 35	38	JA 38	JA 37	G 29	G 25	26	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
2	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	ES 16	G	G	G	G 30	G 28	G 23	G	G	31	G	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
3	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	34	37	38	38	35	JA 35	G 19	G	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
4	ES 16	ES 16	ES 16	ES 16	JA 24	ES 16	ES 16	ES 16	G	35	39	39	37	G 31	G 31	G 29	30	G 20	ES 16	JA 32	ES 16	ES 16	ES 16	ES 16
5	JA 25	JA 20	ES 16	ES 16	JA 37	ES 16	ES 16	ES 16	G 20	JA 32	G 19	JA 35	G	G 24	G 26	G 23	JA 40	JA 33	JA 23	JA 22	ES 16	ES 16	ES 16	ES 16
6	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	33	34	35	37	JA 38	G 20	G 20	G 24	G 20	ES 16	ES 16	JA 23	ES 16	ES 16	ES 16
7	ES 16	ES 16	22	22	24	ES 16	ES 16	ES 16	JA 24	JA 31	JA 64	37	39	JA 40	JA 37	G 26	G 25	24	ES 16	JA 25	ES 16	ES 16	ES 16	ES 16
8	ES 16	ES 15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	34	36	JA 39	G	G 29	G	G	G	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
9	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	36	JA 38	JA 35	JA 43	35	32	G 21	G 13	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
10	ES 16	ES 16	19	ES 16	ES 16	ES 16	ES 16	ES 16	JA 25	30	G	G	36	G 23	G	G 23	G 19	G 19	JA 24	JA 21	23	ES 16	ES 16	ES 16
11	21	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	G	33	34	JA 40	G 30	34	JA 36	34	JA 22	19	JA 27	ES 16	ES 16	ES 16
12	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	ES 16	ES 16	G	G	G	35	37	JA 38	JA 35	JA 34	G	G	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
13	ES 16	ES 16	JA 17	ES 16	20	ES 15	ES 16	ES 16	G	JA 34	JA 36	45	JA 41	JA 59	41	JA 43	33	G	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
14	ES 16	ES 16	JA 18	ES 16	JA 19	ES 16	ES 16	ES 16	G	G	G	35	36	35	JA 33	JA 34	G	JA 23	18	JA 20	ES 16	ES 16	ES 16	ES 16
15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	23	22	32	G 30	G	G 26	G	G	G	G	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	33	G	35	36	JA 33	G	G	G	17	ES 16	ES 16	ES 16	ES 16	ES 16
17	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	34	35	37	G	G	G 25	G	G	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
18	ES 16	ES 16	ES 16	ES 16	ES 16	JA 22	ES 16	ES 16	24	23	33	35	37	38	37	35	JA 37	29	24	JA 20	22	ES 16	ES 16	ES 16
19	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	35	37	43	40	35	G 30	31	G	JA 25	JA 24	ES 16	ES 16	ES 16	ES 16
20	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	30	G	G	G	G	35	34	JA 35	26	JA 25	20	ES 16	ES 16	ES 16	ES 16
21	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	JA 32	G	G	37	36	G	36	35	34	JA 43	29	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
22	JA 22	ES 16	ES 16	JA 21	JA 22	JA 13	ES 16	ES 16	G	G	41	50	47	JA 44	JA 46	JA 44	JA 41	JA 39	19	ES 16	ES 16	ES 16	JA 17	JA 17
23	JA 24	ES 16	ES 16	ES 16	ES 16	ES 16	JA 30	25	JA 38	JA 88	JA 55	98	JA 64	36	33	JA 34	G 19	G 21	JA 21	JA 24	21	JA 20	JA 40	ES 16
24	ES 16	JA 25	JA 19	JA 21	JA 19	JA 17	ES 16	ES 16	G	G	33	JA 40	40	37	35	JA 36	29	G 21	ES 16	ES 16	JA 30	JA 25	JA 25	JA 23
25	JA 21	21	21	JA 30	JA 23	JA 29	21	JA 24	JA 37	G 19	G 25	35	37	37	36	35	31	ES 250	JA 21	JA 20	JA 25	JA 21	JA 21	ES 16
26	JA 17	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	20	G	G 22	G 26	36	35	35	G 25	32	29	G 23	JA 26	JA 25	ES 16	ES 16	ES 16	ES 16
27	ES 16	ES 16	ES 16	ES 16	JA 20	ES 16	ES 16	ES 16	G	33	35	35	G	G	G	32	31	24	19	JA 24	JA 21	ES 16	ES 16	ES 16
28	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G 29	36	36	37	36	G 28	G	JA 35	JA 32	JA 33	ES 16	ES 16	ES 16	ES 16	ES 16
29	ES 16	ES 16	ES 16	ES 16	ES 16	JA 18	JA 21	ES 16	G 18	G 22	G 25	G	G	42	43	40	34	34	JA 31	JA 25	23	JA 24	ES 16	ES 16
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
MED	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G 21	33	35	37	36	35	32	29	G 21	17	ES 16	ES 16	ES 16	ES 16	ES 16
UQ	ES 16	ES 16	ES 16	ES 16	JA 20	ES 16	ES 16	ES 16	G 18	30	36	37	38	JA 33	37	34	34	28	JA 23	JA 22	21	ES 16	ES 16	ES 16
LQ	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	G 24	35	34	G 31	G 25	G 25	G 19	G	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16

FEB. 1988 | FOES (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | FBES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 24 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 16	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	G	G 21	G 24	35	G	35	34	G 28	G 24	22	E S 16	E S 15	E S 15	E S 16	E S 16	E S 16
2	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	G	G	G	G 30	G 28	G 23	G	G	31	G	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16
3	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	31	34	36	34	34	31	G 19	G	E S 16	E S 15	E S 15	E S 16	E S 16	E S 15
4	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	32	35	39	37	G 31	G 27	G 27	28	G 20	E S 16	23	E S 15	E S 16	E S 16	E S 16
5	17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G 20	28	G 19	G 28	G	G 24	G 27	G 25	35	25	21	21	E S 15	E S 16	E S 16	E S 16
6	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	32	33	35	36	G 30	G 20	G 20	G 24	G 19	E S 16	E S 16	19	E S 16	E S 16	E S 16
7	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	28	31	36	35	35	34	G 25	G 24	G 21	E S 16	25	E S 15	E S 16	E S 16	E S 16
8	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	G	G	34	35	G	G	G 29	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
9	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	35	34	35	35	34	G 30	G 21	G 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
10	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	25	28	G	G	36	G 31	G	G 23	G 19	G 19	22	20	E S 16	E S 16	E S 16	E S 16
11	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G	G 31	34	35	G 29	33	G 22	25	19	E S 16	22	E S 16	E S 16	E S 16
12	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	G	G	G	34	36	G 35	34	31	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
13	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	G	30	32	37	36	G 35	G 33	34	31	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
14	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G	35	G	35	33	G 29	G	G 17	18	E S 16	E S 16	E S 16	E S 16	E S 16
15	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	29	31	G 30	G	G 28	G	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	33	G	35	35	33	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	34	35	37	G	G	G 25	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	28	33	35	37	36	34	32	33	24	20	E S 16	17	E S 16	E S 16	E S 16
19	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	34	36	40	39	34	G 30	31	G	20	21	E S 15	E S 16	E S 16	E S 16
20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	30	G	G	G	G	35	34	33	24	E S 16	20	E S 16	E S 16	E S 16	E S 16
21	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	36	36	G	35	35	33	48	23	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
22	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	38	45	39	37	39	37	40	38	18	E S 16	E S 15	E S 16	E S 16	E S 16
23	24	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	37	80	40	70	45	35	33	31	G 19	G 20	17	20	E S 15	19	34	E S 16
24	E S 16	19	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	32	33	37	35	35	35	28	G 21	E S 16	E S 16	E S 15	22	E S 16	E S 16
25	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	19	28	G 19	G 24	34	36	36	35	34	30	E S 16	E S 16	E S 16	22	E S 16	E S 16	E S 16
26	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	19	G	G 20	G 25	35	35	35	G 24	32	29	G 23	20	24	E S 16	E S 16	E S 16	E S 16
27	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	33	34	35	G	G	G	32	30	24	19	E S 16	E S 16	E S 16	E S 16	E S 16
28	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G 29	34	36	36	35	G 22	G	32	30	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
29	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G 18	G 22	G 25	G	G	36	41	40	32	31	28	24	17	18	E S 16	E S 16
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
MED	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G 20	32	35	35	35	33	G 30	28	G 20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
UQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G 18	29	34	36	36	35	34	33	31	24	19	20	E S 16	E S 16	E S 16	E S 16
LQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G 24	G 31	G	G 30	G 25	G 23	G 19	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16

The Radio Research Laboratory, Japan

FEB. 1988 | FBES (0.1 MHZ)

IONOSPHERIC DATA

FEB. 1988 | FMIN (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 24 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	ES 16	ES 16	ES 16	ES 15	ES 16	ES 16	ES 16	ES 16	15	16	17	16	17	17	20	16	16	15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
2	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	ES 15	ES 16	16	16	15	17	15	17	17	18	16	17	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
3	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	17	17	17	17	16	16	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
4	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	16	17	17	17	16	16	15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
5	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	16	16	17	16	18	16	16	ES 15	ES 15	ES 16	ES 16	ES 16	ES 16
6	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	15	17	16	17	16	16	17	15	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
7	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	15	17	17	17	17	17	17	15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
8	ES 16	ES 15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	16	17	17	17	17	16	16	ES 16	ES 15	ES 16	ES 16	ES 16	ES 16
9	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	17	17	17	18	17	17	17	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
10	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	17	17	17	17	17	17	15	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
11	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	16	17	16	17	15	15	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
12	ES 16	ES 15	ES 16	ES 16	ES 16	ES 15	ES 16	ES 16	16	15	13	16	16	16	16	16	16	15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
13	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	ES 15	ES 16	16	16	16	16	16	17	17	16	16	16	ES 16	ES 16	ES 15	ES 16	ES 16	ES 16
14	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	17	18	16	17	16	14	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	15	16	17	17	16	16	16	16	17	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	17	16	17	17	16	16	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
17	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	18	18	16	19	17	17	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
18	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	15	16	18	18	16	18	16	16	15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
19	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	16	17	19	16	18	15	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
20	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	15	16	17	16	16	17	22	18	16	15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
21	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	15	16	17	16	18	16	16	17	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
22	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	15	15	16	17	18	18	17	17	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
23	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	16	17	17	16	17	15	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
24	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	15	15	15	16	16	16	17	17	17	16	ES 16	ES 16	ES 16	ES 16	ES 15	ES 16
25	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	16	22	21	18	17	18	25	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
26	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	17	17	16	17	20	20	19	22	20	15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
27	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	15	17	18	20	21	22	20	20	13	17	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
28	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	18	19	20	21	21	19	17	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
29	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	17	18	21	21	18	22	20	17	17	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	29	29	29	29	27	29	29	29	29	29	29	29	29	29
MED	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	17	17	17	17	17	16	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
UQ	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	17	17	13	18	18	18	17	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
LQ	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	16	16	16	17	16	16	16	ES 16	ES 15	ES 16	ES 16	ES 16	ES 16

FEB. 1988 | FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | M(3000)F2 (0.01) | 135° E Mean Time (G.M.T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 24 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	285	305	305	340	350	290	280	320	375	350	350	340	325	325	340	345	345	355	320	345	285	300	345	310
2	285	305	290	295	315	350	305	325	365	340	320	330	315	325	320	335	340	340	355	340	295	300	310	290
3	285	290	290	305	340	355	280	315	355	360	325	335	310	345	320	330	330	350	355	S 330	295	300	310	S 255
4	305	270	295	310	350	355	300	325	350	340	H 325	320	325	290	335	H 270	U H 290	U H 300	350	S 340	S 315	310	270	285
5	285	S 270	S 310	335	365	320	300	310	350	335	315	315	335	315	U H 305	310	325	310	345	305	335	285	335	285
6	285	290	S 295	335	320	275	315	320	355	315	320	U H 310	350	335	340	320	325	355	330	320	S 300	S 310	305	295
7	S 270	280	305	315	335	345	305	310	350	335	310	310	325	320	J R 290	H 295	H 270	315	U H 295	300	315	S 300	S 260	S 260
8	280	290	285	295	335	355	320	335	355	350	345	325	325	320	320	300	315	340	315	315	U S 265	290	S 305	285
9	330	315	295	305	320	325	305	315	345	350	320	310	305	295	320	H 295	330	295	335	H 285	300	340	285	305
10	285	295	280	275	310	355	290	325	350	360	325	310	335	310	310	325	325	320	335	310	305	340	305	280
11	270	310	315	320	360	285	280	305	320	345	350	H 305	330	350	315	350	320	345	S 330	U S 290	J S 255	290	320	305
12	285	295	325	320	300	275	290	310	330	340	320	330	315	H 305	310	315	320	U H 315	335	310	H 275	280	275	285
13	310	330	330	315	315	275	285	325	330	330	315	290	335	H 330	315	325	315	320	345	S 335	S 290	S 285	290	315
14	300	285	305	290	330	275	295	330	345	320	335	295	345	290	315	320	320	345	335	335	S 290	295	330	300
15	285	285	300	315	350	310	300	325	335	350	325	305	310	330	H 335	H 330	320	325	340	S 290	S 290	U S 295	F	F
16	295	315	285	305	325	295	305	315	335	335	320	325	320	310	305	350	H 310	H 310	335	H 310	275	325	320	305
17	285	280	315	350	365	270	280	315	345	310	295	315	325	305	320	335	H 305	340	360	335	280	315	295	305
18	300	330	295	285	310	350	335	335	340	310	330	320	315	320	305	300	H 310	H 310	S 320	H 315	H 305	H 270	H 275	305
19	305	295	290	295	305	355	300	325	350	345	325	325	335	325	295	305	315	315	H 305	U S 285	U H 265	S 305	U H 275	U H 240
20	H 240	285	315	320	320	340	355	335	H 355	350	340	335	335	325	330	330	360	345	330	340	290	295	310	320
21	320	285	295	310	315	325	320	350	350	H 325	350	H 320	315	310	H 305	310	325	335	325	330	310	310	300	265
22	295	285	295	295	300	305	280	300	G	210	280	A	250	305	320	335	315	H 315	300	310	315	280	250	270
23	335	F	F	F	H 270	S 260	F	320	S 355	310	H 300	320	305	320	295	315	300	325	310	330	275	290	S 305	325
24	305	325	360	285	260	300	295	350	350	350	335	320	345	330	335	H 325	335	350	340	340	310	350	290	310
25	305	290	310	335	320	330	320	335	350	365	340	325	330	330	325	350	365	350	320	340	300	295	270	310
26	300	305	310	345	305	300	290	340	360	330	335	335	350	320	330	350	340	330	340	325	315	350	325	305
27	305	275	270	310	285	275	305	345	355	H 310	335	335	310	315	320	335	355	335	330	330	325	325	285	305
28	305	305	310	315	335	310	300	335	350	330	330	315	315	320	330	335	320	340	360	320	320	320	305	320
29	285	285	F	F	340	365	305	345	355	350	320	305	315	330	345	355	345	360	350	330	335	290	S 300	S 290
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	28	27	27	29	29	28	29	29	29	29	28	29	29	29	29	29	29	29	29	29	29	28	28
MED	295	290	300	310	320	310	300	325	350	340	325	320	325	320	320	325	320	335	335	325	300	300	302	302
UQ	305	305	310	320	340	350	305	335	355	350	335	328	335	330	330	335	335	345	345	335	315	315	310	308
LQ	285	285	292	295	310	285	290	315	345	325	320	310	315	310	310	310	315	315	320	310	285	290	285	285

FEB. 1988 | M(3000)F2 (0.01)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | M(3000)F1 (0.01) | 135° E Mean Time (G.M.T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	U L 380	U L 365	L 345	L	L	440						
2										L	L	L 380	L 360	L 345	L 375	L	L	L						
3										L	L	L 360	U L 370	L 385	L 375	L 355	L							
4										L	L	L 370	L 380	L 355	L 385	U L 400	L							
5										L	U L 360	L 360	L 365	L 385	L 335	L 375	L	L						
6										L	U L 360	L	L	375	U L 360	L	L 365							
7										L	L	L 345	L 350	L 350	U L 350	L	L	L						
8										L	L	L 345	L 360	L 355	L 355	330	U L 370							
9											L	L 355	L 375	L 360	L 350	L	U L 335	L						
10										L	U L 400	U L 380	L 355	U L 355	L 355	U L 345	U L 360							
11										L	U L 360	380	L	U L 370	L 390	L 345	U L 330							
12										L	L	U L 355	U L 355	U L 350	U L 345	U L 365	L							
13										L	U L 335	U L 335	U L 355	U L 355	L 350	U L 365	L	L 420						
14										L	L	U L 335	U L 345	L 380	U L 345	U L 335	L							
15									L	L	L 385	L 365	U L 375	345	U L 390	L	L	L						
16										L	L 355	L	L 340	L 375	L 340	L	L	L						
17										L	L	L 340	365	385	L	L 375	L	L						
18											L	L 340	L 355	L 350	L 360	L 355	L							
19										L	U L 355	L	L 365	L 355	L 350	U L 370	L	L						
20									L		U L 370	L 375	H 380	L 365	L 380	L 370	U L 375	L 410						
21										410	U L 370	L	L 365	L 350	L	L 325	A							
22									320	350	A	A	375	365	L 375	U L 370	A							
23										A	L	A	L	L 370	L 375	L 360	L 395							
24										L	L 385	L 370	L 380	L 365	L 370	L 385	L							
25										395	U L 390	L 365	L 370	L 370	L 360	L	375	L 385						
26										L	L 375	L 365	L 365	L 365	L 360	L 375	U L 400	L						
27										L	U L 385	L	L 365	L 365	L 360	U L 355	L	L						
28											U L 355	U L 360	L 355	U L 370	L 390	L 365	L	L						
29										L	L	L 365	L 370	L 375	U L 370	L 375	L	L						
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	3	15	21	26	29	27	21	9	4						
MED									320	395	U L 370	L 360	L 365	L 365	L 360	L 365	U L 370	L 415						
UQ										402	U L 385	L 370	L 375	L 370	L 375	L 375	U L 375	430						
LQ										372	U L 353	L 345	L 355	L 355	L 350	L 355	U L 360	393						

FEB. 1988 | M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | H*F2 (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 24 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										245	245	255	255	270	255	245	235	230						
2										245	265	255	295	265	255	245	240	225						
3										230	270L	275	285	260	270	260	260							
4										250	260	245	280	290	260	235	235							
5										245	280	270	260	250	285	260	250	235						
6										275	260	270	245	270	265	255	255							
7										245	250L	285	260	270	270	250	230	230						
8										235	245	285	260	280	260	255	250							
9											240	270	260	290	270	240	260	235						
10										240	250	270L	260	265	300	255	255							
11										250	245	245	260	250	270	250	270							
12										250	250	265	280	280	280	270	245							
13										245	295	305	255	245	280	250	255	240						
14										255	245	300	250	275	270	255	250							
15									225	235	270	275	265	260	240	250	265	245						
16										260	280	265	290	250	290	235	235	220						
17										300	270L	275	255	290	250	250	235	240						
18											270	280	250	275	265	280	230							
19										250	270	260	260	270	300	280	250	240						
20									220		255	260	265	265	265	260	245	225						
21										225	245	260	270	280	260	280	250							
22									G	670	410	E A 550	525	325	280	275	250							
23										A	300	275	280	250	255	270	250							
24										235	265	280	245	275	250	230	240							
25										230	270	300	270	270	280	250	240	230						
26										255	270	275	250	290	275	250	245	250						
27										250	265	275	300	290	280	250	240	230						
28											275	275	290	280	260	255	250	245						
29										240	285	315	280	270	255	245	245	235						
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										3	24	29	29	29	29	29	29	16						
MED										225	245	265	275	260	270	270	250	250	235					
UQ										D G 225	252	270	280	280	280	280	260	255	240					
LQ										222	238	250	265	255	265	260	250	240	230					

The Radio Research Laboratory, Japan

FEB. 1988 | H*F2 (KM)

IONOSPHERIC DATA

FEB. 1988 | H'F (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 24 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	S 325	S 285	260	230	220	ES 310	ES 305	265	H 225	230	H 200	230	205	205	200	225	210	EA 230	235	205	S 250	235	215	250
2	ES 285	S 285	S 290	S 295	250	220	ES 260	250	210	205	H 215	200	H 185	H 175	205	H 210	230	230	205	200	S 250	235	255	ES 275
3	ES 290	ES 295	ES 305	ES 285	235	215	ES 300	255	H 220	H 220	H 190	H 210	215	180	210	205	220	H 225	205	220	S 230	230	230	S 260
4	ES 285	ES 285	S 295	255	225	220	ES 270	255	220	235	230	220	195	H 195	230	H 215	215	235	215	A 220	235	215	ES 300	ES 300
5	EA 345	S 320	290	240	220	ES 245	ES 315	255	230	235	H 195	H 200	H 195	205	H 195	215	220	A	205	EA 250	210	ES 295	235	ES 285
6	S 310	ES 270	ES 295	235	250	ES 305	265	H 200	230	245	225	H 215	H 220	205	H 200	220	210	H 235	205	215	A 275	250	245	ES 280
7	ES 300	ES 315	S 280	245	230	225	ES 270	245	235	H 190	H 175	205	195	H 195	200	H 210	225	215	220	215	245	200	245	250
8	ES 295	ES 260	ES 300	ES 285	245	220	ES 270	235	225	H 220	215	220	205	200	H 205	205	200	H 245	210	220	210	245	245	ES 290
9	250	250	ES 300	S 280	255	245	S 255	250	H 220	H 240	220	205	H 200	200	H 200	215	205	215	220	200	215	220	225	220
10	ES 290	ES 280	ES 305	ES 325	ES 275	215	ES 280	250	H 240	H 205	H 200	H 195	225	205	200	210	205	230	220	225	245	220	245	ES 285
11	ES 320	S 285	250	255	210	ES 325	ES 315	260	H 205	230	220	205	H 175	H 205	195	H 200	205	H 235	225	205	EA 275	250	220	255
12	ES 295	260	240	S 245	ES 255	ES 315	ES 295	250	240	230	200	205	210	210	205	200	H 215	220	220	240	200	S 235	275	S 290
13	285	240	245	245	S 230	ES 300	ES 300	235	220	230	225	H 210	200	H 195	205	230	215	H 215	205	205	S 230	245	S 260	255
14	255	S 275	S 250	S 290	240	ES 250	ES 285	250	H 235	230	H 225	210	225	200	195	195	235	H 235	220	215	235	250	220	270
15	290	305	285	250	225	ES 240	ES 305	250	210	220	H 205	205	200	H 250	H 215	205	200	240	220	215	245	225	220	270
16	280	255	S 300	280	240	205	ES 285	265	H 250	235	H 205	H 195	H 220	215	H 205	225	215	225	220	200	220	230	260	305
17	305	315	260	235	210	ES 335	ES 330	255	235	235	235	H 215	H 210	H 190	255	215	215	H 220	215	250	280	250	290	S 285
18	S 270	235	ES 275	S 315	270	215	ES 255	240	H 220	H 200	H 205	235	215	210	210	200	EA 245	H 235	220	200	210	235	285	250
19	245	S 300	S 300	295	280	220	ES 280	240	225	235	230	220	230	230	195	240	235	225	210	200	220	205	210	240
20	280	285	250	250	260	230	230	230	220	H 210	190	H 180	190	H 190	230	215	A 215	A 205	230	215	245	255	255	250
21	260	S 295	270	265	255	245	S 265	235	220	195	215	H 185	H 200	195	H 195	220	A	230	225	205	245	S 215	S 250	ES 350
22	ES 300	ES 300	ES 280	ES 290	ES 270	ES 270	ES 320	250	270	250	EA 280	A	EA 245	220	EA 240	EA 230	A	235	240	235	215	ES 275	ES 320	ES 320
23	235	240	ES 320	S 245	ES 270	ES 250	ES 315	230	230	A	EA 250	A	A	220	215	210	205	H 205	220	205	ES 275	EA 290	EA 300	240
24	255	250	220	ES 275	ES 325	ES 290	ES 275	230	H 220	215	H 190	H 190	H 205	H 195	H 200	H 205	H 195	235	215	220	250	230	ES 270	ES 270
25	265	ES 300	ES 295	ES 265	ES 265	ES 245	ES 250	240	230	205	205	H 200	195	H 195	220	235	210	215	240	205	EA 230	ES 270	ES 300	ES 270
26	ES 270	ES 280	S 250	220	ES 250	ES 300	ES 230	240	240	225	210	H 225	220	H 200	H 210	220	220	220	230	225	ES 250	220	ES 250	ES 270
27	ES 290	ES 330	ES 320	ES 275	ES 300	ES 300	ES 255	225	H 220	230	H 210	H 220	H 210	210	200	210	215	220	230	215	S 230	220	ES 270	ES 290
28	ES 280	ES 300	ES 300	ES 270	230	S 240	ES 250	230	230	240	230	230	225	200	H 220	H 200	210	A	215	225	ES 240	ES 245	ES 275	ES 270
29	ES 300	ES 320	ES 270	245	220	220	ES 280	240	230	H 205	H 230	215	H 225	H 225	EA 240	A 230	H 200	A	225	A 230	225	EA 280	ES 300	ES 320
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	28	29	27	28	29	29	29	27	26	29	29	29	29	29	29
MED	US 260	US 262	US 265	255	U 238	ES 245	ES 280	245	225	230	212	210	206	200	205	212	215	226	220	215	232	230	U 240	US 245
UQ	ES 300	S 292	ES 300	ES 285	ES 265	ES 300	ES 300	250	235	235	225	220	220	210	212	220	219	235	225	222	248	242	ES 275	ES 290
LQ	262	250	255	245	228	220	ES 265	235	220	203	H 200	200	198	H 195	200	205	205	220	215	205	220	220	232	252

FEB. 1988 | H'F (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | H'E (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 24 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								S	120	A 120	A 120	E A 125	110	115	115	A 120	A 120	A	S					
2								S	120	105	105	A 115	A 115	A 115	115	115	115	120	S					
3								S	120	115	110	110	110	110	A	A	A 110	120	S					
4								S	125	115	110	A	A	E A 145	A 125	A 125	A	E A 140	S					
5								S	A 115	A	A 115	A 120	110	A 120	A 120	A 115	A	A	S					
6								S	120	A	A	A	E A 130	A 125	A 110	A 110	A 125	A	S					
7								S	A	A	A	110	A	A	A	A 115	A 120	E A 125	S					
8								S	120	110	110	105	A 120	110	E A 120	110	115	115	S					
9								S	120	110	105	105	A	A	A	E A 125	A 110	A 120	S					
10								S	A	A	105	105	A	A 125	105	A 110	A 110	E A 125	S					
11								S	115	110	105	A	A	A	E A 120	A 115	E A 120	A	S					
12								S	110	105	105	A 120	105	105	105	105	105	105	S					
13								S	120	110	115	105	A	A	A	A	A	115	S					
14								S	120	110	105	105	105	105	A	A 120	105	A 115	S					
15								S	115	115	A	A	E A 125	110	A 110	105	110	110	115	S					
16								S	120	110	110	105	110	110	A	105	110	120	S					
17								S	120	110	110	110	110	105	110	A 120	110	120	S					
18								S	115	110	110	110	105	110	110	A	A	A	S					
19								S	115	110	110	110	110	110	110	A 120	A	115	S					
20								S	110	A 115	110	110	110	110	110	110	A	A	S					
21								S	120	110	110	110	110	E A 130	A	A 110	110	A	S					
22								S	120	110	110	115	105	105	110	110	110	A	S					
23								S	115	110	105	105	105	110	A	A	A 115	E A 125	S					
24								S	110	110	105	105	105	105	105	110	A	E A 125	S					
25								S	A	115	A	E A 120	120	120	A 120	A 120	A 120	B	S					
26								S	130	A 120	A 120	A 120	A 115	A 115	A 115	A 115	A 120	A	S					
27								S	120	120	115	115	115	120	120	120	120	A	A					
28								S	120	A	115	110	A 120	A 120	A 120	115	A	A	S					
29								S	A 120	A 120	A 120	110	115	110	115	115	115	A	S					
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									26	24	25	26	23	25	21	25	21	16						
MED									120	110	110	110	110	110	112	A 115	112	118						
UQ									120	115	115	A 112	115	A 118	A 120	A 120	A 120	E A 125						
LQ									115	110	105	105	108	110	110	110	110	115						

The Radio Research Laboratory, Japan

FEB. 1988 | H'E (KM)

IONOSPHERIC DATA

FEB. 1988 | H'ES (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 24 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	S	S	S	S	105	105	S	S	G	110	110	120	120	120	120	115	110	110	S	S	S	S	S	S
2	S	S	S	S	S	S	S	S	G	G	G	105	105	105	G	G	125	G	S	S	S	S	S	S
3	S	S	S	S	S	S	S	S	G	G	125	125	120	120	120	120	105	G	S	S	S	S	S	S
4	S	S	S	S	135	S	S	S	G	160	155	145	165	105	105	100	105	105	S	105	S	S	S	S
5	110	105	S	S	105	S	S	S	110	105	105	105	G	105	100	100	105	100	95	95	S	S	S	S
6	S	S	S	S	S	S	S	S	G	155	E G 175	E G 170	E G 165	105	105	105	105	105	S	S	105	S	S	S
7	S	S	105	105	105	S	S	S	110	110	105	155	110	110	110	105	105	105	S	100	S	S	S	S
8	S	S	S	S	S	S	S	S	G	G	E G 155	130	120	G 110	G	G	G	G	S	S	S	S	S	S
9	S	S	S	S	S	S	S	S	G	G	E G 175	130	110	110	110	105	105	105	S	S	S	S	S	S
10	S	S	100	S	S	S	S	S	115	125	G	G	105	105	G	105	105	105	100	100	105	S	S	S
11	100	S	S	S	S	S	S	S	G	G	G	105	105	105	105	125	100	95	100	110	105	S	S	S
12	S	S	S	S	S	S	S	S	G	G	G	145	120	120	115	120	G	G	S	S	S	S	S	S
13	S	S	105	S	105	S	S	S	G	130	125	115	105	120	110	105	105	G	S	S	S	S	S	S
14	S	S	115	S	105	S	S	S	G	G	G	E G 175	E G 155	110	105	105	G	105	105	100	S	S	S	S
15	S	S	S	S	S	S	S	S	140	145	140	110	G	110	G	G	G	G	S	S	S	S	S	S
16	S	S	S	S	S	S	S	S	G	G	E G 175	G	125	120	110	G	G	G	110	S	S	S	S	S
17	S	S	S	S	S	S	S	S	G	G	E G 175	125	145	G	G	110	G	G	S	S	S	S	S	S
18	S	S	S	S	S	145	S	S	150	160	E G 150	140	140	130	120	110	105	105	105	105	100	S	S	S
19	S	S	S	S	S	S	S	S	G	G	E G 170	E G 155	125	115	120	105	105	G	100	95	S	S	S	S
20	S	S	S	S	S	S	S	S	G	E G 150	G	G	G	G	125	115	105	105	110	110	S	S	S	S
21	S	S	S	S	S	S	S	105	G	G	170	E G 175	G	135	105	130	110	110	S	S	S	S	S	S
22	105	S	S	105	100	100	S	S	G	G	125	120	120	115	110	110	105	105	105	S	S	S	120	120
23	115	S	S	S	S	S	150	135	125	120	120	110	110	115	110	110	105	100	100	100	150	105	100	S
24	S	100	100	105	100	105	S	S	G	G	125	120	120	115	115	110	110	115	S	S	100	100	110	105
25	105	110	105	100	105	105	105	100	100	105	100	130	125	125	125	125	115	B	115	105	105	105	105	S
26	105	S	S	S	S	S	S	110	G	105	100	150	150	150	100	125	120	100	100	95	S	S	S	S
27	S	S	S	S	100	S	S	S	G	E G 175	E G 175	145	G	G	G	120	120	115	110	105	110	S	S	S
28	S	S	S	S	S	S	S	S	G	110	150	150	E G 170	E G 170	115	G	100	100	105	S	S	S	S	S
29	S	S	S	S	S	110	105	S	110	110	110	G	G	120	120	110	115	105	105	105	105	100	S	S
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	3	6	4	10	6	3	4	8	16	23	25	23	25	24	24	23	19	15	14	9	4	4	2
MED	105	105	105	105	105	105	105	108	112	U 116	U 122	125	120	115	110	110	105	105	105	102	105	102	108	112
UQ	110	108	105	105	105	110	128	122	132	145	E G 170	145	U 134	120	120	120	110	105	108	105	105	105	115	
LQ	105	102	100	102	100	105	105	102	110	110	115	120	110	110	105	105	105	102	100	100	105	100	102	

FEB. 1988 | H'ES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | TYPES OF ES | 135° E Mean Time (G.M.T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 24 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 1	F 1				L 1	L 1	CL 11	C 2	C 1	C 1	L 1	L 2	L 3						
2												L 2	L 1	L 1			C 2							
3											C 1	C 2	C 2	C 1	CL 22	CL 12	L 1							
4					F 1					H 2	H 2	HL 22	HL 12	L 2	L 2	L 2	L 2	L 1		F 4				
5	F 2	F 1			F 1				L 2	L 2	L 1	L 2		L 2	L 2	L 2	LL 22	L 4	L 4	F 4				
6										HL 22	HL 11	HL 11	HL 21	L 1	L 1	L 1	L 2	L 1			F 4			
7			F 2	F 2	F 3				L 2	L 2	L 1	HC 11	L 2	L 2	L 1	L 1	L 3	L 2		F 5				
8											H 1	H 2	CL 11		L 1									
9											H 1	H 1	L 1	L 1	L 2	L 2	L 2	L 2						
10			F 1						L 2	CL 22			L 2	L 1		L 2	L 3	L 2	L 4	F 3	F 2	F 1		
11	F 3				F 1	F 1						L 2	L 1	L 3	L 2	CL 12	LC 22	L 5	L 4	FF 31	F 2			
12												CL 11	C 2	C 1	C 1	C 2								
13			F 1		F 1					C 2	C 1	C 2	L 2	CL 11	L 2	L 3	L 3							
14			F 1		F 1							H 1	H 1	C 2	L 1	L 2		L 1	L 1	F 3	F 1			
15									H 2	HL 22	HL 12	L 2		L 1										
16											H 1		C 1	C 1	L 1				L 1		F 1	F 1		
17											H 1	C 1	H 1			L 2					F 1	F 1	F 1	
18						F 1			H 2	H 2	H 1	H 1	H 1	C 1	C 1	L 2	L 3	L 2	L 3	F 1	F 2			
19											H 1	H 1	C 2	C 2	C 1	L 2	L 2		L 3	F 4	F 1			
20										HL 11					C 1	C 1	L 4	L 3	L 2	F 2	F 1			
21								L 1			H 1	H 1		HL 21	L 2	HL 11	C 4	L 4			F 1			
22	F 2			F 2	F 2	F 2					C 3	C 4	C 2	C 2	C 3	C 3	C 4	L 5	F 2				F 2	F 2
23	F 7						F 3	C 6	C 4	C 6	C 5	C 4	C 6	C 2	L 2	L 2	L 2	L 3	F 1	F 3	FF 11	F 2	F 4	
24		F 2	F 2	F 2	F 3	F 2					C 2	C 1	C 2	C 1	C 2	C 3	L 2	L 2			F 2	F 4	F 1	F 2
25	F 3	F 2	F 2	F 3	F 2	F 3	F 2	L 6	L 4	L 1	L 3	CL 11	C 1	C 2	CL 11	CL 21	CL 11		C 1	F 1	F 5	F 2	F 2	
26	F 1					F 1	F 1	L 1		L 1	L 2	HL 12	HL 11	HL 11	L 1	C 1	CL 11	L 2	F 3	F 5				
27					F 2					H 1	H 1	H 1				C 1	C 1	L 1	L 1	F 2	F 3			
28										L 1	H 1	H 2	HL 11	HL 11	L 1		L 3	L 3	L 2	F 1				
29						F 1	F 2		L 1	L 1	L 1			C 1	C 2	C 2	C 2	L 2	L 3	F 3	F 2	F 4		
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 Laboratory, Japan

FEB. 1988 | TYPES OF ES

IONOSPHERIC DATA

FEB. 1988 | FXI (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station OKINAWA Lat. 26° 16.9 N, Long. 127° 48.4 E Sweep 1 MHz to 25 MHz in 24 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	X 41	X 44	X 49	X 40	X 35	X 26	X 26	X 36												X 67	X 70	X 78	X 75	X 44
2	X 43	X 39	X 40	X 37	X 41	X 40	X 29	X 38												X 71	X 63	X 61	X 63	X 53
3	X 44	X 43	X 42	X 38	X 38	X 36	X 29	X 38												X 91	X 77	X 87	X 82	X 68
4	X 62	X 57	X 50	X 48	X 52	X 29	X 24	X 37												X 78	X 67	X 70	X 52	X 41
5	X 38	X 38	X 40	X 47	X 39	X 26	X 24	X 36												X 80	X 82	X 58	X 56	X 36
6	X 37	X 41	X 45	X 43	X 35	X 32	X 32	X 41												X 55	X 57	X 63	X 62	X 42
7	X 36	X 36	X 39	X 42	X 40	X 27	X 28	X 40												X 111	X 99	X 86	X 76	X 72
8	X 55	X 49	X 40	X 38	X 40	X 34	X 28	X 39												X 132	X 107	X 84	X 73	X 65
9	X 57	X 43	X 36	X 36	X 33	X 36	X 31	X 42												X 135	X 102	X 89	X 90	X 65
10	X 54	X 41	X 38	X 36	X 38	X 34	X 32	X 45												X 96	X 84	X 76	X 72	X 50
11	X 47	X 43	X 43	X 37	X 29	X 26	X 28	X 36												X 130	X 118	X 100	X 96	X 78
12	X 62	X 63	X 50	X 48	X 33	X 28	X 28	X 44												U X 110	X 130	U X 108	X 94	X 79
13	X 72	X 62	X 40	X 37	X 32	X 27	X 28	X 43												X 103	X 100	X 90	X 84	X 76
14	X 67	X 62	X 58	X 47	X 45	X 37	X 36	X 46												U X 106	U X 112	U X 97	U X 92	U X 73
15	X 59	X 56	X 55	X 60	X 45	X 31	X 31	X 43												X 143	X 148	X 168	X 126	X 92
16	X 66	X 56	X 47	X 45	X 43	X 30	X 28													X 115	X 98	X 82	X 75	X 76
17	94	X 57	X 52	X 51	X 28	X 26	X 30													X 86	X 85	X 72	X 57	X 52
18	X 47	X 43	X 33	X 33	X 35	X 37	X 27													X 145	X 126	X 106	X 81	X 66
19	X 64	X 50	X 46	X 49	X 43	X 36	X 30													C	X 140	C	C	145
20	94	X 33	X 82	X 66	X 52	X 45	X 30													C	C	C	C	C
21	C	C	C	C	C	C	C													C	C	C	C	C
22	C	C	C	C	C	C	C													X 122	X 115	X 93	X 97	X 99
23	150	120	150	120	92	100	92	118	112	115	110									X 166	X 130	X 98	X 90	X 64
24	X 68	X 51	X 33	X 23	X 31	33	35													U X 126	U X 91	X 54	X 38	39
25	X 37	X 33	35	44	X 38	33	32													X 87	X 83	X 57	43	47
26	X 57	X 49	X 53	X 39	X 38	X 38	X 39													X 97	X 101	X 83	X 60	X 45
27	X 39	X 40	X 38	X 40	X 39	X 40	X 43													X 76	X 70	X 56	X 46	X 42
28	X 40	X 40	X 40	X 45	X 46	X 36	X 32													X 90	X 80	X 70	X 70	X 50
29	X 44	X 42	X 44	X 44	X 46	X 30	28													X 81	X 63	X 54	X 51	X 43
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	27	27	27	27	27	16	1	1	1									26	27	26	26	27
MED	X 55	X 48	X 43	X 43	X 39	X 33	X 30	X 40	112	115	110									X 100	X 98	X 82	X 75	X 64
UQ	X 65	X 56	X 50	X 48	X 45	X 36	X 32	X 44												X 126	X 114	X 93	X 90	X 74
LQ	X 42	X 41	X 40	X 38	X 35	X 28	X 28	X 38												X 81	X 78	X 63	X 57	X 44

FEB. 1988 | FXI (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | FOF2 (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station OKINAWA Lat. 26° 16.9' N, Long. 127° 48.4' E Sweep 1 MHz to 25 MHz in 24 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	35	38	43	34	29	20	20	30	64	82	72	87	91	100	100	106	87	75	73	61	64	72	69	33
2	37	33	34	31	35	34	23	32	58	69	80	88	95	108	124	122	104	93	75	65	57	55	57	S 47
3	38	37	36	32	32	30	23	32	67	70	70	80	90	112	117	110	P 140	U R 159	U R 118	85	S 71	81	S 76	S 62
4	56	51	U S 44	42	S 46	23	18	31	60	72	92	104	R 120	135	137	144	145	133	111	72	61	64	S 46	35
5	S 32	32	F	41	33	20	18	30	60	69	89	99	110	125	132	149	145	145	122	74	S 76	S 52	50	30
6	31	35	39	37	29	F	F	35	56	72	92	91	103	89	91	H 94	87	87	78	49	J S 51	57	56	36
7	30	30	33	36	34	21	22	34	64	85	91	114	131	139	163	153	144	134	123	105	S 93	80	70	66
8	S 49	43	34	32	34	28	22	33	57	64	81	86	103	106	133	148	R 130	135	143	126	J S 101	S 78	72	59
9	S 51	S 37	30	30	32	30	25	36	63	75	88	81	97	104	126	143	130	R 129	147	149	96	83	84	59
10	S 48	35	32	30	32	28	26	39	68	73	84	82	100	104	106	R 117	R 117	R 103	90	90	72	70	66	S 44
11	S 41	42	S 37	31	23	S 20	22	30	68	89	105	88	98	122	R 121	R 137	125	R 125	R 125	124	S 112	S 94	90	72
12	56	57	44	42	27	22	22	38	66	85	95	90	90	108	U R 120	130	129	146	125	U S 104	124	U S 102	S 88	S 73
13	66	56	34	F 27	F 20	21	22	37	60	R 71	75	104	126	133	130	140	139	133	113	S 97	S 94	S 84	S 73	70
14	S 61	56	52	S 41	39	31	30	40	69	82	98	100	U R 119	113	109	R 120	117	125	R 112	U S 100	U S 106	U S 91	U S 86	U S 67
15	53	50	49	54	39	25	25	37	59	77	84	95	104	112	118	118	125	143	155	137	142	F	U S 120	86
16	60	50	41	39	42	24	22	32	69	95	102	111	127	151	147	166	143	137	126	109	92	76	69	70
17	F	51	46	45	22	20	24	38	68	84	103	136	152	R 138	150	147	126	110	R 98	80	S 77	S 66	51	S 46
18	41	37	27	27	29	31	21	36	60	69	102	100	120	125	147	165	178	171	157	139	120	S 100	S 73	60
19	58	44	S 40	43	37	30	S 24	40	C	69	86	95	101	100	112	143	R 170	R 172	R 180	C	134	C	C	F
20	F	77	S 76	60	46	39	24	40	69	66	76	82	89	106	105	103	94	H 84	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	70	91	94	97	100	104	R 95	116	109	87	S 91	93
23	F	F	F	F	F	F	F	F	F	F	F	J R 137	122	143	145	145	155	168	128	160	124	92	84	S 58
24	62	45	27	22	25	F	F	42	67	82	90	112	166	119	128	118	112	138	147	U S 120	U S 85	48	32	F
25	31	27	F	F	32	F	F	45	60	70	72	77	105	96	91	105	90	69	68	81	77	U S 51	F	F
26	U S 51	S 43	47	33	32	32	33	48	70	74	78	87	92	78	94	100	59	81	94	91	95	77	54	39
27	33	34	32	V 34	33	34	37	44	60	74	70	90	84	94	102	104	89	76	75	S 70	64	S 50	40	36
28	34	34	34	39	40	30	26	44	63	69	76	80	105	110	114	110	106	111	105	S 84	H 74	S 64	U S 64	44
29	38	36	S 38	38	S 40	S 24	F 19	42	69	72	67	91	113	110	110	97	78	77	71	S 75	57	S 48	S 45	U S 37
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	24	26	24	25	26	23	23	26	25	26	26	27	28	28	28	28	28	28	27	26	27	25	25	24
MED	44	40	38	36	32	28	23	37	64	72	85	91	104	110	119	121	125	127	113	94	92	76	69	58
UQ	56	50	44	41	39	30	25	40	68	82	92	102	120	125	134	144	142	140	127	120	108	84	S 84	68
LQ	34	35	34	31	29	22	22	32	60	69	76	86	94	102	104	106	97	90	92	75	72	57	54	38

The Radio Research Laboratory, Japan

FEB. 1988 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

FEB. 1938 | FOF1 (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station OKINAWA Lat. 26° 16'.9 N, Long. 127° 48'.4 E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	U L 450	U L 490	U L 490	U L 480	L	L	L						
2									L	L	L	480	U L 470	500	480	430	L	L						
3										L	L	500	L 490	500	500	L 460	440	L						
4										L	470	480	500	500	U L 530	U L 470	L	L						
5										L	L	480	500	470	500	480	450	L						
6										L	L	L	L	L	L	L	L							
7										L	L	U L 510	U L 480	L	L	U L 480	U L 440	L						
8										L	L	L	U L 490	L	U L 490	L	L	L						
9										L	U L 470	U L 480	U L 490	U L 490	U L 500	U L 480	L	L						
10										L	L	U L 480	U L 480	U L 500	U L 490	L	L	L						
11										L	L	470	500	500	510	470	440	A						
12										L	L	U L 500	U L 500	L 490	480	470	L	L						
13										L	L	L	U L 490	L	L	L	L	L						
14										L	U L 460	U L 480	U L 470	490	480	U L 460	L	L						
15										L	L	L	U L 500	L	U L 490	L	L	L						
16										L	L	U L 490	U L 510	U L 500	U L 480	L	L	L						
17										L	L	U L 500	U L 500	L	U L 500	L	L	L						
18										L	L	L	L	U L 500	L	U L 490	L	L						
19									C		L	U L 480	L 500	A	U L 490	L	L	L						
20										L	L	U L 480	L 480	U L 500	U L 500	L	L		C					
21								C	C	C	C	C	C	C	C	C	C	C	C					
22								C	C	C	C	C	A	L	L	L	L							
23										L	L	L	L	L	460	A	440	L						
24										L	500	480	U L 490	480	470	L	L	L						
25										L	L	U L 500	480	U L 480	500	U L 470	L	L	L					
26										L	L	470	480	U L 500	U L 500	U L 460	L	L						
27										L	L	L	U L 500	U L 500	U L 490	L	L							
28										L	L	L	U L 500	L	U L 470	L	L	L						
29									L	L	L	U L 500	U L 460	U L 470	L 470	L	L	L						
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											4	19	24	18	23	12	5							
MED											470	U L 480	U L 490	U L 500	U L 490	U L 470	440							
UQ											485	U L 500	U L 500	U L 500	U L 500	U L 480	440							
LQ											U L 465	U L 480	U L 480	U L 490	L 480	L 465	440							

FEB. 1938 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

FEB. 1988 | FOE (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station OKINAWA Lat. 26° 16.9' N, Long. 127° 48.4' E Sweep 1 MHz to 25 MHz in 24 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									215	A	A	A	A	A	A	A	A	255	S						
2									195	250	290	A	A	A	330	A	300	A	S						
3									200	250	300	A	A	A	A	A	A	230	S						
4									210	A	300	320	330	A	A	A	A	230	S						
5									210	A	A	320	330	340	340	330	320	250	S						
6									295	A	A	340	A	A	335	330	A	A	A						
7									210	A	A	A	A	355	350	330	305	255	S						
8									215	265	295	310	A	A	A	340	300	255	S						
9									215	280	305	325	335	A	A	A	A	R 245	A						
10									R 210	A	A	A	A	345	A	A	A	A	S						
11									S	A	A	R 315	A	A	A	A	A	A	A						
12									210	270	310	320	330	340	A	A	A	A	S						
13									R 225	A	R 320	335	A	A	A	A	A	A	A						
14									220	270	310	320	330	330	A	A	290	A	A						
15									200	270	315	A	A	A	335	330	305	250	S						
16								S	220	265	305	325	330	A	A	A	300	R	S						
17								S	215	275	310	A	A	A	A	325	300	A	S						
18								S	215	280	310	325	A	A	A	A	A	A	S						
19								S	C	280	320	335	345	345	R 320	R 335	310	255	R 130						
20								S	215	A	A	A	U A 340	R 355	350	A	A	A	C						
21								C	C	C	C	C	C	C	C	C	C	C	C						
22								C	C	C	C	C	A	A	A	A	A	A	A						
23								S	A	A	A	A	A	A	A	A	A	A	A						
24								S	230	270	310	A	A	A	340	A	A	A	200						
25								S	230	270	320	325	330	340	350	330	A	A	S						
26								S	230	A	A	A	350	350	345	A	A	A	A						
27								S	220	A	320	330	335	R 340	R 340	A	A	A	A						
28								180	225	275	U A 310	A	A	R 345	340	320	R 285	265	S						
29								170	235	295	A	340	345	340	325	305	R 235	A	A						
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	24	15	17	15	12	12	13	10	11	10	2					
MED								175	215	270	310	325	332	342	340	330	300	252	190					
UQ									225	278	315	332	342	348	345	330	305	255						
LQ									210	268	305	320	330	340	335	325	295	245						

The Radio Research Laboratory, Japan

FEB. 1988 | FOE (0.01 MHZ)

IONOSPHERIC DATA

FEB. 1988 | FOES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station OKINAWA Lat. 26° 16.9 N, Long. 127° 48.4 E Sweep 1 MHz to 25 MHz in 24 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 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G 18	J A 33	34	J A 36	J A 39	J A 51	J A 43	J A 35	J A 32	G	J A 25	J A 18	22	E S 16	E S 16	E S 16
2	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	G	G	J A 43	J A 40	J A 37	G	34	32	J A 30	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
3	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G	J A 40	J A 38	J A 42	J A 40	J A 40	J A 30	G	E S 16	22	20	E S 16	E S 16	E S 16
4	E S 16	22	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	33	35	38	40	J A 36	35	34	J A 35	G	E S 16	J A 24	22	E S 16	J A 22	E S 16
5	E S 16	J A 25	J A 20	J A 20	J A 20	J A 20	E S 16	E S 16	G	25	J A 33	G	G	G	G	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	22
6	18	20	J A 19	E S 16	E S 16	E S 16	E S 16	E S 16	G	J A 34	36	38	J A 37	36	G	G	J A 31	J A 43	J A 23	J A 21	J A 17	E S 16	E S 16	20
7	23	E S 16	J A 22	18	E S 16	E S 16	20	E S 16	G	J A 34	J A 35	J A 50	J A 40	G	G	G	G	G	E S 16	J A 17	J A 25	21	E S 16	E S 16
8	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G	37	41	J A 39	J A 41	G	G	G	E S 16	J A 19	E S 16	22	J A 18	23
9	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G	34	J A 38	40	J A 41	J A 43	J A 34	G	J A 29	J A 24	23	E S 16	21	22
10	20	20	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	G	J A 31	J A 34	J A 35	J A 37	J A 75	J A 41	J A 36	J A 32	J A 29	E S 17	22	20	E S 16	E S 16	E S 16
11	E S 16	E S 16	E S 16	20	20	20	22	20	22	J A 32	J A 36	G	J A 36	J A 38	J A 53	J A 35	J A 34	J A 43	J A 40	J A 22	E S 16	E S 16	E S 16	J A 20
12	E S 16	E S 16	E S 16	E S 16	E S 16	20	E S 16	E S 16	G	G	G	36	33	40	38	J A 37	J A 35	J A 26	E S 16	E S 16	J A 20	22	J A 30	J A 22
13	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	G	J A 40	39	J A 41	J A 60	J A 64	J A 73	J A 34	J A 44	J A 34	J A 33	J A 23	E S 16	E S 16	E S 16	E S 16
14	20	E S 16	E S 16	E S 16	E S 16	E S 16	22	E S 16	G	G	36	38	42	40	J A 49	J A 40	G	J A 33	J A 28	J A 30	J A 26	22	E S 16	E S 16
15	22	J A 18	18	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G	37	37	J A 35	G	G	G	G	E S 16	E S 16	E S 16	E S 16	J A 25	J A 22
16	19	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	26	J A 34	34	36	38	36	36	35	G	G	J A 25	18	19	J A 25	J A 25	22
17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G	37	37	36	35	G	G	J A 29	J A 24	23	E S 16	21	E S 16	E S 16
18	20	J A 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G	38	J A 38	J A 41	J A 42	J A 40	J A 34	J A 30	J A 22	J A 22	20	J A 29	23	E S 16
19	23	E S 16	J A 22	E S 15	J A 26	J A 26	23	22	C	G	36	39	J A 46	J A 62	38	G	G	G	G	E S 16	22	C	C	E S 16
20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	E S 15	G	J A 35	J A 34	J A 34	40	40	44	J A 47	J A 38	J A 37	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	J A 48	J A 49	J A 54	J A 47	J A 43	J A 30	J A 21	E S 16	E S 16	23	J A 25	J A 33
23	J A 32	J A 24	J A 24	J A 22	J A 17	J A 20	17	18	J A 23	30	J A 54	J A 44	J A 77	J A 77	J A 76	J A 140	J A 65	J A 27	J A 33	J A 53	E S 16	E S 16	18	E S 16
24	E S 16	E S 16	E S 16	E S 16	J A 23	J A 28	J A 20	J A 18	G	G	33	38	J A 38	J A 44	G	34	J A 32	J A 27	24	J A 18	E S 16	J A 66	J A 33	J A 22
25	J A 25	J A 20	J A 24	E S 16	E S 16	J A 20	J A 17	22	26	G	33	38	40	40	40	38	J A 42	J A 33	22	J A 27	J A 33	J A 32	J A 32	21
26	J A 17	J A 23	E S 16	18	E S 16	J A 28	J A 23	J A 22	G 20	J A 30	J A 34	37	37	37	36	J A 36	35	J A 34	J A 30	J A 26	J A 21	20	J A 22	22
27	E S 16	22	22	22	J A 22	20	22	22	25	33	G	38	37	G	G	J A 41	38	J A 44	J A 35	J A 25	J A 21	E S 15	E S 16	E S 16
28	22	22	E S 16	E S 16	E S 15	E S 15	E S 15	G	G	G	38	J A 41	J A 47	40	41	39	31	G	E S 20	E S 15	E S 16	E S 16	E S 16	E S 16
29	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	G	G	G	J A 33	G	40	39	39	35	30	J A 28	20	J A 21	E S 16	J A 21	E S 16	E S 16
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	27	27	27	27	27	27	26	27	27	27	23	23	23	23	28	28	27	27	27	26	26	27
MED	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	34	38	J A 38	40	40	35	J A 32	J A 28	22	J A 21	19	E S 16	E S 16	E S 16
UQ	20	20	18	E S 16	E S 16	20	18	17	G J A 20	33	36	38	J A 40	J A 43	J A 43	J A 40	J A 35	J A 33	J A 26	J A 24	22	22	J A 23	22
LQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G	36	37	36	E G 35	E G 34	G	G	E S 16	16	E S 16	E S 16	E S 16	E S 16

FEB. 1988 | FOES (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | FBES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station OKINAWA Lat. 26° 16.9 N, Long. 127° 48.4 E Sweep 1 MHz to 25 MHz in 24 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	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G 16	27	33	35	37	36	35	34	30	G	G	ES 16	ES 16	ES 16	ES 16	ES 16
2	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	22	G	G	35	40	37	G	34	32	28	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
3	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	G	36	38	40	37	33	30	G	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
4	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	33	35	38	36	36	35	33	35	G	ES 16	20	ES 16	ES 16	20	ES 16
5	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	25	32	G	G	G	G	G	G	G	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
6	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	31	36	35	36	35	G	G	30	27	17	ES 16	ES 16	ES 16	ES 16	ES 16
7	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	31	32	35	38	G	G	G	G	G	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
8	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	G	37	39	37	35	G	G	G	ES 16	18	ES 16	ES 16	ES 16	ES 16
9	ES 16	ES 16	ES 15	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	G	34	38	37	36	33	30	G	21	21	ES 15	ES 16	ES 16	ES 16
10	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	ES 16	ES 16	G	31	33	35	37	38	36	33	31	20	ES 17	ES 16	ES 16	ES 16	ES 16	ES 16
11	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	22	30	32	G	35	38	42	35	32	43	30	20	ES 16	ES 16	ES 16	ES 16
12	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	G	36	38	40	36	35	30	26	ES 16	ES 16	18	ES 16	29	20
13	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	G	30	34	37	37	39	40	34	32	30	20	18	ES 16	ES 16	ES 16	ES 16
14	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	36	36	39	38	35	32	G	27	23	30	25	ES 16	ES 16	ES 16
15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	G	36	36	35	G	G	G	G	ES 16	ES 16	ES 16	ES 16	UA 25	UY 22
16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	26	31	34	36	38	36	36	35	G	G	19	ES 16	ES 16	UY 25	24	ES 16
17	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	G	36	37	36	35	G	G	27	16	ES 16	ES 16	ES 16	ES 16	ES 16
18	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	G	37	37	37	38	35	32	28	ES 15	ES 16	ES 16	29	ES 16	ES 16
19	ES 16	ES 16	20	ES 15	ES 16	20	ES 16	ES 16	C	G	36	38	41	57	37	G	G	G	G	ES 16	ES 16	C	C	ES 16
20	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	ES 15	G	33	31	34	40	37	43	42	34	34	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	48	43	45	41	43	27	18	ES 16	ES 16	ES 16	25	23
23	30	17	ES 16	ES 16	ES 16	ES 16	ES 16	18	23	28	35	40	45	47	40	30	36	27	23	50	ES 16	ES 16	ES 16	ES 16
24	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	17	G	G	33	36	36	38	G	34	32	27	22	ES 16	ES 16	25	ES 16	ES 16
25	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	17	26	G	33	37	37	38	40	38	41	32	22	22	33	27	25	ES 16
26	ES 16	18	ES 16	ES 16	ES 16	18	ES 16	17	G 18	30	34	37	37	37	36	36	35	32	25	26	ES 16	ES 16	ES 16	ES 16
27	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	25	31	G	38	37	G	G	36	36	34	26	ES 16	ES 16	ES 15	ES 16	ES 16
28	ES 16	ES 16	ES 16	ES 16	ES 15	ES 15	ES 15	G	G	G	36	40	38	37	33	35	30	G	ES 20	ES 15	ES 16	ES 16	ES 16	ES 16
29	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	ES 16	G	G	G	34	G	36	38	38	34	30	27	20	19	ES 16	ES 16	ES 16	ES 16
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	27	27	27	27	27	27	26	27	27	27	28	28	28	28	28	28	27	27	27	26	26	27
MED	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	33	36	37	37	36	34	30	27	16	ES 16	ES 16	ES 16	ES 16	ES 16
UQ	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G 18	30	34	37	38	38	38	35	33	28	22	20	ES 16	ES 16	ES 16	ES 16
LQ	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	G	G	35	36	36	EG 34	EG 32	G	G	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16

The Radio Research Laboratory, Japan

FEB. 1988 | FBES (0.1 MHZ)

IONOSPHERIC DATA

FEB. 1988 | FMIN (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station OKINAWA Lat. 26° 16.9' N, Long. 127° 48.4' E Sweep 1 MHz to 25 MHz in 24 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	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	15	14	16	16	18	13	18	16	17	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
2	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	15	16	16	18	16	16	15	17	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
3	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	15	15	16	21	22	18	18	17	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
4	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	ES 16	ES 16	16	16	15	16	18	17	17	16	16	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
5	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	15	16	14	16	25	23	19	18	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
6	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	17	18	23	16	17	18	16	16	16	ES 16	ES 16	ES 16	ES 16	ES 16
7	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	17	16	19	20	21	18	23	16	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
8	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	16	17	28	24	18	16	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
9	ES 16	ES 16	ES 15	ES 16	ES 16	ES 16	ES 16	ES 16	15	16	16	16	23	19	20	19	17	16	ES 15	ES 14	ES 15	ES 16	ES 16	ES 16
10	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	ES 16	ES 16	16	16	20	17	23	24	23	21	17	15	ES 17	ES 16	ES 16	ES 16	ES 16	ES 16
11	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	18	19	18	20	15	15	16	14	ES 16	ES 16	ES 16	ES 16	ES 16
12	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	ES 16	16	15	16	16	13	13	16	16	14	14	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
13	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	17	17	20	23	23	23	22	16	15	16	16	ES 16	ES 16	ES 16	ES 16	ES 16
14	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	19	27	27	23	20	25	16	16	15	14	ES 16	ES 16	ES 16	ES 16	ES 16
15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	15	16	16	21	24	19	16	16	17	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	15	16	17	19	21	21	17	16	15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
17	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	15	16	16	17	13	21	17	16	16	14	ES 15	ES 16	ES 16	ES 16	ES 16	ES 16
18	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	19	16	20	20	16	18	16	16	ES 15	ES 16	ES 16	ES 16	ES 16	ES 16
19	ES 16	ES 16	ES 16	ES 15	ES 16	ES 16	ES 16	ES 16	C	14	17	19	20	19	22	22	19	16	ES 16	ES 16	ES 16	C	C	ES 16
20	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	ES 15	15	16	16	17	17	20	24	17	17	15	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	22	22	18	17	16	16	16	ES 16	ES 16	ES 16	ES 16	ES 16
23	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	15	15	20	16	18	15	16	17	16	15	ES 16	ES 16	ES 16	ES 16	ES 16
24	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	16	16	17	15	26	17	16	16	ES 16	ES 16	ES 16	ES 16	ES 16
25	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	15	16	16	16	16	16	17	15	23	22	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
26	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	15	16	16	24	17	24	16	24	16	16	ES 16	ES 16	ES 16	ES 16	ES 16
27	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	ES 16	ES 16	16	17	21	26	24	27	23	32	20	18	16	ES 16	ES 16	ES 15	ES 16	ES 16
28	ES 16	ES 16	ES 16	ES 16	ES 15	ES 15	ES 15	ES 16	16	16	17	22	24	23	23	22	20	21	ES 20	ES 15	ES 16	ES 16	ES 16	ES 16
29	ES 16	ES 16	ES 16	ES 16	ES 16	ES 15	ES 16	ES 15	16	16	16	20	22	23	22	24	23	19	16	ES 15	ES 16	ES 16	ES 16	ES 16
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	27	27	27	27	27	27	26	27	27	27	23	28	23	28	28	28	27	27	27	26	26	27
MED	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	16	17	20	20	20	17	17	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
UQ	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	16	17	19	23	23	23	20	18	16	16	ES 16	ES 16	ES 16	ES 16	ES 16
LQ	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	16	15	16	16	18	18	17	16	16	16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16

FEB. 1988 | FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | M(3000)F2 (0.01) | 135° E Mean Time (G.M.T. + 9 h)

Station OKINAWA Lat. 26° 16.9' N · Long. 127° 48.4' E Sweep 1 MHz to 25 MHz in 24 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	270	300	335	365	360	325	300	300	350	360	345	325	320	320	320	340	340	325	335	325	305	320	355	300
2	325	305	295	305	340	365	345	330	345	340	345	330	315	305	320	330	325	340	345	340	290	300	300	S 310
3	315	310	320	330	330	335	345	310	345	355	340	310	320	310	305	305	R 300	U R 300	U R 330	295	S 280	310	S 285	S 290
4	275	305	U S 320	310	S 360	345	335	320	365	340	325	320	R 315	325	300	295	310	325	350	345	325	310	305	285
5	S 295	295	F	315	375	325	360	335	350	330	325	325	310	305	295	310	310	315	325	305	S 300	290	320	285
6	260	270	305	350	345	F	F	340	340	345	330	315	325	320	320	H 325	315	340	350	325	S	305	320	335
7	285	285	305	335	365	285	295	310	335	340	315	310	325	295	315	310	310	315	330	325	S 315	320	320	335
8	S 275	300	295	295	325	355	320	320	360	335	335	330	325	290	315	305	R 285	290	325	335	J S 340	S 270	310	295
9	S 265	S 325	300	300	310	335	340	320	350	345	350	320	325	295	300	305	305	R 310	315	350	345	300	320	320
10	S 280	300	310	285	310	320	290	320	350	340	350	315	315	310	300	R 310	R 305	R 305	320	320	345	300	325	S 285
11	S 280	330	S 350	355	375	S 300	320	315	330	335	355	330	305	325	R 320	R 315	310	R 305	R 320	320	S 335	S 310	335	320
12	285	305	340	335	315	340	320	330	335	325	345	335	320	315	U R 300	315	300	330	340	U S 290	305	U S 315	S 305	S 300
13	305	310	325	F 335	F 350	310	295	325	350	R 330	300	300	315	325	305	310	300	315	325	S 315	S 345	S 275	S 275	305
14	S 325	295	305	S 305	335	340	300	325	335	320	325	310	U R 310	320	305	R 315	305	330	R 330	U S 320	U S 285	U S 285	U S 290	U S 315
15	300	270	295	340	370	320	300	325	330	325	335	320	305	315	325	315	305	310	320	320	290	F	U S 330	295
16	265	310	280	305	320	375	270	295	325	325	330	305	305	310	300	290	315	315	340	320	310	290	310	285
17	F	275	315	365	295	300	310	315	325	325	290	315	330	R 280	315	320	330	315	R 335	380	S 245	S 270	295	S 315
18	330	335	295	275	295	340	380	335	350	305	325	305	320	300	300	295	230	285	320	327	315	S 315	S 310	310
19	335	285	S 275	290	325	335	S 310	325	C	340	330	335	325	295	280	295	R 310	R 315	R 315	C	310	C	C	F
20	F	290	S 315	325	305	360	335	325	355	355	340	330	325	315	325	320	340	H 325	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	315	285	335	330	320	305	R 320	310	320	320	S 325	315
23	F	F	F	F	F	F	F	F	F	F	F	J R 320	280	285	300	290	285	285	320	300	300	270	295	S 300
24	305	300	305	280	290	F	F	310	330	320	310	310	295	300	305	295	285	290	310	U S 310	U S 330	310	310	F
25	300	280	F	F	310	F	F	320	350	300	320	310	300	290	295	315	300	320	310	310	300	U S 315	F	F
26	U S 295	S 315	295	310	290	300	305	310	315	325	305	310	305	295	295	300	305	320	305	310	305	310	300	305
27	305	310	310	V 310	305	295	310	340	340	350	330	335	315	320	315	330	325	330	325	S 320	335	S 320	300	290
28	310	295	295	305	335	350	325	340	355	320	320	305	285	325	335	320	310	325	340	S 295	H 290	S 295	U S 265	295
29	290	290	S 290	340	S 335	S 355	F 315	320	345	345	305	305	325	330	330	340	325	335	345	S 340	315	S 290	S 275	U S 310
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	24	26	24	25	26	23	23	26	25	26	26	27	28	28	23	28	28	28	27	26	26	25	25	24
MED	295	300	305	310	328	335	315	320	345	335	330	315	315	310	305	312	310	315	325	320	310	305	310	302
UQ	308	310	318	335	350	348	335	330	350	345	340	328	325	320	320	320	318	325	338	327	330	315	320	315
LQ	278	290	295	305	310	315	300	315	335	325	320	310	305	295	300	302	300	305	320	310	300	290	295	292

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FEB. 1988 | M(3000)F2 (0.01)

IONOSPHERIC DATA

FEB. 1988 | M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station OKINAWA Lat. 26° 16.9' N, Long. 127° 48.4' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	U L 400	U L 365	U L 365	U L 355	L	L	L						
2									L	L	L	375	U L 405	360	375	390	L	L						
3										L	L	380	L 375	370	370	L 390	385	L						
4										L	380	375	370	370	U L 360	U L 370	L	L						
5										L	L	375	360	390	370	375	375	L						
6										L	L	L	L	L	L	L	L							
7										L	L	U L 345	U L 375	L	L	U L 355	U L 350	L						
8										L	L	L	U L 365	L	U L 345	L	L	L						
9										L	U L 370	U L 375	U L 375	U L 375	U L 360	U L 365	L	L						
10										L	L	U L 375	U L 375	U L 380	U L 365	L	L	L						
11										L	L	405	370	370	370	365	395	A						
12										L	L	U L 380	U L 370	L 375	385	380	L	L						
13										L	L	L	U L 375	L	L	L	L	L						
14										L	U L 395	U L 385	U L 380	385	385	U L 390	L	L						
15										L	L	L	U L 360	L	U L 355	L	L	L						
16										L	L	U L 355	U L 350	U L 350	U L 355	L	L	L						
17										L	L	U L 340	U L 360	L	U L 370	L	L	L						
18										L	L	L	L	U L 360	L	U L 345	L	L						
19									C		L	U L 385	L 370	A	U L 375	L	L	L						
20										L	L	U L 385	L 385	U L 370	U L 370	L	L		C					
21								C	C	C	C	C	C	C	C	C	C	C	C					
22								C	C	C	C	C	A	L	L	L	L							
23										L	L	L	L	L	405	A	385	L						
24										L	380	375	U L 385	375	370	L	L	L						
25										L	L	U L 380	375	370	375	U L 380	L	L	L					
26										L	L	380	375	U L 385	U L 375	U L 375	L	L						
27										L	L	L	U L 370	U L 370	U L 365	L	L							
28										L	L	L	U L 380	L	U L 395	L	L	L						
29									L	L	L	U L 360	U L 400	U L 395	L 395	L	L	L						
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											4	19	24	18	23	12	5							
MED											380	U L 375	U L 375	L 370	U L 370	U L 375	385							
UQ											388	U L 382	U L 378	L 380	375	385	385							
LQ											375	U L 375	U L 363	U L 370	U L 362	U L 365	375							

FEB. 1988 | M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | H'F2 (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station OKINAWA Lat. 26° 16.9 N Long. 127° 48.4 E Sweep 1 MHz to 25 MHz in 24 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										240	240	265	275	275	280	250	250	235						
2									220	240	260	260	270	290	270	260	250	240						
3										240	240	290	275	290	280	270	270	240						
4										260	270	275	270	255	290	270	260	230						
5										240	275	275	280	270	290	270	260	240						
6										265	275	260	275	275	280	255	L 260							
7										265	280	290	270	295	275	270	260	240						
8										L 250	280	275	270	300	285	250	235	270						
9										250	255	285	270	295	300	270	245	255						
10										250	250	285	280	290	270	230	250	240						
11										250	240	250	290	270	280	270	245	255						
12										260	250	265	280	285	280	275	260	245						
13										280	280	280	280	270	270	260	250	235						
14										250	280	270	280	260	275	275	265	250						
15										280	255	280	280	280	275	270	255	260						
16										270	255	250	280	265	270	265	245	240						
17										270	325	285	255	260	285	240	240	230						
18										L 305	280	285	275	280	285	230	265	245						
19									C		270	270	270	305	295	320	265	250						
20										240	255	270	280	285	270	270	245		C					
21								C	C	C	C	C	C	C	C	C	C	C	C					
22								C	C	C	C	C	300	300	255	255	255							
23										240	270	270	270	240	230	A	270	260						
24										230	280	265	280	255	240	240	240	265						
25										240	270	270	280	260	275	265	240	235	230					
26										240	270	220	265	270	280	260	255	240						
27										235	260	275	290	295	280	255	245							
28										250	280	235	295	270	270	265	255	250						
29									250	255	300	305	270	255	250	250	245	250						
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									2	26	27	27	23	29	28	27	28	24	1					
MED									235	250	270	275	278	275	278	265	252	242	230					
UQ										265	280	285	280	290	282	270	260	252						
LQ										240	255	265	270	262	270	255	245	240						

The Radio Research Laboratory, Japan

FEB. 1988 | H'F2 (KM)

IONOSPHERIC DATA

FEB. 1988 | H'F (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station OKINAWA Lat. 26° 16'.9 N, Long. 127° 48'.4 E Sweep 1 MHz to 25 MHz in 24 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	S 295	S 300	245	205	230	S	S	S 270	225	215	220	200	200	205	230	220	220	225	210	215	235	220	230	S 225
2	250	250	S 270	E S 280	250	210	S	250	190	200	H 190	200	190	190	200	H 230	220	230	210	200	200	250	210	S 240
3	260	270	260	260	240	230	S	E S 270	240	H 190	220	210	200	200	200	200	220	A	200	200	200	240	230	240
4	S 270	260	260	260	220	S	S	255	240	A 240	A 240	A 220	190	H 190	H 190	H 190	A 230	A	210	210	205	215	225	E S 290
5	E S 300	S	S	250	200	S	S	265	230	190	A 230	210	H 190	210	200	220	200	220	210	210	210	S 240	225	S
6	E S 355	S 315	265	225	S 235	Q 345	Q 310	230	230	245	230	225	H 195	H 190	220	245	205	245	225	200	S 255	250	235	230
7	E S 315	S 315	S 280	250	205	S	E S 300	260	240	240	A 200	205	A 200	H 190	H 135	210	210	225	215	220	200	210	240	215
8	S 235	275	S 275	S 295	250	230	S 280	255	220	230	215	205	210	195	195	210	210	H 200	230	200	205	S 205	240	240
9	255	250	260	S 285	270	230	245	245	230	210	210	200	220	200	200	220	205	205	245	205	200	215	230	220
10	250	270	275	S 320	S 280	225	S	250	230	230	220	210	205	205	215	205	220	205	230	230	220	200	215	S 270
11	S	E S 270	230	230	230	S	S	E S 230	235	H 210	H 200	H 200	H 190	H 190	A 220	190	A 225	A	225	230	200	230	215	220
12	S 240	240	220	220	S 240	S	S	255	240	H 210	210	210	A 220	210	200	200	210	A 220	220	210	215	200	240	255
13	235	215	235	250	S 260	S	S	250	225	220	220	205	205	200	A 250	215	210	A 235	220	210	200	205	230	230
14	225	260	230	S 260	S 260	220	S	265	240	240	A 220	A 220	A 220	A 220	200	190	H 190	A 240	220	220	215	225	220	225
15	S 240	S 275	S 270	230	205	S	S	250	215	230	225	220	215	H 195	200	H 235	225	225	215	220	255	Q 220	A 230	A 230
16	S 255	250	S 285	S 280	225	S 200	S	280	250	235	225	215	205	H 200	200	230	215	H 215	210	210	210	A 260	240	250
17	250	S 280	255	200	S	S	S	250	240	235	225	220	220	210	200	H 195	220	230	215	205	200	265	255	S 245
18	245	230	S 265	E S 330	E S 280	S 240	S 230	240	230	205	215	225	220	210	215	210	A	230	220	205	190	A 225	210	S 230
19	240	260	315	265	230	A 250	S 270	250	C	225	220	220	A 230	A	200	190	190	220	235	205	200	C	C	Q 220
20	250	250	235	230	245	215	215	245	230	210	200	200	200	200	A	A 250	210	220	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	A	A	A	A 240	230	235	235	230	215	255	270	310
23	A 230	225	Q 270	Q 260	Q 260	Q 260	Q 240	245	240	220	A 230	A	A	A	A 220	A	A	210	230	230	210	240	230	220
24	225	220	225	S	S	S	230	230	230	210	H 190	200	H 190	200	H 190	200	200	210	220	200	200	A 240	230	270
25	210	E S 310	S	245	240	S	E S 280	240	225	210	190	200	200	H 190	220	210	A	A 220	A 220	240	225	A 230	A	E S 280
26	240	240	230	220	E S 300	E A 290	270	240	240	220	210	210	H 200	210	210	215	215	A 230	240	230	220	200	220	235
27	255	275	305	305	280	310	295	205	220	220	200	220	205	200	205	200	A 225	250	235	205	225	200	S 240	S 285
28	280	300	290	265	235	205	S	230	230	225	220	210	205	200	200	200	205	220	220	200	215	210	220	250
29	270	285	275	245	230	200	S	245	200	230	215	215	200	200	210	205	215	215	225	220	205	230	S 285	280
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	26	25	26	25	16	12	27	26	27	27	26	26	25	26	27	25	25	27	27	27	26	25	26
MED	246	262	265	252	238	229	U 256	250	230	220	220	210	202	200	200	210	215	220	220	210	210	225	230	236
UQ	262	S 278	275	S 272	255	250	S 282	256	240	230	222	220	215	205	215	220	220	230	230	220	213	240	240	260
LQ	240	250	235	230	230	212	235	242	225	210	205	200	200	195	200	200	205	215	215	205	200	210	220	225

FEB. 1988 | H'F (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | H'E (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station OKINAWA Lat. 26° 16.9' N, Long. 127° 48.4' E Sweep 1 MHz to 25 MHz in 24 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									125	105	A	105	105	110	110	105	115	115	S					
2									110	110	110	110	A	A	110	110	110	A	S					
3									100	110	110	110	110	110	110	A	A	110	S					
4									110	110	110	110	110	A	110	110	110	110	S					
5									110	110	105	110	110	110	110	110	110	110	S					
6									115	110	105	105	105	105	H 105	H 110	A	A	A					
7									H 115	A	A	A	110	115	115	110	115	115	S					
8									120	110	110	105	105	B 115	B 115	105	105	115	S					
9									115	105	105	105	105	105	A	A	A	100	A					
10									115	110	105	105	105	105	110	A	A	A	S					
11									S	110	110	110	A	A	A	A	A	A	A					
12									110	110	110	110	110	110	110	A	A	A	S					
13									120	110	105	105	A	A	A	A	A	A	A					
14									110	110	110	110	110	110	A	A	110	A	A					
15									115	110	105	105	105	110	105	100	105	115	S					
16								S	120	110	105	105	105	105	105	105	110	105	S					
17								S	120	110	105	105	110	105	100	100	110	A	S					
18								S	120	115	110	110	110	110	110	110	110	A	S					
19								S	C	105	105	105	105	105	105	115	110	110	S 145					
20								S	105	105	A	A	105	105	105	105	A	A	C					
21								C	C	C	C	C	C	C	C	C	C	C	C					
22								C	C	C	C	C	105	A	A	A	A	A	A					
23								S	110	A	110	110	105	A	A	A	A	110	A					
24								S	110	110	110	105	105	105	105	115	105	A	105					
25								S	115	110	105	105	105	115	115	115	105	A	S					
26								S	115	A	A	A	110	110	110	A	110	A	A					
27								S	110	A	105	115	110	110	105	110	105	A	A					
28								S	105	105	A	A	A	105	105	105	110	115	S					
29								S	110	105	105	100	100	105	100	105	110	110	A					
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									25	23	22	23	24	22	22	18	18	13	2					
MED									115	110	105	105	105	110	110	110	110	110	125					
UQ									115	110	110	110	110	110	110	110	110	115						
LQ									110	108	105	105	105	105	105	105	105	110						

FEB. 1988 | H'E (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1988 | H'ES (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station OKINAWA Lat. 26° 16.9 N, Long. 127° 48.4 E Sweep 1 MHz to 25 MHz in 24 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	S	S	S	S	S	S	S	S	100	105	155	115	120	115	115	115	115	G	110	105	105	S	S	S
2	S	S	S	S	S	S	S	S	130	G	G	130	110	110	G	120	120	110	S	S	S	S	S	S
3	S	S	S	S	S	S	S	S	G	G	G	130	125	125	120	110	110	G	S	100	100	S	S	S
4	S	100	S	S	S	S	S	S	G	125	E G 165	160	150	160	120	115	115	G	S	110	100	S	100	S
5	S	110	100	100	100	100	S	S	G	115	120	G	G	G	G	G	G	G	S	S	S	S	S	100
6	100	100	100	S	S	S	S	S	G	115	G 155	120	110	105	G	G	100	100	100	105	95	S	S	105
7	95	S	135	110	S	S	100	S	G	110	110	105	115	G	G	G	G	G	S	145	105	105	S	S
8	S	S	S	S	S	S	S	S	G	G	G	145	120	115	115	G	G	G	S	125	S	100	95	100
9	S	S	S	S	S	S	S	S	G	G	G	E G 145	120	115	105	105	105	G	100	100	105	S	100	100
10	100	100	S	S	S	S	S	S	G	120	115	125	120	120	120	105	105	105	S	100	100	S	S	S
11	S	S	S	110	110	110	110	110	115	120	125	G	110	110	100	105	100	100	100	100	S	S	S	100
12	S	S	S	S	S	100	S	S	G	G	G	E G 140	130	125	120	110	110	110	S	S	105	110	100	105
13	S	S	S	S	S	S	S	S	G	125	120	120	110	110	110	105	100	100	105	105	S	S	S	S
14	100	S	S	S	S	S	100	S	G	G	135	135	120	120	110	110	G	110	110	100	100	100	S	S
15	100	100	100	S	S	S	S	S	G	G	G	135	105	115	G	G	G	G	S	S	S	S	105	105
16	100	S	S	S	S	S	S	S	160	110	E G 150	145	130	115	115	110	G	G	100	100	100	125	100	95
17	S	S	S	S	S	S	S	S	G	G	G	E G 155	135	115	115	G	G	95	95	95	S	105	S	S
18	100	100	S	S	S	S	S	S	G	G	G	135	120	110	115	115	110	105	105	105	100	120	115	S
19	105	S	100	S	105	100	100	105	C	G	150	150	130	115	115	G	G	G	G	S	100	C	C	S
20	S	S	S	S	S	S	S	S	G	110	105	105	155	150	120	115	105	105	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	115	105	105	105	105	110	110	S	S	115	115	115
23	110	110	110	110	110	110	110	110	120	G 145	120	120	110	110	110	100	100	115	105	100	S	S	110	S
24	S	S	S	S	100	105	100	100	G	G	120	120	120	115	G	120	120	110	155	100	S	110	100	110
25	110	110	110	S	S	100	110	100	E G 160	G	125	125	125	125	125	120	115	110	110	110	110	100	100	100
26	105	105	S	100	S	100	100	100	100	100	E G 160	E G 150	E G 140	135	130	125	125	120	110	110	110	100	100	100
27	S	100	100	100	100	100	100	110	145	160	G	150	150	G	G	115	110	105	105	105	100	S	S	S
28	100	100	S	S	S	S	S	G	G	G	150	105	135	145	125	120	120	G	S	S	S	S	S	S
29	S	S	S	S	S	S	S	G	G	G	115	G	125	120	110	115	115	110	105	105	S	100	S	S
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	11	8	6	6	9	9	7	8	13	18	24	27	25	21	21	20	17	16	20	15	12	12	12
MED	100	100	100	105	102	100	100	105	122	115	122	127	120	115	115	115	110	110	105	105	100	105	100	100
UQ	105	103	110	110	110	105	110	110	145	125	U 142	140	130	125	120	115	115	110	110	108	105	112	108	105
LQ	100	100	100	100	100	100	100	100	103	110	120	120	115	110	110	105	105	105	100	100	100	100	100	100

FEB. 1988 | H'ES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

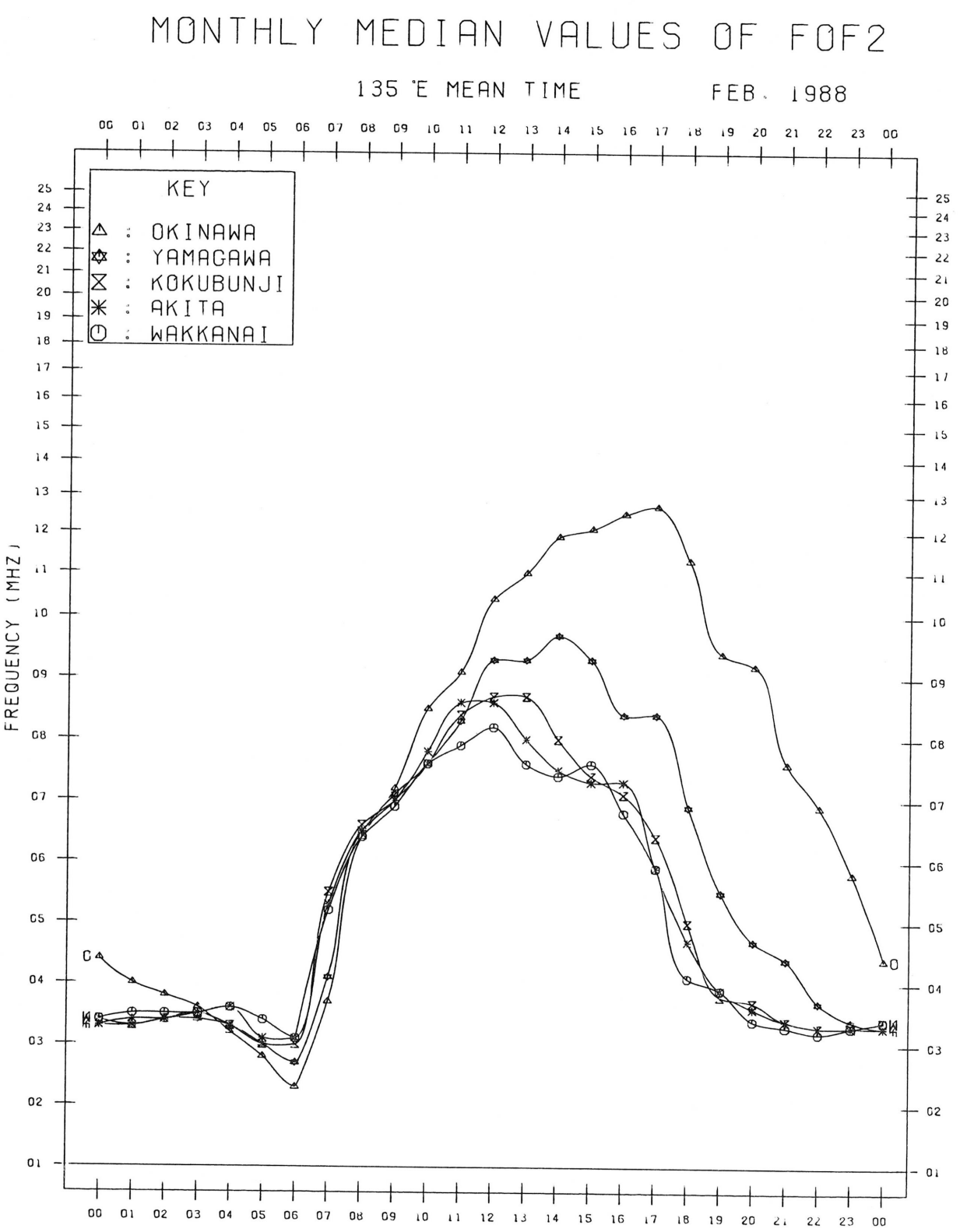
FEB. 1988 | TYPES OF ES | 135° E Mean Time (G.M.T. + 9 h)

Station OKINAWA Lat. 26° 16·9 N, Long. 127° 48·4 E Sweep 1 MHz to 25 MHz in 24 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 1	L 1	HL 11	C 2	C 1	C 1	C 1	C 2	C 1		L 1	F 2	F 1			
2									C 2			C 1	L 1	L 1		C 2	C 2	L 1						
3												C 1	C 1	C 2	C 1	L 2	L 1			F 2	F 1			
4		F 2								C 2	H 1	H 1	H 1	HL 11	C 2	C 2	C 2			F 3	F 1		F 3	
5		F 2	F 2	F 2	F 1	F 1				C 1	C 2													F 1
6	F 1	F 1	F 1							CH 11	HC 21	C 1	C 2	C 2			L 2	L 2	L 1	F 1	F 2			F 1
7	F 1		F 1	F 1			F 1			L 1	L 1	L 1	C 2							F 2	F 3	F 1		
8												H 1	C 2	C 2	C 1					FF 31		F 3	F 2	F 2
9												C 2	C 1	C 2	L 2	L 3	L 1		L 2	F 4	F 1		F 2	F 3
10	F 1	F 2								C 1	C 1	C 1	C 1	C 1	C 1	L 2	L 2	L 2		F 1	F 1			
11				F 1	F 1	F 1	F 1	F 1	C 2	C 1	C 1		L 2	L 2	L 3	L 2	L 2	L 2	L 3	F 2				F 2
12						F 1						H 1	H 1	C 1	C 1	L 1	L 1	L 3			F 1	F 1	F 3	F 2
13										C 1	C 2	C 2	L 1	L 2	L 2	L 2	L 3	L 3	L 1	F 2				
14	F 1						F 1				H 1	H 1	C 2	C 1	L 1	L 1		L 1	L 3	F 4	F 6	F 2		
15	F 3	F 2	F 1									HL 12	C 1	C 1									F 3	F 7
16	F 2								H 1	CH 12	H 1	H 2	C 1	C 1	C 1	C 1			L 2	F 2	F 1	FF 31	F 4	F 1
17												HC 12	HC 11	C 1	C 1			L 4	L 3	F 3		F 1		
18	F 1	F 1										H 1	C 1	C 1	C 1	C 2	C 2	L 1	L 1	F 3	F 1	FF 62	FF 31	
19	F 1		F 2		F 1	F 3	F 2	C 1			H 1	H 1	C 1	C 4	C 1						F 1			
20										C 2	L 2	L 2	HL 11	H 1	C 2	C 3	L 3	L 4						
21																								
22													C 2	L 2	L 3	L 3	L 4	L 1	L 1			F 3	F 6	F 6
23	F 7	F 3	F 4	F 4	F 2	F 4	F 1	L 1	C 1	HL 11	C 1	C 1	C 3	L 3	L 3	L 3	L 3	C 2	L 2	F 4			F 1	
24					F 1	F 2	F 2	L 1			C 1	C 2	C 1	C 1		C 1	C 1	L 1	H 1	F 1		F 7	F 6	F 2
25	F 3	F 1	F 2			F 2	F 2	L 1	HL 11		C 1	C 1	C 1	CL 11	CL 11	CL 11	C 2	L 1	L 1	F 4	F 3	F 5	F 4	F 1
26	F 4	F 2		F 1		F 4	F 3	L 2	L 2	L 2	HL 11	HL 11	H 1	C 1	C 1	CL 11	C 1	CL 11	L 2	F 5	F 4	F 1	F 1	F 1
27		F 2	F 4	F 3	F 2	F 1	F 2	C 1	H 1	HL 11		H 1	H 1			C 1	C 3	L 3	L 3	F 3	F 3			
28	F 2	F 2									HL 21	L 2	CL 11	H 1	C 1	C 1	C 1							
29											C 1		C 1	C 1	C 2	C 1	C 1	C 1	L 1	L 2		F 3		
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																								

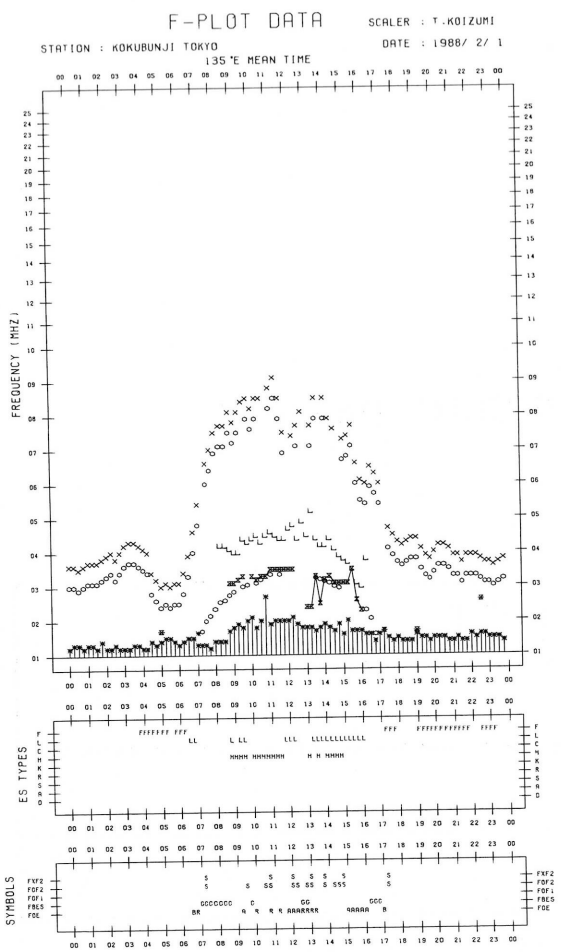
The Radio Research Laboratory, Japan

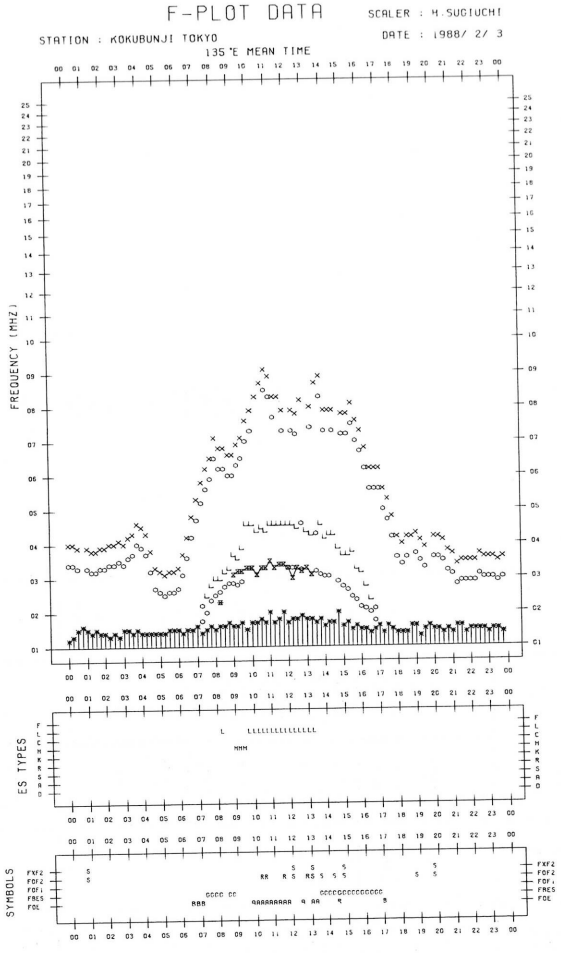
FEB. 1988 | TYPES OF ES

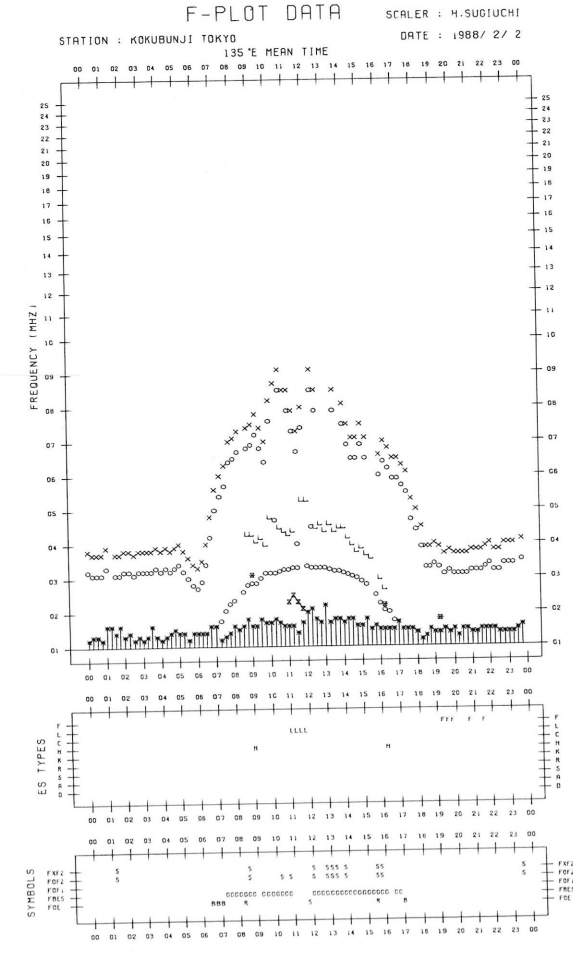

MONTHLY MEDIAN VALUES OF FOF2
135 °E MEAN TIME
FEB. 1988
KEY
OKINAWA
YAMAGAWA
KOKUBUNJI
AKITA
WAKKANAI
FREQUENCY (MHZ)
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 00
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

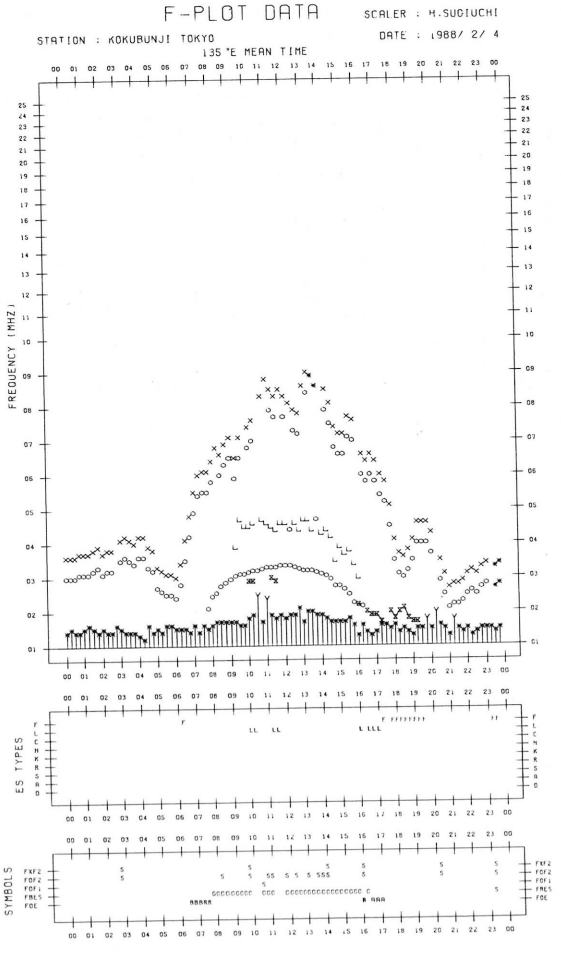
f-PLOTS OF IONOSPHERIC DATA

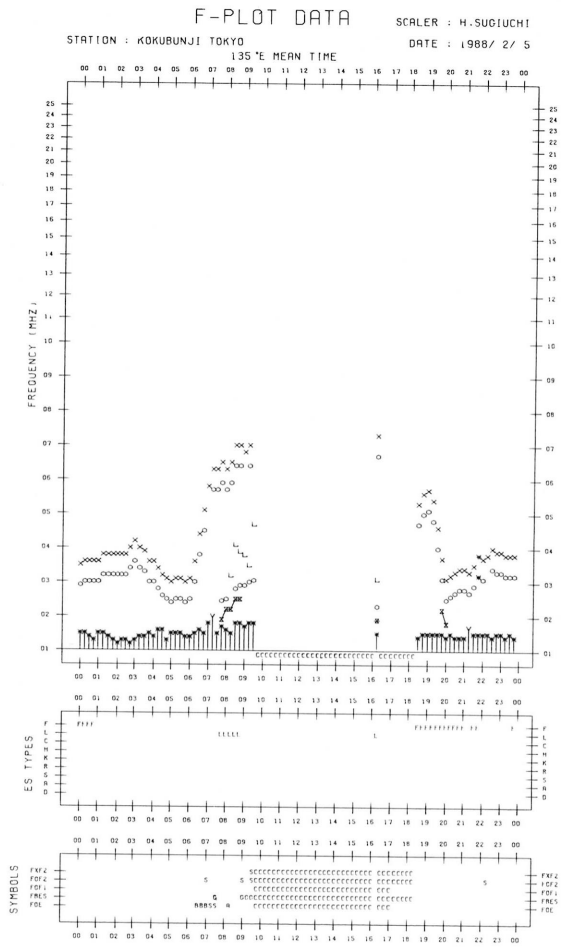
KEY OF F-PLOT	
!	SPREAD
○	FOF2, FOF1, FOE
×	FXF2
✳	DOUBTFUL FOF2, FOF1, FOE
⧖	FBES
L	ESTIMATED FOF1
⍑, Y	FMIN
∧	GREATER THAN
∨	LESS THAN

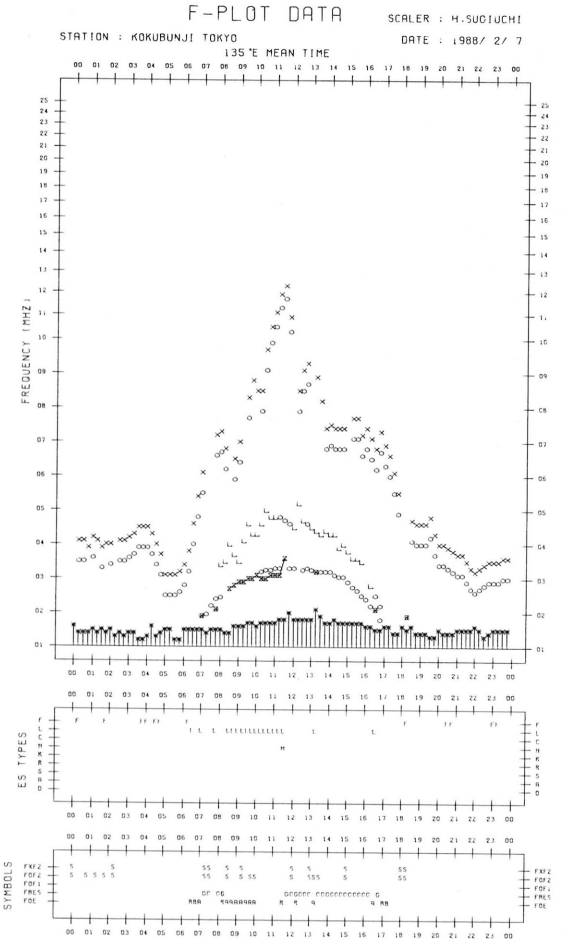

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/ 1
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

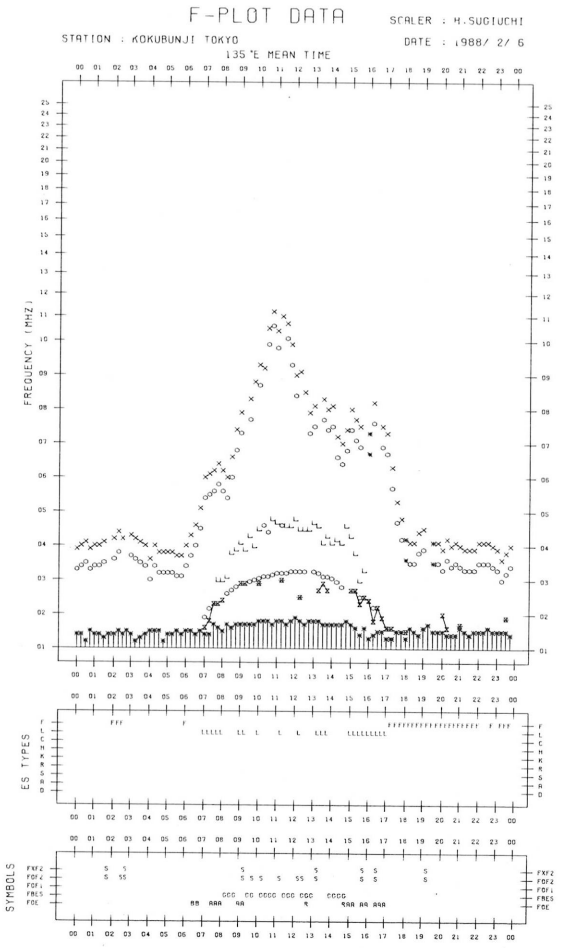

F-PLOT DATA
SCALER : M.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/ 3
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

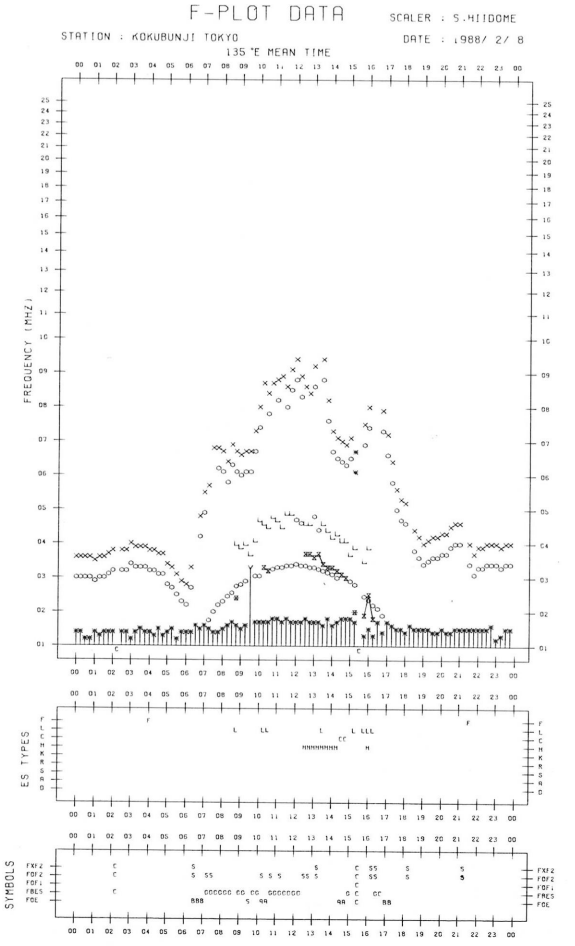

F-PLOT DATA
SCALER : M.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/ 2
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

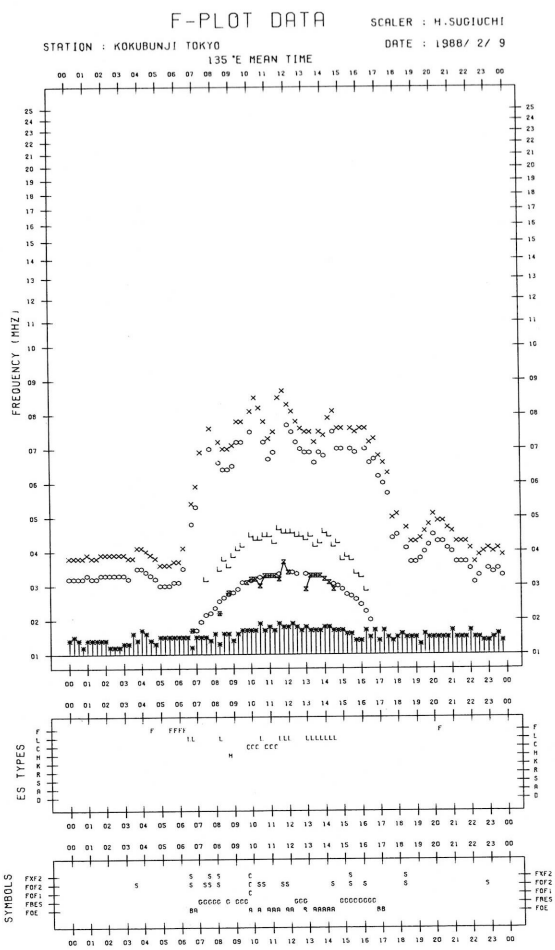

F-PLOT DATA
SCALER : M.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/ 4
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

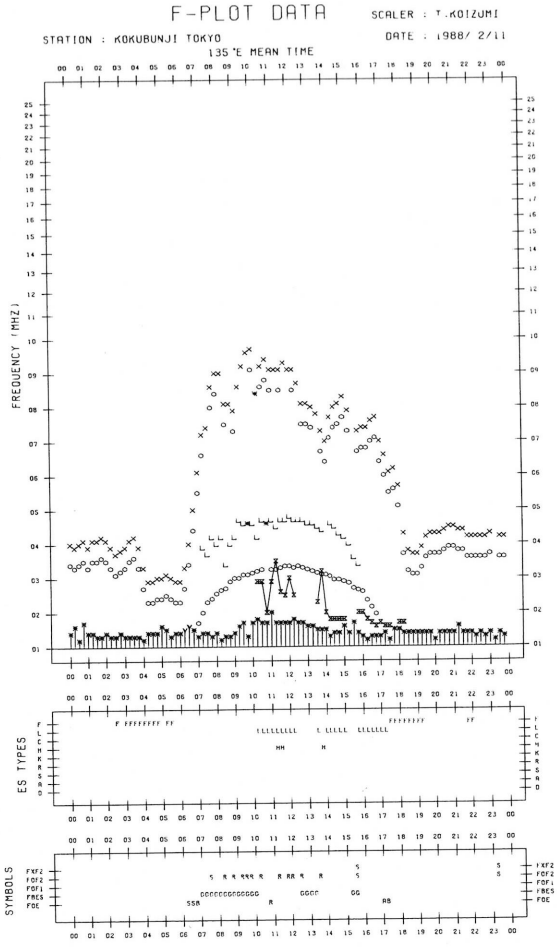

F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/ 5
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

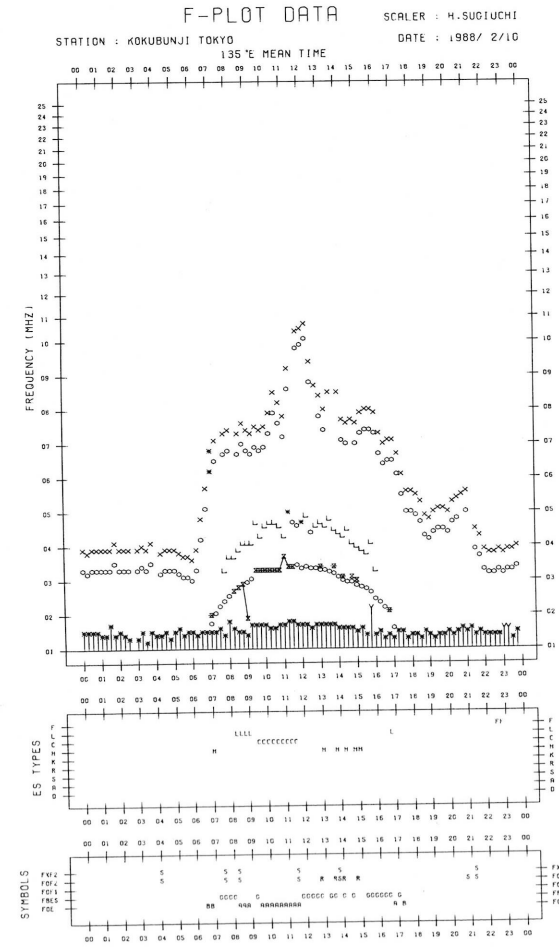

F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/ 7
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

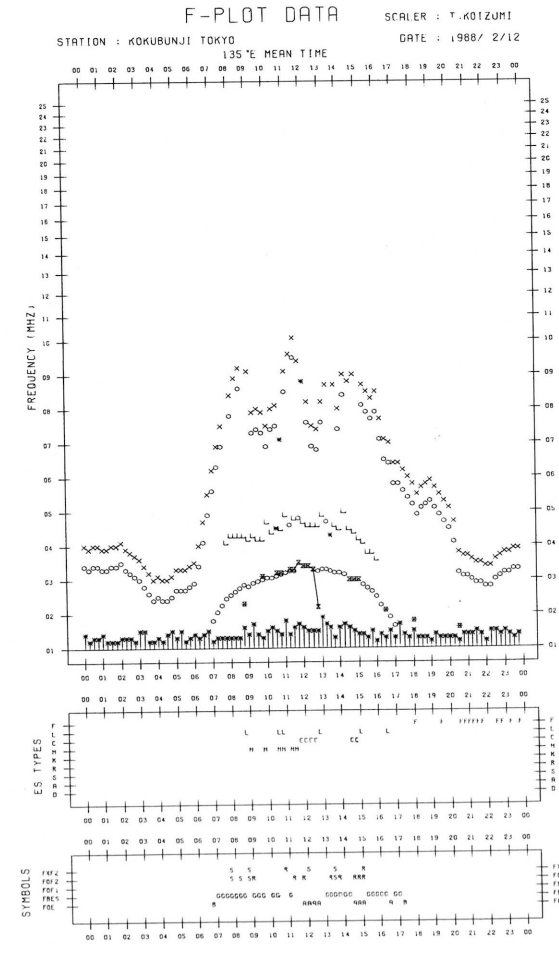

F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/ 6
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

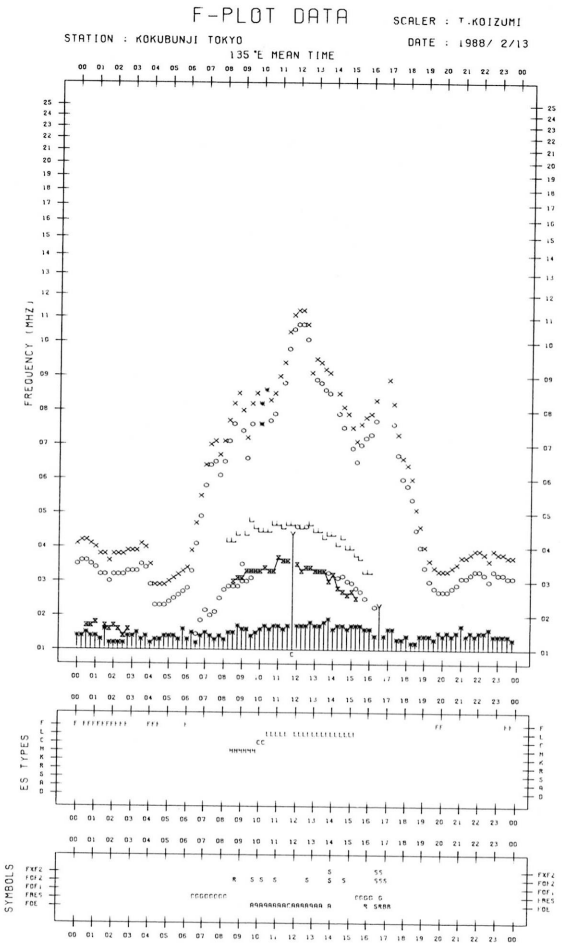

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/ 8
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

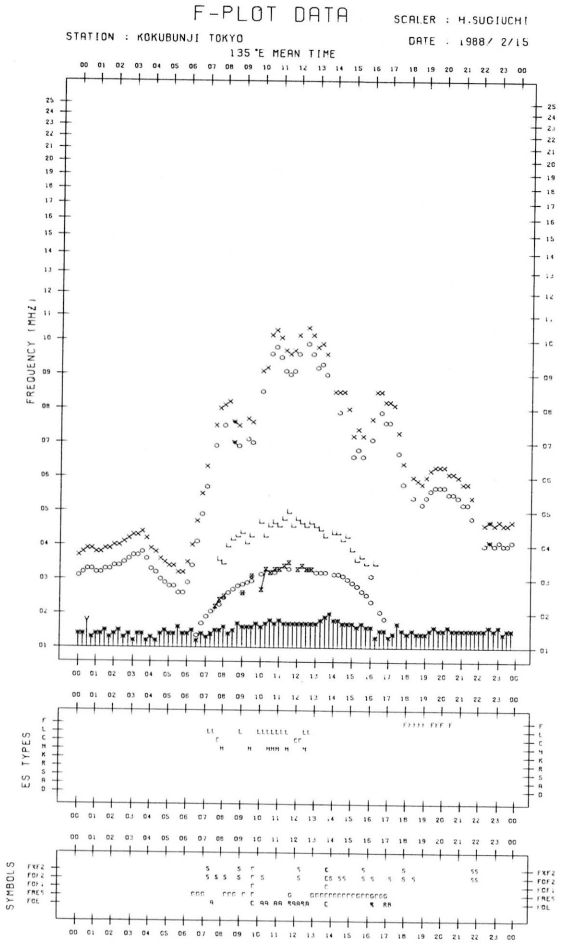

F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/ 9
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

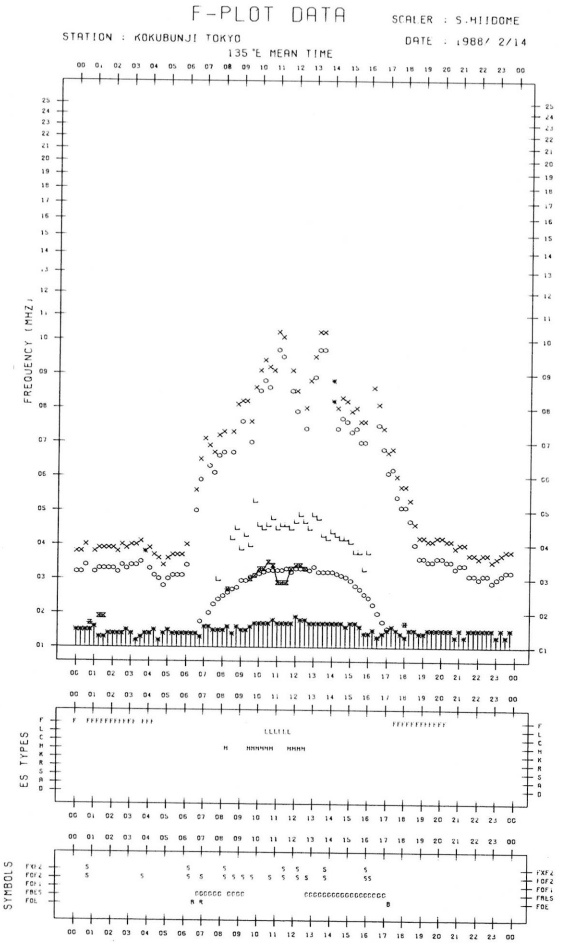

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/11
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

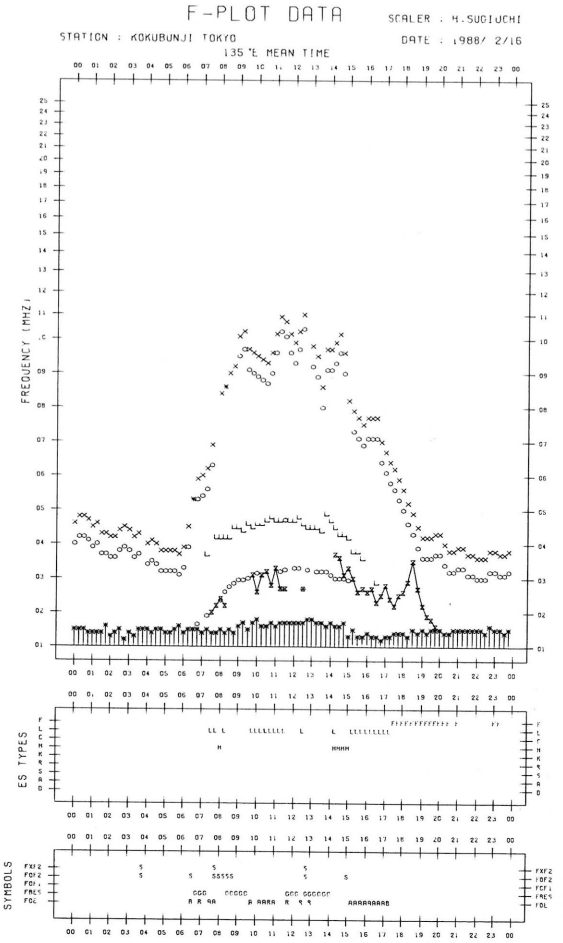

F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/10
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

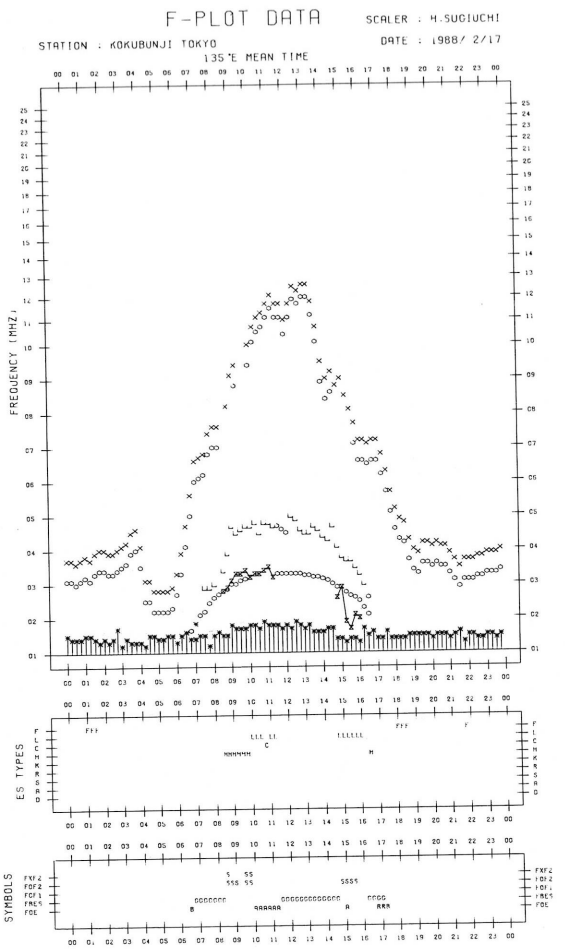

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/12
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

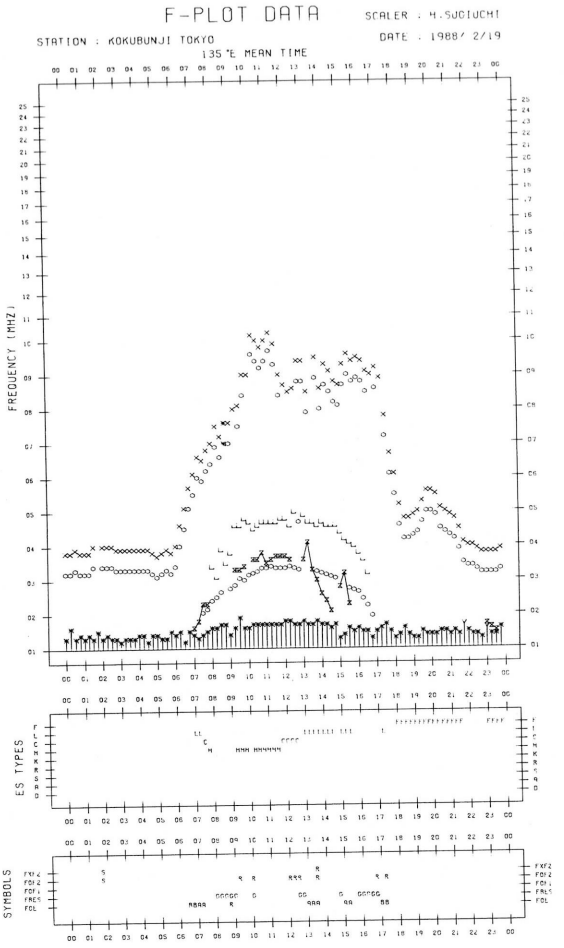

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/13
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

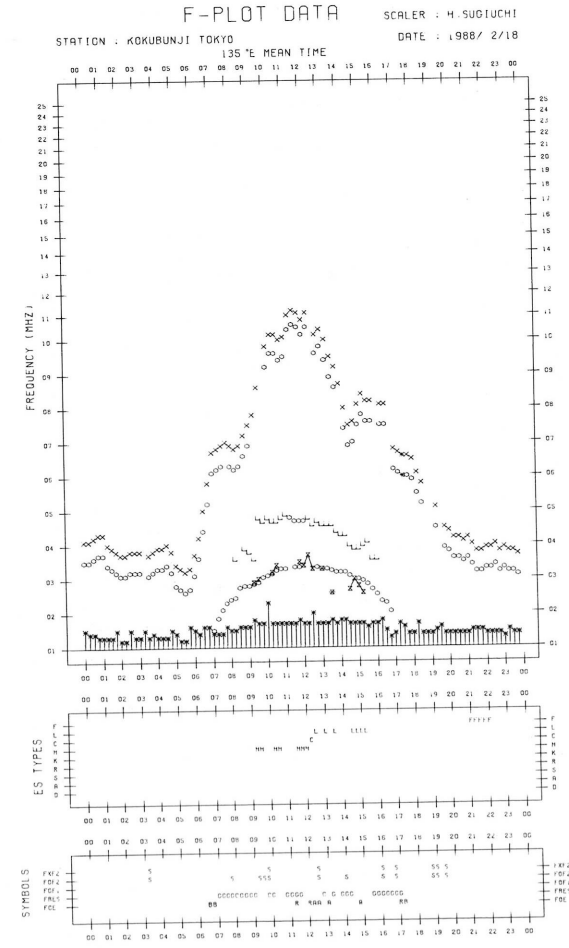

F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/15
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

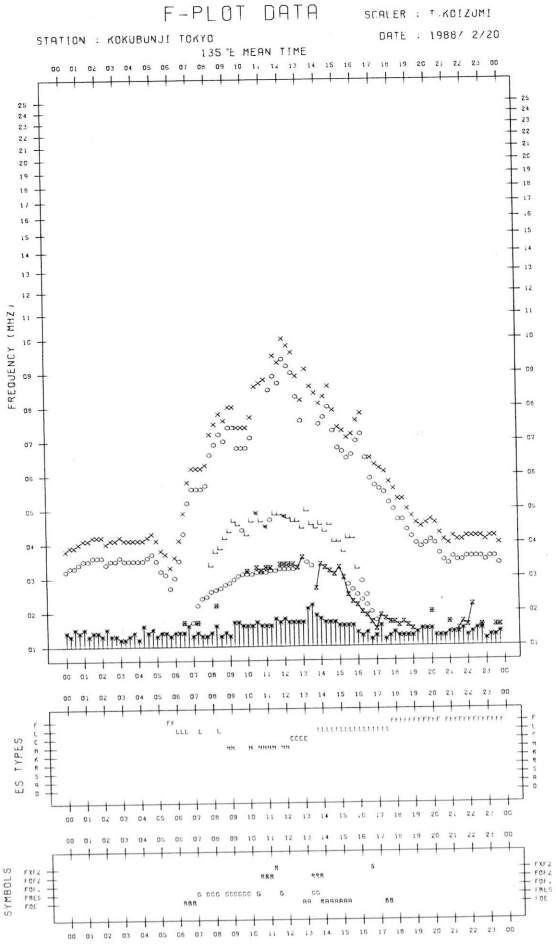

F-PLOT DATA
SCALER : S.MIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/14
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

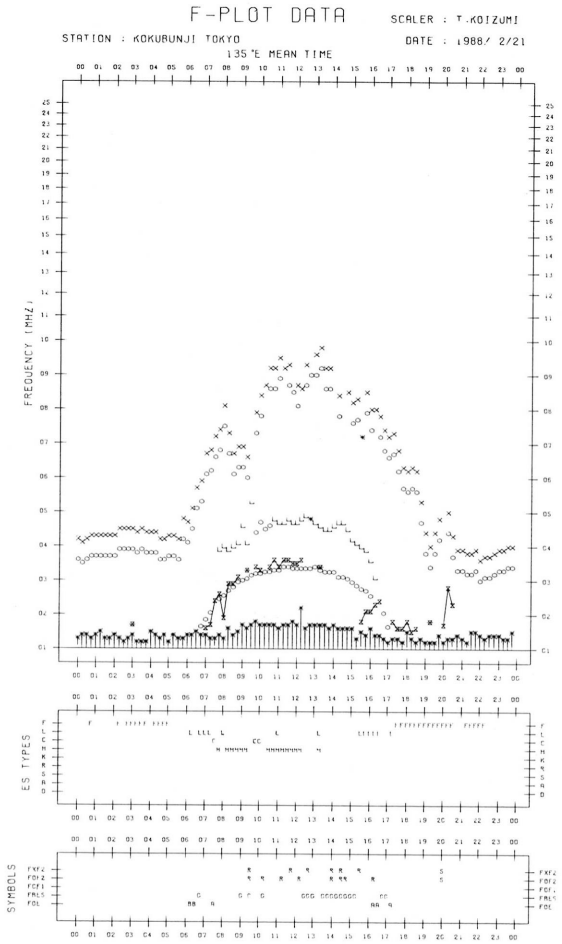

F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/16
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

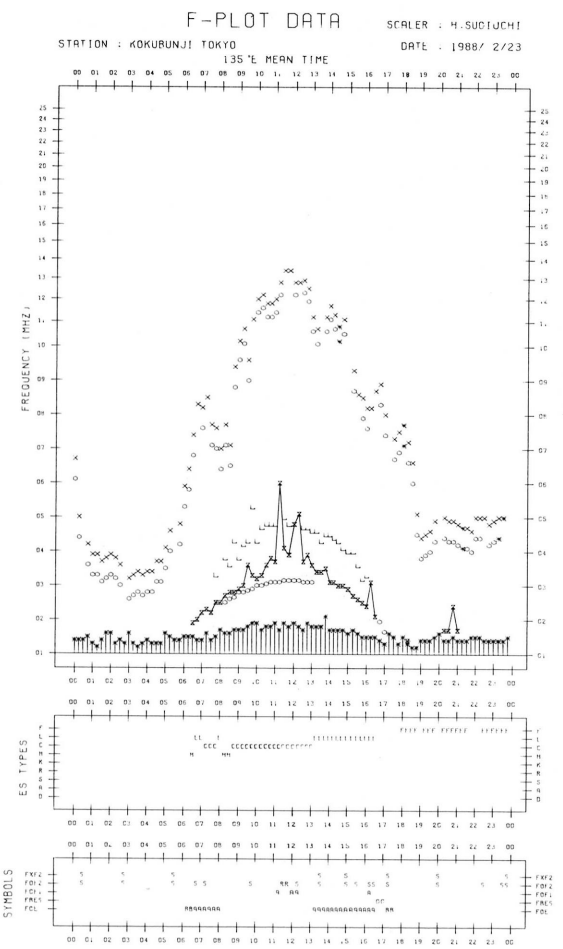

F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/17
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

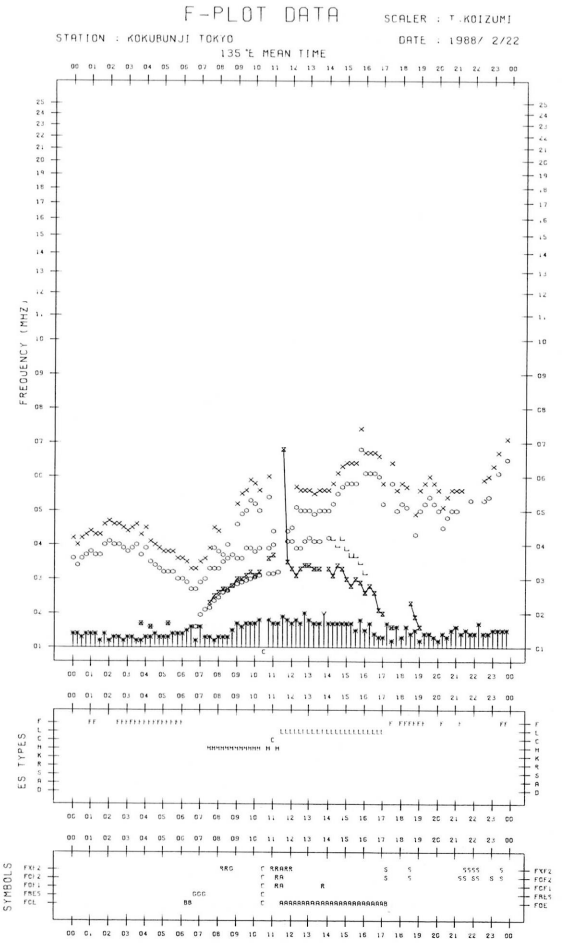

F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/19
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

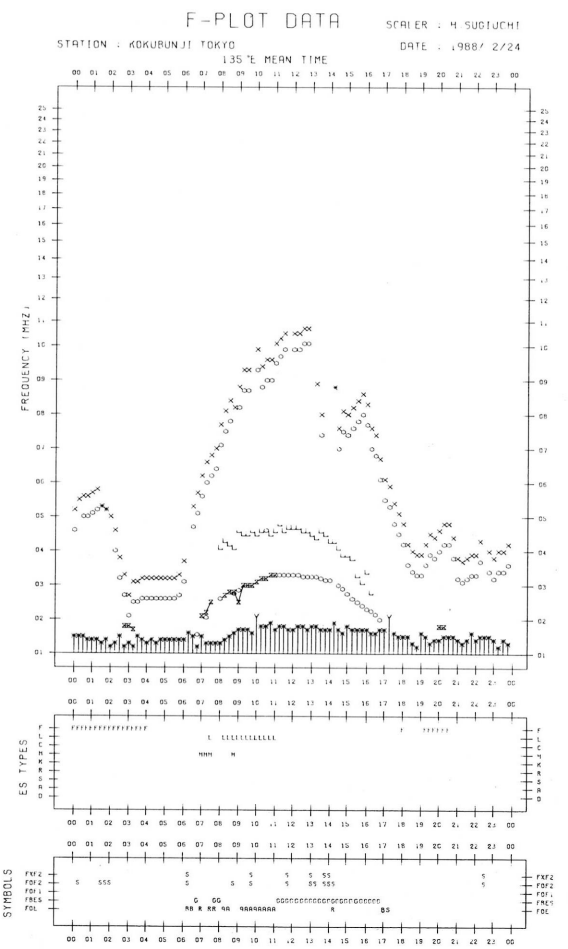

F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/18
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

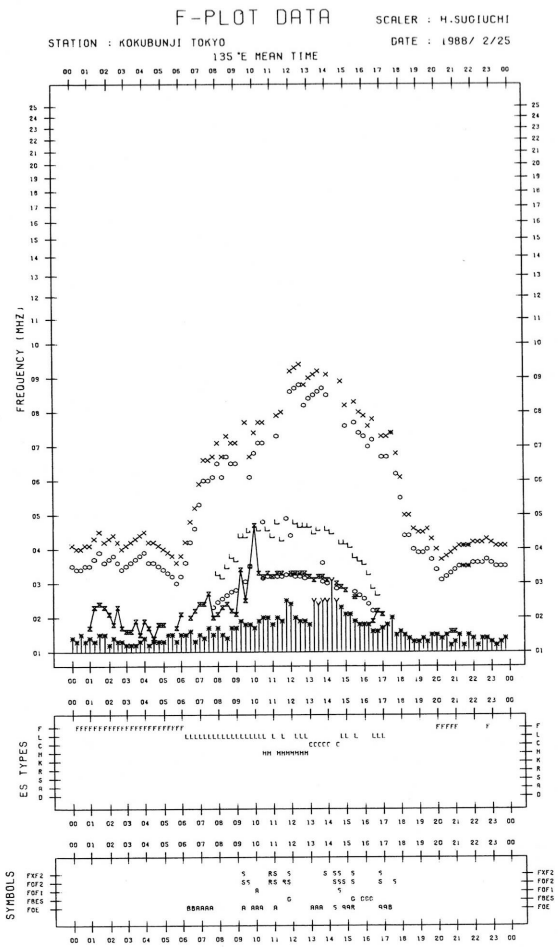

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/20
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

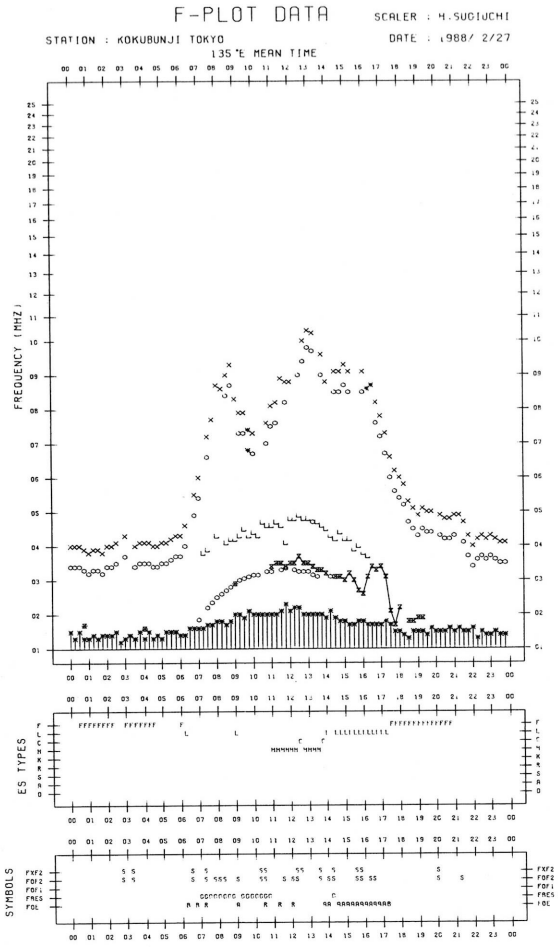

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/21
135 'E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

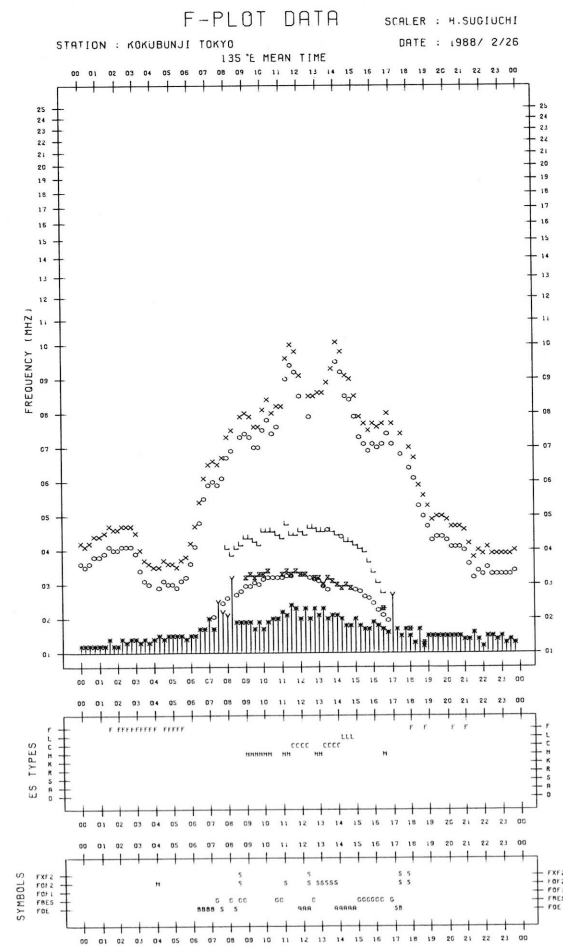

F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/23
135 'E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

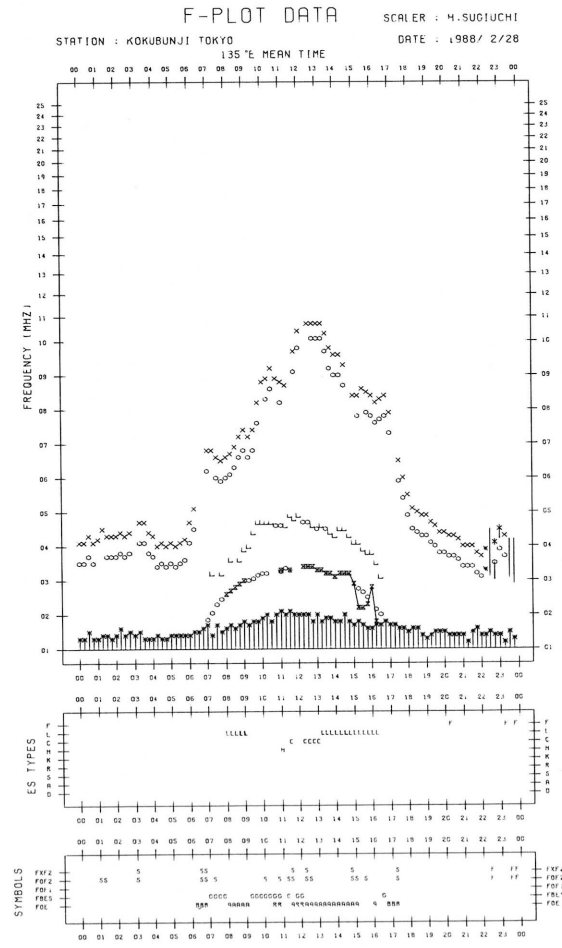

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/22
135 'E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

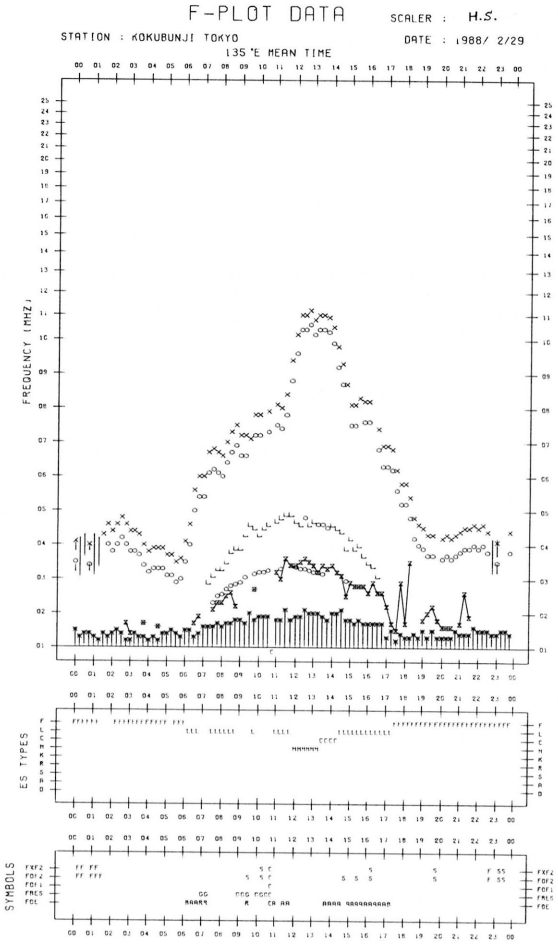

F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/24
135 'E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/25
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FMES
FOE


F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/27
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FMES
FOE


F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/26
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FMES
FOE


F-PLOT DATA
SCALER : H.SUGIUCHI
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/28
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FMES
FOE


F-PLOT DATA
SCALER : H.S.
STATION : KOKUBUNJI TOKYO
DATE : 1988/ 2/29
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FMES
FOE

B. Solar Radio Emission

a. Daily Data at Hiraiso

200 MHz

Hiraiso February 1988

Single-frequency total flux observations at 200 MHz										
	FLUX DENSITY: $10^{-22}Wm^{-2}Hz^{-1}$					VARIABILITY: 0 TO 3				
UT	00-03	03-06	06-09	21-24	DAY	00-03	03-06	06-09	21-24	DAY
DATE										
1	9	9	(9)	9	9	2	1	(1)	1	2
2	9	9	(9)	q	9	1	1	(2)	*	1
3	9	9	(9)	8	9	1	0	(1)	*	0
4	8	8	(8)	8	8	1	0	(*)	0	*
5	8	8	(8)	8	8	0	0	(0)	*	0
6	8	8	(8)	8	8	*	0	(*)	*	*
7	8	8	(8)	8	8	0	0	(0)	0	0
8	8	8	(8)	8	8	0	0	(0)	0	0
9	8	8	(8)	8	8	0	0	(0)	0	0
10	q	q	(q)	8	q	*	*	(*)	*	*
11	8	8	(8)	8	8	0	0	(0)	0	0
12	8	8	(8)	8	8	0	0	(0)	0	0
13	9	9	(9)	9	9	0	0	(0)	0	0
14	9	9	(9)	9	9	0	0	(0)	0	0
15	9	9	(9)	9	9	*	0	(0)	0	0
16	9	9	(9)	9	9	*	*	(*)	0	*
17	9	9	(9)	9	9	*	*	(*)	0	*
18	9	9	8	9	9	*	*	*	0	*
19	9	9	9	9	9	*	*	0	1	0
20	9	9	9	9	9	1	2	1	2	1
21	9	9	9	9	9	1	0	0	0	1
22	8	8	8	8	8	0	0	0	0	0
23	8	9	9	8	9	0	2	1	0	1
24	8	8	8	8	8	0	0	0	0	0
25	8	8	8	8	8	*	0	0	0	0
26	8	8	8	8	8	0	0	0	0	0
27	8	8	8	8	8	0	0	0	0	0
28	8	8	8	9	8	0	0	0	1	0
29	9	9	9	9	9	1	1	2	2	1

1. (q) likely quiet.
2. (*) interference.

B. SOlar Radio Emission

a. Daily Data at Hiraiso

500 MHz

Hiraiso February 1988

Single-frequency total flux observations at 500 MHz					
FLUX DENSITY: $10^{-22}Wm^{-2}Hz^{-1}$					
UT	00-03	03-06	06-09	21-24	DAY
DATE					
1	38	38	(37)	-	37
2	37	37	(37)	35	37
3	36	36	(36)	37	36
4	37	38	(38)	35	38
5	37	37	(37)	36	37
6	36	36	(36)	36	36
7	36	36	(36)	35	36
8	37	37	(36)	35	36
9	36	37	(37)	36	36
10	38	38	(37)	36	37
11	37	38	(37)	35	37
12	36	36	(37)	37	36
13	37	38	(37)	36	37
14	37	37	(36)	36	36
15	37	37	(37)	36	37
16	37	37	(36)	35	36
17	37	37	(36)	37	36
18	37	37	36	38	37
19	39	39	38	37	38
20	38	37	36	36	37
21	37	36	36	36	36
22	37	37	35	34	36
23	37	37	37	35	36
24	36	36	35	36	35
25	36	36	35	34	36
26	36	35	35	-	35
27	35	34	34	34	34
28	35	34	34	34	34
29	36	36	36	36	35

Note: No observations during the following periods.

1st 2140 - 2353
26th 2135 - 27th 0009

B. Solar Radio Emission

b. Outstanding Occurrences at Hiraiso

Hiraiso February 1988

Single-frequency observations

Normal observing period: 2130 - 0820 U.T. (sunrise to sunset)

FEB 1988	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1}) MEAN	POLARIZATION REMARKS
1	100	46 C	0048.2	0049.5	2.1	920	340	-
	200	46 C	0048.3	0048.6	1.2	710	205	0
	200	42 SER	0228.0	0229.2	4.6	110	-	WR
	100	42 SER	0228.8	0229.7	2.6	630	-	-
	500	41 F	0255.5	0257.0	3.0	27	-	0
	200	42 SER	0519.8	0542.2	24	1300	-	0
	100	42 SER	0534.0	0542.2	10.6	1000D	-	-
	200	44 NS	2140E	0653	580D	10	2	MR
18	200	24 R	2200	0137	680D	5	2	WR
19	200	44 NS	2124E	0120	650D	25	4	MR
20	500	46 C	0403.8	0409.0	59	153	37	ML
	200	46 C	0405.3	0411.9	36	170	31	0
	100	48 C	0406.6	-	42	1000D	130D	-
	500	42 SER	0503.5	0515.0	16.5	7	-	0
	500	27 RF	0558.5	0609.5	20	5	2	0
	200	44 NS	2124E	0145	330D	14	2	MR
21	200	8 S	2320.5	2320.8	0.8	56	-	0
22	500	27 RF	0019	0117	200	6	3	0
	500	42 SER	2354	0019.4	69	61	-	0
23	500	27 RF	0234	0253	52	5	3	0
	200	43 NS	0254	0430	182	7	2	0
	500	27 RF	0329	0358	98	9	4	0
	500	24 R	0653	0728	70D	8	2	0 SUNSET
24	500	27 RF	0006	0216	275	6	3	0
	200	46 C	0348.8	0405.9	48	45	2	MR
				0414.5		21		MR
	500	24 R	2135E	2223	80D	7	3	0 SUNRISE
25	500	27 RF	0033	0119	93	6	2	0
	500	42 SER	0325	0330	138	6	-	0
26	500	46 C	0404.8	0408.1	13	5	1	0
28	200	43 NS	2330	0700	540D	12	5	WR
29	100	43 NS	0130	0218	170	4	1	-
	200	44 NS	2109E	0600	680D	29	7	MR

RADIO PROPAGATION

MEASUREMENT OF H.F. FIELD STRENGTH (UPPER SIDE-BAND OF WWV)

FEB 1988 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

UT DAY	00H 15M	01H 15M	02H 15M	03H 15M	04H 15M	05H 15M	06H 15M	07H 15M	08H 15M	09H 15M	10H 15M	11H 15M	12H 15M	13H 15M	14H 15M	15H 15M	16H 15M	17H 15M	18H 15M	19H 15M	20H 15M	21H 15M	22H 15M	23H 15M
1	-1	ES -2	ES -3	-4	ES -3	ES -2	0	ES -4	ES -15	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	-4	ES -24	ES -24	-3	-3
2	2	2	UC -4	ES -7	ES -3	ES 1	ES 1	ES -3	ES 3	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -26	-4	-5	2
3	1	-1	ES -11	ES -7	ES -5	ES -6	ES -1	ES -7	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	6	-1	ES -25	-5	2	6
4	ES -26	ES -26	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -26	ES -26	ES -26	ES -26	-5	7	2
5	10	9	7	5	ES -19	ES -19	ES -19	1	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	3	9	5
6	-1	9	ES -23	ES -23	ES -23	ES -23	ES -6	ES -6	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	2	4	2
7	6	6	5	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	-3	3	6
8	8	3	ES 0	ES -5	ES -23	ES -23	ES -23	ES 0	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	6	3	-5
9	3	10	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	2	6	4
10	7	7	5	ES -5	ES -23	ES -23	ES -23	ES 3	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	0	9	7	5
11	5	1	-1	ES -23	ES -23	ES -23	ES -6	1	3	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	0	12	4
12	3	9	10	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	1	3	5
13	5	9	7	ES -3	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	3	6	9
14	3	8	-4	ES 3	ES -8	ES -8	ES -14	ES -8	ES -8	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	5	7
15	10	6	ES -21	3	ES -21	ES -21	ES -21	ES -21	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	-3	-1	14	2
16	2	ES -6	ES -24	ES -24	ES -24	ES -24	ES -3	ES -3	ES -3	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	0	0	5
17	4	2	ES 2	ES -3	ES 2	ES -3	ES -9	ES -9	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	1	4	2
18	5	9	ES 1	ES -6	ES -9	ES -24	ES -24	ES -3	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	3	2	1
19	2	0	ES -6	ES 2	ES -1	ES -6	ES 2	ES -3	ES -3	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	3	2
20	4	4	8	ES -15	ES -24	ES -24	ES -24	ES -3	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	3	0	0	9
21	ES 2	0	ES -6	ES -24	ES -24	ES -24	ES -9	C	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24
22	ES -24	ES -24	ES -24	ES -24	C	C	C	C	C	C	C	C	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24
23	ES -24	ES -9	ES -9	ES -3	ES 2	ES 4	ES -3	ES -3	ES -3	ES -3	ES -3	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24
24	ES -24	ES 2	ES -9	0	ES -3	ES 0	ES -3	2	ES -3	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24
25	ES -24	ES -6	ES -9	ES -9	ES -9	ES -9	ES -5	ES -6	ES -9	ES -24	ES -24	ES -24	ES -21	ES -21	ES -21	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20
26	ES 2	ES 6	ES 8	ES 8	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	4	ES -19
27	1	3	ES -19	ES 1	ES -21	ES -21	ES -21	ES -21	ES -8	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	-3	1	-8	-8	-14	-4	-5
28	-4	-3	ES -5	ES -4	-2	ES -4	ES 3	5	ES 3	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	14	6	6
29	7	3	ES -3	-3	ES -3	ES -1	ES -1	ES -1	ES -1	ES -1	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	1	4	-3

CNT	29	29	29	29	28	28	28	27	28	28	28	28	29	29	29	29	29	29	29	29	29	29	29	29
MED	2	US 3	ES -4	ES -5	ES -20	ES -21	ES -12	ES -4	ES -20	ES -23	ES -23	ES -24	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	-1	3	2
UD	8	9	ES 8	ES 3	ES -1	ES 0	ES 1	ES 2	ES 3	ES -19	ES -19	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -19	ES -19	-8	-3	6	9	7
LD	ES -24	ES -9	ES -24	ES -24	ES -24	ES -24	ES -24	ES -23	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -25	ES -24	ES -24	ES -24

RADIO PROPAGATION

MEASUREMENT OF H.F. FIELD STRENGTH (UPPER SIDE-BAND OF WWVH)

FEB 1988 FREQUENCY 15 MHZ BANDWIDTH 20 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

UT DAY	00H 45M	01H 45M	02H 45M	03H 45M	04H 45M	05H 45M	06H 45M	07H 45M	08H 45M	09H 45M	10H 45M	11H 45M	12H 45M	13H 45M	14H 45M	15H 45M	16H 45M	17H 45M	18H 45M	19H 45M	20H 45M	21H 45M	22H 45M	23H 45M
1	12	10	14	16	22	17	ES -3	ES -4	-7	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	9	19	16	13
2	16	15	21	19	UC 20	21	4	ES -3	ES -9	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	10	15	12	12
3	12	12	16	20	24	24	0	-7	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	8	17	18	12
4	15	17	18	16	25	22	0	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -26	ES -26	ES -26	7	13	13	7
5	15	17	17	19	16	19	28	19	3	14	1	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	19	20	14	11
6	20	19	25	17	23	17	ES -6	8	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	14	8	22	8
7	19	17	22	21	22	12	4	0	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	17	22	16	16
8	14	18	18	19	24	23	ES 0	-5	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	16	21	19	15
9	10	14	15	16	25	25	3	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	18	15	14	17
10	16	18	19	20	23	22	2	ES 3	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	13	15	19	10	13
11	12	14	17	17	19	19	23	8	ES -1	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	9	14	15	9
12	12	10	23	15	17	30	8	-3	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	14	16	15	16
13	18	16	20	22	22	31	25	3	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	18	19	16	13
14	13	13	16	16	22	21	2	ES -8	ES -8	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	20	15	17	9
15	13	19	20	18	24	24	2	4	ES -22	ES -22	-1	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	9	16	13	16
16	11	4	13	21	26	18	ES -3	ES -3	ES -3	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	0	13	16	17
17	12	13	18	19	24	20	ES -9	ES -9	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	11	21	14	14
18	14	14	16	21	22	25	22	ES -5	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	13	14	13	9
19	9	15	13	18	23	28	27	ES -3	ES -3	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	13	18	10	13
20	9	13	15	20	17	14	ES -24	ES -3	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	3	11	14	13	13
21	11	15	19	16	18	UC 19	UC 10	C	-6	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	0	-6	9
22	3	14	15	21	C	C	C	C	C	C	C	C	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	2	20	31	20	20
23	19	19	14	12	16	ES -3	ES -3	ES -3	ES -3	ES -3	ES -3	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	14	12	11	14	20
24	18	21	20	25	30	22	12	ES 4	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	10	14	25	12
25	6	-1	10	14	18	13	ES -6	3	ES -24	ES -24	ES -24	ES -24	ES -21	ES -21	ES -21	ES -20	ES -20	ES -20	ES -20	ES -20	11	13	15	13
26	ES 23	ES 19	26	29	28	30	26	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	ES -19	7	8	8	15
27	18	14	11	22	28	28	22	2	ES -8	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	4	15	9	11
28	12	15	18	18	18	UC 18	26	6	ES 8	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	3	6	ES -20	16	23	16	21
29	8	7	18	18	15	25	20	ES -1	ES -1	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	6	8	9	4
CNT	29	29	29	29	28	28	28	27	28	28	28	28	29	29	29	29	29	29	29	29	29	29	29	29
MED	US 13	US 15	18	19	22	22	4	ES -3	ES -22	ES -23	ES -23	ES -24	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	11	15	14	13
UD	ES 19	19	23	22	28	30	26	8	ES -1	ES -19	ES -3	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -19	ES -19	3	19	22	20	20
LD	ES 8	ES 7	13	15	16	13	ES -6	ES -19	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	4	8	9	8

C. Radio Propagation

b. Radio Propagation Quality Figures at Hiraiso

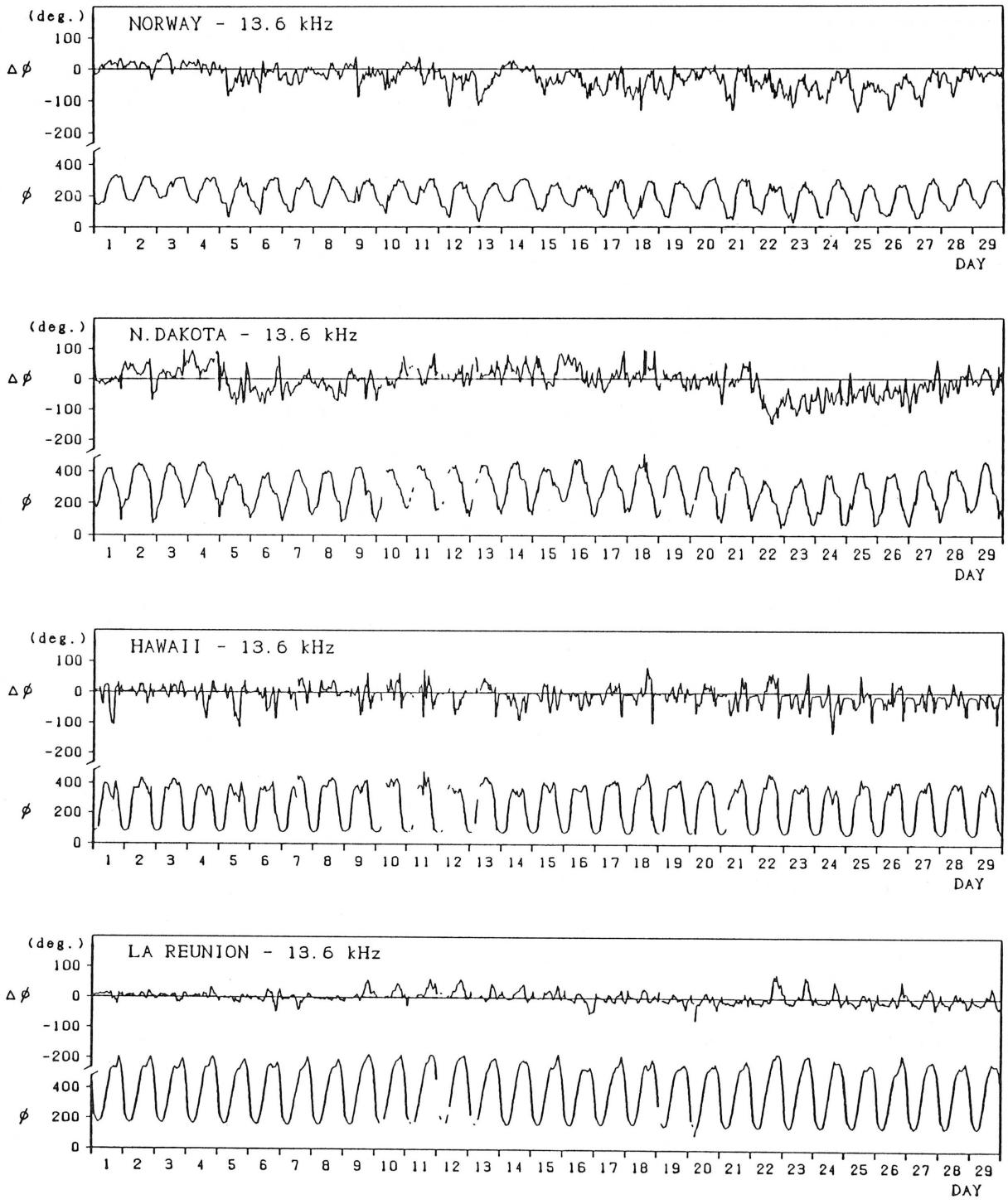
Hiraiso — Time in U.T.

Feb. 1988	Whole Day Figure	W W V 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Conditions 00 06 12 18 / 06 12 18 24	Principal Geomagnetic Storms Start	End	Range
1	4-	4U S S 3U	4 4U S 4	N N N N			
2	4o	4U S S 4	4 S S 4	N N N N			
3	4o	4U S S 4U	4 S S 4	N N N N			
4	3+	1U S S 4	4 S S 4	N N N N			
5	4+	5U S S 4	4 5U S 4	N N N N			
6	4o	4U S S 4	4 4U S 4	N N N N			
7	4o	4U S S 4	4 4U S 4	N N N N			
8	4o	4U S S 4	4 S S 4	N N N N			
9	4o	4U S S 4	4 S S 4	N N N N			
10	4o	4U S S 4	4 S S 4	N N N N			
11	4o	4U 4U S 4	4 5U S 4	N N N N			
12	4+	5U S S 4	4 4U S 4	N N N N			
13	4+	5U S S 4	4 5U S 4	N N N N			
14	4o	4U S S 4U	4 S S 4	N N N N			
15	4+	4U S S 4	4 5U S 4	N N N N			
16	4-	3U S S 4	4 S S 4	N N N N			
17	4o	4U S S 4	4 S S 4	N N N N			
18	4o	4U S S 4	4 S S 4	N N N N			
19	4-	4U S S 3U	4 S S 4	N N N N			
20	4-	4U S S 4U	3 S S 4	N N N N			
21	3-	4U S S 1U	4 S S 2	N N N N	0156	---	159
22	3-	1U C S 1U	4 C S 5	U N N N	---	---	
23	2+	2U S S 1U	3 S S 4	U U U U	---	21.0	
24	3+	3U S S 1U	5 S S 4	U N N N			
25	3o	2U S S 2U	3 4U S 4	N N N N			
26	4o	S S S 3U	5 S S 4	U U U U			
27	4o	4U S 5U 4	4 4U S 4	U U U U			
28	4+	4U S S 4	4 5U 5U 4	U U U U			
29	4-	4U S S 4U	4 S S 3	U U U U			

C. Radio Propagation

c. Phase Variations in OMEGA Radio Waves at Inubo

Inubo February 1988



Polar Cap Phase Anomaly (PCPA) on Norway-Inubo Circuit

NONE

C. Radio Propagation

d. Sudden Ionospheric Disturbance

(i) Short Wave Fade-out (SWF) at Hiraiso

Hiraiso

Time in U.T.

Feb. 1988	S W F						Correspondence		
	Drop-out Intensities (dB) CO	HA	1)	2)	Start	Duration	Type	Imp.	Solar Flare	Solar Noise	Geomag. Crochet
20	x	x	15		0409	38	2	1	0407	0400	

Notes CO: Colorado(WWV) HA: Hawaii(WWVH) 1): Australia 2): London

(ii) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Feb. 1988	S P A							
	Phase Advance (degrees)					Time (U.T.)		
Date	Ω/N	Ω/LR	NWC	Ω/H	Ω/ND	Start	End	Maximum
3		7	9	6		0246	0309	0249
11			8			0250	0314	0253
12		—	6	—	—	0358	0418	0402
20	25	126	98	62	23	0407	0620	0422
29		9	—			0506	0535	0512

IONOSPHERIC DATA IN JAPAN FOR FEBRUARY 1988

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Queries about "Ionosperic Data in Japan" should be forwarded to:
Communications Research Laboratory, Ministry of Posts and Telecommunications,
2-1 Nukui-Kitamachi 4-chome, Koganei-shi, Tokyo 184 JAPAN.