

# IONOSPHERIC DATA IN JAPAN

FOR JANUARY 1988

VOL.40 NO. 1

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## BRIEFING

This Series contains data on ionosphere (I), solar radio emis-

sion (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  $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$  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 <sup>+</sup>
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 <sup>+</sup>

*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
	WWV	WWVH	
Station Call	WWV	WWVH	Hiraiso, Ibaraki
Location	Fort Collins, Colorado	Kauai, Hawaii	
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	$\lambda/2$ vertical	$\lambda/2$ 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 10, 1+, 2-, 20, 2+, 3-, 30, 3+, 4-, 40, 4+, 5-, 50 stands for an average of six-hourly ones of the two circuits. Abbreviated symbols are as follows:

C	artificial accident,
S	propagation 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 ( $\phi$ ) and those in phase deviation ( $\Delta\phi$ ) are shown in the lower part and the upper one, respectively. Variations in phase ( $\phi$ ) 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 ( $\Delta\phi$ ) 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

JAN. 1988

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station		WAKKANAI							Lat.	45 23.5 N			Long.	141 41.2 E			Sweep 1 MHz to 25 MHz in 24sec 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	X	X	X	X	X	X										X	X	X	X	X	X	X			
2		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
3		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
4		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
5		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
6		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
7		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
8		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
9		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
10		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
11		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
12		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
13		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
14		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
15		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
16		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
17		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
18		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
19		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
20		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
21		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
22		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
23		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
24		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
25		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
26		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
27		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
28		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
29		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
30		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
31		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
CNT		31	31	31	31	31	31	29										31	31	30	30	29	31	31			
MED		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
UQ		X	X	X	X	X	X	X										X	X	X	X	X	X	X			
LQ		X	X	X	X	X	X	X										X	X	X	X	X	X	X			

JAN. 1988

FXI (0.1 MHz)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JAN. 1988

FOF2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station Hour Day	WAKKANAI				Lat. 45 23.5 N				Long. 141 41.2 E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation														
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	32	32	33	31	32	33	33	43	69	72	71	84	66	68	65	64	44	32	26	31	34	24	28	31			
2	31	32	33	31	30	31	28	38	53	65	79	72	70	H	75	76	54	42	41	35	36	33	33	32	32		
3	34	34	30	30	30	30	26	39	C	64	75	71	H	69	79	71	68	60	45	F	F	F	F	F	F		
4	F	F	F	F	F		36	30	36	51	63	72	H	H	H	74	H	42	H	33	33	29	29	27	26	27	
5	26	25	27	27	30	29	31	43	56	80	61	86	69	61	61	57	56	48	37	28	33		A	23	26		
6	28	30	31	31	30	30	30	45	65	68	H	82	68	H	64	71	58	47	47	26	26	31	29	29	31		
7	31	31	34	39	29	29	A	49	61	71	78	89	69	94	83	64	53	33	32	34	36	37	41	46			
8	40	32	34	36	F	F	F	38	62	59	81	81	72	71	74	75	53	44	40	27	32	32	33	35			
9	32	F	31	35	30	31	28	41	69	V	74	97	73	74	73	67	64	51	36	31	30	34	28	34	32		
10	31	33	33	35	34	34	34	43	61	R	72	73	71	70	64	66	54	49	H	28	28	24	24	26	28		
11	30	30	31	31	31	31	25	33	52	65	64	67	H	73	H	70	58	57	47	33	A	28	29	32	34		
12	34	36	33	34	34	33	30	39	H	75	74	84	81	Z	59	75	V	72	49	49	25	25	23	A	27	28	
13	27	27	27	28	29	27	26	46	74	H	67	70	83	66	67	66	68	50	36	36	25	26	26	28	29		
14	30	30	31	31	31	30	26	41	51	56	94	66	71	74	66	H	76	59	43	37	26	23	25	30	31		
15	31	30	31	30	41	27	A	36	64	72	94	100	94	103	99	102	98	84	60	F	57	58	55	56			
16	38	37	35	32	35	26	29	33	H	92	Z	76	91	H	76	60	65	68	57	34	33	28	23	22	22	24	
17	24	24	25	27	27	24	21	43	60	H	61	65	79	H	66	71	65	63	66	34	29	32	26	26	22	26	
18	29	29	29	29	30	30	27	39	53	69	72	83	72	Z	71	69	H	56	61	38	35	32	29	29	26	26	
19	28	29	30	30	29	28	28	41	50	65	74	70	67	89	H	68	60	61	36	33	36	27	26	27	29		
20	31	32	32	30	30	31	31	40	55	58	61	73	H	73	65	J R	75	57	57	35	34	35	26	24	24	28	
21	29	30	31	31	30	32	28	38	H	53	67	64	75	72	H	Z	66	58	H	56	37	30	38	29	27	30	33
22	34	36	36	36	35	34	35	49	65	69	63	75	H	V	68	71	70	61	H	55	42	32	31	28	29	28	30
23	32	31	31	32	32	34	26	39	56	H	61	66	69	66	64	66	H	59	H	55	40	29	27	31	26	24	26
24	27	27	29	28	29	26	26	45	51	61	67	61	65	64	66	54	50	36	31	29	27	23	23	24			
25	26	27	28	28	29	29	29	36	56	53	69	69	64	60	Z	65	62	55	39	35	38	29	27	30	32		
26	31	33	32	33	34	35	27	41	54	63	71	74	J R	77	59	56	64	52	36	34	31	31	29	31	30		
27	30	31	32	31	31	31	24	44	64	63	59	76	66	63	68	60	60	56	35	35	38	34	36	37			
28	38	38	37	37	35	30	27	44	59	68	60	75	87	63	65	60	58	42	37	30	S	30	31	31			
29	31	33	34	32	33	32	28	37	56	62	72	65	66	H	65	76	69	61	39	38	35	30	28	30	31		
30	34	34	33	32	31	32	28	46	55	60	73	74	70	64	63	62	63	42	44	31	33	25	27	30			
31	30	31	32	34	34	28	28	40	59	59	69	79	84	H	64	66	65	56	44	29	36	33	32	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	30	29	30	30	29	30	28	31	30	30	31	31	31	31	31	31	31	31	30	28	29	28	30	30			
MED	31	31	32	31	31	30	28	41	58	65	72	75	70	68	67	62	56	40	33	31	29	28	28	30			
UQ	32	33	33	34	34	32	30	44	64	69	75	82	73	72	72	67	60	44	36	35	33	30	31	32			
LQ	29	30	30	30	30	29	26	38	53	61	66	72	66	64	65	58	52	36	30	28	27	26	26	28			

The Radio Research Laboratory, Japan

JAN. 1988

FOF2 (0.1 MHz)

# IONOSPHERIC DATA

JAN. 1988

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9h)

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

JAN. 1988

FOF1 (0.01 MHz)

# IONOSPHERIC DATA

JAN. 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	B	245	255	275	275	260	235	210	S								
2								S		190	240	260	280	275	260	240	200	S							
3								A	C	A	265	A	B	265	B	B	S								
4								S	B	B	B	B	B	B	250	S	S								
5								S		200	240	275	B	B	B	B	S	S							
6								S	B	B	B	B	B	B	B	S	S								
7								S		200	235	255	270	270	255	225	205	S							
8								S	A	230	250	275	A	260	240	205	S								
9								S	A	240	A	A	280	270	255	S	S								
10								S	B	A	275	285	290	275	B	B	S								
11								S		185	245	270	285	B	275	240	200	S							
12								S		200	255	270	285	290	280	240	B	S							
13								S		205	250	270	285	285	270	B	210	S							
14								S		200	240	260	285	290	B	250	205	S							
15								S	A	B	B	B	290	280	B	A	S								
16								S		215	250	275	280	290	285	255	215	S							
17								S		200	230	260	280	280	270	B	215	S							
18								S		205	245	275	295	295	285	255	215	S							
19								S		205	245	A	A	285	270	260	230	H	S						
20								S		210	255	H	280	295	295	280	255	210	S						
21								S		210	B	270	290	295	280	B	230	S							
22								S	A	245	270	290	295	280	255	220	S								
23								S		205	245	275	295	295	275	250	240	190							
24								S		210	240	275	290	285	275	260	240	B							
25								S		200	250	285	300	300	290	260	235	S							
26								S	B	250	265	285	285	275	260	230	S								
27								S		220	240	285	B	B	B	B	S								
28								S		210	260	B	B	B	B	260	225	S							
29								S	A	235	260	285	290	280	260	220	H	S							
30								S		225	250	A	300	295	285	A	235	205							
31								S		215	255	280	295	B	B	B	B	S							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									20	25	24	22	22	24	20	21	2								
MED									205	245	270	285	290	275	255	215	198								
UQ									210	250	275	295	295	280	260	230									
LQ									200	240	260	280	285	270	240	210									

JAN. 1988

FOE (0.01 MHz)



# IONOSPHERIC DATA

JAN. 1988

FOES (0.1 MHz)

135 E Mean Time (G.M.T. + 9h)

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	J A 20		22		J A 20	E S 16	E S 16		22	J A 27	E B 21		G		G		G		E S 17		23	26	E S 16	E S 16	23	E S 15	E S 16																									
2	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16		22	25	G	24	G	20	G	G	G	G	E S 17	J A 25	E S 16	E S 16	J A 26	E S 16	26	26	25																										
3	E S 16	E S 16	J A 21	J A 23	J A 33	J A 27	E S 17	28	C	J A 28	G	30	E B 28	G	E B 25	E B 24	E S 18	J A 24	J A 27	26	E S 16	E S 16	E S 16	E S 16	E S 16																											
4	E S 16	E S 16	E S 15		E S 16	E S 16	E S 16	23	J A 20	E B 25	E B 30	E B 28	E B 29	32	G	E S 24	21	E S 16	E S 18	J A 32	E S 16	25	26	26																												
5	E S 15	E S 15	21	E S 16	E S 16	E S 16	26	E S 15	G	G	G	E B 30	E B 32	E B 32	E B 27	E S 26	E S 17	J A 52	J A 31	J A 20	J A 25	39	E S 13	E S 16																												
6	E S 15	25	24		E S 15	E S 16	25	26	E B 20	E B 26	E B 30	E B 32	E B 31	E B 32	E B 30	25	E S 18	E S 16	J A 26	J A 23	E S 16	E S 16	24	22																												
7	E S 16	26	E S 16	E S 15	E S 16	E S 16	J A 61	26	G	G	G	G	G	G	G	G	E S 16	E S 16	E S 16	26	E S 17	E S 15	26	21																												
8	E S 16	E S 16	E S 16	E S 13	E S 16	E S 16	J A 23	J A 28	J A 35	G	32	G	41	G	G	G	E S 18	23	26	E S 16	E S 16	J A 25	E S 16	E S 16	E S 16																											
9	E S 16	E S 16	E S 16	E S 16	E S 14	23	J A 27	J A 36	J A 27	G	41	34	G	G	G	23	E S 17	24	J A 21	26	J A 25	E S 16	J A 25	E S 16	E S 16																											
10	E S 16	E S 15	E S 15	E S 16	J A 20	E S 16	E S 16	23	23	27	G	G	G	G	E B 27	E B 24	E S 18	E S 16	E S 16	E S 16	22	E S 16	E S 16	E S 16	E S 15																											
11	E S 16	E S 15	E S 15	E S 16	E S 16	E S 16	25	23	24	G	31	32	33	G	29	E S 17	21	E S 16	J A 57	E S 16	25	16	25	16	16																											
12		20	E S 16	E S 16	E S 16	17	E S 16	E S 16	28	G	G	G	G	G	G	E B 24	E S 17	E S 16	E S 16	23	23	26	22	23																												
13	E S 16	21	E S 16	E S 16	E S 16	E S 16	26	J A 32	G	G	G	G	G	G	E B 26	G	E S 17	16	16	16	16	26	J A 22	23	E S 16																											
14	E S 16	22	E S 16	E S 15	E S 16	E S 16	26	27	25	G	G	G	G	E B 30	G	23	24	J A 28	J A 29	J A 26	E S 16	E S 18	16	E S 16	E S 16																											
15	E S 16	E S 16	E S 15	E S 16	E S 15	E S 16	25	J A 35	J A 30	26	E B 32	E B 30	G	G	E B 27	E S 26	E S 18	E S 16	E S 16	23	E S 16	26	21	26																												
16		23	E S 16	E S 16	E S 16	E S 15	E S 16	20	25	J A 28	31	G	G	G	G	G	J A 25	26	E S 16	E S 15	J A 24	J A 25	16	16	E S 16																											
17	E S 16	E S 16	23	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G	34	23	G	E B 28	G	23	E S 16	E S 16	E S 16	J A 24	E S 16	E S 16	E S 16	E S 16																											
18	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	30	G	G	G	G	G	G	E S 18	16	16	16	16	16	16	16	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	21	26	32	30	33	G	G	G	22	E S 15	26	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16																											
20	E S 15	E S 16	20	E S 16	E S 16	E S 15	24	E S 16	G	G	G	G	G	G	31	26	20	J A 20	E S 16	J A 21	23	E S 15	23	26																												
21	E S 17		E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	G	27	G	34	G	G	30	G	19	J A 33	26	E S 16	J A 24	26	24	28	J A 28																											
22		25	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	26	G	G	G	G	G	G	G	E S 17	E S 16	E S 16	21	26	E S 16	23	E S 19																												
23	E S 16	E S 16	E S 16	E S 16	E S 16	20	E S 16	E S 16	24	29	G	G	G	G	31	29	G	E S 16	E S 16	E S 15	26	J A 28	J A 32	26																												
24	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	E S 15		G	G	G	34	33	G	33	G	E B 20	16	26	E S 16	25	E S 17	16	16																												
25	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	G	G	G	G	G	G	G	G	E S 20	E S 18	E S 17	E S 16	E S 16	E S 15	E S 16	E S 16																												
26	E S 16	24	E S 16		E S 16	E S 17	E S 16	E S 16	E B 22	29	G	G	G	G	G	G	E S 19	23	E S 16	E S 16	J A 24	E S 16	E S 16	E S 16																												
27		20	23	E S 16	E S 16	E S 16	E S 17	E S 16	G	35	J A 46	E B 35	E B 35	E B 32	28	E B 27	E S 20	E S 16	E S 16	J A 21	22	E S 16	16	J A 23																												
28	24	E S 16	E S 16	21	E S 16	E S 16	E S 18	25	G	E B 30	33	E B 32	E B 31	G	G	E S 20	E S 17	E S 15	E S 16	E S 20	23	E S 16	16	E S 16																												
29	E S 16	E S 16	E S 16		E S 16	E S 17	E S 16	E S 16	23	G	G	G	G	G	25	J A 28	26	J A 25	J A 20	21	23	E S 16	22																													
30	E S 17	26	23	J A 24	25	E S 16	E S 16	19	26	G	30	G	G	G	J A 33	G	G	E S 16	17	37	J A 36	J A 35	16	26																												
31	E S 16	E S 17	22	J A 25	E S 15	E S 16	E S 17	17	G	G	G	G	E B 34	E B 31	E B 30	E B 28	23	E S 16	J A 24	26	J A 23	16	17	16	E S 16																											
CNT	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31																										
MED	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 17	E S 18	22	G	G	G	G	G	G	G	E S 18	16	16	20	22	E S 18	16	16																												
UQ	E S 16	19	18	E S 16	E S 16	E S 16	24	26	25	26	29	30		G	E B 28		20	24	26	J A 24	24	25	23	23																												
LQ	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	G	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	E S 16	E S 16																											

JAN. 1988

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

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

The Radio Research Laboratory, Japan

JAN. 1988

FBES (0.1 MHZ)

# IONOSPHERIC DATA

JAN. 1988

FMIN (0.1 MHZ)

135 E Mean Time (G.M.T. + 9h)

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

JAN. 1988

FMIN (0.1 MHZ)

### IONOSPHERIC DATA

JAN. 1988

M(3000)F2 (0.01)

135° E Mean Time (G.M.T. + 9h)

Station	WAKKANAI																										
	00	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	300	295	310	295	310	325	335	375	325	355	360	335	355	355	345	355	345	310	320	350	310	280	285			
2	295	310	320	330	300	330	320	335	360	340	355	360	355	335	340	375	355	315	320	315	270	305	280	295			
3	290	315	285	265	265	260	280	305	C	345	355	340	315	345	340	340	340	310	F	F	F	F	F	F			
4	F	F	F	F	F	325	350	310	380	350	335	305	325	345	350	335	340	310	335	345	310	350	285	295			
5	290	295	290	290	275	305	330	350	355	360	345	330	355	340	350	335	335	335	325	305	355	A	270	285			
6	285	285	315	345	295	275	295	345	360	370	305	360	350	330	350	355	340	320	290	300	330	280	275	265			
7	295	290	310	335	270	350	A	345	360	340	350	330	340	350	360	340	360	325	285	300	300	295	290	310			
8	335	305	300	305	F	F	F	325	355	350	345	360	345	350	340	345	385	320	350	335	295	295	285	315			
9	320	F	315	315	300	320	330	340	360	370	330	330	335	340	360	355	335	325	320	335	345	270	345	305			
10	300	305	285	300	310	315	350	325	360	R	360	335	340	355	330	350	355	365	265	350	325	290	290	285			
11	285	295	305	295	290	320	330	350	390	365	370	345	H	H	355	360	355	355	320	A	320	260	285	295			
12	300	310	305	285	295	320	305	340	325	365	345	325	360	355	340	335	365	380	360	320	315	A	260	280			
13	335	290	290	280	275	290	300	325	365	315	340	350	320	350	335	320	360	335	340	320	305	315	280	275			
14	285	275	290	295	295	295	320	345	370	350	340	370	325	335	330	305	330	360	330	305	255	280	260	265			
15	275	260	285	310	365	320	A	320	330	310	315	325	300	300	300	310	315	310	320	F	305	285	290	325			
16	315	295	285	290	315	345	380	395	H	375	340	350	330	355	355	330	355	360	345	310	340	A	320	265	260		
17	285	290	290	295	315	305	325	325	350	330	340	340	305	330	355	350	335	350	310	335	305	355	270	280			
18	295	280	295	285	285	300	335	365	285	335	360	340	335	340	340	340	350	315	330	330	310	310	290	305			
19	290	280	285	285	315	305	325	345	360	340	350	325	360	345	H	345	325	335	325	325	310	280	290	280			
20	295	295	285	300	285	305	320	350	365	350	345	355	305	H	345	R	350	355	355	315	320	305	305	300	280		
21	275	295	305	305	300	305	355	350	H	345	365	345	360	330	H	Z	370	350	335	285	340	345	290	310	295		
22	300	300	310	305	320	300	315	350	335	360	350	305	H	V	320	350	350	335	345	320	350	325	290	290	275		
23	310	300	285	310	320	330	340	335	365	H	310	H	335	345	335	340	335	355	H	H	350	280	305	340	320	285	275
24	290	295	305	315	310	295	320	360	365	360	360	345	340	345	335	365	360	315	320	340	325	295	315	280			
25	290	290	290	290	295	300	345	350	375	355	345	350	335	360	305	Z	345	360	325	320	330	345	305	275	285		
26	295	295	295	305	300	320	295	340	370	350	365	365	R	355	350	345	365	335	325	320	320	305	315	295			
27	300	290	310	310	330	340	295	330	365	365	370	335	335	350	340	360	335	345	330	320	325	295	290	290			
28	280	295	300	295	320	300	320	360	355	370	345	345	360	345	335	350	350	320	325	335	S	300	305	290			
29	290	305	310	310	310	335	330	350	370	355	360	355	325	325	H	355	360	360	320	315	330	310	280	300	295		
30	300	310	325	310	320	295	330	360	370	325	345	360	345	345	340	320	335	335	355	A	325	320	285	295			
31	295	285	285	295	325	330	330	335	355	355	360	355	365	H	320	335	360	350	325	A	325	335	335	300	285		
CNT	30	29	30	30	29	30	28	31	30	30	31	31	30	31	30	31	31	31	31	29	27	28	28	30	30		
MED	295	295	295	302	300	308	325	345	360	350	345	345	335	345	340	350	350	335	320	325	320	298	288	285			
UQ	300	300	310	310	315	325	332	350	370	360	358	358	350	350	350	355	360	345	330	335	332	312	300	295			
LQ	285	290	285	290	295	300	318	332	355	340	342	330	325	332	335	340	335	320	310	320	305	288	280	280			

JAN. 1988

M(3000)F2 (0.01)

# IONOSPHERIC DATA

JAN. 1988

M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9h)

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

JAN. 1988

M(3000)F1 (0.01)

### IONOSPHERIC DATA

JAN. 1988

H<sup>o</sup>F<sub>2</sub> (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												225												
2												225	240											
3											245	235	250	230										
4													225	245										
5											225													
6																								
7															245									
8												220	235	230										
9											220			245										
10											230	240	225											
11														235										
12												255	225		250									
13											210	225	240	225	235									
14												215	250	245										
15																								
16											250	250	215	230										
17											220	245	225											
18											280	230	255											
19											250	245		255										
20													235											
21											240			290										
22											240	245	240	250										
23											230	240	250	245										
24											235	235		245										
25											245	240	250	235										
26											220	235	255	240										
27											215	260	245	240	255									
28											250	260	245	240	245									
29											240	235	245	240										
30											300	240	245	230	225									
31											235	240	245	230	240									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT											5	19	22	19	19	6								
MED											250	235	240	240	240	245								
UQ											280	242	245	248	245	250								
LQ											240	225	235	228	235	240								

JAN. 1988

H<sup>o</sup>F<sub>2</sub> (KM)

# IONOSPHERIC DATA

JAN. 1988

H<sup>o</sup>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	00	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	295	305	280	295	260	250	220	210	210	205	205	225	225	220	230	200	220	255	250	215	280	325	315												
2	295	280	255	245	290	255	240	220	210	230	225	210	220	200	230	205	200	250	250	255	330	285	330	295												
3	305	270	300	350	A	345	E S	300	285	C	225	240	205	205	220	220	215	205	220	235	235	240	255	260	300											
4	285	280	275	255	275	250	220	245	205	225	235	205	200	200	245	205	205	250	240	270	A	240	225	315	300											
5	290	290	310	305	305	280	235	205	H	200	230	210	220	220	225	235	245	215	235	225	250	225	A	305	325											
6	290	305	275	230	300	300	230	225	205	205	225	225	225	220	245	225	225	225	255	295	240	255	315	330												
7	295	310	275	240	330	225	A	205	205	H	205	230	225	220	210	220	210	205	220	250	255	295	275	290	250											
8	230	245	280	265	255	245	260	230	220	210	240	200	A	205	235	230	205	245	205	245	255	300	300	300												
9	250	300	275	255	285	255	250	230	225	H	A	H	210	205	235	230	225	205	220	250	250	235	305	235	280											
10	280	275	295	275	275	255	220	225	205	225	205	200	205	230	225	220	205	220	240	230	250	285	305	300												
11	285	290	275	275	290	250	225	205	205	220	220	225	H	220	225	225	H	205	215	225	A	245	305	310	295											
12	275	260	250	270	295	255	250	210	205	225	210	235	205	210	205	225	200	200	215	260	285	A	350	310												
13	250	305	310	315	310	305	290	250	215	H	195	200	200	200	200	H	225	200	220	235	255	265	255	305	325											
14	300	305	305	285	280	270	240	210	200	H	195	245	205	220	225	225	210	215	205	275	A	E S	E S	350	350											
15	335	325	315	265	200	245	A	245	A	225	250	250	245	245	245	250	245	225	220	205	240	255	270	255	245											
16	245	275	300	300	255	210	210	195	H	215	220	250	220	225	215	225	225	210	200	295	240	A	270	E S	350											
17	330	300	320	280	255	265	285	235	215	H	205	200	A	205	H	200	225	225	220	200	255	250	250	E S	365	325										
18	295	305	300	255	300	290	250	225	205	215	235	210	225	235	225	205	210	205	240	245	255	275	275	260												
19	290	300	310	305	255	275	225	210	205	235	245	200	240	210	215	210	225	225	255	255	255	305	300	300												
20	300	280	305	290	305	275	245	205	205	220	H	H	205	235	235	215	215	200	225	245	300	260	275	320												
21	320	275	275	275	280	260	225	205	H	200	225	230	240	220	200	235	205	205	205	350	A	230	A	270	255	305										
22	280	300	255	265	255	275	260	215	220	H	205	215	210	205	210	235	230	220	205	245	235	255	255	275	325											
23	265	280	310	285	255	230	225	220	215	205	195	200	205	220	235	H	205	210	205	240	270	230	250	305	310											
24	300	280	275	260	255	300	255	210	200	H	205	200	A	240	230	A	220	215	250	245	235	255	275	260	305											
25	320	310	305	300	260	275	230	205	205	220	220	235	210	210	220	225	225	235	245	235	220	255	295	295												
26	305	290	300	275	280	245	255	220	210	215	225	225	220	225	H	H	205	205	210	250	250	245	300	270	280											
27	285	295	275	275	255	235	E S	290	230	205	220	A	250	B	225	225	225	230	225	205	285	240	285	300	300											
28	305	280	260	280	255	250	255	235	220	220	215	250	A	250	225	230	225	210	205	225	245	265	280	275	300											
29	325	295	270	245	275	240	215	205	210	225	215	200	225	220	H	220	235	210	205	245	245	250	305	300	305											
30	295	280	255	280	250	295	235	235	210	205	220	225	220	210	225	240	225	205	225	A	255	A	305	300												
31	305	305	300	300	250	245	245	220	220	225	240	235	B	250	210	210	235	220	210	A	240	250	245	295	300											
CNT	31	31	31	31	30	31	29	31	30	31	29	29	29	31	30	31	31	31	31	30	29	30	29	31	31											
MED	295	290	295	275	275	255	242	220	208	220	220	220	220	220	225	225	210	220	242	250	250	272	300	300												
UQ	305	302	305	288	295	275	255	230	215	225	235	225	225	225	235	228	220	225	250	255	255	285	308	313												
LQ	282	280	275	262	255	245	225	208	205	205	210	205	205	210	220	210	205	205	225	240	240	255	275	298												

JAN. 1988

H<sup>o</sup>F (KM)

### IONOSPHERIC DATA

JAN. 1988 H°E (KM)

135° E Mean Time (G.M.T. + 9h)

Hour Day	Station WAKKANAI				Lat. 45° 23.5' N				Long. 141° 41.2' E				Sweep 1 MHz to 25 MHz		in 24 sec in		automatic operation								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							S	B	A							H	S								
2							S	H	A							S	S								
3							A	C	A	A	A	B	B	B	B	S									
4							S	B	B	B	B	B	B	B	155	S	S								
5							S	B	B	135	B	B	B	B	B	S	S								
6							S	B	B	B	B	B	B	B	B	S	S								
7							S										S								
8							S	A					A		130	125	130	S	S						
9							S	A	B	A	A			130	125	125	S	S							
10							S	B	A						B	B	S								
11							S	B					B			S	S								
12							S	A								B	S								
13							S								B		S								
14							S								B	115	130	S	S						
15							S	A	B	B	B		125	130	B	A	S								
16							S	H									S								
17							S	B					A		B	B	S								
18							S										S								
19							S	A	A	A	A		120	125	125	125	S								
20							S										S								
21							S	B							B	140	S								
22							S	A								B	S								
23							S										S								
24							S									B	B								
25							S										S								
26							S	B								S	S								
27							S	B	B	B	B	B	B	B	B	B	S								
28							S	B	B	B	B	B	B	B	B	B	S								
29							S	A							H	B	S								
30							S										S								
31							S										S								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									19	24	24	22	22	24	21	21	2								
MED									140	125	125	125	125	125	125	130	148								
UQ									150	132	125	125	125	128	125	135									
LQ									130	122	122	125	120	122	125	125									

JAN. 1988 H°E (KM)



# IONOSPHERIC DATA

JAN. 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	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
1	105	100	100	110	S	S	120	105	B	G	105	G	G	G	G	S	120	115	S	S	105	S	S										
2	S	S	S	S	S	S	120	115	G	110	105	G	G	G	G	S	115	S	S	S	105	105	105										
3	S	S	125	110	105	105	S	120	C	105	105	105	B	G	B	B	S	120	110	120	S	S	S	S									
4	S	S	S	E	S	S	S	115	B	B	B	B	B	B	B	S	S	S	S	S	105	105	105	S									
5	S	S	100	S	S	S	120	S	G	G	G	B	B	B	B	S	S	110	105	105	105	105	S	S									
6	S	105	105	E	S	S	120	115	B	B	B	B	B	B	B	S	S	S	110	125	S	S	130	105									
7	S	105	S	S	S	S	110	110	G	G	G	G	G	G	G	S	S	S	120	S	S	110	105	S									
8	S	S	S	S	S	S	115	110	110	G	180	G	105	G	G	G	S	105	120	S	S	110	S	S									
9	S	S	S	S	S	125	115	105	105	G	105	140	G	G	G	S	105	105	115	105	S	105	S	S									
10	S	S	S	S	105	S	S	125	175	105	G	G	G	G	B	B	S	S	S	S	105	S	S	S									
11	S	S	S	S	S	S	115	105	145	G	180	170	B	G	125	G	S	120	S	105	S	110	S	S									
12	105	S	S	E	S	S	S	S	120	G	G	G	G	G	G	B	S	S	S	120	120	105	115	110									
13	S	105	S	S	S	S	115	110	G	G	G	G	G	G	B	G	S	S	S	S	110	110	120	S									
14	S	105	S	S	S	S	110	105	140	G	G	G	G	B	G	140	120	110	105	105	S	S	S	S									
15	S	S	S	S	S	S	120	110	110	120	B	B	G	G	B	105	S	S	S	125	S	115	115	105									
16	110	S	S	S	S	S	S	170	150	105	180	G	G	G	G	G	110	125	S	S	110	115	S	S									
17	S	S	105	S	S	S	S	S	G	G	G	175	105	G	B	G	135	S	S	S	105	S	S	S									
18	S	S	S	E	S	S	S	S	G	170	G	G	G	G	G	G	S	S	S	S	S	S	S	S									
19	S	S	S	S	S	S	S	S	125	115	105	105	175	G	G	G	135	S	125	S	S	S	S	S									
20	S	S	105	S	S	S	110	S	G	G	G	G	G	G	G	170	135	120	110	S	105	105	110	110									
21	S	E	S	S	S	S	S	S	G	105	G	155	G	G	160	G	140	115	120	S	105	110	115	105									
22	105	S	S	S	S	S	S	S	115	G	G	G	G	G	G	G	S	S	S	125	125	S	105	S									
23	S	S	S	S	S	110	S	S	175	150	G	G	G	G	G	125	150	G	S	S	125	105	105	125									
24	S	S	S	S	E	S	S	S	G	G	G	185	170	130	G	G	B	S	S	110	120	S	S	S									
25	S	S	S	S	E	S	S	S	150	G	G	G	G	G	G	G	S	S	S	S	S	S	S	S									
26	S	105	S	E	S	S	S	S	B	185	G	G	G	G	G	G	S	105	S	S	135	S	S	S									
27	105	105	S	S	S	S	S	S	G	130	125	B	B	B	B	B	S	S	S	105	105	S	S	105									
28	105	S	S	105	S	S	S	S	160	G	B	175	B	B	G	G	S	S	S	S	S	125	S	S									
29	S	S	S	E	S	S	S	S	110	G	G	G	G	G	G	125	105	110	105	105	115	105	S	105									
30	S	110	110	110	110	S	S	S	150	G	125	G	G	G	110	G	G	S	S	105	110	110	S	115									
31	S	S	105	105	S	S	S	S	G	G	G	G	B	B	B	B	150	S	105	105	105	S	S	S									
CNT	6	8	8	5	3	3	12	14	15	11	10	8	4	1	5	6	9	13	12	16	17	15	12	12									
MED	105	105	105	110	105	110	115	110	140	115	115	162	138	180	128	138	130	110	110	105	110	110	110	105									
UQ	105	105	108	110	108	118	120	115	150	140	180	175	172	160	145	140	120	118	120	120	110	115	110	110									
LQ	105	105	102	105	105	108	112	105	112	105	105	122	105	125	125	120	110	105	105	105	105	105	105	105									

JAN. 1988

H°ES (KM)

# IONOSPHERIC DATA

JAN. 1988

TYPES OF ES

135° E Mean Time (G.M.T. + 9h)

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	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>			F <sub>1</sub>	L <sub>3</sub>			L <sub>1</sub>							F <sub>1</sub>	FF <sub>11</sub>			F <sub>2</sub>			
2							F <sub>1</sub>	L <sub>1</sub>		L <sub>1</sub>	L <sub>1</sub>							F <sub>2</sub>				F <sub>2</sub>	F <sub>2</sub>	F <sub>1</sub>	
3			F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	F <sub>2</sub>		LC <sub>11</sub>		L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>						F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>					
4								L <sub>2</sub>						H <sub>1</sub>			C <sub>1</sub>			F <sub>3</sub>		F <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>	
5			F <sub>2</sub>				F <sub>1</sub>											F <sub>2</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>4</sub>	F <sub>3</sub>			
6		F <sub>1</sub>	F <sub>2</sub>				F <sub>1</sub>	L <sub>1</sub>											F <sub>2</sub>	F <sub>1</sub>			F <sub>1</sub>	F <sub>1</sub>	
7		F <sub>2</sub>					F <sub>4</sub>	L <sub>1</sub>												F <sub>1</sub>			F <sub>1</sub>	F <sub>2</sub>	
8							F <sub>2</sub>	L <sub>3</sub>	L <sub>2</sub>		H <sub>1</sub>		L <sub>2</sub>					F <sub>2</sub>	F <sub>1</sub>			F <sub>2</sub>			
9						F <sub>1</sub>	F <sub>2</sub>	L <sub>3</sub>	L <sub>1</sub>		L <sub>2</sub>	CL <sub>11</sub>				C <sub>1</sub>		F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>		F <sub>1</sub>		
10					F <sub>2</sub>			C <sub>1</sub>	H <sub>1</sub>	L <sub>2</sub>												F <sub>1</sub>			
11							F <sub>1</sub>	L <sub>1</sub>	C <sub>1</sub>		H <sub>1</sub>	H <sub>1</sub>			C <sub>1</sub>			F <sub>1</sub>		F <sub>4</sub>		F <sub>1</sub>			
12	F <sub>1</sub>								L <sub>1</sub>											F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>	
13		F <sub>2</sub>					F <sub>2</sub>	L <sub>2</sub>														F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	
14		F <sub>1</sub>					F <sub>2</sub>	L <sub>2</sub>	C <sub>1</sub>						C <sub>1</sub>	C <sub>1</sub>	C <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>	F <sub>2</sub>					
15							F <sub>3</sub>	L <sub>3</sub>	L <sub>2</sub>	C <sub>1</sub>					L <sub>2</sub>					F <sub>1</sub>		F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	
16	F <sub>1</sub>							H <sub>1</sub>	C <sub>2</sub>	L <sub>1</sub>	H <sub>1</sub>						L <sub>1</sub>	F <sub>1</sub>			F <sub>2</sub>	F <sub>1</sub>			
17			F <sub>1</sub>									HL <sub>11</sub>	L <sub>1</sub>				C <sub>2</sub>				F <sub>2</sub>				
18											H <sub>2</sub>														
19									L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	H <sub>1</sub>				H <sub>2</sub>		F <sub>1</sub>						
20			F <sub>2</sub>				F <sub>2</sub>								H <sub>1</sub>	C <sub>1</sub>	C <sub>1</sub>	F <sub>1</sub>		F <sub>2</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>1</sub>		
21										L <sub>1</sub>		C <sub>2</sub>			H <sub>1</sub>		C <sub>1</sub>	F <sub>3</sub>	F <sub>1</sub>		F <sub>4</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>	
22	F <sub>2</sub>								LC <sub>12</sub>											F <sub>1</sub>	F <sub>2</sub>		F <sub>2</sub>		
23						F <sub>1</sub>			H <sub>1</sub>	C <sub>1</sub>					C <sub>1</sub>	H <sub>1</sub>					F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>1</sub>	
24												H <sub>1</sub>	H <sub>1</sub>		C <sub>1</sub>					FF <sub>12</sub>		F <sub>1</sub>			
25									C <sub>1</sub>																
26			F <sub>2</sub>							H <sub>1</sub>								F <sub>1</sub>				F <sub>1</sub>			
27	F <sub>1</sub>	F <sub>1</sub>							C <sub>1</sub>	C <sub>1</sub>										F <sub>2</sub>	F <sub>1</sub>			F <sub>2</sub>	
28	F <sub>1</sub>			F <sub>1</sub>					H <sub>1</sub>			H <sub>1</sub>											F <sub>1</sub>		
29									L <sub>1</sub>							C <sub>1</sub>	L <sub>1</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>		F <sub>1</sub>	
30		F <sub>2</sub>	F <sub>2</sub>	F <sub>2</sub>	F <sub>2</sub>				C <sub>1</sub>		C <sub>1</sub>				C <sub>1</sub>					F <sub>3</sub>	F <sub>4</sub>	F <sub>2</sub>		F <sub>1</sub>	
31			F <sub>1</sub>	F <sub>2</sub>													C <sub>1</sub>		F <sub>2</sub>	F <sub>2</sub>	F <sub>2</sub>				
	00	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																									

JAN. 1988

TYPES OF ES



### IONOSPHERIC DATA

JAN. 1988      FOF2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station		AKITA												Lat. 39° 43.5' N		Long. 140° 08.0' E		Sweep 1 MHz to 25 MHz in 2.5 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	32	33	35	F	F	33	35	58	69	63	76	80	69	66	58	60	54	H	30	33	33	27	28	F					
2	F	32	33	34	32	30	29	32	42	60	59	82	84	70	71	76	67	47	30	39	42	41	35	34	F				
3	F	F	F	F	30	30	28	41	100	H	101	H	83	84	79	76	56	41	40	32	33	32	37	F					
4	F	F	F	F	F	F	F	47	H	58	69	63	94	71	H	H	75	62	39	39	36	42	30	27	30				
5	31	F	F	F	F	32	33	53	59	67	86	H	82	71	62	H	H	59	50	43	31	29	29	27	28				
6	30	33	40	30	29	29	30	52	80	79	73	81	75	71	60	70	54	45	48	35	A	27	25	30					
7	F	30	33	32	31	30	33	24	53	64	67	79	85	82	86	85	66	55	43	36	39	40	41	38	45				
8	40	39	36	36	36	35	44	57	68	72	H	103	80	H	75	62	76	62	39	36	36	31	30	F	F				
9	36	31	32	F	F	F	F	A	56	74	84	79	74	72	70	64	55	42	37	33	34	26	A	A					
10	33	F	F	F	34	33	27	44	67	60	76	86	74	76	63	76	56	44	45	26	28	25	26	27					
11	30	30	31	31	32	32	28	45	51	68	65	67	74	72	73	61	66	41	35	33	31	30	31	35					
12	36	35	32	33	33	32	29	48	65	70	76	63	95	86	H	69	61	I	C	48	35	26	29	31	29	I	C		
13	32	28	31	29	30	29	30	52	80	64	H	80	87	76	72	63	64	61	36	37	39	32	28	24	27				
14	30	30	30	31	30	25	24	52	56	H	64	67	99	70	77	79	H	72	51	37	26	26	28	29	32				
15	32	33	32	31	45	26	22	51	91	74	H	90	96	94	104	104	114	103	86	81	60	56	50	F	F				
16	53	31	40	45	50	36	32	51	H	70	72	H	90	115	H	H	H	H	H	44	36	33	30	23	23	24			
17	24	26	26	27	29	23	22	44	66	73	74	66	82	68	75	72	74	42	29	35	34	29	25	25					
18	28	30	29	31	31	30	28	H	46	55	68	76	79	75	74	67	70	60	47	33	36	34	28	26	28				
19	30	30	30	30	32	26	32	49	H	58	H	64	72	H	83	77	67	92	73	54	46	33	29	39	32	24	28		
20	30	30	30	31	30	30	32	47	59	61	70	72	70	71	65	66	57	46	33	29	36	27	26	27					
21	29	32	33	30	30	30	30	50	56	H	59	H	69	72	H	H	H	71	52	44	36	36	38	27	30	32			
22	33	35	34	35	32	33	36	52	59	65	74	80	78	74	76	69	56	45	42	30	27	26	25	27					
23	28	30	29	30	33	30	28	44	H	54	H	57	77	70	79	64	69	64	57	43	33	30	32	28	24	26			
24	26	28	30	31	29	26	26	50	59	56	67	73	64	76	60	62	52	39	35	32	30	31	25	26					
25	26	28	29	30	30	30	31	45	50	51	72	70	72	64	70	65	60	46	40	34	32	26	27	32					
26	33	32	34	34	34	32	33	51	56	H	59	76	78	73	69	57	59	58	45	34	35	37	31	33	33				
27	30	31	32	33	36	27	23	45	68	68	79	59	81	74	66	70	57	55	49	H	30	38	32	31	F	33			
28	F	33	34	36	35	35	30	28	48	61	63	76	66	73	86	69	62	55	50	37	36	28	29	30	29				
29	30	31	32	33	32	29	27	45	54	63	66	79	70	67	H	64	75	61	49	33	39	28	28	29	30				
30	29	31	32	30	31	28	28	49	63	72	68	81	81	70	59	64	60	52	36	39	31	32	28	31					
31	31	31	31	33	36	H	27	30	45	59	60	71	82	H	77	81	H	61	60	58	46	32	32	H	28	29	29		
CNT	30	30	30	28	29	29	29	30	31	31	31	31	31	31	31	31	31	31	31	31	30	31	28	27					
MED	30	31	32	31	32	30	29	48	59	65	76	80	75	72	68	67	58	45	36	33	32	29	28	30					
UQ	33	33	34	33	34	32	32	52	68	71	79	84	80	76	74	72	61	48	40	36	37	31	30	32					
LQ	30	30	30	30	30	28	27	45	56	60	70	72	72	68	63	64	55	42	34	30	30	27	25	27					

JAN. 1988      FOF2 (0.1 MHz)

# IONOSPHERIC DATA

JAN. 1988

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9h)

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	L																						
2										340		L	L	L	L	360																				
3											L	L	L	L	L																					
4											L	L	L	L																						
5										L	L	L	L	L																						
6												L	L	L																						
7										A	A	390	L	L	L																					
8										L	470	L	L	L	L	L																				
9										L	L	L	L	L	400	L																				
10										370	L	L	L	L	400	L																				
11										L	L	L	L	L	L	L	310																			
12										L	L	L	L	L	L																					
13										L	L	410	L	L	L																					
14										L	400	L	L	L	370	L																				
15												L	L	L	L																					
16										L	L	L	L	L	L	370																				
17											L	L	L	L	L																					
18											L	L	L	L	L	L																				
19										L	340	L	L	L	L	L																				
20											330	400	380	L	L	L																				
21										L	L	L	L	L	350	L																				
22										L	L	L	L	L	L	L																				
23										L	L	L	L	L	L	L																				
24										330	L	L	L	L	410	420	L																			
25										L	L	L	L	L	L	L																				
26										L	L	L	L	L	L																					
27										L	L	L	L	L	L	L																				
28										L	L	L	L	L	L	L																				
29										L	L	L	L	L	L																					
30										L	L	L	L	L	L																					
31										L	L	L	L	L	L																					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23												
CNT										5	7	9	3	4	4	1																				
MED										340	400	410	410	410	365	310																				
UQ										340	410	420	420	420	370																					
LQ										330	395	390	390	400	355																					

JAN. 1988

FOF1 (0.01 MHz)

# IONOSPHERIC DATA

JAN. 1988

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9h)

Station	AKITA				Lat.	39 43.5 N				Long.	140 08.0 E				Sweep 1 MHz to 25 MHz in 24sec 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	A	260	290	295	300	300	275	215	S							
2								S	A	A	280	300	305	290	260	240	S							
3								S	A	A	A		300	285	260	220	S							
4								S		205	255	290	295	300	290	270	235	S						
5								S		205	260	295	305	310	295	275	B	S						
6								S	B	255	290	300		B	295	270	225	S						
7								S	A	A	A		300	295	270	230	S							
8								S		230	255	290	300	A		300	290	240	S					
9								S	A	A	A		305	305	305	A	A	S						
10								S		200	255	295	300		A	300	280	235	S					
11								S	A	220		295	305	305	295	260	230	S						
12								S	A	210		300	305	310	305	275	250	S						
13								S		200	250	300	305	315	A		290	240	S					
14								S		240	260	300	310	305	310	290	250	180	S					
15								S		200	255	290	300	300	300	280	250	195	S					
16								S	A	200		290	305	305	310	A	A	S						
17								S		210	260	290	310	310	305	290	245	S						
18								S		215	260	300	310	310	305	290	A	S						
19								S	A	A	A		305	305	305	295	250	200	S					
20								S	A	A		295	310	310	300	290	255	190	S					
21								S		205	250	300	305	310	300	285	250	190	S					
22								S	A	205		A	305	315	305	280	250	S						
23								S		230	265	300	305	310	305	A	260	205	S					
24								S		220	255	300	305	315	305	A	270	A	S					
25								S		230	270	A	A	315	310	295	255	A	S					
26								S	A	220		A	A	305	305	285	255	190	S					
27								S	A	210		300	310	A	305	280	B	B	S					
28								S	A	220		300	305	315	305	285	255	B	S					
29								S	A	205		A	A	A	A	290	A	S						
30								S		230	280	A	A	A	A	295	265	200	S					
31								S	A	215		300	305	320	305	295	275	S						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									25	16	22	25	25	28	27	25	8							
MED									210	258	295	305	310	305	285	250	192							
UQ									220	260	300	305	310	305	290	255	200							
LQ									205	255	290	300	305	298	275	235	190							

JAN. 1988

FOE (0.01 MHz)

IONOSPHERIC DATA

JAN. 1988

FOES (0.1 MHz)

135 E Mean Time (G.M.T. + 9h)

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 15	J 22	E 15	E 15	J 23	J 30	J 65	J 56	J 78	G	J 40	30	J 34	G	G	G	E 19	E 16	E 16	J 23	J 26	J 26	E 16	E 15
2	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 17	J 36	J 28	G	G	G	G	G	G	E 18	J 24	J 28	J 24	E 15	J 24	J 21	J 21
3	J 24	E 15	E 15	J 25	J 31	J 36	E 15	22	30	J 36	J 45	J 40	G	G	G	25	E 18	E 16	J 60	J 45	J 26	J 25	E 15	E 16
4	E 15	E 15	E 15	E 15	J 26	E 15	E 15	24	G	G	G	G	G	G	G	G	21	E 16	J 24	E 16	E 16	E 16	E 17	E 16
5	J 23	E 15	E 16	E 15	E 15	E 15	J 21	J 25	G	G	G	G	G	G	G	E 25	21	E 16	J 30	J 38	J 52	J 19	J 25	J 33
6	J 45	J 26	J 25	J 21	J 20	J 20	E 16	J 25	E 21	G	G	G	E 32	G	G	G	E 18	E 15	J 26	J 54	J 58	E 16	E 16	J 28
7	J 25	J 28	J 25	E 16	E 16	E 16	E 16	J 23	J 24	J 84	J 74	J 46	32	30	30	J 35	E 17	E 15	E 15	J 24	E 15	J 26	J 24	E 15
8	J 24	J 25	E 16	E 16	E 16	E 15	E 16	J 21	J 29	G	30	G	34	G	G	G	E 19	E 16	E 16	E 15	E 16	E 16	E 16	J 33
9	J 25	J 25	E 15	E 15	E 15	J 37	J 24	J 47	J 29	J 41	31	J 44	G	J 34	J 51	J 47	J 29	E 15	J 22	J 24	J 24	J 54	J 52	J 46
10	J 33	J 20	J 21	J 19	J 26	E 15	J 20	J 20	24	G	G	34	J 40	G	29	G	E 18	E 15	E 15	E 15	J 21	J 24	E 15	E 15
11	E 17	E 16	E 17	E 16	E 15	E 16	E 16	E 15	25	J 36	G	G	G	G	G	G	22	E 15	E 16	E 15	E 15	E 15	E 24	E 15
12	E 16	E 15	E 16	E 15	E 16	E 16	E 16	E 16	G	J 46	G	G	G	G	G	G	E 17	E 15	E 15	E 16	E 15	E 15	E 15	C
13	E 16	E 15	E 16	E 15	E 16	E 16	E 16	E 15	G	G	J 51	J 50	J 50	J 42	J 38	G	E 17	E 16	J 19	E 15	E 19	E 15	E 21	E 15
14	J 24	J 24	J 23	E 15	E 15	E 15	E 15	21	G	G	G	35	G	G	G	G	22	E 15	E 15	E 15	E 15	E 15	E 15	E 15
15	E 17	E 16	E 15	E 15	E 15	E 15	J 19	J 25	23	G	G	G	G	G	33	28	G	E 15	E 15	E 15	E 15	E 15	E 15	E 15
16	E 15	E 15	E 15	E 16	E 15	E 15	E 15	19	G	J 50	G	33	J 52	J 39	J 34	29	J 29	J 22	E 15	E 15	E 15	E 16	E 24	J 24
17	J 24	J 18	J 24	J 24	E 15	E 15	E 15	E 18	G	J 29	G	G	G	G	G	G	E 18	E 18	E 17	E 15	E 15	J 42	J 24	E 15
18	E 16	E 16	E 15	E 16	E 15	E 16	E 16	E 15	G	G	G	G	J 48	G	G	J 33	J 32	J 23	E 15	E 15	E 15	E 15	E 15	E 15
19	E 16	E 16	E 15	E 15	E 15	J 26	E 16	E 16	25	J 32	J 33	G	G	G	G	G	E 15	E 15	E 29	E 15	E 22	E 16	E 15	
20	E 16	J 24	J 20	E 15	E 16	E 16	E 16	E 17	J 25	30	G	G	G	G	G	G	G	E 18	E 15	J 24	J 21	E 15	J 24	E 15
21	E 16	J 22	E 15	E 16	E 16	E 16	E 16	E 15	G	G	G	G	G	G	G	G	G	E 16	E 28	J 18	J 20	J 21	J 21	J 36
22	E 15	J 19	J 24	J 22	J 26	E 18	E 15	E 18	J 26	J 50	J 32	J 42	G	G	G	G	E 17	E 16	E 15	E 15	E 15	E 15	E 15	E 15
23	E 15	E 15	E 15	E 15	E 15	E 15	E 16	E 16	G	G	J 42	34	38	37	J 33	J 32	G	E 15	E 15	E 15	E 15	E 15	J 23	J 20
24	J 20	E 15	E 15	E 15	E 15	E 15	E 15	E 16	G	G	G	G	G	G	J 33	G	22	E 15	E 15	E 16	E 15	E 15	E 15	E 15
25	J 29	E 16	E 15	E 15	E 16	E 16	E 16	E 16	G	G	31	35	G	G	G	28	J 28	J 24	J 21	E 15	E 15	E 24	E 15	E 15
26	E 15	E 15	E 15	E 15	E 15	E 15	E 15	21	G	J 28	J 36	J 33	G	G	G	G	G	E 15	E 20	J 18	J 25	E 60	E 22	E 16
27	E 15	E 16	E 15	E 15	E 16	E 16	E 16	E 17	G	31	J 44	G	34	G	G	E 27	E 24	E 16	E 16	E 15	J 24	J 25	J 24	J 29
28	J 28	J 25	J 52	E 15	E 15	E 16	E 15	E 16	G	28	G	G	G	G	G	G	E 21	E 16	E 15	E 15	J 18	J 18	E 15	E 15
29	E 16	E 15	E 16	E 16	E 16	E 16	E 16	24	G	J 30	35	32	33	32	37	33	J 33	E 16	E 16	E 16	E 23	E 18	E 17	E 16
30	E 15	E 15	J 25	E 16	J 19	J 25	J 25	J 22	G	G	31	34	J 51	J 33	G	G	G	E 16	E 18	E 16	J 24	J 27	J 31	E 16
31	E 16	E 15	E 16	E 15	E 15	E 16	E 16	E 18	G	J 29	G	G	G	G	J 33	G	34	E 16	J 24	E 17	E 16	E 16	E 16	E 16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	30
MED	E 16	E 16	E 16	E 15	E 16	E 16	E 16	E 18	G	28	G	G	G	G	G	G	E 18	E 16	E 16	E 16	E 16	E 18	E 17	E 16
UQ	J 24	J 22	J 20	E 16	E 16	E 16	E 16	J 22	25	J 32	J 34	J 34	34	E 26	32	25	22	E 16	J 22	J 24	J 24	J 24	J 24	J 21
LQ	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 16	G	G	G	G	G	G	G	G	E 17	E 15	E 15	E 15	E 15	E 15	E 15	E 15

JAN. 1988

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JAN. 1988

FBES (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station		AKITA							Lat.	39° 43' 5" N			Long.	140° 08' 0" E			Sweep 1 MHz to 25 MHz in 2 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 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15	G 24	G 22	G 23	G 22	G 19	E 16	S 16	E 16	S 15	E 20	S 16	E 16	S 15	
2		E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15	G 23	G 26	G 26	G 26	G 18	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15	
3		E 15	S 15	E 15	S 15	E 22	S 23	E 15	S 21	E 28	S 30	E 30	S 30	G 25	G 18	E 16	S 16	E 16	S 20	E 15	S 15	E 15	S 15	E 15	S 16		
4		E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15	G 19	G 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 17	S 16		
5		E 16	S 15	E 16	S 15	E 15	S 15	E 18	S 21	G 25	G 20	E 20	S 16	E 16	S 16	E 16	S 16	E 15	S 16	E 18	S 19						
6		E 23	S 15	E 15	S 15	E 15	S 16	E 16	S 17	E 21	G 32	G 32	E 32	S 31	G 21	G 19	E 18	S 15	E 15	S 18	A 53	E 16	S 16	E 18	S 18		
7		E 15	S 23	E 20	S 16	E 16	S 16	E 16	S 17	E 18	S 39	E 46	S 32	G 31	G 22	G 19	E 17	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15		
8		E 16	S 15	E 16	S 16	E 16	S 16	E 16	S 16	E 21	G 26	G 26	G 32	G 32	G 32	G 19	E 19	S 16	E 16	S 15	E 16	S 16	E 16	S 16	E 18		
9		E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 47	E 23	S 27	E 29	S 33	G 26	G 30	E 27	E 20	S 15	E 15	S 15	E 15	S 15	E 15	S 52	E 46		
10		E 22	S 15	E 15	S 15	E 15	S 15	E 15	S 16	E 23	G 23	G 24	S 32	E 25	G 20	G 18	E 18	S 17	E 15	S 15	E 15	S 15	E 15	S 15	E 15		
11		E 17	S 16	E 17	S 16	E 15	S 16	E 16	S 15	E 24	S 29	G 24	G 24	G 24	G 24	G 22	E 22	S 15	E 16	S 15	E 15	S 15	E 15	S 15	E 15		
12		E 16	S 15	E 16	S 15	E 16	S 16	E 16	S 16	E 33	G 33	G 33	G 33	G 33	G 33	G 17	E 17	S 15	E 16	S 15	E 15	S 15	E 15	S 15	E 15		
13		E 16	S 15	E 16	S 15	E 16	S 16	E 16	S 15	E 28	G 27	G 27	G 22	G 30	G 26	G 17	E 17	S 16	E 15	S 15	E 15	S 15	E 15	S 15	E 15		
14		E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 29	G 29	G 29	G 29	G 29	G 21	G 15	E 21	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15		
15		E 17	S 16	E 15	S 15	E 15	S 15	E 24	S 23	G 24	G 24	G 24	G 24	G 24	G 24	G 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15		
16		E 15	S 15	E 15	S 16	E 15	S 15	E 15	S 15	E 29	G 32	G 36	G 26	G 30	G 26	G 22	E 22	S 16	E 15	S 15	E 15	S 15	E 15	S 16	E 15		
17		E 16	S 15	E 15	S 15	E 15	S 15	E 15	S 18	E 21	G 21	G 21	G 21	G 21	G 18	E 18	S 18	E 17	S 15	E 15	S 15	E 15	S 15	E 15	S 15		
18		E 16	S 16	E 15	S 16	E 15	S 16	E 16	S 15	E 23	G 23	G 23	G 23	G 23	G 20	E 18	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15		
19		E 16	S 16	E 15	S 15	E 15	S 16	E 16	S 16	E 23	G 23	G 30	G 30	G 30	G 30	G 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 16	E 15		
20		E 16	S 15	E 15	S 15	E 16	S 16	E 16	S 17	E 23	G 23	G 23	G 23	G 23	G 18	E 18	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15		
21		E 16	S 16	E 15	S 16	E 16	S 16	E 16	S 15	E 23	G 23	G 23	G 23	G 23	G 23	G 16	E 16	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15		
22		E 15	S 15	E 15	S 15	E 15	S 18	E 15	S 18	E 19	G 28	G 30	E 27	G 27	G 17	E 17	S 16	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15		
23		E 15	S 15	E 15	S 15	E 15	S 15	E 16	S 16	E 35	G 34	E 35	S 34	G 30	E 28	G 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15		
24		E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 16	E 30	G 30	G 30	G 30	G 30	G 22	E 22	S 15	E 15	S 16	E 15	S 15	E 15	S 15	E 15	S 15		
25		E 16	S 16	E 15	S 15	E 16	S 16	E 16	S 16	E 31	G 32	G 32	G 32	G 22	E 22	G 20	E 16	S 16	E 15	S 15	E 15	S 15	E 15	S 15	E 15		
26		E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 16	E 27	G 30	E 31	G 31	G 31	G 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 16		
27		E 15	S 16	E 15	S 15	E 16	S 16	E 16	S 17	E 30	G 35	G 34	G 34	G 27	E 24	E 16	S 16	E 16	S 15	E 15	S 15	E 15	S 15	E 21	E 16		
28		E 18	S 15	E 19	S 15	E 15	S 16	E 15	S 16	E 28	G 28	G 28	G 28	G 28	E 21	E 16	S 16	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15		
29		E 16	S 15	E 16	S 16	E 16	S 16	E 16	S 19	E 30	G 33	E 32	S 33	E 32	G 27	E 24	E 16	S 16	E 16	S 16	E 16	S 16	E 17	E 16			
30		E 15	S 15	E 16	S 16	E 15	S 17	E 19	S 18	E 30	G 34	E 41	S 33	G 20	E 16	E 18	E 16	S 16	E 16	S 16	E 16	S 17	E 15	E 16			
31		E 16	S 15	E 16	S 15	E 15	S 16	E 16	S 18	E 23	G 23	G 23	G 23	G 25	G 34	E 16	E 21	E 17	S 16	E 16	S 16	E 16	S 16	E 16	S 16		
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT		31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	30		
MED		E 16	S 15	E 15	S 15	E 15	S 15	E 15	S 16	E 21	G 21	G 21	G 21	G 21	G 18	E 18	S 16	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15		
UQ		E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 18	E 23	G 23	E 30	S 30	E 32	G 21	E 23	G 20	E 16	S 16	E 16	S 16	E 15	S 16	E 16	S 16		
LQ		E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 16	E 23	G 23	G 23	G 23	G 23	G 17	E 17	S 15	E 15	S 15	E 15	S 15	E 15	S 15	E 15	S 15		

JAN. 1988

FBES (0.1 MHz)





# IONOSPHERIC DATA

JAN. 1988

M(3000)F2 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station	AKITA																											
	00	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	300	290	F	F	315	A	365	380	355	350	350	375	355	360	390	H	315	310	335	365	325	270	F				
2	F	310	320	315	300	305	345	345	365	340	340	355	360	350	355	360	300	315	320	330	280	280	F	F				
3	F	F	F	F	275	275	285	280	380	355	H	310	345	335	325	350	345	355	400	370	350	375	365	285	310	F		
4	F	F	F	F	F	F	F	355	H	315	345	360	360	350	335	H	305	360	390	325	325	355	340	300	265	295		
5	310	F	F	F	F	295	305	365	370	330	355	H	340	350	365	H	340	335	335	325	350	320	305	310	270	280		
6	290	295	325	335	275	275	285	330	355	375	365	335	350	355	360	360	345	315	355	340			A	295	285	305		
7	F	295	310	320	300	300	270	375	355	345	345	335	340	335	365	370	350	340	320	305	300	315	280	310				
8	300	325	310	290	325	290	320	350	365	370	H	330	360	335	H	300	400	350	370	315	310	365	310	295	F	F		
9	315	320	320	F	F	F	F	A	360	350	350	350	330	360	355	350	360	330	345	350	340	275		A	A			
10	305	F	F	300	325	335	335	330	380	350	335	360	335	350	390	345	360	345	375	310	325	320	295	295				
11	295	300	290	295	295	300	345	360	390	375	370	345	360	355	360	360	365	355	315	340	325	290	290	290				
12	280	295	300	295	305	295	305	335	370	365	345	340	355	390	H	320	355	355	I	C	350	270	295	310	275	I	C	
13	305	275	290	275	295	270	300	325	385	370	H	325	375	355	350	350	355	360	305	320	360	345	320	290	275			
14	285	290	290	305	325	305	290	355	355	H	345	340	335	340	335	350	355	335	325	305	340	270	280	270	265			
15	285	305	285	310	360	290	350	355	330	315	H	290	340	305	285	290	305	310	300	330	315	305	305	F	F			
16	360	295	295	290	345	365	330	360	H	315	H	310	360	H	325	H	340	H	315	H	325	335	315	355	335	345	280	260
17	290	295	275	310	320	340	320	335	345	385	380	345	355	350	345	365	350	365	280	320	335	325	290	280				
18	285	295	285	300	295	290	355	H	310	345	370	335	355	330	360	340	360	370	395	310	320	350	330	310	305			
19	300	275	280	295	305	275	380	365	H	350	H	325	345	335	390	325	355	355	360	345	365	315	350	355	265	280		
20	270	295	295	295	285	300	310	335	375	375	365	335	370	360	375	370	360	335	335	350	360	350	305	275				
21	275	285	305	300	300	295	320	360	390	H	310	H	335	360	H	340	H	335	365	375	340	340	320	340	340	275	285	
22	295	290	295	295	305	275	305	365	375	380	355	315	350	345	350	360	375	315	350	325	335	345	280	290				
23	290	300	305	285	320	370	355	360	H	340	H	340	350	335	365	360	365	350	375	355	320	345	345	320	275	285		
24	305	295	300	315	310	305	310	360	385	380	355	365	345	355	360	355	360	360	355	335	335	335	350	290	295			
25	270	275	280	285	295	300	325	360	360	390	350	325	345	360	335	360	360	340	325	350	320	350	305	285				
26	305	285	295	325	300	305	335	360	360	H	325	355	355	355	365	360	340	360	350	300	315	330	320	290	320			
27	270	275	285	290	335	300	305	335	380	380	360	385	335	355	335	345	320	345	340	H	265	320	310	285	285			
28	F	290	275	315	315	295	305	345	345	340	345	335	330	365	365	350	355	370	320	350	330	325	295	275				
29	265	255	305	335	310	310	340	355	370	340	320	340	340	335	H	315	345	375	365	305	335	300	285	280	285			
30	300	295	300	295	320	285	305	355	350	385	305	335	365	360	370	345	365	365	275	330	320	345	255	285				
31	295	290	290	305	H	265	320	345	385	365	320	330	H	330	H	325	330	365	345	345	345	345	H	290	275	315		
CNT	30	30	30	28	29	29	29	29	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	28	27		
MED	295	295	295	298	305	300	320	355	360	350	345	340	345	355	350	355	360	340	325	335	332	320	280	285				
UQ	300	300	305	312	325	305	335	360	375	375	355	358	355	360	360	360	370	355	348	350	345	335	290	295				
LQ	285	285	290	290	300	290	305	335	350	360	335	335	335	335	342	338	345	352	325	312	320	320	295	275	280			

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M(3000)F2 (0.01)



# IONOSPHERIC DATA

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H<sup>o</sup>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										210	230	240	235	235											
2										220	250	225	230	230	245										
3											260	225	250	245	235										
4											230	245	230	230											
5										240	245	220	235	230											
6											230	240	240	245											
7										230	245	250	250	255	225										
8										230	285	245	225	235	230	235									
9										240	245	225	240	245	240										
10										230	250	240	255	245	220										
11										225	225	230	235	245	240	210									
12										225	245	220	245	225	215										
13										220	275	235	235	240	235										
14										210	240	260	245	235	240										
15											250	270	260	250											
16										245	225	240	240	240	240										
17											230	225	250	240	250										
18											260	230	270	240	240	240									
19										225	245	220	205	250	245	225									
20										220	250	245	235	240	240										
21										220	245	240	250	260	240	240									
22										235	250	255	235	240	245	240									
23										240	220	240	245	225	245	245	245								
24										205	250	240	240	230	230										
25										225	210	260	245	250	250	260									
26										220	250	235	240	240	240										
27										230	235	240	230	260	260	250	240								
28										230	255	260	265	240	240	225									
29										230	225	250	265	300	260										
30										235	240	240	240	240	230										
31										230	290	240	230	245	225										
	00	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	25	30	31	31	31	25	11									
MED									230	225	245	240	240	240	240	240									
UQ									235	230	250	245	250	245	245	240									
LQ									228	220	240	230	235	238	230	230									

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H<sup>o</sup>F2 (KM)

# IONOSPHERIC DATA

JAN. 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									
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	285	275	270	285	260	255	A	230	205	200	205	230	235	220	225	200	200	250	245	225	235	E S	300	
2	E S 295	255	245	240	270	280	235	220	210	200	200	200	230	225	195	210	200	210	260	260	240	E S 295	E S 340	E S 305	
3	270	245	270	E S 345	A	A	E S 310	210	245	220	200	220	225	200	230	225	200	200	225	210	220	250	260	250	
4	260	270	250	240	260	235	220	220	205	230	220	200	230	195	235	220	210	235	240	235	230	E S 325	E S 295		
5	235	E S 295	270	295	305	290	245	220	210	200	235	220	210	235	230	225	230	205	210	230	250	245	E A 300	E A 330	
6	A	300	250	215	290	E S 305	285	235	225	220	200	195	220	230	230	240	220	225	220	235	A	E S 290	E S 290	E A 290	
7	E S 315	A	275	230	285	295	E S 330	200	220	A	A	220	210	210	225	210	215	215	235	270	275	250	E S 255	245	
8	245	230	235	260	250	260	230	225	215	230	H 205	255	200	200	225	240	210	200	250	215	245	275	E S 210	E A 335	
9	280	225	250	250	235	270	E S 260	A	210	200	200	210	210	210	230	230	220	220	235	230	240	E S 270	A	A	
10	A	260	280	275	250	240	235	220	210	195	220	230	215	200	220	245	210	205	220	E S 270	240	260	E S 300	E S 305	
11	E S 300	285	285	275	280	255	235	220	200	210	215	195	H 200	225	235	205	240	200	240	210	240	E S 290	E S 305	E S 290	
12	275	245	270	275	265	295	240	240	220	A	220	200	205	230	200	240	210	I C 205	205	E S 280	E S 295	E S 310	E S 300	C	
13	265	E S 300	295	E S 300	275	E S 340	275	250	210	H 200	205	200	200	200	200	225	210	200	240	230	230	220	E S 320	E S 330	
14	E S 320	E S 310	E S 320	260	235	E S 295	E S 280	230	210	205	210	250	210	200	200	220	H 210	210	220	220	E S 300	E S 320	E S 350	E S 325	
15	E S 320	265	E S 300	255	225	360	255	240	255	245	250	230	225	230	230	250	230	220	220	230	245	240	E S 320	230	
16	220	E S 280	E S 280	270	225	210	230	230	215	220	225	225	220	220	210	220	205	195	220	250	215	230	E S 330	E S 350	
17	E S 335	E S 300	E S 315	265	245	E S 250	E S 275	230	225	205	200	195	H 195	220	230	240	240	200	E S 260	250	230	260	E S 295	E S 325	
18	E S 320	E S 285	E S 290	260	260	E S 300	215	210	200	205	H 210	220	200	200	230	195	225	200	225	250	240	230	250	E S 300	
19	280	E S 300	E S 310	E S 300	245	285	220	225	205	200	200	220	H 200	235	245	210	210	200	215	275	240	225	E S 350	E S 325	
20	E S 320	285	290	285	295	290	245	230	215	205	200	200	H 200	230	220	230	210	H 200	230	220	235	230	E S 300	E S 350	
21	E S 330	280	265	260	265	250	245	230	215	195	225	210	200	H 200	200	200	210	205	225	225	230	220	E S 305	E S 300	
22	285	275	265	255	265	290	250	210	220	200	195	200	210	220	220	225	210	235	220	225	230	230	E S 300	E S 310	
23	300	280	280	E S 300	255	205	220	225	205	H 220	A	220	225	220	195	220	220	200	220	215	230	255	E S 300	E S 330	
24	E S 305	E S 300	270	245	255	E S 285	270	225	215	200	195	200	205	225	220	225	220	210	225	240	210	225	E S 300	E S 295	
25	E S 335	E S 310	E S 300	285	280	245	230	205	200	200	245	220	220	205	205	230	220	210	230	220	225	225	260	E S 280	
26	E S 280	E S 320	280	275	270	255	240	225	225	200	200	200	230	230	220	220	220	210	245	245	240	235	270	245	
27	295	E S 300	290	280	235	230	295	235	225	220	220	210	210	240	230	220	225	225	230	265	250	255	E A 340	E S 330	
28	E A 330	290	E A 320	260	250	250	270	220	225	220	200	200	245	240	230	210	220	210	250	220	230	250	E S 300	E S 310	
29	E S 320	E S 325	280	245	235	240	230	215	225	215	210	225	220	205	230	205	220	205	250	230	240	285	E S 300	E S 295	
30	E S 295	285	260	275	250	290	265	230	220	225	215	240	A	210	205	240	230	215	270	225	230	245	E S 340	E S 310	
31	290	295	300	270	225	E S 265	250	215	220	200	225	250	220	230	210	235	225	215	235	210	235	235	E S 305	285	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	30	31	31	30	30	31	29	31	29	29	31	30	31	31	31	31	31	31	31	31	30	31	30	29
MED	E S 295	E U 265	272	265	258	259	240	225	215	205	210	210	210	220	220	225	220	205	230	230	235	238	E S 300	E S 305	
UQ	E S 320	E S 300	286	276	275	288	261	230	225	220	220	222	225	230	230	232	222	215	241	248	240	258	E S 320	E S 325	
LQ	272	265	266	255	245	245	232	220	210	200	200	200	200	202	208	215	210	200	220	220	230	230	E S 295	E S 290	

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H·F (KM)

### IONOSPHERIC DATA

JAN. 1988

H°E (KM)

135° E Mean Time (G.M.T. + 9h)

Station	AKITA							Lat. 39° 43' 5" N	Long. 140° 08' 0" E	Sweep 1	MHz to 25	MHz in 25	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	A	115	A	A	110	110	110	110	S								
2								S		120	110	110	110	110	115	110	115	S							
3								S		120	110		A	A	105	110	110	S							
4								S	S	110	115	115	E B	E B	120	115	E S	S							
5								S	S	110	E B	E B	E B	E B	E B	E B	B	S							
6								S	B	E B	E B	E B	B	E B	E B	E B	S								
7								S		110	A	A	A	100	105	A	A	S							
8								S	A			A	105		105	110	110	115	120						
9								S		110	110		A	105	105	A	A	A	S						
10								S	E S	120	110	110		A	A	A	A	120	S						
11								S	S		105	110	115	110	110	110	110	S							
12								S		115	110	105	105	105	110	110	120	S							
13								S	S		105		A	A	A	A	110	S							
14								S	S		110	110		A	105	110	110	120	S						
15								S	E S	120	110	110	110	110	110		A	A	S						
16								S	E S	120	A	110	110	105		A	A	A	S						
17								S	S		A	105	105	115	110	115	115	S							
18								S		115	115	110	110	110	110	115		A	S						
19								S	S		115	110	110	110	110	105	105	S							
20								S	S		115	110	110	110	110	110	120	E S							
21								S	E S	125	115	110	110	115	115	115	120	S							
22								S	A		A	A	A	105	105	115	115	S							
23								S	S	E B	120	115	115	E B	120	110	110	110	S						
24								S		120	110	105	110	110	110	110	115	S							
25								S	S		110	110	110	110	110	110		A	A						
26								S		110	110	110	110	110	105	115	120	E S							
27								S	S		115	110	E B	E B	125	125	110	E B	B	B					
28								S	E B	E B		E B	B	125	120	110	110	E B	B						
29								S	E S	125	110	110	110	110	110	110	105	S							
30								S		110	110	110	110	110	110	110	110	S							
31								S	E S	120	115	110	110	110	105		A	S							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									16	27	24	24	29	27	24	23	2								
MED									115	110	110	110	110	110	110	115	E S								
UQ									E E	120	114	110	112	112	110	115	120								
LQ									111	110	110	110	110	110	110	110	110								

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H°E (KM)

# IONOSPHERIC DATA

JAN. 1988

H°ES (KM)

135° E Mean Time (G.M.T. + 9h)

Station		AKITA							Lat. 39° 43' 5" N	Long. 140° 08' 0" E			Sweep 1 MHz to 25 MHz in 2 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	105	S	S	110	105	110	105	105	G	100	100	100	G	G	G	S	S	S	105	100	100	S	S	
2	S	S	S	S	S	S	S	S	120	120	G	G	G	G	G	G	S	100	105	105	S	105	105	105	
3	100	S	S	115	115	110	S	135	125	110	105	105	G	G	G	135	S	S	110	105	100	105	S	S	
4	S	S	S	S	115	S	S	105	G	G	G	G	G	G	G	G	125	S	120	S	S	S	S	S	
5	100	S	S	S	S	S	110	105	G	G	G	G	G	G	G	B	150	S	115	105	105	100	100	100	
6	100	100	105	105	100	100	S	110	B	G	G	G	B	G	G	G	S	S	S	110	110	105	S	S	
7	100	100	95	S	S	S	S	115	105	105	100	100	145	100	100	100	S	S	S	110	S	105	105	S	
8	105	100	S	S	S	S	S	115	105	G	105	G	120	G	G	G	S	S	S	S	S	S	S	100	
9	100	100	S	S	S	115	115	110	110	110	105	110	G	100	100	105	100	S	100	105	100	105	105	100	
10	100	100	100	100	100	S	105	105	130	G	G	100	100	100	100	G	S	S	S	S	S	95	95	S	S
11	S	S	S	S	S	S	S	S	140	110	G	G	G	G	G	G	150	S	S	S	S	S	S	S	
12	S	S	S	S	S	S	S	S	G	120	G	G	G	G	G	G	S	C	S	S	S	S	S	C	
13	S	S	S	S	S	S	S	S	G	G	105	105	105	100	95	G	S	S	115	S	105	S	100	S	
14	105	105	105	S	S	S	S	110	G	G	G	105	G	G	G	G	145	S	S	S	S	S	S	S	
15	S	S	S	S	S	S	145	140	140	G	G	G	G	G	G	105	100	G	S	S	S	S	S	S	
16	S	S	S	S	S	S	S	110	G	105	150	115	100	100	100	100	100	110	S	S	S	S	S	105	100
17	105	110	95	100	S	S	S	S	G	105	G	G	G	G	G	G	S	S	S	S	S	S	100	100	S
18	S	S	S	S	S	S	S	S	G	G	G	G	105	G	100	100	125	100	S	S	S	S	S	S	
19	S	S	S	S	S	110	S	S	125	120	120	G	G	G	G	G	G	S	S	110	S	105	S	S	
20	S	100	100	S	S	S	S	S	130	120	G	G	G	G	G	G	G	S	S	105	105	S	100	S	
21	S	100	S	S	S	S	S	S	G	G	G	G	G	G	G	G	G	S	110	110	120	110	110	105	
22	S	115	115	100	100	S	S	S	105	105	105	100	G	G	G	G	S	S	S	S	S	S	S	S	
23	S	S	S	S	S	S	S	S	G	G	125	150	130	130	110	130	G	S	S	S	S	S	105	105	
24	100	S	S	S	S	S	S	S	G	G	G	G	G	G	115	G	120	S	S	S	S	S	S	S	
25	100	S	S	S	S	S	S	S	G	G	125	125	G	G	100	100	100	100	100	S	S	S	S	S	
26	S	S	S	S	S	S	S	115	G	110	110	110	G	G	G	G	G	S	110	105	105	105	105	S	
27	S	S	S	S	S	S	S	S	G	140	120	G	120	G	G	B	B	S	S	S	110	105	100	120	
28	100	100	100	S	S	S	S	S	G	125	G	G	G	G	G	G	B	S	S	S	110	110	S	S	
29	S	S	S	S	S	S	S	105	G	110	120	110	110	110	110	110	105	S	S	S	100	100	S	S	
30	S	S	95	S	115	105	100	110	G	G	120	115	110	110	G	G	G	S	S	S	105	105	125	S	
31	S	S	S	S	S	S	S	S	G	130	G	G	G	G	G	100	G	100	S	95	S	S	S	S	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	12	12	9	5	7	6	6	15	12	16	14	14	11	8	12	9	11	4	11	11	14	16	14	9	
MED	100	100	100	100	110	108	110	110	122	110	108	108	110	100	100	100	120	100	110	105	105	105	105	100	
UQ	102	105	105	105	115	110	115	115	130	120	120	115	120	110	108	110	135	105	112	110	105	105	105	105	
LQ	100	100	95	100	100	105	105	105	105	108	105	100	105	100	100	100	100	100	102	105	100	100	100	100	

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H°ES (KM)

# IONOSPHERIC DATA

JAN. 1988

TYPES OF ES

135° E Mean Time (G.M.T. + 9h)

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 <sub>2</sub>			F <sub>2</sub>	F <sub>2</sub>	F <sub>2</sub>	L <sub>3</sub>	L <sub>2</sub>		L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>							F <sub>2</sub>	F <sub>4</sub>	F <sub>2</sub>			
2									C <sub>1</sub>	C <sub>1</sub>								F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>		F <sub>2</sub>	F <sub>1</sub>	F <sub>1</sub>	
3	F <sub>1</sub>			F <sub>4</sub>	F <sub>5</sub>	F <sub>4</sub>		H <sub>3</sub>	C <sub>2</sub>	C <sub>2</sub>	L <sub>1</sub>	L <sub>1</sub>				H <sub>1</sub>			F <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>	F <sub>1</sub>			
4					F <sub>2</sub>			L <sub>1</sub>									C <sub>1</sub>		F <sub>1</sub>						
5	F <sub>2</sub>					F <sub>2</sub>		L <sub>5</sub>									H <sub>1</sub>		F <sub>1</sub>	F <sub>3</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>2</sub>	
6	F <sub>2</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>		C <sub>3</sub>											F <sub>1</sub>	F <sub>2</sub>	F <sub>5</sub>			F <sub>1</sub>	
7	F <sub>2</sub>	F <sub>3</sub>	F <sub>3</sub>					C <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>2</sub>	L <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>			F <sub>1</sub>		F <sub>1</sub>	F <sub>1</sub>			
8	F <sub>1</sub>	F <sub>1</sub>						C <sub>1</sub>	L <sub>2</sub>		L <sub>1</sub>		C <sub>1</sub>											F <sub>2</sub>	
9	F <sub>2</sub>	F <sub>1</sub>			F <sub>2</sub>	F <sub>2</sub>		C <sub>3</sub>	C <sub>1</sub>	C <sub>1</sub>	L <sub>1</sub>	C <sub>1</sub>		L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>		F <sub>2</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>	F <sub>2</sub>	
10	F <sub>2</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>		F <sub>1</sub>	L <sub>1</sub>	C <sub>1</sub>			L <sub>1</sub>	L <sub>2</sub>	L <sub>1</sub>	L <sub>1</sub>						F <sub>2</sub>	F <sub>1</sub>			
11									H <sub>2</sub>	C <sub>1</sub>								H <sub>1</sub>						F <sub>1</sub>	
12										C <sub>2</sub>															
13											L <sub>2</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>				F <sub>1</sub>		F <sub>1</sub>			F <sub>1</sub>	
14	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>					C <sub>2</sub>				L <sub>2</sub>						H <sub>2</sub>							
15						F <sub>1</sub>	H <sub>2</sub>	H <sub>1</sub>							L <sub>1</sub>	L <sub>1</sub>									
16								C <sub>1</sub>	L <sub>2</sub>		H <sub>1</sub>	C <sub>1</sub>	L <sub>2</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	F <sub>1</sub>						F <sub>1</sub>	F <sub>2</sub>	
17	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>					L <sub>1</sub>													F <sub>2</sub>	F <sub>2</sub>		
18													L <sub>1</sub>		L <sub>1</sub>	L <sub>1</sub>	C <sub>1</sub>	F <sub>1</sub>							
19					F <sub>1</sub>				C <sub>1</sub>	C <sub>1</sub>	C <sub>1</sub>									F <sub>2</sub>		F <sub>1</sub>			
20		F <sub>1</sub>	F <sub>1</sub>						C <sub>1</sub>	C <sub>2</sub>										F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>		F <sub>1</sub>	
21		F <sub>1</sub>																	F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>	
22		F <sub>1</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>				L <sub>1</sub>	L <sub>2</sub>	L <sub>1</sub>	L <sub>1</sub>													
23										C <sub>1</sub>	H <sub>1</sub>	C <sub>1</sub>	C <sub>1</sub>	C <sub>1</sub>	C <sub>1</sub>	C <sub>1</sub>							F <sub>1</sub>	F <sub>1</sub>	
24	F <sub>1</sub>														C <sub>1</sub>		C <sub>2</sub>								
25	F <sub>1</sub>									C <sub>1</sub>	C <sub>1</sub>				L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>			F <sub>1</sub>			
26								C <sub>1</sub>		C <sub>1</sub>	C <sub>1</sub>	C <sub>1</sub>						F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>1</sub>		
27									H <sub>2</sub>	C <sub>1</sub>			C <sub>1</sub>							F <sub>3</sub>	F <sub>2</sub>	F <sub>4</sub>	F <sub>2</sub>	F <sub>2</sub>	
28	F <sub>3</sub>	F <sub>2</sub>	F <sub>3</sub>						C <sub>1</sub>												F <sub>1</sub>	F <sub>1</sub>			
29								L <sub>1</sub>		C <sub>1</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>1</sub>	C <sub>1</sub>	L <sub>3</sub>				F <sub>2</sub>	F <sub>2</sub>			
30			F <sub>1</sub>		F <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>	C <sub>1</sub>			C <sub>2</sub>	C <sub>2</sub>	C <sub>2</sub>	C <sub>1</sub>							F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>		
31										C <sub>1</sub>					L <sub>1</sub>		L <sub>1</sub>		F <sub>2</sub>						
	00	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																									

JAN. 1988

TYPES OF ES



# IONOSPHERIC DATA

JAN. 1988

FXI (0.1 MHz)

135 E Mean Time (G.M.T. + 9h)

Station	ROKUBUNJI		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 38	A	43	X 40	X 40	X 39	X 41											X 42	X 36	X 39	X 40	X 33	X 32	X 37
2	X 37	X 39	X 37	X 37	X 37	X 36	X 38											X 46	X 39	X 47	X 48	X 46	75	71
3	70	52	47	X 35	X 34	X 34	X 30											X 46	X 43	X 49	X 33	X 34	40	X 39
4	X 42	X 43	49	55	46	50	48											X 57	X 39	X 43	X 44	X 34	X 31	X 33
5	X 36	X 36	X 39	X 39	X 35	X 36	X 38											X 60	X 48	X 44	X 30	X 31	X 35	X 31
6	X 35	X 36	X 47	X 26	X 29	X 31	X 32											X 50	X 62	A	X 38	A	X 30	X 32
7	X 34	X 36	X 38	X 33	X 32	X 30	X 35											X 54	X 41	X 41	X 45	X 47	X 42	X 40
8	X 41	X 45	X 44	X 38	X 40	X 37	X 40											X 49	X 37	X 44	X 38	X 35	X 37	X 37
9	X 41	X 45	X 31	X 33	X 34	X 32	X 34							75				X 52	X 42	X 41	X 38	X 33	X 33	X 33
10	X 34	X 38	X 37	X 39	X 39	X 36	X 29		74									X 50	X 42	X 39	X 36	X 29	X 30	X 32
11	X 34	X 36	X 36	X 36	X 38	X 34	X 31											X 66	X 39	X 45	A	X 39	X 38	X 40
12	X 41	X 36	X 36	X 40	X 41	X 37	X 36											X 62	X 48	X 41	X 40	X 46	X 41	X 46
13	X 39	X 39	X 39	X 36	X 35	X 34	X 35											X 51	X 41	X 49	X 45	X 32	X 27	X 30
14	X 33	X 34	X 33	X 35	X 39	X 28	X 27											X 66	X 51	X 41	X 35	X 37	X 38	X 39
15	X 40	X 42	X 40	X 35	X 45	X 28	X 31											X 99	X 89	X 76	0	X 53	X 57	X 65
16	X 64	X 33	X 37	X 42	X 49	X 40	X 31											X 47	X 38	X 45	X 32	X 30	X 30	
17	X 31	X 33	X 33	0	X 36	X 27	X 27											X 36	X 43	X 45	X 38	X 36	X 31	
18	X 34	X 38	X 36	X 38	X 37	X 36	X 32											X 33	X 42	X 49	X 38	X 31	X 33	
19	X 32	X 32	X 34	X 35	X 37	X 30	X 31											C	C	C	C	C	C	C
20	C	C	C	C	C	C	C											X 65	X 63	X 64	X 36	X 30	X 31	
21	X 33	X 36	X 37	X 34	X 37	X 30	X 36											C	C	C	C	C	C	C
22	C	C	C	C	C	C	C											X 37	X 38	X 31	X 31	X 29	X 33	
23	X 34	X 36	X 36	X 34	X 38	X 33	X 30											X 42	X 38	X 36	C	C	C	
24	C	C	C	C	C	C	C											C	C	C	C	C	C	C
25	C	C	C	C	C	C	C											X 46	X 44	X 40	X 33	X 32	X 35	
26	X 37	X 37	X 37	X 40	X 39	X 38	X 37											X 44	X 42	X 48	X 42	X 37	X 39	
27	X 36	X 36	X 37	X 39	X 39	X 30	X 28											C	X 40	C	S	X 42	X 34	X 37
28	X 39	X 39	X 39	X 40	X 37	X 36	X 34											C	X 49	X 36	X 35	X 32	X 33	
29	X 36	X 36	X 36	X 40	X 40	X 32	X 30											C	C	X 39	X 33	X 35	X 37	
30	X 35	X 37	X 38	X 36	X 40	X 32	X 33											X 42	X 50	X 38	X 41	X 34	X 36	
31	C	C	C	C	C	C	X 32											X 50	X 50	X 37	X 35	X 32	X 35	
	00	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	26	26	26	26	27		1					1				15	25	26	26	26	27	27
MED	X 36	X 36	X 37	X 36	X 38	X 34	X 32		74					75				X 52	X 42	X 43	X 40	X 35	X 34	X 35
UQ	X 40	X 39	X 39	X 40	X 40	X 36	X 36											X 61	X 47	X 47	X 45	X 41	X 38	X 39
LQ	X 34	X 36	X 36	X 35	X 36	X 30	X 30											X 50	X 39	X 41	X 36	X 33	X 31	X 32

JAN. 1988

FXI (0.1 MHz)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JAN. 1988

FOF2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station		ROKUBUNJI 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		32	A	F	35	34	34	33	35	55	63	73	78	77	72	68	65	63	58	H	36	30	33	34	27	26	31					
2		31	33	31	31	31	30	32	55	64	73	66	104	78	73	V	77	77	51	40	33	41	42	40	F	U	F	42				
3		U	F	F	F	29	28	28	24	58	S	98	108	88	V	84	86	76	89	S	79	62	40	37	43	27	28	F	33			
4		36	37	F	F	40	39	42	49	65	67	75	81	79	69	H	61	83	70	51	33	37	38	28	25	27						
5		30	30	33	33	29	30	32	54	61	I	C	64	94	92	67	68	64	H	67	56	54	42	38	24	25	29	25				
6		29	30	41	20	23	25	26	54	79	83	75	67	82	73	72	70	60	44	56			A	32		A	24	26				
7		28	30	32	27	26	24	29	45	62	73	84	I	S	88	96	83	82	S	65	54	48	35	35	39	41	36	S	34			
8		35	S	38	32	S	S	34	60	72	70	71	88	86	77	R	77	78	74	43	31	38	32	29	31	31						
9		S	39	25	V	27	28	26	28	45	73	R	69	83	R	98	74	65	71	65	61	46	36	35	32	27	27	27				
10		28	32	31	33	33	30	23	47	60	69	78	87	86	93	75	65	R	75	44	36	33	30	23	24	26						
11		28	30	30	30	32	28	25	55	61	60	74	74	73	69	C	J	S	79	59	60	33	39		A	33	32	34				
12		35	30	S	34	35	31	30	52	S	73	69	72	92	90	100	75	S	68	71	56	42	35	34	40	S	S	S	40			
13		33	33	33	30	S	S	29	28	S	J	S	56	85	70	80	80	77	79	65	68	60	45	35	43	39	26	21	24			
14		27	28	27	29	33	22	21	53	63	78	58	79	96	R	85	70	73	63	60	V	45	S	35	29	31	32	33				
15		34	36	34	29	R	22	25	44	R	71	65	J	R	81	98	105	106	116	114	J	R	110	93	S	83	70	53	S	F	F	54
16		58	27	31	36	43	34	25	53	57	75	92	104	83	67	73	J	S	73	73	52	41	32	39	26	24	24					
17		25	27	27	27	30	21	21	50	70	89	71	J	R	71	71	72	88	67	74	70	56	30	37	S	39	32	30	25			
18		28	32	30	32	31	30	26	47	65	74	90	85	74	79	J	S	79	74	60	61	27	36	43	32	25	27					
19		26	26	28	29	31	24	25	52	61	62	J	R	80	84	78	C	C	C	C	C	C	C	C	C	C	C	C	C			
20		c	c	c	c	c	c	c	c	c	c	c	c	65	71	77	H	77	H	66	60	46	39	37	38	28	24	25				
21		27	30	31	28	31	24	30	54	62	62	86		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	91	85	77	77	62	50	45	31	32	25	25	23	27						
23		28	30	30	28	32	27	24	43	56	58	71	87	77	68	62	64	65	51	36	32	30			C	C	C					
24		c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c			
25		c	c	c	c	c	c	c	c	c	c	c	c	74	C	63	U	S	76	63	50	40	38	34	27	26	29					
26		31	31	S	34	33	32	31	53	60	63	73	86	70	J	H	U	S	69	65	62	47	38	36	42	36	S	31	33			
27		30	30	31	33	33	24	22	49	67	65	73	C	C	75	C	C	C	C	C	C	C	C	34	C	S	28	31				
28		33	33	33	34	31	30	28	49	58	V	63	77	C	C	C	C	C	C	C	C	C	C	43	30	29	26	S	27			
29		30	30	S	34	34	26	24	50	60	60	72	82	76	70	H	66	67	77	57	I	C	I	C	34	34	33	27	29	31		
30		29	31	32	30	34	26	27	52	61	71	70	R	I	R	87	76	68	J	R	61	62	57	36	44	32	S	28	30			
31		I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	I	C	
		30	30	30	32	36	24	26	54	59	66	65	80	86	75	63	67	64	59	44	44	S	31	29	26	29						
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
CNT		27	25	27	27	27	27	27	27	27	27	28	26	27	26	25	26	26	26	26	26	26	27	26	26	26	27					
MED		30	30	31	31	32	28	26	52	63	69	75	86	78	75	70	68	62	50	36	37	34	29	28	29							
UQ		34	33	33	34	34	30	30	54	70	73	82	91	86	79	75	76	70	57	41	40	39	35	31	33							
LQ		28	30	30	29	30	24	24	49	60	64	71	80	74	68	65	65	60	45	33	34	30	27	25	26							

The Radio Research Laboratory, Japan

JAN. 1988

FOF2 (0.1 MHz)

# IONOSPHERIC DATA

JAN. 1988

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9h)

Station		Tokyo							Rokubunji							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									A	A	L	L	L	U	L	L									
2											L	L	L	U	L	L	L	L							
3											L	L	L	L	L	L	L	L							
4									250		L	L	L	L	L	L	L	L							
5											C	L	L	L	L	L	L	L							
6										L	L	L	L	L	L	L	L	L							
7												L	L	L	L	L	L	L							
8											L	L	L	L	L	L	L	L							
9											L	L	L	A	A	L	L	L							
10									290		L	L	L	L	L	L	L	L							
11											L	L	L	L	L	L	C	L							
12											L	L	L	L	L	L	L	L							
13										L	L	L	L	L	L	L	L	L							
14											L	L	L	L	L	L	L	L							
15											L	L	L	L	L	L	L	L							
16											L	L	L	L	L	L	L	L	L						
17											L	L	L	L	L	L	L	L	L						
18											L	L	L	L	L	L	L	L	L						
19												L	L	C	C	C	C	C	C						
20									C	C	C	C	L	L	L	L	L	L	L						
21											L	C	C	C	C	C	C	C	C						
22									C	C	C	C	L	L	L	L	L	L	L						
23											L	L	L	L	L	L	L	L	L						
24									C	C	C	C	C	C	C	C	C	C	C						
25									C	C	C	C	C	L	C	L	L	L	L						
26											L	L	L	L	L	L	L	L	L						
27										L	L	C	C	L	C	C	C	C	C						
28											L	L	C	C	C	C	C	C	C						
29										L	L	L	L	L	L	L	L	L	L						
30										L	L	L	L	L	L	L	L	L	L						
31										L	C	C	C	C	L	L	L	L	L						
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT											2	4	2	3	1	1									
MED										270		450	420	U	L	L	L								
UQ												480		470											
LQ												435		430											

JAN. 1988

FOF1 (0.01 MHz)

# IONOSPHERIC DATA

JAN. 1988

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station **ROKUBUNJI 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								A	A	A	A	320	325	310	290	245	H							
2								B	245	270	305	315	320	310	285	245	190							
3								H	275	295	A	315	315	305	290	255	205							
4								A	220	275	305	320	325	310	290	250	210							
5								A	235	I C	280	310	320	320	310	295	250	200						
6								165	250	A	A	310	315	310	285	235	R							
7								A	U A	A	A	280	U S	300	315	295	285	S	R					
8								A	215	270	300	305	320	310	300	A	190							
9								A	A	R	295	A	A	A	295	265	200							
10								U A	180	245	280	R	325	325	320	305	260	210						
11								175	225	R	305	320	325	R	C	250	U S	190						
12								R	A	A	A	R	325	315	300	265	R							
13								A	230	280	305	325	320	305	290	265	A							
14								B	A	280	R	330	340	325	305	270	200							
15								A	235	280	300	310	310	315	295	270	215							
16								B	225	275	A	325	335	330	A	265	215	B						
17								B	230	290	310	325	335	325	305	265	205	R						
18								185	250	A	U R	310	325	R	320	305	275	A	B					
19								175	R	285	A	320	U R	C	C	C	C	C	C					
20								C	C	C	305	320	325	315	R	R	R	B						
21								B	215	280	310	C	C	C	C	C	C	C						
22								C	C	C	C	325	325	300	275	205	H	B						
23								B	230	285	A	315	335	320	A	280	225	B						
24								C	C	C	C	C	C	C	C	C	C	C						
25								C	C	C	C	C	325	C	300	280	A	A						
26								B	A	A	A	A	R	310	295	A	225	B						
27								B	220	285	315	C	C	325	C	C	C	C						
28								170	240	R	305	C	A	C	C	C	C	C						
29								A	A	280	A	320	330	330	310	280	230	B						
30								175	245	280	300	315	A	A	305	275	225	B						
31								185	230	I C	285	C	C	C	325	300	285	A	B					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								8	20	18	16	22	22	23	22	22	18							
MED								175	230	280	305	320	325	315	295	265	205							
UQ								182	245	285	310	325	325	322	305	275	215							
LQ								172	222	280	300	315	320	310	290	250	195							

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JAN. 1988

FOE (0.01 MHz)

### IONOSPHERIC DATA

JAN. 1988

FOES (0.1 MHZ)

135° E Mean Time (G.M.T. + 9h)

Station	Rokubunji 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	J A 54	J A 55	J A 32	J A 26	J A 27	J A 27	J A 22	J A 32	J A 66	J A 48	J A 78	G 28	G 24	J A 32	G 18	G	G 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 21	J A 18				
2	E B 13	E B 13	E B 14	J A 23	E B 14	E B 14	E B 13	E B 14	25	G	G	G	G 25	G 18	G 26	G	G 22	J A 15	E B 24	J A 20	J A 22	E B 15	J A 25					
3	E B 13	E B 13	E B 13	J A 20	22	J A 18	E S 15	G	36	J A 48	34	G 29	G 28	G	G	G 23	G	E B 23	E B 14	J A 52	J A 52	J A 43	J A 30	J A 29				
4	E B 13	18	E B 15	E B 15	E B 12	J A 25	E B 13	J A 29	J A 29	G	G	G	G	G	G	J A 53	J A 23	E B 12	E B 13	E B 15	E B 13	E B 20	J A 18					
5	E B 14	E B 13	E B 12	E B 13	J A 25	E B 14	E B 14	J A 25	J A 28	C	G	G	G	G	G	29	25	25	J A 33	J A 19	J A 17	E B 25	E S 16					
6	E B 12	J A 23	E B 14	17	E B 12	E B 12	E B 12	19	J A 36	J A 30	44	30	G	G	G	G	G 16	J A 45	J A 52	J A 31	J A 56	J A 26	J A 27					
7	33	J A 25	J A 17	E B 15	J A 16	E B 13	E B 15	18	25	J A 32	G	G	G	G	G	E S 26	G	E B 14	19	18	E B 14	E B 14	E B 15	J A 21				
8	J A 20	24	J A 18	E B 15	E B 15	E B 15	E B 15	22	G	27	G	G	G	G	34	19	30	G	19	E B 13	E B 13	E B 14	E B 14	19				
9	J A 31	J A 25	E B 12	17	E B 12	E B 13	E B 14	J A 21	J A 33	G	G	J A 56	J A 31	J A 43	34	G	25	G	J A 27	22	22	17	J A 19	J A 22	J A 24			
10	J A 32	J A 28	J A 26	J A 29	22	J A 14	21	J A 26	J A 44	G	G	G	G	G	G	G	G	G	J A 17	J A 35	J A 20	J A 28	19	19	14	18		
11	J A 18	E B 13	E B 14	E B 13	E B 12	E B 13	E B 14	G	G	G	J A 34	30	G	G	C	G	G	J A 24	E B 15	J A 34	J A 62	25	E B 15	E B 14				
12	E B 15	19	E B 17	E B 12	E B 14	E B 14	E B 14	G	33	33	36	G	G	G	G	G	G	E B 15	E B 14	18	E B 14	E B 14	E B 15	E B 15				
13	E B 15	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	20	G	G	G	G	G	G	G	G	26	26	26	16	14	14	19	22	E B 14			
14	E B 14	E B 14	E B 14	17	E B 13	E B 14	E B 14	E B 14	J A 52	26	G	G	G	G	G	G	G	E B 14	18	E B 14	14	14	14	14	15			
15	E B 14	E B 15	E B 14	E B 15	18	E B 15	J A 19	22	33	25	G	G	G	G	G	G	G	J A 23	J A 27	E B 15	E B 14	E B 14	E B 15	E B 14	E B 15			
16	E B 14	E S 18	E B 12	E B 13	E B 14	J A 22	E B 14	23	G	31	33	38	J A 37	G	33	G	G	E B 15	E B 13	J A 17	19	18	J A 17	19				
17	20	19	16	17	21	19	E S 14	E B 14	27	34	33	30	28	37	25	G	G	18	E B 14	21	21	E B 13	20	J A 27				
18	18	E B 14	E B 12	E B 14	E B 14	E B 14	E B 13	19	27	32	G	G	G	G	G	G	G	J A 29	E B 14	E B 14	E B 14	E B 15	E B 14	E B 14				
19	E B 14	E B 12	E B 14	E B 12	E B 13	E B 13	E B 13	G	G	32	35	G	41	C	C	C	C	C	C	C	C	C	C	C	C			
20	C	C	C	C	C	C	C	C	C	C	C	C	35	G	G	G	G	G	E B 14	E B 15	E B 15	E B 15	E B 14	E B 14	E B 14			
21	E B 13	21	E B 13	E B 14	E B 14	E B 15	E B 13	14	G	31	37	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	C	C	C	C	C	G	E B 14	J A 17	18	E B 14	17	E B 14	E B 13			
23	18	E B 14	E B 13	E B 14	E B 12	E B 13	E B 14	19	G	G	33	34	37	G	32	J A 32	G	E B 15	E B 15	21	E B 13	C	C	C	C			
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	J A 27	J A 23	20	18	J A 26	J A 30	J A 18	E B 15			
26	18	E B 14	E B 15	E B 14	19	E B 14	E B 14	16	29	J A 30	35	33	G	G	33	31	G	J A 21	J A 25	J A 26	J A 21	21	20	J A 24				
27	J A 17	E B 14	21	24	J A 25	J A 20	E B 15	25	33	J A 47	C	C	C	C	C	C	C	C	C	C	J A 22	C	J A 18	J A 23	J A 25			
28	J A 24	18	J A 22	19	19	18	17	G	G	G	G	C	D	C	C	C	C	C	C	C	C	E B 15	18	18	20	E B 14		
29	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	J A 20	J A 26	J A 25	48	36	38	39	36	25	G	G	18	C	C	E B 14	E B 14	E B 14	21			
30	E B 14	18	J A 18	E B 15	E B 13	J A 21	19	J A 19	G	G	33	36	40	35	28	G	G	G	E B 17	E B 14	19	E B 13	J A 16	E B 12	J A 23			
31	C	C	C	C	C	C	E B 13	G	G	C	C	C	C	C	C	C	C	37	30	31	J A 29	J A 22	22	20	E B 13	E B 14	E S 17	E B 14

JAN. 1988

FOES (0.1 MHZ)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JAN. 1988      FBES (0.1 MHZ)

135° E Mean Time (G.M.T. + 9 h)

Station	Tokyo							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	19	A 55	19	15	15	21	E 16	43	49	31	40	27	G 24	G 26	G 17	G	G	E 14	E 14	E 14	E 14	E 14	E 15	E 14
2	E 13	E 13	E 14	E 12	E 14	E 14	E 13	E 14	23	G	G	G	G 25	G 18	G 26	G	G	E 16	E 15	E 19	E 13	E 15	E 15	E 14
3	E 13	E 13	E 13	E 14	E 13	E 18	E 15	G	36	42	31	26	G 26	G	G	G	G	E 15	E 14	E 22	E 16	E 22	E 20	E 14
4	E 13	E 15	E 15	E 15	E 12	E 13	E 13	E 16	16	G	G	G	G	G	G	G	G	E 16	E 12	E 13	E 15	E 13	E 13	E 14
5	E 14	E 13	E 12	E 13	E 15	E 14	E 14	E 17	19	G	C	G	G	G	G	G	29	23	17	26	17	E 13	E 15	E 12
6	E 12	E 14	E 14	E 14	E 12	E 12	E 12	E 14	23	29	31	27	G	G	G	G	G	E 14	E 36	A 52	15	A 56	E 15	E 20
7	17	17	E 14	E 15	E 15	E 13	E 15	15	22	27	G	G	G	G	G	E 26	G	E 14	E 15	E 13	E 14	E 14	E 15	E 14
8	19	19	E 15	E 15	E 15	E 15	E 15	15	22	27	G	G	G	G	G	E 19	28	G	E 16	E 13	E 13	E 14	E 14	E 13
9	E 14	E 15	E 12	E 13	E 12	E 13	E 14	E 15	25	G	G	36	50	33	31	22	G	15	E 14	E 17	E 12	E 15	E 13	E 14
10	21	20	E 16	E 15	E 14	E 12	E 15	E 18	19	G	G	34	G	G	G	G	G	16	17	17	21	E 14	E 14	E 13
11	E 14	E 13	E 14	E 13	E 12	E 13	E 14	G	G	G	G	27	G	G	G	G	G	E 15	E 15	E 25	A 62	E 16	E 15	E 14
12	E 15	E 15	E 17	E 12	E 14	E 14	E 14	G	24	29	32	G	G	G	G	G	G	E 15	E 14	E 14	E 14	E 14	E 15	E 15
13	E 15	E 15	E 14	E 14	E 14	E 14	E 14	E 16	G	G	G	G	G	G	G	G	G	24	18	E 16	E 14	E 14	E 15	E 14
14	E 14	E 14	E 14	E 15	E 13	E 14	E 14	E 14	U 31	A 20	29	G	G	G	G	G	G	E 14	E 14	E 14	E 14	E 14	E 14	E 15
15	E 14	E 15	E 14	E 15	E 14	E 15	E 15	E 20	28	22	G	G	24	G	G	G	G	17	21	E 15	E 14	E 14	E 15	E 14
16	E 14	E 18	E 12	E 13	E 14	E 14	E 14	E 16	G	G	31	36	27	G	G	G	G	E 15	E 13	E 13	E 13	E 14	E 15	E 14
17	E 14	E 14	E 14	E 16	E 14	E 14	E 14	E 14	20	31	32	24	G	G	36	24	G	G	17	E 14	E 14	E 13	E 13	E 14
18	E 13	E 14	E 12	E 14	E 14	E 14	E 13	E 15	22	27	G	G	G	G	G	G	G	21	E 14	E 14	E 14	E 15	E 14	E 14
19	E 14	E 12	E 14	E 12	E 13	E 15	E 13	G	G	31	33	G	38	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	30	G	G	G	G	G	G	E 14	E 15	E 15	E 15	E 14	E 13
21	E 13	E 14	E 13	E 14	E 14	E 15	E 13	E 14	G	31	36	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	G	G	G	G	G	G	E 14	E 14	E 13	E 14	E 14	E 13
23	E 13	E 14	E 13	E 14	E 12	E 13	E 14	E 15	G	G	33	33	35	G	30	25	G	E 15	E 15	E 14	E 13	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	G	21	21	E 15	E 15	20	E 14	E 15
26	E 14	E 14	E 15	E 14	E 14	E 14	E 14	E 16	24	28	32	32	G	G	32	30	G	18	16	19	E 13	E 15	E 15	
27	E 15	E 14	E 14	E 14	E 18	E 15	E 15	E 15	24	29	39	C	C	G	C	C	C	C	C	C	16	C	E 15	
28	E 14	E 13	E 14	E 13	E 13	E 13	E 15	G	G	G	G	C	37	C	C	C	C	C	C	E 15	E 14	E 15	E 14	
29	E 14	E 14	E 14	E 14	E 14	E 14	E 14	E 18	23	19	29	34	36	35	32	23	G	16	C	C	E 14	E 14	E 14	
30	E 14	E 13	E 18	E 15	E 13	E 14	E 13	E 15	18	G	G	32	33	40	32	26	G	G	E 17	E 14	E 13	E 13	E 15	
31	C	C	C	C	C	C	E 13	G	G	C	C	C	C	C	35	27	G	22	16	15	E 15	E 13	E 14	
CNT	26	26	26	26	26	26	27	27	27	25	27	25	27	26	25	26	26	26	25	27	27	27	27	27
MED	E 14	E 14	E 14	E 14	E 14	E 14	E 14	E 15	20	G	29	24	G	G	G	G	G	15	E 15	E 15	E 14	E 14	E 14	E 14
UQ	E 15	E 15	E 15	E 15	E 14	E 15	E 14	E 16	24	29	32	32	G	G	G	G	G	16	17	E 15	E 17	E 14	E 15	E 15
LQ	E 13	E 13	E 13	E 13	E 13	E 13	E 13	E 14	G	G	G	G	G	G	G	G	G	G	E 14	E 14	E 14	E 13	E 14	E 14

JAN. 1988      FBES (0.1 MHZ)

### IONOSPHERIC DATA

JAN. 1988

FMIN (0.1 MHZ)

135° E Mean Time (G.M.T. + 9h)

Station		Rokubunji 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		14	13	13	13	14	13	14	13	22	24	21	23	18	16	14	16	13	14	14	14	14	14	E S	13	14		
2		13	13	14	12	14	14	13	14	14	15	17	16	17	21	13	14	13	13	15	15	13	13	15	14			
3		13	13	13	12	13	15	E S	15	13	15	20	19	21	21	20	16	15	14	13	14	14	14	15	14	14		
4		13	15	15	15	12	13	13	13	13	16	17	20	21	21	18	16	13	12	13	15	13	13	14	12			
5		14	13	12	13	15	14	14	13	14	C	21	23	24	24	22	18	15	14	15	14	13	13	12	E S	16		
6		12	14	14	14	12	12	12	12	15	20	21	20	21	21	21	20	15	14	15	14	14	15	15	15			
7		15	15	14	15	15	13	15	12	15	16	15	E S	21	21	21	18	E S	26	16	14	15	13	14	14	15	14	
8		15	15	15	15	15	15	15	14	14	14	15	16	20	20	16	18	15	14	13	13	14	14	14	13			
9		14	13	12	13	12	13	14	14	14	22	19	21	20	20	17	15	14	13	14	13	13	13	13	14			
10		14	14	13	12	13	12	15	13	14	20	21	17	18	23	16	15	13	14	16	14	14	14	14	13			
11		14	13	14	13	12	13	14	14	14	15	19	19	16	18	C	16	16	15	15	14	19	16	15	14			
12		15	15	17	12	14	14	14	14	16	21	22	21	21	21	22	16	15	15	14	14	14	14	15	15			
13		15	15	14	14	14	14	14	14	14	14	16	16	21	15	19	15	15	14	16	14	14	14	14	14			
14		14	14	14	13	13	14	14	14	14	14	17	21	23	18	16	15	13	14	15	14	14	14	14	15			
15		14	15	14	15	14	15	14	14	14	15	16	19	17	16	15	13	14	13	15	14	14	15	14	15			
16		14	E S	18	12	13	14	14	14	16	13	16	17	20	18	17	16	15	14	15	13	13	14	14	13	14		
17		14	14	14	13	14	14	E S	14	14	15	17	16	18	20	24	15	18	15	15	14	14	13	13	14	12		
18		13	14	12	14	14	14	13	13	15	16	20	18	22	20	19	19	15	14	14	14	15	14	15	14			
19		14	12	14	12	13	15	13	14	15	16	18	20	19	C	C	C	C	C	C	C	C	C	C	C	C		
20		C	C	C	C	C	C	C	C	C	C	C	17	19	22	20	19	19	15	14	15	15	15	14	13	14		
21		13	14	13	14	14	15	13	14	15	22	21	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	16	26	15	16	14	13	14	14	12	14	14	14	13		
23		13	14	13	14	12	13	14	16	14	16	18	17	20	21	17	14	14	15	15	14	13	C	C	C			
24		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
25		C	C	C	C	C	C	C	C	C	C	C	C	16	C	15	15	14	16	15	15	14	14	15	15			
26		14	14	15	14	14	14	14	16	13	14	16	16	17	20	19	16	16	14	15	15	13	15	15	15			
27		15	14	14	14	14	15	15	15	14	20	16	C	C	22	C	C	C	C	C	C	12	C	15	13	13		
28		14	14	14	13	13	13	15	13	16	22	23	C	24	C	C	C	C	C	C	C	15	14	15	14	14		
29		14	14	14	14	14	14	14	15	14	13	14	14	16	18	14	15	14	12	C	C	14	14	14	15			
30		14	13	13	15	13	14	13	12	12	19	17	20	19	19	19	18	17	17	14	13	13	E S	15	12	14		
31		C	C	C	C	C	C	13	12	15	C	C	C	C	17	17	14	13	13	14	E S	15	13	14	E S	17	14	
		00	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	26	26	26	26	27	27	27	25	27	25	27	26	25	26	26	26	25	27	27	27	27	27	27		
MED		14	14	14	14	14	14	14	14	14	16	17	19	20	20	17	16	14	14	15	14	14	14	14	14	14		
UQ		14	14	14	14	14	14	14	14	15	20	20	21	21	21	19	18	15	15	15	14	14	15	15	14	14		
LQ		13	13	13	13	13	13	13	13	14	15	16	17	18	18	16	15	13	13	14	14	13	14	14	14	14		

JAN. 1988

FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

### IONOSPHERIC DATA

JAN. 1988

M(3000)F2 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station	ROKUBUNJI		TOKYO		Lat.	35 42.4 N				Long	139 29.3 E				Sweep 1 MHz to 25 MHz in 24sec 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	305	A	F	320	320	310	305	330	350	355	330	325	335	335	345	345	360	H	365	335	335	350	355	290	295					
2	310	320	340	320	315	310	330	355	345	350	320	335	315	345	325	V	330	350	335	305	315	320	290	F	U F 290					
3	U F 320	F	F	305	275	295	285	315	340	S	335	340	315	315	325	325	S	355	320	340	350	355	270	F	305					
4	305	315	F	305	340	315	335	355	335	325	335	325	330	350	335	H	310	355	360	320	350	360	350	325	305					
5	320	315	320	325	290	305	335	355	365	I C	350	335	335	340	325	345	H	340	350	340	345	365	350	350	330	295				
6	290	305	350	335	310	305	330	330	350	340	330	320	315	315	330	310	335	325	325	A	345	A	285	295						
7	285	315	305	345	310	270	320	355	335	305	315	I S	320	305	305	330	S	330	325	335	300	290	325	305	S	290				
8	285	S	325	290	315	S	310	305	325	345	330	350	305	330	R	325	R	335	340	345	340	325	350	330	340	305	280			
9	320	S	350	320	320	S	335	305	335	350	335	345	R	320	R	335	F	325	340	345	345	335	350	330	335	315	315			
10	290	315	315	315	340	330	345	345	340	365	335	320	320	330	330	335	R	350	360	335	360	350	325	320	310					
11	305	310	310	320	325	325	355	355	365	340	335	345	300	325	C	J S	335	325	325	300	320	A	320	295	295					
12	305	320	S	305	330	290	315	320	330	S	340	315	320	295	315	325	S	335	330	330	335	325	290	315	310	S	290			
13	315	300	305	305	300	S	280	S	J S	340	335	320	320	325	315	315	320	325	345	300	320	335	345	305	280					
14	285	285	285	305	335	300	290	330	350	340	350	315	320	330	R	335	330	335	335	335	V	S	350	315	300	290	290			
15	295	315	310	335	320	R	365	315	R	325	300	330	J R	290	300	295	285	285	295	J R	320	S	330	335	295	S	300	F	F	305
16	330	345	295	310	340	350	295	335	360	320	320	300	355	345	350	J S	345	340	340	325	355	355	355	315	305					
17	290	300	320	320	350	325	320	335	335	335	345	J R	340	320	335	330	335	340	340	375	315	S	335	335	335	300				
18	285	315	320	325	350	310	350	325	350	310	320	320	305	315	J S	320	305	325	335	310	305	320	340	305	300					
19	295	300	290	290	325	330	320	325	340	345	J R	290	325	325	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
20	C	C	C	C	C	C	C	C	C	C	C	C	290	340	315	H	295	H	300	340	325	340	315	325	350	295	275			
21	270	300	300	325	345	285	320	325	325	335	310	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	320	320	320	340	350	350	345	340	340	350	335	300	305					
23	295	300	315	305	340	355	345	350	350	350	300	335	330	345	335	350	335	360	340	350	335	C	C	C	C					
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	330	C	310	U S	320	330	330	330	330	340	325	305	290					
26	290	270	S	305	320	305	305	340	340	325	280	315	285	J H	U S	320	315	330	335	340	305	325	335	325	S	300				
27	305	285	295	300	335	315	315	320	330	345	325	C	C	315	C	C	C	C	C	C	345	C	345	285	285					
28	305	325	305	320	350	320	325	350	350	V	310	325	C	C	C	C	C	C	C	C	C	325	325	315	270	S	290			
29	285	285	S	320	340	325	315	330	335	340	330	320	320	335	335	H	335	345	345	C	C	335	325	325	315					
30	320	305	320	315	335	310	325	335	345	335	315	R I R	330	350	335	J R	325	330	340	355	345	325	335	S	345	295				
31	C	C	C	C	C	C	335	350	335	C	C	C	C	325	345	330	325	350	350	335	S	355	335	290	300					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	26	24	26	26	26	26	27	27	27	26	27	25	26	26	25	26	26	26	25	26	26	26	26	26	27					
MED	300	308	310	318	332	310	320	335	340	335	320	320	320	325	330	332	340	340	335	332	335	335	305	295						
UQ	310	315	320	320	340	325	335	350	350	345	335	335	330	335	335	340	350	345	340	350	350	345	320	305						
LQ	290	300	300	305	315	305	315	325	335	330	315	320	315	315	325	320	330	330	325	320	325	320	295	290						

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M(3000)F2 (0.01)



# IONOSPHERIC DATA

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M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9h)

Station		ROKUBUNJI 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									A	A	L	L	L	U	L	L														
2											L	L	L	420	U	L	L													
3											L	L	L	L	L	L	L													
4									415		L	L	L	L	L	L	L													
5										C	L	L	L	L	L															
6										L	L	L	L	L	L	L														
7												L	L	L	L	L														
8											L	L	L	L	L	L	L													
9											L	L	L	A	A	L	L													
10										L	L	L	L	L	L	L	395	L												
11									400		L	L	L	L	L	C	L													
12											L	L	L	L	L	L	L													
13										L	L	L	L	L	L	L	L													
14											L	L	L	L	L	L	L													
15												L	L	L	L	L	L													
16											L	L	L	L	L	L	L	L												
17											L	L	L	L	L	L	L													
18											L	L	L	L	L	L	L	L												
19													L	L	C	C	C	C	C	C										
20										C	C	C	C	395	L	L	L	L	L											
21												L	C	C	C	C	C	C	C											
22										C	C	C	C	L	L	L	L	L												
23											L	L	L	L	L	L														
24										C	C	C	C	C	C	C	C	C	C											
25										C	C	C	C	C	L	C	L	L												
26											L	L	L	L	L	L	L													
27											L		L	C	C	L	C	C	C											
28											L	L	C	C	C	C	C	C	C											
29											L	L	L	L	L	L	L	L												
30											L	L	L	L	L	L	L	L												
31											L	C	C	C	C	L	L	L												
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT										2		4	2	3	1	1		1												
MED										408		395	410	U	L	L	L	L												
UQ											398		U	L	L	L	L	L												
LQ												378		385																

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M(3000)F1 (0.01)

# IONOSPHERIC DATA

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H<sup>o</sup>F<sub>2</sub> (KM)

135° E Mean Time (G.M.T. + 9h)

Station **ROKUBUNJI 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								A 255	245	255	260	245	260	255	245									
2											230	265	250	285	245	L 270	240	215						
3											250	225	260	275	240	255	225							
4										L 220	250	245	255	260	230	H 235	L 280							
5											C 245	240	240	255										
6											225	230	235	250	260	250	255							
7												260	240	265	255	240								
8											250	230	265	235	260	255	235							
9											230	260	250	E A 285	230	260	230							
10											225	215	245	260	265	245	250	245						
11											230	235	220	270	245	C 235								
12											230	255	255	285	250	230	230							
13											240	225	235	250	245	260	235	245						
14											245	230	260	270	255	245	245							
15											320	295	285	310	285	270								
16											260	265	305	220	255	230	240	235						
17											245	240	240	265	250	255	245							
18											285	260	245	275	260	255	240	225						
19												285	245	230	C	C	C	C	C					
20									C	C	C	330	235	265	250	270	235							
21												265	C	C	C	C	C	C	C					
22									C	C	C	C	270	265	260	235	215							
23											230	310	255	255	250		240							
24									C	C	C	C	C	C	C	C	C	C						
25									C	C	C	C	C	260	C	250	240							
26											250	H 270	255	U L 295	H 290	265	255							
27											240		255	C	C	280	C	C	C	C				
28											250	245		C	C	C	C	C	C					
29											230	240	260	270	265	255	H 235	255	235					
30											230	240	280	275	240	240	275	255						
31											245	C	I C 265	I C 265	I C 260	260	240	260						
	00	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	9	20	28	26	27	26	23	22	4							
MED								A 255	230	242	260	255	265	255	250	240	230							
UQ									240	250	265	265	271	260	258	255	235							
LQ									225	230	242	245	258	245	238	235	220							

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H<sup>o</sup>F<sub>2</sub> (KM)

# IONOSPHERIC DATA

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H\*F (KM)

135° E Mean Time (G.M.T. + 9h)

Station		Rokubunji TOKYO Lat. 35° 42' 4" N Long. 139° 29' 3" E										Sweep 1 MHz to 25 MHz in 2 sec in automatic operation																
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	310	A	280	265	280	E A	310	255	A	A	240	A	210	190	H	210	225	235	210	H	205	240	240	225	220	320	320	
2	285	260	240	265	270	295	255	220	235	225	210	190	200	H	215	215	215	210	235	285	270	255	305	305	310			
3	250	240	285	360	360	E S	365	270	230	A	H	H	210	220	H	240	215	225	240	240	240	E A	E A	E A	280			
4	280	275	265	275	230	260	235	215	190	H	215	195	205	220	230	210	235	215	205	250	225	215	230	E B	305			
5	275	275	270	255	330	300	240	215	210	C	235	220	200	200	240	230	225	220	E A	255	220	E B	255	255	E S			
6	325	305	230	E B	305	310	270	245	230	225	210	205	185	210	245	240	225	210	255	A	220	A	325	340				
7	345	295	275	230	275	350	250	205	225	230	255	230	230	225	225	225	220	230	225	265	280	230	250	275				
8	300	270	240	255	240	250	255	240	220	H	215	210	195	H	220	235	245	230	210	245	225	255	240	290	325			
9	270	220	275	275	255	280	240	215	A	225	H	200	260	A	A	220	230	230	215	225	235	245	240	285	295			
10	E A	E A	280	270	235	250	E B	270	225	205	205	190	240	215	215	215	205	210	215	250	240	240	E B	275	295	305		
11	305	285	290	275	260	255	E B	250	215	215	210	205	220	195	195	C	235	225	230	265	255	A	270	285	285			
12	270	245	305	270	240	295	255	235	230	230	220	235	210	235	220	235	225	215	205	225	295	250	265	290				
13	255	275	275	285	280	320	280	245	225	220	230	210	230	190	215	205	220	215	265	235	220	225	E B	E B	350			
14	325	315	325	280	230	E B	E B	345	325	230	215	230	205	205	235	215	220	220	230	225	210	235	290	295	310	330		
15	310	275	270	235	260	230	H	280	245	A	230	240	215	225	225	255	240	E A	260	245	230	220	280	285	275			
16	240	260	305	280	230	225	325	235	205	H	210	260	230	220	225	220	235	220	235	220	220	240	305	320				
17	355	320	285	285	235	285	E S	290	230	235	245	225	205	195	255	225	210	H	230	210	205	270	230	235	E A	315		
18	325	280	270	275	235	290	220	235	225	230	255	230	225	215	225	220	230	205	200	255	245	220	E B	270				
19	295	285	305	300	250	245	255	245	225	220	215	245	235	C	C	C	C	C	C	C	C	C	C	C	C	C		
20	C	C	C	C	C	C	C	C	C	C	C	C	H	180	220	210	245	225	230	220	215	220	235	235	220	E B	310	340
21	345	285	270	255	230	E B	310	255	240	235	230	245	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	235	215	225	235	230	215	225	230	235	255	255	E B	305	305		
23	325	320	290	305	255	230	240	220	225	220	200	205	H	235	220	210	H	240	235	215	225	225	240	C	C	C		
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
25	C	C	C	C	C	C	C	C	C	C	C	C	C	225	C	200	250	230	225	220	220	265	265	280	E B	310		
26	300	350	305	275	255	275	275	225	230	225	200	220	H	185	225	230	220	230	220	220	280	240	230	240	285			
27	270	315	300	285	240	275	265	245	235	230	245	A	C	C	C	C	C	C	C	C	C	C	C	C	E A	E A	345	
28	295	255	280	260	220	265	265	225	220	210	E S	255	C	C	C	C	C	C	C	C	C	230	230	260	E B	335	320	
29	310	305	275	255	225	255	265	230	185	200	220	225	235	230	215	210	240	220	I C	I C	210	255	230	265	260	305		
30	270	285	E A	270	245	285	265	235	220	215	200	205	A	H	205	210	215	230	215	225	255	240	240	245	310			
31	I C	I C	I C	I C	I C	I C	I C	260	225	225	I C	I C	I C	I C	225	235	215	205	230	215	215	A	225	220	250	E S	310	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	27	26	27	27	27	27	27	26	26	26	27	26	25	25	25	26	26	26	26	26	27	26	26	27	27			
MED	300	284	280	272	245	272	258	230	225	225	212	220	215	220	220	230	228	215	226	235	240	242	U	275	308			
UQ	322	310	295	280	265	298	268	240	230	230	229	235	230	225	225	235	230	225	248	255	255	262	E E	315	318			
LQ	272	270	270	262	232	255	252	220	215	215	202	205	200	210	215	215	220	215	220	225	225	230	266	290				

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H\*F (KM)

# IONOSPHERIC DATA

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H°E (KM)

135° E Mean Time (G.M.T. + 9 h)

Station		ROKUBUNJI 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									A	A	A	A	E A	E A	E A	115	120	120							
2									B	A			A												
3									165	125	120	A	E A	E A	120	115	E A	115							
4									A	E A	135	130	120	120	125	120	120	E A	E A						
5									A	E A	140	C	125	125	125	130	120	125	E B	140					
6									A	A	A	A	A	130	115	120	125	125	115						
7									A	A	A			110	115	125	125	120	S						
8									A	125	E A	130	110	E A	125	120	E A	120	A	125					
9									A	A	120	115	A	A	A	120	E A	135	130						
10									E A	E A	165	135	120	125	125	115	120	E A	120	110	E A	135			
11									E B	155	125	120	A	135	130	125	120	C	120	E S	135				
12									E B	170	A	A	A	120	120	120	130	B	120	125					
13									A	120	120	120	115	125	125	130	E A	140	A						
14									B	A	A	130	125	120	125	120	120	125	125						
15									B	120	130	120	130	125	115	120	125	E A	135						
16									B	125	120	A	120	E A	E A	135	125	110	120	125	B				
17									B	E A	145	120	E A	E A	E A	135	125	E A	125	120	125	B			
18									E A	190	A	A	120	110	125	120	115	125	A	B					
19									E B	170	120	120	120	120	120		C	C	C	C	C				
20									C	C	C			120	120	120	120	120	125	120	R				
21									B	130	130	120		C	C	C	C	C	C	C	C				
22									C	C	C	C		115	120	115	120	115	E B	180	B				
23									B	130	125	120	120	125	115		A	A	125	B					
24									C	C	C	C	C	C	C	C	C	C	C	C	C				
25									C	C	C	C	C		120	C	120	115	A	A					
26									B	A	A	A	A	120	120	120	A	110	B						
27									B	120	120	115		C	C	120	C	C	C	C					
28									E B	155	120	125	120		C	A	C	C	C	C	C				
29									A	A	E A	135	110	120	120	120	E A	E A	115	B					
30									E A	E A	145	130	125	115	115		A	A	E A	B					
31									E B	165	125		C	C	C	C	115	E A	E A	A	B				
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									9	17	19	21	23	24	24	24	22	22							
MED									E B	165	122	120	120	120	122	120	120	122	122						
UQ									E B	170	130	128	120	122	125	122	122	130	135						
LQ									E B	155	120	120	115	120	120	120	120	120							

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H°E (KM)

### IONOSPHERIC DATA

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H<sup>°</sup>ES (KM)

135° E Mean Time (G.M.T. + 9h)

Station		ROKUBUNJI TOKYO		Lat.	35° 42' 4" N		Long.	139° 29' 3" E		Sweep 1 MHz to 25 MHz in 2 sec in automatic operation																	
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		110	110	110	110	115	110	120	115	110	110	110	110	105	105	100	G	G	B	B	B	B	B	125	105		
2		B	B	B	115	B	B	B	B	125	G	G	G	115	G	110	150	G	115	B	115	110	110	B	110		
3		B	B	B	125	125	120	S	G	135	125	115	115	115	G	G	110	G	120	B	110	110	105	105	110		
4		B	100	B	B	B	120	B	115	110	G	G	G	G	G	G	115	120	B	B	B	B	B	110	105		
5		B	B	B	B	110	B	B	115	110	C	G	G	G	G	G	165	135	115	115	105	105	110	B	S		
6		B	110	B	110	B	B	B	115	115	110	110	110	G	G	G	G	G	B	115	110	110	110	105	100		
7		105	105	105	B	100	B	B	120	120	110	G	G	G	G	G	S	G	B	105	100	B	B	B	110		
8		100	110	110	B	B	B	B	115	G	110	G	110	G	E G	170	105	105	G	105	B	B	B	B	125		
9		115	110	B	120	B	B	B	115	115	G	G	105	105	110	125	110	G	115	105	110	F	110	110	135		
10		105	105	105	110	115	115	115	110	110	G	G	E G	175	G	G	110	G	105	105	110	100	105	105	B	105	
11		105	B	B	B	B	B	B	G	G	G	105	110	G	C	G	G	110	B	120	115	115	B	B	B		
12		B	105	B	B	B	B	B	G	125	120	120	G	G	G	G	G	G	B	B	110	B	B	B	B	B	
13		B	B	B	B	B	B	110	110	G	G	G	G	G	105	105	100	100	105	B	B	B	110	115	B		
14		B	B	B	115	B	B	B	B	115	115	115	G	G	G	G	G	G	B	110	B	B	B	B	B	B	
15		B	B	B	B	160	B	145	145	140	115	G	110	110	G	105	110	110	105	B	B	B	B	B	B	B	
16		B	S	B	B	B	125	B	100	G	130	125	E G	175	110	110	120	G	G	B	B	110	105	105	100	105	
17		105	105	110	110	110	105	S	B	120	155	E G	175	110	105	E G	170	105	G	G	115	B	150	140	B	95	115
18		115	B	B	B	B	B	B	120	125	120	G	G	G	G	G	G	110	B	B	B	B	B	B	B	B	B
19		B	B	B	B	B	B	B	G	G	140	125	G	130	C	C	C	C	C	C	C	C	C	C	C	C	C
20		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	B	B	B	B
21		B	115	B	B	B	B	B	B	G	E G	175	150	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	G	G	G	G	G	G	B	120	120	B	125	B	B	B
23		120	B	B	B	B	B	B	120	G	G	120	E G	165	150	G	120	115	G	B	B	115	B	C	C	C	C
24		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	B	B	B	B
26		105	B	B	B	110	B	B	B	120	115	115	115	G	G	155	135	G	110	110	110	120	105	110	115	115	
27		110	B	110	110	110	105	110	B	140	140	125	C	C	G	C	C	C	C	C	C	105	C	110	105	100	
28		105	100	110	115	115	110	105	G	G	G	G	C	110	C	C	C	C	C	C	C	B	120	115	115	B	
29		B	B	B	B	B	B	B	115	120	115	120	E G	160	E G	165	145	135	115	G	110	C	C	B	B	B	100
30		B	105	110	B	B	110	110	105	110	G	120	120	110	115	110	G	G	B	B	115	B	115	B	105	105	
31		C	C	C	C	C	C	B	G	G	C	C	C	C	E G	160	105	140	105	110	105	105	B	B	S	B	B
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT		12	12	3	10	10	9	7	15	18	16	15	14	14	9	14	12	8	14	10	18	11	15	12	15		
MED		105	105	110	112	112	110	110	115	120	115	120	111	110	110	110	115	108	110	110	110	110	110	110	110	105	
UQ		112	110	110	115	115	120	118	118	125	132	125	E G	160	E G	160	120	138	115	115	115	115	118	112	115	112	
LQ		105	105	108	110	110	110	110	112	110	112	115	110	110	110	105	110	105	105	105	105	108	108	105	105		

JAN. 1988

H<sup>°</sup>ES (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JAN. 1988      TYPES OF ES

135° E Mean Time (G.M.T. + 9h)

Station		Rokubunji		Tokyo		Lat. 35° 42' 4" N		Long. 139° 29' 3" E		Sweep 1		MHz to 25		MHz in 24		sec in		automatic operation								
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Hour	Day																									
1		F <sub>2</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>2</sub>	F <sub>2</sub>	F <sub>4</sub>	F <sub>2</sub>	L <sub>3</sub>	L <sub>2</sub>	L <sub>2</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>1</sub>									F <sub>1</sub>	F <sub>1</sub>	
2					F <sub>1</sub>					L <sub>2</sub>			L <sub>1</sub>		L <sub>1</sub>	HL <sub>11</sub>		F <sub>2</sub>		F <sub>1</sub>	F <sub>1</sub>	F <sub>2</sub>		F <sub>1</sub>	F <sub>1</sub>	
3					F <sub>2</sub>	F <sub>2</sub>	F <sub>1</sub>			H <sub>2</sub>	C <sub>2</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>		L <sub>1</sub>		F <sub>1</sub>		F <sub>3</sub>	F <sub>2</sub>	F <sub>4</sub>	F <sub>2</sub>	F <sub>2</sub>	F <sub>2</sub>	
4			F <sub>1</sub>			F <sub>2</sub>			L <sub>2</sub>	L <sub>1</sub>						L <sub>1</sub>	L <sub>1</sub>							F <sub>1</sub>	F <sub>1</sub>	
5					F <sub>1</sub>				L <sub>2</sub>	L <sub>1</sub>						H <sub>1</sub>	H <sub>1</sub>	FF <sub>11</sub>	F <sub>2</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>		F <sub>1</sub>	F <sub>2</sub>	
6			F <sub>1</sub>		F <sub>1</sub>				L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>							F <sub>5</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>	F <sub>4</sub>	F <sub>4</sub>	
7		F <sub>3</sub>	F <sub>2</sub>	F <sub>4</sub>		F <sub>2</sub>			L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>							F <sub>1</sub>	F <sub>1</sub>				F <sub>2</sub>	F <sub>2</sub>	
8		F <sub>2</sub>	F <sub>1</sub>	F <sub>1</sub>					L <sub>2</sub>		L <sub>1</sub>				H <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>		F <sub>1</sub>					F <sub>1</sub>	F <sub>1</sub>	
9		F <sub>2</sub>	F <sub>1</sub>		F <sub>1</sub>				L <sub>1</sub>	L <sub>3</sub>			L <sub>2</sub>	L <sub>2</sub>	L <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>		F <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>1</sub>	
10		F <sub>3</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	LH <sub>11</sub>	L <sub>2</sub>			HL <sub>11</sub>			L <sub>1</sub>		L <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>3</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	
11		F <sub>1</sub>										L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>					F <sub>1</sub>		F <sub>4</sub>	F <sub>4</sub>	F <sub>3</sub>			
12			F <sub>1</sub>							L <sub>2</sub>	L <sub>1</sub>	L <sub>1</sub>									F <sub>1</sub>					
13						F <sub>1</sub>	L <sub>1</sub>							L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>		L <sub>2</sub>	F <sub>2</sub>				F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	
14				F <sub>1</sub>					L <sub>3</sub>	L <sub>1</sub>	L <sub>1</sub>										F <sub>1</sub>					
15					F <sub>1</sub>		F <sub>2</sub>	C <sub>1</sub>	H <sub>2</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	F <sub>2</sub>								
16						F <sub>1</sub>		L <sub>1</sub>		C <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	LH <sub>11</sub>	L <sub>1</sub>	C <sub>2</sub>						F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	
17		F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>			L <sub>1</sub>	H <sub>1</sub>	HL <sub>11</sub>	L <sub>1</sub>	L <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>		L <sub>1</sub>		F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>		
18		F <sub>1</sub>							L <sub>2</sub>	L <sub>1</sub>	L <sub>1</sub>							L <sub>1</sub>								
19											H <sub>1</sub>	C <sub>1</sub>		HL <sub>21</sub>												
20												H <sub>1</sub>														
21			F <sub>1</sub>								H <sub>1</sub>	H <sub>1</sub>														
22																					F <sub>1</sub>	F <sub>1</sub>		F <sub>1</sub>		
23		F <sub>1</sub>							L <sub>1</sub>			C <sub>1</sub>	H <sub>1</sub>	H <sub>1</sub>		L <sub>1</sub>	L <sub>3</sub>				F <sub>1</sub>					
24																										
25														L <sub>1</sub>				L <sub>2</sub>	L <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>4</sub>	F <sub>3</sub>	F <sub>1</sub>		
26		F <sub>1</sub>			F <sub>1</sub>					L <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>1</sub>		H <sub>1</sub>	HL <sub>11</sub>		L <sub>2</sub>	F <sub>2</sub>	F <sub>2</sub>	F <sub>2</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>3</sub>		
27		F <sub>2</sub>		F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	F <sub>3</sub>	F <sub>2</sub>		H <sub>1</sub>	H <sub>1</sub>	H <sub>2</sub>									F <sub>3</sub>		F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	
28		F <sub>3</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>						L <sub>1</sub>									F <sub>1</sub>	F <sub>1</sub>	F <sub>2</sub>	
29									L <sub>1</sub>	L <sub>1</sub>	L <sub>1</sub>	CH <sub>11</sub>	H <sub>2</sub>	H <sub>1</sub>	H <sub>1</sub>	HL <sub>21</sub>	L <sub>1</sub>		L <sub>1</sub>						F <sub>2</sub>	
30			F <sub>1</sub>	F <sub>2</sub>		F <sub>2</sub>	F <sub>2</sub>	L <sub>1</sub>	L <sub>1</sub>		C <sub>2</sub>	C <sub>1</sub>	L <sub>2</sub>	L <sub>2</sub>	L <sub>2</sub>						F <sub>1</sub>		F <sub>1</sub>		F <sub>2</sub>	
31															H <sub>1</sub>	L <sub>2</sub>	HL <sub>12</sub>	L <sub>3</sub>	L <sub>1</sub>	F <sub>2</sub>	F <sub>2</sub>					
		00	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																										

JAN. 1988      TYPES OF ES

# IONOSPHERIC DATA

JAN. 1988

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station		YAMAGAWA							Lat.	31° 12' 1" N			Long.	130° 37' 1" E			Sweep 1 MHz to 25 MHz in 2 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	A 39	X 38	X 38	X 36	X 36	X 44											X 45	X 39	X 39	X 39	X 33	X 33		
2		X 38	X 39	X 34	X 28	X 31	X 32	X 30	X 41										X 40	X 45	X 56	X 59	X 59	X 63		
3		73	64	45	45	35	X 32	X 26	X 53										X 47	X 46	X 36	X 34	X 37	X 36		
4	0	X 38	X 39	X 41	X 41	X 41	X 39	X 38	X 44										X 47	X 47	X 50	X 57	X 44	X 34		
5		X 35	X 36	X 35	X 36	X 34	X 33	X 33	X 45										X 55	X 55	X 44	X 42	X 43	X 32		
6		X 34	X 36	X 44	X 26	X 30	X 32	X 31	X 44										X 49	X 56	X 53	X 36	X 30	X 31		
7		X 31	X 36	X 41	X 30	X 30	X 32	X 32	X 36										X 55	X 39	X 40	X 51	X 52	X 25		
8		X 31	X 35	X 39	X 36	X 38	X 30	X 26	X 38										X 51	X 50	X 50	X 44	X 38	X 35		
9		X 35	X 43	X 29	X 29	X 30	X 30	X 30	X 40	79									X 68	X 59	X 48	X 55	X 46	X 41		
10		X 35	X 34	X 35	X 36	X 39	X 33	X 30	X 36										X 66	X 61	X 44	X 46	X 34	X 33		
11		X 33	X 36	X 37	X 38	X 41	X 36	X 36	X 42										X 52	X 54	X 48	X 49	X 45	X 37		
12		X 37	X 36	X 37	X 39	X 40	X 36	X 35	X 42										X 95	X 80	X 56	X 66	X 70	X 50		
13		X 40	X 43	X 48	X 34	X 33	X 31	X 30	X 38										X 53	X 53	X 62	X 41	X 32	X 29		
14		X 31	X 35	X 35	X 36	X 43	X 27	X 27	X 37										X 76	X 55	X 60	X 55	X 53	X 45		
15		X 42	X 45	X 44	X 34	X 37	X 27	X 27	X 45										X 91	X 74	X 63	X 49	X 49	X 39		
16		44	40	41	40	X 51	X 34	X 25	X 39										X 82	X 60	X 73	X 89	X 50	X 39		
17		X 33	X 36	X 39	X 39	X 38	X 32	X 29	X 39										X 68	X 51	X 55	X 59	X 50	X 40		
18		X 34	X 37	X 39	X 36	X 39	X 36	X 34	X 38										X 77	X 69	X 57	X 63	X 38	X 31		
19		X 29	X 32	X 33	X 34	X 38	X 29	X 29	X 41										X 69	X 51	X 53	X 58	X 49	X 28		
20		X 31	X 33	X 36	X 34	X 37	X 36	X 32	X 38										X 58	X 53	X 49	X 49	X 39	X 33		
21		X 34	X 35	X 37	X 39	X 44	X 29	X 28	X 40										X 54	X 40	X 47	X 43	X 35	X 34		
22		X 34	X 35	X 35	X 36	X 36	X 34	X 31	X 42										X 71	X 51	X 42	X 38	X 35	X 33		
23		X 34	X 36	X 38	X 38	X 40	X 37	X 29	X 37										X 58	X 48	X 43	X 47	X 45	X 34		
24		X 32	X 34	X 35	X 37	X 36	X 34	X 34	X 38										X 75	X 56	X 63	X 59	X 43	X 31		
25		X 34	X 34	X 35	X 36	X 38	X 40	X 39	X 37										X 70	X 41	X 43	X 38	X 30	X 32		
26		X 34	X 36	X 37	X 38	X 43	X 34	X 34	X 41										X 69	X 47	X 51	X 53	X 43	X 31		
27		X 33	X 34	X 35	X 37	X 39	X 31	X 28	X 38										X 70	X 55	X 55	X 58	X 35	X 34		
28		X 36	X 39	X 37	X 38	X 41	X 38	X 31	X 39										X 58	X 44	X 46	X 40	X 33	X 34		
29		X 35	X 35	X 36	X 39	X 43	X 34	X 28	X 38										X 73	X 44	X 49	X 48	X 41	X 39		
30	0	X 36	X 34	X 34	X 35	X 37	X 34	X 33	X 40										X 65	X 45	X 51	X 47	X 41	X 31		
31		X 32	X 32	X 35	X 34	X 39	X 31	X 32	X 38										X 65	X 55	X 54	X 39	X 36	X 34		
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		31	30	31	31	31	31	31	31	1										31	31	31	31	31	31	
MED		X 34	X 36	X 37	X 36	X 38	X 33	X 31	X 39	79										X 65	X 51	X 50	X 49	X 41	X 34	
UQ		X 36	X 39	X 39	X 38	X 40	X 36	X 34	X 42										X 70	X 56	X 56	X 58	X 48	X 38		
LQ		X 33	X 34	X 35	X 34	X 36	X 31	X 28	X 33										X 54	X 46	X 45	X 42	X 35	X 32		

JAN. 1988

FXI (0.1 MHz)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JAN. 1988

FOF2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

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
1	30	A	33	32	32	30	30	38	69	82	84	H 85	84	85	H 83	71	69	54	39	33	33	33	27	27
2	32	33	28	22	25	26	24	35	57	70	71	76	91	77	71	77	69	63	34	39	50	53	53	F
3	F	F	F	F	F	26	20	47	84	106	90	91	121	107	104	80	65	58	41	40	30	28	31	30
4	32	34	35	35	35	F 33	S 32	39	59	80	61	91	78	87	61	81	91	80	H 41	S 41	44	51	39	28
5	29	30	29	30	28	28	27	39	66	64	86	83	84	86	76	H 79	H 72	64	49	49	H 37	36	S 37	27
6	28	31	38	21	24	26	26	38	73	89	79	77	79	97	100		72	H 66	42	50	47	30	24	25
7	26	30	35	25	25	26	26	31	55	79	78	94	109	86	83	H 66	64	60	49	33	J S 34	45	46	19
8	25	29	33	30	32	25	H 21	32	67	H 76	92	H 90	89	74	86	98	98	H 62	45	44	44	38	32	30
9	30	37	23	20	F 24	F 24	F 24	F 34	F 69	71	81	85	V 84	86	79	77	75	65	S 62	S 53	S 42	49	40	35
10	29	28	30	30	33	27	24	30	59	73	80	83	95	123	J H 135	U H 118	H 128	H 89	H 60	55	H 38	40	28	27
11	27	30	31	32	35	31	30	35	55	61	86	65	73	80	95	92	71	H 71	46	48	S 42	43	S 38	31
12	31	30	31	33	34	30	29	36	61	69	78	89	103	125	U H 110	U H 125	U R 130	R 123	89	J S 74	50	60	64	44
13	34	36	S 42	28	27	25	24	32	66	78	88	90	J R 88	85	79	72	74	56	47	47	56	35	26	23
14	25	29	29	30	37	20	21	31	71	83	90	H 89	101	130	95	80	88	74	70	S 49	J S 54	J S 49	47	39
15	36	39	38	28	S 31	21	20	39	54	H 74	72	88	94	94	109	100	110	98	85	68	57	43	43	S 33
16	F 23	F 34	F 33	F 34	44	28	F 19	33	72	H 79	108	S 118	H 104	92	H 99	U R 92	84	86	U H 76	54	67	83	44	33
17	27	30	33	33	32	26	23	33	62	88	94	87	82	81	80	86	89	H 88	U H 62	S 45	S 49	J S 53	44	33
18	28	31	33	30	33	30	28	32	57	65	86	84	86	86	87	103	95	71	71	63	51	57	32	25
19	23	26	27	28	32	23	23	35	62	67	H 85	91	103	102	H 78	103	H 79	64	63	H 45	47	52	43	22
20	25	27	30	28	31	30	26	32	66	73	68	97	81	65	86	82	77	58	52	47	43	43	33	27
21	28	29	31	33	38	23	22	34	62	71	83	74	80	88	H 75	70	74	H 71	48	34	41	37	29	28
22	28	29	29	30	30	28	25	36	56	67	67	72	80	124	U R 138	U R 124	U R 117	87	65	45	36	32	29	27
23	28	30	32	32	34	31	23	31	64	H 59	71	79	81	89	H 75	78	69	H 76	52	42	37	41	39	28
24	26	28	29	31	30	28	28	32	58	71	70	72	72	93	87	99	H 103	U R 86	69	50	57	53	H 37	25
25	28	28	29	30	32	36	33	31	50	60	65	70	79	90	89	H 100	H 88	H 66	65	H 35	37	S 32	24	26
26	28	30	31	32	S 37	28	28	35	62	61	62	81	86	83	H 73	H 74	74	U H 74	S 63	H 41	45	47	J S 37	25
27	27	29	30	31	33	26	23	32	66	69	67	62	78	91	H 85	89	75	63	64	S 49	S 49	S 52	29	28
28	30	33	31	32	35	31	26	33	59	71	76	H 81	74	82	89	90	69	H 58	51	38	S 40	34	27	28
29	29	30	31	33	S 37	28	22	32	66	64	68	78	94	85	H 92	H 89	72	71	67	38	43	S 42	35	S 33
30	30	28	28	29	31	28	27	34	S 61	77	75	66	75	75	H 82	71	71	69	59	39	45	41	35	25
31	26	27	29	29	33	25	26	32	59	68	H 71	77	81	83	H 87	H 88	79	79	59	49	48	33	30	28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	30	30	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	30
MED	28	30	31	30	32	28	25	33	62	71	78	83	84	86	86	87	75	71	59	45	44	43	35	28
UQ	30	31	33	32	35	30	28	36	66	78	86	90	94	94	95	99	90	80	65	50	50	52	42	31
LQ	26	29	29	28	30	26	23	32	58	67	70	76	80	83	79	77	72	63	48	40	39	36	29	25

JAN. 1988

FOF2 (0.1 MHz)



# IONOSPHERIC DATA

JAN. 1988

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9h)

Station		YAMAGAWA							Lat. 31° 12' 1" N		Long. 130° 37' 1" E		Sweep 1 MHz to 25 MHz in 2 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	450	450	H	L	L	L							
2											L	L	430	L	L	L	L								
3											L	L	U	L	L	L	L								
4											L	L	L	L	L	L	440								
5											L	L	L	L	L	L	L								
6											L	L	L	400	480	L									
7											L	L	500	500	L	L	L	L							
8											L	L	L	450	450	L	L	L							
9											L	L	450	L	450	L	L								
10											L	U	L	L	L	L	L								
11										250	330	L	L	L	450	440	440	L	L						
12											L	U	L	A	L	L	L	L							
13											L	L	460	440	420	430	L								
14											L	L	460	500	490	450	410	L	L						
15											U	L	460	L	470	470	L	L							
16											L	L	L	U	L	460	L	A	L						
17											L	L	450	L	490	L	440	L							
18											L	L	L	460	410	U	L	450	450	L					
19											L	L	U	L	L	L	L	L							
20											L	L	450	450	420	L	L	L							
21											L	L	L	420	L	L	L	L							
22											L	L	L	440	A	L	U	L	L						
23											L	400	L	450	460	470	U	A	L						
24											L	L	L	U	L	L	L	L	L						
25											L	L	L	L	470	L	L	L	L						
26									280		L	L	L	L	470	L	L	L	L						
27											L	L	460	L	450	590	L	L							
28											L	L	L	500	L	L	L	350							
29											L	L	L	590	470	L	L	L							
30										310	L	L	L	L	480	460	L	L							
31											L	L	450	L	440	L	L	L	L						
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										2	2	3	13	19	19	9	6	1							
MED										265	320	U	L	L	430	450	450	460	450	435	350				
UQ											U	L	L	465	460	485	470	470	440						
LQ											415	450	450	445	450	420	U	L							

JAN. 1988

FOF1 (0.01 MHz)

# IONOSPHERIC DATA

JAN. 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	00	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	260	300	305	A	A	305	A	A	A							
2										210	265	290	305	320	315	300	275	235	190							
3										230	285	310		A	A	A	A	A	A							
4										190	260	A	310	310	310	305	290	240	180	U	A					
5										205	275	300	310	315	315	300	280	250		S						
6										195	260	300	305	315	310	305		245		S						
7										A	260	295	320	335	330	310	295	245		S						
8										200	235	A	305	310	315	310	290	250		S						
9										190	250	300	305	330	325	310	300		A	A						
10										A	295	305	320	330	335	310	290	250		A						
11										185	250	305	320	325	330	315	290	250		A						
12										A	265	A	A	A	325	315	300		A	A						
13										200	265	300	320	325	330	325	305	255	195							
14										U	A	A	310	330	330	340	325	310	250		S					
15										180	250	300	310	315	320	310		A	A	U	A					
16										195	250	A	320	A	A	A	A	A	A							
17										200	A	U	A	A	330	320	320	300	260		A					
18										205	260	A	315	330	330	325	300	250	180							
19										200	A	320	330	335	330	A	300	270		S						
20										215	295	305	325	A	A	A	300	260		S						
21										225	255	A	320	340	325	315	300	R	260	185						
22										200	270	300	320	330	A	315	290	250	195							
23										205	270	300	315	325	320	A	A	A	S							
24										215	235	A	A	A	A	A	310	280	200							
25										205	270	A	330	345	A	310	290	270	210							
26										200	240	295	A	340	335	U	A	A	260	200						
27										205	295	320	R	A	345	345	310	300	260	205						
28										245	300	A	A	345	A	335	300	270		A						
29										200	260	300	310	345	345	A	310	265		A						
30										205	280	300	325	340	U	A	330	305	260	200						
31										190	260	300	330	345	340	335	305	280	205							
CNT										28	28	22	24	25	23	24	24	24	13							
MED										200	260	300	320	330	330	312	300	258	195							
UQ										205	272	305	322	340	335	322	302	262	200							
LQ										198	252	300	310	325	320	310	290	250	185							

The Radio Research Laboratory, Japan

JAN. 1988

FOE (0.01 MHZ)

# IONOSPHERIC DATA

JAN. 1988

FOES (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station	YAMAGAWA																							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A 34	J A 54	J A 42	J A 41	J A 36	J A 18	E S 16	E S 16	G 18	G 32	J A 32	J A 32	J A 54	J A 47	J A 35	J A 50	J A 25	J A 20	E S 16	E S 16	E S 16	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	G 16	G 16	G 16	G 16	37	39	34	G 16	G 16	21	17	E S 16	J A 20	J A 23	J A 18	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 16	G 16	33	J A 60	J A 42	J A 49	J A 54	J A 47	J A 41	J A 36	J A 25	J A 18	J A 21	J A 18	J A 22	J A 17
4	24	J A 37	J A 25	E S 16	E S 16	E S 16	E S 16	E S 16	G 16	G 16	J A 61	J A 35	G 16	G 16	G 16	G 16	G 16	20	16	16	E S 16	E S 16	E S 16	E S 16
5	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 16	G 16	20	19	20	G 16	G 16	G 16	G 16	E S 16	17	18	J A 18	J A 24	E S 16	E S 16
6	E S 16	E S 16	E S 16	E S 16	E S 16	J A 18	J A 24	J A 17	25	G 16	G 16	G 16	G 16	G 16	G 16	G 16	G 16	E S 16	19	16	E S 16	J A 33	J A 24	J A 30
7	J A 25	J A 25	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	J A 32	J A 32	19	19	24	21	21	22	J A 19	E S 16	E S 16	E S 16	E S 16	J A 18	E S 16
8	J A 24	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	G 16	J A 33	G 16	G 16	G 16	G 16	G 16	G 16	E S 16	17	J A 23	J A 21	E S 16	E S 16	E S 16
9	E S 16	J A 42	E S 16	J A 19	J A 17	J A 24	E S 16	E S 16	G 16	G 16	34	35	G 16	G 16	G 16	J A 43	J A 31	J A 26	J A 29	J A 17	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	27	23	25	30	J A 62	31	G 16	G 16	G 16	24	J A 25	J A 33	22	E S 16	E S 16	E S 16
11	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 16	30	34	23	G 16	44	25	22	J A 33	J A 24	20	E S 16	E S 16	E S 16	J A 19	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	24	23	34	47	J A 42	J A 35	J A 40	G 16	J A 43	J A 51	J A 44	22	J A 20	20	J A 36	23
13	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	20	G 16	G 16	J A 34	G 16	G 16	G 16	G 16	G 16	J A 25	24	18	E S 16	E S 16	E S 16	J A 20
14	E S 16	E S 16	E S 15	E S 15	E S 16	J A 24	E S 16	E S 16	26	J A 29	J A 34	37	34	25	G 16	G 16	G 16	E S 16	E S 16	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	26	32	21	G 16	J A 41	24	24	J A 36	J A 33	J A 30	23	20	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 16	J A 30	34	G 16	J A 38	J A 49	J A 42	J A 80	J A 53	J A 38	J A 30	26	J A 19	J A 24	E S 16	J A 19
17	23	E S 16	E S 15	J A 19	E S 16	E S 16	E S 15	E S 16	G 16	30	33	33	28	27	24	22	21	J A 21	22	E S 16	E S 16	E S 16	J A 25	J A 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	G 16	32	33	J A 35	G 16	G 16	G 16	G 16	G 16	22	E S 16	E S 16	E S 16	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	23	J A 31	G 16	G 16	G 16	G 16	34	33	28	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 16	E S 16	E S 16	E S 16	E S 16	E S 16	G 16	G 16	J A 34	37	39	36	38	G 16	G 16	22	J A 25	E S 16	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 16	G 16	40	49	G 16	G 16	G 16	G 16	G 16	G 16	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 16	G 16	G 16	37	G 16	J A 50	G 16	G 16	G 16	G 16	18	16	16	E S 16	E S 16	J A 18
23	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 16	G 16	36	40	44	J A 43	J A 52	J A 51	J A 35	J A 37	16	16	16	16	16	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 16	G 16	31	J A 36	J A 42	J A 36	J A 37	J A 35	J A 35	G 16	G 16	E S 16	E S 16	J A 17	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	E S 16	G 16	29	J A 35	G 16	38	39	31	19	G 16	J A 31	J A 35	J A 45	J A 32	J A 24	J A 19	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	E S 16	G 16	G 16	34	J A 36	24	36	35	35	G 16	G 16	20	20	E S 16	E S 16	E S 16	J A 18
27	J A 21	J A 22	E S 16	E S 16	E S 16	J A 22	J A 21	E S 16	G 16	30	J A 41	J A 44	G 16	G 16	G 16	G 16	G 16	22	J A 22	J A 32	J A 47	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 16	27	37	40	37	38	35	G 16	G 16	J A 24	J A 28	20	E S 16	E S 16	E S 16	E S 16
29	J A 19	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G 16	G 16	G 16	36	36	G 16	G 16	G 16	G 16	G 16	24	24	E S 16	E S 16	E S 16	E S 16
30	24	E S 16	E S 16	E S 16	E S 16	E S 16	J A 18	E S 16	G 16	G 16	J A 44	25	36	35	34	32	G 16	G 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
31	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 16	G 16	G 16	36	G 16	G 16	G 16	G 16	G 16	G 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31
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 16	G 16	33	35	28	31	28	22	G 16	G 16	21	17	E S 16	E S 16	E S 16	E S 16
UQ	18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	30	34	37	38	38	35	33	30	J A 26	J A 24	19	J A 18	J A 18	J A 18	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 16	G 16	G 16	G 16	G 16	G 16	G 16	G 16	G 16	G 16	16	E S 16	E S 16	E S 16	E S 16	E S 16

JAN. 1988

FOES (0.1 MHz)

IONOSPHERIC DATA

JAN. 1988

FBES (0.1 MHZ)

135 E Mean Time (G.M.T. + 9h)

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 16	S 40	A 16	E 16	S 17	E 16	S 16	E 16	S 16	E 16	S 17	G 26	G 32	G 34	G 32	G 34	G 35	G 25	G 20	E 16	S 16	E 16	S 16	E 16	S 16						
2	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 36	G 38	G 34	G 21	G 16	E 16	S 16	E 16	S 16	E 16	S 18	E 16	S 16						
3	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 32	G 37	G 37	G 33	G 32	G 30	G 25	G 21	E 16	S 16	E 16	S 16	E 22	S 16					
4	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 35	G 24	G 24	G 24	G 24	G 20	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16					
5	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 19	G 19	G 20	G 22	G 22	G 22	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16					
6	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 24	G 22	G 20	G 20	G 20	G 20	E 16	S 16	E 16	S 16	E 16	S 21	E 16	S 18					
7	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 24	G 22	G 32	G 19	G 19	G 23	G 19	G 17	G 20	E 16	S 16	E 16	S 16	E 16	S 16				
8	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 23	G 31	G 31	G 24	G 19	G 20	G 16	E 16	S 16	E 16	S 17	E 19	E 16	S 16					
9	E 16	S 30	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 34	G 34	G 35	G 27	G 23	G 26	G 27	E 16	S 24	E 16	S 28	E 16	S 16	E 16	S 16				
10	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 21	G 27	G 25	G 30	G 27	G 31	G 20	G 23	E 16	S 22	E 16	S 24	E 16	S 16	E 16	S 16			
11	E 16	S 16	E 16	S 15	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 27	G 23	G 22	G 22	G 23	G 19	G 24	E 16	S 19	E 16	S 16	E 16	S 16	E 16	S 16				
12	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 22	G 32	G 44	G 33	G 27	G 27	G 47	E 16	S 16	E 16	S 16	E 16	S 16	E 29	E 16	S 16			
13	E 16	S 16	E 16	S 15	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 23	G 24	G 18	G 25	G 19	G 23	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 18			
14	E 16	S 16	E 15	S 15	E 16	S 18	E 16	S 16	E 16	S 16	E 16	S 16	G 24	G 27	G 32	G 25	G 32	G 25	G 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16		
15	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 23	G 28	G 21	G 27	G 24	G 22	G 30	E 16	S 26	E 16	S 18	E 16	S 16	E 16	S 16	E 16	S 16		
16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 29	G 32	G 35	G 32	G 40	G 59	G 28	E 16	S 22	E 16	S 28	E 16	S 16	E 17	E 16	S 16			
17	E 16	S 16	E 15	S 15	E 16	S 16	E 16	S 15	E 16	S 16	E 16	S 16	G 30	G 32	G 27	G 26	G 21	G 20	G 19	G 21	E 16	S 16	E 16	S 16	E 16	S 16	E 20	E 16	S 16		
18	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 32	G 30	G 31	G 31	G 31	G 31	G 31	G 22	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	
19	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 23	G 26	G 32	G 33	G 32	G 33	G 28	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16		
20	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 32	G 36	G 35	G 35	G 38	G 38	G 21	G 23	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	
21	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 33	G 44	G 44	G 44	G 44	G 44	G 44	G 44	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	
22	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 37	G 48	G 48	G 48	G 48	G 48	G 23	G 18	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	
23	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 35	G 39	G 43	G 37	G 40	G 43	G 30	G 32	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	
24	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 28	G 31	G 34	G 34	G 34	G 34	G 34	G 34	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	
25	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 29	G 31	G 31	G 35	G 30	G 19	G 30	G 18	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 20	E 16	S 16
26	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 35	G 24	G 36	G 35	G 34	G 34	G 20	G 18	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 19	
27	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 26	G 34	G 34	G 34	G 34	G 20	G 19	G 17	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	
28	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 27	G 35	G 34	G 36	G 37	G 37	G 20	G 24	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	
29	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 35	G 26	G 34	G 30	G 30	G 24	G 22	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16
30	E 16	S 20	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 31	G 25	G 35	G 35	G 34	G 30	G 30	G 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	
31	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 35	G 31	G 28	G 21	G 19	G 19	G 19	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 30	G 31	G 24	G 26	G 22	G 20	G 20	G 19	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	
UQ	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 19	G 27	G 32	G 35	G 34	G 35	G 34	G 30	G 25	G 22	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	
LQ	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	G 35	G 31	G 28	G 21	G 19	G 19	G 19	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16	E 16	S 16

JAN. 1988

FBES (0.1 MHZ)

# IONOSPHERIC DATA

JAN. 1988

FMIN (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station	YAMAGAWA				Lat. 31° 12' 1" N				Long. 130° 37' 1" E				Sweep 1 MHz to 25 MHz in 2 sec in automatic operation														
	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 S	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	15	16	15	15	15	16	16	E S	E S	E S	E S	E S	E S	E S	E S	
2	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	16	17	16	16	16	16	E S	E S	E S	E S	E S	E S	E S	E S
3	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	18	20	19	17	16	16	16	E S	E S	E S	E S	E S	E S	E S	E S
4	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	16	15	16	20	20	21	17	17	E S	E S	E S	E S	E S	E S	E S	E S
5	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	16	19	20	24	21	20	E S	E S	E S	E S	E S	E S	E S	E S
6	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	15	16	19	17	17	20	15	15	E S	E S	E S	E S	E S	E S	E S	E S
7	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	15	15	16	17	16	16	15	15	E S	E S	E S	E S	E S	E S	E S	E S
8	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	20	20	19	16	16	17	E S	E S	E S	E S	E S	E S	E S	E S
9	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	15	17	20	21	23	20	17	16	16	E S	E S	E S	E S	E S	E S	E S
10	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	17	18	19	17	16	14	15	E S	E S	E S	E S	E S	E S	E S
11	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	17	17	18	17	16	16	E S	E S	E S	E S	E S	E S	E S	E S
12	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	19	17	17	19	17	16	16	E S	E S	E S	E S	E S	E S	E S	E S
13	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	17	17	17	16	16	16	E S	E S	E S	E S	E S	E S	E S	E S
14	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	16	17	17	17	18	17	16	15	E S	E S	E S	E S	E S	E S	E S	E S
15	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	18	17	17	17	16	14	15	E S	E S	E S	E S	E S	E S	E S
16	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	18	18	18	17	17	17	15	E S	E S	E S	E S	E S	E S	E S
17	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	20	22	19	17	15	16	16	E S	E S	E S	E S	E S	E S	E S
18	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	17	16	20	20	18	18	16	18	16	E S	E S	E S	E S	E S	E S	E S
19	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	20	18	17	17	17	16	16	E S	E S	E S	E S	E S	E S	E S
20	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	19	19	17	18	18	16	16	E S	E S	E S	E S	E S	E S	E S
21	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	17	18	22	20	21	18	18	16	E S	E S	E S	E S	E S	E S	E S	E S
22	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	17	17	18	17	15	16	15	E S	E S	E S	E S	E S	E S	E S
23	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	18	18	18	18	16	16	E S	E S	E S	E S	E S	E S	E S	E S
24	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	16	16	17	19	18	18	16	15	E S	E S	E S	E S	E S	E S	E S	E S
25	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	15	17	16	17	17	16	16	15	E S	E S	E S	E S	E S	E S	E S	E S
26	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	14	15	16	16	16	16	16	15	16	E S	E S	E S	E S	E S	E S	E S
27	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	15	16	18	18	18	17	16	16	16	E S	E S	E S	E S	E S	E S	E S
28	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	16	20	19	20	20	17	17	15	15	E S	E S	E S	E S	E S	E S	E S
29	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	15	15	16	17	16	16	16	15	16	E S	E S	E S	E S	E S	E S	E S
30	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	15	16	17	18	16	16	16	15	E S	E S	E S	E S	E S	E S	E S
31	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	16	17	17	16	17	15	15	E S	E S	E S	E S	E S	E S	E S
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	
MED	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	17	18	18	17	16	16	E S	E S	E S	E S	E S	E S	E S	E S
UQ	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	19	19	19	18	17	16	16	E S	E S	E S	E S	E S	E S	E S
LQ	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	16	17	17	16	16	15	15	E S	E S	E S	E S	E S	E S	E S

JAN. 1988

FMIN (0.1 MHz)

# IONOSPHERIC DATA

JAN. 1988

M(3000)F2 (0.01)

135° E Mean Time (G.M.T. + 9h)

Station		YAMAGAWA								Lat. 31° 12' N		Long 139° 37' E		Sweep 1 MHz to 25 MHz in 2 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	A	305	310	310	300	315	315	345	340	355	H	335	315	H	340	360	380	345	365	350	335	335	295								
2		330	350	355	295	300	325	310	340	375	350	365	320	350	365	325	350	355	350	380	305	290	290	290	F								
3		F	F	F	F	F		325	325	360	335	350	340	315	330	320	335	355	370	370	340	335	355	285	320	300							
4		295	310	315	315	300	F	S	335	330	335	355	360	370	360	335	345	345	325	345	360	360	S	330	370	320	305						
5		295	315	310	335	320	305	315	345	395	345	350	355	320	350	330	315	H	H	345	335	335	345	310	H	290	S	295					
6		285	305	370	310	290	305	290	315	355	380	365	335	315	325	335		370	H	335	335	340	360	335	290	280							
7		270	300	355	320	320	270	305	340	345	315	335	325	320	335	350	H	345	350	345	320	J	S	295	300	345	395						
8		300	295	305	335	345	H	310	360	H	345	H	355	350	325	315	325	H	355	340	320	320	320	315	295	285							
9		300	350	305	300	F	F	290	290	310	295	F	F	355	340	345	350	V	325	350	335	330	355	340	S	S	310	S	295	300	315		
10		310	305	300	335	335	370	335	335	355	355	350	320	315	315	310	275	J	H	U	H	H	H	H	H	H	275	H	350	305	295		
11		275	285	290	295	330	330	335	335	335	335	365	370	330	325	335	355	350	H	320	330	330	S	315	S	330	S	290					
12		290	285	295	315	330	300	295	335	360	345	325	340	320	350	U	H	U	H	U	R	U	R	310	J	S	250	295	335	295			
13		270	290	S	255	295	270	290	320	355	345	345	345	J	R	310	335	345	325	345	355	320	300	350	350	325	280						
14		280	295	290	315	350	240	285	290	340	330	355	325	H	305	330	340	330	330	335	330	S	J	S	J	S	300	280					
15		275	295	330	265	S	380	285	310	295	330	300	310	295	225	255	210	285	290	300	320	315	280	295	S	320							
16		445	F	F	F	F	365	375	315	F	305	325	315	H	360	S	335	H	315	325	H	305	U	R	335	350	340	H	300	300	360	340	310
17		265	270	320	320	345	325	305	310	320	345	345	375	325	335	330	335	335	H	U	H	S	285	S	J	S	330	310					
18		285	290	320	300	335	300	305	345	335	325	350	340	345	315	340	335	335	340	330	285	H	275	335	345	320							
19		280	325	295	285	330	325	280	315	345	335	330	320	335	325	H	305	345	H	330	360	325	H	285	335	360	270						
20		280	275	300	285	320	350	325	310	340	370	365	350	345	345	335	340	350	345	335	310	325	335	350	275								
21		265	295	305	335	355	325	295	325	370	365	345	360	345	345	300	H	350	340	H	375	310	315	325	310	305							
22		285	310	310	335	315	305	340	335	365	360	365	355	320	340	U	R	U	R	U	R	305	325	330	355	290	330	310	295				
23		305	300	310	310	340	355	345	320	360	H	345	320	320	340	305	350	325	H	355	355	335	325	315	335	320							
24		290	285	295	320	335	320	320	330	360	365	365	335	335	345	325	335	H	U	R	305	290	305	330	310	H	280						
25		305	285	295	300	310	350	365	385	360	350	355	350	320	335	320	320	H	H	H	H	H	H	H	S	S	360	310	290				
26		285	285	290	310	S	320	285	330	370	375	320	335	330	350	H	H	345	335	310	350	H	310	320	J	S	350	320					
27		295	275	285	320	350	325	305	310	355	385	375	340	305	325	310	335	340	350	345	S	S	S	325	305	325	275	285					
28		300	305	320	310	330	355	305	335	355	340	330	320	H	285	315	315	355	345	345	345	330	325	340	335	285							
29		295	300	305	305	S	325	355	320	330	370	360	350	305	335	325	H	H	345	340	360	340	300	310	S	315	S	320					
30		335	285	285	295	320	320	295	325	S	345	350	365	365	320	325	H	345	340	325	345	370	305	320	315	330	340						
31		270	295	295	295	335	340	325	330	340	345	340	H	320	345	330	310	H	H	315	350	340	325	355	320	335	285						
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
CNT		30	29	30	30	30	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	30						
MED		290	295	305	310	330	325	310	330	355	345	350	335	325	330	325	335	340	345	340	320	310	320	325	295								
UQ		300	305	320	320	340	345	325	335	360	360	365	352	335	345	335	345	350	350	350	338	325	335	335	315								
LQ		280	285	295	295	310	302	295	312	340	340	342	320	318	325	H	315	325	335	330	305	292	305	308	285								

JAN. 1988

M(3000)F2 (0.01)

# IONOSPHERIC DATA

JAN. 1988

M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9h)

Station		YAMAGAWA							Lat.		31° 12' 1" N		Long.		130° 37' 1" E		Sweep		1 MHz to 25 MHz		in 2 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	375	390	H	L	L	L				
2														L	L	405	L	L	L	L					
3														L	L	U L	370	L	L	L					
4														L	L	L	L	L	L	330					
5														L	L	L	L	L	L	L					
6														L	L	L	435	345	L						
7														L	L	340	340	L	L	L	L				
8														L	L	400	390	L	L	L					
9														L	L	375	L	375	L	L					
10														L	U L	390	L	L	L	L					
11										410	425	L	L	L	L	390	385	365	L	L					
12														L	U L	385	A	L	U L	L	L				
13														L	L	380	390	405	405	L	L				
14														L	L	360	360	355	390	390	L	L			
15														U L	L	340	350	L	U L	360	345	L	L		
16														L	L	L	U L	U L	L	A	L				
17														L	L	385	L	355	L	365	L	L			
18														L	L	L	370	390	U L	390	365	L	L		
19														L	L	U L	360	L	L	L	L				
20														L	L	365	390	405	L	L	L				
21														L	L	L	405	L	L	L	L				
22														L	L	L	385	A	L	U L	370	L			
23														L	400	L	A	370	370	A	L				
24														L	L	L	U L	390	360	L	L	L			
25														L	L	L	L	360	L	L	L	L			
26										445				L	L	L	360	L	375	355	L	L			
27														L	L	L	350	L	L	L	385				
28														L	L	L	320	360	L	L	L				
29														L	L	L	L	355	370	L	L				
30										420				L	L	L	390	L	420	L	L	L			
31														L	L	L	H	395	L	L	L	L			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									2	2	3	13	18	19	9	5	1								
MED									428	422	385	375	378	375	370	365	385								
UQ									392	390	390	388	390	370											
LQ									U L	362	360	360	360	360	365	365									

JAN. 1988

M(3000)F1 (0.01)

# IONOSPHERIC DATA

JAN. 1988

H\*F2 (KM)

135° E Mean Time (G.M.T. + 9h)

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											250	230	230	255	270	245	255	230							
2											245	230	270	250	245	255	245								
3											240	250	275	250	250	235									
4											245	225	240	280	250	235	280								
5											240	245	235	275	245	255	240								
6											230	240	245	240	270	250									
7											295	280	265	275	255	245	220	240							
8											250	230	260	250	265	260	230								
9											245	255	265	260	265	250									
10											240	260	285	265	245	235									
11										205	225	235	225	255	275	260	250	230							
12											235	255	250	280	250	245	240	225							
13											245	240	245	245	250	250	250								
14											240	225	235	300	255	230	240	230							
15											<sup>L</sup> 320	<sup>L</sup> 310	<sup>L</sup> 300	<sup>L</sup> 350	<sup>L</sup> 335	<sup>L</sup> 280	<sup>L</sup> 275								
16											245	235	265	255	250	275	275	240							
17											245	230	<sup>L</sup> 275	<sup>L</sup> 275	265	270	255								
18											250	245	250	255	255	260	260	230							
19											250	275	250	250	240	240	240								
20											240	235	265	270	250	255	245	240							
21											240	255	245	270	250	240	240	245							
22											250	290	275	240	250	240									
23											230	255	280	255	260	290	250	240							
24											240	240	250	265	270	250	260	250							
25										220	235	250	250	285	270	280	260	225	220						
26											235	260	260	265	245	310	250	260							
27											230	245	310	280	250	260	240								
28											255	260	250	355	270	265	245	245							
29											230	245	265	265	265	255	225	240							
30											250	240	240	265	265	260	250	<sup>L</sup> 240							
31											240	245	260	255	255	260	255	245							
		00	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	22	30	31	31	31	31	30	23	1						
MED										212	240	245	250	265	255	255	250	240	220						
UQ										245	250	262	280	270	265	260	245								
LQ										235	235	242	255	250	245	240	230								

JAN. 1988

H\*F2 (KM)



# IONOSPHERIC DATA

JAN. 1988

H\*F (KM)

135° E Mean Time (G.M.T. + 9h)

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	A	285	280	A	280	S	S	270	250	240	220	215	205	190	185	235	E A	245	240	215	220	220	E S	S	E S	E S					
2		E S		225	220	E S	E S	E S	E S	275	240	210	190	210	180	240	255	220	215	H	200	230	200	E S	260	E S	E A	E S	E S				
3		E S		205	E S	E S	E S	E S	E S	370	350	320	235	240	230	235	245	230	215	220	230	220	220	215	230	205	E S	E A	E S				
4		E S		265	245	240	255	245	250	235	265	230	205	190	H	185	H	H	205	220	245	215	190	245	S	230	200	235	E S				
5		S	S	S	S	S	S	S	S	E S	E S	220	210	215	200	195	H	245	240	230	225	H	230	200	220	220	255	S	240	E S			
6		E S		290	S	220	255	E S	S	305	S	300	255	235	H	230	215	200	185	H	190	200		H	235	210	200	235	220	220	A	E A	E S
7		E S		295	S	230	230	S	S	380	E S	190	215	225	225	220	205	215	215	210	215	H	230	205	215	295	270	210	210	S			
8		S	S	300	260	245	240	S	E S	255	E S	265	235	230	230	245	195	205	200	240	230	H	230	205	210	230	245	S	S	S			
9		S	E A	255	250	345	345	S	S	305	E S	270	265	230	230	220	210	220	215	210	220	H	240	225	220	220	260	240	250	250			
10		S		310	280	255	245	205	280	270	220	235	230	210	210	180	H	220	205	240	210	205	210	230	210	215	S	E S	295				
11		S	S	305	295	285	255	230	245	205	195	195	230	200	195	195	H	200	195	220	H	220	220	200	230	225	250	235	255	S			
12		S	S	300	285	255	245	250	270	245	220	220	215	A	200	180	H	210	205	210	H	210	200	205	E S	275	270	235	260	S			
13		E S	E S	285	235	E S	E S	E S	E S	305	300	310	255	195	H	200	195	H	195	H	200	220	205	210	245	220	215	E S	E A	380			
14		E S	E S	295	300	250	225	A	E S	330	270	245	195	215	210	185	H	200	210	200	180	H	235	205	235	210	270	245	270				
15		S	S	285	230	E S	E S	295	215	E S	260	250	230	220	H	220	225	220	220	235	H	220	235	220	220	235	260	255	255				
16		E S		290	265	285	280	225	200	E S	345	280	220	H	200	215	175	210	220	E A	255	A	245	235	200	205	250	205	215	E S	270		
17		E S	E S	325	270	255	235	245	280	230	220	230	230	205	195	185	H	200	200	195	H	220	220	200	195	250	245	245	245				
18		E S	E S	300	270	265	E S	E S	265	225	220	180	H	235	225	220	200	H	200	210	H	225	225	205	200	E S	E S	210	E S	250			
19		E S	E S	320	310	E S	E S	320	E S	290	215	E S	E S	225	230	225	220	H	180	H	H	H	230	200	220	200	230	245	205	E S	330		
20		E S	E S	320	320	295	280	E S	E S	275	230	E S	E S	270	230	230	230	220	215	H	A	215	210	H	200	210	210	210	230	S	220	E S	270
21		E S	E S	340	340	E S	290	245	230	270	E S	260	230	230	240	A	H	195	220	220	A	225	200	230	245	E S	E S	E S	E S	E S			
22		E S	E S	310	280	280	270	275	275	300	245	210	180	190	230	200	A	220	195	200	H	200	215	210	205	220	S	240	E S	300	300		
23		E S	E S	335	310	295	270	240	220	225	255	230	205	210	E A	250	A	220	E A	A	210	230	200	215	230	S	E S	225	E S	250			
24		E S	E S	315	310	280	260	140	255	240	250	225	235	220	215	190	210	215	210	210	210	215	200	210	210	230	225	210	E S	315			
25		S	S	315	S	295	270	230	210	210	190	215	205	210	190	H	200	175	H	240	225	220	215	200	235	S	210	E A	300	E S	285		
26		S	S	320	320	295	270	245	240	290	250	220	210	195	210	225	225	215	H	H	250	215	215	205	200	245	230	215	E A	250			
27		E S	E S	315	335	320	270	240	245	250	260	230	220	230	210	190	175	H	H	205	215	205	225	215	E A	250	260	210	245	S	330		
28		S	S	305	265	265	280	255	235	270	S	260	230	240	230	230	225	H	230	210	230	215	220	220	215	230	230	230	300	S			
29		S	S	300	305	285	250	250	215	E S	260	250	230	200	220	210	210	210	215	220	230	240	215	200	270	225	255	250	S				
30		E A	E S	285	280	300	295	265	250	270	S	250	230	220	H	200	H	195	H	190	195	H	215	200	H	230	205	240	245	220	230	230	
31		S	S	330	310	305	305	245	E S	235	S	230	230	200	H	200	195	H	190	230	H	200	225	235	205	205	205	250	S	S	S		
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
CNT		31	30	31	31	31	30	31	31	31	31	31	29	30	30	30	28	30	31	31	31	31	31	31	31	31	31	31	31	31			
MED		E S	U S	S	S	248	U S	E S	E S	248	230	220	220	210	198	200	210	215	220	220	205	215	232	232	230	E S	270						
UQ		E S	S	S	S	265	E S	E S	E S	259	230	230	230	220	210	220	220	228	230	230	215	230	248	248	246	E S	300						
LQ		U S	U S	U	S	240	U S	238	234	218	202	208	200	190	190	H	200	H	210	215	200	205	222	220	220	U S	235						

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H\*F (KM)

# IONOSPHERIC DATA

JAN. 1988

H<sup>o</sup>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									A	A	A	A	A	A	A	A	A	A							
2									120	110	120														
3									120	115	110	110	110	110	110	115	120	120							
4									120	115		A	E	A											
5									110	120	A	115	A	110	E	A	115	110	125						
6									E	S	130	110	110	110	115	115	115		A						
7									A	A	120	120	115	120	115	115	120								
8									E	S	130	110	A	115	115	115	A	115	115						
9									S	125	110	110	115	115		125	120								
10									A	A	A	A	A	A	A	110	115								
11									120	115	115	120	115	115	110	115									
12									A	115	115	110	115	110	105	105									
13									E	S	125	115	105	110	110	120	125	120	130						
14									A	A	110	110	120	110	110	115	115								
15									125	120	A	115	110	E	A	A	A								
16									120	110	115	110	110	110		A	A	A	A						
17									125	115	115	110	120	115	115	115	120								
18									120	120	115	120	115	115	110	115	120	125							
19									B	125	115	120	120	115	115	115	115	120							
20									A	120	B	115	115	115	115	115	115								
21									120	120	120	120	115	120	120	120	115	120							
22									120	115	110	115	110		A	110		A	110						
23									E	B	E	B	130	120	110	110	110	115	115	115					
24									E	B	130	115	105	105	110	110	110	110	105						
25									120	110	110	110	E	A	135	A	130	110	110	130					
26									S	110	110	105	110	110	110	115	120	A	E	A					
27									S	A	A	A	A	110	110	110	115	115	125						
28									120	E	A	A	A	120	A	110	110	120							
29									120	110	110	110	110	110	A	E	A	A	A						
30									120	110	A	A	A	A	120		A	A	110	120					
31									115	110	110	110	110	E	A	A	A	120	120						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									26	28	28	27	29	24	28	24	23	10							
MED									120	115	115	110	115	115	114	115	115	121							
UQ									122	113	115	115	115	113	116	115	120	130							
LQ									120	110	110	110	110	110	110	115	115	120							

JAN. 1988

H<sup>o</sup>E (KM)

# IONOSPHERIC DATA

JAN. 1938

H°ES (KM)

135° E Mean Time (G.M.T. + 9h)

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	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		110	105	105	105	110	115	S	S	110	G	105	105	100	100	100	95	95	100	S	S	S	S	S	S
2		S	S	S	S	S	S	S	S	G	G	G	G	165	170	165	G	G	170	105	S	100	100	100	S
3		S	S	S	S	S	S	S	S	G	G	115	110	100	100	100	100	100	100	100	100	100	100	95	100
4		90	110	110	S	S	S	S	S	G	G	95	100	G	G	G	G	G	150	S	S	S	S	S	S
5		S	S	S	S	S	S	S	S	G	110	110	105	G	110	G	G	G	S	120	105	100	100	S	S
6		S	S	S	S	S	110	105	105	145	G	G	G	105	100	G		100	S	S	S	105	100	100	100
7		105	110	S	S	S	S	S	S	150	105	180	110	105	105	105	105	100	100	S	S	S	S	100	S
8		105	S	S	S	S	S	S	S	140	G	105	G	G	105	100	100	G	S	200	100	95	S	S	S
9		S	105	S	105	115	105	S	S	G	G	E G 175	165	G	160	110	105	105	105	105	100	105	S	S	S
10		S	S	S	S	S	S	S	S	115	115	110	110	110	105	G	105	100	100	100	100	S	S	105	S
11		S	S	S	S	S	S	S	S	G	125	160	105	105	105	105	100	105	100	105	S	S	S	105	S
12		S	S	S	S	S	S	S	S	115	160	115	105	115	125	120	G	100	100	100	105	100	105	95	95
13		S	S	S	S	S	S	S	S	105	G	G	125	105	100	100	95	100	E G 180	100	S	S	S	S	100
14		S	S	S	S	S	105	S	S	175	115	125	150	110	105	G	G	G	S	S	S	S	S	S	S
15		S	S	S	S	S	S	S	S	140	130	110	G	105	105	105	95	95	100	100	100	S	S	S	S
16		S	S	S	S	S	S	S	S	G	125	120	G	125	110	105	100	100	100	100	105	100	130	S	100
17		100	S	S	120	S	S	S	S	G	E G 175	120	105	105	100	100	100	100	100	100	S	S	S	100	100
18		S	S	S	S	S	S	S	S	G	160	120	120	G	G	G	G	G	150	S	S	S	S	S	S
19		S	S	S	S	S	S	S	S	150	120	G	G	G	G	125	E G 175	E G 160	S	S	S	S	S	S	S
20		S	S	S	S	S	S	S	S	G	G	125	E G 170	115	120	115	G	G	105	100	S	S	S	S	S
21		S	S	S	S	S	S	S	S	G	G	125	125	G	G	G	G	G	G	S	S	S	S	S	S
22		S	S	S	S	S	S	S	S	G	G	G	145	G	100	G	100	G	100	S	S	S	S	100	S
23		S	S	S	S	S	S	S	S	G	E G 165	140	125	115	110	110	110	110	S	S	S	S	S	S	S
24		S	S	S	S	S	S	S	S	G	125	120	125	120	120	120	115	G	G	S	S	100	S	S	S
25		S	S	S	S	S	S	S	S	G	180	115	G	105	105	105	105	145	105	120	110	110	110	105	S
26		S	S	S	S	S	S	S	S	G	G	120	110	105	165	E G 150	E G 170	110	110	S	S	S	S	110	105
27		105	105	S	S	S	105	105	S	G	110	140	110	G	G	G	110	G	105	105	105	S	S	S	S
28		S	S	S	S	S	S	S	S	G	115	110	110	E G 170	150	E G 160	G	100	100	100	S	S	S	S	S
29		110	S	S	S	S	S	S	S	G	G	G	E G 160	E G 150	E G 160	110	120	110	105	105	S	S	S	S	S
30		95	S	S	S	S	105	105	S	G	G	125	105	155	E G 140	E G 120	110	G	G	S	S	S	S	S	S
31		S	S	S	S	S	S	S	S	G	G	G	E G 170	G	110	105	110	110	G	S	S	S	S	S	S
CNT		8	5	2	3	2	6	3	1	10	15	24	24	21	26	22	21	19	22	16	10	10	7	11	7
MED		105	105	108	105	112	105	105	105	140	120	118	112	108	106	106	102	100	101	100	102	100	100	100	100
UQ		108	110		112		110	105		150	123	128	134	120	120	120	110	106	108	105	105	105	108	105	100
LQ		98	105		105		105	105		115	115	110	108	105	105	105	100	100	100	100	100	100	100	100	100

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H°ES (KM)

# IONOSPHERIC DATA

JAN. 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 2 sec in automatic operation													
	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	FF 22	F 4	F 2	F 2	F 2	F 1	F 1		L 1		L 2	L 2	L 2	L 2	LH 31	L 2	L 2	L 2		F 3		F 2	F 2	F 1		
2														H 1	H 2	H 2			H 2	F 3		F 2	F 2	F 1		
3											C 2	C 3		L 2	L 1	L 3	L 2	L 2	L 2	F 3	F 4	F 3	F 2	F 7	F 1	
4	F 2	FF 21	F 3					F 1			L 3	L 1							HL 11		F 1					
5									L 1	L 1	L 1			L 1						F 1	F 1	F 1	F 2			
6					F 1	F 2	F 1		H 3				L 1	L 1				L 2			F 1	F 4	F 3	F 3	F 1	
7	F 2	F 1							HL 32	LH 32	HL 11	L 1	L 1	L 1	L 1	L 1	L 1	L 1	L 1				F 1	F 2		
8	F 1						F 1		H 2		L 2			L 1	L 1	L 1				F 2	F 3	F 2				
9		F 4		F 1	F 1	F 2				H 2	HH 11			HL 11	L 1	L 1	L 2	L 3	F 5	F 7	F 2			F 1		
10							F 1	L 2	L 1	L 2	L 3	L 3	L 2	L 3	L 3	L 1	L 3	L 3	F 2	F 1				F 1		
11									C 1	HC 11	L 1	L 1	L 1	L 1	L 1	L 1	L 1	L 1	F 1					F 2		
12								C 2	H 1	C 2	C 3	C 1	C 1	C 1	C 1		L 2	L 4	F 3	F 1	F 2	F 1	F 4	F 2		
13								L 1			CL 11	L 1	L 1	L 1	L 2	L 1	L 1	HL 11	F 1					F 3		
14				F 2				HL 22	L 2	C 1	H 1	L 1	L 1													
15								H 2	C 2	L 1			L 1	L 1	L 1	L 2	L 3	L 2	F 1	F 1						
16									C 1	C 1		C 1	C 1	L 3	L 4	L 3	L 2	L 2	F 3	F 1	F 2	FF 12		F 2		
17	F 1			F 1					C 1	HC 11	C 1	L 1	L 1	L 1	L 1	L 1	L 1	L 1	F 1				F 4	F 2		
18									H 1	C 2	C 1								H 2							
19								H 2	C 1					C 1	H 1		H 1									
20										C 2	H 2	C 1	C 2	C 2				L 2	F 4							
21										C 1	C 3															
22											HC 22			L 4		L 2		L 2						F 2		
23										H 1	H 2	C 2	C 3	C 3	C 3	C 3	C 3	C 3								
24									C 2	C 2	C 2	C 2	C 1	C 2	C 1							F 2				
25								H 2	C 2			L 5	L 5	L 5	L 1		H 2	LH 23	FF 11	F 1	F 4	F 5	F 4			
26	F 1								CL 12	C 1	L 2	H 1	HC 11	HL 11		L 1	L 1	F 1					F 1	F 4		
27	F 2	F 1			F 3	F 2		L 2	HL 11	L 1						L 1		L 2	F 5	FF 44						
28								L 1	L 1	L 1	HL 11	HL 11	HL 11		L 1	L 2	L 4	F 3						F 1		
29	F 2	F 1							H 1	H 1	L 1	CL 11	L 2	L 2	L 4	F 1	F 1									
30	F 1			F 1	F 3	F 2	F 1		HL 12	L 2	HL 11	HCL 11	CL 12	L 2					F 1							
31										H 1				L 2	L 2	L 1	L 1									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT																										
MED																										
UQ																										
LQ																										

The Radio Research Laboratory, Japan

JAN. 1988

TYPES OF ES

# IONOSPHERIC DATA

JAN. 1988

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station		OKINAWA							Lat.	26 16' 9" N				Long.	127 48' 4" E				Sweep 1 MHz to 25 MHz in 2 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	C	C	C	C	C	C	C										X	X	X	X	X	X	
2		X	X	X	X	X	X	X	X										64	46	52	63	64	42	
3		88	67	X	X	35	32	U	X										63	45	64	76	79	68	
4		X	X	X	X	X	X	X	X										64	48	58	47	47	42	
5		X	X	X	X	X	X	X	X										89	62	73	67	54	50	
6		X	X	X	X	X	X	X	X										71	56	63	57	53	43	
7		X	X	X	X	X	X	X	X										108	63	86	58	43	39	
8		X	X	X	X	X	X	X	X										66	49	U	X	60	X	
9		X	X	X	X	X	X	X	X										71	74	57	64	60	47	
10		X	X	X	X	X	X	X	X										99	86	84	82	82	66	
11		X	X	X	X	X	X	X	X										X	X	X	X	X	X	
12		X	X	X	X	X	X	X	X										96	70	69	69	56	40	
13		X	X	X	X	X	X	X	X										133	108	91	88	98	85	
14		X	X	X	X	X	X	X	X										82	71	83	77	43	37	
15		X	X	X	X	X	X	X	X										100	84	74	69	69	63	
16		X	X	X	X	X	X	X	X										X	X	X	X	X	X	
17		X	X	X	X	X	X	X	X										91	93	108	81	51		
18		X	X	X	X	X	X	X	X										U	X	X	X	X	X	
19		X	X	X	X	X	X	X	X										124	91	89	89		S	
20		X	X	X	X	X	X	X	X										93	84	86	78	57		
21		X	X	X	X	X	X	X	X										X	X	X	X	X	X	
22		X	X	X	X	X	X	X	X										64	50	60	59	46		
23		X	X	X	X	X	X	X	X										77	64	61	56	49		
24		X	X	X	X	X	X	X	X										89	68	70	70	50	X	
25		X	X	X	X	X	X	X	X										90	75	78	77	44		
26		X	X	X	X	X	X	X	X										X	X	X	X	X	X	
27		X	X	X	X	X	X	X	X										90	60	64	58	44		
28		X	X	X	X	X	X	X	X										92	77	90	50	42		
29		X	X	X	X	X	X	X	X										64	58	55	47	38		
30		X	X	X	X	X	X	X	X										105	76	84	81	63		
31		X	X	X	X	X	X	X	X										X	X	X	X	X	X	
		X	X	X	X	X	X	X	X										99	81	74	50	47		
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		30	30	30	30	30	30	29	30										14	31	31	31	31	30	
MED		X	X	X	X	X	X	X	X										X	X	X	X	X	X	X
UQ		X	X	X	X	X	X	X	X										86	77	68	69	60	46	
LQ		X	X	X	X	X	X	X	X										100	90	79	79	78	56	
		X	X	X	X	X	X	X	X										X	X	X	X	X	X	X
		X	X	X	X	X	X	X	X										66	64	60	61	52	42	

JAN. 1988

FXI (0.1 MHz)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JAN. 1988

FOF2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station	OKINAWA				Lat. 26 16' 9" N				Long. 127 42' 4" E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																	
	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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	R	R	81	68	58	40	46	57	58	S						
2		36	36	28	22	22	22	23	32	60	73	84	94	98	91	34	30	89	63	57	39	58	70	U S	F					
3	F	U S	J S	J S	F	F	U S	21	37	105	78	91	103	137	138	143	122	92	69	58	42	52	41	41	36					
4		27	23	32	32	24	F	F	32	70	79	90	78	90	97	105	89	99	114	33	56	67	61	43	44					
5		34	31	29	33	31	25	22	35	62	69	90	78	84	109	107	111	94	85	65	50	57	51	S	37					
6		31	34	37	21	22	23	25	35	75	84	85	79	94	105	140	138	R	R	R	192	57	80	52	37	S				
7		32	33	S	24	19	22	27	30	53	62	90	98	108	108	91	75	68	69	60	43	U S	55	54	S					
8		20	23	24	27	F	F	19	30	58	85	109	100	83	86	95	116	127	85	65	68	51	58	54	41					
9		37	41	26	22	22	S	34	32	70	90	77	82	98	98	93	98	R	103	100	93	80	73	S	S	60				
10		44	28	30	34	30	18	20	32	63	80	96	93	107	150	180	138	R	R	U R	128	130	104	60	64	57	46	39		
11		33	31	31	V	35	32	25	30	55	71	81	81	75	88	110	125	H	99	R	70	90	64	S	S	50	34			
12		26	27	31	28	34	23	23	32	63	76	87	110	109	U R	128	145	U R	154	145	147	127	U S	102	85	82	92	U S		
13	S	52	55	57	40	35	41	30	S	70	88	128	102	U R	121	121	125	116	112	100	76	S	65	77	71	37	31			
14		28	27	29	32	31	18	A	28	63	91	110	99	112	162	U R	152	U R	118	117	72	94	78	S	63	63	57			
15		41	S	47	28	21	30	U S	22	S	39	56	63	52	60	63	59	70	74	82	82	33	68	S	52	U S	45	37		
16		26	U S	31	34	41	17	18	29	73	94	110	114	129	134	134	142	134	132	R	113	S	87	102	U S	75	45			
17		38	36	42	42	32	25	22	33	61	79	115	116	R	104	U R	117	113	127	R	137	149	136	U S	U S	S	81	61		
18		49	47	S	38	36	42	30	36	59	68	102	99	111	118	111	142	R	166	141	120	118	S	85	83	83	S			
19		27	28	28	28	34	24	19	31	69	71	78	99	124	R	118	R	132	R	125	150	110	105	S	87	78	80	72	S	
20	S	40	40	38	32	42	31	20	30	69	90	84	82	100	79	94	94	88	79	77	57	55	53	S	61	S	50			
21		39	34	38	44	60	24	18	30	61	80	90	106	90	102	R	113	R	98	R	88	94	76	S	54	54	S	40		
22		35	32	30	30	32	28	26	34	60	66	84	90	124	U R	156	J R	162	141	R	137	130	95	71	58	55	S	S		
23		43	S	43	46	50	65	37	22	32	67	81	61	70	92	115	110	110	U R	107	109	109	S	83	62	64	64	U S	44	
24	S	33	32	32	32	35	30	28	32	57	71	77	88	84	114	141	150	U R	156	151	112	84	69	72	71	38				
25	S	35	34	34	34	37	S	U S	29	30	50	66	77	74	85	U R	120	138	R	171	U R	156	123	108	R	78	S	55	35	28
26		30	30	30	32	36	27	28	32	64	65	70	78	94	102	110	R	110	R	113	122	104	R	84	54	58	U S	38		
27		25	26	27	29	31	23	21	30	67	63	71	67	71	104	116	105	108	92	34	86	71	84	44	S	36				
28	S	36	34	31	31	33	37	20	30	59	70	99	94	77	84	107	102	90	78	65	58	52	S	49	41	S	32			
29		30	30	32	31	31	23	F	32	54	75	71	84	100	117	128	146	128	125	121	R	S	U S	78	74	S	57			
30		33	28	27	27	29	28	23	32	64	82	88	80	67	87	103	103	95	90	94	S	84	59	64	55	38				
31		30	27	28	30	31	30	18	31	53	73	88	86	79	91	117	141	145	136	130	R	93	S	68	44	41				
CNT		29	30	30	30	28	27	27	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	29			
MED		33	32	31	32	32	26	22	32	62	76	88	89	96	108	113	116	112	100	94	71	62	63	54	39					
UQ		38	36	38	34	36	30	26	32	69	82	96	99	109	120	136	140	R	137	128	108	S	73	72	72	45				
LQ		30	28	28	28	30	23	20	30	58	69	77	79	84	91	107	100	93	84	76	58	54	55	46	36					

The Radio Research Laboratory, Japan

JAN. 1988

FOF2 (0.1 MHz)

# IONOSPHERIC DATA

JAN. 1988

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9h)

Station		OKINAWA								Lat. 26 16.9 N		Long. 127 48.4 E		Sweep 1 MHz to 25 MHz in 2 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	C	C	C	C	C	U L	L	L	L						
2																460	L	L	L						
3																460 470 480 440	L	L	L						
4																460	L	L	L						
5																440 450	L	U L	L						
6										L	L	L	L			450 480 460	L	L	L						
7																400 470 460	L	L	L						
8																470 480 460	L	L	L						
9																L	L	L	L						
10																L	U L	L	L						
11																490	L	L	L						
12																L	L	L	L						
13										L	L	L	L			480 490 450 430	L	L	L						
14																480	L	L	L						
15																L	420 430 470 450	L	430	L					
16																L	L	L	L						
17																L	490 470	L	L	L					
18																L	490 490	L	480	L					
19																L	490	L	L	L					
20																L	490	L	L						
21																L	480 490	L	L	L					
22																L	450 470 500 470 470	L	L						
23																L	480 460 450	L	A						
24																L	460 470 490 470 480 450	L	L						
25																L	490 490	L	L	A					
26																L	450 470 480	L	L	L					
27																L	L	L	L						
28																L	470	L	450	L					
29																L	490 490 490 450	L	L						
30																L	460 490 490 440	L							
31																L	470	L	L						
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT													3	8	15	19	17	11	2						
MED													L	U L	U L	U L	U L	U L	U L						
UQ													450	460	470	480	470	450	440						
LQ													L	U L	L	U L	U L	L							
													465	470	490	490	480	465							
													U L	U L	U L	U L	U L	U L							
													425	455	465	470	460	440							

JAN. 1988

FOF1 (0.01 MHz)

# IONOSPHERIC DATA

JAN. 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									C	C	C	C	C	C	320	295	265	205							
2									205	265	295	305	315	A	315	285	250	200							
3									210	275	295	325	340	335	315	295	255	210							
4									190	255	300	325	340	340	330	310	265	200							
5									210	A	A	315	320	320	A	295	260	A							
6									200	260	A	A	A	325	320	300	280	200							
7									200	250	290	315	330	335	320	300	270	200							
8									200	A	305	320	A	A	315	300	260	200							
9									195	255	300	335	340	A	330	315	A	A							
10									R	A	A	A	A	R	340	320	R	305	255	195					
11									220	255	305	330	340	340	335	A	A	R	230						
12									S	A	A	A	A	A	A	A	A	A	210						
13									200	260	A	320	330	330	320	300	280	220							
14									190	A	A	A	330	340	330	310	280	210							
15									195	250	290	315	330	330	320	300	280	A	S						
16									190	260	300	320	340	345	A	A	A	210	A						
17									200	280	310	A	345	340	340	310	275	210	A						
18									205	270	A	A	345	350	340	320	280	215	S						
19									185	255	A	A	340	340	R	R	R	R	R	S					
20									R	A	A	340	350	345	A	A	280	220	S						
21									180	265	300	R	R	A	R	R	305	295	R	S					
22									180	A	A	310	320	330	A	A	A	200	S						
23									200	250	290	305	A	A	A	A	A	A	S						
24									180	250	285	300	A	A	A	A	A	A	S						
25									200	260	R	A	A	A	A	R	U	A	S						
26									R	R	R	R	A	A	A	A	290	R	S						
27									R	A	310	A	A	A	335	A	290	240	S						
28									205	A	A	R	310	A	A	U	A	A	R	S					
29									180	250	280	295	A	A	A	A	280	225	S						
30									A	A	A	325	325	A	A	325	J	R	S						
31									185	255	A	330	A	340	345	330	300	245	S						

CNT	28	21	17	21	18	17	20	20	23	26
MED	200	260	300	320	340	340	325	305	280	212
UQ	202	260	305	325	340	340	335	312	285	225
LQ	190	255	290	310	330	330	320	300	265	200

The Radio Research Laboratory, Japan

JAN. 1988

FOE (0.01 MHz)



# IONOSPHERIC DATA

JAN. 1988

FOES (0.1 MHz)

135 E Mean Time (G.M.T. + 9h)

Station	OKINAWA				Lat.	26 16 9 N				Long	127 48 4 E				Sweep	1 MHz to 25 MHz		in 2 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	38	34	30	23	J A	J A	E S	E S	E S	19	
2		E S	E S	E S	E S	E S	E S		G	G	G		G	J A	G					J A	J A	E S	E S	E S	26	
3	E S	E S	E S	E S	E S	E S	E S		G	G	G	G	J A	G	J A					J A	J A	E S	E S	E S	21	
4		J A	J A	E S	E S	E S	E S	J A		G	G		J A	J A	G	G	G	G	G	E S	E S	E S	E S	E S	18	
5	E S	E S	E S	E S	E S	E S	E S		G	J A	J A	G	G	G	J A					J A	J A	E S	E S	E S	16	
6	E S	E S	E S	E S	E S	E S	E S			J A	J A	J A	G	G	G					E S	E S		J A	J A	J A	20
7	E S	E S	J A	E S	E S	E S	E S				G		G	G	G					J A	J A	E S	E S	E S	20	
8	J A	E S	E S	E S	E S	E S	E S		G	J A		G		G	G	J	G					E S	E S	E S	18	
9	E S	E S	E S	E S	E S	J A	E S	E S					G	J A		J A	J A	J A		E S	J A	E S	E S	E S	16	
10	E S	E S	E S	E S	E S	E S	E S		G	J A	J A	J A	J A	G	G	G					J A	J A	E S	E S	E S	16
11	E S	E S	E S	E S		E S	E S	E S		G	G		G	G	G	J A	J A			J A	J A	J A	J A	E S	E S	16
12	E S	E S	E S	E S	E S	E S	E S			J A		J A	J A	J A	J A	J A					J A	J A	E S	E S	E S	16
13	E S		E S	E S	E S	E S	E S		G	G	J A		G	G	G							E S	E S	E S	16	
14	E S	E S	E S	E S	E S	E S	J A	E S			J A	J A	J A	G	G	G					E S	E S	E S	E S	E S	16
15	E S	E S	E S	E S	E S	E S	E S				G	G	G	G	G						J A	J A	E S	E S	E S	16
16	E S	E S	E S	E S	E S	E S	E S		G	G	G	J A				J A	G	J A				E S	E S	E S	16	
17	E S	E S	E S	E S	E S	E S	E S		G		J A		J G	G	G					J A	J A	J A	J A	E S	E S	16
18		E S	E S	E S	E S	E S	E S		G	G												E S	E S	E S	16	
19	E S	E S	E S	E S	E S	E S	E S			G	J A	J A	G	G	G							E S	E S	E S	16	
20	E S	E S	E S	E S	E S	E S	E S		G	G	J A		G			40	38	34	30	G	E S	E S	E S	E S	E S	16
21	E S	E S	J A	E S	E S	E S	E S			G												E S	E S	E S	16	
22	E S	E S	E S	E S	E S	E S	E S		G	J A	J A	G	J G	G	J A	J A	J A					E S	E S	E S	16	
23	E S	E S							G	G			J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E S	E S	16	20
24	E S	E S	E S	E S	E S	E S	E S		G				J A	J A	J A	J A	J A	J A	E S	E S	J A	J A	J A	J A	16	22
25		E S	E S	E S	E S	E S	E S		G				J A	J A	J A	J A	J A	J A	J A	J A	J A	E S	E S	E S	16	24
26	E S	E S	J A	E S	E S	E S	E S		G	G	G	J A	J A	J A	J A	J A	G	G			E S	J A	E S	E S	E S	16
27		J A	J A		E S	E S	E S	E S		G	J A		J A	J A	J A	J A	G	G			E S	E S	E S	J A	E S	16
28	J A	E S	E S	E S	E S	E S	E S		G		J A		J A	J A	J A	J A	J A	J A	G	E S	E S	E S	E S	E S	E S	16
29	E S	J A	E S	E S	E S	E S	E S		G	G	J A		J A	J A	J A	J A	G	G			E S	J A	J A	J A	E S	16
30	E S	E S	E S	E S	J A	E S	E S			J A	J A	J A	G		J A	J A	J A	J A	G	J A	J A	E S	E S	E S	E S	16
31	E S	E S	E S	E S	E S	E S	E S		G	G	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E S	E S	E S	E S	16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	
MED	E S	E S	E S	E S	E S	E S	E S		G																E S	E S
UQ	E S	E S	E S	E S	E S	E S	E S			J A			J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E S	E S
LQ	E S	E S	E S	E S	E S	E S	E S		G	G															E S	E S

JAN. 1988

FOES (0.1 MHz)

# IONOSPHERIC DATA

JAN. 1988

FBES (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

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

JAN. 1988

FBES (0.1 MHz)

# IONOSPHERIC DATA

JAN. 1988

FMIN (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

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

JAN. 1988

FMIN (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

JAN. 1988

M(3000)F2 (0.01)

135° E Mean Time (G.M.T. + 9h)

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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	R	R	360	365	355	335	270	305	345	S								
2	320	345	340	320	320	295	325	330	360	340	340	355	335	325	340	345	355	355	360	305	285	290	275	F								
3	F	U S	J S	J S	F	F	U S	260	335	360	350	330	305	315	310	320	325	345	355	370	310	325	290	315	335							
4	275	305	330	375	355	F	F	310	365	375	350	295	325	320	340	310	325	360	380	285	315	320	310	340								
5	295	320	325	335	355	330	320	330	355	R	345	355	345	320	330	320	335	330	350	340	310	315	315	S	295							
6	305	325	365	335	320	325	340	315	345	355	350	320	320	285	305	R	R	R	350	S	350	365	350	S	S							
7	295	305	S	385	370	320	295	335	360	355	320	315	315	335	330	345	340	345	350	370	295	310	350	S	S							
8	275	305	335	335	F	F	290	300	335	340	350	345	360	330	305	310	345	335	S	340	295	310	325	315	S							
9	285	340	365	320	295	S	290	310	F	345	320	365	350	340	305	315	320	345	R	335	345	330	S	S	S							
10	350	285	300	365	365	305	300	310	340	350	335	315	300	300	R	R	320	345	S	310	345	305	325	320	S							
11	305	305	305	S	340	345	340	315	365	365	340	365	345	305	305	330	H	R	355	295	310	S	S	330	325							
12	305	295	320	320	365	325	345	330	350	340	310	335	320	U R	U R	295	310	305	310	330	U S	315	300	300	U S	S						
13	S	270	290	325	310	285	315	300	S	330	340	U R	335	U R	U R	305	330	300	320	330	S	340	325	310	340	350	285					
14	285	295	325	345	380	380	A	320	335	340	340	305	285	320	U R	U R	R	315	305	315	315	340	S	310	315	315	335					
15	280	S	300	350	340	310	335	U S	320	S	305	340	340	280	270	270	250	270	260	265	265	300	S	325	315	300	335	335				
16	290	U S	S	320	305	310	390	S	S	295	335	340	325	305	340	315	300	320	315	R	310	340	S	340	300	335	U S	S	320			
17	290	265	320	335	345	340	320	320	360	310	350	355	R	325	U R	315	310	310	315	330	335	325	U S	270	300	340	345	S				
18	275	275	S	290	315	335	335	285	320	365	345	335	325	335	295	310	310	280	R	335	S	325	U S	270	315	335	S	S				
19	275	285	305	305	340	355	290	305	345	350	305	305	R	335	R	R	R	R	R	R	R	R	S	290	320	345	345	S				
20	S	300	285	275	310	345	355	325	300	340	365	340	335	355	355	325	350	345	340	335	350	300	300	345	S	S	320	S				
21	295	280	275	305	365	355	335	300	345	350	325	360	315	325	R	R	320	305	R	345	355	295	S	295	295	330	S	310				
22	330	295	315	335	310	305	305	325	360	340	345	320	305	300	U R	J R	290	310	R	320	345	R	345	350	325	320	S	S	315			
23	290	S	315	305	320	360	350	365	310	335	365	345	330	325	290	320	335	U R	U R	U R	315	300	330	335	320	310	310	U S	340			
24	S	305	280	310	330	340	335	340	345	335	340	350	350	350	315	305	300	U R	R	315	335	340	345	305	320	350	370	S				
25	S	285	295	295	295	S	325	U S	360	S	380	315	360	340	365	345	290	U R	310	300	325	R	325	340	R	310	340	S	305	345	340	305
26	300	285	285	295	345	315	S	305	310	360	340	340	325	320	315	R	340	R	R	R	R	S	S	305	S	320	U S	S	355			
27	280	270	275	310	340	345	335	315	365	365	370	365	295	300	335	310	350	335	340	360	270	S	350	320	290	S	S	290	S			
28	S	290	325	305	305	320	350	300	315	340	330	345	350	325	310	315	330	345	335	355	300	315	315	305	S	310	S	310	S	310		
29	300	300	295	290	355	325	F	330	350	355	340	340	315	325	320	330	320	330	R	S	S	U S	330	280	305	305	S	S	360	S		
30	335	305	295	295	295	355	325	310	345	370	365	370	335	310	320	330	325	325	S	325	315	290	330	335	340	S	S	340	S	340		
31	265	275	285	300	320	350	S	320	360	340	340	355	295	290	310	310	325	325	R	350	340	S	300	315	305	315	S	S	315	S		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
CNT	29	30	30	30	28	26	25	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29		
MED	290	298	308	318	340	335	320	315	348	345	340	338	320	315	315	315	320	335	340	330	300	315	330	320								
UQ	305	315	330	335	358	350	335	330	360	355	350	350	335	320	325	330	335	345	352	340	315	320	342	340								
LQ	280	285	295	305	320	320	300	310	340	340	335	315	305	300	305	310	R	315	325	330	310	290	302	312	310							

JAN. 1988

M(3000)F2 (0.01)

# IONOSPHERIC DATA

JAN. 1988

M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9h)

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	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																									
2																									
3																									
4																									
5																									
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8																									
9																									
10																									
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25																									
26																									
27																									
28																									
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT											3	8	15	19	17	11	2								
MED											400	380	385	375	370	390	370								
UQ											400	390	395	382	385	395									
LQ											398	380	372	365	365	370									

JAN. 1988

M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JAN. 1988

H<sup>o</sup>F2 (KM)

135° E Mean Time (G.M.T. + 9h)

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									c	c	c	c	c	c		250	230	245	220										
2										250	250	240	280	270	245	240	230												
3										225	260	285	275	255	250	250	235												
4										240	225	250	L	250	275	250	L	260	225										
5										240	240	245	270	270	245	250	235												
6									255	240	240	235	240	270	275	260	240												
7										265	260	265	260	240	240	240													
8										280	260	245	240	280	290	280	240												
9										225	245	255	280	250	255	275	240	220											
10										245	260	240	270	300	270	230	245												
11										245	270	235	255	300	285	250	225												
12										245	260	260	250	275	260	275	250	250											
13										265	240	240	235	265	260	250	260	250											
14										260	260	240	250	270	235	240	235												
15										L	280	450	450	580	420	L	420	340	L	300									
16										250	280	295	255	260	275	255	240												
17										L	285	250	245	245	250	280	265	240	230										
18											270	250	255	275	270	280	230												
19										235	270	285	265	270	245	280	235	210											
20										230	230	250	250	230	285	245	240												
21										255	270	240	240	260	250	250	235	230											
22										240	260	280	280	280	275	250	250												
23										275	240	245		A	270	260	260	240	245										
24										240	250	250	240	290	260	280	265	230											
25											250	265	320	300	280	260	230	215											
26										250	260	265	270	270	245	270	255	235											
27											235	235	250	300	265	270	230	230											
28										270	255	235	270	280	280	250	230	230											
29										245	L	245	265	280	270	260	235	235	230										
30										240	230	235	250	300	275	245	240												
31										255	265	245	L	280	L	300	295	270	245	230									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT										2	25	30	30	29	30	31	31	31	16										
MED										260	245	258	248	265	270	260	260	240	230										
UQ										255	265	265	275	290	278	270	245	232											
LQ										240	240	240	250	260	250	248	235	222											

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JAN. 1988

H<sup>o</sup>F2 (KM)

IONOSPHERIC DATA

JAN. 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		2 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	245	220	250	225	200	200	S	250	255	225	245							
2		250	225	210	S	S	S	S	270	240	230	220	215	205	210	215	225	225	240	215	200	A	300	260	280	280								
3		235	210	260	S	S	E S	S	345	355	355	395	280	230	225	225	210	230	200	270	230	230	230	225	270	245								
4	E S	260	E S	280	260	220	235	270	300	230	230	235	220	200	180	190	220	200	230	240	200	190	235	205	230	230								
5	S	260	E S	280	270	250	240	250	S	240	215	220	205	210	190	H	A	A	210	220	205	215	235	210	230	S								
6	S	S	270	210	S	S	S	E S	280	220	A	240	230	210	210	200	200	200	200	A	215	210	200	210	190	230	S							
7	S	E S	280	240	220	S	S	S	S	S	220	225	210	220	200	210	220	220	210	240	215	215	A	270	215	220								
8	S	S	S	S	270	240	250	S	S	S	230	H	A	210	A	200	205	H	210	H	210	210	205	210	240	225	240							
9	290	225	210	S	S	S	250	245	245	230	205	215	190	215	235	215	230	230	200	200	200	200	220	230	225	230								
10	220	E S	290	280	225	210	S	S	250	230	230	240	220	210	190	215	200	225	230	195	200	200	200	250	225	230								
11	270	300	290	290	250	225	240	210	220	230	200	205	200	190	250	250	225	220	220	210	205	230	220	235	S									
12	S	S	E S	270	230	225	S	S	250	240	230	210	205	200	210	210	190	220	240	210	190	A	235	265	220	210								
13	235	E S	280	215	250	S	235	S	S	220	220	210	210	190	210	200	200	200	230	210	215	220	210	220	S									
14	S	S	E S	280	250	210	S	A	E S	275	240	230	210	210	H	190	H	H	210	215	215	210	200	230	230	240	225							
15	E S	280	E S	290	220	230	S	230	S	270	240	240	220	220	200	H	H	220	A	230	A	A	245	225	215	S	250	240						
16	260	S	275	270	270	205	S	S	300	250	230	230	225	230	225	A	H	200	220	225	200	180	230	230	195	250								
17	S	S	S	S	250	320	260	230	230	245	260	260	230	230	240	225	200	195	200	195	230	240	205	185	200	270	235	225						
18	240	275	250	255	235	230	290	S	245	225	220	230	240	225	H	190	225	195	240	210	205	195	200	230	220	205								
19	270	S	300	275	300	235	205	S	260	235	225	215	205	195	205	200	200	250	220	200	195	235	210	205	230									
20	255	280	S	300	255	245	200	S	290	245	230	205	225	205	200	235	200	245	225	205	200	205	220	220	210									
21	280	315	S	300	260	210	200	S	270	235	230	245	200	210	200	200	205	215	240	200	200	205	235	235	245	S								
22	255	S	E S	280	265	260	270	S	260	215	190	190	190	190	210	190	A	210	235	200	200	210	220	210	260	S								
23	E S	290	E S	290	275	240	215	205	S	260	240	210	225	A	A	210	A	A	A	A	210	195	220	240	225	210								
24	E S	260	S	E S	280	250	245	235	240	240	220	H	H	A	200	190	210	210	220	A	A	200	245	230	220	220	200							
25	295	295	295	300	255	215	200	245	200	240	235	220	190	200	195	250	230	A	220	200	205	220	230	220	230	A								
26	S	S	S	S	250	255	290	260	235	220	205	205	190	200	200	195	210	240	210	200	215	225	220	200	215	200								
27	S	S	S	S	330	335	320	280	245	215	265	255	225	220	220	220	190	190	190	220	215	225	215	200	225	205	200	A						
28	280	255	270	S	255	270	220	S	260	245	245	240	220	200	190	210	225	220	225	215	205	205	250	230	250	S								
29	S	S	270	275	225	275	270	250	220	205	H	A	200	210	210	215	H	200	245	215	195	200	250	205	210									
30	S	245	280	S	280	295	285	235	260	260	240	235	225	200	200	H	185	250	205	200	230	225	195	275	230	225	220							
31	S	275	S	325	310	S	280	245	230	S	240	225	245	220	215	195	180	190	200	230	225	210	195	S	210	255	235							
	00	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	25	29	28	25	23	14	27	30	30	29	28	29	30	29	28	29	23	31	30	30	30	31	28										
MED	S	S	278	270	258	240	235	262	252	230	230	220	210	200	200	210	208	220	225	210	200	215	230	225	230									
UQ	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S								
LQ	280	300	280	280	250	252	280	260	240	230	225	220	205	210	225	220	230	240	212	205	230	250	230	242										
	248	U S	250	255	245	225	218	250	242	220	220	210	205	190	190	200	200	210	220	200	195	205	220	220	215									

JAN. 1988

H \* F (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JAN. 1988

H°E (KM)

135° E Mean Time (G.M.T. + 9h)

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									C	C	C	C	C	C	105	105	110	E B											
2									B	115	105	105	105	100	A	A	H												
3									115	115	110	110	105	105	105	105	110	120											
4									125	110	110	110	A	A	A	110	110	115	115										
5									110	A	A	110	110	110	110	A	110	A											
6									A	120	110	A	110	110	110	110	110	110											
7									B	125	110	110	110	110	110	110	110	110	110										
8									E B	125	110	110	110	A	A	105	110	A	B										
9									S	105	100	105	115	110	110	105		A	A										
10									115	105	A	A	A	100	100	105	110	110											
11									120	115	110	105	105	110	110	105	A	105											
12									S	110	110	105	105	A	A	A	A	110											
13									110	110	A	110	110	110	110	110	110	120											
14									110	105	A	105	110	110	110	110	110	110											
15									B	120	110	110	110	110	110	105	115	A	A	S									
16									120	115	115	115	115	110	110	110	110	115	A										
17									120	H	115	110	110	A	105	110	115	115	120	A									
18									130	125	120	115	115	110	115	110	110	120	S										
19									115	110	105	105	105	105	105	105	105	115	S										
20									115	115	110	100	105	105	105	105	110	115	S										
21									115	105	105	110	105	105	105	105	105	105	S										
22									110	110	110	110	A	105	A	A	A	105	S										
23									B	120	110	110	110	110	110	105	110	A	S										
24									B	125	110	110	110	105	A	A	105	A	110	S									
25									S	110	105	105	A	A	A	105	110	115	S										
26									110	105	105	105	105	A	A	A	105	110	S										
27									115	105	105	110	105	A	105	105	105	105	S										
28									115	105	105	105	A	A	100	A	A	110	S										
29									120	105	105	105	A	110	110	110	110	110	S										
30									A	110	110	115	115	115	115	105	110	105	S										
31									115	110	105	110	110	105	110	110	115	115	S										
CNT									26	29	25	29	25	22	26	27	25	27											
MED									115	110	110	110	110	110	110	105	110	110											
UQ									120	110	110	110	110	110	110	110	110	115											
LQ									115	105	105	105	105	105	105	105	110	110											

JAN. 1988

H°E (KM)



# IONOSPHERIC DATA

JAN. 1988

H<sup>+</sup>ES (KM)

135° E Mean Time (G.M.T. + 9h)

Station	OKINAWA				Lat. 26° 16' 9" N				Long. 127° 48' 4" E				Sweep 1		MHz to 25		MHz in 26		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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	170	150	175	145	100	100	S	S	S	95	
2	95	S	S	S	S	S	S	S	G	G	G	G	G	G	95	100	155	G	125	S	110	115	100	100	110	
3	S	S	S	S	S	100	S	175	G	G	G	G	105	G	100	110	G	G	100	100	100	95	95	100		
4	105	110	105	S	S	S	S	105	G	G	G	115	100	100	100	100	G	G	G	S	S	S	S	100	140	
5	S	S	S	S	S	S	S	S	G	G	G	110	110	G	G	G	115	160	150	100	100	100	100	100	S	
6	S	S	S	S	S	S	S	S	E G	160	110	120	120	G	G	G	G	G	S	S	110	100	100	100		
7	S	S	100	S	S	S	S	S	E G	165	150	145	140	G	G	G	G	G	130	110	100	100	100	105	110	
8	110	S	S	S	S	S	S	S	G	120	E G	165	G	E G	170	150	G	G	100	G	105	100	100	S	110	
9	S	S	S	S	S	105	S	S	155	E G	160	E G	130	G	125	150	125	100	110	100	S	S	S	S		
10	S	S	S	S	S	S	S	S	G	120	105	105	110	G	G	G	G	G	145	100	115	S	S	100		
11	S	S	S	S	115	S	S	S	G	G	155	135	G	G	G	115	110	G	G	105	115	105	105	S	S	
12	S	S	S	S	S	S	S	S	120	125	115	115	115	110	110	105	100	G	G	100	110	110	S	S		
13	S	110	S	S	S	S	S	S	G	G	110	150	G	G	G	G	E G	E G	170	160	125	110	110	110	S	S
14	S	S	S	S	S	S	110	S	155	115	110	115	G	G	G	G	G	G	S	S	S	S	S	S	S	
15	S	S	S	S	S	S	S	S	155	165	E G	165	G	G	G	G	E G	170	100	100	100	100	S	S	S	S
16	S	S	S	S	S	S	S	S	G	G	G	115	130	115	110	110	115	G	105	100	150	125	100	100		
17	S	S	S	S	S	S	S	S	G	170	120	110	100	G	G	G	160	100	95	100	105	105	100	S		
18	100	S	S	S	S	S	S	S	G	G	120	115	125	G	G	G	G	G	S	S	125	125	S	S		
19	S	S	S	S	S	S	S	S	150	G	120	115	G	G	G	G	150	125	S	S	S	110	105	100		
20	S	S	S	S	S	S	S	S	G	G	120	G	G	G	G	120	115	110	150	G	S	S	S	S	S	
21	S	S	105	S	S	S	S	S	145	G	155	120	G	115	110	G	G	G	S	S	S	115	100	S		
22	S	S	S	S	S	S	S	S	G	125	125	G	105	G	105	100	100	G	S	115	110	110	S	100		
23	S	S	100	100	100	100	100	100	G	G	150	140	125	125	120	115	115	110	110	110	105	100	S	100		
24	S	S	S	S	S	S	100	S	G	145	150	125	120	110	110	115	110	125	S	S	110	110	105	100		
25	100	S	S	S	S	S	S	S	G	E G	160	140	120	110	110	105	150	130	120	115	S	S	100	100	100	
26	S	S	100	S	S	S	S	S	G	G	G	125	115	105	105	110	G	G	S	115	S	105	S	S		
27	100	100	100	100	S	S	S	S	G	125	140	115	115	110	G	115	G	G	S	S	S	100	S	100		
28	100	S	S	S	S	S	S	S	G	115	115	115	105	105	150	100	100	G	S	100	S	S	S	S		
29	S	105	S	S	S	S	S	S	G	G	145	165	110	110	115	115	G	G	S	100	130	105	100	S		
30	S	S	S	S	100	S	S	100	100	115	115	G	130	120	120	G	G	110	105	125	125	S	100	S		
31	S	S	S	S	S	S	S	S	G	G	110	125	115	G	G	G	G	G	S	S	125	S	S	S		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	7	4	6	2	3	3	3	5	9	16	24	23	20	16	18	18	17	14	16	19	12	19	15	14		
MED	100	108	100	100	100	100	100	100	152	122	119	120	115	110	110	114	112	118	102	100	110	105	100	100		
UQ	102	110	105		108	102	105	105	155	142	144	132	124	119	120	132	150	128	108	112	120	110	100	110		
LQ	100	102	100		100	100	100	100	145	118	112	115	108	108	105	110	100	110	100	100	102	100	100	100		

JAN. 1938

H<sup>+</sup>ES (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JAN. 1988

TYPES OF ES

135° E Mean Time (G.M.T. + 9h)

Station		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															H 2	H 2	H 2	H 1	F 1	F 1				F 1	
2		F 1						F 1				H 1		L 2	L 1	H 1		C 1		F 6	F 3	F 1	F 1	F 2	
3						F 2		H 1					L 1		L 1	L 1			F 2	F 3	F 3	F 3	F 4	F 2	
4		F 2	F 1	F 3				F 1			L 1	L 1	L 1	L 1	L 1								F 1	F 1	
5										L 2	L 1				C 1	HL 1	H 1	L 1	F 4	F 2	F 2	F 2	F 2		
6									HL 1	H 1	L 1	C 1	C 1								F 1	F 1	F 3	F 2	
7			F 1					H 1	H 1	H 1	H 1	H 1	H 1					C 1	F 1	F 4	F 4	F 1	F 1	F 1	
8		F 1						C 1	H 1				HL 1	HL 2			L 1		F 1	F 3	F 1			F 1	
9						F 1		H 2	H 1	H 1	C 1		C 1	H 1	C 1	C 1	L 4	L 3	F 2	F 3	F 3				
10								C 2	L 4	L 3	L 2							H 2	F 2	F 7			F 2		
11					F 1				H 1	H 1						C 1	L 2		F 1	F 2	F 2	F 3			
12								C 1	C 1	C 1	C 2	C 2	C 2	L 2	L 2	L 3	L 2		F 3	F 1	F 3				
13		F 1							L 1	H 1							H 1	H 1	F 1	F 3	F 1	F 1			
14						F 1		H 1	C 1	L 1	C 1														
15								H 1	H 1						H 1		L 2	L 3	L 2	F 1					
16										L 1	H 1	C 1	C 2	C 1	C 1	C 1	C 1		L 1	F 1	F 1	F 1	F 1	F 1	
17								H 2	LH 1	L 1	L 1	L 1					H 2	LH 1	L 1	F 1	F 3	F 4	F 2		
18		F 1							C 1	C 1	C 1										F 1	F 1			
19								H 1	C 1	C 2							H 1	C 1			F 1	F 1	F 1	F 2	
20										C 2				C 2	C 2	C 2	H 1								
21			F 1					H 1		H 2	C 1			C 1	C 1							F 1	F 4		
22									C 1	C 1			L 1		L 2	L 3	L 1			F 6	F 2	F 1		F 1	
23			F 2	F 2	F 1	F 1	F 1			H 1	H 2	C 3	C 2	C 3	C 2	C 3	C 3	L 5	L 5	F 2	F 5	F 1		F 1	
24							F 1		H 1	H 1	C 3	C 2	L 1	L 1	C 2	L 2	C 2				F 3	F 1	F 4	F 1	
25		F 1							H 2	H 1	C 1		L 2	L 2	L 1	H 2	CL 2	C 6	C 7			F 2	F 4	F 2	
26				F 2							C 2	C 1	L 2	L 1	L 2					F 4		F 2			
27		F 4	F 2	F 1	F 1				CL 1	H 2	C 2	C 2	L 1		C 1							F 5		F 4	
28		F 1							C 2	C 2	C 1	L 1	L 2	HL 1	L 3	L 2				F 2					
29			F 4							H 1	H 1	L 1	C 1	C 1	C 1					F 1	FF 3	F 3	F 3		
30					F 2		F 1	L 1	C 1	C 1			H 1	C 2	C 1			C 1	L 1	F 1	F 1		F 1		
31											C 1	C 2	C 1									F 1			
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																									
MED																									
UQ																									
LQ																									

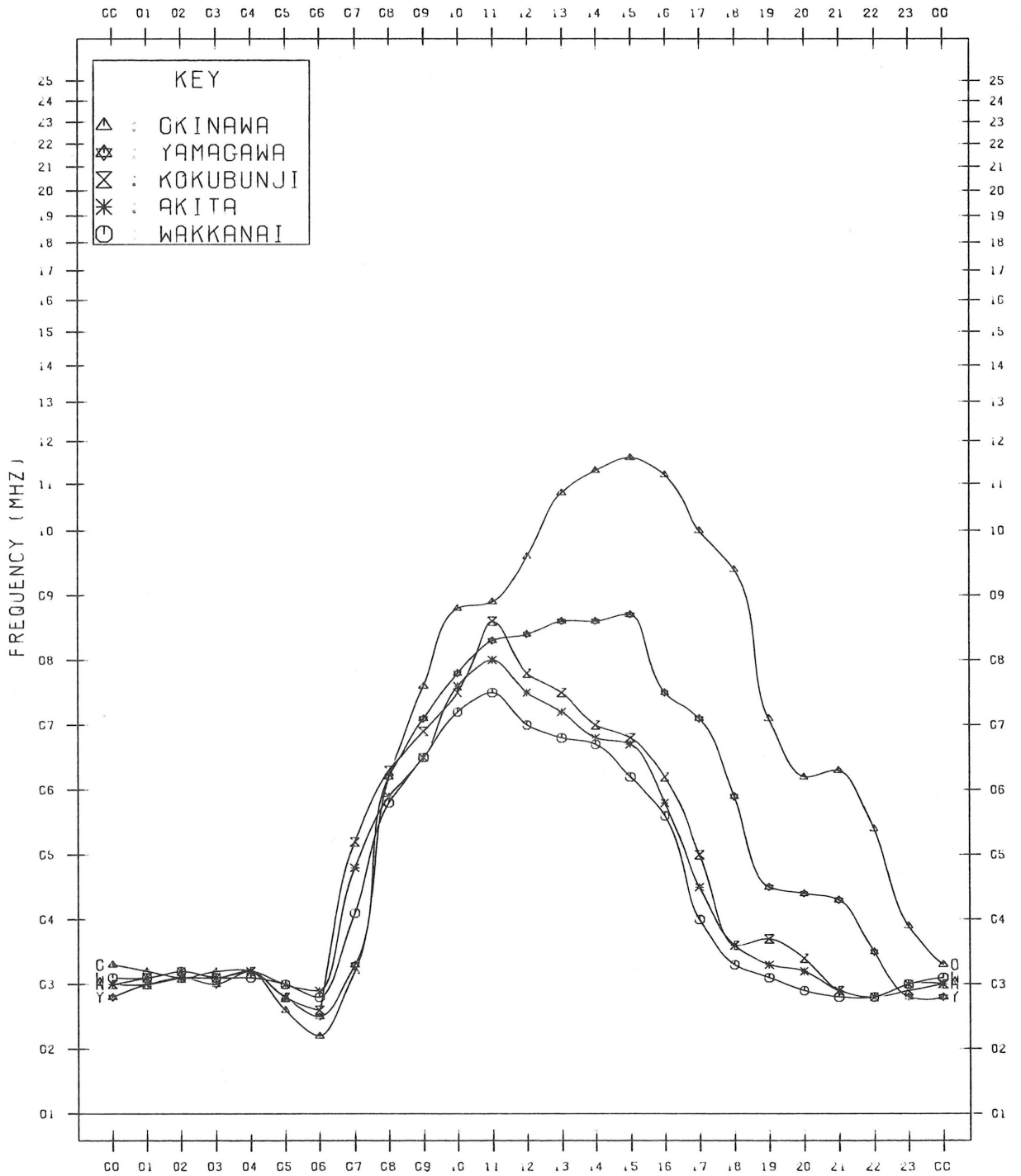
JAN. 1988

TYPES OF ES

# MONTHLY MEDIAN VALUES OF FOF2

135 E MEAN TIME

JAN. 1988



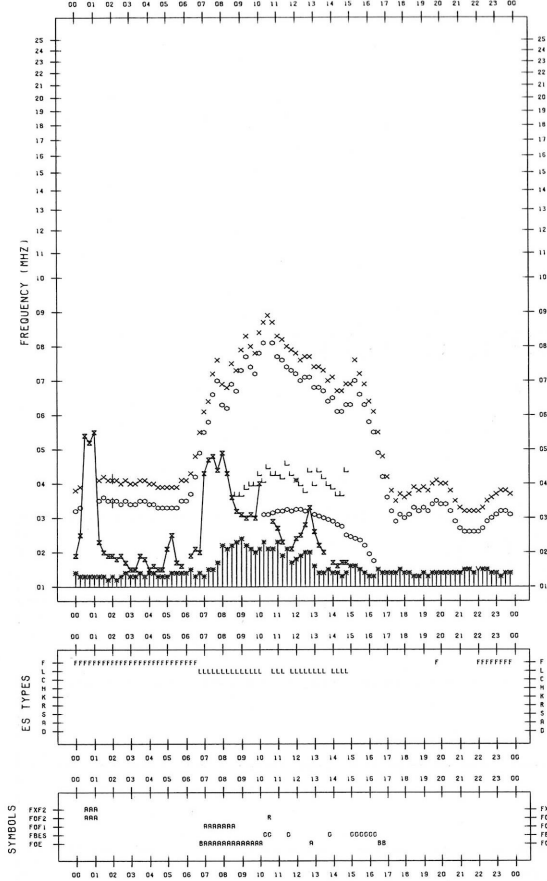
*f*-PLOTS OF IONOSPHERIC DATA

KEY OF F-PLOT	
I	SPREAD
○	F <sub>0</sub> F <sub>2</sub> , F <sub>0</sub> F <sub>1</sub> , F <sub>0</sub> E
×	F <sub>X</sub> F <sub>2</sub>
*	DOUBTFUL F <sub>0</sub> F <sub>2</sub> , F <sub>0</sub> F <sub>1</sub> , F <sub>0</sub> E
⊗	FBES
L	ESTIMATED F <sub>0</sub> F <sub>1</sub>
* <sub>1</sub>	F <sub>MIN</sub>
^	GREATER THAN
v	LESS THAN

F-PLOT DATA

SCALER : T.KOIZUMI

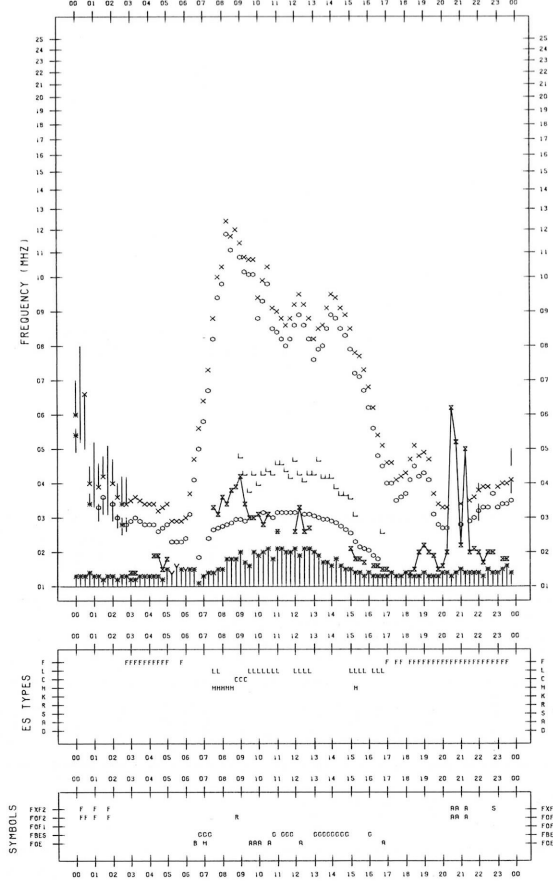
STATION : KOKUBUNJI TOKYO DATE : 1988/ 1/ 1  
135°E MEAN TIME



F-PLOT DATA

SCALER : T.KOIZUMI

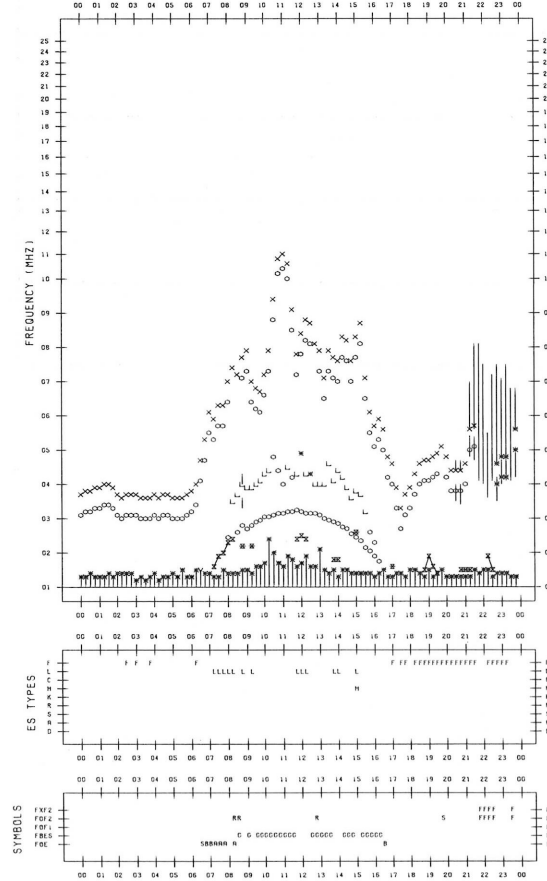
STATION : KOKUBUNJI TOKYO DATE : 1988/ 1/ 3  
135°E MEAN TIME



F-PLOT DATA

SCALER : T.KOIZUMI

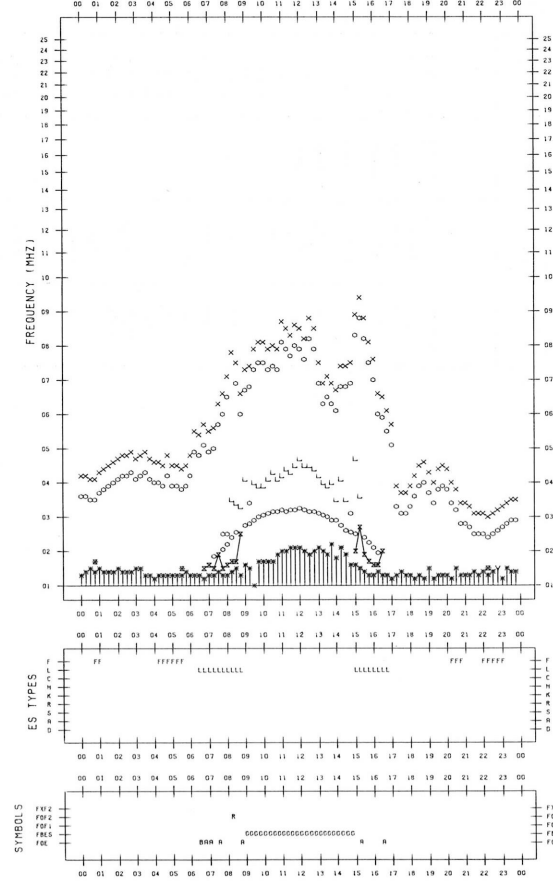
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135°E MEAN TIME

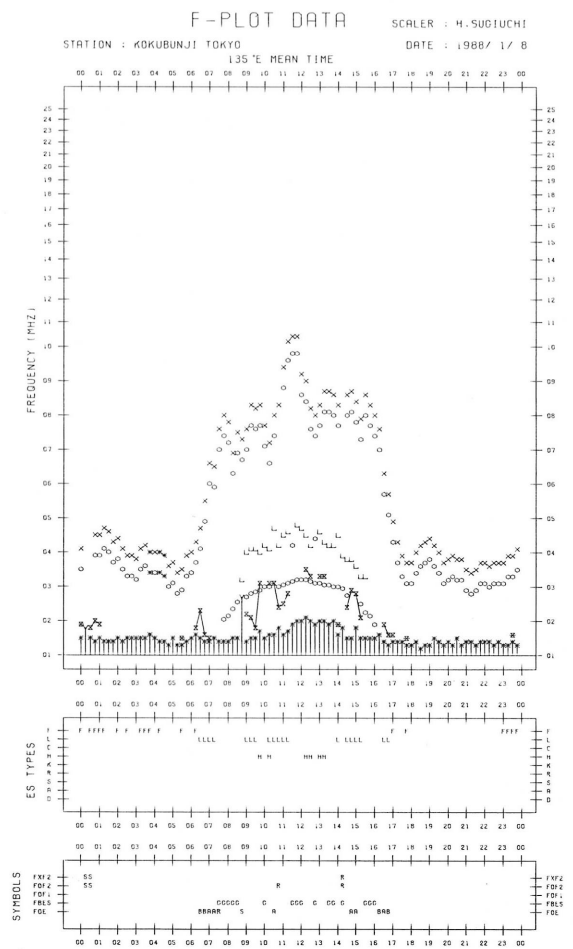
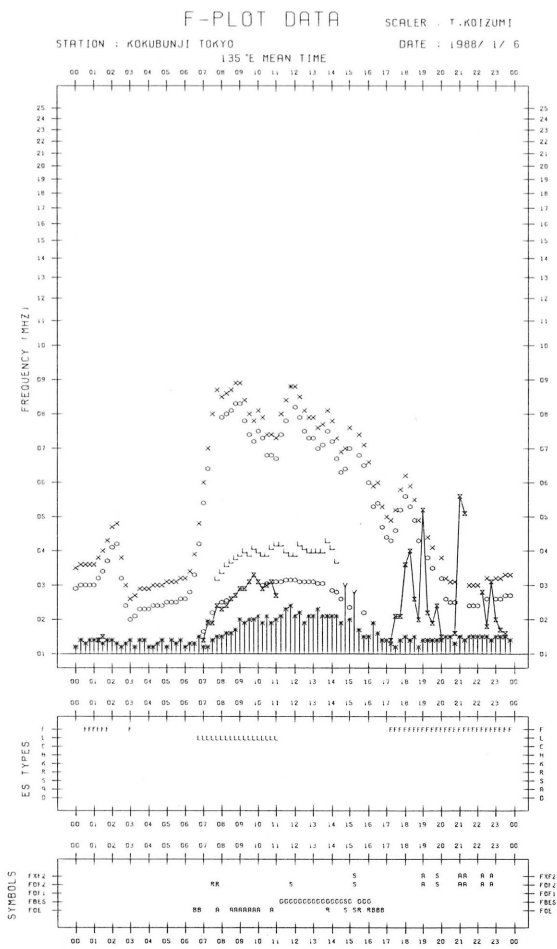
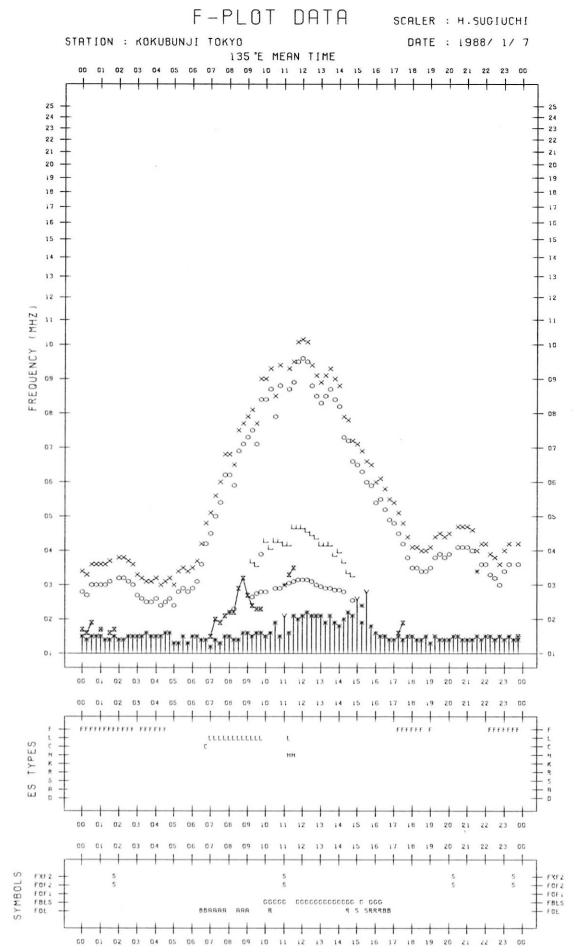
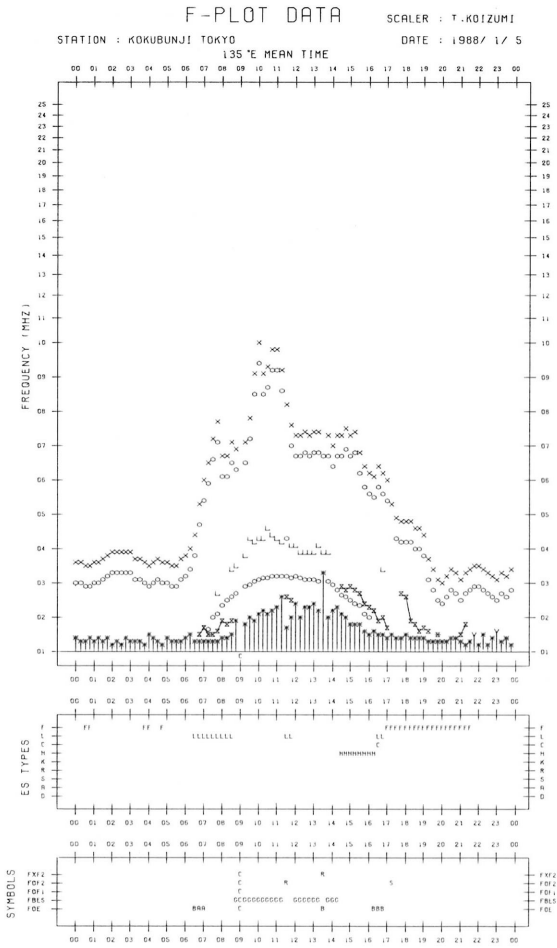


F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO DATE : 1988/ 1/ 4  
135°E MEAN TIME





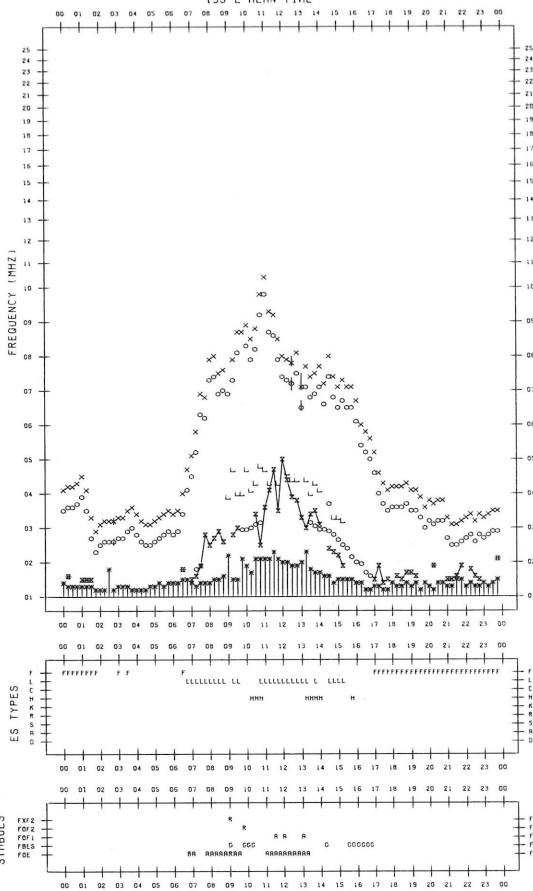
F-PLOT DATA

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STATION : KOKUBUNJI TOKYO

DATE : 1988/ 1/ 9

135°E MEAN TIME



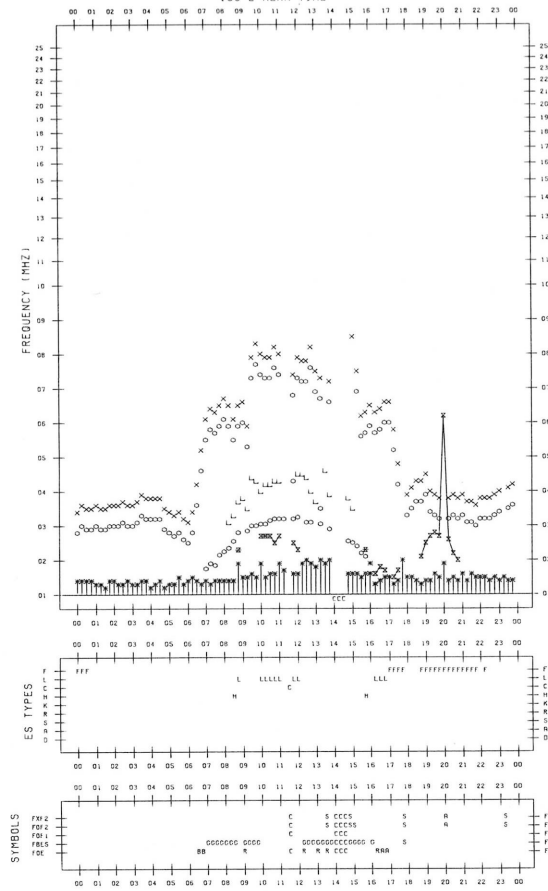
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STATION : KOKUBUNJI TOKYO

DATE : 1988/ 1/11

135°E MEAN TIME



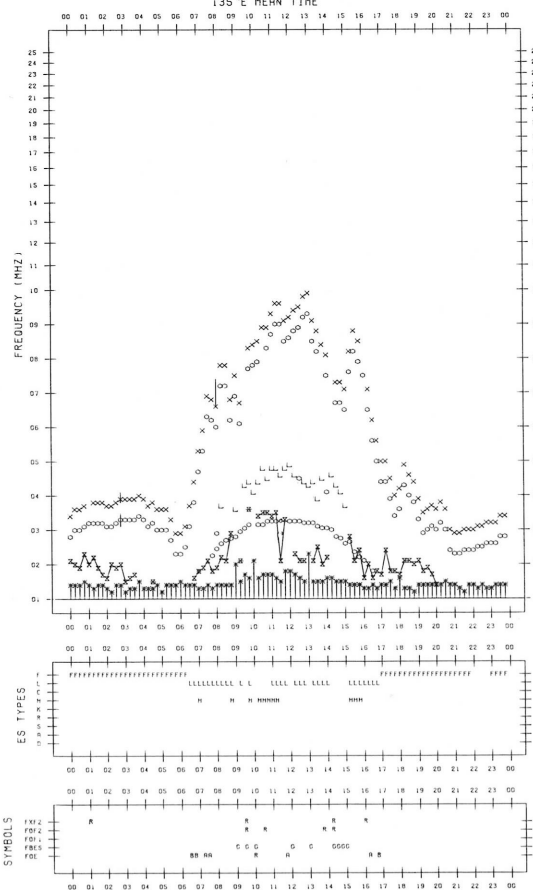
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1988/ 1/10

135°E MEAN TIME



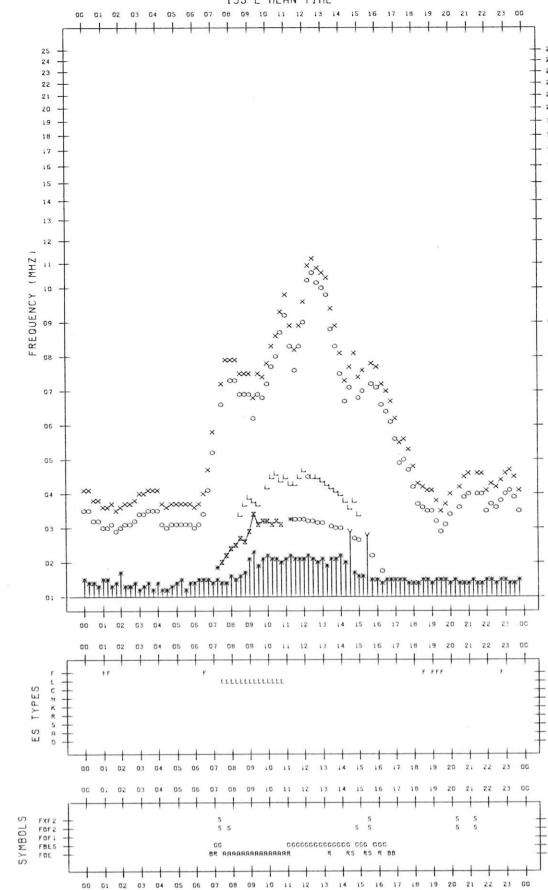
F-PLOT DATA

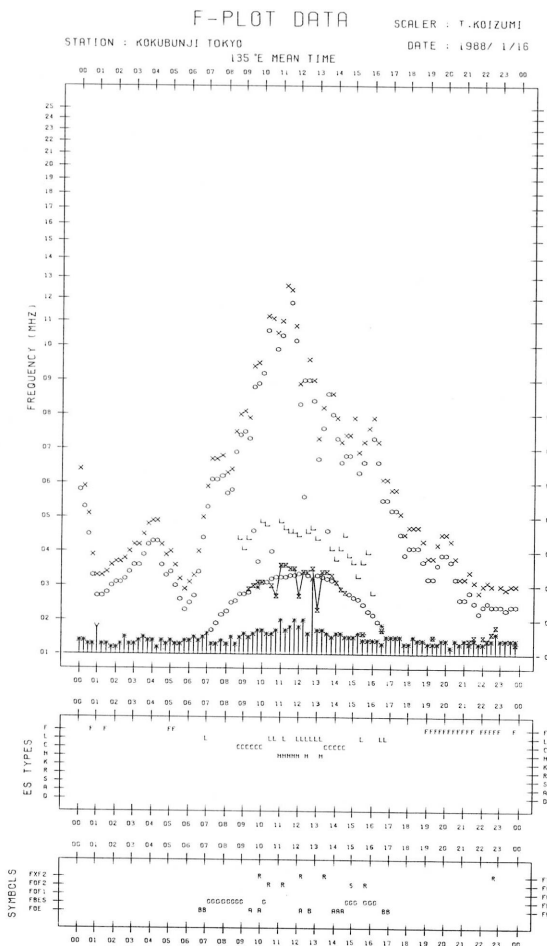
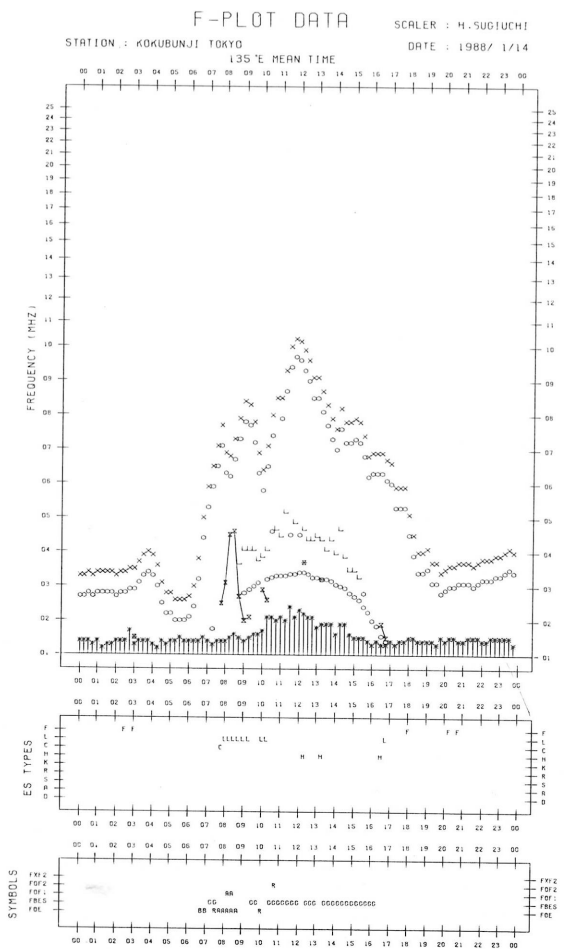
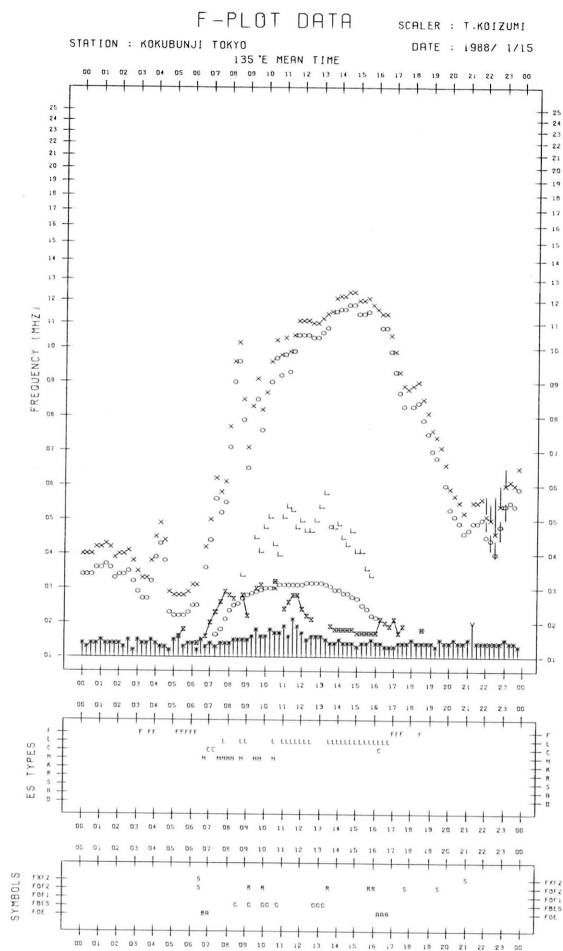
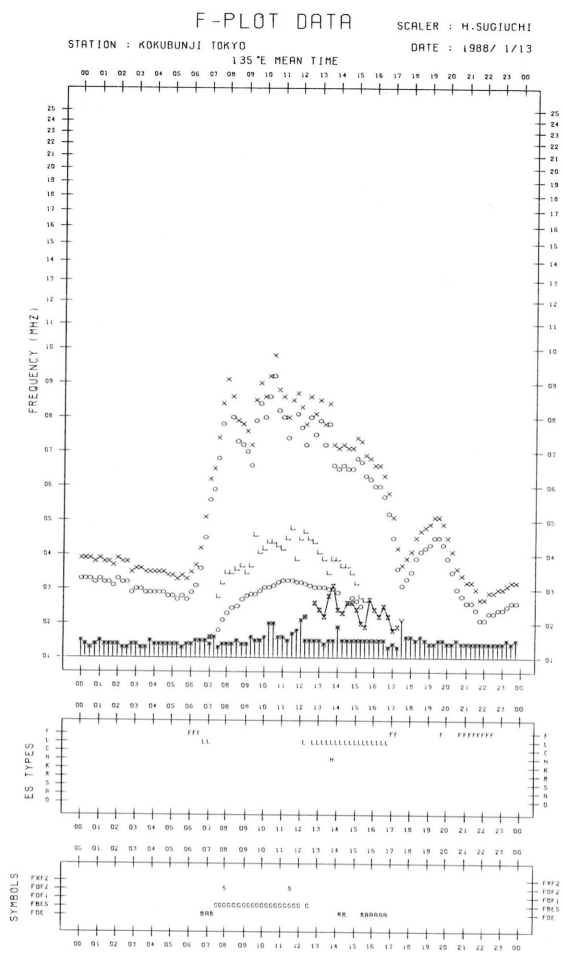
SCALER : H.SUGIUCHI

STATION : KOKUBUNJI TOKYO

DATE : 1988/ 1/12

135°E MEAN TIME



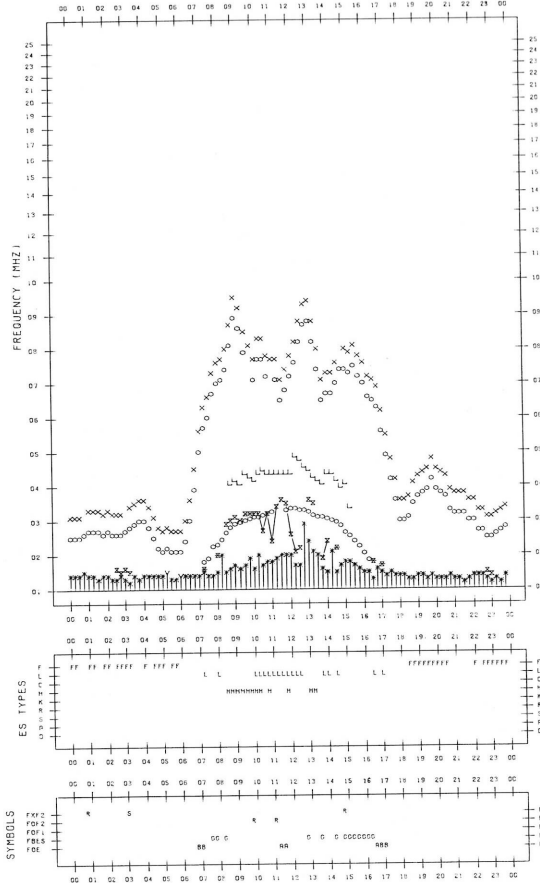




F-PLOT DATA

SCALER : T.KOIZUMI

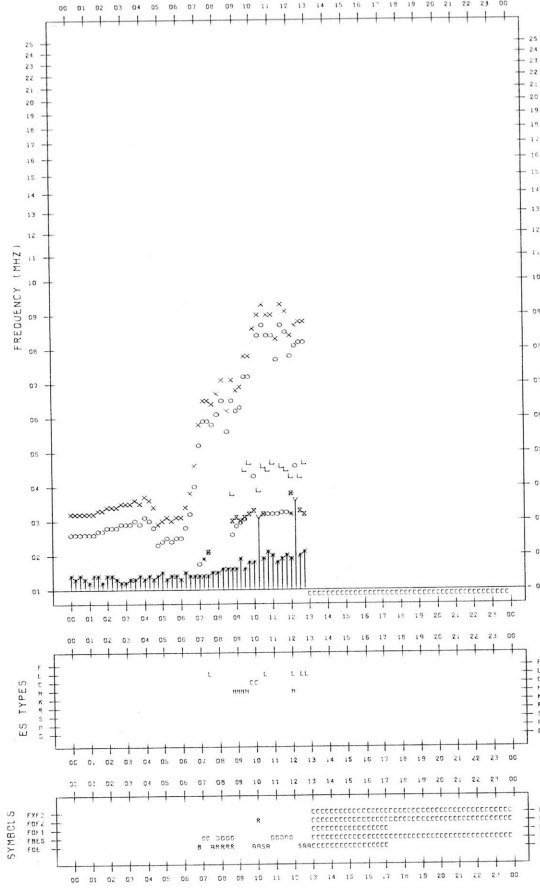
STATION : KOKUBUNJI TOKYO 135°E MEAN TIME DATE : 1988/1/17



F-PLOT DATA

SCALER : H.SUGIUCHI

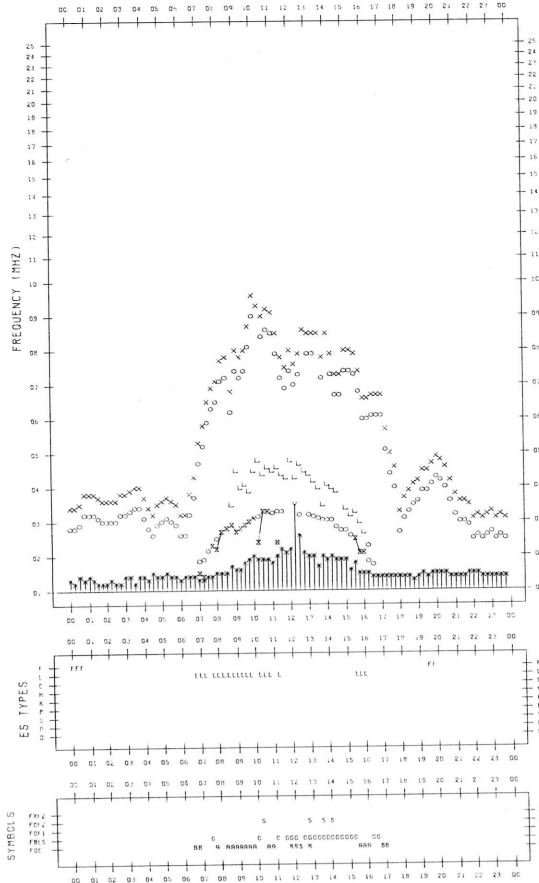
STATION : KOKUBUNJI TOKYO 135°E MEAN TIME DATE : 1988/1/19



F-PLOT DATA

SCALER : T.KOIZUMI

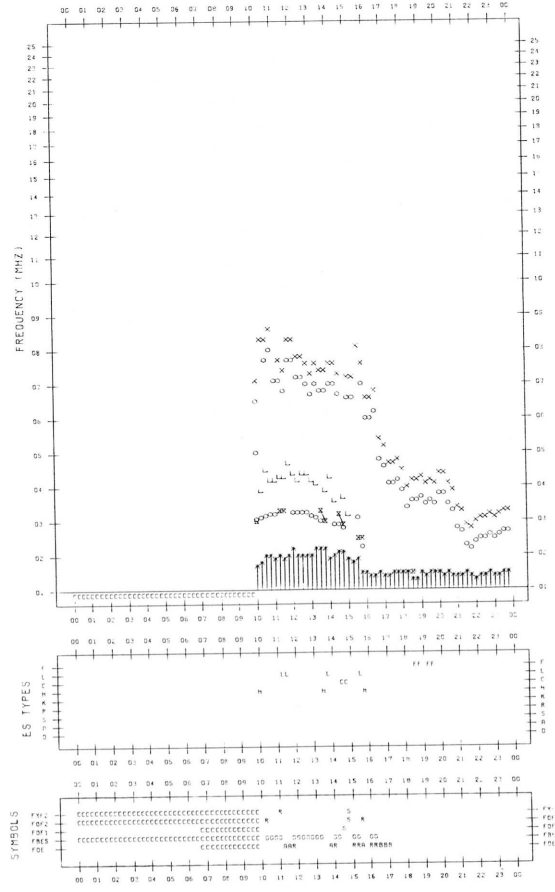
STATION : KOKUBUNJI TOKYO 135°E MEAN TIME DATE : 1988/1/18

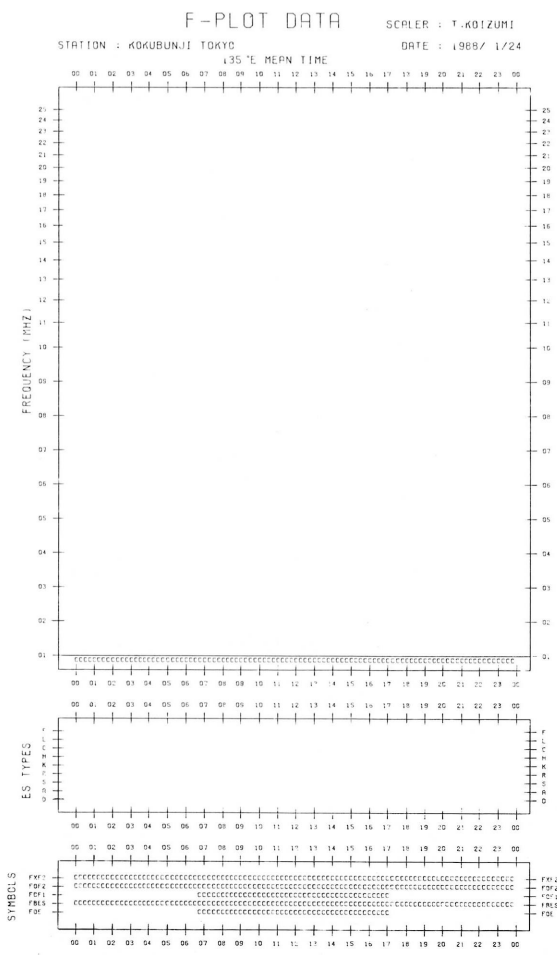
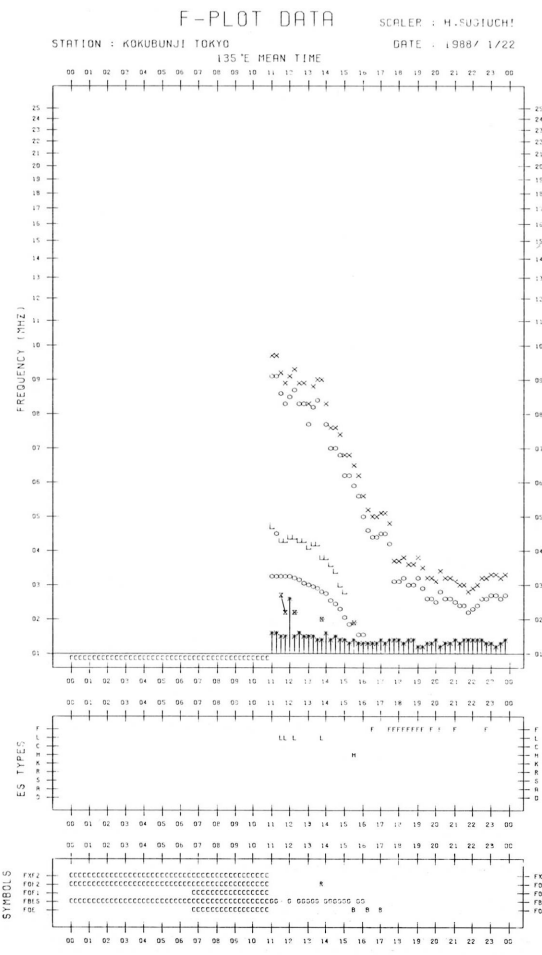
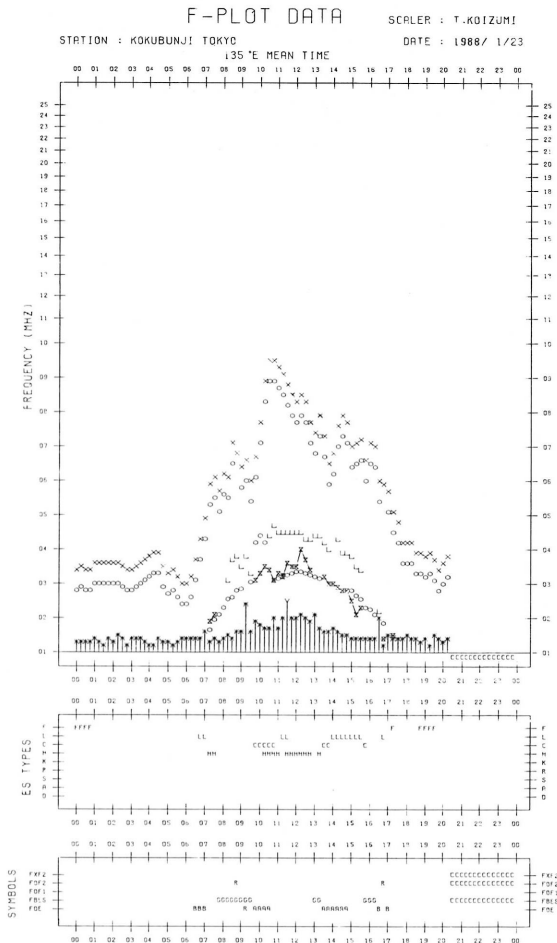
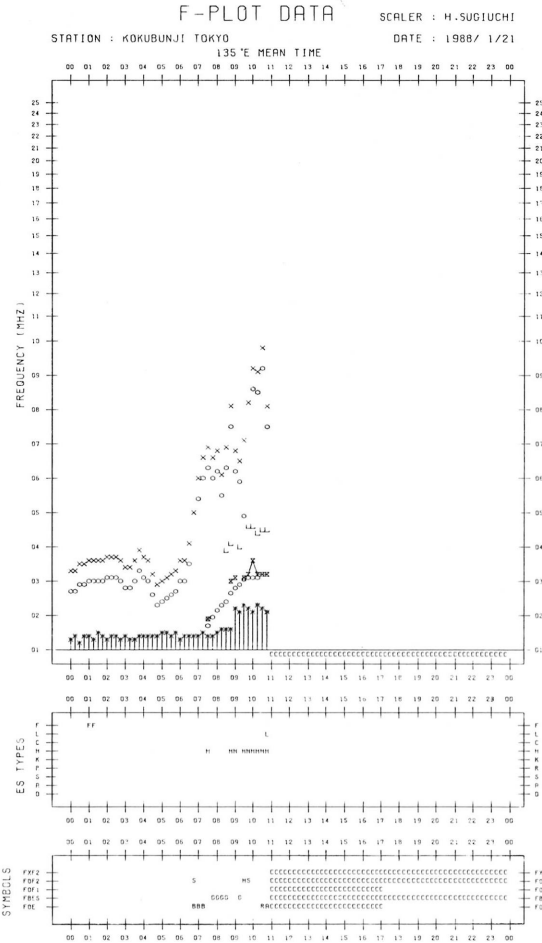


F-PLOT DATA

SCALER : H.SUGIUCHI

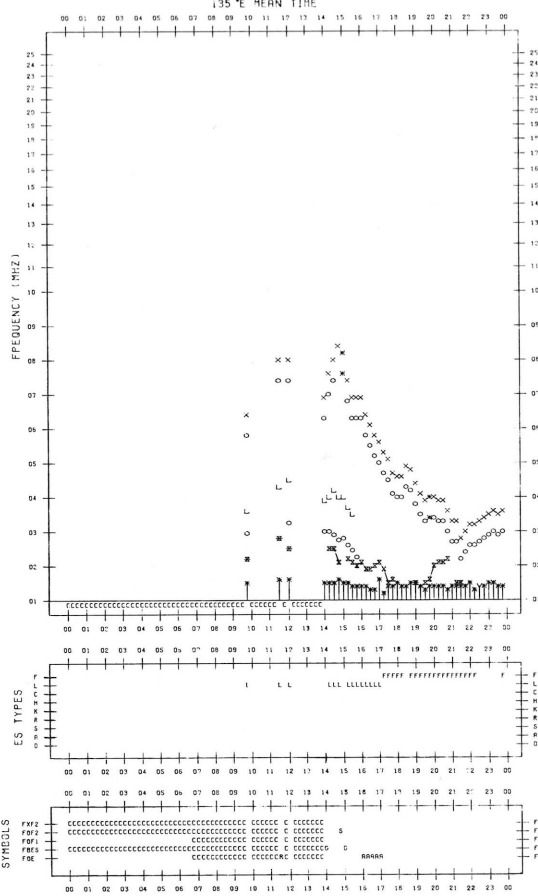
STATION : KOKUBUNJI TOKYO 135°E MEAN TIME DATE : 1988/1/20





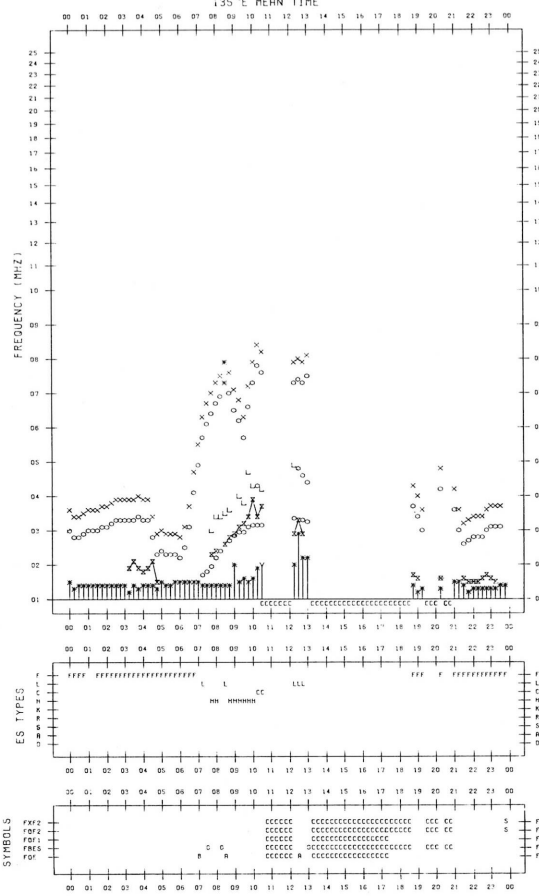
F-PLOT DATA

SCALER : T.KOIZUMI  
STATION : KOKUBUNJI TOKYO  
DATE : 1988/ 1/25  
135°E MEAN TIME



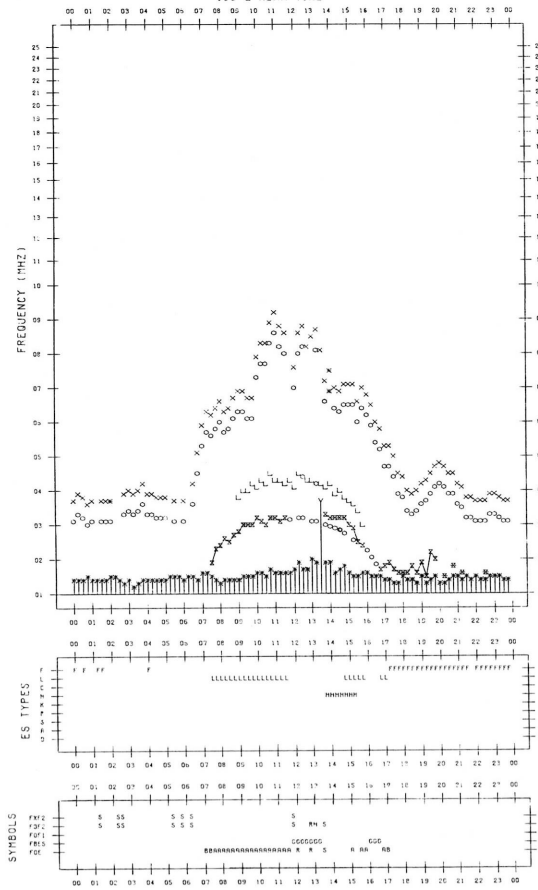
F-PLOT DATA

SCALER : H.SUGIUCHI  
STATION : KOKUBUNJI TOKYO  
DATE : 1988/ 1/27  
135°E MEAN TIME



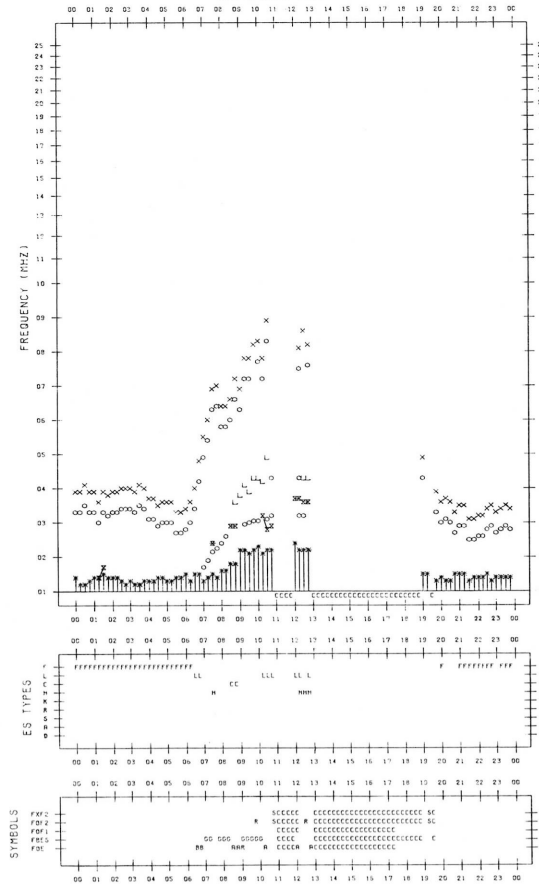
F-PLOT DATA

SCALER : H.SUGIUCHI  
STATION : KOKUBUNJI TOKYO  
DATE : 1988/ 1/26  
135°E MEAN TIME



F-PLOT DATA

SCALER : T.KOIZUMI  
STATION : KOKUBUNJI TOKYO  
DATE : 1988/ 1/28  
135°E MEAN TIME



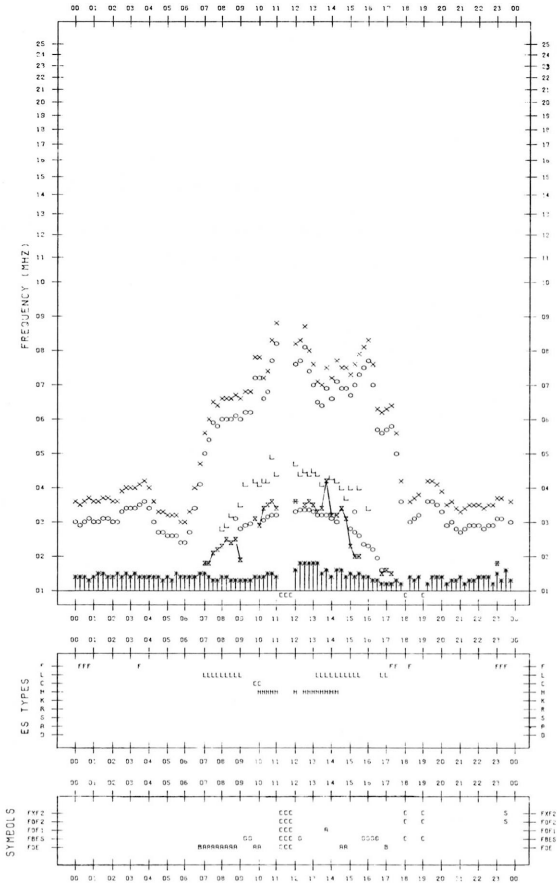
F-PLOT DATA

SCALER : H.SUGIUCHI

STATION : KOKUBUNJI TOKYO

DATE : 1988/ 1/29

135 °E MEAN TIME



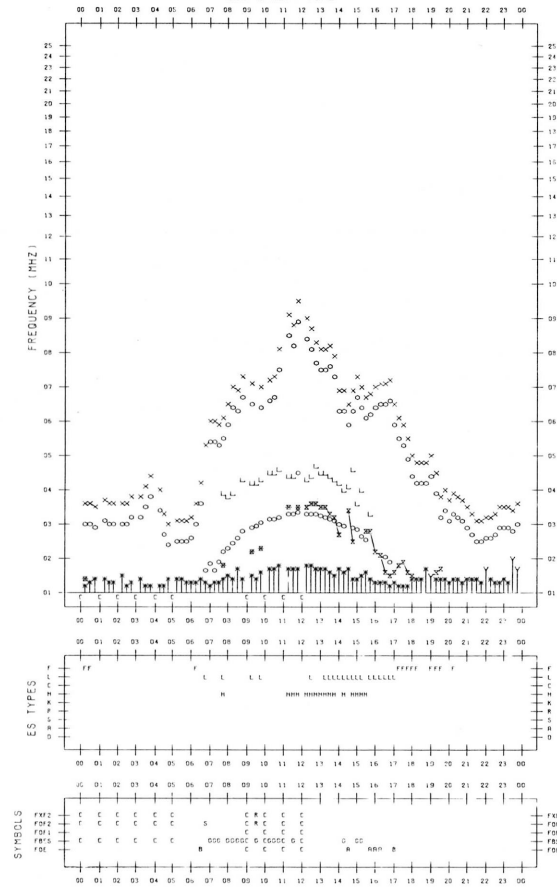
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1988/ 1/31

135 °E MEAN TIME



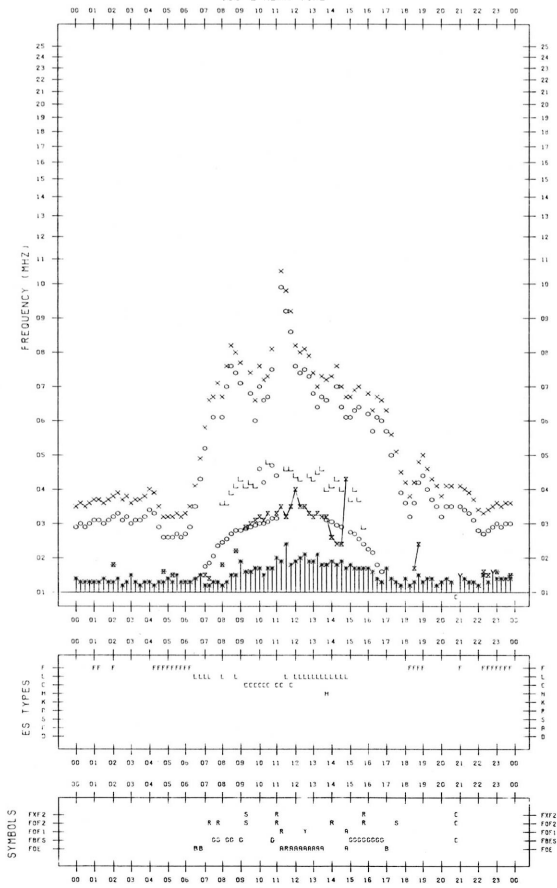
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1988/ 1/30

135 °E MEAN TIME



B. Solar Radio Emission  
 a. Daily Data at Hiraiso  
 200 MHz

Hiraiso

January 1988

Single-frequency total flux observations at 200 MHz										
FLUX DENSITY: $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$						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	10	10	(10)	9	10	1	1	(1)	0	1
2	9	9	(9)	q	9	0	*	(*)	*	0
3	8	7	(7)	8	7	*	*	(*)	0	*
4	8	8	(8)	9	8	0	0	(0)	0	0
5	9	9	(9)	9	9	0	0	(0)	0	0
6	9	9	(9)	9	9	0	0	(0)	0	0
7	9	9	(9)	9	9	0	0	(0)	0	0
8	9	9	(9)	9	9	0	1	(1)	0	1
9	9	9	(9)	9	9	0	0	(0)	0	0
10	9	9	(9)	9	9	0	0	(0)	0	0
11	9	9	(9)	11	9	0	0	(0)	0	0
12	10	10	(9)	9	10	0	1	(1)	*	0
13	9	9	(9)	9	9	0	0	(0)	0	0
14	9	9	(9)	9	9	0	0	(0)	1	0
15	9	9	(9)	9	9	1	1	(1)	1	1
16	9	9	(9)	9	9	2	1	(1)	1	1
17	10	10	(10)	8	10	1	0	(0)	0	1
18	8	8	(9)	8	8	0	0	(*)	0	0
19	9	9	(9)	9	9	1	2	(3)	3	2
20	9	9	(9)	9	9	1	*	(0)	*	1
21	9	9	(9)	9	9	0	0	(2)	0	1
22	9	9	(9)	9	9	0	*	(*)	0	0
23	9	9	(9)	9	9	0	0	(0)	1	0
24	9	9	(9)	8	9	0	0	(*)	0	0
25	8	8	(9)	8	8	0	0	(0)	0	0
26	8	8	(8)	8	8	0	0	(0)	0	0
27	8	8	(8)	8	8	*	0	(0)	2	0
28	8	8	(8)	8	8	3	3	(3)	3	3
29	8	8	(8)	8	8	3	3	(3)	2	3
30	8	8	(8)	8	8	2	2	(2)	1	2
31	8	8	(8)	8	8	3	3	(1)	3	2

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

B. Solar Radio Emission  
 a. Daily Data at Hiraiso  
 500 MHz

Hiraiso

January 1988

Single-frequency total flux observations at 500 MHz					
FLUX DENSITY; $10^{-22} \text{Wm}^{-2} \text{Hz}^{-1}$					
UT	00-03	03-06	06-09	21-24	DAY
DATE					
1	35	35	(34)	33	35
2	34	34	(34)	34	34
3	34	35	(34)	33	34
4	33	33	(32)	33	33
5	34	33	(32)	33	33
6	34	34	(33)	33	33
7	35	34	(34)	35	34
8	36	37	(36)	36	36
9	37	37	(35)	35	36
10	36	38	(37)	34	37
11	35	36	(36)	35	35
12	36	38	(38)	35	37
13	36	36	(36)	-	36
14	36	38	(36)	35	37
15	36	37	(36)	36	36
16	37	38	(37)	35	37
17	37	37	(37)	-	36
18	38	38	(37)	37	38
19	38	37	(37)	39	37
20	38	37	(37)	37	38
21	37	37	(36)	36	37
22	36	36	(35)	35	36
23	36	36	(35)	36	36
24	36	36	(35)	34	36
25	34	34	(34)	34	34
26	34	33	(33)	34	34
27	34	34	(34)	34	34
28	36	36	(35)	35	35
29	36	36	(35)	35	36
30	36	37	(36)	-	36
31	38	37	(36)	37	37

Note: No observations during the following periods.

13th 2145 - 2345

17th 2145 - 2342

30th 2140 - 2400

B. Solar Radio Emission  
b. Outstanding Occurrences at Hiraiso

Hiraiso

January 1988

Single-frequency observations								
Normal observing period: 2150 - 0750 U.T. (sunrise to sunset)								
JAN 1988	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY ( $10^{-22} \text{Wm}^{-2} \text{Hz}^{-1}$ )		POLARIZATION REMARKS
						PEAK	MEAN	
2	500	46 C	2149.5E	2239.5U	97D	160	35U	WL SUNRISE
	200	46 C	2150E	2158U	90D	120U	35U	ML
3				2228.4		110		WL
	100	46 C	2150E	2227.0	64D	640	210U	- SUNRISE
	200	46 C	2314.2	2315.8	2.6	54	23	0
4	100	46 C	2315.2	2315.7	2.1	215	90	-
	500	6 S	2315.5	2316.0	1.5	4	-	0
8	200	42 SER	0421	0535	74	120	-	0
9	500	46 C	0619.9	0620.8	8.0	12	4	0
9	200	24 R	2322	0243	390D	15	7	MR
	100	24 R	2325	0524	440D	120	53	-
11	500	45 C	2340.3	2342.1	3.5	3	1	0
	500	45 C	2201.0U	2201.5	1.5	29	9	0 SUNRISE
	500	46 C	2216.5	2218.5	3.9	8	4	0
13	500	27 RF	2224.7	2244.7	48	6	2	0
	200	42 SER	0417	0518	102	100	-	0
	200	46 C	0638.3	0638.7	2.6	130	47	0
14	100	42 SER	0638.3	0638.7U	8.8	1000D	-	-
14	200	44 NS	2147E	0300	580D	3	1	0
15	200	44 NS	2147E	0620	580D	4	1	WL
16	200	44 NS	2147E	0012	190D	3	1	WL
	200	46 C	2315.2	2316.6	2.2	590	135	0
17	100	46 C	2315.4	2316.5	2.6	920	350	-
	500	46 C	2316.5	2317.3	2.0	120	27	0
	100	8 S	0055.4	0055.4U	0.7	1000D	-	-
	200	8 S	0055.4	0055.6	0.3	9500	-	0
	500	8 S	0055.6	0055.8	0.5	34	-	0
	200	42 SER	0158.7	0202.5	4.0	1600	-	0
	100	46 C	0201.2	0202.3	2.1	980	240	-
19	200	42 SER	0622.1	0622.1	13.9	490	-	0
	100	8 S	0622.4	0622.4	0.7	1100	-	-
	200	43 NS	0030	0649	420D	16	4	WR
20	200	44 NS	2147E	2230	150D	8U	2U	WL SUNRISE
	100	42 SER	0510.2	0546.0	36	1000D	-	-
20	200	42 SER	0511	0546	38	1040	-	0
	21	200	8 S	0238.7	0238.9	0.4	490	-
21	100	8 S	0238.9	0239.0	0.5	680	-	-
	200	43 NS	0515	0642	150D	9	2	0
23	200	44 NS	2145E	2325	125D	8	2	WL
27	200	44 NS	2145E	0107	580D	22	10	WR
28	200	44 NS	2145E	0240	580D	28	16	0
29	200	44 NS	2145E	0426	580D	17	9	WR
30	500	42 SER	0410	0424.8	28	27	-	MR
	200	44 NS	2145E	0146	580D	45	10	MR
31	100	43 NS	2253	0100U	210	50U	20U	-
	200	44 NS	2145E	2250	580D	9	4	WR





RADIO PROPAGATION

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

JAN 1988		FREQUENCY 15 MHZ					BANDWIDTH 80 HZ					RECEIVING ANTENNA ROD 4.5 M					MEASURED AT HIRAI SO									
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	16	13	18	15	0	ES -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	14	21	17	18		
2	16	15	21	26	22	5	ES -11	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	-5	0		
3	10	11	15	23	23	23	32	2	-5	ES -23	ES -23	ES -23	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	14	19	23	19		
4	14	15	17	21	22	18	10	-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	8	20	13	14		
5	17	13	14	22	26	10	5	5	9	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	16	25	15	15		
6	17	11	17	17	C	-1	5	ES -22	15	5	11	2	ES -22	ES -22	ES -22	ES -22					C	C	C	C		
7	15	19	19	25	18	12	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	17	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	0	ES -22	19	19	21	11
8	15	19	21	25	31	21	11	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	14	22	18	14		
9	17	18	17	20	20	20	10	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	17	19	14	12		
10	11	16	19	20	28	25	1	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	19	20	24	16		
11	19	12	14	19	20	19	11	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	7	15	15	10		
12	18	15	17	20	25	ES -21	6	22	6	ES -21	ES -21	ES -21	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	9	24	24	16		
13	19	11	17	25	24	24	-1	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	-2	10	18	11		
14	17	15	17	26	27	20	13	ES -21	-1	ES -21	ES -21	ES -21	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	0	22	16	22		
15	19	18	26	26	27	32	32	33	22	25	27	6	10	0	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	14	21	18	17		
16	23	22	22	26	25	20	14	6	3	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	ES -20	8	23	21	16		
17	14	C	C	C	20	21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	17	21	18	15		
18	18	22	20	23	18	24	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	8	22	11	22		
19	24	14	16	20	22	24	10	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	0	27	18	16		
20	16	UC 19	19	22	28	16	8	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	10	15	19	18		
21	18	23	21	25	20	-1	ES -9	-1	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	16	19	14		
22	11	16	17	19	26	15	3	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	4	10	10	15		
23	18	15	18	17	18	10	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	4	15	16	12		
24	17	15	17	22	25	26	0	-1	-5	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	10	17	10	13		
25	16	14	17	21	21	20	8	-1	ES -23	ES -23	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	-3	17	15	16		
26	20	17	17	24	15	10	2	2	-2	-5	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	-1	19	24	24		
27	20	14	19	14	23	17	12	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	13	13	17	10		
28	14	12	16	18	24	23	3	-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	20	19	15	15		
29	19	16	19	16	18	20	2	5	-5	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	12	14	19	21		
30	17	20	20	19	17	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	17	19	15	22		
31	14	15	13	16	26	19	4	2	-2	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	10	23	14	14		
CNT	31	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	30	30	30	30	30	30	30	30		
MED	17	15	17	21	22	19	4	US -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	10	19	17	15		
UD	20	22	21	26	28	25	14	6	9	-5	ES -20	ES -20	ES -20	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	19	24	24	22		
LD	11	11	14	16	17	-1	ES -21	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	-2	10	10	10		

## C. Radio Propagation

## b. Radio Propagation Quality Figures at Hiraiso

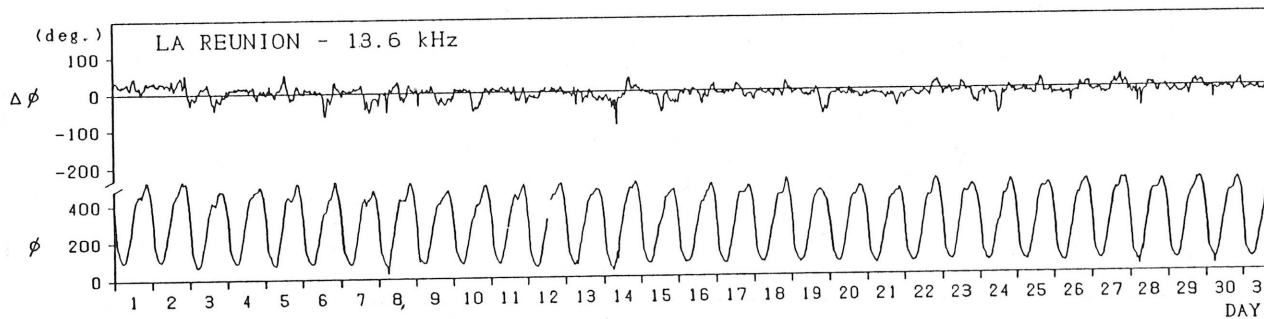
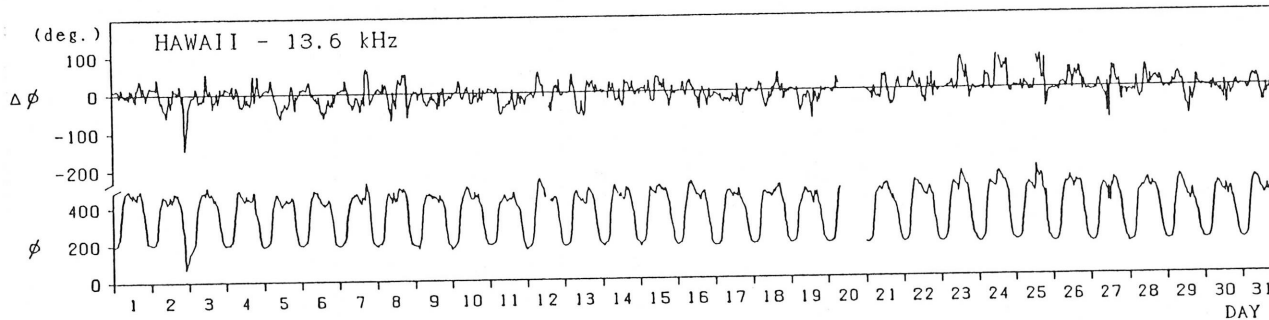
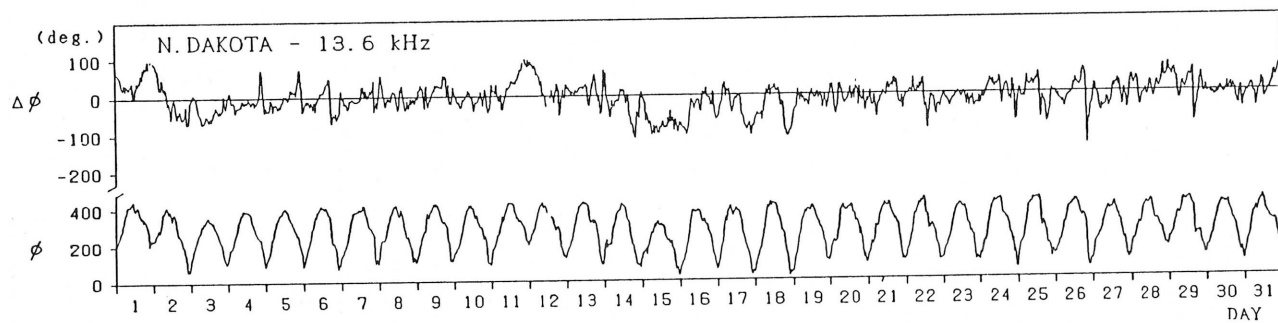
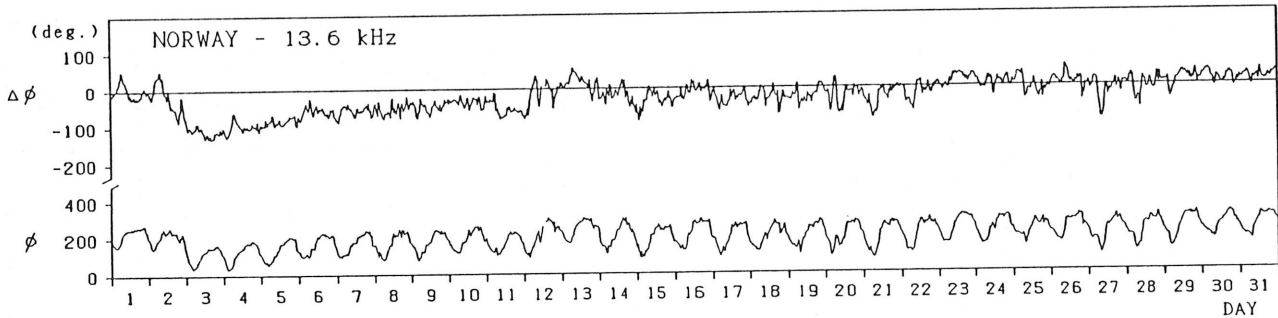
Hiraiso		Time in U.T.														
Jan. 1988	Whole Day Figure	W W V				W W V H				Conditions				Principal Geomagnetic Storms		
		00	06	12	18	00	06	12	18	00	06	12	18	Start	End	Range
		06	12	18	24	06	12	18	24	06	12	18	24			
1	3+	3U	S	S	4U	3	3U	S	4	N	N	N	N	08.4	---	123
2	3-	S	S	S	2U	4	3U	S	2U	N	N	N	N			
3	4o	3U	S	S	4U	4	5U	S	4	U	U	U	U			
4	4-	S	S	S	2U	4	5U	S	4	U	U	U	U			
5	4-	3U	S	S	3U	4	5U	S	4	U	U	U	U			
6	4+	S	S	S	C	4	5U	S	C	U	U	U	U	04.4	---	100
7	3+	4U	S	S	3U	3	3U	S	4	N	N	N	N			
8	4-	S	S	S	3U	4	4U	S	4	N	N	N	N			
9	4o	S	S	S	4U	4	4U	S	4	N	N	N	N			
10	4o	S	S	S	4U	4	4U	S	4	N	N	N	N			
11	4o	S	S	S	4U	4	4U	S	4	N	N	N	N	2330	---	189
12	4-	4U	S	S	2U	4	5U	S	4	N	N	N	N			
13	4o	S	S	S	5U	4	3U	S	4	N	N	N	N			
14	4+	5U	S	S	4U	4	5U	S	4	N	N	N	N			
15	4o	5U	S	S	2U	4	5U	5U	4	N	N	N	N			
16	4-	S	S	S	2U	4	5U	S	4	N	N	N	N	---	---	23.0
17	3-	S	S	S	2U	3	2U	S	4	N	N	N	N			
18	3o	S	S	S	2U	4	2U	S	4	U	U	U	U			
19	3+	S	S	S	2U	4	4U	S	4	U	U	U	U			
20	4-	S	S	S	3U	4	4U	S	4	U	U	U	U			
21	4+	5U	S	S	5U	4	4U	S	4	U	U	U	U	---	---	---
22	3+	S	S	S	3U	4	4U	S	3	N	N	N	N			
23	4o	S	S	S	5U	4	3U	S	4	N	N	N	N			
24	4+	5U	S	S	4U	4	5U	S	4	N	N	N	N			
25	4o	S	S	S	4U	4	4U	S	4	N	N	N	N			
26	4+	4U	S	S	5U	4	5U	S	4	N	N	N	N	---	---	---
27	4+	4U	S	S	4U	4	5U	S	4	N	N	N	N			
28	4o	4U	S	S	4U	4	4U	S	4	N	N	N	N			
29	4+	S	S	S	5U	4	5U	S	3	N	N	N	N			
30	4-	S	S	S	5U	3	3U	S	4	N	N	N	N			
31	4+	4U	S	S	5U	4	5U	S	4	N	N	N	N			

C. Radio Propagation

c. Phase Variations in OMEGA Radio Waves at Inubo

Inubo

January 1988



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

Start (U.T.)	End (U.T.)	Max. (U.T.)	Max. Phase Deviation (negative value, deg.)
Jan.02/2306	Jan.08/1900	Jan.03/1230	142.0

## C. Radio Propagation

## d. Sudden Ionospheric Disturbance

## (i) Short Wave Fade-out (SWF) at Hiraíso

Hiraíso

Time in U.T.

Jan. 1988	S W F							Correspondence			
	Drop-out Intensities (dB)				Start	Duration	Type	Imp.	Solar Flare	Solar Noise	Geomag. Crochet
	CO	HA	1)	2)							
2		x	21		2130	45	SL	2-	2123	x	
28		x	8		0606	10	S	1-	0604	x	

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

## (ii) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Jan. 1988	S P A					Time (U.T.)		
	Phase Advance (degrees)					Start	End	Maximum
Date	$\Omega/N$	$\Omega/LR$	NWC	$\Omega/H$	$\Omega/ND$			
1		4	<u>3</u>			0457	0514	0459
1		<u>8</u>	6			0602	0629	0606
1		14				0907	0943	0921
2				<u>148</u>	49	2119	0421	2143
3			<u>9</u>	6		2318	2328	2320
5			17			0744	0808	0746
6		10				0619	0713	0628
7				4		2239	2258	2242
7			6	<u>6</u>		2306	2349	2315
8			<u>13</u>	9		0019	0052	0025
8		19	<u>28</u>	12		0200	0249	0207
8		<u>41</u>	22			0621	0715	0629
9		44	<u>48</u>	21		0222	0337	0230
9			26	<u>17</u>		2327	0117	0003
11			8	<u>15</u>		2238	0008	2256
13		<u>19</u>	10			0639	0707	0645
13		<u>34</u>	12			0719	0803	0733
13		29				1150	1311	1202
13			<u>6</u>	4		2334	2355	2335
14		<u>27*</u>	10*			0614	0708	0639
14		<u>63</u>	34			0741	0825	0748
14		<u>22</u>	13			0848	0916D	0853
14		<u>103</u>	20			0916E	1030	0924
14			<u>8</u>	7		2340	2357	2346
15		15	<u>27</u>	26		0009	0100	0016
15		11				0553	0631	0605
15		<u>15*</u>	10			0705	0746	0712
18			<u>10</u>	6		0029	0051	0033
24			<u>13</u>	8		0034	0056	0036
24		<u>17</u>	19			0341	0434	0359
24		8				0818	0828	0821
25			6			0257	0317	0301
26		10				0625	0650	0637
26		28				1059	1156	1119
27		8	—			0604	0624	0610
27		12				0713	0741	0717
27			26	—		2300	2317	2303
27			14	—		2325	2350D	2330
27			<u>10</u>	—		2350E	0005D	2353
28	9		<u>17</u>	10		0005E	0037	0011
28			<u>6</u>	4		0154	0212	0158
28		13	<u>24*</u>	8*		0217	0337	0246
28			5			0426	0435	0428
28		20	<u>18</u>			0441	0510D	0447
28			8			0510E	0526	0517
28		<u>88</u>	55			0604	0709	0612
28		<u>64</u>	38			0846	0938	0851
29		6	<u>10</u>	5		0219	0257	0230
29			<u>6</u>	4		2326	2340	2329
30		<u>51</u>	28	16		0515	0637	0520
31		8				1003	1026	1006
31		15				1040	1118	1051

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IONOSPHERIC DATA IN JAPAN FOR JANUARY 1988

F-469 Vol. 40 No. 1 (Not for Sale)

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電離層月報 (1988年1月)

第40卷 第1号 (非売品)

1988年5月30日 印刷

1988年6月6日 発行

編集兼 郵政省通信総合研究所

発行所 〒184 東京都小金井市貫井北町4丁目2-1

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