

IONOSPHERIC DATA IN JAPAN

FOR FEBRUARY 1987

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

(ii) Qualifying Letters

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

- 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 *f_{min}*.
- 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+
8	S	Spike
20	GRF	Simple 3
21	GRF	Simple 3A
22	GRF	Simple 3F
23	GRF	Simple 3AF
24	R	Rise
25	R	Rise A
26	FAL	Fall
27	RF	Rise and Fall
28	PRE	Precursor
29	PBI	Post Burst Increase
30	PBI	Post Burst Increase A
31	ABS	Post Burst Decrease
32	ABS	Absorption
40	F	Fluctuations
41	F	Group of Bursts
42	SER	Series of Bursts
43	NS	Onset of Noise Storm
44	NS	Noise Storm in progress
45	C	Complex
46	C	Complex F
47	GB	Great Burst
48	C	Major
49	GB	Major+

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

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

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

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

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

C. RADIO PROPAGATION

a. H.F. Field Strength at Hiraiso

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

Characteristics	Transmitter		Receiver
	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	propagational accident,
U	inaccurate.

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

N	normal,
U	unstable,
W	disturbed

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

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

c. Phase Variations in OMEGA Radio Waves at Inubo

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

In each of the four figures, variations in phase (ϕ) and those in phase deviation ($\Delta\phi$) are shown in the lower part and the upper one, respectively. Variations in phase (ϕ) are expressed by relative values at intervals of 30 minutes within every day (U.T.) (48 dots). An increasing value in this case denotes a phase delay. On the other hand, variations in phase deviation ($\Delta\phi$) 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

FEB. 1987

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	60	59	50	A	A	60	57											A	X	X				
2	42	41	40	40	40	36	36											X	X	X	X	X	X	X
3	41	40	41	40	X	X	X											X	X	X	X	X	X	X
4	43	44	43	40	40	39	35											X	X	X	X	X	X	X
5	40	40	40	40	38	42	30											X	X	X	X	X	X	X
6	40	40	38	34	36	32	31											X	X	X	X	X	40	41
7	X	40	38	35	36	36	37											X	X	X			41	39
8	40	44	X	X	X	X	X											X	A	A	X	X	X	38
9	37	37	36	37	40	38	33											X	X	X	X	X	40	40
10	42	39	40	42	45	40	43											A	A	X			47	44
11	47	50	45	43	42	54	50	46										X	X	X	X	X	51	54
12	54	60	59	58	59	51	43											X	X	X	X	X	51	44
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	48	50	50	50	42	40	X											A	X	X	A	X	X	43
17	40	40	X	X	38	38	34											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	41	X	43												X	X	X	X	X	44	48
27	51	53	51	45	X	X												X	X	A	X	X	X	X
28	X	X	X	X	X	44	43											X	X	X	X	X	X	X
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	23	23	23	27	27	28	20	1										16	26	27	26	27	28	28
MED	42	42	42	42	40	40	38	46										X	X	X	X	X	X	X
UQ	48	48	46	44	42	44	43											X	X	X	X	X	46	46
LQ	X	X	X	40	40	38	33											X	X	X	X	X	40	40

FEB. 1987

FXI (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

FOF2 (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	F 52	F	F	A	A	F	F 44	43	50	58	55	60	56	60	55	49	43	A	28	24	F	F 28	F	F
2	F	F	F	F	F	F	F	37	48	62	61	57	56	51	57	51	46	35	24	31	33	27	30	F 30
3	F 32	33	F 30	F 28	30	26	22	39	53	60	58	H 56	61	53	51	50	44	29	28	31	32	31	33	34
4	F	F	F	F	F	F 27	F 28	36	53	55	54	53	55	51	48	52	53	36	27	27	29	26	30	F 30
5	F	F	F	F	F	F 30	F 23	41	48	H 53	51	57	57	48	47	51	44	32	26	28	29	29	30	33
6	F 31	F 30	F 29	F 25	F 25	F	F	24	39	54	55	50	60	55	55	55	48	53	43	26	27	31	F 28	F 30
7	30	F 29	F	F	F	F	F	41	48	63	65	64	51	54	48	48	43	45	40	34	F 30	F	F 30	F 30
8	F 30	F	36	36	35	35	36	47	53	70	66	65	H 67	58	55	50	50	37	A	A	33	26	27	F
9	F 30	30	29	30	F 27	F	F	26	40	49	48	56	70	80	57	52	55	55	43	30	26	29	31	33
10	F 30	F	F 29	F 32	F	F 30	F	45	61	64	60	63	63	60	53	60	53	A	A	30	F 30	A	F	F
11	F 37	F	F 33	F	F	F	F	F	64	65	61	61	57	H 66	54	60	50	48	30	F	F	F	F	F 47
12	F	F	F 52	F	F	F	F	S 46	53	65	60	60	65	61	61	59	48	41	52	45	46	44	44	37
13	34	35	33	31	33	35	33	47	60	60	63	64	62	71	63	63	63	51	30	25	27	29	33	33
14	33	32	32	32	32	33	31	40	55	57	65	65	68	63	55	61	51	46	43	40	37	35	34	37
15	40	39	37	F 36	F 35	33	31	46	57	70	66	54	65	73	56	59	56	47	38	30	31	33	F	F
16	F	F	F	F	F	F 30	24	43	53	59	60	68	65	63	62	60	55	A	43	38	A	39	33	F 34
17	F 31	33	30	33	F 28	F 27	F 23	43	H 51	59	53	54	57	56	55	55	59	49	33	32	30	30	30	30
18	31	30	30	30	30	30	26	46	H 50	H 55	66	62	61	62	54	55	48	45	43	46	47	47	43	46
19	50	50	46	43	40	40	36	45	50	54	58	65	67	62	57	53	55	53	34	34	36	35	36	33
20	35	34	36	36	37	41	30	52	60	64	60	56	66	60	58	50	59	63	54	52	45	34	31	36
21	35	36	33	33	33	32	32	51	59	78	64	81	67	60	H 62	61	56	49	50	47	46	43	39	42
22	41	37	35	35	35	33	31	53	68	65	61	72	65	58	67	57	63	70	35	35	28	30	33	34
23	34	36	36	34	33	30	30	52	58	65	66	62	77	68	59	64	55	55	51	44	44	38	34	35
24	33	35	38	37	35	37	37	50	64	71	65	70	65	67	58	60	58	45	43	45	43	43	42	S 47
25	S 45	42	41	41	39	35	34	46	55	49	54	58	68	65	H 63	56	56	48	40	33	35	37	36	34
26	33	33	32	F 34	34	F 36	41	44	50	H 54	61	69	55	H 66	64	56	55	51	42	45	44	42	F 37	F 39
27	F 44	F 44	44	F 38	35	34	36	48	53	H 55	65	70	62	57	54	54	54	53	43	46	A	45	44	40
28	39	40	39	39	37	F 34	F 35	52	51	62	58	70	68	68	59	57	55	49	40	43	40	44	41	40
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	23	19	22	20	19	21	23	27	28	28	28	28	28	28	28	28	28	25	26	26	24	25	24	23
MED	34	35	34	34	34	33	31	45	53	60	60	62	64	60	56	56	54	47	39	34	33	34	33	34
UQ	40	38	38	36	35	35	36	48	58	65	65	68	67	66	60	60	56	51	43	45	44	42	38	40
LQ	31	32	30	32	31	30	26	41	50	55	57	58	57	56	54	51	49	43	30	30	30	29	30	33

The Radio Research Laboratory, Japan

FEB. 1987

FOF2 (0.1 MHz)

IONOSPHERIC DATA

FEB. 1987

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 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											L	L												
2										L	L	390	390		L									
3										A	L	L	400	380										
4													400											
5												L	400	L										
6											L	400	400	L	L									
7											L	L												
8											L	L	400	390	A									
9											L	L	400	400	A	L								
10											370	400	390	380	L									
11												410	A											
12										L	L	380	400	400	400									
13													L	A	A									
14										L	L	L	L	L	L	L								
15										L	400	390	400	L	L									
16										L	400	410	410	410	L									
17										370	390	400	400	L	L									
18										L	L	390	400	400	L									
19										L	L	410	400	400	400									
20										L	L	400	390	430	410	L								
21										L	L	400	400	400	380									
22										360	380	410	400	390	L									
23										L	L	410	L	390	L									
24										L	L	370	400	400	400	410								
25										340	380	L	420	400										
26										L	L	350	380	390	400	410	390	390						
27										L	L	410	410	410	400	L								
28										400	400	400	410	410	400	L								
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									2	5	17	22	23	17	2									
MED									345	370	400	400	400	400	395									
UQ									380	400	L	405	400											
LQ									370	380	400	400	390											

FEB. 1987

FOF1 (0.01 MHz)

IONOSPHERIC DATA

FEB. 1987

FOE (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 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	A	A	260	275	280	280	260	220	190							
2								S	A	240	260	270	A	265	255	225	S							
3								A	A	A	260	285	285	280	260	220	180							
4								S	205	240	260	275	285	275	260	225	185							
5								S	200	240	275	285	285	275	265	225	190							
6								S	A	250	270	285	285	280	255	220	190							
7								S	205	240	275	285	290	280	260	225	180							
8								S	A	A	A	280	290	A	A	225	190							
9								S	A	245	275	290	290	290	A	225	B							
10								S	200	A	A	A	A	285	275	245	190							
11								S	215	250	275	290	A	285	A	240	A							
12								160	A	245	275	295	295	290	275	230	200							
13								S	205	A	290	295	A	285	255	225	S							
14								S	205	245	280	290	295	285	280	245	A							
15								S	A	245	270	295	295	290	275	240	190							
16								S	210	245	280	295	295	290	275	250	200							
17								A	A	245	270	275	290	290	270	235	200							
18								S	200	245	270	290	295	A	270	230	200							
19								S	210	255	270	290	295	290	275	230	190							
20								S	S	215	265	290	290	295	290	270	240	A	S					
21								S	A	A	250	280	290	295	290	270	245	205	S					
22								S	A	A	250	265	285	290	280	260	235	190	S					
23								S	S	235	255	270	280	A	A	260	245	215	H	S				
24								S	S	A	A	285	290	285	275	260	235	A	S					
25								S	S	210	A	A	290	300	290	280	A	225	S					
26								S	S	235	260	290	300	300	290	275	235	A	S					
27								S	S	220	A	290	300	300	A	285	255	200	S					
28								S	S	200	A	295	300	300	295	280	A	A	S					
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								1	16	19	25	27	23	24	25	26	19							
MED								160	208	245	275	290	295	285	270	232	190							
UQ									215	250	280	292	295	290	275	240	200							
LQ									202	245	270	285	288	280	260	225	190							

FEB. 1987

FOE (0.01 MHz)

IONOSPHERIC DATA

FEB. 1937

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

FEB. 1937

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

FBES (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 ¹ / 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 15	E 15	A A 15	A A 16	E S 16	E S 16	E S 15	23	28	G	G	35	33	31	29	29	A A 16	A A 16	E S 16	E S 16	E S 16	E S 16	E		
2	E S 15	E S 16	E 16	E 16	E S 16	E S 16	E S 17	21	G	G	G	28	G	G	G	23	E S 16	20	20	E S 17	E S 17	E S 17	E S 11		
3	E S 15	E S 15	E S 16	E S 17	E S 17	E S 16	E S 15	25	21	37	G	G	G	G	G	G	E S 15	20	F S 17	20	E S 17	E S 15	E S 17		
4	E S 15	E S 15	E S 15	E 16	E S 16	E S 16	E S 17	E S 15	G	G	G	G	G	G	G	23	30	E S 16	E S 16	E S 17	E S 16	E S 17	E S 16		
5	E S 15	E S 15	E S 12	E S 15	E S 12	E S 15	E S 16	E S 15	G	G	G	G	G	G	G	G	E S 17	E S 17	E S 17	E S 16	E S 17	E S 17	E S 16		
6	E S 15	E S 12	E S 16	E S 15	E S 15	E S 16	E S 16	E S 15	21	G	G	G	G	G	G	G	E S 15	E S 17	E S 17	E S 16	E S 16	E S 15	E S 16		
7	E S 16	E S 15	E S 11	E S 16	E S 15	E S 16	E S 17	E S 15	G	G	G	G	G	G	34	G	37	32	25	E S 17	E S 16	E S 15	E S 16	E S 16	
8	17	E S 16	E S 16	19	E S 16	E S 16	E S 17	E S 15	22	27	27	25	25	34	40	G	E S 16	E S 16	A A 61	A A 63	20	E S 16	E S 16	E S 15	
9	E S 16	E S 13	E S 15	E S 15	E S 17	E S 17	E S 17	30	17	24	21	37	36	28	28	27	19	E S 16	E S 16	20	E S 16	E S 11	E S 17		
10	19	E S 15	E S 16	E S 16	E S 15	E S 16	E S 17	E S 16	G	28	27	30	30	G	G	G	30	A A 52	A A 60	19	13	A A 55	E S 16	17	
11	E S 17	E S 15	E S 16	E S 15	E S 16	E S 18	E S 17	E S 16	G	20	G	G	G	38	36	30	35	40	25	22	20	E S 17	20	E S 16	E S 16
12	E S 16	E S 17	17	E S 16	E S 15	E S 17	G	23	20	20	G	G	G	G	G	G	18	15	20	E S 16	E S 15	E S 16	E S 15		
13	E S 17	E S 16	E S 15	E S 16	E S 17	21	29	E S 17	G	26	G	G	33	38	47	49	39	E S 16	E S 17	E S 16	E S 16	18	E S 17	E S 17	
14	E S 13	E S 17	E S 16	E S 17	E S 15	E S 16	E S 16	E S 16	G	G	G	G	G	G	G	G	23	25	23	E S 17	E S 17	20	20	E S 15	
15	E S 16	E S 16	E S 16	E 16	E S 16	E S 16	E S 17	53	G	G	G	G	G	35	G	G	G	18	E S 16	E S 16	E S 17	E S 16	E S 16	E S 16	
16	E S 16	E S 16	E S 16	E 16	E S 16	E S 17	E S 17	20	G	G	G	G	G	G	G	G	31	A A 50	23	19	A A 55	E S 17	20	E S 17	
17	E S 16	E S 17	E S 14	E S 16	E S 16	E S 15	21	20	25	G	G	G	G	G	G	G	G	23	23	23	18	E S 16	E S 17	E S 17	
18	E S 16	E S 16	E S 17	E S 12	E S 15	E S 16	E S 16	E S 17	G	G	G	G	23	30	23	G	G	E S 17	E S 16	E S 15	E S 16	21	E S 16	E S 17	
19	E S 16	E S 16	E S 17	E S 15	E S 11	E S 17	E S 15	E S 16	G	G	G	G	G	G	G	G	G	19	14	20	20	E S 17	E S 17	E S 16	
20	E S 15	E S 15	E 16	E S 16	E S 16	E S 16	E S 17	G	22	G	G	23	21	G	G	G	21	E S 15	17	E S 17	19	E S 16	E S 15	E S 17	
21	E S 17	E S 16	E S 14	E S 15	E S 15	E S 17	18	23	23	G	G	G	G	G	G	32	G	23	24	23	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	25	55	20	G	G	G	G	G	G	G	G	E S 15	17	E S 15	E S 16	E S 16	E S 16	E S 16	
23	E S 16	E S 16	E S 16	E S 16	E S 16	E S 17	E S 16	E S 20	G	G	G	G	33	30	G	G	G	25	18	34	40	E S 16	20	E S 16	
24	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	18	24	27	25	25	22	G	G	G	23	E S 16	E S 16	20	E S 16	E S 16	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 20	G	30	35	36	G	G	G	35	G	23	26	22	20	E S 16	E S 16	E S 15		
26	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	19	G	G	G	G	G	G	G	G	28	22	E S 16	18	E S 16	E S 16	E S 16	E S 15		
27	E S 15	E S 13	E S 16	E S 16	E S 16	E S 16	44	20	27	G	G	G	22	30	G	G	G	17	22	25	A A 53	E S 15	E S 16	E S 16	
28	E S 15	E S 15	E S 16	E S 16	E S 17	E S 15	E S 17	20	G	30	G	G	G	G	G	26	24	22	E S 17	E S 16	E S 16	E S 15	E S 17	E S 16	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	
MED	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 17	E G 20	G 18	G	G	G	G	G	G	18	18	18	E S 17	E S 17	E S 15	E S 16	E S 16	
UQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 17	20	23	27	E G 20	22	26	30	24	G	27	26	25	23	20	20	E S 17	E S 17	
LQ	E S 15	E S 15	E S 14	E S 15	E S 16	E S 16	E S 16	G	G	G	G	G	G	G	G	G	G	E S 16	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	

FEB. 1987

FBES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

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

FEB. 1987

FMIN (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

M(3000)F2 (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 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	F 330	F	F	A	A	F	F 340	F 335	F 360	F 345	F 350	F 350	F 325	F 350	F 365	F 365	F 355	A	F 340	F 325	F	F 285	F	F
2	F	F	F	F	F	F	F	F 350	F 355	F 370	F 345	F 350	F 355	F 350	F 350	F 385	F 360	F 340	F 330	F 340	F 355	F 295	F 300	F 310
3	F 320	F 320	F 330	F 305	F 335	F 305	F 320	F 360	F 360	F 350	F 355	F 340	F 355	F 370	F 370	F 370	F 370	F 345	F 320	F 340	F 325	F 320	F 310	F 300
4	F	F	F	F	F	F 335	F 320	F 360	F 375	F 365	F 350	F 360	F 360	F 390	F 375	F 350	F 375	F 345	F 335	F 335	F 360	F 305	F 300	F 300
5	F	F	F	F	F	F 335	F 310	F 365	F 395	F 340	F 390	F 355	F 355	F 375	F 360	F 370	F 375	F 345	F 305	F 320	F 315	F 305	F 315	F 330
6	F 315	F 310	F 285	F 290	F 295	F	F 335	F 360	F 370	F 380	F 365	F 365	F 355	F 355	F 355	F 355	F 360	F 360	F 325	F 335	F 350	F 295	F 280	F 290
7	F 265	F 295	F	F	F	F	F	F	F 355	F 385	F 365	F 325	F 360	F 370	F 375	F 355	F 370	F 335	F 355	F 325	F 330	F 300	F	F 325
8	F 300	F	F 305	F 290	F 315	F 315	F 335	F 370	F 365	F 355	F 335	F 355	F 320	F 355	F 365	F 370	F 370	F 325	A	A	F 345	F 325	F 295	F
9	F 280	F 300	F 295	F 315	F 260	F	F 355	F 375	F 365	F 360	F 345	F 330	F 360	F 350	F 355	F 365	F 365	F 350	F 335	F 305	F 310	F 305	F 320	F
10	F 330	F	F 305	F 310	F	F 300	F	F 360	F 355	F 350	F 365	F 350	F 350	F 365	F 350	F 350	F 360	A	A	F 300	F 300	A	F	F
11	F 295	F	F 305	F	F	F	F	F	F 370	F 360	F 325	F 325	F 355	F 320	F 350	F 335	F 360	F 345	F 325	F	F	F	F	F 310
12	F	F	F 325	F	F	F	F	F 345	F 360	F 375	F 355	F 335	F 330	F 325	F 335	F 355	F 360	F 305	F 325	F 320	F 320	F 320	F 320	F 325
13	F 295	F 315	F 285	F 290	F 295	F 300	F 350	F 360	F 360	F 355	F 335	F 365	F 345	F 350	F 340	F 350	F 355	F 370	F 345	F 320	F 315	F 310	F 320	F 305
14	F 305	F 295	F 305	F 295	F 310	F 325	F 355	F 350	F 370	F 355	F 360	F 340	F 365	F 350	F 365	F 360	F 360	F 345	F 345	F 335	F 325	F 330	F 315	F 310
15	F 295	F 295	F 295	F 310	F 300	F 335	F 330	F 370	F 355	F 375	F 350	F 355	F 335	F 355	F 355	F 345	F 355	F 355	F 340	F 335	F 355	F 320	F	F
16	F	F	F	F	F	F 300	F 335	F 370	F 350	F 345	F 350	F 350	F 365	F 340	F 345	F 350	F 370	A	F 325	F 330	A	F 300	F 335	F 330
17	F 320	F 320	F 265	F 305	F 320	F 290	F 295	F 350	F 335	F 355	F 360	F 350	F 360	F 355	F 360	F 345	F 355	F 365	F 340	F 345	F 325	F 325	F 295	F 300
18	F 320	F 290	F 300	F 300	F 300	F 335	F 345	F 370	F 325	F 325	F 335	F 355	F 345	F 350	F 370	F 345	F 375	F 340	F 310	F 345	F 340	F 310	F 315	F 310
19	F 300	F 330	F 305	F 300	F 300	F 315	F 330	F 355	F 340	F 355	F 340	F 350	F 360	F 340	F 350	F 360	F 350	F 360	F 340	F 325	F 325	F 330	F 315	F 305
20	F 315	F 295	F 305	F 310	F 295	F 355	F 335	F 355	F 365	F 375	F 345	F 340	F 335	F 345	F 345	F 360	F 340	F 340	F 335	F 330	F 330	F 300	F 265	F 305
21	F 310	F 310	F 300	F 305	F 315	F 320	F 330	F 350	F 340	F 360	F 345	F 350	F 350	F 350	F 350	F 350	F 350	F 345	F 325	F 300	F 325	F 315	F 295	F 295
22	F 310	F 315	F 300	F 315	F 320	F 325	F 335	F 360	F 290	F 365	F 335	F 355	F 340	F 360	F 345	F 350	F 340	F 350	F 335	F 335	F 330	F 295	F 295	F 315
23	F 300	F 300	F 305	F 295	F 310	F 335	F 335	F 350	F 345	F 370	F 350	F 340	F 340	F 350	F 340	F 360	F 360	F 350	F 335	F 320	A	F 335	F 325	F 315
24	F 305	F 305	F 295	F 300	F 300	F 330	F 320	F 355	F 345	F 365	F 370	F 350	F 340	F 350	F 360	F 350	F 355	F 365	F 310	F 325	F 325	F 305	F 305	F 310
25	F 310	F 300	F 285	F 290	F 300	F 310	F 345	F 370	F 365	F 380	F 355	F 335	F 350	F 340	F 335	F 355	F 355	F 360	F 330	F 325	F 300	F 310	F 320	F 325
26	F 285	F 310	F 310	F 300	F 310	F 310	F 320	F 270	F 360	F 305	F 345	F 350	F 340	F 325	F 360	F 355	F 365	F 355	F 315	F 330	F 335	F 335	F 310	F 305
27	F 295	F 285	F 320	F 320	F 315	F 315	F 340	A	F 360	F 325	F 330	F 340	F 355	F 340	F 340	F 350	F 350	F 360	F 305	F 305	A	F 310	F 295	F 325
28	F 305	F 290	F 290	F 290	F 290	F 295	F 300	F 365	F 355	F 340	F 345	F 335	F 340	F 350	F 340	F 340	F 350	F 345	F 310	F 300	F 300	F 315	F 300	F 300
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	23	19	22	20	19	21	23	26	28	28	28	28	28	28	28	28	28	25	26	26	23	25	24	23
MED	305	300	302	300	300	315	335	360	360	353	348	350	350	350	352	355	360	350	328	328	325	310	310	310
UQ	315	312	305	310	315	335	340	365	365	368	355	355	358	355	360	362	365	360	335	335	338	320	320	315
LQ	295	295	295	292	298	305	320	350	348	348	338	340	340	342	345	350	352	345	320	320	315	305	295	302

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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	WAKKANAI																							Lat.	45 23.5 N.		Long.	141 41.2 E		Sweep 1 MHz to 25 MHz in 2 ¹ / 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																																								
2										L	L	L	385	385		L																																				
3										A	L	L		375	390																																					
4														375																																						
5												L	375	375	L																																					
6											L	375	375	L	L																																					
7											L	L																																								
8											L	L	390	375	375	A	A																																			
9												L		A	A	L																																				
10											390	370	L	385	390																																					
11												355	A																																							
12										L	L	L	L	L	400	375																																				
13													L	A	A																																					
14										L	L	L	L	L	L	L	L																																			
15										L	375	385	375	L	L																																					
16										L	375	380	L	390	L	L																																				
17										380	385	375	375	L	L																																					
18										L	L	375	375	375	L																																					
19										L	L	365	375	375	375																																					
20											L	395	375	350	370	L																																				
21											L	385	385	375	380																																					
22										355	L	395	380	370	360	L																																				
23											L	L	L	390	380																																					
24										L	370	375	380	L	L	370																																				
25									405		A	L	355	365																																						
26									L	L	350	390	380	375	L	390	380	L																																		
27									L		385	380	380	375	L																																					
28										360	375	375	365	365	370	L																																				
29																																																				
30																																																				
31																																																				
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																												
CNT									2	5	16	22	22	16	2																																					
MED									378	370	385	375	375	375	370																																					
UQ									L	L	380	390	380	380	380																																					
LQ									360	375	375	375	375	370																																						

FEB. 1987

M(3000)F1 (0.01)

IONOSPHERIC DATA

FEB. 1987

H^oF₂ (KM)

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 ¹ / 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											225	240												
2										225	250	245	240		250									
3										225	240	255	245	240										
4													250											
5											250	245	240											
6											225	245	255	250	255									
7											250	225												
8											255	235	250	250	250									
9												270	240	240	245									
10											220	245	250	225										
11												285	230											
12										210	230	260	240	250										
13													260	240	250									
14											235	220	250	235	245	235	240							
15											220	245	240	265	240	240								
16											245	240	245	225	240	240								
17											235	230	270	250	245	250								
18											235	235	250	250	250	225								
19											230	270	260	240	260									
20											250	235	285	270	250									
21											230	245	230	240										
22											225	250	235	240	245	250								
23											240	245	250	225										
24											230	230	240	245	250									
25											225	245	255	250	260									
26											250	245	250	245	255	255	240							
27											235	255	260	250	250	250								
28											260	250	265	260	250	250	250							
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	13	23	26	26	23	15	2								
MED									235	230	240	245	250	245	250	245								
UQ									242	235	250	260	250	250	250									
LQ									230	225	230	240	240	240	240									

FEB. 1987

H^oF₂ (KM)

IONOSPHERIC DATA

FEB. 1987

H*F (KM)

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 ¹ / 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	220	225	250	A	A	245	205	205	220	220	200	H	H	260	245	245	230	225	A	255	250	240	295	250	270		
2	250	250	255	270	255	275	260	200	200	215	200	H	H	205	250	240	220	215	200	A	250	210	300	265	280		
3	255	260	255	275	250	270	225	205	205	A	210	200	235	205	225	215	210	200	270	245	250	250	260	280			
4	275	255	265	250	255	250	220	200	200	210	225	225	225	220	230	235	205	A	220	220	215	255	285	275			
5	250	255	265	270	265	225	250	200	200	H	205	215	220	215	215	235	205	200	250	250	250	300	270	250			
6	250	270	270	290	290	275	250	205	210	H	200	210	210	225	215	215	205	200	245	250	235	285	290	275			
7	305	275	265	265	275	255	240	215	200	230	200	225	230	235	235	220	A	A	245	250	230	250	265	245	255		
8	250	250	265	280	265	250	225	210	205	235	205	215	200	A	A	225	210	215	A	A	230	235	250	275			
9	300	270	275	275	275	255	220	200	210	215	250	250	A	A	200	230	215	210	255	255	300	275	250	280			
10	250	300	275	250	250	265	235	215	220	205	205	215	225	220	240	250	225	A	A	265	270	A	250	265			
11	265	255	245	300	290	270	220	205	220	210	200	200	A	H	H	250	A	A	205	225	250	210	245	260	220		
12	250	245	250	230	240	250	235	220	210	210	215	210	215	200	250	215	215	245	250	250	240	220	240	220			
13	270	245	300	310	275	295	A	200	215	H	200	240	H	250	A	A	A	A	205	225	250	250	285	255	255		
14	270	290	295	280	265	240	200	H	220	H	200	195	200	205	200	220	215	220	215	245	220	220	240	250	245		
15	285	275	275	265	255	245	245	205	A	200	200	200	205	A	220	225	215	205	200	235	230	250	245	245			
16	270	260	270	275	250	270	250	210	220	225	220	205	225	220	225	225	210	A	250	240	A	260	235	230			
17	250	250	310	275	270	280	A	230	210	215	205	200	195	245	230	230	225	205	225	250	245	240	275	280			
18	270	290	285	270	260	245	220	225	205	200	235	200	195	210	215	215	205	215	220	210	230	255	210	255			
19	245	235	245	260	260	245	220	215	205	200	200	235	225	200	225	230	225	210	200	250	250	235	250	250			
20	265	265	255	240	240	210	235	215	H	220	200	195	200	205	215	220	230	210	225	250	240	230	315	285			
21	260	255	270	255	255	250	245	235	H	215	225	205	225	195	H	220	245	230	210	250	255	230	245	265	255		
22	245	250	280	275	255	235	220	220	A	200	190	195	H	220	205	240	225	235	215	205	220	250	280	285	265		
23	295	280	260	250	255	250	240	200	220	205	220	210	H	A	225	225	245	240	230	230	A	A	205	255	250		
24	260	280	295	275	275	240	230	225	210	205	200	200	195	H	200	210	230	220	205	240	240	240	240	255	255		
25	245	260	275	255	260	255	230	230	H	200	H	A	A	245	225	H	240	245	230	215	A	245	255	300	250	245	225
26	285	250	275	275	265	250	205	205	200	195	205	200	200	200	H	200	225	205	220	215	225	210	220	215	250		
27	250	270	230	215	250	245	210	A	225	H	200	215	200	205	200	205	H	230	215	255	250	A	230	245	210		
28	240	255	275	290	295	300	235	225	215	210	200	200	240	220	210	215	230	215	220	255	260	265	255	270			
29																											
30																											
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	28	28	28	27	27	28	26	27	26	27	27	27	26	24	26	27	26	24	25	26	25	27	28	28			
MED	258	258	270	270	260	250	230	210	210	205	205	205	220	218	225	225	220	210	240	250	240	250	252	255			
UQ	270	272	275	275	272	270	240	220	220	215	215	218	230	225	240	232	230	215	250	250	250	270	265	275			
LQ	250	250	255	255	255	245	220	202	205	200	200	200	205	200	215	218	210	205	220	235	230	238	245	248			

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H*F (KM)

IONOSPHERIC DATA

FEB. 1987

H^oE (KM)

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								S	A	A	115	105	120	A	125	125	115							
2								S	A	125	120	125	A	120	125	125	S							
3								A	A	A	115	115	120	120	A	120	S							
4								S	120	115	115	115	115	115	115	115	S							
5								S	120	125	115	120	115	115	120	125	125							
6								S	A	115	115	115	110	115	115	115	140 ^E							
7								S	140 ^B	115	115	110	110	115	110	115	B							
8								S	A	A	A	A	A	A	A	110	125	A						
9								S	A	110	125	120	115	110	A	110	B							
10								S	115	A	A	A	A	110	115	120	120							
11								S	130	120	110	110	A	120	A	120	A							
12								115	A	110	115	110	110	115	115	115	140 ^B							
13								S	120	A	A	A	A	115	115	115	S							
14								S	115	105	110	115	120	115	115	115	A							
15								S	A	105	105	110	105	110	110	115	125							
16								S	140 ^A	115	120	125	115	115	115	120	125							
17								A	A	110	115	110	115	115	115	120	130 ^S							
18								S	115	110	110	110	115	A	120	115	S							
19								S	120	115	115	120	115	115	115	115	S							
20							S	S	120	130	115	115	115	115	120	115	A	S						
21							S	A	A	A	115	105	110	120	115	125	125	S						
22							S	A	A	125	120	120	125	125	120	125	130	S						
23							S	S	130	120	105	105	A	A	120	125	125	S						
24							S	S	120	A	A	A	125	120	115	110	120	A	S					
25							S	S	125	A	A	130	130	110	125	A	130	S						
26							S	S	120	120	110	120	130	120	125	115	A	S						
27							S	S	A	A	120	125	115	A	115	115	120	S						
28							S	S	110	A	110	115	110	130 ^A	130 ^A	A	A	S						
29																								
30																								
31																								
CNT								1	16	18	23	27	23	23	25	26	14							
MED								115	120	115	115	115	115	115	115	115	125							
UQ								128	120	115	122	120	120	120	120	130								
LQ								118	110	110	110	112	115	115	115	125								

FEB. 1987

H^oE (KM)

IONOSPHERIC DATA

FEB. 1987

H^oES (KM)

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 ¹ / 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	E	130	110	110	110	110	S	105	105	G	G	165	150	145	130	115	110	105	110	S	S	S	E
2	S	S	E	E	E	S	110	105	105	G	G	G	100	G	150	135	125	S	105	110	105	105	105	S
3	S	100	S	100	S	S	120	105	105	100	G	G	G	G	100	G	130	S	105	S	105	105	S	S
4	S	S	S	E	S	S	S	S	G	G	G	G	150	G	160	145	120	110	110	S	105	S	S	S
5	S	S	S	S	S	S	S	S	G	G	G	G	G	G	G	150	G	115	S	110	S	105	105	S
6	S	S	S	S	S	S	S	S	110	G	G	G	G	G	G	G	G	S	115	110	S	S	S	S
7	S	S	S	S	S	S	S	S	G	150	G	G	G	G	150	125	120	115	110	110	110	105	S	S
8	105	105	105	105	105	105	S	S	105	105	105	105	100	100	105	G	110	110	110	110	105	S	S	S
9	S	S	E	S	105	S	105	105	105	105	150	150	145	145	105	155	145	135	S	100	150	S	S	110
10	105	S	120	110	S	120	S	S	G	105	105	105	105	G	G	G	130	110	105	105	105	105	105	100
11	100	S	S	S	S	110	110	S	G	105	G	G	125	120	125	125	115	115	110	105	105	100	105	100
12	100	100	100	E	S	S	115	115	105	105	105	G	G	G	G	160	130	150	150	S	105	S	S	S
13	S	S	S	S	S	115	110	S	G	105	170	155	105	125	125	115	115	115	110	S	S	105	S	S
14	S	105	S	S	S	S	S	S	G	G	G	G	G	G	G	G	100	100	100	S	S	105	105	105
15	S	S	S	E	E	S	S	S	105	G	G	G	G	G	150	140	120	125	115	S	S	105	S	S
16	S	100	S	E	E	S	S	S	105	G	105	100	G	G	G	G	125	115	110	105	105	105	105	S
17	S	105	S	S	115	115	110	115	105	G	G	G	G	G	G	130	120	110	110	105	105	S	105	S
18	S	S	S	S	S	S	S	S	G	G	150	G	100	100	100	G	G	S	S	S	S	105	105	S
19	S	S	S	S	S	S	S	S	G	G	G	G	G	G	G	G	125	115	110	110	105	105	S	S
20	S	S	E	E	S	S	S	S	G	105	G	105	105	G	G	G	115	S	115	105	105	S	S	S
21	S	S	S	E	S	S	S	115	105	160	G	155	150	G	155	130	115	110	105	105	110	S	105	S
22	S	S	S	S	S	S	S	105	105	110	G	G	G	G	G	G	125	S	105	S	S	S	S	S
23	S	S	S	E	100	100	S	S	G	G	G	G	105	105	G	155	150	150	150	130	105	115	105	S
24	105	S	S	100	S	S	S	120	120	105	105	105	105	G	G	G	105	S	S	105	S	S	S	S
25	S	S	105	110	105	100	S	S	125	105	145	175	155	G	G	165	145	110	105	105	110	105	105	S
26	S	S	S	S	105	S	120	120	G	G	G	G	175	G	G	115	110	S	105	S	S	S	E	S
27	S	S	S	E	S	S	S	110	110	105	G	G	100	105	G	G	115	115	105	105	125	S	S	S
28	S	100	100	S	S	S	S	115	110	105	G	100	G	105	100	105	100	100	105	S	S	S	S	105
29																								
30																								
31																								
CNT	5	7	6	6	7	8	9	11	16	16	9	10	16	11	14	16	25	20	22	19	17	12	12	5
MED	105	100	105	108	105	110	110	115	105	105	105	105	105	120	125	130	120	112	108	105	105	105	105	105
UQ	105	105	120	110	108	115	115	115	110	105	150	155	150	148	150	148	125	115	110	110	105	105	105	105
LQ	100	100	100	100	105	102	110	105	105	105	105	105	102	105	105	120	115	110	105	105	105	105	105	100

FEB. 1987

H^oES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

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 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			F1	F7	F5	F2	F1		L2	L2			H1	HL11	HL21	C2	C3	F3	F3	F1													
2							F2	L1	L1				L1		H1	C1	C1		F2	F2	F1	F2	F1										
3		F1		F1			F1	L2	L2	L2					L1		C1		F2		F2	F2											
4													H1		H1	H2	C2	F5	F1		F1												
5																H1		F1		F1		F2	F2										
6									L1										F1	F1													
7										H1				H1	C2	C2	C5	F5	F4	F2	F2		F1										
8	F2	F2	F2	F2	F2	F1			L2	L3	L2	L2	L3	L4	L3		L1	F1	F4	F5	F2												
9					F1		F2	L1	L2	L2	HL22	HL11	H3	H2	L3	H1	H3	FF22		F2	F1			F2									
10	F2		F1	F2		F2				L4	L2	L2	L2				C2	F3	F4	F2	F2	F4	F2	F2									
11	F2				F2	F2			L1				CL23	CL33	CL22	CL31	CL32	FF12	FF22	F2	F1	F3	F2	F2									
12	F2	F2	F2			F1	C1	L2	L1	L1					H1	C2	H1	F1		F2													
13					F2	F4			L2	HL12	HL12		L2	C2	C2	C2	C4	F1	F1			F2											
14		F2															L1	F2	F2			F2	F2	F2									
15									L4					H1	H1	C2	C2	F1			F2												
16		F1							L2		L2						C4	F3	F3	F3	F3	F2	F3	F3									
17		F2			F2	F2	F6	L2	L3							C1	C1	F2	F3	F3	F2		F2	F2									
18										H1			L2	L1	L1							F2	F1										
19																	C2	F1	F1	F2	F2	F2											
20									L1		L1		L1				L1		F1	F2	F2												
21							L1	L2	HL22		H1		H1		H1	C3	C1	L2	F3	F3	F2		F2	F2									
22							L2	L2	L1								C2		F3														
23					F2	F2							L2	L1		H2	H2	H3	F1	FF42	F7	F1	F2										
24	F2			F2			C2	C2	L3	L2	L2		L2				L2			F5													
25			F2	F2	F2	F2		C1	L2	HL12	H2		HL11			HL22	C2	L3	F3	F3	F3	F2	F2	F2									
26					F2		C1	C2					H1			C2	L1		F2														
27							L6	L2	L1				L1	L2			C2	C2	F4	F2	FF23												
28		F2	F2				C2	C1	L2		L1		L1	L2	L2		L2	L2	F2					F2									
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																																	

FEB. 1987

TYPES OF ES

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

FXI (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 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	40	49	63	40	X 32	A	44												A	A	A	A	38	37	
2	40	38	38	35	33	33	X 27												X 34	X 35	X 39	A	A	39	
3	39	39	38	38	37	X 31	X 31												X 30	X 36	X 38	X 36	47	48	
4	50	47	39	40	37	X 30	X 30												A	X 38	X 37	X 32	38	40	
5	40	39	39	45	38	39	X 30												A	X 33	X 37	X 37	40	43	
6	40	39	38	36	35	38	X 31												X 37	X 36	X 35	X 37	39	40	
7	37	38	34	33	34	34	31												X 48	X 44	A	X 37	39	40	
8	A	A	41	43	40	40	46												X 39	X 39	X 36	X 36	A	36	
9	39	38	38	38	38	39	35												X 45	X 38	X 37	X 37	X 38	X 36	
10	X 39	A	39	39	39	39	38												X 38	A	A	A	40	43	
11	40	X 38	X 37	X 35	40	37	X 34												A	A	46	40	50	43	
12	50	52	62	61	56	52	52												X 47	X 55	X 50	X 45	X 40	49	
13	46	48	42	41	X 39	40	X 37												A	X 36	X 36	X 35	X 38	X 39	
14	X 38	X 38	X 37	X 36	X 36	X 36	X 30												A	X 50	X 46	X 34	X 37	X 40	
15	X 40	X 39	X 40	X 37	X 37	X 35	X 35												A	A	X 39	X 35	X 37	40	
16	40	42	40	39	X 37	37	39												A	X 51	X 46	X 48	X 44	48	
17	40	44	38	39	39	38	38												X 44	X 41	X 38	X 36	X 36	X 36	
18	X 37	X 36	X 36	X 34	X 36	X 33	X 32												X 44	X 49	X 44	47	48	48	
19	X 47	X 49	X 47	50	50	46	40												X 47	X 38	X 43	X 37	X 38	48	
20	40	40	40	43	41	X 36	X 32												X 58	X 55	X 44	A	X 39	X 39	
21	X 42	X 40	X 39	X 38	X 38	X 39	X 39												A	58	X 57	X 46	X 42	X 42	
22	X 44	X 42	X 42	X 41	X 43	X 40	X 36												A	A	X 39	X 39	X 39	X 42	
23	X 42	X 40	X 41	X 41	X 39	X 38	X 36												X 60	X 50	X 48	X 42	A	X 38	
24	43	43	47	43	46	48	46												X 46	A	A	49	48	52	
25	58	50	50	49	48	48	43												A	X 48	A	A	A	40	
26	40	39	45	40	40	40	44												X 51	X 47	X 48	X 35	X 34	X 38	
27	46	51	48	40	40	38	X 41												X 47	X 47	X 46	X 46	49	49	
28	S 42	50	52	49	50	49	49												X 42	X 43	X 45	X 46	X 47	X 47	
29																									
30																									
31																									
CNT	27	26	28	28	28	27	28													17	22	23	23	24	28
MED	40	40	40	40	39	38	X 36												X 45	X 44	X 43	X 37	X 39	X 40	
UQ	44	48	46	43	40	40	42												X 47	X 50	X 46	X 46	46	48	
LQ	40	39	38	38	37	36	X 32												X 39	X 38	X 38	X 36	X 38	39	

FEB. 1987

FXI (0.1 MHZ)

IONOSPHERIC DATA

FEB. 1987 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 sec in automatic operation																								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F	F	F	F	26	26	A	F	44	50	59	60	54	59	58	56	57	48	A	A	A	A	A	F	F
2	F	F	F	F	24	24	21	39	56	62	60	58	55	61	54	55	51	A	28	29	33	A	A	F	
3	F	F	F	F	F	25	25	A	A	60	65	61	57	54	52	49	44	A	24	30	32	30	F	F	
4	F	F	F	F	26	24	24	45	53	48	56	59	55	56	50	51	51	A	A	32	31	26	28	F	F
5	F	F	F	F	F	F	24	43	56	50	55	55	57	54	48	50	50	38	A	27	31	31	31	F	F
6	F	F	F	F	F	F	25	25	45	55	52	54	49	57	56	52	55	46	44	31	30	29	F	F	F
7	F	F	F	F	25	25	23	40	57	52	54	65	57	49	51	46	48	44	42	38	A	31	F	F	
8	A	A	31	F	F	F	F	48	54	57	65	65	61	60	56	58	47	42	33	33	30	30	A	F	
9	F	F	F	F	F	F	F	44	50	49	52	57	77	72	59	53	58	39	39	32	31	31	32	30	
10	33	A	F	F	F	F	F	53	70	54	60	60	65	57	56	51	60	47	32	A	A	A	F	F	
11	F	32	31	29	F	F	28	50	56	56	74	54	72	59	59	50	58	44	A	A	F	F	F	F	
12	F	F	F	F	F	F	F	53	67	61	58	66	71	67	54	61	53	41	41	49	44	39	34	F	F
13	F	F	F	F	33	31	31	62	59	66	60	67	59	63	64	76	57	57	A	30	30	29	32	33	
14	32	32	31	30	30	30	24	43	53	65	60	63	70	67	59	57	58	47	A	44	40	28	31	34	
15	34	33	34	31	31	29	29	51	65	67	69	65	58	70	67	61	56	A	A	A	33	29	31	F	F
16	F	F	F	F	31	26	29	50	57	55	66	75	69	66	62	64	58	48	A	45	40	42	38	F	F
17	F	F	F	F	F	F	28	46	62	58	65	59	66	59	55	56	60	57	38	35	32	30	30	30	
18	31	30	30	28	30	27	26	51	52	49	65	66	76	60	60	54	54	46	38	43	38	F	F	F	F
19	41	43	41	39	F	F	F	50	60	56	56	69	69	70	59	63	55	55	41	32	37	31	32	F	
20	F	F	F	F	F	30	26	50	62	58	60	59	58	65	65	56	A	64	52	49	38	A	33	33	
21	36	34	33	32	32	33	33	53	67	71	73	76	75	61	59	57	59	55	A	F	48	51	40	36	36
22	38	36	36	35	37	34	30	54	67	77	73	72	75	64	59	70	58	64	A	A	33	33	33	36	
23	36	34	35	35	33	32	30	48	59	66	66	66	71	78	61	60	63	60	54	44	42	36	A	32	
24	F	F	F	F	F	F	F	63	75	77	66	63	72	74	61	55	59	59	40	A	A	F	F	F	
25	F	F	F	F	F	F	F	58	52	50	58	67	70	78	71	60	56	54	A	42	A	A	A	F	
26	F	F	F	F	F	F	F	46	56	64	56	62	66	58	69	69	61	52	45	41	42	29	28	32	
27	F	F	F	F	F	F	F	35	53	60	61	58	68	68	58	55	52	56	56	41	41	40	40	F	F
28	S	F	F	F	F	F	F	40	54	54	58	56	71	82	76	67	59	59	52	36	37	39	40	41	41
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	14	15	19	22	16	18	24	27	27	28	28	28	28	28	28	28	27	23	17	22	22	20	17	15	
MED	34	32	31	31	30	30	28	50	57	58	60	64	67	61	59	56	56	52	39	38	35	31	32	33	
UQ	36	34	34	35	32	32	32	53	62	64	66	67	72	68	62	60	58	56	41	44	40	38	36	36	
LQ	F	F	F	F	F	F	F	25	45	54	53	56	59	58	58	54	52	51	44	33	32	31	30	31	32

IONOSPHERIC DATA

FEB. 1987

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 2sec 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	390	390	L	L	L	L								
2										L	380	L	L	400	380	L	A							
3										L	L	L	400	410	390	L	L							
4										320	L	L	L	410	390	A	A							
5										L	A	A	L	400	L	L	L							
6										L	L	L	L	410	390	L	L							
7										L	L	L	L	390	L									
8										L	L	L	L	410	400	400	L	L						
9													A	400	420	L								
10										L	380	L	L	L	410	L	L	A						
11										L	L	A	L	380	390	A	A							
12										L	L	L	L	L	410	L	370	L						
13													L	L	L	A	A							
14										L	L	L	L	A	400	A	L							
15										L	L	L	L	L	L	A	A							
16										L	400	L	L	L	A	A								
17										L	L	L	L	L	L	L	L							
18										L	L	L	L	L	L	L								
19										A	L	L	L	420	410	400	360							
20										L	L	L	L	L	410	420	A							
21										L	A	L	A	L	400	L	420	L						
22										L	A	L	L	L	410	L	L	L						
23										L	L	L	L	L	410	L	L	L						
24										L	L	L	L	L	410	L	L							
25													A	A	440	L	L	L						
26										L	L	L	L	420	420	410	L							
27										L	410	L	L	400	430	L	L	L	L					
28										L	L	L	L	380	410	L	410	L	L					
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										8	9	8	19	13	6	1								
MED										370	400	405	410	400	410	360								
UQ										380	400	410	415	410	420									
LQ										350	380	395	400	390	400									

FEB. 1987

FOF1 (0.01 MHz)

IONOSPHERIC DATA

FEB. 1987

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 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	205	A	260	275	280	270	265	245	A	S						
2								S	A	A	A	290	290	280	260	250	A	S						
3								S	A	A	280	290	300	300	275	250	A	S						
4								S	A	245	270	285	295	300	280	250	200	S						
5								S	A	A	A	295	300	290	280	250	A	S						
6								S	A	A	280	A	A	295	280	250	195	S						
7								S	215	255	280	295	295	280	275	250	200	S						
8								S	220	A	A	A	A	A	A	240	205	S						
9								S	220	255	280	300	300	295	A	245	205	S						
10								S	210	250	265	285	295	290	275	250	205	S						
11								S	230	255	285	295	305	295	280	A	205	S						
12								S	A	255	280	300	305	305	280	245	205	S						
13								S	A	255	280	295	305	295	275	250	200	S						
14								S	210	A	A	A	A	A	300	A	255	A	S					
15								S	210	255	280	A	A	A	A	255	205	S						
16								S	220	255	280	300	305	300	285	260	230	S						
17								S	A	A	A	295	300	300	280	255	215	S						
18								S	205	250	280	295	305	300	280	260	210	S						
19								S	A	A	285	300	305	300	290	260	220	S						
20								S	240	A	280	A	300	A	280	255	220	S						
21								S	A	A	A	A	A	A	A	260	A	S						
22								S	A	A	A	A	305	300	295	255	A	S						
23								S	250	270	285	300	300	A	A	255	225	S						
24								S	A	A	A	A	A	300	A	A	A	S						
25								S	A	260	290	305	A	A	A	A	A	S						
26								S	A	A	300	305	310	A	A	270	A	S						
27								A	A	280	305	310	310	310	300	270	A	S						
28								S	A	A	A	A	A	300	290	270	225	S						
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									12	13	19	19	20	21	19	25	17							
MED									218	255	280	295	300	300	280	255	205							
UQ									225	255	285	300	305	300	282	260	220							
LQ									210	255	280	292	298	295	275	250	205							

FEB. 1987

FOE (0.01 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

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 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 15	E 15	J 24	J 29	J 37	J 33	J 24	E 15	G	J 44	G	G	G	J 116	34	31	J 43	J 62	J 84	J 52	J 46	J 26	J 23	E 16
2		E 16	E 15	E 15	E 15	E 15	E 15	E 15	E 16	J 32	J 29	J 30	G	G	G	32	35	J 42	J 41	J 52	J 36	J 28	J 28	J 30	J 22
3		J 24	J 19	E 15	E 15	E 15	E 15	J 25	J 61	J 82	J 43	G	G	G	33	30	32	J 32	J 101	J 34	J 26	J 25	E 15	E 15	J 25
4		J 21	J 19	E 15	J 18	E 16	E 15	J 18	J 19	J 29	G	G	G	G	33	34	35	G	J 44	J 45	J 41	E 15	E 15	J 18	E 16
5		E 16	E 15	J 22	J 20	E 15	E 15	E 16	E 17	J 25	J 29	J 47	J 50	G	G	J 28	32	J 38	E 16	J 36	E 16	J 24	J 25	J 24	J 26
6		J 26	J 24	E 15	E 15	J 20	E 15	E 15	E 16	J 26	J 29	J 29	J 37	J 32	G	G	G	G	J 18	J 20	E 15	J 57	J 29	J 24	E 15
7		J 20	E 15	E 16	E 15	E 15	E 15	E 16	E 15	26	G	G	36	36	J 43	J 40	J 36	J 32	J 32	J 27	J 65	J 64	J 62	J 28	E 16
8		J 65	J 45	J 44	J 37	J 30	J 24	E 15	E 16	G	J 38	J 32	J 44	J 52	J 40	J 31	G	G	E 15	J 18	E 16	J 25	J 25	J 83	E 15
9		E 15	E 15	J 20	J 20	E 15	E 16	E 15	E 16	G	G	G	J 44	G	35	35	32	32	E 16	J 20	J 32	J 19	J 20	J 24	J 41
10		J 24	J 29	J 18	E 16	E 15	J 24	E 15	E 16	G	G	G	G	35	36	32	J 47	31	J 26	J 24	J 53	J 52	J 34	J 26	J 34
11		J 33	J 26	J 19	J 24	E 15	E 15	J 21	J 24	G	33	35	J 44	38	J 44	J 52	J 41	24	J 26	J 72	J 60	J 60	J 26	J 28	E 15
12		J 24	E 16	E 15	E 15	E 15	E 15	E 15	E 16	J 25	J 30	G	G	37	G	G	G	J 35	J 29	J 36	J 23	J 24	J 19	E 15	E 16
13		J 24	J 25	E 15	E 15	E 15	E 15	J 30	J 50	G	G	G	37	36	36	J 44	J 52	J 33	J 33	J 79	J 25	E 16	J 18	J 30	J 20
14		E 15	E 15	E 15	E 15	J 23	E 15	E 15	E 15	G	J 36	J 42	J 61	J 44	J 45	J 50	J 40	J 35	J 45	J 44	J 32	J 25	J 30	J 24	J 24
15		J 24	J 20	E 16	J 20	J 21	J 18	J 18	E 16	J 23	J 25	J 29	J 37	J 50	J 43	J 74	J 54	65	J 74	J 90	J 113	J 32	J 25	J 44	E 15
16		J 41	J 44	J 21	J 26	E 15	E 15	E 15	E 16	G	G	J 32	36	36	G	40	J 46	J 44	J 163	J 84	J 29	J 20	J 29	J 21	J 36
17		J 18	E 15	E 15	J 24	J 30	E 15	E 15	22	J 40	J 30	J 40	J 42	J 27	G	32	32	J 32	J 24	J 32	J 24	J 24	J 24	J 29	J 19
18		E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 16	G	G	36	32	G	35	G	32	30	20	E 16	J 24	J 23	J 29	J 28	J 28
19		J 24	J 24	J 24	J 18	E 15	J 18	E 15	E 16	J 31	J 36	J 29	38	J 46	39	32	36	J 53	J 40	E 15	J 49	J 29	J 48	J 28	J 18
20		E 15	E 16	E 15	E 15	J 18	E 15	E 15	E 17	G	J 28	G	J 44	J 52	J 32	39	J 42	J 59	J 44	E 16	J 21	J 28	J 34	J 24	J 21
21		E 16	E 15	E 15	E 15	E 15	E 15	J 19	E 17	J 36	J 75	J 75	J 70	J 42	J 31	J 41	32	J 44	J 32	J 83	J 59	J 21	J 18	E 16	E 15
22		J 25	J 18	J 18	J 18	J 20	E 15	E 15	E 17	J 29	J 76	J 52	J 54	G	G	G	34	J 54	J 32	J 76	J 54	J 52	J 49	E 15	E 15
23		E 16	E 15	J 24	J 21	E 16	E 16	E 16	E 16	G	G	G	J 28	J 30	J 44	J 29	G	G	23	E 16	J 24	J 34	J 60	J 54	J 36
24		J 32	J 34	J 29	J 24	J 21	E 16	E 15	J 26	J 41	32	J 32	J 31	J 31	J 30	J 44	J 41	J 30	J 29	J 52	J 110	J 87	J 27	J 26	J 28
25		J 40	J 48	J 24	J 18	J 24	J 36	E 15	E 16	J 31	G	40	44	41	J 53	J 59	J 38	64	J 44	J 56	J 123	J 64	J 51	J 41	J 24
26		J 26	J 33	J 23	E 16	E 15	E 15	E 16	J 44	J 60	J 60	G	G	G	J 36	J 40	G	29	J 50	J 65	J 50	J 25	J 26	J 18	J 23
27		E 15	E 15	J 18	E 15	E 15	E 15	E 15	26	25	G	G	G	G	35	33	G	J 27	J 25	J 52	J 29	J 36	E 16	J 41	J 29
28		J 40	J 36	E 15	E 15	E 15	E 15	E 15	20	J 29	30	J 44	J 66	J 40	J 30	G	G	G	21	J 26	J 32	J 64	J 21	J 29	J 28
29																									
30																									
31																									
CNT		28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED		J 24	J 18	17	17	E 15	E 15	E 15	E 16	J 26	J 29	29	37	34	35	34	33	J 32	J 32	J 40	J 32	J 28	J 26	J 26	J 22
UQ		J 26	J 28	J 22	J 20	J 20	E 16	E 16	21	J 32	J 36	J 38	J 44	40	J 42	J 40	J 40	J 44	J 44	J 68	J 54	J 52	J 32	J 30	J 28
LQ		E 16	E 15	E 15	E 15	E 15	E 15	E 16	G	G	G	E 27	G	E 30	30	E 31	28	J 24	J 22	J 24	J 24	J 24	J 20	J 22	E 16

FEB. 1987

FOES (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

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 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 15	E 15	E 15	E 15	E 15	A 33	E 15	E 15	G	34	G	G	G	29	32	26	32	A 62	A 84	A 52	A 46	A 26	E 15	E 16	
2	E 16	E 15	E 15	E 15	E 15	E 15	E 15	E 16	25	27	29	G	G	G	31	35	35	A 41	21	E 15	E 15	A 28	A 30	18	
3	E 15	E 15	E 15	E 15	E 15	E 15	19	A 61	A 82	30	G	G	G	32	29	32	27	A 101	E 15	E 15	E 15	E 15	E 15	E 15	
4	E 15	E 15	E 15	E 15	E 16	E 15	E 15	E 16	22	G	G	G	G	33	34	31	G	A 44	A 45	20	E 15	E 15	E 15	E 16	
5	E 16	E 15	E 15	E 15	E 15	E 15	E 16	E 17	24	26	40	45	G	G	G	G	22	28	34	E 16	A 36	E 16	E 15	E 15	
6	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 16	22	26	25	29	30	G	G	G	G	E 16	E 15	E 15	E 15	E 15	E 15	E 15	
7	E 15	E 15	E 16	E 15	E 15	E 15	E 16	E 15	25	G	G	35	36	35	29	28	23	18	E 15	29	A 64	E 15	E 15	E 16	
8	A 65	A 45	E 15	E 15	E 15	E 15	E 15	E 16	G	26	30	30	31	29	28	G	G	E 15	E 15	E 16	E 15	E 15	A 83	E 15	
9	E 15	E 15	E 15	E 15	E 15	E 16	E 15	E 16	G	G	G	38	G	34	35	32	29	E 16	19	19	E 15	E 16	24	E 15	
10	E 15	A 29	E 15	E 15	E 15	E 15	E 15	E 16	G	G	G	G	35	34	31	46	27	E 16	E 15	A 53	A 52	A 34	E 15	E 15	
11	18	E 15	E 15	E 15	E 15	E 15	E 15	E 16	G	31	34	44	35	37	48	34	23	E 16	A 72	A 60	22	E 15	E 15	E 15	
12	E 15	E 16	E 15	E 15	E 15	E 15	E 15	E 16	23	24	G	G	G	G	G	G	28	22	E 15	E 15	E 15	E 15	E 15	E 16	
13	E 15	E 15	E 15	E 15	E 15	E 15	E 16	24	45	G	G	37	36	36	41	50	30	20	A 79	E 16	E 16	E 15	26	E 15	
14	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 15	G	27	29	37	43	28	38	19	27	24	A 44	27	E 15	18	E 15	E 15	
15	E 16	E 15	E 16	E 15	E 15	E 15	E 15	E 16	19	21	25	32	32	31	62	41	35	A 74	A 90	A 113	E 15	E 15	18	E 15	
16	E 15	17	E 15	E 15	E 15	E 15	E 15	E 16	G	G	G	26	35	35	G	39	38	27	E 16	A 84	E 15	E 15	18	E 15	
17	E 15	E 15	E 15	19	E 15	E 15	E 15	19	25	28	28	27	20	G	G	32	32	28	18	22	E 15	E 15	E 15	E 15	
18	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 16	G	G	36	32	G	35	G	31	26	20	E 16	E 15	20	E 15	18	20	
19	20	19	18	E 15	E 15	E 15	E 15	E 16	24	34	26	38	26	33	32	29	24	20	E 15	20	26	22	E 15	E 15	
20	E 15	E 16	E 15	E 15	E 15	E 15	E 15	E 17	G	27	G	35	28	31	38	32	A 59	43	E 16	20	E 15	A 34	E 16	E 15	
21	E 16	E 15	E 15	E 15	E 15	E 15	E 15	E 17	32	59	38	43	38	29	39	29	40	22	A 83	32	E 16	E 15	E 16	E 15	
22	18	E 15	E 15	E 15	E 15	E 15	E 15	E 17	27	39	36	34	G	G	G	31	52	21	A 76	A 54	23	18	E 15	E 15	
23	E 16	E 15	E 15	E 15	E 16	E 16	E 16	E 16	G	G	G	G	25	25	32	29	G	22	E 16	E 15	29	29	A 54	20	
24	28	23	E 15	E 15	E 15	E 15	E 15	25	38	29	30	31	31	G	26	31	29	26	26	34	A 110	A 87	23	19	20
25	25	25	21	E 15	E 15	E 15	E 15	E 16	29	G	39	42	37	33	34	30	30	32	A 56	29	A 64	A 51	A 41	E 15	
26	19	26	E 15	E 16	E 15	E 15	E 16	20	48	30	G	G	G	32	32	G	26	25	31	22	E 15	18	E 15	E 15	
27	E 15	E 15	E 15	E 15	E 15	E 15	E 15	25	25	G	G	G	G	34	33	G	24	21	23	20	30	E 16	18	E 15	
28	25	27	E 15	E 15	E 15	E 15	E 15	20	25	29	32	32	32	G	G	G	G	19	E 15	E 15	E 15	E 15	18	E 15	
29																									
30																									
31																									
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 16	24	26	G	26	32	29	31	32	30	27	21	22	20	E 15	E 15	E 16	E 15
UQ	18	18	E 15	E 15	E 15	E 15	E 15	18	26	30	31	37	35	34	36	32	31	29	A 64	30	28	22	18	E 16	
LQ	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 16	G	G	G	E 20	G	E 25	28	E 19	24	17	E 15	E 15	E 15	E 15	E 15	E 15	

FEB. 1987

FBES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

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

FEB. 1987

FMIN (0.1 MHZ)

IONOSPHERIC DATA

FEB. 1987

M(3000)F2 (0.01)

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		F	F	F	F	320	A	F		360	365	370	365	335	365	340	365	380	375	A	A	A	A	A	F	F
2		F	335	330	320	335	295	335	365	375	375	360	345	365	375	360	350	370	A	330	330	340	A	A	F	
3		330	330	330	310	F	320	345	A	A	365	370	355	370	370	375	385	385	A	290	340	360	325	F	F	
4		F	F	315	F	325	370	360	390	360	365	375	370	350	360	360	350	355	A	A	345	340	330	310	F	F
5		F	F	F	F	F	F	355	365	390	380	360	355	360	365	360	360	375	380	A	335	320	315	320	F	F
6		F	345	F	310	F	320	345	375	400	385	390	350	355	375	340	380	370	340	375	325	330	F	F	F	
7		F	315	340	320	325	355	335	365	390	370	355	365	375	385	360	365	360	340	340	350	A	340	F	F	
8		A	A	320	F	F	330	F	365	365	355	365	355	350	375	350	360	365	355	345	340	350	320	A	F	
9		F	F	310	F	F	315	360	380	390	365	325	310	345	345	370	340	380	390	335	345	325	320	310	325	
10		335	A	325	315	335	330	325	360	370	370	350	350	355	355	370	350	375	380	370	A	A	A	F	F	
11		F	315	315	305	F	F	350	380	380	355	375	340	365	335	370	360	380	365	A	A	F	F	F	F	
12		F	F	F	F	F	F	F	360	385	385	375	355	340	365	365	370	375	370	305	335	320	365	355	330	
13		340	335	300	305	310	310	325	400	370	365	340	360	350	335	355	375	370	380	A	355	325	315	310	305	
14		310	305	310	320	320	365	375	355	360	370	380	340	350	360	355	385	365	370	A	345	365	355	320	325	
15		330	325	315	315	340	320	345	375	380	375	390	370	360	330	355	370	385	A	A	A	345	310	315	330	
16		F	F	F	F	330	325	350	380	380	370	350	370	375	360	365	370	365	390	A	355	350	360	355	335	
17		345	F	F	305	F	F	340	370	360	385	355	360	365	365	365	375	365	385	370	365	350	315	310	320	
18		320	305	315	320	345	335	345	375	385	370	365	350	370	345	355	345	375	370	330	330	335	350	325	F	F
19		325	315	330	325	F	350	335	375	385	355	360	355	365	360	360	360	370	365	375	320	345	355	310	F	
20		340	320	F	335	350	340	380	375	385	375	380	350	350	345	340	355	A	355	345	340	335	A	305	280	
21		340	310	320	315	310	335	340	355	370	365	360	355	360	365	340	360	375	365	A	F	310	335	355	335	335
22		335	320	300	310	350	350	335	365	345	340	375	350	355	350	340	365	360	355	A	A	345	305	320	315	
23		320	335	320	315	335	330	355	375	375	385	355	355	325	360	370	360	350	355	345	340	335	345	A	315	
24		F	310	325	310	F	F	F	355	375	365	375	340	345	360	365	360	350	365	350	A	A	F	335	F	
25		F	F	F	325	F	315	325	380	375	360	355	345	340	355	355	365	360	370	A	345	A	A	A	F	
26		F	F	F	345	F	F	365	380	370	370	360	340	355	350	355	360	370	370	345	330	355	345	325	310	
27		310	F	345	340	F	F	355	370	360	360	355	350	345	360	340	340	355	360	350	345	335	340	F	F	
28		320	F	305	305	F	F	345	365	350	360	325	335	330	340	360	360	365	375	370	305	305	305	325	320	
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		14	15	19	22	16	18	24	27	27	28	28	28	28	28	28	28	27	23	17	22	22	20	17	15	
MED		330	320	320	315	328	330	345	370	375	370	360	350	355	360	360	360	370	370	345	340	338	335	320	325	
UQ		340	332	328	325	338	350	355	378	385	375	375	355	365	365	365	370	375	378	370	345	350	352	325	330	
LQ		320	312	312	310	320	320	335	365	365	362	355	342	348	345	355	358	362	358	335	330	330	315	310	315	

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M(3000)F2 (0.01)

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IONOSPHERIC DATA

FEB. 1987

M(3000)F1 (0.01)

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										A	430	425	L	L	L	L								
2										L	405	L	395	370	L	A								
3										L	L	380	390	395	L	L								
4									430	L	L	L	390	390	A	A								
5									L	A	A	390	L	L	L									
6									L	L	L	L	L	375	385	L	L							
7									L	L	L	A	L											
8									L	L	385	395	395	L	L									
9									410	400	A	375	380	L										
10									L	425	L	L	370	L	L	A								
11									L	L	A	400	A	A	A									
12									L	L	L	L	380	L	410	L								
13									420	455	L	L	L	A	A									
14									L	L	L	L	A	395	A	L								
15									L	L	L	L	L	L	A	A								
16									L	385	L	L	L	A	A									
17									L	L	395	415	L	L	L	L								
18									L	430	L	375	L	L	L									
19									A	L	L	395	385	385	400									
20									L	L	385	L	L	370	365	A								
21									L	A	L	A	A	L	390	L								
22									L	A	L	L	390	L	L	L								
23									L	L	L	395	L	385	L	L								
24									L	405	L	395	L	L										
25									440	A	A	385	L	L	L									
26									L	L	L	380	380	375	L									
27									L	385	L	420	385	L	L	L	L							
28									L	L	430	390	L	375	L	L								
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										8	9	8	17	12	6	1								
MED										422	400	405	390	385	380	400								
UQ										430	405	422	395	392	390									
LQ										410	395	382	380	378	375									

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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H^oF₂ (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 ¹ / ₆ sec in automatic operation												
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1										230	250	270	250	275	250	230									
2										240	250	265	240	245	255	240									
3										250	230	260	240	245	245	220									
4										205	250	250	260	250	245	250									
5										230	255	255	255	250	240	240									
6										215	230	255	265	250	280	235									
7										230	230	245	245	245											
8										270	250	255	255	245	255	250									
9										240	245	250	260	245	240										
10									225	225	270	255	255	255	250	A									
11										220	240	255	255	260	245	230									
12										215	210	230	250	270	245	240	245								
13										245	245	250	260	270	250	240									
14										230	225	225	240	260	250	245	225								
15										225	230	220	245	245	280	A	240								
16										220	250	235	230	250	245	240									
17										245	230	245	255	240	250	245	240								
18										220	235	245	260	245	250	240									
19										235	250	255	245	250	260	245									
20										220	225	245	255	275	255	275	250								
21										230	240	250	240	250	240	270	250								
22										245	240	220	250	240	255	260	245								
23										225	235	250	245	275	245	245	260								
24										230	230	250	255	245	245										
25										235	255	260	270	250	230	240									
26										235	245	250	250	265	270	260									
27									240	240	250	250	250	250	255	250	250								
28										240	310	260	275	250	250	250	245								
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									11	28	28	28	28	28	28	26	23	2							
MED									225	232	245	252	255	250	248	240	248								
UQ									235	240	250	255	260	255	255	250									
LQ									222	225	230	250	245	245	245	240									

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H^oF₂ (KM)

IONOSPHERIC DATA

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H*F (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 2sec in automatic operation																									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	230	235	250	270	260	A	220	210	230	A	205	195	H	H	240	235	220	A	A	A	A	A	270	250		
2	260	255	255	275	275	270	265	230	240	220	200	200	200	255	240	A	220	A	A	250	245	A	A	E A 300		
3	250	250	260	270	250	270	245	A	A	A	A	220	220	230	220	215	A	210	A	250	240	215	250	265	250	
4	255	275	280	260	255	225	235	200	220	200	200	220	210	230	A	A	240	A	A	A	250	220	250	E S 305	E S 300	
5	E S 305	270	255	260	245	245	230	210	205	195	A	A	200	240	220	225	225	200	A	260	250	270	270	250		
6	250	230	270	E S 295	260	270	240	210	205	200	200	200	200	195	H	220	220	210	200	205	240	230	265	285	280	
7	295	E S 300	255	280	275	220	E S 255	220	225	210	205	A	A	A	250	220	240	220	230	A	A	240	255	250		
8	A	A	275	275	270	250	230	205	225	195	205	200	205	200	H	240	215	205	215	230	220	270	A	E S 310		
9	E S 310	245	260	E S 305	270	245	230	205	220	200	195	A	200	240	A	225	220	200	245	240	240	255	A	275		
10	245	A	265	270	245	250	245	230	220	205	200	H	H	A	220	245	A	220	200	210	A	A	A	255	245	
11	255	260	270	270	270	270	230	205	220	200	A	A	A	A	A	A	230	205	A	A	A	220	240	225		
12	280	250	225	225	210	210	235	225	210	200	200	200	210	220	200	200	220	205	270	230	240	210	235	255		
13	240	240	290	300	270	290	245	220	225	200	200	A	A	A	A	A	225	210	A	225	235	260	A	245		
14	255	275	280	270	260	210	205	205	200	200	205	A	A	210	A	A	225	205	A	A	200	220	240	245		
15	255	270	270	270	250	250	240	210	205	205	200	210	210	A	A	A	220	A	A	A	225	250	270	230		
16	270	250	270	255	250	275	220	215	225	195	H	195	A	225	195	H	A	A	225	210	A	225	220	210	220	250
17	250	245	280	290	260	265	240	225	210	205	195	195	205	230	235	235	240	210	220	210	220	260	285	280		
18	260	260	265	270	245	235	240	225	200	200	A	200	200	220	220	220	220	220	210	240	240	220	260	260		
19	255	245	240	260	255	235	225	210	220	A	235	A	A	210	220	230	230	225	200	255	A	A	260	245		
20	245	270	270	245	220	220	200	220	200	200	200	220	220	235	A	A	A	A	235	210	230	230	A	270	305	
21	245	270	255	255	270	240	240	240	A	A	A	A	A	205	205	235	230	220	A	A	240	210	230	235		
22	250	270	285	270	230	220	220	210	230	A	A	210	200	200	220	A	A	215	A	A	A	280	275	255		
23	270	240	260	260	245	250	235	205	200	H	H	H	205	210	220	230	250	245	220	215	210	A	A	A	280	
24	A	A	270	275	255	250	230	235	210	205	200	200	195	195	225	220	230	220	A	A	A	230	230	A	275	
25	A	A	280	255	245	250	240	220	200	190	A	A	A	220	A	230	220	220	A	A	A	A	A	A	E S 300	
26	E A 295	A	270	245	275	240	215	205	A	200	200	200	200	200	200	220	240	210	A	A	210	210	255	275		
27	260	245	220	235	250	250	225	230	210	210	195	200	210	H	205	220	210	220	210	225	A	235	270	240		
28	A	A	270	290	260	280	230	220	210	210	200	200	200	195	220	230	220	210	200	270	275	275	240	250		
29																										
30																										
31																										
CNT	24	22	28	28	28	27	28	27	25	23	22	18	20	24	19	17	26	23	14	18	20	22	22	28		
MED	254	251	270	270	255	250	231	215	210	200	200	200	202	215	220	225	222	210	212	240	232	245	259	251		
UQ	265	270	272	274	270	268	240	225	225	205	205	210	210	225	232	235	230	220	230	250	242	260	270	274		
LQ	250	245	255	258	245	235	225	208	205	200	200	200	200	200	210	220	220	205	210	225	220	220	240	245		

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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 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	120	A	105	110	105	105	105	A	A	S						
2								S	A	A	105	105	110	110	110	110	A	S						
3								S	A	A	105	110	105	110	110	110	115	S						
4								S	A	105	110	105	110	110	110	110	110	S						
5								S	A	A	A	105	105	110	A	110	A	S						
6								S	A	A	A	A	A	105	105	110	S	S						
7								S	110	110	105	A	A	A	105	110	110	S						
8								S	110	A	A	A	A	A	A	105	110	S						
9								S	115	110	105	105	105	105	A	A	S	S						
10								S	110	105	105	105	105	105	110	110	110	S						
11								S	110	105	105	110	105	105	110	110	115	S						
12								S	A	A	105	105	110	110	110	110	110	S						
13								S	A	105	105	105	105	105	110	110	110	S						
14								S	105	A	A	A	A	A	A	110	A	S						
15								S	A	110	110	A	A	A	105	110	110	S						
16								S	110	105	A	105	105	105	105	105	110	S						
17								S	A	A	A	A	110	105	110	110	110	S						
18								S	110	105	105	105	105	105	110	110	120	S						
19								S	A	A	A	A	A	110	A	110	110	S						
20								S	110	A	105	A	A	A	105	105	110	S						
21								S	A	A	A	A	A	A	A	105	110	S						
22								S	A	A	A	A	100	105	100	105	110	S						
23								S	115	110	105	A	A	A	A	110	110	S						
24								S	105	105	A	A	A	A	A	A	A	S						
25								S	110	105	A	A	A	A	105	110	110	S						
26								S	A	A	105	105	105	105	A	110	110	S						
27								S	110	105	105	105	110	110	110	110	110	S						
28								S	110	110	A	A	A	A	100	100	110	S						
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									15	14	16	14	16	18	19	25	21							
MED									110	105	105	105	105	105	110	110	110							
UQ									110	110	105	105	110	110	110	110	110							
LQ									110	105	105	105	105	105	105	110	110							

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H°E (KM)

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IONOSPHERIC DATA

FEB. 1987

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 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	S	130	120	110	110	115	S	G		G	G	G	110	140	130	120	110	110	105	100	100	100	S			
2		S	S	S	S	S	S	S	S	105	105	120	G	G	G	155	135	120	115	105	105	105	100	95	95			
3		105	105	S	S	S	S	110	105	105	100	G	100	G	145	150	130	120	110	110	105	105	S	S	100			
4		100	100	S	100	S	S	110	110	105		G	G	G	150	160	140	G	110	105	105	S	S	105	S			
5		S	S	105	105	S	S	S	S	105	100	145	135	G	G	100	150	130	S	115	S	100	100	100	105			
6		105	100	S	S	100	S	S	S	105	105	100	100	100	G	G	G	G	100	100	S	105	105	105	S			
7		100	S	S	S	S	S	S	S	155	G	G	155	145	135	130	130	125	110	130	105	105	105	105	S			
8		105	105	105	100	100	100	S	S	G	105	105	105	105	105	105	G	G	S	110	S	105	115	105	S			
9		S	S	105	100	S	S	S	S	G	G	G		150	150	145	135	155	S	100	150	145	140	120	105			
10		100	125	140	S	S	105	S	S	G	G	G	G	145	145	145	120	120	125	120	110	110	105	105	100			
11		100	100	105	100	S	S	110	100	G	125	135	120	150	125	120	115	145	120	110	105	105	100	100	S			
12		100	S	S	S	S	S	S	S	105	105	G	G	125	G	G	G	140	125	110	105	105	105	S	S			
13		105	105	S	S	S	S	S	105	105	G	G	165	155	145	125	115	110	110	110	110	S	105	105	100			
14		S	S	S	S	130	S	S	S	G				100	100	100	100	100	100	100	130	115	110	110	105	105	100	100
15		100	100	S	100	100	105	105	S	100	100	100	100	105	105	120	120	110	110	105	105	105	105	105	105	S		
16		105	105	105	120	S	S	S	S	G	G	100	150	150	G	140	125	130	110	110	110	105	105	105	100			
17		110	S	S	115	115	S	S	120	105	105	100	100	100	G	150	130	120	110	105	105	105	105	105	105	105		
18		S	S	S	S	S	S	S	S	G	G	145	150	G	140	G	140	150	155	S	105	135	100	100	100			
19		95	95	95	95	S	100	S	S	100	100	100	145	100	145	150	140	130	140	S	105	105	105	105	100			
20		S	S	S	S	105	S	S	S	G	105	G	100	100	100	130	130	115	110	S	105	105	105	105	105			
21		S	S	S	S	S	S	120	S	105	100	100	100	100	100	100	135	110	110	105	105	105	105	S	S			
22		100	100	100	100	100	S	S	S	105	100	100	100	G	G	G	130	110	100	100	100	105	105	S	S			
23		S	S	100	100	S	S	S	S	G	G	G	105	100	100	100	G	G	150	S	110	110	105	105	100			
24		100	100	95	100	100	S	S	110	105	105	105	100	100	100	100	100	105	115	105	100	100	100	100	100			
25		105	105	105	105	105	105	S	S	110	G	155	145	145	100	120	120	110	110	105	105	105	105	105	105			
26		105	105	100	S	S	S	S	110	105	105	G	G	G	120	105	G	110	110	105	100	105	100	100	95			
27		S	S	100	S	S	S	S	120	120	G	G	G	G	125	120	G	115	110	105	105	100	S	105	100			
28		95	100	S	S	S	S	S	120	115	110	105	100	100	100	G	G	G	120	110	110	105	105	100	100			
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		18	15	14	14	10	6	6	9	18	18	16	21	18	21	23	21	23	25	24	25	26	25	24	18			
MED		100	100	105	100	102	105	110	110	105	105	102	105	102	120	125	130	120	110	108	105	105	105	105	100			
UQ		105	105	105	105	110	105	115	120	105	105	128	145	145	145	145	135	130	120	110	110	105	105	105	105			
LQ		100	100	100	100	100	100	110	105	105	100	100	100	100	100	105	120	110	110	105	105	105	100	100	100			

FEB. 1987

H°ES (KM)

IONOSPHERIC DATA

FEB. 1987

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 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			F1	F3	F6	F3	F1			L4				C1	H2	C2	CL51	C7	F3	F3	F3	F4	F2		
2									L2	L2	C1				H1	H2	CL31	C2	F4	F3	F2	F3	F2	F1	
3	F1	F1				F5	L4		L4	L3		L1		H2	H1	C3	C2	C3	F2	F1	F1			F2	
4	F1	F1		F1		F2	C1		L1					H1	H2	H3		C2	F3	F2			F1		
5			F2	F2					L2	L1	HL32	H3			L1	H2	CL31		FF42		F2	F1	F1	F2	
6	F2	F1			F1				L2	L1	L2	L2	L2					L1	F1		F2	F1	F1		
7	F1								H1			HL12	HL23	HL22	C1	C2	C1	C1	F2	FF41	F3	F3	F2		
8	F3	F3	F2	F2	F2	F2				L3	L2	L2	L2	L2	L2				F1		F2	F2	F3		
9			F1	F2								H2		H1	HL23	HL33	H4		F3	FF13	FF11	F1	F4	F2	
10	F2	F4	F1			F2							H1	H1	H2	C3	C4	C1	F1	F4	F7	F4	F2	F2	
11	F2	F1	F1	F1		F1	L2			C2	H2	C2	H1	C2	C3	C5	H1	C1	FF42	F4	F4	F2	F2		
12	F2								L2	L3				C3			H4	C2	F2	F2	F2	F1			
13	F1	F2					L2		L3			H2	H1	H1	C2	C3	C4	C3	F4	F2		F2	F6	F2	
14					F1				L3	L3	L2	L2	L2	LH21	L3	LH21	CL12	C2	F3	F3	F1	F2	F2	F2	
15	F2	F1		F1	F1	F1	F2		L2	L1	L2	L3	L3	LH21	C2	C5	C3	C6	F3	F3	F2	F2	F2		
16	F2	F2	F2	F2					L2	H1		H1			H2	C2	C2	C2	F3	F1	F1	F1	F2	F2	
17	F2			F2	F2		C1		L2	L2	L2	L1	L1		H1	C3	C2	C2	F5	F1	F1	F2	F2	F1	
18										H2	H1			H1		HL21	HL21	H2		F2	F2	F2	F2	F2	
19	F3	F3	F3	F1		F1			L3	L4	L2	HL11	LH21	HL11	HL11	HL22	CL11	H1		F3	F2	F3	F2	F2	
20					F1					L2		L3	L2	L2	CL32	C2	C3	C3		F2	F2	F3	F2	F2	
21						F1			L4	L3	L2	L3	L3	L3	L2	H2	CL21	C5	F4	F4	F1	F1			
22	F2	F1	F1	F1	F1				L2	L2	L2	L2				C2	C3	L2	F3	F2	F2	F2			
23			F2	F2								L2	L1	L2	L2			H3		F1	F3	F4	F5	F3	
24	F5	F3	F2	F2	F1		C3	C3	C2	L1	L1	L2	L2	L2	L2	L3	C3	C3	F3	F2	F4	F2	F2	F2	
25	F2	F3	F3	F1	F2	F3			C3		HL11	HL21	HL12	L1	C2	C1	C2	C3	F4	F3	F3	F3	F5	F2	
26	F2	F2	F1				C2	L2	L2					C1	L2		C2	C3	F2	F2	F1	F1	F1	F1	
27			F1				C3	C1						C1	C1		C3	C2	F2	F4	F6		F3	F3	
28	F3	F3					C2	C2	C2	L2	L2	L1	L1					C2	F1	F2	F2	F2	F2	F2	
29																									
30																									
31																									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
UQ																									
LQ																									

FEB. 1987

TYPES OF ES

IONOSPHERIC DATA

FEB. 1987

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station **KOKUBUNJI TOKYO** Lat. **35 42.4 N**, Long. **139 29.3 E** Sweep **1 MHz to 20 MHz** in **20 Sec** in **automatic operation**

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	40	X 32	X 31	X 31	A 30	X 30													X 48	A 33	X 32	X 33	X 36		
2	X 36	X 35	X 35	X 33	X 35	X 31													A 36	X 42	X 32	X 32	X 34		
3	X 35	X 36	X 36	X 35	X 34	X 30													X 31	X 35	X 39	X 33	X 36	X 35	
4	X 35	X 36	X 34	X 33	X 33	X 29													X 34	X 35	X 39	X 32	X 33	X 31	
5	X 31	X 33	X 32	X 32	X 31	X 30													A 33	X 33	A 39	X 40	X 39		
6	X 39	X 32	X 31	X 30	X 30	X 31													X 41	X 36	X 37	X 36	X 33	X 34	
7	X 32	X 32	X 33	X 31	X 32	X 30													X 46	X 40	X 36	X 34	X 37	X 35	
8	X 34	X 32	X 34	S 34	X 36	X 36													X 44	X 38	X 38	X 32	U 32	X 33	
9	X 36	X 39	X 39	X 35	X 39	X 35													X 43	X 44	X 40	X 37	X 38	X 35	
10	X 37	X 35	X 37	X 36	X 37	X 35													X 43	X 37	X 37	X 37	X 40	X 38	
11	X 35	X 36	X 36	X 36	X 36	X 35													X 41	A 36	A 36	A 36	X 36	X 37	
12	X 38	X 40	X 39	X 40	X 40	X 35	45												X 41	X 51	X 43	X 43	X 36	X 40	
13	X 41	X 40	X 37	X 37	X 39	X 37													X 44	A 36	X 36	X 33	X 36	X 37	
14	X 37	X 37	X 36	X 35	X 36	X 32													X 45	X 49	X 48	X 35	X 33	X 36	
15	X 37	X 38	X 37	X 37	X 37	X 35													X 40	X 38	X 38	X 37	A 37	X 37	
16	X 36	X 37	X 37	X 36	X 35	X 33													X 41	X 49	X 49	X 40	X 39	X 39	
17	X 39	X 39	X 39	X 36	X 37	X 34													X 50	X 39	X 35	X 34	X 35	X 36	
18	X 36	X 35	X 35	X 35	X 36	X 31													X 45	X 47	X 39	X 40	X 39		
19	X 40	X 40	X 40	X 39	X 38	X 37													X 47	X 37	X 41	X 38	X 34	X 40	
20	U 42	X 41	X 40	X 40	X 40	X 32													A 54	X 54	X 40	X 38	X 39	X 37	
21	X 42	X 41	X 42	X 39	X 39	X 40													X 50	X 51	X 52	X 52	X 42	X 34	
22	X 36	X 38	X 39	X 38	X 41	X 34													C	C	C	C	C	C	
23	C	C	C	C	C	C													C	C	C	C	C	C	
24	C	C	C	C	C	C													C	X 42	C	C	C	C	
25	A 46	U 46	X 44	X 42	X 44	X 41													A 48	X 48	X 46	X 36	X 31	X 34	
26	O 34	X 35	X 36	X 37	X 38	X 35													C	X 45	X 46	X 35	C	C	
27	C	C	C	C	C	X 31													X 56	X 43	C	C	C	C	
28	C	C	C	C	C	C													X 44	X 39	X 43	X 43	X 46	X 45	
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	23	24	24	23	23	25	1												19	23	22	23	22	23	
MED	X 36	X 36	X 36	X 36	X 37	X 34	45												X 44	X 40	X 40	X 37	X 36	X 36	
UQ	X 39	X 40	X 39	X 38	X 39	X 35													X 46	X 46	X 46	X 38	X 39	X 38	
LQ	X 35	X 35	X 34	X 34	X 35	X 31													X 41	X 37	X 37	X 34	X 33	X 34	

FEB. 1987

FXI (0.1 MHz)

IONOSPHERIC DATA

FEB. 1987

FOF2 (0.1 MHz)

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

Station **KOKUBUNJI TOKYO** Lat. **35 42.4 N**, Long. **139 29.3 E** Sweep 1 MHz to 20 MHz in 2Sec 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	26	25	S	A	S	S	S	56	54	56	64	60	56	63	S	50	42	S	A	S	S	27	30	
2	S	30	29	29	S	F	S	S	41	58	60	62	61	60	60	60	54	41	A	30	36	26	26	S	
3	S	29	30	30	F	S	S	S	43	46	55	67	61	65	59	54	49	A	A	25	29	33	27	S	
4	29	F	28	27	S	S	S	S	44	51	55	53	61	63	56	58	49	51	S	28	29	S	26	S	
5	S	S	S	S	S	S	S	S	41	62	49	51	61	61	57	50	51	49	40	A	27	A	S	F	
6	S	33	26	S	S	S	S	S	45	58	54	56	51	52	59	55	56	47	40	35	30	31	30	S	
7	26	26	27	S	S	S	S	S	39	55	57	55	57	68	54	50	47	49	45	40	34	30	28	F	
8	S	S	S	A	S	F	S	S	51	54	63	62	65	63	60	59	55	41	S	38	32	32	31	S	
9	S	S	S	S	F	F	S	S	52	50	53	55	63	72	82	S	A	52	46	37	38	34	31	S	
10	31	J	S	31	S	S	S	S	53	62	54	62	65	57	68	59	59	60	50	S	37	31	31	S	
11	S	29	30	30	S	S	S	S	59	55	60	66	65	55	69	59	55	54	50	35	A	A	A	S	
12	S	F	F	F	F	F	F	S	I	S	58	57	J	R	S	S	S	58	48	35	S	45	42	S	
13	S	S	S	S	S	S	S	S	65	71	70	70	63	63	64	64	68	68	52	38	A	30	27	S	
14	S	31	31	30	29	26	25	50	S	60	69	S	J	S	S	S	59	57	U	S	S	S	42	29	
15	31	32	31	S	31	29	S	S	51	67	62	71	56	68	59	80	66	61	49	34	32	32	31	A	
16	S	30	31	S	S	S	S	S	53	63	57	66	78	U	S	S	66	63	61	57	51	35	43	S	
17	33	S	S	S	S	S	S	S	51	63	65	J	S	C	S	S	65	64	57	55	63	66	44	S	
18	30	29	29	S	30	25	26	S	59	57	52	65	74	R	71	75	H	C	55	46	35	39	41	S	
19	34	34	34	33	32	31	28	S	50	58	65	62	63	70	65	65	64	58	51	S	J	S	U	S	
20	U	S	S	F	F	S	S	S	50	60	59	58	63	61	72	70	59	56	59	A	S	48	34	32	S
21	36	35	36	33	33	34	32	53	69	75	S	R	J	R	S	S	56	58	55	44	45	46	46	S	
22	S	S	S	32	35	28	30	52	64	89	99	J	C	J	C	C	62	63	58	60	C	C	C	C	
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	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	36	C	C	
25	A	U	S	F	S	S	S	S	50	62	65	64	J	R	75	J	R	J	R	59	A	A	J	S	
26	28	29	S	S	32	29	29	52	S	63	65	65	65	69	67	65	73	S	S	C	S	S	40	29	
27	C	C	C	C	C	25	C	C	C	73	61	C	C	H	70	59	59	59	60	50	37	C	C	C	
28	C	C	C	C	C	C	C	C	C	57	65	68	80	81	J	R	H	65	63	57	38	33	37	S	
29																								S	
30																								S	
31																								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	22	23	23	21	19	23	23	24	24	26	26	24	25	26	26	24	25	24	20	23	22	23	21	22	
MED	S	30	30	S	30	27	28	51	59	58	62	63	67	66	62	59	57	50	38	34	S	34	31	S	
UQ	33	33	33	31	32	29	30	53	63	65	66	66	71	72	65	64	59	56	40	40	S	40	32	33	
LQ	S	29	28	S	S	S	S	44	55	54	57	61	61	59	58	56	54	46	35	31	31	28	27	S	

FEB. 1987

FOF2 (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

FOF1 (0.01 MHZ)

135° E Mean Time (G.M.T. + 9h)

Station		KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 20 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 300	L 410	U L 400	L 410	L 400	L 400	L	L									
2									L	L	L 400	L 420	L	L	L 390	L									
3										L	L 400	L 420	L 390	L 400	L	A									
4										L	L 390	L 400	A	A	L	A	A								
5										L 360	L 400	U A 410	L 420	L 410	L	L	L								
6										U L 350	L 380	L 410	L 420	L 410	L 400	U L 370									
7										L	L 400	L	L 410	A	A	A									
8									L	L	L	L 420	L 420	L 420	L 400	L	L								
9										L	L 400	L 420	L	L 400	A	A	A								
10									L	L 360	U L 420	L 400	L 420	L 410	A	A	A 280								
11										L	L 420	L 430	L 470	A	A	A									
12									L	L	U L 430	L 410	L 450	L 430	L										
13									L	L	L 400	L 400	L	A	A	A	A								
14									L	L 400	U L 420	L 520	L 460	L 430	A	L	A								
15									L	L	L 430	L 410	A	A	A	A	A								
16									L	L 350	L	L 420	L	L 420	A	A	A								
17									L	L	L 420	C	L 430	U L 420	A	L	A								
18									L 340	L 370	L 430	L 430	L	L	L	C									
19										L	L	L 420	L 430	L	L	L	L								
20								L	L	L	L 410	L 430	U L 450	U A 440	A	A	A								
21									L	L	L 430	U A 420	A	A	A	A	A								
22									L 290	L	L 420	A	U A 440	A	L 410	L	A								
23									C	C	C	C	C	C	C	C	C								
24									C	C	C	C	C	C	C	C	C								
25									L	L 380	A	L 450	L 440	U A 440	L	L									
26								L 240	L 290	A	L 430	L 430	L 440	A	L 440	L 390	L								
27								C	C	L 400	L 420	C	C	L 430	L 410	L 410	L								
28								C	C	U L 410	L 420	L 450	L 430	L 430	L 420	L 400	L								
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								1	4	9	21	21	18	15	9	4	1								
MED								L 240	L 295	L 370	L 420	L 420	L 430	L 420	L 410	L 395	L 280								
UQ								L 320	L 400	L 420	L 430	L 450	L 430	L 420	L 405										
LQ								L 290	L 360	L 400	L 410	L 420	L 410	L 400	L 380										

FEB. 1987

FOF1 (0.01 MHZ)

IONOSPHERIC DATA

FEB. 1987

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9h)

Statio KOKUBUNJI TOKYO Lat. 35 42.4 N, Long. 139 29.3 E Sweep 1 MHz to 20 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	S	225	255	275	295	A	A	A	A	A	S						
2							S	S	240	265	285	300	300	300	285	265	215	S						
3							S	S	A	A	A	A	A	305	290	270	210	S						
4							S	S	A	260	280	300		A	A	A	275	210	S					
5							S	S	A	A	295	305	315	A	295	270	220	S						
6							S	S	H	240	265	A	A	A	300	285	A	A	S				S	
7							S	S	H	230	270	290	305	310	300	A	255	A	S					
8	S						S	S	240	A	A	A	A	A	A	A	230	S						
9							S	S	240	A	A	A		310	300	A	A	S						
10							S	S	230	260	275	295	310	300	290	260	A	S	S					
11							S	S	H	250	275	295	310	310	310	290	260	220	S					
12							S	S	240	280	295	310	320	330	290	270	230	S					S	
13			S				S	S	240	270	295	300	320	300	290	270	A	S						
14							S	S	245	275	300	310	315	310	300	270	235	B						
15							S	S	240	275	H	305	H	310	320	310	295	265	A	S				
16							S	S	240	270	300	310	H	320	310	300	270	240	S					
17							S	S	250	270	A	C	310	310	295	275	235	S						
18							S	S	220	260	300	305	320	305	295	C	240	S	S	S				
19							S	S	H	240	H	275	295	320	320	315	300	285	245	S				
20							S	180	250	275	A	300	U	A	315	300	280	A	B				S	
21			S	S	S	S	S	180	A	A	295	310	A	310	U	A	U	A	235	S				
22							S	A	245	U	A	270	A	A	A	U	A	290	A	S				
23							C	C	C	C	C	C	C	C	C	C	C	C	C					
24							C	C	C	C	C	C	C	C	C	C	C	C	C					
25							S	A	A	275	305	U	A	A	A	A	A	A	S					
26							S	195	A	A	A	A	A	A	A	A	A	A	S					
27							C	C	C	290	305	C	C	C	310	305	295	240	S					
28							C	C	C	A	300	310	A	A	315	300	280	A	S					
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	18	19	18	18	15	19	18	19	15							
MED								180	240	270	295	308	315	310	295	270	230							
UQ								188	245	275	300	310	320	310	300	278	238							
LQ								180	240	265	290	300	310	300	290	268	218							

FEB. 1987

FOE (0.01 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

FOES (0.1 MHz)

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

Statio **MOKUBUNJI TOKYO** Lat. 35 42.4 N, Long. 139 29.3 E Sweep 1 MHz to 20 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 15	E S 14	J A 24	J A 27	J A 52	22	J A 24	E S 15	G 21	G	G	G	J A 30	J A 32	J A 33	J A 30	30	J A 29	J A 86	J A 49	J A 48	J A 48	J A 26	J A 19	
2	24	E S 15	E S 15	E S 14	21	22	E S 15	18	30	33	34	33	G	37	36	33	J A 36	J A 51	J A 55	J A 52	J A 40	J A 19	J A 30	23	
3	25	J A 20	20	21	26	E S 15	E S 15	J A 28	J A 44	J A 31	J A 36	J A 38	35	33	33	J A 52	J A 50	J A 63	J A 50	J A 24	23	E S 15	E S 15	E S 14	
4	J A 34	J A 20	E S 13	E S 14	E S 15	20	E S 15	J A 54	J A 29	J A 33	J A 32	38	40	42	36	J A 50	J A 46	120	J A 36	J A 33	J A 33	J A 18	23	24	
5	J A 19	22	19	21	E S 14	18	20	24	35	J A 31	36	43	36	J A 33	34	29	26	23	J A 34	J A 48	J A 47	J A 33	J A 20	19	
6	24	20	J 19	J 19	23	J A 19	20	23	26	27	J A 33	J A 32	J A 33	34	38	J A 37	J A 23	E S 14	E S 14	E S 15	E S 16	E S 14	J A 22	22	
7	20	J A 26	J A 32	J A 31	J A 22	J A 27	J A 18	20	G	32	34	38	41	44	J A 45	J A 40	25	J A 29	J A 24	J A 21	J A 25	20	E S 15	E S 15	
8	E S 15	22	J A 51	J A 33	J A 31	J A 29	J A 25	23	23	27	30	35	J A 36	J A 33	J A 34	J A 29	25	J A 33	J A 20	J A 20	19	19	18	J A 27	
9	E S 14	E S 15	18	19	J A 19	23	21	15	G	31	33	32	37	38	46	54	J A 54	25	J A 30	J A 22	J A 24	J A 26	J A 32	J A 35	
10	J A 41	J A 39	E S 14	18	J A 24	J A 26	20	21	20	G	35	G	35	34	40	J A 41	25	E S 14	E S 15	E S 14	J A 23	J A 25	J A 17	E S 15	
11	E S 14	J A 31	J A 30	J A 23	J A 24	19	19	22	31	32	37	37	35	42	J A 47	J A 41	G	20	E S 15	J A 50	J A 59	J A 54	J A 33	19	
12	J A 19	20	E S 15	19	22	22	19	23	22	19	32	G	35	G	G	G	32	J A 43	J A 31	J A 50	J A 54	J A 26	J A 20	20	
13	J A 31	J A 22	E S 15	21	25	E S 15	E S 15	E S 16	25	23	23	G	38	44	J A 50	J A 49	J A 43	J A 33	J A 32	J A 54	25	18	J A 23	J A 25	
14	J A 33	J A 20	J A 21	E S 15	E S 14	E S 15	E S 16	20	27	31	33	G	37	44	43	35	84	J A 66	40	J A 24	J A 26	J A 24	J A 26	J A 25	
15	J A 22	19	J A 20	J A 20	18	23	21	J A 20	G	G	G	G	46	47	J A 54	J A 44	45	J A 32	J A 19	J A 27	J A 53	J A 34	J A 65	J A 38	
16	J A 45	J A 33	J A 25	J 33	J A 19	18	18	23	G 19	G	G	37	42	G	42	J A 43	J A 45	J A 47	J A 47	J A 52	J A 34	J A 24	J A 27	J A 30	
17	J A 30	J A 21	J A 22	23	J A 22	E S 15	E S 15	J A 18	25	27	J A 44	C	J A 38	35	38	36	37	J A 29	J A 26	J A 29	J A 26	J A 21	J A 21	21	
18	J A 25	18	18	E S 15	E S 14	E S 15	17	E S 15	18	G	22	35	33	36	34	35	C	31	J A 42	E S 15	E S 14	J A 30	19	J A 19	J A 25
19	J A 20	E S 15	E S 14	E S 14	E S 15	E S 15	E S 14	E S 15	G	21	33	34	35	36	35	38	39	J A 43	24	J A 38	J A 64	J A 32	J A 34	J A 30	
20	J A 31	J A 22	J A 20	22	20	E S 15	E S 15	G	22	27	J A 32	J A 34	39	44	J A 54	J A 84	J A 63	J A 54	J A 87	J A 48	J A 31	22	J A 21	J A 27	
21	J A 28	J A 19	J A 19	19	E S 15	E S 15	E S 15	G	26	28	G	43	43	43	42	50	35	J A 51	J A 50	J A 54	J A 33	J A 33	J A 26	18	
22	21	19	E S 15	18	18	E S 14	E S 15	20	G	24	27	J A 43	J A 85	J A 104	J A 64	J A 53	J A 46	J A 57	J A 53	C	C	C	C	C	
23	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
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	J A 35	C	C	C	C
25	J A 51	J A 51	J A 23	J A 26	J A 30	J A 29	20	J A 21	J A 37	G 26	40	42	38	35	J A 54	J A 50	J A 51	J A 61	J A 86	J A 54	J A 53	J A 24	J A 36	J A 29	
26	J A 35	22	J A 18	22	19	E S 14	E S 15	G	27	J A 69	J A 36	J A 42	J A 39	J A 46	42	34	J A 42	24	C	J A 59	J A 50	J A 30	C	C	
27	C	C	C	C	C	E S 16	C	C	C	G 23	G 23	C	C	34	35	G	31	26	J A 29	36	C	C	C	C	
28	C	C	C	C	C	C	C	C	C	31	G 28	G 25	J A 44	G 30	G 22	G 22	J A 47	J A 84	J A 33	J A 29	J A 50	J A 30	J A 25	J A 29	
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	24	24	24	24	24	25	24	24	24	26	26	24	25	26	26	25	26	26	24	26	24	24	23	23	
MED	J A 24	20	J A 19	20	20	18	18	20	24	27	33	34	37	35	39	J A 40	J A 40	J A 33	J A 32	J A 36	J A 32	J A 24	J A 25	J A 24	
UQ	J A 32	J A 22	J A 22	23	J A 24	22	20	23	28	31	36	38	40	44	J A 46	J A 49	J A 47	J A 53	J A 48	J A 52	J A 49	J A 31	J A 31	J A 28	
LQ	20	19	E S 15	18	16	E S 15	E S 15	E S 15	G 20	G 23	G 28	G 26	35	33	35	33	30	25	J A 22	J A 24	J A 25	19	J A 20	19	

FEB. 1987

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

FBES (0.1 MHz)

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

Station KOKUBUNJI TOKYO Lat. 35 42.4 N, Long. 139 29.3 E Sweep 1 MHz to 20 MHz in 2Sec 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 15	E S 14	E S 19	E S 21	A A 52	E S 15	E S 17	E S 15	G 20	G	G 22	G 25	30	30	33	30	30	25	33	A A 49	21	16	17	E S 15	
2	E S 14	E S 15	E S 15	E S 14	E S 14	E S 14	E S 15	17	30	31	33	33	G	37	36	31	26	25	A A 55	25	25	E S 15	E S 14	E S 15	
3	E S 15	E S 15	E S 14	E S 15	E S 15	E S 15	E S 15	23	30	27	31	35	35	33	33	44	A A 50	A A 63	16	16	E S 15	E S 15	E S 15	E S 14	
4	20	E S 15	E S 13	E S 14	E S 15	E S 15	E S 15	19	26	23	24	37	40	42	33	41	40	22	20	E S 16	19	E S 14	E S 15	E S 15	
5	E S 14	E S 15	E S 14	E S 15	E S 14	E S 15	E S 17	24	34	27	35	41	34	31	34	29	25	19	A A 34	24	A A 47	20	E S 15	E S 15	
6	E S 15	E S 15	E S 15	E S 14	E S 15	E S 15	E S 15	21	23	G 24	G 30	G 31	31	33	36	29	23	E S 14	E S 14	E S 15	E S 16	E S 14	23	E S 14	
7	E S 15	E S 14	E S 15	E S 21	E S 14	E S 15	E S 15	20	G	32	34	38	37	43	40	39	24	17	21	E S 15	E S 15	E S 14	E S 15	E S 15	
8	E S 15	E S 15	23	A A 33	E S 19	E S 23	E S 19	E S 15	23	G 27	30	34	32	31	31	28	23	26	E S 14	E S 15	E S 15	E S 15	E S 15	E S 15	
9	E S 14	E S 15	E S 15	E S 14	E S 13	E S 15	E S 15	E S 15	G	30	32	32	36	38	43	A A 54	45	24	21	19	24	21	27	E S 14	
10	28	26	E S 14	E S 14	E S 19	E S 15	E S 15	E S 15	G 20	G	35	G	35	34	40	41	25	E S 14	E S 15	E S 14	16	E S 15	E S 15	E S 15	
11	E S 14	19	E S 15	15	15	E S 15	E S 14	21	31	31	35	36	35	42	45	41	G	20	E S 15	A A 50	A A 59	A A 54	16	E S 15	
12	15	E S 14	E S 15	E S 14	E S 14	E S 15	E S 15	E S 14	20	G 19	31	G	34	G	G	G	26	33	24	26	29	18	E S 15	E S 15	
13	20	19	E S 15	E S 14	E S 15	E S 15	E S 15	16	22	G 23	G 22	G	38	44	49	49	41	31	26	A A 54	E S 15	E S 15	19	16	
14	E S 16	E S 14	E S 15	E S 15	E S 14	E S 15	E S 16	19	26	31	32	G	37	39	43	33	45	23	34	22	19	E S 15	25	E S 15	
15	E S 15	E S 15	E S 13	E S 14	E S 15	E S 15	E S 15	E S 15	G	G	G	G	46	47	43	43	36	21	E S 15	21	25	24	A A 65	26	
16	25	E S 14	16	19	E S 14	E S 15	E S 15	E S 15	G 18	G	G	G	36	41	G	40	37	33	45	20	16	25	E S 15	E S 15	26
17	21	19	E S 14	E S 14	E S 15	E S 15	E S 15	17	23	G 24	G 30	C	33	35	38	34	35	23	22	21	E S 15	E S 15	E S 15	E S 14	
18	E S 15	E S 14	E S 14	E S 15	E S 14	E S 15	E S 15	E S 15	G 18	G 19	35	33	36	34	35	C	29	23	E S 15	E S 14	E S 15	E S 15	E S 15	E S 15	
19	16	E S 15	E S 14	E S 14	E S 15	E S 15	E S 14	E S 15	G 20	G 33	34	34	36	33	34	31	27	21	36	24	32	24	23	26	
20	E S 15	15	E S 14	E S 15	E S 14	E S 15	E S 15	G	G 22	G 25	30	G 28	39	44	43	41	46	34	A A 87	28	E S 15	E S 15	E S 15	E S 15	
21	E S 15	E S 14	E S 14	E S 14	E S 15	E S 15	E S 15	G	25	23	G	43	42	43	42	49	34	37	22	16	19	22	15	E S 14	
22	E S 15	E S 15	E S 15	E S 14	E S 15	E S 14	E S 15	19	24	G 26	G 32	55	44	47	40	29	53	42	C	C	C	C	C	C	
23	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
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	A A 51	34	E S 15	15	23	16	E S 14	20	25	G 23	40	39	37	34	44	33	26	A A 61	A A 86	31	34	21	16	22	
26	26	E S 14	15	E S 14	E S 14	E S 14	E S 15	G	26	47	32	33	34	44	40	30	26	19	C	29	34	17	C	C	
27	C	C	C	C	C	E S 16	C	C	C	G 23	G 23	C	C	33	35	G	30	25	26	E S 14	C	C	C	C	
28	C	C	C	C	C	C	C	C	C	29	G 25	G 25	34	G 26	G 20	G 20	25	20	21	15	E S 15	E S 16	E S 15	E S 15	
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	24	24	24	24	24	25	24	24	24	26	26	24	25	26	26	25	26	26	24	26	24	24	23	23	
MED	E S 15	E S 15	E S 15	E S 14	E S 15	E S 15	E S 15	16	G 23	G 26	31	33	36	34	39	33	30	24	22	20	19	E S 15	E S 15	E S 15	
UQ	20	15	E S 15	15	E S 15	E S 15	E S 15	20	26	30	34	36	38	43	43	41	40	33	34	26	27	20	18	E S 15	
LQ	E S 15	E S 14	E S 14	E S 14	E S 14	E S 15	E S 15	E S 15	G 20	G 23	G 24	G 25	34	33	34	29	25	20	16	E S 15	E S 15	E S 15	E S 15	E S 15	

FEB. 1987

FBES (0.1 MHz)

IONOSPHERIC DATA

FEB. 1987

FMIN (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station: KOKUBUNJI TOKYO Lat. 35° 42.4' N. Long. 139° 29.3' E Sweep 1 MHz to 20 MHz in 20 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	E 14	E 14	E 14	E 14	E 15	E 15	E 15	E 15	14	15	15	16	16	19	15	14	14	E 14	E 14	E 15	E 15	E 14	E 14	E 15
2	E 14	E 15	E 15	E 14	E 14	E 14	E 15	E 15	E 15	14	14	15	19	15	14	14	16	15	E 14	E 14	E 14	E 15	E 15	E 14	E 15
3	E 15	E 15	E 14	E 15	E 15	E 15	E 15	E 15	E 15	15	15	15	16	15	15	16	15	15	E 15	E 15	E 14	E 15	E 15	E 15	E 14
4	E 16	E 15	13	E 14	E 15	E 15	E 15	E 14	E 14	14	14	14	14	19	15	16	15	15	E 14	E 15	E 16	E 15	E 14	E 15	E 15
5	E 14	E 15	E 14	E 15	E 14	E 15	E 15	E 14	14	14	14	15	15	19	14	15	14	E 14	13	E 14	E 15	E 15	E 15	E 15	
6	E 15	E 15	E 15	E 14	E 15	E 15	E 15	E 15	15	14	14	14	14	14	14	14	15	E 14	E 14	E 15	E 15	E 16	E 14	E 15	E 14
7	E 15	E 14	E 15	E 15	E 14	E 15	E 15	E 14	14	15	14	16	16	14	14	14	14	E 14	E 15	E 15	E 15	E 14	E 15	E 15	E 15
8	E 15	E 15	E 15	E 14	E 15	E 14	E 15	E 15	14	15	15	15	15	16	16	15	15	E 14	E 14	E 15	E 15	E 15	E 15	E 15	E 15
9	E 14	E 15	E 15	E 14	13	E 15	E 15	E 15	15	14	14	14	15	15	15	14	14	E 14	E 14	E 15	E 14	E 14	E 15	E 14	E 14
10	E 15	E 14	E 14	E 14	E 14	E 15	E 15	E 15	15	14	14	15	16	14	15	14	14	E 14	E 15	E 14	E 14	E 15	E 15	E 15	E 15
11	E 14	E 14	E 15	E 14	13	E 15	E 14	E 14	14	14	14	14	15	14	14	14	14	E 15	E 15	E 14	E 15	E 15	E 14	E 15	E 15
12	E 14	E 14	E 15	E 14	E 14	E 15	E 15	E 14	14	14	14	15	14	16	14	15	14	E 14	E 15	E 15	E 15	E 15	E 15	E 15	E 15
13	E 14	E 14	E 15	E 14	E 15	E 15	E 15	E 16	14	14	14	15	16	16	14	16	14	E 14	E 15	E 15	E 15	E 15	E 15	E 15	E 15
14	E 16	E 14	E 15	E 15	E 14	E 15	E 16	E 16	16	14	14	14	14	15	16	14	14	13	E 14	E 15	E 14	E 15	E 15	E 15	E 15
15	E 15	E 15	13	E 14	E 15	E 15	E 15	E 15	14	14	14	15	15	15	16	14	14	E 14	E 15	E 14	E 15	E 15	E 15	E 15	E 14
16	E 15	E 14	E 14	E 14	E 14	E 15	E 15	E 15	15	14	14	14	14	14	15	14	14	E 14	E 14	E 15	E 15	E 15	E 15	E 15	E 14
17	E 15	E 14	E 14	E 14	E 15	E 15	E 15	E 14	15	14	14	C	15	19	16	14	14	E 15	E 14	E 14	E 15	E 15	E 15	E 15	E 14
18	E 15	E 14	E 14	E 15	E 14	E 15	E 15	E 15	14	14	14	15	16	16	16	C	16	E 15	E 15	E 14	E 15	E 15	E 15	E 15	E 15
19	E 14	E 15	E 14	E 14	E 15	E 15	E 14	E 15	14	14	15	15	17	15	15	14	15	E 14	E 15	E 15	E 14	E 15	E 14	E 15	E 15
20	E 15	13	E 14	E 15	E 14	E 15	E 15	E 14	14	14	14	15	16	19	14	14	14	13	E 15	E 14	E 15	E 15	E 15	E 15	E 15
21	E 15	E 14	E 14	E 14	E 15	E 15	E 15	E 14	14	14	14	14	14	14	14	14	14	E 14	E 14	E 14	E 14	E 14	E 14	E 14	E 14
22	E 15	E 15	E 15	E 14	E 15	E 14	E 15	E 14	14	14	20	16	15	16	15	14	14	E 14	C	C	C	C	C	C	C
23	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
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E 14	C	C	C	C
25	E 14	E 14	E 15	E 14	E 14	E 14	E 14	14	14	14	16	15	20	20	16	15	14	E 14	E 15	E 15	E 15	E 14	E 14	E 15	E 15
26	E 14	E 14	E 14	E 14	E 14	E 14	E 15	E 15	15	14	16	16	16	19	19	16	14	E 14	C	E 15	E 15	E 14	C	C	C
27	C	C	C	C	C	E 16	C	C	C	15	20	C	C	18	16	15	14	E 14	E 14	E 14	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	15	14	15	15	15	14	14	14	E 15	E 14	E 14	E 15	E 16	E 15	E 15	E 15
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	24	24	24	24	24	25	24	24	24	26	26	24	25	26	26	25	26	26	24	26	24	24	23	23	
MED	E 15	E 14	E 14	E 14	E 14	E 15	E 15	E 15	14	14	14	15	15	15	15	14	14	E 14	E 14	E 14	E 15	E 15	E 15	E 15	E 15
UQ	E 15	E 15	E 15	E 14	E 15	E 15	E 15	E 15	15	14	15	16	16	18	16	15	15	E 14	E 15	E 15	E 15	E 15	E 15	E 15	E 15
LQ	E 14	E 14	E 14	E 14	E 14	E 15	E 15	E 14	14	14	14	14	15	14	14	14	14	E 14	E 14	E 14	E 15	E 14	E 14	E 14	E 14

FEB. 1987

FMIN (0.1 MHz)

IONOSPHERIC DATA

FEB. 1987

M(3000)F2 (0.01)

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

Station **KOKUBUNJI TOKYO** Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 20 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	F	320	320	310	S	A	S	S	S	350	355	330	355	340	340	340	360	360	350	S	A	S	S	310	
2	320	320	325	310	S	F	320	335	345	360	350	355	350	310	350	330	360	355	355	A	300	295	335	290	
3	300	310	320	315	F	S	300	330	360	370	360	335	355	350	340	355	355	A	A	310	310	335	300	315	
4	310	F	305	325	S	S	350	350	330	350	360	330	330	360	350	355	350	345	360	S	350	330	325	320	
5	300	S	310	330	S	310	S	305	330	355	355	350	350	350	350	360	350	370	350	A	295	A	325	F	
6	330	S	330	320	S	S	330	320	330	350	380	335	350	335	325	340	350	355	360	340	350	340	330	340	
7	300	290	310	290	S	310	S	330	310	350	360	380	345	330	345	360	360	355	340	360	330	340	340	315	
8	315	S	310	310	A	285	S	310	330	360	350	330	340	340	350	340	350	360	360	S	350	355	320	330	
9	310	S	310	330	S	F	F	345	355	360	355	330	330	320	335	350	A	370	355	330	335	330	310	310	
10	315	J	S	315	320	325	330	310	350	360	360	320	360	355	350	350	340	350	330	S	345	330	310	310	
11	320	315	310	300	S	320	310	340	360	370	345	340	350	290	345	335	360	350	360	340	A	A	A	S	
12	300	S	300	F	F	F	F	F	F	340	I	S	350	360	340	335	S	305	320	340	340	365	350	290	
13	320	S	310	290	S	285	290	305	340	S	S	350	350	345	350	330	345	340	355	345	350	A	330	320	
14	290	S	300	300	310	320	350	340	355	355	355	340	J	S	S	S	330	330	320	350	360	U	S	345	
15	310	300	300	295	S	320	315	325	350	S	360	345	340	335	345	330	345	S	365	355	330	320	325	S	
16	310	S	315	310	S	320	310	300	325	350	370	345	345	S	U	S	340	350	340	325	360	370	325	310	
17	320	S	310	300	285	S	300	290	315	360	350	355	J	S	C	345	345	345	350	345	370	345	330	330	
18	310	315	300	300	S	330	275	325	365	S	380	355	340	325	R	310	350	R	H	C	345	365	355	310	
19	315	325	325	315	320	330	315	350	S	360	360	345	355	330	340	340	340	S	355	355	340	S	J	335	
20	U	S	S	290	F	F	F	310	S	350	360	360	350	340	340	320	320	R	335	340	350	340	A	325	
21	310	310	320	310	285	320	310	350	325	355	S	R	J	R	340	355	340	R	R	355	345	345	310	315	
22	300	S	295	285	300	360	320	325	355	340	335	350	S	J	C	J	C	C	C	S	300	330	355	340	
23	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
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	A	U	S	300	S	300	S	335	S	305	335	370	S	380	350	345	340	J	R	325	330	J	R	J	R
26	300	290	300	310	S	330	340	315	360	355	355	355	340	330	345	330	330	340	S	S	360	C	330	350	
27	C	C	C	C	C	330	C	C	C	C	355	345	C	C	330	340	330	355	355	370	335	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	340	330	315	325	320	J	R	H	355	370	355	290	295	295	300
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	22	23	23	21	19	23	23	24	24	26	26	24	25	26	26	24	25	24	20	23	22	23	21	22	
MED	S	310	310	310	310	320	315	325	352	360	355	340	340	335	340	340	350	355	355	342	330	S	330	320	
UQ	315	315	320	310	330	330	332	360	365	355	345	350	350	350	350	355	360	360	350	332	335	330	315	310	
LQ	S	300	300	300	S	310	S	302	315	S	350	S	350	345	335	330	325	330	335	340	350	348	328	310	

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M(3000)F2 (0.01)

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M(3000)F1 (0.01)

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

Statio KOKUBUNJI TOKYO Lat. 35 42.4 N, Long. 139 29.3 E Sweep 1 MHz to 20 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 385	L 380	U 380	L 395	L 380	L 375	L 360	L								
2									L	L	L 380	L 370	L	L	L 375	L								
3										L	L 365	L 380	L 380	L 370	L	A								
4										L	L 400	L 380	A	A	L	A	A							
5										450	L 380	A	L 375	L 360	L	L	L							
6										U 420	L 370	L 380	L 360	L 355	L 370	U 370								
7										L	L 370	L	L 355	A	A	A								
8									L	L	L	L 375	L 360	L 375	L 360	L	L							
9										L	L 380	L 350	L	A	A	A	A							
10									L	430	U 360	L 380	L 380	L 365	A	A	420							
11										L	L 360	L 370	L 355	A	A	A								
12									L	L	L 370	L 380	L 355	L 350	L									
13									L	L	405	430	L	A	A	A	A							
14									L	L	U 370	L 390	L 340	L 360	L 360	A	L	A						
15									L	L	L 360	L 395	A	A	A	A	A							
16									L	420	L	L 360	L	L 395	A	A	A							
17									L	L	L 380	C	L 375	L 380	A	L	A							
18									L	L	L 395	L 420	L 355	L 360	L	L	C							
19										L	L	L	L 360	L 370	L	L	L							
20								L	L	L	L 390	L 380	U 350	A	A	A	A							
21								L	L	L	A	A	A	A	A	A	A							
22									410	L	L 370	A	A	A	A	L	A							
23									C	C	C	C	C	C	C	C	C							
24									C	C	C	C	C	C	C	C	C							
25								L	L	415	A	L	U 345	L 360	A	L	L							
26								L	430	430	A	L 370	L 375	L 375	A	L 360	L 360	L						
27								C	C	C	L 375	L 380	C	C	L 350	L 390	L 340	L						
28								C	C	C	U 370	L 380	L 365	L 370	L 365	L 360	L 360	L						
29																								
30																								
31																								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	4	9	21	19	16	13	7	4	1							
MED								L 430	L 402	L 420	L 380	L 375	L 365	L 365	L 360	L 360	420							
UQ								420	420	L 380	L 380	L 375	L 375	L 372	L 365									
LQ								390	375	L 370	L 362	L 355	L 360	L 360	L 350									

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M(3000)F1 (0.01)

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H^oF₂ (KM)

135° E Mean Time (G.M.T. + 9h)

Station **KOKUBUNJI TOKYO** Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 20 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									240	240	285	250	260	275	260	240								
2									240	230	245	245	285	265	230	230								
3									245	255	240	255	260	235	E ^o A ^o 250									
4									230	230	280	240	250	240	E ^o A ^o 260	E ^o A ^o 255								
5									250	275	270	250	255	250	255	225								
6									245	260	285	315	270	255	255									
7									220	255	295	255	260	245	E ^o A ^o 245									
8									235	275	250	255	250	270	245	235	220							
9									245	290	290	260	265	240	A ^o 245	E ^o A ^o 245								
10									220	250	270	230	245	260	260	250	230							
11									245	275	265	400	250	260	240									
12									210	205	275	255	305	255	245									
13									230	235	255	260	250	275	260	255	A ^o 235							
14									230	235	255	300	275	265	230	245	E ^o A ^o 240							
15									220	245	255	250	260	300	255	240	225							
16									210	240	240	240	245	250	260	235	230							
17									250	245	255	C	260	250	255	250	250							
18									215	235	280	250	285	235	250	H ^o 250	C							
19									250	255	250	275	250	250	245	225								
20								205	215	220	265	275	310	290	255	260	250							
21									240	235	235	250	245	265	245	E ^o A ^o 260	235							
22									230	255	235	E ^o A ^o 255	255	270	250	250	E ^o A ^o 275							
23									C	C	C	C	C	C	C	C	C							
24									C	C	C	C	C	C	C	C	C							
25									210	250	245	260	270	270	260	240	235							
26								230	235	250	245	250	270	265	285	250	230							
27								C	C	235	250	C	C	240	275	270	245							
28								C	C	260	270	305	255	265	265	250	240							
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	16	26	26	24	25	26	26	23	18							
MED								218	230	245	255	255	260	265	252	248	232							
UQ									238	250	275	278	275	270	260	252	A ^o 240							
LQ									215	235	250	250	250	250	245	240	230							

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H^oF₂ (KM)

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H*F (KM)
135° E Mean Time (G.M.T. + 9h)

Statio KOKUBUNJI TOKYO Lat. 35° 42.4' N. Long. 139° 29.3' E Sweep 1 MHz to 20 MHz in 20sec 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	260	240	290	E A 330	A	255	E A 265	230	215	H 190	H 175	H 205	185	175	230	E A 240	220	220	235	A	A	E A 255	295	255
2	260	270	255	270	270	255	E S 280	235	240	215	225	220	195	H 275	E A 230	255	220	220	A	E A 330	E A 280	225	300	300
3	275	260	255	265	280	270	255	220	230	A 195	H 200	E A 225	225	225	230	A	A	A	255	260	230	235	270	290
4	E A 305	285	280	265	225	235	235	220	215	215	H 185	E A 255	A	A	A	A	A	E A 240	220	230	245	230	285	305
5	305	270	240	280	260	280	255	220	230	H 190	235	A	220	185	E A 230	230	230	210	A	A	A	E A 250	260	275
6	220	245	270	300	265	260	245	215	215	H 185	190	H 185	180	245	A	215	225	210	225	230	235	240	A	295
7	305	305	290	E A 320	260	240	E S 280	225	230	H 225	220	E A 265	A	A	A	A	230	205	235	205	230	250	230	230
8	240	285	E A 340	A	E A 280	E A 320	255	220	220	H 205	H 195	225	205	190	240	215	220	220	210	230	250	220	270	325
9	280	270	255	285	265	250	240	220	230	H 220	195	195	A	A	A	A	A	230	235	230	250	E A 300	E A 315	250
10	E A 335	A	270	270	265	240	255	235	220	H 205	250	H 190	225	225	A	A	200	215	230	220	260	270	245	245
11	240	E A 280	280	305	255	270	235	230	225	215	220	230	200	A	A	A	H 225	210	220	A	A	A	240	265
12	265	270	265	230	240	240	255	H 230	205	200	185	H 205	H 205	210	215	240	240	230	E A 300	270	250	215	E A 305	250
13	265	255	310	305	290	305	265	240	225	215	205	H 190	H 250	A	A	A	A	E A 235	230	A	230	240	270	275
14	295	280	285	270	250	220	225	220	215	210	200	175	225	E A 250	A	E A 245	A	210	A	245	215	225	A	265
15	270	280	275	305	255	250	255	220	210	H 190	210	H 195	A	A	A	A	A	205	210	270	E A 270	E A 300	A	E A 325
16	E A 325	285	275	275	270	285	235	215	215	H 190	H 185	245	250	180	A	A	A	E A 250	225	245	230	200	260	E A 300
17	250	E A 285	270	320	280	285	235	220	180	H 185	H 190	C	185	H 235	A	E A 235	A	220	205	230	220	290	300	290
18	280	265	290	280	235	225	255	225	200	H 175	240	H 195	240	E A 245	235	C	H 230	210	200	245	225	225	255	250
19	275	255	245	255	250	240	255	215	235	235	235	235	250	235	240	230	225	210	A	E A 250	E A 270	E A 260	A	E A 320
20	255	260	285	245	225	260	220	210	210	H 195	H 185	H 185	260	A	A	A	A	E A 240	A	E A 245	240	255	295	280
21	265	265	255	255	290	250	245	H 225	210	H 195	H 175	A	A	A	A	A	A	E A 240	240	260	270	240	230	220
22	300	280	300	285	215	230	235	H 210	195	180	200	A	A	A	A	225	A	E A 255	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	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
25	A	E A 335	285	255	255	265	225	H 205	190	175	A	250	E A 255	230	A	E A 245	230	A	A	E A 280	E A 270	235	E A 350	E A 360
26	A	310	285	275	250	230	230	H 200	190	A	200	200	205	A	A	230	225	215	C	255	E A 250	245	C	C
27	C	C	C	C	C	255	C	C	C	210	200	C	C	H 215	200	235	240	230	205	225	C	C	C	C
28	C	C	C	C	C	C	C	C	C	205	190	H 190	205	215	205	220	225	220	215	295	275	285	265	260
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	22	23	24	23	23	25	24	24	24	25	25	21	19	16	10	14	15	24	18	22	21	23	19	23
MED	268	270	276	272	258	252	244	220	215	200	200	200	212	220	230	227	225	215	224	238	240	235	265	268
UQ	290	282	286	294	269	268	255	228	228	215	220	225	238	236	235	E A 240	230	226	235	258	260	250	288	292
LQ	260	262	260	265	250	240	235	215	208	H 190	H 190	H 190	202	200	208	225	222	210	210	230	230	228	258	252

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H^oE (KM)

135° E Mean Time (G.M.T. + 9h)

Station **KOKUBUNJI TOKYO** Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 20 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	S	E A 125	A 110	A 120	E A 125	A	A	A	A	A	S						
2							S	S	115	110	110	115	110	110	115	110	120	S						
3							S	S	A	A	A	A	A	115	115	115	115	S						
4							S	S	A	E A 125	E A 115	E A 115	115	110	115	115	120	S						
5							S	S	A	A	110	110	110	A	A	A 120	110	S						
6							S	S	A	A 120	A	A	A	A	115	115	A	A	S				S	
7							S	S	115	110	105	115	115	110	A	E A 130	A	S						
8	S						S	S	A	A	A	A	A	A	A	A	A	S						
9							S	S	115	105	110	110	110	110	A	A	E A 120	S						
10							S	S	E A 125	110	A 120	105	110	110	110	110	110	S	S					
11							S	S	115	105	105	110	110	105	105	110	115	S						
12							S	S	A 125	E A 130	E A 120	105	110	110	110	110	110	S					S	
13		S					S	S	E A 130	A 120	A 120	110	110	110	105	110	110	S						
14							S	S	115	120	A 120	105	105	110	110	110	115	B						
15							S	S	115	105	105	110	110	110	110	105	115	S						
16							S	S	A 125	105	105	105	105	110	105	110	110	S						
17							S	S	E A 120	E A 130	A	C	115	115	110	110	115	S						
18							S	S	A 120	E A 115	110	105	110	110	115	C	115	S	S	S				
19							S	S	A 125	110	110	105	110	105	115	110	110	S						
20							S	S	125	E A 130	E A 125	A 130	A	110	110	110	110	B					S	
21		S	S		S	S	S	S	E S 120	115	105	105	A 120	A	E A 120	A	A	A	S					
22							S	A	A	A	A	A	A	A	A	A	A	S						
23							C	C	C	C	C	C	C	C	C	C	C	C	C					
24							C	C	C	C	C	C	C	C	C	C	C	C	C					
25							S	A	A	E A 120	E A 125	A	115	A	115	115	A	S						
26							S	E S 130	120	110	105	105	A	110	110	110	A	S						
27							C	C	C	E A 125	E A 125	C	C	110	110	110	115	S						
28							C	C	C	A	E A 125	E A 120	A	E A 125	A 120	E A 120	115	S						
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	17	21	20	19	16	21	19	19	19							
MED								E S 125	A 118	108	108	108	110	110	110	110	115							
UQ								126	A 122	E A 120	A 115	112	112	110	115	112	115							
LQ								122	115	110	105	105	110	110	110	110	110							

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H^oE (KM)

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IONOSPHERIC DATA

FEB. 1987

H^oES (KM)

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

Station **KOKUBUNJI TOKYO** Lat. 35 42.4 N, Long. 139 29.3 E Sweep 1 MHz to 20 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	S	130	115	110	110	110	S	110	G	105	105	110	105	105	105	120	115	110	105	105	105	100	100	
2	100	S	S	S	110	110	S	130	145	120	125	120	G	160	135	130	125	120	120	105	110	110	125	105	
3	110	110	110	105	110	S	S	110	105	110	105	105	160	155	135	120	115	110	110	105	110	S	S	S	
4	100	100	B	S	S	110	S	105	105	100	100	150	145	135	145	125	120	110	140	105	105	105	100	100	
5	105	105	110	105	S	110	110	150	155	110	E ₁₇₅ G	140	135	110	E ₁₇₀ G	155	140	125	115	120	110	105	105	110	
6	100	105	100	105	105	105	105	135	110	105	105	105	105	150	125	100	105	S	S	S	S	S	S	110	115
7	105	120	115	110	110	115	105	105	G	E ₁₇₅ G	E ₁₇₅ G	150	130	125	125	120	125	115	110	110	100	100	S	S	
8	S	110	110	105	105	105	105	105	110	110	105	105	110	110	110	110	105	105	105	105	100	105	100	120	
9	S	S	110	105	105	105	100	S	G	115	120	120	165	155	130	120	115	170	100	100	135	130	120	115	
10	110	110	S	110	115	110	105	105	110	G	E ₁₇₅ G	G	155	150	125	120	115	S	S	S	110	105	110	S	
11	S	115	120	105	105	110	105	145	125	135	130	130	140	125	115	115	G	140	S	105	105	105	105	105	
12	105	115	S	125	120	115	115	115	105	105	125	G	140	G	G	G	150	125	110	105	100	100	100	125	
13	110	110	S	105	125	S	S	S	105	105	105	G	155	130	120	115	115	105	105	105	105	105	105	105	
14	105	105	105	S	S	S	S	130	135	130	135	G	175	155	130	125	120	110	110	110	110	105	105	105	
15	105	100	105	105	110	105	105	105	G	G	G	G	140	135	120	115	110	110	120	105	105	105	105	105	
16	105	105	115	110	110	120	115	110	110	G	G	E ₁₇₅ G	130	G	135	125	120	110	110	110	105	105	105	105	
17	105	105	105	115	120	S	S	125	105	110	105	C	120	170	140	125	115	115	110	105	110	110	110	105	
18	105	105	120	S	S	S	120	S	105	105	155	160	150	150	130	C	125	110	S	S	110	105	105	105	
19	105	S	S	S	S	S	S	S	110	E ₁₈₀ G	170	150	160	150	140	130	120	115	110	105	105	105	105	105	
20	105	105	110	105	105	S	S	G	110	105	105	100	155	140	125	120	110	110	105	105	105	105	110	105	
21	105	105	105	105	S	S	S	G	120	120	G	150	135	130	130	130	120	110	110	105	105	105	100	105	
22	100	100	S	105	125	S	S	110	110	110	105	100	100	100	100	100	115	115	C	C	C	C	C	C	
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	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	105	C	C	C	
25	105	105	115	105	105	105	120	105	105	100	160	150	160	120	110	115	115	110	105	110	105	105	110	110	
26	110	115	105	105	105	S	S	G	120	110	110	110	110	110	110	115	110	110	C	105	105	105	C	C	
27	C	C	C	C	C	S	C	C	C	105	105	C	C	130	125	G	115	110	105	105	C	C	C	C	
28	C	C	C	C	C	C	C	C	C	105	105	105	100	100	100	105	115	110	110	110	105	105	105	105	
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	20	20	17	19	18	14	13	16	21	22	23	19	24	24	25	23	25	24	20	23	23	22	21	20	
MED	105	105	110	105	110	110	105	110	110	109	108	120	140	132	125	120	115	110	110	105	105	105	105	105	
UQ	105	110	115	110	115	110	115	130	120	115	U ₁₃₅	150	155	150	132	125	120	115	110	108	110	105	110	110	
LQ	105	105	105	105	105	105	105	105	105	105	105	105	115	115	115	115	115	110	105	105	105	105	105	105	

FEB. 1987

H^oES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

TYPES OF ES

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

Station **KOKUBUNJI TOKYO** Lat. **35 42.4 N**, Long. **139 29.3 E** Sweep 1 MHz to 20 MHz in 20 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			F3	FF61	F7	F2	L4		L2		L1	L1	L1	L2	L3	L3	CL33	CL14	F3	F4	F3	F5	F2	F2	
2	F2				F2	F3		C4	H2	C2	C2	C1		H2	HL21	H2	C3	C5	FF21	F3	F4	F1	FF21	F1	
3	F1	F2	F1	F2	F2		C1	L4	L4	LL22	LL21	L2	HL11	H1	H2	C3	C4	CL51	F2	F3	F1				
4	F2	F2			F1			L2	L3	L2	L1	HL21	HCL22	HC22	HC22	H2	CL31	CH31	FF11	F2	F1	F1	F1	F1	
5	F2	F1	F1	F2		F1	L2	HL42	HL23	L2	H2	H3	H1	L1	HLL12	HL22	H2	H2	F5	F2	F5	F3	F1	F1	
6	F2	F1	F2	F1	F2	F2	L2	HL41	L2	L2	L2	L1	L1	HL11	HL21	L2	L3					K1	F3	F2	
7	F1	F2	FF22	F3	FF22	FF22	L2	L2		H2	H2	H2	H2	H2	CL13	CL32	CL24	CL12	FF22	FF12	F2	F3			
8	K1	F2	F3	F4	F2	F3	L4	L1	L2	L2	L2	L2	L2	L2	L2	L2	LH21	L3	F1	F2	F2	F1	F1	FF11	
9			F1	F2	F2	F2	L4			C4	C2	C2	H1	H2	HL32	HL43	CL32	HL31	F2	F2	FF32	FF51	F6	F2	
10	F3	F3		F2	F4	F2	L3	L1	L3		HL21		H1	H1	H2	C2	C2		K1		F3	F2	F1		
11		F2	FF21	F2	F4	F1	L3	H4	H3	H2	H2	H2	H1	H2	C2	C3		H3	F1	F4	F4	F4	F2	F1	
12	F2	F1		F1	F1	F1	L2	L1	L2	L2	CL21		H2				H3	H6	F3	F5	F3	F2	F1	LK11	
13	F4	F2	K1	F6	F3				L3	L2	L1		H2	H2	C4	C4	C4	L7	F5	F5	F3	F3	F5	F4	
14	F4	F2	F2				H2		H2	CL32	CL22		H2	H2	H3	H3	C3	CL41	FF61	F3	F4	F3	F7	F2	
15	F2	F1	F2	FF11	F1	F1	L2	L2					H2	H2	C4	C4	C4	C3	F1	F7	F4	F6	F5	F4	
16	F4	F4	F5	F3	F2	F2	L1	L1	L3			H2	H1		H2	H2	C4	C5	F3	F3	F3	F2	F2	F2	
17	F5	F4	F2	FF22	F3		H2		L3	L3	L2		CL11	H1	H2	H2	C4	C5	F3	F3	F1	F2	F2	F2	
18	F2	F2	F1				L1		L2	L2	HL11	H1	H1	H1	H2		H2	C3		K1	F2	F2	F2	F2	
19	F3								L2	H2	H1	H2	H2	H1	HL22	H2	C3	C3	F4	F3	F2	F2	F4	F5	
20	F2	F4	F2	F2	F1				L2	L2	L2	L2	HL22	H2	H2	C3	C5	C5	F6	F3	F2	F2	LK21	F2	
21	F2	F2	LK21	LK21	K1	K1			C3	C1		HL22	HL22	HL22	HL22	HL22	CL31	CL41	FF31	F3	F2	F3	F2	F1	
22	F1	F2		F1	FF11		L3		L2	L2	L2	L3	L3	L2	L2	LC21	CL33	CL22							
23																									
24																					F3				
25	F3	F4	F1	F2	F6	F3	L1	L3	L3	L2	HL21	HL12	HC11	C1	C2	C2	L2	C3	F4	F3	F6	F4	F3	F3	
26	F5	FF11	F2	F2	F1				C2	C2	C1	C1	L1	C2	C3	C1	L2	L2		F4	F4	F2			
27										L1	L1			H1	C1		C4	C2	F6	F2					
28										L2	L2	L2	L3	L2	L1	L1	C2	C2	F2	F2	F2	F2	F2	F2	
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																									

FEB. 1987

TYPES OF ES

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

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 2sec 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	X	X	X	X	X	X	A	X										X	X	X	X	X	X	X	X
2	X	X	X	X	X	X	X	X											X	X	X	X	A	X	X
3	X	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	X
5	X	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	X
7	X	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	X
9	X	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	X
11	X	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	X
13	X	X	X	X	X	X	X	X		74	89								X	X	X	X	X	X	X
14	X	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	X
16	X	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	X
18	X	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	X
20	X	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	X
22	X	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	X
24	X	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	X
26	X	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	X
28	X	X	X	X	X	X	X	X											X	X	X	X	X	X	X
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	27	28	28	28	25	1	1	1									1	27	24	25	24	26	
MED	X	X	X	X	X	X	X	X		74	89								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	

FEB. 1987

FXI (0.1 MHz)

IONOSPHERIC DATA

FEB. 1987

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 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	27	29	27	F 25	S 28	31	A	30	54	61	66	66	73	H 78	85	R 85	75	53	51	35	36	S 42	H 37	S 36	
2	33	32	30	F 29	F 27	29	25	30	57	64	67	61	H 62	62	56	74	54	49	37	H 27	30	31	A	F	
3	F 27	F 30	29	27	25	24	23	30	49	51	67	63	63	58	63	53	53	46	33	23	31	32	30	30	
4	30	30	29	F	29	26	20	30	47	R 57	53	H 59	62	63	H 64	57	49	48	48	30	32	28	F	F	
5	F 25	F	28	27	28	24	24	28	J R 52	R 51	50	54	64	63	56	52	55	48	36	31	30	33	35	24	
6	28	25	25	25	26	24	25	36	53	53	63	49	51	61	58	60	53	45	39	36	30	25	24	25	
7	J S 26	27	26	29	29	29	24	30	49	50	56	58	60	57	52	52	54	60	43	38	32	26	25	33	
8	23	25	24	26	27	26	25	33	53	56	62	63	60	67	57	58	J R 61	49	53	H 30	31	32	29	28	
9	29	29	29	29	30	27	25	34	50	52	64	75	80	80	77	59	55	51	48	S 41	35	29	30	31	
10	29	31	26	28	F	28	25	42	46	52	63	H 70	60	51	J R 60	62	74	S 60	42	36	35	35	S 34		
11	30	26	29	30	F 34	29	26	36	S 61	61	62	69	67	60	75	70	59	62	45	32	29	32	28	28	
12	30	29	26	27	F 29	26	23	38	67	59	J A 54	59	74	J R 102	85	73	56	55	52	S 43	41	36	31	33	
13	35	31	29	28	29	30	S 32	47	F 64	F	80	82	76	70	71	73	69	52	R 60	40	30	32	27	29	
14	31	31	31	30	30	28	27	42	54	J R 63	64	63	67	76	74	74	57	60	52	34	39	A	A	25	
15	28	29	30	30	31	26	25	40	S 63	57	67	75	64	68	67	H 83	65	52	39	30	32	31	28	S 29	
16	J F 29	F 28	31	30	28	25	A	47	52	56	73	81	72	64	R 64	59	65	J R 62	47	35	U R 41	35	R 30	U R 29	
17	U R 33	29	32	F 28	F 31	30	F 25	39	60	79	73	R 74	72	R 73	65	59	J R 64	79	60	34	32	25	27	28	
18	29	F 31	29	30	32	24	24	39	49	56	63	84	72	69	74	71	R 63	53	46	33	A	36	F	33	
19	F 23	28	29	26	F 28	26	22	36	53	60	73	72	66	66	77	H 83	62	54	47	36	A	A	A	A	
20	31	31	30	29	30	F 27	28	41	51	52	62	71	73	79	86	U H 85	68	54	56	40	A	A	34	40	
21	32	34	27	29	29	34	23	40	R 63	R 91	R 61	R	70	68	63	61	53	55	59	54	54	F	F	F 25	
22	23	28	32	32	37	25	21	37	67	83	90	87	75	76	76	70	69	58	55	39	37	J S 40	36	39	
23	35	34	35	34	34	30	27	44	59	59	65	72	58	75	H 78	88	93	64	54	54	44	46	27	28	
24	28	30	30	31	30	30	30	48	77	68	73	83	83	73	70	63	62	60	67	43	37	39	31	31	
25	31	33	A	33	33	32	A	43	50	62	70	75	78	92	R 105	J R 95	85	58	57	43	46	39	A	26	
26	30	32	30	33	43	40	22	40	54	62	78	72	82	90	95	U R 93	89	64	66	33	30	34	27	30	
27	31	32	30	30	26	20	20	41	57	72	79	78	J R 100	132	137	96	80	81	73	A	A	35	33	A	
28	28	28	29	29	29	28	29	45	50	52	74	68	79	93	89	87	70	57	53	30	32	24	35	S 34	
29																									
30																									
31																									
CNT	28	27	27	27	27	28	25	28	28	27	28	27	28	28	28	28	28	28	28	27	24	24	21	24	
MED	29	30	29	29	29	28	25	39	54	59	66	71	71	70	72	70	62	55	52	35	32	32	30	30	
UQ	31	31	30	30	31	30	26	42	60	62	73	75	76	78	82	84	70	60	56	40	38	36	34	33	
LQ	28	28	28	28	28	26	23	34	50	52	62	63	62	63	63	59	55	52	44	32	30	30	27	28	

FEB. 1987

FOF2 (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

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 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										L	410	410	420	410	410	400	L								
2									L	L	L	410	420	420	420	A	L								
3									A	L	410	A	420	420	410	A	L								
4										L	L	A	U	L	A	L	L								
5										A	L	A	420	420	410	L	L								
6										L	L	L	420	420	420	390	L								
7										L	L	U	L	420	420	410	U	L	L						
8									L	L	400	420	410	410	L	400	L								
9									L	350	400	L	460	430	420	400	360	A							
10									L	L	L	440	420	430	420	400	L	L							
11									L	L	L	420	440	440	400	L	L	L							
12									L	L	A	400	490	L	430	L	H								
13									L	L	L	420	440	420	A	A	A	A							
14									L	L	410	L	A	A	A	A	L	L							
15									L	L	U	L	430	400	420	440	A	A	A	L					
16											430	430	430	A	A	A	L								
17									L	U	U	L	440	U	L	330	L	U	L	L					
18									L	U	L	410	430	L	U	A	430	U	L	L					
19									L	L	L	430	430	U	L	440	440	L	L	A					
20									L	U	U	L	440	440	440	420	420	U	L	L					
21									L	L	L	410	U	L	430	L	A	U	L	L					
22									L	L	U	L	440	A	450	440	A	L	L						
23										L	L	L	420	450	L	420	L								
24									L	L	L	440	440	L	A	A	A	L							
25									L	L	L	L	U	L	440	420	A	L	L						
26									L	L	L	U	440	450	450	A	A	A	A						
27									L	L	L	430	440	450	A	440	420	390	L	L					
28									L	U	L	430	A	U	440	U	440	L	A	L					
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									1	5	15	19	26	21	19	13	4								
MED									380	U	L	410	430	430	430	420	410	365							
UQ									380	430	440	440	440	430	410	380									
LQ									U	L	410	420	420	420	415	400	350								

FEB. 1987

FOF1 (0.01 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

FOE (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 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	A	A	295	300	305	295	270	A	A	S					
2								S	210	255	275	305	305	305	300	280	A	A	S					
3								S	A	A	A	A	A	A	A	A	A	A	S					
4								S	205	260	280	300	321	A	A	A	A	A	S					
5								S	200	A	A	A	A	A	A	A	260	215	S					
6								S	200	A	A	A	A	310	A	285	250	205	S					
7								S	180	240	280	305	310	305	300	285	A	A	S					
8								S	A	250	275	300	310	A	A	A	A	A	S					
9								S	205	250	290	300	305	305	300	290	250	A	S					
10								S	210	R	295	300	300	R	R	H	A	S	S					
11								S	210	260	300	305	310	305	305	290	250	205	S					
12								S	210	A	A	300	315	310	300	R	265	200	S					
13								S	210	260	280	R	305	R	300	280	250	200	S					
14								S	205	265	U R	U R	U R	305	300	R	255	A	S					
15								S	205	260	300	310	310	R	305	290	A	A	S					
16								S	205	260	280	300	315	315	305	290	255	215	S					
17								S	A	260	295	305	320	315	310	300	270	A	A					
18								S	220	270	R	310	315	315	310	300	260	210	A					
19								S	230	260	295	320	310	315	315	295	285	210	A					
20								S	220	260	R	A	A	325	310	300	A	220	A					
21								S	A	A	285	310	315	320	305	A	265	U A	A					
22								S	215	265	295	310	R	C	A	U A	A	A	A					
23								S	225	260	290	310	315	A	310	A	A	A	S					
24								S	195	A	A	A	A	A	A	A	A	A	S					
25								S	220	A	A	A	A	A	A	315	A	A	A	S				
26								S	235	A	A	A	A	A	A	A	A	A	S					
27								S	A	A	A	A	A	A	A	A	A	A	S					
28								S	A	A	A	A	A	A	A	A	A	A	S					
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									21	16	16	18	18	14	18	15	12	10						
MED									210	260	290	305	310	310	305	290	258	210						
UQ									220	260	295	310	315	315	310	295	265	215						
LQ									205	258	280	300	305	305	300	285	250	205						

FEB. 1987

FOE (0.01 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

FOES (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	E S 16	J A 22	J A 18	J A 24	J A 43	J A 80	J A 38	J A 30	J A 29	J A 41	J A 29	32	32	37	34	36	J A 31	J A 30	J A 18	J A 17	J A 50	J A 41	J A 33	J A 33	
2	J A 23	J A 29	J A 33	J A 21	J A 18	E S 16	E S 16	E S 16	G	G	G	33	36	33	G	43	27	J A 33	J A 33	J A 22	E S 16	J A 32	J A 41	J A 20	
3	E S 16	J A 19	E S 16	J A 17	J A 17	E S 16	E S 16	E S 16	39	33	36	J A 46	J A 47	37	J A 42	J A 41	J A 33	J A 30	J A 32	J A 27	J A 35	J A 17	J A 22	25	
4	E S 16	E S 16	E S 16	E S 16	J A 18	J A 19	J A 17	J A 20	G	30	37	40	38	41	J A 38	J A 39	32	30	J A 26	J A 21	E S 16	J A 25	J A 20	J A 34	
5	J A 20	J A 25	J A 17	J A 17	J A 18	J A 17	J A 19	J A 22	32	J A 35	J A 39	J A 44	J A 70	J A 48	J A 35	33	29	24	J A 24	J A 27	E S 16	E S 16	J A 26	J A 24	
6	J A 17	J A 18	J A 17	J A 18	E S 16	E S 16	E S 16	J A 17	31	29	30	33	36	41	36	G	G	G	E S 16	E S 16	J A 17	J A 16	E S 16	E S 16	
7	E S 16	J A 19	J A 26	J A 17	E S 16	E S 16	E S 16	E S 16	22	G	34	36	38	38	34	33	J A 35	J A 33	J A 33	J A 28	J A 21	J A 17	E S 16	E S 16	
8	J A 20	E S 16	J A 17	E S 16	E S 16	J A 16	J A 25	J A 22	J A 27	G	G	G	G	34	35	32	J A 30	J A 24	J A 22	J A 17	J A 21	J A 17	J A 18	J A 16	
9	E S 16	E S 16	J A 19	J A 35	J A 23	E S 16	J A 19	G	G	G	G	G	39	38	39	32	G	J A 26	J A 25	J A 23	J A 24	18	J A 24	J A 30	
10	J A 19	J A 28	E S 16	J A 16	E S 16	J A 18	E S 16	J A 29	G	G	34	35	G	38	35	31	28	22	J A 20	E S 16	J A 18	J A 22	E S 16	E S 16	
11	E S 16	E S 16	E S 16	E S 16	E S 16	22	J A 19	G	26	31	35	39	41	43	39	35	30	23	18	28	E S 16	E S 16	J A 30	J A 25	
12	J A 25	27	E S 16	E S 16	J A 26	J A 33	J A 50	J A 33	24	35	59	36	35	35	35	G	G	24	24	45	J A 29	31	J A 29	J A 20	
13	J A 18	E S 16	J A 17	E S 16	E S 16	E S 16	E S 16	G	G	29	31	G	G	37	56	72	J A 55	J A 51	J A 54	J A 37	J A 42	J A 34	J A 28	E S 16	
14	E S 16	E S 16	E S 16	J A 24	E S 16	J A 19	E S 16	G	22	31	21	G	G	49	45	45	41	32	J A 32	29	J A 35	J A 35	J A 32	J A 22	
15	J A 19	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	J A 21	G	G	20	36	36	40	J A 59	J A 68	45	26	22	J A 24	J A 21	J A 23	J A 30	
16	E S 16	18	18	23	J A 20	J A 50	J A 41	J A 25	24	G	38	39	41	45	48	47	35	37	40	27	39	24	J A 52	J A 21	
17	J A 19	E S 16	J A 22	E S 16	19	J A 21	21	23	J A 25	G	31	33	G	G	36	37	J A 35	J A 38	J A 53	J A 32	J A 21	J A 29	J A 32	J A 27	
18	J A 30	J A 20	J A 22	E S 16	E S 15	E S 16	E S 16	E S 16	G	G	35	32	34	43	34	34	34	24	21	J A 20	J A 62	J A 67	30	18	
19	17	21	E S 15	E S 16	20	17	E S 16	22	G	20	31	34	33	35	36	33	36	J A 39	J A 36	J A 30	J A 27	J A 40	J A 49	J A 65	J A 27
20	J A 27	J A 19	21	23	E S 16	21	J A 21	J A 20	J A 17	J A 25	G	21	36	41	39	35	36	J A 30	23	J A 31	J A 39	J A 64	84	J A 67	J A 20
21	J A 63	J A 51	J A 37	E S 16	17	21	J A 18	E S 16	23	29	31	34	39	35	J A 46	J A 35	34	26	37	36	32	47	J A 22	J A 19	
22	J A 19	J A 34	J A 34	21	J A 27	J A 19	J A 21	J A 25	J A 25	J A 24	31	35	J A 55	J A 48	J A 36	J A 43	J A 32	J A 29	J A 18	22	20	41	20	20	
23	J A 30	J A 31	J A 17	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	31	G	34	32	36	39	J A 39	J A 31	J A 18	J A 19	E S 16	J A 22	E S 16	J A 30	
24	J A 29	J A 25	J A 26	J A 17	J A 20	J A 20	J A 17	E S 16	24	33	36	38	J A 40	J A 62	82	45	J A 41	J A 30	J A 24	J A 18	J A 21	J A 22	J A 27	J A 31	
25	E S 16	J A 21	J A 45	J A 35	J A 46	J A 29	J A 28	J A 28	G	36	J A 43	37	39	41	40	J A 51	J A 33	26	J A 23	J A 66	J A 50	J A 31	J A 33	J A 27	
26	J A 52	J A 32	E S 16	J A 28	J A 37	J A 29	J A 26	E S 16	G	J A 32	J A 35	J A 34	J A 40	38	59	81	J A 62	J A 41	J A 42	33	30	40	J A 20	E S 16	
27	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	J A 20	25	31	34	36	37	J A 80	J A 52	38	37	28	J A 26	J A 39	J A 34	J A 24	J A 30	J A 30	
28	E S 16	J A 27	J A 26	J A 35	J A 62	E S 16	E S 16	E S 16	30	32	J A 36	J A 44	J A 33	J A 32	J A 33	J A 35	J A 62	J A 60	J A 40	J A 20	E S 16	E S 16	J A 21	J A 30	
29																									
30																									
31																									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	
MED	J A 18	J A 20	J A 17	17	18	18	17	16	22	29	34	35	38	38	36	36	J A 33	J A 30	J A 26	J A 27	J A 22	J A 24	J A 28	J A 23	
UQ	J A 26	J A 27	J A 24	J A 24	J A 22	J A 21	J A 21	J A 22	26	32	36	38	40	43	J A 46	J A 43	J A 38	J A 33	J A 33	J A 32	J A 37	J A 38	J A 32	J A 30	
LQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	30	32	34	36	35	34	30	24	J A 22	J A 20	18	18	J A 20	18	

FEB. 1987

FOES (0.1 MHz)

IONOSPHERIC DATA

FEB. 1937

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 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 16	E S 16	E S 16	E S 16	E S 16	E S 16	A A 33	21	21	26	29	32	32	37	34	34	28	28	17	E S 16	31	32	17	28	
2	25	24	21	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G	33	35	32	G	43	27	29	30	E S 16	E S 16	20	A A 41	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	39	32	35	43	40	36	38	39	32	23	30	19	E S 16	E S 16	E S 16	19	
4	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	30	35	40	37	41	36	37	30	30	E S 16	E S 16	E S 16	20	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	18	26	35	33	43	32	30	33	30	29	23	24	27	E S 16	E S 16	E S 16	20	
6	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	30	26	19	32	33	35	32	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	
7	E S 16	17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	G	34	35	37	37	33	32	33	25	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	
8	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	19	22	G	G	G	G	34	35	30	29	20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	
9	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G	G	G	39	38	39	30	G	20	17	19	12	E S 16	19	26	
10	18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	G	G	34	34	G	37	35	30	28	21	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	
11	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	25	30	34	37	41	43	36	35	29	23	18	E S 16	E S 16	E S 16	19	21	
12	21	18	E S 16	E S 16	E S 16	E S 16	E S 16	24	21	28	53	33	34	35	35	G	G	24	24	29	23	25	24	19	
13	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	29	31	G	G	37	55	70	55	50	53	20	E S 16	E S 16	E S 16	E S 16	
14	E S 16	E S 16	E S 16	E S 16	E S 16	19	E S 16	G	22	31	21	G	48	45	45	41	31	25	29	29	35	A A 35	A A 32	20	
15	19	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	J G 19	G 19	G 20	36	35	40	59	67	41	25	22	22	20	20	23	25	
16	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15	A A 41	22	24	G	37	37	40	44	44	46	34	37	40	25	36	21	20	E S 16	
17	17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	17	23	G	31	33	G	G	36	35	33	34	52	21	19	E S 16	E S 16	E S 16	
18	E S 16	E S 16	18	E S 16	E S 15	E S 15	E S 16	E S 16	G	G	34	32	34	42	33	34	33	24	21	20	A A 62	25	E S 16	E S 16	
19	E S 16	E S 15	E S 15	E S 16	E S 16	E S 16	E S 16	G	19	30	32	32	33	34	32	G	35	33	26	26	A A 40	A A 49	A A 65	A A 27	
20	19	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	19	21	35	41	37	35	35	28	G	23	32	A A 64	A A 84	E S 16	17	
21	24	21	23	E S 16	E S 16	E S 16	E S 16	E S 16	22	29	31	34	39	34	44	31	31	17	35	29	19	31	E S 16	E S 16	
22	E S 16	25	17	19	E S 16	E S 16	E S 16	E S 16	20	G	30	33	53	36	36	42	30	25	18	E S 16	E S 16	E S 16	E S 16	E S 16	
23	24	24	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	30	G	34	32	33	35	35	30	E S 16	E S 16	E S 16	18	E S 16	20	
24	21	23	24	E S 16	E S 16	E S 16	E S 16	E S 16	23	32	36	37	35	40	58	43	38	27	19	E S 16	18	E S 16	19	25	
25	E S 16	E S 16	A A 45	19	22	19	A A 28	26	G	35	39	36	36	39	39	47	26	25	22	23	26	22	A A 33	20	
26	20	25	E S 16	E S 16	22	26	E S 16	E S 16	G	30	34	34	36	36	44	58	45	39	39	19	E S 16	29	20	E S 16	
27	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	20	25	30	34	35	36	46	36	36	36	23	24	A A 39	A A 34	E S 16	24	A A 30	
28	E S 16	20	22	25	24	E S 16	E S 16	E S 16	29	32	35	43	33	32	33	35	52	26	39	E S 16	E S 16	E S 16	E S 16	E S 16	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	16	21	27	32	34	35	37	36	35	31	25	22	19	17	17	E S 16	16	
UQ	19	19	16	E S 16	E S 16	E S 16	E S 16	18	24	30	34	36	39	40	42	42	35	30	30	26	28	25	22	20	
LQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	25	32	33	34	33	30	30	28	23	17	E S 16	E S 16	E S 16	E S 16	E S 16	

FEB. 1937

FBES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

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

FEB. 1987

FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

M(3000)F2 (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 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	295	325	335	300	F	S	340	385	A	350	350	345	350	305	330	H	315	330	R	340	365	360	350	355	320	310	S	H	S	305			
2	350	330	350	345	F	335	345	300	350	360	360	380	335	330	H	355	355	380	360	355	350	315	300	370	A	F							
3	315	F	335	325	335	340	335	305	365	365	380	360	355	335	360	365	365	375	370	380	325	320	330	335	315								
4	335	335	310	F	360	325	350	350	360	R	350	365	H	340	365	330	360	365	355	375	350	345	355	F	F								
5	F	F	320	315	320	310	335	355	365	J	R	360	350	350	345	355	355	345	345	385	360	340	315	320	355	355							
6	355	320	300	300	305	310	320	360	395	360	375	335	325	350	345	350	360	375	360	345	365	340	335	320									
7	J	S	325	315	325	310	310	345	310	335	375	370	350	345	350	350	355	335	350	375	350	330	375	345	340	225							
8	370	320	335	325	335	325	360	350	340	355	360	340	335	335	360	335	J	R	360	355	385	300	H	320	345	325	305						
9	310	310	310	295	300	335	340	350	360	325	310	320	310	335	365	345	380	350	355	340	S	340	340	310	300	340							
10	310	355	305	305	F	305	320	370	380	325	350	330	350	335	H	330	365	340	355	S	335	315	330	345	340	S							
11	350	305	310	335	F	310	345	325	345	S	385	360	355	345	345	325	355	355	355	370	375	345	295	345	320	305							
12	335	310	305	315	F	345	305	325	355	390	370	R	315	295	R	340	355	365	365	355	S	335	355	335	305	305							
13	340	340	345	285	295	300	295	S	340	S	F	330	330	330	330	340	A	345	A	365	R	375	300	345	315	310							
14	305	305	320	315	335	340	335	380	360	R	360	350	R	335	340	335	350	350	360	365	325	335	A	A	320								
15	320	310	315	315	355	325	300	335	S	350	330	360	310	350	330	355	H	355	375	370	350	330	340	320	S								
16	J	F	305	F	320	335	320	320	A	370	405	330	350	345	345	345	R	360	345	J	R	360	380	330	U	R	315	315	R	U	R		
17	U	R	310	330	285	F	F	340	335	340	335	340	375	365	350	R	335	340	355	330	J	R	330	360	390	340	345	340	295	320			
18	295	305	F	310	300	345	355	335	360	365	365	340	350	345	325	335	345	350	R	365	370	320	A	345	F	350							
19	F	325	340	345	305	F	340	345	295	345	350	335	350	340	350	325	320	345	H	360	370	350	360	A	A	A	A						
20	340	320	315	325	350	F	335	375	390	360	365	330	330	320	310	320	U	H	325	345	360	365	350	A	A	295	335						
21	310	340	295	295	310	350	305	325	R	325	R	370	R	350	R	340	340	340	345	340	345	330	315	335	F	F	F	360					
22	305	285	310	330	350	360	310	335	335	335	325	355	345	350	340	340	345	355	355	355	335	295	J	S	275	305	320						
23	315	325	330	325	350	335	315	350	355	365	355	370	345	325	325	H	340	365	360	350	350	340	345	335	285								
24	320	300	300	340	315	315	315	345	375	365	340	350	355	340	355	325	345	340	365	370	325	325	345	340	320								
25	305	335	A	335	320	360	A	395	340	345	355	340	315	320	340	R	J	R	345	370	360	350	325	345	345	A	305						
26	300	330	335	305	335	375	295	360	370	345	360	390	365	315	320	U	R	320	340	360	385	350	350	350	315	300							
27	305	330	335	350	385	350	325	355	370	360	340	320	J	R	295	320	335	335	335	345	375	A	A	330	335	A							
28	285	285	295	295	310	285	310	375	350	335	335	390	355	320	320	340	365	370	375	315	295	290	315	340	S								
29																																	
30																																	
31																																	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
CNT	28	27	27	27	27	28	25	28	26	26	27	27	28	27	27	27	28	27	28	27	24	24	21	23									
MED	318	320	320	315	335	335	320	350	360	360	350	345	338	335	340	345	358	360	365	340	332	340	320	320									
UQ	335	332	332	332	345	348	335	362	375	365	360	352	345	350	355	350	365	370	375	350	345	345	335	338									
LQ	305	308	310	300	312	318	305	345	350	345	340	332	328	325	330	335	345	355	352	325	315	325	315	305									

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M(3000)F2 (0.01)

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IONOSPHERIC DATA

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

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M(3000)F1 (0.01)

IONOSPHERIC DATA

FEB. 1987

H^oF₂ (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 2 ¹ / 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											250	250	285	270	265	240	245	225							
2										240	250	240	270	260	270	275	235	250							
3										A	240	250	265	270	250	270	250	240							
4											250	250	255	275	270	260	250	240							
5											250	250	280	255	250	250	265	260							
6											255	240	270	280	275	280	250	240							
7											240	270	280	265	270	270	280	255							
8										250	255	250	275	270	280	255	280	250							
9											235	245	295	285	290	265	245	250	230	230					
10											210	U _L 280	270	280	255	280	285	275	240	230					
11											220	255	250	270	275	300	260	245	245	230					
12											210	230	A	255	320	255	250	245	240						
13											235	250	255	255	275	260	280	A E A 255	A						
14											215	240	245	260	270	275	270	250	240	230					
15											210	260	U _L 265	250	265	270	A	A 250	240	215					
16												260	245	250	265	255	255	250							
17											L 235	220	235	250	265	255	250	L 260	260						
18											210	245	285	260	255	280	275	260	255						
19											235	L 255	255	255	270	280	295	235	235	230					
20											210	230	285	280	275	310	270	255	245	225					
21											270	225	245	250	270	270	270	255	245						
22											250	240	255	245	260	260	270	255	250	225					
23												240	250	250	250	300	265	270	240						
24											230	230	265	265	255	260	255	270	255	250					
25											270	250	250	260	295	280	275	255	250	230					
26											240	250	250	275	280	280	260	275	240	230					
27											235	250	260	250	295	255	250	250	260	240					
28											225	245	280	270	320	280	270	260	250	235					
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										20	27	27	28	28	28	27	27	28	13						
MED										235	250	250	262	270	270	270	255	245	230						
UQ										240	250	265	275	278	280	272	262	251	230						
LQ										212	240	250	252	260	260	255	250	240	230						

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H^oF₂ (KM)

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IONOSPHERIC DATA

FEB. 1987

H^oF (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 2sec 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 295	S 250	S 250	E 290	E 250	200	A	255	225	190	220	200	195	250	245	250	230	210	200	195	E 325	E 315	A 250	E 325	
2		E 275	A 275	E 255	E 250	E 255	240	E 275	S 250	225	220	180	H 205	205	H 200	H 180	A	H 200	H 230	225	225	E 255	220	A	E 290	
3		E 270	S 250	S 240	S 250	S	E 250	E 290	230	A	A	E 230	A	A	E 240	A	A	A	230	E 270	E 290	E 275	S 240	E 270	E 280	
4		E 250	E 250	E 265	E 270	220	220	E 280	240	185	H 230	240	A	225	A	240	A	205	230	205	E 250	E 240	E 250	E 300	E 265	
5		E 270	S 270	S 250	S 270	E 250	E 270	E 250	E 240	230	A	220	A	195	H 195	A	220	225	230	220	225	E 275	E 270	E 270	220	230
6		225	E 250	E 290	E 300	E 270	E 280	E 270	220	215	205	190	220	215	A	225	215	195	H 180	H 210	220	215	225	E 255	E 290	
7		E 250	E 270	E 275	E 270	E 270	240	230	230	220	H 200	230	E 240	E 240	E 240	215	210	A	235	200	215	220	215	E 230	E 270	
8		E 245	E 290	E 265	E 275	E 270	E 260	230	E 240	225	205	215	200	200	190	220	180	230	220	205	205	E 265	E 230	E 260	E 270	
9		E 265	E 280	E 280	E 300	E 285	E 250	E 240	230	230	205	250	280	240	270	A	225	210	A	230	235	A	E 285	E 305	A	
10		E 285	235	E 240	E 300	E 295	E 265	E 260	225	205	245	245	220	210	235	225	230	230	230	200	215	S 260	S 250	S 235	230	
11		E 230	E 275	E 285	255	S 260	E 240	E 250	S 230	225	215	230	A	A	A	225	A	225	235	200	E 225	E 285	S 215	E 250	A	
12		E 290	E 260	E 285	E 280	E 250	E 285	E 295	240	220	210	A	200	220	300	225	210	H 210	H 230	220	E 250	A 230	E 250	A	E 280	
13		E 260	E 245	E 240	E 325	E 300	E 280	300	245	230	225	215	205	290	235	A	A	A	A	E 250	A 225	E 245	S 240	E 250	E 270	
14		E 280	E 275	270	E 275	E 255	E 255	E 255	210	210	220	200	245	A	A	A	A	220	230	215	A	A	A	A	E 300	
15		E 290	E 280	E 280	E 290	240	S 235	E 290	235	210	200	200	235	220	295	A	A	A	220	200	E 255	E 250	E 250	A	A	
16		285	295	260	250	245	E 230	A	215	200	200	A	225	A	A	A	A	A	235	225	A 255	E 290	E 250	E 280	E 255	
17		A 255	E 255	260	A 300	255	245	255	235	210	195	205	H 200	200	180	H 230	235	E 245	240	220	A 220	A 205	E 235	E 300	E 280	
18		E 300	E 300	270	E 275	235	210	E 250	210	200	H 185	H 230	195	H 200	H 215	H 215	A	215	245	E 245	220	210	E 275	A 255	E 285	230
19		E 250	E 250	235	E 270	255	205	E 290	220	200	H 225	225	210	200	200	190	230	A	A	220	230	A	A	A	A	
20		260	260	255	255	245	245	220	200	205	185	180	220	A	235	245	240	230	215	220	E 250	A	A	E 325	240	
21		E 300	A 255	E 340	E 275	E 290	220	E 280	240	210	200	210	210	A	240	A	220	230	230	245	255	255	245	205	E 230	
22		E 335	E 395	E 285	260	230	200	E 350	245	240	200	185	230	A	230	255	A	220	225	205	210	255	E 305	E 275	245	
23		E 300	E 290	E 265	E 250	240	E 250	E 270	230	190	H 180	H 205	200	190	180	230	E 240	A	225	220	215	225	230	220	A	
24		A	A	A	E 250	E 270	E 280	E 270	235	220	205	230	225	210	A	A	A	A	A	220	200	E 230	E 245	E 250	E 300	
25		E 300	E 250	A	E 250	E 275	E 240	A	200	200	H 245	A	240	230	E 240	A	A	225	220	220	E 240	E 290	225	A	A	
26		E 300	E 300	E 270	S	E 250	220	S	215	230	215	225	210	205	205	A	A	A	A	210	220	220	E 270	E 300	S	
27		E 280	E 245	E 250	E 245	220	E 250	E 280	235	220	220	205	210	190	H 210	A	A	230	A	A	210	A	E 230	E 270	A	
28		E 300	A	A	A	A	E 300	E 270	215	220	200	215	A	200	195	205	E 250	A	225	225	220	E 280	E 290	E 270	E 250	
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		27	26	25	26	26	28	24	28	27	26	25	23	21	19	17	16	17	22	28	26	23	25	22	20	
MED		E 280	E 265	E 265	E 270	E 255	E 248	E 270	230	220	205	215	210	205	U 220	225	228	222	228	216	216	E 255	E 245	E 265	E 270	
UQ		E 298	E 280	E 280	E 290	E 270	E 268	E 285	240	225	220	230	226	220	240	230	236	A 230	230	222	E 250	E 272	E 255	E 285	E 285	
LQ		E 258	E 250	242	E 250	U 232	222	E 250	218	205	200	205	202	200	200	215	218	210	220	205	215	220	225	E 250	236	

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H^oF (KM)

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IONOSPHERIC DATA

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H^oE (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 2 ¹ / 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	A	A	A	115	105		110	110	110		A	S						
2								S	120	115	110	105	110	110	110		A	A	A	S						
3								S	115	115	115	115	115	120	115	115	120	120		S						
4								S	130	A	115	115	115	115	115	115	115		A	S						
5								S	A	120	115	115	110	115	115	110	110	110		S						
6								S	120	115	105	110	110	105	110	110	110	120		S						
7								S	125	120	115	115	110	115	110	110		A	A	S						
8								S	A	115	115	110	115	110	115	110	115		A	S						
9								S	S	A	A	A	A	A	A	110	110		A	S						
10								S	S	110	115	110	105	110	110	110	110		S	S						
11								S	S	110	110	110	110	110	105	110	110		S	S						
12								S	S	A	A	110	110	110	110	110	115	115		S						
13								S	125	120	115	115	110	110	115	110		B	S	S						
14								S	S	A	A	110	110	110	110	115	115	115		S						
15								S	A	A	A	115	115	115	110	110	110		B	S						
16								S	120	105	105	105	105	105	105	110	110	115		S						
17								S	A	115	115	115	110	110	115	110	115	110		A						
18								S	E S 130	115	110	110	110	115	110	110	115	115		A						
19								S	E A 130	115	110	110	110	110	110	110	110	115		A						
20								S	115	105	A 110	110	110	110	110	110	115	115		A						
21								S	120	110	110	110	115	H 105	110	110	110	115		A						
22								S	A	A 130	115	A	C	110	110	115	115		A	A						
23								S	115	115	110	110	110	110	110	110	110	115		S						
24								S	120	110	105	105		A	A	A	A	A	A	S						
25								S	125	105	110	110	110	110	110	110	110	115		S						
26								S	125	115	110	110	110	110	110	110	110	115		S						
27								S	A	120	A	110	110	110	115	115	115	115		S						
28								S	115	110	110	110	110	110	110	115	115	115		S						
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									16	22	22	26	25	25	26	26	24	16								
MED									120	115	110	110	110	110	110	110	110	115								
UQ									125	115	115	115	110	110	115	110	115	115								
LQ									118	110	110	110	110	110	110	110	110	115								

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H^oE (KM)

IONOSPHERIC DATA

FEB. 1987

H^oES (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 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	110	105	105	105	105	110	105	105	100	100	150	150	175	145	120	120	110	110	105	100	100	105	105
2	105	105	100	105	110	S	S	S	G	G	G	160	140	150	G	135	140	100	100	100	S	100	100	120
3	S	105	S	110	105	S	S	S	115	120	120	115	120	120	120	115	120	120	115	110	110	110	105	100
4	S	S	S	S	120	120	120	105	G	175	170	140	140	130	120	115	120	165	105	110	S	130	100	105
5	100	100	105	110	105	105	100	100	140	120	115	115	115	110	115	170	170	150	100	105	S	S	120	105
6	105	100	100	120	S	S	S	160	130	120	120	120	120	130	130	G	G	G	S	S	105	105	S	S
7	S	100	100	100	S	S	S	S	160	G	175	150	130	130	130	125	105	100	105	100	100	105	S	S
8	100	S	115	S	S	105	105	100	100	G	G	G	G	125	130	120	120	105	105	105	105	105	100	100
9	S	S	110	110	110	S	105	G	G	105	105	110	150	180	145	160	G	100	100	100	100	S	125	120
10	120	120	S	110	S	110	S	100	G	G	170	170	G	160	150	145	110	110	110	S	105	100	S	S
11	S	S	S	S	S	105	110	G	130	130	130	120	120	120	120	120	120	160	130	110	S	S	105	100
12	100	100	S	S	120	120	110	110	135	110	105	120	130	120	130	G	G	185	145	110	105	100	100	105
13	100	S	110	S	S	S	S	G	G	135	135	G	G	160	130	120	120	115	110	110	110	110	110	S
14	S	S	S	125	S	115	S	G	145	130	110	G	145	140	130	120	125	110	150	130	105	110	105	110
15	105	S	S	S	S	S	S	S	G	105	105	110	180	175	140	120	115	110	115	110	110	110	105	105
16	S	140	135	115	120	105	110	105	165	G	140	135	130	125	120	115	145	130	110	110	110	105	105	105
17	105	S	105	S	125	120	120	115	110	G	E G	150	135	G	G	160	145	125	120	110	105	105	105	105
18	105	110	105	S	S	S	S	S	G	G	160	E G	E G	135	135	150	145	130	145	135	120	110	105	105
19	110	105	S	S	105	105	S	110	105	160	160	E G	E G	145	130	125	125	120	120	120	115	105	105	105
20	105	105	105	105	S	110	105	105	105	105	105	160	155	155	150	140	120	E G	150	110	105	105	110	110
21	105	105	105	S	120	105	105	S	120	115	135	160	140	145	120	125	175	115	105	105	105	105	125	100
22	100	105	105	105	120	105	105	105	105	105	145	125	115	120	115	110	115	110	115	110	110	110	105	105
23	100	100	105	S	S	S	S	S	G	G	135	G	130	125	140	115	110	110	110	105	S	100	S	100
24	100	100	100	105	100	100	105	S	120	110	110	105	105	100	100	100	105	105	110	115	100	110	100	100
25	S	100	100	100	105	100	100	100	G	160	120	155	120	120	120	115	115	115	110	105	105	100	100	100
26	105	105	S	110	100	100	100	S	G	120	120	120	120	120	115	110	110	105	105	100	105	100	100	S
27	S	S	S	S	S	S	S	S	100	120	120	120	120	120	120	125	120	115	115	105	100	100	100	105
28	S	105	100	100	100	S	S	S	110	110	110	105	110	115	120	120	110	115	110	110	S	S	120	105
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	17	19	18	16	16	17	15	14	19	20	26	24	24	27	27	26	25	27	27	26	22	24	24	23
MED	105	105	105	108	108	105	105	105	120	120	120	U	128	130	125	125	120	120	115	110	108	105	105	105
UQ	105	105	105	110	120	110	110	110	132	130	142	152	140	142	135	135	125	122	112	110	110	110	108	105
LQ	100	100	100	105	105	105	105	100	105	108	110	120	120	120	120	115	110	110	105	105	105	100	100	100

FEB. 1987

H^oES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

TYPES OF ES

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 ^{1/2} 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		F2	F2	F3	F3	F1	F7	L6	L4	L3	L1	HL11	HL11	HL22	H2	C3	C4	L7	L3	F1	F6	FF62	F4	F4	
2	F4	F3	F3	F2	F2							H2	H2	H2		HL24	HL13	L6	L4	F1		F4	F5	F2	
3		F2		F1	F2				C5	C6	C4	C5	C4	C3	C3	C4	C5	C7	C6	F3	F2	F1	F1	F2	
4					F1	F1	F2	L2		HL21	H3	H4	H2	HC23	C3	C4	C5	HL27	L1	F2		FF22	F3	F4	
5	F2	F2	F1	F1	F2	F4	F4	L6	HL62	C6	C2	C4	C4	C3	C1	HC33	H2	H2	L3	F5			F1	F5	
6	F2	F4	F4	F2				H2	H4	C3	C2	C1	C1	H3	C1						F2	F2			
7		F4	F2	F2					H4		H3	H2	H3	H3	H2	C3	L6	L5	L1	F2	F2	F2			
8	F3		F4			F1	F2	L3	L2					C2	C2	C3	C2	L3	L2	F2	F2	F1	F2	F1	
9			F6	F2	F2		F3			L1	L2	L2	HL21	HL21	HL31	H1		L6	L5	F4	F4	FF22	F1	F6	
10	F5	F1		F2		F1		L2			H2	H2		H2	H1	H1	C2	C3	C1		F2	F3			
11					F2	F1			C3	C2	C3	C4	C4	C3	C3	C4	C3	H2	H3	F6			F3	F5	
12	F3	F6			F3	F2	F5	L5	C1	L2	L4	C1	C2	C2	C2			HH41	H5	F4	F4	F3	F4	F2	
13	F2		F3						C1	C1				H1	H3	C5	C6	C7	C7	F3	F3	F3	F2		
14				F3		F3			H3	CL21	L2		H2	H2	H5	C4	C2	C6	H5	F6	F7	F3	F3	FF22	
15	F3								L2	L1	L1	H2	H1	H2	C4	C6	C7	C7	C7	F7	F6	F3	F5	F3	
16		F1	F1	F2	F1	F6	F7	L5	H3		H3	H2	H2	C2	C3	C6	H3	C6	L7	F8	F8	F4	F4	F1	
17	F3		F3		F1	F2	F2	C2	C6		H1	H1			H1	H3	C4	C6	L3	F2	F6	F2	F2	F2	
18	F2	F1	F4								H1	H1	H1	H2	H1	H2	H3	H2	C5	F3	F5	F3	F2	F1	
19	FF11	F2			F1	F1		C2	L4	H2	H1	H1	C1	C2	C1	CH12	C3	C6	C7	F3	F8	F7	F4	F8	
20	F4	F2	F2	F2		F1	F2	L1	L2	L3	L2	HC21	HC21	H2	H1	H1	C1	H1	L3	F5	F6	F4	F3	F3	
21	F3	F3	F3		F1	F1	F2		C5	C5	H2	H1	H2	H1	C3	C1	H2	LH21	L8	F5	F4	F3	FF11	F2	
22	F1	F8	F3	F3	F2	F1	F3	L2	LH52	L3	HL12	CL11	C4	C2	C3	C3	C1	L4	L2	F1	F1	F3	F1	F1	
23	F5	F4	F2								C2		C1	C1	H1	C3	C4	C5	C1	F1		F5		F2	
24	F4	F5	F3	F1	F2	F2	F2		C2	C4	C5	C3	L1	L3	L5	L4	L6	L6	C2	F1	F4	F2	F3	F2	
25		F1	F3	F2	F2	F3	F7	L8		HC32	C3	HC11	C2	C2	C2	C3	C1	C2	C4	F2	F3	F3	F4	F5	
26	F2	FF22		F2	F4	F6	F3			C1	C1	C1	C1	C2	C3	C4	C4	C7	C7	F2	F1	F2	F1		
27								L2	CL21	C1	CL21	C2	C2	C3	C2	C4	C3	C7	L8	F7	F4	F2	F5	F6	
28		F4	F6	F4	F4				C6	C4	C2	C4	C1	C1	C1	C3	C4	C2	C8	F3			F3	F2	
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																									

FEB. 1987

TYPES OF ES

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

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	X 29	X 30	X 31	X 30	X 35	X 35	A	A												X 54	X 48	X 46	X 40	X 37	
2	X 39	X 40	X 40	X 40	X 37	X 34	X 34	X 36												X 48	X 47	X 48	X 40	X 28	
3	32	33	X 34	X 34	X 28	X 27	28	X 34												A	A	A	A	42	
4	42	46	44	40	40	28	27	X 33												X 48	X 41	48	X 38	34	
5	X 34	X 35	X 34	X 33	X 35	33	X 34	X 37												X 46	S	X 41	X 43	X 34	
6	X 30	X 30	X 29	X 28	32	32	32	40												X 48	X 43	X 34	X 32	X 30	
7	31	32	33	33	X 37	X 35	X 30	X 34												U 70	X 58	X 38	X 37	X 33	
8	X 33	32	35	39	X 37	X 32	X 28	X 34												X 49	X 47	X 48	X 43	X 41	
9	X 38	X 37	X 37	X 36	X 36	X 34	X 34	X 37												X 67	X 56	X 47	X 44	X 45	
10	X 41	X 45	X 38	X 33	X 33	U 34	X 35	X 36												U 59	X 51	X 53	X 50	X 46	
11	X 34	X 34	X 31	X 35	X 37	X 25	X 29	X 38												A	X 33	X 36	X 39	X 42	
12	X 36	X 35	X 33	X 32	X 32	X 37	27	X 47												X 62	X 56	X 61	X 67	X 63	
13	X 60	X 53	X 48	X 39	X 38	40	40	43												A	A	X 43	A	A	
14	A	A	A	X 34	X 33	X 30	32	X 41												X 48	X 42	A	A	X 33	
15	X 34	X 34	X 34	X 34	X 38	X 30	X 25	X 38												A	A	A	A	A	
16	40	40	43	X 41	X 34	X 32	X 30													X 41	X 44	X 44	X 37	X 40	
17	X 42	X 41	X 35	X 32	X 36	40	30													U 48	X 53	X 43	U 42	X 39	
18	X 41	X 37	36	35	X 43	X 33	0 25	X 25												X 49	X 43	X 46	X 38	40	
19	45	U 38	X 36	X 31	X 26	X 28	X 26													X 47	X 37	X 41	X 43	47	
20	42	60	45	44	X 41	X 36	X 31													X 55	X 50	X 46	X 56	X 58	
21	X 48	U 41	X 40	X 34	35	36	X 28													X 66	X 64	73	65	A	
22	A	A	X 31	X 36	43	32	A													X 45	X 52	X 52	X 60	S 53	
23	X 46	X 38	X 36	X 36	38	35	A													X 112	X 110	X 89	X 50	X 40	
24	X 50	X 52	X 48	X 49	X 36	X 35	X 37													X 85	X 50	X 48	X 50	X 50	
25	X 44	X 39	X 43	X 36	42	29	29													X 77	X 81	X 68	X 53	X 44	
26	X 46	X 46	X 50	X 48	53	44	A													X 66	X 46	48	X 52	50	
27	X 54	X 53	X 52	X 54	44	30	X 25													X 58	X 48	X 46	X 43	X 42	
28	X 44	X 44	X 44	X 42	U 42	X 44	X 39													X 49	X 37	X 39	X 43	X 45	
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	26	26	27	28	28	28	24	14												24	24	25	24	25	
MED	X 41	X 38	X 36	X 36	X 37	X 33	X 30	X 37												X 52	X 48	X 46	X 43	X 42	
UQ	X 45	X 45	X 44	X 40	X 40	X 36	X 34	X 40												X 66	X 54	X 48	X 51	X 46	
LQ	X 34	X 34	X 34	X 35	X 34	X 30	X 28	X 34												X 48	X 43	X 43	X 40	X 37	

FEB. 1987

FXI (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

FOF2 (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	23	24	25	24	29	27	A	A	50	60	77	91	109	110	114	120	89	75	76	48	42	40	34	31				
2	33	34	34	34	31	28	28	30	59	67	65	74	80	94	104 ^R	107 ^R	84 ^H	71	60 ^R	42	41	42	34	22 ^S				
3	F	F	S	28	22	21	F	28	47	55	53	70	71	71	81 ^H	89	60	A	44	A	A	A	A	F				
4	F	F	F	F	F	F	F	S	27	48	55	68	75	84	80	82 ^R	90	60	50	51 ^R	42 ^S	35	F	32	F			
5	28	29	28	27	29	F	28	31	50 ^R	56	A	62 ^R	79	85	62	64 ^R	60	75	U	63 ^R	40 ^S	A	35	37	28			
6	S	24	24	S	F	F	F	F	45	57	57	52	55	61	74 ^R	71	64	54	44	42	37	28	26	24 ^S				
7	F	F	F	F	31	29	24	28	48	52	53	53	69	67	65	56	68	74 ^R	72	U	64 ^S	52 ^R	32	31	27			
8	27	F	F	F	S	26	22	28	49	59	69	70	80	70	82 ^R	73 ^R	71	76	64	43	S	41	37	35				
9	32	31	31	30	30	28	28	31	50	62	73	89	98	104	94	90	66	62	65	61	U	S	41	38	39			
10	35	39	32	27	27	U	S	F	30	48	52	63	75	76	58	57	78	95	84 ^R	78	U	S	45	47	44	40		
11	28	28	25	27	31	22	23	32	55	60	66	70	69	76	80	75	73	62	60	A	U	S	30	33	36			
12	30	29	27	26	S	S	F	37	61	54 ^R	56	75 ^R	94	114 ^R	141	117	88	70	66	56	S	F	61	57				
13	54	47	42	33	32	F	F	F	R	R	81	94	90	90	86	88	70	69 ^R	A	A	A	S	A	A				
14	A	A	A	28	27	24	F	35	51	67	62	66	71	78	101	90	84	72	55	42	36	A	A	27				
15	28	28	28	28	32	24	19	32	50	62	70	80	81	86	88	98	75	55	52	A	A	A	A	A				
16	F	F	F	35	28	26	24	35	52	56	67	81	82	70	A	62	62	79	60	35	38	38	31	34				
17	36	35	29	F	F	F	S	35	61 ^R	71	79	96 ^R	99	98	U	99 ^R	84 ^R	74	90	80	U	42	37	33				
18	35	31	F	F	37	27	19	32	55	61 ^R	62	77	98	U	97 ^R	125	U	124 ^R	U	92 ^R	54	43	37	40	32	F		
19	F	U	S	30	F	F	20	35	49	58	75	85	80	87	U	118 ^R	U	108 ^R	U	92 ^R	68	60	41	31	35	37	F	
20	F	F	F	F	35	30	25	37	48	52	59	75	99	117	140	142	J	120 ^R	U	102 ^R	65	49	S	44	40	50	U	52
21	S	U	S	S	F	F	U	S	R	87	64	56	70	85	88	75	65	57	54	60	58	F	F	A				
22	A	A	S	U	S	F	A	A	62	78	85	94	84	94	95 ^R	89	87	80 ^R	62	39	46	U	S	46	54	47		
23	40	32	30	30	F	F	A	R	R	61	67	80	79	70	96 ^R	114	134	U	104 ^R	U	S	104	U	S	83	44	34	
24	U	S	S	S	30	29	31	42	76	65	82	96	98	90	88	88	96	76	82	79	S	S	S	S	44	44		
25	38	33	37	30	F	F	F	34	55	64	64	81	95	114	134	144	131	124	93	71	U	S	62	47	38			
26	40	40	44	42	F	A	37	54	66	75	94	114	134	144	137	134	U	119 ^R	88	60	38	F	46	F				
27	48	47	46	48	38	24	19	38	61	71	87	105	126	U	120 ^R	126	130	113	114	98	52	42	40	37	36			
28	38	38	U	S	U	S	38	33	42	48	55	76	90	87	104	108	110	89	72	64	43	31	33	37	39			
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	20	20	21	22	21	19	16	24	28	28	27	28	28	28	27	28	28	27	27	24	24	21	23	20				
MED	35	32	30	29	31	27	24	34	52	60	67	78	83	88	95	90	84	75	64	46	42	40	37	36				
UQ	40	38	37	34	32	29	28	37	61	66	76	90	98	104	116	118	102	87	77	60	48	S	44	40				
LQ	28	29	28	27	28	25	21	30	48	56	62	70	78	74	82	76	67	68	58	42	37	35	34	30				

FEB. 1987

FOF2 (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1937

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										L	L	L	L	U	L	L																															
2										L	L	L	L	U	L	L																															
3										A	A	U	A	U	L	A	A																														
4										L	A	A	A	A	A	A	U	L	A	A																											
5										L	A	A	A	A	A	A	U	L	A	A																											
6										L	L	U	L	L	L	L																															
7										L	L	L	L	A	A	A	U	L	L																												
8										L	U	L	L	A	L	L	U	L	L																												
9										L	U	L	L	L	L	L	U	L	L																												
10										L	L	L	L	L	L	L	U	L	L																												
11										L	L	L	L	L	L	L	L	L	L																												
12										A	L	L	L	L	L	L	L	L	A																												
13										L	L	U	L	L	L	L	L	A	A	A																											
14										L	L	L	L	U	L	L	L	L	L																												
15										U	L	U	L	L	U	A	A	A	A																												
16										L	L	U	A	U	A	A	A	A	A																												
17										L	U	L	U	L	U	L	U	L	L																												
18										L	L	L	L	L	L	L	L	L	L																												
19										L	U	L	L	L	L	L	U	L	L																												
20										L	L	L	L	L	L	L	L	L	L																												
21										L	L	L	U	L	U	L	U	L	L																												
22										A	L	L	L	L	L	L	A	L	L																												
23										L	U	L	L	L	L	L	L	L	L																												
24										L	L	U	L	L	A	U	L	L	L	A																											
25										L	L	L	L	L	L	L	L	L	L																												
26										L	U	L	L	U	L	U	L	U	L	A	A																										
27										L	L	U	L	U	L	U	L	U	L	L																											
28										L	L	L	L	A	L	A	A	L	L																												
29																																															
30																																															
31																																															
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																							
CNT									1	3	15	26	26	24	21	21	12	1																													
MED									280	U	L	U	L	L	L	L	U	L	U	L																											
UQ									400	U	L	L	L	L	L	L	U	L	L																												
LQ									U	L	U	L	L	L	L	U	L	L	L																												

FEB. 1937

FOF1 (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

FOE (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									S	A	A	A	320	315	310	300	260	A	S					
2									S	255	290	310	320	R	315	305	290	270	A	S				
3									S	250	285	300	315	315	310		A	A	A	S				
4									200	250	290	U A	305	320	320	A	A	A	A	A				
5									A	R	R	A	A	A	A	A	A	A	A	S				
									250	290														
6									200	250	290	305	330	R	A	A	A	A	230	S				
7									190	250	A	305	320	315	A	A	U A	A	A	S				
																	300							
8									200	A	A	305	U A	A	A	320	A	A	A	S				
9									200	250	290	305	320	320	320	300	270	230	S					
10									S	R	290	310	320	U A	A	320	295	A	A	S				
11									R	265	295	310	320	320	305	295	265	220	S					
12									A	A	A	A	A	A	R	310	300	A	A	A				
13									R	R	295	305	315	320	315	300	270	A	A	A				
									195	255														
14									205	270	290	310	325	320	310	300	R	R	A	A				
																	275							
15									220	270	300	315	320	325	315	295	275	220	A					
16								S	220	260	A	315	325	320	315	295	A	220	A					
17								S	200	250	290	310	320	320	320	310	280	A	S					
18								S	205	R	300	315	320	320	320	310	A	A	A	S				
19								S	200	255	300	310	320	320	A	A	A	A	S					
20								S	205	255	300	310	330	R	325	A	A	A	S					
21								S	205	265	300	315	320	320	A	A	A	A	A					
22								A	A	A	A	315	325	R	A	A	A	A	A					
23								A	205	R	A	A	A	A	A	A	A	A	A					
										260														
24								A	A	A	A	A	A	A	A	A	U A	A	A	A				
																	280							
25								S	A	A	A	A	325	A	310	300	A	A	A					
26								S	A	A	A	A	A	A	A	A	A	A	A	S				
27								S	A	A	290	A	325	320	315	300	280	A	S					
28								S	A	260	290	310	325	A	A	300	A	A	S					
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									16	20	18	20	23	19	17	15	11	5						
MED									202	255	290	310	320	320	315	300	275	220						
UQ									205	260	300	312	325	320	320	300	280	230						
LQ									200	250	290	305	320	320	310	295	270	220						

FEB. 1987

FOE (0.01 MHz)

IONOSPHERIC DATA

FEB. 1987

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 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 16	E S 16	E S 16	18	E S 16	J A 18	J A 32	J A 86	J A 36	J A 34	J A 34	J A 34	G	G		J A 37	J A 34	J A 31	J A 36	J A 24	J A 34	J A 40	J A 30	J A 25	E S 16
2	E S 16	J A 17	J A 25	J A 18	J A 18	E S 16	E S 16	E S 16	J A 21	G	G	G	G	G	G	G	38	34	32	J A 23	J A 24	J A 22	J A 24	E S 16	E S 16
3	J A 25	J A 52	J A 22	E S 16	E S 16	20	E S 16	19	J A 22	J A 42	J A 53	J A 46	41	40	41	J A 76	J A 50	J A 77	J A 51	J A 33	J A 25	J A 33	J A 59	J A 34	
4	J A 30	J A 26	J A 27	J A 22	18	E S 16	19	18	24	30	34	J A 47	J A 47	J A 48	J A 47	J A 64	J A 44	J A 67	J A 37	J A 20	J A 29	E S 16	18	E S 16	
5	J A 20	J A 22	J A 22	J A 23	22	J A 22	E S 16	18	J A 22	33	J A 53	J A 56	41	40	39	J A 38	J A 44	J A 40	J A 47	J A 33	J A 35	J A 40	J A 25	19	
6	22	22	E S 16	20	22	21	22	18	28	32	36	38	41	J A 37	J A 36	J A 37	J A 31	G	J A 30	J A 35	22	J A 25	18	E S 16	
7	19	19	21	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	32	38	38	J A 47	J A 39	J A 33	33	J A 26	J A 25	J A 34	J A 25	21	26	22	
8	J A 21	22	E S 16	J A 25	23	E S 16	22	22	G	J A 32	J A 30	G	36	54	32	33	J A 24	J A 30	22	18	22	E S 16	20		
9	E S 16	J A 25	18	20	J A 21	J A 21	J A 26	20	22	G	J A 26	J A 28	G	37	34	G	G	G	E S 16	52	22	J A 25	22	J A 21	
10	22	18	J A 19	J A 22	E S 16	J A 40	19	E S 16	J A 22	J A 27	33	33	36	35	33	33	32	J A 30	J A 32	J A 24	J A 28	E S 16	E S 16	E S 16	
11	20	E S 16	E S 15	E S 16	E S 16	E S 15	J A 22	22	28	J A 33	J A 34	37	34	38	41	G	G	27	21	J A 42	J A 25	J A 22	J A 22	22	
12	J A 26	E S 16	E S 16	23	21	20	23	J A 20	J A 26	J A 75	J A 34	J A 38	J A 44	J A 39	34	G	J A 33	J A 40	J A 30	22	J A 28	J A 60	J A 33	J A 21	
13	E S 16	E S 16	22	21	J A 22	24	23	22	24	J A 30	J A 33	36	39	G	G	G	J A 42	J A 60	J A 88	J A 87	J A 84	J A 40	J A 35	J A 37	
14	J A 42	J A 32	J A 32	J A 30	J A 25	E S 16	E S 16	E S 16	G	G	G	G	40	40	42	J A 44	39	J A 34	J A 32	J A 22	22	J A 52	J A 42	J A 22	
15	J A 24	J A 21	E S 16	E S 16	E S 16	E S 16	E S 16	20	G	G	33	36	41	J A 45	J A 48	J A 56	J A 46	J A 44	J A 43	J A 37	J A 34	J A 60	J A 64	J A 53	
16	J A 25	J A 30	J A 21	J A 26	19	J A 25	J A 39	22	G	G	J A 65	44	J A 54	J A 52	J A 71	J A 52	J A 50	J A 40	J A 24	J A 22	J A 30	J A 34	J A 18	J A 22	
17	J A 25	E S 16	E S 16	E S 16	19	J A 20	E S 16	E S 16	G	G	G	G	G	G	G	35	32	J A 33	J A 36	J A 35	J A 67	J A 33	J A 30	J A 24	
18	J A 29	J A 25	J A 30	J A 35	J A 20	21	J A 22	E S 16	G	30	38	38	40	G	38	34	32	32	E S 16	E S 16	J A 21	E S 16	J A 22	J A 64	
19	J A 26	J A 21	E S 16	E S 16	E S 16	J A 30	J A 30	E S 16	30	32	32	G	G	38	J A 40	J A 54	J A 35	28	22	J A 18	J A 25	23	J A 22	J A 25	
20	J A 64	J A 52	J A 20	E S 16	18	E S 16	22	21	19	30	35	36	38	40	36	J A 40	J A 33	J A 27	J A 21	E S 16	J A 28	J A 20	23	22	
21	J A 84	J A 84	J A 32	J A 26	23	J A 30	23	J A 31	G	33	G	37	42	39	J A 44	J A 40	J A 60	J A 33	J A 21	E S 16	E S 16	E S 16	J A 41	J A 61	
22	J A 54	J A 28	J A 26	J A 65	J A 37	J A 38	J A 45	J A 51	J A 31	J A 30	J A 33	39	40	J A 48	J A 50	J A 57	J A 41	J A 42	J A 32	J A 22	J A 22	E S 16	J A 31	J A 28	
23	J A 22	J A 25	J A 26	J A 22	E S 16	J A 22	J A 52	22	G	G	J A 35	J A 34	J A 36	J A 54	J A 53	J A 55	J A 48	J A 35	J A 33	23	E S 16	E S 16	E S 16	J A 22	
24	E S 16	E S 16	E S 16	J A 21	J A 25	J A 21	J A 22	J A 26	J A 28	J A 32	J A 31	J A 37	J A 43	J A 65	J A 64	J A 42	J A 42	J A 48	J A 49	J A 26	J A 37	J A 36	J A 25	J A 22	
25	J A 25	E S 16	E S 16	E S 16	J A 36	J A 25	J A 25	J A 21	J A 25	32	37	40	41	J A 41	40	38	J A 37	J A 42	J A 63	J A 88	J A 84	J A 32	J A 25	J A 25	
26	J A 18	E S 16	J A 29	J A 30	J A 36	J A 31	J A 36	J A 25	J A 32	J A 33	J A 38	J A 54	J A 44	J A 54	J A 54	J A 54	J A 54	J A 65	J A 50	J A 75	J A 32	J A 41	J A 30	J A 60	
27	J A 28	J A 32	J A 26	E S 16	E S 16	E S 16	E S 16	E S 16	J A 25	J A 30	J A 34	37	39	G	43	41	J A 46	J A 36	40	J A 33	J A 22	J A 23	J A 25	J A 25	
28	J A 18	J A 17	J A 25	J A 24	J A 41	J A 24	J A 22	E S 16	25	29	35	40	J A 48	J A 47	44	J A 57	J A 88	J A 64	J A 26	E S 16	E S 16	E S 16	E S 16	E S 16	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	
MED	J A 23	J A 22	J A 21	21	20	J A 21	22	20	22	30	34	37	40	40	40	J A 39	J A 38	J A 36	J A 31	J A 25	J A 25	J A 24	J A 25	J A 22	
UQ	J A 27	J A 27	J A 26	J A 24	J A 23	J A 24	J A 26	22	J A 27	J A 32	J A 36	40	42	J A 48	J A 46	J A 54	J A 46	J A 43	J A 42	J A 34	J A 33	J A 35	J A 30	J A 26	
LQ	18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	32	34	36	36	35	34	32	J A 29	J A 24	22	J A 22	18	18	20	

FEB. 1987

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

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 2¹/₂ 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 16	E S 16	E S 16	E S 16	E S 16	E S 16	A A 32	A A 86	32	29	30	32	G	G	36	32	30	33	20	33	29	24	20	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	20	G	G	G	G	G	G	36	32	31	22	22	20	E S 16	E S 16	E S 16
3	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	41	49	43	40	40	41	57	37	A A 77	37	A A 33	A A 25	A A 33	A A 59	23
4	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	30	34	46	46	40	45	55	30	45	30	20	20	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	22	32	A A 53	39	36	38	38	38	30	40	42	30	A A 35	18	18	E S 16
6	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	25	30	36	38	37	37	33	30	29	G	30	22	19	20	E S 16	E S 16
7	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	32	38	38	46	38	32	33	26	20	25	E S 16	E S 16	E S 16	E S 16
8	E S 16	E S 16	E S 16	18	E S 16	E S 16	E S 16	E S 16	G	32	30	G	36	51	G	32	32	23	20	E S 16	E S 16	E S 16	E S 16	E S 16
9	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	17	G	G 26	G 28	G	37	34	G	G	G	E S 16	40	E S 16	22	E S 16	E S 16
10	E S 16	E S 16	E S 16	E S 16	E S 16	20	E S 16	E S 16	18	20	33	33	36	35	33	33	32	27	32	E S 16	25	E S 16	E S 16	E S 16
11	E S 16	E S 16	E S 15	E S 16	E S 16	E S 15	E S 15	E S 15	25	28	34	35	34	37	40	G	G	24	18	A A 42	E S 16	E S 16	E S 16	E S 16
12	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	E S 15	E S 16	22	42	31	35	41	39	33	G	30	40	30	22	24	46	24	E S 16
13	E S 16	E S 16	E S 16	E S 16	21	E S 16	E S 16	E S 15	24	28	32	34	36	G	G	G	42	58	A A 88	A A 87	A A 84	E S 16	A A 35	A A 37
14	A A 42	A A 32	A A 32	20	E S 16	E S 16	E S 16	E S 16	G	G	G	G	40	39	42	40	38	32	29	20	E S 16	A A 52	A A 42	21
15	20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	33	36	40	45	47	54	45	32	42	A A 37	A A 34	A A 60	A A 64	A A 53
16	24	18	E S 16	E S 16	E S 16	20	21	17	G	G	36	44	43	50	A A 71	49	45	38	22	20	26	33	E S 16	E S 16
17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G	G	G	G	G	35	32	28	22	23	E S 16	18	19	18
18	19	20	21	20	E S 16	E S 16	E S 16	E S 16	G	30	38	38	39	G	33	34	32	27	E S 16	E S 16	20	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	28	32	32	G	G	35	40	40	32	28	22	17	25	E S 16	E S 16	E S 16
20	25	18	E S 16	E S 16	E S 16	E S 16	E S 16	18	G 18	29	35	36	37	38	36	34	30	27	20	E S 16	24	18	21	E S 16
21	22	27	23	E S 15	E S 16	22	20	17	G	30	G	35	41	39	42	35	36	32	20	E S 16	E S 16	E S 16	33	A A 61
22	A A 54	A A 28	E S 16	E S 16	31	E S 15	A A 45	A A 51	30	29	32	38	37	42	42	56	31	29	20	20	13	E S 16	E S 16	20
23	17	17	E S 16	E S 16	E S 16	E S 16	A A 52	15	G	G	31	33	33	33	34	39	39	28	32	16	E S 15	E S 16	E S 16	E S 16
24	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	18	22	29	30	37	40	58	39	37	34	43	30	5	36	20	20	20
25	24	E S 16	E S 16	E S 16	29	E S 16	18	17	24	30	36	38	38	38	38	38	33	31	59	62	42	29	20	E S 16
26	E S 16	E S 16	E S 16	25	20	23	A A 36	20	24	32	32	36	36	36	40	39	40	38	40	31	27	E S 16	E S 16	25
27	25	27	19	E S 16	E S 16	E S 16	E S 16	E S 16	24	28	32	35	37	G	41	39	38	32	39	24	E S 16	20	22	21
28	E S 16	E S 16	22	E S 16	28	18	E S 16	E S 16	24	28	35	39	47	40	40	51	65	33	24	E S 16	E S 16	E S 16	E S 16	E S 16
29																								
30																								
31																								
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
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	22	29	32	36	37	38	38	36	32	32	26	22	20	17	E S 16	E S 16
UQ	21	18	E S 16	E S 16	E S 16	E S 16	17	17	24	30	35	38	40	40	41	40	38	38	34	32	26	23	22	20
LQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	30	32	35	34	34	32	30	27	20	16	E S 16	E S 16	E S 16	E S 16

The Radio Research Laboratory, Japan

FEB. 1987

FBES (0.1 MHz)

IONOSPHERIC DATA

FEB. 1987

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

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FMIN (0.1 MHz)

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IONOSPHERIC DATA

FEB. 1987

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 2 1/2 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	305	335	360	355	380	390	A	A	340	315	325	325	320	325	340	350	370	345	355	355	335	350	350	305			
2	335	350	340	350	355	320	320	335	355	360	340	335	345	345	310	345	350	350	350	380	330	335	380	295			
3	F	F	M	340	365	380	F	355	370	365	320	355	340	330	335	335	365	A	375	A	A	A	A	F			
4	F	F	F	F	F	F	F	S	350	365	365	315	320	335	325	305	350	360	350	360	365	345	F	F			
5	340	345	340	295	325	F	320	355	360	365	A	320	340	365	345	310	335	345	U	R	S	A	315	335	365		
6	S	365	S	S	F	F	F	F	355	350	350	355	325	325	335	340	360	360	365	355	S	350	S	310	S		
7	F	F	F	F	340	345	335	355	365	365	340	320	345	335	345	365	340	335	345	U	S	R	310	340	360		
8	335	F	F	F	S	345	320	340	345	340	335	305	300	300	340	340	340	360	360	360	305	310	S	325	330		
9	330	320	320	315	335	320	320	355	360	320	310	320	325	335	350	355	335	340	340	345	U	S	S	315	320		
10	315	335	360	315	335	U	S	F	350	365	340	335	335	320	315	325	340	355	335	360	U	S	310	320	340	350	
11	320	320	320	315	320	340	325	345	365	350	350	350	320	335	335	345	355	355	365	A	U	S	S	S	320		
12	315	325	295	325	345	S	S	F	350	360	360	310	295	305	315	335	340	365	365	365	320	340	F	320	315		
13	350	340	335	285	280	F	F	F	R	R	320	335	335	335	320	340	350	360	A	A	A	S	A	A			
14	A	A	A	355	335	375	F	385	350	360	345	340	340	320	335	350	350	360	380	355	335	A	A	335			
15	320	320	320	320	375	375	340	375	360	355	335	345	315	325	330	345	375	370	385	A	A	A	A	A			
16	F	F	F	340	320	345	355	355	365	355	345	365	360	340	A	345	340	365	375	355	330	330	320	340			
17	295	340	345	F	F	F	S	340	365	350	330	355	340	335	335	335	325	355	365	365	320	335	335	335			
18	315	320	F	F	295	360	370	345	365	360	345	310	345	U	R	320	U	R	320	325	350	350	310	325	345	F	
19	F	U	S	345	F	F	350	340	355	355	345	350	325	295	300	340	U	R	340	350	365	370	320	315	310	F	
20	F	F	F	F	355	365	360	365	355	345	340	300	325	305	320	325	U	R	335	360	355	305	320	285	290	U	S
21	S	U	S	340	S	F	F	A	320	R	345	375	375	325	320	335	340	325	345	360	340	325	355	F	F	A	
22	A	A	300	U	S	285	F	A	A	345	340	335	340	320	335	325	330	340	350	360	320	305	U	S	270	310	
23	335	330	300	335	F	F	A	355	R	360	360	335	335	340	300	310	330	345	350	U	R	U	S	330	295		
24	U	S	S	U	S	S	335	R	370	340	330	335	335	335	330	320	345	350	355	350	S	S	S	S	295		
25	290	335	350	335	F	F	F	350	355	350	330	315	310	315	315	330	335	355	360	330	U	S	340	310	300		
26	300	325	320	335	F	400	A	335	350	350	320	330	305	315	305	320	345	U	R	360	370	400	340	F	315	F	
27	310	320	325	335	395	355	370	355	350	340	320	325	295	310	310	340	325	360	380	375	355	S	325	325	305		
28	290	290	U	S	335	U	S	360	315	320	380	355	325	310	320	285	315	320	335	335	345	375	395	290	305	325	345
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	20	20	21	22	21	19	15	24	28	28	27	28	28	28	27	28	28	27	27	24	24	21	23	20			
MED	318	328	325	335	335	355	335	350	358	350	335	332	325	325	330	340	345	355	360	352	332	320	325	320			
UQ	335	340	345	340	355	370	355	355	365	360	342	342	340	335	335	345	355	360	368	365	345	330	338	338			
LQ	302	320	315	315	320	338	320	340	350	340	320	320	318	315	318	330	335	348	352	328	315	310	S	315	305		

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M(3000)F2 (0.01)

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IONOSPHERIC DATA

FEB. 1987

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 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										L	L	355	395	395	U L	420	355	375	L					
2									L	L	380	395	395	L	385	415	380	L	L					
3										A	A	A	A	395	A	A	L	A						
4										L	390	A	A	390	A	A	U L	A	A					
5										L	A	400	400	380	430	390	385	A	A					
6										L	L	U L	405	395	405	390	390	L	L					
7										L	L	L	395	405	A	405	390	385	L					
8									L	375	390	395	400	A	L	400	U L	L						
9									L	U L	400	405	405	395	395	405	390	U L	L					
10									L	L	380	395	400	405	400	390	U L	L						
11										L	380	385	395	395	380	380	L	L						
12										A	L	385	375	395	L	U L	L	A						
13										L	L	U L	375	L	385	L	L	A	A	A				
14										L	L	L	L	A	L	A	L	L						
15										U L	375	U L	370	L	395	A	A	A	A					
16										L	L	A	A	A	A	A	A	A						
17										L	U L	405	U L	385	400	410	395	395	U L	L				
18										L	L	395	395	385	395	380	400	L						
19										L	U L	390	395	405	410	380	390	U L	L					
20										L	L	405	385	400	395	380	400	L						
21									L	L	L	U L	385	L	375	A	U L	L						
22								A		L	U L	395	385	L	360	L	A	A	L	L				
23										L	U L	385	385	L	370	390	385	L	L	L				
24										L	L	U L	370	L	375	A	U L	L	L	A				
25									L	430	L	L	L	370	370	370	405	L	L	L				
26										L	U L	365	385	U L	380	U L	370	L	A	A	A	A		
27									L	L	U L	385	U L	370	380	L	A	A	A	A				
28									L	L	L	L	375	A	395	L	A	A	L					
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	3	15	24	22	23	16	18	10							
MED									430	U L	375	U L	385	390	395	395	385	U L						
UQ									388	U L	390	395	400	400	405	390	U L							
LQ									375	375	L	385	L	375	L	385	380	U L						

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M(3000)F1 (0.01)

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H^oF₂ (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 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											290	270	260	255	260	255	250	215						
2											255	245	270	255	260	250	250	240	215	235				
3											255	A	245	265	280	260	250	245	A					
4											260	280	280	265	260	275	255	240	A	230				
5											245	A	300	265	235	260	280	275	250	220				
6											260	260	260	320	300	260	250	240	225					
7											235	270	300	265	275	255	280	265	245					
8											250	275	270	260	250	A	250	255	250	230				
9											245	290	280	290	265	245	250	240	235	240				
10											230	240	290	260	245	255	310	275	240	235				
11											265	265	255	285	270	270	260	245	255					
12											235	305	305	300	290	255	245	225	230					
13											270	270	255	255	265	285	250	240	250	A				
14											220	250	240	260	270	300	260	255	250	240				
15											270	270	260	290	265	260	250	220						
16											250	265	250	250	250	A	270	275	245					
17											240	260	250	260	260	240	250	265	240					
18											240	260	290	260	280	260	250	240	230					
19											260	270	250	265	290	280	250	215	235					
20											250	260	260	280	300	275	260	240	215					
21											250	220	225	275	290	280	255	260	255					
22											A	255	265	255	280	265	275	250	245	230				
23											230	270	275	250	300	305	275	245	225					
24											230	240	270	265	250	250	250	280	250	230				
25											255	L	220	255	260	300	305	290	265	255	250	220		
26											260	290	275	300	290	280	255	245	225	210				
27											250	260	290	290	310	300	300	250	250	240				
28											225	L	255	310	280	330	290	275	260	250	250			
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							1	10	28	26	28	28	27	27	28	28	23	3						
MED							255	238	255	270	260	265	275	260	255	245	235	220						
UQ								250	260	280	285	290	290	275	260	250	242	225						
LQ								225	240	260	255	258	260	255	250	240	230	215						

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H^oF₂ (KM)

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IONOSPHERIC DATA

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H³F (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 2 ¹ / 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	295	250	250	255	220	200	A	A	250	240	210	200	200	195	A	225	215	225	210	210	265	240	225	300																														
2	270	240	245	220	205	270	250	250	215	210	200	200	190	195	200	A	240	210	200	200	250	240	200	S																														
3	270	260	250	240	240	250	295	235	220	A	A	A	A	A	A	A	A	A	210	A	A	A	A	300																														
4	260	255	255	250	200	210	S	240	235	240	A	A	A	A	A	A	205	A	A	210	A	225	200	S																														
5	260	250	250	270	240	260	S	260	210	230	230	A	A	200	A	210	A	A	A	240	A	250	240	230																														
6	230	255	S	265	E	S	S	270	210	230	240	A	A	A	210	215	215	210	200	200	220	A	250	S																														
7	250	270	260	250	235	240	S	240	220	220	210	220	A	A	A	235	200	A	230	210	210	200	230	245																														
8	260	S	S	270	250	240	E	S	270	250	210	220	A	210	200	H	210	A	200	H	210	225	225	S																														
9	240	265	265	E	S	280	260	250	250	240	230	210	215	190	190	H	A	215	210	200	200	215	A	250																														
10	255	240	215	E	S	260	S	240	230	210	210	210	225	210	230	220	200	215	215	225	220	200	E	260																														
11	245	245	S	S	280	240	215	S	230	225	215	205	205	205	215	A	200	230	220	200	A	250	S	270																														
12	255	250	280	255	260	225	280	230	220	A	200	220	A	200	A	245	220	A	220	220	210	A	265	240																														
13	220	220	230	255	A	295	290	250	240	215	200	205	215	200	215	200	A	A	A	A	A	240	A	A																														
14	A	A	A	250	250	250	250	200	200	200	200	200	A	A	A	A	A	A	205	220	215	A	A	A																														
15	300	300	290	300	235	210	S	230	200	200	225	210	A	A	A	A	A	A	230	215	A	A	A	A																														
16	320	310	265	225	250	295	A	210	220	215	A	A	A	A	A	A	A	A	205	205	270	A	225	250																														
17	270	230	230	S	250	225	240	240	215	200	200	190	190	190	200	A	220	220	225	210	200	215	230	250																														
18	260	A	A	A	220	210	250	S	240	240	230	A	230	220	A	200	H	A	220	220	220	210	205	230																														
19	250	240	220	250	230	230	E	S	260	220	225	230	215	205	205	200	A	A	A	220	215	190	A	260																														
20	A	275	S	230	230	210	S	240	215	210	200	220	210	220	200	225	A	220	220	210	200	210	A	290																														
21	230	A	250	S	S	A	A	255	245	225	220	205	A	225	A	225	230	220	220	225	210	230	240	A																														
22	A	A	S	295	240	200	A	A	230	230	215	230	220	A	A	A	215	230	200	220	255	240	270	265																														
23	235	250	270	S	250	240	245	A	230	220	200	200	205	205	200	200	A	A	225	205	200	200	195	200																														
24	270	255	270	220	250	290	290	240	220	200	190	A	A	A	A	240	250	A	220	200	240	270	260	260																														
25	315	275	235	225	245	270	220	190	195	180	240	225	215	210	200	A	A	A	215	A	225	230	220	275																														
26	290	270	265	275	225	195	A	240	235	225	200	200	195	200	A	A	A	A	A	200	235	270	250	315																														
27	280	270	250	230	195	250	S	225	215	210	195	210	195	190	A	A	A	A	210	200	205	245	260	295																														
28	300	300	295	265	A	250	250	200	195	175	250	250	A	A	A	A	A	A	215	195	S	305	270	240																														
29																																																						
30																																																						
31																																																						
CNT	25	24	22	26	26	27	18	26	28	26	25	22	17	16	12	13	16	16	24	22	22	22	24	23																														
MED	260	255	252	251	240	240	252	230	220	215	210	205	205	200	205	215	220	222	210	205	220	240	242	252																														
UQ	280	270	270	268	250	255	S	240	230	230	225	220	215	212	215	225	230	225	218	220	245	250	261	270																														
LQ	250	248	245	240	230	212	250	210	212	200	200	200	195	198	200	210	215	220	208	200	210	230	228	245																														

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H³F (KM)

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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 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	A	A	A	110	110	110	110	110	A	S						
2									S	110	110	110	110	105	105	105	110	A	S						
3									S	110	110	110	110	110	110	A	A	A	S						
4									110	110	110	A	110	110	110	110	110	A	A						
5									A	110	105	105	110	110	110	110	A	A	S						
6									110	110	110	110	110	A	A	A	A	110	S						
7									110	110	110	110	110	110	110	A	A	A	S						
8									110	A	A	110	A	110	110	110	A	A	S						
9									110	110	110	110	110	110	110	110	110	110	S						
10									S	110	110	110	110	A	110	110	110	A	S						
11									105	100	105	105	105	105	105	105	105	105	S						
12									A	A	A	A	A	A	105	105	105	A	A						
13									110	105	105	105	105	105	105	105	105	A	A						
14									110 ^B	110	110	110	110	110	110	110	110	A	A						
15									110 ^B	110	110	110	110	110	110	110	110	110	A						
16									S	110	110	A	110	110	110	110	105	110	A						
17									S	110	110	110	110	110	110	110	110	110	S						
18									S	110	110	110	110	110	110	110	110	110	S						
19									S	110	110	110	110	110	110	110	110	110	S						
20									S	110	110	110	110	110	110	110	110	110	S						
21									S	110	110	105	105	105	105	A	A	A	A	A					
22									A	A	A	A	105	105	105	A	A	A	A	A					
23									A	110	105	A	A	A	105	105	A	A	A	A					
24									A	A	A	A	A	A	A	A	A	105	A						
25									S	A	A	110	110	110	110	110	110	A	A						
26									S	A	A	110	110	A	110	110	A	A	A	S					
27									S	A	A	110	110	110	110	110	110	A	S						
28									S	110	110	110	110	110	110	110	A	A	S						
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									17	20	21	23	23	24	24	20	17	10							
MED									110	110	110	110	110	110	110	110	110	110							
UQ									110	110	110	110	110	110	110	110	110	110							
LQ									110	110	110	110	110	108	110	110	110	110							

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H*E (KM)

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IONOSPHERIC DATA

FEB. 1987

H^oES (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 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	S	S	110	S	110	100	100	100	100	100	150	G	G	150	160	115	110	110	100	100	100	100	S																									
2	S	100	105	100	100	S	S	S	115	G	G	G	G	G	G	150	115	110	100	100	145	125	S	S																									
3	105	105	100	S	S	100	S	100	115	110	110	110	110	115	110	110	110	110	105	105	105	105	100	100																									
4	110	110	110	110	110	S	110	110	130	160	160	135	135	125	120	115	115	110	110	105	105	S	110	S																									
5	100	100	100	100	100	105	S	100	100	120	115	115	115	115	115	115	110	110	110	110	110	110	110	105																									
6	110	110	S	110	110	110	110	110	160	155	150	140	130	110	110	110	110	G	100	100	100	100	100	S																									
7	100	110	110	S	S	S	S	S	G	G	125	155	145	120	120	110	165	110	110	105	105	100	110	105																									
8	100	100	S	110	110	S	110	110	G	100	100	G	150	125	G	120	110	110	110	110	100	100	S	100																									
9	S	105	110	110	110	110	110	110	G	105	105	G	E G 165	E G 165	E G 165	G	G	G	S	100	100	110	100	110																									
10	110	110	110	110	S	110	110	S	100	100	160	E G 165	150	150	E G 160	130	120	105	100	100	100	S	S	S																									
11	100	S	S	S	S	S	100	100	130	100	120	125	150	125	120	G	G	150	120	105	105	105	105	100																									
12	100	S	S	100	100	105	115	105	110	105	105	105	105	110	115	G	120	105	105	105	100	110	100	100																									
13	S	S	105	100	105	105	105	105	120	120	120	125	125	G	G	G	120	105	105	105	105	105	100	100																									
14	100	100	100	100	100	S	S	S	G	G	G	G	150	140	120	110	110	105	105	105	105	100	105	100																									
15	100	100	S	S	S	S	S	100	G	G	155	155	150	130	125	110	110	110	110	105	105	105	100	100																									
16	100	100	105	110	110	105	105	105	G	G	100	125	120	115	110	110	110	110	110	110	105	105	105	100																									
17	110	S	S	S	110	100	S	S	G	G	G	100	100	G	G	E G 165	135	120	110	110	110	110	110	105																									
18	110	110	110	110	110	110	110	S	G	125	120	120	G	G	145	135	120	120	S	S	110	S	110	110																									
19	110	110	S	S	S	110	110	S	135	135	E G 160	G	G	125	120	115	120	120	125	110	110	110	110	110																									
20	110	110	110	S	100	S	110	110	100	150	E G 160	E G 165	E G 165	135	E G 160	125	125	125	110	S	110	110	110	110																									
21	105	100	100	100	105	100	100	120	G	140	G	135	120	120	110	110	105	110	105	S	S	S	105	105																									
22	105	105	105	105	105	110	105	105	100	100	100	120	120	120	110	105	105	105	105	105	105	S	105	105																									
23	100	100	105	100	S	100	100	100	G	G	105	105	105	120	120	105	105	105	105	105	S	S	S	100																									
24	S	S	S	100	100	100	100	100	100	105	105	105	105	105	110	110	145	120	110	100	100	100	95	95																									
25	100	S	S	S	100	100	100	100	140	120	155	160	115	115	110	110	110	105	100	100	100	135	105	100																									
26	100	S	100	100	105	100	100	100	100	110	115	115	105	115	110	105	105	110	100	100	100	105	100	100																									
27	100	100	100	S	S	S	S	S	115	115	110	110	110	G	110	110	110	110	105	100	100	100	115	100																									
28	100	105	100	100	100	100	100	S	110	110	115	110	110	110	110	110	110	110	110	S	S	S	S	S																									
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	23	20	18	19	19	19	20	19	19	20	24	24	24	22	24	24	26	26	26	24	25	21	23	22																									
MED	100	105	105	100	105	105	105	105	110	112	114	120	120	120	114	110	110	110	108	105	105	105	105	100																									
UQ	110	110	110	110	110	110	110	110	125	130	137	140	144	125	121	120	120	110	110	105	105	110	110	105																									
LQ	100	100	100	100	100	100	100	100	100	102	105	110	110	115	110	110	110	105	105	100	100	100	100	100																									

FEB. 1987

H^oES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

FEB. 1987

TYPES OF ES

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			F2		F1	F5	F5		L4	L2	L2	HL11			H2	H1	C2	L7	LH12	F7	F4	F4	F2		
2		F2	F1	F1	F1				C2							H2	CL21	CL23	L4	F4	FF51	FF31			
3	F2	FF21	F2			F2		F2	C2	C4	C3	C3	C2	C2	C3	L3	L3	L3	L3	F7	F6	F5	F4	F5	
4	F2	F2	F2	F2	F1		F1	F1	C2	H1	H1	HL32	H3	C3	C3	C4	C3	L4	L4	F4	F4		F1		
5	F2	F2	F3	F2	F2	F2		F1	L2	C3	C2	C2	CL21	C3	C2	C3	L3	L5	L6	F7	F5	F3	F2	F2	
6	F1	F1		F1	F1	F1	F2	F1	HL31	H2	H2	H3	C1	L2	L1	L2	L2		L5	F4	F2	F2	F1		
7	F1	F1	F1								C1	H2	H2	C4	C3	L2	HL22	L1	L4	F4	F2	F2	F4	F3	
8	F2	F2		F3	F2	F2	F2		L4	L2			HL11	C3		C1	L3	L2	L2	F1	F1	F1		F1	
9		F3	F1	F2	F3	F3	F2	F1	L1		L1	L1		H2	HL11					F7	F2	F3	F2	F2	
10	F2	F1	F1	F2		F2	F1		L2	L2	H1	H1	HL11	HL11	H1	C1	C2	L3	L3	F2	F1				
11	F1					F4	F2		C3	LC21	C2	C2	H1	C2	C3			H2	C2	F4	F3	F2	F2	F3	
12	F2			F1	F1	F2	F1		L3	L5	L3	L2	L4	L2	C1		C2	L7	L7	F3	F5	FF54	F4	F1	
13			F4	F2	F5	F2	F3	F4	C2	C2	C2	C1	C1				C4	L4	L7	F4	F4	L3	F2	F7	
14	F5	F5	F4	F1	F2								H1	H1	C2	C3	C6	L5	L4	F4	F2	F4	FF21	F1	
15	F3	F2					F2				HL11	HL11	H2	H3	C4	C4	C5	C3	L4	F7	F6	F7	F5	F7	
16	F8	F4	F2	F3	F3	F5	F3	L5			L2	H2	C2	C2	C4	C3	C5	C5	L3	F4	F7	F6	F4	F3	
17	F3				F2	F2						L1	L1			H1	H2	C2	L2	F3	F1	F2	F2	F2	
18	F2	F2	F2	F2	F1	F1	F2			C2	C2	C2	C2		H2	H1	C2	C2			F2		F3	F2	
19	F2	F2				F1	F2		HL21	H2	H1			C1	C2	C2	C2	C2	C3	F4	F7	F3	F2	F2	
20	F4	F4	F3		F1		F2	L1	L1	H1	H2	H1	H1	H1	H1	C1	C1	C2	L1		F7	F6	F3	F1	
21	F4	F4	F3	F2	F2	F4	F4	CL22		H2		C1	C3	C2	L3	L2	L3	L3	L5				F4	F5	
22	F7	F7	F7	F6	F4	F3	F4	L7	L4	L2	L2	C2	C1	C3	L3	L5	L2	L4	L3	F3	F3		F2	F4	
23	F3	F4	F2	F3		F2	F7	L2			L2	L1	L1	C1	C1	L4	L5	L3	L7	F1				F2	
24				F1	F3	F1	F2	L6	L3	L4	L3	L3	L3	L4	L3	L2	HL22	C6	L4	F8	F6	F4	F3	F2	
25	F2				F5	F2	F4	L1	HL13	CL21	HC21	HC11	C1	C2	C2	C3	C3	L2	L4	F6	F4	FF11	F1	F3	
26	F2		F2	F4	FF32	F2	F4	L2	L3	L3	CL21	C2	L1	CL12	CL22	L3	L4	L4	L6	F4	F2	F2	F3	F3	
27	F2	F3	F3						CL11	CL11	CL22	C2	C3		C3	C3	C4	L5	L6	F3	F5	F2	FF41	F3	
28	F2	F2	F4	F3	F3	F2	F3		C2	C2	C1	C3	C3	C2	C3	C4	L6	L3	L3						
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																									

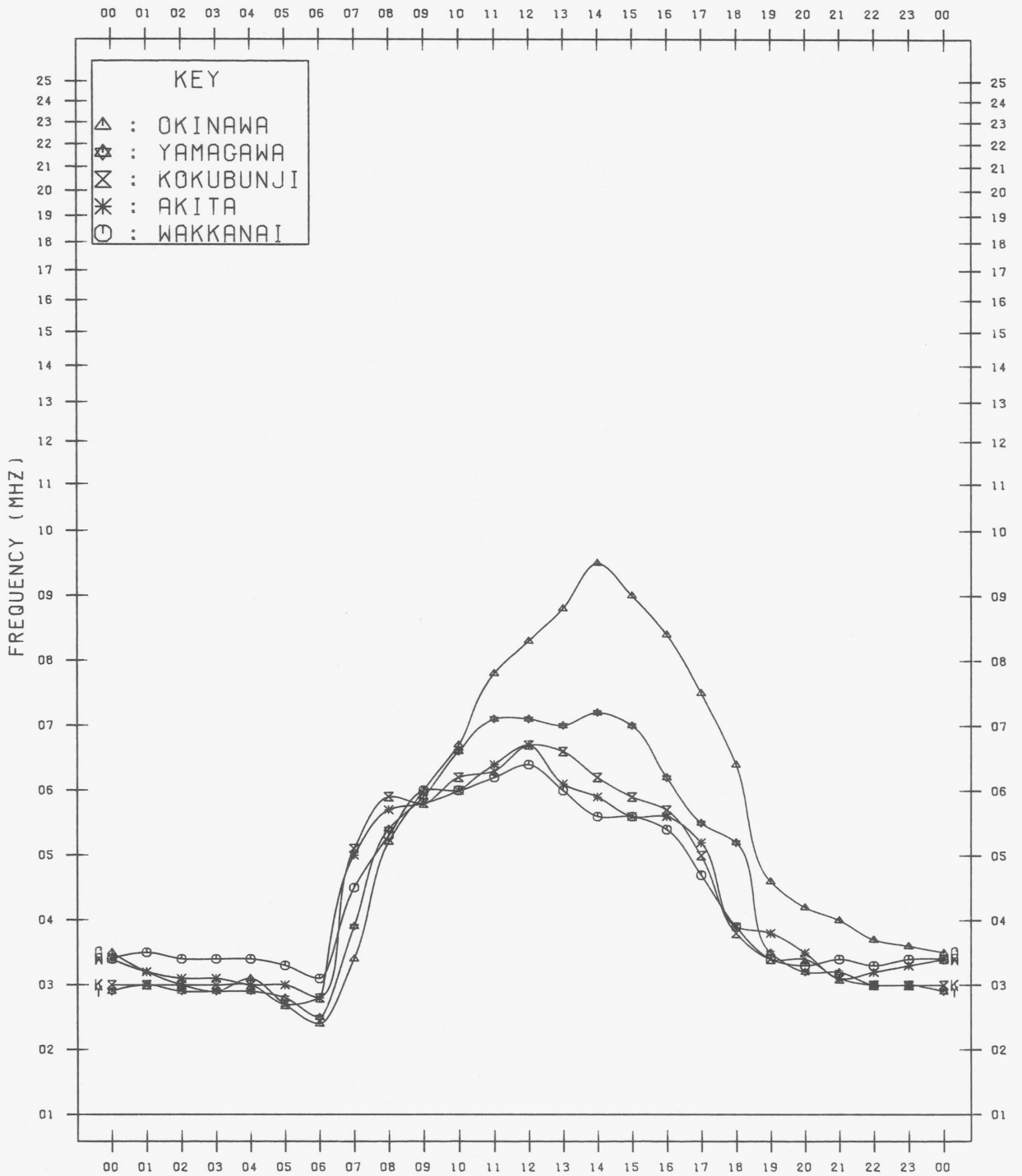
FEB. 1987

TYPES OF ES

MONTHLY MEDIAN VALUES OF FOF2

135°E MEAN TIME

FEB. 1987



f-PLOTS OF IONOSPHERIC DATA

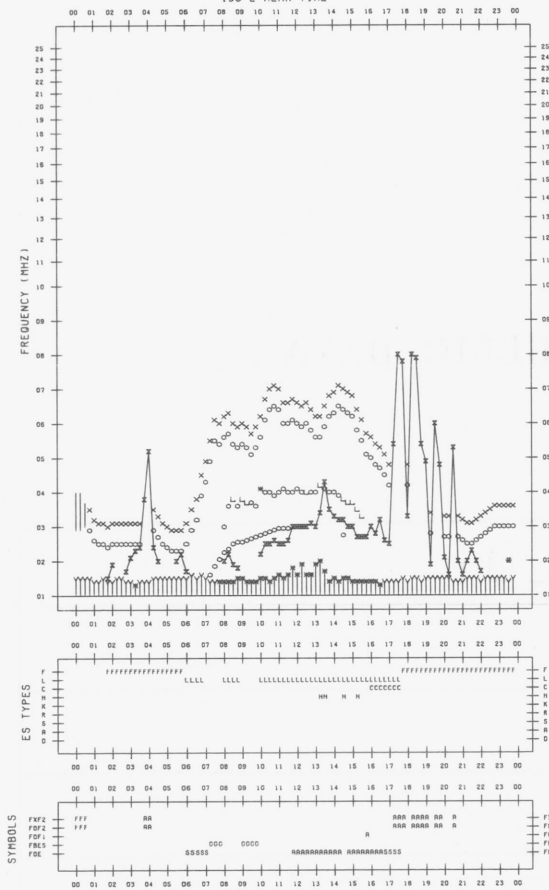
KEY OF F-PLOT	
I	SPREAD
○	F ₀ F ₂ , F ₀ F ₁ , F ₀ E
×	F _X F ₂
*	DOUBTFUL F ₀ F ₂ , F ₀ F ₁ , F ₀ E
⊗	FBES
L	ESTIMATED F ₀ F ₁
*.Y	F _{MIN}
^	GREATER THAN
v	LESS THAN

F-PLOT DATA

SCALER : S-HIIDOME

STATION : KOKUBUNJI TOKYO
135°E MEAN TIME

DATE : 1987/ 2/ 1

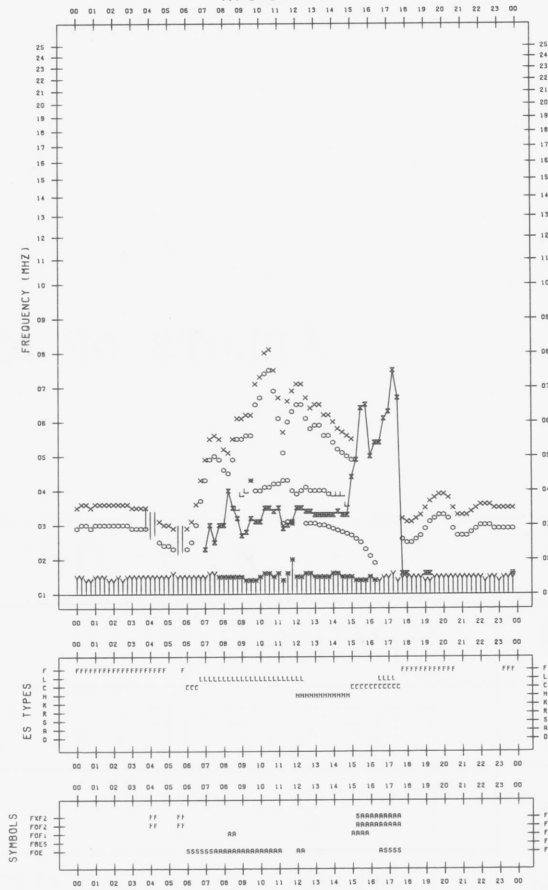


F-PLOT DATA

SCALER : S-HIIDOME

STATION : KOKUBUNJI TOKYO
135°E MEAN TIME

DATE : 1987/ 2/ 3

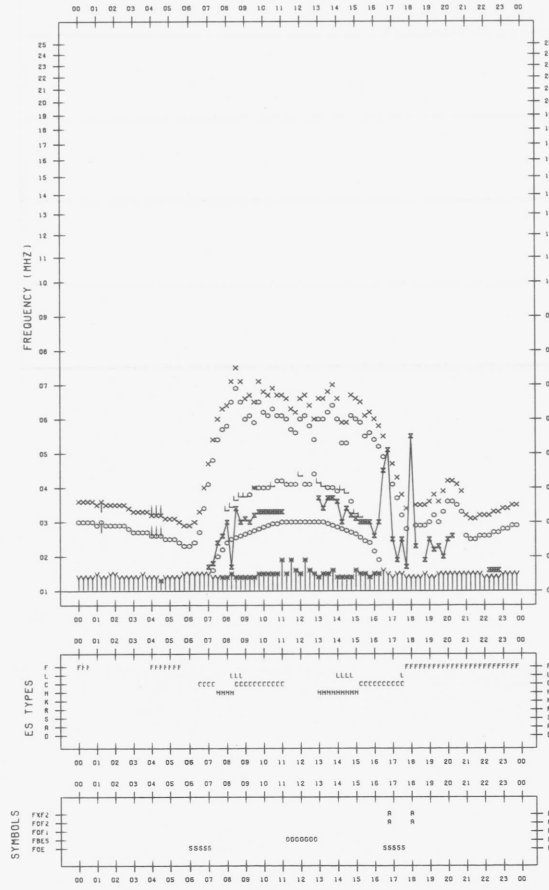


F-PLOT DATA

SCALER : S-HIIDOME

STATION : KOKUBUNJI TOKYO
135°E MEAN TIME

DATE : 1987/ 2/ 2

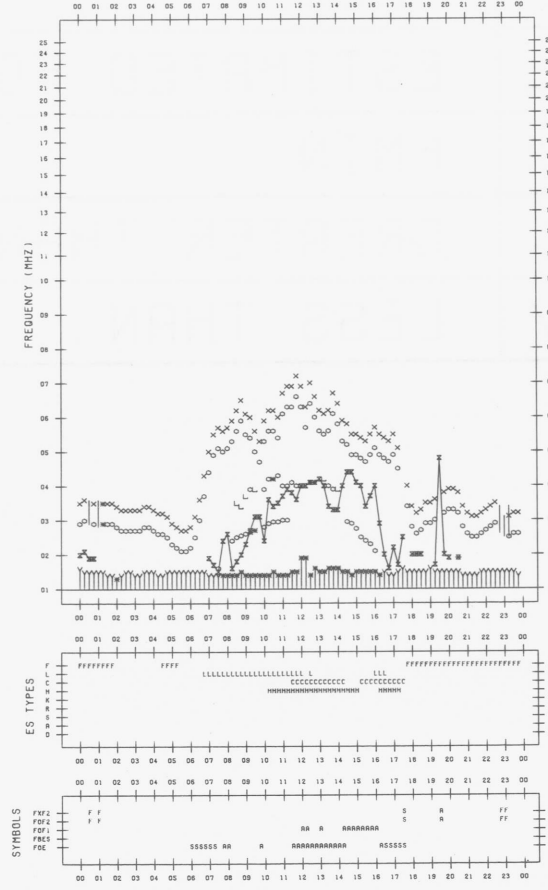


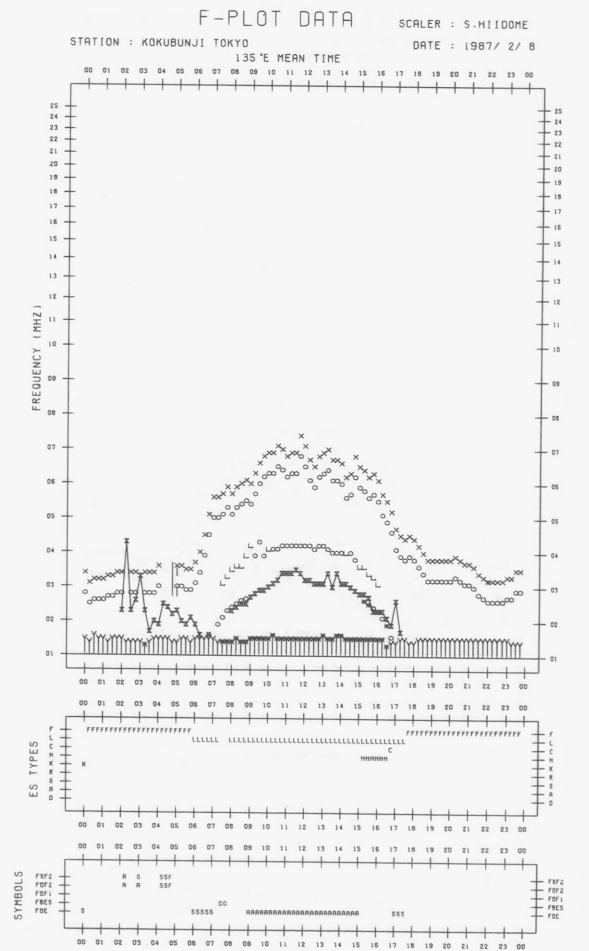
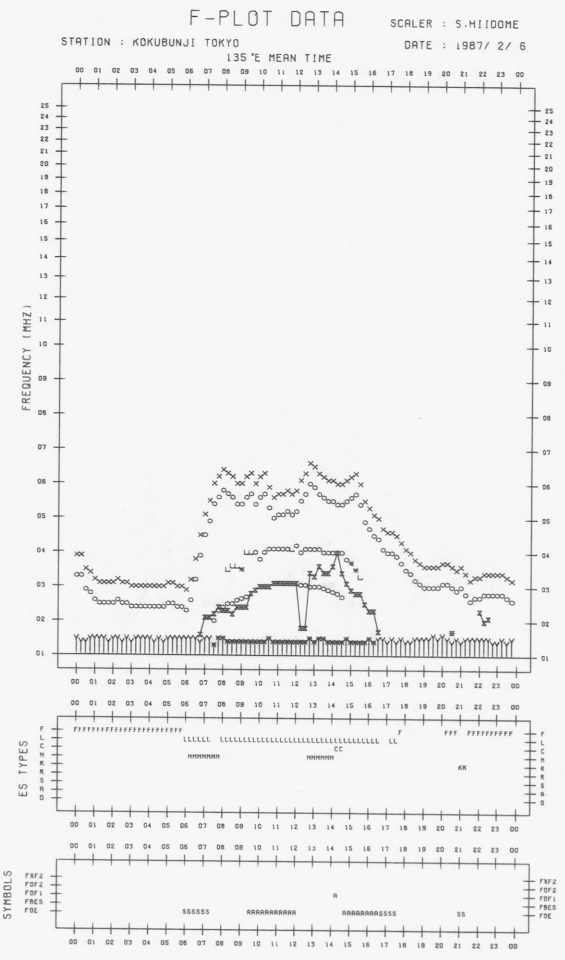
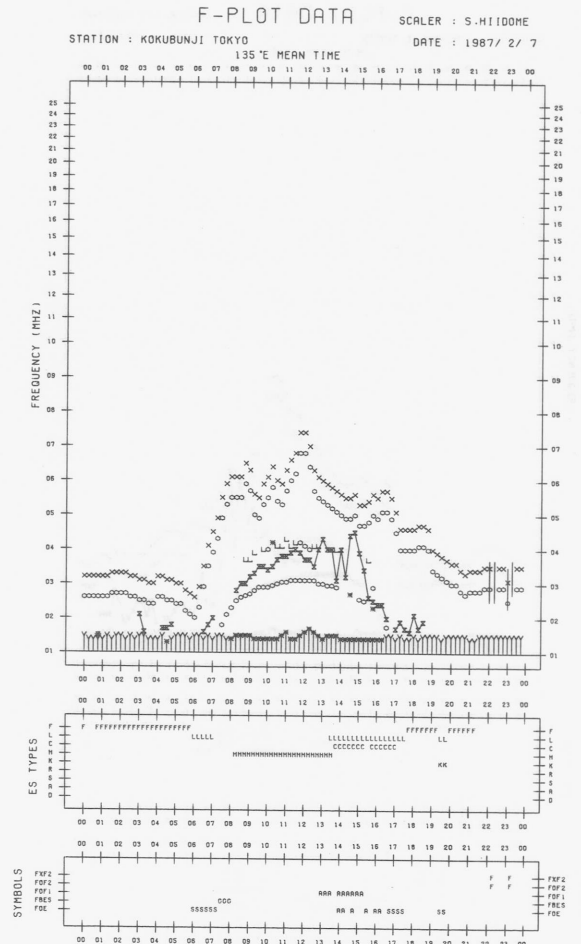
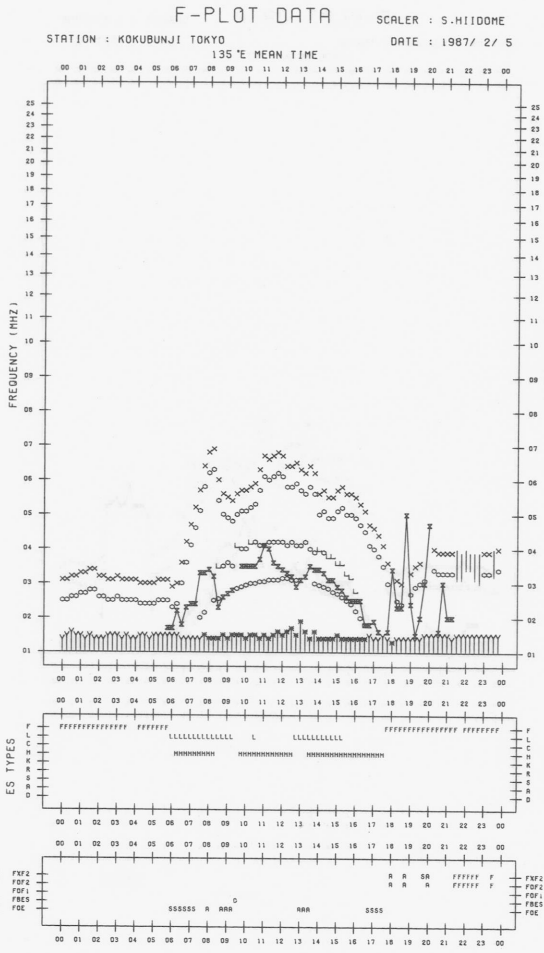
F-PLOT DATA

SCALER : S-HIIDOME

STATION : KOKUBUNJI TOKYO
135°E MEAN TIME

DATE : 1987/ 2/ 4





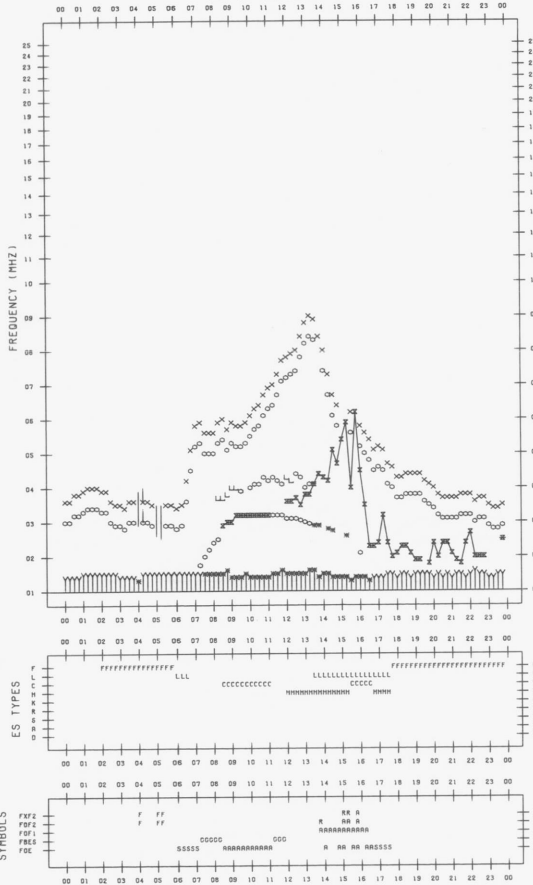
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 2/ 9

135°E MEAN TIME



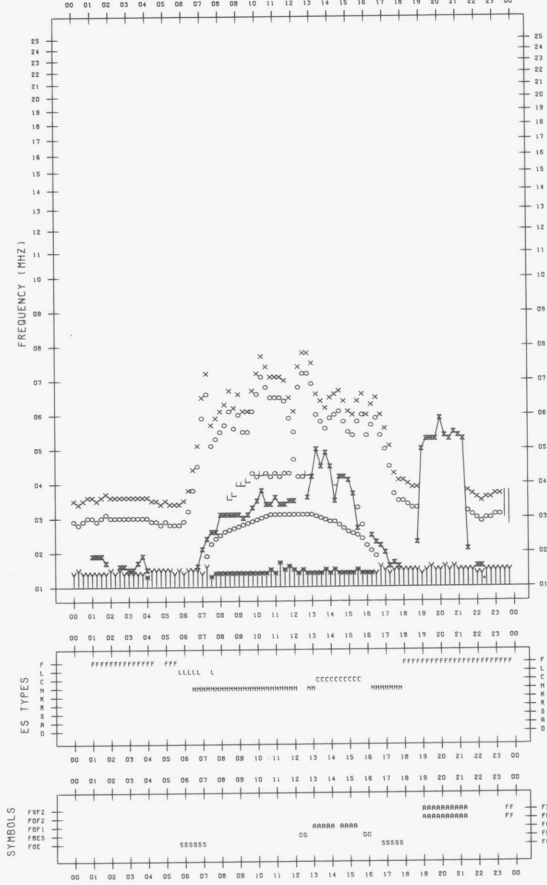
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 2/11

135°E MEAN TIME



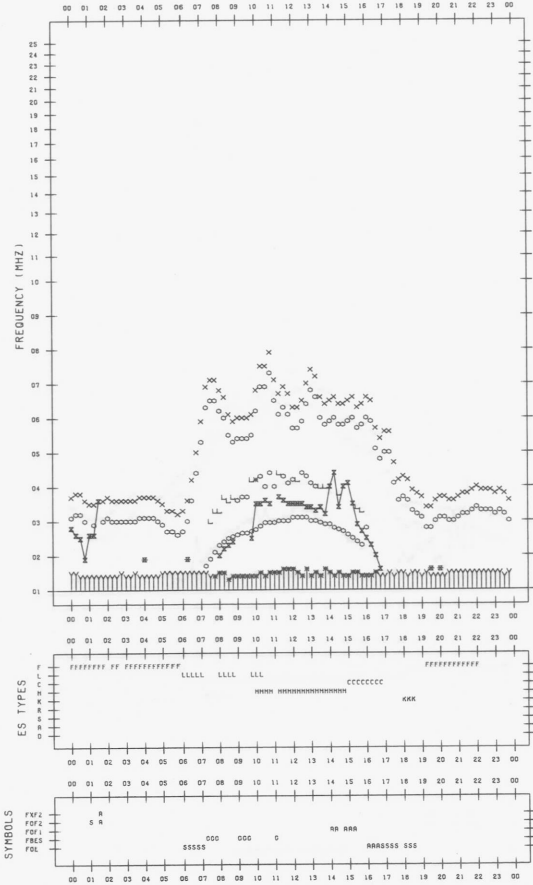
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 2/10

135°E MEAN TIME



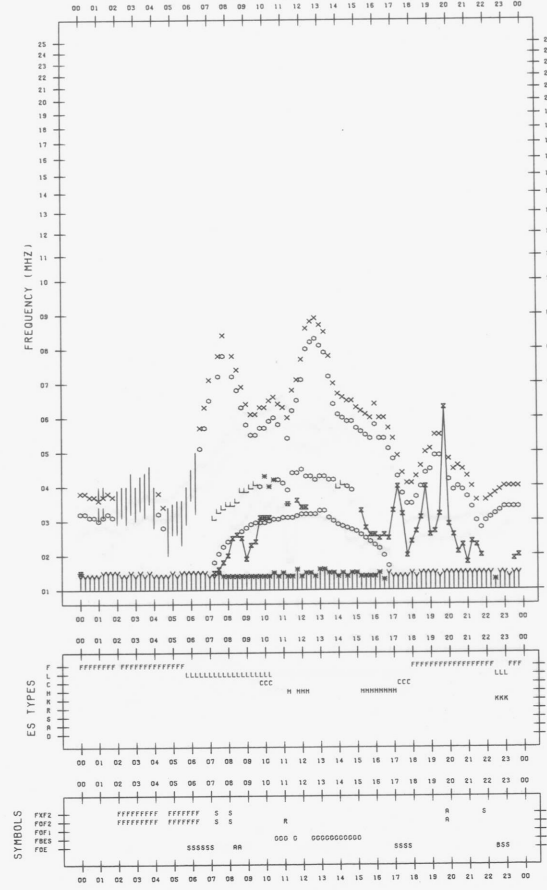
F-PLOT DATA

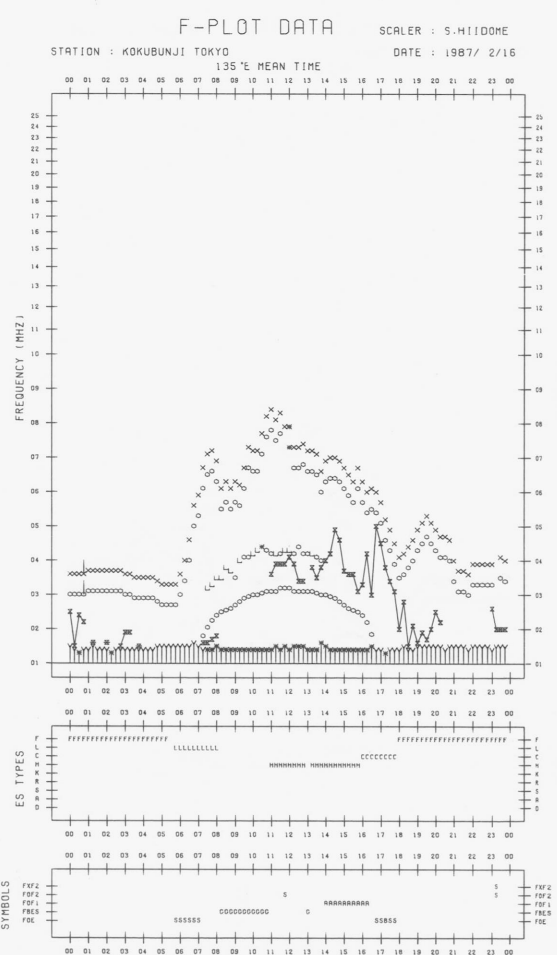
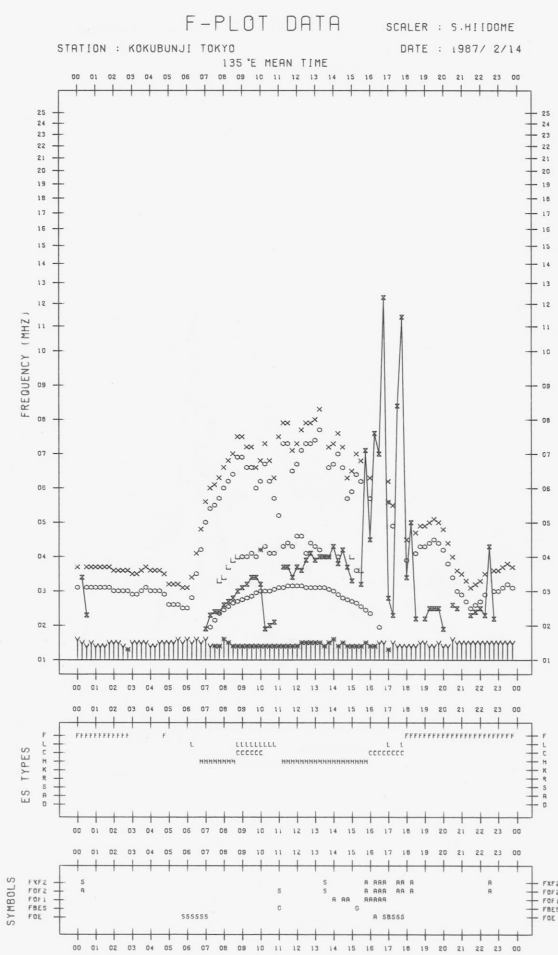
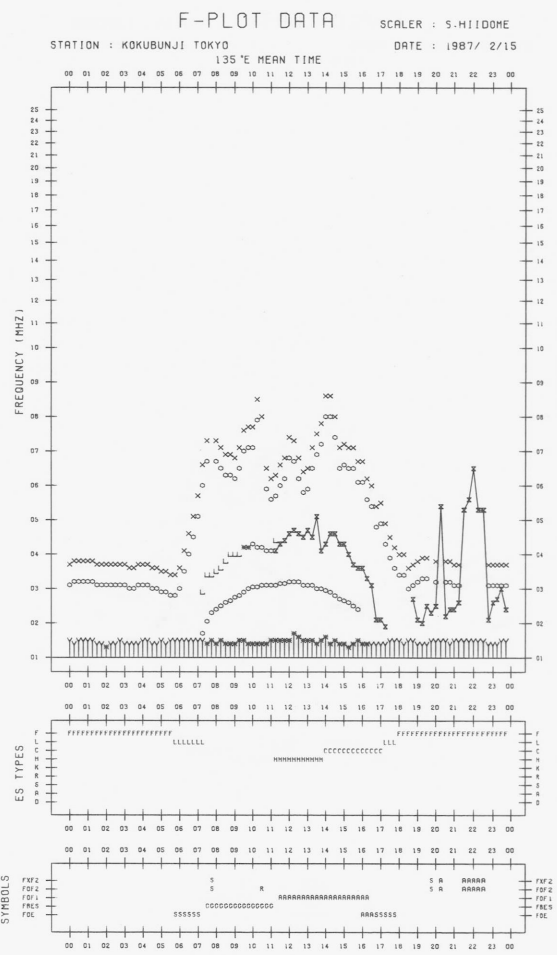
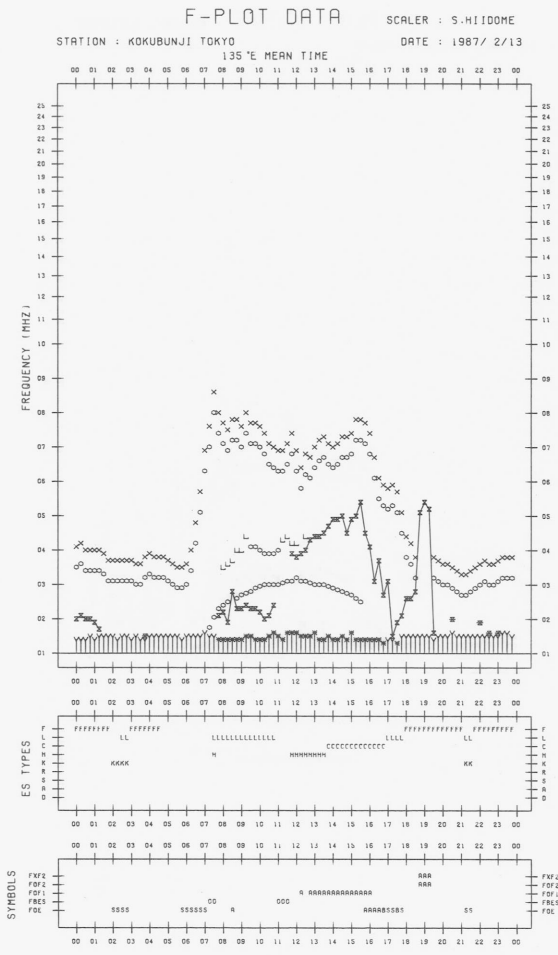
SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 2/12

135°E MEAN TIME



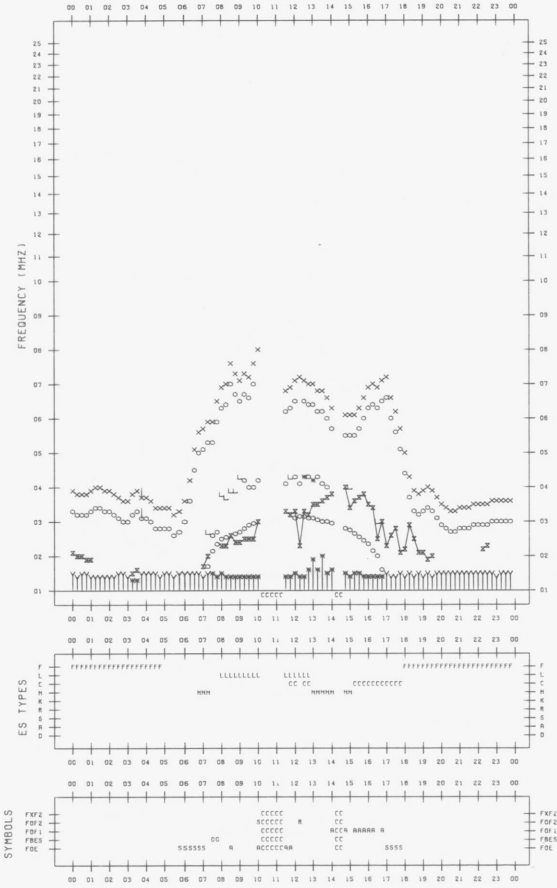


F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO DATE : 1987/ 2/17

135°E MEAN TIME

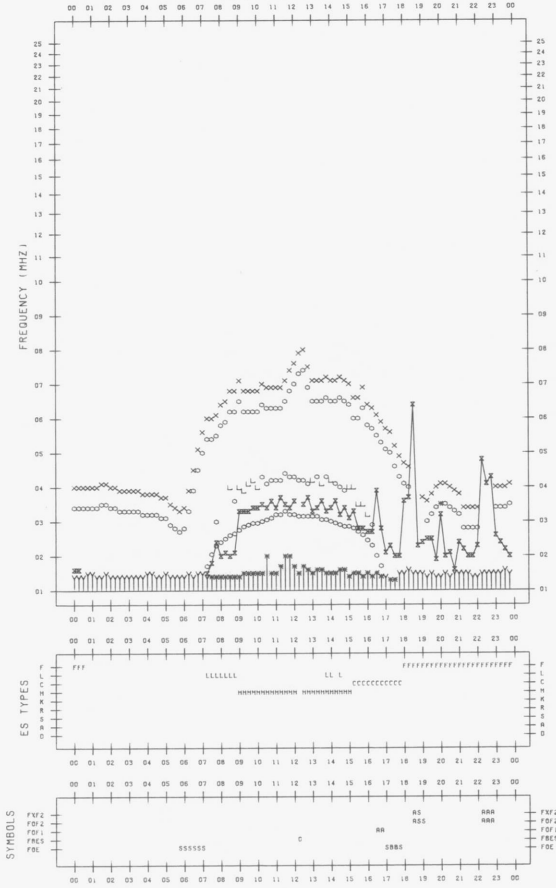


F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO DATE : 1987/ 2/19

135°E MEAN TIME

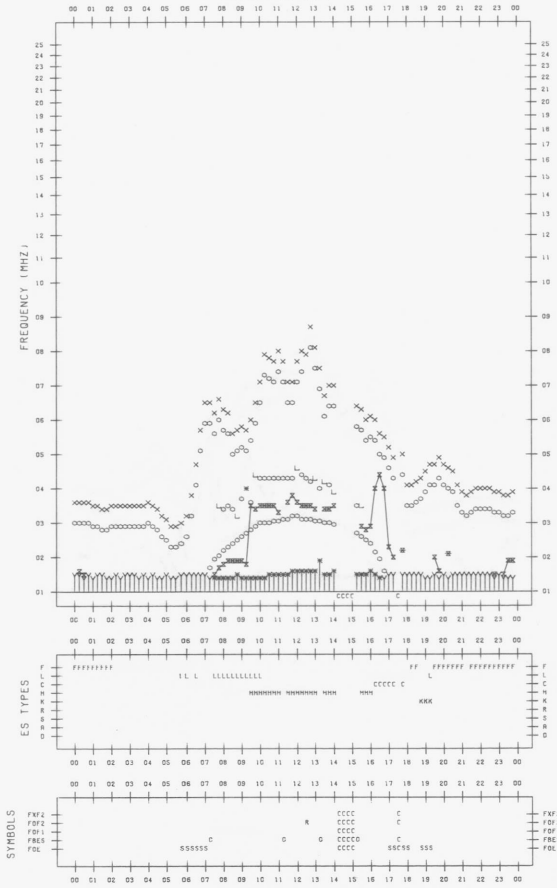


F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO DATE : 1987/ 2/18

135°E MEAN TIME

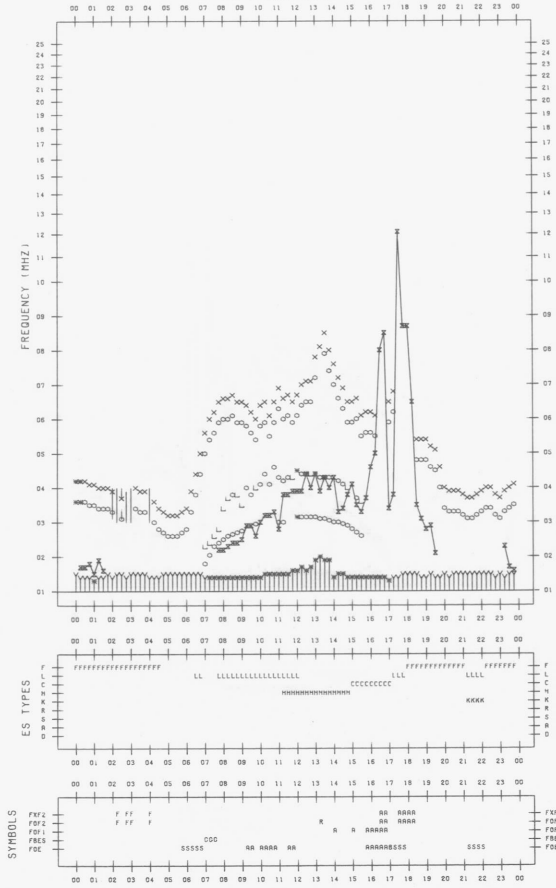


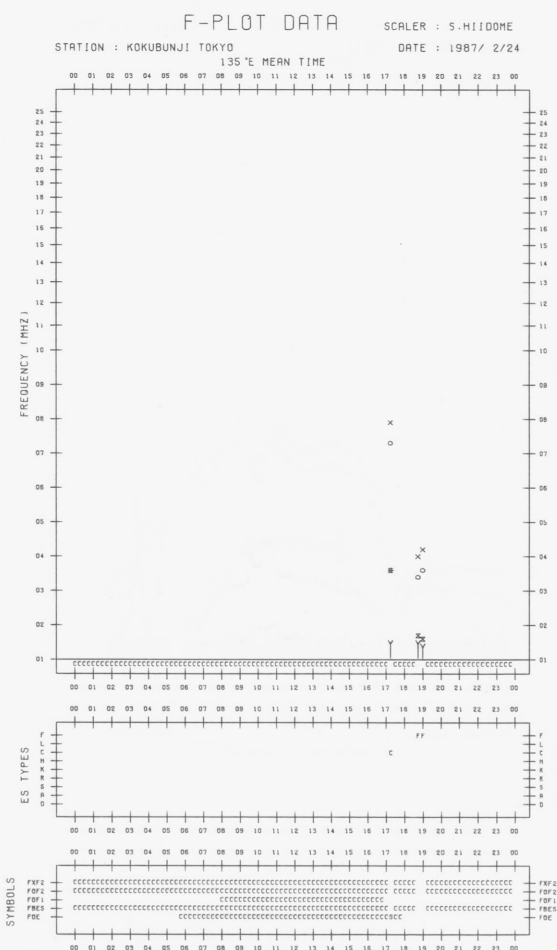
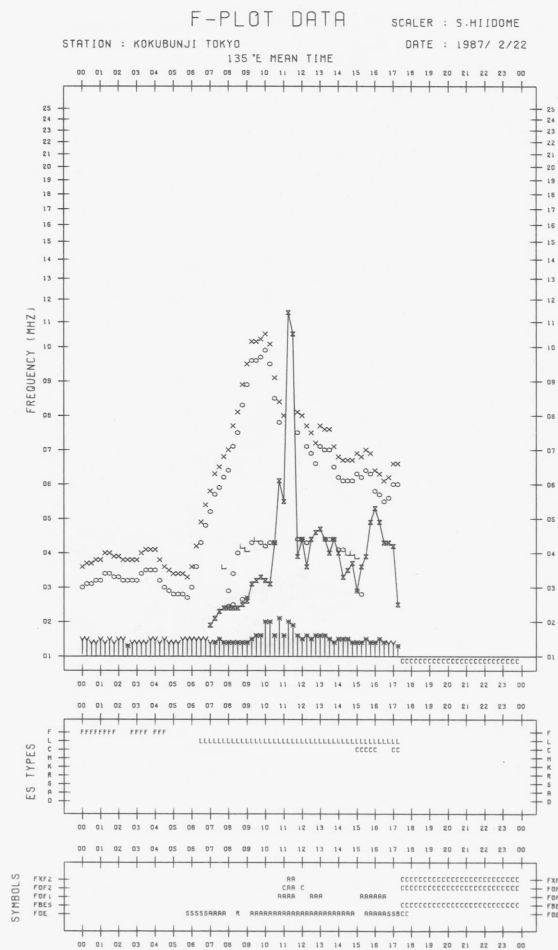
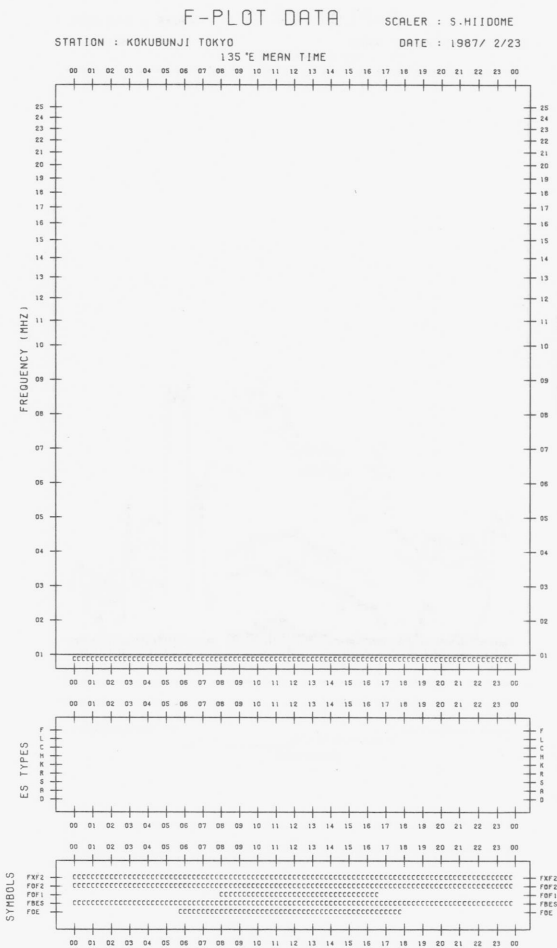
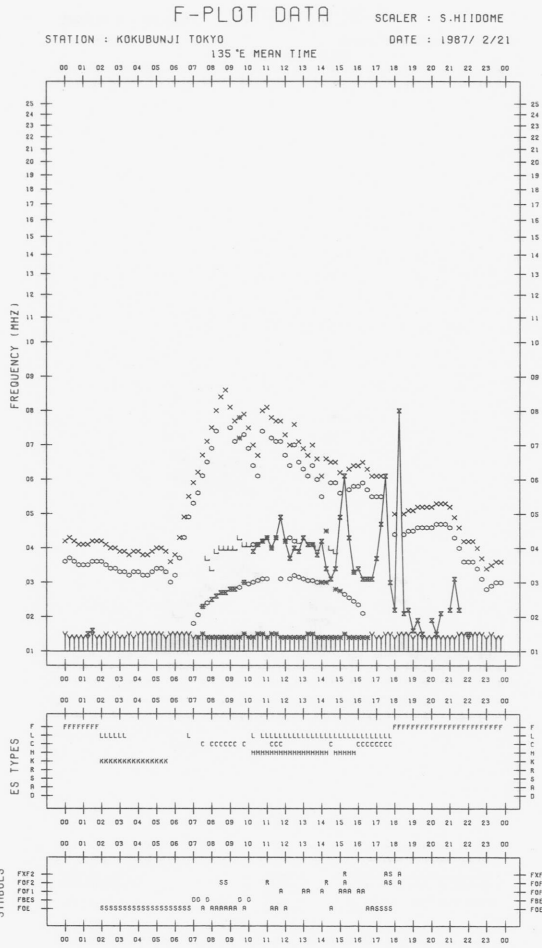
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO DATE : 1987/ 2/20

135°E MEAN TIME





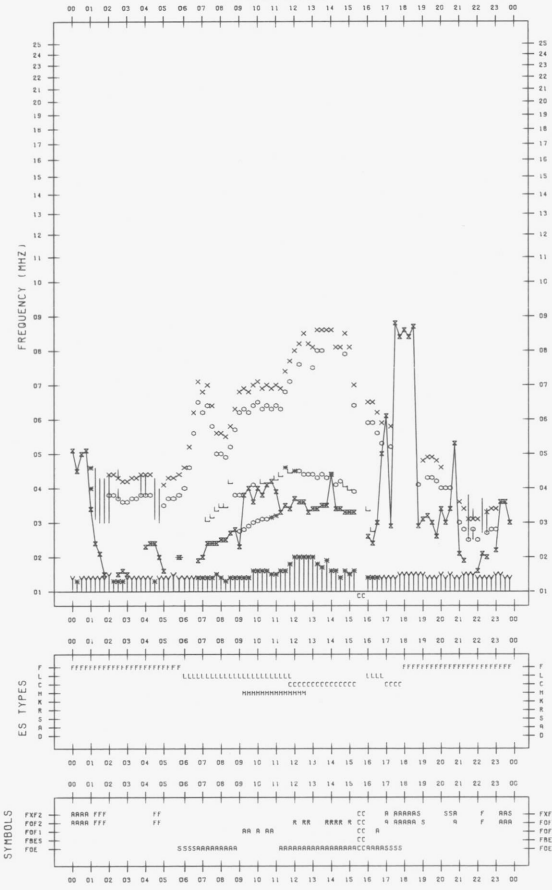
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 2/25

135°E MEAN TIME



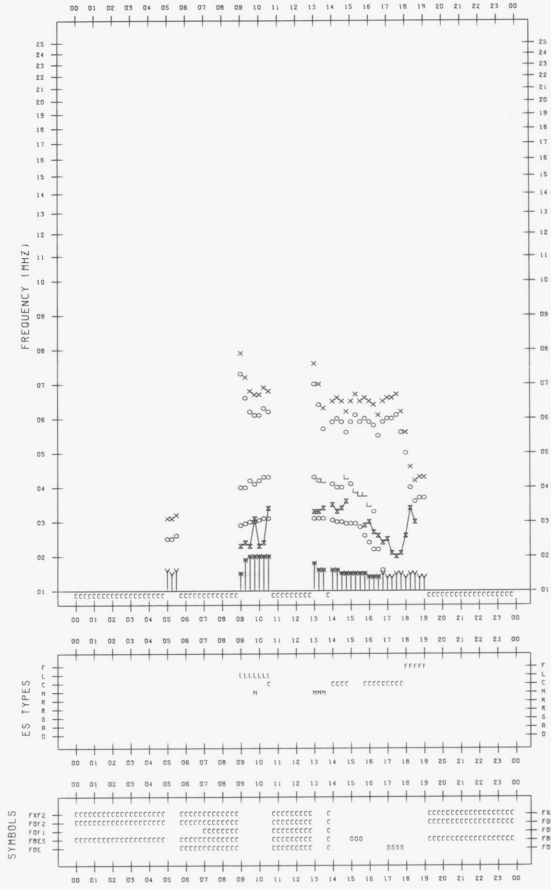
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 2/27

135°E MEAN TIME



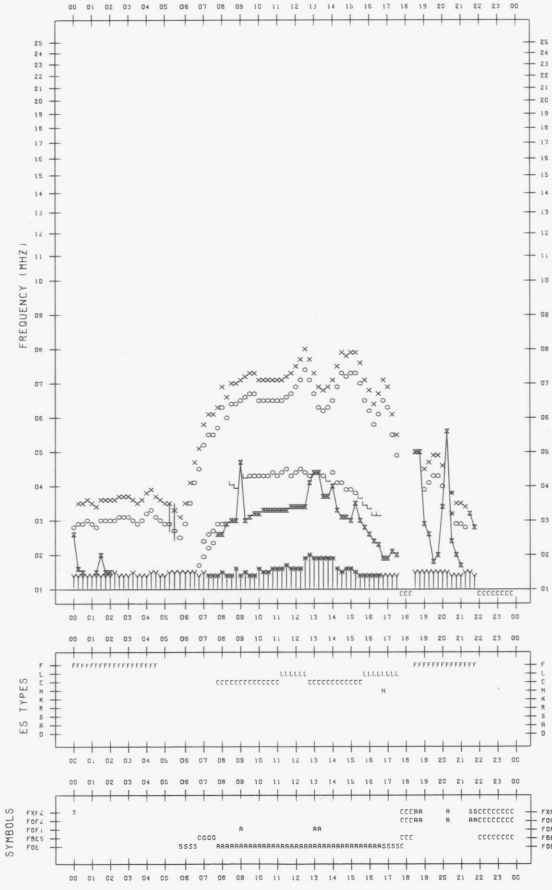
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 2/26

135°E MEAN TIME



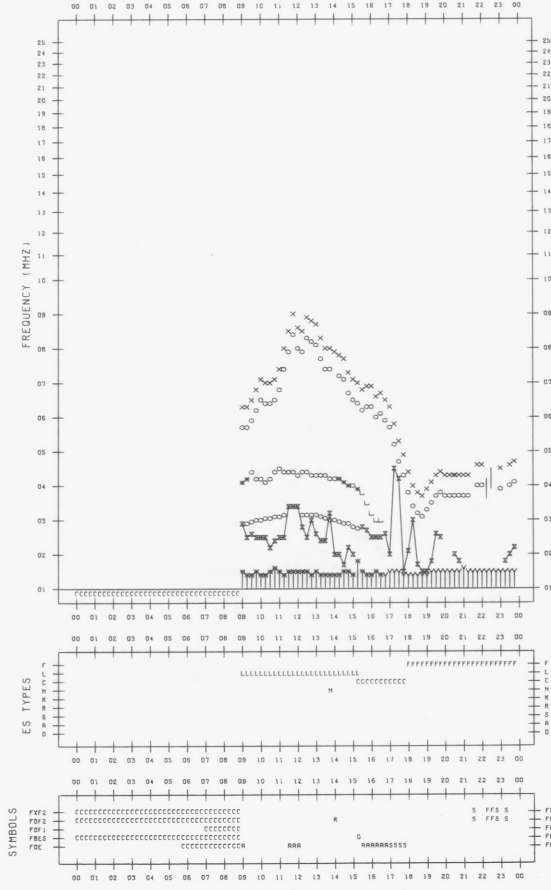
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 2/28

135°E MEAN TIME



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

Hiraiso

February 1987

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	6	6	(6)	-	6	0	0	(0)	-	0
2	6	6	(6)	6	6	0	0	(*)	*	0
3	6	6	6	6	6	*	0	*	*	*
4	6	6	6	6	6	0	0	*	*	*
5	6	6	6	6	6	*	0	0	*	*
6	6	6	6	6	6	0	0	*	*	0
7	6	6	6	6	6	*	*	*	*	*
8	6	6	6	6	6	*	0	0	*	*
9	6	6	6	6	6	*	*	*	0	*
10	6	6	6	6	6	0	0	0	0	0
11	6	q	q	6	6	*	*	*	*	*
12	6	q	-	-	6	*	*	-	-	*
13	6	6	6	q	6	*	0	0	*	0
14	q	q	q	q	q	*	*	*	*	*
15	q	q	q	q	q	*	*	*	*	*
16	6	6	6	6	6	*	0	0	0	*
17	6	6	6	q	6	0	0	0	*	0
18	6	6	q	6	6	*	0	*	*	*
19	6	6	6	6	6	0	0	0	0	0
20	6	6	6	q	6	0	0	0	*	0
21	6	6	6	6	6	*	*	*	0	*
22	6	q	q	q	6	*	*	*	*	*
23	q	6	6	6	6	*	*	*	*	*
24	6	6	6	6	6	*	*	*	*	*
25	6	6	6	6	6	*	*	*	0	*
26	6	6	6	6	6	0	*	*	*	*
27	6	6	6	6	6	*	*	0	*	*
28	6	6	6	6	6	*	0	0	*	*

Notes: 1. No observations during the following periods.

1st 2200 - 2349
 12th 0400 - 0810
 12th 2127 - 2347

2. (q) likely quiet.

3. (*) interference.

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

Hiraiso

February 1987

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

Note: No observations during the following periods.

5th	0300 - 0344	15th	0600 - 0810
9th	2325 - 10th 0125	15th	2128 - 2345
12th	0400 - 0810	22nd	2120 - 2348
12th	2130 - 2343		

B. Solar Radio Emission
 b. Outstanding Occurrences at Hiraiso

Hiraiso

February 1987

Single-frequency observations								
Normal observing period: 2130 - 0820 U.T. (sunrise to sunset)								
FEB 1987	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	
26	200	46 C	0710.9	0711.6	2.6	190	54	0
	100	46 C	0710.9	0712.0	1.4	520	130	-
	500	46 C	0711.0	0711.5	1.8	3	1	0
28	500	8 S	0701.0	0701.4	0.7	2	1	0

C. Radio Propagation
a. HF Field Strength at Hiraiso

WWVH 15 MHz

Feb. 1987

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	16	16	16	14	15	-9	3	6	2	-15	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	-12	-12	11	17	C	C		
2	9	15	16	15	15	5	2	-5	ES -10	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	4	11	13	7	
3	12	15	14	16	15	4	-5	5	2	-14	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	-14	15	11	10	
4	14	11	14	15	18	17	14	13	10	5	-1	ES -25	ES -11	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	-3	11	14	13	
5	14	13	13	20	24	ES -15	1	-7	-2	3	-2	-9	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	6	16	15	16	
6	17	15	14	14	18	13	9	ES -24	ES -24	ES -24	ES -24	-15	-11	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	15	13	13	12	
7	12	14	17	18	17	17	16	7	1	-4	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	-17	-4	12	11	10	
8	16	21	14	16	22	16	-5	-3	-3	-15	-9	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	12	15	14	14	
9	15	15	21	22	17	16	15	5	ES -24	ES -24	ES -24	-9	ES -25	-11	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	0	16	18	11	
10	12	19	16	20	12	-4	1	-3	-11	ES -25	ES -25	-8	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	-3	13	16	15	12
11	12	14	17	20	18	16	19	11	10	6	-11	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	-5	-11	10	14	17	15	
12	10	16	18	19	18	14	15	10	6	8	5	-1	-8	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	10	19	13	17	
13	15	11	16	17	19	22	19	19	0	-11	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	-6	ES -25	2	13	9	18	
14	14	11	18	20	20	10	16	13	10	8	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	8	17	18	9	
15	18	17	13	18	15	ES -5	-7	ES -5	-8	-8	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	5	15	17	12	
16	12	12	19	18	17	18	13	-3	ES -10	-14	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	14	16	11	16	
17	15	12	14	22	14	9	7	13	7	-11	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	5	8	13	13	
18	14	19	16	23	19	2	ES -11	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	10	13	11	11	
19	19	16	19	16	15	19	10	4	ES -11	-1	-11	-8	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	10	16	15	20	
20	12	12	20	21	21	20	15	13	13	11	-5	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	-11	14	18	17	17
21	15	14	15	19	20	23	16	-2	0	-8	ES -13	4	-10	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	12	17	14	12	
22	16	17	16	19	17	13	18	15	14	12	5	1	-2	-10	ES -25	ES -25	ES -25	ES -25	ES -25	-17	ES -25	14	14	15	10	
23	15	13	15	17	17	20	6	6	0	-5	-7	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	23	20	18	17	
24	17	15	19	18	16	18	-3	-2	7	7	8	4	-6	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	-7	ES -24	16	21	18	13	
25	14	17	17	20	17	21	5	ES -9	ES -24	0	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	-18	ES -24	9	13	13	9	
26	13	9	14	19	18	26	15	12	-4	-3	9	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	-11	ES -25	10	16	14	12	
27	13	9	16	24	14	ES -15	ES -15	ES -15	ES -15	ES -15	ES -15	ES -15	ES -15	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	19	17	18	18	
28	14	16	21	24	23	24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	15	12	12	10	
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	
MED	14	15	16	19	17	16	8	4	-1	-8	ES -24	ES -24	ES -24	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	10	16	14	12	
UD	17	19	20	23	22	23	18	13	10	8	5	1	-8	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	-7	-11	16	19	18	18	
LD	12	11	14	15	14	ES -9	ES -11	ES -24	ES -24	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	-3	11	11	9	

C. Radio Propagation

B. Radio Propagation Quality Figures at Hiraiso

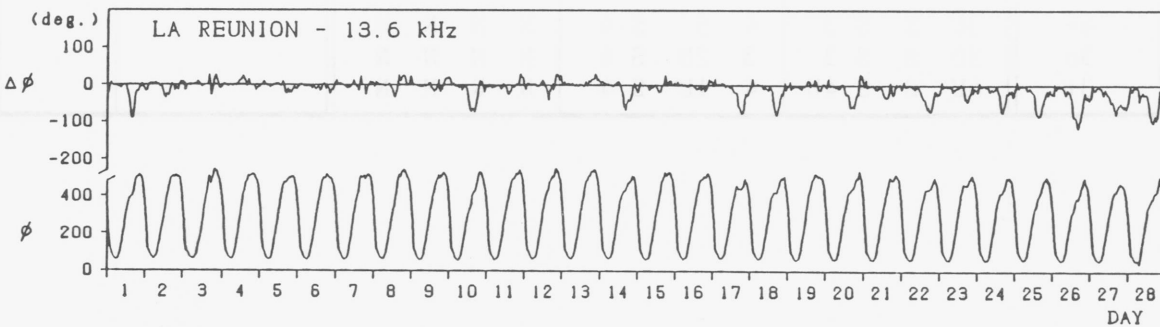
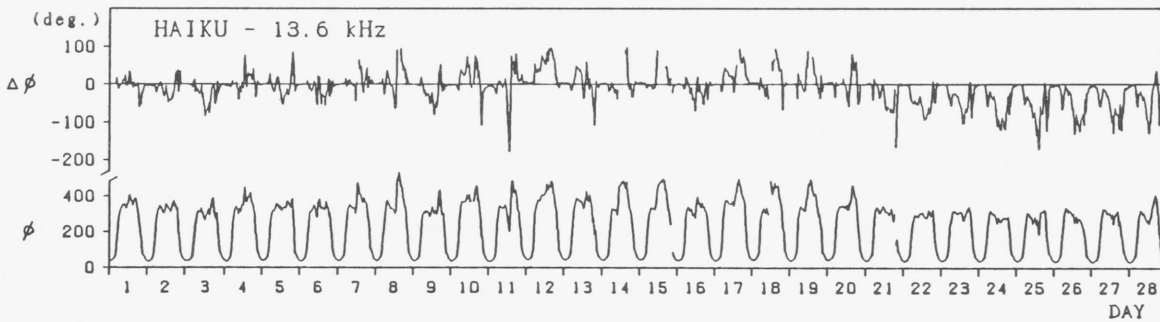
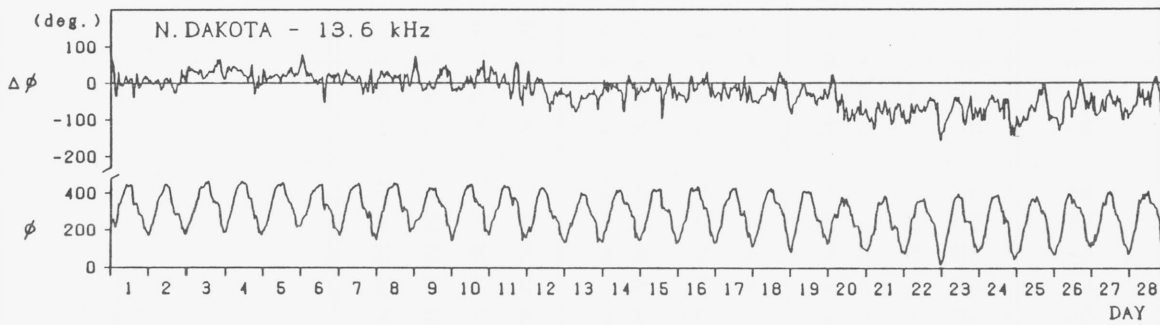
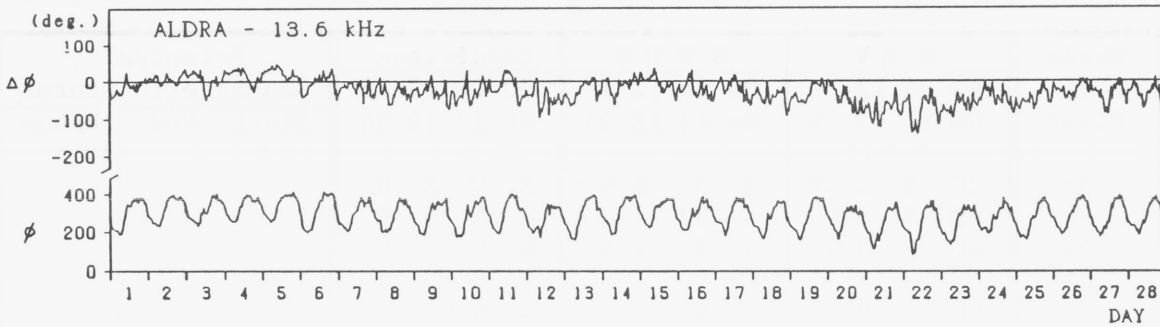
Hiraiso		Time in U.T.														
Feb. 1987	Whole Day Figure	W W V				W W V H				Conditions			Principal Geomagnetic Storms			
		00 06	06 12	12 18	18 24	00 06	06 12	12 18	18 24	00 06	06 12	12 18	Start	End	Range	
1	3+	3U	S	S	4U	3	3	S	4	N	N	N	N			
2	4-	4U	S	S	4	4	3U	S	3	N	N	N	N			
3	4-	4U	S	S	4	4	3	S	4	N	N	N	N			
4	4+	4U	S	S	4	4	5	S	4	N	N	N	N			
5	4-	4U	S	S	4	3	4	S	4	N	N	N	N			
6	3+	3U	S	S	3	4	3U	S	4	N	N	N	N			
7	4o	4U	S	S	4	4	4	S	4	N	N	N	N			
8	4o	4U	S	S	4	4	4	S	4	N	N	N	N			
9	4o	4U	S	S	4	4	4U	S	4	N	N	N	N			
10	4-	3U	S	5U	5	3	3U	S	4	N	N	N	N			
11	4+	4U	S	S	4	4	5	S	4	N	N	N	N			
12	4+	5U	S	S	3U	4	5	S	4	N	N	N	N			
13	4-	3U	S	S	4	4	4	S	4	N	N	N	N			
14	4+	4U	S	S	4	4	5	S	4	N	N	N	N			
15	4-	4U	S	S	4	3	3U	S	4	N	N	N	N			
16	4-	4U	S	S	4	4	3U	S	4	N	N	N	N			
17	4+	5U	S	S	4	4	4	S	4	N	N	N	N			
18	4-	4U	S	S	4	4	2U	S	4	N	N	N	N			
19	4o	4U	S	S	4	4	4U	S	4	N	N	N	N	18.7	---	118
20	4+	5U	S	S	4	4	5	S	4	N	N	N	N	---	---	
21	4o	4U	S	S	4	4	4	S	4	N	N	N	N		18.0	
22	4o	4U	S	S	3U	4	5	5U	4	N	N	N	N			
23	3+	2U	S	S	3	4	4	S	4	N	N	N	N			
24	4o	4U	S	S	3U	4	4	5U	4	N	N	N	N			
25	4-	4U	S	S	3	4	3U	S	4	N	N	N	N			
26	4-	3U	S	S	3	4	5	S	4	N	N	N	N			
27	3o	3U	S	S	3	3	2U	S	4	N	N	N	N			
28	3+	4U	S	S	4U	4	1U	S	4	N	N	N	N			

C. Radio Propagation

c. Phase Variations in OMEGA Radio Waves at Inubo

Inubo

February 1987



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

NONE

C. Radio Propagation

d. Sudden Ionospheric Disturbance

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

Hiraiso

Time in U.T.

Feb. 1987	S W F						Correspondence				
	Drop-out Intensities (dB)				Start	Duration	Type	Imp.	Solar Flare	Solar Noise	Geomag. Crochet
	CO	HA	1)	2)							
					None						

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

(ii) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Feb. 1987	S P A							
	Phase Advance (degrees)					Time (U.T.)		
Date	GBR	Ω /LR	NWC	Ω /H	Ω /ND	Start	End	Maximum
28		<u>41</u>	16			0703	0813	0715

IONOSPHERIC DATA IN JAPAN FOR FEBRUARY 1987

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2-1 Nukui-Kitamachi 4-chome, Koganei-shi, Tokyo 184 JAPAN.