

IONOSPHERIC DATA IN JAPAN

FOR APRIL 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 *fmin*.
- n The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.
- k The designation 'k' is used to show the presence of particle *E*. When $foEs > foE$ (particle *E*) the *Es* type precedes k.

c. Definitions of the CNT, MED, UQ and LQ

Median count (CNT) is the number of values from which a median has been computed. In addition to numerical values, the count may include certain descriptive letters.

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

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

B. SOLAR RADIO EMISSION

Solar radio observations are carried out on 100, 200 and 500 MHz at Hiraio. 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 Hiraio

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 Hiraio

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 Hiraio

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 Hiraio. 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	Fort Collins, Colorado	Kauai, Hawaii	Hiraio, Ibaraki
Location			
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 crochets 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

APR. 1937

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station		WAKKANAI				Lat.	45° 23.5' N					Long.	141° 41.2' E					Sweep 1 MHz to 25 MHz in 24 sec in automatic operation							
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		X 48	X 47	X 47	X 46	X 47	X 50													X 61	X 58	X 55	X 54	X 54	
2		X 52	X 50	X 48	X 49	X 45	X 44													X 53	X 50	X 50	X 47	X 47	
3		X 47	X 49	X 43	X 43	X 44	X 48													X 57	X 53	X 51	X 50	X 45	
4		X 45	X 45	X 43	X 45	X 47	X 44													X 66	X 60	X 57	X 54	X 51	
5		X 48	X 43	X 43	X 43	X 30	X 32													X 54	X 49	X 48	X 50	X 51	
6		50	47	42	44	40	42													X 51	X 53	X 53	X 53	X 50	
7		X 48	51	51	52	X 47	X 45													X 66	X 62	X 57	X 43	X 42	
8		X 44	X 44	X 46	X 46	X 44	X 47													X 68	X 67	X 61	X 60	X 59	
9		X 57	X 52	X 50	X 50	X 52	X 48													X 60	X 61	X 60	X 60	X 56	
10		57	50	50	47	50	X 47													X 66	X 64	X 59	X 53	X 45	
11		50	52	50	54	X 44	55													X 70	X 71	X 66	X 62	X 57	
12		58	58	60	59	50														X 59	X 57	X 57	X 51	X 47	
13		57	57	47	44	43														X 69	X 69	X 67	X 57	X 50	
14		X 46	X 45	X 43	X 40	X 40														X 69	X 67	X 64	X 61	X 56	
15		X 54	X 51	X 51	X 51	X 46														X 69	X 65	X 62	X 58	X 55	
16		X 54	X 51	X 50	X 51	X 51														X 71	X 74	X 73	X 71	X 67	
17		70	66	69	72	67														X 71	X 66	X 64	X 61	X 57	
18		X 57	X 55	X 51	X 51	X 50														X 67	X 67	X 64	X 61	X 60	
19		X 60	X 57	X 56	X 55	X 56														X 88	X 74	X 67	X 64	X 59	
20		X 57	X 57	X 57	X 57	X 52														X 85	X 79	X 68	X 62	X 55	
21		X 50	X 49	X 47	X 45	X 48														X 71	X 66	X 66	X 59	X 55	
22		X 54	X 52	X 51	X 51	X 46														X 77	X 63	X 63	X 59	X 57	
23		X 59	X 56	X 53	X 49	X 45														X 74	X 69	X 63	X 57	X 55	
24		X 53	X 52	X 51	X 50	X 48														X 85	X 75	X 59	X 54	X 52	
25		X 50	X 55	X 51	X 46	X 39														X 64	X 66	X 63	X 57	X 52	
26		X 50	X 47	X 44	X 45	X 44														X 71	X 74	X 66	X 52	X 46	
27		X 46	X 46	X 46	X 45	X 43														X 76	X 73	X 72	X 66	X 53	
28		X 52	X 49	X 48	X 46	X 47														X 66	X 66	X 61	X 57	X 55	
29		X 51	X 49	X 47	X 46	X 46														X 71	X 68	X 65	X 66	X 64	
30		60	52	54	50	47														X 79	X 82	X 76	X 61	X 51	
31																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		30	30	30	30	30	11													30	30	30	30	30	
MED		X 52	X 51	X 50	X 48	X 46	X 47													X 69	X 66	X 63	X 58	X 54	
UQ		X 57	X 55	X 51	X 51	X 50	X 48													X 71	X 71	X 66	X 61	X 57	
LQ		X 48	X 47	X 46	X 45	X 44	X 44													X 64	X 61	X 57	X 53	X 50	

APR. 1937

FXI (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

APR. 1987

FOF2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

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

The Radio Research Laboratory, Japan

APR. 1987

FOF2 (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	WAKKANAI				Lat.	45 23.5 N				Long.	141 41.2 E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										400	420	430	430	420	410	400 ^H	370 ^L							
2											420	430	430	420	420	380	380 ^L							
3							L		410	410	420	430	420	420	400	400 ^L	L							
4										410	420	430	430	420	410 ^H	390 ^H								
5									390	400	410	410	410	420	410	400	360 ^L							
6									400	420	430	430	430	430	410	400 ^H	380 ^L							
7									420	420	430	430	430	430	410	400	380							
8									400	420	430	440	430	430	420	400	380 ^L							
9									410	430	430	430	440	A	390	410 ^L	390 ^L	L						
10									380	400 ^L	430	440	450	440	440	440	430	400						
11									430	440	A	A	A	440	440	410	400							
12									420	430	440	440	450	440	430	420	400 ^L							
13							L		430 ^L	440	440	450	460	450	440	420	A	L						
14								400	420	430	430	440	460	460	440	410	390							
15							L		430	450	460	460	460	460 ^H	440	410 ^L	400 ^L							
16									430	440	460	460	460	450	450	430	400 ^L	L						
17									430	450	440	460	470	470	440	430	400		L					
18									430	430	460	470	480	460	440	420	400							
19									L	440	450	470	470	460	440	430	400 ^L	L						
20							L		430 ^L	450	450	460	460	450	450	420	400 ^L	L						
21							L		420 ^L	440	450	450	A	450	450	430	400	A						
22									410	430	440	450	440	450	440	430	400		L					
23									430	430	440	440	450	430	430	420	400	330 ^L						
24								400	410	450	430	430	440	440	A	400	A	L						
25									360 ^H	A	A	430	430	440	440	430	410 ^H	400	A					
26								400	410	420	430	430	430	430	430	420	400	370 ^L						
27								400	410	430	430	430	430	430	430	420	400 ^H	L						
28									390	410	430	430	430	460	440	430	410	A	A					
29							L		410	430	440	430	450	430	430	420	380		A					
30								A		420	430	440	450	450	430	430	420	410	A					
31									420	430	440	450	450	430	430	420	410							
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								7	25	23	29	29	28	29	29	30	25	2						
MED								400	420	430	430	440	440	440	430	415	400	350 ^L						
UQ								400	430	440	440	450	460	450	440	420	400							
LQ								385	410	420	430	430	430	430	420	400	380							

APR. 1987

FOF1 (0.01 MHz)

IONOSPHERIC DATA

APR. 1987

F0E (0.01 MHz)

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

Station	WAKKANAI																								Lat.	45	23.5	N	Long	141	41.2	E	Sweep	1	MHz to 25 MHz in 24 sec in automatic operation															
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																										
1							S	225	260	285	300	305	305	300	295	270	235	200						S																										
2							S	220	270	295	A	310	310	305	295	275	A	200						S																										
3								170	220	275	295	305	310	310	310	300	270	235	205					S																										
4								190	235	275	300	305	310	310	305	295	275	240	200					S																										
5								190	225	265	290	300	300	300	300	290	275	255	295					S																										
6								185	220	265	295	305	315	310	300	A	A	250	210					S																										
7								190	240	285	300	310	310	A	A	300	275	A	210					S																										
8								200	240	285	300	305	310	310	305	300	285	250	A					S																										
9								210	260	285	300	310	315	330	305	305	290	270	210					S																										
10								205	250	280	300	315	310	A	315	300	300	255	210					S																										
11							S	205	255	290	310	325	325	320	315	305	290	250	205					S																										
12							S	200	255	290	305	315	315	A	A	A	A	A	A					S																										
13							S	200	250	300	315	315	325	325	A	A	A	A	205					S																										
14							S	205	260	295	310	315	315	325	320	315	295	260	215					S																										
15							S	205	275	290	305	310	310	310	315	310	300	255	215					S																										
16							S	210	265	295	305	315	310	315	325	305	290	275	215					S																										
17							S	210	275	295	310	320	325	A	A	A	A	A	A					S																										
18							S	220	270	300	315	320	325	330	320	315	300	260	215					S																										
19							S	210	275	295	A	325	320	A	330	315	A	270	215					S																										
20							S	220	275	300	310	320	320	330	325	A	A	275	215					S																										
21							S	225	275	300	310	330	320	310	A	A	295	265	A					S																										
22							S	220	275	300	305	310	315	A	A	305	290	270	220					S																										
23							S	215	265	290	305	315	320	320	315	300	290	260	215					S																										
24							S	220	270	300	305	315	320	310	A	A	295	260	220					S																										
25							S	220	265	290	305	315	320	315	310	300	290	A	A					S																										
26							S	220	275	295	305	310	310	310	300	300	290	A	A					S																										
27							S	A	270	295	305	310	310	315	310	300	285	270	210					S																										
28							S	230	270	290	305	310	320	320	315	310	290	270	215					S																										
29							S	220	265	290	300	300	A	A	325	320	300	275	220					S																										
30							S	225	275	295	305	315	315	A	A	A	A	A	A					S																										
31																																																		
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																											
CNT						27	30	30	29	29	29	22	22	22	23	22	23																																	
MED						210	265	290	305	315	315	312	312	300	290	260	215																																	
UQ						220	275	295	305	315	320	320	320	310	295	270	215																																	
LQ						200	240	285	300	310	310	310	305	300	280	250	205																																	

APR. 1987

F0E (0.01 MHz)

IONOSPHERIC DATA

APR. 1987

FOES (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station		WAKKANAI							Lat.	45 23.5 N			Long.	141 41.2 E			Sweep 1 MHz to 25 MHz in 24 sec in automatic operation										
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		E S 16	E S 16	E S 15	E S 15	E S 15	E S 15	E S 16	G	G	G	G	G	G	G	G	G	G	E S 15	E S 16	E S 16	E S 16	E S 17	E S 15			
2		E S 16	E S 15	E S 15	E	E S 17	E S 17	23	G	G	G	31	G	G	G	G	G	38	G	E S 16	E S 16	E S 15	E S 17	E S 17			
3		E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	G	G	G	G	G	G	G	G	G	G	G	E S 16	E S 17	E S 17	E S 16	E S 17	E S 15			
4		E S 16	E S 17	E S 15	E S 15	E S 16	E S 15	G	28	G	G	G	G	G	G	G	G	G	E S 16	E S 17	E S 17	E S 15	E S 16	E S 16			
5		E S 16	E S 16	E S 16	E S 16	E S 15	E S 15	24	26	G	G	G	G	G	G	G	G	G	E S 15	E S 15	E S 16	E S 17	E S 16	E S 16			
6		E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	23	25	G	G	G	G	43	37	34	40	G	G	E S 17	E S 17	E S 16	E S 16	E S 15			
7		E S 15	E S 15	E S 15	E	23	24	G	G	G	35	37	J A 46	33	G	G	31	24	19	22	E S 16	E S 15	E S 16	E S 15			
8		E S 15	E S 17	E S 17	22	33	23	G	30	33	G	G	G	G	G	G	29	30	E S 16	E S 17	E S 17	E S 16	E S 15				
9		E S 15	E S 16	E S 16	E S 16	E S 16	E S 17	G	G	31	G	35	35	G	48	G	24	30	26	21	30	31	E S 17	E			
10		E S 16	E S 17	E S 16	E S 15	E S 15	E S 16	G	G	G	G	G	35	34	G	G	33	33	28	20	E S 17	21	E S 17	E S 16			
11		E S 15	E S 16	E S 15	E S 16	E S 17	E S 15	G	G	37	40	48	J A 57	J A 60	40	41	40	34	31	36	42	40	36	J A 50	J A 63		
12		30	E S 15	E S 15	E S 16	E S 12	E S 16	43	37	39	39	40	40	38	34	33	40	32	37	E S 17	28	38	E S 16	E S 16			
13		E S 17	E S 15	E S 15	E S 15	E S 16	E S 16	G	30	G	G	G	G	G	41	J A 45	38	J A 50	24	E S 17	E S 17	E S 16	E S 16	E S 16			
14		E S 17	E S 16	E S 17	E S 15	E S 16	E S 17	G	G	G	G	G	G	G	G	G	G	G	E S 17	E S 17	E S 16	E S 16	E S 17	E S 17			
15		E S 17	E S 17	E S 15	E S 16	E S 16	E S 17	G	G	G	33	G	G	35	G	G	G	G	E S 16	E S 16	E S 17	E S 15	E S 15	E S 16			
16		E S 16	E S 16	E S 16	E S 17	E S 16	E S 16	G	G	G	33	G	G	36	G	G	G	G	G	20	E S 17	E S 15	E S 17	E S 15			
17		E S 15	E S 14	E S 16	E S 17	E S 16	E S 16	G	G	G	G	G	G	35	36	42	37	41	35	38	30	E S 16	30	E S 17			
18		22	E S 17	E S 15	E S 15	E S 16	E S 15	G	G	G	G	G	G	G	G	23	G	G	E S 17	E S 16	E S 17	E S 17	E S 16	E S 16			
19		E S 15	E	E	E	E S 17	E S 17	G	G	G	J A 68	39	35	34	G	30	31	25	G	33	16	E S 15	E S 16	E S 15			
20		E S 15	E S 16	E S 17	E S 17	E S 17	E S 17	G	G	35	J A 53	J A 64	40	G	G	35	35	G	G	E S 17	E S 15	E S 15	21	E S 17			
21		E S 15	E S 16	20	E S 16	E S 16	E S 16	G	G	G	G	G	39	J A 55	35	43	28	31	J A 51	30	E S 16	E S 16	E S 17	E S 16			
22		E S 15	E S 15	E S 16	E S 15	E S 16	E S 18	G	G	G	G	36	G	33	32	G	G	G	G	23	20	26	E S 17	E S 16			
23		E S 16	E S 16	E S 16	E S 16	E S 16	E S 17	G	G	33	36	35	G	G	G	24	23	G	27	24	27	E S 17	E S 15				
24		E S 15	E S 17	E S 16	E S 16	E S 16	E S 17	G	G	G	G	G	G	40	33	J A 56	35	39	33	46	40	31	38	24	29		
25		29	34	36	27	30	E S 18	G	32	39	J A 46	36	G	G	G	G	G	36	J A 47	34	30	E S 17	E S 17				
26		E S 15	22	21	E S 15	E S 11	E S 17	28	G	34	35	35	37	35	44	39	G	30	40	34	30	28	E S 16	E S 16			
27		E S 17	E S 16	E S 16	E	E S 17	E S 17	31	34	34	38	34	G	G	G	27	G	G	30	28	E S 16	E S 15	E S 16	E S 17			
28		E S 16	E S 17	E S 16	E	E S 17	E S 17	G	G	G	G	G	G	G	G	G	35	43	44	21	E S 16	E S 17	E S 17	E S 16			
29		E S 17	E S 16	E S 16	E S 15	E S 16	E S 16	25	32	34	33	G	34	33	38	G	G	G	J A 43	43	40	E S 17	E S 17	E S 17			
30		E S 16	E S 15	E S 16	E S 15	E S 16	20	J A 64	32	43	35	37	36	35	37	34	J A 41	37	39	43	34	29	E S 16	11	16		
31																											
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT		30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MED		E S 16	E S 16	E S 16	E S 16	E S 16	E S 17	G	G	G	G	G	G	E G 33	G	E G 23	G	27	25	20	E S 17	E S 16	E S 16	E S 16			
UQ		E S 17	E S 17	E S 16	E S 16	E S 16	E S 17	23	28	34	35	35	35	35	36	35	35	34	35	33	30	E S 17	E S 17	E S 17			
LQ		E S 15	E S 15	E S 15	E S 15	E S 12	E S 16	G	G	G	G	G	G	G	G	G	G	G	E S 17	E S 16	E S 16	E S 16	E S 16	E S 15			

APR. 1987

FOES (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FBES (0.1 MHz)

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

Station		WAKKANAI							Lat. 45 23.5 N · Long. 141 41.2 E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation													
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		E 16	E 16	E 15	E 15	E 15	E 15	E 16	G	G	G	G	G	G	G	G	G	G	E 15	E 16	E 16	E 16	E 17	E 15		
2		E 16	E 15	E 15	E	E 17	E 17	22	G	G	G	31	G	G	G	G	G	27	G	E 16	E 16	E 15	E 17	E 17		
3		E 16	E	E 16	E 16	E 15	E 16	G	G	G	G	G	G	G	G	G	G	G	E 16	E 17	E 17	E 16	E 17	E 15		
4		E 16	E 17	E 15	E 15	E 16	E 15	G	G	G	G	G	G	G	G	G	G	G	E 16	E 17	E 17	E 15	E 16	E 16		
5		E 16	E 16	E 16	E 16	E 15	E 15	G	G	G	G	G	G	G	G	G	G	G	E 15	E 15	E 16	E 17	E 16	E 16		
6		E 16	E 16	E 15	E 16	E 16	E 16	G	G	G	G	G	G	39	G	30	30	G	G	E 17	E 17	E 16	E 16	E 15	E 15	
7		E 15	E 15	E 15	E	E 17	E 15	G	G	G	G	G	37	34	32	G	G	27	G	17	17	E 16	E 15	E 16	E 15	
8		E 15	E 17	E 17	E 15	E 17	E 17	G	G	G	G	G	G	G	G	G	G	G	23	E 16	E 17	E 17	E 16	E 15	E 15	
9		E 15	E 16	E 16	E 16	E 16	E 17	G	G	G	G	G	G	G	48	G	G	G	G	20	18	22	E 17	E 16	E	
10		E 16	E 17	E 16	E 15	E 15	E 16	G	G	G	G	G	G	34	G	G	G	G	33	27	20	E 17	E 17	E 17	E 16	
11		E 15	E 16	E 15	E 16	E 17	E 15	G	G	37	38	47	52	55	40	40	39	G	G	25	38	20	E 16	20	25	
12		E 15	E 15	E 15	E 16	E 12	E 16	38	37	38	G	G	40	35	34	33	33	30	29	E 17	E 17	27	E 16	E 15	E 16	
13		E 17	E 15	E 15	E 15	E 16	E 16	G	G	G	G	G	G	G	40	38	32	47	G	E 17	E 17	E 16	E 16	E 17	E 16	
14		E 17	E 16	E 17	E 15	E 16	E 17	G	G	G	G	G	G	G	G	G	G	G	G	E 17	E 17	E 16	E 16	E 17	E 17	
15		E 17	E 17	E 15	E 16	E 16	E 17	G	G	G	G	G	G	G	G	G	G	G	G	E 16	E 16	E 17	E 15	E 15	E 16	
16		E 16	E 16	E 16	E 17	E 16	E 16	G	G	G	G	G	G	G	G	G	G	G	G	E 17	E 15	E 17	E 15	E 17	E 17	
17		E 15	E 14	E 16	E 17	E 16	E 16	G	G	G	G	G	G	35	33	37	31	34	26	28	E 17	E 16	19	E 17	E 15	
18		E 17	E 17	E	E 15	E 16	E 15	G	G	G	G	G	G	G	G	23	G	G	G	E 17	E 16	E 17	E 17	E 16	E 16	
19		E 15	E	E	E	E 17	E 17	G	G	G	G	G	G	40	G	G	31	G	G	26	16	E 15	E 16	E 17	E 15	
20		E 15	E	E 16	E 17	E 17	E 17	G	G	G	G	G	G	41	G	40	34	31	G	G	E 17	E 15	E 15	E 16	E 17	E 15
21		E 15	E 16	E 17	E 16	E 16	E 16	G	G	G	G	G	G	49	35	37	G	27	G	20	36	21	E 16	E 16	E 17	E 16
22		E 15	E 15	E 16	E 15	E 16	E 16	G	G	G	G	G	G	33	32	G	G	G	G	E 17	17	E 17	E 16	E 16	E 16	
23		E 16	E 16	E 16	E 16	E 16	E 17	G	G	G	G	G	G	G	G	24	23	G	G	23	19	E 17	E 15	E 17	E 15	
24		E 15	E 17	E 16	E 16	E 16	E 17	G	G	G	G	G	G	G	33	44	G	38	28	40	35	20	36	E 17	19	
25		E 17	E 17	28	20	E 17	E 18	G	G	39	42	G	G	G	G	G	G	29	43	25	22	E 17	E 17	E 17	E 16	
26		E 15	E 16	E 15	E 15	E 11	E 17	G	G	G	G	G	G	G	40	38	G	27	30	24	22	20	E 16	E 16	E 16	
27		E 17	E 16	E 16	E	E 17	E 17	23	G	G	G	G	G	G	G	G	G	G	G	20	20	E 16	E 15	E 16	E 17	E 17
28		E 16	E 17	E 16	E	E 17	E 17	G	G	G	G	G	G	G	G	G	35	41	40	21	E 16	E 17	E 17	E 16	E 17	
29		E 17	E 16	E 16	E 15	E 16	E 16	G	G	G	G	G	34	33	G	G	G	G	G	40	34	32	E 17	E 17	E 17	E 17
30		E 16	E 15	E 16	E 15	E 16	E 17	64	32	40	G	G	G	35	36	32	34	32	38	38	30	20	E 16	E 11	E 16	
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED		E 16	E 16	E 16	E 15	E 16	E 16	G	G	G	G	G	G	G	G	G	G	G	G	17	E 17	E 17	E 16	E 16	E 16	
UQ		E 16	E 17	E 16	E 16	E 16	E 17	G	G	G	G	G	G	34	33	33	31	27	29	25	19	E 17	E 17	E 17	E 17	
LQ		E 15	E 15	E 15	E 15	E 12	E 16	G	G	G	G	G	G	G	G	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 15	

APR. 1987

FBES (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FMIN (0.1 MHz)

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

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

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FMIN (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

M(3000)F2 (0.01)

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

Station	WAKKANAI				Lat. 45 23.5 N				Long. 141 41.2 E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	305	300	290	300	315	325	370	360	345	350	340	335	325	335	335	320	315	320	325	330	315	290	295	295
2	295	300	310	310	305	315	350	360	340	320	335	330	325	330	325	325	335	340	345	325	295	300	295	295
3	300	310	305	305	300	325	360	365	350	345	325	320	330	335	330	340	345	345	350	330	315	305	300	305
4	300	290	305	305	325	350	355	355	340	340	330	340	335	335	335	350	335	330	335	320	300	300	295	295
5	305	285	305	335	305	320	330	310	285	340	320	295	335	330	335	330	345	320	340	325	300	305	235 ^S	F
6	F	F	F	F	F	335	340	325	310	315	320	330	325	330	335	335	345	350	340	320	325	305	285	280
7	290	F	F	300	325	330	335	340	295	325	335	330	315	325	335	325	340	315	315	320	310	330	315	300
8	295	300	280	290	305	325	335 ^S	335	315	340	340	330	330	335	325	340	345	345	325	310	315	315	300	305
9	290	280	290	300	310	315	330	320	325	325	330	325	335	345	325	325	340	340	345	320	315	320	F	F
10	F	F	F	F	F	325	340	365	340	320	320	345	310	325	315	320	335	335	330	320	315	305	305	305
11	F	F	F	F	325	335	345	340	330	330	335	340	320	325	310	315	330	330	315	310	305	325	F	F
12	F	F	F	F	F	340	340	355	335	320	325	325	320	320	315	325	325	325	350	310	310	320	305	295
13	F	F	F	F	325	320	325	350	360	325	320	340	320	320	310	320	325	315	335	325	310	310	325	295
14	290	290	285	310	305	325	315	305	315	320	315	325	310	315	320	335	335	340	330	305	310	300	305	290
15	275	295	290	320	305	325	340	335	310	330	330	325	330	315	320	325	340	320	325	315	310	310	300	290
16	285	295	290	285	315	325	340	315	305	325	315	330	330	320	305	320	325	335	325	305	295	300	305	310
17	F	F	F	F	F	325	325	325	315	325	315	310	305	305	315	330	330	345	330	310	305	305	310	285
18	285	280	290	295	325	330	360	320	320	330	330	310	310	315	325	325	330	335	335	315	310	305	315	290
19	285	300	F	310	320	360	345	340	315	325	320	300	325	310	315	315	320	310	300	310	300	300	300	290
20	275	300	295	305	310	340	335	335	325	310	335	320	320	325	305	310	305	295	300	310	305	315	330	290
21	300	290	300	295	300	340	360	325	325	310	315	330	335	310	310	320	325	330	320	310	310	315	305	290
22	295	290 ^S	300	310	305	340	325	330	330	315	330	335	325	320	310	320	315	325	310	315	320	305	295	290
23	290	305	305	310	300	340	340	315	320	320	325	325	335	320	320	320	330	325	325	320	315	320	290	300
24	300	290	295	300	315	340	300	350	335	310	320	335	320	315	325	325	310	315	305	320	340	300	295	290
25	285 ^S	310	320	305 ^S	310	305	285	280	320	340	335	335	325	290	320	325	330	340	340	315	305	320	320	295
26	300	290	295	305	325	330	350	295	335	325	335	335	300	320	325	315	335	335	325	310	320	320	325	290
27	290	295	295	300	320	315	340	340	335	335	340	335	345	325	320	325	325	320	305	305	295	305	325	305
28	310	285	290	295	300	335	330	350	355	335	350	315	310	315	325	335	320	340	340	320	315	315	300	300
29	300	290	300	305	305	340	345	345	345	335	315	320	320	315	320	320	320	330	320	310	310	315	305	305
30	320	295	F	F	310	335	A	320	325	335	325	325	325	320	325	320	310	325	310	305	315	320	335	295
31																								
CNT	24	23	21	25	26	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	27
MED	295	295	295	305	310	330	340	335	325	325	330	328	325	320	320	325	330	330	325	315	310	308	302	295
UQ	300	300	305	310	320	340	350	350	335	335	335	335	330	330	325	330	335	340	340	320	315	320	312	300
LQ	288	290	290	300	305	325	330	320	315	320	320	320	320	315	315	320	320	320	315	310	305	305	295	290

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M(3000)F2 (0.01)

IONOSPHERIC DATA

APR. 1987

M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station	WAKKANAI				Lat.	45° 23.5' N				Long.	141° 41.2' E				Sweep	1 MHz to 25 MHz		in 24 sec		in automatic operation					
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1										375	375	370	360	380	365	H	L								
2											365	360	370	380	360	370	L								
3								L	375	365	375	370	380	380	375	L	L								
4										365	370	370	370	380	H	H									
5									335	350	390	390	365	355	350	350	L								
6									355	355	370	380	370	375	365	H	L								
7									355	355	360	370	390	380	365	350	370								
8									350	355	370	380	395	395	370	375	L								
9									340	355	380	385	385	A	410	L	L	L							
10								370	L	390	370	385	355	385	380	370	350	360							
11									350	365	A	A	A	385	A	A	350								
12									A	355	360	A	375	380	365	355	L								
13								L	L	370	365	365	390	360	375	365	355	A	L						
14								340	355	370	390	385	370	355	365		360								
15								L	355	360	375	375	390	H	355	365	L	L							
16									355	365	370	375	370	375	360	360	L	L							
17									370	360	385	370	365	360	360	360	375	L							
18									370	380	370	380	355	365	365	380									
19									L	A		365	355	370	365	365	355	L	L						
20								L	L	360	A	375	365	370	370	355	355	L	L						
21								L	L	350	365	370	375	A	375	360	350	360	A						
22									355	370	370	375	385	375	345	360	365	L							
23									350	370	365	380	375	390	370	355	350	L							
24									365	375	370	395	385	380	375	A	365	A	L						
25									H	A	A	370	395	365	380	350	H	A							
26									350	365	380	395	395	375	A	A	345	330	L						
27									350	365	355	390	380	385	390	355	355	H	L						
28									365	380	370	395	400	360	380	360	360	A	A						
29								L	390	370	385	395	380	395	370	355	370	A							
30							A		A		375	385	370	390	395	360	345	340	A						
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								7	23	26	29	28	28	28	27	28	24	2							
MED								360	355	365	375	378	372	380	365	358	365	358							
UQ								365	370	370	385	385	385	380	365	362	L								
LQ								350	352	355	370	370	368	372	360	352	355								

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M(3000)F1 (0.01)

IONOSPHERIC DATA

APR. 1987

H^oF₂ (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	WAKKANAI				Lat. 45° 23.5' N		Long. 141° 41.2' E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																	
	Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1									275	290	290	275	275	300	300	270										
2									270	280	300	285	305	275	250											
3								235	275	265	285	310	275	260	265	275	250									
4									280	275	270	275	300	275	270											
5									415	310	330	400	305	320	300	315	265									
6									275	320	315	300	295	295	295	280	265									
7									385	315	270	295	335	300	310	310	275									
8									330	315	300	300	300	305	305	280	260									
9									300	280	260	275	290	300	300	290	255	250								
10								250	265	305	300	255	300	280	310	280	265									
11									300	275	270	A	A	300	320	290	255									
12									300	340	305	305	310	310	295	300	280									
13								250	300	295	270	290	300	320	300	275	275	255								
14									325	345	345	275	275	300	305	280	270	260								
15									255	300	270	270	280	280	295	280	265	260								
16									320	265	285	280	290	300	305	280	270	245								
17									315	300	285	305	320	315	295	275	250									
18									305	275	275	315	300	300	280	280	255									
19									300	275	290	295	280	295	280	280	280	270								
20									260	310	295	275	270	290	295	305	295	295	290							
21								L	275	300	305	285	260	275	305	330	305	290	270							
22									280	285	275	265	270	300	305	300	275	255								
23									315	300	260	270	275	305	325	300	290	250								
24									260	260	320	285	290	345	315	300	285	300	270							
25									410	330	285	305	300	300	350	305	295	260	265							
26									350	285	275	280	320	330	325	315	330	290	265							
27									255	270	275	280	270	275	315	310	305	305	275							
28									260	255	290	270	335	355	310	275	280	265	255							
29									260	265	270	300	275	300	315	305	300	280	270							
30								A	300	275	290	280	320	320	300	300	300	260								
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								13	27	29	30	29	29	30	30	30	28	16								
MED								260	300	285	282	290	300	302	300	288	270	262								
UQ								275	315	305	290	300	305	315	305	300	285	270								
LQ								255	278	275	270	275	280	295	295	280	260	252								

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H^oF₂ (KM)

IONOSPHERIC DATA

APR. 1987

H' F (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	WAKKANAI																								
Lat.	45 23.5 N												Long.	141 41.2 E											
Sweep 1	MHz to 25 MHz in 24 sec in automatic operation																								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	260	255	265	255	235	220	215	205	200 ^H	205	210	205	205	210	200	200 ^H	245	240	230	220	240	260	270	255	
2	250	250	250	240	235	245	220	240	225	220 ^H	200	205	210	200	200	215	220	245	215	220	250	250	260	275	
3	275	230	250	265	260	225	205 ^H	225	210	225	210	205	205	210	200	200	205	230	225	220	245	250	250	250	
4	275	275	275	255	220	205	205	210	225	215	210	210	205	200	200 ^H	200 ^H	240	245	245	245	275	250	255	275	
5	260	300	285	225	S	S	270	240	240	230	225	220	205	205	205	225	225	240	245	235	220	250	255	300	265
6	280	275	270	240	240	240	235	235	230	225	215	200 ^H	A	240	215	220	195 ^H	245	240	225	245	240	250	270	275
7	260	260	275	240	245	220	225	220	220	225	205	215	A	200	205	225	225	245	255	260	240	245	220	240	265
8	270	285	275	290	250	215	225	240	230	235	225	215	200	205	200	250	240	240	250	245	245	235	260	250	
9	270	265	270	270	250	230	225	225	240	210	215	205	205	A	190	240	245	230	240	235	265	250	255	255	
10	285	295	300	265	260	235	235	230	215	225	205	205	205	205	200	240	250	250	240	240	245	245	250	245	
11	260	260	260	215	240	225	225	235	250 ^A	245 ^A	A	A	A	215	A	A	250	250	245	A	250	230	290	A	
12	290	305	275	230	210	230	A	A	A	250	240	A	215	200	215	230	250	245	225	240	270	250	230	255	
13	305	280	300	255	230	245	225	235	225	215	205	200	215	225 ^A	A	230	A	240	245	250	250	245	250	250	
14	285	295	305	305	305	255	240	220	205	210	215	210	205	210	220	205	215	230	240	250	250	260	250	265	
15	295	275	280	250	245	225	245	240	215	230	205	200	195	200	220	220	240	225	240	230	250	250	250	275	
16	275	295	285	280	255	240	225	225	215	250	205	205	210	200	205	205	240	235	240	250	250	250	240	255	
17	260	270	260	245	215	215	225	235	220	210 ^H	205	210 ^H	200	200	245 ^A	225 ^A	245 ^A	250	225	240	250	255	235	265	
18	295	300	280	260	240	205	215	215	225	220	215	200	195	205	225	220	225	245	225	240	250	255	250	260	
19	280	255	270	255	235	200	200 ^H	230	230	A	210	210	205	210	225	215	230	245	265	250	220	245	245	250	
20	265	250	255	240	250	245	220	240	240	A	225	230 ^A	205	205	215	205	230	240	250	235	225	230	230	255	
21	250	250	260	260	250	220	235 ^H	210	215	205	250	205	A	200	235	215	230	A	250	225	250	245	250	250	
22	275	270	260	250	220	225	225	205	235	205	230	205	200	200	200	235	240	240	250	235	225	250	265	270	
23	255	250	265	220	275	250	225	225	215	225	240	205	225	205	200	215	240	240	235	235	235	240	250	250	
24	260	270	275	250	225	225	215	220	225	205	220	200	215	205	A	225	A	255	A	A	215	A	250	295	
25	305	275	A	220	235	255	250	230 ^H	A	A	230	200	205	205	200	200 ^H	225	A	250	250	250	240	240	250	
26	255	265	295	250	230	200 ^H	220	215	250	215	205	200	205	A	A	220	220	250	250	250	235	220	220	250	
27	275	275	265	250	225	215	220	235	215	235	205	210	205	205	200	210	200 ^H	235	255	250	255	230	225	245	
28	255	270	270	280	250	240	220	225	215	205	200	205	205	205	245	250	A	A	250	230	250	250	250	250	
29	265	270	265	250	250	235	215	210	215	200	200	205	205	210	240	200 ^H	215	A	A	A	230	255	255	240	
30	235	255	295	255	250	225	A	235	A	215	215	205	205	205	200 ^H	250 ^A	A	A	A	A	250	245	220	205	260
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	29	30	29	30	28	29	27	27	29	28	28	28	26	29	27	25	27	27	30	29	30	29	
MED	270	270	270	250	240	225	225	225	225	220	210	205	205	205	210	220	240	240	240	240	250	250	250	255	
UQ	280	280	280	260	250	240	230	235	230	225	220	210	208	210	225	230	245	245	250	250	250	250	255	265	
LQ	260	255	265	240	230	220	218	220	215	210	205	202	205	200	200	205	225	240	232	232	240	240	240	250	

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H' F (KM)

IONOSPHERIC DATA

APR. 1987

H^oE (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	WAKKANAI																							
Lat.	45° 23.5' N												Long. 141° 41.2' E											
Sweep 1	MHz to 25 MHz in 24 sec in automatic operation																							
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						S	115	110	110	105	110	110	110	115	110	115	135	S						
2						S	110	115	105	115	115	110	115	115	115	A	125	S						
3							125	115	115	105	110	110	110	115	110	115	120	125	S					
4							130	115	110	110	115	110	105	B	130	120	115	115	140	S				
5							130	115	110	110	110	115	115	115	110	115	115	120	S					
6						S	150	115	110	110	110	105	110	105	110	A	125	135	S					
7							125	115	110	110	115	110	105	110	110	105	A	125	S					
8							130	120	110	110	110	110	105	105	105	105	110	A	S					
9							130	115	110	105	110	110	105	110	105	A	120	120	S					
10							125	115	110	105	110	110	110	110	110	105	115	120	S					
11						S	125	115	110	110	110	105	115	115	115	110	115	125	S					
12						S	125	115	110	105	105	110	105	105	105	A	A	A	S					
13						S	125	110	110	110	105	110	110	110	A	A	A	115	S					
14						S	120	115	110	110	105	110	105	110	110	110	110	120	S					
15						S	120	110	110	105	105	105	105	110	110	110	110	120	S					
16						S	120	115	110	105	105	105	105	105	105	110	110	120	S					
17						S	120	115	110	110	105	110	110	A	A	A	A	A	A	S				
18						S	125	115	115	115	110	115	115	105	115	115	115	125	S					
19						S	120	110	110	A	105	110	110	110	A	A	110	110	A					
20						S	120	115	110	110	110	110	110	110	A	A	110	115	S					
21						S	120	110	110	110	105	110	110	110	A	115	115	A	S					
22						S	120	110	105	105	105	105	105	A	110	110	110	120	S					
23						S	120	110	110	105	110	105	105	105	110	115	115	120	S					
24						S	130	115	115	110	110	110	110	A	A	105	120	120	S					
25						S	125	115	105	105	105	110	105	115	110	105	A	A	S					
26						S	120	115	110	110	110	105	110	110	110	110	A	A	S					
27						S	A	110	105	105	105	110	110	110	120	110	120	A	S					
28						S	115	110	110	105	110	110	105	115	115	110	110	120	S					
29						S	120	110	105	105	105	A	A	105	110	115	105	115	S					
30						S	115	110	105	110	105	105	A	A	A	A	A	A	S					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							27	30	30	29	30	29	28	26	23	23	22	22						
MED							125	115	110	110	110	110	110	110	110	110	115	120						
UQ							125	115	110	110	110	110	110	115	115	115	115	125						
LQ							120	110	110	105	105	105	105	105	110	110	110	120						

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H^oE (KM)

IONOSPHERIC DATA

APR. 1987

H^oES (KM)

135° E Mean Time (G.M.T. + 9 h)

Station WAKKANAI				Lat. 45° 23.5' N				Long. 141° 41.2' E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation															
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	S	S	S	S	E	S	S	G	G	G	G	G	G	G	G	G	G	G	S	S	S	S	S	S			
2	S	S	S	E	S	S	150	G	G	G	115	G	G	G	G	G	105	G	S	S	S	S	S	S			
3	S	E	S	S	S	S	G	G	G	G	G	G	G	G	G	G	G	G	S	S	S	S	S	S			
4	S	S	S	S	S	S	G	155	G	G	G	G	G	G	G	G	G	G	S	S	S	S	S	S			
5	S	S	S	S	S	S	130	130	G	G	G	G	G	G	G	G	G	G	S	S	S	S	S	S			
6	S	S	S	S	E	S	150	150	G	G	G	G	120	120	110	115	G	G	S	S	S	S	S	S			
7	S	S	S	E	105	100	G	G	G	115	G	110	110	110	G	G	105	145	125	100	S	S	S	S			
8	S	S	S	105	100	100	G	130	130	G	G	G	G	G	G	G	150	105	S	S	S	S	S	S			
9	S	S	S	S	S	S	G	G	150	G	135	125	G	110	G	105	150	135	125	120	110	S	S	E			
10	S	S	S	S	S	S	G	G	G	G	G	110	110	G	110	G	150	125	120	115	S	105	S	S			
11	S	S	S	S	S	S	G	G	135	125	125	115	115	120	120	115	120	140	125	115	115	115	115	110			
12	110	S	S	S	S	S	125	125	120	120	115	110	105	105	105	100	100	100	S	120	115	S	S	S			
13	S	S	S	S	E	S	G	150	G	G	G	G	G	G	G	G	110	105	110	105	115	S	S	S			
14	S	S	S	S	S	S	G	G	G	G	G	G	G	G	G	G	G	G	S	S	S	S	S	S			
15	S	S	S	S	S	S	G	G	G	125	G	G	120	G	G	G	G	G	S	S	S	S	S	S			
16	S	S	S	S	S	S	G	G	G	125	G	G	115	G	G	G	G	G	140	S	S	S	S	S			
17	S	S	S	S	S	S	G	G	G	G	G	G	110	105	105	100	100	100	125	120	S	115	S	S			
18	105	S	E	S	S	S	G	G	G	G	G	G	G	G	105	G	G	G	S	S	S	S	S	S			
19	S	E	E	E	E	S	G	G	G	105	115	115	110	G	105	105	100	G	100	120	S	S	S	S			
20	S	E	S	S	E	S	G	G	120	115	120	110	G	G	105	135	G	G	S	S	S	115	S	S			
21	S	S	100	S	S	S	G	G	G	G	G	110	110	110	105	100	100	100	100	S	S	E	S	S			
22	S	S	S	S	S	140	G	G	G	G	125	G	105	105	G	G	G	G	125	120	100	S	S	S			
23	S	S	S	S	S	S	G	G	125	125	125	G	G	G	105	100	G	135	120	100	S	S	S	S			
24	S	S	S	S	S	S	G	G	G	G	G	G	110	105	105	135	125	135	120	115	120	115	110	110			
25	105	105	105	100	105	S	G	130	120	115	120	G	G	G	G	G	105	105	100	100	S	S	S	S			
26	S	100	100	S	S	S	150	G	125	120	115	110	115	110	110	G	105	100	100	100	100	S	S	S			
27	S	S	S	E	E	S	115	125	120	120	125	G	G	G	105	G	100	105	100	S	S	S	S	S			
28	S	S	S	E	S	S	G	G	G	G	G	G	G	G	G	150	125	120	120	S	S	S	S	S			
29	S	S	S	S	S	S	150	125	120	115	G	105	105	145	G	105	G	125	120	115	S	S	S	S			
30	S	S	S	S	S	100	125	140	125	120	115	110	105	105	105	100	100	125	115	115	110	S	S	S			
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	3	2	3	2	3	4	8	10	11	13	12	11	15	13	15	14	17	17	17	14	7	5	2	2			
MED	105	102	100	102	105	100	140	130	125	120	120	110	110	110	105	105	105	120	120	115	110	115	112	110			
UQ	108		102		105	120	150	150	128	125	125	112	115	110	108	115	125	135	125	120	115	115					
LQ	105		100		102	100	125	125	120	115	115	110	108	105	105	100	100	105	100	100	105	115					

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H^oES (KM)

IONOSPHERIC DATA

APR. 1987

TYPES OF ES

135° E Mean Time (G.M.T. + 9 h)

Station	WAKKANAI				Lat. 45° 23.5' N	Long. 141° 41.2' E	Sweep 1	MHz to 25	MHz in 24	sec in	automatic operation														
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1																									
2						H ₂					C ₁						L ₂								
3																									
4								H ₁																	
5							C ₂	C ₁																	
6						C ₁	H ₁						C ₁	C ₁	C ₁	L ₁									
7					F ₂	F ₁				C ₁	C ₂	C ₂	C ₂	C ₁			L ₂	C ₂	C ₁	F ₁					
8				F ₂	F ₂	F ₁		C ₂	C ₁								H ₁	L ₂							
9									H ₁		H ₁	C ₁		C ₂		L ₂	H ₁	C ₂	C ₂	F ₁	F ₄				
10											C ₂	C ₂	C ₂		C ₂		H ₁	CL ₂₁	C ₂	F ₂		F ₁			
11									C ₂	C ₁	C ₁	C ₂	C ₂	C ₂	C ₁	C ₂	C ₁	H ₁	C ₄	F ₅	F ₃	F ₁	F ₃	F ₄	
12	F ₂					C ₂	C ₂	C ₂	C ₁	C ₁	C ₁	C ₁	C ₂	C ₂	L ₂	L ₂	L ₂	L ₂		F ₁	F ₃				
13							H ₁							C ₂	L ₂	L ₂	L ₂	C ₂							
14																									
15									C ₁				C ₁												
16									C ₁				C ₁						C ₁						
17													C ₁	L ₂	L ₂	L ₃	L ₃	L ₃	CL ₂₂	F ₁		F ₂			
18	F ₂														L ₁										
19									L ₁	C ₁	C ₁	C ₁	C ₁		L ₂	L ₂	L ₂		L ₃	F ₁					
20								C ₂	C ₁	C ₁	C ₂				L ₂	L ₂						F ₁			
21			F ₂								C ₁	C ₂	C ₂	L ₂	L ₂	L ₂	L ₂	L ₂	L ₂						
22						C ₁					C ₁		C ₁	L ₁					C ₂	F ₁	F ₁				
23									C ₁	C ₁	C ₁								C ₁	C ₂	F ₂				
24												C ₁	L ₁	L ₂	H ₁		C ₂	C ₂	C ₅	F ₀	F ₁	F ₄	F ₂	F ₂	
25	F ₂	F ₃	F ₄	F ₂	F ₁			C ₂	C ₂	C ₁	C ₁					L ₂	L ₄	L ₂	F ₃						
26		F ₂	F ₂				H ₁		C ₁	C ₁	C ₁	C ₁	C ₂	C ₂	C ₁		L ₂	L ₂	L ₂	F ₂	F ₁				
27							L ₁	C ₁	C ₂	C ₁	C ₁				L ₁		L ₁	LH ₁₁	L ₁						
28																H ₁	C ₂	C ₃	C ₂						
29							H ₁	C ₁	C ₂	C ₁		L ₁	L ₂	H ₁		L ₂		C ₃	CL ₄₁	F ₅					
30						L ₂	C ₅	H ₁	C ₂	C ₁	C ₁	C ₁	L ₁	L ₂	L ₂	L ₂	LC ₂₂	CL ₃₂	C ₃	F ₂	F ₂				
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
UQ																									
LQ																									

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TYPES OF ES

IONOSPHERIC DATA

APR. 1987

FXI (0.1 MHz)

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

Station	AKITA				Lat. 39 43.5 N	Long. 140 08.0 E	Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	X 48	X 48	X 46	X 45	X 45	X 44														X 63	X 58	X 52	X 51	X 52					
2	X 52	X 50	X 49	X 45	X 33	X 38														X 51	X 42	X 42	X 42	X 42					
3	X 42	X 42	X 40	X 38	X 37	X 40														X 59	X 51	X 46	X 42	X 41					
4		43	50	45	50	46		c														54	56	52	54				
5		52	47	48	40	30	33													X 53	47	48	48	49					
6		47	48	45	39	38	X 39													X 52	X 49	X 46	X 43	X 42					
7		X 42	49	49	50	49	44													X 63	X 62	X 51	X 42	X 41					
8		X 40	X 41	47	50	X 40	X 41													X 64	X 62	X 55	X 53	X 52					
9		X 51	X 49	60	60	59	51													X 61	X 60	X 56	X 50	52					
10		51	51	51	49	47	43													X 71	X 61	X 55	X 47	X 48					
11		X 46	49	50	X 45	X 40	X 42													X 72	X 65	X 58	X 51	X 61					
12			55	51	51	56	39	X 39												X 61	X 58	X 56	X 50	X 46					
13		X 46	X 45	X 44	X 44	X 41	X 45													X 76	X 79	X 56	X 48	51					
14		X 47	X 47	X 46	X 42	X 41	49													X 65	X 63	X 62	X 61	X 58					
15		X 56	X 56	X 53	X 53	X 45	X 42													X 67	X 64	X 59	X 55	X 55					
16		X 56	X 52	X 50	X 49	X 50														X 65	X 65	X 64	X 63	X 66					
17			66	65	64	68	58	56	62											X 65	X 63	X 56	X 56	X 55					
18		X 54	X 52	X 50	X 53	45														X 67	X 64	X 60	X 57	62					
19		X 56	X 56	X 52	X 50	X 44														X 93	X 78	X 60	X 58	X 56					
20		X 53	X 52	X 52	X 50	X 45														X 92	X 85	X 62	X 58	X 52					
21		X 50	X 48	X 47	X 46	X 45														X 75	X 70	X 61	X 56	X 56					
22		X 54	X 52	X 53	X 55	X 40														X 74	X 70	X 58	X 55	X 55					
23		X 56	X 54	X 52	X 49	X 46														X 73	X 69	X 55	X 56	X 59					
24			54	53	54	56	42													X 90	X 79	X 58	X 53	X 53					
25			52	X 50	54	52	X 37													X 66	X 65	X 63	X 53	X 55					
26		X 52	X 50	X 46	X 45	X 44														X 73	X 76	X 55	X 46	X 45					
27		X 45	X 45	X 45	46	44	50													X 81	X 78	X 71	X 66	X 57					
28		X 58	56	54	52	53														X 71	X 67	X 62	X 56	X 53					
29		X 51	X 50	X 47	X 46	X 45														X 69	X 66	X 69	X 66	X 62					
30			56	53	53	50	49													X 88	X 89	X 66	X 67	X 62					
31																													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	30	30	30	30	30	16	1													29	30	30	30	30					
MED	X 52	X 50	X 50	X 50	X 44	X 42	62													X 68	X 64	X 57	X 54	X 54					
UQ	X 55	X 52	X 53	X 52	X 46	X 47														X 74	X 70	X 62	X 58	X 57					
LQ	X 47	X 48	X 46	X 45	X 40	X 40														X 64	X 60	X 55	X 48	X 49					

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FXI (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FOF2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

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

APR. 1987

FOF2 (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	AKITA				Lat. 39 43.5 N				Long. 140 08.0 E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	420	430	430	430	420	420	L	L							
2									L	L	420	440	440	440	L	L								
3									L	L	420	430	430	430	420	400								
4									L	420	430	440	440	430	420	400	L	L						
5									L	420	420	420	440	430	420	410	L	L						
6									L	420	440	430	440	440	430	410	A							
7								L	L	410	440	440	A	440	A	420	L	A						
8									L	430	440	450	460	450	440	410	L							
9								L	410	430	440	450	460	450	L	L	L							
10								L	L	440	440	L	460	460	460	L	L	A						
11								L	L	440	440	L	L	470	L	430	L	L						
12									L	440	460	450	460	460	460	430	400	L						
13								L	L	440	450	460	460	460	440	A	L							
14									440	440	460	460	470	460	450	420	L							
15								L	440	450	460	460	460	460	450	L	L							
16									430	A	460	460	460	470	460	420	L							
17									440	420	460	L	490	470	460	420	390	L						
18									L	450	L	L	470	460	450	430	410	L						
19									420	450	460	460	460	470	460	430	400	L						
20									L	460	460	460	460	A	450	420	410	L						
21								L	440	440	440	450	460	460	450	430	A	A						
22									L	410	440	460	460	440	L	440	420	390	L					
23								L	420	420	440	460	460	460	440	420	400	A						
24									400	410	A	430	460	440	450	440	L	400	L					
25								L	400	410	430	430	A	440	420	440	420	400	A					
26									380	410	420	440	440	450	440	430	410	400	L					
27								L	A	A	440	440	450	440	430	430	L	L						
28								L	410	430	440	460	450	440	430	410	L	L						
29								L	410	430	440	440	440	L	430	430	A	A						
30								A	A	A	A	440	450	A	440	A	A	A						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	14	25	28	25	28	26	27	24	10							
MED								400	415	430	440	450	455	450	440	420	400							
UQ								400	440	440	460	460	460	460	450	430	400							
LQ								390	410	420	435	440	440	440	430	410	400							

APR. 1987

FOF1 (0.01 MHz)

IONOSPHERIC DATA

APR. 1987

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 0 h)

Station	AKITA				Lat. 39° 43.5' N	Long. 140° 08.0' E	Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																							
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
1							S 220	A 295	310		A	A	310	300	295	245	200							S						
2							S 220	255	300		A	310	320	320	A	285	270	195						S						
3							190	230	275		A	A	325	325	325	A	295	250	210					S						
4							200	250	290	305	310	330	315	320	300	290	245	200						S						
5							190	240		A	300	310	320		A	315	300	235	250	215				S						
6							S 240	280	305	305	315		A	A	A	A	A	A	S					S						
7							S 225	285		A	A	A	A	A	A	300	265	210						S						
8							200	250	280	305	315	325	330		A	A	295	255	215					S						
9							205	255	295	305	330	330		A	A	A	300	280	215					S						
10							200	255	305	310		A	335		A	A	A	300	265	215				S						
11							185	245	290	310	320		A	A	335	320	300	270	240					S						
12							190	270	300		A	A	A	A		320	295	260		A	S			S						
13							195	245	290	325		A	A	A	340	325		A	A	A	S			S						
14							200	255	300		A	A	A	340	340	320	300	275	230					S						
15							200	250	295	310	320		A	330	330	320	310	275	230					S						
16							S 200	250	300	305	320		A	A	A	A	300	275	220					S						
17							S 200	260	290	315	330	330	340	325	310	300	280	220						S						
18							S 205	260	295	320		A	A	335	340	340		A	A	210				S						
19							S 200	270	300	315		A	A	A	A	A	A	A	240					S						
20							S A	260	305		A	A	A	A	A	A	A	A	240					S						
21							S 205	280	300		A	330	340		A	A	315	295		A	A	S		S						
22							S 210	255	300	310		A	340		A	345	315	295	270	220				S						
23							S 210	250	285	305	315		A	A	340		295	260		A	S			S						
24							S 220	255	300	310		A	340		A	A	310	295	275		A	S		S						
25							S 205		A	A	A		330		A	A	A	A	A	A	S			S						
26							S 205	255	300		A	A	340		A	A	A	300	275		A	S		S						
27							S 215	260	290		A	A	A		A	A	305	290	270	235				S						
28							S 210	260		A	A		320		A	A	330	310	295	260	215			S						
29							S 205	255	290	300		A	A		A	A	A	300	275	235				S						
30							S 235		A	295		A	A		340		A	A	A	300	275	240		S						
31																														
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT							25	28	26	19	14	14	8	14	15	24	23	22												
MED							200	255	295	305	320	330	330	330	315	295	270	218												
UQ							205	260	300	310	330	340	338	340	320	300	275	235												
LQ							200	245	290	305	310	325	322	320	308	295	260	210												

The Radio Research Laboratory, Japan

APR. 1987

FOE (0.01 MHz)

IONOSPHERIC DATA

APR. 1987

FOES (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station		AKITA							Lat.	39 43.5 N			Long.	140 08.0 E			Sweep 1 MHz to 25 MHz in 24 sec in automatic operation										
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 17	G	J A 30	G	G	J A 34	J A 36	G	G	G	J A 28	J A 20	J A 23	E S 15	E S 15	E S 15	E S 15			
2		E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 17	G	G	35	36	G	39	G	J A 72	J A 44	30	23	J A 41	J A 40	J A 29	E S 15	E S 15	E S 15		
3		E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	G	G	G	J A 34	J A 45	G	G	G	J A 39	G	G	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16			
4		E S 15	E S 15	E S 15	E S 15	E S 15	C	G	G	34	G	G	G	G	G	G	J A 25	G	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15			
5		E S 15	E S 15	E S 15	E S 15	E S 16	22	32	J A 38	G	G	G	36	G	G	G	J A 32	25	21	E S 16	E S 15	E S 15	E S 15	E S 15			
6		E S 15	E S 15	E S 15	E S 15	E S 15	E S 17	29	33	37	G	35	39	37	J A 34	J A 32	J A 61	29	24	J A 28	J A 21	J A 25	E S 15	E S 15			
7		E S 15	E S 15	E S 15	E S 15	E S 15	E S 17	G	G	J A 43	J A 41	J A 54	J A 51	J A 66	J A 49	G	33	J A 41	J A 29	J A 41	J A 21	E S 15	E S 15	E S 15			
8		E S 15	E S 15	E S 15	E S 15	E S 15	G	G	32	J A 41	42	38	37	37	J A 32	G	G	25	18	J A 23	J A 24	E S 15	E S 15	E S 15			
9		E S 15	E S 15	E S 15	E S 15	E S 15	G	G	G	G	G	38	38	J A 35	J A 36	G	G	27	J A 24	J A 24	J A 26	J A 28	J A 23	J A 20			
10		E S 15	E S 15	E S 15	E S 15	E S 15	G	G	G	G	J A 38	38	41	J A 49	36	G	40	J A 39	J A 65	J A 44	J A 39	J A 20	J A 24	E S 15			
11		E S 15	E S 15	E S 15	E S 15	E S 15	G	32	39	40	J A 45	36	J A 43	G	G	35	G	27	24	J A 27	E S 15	E S 15	E S 15	E S 15			
12		J A 28	J A 34	J A 21	J A 21	E S 15	G	G	40	J A 48	J A 46	40	J A 44	J A 38	G	31	G	24	J A 28	E S 15	E S 15	J A 25	J A 32	J A 24			
13		E S 15	E S 15	E S 15	E S 15	J A 18	E S 15	G	G	G	G	39	J A 36	38	G	40	J A 50	J A 44	J A 35	J A 28	J A 39	J A 24	E S 15	E S 15			
14		J A 24	J A 20	E S 15	E S 15	E S 15	G	G	33	34	J A 35	J A 34	G	G	37	G	G	26	20	E S 15	E S 15	E S 15	E S 15	E S 15			
15		E S 15	E S 15	E S 15	E S 15	E S 15	25	29	35	G	37	J A 45	G	G	G	G	36	J A 35	J A 28	J A 25	J A 32	E S 15	E S 15	E S 15			
16		E S 15	E S 15	E S 15	E S 15	E S 16	G	31	38	48	39	42	39	35	38	G	32	31	J A 28	J A 20	J A 20	E S 16	E S 15	E S 15			
17		E S 15	E S 15	E S 15	E S 15	E S 16	G	G	32	35	J A 54	G	37	G	G	G	G	G	20	J A 24	J A 21	J A 36	J A 32	E S 15			
18		E S 15	J A 28	E S 15	E S 15	E S 17	28	33	42	39	37	35	G	G	G	36	32	G	J A 20	J A 18	E S 15	E S 15	E S 16	E S 15			
19		E S 15	E S 15	E S 15	E S 15	E S 17	G	G	G	37	36	39	36	J A 37	35	J A 40	J A 108	G	21	J A 21	J A 21	J A 18	E S 15	E S 15			
20		E S 15	E S 15	E S 15	E S 15	E S 16	38	G	G	38	J A 41	J A 50	J A 46	J A 100	J A 44	J A 34	J A 32	G	E S 17	E S 15	J A 21	J A 20	J A 20	E S 16			
21		E S 15	J A 13	E S 15	E S 15	E S 16	24	G	G	J A 54	G	40	36	36	G	33	J A 54	J A 37	J A 24	E S 16	E S 15	E S 15	E S 15	E S 15			
22		E S 15	E S 15	E S 15	E S 15	E S 16	G	G	G	36	39	37	37	G	G	G	G	29	24	J A 24	J A 18	E S 16	E S 15	E S 15			
23		E S 15	E S 15	E S 15	E S 15	E S 16	G	29	37	34	37	37	36	G	38	35	37	J A 40	J A 38	J A 32	J A 27	E S 15	J A 51	J A 29			
24		E S 15	E S 15	E S 15	E S 15	E S 16	G	33	J A 46	J A 54	32	J A 50	J A 46	40	37	41	J A 64	J A 52	J A 53	J A 78	J A 24	J A 40	J A 21	J A 44			
25		J A 64	J A 44	J A 44	J A 60	J A 25	25	J A 35	J A 42	J A 42	41	J A 64	J A 44	36	J A 35	J A 34	J A 50	J A 48	J A 26	E S 16	E S 15	J A 33	J A 50	J A 24			
26		J A 18	E S 15	J A 18	J A 24	J A 21	E S 17	G	G	36	35	41	44	39	46	39	G	J A 35	J A 41	J A 45	J A 41	E S 15	E S 15	E S 15			
27		E S 15	J A 24	J A 21	J A 44	J A 20	E S 17	25	34	J A 49	J A 49	J A 46	40	J A 40	J A 40	G	G	G	G	22	E S 16	J A 18	E S 15	E S 15			
28		E S 15	E S 15	E S 15	E S 15	E S 16	G	G	32	35	G	35	J A 35	37	41	40	J A 46	J A 44	J A 46	J A 34	J A 43	E S 15	E S 15	E S 15			
29		E S 15	E S 15	E S 15	J A 20	E S 19	28	J A 40	40	38	J A 41	J A 39	37	45	41	G	J A 44	J A 44	J A 29	J A 38	J A 40	J A 25	E S 15	J A 29			
30		J A 44	J A 41	J A 28	J A 21	J A 19	E S 16	G	J A 41	J A 55	J A 124	65	G	J A 42	J A 48	45	45	J A 50	J A 53	J A 50	J A 31	J A 40	J A 24	J A 15			
31																											
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT		30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MED		E S 15	E S 15	E S 15	E S 15	E S 16	G	G	33	36	38	38	38	38	36	36	G	32	28	J A 24	J A 24	J A 21	E S 16	E S 15	E S 15		
UQ		E S 15	E S 15	E S 15	E S 15	E S 16	22	32	39	J A 42	J A 41	40	41	40	39	35	J A 44	J A 39	J A 29	J A 34	J A 27	J A 25	J A 21	J A 16			
LQ		E S 15	E S 15	E S 15	E S 15	E S 15	G	G	G	34	32	34	36	G	G	G	G	23	20	E S 16	E S 15	E S 15	E S 15	E S 15			

APR. 1987

FOES (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FBES (0.1 MHz)

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

Station	AKITA				Lat. 39 43.5 N	Long. 140 08.0 E	Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	E 15	E 15	E 15	E 15	E 15	E 15	E 17	G	29	G	G	34	33	G	G	G	G	E 16	E 16	E 16	E 15	E 15	E 15	E 15					
2	E 15	E 15	E 15	E 15	E 15	E 15	E 17	G	G	33	34	G	35	G	40	20	28	23	20	18	29	E 15	E 15	E 15					
3	E 15	E 15	E 15	E 15	E 15	E 15	G	G	G	32	24	G	G	G	31	G	G	G	E 16	E 16	E 16	E 15	E 16	E 16					
4	E 15	E 15	E 15	E 15	E 15	C	G	G	32	G	G	G	G	G	G	G	G	G	E 16	E 15	E 15	E 15	E 15	E 15					
5	E 15	E 15	E 15	E 15	E 15	E 16	21	30	29	G	G	G	35	G	G	G	G	23	24	20	E 16	E 15	E 15	E 15					
6	E 15	E 15	E 15	E 15	E 15	E 15	E 17	28	33	36	G	35	36	34	32	31	40	26	22	E 15	18	20	E 15	E 15					
7	E 15	E 15	E 15	E 15	E 15	E 15	E 17	G	G	34	37	35	50	34	44	G	33	39	28	37	18	E 15	E 15	E 15					
8	E 15	E 15	E 15	E 15	E 15	E 15	G	G	32	38	40	36	37	34	32	G	G	G	E 18	E 16	19	22	E 15	E 15					
9	E 15	E 15	E 15	E 15	E 15	E 15	G	G	G	G	G	37	35	35	34	G	G	25	E 16	19	25	22	18	E 15					
10	E 15	E 15	E 15	E 15	E 15	E 15	G	G	G	G	34	37	40	36	33	G	35	35	A 65	33	33	19	20	E 15					
11	E 15	E 15	E 15	E 15	E 15	E 15	G	31	38	38	40	36	37	G	G	34	G	26	22	27	E 15	E 15	E 15	E 15					
12	E 15	26	E 15	E 15	E 15	E 15	G	G	34	41	41	37	34	35	30	24	G	24	22	E 15	E 15	18	E 15	22					
13	E 15	E 15	E 15	E 15	E 15	E 15	G	G	G	G	37	36	37	G	36	45	35	30	27	38	E 15	E 15	E 15	E 15					
14	E 15	E 15	E 15	E 15	E 15	E 15	G	G	32	34	35	34	G	G	36	G	G	26	20	E 15	E 15	E 15	E 15	E 15					
15	E 15	E 15	E 15	E 15	E 15	E 15	25	28	34	G	36	35	G	G	G	G	35	30	25	24	25	E 15	E 15	E 15					
16	E 15	E 15	E 15	E 15	E 15	E 16	G	30	34	45	37	36	36	35	35	G	31	24	22	E 16	19	E 16	E 15	E 15					
17	E 15	E 15	E 15	E 15	E 15	E 16	G	G	32	35	29	G	37	G	G	G	G	G	18	E 15	E 15	29	30	E 15					
18	E 15	E 15	E 15	E 15	E 15	E 17	28	31	41	38	37	35	G	G	G	33	30	G	19	E 15	E 15	E 15	E 16	E 15					
19	E 15	E 15	E 15	E 15	E 15	E 17	G	G	G	36	36	38	36	36	35	32	32	G	20	E 15	20	E 15	E 15	E 15					
20	E 15	E 15	E 15	E 15	E 15	E 16	25	G	G	36	35	39	38	A 100	38	32	28	G	E 17	E 15	E 15	E 15	E 15	E 16					
21	E 15	E 15	E 15	E 15	E 15	E 16	24	G	G	34	G	38	36	36	G	27	50	35	20	E 16	E 15	E 15	E 15	E 15					
22	E 15	E 15	E 15	E 15	E 15	E 16	G	G	G	34	38	37	36	G	G	G	G	28	22	24	E 15	E 16	E 15	E 15					
23	E 15	E 15	E 15	E 15	E 15	E 16	G	29	35	34	37	37	36	G	33	35	36	38	21	19	E 15	E 15	22	23					
24	E 15	E 15	E 15	E 15	E 15	E 16	G	31	40	48	40	43	38	36	35	35	36	32	30	42	20	19	18	30					
25	E 15	E 15	22	25	23	20	25	30	33	34	36	50	35	35	35	33	31	40	26	E 16	E 15	30	29	E 15					
26	E 15	E 15	E 15	E 15	E 15	E 17	G	G	33	35	39	40	38	36	35	G	G	G	25	40	43	E 16	E 15	E 15	E 15				
27	E 15	E 15	E 15	22	E 15	E 17	25	32	42	44	42	38	37	35	G	G	G	G	20	E 16	E 15	E 15	E 15	E 15					
28	E 15	E 15	E 15	E 15	E 15	E 16	G	G	31	33	G	35	35	36	40	39	37	33	25	32	29	E 15	E 15	E 15					
29	E 15	E 15	E 15	E 15	E 15	18	28	35	38	37	41	36	37	43	38	G	42	43	22	38	32	E 15	E 15	E 15					
30	28	E 15	E 15	E 15	E 15	E 16	G	38	51	A 124	62	G	42	46	35	44	50	53	50	31	E 15	20	E 15	E 15					
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	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30					
MED	E 15	E 15	E 15	E 15	E 15	E 16	G	G	32	34	36	36	36	34	33	G	29	26	22	17	E 15	E 15	E 15	E 15					
UQ	E 15	E 15	E 15	E 15	E 15	E 16	21	30	34	33	39	37	37	36	35	33	35	33	25	31	20	18	E 16	E 15					
LQ	E 15	E 15	E 15	E 15	E 15	E 15	G	G	G	32	23	34	35	G	G	G	G	G	16	19	E 15	E 15	E 15	E 15					

APR. 1987

FBES (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FMIN (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	AKITA				Lat. 39 43.5 N	Long. 140 08.0 E	Sweep 1	MHz to 25		MHz in 24 sec in		automatic operation												
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E 15	E 15	E 15	E 15	E 15	E 15	E 17	16	17	17	17	17	17	17	17	17	16	E 16	E 16	E 16	E 15	E 15	E 15	E 15
2	E 15	E 15	E 15	E 15	E 15	E 15	E 17	16	16	16	18	18	17	18	17	17	17	E 16	E 16	E 15	E 15	E 15	E 15	E 15
3	E 15	E 15	E 15	E 15	E 15	E 15	E 16	16	16	16	17	16	18	16	17	16	16	E 16	E 16	E 16	E 16	E 15	E 16	E 16
4	E 15	E 15	E 15	E 15	E 15	C	E 15	16	17	17	16	16	17	17	17	17	16	E 16	E 15	E 15	E 15	E 15	E 15	E 15
5	E 15	E 15	E 15	E 15	E 15	E 16	E 16	16	16	16	17	17	18	17	18	16	17	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 17	16	16	18	17	17	18	18	18	17	16	E 16	E 15	E 15	E 15	E 15	E 15	E 15
7	E 15	E 15	E 15	E 15	E 15	E 15	E 17	15	17	17	18	17	20	19	17	17	17	E 16	E 16	E 16	E 15	E 15	E 15	E 15
8	E 15	E 15	E 15	E 15	E 15	E 15	E 16	16	16	17	17	17	18	17	18	17	17	E 16	E 15	E 15	E 15	E 15	E 15	E 15
9	E 15	E 15	E 15	E 15	E 15	E 15	E 16	16	17	17	18	18	18	18	17	18	17	E 16	E 16	E 16	E 15	E 15	E 15	E 15
10	E 15	E 15	E 15	E 15	E 15	E 15	E 16	16	17	16	18	18	18	18	18	16	17	E 16	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	16	16	17	18	20	17	17	17	17	16	E 16	E 15	E 15	E 15	E 15	E 15	E 15
12	E 15	E 15	E 15	E 15	E 15	E 15	E 16	16	17	18	18	19	20	20	18	17	17	E 16	E 15	E 15	E 15	E 15	E 15	E 15
13	E 15	E 15	E 15	E 15	E 15	E 15	E 16	17	18	20	18	18	18	18	17	17	16	E 16	E 15	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	16	18	17	17	17	18	18	17	17	16	E 16	E 15	E 15	E 15	E 15	E 15	E 15
15	E 15	E 15	E 15	E 15	E 15	E 15	E 16	16	16	17	17	18	17	20	17	18	16	E 16	E 16	E 15	E 15	E 15	E 15	E 15
16	E 15	E 15	E 15	E 15	E 15	E 16	16	16	17	18	17	19	18	18	17	17	17	E 17	E 16	E 15	E 16	E 15	E 15	E 15
17	E 15	E 15	E 15	E 15	E 15	E 15	E 16	16	17	17	18	19	20	20	20	19	18	E 17	E 17	E 15	E 15	E 15	E 15	E 15
18	E 15	E 15	E 15	E 15	E 15	E 17	E 16	16	17	20	18	20	20	18	19	17	17	E 16	E 15	E 15	E 15	E 15	E 16	E 15
19	E 15	E 15	E 15	E 15	E 15	E 17	16	17	17	18	18	20	18	20	18	17	17	E 17	E 17	E 15	E 15	E 15	E 15	E 15
20	E 15	E 15	E 15	E 15	E 15	E 16	16	17	17	17	18	18	19	20	17	17	17	E 17	E 15	E 15	E 15	E 15	E 15	E 16
21	E 15	E 15	E 15	E 15	E 15	E 16	16	16	17	17	18	18	19	17	17	18	20	E 16	E 16	E 15	E 15	E 15	E 15	E 15
22	E 15	E 15	E 15	E 15	E 15	E 16	E 16	16	17	17	17	18	19	18	17	17	16	E 16	E 15	E 15	E 16	E 15	E 15	E 15
23	E 15	E 15	E 15	E 15	E 15	E 16	E 16	16	17	17	18	17	18	17	17	16	17	E 16	E 16	E 15	E 15	E 16	E 15	E 15
24	E 15	E 15	E 15	E 15	E 15	E 16	16	16	17	17	18	18	17	17	17	17	16	E 17	E 17	E 15	E 15	E 15	E 15	E 15
25	E 15	E 15	E 15	E 15	E 15	E 15	16	16	16	17	18	18	18	18	18	17	16	E 16	E 16	E 15	E 15	E 15	E 15	E 15
26	E 15	E 15	E 15	E 15	E 15	E 17	E 16	16	18	17	17	17	17	20	18	17	17	E 16	E 16	E 16	E 15	E 15	E 15	E 15
27	E 15	E 15	E 15	E 15	E 15	E 17	16	17	17	18	18	18	19	18	18	17	16	E 16	E 16	E 15	E 15	E 15	E 15	E 15
28	E 15	E 15	E 15	E 15	E 15	E 16	E 16	17	17	18	17	18	17	18	19	18	17	E 17	E 16	E 16	E 15	E 15	E 15	E 15
29	E 15	E 15	E 15	E 15	E 15	E 16	16	17	17	17	17	19	20	20	18	17	17	E 16	E 16	E 15	E 15	E 15	E 15	E 15
30	E 15	E 15	E 15	E 15	E 15	E 16	16	17	17	17	17	20	18	18	17	17	16	E 16	E 15	E 15	E 15	E 15	E 15	E 15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E 15	E 15	E 15	E 15	E 15	E 16	E 16	16	17	17	18	18	18	18	17	17	17	E 16	E 16	E 15	E 15	E 15	E 15	E 15
UQ	E 15	E 15	E 15	E 15	E 15	E 16	16	17	17	18	18	19	19	19	18	17	17	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 16	16	16	17	17	17	17	17	17	17	16	E 16	E 15	E 15	E 15	E 15	E 15	E 15

APR. 1987

FMIN (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

M(3000)F2 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station	AKITA				Lat.	39 43.5 N				Long	140 08.0 E				Sweep 1	MHz to 25 MHz in 24 sec in				automatic operation						
Hour Day	00	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	310	320	325	330	335	365	350	355	355	340	340	330	345	350	325	330	330	340	340	310	295	290	305		
2	315	310	330	335	340	335	355	360	360	355	335	330	345	340	325	325	340	355	370	345	330 ^S	315	310	320		
3	315	320	310	310	320	325	365	370	375	325	340	330	330	335	340	350	335	345	350	340	340	315	305	F		
4	F	F	F	F	F	F	360 ^{I C}	365	300	340	340	340	340	335	340	330	350	355	345	335	340	F	F	F	F	
5	F	F	F	F	F	F	320	355	335	300	325	350	335	330	315	340	335	350	345	355	330	F	F	F	F	
6	F	F	F	F	320	325	340	375	335	330	335	330	345	335	345	335	325	340	345	355	330	315	325	320	315	
7	325	305	F	F	F	F	355	345	295	330	350	320	335	335	320	335	345	330	320	320	340	335	320	315		
8	315	315	F	F	325	330	345	335	335	345	340	335	330	325	325	345	345	345	325	315	320	325	290	295		
9	295	295	F	F	F	F	355	340	335	335	350	355	330	345	325	335	340	350	345	315	310	320	305	F		
10	F	F	F	F	F	F	315	310	365	365	350	340	325	335	330	305	315	325	325	345	A	330	325	310	310	295
11	300	F	F	335	340	355	375	345	340	360	355	330	320	310	310	325	330	340	335	335	335	305	300	F		
12	F	F	F	F	F	F	340	360	335	345	335	330	340	315	320	325	330	340	340	340	315	325	305	305	300	
13	305	305	305	315	335	320	375	340	340	345	325	335	310	315	315	325	335	330	335	315	340	300	300	295	F	
14	290	295	300	280	285	F	345	320	330	330	330	315	315	315	330	345	340	350	340	315	300	300	290	290		
15	280	300	295	310	350	335	335	345	340	335	345	345	320	325	320	325	335	345	340	325	310	305	285	285		
16	290	295	300	295	320	325	345	310	315	330	325	335	330	320	325	340	320	345	345	315	315	300	300	300		
17	F	F	F	F	F	F	320	330	325	320	325	330	315	305	310	315	330	355	335	345	325	325	300	285	295	
18	295	290	290	F	F	325	345	350	330	330	320	310	305	305	305	320	335	345	335	320	315	295	295	F		
19	290	295	295	325	330	335	365	345	340	330	315	310	320	305	310	320	315	300	310	325	350	290	290	295		
20	310	305	305	320	310	325	370	320	315	320	335	330	320	A	310	310	310	295	310	325	335	325	290	295		
21	305	300	295	325	310	330	330	350	315	320	325	325	325	320	325	325	335	335	315	320	325	310	295	300		
22	290	300	300	345	335	330	355	335	320	325	325	385	330	315	320	325	330	340	320	325	335	305	290	285		
23	300	310	320	310	300	315	335	340	325	325	330	330	325	320	320	315	330	335	305	330	340	305	F	F		
24	F	F	F	F	F	F	335	335	380	340	350	345	335	330	325	320	315	310	315	310	315	335	360	F	F	
25	F	295	F	F	315	335	325	325	335	345	340	350	320	335	315	330	350	355	320	315	305	320	F	F		
26	315	305	310	315	330	345	350	360	350	350	335	335	305	300	315	335	325	340	335	325	345	350	315	300		
27	305	305	330	F	F	F	340	330	360	345	345	350	340	325	330	315	315	305	310	315	320	325	305	F	300	
28	305	F	F	F	F	F	325	335	350	355	355	340	355	305	310	330	335	340	330	335	325	320	325	305	310	300
29	315	300	315	315	325	350	380	345	365	350	350	335	340	320	315	325	325	335	340	330	315	F	F	F		
30	F	F	F	F	F	375	340	355	335	A	340	340	345	320	310	305	310	310	320	315	340	320	F	F		
31																										
CNT	24	23	18	19	22	27	30	30	30	29	30	30	30	29	30	30	30	30	29	30	29	26	24	19		
MED	302	300	305	320	325	335	355	342	338	335	335	335	325	320	320	325	335	340	335	325	325	305	300	300		
UQ	312	305	320	330	335	340	365	350	350	345	345	340	330	335	325	335	340	345	340	330	340	320	310	300		
LQ	295	298	300	312	315	325	345	335	325	330	330	330	320	315	315	325	325	330	320	315	315	300	290	295		

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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. + 9 h)

Station		AKITA							Lat. 39 43.5 N		Long. 140 08.0 E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation												
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1									L	375	390	400	410	400	385	L	L	L							
2									L	L	405	380	370	370	A	365	L	L							
3									L	L	380	370	390	395	380	375	L								
4									L	380	385	375	385	390	400	375	L	L							
5									L	360	375	405	385	395	360	360	L	L							
6									L	370	365	395	390	385	390	375	A								
7								L	L	395	395	395	A	390	A	350	L	A							
8									L	360	A	375	370	385	380	370	L								
9								L	365	375	385	390	370	380	L	L	L								
10								L	L	385	405	L	410	375	370	L	L	A							
11								L	L	365	395	L	L	360	L	360	L	L							
12									L	A	A	385	375	370	365	350	370	L							
13								L	L	390	395	385	395	365	335	A	L								
14									355	365	375	385	400	370	360	360	L								
15								L	360	370	380	395	400	380	375	L	L								
16									365	A	390	395	390	365	370	380	L								
17									365	415	380	L	365	360	360	370	385	L							
18									L	380	L	L	370	380	375	375	380	L							
19									385	375	380	390	390	360	365	365	370	L	L						
20									L	350	385	385	370	A	370	375	355	L							
21								L	375	385	385	390	375	375	360	350	A	A							
22									L	375	365	365	380	420	L	370	365	375	L						
23								L	385	405	370	375	380	380	370	345	A	A							
24								375	A	A	410	A	390	375	375	L	A	L							
25								L	360	380	390	395	A	390	405	375	355	370	A						
26									390	370	380	400	A	365	385	365	370	350	L						
27								L	A	A	A	400	390	365	395	350	L	L							
28								L	390	395	385	380	385	375	A	A	L	L							
29								L	A	395	A	385	405	L	395	345	A	A							
30								A	A	A	A	405	A	A	380	A	A	A							
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								3	12	24	24	23	27	26	25	23	8								
MED								375	372	378	385	385	390	378	375	365	370								
UQ								382	382	390	395	395	392	385	380	375	378								
LQ								363	365	365	380	380	372	370	365	352	362								

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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. + 9 h)

Station	AKITA				Lat.	39° 43.5' N				Long.	140° 08.0' E				Sweep	1 MHz to 25 MHz		in 24 sec		in automatic operation						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1									270	270	285	290	290	270	270	305	280	260								
2									250	280	295	290	275	280	295	295	260	240								
3									240	300	280	275	285	275	275	265	270									
4									285	290	270	270	280	270	300	260	260	250								
5									340	305	265	300	305	300	290	290	265	250								
6									290	310	300	270	285	280	290	280	270									
7									300	325 ^L	300	270	320	305	300	325	295	275	270							
8									295	280	275	290	300	310	295	280	265									
9									260	295	285	265	270	300	285	310	290	260								
10									245	275	295	300	280	305	310	320	290	260	240							
11									250	260	250	255	280	305	330	300	280	270	250							
12									290	295	300	280	300	295	290	275	265	250								
13									260	270	270	280	290	330	300	290	280	280								
14									300	275	270	280	305	295	285	270	255									
15									260	280	270	255	290	300	295	280	280	260								
16									300	270	270	270	290	300	295	270	280									
17									300	270	260	295	325	305	280	260	250	245								
18									290	270	300	300	310	300	300	275	270	250								
19									295	290	290	295	280	300	300	270	280	290								
20									290	280	270	280	300	A	305	295	290	300								
21									260	330	300	280	280	285	300	295	290	280	260							
22									300	270	280	260	300	330	310	285	270	250								
23									270	285	295	260	275	290	310	305	305	280	250							
24									290	260	280	285	300	300	310	300	285	285	295							
25									295	325	305	270	290	280	310	295	330	280	255	240						
26									270	260	275	295	295	355	360	270	290	290	255							
27									250	280	270	280	290	315	290	300	310	305	295							
28									250	270	275	275	355	345	300	295	270	290	270							
29									270	250	245	260	280	300	310	320	295	280	260							
30									255	280	A	A	290	270	330	330	310	295	A							
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT							1	15	30	29	29	30	30	29	30	30	30	21								
MED							295	260	288	280	280	285	300	300	298	282	270	250								
UQ							270	300	295	290	295	305	310	305	295	280	270									
LQ							252	270	270	270	280	290	295	290	275	260	250									

APR. 1987

H^oF₂ (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

APR. 1987

H^oF (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	AKITA				Lat. 39 43.5 N · Long. 140 08.0 E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	260	260	245	250	230	230	205	235	220	230	210	200	200	200	220	205	220	240	235	220	240	275	300	270	
2	250	250	230	225	220	260	225	245	230	220	200	210	200	200	A	200 ^H	235	235	220	210	A	270	275	270	
3	270	245	260	270	255	240	230	220	215	200	230	220	200	200	195	200	235	240	230	220	220	235	295	280	
4	275	275	270	250	220	220 ^{I C}	225	230	225	225	220	200	205	195	200	195	245	240	240	225	255	250	275	295	
5	270	285	270	220	290 ^{E S}	270	225	240	220	205	200	200	215	200	200	225	220	240	230	225	250	265	245	290	
6	275	280	270	245	255	250	220	240	240	230	220	225	210	200	200	220	A	250	230	230	240	250	250	270	
7	275	270	260	230	250	240	240	210	215	205	205	200	A	220	A	200	A	A	250	A	230	220	250	255	
8	275	270	275	245	240	245	225	225	235	A	A	220	220	200	200	200	235	240	245	255	240	220	270	270	
9	275	270	270	250	210	250	230	240	225	225	205	205	200	200	200	200	245	240	240	240	250	250	250	270	
10	270	265	295	270	250	265	240	230	225	200	195	200	200	195	200	230	A	A	A	250	A	240	250	275	
11	290	290	250	225	235	230	210	240	A	A	A	200	200	205	200	235	200	245	245	235	220	225	230	290	
12	285	A	275	220	205	220	205	245	230	A	A	205	220	200	205	220	240	230	235	230	235	240	230	A	
13	275	275	275	245	230	245	220	210	235	215	220	195	200	200	220	A	A	260	240	A	220	225	245	280	
14	290	295	270	305	300	255	240	240	200	200	220	205	200	235	230	205	230	240	245	245	240	260	260	270	
15	290	270	270	240	205	250	230	240	235	220	230	220	200	200	200	200	A	240	240	245	260 ^A	240	260	285	
16	280	280	260	270	235	230	230	225	230	A	210	195	200	200	200	210	240	250	240	240	250	255	260	260	
17	270	275	270	240	210	245	220	230	220	200	200	195 ^H	220	200	220	210	210	230	235	240	230	A	A	270	
18	270	295	280	265	225	240	240	235	A	220	200	200	200	200	220	215	230	225	240	240	235	250	250	280	
19	280	270	270	240	210	230	230	235	220	220	210	200	200	200	215	225	220	235	260	230	215	240	250	260	
20	250	270	255	235	230	240	230	225	210	225	200	230	220	A	220	225	200	225	200	235	215	210	260	255	
21	250	270	280	240	250	230	230	230	210	210	215	200	200 ^H	200	200	200	220	A	A	250	230	230	240	265	260
22	280	275	270	230	230	235	210	245	235	220	A	225	200	195	195	220	220	240	245	240	225	240	260	290	
23	270	250	235	235	270	240	240	235	235	215	230	210	205	205	205	A	A	A	230	230	230	225	A	A	
24	270	275	270	230	225	245	220	220	A	A	225	A	200	220	205	230	A	A	A	A	205	275	275	A	
25	295	275	270 ^A	240	A	250	260	230	225	205	220	A	210	200	210	215	220	A	245	240	240	260	A	260	
26	255	250	260	260	245	240	230	235	220	225	200	A	225	210	225	230	230	A	A	A	225	210	240	270	
27	285	275	255	275 ^A	245	235	230	225	A	A	A	200	200	200	200	200	225	240	245	235	235	240	260	255	
28	275	270	270	270	225	240	245	235	210	210	195	200	200	200	A	A	A	A	250	255	245	245	240	260	
29	255	270	265	260	255	235	220	A	A	220	A	210	200	A	230	230	A	A	245	A	A	250	225	250	
30	A	255	270	270	250	220	230	A	A	A	A	200	A	A	220	A	A	A	A	250	225	230	230	255	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	29	30	30	29	30	30	28	24	23	23	27	28	27	27	26	19	20	28	25	27	29	27	27	
MED	275	270	270	245	232	240	230	235	225	220	210	200	200	200	205	215	230	240	240	235	235	240	250	270	
UQ	280	275	270	265	250	250	230	240	232	222	220	210	210	200	220	225	235	240	245	240	240	250	262	280	
LQ	270	270	260	235	225	230	220	225	218	205	200	200	200	200	200	200	220	235	235	230	225	230	245	260	

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H^oF (KM)

IONOSPHERIC DATA

APR. 1987

H^oE (KM)

135° E Mean Time (G.M.T. + 9 h)

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

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H^oE (KM)

IONOSPHERIC DATA

APR. 1987

H°ES (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	AKITA				Lat. 39° 43.5' N	Long. 140° 08.0' E	Sweep 1	MHz to 25	MHz in 24 sec	in automatic operation															
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	S	S	S	S	S	S	S	G	110	G	G	110	110	G	G	G	G	100	100	100	S	S	S	S	
2	S	S	S	S	S	S	S	G	G	115	120	G	130	G	110	100	150	150	130	120	120	S	S	S	
3	S	S	S	S	S	S	G	G	G	110	105	G	G	G	120	G	G	G	S	S	S	S	S	S	
4	S	S	S	S	S	C	G	G	145	G	G	G	G	G	G	G	100	G	S	S	S	S	S	S	
5	S	S	S	S	S	S	135	120	120	G	G	G	110	G	G	G	105	140	120	S	S	S	S	S	
6	S	S	S	S	S	S	S	145	135	135	G	130	120	120	120	115	105	135	100	100	100	110	S	S	
7	S	S	S	S	S	S	S	G	G	120	110	110	110	115	105	G	145	130	120	115	100	S	S	S	
8	S	S	S	S	S	S	G	G	125	120	120	120	120	115	115	G	G	100	100	120	115	S	S	S	
9	S	S	S	S	S	S	G	G	G	G	G	G	120	115	105	100	G	G	125	100	100	110	110	105	105
10	S	S	S	S	S	S	G	G	G	G	G	115	115	110	110	120	G	140	130	120	115	110	105	100	S
11	S	S	S	S	S	S	G	135	135	125	120	115	105	G	G	125	G	150	120	110	S	S	S	S	
12	105	105	115	105	100	S	G	G	130	115	120	110	110	105	100	100	G	110	105	S	S	100	100	105	
18	S	S	S	S	105	S	G	G	G	G	120	110	110	G	120	110	110	110	105	105	105	105	S	S	
14	105	105	S	S	S	S	G	G	120	120	110	105	G	G	145	G	G	145	130	S	S	S	S	S	
15	S	S	S	S	S	S	130	145	120	G	120	110	G	G	G	G	140	130	120	115	110	S	S	S	
16	S	S	S	S	S	S	G	145	130	120	120	110	110	105	120	G	150	130	135	120	115	S	S	S	
17	S	S	S	S	S	S	G	G	150	130	105	G	130	G	G	G	G	G	140	120	115	110	110	S	
18	S	110	S	S	S	S	140	140	125	120	115	120	G	G	G	120	120	G	100	95	S	S	S	S	
19	S	S	S	S	S	S	G	G	G	120	120	110	115	110	105	105	100	G	140	110	110	110	S	S	
20	S	S	S	S	S	S	120	G	G	120	120	110	110	100	105	100	110	G	S	S	100	100	100	S	
21	S	100	S	S	S	S	G	G	G	G	G	110	110	110	G	100	100	95	95	S	S	S	S	S	
22	S	S	S	S	S	S	G	G	G	125	120	120	110	G	G	G	G	130	130	120	115	S	S	S	
23	S	S	S	S	S	S	G	140	120	125	120	115	110	G	110	150	130	120	100	100	110	S	110	110	
24	S	S	S	S	S	S	G	135	125	110	110	110	110	110	155	140	120	120	120	110	110	110	110	105	
25	110	105	105	100	100	115	140	115	120	120	110	105	105	110	105	105	100	100	100	S	S	110	110	130	
26	100	S	105	100	105	S	G	G	125	120	110	110	110	105	110	G	G	100	120	120	110	S	S	S	
27	S	110	110	100	100	S	145	125	110	110	110	110	105	105	G	G	G	G	125	S	100	S	S	S	
28	S	S	S	S	S	S	G	G	120	110	G	120	120	125	140	135	130	120	120	120	120	125	S	S	
29	S	S	S	105	S	140	135	120	120	115	105	100	105	110	120	G	125	120	120	110	110	115	S	105	
30	105	100	100	100	100	S	G	130	120	110	110	G	110	105	105	140	130	120	120	110	110	110	110	S	
31																									
CNT	5	7	5	6	6	2	8	12	20	23	23	24	25	17	20	14	19	23	27	21	20	13	9	6	
MED	105	105	105	100	100	128	138	135	122	120	115	110	110	110	112	112	120	120	120	110	110	110	110	105	
UQ	105	108	110	105	105	140	142	130	120	120	118	115	110	120	135	135	130	122	120	115	110	110	110		
LQ	105	102	105	100	100	132	122	120	112	110	110	110	105	105	100	105	110	100	105	103	105	100	105		

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H°ES (KM)

IONOSPHERIC DATA

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TYPES OF ES

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

Station	AKITA				Lat. 39 43.5 N	Long. 140 08.0 E	Sweep 1	MHz to 25 MHz		in 24 sec in		automatic operation													
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1									C 1			C 1	C 1					L 1	L 1	F 1					
2										C 2	C 1		C 1		C 3	L 1	H 1	H 1	CL 11	F 1	F 4				
3									C 1	L 1					C 1										
4									H 2								L 1								
5						H 2	C 2	C 1					C 1				L 2	H 2	C 2						
6							H 2	H 1	H 1		C 1	C 1	C 1	C 1	C 1	C 1	L 3	HL 22	L 3	F 2	F 2	F 2			
7								C 1	C 1	C 2	C 2	C 2	C 2	C 2	C 2		H 2	C 5	CL 41	FF 52	F 1				
8								C 2	C 2	C 2	C 1	C 1	C 1	C 1	C 1			L 1	L 1	F 2	F 2				
9											C 1	C 1	C 1	C 2	L 2		C 2	L 1	F 2	F 4	F 3	F 3	F 2		
10										C 1	C 1	C 2	C 2	C 2	C 1		H 2	C 4	C 4	F 3	F 7	F 3	F 2		
11							H 2	H 2	C 1	C 1	C 2	C 2				C 1		H 2	C 5	F 7					
12	F 2	F 3	F 1	F 1	F 1			C 2	C 2	C 2	C 1	C 1	C 1	C 1	L 2	L 2		C 2	L 3			F 2	F 2	F 2	
13					F 1					C 1	C 1	C 1	C 1	C 1	C 3	C 3	C 3	C 4	L 3	F 7	F 1	F 1			
14	F 2	F 2						C 2	C 1	C 1	C 1				H 1			H 2	C 2						
15						C 2	H 1	C 1		C 1	C 1						H 3	C 2	C 6	F 3	F 3				
16							H 2	C 1	C 2	C 1	C 1	C 1	C 1	C 1	C 1		H 1	C 1	H 3	F 1	F 2				
17								H 1	C 1	LC 11			C 1						H 1	F 1	F 1	F 5	F 4		
18		F 1				H 2	H 2	C 2	C 1	C 1	C 1					C 1	C 2		L 1	F 1					
19									C 1	C 1	C 1	C 1	C 1	C 1	C 1	C 2	L 2		H 2	F 1	F 2	F 2			
20						C 1			C 1	C 1	C 2	C 2	C 2	L 3	L 3	L 3	C 1				F 1	F 1	F 1		
21		F 2				H 2			C 1		C 2	C 1	C 1	C 1		L 2	L 4	L 5	L 2						
22									C 1	C 1	C 1	C 1	C 1					C 2	C 3	F 6	F 1				
23							H 1	C 1	C 1	C 1	C 1	C 1	C 1		CL 12	H 1	C 2	CL 33	L 2	F 2	FF 12	F 2	F 4		
24							H 2	C 2	C 2	C 2	C 2	C 2	C 2	C 1	H 1	H 2	C 2	C 2	C 3	F 3	F 2	F 3	F 5	F 5	
25	F 2	F 2	F 6	F 2	F 2	C 2	H 2	C 2	C 1	C 1	C 1	C 2	C 1	C 1	C 2	L 2	L 4	L 5	L 4	L 5		F 4	F 4	F 1	
26	F 1		F 1	F 2	F 2			C 1	C 1	C 2	C 2	C 2	C 1	C 1	C 2			LC 32	CL 42	FF 42	F 2				
27		F 1	F 1	F 3	F 1		H 2	C 2	C 2	C 2	C 2	C 2	C 1	C 2				C 3			F 2				
28								C 1	C 1	C 1	C 1	C 1	C 1	C 1	H 1	H 2	C 3	C 4	C 3	F 6	F 3	F 1			
29				F 1		H 2	H 2	C 2	C 2	C 2	C 2	L 2	L 2	C 2	C 1		C 2	C 3	C 2	F 6	F 4	F 1		F 2	
30	F 3	F 2	F 1	F 2	F 1			C 2	C 2	C 3	C 3		C 2	C 2	C 1	H 2	C 3	C 4	C 4	F 6	F 1	F 2	F 2		
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																									

APR. 1987

TYPES OF ES

IONOSPHERIC DATA

APR. 1987

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station RKUBUNJI TOKYO				Lat. 35 42.4 N		Long. 139 29.3 E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
1	X 44	X 46	X 45	U 39	X 40	X 38														X 66	X 56	X 52	X 51	X 52								
2	X 52	U 51	S	U 44	X 35	X 34														S	X 39	X 39	X 39	X 38								
3	X 38	X 38	X 36	X 36	X 35	X 36														X 62	X 52	X 37	X 37	X 36								
4	X 36	X 35	X 33	X 35	X 34	29														X 65	X 45	X 45	X 46	S								
5	X 40	X 38	X 38	X 33	X 27															C	C	C	C	C								
6	C	C	C	C	C	C														X 52	X 45	X 39	X 38	X 39								
7	X 38	X 38	X 38	X 40	X 34	X 33														X 69	X 66	X 43	X 40	X 41								
8	X 40	X 40	X 39	X 43	X 37	X 37														X 62	X 60	X 55	X 49	X 50								
9	X 49	X 47	X 45	X 49	X 40	X 37														X 63	X 62	X 49	X 49	X 48								
10	48	X 46	X 43	X 40	33	37														X 75	C	X 50	X 48	C								
11	X 47	X 46	C	X 45	C	X 40														S	X 60	X 57	X 49	X 47								
12	X 48	X 47	X 47	X 50	X 32	X 35														X 66	X 62	X 54	X 49	X 44								
13	S 44	X 44	X 46	X 47	X 35	X 36														X 87	X 71	X 47	X 46	X 45								
14	X 45	X 45	X 45	X 40	40	39														X 64	X 63	X 62	X 59	X 60								
15	X 57	X 58	X 54	X 57	X 41	X 40														X 66	X 62	X 56	X 55	X 56								
16	X 56	X 54	X 52	X 48	X 50	X 49														X 66	X 53	X 58	X 58	X 59								
17	X 58	X 55	X 54	X 55	X 43															X 68	X 62	X 49	53	53								
18	58	X 50	X 51	X 48	X 44															X 69	X 63	X 56	X 55	X 55								
19	X 58	X 54	X 53	S	X 39	X 44														105	X 73	X 55	X 56	X 55								
20	X 53	X 50	S	X 51	X 47	S														101	X 90	X 57	X 52	X 50								
21	X 50	X 49	X 48	X 46	X 41															X 73	X 73	X 50	X 52	X 51								
22	X 52	X 51	X 51	X 52	X 39															X 73	X 70	X 53	X 52	X 52								
23	X 53	X 54	X 52	X 47	X 43															X 77	X 68	X 45	X 43	45								
24	48	50	43	45	36															X 95	X 77	54	X 52	50								
25	X 47	X 47	R	X 45	A	X 43														X 72	X 72	X 64	X 54	55								
26	58	51	49	46	39															A	R	X 48	X 45	X 45								
27	45	A	X 43	43	39															X 95	X 86	X 65	X 58	58								
28	57	57	55	50	50															X 77	X 69	X 58	A	X 50								
29	S	X 50	X 46	X 44	X 45															A	X 70	X 62	X 57	59								
30	58	53	50	46	X 42															X 99	X 78	X 61	A	A								
31																																
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
CNT	28	28	25	28	27	16														25	27	29	27	26								
MED	X 48	X 50	X 46	X 46	X 39	X 37														X 49	X 63	X 54	X 51	X 50								
UQ	X 56	X 52	X 51	X 48	X 42	X 40														X 77	X 72	X 57	X 54	X 55								
LQ	X 44	X 46	X 43	X 42	X 35	X 36														X 66	X 61	X 48	X 46	X 45								

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FXI (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FOF2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station		Tokubunji Tokyo								Lat. 35° 42.4' N		Long. 139° 29.3' E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation												
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		38	S 40	39	S 33	34	32	44	50	56	58	58	61	I 66	S 67	70	56	61	65	67	60	50	46	45	S 46	
2		46	U 45	S	U 38	S 29	S 28	47	53	61	56	56	71	73	74	66	71	71	71	68	S	33	32	33	32	
3		32	32	30	30	29	30	43	52	54	62	66	75	76	74	72	70	60	60	59	56	46	32	31	30	
4		30	29	28	29	28	F 21	39	48	55	59	66	70	R 76	75	69	69	60	61	59	59	S 39	S 39	S 40	S	
5		U 34	S 32	32	27	21	21	41	S 45	57	65	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
6		C	C	C	C	C	C	C	C	C	C	64	73	71	71	69	62	63	63	63	46	39	33	32	33	
7		32	32	32	34	28	27	40	47	54	J 65	R 66	57	64	63	63	62	63	61	58	63	60	37	34	35	
8		34	34	33	37	31	31	48	50	55	U 69	R 69	63	65	65	64	62	59	55	53	56	54	49	43	44	
9		43	41	39	43	34	31	45	54	59	66	69	68	59	63	65	64	70	65	60	57	56	43	43	S 42	
10		F 40	40	U 37	S 34	F	F 30	54	55	60	64	A	R 75	71	71	76	84	85	R 78	73	69	C	44	42	C	
11		41	40	I 39	C 39	S 35	I 34	51	58	R 73	75	65	58	62	71	89	93	30	81	S 77	S	S 54	51	43	41	
12		42	41	41	44	26	29	48	54	63	72	70	76	83	86	92	92	79	67	64	60	56	48	43	S 38	
13		U 38	S 38	40	S 41	29	30	47	54	68	71	66	69	78	89	90	79	73	70	R 74	J 81	J 65	S 41	40	39	
14		39	39	39	34	F 34	F 33	47	Z 61	R	R 83	76	76	82	81	79	73	68	58	60	58	57	56	53	S 54	
15		51	52	48	51	35	34	52	61	70	78	77	U 77	R 77	C	J 80	U 72	C	R	69	65	U 60	S 56	50	49	S 50
16		50	48	46	42	44	43	53	56	70	85	78	80	78	73	76	76	72	66	67	60	57	52	52	53	
17		52	49	48	49	37	38	59	56	70	78	72	R 72	R	R	R	R	J 78	R 76	66	62	56	43	46	F 45	
18		F	44	45	42	38	40	49	57	65	71	68	74	85	91	95	95	91	79	67	63	57	50	49	49	
19		J 48	F 48	S 47	I 44	S 33	S 38	51	53	65	68	77	85	90	R 95	R 96	94	80	79	R 93	J 99	S 57	49	50	49	
20		S 47	U 44	S 44	S 45	U 41	S	59	59	68	82	87	80	76	J 81	R 83	85	87	84	S 96	95	84	51	46	S 44	
21		44	43	42	40	35	40	63	59	61	R 78	87	J 80	79	76	I 83	R 78	73	68	66	U 67	S 67	44	46	45	
22		46	45	45	46	33	34	50	58	64	78	86	88	64	60	72	78	78	R 75	65	67	64	47	46	46	
23		47	48	46	41	37	37	50	62	69	70	75	73	73	75	67	71	85	77	78	71	S 62	39	U 37	F	
24		F	F	F	39	30	40	53	57	62	63	66	68	R 76	R 74	73	87	82	84	93	89	71	F 47	S 46	F 43	
25		S 41	S 41	R	39	A	37	51	65	69	71	60	67	66	65	74	81	A	64	60	66	65	58	48	F	
26		F	F	43	40	33	36	55	61	60	57	58	58	65	65	77	85	84	74	S 74	A	R	42	S 39	39	
27		F	A	37	F 33	33	40	55	63	58	59	66	62	64	73	74	67	68	76	87	89	80	59	52	F 51	
28		F	F 49	F 46	F 42	F	S 45	64	61	62	70	59	61	69	R 78	77	81	A	64	65	S 71	63	52	A 44	J 44	
29		I 44	S 44	S	40	38	39	49	49	60	65	69	66	R 61	61	57	70	81	A	A	A	A	S	51	F	
30		F	F	F	F	36	41	50	63	59	63	67	A	A	62	71	73	A	A	S 32	U 93	U 72	S 53	A	A	
31																										
CNT		23	25	24	28	26	28	29	29	28	29	28	28	26	28	28	27	24	27	28	25	27	28	27	23	
MED		42	41	40	40	34	34	50	57	62	69	66	72	72	74	74	73	73	69	66	63	57	47	45	44	
UQ		46	45	46	42	36	40	53	61	68	75	76	76	78	79	81	84	81	76	76	71	66	51	48	48	
LQ		38	39	37	34	29	30	47	53	58	63	66	62	65	65	70	70	66	64	62	60	55	42	40	39	

APR. 1987

FOF2 (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

APR. 1987

FOF1 (0.01 MHz)

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

Station		ROKUBUNJI TOKYO			Lat.	35 42.4 N			Long.	139 29.3 E			Sweep 1		MHz to 25		MHz in 24		sec in		automatic operation					
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1										L	420	430	440	S	U	S	H	L	J	L	L					
2										L	400	L	440	H	440	450	430	410	410	A	A					
3									L	L	410	420	440	440	440	430	410	400	H	L						
4										L	440	430	430	H	440	420	420	390	L	L	330					
5										L	400	A	C	C	C	C	C	C	C	C	C					
6								C	C	C	C	440	C	440	440	420	390	L	L							
7									H	390	410	430	440	H	450	440	450	430	420	380	330					
8										L	430	440	450	460	440	430	410	L	L							
9									L	L	420	430	440	440	450	450	430	420	L	L						
10									L	L	400	A	A	A	480	470	450	420	L	L						
11									L	L	420	440	460	L	480	450	460	420	410	L						
12									L	L	420	450	450	A	480	460	450	440	400	L	L					
13										430	430	470	490	460	450	460	440	A	A							
14										L	430	450	450	480	480	470	H	H	L	L						
15										L	440	450	460	460	C	460	450	420	L	A						
16									L	420	430	460	450	H	460	470	450	440	U	L						
17									L	L	440	430	450	H	500	460	460	450	440	400	L					
18										L	440	L	460	H	480	460	470	440	410	L						
19									L	H	440	L	460	470	470	460	450	450	410	L	L					
20								L	L	L	450	460	470	470	470	470	460	440	430	L	L					
21									L	L	450	450	460	470	470	470	440	430	400	L						
22									L	L	420	440	440	460	460	460	440	430	410	L						
23									L	L	420	440	450	460	420	450	440	430	400	L	A					
24									L	L	410	A	440	450	H	450	S	450	430	410	L	L				
25								L	L	L	400	420	430	440	470	450	A	A	A	A	A	A				
26								L	L	L	390	420	420	420	460	450	U	A	A	A	A	A				
27								L	L	L	380	420	440	440	A	A	A	440	420	410	360	L				
28								L	L	L	420	430	460	430	H	U	A	A	A	A	A					
29									L	A	A	450	A	460	A	A	410	A	A	A	A					
30						A		A	A	A	A	A	A	A	A	A	A	A	A	A	A					
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									4	21	23	27	23	26	25	25	25	20	6							
MED									390	L	420	440	450	460	460	460	440	420	405	L	360					
UQ									395	L	430	445	460	470	470	460	450	440	410	L	370					
LQ									L	385	420	430	440	445	450	450	430	420	400	L	330					

APR. 1987

FOF1 (0.01 MHz)

IONOSPHERIC DATA

APR. 1987

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station		RUKUBUNJI TOKYO		Lat.	35 42.4 N		Long.	139 29.3 E		Sweep 1		MHz to 25		MHz in 24		sec in		automatic operation							
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								B	225	270	305	310	A	A	U S	305	290	250	195	S					
2								S	230	275	295	310	A	A	325	320	310	310	275	220	A				
3								165	230	280	300	310	A	A	A	A	A	260	200	B					
4								180	245	295	300	310	320	325	310	A	285	260	205	B					
5						S	B	170	240	285	305	C	C	C	C	C	C	C	C	C	C				
6								C	C	C	C	330	C	340	320	310	275	265	230	A					
7								155	255	290	B	325	A	A	A	A	A	A	225	A					
8								195	265	295	310	325	335	335	320	310	A	A	215	A					
9								200	260	300	315	330	A	U R	330	325	330	305	275	225	A				
10								200	265	290	315	340	325	340	330	320	305	305	230	A					
11								180	255	295	315	330	330	335	345	325	305	275	220	B					
12								200	265	295	320	335	345	320	A	330	305	270	215	B					
13								210	250	300	310	340	A	360	350	345	310	A	A	A					
14								210	265	295	310	A	A	345	345	325	305	280	255	B					
15								210	255	300	315	320	325	R	335	325	315	290	230	A					
16								215	250	295	315	340	350	335	320	295	A	A	225	B					
17								B	200	250	300	310	325	325	355	350	330	310	285	230	165				
18								B	225	275	305	330	R	345	365	360	350	335	315	285	235	B			
19								200	280	305	325	330	A	A	A	350	320	280	235	160					
20								215	265	310	320	A	A	A	A	A	A	A	230	A					
21								B	205	265	300	325	335	A	340	340	R	300	270	230	B				
22								B	205	265	295	320	340	340	345	330	315	305	285	240	165				
23				S				B	200	255	290	305	325	335	330	A	A	310	285	225	B				
24								B	215	270	300	320	330	325	335	355	335	310	270	A	B				
25								195	275	295	325	330	A	A	A	A	A	A	A	A					
26								B	200	255	310	310	U A	325	335	325	A	A	A	A	225	A			
27								B	215	270	305	320	330	335	A	A	A	A	A	275	205	B			
28								B	210	255	285	300	310	315	335	350	H	325	305	270	225	A			
29								B	200	260	295	310	320	A	320	U A	335	A	A	A	230	B			
30								B	225	270	305	315	330	A	A	A	U A	365	310	275	235	A			
31																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								27	29	29	28	27	16	20	19	20	20	21	26	3					
MED								200	260	295	315	330	332	335	335	325	305	275	225	165					
UQ								210	265	300	320	332	338	342	348	332	310	285	230	165					
LQ								198	250	290	308	322	325	328	322	310	305	270	220	162					

APR. 1987

FOE (0.01 MHz)

IONOSPHERIC DATA

APR. 1987

FOES (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	OKUBUNJI TOKYO				Lat.	35 42.4 N				Long	139 29.3 E				Sweep 1	MHz to 25				MHz in 24 sec in				automatic operation			
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	E 16	B 13	E 14	S 16	E 13	E 12	E 15	28	G	34	33	37	J 34	G	G 29	G 22	G	G	E 15	18	18	E 15	E 15	E 15			
2	E 15	E 14	E 14	E 15	E 16	E 15	E 16	26	G	33	35	35	39	46	35	37	45	59	J 46	30	J 30	J 28	J 24	23			
3		E 14	19	22	19	E 14	G	31	34	39	35	37	35	36	33	30	G 24	G	21	19	E 15	E 14	E 15	E 15			
4	E 16	E 15	E 15	E 15	E 15	E 15	24	31	31	34	35	35	G	G 26	32	34	29	26	21	19	19	E 14	E 14	20			
5	18	E 12	E 12	E 13	22	19	30	J 40	37	J 50	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
6	C	C	C	C	C	C	C	C	C	C	40	C	38	37	33	31	G	G	28	J 21	J 29	18	J 31	E 12			
7	18	18	E 12	E 14	E 14	19	21	28	G	E 33	G	36	40	43	33	32	J 38	27	J 33	J 59	J 50	J 57	J 29	E 14			
8	E 15	E 15	E 14	E 14	E 12	E 14	G	G	37	G	37	38	40	42	43	33	J 31	25	20	23	J 22	J 28	23	22			
9	E 15	E 15	21	20	E 14	E 13	G	29	34	40	J 53	J 52	G	G	37	34	33	33	J 32	J 23	25	J 28	J 36	J 32			
10	J 24	18	E 14	J 19	19	E 15	G	30	34	49	J 49	44	39	45	41	38	41	34	J 36	36	C	48	J 31	C			
11	J 19	J 20	C	17	C	E 13	24	32	35	39	38	37	36	G	42	34	G	24	25	J 30	30	22	E 14	J 20			
12	22	24	E 15	E 13	18	E 14	G	32	40	42	J 46	J 61	J 53	41	31	26	G	25	E 15	21	20	17	J 29	J 54			
13	24	19	E 14	E 14	E 13	22	G	J 26	34	34	37	39	42	42	43	45	J 46	J 49	51	J 52	J 31	J 25	24	J 21			
14	18	19	20	20	19	E 15	26	31	48	37	38	41	33	G	37	34	32	G	18	J 23	19	E 14	19	E 15			
15	E 14	E 14	E 13	E 13	E 13	E 13	24	29	33	33	35	35	G	G	G	35	32	J 51	J 60	J 118	J 29	J 51	J 25	E 14			
16	E 13	E 14	E 14	E 13	E 14	19	29	37	40	J 59	J 48	42	36	40	37	J 48	J 32	35	J 39	J 30	J 24	J 17	E 14	E 15			
17	E 14	E 13	E 14	E 14	E 14	E 14	26	31	36	36	G	G	38	37	G	G	G	G	G	21	J 22	J 34	J 33	J 27			
18	J 40	J 22	J 20	E 15	E 13	19	28	32	J 45	45	36	G	G	G	40	22	G	J 30	20	J 17	20	18	21	21			
19	19	E 13	E 13	E 15	E 13	E 13	26	33	34	38	37	39	36	38	G	G	G	G	19	J 29	J 18	J 27	23	22			
20	E 14	J 18	E 24	E 14	E 19	E 14	25	32	G	36	38	43	38	45	40	32	29	J 24	32	J 21	J 39	J 19	19	J 19			
21	J 25	E 14	J 19	21	20	E 14	G	G	35	G	37	J 52	G	G	G	G	G	J 17	J 24	18	E 15	22	20	18	20		
22	J 20	J 18	18	21	22	E 15	G	30	34	35	36	36	G	34	26	34	32	27	26	J 25	J 26	J 22	J 26	E 14			
23	E 15	33	J 20	E 13	E 14	E 13	27	29	33	39	40	38	41	39	43	35	37	36	51	J 59	J 20	38	E 15	J 21			
24	J 18	E 13	J 18	19	18	E 13	G	35	42	48	44	42	36	39	41	61	J 63	J 82	34	78	83	69	84	52			
25	J 74	56	22	J 85	J 60	J 50	31	33	J 50	J 51	44	J 50	J 51	J 53	J 83	J 80	J 109	J 67	47	J 41	19	E 13	J 50	J 48			
26	J 35	E 14	E 14	18	20	18	G	29	33	36	39	42	44	J 51	J 60	J 50	J 76	J 62	110	J 61	J 30	J 51	J 29	J 31			
27	J 29	J 44	J 45	J 47	J 17	E 14	26	36	36	39	50	52	J 58	J 61	J 49	43	36	25	24	21	19	21	21	E 14			
28	E 13	J 61	19	18	E 14	E 14	24	30	31	36	39	39	38	47	50	J 59	J 70	J 65	174	J 112	J 54	J 50	47	28			
29	E 16	E 14	E 13	E 15	19	E 14	26	35	J 71	67	47	56	42	58	64	45	100	204	204	109	51	33	51	32			
30	J 59	J 34	J 35	J 32	J 34	J 37	30	J 48	J 64	44	J 81	143	127	100	J 60	72	118	112	J 51	J 49	J 33	J 78	58	J 60			
31																											
CNT	29	29	28	29	28	29	29	29	29	29	28	29	29	29	29	29	29	29	29	29	28	29	29	28			
MED	18	E 15	E 15	E 15	E 16	E 14	24	31	34	38	38	39	38	39	37	34	32	27	32	J 29	J 24	J 25	J 24	21			
UQ	J 24	20	20	20	19	18	26	33	40	44	44	J 47	41	45	43	45	J 45	J 51	J 47	J 52	J 30	J 38	J 31	J 30			
LQ	E 15	E 14	E 14	E 14	E 14	E 14	G	29	33	34	36	36	34	G 26	32	31	G 17	G	24	20	21	20	18	19	E 15		

APR. 1987

FOES (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FBES (0.1 MHz)

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

Station	OKUBUNJI TOKYO				Lat.	35 42.4 N				Long.	139 29.3 E				Sweep	1 MHz to 25 MHz				in 24 sec in automatic operation						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	E 16	E 13	E 14	E 16	E 15	E 12	E 15	28	G	33	33	35	33	G	G	G	G	G	E 15	E 15	E 14	E 15	E 15	E 15		
2	E 15	E 14	E 14	E 15	E 16	E 15	E 16	25	G	32	34	34	37	42	32	35	42	55	36	29	21	25	20	17		
3	E 15	E 14	E 13	E 16	E 14	E 14	G	30	33	35	35	35	35	34	32	30	G	G	E 15	16	E 15	E 14	E 15	E 15		
4	E 16	E 15	E 15	E 15	E 15	E 15	22	30	31	33	32	33	G	G	32	32	29	25	E 14	E 14	E 14	E 14	E 14	E 14		
5	E 15	E 12	E 12	E 13	14	E 14	19	31	35	46	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
6	C	C	C	C	C	C	C	C	C	C	C	C	39	C	36	37	33	29	G	G	23	20	E 14	E 12		
7	E 13	E 14	E 12	E 14	E 14	E 12	21	27	G	E 33	G	34	35	40	32	32	35	23	22	48	22	22	15	E 14		
8	E 15	E 15	E 14	E 14	E 12	E 14	G	G	34	G	36	37	39	36	35	33	28	24	15	17	17	16	E 15	E 15		
9	E 15	E 15	E 14	E 14	E 14	E 13	G	28	32	39	39	24	G	G	35	34	31	31	31	22	18	21	20	20		
10	E 15	E 14	E 14	E 14	E 14	E 15	G	29	33	49	A 79	41	38	43	41	36	36	34	29	29	C	24	16	C		
11	E 14	E 15	C	E 14	C	E 13	24	30	34	38	37	35	35	G	42	32	G	24	23	30	27	20	E 14	E 14		
12	E 15	14	E 15	E 13	E 13	E 14	G	29	38	40	41	59	47	37	G	G	G	24	E 15	E 13	E 14	E 14	16	E 15		
13	20	E 14	E 14	E 14	E 13	E 13	15	21	33	34	37	37	38	40	40	41	43	44	40	44	21	21	E 16	E 14		
14	E 15	E 14	E 15	E 14	E 13	E 15	24	30	40	37	38	40	G	G	G	33	30	G	17	22	E 14	E 14	E 15	E 15		
15	E 14	E 14	E 13	E 13	E 13	E 15	23	28	32	33	35	U Y 35	G	G	G	35	31	43	31	44	20	18	E 12	E 14		
16	E 13	E 14	E 14	E 13	E 14	E 14	27	33	38	41	39	40	36	40	35	35	29	U A 33	36	30	21	16	E 14	E 15		
17	E 14	E 13	E 14	E 14	E 14	E 14	24	30	35	35	G	G	37	37	G	G	G	G	E 14	E 14	21	C 14	E 14			
18	21	19	17	E 15	E 13	E 15	26	31	39	43	35	G	G	G	37	22	G	G	21	19	16	E 15	E 15	E 15	E 14	
19	E 15	E 13	E 13	E 15	E 13	E 13	24	30	32	38	37	37	35	36	G	G	G	G	18	29	16	18	E 15	E 13		
20	E 14	15	E 24	E 14	E 19	E 14	G	28	G	34	36	40	32	39	36	32	28	G	18	22	16	26	19	E 15	E 15	
21	E 15	E 14	E 14	E 14	E 14	E 14	G	G	32	G	35	35	G	G	G	G	G	G	17	20	17	E 15	E 14	E 14	E 14	E 14
22	16	E 13	E 13	E 15	18	E 15	G	29	34	35	35	35	G	33	G	34	30	25	24	22	19	22	E 15	E 14		
23	E 15	E 15	E 14	E 13	E 14	E 13	25	29	32	39	39	37	41	38	42	34	35	33	40	56	E 15	E 15	E 15	E 14		
24	E 14	E 13	E 14	E 15	E 14	E 13	G	32	39	45	42	37	35	39	38	39	31	30	25	43	61	22	31	E 15		
25	19	E 15	19	29	A 60	21	26	29	36	36	42	40	44	50	62	74	A A 109	53	37	30	E 15	E 13	32	34		
26	E 15	E 14	E 14	E 13	E 14	18	G	28	32	34	38	42	42	46	40	48	39	58	55	A A 61	30	20	22	15		
27	E 15	A A 44	24	E 14	16	E 14	24	32	33	36	41	46	50	48	36	36	29	23	19	E 13	E 13	E 13	E 14	E 14		
28	E 13	15	E 13	E 14	E 14	E 14	24	29	31	34	37	39	37	46	48	51	A A 70	54	22	44	32	34	A A 47	E 15		
29	E 16	E 14	E 13	E 15	E 13	E 14	25	34	55	60	40	55	40	55	62	39	A A 100	A A 204	A A 204	A A 109	29	25	E 14	25		
30	19	E 14	E 15	17	20	30	25	47	55	44	50	A A 143	A A 127	49	57	69	A A 118	A A 112	36	33	30	45	A A 58	A A 60		
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	29	29	28	29	28	29	29	29	29	29	29	28	29	29	29	29	29	29	29	29	27	29	29	27		
MED	E 15	E 14	E 14	E 14	E 14	E 14	21	29	33	36	37	37	36	37	35	34	30	25	23	29	18	18	E 15	E 15		
UQ	E 16	E 15	E 15	E 15	E 15	E 15	24	30	36	40	39	40	39	42	40	36	36	43	36	43	24	22	16	E 15		
LQ	E 14	E 14	E 13	E 14	E 13	E 13	G	28	32	34	35	35	33	G	G	30	G	G	17	20	17	16	E 15	E 14	E 14	E 14

The Radio Research Laboratory, Japan

APR. 1987

FBES (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FMIN (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station		Tokubunji Tokyo							Lat.	35° 42' 4" N			Long.	139° 29' 3" E			Sweep 1 MHz to 25 MHz in 24 sec in automatic operation										
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		16	13	14	E S 16	15	12	15	14	14	15	20	19	15	17	14	15	15	15	E S 15	E S 15	E S 14	E S 15	E S 15	E S 15		
2		E S 15	E S 14	E S 14	E S 15	E S 16	E S 15	E S 16	15	15	15	18	19	20	19	17	15	15	15	15	E S 15	E S 15	E S 15	E S 15	E S 15		
3		E S 15	14	13	14	14	14	14	15	15	16	16	17	16	18	17	17	16	15	15	14	15	14	E S 15	E S 15		
4		E S 16	15	15	15	15	E S 15	12	15	15	14	16	16	15	18	16	13	14	14	14	14	E S 14	E S 14	E S 14	E S 14		
5		E S 15	12	12	13	13	14	12	12	18	16	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
6		C	C	C	C	C	C	C	C	C	C	E C 16	E C 16	20	18	18	14	14	15	14	14	15	14	14	12		
7		12	12	12	14	14	12	12	14	15	33	16	22	21	19	17	16	13	13	14	14	13	14	E S 15	14		
8		E S 15	E S 15	E S 14	14	E S 12	14	13	13	15	16	17	17	19	19	16	16	14	14	14	15	14	15	16	15		
9		15	15	14	15	14	13	14	15	14	15	20	22	22	22	19	19	16	14	13	15	14	E S 15	14	15		
10		E S 15	14	14	14	13	E S 15	15	15	14	16	21	17	21	20	20	17	18	15	13	14	C	15	15	C		
11		14	15	C	14	C	13	15	15	15	16	18	17	19	21	17	16	13	13	14	13	16	15	14	14		
12		15	14	15	13	13	14	14	13	15	16	15	22	21	19	19	15	15	14	15	14	14	14	13	15		
13		15	14	14	14	13	13	13	13	14	15	16	17	20	17	20	15	15	13	14	15	15	15	15	14		
14		15	14	15	14	13	15	13	13	16	16	19	20	20	17	16	15	15	15	14	14	14	14	15	15		
15		14	14	13	13	13	15	14	15	15	15	19	21	20	17	16	24	21	14	13	15	14	15	12	14		
16		13	14	14	13	14	14	14	13	14	19	19	21	21	22	19	15	15	14	15	14	15	15	14	15		
17		14	13	14	14	14	14	14	15	16	15	20	23	28	20	20	16	19	20	13	14	14	14	14	13		
18		12	14	14	15	13	15	14	15	16	29	19	26	22	22	20	16	15	14	14	15	14	15	15	14		
19		15	13	13	E S 15	13	13	14	16	17	21	21	24	24	20	20	21	16	15	14	14	13	13	15	13		
20		14	14	E S 24	14	E S 19	14	15	15	15	16	21	20	21	21	22	21	15	14	14	14	14	13	15	15		
21		15	14	14	14	14	14	15	14	15	18	20	20	20	20	20	14	15	14	15	15	14	14	14	14		
22		14	13	13	15	14	15	15	14	15	15	16	17	20	16	18	16	15	15	13	13	13	13	15	14		
23		15	15	14	13	14	13	13	14	14	16	16	21	22	20	10	17	14	15	14	14	15	15	E S 15	14		
24		13	13	14	15	14	13	13	16	15	20	19	18	18	20	16	16	14	14	14	15	15	15	16	15		
25		14	15	15	14	13	13	14	14	15	18	20	19	21	17	20	14	15	14	16	16	15	13	14	15		
26		15	14	14	13	14	14	13	14	15	15	19	20	17	20	18	19	14	15	14	15	E S 17	14	14	13		
27		15	14	15	14	14	14	13	14	14	16	19	20	17	17	17	17	15	14	14	13	13	13	14	14		
28		13	13	13	14	14	14	14	13	15	15	17	19	16	18	19	17	15	14	13	15	14	13	12	15		
29		E S 16	14	13	15	13	14	14	14	15	15	20	27	20	19	19	17	15	15	14	16	14	15	14	14		
30		15	14	15	14	15	15	14	14	15	20	19	20	23	19	17	17	15	15	14	13	14	14	15	15		
31																											
CNT		29	29	28	29	28	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	28		
MED		14	14	14	14	14	14	14	14	15	16	19	20	20	19	18	16	15	14	14	14	14	14	15	14		
UQ		15	14	14	14	14	15	14	15	15	18	20	22	21	20	20	17	15	15	14	15	15	15	15	15		
LQ		14	13	13	14	13	13	13	14	15	15	16	18	19	18	17	15	14	14	14	14	14	14	14	14		

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FMIN (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

M(3000)F2 (0.01)

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

Station	KUBUNJI TOKYO																								
Lat.	35 42.4 N												Long 139 29.3 E												
Sweep 1	MHz to 25 MHz in 24 sec in automatic operation																								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	295	S 305	300	S 340	350	305	340	340	325	335	295	310	S 315	S 330	350	325	315	325	325	330	325	300	295	S 300	
2	315	U S 320	S	U S 335	S 310	S 325	365	340	335	310	300	320	315	R 315	305	315	340	325	340	S	305	305	300	310	
3	300	300	295	300	310	315	335	325	350	330	325	325	310	325	310	320	340	345	330	350	360	290	290	285	
4	275	290	285	320	360	F 350	360	345	345	315	315	310	R 305	305	315	310	315	335	335	335	S 320	300	290	S	
5	U S 310	U S 300	310	350	315	310	S 335	S 335	315	310	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
6	C	C	C	C	C	C	C	C	C	C	305	310	305	310	320	315	320	320	335	345	335	325	305	305	
7	305	315	315	345	325	315	345	320	310	J R 320	320	295	300	320	310	315	320	335	325	310	315	335	320	315	
8	315	305	305	335	345	320	350	320	310	U R 320	315	310	315	315	315	320	335	325	330	320	325	320	300	305	
9	305	310	315	335	350	320	350	320	315	315	315	325	315	310	320	310	325	340	335	305	340	335	300	S 300	
10	F 305	315	U S 305	S 325	F	F	355	335	335	325	A	P 305	320	320	300	310	320	R 250	330	325	C	300	300	C	
11	300	305	C	S 325	I C 320	320	350	330	330	R 335	330	305	285	300	300	320	315	325	S 325	S	S 340	325	315	305	
12	295	290	320	355	335	320	350	325	320	305	310	305	300	305	305	315	320	325	335	330	335	330	315	S 300	
13	U S 300	295	320	S 345	365	315	350	340	325	335	300	290	290	295	310	315	315	320	R 325	J R 315	J S 340	340	300	295	
14	295	305	315	30	F	305	345	310	Z R 325	315	295	290	305	315	325	330	335	325	315	305	300	300	S 295		
15	290	300	305	330	365	315	335	335	325	325	320	U R 320	C	J R 310	U R 325	C	R	325	330	U S 310	320	295	S 295	290	
16	295	305	300	300	320	345	335	315	315	320	320	315	315	305	315	315	320	325	335	320	315	305	285	300	
17	295	295	300	335	330	325	335	325	325	320	310	300	R	R	R	R	R	J R 320	J R 340	335	325	330	320	F 310	
18	F	305	305	325	320	310	310	335	325	320	290	290	300	295	295	305	320	330	335	335	320	315	305	305	
19	J F 290	310	S 315	I S 340	360	335	370	335	315	305	305	295	290	R 305	R 300	305	305	300	315	R 325	J S 350	295	300	300	
20	S 315	U S 315	S	U S 325	U S 335	S	335	305	310	300	320	305	295	J R 295	R 295	305	295	300	S 310	320	335	345	290	S 320	
21	310	295	305	340	320	330	335	330	315	R 300	305	315	290	285	I R 300	315	320	330	325	U S 330	340	335	295	295	
22	290	300	310	345	350	335	350	330	310	315	310	320	310	290	300	315	315	320	R 335	320	325	325	290	290	
23	300	310	325	330	310	325	310	325	325	320	305	300	300	315	300	295	315	320	325	325	S 325	350	U S 325	F	
24	F	F	F	350	320	325	345	340	330	325	325	300	R 305	R 295	290	300	300	300	320	330	335	F 310	S 285	F 320	
25	S	S 300	R	355	A	305	305	315	320	325	320	310	305	300	300	A	A	325	320	315	325	330	310	F	
26	F	F	320	325	335	325	330	335	335	310	305	285	300	295	290	305	315	350	320	S	A	R	S 320	310	300
27	F	A	320	F 310	315	335	340	335	335	300	325	305	290	300	315	310	300	300	315	320	340	330	310	F 305	
28	F	F	F	F	F	S 320	350	325	320	335	305	315	290	R 305	310	330	A	315	315	S 325	340	320	A	J S 305	
29	I S 300	S 305	305	305	325	350	350	330	335	330	320	315	320	R	A	300	310	A	A	A	A	S 315	S	295	F
30	F	F	F	F	325	335	330	345	A	325	300	A	A	290	295	295	A	A	S	U S 320	U S 325	U S 340	S 295	A	A
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	22	25	23	28	25	27	29	29	27	29	28	28	26	27	28	26	24	27	28	25	27	28	27	22	
MED	300	305	310	332	325	320	345	330	325	320	312	308	302	305	305	315	320	325	325	325	330	320	300	300	
UQ	305	310	315	342	350	332	350	335	332	325	320	315	315	312	315	315	320	332	335	330	340	330	310	305	
LQ	295	300	305	322	320	315	335	325	315	310	305	300	290	295	300	305	315	320	320	320	320	300	295	295	

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M(3000)F2 (0.01)

IONOSPHERIC DATA

APR. 1987

M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station TOKUBUNJI TOKYO		Lat. 35° 42' 4" N							Long. 139° 29' 3" E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L					U S	H	L	U L	L						
2									L	L	H			A			A	A						
3								L	L								H	L						
4									L	H							L							
5									A	A	C	C	C	C	C	C	C	C	C	C				
6							C	C	C	C							L	L						
7								H									A	L						
8									L								L	L						
9								L	L								L							
10								L	L	A	A	A					L							
11								L	L								L							
12								L	A								L	L						
13																	A	A	A	A				
14									L								L							
15									L								L	A						
16								L									U L							
17								L	L								L							
18									L	A	H						L							
19								L	H	L							L	L						
20						L	L	L									L	L						
21								L	L								L							
22								L	L								L	L						
23								L	L								A	L	A					
24								L	A	A	A						A	L	L					
25						L	L	L									A	A	A	A				
26							L	L									A	A	A	A				
27							L	L									A	L						
28							L	L									A	A	A	A				
29							L	L									A	A	A	A				
30					A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								4	18	21	24	22	22	18	21	21	18	6						
MED								L	372	380	380	390	390	385	385	380	380	378	365					
UQ								L	378	385	385	390	395	390	390	390	385	365						
LQ								L	368	370	370	380	380	380	375	375	370	365	L					

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M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

APR. 1987

H^oF2 (KM)

135° E Mean Time (G.M.T. + 9 h)

Station TOKUBUNJI TOKYO		Lat. 35° 42.4' N							Long. 139° 29.3' E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									265	280	300	315	280	295	260	290	275	265						
2									265	275	330	290	300	280	285	280	260	E A 270						
3							250	260	270	290	280	280	275	280	275	250	240							
4								275	290	280	295	275	290	270	275	275	255							
5								295	295	C	C	C	C	C	C	C	C	C	C					
6						C	C	C	C	305	E C 300	290	300	275	280	265	260							
7							305	315	280	280	335	320	300	305	300	275	255							
8								300	285	285	305	310	290	285	275	255	255							
9							285	295	290	285	280	305	305	285	300	265	250							
10							260	260	270	A	310	305	330	310	275	260								
11							260	255	255	260	L 320	365	315	295	265	275	255							
12							260	285	275	295	310	305	290	285	270	260	265							
13								275	255	305	335	320	310	280	275	275	A 280							
14								280	265	285	305	320	295	280	265	255	245							
15								270	265	275	285	C	290	280	270	250	R 260							
16							L 285	280	265	270	285	285	305	280	285	270								
17							285	275	265	H 270	325	335	300	285	R 270	245	250							
18								275	280	320	330	315	295	290	285	260	255							
19							260	285	300	300	310	315	285	305	280	280	305	260						
20						260	L 305	305	295	260	290	310	315	310	290	300	280							
21							255	L 290	300	290	280	320	330	295	285	270	260							
22							260	290	285	280	265	300	350	310	280	270	260							
23							270	260	275	285	305	310	290	305	315	265	255	A 255						
24							250	265	270	275	315	295	300	315	295	290	280	255						
25						L	280	275	260	275	295	305	320	A 315	A	A	285	260						
26							265	250	260	300	300	365	E A 330	355	320	285	270	E A 275	E A 275					
27							250	250	255	310	275	305	E A 335	315	290	295	305	300	265					
28							230	260	270	260	315	310	335	300	285	265	A 305	E A 305						
29							260	E A 260	E A 280	280	E A 315	300	A 340	E A 340	230	A	A	A						
30					E A 260		245	A	275	320	A	A	345	340	E A 350	A	A	255						
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	20	28	29	28	28	27	28	29	28	25	25	7					
MED					E A 260	255	260	275	275	285	305	308	300	283	280	270	253	258						
UQ						262	282	288	290	300	315	320	315	303	289	275	272	261						
LQ						240	252	262	265	275	289	300	290	280	275	260	255	255						

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H^oF2 (KM)

IONOSPHERIC DATA

APR. 1987

H⁺F (KM)

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

Station Hour Day	Rokubunji TOKYO				Lat. 35 42.4 N	Long. 139 29.3 E						Sweep 1 MHz to 25 MHz in 24 sec in automatic operation														
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	275	270	250	245 ^S	215	260	230	235	225	225	220	235	205	210	180	210	220	250	240	230	235	270	300	290		
2	270	250	220	220	260	285	230	230	225	240	195	190	240	A	205	240	A	A	225	230	E A 280	A	320	295		
3	280	270	270	270	250	255	205	225	225	245	225	210	225	210	200	200	H	230	230	225	210	250	300	300		
4	305	305	295	250	210	260	220	225	225	220	195	200	190	H	205	195	H	245	245	230	215	245	275	300	335 ^S	
5	285	290	270	225	275	285	255	260 ^S	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
6	C	C	C	C	C	C	C	C	C	C	E A 250	C	205	225	225	210	230	240	230	225	240	245	290	285		
7	300	280	270	225	255	265	230	210 ^H	210	225	220	210	225	300	205	205	A	235	255	A	230	255	275	270		
8	280	285	290	255	235	265	230	235	245	220	210	210	235	205	220	215	230	235	245	250	240	250	285	280		
9	280	275	280	240	215	255	235	235	230	A	225	A	215	195	240	230	240	A	245	270	A	250	295	300		
10	305	270	275	255	250	305	225	230	215	A	A	A	220	A	210	A	255	A	245	A	255	C	A 280	C		
11	290	300	I C 270	I C 235	I C 230	260	225	235	240	A	240	210	205	205	180	A	220	215	240	245	220	240	235	255	270	
12	300	290	255	215	220	245	230	225	A	A	A	A	A	240	205	195	H	215	215	235	225	225	235	260	305	
13	300	285	260	225	210	260	235	240	225	220	210	190	195	255	A	A	A	A	E A 255	255	220	250	A	305	300	
14	300	290	270	325	310	265	235	245	220	220	215	210	195	185	180	H	230	230	230	240	255	255	265	280	280	
15	300	275	270	235	205	265	230	235	215	205	205	210	C	R	220	E R 255	245	A	250	A	255	285	265	290		
16	285	270	275	275	240	225	230	260	260	A	A	215	205	190	215	225	220	230	255	255	250	255	265	280	270	
17	275	285	275	230	220	255	240	230	240	215	210	H 180	225	200	230	220	220	245	230	225	230	255	285	295		
18	320	290	280	255	235	250	225	230	250	A	A	H 205	205	210	205	230	230	220	230	230	225	230	250	270	275	
19	300	270	260	225	215	245	210	225	205	H	230	215	210	210	210	215	220	220	235	260	A	220	265	275	265	
20	260	265	S	235	245	245	220	200	H	230	220	205	225	215	225	230	210	225	235	260	230	230	215	285	255	
21	265	285	285	230	250	245	240	235	220	215	205	205	195	180	205	230	225	245	250	240	215	225	290	275		
22	290	280	265	220	235	240	220	240	225	215	215	185	205	190	H	210	235	230	230	235	245	240	240	300	295	
23	285	265	240	235	275	245	265	240	225	A	E A 255	215	240	210	A	240	A	A	A	A	225	220	280	330		
24	310	275	275	220	255	240	220	230	A	A	A	190	180	E S 260	235	E A 265	A	A	A	A	A	265	E A 350	310		
25	A 300	290	230	235	A	A	E A 285	255	235	240	215	A	225	A	A	A	A	A	A	A	A	260	225	225	290	A
26	260	265	260	250	230	245	245	230	220	205	205	A	A	A	A	A	A	A	A	A	A	U A 225	260	E A 305	280	
27	295	A	E A 300	270	270	245	230	A	220	205	A	A	A	A	E A	A	240	230	235	E A 255	230	210	220	245	265	
28	310	290	255	270	250	255	230	225	210	205	215	235	230	A	A	A	A	A	A	260	E A 265	A	E A 280	A	265	
29	280	275	275	275	245	220	225	240	A	A	A	215	A	A	A	A	A	A	A	A	A	255	245	275	310	
30	260	280	280	280	255	A	235	A	A	A	A	A	A	A	A	A	A	A	A	A	A	250	A	A	A	
31																										
CNT	29	28	28	29	28	28	29	27	24	21	23	21	22	20	20	23	19	18	23	24	27	27	27	26		
MED	290	280	270	235	242	255	230	235	225	220	212	210	210	209	212	220	230	235	242	238	230	250	282	288		
UQ	300	290	276	255	255	265	235	238	235	225	216	210	225	222	228	234	230	245	255	251	A	241	265	296	300	
LQ	280	270	260	225	220	245	225	228	220	215	205	200	195	198	205	212	220	230	232	225	225	238	275	270		

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H⁺F (KM)

IONOSPHERIC DATA

APR. 1987

H^oE (KM)

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

Station		Tokubunji Tokyo											Lat. 35 42.4 N · Long. 139 29.3 E											Sweep 1 MHz to 25 MHz in 24 sec in automatic operation										
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
1							B	115	110	110	115	110	A	115	115	A	A	115	115		S													
2							S	110	105	110	110	A	110	110	110	A	A	115		A														
3								145	115	115	110	110	110	110	110	110	110	120	A		B													
4								125	115	115	115	110	110	110	120	115	115	110	125		B													
5					S	B		130	115	110	110	C	C	C	C	C	C	C	C	C	C													
6								C	C	C	C		C	110	105	110	110	115	115	120														
7								125	115	110	B	110	A	115	110	110	110	115	E A	125	A													
8								125	115	110	115	115	110	110	110	110	110	A	115	120														
9								125	115	115	110	110	115	110	120	115	110	115	120	115														
10								125	115	110	110	110	110	110	110	110	110	115	115	125														
11								125	115	110	115	110	110	110	110	120	A	A	115	115		B												
12								130	115	110	110	110	110	110	110	A	A	120	110	115		B												
13								H	A	110	110	110	110	110	110	110	110	110	A	110														
14								130						E A	120	110	115	110	110	115	125													
15								125	115	110	110	110	110	120	110	110	120	115	115	120														
16								120	115	110	110	110	110	110	110	110	A	A	A	120	B													
17						B		120	115	110	110	110	C	110	115	110	110	110	120	130	E B	150												
18						B		120	110	115	120	110	115	110	110	120	A	A	105	A	B													
19								120	115	110	110	110	115	115	115	115	115	115	115	115	130	B												
20								115	110	110	115	110	110	110	110	115	110	A	E A	125	A													
21						B		120	110	110	115	110	105	110	110	120	110	110	A	B														
22						B		120	110	110	110	110	110	110	110	E A	120	110	115	120	B													
23			S			B		150	115	105	115	110	110	110	115	110	110	110	115	120														
24						B		115	115	110	110	110	110	105	105	110	110	110	110	110	120													
25								115	110	110	115	115	110	A	110	110	A	A	A	A														
26						B		115	110	110	110	110	110	110	110	105	110	110	120	110														
27						B		115	115	110	110	110	110	110	110	110	A	115	120	B														
28						B		115	110	110	110	110	110	110	110	110	115	110	115	115														
29						B		115	110	110	110	110	B	110	A	A	A	A	110	B														
30						B		115	105	115	110	110	110	110	110	A	110	110	115	115														
31																																		
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
CNT								27	28	29	28	29	25	27	28	26	25	23	26	14														
MED								120	115	110	110	110	110	110	110	110	110	115	115	120														
UQ								125	115	110	115	110	110	110	110	115	115	115	120	122														
LQ								115	110	110	110	110	110	110	110	110	110	110	115	115														

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H^oE (KM)

IONOSPHERIC DATA

APR. 1987

H°ES (KM)

135°E Mean Time (G.M.T. + 9 h)

Station	KOKUBUNJI TOKYO																								Lat.	35 42.4 N		Long.	139 29.3 E		Sweep 1	MHz to 25 MHz		in 24 sec		in automatic operation									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																					
1	B	B	B	S	B	B	D		G					G			G	G	S			S	S	S																					
2	S	S	S	S	S	S	S	165	G	145	155	115	110			110	105			105	105																								
3		B				B	G															B	B	S																					
4	S	B	B	B	B	S		160	150	150	125	125	125	G	105	125	120	185	150	105	105	105	S	S																					
5	150	B	B	B	165	150	130	120	115	115		C	C	C	C	C	C	C	C	C	C	C	C	C																					
6	C	C	C	C	C	C	C	C	C	C	C	C	130	C	120	120	120	120		G	G			B																					
7	110	105		B	B	B		125	155	140			G	B	G					120	115	120	95	110																					
8	S	S	S	B	S	B	G	G					120	G	125	125	115	115	110	110	110	145	120	105																					
9	B	B			B	B	G								G	G	E G	E G																											
10	110	105	B	105	110	S	G	160	130	115	110	110	125	120	E G	200	160	145	125	120	110		C	105																					
11	105	105	C	125	C	B		155	145	135	125	125	125	135		G	155	155		G	E G	175	125	110																					
12	105	105	B	B	105	B	G	140	125	120	115	115	105	125	105	105		G	140	B	125	115	130	130																					
13	105	100	B	B	B			125	110	110	140	135	130	120	125	165	145	135	135	115	115	115	105	105																					
14	140	135	105	105	110	B		170	145	110	120	120	105	110		G	E G	175	155	135		G	125	115																					
15	B	B	B	B	B	B		170	150	135	135	120	115		G	G	G	170	150	120	115	110	115	115																					
16	B	B	B	B	B			110	145	135	135	125	120	125	125	110	110	100	100	120	115	115	115	110																					
17	B	B	B	B	B	B		160	160	140	130		G	G			G	G	G	G	G																								
18	110	105	105	B	B			105	145	140	125	120	130		G	G	G		G	115	100	100	100	100																					
19	115	B	B	S	B	B		155	150	140	120	120	115	120	120		G	G	G	G		140	115																						
20	B	110	S	B	S	B		150	130		G	125	125	110	115	110	110	110	105	100	105	105	105																						
21	120	B	115	110	110	B	G	G	125		G	120	115		G	G		G	105	100	135	B	115																						
22	110	105	100	105	110	B	G		150	130	135	125	120		G	120	105	155	E G	170	140	120	115																						
23	B	110	105	B	B	B		170	135	125	115	120	120	110	115	110		E G	170	125	120	115	110																						
24	110	B	130	135	105	B	G		125	120	120	115	120	115	155	140	130		120	115	120	115	110																						
25	110	110	110	105	105	110	120	120	115	115	115	115	105	105	105	100		100	105	100	100	100	B																						
26	110	B	B	105	110	160	G		140	130	115	115	115	110	105	110	105		110	120	115	105	110																						
27	110	110	110	115	110	B		130	120	120	115	110	110	105	105	105	100		105	135	120	120	105																						
28	B	105	125	115	B	B		160	140	135	115	110	110		E G	170	145	130	125	115	115	115	110																						
29	S	B	B	B	B			135	120	110	110	115	110	115	125	120	100		115	115	110	110	110																						
30	110	110	105	110	105	100	140	130	120	120	110	110	110	105	135	125		120	115	110	110	110	115																						
31																																													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																					
CNT	17	14	12	13	13	8	18	27	25	26	27	26	23	22	26	26	22	23	26	28	27	24	23	19																					
MED	110	105	105	105	110	118	152	140	130	120	120	115	115	115	115	115	116	120	115	115	110	110	110	110																					
UQ	110	110	112	115	110	138	160	150	135	125	125	120	124	125	130	U	145	138	132	120	115	115	115	110																					
LQ	110	105	105	105	105	108	135	130	120	115	115	110	110	105	110	105	105	105	115	110	108	105	110	108																					

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H°ES (KM)

IONOSPHERIC DATA

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TYPES OF ES

135° E Mean Time (G.M.T. + 9 h)

Station		Lat. 35° 42.4' N · Long. 139° 29.3' E											Sweep 1 MHz to 25 MHz in 24 sec in automatic operation												
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								H1		H1	H1	C2	L1		L1	L2				F1	F1				
2								H2		H2	H1	C1	H1	C2	C2	HCL12	HL23	H4	C5	F2	F5	F4	F2	F2	
3		F2		F1	F1	F1		H2	H2	C2	C2	C1	C2	C1	C2	C2	L2		L1	F1					
4							H2	H2	H1	HC22	H1	C1		L1	HL11	H1	HL11	H2	L1	F1	F1			F1	
5		F1				HK11	H1	C2	C2	C1	C2														
6											H2		H1	C1	C1	C1			C3	F2	FF21	F2	F2	F2	
7		F1	F2			F1	H2	H1				L1	C1	C2	H1	C2	C3	HL12	L3	FF42	FF24	FF21	FF21		
8									H1		H2	C1	C1	C1	C1	C1	L2	HL11	C2	FF12	F2	F2	F2	F2	
9				F2	F1			H2	H2	C2	C1	C2			H1	H1	H1	C3	C3	F2	F2	F4	F3	F3	
10		F2	F1		F2	F1		H1	H2	C2	C2	C2	H1	C2	H1	H2	H2	H3	C3	F3		F3	F3	F3	
11		F2	F3		F1		H2	H2	H2	H2	H2	C1	H1		HL11	HL12		H1	H1	F3	F2	F2		F2	
12		F2	F2		F1		H2	H2	C2	C2	C3	C2	C2	CL12	L2	L2		H2		F1	F1	F1	FF13	FF22	
13		F1	F1		F1	L1	L2	H2	H2	H1	C1	C1	C1	H1	H1	H2	HC32	HL42	C4	FF23	F2	F3	F3	F1	
14		F1	FF12	F2	F2	F1		H2	H2	C1	C2	C2	C2	L2		H1	H1	H1		C2	F3	FF21		F2	
15							H1	H1	H1	H1	C1	C2				H1	H1	H3	C3	F3	F3	F3	FF12		
16					F1	H2	H3	H2	C2	C2	C2	C2	C1	C1	C1	L3	L3	HL32	CL41	F4	F3	F2			
17						H2	H2	H2	H1				H1	H1						F1	F2	F3	F2	F2	
18		FF22	F2	F2		L1	H2	H2	H3	C1	C1				HC11	L1		L2	L2	F2	F1	F2	F2	F2	
19		F2					H2	H2	H1	C2	C2	C1	C1	C1					H1	F4	F2	F3	F2	F2	
20			FF11				H2	H2		C1	C1	C2	C1	C2	C1	C1	L2	L2	L3	F2	F3	F3	F2	F1	
21		FF12		F1	F1	F2			H1		C1	C1			L1		L1	L2	HL11		F1	F1	F2	F2	
22		F2	F2	F2	F2	F2		H1	H1	H1	H1	C1		H1	L1	H1	H1	H1	H1	F3	F4	F4	FF21		
23			F2	F3	K1		H2	H2	H1	C2	C1	C1	C1	C1	CL11	C2	H1	H2	C2	C4	F3	F1	FF11	F2	
24		F2		F1	F1	F1		H2	H2	C2	C2	C1	C1	C1	H1	H1	H2	HC	C3	C3	F3	F3	F3	F3	
25		F3	F3	F2	F3	F4	F2	C3	C2	C2	C2	C2	C2	C2	C3	C3	L3	L4	L3	L3	F4	FF12		F4	
26		F2			F1	F1	H1	H1	H1	C2	C2	C2	C2	C2	C2	C2	C2	C3	CL31	CL32	F3	F2	F3	F3	
27		F2	F4	F3	FF23	F2		H2	C3	C2	C2	C2	C2	C3	C2	C2	L3	LH31	HL22	H2	F2	F1	F1	FF12	
28			F3	F1	F1		H2	H2	C1	C1	C2	C1	H1	H2	H2	H3	C4	C4	C3	F4	F3	F3	F3	F2	
29					F1		H2	C4	C3	C3	C2	C2	C2	HL21	HL32	L3	HL33	C4	C4	C3	F4	F4	F4	F4	
30		F3	F2	F3	F2	F3	L3	H2	H3	H2	C2	C2	C2	C2	HL22	H3	H3	C3	C3	F2	F2	F3	F5	F4	
31																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																									
MED																									
UQ																									
LQ																									

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TYPES OF ES

IONOSPHERIC DATA

APR. 1987

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA				Lat. 31° 12' N	Long. 130° 37' E	Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																			
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	39	39	X	X	39	34														X	X	X	X	S	X	
2	X	X	X	X	X	X														X	X	X	X	X	X	
3	X	X	X	X	X	X														X	X	X	X	X	X	
4	31	38	36	38	35	23														X	X	X	X	X	X	
5	X	37	45	38	45	X	X													C	C	C	C	C	C	
6	C	C	C	C	C	C														X	X	X	X	X	X	
7	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	
9	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	
11	46	48	50	52	36	31														X	X	X	X	X	A	
12	60	52	52	56	X	X														X	X	X	X	X	X	
13	55	X	X	X	X	X														X	X	X	X	X	X	
14	X	X	X	X	X	X														X	X	X	X	X	X	
15	X	X	X	X	X	X														X	A	X	X	X	X	
16	64	64	65	62	X	X														A	X	X	S	S	59	
17	59	60	56	S	45	39														X	X	X	X	X	54	
18	52	56	X	X	X	X														X	X	X	X	X	X	
19	X	X	X	X	X	X														X	X	X	X	X	X	
20	X	X	X	X	X	X														X	U	X	X	X	X	
21	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	
23	X	X	X	X	X	X														X	X	U	X	X	X	
24	45	46	45	49	40	36														O	X	X	X	X	U	F
25	48	48	57	A	A	27														X	X	O	X	X	X	
26	X	U	X	X	X	X														X	X	A	A	A	A	
27	A	46	40	43	X	X														X	X	X	X	X	X	
28	X	52	53	52	51	46														X	A	A	A	A	A	
29	A	55	A	48	54	38														X	X	X	X	X	X	
30	48	48	46	47	47	37														A	X	55	50	50	50	
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	27	29	28	27	28	29														24	27	27	26	26	26	
MED	X	X	X	X	X	X														X	X	X	X	X	X	
UQ	52	52	X	X	X	X														X	X	X	X	X	X	
LQ	X	X	X	X	X	X														X	X	X	X	X	X	

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FXI (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

F0F2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station Hour Day	Station YAMAGAWA				Lat. 31 12.1 N				Long. 130 37.1 E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation															
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F				
2	41	41	41	40	27	27	33	50	59	61	64	73	74	85	87	76	71	76	79	75	43	34	35	35				
3	J	S	34	34	32	28	33	47	J	R	63	66	67	71	80	81	78	80	63	64	72	72	43	25	27	27		
4	F	F	F	F	F	S	F	F	F	F	F	F	F	J	R	J	R	R	U	R	R	R	R	R	R	S		
5	31	38	F	F	26	19	31	51	63	68	66	85	I	C	85	87	80	H	C	C	C	C	C	C	C			
6	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			
7	30	30	30	30	26	23	34	48	57	65	77	61	72	81	83	78	72	72	67	72	73	37	30	32				
8	31	30	30	30	29	24	33	48	57	66	67	63	65	68	75	70	67	68	68	78	66	39	39	38				
9	S	38	41	39	35	28	39	54	66	67	67	63	65	69	76	70	67	68	68	78	66	39	39	38				
10	S	39	40	F	F	36	28	39	54	66	62	65	68	79	87	100	106	84	91	89	77	65	40	F	F			
11	F	F	F	F	F	F	F	39	50	67	67	65	60	80	80	97	101	87	87	88	74	65	53	F	A			
12	F	F	F	50	23	21	38	57	69	76	75	78	92	103	120	122	108	109	109	H	83	68	53	43	43			
13	F	39	40	42	29	32	39	56	68	71	72	79	91	J	R	98	105	J	R	100	105	106	J	R	J	S		
14	40	39	39	35	36	39	44	59	76	96	77	80	97	97	96	88	75	68	66	60	61	58	54	53				
15	52	50	51	51	35	30	41	60	75	75	76	79	89	97	102	91	76	74	66	65	A	49	47	F				
16	F	F	F	F	44	39	46	60	76	74	76	68	77	93	92	82	71	71	79	A	J	S	S	S	F			
17	F	F	J	S	F	34	45	63	66	65	68	77	91	104	113	106	89	71	75	77	55	44	43	47				
18	F	F	45	40	39	37	47	60	66	69	71	72	91	105	108	116	106	J	R	99	91	77	64	50	45	47		
19	46	45	J	S	39	35	27	44	58	64	66	78	80	94	104	114	115	109	109	112	112	71	54	53	54			
20	52	48	47	45	43	28	45	56	72	83	79	77	86	94	101	108	109	J	R	J	R	J	R	J	R	S		
21	S	41	40	40	39	32	47	62	R	72	75	80	79	79	91	97	92	86	77	69	76	66	47	39	U	S		
22	42	41	42	47	24	19	40	56	59	72	85	78	77	79	H	77	83	77	68	68	72	67	53	45	45			
23	43	45	45	43	35	34	42	70	68	68	66	70	75	77	79	32	89	87	86	89	67	J	S	38	F			
24	F	F	F	S	F	F	46	55	62	61	62	65	77	79	86	95	93	91	84	93	73	47	F	U	F			
25	U	F	U	F	A	A	U	F	21	41	70	64	58	62	70	77	86	J	R	J	R	J	R	J	R	S		
26	39	J	S	F	F	29	48	69	57	56	54	U	R	61	77	78	92	J	R	112	104	91	86	87	51	A	A	A
27	A	F	F	F	29	23	42	57	68	62	59	59	66	76	77	77	72	77	88	U	R	93	84	52	43	44		
28	39	F	F	F	F	F	43	57	63	68	61	73	82	79	85	81	77	72	76	79	73	A	A	A	A			
29	A	F	A	F	F	32	46	60	63	63	60	A	63	73	81	86	91	90	85	83	77	59	46	45				
30	F	F	F	F	F	31	46	58	63	A	A	61	65	79	83	83	87	86	87	A	A	53	F	F				
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	19	22	21	27	29	29	29	29	29	29	30	30	30	30	29	29	29	27	27	27	22	21				
MED	40	40	40	40	32	28	41	57	64	66	67	72	78	83	90	87	86	77	79	77	66	47	40	41				
UQ	42	42	44	43	36	32	45	60	68	71	76	78	89	97	101	106	93	91	88	85	72	53	45	45				
LQ	34	34	34	35	27	24	38	51	62	63	64	63	73	78	79	80	72	71	68	72	56	40	37	38				

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F0F2 (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FOF1 (0.01 MHZ)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA							Lat.	31 12.1 N				Long.	130 37.1 E				Sweep	1 MHz to 25 MHz		in 24 sec		in automatic operation		
Hour Day	00	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	420	440	450	A	450	440	U	L	U	L	L	L			
2									L	U	L	430	440	440	440	420	U	L	L	L					
3									L	L	420	440	450	H	440	450	440	420	410	L	L				
4										420	440	440	450	450	440	430	410	U	L	370	L				
5										420	430	A	I	C	A	A	430	C	C	C					
6								C	C	420	440	440	460	450	450	430	420	L	L						
7									L	L	U	L	U	L	U	L	420	410	L	L					
8								L	L	420	440	460	460	460	460	450	L	L							
9								L	L	420	430	U	L	460	460	460	U	L	L	L					
10								L	L	L	470	A	470	A	440	450	L	L							
11									L	L	A	A	480	470	460	450	L	L	L						
12									L	L	U	L	470	A	A	470	450	L	L						
13									L	450	490	510	470	480	460	450	450	L	L						
14									460	460	470	500	480	460	470	470	450	L							
15									L	450	450	480	490	500	A	A	420	L							
16									A	A	A	490	480	480	480	450	A	450	A						
17									L	U	L	470	H	480	480	460	A	A	L	400	L				
18									L	470	460	490	500	500	500	460	440	L	L						
19									L	450	470	490	500	490	460	450	450	430	L						
20								L	L	U	L	U	L	U	L	490	480	470	A	A	U	L	L		
21								L	U	L	440	440	460	460	540	460	470	450	430	L					
22									L	U	L	440	450	460	470	470	450	440	420	U	L	390	L		
23								L	U	L	410	440	460	470	460	460	440	450	430	400					
24									L	430	430	460	460	U	A	460	450	A	A	A	L				
25								L	L	U	L	430	A	460	A	A	A	430	U	L	U	L	L		
26								L	400	440	L	A	U	A	450	500	A	440	420	A					
27								L	L	420	440	460	U	480	460	450	440	A	A	A					
28								L	L	U	L	420	460	470	450	460	A	A	A	U	L	A	A		
29									A	A	440	A	A	U	L	460	450	440	430	L	L				
30									A	A	A	460	450	450	450	420	U	L	A	A	A				
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									4	23	25	26	25	26	24	25	18	9							
MED									425	430	450	460	470	460	450	440	420	400							
UQ									450	440	460	480	480	465	450	430	410								
LQ									405	420	440	460	460	450	445	430	410	390							

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FOF1 (0.01 MHZ)

IONOSPHERIC DATA

APR. 1987

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station		YAMAGAWA					Lat. 31° 12' N · Long. 130° 37' E					Sweep 1 MHz to 25 MHz in 24 sec in automatic operation													
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1						S	170	250	275	310	320	A	A	A	A	280	235	A							
2						S	170	255	280	310	325	330	330	325	310	290	240	A							
3						S	200	255	300	310	320	A	A	A	A	A	240	185							
4						S	205	A	295	300	310	A	A	A	310	275	A	160							
5						S	200	260	290	305	310	I C	320	315	A	A	C	C	C						
6						C	C	C	300	325	340	A	J R	340	330	320	295	250	190						
7						S	210	265	305	330	A	U R	330	A	325	300	290	260	190						
8						S	225	260	320	330	340	U R	345	345	330	315	300	255	195						
9						S	210	275	315	325	335	340	340	325	315	300	255	195							
10						S	215	280	310	330	335	340	A	A	320	300	260	195							
11						S	215	270	305	325	340	350	345	340	330	300	265	200							
12						S	240	A	A	345	350	A	A	A	A	A	250	200							
13						S	235	285	320	A	A	A	A	350	315	A	245	195							
14						S	250	A	A	A	A	A	A	A	A	295	260	195							
15						S	205	R	305	325	330	R	A	R	R	300	275	200							
16						S	205	U H	R	340	340	R	R	R	R	300	260	200							
17						S	220	270	305	R	R	R	R	R	310	300	250	190							
18						S	230	280	R	340	R	E B	400	A	R	340	A	H	210						
19						S	250	290	310	A	345	A	R	A	315	A	265	190							
20						S	250	290	A	330	A	A	A	A	A	A	A	210							
21						S	240	300	320	320	A	A	U R	R	A	R	295	250	200						
22						S	220	285	315	315	320	A	340	A	U R	300	300	255	200						
23						S	225	270	300	R	340	R	A	R	315	300	265	A							
24						S	235	295	305	315	325	R	345	325	315	295	255	A							
25						S	225	275	315	335	340	A	A	A	A	A	250	200							
26						S	230	275	320	H	A	A	A	A	330	310	295	260	A						
27							185	255	A	A	A	A	A	U R	R	R	300	260	A	S					
28						S	230	290	U R	R	340	U R	U R	325	310	295	260	210	S						
29							190	225	275	300	A	A	345	340	335	315	300	255	200	S					
30						S	245	280	A	A	A	A	A	U R	R	300	265	A	S						
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT						2	29	24	23	21	19	10	12	15	21	22	27	22							
MED						188	225	275	305	325	335	340	340	330	315	300	255	198							
UQ						235	288	315	330	340	345	345	335	320	300	260	200								
LQ						210	268	300	315	322	330	335	325	310	295	250	190								

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FOE (0.01 MHz)

IONOSPHERIC DATA

APR. 1987

FOES (0.1 MHz)

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

Station	YAMAGAWA				Lat.	31 12.1 N				Long	130 37.1 E				Sweep	1 MHz to 25 MHz		in 24 sec in		automatic operation				
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	28	30	33	33	38	42	40	37	30	G 23	G 17	J A 17	J A 18	J A 18	J A 18	ES 16	ES 16
2	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	23	29	31	33	36	36	34	36	G 29	G 29	J A 19	J A 20	J A 20	J A 20	J A 21	J A 21	J A 18
3	J A 30	J A 22	J A 20	18	17	J A 20	ES 16	26	34	35	34	J A 70	J A 42	33	J A 38	J A 43	28	27	23	J A 19	J A 21	J A 20	J A 20	J A 20
4	ES 16	ES 16	ES 16	ES 16	18	18	ES 16	25	31	33	34	35	34	36	33	G 30	G 26	J A 26	J A 22	J A 20	J A 19	J A 19	J A 19	J A 17
5	20	ES 16	ES 16	19	ES 16	21	22	28	J A 49	J A 41	32	J A 48	C	J A 60	J A 48	29	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	33	G	G	38	37	G	G	G	G	J A 26	J A 33	J A 31	J A 28	J A 21	J A 17
7	J A 18	J A 21	ES 16	ES 16	ES 16	ES 16	ES 16	28	32	37	G	34	G	34	G	G	G	30	24	J A 17	ES 16	ES 16	J A 56	J A 40
8	ES 16	ES 16	ES 16	J A 20	J A 18	J A 17	J A 18	27	32	G	G	G	G	38	38	36	33	33	35	J A 26	J A 21	J A 22	J A 18	J A 17
9	J A 15	J A 25	J A 36	J A 41	J A 52	J A 30	ES 16	30	36	G	G	G	G	38	39	36	33	32	25	J A 27	J A 22	J A 22	J A 18	J A 17
10	J A 15	J A 30	J A 40	J A 40	J A 52	J A 29	J A 17	30	36	41	41	J A 68	45	J A 47	J A 35	G 30	34	28	J A 29	J A 20	J A 18	J A 28	J A 64	J A 40
11	J A 40	J A 17	ES 16	J A 19	ES 16	ES 16	J A 18	29	35	40	50	J A 53	47	G	40	37	37	30	24	J A 19	J A 30	J A 41	J A 90	J A 73
12	J A 50	J A 51	J A 25	J A 17	ES 16	ES 16	J A 16	G	33	40	G	41	J A 70	J A 67	J A 53	34	31	28	24	J A 22	J A 48	J A 26	J A 26	ES 16
13	J A 18	J A 18	J A 18	ES 16	ES 16	ES 16	G	29	31	31	35	35	35	38	41	36	34	29	21	ES 16	J A 22	J A 20	J A 21	J A 21
14	J A 21	J A 29	J A 18	ES 16	ES 16	ES 16	G	29	32	J A 46	J A 49	40	J A 43	J A 44	J A 42	J A 42	34	29	28	20	ES 16	ES 16	ES 16	ES 16
15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	20	26	31	35	35	36	G	39	J A 70	J A 53	34	31	J A 32	J A 39	J A 81	J A 51	J A 25	J A 33
16	J A 31	J A 76	J A 53	J A 25	J A 24	ES 16	25	31	J A 49	50	J A 84	J A 48	37	41	40	42	J A 53	J A 49	J A 44	J A 99	J A 32	J A 30	J A 49	J A 30
17	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	25	30	31	39	36	J A 66	G	48	49	J A 68	19	27	24	J A 28	J A 45	J A 22	J A 22	J A 30
18	J A 22	J A 32	J A 24	ES 16	ES 16	ES 16	G	28	36	45	44	39	38	41	27	G	35	18	23	ES 16	ES 16	ES 16	J A 18	ES 16
19	ES 16	ES 16	ES 16	ES 16	J A 19	ES 16	22	28	31	35	39	39	39	41	38	37	J A 34	32	22	ES 16	J A 33	J A 36	J A 26	J A 20
20	J A 32	J A 16	J A 19	ES 16	ES 16	ES 16	27	31	J A 35	39	41	36	36	J A 43	J A 57	J A 57	23	16	J A 18	J A 17	J A 18	J A 17	ES 16	
21	ES 16	ES 16	ES 15	ES 16	ES 16	ES 16	J A 27	G	36	36	35	37	32	36	35	25	G	G	32	19	J A 21	J A 21	J A 19	J A 17
22	ES 16	22	19	ES 16	ES 16	ES 16	ES 16	30	32	37	36	38	35	39	37	G	G	30	J A 25	J A 36	J A 23	J A 25	20	ES 16
23	ES 16	ES 16	ES 16	J A 20	17	ES 16	20	28	32	32	G	G	G	40	G	36	J A 38	J A 36	J A 43	J A 47	J A 40	J A 32	J A 26	J A 32
24	ES 16	20	ES 16	J A 52	J A 38	J A 22	22	30	J A 37	J A 38	39	J A 42	40	50	50	51	68	65	33	50	J A 27	J A 33	J A 40	J A 33
25	J A 65	J A 45	J A 54	J A 72	J A 71	J A 33	J A 32	28	J A 37	J A 46	47	37	J A 49	J A 62	J A 53	J A 40	J A 36	G 22	G 27	J A 44	J A 30	J A 25	J A 110	
26	J A 86	J A 35	J A 21	J A 20	J A 20	J A 20	J A 22	25	32	G	J A 50	J A 83	63	34	50	44	42	J A 42	J A 72	J A 46	J A 51	J A 80	J A 40	J A 60
27	J A 102	J A 81	J A 35	J A 30	J A 22	J A 21	25	J A 31	32	35	J A 40	37	36	G	37	41	J A 45	J A 56	J A 56	J A 20	J A 21	J A 18	J A 15	J A 17
28	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	37	G	37	G	37	G	43	46	J A 64	J A 71	J A 51	J A 52	J A 50	J A 64	J A 88	J A 80	J A 64
29	J A 77	J A 48	J A 65	J A 78	J A 72	J A 27	24	J A 50	J A 49	J A 64	38	J A 130	56	44	45	36	G	J A 60	24	J A 13	J A 50	J A 42	J A 56	J A 40
30	J A 50	J A 42	J A 31	J A 21	J A 20	ES 16	J A 33	J A 53	J A 69	J A 111	J A 126	J A 42	J A 40	J A 35	37	35	39	J A 55	J A 76	J A 110	J A 142	J A 102	J A 28	J A 22
31																								
CNT	29	29	29	29	29	29	29	29	29	30	30	30	29	30	30	30	29	29	29	29	29	29	29	29
MED	J A 18	J A 20	18	17	ES 16	ES 16	18	28	32	36	36	38	37	39	38	36	34	30	25	J A 20	J A 23	J A 25	J A 22	J A 20
UQ	J A 32	J A 32	J A 25	J A 21	J A 20	J A 20	22	30	36	41	41	J A 48	42	44	J A 46	J A 42	38	J A 36	J A 33	J A 36	J A 44	J A 33	J A 40	J A 33
LQ	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	27	31	33	32	35	34	35	36	30	G 25	G 27	G 23	J A 19	J A 20	J A 19	J A 19	J A 17

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FOES (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FBES (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station		YAMAGAWA							Lat.	31 12.1 N			Long.	30 37.1 E			Sweep 1 MHz to 25 MHz in 24 sec in automatic operation										
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	27	29	32	33	34	42	35	34	30	G 23	G	16	E S 16	E S 16	E S 16	E S 16	E S 16		
2		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	29	31	33	35	35	34	34	G	G	29	26	17	E S 16	E S 16	E S 16	E S 16		
3		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	33	35	33	G	37	33	34	34	26	26	22	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	24	30	32	33	34	34	36	33	G 30	G 24	24	21	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	G	26	49	40	32	47	C	56	45	29	C	C	C	C	C	C	C	C		
6		C	C	C	C	C	C	C	C	C	C	G	G	31	36	G	G	G	G	20	32	31	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	27	32	35	G	34	G	34	G	G	G	30	24	E S 16	E S 16	E S 16	E S 16	18		
8		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	27	32	G	G	G	G	33	38	35	33	32	35	25	19	20	E S 16	E S 16		
9		E S 16	21	E S 16	25	E S 16	E S 16	E S 16	29	35	G	G	G	G	38	33	36	33	32	25	25	19	20	E S 16	F S 16		
10		E S 16	20	E S 16	20	E S 16	E S 16	E S 16	29	36	40	40	60	43	47	33	G 28	33	28	29	20	E S 16	25	18	25		
11		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	17	28	34	40	50	52	43	G	40	37	36	29	24	19	29	36	20	A A 73		
12		E S 16	20	18	E S 16	E S 16	E S 16	E S 16	G	33	36	G	41	68	65	41	34	30	27	22	20	48	E S 16	E S 16	E S 16		
13		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	28	31	G 30	35	35	35	36	40	35	30	28	21	E S 16	17	19	E S 16	E S 16		
14		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G 22	30	40	46	40	39	36	40	37	34	28	28	19	E S 16	E S 16	E S 16	E S 16		
15		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	18	24	31	35	35	36	G	39	67	51	34	29	28	37	A A 81	31	24	33		
16		E S 16	19	29	E S 16	E S 16	E S 16	25	30	49	50	50	46	37	41	39	41	44	40	36	A A 99	25	19	28	E S 16		
17		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	29	31	38	36	46	G	44	48	64	19	27	23	26	45	21	17	25		
18		E S 16	17	E S 16	E S 16	E S 16	E S 16	G	28	34	44	41	39	U Y 38	40	U Y 27	G	31	G 18	21	F 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	20	26	31	35	37	39	38	40	38	34	31	26	21	E S 16	24	25	20	E S 16		
20		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	35	36	40	36	36	40	60	50	26	16	G 16	E S 16	E S 16	E S 16	E S 16			
21		E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	26	G	G	34	34	36	G 32	36	34	25	G	G	31	18	19	19	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	28	31	35	35	38	35	38	37	G	G	30	23	20	22	18	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	20	27	31	32	G 23	G	G	39	G	36	35	34	42	47	40	19	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	21	29	34	37	37	41	40	46	36	43	45	65	26	E S 16	E S 16	20	30	24		
25		E S 16	25	23	A A 72	A A 71	17	32	28	36	36	45	37	46	62	53	36	33	G 21	G	23	32	26	E S 16	18		
26		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	21	G	31	G	48	45	53	34	46	43	41	47	63	46	43	A A 80	A A 40	A A 60		
27		A A 102	E S 16	E S 16	20	E S 16	E S 16	20	29	30	33	39	36	36	G	36	30	44	54	25	17	19	E S 16	E S 16	E S 16		
28		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	26	G	36	G	36	G	42	45	64	59	38	45	48	50	A A 88	A A 80	A A 64			
29		A A 77	E S 16	A A 65	25	23	E S 16	G	50	41	62	36	A A 130	55	44	44	35	G	G	E S 16	34	38	26	21			
30		24	28	E S 16	E S 16	E S 16	E S 16	30	44	55	A A 111	A A 126	42	38	35	36	35	36	50	62	A A 110	A A 142	40	21	20		
31																											
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT		29	29	29	29	29	29	29	29	29	30	30	30	29	30	30	30	29	29	29	29	29	29	29	29		
MED		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	27	31	35	35	38	36	38	38	35	33	28	24	19	19	19	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	20	29	34	40	40	42	40	42	41	37	36	32	29	26	34	25	20	21		
LQ		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	30	32	32	34	31	35	34	30	G 24	G 24	26	21	E S 16	E S 16	E S 16	E S 16	E S 16		

APR. 1987

FBES (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FMIN (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA							Lat. 31 12.1 N	Long. 130 37.1 E	Sweep 1 MHz to 25 MHz in 24 sec in automatic operation														
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S	E S	E S	E S	E S	E S	E S	E S	12	17	17	17	18	18	18	17	15	13	12	E S	E S	E S	E S	E S
2	E S	E S	E S	E S	E S	E S	E S	E S	E S	13	14	17	17	17	17	16	16	17	E S	E S	E S	E S	E S	E S
3	E S	E S	E S	E S	E S	E S	E S	E S	16	17	17	18	17	17	17	17	17	13	E S	E S	E S	E S	E S	E S
4	E S	E S	E S	E S	E S	E S	E S	E S	15	16	17	17	19	E C	23	17	17	14	13	12	E S	E S	E S	E S
5	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	17	18	C	18	18	17	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	17	18	21	20	18	20	18	16	15	E S	E S	E S	E S	E S	E S
7	E S	E S	E S	E S	E S	E S	E S	E S	16	17	17	19	19	22	20	18	18	16	15	E S	E S	E S	E S	E S
8	E S	E S	E S	E S	E S	E S	E S	E S	15	16	18	20	22	30	22	18	18	16	E S	E S	E S	E S	E S	E S
9	E S	E S	E S	E S	E S	E S	E S	E S	15	17	18	20	22	30	24	18	17	16	E S	E S	E S	E S	E S	E S
10	E S	E S	E S	E S	E S	E S	E S	E S	16	17	17	31	20	20	18	17	16	16	E S	E S	E S	E S	E S	E S
11	E S	E S	E S	E S	E S	E S	E S	E S	16	17	18	20	22	31	20	18	17	16	E S	E S	E S	E S	E S	E S
12	E S	E S	E S	E S	E S	E S	E S	E S	15	16	18	21	22	23	18	21	16	17	E S	E S	E S	E S	E S	E S
13	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	24	20	18	18	18	17	16	E S	E S	E S	E S	E S	E S
14	E S	E S	E S	E S	E S	E S	E S	E S	14	17	18	19	19	21	13	18	17	15	E S	E S	E S	E S	E S	E S
15	E S	E S	E S	E S	E S	E S	E S	E S	15	17	18	18	19	18	18	17	17	16	E S	E S	E S	E S	E S	E S
16	E S	E S	E S	E S	E S	E S	E S	E S	16	17	18	21	26	20	18	17	17	15	E S	E S	E S	E S	E S	E S
17	E S	E S	E S	E S	E S	E S	E S	E S	16	17	18	18	21	20	20	17	17	16	E S	E S	E S	E S	E S	E S
18	E S	E S	E S	E S	E S	E S	E S	E S	15	21	22	29	35	22	23	24	20	14	E S	E S	E S	E S	E S	E S
19	E S	E S	E S	E S	E S	E S	E S	E S	17	18	21	26	22	31	26	20	17	16	E S	E S	E S	E S	E S	E S
20	E S	E S	E S	E S	E S	E S	E S	E S	15	16	17	20	18	22	24	17	17	14	13	E S	E S	E S	E S	E S
21	E S	E S	E S	E S	E S	E S	E S	E S	16	17	17	17	17	19	17	16	17	17	E S	E S	E S	E S	E S	E S
22	E S	E S	E S	E S	E S	E S	E S	E S	16	17	17	17	16	17	16	16	16	12	E S	E S	E S	E S	E S	E S
23	E S	E S	E S	E S	E S	E S	E S	E S	14	16	17	18	E C	E C	22	19	16	14	14	E S	E S	E S	E S	E S
24	E S	E S	E S	E S	E S	E S	E S	E S	15	17	17	18	18	21	21	22	17	17	16	E S	E S	E S	E S	E S
25	E S	E S	E S	E S	E S	E S	E S	E S	17	17	20	E C	26	22	18	21	17	17	13	E S	E S	E S	E S	E S
26	E S	E S	E S	E S	E S	E S	E S	E S	15	17	19	18	21	21	17	18	17	16	13	E S	E S	E S	E S	E S
27	E S	E S	E S	E S	E S	E S	E S	E S	15	17	18	20	20	22	18	17	17	17	16	E S	E S	E S	E S	E S
28	E S	E S	E S	E S	E S	E S	E S	E S	17	16	17	20	18	22	18	17	16	16	E S	E S	E S	E S	E S	E S
29	E S	E S	E S	E S	E S	E S	E S	E S	16	17	17	23	21	22	18	18	16	15	E S	E S	E S	E S	E S	E S
30	E S	E S	E S	E S	E S	E S	E S	E S	16	17	17	19	16	18	18	16	17	16	E S	E S	E S	E S	E S	E S
31																								
CNT	29	29	29	29	29	29	29	29	29	30	30	30	29	30	30	30	29	29	29	29	29	29	29	29
MED	E S	E S	E S	E S	E S	E S	E S	E S	16	17	18	20	20	20	18	17	17	16	E S	E S	E S	E S	E S	E S
UQ	E S	E S	E S	E S	E S	E S	E S	E S	16	17	18	21	22	22	21	18	17	16	E S	E S	E S	E S	E S	E S
LQ	E S	E S	E S	E S	E S	E S	E S	E S	15	16	17	18	18	18	18	17	16	14	E S	E S	E S	E S	E S	E S

APR. 1987

FMIN (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

M(3000)F2 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA				Lat. 31° 12' N				Long. 130° 37' E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation															
	Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F				
2	290	305	330	350	370	295	320	360	340	350	320	320	305	310	325	320	315	330	340	365	335	310	300	300				
3	J	S	310	310	340	345	320	320	350	J	R	335	355	330	310	310	320	315	335	325	335	340	360	360	340	275	315	
4	F	F	F	F	F	S	320	355	335	330	335	310	310	J	R	J	R	R	U	R	R	350	370	320	280	280	295	
5	355	330	290	F	F	385	315	325	335	355	330	310	310	I	C	310	325	330	310	C	C	C	C	C	C	C	C	
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
7	300	300	300	335	325	305	350	365	325	R	325	350	H	320	310	315	335	340	320	340	330	325	355	350	300	280		
8	290	300	300	315	360	310	335	355	315	340	345	335	330	325	325	335	345	340	340	335	365	320	295	300				
9	S	300	290	295	335	355	320	345	340	355	345	345	335	330	320	330	335	335	340	340	335	370	320	295	290			
10	S	295	300	F	F	360	320	335	335	365	345	325	295	295	295	310	R	330	325	335	340	335	345	335	F	F		
11	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
12	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
13	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
14	290	280	300	345	380	220	335	340	360	330	335	285	295	300	310	310	320	335	340	340	315	310	300	275	285			
15	280	280	295	335	315	300	330	335	345	340	315	305	295	305	315	325	330	345	340	340	A	285	275	F				
16	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
17	F	F	S	S	F	310	335	335	350	315	H	325	285	285	300	310	320	R	335	325	320	335	310	295	290	275		
18	F	F	290	285	295	295	340	335	355	325	330	275	280	295	290	310	325	R	335	330	330	290	290	285				
19	280	310	S	305	330	295	340	345	330	335	305	260	285	290	300	305	300	295	315	350	310	295	285	275				
20	290	280	275	300	335	340	335	330	R	335	315	300	285	290	R	290	R	295	R	J	R	J	R	J	R	J	R	
21	S	S	285	310	320	330	340	340	R	R	335	325	325	290	270	290	310	R	315	325	330	360	330	350	320	280	280	
22	295	290	S	310	350	395	290	335	355	330	325	330	325	300	295	H	300	H	315	335	330	340	325	330	330	275	275	
23	280	300	310	325	300	295	320	350	350	345	325	290	300	305	305	285	315	325	330	340	365	J	S	330	275	F		
24	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
25	U	F	U	F	A	A	U	F	285	330	350	350	325	315	305	305	285	R	J	R	J	R	J	R	J	R		
26	305	S	F	F	F	310	345	385	375	365	315	285	290	270	300	310	R	J	R	330	310	330	355	345	A	A	A	
27	A	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
28	295	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
29	A	F	A	F	F	360	345	375	365	A	340	A	310	285	300	310	315	305	325	335	335	355	315	300				
30	F	F	F	F	F	340	345	360	340	A	A	320	285	305	295	305	310	315	320	A	A	330	F	F				
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	19	17	22	21	26	29	29	29	28	28	28	30	29	30	29	29	28	28	26	26	27	22	21				
MED	295	300	300	335	345	310	335	350	350	340	328	300	300	305	310	320	325	325	330	335	345	320	288	285				
UQ	300	310	310	345	360	325	345	360	355	350	338	320	310	310	320	330	330	335	340	350	360	335	295	295				
LQ	290	290	295	310	320	295	330	335	335	330	318	290	290	295	300	310	315	315	320	330	330	298	275	280				

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M(3000)F2 (0.01)

IONOSPHERIC DATA

APR. 1987

M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station Hour Day	YAMAGAWA				Lat. 31° 12' N · Long. 130° 37' E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation															
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L			A			U	U	L	L						
2								L	U	L					U	U	L	L						
3								L	L			A			L	L								
4										L					U	U	L	L						
5									A	L		A	C	A	A		C	C	C					
6							C	C	L	L					L	L								
7								L	L	U	L	U	U	L	L	L								
8								L	L	U	L	U	U	L	L	L								
9								L	L	U	L	U	U	L	L	L								
10								L	L	L		A			L	L								
11								L	L	A	A	A	L	L	L	L								
12								L	L	U	L	A	A	A	L	L								
13								L	375	355	350	395	365	370	355	345								
14									335	A	A	380	355	380	360	360	355							
15								L	365	400	375	385	340	A	A									
16								A	A	A	A	395	365	355	A	A	A	A						
17								L	U	L	H	A	375	A	A	A	L	400	L					
18								L	A	A	U	L	A	350	350	360	350	L	L					
19								L	375	360	365	370	365	380	375	355	315	L						
20								L	L	U	L	U	L	375	355	360	A	A	U	L				
21								L	U	L	L	U	L	415	350	365	U	L	L					
22									L	U	L	L	350	360	365	365	355	U	L	L				
23								L	U	L	L	L	400	380	385	345	335	350						
24								L	L	385	420	415	325	A	375	A	A	A	L					
25								L	L	U	L	A	L	A	A	A	U	L	L					
26								L	L	385	375	A	A	A	H	A	A	A	A					
27								L	L	390	395	390	U	L	L	A	A	A	A					
28								L	L	U	L	L	375	A	A	A	A	A	A	A				
29									A	A	L	A	A	A	A	L	L	L	L					
30									A	A	A	L	400	410	390	380	U	L	A	A	A			
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									4	20	23	22	22	22	22	22	17	7						
MED									L	L	L	L	L	L	L	L	L	U	L					
UQ									L	L	L	L	L	L	L	L	L	U	L					
LQ									L	L	L	L	L	L	L	L	L	L	L					

APR. 1987

M(3000)F1 (0.01)

IONOSPHERIC DATA

APR. 1987

H^oF₂ (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA				Lat.	31 12.1 N				Long.	130 37.1 E				Sweep	1 MHz to 25 MHz				in 24 sec in automatic operation				
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									250	255	275	285	300	285	280	255	270	255	255					
2									260	255	310	280	300	295	270	265	285	270	245					
3									270	250	285	290	285	275	280	255	270	265	245					
4									285	270	290	295	280	265	255	255	245	235						
5									280	280	295	I C	300	280	280	285	C	C	C					
6							C	C	280	290	275	290	290	300	275	275	250							
7									260	275	250	325	320	300	290	270	280	270	255					
8							250	300	280	270	280	290	305	290	280	270	270							
9							275	250	280	270	290	290	310	290	280	275	270							
10							280	250	270	320	A	330	315	290	275	270	265							
11									250	250	270	A	360	345	295	270	270	265	245					
12									255	270	270	305	A	305	290	260	270	270						
13									240	285	280	335	305	305	295	280	285	270	245					
14									310	270	250	350	295	285	295	285	265	255						
15									255	265	290	295	310	300	290	270	285	250						
16									255	260	270	315	315	320	290	260	295	285	250					
17									250	U L	290	340	340	310	290	270	255	270	255					
18									260	290	275	L	335	310	310	285	260	260	245					
19									270	280	295	L	320	320	310	290	285	290	260					
20							L	255	265	260	290	310	330	310	320	300	280	285	275					
21								255	275	270	280	305	370	320	295	275	275	255						
22								L	295	275	275	300	315	305	285	270	270	250						
23								245	250	260	280	320	305	310	300	330	285	270						
24									250	250	275	340	295	340	310	290	275	275	270					
25								250	255	L	295	A	320	300	A	290	255	260	275	260				
26								225	230	245	E A	305	360	330	360	330	285	260	265					
27								235	250	255	290	360	350	315	320	300	320	315	280					
28								235	280	270	350	330	300	310	300	A	290	300	270	250				
29								230	A	270	A	A	330	310	310	290	280	260						
30								280	A	A	310	375	325	320	305	300	280	285	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							10	26	27	29	27	28	30	30	30	29	29	19	1					
MED							250	255	270	280	310	305	310	295	280	275	270	255	250					
UQ							255	270	280	290	328	330	320	310	290	285	275	265						
LQ							235	250	255	270	290	298	300	290	270	270	265	245						

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H^oF₂ (KM)

IONOSPHERIC DATA

APR. 1987

H^oF (KM)

135° E Mean Time (G.M.T. + 9 h)

Station Hour Day	YAMAGAWA				Lat.	31 12.1 N · Long				30 37.1 E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	300	285	255	225	220	E S 275	245	225	225	225	210	205	A	H 190	200	H 190	215	H 205	245	225	225	225	E S 300	305	
2	E S 285	255	245	225	205	E S 300	E S 255	220	245	225	200	200	H 190	H 180	225	H 195	H 205	250	A	210	205	E S 255	E S 300	E S 295	
3	E S 345	E S 275	265	245	240	245	225	250	A 230	215	H 215	A	200	H 200	210	200	200	245	250	205	195	E S 250	E S 305	E S 295	
4	E S 325	E S 280	E S 270	245	200	S	E S 245	220	230	230	210	H 195	H 200	H 190	H 200	195	H 195	H 185	240	205	E S 220	E S 315	E S 330	E S 310	
5	E S 290	E S 240	E S 300	E S 245	195	E S 295	E S 245	245	A 255	A	H 200	A	C	A	A	225	C	C	C	C	C	C	C	C	
6	C	C	C	C	C	C	C	C	C	235	230	200	225	220	220	200	H 200	240	240	230	225	E S 245	E S 305	S	
7	E S 300	E S 300	E S 300	E S 270	E S 250	E S 280	240	230	235	225	190	H 200	H 180	H 180	H 200	H 200	220	E A 240	A	240	220	210	S	A	
8	E S 300	E S 300	E S 300	E S 280	230	E S 280	260	240	235	220	210	200	H 180	H 200	235	230	225	E A 250	E A 250	A	210	E A 250	E S 295	E S 300	
9	E S 300	E S 305	E S 295	E S 255	230	E S 275	245	235	A	225	210	200	H 225	H 200	230	230	225	E A 250	250	245	210	E A 250	E S 295	E S 300	
10	E S 300	E S 300	E S 295	E A 255	230	E S 275	245	235	A	A	225	A	E A 235	A	H 185	H 180	240	235	245	230	220	230	E A 300	A	
11	E S 300	E S 290	E S 250	225	210	E S 300	230	235	235	E A 240	A	A	A	H 180	E A 250	225	E A 250	235	240	225	235	E A 250	E A 280	A	
12	S	A	E A 265	205	200	E S 300	240	235	240	A 230	220	230	A	A	A	A	220	H 200	225	230	225	E A 250	220	E S 275	E S 295
13	300	295	270	225	200	E S 300	240	240	235	220	205	H 185	H 175	H 215	235	220	230	230	240	215	A 205	A 215	E S 315	315	
14	295	300	280	295	310	S	255	245	240	220	A	A	200	275	235	245	240	220	225	245	240	250	250	280	295
15	300	295	275	220	205	H 285	250	240	235	210	200	195	195	270	A	A	220	240	245	250	A	E A 310	E A 320	A	
16	S	A	A	S	S	S	240	245	A	A	A	A	190	240	240	A	A	A	A	A	A	A	E A 265	E A 365	S
17	295	280	260	235	200	H 260	240	245	235	225	200	A	215	A	A	A	200	220	250	230	A	285	300	E A 320	
18	300	285	290	270	E S 280	E S 270	240	230	235	A	A	200	195	E A 230	205	215	235	220	245	125	220	S 240	S 280	S 295	
19	285	270	250	E S 250	E S 220	E S 285	240	235	235	210	200	195	185	220	200	220	220	220	250	220	220	E A 265	E A 295	S 285	
20	285	285	280	250	215	E S 240	240	240	230	210	205	H 205	195	H 185	H 220	A	A	220	255	230	225	200	E S 250	280	
21	S	S	295	245	240	E S 245	240	240	230	220	205	H 190	H 175	H 180	H 180	200	H 210	H 200	250	240	210	A 240	E S 295	S 310	
22	295	295	260	210	205	E S 365	230	240	230	220	220	200	195	H 220	205	H 195	H 190	H 235	245	240	245	A 215	E S 280	E S 300	
23	300	280	250	235	250	S 300	250	245	230	210	210	H 200	H 175	200	195	235	E A 250	E A 250	250	245	220	235	E S 295	E S 310	
24	300	280	255	230	230	E S 270	235	220	235	220	200	190	190	A	200	A	A	A	A	250	220	205	E A 245	E A 350	E A 340
25	S 305	E A 350	255	A	A	E A 390	E A 280	230	E A 245	A 215	A	H 185	A	A	A	A	225	220	220	H 200	240	240	225	E S 250	E A 280
26	E S 270	280	255	240	255	S 255	245	235	215	215	A	A	A	H 200	A	A	A	A	A	270	235	E A 260	A	A	
27	A	E S 280	E S 250	240	230	E S 270	230	230	225	210	220	H 195	H 190	H 180	H 230	A	A	A	A	240	210	210	E S 280	E S 275	
28	E S 305	E S 280	255	250	230	230	H 200	A	220	220	190	H 195	H 180	A	A	A	A	A	A	A	A	E A 250	A	A	
29	A	E S 250	A	E A 290	230	220	230	240	A	A	200	H 200	A	A	A	A	220	205	220	235	230	230	240	E A 280	E A 275
30	A	A	E S 310	E S 280	235	S 250	E A 245	240	A	A	A	E A 230	H 190	H 200	H 200	225	E A 240	A	A	A	A	A	E A 250	E A 260	E A 280
31																									
CNT	25	27	27	28	28	28	29	28	24	23	23	22	23	22	22	22	23	23	23	26	26	27	26	22	
MED	S 292	S 280	S 260	235	228	E S 275	240	235	235	220	205	200	H 190	H 200	206	220	215	225	245	230	220	U 230	E S 295	E S 298	
UQ	S 300	S 290	S 278	S 254	S 236	S 298	245	240	235	225	212	200	199	220	230	225	224	238	250	240	230	E A 250	E S 305	S 310	
LQ	S 288	S 280	255	226	205	U S 236	240	230	230	215	200	195	H 182	H 185	H 200	H 200	H 202	H 220	240	220	210	224	E S 280	E S 285	

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H^oF (KM)

IONOSPHERIC DATA

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H^oE (KM)

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

Station	YAMAGAWA				Lat. 31 12.1 N		Long. 130 37.1 E		Sweep 1		MHz to 25		MHz in 24		sec in		automatic operation								
	Hour	00	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	S	120	110	110	110	110	105	105	A	A		A					
2							S	E	S	120	110	105	110	110	110	105	105	105	110	110		S			
3							S	E	S	120	110	110	110	105	105	105	A	A	A	110		S			
4							S	E	S	120	110	110	105	105	110	110	A	A	E	A	A	A			
5							S	E	S	115	110	105	105	110	I	C	110	105	A	C	C	C			
6							C	C	C		110	110	110	110	110	110	110	115	115	E	S				
7							S			110	110	105	110	110	110	110	110	110	110	120	125				
8							S			120	110	110	110	110	110	E	B	120	115	115	115	115	120		
9							S			115	110	110	110	110	110	E	B	125	115	115	115	115	120		
10							S			115	110	110	110	E	B	120	110	A	A	A	110	115	125		
11							S			115	110	110	110	110	110	E	B	125	110	110	110	110	E	S	
12							S			120	110	110	110	110	110	115	110	110	110	110	E	S	130		
13							S			120	110	A	A	A	A	A	A	A	A	A	A	A	S		
14							S			110	110	110	110	A	A	A	A	A	A	A	A	A	S		
15							S			110	110	110	110	110	110	A	110	110	110	110	120				
16							S			115	110	110	110	110	110	105	110	110	110	110	115		S		
17							S			120	110	110	A	A	110	A	110	110	A	115		S			
18							S	S		110	115	110	B	B	A	A	B	A	A	A	A				
19							S			115	110	110	A	110	110	C	C	110	110	115		S			
20							S			110	110	105	105	105	105	A	A	A	A	A	E	A	120		
21							S			105	105	105	105	105	105	A	A	E	A	120	115	120		S	
22							S			110	110	105	105	105	105	105	A	100	105	110	E	S	120		
23							S			110	105	105	105	105	E	C	125	110	110	110	110	110	120		
24							S			110	110	110	105	105	110	105	110	H	105	110	120				
25							S			110	115	110	115	E	C	115	110	110	105	A	E	A	E	S	
26							S			115	105	110	110	105	105	110	105	105	E	A	120	115	120		
27							E	S		130	115	115	110	110	110	110	110	110	110	115	A		S		
28							S			110	110	105	105	105	105	105	110	110	110	110	110	125		S	
29							E	S		140	110	110	110	105	110	110	110	110	110	115	125		S		
30							S			115	110	110	110	110	A	A	105	110	110	115	E	S	125		S
31										110	110	105	105	105	110	105	110	110	110	110	120				
CNT										2	28	29	29	27	26	26	20	22	21	22	24	18			
MED							E	S		135	112	110	110	110	110	110	110	110	110	110	115	120		S	
UQ										120	110	110	110	110	110	110	110	112	115	122				S	
LQ										110	110	105	105	105	110	105	110	110	110	110	120				

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H^oE (KM)

IONOSPHERIC DATA

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H^oES (KM)

135° E Mean Time (G.M.T. + 9 h)

Station		YAMAGAWA										Lat. 31 12.1 N		Long. 130 37.1 E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	S	S	S	S	S	S	S	145	145	150	135	125	110	110	115	105	105	G	100	100	100	100	S	S	
2	S	S	S	S	S	S	S	160	155	E G 150	E G 150	130	130	135	130	G	G	155	130	120	125	115	105	105	
3	105	105	110	110	135	125	S	150	140	130	135	105	115	120	110	110	110	180	140	105	105	100	100	100	
4	S	S	S	S	120	115	S	150	180	120	115	110	115	110	105	105	105	105	155	100	125	100	100	100	
5	145	S	S	120	S	150	145	120	110	110	E G 140	110	C	105	105	105	C	C	C	C	C	C	C	C	
6	C	C	C	C	C	C	C	C	C	150	G	G	160	170	G	G	G	G	130	115	110	115	110	115	
7	110	105	S	S	S	S	S	140	140	125	G	120	G	120	G	G	G	130	130	125	S	S	115	110	
8	S	S	S	105	105	105	150	140	130	G	G	G	G	145	155	150	140	130	130	120	115	110	110	115	
9	125	105	105	105	105	105	S	150	140	G	G	G	G	140	150	150	140	130	130	120	110	110	110	120	
10	125	105	105	105	105	105	170	150	140	130	130	115	125	100	100	100	165	150	125	110	110	105	110	110	
11	110	110	S	125	S	S	160	150	140	130	125	120	125	G	150	140	140	150	130	100	110	105	105	105	
12	105	100	100	100	S	S	155	G	125	125	G	120	110	110	110	110	110	165	140	120	120	120	120	S	
13	105	100	100	S	S	S	G	150	140	120	110	110	110	105	160	180	110	165	135	S	110	105	105	105	
14	105	100	100	S	S	S	G	135	125	110	110	110	105	105	105	100	145	150	125	120	S	S	S	S	
15	S	S	S	S	S	S	145	140	140	125	125	125	G	110	110	135	145	140	120	110	115	120	110	110	
16	110	125	105	105	105	S	150	150	130	125	115	115	145	170	160	140	130	130	125	115	110	110	115	140	
17	S	S	S	S	S	S	145	140	140	135	135	115	G	130	125	120	105	140	150	130	120	115	110	105	
18	100	100	105	S	S	S	G	155	130	125	120	120	115	140	105	G	125	105	145	S	S	S	115	S	
19	S	S	S	S	105	S	155	150	140	130	120	180	115	170	170	120	120	125	155	S	115	110	110	110	
20	105	105	110	S	S	S	S	150	E G 160	120	110	110	110	105	105	105	105	105	105	100	105	100	115	S	
21	S	S	S	S	S	S	S	170	G	145	115	115	105	105	160	120	105	G	130	120	115	110	110	115	
22	S	105	105	S	S	S	S	145	145	125	125	115	110	160	105	G	G	160	140	115	115	110	110	S	
23	S	S	S	135	105	S	150	145	140	135	105	G	G	115	G	155	145	130	120	110	110	105	130	105	
24	S	110	S	105	110	110	135	135	125	120	120	120	125	145	130	130	120	115	115	110	115	115	110	110	
25	105	105	105	105	105	110	120	120	120	120	115	115	110	105	105	105	105	105	G	125	100	95	110	110	
26	130	105	105	110	105	105	105	150	125	G	110	105	110	120	145	145	130	115	115	110	110	110	110	110	
27	110	105	105	100	100	110	140	125	125	120	110	115	110	G	160	130	130	125	110	100	100	100	100	100	
28	S	S	S	S	S	S	S	150	G	140	G	160	G	155	140	130	125	125	120	120	115	115	120	110	
29	110	115	100	105	105	105	150	130	125	120	120	120	130	130	130	140	G	125	120	125	110	110	110	100	
30	100	100	100	100	130	S	130	130	120	115	110	110	100	100	160	150	130	125	120	110	110	110	110	105	
31																									
CNT	17	18	15	15	14	11	16	28	27	27	24	26	22	28	27	25	24	26	28	26	26	26	27	23	
MED	110	105	105	105	105	110	148	148	140	125	118	115	112	120	130	130	125	130	130	115	110	110	110	110	
UQ	110	105	105	110	110	112	152	150	140	131	126	120	125	142	152	140	140	150	138	120	115	115	112	110	
LQ	105	100	100	105	105	105	138	138	125	120	110	110	110	105	105	105	108	125	120	110	110	105	110	105	

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H^oES (KM)

IONOSPHERIC DATA

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TYPES OF ES

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

Station	YAMAGAWA							Lat.	31 12.1 N			Long.	30 37.1 E			Sweep	1 MHz to 25 MHz		in 24 sec in		automatic operation			
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							H3	H1	HH22	H1	C1	C3	C1	C1	L1	L2		L2	F3	F3	F2			
2							H3	H2	H1	HL11	HL11	HL11	H1	H1			H2	C6	F4	F1	F1	F2	F2	
3	F3	F3	F1	F1	F1	F1	H2	H3	C2	H1	LC11	C1	C1	CL11	L1	L1	HL21	HL51	F2	F1	F2	F2	F1	
4					F1	F2	H2	HC11	C1	C1	C1	C1	C1	L1	L2	L2	L2	HL21	F2	FF11	F2	F3	F1	
5	F1			F1	F1	HH11	C3	C6	C2	H1	C2		C4	C3	L1									
6									H2			HC11	H2					H3	F1	F7	F3	F2	F2	
7	F2	F2					H3	H2	C2		C1		C1				C1	C4	F1			F2	F4	
8				F2	F2	F1	H2	H2	C2				H1	H1	H1	H1	H1	H2	F7	F7	F7	F2	F1	
9	F2	F3	F2	F6	F4	F5	H5	H2					H1	H1	H1	H1	H1	H2	F7	F7	F7	F2	F1	
10	F2	F2	F2	F6	F4	F5	H2	H5	H2	H2	H2	C2	C1	L2	L2	L2	H2	H2	C4	F3	F3	F7	F7	
11	F2	F2		F1			H2	H2	H2	H1	C3	C2	C1		H1	H1	H3	H1	H7	F3	F8	F4	F5	
12	F3	F3	F5	F2			H1		C2	C2		C1	C5	C4	C3	C2	C1	H1	H4	F4	F7	F1	F3	
13	F2	F2	F2				H2	H2	L1	L1	L1	L1	L2	HL11	HL12	CHL11	HL11	C2		F5	F3	F4	F3	
14	F2	F2	F2				CH11	C1	C3	C3	L1	L3	L1	L2	L2	L2	HL12	HL21	CL21	FF11				
15						H5	H2	H1	C1	C1	C1		CL11	C5	C2	H1	H1	C4	F4	F4	F3	F4	F5	
16	F2	FF12	F5	F2	F2	H3	H4	H2	H2	C4	C1	H1	H1	H2	H2	C4	C3	C3	F4	F4	F4	F4	FF12	
17						C4	H2	H1	H2	HL11	CL21		HL11	C2	C2	C1	H1	H2	F6	F6	F4	F7	F5	
18	F2	F4	F1				HHL11	C2	C2	C1	C1	C2	HL12	L1		CL11	L1	HL11				F2		
19				F2		H4	H1	H1	H1	CL21	HC11	C1	H1	HC11	C1	C1	C1	H1		F4	F4	F5	F2	
20	F3	F1	F2				H2	H1	C1	C1	C1	C1	L1	L2	L3	L3	L2	L1	F2	F1	F1	F1		
21							H1		HH11	C1	C1	C1	L1	HL11	CL11	L1		C3	F4	F7	F4	F2	F1	
22		F2	F2				H2	H1	C1	C1	C2	C1	HH11	L1			H2	H4	F7	F5	F2	F2		
23				F2	F2	H4	H2	H1	H1	L1			C2		H1	H1	C5	C6	F7	F7	F2	FF12	F2	
24		F1		F3	F2	F3	C4	H2	C3	C2	C2	C2	C2	H3	C1	C2	C3	C6	C4	F1	FF11	FF22	F5	F3
25	F2	F6	F5	F5	F5	F3	C7	C2	C2	C1	C2	C1	C2	C4	C3	C2	L2	L2		FF41	F4	F4	FF21	FF31
26	FF12	F4	F2	F1	F2	F2	L5	H1	C1		C3	C6	C2	C1	H3	HC22	CCL42	C7	C	F6	FF61	F4	F7	F4
27	F5	F4	F3	F2	F1	F5	H4	C3	C1	C1	C1	C1		H1	H3	C3	C4	CL53	L3	F5	F2	F2	F2	
28							H1		H2		H1		H2	H2	C3	C6	C2	C7	C7	F7	F6	F7	F7	
29	F6	F2	F4	F5	F5	F2	H3	H4	C4	C3	C1	HC22	H2	H2	H1	H2		C1	C3	C2	F7	F7	F6	F4
30	F4	F4	F2	F2	F1		H5	H6	C6	C7	C6	C2	L2	L2	H2	H1	H2	C5	C6	C6	F7	F4	F7	F6
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

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TYPES OF ES

IONOSPHERIC DATA

APR. 1987

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA				Lat. 26 16.9 N	Long. 127 48.4 E	Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																		
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 36	X 38	X 38	X 39	X 28	X 25	X 29													X 90	X 70	X 46	X 52	X 50	
2	X 48	X 41	X 48	X 48	X 28	X 28	X 33													X 93	X 67	X 48	U 30	X 38	
3	X 41	X 49	X 40	X 41	X 39	X 31	X 28													X 81	X 57	A	X 35	X 33	
4	X 32	X 32	X 37	X 42	X 35	X 28	X 29													X 93	U 46	U 43	X 48	X 49	
5	X 53	X 57	X 47	X 48	X 44	X 33	X 33													X 67	X 58	X 45	X 44	U 41	
6	X 44	X 40	X 39	X 39	X 34	X 30	X 36													X 84	U 46	X 34	X 33	X 34	
7	X 34	X 34	X 36	X 42	X 38	X 26	X 33													X 100	X 82	X 52	X 43	X 41	
8	X 39	X 39	X 41	X 42	X 43	X 28	U 37													X 77	X 62	X 50	A	X 43	
9	X 44	X 45	X 45	X 47	X 33	X 27	X 34													X 106	X 66	X 43	X 40	X 41	
10	X 41	X 41	X 41	X 44	X 30	X 27														X 111	X 82	X 58	X 48	X 41	
11	X 42	X 48	X 43	X 46	X 35	X 28	X 36													X 113	X 88	X 63	X 48	U 47	
12	X 46	X 47	U 51	X 48	X 26	X 26														X 148	X 118	X 77	X 67	X 68	
13	X 64	X 61	X 64	X 69	X 26	X 25														X 146	X 92	X 63	X 58	X 55	
14	X 58	X 57	X 56	X 56	X 50	X 50														X 76	X 69	X 65	X 58	X 57	
15	X 56	U 56	X 60	X 54	X 41	X 38														X 68	X 60	X 50	A	A	
16	X 58	X 63	X 67	X 68	U 56	X 44														X 83	A	X 60	A	X 50	
17	X 56	X 60	X 61	X 53	X 44	X 38														X 82	X 62	X 56	X 48	X 52	
18	X 52	X 50	X 49	X 45	X 43	X 40														X 129	U 98	X 82	X 81	X 73	
19	X 67	U 66	X 68	U 64	X 36	X 33														X 132	X 83	X 91	X 86	X 88	
20	X 84	X 71	X 67	X 71	X 63	X 41														X 126	X 113	X 82	X 51	X 49	
21	X 50	X 50	X 50	X 49	X 44	X 38															X 66	X 44	X 41	X 42	
22	X 43	X 42	X 46	X 50	X 36	U 26															X 69	X 56	X 50	U 46	
23	U 45	X 47	X 51	X 48	X 36	X 34															X 80	X 41	A	A	
24	X 38	X 38	X 38	X 46	X 38	A															X 80	X 63	X 62	X 61	
25	X 62	X 60	X 62	X 63	A	A															X 103	X 49	X 37	X 36	
26	X 35	X 40	X 35	X 36	X 33	X 33															X 57	X 40	A	X 36	
27	X 38	X 36	X 43	X 42	X 33	S															X 98	X 51	X 48	X 48	
28	X 47	X 44	X 43	X 48	X 41	X 32															X 76	X 51	A	X 46	
29	A	X 48	X 45	X 48	X 43	X 32															X 104	X 59	X 51	X 49	
30	X 50	X 49	X 58	X 55	X 50	X 40															X 82	X 57	A	X 50	
31																									
CNT	29	30	30	30	29	27	10													20	29	29	23	28	
MED	X 46	X 48	X 46	X 48	X 38	X 32	X 33														X 93	X 76	X 52	X 48	X 48
UQ	X 56	X 57	X 58	X 54	X 43	X 38	X 36														X 120	X 88	X 63	X 55	X 51
LQ	X 41	X 40	X 41	X 42	X 33	X 28	X 29														X 82	X 62	X 46	X 42	X 41

APR. 1987

FXI (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FOF2 (0.1 MHz)

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

Station	OKINAWA				Lat. 26 16.9 N	Long. 127 48.4 E	Sweep 1 MHz to 25 MHz in 2.4 sec in automatic operation																						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	30	F 29	F	S 33	22	19	23	46	60	72	74	69	74	93	105	84	68	75	82	84	S 64	S 40	46	U S 44					
2	S 42	U S 35	42	42	22	22	27	49	52	75	75	68	82	95	104	95	82	32	37	S 87	61	42	U S 34	32					
3	35	43	34	35	33	25	22	46	63	70	76	85	88	95	109	100	83	77	91	U S 75	S 51	A	29	27					
4	26	F	F	F	F	F	S 23	U R 48	55	71	79	90	114	146	145	139	130	U R 123	109	87	U S 40	U S 37	42	43					
5	47	51	41	S 42	U S 38	27	S 27	52	66	70	68	82	93	100	104	97	37	91	71	S 61	S 52	S 39	S 38	U S 36					
6	S 38	34	33	33	28	S 24	S 30	50	58	70	78	74	81	89	R 95	101	96	84	80	78	S 40	28	27	S 28					
7	28	28	30	F 28	F 29	S 20	27	S 27	59	76	74	70	87	105	120	108	94	90	92	U S 94	S 76	46	U S 38	S 35					
8	33	S 33	S 35	36	S 37	S 22	S 31	53	R 61	76	68	73	84	90	94	77	68	64	65	71	56	S 44	A	F					
9	F	F 36	F	F	F	F 18	S 28	54	60	74	68	70	67	77	90	85	74	65	R 73	U S 100	60	37	S 34	35					
10	35	F	S 35	S 38	24	21	28	57	83	68	78	78	92	108	126	124	112	105	118	105	U R 76	52	U S 42	35					
11	F	F	F	F	F	F	F	54	68	64	62	68	79	94	114	107	96	100	108	107	S 82	57	U S 42	U S 41					
12	40	41	U S 45	42	20	20	31	56	72	78	79	90	103	133	J R 156	162	150	151	160	142	S 112	71	61	U S 62					
13	58	U S 55	S 58	U S 63	20	19	30	55	70	70	80	92	104	115	122	128	130	146	J R 156	140	S 86	57	U S 52	S 49					
14	S 52	51	50	50	44	44	51	55	74	U R 102	86	98	117	120	R 124	112	98	79	70	70	S 63	59	52	51					
15	S 50	S 50	54	48	S 35	32	34	60	88	75	75	94	110	122	141	R 117	104	87	80	S 62	S 54	U S 44	A	A					
16	F	F	F	F	U S 50	S 38	R 44	61	80	75	74	69	87	105	105	91	36	82	34	77	A	S 54	A	S 44					
17	F	F	F	F 44	F 34	32	40	58	R 66	65	72	82	100	118	R 120	114	95	84	91	76	56	50	U S 42	46					
18	F	44	43	39	37	34	42	57	65	77	76	80	100	J R 122	144	R 148	R 159	J R 154	R 139	123	U S 92	76	U S 75	67					
19	61	U S 60	S 62	U S 58	30	27	38	58	67	72	67	82	103	120	134	148	R 158	U R 152	U R 154	126	77	S 85	80	J S 82					
20	J S 78	S 65	S 61	S 65	57	35	38	59	81	78	75	78	93	109	122	132	137	122	122	120	S 107	76	U S 45	43					
21	44	44	44	43	S 38	S 32	38	58	82	72	74	75	91	105	113	108	104	100	90	76	60	38	35	36					
22	S 37	36	40	44	U S 30	S 20	33	51	60	72	86	74	84	96	R 103	100	84	78	76	R 74	63	50	44	40					
23	S 39	S 41	45	42	30	28	37	63	65	66	74	74	81	88	89	94	93	94	U R 101	R 105	S 74	S 35	A	A					
24	32	F	F	F	32	A	A	59	65	62	62	60	75	91	103	105	107	R 98	R 111	R 124	74	57	56	F					
25	F	F	S 56	J S 57	A	A	39	67	58	59	66	77	89	109	124	R 120	R 104	R 98	95	105	S 97	J S 43	31	30					
26	F	F	F	F	F	27	40	62	71	52	59	72	90	103	110	122	115	108	109	84	51	34	A	F					
27	S 32	S 30	F	F	F	A	35	62	72	60	58	64	79	84	90	90	95	103	R 105	115	92	45	S 42	S 42					
28	41	38	37	S 42	35	F	37	54	S 72	59	63	80	90	95	90	88	90	88	94	87	70	S 45	A	F					
29	A	F	F	F	37	43	63	61	62	62	A	70	89	98	100	102	107	R 101	R 102	98	53	45	S 43	S 43					
30	F	F	F	F	F	F	44	61	R 68	63	65	60	78	97	R 101	100	101	93	93	U R 92	76	S 51	A	F					
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	20	19	21	23	22	28	30	30	30	30	29	30	30	30	30	30	30	30	30	29	29	23	23					
MED	39	41	43	42	33	26	34	56	66	70	74	75	88	102	110	106	97	94	94	90	70	46	S 42	S 42					
UQ	47	50	52	S 48	37	32	40	60	72	75	76	82	100	115	124	122	112	R 107	109	107	82	57	S 49	S 45					
LQ	33	34	36	38	28	20	28	52	60	64	66	70	81	93	101	95	87	82	82	76	56	S 40	S 36	35					

APR. 1987

FOF2 (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

FOF1 (0.01 MHz)

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

Station	OKINAWA				Lat.	26 16.9 N				Long.	27 48.4 E				Sweep 1	MHz to 25		MHz in 24 sec in		automatic operation				
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	420	440	450	470	450	430	A	U	L	A	A				
2										U	L	420	440	430	450	440	440	430	400	L				
3									L	L	430	440	A	450	420	430	410	L	A					
4									L	420	440	450	460	430	450	430	410	L						
5									L	L	U	L	430	460	470	440	A	420	A	L				
6									L	440	450	460	470	460	460	440	430	L	L	L				
7									L	440	U	L	450	460	470	480	460	440	430	L				
8									A	430	440	480	480	460	460	440	400	L						
9									L	440	460	460	470	470	460	450	440	L						
10									L	U	L	450	470	480	480	460	450	L	L	L				
11									L	L	L	L	490	460	460	450	L	L	L					
12									L	U	L	U	L	440	480	480	500	490	A	A	L	L	L	
13									L	L	U	L	460	490	480	U	L	480	480	460	L	L		
14									L	U	L	L	440	470	500	480	480	U	L	490	470	440	L	
15									L	U	L	U	L	460	490	500	490	480	460	L	U	L	L	
16									A	A	L	L	480	490	470	A	A	A	A	A				
17									A	A	U	L	480	490	500	470	460	460	U	L	440	390	L	
18									L	L	U	L	480	A	500	480	A	480	440	U	L	420	L	
19									L	U	L	U	L	450	450	490	480	480	470	480	460	420	L	
20									U	L	L	L	U	L	410	490	490	480	460	U	L	450	410	L
21									L	450	470	480	480	470	460	A	440	L	L	L				
22									L	A	440	460	480	470	460	440	440	L	L	L				
23								L	L	440	480	470	480	460	460	450	430	L	A					
24									A	A	L	A	470	460	460	A	A	440	L	L	A			
25								L	L	440	450	460	460	460	450	440	U	L	L	L				
26								L	L	L	460	460	460	460	450	430	420	L	A	A				
27								L	L	L	460	L	450	450	A	A	A	400	L					
28								L	L	L	450	470	450	450	450	A	A	A	A					
29								A	A	A	A	A	A	A	A	440	430	L	L					
30								L	A	420	450	460	460	460	450	450	A	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	16	27	25	28	28	23	22	22	5						
MED									U	L	L	L	410	440	460	470	475	460	460	445	435	410		
UQ										L	L	L	445	470	490	480	480	460	460	440	U	L		
LQ										L	L	L	425	445	460	460	455	450	440	420	400			

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FOF1 (0.01 MHz)

IONOSPHERIC DATA

APR. 1987

FOE (0.01 MHz)

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

Station	OKINAWA				Lat.	26 16.9 N				Long.	127 48.4 E				Sweep 1	MHz to 25				MHz in 24 sec in				automatic operation			
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1								195	245	285	U A	A	Y	Y	Y	A	U A		A								
2								200	255	295	310	330	340	350	340	320	A	U A		A							
3								210	260	300	A	A	340	A	A	315	300	270	U A								
4								200	A	A	A	A	A	A	A	A	A	260	190								
5								200	A	300	A	A	A	A	A	A	A	A	190								
6								195	265	295	A	A	A	Y		340	320	300	265	200							
7								190	A	A	A	A	A	A	U A	R	300	265	A								
8								210	265	A	325	330	R	A	345	335	300	255	135								
9								195	260	U A	300	320	340	Y	R	345	350	320	305	265	200						
10							S	200	A	300	320	U A	335	A	A	330	320	300	260	200							
11							S	200	260	300	320	340	360	360	350	330	300	260	200								
12							S	200	A	A	A	A	A	A	A	A	A	A	A								
13							S	200	260	R	300	A	A	A	A	A	A	A	A								
14							S	R	A	A	A	A	A	A	A	330	305	270	A								
15							S	R	A	300	325	340	R	360	360	350	340	R	310	265	210						
16							S	R	R	310	325	335	R	R	R	R	R	300	275	200							
17							S	R	280	305	A	A	U R	R	R	R	305	265	185								
18							S	200	255	300	A	A	R	A	A	A	A	A	A								
19							S	220	270	300	325	A	A	A	B	A	A	A	210								
20							S	205	A	A	A	A	A	A	A	320	300	A	A								
21							S	R	R	A	A	A	A	A	A	A	A	275	210	R	A						
22							S	R	R	A	A	A	A	R	R	R	300	270	210	A							
23							S	200	275	295	R	R	R	R	R	R	300	270	195	A							
24							A	A	A	A	320	325	350	350	340	315	300	A	A	A							
25							S	210	260	A	A	A	A	A	A	A	300	A	200	S							
26							S	A	A	A	A	A	U A	A	A	A	A	A	200	S							
27							S	205	A	A	A	A	A	350	R	320	300	270	A	200							
28							S	210	A	A	A	A	U A	U A	330	320	300	270	205	A							
29							S	210	A	A	A	335	340	350	340	320	300	A	A	S							
30							S	A	A	A	A	A	A	A	A	R	300	270	205	S							
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT								27	16	15	11	10	13	13	17	21	22	20	19	1							
MED								205	260	300	320	335	340	350	340	320	300	265	200	200							
UQ								210	272	300	325	340	350	R	350	330	300	270	205								
LQ								200	260	298	320	330	340	350	340	320	300	260	198								

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FOE (0.01 MHz)

IONOSPHERIC DATA

APR. 1987

FOES (0.1 MHZ)

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

Station		OKINAWA							Lat.	26 16.9 N			Long	127 48.4 E			Sweep 1 MHz to 25 MHz in 24 sec in automatic operation										
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		E 16	E 16	E 15	E 15	E 16	E 16	E 16	25	G	32	34	36	Y	Y	Y	J A 64	37	40	J A 42	J A 26	J A 50	J A 33	J A 24	E S 16		
2		19	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	34	G	G	40	39	G	32	31	J A 34	J A 25	J A 28	E S 16	19	18		
3		E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	30	36	41	56	46	42	41	33	G	35	42	40	40	62	22	18		
4		E 16	E 16	J A 24	J A 39	J A 26	E 16	E 16	G	30	J A 35	38	J A 50	35	39	J A 37	J A 36	J A 32	G	G	18	22	E S 16	J A 30	J A 30		
5		J A 22	E 16	19	E 16	E 16	J A 20	J A 27	22	J A 30	G	33	34	J A 46	42	J A 74	J A 39	J A 45	J A 27	G	20	18	E S 16	E S 16	22		
6		23	E 16	E 15	E 16	E 15	E 16	E 16	24	30	J A 48	J A 34	J A 34	J A 34	Y	G	G	G	G	G	23	23	J A 22	J A 21	23		
7		E 16	E 16	E 15	J A 22	E 16	E 15	E 16	23	29	J A 36	J A 36	J A 38	41	J A 52	42	38	G	G	J A 36	J A 21	E S 15	E S 16	E S 16	E S 16		
8		J A 21	J A 26	J A 37	J A 42	J A 41	E S 15	23	J A 30	J A 40	J A 41	J A 46	43	42	43	G	G	G	G	21	J A 29	J A 32	J A 30	J A 65	J A 88		
9		J A 28	J A 25	J A 37	J A 34	J A 33	E 16	E 16	24	31	34	37	39	Y	39	39	J A 44	43	G	J A 34	J A 36	J A 21	J A 25	E S 16	E S 16		
10		19	E 16	J A 24	J A 20	21	19	E 16	G	J A 34	32	G	37	38	J A 40	G	40	33	30	26	J A 25	J A 21	J A 20	E S 16	20		
11		J A 25	J A 30	J A 30	J A 24	J A 30	E 16	E 16	28	36	34	G	G	41	41	40	40	36	30	23	E S 16	E S 16	E S 16	19	E S 16		
12		19	E 16	E 16	E 16	E 16	E 16	22	23	J A 32	J A 35	38	J A 47	43	45	J A 112	J A 57	J A 50	J A 39	J A 22	J A 24	J A 22	J A 24	J A 25	E S 16		
13		E 16	E 16	E 16	E 16	E 16	E 16	E 16	26	32	G	J A 26	J A 40	J A 38	J A 39	J A 38	J A 35	J A 32	J A 42	J A 22	22	20	E S 16	E S 16	E S 16		
14		22	E 16	E 15	E 15	E 16	E 16	E 16	28	J A 33	J A 36	J A 44	J A 49	J A 43	J A 44	J A 40	40	34	38	J A 32	J A 21	23	22	22	E S 16		
15		E 16	E 16	E 16	E 16	E 16	E 16	E 16	28	J A 37	J A 33	J A 51	J A 54	G	G	40	G	35	33	28	J A 28	23	J A 30	J A 53	J A 42		
16		J A 78	J A 66	J A 37	J A 42	J A 35	E 16	E 16	30	40	J A 43	J A 48	J A 66	G	47	48	J A 48	J A 48	J A 42	J A 63	J A 73	J A 84	J A 85	J A 80	J A 40		
17		J A 26	J A 38	J A 33	21	E 16	E 16	20	J A 51	J A 60	J A 56	J A 56	J A 65	G	G	45	40	34	36	J A 26	J A 27	J A 36	J A 25	J A 21	J A 32		
18		J A 21	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	25	32	40	43	70	G	J A 43	J A 56	J A 43	J A 37	J A 28	J A 36	J A 27	20	E S 16	E S 16	22		
19		E S 16	E 16	E 16	E 16	E 16	E 16	E 16	G	32	35	38	38	42	40	J A 41	40	40	35	G	E S 16	E S 16	J A 20	J A 25	J A 30		
20		J A 25	23	19	E 16	E 16	22	E 16	28	J A 36	J A 35	J A 40	42	J A 37	J A 39	J A 40	G	G	J A 28	J A 32	E S 16	18	18	E S 16	E S 16		
21		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	30	37	J A 42	J A 48	J A 48	J A 50	J A 50	J A 74	J A 77	34	31	30	J A 45	33	35	J A 24	J A 21		
22		E S 16	E S 16	E S 16	E 15	E S 16	22	18	28	J A 38	J A 48	J A 65	J A 57	J A 40	G	G	G	35	38	J A 42	J A 29	J A 23	J A 25	J A 33	23		
23		23	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	J A 26	34	38	J A 40	J A 38	G	G	40	41	34	33	J A 44	J A 41	J A 42	J A 38	J A 38	61		
24		J A 90	J A 33	J A 33	J A 37	J A 54	J A 42	J A 38	J A 35	J A 42	J A 55	J A 50	61	47	J A 67	J A 55	46	37	J A 40	J A 65	J A 66	J A 78	J A 26	J A 33	J A 26		
25		J A 40	J A 84	J A 62	J A 53	J A 40	J A 29	J A 25	J A 37	J A 37	33	37	40	J A 44	J A 40	J A 37	J A 35	G	J A 30	G	E S 16	J A 26	J A 25	J A 21	J A 20		
26		23	J A 21	J A 50	J A 53	J A 54	J A 30	J A 25	J A 30	J A 40	J A 41	J A 55	53	42	40	G	41	40	J A 76	J A 66	J A 48	J A 29	J A 26	J A 50	J A 30		
27		J A 27	J A 32	J A 63	J A 30	22	J A 25	E S 16	J A 34	J A 42	J A 40	38	41	J A 40	40	51	64	J A 55	J A 50	J A 38	24	22	22	J A 32	J A 26		
28		20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	25	30	32	32	34	42	43	43	60	J A 64	J A 43	J A 37	J A 38	52	77	50	34		
29		J A 84	J A 50	J A 30	J A 32	J A 21	J A 23	J A 27	J A 43	J A 46	J A 57	J A 54	85	J A 50	52	J A 57	J A 47	J A 41	J A 40	J A 33	J A 25	J A 25	J A 24	J A 22	J A 25		
30		J A 40	J A 25	E S 16	E S 16	J A 30	J A 30	22	31	J A 43	J A 41	J A 40	44	65	44	35	40	J A 54	J A 65	J A 60	J A 80	77	77	87	40		
31																											
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT		30	30	30	30	30	30	30	30	30	30	30	30	28	28	29	30	30	30	30	30	30	30	30	30		
MED		22	E 16	E 16	E 16	E S 16	E S 16	E S 16	27	J A 34	J A 36	J A 39	J A 42	41	40	40	40	35	34	J A 32	J A 26	J A 23	J A 24	J A 23	22		
UQ		J A 26	J A 26	J A 33	J A 32	J A 30	22	22	30	J A 40	J A 41	J A 48	J A 54	44	44	48	46	41	40	42	38	36	30	33	30		
LQ		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	30	34	34	38	34	39	37	35	32	28	22	21	21	18	19	E S 16		

APR. 1987

FOES (0.1 MHZ)

IONOSPHERIC DATA

APR. 1937

FBES (0.1 MHz)

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

Station		OKINAWA							Lat.	26 16.9 N				Long.	127 48.4 E				Sweep	1 MHz to 25 MHz		in 24 sec in		automatic operation		
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		E S	E S	E S	E S	E S	E S	E S		G	31	34	36	Y	Y	Y	45	34	39	41	21	40	21	18	E S	
2		E S	E S	E S	E S	E S	E S	E S	G	G	G	34	G	G	40	39	G	30	30	21	23	28	E S	E S	E S	
3		E S	E S	E S	E S	E S	E S	E S	G									G				A A	E S	E S	E S	
4		E S	E S	E S	E S	E S	E S	E S	G										G	E S	E S	E S	E S	E S	E S	
5		E S	E S	E S	E S	E S	20	18	22	28	G	33	34	42	42	65	34	45	27	G	E S	E S	E S	E S	E S	
6		E S	E S	E S	E S	E S	E S	E S	24	29	32	34	34	34	Y	G	G	G	G	G	E S	E S	E S	E S	E S	
7		E S	E S	E S	E S	E S	E S	E S	23	29	30	34	38	40	44	42	37	G	G	31	17	E S	E S	E S	E S	
8		E S	26	E S	26	26	E S	E S	28	38	40	42	40	40	43	G	G	G	G	21	29	22	27	A A	E S	
9		E S	E S	E S	E S	E S	E S	E S	24	29	34	37	39	Y	39	39	43	42	G	34	33	18	25	E S	E S	
10		E S	E S	18	18	E S	E S	E S	G	29	32	G	37	38	40	G	39	33	30	26	25	20	E S	E S	E S	
11		E S	25	E S	18	22	E S	E S	28	36	34	G	G	41	40	40	44	36	30	23	E S	E S	E S	E S	E S	
12		E S	E S	E S	E S	E S	E S	18	23	31	32	37	43	42	43	100	50	42	32	22	E S	E S	E S	E S	E S	
13		E S	E S	E S	E S	E S	E S	E S	26	32	G	26	32	38	39	38	35	30	32	22	E S	E S	E S	E S	E S	
14		E S	E S	E S	E S	E S	E S	E S	24	33	34	37	40	37	42	40	39	34	36	22	19	E S	E S	E S	E S	
15		E S	E S	E S	E S	E S	E S	E S	26	30	34	37	42	G	G	40	G	34	31	27	25	E S	19	A A	A A	
16		E S	23	E S	20	26	E S	E S	28	40	46	43	46	G	46	48	45	46	41	63	73	A A	25	A A	29	
17		E S	20	25	E S	E S	E S	20	45	58	52	39	38	G	G	43	38	34	36	24	25	36	E S	E S	24	
18		E S	E S	E S	E S	E S	E S	E S	25	32	33	42	53	G	43	50	43	35	22	26	23	F S	E S	E S	E S	
19		E S	E S	E S	E S	E S	E S	E S	G	32	35	38	38	40	40	40	38	33	28	G	E S	E S	20	E S	E S	
20		E S	E S	E S	E S	E S	E S	E S	24	31	32	40	42	37	39	40	G	G	28	30	E S	E S	E S	E S	E S	
21		E S	E S	E S	E S	E S	E S	E S	25	30	34	37	39	46	42	40	60	34	31	27	44	26	24	E S	E S	
22		E S	E S	E S	E S	E S	E S	E S	27	33	44	42	44	37	G	G	G	33	35	26	24	23	19	E S	E S	
23		E S	E S	E S	E S	E S	E S	E S	25	32	33	34	35	G	G	40	40	34	30	40	40	40	20	A A	A A	
24		23	E S	E S	22	20	A A	A A	30	42	46	40	53	45	46	52	46	34	36	52	65	40	23	22	E S	
25		34	25	22	23	A A	A A	A A	20	30	38	31	37	38	42	40	37	35	G	27	G	E S	26	25	E S	
26		E S	E S	E S	E S	E S	20	20	20	30	32	37	37	42	40	G	40	37	55	26	45	25	23	A A	E S	
27		24	25	E S	E S	E S	E S	E S	33	32	32	38	40	40	40	51	52	54	37	33	18	E S	20	25	25	
28		E S	E S	E S	E S	E S	E S	E S	25	28	32	32	34	42	43	42	55	58	43	37	36	52	35	A A	20	
29		A A	E S	E S	E S	E S	E S	E S	40	46	53	53	A A	85	48	52	53	41	39	37	32	25	22	24	E S	
30		22	E S	E S	E S	E S	E S	E S	18	28	43	39	38	40	37	41	35	38	46	55	46	80	20	30	A A	
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		30	30	30	30	30	30	30	30	30	30	30	30	28	28	29	30	30	30	30	30	30	30	30	30	
MED		E S	E S	E S	E S	E S	E S	E S	25	32	32	37	39	39	40	40	38	34	31	26	24	20	20	E S	E S	
UQ		E S	E S	E S	E S	E S	E S	18	28	36	38	39	42	42	43	43	44	39	36	37	33	28	24	25	20	
LQ		E S	E S	E S	E S	E S	E S	E S	23	29	32	34	37	34	39	37	34	30	28	22	E S	E S	E S	E S	E S	

APR. 1937

FBES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

APR. 1937

FMIN (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA							Lat.	26 16.9 N				Long.	27 48.4 E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation							
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E S	E S	E S	E S	E S	E S	E S	E S	15	13	16	22	25	23	24	24	18	14	14	E S	E S	E S	E S	E S	
2	E S	E S	E S	E S	E S	E S	E S	16	15	15	22	23	22	20	20	21	18	15	14	E S	E S	E S	E S	E S	
3	E S	E S	E S	E S	E S	E S	E S	15	16	16	16	16	25	22	22	16	16	15	15	E S	E S	E S	E S	E S	
4	E S	E S	E S	E S	E S	E S	E S	16	16	16	15	19	20	23	18	16	15	15	14	E S	E S	E S	E S	E S	
5	E S	E S	E S	E S	E S	E S	E S	15	15	15	17	18	18	16	17	15	18	14	14	E S	E S	E S	E S	E S	
6	E S	E S	E S	E S	E S	E S	E S	14	14	14	23	23	24	27	24	24	20	14	14	E S	E S	E S	E S	E S	
7	E S	E S	E S	E S	E S	E S	E S	14	16	15	23	26	24	24	14	22	17	17	15	E S	E S	E S	E S	E S	
8	E S	E S	E S	E S	E S	E S	E S	15	14	16	15	17	24	26	26	27	24	14	E S	E S	E S	E S	E S		
9	E S	E S	E S	E S	E S	E S	E S	14	16	16	21	26	27	24	24	14	19	14	13	E S	E S	E S	E S	E S	
10	E S	E S	E S	E S	E S	E S	E S	15	15	15	18	21	24	15	24	23	20	15	15	E S	E S	E S	E S	E S	
11	E S	E S	E S	E S	E S	E S	E S	15	15	20	18	25	25	20	23	15	19	15	15	E S	E S	E S	E S	E S	
12	E S	E S	E S	E S	E S	E S	E S	15	16	15	15	20	22	22	25	20	15	15	15	E S	E S	E S	E S	E S	
13	E S	E S	E S	E S	E S	E S	E S	16	14	15	25	25	24	25	20	25	17	14	14	E S	E S	E S	E S	E S	
14	E S	E S	E S	E S	E S	E S	E S	14	13	15	16	20	20	22	23	20	21	15	14	E S	E S	E S	E S	E S	
15	E S	E S	E S	E S	E S	E S	E S	14	13	17	23	23	27	25	15	24	18	16	14	E S	E S	E S	E S	E S	
16	E S	E S	E S	E S	E S	E S	E S	14	14	14	18	25	26	24	26	22	18	17	E S	E S	E S	E S	E S		
17	E S	E S	E S	E S	E S	E S	E S	14	14	20	27	22	26	26	22	28	25	16	14	E S	E S	E S	E S	E S	
18	E S	E S	E S	E S	E S	E S	E S	15	16	25	18	22	26	30	22	24	18	16	15	E S	E S	E S	E S	E S	
19	E S	E S	E S	E S	E S	E S	E S	16	16	27	20	25	20	25	35	30	25	16	16	E S	E S	E S	E S	E S	
20	E S	E S	E S	E S	E S	E S	E S	16	16	18	20	25	24	28	28	27	22	15	14	E S	E S	E S	E S	E S	
21	E S	E S	E S	E S	E S	E S	E S	15	16	22	23	23	24	26	25	26	19	16	13	14	E S	E S	E S	E S	
22	E S	E S	E S	E S	E S	E S	E S	15	16	19	16	18	17	20	21	21	19	20	14	15	E S	E S	E S	E S	
23	E S	E S	E S	E S	E S	E S	E S	15	16	16	18	22	20	26	27	24	19	16	14	E S	E S	E S	E S	E S	
24	E S	E S	E S	E S	E S	E S	E S	14	14	16	19	22	23	24	23	19	20	16	14	E S	E S	E S	E S	E S	
25	E S	E S	E S	E S	E S	E S	E S	16	16	15	23	23	26	28	25	22	16	15	15	E S	E S	E S	E S	E S	
26	E S	E S	E S	E S	E S	E S	E S	15	15	16	20	22	25	19	23	22	15	14	15	E S	E S	E S	E S	E S	
27	E S	E S	E S	E S	E S	E S	E S	15	15	16	16	23	24	23	23	20	15	16	14	14	E S	E S	E S	E S	
28	E S	E S	E S	E S	E S	E S	E S	15	15	16	16	16	23	22	22	23	20	16	15	14	E S	E S	E S	E S	
29	E S	E S	E S	E S	E S	E S	E S	15	15	16	17	18	21	25	20	15	17	15	15	E S	E S	E S	E S	E S	
30	E S	E S	E S	E S	E S	E S	E S	15	15	16	22	23	15	25	25	20	16	17	15	E S	E S	E S	E S	E S	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E S	E S	E S	E S	E S	E S	E S	15	15	16	18	22	24	24	23	22	18	15	14	E S	E S	E S	E S	E S	
UQ	E S	E S	E S	E S	E S	E S	E S	15	16	17	22	23	25	26	25	24	20	16	15	E S	E S	E S	E S	E S	
LQ	E S	E S	E S	E S	E S	E S	E S	14	14	15	16	20	21	22	21	20	17	15	14	E S	E S	E S	E S	E S	

APR. 1937

FMIN (0.1 MHz)

IONOSPHERIC DATA

APR. 1987

M(3000)F2 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA				Lat.	26 16.9 N							Long	127 48.4 E							Sweep	1 MHz to 25 MHz		in 24 sec		in automatic operation		
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	285	295 ^F	365 ^F	320 ^S	320	290	305	360	350	360	360	335	285	310	335	325	300	315	310	325	320 ^S	325 ^S	280 ^U	285 ^S				
2	295 ^S	355 ^U	335 ^S	355 ^S	320	320	315	345	325	345	345	295	305	315	325	325	315	315	335	345 ^S	360	355 ^S	325 ^U	310 ^S				
3	285	315	325	355	350	360	340	345	350	320	315	305	295	295	320	330	325	310	340	345 ^U	325 ^S	A	290	285				
4	305	F	F	F	F	F	345 ^S	355 ^U	345	340	315	305	300	315	310	295	315	315	355	345	365 ^U	300 ^S	310	290				
5	295	335	315	310 ^S	360 ^U	300	300	345	335	355	325	305	310	315	315	340	310	350	350	345 ^S	345 ^S	305 ^S	300 ^S	305 ^U				
6	290 ^S	295	320	320	340	310 ^S	315 ^S	360	335	330	340	315	310	295	315 ^R	320	335	345	345	365	360 ^S	305	295	285 ^S				
7	305	305	300	320 ^F	360 ^F	325 ^S	315 ^S	365 ^R	345	335	335	300	285	295	330 ^R	335	320	320	320	340 ^U	355 ^S	315 ^U	275 ^S	285 ^S				
8	285	285 ^S	300 ^S	320	350 ^S	295 ^S	320 ^S	350	335 ^R	350	325	300	305	315	335	350	330	335	340	340	330	295	A	F				
9	F	305 ^F	F	F	F	F	335 ^F	305 ^S	350	335	345	340	335	305	310	320	340	335	340	315 ^R	345 ^U	295	295 ^S	285				
10	300	F	340	340 ^S	355	335	320	350	315	340	280	280	295	305	315	340	310	320	300	335 ^U	330 ^R	315 ^U	295 ^S	300				
11	F	F	F	F	F	F	F	360	350	360	320	295	290	295	325	320	310	310	335	325 ^S	340	335	310 ^U	285 ^S				
12	285	305	335 ^U	330	350	300	320	350	345	345	315	300	290	295	315 ^J	300	295	305	330	340	340	325	320	285 ^S				
13	295	290 ^U	300 ^S	330 ^U	300	315	335	345	325	330	310	295	290	285	305	310	305	315	315 ^J	315 ^R	325 ^S	315 ^U	290 ^S	285 ^S				
14	290 ^S	295	300	300	285 ^S	295	315	325	305	325 ^U	325	280 ^R	300	290 ^R	300	330	330 ^R	335	335	330	315 ^S	305	290 ^S	275				
15	280 ^S	280 ^S	315	345	300	295	325	340	350	360	300	295	305	305	325	320 ^R	315 ^R	325	345	345 ^S	305 ^S	235 ^U	A	A				
16	F	F	F	F	310 ^U	330 ^S	320 ^R	345	360	345	345	295	285	315	325	300	315	315	340	330	A	305 ^S	A	270 ^S				
17	F	F	F	340 ^F	325 ^F	310	325	360	355 ^R	325	305	275	280	310 ^R	320	315	315	310	330	340	305	300	260 ^U	280				
18	F	320	325	295	295	295	355	350	355	350	330	285	295	285 ^J	300 ^R	305 ^R	290 ^R	320 ^J	330 ^R	340	335 ^U	295 ^U	285 ^S	285				
19	295	310 ^U	290 ^S	295 ^U	350	300	340	345	360	335	300	280	290	285	290	295 ^R	305 ^U	310 ^U	325 ^U	340	285	295 ^S	285 ^S	280 ^J				
20	290 ^J	290	295 ^S	325	350	340	340	320	345	325	320	290	285	295	295	305	315	310	310	340 ^S	335	355	310 ^U	285				
21	295	295	285	300	330 ^S	330 ^S	340	335	345	335	310	260	280	300	310	315	315	325	340	340	340	330 ^S	285	275				
22	285	305	335	365 ^S	S	300	335	350	340	325	345	295	280	300	305 ^R	330	325	335	335	345 ^R	350	310	295	285 ^S				
23	280 ^S	290 ^S	345	355	300	285	325	350	360	335	295	310	285	290	290	310	305	315	325 ^U	350 ^R	365 ^S	330 ^S	A	A				
24	295	F	F	F	360	A	A	355	355	340	355	290	280	295 ^R	305	305	315	305 ^R	320 ^R	340	350	305	285	F				
25	F	F	320 ^J	350 ^S	A	A	330	350	360	340	310	300	290	300	310	320 ^R	305 ^R	300 ^R	310	335	360 ^S	365 ^J	290	315				
26	F	F	F	F	F	360	350	355	365	340	295	280	285	300	300	325	330	335	350	360	350	295	A	F				
27	290 ^S	300 ^S	F	F	F	A	340	355	360	335	320	290	295	295	300	300	315	310 ^R	315	345	365	295	310	310 ^S				
28	290	285	325	335 ^S	360	F	335	325	360 ^S	340	300	295	310	305	300	310	320	320	330	335	355	340	A	F				
29	A	F	F	F	365	F	350	365	360	345	340	A	295	305	305	300	315	310 ^R	315	335 ^R	355 ^S	310	300 ^S	290 ^S				
30	F	F	F	F	F	F	365	345	350 ^R	350	340	315	305	300	295 ^R	300	320	310	320	360 ^U	340	320	A	F				
31																												
CNT	21	20	19	21	22	22	28	30	30	30	30	29	30	30	30	30	30	30	30	30	29	29	23	23				
MED	290	298	320	330	345	310	328	350	350	340	320	295	292	300	310	318	315	315	330	340	340	310	295 ^S	285 ^S				
UQ	295	308	330	350 ^S	355	330	340	355	360	345	340	305	305	310	320	330	320	325	340	345	355	325	305 ^S	290				
LQ	285 ^S	290	300	320	310	295	318	345	335	335	310	290	285	295	300	305	310	310	315	335	330	300 ^S	285	285				

APR. 1987

M(3000)F2 (0.01)

IONOSPHERIC DATA

APR. 1987

M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA							Lat. 26 16.9 N	Long. 127 48.4 E	Sweep 1 MHz to 25 MHz in 24 sec in automatic operation															
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1									L	L	370	385	390	380	Y	385	A	U	L	A	A				
2											U	L	380	385	415	410	385	385	395	400	L				
3									L	L		395	385	A	395	400	395	385		L	A				
4									L		380	385	390	390	410	390	395	390		L					
5									L	L	U	L	395	390	390	410	A	380	A	L					
6									L	L	365	375	380	380	390	370	375	370	L	L	L				
7									L		U	L	375	375	390	395	A	380	375	360	L				
8									A	L		A	375	385	L	A	380	385	400	L					
9									L	L	L	L	U	L	380	395	L	L	A	A	L				
10									L	U	L	385	385	395	395	395	390	385		L	L	L			
11									L	L	L	L		385	390	385	390		L	L	L				
12									L	U	L	U	L	385	385	385	380	385	A	A	L	L	L		
13									L	L	U	L	390	385	395	U	L	385	385	395	385	L	L		
14									L	U	L	L	U	L	370	385	L	U	L	360	U	L	L		
15									L	U	L	U	L	370	375	370	375	385	390	L	U	L	L		
16									A	A	L	L	385	365	380		A	A	A	A	A				
17									A	A	U	L	U	L	360	370	380	360	L	U	L	410	L		
18									L	L	U	L	385	A	U	L	400	385	A	385	385	U	L	L	
19									L	U	L	U	L	400	400	395	395	385	395	385	385	385	L		
20									U	L	L	U	L	390	385	385	385	385	U	L	385	U	L	L	
21									L	L	L	U	L	A	380	380	A	L	L	L	L				
22									L	A	A	A	395	380	380	385	365	L	L	L	L				
23								L	L	L	375	365	370	385	370	370	365	360	L	A					
24									A	A	L	A	A	A	A	A	L	L	A						
25								L	L	L	385	400	400	390	395	400	385	U	L	L	L				
26								L	L	L	390	390	385	390	400	405	385	A	A	A					
27								L	L	L	390	L	405	400	A	A	A	375	L	L					
28								L	L	L	L	385	395	400	395	400	A	A	A	A					
29								A	A	A	A	A	A	A	A	385	395	L	L						
30								L	A	405	400	400	405	395	385	385	A	A	A						
31																									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									1	16	25	24	26	24	23	21	21	5							
MED									U	L	L	L	388	388	388	385	385	L	385	385					
UQ									L	385	390	392	395	395	390	390	385	405							
LQ									L	372	380	378	380	385	380	380	365	380							

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H⁺F₂ (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA				Lat. 26° 16' 9" N				Long. 127° 48' 4" E				Sweep 1		MHz to 25		MHz in 24 sec in		automatic operation					
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								255	255	255	280	330	300	260	260	290	280	270						
2									260	260	300	310	300	265	280	270	265							
3								260	270	290	300	320	320	280	260	260	270	240						
4								270	280	290	300	265	290	275	265	250	230							
5								280	240	280	320	290	300	A	260	A	240							
6								270	280	255	290	305	300	295	270	255	245	250						
7								275	255	255	305	320	320	270	260	265	270							
8								270	260	280	315	315	285	265	265	270	270							
9								255	260	270	280	320	305	280	260	270	265							
10								260	270	315	360	340	320	290	260	260	270	250						
11								240	240	320	350	360	325	280	270	270	275	245						
12								250	260	290	310	340	330	A	A	290	280	240						
13								245	275	290	330	330	320	260	280	280	265	240						
14								290	255	270	350	310	300	300	260	265	255							
15								255	250	320	305	300	295	270	250	265	255	250						
16								240	260	255	330	350	300	275	275	315	270							
17							245	265	300	300	370	350	305	275	270	265	270	250						
18								250	265	290	A	380	340	300	290	275	250	235						
19								250	270	280	375	350	340	330	305	280	265	240						
20								260	260	280	350	350	335	315	300	270	270	270						
21								255	260	295	320	350	320	295	270	280	255	245						
22								250	295	265	300	360	320	290	270	270	265	245						
23							225	240	285	315	300	350	335	305	300	290	285	255						
24					A			250	270	280	A	375	345	300	300	285	280	275						
25							235	250	290	320	310	350	310	275	260	275	275	270						
26							235	240	265	360	380	365	330	320	280	265	A	A						
27							250	240	270	310	390	340	340	A	A	A	285	275						
28							250	240	260	340	340	310	290	300	A	A	280	260						
29							220	A	A	A	A	380	330	A	300	290	280	260						
30							240	A	260	280	340	400	340	320	310	A	A	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								8	27	29	29	27	30	30	26	27	26	25	20					
MED								238	255	260	290	320	340	320	285	270	270	270	250					
UQ								248	262	270	310	350	350	330	300	285	280	278	265					
LQ								230	248	260	270	300	315	300	275	260	265	260	242					

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135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA				Lat.	26 16.9 N				Long.	127 48.4 E				Sweep 1	MHz to 25		MHz in 24sec in		automatic operation														
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23										
1	305	295	270	210	S	S	S	265	220	225	220	215	200	200	Y	Y	A	215	A	A	230	250	255	280	280									
2	S	260	240	210	S	S	S	220	230	230	A	220	200	190	A	190	H	205	210	A	240	260	220	220	220	E	S	280	E	S	300			
3	S	E	S	260	240	220	210	S	230	A	220	210	A	A	A	200	210	H	A	A	220	A	A	S	S									
4	E	S	S	240	220	200	230	S	230	220	A	200	A	190	190	A	200	200	H	A	190	H	225	210	190	S	A	A						
5	S	270	240	260	260	200	A	A	230	220	220	210	190	A	A	A	210	A	A	230	A	240	215	210	260	S	E	S	E	S	290			
6	275	300	280	245	220	295	255	235	230	235	205	200	200	200	200	200	210	200	225	210	200				S	S	S							
7	310	300	270	260	220	260	255	230	210	215	200	215	210	A	A	225	210	220	255	225	200	205	265	300										
8	320	A	305	300	225	S	270	230	A	A	A	210	200	A	200	205	205	200	250	230	235	290	A	A	305									
9	305	275	295	250	200	S	270	230	230	220	200	200	200	195	225	A	A	220	270	230	200	275	A	S	320									
10	S	300	280	240	S	S	S	240	230	215	200	210	190	200	200	A	230	230	240	A	235	210	230	260	E	S	310							
11	S	A	250	230	A	S	250	220	A	210	200	190	220	A	A	A	A	A	230	A	215	230	225	210	205	E	S	E	S					
12	E	S	290	240	190	S	S	250	230	220	220	200	A	210	A	A	A	A	220	A	210	200	205	E	S	E	S	290						
13	S	280	260	240	200	S	S	250	225	230	A	205	200	190	H	200	H	A	210	210	220	A	A	210	190	200	E	S	S					
14	290	280	270	250	245	265	230	235	225	210	200	200	200	215	250	240	215	240	A	240	235	245	245	270	300									
15	300	300	250	200	215	260	205	230	230	210	210	225	190	190	215	190	220	225	245	220	240	275	A	A										
16	290	300	270	250	270	230	245	220	A	A	A	A	190	A	A	A	A	A	A	A	A	A	250	A	A									
17	305	275	265	230	255	250	250	A	A	A	220	200	190	215	245	200	200	210	225	210	270	A	250	280	320									
18	E	S	275	255	275	E	S	280	270	240	220	230	230	A	A	H	240	A	A	A	220	215	A	220	205	215	260	280						
19	S	280	250	240	260	200	S	240	230	230	210	210	200	200	200	210	215	210	220	A	200	210	215	240	250	265								
20	260	265	255	220	210	220	240	225	200	210	H	210	210	200	200	A	215	210	220	A	235	230	200	225	260	S								
21	280	285	280	245	220	230	245	230	230	220	210	195	A	225	230	A	220	230	245	230	230	240	305	330										
22	310	295	250	200	S	S	240	220	230	A	A	A	195	200	195	215	215	A	230	225	220	235	275	300										
23	320	295	245	215	245	305	250	220	220	205	205	190	200	200	A	A	220	220	A	225	215	245	A	A										
24	A	S	320	270	230	A	A	225	A	A	240	A	A	A	A	A	215	250	A	A	225	220	250	300	325									
25	A	A	250	210	A	A	A	A	A	A	210	200	200	A	200	200	210	210	205	240	240	210	205	S	E	S	305							
26	S	E	S	280	260	S	E	A	250	240	220	A	A	H	190	190	A	A	A	A	A	A	A	A	A	A	A							
27	A	A	E	S	280	220	230	A	240	A	240	210	200	H	200	210	A	A	A	A	A	A	235	200	230	A	A							
28	E	S	280	270	230	220	240	S	230	210	210	210	200	190	A	A	A	A	A	A	A	A	A	A	A	A	A							
29	A	E	S	280	250	220	240	S	230	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	S	E	S				
30	270	E	S	S	260	235	220	235	A	A	A	240	200	210	190	240	210	A	A	A	A	A	A	A	A	A	A	A						
31																																		
CNT	23	25	29	30	21	16	24	25	22	24	26	22	22	19	19	16	21	21	17	23	27	25	18	19										
MED	290	280	260	240	220	242	245	230	230	215	202	200	200	200	210	210	210	220	240	225	215	240	269	290	S									
UQ	306	300	280	260	232	262	250	230	230	220	210	210	200	218	A	215	220	230	A	250	230	225	250	280	310									
LQ	276	268	250	215	215	230	240	220	220	210	200	190	190	200	200	202	210	215	230	213	202	210	240	U	S	276								

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H*E (KM)

135° E Mean Time (G.M.T. + 9 h)

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

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H*E (KM)

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H°ES (KM)

135° E Mean Time (G.M.T. + 9 h)

Station		OKINAWA							Lat.	26 16.9 N			Long.	127 48.4 E			Sweep 1	MHz to 25		MHz in 24 sec in		automatic operation				
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		S	S	S	S	S	S	S	145	G	150	145	120	Y	Y	Y	100	135	155	135	120	105	105	105	S	
2		110	S	S	S	S	S	S	G	G	G	140	G	G	160	160	G	120	165	140	120	110	S	100	110	
3		S	S	S	S	S	S	S	G	160	130	120	120	120	120	120	125	G	160	140	120	110	110	110	100	
4		S	S	100	110	110	S	S	G	120	120	115	115	115	115	110	110	110	G	G	105	100	S	130	130	
5		120	S	120	S	S	130	130	150	110	G	120	120	115	115	100	100	100	100	G	100	100	S	S	110	
6		110	S	S	S	S	S	S	150	150	120	105	105	105	Y	G	G	G	G	G	110	105	110	105	105	
7		S	S	S	105	S	S	S	150	150	120	120	105	105	100	155	150	G	G	110	105	S	S	S	S	
8		105	105	105	100	105	S	105	125	120	115	120	115	115	105	G	G	G	G	G	135	115	115	115	110	115
9		105	105	105	105	105	S	S	145	145	140	125	130	Y	150	150	130	125	G	120	105	105	105	S	S	
10		110	S	100	100	100	100	S	G	110	150	G	150	150	110	G	160	E G 170	150	130	110	110	110	S	110	
11		110	110	110	100	110	S	S	140	130	140	G	G	150	150	150	140	140	110	130	S	S	S	110	S	
12		100	S	S	S	S	S	120	120	120	120	120	115	115	120	100	110	110	100	100	100	100	100	110	S	
13		S	S	S	S	S	S	S	145	140	G	110	110	110	110	100	110	100	100	110	100	100	S	S	S	
14		105	S	S	S	S	S	S	145	115	110	105	100	100	100	100	145	150	125	130	105	105	105	105	S	
15		S	S	S	S	S	S	S	125	115	115	120	115	G	G	E G 170	G	150	130	120	110	110	105	105	110	
16		110	110	110	105	105	S	S	145	130	120	120	115	G	150	130	130	120	120	115	105	105	105	105	105	
17		110	100	105	100	S	S	140	120	120	115	125	110	G	G	120	125	130	115	115	105	105	105	100	100	
18		100	S	S	S	S	S	S	150	150	140	125	115	G	110	100	100	100	100	100	100	100	S	S	105	
19		S	S	S	S	S	S	S	G	130	125	120	120	120	125	120	125	125	125	G	S	S	110	110	110	
20		110	110	110	S	S	110	S	115	110	110	115	115	110	110	110	G	G	105	100	S	100	110	S	S	
21		S	S	S	S	S	S	S	145	110	110	105	105	100	100	105	100	100	150	130	110	105	105	105	105	
22		S	S	S	S	S	105	150	145	115	120	120	115	110	G	G	G	155	130	115	110	105	105	105	105	
23		105	S	S	S	S	S	S	145	120	120	120	120	G	G	150	135	145	130	115	105	105	105	105	105	
24		110	105	105	105	105	105	105	120	115	115	115	115	155	135	130	130	130	115	105	105	115	105	105	105	
25		110	110	110	110	110	110	110	115	115	115	115	115	110	110	110	110	G	110	G	S	110	110	110	110	
26		110	110	110	110	110	110	110	110	110	110	125	125	160	150	G	160	135	120	115	110	110	110	110	110	
27		110	110	110	110	110	110	S	115	115	115	115	115	115	E G 165	135	125	120	120	120	115	110	110	100	100	
28		100	S	S	S	S	S	S	140	115	110	110	110	160	150	140	140	125	125	120	110	110	110	110	110	
29		110	110	110	110	110	110	125	120	125	120	125	125	125	140	135	130	120	120	120	110	110	110	110	110	
30		110	100	S	S	110	110	130	125	115	110	110	100	110	100	100	140	125	120	115	110	110	110	110	110	
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		21	12	14	13	12	10	10	25	28	27	28	28	22	24	24	24	24	25	25	26	27	23	23	22	
MED		110	110	110	105	110	110	122	140	120	120	120	115	115	116	120	128	125	120	120	110	105	110	105	110	
UQ		110	110	110	110	110	110	130	145	130	122	122	120	125	148	142	140	136	130	130	110	110	110	110	110	
LQ		105	105	105	100	105	105	110	120	115	115	115	110	110	110	102	110	115	110	115	105	105	105	105	105	

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H°ES (KM)

IONOSPHERIC DATA

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TYPES OF ES

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA											Lat. 26 16.9 N, Long. 127 43.4 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							H2		H1	HL11	C1					L3	HL13	H3	HL52	FF32	F5	F3	F3										
2	F1									H1				H1	H1		C1	HL11	HL21	F4	F5		F1	F2									
3								H2	C2	C2	C2	C2	C2	C1	C2	C1		H1	HL11	FF23	F4	F6	F1	F1									
4			F1	F2	F2			C2	C2	C2	C3	C1	C2	L2	L1	L2				F1	F1		F3	F4									
5	F4		F1		F4	F2	H1	L2		C2	C2	C2	C1	L4	L3	L3	L2			F1	F1			F1									
6	F2						H2	H1	C1	L1	L1	L1	L1							F3	F5	F2	F3	F2									
7			F1				H2	HL11	C2	C1	L1	L1	L1	L3	HL11	H1			L3	F3													
8	F3	F7	F4	F5	F4	F2	C5	C5	C3	C3	C2	C2	C2	L2					C1	F6	F7	F7	F4	F2									
9	F4	F3	F2	F3	F2		H2	H2	HL21	C2	C1			H1	H1	C1	C2		C5	F7	F4	F5											
10	F1		F2	F2	F2	F2		L2	H1		HL11	HL11	L2		H1	H1	H1	H1	H1	F4	F5	F1		F1									
11	F2	F6	F3	F4	F4		H1	H1	H1				H1	H1	H1	H1	H2	C1	C1				F1										
12	F2					C2	C2	C1	C2	C2	C2	C2	C2	C2	L6	L4	L3	L3	L2	F3	F1	F1	F2										
13							H2	H1		L2	L2	L1	L1	L1	L2	L2	L2	L2	L2	F1	F1												
14	F1						H2	C3	L2	L3	L2	L2	L2	L3	L2	H1	H1	C3	C3	F4	F3	F2	F2										
15							C2	C2	C2	C2	C2				H1		H1	C2	C3	F6	F3	F5	F4	F5									
16	F7	F5	F5	F7	F4		H2	C3	C3	C2	C2			H1	C2	C3	C2	C3	C7	F7	F7	F5	F5	F4									
17	F7	F4	F4	F1		H2	C6	C5	C3	C2	L2			C2	C1	C1	C2	C2	F3	F7	F4	F2	F2										
18	F2						H1	H1	H2	C1	C2			L1	L3	L3	L2	L1	L4	F3	F1			F1									
19								C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C2				F1	F3	F4									
20	F2	F1	F1		F1		C2	L2	L2	C2	C2	L1	L1	L1			L2	L3		F1	F1												
21							H2	LH11	L2	L2	L2	L3	L2	L2	L5	L2	L2	H1	CL22	L7	F3	F4	F3	F4									
22					F2	H1	H2	C3	C4	C3	C3	L1					H1	C2	C3	L5	F7	F6	F4	F3									
23	F2						H2	C2	C1	C1	C1				H1	H1	H1	C2	C4	L7	F7	F3	F5	F3									
24	F6	F4	F4	F4	F6	F6	L6	C4	C4	C3	C3	C2	H1	H2	C3	C3	C2	C3	L5	L7	F3	F3	F3	F3									
25	FF61	FF24	F3	F4	F5	F6	L2	C3	C3	C2	C1	C1	L2	L1	L1	L2		L2		F5	F2	F1	F1										
26	F2	F1	F2	F4	F2	F6	L3	L2	L2	L1	C1	C1	HL11	H1		H1	H1	C6	C7	L7	F6	F4	F5	F2									
27	F6	F7	F2	F3	F2	F4		L3	C3	C2	C2	C2	C2	HL11	H2	C6	C4	C4	C4	C3	F3	F4	F4	F4									
28	F1						H1	C1	L1	L1	L1	HL11	HL11	H1	H5	C5	C4	C4	L7	F4	F7	F7	F2										
29	F4	F2	F2	F2	F2	F2	C3	C5	C5	C3	C3	C6	C2	H2	H3	C3	C3	C3	C4	L5	F5	F5	F3	F2									
30	F3	F2			F3	F2	C2	C2	C3	L3	L2	L2	L1	L2	L2	H1	C3	C3	C6	L7	F3	F3	F5	F6									
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																																	

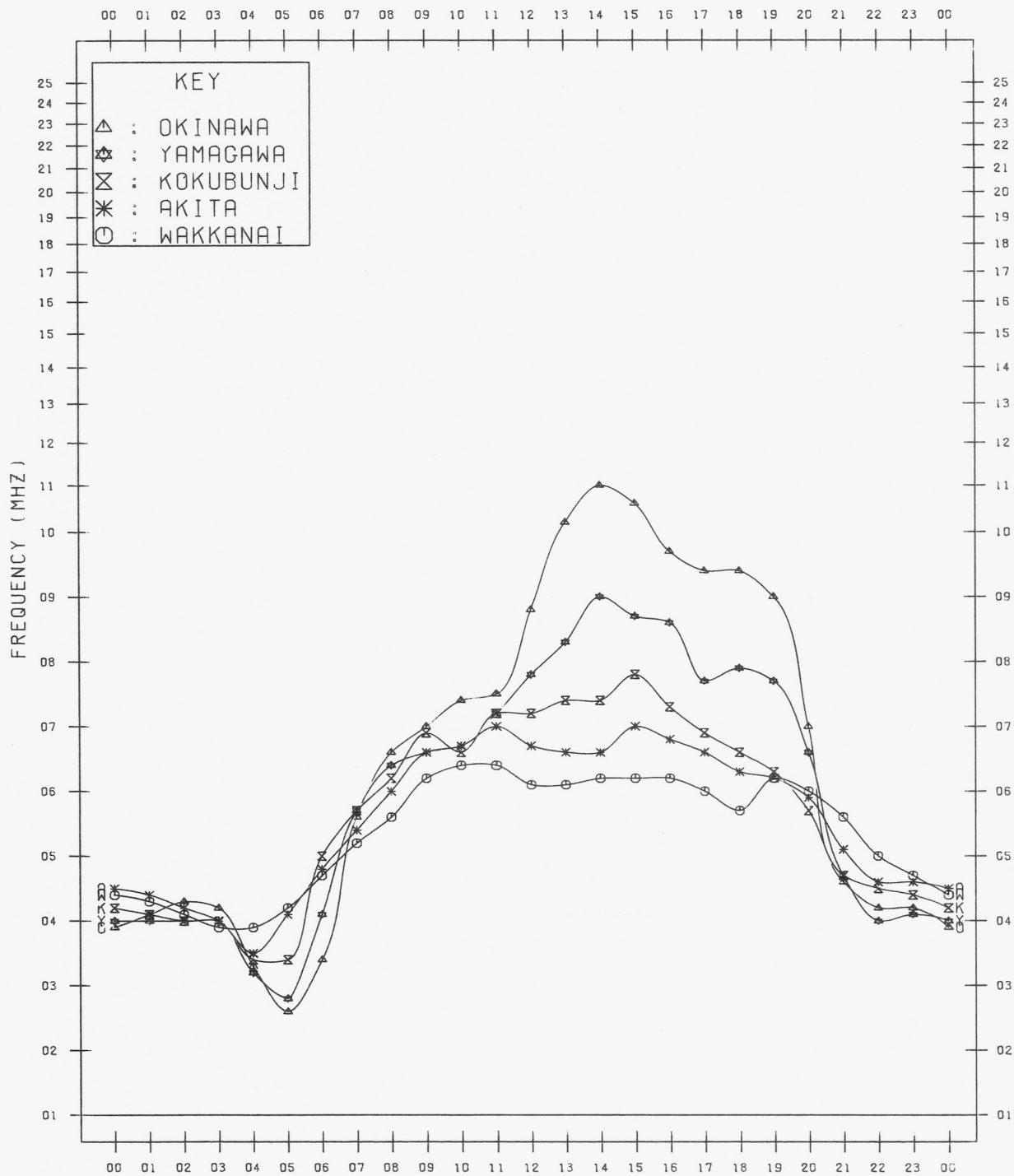
APR. 1987

TYPES OF ES

MONTHLY MEDIAN VALUES OF FOF2

135 °E MEAN TIME

APR. 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

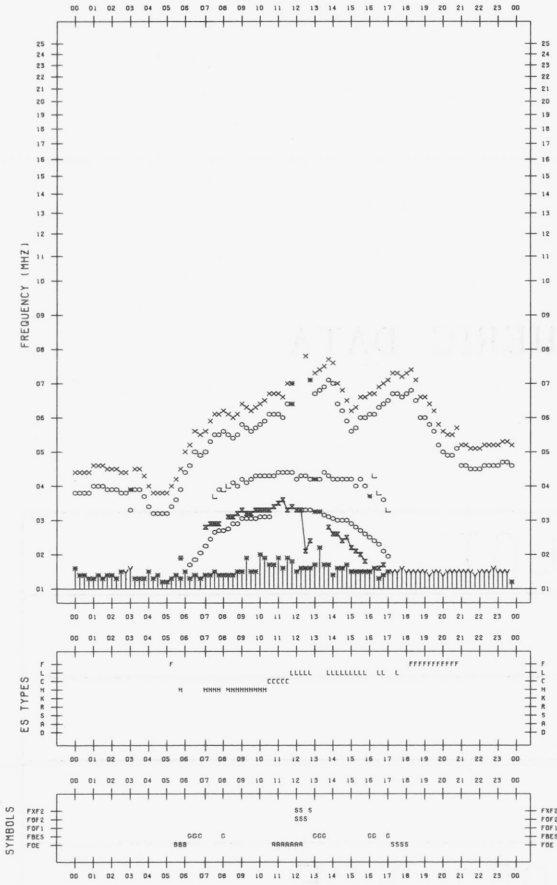
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 4/ 1

135°E MEAN TIME



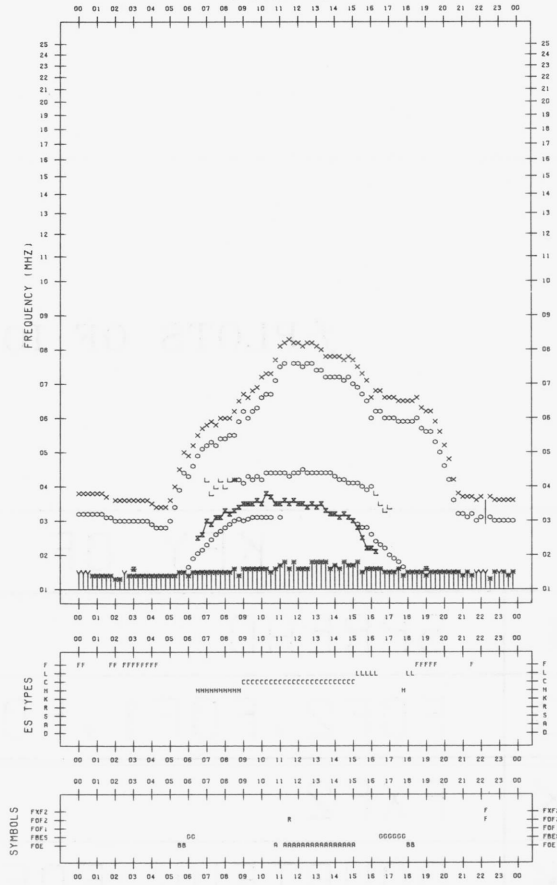
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 4/ 3

135°E MEAN TIME



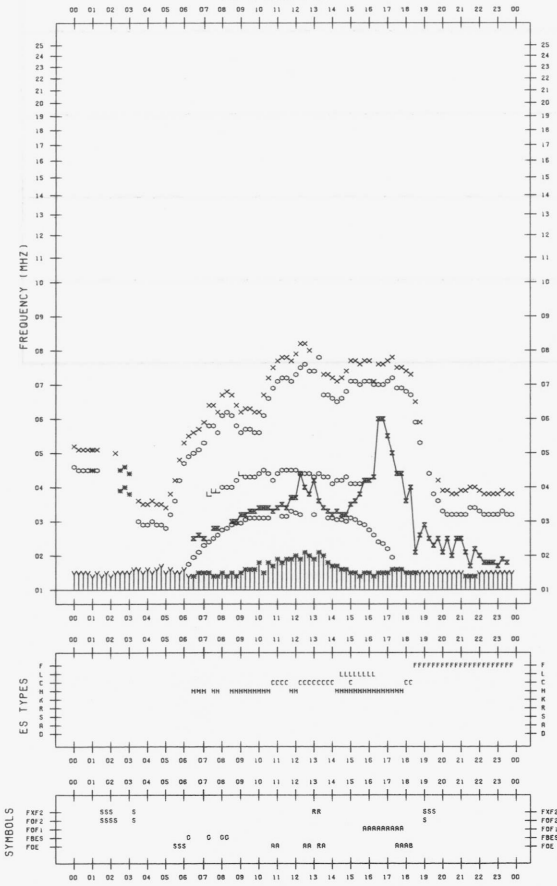
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 4/ 2

135°E MEAN TIME



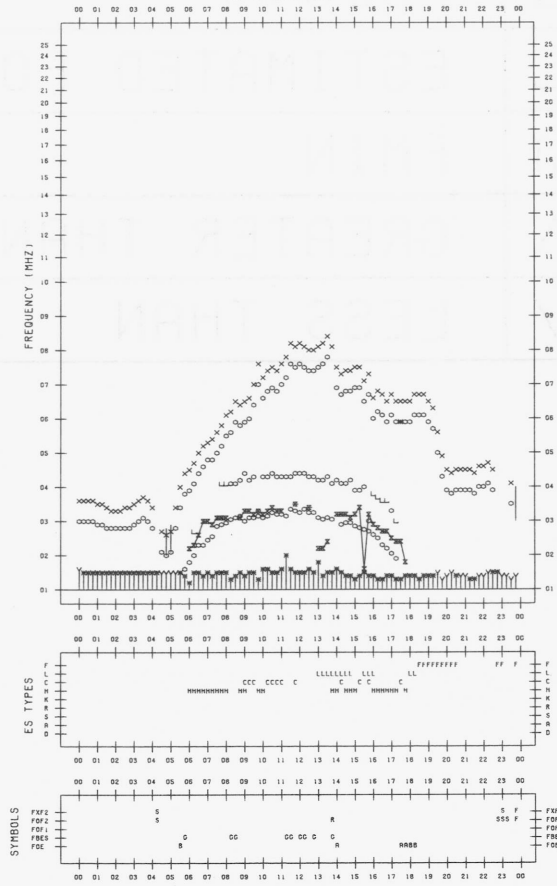
F-PLOT DATA

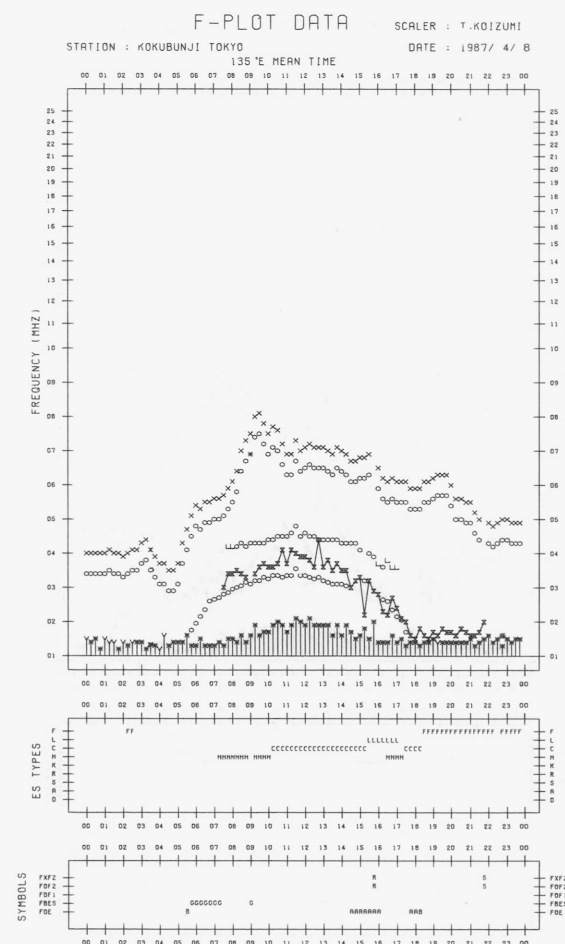
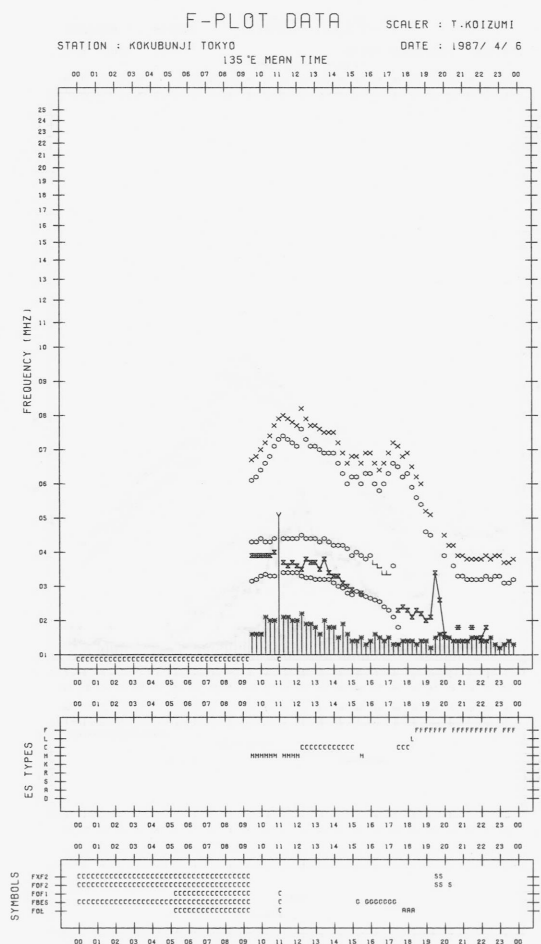
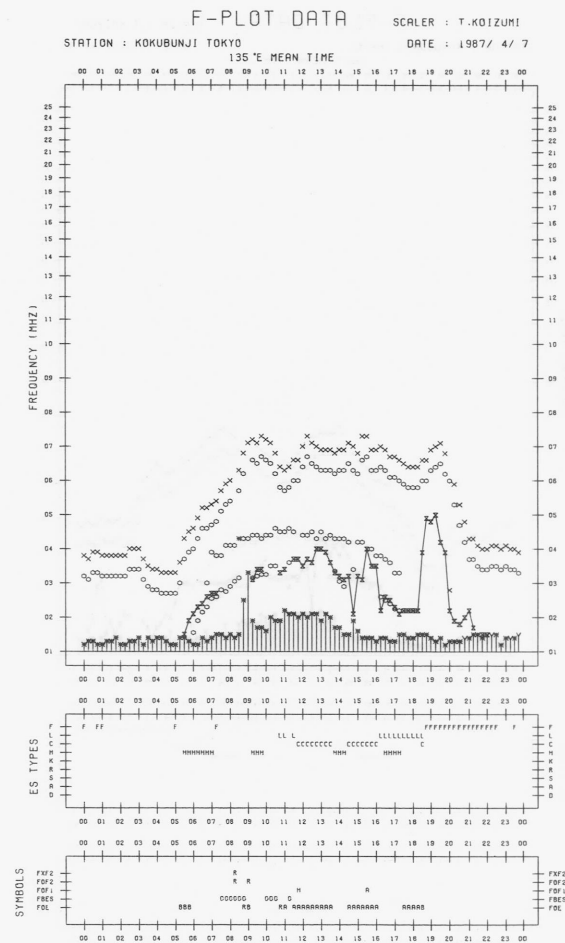
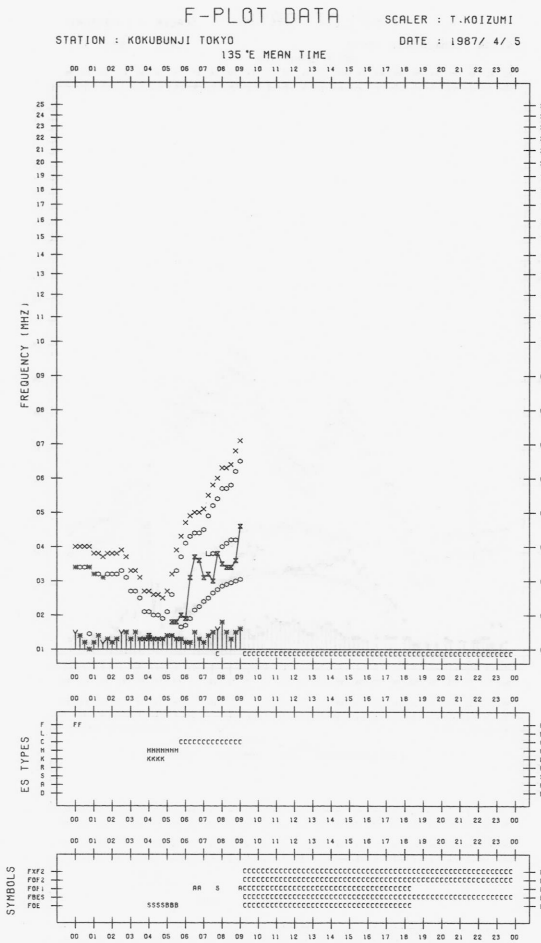
SCALER : S.HIIDOME

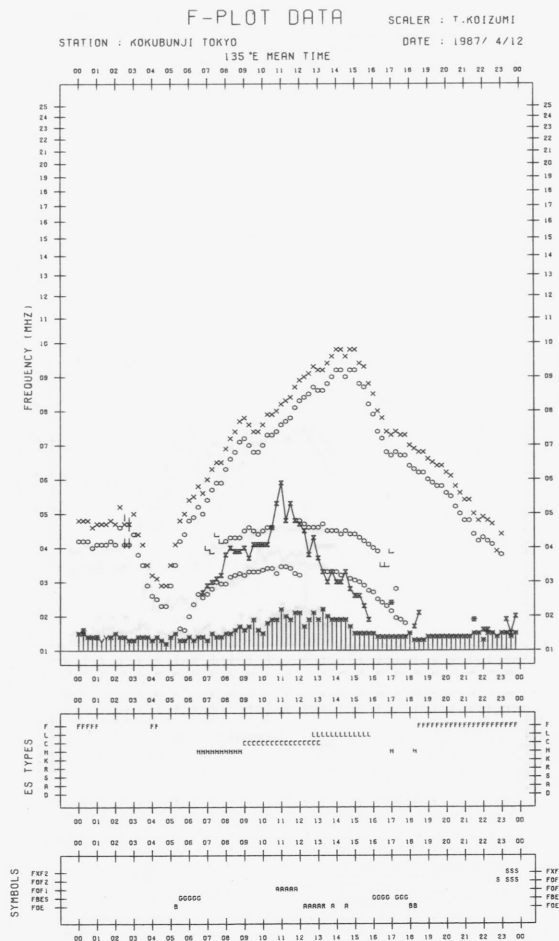
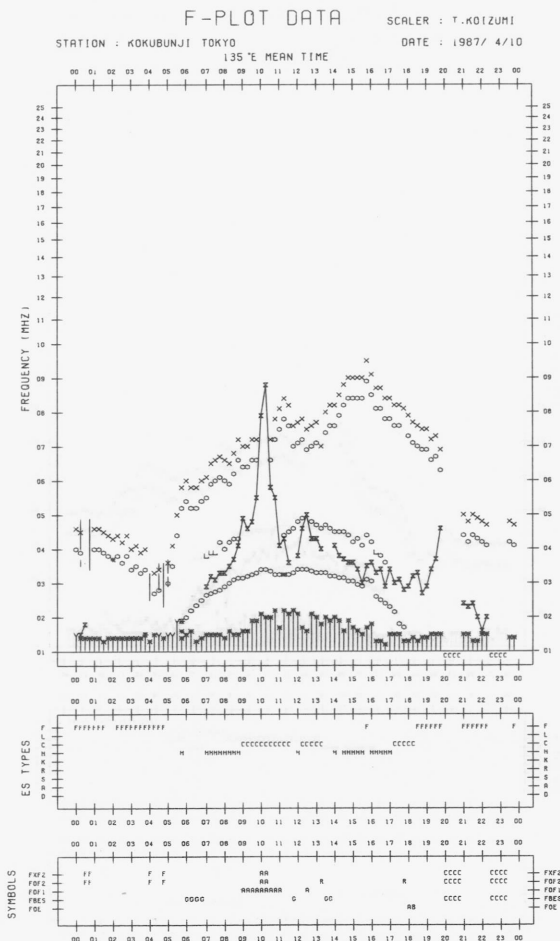
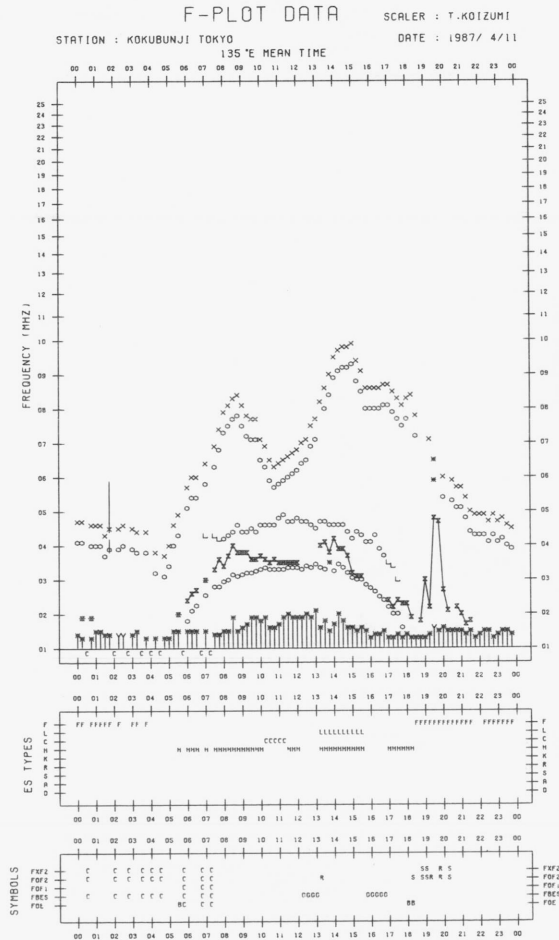
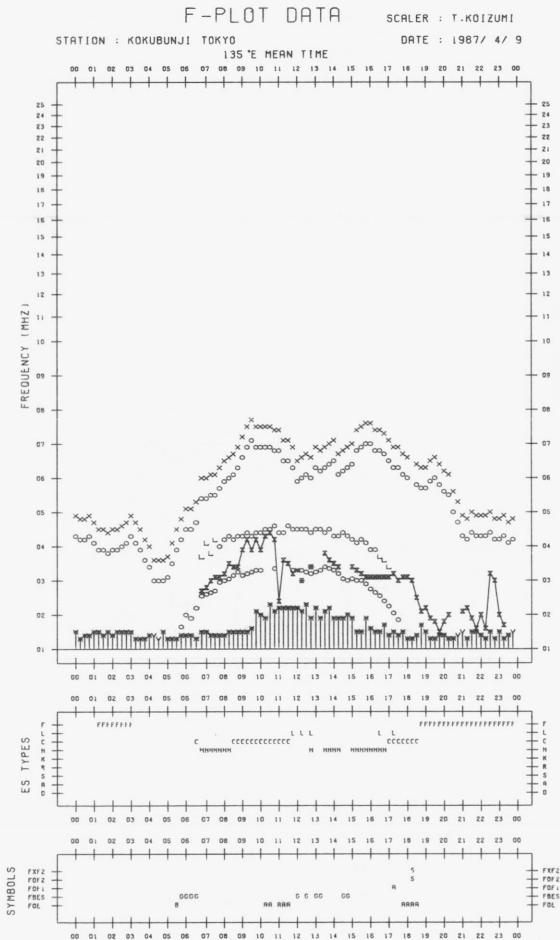
STATION : KOKUBUNJI TOKYO

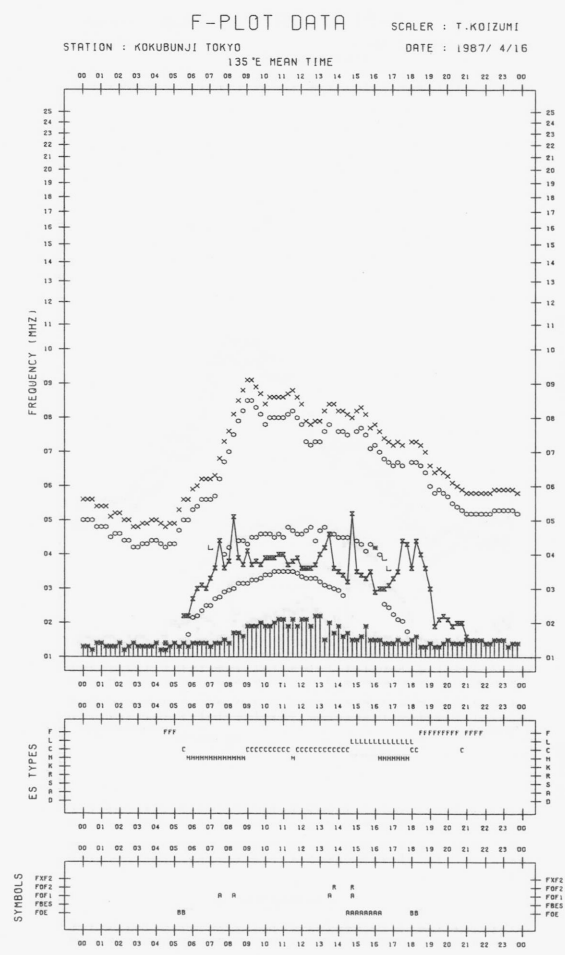
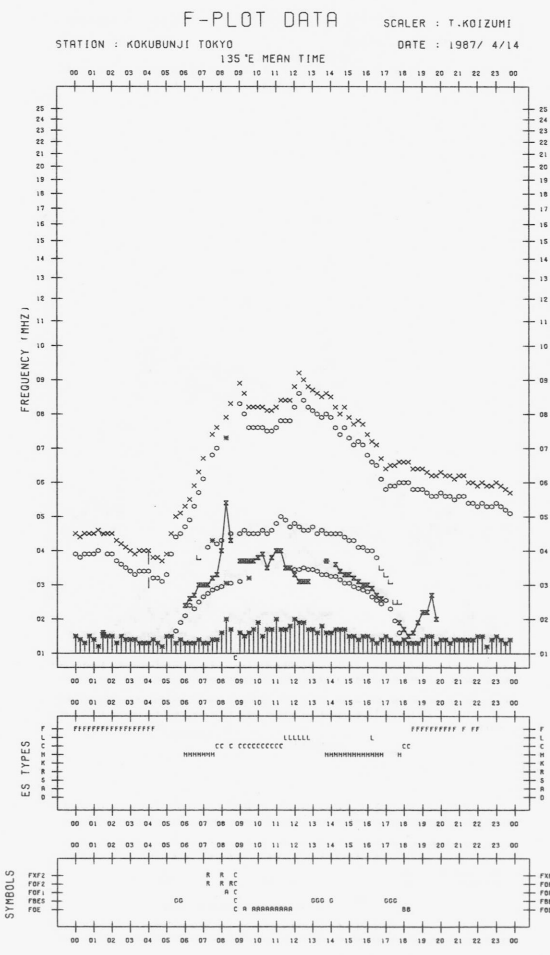
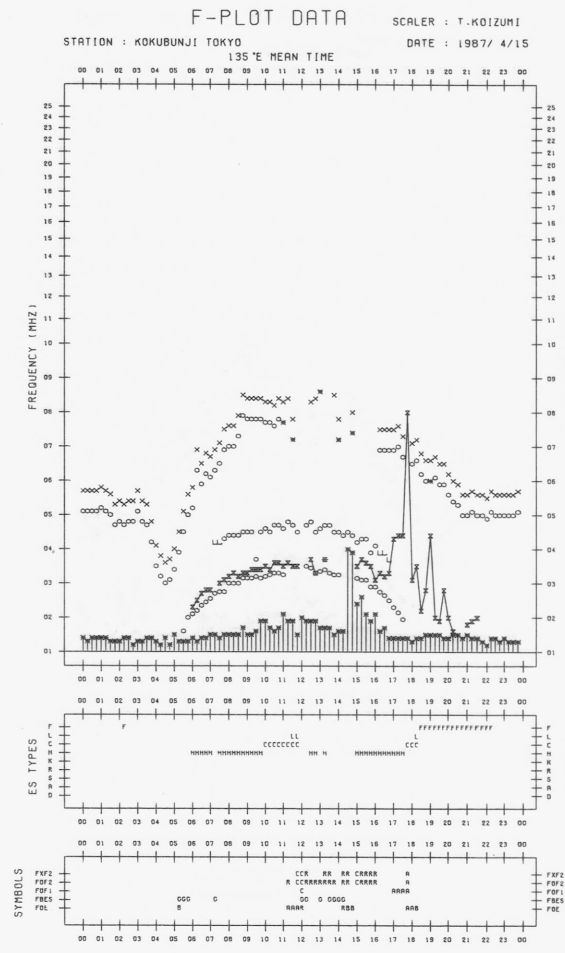
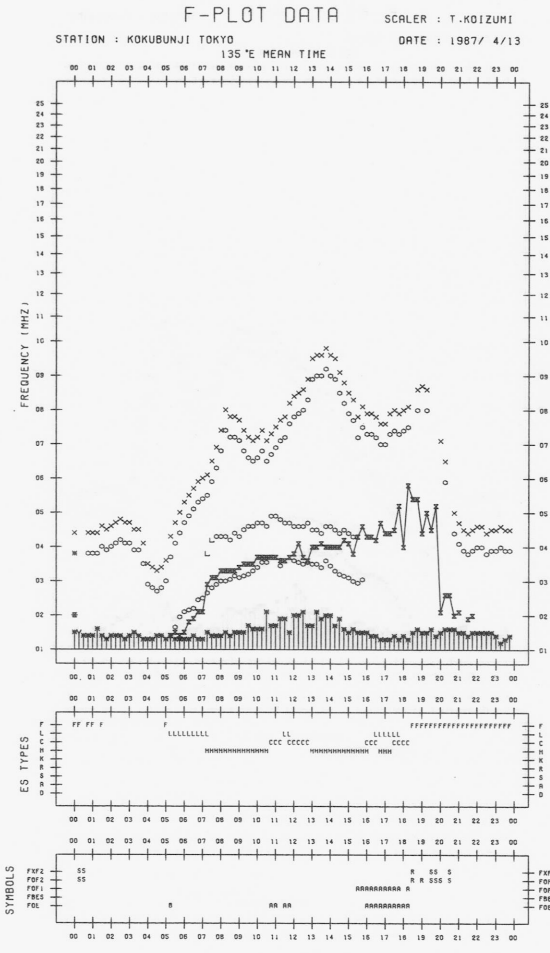
DATE : 1987/ 4/ 4

135°E MEAN TIME









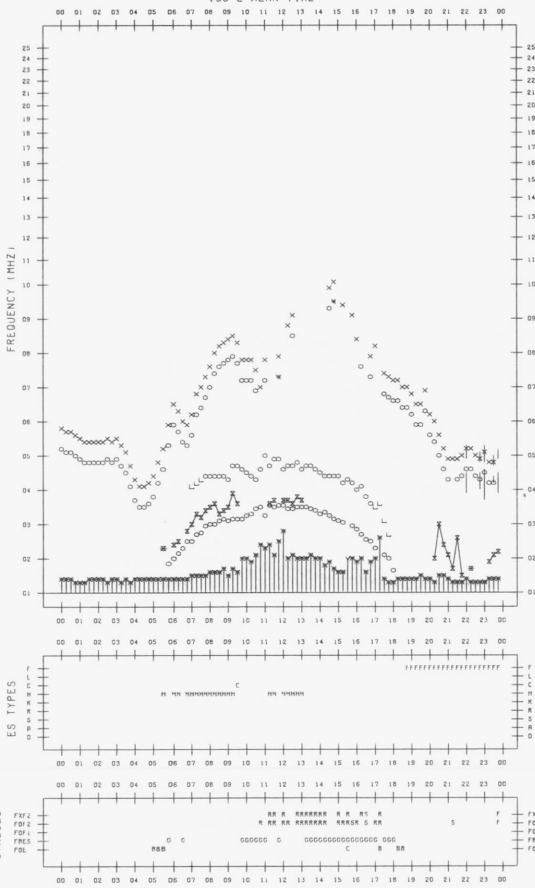
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

135°E MEAN TIME

DATE : 1987/ 4/17



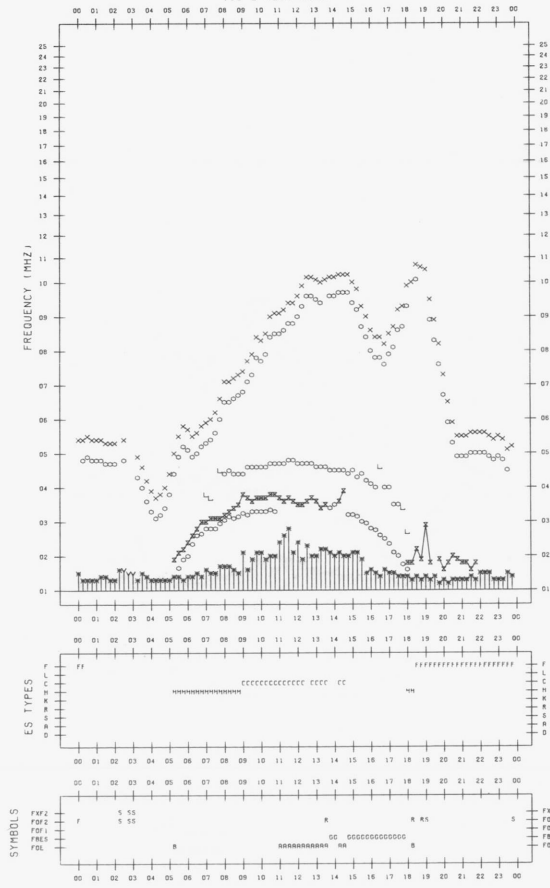
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

135°E MEAN TIME

DATE : 1987/ 4/19



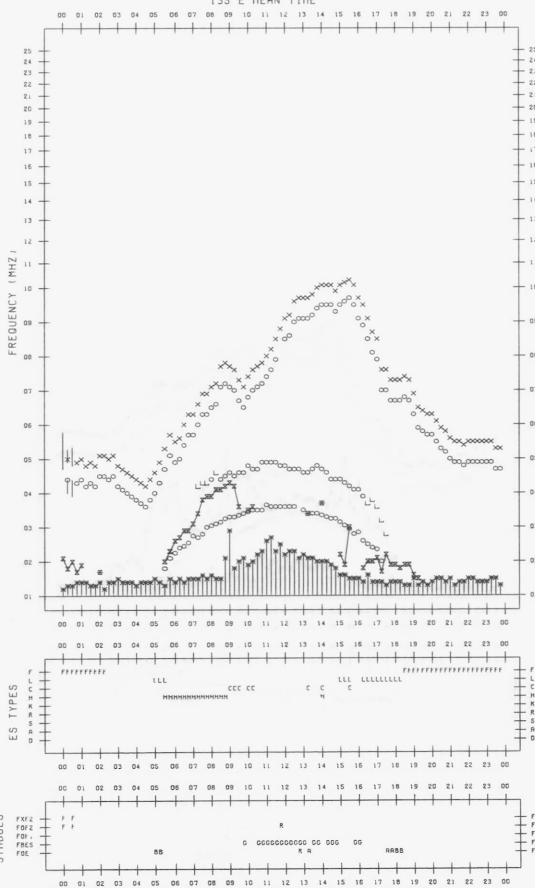
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

135°E MEAN TIME

DATE : 1987/ 4/18



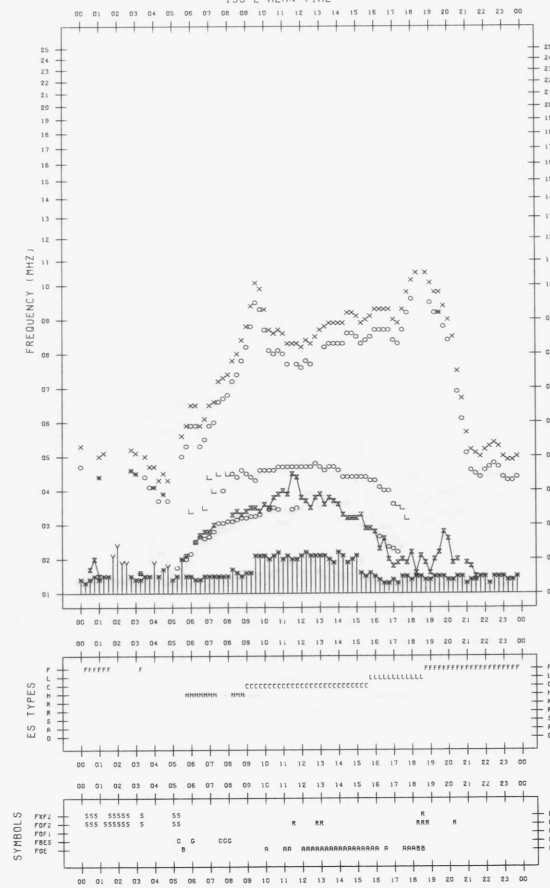
F-PLOT DATA

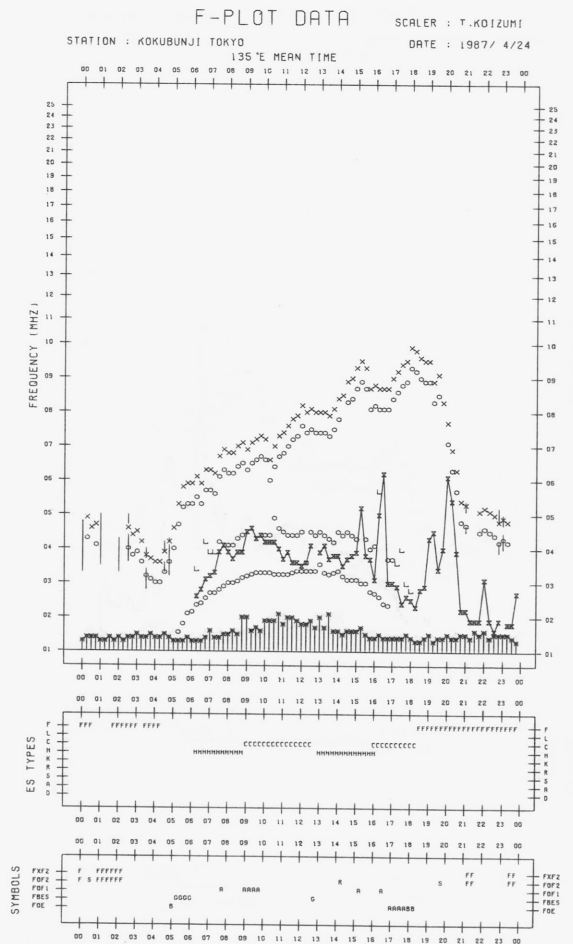
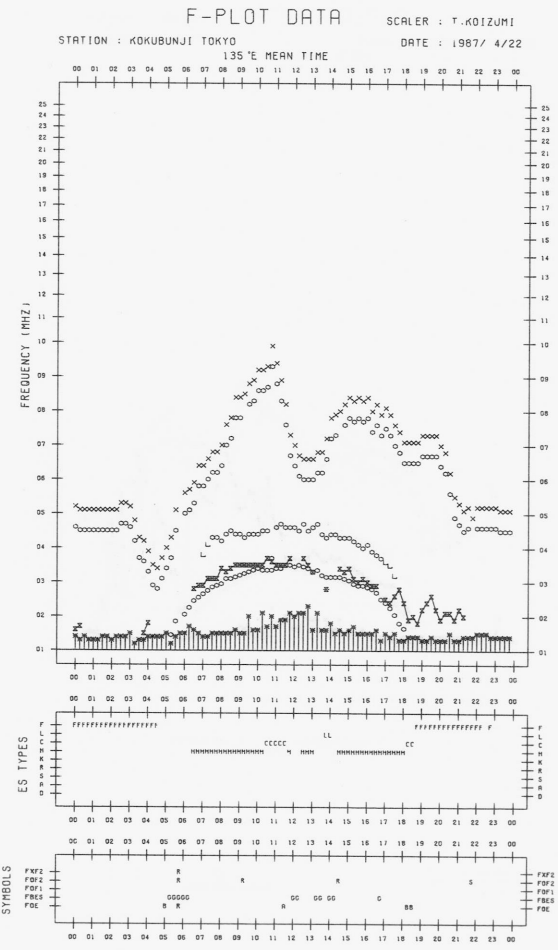
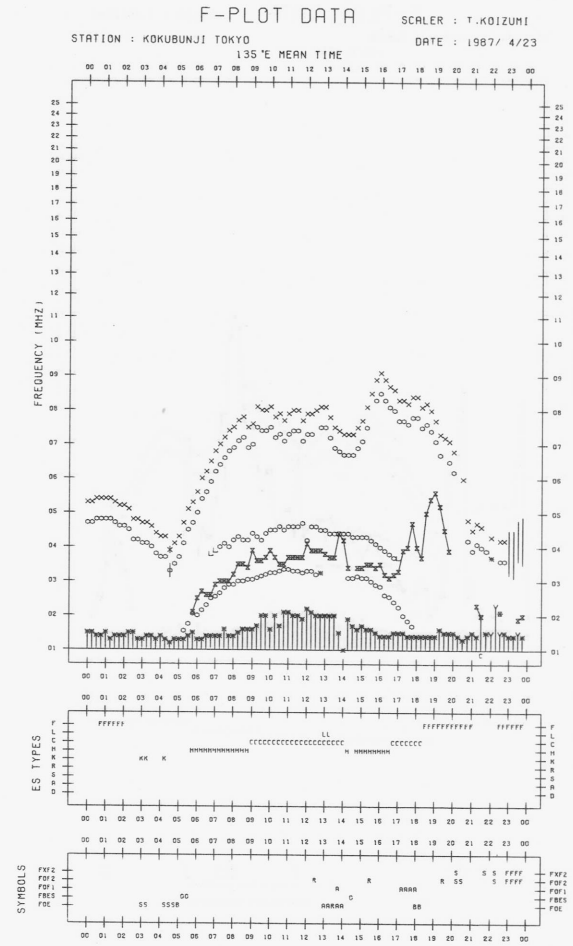
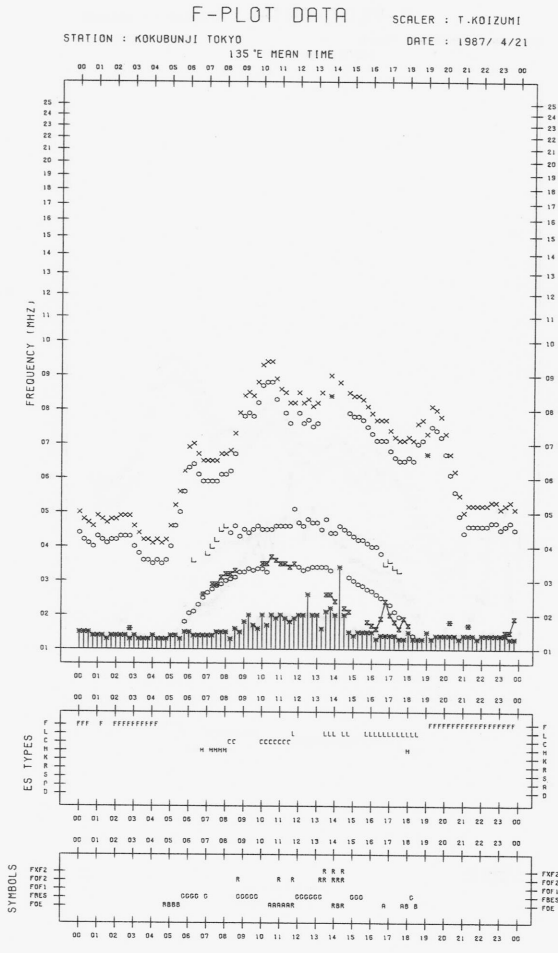
SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

135°E MEAN TIME

DATE : 1987/ 4/20





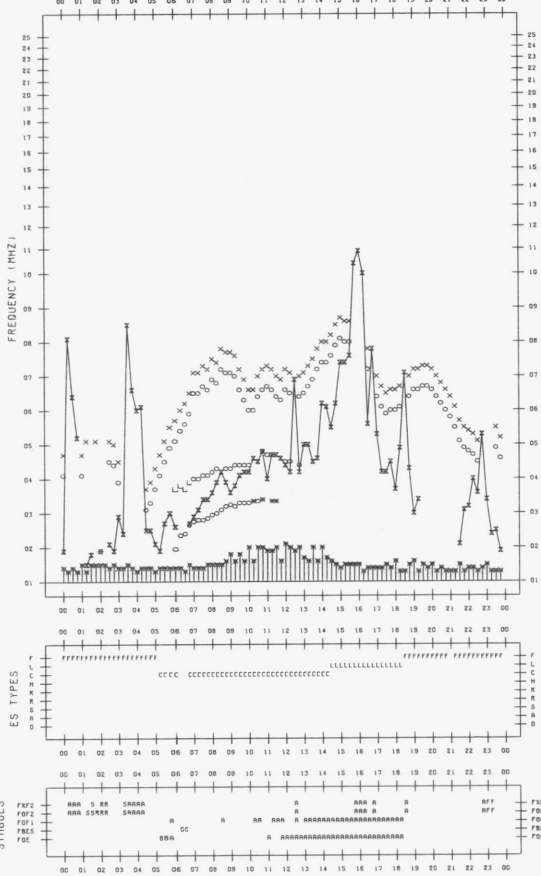
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 4/25

135°E MEAN TIME



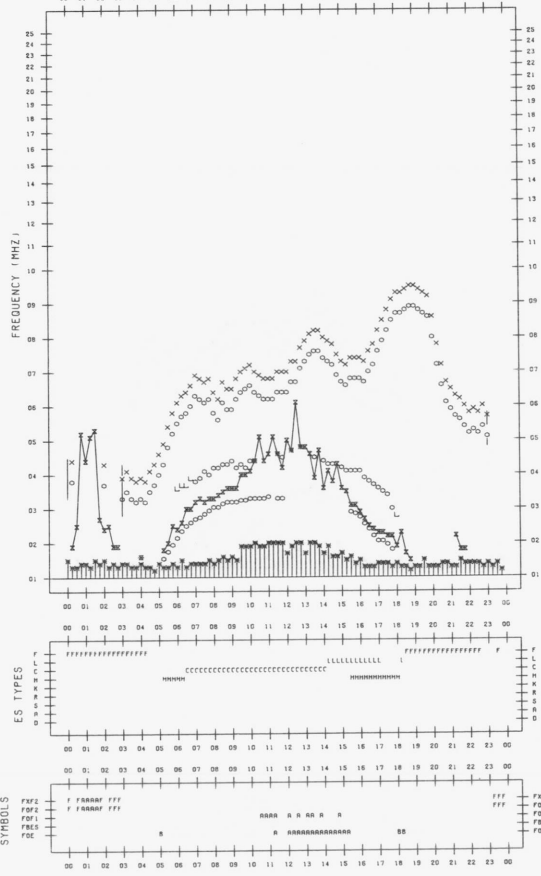
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 4/27

135°E MEAN TIME



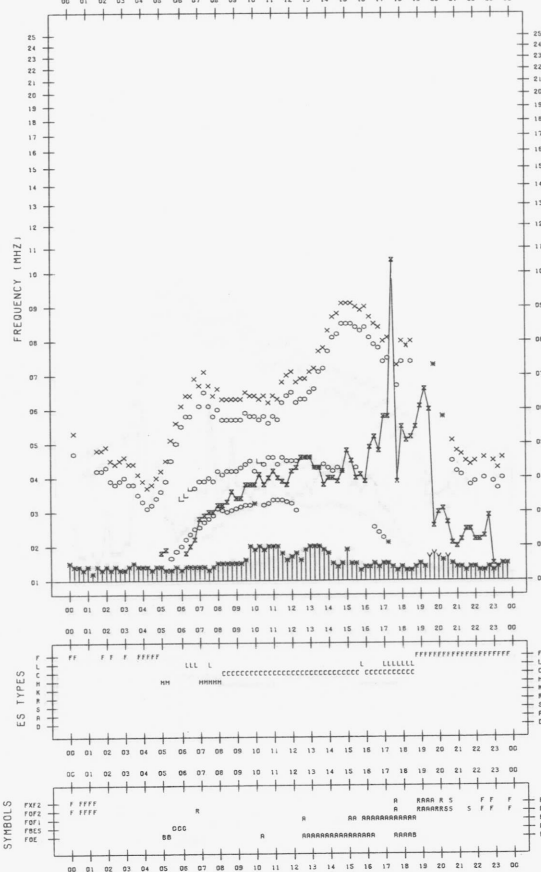
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 4/26

135°E MEAN TIME



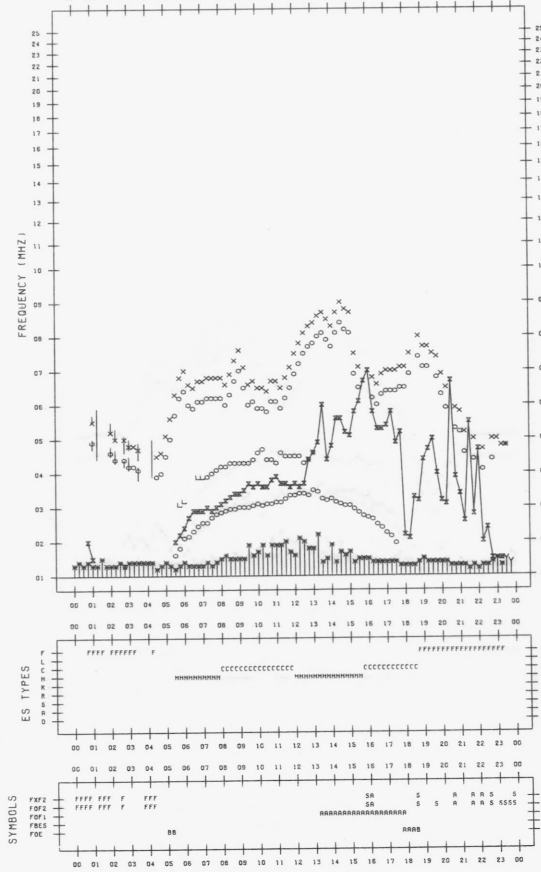
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 4/28

135°E MEAN TIME



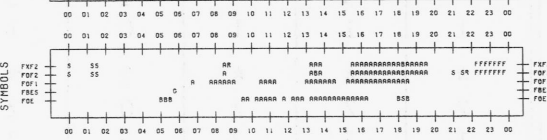
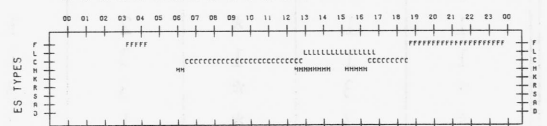
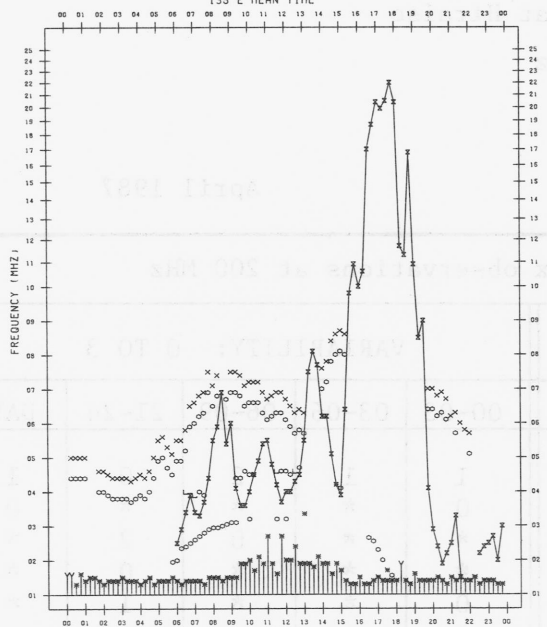
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 4/29

135°E MEAN TIME



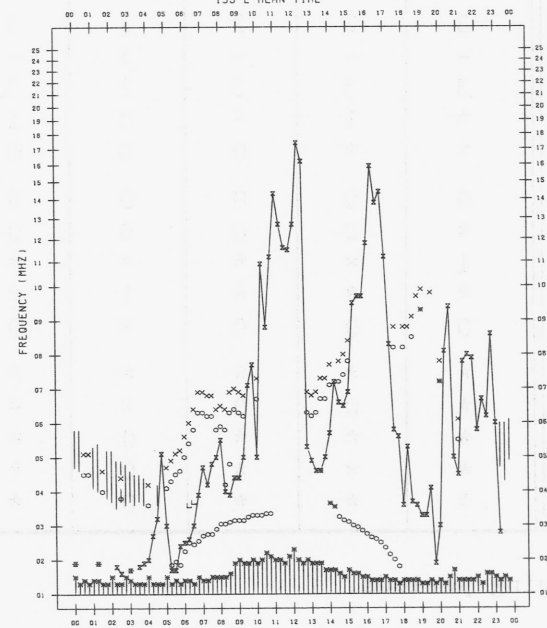
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 4/30

135°E MEAN TIME



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

Hiraiso

April 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	7	7	7	7	7	1	1	2	0	1
2	7	7	q	q	7	0	*	*	*	0
3	q	7	6	7	7	*	*	0	2	*
4	7	7	7	7	7	*	*	*	0	*
5	7	7	7	7	7	0	*	*	1	*
6	7	7	7	7	7	1	1	*	2	1
7	7	7	7	7	7	1	1	1	3	1
8	7	7	q	7	7	*	3	*	3	3
9	7	7	7	7	7	*	3	*	1	3
10	7	7	7	7	7	1	1	1	0	1
11	q	q	7	7	7	*	*	*	2	*
12	7	7	7	6	7	2	2	2	0	2
13	8	8	8	8	8	1	3	3	3	2
14	8	8	8	8	8	3	2	2	2	3
15	8	8	8	8	8	*	*	3	3	2
16	8	8	8	8	8	3	2	2	3	3
17	-	-	-	8	-	-	-	-	3	-
18	8	8	8	7	8	3	3	3	2	3
19	q	7	7	7	7	*	1	*	0	1
20	7	7	7	7	7	*	*	0	0	0
21	7	7	7	7	7	0	0	0	0	0
22	7	7	7	7	7	*	0	0	0	0
23	7	7	7	7	7	1	*	*	*	*
24	7	8	q	7	7	*	*	*	1	*
25	7	7	7	7	7	0	0	0	*	0
26	q	q	7	7	7	*	*	*	*	*
27	7	7	7	7	7	*	0	0	*	*
28	q	7	7	7	7	*	*	*	0	*
29	q	7	7	7	7	*	*	*	0	*
30	7	q	7	7	7	*	*	*	0	*

Notes: 1. No observations during the following periods.

16th 2357 - 17th 0908

2. (q) likely quiet.

3. (*) interference.

B. Solar Radio Emission

a. Daily Data at Hiraïso

500 MHz

Hiraïso

April 1987

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

Note: No observations during the following periods.

17th 2345 - 18th 0401

B. Solar Radio Emission
b. Outstanding Occurrences at Hiraiso

Hiraiso

April 1987

Single-frequency observations								
Normal observing period: 2010 - 0910 U.T. (sunrise to sunset)								
APR 1987	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY ($10^{-22} W_m^{-2} Hz^{-1}$)		POLARIZATION REMARKS
						PEAK	MEAN	
1	500	27 RF	0450	0706.0	190	24	4	ML
	200	43 NS	0456	0522	200	50	5	ML
3	200	44 NS	2020E	2122	160D	10	5	0
5	200	44 NS	2020E	0529	660D	10	5	0
6	200	46 C	0427	0428.1	4.5	145	24	0
	500	45 C	0427.7	0429.9	4.5	57	10	WL
	200	44 NS	2015E	2317	770D	20	10	MR
	500	46 C	2256.0	2258.1	3.8	73	11	WL
	200	46 C	2257.4	2257.8	1.0	140	64	0
	100	46 C	2257.4	2258.0	2.0	84	25	-
7	200	44 NS	2015E	2321	770D	40	15	ML
	500	45 C	2030U	2040.1	35	57	12	WR, SUNRISE
	100	42 SER	2038.0	2039.6	13.9	1000D	-	-
	200	46 C	2038.9	2039.0	4.0	460	110	WL
8	200	44 NS	2014E	0336	770D	30	15	ML
9	200	44 NS	2010E	2316	770D	10	5	WL
11	500	8 S	0327.4	0327.6	0.6	30	-	WL
	200	42 SER	0415.1	0416.2	7.3	140	-	0
	500	7 C	0415.4	0416.3	8.5	50	10	WL
	500	45 C	0510.9	0512.0	11.0	55	5	WL
	200	41 F	0512.8	0513.5	2.0	220	-	0
	200	44 NS	2010E	0428	770D	10	5	WL
13	500	27 RF	0318	0419.5	190	30	10	ML
	200	43 NS	0332	0515	330D	70	30	SL
	100	43 NS	0410	0538	160	8	2	-
	200	44 NS	2007E	0100	780D	35	15	SL
14	500	27 RF	0009	0205.5	374	30	10	ML
	200	44 NS	2005E	0251	780D	15	7	ML
15	500	27 RF	0630	0644.4	39	10	5	WL
	200	41 F	0630	0700	33	120	-	ML
	200	44 NS	2004E	0226	780D	80	30	SL
	100	43 NS	2100	2123	360	30	10	-
	500	27 RF	2109	2213.5	170	10	3	WL
	200	44 NS	2002E	2315	240D	60	40	SL
16	100	44 NS	2002E	2353	240D	55	10	-
	200	44 NS	2000E	2100	780D	85	40	SL
17	100	44 NS	2000E	0302	780D	160	35	-
	200	44 NS	2000E	2132	780D	40	10	ML
18	100	43 NS	2117	2203	170	180	40	-
	200	43 NS	2241	0240	500	10	5	WL
22	200	43 NS	2241	0240	500	10	5	WL
24	200	44 NS	1953E	2045	160D	10	3	WL

RADIO PROPAGATION

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

APR 1987 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISSO

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	8	9	8	13	20	20	24	17	13	-10	-19	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	0	16	5	20	8	
2	10	15	12	17	25	20	29	2	ES -5	ES -8	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	-3	15	9	14	13	
3	16	12	13	20	24	24	26	0	ES -9	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	-6	ES -24	ES -24	7	9	17	8	
4	11	15	19	18	21	26	21	13	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	7	2	9	11	
5	14	15	14	18	19	19	24	12	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	2	18	8	10	12	
6	14	13	16	15	15	23	24	20	-2	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	3	4	12	9	
7	8	4	16	13	18	19	21	17	17	-1	3	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	7	10	6	8	12	
8	10	9	14	17	19	21	28	24	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	13	9	8	10	13	
9	8	12	8	16	17	23	24	22	7	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	6	8	13	7	10	
10	6	10	15	16	19	26	26	21	7	7	5	5	5	-4	ES -24	ES -24	ES -24	ES -24	ES -24	16	7	6	10	10	
11	7	12	15	17	20	27	25	28	-2	-6	12	7	9	2	ES -24	ES -24	-9	0	ES -24	6	4	6	13	0	
12	9	7	12	16	16	21	20	11	1	5	6	-4	9	ES -24	ES -24	ES -24	ES -24	-9	-9	11	7	10	8	7	
13	5	2	9	18	19	21	28	24	12	-3	-3	-6	ES -24	1	-2	ES -24	ES -24	ES -24	ES -24	8	10	12	12	9	
14	8	12	11	13	18	23	21	22	-6	-9	ES -24	ES -24	ES -24	7	ES -24	ES -24	ES -24	-4	ES -24	12	14	13	9	11	
15	7	9	9	14	18	22	24	15	-7	ES -24	ES -24	-7	-2	4	-15	ES -24	ES -24	ES -24	ES -24	14	13	5	12	13	
16	6	6	5	14	13	21	23	15	-7	-6	ES -24	ES -24	-2	-2	3	ES -24	ES -24	12	ES -24	11	10	5	12	9	
17	7	4	3	13	19	22	26	21	-3	-9	-7	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	-6	-6	12	8	4	6	-3	
18	-1	5	10	10	19	22	24	23	6	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	0	ES -24	-12	ES -15	10	12	4	8	6	
19	5	9	13	15	17	20	28	21	23	26	17	8	22	-2	ES -24	ES -24	ES -24	ES -24	ES -24	11	11	9	6	10	
20	8	7	8	15	17	24	21	23	20	23	8	20	ES -24	3	ES -24	ES -24	ES -24	ES -24	ES -24	10	12	5	5	9	
21	14	12	4	12	18	18	22	22	3	ES -24	ES -24	ES -24	ES -24	12	ES -24	ES -24	ES -24	ES -24	ES -24	7	10	8	6	6	
22	8	9	7	17	15	20	21	19	9	ES 0	-8	ES -8	-8	-5	-8	ES -23	15	ES -23	ES -23	8	12	10	12	10	
23	11	13	9	14	18	21	23	21	15	7	11	-6	-5	ES -24	ES -24	ES -24	ES -24	-1	ES -24	12	13	7	8	8	
24	7	12	12	13	17	20	28	24	24	5	ES 2	ES -3	-6	ES -24	ES -24	ES -24	ES -24	-3	-9	2	8	6	10	11	
25	3	3	5	12	17	16	29	23	23	18	15	10	21	12	ES -24	ES -24	ES -24	ES -24	ES -24	6	12	5	4	3	
26	14	2	13	9	18	25	26	21	ES -3	ES -3	12	8	ES -24	-2	ES -15	ES -15	ES -15	-11	-1	6	11	13	7	12	
27	3	12	8	11	19	23	28	23	12	4	4	-2	10	19	ES -24	ES -24	ES -24	ES -24	13	11	8	3	7	3	
28	2	3	7	14	22	23	22	19	19	17	11	12	18	-7	ES -24	ES -24	ES -24	ES -24	6	12	14	9	11	7	
29	8	4	8	12	18	19	20	15	US 3	-2	11	7	5	8	10	-2	-5	4	5	15	13	18	13	7	
30	8	9	10	10	17	20	21	25	21	6	11	2	8	-9	ES -24	ES -24	ES -24	-6	ES -24	7	16	9	5	3	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	8	9	10	14	18	21	24	21	4	US -4	US -5	US -8	US -23	-8	ES -24	ES -24	ES -24	ES -23	ES -24	8	10	8	10	9	
UD	14	15	16	18	22	26	28	24	23	18	12	10	18	12	-2	ES -15	-9	0	5	14	16	13	14	13	
LD	3	3	5	10	15	19	21	11	ES -23	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -23	7	4	5	3	

C. Radio Propagation

b. Radio Propagation Quality Figures at Hiraiso

Hiraiso

Time in U.T.

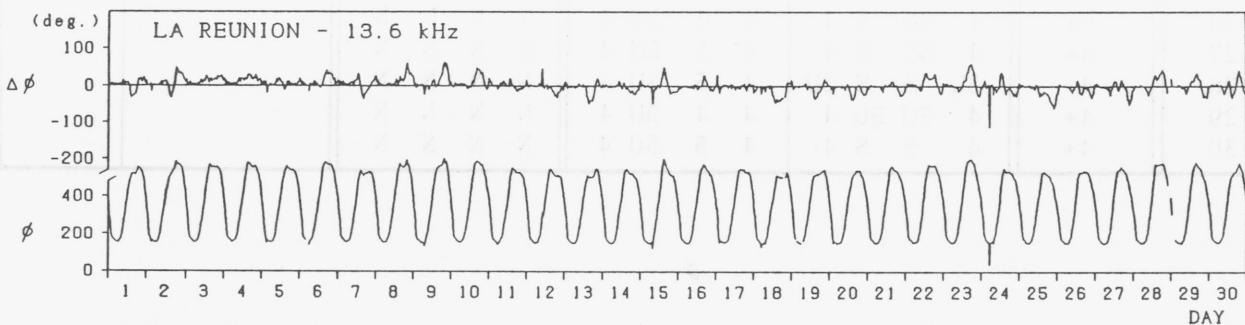
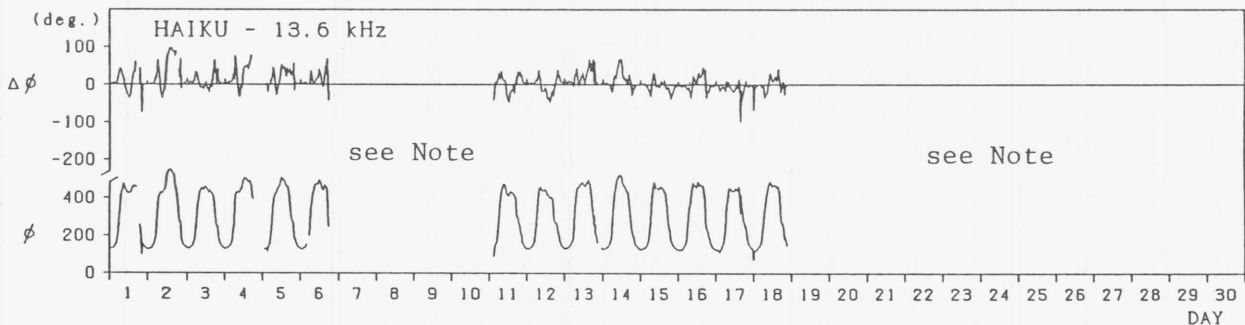
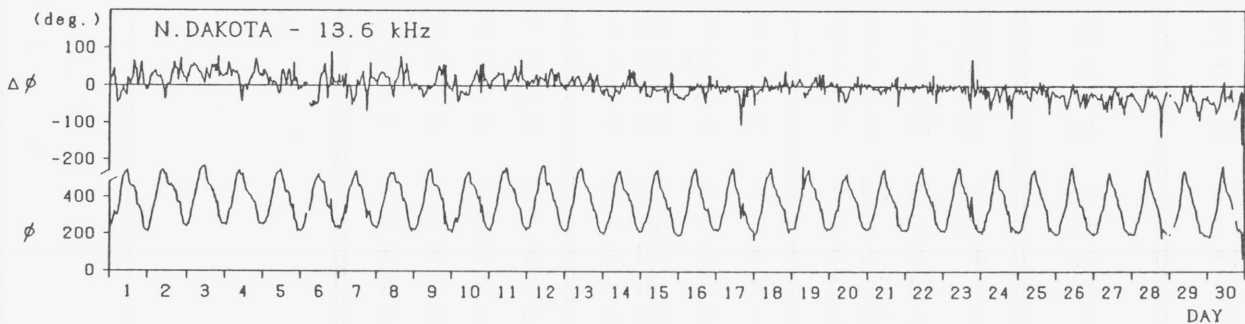
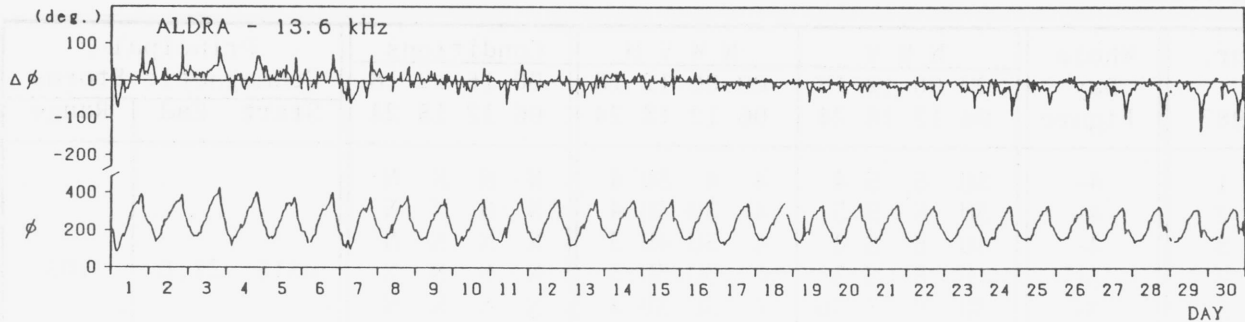
Apr. 1987	Whole Day Figure	W W V				W W V H				Conditions				Principal Geomagnetic Storms		
		00	06	12	18	00	06	12	18	00	16	12	18	Start	End	Range
		06	12	18	24	06	12	18	24	06	12	18	24			
1	4-	3U	S	S	4	4	4	3U	4	N	N	N	N	0315	21.0	103
2	4-	3U	S	S	5	4	3U	3U	4	N	N	N	N			
3	4-	4U	S	S	4	4	3U	4U	3	N	N	N	N			
4	3+	4U	S	S	3	4	3U	3U	3	N	N	N	N			
5	3+	3U	S	S	3U	4	3U	3U	4	N	N	N	N			
6	3o	3U	S	S	3U	4	3U	3U	3	N	N	N	N			
7	3+	3U	S	S	3	4	4	3U	4	N	N	N	N			
8	3+	3U	S	S	4	4	3U	3U	4	N	N	N	N			
9	3+	4U	S	S	3	4	3U	3U	4	N	N	N	N			
10	4o	4U	5U	S	4	4	4	4U	4	N	N	N	N			
11	4o	3U	S	5U	4	4	4	5U	4	N	N	N	N			
12	4o	4U	S	S	4	4	4	4U	4	N	N	N	N			
13	4o	4	S	S	4	4	4	5U	4	N	N	N	N			
14	4o	4	4U	5U	4	4	3	5U	4	N	N	N	N			
15	4-	5	S	5U	4	4	3	5U	4	N	N	N	N			
16	4o	4	S	5U	3U	4	3	4U	4	N	N	N	N			
17	4o	4	4U	S	4	4	3	4U	4	N	N	N	N			
18	4o	4	S	5U	4	4	3U	4U	4	N	N	N	N			
19	4+	4	S	5U	3U	4	5	5U	4	N	N	N	N			
20	4o	4	4U	S	4	4	5	4U	4	N	N	N	N			
21	4-	4	S	S	4	4	3U	4U	4	N	N	N	N			
22	4o	4U	S	S	4	4	4	5U	4	N	N	N	N			
23	4o	4	S	S	4	4	5	4U	4	N	N	N	N			
24	4o	4	S	S	4	4	5	4U	4	N	N	N	N			
25	4o	3	S	S	3U	4	5	5U	4	N	N	N	N			
26	4+	4	5U	S	4	4	4	5U	4	N	N	N	N			
27	4+	4	5U	S	4	4	5	5U	4	N	N	N	N			
28	4-	3U	S	S	2U	4	5	5U	4	N	N	N	N			
29	4+	4	5U	5U	4	4	4	5U	4	N	N	N	N			
30	4+	4	S	S	4	4	5	5U	4	N	N	N	N			

C. Radio Propagation

c. Phase Variations in OMEGA Radio Waves at Inubo

Inubo

April 1987



Note : As for HAIKU - 13.6 kHz, no record during April 06 - 11 and April 18 - 30, due to the maintenance of transmitter.

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.

Apr. 1987	S W F								Correspondence		
	Drop-out Intensities (dB)				Start	Duration	Type	Imp.	Solar Flare	Solar Noise	Geomag. Crochet
	CO	HA	1)	2)							
6	x	x	14		0430	15	SL	1		x	
15			x	10	0733	19	SL	1-	x	x	
17	x	x	23		2336	37	SL	2-	x		
18			10		0448	8	SL	1-			
20	x	x	9		0215	20	S	1-			

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

(ii) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Apr. 1987	S P A							
	Phase Advance (degrees)					Time (U.T.)		
	Date	GBR	Ω /LR	NWC	Ω /H	Ω /ND	Start	End
5	—		8	—		0007	0042	0011
5	—	31	<u>43</u>	23	29	0244	0355	0252
5	—		<u>74</u>	68		1933	2012	1941
6	—	<u>117</u>	—	50	67	0429	0646	0435
6	27		<u>6</u>	—		2301	2315	2306
9			3	—		0146	0203	0149
9		7	<u>9</u>	—		0235	0313	0242
9		<u>38</u>	21	—		0631	0731	0648
10			—	—	11	2139	2153	2145
10			8	—		2359	0015	0008
11			6	—		0118	0133	0120
11		<u>6</u>	6	—		0250	0306	0255
11			4	—		0329	0336	0332
11		<u>8</u>	6	—		0414	0443	0421
11		16	<u>15</u>	—		0512	0537	0514
11			—	4		2314	2345	2328
12			6	—		0317	0339	0323
12			7	—		0347	0423	0353
12			4	—		0445	0506	0449
12		<u>6</u>	8	—		0555	0622	0602
12			10	—		0738	0821	0748
15		20	<u>24</u>	15	16	0234	0321	0236
15	46	<u>83</u>	39	23	22	0733	0909	0739
16			10	—		0145	0214	0148
16		9	<u>10</u>	—		0220	0235	0222
17			—	4		0135	0156	0140
17		30	<u>39*</u>	<u>19*</u>	15	0204	0348	0239
17	24	26	43	<u>48</u>	44	2338	0104	2351
18			5	<u>4</u>		0146	0213	0149
18	29	22	<u>18</u>	13		0440	0534	0456
18		<u>14</u>	8	—		0713	0755	0719
18			—	—	22	2151	2240	2158
20			6	—		0116	0141	0119
20	18	32	<u>43</u>	—	38	0215	0300	0219
20			3	—		0445	0520	0448
20		13	—	—		0847	0909	0854
24	13	<u>40</u>	18	—	21	0735	0842	0740

IONOSPHERIC DATA IN JAPAN FOR APRIL 1987

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