

IONOSPHERIC DATA IN JAPAN

FOR MAY 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

<i>fxI</i>	Top frequency of spread <i>F</i> trace
<i>foF2</i> <i>foF1</i> <i>foE</i> <i>foEs</i>	Ordinary wave critical frequency for the <i>F2</i> , <i>F1</i> , <i>E</i> and <i>Es</i> including particle <i>E</i> layers respectively
<i>fbEs</i>	Blanketing frequency of the <i>Es</i> layer, e.g. the lowest ordinary wave frequency visible through <i>Es</i>
<i>fmin</i>	Lowest frequency which shows vertical ionospheric reflections
<i>M(3000)F2</i> <i>M(3000)F1</i>	Maximum usable frequency factor for a path of 3000 km for transmission by <i>F2</i> and <i>F1</i> layers respectively
<i>h'F2</i> <i>h'F</i> <i>h'E</i> <i>h'Es</i>	Minimum virtual height on the ordinary wave for the <i>F2</i> , whole <i>F</i> , <i>E</i> and <i>Es</i> layers respectively
Types of <i>Es</i>	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 Hiraiso. Observation equipments are: a pair of crossed doublet antennas with a 6-meter and a 10-meter parabolic reflectors for 500 MHz and for 100 and 200 MHz, respectively, and three appropriate receivers. Each pair of crossed doublet antennas is used as a polarimeter. Observations are feasible almost from sunrise to sunset.

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

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

a. Daily Data at Hiraiso

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

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

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

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

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

b. Outstanding Occurrences at Hiraiso

The phenomena are picked up on the following criteria:

1. distinct from the prevailing kind of activity,
2. correlated with other known solar phenomena,
3. remarkable change-over from one situation to another.

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

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

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

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

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

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

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

C. RADIO PROPAGATION

a. H.F. Field Strength at Hiraiso

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

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

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

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

b. Radio Propagation Quality Figures at Hiraiso

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

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

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

Whole day quality figure ranged in grades of 10, 1+, 2-, 20, 2+, 3-, 30, 3+, 4-, 40, 4+, 5-, 50 stands for an average of six-hourly ones of the two circuits. Abbreviated symbols are as follows:

C	artificial accident,
S	propagational accident,
U	inaccurate.

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

N	normal,
U	unstable,
W	disturbed

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

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

c. Phase Variations in OMEGA Radio Waves at Inubo

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

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

(48 dots), deviated from average values at the same time for the six quietest days within the month concerned. A negative value in this case denotes a phase advance.

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

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

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

d. Sudden Ionospheric Disturbances

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

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

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

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

Types of fade-out are as follows:

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

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

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

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

(ii) Sudden Phase Anomaly (SPA) at Inubo

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

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

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

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

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

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

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

IONOSPHERIC DATA

MAY. 1987

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 50	X 50	X 49	X 48	X 48															X 80	X 80	X 71	X 67	X 53						
2	X 50	X 50	X 49	X 49	X 47															X 79	X 82	X 73	X 62	X 52						
3	X 46	X 43	X 43	X 43	X 45															X 73	X 81	X 74	X 61	X 52						
4	X 49	X 47	X 47	X 46	X 43															X 80	X 78	X 70	X 64	X 55						
5	X 50	X 48	X 48	X 47	X 44															X 73	X 77	X 72	X 62	X 54						
6	X 51	X 52	X 52	X 51	53															X 70	X 73	X 73	X 64	X 60						
7	X 55	X 53	X 51	X 50	54															X 79	X 73	X 68	X 66	X 64						
8	X 60	X 59	X 56	X 53	X 57															X 80	X 81	X 71	X 65	X 60						
9	X 58	X 56	X 57	X 53	57															X 82	X 80	X 76	X 67	X 62						
10	X 59	X 57	X 57	X 55	X 55															X 87	X 91	X 82	X 74	X 66						
11	X 62	X 62	X 61	X 56	57															X 71	X 75	X 76	71	65						
12	60	60	58	55	X 47															X 72	X 75	X 75	X 74	X 62						
13	X 53	X 50	X 50	X 48	X 51															X 80	X 80	X 76	X 64	X 58						
14	X 53	X 52	X 53	X 50	X 52															X 89	X 84	X 77	X 70	66						
15	63	60	58	58	53															X 73	X 79	X 74	A	59						
16	56	55	56	52																	X 81	82	72	62						
17	X 54	X 52	X 50	X 48																	X 80	X 82	X 82	X 66						
18	60	63	64	60	56																X 75	X 72	79	79						
19	70	65	63	59	60	61															77	80	X 80	X 67						
20	X 57	X 56	X 55	60	60																X 77	70	A	A						
21	60	60	60	60	60	65															X 80	X 72	X 65	63						
22	60	61	60	60	59																X 91	X 80	X 64	X 60						
23	X 57	X 57	X 54	X 55																	X 82	X 80	X 77	X 65						
24	X 59	X 57	X 56	X 57																	X 89	X 82	X 77	X 72						
25	X 66	X 57	X 56	X 52																	80	86	80	78						
26	71	70	64	60																	X 71	X 70		X 55						
27	X 51	X 51	X 47	X 43																	X 74	X 70	60	57						
28	54	53	54	X 47																	X 77	X 69	X 62	X 54						
29	X 52	X 51	X 50	X 50																	X 73	X 74	X 76	X 69						
30	X 60	X 55	X 51	X 47																	X 77	76	75	X 54						
31	X 47	X 45	X 47	X 46																	A	A	57	A						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	31	31	31	31	20	2														15	30	30	28	29						
MED	X 57	X 55	X 54	X 52	54	63														X 79	X 80	X 74	X 67	X 62						
UQ	X 60	60	58	56	57															X 80	X 81	X 80	X 76	X 66						
LQ	X 52	X 51	X 50	X 48	X 48															X 73	X 75	X 71	X 64	X 55						

MAY. 1987

FXI (0.1 MHz)

IONOSPHERIC DATA

MAY. 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	43	43	42	41	41	44	47	50	53	59	60	62	63	64	65	69	66	63	63	73	73	64	60	46	
2	43	43	42	42	40	48	48	48	51	56	59	65	67	63	65	59	57	59	58	72	75	66	55	45	
3	39	36	36	36	38	45	51	53	59	59	58	54	56	57	58	57	59	55	54	66	74	67	54	45	
4	42	40	40	39	36	37	52	61	62	62	59	54	58	59	62	58	57	55	59	73	71	63	57	48	
5	43	41	41	40	37	44	50	50	53	61	57	59	56	58	60	65	62	57	55	66	70	65	55	47	
6	44	45	45	44	F	47	49	56	56	57	60	55	59	53	62	59	60	60	60	63	66	66	57	53	
7	48	46	44	43	F	47	50	54	59	64	59	66	62	63	66	66	70	67	63	72	66	61	59	57	
8	53	52	49	46	50	63	63	63	64	67	70	63	64	65	62	59	62	62	70	73	74	64	58	53	
9	51	49	50	46	F	54	70	71	63	55	66	63	61	60	65	66	66	65	67	75	73	69	60	55	
10	52	50	50	48	48	54	62	63	63	62	70	67	58	57	64	63	61	61	70	80	84	75	67	59	
11	55	55	54	49	F	49	62	63	56	53	52	55	60	57	58	56	60	57	57	64	68	S 69	E 64	F	
12	F	F	F	F	40	46	51	60	62	59	59	55	53	56	57	60	60	65	64	65	68	68	67	55	
13	46	43	43	41	44	49	53	58	58	56	57	57	60	58	59	58	64	69	66	73	73	69	57	51	
14	46	45	46	43	45	55	62	61	57	A	64	63	58	56	59	58	59	63	A	82	77	70	63	F	
15	F	F	F	F	F	A	A	A	A	A	A	A	53	51	A	51	51	52	55	66	72	67	A	F	
16	F	F	F	F	40	46	42	49	46	51	53	A	60	54	57	55	55	54	53	A	A	74	F	E 63	F
17	47	45	43	41	42	53	58	57	55	55	53	54	54	55	55	54	53	53	57	68	73	75	75	59	
18	F	51	F	F	F	51	57	59	59	60	63	56	56	A	A	A	A	57	52	70	68	65	F	F	
19	60	F	52	48	F	50	54	A	67	67	66	60	61	61	61	63	60	57	57	63	F	70	73	60	
20	50	49	48	45	F	60	60	A	63	69	A	A	61	A	A	A	60	A	A	A	70	F	A	A	
21	F	F	F	F	F	F	50	60	66	A	A	A	55	56	A	61	64	68	74	A	73	65	58	F	
22	F	F	F	F	F	53	60	75	68	57	60	A	63	A	55	54	61	53	64	79	84	73	57	53	
23	50	50	47	48	51	51	54	51	60	54	53	52	A	59	59	61	54	59	63	70	75	73	70	58	
24	52	50	49	50	47	53	70	68	62	51	53	58	60	63	60	69	75	67	80	79	82	75	70	65	
25	59	50	49	45	H 42	42	51	A	A	A	57	52	A	55	57	61	64	62	73	64	F	F	F	F	
26	F	F	F	F	40	43	45	A	A	A	A	A	A	50	R	49	51	53	60	68	64	63	54	48	
27	44	44	40	36	36	A	A	A	A	A	A	A	R	R	48	53	56	56	57	65	67	63	F	F 47	
28	F	F	F	40	42	52	57	51	50	54	54	54	56	56	53	A	60	59	66	71	70	62	55	47	
29	45	44	43	43	45	46	53	51	A	A	53	54	52	53	55	60	63	64	68	68	66	67	69	62	
30	53	48	44	40	42	45	A	54	49	52	55	49	A	A	A	A	A	A	A	69	70	F	F	47	
31	40	38	40	39	34	34	42	A	A	49	A	A	w	A	A	A	A	A	A	A	A	A	F 43	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	24	23	24	26	21	29	28	24	25	24	24	24	25	25	24	26	28	28	26	27	28	26	25	22	
MED	48	45	44	43	42	49	53	58	59	57	59	56	58	57	59	59	60	59	63	70	72	67	59	53	
UQ	52	50	49	46	45	53	60	62	63	62	62	62	61	60	62	63	64	64	67	73	74	70	67	58	
LQ	44	43	42	40	40	45	50	51	55	54	54	54	56	56	57	56	57	56	57	66	68	64	57	47	

MAY. 1987

FOF2 (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 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								L	A	A	440	430	450	450	430	430	400	L										
2								L	A	A	430	450	450	440	420	410	400	L										
3								L	400	420	430	440	A	A	450	440	430	H	400	L								
4								L	370	400	420	430	440	450	460	440	440	430	A	L								
5								L	A	430	430	450	460	460	450	A	420	A	A									
6									400	430	430	440	460	450	450	440	A	A	L	L								
7								L	A	A	440	A	H	450	A	450	430	H	410	L	L							
8								A	440	A	460	A	460	A	450	420	A	400	L	L								
9									390	400	A	470	460	460	470	450	440	430	410	390	L							
10								L	400	430	450	450	450	470	460	450	430	A	390	L								
11								L	330	370	400	430	A	440	450	450	H	440	A	A	A							
12								A	A	A	A	A	440	460	460	460	450	430	420	A	A							
13									400	420	460	440	470	450	460	450	430	410	390	L								
14									390	A	A	A	450	460	460	460	450	440	430	A	A							
15								A	A	A	A	A	A	A	450	A	420	420	390	L	L							
16								A	420	A	440	A	440	460	450	440	430	430	A	A								
17								L	330	A	A	A	450	A	450	440	450	430	420	390	L							
18								A	A	400	A	A	450	A	A	A	A	A	A	L								
19								A	A	A	A	450	460	A	460	450	430	A	L	L								
20								L	A	A	A	A	A	A	A	A	A	A	A	A	A							
21								A	A	A	A	A	A	470	A	A	A	410	390	A								
22								A	A	A	A	A	A	A	A	440	430	H	A									
23									390	450	410	430	440	A	A	440	440	420	400	380	L							
24								L	370	380	400	A	A	A	450	450	450	430	430	A	A	L						
25								L	330	360	A	A	A	A	A	440	440	410	400	A	L							
26								A	A	A	A	A	A	A	430	430	420	400	370	A								
27								A	A	A	A	A	A	410	R	410	A	A	A	A								
28								L	320	380	400	A	A	460	450	A	450	A	A	400	A	A						
29									370	400	A	A	430	450	450	440	430	410	400	370	330							
30									A	A	A	430	440	450	A	A	A	A	A	A	A							
31									310	340	A	A	A	A	A	420	A	A	A	A	A							
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT						5	12	13	9	11	20	18	20	22	23	23	18	13	1									
MED						330	380	400	430	430	440	450	450	450	440	430	405	390	330									
UQ						L	330	385	400	430	445	450	460	460	450	450	430	420	390									
LQ						L	320	370	400	420	430	440	450	450	440	435	420	400	380									

MAY. 1987

FOF1 (0.01 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 1987

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					S	220	285	300	315	315	315		B	A	A	A	275	A	S					
2						195	230	270	300	310	315	320	A	A	310	290	275	230	A					
3						175	225	280	300	310	330	315	A	A	A	290	280	230	S					
4						170	225	270	290	305	310	305	320	315	310	300	280	A	S					
5						170	220	270	300	305	310	A	A	A	A	300	A	230	S					
6						175	240	230	300	310	315	310	325	320	315	A	285	225	S					
7						190	260	235	300	315	320	330	325	315	315	300	285	240	190					
8						180	240	290	305	315	325	325	315	A	A	305	275	230	S					
9						185	240	285	300	315	320	325	A	A	320	300	275	235	175					
10					S	230	275	300	300	305	315	330	325	320	305	275	235	135						
11						195	240	280	300	310	310	310	B	320	315	305	285	240	195					
12					S	245	285	300	320	330	340	335	A	315	300	285	240	135						
13						200	250	290	305	315	320	325	A	320	315	305	285	245	190					
14						205	240	285	305	315	320	325	325	325	315	300	290	240	A					
15						190	245	285	305	325	B	B	335	325	315	A	A	A	A					
16					S	A	250	285	305	315	A	340	340	340	325	305	290	250	200	S				
17					S	205	255	290	305	315	330	B	A	335	330	305	295	245	A	S				
18					E	S	240	290	305	320	325	325	A	A	A	A	A	A	A	S				
19					E	200	255	290	300	315	320	315	A	A	320	A	A	A	A	S				
20					S	205	245	290	310	325	330	B	330	A	A	A	A	A	A	S				
21					S	A	255	290	305	320	A	320	B	320	315	300	290	250	190	E				
22					S	A	255	290	305	320	325	325	A	A	A	A	A	A	195	S				
23					S	200	255	290	305	320	325	325	A	A	A	A	A	245	205	S				
24					S	195	250	295	300	310	B	340	325	315	A	300	285	240	210	S				
25					S	200	260	295	300	315	320	325	325	315	A	A	290	240	200	S				
26					S	200	245	285	300	310	325	B	A	335	320	305	290	245	200	S				
27					S	210	250	275	300	B	325	B	330	335	315	305	290	240	200	S				
28					E	205	245	275	300	B	B	B	B	B	315	300	285	240	195	S				
29					S	200	255	275	295	310	315	325	330	B	315	300	285	240	200	S				
30					S	185	230	270	295	3	325	335	335	330	320	305	A	240	A	S				
31					S	205	240	270	295	305	310	305	B	B	310	300	275	230	185	S				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					3	24	31	31	31	28	26	24	15	16	21	22	23	24	17	1				
MED					E	198	245	285	300	315	320	325	330	322	315	300	285	240	195	E				
UQ					E	202	252	290	305	313	325	325	332	332	320	305	290	242	200					
LQ					E	185	240	275	300	310	315	315	325	318	315	300	278	232	190					

MAY. 1987

FOE (0.01 MHz)

IONOSPHERIC DATA

MAY. 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 16	E 17	E 17	E 16	E 16	E 16	30	37	J A 50	55	41	37	35	35	37	35	34	32	39	E 17	24	E 17	E 17	E 17	
2		E 16	E 15	E 15	E 16	E		22	31	40	43	43	41	37	33	32	25	G	G	20	24	26	27	28	E 16	23
3		E 16	E 17	E 16	E 11	E 15	G	27	G	G	37	G	54	J A 50	40	32	G	G	31	32	36	27	26	23	E 15	
4		E 15	E 16	E 16	E 12	E		21	29	33	33	34	36	33	G	G	G	G	40	40	43	20	E 15	E 16	E 15	E 15
5		E 15	E 15	E 16	E 15	E 15		21	32	43	37	36	G	35	36	33	45	38	52	38	41	31	E 17	E 16	E 17	E 17
6		21	E	E 16	E 17	23	G	33	36	42	37	42	35	G	G	37	48	53	34	22	24	E 16	23	E 16	E 16	
7		22	E 15	23	E	E		23	G	43	43	45	50	39	39	53	G	36	G	37	42	23	J A 51	22	E 17	E 15
8		30	28	26	26	E 16	27	33	J A 50	40	J A 51	41	J A 54	41	J A 57	41	G	54	35	29	20	E 16	20	22	E 17	
9		E 17	E 15	E 17	E	E 15	G	32	36	44	42	42	G	35	40	G	34	33	34	28	E 15	E 17	E 11	E 16	E 17	
10		23	23	E 16	E	E 17	E 18	30	35	38	42	35	G	G	G	G	38	54	37	29	27	22	22	27	E 17	
11		E 16	E 17	E 16	E	E 15	23	33	35	43	45	37	G	39	G	G	40	43	52	35	25	33	J A 61	J A 83	J A 53	
12		J A 50	30	37	37	27	J A 44	50	43	J A 53	44	J A 60	43	42	J A 91	G	G	41	J A 53	J A 50	43	E 15	E 17	E 16	E 16	
13		E 17	E 16	E 15	27	E 15	G	33	40	44	J A 53	43	40	40	G	G	G	34	31	24	J A 53	43	28	27	E 16	
14		E 15	E 16	E 15	E 16	E 16	G	34	J A 50	J A 63	63	J A 50	37	38	36	36	G	40	J A 51	J A 145	J A 85	39	40	E 16	40	
15		J A 43	31	E 15	E 16	32	50	J A 83	J A 86	J A 78	J A 86	61	69	53	40	60	44	31	26	30	48	38	J A 41	J A 121	J A 41	
16		35	38	40	35	28	35	43	42	54	J A 85	J A 100	G	G	G	40	G	38	J A 45	61	J A 85	J A 83	J A 50	E 15	E 17	
17		30	E 16	E 15	E	E 15	G	34	45	58	43	43	53	36	G	G	G	G	J A 50	30	E 15	E 15	E 15	E 15	E 16	
18		E 16	J A 52	25	40	33	54	63	38	45	J A 60	42	J A 54	63	J A 70	J A 73	J A 70	J A 72	J A 63	40	J A 57	J A 78	48	J A 53	40	
19		35	41	40	40	29	30	45	J A 75	J A 80	J A 100	40	35	J A 53	43	G	53	J A 63	35	25	J A 60	40	J A 58	25	30	
20		40	34	30	39	35	28	J A 43	74	J A 60	J A 65	J A 86	72	J A 61	J A 87	J A 83	J A 117	J A 50	J A 89	J A 131	J A 126	J A 70	J A 65	J A 126	J A 127	
21		J A 94	J A 43	J A 61	J A 71	J A 73	41	59	J A 53	J A 70	J A 126	J A 93	J A 77	J A 50	J A 50	J A 90	J A 100	36	29	43	83	J A 53	J A 50	J A 63	J A 58	
22		J A 53	J A 63	J A 53	J A 41	40	40	J A 42	J A 110	J A 50	54	J A 68	J A 87	63	66	45	40	41	42	J A 65	J A 54	43	35	26	E 17	
23		27	27	E 16	26	E 16	G	G	40	40	37	44	55	J A 80	J A 50	35	43	35	31	G	42	42	J A 50	J A 57	27	
24		E	E	E 17	E 16	E 16	G	36	39	J A 60	J A 50	52	G	40	35	32	G	53	42	G	20	30	E 16	E	E	
25		E 15	E 16	E 15	E	E 15	28	33	52	56	J A 104	J A 56	70	63	40	36	33	33	39	39	35	28	E 16	29	32	
26		29	E 15	E 15	E 16	E 16	26	J A 50	J A 61	J A 61	J A 72	J A 90	65	58	G	G	G	G	35	35	34	52	J A 45	J A 63	52	
27		51	J A 51	36	35	27	50	J A 73	67	64	60	57	J A 70	G	42	40	41	44	44	43	53	46	51	E 17	24	
28		E	E	23	E 15	20	26	32	38	40	J A 53	43	40	45	42	54	66	43	64	J A 45	29	27	30	27	39	
29		28	27	27	27	E 16	35	33	40	J A 66	J A 65	36	40	G	E 35	G	G	G	30	G	E 16	E 15	E 16	E 15	E 16	
30		27	42	J A 80	34	24	J A 40	J A 53	J A 50	54	J A 53	40	G	J A 76	J A 80	J A 70	J A 77	J A 64	J A 126	J A 96	J A 50	50	51	33	31	
31		33	E	E 16	E	19	25	40	J A 53	J A 69	J A 60	53	54	40	J A 63	J A 95	J A 85	J A 97	J A 167	J A 112	J A 130	70	J A 98	58	52	
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED		23	17	E 17	E 16	E 16	25	33	43	50	53	43	40	40	40	36	36	40	38	39	35	33	28	23	17	
UQ		34	32	28	34	27	35	46	J A 52	J A 60	J A 64	56	54	53	52	45	46	52	50	44	J A 54	48	J A 50	43	40	
LQ		E 16	E 15	E 16	E 12	E 15	E 16	32	38	42	43	40	35	35	30	G	G	33	33	28	24	20	E 17	E 16	E 16	

MAY. 1987

FOES (0.1 MHz)

IONOSPHERIC DATA

MAY. 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	00	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 17	E 17	E 16	E 16	E 16	E 16	G	33	45	50	40	37	G	35	35	32	G	25	30	E 17	E 17	E 17	E 17	E 17
2	E 16	E 15	E 15	E 16	E	G	30	40	42	43	40	G	33	32	25	G	G	19	G	21	20	19	E 16	E 17
3	E 16	E 17	E 16	E 11	E 15	G	G	6	G	G	G	47	47	39	32	G	G	30	31	29	E 16	20	E 16	E 15
4	E 15	E 16	E 16	E 12	E	G	G	G	G	G	G	G	G	G	G	G	40	33	36	E 17	E 15	E 16	E 15	E 15
5	E 15	E 15	E 16	E 15	E 15	G	31	40	G	G	G	35	36	33	45	38	45	37	33	23	E 17	E 16	E 17	E 17
6	E 17	E 16	E 17	E 17	E 16	G	30	35	40	G	41	G	G	G	G	44	47	30	21	23	E 15	E 16	E 16	E 16
7	15	E 15	E 17	E	E	G	G	40	43	40	47	G	G	46	G	36	G	31	26	20	47	12	E 17	E 15
8	17	E 17	E 17	E 12	E 16	G	G	48	40	48	40	48	40	50	40	G	48	34	29	19	E 16	16	17	E 17
9	E 17	E 15	E 17	E	E 15	G	G	G	43	40	40	G	35	40	G	G	G	G	25	E 15	E 17	E 11	E 16	E 17
10	E 16	E 16	E 16	E	E 17	E 18	G	G	38	G	G	G	G	G	G	G	48	33	28	24	15	15	19	E 17
11	E 16	E 17	E 16	E	E 15	G	31	35	G	45	G	G	38	G	G	39	41	46	33	24	20	31	29	40
12	18	E 16	20	21	18	40	40	42	50	44	40	G	38	36	G	G	40	53	48	24	E 15	E 17	E 16	E 16
13	E 17	E 16	E 16	E 17	E 15	G	31	38	40	G	39	G	37	G	G	G	G	G	G	50	32	26	20	E 16
14	E 15	E 16	E 15	E 16	E 16	G	G	45	53	A 63	41	G	G	G	G	G	40	50	A 145	76	37	27	E 16	18
15	37	E 17	E 15	E 16	E 15	A 50	A 83	A 86	A 78	A 86	A 61	A 69	47	40	A 60	39	30	25	30	40	28	35	A 121	18
16	E 17	23	20	20	E 15	34	40	40	48	G	A 100	G	G	G	G	G	37	44	A 61	A 85	28	30	E 15	E 17
17	E 17	E 16	E 15	E	E 15	G	G	41	50	43	42	47	35	G	G	G	G	35	29	E 15	E	E 15	E 15	E 16
18	E 16	17	17	24	16	49	55	G	44	43	42	53	50	A 70	A 73	A 70	A 72	46	30	52	54	32	41	26
19	24	32	24	23	20	25	43	A 75	60	50	G	G	45	38	G	33	52	26	G	59	23	20	15	20
20	17	17	E 15	E 15	20	28	47	A 74	60	61	A 86	A 72	54	A 87	A 83	A 117	46	A 99	A 131	A 126	60	47	A 126	A 127
21	30	20	40	45	21	30	48	51	45	A 126	A 93	A 77	40	46	A 90	57	36	G	40	A 93	50	47	40	47
22	40	41	20	23	25	32	40	70	45	50	53	A 87	56	A 66	42	38	31	41	60	48	40	26	17	E 17
23	E 15	17	E 16	17	E 16	G	G	40	39	G	G	46	A 80	39	35	38	G	G	G	37	31	50	47	23
24	E	E	E 17	E 16	E 16	G	34	38	46	47	45	G	G	G	32	G	47	38	G	E 16	20	E 16	E	E
25	E 15	E 16	E 15	E	E 15	26	32	A 52	A 56	A 104	45	49	A 63	40	33	31	G	38	30	20	17	E 16	17	E 17
26	17	E 15	E 15	E 16	E 16	G	39	A 61	A 61	A 72	A 90	A 65	A 58	G	G	G	G	32	33	25	45	30	50	40
27	33	19	24	27	20	A 50	A 73	A 67	A 64	A 60	A 57	A 70	G	41	37	41	41	39	41	45	21	25	E 17	E 16
28	E	E	E 16	E 15	18	G	G	35	38	47	G	G	43	41	48	A 66	38	54	37	27	20	25	19	25
29	16	17	16	E 16	E 16	35	30	38	A 66	A 65	G	38	G	E 35	G	G	G	G	G	E 16	E 15	E 16	E 15	E 16
30	17	22	30	31	20	40	A 53	40	47	33	38	G	A 76	A 80	A 70	A 77	A 64	A 126	A 96	45	47	25	19	E 16
31	18	E	E 16	E	E 15	G	32	A 53	A 69	41	A 53	A 54	G	A 63	A 95	A 85	A 97	A 167	A 112	A 130	A 70	A 98	24	A 52
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	17	E 16	E 16	E 16	E 16	G	31	40	45	45	40	35	37	38	32	32	38	34	30	25	20	20	17	E 17
UQ	17	17	17	18	18	31	40	52	54	55	50	51	47	44	44	40	46	45	40	49	38	30	22	22
LQ	E 15	E 15	E 16	E 12	E 15	G	G	35	40	E 33	G	G	G	G	G	G	G	26	26	20	E 16	E 16	E 16	E 16

MAY. 1987

FBES (0.1 MHz)

IONOSPHERIC DATA

MAY. 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 17	E 17	E 17	E 16	E 16	E 16	11	18	17	20	25	23	31	19	20	18	18	17	E 17	E 17	E 17	E 17	E 17	E 17																					
2	E 16	E 15	E 15	E 16	E 17	E 17	17	18	18	19	19	21	21	23	21	20	20	12	10	E 17	E 17	E 17	E 16	E 17																					
3	E 16	E 17	E 16	E 11	E 15	E 10	17	18	19	20	20	24	24	31	20	20	21	18	E 18	E 17	E 16	E 16	E 16	E 15																					
4	E 15	E 16	E 16	E 12	E 15	E 15	14	16	20	21	25	26	29	22	21	20	17	E 17	E 17	E 15	E 16	E 15	E 15	E 15																					
5	E 15	E 15	E 16	E 15	E 15	E 15	17	18	19	20	20	20	23	23	19	19	17	17	E 17	E 17	E 17	E 16	E 17	E 17																					
6	E 17	E 16	E 17	E 16	E 14	E 17	17	18	18	20	20	21	20	27	23	20	20	17	E 17	E 16	E 16	E 16	E 16	E 16																					
7	E 15	E 17	E 17	E 17	E 12	E 17	17	18	20	20	27	26	23	20	25	23	18	17	E 17	E 15	E 17	E 17	E 15	E 15																					
8	E 17	E 17	E 17	E 12	E 16	E 17	18	19	20	20	25	25	26	27	21	19	19	18	E 18	E 15	E 16	E 16	E 17	E 17																					
9	E 17	E 15	E 17	E 17	E 15	E 15	18	18	20	20	24	25	23	21	22	20	19	18	E 17	E 15	E 17	E 11	E 16	E 17																					
10	E 16	E 16	E 16	E 17	E 18	E 18	17	20	20	23	21	22	22	30	19	18	19	17	E 17	E 16	E 16	E 17	E 17	E 17																					
11	E 16	E 17	E 16	E 15	E 17	E 17	17	18	20	20	20	24	34	22	20	20	19	18	E 17	E 15	E 15	E 15	E 15	E 15																					
12	E 17	E 16	E 16	E 17	E 17	E 18	19	18	20	20	20	26	29	20	20	20	20	18	E 17	E 17	E 15	E 17	E 16	E 16																					
13	E 17	E 16	E 16	E 17	E 15	E 17	17	20	20	19	30	20	31	27	20	20	18	17	E 17	E 12	E 12	E 17	E 16	E 16																					
14	E 13	E 16	E 16	E 16	E 16	E 18	18	19	25	23	26	27	29	25	23	25	18	20	E 18	E 17	E 17	E 16	E 16	E 16																					
15	E 15	E 17	E 15	E 16	E 15	E 16	18	19	23	23	33	36	27	21	21	25	18	17	E 17	E 16	E 16	E 16	E 16	E 16																					
16	E 17	E 16	E 17	E 15	E 17	E 17	17	18	20	19	23	30	26	23	20	23	19	19	E 17	E 12	E 17	E 16	E 15	E 17																					
17	E 17	E 16	E 15	E 15	E 17	E 17	18	19	19	27	27	33	23	20	20	19	18	19	E 15	E 15	E 15	E 15	E 15	E 16																					
18	E 16	E 16	E 16	E 16	E 18	E 18	18	19	23	20	26	23	23	21	20	20	18	18	E 11	E 16	E 17	E 16	E 16	E 17																					
19	E 16	E 17	E 17	E 17	E 17	E 18	17	18	19	20	20	25	30	25	23	20	19	16	14	E 13	E 15	E 15	E 15	E 15																					
20	E 15	E 15	E 15	E 15	E 15	E 17	17	20	20	24	30	33	26	25	26	19	19	17	E 17	E 17	E 17	E 17	E 16	E 17																					
21	E 17	E 17	E 17	E 17	E 15	E 12	17	22	20	19	31	30	35	26	24	19	18	17	E 17	E 16	E 16	E 16	E 16	E 16																					
22	E 15	E 17	E 17	E 17	E 17	E 17	17	17	20	29	25	26	27	24	30	30	19	18	12	E 15	E 17	E 17	E 17	E 17																					
23	E 15	E 16	E 16	E 16	E 16	E 17	17	17	20	20	26	22	31	24	23	17	17	18	17	E 17	E 16	E 15	E 15	E 15																					
24	E 16	E 17	E 16	E 16	E 16	E 17	17	18	20	25	33	27	25	20	20	18	21	18	16	E 16	E 16	E 16	E 16	E 16																					
25	E 15	E 16	E 15	E 15	E 15	E 17	17	19	20	22	25	27	22	30	23	21	20	17	E 18	E 13	E 16	E 16	E 16	E 17																					
26	E 15	E 15	E 16	E 16	E 16	E 15	17	19	20	22	27	33	23	27	22	22	19	17	E 18	E 17	E 17	E 16	E 16	E 17																					
27	E 17	E 11	E 16	E 16	E 17	E 17	17	20	24	33	27	34	25	26	23	20	20	19	E 17	E 15	E 15	E 16	E 17	E 16																					
28	E 16	E 16	E 15	E 15	E 17	E 17	17	17	25	31	32	33	34	34	24	23	19	19	12	E 16	E 17	E 15	E 15	E 15																					
29	E 16	E 16	E 16	E 16	E 16	E 17	17	17	20	22	25	30	30	35	20	20	19	18	16	E 16	E 15	E 16	E 15	E 16																					
30	E 17	E 17	E 16	E 16	E 15	E 17	18	19	20	32	24	32	24	25	25	24	18	17	16	E 16	E 15	E 16	E 16	E 16																					
31	E 16	E 16	E 16	E 15	E 15	E 17	18	19	20	24	25	25	31	32	23	19	19	17	17	E 16	E 16	E 15	E 15	E 17																					
CNT	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31																					
MED	E 15	E 16	E 16	E 15	E 15	E 17	17	18	20	20	25	26	26	25	21	20	19	17	E 17	E 16	E 15	E 16	E 15	E 16																					
UQ	E 17	E 17	E 16	E 16	E 16	E 17	18	19	20	24	27	30	30	27	23	22	19	18	E 17	E 17	E 17	E 16	E 16	E 17																					
LQ	E 11	E 15	E 15	E 15	E 15	E 16	17	18	20	20	22	24	23	22	20	19	18	17	E 16	E 15	E 11	E 11	E 15	E 15																					

MAY. 1987

FMIN (0.1 MHz)

IONOSPHERIC DATA

MAY. 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	300	295	285	290	315	340	325	375	340	335	335	320	310	310	305	320	325	315	310	300	315	310	325	305	
2	295	295	280	295	300	335	345	350	325	330	325	325	325	310	325	330	320	320	300	300	320	320	325	310	
3	295	300	300	305	300	335	325	320	340	355	345	310 ^H	330	315	325	335	320	335	315	295	320	320	335	310	
4	290	300	295	295	290	305	315	325	340	340	340	335	325	320	320	320	330	325	310	300	315	315	315	290	
5	315	280	285	300	295	325	350	320	325	320	330	325	320	320	320	330	320	345	310	300	305	305	320	295	
6	295	285	290	295	F	340	325	340	320	335	315	300	320	310	315	320	325	315	320	305	300	305	315	300	
7	290	285	295	300	F	340	340	335	325	330	305	320	310	300	305	300	305	320	310	300	305	310	305	315	
8	295	305	285	305	300	335	335	335	310	320	325	315	310	305	315	320	315	310	310	300	315	305	315	310	
9	300	285	300	305	F	315	320	310 ^H	340	325	320	315	315	300	305	320	320	320	305	305	300	310	315	305	
10	300	290	290	290	305	335	320	320	335	320	320	345	325	305	305	315	315	310	295	300	315	315	300	305	
11	285	285	295	295	F	290	310	320	305	320	290	300	320	320	305	320	325	335	320	305	295	295 ^S	305 ^F	F	
12	F	F	F	F	300	320	300	325	340	310	325	315	305	305	315	315	310	305	310	300	295	295	315	325	
13	305	295	290	305	305	330	340	345	345	305	320	285	320	305	310	305	300	310	305	300	305	320	315	315	
14	295	310	305	290	310	325	340	325	320	A	310	305	325	310	315	310	230	300	A	310	310	300	315	F	
15	F	F	F	F	F	A	A	A	A	A	A	A	320	295	A	305	295	305	300	290	305	300	A	F	
16	F	F	F	F	300	325	310	345	275	295	325	A	330	305	315	315	330	315	320	A	A	295	F	F	
17	275	290	290	290	295	320	330	345	325	345	300	315	315	310	325	335	305	315	310	290	290	295	320	320	
18	F	295	F	F	F	A	A	330	320	315	300	300	300	A	A	A	A	315	315	305	310	295	F	F	
19	F	F	F	F	F	340	315	A	315	320	325	300	325	295	310	315	325	315	305	315	F	310	315	335	
20	330	285	290	290	F	335	295	A	315	310	A	A	295	A	A	A	330	A	A	A	330	F	A	A	
21	F	F	F	F	F	325	A	325	320	A	A	A	300	305	A	315	310	305	300	A	315	305	325	F	
22	F	F	F	F	F	340	315	330	325	340	310	A	310	A	325	295	315	310	295	295	320	330	315	300	
23	300	295	285	290	335	340	325	285	315	335	320	290	A	315	320	320	295	315	295	300	305	300	315	320	
24	310	285	290	300	295	300	330	340	350	315	325	305	300	305	295	300	305	300	300	295	300	300	290	300	
25	315	285	290	290	H	260	315	A	A	A	290	295	A	300	280	295	295	280	300	280	F	F	F	F	
26	F	F	F	F	305	280	275	A	A	A	A	A	A	300	R	235	315	310	310	315	300	300	A	290	
27	270	280	285	285	285	A	A	A	A	A	A	A	R	R	295	285	295	290	285	290	290	300	F	F	
28	F	F	F	F	275	285	295	325	330	350	305	335	295	300	320	310	330	A	300	315	305	310	315	310	295
29	305	305	285	300	335	325	340	350	A	A	300	295	275	265	270	300	300	300	295	290	285	285	290	290	
30	320	280	285	300	290	265	A	315	A	305	325	310	A	A	A	A	A	A	A	300	300	F	F	295	
31	285	290	285	305	300	255	285	A	A	285	A	A	W	A	A	A	A	A	A	A	A	A	280 ^F	A	
CNT	24	23	24	26	21	28	26	24	24	24	24	24	26	25	24	26	28	28	26	27	28	26	24	22	
MED	298	290	290	295	300	325	325	328	325	322	320	310	315	305	315	315	315	315	305	300	305	305	315	305	
UQ	305	295	295	300	305	335	340	342	340	335	325	320	320	310	320	320	320	320	310	305	315	310	318	315	
LQ	290	285	285	290	295	308	315	320	315	315	302	300	305	300	305	300	300	305	300	295	300	300	308	295	

MAY. 1987

M(3000)F2 (0.01)

IONOSPHERIC DATA

MAY. 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								L	A	A	A	395	385	375	370	335	355	L										
2								L	A	A	A	A	360	385	380	380	360	350	L									
3								L	355	345	390	H	A	A	375	365	355	H	350	L								
4								345	350	380	385	390	375	385	385	365	350	A	A									
5								L	A	370	395	375	390	380	355	A	A	A	A									
6								A	A	A	395	A	390	375	375	365	A	A	L	L								
7								A	A	A	A	A	H	400	A	370	A	H	L	L								
8								A	A	A	370	A	370	A	A	355	A	A	L									
9								355	375	A	360	370	370	365	375	370	350	350	360	L								
10								L	375	385	375	395	395	370	370	355	355	A	A	L								
11								L	370	A	370	A	395	375	380	375	H	A	A	A								
12								A	A	A	A	385	375	360	370	350	360	A	A	A								
13								A	A	380	385	380	380	380	370	365	370	355	360	L								
14								360	A	A	A	360	390	380	380	355	365	A	A	A								
15								A	A	A	A	A	A	A	A	A	A	345	335	L								
16								A	A	A	385	A	395	390	375	365	350	A	A	A								
17								L	380	A	A	A	A	375	385	365	355	340	A	L								
18								A	A	375	A	A	A	A	A	A	A	A	A	A								
19								A	A	A	A	390	390	A	390	375	360	A	L	L								
20								L	A	A	A	A	A	A	A	A	A	A	A	A								
21								A	A	A	A	A	A	370	A	A	A	A	350	A								
22								A	A	A	A	A	A	A	A	A	370	H	A									
23								345	A	A	405	405	A	A	375	350	380	360	340	L								
24								335	A	A	A	A	375	390	375	370	365	A	A	L								
25								L	A	A	A	A	A	A	A	365	355	335	A	L								
26								A	A	A	A	A	A	A	370	370	350	350	A	A								
27								A	A	A	A	A	A	365	A	365	A	A	A	A								
28								L	335	370	A	370	365	A	A	A	A	A	A	A								
29								370	A	A	A	385	360	375	370	350	355	350	330	340								
30								A	A	A	375	A	365	A	A	A	A	A	A	A								
31								340	A	A	A	A	A	390	A	A	A	A	A	A								
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT						5	9	6	5	10	14	18	20	19	21	19	13	8	1									
MED						340	355	372	370	385	385	378	380	375	365	355	350	345	340									
UQ						350	370	375	380	395	390	390	385	378	370	362	355	360										
LQ						335	345	355	370	375	370	370	370	370	370	365	352	350	338									

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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	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							240	305	305	295	300	315	305	300	295	285	270								
2						260	270	335	300	305	300	295	300	300	280	300	275								
3						300	315	270	255	285	A	320	350	315	300	300	270								
4						320	270	270	265	300	320	325	320	295	305	300	290								
5						260	305	310	305	325	315	345	315	305	275	270	255								
6						280	325	300	325	400	325	350	310	300	295	280	260								
7						300	300	275	365	300	325	350	320	325	290	275	265								
8						260	295	290	290	310	315	300	315	300	300	280	255								
9						275	250	265	315	300	305	325	355	300	300	300	270	260							
10						275	255	285	295	285	275	335	355	315	300	300	300	295							
11					315	305	270	350	350	405	370	340	330	355	340	300	290	270							
12					320	285	275	335	305	350	395	370	345	330	320	300	A								
13					255	265	345	320	400	320	365	350	355	315	280	265									
14					255	275	A	A	305	340	310	365	335	340	350	A	A								
15					A	A	A	A	A	A	A	360	395	A	365	380	350	300							
16					260	415	400	310	A	305	370	350	350	310	335	325	A								
17					290	255	265	320	300	390	350	355	365	325	320	345	330	300							
18					A	A	280	310	305	330	A	400	A	A	A	A	325	275							
19					305	A	A	A	280	280	350	300	350	315	300	A	300	275							
20					255	A	A	A	A	A	A	A	A	A	A	A	295	A	A						
21					A	300	285	A	A	A	A	380	360	A	A	300	290	275							
22					305	A	260	A	350	A	A	A	A	345	330	310	290								
23					295	420	300	305	335	400	A	340	300	300	315	310	270								
24					335	260	255	255	345	320	360	370	325	350	325	300	285	260							
25					420	320	A	A	A	385	A	A	370	400	355	330	350	260							
26					415	A	A	A	A	A	A	A	390	R	410	355	330	300							
27					A	A	A	A	A	A	A	R	R	500	395	370	360	330							
28					280	300	265		320	375	365	340	355	305	A	325	A	280							
29					270	295	A	A	385	415	435	445	410	350	325	300	295								
30					A	315	A	370	325	360	A	A	A	A	A	A	A								
31					525	415	A	A	410	A	A	W	A	A	A	A	A								
Hour Day	00	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	20	23	20	22	24	21	24	25	24	25	27	26	19							
MED					315	298	275	298	305	322	350	338	350	318	320	300	290	275							
UQ					378	312	300	315	335	358	365	370	365	350	350	328	325	295							
LQ					285	260	262	270	295	300	305	320	330	305	300	300	280	262							

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H^oF₂ (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 1987

H^oF (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	265	275	275	270	245	235	245	230	A	A	A	200	200	210	230	220	245	235	A	250	240	235	220	235	
2	265	265	300	265	275	245	235	A	A	A	A	215	200	200	200	200	205	250	250	255	230	220	230	250	
3	250	285	290	265	280	220	220	225	220	230	200	A	A	220	210	200	250	250	A	235	235	230	205	240	
4	250	265	260	255	265	250	250	235	215	210	200	230	200	200	200	230	A	A	A	250	225	230	230	235	
5	250	275	270	250	265	245	240	A	230	205	205	200	205	235	A	A	A	A	A	250	245	230	225	250	
6	275	230	270	250	260	235	250	A	A	215	A	205	205	200	245	A	A	250	240	250	250	240	230	250	
7	260	290	275	255	255	220	230	A	A	A	A	200	205	A	200	A	225	A	250	250	A	225	255	240	
8	260	255	250	250	265	245	230	A	A	A	225	A	240	A	A	230	A	A	255	240	230	225	245	240	
9	255	275	265	255	265	245	240	235	A	A	220	220	235	215	225	205	235	230	240	250	240	230	230	225	255
10	255	265	265	255	260	225	205	215	220	200	195	205	205	200	225	220	A	A	A	260	230	235	245	250	
11	275	290	265	250	300	255	250	A	225	A	200	205	200	210	200	A	A	A	A	255	250	A	A	A	
12	240	250	255	255	255	A	A	A	A	A	200	220	215	210	220	220	A	A	A	250	255	255	230	225	
13	250	265	275	255	260	240	245	A	A	215	205	200	200	230	230	220	215	230	245	A	A	230	250	245	
14	250	255	260	275	255	240	245	A	A	A	230	205	215	200	210	220	A	A	A	A	A	260	225	265	
15	A	300	295	275	260	A	A	A	A	A	A	A	A	A	A	A	240	215	270	A	250	A	A	250	
16	300	320	300	300	220	A	A	A	A	205	A	200	215	215	250	230	A	A	A	A	250	275	220	230	
17	265	275	275	270	260	250	230	A	A	A	A	A	230	215	215	200	245	A	A	265	255	255	225	205	
18	260	275	250	285	260	A	A	225	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	275	
19	250	A	275	275	250	250	A	A	A	A	200	200	A	210	200	205	A	230	250	A	A	245	225	215	
20	235	280	275	300	270	245	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
21	A	265	A	A	270	250	A	A	A	A	A	A	230	A	A	A	A	225	A	A	A	A	A	A	
22	A	A	270	300	250	235	A	A	A	A	A	A	A	A	A	250	225	A	A	A	A	225	215	255	
23	250	270	265	275	255	225	205	A	A	200	200	A	A	230	230	235	215	245	245	A	255	A	A	225	
24	245	260	275	240	250	250	A	A	A	A	A	225	215	215	205	225	A	A	250	250	250	235	245	235	
25	250	240	260	285	260	215	A	A	A	A	A	A	A	A	225	230	245	A	A	275	285	250	250	270	
26	240	215	215	235	265	250	A	A	A	A	A	A	A	230	220	230	220	A	A	255	A	275	A	A	
27	A	280	325	A	320	A	A	A	A	A	A	A	250	A	270	A	A	A	A	A	270	275	270	260	
28	305	300	280	280	295	255	235	230	245	A	220	230	A	A	A	A	A	A	A	250	230	250	250	275	
29	270	275	290	250	250	A	250	A	A	A	A	225	240	215	210	205	235	215	240	250	270	260	255	260	265
30	230	290	A	A	300	A	A	A	A	205	A	220	A	A	A	A	A	A	A	A	A	275	245	250	
31	300	280	280	250	260	255	A	A	A	A	A	A	215	A	A	A	A	A	A	A	A	A	300	A	
CNT	27	29	29	28	31	24	17	7	6	10	14	18	20	19	21	19	13	11	11	18	20	24	24	26	
MED	255	275	275	260	260	245	240	230	222	208	202	205	215	210	215	225	225	240	250	250	250	238	230	250	
UQ	265	280	280	275	268	250	245	232	230	215	220	225	215	222	230	230	245	248	250	255	255	255	250	255	
LQ	250	265	265	250	255	235	230	225	220	205	200	200	202	205	205	220	215	230	248	250	230	230	225	235	

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H^oF (KM)

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IONOSPHERIC DATA

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H⁺E (KM)

135° E Mean Time (G.M.T. + 9 h)

Station		WAKKANAI				Lat.	45° 23.5' N				Long.	141° 41.2' E				Sweep	1 MHz to		25 MHz in		24 sec in		automatic operation		
Hour	Day	00	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		105	110	115	110	B	105	A	A	115	A	S					
2						S	140	120	110	105	105	105	105	A	A	115	115	115	120	A					
3						S	130	125	115	115	115	110	110	A	B	110	115	120	115	S					
4						S	115	110	110	110	110	110	110	125	125	115	115	A	A	S					
5						S	115	110	110	105	105		A	A	A	A	115	A	120	S					
6						S	130	115	110	105	105	105	105	105	120	A	A	110	115	S					
7						S	135	115	110	110	105	120	115	110	110	115	120	115	115	S					
8						S	120	110	110	110	115	110	110	A	A	110	110	115	S						
9						S	125	120	110	110	105	105	115	A	A	105	105	110	120	S					
10						S	115	110	110	110	105	105	105	125	105	105	110	115	S						
11						S	135	115	110	110	105	105	105	B	115	105	105	110	115	S					
12						S	120	115	115	115	105	105	110	A	105	110	105	115	S						
13						S	145	115	110	110	105	B	110	A	110	105	115	110	110	S					
14						S	140	115	110	120	125	115	115	120	115	115	120	115	120	A					
15						S	130	120	115	115	120	B	B	115	110	110	A	A	A	A					
16						S	A	115	115	110	105	110	130	110	115	110	110	110	120	125	S	S			
17						S	130	115	115	105	120	115	B	A	105	105	105	110	120	A	S				
18						E	S	115	110	120	110	110	105	A	A	A	A	A	A	A	S				
19						E	130	110	110	110	110	105	115	A	A	110	A	A	A	A	S				
20						S	A	115	115	115	115	110	B	110	A	A	A	A	A	A	S				
21						S	A	110	115	110	105	A	B	B	115	105	105	110	115	S	E				
22						S	A	115	115	110	125	110	110	B	A	A	A	A	A	120	S				
23						S	125	120	115	115	105	110	105	A	A	A	A	A	105	130	S				
24						S	130	110	110	105	115	B	115	115	105	A	110	120	115	130	S				
25						S	130	115	115	105	110	115	115	110	B	110	A	120	115	S	S				
26						S	130	110	110	110	110	115	B	A	110	110	110	110	105	S	S				
27						S	130	115	115	120	B	115	B	110	115	115	115	110	115	130	S				
28						E	135	115	120	120	B	B	B	B	B	115	115	110	115	115	S				
29						S	135	115	105	110	115	110	B	B	B	110	105	110	115	125	S				
30						S	110	110	110	B	110	125	110	B	120	115	120	A	110	A	S				
31						S	130	120	115	105	115	115	115	B	B	115	105	110	115	120	S				
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							19	31	31	31	28	26	22	16	16	22	22	22	24	8					
MED							130	115	110	110	110	110	110	110	115	110	110	110	115	125					
UQ							135	118	115	115	115	115	115	115	118	115	115	115	118	130					
LQ							130	115	110	110	105	105	105	110	110	105	105	110	115	120					

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H⁺E (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

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H⁺ES (KM)

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	S	S	S	S	S	130	125	115	115	115	110	110	110	105	100	135	100	120	S	100	S	S	S
2	S	S	S	S	E	150	130	125	120	115	115	115	105	105	105	G	G	100	125	100	100	115	S	105
3	S	S	S	S	S	G	120	G	G	115	G	110	105	110	110	G	G	135	125	115	115	110	110	S
4	S	S	S	S	E	135	130	120	120	115	115	115	G	105	G	G	130	100	115	115	S	S	S	S
5	S	S	S	S	S	130	120	115	115	120	G	105	105	105	125	140	125	125	120	115	S	S	S	S
6	100	E	S	S	110	G	125	130	120	120	115	120	G	G	150	125	120	120	120	115	S	120	S	S
7	105	S	100	E	E	140	G	125	115	115	115	115	110	110	G	125	G	125	125	120	110	120	S	S
8	105	100	100	105	S	125	130	120	115	115	115	110	110	105	105	G	120	115	115	115	S	110	105	S
9	S	S	S	E	S	G	120	115	110	110	110	G	105	105	G	145	130	125	115	S	S	S	S	S
10	100	105	S	E	S	S	115	115	110	110	110	G	G	G	G	135	120	120	115	115	115	110	105	S
11	S	S	S	E	S	135	130	125	120	110	110	G	120	G	G	150	130	125	120	120	115	115	125	105
12	120	105	100	125	100	125	125	120	120	115	115	120	115	105	G	G	125	115	115	110	S	S	S	S
13	S	S	S	100	S	G	135	125	120	115	115	115	110	G	G	G	125	125	120	115	110	110	105	S
14	S	S	S	S	S	G	120	120	115	115	115	115	120	120	115	G	120	115	105	105	115	110	S	110
15	105	105	S	S	150	125	120	120	115	115	115	110	115	115	110	105	105	105	125	120	115	110	110	105
16	100	105	100	110	105	125	120	115	115	110	110	G	G	G	140	G	130	125	115	110	115	105	S	S
17	100	S	S	E	S	G	125	120	115	115	115	110	105	G	G	G	G	120	120	S	E	S	S	S
18	S	110	105	125	105	115	115	120	120	110	110	105	105	105	105	100	100	115	100	115	115	110	110	105
19	105	100	100	100	100	130	125	115	110	110	115	120	105	105	G	105	105	105	125	115	115	115	110	110
20	105	105	105	105	100	130	125	120	115	110	110	110	110	105	105	100	100	100	100	100	100	100	125	110
21	105	100	100	100	105	105	125	115	115	110	105	105	115	115	105	105	115	130	115	110	110	110	110	110
22	105	100	100	100	115	115	120	115	115	115	110	105	105	105	105	105	105	110	115	115	110	110	105	S
23	105	100	S	105	S	G	G	120	120	115	115	105	110	105	105	105	120	120	G	115	115	115	105	100
24	E	E	S	S	S	G	120	120	110	115	115	G	120	115	105	G	120	125	G	130	115	S	E	E
25	S	S	S	E	S	130	125	120	115	115	115	120	110	110	110	110	140	120	120	115	110	S	105	105
26	105	S	S	S	S	145	125	120	115	110	110	110	105	G	G	G	G	120	115	120	110	110	105	105
27	100	100	100	100	100	125	125	120	125	115	115	120	G	130	145	130	125	125	125	120	115	110	S	140
28	E	E	125	S	130	130	125	120	120	115	115	120	115	135	125	115	120	115	115	115	110	105	105	105
29	105	105	105	105	S	130	135	120	110	115	120	115	G	B	G	G	G	130	G	S	S	S	S	S
30	115	110	105	110	125	115	120	120	115	125	115	G	125	125	125	125	120	115	110	105	105	105	110	115
31	105	E	S	E	135	130	125	120	115	115	110	110	110	110	120	115	110	110	120	115	110	105	105	105
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	14	13	13	13	21	29	30	30	31	29	25	25	23	20	19	25	31	28	27	23	22	17	15
MED	105	105	100	105	105	130	125	120	115	115	115	110	110	110	110	115	120	120	118	115	110	110	105	105
UQ	105	105	105	110	125	130	125	120	120	115	115	115	115	115	125	128	125	125	120	115	115	115	110	110
LQ	100	100	100	100	100	125	120	120	115	110	110	110	105	105	105	105	115	112	115	112	110	110	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	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						C1	C1	C3	C3	C1	C1	C1	C1	L2	L2	CL11	L1	CL31		F2				
2						C1	C2	C2	C2	C2	C1	C1	L1	L2	L1		L1	CL11	F2	FF11	F1		F2	
3						C2				C2		C2	L2	L2	L1		C2	C3	F2	F1	F2	F1		
4						C1	C1	C2	C2	C1	C1	C1		L2			CL22	LC11	C3	F1				
5						C2	C2	C2	C2	C1		L2	L2	L2	CL22	HL12	CL22	C2	C3	F2				
6	F2				F1	C2	C2	C2	C1	C2	C1			HL12	CL22	C2	C2	C2	F2		F1			
7	F1		F2			C1		C2	C2	C2	C1	C1	C2	C2		C1		C2	C3	F2	F3	F1		
8	F2	F2	F1	F1		C2	C2	C2	C1	C2	C1	C2	C2	L3	L2		C2	C2	C2	F1		F1	F1	
9						C2	C1	C2	C2	C2	C1		L1	L1		H1	C1	C2	C2					
10	F2	F2				C2	C2	C2	C1	C1					C2		C2	C3	C4	F2	F1	F1	F2	
11						C2	C2	C3	C1	C2	C1		C1			H1	C2	C3	C4	F2	F2	F5	FF13	F4
12	FF12	F2	F2	FF12	F1	C4	C5	C3	C2	C1	C1	C1	C1	L2			C2	C4	C4	F2				
13				F2		C1	C2	C2	C2	C1	C1	C1	L1				C1	C2	C1	F2	F3	F2	F2	
14						C2	C2	C2	C2	C4	C1	C1	C1	C1	C1		C4	C3	L4	F4	F4	F3	F2	
15	F5	F2			F1	C3	C3	C4	C4	C2	C2	C2	C1	C1	C3	L2	L2	L2	F4	F5	F5	F3	F2	
16	F2	F2	F3	FF22	L2	CL41	C4	C1	C2	C1	C4				H1		C2	C3	C5	L1	F3	F3		
17	F2					C2	C2	C2	C2	C2	C2	C2	L1					C4	CL22					
18		F2	F1	F2	L2	C3	C4	C2	C2	C2	C1	C2	L2	L3	L2	L2	L4	CL23	L3	C5	F7	F4	F5	F2
19	F3	F4	F3	F3	L2	C2	C2	C3	C3	C2	C2	C1	L2	L2		L2	L4	L1	CL22	C3	F3	F3	F1	F2
20	F3	F2	F3	F3	L2	CL12	C3	C3	C3	C3	C3	C4	C3	L3	L4	L4	L2	L4	L4	L4	F3	F3	FF13	FF23
21	F4	F4	F6	F5	L3	L4	C5	C2	C2	C3	L2	L3	C1	C1	C3	C3	C2	C2	C2	C6	F4	F5	F7	F5
22	F4	F5	F2	F3	CL23	CL32	C3	C4	C1	C2	C3	C4	C3	L3	L2	L1	L2	L3	C3	C4	F5	F3	F2	
23	F2	F2		F2			C2	C2	C1	C1	C2		L2	L2	L1	L2	CL11	C1		C2	F5	F5	F5	F2
24						C3	C2	C2	C2	C2	C2		C1	C1	L1		C2	C2	C1		F3			
25						C2	C2	C2	C2	C3	C1	C1	C2	C1	C1	L1	C1	C3	C3	C2	F2	F2	F2	F2
26	F2					C2	C3	C3	C3	C2	C2	C2	L2				C2	C3	C2	C7	F7	F3	F6	F5
27	F7	F2	F4	F3	L2	C5	C5	C2	C2	C2	C2	C1		C2	H1	C1	C3	C2	C6	C6	F5	F3	F1	
28			F1		C2	C2	C2	C2	C1	C1	C1	C1	C2	C1	C2	C3	C3	C2	C5	C2	F2	F3	F2	F5
29	F2	F2	F2	F2		C3	H2	C1	C3	C2	C1	C1						H1						
30	F1	F4	F4	F4	C2	C5	C3	C1	C2	C1	C1		C3	C2	C2	C4	CL42	C6	CL72	C4	F7	F7	F2	F2
31	F2				C1	C2	C2	C2	C2	C2	C3	C2	C1	C3	C4	C2	C4	C4	C7	C6	F3	F7	F4	F3
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

MAY. 1937

TYPES OF ES

IONOSPHERIC DATA

MAY. 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	57	X 50	X 49	49	54															X 87	X 88	73	65	59	
2	54	X 51	54	52	53															X 80	X 85	S 72	X 59	X 52	
3	50	X 45	X 42	47	47	53														X 80	X 86	X 78	X 61	X 46	
4	X 44	X 46	X 45	X 43	X 42															X 86	X 86	X 66	X 56	X 52	
5	X 49	X 47	X 49	X 43	X 41															X 76	77	A	X 62	X 56	
6	58	56	60	60	51															X 74	X 80	X 75	X 62	X 56	
7	60	62	56	59	59	59														X 79	77	69	X 62	X 59	
8	X 56	X 54	X 52	X 50	55															X 85	X 82	X 68	X 59	X 56	
9	X 55	54	56	54	54															X 86	X 83	X 72	X 63	X 61	
10	X 58	X 55	X 54	X 52	X 51															X 95	X 99	X 76	X 62	X 62	
11	X 60	X 57	58	58	54	56														A	A	68	68	60	
12	A	59	60	59	52	50														A	80	78	75	X 62	
13	X 60	X 56	X 52	X 50	54															X 82	87	78	70	61	
14	56	52	52	50	50															99	92	73	70	69	
15	64	62	61	62	58															X 76	X 80	X 68	A	A	
16	A	60	62	63	59	61														X 71	X 82	X 72	66	62	
17	56	56	54	52	53	61														A	89	93	A	A	
18	64	61	69	60	58	59														X 77	X 71	X 65	68	71	
19	69	69	60	60	59	56														X 72	X 77	78	80	64	
20	52	57	60	60	57	57														X 75	X 77	75	72	64	
21	62	62	60	60	65	63																74	64	63	61
22	62	59	60	60	58	61	74	80														96	73	55	54
23	63	59	57	56	56	60															X 83	77	70	72	
24	64	62	61	61	61	64															X 92	82	74	X 72	
25	X 68	X 65	X 54	X 52	X 49																X 74	S 75	X 71	X 72	
26	X 64	X 60	X 63	X 50	X 48																X 78	X 58	A	59	
27	55	56	59	62	53																X 76	72	68	63	
28	X 60	X 57	X 50	58	X 53																X 75	66	59	X 54	
29	X 52	52	50	51	52																X 75	X 74	X 74	X 71	
30	X 66	X 57	X 50	X 52	X 56																	77	76	70	66
31	52	47	49	X 46	X 50																X 59	X 60	X 60	59	
CNT	29	31	31	31	31	13	1	1													17	30	30	28	29
MED	58	57	56	54	54	59	74	30													X 80	X 80	73	66	61
UQ	63	60	60	60	53	61															X 86	X 86	76	70	64
LQ	55	X 53	X 51	X 50	51	56															X 76	X 77	X 68	X 62	X 56

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FXI (0.1 MHz)

IONOSPHERIC DATA

MAY. 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	MHz in	sec in	automatic operation														
Hour Day	00	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 46	F 44	F 43	F	F	F 48	F 54	S 54	H 56	F 59	F 62	F 59	F 62	F 70	F 72	F 75	F 76	F 75	F 75	F 81	F 82	F	F	F	
2	F	F 44	F	F	F	F 45	F 50	F 51	F 57	F 56	F 63	F 65	F 69	F 76	F 73	F 71	F 65	F 60	F 63	F 74	F 79	S 66	F 53	F 46	
3	F 41	F 39	F 36	F	F	F 45	F 59	F 62	F 66	F 65	F 54	F 57	F 58	F 61	F 60	F 64	F 65	F 64	F 66	F 74	F 80	F 72	F 55	F 40	
4	F 38	F 40	F 39	F 37	F 36	F 42	F 56	F 71	A	F 62	A	F 56	F 64	F 61	F 65	F 65	F 63	F 59	F 61	F 80	F 80	F 60	F 50	F 46	
5	F 43	F 41	F	F 37	F 35	F 47	F 56	F 56	F 66	F 63	F 66	F 64	F 61	F 62	F 65	F 73	A	A	A	F	A	F	A	F 50	
6	F 50	F 47	F	F	F	F 45	F 54	F 60	F 62	F 58	F 61	F 59	F 59	A	F 70	F 71	F 65	F 71	F 62	F 68	F 74	F 69	F 56	F 50	
7	F	F	F	F	F	F	F 54	F 53	F 59	F 63	F 61	F 68	F 73	F 70	F 75	F 80	A	F 84	F 74	F 73	F	F 60	F 56	F 53	
8	F 50	F 48	F 46	F 44	F	F 53	F 70	F 64	F 61	F 68	F 77	F 76	F 69	F 63	F 67	F 68	F 70	F 72	F 73	F 79	F 76	F 62	F 53	F 50	
9	F 49	F 47	F 46	F 45	F	F 55	F 71	F 66	F 59	F 53	F 66	F 73	F 75	F 69	F 66	F 72	F 75	F 76	F 75	F 80	F 77	F 66	F 57	F 55	
10	F 52	F 49	F 48	F 46	F 45	F 52	F 69	F 59	F 55	F 67	F 63	F 61	F 61	F 60	F 68	F 72	F 66	A	F 75	F 89	F 93	F 70	F 56	F 56	
11	F 54	F 51	F	F	F	F	F 64	A	A	A	A	A	A	F 66	A	F 68	F 68	A	A	A	A	F	F	F	
12	A	F	F	F	F	F 41	F 55	A	F 69	F 63	F 54	F 57	F 60	F 61	F 64	F 68	F 71	F 71	F 66	A	F 70	F 70	F 66	F 56	
13	F 54	F 50	F 46	F 44	F 44	F 55	F 59	F 62	F 55	F 51	F 56	F 60	F 65	F 66	F 70	F 72	F 30	F 39	F 83	F 76	F	F	F	F 52	
14	F 44	F 44	F 43	F 41	F 40	F 59	F 56	F 61	F 64	F 60	F 59	F 66	F 66	F 61	F 62	F 66	A	A	A	F 91	F 84	F	F	F	
15	F	F	F	F	F	A	A	A	A	A	A	A	A	F 56	F 55	F 59	F 57	F 55	F 62	F 70	F 74	F 62	A	A	
16	A	F	F	F	F	F	F 57	A	A	A	H 58	F 57	F 62	A	F 61	A	A	A	A	A	F 65	F 76	F 66	F	F
17	F	F	F	F	F	F 52	F 66	F 56	F 54	F 60	F 55	F 59	F 56	F 61	F 61	F 57	F 56	A	F 62	A	F	F 34	A	A	
18	F	F	F	F	F	F 49	A	A	A	A	A	F 59	F 59	F 66	F 66	F 61	F 61	F 65	F 66	F 71	F 65	F 59	F 59	F	
19	F	F	F	F	F	F	F 57	F 60	F 70	A	F 64	A	A	F 65	F 65	F 68	F 65	F 64	F 60	F 66	F 71	F	F	F	
20	F 43	F	F	F	F	F	F 54	F 67	A	A	A	A	A	F 73	F 51	A	F 75	F 66	F 61	F 69	F 71	F	F	F	
21	F	F	F	F	F	F 56	F 57	F 65	A	F 54	A	A	F 53	F 62	F 62	F 72	F 74	F 73	F 79	F 85	F	F	F	F	
22	F	F	F	F	F	F	F	F 70	A	A	A	A	A	A	F 59	F 57	F 62	A	F 69	F 80	F 87	F	F	F	
23	F	F	F	F	F	F 51	H 60	F 62	F 80	F 53	F 53	F 53	F 58	F 67	F 63	F 63	F 63	F 62	F 67	F 73	F 77	F 69	F	F	
24	F	F	F	F	F	F 54	F 75	F 73	F 66	F 50	F 56	F 56	F 63	F 64	F 69	F 79	F 34	F 71	F 74	F 84	F 86	F	F	F 66	
25	F 62	F 59	F 48	F 46	F 43	F 44	F 49	F 46	A	A	A	F 54	F 55	F 57	A	F 61	A	A	A	F 63	F 68	S 69	F 65	F 66	
26	F 58	F 54	F 57	F 44	F 42	F 48	F 52	F 54	A	A	A	A	F 55	F 53	F 52	F 55	F 60	A	A	F 71	F 72	F 52	A	F	
27	F	F	F	F	F	A	A	A	A	A	A	A	A	A	A	F 52	F 55	A	A	F 70	F 70	F	F	F 55	
28	F 54	F 51	F 44	F	F 47	F 57	F 63	F 56	F 50	F 55	F 57	F 54	F 55	F 57	F 59	F 64	F 64	F 63	F 73	F 80	F 69	F	F	F 48	
29	F 46	F 44	F 42	F 42	F	F 50	F 54	F 50	F 52	A	F 59	F 52	F 60	F 61	F 65	F 74	F 68	F 80	F 80	F 74	F 69	F 68	F 68	F 65	
30	F 60	F 51	F 44	F 46	F 50	F 56	F 62	F 68	F 53	F 54	F 59	F 65	F 55	F 56	F 54	F 55	F 61	F 66	F 70	F 71	F	F	F	F 57	
31	F 43	F	F 40	F 40	F 44	F 35	F 40	F 44	F 50	A	E 42	A	A	A	A	A	A	A	A	F 63	F 66	F 53	F 54	F 54	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	17	17	14	12	10	23	27	25	20	19	21	22	24	26	27	28	25	20	24	22	24	18	14	17	
MED	50	47	44	44	44	50	57	60	60	59	59	59	60	62	65	68	65	70	68	74	75	66	56	53	
UQ	54	51	46	46	45	55	62	65	66	63	63	65	64	67	63	72	71	74	74	80	80	69	59	56	
LQ	43	44	42	40	40	45	54	54	56	56	56	56	58	61	61	61	62	64	62	70	70	60	54	50	

MAY. 1987

FOF2 (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 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								A	A	A	440	460	460	450	440	430	A	A						
2								A	A	A	440	460	450	440	440	420	410	A						
3							L	400	A	A	A	A	A	460	450	420	410	A						
4							L	400	A	440	A	470	440	470	440	420	410	A						
5							L	A	A	A	460	460	460	460	A	A	A	A						
6								A	A	430	A	460	460	A	A	430	440	410	L					
7								A	A	A	460	460	460	450	A	A	A	A						
8								400	430	460	460	A	460	460	440	450	410	L						
9							L	L	L	L	450	460	460	460	460	450	440	410	L					
10						L	L	L	L	L	460	460	460	460	460	450	440	A	A					
11								A	A	A	A	A	A	A	450	A	420	410	A					
12								A	A	A	A	L	460	460	450	450	A	A	A					
13								400	A	L	460	460	460	460	460	440	410	A						
14								A	A	A	A	A	A	A	480	460	A	A	A					
15								A	A	A	A	A	A	A	A	460	440	420	400	A				
16								A	A	A	A	A	460	460	A	A	A	A	A					
17							L	A	430	A	460	460	460	A	460	L	420	A	L					
18								A	A	A	A	A	460	460	450	440	A	420	A					
19								A	A	A	A	A	A	A	450	450	440	A	L	A				
20							L	A	A	A	A	A	A	A	A	A	A	380	L					
21							L	A	A	440	A	A	460	A	A	430	A	380	A					
22							L	A	A	A	A	A	A	A	460	440	A	A	A					
23							L	L	A	A	460	L	A	A	440	A	420	380	A					
24						L	L	A	A	440	460	460	450	460	440	420	410	A	A					
25						L	A	A	A	A	A	A	440	A	A	A	A	A	A					
26						L	A	A	A	A	A	A	440	450	430	430	400	A	A					
27							A	A	A	A	A	A	A	A	A	A	A	A	A					
28						310	L	L	A	440	440	450	450	450	450	A	410	380	A					
29								A	440	A	440	450	460	430	420	410	400	380	320					
30					L	L	390	420	450	A	A	440	A	A	A	A	A	A	A					
31					310	A	360	A	A	420	A	A	A	A	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					4	2	6	5	3	15	16	20	19	21	17	16	6	1						
MED					315	370	400	430	445	460	460	460	450	450	430	410	380	320						
UQ					320		400	430	455	460	460	460	460	450	440	415	380							
LQ					310		390	430	440	440	460	450	450	440	420	410	380							

MAY. 1987

FOF1 (0.01 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 1987

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						S	230	260	A	310	320	340	345	A	320	300	280	235	S					
2						S	215	270	300	310	330	340	A	340	A	A	270	A	S					
3						S	225	A	A	315	A	340	A	A	320	300	275	235	S					
4						S	230	A	A	A	A	A	A	A	320	305	280	230	S					
5						S	220	265	305	A	325	330	340	350	340	305	A	A	S					
6						S	235	280	305	320	330	335	345	340	340	320	A	A	S					
7						180	240	275	305	320	335	A	350	345	340	305	A	255	S					
8						S	230	A	A	A	A	345	A	A	A	305	275	245	S					
9						S	235	270	A	A	A	A	A	345	A	305	280	235	S					
10						180	220	A	300	A	320	A	A	A	340	305	285	240	S					
11						S	220	265	300	315	345	350	A	A	A	305	280	235	130					
12						180	240	290	310	325	340	350	A	A	A	305	275	250	A					
13						185	245	265	300	A	A	345	A	A	A	A	300	245	A					
14						S	245	280	305	320	335	345	A	340	A	A	300	A	S					
15						S	240	290	305	330	340	350	350	A	A	315	280	245	A					
16						A	240	275	310	340	345	A	A	355	A	340	290	250	A					
17						180	250	280	A	335	A	A	A	A	A	310	290	255	S					
18						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
19						180	255	A	A	A	A	A	A	A	A	A	A	A	A					
20						A	255	290	320	340	350	A	A	A	A	A	A	255	200					
21						200	245	A	A	A	330	A	360	A	350	A	A	A	A	S				
22						S	240	275	A	340	A	A	A	A	A	A	A	A	A	S				
23						S	A	A	A	A	A	A	A	A	A	305	235	A	A	S				
24						A	230	285	A	340	335	345	A	A	A	A	295	245	A	S				
25						190	245	A	310	335	345	A	A	A	A	A	A	A	A	S				
26						195	235	280	A	A	A	A	A	A	A	A	A	250	A	S				
27						195	255	285	300	315	340	A	A	A	A	A	A	A	A	S				
28						A	240	275	305	320	A	345	A	A	330	305	A	A	A	S				
29						A	240	A	310	310	325	345	A	340	A	305	290	250	200	S				
30						A	215	270	300	325	345	A	355	345	335	305	275	245	180	S				
31						190	235	275	300	A	A	A	A	340	325	300	280	A	A	S				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						11	29	21	18	19	18	14	7	10	11	19	19	18	4					
MED						135	240	275	305	320	335	345	350	342	335	305	280	245	190					
UQ						192	245	280	310	335	345	345	352	345	340	305	290	250	200					
LQ						130	230	270	300	315	330	340	345	340	322	305	278	235	180					

MAY. 1987

FOE (0.01 MHz)

IONOSPHERIC DATA

MAY. 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		ES 16	ES 15	ES 15	ES 15	ES 15	ES 17	31	JA 50	JA 52	JA 52	42	G	G	JA 50	40	44	JA 58	JA 76	JA 53	JA 36	JA 33	JA 20	JA 24	JA 19																									
2		ES 15	ES 15	ES 15	ES 16	ES 15	20	36	JA 51	JA 54	JA 50	41	39	JA 44	G	JA 32	JA 33	JA 35	JA 44	JA 40	JA 40	JA 25	JA 106	JA 118	JA 77																									
3		JA 20	ES 15	JA 21	ES 15	JA 44	ES 16	JA 34	JA 45	JA 50	JA 60	JA 49	JA 58	JA 72	JA 42	G	G	37	JA 50	JA 36	JA 37	JA 37	JA 36	JA 19	ES 15																									
4		ES 16	ES 16	ES 16	JA 24	ES 15	24	G	37	JA 87	JA 64	JA 75	JA 44	JA 43	JA 41	G	37	40	JA 44	JA 36	JA 32	JA 25	ES 15	ES 15	ES 15																									
5		ES 15	ES 15	ES 15	ES 15	ES 15	20	JA 36	JA 50	JA 48	JA 53	JA 45	41	42	45	JA 66	JA 76	JA 79	JA 84	JA 60	JA 54	JA 65	JA 65	JA 62	ES 15																									
6		ES 15	ES 15	ES 15	JA 36	JA 50	21	JA 46	JA 50	JA 46	JA 50	JA 45	41	JA 54	JA 64	40	38	33	JA 33	JA 54	JA 19	ES 15	ES 15	JA 24	JA 18																									
7		JA 36	JA 24	ES 15	ES 15	JA 46	20	35	JA 56	JA 64	JA 64	JA 46	38	G	JA 46	JA 46	JA 45	110	JA 44	JA 43	JA 40	JA 80	JA 34	JA 24	JA 21																									
8		JA 21	ES 15	ES 15	ES 15	JA 24	22	JA 44	JA 50	JA 44	42	JA 52	JA 54	JA 44	JA 41	JA 33	G	35	JA 38	JA 70	JA 30	JA 29	JA 24	ES 15	JA 18																									
9		ES 16	ES 15	JA 24	ES 15	ES 15	ES 16	G	JA 49	JA 36	33	50	66	JA 50	40	JA 35	39	34	32	JA 30	JA 25	JA 34	JA 18	ES 15	ES 15																									
10		JA 23	ES 15	JA 20	ES 15	ES 15	G	G	JA 44	39	JA 50	JA 42	JA 54	JA 38	JA 36	37	42	JA 50	JA 70	JA 56	JA 56	JA 29	JA 25	ES 15	ES 15																									
11		ES 16	JA 25	JA 26	JA 50	JA 18	26	JA 39	JA 70	JA 74	JA 76	JA 73	JA 76	JA 90	JA 52	107	42	40	JA 103	JA 93	JA 83	JA 145	JA 65	JA 84	JA 52																									
12		JA 87	JA 50	JA 40	JA 32	JA 26	30	JA 50	JA 74	JA 76	JA 77	JA 65	JA 81	JA 64	JA 50	JA 46	44	JA 47	JA 46	JA 47	JA 74	JA 36	JA 24	JA 18	ES 15																									
13		ES 16	ES 15	ES 15	ES 16	ES 15	G	27	37	JA 45	JA 52	JA 60	JA 53	JA 42	JA 53	JA 36	JA 48	G	JA 39	JA 54	JA 50	JA 41	JA 52	JA 31	JA 24																									
14		JA 19	ES 15	ES 15	ES 15	ES 15	JA 26	JA 38	JA 53	JA 60	JA 56	JA 65	JA 58	JA 65	JA 46	40	JA 64	196	111	142	139	110	JA 60	JA 50	JA 32																									
15		JA 64	JA 34	JA 24	JA 28	JA 24	JA 50	JA 84	JA 133	JA 98	JA 75	JA 88	JA 74	JA 85	JA 50	JA 37	G	32	30	JA 34	JA 24	JA 40	JA 54	JA 56	JA 84																									
16		JA 50	JA 53	JA 41	JA 44	JA 48	JA 41	JA 54	JA 76	JA 64	JA 63	JA 85	JA 69	JA 66	162	JA 66	140	JA 94	183	178	ES 16	JA 20	JA 54	JA 50	JA 41																									
17		ES 15	JA 80	JA 34	JA 29	ES 15	JA 34	JA 36	JA 42	JA 50	JA 54	42	38	JA 47	JA 54	JA 49	42	JA 56	JA 87	JA 39	JA 87	JA 54	120	120	JA 116																									
18		JA 50	JA 50	JA 50	JA 29	JA 52	JA 50	JA 74	JA 140	JA 120	JA 126	JA 153	JA 84	JA 54	JA 34	JA 54	JA 48	JA 50	JA 53	JA 48	JA 70	JA 65	JA 76	JA 64	JA 50																									
19		JA 50	JA 41	JA 32	JA 30	JA 27	JA 31	JA 46	JA 61	JA 66	JA 104	JA 97	JA 85	JA 67	JA 50	JA 45	JA 40	JA 53	JA 53	JA 40	JA 20	JA 25	JA 29	JA 34	JA 84																									
20		JA 50	JA 28	JA 32	JA 34	JA 34	JA 31	32	JA 49	JA 73	JA 99	JA 103	JA 165	JA 168	JA 66	JA 106	JA 119	JA 45	32	28	JA 31	JA 30	JA 61	JA 65	JA 86																									
21		JA 52	JA 29	JA 52	JA 32	JA 29	JA 24	33	JA 59	JA 84	JA 54	JA 74	114	JA 74	JA 66	JA 92	36	JA 53	29	JA 49	JA 53	JA 84	110	JA 58	JA 60																									
22		JA 44	JA 47	JA 50	JA 50	JA 29	JA 30	JA 44	110	JA 97	121	JA 66	75	JA 87	JA 93	JA 45	JA 42	JA 77	JA 73	JA 56	JA 84	JA 64	JA 52	JA 52	JA 44																									
23		JA 24	ES 16	ES 16	JA 18	JA 21	JA 34	JA 32	JA 76	JA 60	JA 94	JA 60	JA 46	JA 74	JA 74	JA 50	JA 49	JA 52	JA 41	JA 44	JA 44	JA 62	JA 48	JA 77	JA 77																									
24		JA 64	JA 18	JA 20	ES 15	JA 24	JA 24	33	JA 76	JA 66	JA 50	JA 44	JA 54	JA 50	JA 52	38	40	JA 46	JA 54	JA 54	JA 32	JA 41	JA 60	ES 16	JA 20																									
25		JA 24	ES 16	ES 15	ES 15	ES 15	22	JA 41	JA 50	JA 64	JA 34	JA 105	JA 58	JA 44	JA 85	JA 84	JA 91	JA 90	120	107	JA 76	JA 44	JA 38	ES 16	JA 33																									
26		JA 44	JA 28	JA 18	ES 15	JA 25	G	JA 50	JA 50	JA 54	JA 97	JA 75	JA 96	JA 44	JA 44	JA 44	42	JA 44	JA 94	JA 76	JA 43	JA 32	JA 43	JA 84	JA 84																									
27		JA 54	JA 65	JA 32	JA 25	JA 25	JA 64	JA 64	JA 84	JA 65	JA 52	JA 52	JA 50	JA 74	JA 54	JA 63	JA 48	JA 46	JA 74	JA 95	JA 50	JA 57	JA 62	JA 64	JA 29																									
28		ES 15	ES 16	JA 28	JA 18	JA 18	JA 24	29	JA 44	JA 46	JA 64	JA 46	JA 44	JA 46	JA 38	42	JA 63	JA 48	36	JA 35	JA 41	JA 43	JA 29	JA 35	JA 36																									
29		JA 46	JA 44	JA 28	JA 28	JA 40	23	35	JA 45	34	67	G	JA 42	JA 44	33	JA 41	38	G	30	G	ES 16	ES 15	ES 15	ES 15	ES 15																									
30		ES 16	ES 15	ES 16	ES 16	ES 15	JA 29	30	29	JA 52	37	JA 54	JA 84	44	JA 50	JA 49	JA 49	JA 54	JA 50	JA 41	JA 32	JA 52	113	JA 84	JA 41																									
31		JA 32	JA 30	JA 20	JA 18	ES 16	24	JA 40	JA 38	JA 50	114	JA 49	JA 54	112	JA 64	JA 64	JA 75	JA 64	JA 85	JA 44	JA 84	JA 60	JA 51	JA 38	JA 33																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																									
CNT		31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31																									
MED		JA 24	JA 18	JA 20	JA 18	JA 24	24	JA 36	JA 50	JA 60	JA 63	JA 54	JA 54	JA 50	JA 50	JA 45	JA 42	JA 48	JA 50	JA 48	JA 41	JA 41	JA 51	JA 50	JA 33																									
UQ		JA 50	JA 38	JA 32	JA 30	JA 29	JA 30	JA 45	JA 72	JA 70	JA 80	JA 74	JA 76	JA 73	JA 64	JA 59	JA 49	JA 57	JA 80	JA 58	JA 63	JA 61	JA 62	JA 64	JA 56																									
LQ		ES 16	ES 15	ES 15	ES 15	ES 15	20	32	JA 45	JA 49	JA 52	JA 46	JA 44	JA 44	JA 43	33	38	38	JA 33	JA 40	JA 32	JA 30	JA 27	JA 18	JA 18																									

MAY. 1987

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 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 16	E 15	E 15	E 15	E 15	E 17	29	40	50	50	37	G	G	37	39	40	44	43	30	34	E 16	E 15	E 15	E 15
2	E 15	E 15	E 15	E 16	E 15	19	35	48	50	50	40	37	36	G	32	32	25	40	40	40	23	E 15	21	E 15
3	E 15	E 15	E 15	E 15	26	E 16	30	33	42	46	46	46	52	36	G	G	34	48	35	34	35	24	E 15	E 15
4	E 16	E 16	E 16	18	E 15	22	G	35	A 37	33	A 75	37	38	36	G	36	38	33	31	30	E 15	E 15	E 15	E 15
5	E 15	E 15	E 15	E 15	E 15	20	34	33	46	46	40	40	38	41	61	53	A 79	A 84	A 60	50	42	A 65	19	E 15
6	E 15	E 15	E 15	E 15	28	20	38	48	41	45	40	41	49	A 64	37	34	31	30	52	E 15	E 15	E 15	19	E 15
7	E 15	E 15	E 15	E 15	E 15	20	34	36	G	45	39	36	G	41	46	44	A 110	38	28	40	42	E 15	E 15	19
8	E 15	E 15	E 15	E 15	E 15	20	36	38	35	37	44	46	38	35	35	G	35	34	64	30	23	23	E 15	E 15
9	E 16	E 15	E 15	E 15	E 15	E 16	G	32	33	36	40	36	37	38	35	36	34	29	28	23	30	E 15	E 15	E 15
10	E 15	E 15	E 15	E 15	E 15	G	G	32	37	44	37	39	37	36	37	41	48	A 70	56	42	21	E 16	E 15	E 15
11	E 16	24	E 15	30	E 15	20	39	A 70	A 74	A 76	A 73	A 76	A 90	38	A 107	36	39	A 103	A 93	A 88	A 145	50	38	38
12	A 87	30	24	21	E 15	28	49	A 74	52	46	36	39	43	38	37	44	45	42	45	A 74	29	E 15	E 15	E 15
13	E 16	E 15	E 15	E 16	E 15	G	27	34	44	44	40	40	37	35	35	33	G	38	48	42	30	30	E 15	19
14	E 15	E 15	E 15	E 15	E 15	20	36	50	56	53	57	54	53	40	36	56	A 196	A 111	A 142	66	E 15	50	42	23
15	34	34	E 15	24	18	A 50	A 84	A 133	A 98	A 75	A 88	A 74	A 85	46	36	G	32	23	34	21	36	41	A 56	A 84
16	A 50	29	18	20	29	30	52	A 76	A 64	A 63	46	39	45	A 162	46	A 140	A 94	A 183	A 178	E 16	13	43	32	18
17	E 15	E 15	20	18	E 15	32	31	40	41	51	39	38	45	51	41	36	40	A 87	32	A 87	50	31	A 120	A 116
18	25	18	19	24	26	43	A 74	A 140	A 120	A 126	A 153	33	40	37	37	46	40	42	32	64	45	34	41	34
19	28	30	28	20	E 15	24	41	52	52	A 104	54	A 85	A 67	41	38	35	46	30	35	18	13	20	34	35
20	24	E 15	26	20	23	22	30	46	A 73	A 99	A 103	A 165	A 168	50	65	A 119	44	27	24	19	30	31	30	21
21	30	E 15	E 15	21	E 15	G	33	56	A 84	37	A 74	A 114	40	46	48	34	42	27	48	52	52	30	34	32
22	32	38	28	25	21	22	28	64	A 97	A 121	A 66	A 75	A 87	A 93	44	37	55	A 73	44	66	56	24	24	21
23	E 15	E 16	E 16	E 15	E 15	13	26	38	42	44	38	42	46	49	37	44	40	34	34	35	47	36	41	34
24	40	E 15	E 15	E 15	E 15	21	30	69	62	40	40	42	43	36	38	35	37	43	44	24	21	46	E 16	E 15
25	E 15	E 16	E 15	E 15	E 15	22	38	43	A 64	A 84	A 105	48	37	46	A 84	48	A 90	A 120	A 107	54	25	19	E 16	33
26	33	23	E 15	E 15	E 15	G	29	44	A 54	A 97	A 75	A 96	38	37	37	37	35	A 94	A 76	36	22	36	A 84	28
27	34	38	28	20	E 15	A 64	A 64	A 84	A 65	A 52	A 52	A 50	A 74	A 54	A 68	43	46	A 74	A 95	42	54	18	41	23
28	E 15	E 16	28	E 15	E 15	23	23	35	43	36	38	37	38	37	40	46	36	36	33	32	32	21	32	29
29	29	26	20	20	25	23	34	45	33	A 67	G	37	36	36	39	35	G	28	G	E 16	E 15	E 15	E 16	E 15
30	E 16	E 15	E 16	E 16	E 15	21	27	29	32	34	46	55	37	46	46	43	44	46	40	32	35	35	40	21
31	21	E 15	E 15	E 15	E 16	21	33	31	44	A 114	35	A 54	A 112	A 64	A 64	A 75	A 64	A 85	35	47	47	46	29	18
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E 16	E 15	E 15	E 16	E 15	21	34	44	50	50	44	42	40	40	38	37	40	42	40	36	30	24	24	19
UQ	30	24	20	20	17	23	38	60	A 64	A 76	A 70	A 54	52	48	46	45	47	A 79	58	51	44	36	39	30
LQ	E 15	E 15	E 15	E 15	E 15	13	23	36	42	44	39	38	37	36	36	35	35	34	32	27	21	E 16	E 15	E 15

MAY. 1987

FBES (0.1 MHz)

IONOSPHERIC DATA

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

MAY. 1987

FMIN (0.1 MHz)

IONOSPHERIC DATA

MAY. 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	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Day																								
1	F	F	F	F	F	F	S	H														F	F	F
2	F	F	F	F	F	F	A															S	F	F
3	F	F	F	F	F	F																		
4	F	F	F	F	F	F																		
5	F	F	F	F	F	F																		
6	F	F	F	F	F	F																		
7	F	F	F	F	F	F																		
8	F	F	F	F	F	F																		
9	F	F	F	F	F	F																		
10	F	F	F	F	F	F																		
11	F	F	F	F	F	F																		
12	F	F	F	F	F	F																		
13	F	F	F	F	F	F																		
14	F	F	F	F	F	F																		
15	F	F	F	F	F	F																		
16	F	F	F	F	F	F																		
17	F	F	F	F	F	F																		
18	F	F	F	F	F	F																		
19	F	F	F	F	F	F																		
20	F	F	F	F	F	F																		
21	F	F	F	F	F	F																		
22	F	F	F	F	F	F																		
23	F	F	F	F	F	F																		
24	F	F	F	F	F	F																		
25	F	F	F	F	F	F																		
26	F	F	F	F	F	F																		
27	F	F	F	F	F	F																		
28	F	F	F	F	F	F																		
29	F	F	F	F	F	F																		
30	F	F	F	F	F	F																		
31	F	F	F	F	F	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	17	17	14	12	10	23	26	22	19	19	20	22	24	26	26	28	25	20	24	27	24	18	14	17
MED	300	295	300	305	308	335	340	342	340	335	318	315	308	308	308	310	315	315	308	310	325	322	305	305
UQ	305	305	305	315	320	340	350	350	348	345	332	320	318	315	315	320	320	325	320	322	330	330	315	315
LQ	295	295	295	300	300	325	325	330	325	322	310	300	302	300	300	302	310	312	300	305	310	300	300	300

MAY. 1987

M(3000)F2 (0.01)

IONOSPHERIC DATA

MAY. 1987

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									A	A	A	385	390	390	380	370	A	A	A						
2									A	A	A	385	385	400	395	355	365	370	A						
3								L	380	A	A	A	A	A	370	375	370	365	A						
4								L	385	A	385	A	L	375	415	365	385	355	A	A					
5								L	A	A			380	395	375		A	A	A	A	A				
6								A	A	A	A	375	390	A	A	405	365	365	L						
7								A	A	A	A	380	400	390	395	A	A	A	A						
8								A	375	360	A	A	A	390	380	380	350	365	L						
9								L	L	L	L	390	380	390	380	380	385	355	370	L					
10						L	L	L	L	A		385	390	380	375	370		A	A	A					
11								A	A	A	A	A	A	A	385	A	375	A	A						
12								A	A	A	A	L	385	A	385	375		A	A	A					
13								375	A	L	390	400	395	385	360	360	370	A							
14								A	A	A	A	A	A	A	365	365		A	A	A					
15								A	A	A	A	A	A	A	A	380	385	355	345	A					
16								A	A	A	A	A	385	A	A	A	A	A	A						
17								L	A	L	A	405	405	A	A	350	L	A	A	L					
18								A	A	A	A	A	390	395	395	400	A	A	A						
19								A	A	A	A	A	A	A	400	380	365	A	L	A					
20								L	A	A	A	A	A	A	A	A	A	A	370	L					
21								L	A	A	L	415	A	A	380	A	A	365	A	355	A				
22								390	A	A	A	A	A	A	A	A	390	A	A	A					
23								375	L	A	A	395	L	A	A	385	A	A	A	A					
24						L	L	L	A	A	410	390	390	A	365	385	330	A	A	A					
25						L	L	L	A	A	A	A	A	400	A	A	A	A	A	A					
26								L	A	A	A	A	A	395	380	370	370	375	A	A					
27								A	A	A	A	A	A	A	A	A	A	A	A	A					
28						355	L	L	A	395	400	390	390	390	395	A	A	365	A	A					
29								A	380	A	385	390	370	390	A	380	375	355	355						
30						L	L	L	385	400	375	A	A	395	A	A	A	A	A	A					
31						325	A	385	A	A	400	A	A	A	A	A	A	A	A	A					
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						4	2	5	4	7	14	16	16	18	18	15	10	4	1						
MED						345	382	385	380	390	385	390	390	382	378	365	368	355	355						
UQ						368		385	390	402	395	392	395	395	385	378	370	362							
LQ						330		330	378	330	380	388	380	375	370	362	365	350							

MAY. 1987

M(3000)F1 (0.01)

IONOSPHERIC DATA

MAY. 1987

H⁺F (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	AKITA																								
Lat.	39° 43.5' N, Long. 140° 08.0' E																								
Sweep 1	MHz to 25 MHz in 24 sec in automatic operation																								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	260	270	270	255	285	240	245	A	A	A	225	200	200	200	A	A	A	A	270	240	220	230	240	235	
2	270	270	270	280	260	220	245	A	A	A	225	200	210	200	205	225	230	A	A	A	240	210	250	250	
3	260	270	280	280	A	240	240	220	A	A	A	A	A	220	200	200	A	A	A	275	270	245	240	215	255
4	275	270	255	260	280	245	240	A	A	220	A	210	200	220	205	A	A	A	300	260	215	210	240	235	
5	255	290	270	250	250	245	250	A	A	A	220	200	220	A	A	A	A	A	A	A	255	A	240	245	
6	270	285	270	290	A	240	A	A	A	A	220	220	A	A	200	225	220	220	255	250	240	230	240	250	
7	280	275	270	245	250	225	230	A	A	A	220	200	200	225	A	A	A	A	270	250	A	235	260	255	
8	270	270	270	250	250	245	230	A	220	220	A	A	210	200	210	210	A	A	A	250	225	230	235	255	
9	260	280	270	270	265	240	225	220	205	200	220	200	200	225	200	A	A	245	260	245	245	225	250	250	
10	260	270	270	255	260	220	195	220	210	A	200	200	205	200	220	A	A	A	A	270	225	210	240	260	
11	280	A	270	A	290	260	A	A	A	A	A	A	A	220	A	230	A	A	A	A	A	A	A	A	
12	A	A	280	250	230	250	A	A	A	A	200	200	A	210	200	A	A	A	A	A	A	270	240	230	240
13	250	260	255	255	285	235	230	A	A	A	210	200	195	200	200	230	220	A	250	A	250	245	230	240	
14	255	250	265	280	275	235	230	A	A	A	A	A	A	210	220	A	A	A	A	A	A	A	A	280	
15	A	A	305	280	250	A	A	A	A	A	A	A	A	A	A	200	200	240	240	A	255	250	A	A	
16	A	A	280	260	A	250	A	A	A	A	A	215	A	A	A	A	A	A	A	A	260	240	A	250	
17	250	290	260	295	280	250	230	A	A	A	200	195	A	A	A	220	A	A	A	A	A	240	A	A	
18	285	280	270	245	A	A	A	A	A	A	200	200	200	200	A	A	A	260	A	A	A	A	A	A	
19	A	A	A	280	250	230	A	A	A	A	A	A	A	205	205	215	A	225	A	250	240	275	240	210	
20	A	280	A	290	270	200	240	A	A	A	A	A	A	A	A	A	A	220	240	245	250	260	255	250	
21	A	270	275	290	260	240	A	A	A	195	A	A	210	A	A	225	A	240	A	245	A	240	A	A	
22	A	A	A	A	260	235	235	A	A	A	A	A	A	A	A	210	A	A	A	A	A	205	235	285	
23	280	270	280	265	230	240	205	A	A	A	200	A	A	A	210	A	A	A	A	270	260	245	A	A	
24	A	260	255	235	250	240	A	A	A	225	200	220	A	220	220	205	A	A	A	255	240	A	250	250	
25	260	240	240	255	295	250	A	A	A	A	A	A	220	A	A	A	A	A	A	A	300	260	245	260	
26	245	270	235	220	240	240	245	A	A	A	A	A	205	200	230	230	A	A	A	245	230	A	A	A	
27	A	A	A	275	275	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	270	A	265	
28	275	280	A	275	290	250	225	A	A	200	200	205	215	205	A	A	A	A	A	240	220	235	A	A	
29	A	A	295	275	260	230	240	A	205	A	210	220	215	220	A	220	220	240	245	240	260	255	280	240	
30	230	235	270	270	260	255	240	225	210	200	A	A	205	A	A	A	A	A	A	245	A	A	A	260	
31	275	260	290	270	230	250	A	235	A	A	220	A	A	A	A	A	A	A	A	A	A	A	A	280	
	00	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	23	26	29	27	28	19	5	5	7	15	16	16	18	16	14	5	7	10	19	22	21	18	23	
MED	260	270	270	270	260	240	235	220	210	200	210	200	205	208	205	220	220	240	260	250	240	240	240	250	
UQ	275	280	280	280	278	250	240	225	210	220	220	212	212	220	215	225	230	240	270	258	250	245	250	260	
LQ	255	265	265	255	250	235	230	220	205	200	200	200	200	200	200	210	220	222	250	245	225	230	235	242	

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H⁺F (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 1987

H°E (KM)

135° E Mean Time (G.M.T. + 9 h)

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

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H°E (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 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	130	120	110	110	110	G	G	105	140	130	125	120	115	110	110	110	105	
2	S	S	S	S	S	S	145	130	120	115	110	110	120	110	G	100	100	100	100	100	100	100	110	110	105
3	105	S	105	S	105	S	120	110	110	110	110	105	105	110	G	G	145	125	120	110	110	110	105	S	
4	S	S	S	105	S	130	G	120	105	110	100	105	100	100	G	155	130	120	110	110	105	S	S	S	
5	S	S	S	S	S	135	120	120	110	110	110	110	110	135	125	130	120	120	110	110	120	110	110	S	
6	S	S	S	100	100	130	130	125	120	115	110	120	110	110	135	125	120	110	120	120	S	S	110	105	
7	110	110	S	S	100	140	135	120	100	110	115	120	G	110	110	110	110	120	110	110	110	110	110	105	
8	105	S	S	S	100	125	120	120	110	110	110	105	105	105	110	G	130	120	110	110	110	105	S	105	
9	S	S	100	S	S	S	G	120	120	110	110	105	110	145	105	150	135	125	115	110	105	105	S	S	
10	100	S	100	S	S	G	G	110	110	110	110	105	110	105	145	130	120	120	110	110	110	105	S	S	
11	S	100	105	100	105	135	125	120	110	110	110	110	110	110	110	145	150	120	120	120	120	110	105	105	
12	105	100	100	100	100	135	125	120	120	115	125	110	105	105	105	135	120	120	110	110	115	105	105	S	
13	S	S	S	S	S	G	135	125	110	110	110	110	110	105	110	110	G	120	110	110	120	105	105	105	
14	100	S	S	S	S	130	120	115	110	110	110	110	105	105	105	120	110	110	105	105	105	110	110	100	
15	100	100	100	100	100	125	120	110	110	110	110	110	105	105	110	G	150	120	110	110	105	110	110	105	
16	105	105	100	100	100	130	120	110	110	105	105	110	130	120	110	115	115	115	110	S	105	105	105	105	
17	S	105	125	140	S	120	120	110	110	105	105	115	105	100	100	125	120	110	110	115	110	110	110	105	
18	100	100	100	100	100	115	110	110	105	105	100	105	105	100	100	100	100	100	100	100	105	105	105	100	
19	100	100	100	100	100	130	120	110	105	105	105	105	105	105	100	105	100	100	105	110	110	100	110	100	
20	100	95	95	100	100	105	130	115	110	110	105	105	105	100	100	100	100	130	120	120	105	105	105	105	
21	100	105	100	100	105	105	130	110	105	105	105	105	110	110	105	115	105	120	110	105	105	105	105	105	
22	105	105	100	95	95	100	115	110	105	105	105	105	100	100	105	105	100	100	110	110	110	105	105	100	
23	100	S	S	100	100	115	120	105	105	100	110	110	105	105	100	120	120	120	115	110	110	110	110	105	
24	105	130	100	S	100	95	125	110	110	110	110	110	110	110	110	105	120	115	110	110	110	110	S	100	
25	100	S	S	S	S	130	125	120	110	110	105	105	105	105	100	100	100	115	110	105	105	105	S	100	
26	100	100	100	S	100	G	125	120	110	105	105	105	105	100	100	130	100	120	115	110	95	105	105	100	
27	100	100	95	95	150	130	125	115	120	110	110	110	105	100	105	105	110	110	110	110	110	105	105	105	
28	S	S	120	120	135	135	120	110	110	110	110	110	110	120	125	110	110	110	105	105	110	105	105	100	
29	100	100	100	100	100	150	130	120	125	105	G	110	110	110	105	110	G	135	G	S	S	S	S	S	
30	S	S	S	S	S	120	120	120	115	125	110	110	130	130	125	125	120	115	110	110	110	105	105	105	
31	105	100	105	110	S	130	125	120	115	105	110	105	110	120	115	110	110	105	105	105	105	105	105	105	
	00	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	16	19	17	19	25	28	31	31	31	30	30	29	30	29	28	29	31	30	29	29	28	24	24	
MED	100	100	100	100	100	130	125	120	110	110	110	110	105	105	105	115	120	120	110	110	110	105	105	105	
UQ	105	105	102	100	102	135	130	120	112	110	110	110	110	110	110	130	120	120	115	110	110	110	110	105	
LQ	100	100	100	100	100	120	120	110	110	105	105	105	105	100	105	105	105	110	110	110	105	105	105	100	

MAY. 1987

H⁺ES (KM)

IONOSPHERIC DATA

MAY. 1987

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								C3	C2	C3	C2	C1		C1	H1	C2	C3	C3	C5	F7	F1	F1	F2	F1	
2						HL21		C3	C3	C3	C3	C2	C1	C1		L2	L3	L3	L4	L6	F4	F3	FF11	F2	F2
3		F1		F1		F4		C3	C2	C2	C2	C2	C2	C1			H2	C3	C5	F7	F5	F3	F1		
4				F3			C2		C2	C3	C2	L2	C1	L2	L2	H1	C2	C2	CL51	F3	F1				
5						H2		C4	C2	C3	C2	C2	C2	C1	H2	C2	C2	CL43	CL32	CL34	FF32	FF23	F5	F2	
6				F2		F2	C2	C2	C3	C2	C2	C2	C2	C3	C3	H1	C1	C1	C2	C5	F1			F3	F2
7		F2	F2			F2	H2	H2	C3	LC12	C2	C2	C1		C2	C2	C2	C3	C4	C3	F2	F3	F2	F2	F2
8		F2				F2	C2	C3	C2	C2	C1	C2	C2	C1	C1	C1		C1	C4	C6	F7	F2	F4		F2
9				F1					C3	C1	C1	C2	C1	C1	H1	C1	HL12	H1	C2	C3	F2	F5	F2		
10		F2		F1					C2	C2	C2	C1	C2	C1	C1	H1	C2	C3	C3	C3	F4	F6	F1		
11		F3	F2	F4		F2	H2	C3	C3	C3	C3	C3	C3	C3	C2	C4	H1	H2	C3	C4	F4	F3	F6	F3	F3
12		F3	F4	F3	F2	F1	H2	C5	C4	C3	C2	C1	C2	C2	C2	C2	H2	CL21	C3	C3	F4	F7	F2	F2	
13							H2	C2	C2	C2	C2	C2	C2	C1	C1	C1	C2		CL31	C4	F6	F4	F2	F2	F3
14		F2				C1	C2	C3	C4	C3	C3	C2	C2	C2	C1	C1	C4	C3	C3	L3	F3	F2	F6	F6	F4
15		F3	F5	F2	F5	F2	C4	C4	C7	C3	C3	C4	C3	C5	C2	C1		H1	C2	CL33	F2	F3	F5	F7	F4
16		F6	F3	F4	F4	F4	C5	C6	C3	C3	C7	C2	C2	C2	C3	C2	C3	C6	C5	C4		F2	F3	F5	F2
17			F2	F2	FF21		C4	C3	C2	C2	C2	C2	C1	C2	L2	L2	C1	C3	C3	C2	F4	F6	F4	F4	F3
18		F3	F3	F2	F4	F3	C2	C4	C5	C4	C5	C4	C2	C2	L2	L2	L3	L3	L2	L2	F3	F4	F3	F5	F2
19		F2	F4	F4	F4	F2	C3	C3	C3	C3	C3	C2	C3	C2	L2	L2	L1	L2	L3	L4	F1	F2	F2	F6	F3
20		F2	F2	F3	F2	F4	L2	C2	C3	C3	C4	C7	C3	C4	L3	L3	L3	L2	C1	C2	F1	F5	F2	F2	F3
21		F4	F2	F2	F2	F2	L2	C2	C5	C3	C2	C3	C4	C2	C2	C3	C1	C3	C2	C5	L3	F3	F4	F7	F7
22		F5	F5	F3	F3	F4	L2	C2	C3	C5	C3	C3	C3	C4	C3	C2	C2	L3	L6	CL43	C5	F7	F3	F2	F4
23		F1			F1	F1	CL11	C1	C2	C2	L2	C2	C2	C2	L2	L2	CL22	CL22	CL22	CL23	CL43	F5	F6	F6	F4
24		F3	F1	F2		F1	L1	C3	C2	C5	C2	C2	C2	C2	C1	C1	C2	C2	C3	C4	C6	F4	F4		F3
25		F1				C2	C3	C3	C3	C4	C5	C2	C1	C2	L3	L4	L3	L3	CL22	C5	L3	F2	F3		F5
26		F3	F4	F1		F1		C3	C3	C3	C4	C3	C3	C2	L2	L2	CL12	L2	CL61	CL32	C4	F2	F4	F3	F3
27		F5	F4	F4	F2	FF11	C3	C5	C5	C4	C2	C2	C2	C2	C2	C4	L3	C3	C5	C6	C6	F6	F6	F4	F6
28				F4	F2	F2	H2	C3	C3	C2	C1	C1	C1	C1	C1	C1	C2	C2	C3	C4	L7	F3	F4	F5	F6
29		F7	F4	F2	F2	F2	H2	C4	C3	C1	C3		C1	C1	C1	C2	C1		H2						
30						C2	C2	C1	C1	C1	C2	C2	C2	C1	C2	C2	C2	C2	C4	C4	C7	F7	F3	F4	F3
31		F3	F3	F1	F1		C2	C3	C2	C2	C2	C1	C3	C2	C3	C3	C4	C4	C5	L3	L4	F7	F7	F4	F4
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																									
MED																									
UQ																									
LQ																									

MAY. 1987

TYPES OF ES

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 1987

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station		KOKUBUNJI TOKYO											Lat. 35° 42.4' N, Long. 139° 29.3' E											Sweep 1 MHz to 25 MHz in 24 sec in automatic operation										
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
1		59	X 54	X 50	48	49														X 101	X 93	A	X 51	A										
2		49	49	49	46	45	56													X 38	S	X 58	X 53	X 50										
3		56	58	49	A	X 50														X 90	X 88	X 71	X 61	X 45										
4		X 42	X 44	X 44	X 41	X 40														X 89	X 90	X 61	X 50	X 50										
5		X 46	X 47	X 44	44	X 42														A	X 71	A	A	A										
6		61	59	A	52	A														X 32	X 81	X 68	X 53	61										
7		X 56	X 55	55	56	50														X 92	X 71	X 63	68	64										
8		62	X 54	51	X 50	X 47														X 89	X 83	X 57	56	X 57										
9		X 55	X 52	X 50	X 49	X 49														X 91	X 88	X 69	X 67	67										
10		X 62	X 56	X 54	X 52	X 49														X 105	X 101	X 65	54	X 55										
11		S	S	O 53	X 54	X 49														X 80	X 91	X 70	A	A										
12		A	60	57	58	46														X 90	X 81	72	68	65										
13		65	62	X 56	X 53	X 52														S	X 78	73	A	69										
14		64	X 52	51	X 47	X 44														X 111	X 95	X 72	X 65	X 66										
15		X 63	58	57	56	X 59														X 86	X 80	A	A	A										
16		A	A	A	S	41														A	A	X 70	61	59										
17		63	62	55	52	51														X 84	X 87	82	66	A										
18		A	A	A	A	61	58													X 77	X 78	X 72	72	66										
19		65	62	59	60	58														X 76	X 79	X 74	66	A										
20		62	62	61	59	52														X 73	X 77	X 70	X 67	65										
21		64	60	U 58	X 60	63	67													X 87	X 73	65	60	54										
22		A	54	53	U 51	51														X 91	X 89	X 74	A	X 52										
23		X 50	55	S 43	46	54														X 80	X 87	X 73	X 65	71										
24		65	68	61	58	57														A	X 94	A	68	X 66										
25		68	62	60	X 57	54														A	A	75	X 75	X 67										
26		X 57	X 54	57	X 50	X 46														X 81	A	A	57	66										
27		60	55	51	51	48														X 76	X 79	X 70	65	67										
28		X 63	X 62	X 54	55	X 50														X 96	X 74	X 63	X 61	X 57										
29		X 54	X 53	X 49	X 49	X 53														X 84		X 79		C										
30		X 71	X 66	X 60	C	C														A	X 75	X 70	C	70										
31		C	X 50	X 48	C	C														C	C	X 65	C	X 64										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
CNT		25	28	28	26	28	3													24	25	26	23	24										
MED		62	56	54	52	50	58													X 88	X 81	X 70	65	64										
UQ		64	62	57	56	54	62													X 91	X 89	X 73	67	66										
LQ		X 56	X 54	50	X 49	X 46	57													X 80	X 78	X 65	58	X 56										

MAY. 1987

FXI (0.1 MHz)

IONOSPHERIC DATA

MAY. 1937 FOF2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	F	J R	J R	F	F	47	56	57	60	65	59	64	66	R	73	R	33	85	90	S	87	A	45	A		
2	F	F	F	F	F	50	51	66	62	63	61	63	72	85	84	86	84	70	75	R	S	J S	47	S		
3	F	F	F	A	S	44	44	52	74	69	63	60	58	63	67	67	58	72	74	R	84	82	65	55	39	
4	36	38	38	35	34	40	56	77	70	59	59	64	67	68	65	71	72	A	66	83	84	R	55	44	44	
5	40	41	38	F	36	47	61	64	52	63	66	A	A	A	R	73	33	35	77	A	A	S	A	A	A	
6	F	F	A	F	A	42	A	A	62	58	65	61	A	63	73	33	31	J R	66	76	75	S	62	52	F	
7	50	49	F	F	F	52	52	A	61	J R	A	A	85	79	86	93	95	106	38	86	65	57	F	F	F	
8	F	Z	F	44	41	51	72	64	62	67	80	88	76	70	R	U R	J R	S	U R	J S	77	51	48	51	51	
9	49	46	44	43	43	55	70	57	57	65	66	78	87	84	I C	I C	39	84	33	85	82	63	61	S	F	
10	56	50	48	46	43	50	65	62	65	65	67	58	A	68	75	75	77	75	34	99	U S	59	43	S	49	
11	I S	I S	U S	45	43	46	65	72	A	65	59	A	A	70	R	79	76	65	A	74	F	64	A	A	A	
12	A	F	F	F	40	32	41	60	A	74	A	51	59	63	65	71	83	32	A	U R	84	75	F	F	F	
13	F	53	50	47	46	60	70	56	55	54	A	62	69	69	A	A	D S	R	R	I S	72	F	A	F	F	
14	F	46	44	41	38	54	55	62	61	61	A	64	70	70	R	A	A	J R	100	102	U R	39	66	59	60	
15	57	F	F	F	53	46	A	A	A	A	A	A	A	A	A	A	67	A	71	J R	74	A	A	A	A	
16	A	A	A	S	S	47	59	A	A	A	A	A	A	65	62	A	A	A	A	A	A	J S	64	51	F	
17	F	F	F	F	F	41	55	66	59	61	A	55	62	63	65	66	59	59	59	A	78	J S	F	F	A	
18	A	A	A	A	F	48	55	61	A	A	A	A	63	69	71	70	J R	76	78	74	71	72	66	F	58	
19	F	F	F	F	F	50	59	A	74	71	69	A	65	70	70	I C	74	77	A	A	R	73	68	F	A	
20	F	F	F	F	F	45	56	A	A	A	A	A	A	J R	73	38	94	37	79	70	67	71	S	64	61	54
21	F	F	U S	F	F	50	59	69	72	65	A	A	64	A	A	73	85	37	79	J R	81	67	F	F	F	
22	A	46	F	U S	F	40	48	66	62	A	A	A	A	A	A	A	65	70	73	J R	85	33	68	A	46	
23	S	44	37	S	F	46	51	58	74	73	A	49	A	59	69	73	77	71	67	70	74	81	67	59	58	
24	F	F	F	F	F	42	53	67	65	A	A	C	C	C	C	C	C	C	C	A	A	Z	A	F	J S	
25	F	F	F	F	F	46	44	49	A	58	A	A	A	A	64	64	66	77	A	80	A	A	F	68	69	61
26	51	48	49	44	40	49	55	63	A	A	A	57	A	A	64	69	74	84	73	J R	A	A	F	F	55	
27	F	F	F	F	F	38	45	A	A	A	A	A	Y	Y	A	A	51	53	60	R	62	70	73	64	58	60
28	57	56	48	F	44	52	59	54	A	51	58	55	58	57	61	70	73	80	84	90	68	57	55	51	51	
29	48	47	43	43	47	62	50	50	62	59	A	52	67	70	I C	J R	79	92	35	78	I C	73	I C	I C	69	
30	65	60	54	I C	I C	59	I C	I C	I C	E G	59	I C	C	U R	I C	I C	C	71	A	A	69	64	I C	I C	U S	
31	I C	44	42	I C	I C	C	C	44	49	C	A	E G	E G	A	A	A	A	52	C	C	C	59	I C	I C	57	
	00	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	20	21	19	25	30	27	22	21	17	16	18	17	23	25	25	26	22	22	25	25	23	21	19		
MED	50	48	45	45	43	50	59	62	62	63	60	62	66	69	73	77	77	76	77	31	75	64	55	55		
UQ	54	50	49	46	46	53	66	70	65	65	66	64	70	70	78	83	34	84	84	85	32	66	59	60		
LQ	48	46	42	43	40	46	56	57	60	59	58	58	63	66	66	69	72	70	70	75	71	58	48	48		

MAY. 1937 FOF2 (0.1 MHz)

IONOSPHERIC DATA

MAY. 1987

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	A	A	A	450	450	460	400	440	430	A	L						
2							A	A	A	A	450	470	490	440	440	430	410	L	A					
3						A		A	A	A	A	A	A	U A 470	460	A	A	A	A					
4						L	400	430	440	460	450	H 460	H 450	460	430	A	A	A						
5						L	A	L	450	A	A	A	A	A	A	A	A	380	A					
6						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
7							A	A	A	A	A	A	A	A	A	A	A	A	A					
8						L	A	A	A	A	460	A	470	450	440	420	L							
9					L	L	A	L	A	470	460	U A 450	470	C	C	410	A	A						
10						L	L	400	430	440	H 480	490	A	460	440	A	A	A	A					
11					L	A	A	A	A	A	A	A	A	460	430	440	A	A	A					
12					A	A	A	A	A	A	480	460	450	440	430	A	A	A						
13						L	A	A	A	A	A	U A 470	A	A	A	A	420	370	A					
14						A	A	A	A	A	A	A	A	A	A	A	A	A	U L 320					
15					A	A	A	A	A	A	A	A	A	A	A	A	410	A	A					
16						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
17						L	A	A	A	A	460	460	450	460	A	A	A	A						
18					A	A	A	A	A	A	A	A	A	450	450	430	A	A	L					
19						A	A	A	440	A	A	A	A	U A 460	C	430	A	A						
20						L	A	A	A	A	A	A	A	U A 450	H 430	410	380	A						
21						L	360	400	L	A	A	A	A	A	A	440	A	A	A					
22						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
23						L	A	A	A	A	A	A	450	450	A	A	A	A						
24					L	L	A	A	A	C	C	C	C	C	C	C	C	C	A					
25						L	A	A	A	A	A	A	A	A	A	U A 440	A	A	A					
26						L	A	A	A	A	A	A	A	U A 450	A	A	A	A						
27						L	A	A	A	A	A	U R 420	Y	A	A	5	U A 400	A	A					
28						L	L	L	A	A	450	460	450	450	430	420	420	390	A					
29							A	A	430	A	Y	U Y 460	430	I C 430	420	400	370	A						
30					L	I C 360	I C 330	C	440	A	C	C	C	C	C	C	C	A	A					
31						C	C	370	400	C	A	420	420	A	A	A	A	U A 380	C					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2	5	3	6	5	12	10	15	16	11	11	6	1					
MED							360	400	430	440	460	460	455	450	445	430	410	380	U L 320					
UQ							L	400	430	440	470	470	460	460	455	440	420	380						
LQ								380	415	440	450	450	450	450	435	430	410	370						

MAY. 1987

FOF1 (0.01 MHz)

IONOSPHERIC DATA

MAY. 1987

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	230	280	295	315	335	A	A	345	340	305	285	235	A					
2						A	220	270	305	315	330	335		A	A	A	A	285	235	165				
3						B	A	A	300	310	320	335	330	A	A	A	295	240	160					
4						B	215	270	295	320		A	A	A		335	310	285	245	A				
5						B	215	275	300	315	320	335		A		350	335	325	295	240				
6						B	230	280	305		A	B	B	350	340	325	300	270	A	B				
7							165	235	280	305	330	335	340	335	335	325	305	275	A	A				
8						B	230	280	310	320		A	A	A	A	330	310	230	235	A				
9						B	230	270	305	315		A	A	A	C	C	285	245	A					
10						B	A	270	300	315	330	335		A	A	345	320	295	245	A				
11						B	220	275	300	320	335	340	345	355	335	315	275	235	150					
12							165	240	275	305	320	345	345	A	A	335	320	290	240	165				
13						B	240	285	310	325	335	340	335	A		325	310	290	A	A				
14							160	235	275	305	320	340	340	340	A	340	320	295	230	B				
15						B	235	290	310	320	335	350		A	A	A	A	A	A	A				
16						B	245	280	310	330		A	345	A	360	350	320	300	245	A				
17							165	245	275	305		A	A	A	A	350	330	295	245	A				
18						A	235	275	305		A	A	A	A	A	A	A	A	A	A				
19							160	230	275	305		A	A	A	A	A	C	A	A	A				
20						A	245	285	320		A	350		S	S	A	A	A	A	190				
21						A	240	275		A	A	A	A	345	345	335	300	285	230	A				
22						B	230	280	300	310		A	A	A	A	A	A	A	A	A				
23						B	195	275		A	A	A	A	A	A	A	A	A	A	A				
24						A	235	270	305	315		C	C	C	C	C	C	C	C	A				
25							155	245	285	310	325	345		A	A	A	A	310	275	190				
26							170	245	270	295	305		A	A	A	A	A	A	A	A				
27							175	235	275	305	330	335	340	A	A	R	B	280	240	A				
28							170	240	270	290	U A	A	A	A	A	345	315	290	245	A				
29							165	240	275	305	315	325		A	B	335	C	A	290	A	135			
30							I C	I C	I C	290	305	330		C	C	C	C	C	240	A				
31							C	C	265	290		C	325	335	350	345	325	305	285	240	C			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						11	28	30	29	23	17	13	8	10	17	16	22	19	7					
MED						165	235	275	305	315	335	340	342	345	335	312	288	240	165					
UQ						168	240	280	305	320	335	340	348	350	340	320	295	245	188					
LQ						160	230	270	300	315	330	335	335	340	325	305	285	235	162					

MAY. 1987

FOE (0.01 MHz)

IONOSPHERIC DATA

MAY. 1987

FOES (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station		KOKUBUNJI TOKYO											Lat. 35° 42.4' N, Long. 139° 29.3' E											Sweep 1 MHz to 25 MHz in 24 sec in automatic operation										
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
1	J A	24	25	J A	29	19	19	E B	15	30	J A	46	J A	61	J A	52	J A	49																
2	J A	31	22	23	19	J A	32	28	43	J A	61	J A	62	J A	51	46	42	39	39	38	J A	35	G											
3	J A	52	J A	32	J A	51	J A	44	42	58	J A	35	J A	81	J A	66	J A	54	J A	58	J A	51	50	J A	47									
4	J A	23	J A	18	22	19	E B	14	19	28	34	40	J A	46	40	39	41	39	43	J A	51	J A	72	J A	66									
5	E B	13	21	E B	14	23	J A	27	21	32	60	J A	44	J A	46	73	J A	90	J A	97	J A	69	J A	67										
6	J A	28	34	J A	63	J A	50	J A	49	J A	28	67	73	J A	58	J A	55	50	59	J A	91	65	78	J A	67									
7	J A	26	J A	30	J A	36	J A	30	J A	25	24	37	63	J A	60	J A	66	J A	85	J A	95	J A	78	J A	65									
8	J A	32	26	J A	36	J A	25	J A	18	19	37	J A	52	J A	46	J A	51	J A	68	42	J A	54	J A	43	G									
9	J A	19	21	17	18	E B	13	20	28	J A	41	J A	44	J A	63	J A	49	J A	53	J A	49	G	C	C										
10	22	19	18	22	J A	24	21	27	36	34	40	40	J A	59	83	J A	50	39	48	J A	68	J A	62	J A	79									
11	19	20	E S	E S	E B	14	12	J A	43	J A	66	73	60	61	J A	84	J A	152	40	41	38	J A	70	J A	85									
12	J A	72	J A	51	J A	32	J A	33	22	J A	39	J A	51	J A	69	J A	68	J A	82	43	J A	45	41	38	G									
13	19	20	25	27	J A	19	22	30	J A	53	J A	56	J A	52	J A	67	J A	53	J A	79	105	72	J A	70	J A	44								
14	J A	26	J A	18	24	18	J A	19	27	J A	44	J A	45	58	J A	55	J A	68	J A	59	J A	65	J A	67	J A	66								
15	J A	30	28	J A	22	J A	34	J A	26	J A	52	66	J A	79	74	156	85	34	J A	104	77	J A	168	J A	110									
16	J A	53	J A	57	J A	37	J A	29	J A	29	J A	35	J A	52	J A	79	J A	105	J A	104	129	228	J A	81	51	J A	73							
17	J A	41	J A	38	28	J A	30	24	25	34	J A	43	55	J A	67	J A	54	J A	46	39	40	39	J A	65	J A	59								
18	J A	119	J A	82	J A	66	J A	82	J A	49	36	J A	83	J A	63	J A	85	J A	170	J A	114	84	J A	80	42	J A	54							
19	J A	43	J A	41	J A	45	J A	48	J A	26	J A	29	J A	46	71	J A	49	58	J A	67	J A	113	J A	65	J A	51								
20	J A	65	J A	53	J A	52	J A	53	J A	37	19	J A	49	J A	83	J A	101	J A	183	J A	139	J A	111	J A	114	49	J A	48						
21	J A	33	J A	48	J A	48	J A	31	J A	43	J A	31	27	32	J A	53	J A	87	J A	77	J A	75	J A	72	J A	76								
22	J A	76	J A	50	J A	63	J A	48	J A	44	J A	33	J A	51	J A	63	J A	95	J A	82	J A	87	70	J A	96	J A	128							
23	J A	24	J A	25	J A	34	E B	17	E B	15	J A	33	J A	29	J A	42	J A	79	J A	85	J A	50	J A	87	J A	50								
24	J A	52	J A	41	J A	26	J A	62	J A	27	24	33	J A	51	J A	100	J A	87	C	C	C	C	C	C	C	C	C							
25	J A	63	J A	52	J A	42	26	27	20	J A	42	63	J A	65	J A	82	J A	91	J A	88	J A	81	J A	47	52	J A	58							
26	22	J A	29	J A	32	30	J A	20	22	32	J A	53	74	68	J A	100	J A	82	J A	87	90	J A	52	J A	78	60	J A	73						
27	J A	54	J A	43	J A	63	J A	22	J A	19	J A	32	59	86	J A	82	72	69	41	38	70	49	E B	44	J A	52								
28	J A	20	18	21	J A	25	J A	29	26	32	33	J A	86	J A	60	J A	44	36	41	J A	43	38	39	34	J A	41								
29	J A	37	J A	51	J A	50	J A	30	23	22	30	J A	50	52	45	J A	81	38	43	40	C	36	33	J A	35	J A	39							
30	E B	14	E B	13	E B	13	C	C	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C							
31	C	J A	27	J A	28	C	C	C	C	C	C	J A	43	J A	42	C	J A	47	J A	50	39	J A	59	J A	78	60	J A	62						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23										
CNT	30	31	31	29	29	30	29	30	30	30	30	29	29	30	27	27	29	30	29	30	29	30	29	31	28	30								
MED	J A	30	J A	29	J A	32	J A	29	J A	25	24	37	J A	56	J A	62	J A	63	J A	68	J A	59	J A	65	48	49	J A	51						
UQ	J A	52	J A	46	J A	49	J A	34	J A	29	J A	32	J A	49	J A	69	J A	79	J A	82	J A	35	J A	84	J A	83	J A	67						
LQ	J A	22	21	22	22	19	20	30	J A	43	J A	52	J A	52	J A	49	J A	45	41	40	39	40	J A	49	J A	49	J A	48						

MAY. 1987

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 1987

FBES (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station		KOKUBUNJI TOKYO		Lat.	35° 42.4' N		Long.	139° 29.3' E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation															
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E ₁₄ ^B	E ₁₄ ^B	E ₁₄ ^B	E ₁₄ ^B	E ₁₃ ^B	E ₁₅ ^B	29	43	55	46	45	37	37	38	38	39	32	43	28	28	21	A ₇₉ ^A	17	A ₅₅ ^A	
2	E ₁₄ ^B	E ₁₄ ^B	E ₁₃ ^B	E ₁₄ ^B	E ₁₄ ^B	20	40	55	57	50	44	40	39	37	38	31		G	26	38	27	25	20	24	19
3	26	20	19	A ₄₄ ^A	31	28	33	61	59	42	47	51	50	47	36	48	54	64	61	52	32	33	20	29	
4	16	E ₁₃ ^B	E ₁₄ ^B	E ₁₅ ^B	E ₁₄ ^B	19	27	32	34	39	40	36	38	37	37	40	49	A ₇₂ ^A	57	23	37	30	E ₁₅ ^B	E ₁₄ ^B	
5	E ₁₃ ^B	E ₁₄ ^B	E ₁₄ ^B	E ₁₄ ^B	E ₁₄ ^B	16	29	55	40	43	56	A ₉₀ ^A	A ₉₇ ^A	A ₆₉ ^A	61	46	48	28	A ₉₂ ^A	A ₁₀₁ ^A	49	A ₇₂ ^A	A ₆₈ ^A	A ₇₀ ^A	
6	E ₁₃ ^B	15	A ₆₃ ^A	23	A ₄₉ ^A	20	A ₆₇ ^A	A ₇₃ ^A	56	51	48	54	A ₉₁ ^A	57	53	57	43	75	54	47	20	E ₁₄ ^B	E ₁₄ ^B	22	
7	19	E ₁₅ ^B	22	18	21	22	35	A ₆₃ ^A	53	54	A ₈₅ ^A	A ₉₅ ^A	60	62	62	53	59	77	42	38	27	23	23	21	
8	27	E ₁₃ ^B	25	24	E ₁₄ ^B	17	36	45	43	50	61	41	52	43	30	G	G	30	30	29	20	52	20	E ₁₅ ^B	E ₁₅ ^B
9	E ₁₅ ^B	E ₁₄ ^B	E ₁₃ ^B	E ₁₄ ^B	E ₁₃ ^B	19	27	37	41	59	40	43	45	G	C	C	36	70	34	32	22	24	E ₁₅ ^B	E ₁₄ ^B	
10	E ₁₄ ^B	E ₁₃ ^B	E ₁₄ ^B	E ₁₄ ^B	20	17	23	36	33	38	39	39	A ₈₃ ^A	39	38	47	66	56	61	60	24	36	20	19	
11	E ₁₅ ^B	E ₁₅ ^B	E ₂₂ ^S	E ₁₆ ^S	E ₁₄ ^B	17	42	64	A ₇₃ ^A	60	55	A ₈₄ ^A	A ₁₅₂ ^A	39	39	37	70	55	A ₇₄ ^A	55	79	51	A ₆₅ ^A	A ₇₂ ^A	
12	A ₇₂ ^A	25	20	20	E ₁₃ ^B	32	43	A ₆₉ ^A	66	A ₈₂ ^A	40	40	38	37		G	36	76	A ₁₅₁ ^A	54	28	43	20	E ₁₄ ^B	E ₁₅ ^B
13	E ₁₃ ^B	E ₁₃ ^B	E ₁₃ ^B	17	E ₁₄ ^B	21	29	46	53	49	A ₆₇ ^A	47	64	56	A ₇₂ ^A	A ₇₀ ^A	40	33	A	51	50	44	A ₈₆ ^A	50	
14	19	E ₁₃ ^B	E ₁₄ ^B	E ₁₅ ^B	E ₁₃ ^B	24	43	42	49	53	A ₆₈ ^A	57	61	48	53	A ₁₄₀ ^A	A ₁₆₃ ^A	A ₁₀₃ ^A	25	19	E ₁₅ ^B	22	27	26	
15	22	E ₁₄ ^B	19	21	21	43	A ₆₆ ^A	A ₇₉ ^A	A ₇₄ ^A	A ₁₅₆ ^A	A ₈₅ ^A	A ₈₄ ^A	A ₁₀₄ ^A	A ₇₇ ^A	A ₁₆₈ ^A	A ₁₁₀ ^A	35	A ₉₁ ^A	48	29	35	A ₁₁₂ ^A	A ₈₀ ^A	A ₈₄ ^A	
16	A ₅₃ ^A	A ₅₇ ^A	A ₅₇ ^A	21	22	30	50	A ₇₉ ^A	A ₁₀₅ ^A	A ₁₀₄ ^A	A ₁₂₉ ^A	A ₂₂₈ ^A	A ₈₁ ^A	49	54	A ₈₅ ^A	A ₇₂ ^A	A ₁₁₂ ^A	A ₇₉ ^A	A ₈₀ ^A	A ₈₅ ^A	25	32	37	
17	E ₁₅ ^B	21	19	19	E ₁₃ ^B	23	30	41	47	A ₆₇ ^A	51	44	39	36	37	44	46	51	A ₃₂ ^A	34	30	45	42	A ₈₃ ^A	
18	A ₁₁₉ ^A	A ₈₂ ^A	A ₆₆ ^A	A ₈₂ ^A	19	34	51	49	A ₈₅ ^A	A ₁₇₀ ^A	A ₁₁₄ ^A	A ₈₄ ^A	47	37	42	36	42	45	29	37	32	22	35	26	
19	27	24	33	21	19	21	38	A ₇₁ ^A	47	40	62	A ₁₁₃ ^A	55	43	46	C	32	A ₈₃ ^A	A ₁₁₄ ^A	31	22	20	27	A ₆₆ ^A	
20	20	23	26	25	20	19	33	A ₈₃ ^A	A ₁₀₁ ^A	A ₁₃₃ ^A	A ₁₃₉ ^A	A ₁₁₁ ^A	A ₁₁₄ ^A	48	45	35	32	29	33	27	34	28	21	26	
21	20	E ₁₄ ^B	32	19	19	24	27	31	44	A ₈₇ ^A	A ₇₇ ^A	58	A ₇₂ ^A	A ₇₆ ^A	35	47	47	60	38	39	49	24	29	35	
22	A ₇₆ ^A	34	35	35	27	25	46	57	A ₉₅ ^A	A ₈₂ ^A	A ₈₇ ^A	A ₇₀ ^A	A ₉₆ ^A	A ₁₂₈ ^A	A ₁₀₃ ^A	56	51	45	39	41	44	61	A ₈₅ ^A	19	
23	E ₁₄ ^B	20	E ₁₅ ^B	E ₁₇ ^B	E ₁₅ ^B	32	24	41	45	A ₈₅ ^A	45	A ₈₇ ^A	40	40	44	43	48	54	34	17	21	25	22	26	
24	44	32	21	17	20	22	31	51	A ₁₀₀ ^A	A ₈₇ ^A	C	C	C	C	C	C	C	C	A ₉₄ ^A	A ₉₃ ^A	61	A ₁₀₃ ^A	46	E ₁₃ ^B	
25	43	23	23	E ₁₅ ^B	E ₁₃ ^B	19	39	A ₆₃ ^A	45	A ₈₂ ^A	A ₉₁ ^A	A ₃₈ ^A	A ₈₁ ^A	46	49	44	58	A ₁₇₂ ^A	78	A ₁₄₁ ^A	A ₉₉ ^A	19	19	21	
26	16	18	22	21	18	20	27	49	A ₇₄ ^A	A ₆₈ ^A	A ₁₀₀ ^A	45	A ₈₇ ^A	A ₉₀ ^A	45	61	51	73	43	33	A ₉₀ ^A	A ₁₀₇ ^A	32	42	
27	22	29	25	16	E ₁₃ ^B	27	A ₅₉ ^A	A ₆₆ ^A	A ₈₂ ^A	A ₇₂ ^A	A ₆₉ ^A	39	U ₃₃ ^Y	A ₇₀ ^A	A ₄₉ ^A	E ₄₄ ^B	40	42	48	23	55	55	39	23	
28	E ₁₄ ^B	E ₁₃ ^B	E ₁₄ ^B	14	E ₁₃ ^B	21	28	28	A ₈₆ ^A	50	37	37	37	39	36	38	31	32	47	43	E ₁₅ ^B	E ₁₃ ^B	E ₁₄ ^B	22	
29	23	34	29	26	E ₁₄ ^B	20	28	45	49	37	A ₈₁ ^A	U ₃₈ ^Y	U ₄₂ ^Y	37	C	35	32	27	32	27	C	E ₁₄ ^B	C	C	
30	E ₁₄ ^B	E ₁₃ ^B	E ₁₃ ^B	C	C	G	C	C	C	33	54	C	C	E ₄₇ ^C	C	C	C	50	A ₈₆ ^A	A ₈₆ ^A	35	E ₁₅ ^B	C	29	
31	C	26	E ₁₄ ^B	C	C	C	C	30	36	C	A ₄₇ ^A	37	37	A ₅₉ ^A	A ₇₈ ^A	A ₆₀ ^A	A ₆₂ ^A	38	C	C	C	17	C	27	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	31	31	29	29	30	29	30	30	30	30	29	29	30	27	27	29	30	30	30	29	31	28	30	
MED	19	15	20	18	E ₁₄ ^B	21	33	50	54	56	58	51	55	45	45	44	47	54	48	36	35	25	26	26	
UQ	27	24	26	21	20	25	43	A ₆₄ ^A	A ₇₄ ^A	A ₈₂ ^A	A ₈₅ ^A	A ₈₄ ^A	A ₈₃ ^A	59	54	56	58	75	A ₇₈ ^A	52	50	48	40	42	
LQ	E ₁₄ ^B	E ₁₄ ^B	E ₁₄ ^B	E ₁₅ ^B	E ₁₃ ^B	19	28	41	45	46	45	40	39	38	38	37	35	38	34	27	24	20	18	19	

MAY. 1987

FBES (0.1 MHz)

IONOSPHERIC DATA

MAY. 1987

FMIN (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	KOKUBUNJI TOKYO								Lat.	35° 42.4' N			Long.	139° 29.3' E			Sweep	1 MHz to 25 MHz		in 24 sec in		automatic operation			
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	14	14	14	14	13	15	13	14	16	16	19	20	21	19	17	14	14	14	13	14	14	14	15	15	
2	14	14	13	14	14	14	13	14	14	15	16	16	19	20	15	20	14	13	13	14	14	15	15	14	
3	15	14	13	15	14	14	14	14	15	16	19	20	20	20	19	16	15	14	14	14	14	14	15	13	
4	14	13	14	15	14	14	13	14	19	16	21	20	21	21	20	16	14	14	14	15	14	13	15	14	
5	13	14	14	14	14	13	13	15	15	15	17	21	20	21	21	15	15	15	14	13	14	14	14	14	
6	13	13	13	14	14	15	12	15	15	20	34	37	27	24	22	19	15	14	14	14	13	14	14	15	
7	15	14	14	14	14	13	14	14	18	13	21	20	22	21	22	19	16	15	13	14	14	13	14	13	
8	15	13	14	13	14	14	14	16	17	13	19	20	21	22	20	20	15	14	15	14	15	14	15	15	
9	15	14	13	14	13	14	15	15	19	20	21	21	22	20	C	C	15	16	14	14	14	14	15	14	
10	14	13	13	14	14	14	13	14	20	17	21	21	21	27	21	20	15	16	13	14	14	15	14	14	
11	15	15	E S 22	E S 16	14	14	15	15	16	20	20	21	20	19	19	17	19	14	13	14	13	15	E S 15	15	
12	14	13	13	13	13	13	14	20	16	18	21	20	21	20	20	15	15	15	14	14	13	14	14	15	
13	13	13	13	13	14	13	14	16	16	19	21	23	20	21	20	20	19	14	13	E S 19	14	15	13	13	
14	13	13	14	14	13	14	14	16	16	15	19	23	21	20	21	19	16	14	15	E S 17	15	14	15	14	
15	14	14	14	13	14	13	13	15	16	21	20	22	21	22	19	17	15	14	13	13	13	15	13	14	
16	15	13	14	15	15	14	14	13	15	19	24	28	25	21	26	20	16	14	13	14	14	14	14	13	
17	15	15	14	15	13	12	14	17	16	E S 27	20	20	28	E S 25	20	20	15	15	13	14	13	15	13	13	
18	14	14	E S 17	16	13	14	13	13	15	16	19	22	22	25	20	17	15	14	15	14	15	14	13	14	
19	13	13	13	13	12	13	15	16	16	21	21	21	20	20	20	C	17	15	15	14	14	14	15	15	
20	13	14	14	14	15	14	14	15	16	20	22	24	E S 35	E S 35	20	19	15	15	13	14	15	13	13	14	
21	13	14	14	12	12	13	13	15	16	17	17	19	21	19	17	16	15	13	15	13	13	13	12	13	
22	14	13	14	13	14	14	14	15	18	16	20	21	21	21	22	19	16	15	13	14	13	15	14	13	
23	14	13	13	17	15	13	13	14	15	20	20	19	19	19	19	15	14	13	13	13	15	14	14	13	
24	13	14	13	14	13	13	15	15	16	19	C	C	C	C	C	C	C	C	13	13	13	14	13	13	
25	13	13	13	15	13	13	14	14	16	19	22	22	20	27	31	16	16	14	14	E S 20	15	14	15	13	
26	13	14	14	14	14	13	14	13	16	19	21	21	27	26	21	20	15	15	13	15	14	14	13	14	
27	14	14	13	14	13	14	14	15	16	20	21	21	27	21	21	44	14	15	15	14	13	15	13	14	
28	14	13	14	12	13	13	15	14	15	21	21	20	23	21	20	20	15	14	13	14	15	13	14	13	
29	15	13	14	13	14	13	14	16	19	20	20	21	33	25	C	20	16	15	13	13	C	14	C	C	
30	14	13	13	C	C	13	C	C	C	22	19	C	C	E C 47	C	C	C	14	13	14	15	15	C	15	
31	C	14	15	C	C	C	C	15	16	C	16	20	20	20	20	16	16	15	C	C	C	13	C	15	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	31	31	29	29	30	29	30	30	30	30	29	29	30	27	27	29	30	30	30	29	31	28	30	
MED	14	14	14	14	14	14	14	15	16	19	20	21	21	21	20	19	15	14	13	14	14	14	14	14	
UQ	15	14	14	14	14	14	14	15	16	20	21	22	22	24	21	20	16	15	14	14	15	15	15	15	
LQ	13	13	13	13	13	13	13	14	15	16	19	20	20	20	20	16	15	14	13	14	13	14	13	13	

MAY. 1987

FMIN (0.1 MHz)

IONOSPHERIC DATA

MAY. 1987

M(3000)F2 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station		KOKUBUNJI TOKYO		Lat.	35° 42.4' N		Long.	139° 29.3' E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																							
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
1	F	JR	JR	JR	F	F	335	350	360	A	320	300	315	295	295 ^R	295	305 ^R	290	305	310	325 ^S	340	A	325	A								
2	F	F	F	F	F	F	340	335	A	A	305	320	305	300	300	300	305	325	315	305	270 ^R	S	J	S	300	320 ^S							
3	F	F	F	F	A	295 ^S	310	335	340	340	315	285	300	290	305	305	295	305	295	305 ^R	320	330	335	315	300								
4	300	315	325	320	305	315	315	335	335	325	315	305	290	305	285	305	310	A	A	A	315	335	330 ^R	310	320								
5	305	300	295	F	305	325	345	340	325	310	310	A	A	A	A	285 ^R	305	320	325	A	A	S	A	A	A								
6	F	F	A	F	A	335	A	A	330	350	305	305	A	295	295	305	315	A	A	315	315	325	320 ^S	305	F								
7	300	290	F	F	F	340	360	A	A	JR	A	A	295	290	290	290	295	320	320	325	315	315	F	F									
8	F	Z	300	F	310	315	320	345	330	325	295	295	310	310	295	300	300 ^{UR}	305 ^{JR}	S	320	325	335 ^S	335	300	300								
9	305	305	305	305	305	340	355	350	300	320	290	305	300	300	C	C	310	315	315	320	320	320	290 ^S	F									
10	305	310	315	320	315	325	345	340	320	340	320	265	A	290	300	290	295	290	295	315	335 ^{US}	350	305	290 ^S									
11	I	S	I	S	U	S	285	F	295	300	320	A	A	315	A	A	A	295	300	300	A	325	A	310	F	335	A	A					
12	A	F	F	F	320	315	325	320	A	335	A	355	270	290	290	280	290	A	A	JR	305	320	315	F	F	F							
13	F	300	305	300	300	330	345	355	A	290	A	300	A	295	A	A	S	R	R	S	320	F	A	F									
14	F	305	300	F	305	300	340	350	350	315	315	A	280	305	290	290 ^R	A	A	A	305	325 ^{UR}	340	325	300	305								
15	300	F	290	F	335	A	A	A	A	A	A	A	A	A	A	A	305	A	A	310	315	325	A	A	A								
16	A	A	A	S	320	300	315	A	A	A	A	A	A	290	A	A	A	A	A	A	A	A	J	S	290	F							
17	F	F	F	F	F	335	345	335	335	A	A	290	300	300	300	315	300	295	A	300	J	S	F	F	A								
18	A	A	A	A	305	310	A	325	A	A	A	A	295	290	295	295	J	R	300	320	325	320	310	320	F	310							
19	F	F	F	F	F	320	315	A	315	330	305	A	275	290	290	C	305	A	A	R	340	320	325	290	A								
20	F	F	F	F	F	340	315	A	A	A	A	A	A	J	R	310	285	300	315	320	325	305	315	315	305	300							
21	F	U	S	U	S	300	320	335	340	355	A	A	275	A	A	285	290	310	305	J	R	310	335	295	335	F	F	300					
22	A	F	F	U	S	310	315	330	A	A	A	A	A	A	A	290	300	295	J	R	310	305	315	320	A	300							
23	S	295	F	S	305	315	335	305	325	325	A	A	A	270	285	305	300	295	305	305	320	315	270 ^S	300	295								
24	F	F	F	F	F	325	320	335	A	A	C	C	C	C	C	C	C	C	C	A	A	320	A	F	J	S	310						
25	F	F	F	F	F	270	295	A	280	A	A	A	A	290	285	275	285	A	A	A	A	A	F	300	305								
26	315	295	300	320	320	325	325	325	325	A	A	A	270	A	A	295	235	305	A	320	J	R	A	A	270	F	270						
27	F	F	F	F	F	A	A	A	A	A	A	Y	Y	A	A	260	270	285	285	R	305	295	285	290	F	F							
28	285	310	290	300	310	310	305	325	A	A	310	275	295	275	290	290	300	310	315	320	345	320	300	300									
29	300	290	280	310	330	365	345	A	330	315	A	290	280	275	I	C	R	285	315	315	310	I	C	300	C	C							
30	315	320	295	I	C	I	C	I	C	I	C	I	C	G	295	I	C	290	C	U	R	C	C	310	A	A	315	305	I	C	U	S	300
31	C	295	290	I	C	I	C	C	C	240	295	C	A	G	G	A	A	A	A	285	C	C	C	295	C	295							
CNT	21	20	21	19	25	29	26	18	17	16	13	18	16	23	22	22	23	19	20	24	25	23	19	18									
MED	300	300	300	305	310	325	332	335	325	315	305	290	295	290	292	295	305	310	310	318	320	320	300	300									
UQ	305	305	305	315	315	335	345	340	335	322	315	305	300	298	300	305	310	318	318	322	330	332	305	305									
LQ	300	295	290	298	300	310	315	325	315	300	295	275	285	290	285	290	295	295	305	310	315	305	295	295									

MAY. 1987

M(3000)F2 (0.01)

IONOSPHERIC DATA

MAY. 1987

M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station		KOKUBUNJI TOKYO										Lat. 35° 42.4' N, Long. 139° 29.3' E										Sweep 1 MHz to 25 MHz in 24 sec in automatic operation									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
1							A	A	A	A	425	400	375	385	A	375	A	L													
2							A	A	A	A	A	375	380	395	375	395	360	L	A												
3						A		A	A	A	A	A	A	A	395	A	A	A	A												
4							L	375	375	365	395	H	405	H	365	375	A	A	A	A											
5							L	A	L	A	A	A	A	A	A	A	A	365	A												
6							A	A	A	A	A	A	A	A	A	A	A	A	A	A											
7								A	A	A	A	A	A	A	A	A	A	A	A	A											
8							L	A	A	A	A	A	A	A	380	375	365	L													
9						L	L	A	L	A	385	A	A	A	400	C	C	A	A	A											
10							L	L	375	405	390	H	390	395	A	380	380	A	A	A	A										
11						L	A	A	A	A	A	A	A	A	355	355	350	A	A	A											
12						A	A	A	A	A	A	365	385	385	380	365	A	A	A												
13							L	A	A	A	A	A	A	A	A	A	A	A	A	A											
14							A	A	A	A	A	A	A	A	A	A	A	A	A	U	L										
15						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	350										
16							A	A	A	A	A	A	A	A	A	A	A	A	A	A											
17							L	A	A	A	A	A	395	385	375	A	A	A	A												
18						A	A	A	A	A	A	A	A	395	A	370	A	A	L												
19							A	A	A	360	A	A	A	A	A	C	375	A	A												
20							L	A	A	A	A	A	A	A	A	H	385	380	365	A											
21							L	L	370	385	A	A	A	A	A	A	365	A	A	A											
22							A	A	A	A	A	A	A	A	A	A	A	A	A												
23							L	A	A	A	A	A	350	A	A	A	A	A	A												
24						L	L	A	A	A	C	C	C	C	C	C	C	C	C	A											
25						L	A	A	A	A	A	A	A	A	A	A	A	A	A												
26							L	A	A	A	A	A	A	A	A	A	A	A	A												
27						L	A	A	A	A	A	R	Y	A	A	B	A	A	A												
28						L	L	L	A	A	395	385	375	380	365	340	365	350	A												
29							A	A	375	A	Y	Y	370	C	355	380	365	A													
30						L	C	C	C	380	A	C	C	C	C	C	C	A	A												
31						C	C	365	380	C	A	390	365	A	A	A	A	A	C												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
CNT							1	4	3	5	4	7	8	11	11	8	7	4	1												
MED							L	370	375	380	375	392	390	382	380	375	363	375	365	U	L										
UQ								380	392	380	395	410	398	390	380	330	378	365													
LQ								370	378	365	388	380	370	372	370	352	365	358													

MAY. 1987

M(3000)F1 (0.01)

IONOSPHERIC DATA

MAY. 1987 H^oF2 (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									230	A	285	305	290	330	325	310	300	310	285	270					
2									265	E A	235	A	285	340	370	290	300	295	265	280	E A	295			
3							E A	280	265	E A	260	285	320	A	350	320	310	320	310	A	335	A			
4								270	255	260	270	305	310	330	305	335	305	285	A	A					
5								245	E A	275	265	310	E A	320	A	A	360	290	275	260	A				
6								A	A	E A	290	275	305	E A	320	A	345	325	295	280	A	310			
7									A	A	355	A	A	305	E A	345	345	320	310	E A	280	A	260		
8								240	270	230	325	320	285	295	330	315	310	310	275						
9							255	225	240	L	E A	310	340	295	310	305	I C	I C	280	E A	315	260			
10								240	250	230	260	290	405	A	340	305	325	E A	340	E A	315	E A	320		
11							310	265	E A	325	A	E A	320	A	A	A	320	315	310	A	A	A			
12								295	265	A	E A	275	A	405	355	345	355	310	E A	360	A	E A	315		
13								240	255	A	E A	365	A	335	E A	390	E A	360	A	A	305	270	260		
14								E A	235	245	300	E A	325	A	A	E A	335	340	345	A	A	A	275		
15								A	A	A	A	A	A	A	A	A	A	A	305	A	E A	290			
16								E A	305	A	A	A	A	A	A	330	A	A	A	A	A	A			
17								240	255	275	A	A	345	335	330	320	305	335	E A	360	A	A			
18							E A	285	E A	310	295	A	A	A	350	340	320	320	300	275	265				
19								290	A	275	260	E A	335	A	E A	385	330	350	C	305	A	A			
20								290	A	A	A	A	A	A	355	330	285	275	265	265					
21								245	240	225	A	A	E A	390	A	A	340	320	275	E A	310	260			
22								265	A	A	A	A	A	A	A	A	E A	365	315	315	290				
23								290	255	255	A	A	A	400	350	305	310	E A	315	E A	320	275			
24							270	270	E A	260	A	A	C	C	C	C	C	C	C	C	C	A			
25							L	365	345	A	365	A	A	A	355	365	375	E A	360	A	A				
26								265	E A	280	A	A	A	405	A	A	345	E A	370	310	E A	375	270		
27							310	A	A	A	A	A	Y	Y	A	A	430	395	E A	355	E A	360			
28							290	285	L	270	A	A	325	390	350	395	360	335	310	290	270				
29									A	280	310	A	E Y	365	380	385	I C	345	325	330	290	265			
30								305	I C	270	I C	270	C	G	E A	360	I C	320	C	360	C	I C	330		
31								C	C	490	355	C	A	G	G	A	A	A	A	365	C				
		00	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	23	20	16	15	12	16	17	23	23	24	25	21	19						
MED						292	265	257	276	U	290	312	335	342	335	330	312	308	U	285	265				
UQ						310	279	273	295	313	325	398	368	350	345	325	312	E A	320	E A	292				
LQ						268	242	250	260	276	302	308	330	328	312	302	285	280	265						

MAY. 1987 H^oF2 (KM)

IONOSPHERIC DATA

MAY. 1937

H*F (KM)

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	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	270	270	270	275	240	230	A	A	A	A	180	190	225	230	A	230	A	A	245	225	A	260	A		
2	285	290	265	265	290	230	A	A	A	A	A	235	205	210	230	190	225	230	A	255	235	225	E 285	255		
3	E 310	275	345	A	E 335	A	250	A	A	A	A	A	A	A	190	A	A	A	A	E 265	A 235	245	255	A		
4	305	275	255	260	280	245	230	225	215	240	220	190	H 200	H 240	215	A	A	A	A	250	240	225	A 250	245		
5	285	300	305	280	275	245	A	A	A	A	A	A	A	A	A	A	A	A	A	240	A	A	A	A		
6	260	305	A	315	A	245	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E 275	250	215	245	A 300	
7	300	305	300	265	260	245	225	A	A	A	A	A	A	A	A	A	A	A	A	A	A	250	245	260	295	300
8	270	280	310	275	260	250	A	A	A	A	A	A	A	A	210	225	230	A	255	235	E 260	A 230	280	285		
9	230	270	280	275	265	230	225	A	E 265	A	210	A	A	H 185	C	C	E 260	A	A	A	250	240	235	280	275	
10	260	275	260	250	270	235	215	225	200	210	205	205	A	225	230	A	A	A	A	A	A	240	235	A 285	295	
11	290	295	250	E 305	300	250	A	A	A	A	A	A	A	255	E 255	240	A	A	A	A	A	A	A	A	A	
12	A	E 340	A 300	255	260	A	A	A	A	A	A	H 220	220	215	215	215	240	A	A	A	245	E 260	275	250	270	
13	260	270	260	275	285	245	235	A	A	A	A	A	A	A	A	A	A	A	A	A	265	A	E 325	A	A	
14	255	270	270	270	280	230	A	A	A	A	A	A	A	A	A	A	A	A	A	E 265	235	215	235	E 295	E 285	
15	300	305	320	260	230	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	255	235	A	A	
16	A	A	A	255	E 260	E 285	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	225	E 345	E 380
17	260	320	280	310	290	245	235	A	A	A	A	A	205	215	230	A	A	A	A	E 280	A 255	A 250	E 310	A	A	
18	A	A	A	A	260	A	A	A	A	A	A	A	A	200	A	230	A	A	A	E 260	E 275	A 255	E 300	E 255	A	
19	E 315	E 325	E 340	275	240	240	A	A	A	E 250	A	A	A	A	A	A	C	225	A	A	E 220	235	235	E 305	A	
20	A	A 340	E 310	E 295	270	230	240	A	A	A	A	A	A	A	A	A	H 215	220	240	A	E 250	E 270	E 265	260	E 275	
21	260	305	E 330	315	275	265	230	220	A	A	A	A	A	A	A	230	A	A	A	A	235	E 310	235	E 310	E 325	
22	A	E 315	A	A	285	260	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E 270	A 265	A	A	285	
23	290	285	280	285	255	250	235	A	A	A	A	A	A	A	A	A	A	A	A	A	245	250	230	280	290	
24	A	E 305	275	235	265	235	245	A	A	A	C	C	C	C	C	C	C	C	C	A	A	E 270	A	A	275	
25	E 325	295	230	265	300	255	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	280	255	255
26	245	285	270	260	260	255	235	A	A	A	A	A	A	A	A	A	A	A	A	A	E 260	A	A	E 375	E 365	
27	A 325	E 330	E 330	310	275	A	A	A	A	A	A	E 245	Y	A	A	3	A	A	A	A	275	E 330	A	A	310	
28	295	260	285	260	260	260	225	230	A	A	210	220	225	225	250	A	240	E 260	A	260	210	245	275	310		
29	A 310	A	A	E 290	245	220	225	A	A	225	A	Y	Y	230	C	245	225	245	A	250	I C 265	270	I C 285	I C 250		
30	255	250	280	I C 270	I C 245	255	I C 230	I C 220	I C 220	215	A	C	C	C	C	C	C	C	A	A	A	260	260	C	E 290	
31	I C 270	E 330	305	I C 275	I C 220	C	C	240	A	C	A	215	235	A	A	A	A	A	A	C	C	C	295	I C 310	E 320	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	26	28	26	28	30	25	16	6	4	5	5	8	7	11	11	7	8	5	2	23	24	23	23	23		
MED	280	285	279	270	266	245	230	225	213	220	210	214	205	225	230	230	226	240	258	248	242	240	U 270	U 270		
UQ	295	304	305	282	280	252	235	230	231	232	220	224	220	228	230	240	232	242	256	E 265	260	E 302	A 296			
LQ	260	275	270	260	260	235	225	220	208	215	210	198	202	212	215	220	225	240	245	A	235	232	259	264		

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H*F (KM)

IONOSPHERIC DATA

MAY. 1937

H'E (KM)

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	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	110	110	110	110	110	110	110	110	115	120					
2						A	120	110	110	110	110	110	110	110	105	110	115	110	E B					
3						B	115	115	110	110	110	110	115	A	110	115	115	115	E B					
4							130	110	110	110	110	A	105	110	A	105	E A	E A	E A					
5							125	120	115	110	105	110	110	110	115	115	110	115	115	120				
6						B	115	115	110	110	B	B	115	115	110	115	110	115	110					
7						B	130	115	110	110	110	110	110	110	115	110	110	115	A					
8						B	120	115	110	110	105	110	A	A	E A	E A	130	130	110	115	110			
9						B	115	110	110	110	110	110	110	110	C	C			115	115	125			
10						B	110	110	110	110	110	110	105	115	115	115	115	115	115	120				
11							130	110	110	110	105	110	115	110	110	115	110	110	E B					
12						E B	135	115	115	110	110	115	110	110	110	110	110	110	E B					
13						B	115	115	110	110	115	110	110	110	110	115	120	120	120					
14						E B	135	115	115	115	110	115	115	110	110	110	110	115	115	120				
15							120	110	115	110	110	115	115	115	115	110	110	A	A	A				
16						B	115	110	110	115	115	115	110	110	115	110	110	115	120					
17							125	115	110	110	A	110	110	A	A	115	110	110	110	115				
18						E B	135	110	110	110	115	110	110	110	A	A	A	A	A	A				
19						E B	135	115	110	110	115	105	110	110	A	C	A	A	A					
20						A	115	110	115	110	110	115	110	S	A	110	A	A	110					
21						A	A	110	110	115	110	105	115	110	115	110	110	115	A					
22							115	120	110	115	110	110	110	A	A	A	A	A	A					
23						B	115	110	105	A	A	115	110	A	A	A	A	A	A					
24						A	115	115	115	110	C	C	C	C	C	C	C	C	C	115				
25							120	110	110	110	115	115	115	110	A	A	A	110	115	115				
26						E A	130	115	110	110	110	110	A	A	120	A	A	A	125	A				
27						E B	145	120	110	110	110	110	110	120	115	110	B	115	115	120				
28							125	115	115	110	115	115	110	115	110	115	110	110	110	110				
29						E B	150	E A	130	110	110	110	110	110	B	115	C	110	115	110	125			
30						I C	120	I C	115	C	110	110	C	C	C	C	C	C	110	120				
31						C	C	110	110	C	110	110	115	115	115	110	115	115	C					
	00	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	29	31	30	23	27	27	25	20	20	21	22	24	22					
MED						125	115	110	110	110	110	110	110	110	111	110	111	115	119					
UQ						E B	135	115	115	110	110	112	112	115	115	115	112	115	115	120				
LQ						122	115	110	110	110	110	110	110	110	110	110	110	110	115	115				

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H'E (KM)

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IONOSPHERIC DATA

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

MAY. 1987

H⁺ES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 1987

TYPES OF ES

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F2	F1	F2	F1	F1		H3	H2	C3	C2	C2	C1	C1	H1	H1	H2	H2	C3	C3	F3	F3	F4	F3	F4	
2	F2	F2	F1	F1	F2	HL11	C4	C3	C4	C2	C2	C2	C2	C2	C2	C2		H2	C4	F3	F2	F1	F3	F2	
3	F3	F2	F3	F4	F4	L3	C2	C3	C4	C2	C2	C3	C2	C2	C2	C2	H3	H4	C4	F5	F2	F4	F3	F4	
4	F3	F2	F2	F2		C3	C3	C3	C2	C2	C2	C1	L1	L1	H1	HL21	HL32	CL42	C3	FF31	F3	F3	F1	F1	
5		F1		F1	F3	C1	C3	C3	C3	C2	C3	C3	C2	C3	C3	H2	H2	H2	C6	F4	F4	F5	F5	F5	
6	FF12	F3	FF23	F2	FF22	C2	C2	C3	C2	C2	C1	C1	C2	C2	C2	C3	C3	C3	C3	F3	F2	F1	F2	F3	
7	F2	F3	F4	FF13	F4	H2	H4	H3	C3	C3	C2	C2	C2	C2	C2	C3	C3	C3	L3	F5	F4	F4	F2	F4	
8	F4	F2	F4	F4	F1	H1	C3	C3	C2	C2	C3	C1	L2	L2	L1	L1	H1	H1	C1	F2	F3	F2	F2	F2	
9	F1	F1	F1	F1		C2	C3	C3	C3	C2	C2	C2	C2	C1			H2	C3	C3	F4	F4	F4	F2	F2	
10	F2	F2	F2	F1	F2	L1	C2	C3	C1	C1	C1	C1	C2	C1	H1	C2	C3	C4	C4	F3	F4	F4	F3	F2	
11	F1	F1				C2	C3	C3	C3	C2	C2	C2	C2	H1	H1	H1	C3	C4	C4	F4	F5	F5	F3	F5	
12	F4	F4	F3	F2	F1	C3	C2	C2	C3	C2	C2	C1	C1	C1		H2	C3	C3	C4	F4	F4	F5	F2	F2	
13	F2	F2	F2	F2	F2	H1	C2	C3	C3	C2	C3	C2	C3	C2	C2	C3	C2	C2	C2	F2	F2	F4	F4	F4	
14	F3	F2	FF11	F1	F1	C3	C5	C3	C3	C2	C2	C2	C2	C2	C2	C3	C3	C4	C3	F2	F1	F1	F3	F5	
15	F2	F3	F5	F5	F4	C4	C4	C4	C3	C2	C4	C2	C3	C3	C3	C4	CL22	CL24	L5	F4	F4	FF34	F3	F3	
16	FF12	F2	F3	F2	F2	CL12	C4	C5	C3	C2	C3	C3	C2	H2	H2	H3	C4	C4	C4	F5	F5	F4	F3	F4	
17	F4	F4	F3	F3	F2	C3	C2	C2	C2	L2	C3	C2	L2	L1	H1	C2	C4	C4	C3	F4	F4	F4	F4	F5	
18	F2	F2	F2	F2	F3	C4	C4	C3	C3	C3	C2	C2	C2	L1	L2	L2	L3	L3	L3	FF24	FF25	F4	F5	F4	
19	F4	F4	F5	F3	F2	C2	C3	C3	C3	C2	C3	C3	C2	C2	L2		L3	L3	CL32	FF23	F3	F3	FF23	F4	
20	F4	F4	FF33	F4	F2	L1	C3	C2	C2	C2	C2	C2	C2	L1	L2	C3	L2	L4	C3	F5	F5	F4	F3	F4	
21	F4	F5	F5	F4	F4	L4	HL22	H2	C3	CL22	C3	C2	C2	C3	C2	C2	C2	C4	C3	F5	F4	F4	F6	F4	
22	F5	F5	F4	F5	F3	C3	C4	C3	C3	C3	C3	C2	C2	L2	L3	L3	L3	L3	L5	F4	F4	F3	F3	F2	
23	F2	F2	F1			C3	C2	C2	C3	C2	L2	CL22	C1	L2	HL12	L3	CL23	CL43	CL32	F3	F4	F3	F4	F5	
24	F5	F5	F3	FF13	F3	H1	C3	C3	C2	C3			C2	L3					C2	F3	F6	F4	F5	F3	
25	F4	F3	F3	F2	F2	H2	H3	C3	C2	C2	C2	C2	C2	L3	L1	L3	H3	C3	C4	F4	F5	F2	F3	F4	
26	F2	F3	F3	F2	F3	HL11	C3	C3	C4	C3	C3	L2	L3	CL22	L2	L3	L3	CL32	L2	F2	FF33	F5	F4	F4	
27	F4	F3	FF23	F2	F1	C3	C4	C3	C3	C2	C2	C1	C1	C2	C1		H2	C3	C2	F3	F4	F4	F4	F4	
28	F3	F1	FF21	F2	F3	C3	C2	H2	C3	C3	C1	C1	C1	C1	H1	C1	H1	C3	C5	F4	F1	F1	F2	F3	
29	F4	F4	F5	F5	F1	H2	HL21	C3	C2	C2	C3	C1	C1	C1		C2	C2	C2	C4	F2		F1			
30									C2	C3								C4	C4	F4	F4	F3		F4	
31		F4	F3					C3	C2	C2	H1	H1	C2	C3	C4	C4	C3					F4		F3	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
UQ																									
LQ																									

MAY. 1987

TYPES OF ES

IONOSPHERIC DATA

MAY. 1987

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA				Lat. 31° 12.1' N	Long. 130° 37.1' E	Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																	
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 46	45	47	46	46	X 39															X 93	60	A	50
2	40	X 39	X 39	47	41	39															X 111	X 64	X 45	X 39
3	X 38	X 37	39	X 37	X 36	X 37															X 91	70	66	76
4	S	69	65	58	50	49															U 98	X 71	S	X 51
5	X 51	X 48	X 45	42	37	40															83	X 71	57	A
6	A	55	59	60	56	46															X 90	57	A	X 59
7	60	60	63	60	50	46															X 85	X 73	X 68	X 67
8	72	74	⁰ X 68	65	60	X 55															X 77	X 55	46	A
9	51	50	50	51	48	X 45															X 91	X 75	X 66	X 65
10	X 61	63	69	56	X 53	X 47															A	A	A	A
11	69	60	X 64	61	45	50															X 90	X 83	A	A
12	S	49	48	45	45	44															A	A	A	S
13	S	60	54	55	48	48															X 90	S	S	⁰ S 72
14	S	S	S	S	S	S															X 119	⁰ X 75	X 65	X 65
15	60	S	69	72	72	S															X 94	X 62	S	S
16	S	S	A	40	A	S															X 89	X 66	S	S
17	S	S	58	60	S	59															X 91	84	S	S
18	55	60	58	60	60	61															X 78	X 76	X 68	A
19	50	A	60	55	46	60															⁰ S 96	X 77	X 53	X 53
20	67	56	52	50	53	60															X 86	X 74	X 66	X 59
21	65	62	60	51	54	X 54															X 94	A	A	A
22	A	56	62	62	54	50															S 105	X 54	X 46	47
23	48	50	47	47	46	X 43															X 86	X 63	X 53	55
24	57	A	54	50	54	X 52															X 87	X 79	75	77
25	69	70	68	61	60	59															X 69	X 70	71	76
26	62	57	55	54	47	X 42															X 73	X 51	A	50
27	50	48	49	X 46	X 41	⁰ X 43															72	X 68	⁰ X 62	69
28	72	66	70	X 67	X 39	A															X 85	X 77	U 66	X 58
29	X 58	X 60	X 58	X 59	X 54	X 45															X 87	X 87	X 81	X 75
30	X 70	X 65	X 57	X 56	X 58	X 63															X 81	X 78	X 72	X 66
31	69	S	61	57	49	X 35															⁰ X 60	X 57	59	60
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	24	29	30	28	27															29	26	20	21
MED	60	58	58	56	50	47															X 89	X 71	X 66	X 60
UQ	68	62	63	60	54	54															X 93	X 77	X 68	69
LQ	50	50	50	47	46	X 43															X 83	X 64	X 55	X 53

MAY. 1987

FXI (0.1 MHz)

IONOSPHERIC DATA

MAY. 1987

FOF2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA				Lat.	31° 12.1' N				Long.	130° 37.1' E				Sweep 1	MHz to 25 MHz in 24 sec in				automatic operation						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	40	F	F	F	F	35	33	53	53	61	63	67	59	65	73	83	33	36	93	100	H	87	F	A	F	
2	F	33	33	F	F	F	55	56	A	72	62	62	75	87	71	96	100	U R	99	106	108	105	58	39	33	
3	32	31	F	31	30	31	60	74	A	A	A	A	A	72	75	81	87	84	85	A	35	F	F	F		
4	S	F	F	F	U	F	F	51	67	65	65	62	66	81	75	72	80	80	73	76	91	U R	F	S	45	
5	45	S	41	39	F	F	30	F	51	69	70	75	62	68	74	76	81	95	91	82	J R	A	F	A		
6	A	F	F	F	F	F	54	67	A	A	67	A	A	79	85	71	J R	101	100	J R	104	34	F	A	S	
7	F	F	F	F	F	39	47	59	60	69	72	60	78	91	95	98	109	114	114	R	79	67	J S	61		
8	F	F	F	F	F	49	61	60	A	A	77	82	A	79	92	94	J R	102	94	U R	J R	93	71	49	F	A
9	F	F	F	F	F	40	38	54	63	60	65	70	81	88	94	104	110	105	97	U R	U R	97	85	69	S	59
10	55	F	F	F	F	49	47	41	51	70	70	64	57	61	71	82	75	81	92	A	A	113	A	A	A	A
11	F	F	S	F	F	F	43	55	70	R	R	A	71	74	85	36	90	34	78	71	J R	78	84	77	A	A
12	S	F	F	F	F	F	55	70	66	A	57	67	77	81	85	J R	95	93	A	A	J R	95	A	A	A	S
13	S	F	F	F	F	F	34	59	P	A	A	A	A	A	89	100	103	A	120	106	101	S	84	S	S	S
14	S	S	S	S	S	S	J R	J A	A	61	55	61	73	80	87	101	113	116	109	115	112	S	69	59	59	
15	F	S	F	F	F	S	S	68	68	A	59	A	A	A	A	93	100	92	H	91	J S	88	S	56	S	
16	S	S	A	F	A	S	54	66	56	55	A	69	68	73	77	75	69	65	76	A	32	60	S	S		
17	S	S	F	F	S	F	53	A	68	A	62	69	A	A	63	70	63	65	71	84	85	S	F	S	S	
18	F	F	F	F	F	F	55	61	69	A	A	A	A	80	80	38	39	82	73	73	72	70	62	A		
19	F	A	F	F	F	F	55	62	66	62	61	62	71	A	86	A	A	A	A	86	S	90	71	47	47	
20	F	F	F	F	F	F	53	66	59	69	57	63	73	85	95	100	96	90	77	78	80	63	60	53		
21	F	F	F	F	F	48	70	65	56	H	53	59	62	75	A	39	101	100	39	A	S	80	A	A	A	
22	A	F	F	F	F	F	55	63	60	57	60	65	A	A	73	32	88	83	A	87	J S	99	43	40	F	
23	F	F	F	F	F	37	47	72	65	53	51	59	66	77	83	84	79	79	30	J	70	80	62	47	F	
24	F	A	F	F	F	46	52	56	A	A	60	A	A	80	91	97	101	92	36	36	81	73	F	F		
25	F	F	F	F	F	F	49	49	J R	73	57	A	A	A	64	63	68	86	89	71	65	63	64	F	F	
26	F	F	F	F	F	36	56	59	A	A	A	56	70	A	84	U R	73	R	R	R	R	67	45	A	F	
27	F	F	F	F	S	S	A	A	A	A	A	A	A	J A	48	47	A	J R	54	57	61	64	F	J S	U S	F
28	F	F	F	F	33	A	H	53	56	A	58	56	59	63	63	78	90	U R	83	U R	96	R	79	70	U S	52
29	52	F	S	S	48	39	44	59	72	61	63	57	72	84	85	92	U R	J R	101	94	90	81	81	75	69	
30	64	59	51	50	S	56	J R	H	60	57	56	70	J R	65	68	59	62	67	74	82	78	75	J R	66	J S	60
31	F	S	F	F	F	29	A	49	A	A	A	A	A	56	A	A	A	A	A	A	A	54	F	F	F	54
CNT	10	6	8	9	11	17	30	28	20	16	22	22	19	26	23	28	28	26	26	24	29	21	14	14		
MED	52	44	46	50	40	39	54	53	63	62	62	62	72	79	84	90	92	90	36	39	81	67	60	56		
UQ	55	59	56	52	46	46	56	63	63	67	66	69	75	84	89	96	100	99	96	98	85	70	62	61		
LQ	42	33	36	44	34	36	51	58	60	57	57	59	67	73	76	81	35	79	76	78	76	62	47	52		

MAY. 1987

FOF2 (0.1 MHz)

IONOSPHERIC DATA

MAY. 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	A	A	A	450	460	A	A	A	A	A	A				
2									A	A	U L	L	460	460	A	U L	U L	L	L					
3									A	A	A	A	A	460	U L	A	A	A	A	A				
4								A	A	A	U L	440	450	460	470	440	U L	A	A					
5								A	A	450	U L	A	A	480	470	A	A	A	A	A				
6								A	A	A	A	A	A	A	A	A	430	A	A					
7								A	A	A	A	460	470	A	A	A	430	410						
8								A	A	A	A	A	A	A	470	450	430	U L	A					
9						L	L	U L	440	A	A	460	A	A	A	A	A	A	A	A				
10								L	A	A	A	U L	460	470	460	A	A	A	A	A				
11								L	A	A	A	A	490	470	460	450	450	A	L					
12						A	A	A	A	A	L	500	490	480	480	470	450	450	A	A				
13								A	A	A	A	A	A	A	A	A	A	A	A	A				
14						A	A	A	A	U L	A	480	490	450	460	A	A	A	A					
15						L	A	430	A	A	A	A	A	A	A	A	A	A	A	A				
16								A	A	L	A	A	A	470	A	460	450	450	400	A	A			
17								A	A	A	A	450	A	A	A	A	450	A	A					
18								A	L	A	A	A	A	A	A	A	A	410	A	A				
19								L	L	L	U L	A	U L	L	A	A	A	A	A	A				
20									L	L	A	A	U L	470	460	460	A	A	440	410	L			
21									A	U L	460	L	470	A	A	A	420	A	A					
22								A	L	U L	L	A	A	A	A	A	420	A	A	A				
23								L	L	A	A	U L	460	A	460	450	A	A	A	A				
24								A	A	A	A	A	A	A	A	A	A	A	A	L	A			
25								L	330	A	A	A	A	A	A	U A	A	450	410	L	L			
26								A	A	A	A	A	A	A	A	U A	U A	450	400	A	A			
27								A	A	A	A	A	420	A	420	A	A	A	A	A				
28								A	A	A	A	A	A	460	460	A	A	A	A					
29								L	A	A	A	A	A	U A	A	A	430	420	410	U L				
30								L	L	420	U L	450	L	460	460	440	450	430	U A	A				
31								A	A	A	A	A	A	A	A	A	A	A	A	A	A			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	3	5	10	10	15	14	12	10	16	9	1					
MED								380	430	U L	450	460	460	470	460	460	450	435	410	U L				
UQ								435	U L	450	U L	470	470	470	470	450	450	410	L					
LQ								425	U L	450	L	460	460	460	460	455	440	425	410					

MAY. 1987

FOF1 (0.01 MHz)

IONOSPHERIC DATA

MAY. 1987

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA				Lat.	31° 12.1' N		Long.	130° 37.1' E		Sweep	1 MHz to 25 MHz		in 24 sec		in automatic operation								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							170	245	280	310	325	A	360	345	340	325	305	275	A	S				
2							175	250	295	315	320	355	370	A	A	340	300	280	195	S				
3							170	240	A	315	A	A	A	A	350	335	300	260	205	S				
4							S	245	280	305	A	A	A	A	335	310	300	265	205	S				
5							175	235	270	305	A	A	A	A	340	A	305	275	A	S				
6							A	230	290	A	A	A	A	U R	350	U R	350	R	315	A	A	A	A	S
7							S	255	290	A	325	A	A	A	350	335	320	300	250	A	S			
8							S	A	A	A	A	A	A	A	A	A	A	A	A	A	S			
9							S	A	A	310	330	A	A	A	A	A	A	A	A	A	S			
10							S	245	A	305	315	A	A	A	350	330	310	265	200	S				
11							185	250	A	A	A	A	A	A	345	R	R	R	260	195	S			
12							S	250	295	315	A	A	A	R	A	A	305	270	A	S				
13							200	260	300	315	345	A	C	340	340	315	300	235	A	S				
14							S	255	290	315	320	A	A	390	370	330	310	280	205	S				
15							165	260	300	330	340	340	A	A	340	A	A	A	A	S				
16							170	255	300	A	A	A	R	A	A	330	305	295	215	S				
17							S	250	300	305	325	A	A	A	A	A	A	A	A	S				
18							180	A	300	A	A	A	A	A	A	A	A	A	A	S				
19							200	275	290	A	A	A	A	A	A	A	A	A	A	S				
20							175	270	A	A	A	A	A	A	A	A	A	A	A	S				
21							A	A	A	A	A	A	U R	350	A	A	A	305	260	A	S			
22							S	235	280	A	A	A	A	A	A	A	A	A	A	S				
23							195	A	A	A	A	A	A	A	A	325	300	275	215	S				
24							180	255	280	310	A	A	A	A	A	A	A	A	A	S				
25							205	A	A	315	325	A	A	B	A	A	A	A	220	S				
26							A	A	A	A	A	A	A	A	A	A	A	A	A	S				
27							A	255	295	315	330	A	R	B	A	A	300	A	A	S				
28							A	A	290	305	A	A	A	A	A	A	A	A	A	S				
29							130	250	300	315	A	A	A	340	325	A	A	A	220	S				
30							A	250	A	305	A	A	A	A	U R	345	320	305	265	220	A			
31							190	235	A	305	A	A	345	345	335	310	A	250	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							16	23	19	19	11	2	4	8	13	14	14	16	12					
MED							180	250	290	310	325	348	355	345	340	322	305	268	210					
UQ							192	255	300	315	330		365	350	350	330	305	278	220					
LQ							172	245	285	305	322		340	342	335	315	300	260	202					

MAY. 1987

FOE (0.01 MHz)

IONOSPHERIC DATA

MAY. 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	J A 32	J A 21	J A 15	J A 17	J A 19	E S 16	28	46	J A 45	J A 57	J A 61	J A 55	G	43	46	J A 52	J A 45	J A 53	J A 111	J A 102	J A 52	J A 93	J A 70	J A 51
2	J A 17	J A 18	J A 30	J A 30	J A 35	J A 17	J A 33	J A 51	J A 66	J A 55	J A 46	G	G	J A 38	J A 65	42	G	G	27	J A 25	J A 51	J A 65	J A 32	J A 36
3	J A 32	J A 31	E S 16	E S 16	E S 16	J A 30	39	J A 60	J A 81	J A 81	J A 71	124	J A 152	J A 51	J A 41	J A 55	J A 53	44	60	J A 83	J A 81	J A 84	J A 38	J A 51
4	J A 64	J A 45	J A 80	71	J A 101	J A 33	J A 50	J A 40	J A 44	J A 65	J A 40	J A 50	J A 43	39	36	34	J A 43	J A 61	J A 47	J A 52	J A 63	J A 64	J A 65	J A 32
5	J A 19	J A 30	J A 40	J A 24	J A 24	22	J A 32	J A 43	J A 47	J A 41	J A 37	119	J A 68	38	37	J A 78	J A 55	71	J A 103	J A 83	J A 84	J A 74	J A 71	J A 80
6	J A 81	J A 85	J A 37	J A 37	J A 30	J A 34	J A 33	J A 60	J A 101	J A 95	J A 54	J A 102	J A 83	J A 69	J A 63	J A 53	35	J A 44	J A 50	J A 36	J A 38	J A 60	J A 87	J A 81
7	J A 42	J A 37	J A 60	J A 65	J A 50	J A 54	J A 40	J A 45	J A 58	J A 69	J A 73	J A 52	48	63	63	61	J A 41	J A 42	J A 47	J A 154	J A 79	J A 92	J A 51	J A 37
8	J A 51	J A 34	J A 32	J A 20	J A 35	J A 62	J A 32	J A 53	J A 75	J A 80	J A 80	J A 82	J A 84	90	J A 39	J A 43	J A 40	J A 36	J A 45	J A 48	J A 33	J A 51	J A 40	J A 70
9	J A 44	J A 33	28	18	J A 17	E S 16	J A 27	J A 27	J A 43	J A 53	J A 71	J A 49	J A 78	J A 60	J A 77	J A 79	J A 74	J A 55	J A 54	J A 37	J A 29	J A 89	J A 38	J A 30
10	J A 30	J A 25	J A 33	J A 32	E S 16	19	19	J A 33	J A 48	J A 61	J A 51	J A 36	44	46	J A 56	J A 63	J A 84	J A 100	J A 194	J A 141	J A 88	J A 88	J A 89	J A 87
11	J A 54	J A 100	J A 102	J A 53	J A 33	J A 30	J A 35	J A 39	J A 76	J A 73	J A 145	J A 130	40	42	42	40	37	J A 45	25	J A 32	J A 70	J A 69	J A 65	J A 79
12	J A 75	J A 48	J A 25	J A 30	J A 31	J A 28	J A 43	J A 54	J A 59	J A 89	J A 51	J A 54	J A 43	46	44	49	J A 54	J A 91	J A 110	J A 115	J A 109	J A 110	J A 88	J A 87
13	J A 62	29	J A 53	J A 31	J A 47	J A 19	22	J A 65	J A 96	J A 73	J A 113	J A 107	J A 85	J A 87	J A 91	J A 109	J A 118	J A 95	J A 88	J A 77	J A 139	J A 65	J A 26	J A 25
14	J A 52	J A 80	J A 45	J A 31	J A 29	J A 24	J A 41	J A 77	J A 79	J A 69	J A 56	J A 96	J A 54	G	44	J A 69	J A 80	J A 64	J A 85	70	J A 65	J A 42	J A 24	J A 29
15	J A 42	J A 37	J A 37	J A 32	J A 43	J A 30	31	J A 48	43	J A 81	J A 60	J A 89	J A 149	J A 153	J A 144	J A 115	J A 33	59	J A 71	J A 54	J A 104	J A 81	J A 64	J A 80
16	J A 51	J A 75	J A 73	J A 42	J A 75	J A 53	33	J A 54	J A 63	J A 63	J A 81	J A 64	J A 47	J A 66	J A 41	36	38	J A 45	J A 63	J A 100	J A 100	82	J A 51	J A 21
17	J A 51	J A 25	J A 46	J A 26	32	J A 33	J A 41	J A 72	J A 76	J A 143	J A 104	J A 140	J A 194	J A 143	89	J A 78	J A 80	J A 64	J A 55	71	J A 79	J A 142	J A 105	J A 77
18	J A 55	J A 65	J A 104	J A 84	J A 84	J A 32	J A 82	J A 111	J A 87	J A 95	J A 111	J A 116	J A 101	J A 70	J A 75	J A 70	J A 56	J A 40	J A 40	J A 62	J A 53	J A 51	J A 80	J A 81
19	J A 72	J A 54	J A 33	J A 35	J A 19	E S 16	26	G	36	J A 56	J A 65	J A 79	41	151	J A 75	J A 240	J A 152	J A 129	J A 100	J A 80	J A 67	J A 60	J A 25	J A 90
20	J A 54	J A 37	J A 85	J A 42	J A 71	J A 32	J A 36	J A 31	J A 34	J A 63	J A 45	J A 43	40	42	J A 57	J A 48	J A 41	J A 33	G	E S 16	J A 17	J A 27	J A 30	J A 30
21	J A 50	J A 44	J A 22	J A 35	J A 18	J A 20	J A 50	J A 52	J A 63	39	J A 46	J A 59	42	J A 88	J A 110	J A 67	J A 65	J A 70	J A 47	J A 110	J A 96	J A 126	J A 78	J A 51
22	J A 51	J A 51	J A 57	J A 37	J A 20	J A 18	J A 31	J A 53	J A 50	37	J A 45	J A 65	J A 91	J A 107	J A 81	J A 59	J A 43	J A 70	J A 85	J A 37	J A 50	J A 54	J A 31	J A 72
23	J A 25	J A 23	J A 17	J A 28	J A 19	J A 17	32	31	J A 70	J A 75	J A 61	J A 54	42	J A 50	J A 48	J A 55	J A 67	J A 64	J A 40	J A 51	J A 63	J A 41	J A 49	J A 52
24	J A 54	J A 90	J A 36	J A 30	J A 18	J A 30	J A 34	J A 43	J A 72	J A 82	J A 77	J A 92	J A 81	J A 61	J A 59	J A 61	J A 55	J A 160	J A 64	J A 32	J A 70	J A 41	J A 51	J A 76
25	J A 78	J A 70	69	J A 33	J A 32	E S 16	J A 24	J A 38	J A 65	J A 58	J A 75	J A 123	J A 140	J A 79	J A 70	J A 94	J A 75	J A 37	J A 41	J A 50	J A 51	J A 51	J A 72	J A 78
26	J A 21	J A 22	J A 59	J A 28	J A 24	J A 30	J A 44	J A 54	J A 93	J A 93	J A 81	J A 69	J A 118	J A 145	J A 110	J A 84	J A 68	J A 65	J A 50	J A 39	J A 31	J A 62	J A 51	J A 49
27	J A 42	J A 29	J A 30	J A 20	J A 20	J A 19	J A 33	J A 73	J A 59	J A 114	108	J A 79	J A 65	53	J A 73	J A 60	J A 73	J A 60	J A 50	J A 52	J A 32	J A 64	J A 112	J A 40
28	J A 71	J A 37	J A 33	J A 41	J A 41	J A 63	J A 41	J A 51	J A 62	J A 62	J A 55	J A 57	J A 59	J A 47	J A 52	J A 80	J A 47	J A 46	J A 42	J A 32	J A 51	J A 31	J A 32	J A 31
29	J A 19	J A 16	J A 28	23	25	J A 24	26	J A 40	J A 64	J A 50	J A 70	J A 61	J A 51	J A 48	J A 63	J A 42	J A 45	J A 48	21	17	E S 15	21	J A 24	J A 51
30	J A 51	J A 30	J A 24	J A 33	J A 44	J A 30	J A 25	27	J A 32	J A 47	J A 48	J A 44	J A 65	J A 36	39	38	J A 46	J A 55	J A 65	J A 61	64	39	J A 25	J A 50
31	J A 40	J A 43	J A 42	J A 30	J A 21	24	J A 43	J A 49	J A 70	J A 102	J A 147	D D A 250	J A 94	J A 57	J A 75	J A 82	J A 103	J A 100	J A 115	J A 84	J A 50	23	J A 40	J A 51
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J A 51	J A 37	J A 37	J A 31	J A 30	J A 28	J A 33	J A 49	J A 63	J A 69	J A 65	J A 69	J A 65	J A 57	J A 63	J A 61	J A 55	J A 59	J A 54	J A 54	J A 63	J A 64	J A 51	J A 51
UQ	J A 54	J A 52	J A 53	J A 37	J A 42	J A 32	J A 41	J A 54	J A 74	J A 82	J A 80	J A 104	J A 90	J A 83	J A 75	J A 78	J A 74	J A 70	J A 35	J A 84	J A 80	J A 83	J A 72	J A 78
LQ	J A 36	J A 29	J A 29	J A 27	J A 20	J A 19	30	J A 40	J A 48	J A 55	J A 51	J A 54	43	44	J A 44	J A 48	J A 43	J A 44	J A 44	J A 37	J A 50	J A 46	J A 32	J A 36

MAY. 1987

FOES (0.1 MHz)

IONOSPHERIC DATA

MAY. 1937

FBES (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA																								
Lat.	31° 12.1' N												Long. 130° 37.1' E												
Sweep	1 MHz to 25 MHz in 24 sec in automatic operation																								
Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	20	E S 16	E S 16	E S 16	E S 16	E S 16	23	43	33	57	58	50	G	37	45	51	43	47	68	30	E S 16	E S 16	A A 70	E S 16	
2	E S 16	E S 16	E S 16	25	E S 16	E S 16	29	48	A A 66	A A 52	43	G	G	36	54	40	G	G	25	23	43	53	25	25	
3	20	20	E S 16	E S 16	E S 16	E S 16	24	60	A A 31	A A 81	A A 71	A A 124	A A 152	44	40	55	50	43	59	A A 88	50	32	24	50	
4	17	E S 16	21	17	24	E S 16	46	37	42	63	36	43	42	39	36	34	40	49	39	52	53	41	33	E S 16	
5	E S 16	18	24	E S 16	22	E S 16	32	42	44	39	35	53	51	38	37	73	53	65	76	A A 83	46	33	17	A A 80	
6	A A 81	29	31	26	18	23	32	59	A A 101	A A 96	50	A A 102	A A 88	66	62	52	34	42	42	32	28	24	A A 87	51	
7	42	30	29	49	35	26	31	40	53	57	69	43	46	58	62	54	39	37	46	23	36	32	30	E S 16	
8	40	18	25	E S 16	E S 16	49	29	47	A A 73	A A 80	73	75	A A 84	72	37	43	39	35	43	48	27	28	27	A A 70	
9	20	17	E S 16	E S 16	E S 16	E S 16	23	27	37	46	62	44	74	51	64	78	68	52	53	26	24	53	17	17	
10	19	E S 16	24	E S 16	E S 16	E S 16	19	29	43	57	49	35	43	44	52	61	73	A A 100	A A 194	99	A A 83	A A 88	A A 89	A A 87	
11	40	45	S	25	24	E S 16	34	31	70	61	A A 145	65	39	42	42	40	36	45	24	29	49	54	A A 65	A A 79	
12	S	19	20	18	17	21	34	53	54	A A 39	46	46	40	40	41	42	41	A A 91	A A 110	44	A A 109	A A 110	A A 83	31	
13	S	E S 16	21	19	20	19	21	60	A A 96	A A 73	A A 113	A A 107	A A 85	86	84	85	A A 118	62	74	75	80	S	S	S	
14	42	S	41	30	19	20	30	A A 77	A A 79	58	41	55	40	G	42	45	76	44	65	65	44	41	23	21	
15	33	21	19	25	41	24	25	39	40	A A 81	54	A A 89	A A 149	A A 153	A A 144	54	57	49	70	47	S	S	S	S	
16	S	S	A A 73	26	A A 75	22	29	54	40	60	A A 81	49	43	63	37	35	35	39	44	A A 100	62	53	30	E S 16	
17	S	S	37	S	23	17	36	A A 78	53	A A 143	39	55	A A 194	A A 143	59	69	41	50	47	69	35	S	S	S	
18	35	42	40	20	41	28	40	46	38	A A 95	A A 111	A A 116	A A 101	68	67	60	50	33	35	62	33	50	45	A A 81	
19	25	A A 54	32	29	E S 16	E S 16	22	G	32	38	56	44	41	A A 151	65	A A 240	A A 152	A A 129	A A 100	48	63	49	19	18	
20	35	E S 16	E S 16	E S 16	E S 16	E S 16	35	18	32	54	44	42	40	41	56	45	39	30	G	E S 16	E S 16	E S 16	E S 16	18	
21	E S 16	20	17	E S 16	E S 16	19	38	50	53	39	43	40	42	67	A A 110	54	37	53	47	A A 110	60	A A 126	A A 78	A A 51	
22	A A 51	31	30	E S 16	E S 16	18	29	45	38	34	41	48	A A 91	A A 107	75	59	40	52	A A 85	35	50	41	20	18	
23	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	31	29	45	47	41	53	42	42	47	47	67	62	38	38	32	E S 16	23	E S 16	
24	35	A A 90	30	24	18	E S 16	29	32	A A 72	A A 82	54	A A 92	A A 81	50	53	45	55	42	28	32	22	30	E S 16	44	
25	54	18	E S 16	E S 16	22	E S 16	23	36	49	A A 53	A A 75	A A 123	A A 140	51	46	65	46	33	31	46	49	E S 16	49	38	
26	E S 16	E S 16	40	21	17	21	36	48	A A 93	A A 98	A A 81	50	64	A A 145	67	45	46	35	47	34	E S 16	40	A A 51	E S 16	
27	E S 16	26	21	E S 16	E S 16	E S 16	35	A A 73	A A 59	A A 114	A A 108	A A 79	40	A A 53	41	A A 60	45	53	50	52	19	41	43	29	
28	41	22	25	E S 16	20	A A 63	26	44	47	A A 62	49	47	47	42	44	77	43	43	40	31	46	23	27	29	
29	E S 16	E S 16	E S 16	E S 16	22	E S 16	24	37	59	46	57	52	46	46	63	40	38	40	19	G	E S 16	E S 15	E S 16	E S 16	17
30	20	21	24	31	23	23	22	G	31	38	40	40	36	36	37	37	43	53	64	56	62	21	E S 16	E S 16	
31	E S 16	25	29	E S 16	20	E S 16	A A 43	43	A A 70	A A 102	A A 147	A A 250	A A 94	50	A A 75	A A 82	A A 103	A A 100	A A 115	A A 84	22	E S 16	25	33	
	00	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	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	28	28	28	
MED	20	20	24	16	18	E S 16	29	43	53	60	54	52	46	50	53	54	43	47	47	47	44	36	27	27	
UQ	40	28	30	25	22	22	34	52	A A 70	A A 82	A A 74	A A 84	A A 86	68	64	63	56	56	59	57	53	52	50	50	
LQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	34	40	50	43	44	40	42	42	44	39	40	38	32	24	22	20	16	

MAY. 1937

FBES (0.1 MHz)

IONOSPHERIC DATA

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

MAY. 1987

FMIN (0.1 MHz)

IONOSPHERIC DATA

MAY. 1987

M(3000)F2 (0.01)

135° E Mean Time (G.M.T. + ° 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	310	F	F	F	F	330	335	365	365	350	325	350	305	315	280	295	295	295	305	320	R	360	F	A	F						
2	F	320	320	F	F	F	365	375	A	355	320	280	290	310	300	305	310	305	290	325	350	355	295	305							
3	310	305	F	305	300	305	350	390	A	A	A	A	A	305	290	300	320	310	305	A	350	F	F	F							
4	S	F	F	F	U	F	F	335	350	345	A	315	305	320	320	300	305	305	310	290	315	U	R	300							
5	300	S	305	F	F	F	335	355	335	340	300	315	290	295	290	310	320	325	J	R	A	330	340	F	A						
6	A	F	F	F	F	F	340	350	A	A	350	A	A	285	300	290	J	R	R	J	R	335	365	F	A	S					
7	310	F	F	F	F	320	350	365	360	335	A	300	270	290	285	285	300	310	320	R	315	290	J	S	280	280					
8	295	F	300	F	F	A	R	350	A	A	A	300	A	280	300	290	J	R	R	315	U	R	J	330	340	315	F	A			
9	F	F	F	F	F	310	340	340	350	340	315	315	295	290	305	300	310	315	315	320	U	R	U	R	330	305	290	S	290		
10	280	F	F	305	330	315	345	350	365	360	300	285	290	305	285	275	290	R	A	A	335	A	A	A	A	A	A	A			
11	F	F	S	F	F	F	290	310	315	A	R	A	290	285	300	300	315	295	305	300	R	320	345	A	A	A	A				
12	S	F	F	F	F	F	345	340	370	A	280	285	270	285	275	R	310	A	A	R	A	A	A	A	A	A	S				
13	S	F	F	F	F	F	295	370	R	A	A	A	A	A	A	290	295	A	325	320	320	S	A	S	S	S					
14	S	S	S	S	S	S	R	A	A	A	310	280	280	275	280	285	300	310	300	315	S	350	320	290	290						
15	F	S	F	F	F	S	S	340	325	340	325	A	305	A	A	A	300	310	300	H	315	320	J	S	S	S	S				
16	S	S	A	F	A	S	335	365	320	A	A	290	300	285	300	305	295	290	300	A	315	365	S	S	S	S					
17	S	S	F	F	S	F	340	A	350	A	305	305	A	A	A	A	300	S	280	310	S	330	F	S	S	S					
18	F	F	F	F	F	F	360	325	340	A	A	A	A	295	285	300	315	325	315	315	310	315	340	A	A	A	A				
19	F	A	F	F	F	F	365	355	350	330	320	305	290	A	275	A	A	A	A	315	S	305	280	295	285	285					
20	F	F	F	F	F	F	350	355	345	320	305	270	260	275	300	S	315	310	320	305	305	325	315	315	300	300					
21	F	F	F	F	F	345	355	380	A	H	350	285	305	280	295	A	295	310	325	310	A	S	A	A	A	A					
22	A	F	F	F	F	F	335	355	350	335	300	305	A	A	A	280	300	310	A	305	J	S	345	375	275	F					
23	F	F	F	F	F	335	330	360	370	320	255	290	280	290	300	305	305	305	310	J	S	330	335	355	295	F					
24	F	A	F	F	F	335	355	340	A	A	315	A	A	270	290	300	320	320	320	315	320	310	F	F	F	F					
25	F	F	F	F	F	280	F	305	J	R	340	335	A	A	A	A	305	275	A	230	315	295	290	270	290	F	310				
26	F	F	F	F	F	320	340	345	A	A	A	275	285	A	280	U	R	R	R	R	310	R	R	360	290	A	F				
27	285	F	F	300	325	330	285	A	A	A	A	A	A	A	A	L	A	J	R	A	250	265	285	280	295	F	J	S	U	S	F
28	F	275	285	295	320	A	305	H	320	330	A	295	295	285	295	280	A	295	U	R	340	U	R	315	315	315	300	U	S	280	
29	290	F	S	S	320	320	330	330	345	360	335	235	250	280	270	280	U	R	J	R	310	310	310	285	295	300	280	280			
30	280	295	295	290	S	305	J	R	325	305	H	325	290	305	305	J	R	300	315	315	300	300	295	310	300	S	J	R	J	S	300
31	F	S	F	F	F	310	310	A	315	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	325	F	F	F	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	10	6	8	9	11	16	28	27	19	13	20	22	19	24	25	24	28	25	26	22	28	21	13	13							
MED	298	300	300	305	310	320	340	350	345	335	305	295	285	295	290	300	305	310	310	315	330	315	295	290							
UQ	310	305	305	325	325	335	352	358	350	350	318	305	290	305	300	305	310	320	315	325	350	340	300	300							
LQ	285	295	298	295	302	305	332	340	335	320	300	285	280	282	280	290	295	305	300	310	315	295	290	285							

MAY. 1987

M(3000)F2 (0.01)

IONOSPHERIC DATA

MAY. 1987

M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station		YAMAGAWA							Lat. 31° 12.1' N		Long. 130° 37.1' E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	A	A	A	L	A	A	A	A	A	A	A				
2									A	A	A	380	L	L	A	U	L	L	L					
3									A	A	A	A	A	A	U	L	A	A	A	A	A			
4								A	A	A	U	L	A	A	370	370	375	A	A	A				
5								A	A	365	U	L	A	A	365	370	A	A	A	A	A			
6								A	A	A	A	A	A	A	A	A	360	A	A					
7								A	A	A	A	A	A	A	A	A	335	A						
8								A	A	A	A	A	A	A	340	A	350	U	L	A				
9						L	L	U	L	A	A	A	A	A	A	A	A	A	A	A				
10						L	L	A	A	A	U	L	A	A	A	A	A	A	A	A				
11								L	A	A	A	A	A	A	A	A	355	A	L					
12							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
13								A	A	A	A	A	A	A	A	A	A	A	A	A				
14								A	A	A	A	A	A	A	A	A	A	A	A	A				
15							L	A	A	A	A	A	A	A	A	A	A	A	A	A				
16								A	A	L	A	A	A	A	A	370	375	355	A	A	A			
17								A	A	A	A	R	A	A	A	A	A	A	A	A				
18								A	L	A	A	A	A	A	A	A	A	A	A	A				
19							L	L	L	U	L	A	A	L	A	A	A	A	A	A				
20							L	L	A	A	U	L	A	L	A	A	L	L	L					
21								A	U	L	A	L	L	A	A	A	L	A	A					
22								A	L	U	L	L	A	A	A	A	A	A	A					
23							A	L	A	A	U	L	A	L	A	A	A	A	A					
24								A	A	A	A	A	A	A	A	A	A	A	A					
25							L	A	A	A	A	A	A	A	A	A	A	L	L					
26								A	A	A	A	A	A	A	A	A	A	350	A	A				
27								A	A	A	A	A	A	A	380	A	A	A	A					
28								A	A	A	A	A	A	370	A	A	A	A	A					
29								A	A	A	A	A	A	A	A	350	A	A	U	L				
30							L	L	345	U	L	L	370	390	385	365	370	A	A					
31								A	A	A	A	A	A	A	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									2	5	6	5	11	8	7	5	8	5	1					
MED									365	U	L	385	380	380	373	370	375	358	355	U	L			
UQ									U	L	390	390	390	388	370	375	372	355						
LQ									U	L	370	380	363	370	362	370	352	350						

MAY. 1987

M(3000)F1 (0.01)

IONOSPHERIC DATA

MAY. 1937

H⁺F₂ (KM)

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1									250	A	A	A	310	370	320	330	325	300	270	250					
2									A	265	315	370	340	310	305	300	290	300	280						
3									A	A	A	A	A	330	335	325	290	295	295	A	A				
4								250	250	E A 325	315	330	295	295	330	300	290	295	300						
5								250	255	270	L	310	325	325	320	305	280	295	A E A 335	A					
6								E A 270	A	A	260	A	A	E A 355	315	320	295	280	260						
7								250	270	295	A 345	340	330	305	335	325	300	285							
8								245	A	A	E A 375	E A 370	A	E A 400	320	305	285	270	270						
9								250	240	270	295	335	335	350	320	305	295	A 280	A 280	270					
10								250	240	260	A 320	E A 350	L	335	315	330	355	A 345	A	A					
11								270	A	A	A	A	345	315	310	290	290	285	290						
12								255	265	A 240	A	390	375	330	350	345	305	290	A	A					
13								A	A	A	A	A	A	A	A	A	A	280	E A 265						
14								230	A	A	A	U L 310	A	305	360	345	330	E A 305	280	E A 300					
15								265	270	260	A	A	A	A	A	A	325	285	290	A					
16								250	A	300	A	A	350	320	E A 350	330	310	310	335	A	A				
17								235	A	265	A	345	325	A	A	A	A	330	E A 330	E A 320					
18								E A 270	250	A	A	A	A	A	A	A	290	280	275	A					
19								240	250	250	280	A	340	350	A	A	A	A	A	A					
20								260	250	A	A	390	400	370	320	295	280	275	275						
21								E A 300	260	410	340	400	A	A	A	330	300	270		A					
22								250	250	280	360	330	A	A	A	E A 355	305	290	A						
23								280	250	230	A	520	A	380	340	320	305	A	A	280					
24								A	A	A	A	A	A	370	325	315	280	280	275	270					
25								L 275	E A 290	A	A	A	A	345	400	E A 530	345	280	280						
26								270	250	A	A	A	E A 400	E A 400	A	A	305	300	280	265					
27								A	A	A	A	A	A	A	575	A	420	460	355	350					
28								E A 290	A 280	A	385	375	395	365	365	A	310	285	270						
29								280	270	220	350	E A 545	430	350	360	340	305	275	270						
30								245	250	285	L	325	315	350	310	320	330	320	305						
31								A	330	A	A	A	A	A	A	A	A	A	A	A	A				
Hour Day	00	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	21	20	10	17	18	19	22	23	24	27	26	21	3					
MED							250	250	254	272	335	342	348	338	330	313	298	284	272	270					
UQ							265	268	272	288	375	362	384	362	345	329	310	295	288	310					
LQ							240	250	250	260	312	330	328	315	320	305	290	280	270	260					

MAY. 1987

H⁺F₂ (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 1987

H·F (KM)

135° E Mean Time (G.M.T. + 9 h)

Station		YAMAGAWA		Lat. 31° 12.1' N		Long. 130° 37.1' E		Sweep 1		MHz to 25		MHz in 24		sec in		automatic operation																	
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
1		E A 290	S	E S 280	E S 280	S 245	S 240	210	E A 250	220	A	A	A	215	A	A	A	A	A	A	A	220	E S 270	A	E S 250								
2		E S 290	E S 295	S	A	S	E S 275	230	230	A	A	A	H 195	H 190	200	A	E A 230	H 200	225	250	245	225	E A 250	E A 290	A								
3		E A 300	A	S	E S 295	E S 280	E S 295	E A 240	225	A	A	A	A	A	A	E A 250	A	A	A	A	A	E A 245	E A 245	A	A								
4		E A 260	250	250	A	E A 285	275	E A 300	A	A	A	185	E A 240	E A 270	235	215	205	E A 285	A	A	A	270	240	245	E A 325	300							
5		285	285	E A 290	255	305	270	255	A	A	A	245	200	A	A	H 200	215	A	A	A	A	A	265	A	230	300	A						
6		A	E A 300	E A 335	E A 300	260	E A 275	245	A	A	A	A	A	A	A	A	A	A	A	A	245	215	E A 250	A	E A 400								
7		E A 330	E A 330	E A 290	E A 330	E A 295	260	235	A	A	A	A	E A 330	A	A	A	A	E A 275	A	245	230	250	280	300	E S 300								
8		E A 300	265	275	A	245	E S 255	A	245	A	A	A	A	A	A	A	H 200	A	E A 270	E A 245	A	245	215	250	E A 350	A							
9		E A 330	E A 325	E S 285	245	250	220	230	215	E A 230	A	A	A	A	A	A	A	A	A	A	A	240	230	E A 275	E A 260	275							
10		305	280	305	260	210	220	235	235	A	A	A	H 180	A	255	A	A	A	A	A	A	E A 255	A	A	A	A							
11		E A 370	S	S	S	285	300	S 280	E A 280	245	A	A	A	A	A	H 195	A	A	A	A	220	A	A	240	A	260	E A 265	E A 250	A	A			
12		S	A	E A 300	E A 250	290	A	265	A	A	A	A	A	A	E A 215	E A 225	A	A	A	A	A	A	A	A	A	260	A	A	A	E A 365			
13		S	270	280	A	290	E A 280	260	215	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 265	A	S	S	S			
14		E A 300	A	S	E A 305	245	260	A	265	A	A	A	A	A	A	200	A	A	A	A	A	A	E A 270	215	235	265	A	290					
15		A	330	335	320	A	280	E A 250	A	250	270	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	260	S	S	S	S		
16		S	S	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 230	220	240	A	A	A	A	A	A	A	A	A	A	E A 295	A	S	250
17		S	S	A	S	305	A	280	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	270	S	S	S	S		
18		A	A	A	250	E A 300	220	E A 270	A	225	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 260	E A 280	E A 270	A	A		
19		E A 290	A	E A 290	E A 275	E S 300	E S 290	230	230	215	215	A	A	205	A	A	A	A	A	A	A	A	E A 270	E A 250	E A 250	230	A	E A 300					
20		A	E S 275	E S 290	E S 290	E S 290	240	240	225	H 195	A	A	E A 240	E A 230	E A 230	A	A	E A 255	225	225	250	240	220	250	S	255	A						
21		E S 300	E A 300	E A 295	E S 270	E S 270	240	230	225	A	H 205	A	H 190	E A 235	A	A	A	E A 240	A	275	A	A	A	A	A	260	A	A	A	A	A		
22		A	A	E A 300	255	250	250	240	A	230	205	210	A	A	A	A	A	A	A	A	A	A	E A 275	230	220	A	A	A					
23		S	E S 300	E S 290	E S 270	E S 265	250	A	240	A	A	230	A	E A 250	E A 250	A	A	A	A	A	A	A	E A 270	240	220	E A 270	S	A					
24		A	A	A	A	240	220	220	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	240	250	E S 290	A	A		
25		E A 300	A	A	E S 335	350	275	250	A	A	A	A	A	A	A	A	A	A	A	A	255	E A 270	E A 300	E A 350	275	E A 350	E A 270	A	A				
26		230	290	E A 325	A	250	265	270	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	230	195	E A 360	A	300		
27		320	330	A	300	240	250	265	E A 305	A	A	A	A	A	E A 250	A	260	A	A	A	A	A	A	A	A	A	280	330	E A 360	E A 370	A		
28		E A 375	295	300	220	E A 260	A	E A 260	A	A	A	A	A	A	A	245	A	A	A	A	A	A	A	A	A	250	250	245	255	315	A		
29		295	295	260	245	220	245	245	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	220	H 245	270	260	255	245	S	
30		A	285	265	E A 295	305	260	250	230	215	205	255	250	225	200	H 185	230	230	A	A	300	E A 295	E A 320	250	230	260	A	A	A	A	A		
31		280	300	300	250	210	270	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	255	295	335	A	A		
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
CNT		21	21	24	27	29	28	24	11	7	5	6	7	13	8	7	5	9	5	8	21	26	24	19	17								
MED		E A 300	U 280	E A 292	252	U 242	256	235	228	218	215	205	U A 202	205	U 214	222	230	E A 240	245	245	250	239	U A 238	E A 290	U 278								
UQ		E A 320	A 298	E A 300	E 288	E A 290	272	250	235	225	245	230	E A 240	E A 250	A 236	A 235	A 230	E A 270	A 250	272	E A 270	258	262	E A 312	308								
LQ		E A 290	270	E 282	250	245	242	230	225	210	205	195	H 192	200	196	212	212	228	225	232	245	228	U A 232	U 244	255								

MAY. 1987

H·F (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 1987 H⁺E (KM)

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							E S 130	115	110	110	110	110	110	110	110	115	115	115	115		S			
2							E S 140	110	105	105	105	105	115	110	115	105	105	110	125		S			
3								115	115	110	110	110	110	110	110	110	110	110	120		S			
4							S		110	105	105	105	105		B	115	105	105	110	115		S		
5							S	125	110	105	105	105	115	B	105	105	105	A	105	105	E S 120		S	
6							E S 135	110	105	105	105	A	115	B	105	105	105	105	110	E S 120		S		
7							S	115	105	110	110	110	E A 115	105	115	110	105	110		A		S		
8							S	110	105	110	110	105	A	A	A	A	A	A	A	A	A		S	
9							S	115	110	105	110	105	110		A	A	A	A	A	A	A		S	
10							S	110	105	110	105	105		B	105	105	105	110	115	115		S		
11							S	110	110	110	110	110		C	110	110	110	A	110	120		S		
12							S	110	110	110	110	110		A	A	110	A	110	110	115		S		
13							S	110	110	110	110	115	C	C	C	110	110	110	115		S		S	
14							S	110	110	110	110	110	110	110	110	110	110	110	110	115		S		
15							S	110	110	110	110	110	105	110	110		A	A	A	A		S		
16							S	110	110	110	105	B	110	B	110	110	110	110	115		S			
17							S	110	110	105	110	A	A	A	110	110		A	A	A		S		
18							S	125	110	105	110	110	105	105		A	A	A	A	A	A		S	
19							S	120	110	110	110	105	105	105		A	A	A	A	A	A		S	
20							S	125	110	110	105	105	105	105	110		A	A	A	A	105		S	
21							A	A	A	105	110	110	105	110	110	110	110	110	115		S			
22							S	110	105	110	110	110	110	110	110	115	110	110		A		S		
23								115	110	A	A	A	105	110	110	105	105	105	110	120		S		S
24							S	105	110	110	110	110	110	110	110	110	110	110	105	115		S		
25								120	105	105	105	105	105	105		B	A	A	A	A	115		S	
26							A	110	105	105	110	105		A	A	A	A	A	A	A		S		
27							E S 135	115	105	110	105	105		B	105	105	105	105	110	115		S		
28							A	110	110	110	110	105	105	110	105	105	105	110		A		S		
29							E S 125	110	110	105	105	105	105	110	110	105	105	105	E A 125		S			
30							A	105	105	110	105	105		A	A	105	130	105	105	120		A		
31								125	105	105	105	105	105	105	110	115	110		A	H 105	A	A		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							13	30	29	30	30	28	22	19	24	21	20	22	19					
MED							S 120	110	110	110	110	105	106	110	110	110	108	110	115					
UQ							E S 130	110	110	110	110	110	110	110	110	110	110	110	119					
LQ							120	110	105	105	105	105	105	108	105	105	105	110	115					

MAY. 1987

H⁺E (KM)

IONOSPHERIC DATA

MAY. 1987

H°ES (KM)

135° E Mean Time (G.M.T. + 9 h)

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

MAY. 1987

H°ES (KM)

IONOSPHERIC DATA

MAY. 1987

TYPES OF ES

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F3	F2	F1	F1	F1		H5	H6	C1	C5	C2	C2		H1	H2	H5	H2	C3	C5	CC23	F2	F3	F4	F5
2	F2	F2	F3	F4	F2	F2	H6	C6	C7	C5	C3			C1	C3	H2			C4	C7	F6	F5	F6	F4
3	F3	F3			F2	F2	H5	C4	C7	C2	C4	C6	C4	C2	H1	H4	H4	H6	C7	C6	F4	F4	F7	F6
4	F6	FF13	FF24	F3	F4	F3	C5	C4	C5	C3	C1	C2	C2	HC12	H1	HHL11	C2	C5	C7	L7	F6	F7	F8	F3
5	FF12	F3	F4	F2	F6	F1	C3	C5	C5	C2	C1	C3	C3	C1	HL11	CL41	C4	C4	C5	L7	F5	F3	F6	F7
6	F6	FF24	F3	FF21	F2	F5	C3	C5	C4	C4	C2	CLL62	C6	C2	C4	CC22	C1	C2	C5	L7	F6	FF72	F6	F5
7	F8	FF81	F5	F4	FF42	FF71	CL41	C2	C4	C4	C6	C2	C2	C2	C4	C4	C3	C2	L5	L3	F3	F3	FF33	F2
8	F5	FF42	F3	F2	FF21	FF51	C3	C6	C7	C3	C8	C5	L5	L3	L2	L2	L3	L6	CL23	CL47	F7	FF27	F6	F7
9	FFF12	F3	FF21	F1	F1		C3	C1	C3	C2	C3	C2	C5	L3	L3	L3	L6	L6	L5	L4	F7	F5	F2	F3
10	F3	F2	F6	F1		F1	C1	C2	C3	C6	C2	C1	HC11	HC22	C2	C4	C6	C7	C3	L8	F7	F7	F6	F6
11	F7	F6	F4	F4	F7	F2	C6	C5	C6	C5	C7	HC22	C1	H1	H1	H2	HL11	C6	C1	C7	F6	F6	F7	F7
12	F4	F5	F4	FF12	FFF22	F6	C6	C6	C6	C5	C2	C2	L2	L1	C1	HL21	C2	C4	C5	C4	F7	F7	F5	F4
13	F7	F3	F4	F2	F2	F1	C2	C5	C7	C4	C5	C7	C3	C2	C4	C6	C6	C7	C5	CL73	FFF14	FF72	F7	F7
14	F7	F4	F3	F7	F3	F3	C4	C5	C7	C4	C2	C2	C1		H2	H2	C6	C6	C7	C7	F6	F7	F7	F7
15	F5	F4	F6	FFF25	FF61	F2	C4	C4	C3	C5	C3	C3	C3	C4	C4	L2	CL25	HL24	CL66	CL47	FF28	FF16	FF27	F7
16	F7	F7	F7	F7	F6	F5	C4	C6	C4	C4	C4	L2	L2	L4	L2	H1	H1	H3	C7	C7	F4	F6	F7	F6
17	F6	F6	F6	F5	F5	FF32	C4	C6	C4	C6	C2	CL25	L4	L4	C4	C4	L2	L4	L5	CL27	FF16	FF18	FF37	FF15
18	F4	F5	F4	F5	F7	F4	C5	C5	C3	C5	C7	C4	C6	L4	L5	L5	L5	CL44	CL73	CL55	FF34	FF66	F5	F5
19	F5	F6	F7	F5	F2		H2		C4	C2	C3	C3	C2	L4	L4	L5	L6	L5	L7	L3	F8	F6	F3	L3
20	F3	F2	F2	F6	F4	F5	C5	CH21	C1	C3	C2	C2	C2	C1	L3	L4	L3	L3			F2	F3	F4	F3
21	F3	F3	F4	F4	F2	F4	L6	L7	L4	C3	C2	C2	H1	C2	C5	C5	C2	C5	C4	C6	FF78	F7	F6	F7
22	F7	FF26	FF27	FF23	F3	F4	C5	C4	C4	C1	C2	C4	C4	C4	C5	C3	C4	C4	L4	L5	F8	F5	F5	FF23
23	F2	F2	F2	F2	F2	F1	C3	C3	L3	L3	L2	C3	HC12	C1	C1	C2	C4	C4	C4	C6	F4	F2	F3	F3
24	F3	F5	F5	F3	F1	F1	C4	C3	C5	C5	C3	C3	C3	C3	C3	C2	C4	C4	C2	C3	F4	F4	F2	F4
25	F5	F7	F3	F3	F5		H3	C3	C4	C3	C4	C5	C4	C2	L3	L4	L2	CL12	C2	L6	F6	F3	F4	F4
26	F2	F2	F4	F5	FF31	FF23	CL41	C5	C7	C5	C3	C2	C2	L3	LL43	LL12	LL22	LL22	L3	L4	FF31	F7	F7	F2
27	F2	F5	F4	F2	F1	F1	C5	C4	C3	C6	C4	C2	C1	C2	C2	C4	C3	C4	C4	L4	FF32	F8	F4	F7
28	F3	F5	F6	F3	FF22	FF63	CL22	CL42	C2	C4	C2	C3	C3	C2	C3	C5	C3	C5	L4	L6	F5	F8	F7	FF24
29	F2	F2	FF32	FF11	F3	F2	H3	C3	C6	C3	C4	C3	C2	C2	C5	C2	C2	C3	L4	L1		F2	F2	FF33
30	FF42	F5	FF41	F7	F4	F3	L4	C1	C1	C2	C2	C2	L1	L1	H1	HL21	C2	C4	C7	L3	F8	F6	F4	F2
31	F3	F5	F3	F3	FF12	F2	C4	CL51	C6	C5	C4	C3	C3	C2	C3	C3	CL71	CL61	CL71	L7	L4	F2	F6	F7
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

MAY. 1987

TYPES OF ES

IONOSPHERIC DATA

MAY. 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 50	A	39	42	38	38															X 90	X 50	A	A						
2	A	A	A	A	A	38															X 120	X 76	X 59	X 55						
3	A	A	A	40	A	X 50															A	A	A	65						
4	64	67	67	65	44	A															X 106	X 69	A	A						
5	A	A	60	A	43	37															X 89	X 63	A	A						
6	A	57	58	58	45	43															87	56	53	62						
7	63	61	68	72	50	A															X 110	X 76	X 71	X 73						
8	82	92	X 89	83	61	48															X 78	X 64	X 62	60						
9	58	62	66	68	51	X 38															X 97	X 67	64	64						
10	65	60	64	66	52	X 36															A	A	A	A						
11	A	A	A	60	57	49															X 118	X 70	A	A						
12	45	55	62	47	48	38															U 91	A	A	A						
13	A	32	A	42	43	42															X 98	X 79	X 71	X 65						
14	X 63	67	68	62	60	56															X 144	X 96	X 88	X 86						
15	X 79	80	90	91	60	60	66														X 95	X 59	61	60						
16	64	66	68	64	56	50															X 86	A	X 68	65						
17	61	62	A	A	A	50	58														X 90	X 70	X 66	66						
18	68	71	73	58	50	50															X 86	X 85	X 57	65						
19	67	60	58	60	52	57															X 96	X 63	X 50	62						
20	57	61	60	50	50	42															X 98	X 86	X 65	X 63						
21	X 62	X 59	X 55	X 53	X 52	X 56															X 86	X 68	X 63	X 59						
22	62	62	62	63	58	57															X 101	X 61	X 59	X 58						
23	X 58	X 58	X 58	X 53	48	48															X 90	X 60	X 56	60						
24	63	62	60	59	60	X 51															81	79	84	A						
25	83	73	66	62	58	48															X 61	A	X 66	65						
26	A	A	60	55	55	X 52															X 76	X 61	58	A						
27	62	57	56	50	38	36															X 70	X 68	X 60	58						
28	58	60	63	73	33	A	44	61													X 106	X 100	X 80	X 70						
29	X 66	X 69	X 69	57	46	36															X 100	U 100	X 76	X 74						
30	X 72	X 74	X 66	X 64	X 66	X 68															A	A	A	68						
31	67	64	61	64	56	45															X 71	X 63	X 60	X 64						
	00	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	25	26	28	28	28	3	1													28	25	23	23						
MED	63	62	62	60	52	48	58	61													X 90	X 68	X 63	64						
UQ	67	67	68	64	58	52	62														X 100	X 79	X 70	66						
LQ	60	60	60	53	46	38	51														X 86	X 63	X 59	60						

MAY. 1987

FXI (0.1 MHz)

IONOSPHERIC DATA

MAY. 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 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 44	A	F 30	F	F	F 29	R 50	58	58	A	64	66	80	94	R 110	R 120	R 118	R 114	R 120	110	84	44	A	A
2	A	A	A	A	A	F	44	52	A	71	A	A	84	101	110	121	132	142	R 155	R 161	114	70	S 53	49
3	A	A	A	F	A	U 44	S 61	61	54	56	61	67	84	87	94	101	111	106	112	R 123	A	A	A	F
4	F	F	F	F	F	A	50	68	66	A	A	74	82	94	91	101	98	83	93	105	S 100	63	A	A
5	A	A	F	A	F	F	A	80	82	71	70	79	90	99	107	109	106	97	R 97	104	S 83	S 57	A	A
6	A	F	F	F	F	F	48	67	A	65	61	65	80	92	92	100	112	113	U 129	A	F	50	S 47	F
7	F	F	F	F	F	A	A	67	A	A	64	60	80	100	107	115	124	U 123	R 141	R 145	J 104	S 70	S 65	S 67
8	F	F	83	F	F	F	57	57	64	74	80	88	97	104	114	125	126	135	140	117	R 72	58	S 56	F
9	F	F	F	F	F	32	44	58	67	68	69	80	91	105	R 118	R 126	126	123	126	R 110	91	S 61	F	F
10	F	F	F	F	F	30	46	76	A	A	A	A	80	84	84	92	A	A	A	A	A	A	A	A
11	A	A	A	F	F	F	R 50	R 72	75	A	72	77	R 87	94	100	103	100	90	90	U 100	S 112	64	A	A
12	F	F	F	F	F	F	48	78	A	A	67	83	A	R 106	118	R 118	114	104	108	R 117	S 85	A	A	A
13	A	F	A	F	F	F	52	55	A	A	A	66	79	94	109	125	143	138	133	R 128	92	73	65	59
14	57	F	F	F	F	F	A	65	66	64	A	67	84	97	103	120	144	R 147	141	152	138	90	82	80
15	S 73	F	F	F	F	F	F	64	62	R 57	60	57	81	90	102	117	118	109	102	R 112	89	53	F	F
16	F	F	F	F	F	F	R 48	A	68	A	64	A	A	90	90	86	86	84	91	U 98	80	A	S 62	F
17	F	F	A	A	A	F	R 48	67	R 66	A	64	73	A	A	A	90	R 88	79	88	93	S 84	64	60	F
18	F	F	F	F	F	F	46	65	70	56	60	74	R 86	A	A	107	109	94	93	92	80	79	S 51	F
19	F	F	F	F	F	F	57	62	63	62	64	67	75	82	A	108	117	113	104	116	S 90	57	44	F
20	F	F	F	F	F	F	48	62	60	A	63	68	81	95	104	110	109	98	91	90	S 92	80	59	57
21	56	S 53	49	47	U 46	S 50	R 62	R 61	58	52	54	62	70	81	86	95	108	102	103	110	S 80	S 62	S 57	S 53
22	F	F	F	F	F	F	52	65	64	62	69	A	74	82	89	94	100	99	R 95	110	S 95	55	53	52
23	U 52	S 52	S 52	47	F	F	52	67	58	A	A	60	72	84	88	95	92	90	90	91	84	54	R 50	F
24	F	F	F	F	F	S 45	42	55	60	A	A	A	66	84	R 97	106	101	112	90	75	F 70	F	F	A
25	F	F	F	F	F	F	60	33	68	A	A	56	70	A	A	A	90	92	R 66	A	S 55	A	60	F
26	A	A	F	F	F	46	53	53	A	A	A	60	69	85	R 97	108	108	108	106	R 102	70	55	F	A
27	F	F	F	F	F	F	42	47	45	A	A	A	A	A	A	A	A	57	63	A	64	S 62	54	F
28	F	F	F	F	F	A	F	52	53	A	A	A	A	A	A	104	102	124	125	124	S 100	94	74	S 64
29	60	S 63	S 63	F 46	F	F	44	63	70	65	A	62	A	91	94	99	105	109	107	R 111	94	S 94	70	S 68
30	66	68	S 60	58	60	S 62	49	R 50	60	70	82	84	87	81	80	76	78	A	A	A	A	A	A	F
31	F	F	F	F	F	F	35	39	50	52	45	48	56	63	68	72	78	81	74	71	81	65	57	S 58
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	7	4	6	4	2	9	26	30	24	15	19	24	25	26	25	29	29	29	29	26	27	24	19	10
MED	57	58	56	47	53	44	48	62	64	64	64	67	80	92	97	106	108	106	103	110	85	62	57	58
UQ	63	66	S 63	52		S 46	52	67	68	69	69	76	84	97	107	117	118	114	125	R 117	S 94	72	64	S 67
LQ	54	52	49	46		32	46	55	58	56	61	61	74	84	90	95	100	92	91	98	80	56	53	53

MAY. 1987

FOF2 (0.1 MHz)

IONOSPHERIC DATA

MAY. 1987

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA				Lat.	26° 16.9' N				Long.	127° 48.4' E				Sweep 1	MHz to 25		MHz in 24		sec in		automatic operation		
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									A	A	U A 450 480	A	470	A	A	A	A	A						
2								A	A	A	A	A	A		470	450	440	430	L					
3									A	A	L 460 470	A	A		460	460	A	A						
4									L	A	A	A	A		470	470	450	A	A	A				
5						A	A		A	A	A	A	A		A	A	440	A	A	A				
6								A	A	L	L	470	460	480	480	450	U L 450	A	A	A				
7						A	A		A	A	A	L	470	470	A	A	L	A	L	A				
8								A	L	A	L	A	A	A	A	A	A	A	A	A				
9									L	U L 470	U L 500	480	A	A	A	A	440	430	L	L				
10								A	A	A	A	A	A	A	A	A	A	A	A	A				
11									A	A	L 470	U L 490	480	470	460	460	440	A	A					
12						A	L		A	A	A	A	A		470	460	440	U L 430	A	A				
13								A	A	A	A	A	480	A	A	U A 460	A	A	A					
14								A	A	A	A	480	490	480	460	440	430	A	A					
15								L	L	L	L	A	490	500	A	440	430	A	L					
16								A	U L 440	A	A	A	A	A	A	460	450	410	L					
17								A	A	A	A	L 490	A	A	A	A	A	A	A					
18								L	U L 410	L 460	L 500	480	460	A	A	A	A	A	L					
19								L	A	A	460	A	A	A	A	A	A	A	A					
20								L	L	A	L	480	A	A	460	430	A	A	L					
21								L	U L 410	L	A	460	460	460	460	A	A	420	L	A				
22						L	L		U L 420	450	460	A	A	A	A	A	A	400	U L 370					
23						L	L		L	A	A	460	A	A	A	440	A	A	A					
24								A	A	A	A	A	A	L 450	L 460	440	A	U L 410	A					
25								A	A	A	A	450	450	A	A	A	A	A	A					
26									A	A	A	A	460	A	460	A	L 450	U L 420	L					
27								L	380	A	A	A	A	A	A	A	A	A	A					
28								A	A	A	A	A	A	A	A	A	A	A	A					
29								L	A	A	A	A	A	A	A	440	A	U L 420	L					
30								L	L	450	A	460	440	A	A	A	A	A	A					
31								L	A	420	430	440	440	440	440	430	410	U L 410	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									5	5	8	14	12	10	12	16	11	10	1					
MED									U L 410	450	460	475	460	470	460	445	440	420	U L 370					
UQ									U L 420	460	L 485	480	480	480	470	460	445	430	L					
LQ									U L 410	450	455	460	455	460	460	440	435	U L 410						

MAY. 1987

FOF1 (0.01 MHz)

IONOSPHERIC DATA

MAY. 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	MHz in	sec in	automatic operation													
Hour Day	00	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	R	A	A	A	A	A	345	R	330	305	275	A	A				
2							S	R	A	A	A	A	A	A	365	330	310	A	A	S				
3							A	A	A	A	A	A	A	A	340	340	310	275	205	A				
4							S	R	A	A	A	A	A	A	A	335	310	275	A	A				
5							S	R	A	A	A	A	A	A	A	A	305	A	R	A				
6							S	A	A	A	A	A	A	A	U A	320	300	260	A	A				
7							S	A	A	A	A	A	A	350	350	340	A	R	A	A				
8							S	A	A	A	A	A	A	A	A	A	A	A	A	A				
9							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
10							S	A	A	A	A	A	A	A	340	335	310	R	A	A				
11							A	A	A	A	A	A	A	A	U A	R	305	265	A	A				
12							S	R	270	300	R	A	A	A	A	A	310	A	R	A				
13							S	230	A	R	325	A	A	350	R	330	310	280	215	A				
14							S	R	A	A	A	A	A	R	R	330	320	270	205	S				
15							S	R	A	A	A	335	A	A	A	A	310	280	220	S				
16							S	A	A	A	A	A	A	A	A	345	310	285	230	A				
17							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
18							S	A	A	A	320	A	A	A	A	A	A	A	A	A				
19							S	240	A	A	A	A	A	A	A	A	A	A	A	A				
20							S	A	A	A	A	A	A	A	A	A	A	A	A	A				
21							S	A	A	A	A	A	A	A	A	A	A	A	A	S				
22							180	230	A	A	A	A	A	A	A	A	A	A	A	A				
23							180	A	A	A	A	A	A	A	A	320	310	270	A	S				
24							R	A	A	A	A	A	A	A	A	A	A	A	A	A				
25							R	150	A	A	A	A	A	A	A	A	A	A	A	A				
26							A	R	A	A	A	A	A	A	R	R	R	295	A	A				
27							S	R	A	A	A	A	A	A	A	A	A	A	A	A				
28							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
29							S	A	A	A	A	A	A	A	A	A	A	A	U A	A				
30							A	A	A	A	A	A	A	A	A	A	A	280	A	A				
31							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						4	12	1	2	3	1			4	10	13	15	14	8					
MED						180	R	270	302	320	335			350	345	330	310	275	215					
UQ						182	230			322				350	350	340	310	280	222					
LQ						165	R	318						348	340	330	308	270	205					

MAY. 1987

FOE (0.01 MHz)

IONOSPHERIC DATA

MAY. 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	J	A 33	J A 50	J A 32	J A 32	J A 21	E S 16	J A 20	J A 35	J A 50	J A 77	J A 64	J A 50	J A 112	42	J A 48	J A 78	J A 77	J A 76	J A 85	J A 40	J A 32	J A 52	J A 60	J A 34
2	J	A 44	J A 55	J A 51	J A 51	J A 37	J A 26	22	35	J A 78	J A 88	J A 121	J A 120	J A 90	J A 88	J A 51	G	G	J A 38	J A 25	E S 15	E S 16	J A 21	J A 41	J A 33
3	J	A 105	J A 111	J A 137	J A 84	J A 88	J A 58	J A 42	J A 60	J A 53	J A 58	J A 58	J A 58	50	J A 51	G	43	J A 45	J A 44	J A 46	J A 63	J A 97	J A 86	J A 84	J A 61
4	J	A 44	J A 78	J A 112	J A 86	J A 83	J A 43	J A 37	J A 42	J A 46	J A 75	J A 70	J A 67	J A 57	J A 38	42	43	J A 53	J A 68	J A 58	J A 60	J A 51	J A 43	J A 56	J A 84
5	J	A 60	J A 57	J A 53	J A 78	J A 34	J A 74	J A 50	J A 84	J A 53	J A 87	J A 77	J A 67	J A 50	J A 48	J A 52	J A 40	J A 73	J A 65	J A 77	J A 50	J A 42	J A 76	J A 87	J A 52
6	J	A 50	J A 40	J A 40	J A 35	J A 36	J A 28	J A 38	J A 42	J A 65	J A 64	J A 48	J A 40	J A 40	42	J A 50	42	J A 40	J A 55	J A 65	J A 170	J A 65	J A 30	J A 25	J A 40
7	J	A 31	J A 25	J A 52	J A 53	J A 35	J A 87	J A 120	J A 53	J A 87	J A 130	J A 120	J A 104	J A 43	G	49	J A 72	J A 42	J A 48	J A 27	J A 87	J A 77	J A 26	J A 34	J A 52
8	J	A 35	J A 36	J A 28	J A 25	J A 25	J A 53	J A 42	J A 45	J A 50	J A 43	J A 56	J A 82	J A 76	J A 94	J A 66	J A 74	J A 62	J A 85	J A 84	J A 33	J A 50	J A 26	J A 52	
9	J	A 33	J A 32	J A 65	J A 38	J A 27	J A 22	J A 37	J A 32	J A 38	J A 44	J A 48	J A 54	J A 58	J A 61	J A 76	J A 57	J A 46	J A 44	J A 39	J A 30	J A 22	21	J A 30	J A 84
10	J	A 84	J A 78	J A 51	J A 30	J A 38	J A 30	J A 26	J A 57	J A 112	J A 170	J A 89	J A 88	J A 110	J A 55	J A 77	J A 38	J A 147	J A 206	J A 196	J A 104	J A 67	J A 65	J A 65	J A 41
11	J	A 65	J A 84	J A 66	J A 54	J A 37	J A 24	J A 32	J A 60	J A 64	J A 90	J A 86	J A 84	J A 48	J A 40	39	40	38	J A 43	J A 68	J A 35	J A 41	J A 33	J A 61	J A 54
12	J	A 50	J A 40	J A 40	J A 36	E S 16	J A 25	J A 32	J A 52	J A 70	J A 90	J A 76	J A 130	J A 236	J A 110	J A 64	46	43	J A 48	J A 67	J A 47	J A 70	J A 110	J A 110	J A 102
13	J	A 78	J A 77	J A 54	J A 26	J A 25	22	22	J A 40	J A 77	J A 104	J A 140	J A 64	J A 80	J A 65	J A 52	J A 52	J A 131	J A 57	J A 65	J A 45	J A 87	J A 25	E S 16	E S 16
14	J	A 30	J A 52	J A 84	J A 42	J A 42	J A 32	J A 110	J A 64	J A 87	J A 165	J A 142	J A 130	J A 54	42	42	40	36	J A 55	J A 78	J A 40	J A 25	22	J A 25	22
15	22	E S 16	E S 16	E S 16	E S 16	20	20	22	30	J A 38	J A 42	J A 76	J A 90	J A 66	J A 60	J A 60	J A 47	40	J A 53	28	22	22	J A 21	J A 22	J A 21
16	J	A 52	J A 41	J A 41	J A 38	J A 44	J A 26	J A 40	J A 77	J A 56	J A 142	J A 58	J A 92	J A 171	J A 104	J A 34	G	39	33	J A 36	J A 53	J A 85	J A 85	J A 52	J A 52
17	J	A 51	J A 65	J A 66	J A 102	J A 102	J A 87	J A 87	J A 78	J A 88	J A 145	J A 145	J A 110	J A 162	J A 141	J A 140	J A 84	J A 107	J A 47	J A 52	J A 74	J A 50	J A 59	J A 52	J A 26
18	J	A 32	J A 25	J A 26	J A 41	J A 41	J A 28	J A 38	J A 52	J A 40	J A 50	38	38	J A 144	J A 198	J A 212	J A 110	J A 108	J A 50	J A 79	J A 42	J A 30	J A 26	J A 26	J A 41
19	J	A 40	J A 52	J A 52	J A 52	J A 53	J A 30	J A 40	30	J A 56	J A 50	J A 56	J A 100	J A 90	J A 84	J A 124	J A 90	J A 106	J A 65	J A 65	J A 102	J A 54	J A 30	J A 30	J A 25
20	J	A 40	J A 53	J A 60	J A 52	J A 44	J A 22	25	J A 55	J A 65	J A 85	J A 50	J A 37	J A 64	J A 54	40	J A 44	J A 54	J A 47	J A 50	J A 35	J A 35	J A 25	20	18
21	J	A 25	18	J A 26	J A 42	J A 22	E S 16	20	J A 32	J A 32	J A 40	J A 48	J A 65	J A 48	J A 54	J A 50	62	J A 50	J A 54	J A 44	J A 84	J A 35	J A 21	22	J A 40
22	J	A 27	J A 35	J A 50	J A 32	J A 25	J A 25	G	G	J A 35	J A 53	J A 54	J A 84	J A 84	J A 82	J A 86	J A 76	J A 87	J A 50	J A 27	J A 30	J A 50	J A 26	J A 36	J A 40
23	J	A 25	J A 38	J A 80	J A 27	E S 16	21	G	J A 28	J A 36	J A 64	J A 90	J A 87	J A 110	J A 80	J A 56	J A 52	J A 86	J A 88	J A 64	J A 55	J A 110	J A 54	J A 38	J A 32
24	J	A 42	J A 52	J A 37	J A 30	E S 16	E S 16	24	J A 41	J A 65	J A 103	J A 88	J A 155	J A 107	J A 75	J A 53	J A 54	J A 64	J A 40	J A 42	J A 32	J A 84	J A 80	J A 84	J A 84
25	J	A 65	J A 65	J A 40	J A 24	J A 33	23	22	J A 53	J A 82	J A 88	J A 77	J A 88	J A 55	J A 111	J A 144	J A 145	J A 162	J A 85	J A 37	J A 86	J A 88	J A 84	J A 54	J A 50
26	J	A 84	J A 66	J A 54	J A 34	J A 25	J A 33	J A 41	J A 32	J A 80	J A 184	J A 211	J A 145	J A 78	J A 56	43	J A 60	44	G	J A 44	J A 42	J A 86	J A 35	J A 36	J A 65
27	J	A 34	J A 33	J A 26	J A 27	J A 26	E S 16	J A 36	J A 60	J A 38	J A 62	J A 137	J A 142	J A 170	J A 107	J A 144	J A 145	J A 94	J A 54	J A 43	J A 87	J A 42	J A 27	J A 21	J A 26
28	22	J A 32	J A 26	J A 21	J A 24	J A 67	J A 77	J A 77	J A 77	J A 58	J A 76	J A 87	J A 88	J A 110	J A 111	J A 111	J A 48	J A 48	J A 102	J A 107	J A 54	J A 57	J A 25	J A 24	J A 26
29	J	A 21	21	J A 26	J A 30	J A 27	J A 50	23	J A 36	J A 58	J A 76	J A 110	J A 67	J A 89	J A 75	J A 74	J A 60	J A 65	J A 50	26	J A 27	J A 32	J A 27	J A 30	J A 37
30	22	J A 23	J A 40	22	E S 16	J A 23	22	J A 33	J A 39	J A 50	J A 75	J A 58	J A 65	J A 104	J A 73	J A 77	J A 77	J A 77	J A 107	J A 99	J A 120	J A 145	J A 162	J A 107	J A 53
31	J	A 52	J A 51	J A 33	J A 54	J A 28	J A 28	J A 27	J A 41	J A 85	J A 77	J A 60	J A 50	J A 50	J A 41	J A 65	J A 42	J A 44	J A 42	J A 42	J A 35	J A 26	J A 25	21	J A 21
CNT		31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J	A 40	J A 50	J A 50	J A 36	J A 28	J A 26	J A 32	J A 42	J A 58	J A 77	J A 76	J A 84	J A 80	J A 65	J A 60	J A 54	J A 54	J A 53	J A 58	J A 50	J A 50	J A 30	J A 36	J A 40
UQ	J	A 52	J A 61	J A 57	J A 52	J A 40	J A 32	J A 40	J A 60	J A 79	J A 97	J A 100	J A 102	J A 110	J A 96	J A 85	J A 76	J A 86	J A 65	J A 78	J A 84	J A 80	J A 62	J A 58	J A 52
LQ	J	A 30	J A 32	J A 32	J A 28	J A 24	22	22	J A 34	J A 46	J A 56	J A 57	J A 58	J A 54	J A 50	J A 50	43	J A 44	J A 46	J A 42	J A 35	J A 32	J A 25	J A 25	J A 26

MAY. 1987

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 1987 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		24	A A 50	E S 15	E S 16	E S 16	E S 16	16	31	43	A A 77	45	47	43	42	48	60	44	66	64	38	28	26	A A 60	A A 34	
2		A A 44	A A 55	A A 51	A A 51	A A 37	E S 16	18	32	A A 78	63	A A 121	A A 120	47	48	40	G	G	29	25	E S 15	E S 16	18	29	E S 16	
3		A A 105	A A 111	A A 137	17	A A 88	34	40	39	48	44	38	44	49	49	G	43	44	44	45	59	A A 97	A A 86	A A 84	E S 16	
4		25	E S 16	18	32	E S 16	A A 43	28	34	39	A A 75	A A 70	52	49	38	42	42	44	63	56	58	38	43	A A 56	A A 84	
5		A A 60	A A 57	A A 53	A A 78	20	23	A A 50	70	50	43	57	58	48	48	49	40	70	50	62	32	30	35	A A 87	A A 52	
6		A A 50	35	23	20	25	17	30	40	A A 65	40	40	38	40	42	45	41	40	42	62	A A 170	37	25	18	37	
7		E S 16	23	26	32	30	A A 87	A A 120	45	A A 87	A A 130	50	43	35	G	49	68	38	48	27	72	24	24	23	33	
8		30	33	23	E S 16	25	18	35	50	41	50	38	49	76	63	83	60	61	52	42	51	29	25	20	25	
9		E S 16	22	26	27	21	17	28	28	34	39	39	44	48	52	58	47	40	37	32	23	19	E S 16	18	48	
10		46	E S 16	25	E S 16	30	18	20	57	A A 112	A A 170	A A 89	A A 88	67	48	76	80	A A 147	A A 206	A A 196	A A 104	A A 67	A A 65	A A 65	A A 41	
11		A A 65	A A 84	A A 66	20	E S 15	E S 15	28	46	43	A A 90	41	44	40	40	39	39	36	40	67	26	38	27	A A 61	A A 54	
12		28	30	27	E S 16	E S 16	24	32	27	A A 70	A A 90	57	73	A A 236	70	41	38	40	39	62	47	32	A A 110	A A 110	A A 102	
13		A A 78	E S 16	A A 54	E S 16	E S 16	E S 16	20	40	A A 77	A A 104	A A 140	58	43	60	50	46	65	48	58	45	28	25	E S 16	E S 16	
14		E S 16	40	46	25	19	25	A A 110	50	55	48	A A 142	43	40	42	42	40	37	48	50	40	E S 16	E S 16	25	E S 16	
15		21	E S 16	E S 16	E S 16	E S 16	E S 16	20	29	32	35	38	50	43	42	50	40	38	43	27	20	17	18	E S 16	E S 16	
16		33	34	36	25	33	E S 15	33	A A 77	37	A A 142	48	A A 92	A A 171	54	66	G	36	32	34	53	43	A A 85	50	46	
17		47	34	A A 66	A A 102	A A 102	20	34	44	48	A A 145	60	47	A A 162	A A 141	A A 140	48	75	44	43	74	49	34	25	E S 15	
18		E S 16	E S 16	E S 16	18	20	E S 15	26	32	33	38	38	37	41	A A 198	A A 212	71	68	50	34	24	17	17	E S 16	35	
19		32	30	22	22	30	29	25	30	52	48	39	56	60	58	A A 124	50	82	56	50	52	52	30	30	E S 16	
20		21	E S 16	20	28	E S 16	E S 16	25	28	40	A A 85	45	37	60	U A 47	40	40	48	46	28	27	33	25	E S 16	E S 16	
21		E S 16	E S 16	E S 16	27	18	E S 16	18	28	30	36	46	40	40	40	41	58	U A 46	37	26	62	30	E S 16	E S 16	E S 16	
22		27	30	30	25	20	E S 16	G	G	30	35	42	A A 84	68	68	77	70	30	35	27	24	30	21	25	35	
23		25	E S 16	E S 16	18	E S 16	E S 16	G	27	32	A A 64	A A 90	40	52	49	51	42	64	65	62	53	50	35	33	20	
24		E S 16	22	22	E S 16	E S 16	E S 16	22	38	48	A A 108	A A 88	A A 155	49	43	42	41	48	33	38	28	40	E S 16	34	A A 84	
25		25	22	29	E S 16	29	E S 16	19	46	63	A A 88	A A 77	42	42	A A 111	A A 144	A A 145	70	63	42	A A 86	33	A A 84	40	44	
26		A A 84	A A 66	24	23	18	21	24	23	A A 80	A A 184	A A 211	52	39	48	42	47	37	G	26	34	32	19	22	A A 65	
27		19	25	20	20	E S 16	E S 16	24	32	34	A A 62	A A 137	A A 142	A A 170	A A 107	A A 144	A A 145	A A 94	40	40	A A 87	19	24	18	25	
28		E S 16	22	E S 15	E S 16	E S 15	A A 67	29	43	50	A A 76	A A 87	A A 88	A A 110	A A 111	A A 111	47	48	57	66	33	53	19	19	24	
29		E S 16	E S 16	18	E S 16	19	E S 16	20	32	45	48	110	56	A A 89	52	52	40	46	38	23	24	25	19	21	29	
30		E S 16	24	36	E S 16	E S 16	20	21	27	32	33	60	45	41	60	60	60	65	A A 76	A A 99	A A 120	A A 145	A A 162	A A 107	24	
31		24	E S 16	E S 16	22	E S 15	24	20	33	44	38	40	38	40	38	41	35	36	36	27	24	19	20	E S 16	E S 16	
CNT		31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED		25	24	24	20	19	17	25	33	45	A A 64	57	49	48	49	50	46	46	44	42	45	32	25	25	29	
UQ		45	34	36	26	27	24	31	44	59	A A 90	A A 88	66	68	62	76	60	66	54	62	60	42	35	53	45	
LQ		E S 16	E S 16	18	E S 16	E S 16	E S 16	20	28	36	42	40	43	41	42	42	40	39	38	28	26	24	19	18	E S 16	

MAY. 1987 FBES (0.1 MHz)

IONOSPHERIC DATA

MAY. 1987

FMIN (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station		OKINAWA										Lat. 26° 16.9' N, Long. 127° 48.4' E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation												
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		E16	S15	E15	S16	E16	S16	E15	14	15	17	23	25	24	27	27	18	22	17	14	14	E16	S16	E16	S16	
2		E15	S15	E16	S16	E16	S16	E15	14	18	18	26	26	26	24	26	17	19	13	14	E15	S16	E16	S16	E16	
3		E16	S16	E16	S15	E15	S15	14	16	16	16	18	24	27	25	22	20	17	16	14	14	E16	S16	E15	S16	
4		E16	S16	E16	S16	E16	S14	15	14	18	22	27	24	26	25	18	18	15	14	15	E16	S16	E16	S16	E16	
5		E16	S16	E16	S16	E16	S16	15	15	15	20	22	27	25	22	23	21	15	14	15	E16	S16	E16	S16	E16	
6		E16	S16	E16	S16	E16	S16	16	15	16	17	20	20	20	23	20	15	16	14	13	E15	S16	E16	S16	E16	
7		E16	S16	E16	S16	E16	S15	16	15	19	23	27	23	22	28	23	22	16	14	15	E16	S16	E16	S16	E16	
8		E16	S16	E16	S16	E16	S16	14	14	21	24	23	28	27	26	18	16	15	15	14	E15	S15	E16	S16	E16	
9		E16	S16	E15	S15	E16	S15	14	14	19	22	24	27	27	28	24	25	18	17	15	13	E15	S16	E16	S16	
10		E16	S16	E16	S16	E15	S15	14	16	21	23	24	26	27	25	21	20	16	16	13	E16	S16	E16	S16	E16	
11		E16	S16	E15	S15	E15	S15	14	14	16	17	24	25	26	25	22	23	20	17	15	14	E16	S15	E16	S15	
12		E16	S16	E16	S16	E16	S16	13	15	15	23	28	27	27	20	20	18	16	14	14	E16	S16	E16	S16	E16	
13		E16	S16	E16	S16	E16	S16	16	15	25	25	20	23	25	27	25	18	14	15	13	E16	S16	E16	S16	E16	
14		E16	S16	E16	S16	E16	S16	13	13	16	24	20	25	21	25	23	20	17	14	E16	S16	E16	S16	E16		
15		E16	S16	E16	S16	E16	S16	15	15	15	17	27	27	25	20	17	20	15	15	E16	S16	E16	S16	E16		
16		E16	S15	E15	S15	E15	S15	14	14	18	20	29	27	28	26	25	18	18	16	14	E15	S16	E16	S16	E16	
17		E16	S16	E16	S15	E15	S15	14	14	16	16	18	22	26	23	20	20	17	15	14	15	E16	S16	E16	S15	
18		E16	S16	E16	S15	E15	S15	13	14	18	18	20	23	21	26	23	17	18	14	15	E15	S15	E16	S16	E16	
19		E16	S16	E16	S16	E16	S16	15	16	18	18	20	25	23	22	20	15	15	15	15	E16	S16	E16	S16	E16	
20		E16	S16	E16	S16	E16	S16	15	16	16	16	25	25	25	25	25	16	16	15	13	E16	S16	E16	S16	E16	
21		E16	S16	E16	S16	E16	S16	13	15	15	17	23	24	22	22	22	22	16	14	E16	S16	E16	S16	E16	E16	
22		E16	S16	E16	S16	E16	S16	16	13	16	15	18	22	22	22	20	22	15	16	13	14	E16	S16	E16	S16	E16
23		E16	S16	E16	S16	E16	S16	16	14	16	18	18	25	26	25	25	22	20	17	15	E16	S16	E16	S16	E16	
24		E16	S15	E16	S16	E16	S15	13	14	17	19	19	24	20	23	21	20	17	14	14	E16	S16	E16	S16	E15	
25		E15	S15	E16	S16	E16	S14	13	13	16	18	24	23	25	25	21	18	16	13	14	E15	S16	E16	S16	E15	
26		E16	S16	E15	S16	E16	S15	15	13	14	17	23	23	24	24	20	20	17	14	14	14	E15	S16	E15	S16	E16
27		E15	S16	E16	S15	E16	S16	14	16	24	24	27	26	28	24	25	14	16	16	16	E15	S16	E16	S16	E16	
28		E16	S15	E15	S16	E15	S16	15	14	17	21	23	17	24	24	24	12	17	16	14	14	E16	S15	E16	S15	E15
29		E16	S16	E16	S16	E16	S15	13	13	17	24	23	24	23	22	24	17	15	13	13	E15	S16	E16	S15	E16	
30		E16	S15	E16	S16	E16	S15	13	14	18	19	20	24	24	24	24	20	16	14	14	E16	S15	E16	S16	E16	
31		E16	S16	E16	S16	E15	S15	14	14	14	17	23	23	24	20	23	20	20	16	14	13	E16	S15	E16	S16	E16
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED		E16	S16	E16	S16	E16	S16	E15	14	15	17	22	24	25	25	24	21	18	16	14	14	E16	S16	E16	S16	E16
UQ		E16	S16	E16	S16	E16	S16	E16	15	16	18	24	26	26	26	25	23	20	16	15	14	E16	S16	E16	S16	E16
LQ		E16	S16	E16	S16	E16	S14	13	14	16	18	22	24	22	22	20	17	15	14	14	E15	S16	E16	S16	E16	

MAY. 1987

FMIN (0.1 MHz)

IONOSPHERIC DATA

MAY. 1937

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	S 305	A	F 300	F	F	F 310	R 360	370	335	A	345	280	260	275	R 275	R 285	R 280	R 310	R 340	305	365	365	A	A		
2	A	A	A	A	A	F	365	355	A	370	A	A	275	290	295	R 295	305	R 300	U 320	R 345	345	305	290	S 275		
3	A	A	A	F	A	U 365	S 350	S 385	365	320	320	275	280	275	285	290	310	315	320	R 350	A	A	A	F		
4	F	F	F	F	F	A	340	350	355	A	A	295	285	310	300	310	320	R 295	300	325	S 330	340	A	A		
5	A	A	F	A	F	F	A	335	355	325	295	290	295	R 300	305	315	320	320	R 310	335	S 335	S 315	A	A		
6	A	F	F	F	F	F	320	345	A	340	310	295	300	305	295	295	310	310	U 325	A	F	280	S 285	F		
7	F	F	F	F	F	A	A	345	A	A	310	285	280	290	295	295	300	U 310	R 320	R 335	J 300	300	S 285	S 280		
8	F	F	300	F	F	F	320	335	320	310	300	295	295	295	295	305	310	310	335	R 365	325	295	S 330	F		
9	F	F	F	F	F	F	360	340	345	335	310	290	280	285	295	R 300	R 315	315	315	340	S 325	355	310	F		
10	F	F	F	F	F	F	315	335	360	A	A	A	A	300	295	280	270	A	A	A	A	A	A	A		
11	A	A	A	F	F	F	R 300	R 325	355	A	290	270	R 280	290	295	305	315	300	290	U 315	R 350	365	A	A		
12	F	F	F	F	F	F	300	295	A	A	295	290	A	R 285	295	R 300	305	300	315	R 350	R 365	A	A	A		
13	A	F	A	F	F	F	365	365	A	A	A	290	290	285	290	300	305	320	310	R 330	335	300	305	290		
14	300	F	F	F	F	F	A	345	350	320	A	295	285	290	285	295	310	300	295	315	340	310	290	285		
15	300	F	F	F	F	F	F	330	355	R 350	300	315	300	295	300	305	300	310	315	R 320	360	285	F	F		
16	F	F	F	F	F	F	R 335	A	330	A	295	A	A	285	295	290	295	285	305	U 335	R 350	A	S 280	F		
17	F	F	A	A	A	F	R 335	345	R 365	A	320	275	A	A	A	290	R 295	290	305	325	R 320	310	300	F		
18	F	F	F	F	F	F	335	355	340	355	285	265	R 295	A	A	300	315	310	300	320	310	340	S 315	F		
19	F	F	F	F	F	F	360	355	350	320	310	285	285	290	A	305	300	310	305	335	S 345	315	320	F		
20	F	F	F	F	F	F	355	355	360	A	300	285	290	285	290	310	310	305	295	310	S 325	350	290	280		
21	295	S 300	S 305	295	U 305	S 340	R 365	R 365	360	345	295	285	285	295	300	295	315	305	300	345	S 310	S 300	290	S 290		
22	F	F	F	F	F	F	345	340	315	320	320	A	280	285	280	295	300	305	R 300	320	S 355	300	290	290		
23	U 305	S 305	325	320	F	F	345	345	360	A	A	285	295	285	295	305	315	320	310	320	345	305	R 280	F		
24	F	F	F	F	F	F	S 365	335	345	340	A	A	A	270	275	R 295	310	345	340	335	305	S 305	F	F		
25	F	F	F	F	F	F	340	325	365	A	A	285	300	A	A	A	275	325	R 295	A	S 310	A	300	F		
26	A	A	F	F	F	335	350	360	A	A	A	290	275	270	R 285	305	335	315	315	R 335	320	310	F	A		
27	F	F	F	F	F	F	320	320	275	A	A	A	A	A	A	A	A	270	270	A	S 280	S 300	315	F		
28	F	F	F	F	F	A	F	F 325	350	A	A	A	A	A	A	275	325	315	315	330	S 310	335	305	S 280		
29	290	S 295	S 300	295	F	F	350	335	355	305	A	260	A	280	280	280	295	310	315	R 315	S 310	S 335	S 285	S 280		
30	285	300	S 300	300	315	S 360	335	R 320	290	285	285	290	310	300	310	300	295	A	A	A	A	A	A	F		
31	F	F	F	F	F	F	330	305	320	325	275	240	285	285	295	290	290	320	310	280	300	315	290	S 275		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	7	4	6	4	2	9	26	30	24	15	19	24	25	26	25	29	29	29	29	26	27	24	19	10		
MED	300	300	300	298	310	340	340	345	350	320	300	285	285	290	295	300	310	310	310	325	330	310	290	282		
UQ	302	302	305	310		S 360	350	355	358	342	310	290	295	295	295	305	315	315	320	R 335	348	335	305	290		
LQ	292	298	S 300	295		330	335	330	332	310	292	280	280	285	285	290	300	300	300	315	310	300	285	S 280		

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M(3000)F2 (0.01)

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IONOSPHERIC DATA

MAY. 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									A	A	A	A	A	370	A	A	A	A	A					
2								A	A	A	A	A	A	A	370	390	365	360	L	L				
3									A	A	L	A	A	A	370	A	A	A						
4									L	A	A	A	A	380	380	A	A	A	A					
5							A	A	A	A	A	A	A	A	A	410	A	A	A					
6								A	A	L	L	405	410	405	390	385	U	L	A	A	A			
7							A	A	A	A	A	L	405	390	A	A	L	A	L	A				
8								A	L	A	L	A	A	A	A	A	A	A	A	A				
9									L	U	L	U	L	A	A	A	A	L	L					
10								A	A	A	A	A	A	A	A	A	A	A	A	A				
11									A	A	L	U	L	360	365	375	380	380	370	375	A	A		
12							A	L	A	A	A	A	A	A	385	390	395	U	L	A	A			
13								A	A	A	A	A	395	A	A	A	A	A	A					
14								A	A	A	A	385	385	395	390	385	385	A	A					
15								L	L	L	L	A	385	390	A	385	390	A	L					
16								A	U	L	A	A	A	A	A	370	365	380	L					
17								A	A	A	A	A	A	A	A	A	A	A	A					
18								L	U	L	L	L	380	A	A	A	A	A	L					
19								L	A	A	405	A	A	A	A	A	A	A	A	A				
20								L	L	A	L	395	A	A	390	410	A	A	L					
21								L	U	L	A	390	415	405	400	A	A	355	L	A				
22							L	L	U	L	385	390	A	A	A	A	A	385	U	L				
23							L	L	L	A	A	390	A	A	A	385	A	A	A	A				
24								A	A	A	A	A	A	L	L	385	A	U	L	A				
25								A	A	A	A	365	375	A	A	A	A	A	A					
26									A	A	A	A	400	A	A	A	375	U	L	L				
27							L	355	A	A	A	A	A	A	A	A	A	A	A					
28								A	A	A	A	A	A	A	A	A	A	A	A					
29								L	A	A	A	A	A	A	A	365	A	A	L					
30								L	L	365	A	A	395	A	A	A	A	A	A	A				
31								L	A	370	385	395	395	395	395	385	390	U	L	L				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									5	5	7	10	12	10	11	13	10	9	1					
MED									U	L	400	370	385	388	395	390	385	385	385	370	U	L	380	
UQ									U	L	400	380	390	395	402	395	390	390	390	U	L	380		
LQ									U	L	375	365	365	375	382	380	375	385	375	360	L			

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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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									275	A	270	380	370	370	350	330	305	295	255					
2							230		A	A	A	A	370	330	320	310	300	300	260					
3								240	270	305	370	360	355	345	325	300	275							
4								250	A	A	A	320	350	310	305	290	275	305	300					
5						A	A	A	A	A	A	A	330	320	310	280		A	A	A				
6							A	A	A	250	300	350	330	315	340	340	305	A	A	A				
7						A	A	A	A	A	A	300	415	340	A	A	300	A	250	A				
8							A	280	A	300	A	A	A	A	A	A	A	A	A	A	220			
9								270	315	350	355	350	345	315	290	270	280	250						
10							250	A	A	A	A	A	330	315	A	A	400	A	A	A	A			
11								230	A	330	375	345	240	310	300	270	280	A						
12						A	240	A	A	A	A	A	A	A	310	305	290	300	A	A	A			
13							A	A	A	A	A	A	405	A	350	310	A	A	A					
14							A	A	A	A	405	400	350	370	340	290	A	280						
15							240	250	280	330	A	390	370	340	300	270	270	270						
16							A	280	A	350	A	A	345	340	330	320	315	285						
17							255	250	A	A	390	A	A	A	330	350	320	285						
18							255	250	280	420	380	375	A	A	330	295	280	295						
19							250	A	A	320	A	A	A	A	A	A	A	A	A	A				
20							230	265	A	350	440	A	375	330	290	290	A	290						
21							220	250	260	A	400	400	350	360	A	300	290	280	A					
22							240	240	250	300	310	A	A	A	A	A	A	310	290					
23							240	240	240	A	A	440	A	A	A	310	A	A	A	A				
24							255	290	A	A	A	460	395	330	305	285	250	255						
25							250	250	A	A	440	350	A	A	A	370	300	310	A					
26								A	A	A	A	400	315	350	320	300	280	270						
27							330	450	A	A	A	A	A	A	A	A	A	400	360	A				
28							275	A	A	A	A	A	A	A	A	340	320	280	270					
29							270	255	285	A	A	A	A	375	365	335	310	280	270					
30							250	350	340	350	320	300	330	315	345	350	A	A	A					
31							320	320	660	560	415	370	345	330	325	290	300	330						
00	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	18	20	10	14	16	20	20	20	24	23	20	20	1					
MED						240	250	252	282	330	380	370	345	335	322	300	292	280	220					
UQ						255	280	315	350	410	400	362	350	332	308	302	292							
LQ						240	250	270	305	352	348	318	315	302	290	280	265							

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H*F2 (KM)

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IONOSPHERIC DATA

MAY. 1987

H'F (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA																								
Lat.	26° 16.9' N, Long. 127° 48.4' E																								
Sweep 1	MHz to 25 MHz in 24 sec in automatic operation																								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	300	A	315	300	240	255	210	215	A	A	A	A	A	E A 260	A	A	A	A	A	220	205	205	A	A	
2	A	A	A	A	A	255	210	A	A	A	A	A	A	A	230	195	210	205	245	225	200	205	280	315	
3	A	A	A	270	A	230	225	205	A	A	200	A	A	A	255	A	A	A	270	225	A	A	A	320	
4	300	280	245	235	270	A	270	230	A	A	A	A	A	200	250	A	A	A	A	265	220	245	A	A	
5	A	A	A	A	E A 280	E A 270	A	A	A	A	A	A	A	A	A	230	A	A	A	240	215	E A 260	A	A	
6	A	A	A	E A 280	250	250	245	A	A	A	210	190	200	A	A	A	A	A	A	A	A	E A 300	A	A	
7	E S 310	A	E A 270	260	250	A	A	A	A	A	A	210	200	200	A	A	A	A	240	A	220	230	280	S 61	
8	E A 300	E A 290	260	230	230	220	260	A	A	A	210	A	A	A	A	A	A	A	A	A	220	E A 270	275	A	
9	315	315	290	250	230	220	250	220	215	250	220	A	A	A	A	A	A	A	A	245	230	200	215	290	
10	A	290	290	225	220	265	245	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
11	A	A	A	295	270	250	250	270	A	A	A	230	205	205	200	220	220	A	A	255	235	200	A	A	
12	A	A	A	215	250	A	A	A	A	A	A	A	A	A	A	240	205	A	A	A	A	205	A	A	
13	A	E S 290	A	265	255	240	225	A	A	A	A	A	A	A	A	A	A	A	A	235	210	230	240	S 280	
14	275	A	A	E A 260	A	E A 270	A	A	A	A	A	A	200	A	230	250	220	A	A	260	205	200	250	270	
15	E A 300	S	280	260	210	220	220	210	210	190	190	A	A	A	A	A	230	A	220	250	205	250	280	280	
16	350	335	350	230	270	250	270	A	235	A	A	A	A	A	A	200	235	220	A	255	245	A	A	A	
17	350	335	A	A	A	260	270	A	A	A	A	A	A	A	A	A	A	A	A	280	265	245	270	295	
18	280	255	230	225	270	250	245	240	200	215	200	195	225	A	A	A	A	A	245	245	225	225	210	320	
19	A	A	A	A	A	230	215	230	A	A	200	A	A	A	A	A	A	A	A	A	A	A	A	E S 290	
20	290	260	S 300	290	265	210	230	215	240	A	A	190	A	A	240	210	A	A	A	240	260	240	220	S 280	
21	280	280	S 290	A	280	E S 290	210	205	200	200	A	200	210	200	A	A	A	A	220	A	205	230	260	E S 280	
22	A	A	A	260	265	230	220	210	200	200	A	A	A	A	A	A	A	240	220	250	200	250	A	A	
23	A	260	240	250	S	250	230	210	200	A	A	210	A	A	A	A	A	A	A	A	230	A	A	A	
24	295	300	295	300	240	200	235	A	A	A	A	A	A	A	A	250	A	A	A	245	285	285	320	A	
25	275	290	250	300	300	285	250	A	A	A	A	A	A	A	A	A	A	A	A	A	300	A	315	A	
26	A	A	300	330	250	255	250	230	A	A	A	A	200	A	A	A	A	235	225	240	235	220	250	315	
27	320	325	285	240	305	285	230	A	A	A	A	A	A	A	A	A	A	A	A	A	290	265	270	A	
28	330	350	230	210	250	A	300	A	A	A	A	A	A	A	A	A	A	A	A	235	260	220	245	280	
29	285	275	245	250	230	S	250	240	A	A	A	A	A	A	A	250	A	A	A	230	255	250	250	225	305
30	195	280	315	255	250	220	235	215	220	215	A	A	245	A	A	A	A	A	A	A	A	A	A	260	
31	295	290	305	255	250	255	245	A	A	250	250	200	205	210	235	200	220	250	230	260	225	290	300	230	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	19	13	20	26	25	26	27	15	9	7	8	8	9	6	3	10	7	5	12	20	26	23	18	15	
MED	295	290	284	258	250	243	245	215	210	215	205	200	205	201	238	215	220	225	240	248	220	238	272	280	
UQ	312	315	300	280	270	253	250	230	220	232	215	210	210	208	245	250	232	240	245	258	245	252	290	300	
LQ	281	270	252	238	240	230	225	210	200	200	200	192	200	200	230	200	220	220	225	235	205	220	245	270	

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H'F (KM)

IONOSPHERIC DATA

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H'E (KM)

135° E Mean Time (G.M.T. + 9 h)

Station		OKINAWA		Lat. 26° 16.9' N		Long. 127° 48.4' 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
1						S	105	A	A	A	A	A	110	110	105	110	110	A	A					
2						S	105	A	A	A	A	A	A	105	105	105	105	A	S					
3						A	A	A	A	A	A	A	A	105	105	105	105	110	A					
4						S	105	A	A	A	A	A	A	A	105	105	105	A	A					
5						S	110	105	A	A	A	A	A	A	A	105	A	105	A					
6						S	105	105	A	A	A	A	A	A	110	105	105	A	A					
7						S	A	105	A	A	A	A	110	110	110	110	110	A	A					
8						S	A	A	A	A	A	A	A	A	A	A	A	A	A					
9						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
10						S	A	A	A	A	A	A	A	110	105	105	105	A	A					
11						A	A	A	A	A	A	A	A	A	105	105	100	A	A					
12						S	105	105	105	105	A	A	A	A	A	110	105	105	A					
13						S	110	105	105	110	A	A	110	110	110	110	110	110	A					
14						S	105	A	A	A	A	A	110	110	110	110	110	110	S					
15						S	110	105	105	105	105	110	110	105	A	105	105	105	S					
16						S	A	A	A	A	A	A	A	A	105	105	100	105	A					
17						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
18						S	105	105	105	105	A	A	A	A	A	A	A	A	A					
19						S	110	110	105	105	105	A	A	A	A	A	A	A	A					
20						S	A	A	A	A	A	A	A	A	A	A	A	A	A					
21						S	A	A	A	A	A	105	105	105	105	A	A	A	S					
22						B	120	105	105	A	A	A	A	A	A	A	A	A	A					
23						B	120	105	A	A	A	A	A	A	105	105	105	A	S					
24						S	105	A	A	A	A	A	A	A	A	A	A	A	A					
25						S	A	A	A	A	A	A	A	A	A	A	A	A	A					
26						A	100	A	A	A	A	A	A	100	100	105	105	A	A					
27						S	105	A	A	A	A	A	A	A	A	A	A	A	A					
28						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
29						S	105	A	A	A	A	A	A	A	A	A	A	A	A					
30						A	A	A	A	A	A	A	A	A	A	A	100	A	A					
31						105	A	A	A	A	A	A	A	A	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	17	9	5	5	2	2	6	10	14	16	16	7						
MED						B	120	105	105	105	105	105	108	110	108	105	105	105	105					
UQ						B	120	105	105	105	105		110	110	110	110	108	110						
LQ						112	105	105	105	105			110	105	105	105	105	105	105					

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H'E (KM)

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IONOSPHERIC DATA

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

MAY. 1987

H⁺ES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

MAY. 1987 TYPES OF ES

135° E Mean Time (G.M.T. + 9 h)

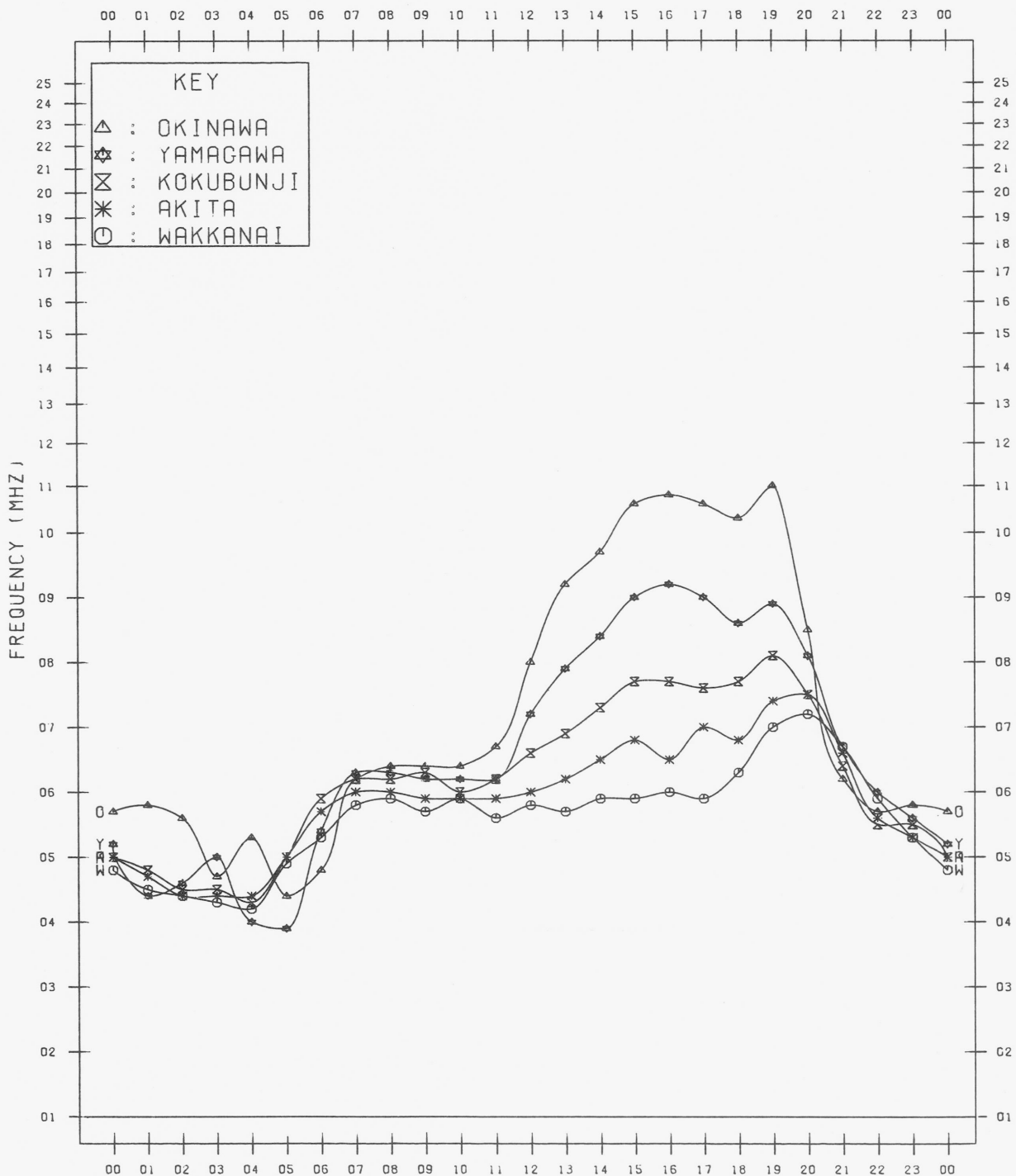
Station		OKINAWA							Lat. 26° 16.7' N, Long. 127° 48.4' E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation														
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F	F	F	F	F	F	C	C	L	L	L	L	L	H	C	C	C	C	L	L	F	F	F	F	
2	F	F	F	F	F	F	C	C	L	L	L	L	L	L	L	L	C	C	L	L	F	F	F	F	
3	FF	FF	FF	FF	FF	FF	LL	L	L	L	L	L	HL	L	H	C	C	C	L	L	F	F	F	F	
4	F	F	F	F	F	F	C	C	L	L	L	L	L	L	L	L	C	C	L	L	F	F	F	F	
5	F	F	0	F	F	F	C	C	C	L	L	L	L	L	L	L	C	C	L	L	F	F	F	FF	
6	F	F	F	F	F	F	C	C	C	L	L	L	L	HL	HL	H	C	C	L	L	F	F	F	F	
7	F	F	F	F	F	F	L	L	C	L	L	L	L	L	H	C	C	C	L	L	FF	F	F	F	
8	F	F	F	F	F	F	L	L	L	L	L	L	L	L	L	L	L	L	L	L	F	FF	F	F	
9	F	F	F	F	F	F	L	L	L	L	L	L	L	L	L	L	L	L	L	L	F	F	F	F	
10	F	FF	FF	F	F	F	C	L	L	L	L	L	L	CL	C	C	C	C	L	L	F	F	FF	F	
11	F	F	F	F	F	F	L	L	L	L	L	L	L	L	HL	C	C	C	L	L	F	F	F	F	
12	FF	F	F	F	F	F	C	C	C	C	L	L	CL	L	CL	HL	C	C	C	L	F	F	F	F	
13	F	F	F	F	F	F	C	C	C	C	L	L	CL	C	H	H	C	C	C	L	FF	F	F	F	
14	F	F	F	F	F	F	C	C	C	L	L	L	L	H	H	H	H	C	L	L	F	F	F	F	
15	F	F	F	F	F	F	C	C	C	C	C	C	C	C	C	C	H	C	C	L	F	F	F	F	
16	F	F	F	F	F	F	C	C	L	L	L	L	L	L	L	L	C	C	C	L	F	F	F	F	
17	FF	FF	FF	FF	FF	F	L	L	L	L	L	L	L	L	L	L	L	L	L	L	F	F	F	F	
18	FF	F	F	F	F	F	C	C	C	C	L	L	L	L	L	L	L	L	L	L	F	F	F	F	
19	F	F	F	F	F	F	C	H	C	C	C	C	L	L	L	L	L	L	L	L	F	F	F	F	
20	F	F	F	F	F	F	HL	L	L	L	L	L	L	L	HL	L	L	L	L	L	F	F	F	F	
21	F	F	F	F	F	F	C	L	L	L	L	L	C	C	C	C	L	CL	CL	L	F	F	F	F	
22	F	F	F	F	F	F	C	C	C	L	L	L	L	L	L	L	L	L	L	L	F	F	F	F	
23	F	FF	F	F	F	F	C	C	L	L	L	L	L	L	CL	C	C	C	L	L	F	F	F	F	
24	F	F	F	F	F	F	C	C	L	L	L	L	L	L	L	L	L	L	L	L	F	F	F	F	
25	F	F	F	F	F	F	C	C	L	L	L	L	L	L	L	L	L	L	L	L	F	F	F	F	
26	F	F	F	F	F	F	C	C	L	L	L	L	L	L	C	C	C	C	CL	L	FF	F	F	F	
27	F	F	F	F	F	F	C	C	L	L	L	L	L	L	L	L	L	L	L	L	F	F	F	F	
28	F	F	F	F	F	FF	CL	L	L	L	L	L	L	L	L	L	L	L	L	L	F	F	F	F	
29	F	F	F	F	F	F	C	C	L	L	L	L	L	L	L	L	L	L	L	HL	F	F	F	F	
30	F	F	F	F	F	F	L	L	L	L	L	L	L	L	L	L	CL	C	L	L	F	F	F	F	
31	F	F	F	F	F	F	C	L	L	L	L	L	L	L	L	L	L	L	L	L	F	F	F	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																									
MED																									
UQ																									
LQ																									

MAY. 1987 TYPES OF ES

MONTHLY MEDIAN VALUES OF FOF2

135 °E MEAN TIME

MAY 1987



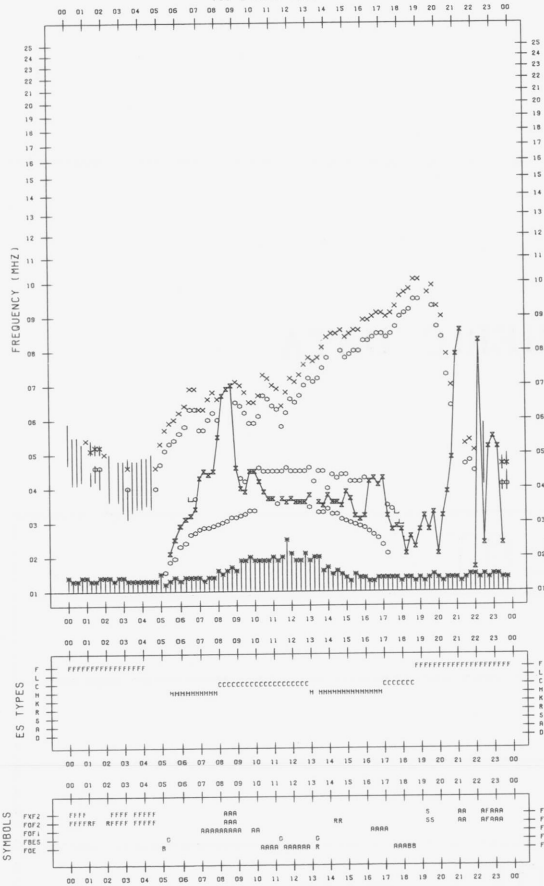
f-PLOTS OF IONOSPHERIC DATA

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
* ₁	F _{MIN}
^	GREATER THAN
v	LESS THAN

F-PLOT DATA

SCALER : T.KOIZUMI

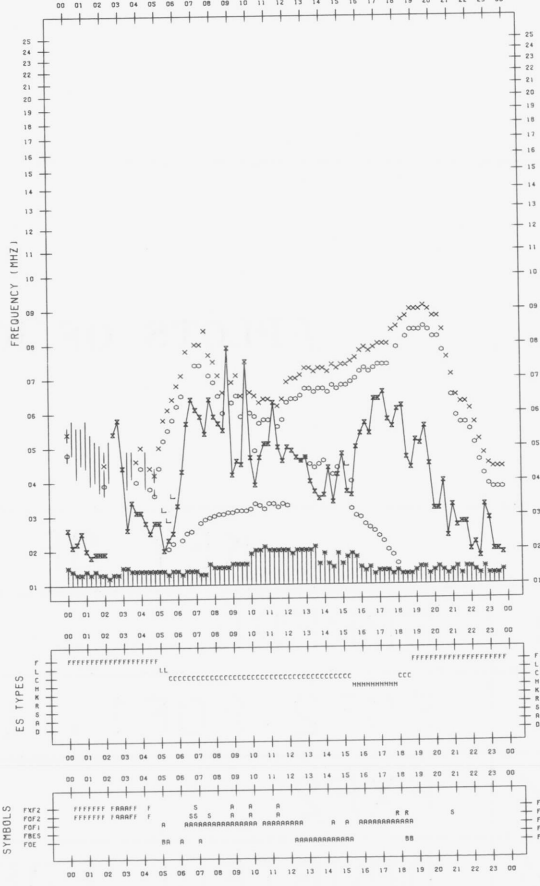
STATION : KOKUBUNJI TOKYO 135°E MEAN TIME DATE : 1987/ 5/ 1



F-PLOT DATA

SCALER : T.KOIZUMI

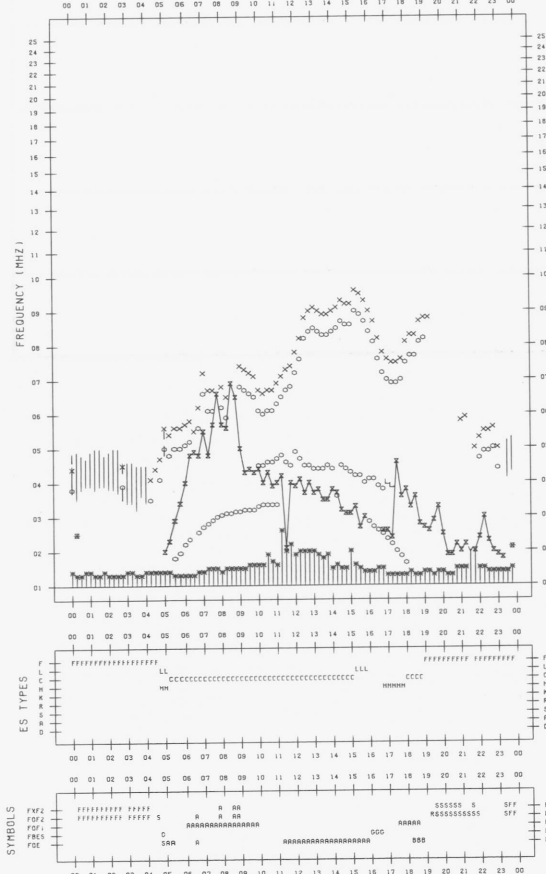
STATION : KOKUBUNJI TOKYO 135°E MEAN TIME DATE : 1987/ 5/ 3



F-PLOT DATA

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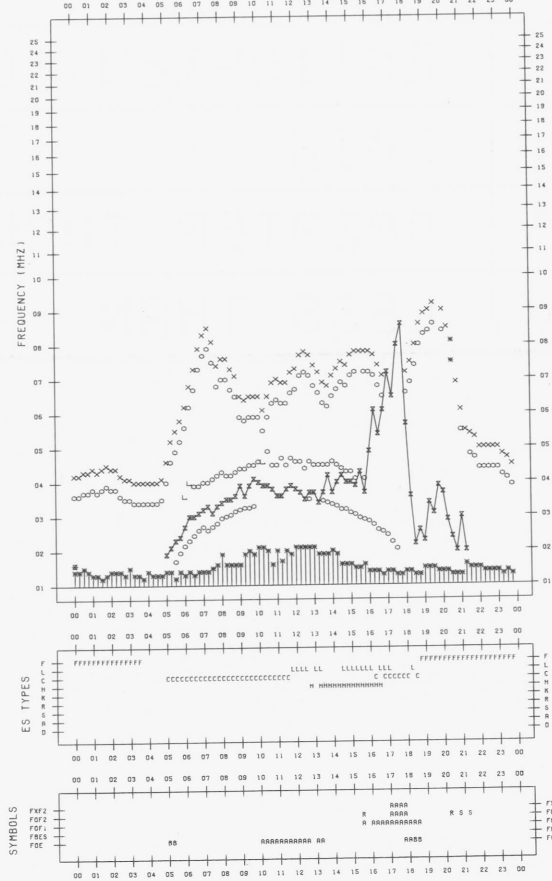
STATION : KOKUBUNJI TOKYO 135°E MEAN TIME DATE : 1987/ 5/ 2

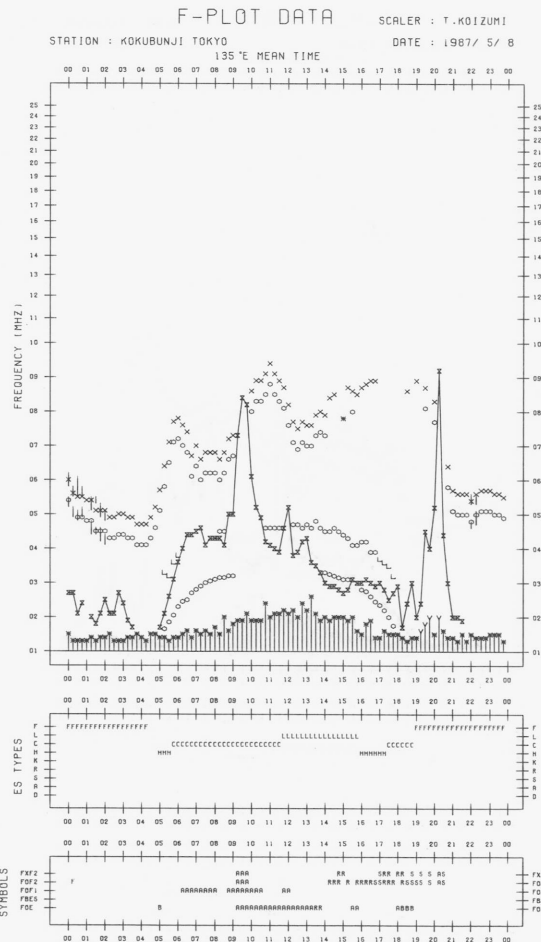
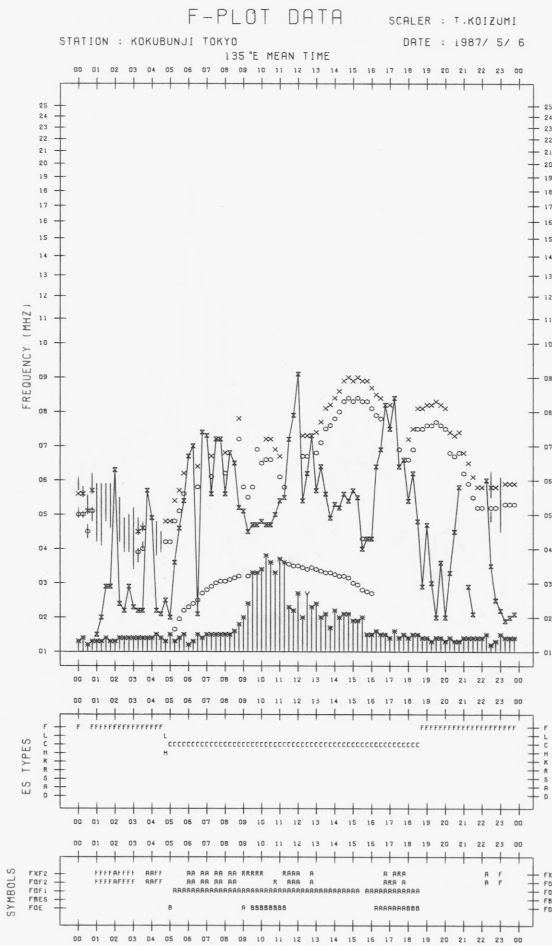
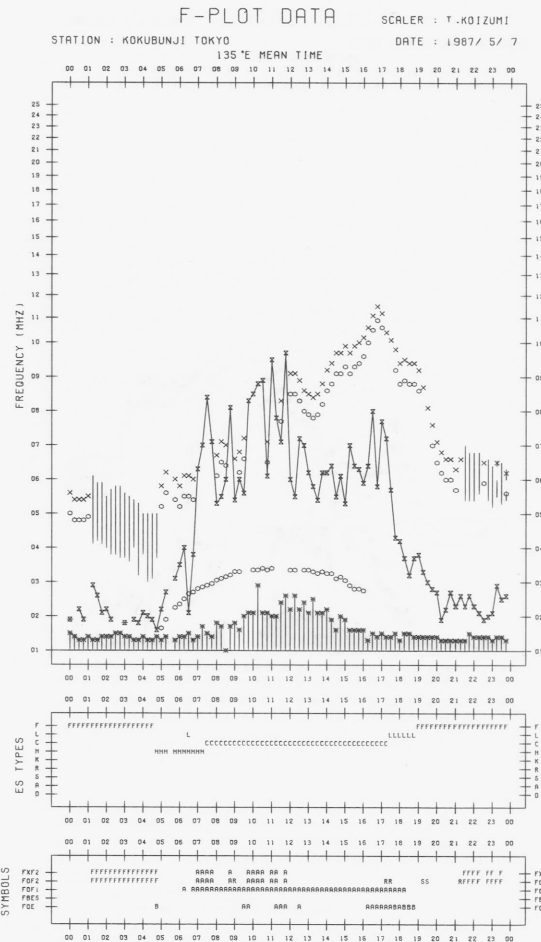
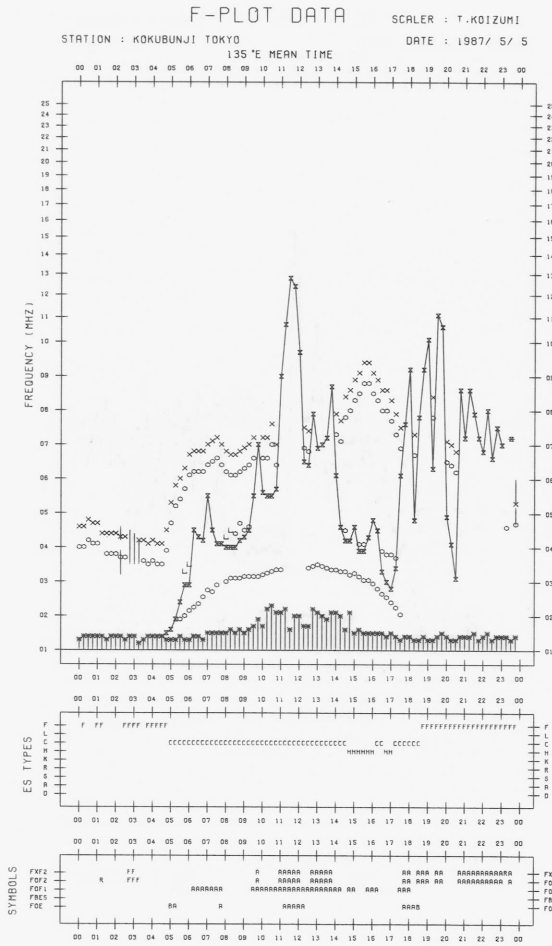


F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO 135°E MEAN TIME DATE : 1987/ 5/ 4

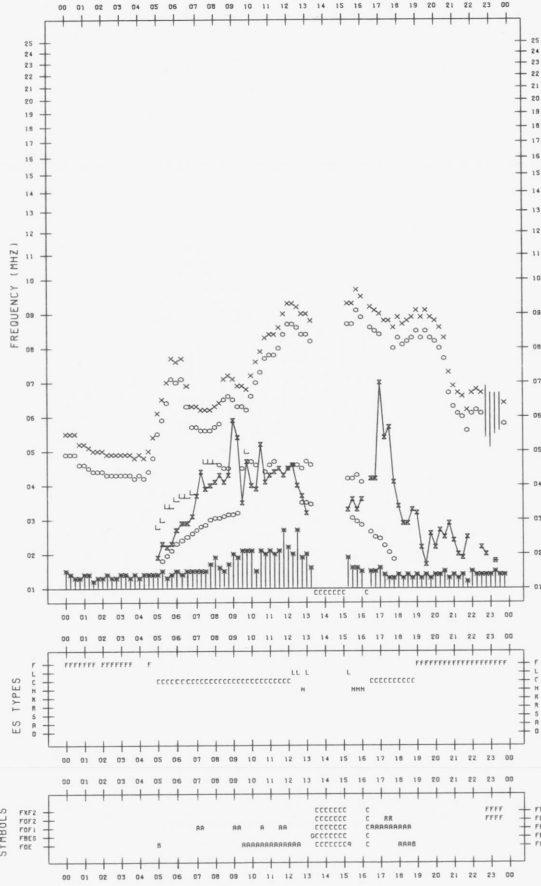




F-PLOT DATA

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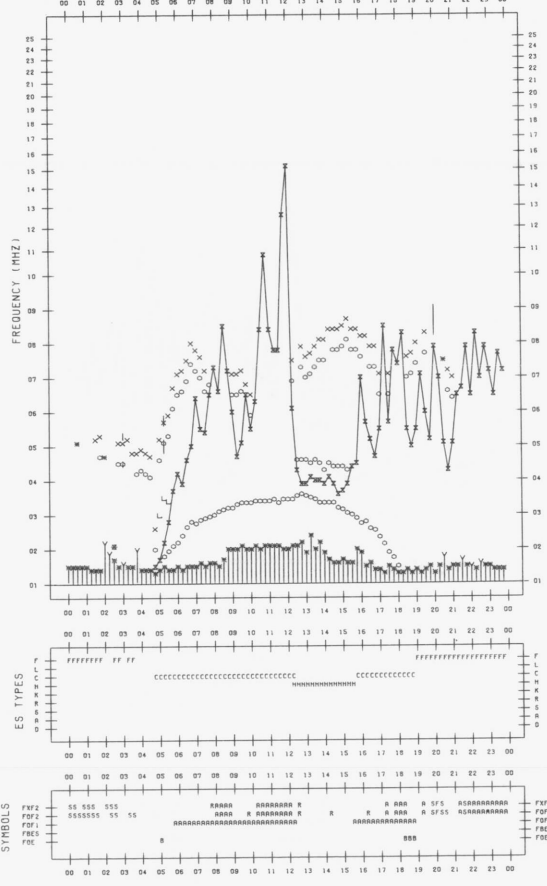
STATION : KOKUBUNJI TOKYO DATE : 1987/ 5/ 9
135°E MEAN TIME



F-PLOT DATA

SCALER : T.KOIZUMI

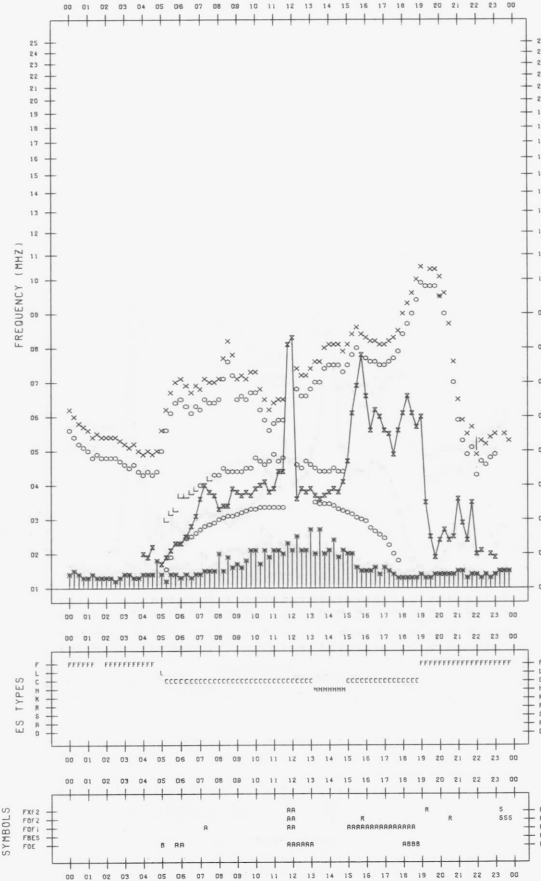
STATION : KOKUBUNJI TOKYO DATE : 1987/ 5/11
135°E MEAN TIME



F-PLOT DATA

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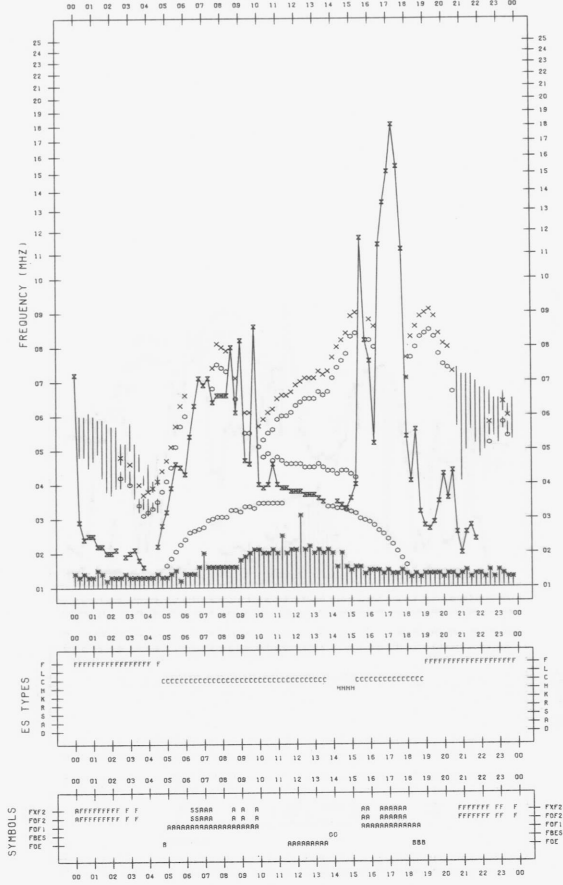
STATION : KOKUBUNJI TOKYO DATE : 1987/ 5/10
135°E MEAN TIME

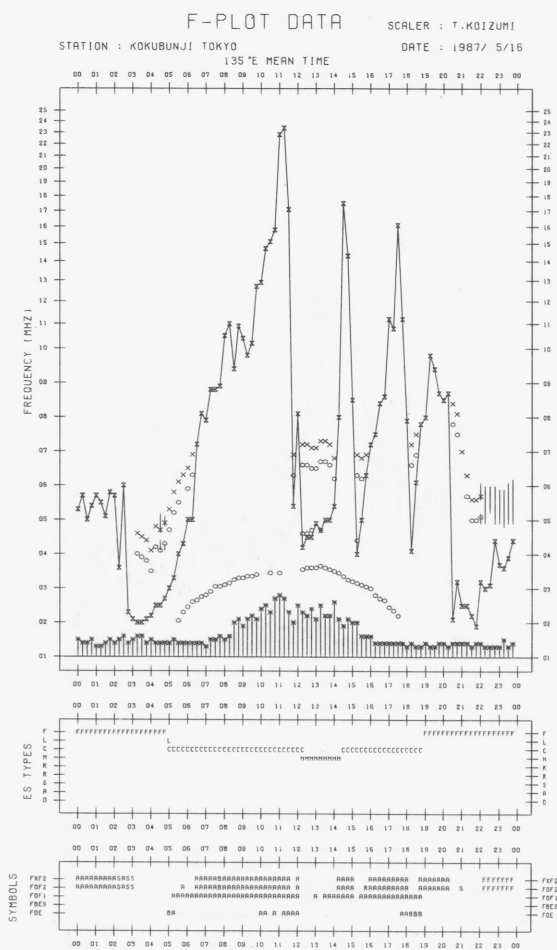
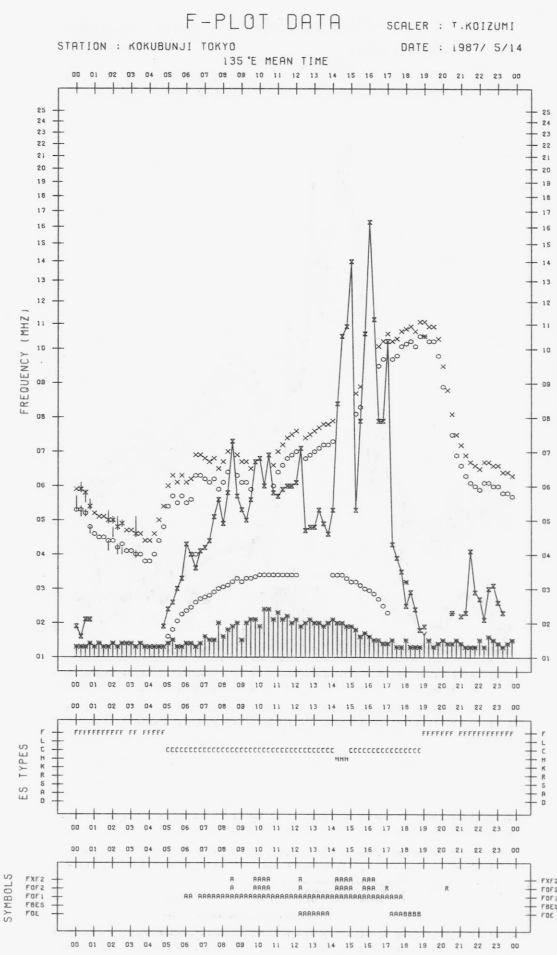
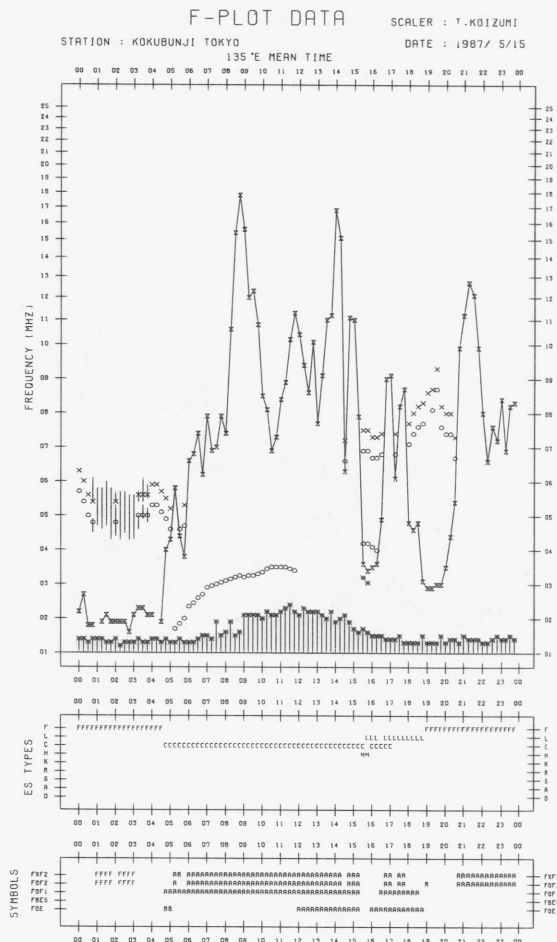
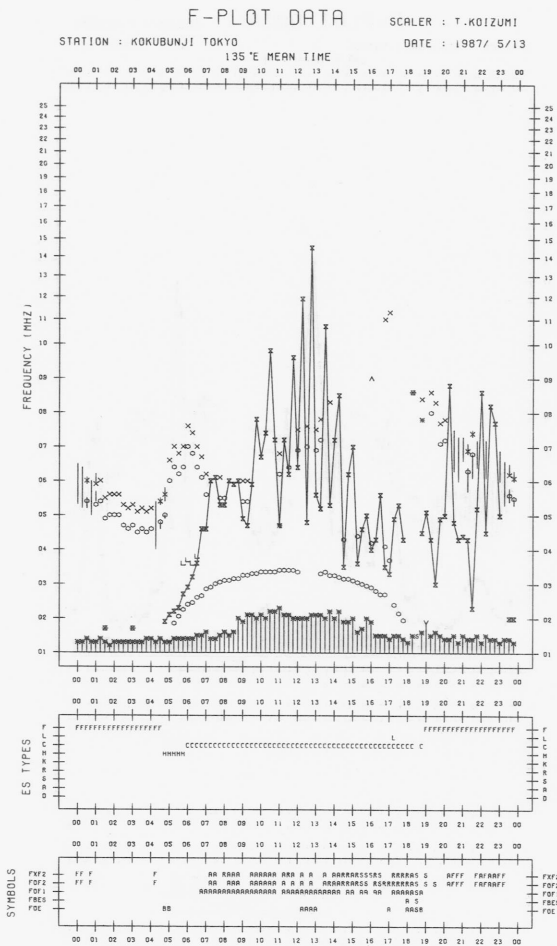


F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO DATE : 1987/ 5/12
135°E MEAN TIME

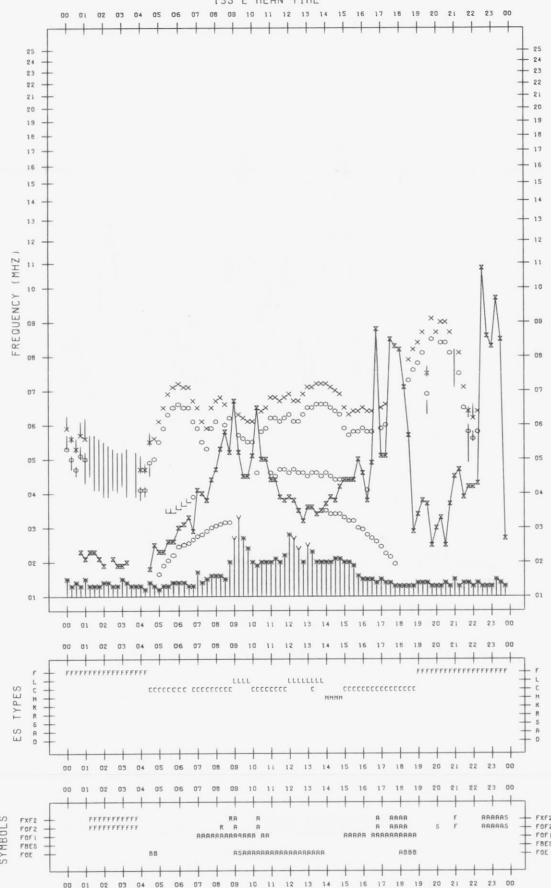




F-PLOT DATA

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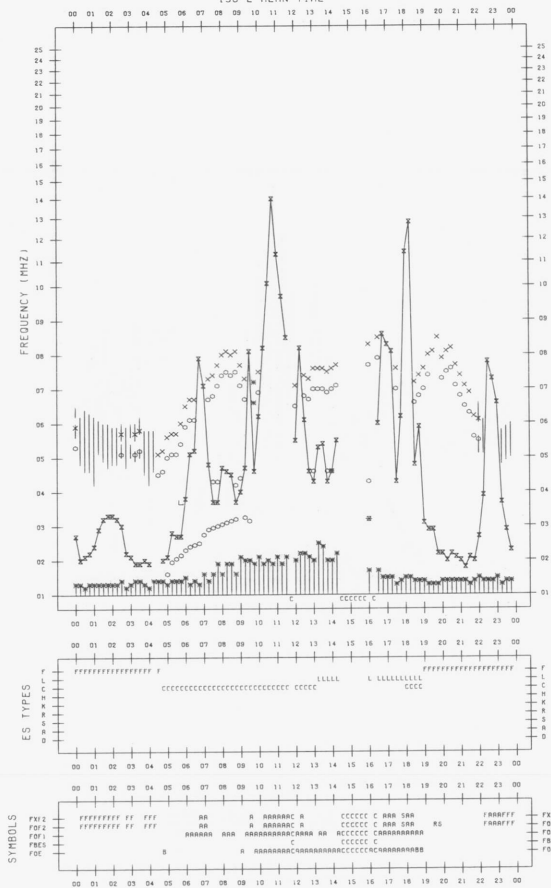
STATION : KOKUBUNJI TOKYO DATE : 1987/ 5/17
135°E MEAN TIME



F-PLOT DATA

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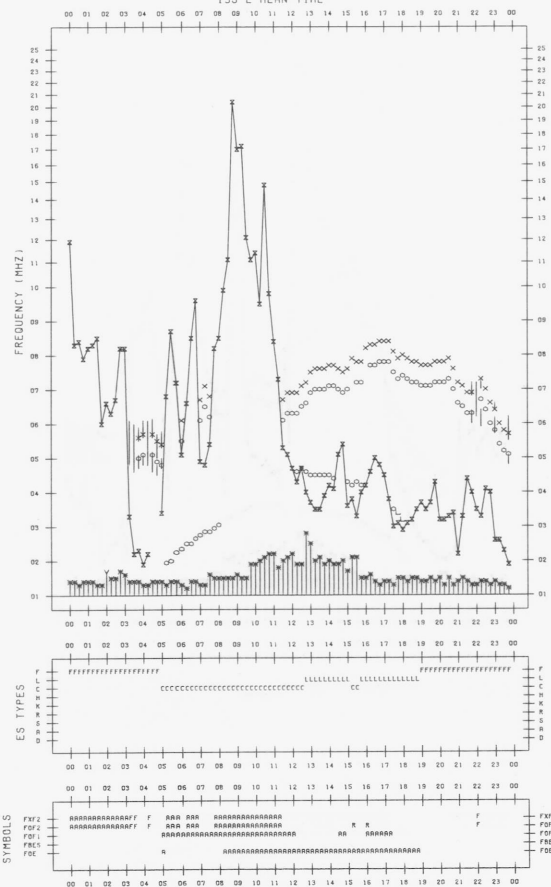
STATION : KOKUBUNJI TOKYO DATE : 1987/ 5/19
135°E MEAN TIME



F-PLOT DATA

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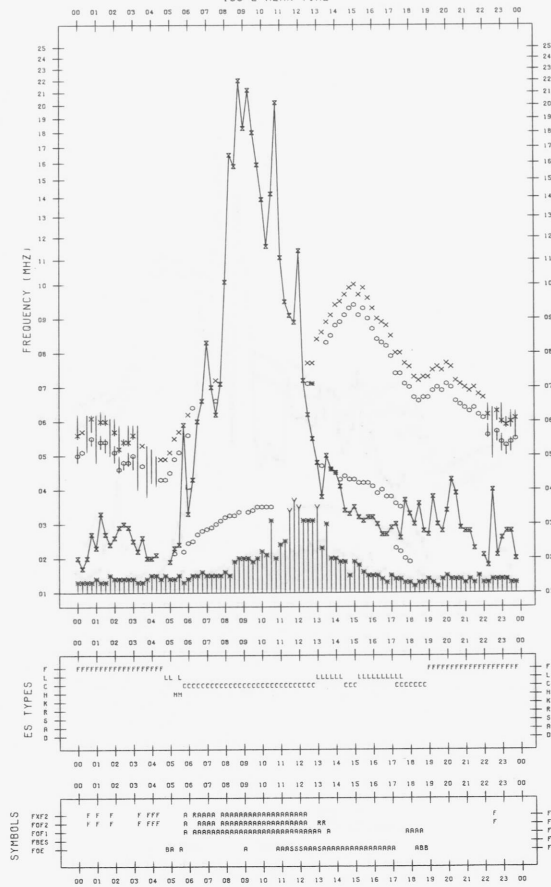
STATION : KOKUBUNJI TOKYO DATE : 1987/ 5/18
135°E MEAN TIME

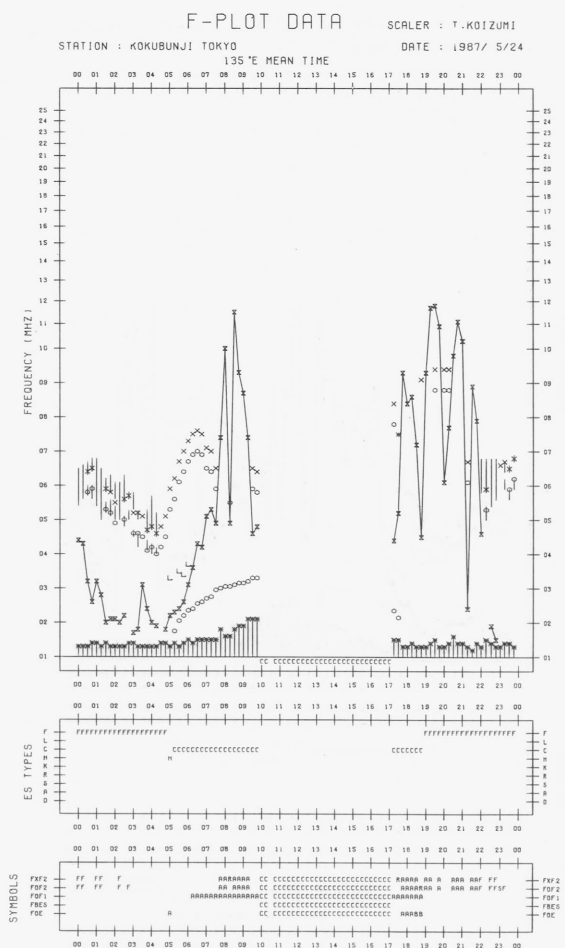
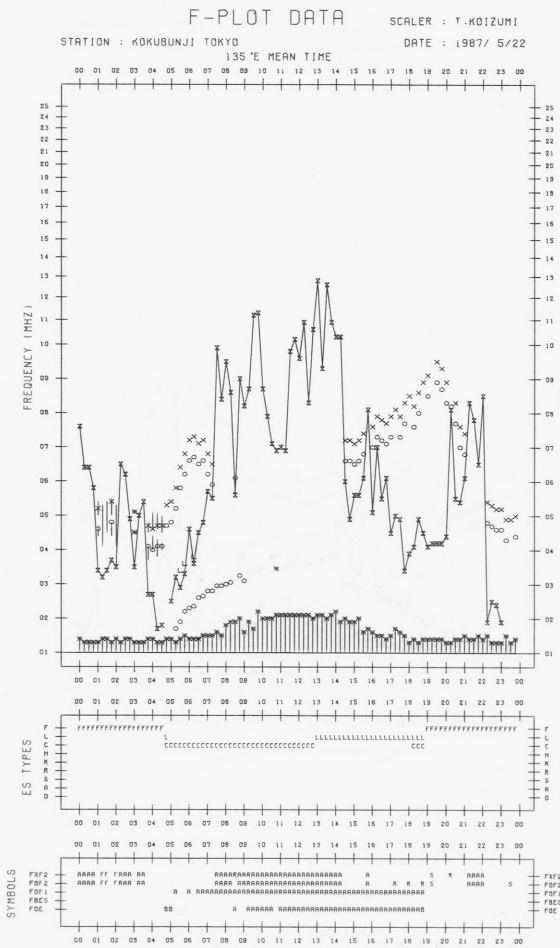
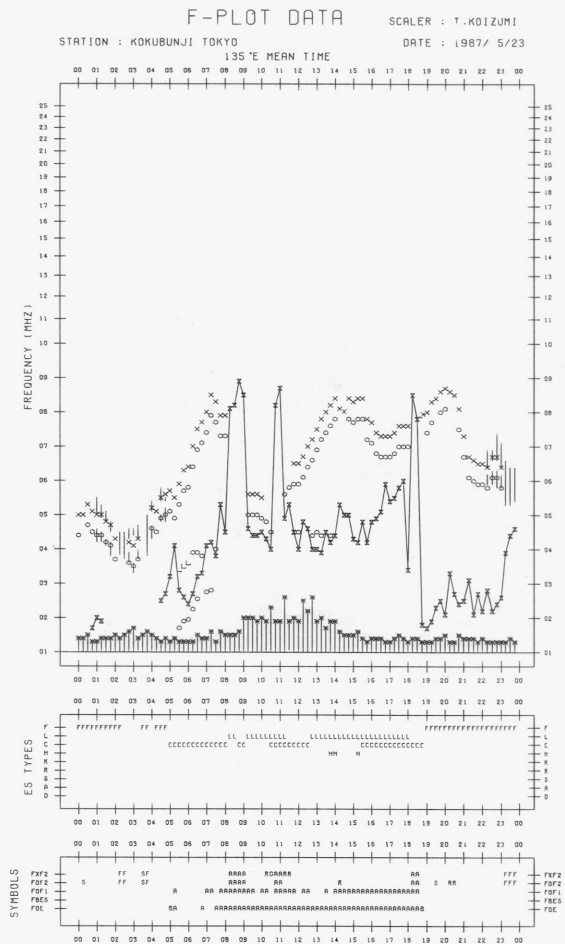
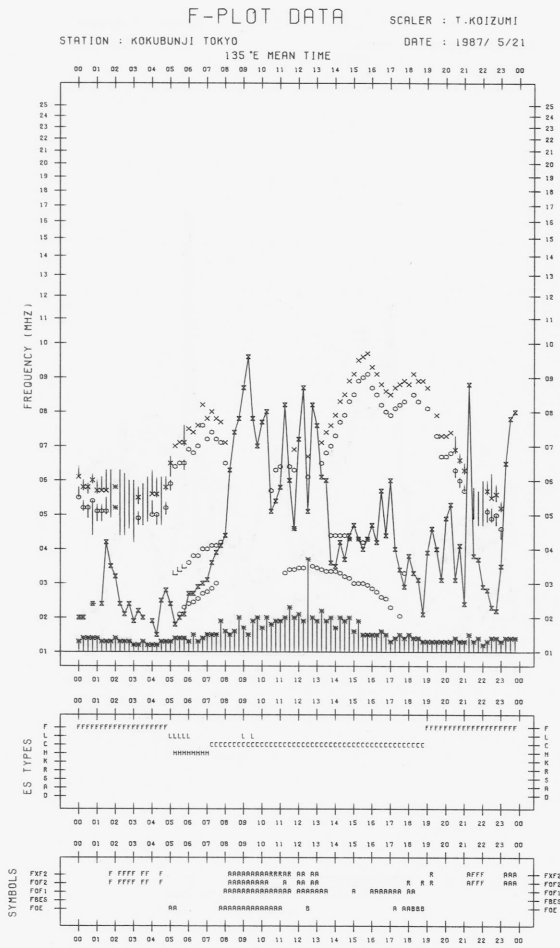


F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO DATE : 1987/ 5/20
135°E MEAN TIME





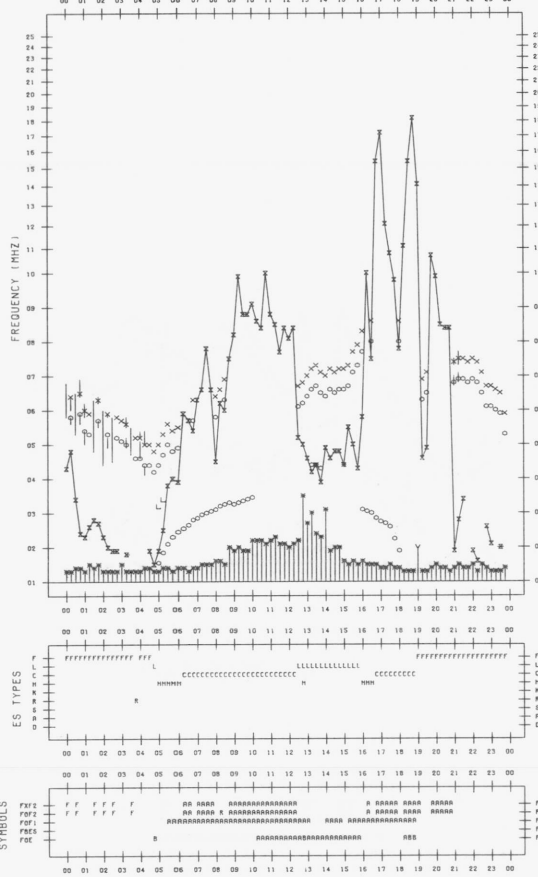
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 5/25

135°E MEAN TIME



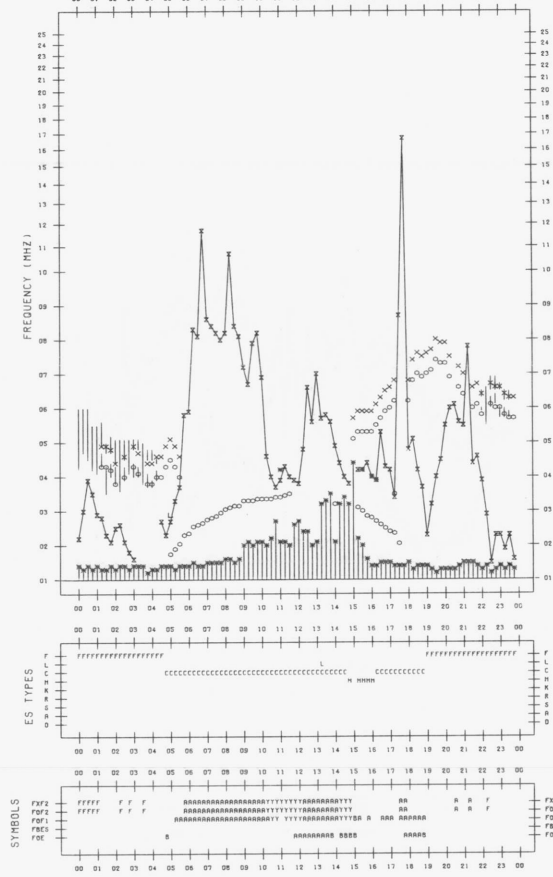
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 5/27

135°E MEAN TIME



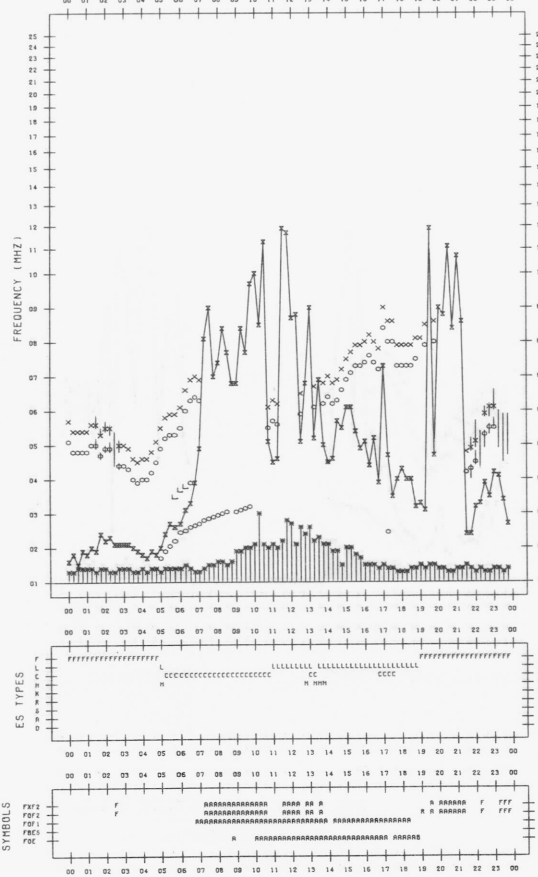
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 5/26

135°E MEAN TIME



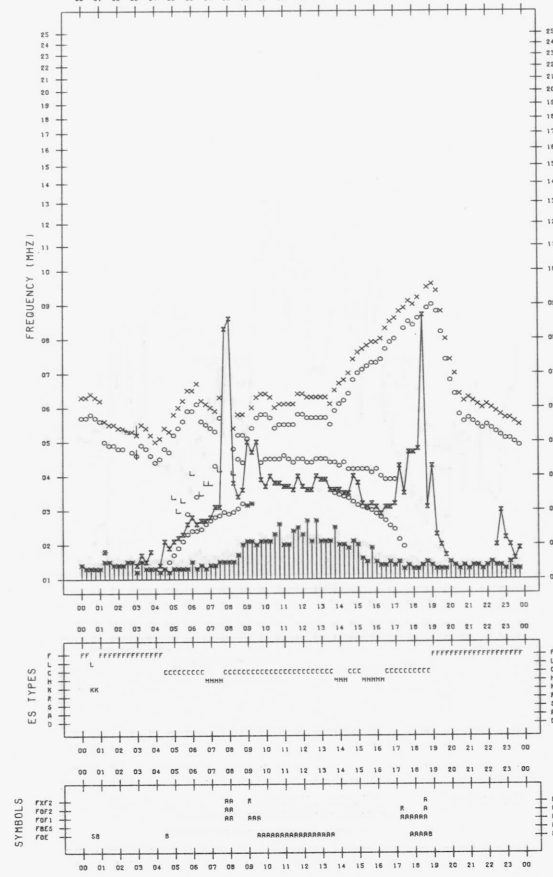
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STATION : KOKUBUNJI TOKYO

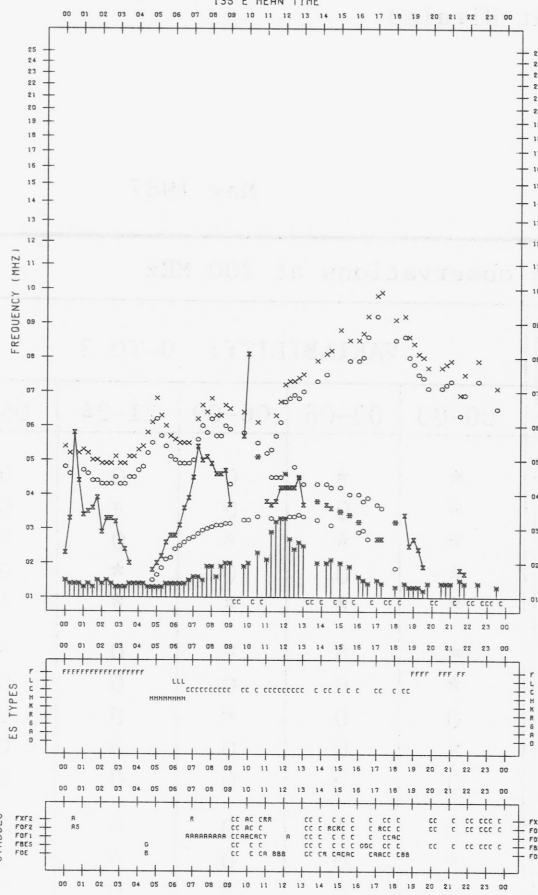
DATE : 1987/ 5/28

135°E MEAN TIME



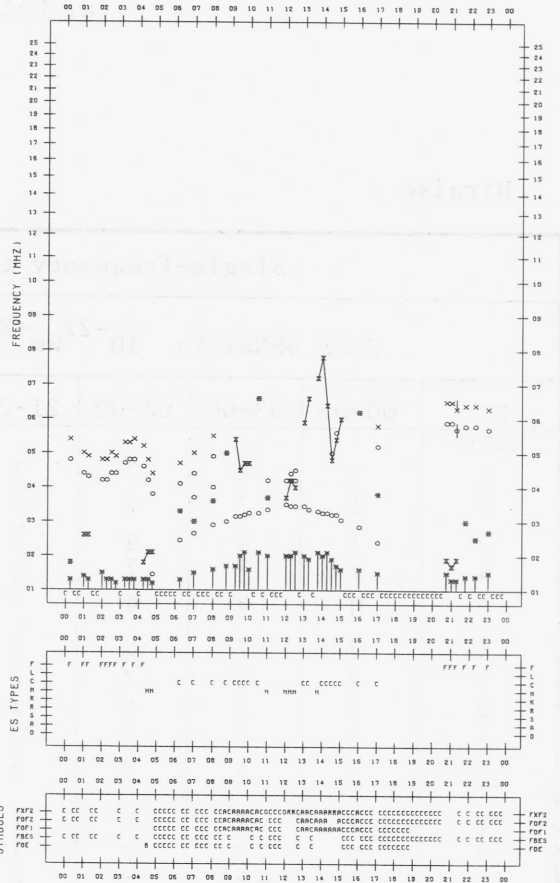
F-PLOT DATA

STATION : KOKUBUNJI TOKYO
SCALER : T.KOIZUMI
DATE : 1987/ 5/29
135°E MEAN TIME



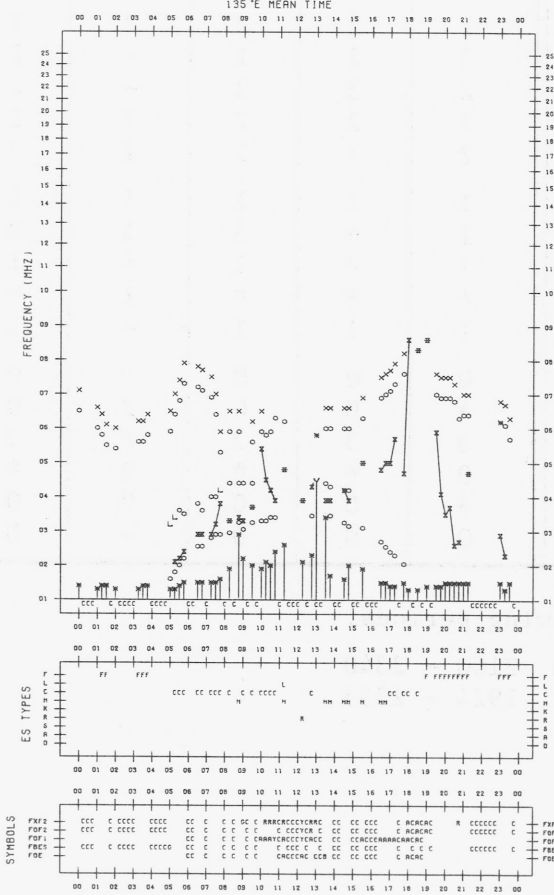
F-PLOT DATA

STATION : KOKUBUNJI TOKYO
SCALER : T.KOIZUMI
DATE : 1987/ 5/31
135°E MEAN TIME



F-PLOT DATA

STATION : KOKUBUNJI TOKYO
SCALER : T.KOIZUMI
DATE : 1987/ 5/30
135°E MEAN TIME



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

Hiraiso

May 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	*	*	0	0	0
2	7	7	7	7	7	*	0	0	*	0
3	7	q	q	7	7	*	*	*	0	*
4	7	7	7	q	7	*	0	0	*	0
5	q	q	q	7	q	*	*	*	*	*
6	7	7	q	7	7	*	*	*	0	*
7	7	7	7	7	7	*	0	0	0	0
8	7	7	7	7	7	0	0	*	0	0
9	7	7	7	7	7	*	0	0	0	0
10	7	7	7	7	7	0	0	0	0	0
11	7	7	7	7	7	0	*	0	*	0
12	7	7	7	7	7	*	0	0	*	0
13	q	8	7	8	7	*	*	*	0	*
14	q	8	8	q	8	*	1	1	*	1
15	q	q	q	8	q	*	*	*	*	*
16	8	8	8	8	8	1	2	2	2	2
17	8	8	8	-	8	2	2	1	-	2
18	8	8	8	-	8	2	3	2	-	2
19	8	8	8	8	8	2	2	2	3	2
20	8	8	8	8	8	2	1	2	1	2
21	8	8	8	8	8	1	1	1	1	1
22	8	8	8	8	8	1	*	3	1	2
23	8	q	8	8	8	1	*	1	*	1
24	q	q	8	8	8	*	*	*	1	*
25	8	8	8	-	8	1	1	1	-	1
26	8	8	8	8	8	0	0	0	0	0
27	8	9	7	8	8	*	0	0	2	0
28	8	8	8	8	8	3	3	3	*	3
29	8	8	8	7	8	0	*	*	0	*
30	7	7	7	6	7	*	0	0	0	0
31	7	7	7	-	7	0	0	0	-	0

Notes: 1. No observations during the following periods.

17th 1930 - 2344

25th 2100 - 2340

18th 1930 - 2344

31st 1924 - 2353

2. (q) likely quiet.

3. (*) interference.

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

Hiraiso

May 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	27	26	26	27
2	26	26	26	27	26
3	27	26	26	28	27
4	27	27	27	28	27
5	28	28	27	28	28
6	29	29	28	28	28
7	29	29	29	30	29
8	30	29	28	q	29
9	29	29	28	q	29
10	30	30	29	30	30
11	30	30	30	30	30
12	30	30	30	30	30
13	30	30	30	30	30
14	31	31	31	32	31
15	32	31	31	33	32
16	33	33	32	32	33
17	32	32	32	32	32
18	32	30	30	30	31
19	30	30	30	35	30
20	35	35	35	28	35
21	28	28	28	32	28
22	30	34	32	29	32
23	29	29	28	30	29
24	30	30	31	32	30
25	30	29	27	29	30
26	30	30	29	29	29
27	29	28	28	28	29
28	29	29	28	-	28
29	28	28	28	28	28
30	28	27	27	27	27
31	27	27	26	28	27

Notes: 1. No observations during the following periods.

5th 0300 - 0413
 28th 2100 - 2344

2. (q) likely quiet.

B. Solar Radio Emission
b. Outstanding Occurrences at Hiraiso

Hiraiso

May 1987

Single-frequency observations								
Normal observing period: 1940 - 0935 U.T. (sunrise to sunset)								
MAY	FREQ.	TYPE	START TIME	TIME OF MAXIMUM	DUR.	FLUX DENSITY		POLARIZATION
						(10 ⁻²² Wm ⁻² Hz ⁻¹)		
1987	(MHz)		(U.T.)	(U.T.)	(MIN.)	PEAK	MEAN	REMARKS
13	200	43 NS	2340	0730	550D	9	5	0
15	200	44 NS	1930E	0300	840D	9	7	WR
16	200	44 NS	1930E	0530	840D	20	10	WR
17	200	8 S	0003.3	0004.2	0.9	1650	-	0
	200	8 S	0003.6	0004.4U	0.9	1000D	-	-
	200	42 SER	0023.2	0027.1	12	380	-	0
	100	42 SER	0023.7	0024.6	11	840	-	-
	200	41 F	0143	0146.5	6.0	3200	-	WR
	500	41 F	0143.0	0147.2	9.0	130	-	WR
	100	41 F	0143.8	0147.0U	5.7	1000D	-	-
	200	42 SER	0218.0	0218.5	40	95	-	MR
	200	41 F	0345.5	0345.5	4.0	440	-	WR
	200	46 C	0410.0	0410.6	1.6	205	85	MR
	200	41 F	0549.5	0551.6	2.3	1750	-	0
	100	8 S	0550.8	0551.4	0.9	520	-	-
	500	46 C	0833.5	0845.1	56D	420	70	-, UNCERTAIN
	200	44 NS	2344E	0000	600D	35	15	MR
18	500	46 C	2319.5	2324.0	7.5	220	20	-
	200	44 NS	2344E	0450	600D	50	20	MR
19	500	46 C	0021.0	0023.5	10	35	10	MR
	200	46 C	0305.3	0306.2	1.5	79	28	MR
	100	41 F	0531	0636U	92	1000D	-	-
	200	41 F	0624.4	0636.3	40	1050	-	WR
	100	44 NS	1927E	2313	840D	240	80	-
	200	44 NS	1927E	0800	840D	70	25	MR
	500	24 R	2045	-	810D	200D	-	-
	200	46 C	2307.9	2310.9	13	72	34	MR
	200	46 C	2334.5	2335.6	5.3	26	10	MR
20	200	42 SER	0240.2	0324.8	46	114	-	MR
	100	42 SER	0309.7	0344	100	790	-	-
	200	42 SER	0634.8	0647.5	41	405	-	WR
	200	46 C	0900	0901.6	2.2	120	64	SR
	200	44 NS	1927E	2121	840D	37	15	MR
	100	44 NS	1927E	2122	840D	850	250U	-
	100	27 RF	2324	2336U	76	1000D	290U	-
	200	27 RF	2327.7	2338.9	71	41	15	MR
21	100	46 C	0119.5	0120.9	2.2	1000D	450D	-
	100	46 C	0308.6	0325.7	20	1000D	184D	-
	200	46 C	0308.7	0317.0	107	470	35	0
				0346.3		290		WR
	500	46 C	0312.0	0324.7	18.0	140	30	0
	100	27 RF	0331	0440.6	162	590	180	-
	500	46 C	0342.0	0345.0	15.0	150	20	WL
	200	45 C	0842.9	0843.5	1.3	195	74	WR
	100	45 C	0843	0843.7	1.6	800D	430D	-
	200	44 NS	1927E	0500	840D	100	10	MR
	200	46 C	2100	2100.8	8.6	30	8	MR
	200	46 C	2210.5	2212.8	91	1900	21	MR
	500	7 C	2212.1	2215.4	40	200D	15	-
	100	46 C	2212.4	2213.0	2.3	960	440	-
	100	41 F	2234.8	2238.0	69	350	-	-
	100	42 SER	2335.9	2345.5	22	1000D	-	-
	200	42 SER	2339.6	2339.9	6.9	1070	-	0
	500	8 S	2345.1	2345.5	0.6	20	15	WR
22	200	46 C	0312.5	0313.8	4.0	100	45	MR
	500	45 C	0324.4	0324.6	2.5	55	17	MR
	200	46 C	0553.6	0556.1	9.2	430	84	WR
	500	45 C	0555.2	0557.2	3.0	70	10	WR
	200	27 RF	0605.9	0619.0	63	56	14	MR
	200	41 F	0734.8	0800	33	310	-	SR
	200	44 NS	1926E	2353	840D	20	10	WR
	100	46 C	2128.4	2129.6U	2.3	1000D	380D	-
	200	45 C	2129.0	2129.7	1.5	2500	800	0
23	500	27 RF	0133.8	0247.8	130	48	5	WR
	200	8 S	0408.8	0409.0	0.9	350	-	0
	200	44 NS	1926E	-	840D	-	20U	-
	500	45 C	2324.6	2326.0	3.0	23	5	0
	500	45 C	2330.1	2331.5	2.5	38	10	WR
24	500	45 C	0007.2	0009.6	3.0	5	2	WR
	500	45 C	0043.4	0045.7	5.0	28	10	WR
	500	45 C	0101.3	0101.6	8.0	15	5	WR
	500	42 SER	0123	0133.6	25	30	3	0
	500	42 SER	0240.8	0250.5	25	40	15	WR
	500	27 RF	0450.1	0552.4	72	55	7	WR
	100	44 NS	1926E	2146	840D	40	10	-
	200	44 NS	1926E	2313.4	840D	35	10	MR
	100	42 SER	2035.6	2116.5	46	760	-	-
	500	8 S	2039.2	2039.4	0.2	30	-	0
	500	45 C	2048	2116.7	75	150	30	MR
				2111.8		140		WR
	200	46 C	2115.4	2116.8	2.3	235	140	0
	500	46 C	2255.5	2312.8	49	35	15	WR
25	500	42 SER	0432.1	0440.1	9	10	-	WR
	100	42 SER	0438	0505.1	36	960	-	-
	500	41 F	0502.1	0504.5	13	50	-	WL
	200	46 C	0502.6	0503.6	46	340	18	WR
26	500	7 C	0033.5	0033.6	4.5	20	5	WL
	500	6 S	0604.5	0604.9	1.5	8	4	0
	200	8 S	0928.0	0928.3	0.5	176	-	0
27	500	6 S	0158.0	0158.5	1.5	10	5	WR
	200	44 NS	1924E	0148	840D	18	10	0
	500	41 F	2045.3	2047.1	2.0	25	-	WR
28	100	8 S	0006.1	0006.1	0.7	1000D	-	-
	200	46 C	0006.2	0006.3	1.3	330	86	0
29	100	8 S	0848.0	0848.4	0.5	1000D	-	-
	200	8 S	0848.2	0848.3	0.5	4800	-	0
	500	45 C	0848.6	0848.7	2.0	140	40	0
	200	43 NS	1947	2050	105	15	7	WR
	100	43 NS	1947	2134	139	40	15	-
30	200	8 S	0029.0	0029.3	0.4	150	-	0
	500	8 S	0234.0	0234.1	0.6	10	6	0
	100	42 SER	0706.6	0741.6	39	230	-	-
	500	7 C	0731.6	0731.8	2.0	13	4	0
	200	41 F	0748.2	0752.0	7.5	430	-	0
	100	41 F	0748.2	0752.1	7.3	510	-	-
	500	46 C	0752.2	0752.5	4.0	320	40	-
	500	6 S	2256.4	2256.5	1.0	130	40	WL

C. Radio Propagation
 a. HF Field Strength at Hiraiso

WWVH 15 MHz

May 1987

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

C. Radio Propagation

b. Radio Propagation Quality Figures at Hiraiso

Hiraiso

Time in U.T.

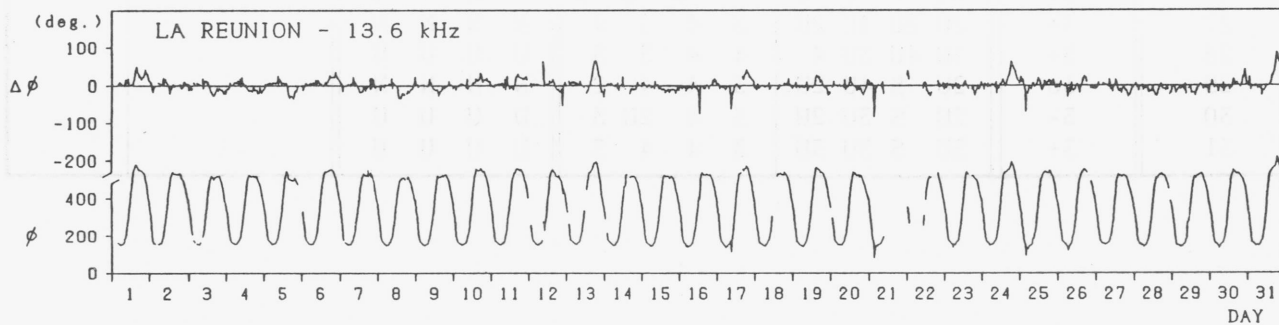
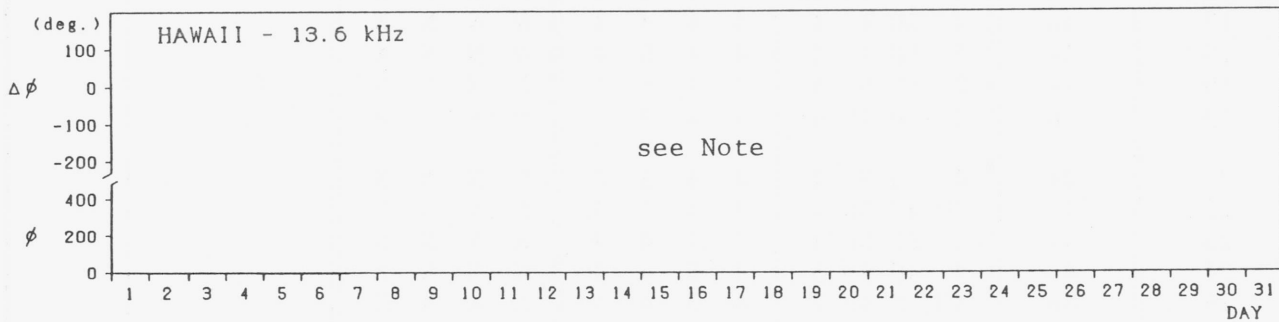
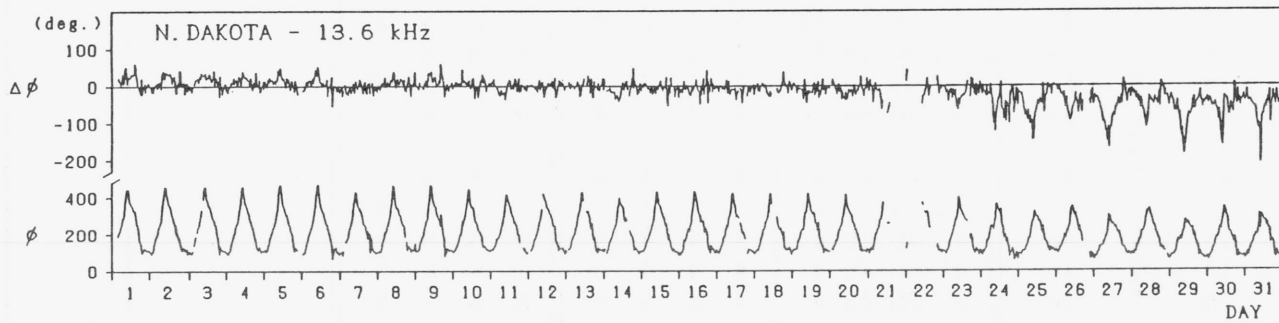
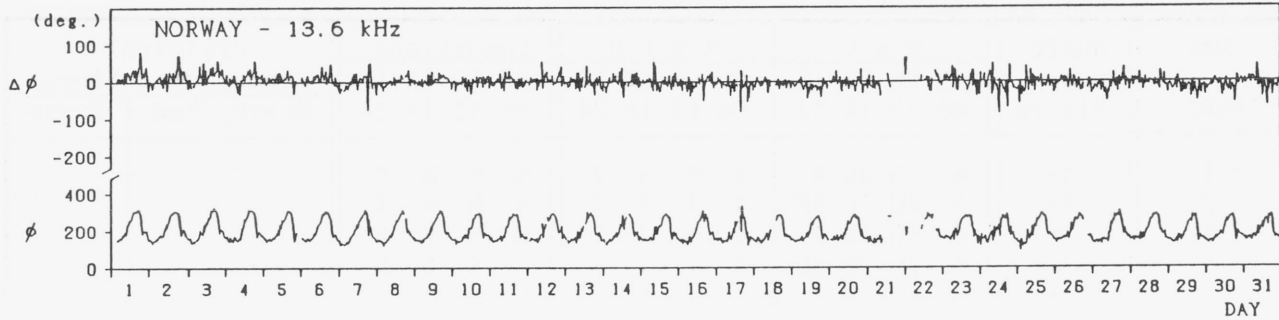
May 1987	Whole Day Figure	W W V				W W V H				Conditions				Principal Geomagnetic Storms		
		00	06	12	18	00	06	12	18	00	06	12	18	Start	End	Range
		06	12	18	24	06	12	18	24	06	12	18	24			
1	4-	4	S	2U	4	4	4	3	4	N	N	N	N			
2	4-	5	4U	2U	3U	4	4	3	4	N	N	N	N			
3	3+	4	4U	2U	4	4	4	2	4	N	N	N	N			
4	3+	4	3U	2U	4U	4	4	3	4	N	N	N	N			
5	3+	3U	S	2U	3	4	4	4	4	N	N	N	N			
6	4-	4	S	4	4	4	3	3	3	N	N	N	N			
7	4-	4	S	4	3U	4	4	3	4	N	N	N	N			
8	3+	3U	3U	4U	4	4	3	2	4	N	N	N	N			
9	4-	4	4U	2U	4	4	4	3	4	N	N	N	N			
10	4-	4	4U	3U	2U	4	4	4	4	N	N	N	N			
11	4o	3	4U	4	4	4	4	4	4	N	N	N	N			
12	4o	4U	S	4U	4	4	4	4	4	N	N	N	N			
13	4o	4	4U	4U	4	4	4	4	4	N	N	N	N			
14	4o	4	4U	4U	4	4	4	4	4	N	N	N	N			
15	4o	4	3U	4U	4	4	4	5	4	N	N	N	N			
16	4o	4	4U	4U	4U	4	4	4	4	N	N	N	N			
17	4o	4	5U	4	4	4	4	4	4	N	N	N	N			
18	4+	5	5U	4	4	4	4	5	4	N	N	N	N			
19	4+	5	4U	5	4	4	4	5	4	N	N	N	N			
20	4o	4	5U	4U	4	4	4	4	4	N	N	N	N			
21	4+	4	S	5	4	4	4	5	4	N	N	N	N			
22	4-	3U	4U	3U	4	4	4	4	4	N	N	N	N			
23	4+	4	5U	5U	4	4	4	4	4	N	N	N	N			
24	4o	4	4U	4U	3	4	5	4	4	N	N	N	N			
25	4o	4U	S	4U	2	4	5	4	4	N	N	N	N			
26	3+	3U	C	C	C	4	C	C	C	U	N	N	N			
27	3+	2U	2U	4U	2U	3	4	5	4	N	N	N	N			
28	3+	3U	4U	3U	4	4	4	3	3	U	U	U	U			
29	3o	2U	S	4U	2U	3	4	4	2	N	N	N	N			
30	3-	2U	S	3U	2U	3	4	2U	3	U	U	U	U			
31	3+	3U	S	3U	3U	3	4	4	3	U	U	U	U			

C. Radio Propagation

c. Phase Variations in OMEGA Radio Waves at Inubo

Inubo

May 1987



Note: As for HAWAII - 13.6 kHz, no record during April 18 - June 15,
due to the maintenance of transmitter.

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

NONE

C. Radio Propagation

d. Sudden Ionospheric Disturbance

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

Hiraiso

Time in U.T.

May 1987	S W F							Correspondence			
	Drop-out Intensities (dB)				Start	Duration	Type	Imp.	Solar Flare	Solar Noise	Geomag. Crochet
	CO	HA	1)	2)							
21	x	x	11		0321	24	SL	1-			
25			20		0341	15	S	2			

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

(ii) Sudden Phase Anomaly (SPA) at Inubo

Inubo

May 1987	S P A					Time (U.T.)		
	Phase Advance (degrees)					Start	End	Maximum
Date	GBR	Ω /LR	NWC	Ω /H	Ω /ND	Start	End	Maximum
2		<u>44</u>	39	—	26	0203	0313	0214
15			6	—		0030	0120	0037
16		17	<u>13</u>	—		0408	0456	0418
16		15		—		0945	1006	0950
17	24	<u>19</u>		—		0459	0603	0520
17		69		—		0842	0958	0858
19			9	—		0004	0053	0010
19		13	<u>4</u>	—		0549	0630	0556
21	32	<u>78</u>	72	—	37	0323	0516	0333
22		—	6	—	—	0307	0350	0316
22		—	5	—	—	0557	0641	0604
24			10	—		0105	0217	0130
24		18		—		0907	1006	0913
24	14			—		1527	1556	1540
24	23		<u>5</u>	—		2327	0010	2332
25		<u>14</u>	6	—		0320	0342	0323
25	29	<u>104</u>	86	—	40	0342	0444D	0348
25		<u>27</u>	22	—		0444E	0504D	0448
25	16	<u>45</u>	35	—		0504E	0555	0515
26	28	<u>40</u>	—	—		0610	0712	0617
26		20*	—	—		0748	0836	0753
28			6	—		0045	0104	0048
29			23	—		0143	0332	0216

IONOSPHERIC DATA IN JAPAN FOR MAY 1987

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