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IONOSPHERIC DATA IN JAPAN

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CONTENTS

RADIO RESEARCH LABORATORY
MINISTRY OF POSTS AND TELECOMMUNICATIONS
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BRIEFING

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

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

A. IONOSPHERE

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

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

All symbols and terminology in the tables or figures of ionospheric data are used in accordance with the "URSI Handbook of Ionogram Interpretation and Reduction (Second Edition) 1972" and its revision of chapters 1-4, published in July 1978.

a. Characteristics of Ionosphere

fxI	Top frequency of spread *F* trace
foF2 *foF1* *foE* *foEs*	Ordinary wave critical frequency for the *F2*, *F1*, *E* and *Es* including particle *E* layers respectively
fbEs	Blanketing frequency of the *Es* layer, e.g. the lowest ordinary wave frequency visible through *Es*
fmin	Lowest frequency which shows vertical ionospheric reflections
M(3000)F2 *M(3000)F1*	Maximum usable frequency factor for a path of 3000 km for transmission by *F2* and *F1* layers respectively
h'F2 *h'F* *h'E* *h'Es*	Minimum virtual height on the ordinary wave for the *F2*, whole *F*, *E* and *Es* layers respectively
Types of *Es*	See below A. b. (iii)

b. Symbols

(i) Descriptive Letters

The following letters are entered after, or used to replace a numerical value on the monthly tabulation sheets.

A Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example *Es*.

B Measurement influenced by, or impossible because of, absorption in the vicinity of *fmin*.

C Measurement influenced by, or impossible because of, any non-ionospheric reason.

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

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

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

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

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

K Presence of particle *E* layer.

L Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.

M Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

P Man-made perturbations of the observed parameter; or spur type spread *F* present.

Q Range spread present.

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

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

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

V Forked trace which may influence the measurement.

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

X Measurement refers to the extraordinary component.

Y Lacuna phenomena, severe layer tilt.

Z Third magneto-electronic component present.

(ii) Qualifying Letters

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

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

D Greater than.

E Less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

M Mode interpretation uncertain.

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

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

U Uncertain or doubtful numerical value.

Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

When more than one type of *Es* trace are present on the ionogram, the type for the trace used to determine *foEs* must be written first. The number of multiple traces is indicated after the type letter.

The types are:

f An *Es* trace which shows no appreciable increase of height with frequency.

l A flat *Es* trace at or below normal *E* layer minimum virtual height or below the particle *E* layer minimum virtual height.

c An *Es* trace showing a relatively symmetrical cusp at or below *foE*. (Usually a daytime type.)

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

q An *Es* trace which is diffuse and non-blanketing over a wide frequency range.

r An *Es* trace showing an increase in virtual height at the high frequency end similar to group retardation.

a An *Es* trace having a well-defined flat or gradually rising lower edge with stratified and diffuse traces

present above it.

s A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace.

d A weak diffuse trace at heights below 95 km associated with high absorption and large *fmin*.

n The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.

k The designation 'k' is used to show the presence of particle *E*. When *foEs* > *foE* (particle *E*) the *Es* type precedes k.

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

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

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

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

B. SOLAR RADIO EMISSION

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

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

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

a. Daily Data at Hiraiso

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

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

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

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

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

b. Outstanding Occurrences at Hiraiso

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

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

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

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

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

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

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

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

C. RADIO PROPAGATION

a. H.F. Field Strength at Hiraiso

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

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

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

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

b. Radio Propagation Quality Figures at Hiraiso

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

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

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

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

C	artificial accident,
S	propagational accident,
U	inaccurate.

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

N	normal,
U	unstable,
W	disturbed

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

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

c. Phase Variations in OMEGA Radio Waves at Inubo

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

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

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

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

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

d. Sudden Ionospheric Disturbances

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

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

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

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

Types of fade-out are as follows:

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

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

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

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

(ii) Sudden Phase Anomaly (SPA) at Inubo

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

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

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

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

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

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

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

IONOSPHERIC DATA

OCT. 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 42	x 40	x 40	x 41	x 41	x 38													A	x 52	x 55	x 47	x 48	x 45
2	x 43	x 42	x 43	x 42	x 39	x 38													x 58	x 57	x 52	x 50	x 51	x 48
3	x 44	x 43	x 43	x 42	x 39	x 39													x 57	x 61	x 59	x 55	x 52	x 40
4	43	x 38	38	36	31	x 35													x 49	x 45	x 45	x 45	x 44	x 43
5	x 38	x 38	x 36	x 35	x 32	x 34													x 56	x 50	x 47	x 46	x 45	x 44
6	x 42	x 41	x 40	x 40	x 38	x 38													x 57	x 53	x 50	x 50	x 44	x 45
7	x 46	x 45	x 44	x 43	x 43	x 41													x 57	x 58	x 56	x 54	x 51	x 51
8	x 50	x 50	x 54	x 53	x 35	x 33													x 51	x 53	x 54	x 56	A	x 54
9	x 49	x 46	x 49	x 48	x 48	x 47													x 58	x 55	x 56	x 56	x 52	x 49
10	x 48	x 46	x 46	x 44	x 43	x 40													72	70	66	65	57	56
11	63	54	x 51	58	57	57													x 65	x 63	x 55	x 51	x 53	x 52
12	x 52	x 49	x 47	x 46	x 46	x 48													x 62	x 63	x 61	x 59	x 57	x 51
13	x 51	x 50	x 51	x 53	x 52	x 50													x 67	x 66	x 63	x 59	x 58	x 57
14	x 59	x 58	x 56	x 55	51	47													x 66	69	53	58	58	47
15	51	39	42	52	53	56													x 55	x 57	x 50	x 51	x 52	x 50
16	x 52	x 50	x 52	x 51	x 49	x 49													x 59	x 59	58	57	55	57
17	55	59	56	57	59	x 47													56	60	57	53	57	55
18	56	57	56	x 55	50	x 46													x 70	x 70	x 64	x 62	x 50	x 50
19	x 50	x 50	x 51	x 49	x 51	x 49													x 62	x 62	x 56	x 54	x 49	x 49
20	x 51	x 51	x 50	x 52	x 51	x 48													x 67	x 64	A	x 51	x 50	x 49
21	x 50	51	50	x 50	x 50	x 50												x 63	x 66	x 65	x 61	A	x 55	x 43
22	x 44	x 49	58	59	63	61	57			92								x 64	x 59	x 62	x 62	x 67	57	x 52
23	50	52	57	x 56	x 55	x 49	x 57											x 62	x 58	x 56	x 49	x 51	x 51	x 46
24	x 38	x 44	x 45	x 50	x 51	x 50	63											x 62	x 54	x 53	x 51	x 47	x 50	x 51
25	x 50	x 41	x 42	x 44	x 42	x 42	x 57											x 74	x 53	x 55	48	54	56	57
26	53	x 42	x 42	A	x 42	x 40	x 50											x 62	A	x 50	x 49	x 43	x 40	x 39
27	A	x 42	x 42	x 41	x 41	x 39	x 45											x 72	x 47	x 49	x 44	x 43	x 43	x 44
28	x 44	x 44	x 40	x 41	x 38	x 34	x 37											x 56	x 46	x 46	x 42	x 41	43	42
29	x 46	A	x 49	48	48	43	x 42											x 51	A	A	x 49	54	56	50
30	x 45	x 46	x 48	x 48	x 50	x 39	x 43											x 53	x 41	x 40	x 40	x 43	x 43	x 45
31	x 47	x 44	x 44	A	x 41	x 41	x 43											x 66	x 50	x 46	x 41	x 39	x 38	x 37
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	31	29	31	31	10			1								11	28	30	30	30	30	31
MED	x 50	x 46	x 47	x 48	x 48	x 43	x 48			92								x 62	x 58	x 57	x 54	x 52	x 51	x 49
UQ	x 51	x 50	x 51	x 53	x 51	x 49	x 57											x 65	x 64	x 63	x 58	x 56	x 56	x 52
LQ	x 44	x 42	x 42	x 42	x 41	x 39	x 43											x 59	x 54	x 52	x 49	x 47	x 45	x 44

OCT. 1987 | FXI (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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	35	33	33	34	34	31	H 48	49	A	60	57	61	A	61	61	58	59	55	A	45	48	40	41	38
2	36	35	36	35	32	31	41	59	60	69	76	81	86	70	64	58	62	58	51	50	45	43	44	41
3	37	36	36	35	32	32	43	58	60	71	84	66	65	70	73	66	58	56	50	54	52	48	45	33
4	F 36	31	F 31	F 29	F 25	28	32	36	43	E G 43	53	55	55	57	55	54	52	49	42	38	38	38	37	36
5	31	31	29	28	25	27	39	49	52	54	56	56	62	60	55	54	57	61	49	43	40	39	38	37
6	35	34	33	33	31	31	46	50	56	63	76	73	64	60	57	54	55	54	50	46	43	43	37	38
7	39	38	37	36	36	34	46	56	64	65	67	68	75	67	66	64	60	53	50	51	49	47	44	44
8	43	43	47	46	28	26	50	66	64	76	80	73	76	68	68	60	64	53	44	46	47	49	A	47
9	42	39	42	41	41	40	47	52	H 61	67	67	77	73	69	65	66	68	60	51	48	49	49	45	42
10	41	39	39	37	36	33	44	60	67	76	76	75	79	73	67	71	71	73	F 64	F 63	F 59	F 58	F 50	F
11	F	F 44	44	F 48	F 49	F	58	68	H 66	74	H 86	86	87	71	69	81	79	68	58	56	48	44	46	45
12	45	42	40	39	39	41	52	64	67	68	76	99	103	98	78	76	74	58	55	56	54	52	50	44
13	44	43	44	46	45	43	47	62	71	83	71	81	85	82	71	76	68	60	60	59	56	52	51	50
14	52	51	49	48	F 44	F	H 37	51	64	70	71	76	85	73	76	68	63	62	59	F	F	F	F	F
15	F	F	F	F	F	F	63	H 64	66	77	79	79	83	72	74	75	76	69	48	50	43	44	45	43
16	45	43	45	44	42	42	55	66	H 77	85	74	85	74	70	75	74	71	60	52	52	F	F	F	F
17	F	F	F	F	F 52	40	41	62	64	70	83	93	87	77	C	C	76	65	F 49	F 53	F 50	F 46	F 50	F 48
18	F 49	F 50	F 49	48	F 43	39	56	70	71	78	90	80	80	73	67	73	70	67	63	63	57	55	43	43
19	43	43	44	42	44	42	58	73	67	71	76	H 70	85	81	70	67	71	61	55	55	49	S 47	42	42
20	S 44	44	43	45	44	41	48	61	69	79	81	80	81	77	71	69	70	65	60	57	A	44	43	42
21	43	F 44	F 43	43	43	S 43	43	65	63	72	84	80	80	88	83	37	68	56	59	58	54	A	48	36
22	37	S 42	F	F	F	F	F	61	76	F 86	S 97	93	94	75	80	73	65	57	52	55	55	60	F 50	45
23	F	F	F 47	49	48	42	50	68	82	77	H 77	80	85	85	84	74	68	55	51	49	42	44	44	39
24	31	37	38	43	44	S 43	F 53	75	93	97	104	84	77	78	69	77	74	55	47	46	44	40	43	44
25	43	34	35	37	35	35	H 50	79	78	107	95	100	75	93	94	81	84	67	46	48	F	F 45	F	F
26	F	35	35	A	35	33	43	65	83	71	77	75	76	72	72	72	73	55	A	43	42	36	33	32
27	A	35	35	34	34	32	38	68	74	76	82	85	83	80	71	76	77	65	40	42	37	36	36	37
28	37	37	33	34	31	27	30	42	46	59	63	69	73	69	73	70	67	49	39	39	35	34	F 36	F
29	39	A	42	F 41	F 36	F	35	53	59	70	H 70	74	82	69	68	64	58	44	A	A	42	F 45	F	F
30	38	39	41	41	43	32	36	49	57	68	66	A	70	A	67	67	66	46	34	33	33	36	36	38
31	40	37	37	A	34	34	36	56	74	72	79	82	72	74	72	70	64	59	43	39	34	32	31	30
	00	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	27	28	26	29	26	30	31	30	31	31	30	30	30	30	30	31	31	28	29	27	28	26	25
MED	40	39	40	41	36	34	46	61	66	71	76	80	80	72	70	70	68	58	50	50	47	44	44	42
UQ	43	43	44	45	44	41	50	66	74	77	82	84	85	78	74	75	72	64	56	55	51	48	46	44
LQ	37	35	35	35	34	31	39	52	60	68	70	73	73	69	67	64	62	55	46	45	42	40	37	37

OCT. 1987 | FOF2 (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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									A	410	430	410	A	430	A	A								
2								L 300	L 390	L 420	420	L 430	H 430	420	L 390	L 310								
3									L	H 420	L 430	420	L 460	L 430	380	L								
4									360	H 430	410	410	420	410	390	L 330								
5									380	410	L 430	430	430	L 420	L 410									
6									L	430	420	420	L 430	L 410	L 380									
7									H 400	410	430	L	430	L 410	L 410									
8									L 400	430	H 430	H 430	430	L 410	L 400									
9										L 410	L 420	440	440	L 410	L 360	L								
10									350	L 440	H 440	L 430	L 430	L 430	L 400	L 330								
11										400	H 410	420	430	L 410	L	L								
12										400	L 410	A	450	L 430	L 410									
13									L 350	L 430	420	L 440	L 420	L 410										
14										L 410	L 420	440	440	L 410	L									
15										L 430	L 430	L 430	L 440	L 410										
16									L 400	H 440	420	L 430	L 420											
17										L	420	H 440	L 460	L	C	C								
18										L	H 430	L	L 430	L 400	L 370									
19										L	430	390	L 440	400	L 370									
20											L 440	L 430	L 430	L 430	L 390									
21											L 430	A	A	L 430	L 410									
22											A	A	L	L 410	L 410									
23									L	400	L 430	L 430	430	L										
24									L 390	L 420	L 420		L	L										
25									A	A	A	H 420	L 410	A										
26									A	A	L 410	A	L 380	A	A									
27									L 380	A	A	A	A	L 430										
28										A	A	430	L 420	L 390	A									
29										L 410	L 410	L 420	L 410	L	L 350									
30									A	A	A	A	A	A	A									
31										L	L 390	A	A	L 410										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	10	19	26	21	24	23	16	3								
MED								L 300	L 385	420	420	430	L 430	L 410	L 390	L 330								
UQ									L 400	430	430	L 430	440	L 430	L 410	L 330								
LQ									360	410	L 420	420	L 420	410	L 375	L 320								

OCT. 1987 | FOF1 (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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	H 230	250	280	A	315	A	A	A	A	210	S						
2							S	225	270	295	305	310	305	300	280	A	A	S						
3							S	230	275	290	A	310	305	300	290	265	220	S						
4							S	H 230	A	A	A	A	300	A	270	H 250	200	S						
5							S	220	260	275	295	A	305	290	A	270	220	S						
6							S	230	260	285	295	305	305	295	270	240	195	S						
7							S	230	260	280	300	305	310	300	290	250	A	S						
8							170	225	260	280	A	A	A	300	290	265	200	S						
9							S	215	260	285	A	A	305	305	290	H 250	195	A						
10							S	220	250	H 300	305	310	310	305	285	250	205	A						
11							S	210	260	290	300	310	310	H 300	280	250	195	S						
12							S	200	255	290	300	310	310	300	280	250	200	S						
13							S	A 260	290	300	305	305	300	275	255	210	S							
14							S	205	250	280	295	300	A	A	275	A	205	S						
15							S	205	230	275	A	300	305	300	290	250	200	S						
16							S	A 255	H 285	300	305	305	295	275	255	205	S							
17							S	205	260	285	305	310	310	300	C	C	185	S						
18							S	215	265	290	300	310	A	A	290	250	H 200	S						
19							S	A	A	A	305	310	305	290	280	250	185	S						
20							S	H 210	255	285	295	A	A	300	A	250	205	S						
21							S	225	250	275	295	300	290	280	A	A	A							
22								H 210	H 245	270	285	285	285	270	250	200	S							
23								215	245	270	280	A	A	305	A	235	200							
24								205	250	270	A	A	H 300	A	265	225	A							
25								205	245	270	280	A	A	A	A	240	190							
26								200	245	270	285	A	A	A	A	A	S							
27								A	A	270	290	290	A	A	240	210	S							
28								205	225	260	A	A	300	A	A	215	S							
29								205	A	250	A	A	A	A	A	A	S							
30								205	235	255	265	A	A	A	A	A	S							
31								A	A	H 290	A	A	A	A	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							1	26	26	29	21	18	19	19	19	22	20							
MED							170	212	255	280	295	308	305	300	280	250	200							
UQ								225	260	290	300	310	308	300	290	250	205							
LQ								205	245	270	290	300	302	295	272	240	195							

OCT. 1987 | FOE (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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	24	E S 16	20	J A 52	J A 23	J A 27	22	G	J A 65	33	46	G	J A 67	J A 54	J A 49	J A 42	29	23	J A 70	J A 24	J A 23	24	J A 24	J A 21
2	23	20	J A 23	E S 16	E S 16	E S 16	20	G	G	34	G	G 27	G	G	G	34	33	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16
3	E S 16	E S 16	E S 16	E S 10	E S 16	E S 16	E S 20	G	G	G	J A 34	G 23	G	G 23	G	G	G	E S 16	26	E S 17	E S 16	26	21	E S 16
4	E S 16	E S 16	22	23	24	26	21	G	31	J A 34	32	40	G	34	G	G	G	E S 16	26	23	25	J A 23	J A 23	J A 24
5	J A 23	22	E S 10	26	20	E S 16	20	26	31	43	G	J A 56	G	G	35	G	J A 84	J A 65	J A 27	J A 29	J A 25	23	E S 16	E S 16
6	20	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	G	G	G	G	G 27	G	G	G 22	G	23	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
7	E S 16	E S 16	E S 15	21	E S 15	E S 16	21	G	G	G	G	38	36	G 23	G	28	31	28	26	26	J A 49	J A 29	E S 17	E S 16
8	E S 17	J A 28	E S 16	E S 16	26	24	21	28	39	34	32	33	34	43	G	G	G	J A 24	J A 25	J A 28	J A 31	J A 26	J A 75	J A 24
9	E S 13	21	20	E S 16	E S 16	26	24	34	34	34	J A 42	34	44	43	G	G	G	35	J A 25	E S 16	22	E S 16	E S 17	E S 16
10	E S 16	E S 16	E S 15	21	23	J A 24	26	G	G	G	G	G	G	G	G	G	G	J A 28	J A 24	E S 16	J A 24	E S 16	E S 15	E S 16
11	E S 16	E S 16	E S 15	E S 16	E S 16	E S 10	E S 18	G	G	G	34	G	G	G	G	G	26	20	J A 23	J A 27	J A 25	J A 25	J A 24	J A 24
12	E S 16	E S 16	E S 16	E S 16	E	E S 16	E S 16	G	30	G	G	45	35	34	34	29	26	J A 25	E S 16	J A 25	24	J A 39	J A 35	J A 27
13	26	E S 16	E S 16	E S 16	E S 16	23	E S 16	J A 30	G	G 19	35	G	34	G	33	30	260	22	26	J A 31	J A 28	26	E S 16	20
14	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	30	34	G	33	35	36	G 23	34	G	E S 17	J A 21	24	J A 63	J A 32	J A 31	J A 51
15	23	E S 16	E S 16	26	J A 24	E S 17	19	29	J A 36	G	47	G 29	G	G	G	G	25	J A 28	26	E S 16	E S 16	26	E S 16	E S 16
16	E S 16	E S 18	E S 16	E S 16	E S 16	23	J A 32	J A 31	G	G	G 28	G 27	G 30	G 28	G 26	G	G	27	J A 23	24	23	24	26	E S 15
17	25	J A 29	24	26	20	22	21	29	G	G	G	35	G	G	C	C	25	J A 29	J A 20	E S 16	E S 16	E S 16	E S 16	E S 16
18	E S 16	E S 16	E S 15	E S 16	J A 28	25	J A 25	G	J A 26	39	31	35	33	32	G	G	27	18	35	J A 56	31	E S 17	23	28
19	E S 17	25	E S 16	E S 16	E S 11	E S 16	J A 23	J A 28	J A 35	39	G	G	G	G	G	G	G	25	J A 43	J A 28	23	32	26	25
20	27	E S 16	E S 15	35	36	31	E S 16	25	J A 41	42	34	34	J A 42	G 24	J A 36	35	34	J A 29	J A 30	J A 50	J A 70	J A 70	J A 50	J A 30
21	E S 17	24	28	J A 27	25	27	J A 20	G	31	35	J A 40	J A 43	J A 59	J A 36	32	33	25	E S 16	J A 34	J A 93	J A 46	J A 50	J A 41	25
22	27	30	22	25	28	24	22	25	34	35	J A 49	J A 55	G	35	30	J A 31	J A 45	J A 45	E S 16	E S 16	E S 15	E S 16	E S 15	E S 16
23	E S 15	E S 15	E S 15	E S 15	30	24	22	27	27	31	31	30	39	G	31	G	23	J A 25	J A 22	J A 36	25	E S 15	E S 16	E S 16
24	E S 16	E S 16	E S 15	E S 15	E S 15	E S 16	23	22	G	34	36	38	G	32	G	26	31	J A 27	J A 25	26	J A 40	J A 28	J A 24	E S 16
25	25	22	J A 21	26	23	E S 16	E S 16	25	50	J A 51	J A 50	34	34	J A 47	J A 32	34	26	J A 23	J A 51	J A 62	J A 29	26	J A 32	J A 22
26	25	22	J A 26	J A 52	J A 35	J A 25	26	30	43	56	J A 56	J A 72	J A 45	J A 56	J A 65	J A 50	J A 64	J A 53	J A 60	J A 27	J A 25	E S 15	E S 15	32
27	J A 60	J A 28	E S 15	J A 25	J A 27	25	26	J A 26	32	J A 41	J A 51	J A 62	J A 73	41	32	28	J A 83	J A 34	J A 25	24	22	E S 16	E S 16	E S 16
28	24	E S 16	21	22	23	E S 16	E S 17	25	26	J A 66	J A 67	J A 65	G	J A 54	43	26	J A 24	E S 16	E S 16	E S 16	E S 16	23	E	J A 29
29	J A 35	J A 57	26	J A 32	J A 43	J A 22	25	28	J A 34	43	43	42	39	J A 31	40	42	J A 28	J A 95	J A 93	J A 83	J A 49	E S 15	E S 16	23
30	J A 20	J A 31	J A 20	J A 56	J A 59	J A 73	J A 32	25	J A 52	J A 45	J A 65	J A 140	J A 119	J A 77	J A 60	J A 65	21	J A 23	J A 28	26	J A 23	J A 30	J A 28	J A 43
31	J A 20	24	J A 27	J A 51	J A 43	J A 44	J A 24	31	27	G	36	J A 51	J A 50	J A 57	J A 28	27	26	J A 20	J A 35	J A 34	23	26	J A 31	J A 29
	00	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	30	30	31	31	31	31	31	31	31	31
MED	20	E S 16	E S 16	21	23	23	21	25	30	34	34	34	34	32	27	26	26	J A 25	J A 26	26	24	24	21	21
UQ	24	24	22	26	28	25	24	28	34	40	J A 44	44	40	42	34	34	31	J A 23	J A 32	J A 30	J A 30	J A 27	J A 27	J A 26
LQ	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 18	G	G	G	G	G 27	G	G	G	G	E G 21	19	J A 22	E S 16	22	E S 16	E S 16	E S 16

OCT. 1987 | FOES (0.1 MHZ)

IONOSPHERIC DATA

OCT. 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 16	E S 16	E S 16	E S 16	16	16	21	G	A A 65	G	42	G	A A 67	42	48	40	G	21	A A 70	16	E S 16	E S 16	19	19
2	E S 16	E S 16	19	E S 16	E S 16	E S 16	20	G	G	G	G	G 27	G	G	G	26	25	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16
3	E S 16	E S 16	E S 16	E S 10	E S 16	E S 16	E S 20	G	G	G	32	G 23	G	G 23	G	G	G	E S 16	E S 16	E S 17	E S 16	E S 16	E S 15	E S 16
4	E S 16	E S 16	E S 15	15	18	16	21	G	30	31	31	36	G	31	G	G	G	E S 16	E S 16	E S 16	E S 16	20	20	E S 16
5	16	E S 16	E S 10	E S 16	E S 16	E S 16	18	G	G	37	G	31	G	G	29	G	30	60	24	25	23	E S 16	E S 16	E S 16
6	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	G	G	G	G	G 27	G	G	G 22	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
7	E S 16	E S 16	E S 15	E S 16	E S 15	E S 16	20	G	G	G	G	38	36	G 23	G	G 21	21	21	E S 17	E S 16	24	25	E S 17	E S 16
8	E S 17	20	E S 16	E S 16	16	E S 16	G	G	38	32	32	33	33	40	G	G	G	22	23	23	27	23	A A 75	E S 16
9	E S 13	E S 15	E S 16	E S 16	E S 16	E S 16	G	32	G	G	41	33	39	38	G	G	G	34	24	E S 16	E S 15	E S 16	E S 17	E S 16
10	E S 16	E S 16	E S 15	E S 15	E S 16	19	19	G	G	G	G	G	G	G	G	G	G	24	19	E S 16	E S 16	E S 16	E S 15	E S 16
11	E S 16	E S 16	E S 15	E S 16	E S 16	E S 10	E S 18	G	G	G	34	G	G	G	G	G	25	E S 16	E S 16	E S 17	24	E S 16	E S 17	18
12	E S 16	E S 16	E S 16	E S 16	E	E S 16	E S 16	G	G	G	G	45	G	G	34	G	G	23	E S 16	24	E S 16	E S 16	28	E S 15
13	20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	29	G	G 19	G	G	G	G	33	G	G	21	18	E S 16	25	18	E S 16	E S 16
14	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	G	G	G	33	30	G 23	27	G	E S 17	E S 16	E S 16	E S 15	16	F S 16	16
15	E S 16	E S 16	E S 16	E S 16	16	E S 17	18	G	33	G	41	G 29	G	G	G	G	G	24	E S 16	E S 16	E S 16	18	E S 16	E S 16
16	E S 16	E S 18	E S 16	E S 16	E S 16	E S 15	25	24	G	G	G 27	G 27	G 30	G 28	G 22	G	G	19	18	E S 17	E S 16	E S 16	E S 16	E S 15
17	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	20	G	G	G	G	35	G	G	C	C	G	21	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16
18	E S 16	E S 16	E S 15	E S 16	E S 17	17	E S 16	G	G	39	G	G	33	32	G	G	G	E S 17	E S 17	22	19	E S 17	E S 17	E S 17
19	E S 17	E S 16	E S 16	E S 16	E S 11	E S 16	E S 16	28	35	31	G	G	G	G	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 17
20	E S 16	E S 16	E S 15	E S 16	17	E S 16	E S 16	G	38	32	34	34	37	G 24	35	G 22	29	28	19	40	A A 70	22	E S 15	E S 16
21	E S 17	E S 15	16	E S 16	E S 15	E S 16	20	G	30	35	40	42	47	G	32	26	21	E S 16	26	50	42	A A 50	29	E S 16
22	19	17	E S 15	E S 16	16	E S 15	17	G	32	35	48	54	G	35	30	31	45	33	E S 16	E S 16	E S 15	E S 16	E S 15	E S 16
23	E S 15	E S 15	E S 15	E S 15	20	E S 17	E S 16	G	G	G	G	30	33	G	31	G	G	17	20	36	18	E S 15	E S 16	E S 16
24	E S 16	E S 16	E S 15	E S 15	E S 15	E S 16	E S 16	G	G	34	35	32	G	30	G	G 19	23	18	21	E S 16	27	25	E S 16	E S 16
25	E S 16	E S 15	E S 16	E S 16	E S 15	E S 16	E S 16	G	44	46	50	32	34	46	31	31	G	20	42	29	E S 16	E S 16	E S 15	E S 16
26	E S 16	E S 16	E S 17	A A 52	17	E S 16	E S 16	G	38	54	33	55	37	46	49	28	40	51	A A 60	21	21	E S 15	E S 15	26
27	A A 60	20	E S 15	E S 16	E S 16	E S 16	18	24	27	40	48	59	71	41	31	27	56	25	19	E S 16	E S 15	E S 16	E S 16	E S 16
28	E S 13	E S 16	E	E S 16	E S 16	E S 16	E S 17	G	G	50	50	40	G	29	36	G 20	19	E S 16	E S 16	E S 16	E S 16	E S 16	E	26
29	21	A A 57	E S 16	21	E S 16	E S 16	E S 16	G	34	36	36	37	35	31	33	35	25	19	A A 93	A A 83	19	E S 15	E S 16	E S 16
30	E S 16	19	E S 16	22	21	21	20	G	50	41	58	A A 140	56	A A 77	53	35	19	E S 15	21	E S 16	E S 16	19	23	34
31	E S 16	E S 16	E S 16	A A 51	27	29	21	24	27	G	33	49	40	38	28	24	18	20	28	26	E S 16	E S 16	30	19
	00	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	30	30	31	31	31	31	31	31	31	31
MED	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E G 17	G	G	G 19	32	32	G 30	G 28	26	E G 19	G	20	18	E S 16	E S 16	E S 16	E S 16	E S 16
UQ	E S 16	E S 16	E S 16	E S 16	16	E S 16	20	G	34	36	40	39	36	36	33	27	24	24	24	24	22	18	E S 17	E S 16
LQ	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	G	G	G	G	G 25	G	G	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | FMIN (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

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

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

OCT. 1987 | FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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	310	285	295	290	295	325	H 315	310	A	335	340	325	A	330	330	350	335	345	A	290	295	295	290	305
2	310	300	290	320	305	295	340	345	335	335	330	325	335	340	335	350	350	340	335	315	305	285	290	300
3	300	300	315	325	320	320	330	345	350	340	345	350	325	340	345	350	340	350	295	300	305	290	335	270
4	F 275	265	F 285	F 275	F 270	290	345	335	290	G	310	325	330	320	340	340	340	325	300	285	295	295	290	305
5	280	285	280	285	290	305	335	330	355	350	315	340	325	335	350	340	335	A	340	305	300	290	290	295
6	290	300	305	310	320	315	345	355	355	315	340	340	345	350	335	335	350	345	330	315	295	295	300	295
7	295	305	310	305	315	325	360	360	330	340	325	320	340	320	335	335	350	345	320	300	300	290	280	295
8	285	285	300	325	350	295	345	355	345	330	335	335	330	325	340	350	345	360	295	280	275	285	A	300
9	285	285	285	290	285	295	360	360	H 325	330	345	315	330	315	335	330	325	335	315	300	295	300	315	290
10	290	300	300	300	315	320	345	350	345	345	320	325	330	330	325	335	310	315	F 310	F 305	F 305	F 295	F 290	F
11	F	F 290	290	F 310	F 285	F	330	365	H 285	350	H 315	325	320	330	320	325	330	325	325	325	300	270	265	290
12	280	285	275	275	280	295	350	345	330	315	300	325	320	345	320	330	335	330	310	305	315	290	300	285
13	295	275	270	295	295	345	340	340	345	335	310	330	340	310	325	340	340	320	320	310	305	305	295	285
14	295	275	275	275	F 295	F	H 325	335	345	330	340	320	330	330	320	340	335	320	305	F	F	F	F	F
15	F	F	F	F	F	F	350	H 330	365	325	345	315	335	335	325	325	330	335	295	320	285	275	270	280
16	285	280	290	280	285	290	345	350	H 340	345	335	340	340	315	330	330	340	335	310	305	F	F	F	F
17	F	F	F	F	F 325	305	340	340	340	345	330	345	335	325	C	C	340	340	F 285	F 315	F 295	F 275	F 300	F 270
18	F 270	F 275	F 270	295	F 315	285	350	355	355	340	345	340	345	345	330	330	330	320	310	315	320	330	300	290
19	280	285	295	310	305	295	360	355	360	355	330	H 325	335	360	330	330	340	325	325	330	310	S 310	300	295
20	S 280	290	285	300	290	310	330	345	355	335	335	355	340	335	350	330	345	325	325	320	A	305	295	290
21	290	F 275	F 280	285	295	S 335	325	370	350	345	290	335	300	325	315	335	345	325	315	230	335	A	355	315
22	315	S 290	F	F	F	F	F	325	340	F 325	S 350	345	340	350	350	340	340	335	310	320	320	340	F 335	315
23	F	F	F 290	295	310	305	350	350	345	340	H 330	325	330	320	325	335	350	330	335	330	305	320	325	325
24	285	290	305	285	325	S 285	F 310	355	355	340	345	345	325	345	315	325	345	345	315	305	310	295	290	295
25	325	295	290	295	290	300	H 300	350	300	340	335	340	335	310	340	320	345	340	A	335	F	F 285	F	F
26	F	285	290	A	295	270	320	325	345	355	345	345	345	335	335	335	340	A	A	305	310	310	280	295
27	A	300	285	300	300	305	315	350	340	350	345	340	335	335	335	330	335	340	305	310	275	300	275	290
28	300	295	280	295	265	260	295	310	325	335	305	335	330	320	330	335	345	325	305	305	310	295	F 300	F
29	290	A	290	F 295	F 300	F	315	345	325	340	H 315	325	340	320	340	330	345	320	A	A	285	F 275	F	F
30	295	285	290	285	325	290	360	365	330	340	325	A	345	A	340	330	365	345	325	305	305	300	300	A
31	300	300	300	A	A	A	340	340	345	345	340	345	335	335	345	350	330	340	330	305	325	305	A	300
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	27	28	26	28	25	30	31	30	31	31	30	30	30	30	30	31	29	27	29	27	28	25	24
MED	290	285	290	295	298	300	340	345	345	340	335	335	335	330	335	335	340	335	315	305	305	295	295	295
UQ	300	298	298	305	315	315	350	355	350	345	342	340	340	340	340	340	345	340	325	315	310	305	300	300
LQ	285	285	282	285	290	290	325	338	330	332	318	325	330	320	325	330	335	325	305	305	295	288	290	290

OCT. 1987 | M(3000)F2 (0.01)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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									A	390	A	385	A	A	A	A								
2								L 380	L 365	L 350	380	L 395	H 350	355	L 370	L 455								
3									L	H 340	L 355	385	L 360	L 335	375	L								
4									395	H 335	355	345	340	355	360	L 365								
5									345	A	L 370	355	350	L 355	L 345									
6									L	370	360	385	L 355	L 365	L 340									
7									H 355	365	370	L	365	L 385	L 355									
8									A	355	H 385	H 370	370	A	L 350									
9										L 365	A	365	A	A	L 390	L								
10									385	L 380	H 340	L 370	L 370	L 375	L 370	L 365								
11										355	H 405	430	370	L 360	L	L								
12										375	L 365	A	335	L 345	L 365									
13									L 370	L 330	385	L 365	L 385	L 355										
14										L 360	L 360	365	340	L 355	L									
15										L 350	A	L 350	L 330	L 345										
16									L 335	H 320	390	L 390	L 385											
17										L	380	H 385	L 390	L	C	C								
18										L	H 365	L	L 350	L 365	L 390									
19										L	395	425	L 340	395	L 405									
20											L 380	L 355	L 385	L 390	A									
21											L 415	A	A	L 330	L 315									
22											A	A	L	L 400	L 390									
23									L	370	L 350	L 350	350	L										
24									L 385	L 350	L 375		L	L										
25									A	A	A	H 355	L 390	A										
26									A	A	L 390	A	A	A	A									
27									L 355	A	A	A	A	A										
28										A	A	A	L 335	L 360	A									
29										A	A	A	L 360	L	A									
30									A	A	A	A	A	A	A									
31										L	L 380	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	9	17	22	19	22	18	14	3								
MED								L 380	L 365	355	378	370	L 358	L 358	L 368	L 365								
UQ									L 385	370	385	385	L 370	L 375	L 390	L 410								
LQ									L 355	350	L 360	355	340	L 355	L 350	L 365								

OCT. 1987 | M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | H*F2 (KM) | 135° E Mean Time (G.M.T. + 9 h)

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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									A	285	275	290	A	270	270	255								
2								250	245	250	255	255	250	245	255	245								
3									235	250	245	240	290	255	250	240								
4									355	G	350	300	300	310	280	255								
5									270	275	305	295	280	270	260									
6									250	290	250	250	250	260	255									
7									255	235	250	255	250	250	255									
8									245	255	250	245	255	265	255									
9										255	250	295	250	255	250	250								
10									240	250	255	245	260	255	250	250								
11										245	255	260	250	250	255	255								
12										240	250	270	275	235	250									
13									230	235	230	270	245	235										
14										255	255	260	255	255	255									
15										260	245	255	250	245										
16									240	230	230	250	235											
17										235	255	245	250	230	C	C								
18										250	245	235	235	240	240									
19										230	235	220	255	250	245									
20											255	240	255	250	240									
21											225	245	260	250	250									
22											240	250	240	235	250									
23									225	230	230	240	255	250										
24									250	250	240		240	245										
25									250	230	245	240	235	275										
26									230	235	250	250	235	255	255									
27									250	245	235	245	A	245										
28										A 280	A 300	260	265	270	250									
29										255	255	265	245	250	250									
30									A	255	A	A	A 250	A	A 270									
31										250	245	240	230	235										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	15	28	30	29	29	29	22	7								
MED								250	245	250	250	250	250	250	252	250								
UQ									250	255	255	260	255	255	255	255								
LQ									238	235	240	245	245	245	250	248								

The Radio Research Laboratory, Japan

OCT. 1987 | H*F2 (KM)

IONOSPHERIC DATA

OCT. 1987 | H'F (KM) | 135° E Mean Time (G.M.T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	265	300	300	285	290	215	255	230	A	210	A	195	A	A	A	A	230	230	A	285	255	250	285	255
2	265	285	300	250	250	250	225	225	225	225	205	200	195	205	205	205	235	235	225	250	255	270	285	250
3	255	280	255	235	245	255	205	235	225	215	H 220	200	195	H 200	225	H 230	H 220	225	250	275	250	260	205	325
4	325	335	285	300	E S 340	275	250	240	255	200	205	A 255	235	215	220	225	245	245	240	280	280	295	300	280
5	295	295	260	275	295	275	235	250	225	A	H 200	195	220	210	H 200	245	250	A	235	275	285	270	290	255
6	285	285	260	255	250	255	235	220	235	205	205	200	200	200	200	230	235	225	230	245	255	250	275	285
7	270	255	255	260	250	245	215	225	220	H 205	H 195	A	A 250	205	225	250	235	220	235	250	255	295	290	265
8	290	300	250	220	220	290	230	235	A	225	200	205	205	A	H 230	230	235	210	255	280	310	290	A	255
9	240	295	280	260	260	260	225	225	230	215	A	H 195	A	A	225	225	235	A 235	250	245	255	255	245	255
10	260	250	250	255	250	255	225	H 225	H 205	H 210	H 205	H 200	205	225	225	225	240	235	225	235	240	240	235	255
11	260	255	255	250	250	245	210	215	H 205	H 225	H 200	195	200	225	H 200	250	230	220	240	240	255	295	315	275
12	290	275	325	320	300	265	205	225	215	200	205	A	235	240	225	235	230	225	240	275	250	265	285	260
13	295	300	305	255	255	215	220	215	205	H 210	205	H 205	225	H 200	245	240	225	220	235	255	265	255	255	270
14	270	295	290	280	265	255	205	H 200	H 230	225	210	205	H 205	205	215	235	230	225	245	250	250	250	275	285
15	300	330	325	325	255	245	225	225	225	200	A	215	205	200	235	245	235	210	225	235	255	310	300	305
16	280	300	270	285	260	245	225	225	H 200	H 225	210	205	205	200	245	240	230	215	235	250	245	250	270	290
17	260	305	265	260	245	210	205	225	220	220	205	H 205	200	H 195	C	C	225	215	210	240	250	230	265	290
18	280	290	270	250	240	A 275	220	225	230	A	200	A 225	H 205	H 205	230	245	225	225	235	250	240	235	235	260
19	295	290	270	265	245	245	225	235	220	225	210	190	H 195	205	195	H 225	225	215	220	230	235	240	245	265
20	295	280	260	275	260	225	210	210	220	230	200	H 200	A 220	220	A	225	230	230	230	A	A	A 245	255	285
21	270	285	275	275	260	225	225	205	220	240	A 240	A	A	H 220	225	235	225	225	255	A	A	A	230	245
22	A 275	280	280	280	245	205	215	220	235	230	A	A	H 195	220	225	235	A	A 245	235	250	250	230	220	230
23	255	255	265	245	240	225	220	225	220	210	205	H 200	210	240	245	235	225	220	225	A	255	250	240	215
24	A 270	270	285	285	280	240	235	225	230	225	220	H 200	205	210	225	245	220	210	245	250	A 280	A 305	275	250
25	225	255	285	275	280	280	230	210	A	A	A	205	205	A	240	250	225	210	A	A 265	280	255	305	250
26	225	275	275	A	275	265	245	230	A	A	210	A	A	A	A	245	240	A	A	255	255	255	280	A
27	A	300	275	270	300	255	220	230	225	A	A	A	A	A	230	235	A 250	220	240	240	310	270	300	295
28	260	260	255	295	345	335	305	255	240	A	A	A	225	215	A	H 240	230	225	250	245	255	280	285	A
29	300	A	255	275	305	305	255	245	250	A	A	A	A 240	235	A	245	220	215	A	A	295	290	260	285
30	285	305	275	290	255	A 305	250	235	A	A	A	A	A	A	A	240	220	210	255	245	255	300	A 300	A
31	275	270	270	A	A	A	230	230	235	225	205	A	A	A	230	235	225	215	A 245	A 260	240	255	A	A 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	30	30	31	29	30	30	31	31	26	23	22	21	24	23	24	29	30	29	27	27	29	30	29	28
MED	272	285	270	275	256	255	225	225	225	220	205	200	205	210	225	235	230	220	235	250	255	255	275	265
UQ	290	300	285	285	280	275	235	232	230	225	210	205	222	220	230	245	235	225	245	262	265	290	290	285
LQ	260	270	260	255	250	240	213	222	220	210	200	200	200	202	213	230	225	215	230	245	250	250	245	255

OCT. 1987 | H'F (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | 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	125	115	110	110	110	A	A	A	A	125	S						
2							S	130	125	115	110	A 130	115	120	120	A	A	S						
3							S	H 125	120	H 120	A	120	120	125	115	120	130	S						
4							S	120	A	A	115	A	115	115	125	125	135	S						
5							S	125	120	115	110	A	125	105	A	115	120	S						
6							S	H 130	120	120	115	A 130	110	110	120	110	S 130	S						
7							S	125	115	110	115	120	125	125	120	125	A	S						
8							S	130	125	120	110	125	120	110	115	115	120	S						
9							S	125	110	110	110	110	110	120	115	115	120	A						
10							S	H 120	120	115	H 120	H 110	110	120	110	120	H 115	A						
11							S	125	120	115	120	110	110	105	110	120	120	S						
12							S	125	120	115	110	110	105	115	125	125	125	S						
13							S	A	110	115	115	110	115	115	115	H 120	135	S						
14							S	H 120	125	110	110	105	A	A	A 125	A	130	S						
15							S	130	120	110	115	A	115	110	120	125	S 130	S						
16							S	A	120	110	A	A	A	A	125	130	135	S						
17							S	130	120	120	115	120	115	115	C	C	125	S						
18							S	130	120	120	120	115	115	115	120	120	130	S						
19							S	A	120	120	120	120	125	115	115	120	S 135	S						
20							S	125	125	120	110	A	A	110	120	A	145	S						
21							S	130	120	115	115	115	120	115	A	A	A							
22								135	115	115	110	110	110	115	120	115	S							
23								145	120	120	120	120	A	105	A	125	150							
24								120	115	120	110	110	110	A	110	125	A							
25								145	125	125	120	120	A	A	A	125	S 145							
26								S 140	125	120	120	110	A	A	A	A	S							
27								A	A	120	115	120	115	120	125	125	S							
28								130	125	115	120	A	H 110	A	A	A 130	S							
29								125	125	115	115	125	120	A	A	A	S							
30								125	120	120	115	115	A	A	A	A	S							
31								A	A	115	110	A	A	A	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								26	28	30	29	24	22	21	20	21	20							
MED								125	120	115	115	115	115	115	120	120	130							
UQ								130	125	120	120	120	120	120	122	125	135							
LQ								125	120	115	110	110	110	110	115	120	122							

The Radio Research Laboratory, Japan

OCT. 1987 | H'E (KM)

IONOSPHERIC DATA

OCT. 1987 | 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	105	S	105	120	120	120	155	G	130	125	110	G	105	100	100	105	105	125	110	110	110	110	110	105
2	105	105	105	S	S	S	155	G	G	115	G	105	G	G	G	105	105	S	S	S	S	S	S	S
3	S	S	S	S	S	S	S	G	G	G	105	105	G	105	G	G	G	S	120	S	S	115	105	S
4	S	S	125	120	120	120	125	G	105	105	105	105	G	130	G	G	G	S	100	105	105	105	105	105
5	105	115	S	105	105	S	135	140	130	115	G	105	G	G	105	G	125	120	105	100	100	105	S	S
6	100	S	S	S	S	S	S	G	G	G	G	105	G	G	105	G	130	S	S	S	S	S	S	S
7	S	S	S	105	S	S	150	G	G	G	G	175	170	105	G	100	100	100	100	105	115	105	S	S
8	S	105	S	S	135	135	135	130	115	115	120	115	115	120	G	G	G	135	120	110	110	110	105	105
9	S	105	105	S	S	135	155	135	135	125	105	105	110	120	G	G	G	105	105	S	120	S	S	S
10	S	S	S	125	125	110	115	G	G	G	G	G	G	G	G	G	G	100	105	S	110	S	S	S
11	S	S	S	S	S	S	S	G	G	G	170	G	G	G	G	G	130	125	120	120	100	110	115	115
12	S	S	S	S	E	S	S	G	145	G	G	145	155	145	135	140	125	125	S	120	115	115	110	120
13	115	S	S	S	S	115	S	105	G	105	125	G	130	G	180	150	135	125	120	105	115	115	S	105
14	S	S	S	S	S	S	S	G	150	130	G	125	125	100	105	115	G	S	125	115	105	105	110	105
15	105	S	S	125	120	S	150	115	110	G	110	110	G	G	G	G	135	125	110	S	S	105	S	S
16	S	S	S	S	S	125	110	110	G	G	105	105	105	105	105	G	G	105	100	100	105	105	110	S
17	105	105	110	110	110	105	155	155	G	G	G	120	G	G	C	C-	130	110	110	S	S	S	S	S
18	S	S	S	S	125	110	115	G	120	120	120	115	110	110	G	G	135	130	110	110	105	S	105	105
19	S	100	S	S	S	S	125	115	115	115	G	G	G	G	G	G	G	115	115	115	110	110	105	105
20	105	S	S	115	115	125	S	150	125	120	120	110	100	105	125	170	155	150	110	105	120	135	135	120
21	S	120	110	145	110	110	165	G	130	125	125	110	110	120	105	110	150	S	140	125	120	115	110	110
22	115	110	110	110	140	115	125	145	125	125	115	115	G	115	115	110	105	105	S	S	S	S	S	S
23	S	S	S	S	105	105	110	140	125	125	120	115	180	G	110	G	145	140	125	115	110	S	S	S
24	S	S	S	S	S	S	105	140	G	120	110	105	G	105	G	105	100	125	115	120	105	105	105	S
25	105	105	105	100	125	S	S	140	130	120	110	115	110	105	105	160	150	130	110	105	110	105	105	105
26	105	105	105	100	105	100	150	140	125	120	115	105	105	105	105	105	105	100	100	100	105	S	S	105
27	105	105	S	105	105	105	105	105	125	125	115	110	110	110	115	110	105	105	105	115	115	S	S	S
28	120	S	115	125	125	S	S	170	125	110	105	110	G	120	105	110	110	S	S	S	S	115	E	105
29	105	105	105	105	105	105	105	125	115	110	110	110	105	105	105	105	115	115	105	105	105	S	S	105
30	115	105	105	105	125	105	110	135	120	115	110	105	120	105	105	105	105	110	105	110	110	105	105	110
31	110	110	105	105	105	105	105	100	105	G	120	105	105	105	105	105	105	100	105	105	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	16	14	13	17	19	18	22	19	21	21	22	26	18	21	18	17	23	24	26	22	24	20	16	17
MED	105	105	105	110	120	110	125	135	125	120	112	110	110	105	105	110	125	118	110	110	110	108	105	105
UQ	112	110	110	120	125	120	150	140	130	125	120	115	125	120	115	115	135	125	120	115	115	115	110	110
LQ	105	105	105	105	105	105	110	115	115	115	110	105	105	105	105	105	105	105	105	105	105	105	105	105

OCT. 1987 | H'ES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | TYPES OF ES | 135° E Mean Time (G.M.T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F2		F2	FF12	F2	F1	C2		C3	C2	C2		L6	L5	L2	L4	LC22	C2	F7	F2	F2	F1	F3	F2
2	F2	F2	F2				C1			C2		L1				L3	L4							
3											L2	L2		L1					F1			F2	F1	
4			F2	F2	F2	F2	C2		L2	L2	C2	L2		C1					F2	F2	F2	F2	F3	F2
5	F2	F1		F2	F1		C1	C2	C2	C2		L2			L2		C3	CL62	F2	F3	F2	F2		
6	F1											L2			L2		C2							
7				F2			C2					HL11	H1	L1		L2	LC22	L2	F2	F2	F3	F3		
8		F3			F1	F1	C2	C2	C2	C2	C1	C1	C1	C3				C2	FF41	F4	F5	F6	F6	F4
9		F2	F1			F1	C2	C4	C2	C2	C3	C2	C1	C1				L4	F3		F1			
10				F2	F1	F2	L2											L3	F2		F1			
11											H1						C2	C1	F2	F2	F3	FF22	F2	F2
12									C1			H1	H1	H1	C2	C1	C4	C3		FF42	F2	F5	F3	FF22
13	F3					F1		L3		L1	C1		C1		H1	H2	C3	C3	F1	F2	F6	FF22		F1
14									C1	C2		C1	CL12	L2	L2	L2			F1	F2	F3	F2	F3	F2
15	F2			F2	F2		C1	C2	C3		C3	L1					C2	C4	F1			F2		
16						F1	L3	L2			L2	L1	L1	L2	L1			L2	F2	F2	F1	F1	F1	
17	F2	F3	F2	F1	F1	F1	C3	C2				C1					C2	L3	F1					
18					F2	F2	L3		C1	C2	C1	C1	C1	C2			C3	L4	F3	F4	F2		F3	F2
19		F2					L1	L1	C1	C2								L1	F1	F2	F1	F2	F2	F2
20	F2			F2	F3	FF12		C2	C3	C2	C2	L1	L3	L2	CH22	HL11	C2	C3	F3	F3	FF61	F4	F2	FF12
21		FF22	F4	FF22	FF21	F2	C4		C3	C2	C2	C2	C2	C1	L2	L2	HL12		FF43	F6	FF42	F5	F5	F2
22	F4	F5	F2	F2	FF33	F1	FF11	C2	C3	C2	C2	C3		C3	C2	C2	L7	F5						
23					F6	F2	F1	CL21	C1	C1	C1	C2	HL11		L2		C2	F2	F4	FF32	F1			
24							F2	C1		C2	C2	C2		L2		L1	L3	FF32	F3	F2	F3	F2	F2	
25	F1	F2	F2	F2	F2			C2	C3	C4	C2	C1	L2	L3	L3	H2	C2	F6	F4	F4	F2	F3	F2	F2
26	F2	F2	F2	F5	F2	F2	F1	C1	C2	C2	C2	C2	L2	L4	L3	L2	L3	F3	F3	F3	F3			F5
27	F6	F4		F4	F2	F2	F2	L2	CL12	C2	C2	C4	C3	C2	C3	C3	L2	F3	F2	F1	F2			
28	F1		F2	F2	F1			H1	C2	C3	C3	L2		CL12	L3	L2	L1					F2		F4
29	F5	F3	F2	F7	F4	F3	F2	C3	C2	C4	C3	C3	C3	L2	L3	L3	L3	F2	F5	F6	F3			F2
30	F2	F2	F2	F4	FF14	F3	F3	C2	C4	C5	C3	C4	CL14	L5	L3	L3	L2	F1	F3	F1	F2	F2	F4	F6
31	F2	F2	F2	F5	F4	F3	F3	L2	L2		C2	L2	L2	L2	L2	L2	L1	F2	F3	F6	F1	F2	F3	F2
	00	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																								

OCT. 1987 | TYPES OF ES

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | FXI (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

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

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

OCT. 1987 | FXI (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | FOF2 (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	36	36	34	35	35	34	44	65	67	74	65	63	68	72	66	64	63	61	59	F	F	F	F	F 44
2	42	41	39	34	32	33	43	59	65	86	84	79	86	90	71	62	56	56	71	52	F 46	F 44	F	F
3	39	38	39	33	31	31	46	58	73	77	77	73	73	74	70	62	66	59	51	57	53	50	49	34
4	33	33	34	35	30	29	48	43	45	56	60	A	71	64	67	62	61	59	47	38	40	40	39	38
5	32	32	30	30	27	27	44	51	67	60	73	68	71	66	62	60	64	64	54	44	40	37	F 36	F 39
6	F 36	36	34	34	31	30	46	64	65	63	68	71	73	67	63	59	62	59	59	45	40	40	39	38
7	41	40	38	36	36	30	48	64	70	73	63	75	74	78	65	69	74	61	50	46	47	42	41	42
8	R 42	42	44	38	29	26	45	76	71	78	82	85	83	77	75	71	63	59	48	49	49	F	51	50
9	44	41	42	43	41	F 41	51	61	70	69	72	76	83	79	75	70	72	68	61	56	55	52	49	44
10	44	42	40	40	36	32	46	68	71	71	78	82	86	75	77	70	79	77	70	61	56	50	47	47
11	45	44	44	45	45	42	65	H 70	77	67	80	91	89	86	76	78	82	69	56	54	47	44	44	45
12	45	44	42	42	42	45	58	74	72	78	H 72	96	110	106	94	86	61	60	55	56	F 56	52	50	43
13	44	43	42	48	48	42	49	59	68	74	82	84	91	80	86	86	73	64	55	56	51	S 50	48	45
14	43	42	42	43	44	37	48	58	68	82	79	84	86	83	77	82	68	64	55	F	F 45	F 42	F 42	F 43
15	F	F	F	F	F	F	54	68	64	65	86	86	89	79	79	85	89	75	52	44	42	41	F	F 43
16	F 44	F	F 46	F 43	F	42	53	69	79	H 82	H 89	80	79	80	80	82	78	64	56	51	50	44	40	F
17	49	F 46	F	F	F	F	51	65	78	71	71	99	94	80	81	75	79	73	52	49	45	42	44	F
18	F	F	F	F	F	F 38	59	72	82	73	81	95	79	71	72	71	80	64	65	66	56	45	43	39
19	42	42	42	42	43	42	56	82	85	75	72	75	82	84	71	76	73	65	59	59	53	48	39	39
20	41	42	42	40	43	37	48	65	80	83	85	84	82	90	80	77	75	72	65	53	45	41	R 42	41
21	42	42	43	41	40	40	52	70	77	H 72	H 76	86	88	89	97	91	78	62	56	59	58	46	A	32
22	38	A	42	F	51	34	48	63	84	90	85	93	84	80	72	85	73	57	51	F 52	53	58	42	40
23	39	44	45	F 45	43	42	52	73	82	82	87	70	89	83	91	87	70	55	52	49	42	38	38	F 38
24	F 31	F 31	F 32	35	42	39	53	74	91	98	90	82	95	76	75	74	83	56	45	44	F 46	43	44	F
25	F	F	F	F	F	F	52	73	62	99	90	116	109	89	109	92	87	66	A	43	41	F	F 43	F
26	F 46	F	39	40	F	F	44	68	93	82	84	83	80	76	75	81	78	64	43	46	49	45	35	33
27	32	32	31	30	F	F	45	75	82	84	85	89	76	79	80	85	79	73	48	44	39	44	38	39
28	37	37	33	36	32	30	39	H 56	68	68	69	85	91	91	90	75	76	53	47	39	36	34	37	F
29	F	A	F 38	F	F	F 32	F 49	60	68	81	76	H 79	76	78	76	69	69	56	H 39	38	F 43	F	46	F
30	F	F	F	40	38	32	39	55	65	72	71	84	84	73	73	76	70	46	33	35	35	A	36	36
31	34	33	A	32	32	32	42	62	78	76	77	86	H 82	78	77	78	70	55	46	41	A	34	30	31
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	23	25	25	23	26	31	31	31	31	31	30	31	31	31	31	31	31	30	29	29	26	27	24
MED	42	41	40	40	38	34	48	65	71	75	78	84	83	79	76	76	73	62	53	49	46	44	42	40
UQ	44	42	42	42	43	41	52	71	80	82	84	86	89	84	80	84	78	66	59	56	53	48	45	44
LQ	36	36	34	35	32	31	45	60	68	71	72	76	78	76	72	70	67	58	48	44	42	41	38	38

OCT. 1987 | FOF2 (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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									400	L	440	430	440	440	L	330								
2									L	420	440	440	A	L	410	L								
3									L 400	L	420	L	450	440	L 410	L	L							
4								A	410	410	460	A	430	L 430	400	L								
5									L 400	420	440	450	L 440	430	L	L	L							
6								L	L	440	440	440	L	L 430	L	L								
7									L	L 410	L	L	L 460	L	L	L	L							
8								L	L	L 420	L 430	L	L 450	L 420	L 400	L								
9									L	L	A	A	L	L	L	L								
10								L	L	L 400	L	L	L	L	L	L								
11									L	L 420	L 400	L	L	L	L	L								
12									L	L	L	R 440	L	L	L	L								
13									A	L	L	L 450	L 430	L	L									
14									L	L	L	L	460	L 420	L	L								
15									L	L	410	L	L	L 410	L	L								
16									L	L	L	L 430	L	L	L	L								
17									L	L 410	L	L	L	L	L	L								
18									L	L	L	L	L	L	L									
19									L	L	L	L	L	L	L	L								
20									A	400	410	L	L	L	L									
21									L	L	420	L	A	L	L	L								
22									L	L	A	L	A	L	L	L								
23									L	L	L	430	L	L	L	L								
24									L	L	L	L	L	L	L	L								
25									A	A	L	L	L	L	L									
26									L	400	A	A	390	L	L									
27									L	L	430	L	L	A	A	A	A							
28									L	L	L	L	L 430	U A 420	L	330								
29									A	A	A	A	L	L	A									
30									L	L	A	410	A	L	L	L								
31									L	L	A	L	L	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	11	12	9	10	9	4	2								
MED									400	410	430	440	440	L 430	405	330								
UQ									405	420	440	440	450	430	410									
LQ									L 400	405	415	430	L 430	L 420	400									

OCT. 1987 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

OCT. 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	A	A	A	A	A	A	320	305	270	240	S						
2							S	220	A	A	A	A	A	A	300	A	215	S						
3							S	250	275	300	305	315	310	315	300	275	235	S						
4							S	A	A	A	A	A	305	300	280	250	220	S						
5							S	220	265	295	305	320	330	320	300	275	220	S						
6							S	A	280	A	A	320	315	310	290	A	220	S						
7							S	220	A	295	315	R 320	320	310	300	275	220	S						
8							S	A	275	A	A	A	320	325	300	A	A	S						
9							S	A	280	300	305	310	320	320	300	270	A	S						
10							S	225	290	310	A	320	330	315	305	280	A							
11							S	225	275	295	310	320	330	320	305	285	225	S						
12							S	220	275	295	305	310	310	305	295	275	210	S						
13							S	225	A	300	305	310	325	315	305	260	225	S						
14							S	220	270	A	A	320	325	310	290	255	215	S						
15							S	210	A	A	305	310	310	315	305	A	225	S						
16							S	A	A	A	A	A	315	310	290	A	A	S						
17							S	215	285	305	310	315	A	305	A	A	A	S						
18							S	220	290	300	310	315	A	A	305	270	225	S						
19							S	A	A	A	A	315	A	310	305	270	210	S						
20							S	225	275	A	A	320	320	315	A	265	205	S						
21							S	A	285	295	A	A	300	A	A	A	205	S						
22							S	220	260	A	300	300	295	290	A	U A 250	U A 200	S						
23							S	A	A	285	315	315	315	305	275	255	205	S						
24							S	215	A	A	A	A	A	A	A	A	205	S						
25							S	210	250	290	300	A	A	A	280	270	A	S						
26							S	205	A	295	A	A	A	A	A	275	S	S						
27							S	A	265	295	305	A	A	A	235	A	A	S						
28							S	A	A	280	A	A	A	A	A	260	205	S						
29							S	A	A	A	A	A	A	A	A	255	180	S						
30							S	205	245	280	A	A	A	A	A	A	A	S						
31							S	220	285	295	305	A	A	A	A	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								19	18	18	15	17	18	20	21	20	21							
MED								220	275	295	305	315	318	312	300	270	215							
UQ								222	285	300	310	320	325	318	305	275	225							
LQ								215	265	295	305	310	310	308	290	255	205							

OCT. 1987 | FOE (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | FOES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 16	E S 15	E S 16	E S 16	E S 16	J A 24	E S 16	J A 63	J A 44	J A 50	J A 50	J A 50	J A 83	G	G	G	G	25	J A 126	J A 32	J A 44	J A 84	J A 24	J A 18
2	J A 42	E S 15	J A 28	J A 24	E S 16	E S 16	E S 16	28	32	J A 44	36	J A 60	J A 49	J A 40	34	J A 27	G	E S 16	J A 36	J A 28	J A 45	J A 56	E S 15	J A 25
3	E S 15	E S 15	E S 15	E S 15	E S 15	J A 21	J A 25	J A 29	31	36	G	G	J A 52	J A 42	G	J A 29	G	E S 16	J A 23	J A 25	J A 24	J A 41	J A 28	E S 15
4	J A 26	J A 21	E S 16	E S 16	J A 24	E S 16	20	J A 43	30	J A 35	J A 38	J A 106	G	G	G	G	G	J A 20	J A 20	J A 24	J A 20	E S 16	J A 34	J A 21
5	J A 31	J A 23	J A 24	J A 24	J A 23	E S 16	20	G	G	G	G	G	G	G	G	G	31	J A 25	J A 24	J A 60	E S 15	J A 25	E S 15	E S 15
6	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	20	27	G	30	33	G	G	G	G	J A 36	J A 35	J A 29	J A 24	J A 24	E S 15	E S 15	E S 15	E S 15
7	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	19	G	30	G	G	G	G	G	32	31	30	J A 21	E S 16	E S 15	E S 15	E S 16	E S 16	E S 16
8	E S 16	E S 16	E S 16	E S 15	E S 15	E S 16	20	30	32	34	38	34	35	G	G	J A 31	J A 25	E S 18	J A 19	J A 25	J A 30	J A 33	J A 25	J A 23
9	J A 23	E S 16	J A 22	J A 19	E S 15	E S 15	22	30	J A 42	J A 46	J A 66	J A 54	J A 44	G	G	31	J A 32	J A 24	E S 16	J A 22	J A 24	E S 16	E S 16	E S 16
10	E S 16	E S 15	J A 21	J A 22	E S 15	E S 16	J A 23	26	G	G	35	G	G	G	G	G	J A 30	J A 18	J A 29	J A 21	J A 36	J A 20	J A 22	E S 15
11	E S 16	E S 16	E S 16	J A 19	E S 15	E S 16	E S 16	25	30	G	G	41	G	G	G	G	27	21	J A 28	J A 20	J A 33	J A 27	J A 24	E S 15
12	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 17	G	G	J A 44	36	G	G	G	G	31	27	E S 16	E S 16	J A 20	J A 18	E S 16	E S 16	E S 16
13	E S 16	E S 15	E S 16	E S 15	E S 15	E S 16	E S 16	G	J A 52	J A 38	35	G 30	37	35	G	32	31	25	J A 31	E S 15	E S 15	J A 21	E S 15	E S 15
14	E S 16	E S 16	E S 15	E S 16	E S 16	E S 15	E S 16	G	33	36	J A 44	G	G	G	G	G	G	E S 16	J A 20	J A 24	J A 29	J A 24	E S 15	E S 15
15	E S 16	E S 15	J A 25	E S 16	E S 15	E S 16	E S 16	30	33	J A 34	G	G	38	G	G	35	G	E S 16	J A 29	J A 53	J A 33	J A 23	J A 24	E S 16
16	E S 16	E S 16	E S 16	E S 16	J A 22	J A 21	21	J A 46	J A 61	37	J A 41	J A 33	G	G	G	J A 44	J A 54	J A 33	J A 52	J A 39	J A 24	E S 16	E S 16	E S 16
17	E S 16	E S 16	E S 16	E S 15	E S 15	E S 16	E S 16	G	G	G	G	40	40	G	30	J A 30	J A 24	J A 23	J A 29	J A 26	J A 29	J A 24	J A 25	J A 22
18	E S 16	E S 15	E S 15	E S 15	J A 22	J A 24	E S 16	37	G	34	G	G	38	38	G	J A 30	G	J A 18	J A 53	J A 30	J A 28	J A 25	J A 30	J A 33
19	J A 53	J A 30	J A 25	J A 22	E S 15	E S 16	J A 43	J A 26	30	J A 43	J A 34	G	J A 35	G	G	G	G	J A 27	J A 38	J A 23	J A 31	J A 33	J A 22	J A 33
20	J A 23	J A 21	E S 16	E S 16	E S 16	E S 16	E S 16	30	J A 44	J A 33	J A 34	G	G	G	J A 32	30	24	E S 16	E S 16	E S 16	J A 22	J A 23	J A 24	J A 24
21	E S 16	J A 24	J A 26	J A 24	E S 16	E S 16	E S 16	J A 26	35	J A 62	J A 34	J A 71	J A 67	J A 54	J A 31	J A 27	G	E S 16	E S 17	J A 20	J A 23	J A 40	J A 84	J A 52
22	J A 34	J A 88	J A 40	J A 24	J A 30	J A 52	E S 16	31	J A 43	J A 42	J A 51	J A 43	J A 47	J A 39	J A 54	J A 30	J A 24	E S 16	J A 25	J A 53	J A 27	E S 17	J A 23	E S 16
23	E S 16	E S 15	E S 15	E S 15	E S 16	E S 15	E S 16	24	31	34	G	G	G	G	G	G	G	20	J A 24	J A 31	E S 16	J A 32	J A 38	E S 16
24	J A 50	E S 15	E S 15	E S 15	E S 15	E S 15	J A 20	G	J A 30	J A 33	J A 44	J A 37	J A 46	J A 41	J A 33	J A 26	G	J A 25	J A 50	J A 44	J A 37	E S 16	E S 15	E S 15
25	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	32	J A 50	J A 53	J A 44	39	J A 50	36	G	G	30	J A 44	J A 107	J A 38	J A 52	J A 28	J A 53	J A 36
26	J A 20	J A 24	J A 24	E S 15	J A 24	J A 20	J A 20	G	32	34	J A 53	J A 56	J A 33	J A 42	31	31	21	E S 16	J A 18	E S 16	J A 21	E S 15	J A 20	J A 28
27	E S 16	J A 20	J A 29	J A 45	J A 46	J A 39	J A 23	J A 26	31	35	37	J A 46	J A 46	J A 46	J A 44	J A 42	J A 65	J A 34	J A 21	J A 33	J A 30	E S 16	E S 16	E S 16
28	E S 16	J A 20	E S 16	J A 21	J A 54	E S 16	E S 16	J A 25	30	36	J A 43	J A 40	J A 47	J A 44	J A 52	G	22	J A 28	J A 20	J A 49	J A 50	J A 31	J A 24	J A 52
29	J A 33	J A 65	J A 64	E S 16	J A 45	J A 44	J A 33	J A 51	J A 49	J A 46	J A 44	J A 47	J A 52	J A 77	J A 50	G	28	E S 16	J A 21	E S 15	J A 20	E S 15	E S 16	E S 16
30	E S 15	E S 15	J A 22	J A 32	E S 15	J A 22	E S 16	G	31	33	J A 87	J A 100	J A 109	J A 84	J A 32	J A 36	J A 53	J A 32	J A 20	J A 36	J A 84	J A 50	J A 24	J A 24
31	J A 23	J A 50	J A 44	J A 30	J A 22	J A 24	E S 16	G	G	36	J A 44	J A 46	35	J A 52	J A 51	J A 48	J A 28	J A 24	E S 16	J A 24	J A 49	J A 24	E S 16	E S 16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	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 S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	26	31	36	J A 36	37	37	G	G	30	24	J A 21	J A 24	J A 25	J A 28	J A 24	J A 22	E S 16
UQ	J A 23	J A 21	J A 24	J A 22	J A 22	J A 21	20	30	38	J A 42	J A 44	J A 46	J A 47	J A 42	J A 32	J A 31	J A 30	J A 25	J A 30	J A 34	J A 34	J A 32	J A 24	J A 24
LQ	E S 16	E S 15	E S 16	E S 15	E S 15	E S 16	E S 16	G	30	34	E G 33	G	G	G	G	G	G	E S 16	J A 20	J A 20	J A 20	E S 16	E S 16	E S 16

OCT. 1987 | FOES (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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 24sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	41	35	32	35	36	36	G	G	G	G	20	E S 16	E S 15	22	E S 15	E S 15	E S 15
2	E S 16	E S 15	25	19	E S 16	E S 16	E S 16	28	32	34	35	38	48	37	G 23	27	G	E S 16	E S 16	E S 15	E S 15	22	E S 15	E S 15
3	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	G 22	30	32	G	G	G 22	33	G	G 23	G	E S 16	18	E S 16	E S 15	22	E S 15	E S 15
4	E S 16	18	E S 16	E S 16	E S 16	E S 16	19	40	30	33	32	A A 106	G	G	G	G	G	E S 16	E S 16	E S 15	E S 15	E S 16	22	E S 15
5	26	E S 16	20	E S 15	E S 15	E S 16	20	G	G	G	G	G	G	G	G	G	26	18	E S 16	35	E S 15	24	E S 15	E S 15
6	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	18	26	G	30	33	G	G	G	G	28	G 20	18	18	E S 16	E S 15	E S 15	E S 15	E S 15
7	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	19	G	30	G	G	G	G	G	32	30	28	E S 16	E S 16	E S 15	E S 15	E S 16	E S 16	E S 16
8	E S 16	E S 16	E S 16	E S 15	E S 15	E S 16	19	29	30	34	36	34	35	G	G	29	25	E S 16	E S 16	18	19	E S 15	18	E S 16
9	E S 16	E S 16	E S 16	E S 16	E S 15	E S 15	20	19	32	40	64	50	41	G	G	30	28	18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
10	E S 16	E S 15	19	E S 15	E S 15	E S 16	20	25	G	G	35	G	G	G	G	G	23	E S 16	20	E S 15	E S 15	E S 15	E S 15	E S 15
11	E S 16	E S 16	E S 16	E S 15	E S 15	E S 16	E S 16	25	29	G	G	40	G	G	G	G	26	20	23	E S 15	20	E S 15	E S 15	E S 15
12	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 17	G	G	34	35	G	G	G	G	30	24	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
13	E S 16	E S 15	E S 16	E S 15	E S 15	E S 16	E S 16	G	49	G 28	34	G 21	35	34	G	31	29	24	30	E S 15	E S 15	18	E S 15	E S 15
14	E S 16	E S 16	E S 15	E S 16	E S 16	E S 15	E S 16	G	30	32	35	G	G	G	G	G	G	E S 15	E S 15	20	E S 15	E S 15	E S 15	E S 15
15	E S 16	E S 15	E S 16	E S 16	E S 15	E S 16	E S 16	26	33	31	G	G	35	G	G	28	G	E S 16	E S 15	19	19	E S 15	E S 16	E S 16
16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	18	26	30	33	39	33	G	G	G	29	30	26	49	19	E S 16	E S 16	E S 16	E S 16
17	E S 16	E S 16	E S 16	E S 15	E S 15	E S 16	E S 16	G	G	G	G	39	38	G	30	28	23	E S 17	E S 16	19	E S 16	E S 16	18	E S 16
18	E S 16	E S 15	E S 15	E S 15	E S 16	19	E S 16	25	G	34	G	G	38	35	G	G 25	G	E S 16	31	E S 15	23	E S 15	22	29
19	23	E S 15	19	E S 15	E S 15	E S 16	E S 16	23	29	33	32	G	35	G	G	G	G	23	24	E S 16	23	E S 15	E S 16	E S 16
20	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	30	39	32	34	G	G	G	30	29	21	E S 16	E S 16	E S 16	E S 16	18	18	21
21	E S 16	E S 15	20	E S 15	E S 16	E S 16	E S 16	25	32	32	33	33	53	35	30	26	G	E S 16	E S 17	E S 16	19	24	A A 84	17
22	E S 16	A A 88	E S 15	E S 15	23	29	E S 16	26	39	36	48	40	45	35	30	25	20	E S 16	18	33	18	E S 17	19	E S 16
23	E S 16	E S 15	E S 15	E S 15	E S 16	E S 15	E S 16	24	29	30	G	G	G	G	G	G	G	20	E S 15	21	E S 16	E S 15	30	E S 16
24	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	19	G	27	30	34	36	35	35	31	26	G	23	34	23	E S 15	E S 16	E S 15	E S 15
25	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	30	49	50	31	36	41	33	G	G	28	33	A A 107	24	E S 15	23	23	29
26	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	G	29	31	50	49	33	31	30	G 22	21	E S 16	E S 16	E S 16	E S 15	E S 15	E S 15	E S 15
27	E S 16	E S 16	E S 16	24	21	28	E S 16	23	28	32	36	35	35	46	44	40	50	28	E S 16	21	E S 16	E S 16	E S 16	E S 16
28	E S 16	E S 16	E S 16	E S 16	20	E S 16	E S 16	24	30	29	37	35	32	42	31	G	22	19	E S 16	25	19	26	E S 15	E S 15
29	E S 15	A A 65	20	E S 16	24	E S 15	29	E S 16	48	42	43	44	39	36	43	G	24	E S 16	19	E S 15	E S 15	E S 15	E S 16	E S 16
30	E S 15	E S 15	E S 16	E S 15	E S 15	E S 16	E S 16	G	29	34	64	40	64	40	29	28	23	18	E S 15	E S 15	24	A A 50	E S 15	E S 15
31	E S 16	26	A A 44	E S 15	E S 16	E S 16	E S 16	G	G	35	41	35	35	45	38	34	22	E S 16	E S 16	21	A A 49	21	E S 16	E S 16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	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 S 16	E S 15	E S 16	E S 15	E S 16	E S 16	E S 16	24	30	32	34	34	35	G	G	26	22	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
UQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	18	26	32	34	36	38	38	35	30	29	26	20	20	20	19	20	18	E S 16
LQ	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	G	28	30	E G 31	G	G	G	G	G	G	E S 16	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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

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

OCT. 1987 | FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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 24sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	305	275	290	285	290	330	340	345	345	340	365	335	325	330	345	345	350	345	350	F	F	F	F	F 315
2	295	295	320	350	295	310	340	340	340	345	345	330	335	345	370	355	355	340	350	320	F 320	F 295	F	F
3	290	315	310	355	305	310	360	365	355	365	350	330	340	325	355	350	345	355	310	315	305	300	330	290
4	265	270	280	355	300	280	355	A	270	335	320	A	330	330	330	340	345	340	345	290	285	290	295	300
5	290	280	305	315	295	295	350	365	355	335	350	345	340	350	350	350	335	345	345	330	310	310	F 290	F 295
6	F 310	310	325	300	315	315	350	360	360	335	335	335	330	330	350	340	350	350	355	320	330	300	300	290
7	300	310	295	315	310	305	360	365	370	360	350	335	325	350	340	340	360	360	340	310	320	290	280	290
8	R 285	290	310	340	325	305	335	355	360	335	330	330	325	335	335	350	345	355	295	285	285	F	295	300
9	295	275	295	305	295	F 290	350	365	360	345	345	345	320	330	345	340	345	350	325	320	310	305	320	295
10	295	305	315	300	315	295	345	350	370	330	345	330	330	335	340	330	330	330	320	330	310	310	295	295
11	315	295	300	295	315	295	355	H 355	375	320	325	330	330	330	340	325	335	335	330	310	300	235	270	290
12	285	295	270	265	285	325	360	355	345	345	H 310	310	310	325	335	335	345	340	315	305	F 320	325	305	290
13	285	275	285	310	320	360	355	355	355	320	330	320	330	320	335	345	345	345	310	320	300	S 305	290	290
14	280	285	285	285	310	270	320	325	330	345	340	330	330	325	335	350	350	335	315	F	F 310	F 285	F 285	F 295
15	F	F	F	F	F	F	365	360	345	400	340	345	350	345	330	330	335	355	345	295	290	270	F	F 300
16	F 295	F	F 305	F 305	F	310	350	340	340	H 340	H 335	335	330	335	330	345	345	345	345	305	320	310	295	F
17	290	F 280	F	F	F	F	360	355	350	360	320	335	355	320	345	340	340	360	325	305	310	300	315	F
18	F	F	F	F	F	F 315	355	370	360	370	345	345	365	335	335	340	345	330	325	325	320	315	305	330
19	280	285	300	295	305	330	345	360	370	375	345	340	330	325	340	345	360	340	320	335	360	335	305	285
20	285	290	295	300	325	315	320	370	330	345	350	335	340	355	345	340	360	345	355	325	335	295	R 315	285
21	285	285	295	290	300	300	360	385	335	H 345	H 325	330	330	310	340	325	320	330	305	305	340	360	A	275
22	275	A	280	F	340	345	355	355	345	345	340	355	325	335	325	350	355	340	315	F 290	335	345	335	300
23	295	320	310	F 315	305	310	345	370	355	350	360	310	335	310	325	340	355	330	330	320	330	320	325	F 325
24	F 330	F 315	F 305	290	310	305	350	350	330	355	365	325	340	340	345	345	355	345	335	305	F 320	315	315	F
25	F	F	F	F	F	F	340	350	340	345	310	325	340	305	335	345	350	350	A	305	295	F	F 275	F
26	F 320	F	290	305	F	F	320	355	350	355	355	330	350	330	335	350	355	345	300	305	310	350	315	290
27	280	295	300	295	F	F	335	380	360	360	355	355	340	330	340	335	350	355	350	320	270	305	270	280
28	300	295	270	270	255	265	305	H 315	325	340	325	330	325	340	345	345	340	350	315	315	310	300	320	F
29	F	A	F 315	F	F	F 280	F 335	355	340	350	340	H 325	335	330	340	360	355	355	H 340	315	F 295	F	295	F
30	F	F	F	315	310	300	335	345	345	355	335	345	345	340	350	350	355	340	305	315	285	A	325	305
31	305	290	A	295	305	295	340	355	345	350	355	335	H 330	335	335	345	370	345	325	320	A	340	315	315
	00	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	23	25	25	23	26	31	30	31	31	31	30	31	31	31	31	31	31	30	29	29	26	27	24
MED	292	290	300	300	305	305	350	355	345	345	340	332	330	330	340	345	350	345	325	315	310	305	305	295
UQ	300	300	310	315	315	315	355	365	360	355	350	340	340	338	345	350	355	350	345	320	320	320	315	300
LQ	285	282	290	295	298	295	338	350	340	340	330	330	330	325	335	340	345	340	315	305	300	295	292	290

OCT. 1987 | M(3000)F2 (0.01)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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									375	L	395	420	370	365	L	400								
2									L	365	385	385	A	L	390	L								
3									L 400	L	405	L	390	385	L 395	L	L							
4								A	365	370	360	A	370	L 370	390	L								
5									L 395	405	390	375	L 385	385	L	L	L							
6								L	L	395	410	405	L	L 395	L	L								
7									L	L 415	L	L	L 370	L	L	L	L							
8								L	L	L 410	L 395	L	L 375	L 405	L 375	L								
9									L	L	A	A	L	L	L	L								
10								L	L	L 425	L	L	L	L	L	L								
11									L	L 405	L 420	L	L	L	L	L								
12									L	L	L	R 385	L	L	L	L								
13									A	L	L	L 400	L 410	L	L									
14									L	L	L	L	375	L 395	L	L								
15									L	L	440	L	L	L 415	L	L								
16									L	L	L	L 415	L	L	L	L								
17									L	L 415	L	L	L	L	L	L								
18									L	L	L	L	L	L	L									
19									L	L	L	L	L	L	L	L								
20									A	415	435	L	L	L	L									
21									L	L	445	L	A	L	L	L								
22									L	L	A	L	A	L	L	L								
23									L	L	L	420	L	L	L	L								
24									L	L	L	L	L	L	L	L								
25									A	A	L	L	L	L	L									
26									L	395	A	A	435	L	L									
27									L	L	395	L	L	A	A	A	A							
28									L	L	L	L	L 395	A	L	410								
29									A	A	A	A	L	L	A									
30									L	L	A	A	A	L	L	L								
31									L	L	A	L	L	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	11	12	8	10	8	4	2								
MED									385	405	400	402	380	L 390	390	405								
UQ									L 398	L 415	428	418	L 395	L 400	392									
LQ									370	395	392	385	370	378	382									

OCT. 1987 | M(3000)F1 (0.01)

IONOSPHERIC DATA

OCT. 1987 | H'F2 (KM) | 135° E Mean Time (G.M.T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									260	255	240	275	280	275	255	250								
2									255	255	245	250	260	250	240	245								
3									240	225	250	270	260	280	240	245	245							
4								A	430	300	350	A	270	260	275	255								
5									250	270	260	255	270	250	255	250	250							
6								240	240	280	260	260	275	260	260	250								
7									235	245	245	265	275	250	250	255	245							
8								250	235	265	260	275	250	H 255	255	240								
9									250	240	A	250	275	260	265	255								
10								235	225	240	250	270	260	260	265	245								
11									235	250	250	255	260	270	260	250								
12									230	230	H 245	285	260	260	245	245								
13									235	225	270	260	255	H 230	270									
14									240	240	250	260	255	245	245	245								
15									230	225	H 250	255	250	245	250	255								
16									225	235	240	245	245	260	265	245								
17									235	235	225	275	230	275	245	235								
18									230	230	235	250	225	245	250									
19									225	225	240	245	250	250	240	235								
20									240	H 240	245	H 240	245	250	245									
21									235	H 220	240	270	260	265	260	250								
22									245	245	245	245	245	240	240	245								
23									230	235	245	H 240	260	260	255	245								
24									245	240	220	270	260	245	245	250								
25									245	240	240	255	245	H 250	255									
26									250	230	235	245	235	270	250									
27									230	230	240	240	235	245	245	240	230							
28									H 255	240	255	275	265	250	240	240								
29									A	245	240	245	250	255	255									
30									240	245	A	255	A 245	245	240	245								
31									240	230	240	250	230	240	250	240								
	00	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	30	31	29	30	31	31	31	25	4							
MED								240	240	240	245	255	255	250	250	245	245							
UQ								245	245	245	250	270	260	260	258	250	248							
LQ								238	230	230	240	245	245	245	245	245	238							

OCT. 1987 | H'F2 (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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	255	295	285	285	285	230	H 220	A 245	A	210	205	200	230	220	215	210	245	240	220	240	A	255	270	250
2	275	285	A 270	240	275	265	225	230	230	220	230	225	A	A	220	220	240	240	215	220	245	A	270	245
3	245	250	250	205	250	255	220	225	220	H 200	210	210	210	205	225	230	220	230	235	245	255	270	220	260
4	345	350	305	235	295	300	240	A	235	205	200	A	200	H 195	200	235	240	240	220	255	280	285	A	275
5	A	300	A 270	270	E S 280	285	230	230	220	200	200	200	220	220	230	220	230	225	220	A	240	A	290	265
6	270	255	245	260	240	270	240	230	225	205	200	195	200	H 195	220	240	240	225	225	230	240	290	265	275
7	270	255	250	255	245	235	210	235	220	200	195	195	220	H 210	220	235	240	220	225	235	240	270	300	285
8	285	275	250	200	205	280	220	A 245	225	200	215	H 195	220	215	210	225	225	215	230	270	300	275	270	245
9	235	280	275	255	260	270	210	225	220	A	A	A	A	205	210	225	240	220	225	240	240	250	240	255
10	265	250	250	250	225	250	205	220	230	200	200	200	200	205	225	230	H 240	235	230	220	240	245	245	260
11	240	250	260	255	235	255	230	205	225	210	200	A	190	220	H 200	225	240	210	220	240	245	280	295	275
12	285	265	230	305	290	245	210	H 230	225	225	195	215	210	230	235	225	H 230	215	230	255	250	230	245	250
13	290	300	315	260	235	205	225	210	A	205	200	205	210	200	240	245	230	220	A	240	240	260	250	260
14	275	295	295	280	250	270	240	225	215	200	205	H 205	200	200	205	220	225	210	240	250	210	230	285	240
15	295	270	295	285	265	245	215	230	215	225	195	220	210	200	205	235	235	210	200	250	285	310	310	300
16	295	260	275	260	255	255	210	220	A	220	220	200	H 200	H 200	225	240	230	225	A	255	230	240	255	285
17	255	270	255	265	230	200	210	225	230	200	200	H 200	A	205	225	225	225	210	215	250	245	245	270	300
18	290	300	260	245	235	245	225	H 210	200	215	200	195	200	205	240	H 240	240	215	A 250	235	230	235	A 270	A
19	A	285	275	270	245	230	225	H 230	220	210	195	200	195	195	230	235	230	215	A 230	240	225	230	250	285
20	295	285	250	255	235	220	215	205	A	200	195	235	205	H 205	220	225	H 230	225	210	215	215	270	250	A 290
21	290	280	A 285	270	255	250	200	210	230	205	195	195	A	240	H 210	H 205	225	225	250	260	235	A 230	A	250
22	290	A	280	275	A 245	A	230	220	A	225	A	A	A	225	H 200	240	230	210	235	A	250	215	240	250
23	265	255	250	245	235	250	225	225	220	210	200	195	200	230	230	240	225	210	230	245	225	255	A	235
24	245	E S 290	E S 290	E S 295	250	240	225	225	225	220	200	225	210	230	230	240	240	205	A	A	255	240	240	230
25	235	230	275	260	260	250	240	210	A	A	230	225	A	200	210	235	230	220	A	A	265	A	A	A
26	220	220	260	260	260	260	245	240	230	210	A	A	200	200	235	240	225	210	220	270	250	220	255	E S 295
27	250	290	250	A	A	A	210	230	225	225	210	230	230	A	A	A	A	210	205	280	290	265	295	275
28	270	280	305	310	A	330	270	220	235	240	220	H 195	195	A	235	210	240	210	230	A	255	A	260	280
29	310	A	A 290	260	A	300	230	235	A	A	A	A	A	A	A	235	225	210	225	235	255	245	260	230
30	280	275	280	250	235	265	245	230	230	230	A	A	A	A	215	220	225	200	215	250	A	A	230	280
31	250	A	A	285	280	265	235	220	230	215	A	200	220	A	A	A	220	220	230	245	A	245	235	255
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	28	30	30	28	29	31	30	24	28	25	24	23	25	28	29	30	31	27	26	28	26	27	29
MED	270	276	271	260	249	255	225	225	225	210	200	200	205	205	220	230	230	215	225	245	245	252	260	260
UQ	290	290	285	272	261	270	232	230	230	220	210	218	215	220	230	240	240	225	230	255	255	270	270	280
LQ	250	255	250	250	235	245	212	220	220	200	200	195	200	200	210	225	225	210	220	235	238	240	245	250

OCT. 1987 | H'F (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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 24sec in automatic operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	105	105	105	A	A	A	100	105	105	110	S						
2							S	110	105	105	105	A	A	A	A	A	110	S						
3							S	A	105	105	105	105	110	105	100	A	110	S						
4							S	E S 115	110	105	105	A	105	105	105	100	E S 120	S						
5							S	110	110	105	105	105	110	105	105	110	110	S						
6							S	110	110	105	110	110	105	105	105	A	A	S						
7							S	110	110	105	105	105	100	105	110	110	E S 120	S						
8							S	110	110	105	105	105	105	105	110	110	110	S						
9							S	E S 120	110	105	105	105	110	110	110	110	110	S						
10							S	105	105	105	100	105	110	105	105	105	110							
11							S	110	110	105	105	105	105	105	105	105	E S 120	S						
12							S	E S 120	110	105	105	105	100	105	105	105	E S 120	S						
13							S	E S 120	A	A	105	110	105	105	105	110	110	S						
14							S	110	110	110	105	105	105	105	105	110	E S 120	S						
15							S	E S 115	110	105	105	100	105	110	110	110	110	S						
16							S	S	110	105	A	A	105	105	105	A	A	S						
17							S	115	110	110	110	110	110	105	105	105	E S 120	S						
18							S	E S 120	110	110	110	110	110	110	110	A	110	S						
19							S	110	110	105	110	105	105	110	110	110	E S 120	S						
20							S	E S 120	110	110	110	105	105	100	105	110	S	S						
21							S	110	110	110	105	105	105	105	105	115	S	S						
22							S	S	105	105	105	105	105	105	105	A	S	S						
23							S	110	110	105	105	105	105	105	105	110	S	S						
24							S	115	105	105	105	A	A	A	A	A	110	S						
25							S	S	110	110	110	105	A	100	105	110	S	S						
26							S	110	110	110	105	A	A	A	A	A	S	S						
27							S	A	105	105	100	100	110	110	110	110	A	S						
28							S	S	110	110	105	105	A	A	A	110	S	S						
29							S	S	110	105	105	105	105	A	105	110	S	S						
30							S	S	110	105	105	A	A	A	100	110	A	S						
31							S	S	110	105	105	105	105	105	A	A	S	S						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								22	30	30	29	24	24	25	26	22	18							
MED								110	110	105	105	105	105	105	105	110	110							
UQ								E S 115	110	110	105	105	110	105	110	110	E S 120							
LQ								110	110	105	105	105	105	105	105	105	110							

The Radio Research Laboratory, Japan

OCT. 1987 | H'E (KM)

IONOSPHERIC DATA

OCT. 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

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

OCT. 1987 | H'ES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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						F 3		C 5	C 4	C 2	CL 12	L 1	CL 22					C 2	F 1	F 2	F 3	F 3	F 2	F 2
2	F 2		F 4	F 2				C 1	C 2	C 2	C 1	L 3	L 2	L 2	L 1	L 2			F 1	F 2	F 2	F 3		F 4
3						F 1	LH 11	L 1	C 2	C 1			L 1	C 1		L 2			F 2	F 2	F 2	F 3	F 2	
4	F 2	F 3			F 3		C 2	C 4	C 2	C 2	C 1	L 3						L 2	F 1	F 2	F 2		F 3	F 2
5	F 5	F 4	F 3	F 2	F 2		H 2										C 2	C 1	F 1	F 2		F 2		
6							H 1	C 1		C 1	C 2					L 2	L 2	L 2	F 1	F 1				
7							H 1		C 1						H 1	C 2	C 2	C 1						
8							H 2	C 2	C 2	C 1	C 1	C 1	C 1			C 1	C 2		F 1	F 2	F 3	F 2	F 2	F 2
9	F 1		F 2	F 2			H 1	C 1	C 1	C 2	C 4	C 3	C 2			C 2	C 3	L 2		F 1	F 1			
10			F 2	F 3			L 1	H 1			C 2						C 1	C 1	F 3	F 1	F 1	F 1	F 2	
11				F 1				H 1	C 1			C 1					H 2	C 3	F 3	F 2	F 2	F 1	F 1	
12										C 2	C 1					C 2	C 2			F 2	F 1			
13									L 3	L 3	CL 11	L 1	HL 11	H 1		H 2	C 3	CL 41	F 3			F 3		
14									C 2	C 2	C 1								F 1	F 2	F 2	F 2		
15			F 2					C 3	C 2	C 1			C 1			C 1			F 1	F 2	F 2	F 1	F 1	
16					F 2	F 2	C 1	C 2	C 3	C 2	L 4	L 2				L 4	L 2	L 2	F 4	F 2	F 1			
17												C 2	C 2		C 1	C 1	C 2	C 1	F 1	F 2	F 1	F 1	F 2	F 1
18					F 1	F 2		H 2		C 1			C 1	C 1		L 2		L 1	F 4	F 2	F 3	F 3	F 7	F 4
19	F 5	F 2	F 3	F 2			C 4	C 1	C 2	C 2	C 1		C 1					C 2	F 3	F 2	F 3	F 2	F 2	F 2
20	F 2	F 2						HL 11	C 1	C 1	C 1				C 1	H 2	H 2				F 1	F 2	F 2	F 2
21		F 2	F 4	F 1				C 1	H 2	C 1	C 1	C 1	C 3	C 2	C 1	C 1				F 2	F 3	F 7	F 7	F 5
22	F 2	F 4	F 2	F 2	F 4	F 3		H 1	C 3	C 1	C 3	C 2	C 2	C 2	C 2	LH 11	LH 11		F 2	F 3	F 2		F 1	
23								C 1	C 1	C 1								C 2	F 1	F 4		F 2	F 4	
24	F 2						L 2		C 2	C 2	C 2	L 2	L 2	L 2	L 2	L 2		C 2	FF 32	F 2	F 2			
25								C 2	C 2	C 3	C 1	C 1	L 3	C 1			C 3	C 4	F 4	F 5	F 2	F 3	F 5	F 5
26	F 2	F 1	F 2		F 1	F 1	L 1		H 1	C 1	C 2	L 3	L 2	L 2	L 2	L 1	H 2		F 1		F 1		F 2	F 2
27		F 2	F 2	F 5	F 4	F 7	L 1	LH 41	C 1	C 2	C 2	C 1	C 2	C 2	C 2	C 3	L 4	L 2	F 1	F 3	F 2			
28		F 2		F 2	F 4			C 2	C 1	C 1	C 2	C 1	L 1	L 2	L 1		C 1	C 2	F 1	F 3	F 2	F 5	F 2	F 3
29	F 3	F 6	F 6		F 5	F 2	L 4	C 4	C 3	C 2	C 2	C 2	C 2	L 2	C 2		C 4		F 2		F 1			
30			F 2	F 2		F 2			C 3	C 2	C 2	L 3	L 3	L 2	C 1	C 2	L 1	L 1	F 1	F 2	F 2	F 4	F 1	F 2
31	F 2	F 4	F 7	F 2	F 2	F 2				C 2	C 2	C 2	C 2	C 2	CL 22	CL 21	C 1	CL 11		F 2	F 3	F 3		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratory, Japan

OCT. 1987 | TYPES OF ES

IONOSPHERIC DATA

OCT. 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	X 46	X 43	X 42	X 42	X 39	X 41													X 78	X 58	X 52	54	54	X 46
2	44	X 45	X 42	X 37	X 36	38													X 81	X 69	X 55	X 51	X 50	X 51
3	51	X 49	X 47	X 41	X 37	X 37													X 65	X 65	X 58	S	X 56	X 42
4	U X 43	X 41	X 40	X 51	X 35	X 34													X 56	X 45	X 45	X 46	X 47	X 45
5	X 39	X 35	X 36	X 34	X 31	X 32													X 60	X 50	X 43	X 42	44	X 42
6	X 41	X 43	X 34	X 36	X 33	X 34													X 62	C	X 44	X 44	X 44	X 43
7	X 44	X 44	X 43	X 42	X 39	X 33													X 59	X 46	X 45	X 45	44	X 43
8	X 43	X 43	X 42	X 42	X 29	X 29													X 56	X 53	X 53	X 55	X 58	X 51
9	X 51	X 47	X 45	X 49	X 42	S													C	X 70	X 64	X 58	X 57	X 49
10	X 50	X 50	X 47	X 48	X 39	X 38													S	S	X 54	X 50	X 51	X 53
11	X 53	X 48	X 47	X 47	X 46	X 44													X 63	X 53	X 54	X 49	X 48	X 50
12	X 48	X 47	X 47	X 47	X 46	X 44													X 61	X 61	X 62	X 60	X 56	X 51
13	X 48	X 48	X 47	X 53	X 58	X 43													X 58	X 54	S	S	X 54	U X 46
14	U X 42	X 45	X 47	X 48	X 44	X 39													X 64	X 57	X 57	X 51	X 50	X 52
15	X 50	X 49	52	52	52	X 52													X 57	X 44	X 46	X 46	X 48	X 47
16	X 48	X 50	53	49	X 49	X 45													X 64	X 56	X 56	X 53	X 47	X 42
17	U X 46	S	S	S	S	X 34													X 59	X 52	X 52	X 52	X 51	X 47
18	X 50	X 46	X 48	X 48	X 43	X 42													X 71	X 70	X 55	X 47	C	C
19	X 45	X 45	X 46	X 46	X 45	X 46													X 67	X 66	X 63	X 46	X 41	X 42
20	X 44	X 45	X 47	X 43	X 49	X 40													X 72	X 54	X 50	X 45	X 46	X 42
21	X 44	X 44	X 44	X 43	X 42	X 43													X 61	X 65	X 63	X 54	X 42	X 36
22	X 39	X 42	X 43	X 43	X 49	X 40													C	C	C	X 49	X 40	X 40
23	X 41	X 41	X 42	X 44	X 42	X 43												X 74	X 55	X 54	X 49	X 42	X 38	X 38
24	X 35	X 33	X 35	38	43	X 41												X 73	X 52	X 46	53	54	53	X 41
25	X 41	X 40	X 37	X 39	X 39	46												X 82	A	U X 47	X 48	X 50	X 36	X 43
26	X 44	X 37	X 33	X 37	X 42	48												X 75	X 55	U S 47	60	X 56	X 40	X 38
27	X 36	X 37	X 36	X 33	34	X 35												X 85	X 59	X 49	X 46	X 52	X 40	X 43
28	X 42	X 42	X 39	X 40	X 38	X 37												X 86	X 55	A	X 42	X 39	X 41	X 41
29	X 36	X 42	X 39	A	X 36	X 36												X 68	X 44	X 40	X 44	X 41	X 46	X 49
30	X 47	X 50	X 50	X 50	X 39	X 38												X 55	X 42	A	X 41	X 39	X 41	X 41
31	X 42	U X 41	X 38	X 38	X 38	X 37												X 58	X 52	X 50	X 43	X 42	X 38	X 34
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	30	29	30	30												9	27	26	29	29	30	30
MED	X 44	X 44	X 43	X 43	X 40	X 40												X 74	X 59	X 54	X 52	X 49	X 46	X 43
UQ	X 48	X 47	X 47	X 48	X 45	X 43												X 82	X 64	X 61	X 56	X 53	X 51	X 49
LQ	X 42	X 41	X 39	X 39	X 37	X 36												X 68	X 56	X 47	X 46	X 45	X 41	X 41

OCT. 1987 | FXI (0.1 MHZ)

IONOSPHERIC DATA

OCT. 1987 | FOF2 (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	40	37	36	36	33	35	49	72	72	80	J R 77	59	79	78	71	64	64	70	72	52	46	F	F 45	40
2	F 35	39	36	31	30	F 32	47	64	73	80	91	78	91	97	79	61	57	64	75	63	49	45	44	45
3	F 43	43	41	35	31	31	50	61	J R 82	81	59	92	81	J R 80	69	65	70	72	59	59	S 52	I S 50	J S 50	36
4	U S 37	S 35	S 34	J S 45	29	28	48	53	57	60	70	86	83	82	65	72	70	65	50	39	39	40	41	39
5	33	29	30	28	25	26	49	58	74	68	77	78	75	67	63	68	67	63	54	44	37	36	F 36	36
6	35	37	28	30	27	28	49	70	R 79	R 73	64	71	75	79	69	62	62	70	56	I C 46	38	38	38	37
7	38	38	37	36	33	27	46	58	85	68	64	72	80	R 73	73	68	74	J R 80	53	40	39	39	F 36	37
8	37	37	36	36	23	23	45	70	94	R 75	81	99	103	85	79	73	62	57	50	47	S 47	49	52	45
9	45	41	39	43	36	I S 38	52	S	68	64	R 77	R 80	C	C	80	74	C	C	C	64	58	52	51	43
10	44	44	41	42	33	32	56	70	74	66	74	86	87	J R 79	J R 80	R	U S 76	S	S	S	U S 43	J S 44	45	47
11	47	42	41	41	40	38	58	76	82	69	69	86	99	98	89	77	78	78	57	47	48	43	42	44
12	42	41	41	41	40	38	56	66	80	85	83	101	112	118	106	101	R 74	64	55	55	56	54	50	45
13	42	42	41	47	52	37	53	67	71	68	83	96	86	89	93	88	88	69	52	S 48	S	S	S 48	U S 40
14	U S 36	S 39	J S 41	42	38	33	52	68	83	89	81	87	95	93	93	89	80	73	58	51	51	45	44	46
15	44	43	F 42	F 42	F 42	46	49	68	78	83	82	101	83	83	81	88	92	82	51	38	40	40	42	41
16	42	44	F 43	F 41	43	39	55	65	86	83	84	84	81	81	77	80	82	76	58	50	50	47	41	36
17	U S 40	S	S	S	S	28	U S 45	S 65	80	J S 80	74	95	107	87	89	90	81	75	53	46	46	46	45	41
18	44	40	42	42	37	36	53	R 79	80	84	79	97	87	76	84	78	80	73	65	64	49	41	I C 40	I C 39
19	39	39	40	40	39	40	55	76	87	R 76	74	82	84	80	81	74	R 79	70	61	60	57	40	35	36
20	38	39	41	37	43	34	46	J S 66	I S 74	U S 83	89	84	84	85	I S 84	J S 79	79	73	66	48	44	39	40	36
21	38	38	V 38	37	36	37	50	66	80	I C 76	72	84	93	89	98	91	81	66	55	59	62	48	36	30
22	33	36	37	37	43	34	47	64	78	86	91	87	76	89	R 76	81	79	C	C	C	C	43	34	34
23	35	35	36	38	36	37	53	R 74	74	79	90	86	82	87	98	102	77	68	49	48	43	36	32	32
24	29	27	29	F 29	F 33	35	51	73	89	102	93	83	97	87	76	73	U S 81	67	46	40	F 43	F 41	F 45	35
25	35	34	31	33	33	F 36	51	67	74	H 81	R 83	113	122	99	109	99	92	76	A	40	42	44	30	37
26	38	31	27	31	36	F 40	45	75	92	99	83	80	82	R 80	92	90	81	69	49	U S 41	F 51	50	34	32
27	30	31	30	27	F 27	29	48	67	R 78	87	83	J S 87	86	J R 78	J S 86	93	86	79	53	43	40	S 46	34	37
28	36	36	33	34	32	31	50	64	70	73	R 80	91	106	110	98	85	74	J R 80	49	A	36	33	S 35	35
29	S 30	36	33	A	30	30	49	62	73	86	86	86	80	79	I S 88	I S 79	70	62	38	34	38	35	40	43
30	41	44	44	J S 44	33	32	40	64	68	74	U S 73	74	94	J S 84	I S 88	J R 79	71	49	36	A	35	33	S 35	35
31	36	U S 35	32	32	32	31	44	67	R 76	81	R 73	80	90	80	88	86	74	52	46	44	42	36	32	28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	30	29	30	31	31	30	31	31	31	31	30	30	31	30	30	28	27	27	29	29	31	31
MED	38	38	37	37	33	34	49	67	78	80	80	86	86	84	84	79	78	70	53	47	46	43	40	37
UQ	42	41	41	42	39	37	52	70	82	84	83	92	95	89	90	89	81	76	58	54	50	46	45	42
LQ	35	35	33	33	31	30	47	64	74	73	74	80	81	79	76	73	70	64	50	42	40	39	35	36

The Radio Research Laboratory, Japan

OCT. 1987 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

OCT. 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								L	L	440	450	L 450	460	L	L	L	L							
2									L	L 440	440	L 450	L 470	L 460	U L 420	L	L							
3								L	U L 400	L	U L 430	460	H 460	440	L 430	L	L							
4								L	L 410	L 420	H 450	450	450	450	L 420	L	L							
5								L	U L 410	L 440	430	L 460	L 460	L	L	L	L							
6								L	L 420	430	L 450	450	L 470	L 460	L	L								
7									L	U L 430	U L 460	L 440	L 450	L	L	L	A							
8								L	L	L 440	U L 510	470	L 460	L	L	L	L							
9									L	L	U L 480	L 460	C	C	L 450	L	C	C						
10									L	L	U L 480	L	L	L 510	L	L								
11								L	L	L	L	L 490	U L 480	L 460	L	L	L							
12									L	L	L	L 470	L 480	L	L	L	L							
13									L		480	450	L	L	L									
14									L	L 450	440	L	L	L	L	L								
15									L	L	L	440	L 460	L	L	L								
16									L	U L 420	L	A	L	L	L	L								
17									L	L	L	460	L	L	L 460	L	L							
18									L	U L 430	L	L 470	L	L	L	L								
19									L	L	L 450	L 470	L	L	L	L	L	A						
20									L	L	L	L 470	L	L	L	L	L							
21									L	C	L	L 460	L 470	L	L	L	L							
22										L	A	A	A	L	L	L								
23									L	L	L	L 460	L 430	L	L	L								
24									L	L	L	L	L 480	L	L	L								
25											L	A	L	L	L	L	A							
26									L	L 410	L	L 460	L	L	L	L								
27							A		L	L	L	U L 470	L	L	L	L								
28									L	L	L	L	L 450	L	L	L								
29									L	U L 440	440	430	L	L	L	L								
30								L	L	L	L 430	L	L	L	L	L	L							
31									L	L	L	L 440	L	L	L	L								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									4	12	15	23	15	6	5									
MED									L 410	L 435	L 450	L 460	L 460	L 460	L 430									
UQ									L 415	L 440	L 470	L 470	L 470	L 460	L 450									
LQ									U L 405	L 425	440	L 450	L 455	450	L 420									

OCT. 1987 | FOF1 (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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							A	A	A	A	A	330	330	330	310	295	235	A						
2							185	240	280	A	A	A	A	A	315	280	235	180						
3							A	A	A	300	325	330	340	325	315	280	235	H 195						
4							A	A	270	A	A	A	A	325	290	265	225	175						
5							A	235	275	310	325	330	330	325	310	270	235	165						
6							160	250	280	310	A	R	A	A	A	A	A	A						
7							B	250	285	310	325	335	335	330	305	280	230	A						
8							A	H 240	280	305	320	335	345	A	310	275	A	B						
9							B	A	275	305	R 330	B	C	C	315	280	C	C						
10							175	240	285	315	330	335	340	325	315	280	225	160						
11							A	250	275	H 305	330	335	330	325	310	235	225	B						
12							B	235	270	A	325	335	335	320	305	275	A	160						
13							B	225	275	A	U A 330	325	340	330	320	285	235	A						
14							B	240	275	A	330	A	330	325	300	275	A	A						
15							160	235	275	300	320	A	340	330	320	235	240	B						
16							A	A	A	A	A	A	A	A	A	A	225	B						
17							185	245	290	330	340	335	345	330	305	H 275	220	B						
18							B	240	290	A	A	A	A	A	310	285	230	A						
19							B	A	290	315	A	A	A	A	A	A	220	B						
20							B	255	275	315	330	335	340	A	U S 320	285	220	B						
21							160	250	280	I C 300	320	340	335	330	310	275	230	B						
22							165	235	280	300	320	320	315	310	305	235	H 255							
23							U R 160	215	265	295	320	A	330	310	295	260	210							
24							B	A	260	290	A	A	330	315	A	A	A							
25							150	230	280	300	A	A	A	305	300	A	A							
26							B	215	U A 285	A	A	A	325	A	A	255	U A 200							
27							A	A	260	295	315	320	325	320	300	A	A							
28							B	200	260	U A 305	A	A	A	A	A	270	215							
29							B	220	255	285	300	A	300	300	290	275	195							
30							A	220	265	295	A	A	A	R	290	A	A							
31							B	215	290	A	315	330	315	315	A	255	215							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							9	23	28	21	19	15	21	20	24	24	22	6						
MED							160	235	275	305	325	335	330	325	310	278	225	170						
UQ							175	242	282	310	330	335	340	330	315	235	235	180						
LQ							160	222	270	300	320	330	330	315	300	272	220	160						

OCT. 1987 | FOE (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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	JA 23	JA 22	JA 20	22	JA 16	EB 13	23	JA 32	33	JA 50	JA 38	G	G 25	38	36	G	26	JA 31	JA 23	EB 14	JA 46	JA 59	JA 51	JA 23
2	JA 20	JA 24	23	19	JA 12	EB 14	25	33	33	38	39	36	40	JA 43	G 22	G	25	G	EB 15	JA 27	JA 32	JA 29	JA 44	JA 33
3	JA 32	JA 21	JA 24	19	18	JA 19	JA 24	JA 34	JA 44	32	G	G	G	G 18	G 24	G 19	G 17	G 19	JA 30	JA 22	JA 22	23	JA 30	JA 19
4	JA 19	JA 17	EB 15	EB 15	EB 13	EB 14	25	26	27	32	33	33	JA 48	G 27	G 23	28	G	G	JA 17	JA 13	JA 16	JA 20	JA 22	JA 29
5	JA 16	19	JA 17	JA 16	JA 19	JA 28	JA 22	G 19	G	G 19	G	G	34	G	G	30	28	24	JA 19	24	JA 27	23	EB 14	JA 38
6	JA 35	JA 18	JA 19	17	JA 16	JA 15	19	G	G	33	36	G 33	34	32	33	JA 30	JA 50	JA 48	JA 21	C	JA 20	JA 14	EB 15	19
7	EB 13	EB 15	EB 13	EB 14	17	19	18	G	G	G	G	G	G	36	34	34	37	JA 22	EB 13	EB 14	EB 13	EB 13	EB 13	EB 14
8	EB 14	EB 14	EB 13	EB 13	EB 14	JA 14	22	30	33	35	35	35	G	36	G	30	26	EB 17	EC 15	20	JA 36	JA 19	JA 25	JA 25
9	JA 16	JA 18	JA 14	EB 13	JA 18	JA 17	21	JA 29	34	32	40	36	C	C	33	33	C	C	C	JA 19	JA 22	JA 19	JA 14	EB 15
10	EB 15	EB 13	EB 13	EB 13	JA 26	JA 17	22	G	G	G	G	G	G	G	G	G	25	G 15	EB 15	JA 20	JA 26	JA 19	JA 29	JA 16
11	20	EB 12	EB 13	EB 12	EB 13	20	23	31	33	32	G	37	34	35	33	32	JA 38	JA 21	JA 18	JA 24	JA 17	EB 15	JA 17	EB 14
12	JA 13	JA 12	JA 13	JA 17	EB 13	EB 15	24	26	32	35	35	38	G	35	32	G	JA 30	G	JA 14	EB 14	JA 22	JA 17	EB 15	EB 13
13	EB 14	EB 12	EB 13	EB 13	JA 18	EB 14	18	30	32	JA 44	42	44	G 25	G 23	38	38	JA 39	JA 27	JA 30	22	18	21	JA 30	JA 15
14	ES 15	EB 14	EB 15	EB 13	EB 14	EB 13	EB 16	G 19	29	32	G	41	G 30	G 26	G	G 23	JA 32	JA 25	JA 18	JA 22	22	JA 46	19	JA 26
15	19	JA 21	JA 19	JA 15	JA 18	EB 13	19	27	31	34	36	JA 35	G 33	G	G	G	26	20	JA 21	JA 30	JA 32	JA 29	JA 23	JA 28
16	JA 19	JA 18	JA 21	EB 13	19	JA 24	JA 26	JA 36	JA 48	JA 33	JA 35	JA 70	JA 65	JA 42	JA 38	JA 49	JA 29	JA 29	JA 23	JA 47	JA 33	JA 33	JA 19	17
17	EB 15	EB 13	EB 13	ES 14	ES 18	EB 15	G	G	G	G	G	35	G 27	G	G	G	G 17	20	EB 13	19	JA 34	JA 29	JA 25	JA 18
18	EB 14	19	EB 13	JA 14	JA 16	EB 15	JA 25	G	34	35	35	JA 39	36	35	G	30	26	19	EB 13	EB 14	JA 37	JA 32	C	C
19	JA 22	JA 22	JA 23	JA 26	JA 24	JA 17	JA 16	JA 29	G 26	G 30	34	34	34	32	36	31	24	JA 53	JA 51	JA 28	JA 25	JA 29	JA 24	JA 23
20	JA 20	JA 19	JA 18	JA 15	JA 20	EB 13	21	27	31	35	G	G 28	37	JA 34	G	31	28	JA 22	JA 27	JA 20	JA 29	JA 20	21	20
21	JA 20	JA 16	EB 14	EB 13	EB 14	EB 14	G	JA 27	30	C	37	G	39	G 24	G	29	G	18	21	19	EB 13	EB 14	20	JA 22
22	JA 19	JA 19	JA 19	JA 25	JA 27	JA 32	26	31	JA 42	40	JA 51	JA 67	JA 60	38	35	36	31	C	C	C	C	JA 31	22	JA 19
23	JA 18	20	JA 19	19	19	JA 18	G	27	33	35	33	36	G 26	G 21	G 28	G	G	EB 16	21	JA 31	JA 47	JA 33	JA 32	JA 25
24	JA 51	JA 53	JA 36	JA 39	JA 37	JA 23	JA 26	31	30	32	JA 43	36	G 27	G	JA 46	JA 30	JA 33	JA 18	17	JA 29	JA 51	JA 50	JA 35	JA 25
25	JA 21	19	19	JA 21	20	19	G	23	35	33	39	JA 67	JA 49	32	G 24	JA 40	JA 47	JA 35	JA 64	JA 46	JA 40	JA 32	21	JA 21
26	JA 30	JA 17	JA 27	JA 19	JA 62	JA 33	JA 18	G	30	36	JA 42	34	G 29	36	JA 54	JA 28	JA 30	JA 20	JA 17	22	18	JA 21	JA 31	19
27	JA 17	JA 15	JA 26	JA 31	JA 36	JA 32	JA 38	38	31	35	35	37	38	37	37	34	JA 37	JA 29	JA 51	JA 38	JA 22	JA 28	JA 20	16
28	18	EB 13	EB 12	16	21	JA 15	EB 15	34	32	JA 40	JA 46	JA 47	JA 45	JA 44	32	G	24	JA 22	JA 51	JA 66	JA 50	JA 33	JA 49	JA 51
29	JA 50	JA 74	JA 57	JA 47	JA 16	JA 36	22	29	33	36	32	37	36	G 25	G 25	G	G 16	EB 14	JA 21	JA 25	JA 18	JA 20	JA 19	21
30	JA 18	JA 16	JA 17	EB 14	EB 13	EB 14	EB 15	24	G	32	33	JA 36	JA 45	G	34	JA 31	JA 50	JA 50	JA 18	JA 52	JA 27	JA 29	JA 41	JA 26
31	JA 19	ES 16	JA 19	JA 26	JA 29	JA 19	18	G	32	32	33	G	G 28	G 24	30	31	26	JA 21	JA 18	JA 35	JA 27	JA 18	JA 16	23
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	30	31	31	30	30	31	31	30	29	29	29	30	31	30	30
MED	JA 19	JA 18	JA 18	16	JA 18	JA 17	21	27	32	33	35	36	34	32	30	30	27	JA 21	JA 19	JA 22	JA 26	JA 23	JA 22	JA 21
UQ	JA 20	JA 20	JA 20	JA 20	JA 20	JA 20	24	31	33	35	38	38	39	36	34	32	JA 33	JA 27	JA 23	JA 30	JA 34	JA 32	JA 30	JA 25
LQ	16	EE 14	EB 13	EB 14	14	EB 14	17	G 19	28	32	EG 32	G 30	G 26	G 21	G	G	24	18	JA 17	19	JA 20	JA 19	19	17

OCT. 1987 | FOES (0.1 MHZ)

IONOSPHERIC DATA

OCT. 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 B 15	E B 14	16	E B 13	E B 14	E B 13	20	31	31	39	33	G	G 25	37	31	G	26	27	E B 14	E B 14	24	31	21	16
2	15	16	E B 15	E B 14	E B 12	E B 14	21	30	31	32	36	35	36	41	G 21	G	24	G	E B 15	18	19	21	21	24
3	23	17	16	17	15	E B 15	21	25	29	32	G	G	G	G 18	G 22	G 19	G 16	G 15	26	20	19	19	27	E B 14
4	E B 15	E B 15	E B 15	E B 15	E B 13	E B 14	23	25	G 24	30	32	32	34	G 26	G 23	28	G	G	16	E B 13	E B 14	18	17	E B 15
5	E B 14	E B 14	E B 13	E B 13	E B 13	E B 13	18	G 16	G	G 13	G	G	G	G	G	29	26	21	16	19	19	E B 14	E B 14	27
6	17	14	E B 12	E B 13	E B 14	E B 12	G 14	G	G	32	33	U Y 33	33	32	31	29	31	27	16	C	E B 15	E B 14	E B 15	E B 13
7	E B 13	E B 15	E B 13	E B 14	E B 15	E B 14	18	G	G	G	G	G	G	35	33	32	34	18	E B 13	E B 14	E B 13	E B 13	E B 13	E B 14
8	E B 14	E B 14	E B 13	E B 13	E B 14	E B 13	20	28	32	34	34	35	G	33	G	29	24	E B 17	E C 15	E B 14	32	E B 14	17	E B 13
9	E B 14	15	E B 13	E B 13	E B 14	E B 13	19	26	28	32	38	E B 34	C	C	32	31	C	C	C	E B 13	E B 14	E B 14	E B 14	E B 15
10	E B 15	E B 13	E B 13	E B 13	E B 13	E B 14	21	G	G	G	G	G	G	G	G	G	25	G 15	E B 15	E B 15	E S 15	E B 14	16	E B 13
11	E B 15	E B 12	E B 13	E B 12	E B 13	E B 13	20	G	30	32	G	36	34	34	32	30	30	19	E B 13	E B 14	E B 13	E B 15	E B 14	E B 14
12	E B 13	E B 13	E B 14	E B 13	E B 13	E B 15	21	26	28	31	34	37	G	34	32	G	23	G	E B 14	E B 14	E B 15	E B 14	E B 15	E B 13
13	E B 14	E B 12	E B 13	E B 13	E B 14	E B 14	17	27	G	38	37	36	G 24	G 23	37	37	37	19	29	E B 14	E B 13	E S 15	20	E S 15
14	E S 15	E B 14	E B 15	E B 13	E B 14	E B 13	E B 16	G 17	28	31	G	38	G 30	G 25	G	G 22	26	18	15	E B 14	E B 15	E B 15	E B 15	16
15	E B 13	15	E B 12	E B 12	E B 13	E B 13	G	26	30	32	35	35	G 31	G	G	G	25	17	E B 15	E B 14	19	19	18	16
16	E B 13	E B 14	16	E B 13	E B 13	16	19	32	29	32	35	60	44	35	32	28	G 20	17	17	27	24	27	18	E B 13
17	E B 15	E B 13	E B 13	E S 14	E S 18	E B 15	G	G	G	G	G	35	G 27	G	G	G	G 16	15	E B 13	E B 14	19	21	20	E B 14
18	E B 14	E B 14	E B 13	E B 13	E B 14	E B 15	22	G	32	33	35	39	34	G	G	G	25	15	E B 13	E B 14	19	23	C	C
19	19	E B 12	16	20	20	E B 13	E B 15	24	G 22	G 19	33	33	34	32	33	28	24	53	49	17	20	19	E B 14	E B 13
20	15	16	15	E B 13	16	E B 13	18	G	30	34	G	G 28	G	34	G	30	25	15	E B 14	16	21	E B 13	16	E B 15
21	15	E B 14	E B 14	E B 13	E B 14	E B 14	G	G 22	30	32	35	G	36	G 22	G	G	G	17	E B 14	E B 14	E B 13	E B 14	E B 14	18
22	16	15	15	19	20	26	23	29	34	39	49	67	58	32	32	34	26	C	C	C	C	E B 14	E B 15	E B 15
23	E B 14	E B 13	E B 12	E B 13	E B 13	E B 13	G	25	32	31	33	33	G 26	G 21	G 23	G	G	E B 16	E B 13	23	21	16	15	E B 13
24	19	18	E D 12	E B 13	22	19	23	23	28	32	37	32	G 23	G	39	27	25	18	14	25	31	21	E B 14	17
25	15	E B 14	E B 12	E B 12	E B 13	E B 13	G	G 17	30	32	35	64	44	32	G 23	28	47	26	A A 04	22	22	16	18	19
26	E B 14	E B 12	19	E B 13	E B 13	E B 14	16	G	30	32	33	33	G 28	33	34	G 23	20	15	E B 14	E B 15	15	14	18	E B 12
27	E B 14	E B 13	16	17	16	24	32	20	30	34	34	36	36	36	33	32	33	25	U A 21	31	15	16	16	E B 12
28	E B 13	E B 13	E B 12	E B 12	E B 13	E B 14	E B 15	32	29	38	40	43	36	33	30	G	23	18	38	A A 66	17	15	20	19
29	15	27	E B 14	A A 47	E B 14	18	E B 14	27	32	34	31	33	32	G 25	G 20	G	G 15	E B 14	16	E B 14	E B 14	E B 14	E B 13	E B 14
30	E B 14	E B 12	E B 13	E B 14	E B 13	E B 14	E B 15	23	G	31	32	35	36	G	30	28	24	19	E B 14	A A 52	23	E B 13	24	16
31	E B 14	E S 16	E B 14	15	16	E B 14	E B 13	G	30	31	33	G	G 26	G 24	30	28	24	E B 14	17	30	21	16	16	E B 14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	30	29	29	29	30	31	30	30
MED	E B 15	E B 14	E B 13	E B 13	E B 14	E B 14	18	23	29	32	33	34	G 30	29	30	28	24	17	E 15	E B 15	19	15	16	E B 14
UQ	15	14	15	E B 14	E E 15	E B 15	21	26	30	34	35	36	36	34	32	29	26	19	17	22	21	19	18	16
LQ	E B 14	E B 13	E B 13	E B 13	E B 13	E B 13	E G 14	G	G 23	31	E G 31	29	G 23	G 18	G	G	20	15	E B 14	E B 14	E B 15	E B 14	E B 14	E B 13

OCT. 1987 | FBES (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

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

OCT. 1987 | FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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	315	315	300	325	315	325	335	335	345	325	J R 335	340	315	315	330	330	335	335	340	340	295	F	F 305	330
2	F 315	315	350	330	310	F 300	350	335	330	315	325	325	305	325	340	340	325	320	330	350	330	295	295	305
3	F 310	325	335	350	325	325	370	350	J R 340	345	335	315	330	J R 330	330	325	330	330	345	330	S 310	I S 310	J S 315	320
4	U S 275	S 285	S 300	J S 330	315	300	320	350	320	315	305	315	315	320	320	335	340	350	340	330	290	290	310	315
5	325	300	315	320	325	320	330	335	325	335	325	320	325	325	325	325	335	340	350	345	305	310	F 310	A
6	310	330	365	320	340	320	335	345	R 285	R 335	340	315	320	320	320	340	325	335	340	I C 320	305	300	300	305
7	310	315	320	330	340	340	355	335	350	345	335	315	320	R 300	325	320	345	J R 355	360	345	330	320	F 305	300
8	295	320	330	355	345	315	350	330	345	R 345	310	305	325	320	325	335	345	335	340	315	S 290	295	320	320
9	320	300	305	325	325	I S 345	360	S	350	360	R 315	R 315	C	C	320	330	C	C	C	330	325	320	325	315
10	320	310	325	330	360	325	350	355	340	335	315	320	315	J R 305	J R 310	R	U S 325	S	S	S	U S 335	J S 320	305	310
11	325	315	305	320	325	315	350	340	340	340	325	300	310	315	325	325	320	335	350	320	325	315	285	300
12	310	315	285	290	310	345	350	345	320	335	300	290	300	300	315	325	R 335	325	335	310	315	320	320	310
13	295	290	280	315	350	365	360	355	350	325	300	320	325	305	325	325	340	350	330	S 325	S	S	S 315	U S 325
14	U S 315	S 305	J S 300	305	350	300	335	350	335	345	330	315	315	315	325	335	335	335	325	320	315	310	295	305
15	295	315	F 290	F 295	F 300	340	345	350	345	330	325	330	320	320	315	310	335	340	360	340	290	280	280	300
16	290	315	F 295	F 315	320	330	350	340	335	335	335	320	315	305	315	315	330	335	335	315	315	315	320	300
17	U S 305	S	S	S	S	350	U S 350	S 345	340	J S 320	315	310	320	325	320	325	340	345	345	325	310	305	305	305
18	290	295	310	325	330	325	340	R 350	350	345	320	320	335	320	325	325	340	350	325	330	345	325	C	C
19	300	305	300	310	315	335	350	340	350	R 345	325	315	320	305	330	330	R 350	340	325	325	335	365	300	285
20	300	305	320	325	340	345	345	J S 355	I S 335	U S 330	340	320	340	315	I S 320	J S 330	335	350	345	345	325	325	325	315
21	305	310	V 315	315	330	320	335	350	330	I C 340	315	320	315	300	310	315	325	335	305	300	325	340	345	315
22	285	305	300	310	335	315	345	345	320	340	335	335	315	305	R 320	315	340	C	C	C	C	340	345	305
23	320	320	320	305	325	325	345	R 350	340	325	335	325	300	305	305	320	340	345	325	315	330	325	315	320
24	345	290	295	F 285	F 285	325	350	335	305	335	320	305	305	320	335	335	U S 335	350	350	310	F 280	F 310	F 320	350
25	325	320	305	320	335	F 335	325	350	340	H 315	R 315	305	320	315	310	325	325	350	A	295	300	320	345	300
26	320	345	290	305	315	F 305	335	325	340	340	330	325	325	R 310	325	325	345	345	340	U S 315	F 320	345	340	305
27	325	300	340	320	F 300	A	345	350	R 340	325	340	J S 320	320	J R 320	J S 325	320	325	335	350	295	325	S 310	340	305
28	295	315	300	285	295	285	325	360	325	335	R 335	310	310	320	320	345	325	J R 345	340	A	310	320	S 295	295
29	S 280	290	320	A	290	295	335	335	330	320	325	325	305	310	I S 315	I S 330	335	350	365	330	320	315	300	325
30	295	305	305	J S 325	325	320	335	335	345	320	U S 340	320	325	J S 325	I S 330	J R 340	350	350	345	A	320	320	S 300	300
31	315	U S 325	315	300	305	305	335	350	R 330	325	R 320	330	325	315	330	345	350	350	335	330	330	335	345	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	31	30	30	29	30	30	31	30	31	31	31	31	30	30	31	30	30	28	27	27	29	29	30	29
MED	310	312	305	320	325	325	345	345	340	335	325	320	320	315	325	325	335	342	340	325	320	320	312	305
UQ	320	315	320	325	335	335	350	350	345	340	335	322	325	320	325	335	340	350	348	330	325	325	325	320
LQ	295	300	300	305	310	315	335	335	330	325	315	315	315	305	318	325	325	335	332	315	305	310	300	300

OCT. 1987 | M(3000)F2 (0.01)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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								L	L	380	395	L 400	415	L	L	L	L							
2									L	L 390	390	L 395	L 395	A	U L 400	L	L							
3								L	U L 395	L	U L 415	430	H 430	400	L 395	L	L							
4								L	L 385	L 395	H 390	395	385	395	L 380	L	L							
5								L	U L 385	L 390	405	L 405	L 435	L	L	L	L							
6								L	L 380	395	L 395	400	L 420	L 420	L	L								
7									L	U L 395	U L 400	L 420	L 420	L	L	L	A							
8								L	L	L 390	U L 395	420	L 415	L	L	L	L							
9									L	L	U L 390	L 395	C	C	L 385	L	C	C						
10									L	L	U L 405	L	L	L 395	L	L								
11								L	L	L	L	L 390	U L 395	L 390	L	L	L							
12									L	L	L	L 375	L 385	L	L	L	L							
13									L		390	390	L	L	L									
14									L	L 395	400	L	L	L	L	L								
15									L	L	L	395	L 395	L	L	L								
16									L	U L 390	L	A	L	L	L	L								
17									L	L	L	415	L	L	L 425	L	L							
18									L	U L 395	L	L 395	L	L	L	L								
19									L	L	L 395	L 405	L	L	L	L	L	A						
20									L	L	L	L 405	L	L	L	L	L							
21									L	C	L	L 405	L 395	L	L	L	L							
22										L	A	A	A	L	L	L								
23									L	L	L	L 395	L 415	L	L	L								
24									L	L	L	L	L 415	L	L	L								
25											L	A	L	L	L	L	A							
26									L	L 385	L	L 400	L	L	L	L								
27							A		L	L	L	U L 390	L	L	L	L								
28									L	L	L	L	L 385	L	L	L								
29									L	U L 365	395	405	L	L	L	L								
30								L	L	L	L 415	L	L	L	L	L	L							
31									L	L	L	L 395	L	L	L	L								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									4	12	15	23	15	5	5									
MED									L 385	L 390	L 395	L 400	L 415	L 395	L 395									
UQ									L 390	L 395	L 402	L 405	L 418	400	L 400									
LQ									L 382	L 388	392	L 395	L 395	L 395	L 385									

OCT. 1987 | M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | H'F2 (KM) | 135° E Mean Time (G.M.T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								250	240	275	255	265	285	285	260	260	260							
2									265	265	265	265	290	260	245	250	255							
3								240	250	235	260	280	260	265	260	L 265	255							
4								255	290	295	315	285	285	270	L 270	255	245							
5								260	260	260	270	275	265	265	265	265	250							
6								255	260	260	260	280	285	285	285	255								
7									235	245	260	280	270	L 315	260	275	250							
8								260	240	235	285	285	260	270	265	255	230							
9									240	235	290	270	C	C	270	255	C	C						
10									240	225	285	275	265	295	270	250								
11								235	240	245	260	305	270	280	265	265	260							
12									260	235	290	310	285	290	265	255	235							
13									225		305	260	245	300	265									
14									255	240	250	270	275	270	255	250								
15									240	255	260	260	260	260	280	270								
16									245	250	255	A 265	270	285	260	260								
17									235	245	L	280	260	260	280	255	235							
18									220	240	270	270	245	275	265	255								
19									230	235	265	270	270	L	250	250	225	E A 255						
20									235	255	250	260	245	290	250	240	230							
21									250	I C 245	260	260	275	295	275	250	235							
22										240	255	A 260	E A 295	285	260	265								
23									235	255	245	260	H 260	275	285	260								
24									L 275	245	265	L 280	280	255	245	255								
25											255	280	260	260	270	240	255							
26									240	240	250	255	260	L 265	265	260								
27							A 245		230	260	245	255	255	260	265	260								
28									265	240	255	285	275	265	260	230								
29									260	265	255	265	285	270	260	245								
30								255	235	265	245	270	265	255	255	240	225							
31									240	250	260	260	260	270	260	235								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	8	29	29	30	31	30	29	31	30	15	1						
MED							A 245	255	240	245	260	270	266	270	265	255	245	E A 255						
UQ								258	260	260	270	280	278	285	270	260	255							
LQ								245	235	240	255	260	260	265	260	250	232							

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IONOSPHERIC DATA

OCT. 1987 | 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	275	280	300	260	275	260	255	A	240	A 225	205	H 190	190	A 255	220	235	H 235	A 255	225	220	E A 305	A	275	245
2	280	280	230	260	280	295	230	255	230	220	215	210	210	E A 270	H 195	H 190	220	250	235	225	245	A 305	305	A 285
3	295	255	245	230	260	260	215	H 230	210	215	195	180	H 180	H 200	210	H 210	230	240	A 230	250	275	265	A 265	260
4	350	330	310	245	275	305	A 265	235	225	210	H 220	205	225	210	230	230	250	235	220	250	315	320	290	275
5	260	305	280	265	275	295	245	235	225	H 215	200	190	H 175	215	220	240	240	235	215	240	300	275	270	A
6	285	260	225	255	255	280	250	240	230	215	H 200	205	190	185	210	240	A 245	240	225	I C 240	280	290	285	290
7	280	275	265	250	240	240	225	225	230	205	200	195	190	230	220	240	A	230	210	225	255	270	310	300
8	305	275	255	220	E B 260	310	230	235	225	220	205	195	H 190	210	225	225	225	225	225	255	A	290	255	260
9	255	265	285	255	260	265	215	225	240	215	220	205	C	C	225	225	C	C	C	230	240	245	250	250
10	260	260	240	250	210	260	220	225	215	215	190	H 200	220	210	225	230	230	225	235	205	225	250	280	265
11	240	250	260	255	250	270	225	220	220	220	205	215	210	215	240	230	A	220	210	250	250	265	315	305
12	270	260	335	305	280	220	220	225	230	225	190	230	220	230	220	H 210	230	225	220	260	260	255	255	255
13	285	305	325	265	230	210	215	220	215	235	215	215	H 210	H 205	A 255	A 250	235	225	A 255	250	260	255	260	260
14	270	285	295	275	230	295	H 210	H 220	H 205	205	200	230	H 205	215	215	215	240	235	225	250	230	265	300	265
15	290	260	310	285	280	230	215	225	235	230	210	205	210	205	220	240	235	225	205	235	310	A 340	340	305
16	305	265	A 305	255	260	255	225	235	235	215	225	A	A	H 215	240	235	245	220	220	A 275	A 265	E A 285	260	295
17	285	270	265	285	230	225	215	230	225	225	H 210	195	H 185	H 185	H 190	235	225	220	210	240	265	280	280	275
18	305	300	270	245	225	255	230	225	225	210	210	210	190	220	H 205	230	A 240	220	235	230	235	A 260	C	C
19	A 290	285	280	A 280	A 270	240	220	225	215	220	205	200	H 210	H 195	245	A 240	235	A	A	245	235	A 220	E B 275	310
20	300	280	260	245	230	225	220	215	230	220	205	200	H 180	215	230	235	235	215	220	225	255	250	255	275
21	290	280	265	270	255	255	215	220	H 220	I C 225	215	195	H 240	245	240	240	240	235	250	270	235	215	220	E A 295
22	320	290	300	280	240	A	235	230	A 255	230	A	A	A	H 185	230	A 260	230	C	C	C	C	235	235	280
23	260	260	270	265	245	245	225	225	225	H 230	220	205	190	H 180	H 210	H 215	240	225	225	260	250	255	290	255
24	255	E A 360	310	330	E A 335	260	225	235	225	230	225	190	195	230	A	215	250	215	215	E A 305	E A 360	A 295	255	225
25	255	260	280	270	240	240	235	215	230	H 230	235	A	A	H 210	210	235	A	A 230	A	E A 305	E A 300	260	245	315
26	255	220	E A 355	280	280	270	240	245	230	220	210	205	H 190	190	260	240	225	215	220	270	250	220	250	275
27	270	290	250	E A 295	E A 355	A	A	225	230	230	220	220	210	230	235	E A 245	235	230	A 230	E A 335	255	280	235	285
28	285	265	290	325	305	340	255	225	225	230	A	A	225	240	220	225	245	225	E A 270	A	280	255	E A 320	310
29	355	E A 365	270	A	310	335	235	240	255	A 240	205	195	H 190	220	240	235	235	215	210	250	260	260	285	250
30	290	270	270	230	250	270	240	230	235	210	195	215	225	225	230	230	235	215	220	A	E A 295	265	E A 330	305
31	275	255	270	295	305	280	240	235	225	225	215	205	H 185	H 175	H 200	245	225	215	230	E A 275	255	250	240	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	31	31	31	30	31	29	30	30	31	31	29	27	27	30	30	31	27	28	27	28	29	30	30	29
MED	285	272	270	264	258	260	225	225	225	220	210	205	195	214	222	235	235	225	222	245	258	261	266	275
UQ	292	285	299	280	278	280	240	235	230	230	215	210	210	228	235	240	240	235	230	258	272	280	288	295
LQ	265	260	262	250	240	240	220	225	225	215	200	195	H 190	H 200	210	225	230	220	218	232	250	250	255	260

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IONOSPHERIC DATA

OCT. 1987 | 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 24sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A 120		115	A	A	E A 110	E A 125	125	120	115	115	A						
2							135	115	120	A	115	110	A	A	A 125	115	120	135						
3							A 105		A	E A 125	115	115	115	115	A 125	A 120	A 120	E A 130						
4							A 120		A	115	115	A	A	A 125	E A 120	A 120	125	135						
5							A	E A 125	115	120	115	115	120	115	115	115	A 130	E B 140						
6							E A 145	120	115	115	A	E B 125	A	A	A	A	A	A						
7							B	120	115	110	115	120	115	125	110	120	115	A						
8							A	A 130	115	115	115	115	120	115	115	115	A	B						
9							B	A	115	115	110	B	C	C	115	115	C	C						
10							A 130	120	115	115	115	115	120	115	115	115	120	125						
11							135	A 125	115	A 120	115	115	115	110	115	115	120	B						
12							B	120	115	115	110	110	115	E A 150	115	115	A	E B 135						
13							B	120	120	A	A	E A 120	A 125	E A 125	120	115	125	A						
14							B	E A 130	115	A	115	A	E A 130	A 120	115	E A 125	A	A						
15							E B 160	120	125	E A 145	E A 135	A	E A 150	115	120	125	125	B						
16							A	115	115	A	A	A	A	A	A	A	A	B						
17							E B 155	125	120	E B 135	115	120	E A 125	120	115	110	E A 130	B						
18							B	115	120	115	115	A	A	A	115	115	125	A						
19							B	A	E A 130	115	A	120	A	A	A	A	120	B						
20							B	E A 135	E A 130	120	110	E A 130	E A 120	115	115	120	125	B						
21							E B 155	E A 140	120	C	115	115	115	E A 125	120	120	120	B						
22							E B 160	E A 155	120	115	115	120	115	115	115	125	125							
23							B	120	120	120	E A 140	A	A 125	A 120	A 125	115	120							
24							B	A	120	115	115	A	E A 135	115	A	A	A							
25							E B 145	130	115	120	115	A	A	E A 135	E A 130	115	120							
26							B	120	A	120	115	115	E A 135	A	A	A	E A 155							
27							A	A	E A 130	115	115	A 125	E A 125	120	115	115	115							
28							B	120	120	110	115	115	A	A	A	120	120							
29							B	120	115	115	115	110	E A 135	E A 135	E A 120	115	E A 125							
30							A	120	120	115	115	A	A	110	120	A	A							
31							B	125	120	120	120	115	E A 125	A 120	A	120	E A 140							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							9	27	28	25	26	21	21	23	24	25	23	6						
MED							E B 145	120	118	115	115	115	A 120	118	115	115	120	130						
UQ							E B 155	122	120	120	115	118	E A 125	A 122	120	120	125	135						
LQ							132	120	115	115	115	115	115	115	115	115	120	E E 130						

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IONOSPHERIC DATA

OCT. 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	105	105	105	110	110	B	170	115	110	110	110	G	105	130	135	G	155	120	120	B	115	115	110	105
2	105	105	105	100	110	B	135	130	125	120	115	110	105	110	115	G	E G 165	G	B	110	105	105	105	105
3	105	105	110	95	110	110	105	105	110	130	G	G	G	105	115	110	105	110	105	105	105	100	115	110
4	115	115	B	B	B	B	125	120	115	115	115	110	110	110	110	155	G	G	105	110	105	115	110	110
5	110	110	110	105	110	110	105	115	G	110	G	G	135	G	G	E G 175	155	130	120	115	110	110	B	105
6	100	105	110	110	120	115	115	G	G	E G 170	115	120	120	110	110	110	120	110	105	C	105	105	B	105
7	B	B	B	B	115	110	155	G	G	G	G	G	G	170	150	135	115	125	B	B	B	B	B	B
8	B	B	B	B	B	B	140	130	125	120	130	140	G	120	G	125	120	B	C	110	120	120	110	110
9	110	110	125	B	110	115	135	120	120	140	120	135	C	C	E G 165	125	C	C	C	115	105	110	115	B
10	B	B	B	B	115	125	155	G	G	G	G	G	G	G	G	G	120	120	D	115	105	115	110	120
11	105	B	B	B	B	105	135	140	140	150	G	135	E G 155	135	E G 195	150	120	115	115	110	110	B	105	B
12	105	110	170	110	B	B	140	150	115	125	120	E G 135	G	180	E G 170	G	115	G	120	B	110	105	B	B
13	B	B	B	B	120	B	135	120	120	105	130	125	105	110	155	140	130	130	115	120	115	105	105	110
14	S	B	B	B	B	B	B	115	E G 160	120	G	115	110	110	G	105	105	110	105	110	115	115	115	105
15	105	105	115	110	110	B	160	E G 165	E G 165	140	135	120	125	G	G	G	160	125	120	115	110	110	105	105
16	115	110	105	B	110	120	115	115	110	110	110	105	105	105	110	105	105	105	105	110	110	105	110	105
17	B	B	B	S	S	B	G	G	G	G	G	145	110	G	G	G	115	125	B	125	110	105	105	110
18	B	110	B	125	120	B	130	G	140	125	115	110	115	125	G	170	130	120	B	B	115	105	C	C
19	100	110	105	105	100	105	105	120	115	110	120	120	115	120	115	120	130	110	110	110	110	125	110	105
20	105	105	110	105	115	B	155	155	135	125	G	105	125	125	G	145	125	130	120	115	105	110	110	105
21	105	105	B	B	B	B	G	120	150	C	125	G	E G 165	110	G	E G 195	G	145	140	130	B	B	115	110
22	115	110	105	110	130	125	145	145	125	120	115	115	120	120	170	165	155	C	C	C	C	105	105	105
23	105	105	115	105	110	115	G	130	115	130	155	115	110	105	110	G	G	B	125	115	115	110	115	110
24	110	110	110	105	105	110	105	110	120	120	110	115	115	G	105	100	105	105	120	120	115	115	115	110
25	105	110	110	135	110	110	G	130	145	130	115	110	110	150	110	125	115	115	115	115	110	110	110	110
26	115	130	115	145	130	150	110	G	155	125	115	115	115	110	100	105	105	105	105	100	105	115	105	115
27	115	115	110	105	105	110	110	100	135	125	130	130	135	125	120	115	110	110	115	110	110	115	105	115
28	115	B	B	120	120	130	B	125	130	120	115	110	110	110	115	G	E G 155	125	115	115	115	125	110	115
29	115	110	105	110	110	110	115	130	120	120	130	120	125	105	105	G	110	B	115	115	115	115	110	110
30	110	110	110	B	B	B	B	E G 170	G	135	120	110	110	G	120	120	115	115	120	115	110	110	115	110
31	110	S	105	105	105	105	110	G	135	125	130	G	115	115	120	155	135	105	105	115	110	115	110	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	24	22	20	19	23	18	24	24	25	27	23	24	25	24	22	22	27	23	23	25	28	28	26	26
MED	108	110	110	110	110	110	132	121	122	122	120	115	112	112	114	124	118	115	115	115	110	110	110	110
UQ	115	110	112	110	118	120	142	132	138	129	130	125	122	125	U 135	150	131	125	120	115	115	115	115	110
LQ	105	105	105	105	110	110	110	115	115	120	115	110	110	110	110	110	112	110	105	110	105	105	105	105

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IONOSPHERIC DATA

OCT. 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	F 2	F 2	F 2	F 2	F 1		HL 12	C 3	C 2	L 3	L 2		L 1	H 1	CL 11		H 2	C 4	F 2		F 2	F 4	F 4	F 2
2	F 2	F 3	F 2	F 1	F 1		C 1	H 3	H 2	C 2	C 2	C 2	L 2	L 2	L 1		H 1			F 3	F 2	F 3	F 3	F 5
3	F 2	F 4	FF 11	F 1	F 1	F 2	L 3	C 4	L 2	CL 11				L 1	L 1	L 1	L 1	L 2	F 3	F 3	F 2	F 2	F 2	F 1
4	F 2	F 1					L 3	C 3	L 2	C 2	C 1	L 2	L 2	L 1	L 2	HL 11			F 2	F 2	F 3	F 2	F 4	F 2
5	F 3	F 2	F 2	F 2	F 2	F 2	L 4	L 2		L 1			C 1			H 1	HL 21	H 3	F 1	F 2	F 3	F 2		F 4
6	F 3	F 2	F 1	F 1	F 2	F 2	L 1			H 1	L 2	L 2	L 1	L 2	L 2	L 2	CL 24	L 3	F 3		F 2	F 1		F 2
7					F 1	F 2	H 1							HL 11	H 1	H 2	C 4	C 2						
8						F 1	H 2	CL 32	C 2	C 2	C 1	H 1		C 1		C 2	L 2			F 2	F 4	F 2	F 3	F 2
9	F 2	F 2	F 1		F 2	F 2	H 2	CL 11	C 1	H 1	C 1	H 1			H 1	H 2				F 1	F 2	F 2	F 1	
10					F 1	F 1	HL 21										C 1	L 1		F 1	F 2	F 2	F 2	F 2
11	F 1					F 1	C 2	CL 12	H 2	HL 11		HL 11	H 1	H 1	H 1	H 1	C 3	C 4	F 1	F 2	F 2		F 1	
12	F 1	F 1	F 1	F 2			H 3	HL 12	C 2	C 1	C 1	H 1		HL 11	H 1		C 2		F 1		F 2	F 2		
13					F 1		C 1	C 3	C 2	L 4	HL 13	CL 22	L 2	L 1	H 1	H 1	H 3	CL 12	F 4	F 2	F 1	F 2	F 1	F 1
14								L 1	H 1	L 1		L 2	L 2	L 1		L 2	L 3	L 2	F 2	F 2	F 1	F 3	F 1	F 2
15	F 1	F 2	F 2	F 2	F 2		H 1	H 1	H 2	HL 11	HL 12	L 1	LL 11				H 1	C 1	F 1	F 2	F 2	F 2	F 2	F 3
16	F 1	F 1	F 3		F 1	F 3	C 3	C 3	C 3	L 3	L 2	L 3	L 3	L 2	L 3	L 2	LH 31	L 2	F 3	FF 22	F 3	F 2	F 2	F 1
17												H 1	L 1				L 1	C 1		F 1	F 3	F 2	F 3	F 2
18		F 1		F 1	FF 11		H 3		HL 11	C 2	C 2	L 2	L 1	L 1		H 1	H 2	C 2			F 3	F 4		
19	F 3	F 2	F 2	F 4	F 4	F 2	L 1	L 2	L 2	L 1	L 1	C 2	L 2	L 2	L 3	L 2	H 2	C 4	F 3	F 3	F 3	FF 13	F 3	FF 11
20	F 2	F 2	F 2	F 3	F 2		LL 11	HL 11	HL 21	H 1		L 1	CL 12	C 1		H 1	C 2	CL 11	FF 12	F 3	F 3	F 2	F 2	F 2
21	F 2	F 2						L 1	H 1		H 2		H 1	L 1		H 1		H 1	F 1	F 1			F 2	F 3
22	F 2	F 3	F 2	F 3	FF 13	F 5	HL 31	HL 22	H 3	C 2	C 3	C 3	C 3	C 2	H 2	H 2	H 2					F 3	F 1	F 2
23	F 2	F 2	FF 22	F 2	F 2	F 1		H 2	C 3	C 2	HL 13	L 2	L 1	L 1	L 1				F 1	F 3	F 3	F 3	F 2	F 2
24	F 2	F 3	F 2	F 3	F 3	F 4	L 2	CL 33	C 2	C 2	C 3	L 2	L 1		L 3	L 3	L 3	F 2	F 1	F 3	F 4	F 3	F 2	F 3
25	F 2	F 2	FF 21	FF 11	F 2	F 2		LH 11	H 2	H 2	C 2	L 3	L 3	HL 12	L 2	C 2	C 4	F 4	F 4	F 4	F 4	F 3	F 2	F 3
26	FF 22	FF 11	F 3	FF 22	FF 21	FF 21	L 2		HL 23	C 2	C 3	C 2	L 1	L 2	L 3	L 2	L 2	F 2	F 2	F 2	F 2	F 1	F 3	F 1
27	F 2	F 2	F 3	F 4	F 3	F 5	L 5	LH 31	HL 22	C 2	HL 11	HL 21	HL 11	C 1	C 1	C 2	C 4	F 3	F 3	F 4	F 2	F 2	F 2	F 1
28	F 1			F 1	F 2	F 1		C 3	C 3	C 2	C 2	C 3	L 2	L 1	L 2		H 1	F 2	F 4	F 4	F 2	F 1	F 2	F 2
29	F 2	F 5	F 4	F 5	F 2	F 4	L 1	H 3	C 2	C 2	C 1	C 2	CL 11	L 2	L 1		L 1		F 2	F 2	F 1	F 2	F 1	F 1
30	F 2	F 2	F 2					H 1		H 1	C 1	L 1	L 3		C 2	L 1	L 2	F 1	F 1	F 4	F 3	F 3	F 2	F 3
31	F 2		F 2	F 2	F 2	F 2	L 1		H 1	C 1	C 1		L 1	L 1	L 1	H 2	HL 21	FF 11	F 2	FF 42	F 4	F 2	F 2	F 2
	00	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																								

OCT. 1987 | TYPES OF ES

IONOSPHERIC DATA

OCT. 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 45	X 42	X 40	X 40	X 38	X 37	X 40												X 85	X 78	X 56	X 49	X 51	X 50
2	X 48	X 49	X 39	X 36	X 35	X 36	X 42												X 86	X 78	X 65	X 46	X 45	X 48
3	X 49	X 50	X 39	X 39	X 35	X 33	X 41												X 87	X 66	X 62	X 57	X 51	X 49
4	X 45	X 45	X 48	X 52	X 35	X 32	X 42												X 68	X 57	X 49	X 51	X 53	X 47
5	X 44	X 35	X 39	X 37	X 35	X 34	X 39													X 60	X 45	X 42	X 42	X 44
6	X 46	X 44	X 34	X 33	X 33	X 32	X 38													X 60	X 44	45	X 46	X 45
7	X 45	X 45	X 44	X 39	X 31	X 26	X 36													X 61	X 40	X 40	X 40	X 40
8	X 41	X 43	X 41	X 42	X 26	X 26	X 36													X 63	X 57	X 60	X 59	X 50
9	X 51	X 49	X 48	X 49	X 44	X 44	X 51													X 74	X 59	X 56	X 55	X 54
10	X 51	X 50	X 49	X 45	X 36	X 38	X 44													X 81	X 56	X 52	X 51	X 51
11	X 51	X 50	X 49	X 46	X 46	X 40	X 45												X 80	X 49	X 52	X 53	X 48	X 49
12	X 50	X 50	X 46	X 48	X 48	X 44	X 42													X 66	X 66	X 64	X 54	X 52
13	X 49	X 46	X 44	X 50	X 56	X 40	X 40													X 61	X 59	X 58	X 55	X 45
14	X 46	X 46	X 44	X 46	H 38	X 37	X 45													X 53	X 58	X 53	X 48	X 49
15	X 50	X 51	X 46	X 47	X 50	X 50	X 40													X 45	X 45	X 46	X 45	X 46
16	X 47	X 49	X 42	X 43	X 43	X 37	X 39													X 63	X 58	X 58	X 54	O X 50
17	X 46	X 49	X 50	X 44	X 46	X 30	X 37													X 67	X 51	X 50	O X 49	O X 49
18	X 47	X 46	X 48	X 50	X 40	X 32	X 39													X 66	X 53	X 50	X 46	X 44
19	X 44	X 44	X 44	X 40	X 42	X 47	X 43												X 78	X 71	X 59	X 47	X 39	X 39
20	X 40	X 41	X 44	X 41	X 43	X 30	X 35												X 75	X 62	X 51	X 50	X 45	X 45
21	X 43	X 41	X 41	X 41	X 39	X 38	X 41												X 76	X 71	X 68	S	X 42	O X 35
22	X 35	X 36	X 39	X 41	X 40	X 32	X 35												X 77	X 58	X 50	50	50	58
23	55	A	X 39	X 38	A	X 38	X 36												X 88	X 57	X 44	X 40	X 40	X 41
24	X 36	X 35	X 36	X 38	X 41	X 41	X 35												X 97	A	X 52	X 55	X 39	X 40
25	U X 41	X 39	X 38	X 39	X 39	X 33	X 37												X 69	X 51	A	X 50	X 52	X 44
26	X 49	X 46	X 31	X 32	X 34	X 36	X 40												X 86	X 59	X 55	X 59	X 46	X 35
27	X 38	X 38	X 40	X 38	X 38	X 37	X 38												X 84	X 53	X 56	X 53	X 57	X 37
28	X 39	X 41	X 42	X 42	X 51	X 39	X 39												X 84	X 49	X 47	X 43	A	X 43
29	A	X 37	X 37	X 36	X 42	X 36	X 40												X 69	X 48	X 41	X 43	X 38	X 42
30	X 37	X 40	X 38	X 39	X 40	X 37	X 37												X 70	A	X 49	X 52	X 41	X 38
31	X 38	X 38	X 35	X 35	X 37	X 35	X 36												X 66	X 71	X 69	X 51	X 46	X 36
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	31	31	30	31	31												18	29	30	30	30	31
MED	X 46	X 44	X 41	X 41	X 40	X 37	X 39												X 79	X 61	X 54	X 50	X 47	X 45
UQ	X 49	X 49	X 45	X 46	X 43	X 38	X 42												X 86	X 67	X 59	X 55	X 52	X 49
LQ	X 41	X 40	X 39	X 38	X 35	X 32	X 37												X 70	X 57	X 49	X 46	X 42	X 40

OCT. 1987 | FXI (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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	39	36	34	34	32	31	34	61	70	77	70	77	82	78	79	72	66	68	79	72	50	43	45	44
2	42	43	33	30	29	30	36	59	79	83	84	87	88	102	90	67	60	68	80	72	59	40	39	42
3	43	44	33	33	29	27	35	57	66	84	65	77	93	92	83	72	78	80	81	60	56	51	45	43
4	39	39	42	46	H 29	26	36	76	72	68	92	90	94	85	81	74	63	65	62	51	43	45	47	41
5	38	30	33	31	29	28	33	51	66	71	65	73	78	75	80	82	67	64	64	54	39	36	36	S 38
6	40	38	28	27	27	26	32	61	H 72	H 78	75	69	79	R 102	111	H 89	68	75	63	54	38	F	40	S 39
7	39	39	38	33	25	21	30	60	71	79	79	75	80	90	94	39	74	89	73	55	34	34	S 34	34
8	S 35	S 37	35	36	20	20	30	60	78	82	89	98	107	98	89	85	69	66	60	57	S 51	54	53	44
9	45	43	42	43	38	38	45	56	71	66	80	83	94	101	106	84	68	75	77	68	54	50	49	48
10	45	44	43	39	31	32	38	69	70	76	69	83	97	92	87	86	78	80	84	75	50	46	45	45
11	45	44	43	40	40	35	39	69	79	69	78	89	105	111	100	87	84	96	74	43	S 46	47	42	43
12	44	44	39	42	42	38	36	R 61	H 80	84	86	101	113	125	120	115	90	73	70	60	60	59	S 48	46
13	43	U S 41	J S 38	44	50	34	34	S 61	83	73	77	102	97	95	107	106	111	82	67	55	53	52	S 49	40
14	40	S 40	39	40	H 32	31	39	67	79	85	H 78	91	91	105	H 99	89	88	H 77	73	47	53	47	42	S 43
15	44	45	J S 40	41	44	44	H 34	64	77	J R 76	H 104	89	87	93	103	99	103	94	64	39	S 39	40	39	40
16	S 41	43	36	37	37	31	33	69	81	96	84	87	88	89	94	89	87	85	81	57	52	52	S 48	S 44
17	S 40	S 43	44	38	40	24	31	66	76	88	85	92	95	103	108	U H 108	J R 99	H 77	67	61	45	44	43	43
18	41	40	42	44	34	26	33	71	79	80	104	87	94	106	H 104	85	87	81	71	60	47	44	40	38
19	38	38	38	34	S 36	S 41	37	66	75	81	79	77	93	78	85	81	77	75	71	65	53	41	33	33
20	34	35	38	35	37	25	29	59	77	87	89	86	90	90	89	84	81	77	H 69	56	45	44	39	39
21	37	35	35	35	33	32	35	61	76	76	79	83	77	92	107	93	87	77	70	65	61	I S 47	35	29
22	30	31	33	35	34	26	29	62	78	80	94	94	88	95	105	93	83	76	71	52	44	F	F	47
23	F	A	33	32	A	32	30	60	71	69	95	107	99	101	124	S 129	J H 111	98	81	51	38	35	34	35
24	30	30	30	32	35	35	30	59	84	92	93	106	109	112	118	105	90	85	91	A	46	49	33	34
25	35	33	32	33	33	27	31	68	67	65	95	114	121	118	113	114	97	83	63	45	A	44	46	S 38
26	43	40	25	26	28	30	34	72	84	80	88	83	H 88	97	110	117	99	105	80	53	49	53	40	29
27	32	32	34	32	32	31	32	62	69	H 80	86	83	H 83	87	87	101	97	97	78	47	50	47	51	31
28	33	35	36	36	45	33	33	58	77	78	93	106	116	122	113	110	91	96	78	43	41	37	A	37
29	A	31	31	30	36	30	34	56	69	82	103	93	87	97	107	109	85	76	63	42	35	37	32	36
30	31	34	32	33	34	31	31	60	67	73	84	77	93	87	105	102	72	67	64	A	43	46	35	32
31	32	32	29	29	31	29	30	61	75	72	90	92	91	91	109	120	100	71	60	65	63	45	40	30
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	30	29	29	31
MED	39	38	35	35	34	31	33	61	76	79	85	87	93	95	104	89	85	77	71	55	48	45	40	39
UQ	43	43	39	40	37	32	36	66	79	82	92	94	97	102	108	107	94	85	78	61	53	49	46	43
LQ	35	34	33	32	29	26	31	60	70	73	78	83	88	90	89	84	73	75	64	51	43	41	36	34

OCT. 1987 | FOF2 (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | FOF1 (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	420	L 450	L 480	450	L	L	L	L						
2									L	L	L 450	460	L 460	L 470	L	L	L							
3									L	L	L	460	480	470	450	L	L	L						
4									L	L 450	450	L 460	460	460	440	L	L							
5									L	L 440	L 460	H 460	L 460	L 460	450	L 420	L	L						
6									L	L 440	450	460	L 500	L 490	L 470	L	L							
7									L	L	L 480	U L 500	L 450	L	470	L 440	L	L						
8									L	L 440	L 470	L 480	490	L 490	L	L	L							
9									L	L	L 470	L 460	L 490	H 490	L	L 450	L	L						
10										440	H 540	L 470	470	L	L	L	L	L						
11									L	L	L	L	L	500	500	L	L	A						
12										L	L	L 490	L 480	U L 500	U L 480	L	L							
13									L		L	U L 480	L 470	L	L 480	L	L							
14									L	L	L	U L 500	460	L 480	L	L	L							
15											L	A	U L 500	L	U L 470	L	L							
16									L	L	L	U L 490	470	U L 500	L	L	L							
17										L	L	L 460	L 450	U L 500	U L 510	L	L							
18									L	L	L 500	L	U L 500	U L 500	L	L	L							
19									L	L	H 450	L 530	L	L	450	U L 410	L							
20										L	L 450	L	L	L	L	L	A							
21										L	L	L	L	490	L	L	L							
22									L	A	L 470	L	L	L	L	L	L							
23									L		L	L	H 490	L	460	L	L							
24									L	L	L	L	480	L	L	L	L							
25									L	U L 520	H 450	450	460	L	L 430	L	A	A						
26										L	L	L	L	L 520	L	L	L							
27										L	L	L	L	L 470	L	L	L							
28										A	L	L	L	L	L	L								
29										L	L 450	A	U A 440	L	L	U A 420	L							
30									L	L	L 440	L	450	L 450	L	L								
31									L	L	L	L 460	L	L	U A 480	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										6	16	18	22	18	14	5								
MED										L 440	L 450	L 460	470	L 490	470	L 420								
UQ										L 450	L 470	L 490	L 490	L 500	L 480	L 440								
LQ										L 440	450	L 460	460	470	450	U L 420								

OCT. 1987 | FOF1 (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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								230	260	295	310	A	R 340	330	320	300	260	210	S					
2								200	255	A	330	340	345	330	320	300	270	220	S					
3								200	A	300	320	330	R 340	330	R 310	300	260	210	S					
4								195	A	310	320	325	U R 340	325	R 305	R 290	270	200	S					
5								205	265	A	315	330	335	330	320	305	270	215	S					
6								200	250	U A 290	320	335	335	335	320	300	260	200	S					
7								H 205	250	295	I R 305	330	345	345	325	300	270	190	S					
8								200	250	A	A	345	345	340	320	H 300	H 260	200	S					
9								195	270	H 300	320	340	340	340	330	305	260	200	S					
10								200	260	300	320	340	H 340	340	H 325	300	260	200	S					
11								A	U A 260	A	310	345	345	340	330	300	265	200	S					
12								A 190	255	290	310	320	330	325	310	295	255	A	S					
13								A	A	295	310	320	330	325	320	300	265	205	S					
14								210	255	A	315	A	H 330	R 330	325	H 300	260	A	S					
15								190	260	290	305	A	A	A	325	315	270	U A 195	S					
16								A	A	A	A	330	A	330	325	305	260	205	S					
17								200	260	300	320	325	H 340	340	R 330	300	250	200	S					
18								195	255	310	A	335	345	345	325	305	260	190	S					
19								205	240	290	A	330	A	A	A	310	A	A						
20								195	A	A	320	340	340	340	320	300	260	H 205						
21								185	250	290	310	320	R 325	320	305	290	250	H 195						
22								210	255	295	A	A	335	310	305	290	245	190						
23								A	245	U A 295	310	320	R 330	R 320	305	290	255	195						
24								A	250	285	A	A	A	A	310	A	245	A						
25								190	255	A	A	A	A	A	315	U A 300	250	A						
26								170	250	280	A	A	325	325	315	280	250	180						
27								170	250	290	310	325	330	325	315	290	245	A						
28								A	230	275	310	315	330	340	330	305	355	175						
29								A	A	270	300	310	320	A	A	A	A	A						
30								190	A	285	310	A	330	A	320	290	250	A						
31								180	A	A	A	A	330	A	315	290	230	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	22	22	22	26	24	29	29	29	22						
MED								198	255	292	310	330	335	330	320	300	260	200						
UQ								202	260	300	320	340	340	340	325	300	265	205						
LQ								190	250	290	310	320	330	325	315	290	250	195						

OCT. 1987 | FOE (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	30	G	G	J A 35	G	G	G	G	28	26	J A 22	J A 24	J A 36	J A 21	J A 25	J A 24
2	J A 25	24	E S 16	E S 16	E S 16	E S 16	E S 16	J A 37	37	33	G	G	G 33	G	G	33	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
3	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	30	32	G	G	G 26	G 26	G 28	G 22	G 24	J A 24	J A 20	E S 16	J A 21	J A 18	J A 17	E S 16
4	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	J A 20	24	J A 29	G	G	G	G	G 27	G 28	G 21	30	23	J A 18	E S 16	E S 16	E S 16	E S 16	E S 16
5	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G 20	G 26	33	G 21	G 23	35	37	G	33	30	24	25	E S 16	J A 24	J A 22	E S 16	J A 24
6	J A 18	E S 16	E S 16	E S 16	E S 16	E S 16	J A 22	22	29	30	G 29	G 28	36	G 25	G 23	G 21	30	27	19	E S 16	E S 16	20	22	21
7	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	29	33	G 31	35	37	36	42	34	32	24	18	E S 16	E S 16	E S 16	E S 16	E S 16
8	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	34	31	J A 44	G	G	G	G	G	G	22	E S 16	18	J A 30	21	22	J A 24
9	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	25	31	32	34	G	G 23	G 25	G 25	G	28	23	E S 16	E S 16	24	J A 33	J A 20	E S 16
10	J A 17	J A 17	E S 16	E S 16	E S 16	E S 16	E S 16	26	30	33	34	G 22	G 22	G	G	G	39	33	25	22	J A 24	24	E S 16	E S 16
11	E S 16	E S 16	E S 16	E S 16	29	E S 16	J A 23	21	30	J A 44	45	40	48	49	45	33	34	30	J A 32	J A 19	E S 16	19	J A 17	E S 16
12	E S 16	E S 16	E S 16	21	E S 16	20	J A 22	22	G	G	G 26	G 27	35	35	33	31	30	J A 30	J A 34	J A 22	21	E S 16	20	21
13	E S 16	E S 16	E S 16	E S 16	17	J A 17	20	J A 24	29	35	37	39	36	36	G 26	35	38	30	J A 35	J A 34	J A 31	J A 38	J A 29	21
14	E S 16	17	E S 16	E S 16	E S 16	E S 16	20	22	32	J A 53	G	34	G	G	G	G 24	J A 29	32	J A 26	24	20	J A 22	J A 18	22
15	23	E S 16	J A 18	J A 22	62	E S 16	20	26	30	33	J A 51	J A 66	J A 54	J A 49	G	34	29	29	J A 23	J A 29	J A 51	J A 25	21	J A 22
16	J A 25	J A 39	J A 33	J A 30	J A 23	E S 16	22	J A 33	J A 38	J A 84	J A 53	35	35	G 23	34	G 19	G	22	J A 30	22	18	J A 24	J A 21	E S 16
17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	26	31	33	J A 36	34	G 22	G 23	G 23	G 20	G	G 19	J A 29	J A 39	J A 20	J A 32	J A 52	J A 32
18	J A 25	23	J A 27	J A 25	E S 16	22	E S 16	J A 25	29	33	J A 88	41	40	J A 43	41	32	G	24	J A 23	J A 26	E S 16	22	18	E S 16
19	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G 20	27	33	33	G 19	39	34	34	36	34	24	17	E S 16	E S 16	J A 23	19	J A 22
20	J A 29	22	23	20	J A 17	J A 17	E S 16	26	J A 32	J A 40	34	35	39	36	35	31	31	G	E S 16	E S 16	18	E S 16	E S 16	E S 16
21	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	28	36	36	47	37	38	34	32	32	30	23	21	J A 30	J A 76	J A 51	J A 41	J A 41
22	J A 20	19	E S 16	19	E S 16	J A 21	E S 16	23	30	J A 46	40	40	G 25	G 24	G 26	34	34	G	E S 16	J A 28	J A 20	J A 26	J A 25	E S 16
23	J A 51	J A 73	J A 51	J A 26	J A 54	J A 29	J A 20	23	32	35	34	G 30	G 28	G 23	G 26	34	30	25	J A 26	E S 16	E S 16	E S 16	J A 37	E S 16
24	J A 17	E S 16	39	E S 16	E S 16	E S 16	J A 22	J A 22	30	35	35	36	J A 46	J A 47	G 27	J A 44	G	30	25	J A 57	J A 29	J A 29	J A 25	E S 16
25	19	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	28	33	J A 52	J A 46	J A 71	J A 39	36	36	35	40	J A 140	J A 26	J A 60	J A 29	J A 25	J A 24
26	J A 21	J A 20	E S 16	E S 16	E S 16	J A 18	E S 16	22	30	34	J A 41	J A 45	G 26	G 26	G	G	27	22	E S 16	E S 16	E S 16	E S 16	J A 25	E S 16
27	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	26	J A 38	33	J A 53	37	36	37	33	32	28	18	E S 16	E S 16	E S 16	E S 16	J A 38	J A 20
28	E S 16	E S 16	J A 17	E S 16	E S 16	E S 16	E S 16	20	30	J A 50	42	J A 48	37	J A 37	G 23	G 24	G 21	20	J A 18	E S 16	J A 41	J A 41	J A 50	J A 25
29	J A 50	J A 19	E S 16	J A 52	J A 36	J A 30	J A 25	J A 31	J A 27	33	34	J A 51	44	J A 39	J A 43	J A 63	J A 47	J A 30	J A 17	E S 16	J A 30	J A 24	J A 24	J A 17
30	J A 18	J A 21	E S 16	E S 16	E S 16	E S 16	E S 16	G	J A 30	G	G	34	39	J A 75	37	39	J A 53	J A 68	J A 97	J A 84	J A 62	J A 18	J A 17	J A 25
31	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	27	40	33	J A 40	37	J A 54	48	J A 47	J A 36	J A 25	J A 36	J A 78	J A 39	E S 16	J A 30	J A 25
	00	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 S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	30	33	34	35	36	34	G 27	32	30	24	J A 22	19	J A 21	J A 22	J A 21	20
UQ	J A 20	19	E S 16	18	E S 16	16	20	26	32	37	43	40	39	38	34	34	34	30	J A 28	J A 27	J A 30	J A 26	J A 25	J A 24
LQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	29	32	G 28	G 25	G 26	G 24	E G 23	G 21	26	22	17	E S 16	E S 16	E S 16	17	E S 16

OCT. 1987 | FOES (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | FBES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G 30		G	G	35	G	G	G	G	28	23	21	ES 16	24	ES 16	20	20
2	19	21	ES 16	ES 16	ES 16	ES 16	ES 16	31	35	32	G	G	G 30	G	G	32	G	G	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
3	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	23	30	G	G	G	G 25	G 24	G 28	G 22	G 23	24	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
4	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	19	23	27	G	G	G	G	G 27	G 28	G 20	29	22	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
5	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G 20	G 25	31	G 21	G 23	G	37	G	G	29	24	19	ES 16	18	ES 16	ES 16	ES 16
6	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	29	29	G 29	G 28	35	G 25	G 23	G 21	30	27	19	ES 16	ES 16	ES 16	ES 16	ES 16
7	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	29	32	G 31	35	37	36	41	34	31	23	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
8	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	27	34	31	35	G	G	G	G	G	G	22	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
9	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	23	29	32	34	G	G 22	G 24	G 25	G	28	23	ES 16	ES 16	20	ES 16	ES 16	ES 16
10	ES 16	17	ES 16	ES 16	ES 16	ES 16	ES 16	24	29	33	34	G 22	G 22	G	G	G	39	30	25	ES 16	ES 16	ES 16	ES 16	ES 16
11	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	21	29	32	35	39	46	48	45	31	34	30	30	ES 16	ES 16	ES 16	ES 16	ES 16
12	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	20	20	G	G	G 26	G 27	35	G	G	G	28	27	33	ES 16	ES 16	ES 16	ES 16	ES 16
13	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	22	29	33	36	37	34	35	G 26	34	36	29	33	33	26	22	21	ES 16
14	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	31	32	G	34	G	G	G	G 24	20	31	23	ES 16	ES 16	19	ES 16	ES 16
15	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	23	G	33	42	48	42	43	G	G	G	22	19	ES 16	24	18	ES 16	ES 16
16	ES 16	21	33	22	ES 16	ES 16	ES 16	20	25	32	34	G	35	G 20	G	G 19	G	G	21	ES 16	ES 16	ES 16	ES 16	ES 16
17	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	23	29	32	35	34	G 22	G 23	G 23	G 19	G	G 17	22	ES 16	ES 16	ES 16	27	22
18	21	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	23	G	G	45	38	36	35	40	G	G	24	23	24	ES 16	ES 16	ES 16	ES 16
19	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G 20	27	31	33	G 19	39	34	34	31	28	23	ES 16	ES 16	ES 16	19	ES 16	ES 16
20	20	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	25	29	31	34	35	35	35	35	31	31	G	ES 16	ES 16	18	ES 16	ES 16	ES 16
21	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	25	35	35	45	36	35	34	32	31	29	22	20	28	29	35	ES 16	33
22	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	29	44	37	36	G 25	G 24	G 26	34	33	G	ES 16	26	ES 16	19	25	ES 16
23	29	AA 73	24	ES 16	AA 54	24	ES 16	23	31	34	34	G 30	G 28	G 23	G 26	34	30	25	24	ES 16	ES 16	ES 16	ES 16	ES 16
24	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	20	22	28	35	34	35	35	40	G 27	G 28	G	24	19	AA 57	20	25	ES 16	ES 16
25	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	23	28	36	34	34	44	36	35	32	35	35	ES 16	23	AA 60	17	18	ES 16
26	18	18	ES 16	ES 16	ES 16	ES 16	ES 16	21	28	32	41	36	G 26	G 26	G	G	26	22	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16
27	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	25	32	33	36	34	36	36	33	31	27	18	ES 16	ES 16	ES 16	ES 16	25	ES 16
28	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	19	29	50	40	43	35	28	G 23	G 20	G 20	20	ES 16	ES 16	ES 16	33	AA 50	20
29	AA 50	ES 16	ES 16	ES 16	ES 16	ES 16	21	30	26	32	34	51	44	37	41	42	35	21	ES 16	ES 16	19	20	ES 16	ES 16
30	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	26	G	G	34	35	34	35	34	38	45	ES 16	AA 84	ES 16	ES 16	ES 16	ES 16
31	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G	27	38	33	35	36	33	48	40	29	23	32	50	37	ES 16	22	20
	00	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	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	22	29	32	34	34	35	28	G 26	G 24	28	23	19	ES 16	ES 16	ES 16	ES 16	ES 16
UQ	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	23	30	33	36	36	36	36	34	32	31	26	22	20	20	18	17	ES 16
LQ	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16	G 20	27	31	G 28	G 22	G 24	G 23	G	G	G 20	22	ES 16	ES 16	ES 16	ES 16	ES 16	ES 16

The Radio Research Laboratory, Japan

OCT. 1987 | FBES (0.1 MHZ)

IONOSPHERIC DATA

OCT. 1987 | FMIN (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

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

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

OCT. 1987 | FMIN (0.1 MHZ)

IONOSPHERIC DATA

OCT. 1987 | M(3000)F2 (0.01)

135° E Mean Time (G.M.T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	320	305	310	310	330	305	340	360	350	350	370	320	325	335	315	335	325	330	340	360	330	315	310	305
2	310	335	335	300	310	300	335	355	360	350	355	345	320	340	335	335	335	330	345	345	370	300	295	295
3	315	340	320	335	360	315	330	370	350	355	355	330	320	335	335	325	340	345	345	335	310	335	310	290
4	280	280	295	345	H 295	290	305	350	355	310	320	320	330	330	340	350	340	355	340	335	290	300	320	315
5	315	300	305	320	345	305	335	335	350	340	315	320	335	335	335	345	360	335	345	335	335	290	290	S 290
6	325	330	320	315	295	305	310	350	H 335	H 325	375	345	295	R 305	325	H 315	340	360	335	340	315	F	285	S 280
7	295	305	315	365	340	310	315	350	365	355	330	335	310	305	320	325	330	350	370	365	325	295	S 295	295
8	S 285	S 295	315	360	350	300	315	340	360	335	335	305	320	315	315	335	335	350	335	315	S 285	325	320	295
9	300	300	295	315	315	300	345	375	365	340	335	300	305	305	330	340	325	335	335	340	305	300	295	300
10	310	295	325	335	320	330	340	375	340	355	320	315	320	315	320	335	325	330	345	335	320	295	290	290
11	290	320	300	310	335	285	305	360	365	345	320	310	305	315	320	325	315	345	330	290	S 305	310	275	280
12	295	290	270	275	310	330	305	R 345	H 320	325	315	295	305	310	310	330	325	335	330	310	320	320	S 300	280
13	290	U S 280	J S 275	305	370	350	325	S 350	375	310	310	325	320	305	320	325	340	360	335	320	310	315	S 305	300
14	285	S 290	280	300	H 310	290	305	350	350	350	H 325	325	305	315	H 330	330	340	H 335	335	340	290	350	275	S 290
15	285	300	J S 275	290	295	340	H 295	375	310	J R 300	H 340	340	335	295	310	310	320	350	360	280	S 270	285	270	275
16	S 305	300	290	310	310	340	320	340	350	350	315	325	320	310	325	320	325	325	335	310	290	300	S 300	S 295
17	S 285	S 315	320	330	350	310	305	365	330	335	330	325	310	300	320	U H 320	J R 340	H 345	335	320	300	305	290	290
18	280	260	295	330	365	325	320	350	355	330	345	325	315	310	H 315	330	340	340	340	340	295	305	300	290
19	290	290	315	295	S 305	S 315	325	365	360	345	355	325	335	320	330	335	345	345	340	340	330	340	305	305
20	280	300	315	340	335	340	310	340	335	345	350	335	335	320	325	340	340	355	H 325	330	320	305	305	305
21	325	315	300	315	305	295	315	345	355	350	330	325	310	305	315	320	335	335	335	325	325	I S 335	340	295
22	285	290	305	330	340	345	295	355	340	350	330	320	305	300	325	325	345	340	345	345	295	F	F	310
23	F	A	335	310	A	345	335	365	365	325	325	325	325	285	305	S 330	J H 305	340	340	345	315	300	310	315
24	315	285	300	295	330	340	285	330	345	335	325	315	300	310	320	315	320	335	360	A	295	335	320	295
25	300	305	295	320	335	315	320	365	375	290	305	315	320	315	305	325	330	355	335	335	A	285	315	S 290
26	300	350	340	290	305	300	340	370	380	370	355	335	H 310	310	320	340	325	330	350	340	305	340	350	295
27	295	295	325	310	330	340	360	360	375	H 335	370	350	H 315	335	315	325	335	350	365	320	320	310	350	290
28	305	300	290	290	335	305	320	355	370	340	340	330	320	325	320	335	335	350	345	325	305	310	A	325
29	A	320	320	285	305	285	350	355	340	340	350	360	325	320	315	340	360	355	355	335	300	325	295	305
30	290	295	295	320	340	305	290	360	365	355	370	345	350	315	335	350	370	375	335	A	300	325	330	330
31	310	330	310	295	320	310	300	370	375	335	335	345	335	325	315	335	360	365	335	330	325	320	335	300
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	30	29	29	31
MED	295	300	305	310	330	310	320	355	355	340	335	325	320	315	320	330	335	345	340	335	308	310	305	295
UQ	310	315	320	330	340	335	335	365	365	350	352	335	325	322	328	335	340	352	345	340	320	325	320	305
LQ	285	290	295	298	310	300	305	350	342	332	322	320	310	305	315	325	325	335	335	320	295	300	295	290

The Radio Research Laboratory, Japan

OCT. 1987 | M(3000)F2 (0.01)

IONOSPHERIC DATA

OCT. 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 24sec in automatic operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	405	L 400	L 375	375	L	L	L	L						
2									A	L	L 390	390	L 400	L 380	L	L	L							
3									L	L	L	390	375	370	375	L	L	L						
4									L	L 355	355	L 370	360	370	365	L	L							
5									L	L 365	L 370	H 380	L 380	L 370	355	L 370	L	L						
6									L	L 365	375	390	L 360	L 355	L 340	L	L							
7									L	L	L 345	U L 340	L 400	L	360	L 350	L	L						
8									L	L 365	L 360	L 365	355	L 345	L	L	L							
9									L	L	L 360	L 390	L 365	H 365	L	L 355	L	L						
10										385	355	L 380	370	L	L	L	L	L						
11									L	L	L	L	L	A	A	L	L	A						
12										L	L	L 345	L 355	U L 340	U L 345	L	L							
13									L		L	U L 365	L 380	L	L 355	L	L							
14									L	L	L	U L 340	390	L 355	L	L	L							
15											L	A	U L 360	L	U L 360	L	L							
16									L	L	L	U L 355	370	U L 350	L	L	L							
17										L	L	L 380	L 390	U L 350	U L 325	L	L							
18									L	L	L 360	L	U L 370	U L 350	L	L	L							
19									L	L	H 355	L 340	L	L	375	U L 390	L							
20										L	L 375	L	L	L	L	L	A							
21										L	L	L	L	345	L	L	L							
22									L	A	L 360	L	L	L	L	L	L							
23									L		L	L	H 365	L	345	L	L							
24									L	L	L	L	355	L	L	L	L							
25									L	U L 345	H 375	400	A	L	L 370	L	A	A						
26										L	L	L	L	L 345	L	L	L							
27										L	L	L	L	L 370	L	L	L							
28										A	L	L	L	L	L	L								
29										L	L 375	A	A	L	L	A	A							
30									L	L	L 385	L	390	L 390	L	L								
31									L	A	L	L 370	L	L	A	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										6	16	18	20	17	12	4								
MED										L 365	L 365	L 375	L 370	L 355	358	L 362								
UQ										L 365	L 375	390	L 385	L 370	368	L 380								
LQ										L 355	L 358	L 355	360	L 350	L 345	L 352								

OCT. 1987 | M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | 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	240	245	280	290	275	300	270	265	255						
2									250	260	250	250	280	270	250	270	270							
3									250	250	245	290	290	260	260	280	275	250						
4									245	300	275	290	280	280	270	250	250							
5									265	275	305	285	275	280	275	265	245	250						
6									250	250	240	255	320	290	260	255	255							
7									240	250	265	275	280	285	290	260	255	235						
8									240	265	260	280	275	275	280	255	250							
9									235	240	265	290	285	300	270	255	270	260						
10										235	300	285	270	270	275	250	245	255						
11									220	245	265	280	290	265	280	260	280	240						
12										245	260	305	280	285	270	250	250							
13									230		265	270	255	270	270	270	250							
14									225	230	245	280	255	265	250	250	245							
15											245	245	270	280	280	270	245							
16									230	245	295 L	260	280	280	280	255	255							
17										245	250	270	255	285 L	275	270	230							
18									225	225	255	270	270	275	255	245	240							
19									230	245	240	300	260	255	270	255	240							
20										240	240	250	260	275	250	255	240							
21										250	280	255	260	310	275	250	245							
22									235	240	265	250	255	290	265	260	240							
23									230		255	255	255	265	290	245	240							
24									230	250	255	270	265	270	260	250	240							
25									220	U L 330	290	280	260	280	270	245	240	220						
26										230	245	255	240	310	280	255	250							
27										240	240	265	240	270	300	270	245							
28										255	270	265	270	250	250	245								
29										250	255	245	275	290	280	250	235							
30									235	240	250	250	255	280	260	240								
31									240	240	250	255	270	275	280	250	235							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									21	28	31	31	31	31	31	31	29	8						
MED									235	245	255	270	270	275	270	255	245	250						
UQ									245	250	265	280	280	285	280	262	255	255						
LQ									230	240	245	255	258	270	260	250	240	238						

The Radio Research Laboratory, Japan

OCT. 1987 | H'F2 (KM)

IONOSPHERIC DATA

OCT. 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	ES 280	ES 260	ES 300	ES 270	ES 245	ES 280	245	240	230	225	205	H 200	H 190	H 190	H 200	240	230	240	240	215	EA 240	ES 270	EA 270	EA 275
2	250	250	230	ES 255	ES 275	ES 300	250	240	A	220	200	200	H 190	H 180	H 180	220	H 220	240	240	210	205	220	ES 290	ES 290
3	ES 255	S 230	ES 240	ES 250	220	ES 295	240	225	220	215	220	H 200	H 195	H 190	H 200	H 200	220	240	225	220	240	240	ES 250	ES 290
4	ES 330	ES 325	ES 270	225	215	ES 350	EA 295	240	230	200	H 200	H 205	H 195	H 180	210	230	230	230	235	225	ES 275	ES 280	ES 250	ES 250
5	255	295	290	250	230	280	240	240	240	210	200	180	200	200	H 210	220	230	225	225	220	A 220	285	290	290
6	255	235	275	270	275	285	255	H 235	225	205	205	195	H 190	H 185	H 175	235	230	H 235	215	220	215	325	290	295
7	285	265	250	215	225	ES 295	250	230	220	205	H 190	H 200	195	H 220	A 240	230	230	230	220	205	225	290	305	305
8	320	275	235	210	225	ES 350	255	230	230	210	200	190	H 185	H 195	H 210	225	225	240	230	240	285	250	240	270
9	270	260	255	240	250	260	215	215	225	210	205	200	H 190	H 180	240	220	210	215	230	230	240	265	260	255
10	260	260	250	215	S 240	240	220	220	215	210	H 200	185	H 200	200	H 200	225	230	250	230	225	210	260	280	290
11	280	260	250	235	230	S 285	250	220	225	215	H 215	A 220	A	A	A	230	240	A	210	S 220	265	240	290	300
12	260	270	330	305	255	215	EA 265	H 230	H 220	H 200	H 185	H 195	215	230	220	220	235	A 230	A 220	245	245	235	245	ES 280
13	235	305	S 325	255	210	230	S 230	H 210	225	H 210	215	205	200	200	H 195	235	A	220	235	EA 250	EA 260	260	A 255	S 225
14	ES 280	S 290	S 295	255	ES 220	ES 275	235	H 205	220	220	H 200	H 195	H 200	185	200	220	235	225	225	205	255	225	ES 285	305
15	ES 300	250	ES 300	S 300	260	215	200	215	205	H 210	A	A	EA 235	EA 245	215	H 245	235	225	205	210	EA 325	EA 300	S 310	320
16	270	270	EA 330	A 280	255	225	245	225	225	210	H 210	190	195	H 185	230	225	225	230	220	200	250	245	255	255
17	ES 285	265	250	225	220	ES 230	S 250	225	220	210	215	H 195	H 185	H 180	210	H 210	230	H 225	220	215	ES 240	280	EA 285	300
18	EA 310	ES 330	S 290	220	210	S 240	S 255	225	220	210	200	205	H 200	H 195	255	220	H 205	220	225	220	240	235	S 245	ES 275
19	280	275	245	270	270	240	225	225	215	200	200	195	235	195	205	220	235	235	220	220	220	220	S 250	S 280
20	EA 320	285	260	235	230	ES 235	265	215	230	225	205	H 205	195	H 195	230	220	A	220	210	210	235	240	250	245
21	260	265	270	250	260	285	235	220	235	230	A	210	H 200	H 195	245	235	235	235	230	250	A 240	EA 260	230	A
22	300	S 310	280	245	235	S 230	S 250	235	235	A	215	210	H 185	H 185	H 240	240	240	235	220	220	285	300	EA 300	240
23	A 280	A	EA 265	S 265	A	A 255	220	215	230	H 215	200	195	H 185	H 185	H 195	255	235	240	210	200	235	S 270	255	245
24	S 255	S 300	S 330	300	255	215	A	225	230	220	200	190	H 185	A	H 240	215	225	240	220	A	A 290	245	260	S 290
25	275	S 255	S 260	260	265	250	S 270	220	215	215	200	215	A	205	230	235	A	A	210	235	A	285	265	310
26	EA 260	225	S 245	ES 305	ES 300	ES 295	S 255	225	220	225	EA 240	205	200	H 190	H 180	H 190	230	230	205	215	ES 260	225	220	ES 290
27	ES 300	ES 290	ES 255	ES 270	ES 255	ES 260	225	225	225	220	230	H 200	205	H 200	220	235	230	225	205	205	245	ES 280	230	ES 290
28	ES 320	ES 290	ES 290	ES 325	240	ES 280	240	210	220	A	EA 250	A	H 220	225	220	H 200	235	240	200	215	ES 250	A	A	EA 260
29	A	ES 270	ES 280	ES 330	ES 290	ES 325	EA 240	230	230	220	H 200	A	A	225	EA 255	H 200	A	225	205	205	EA 275	EA 260	ES 300	ES 270
30	ES 275	ES 300	ES 290	ES 275	ES 250	ES 280	ES 245	225	H 190	205	215	H 200	205	H 200	240	230	225	A 230	220	A	ES 270	S 240	ES 245	ES 250
31	ES 275	ES 250	ES 275	ES 305	ES 280	ES 250	ES 260	H 180	230	A	220	200	H 200	H 180	A	A	A	220	EA 245	EA 280	EA 240	220	EA 240	EA 300
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	31	31	30	31	30	31	30	29	29	28	28	29	29	30	26	29	31	29	30	30	30	30
MED	268	265	260	245	238	U S 238	242	225	225	210	202	200	H 196	H 195	212	225	230	230	220	218	232	250	252	U 265
UQ	EE 300	S 282	S 281	S 268	258	ES 285	252	230	230	220	215	205	200	200	235	235	235	240	229	222	255	272	U 275	292
LQ	258	255	249	234	225	233	230	218	220	210	200	195	H 190	H 185	H 200	220	225	225	210	210	223	233	242	U 240

OCT. 1987 | H'F (KM)

IONOSPHERIC DATA

OCT. 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								120	110	105	105	A	105	110	110	110	110	120	S					
2								120	115	110	110	110	A	110	110	110	110	115	S					
3								115	110	110	110	H 105	110	110	A	110	A	A	S					
4								125	120	110	110	110	110	A	A	110	110	A	S					
5								E A 125	A	A	A 110	A 115	A 115	115	115	110	115	115	S					
6								E A 125	E A 125	A	A 120	A 120	A 120	A 120	A 115	A 120	115	120	S					
7								E S 125	A 120	110	A	E A 120	A 115	A 115	E A 120	105	115	120	S					
8								E S 125	120	110	110	110	115	115	115	115	110	E S 120	S					
9								E S 125	115	110	115	115	A 115	A 115	E A 120	110	115	120	S					
10								A	A 120	110	110	A 115	E A 120	115	110	110	110	B 120	S					
11								E A 125	A	A	A 110	A 110	A 110	A 110	A 110	110	110	120	S					
12								A 120	110	105	A 115	A 115	110	110	110	110	115	S 120	S					
13								S 125	115	110	110	105	E A 115	115	E A 125	115	110	E A 120	S					
14								130	105	105	105	105	105	105	105	115	E A 120	E S 120	S					
15								E S 120	105	110	115	110	110	110	110	110	115	A	S					
16								A	A	105	A	E A 120	110	115	110	110	105	E A 120	S					
17								125	115	115	115	115	115	115	115	115	115	115	S					
18								120	115	110	110	110	115	A	105	115	115	E S 125	S					
19								A	110	110	105	A 115	A	115	115	115	115	A						
20								125	115	110	A 115	110	110	115	115	110	110	120						
21								S	110	110	A 120	A 115	E A 125	A 110	A 110	A 115	115	B 130						
22								120	110	110	110	A	A 110	A 115	E A 120	A 115	115	S 130						
23								A	E A 120	A	E A 130	A 120	A 115	A 115	A 115	110	115	S						
24								A	A	A 120	A 115	A 120	A 110	A	A 120	A	110	A						
25								S	115	110	110	A	A	A	A 110	A	115	A						
26								125	105	110	105	105	A	A	115	110	110	125						
27								A	A	A	A	A	A	A	A	A	A	120						
28								120	110	105	105	105	105	A	A	A	A	A						
29								A	A	110	105	105	105	A	A	A	A	A						
30								125	115	110	110	110	A	110	110	110	115	A						
31								130	110	110	105	A	A	A	110	115	115	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								22	25	26	28	26	24	22	26	26	27	20						
MED								125	112	110	110	110	110	115	111	110	115	120						
UQ								125	115	110	115	A 115	A 115	115	A 115	115	115	120						
LQ								120	110	110	108	110	110	110	110	110	110	120						

OCT. 1987 | H'E (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	S	S	S	S	S	G	155	G	G	100	G	G	G	G	155	140	110	110	105	105	100	100
2	100	100	S	S	S	S	S	120	120	120	G	G	100	G	G	125	G	G	S	S	S	S	S	S
3	S	S	S	S	S	S	S	125	150	170	G	G	100	100	105	100	100	100	100	S	100	100	95	S
4	S	S	S	S	S	S	120	125	110	G	G	G	G	100	100	100	125	125	100	S	S	S	S	S
5	S	S	S	S	S	S	S	120	115	115	105	105	130	125	G	165	150	145	120	S	110	105	S	105
6	100	S	S	S	S	S	110	150	150	110	110	110	150	105	105	100	160	130	120	S	S	100	100	100
7	S	S	S	S	S	S	S	G	130	125	120	140	145	E G 170	125	135	120	115	120	S	S	S	S	S
8	S	S	S	S	S	S	S	120	120	115	105	G	G	G	G	G	G	130	S	110	110	110	105	110
9	S	S	S	S	S	S	S	130	130	125	130	G	100	95	95	G	E G 155	125	S	S	105	110	110	S
10	100	100	S	S	S	S	S	140	150	135	140	105	105	G	G	G	E G 150	115	110	115	110	110	S	S
11	S	S	S	S	110	S	105	130	145	120	135	130	120	120	130	140	115	125	115	110	S	110	110	S
12	S	S	S	110	S	145	125	125	G	G	105	100	E G 175	165	170	E G 155	145	115	105	105	105	S	100	95
13	S	S	S	S	125	125	125	125	125	120	120	120	125	130	100	170	135	120	115	105	105	105	105	105
14	S	105	S	S	S	S	150	E G 155	125	120	G	105	G	G	G	105	105	125	115	115	115	105	105	105
15	110	S	105	105	105	S	140	140	135	125	115	110	105	105	G	E G 185	E G 190	145	125	110	100	100	105	105
16	105	105	100	105	125	S	105	105	105	105	100	160	120	100	180	105	G	105	100	105	105	105	105	S
17	S	S	S	S	S	S	S	140	140	135	145	150	105	105	105	105	G	100	95	130	110	105	100	105
18	100	105	115	105	S	115	S	140	145	150	120	125	120	105	160	185	G	180	125	115	S	100	110	S
19	S	S	S	S	S	S	S	135	120	120	120	105	110	120	115	145	120	110	110	S	S	105	110	105
20	105	105	100	105	105	105	S	140	135	130	135	130	120	130	130	130	120	G	S	S	105	S	S	S
21	S	S	S	S	S	S	S	135	125	125	120	125	125	135	130	E G 175	150	155	120	110	110	105	110	105
22	110	110	S	110	S	115	S	130	120	110	110	110	105	105	100	165	135	G	S	120	150	120	115	S
23	110	110	110	110	110	110	115	130	120	115	135	110	105	105	100	160	145	130	115	S	S	S	110	S
24	105	S	105	S	S	S	105	105	120	115	115	110	110	100	100	105	G	165	140	110	110	110	110	S
25	110	S	S	S	S	S	S	145	125	115	110	110	105	105	130	125	115	120	110	110	105	105	105	105
26	100	100	S	S	S	120	S	150	140	120	110	105	100	100	G	G	160	125	S	S	S	S	110	S
27	S	S	S	S	S	S	S	140	100	125	125	125	125	125	130	130	125	120	S	S	S	S	105	105
28	S	S	105	S	S	S	S	140	130	115	120	110	125	100	100	100	100	140	100	S	110	105	105	105
29	100	105	S	100	105	100	105	100	100	130	130	115	125	100	100	100	100	100	100	S	105	100	105	105
30	105	100	S	S	S	S	S	G	115	G	G	125	125	120	130	125	115	105	110	110	110	105	105	105
31	S	S	S	S	S	S	S	G	125	110	115	105	140	100	130	125	115	105	105	100	100	S	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	14	11	7	8	7	8	11	27	30	27	25	26	27	26	23	26	25	28	24	17	21	22	25	17
MED	105	105	105	105	110	115	115	130	125	120	120	110	120	105	115	126	122	125	110	110	105	105	105	105
UQ	110	105	108	110	118	122	125	140	140	125	130	125	125	122	130	U 150	148	135	120	115	110	110	110	105
LQ	100	100	102	105	105	108	105	125	120	115	110	105	105	100	100	105	115	112	102	110	105	105	105	105

OCT. 1987 | H'ES (KM)

IONOSPHERIC DATA

OCT. 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									H 2			L 3					H 1	H 3	C 2	F 1	F 3	F 2	F 3	F 3
2	F 2	F 3						C 5	C 3	C 2			L 1			C 1								
3								C 3	HC 22	H 2			L 1	L 1	L 2	L 1	L 2	L 4	L 2		F 4	F 2	F 2	
4							F 7	C 4	C 3					L 1	L 2	L 2	C 3	CL 32	L 2					
5						F 1	F 1	L 2	L 2	LL 21	L 1	L 1	HL 11	C 1		H 1	H 1	H 1	C 3	F 1	F 4	F 2		F 3
6	F 1						F 3	HL 11	HL 12	L 2	L 1	L 1	HL 11	L 1	L 1	L 1	H 1	H 3	C 3	F 1		F 1	F 1	F 1
7									HL 12	C 2	CL 11	HL 11	HL 11	HL 11	CL 21	H 2	C 2	C 3	C 1					F 1
8							F 1	C 3	C 2	C 2	L 3							C 2		F 2	F 4	F 2	F 2	F 3
9	F 1		F 1				F 1	H 3	H 2	C 2	H 1		L 1	L 2	L 2		H 1	C 3	C 1	F 1	F 4	F 2	F 1	
10	F 1	F 1			F 1	F 1		HL 22	HHL 21	H 1	H 1	L 1	L 1				H 1	C 3	C 3	F 1	F 1	F 4	F 1	F 1
11					F 3	F 1	F 2	CL 22	HL 21	CL 13	HL 11	HL 11	HL 21	CL 21	HL 31	H 1	C 2	H 3	F 7	F 4	F 1	F 2	F 1	F 1
12				F 1		F 1	F 3	C 2			L 2	L 2	HL 11	H 1	HL 11	HL 11	HL 12	C 3	L 7	F 2	F 1		F 1	F 3
13					F 1	F 1	F 1	C 2	C 2	CL 21	CL 21	CL 21	CL 12	CL 12	L 1	HL 21	H 3	CL 31	LL 52	FF 81	F 4	F 3	F 3	F 2
14		F 1					F 1	H 1	CL 21	C 1		C 1				L 1	LH 21	C 2	L 4	F 2	F 1	F 3	F 2	F 1
15	FF 11		F 2	F 2	F 2		FF 11	H 3	H 2	CL 11	CL 31	CL 31	C 2	C 2		H 1	HL 12	HCL 11	CC 31	F 2	F 3	F 2	F 1	F 2
16	F 2	F 5	F 6	F 5	FF 12		F 1	LH 31	LH 31	CH 31	L 2	HL 11	CL 11	L 1	HL 11	L 1		L 1	L 3	F 1	F 1	F 1	F 1	
17								HL 21	HL 21	HL 11	HL 21	HL 11	L 1	L 1	L 1	L 1		L 3	L 3	F 1	F 1	F 4	F 4	F 3
18	F 7	F 2	F 3	FF 11		F 2		H 3	H 1	H 1	CL 21	CL 21	CL 11	L 2	HL 21	HL 11		H 1	L 3	FF 71		F 1	F 1	
19			F 1	F 1				HL 32	C 2	C 2	C 1	L 1	L 2	C 2	C 2	H 1	C 3	L 3	F 1			F 3	F 2	F 2
20	F 3	F 2	F 3	F 2	F 2	F 1		H 3	HC 21	HC 11	CL 11	C 1	C 1	C 1	C 1	C 1	C 2			F 1	F 3		F 1	
21							F 1	H 3	H 3	C 2	CL 31	CL 12	HL 12	HL 12	CL 11	HL 11	H 2	H 2	F 4	F 7	F 2	F 4	F 3	F 3
22	F 2	F 2	F 1	F 1		F 1		C 1	C 2	C 3	C 3	L 2	L 2	L 1	L 2	HL 11	H 2		F 1	F 7	F 1	F 2	F 3	F 1
23	F 4	F 5	F 4	F 6	F 6	F 7	F 3	CL 63	HL 32	HC 22	L 1	L 1	L 2	L 1	L 3	H 2	H 2	C 4	F 5	F 1			F 3	F 1
24	F 2	F 1	F 5			F 1	F 6	L 5	CL 23	CL 33	CL 11	CL 21	CL 21	L 3	L 2	L 2		HL 21	F 2	F 6	F 4	F 7	F 3	F 1
25	F 2	F 1		F 1	F 1	F 1		H 4	H 2	C 2	C 2	L 1	L 3	L 3	HL 21	HL 24	C 3	C 6	F 3	F 3	F 2	F 2	F 3	F 2
26	F 4	F 5				F 2		H 2	H 2	C 2	C 2	C 2	L 2	L 1			H 1	C 3					F 1	
27								HL 42	LH 51	CL 22	CL 23	CL 12	CL 12	CL 11	CL 11	CL 12	CL 23	C 2					F 2	F 2
28			F 2					H 2	H 2	C 5	C 2	C 2	C 1	L 2	L 2	L 1	L 2	H 2	F 1		F 3	F 5	F 4	F 5
29	F 4	F 2		F 3	F 2	F 3	F 8	L 4	L 5	C 3	C 2	C 3	C 2	L 3	L 4	L 2	L 3	L 3	F 2		F 2	F 3	F 2	F 1
30	F 2	F 3							C 2			C 1	CL 11	C 2	C 1	C 2	C 3	L 2	F 2	F 5	F 3	F 2	F 2	F 2
31									C 2	C 2	C 2	L 2	HL 12	L 2	C 2	C 3	C 2	L 3	F 5	F 5	F 5		F 4	F 5
	00	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																								

OCT. 1987 | TYPES OF ES

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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 44	X 43	X 41	X 41	X 32	X 33	X 39													X 89	X 57	X 46	X 46	X 51
2	X 45	U X 43	X 35	X 31	X 32	X 32	X 37													X 121	X 88	X 48	A	U X 46
3	X 53	X 48	X 29	X 32	X 26	X 28	X 33													U X 93	X 86	X 82	X 73	X 68
4	X 68	X 57	X 67	X 48	X 47	X 34	X 38													X 70	X 53	X 58	X 58	X 50
5	X 49	X 44	X 39	X 41	X 32	X 28	X 34													U X 69	X 47	X 44	X 46	X 43
6	X 48	X 43	X 35	X 31	X 27	X 29	X 31													X 65	X 54	X 50	U X 54	X 50
7	U X 50	X 48	X 57	X 47	X 36	X 23	X 30													C	C	X 46	X 47	X 47
8	X 44	X 46	X 55	X 39	X 24	X 23	X 30													X 67	X 63	X 62	X 57	X 45
9	X 46	X 49	X 48	X 41	X 37	X 37	X 40													X 67	X 72	X 60	X 56	X 49
10	X 49	X 48	X 48	X 39	X 34	X 33	X 36													X 78	X 78	X 52	X 49	X 49
11	X 49	X 48	X 46	X 44	X 34	X 31	X 36													X 69	X 58	U X 56	X 48	X 49
12	X 46	X 46	X 42	X 43	X 46	X 36	X 32													X 82	X 82	X 64	X 58	X 70
13	X 57	X 50	X 43	X 46	X 58	X 28	X 33													X 72	X 65	X 61	X 56	X 47
14	X 46	X 48	X 46	X 43	X 43	X 37	X 41													X 70	X 58	X 63	X 43	X 45
15	X 49	X 49	X 39	X 41	X 43	X 43	X 32												X 90	U X 86	X 90	U X 65	X 56	X 56
16	X 56	X 57	X 49	X 43	X 41	X 34	X 34												X 115	X 99	X 73	X 74	X 81	X 79
17	X 72	X 67	X 61	X 56	X 36	X 28	X 32												U X 112	U X 110	X 90	X 71	X 64	X 54
18	X 49	X 47	X 49	X 69	X 27	X 26	X 30												X 116	X 94	U X 93	X 96	U X 92	X 90
19	X 90	X 85	X 76	X 50	X 37	X 40	X 36												X 92	X 87	X 70	X 62	X 70	X 58
20	X 50	X 56	X 62	X 47	X 44	X 30	X 33												X 84	X 81	X 71	X 59	X 56	X 51
21	X 47	X 40	X 43	X 37	X 39	X 36	X 37												X 101	X 84	X 78	50	X 46	A
22	38	36	X 39	X 46	X 37	X 28	X 31												X 98	X 61	X 46	X 46	X 46	X 46
23	X 47	X 41	40	40	41	32	29												X 136	X 124	X 84	X 60	X 50	X 46
24	X 39	X 37	X 38	X 41	X 44	X 36	X 28												X 139	X 126	X 93	X 82	X 69	U X 55
25	X 56	X 58	X 54	X 49	X 40	X 27	X 31												X 89	A	X 59	X 56	X 63	X 61
26	X 61	X 57	X 42	X 36	X 35	X 35	X 38												X 163	X 136	X 97	X 100	X 80	X 44
27	X 41	X 43	X 38	X 38	X 40	X 34	X 34												X 116	X 105	X 88	X 83	X 82	J X 37
28	A	X 37	X 37	X 38	U X 64	S	X 32												U X 182	X 112	U X 110	X 85	X 58	X 47
29	X 42	X 38	X 36	O X 33	X 36	X 37	X 37												U X 131	U X 112	U X 116	U X 85	X 70	X 45
30	X 48	X 38	O X 37	49	X 51	36	X 35												X 97	U X 90	U X 84	X 82	A	X 41
31	X 38	X 39	X 34	X 35	X 36	X 34	X 32												X 146	U X 140	X 116	X 96	X 71	X 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	30	31	31	31	31	30	31												17	29	30	31	29	30
MED	X 48	X 47	X 42	X 41	X 37	X 33	X 33												X 115	X 87	X 78	X 62	X 57	X 49
UQ	X 53	X 50	X 49	X 46	X 43	X 36	X 36												X 136	X 110	X 90	X 82	X 70	X 56
LQ	X 45	X 42	X 38	X 38	X 34	X 28	X 32												X 97	X 70	X 59	X 54	X 49	X 46

OCT. 1987 | FXI (0.1 MHZ)

IONOSPHERIC DATA

OCT. 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 24sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	38	S 37	35	35	26	27	33	53	75	69	77	104	98	89	95	95	85	83	90	83	51	40	40	S 45
2	39	U R 37	29	25	26	26	31	63	70	87	105	103	118	133	145	145	R 122	U R 109	U R 112	S 115	82	42	A	U S 40
3	47	42	23	26	20	22	27	57	67	77	87	R 100	103	126	125	U R 126	R 120	R 122	113	U R 87	80	U R 76	67	U S 62
4	S 62	S 51	S 61	S 42	S 41	S 28	32	81	86	84	115	100	117	U R 120	105	89	69	70	78	64	47	52	52	44
5	43	38	S 33	35	26	22	28	53	65	75	88	93	89	110	107	90	76	68	75	U S 62	U S 41	38	S 40	37
6	42	37	29	25	21	23	25	59	79	R 92	102	92	U R 121	R 159	163	156	R 140	107	90	59	48	U S 44	S 48	U S 44
7	U S 44	42	51	41	30	J S 17	24	56	68	70	95	98	101	R 114	R 131	R 132	C	C	C	C	C	40	S 41	S 41
8	38	S 40	49	33	18	17	24	60	77	79	99	R 126	R 138	146	147	143	116	84	71	61	57	56	51	39
9	40	43	42	35	31	31	34	57	64	74	95	94	107	R 119	R 137	R 113	95	90	84	61	66	54	50	43
10	U S 43	42	42	33	28	27	30	59	79	72	78	80	100	107	101	101	93	84	88	S 72	72	46	S 43	43
11	43	42	40	38	28	25	30	71	80	65	82	104	U R 120	142	138	125	113	104	78	S 63	52	U S 50	42	43
12	40	S 40	S 36	37	40	30	26	63	83	91	98	102	R 120	141	146	125	122	111	84	S 76	S 76	58	52	S 62
13	S 51	S 44	S 37	S 40	52	22	27	62	R 75	79	90	103	104	110	122	U R 120	130	100	84	S 66	59	55	50	41
14	40	42	S 40	37	37	31	35	S 63	77	80	87	93	98	R 118	R 121	97	99	99	83	64	52	57	37	39
15	43	43	33	35	37	37	26	61	73	85	99	123	99	R 126	R 147	149	R 144	R 128	S 84	U S 80	J S 84	U S 59	S 50	S 50
16	50	51	43	37	35	28	28	67	81	83	92	108	109	109	117	R 119	R 106	109	109	S 93	S 72	S 68	S 75	S 73
17	S 66	S 61	55	50	30	22	26	60	81	82	94	99	99	107	133	145	R 137	R 135	U S 106	U S 104	U S 84	U S 65	S 58	S 48
18	S 43	S 41	S 43	63	21	20	J S 24	62	91	84	R 103	106	111	149	163	U R 157	U R 136	U R 122	110	88	U S 92	90	U S 86	84
19	84	79	70	S 44	31	34	30	61	75	87	100	R 111	109	114	R 106	94	87	84	86	S 81	S 64	56	S 64	S 52
20	S 44	S 50	56	41	38	24	27	59	84	102	96	100	105	R 119	126	R 120	104	90	78	S 75	S 65	53	S 50	S 45
21	S 41	34	37	31	33	30	31	61	79	84	94	112	89	R 104	124	R 120	107	100	95	78	72	F 40	40	A
22	F 29	F	33	40	31	22	25	58	74	86	96	114	106	113	130	132	106	92	92	55	40	40	S 40	40
23	S 41	35	F	F 30	F 32	F	F 20	55	72	72	93	116	121	142	150	160	R 162	135	130	118	U S 78	S 54	S 44	40
24	33	31	32	35	38	30	22	58	82	87	106	J R 117	130	R 152	166	162	144	124	133	U S 119	S 87	76	J S 63	U S 49
25	50	52	48	43	34	21	U S 26	63	J R 74	63	89	124	R 128	R 129	139	R 136	112	96	83	A	53	50	57	S 55
26	S 55	51	36	30	29	29	32	64	78	89	80	85	95	R 120	R 137	R 145	R 150	R 150	J S 157	S 130	S 91	S 94	S 74	S 38
27	35	37	32	32	34	S 28	28	54	75	73	83	91	95	86	98	R 117	R 118	U R 120	110	U S 99	S 82	U S 77	76	31
28	A	U S 31	31	32	J S 58	S	26	55	71	77	112	J R 120	U R 130	R 139	U R 153	U R 165	U R 167	U R 165	U S 176	U S 106	U S 104	79	S 52	41
29	36	32	30	27	30	31	S 31	57	66	R 87	R 112	102	92	108	123	R 148	141	U R 123	U S 125	U S 106	U S 110	U S 79	S 64	S 39
30	U S 42	32	31	F	45	F	29	53	69	73	83	104	80	100	J R 113	133	107	100	91	U S 84	U S 78	U S 76	A	35
31	32	33	28	29	30	28	26	57	70	74	96	110	96	95	R 124	146	U R 156	R 139	U S 140	S 134	S 110	S 90	S 65	S 54
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	31	28	31	31	31	31	31	31	31	31	31	31	30	30	30	29	30	31	29	30
MED	42	42	36	35	31	27	27	59	75	80	95	103	106	119	130	132	117	106	90	S 81	S 72	56	S 51	S 43
UQ	S 47	44	43	40	37	30	30	62	80	86	100	112	119	R 136	146	146	R 140	R 123	112	S 104	S 84	76	S 64	S 50
LQ	39	37	32	31	28	22	26	57	70	74	88	98	98	108	120	118	104	90	34	S 64	53	48	S 43	40

OCT. 1987 | FOF2 (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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 24sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	U L 470	L 460	L 480	L 480	430	L	L	A					
2									L	U L 430	470	470	470	U L 480	U L 480	450	L	L						
3									L	L	L	470	470	460	U L 460	460	420	L	L					
4									L	L	U L 440	L 460	U L 470	470	480	450	L	L						
5									L	L	480	470	L 480	L 450	450	430	L	L						
6									L	L	450	U L 480	500	500	U L 460	U L 440	L	L						
7									L	L	L 500	U L 480	U L 510	L 490	L 480	U L 470	C	C	C					
8									L	L	L	U L 480	U L 500	L 480	L 470	L 500	L 430	L						
9									L	L	U L 480	L 480	U L 500	U L 510	U L 490	U L 490	U L 450	U L 360						
10									L	L	L 470	U L 490	U L 500	500	U L 480	L	L	L						
11									L	L	U L 500	L 500	U L 500	L 500	500	U L 460	L	A						
12									L	L	L	L	480	500	U L 480	L	L	L						
13									A	L	L	U L 430	L 500	L 490	U L 460	L	L	L						
14									L	L	L 480	U L 480	L 500	L 480	L	L	L	A						
15									L	L	L	U L 480	U L 500	U L 500	U L 500	L 470	L							
16									L	L	U L 460	U L 470	L	L	500	U L 450	L	L						
17									L	L	L	470	U L 400	U L 530	L 500	490	L							
18									L	L	U L 500	U L 500	L	U L 510	U L 490	L	L							
19									L	L	L	L 470	U L 490	U L 500	U L 480	L	L							
20									L	L	L	U L 490	U L 500	L 490	L 480	L	L							
21									L	L	U L 500	L 480	L	L	L 490	L	L	L						
22									L	L	L	L 480	L 480	U L 510	U L 480	L	L							
23									L	L	L	L 470	L	U L 480	U L 490	L	L							
24									L	L	U L 470	U L 460	L	L	L 490	L	L							
25										A	A	A	A	U L 470	U L 480	A								
26									L	L	L 470	L 440	L	L	U L 490	U L 490	L	L						
27										L	L	L 500	L	U L 480	L	L	L							
28										L	L	U L 470	L	U L 460	U L 490	L	L							
29										L	L	L	L	L	A	A	A							
30										L	U L 430	L 460	U L 460	U L 470	L	A	A							
31									L	L	U L 450	L	U L 490	U L 490	U L 480	L	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	16	27	21	26	27	14	3	1						
MED										U L 430	U L 470	L 480	U L 490	L 490	U L 480	L 460	L 430	U L 360						
UQ											L 490	U L 480	U L 500	L 500	L 490	L 490	L 440							
LQ											U L 455	L 470	L 470	U L 480	U L 480	450	425							

OCT. 1987 | FOF1 (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | FOE (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								190	R 240	A	A	330	A	340	330	305	280	A	S					
2								S	A	A	A	325	330	340	330	320	230	220	S					
3								195	A	A	A	A	335	340	330	A	A	A	A					
4								S	R 250	A	A	330	335	335	330	320	230	230	S					
5								200	A	A	310	325	330	330	325	305	270	215	S					
6								S	A	A	310	A	330	340	A	300	270	215	S					
7								200	R 250	300	320	330	340	345	335	310	C	C	C					
8								190	240	A	A	330	340	340	330	S 320	280	230	S					
9								200	260	300	A	A	A	360	350	320	A	A	S					
10								190	R 250	300	320	330	340	R 345	340	320	280	235	S					
11								A	A	300	315	330	340	350	340	320	290	225	S					
12								190	A	A	310	325	335	340	330	315	280	220	S					
13								S	A	290	305	320	330	A	335	320	290	220	S					
14								195	250	290	315	R 325	A	340	325	310	280	R 215	S					
15								S	R 250	290	315	A	A	A	330	320	300	S						
16								S	A	A	A	330	340	345	340	315	290	A						
17								200	250	290	310	330	A	A	A	A	A	A						
18								S	A	300	320	A	A	340	330	320	230	220						
19								190	260	300	320	340	R 345	A	A	320	230	S						
20								190	A	A	A	A	A	A	A	A	A	R 230						
21								175	R 255	R 295	340	345	345	345	340	305	280	210						
22								160	R 235	R 290	R 310	A	A	A	320	300	230	210						
23								A	A	A	A	R 330	A	330	325	300	270	215						
24								A	240	290	310	A	R 340	R 340	320	305	270	210						
25								200	A	290	R	A	A	340	330	310	A	A						
26								A	A	A	A	A	R 335	340	330	R 305	R 260	R 195						
27								S	250	285	305	320	330	U A 330	320	300	265	S						
28								190	240	285	310	R 325	A	R 340	330	R 305	R 275	S						
29								190	R 250	R 280	300	320	330	A	325	A	A	S						
30								S	245	280	305	325	330	330	A	A	A	S						
31								195	R 255	R 285	R 335	340	345	345	R 335	300	A	205						
	00	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	18	19	20	21	20	24	26	26	22	13						
MED								190	250	290	310	330	335	340	330	310	280	218						
UQ								200	R 250	300	320	330	340	345	335	320	280	225						
LQ								190	240	288	310	325	330	340	325	305	270	210						

OCT. 1987 | FOE (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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 28	J A 25	22	22	E S 16	E S 16	E S 16	24	30	J A 32	J A 54	G 31	38	38	G	J A 50	36	J A 28	J A 50	J 30	J A 42	J A 34	E S 16	J A 22
2	20	22	E S 16	E S 16	E S 16	E S 16	E S 16	23	J A 37	33	38	G	G	G	39	34	31	28	22	22	J A 30	J A 34	J A 52	J A 33
3	J A 22	21	E S 16	E S 16	E S 16	21	18	G	30	J A 35	J A 33	J A 24	G	G 30	36	J A 31	28	J A 35	J A 34	J A 25	J A 26	18	19	J A 22
4	E S 16	20	E S 16	E S 16	E S 16	E S 16	E S 16	23	29	J A 38	J A 40	G	G	G	G	G	32	24	18	E S 16	E S 16	E S 16	E S 16	E S 16
5	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	J A 27	30	G	G	38	38	G	35	38	30	J A 38	J A 26	J A 20	22	E S 18	E S 16
6	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	J A 27	J A 35	G	38	37	G	J A 33	G	G 26	23	23	J A 19	E S 16	E S 16	E S 16	J A 24
7	J A 27	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	23	30	35	36	39	41	G	38	37	C	C	C	C	C	21	E S 17	E S 16
8	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	20	23	J A 35	J A 46	J A 46	G	G	G	G	G	30	J A 27	17	19	E S 16	E S 16	J A 26	22
9	J A 23	J A 22	J A 26	J A 25	18	17	E S 16	24	32	32	J A 34	J A 35	J A 36	G	38	34	J A 32	J A 30	22	22	23	J A 25	22	J A 21
10	22	20	20	J A 21	J A 21	J A 19	20	24	G	G 27	35	G	G	G	38	35	32	29	20	24	J A 35	J A 25	J A 25	E S 16
11	E S 16	E S 16	E S 16	E S 16	E S 16	20	20	J A 26	28	33	40	40	42	40	G	G	J A 47	J A 47	J A 22	J A 33	J A 21	J A 24	19	19
12	J A 24	22	22	J A 22	E S 16	E S 16	E S 16	G	J A 30	J A 36	G 30	G	G	39	37	36	G	30	J A 26	22	J A 22	22	J A 25	22
13	20	E S 16	E S 16	E S 16	18	18	18	J A 37	J A 120	J A 43	J A 57	J A 72	J A 52	J A 44	G	42	G	28	J A 30	J A 30	J A 30	J A 21	J A 32	J A 25
14	J A 24	20	E S 16	E S 16	E S 16	E S 16	E S 16	23	J A 37	38	J A 37	G	J A 44	G	G	33	G	J A 36	J A 34	J A 32	19	19	E S 16	20
15	J A 20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	32	J A 64	J A 50	J A 90	J A 49	J A 39	G	42	32	J A 24	J A 32	J A 41	J A 60	J A 25	J A 32	J A 25
16	22	J A 20	J A 20	J A 20	18	22	E S 16	22	31	40	38	G 29	J A 36	G	37	J A 33	G 27	J A 32	J A 31	J A 30	J A 40	J A 25	J A 20	22
17	E S 16	J A 22	J A 21	J A 22	E S 16	E S 16	E S 16	G	28	36	34	35	J A 40	J A 35	J A 50	J A 39	J A 32	J A 23	J A 24	J A 22	19	J A 22	J A 34	J A 54
18	J A 24	J A 24	J A 24	J A 26	J A 20	J A 20	E S 16	23	J A 31	37	43	42	J A 48	G	G	38	G	J A 30	J A 20	J A 26	J A 25	22	22	19
19	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	31	33	37	36	41	43	38	G	J A 30	23	J A 21	21	J A 21	22	J A 26	J A 26
20	J A 22	22	J A 26	J A 21	E S 16	E S 16	E S 16	24	28	J A 37	J A 36	J A 42	J A 36	J A 40	J A 35	J A 34	J A 30	J A 24	E S 16	22	21	J A 22	22	22
21	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	J A 35	J A 38	36	G	G	G	G	G	34	32	24	J A 28	J A 22	21	J A 25	J A 26	J A 55
22	J A 28	J A 25	21	21	E S 16	E S 16	E S 16	22	J A 37	J A 44	36	J A 34	J A 34	J A 42	G	36	34	24	J A 21	E S 16	J A 33	J A 27	22	J A 25
23	J A 32	J A 65	J A 32	J A 32	J A 25	J A 42	J A 26	J A 26	J A 33	J A 31	J A 41	G	J A 35	G	G	37	37	32	J A 33	E S 16	E S 16	E S 16	E S 16	E S 16
24	J A 20	23	J A 19	J A 17	E S 16	E S 16	23	24	29	36	37	36	36	J G 33	G	G	G	G	19	39	E S 17	25	29	32
25	18	23	E S 15	E S 16	E S 16	E S 16	18	G	J A 34	J A 47	J A 44	J A 71	J A 78	43	37	J A 63	J A 54	J A 36	J A 43	J A 86	J A 106	J A 26	J A 29	37
26	J A 24	J A 25	E S 16	E S 16	E S 16	E S 16	E S 16	J A 26	J A 33	J A 54	J A 47	J A 37	G	G	G	G	G	23	E S 16	E S 16	E S 16	E S 16	J A 24	22
27	22	20	E S 16	E S 16	E S 16	E S 16	18	22	G	32	34	37	37	38	38	J A 54	31	J A 24	J A 22	E S 16	E S 16	E S 16	E S 16	J A 32
28	J A 37	J A 32	J A 21	E S 16	E S 16	S	E S 16	G	29	37	38	G	J A 56	38	G	G	G 26	20	22	23	J A 26	E S 16	22	J A 25
29	J A 40	J A 52	J A 29	J A 26	J A 26	22	E S 16	G	G	32	35	41	40	42	J 65	J A 55	J A 53	22	E S 16	E S 16	22	E S 16	E S 16	E S 16
30	20	J A 21	J A 43	J A 25	J A 21	18	22	20	27	30	37	38	40	36	J A 53	J A 54	J A 47	J A 33	J A 26	J A 26	J A 22	J A 18	J A 60	22
31	23	J A 24	E S 16	E S 15	E S 15	E S 16	E S 16	G	G	34	G	40	40	G	J A 73	33	30	G	E S 16	E S 16	E S 16	E S 16	E S 16	22
	00	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	30	31	31	31	31	31	31	31	31	31	31	30	30	30	30	30	31	31	31
MED	22	21	E S 16	E S 16	E S 16	E S 16	E S 16	23	30	36	37	35	37	G 33	33	34	31	28	J A 22	22	J A 22	22	22	22
UQ	J A 24	J A 24	J A 22	J A 22	17	18	18	24	J A 33	J A 38	J A 40	40	41	39	38	38	34	J A 30	J A 31	J A 30	J A 30	J A 25	J A 26	J A 25
LQ	17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E G 20	28	32	34	G	E G 34	G	G	E G 31	G 26	24	20	19	E S 17	E S 16	E S 16	20

OCT. 1987 | FOES (0.1 MHZ)

IONOSPHERIC DATA

OCT. 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	26	25	E S 16	E S 16	E S 16	E S 16	E S 16	24	28	32	35	G 26	38	38	G	40	33	28	40	E S 16	24	25	E S 16	E S 16
2	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	37	33	38	G	G	G	38	34	31	28	22	E S 16	E S 16	25	A A 52	33
3	18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	28	33	33	24	G	G 30	36	31	28	31	25	23	25	E S 16	19	22
4	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	29	35	35	G	G	G	G	G	32	24	18	E S 16	E S 16	E S 16	E S 16	E S 16
5	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	27	30	G	G	38	38	G	35	38	30	30	20	E S 16	E S 16	E S 18	E S 16
6	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	27	35	G	35	37	G	33	G	G 26	28	23	19	E S 16	E S 16	E S 16	E S 16
7	26	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	23	30	34	36	38	41	G	38	35	C	C	C	C	C	E S 16	E S 17	E S 16
8	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	33	43	43	G	G	G	G	G	29	26	16	E S 16	E S 16	E S 16	E S 16	E S 16
9	20	18	23	20	E S 16	E S 16	E S 16	23	29	32	34	35	36	G	38	33	29	25	18	E S 15	E S 16	E S 16	E S 16	E S 16
10	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	G	G 25	35	G	G	G	38	35	32	29	18	20	28	18	E S 16	E S 16
11	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	28	33	38	38	42	38	G	G	32	47	22	32	20	E S 16	E S 16	E S 16
12	18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	26	30	G 28	G	G	39	37	35	G	26	24	E S 16	19	E S 16	E S 16	18
13	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	28	56	34	35	40	45	36	G	42	G	28	28	30	25	E S 16	20	E S 16
14	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	33	35	36	G	35	G	G	32	G	36	32	25	E S 16	E S 16	E S 16	E S 16
15	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	30	34	38	38	38	36	G	33	32	24	26	25	25	E S 16	27	18
16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	29	34	38	G 27	G 28	G	37	20	G 22	27	26	E S 16	22	E S 16	E S 16	E S 16
17	E S 16	E S 16	20	17	E S 16	E S 16	E S 16	G	28	33	34	35	36	35	38	32	29	23	22	18	E S 16	18	21	24
18	22	E S 16	20	20	E S 16	E S 16	E S 16	23	31	33	36	38	42	G	G	38	G	G 20	E S 16	25	E S 16	E S 16	E S 16	E S 16
19	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	21	29	33	35	36	38	40	38	G	30	23	20	E S 16	E S 16	18	21	24
20	E S 16	E S 16	20	E S 16	E S 16	E S 16	E S 16	24	28	32	34	35	36	36	34	34	29	24	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
21	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	24	28	34	G	G	G	G	G	34	29	24	24	E S 16	E S 16	E S 16	E S 16	A A 55
22	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	20	27	30	34	34	34	40	G	36	33	24	18	E S 16	24	25	E S 16	E S 16
23	29	26	E S 16	E S 16	21	19	E S 16	24	31	31	34	G	34	G	G	36	35	32	30	E S 16	E S 16	E S 16	E S 16	E S 16
24	E S 16	17	E S 16	E S 16	E S 16	E S 16	E S 16	22	27	35	33	34	35	G 27	G	G	G	G	E S 16	U A 25	E S 17	25	29	U A 30
25	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	G	26	46	41	65	48	41	36	61	45	35	43	A A 86	E S 16	E S 16	25	27
26	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	19	28	32	37	34	G	G	G	G	G	22	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
27	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	G	32	34	37	37	37	38	40	31	23	E S 16	E S 16	E S 16	E S 16	E S 16	28
28	A A 37	29	21	E S 16	E S 16	S	E S 16	G	29	37	36	G	37	48	G	G	G 22	20	E S 16	E S 16	25	E S 16	E S 16	19
29	E S 16	E S 16	E S 16	21	E S 16	E S 16	E S 16	G	G	32	35	41	40	40	58	50	45	22	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
30	E S 16	E S 16	E S 16	20	19	E S 16	E S 16	20	27	30	37	38	40	36	37	50	45	32	26	26	20	E S 16	A A 60	E S 16
31	E S 16	20	E S 16	E S 15	E S 15	E S 16	E S 16	G	G	33	G	40	39	G	38	33	28	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	30	30	30	30	30	31	31	31
MED	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	28	33	35	34	36	G 30	33	34	29	26	22	E S 16	E S 16	E S 16	E S 16	E S 16
UQ	17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	30	34	36	38	38	38	38	36	32	29	26	25	22	E S 16	20	20
LQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E G 19	27	32	34	G	E G 28	G	G	E G 20	G 22	23	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16

The Radio Research Laboratory, Japan

OCT. 1987 | FBES (0.1 MHZ)

IONOSPHERIC DATA

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

OCT. 1987 | FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | M(3000)F2 (0.01) | 135° E Mean Time (G.M.T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	300	S 325	315	330	305	315	335	360	345	335	310	325	325	315	305	325	330	315	345	340	350	300	300	S 285
2	335	320	345	315	305	305	320	365	355	320	315	365	305	295	310	325	R 325	U R 320	U R 320	S 365	365	310	A	U S 300
3	320	365	325	345	350	320	315	365	320	335	335	R 320	310	310	305	U R 315	R 325	R 335	355	U R 365	325	U R 300	300	U S 290
4	S 285	S 290	S 310	S 310	S 365	S 290	295	360	360	295	330	290	315	U R 335	335	360	345	330	345	330	320	305	305	295
5	300	315	S 305	340	365	320	320	360	345	335	330	335	305	320	325	355	330	350	345	U S 355	U S 315	290	S 300	295
6	320	350	345	340	330	325	320	340	355	R 355	350	315	U R 290	R 300	290	320	R 340	345	345	340	310	U S 295	S 290	U S 305
7	U S 320	310	315	355	380	J S 295	335	355	350	330	330	325	285	R 300	R 305	R 320	C	C	C	C	C	260	S 290	S 280
8	290	S 300	325	365	305	295	310	350	350	330	305	R 310	R 310	310	315	325	335	335	330	325	305	305	325	295
9	285	315	335	330	305	305	310	360	360	325	330	295	300	R 295	R 315	R 310	315	335	355	325	270	305	310	300
10	U S 325	310	335	365	355	335	315	355	365	345	320	300	300	315	305	315	335	320	340	S 320	290	305	S 290	300
11	300	310	335	340	355	300	300	360	350	345	310	305	U R 300	315	310	310	320	335	345	S 325	305	U S 320	295	280
12	300	S 310	S 290	285	325	340	305	350	330	330	325	295	R 300	300	315	310	320	340	335	S 330	S 310	310	290	S 295
13	S 275	S 285	S 285	S 310	380	320	315	360	R 360	355	335	320	315	310	310	U R 325	330	350	345	S 315	355	335	310	305
14	300	310	S 310	325	335	320	315	S 350	365	345	345	320	305	R 320	R 330	320	325	345	335	335	300	325	295	280
15	300	335	285	285	310	355	305	350	350	350	315	350	315	R 295	R 290	315	R 320	R 345	S 345	U S 295	J S 280	U S 285	S 290	S 280
16	310	315	350	310	330	355	320	350	365	350	315	335	310	300	300	R 320	R 310	320	330	S 320	S 290	S 295	S 280	S 300
17	S 280	S 310	325	350	350	340	305	350	360	305	330	340	290	280	310	290	R 315	R 335	U S 320	U S 300	U S 275	U S 270	S 275	S 270
18	S 280	S 280	S 315	380	355	350	J S 290	320	350	335	330	330	315	280	310	U R 320	U R 325	U R 325	345	320	U S 295	310	U S 300	295
19	290	315	340	S 320	320	350	335	360	345	335	320	R 335	315	310	R 315	325	345	350	345	S 345	S 310	295	S 280	S 290
20	S 285	S 290	320	365	355	310	315	345	355	350	350	330	325	R 300	325	R 300	335	335	325	S 320	S 315	290	S 280	S 335
21	S 340	295	310	320	320	285	290	350	355	350	320	350	290	R 285	305	R 335	320	330	335	320	340	F 325	325	A
22	F 310	F	305	335	355	320	340	360	350	350	315	335	295	290	315	330	325	340	365	365	300	300	S 300	310
23	S 315	315	F	F 335	F 360	F	F 350	365	370	335	310	330	315	305	295	285	R 325	325	345	315	U S 320	S 285	S 295	325
24	335	290	295	315	340	400	295	325	280	315	315	J R 315	305	R 290	295	315	320	320	340	U S 365	S 290	320	J S 335	U S 305
25	300	315	310	315	380	310	U S 290	350	J R 345	335	280	310	R 310	R 300	305	R 320	330	345	350	A	290	300	290	S 310
26	S 300	315	320	300	295	310	310	365	350	365	335	315	285	R 310	R 305	R 305	R 325	R 330	J S 345	S 365	S 300	S 335	S 315	S 300
27	285	325	310	330	350	S 320	320	365	360	370	335	340	335	315	295	R 290	R 340	U R 335	325	U S 335	S 285	U S 285	355	355
28	A	U S 355	305	290	J S 350	S	290	345	340	310	320	J R 315	U R 315	R 315	U R 310	U R 310	U R 310	U R 315	U S 340	U S 320	U S 290	330	S 290	305
29	320	310	335	295	300	305	S 290	360	350	R 335	R 340	325	305	305	310	R 305	335	U R 335	U S 335	U S 350	U S 285	U S 280	S 285	S 305
30	U S 355	295	290	F	355	F	325	360	360	355	335	345	325	330	J R 315	345	325	330	340	U S 295	U S 295	U S 340	A	315
31	310	335	305	295	315	340	325	360	355	330	335	355	350	300	R 315	330	U R 335	R 310	U S 330	S 330	S 335	S 305	S 285	S 295
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	31	28	31	31	31	31	31	31	31	31	31	31	30	30	30	29	30	31	29	30
MED	300	312	315	328	350	320	315	360	350	335	330	325	310	305	310	320	325	335	342	S 330	S 302	305	S 295	S 300
UQ	320	320	335	340	355	340	320	360	360	350	335	335	315	315	315	325	335	340	345	S 345	320	315	305	305
LQ	290	300	305	310	318	305	302	350	348	330	315	315	300	298	305	R 310	320	325	335	S 320	S 290	292	S 290	S 290

OCT. 1987 | M(3000)F2 (0.01)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | M(3000)F1 (0.01) | 135° E Mean Time (G.M.T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	U L 390	L 400	L 385	L 375	385	L	L	A					
2									L	U L 390	380	380	405	U L 395	U L 375	375	L	L						
3									L	L	L	380	395	400	U L 390	385	380	L	L					
4									L	L	U L 410	L 405	U L 380	375	375	390	L	L						
5									L	L	375	380	L 385	L 405	385	395	L	L						
6									L	L	385	U L 395	385	380	U L 380	U L 385	L	L						
7									L	L	L 360	U L 365	U L 370	L 360	L 355	U L 350	C	C	C					
8									L	L	L	U L 365	U L 360	L 375	L 360	L 360	L 385	L						
9									L	L	U L 365	L 375	U L 370	U L 365	U L 380	U L 385	U L 385	U L 390						
10									L	L	L 395	U L 375	U L 380	370	U L 375	L	L	L						
11									L	L	U L 370	L 380	U L 370	L 380	370	U L 380	L	A						
12									L	L	L	L	375	380	U L 375	L	L	L						
13									A	L	L	U L 395	A	L 375	U L 400	L	L	L						
14									L	L	L 395	U L 395	L 380	L 385	L	L	L	A						
15									L	L	L	U L 395	U L 380	U L 380	U L 370	L 380	L							
16									L	L	U L 390	U L 380	L	L	380	U L 385	L	L						
17									L	L	L	380	U L 415	U L 370	L 370	365	L							
18									L	L	U L 420	U L 385	L	U L 370	U L 365	L	L							
19									L	L	L	L 395	U L 375	U L 370	U L 375	L	L							
20									L	L	L	U L 375	U L 370	L 375	L 365	L	L							
21									L	L	U L 360	L 375	L	L	L 355	L	L	L						
22									L	L	L	L 375	L 385	U L 370	U L 365	L	L							
23									L	L	L	L 380	L	U L 385	U L 365	L	L							
24									L	L	U L 360	U L 370	L	L	L 355	L	L							
25										A	A	A	A	U L 360	U L 345	A								
26									L	L	L 380	L 395	L	L	U L 355	U L 355	L	L						
27										L	L	L 380	L	U L 395	L	L	L							
28										L	L	U L 395	L	U L 400	U L 385	L	L							
29										L	L	L	L	L	A	A	A							
30										L	U L 410	L 390	U L 405	U L 380	L	A	A							
31									L	L	U L 375	L	U L 385	U L 375	U L 365	L	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	16	27	20	26	27	14	3	1						
MED										U L 390	U L 380	L 380	U L 380	L 378	U L 370	L 382	L 385	U L 390						
UQ											L 395	L 395	L 390	L 385	U L 378	385	L 385							
LQ											U L 368	L 375	U L 372	U L 370	L 365	L 365	382							

OCT. 1987 | M(3000)F1 (0.01)

IONOSPHERIC DATA

OCT. 1987 | 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									250	250	270	260	250	290	300	270	265	260	A					
2									250	260	270	250	260	290	280	260	240	260						
3									235	260	270	270	290	275	275	280	260	240	220					
4									250	300	265	280	290	260	260	240	250	270						
5									250	260	275	260	310	275	260	260	265	240						
6									260	240	250	270	315	290	275	250	240	240						
7									240	250	280	255	305	300	280	275	C	C	C					
8									250	265	295	265	280	275	275	265	240	240						
9									225	L 275	270	270	290	315	280	260	275	250						
10									225	230	260	290	300	280	270	275	255	250						
11									230	240	290	300	A 290	280	265	265	260	A						
12									250	250	280	290	320	310	270	260	275	235						
13									A	255	270	275	265	290	280	270	250	225						
14									225	240	250	275	280	280	260	250	260	240						
15									230	240	260	250	265	315	300	260	250							
16									235	240	260	265	290	290	290	270	260	245						
17									240	240	260	255	280	310	290	275	250							
18									240	240	260	260	280	300	270	250	240							
19									235	250	265	255	265	265	265	260	255							
20									245	250	240	265	265	270	265	250	225							
21									240	250	280	240	270	320	295	255	255	240						
22									230	245	270	265	250	270	285	260	245							
23									230	275	285	275	270	255	290	270	250							
24									250	L 250	280	275	300	300	285	260	240							
25										A 250	305	290	275	280	280	250								
26									245	235	255	255	270	295	280	280	255	230						
27										240	250	260	260	265	300	270	240							
28										250	260	280	265	270	260	255	250							
29										260	250	250	250	290	A	A	A							
30										230	245	250	240	265	280	A	235							
31									230	245	270	235	250	285	290	265	235	220						
	00	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	31	31	31	31	31	30	29	28	16	1					
MED									240	250	270	265	275	285	280	260	250	240	220					
UQ									250	258	278	275	290	298	290	270	260	250						
LQ									230	240	260	255	265	272	270	255	240	238						

OCT. 1987 | H'F2 (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 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 24sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A 260	A	S 270	260	S	S	240	230	225	210	210	220	200	190	190	A	A 240	A	A	220	210	A	265	270
2	250	230	210	S	S	S	E S 270	225	A	210	200	205	190	190	190	A 220	220	A 240	A 240	210	205	A	A	A
3	260	210	S	S 260	S	S	E S 270	220	H 210	210	200	210	200	190	190	H 190	220	A	210	220	210	240	240	E A 290
4	E S 310	S	S 235	210	S 230	S	S	230	220	230	200	H 190	H 190	H 200	210	220	220	220	240	215	230	S 270	240	260
5	S 280	250	E S 270	240	230	S	S 270	220	220	H 190	200	200	200	190	H 190	A 220	A 250	A	240	210	S 230	S	S	E S 290
6	240	230	230	220	S	S	S	A 240	220	A 230	200	205	190	H 190	200	220	220	A 230	210	210	220	E S 275	E S 275	E S 280
7	A 300	270	240	200	210	S	E S 280	220	220	200	A 230	A 215	A 210	225	A 230	220	C	C	C	C	C	S 285	305	S 300
8	S 320	285	230	205	S	S	E S 280	230	A 225	A	A	220	210	200	190	H 230	220	235	225	S 230	S 240	S 255	S 245	S 265
9	E S 300	275	245	A 245	S 255	S 260	S 240	215	225	205	200	200	190	180	250	225	H 220	235	220	230	230	250	250	270
10	260	260	240	230	230	E S 250	240	220	220	215	190	190	H 190	195	A 230	A 235	230	A 240	220	215	A 235	A 250	E S 275	E S 290
11	S 290	260	240	240	220	S	S	240	220	220	200	210	230	205	H 200	220	A 235	A	220	A 230	A 230	S 250	S 280	E S 295
12	E A 290	260	E S 300	S	250	200	S	240	220	205	190	200	210	A 230	A 225	215	220	A	215	220	220	225	250	E A 280
13	E S 290	E S 280	S	S 270	200	S	S	220	A	210	210	A 220	A	200	200	A	240	A	215	A 240	A 240	220	250	280
14	E S 290	S 270	S 270	S 270	240	240	S 260	220	A	210	200	200	200	200	200	H 200	H 200	A	220	220	230	230	S	S
15	S 280	250	E S 265	S	S 260	230	S	230	A	210	220	200	210	200	210	210	230	240	200	220	A 240	E S 280	A	A
16	265	250	220	S 250	S 240	220	E S 265	235	230	200	200	H 190	H 200	H 190	A 220	210	A 225	A	230	210	A 230	260	240	250
17	S 260	250	250	220	210	S	S	220	210	210	210	200	H 190	H 190	200	210	H 200	230	210	210	200	265	E A 280	A
18	A	S	E S 290	205	S 240	S	S	230	225	210	220	210	A 220	H 190	H 190	A	220	220	210	205	205	240	235	240
19	250	235	205	205	255	230	235	220	205	200	200	205	205	220	200	205	220	235	220	200	205	235	245	270
20	295	260	250	205	205	S 240	S 280	225	225	220	215	205	200	200	195	225	225	230	210	210	225	245	245	230
21	230	270	255	250	245	S 290	290	220	225	230	210	205	215	205	200	240	230	240	225	215	215	220	225	A
22	290	300	290	235	205	S 270	250	220	220	220	215	200	200	200	190	245	230	230	220	200	A 270	A 290	270	270
23	A 290	A 295	275	270	250	A 265	S 250	220	215	205	205	200	190	200	200	240	250	230	220	200	200	255	250	230
24	230	E A 320	E S 305	E S 270	250	200	S	230	230	A 225	200	195	195	H 180	H 215	255	220	230	230	200	210	250	220	E A 300
25	270	250	245	235	195	S	S	230	225	A	A	A	A	A 220	215	A	240	235	230	A	S 250	270	280	260
26	250	230	235	250	S 285	S 295	265	220	220	A 245	210	200	200	185	225	200	235	230	210	195	215	220	205	245
27	E S 305	240	S 260	S 255	230	S 250	240	215	220	210	205	210	210	200	A 220	A	A	245	215	210	240	240	220	S
28	A	A	A	S	220	S	S	225	215	A 230	210	210	A 230	215	205	210	230	240	205	200	205	210	S 240	E A 280
29	260	260	250	A	E S 300	S 280	S 260	220	220	220	A 230	A 220	A 230	210	A	A	A	220	210	200	200	220	235	E S 280
30	230	E S 290	S	A	220	S 230	S 250	210	215	200	200	200	210	200	A 230	A	A	225	210	A 220	A 230	210	A	S 250
31	260	275	245	285	255	240	S 260	220	225	215	205	230	195	195	220	235	225	225	205	200	200	195	220	235
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	27	27	25	26	17	20	31	27	29	29	30	29	31	30	24	27	22	29	29	30	28	26	25
MED	265	255	245	240	232	S 240	S 252	220	220	210	205	205	200	200	200	220	225	230	220	210	222	244	242	U 255
UQ	S 285	272	S 260	258	250	S 265	S 265	230	225	220	210	210	210	202	220	232	232	240	225	220	230	258	260	E E 280
LQ	260	250	238	220	220	230	245	220	220	205	200	200	195	190	195	210	220	230	210	200	205	222	235	250

OCT. 1987 | H'F (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | 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 24sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								115	110	105	A	115	110	105	105	105	105	A	S					
2								S	105	105	105	105	105	105	105	105	105	105	S					
3								110	110	A	A	105	105	115	110	105	105	A	A					
4								S	110	A	A	110	110	110	110	110	110	110	S					
5								110	A	105	105	110	110	110	110	110	110	110	S					
6								S	A	A	110	105	105	105	A	105	A 115	110	S					
7								E B 125	105	105	E B 125	E B 125	115	110	100	110	C	C	C					
8								B 120	110	105	110	105	110	100	100	110	115	115	S					
9								125	105	105	105	100	100	B 120	115	115	A	A	S					
10								110	110	A 115	A 120	110	110	110	110	110	110	110	S					
11								A	A	110	A 120	A 120	110	110	110	110	110	110	S					
12								110	A	A	A 115	110	110	110	A 115	110	110	110	S					
13								S	105	105	105	105	110	110	105	110	110	B 115	S					
14								110	110	110	110	110	A	110	110	110	110	110	S					
15								S	110	110	110	A	A	A	110	110	110	S						
16								S	A	A	A	A 115	A 115	110	105	A 115	A 115	A						
17								B 120	110	105	105	105	A	A	A	A	A	A						
18								S	105	105	105	A	105	110	110	110	105	A 115						
19								S	105	105	105	110	105	105	105	105	110	S						
20								S	105	105	105	105	105	105	105	105	105	105						
21								S	105	105	105	105	105	110	105	105	110	110						
22								S	105	105	105	A	A	A	100	100	100	110						
23								105	A	A	105	100	A	100	100	100	100	100						
24								A	100	105	105	100	A 115	105	105	100	100	100						
25								130	110	110	110	115	110	100	100	A 120	A 120	B 120						
26								A	A	A	A	A	100	100	100	100	105	110						
27								S	110	105	A 115	A 115	A 115	A	110	A 120	105	S						
28								E S 125	110	110	105	B 115	A	105	105	105	A 115	S						
29								E S 125	105	110	110	105	A 115	A	A 115	A	110	S						
30								S	110	110	105	105	105	110	105	105	105	S						
31								S	105	105	105	105	105	105	105	105	105	110						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								14	24	24	26	27	25	26	29	29	28	19						
MED								114	108	105	105	105	110	110	105	110	110	110						
UQ								125	110	110	110	111	110	110	110	110	110	110						
LQ								110	105	105	105	105	105	105	105	105	105	110						

OCT. 1987 | H'E (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | 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	100	100	100	100	S	S	S	E G 135	120	120	110	100	120	120	G	115	150	100	120	110	110	105	S	105
2	100	100	S	S	S	S	S	125	120	120	120	G	G	G	120	120	120	140	120	110	100	100	100	100
3	100	100	S	S	S	100	100	G	120	110	110	120	G	100	120	115	115	100	100	100	100	100	120	120
4	S	100	S	S	S	S	S	120	120	110	110	G	G	G	G	G	120	125	120	S	S	S	S	S
5	S	S	S	S	S	S	S	G	110	120	G	G	125	125	G	150	140	125	120	110	110	100	S	S
6	S	S	S	S	S	S	S	160	110	110	G	120	130	G	110	G	100	140	120	110	S	S	S	100
7	95	S	S	S	S	S	S	135	130	120	E G 170	140	130	G	150	140	C	C	C	C	C	120	S	S
8	S	S	S	S	S	S	130	120	115	110	100	G	G	G	G	G	145	125	120	115	S	S	105	95
9	100	95	95	95	100	100	S	130	125	E G 130	120	115	115	G	170	170	95	95	100	110	105	105	100	100
10	100	100	100	100	100	100	110	135	G	105	E G 140	G	G	G	E G 165	150	140	125	115	110	110	105	110	S
11	S	S	S	S	S	100	110	105	E G 130	125	125	E G 140	130	140	G	G	125	120	110	110	110	100	105	100
12	100	100	105	110	S	S	S	G	110	110	100	G	G	E G 160	150	145	G	125	110	110	110	110	110	100
13	100	S	S	S	120	120	115	120	115	115	115	115	115	120	G	125	G	120	115	110	105	110	110	105
14	105	105	S	S	S	S	S	E G 140	120	125	125	G	100	G	G	E G 140	G	135	120	110	110	110	S	110
15	100	S	S	S	S	S	S	125	125	120	120	110	110	110	G	E G 160	E G 145	110	110	110	100	100	100	100
16	110	110	110	105	105	110	S	150	150	145	150	100	100	G	E G 160	100	100	110	100	110	105	100	100	100
17	S	100	100	100	S	S	S	G	125	125	125	E G 130	100	100	100	100	100	100	100	100	100	100	100	100
18	100	110	100	100	100	100	S	140	125	125	125	120	120	G	G	E G 165	G	100	100	110	110	100	100	100
19	S	S	S	S	S	S	S	145	130	120	120	120	120	115	115	G	120	115	105	100	100	100	100	100
20	100	100	100	100	S	S	S	140	120	115	115	120	120	120	120	120	115	115	S	100	100	100	105	100
21	S	S	S	S	S	S	S	120	120	120	G	G	G	G	G	E G 160	140	150	120	100	100	120	100	100
22	105	100	100	100	S	S	S	120	120	115	115	105	100	100	G	150	130	E G 150	95	S	105	105	105	105
23	105	105	105	105	105	105	105	120	105	105	120	G	100	G	G	150	130	120	105	S	S	S	S	S
24	100	95	100	100	S	S	105	100	120	120	110	105	E G 150	105	G	G	G	G	100	105	S	105	100	100
25	100	100	S	S	S	S	130	G	115	110	110	100	110	120	125	115	110	110	105	105	105	100	100	100
26	100	100	S	S	S	S	S	105	105	100	100	105	G	G	G	G	G	125	S	S	S	S	105	100
27	105	105	S	S	S	S	110	125	G	135	130	125	130	130	125	120	120	100	100	S	S	S	S	100
28	100	100	100	S	S	S	S	G	140	135	125	G	110	130	G	G	100	100	100	100	130	S	105	100
29	100	110	105	100	100	100	S	G	G	140	140	135	135	120	120	110	115	110	S	S	100	S	S	S
30	100	100	110	100	100	100	110	150	155	E G 160	135	135	130	E G 140	125	120	115	115	110	110	110	110	105	100
31	100	100	S	S	S	S	S	G	G	115	G	140	135	G	100	145	120	G	S	S	S	S	S	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	23	22	14	13	8	10	10	23	27	31	27	21	23	17	16	23	24	23	26	23	22	22	21	25
MED	100	100	100	100	100	100	110	125	120	120	120	118	120	120	121	U 130	120	116	110	110	105	102	105	100
UQ	100	105	105	100	105	105	115	140	125	124	125	125	130	125	U 138	148	132	125	120	110	110	110	105	100
LQ	100	100	100	100	100	100	105	120	115	110	110	105	110	110	118	116	112	105	100	102	100	100	100	100

OCT. 1987 | H'ES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

OCT. 1987 | TYPES OF ES | 135° E Mean Time (G.M.T. + 9 h)

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

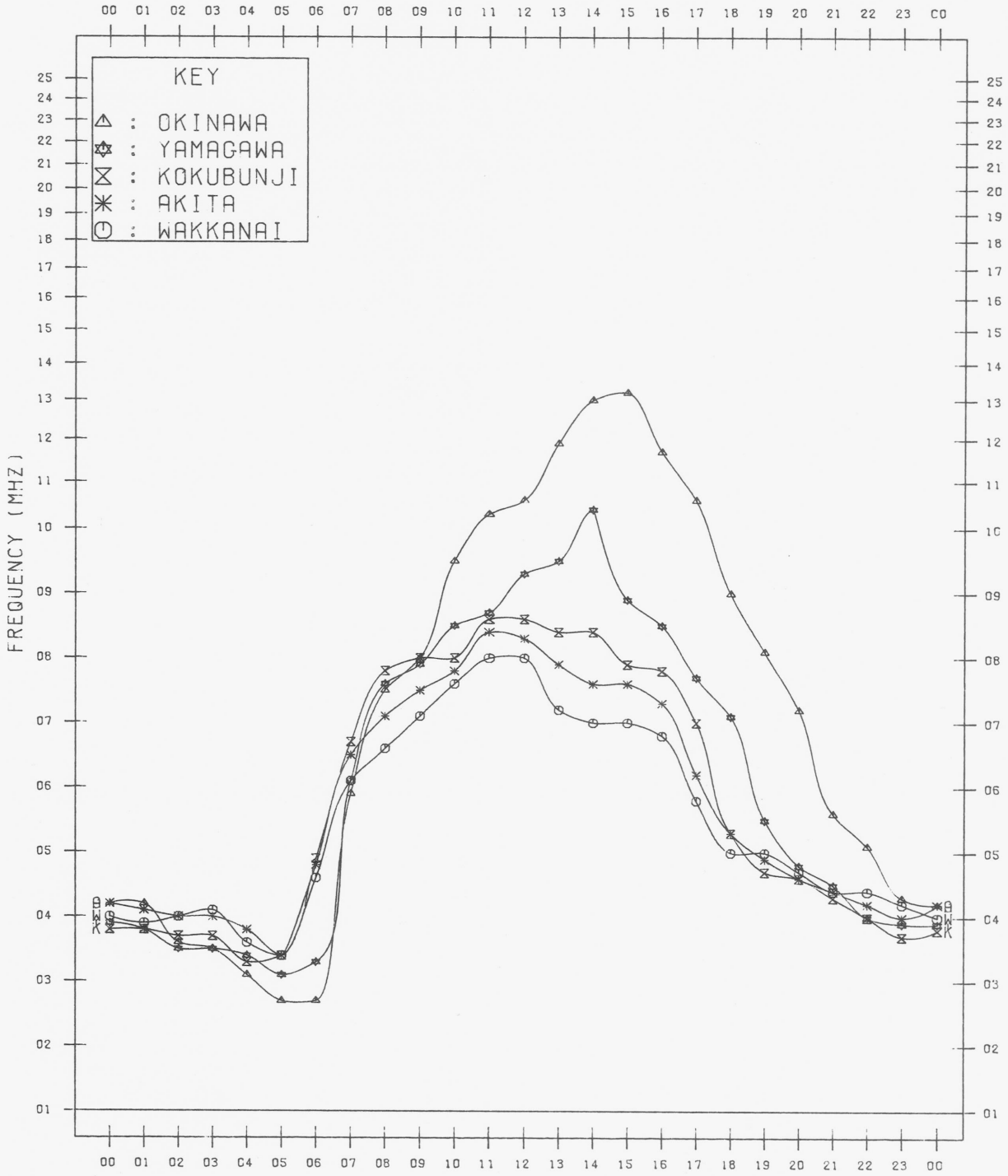
Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 2	F 1	F 2	F 2				C 2	C 1	C 1	L 1	L 1	C 1	C 1		C 3	H 2	L 3	C 4	F 1	F 2	F 2		F 1
2	F 1	F 1						C 1	C 1	C 1	C 1				C 1	C 1	C 1	H 2	C 1	F 2	F 3	F 4	F 3	F 3
3	F 3	F 1				F 2	F 1		C 1	L 2	L 1	C 1		L 1	C 1	C 1	C 1	L 3	L 5	F 4	F 4	F 1	F 1	F 4
4		F 1						C 2	C 1	L 2	L 2						CL 11	CL 11	CL 11					
5									L 1	C 1			C 1	CL 11		H 1	H 1	C 3	C 4	F 1	F 1	F 1		
6								HL 11	L 1	L 3		C 1	C 1		L 3		L 1	H 1	C 5	F 7				F 2
7	F 4							H 2	C 2	C 2	H 1	H 1	H 1		H 1	HL 11						F 1		
8							F 1	C 3	C 4	C 4	C 4						H 1	C 1	C 2	F 1			F 4	F 1
9	F 1	F 2	F 4	F 3	F 1	F 1		C 1	C 1	C 1	C 1	C 1	C 1		H 1	H 1	L 2	L 2	L 1	F 1	F 3	F 2	F 2	F 2
10	F 1	F 1	F 1	F 1	F 1	F 2	F 1	H 1		L 1	HL 11				H 1	H 1	H 1	C 1	C 1	F 2	F 6	F 4	F 1	
11						F 1	F 1	L 1	CL 11	C 2	CL 11	CL 11	C 1	H 1			C 3	C 4	L 3	F 5	F 2	F 4	F 1	F 1
12	F 1	F 1	F 1	F 1					L 2	L 1	L 2			H 1	HL 11	H 1		C 1	L 4	F 1	F 4	F 2	F 4	F 1
13	F 1				F 1	F 1	F 1	C 2	C 4	C 2	C 1	C 2	C 2	C 1		C 1		C 1	C 4	F 7	F 6	F 1	F 4	F 2
14	F 2	F 1						H 1	C 4	C 2	C 2		L 1			H 1		H 3	C 6	F 3	F 1	F 1		F 1
15	F 2							C 2	C 1	C 1	C 2	L 1	L 2	L 1		H 1	H 1	L 1	F 3	F 2	F 3	F 2	F 3	F 2
16	F 1	F 1	F 2	F 2	F 1	F 1		H 1	HL 11	HL 11	HL 11	L 1	L 1		H 1	L 1	L 1	L 1	F 2	FF 21	F 4	F 1	F 1	F 1
17		F 1	F 1	F 1					C 1	C 1	C 1	C 1	L 1	L 1	L 1	L 2	L 1	L 1	F 6	F 2	F 1	F 2	F 3	F 3
18	F 4	F 1	F 4	F 3	F 1	F 1		H 1	C 1	C 2	C 1	CL 11	C 1			H 1		L 1	F 2	FF 21	F 3	F 1	F 1	F 1
19								H 2	C 1	C 1	C 1	C 1	C 1	C 2	C 1		C 1	C 1	F 2	F 1	F 3	F 2	F 4	F 3
20	F 6	F 2	F 7	F 2				H 2	C 1	C 1	C 1	C 1	C 1	C 1	C 1	C 1	C 1	C 2		F 1	F 1	F 3	F 1	F 2
21								C 5	C 3	C 1						H 2	H 2	H 2	F 3	F 1	F 1	F 1	F 3	F 6
22	F 3	F 2	F 1	F 1				C 3	C 2	C 3	C 2	L 1	L 1	L 3		H 1	C 2	C 1	F 1		F 4	F 8	F 3	F 3
23	F 6	F 4	F 3	F 3	F 3	F 4	F 4	C 2	L 4	L 2	C 1		L 2			H 2	C 3	CL 53	F 7					
24	F 1	F 3	F 1	F 1			F 2	L 2	C 1	C 1	C 1	C 1	HL 11	L 1					F 1	F 6		F 2	F 2	F 4
25	F 1	F 1					F 1		C 3	C 5	C 3	C 3	C 4	C 2	C 2	CL 51	CL 41	C 6	F 6	F 4	F 2	F 2	F 2	F 3
26	F 2	F 2						L 1	L 2	L 3	L 3	L 2						C 2					F 3	F 2
27	F 1	F 1					F 1	C 2		H 1	CL 11	CL 11	CL 11	CL 12	C 1	CL 31	C 1	L 1	F 1					F 4
28	F 7	F 6	F 1						H 1	H 2	C 1		L 2	C 1			L 1	L 1	F 1	F 3	F 1		F 1	F 1
29	F 2	FF 12	F 2	F 6	F 2	F 1				H 1	HL 11	H 2	HL 11	CL 11	CL 41	LL 32	CL 31	L 1			F 1			
30	F 1	F 2	FF 12	F 2	F 2	F 1	F 1	H 1	H 1	H 1	H 2	H 1	H 1	H 1	C 1	C 4	C 6	C 4	F 3	F 5	F 4	F 1	F 5	F 1
31	F 1	F 2								C 1		H 1	C 2		LH 11	H 1	C 1							F 1
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratory, Japan

OCT. 1987 | TYPES OF ES

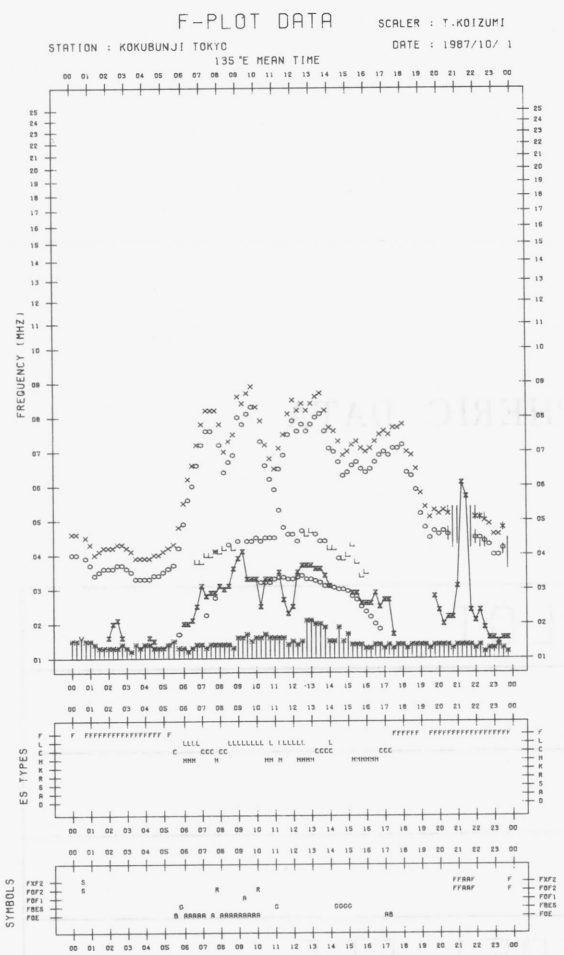
MONTHLY MEDIAN VALUES OF FOF2

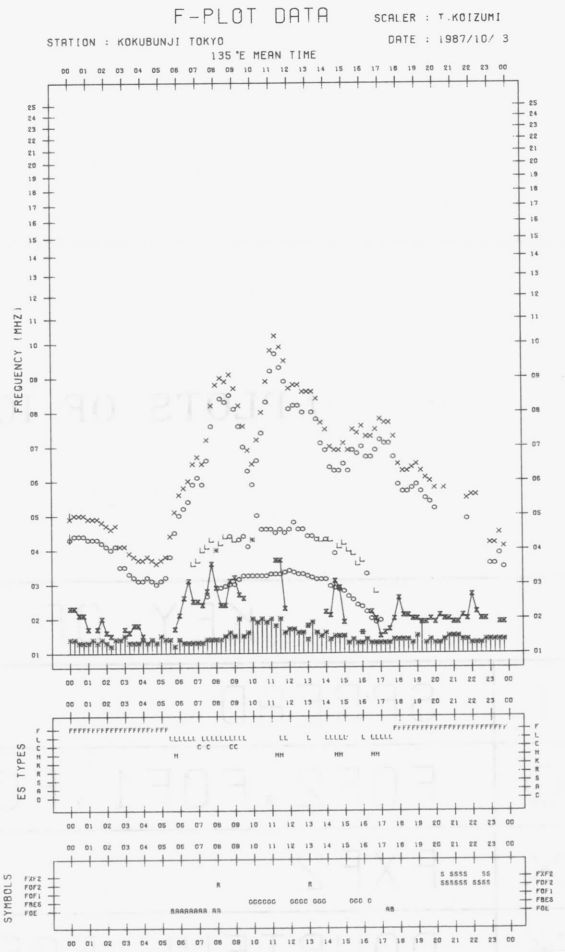
135 °E MEAN TIME OCT. 1987

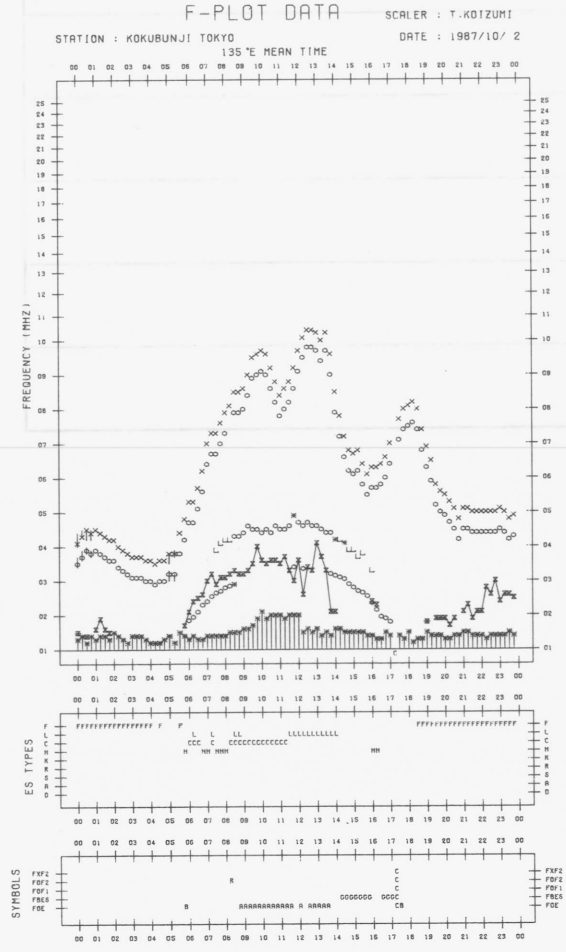


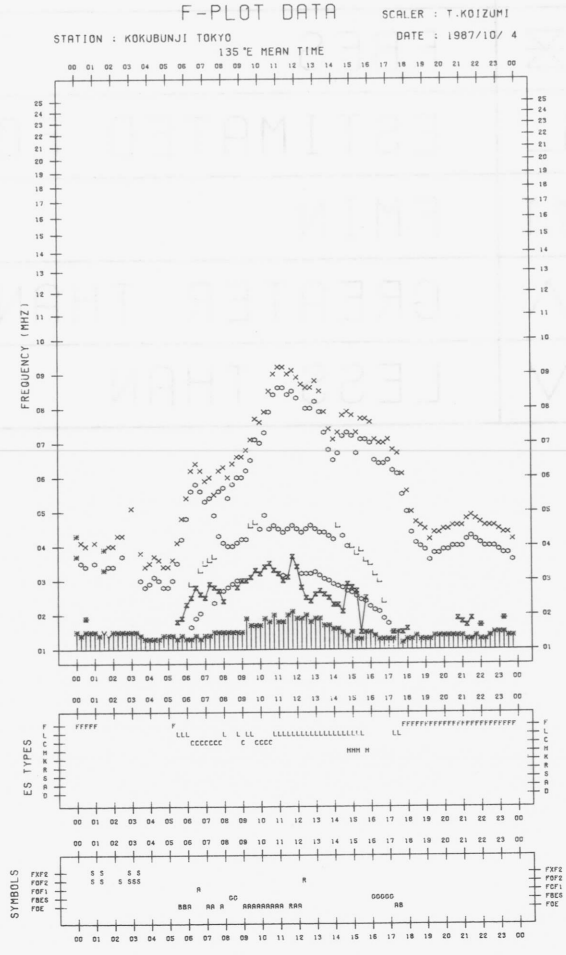
f-PLOTS OF IONOSPHERIC DATA

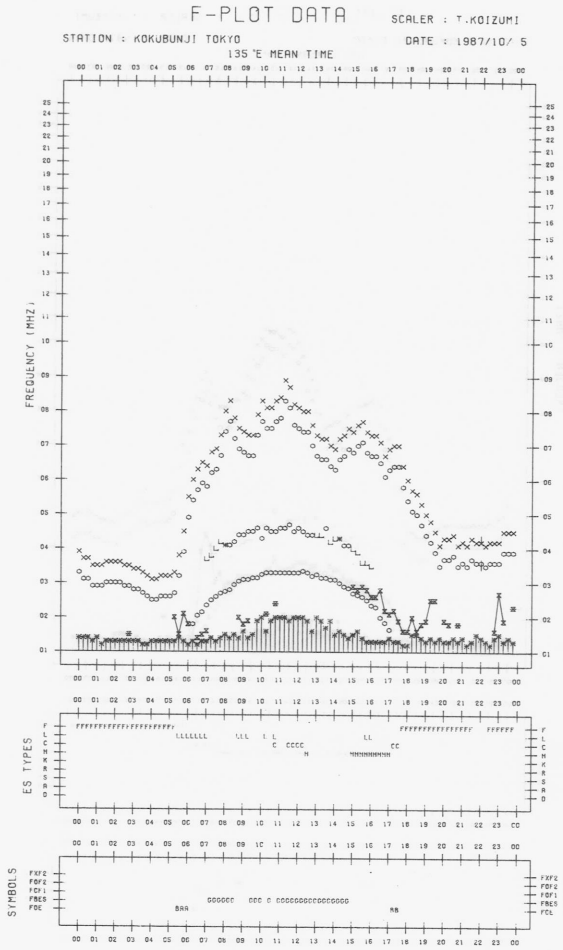
KEY OF F-PLOT	
I	SPREAD
○	FOF2, FOF1, FOE
×	FXF2
✳	DOUBTFUL FOF2, FOF1, FOE
⊠	FBES
⌊	ESTIMATED FOF1
*, Y	FMIN
∧	GREATER THAN
∨	LESS THAN

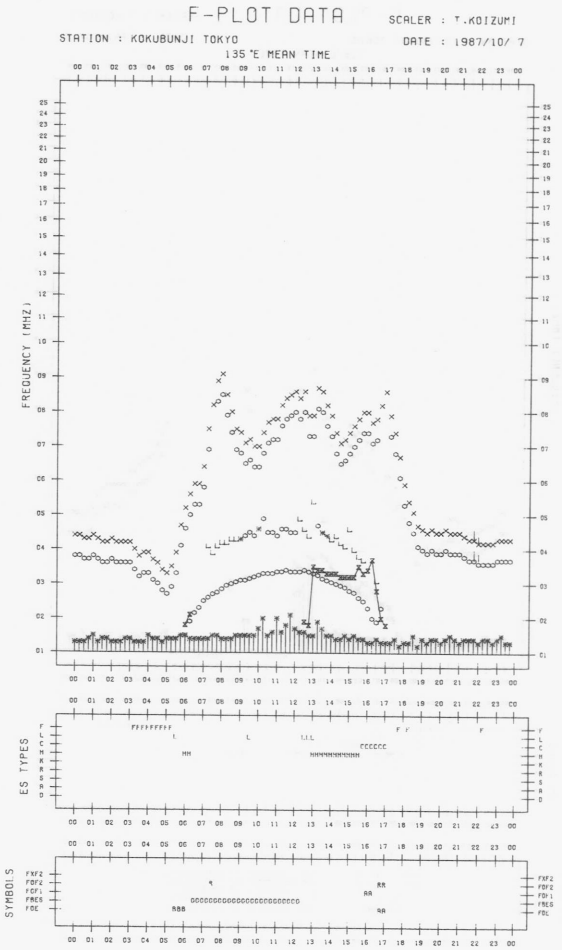

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/ 1
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

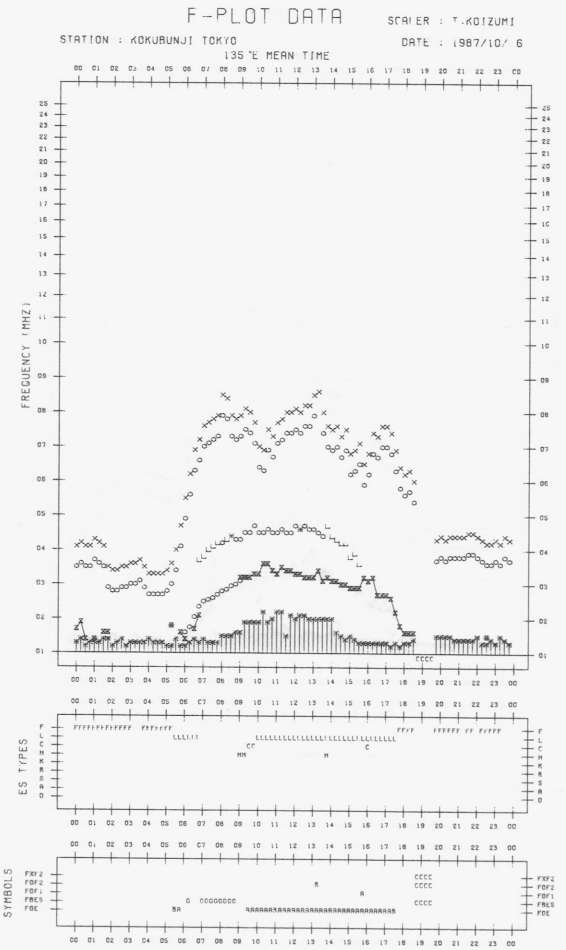

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/ 3
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

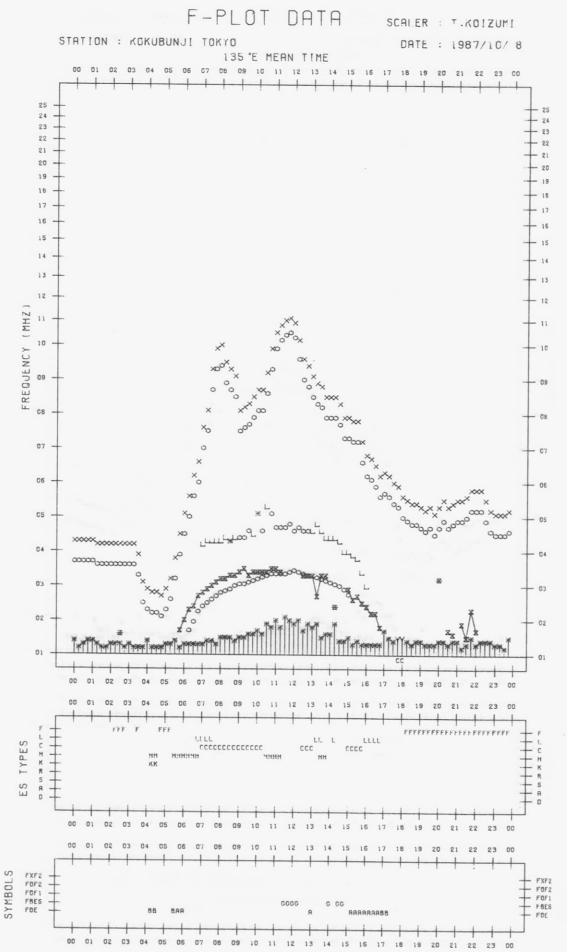

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/ 2
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

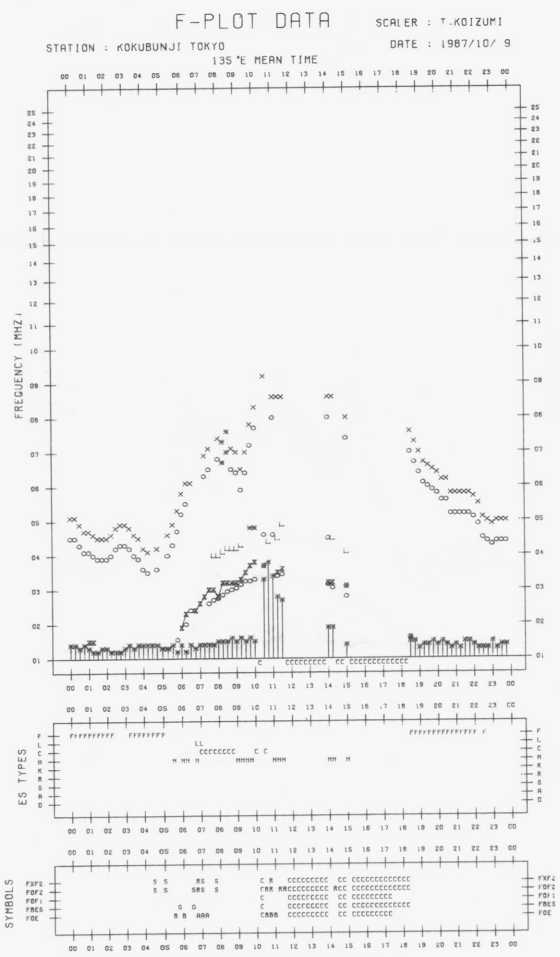

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/ 4
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

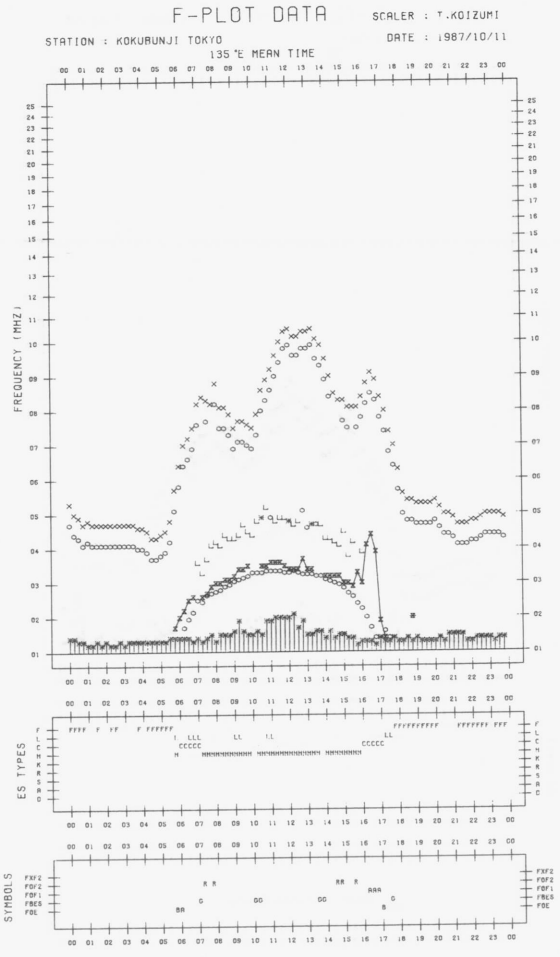

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/ 5
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

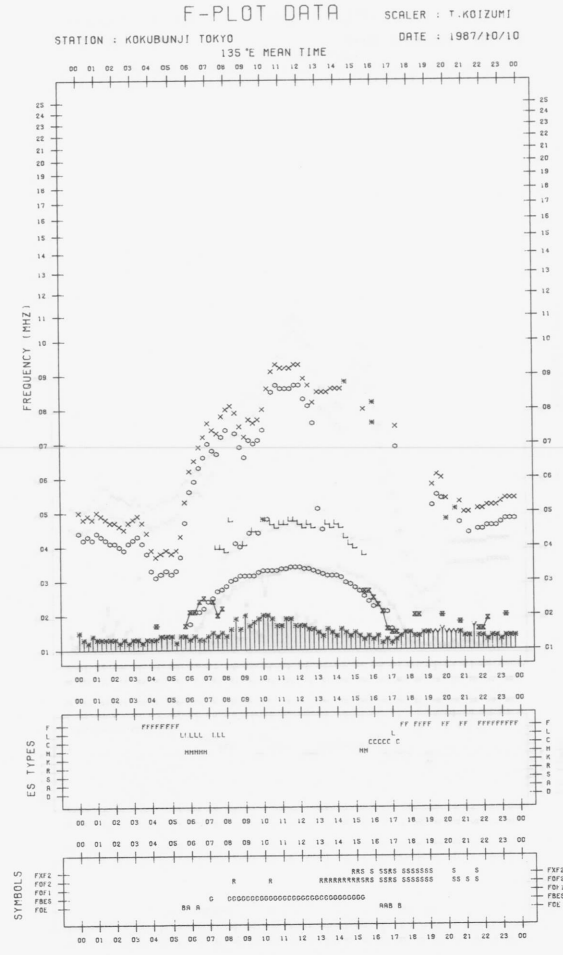

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/ 7
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

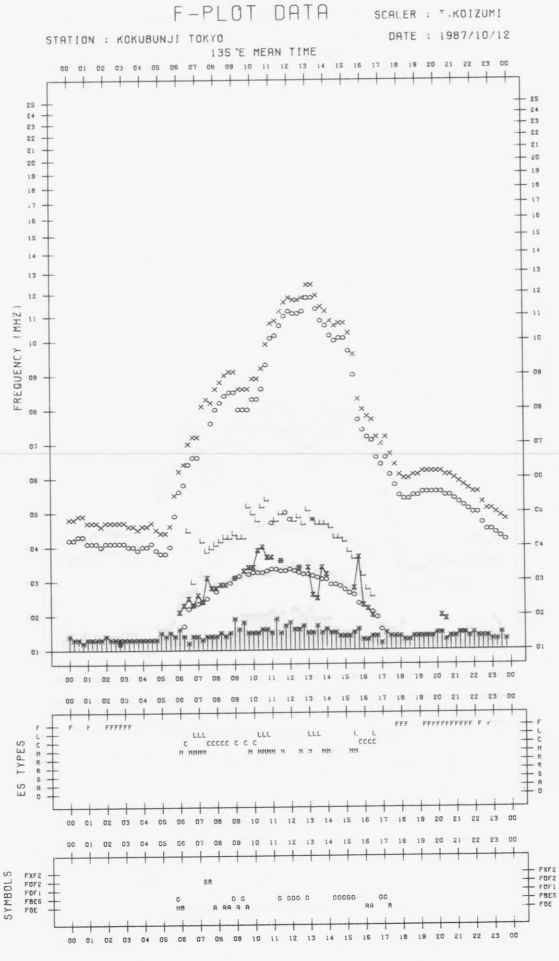

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/ 6
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

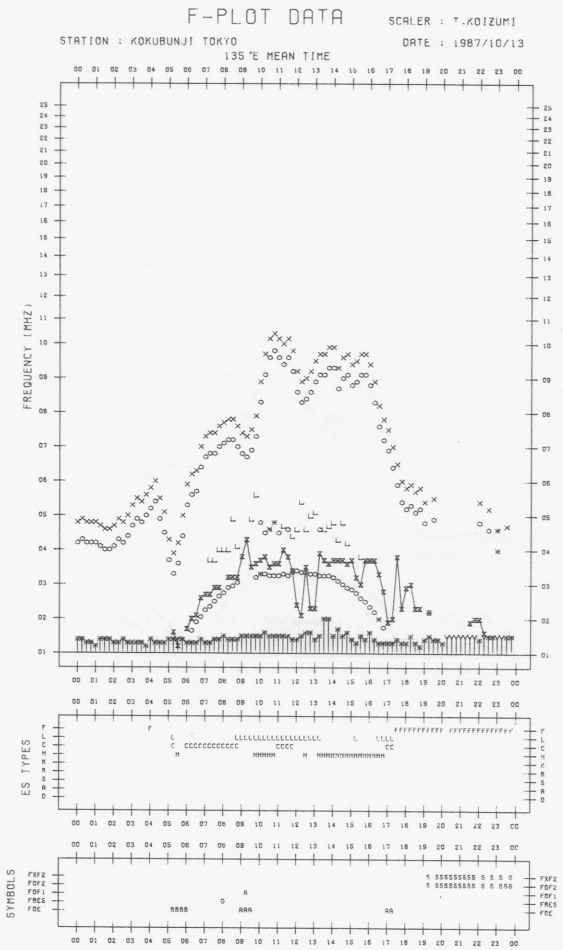

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/ 8
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

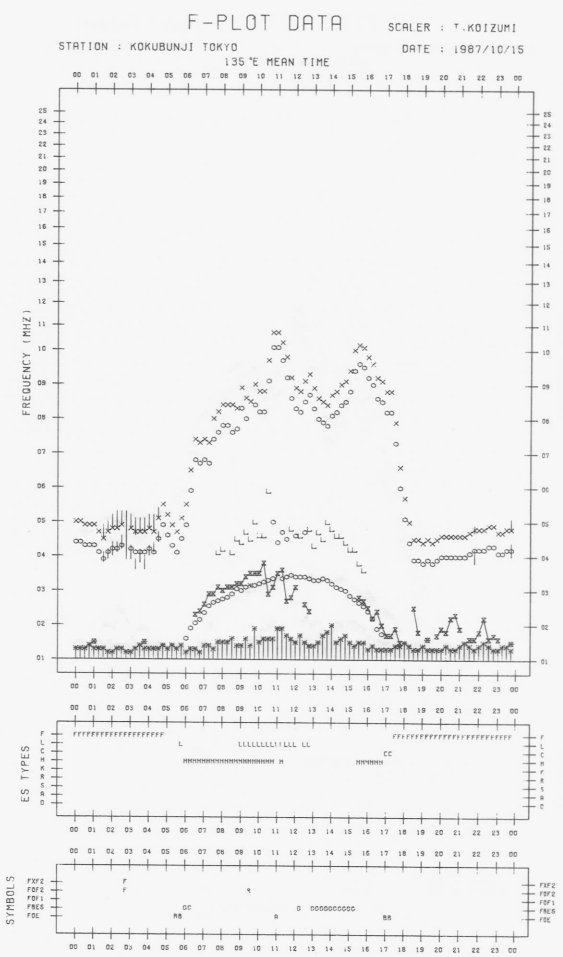

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/ 9
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

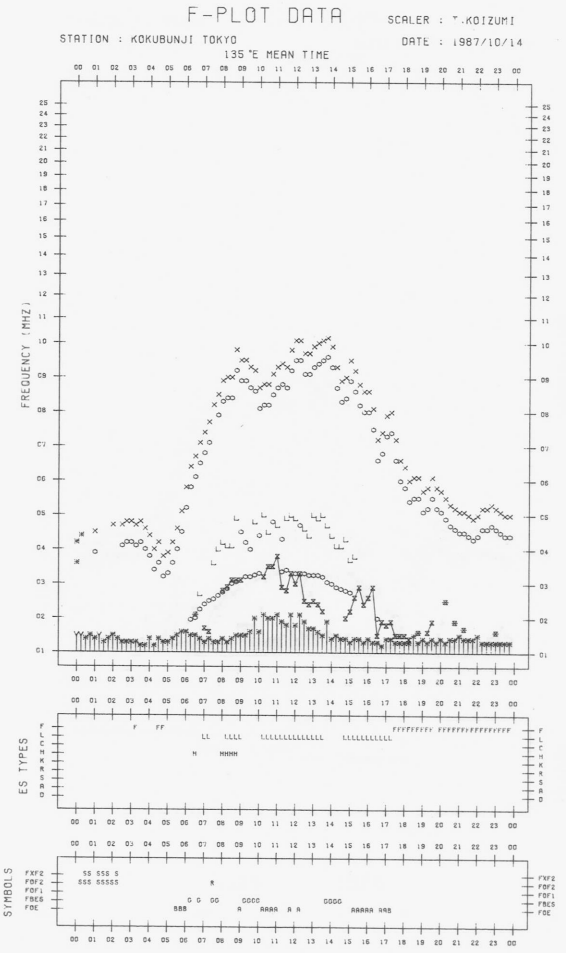

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/11
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

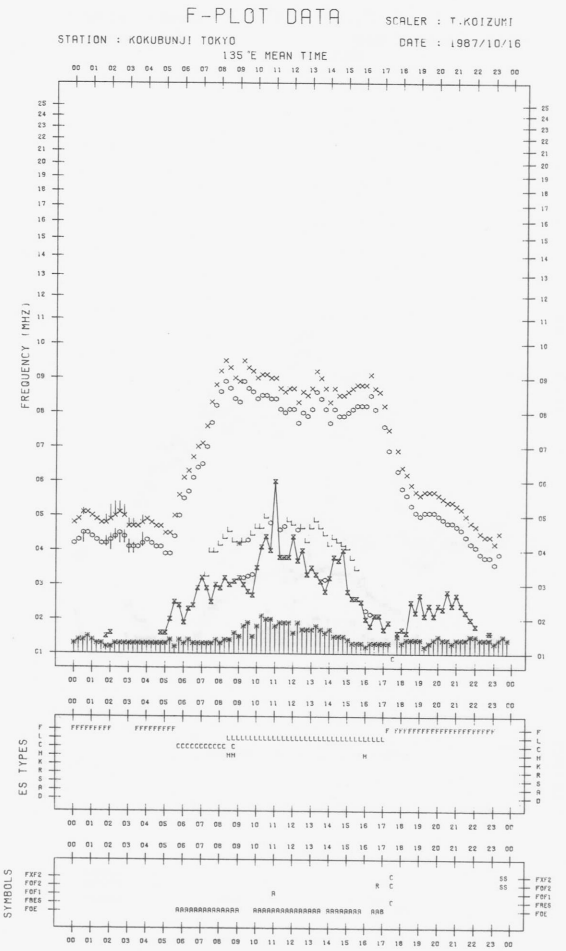

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/10
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

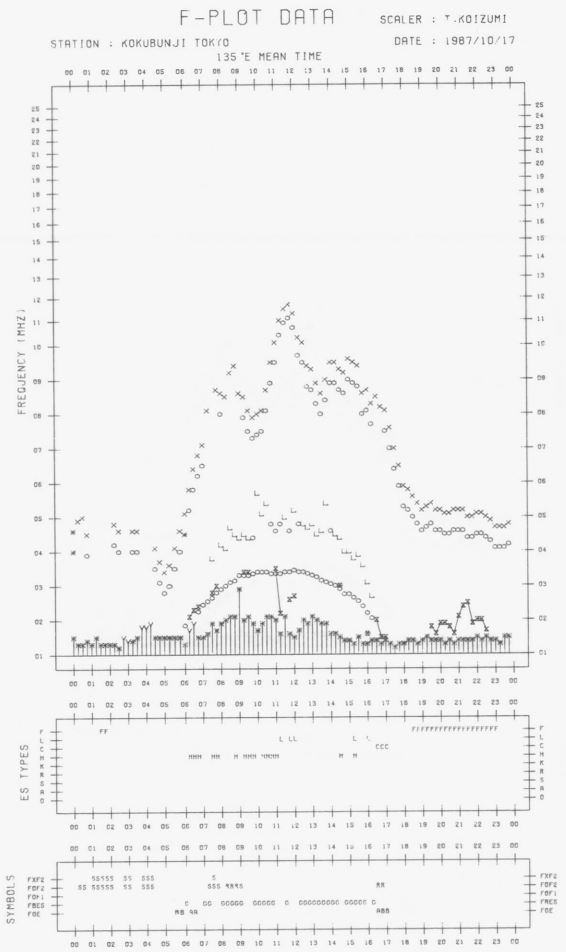

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/12
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

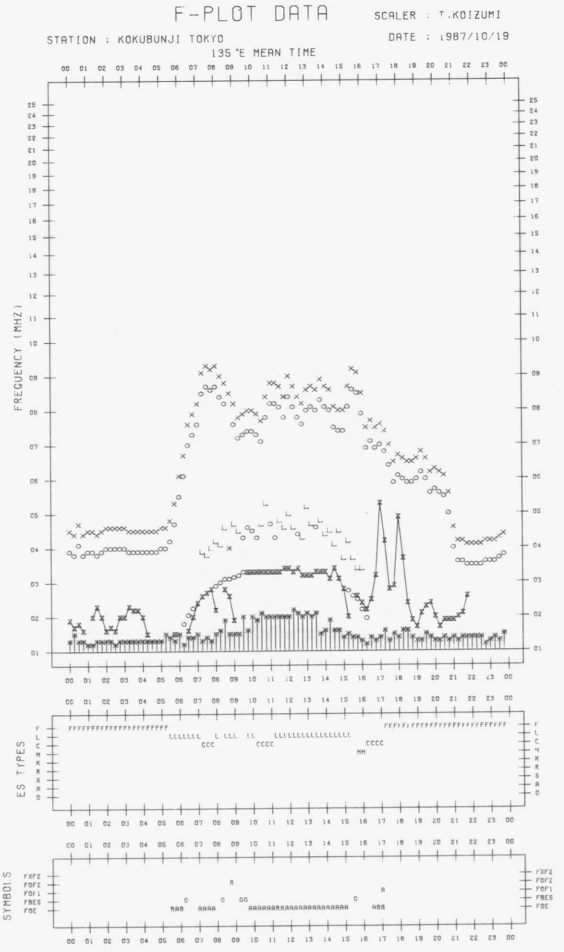

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/13
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

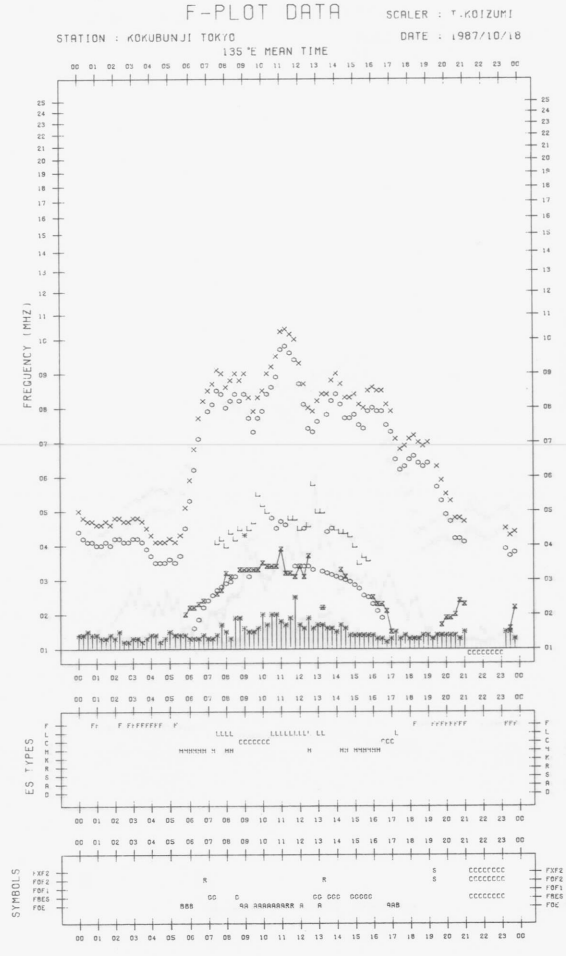

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/15
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

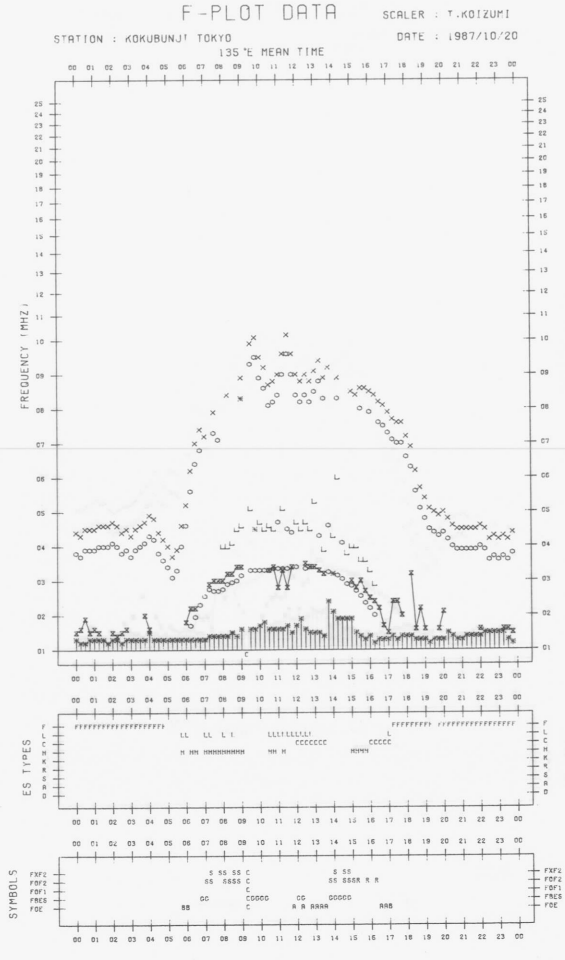

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/14
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

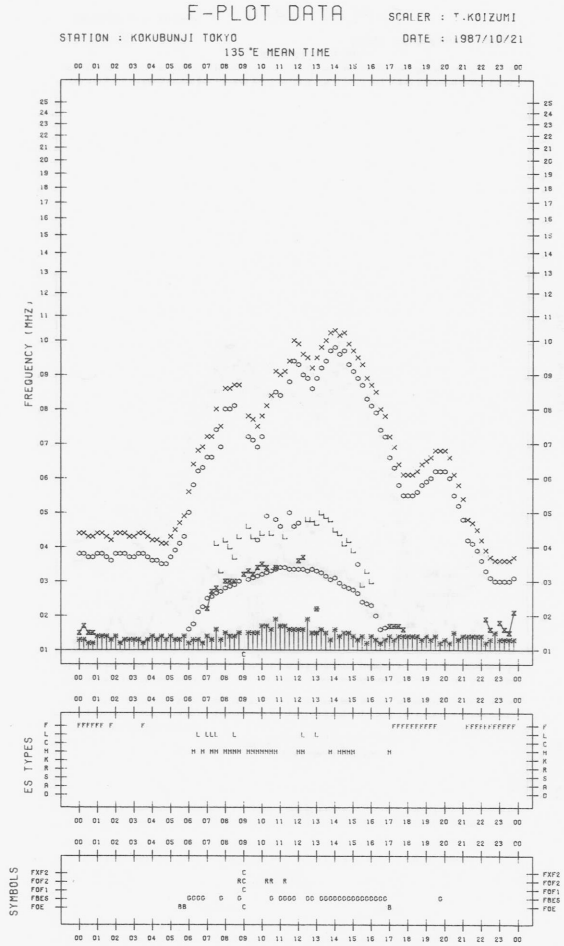

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/16
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

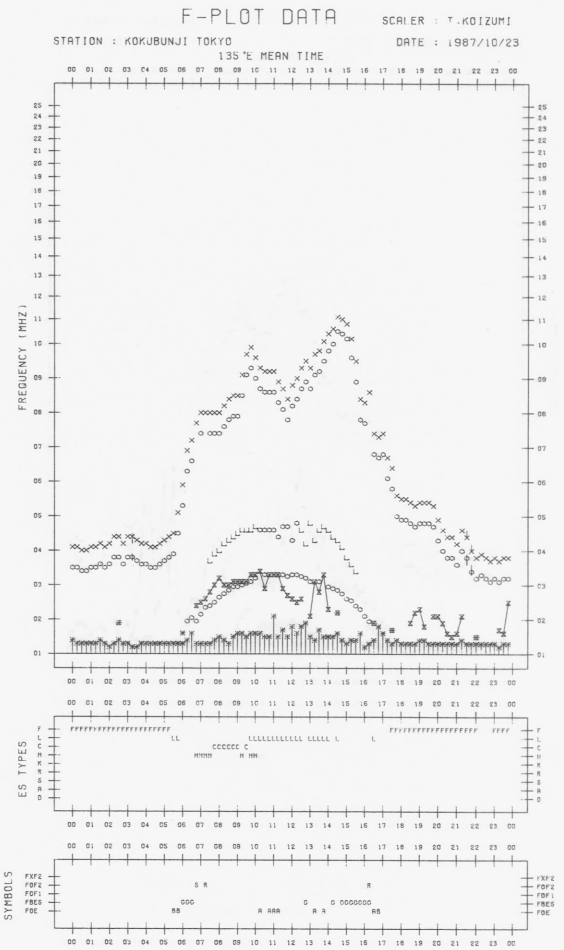

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/17
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FMES
FDE

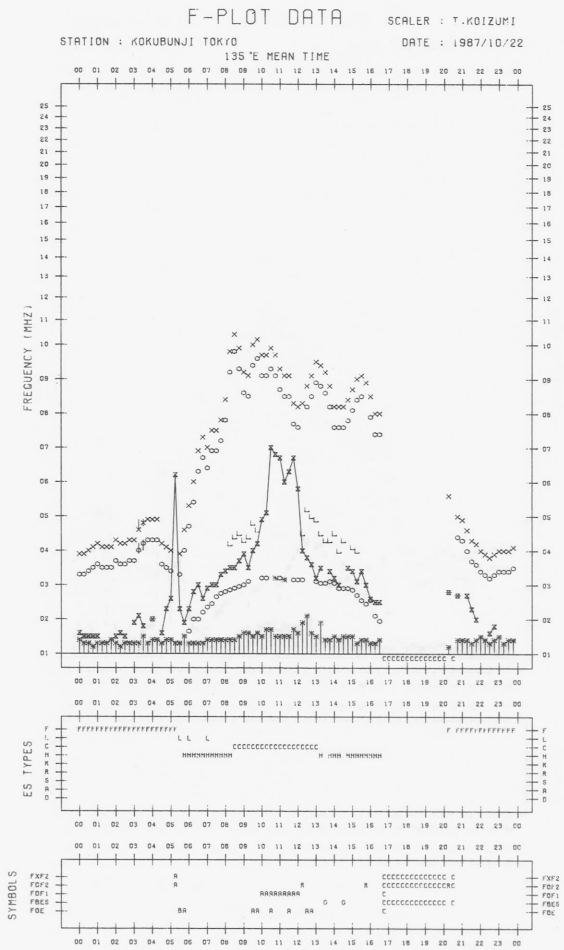

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/19
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FMES
FDE

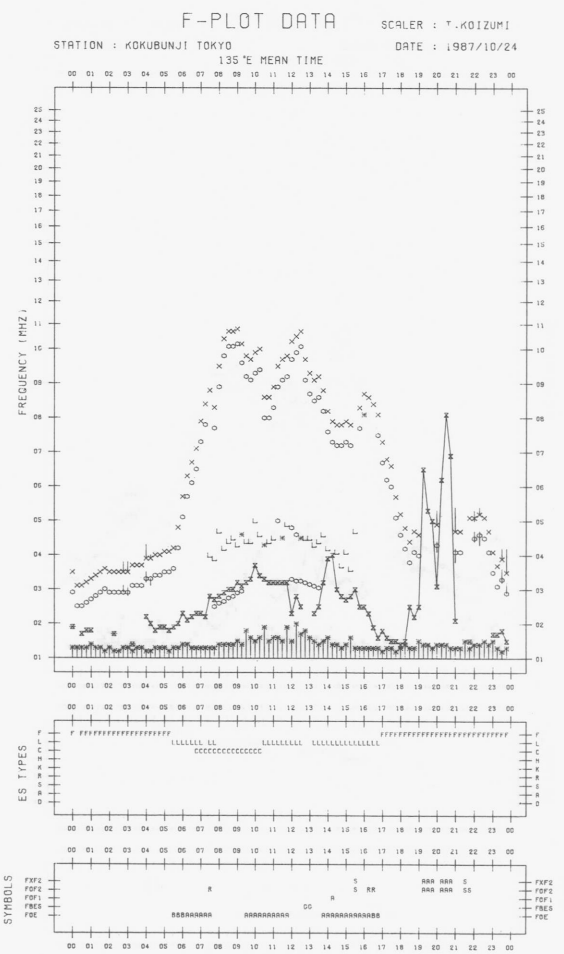

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/18
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FMES
FDE

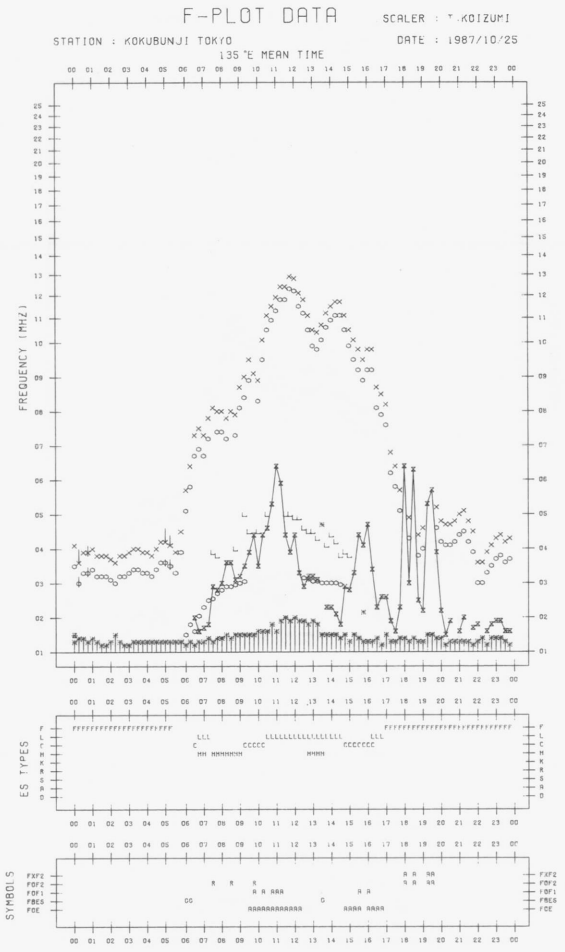

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/20
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FMES
FDE

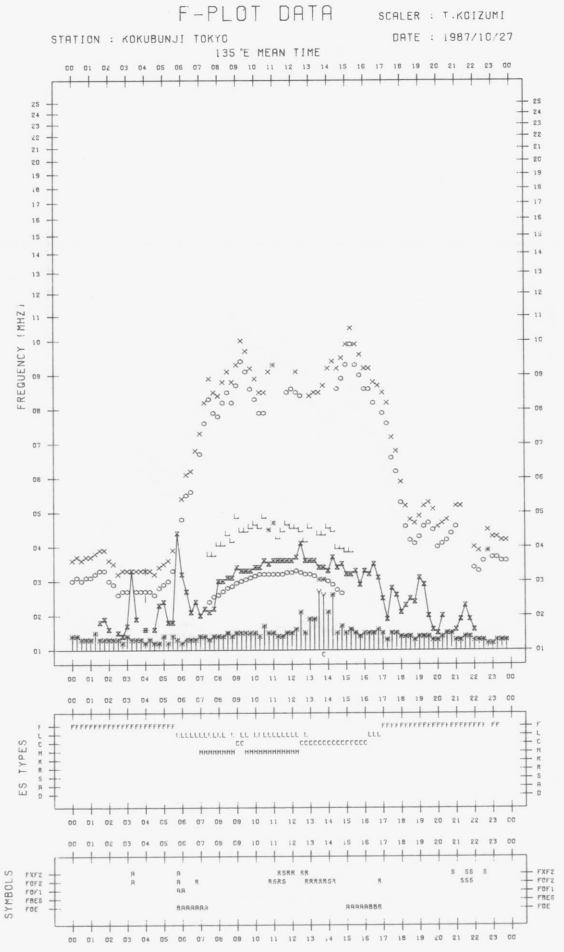

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/21
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FMES
FDE

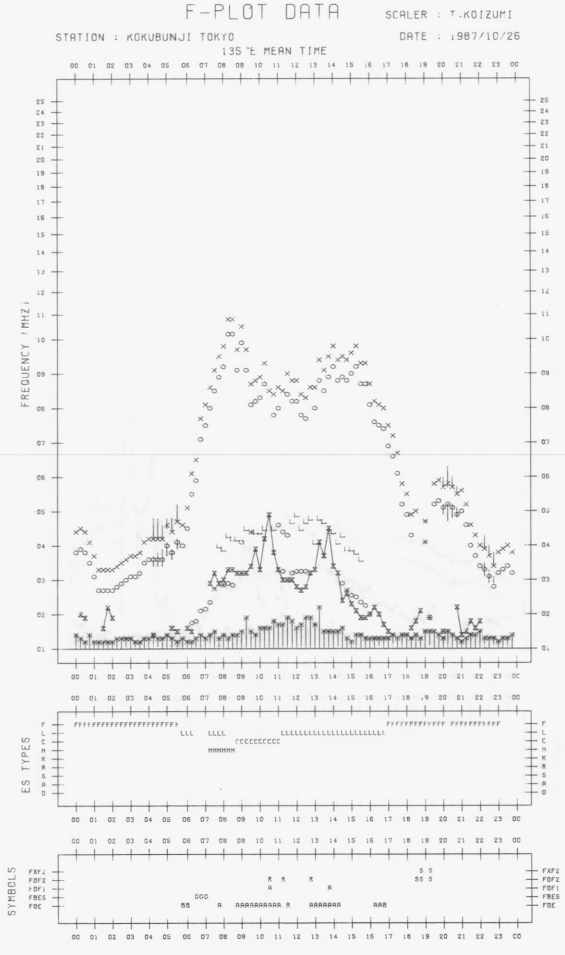

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/23
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FMES
FDE

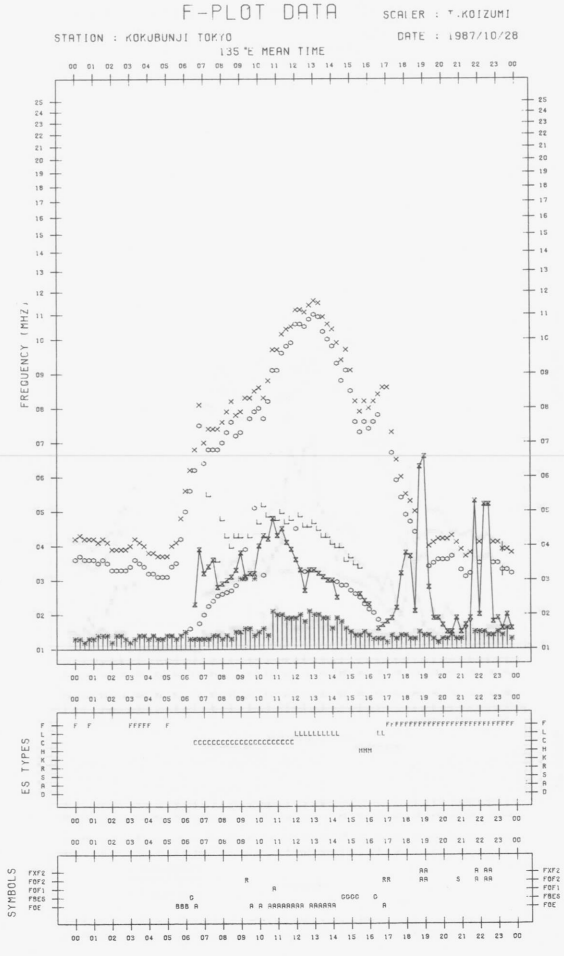

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/22
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FMES
FDE

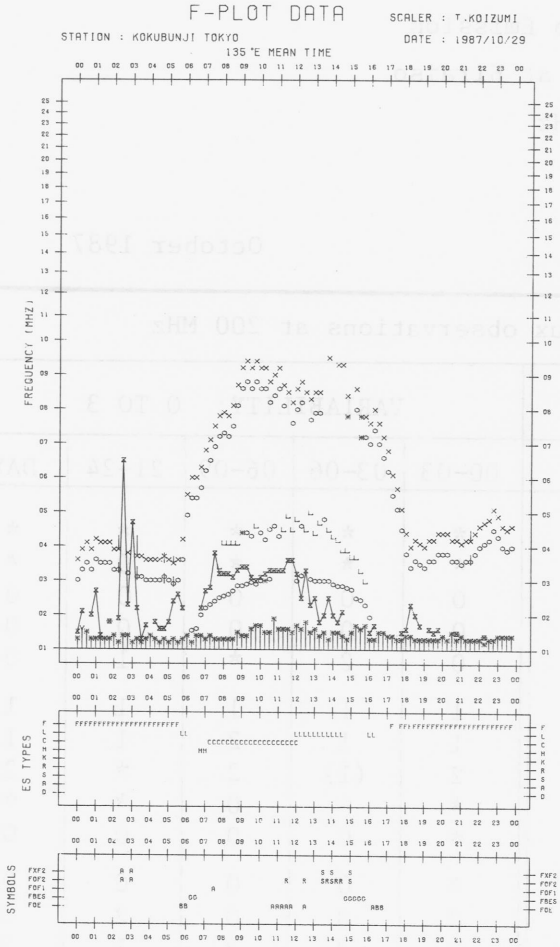

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/24
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FMES
FDE

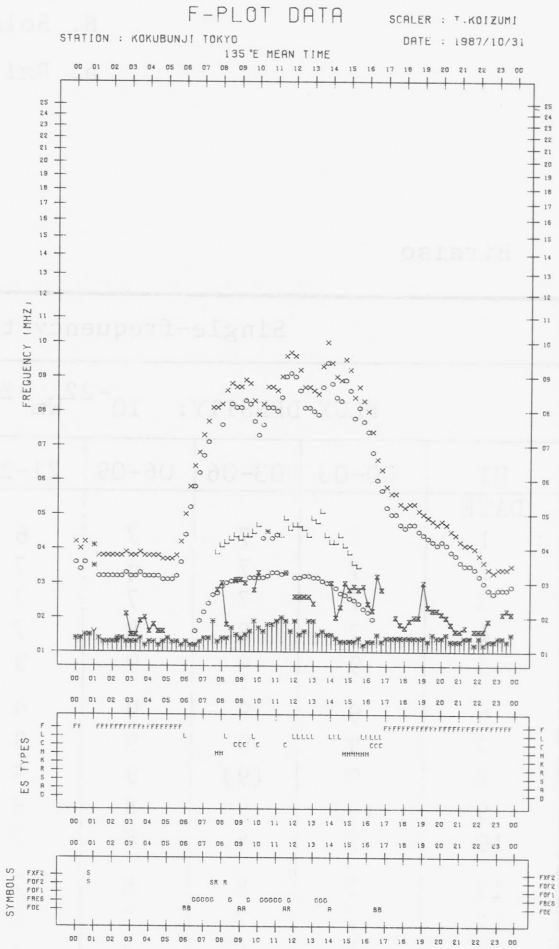

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/25
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FMES
FDE

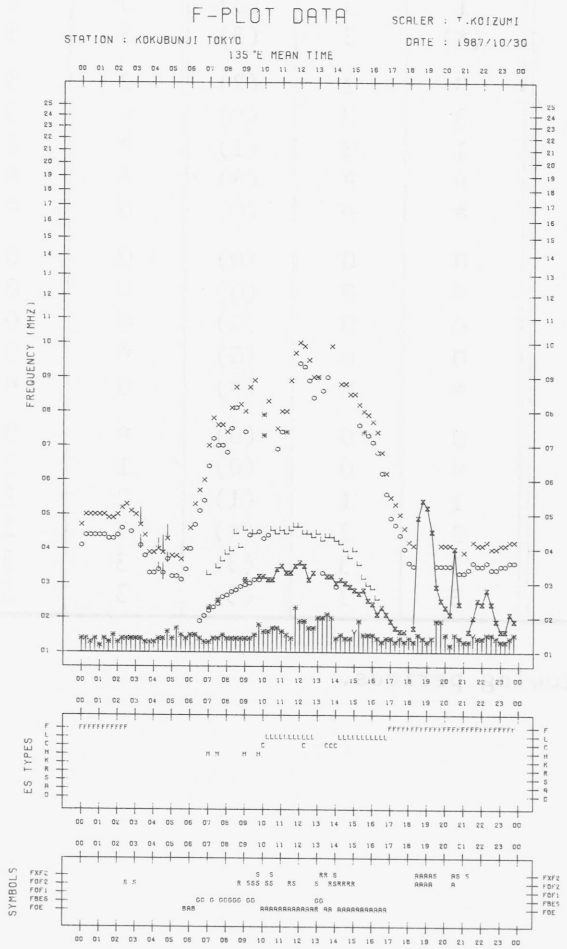

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/27
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FMES
FDE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/26
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FMES
FDE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/28
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FMES
FDE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/29
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FRES
FDE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/31
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FRES
FDE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1987/10/30
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FRES
FDE

B. Solar Radio Emission

a. Daily data at Hiraiso

200 MHz

Hiraiso October 1987

Single-frequency total flux observations at 200 MHz										
	FLUX DENSITY: $10^{-22}Wm^{-2}Hz^{-1}$					VARIABILITY: 0 TO 3				
UT	00-03	03-06	06-09	21-24	DAY	00-03	03-06	06-09	21-24	DAY
DATE										
1	7	7	7	6	7	*	*	*	*	*
2	7	7	q	7	7	*	*	*	0	*
3	7	7	7	7	7	0	0	0	0	0
4	7	8	8	7	8	0	0	0	0	0
5	9	9	9	9	9	0	2	*	1	0
6	9	9	9	9	9	1	1	1	1	1
7	9	9	9	9	9	1	1	2	1	1
8	9	(9)	9	9	9	2	(1)	2	*	2
9	(9)	9	8	8	9	*	*	0	*	*
10	8	8	8	7	8	*	0	0	0	0
11	7	8	8	7	7	*	0	0	0	0
12	7	7	7	8	7	0	0	0	2	0
13	8	8	8	8	8	3	3	3	1	3
14	8	8	8	8	8	1	3	(3)	3	2
15	(8)	8	(8)	8	8	(*)	3	(3)	3	3
16	8	8	(8)	8	8	3	2	(2)	2	3
17	8	8	(8)	8	8	3	3	(*)	*	3
18	8	8	(8)	8	8	1	3	(1)	*	1
19	8	8	(8)	8	8	*	*	(*)	*	*
20	8	7	(7)	8	8	*	0	(0)	0	*
21	8	8	(8)	8	8	0	0	(0)	0	0
22	8	8	(8)	8	8	*	0	(0)	0	0
23	8	8	(8)	8	8	0	0	(0)	0	0
24	8	8	(8)	q	8	0	0	(0)	*	0
25	q	8	(8)	8	8	*	*	(*)	0	*
26	8	8	(8)	8	8	0	0	(0)	*	0
27	8	8	(8)	9	8	*	0	(0)	1	0
28	9	9	(9)	9	9	1	1	(1)	2	1
29	9	9	(9)	9	9	2	2	(*)	3	2
30	9	9	(9)	9	9	3	3	(3)	3	3
31	9	9	(9)	9	9	3	3	(3)	3	3

Notes: 1. No observations during the following periods.

8th 0310 - 0430
15th 0130 - 0300

2. (q) likely quiet.

3. (*) interference.

B. Solar Radio Emission

a. Daily Data at Hiraiso

500 MHz

Hiraiso October 1987

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

Note: No observations during the following periods.

3rd	2148 - 4th 0023		4th	0415 - 0815	
4th	2040 - 2342		5th	0315 - 0520	
5th	0720 - 0815		5th	2040 - 2350	
10th	2040 - 11th 0030		11th	2040 - 12th	0410
12th	2040 - 2345		14th	2050 - 15th	0400
15th	2050 - 2347		19th	2050 - 2400	
20th	2100 - 2400		23th	2100 - 2400	
29th	0503 - 0600		30th	0300 - 0410	
30th	2105 - 2400				

B. Solar Radio Emission

b. Outstanding Occurrences at Hiraiso

Hiraiso October 1987

Single-frequency observations

Normal observing period: 2050 - 0800 U.T. (sunrise to sunset)

OCT 1987	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1}) MEAN	POLARIZATION REMARKS
5	200	43 NS	0354	0432	106	8	2	WR
	200	44 NS	2045E	2312	600D	7	2	WR
	100	46 C	2131.0	2136.3	10	940	146	WL
	200	46 C	2131.4	2132.1	7.3	340	90	WR
6	500	41 F	0405	0428.5	88	3	-	0
	100	46 C	2053.4	2058.1	13.9	3200U	450U	0 SUNRISE
	200	46 C	2054.7	2058.0	5.3	1700U	250U	0 SUNRISE
7	100	42 SER	0040.4	0054.1	27.7	1000D	-	-
	200	42 SER	0043.2	0053.5	13	6500	-	0
	200	27 RF	0107	0135.6	44	21	6	WR
	500	46 C	0238	0242.2	9.0	40	12	WR
	200	43 NS	0615.2	0638	73	45	18	MR
	200	43 NS	2313	0017	540D	56	5	MR
9	200	46 C	0224.4	0228.4	6.7	84	37	0
	500	8 S	0630.6	0631,1	0.6	22	-	0
12	200	44 NS	2050E	0553	660D	39	19	MR
13	200	44 NS	2050E	-	120D	-	3	WR
14	200	43 NS	0125	0620	360D	86	28	MR
	500	27 RF	0330	0413	105	8	2	WR
	500	27 RF	0603	0635	65	9	4	WR
	200	44 NS	2050E	2343U	660D	49U	25U	MR
15	200	44 NS	2050E	2200	660D	152	38	MR
	100	44 NS	2050E	2205	180D	180	65	-
16	500	7 C	0620.5	0623.4	4.5	95	34	0
	200	44 NS	2050E	0603	660D	30	15	MR
18	200	44 NS	0150	0313	360D	17	4	WR
	500	41 F	0523.2	0524.0	1.8	27	-	WR
21	500	8 S	2217.5	2217.7	0.2	29	-	0
27	200	43 NS	2300	0600	520D	4	2	WL
28	200	44 NS	2055E	2326	640D	9	5	WL
29	200	44 NS	2055E	0030	640D	6	3	WL
30	200	44 NS	2055E	0100	640D	50	44	0
	100	44 NS	2055E	0147	640D	850	500	-
	200	48 C	2158.1	2356.1	152	750	118	ML
	100	48 C	2205U	2356U	158	1000D	210D	-
31	100	44 NS	2100E	2250	620D	80	28	-
	200	44 NS	2100E	0203	620D	112	24	ML

RADIO PROPAGATION

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

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

MEASURED AT HIRAISO

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

RADIO PROPAGATION

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

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

MEASURED AT HIRAISO

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

C. Radio Propagation

b. Radio Propagation Quality Figures at Hiraiso

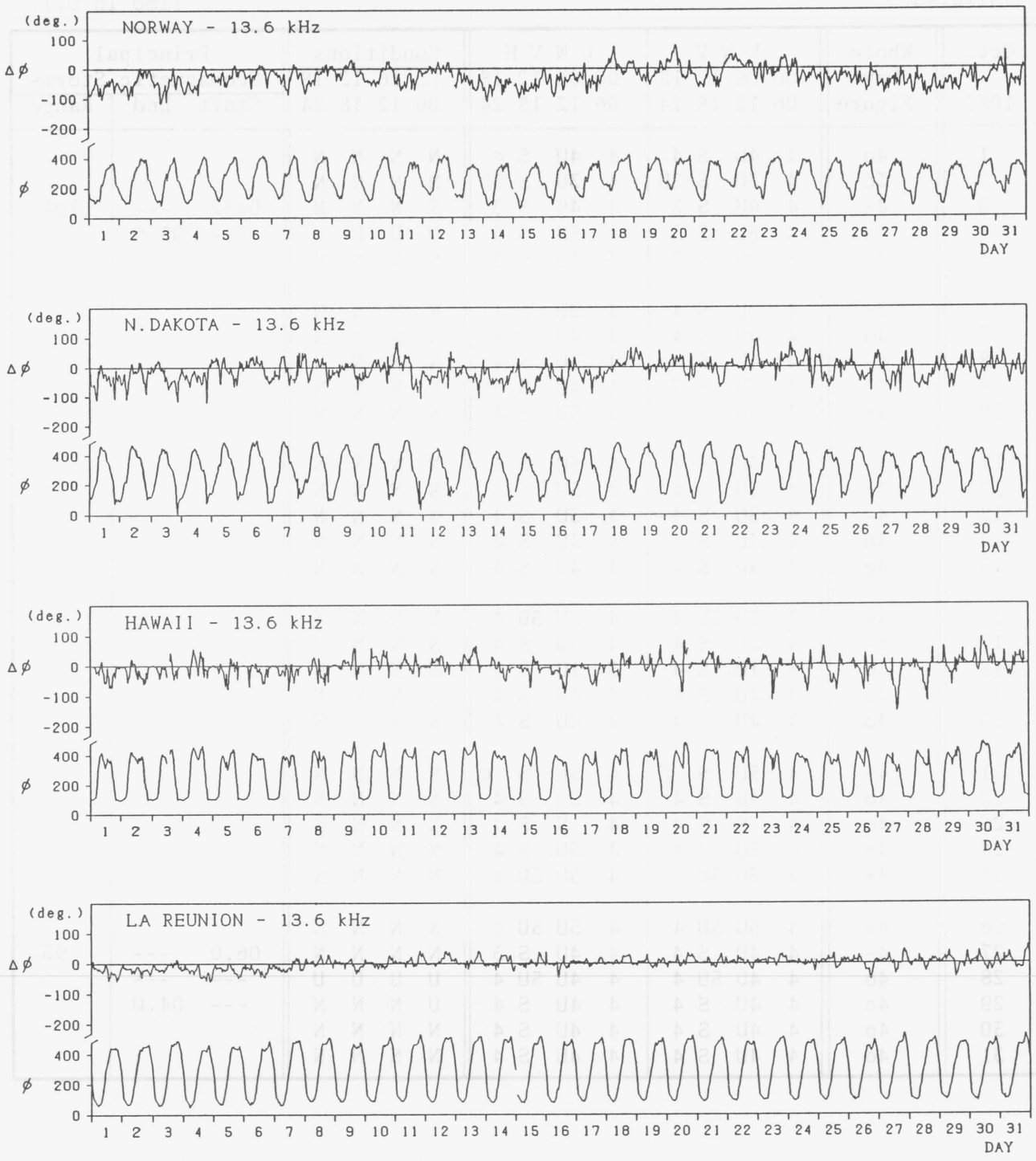
Hiraiso — Time in U.T.

Oct. 1987	Whole Day Figure	W W V 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Conditions 00 16 12 18 / 06 12 18 24	Principal Geomagnetic Storms Start	End	Range
1	4o	4 4U S 4	4 4U S 4	N N N N			
2	3o	4 3U S 2U	4 3U S 3U	N N N N			
3	4-	4 4U S 3	4 4U S 3	N N N N	0432	---	104
4	4o	4 5U S 3	4 5U S 3	U U U U	---	05.0	
5	3+	3 4U S 3	3 4U S 3	N N N N			
6	3+	4 2U S 4	4 2U S 4	N N N N			
7	4o	4 4U S 4	4 4U 5U 4	N N N N			
8	4-	4 4U S 4	4 3U S 4	N N N N			
9	4-	4 4U S 3	4 4U S 3	N N N N			
10	4+	4 5U S 4	4 5U S 4	N N N N			
11	4-	4 3U S 4	4 3U S 4	N N N N			
12	4+	4 5U S 4	4 5U S 4	N N N N			
13	4-	4 3U S 4	4 3U S 4	N N N N			
14	4o	4 4U S 4	4 4U S 4	N N N N			
15	4o	4 4U S 4	4 4U S 4	N N N N			
16	4+	4 5U 5U 4	4 5U 5U 4	N N N N			
17	4-	4 3U S 4	4 3U S 4	N N N N			
18	4o	3 1U S 4	3 1U S 4	N N N N			
19	4o	4 4U S 4	4 4U S 4	N N N N			
20	4o	4 4U S 4	4 4U S 4	N N N N			
21	4+	4 5U S C	4 5U S C	N N N N			
22	4o	4 4U S 4	4 5U S 4	N N N N			
23	4o	4 S S 4	4 S S 4	N N N N			
24	4+	4 5U S 4	4 5U S 4	N N N N			
25	4+	4 5U 5U 4	4 5U 5U 4	N N N N			
26	4+	4 5U 5U 4	4 5U 5U 4	N N N N			
27	4-	4 4U S 4	4 4U S 3	N N N N	06.0	---	93
28	4o	4 4U 5U 4	4 4U 5U 4	U U U U	---	---	
29	4o	4 4U S 4	4 4U S 4	U N N N	---	04.0	
30	4o	4 4U S 4	4 4U S 4	N N N N			
31	4o	4 4U S 4	4 4U S 4	N N N N			

C. Radio Propagation

c. Phase Variations in OMEGA Radio Waves at Inubo

Inubo October 1987



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.

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

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

(ii) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Oct. 1987	S P A							
	Phase Advance (degrees)					Time (U.T.)		
Date	Ω/N	Ω/LR	NWC	Ω/H	Ω/ND	Start	End	Maximum
5				4		2135	2157	2137
7		17	10	6	16	0248	0324	0255
15		9				0904	0929	0912
15		14				1108	1142	1114
16		11				0621	0650	0628
16		65				0957	1120	1104
17		17				1222	1313	1226
17				17		2213	2237D	2225
17	10	17	12	40		2237E	2357	2243
18		12	8			0521	0612	0540
18				6		2037	2103	2042
20			11	12	11	0009	0114	0014
20		6	8	4		0359	0433	0402
20		8				0845	0916	0849
22		8				0832	0845	0835
28			24	12		0123	0241	0146

IONOSPHERIC DATA IN JAPAN FOR OCTOBER 1987

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