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# IONOSPHERIC DATA IN JAPAN

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CONTENTS



RADIO RESEARCH LABORATORY
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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*<br>*foF1*<br>*foE*<br>*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*<br>*M(3000)F1* | Maximum usable frequency factor for a path of 3000 km for transmission by *F2* and *F1* layers respectively |
| *h'F2*<br>*h'F*<br>*h'E*<br>*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 ($\phi$) and those in phase deviation ($\triangle\phi$) are shown in the lower part and the upper one, respectively. Variations in phase ($\phi$) are expressed by relative values at intervals of 30 minutes within every day (U.T.) (48 dots). An increasing value in this case denotes a phase delay. On the other hand, variations in phase deviation ($\triangle\phi$) 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 (kW) | 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 |
| Aldra | 66°25'N | 013°09'E | Ω/N | 13.6 | 10 | 7820 |
| North Dakota | 46°22'N | 098°21'W | Ω/ND | 13.6 | 10 | 9140 |
| Haiku | 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

DEC. 1986 | FXI (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | X 40 | X 38 | X 39 | X 38 | X 39 | X 36 | X 35 | | | | | | | | | | | X 49 | X 43 | X 45 | X 42 | X 47 | X 46 | 49 |
| 2 | 50 | 56 | 56 | 57 | 60 | 57 | X 45 | | | | | | | | | | | X 41 | X 42 | X 43 | X 42 | X 45 | X 45 | 48 |
| 3 | 51 | 55 | 56 | 50 | 47 | X 40 | X 37 | | | | | | | | | | | X 41 | X 37 | 40 | 40 | 41 | 43 | 44 |
| 4 | 42 | 40 | 40 | 40 | 38 | 40 | 43 | | | | | | | | | | | X 42 | X 39 | 44 | 44 | 46 | 45 | 50 |
| 5 | 51 | 50 | X 47 | X 46 | X 49 | X 38 | X 42 | | | | | | | | | | | X 35 | X 36 | 40 | 40 | 43 | 44 | 50 |
| 6 | 44 | 44 | 45 | 40 | 40 | 40 | 40 | | | | | | | | | | | X 38 | X 37 | X 40 | 35 | X 37 | 43 | 48 |
| 7 | 50 | 51 | 53 | 51 | 43 | X 39 | X 33 | | | | | | | | | | | X 33 | X 40 | X 43 | 43 | X 43 | 47 | 46 |
| 8 | 50 | 50 | 50 | 51 | 43 | 31 | 30 | | | | | | | | | | | X 33 | X 32 | X 35 | X 37 | X 40 | 45 | 46 |
| 9 | 45 | 45 | 45 | 43 | 45 | X 44 | X 40 | | | | | | | | | | | X 34 | X 35 | X 40 | X 39 | 43 | X 43 | 50 |
| 10 | X 45 | X 47 | X 49 | 45 | 38 | 43 | X 37 | | | | | | | | | | | X 36 | X 33 | X 38 | X 43 | X 45 | X 47 | X 47 |
| 11 | X 46 | X 47 | X 44 | X 42 | X 42 | X 42 | X 42 | | | | | | | | | | | X 35 | X 35 | X 38 | X 36 | X 39 | X 43 | X 44 |
| 12 | X 44 | X 44 | X 45 | 46 | 47 | X 36 | X 34 | | | | | | | | | | | X 40 | X 40 | X 43 | X 30 | X 32 | X 36 | X 39 |
| 13 | X 40 | X 42 | X 44 | X 43 | 44 | X 44 | 46 | 57 | | | | | | | | | | X 39 | X 36 | X 43 | X 42 | 50 | 58 | 57 |
| 14 | 56 | 57 | 57 | 50 | 46 | 50 | 52 | | | | | | | | | | | X 59 | X 59 | X 40 | X 47 | X 55 | 58 | 58 |
| 15 | 50 | 51 | 53 | 53 | 53 | 46 | 42 | | | | | | | | | | | X 34 | X 37 | X 40 | X 41 | 41 | 50 | X 44 |
| 16 | X 43 | X 41 | X 40 | X 37 | X 39 | X 45 | X 44 | | | | | | | | | | | X 33 | X 31 | X 36 | X 37 | 40 | 40 | 42 |
| 17 | 40 | 41 | 40 | 40 | 35 | 39 | 33 | | | | | | | | | | | X 36 | X 37 | X 43 | X 48 | 43 | 46 | 57 |
| 18 | 47 | 50 | 54 | 51 | 51 | 52 | 43 | | | | | | | | | | | X 31 | 33 | 41 | 42 | 46 | 49 | X 50 |
| 19 | 57 | 57 | 55 | 50 | 46 | 32 | 40 | | | | | | | | | | | X 31 | 36 | 42 | 42 | 40 | 48 | 53 |
| 20 | 50 | 57 | 52 | 56 | 51 | 56 | 55 | 51 | | | | | | | | | | X 40 | X 35 | X 37 | X 33 | X 31 | 42 | 44 |
| 21 | 44 | 48 | 44 | 50 | 44 | 36 | 27 | | | | | | | | | | | X 36 | X 34 | X 40 | X 36 | 36 | X 37 | X 39 |
| 22 | 40 | 40 | 43 | X 41 | 42 | 30 | 34 | | | | | | | | | | | X 38 | X 36 | X 37 | A | 36 | 40 | 40 |
| 23 | X 38 | X 39 | X 39 | X 37 | 40 | X 38 | 31 | | | | | | | | | | | X 43 | X 32 | X 34 | X 33 | 40 | 40 | 40 |
| 24 | 40 | 41 | 41 | 45 | 50 | 35 | 36 | | | | | | | | | | | X 32 | X 29 | X 35 | X 30 | X 32 | X 33 | X 37 |
| 25 | 40 | 40 | 40 | 37 | X 35 | X 35 | X 30 | | | | | | | | | | | X 34 | X 35 | X 35 | X 32 | X 32 | X 34 | 40 |
| 26 | 40 | 40 | X 40 | 43 | 40 | 37 | 37 | | | | | | | | | | | X 42 | X 47 | X 41 | X 37 | X 37 | 40 | X 37 |
| 27 | X 38 | X 40 | X 40 | 52 | 46 | 42 | 44 | | | | | | | | | | | A | X 34 | X 36 | A | X 36 | X 38 | X 40 |
| 28 | X 39 | 43 | 48 | 50 | X 47 | X 43 | X 42 | | | | | | | | | | | X 40 | X 40 | X 38 | X 37 | X 35 | X 39 | 41 |
| 29 | 38 | 38 | 36 | X 34 | X 35 | X 37 | X 33 | | | | | | | | | | | X 32 | X 33 | X 36 | X 33 | X 31 | X 34 | X 36 |
| 30 | 38 | 40 | X 39 | X 39 | 38 | 40 | 36 | | | | | | | | | | | X 37 | X 39 | X 40 | X 35 | 38 | 40 | 44 |
| 31 | 44 | 50 | 50 | 46 | 50 | 50 | 44 | 45 | | | | | | | | | | X 40 | X 41 | X 46 | X 36 | 38 | 45 | 46 |
| | 00 | 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 | 3 | | | | | | | | | | 30 | 31 | 31 | 29 | 31 | 31 | 31 |
| MED | 44 | 44 | 45 | 45 | 44 | 40 | 40 | 51 | | | | | | | | | | X 36 | X 36 | X 40 | X 37 | X 40 | 43 | 44 |
| UQ | 50 | 50 | 51 | 50 | 47 | 44 | 43 | 54 | | | | | | | | | | X 40 | X 40 | X 42 | X 42 | 43 | 46 | 50 |
| LQ | 40 | 40 | X 40 | 40 | 40 | 36 | 34 | 48 | | | | | | | | | | X 34 | X 34 | X 37 | X 35 | X 36 | X 40 | 40 |

DEC. 1986 | FXI (0.1 MHZ)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | FOF2 (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station WAKKANAI Lat. 45° 23.5' N. Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 33 | 31 | 32 | 31 | 32 | 29 | 28 | 51 | 70 | 65 | 80 | 81 | 78 | 68 | 66 | 59 | 47 | 42 | 36 | 38 | 35 | 40 | 39 | F 37 |
| 2 | F | F | F | F | F 50 | F 48 | 38 | 44 | 55 | 64 | 72 | 69 | 65 | 67 | C | C | C | 34 | 35 | 36 | 35 | 38 | 38 | F |
| 3 | F | F | F | F | F | 33 | 30 | 42 | 57 | 73 | C | 69 | 61 | 59 | 57 | 50 | 36 | 34 | 30 | F 30 | F 30 | F | F | F |
| 4 | F | F | F | F 28 | F | F 33 | F | 44 | 58 | 76 | 62 | 66 | 58 | 59 | 56 | 53 | 40 | 35 | 32 | F 34 | F | F | F 34 | F 42 |
| 5 | F | F 38 | 40 | 39 | 42 | S 31 | S 35 | S 47 | 74 | 63 | 69 | 68 | H 59 | 64 | 60 | 55 | 41 | 28 | 29 | F 33 | F | F | F | F |
| 6 | F | F | F | F | F | F 30 | F | 40 | 48 | 55 | 73 | 65 | 60 | 58 | 56 | 50 | 37 | 31 | 30 | 33 | F 25 | 30 | F 33 | F |
| 7 | F | F 39 | F | F | F | 32 | 26 | 37 | 50 | 59 | 63 | 61 | 57 | 54 | 61 | 50 | 34 | 26 | 33 | 36 | F | 36 | F | F |
| 8 | F | F | F | F | F | F | F 19 | 35 | 51 | 71 | 65 | 60 | 54 | 52 | 50 | 47 | 35 | 26 | 25 | 28 | 30 | 33 | F | F |
| 9 | F 35 | F 34 | F 34 | F | F | 37 | 33 | S 51 | 51 | 65 | 66 | 69 | 60 | 52 | 58 | 44 | 39 | 27 | 28 | 33 | 32 | F 33 | 36 | F 38 |
| 10 | 38 | 40 | 42 | F 36 | F | F | 30 | 40 | 56 | 66 | 65 | 67 | 58 | 60 | 66 | 55 | 40 | 29 | 26 | 31 | 36 | 38 | 40 | 40 |
| 11 | 39 | 40 | 37 | 35 | 35 | 35 | 35 | 42 | 57 | H 63 | 67 | 77 | 64 | 69 | 54 | 50 | 41 | 23 | 28 | 31 | 29 | 32 | 36 | 37 |
| 12 | 37 | 37 | 38 | F | F 36 | 29 | 27 | 43 | 50 | 64 | 65 | 77 | 61 | 56 | 59 | 67 | 45 | 33 | 33 | 36 | 23 | 25 | 29 | 32 |
| 13 | 33 | 35 | 37 | 36 | F 33 | 37 | F | F | 51 | 63 | 66 | 71 | 69 | 69 | 69 | 61 | 43 | 32 | 29 | 36 | 35 | F | F | F |
| 14 | F | F | F | F | F 32 | F | F 42 | 40 | 56 | 64 | 94 | 83 | 77 | 64 | 65 | 60 | 42 | 52 | 52 | 33 | 40 | 48 | F | F |
| 15 | F | F | F | F | F | F | F 32 | 43 | 58 | 70 | 63 | 66 | 54 | 61 | 58 | 51 | 40 | 27 | 30 | 33 | 34 | F 33 | F | 37 |
| 16 | 36 | 34 | 33 | 30 | 32 | S 38 | 37 | 40 | 46 | 50 | 55 | 63 | 60 | 55 | 56 | 52 | 33 | 26 | 24 | 29 | 30 | F | F | F |
| 17 | F | F | F | F 32 | F | F | F 24 | 40 | 52 | 57 | 64 | 67 | 63 | 61 | 56 | 52 | 39 | 29 | 30 | 36 | 41 | F | F | U F 36 |
| 18 | F | F | F | F | F | F | F 35 | 46 | 50 | 48 | 60 | 65 | 62 | 58 | 57 | 51 | 42 | 24 | F 23 | F 30 | F 30 | F | F | 43 |
| 19 | F | F | F | F | F | F | F | 40 | 45 | 49 | 75 | 71 | 62 | 56 | 51 | 68 | 43 | 24 | F 25 | F 30 | F | F | F | F |
| 20 | F | F | F | F | F | F | F | F | 49 | 48 | 76 | 64 | 63 | 59 | 52 | 50 | 43 | 33 | 28 | 30 | 26 | 24 | F | F |
| 21 | F | F | F 37 | F | F | F | F | 33 | 48 | 52 | 61 | 73 | 56 | 55 | 55 | 55 | 50 | 29 | 27 | 33 | 29 | F | 30 | 32 |
| 22 | F | F | F | 34 | F | F 23 | F | 34 | 55 | 55 | 56 | H 67 | 67 | 53 | 66 | 51 | 44 | 31 | 29 | 30 | A | F 29 | F | F |
| 23 | 31 | 32 | 32 | 30 | F | 31 | F 20 | 33 | 53 | 67 | 63 | 65 | 67 | H 57 | 63 | 52 | 37 | 36 | 25 | 27 | 26 | F | F | F 29 |
| 24 | F 30 | F | F | F | F | F | F | 32 | 53 | 70 | 63 | 63 | H 68 | 55 | 53 | 58 | 43 | 25 | 22 | 28 | 23 | 25 | 26 | 30 |
| 25 | F 28 | F | F 30 | F | 28 | 28 | 23 | 32 | 50 | 59 | 71 | A | 57 | 73 | 70 | 48 | 43 | 27 | 28 | 28 | 25 | 25 | 27 | F 30 |
| 26 | F 30 | F 33 | 33 | F | F | F | F | 32 | 43 | 49 | 61 | 58 | 57 | H 57 | 53 | 51 | 43 | 35 | 40 | 34 | 30 | 30 | F 30 | 30 |
| 27 | 31 | 33 | 33 | F | F | F | F | 36 | 46 | 65 | 64 | 57 | 54 | 54 | 53 | 46 | 37 | A | 27 | 29 | A | 29 | 31 | 33 |
| 28 | 32 | F | F | F 41 | 40 | 36 | 35 | 32 | 45 | 56 | 69 | 59 | 54 | 60 | 53 | 47 | 45 | 33 | 33 | 31 | 30 | 28 | 32 | F 31 |
| 29 | F 29 | F 29 | F 27 | 27 | 28 | 30 | 26 | 34 | 43 | 53 | 63 | 59 | 53 | 54 | 54 | 45 | 35 | 25 | 26 | 29 | 26 | 24 | 27 | 29 |
| 30 | F 28 | F 30 | 32 | 32 | F 28 | F 30 | F 25 | 34 | 43 | 53 | 53 | 56 | 54 | 51 | 53 | 55 | 43 | 30 | 32 | 33 | 23 | F 30 | F 31 | F |
| 31 | F | F | F | F | F | F | F | F 38 | 50 | 51 | 54 | 57 | 52 | H 50 | 49 | H 48 | 41 | 33 | 34 | 39 | 29 | F 28 | F | F |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 15 | 14 | 15 | 13 | 12 | 18 | 20 | 29 | 31 | 31 | 30 | 30 | 31 | 31 | 30 | 30 | 30 | 30 | 31 | 31 | 25 | 21 | 16 | 17 |
| MED | 32 | 34 | 33 | 32 | 32 | 32 | 30 | 40 | 51 | 63 | 64 | 66 | 60 | 58 | 56 | 51 | 41 | 30 | 29 | 33 | 30 | 30 | 32 | 33 |
| UQ | 36 | 38 | 37 | 36 | 38 | 36 | 35 | 43 | 56 | 65 | 69 | 69 | 64 | 61 | 61 | 55 | 43 | 33 | 32 | 34 | 34 | 33 | 36 | 37 |
| LQ | F 30 | 32 | 32 | 30 | 30 | 30 | 26 | 34 | 48 | 53 | 62 | 61 | 56 | 54 | 53 | 50 | 37 | 27 | 26 | 30 | 26 | 28 | 30 | 30 |

DEC. 1986 | FOF2 (0.1 MHZ)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | FOF1 (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | L | L 390 | A | L | | | | | | | | | | |
| 2 | | | | | | | | | | | | 360 | | L | C | | | | | | | | | |
| 3 | | | | | | | | | | | C | L | L | | | | | | | | | | | |
| 4 | | | | | | | | | | | | L | | | | | | | | | | | | |
| 5 | | | | | | | | | | | L | 370 | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | L | L | L 340 | | | | | | | | | | | |
| 8 | | | | | | | | | | L | L | L | | | | | | | | | | | | |
| 9 | | | | | | | | | | | L | L | L 360 | | | | | | | | | | | |
| 10 | | | | | | | | | | | | L | L | | | | | | | | | | | |
| 11 | | | | | | | | | | | | L | L | | | | | | | | | | | |
| 12 | | | | | | | | | | | L | | L | | | | | | | | | | | |
| 13 | | | | | | | | | | | L | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | L | L | L | | | | | | | | | | | |
| 15 | | | | | | | | | | | | L | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | A | A | L | | | | | | | | | | |
| 17 | | | | | | | | | | | | L | L | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | L | L | | | | | | | | | | |
| 19 | | | | | | | | | | | | L | L | L | | | | | | | | | | |
| 20 | | | | | | | | | | | L | L | | L | | | | | | | | | | |
| 21 | | | | | | | | | | | | 390 | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | L | | | | | | | | | | | |
| 23 | | | | | | | | | | L | | L | L | | | | | | | | | | | |
| 24 | | | | | | | | | | | L | L | L | L | | | | | | | | | | |
| 25 | | | | | | | | | | | A | A | L 390 | | | | | | | | | | | |
| 26 | | | | | | | | | | | L | L | L | | | | | | | | | | | |
| 27 | | | | | | | | | | | L | | L | L | | | | | | | | | | |
| 28 | | | | | | | | | | | L | L | L | L | | | | | | | | | | |
| 29 | | | | | | | | | | | L | L | L | | | | | | | | | | | |
| 30 | | | | | | | | | | | | L | L | | | | | | | | | | | |
| 31 | | | | | | | | | | | | 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 | 3 | | | | | | | | | | | |
| MED | | | | | | | | | | | | 380 | L 360 | | | | | | | | | | | |
| UQ | | | | | | | | | | | | 390 | L 375 | | | | | | | | | | | |
| LQ | | | | | | | | | | | | 365 | L 350 | | | | | | | | | | | |

DEC. 1986 | FOF1 (0.01 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FOE (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| 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 | A | A | A | A | A | B | A | A | S | | | | | | | |
| 2 | | | | | | | | A | B | B | 250 | A | B | B | C | C | C | | | | | | | |
| 3 | | | | | | | | S | 200 | B | C | A | B | 250 | 225 | S | S | | | | | | | |
| 4 | | | | | | | | S | 200 | B | B | B | B | B | B | B | S | | | | | | | |
| 5 | | | | | | | | S | A | A | A | B | B | B | B | B | S | | | | | | | |
| 6 | | | | | | | | S | A | 220 | 250 | A | A | B | B | B | S | | | | | | | |
| 7 | | | | | | | | S | A | 230 | 250 | 260 | A | 240 | 215 | A | S | | | | | | | |
| 8 | | | | | | | | E | 205 | 235 | 250 | 260 | A | 230 | 205 | S | S | | | | | | | |
| 9 | | | | | | | | S | A | 225 | 240 | 250 | 250 | 240 | 215 | S | S | | | | | | | |
| 10 | | | | | | | | S | B | 235 | 250 | 260 | 270 | 255 | 220 | 180 | S | | | | | | | |
| 11 | | | | | | | | S | A | 225 | A | 270 | 270 | 245 | 225 | S | S | | | | | | | |
| 12 | | | | | | | | S | 185 | 225 | 250 | A | 265 | B | B | S | S | | | | | | | |
| 13 | | | | | | | | S | 200 | 235 | 250 | B | 270 | 240 | 220 | B | S | | | | | | | |
| 14 | | | | | | | | E | 195 | A | A | A | 260 | A | A | S | | | | | | | | |
| 15 | | | | | | | | S | 190 | A | A | 250 | A | A | A | A | S | | | | | | | |
| 16 | | | | | | | | S | A | A | B | B | A | A | A | B | S | | | | | | | |
| 17 | | | | | | | | A | A | A | A | A | B | B | 210 | S | S | | | | | | | |
| 18 | | | | | | | | S | S | 220 | 250 | 260 | 260 | 230 | 210 | S | S | | | | | | | |
| 19 | | | | | | | | S | 200 | 230 | 250 | 260 | 260 | 245 | 215 | 180 | S | | | | | | | |
| 20 | | | | | | | | S | S | 220 | 250 | 275 | 260 | 235 | 220 | 190 | S | | | | | | | |
| 21 | | | | | | | | S | 205 | 230 | A | 280 | 260 | 250 | 220 | 195 | A | | | | | | | |
| 22 | | | | | | | | S | 195 | 225 | 255 | 270 | 270 | 260 | 220 | S | S | | | | | | | |
| 23 | | | | | | | | E | A | A | A | 250 | 250 | 245 | 215 | 195 | S | | | | | | | |
| 24 | | | | | | | | S | 185 | 215 | 225 | 250 | 245 | 240 | 225 | 190 | S | | | | | | | |
| 25 | | | | | | | | S | S | 210 | 225 | A | A | 225 | 215 | S | S | | | | | | | |
| 26 | | | | | | | | S | S | 220 | A | 265 | 250 | 230 | 220 | S | S | | | | | | | |
| 27 | | | | | | | | S | A | B | B | B | B | B | B | B | S | | | | | | | |
| 28 | | | | | | | | A | 190 | 225 | 245 | 265 | 260 | 240 | 220 | S | S | | | | | | | |
| 29 | | | | | | | | S | S | 220 | 235 | B | B | B | B | B | S | | | | | | | |
| 30 | | | | | | | | S | 200 | 220 | 250 | 250 | 255 | 250 | 225 | S | S | | | | | | | |
| 31 | | | | | | | | S | S | A | 230 | 250 | 250 | 240 | 220 | 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 | | | | | | | | 3 | 13 | 19 | 18 | 17 | 17 | 19 | 20 | 6 | | | | | | | | |
| MED | | | | | | | | E | 200 | 225 | 250 | 260 | 260 | 240 | 220 | 190 | | | | | | | | |
| UQ | | | | | | | | E | 200 | 230 | 250 | 265 | 265 | 248 | 220 | 195 | | | | | | | | |
| LQ | | | | | | | | E | 190 | 220 | 240 | 250 | 250 | 238 | 215 | 180 | | | | | | | | |

The Radio Research Laboratory, Japan

DEC. 1986 | FOE (0.01 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FOES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station WAKKANAI Lat. 45° 23' 5" N, Long. 141° 41' 2" E Sweep 1 MHz to 25 MHz in 24sec in automatic operation

| 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 | 41 | 33 | 41 | 30 | ES 16 | 30 | 31 | JA 43 | 35 | JA 38 | JA 57 | 32 | 42 | EB 24 | JA 41 | 33 | 40 | 40 | 20 | ES 17 | ES 16 | ES 12 | ES 16 | 34 |
| 2 | 41 | 34 | ES 17 | ES 16 | E | ES 17 | ES 15 | 22 | EB 23 | EB 25 | G | 31 | EB 25 | EB 25 | C | C | C | ES 17 | 31 | ES 17 | ES 16 | 30 | ES 17 | ES 15 |
| 3 | ES 16 | ES 15 | ES 15 | ES 15 | E | ES 16 | E | ES 15 | G | EB 23 | C | 27 | EB 27 | G | JA 60 | ES 19 | ES 17 | 29 | 28 | ES 16 | 30 | 30 | 38 | 34 |
| 4 | 40 | 30 | ES 17 | ES 15 | ES 12 | 27 | ES 15 | ES 15 | 22 | EB 27 | EB 26 | EB 29 | EB 29 | EB 27 | EB 24 | EB 21 | ES 17 | ES 17 | JA 44 | ES 15 | 28 | 30 | 22 | ES 15 |
| 5 | ES 15 | 30 | 26 | ES 15 | E | ES 16 | ES 16 | 23 | 43 | 30 | 32 | EB 27 | EB 27 | EB 30 | EB 25 | EB 20 | ES 16 | ES 16 | ES 17 | 39 | ES 15 | 40 | JA 50 | 40 |
| 6 | 28 | ES 16 | ES 12 | ES 15 | 23 | ES 15 | 23 | 27 | 27 | G | G | 37 | 34 | EB 31 | EB 24 | EB 20 | ES 15 | ES 15 | ES 16 | ES 16 | ES 15 | E | ES 15 | 31 |
| 7 | 40 | 41 | 27 | 30 | 23 | 23 | ES 15 | ES 16 | 38 | G | G | G | 30 | 30 | G | 27 | 30 | 23 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 |
| 8 | 36 | 26 | ES 16 | E | ES 17 | ES 15 | ES 15 | 17 | G | G | G 23 | G | 36 | G | G | ES 19 | 26 | ES 17 | ES 17 | E | ES 16 | ES 15 | ES 15 | ES 16 |
| 9 | ES 16 | 23 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | 20 | G | G | G | G | 29 | G | ES 18 | ES 16 | ES 17 | ES 17 | ES 17 | ES 17 | 21 | ES 15 | ES 16 |
| 10 | ES 15 | 31 | 24 | ES 15 | ES 16 | ES 17 | ES 17 | ES 15 | EB 19 | G | G | G | G | G | G | G | ES 17 | ES 16 | 23 | ES 16 | ES 15 | 23 | 23 | 22 |
| 11 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | 26 | 30 | 28 | G | G | G | G | ES 18 | ES 15 | ES 16 | ES 17 | ES 17 | 26 | 34 | 30 | 27 |
| 12 | ES 15 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | ES 15 | 22 | 30 | G | 30 | 27 | EB 26 | EB 25 | ES 20 | ES 16 | ES 16 | ES 17 | ES 16 | ES 16 | 24 | ES 15 | ES 11 |
| 13 | ES 12 | ES 17 | ES 17 | ES 16 | ES 13 | ES 15 | ES 16 | ES 15 | G | G | G | 30 | G | G | G | EB 19 | ES 16 | ES 12 | ES 17 | JA 53 | JA 52 | 36 | 30 | ES 16 |
| 14 | 29 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 16 | 20 | G | JA 84 | 30 | 29 | G | JA 50 | 33 | ES 20 | ES 18 | ES 17 | JA 51 | JA 54 | 40 | JA 51 | ES 15 | 27 |
| 15 | 30 | ES 13 | 23 | E | ES 15 | ES 15 | ES 16 | ES 15 | G | JA 53 | 36 | G 23 | 30 | 28 | 25 | 30 | 30 | 34 | JA 50 | 35 | ES 15 | ES 16 | 28 | 30 |
| 16 | ES 16 | ES 16 | ES 16 | ES 15 | E | ES 17 | ES 16 | ES 17 | 52 | 34 | 30 | JA 58 | 40 | 30 | 32 | 23 | 20 | 31 | JA 50 | 40 | ES 16 | 31 | JA 51 | 33 |
| 17 | 23 | 26 | 30 | 30 | ES 15 | ES 16 | ES 16 | 27 | 32 | 42 | 41 | 42 | EB 27 | EB 28 | G | 21 | ES 15 | ES 17 | ES 16 | 36 | 31 | 34 | 37 | 40 |
| 18 | ES 16 | ES 15 | ES 15 | E | ES 14 | ES 15 | ES 16 | ES 15 | ES 20 | G | G | G | G | G 20 | G | ES 20 | ES 17 | ES 16 | ES 15 | ES 15 | ES 14 | ES 15 | ES 16 | ES 15 |
| 19 | ES 16 | ES 16 | ES 17 | ES 16 | ES 15 | ES 15 | ES 15 | ES 16 | G | G | G | G | G | G | G | G | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | E | ES 15 | ES 15 |
| 20 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 15 | ES 17 | 22 | 28 | G | G | G | G | G | G | ES 16 | E | ES 16 | ES 17 | 40 | ES 16 | ES 15 | ES 15 |
| 21 | ES 16 | ES 15 | ES 15 | ES 15 | ES 11 | E | 22 | ES 15 | G | G | 32 | G | G | G | 43 | G | 33 | 31 | 27 | 30 | 27 | ES 15 | 34 | ES 16 |
| 22 | ES 15 | ES 15 | E | E | E | ES 15 | ES 15 | ES 15 | G | 26 | 40 | 31 | 35 | 31 | G | ES 19 | ES 15 | ES 15 | 31 | 34 | 40 | ES 16 | 30 | 32 |
| 23 | 27 | ES 16 | ES 16 | ES 15 | 24 | 28 | 27 | 26 | JA 53 | 36 | 35 | G | G | G | G | G | ES 16 | ES 12 | 25 | ES 16 | ES 15 | ES 15 | ES 15 | E |
| 24 | ES 15 | ES 12 | ES 15 | ES 16 | ES 15 | ES 16 | ES 17 | ES 15 | G | G | G | G | G | G | G | G | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | JA 30 | 30 |
| 25 | JA 30 | ES 16 | ES 15 | E | ES 15 | ES 15 | ES 16 | ES 17 | 20 | 37 | 36 | JA 82 | 43 | G | G | 22 | 42 | ES 16 | 26 | 36 | JA 33 | 40 | ES 15 | ES 15 |
| 26 | ES 17 | ES 16 | ES 15 | E | ES 15 | ES 16 | ES 16 | ES 17 | ES 19 | G | 29 | G | 28 | 27 | G | ES 20 | 20 | JA 33 | 30 | 27 | ES 16 | E | ES 15 | ES 12 |
| 27 | ES 16 | ES 14 | ES 15 | ES 15 | ES 15 | ES 17 | ES 16 | ES 15 | 36 | 26 | 27 | 35 | EB 27 | EB 27 | EB 30 | 29 | 34 | JA 54 | JA 51 | JA 40 | JA 61 | JA 43 | 37 | 28 |
| 28 | ES 15 | ES 15 | ES 15 | E | ES 16 | ES 15 | ES 16 | 22 | G | G | G | G | G | G | G | ES 20 | ES 17 | ES 16 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 |
| 29 | 28 | 27 | ES 16 | ES 16 | ES 15 | ES 15 | ES 16 | ES 15 | ES 17 | G | G | EB 27 | EB 27 | EB 27 | EB 23 | EB 20 | ES 16 | ES 15 | ES 15 | ES 17 | ES 17 | ES 15 | ES 15 | ES 15 |
| 30 | ES 16 | ES 16 | ES 14 | E | ES 16 | E | ES 15 | ES 15 | G | 27 | 31 | 33 | 30 | 30 | 26 | 24 | ES 15 | ES 16 | ES 16 | 24 | 31 | ES 14 | ES 15 | 31 |
| 31 | 30 | 23 | 22 | ES 14 | ES 15 | ES 16 | ES 16 | ES 15 | 21 | 27 | G | G | G | G | G | ES 19 | ES 15 | ES 15 | 33 | JA 50 | JA 55 | 33 | 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 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 30 | 31 | 31 | 31 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED | ES 16 | ES 16 | ES 16 | ES 15 | ES 15 | ES 16 | ES 16 | ES 16 | EG 20 | EG 26 | 24 | EG 27 | EG 27 | EG 25 | G | EE 20 | ES 16 | ES 16 | ES 17 | ES 17 | ES 16 | 16 | ES 16 | 16 |
| UQ | 30 | 26 | ES 17 | ES 16 | ES 16 | ES 16 | ES 16 | 18 | 26 | 30 | 32 | 31 | 30 | 28 | EG 25 | 21 | 20 | 20 | 30 | 36 | 31 | 32 | 30 | 31 |
| LQ | ES 15 | ES 15 | ES 15 | EE 14 | ES 14 | ES 15 | ES 15 | ES 15 | G | G | G | G | G | G | G | EE 18 | ES 16 | ES 16 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 |

DEC. 1986 | FOES (0.1 MHZ)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | FBES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station WAKKANAI Lat. 45° 23.5' N. Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 30 | 25 | 23 | 20 | ES 16 | 20 | 19 | 24 | 26 | 25 | 28 | 30 | 38 | EB 24 | 33 | 27 | 32 | 24 | 20 | ES 17 | ES 16 | ES 12 | ES 16 | ES 16 |
| 2 | 22 | 23 | ES 17 | ES 16 | E | ES 17 | ES 15 | 17 | EB 23 | EB 25 | G | 27 | EB 25 | EB 25 | C | C | C | ES 17 | 22 | ES 17 | ES 16 | ES 16 | ES 17 | ES 15 |
| 3 | ES 16 | ES 15 | ES 15 | ES 15 | E | ES 16 | E | ES 15 | G | EB 23 | C | 26 | EB 27 | G | G | ES 19 | ES 17 | ES 17 | 18 | ES 16 | ES 16 | 17 | ES 16 | 17 |
| 4 | 17 | ES 15 | ES 17 | ES 15 | ES 12 | ES 15 | ES 15 | ES 15 | G | EB 27 | EB 26 | EB 29 | EB 29 | EB 27 | EB 24 | EB 21 | ES 17 | ES 17 | 20 | ES 15 | ES 16 | 20 | 19 | ES 15 |
| 5 | ES 15 | 19 | ES 17 | ES 15 | E | ES 16 | ES 16 | 22 | 41 | 28 | 31 | EB 27 | EB 27 | EB 30 | EB 25 | EB 20 | ES 16 | ES 16 | ES 17 | ES 16 | ES 15 | ES 16 | ES 17 | 20 |
| 6 | ES 16 | ES 16 | ES 12 | ES 15 | 16 | ES 15 | ES 16 | ES 16 | 22 | G | G | 28 | 31 | EB 31 | EB 24 | EB 20 | ES 15 | ES 15 | ES 16 | ES 16 | ES 15 | E | ES 15 | 18 |
| 7 | ES 17 | 20 | 19 | ES 16 | ES 15 | ES 15 | ES 15 | ES 16 | 25 | G | G | G | 27 | G 20 | G | 20 | 21 | ES 17 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 |
| 8 | 25 | 16 | ES 16 | E | ES 17 | ES 15 | ES 15 | 15 | G | G | G 21 | G | 27 | G | G | ES 19 | ES 16 | ES 17 | ES 17 | E | ES 16 | ES 15 | ES 15 | ES 16 |
| 9 | ES 16 | ES 17 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | 20 | G | G | G | G | G | G | ES 18 | ES 16 | ES 17 | ES 17 | ES 17 | ES 17 | ES 16 | ES 15 | ES 16 |
| 10 | ES 15 | 20 | ES 16 | ES 15 | ES 16 | ES 17 | ES 17 | ES 15 | EB 19 | G | G | G | G | G | G | G | ES 17 | ES 16 | ES 16 | ES 16 | ES 15 | ES 17 | E | ES 16 |
| 11 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | G | G | 26 | G | G | G | G | ES 18 | ES 15 | ES 16 | ES 17 | ES 17 | ES 17 | 20 | 19 | ES 17 |
| 12 | ES 15 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 15 | ES 15 | G | G | G | 27 | G 22 | EB 26 | EB 25 | ES 20 | ES 16 | ES 16 | ES 17 | ES 16 | ES 16 | ES 15 | ES 15 | ES 11 |
| 13 | ES 12 | ES 17 | ES 17 | ES 16 | ES 13 | ES 15 | ES 16 | ES 15 | G | G | G | G | G | G | G | EB 19 | ES 16 | ES 12 | ES 17 | 15 | ES 17 | ES 17 | ES 16 | ES 16 |
| 14 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 16 | 15 | G | 31 | 26 | 27 | G | 27 | 24 | ES 20 | ES 18 | ES 17 | 40 | 26 | 18 | 25 | ES 15 | ES 15 |
| 15 | ES 16 | ES 13 | E | E | ES 15 | ES 15 | ES 16 | ES 15 | G | 28 | 28 | G 21 | 26 | 24 | 23 | 27 | 20 | 21 | ES 17 | ES 17 | ES 15 | ES 16 | ES 16 | 20 |
| 16 | ES 16 | ES 16 | ES 16 | ES 15 | E | ES 17 | ES 16 | ES 17 | 25 | 25 | G | 45 | 36 | 26 | 28 | G | 18 | ES 15 | 20 | 23 | ES 15 | ES 16 | 20 | 20 |
| 17 | ES 16 | ES 16 | 17 | ES 17 | ES 15 | ES 16 | ES 16 | 16 | 21 | 33 | 33 | 30 | EB 27 | EB 28 | G | G | ES 15 | ES 17 | ES 16 | 17 | E | 19 | ES 17 | ES 16 |
| 18 | ES 16 | ES 15 | ES 15 | E | ES 14 | ES 15 | ES 16 | ES 15 | ES 20 | G | G | G | G | G 19 | G | ES 20 | ES 17 | ES 16 | ES 15 | ES 15 | ES 14 | ES 15 | ES 16 | ES 15 |
| 19 | ES 16 | ES 16 | ES 17 | ES 16 | ES 15 | ES 15 | ES 15 | ES 16 | G | G | G | G | G | G | G | G | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | E | ES 15 | ES 15 |
| 20 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 15 | ES 17 | 22 | G | G | G | G | G | G | G | ES 16 | E | ES 16 | ES 17 | 20 | ES 16 | ES 15 | ES 15 |
| 21 | ES 16 | ES 15 | ES 15 | ES 15 | ES 11 | E | 15 | ES 15 | G | G | 27 | G | G | G | G | G | 16 | 23 | 17 | 25 | ES 17 | ES 15 | ES 16 | ES 16 |
| 22 | ES 15 | ES 15 | E | E | E | ES 15 | ES 15 | ES 15 | G | G | G 20 | G 22 | G | G | G | ES 19 | ES 15 | ES 15 | ES 16 | ES 16 | AA 40 | ES 16 | ES 16 | 19 |
| 23 | ES 17 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | 15 | 40 | 23 | 26 | G | G | G | G | G | ES 16 | ES 12 | ES 17 | ES 16 | ES 15 | ES 15 | ES 15 | E |
| 24 | ES 15 | ES 12 | ES 15 | ES 16 | ES 15 | ES 16 | ES 17 | ES 15 | G | G | G | G | G | G | G | G | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 17 |
| 25 | ES 15 | ES 16 | ES 15 | E | ES 15 | ES 15 | ES 16 | ES 17 | G | 30 | 36 | AA 82 | 30 | G | G | G | 20 | ES 16 | 16 | ES 17 | 19 | 20 | ES 15 | ES 15 |
| 26 | ES 17 | ES 16 | ES 15 | E | ES 15 | ES 16 | ES 16 | ES 17 | ES 19 | G | 27 | G | G | G | G | ES 20 | ES 17 | ES 16 | ES 17 | 16 | ES 16 | E | ES 15 | ES 12 |
| 27 | ES 16 | ES 14 | ES 15 | ES 15 | ES 15 | ES 17 | ES 16 | ES 15 | 30 | G | G | 34 | EB 27 | EB 27 | EB 30 | 24 | 25 | AA 54 | ES 17 | 25 | AA 61 | ES 17 | ES 17 | ES 17 |
| 28 | ES 15 | ES 15 | ES 15 | E | ES 16 | ES 15 | ES 16 | 17 | G | G | G | G | G | G | G | ES 20 | ES 17 | ES 16 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 |
| 29 | ES 15 | ES 16 | ES 16 | ES 16 | ES 15 | ES 15 | ES 16 | ES 15 | ES 17 | G | G | EB 27 | EB 27 | EB 27 | EB 23 | EB 20 | ES 16 | ES 15 | ES 15 | ES 17 | ES 17 | ES 15 | ES 15 | ES 15 |
| 30 | ES 16 | ES 16 | ES 14 | E | ES 16 | E | ES 15 | ES 15 | G | G | G | G | G | G | G | 23 | ES 15 | ES 16 | ES 16 | ES 17 | 17 | ES 14 | ES 15 | ES 16 |
| 31 | ES 17 | ES 17 | ES 15 | ES 14 | ES 15 | ES 16 | ES 16 | ES 15 | G | 23 | G | G | G | G | G | ES 19 | ES 15 | ES 15 | 20 | 22 | 22 | ES 17 | ES 16 | ES 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 | 30 | 31 | 31 | 31 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED | ES 16 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | ES 16 | ES 15 | G | G | G | G | G | G | G | EE 19 | ES 16 | ES 16 | ES 17 | 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 | 16 | 22 | 24 | 26 | 27 | U 24 | EB 26 | EG 24 | EE 20 | ES 17 | ES 17 | 17 | ES 17 | ES 17 | ES 17 | ES 16 | ES 17 |
| LQ | ES 15 | ES 15 | ES 15 | EE 14 | ES 14 | ES 15 | ES 15 | ES 15 | G | G | G | G | G | G | G | G | ES 16 | ES 15 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 |



The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | FMIN (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 2.4sec 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 | ES 17 | ES 15 | ES 17 | ES 15 | ES 16 | ES 16 | E | ES 17 | 17 | 23 | 23 | 22 | 24 | 24 | 22 | 16 | ES 16 | ES 17 | ES 16 | ES 17 | ES 16 | ES 12 | ES 16 | ES 16 |
| 2 | E | ES 15 | ES 17 | ES 16 | E | ES 17 | ES 15 | E | 23 | 25 | 23 | 23 | 25 | 25 | C | C | C | ES 17 | ES 17 | ES 17 | ES 16 | ES 16 | ES 17 | ES 15 |
| 3 | ES 16 | ES 15 | ES 15 | ES 15 | E | ES 16 | E | ES 15 | 18 | 23 | C | 20 | 27 | 20 | 19 | ES 19 | ES 17 | ES 17 | ES 17 | ES 16 | ES 16 | E | ES 16 | E |
| 4 | ES 15 | ES 15 | ES 17 | ES 15 | ES 12 | ES 15 | ES 15 | ES 15 | 18 | 27 | 26 | 29 | 29 | 27 | 24 | 21 | ES 17 | ES 17 | ES 17 | ES 15 | ES 16 | ES 16 | E | ES 15 |
| 5 | ES 15 | ES 16 | ES 17 | ES 15 | E | ES 16 | ES 16 | ES 17 | 20 | 22 | 20 | 27 | 27 | 30 | 25 | 20 | ES 16 | ES 16 | ES 17 | ES 16 | ES 15 | ES 16 | ES 17 | E |
| 6 | ES 16 | ES 16 | ES 12 | ES 15 | E | ES 15 | ES 16 | ES 16 | 17 | 19 | 20 | 20 | 23 | 31 | 24 | 20 | ES 15 | ES 15 | ES 16 | ES 16 | ES 15 | E | ES 15 | E |
| 7 | ES 17 | E | ES 17 | ES 16 | ES 15 | ES 15 | ES 15 | ES 16 | 17 | 17 | 17 | 18 | 17 | 17 | 18 | 17 | ES 15 | ES 17 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 |
| 8 | ES 15 | E | ES 16 | E | ES 17 | ES 15 | ES 15 | E | 11 | 17 | 17 | 10 | 17 | 19 | 17 | ES 19 | ES 16 | ES 17 | ES 17 | E | ES 16 | ES 15 | ES 15 | ES 16 |
| 9 | ES 16 | ES 17 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | 14 | 17 | 17 | 17 | 17 | 18 | 19 | ES 18 | ES 16 | ES 17 | ES 17 | ES 17 | ES 17 | ES 16 | ES 15 | ES 16 |
| 10 | ES 15 | ES 15 | ES 16 | ES 15 | ES 16 | ES 17 | ES 17 | ES 15 | 19 | 17 | 17 | 18 | 19 | 17 | 18 | ES 17 | ES 17 | ES 16 | ES 16 | ES 16 | ES 15 | ES 17 | ES 16 | ES 16 |
| 11 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | 15 | 17 | 17 | 17 | 18 | 18 | 19 | ES 18 | ES 15 | ES 16 | ES 17 | ES 17 | ES 17 | ES 17 | ES 16 | ES 17 |
| 12 | ES 15 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | ES 15 | 17 | 18 | 19 | 20 | 20 | 26 | 25 | ES 20 | ES 16 | ES 16 | ES 17 | ES 16 | ES 16 | ES 15 | ES 15 | ES 11 |
| 13 | ES 12 | ES 17 | ES 17 | ES 16 | ES 13 | ES 15 | ES 16 | ES 15 | 18 | 18 | 20 | 25 | 22 | 20 | 19 | 19 | ES 16 | ES 12 | ES 17 | ES 11 | ES 17 | ES 17 | ES 16 | ES 16 |
| 14 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 16 | E | 16 | 13 | 18 | 20 | 20 | 20 | 19 | ES 20 | ES 18 | ES 17 | ES 17 | E | ES 15 | ES 17 | ES 15 | ES 15 |
| 15 | ES 16 | ES 13 | E | E | ES 15 | ES 15 | ES 16 | ES 15 | 18 | 17 | 18 | 17 | 18 | 20 | 19 | 19 | ES 17 | ES 18 | ES 17 | ES 17 | ES 15 | ES 16 | ES 16 | ES 17 |
| 16 | ES 16 | ES 16 | ES 16 | ES 15 | E | ES 17 | ES 16 | ES 17 | 18 | 20 | 25 | 27 | 23 | 22 | 21 | 20 | ES 15 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 15 |
| 17 | ES 16 | ES 16 | E | ES 17 | ES 15 | ES 16 | ES 16 | ES 11 | 19 | 22 | 23 | 25 | 27 | 28 | 20 | ES 17 | ES 15 | ES 17 | ES 16 | E | E | ES 14 | ES 17 | ES 16 |
| 18 | ES 16 | ES 15 | ES 15 | E | ES 14 | ES 15 | ES 16 | ES 15 | ES 20 | 16 | 17 | 17 | 18 | 17 | 17 | ES 20 | ES 17 | ES 16 | ES 15 | ES 15 | ES 14 | ES 15 | ES 16 | ES 15 |
| 19 | ES 16 | ES 16 | ES 17 | ES 16 | ES 15 | ES 15 | ES 15 | ES 16 | 17 | 17 | 18 | 20 | 19 | 19 | 18 | ES 17 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | E | ES 15 | ES 15 |
| 20 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 15 | ES 17 | ES 19 | 17 | 17 | 17 | 18 | 18 | 17 | 17 | ES 16 | E | ES 16 | ES 17 | ES 17 | ES 16 | ES 15 | ES 15 |
| 21 | ES 16 | ES 15 | ES 15 | ES 15 | ES 11 | E | E | ES 15 | 16 | 17 | 17 | 18 | 17 | 17 | 17 | ES 18 | E | E | ES 16 | ES 16 | ES 17 | ES 15 | ES 16 | ES 16 |
| 22 | ES 15 | ES 15 | E | E | E | ES 15 | ES 15 | ES 15 | 17 | 17 | 17 | 18 | 18 | 17 | 17 | ES 19 | ES 15 | ES 15 | ES 16 | ES 16 | ES 17 | ES 16 | ES 16 | ES 15 |
| 23 | ES 17 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | E | 17 | 17 | 17 | 19 | 19 | 17 | 18 | 17 | ES 16 | ES 12 | ES 17 | ES 16 | ES 15 | ES 15 | ES 15 | E |
| 24 | ES 15 | ES 12 | ES 15 | ES 16 | ES 15 | ES 16 | ES 17 | ES 15 | 17 | 17 | 18 | 19 | 18 | 18 | 18 | ES 17 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 17 |
| 25 | ES 15 | ES 16 | ES 15 | E | ES 15 | ES 15 | ES 16 | ES 17 | ES 17 | 13 | 20 | 20 | 24 | 20 | 20 | ES 20 | ES 18 | ES 16 | ES 12 | ES 17 | ES 17 | ES 17 | ES 15 | ES 15 |
| 26 | ES 17 | ES 16 | ES 15 | E | ES 15 | ES 16 | ES 16 | ES 17 | ES 19 | 18 | 20 | 23 | 22 | 20 | 20 | ES 20 | ES 17 | ES 16 | ES 17 | E | ES 16 | E | ES 15 | ES 12 |
| 27 | ES 16 | ES 14 | ES 15 | ES 15 | ES 15 | ES 17 | ES 16 | ES 15 | 17 | 22 | 24 | 25 | 27 | 27 | 30 | 22 | ES 17 | ES 17 | ES 17 | ES 17 | ES 17 | ES 17 | ES 17 | ES 17 |
| 28 | ES 15 | ES 15 | ES 15 | E | ES 16 | ES 15 | ES 16 | E | 17 | 19 | 20 | 21 | 22 | 20 | 20 | ES 20 | ES 17 | ES 16 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 |
| 29 | ES 15 | ES 16 | ES 16 | ES 16 | ES 15 | ES 15 | ES 16 | ES 15 | ES 17 | 20 | 20 | 27 | 27 | 27 | 23 | 20 | ES 16 | ES 15 | ES 15 | ES 17 | ES 17 | ES 15 | ES 15 | ES 15 |
| 30 | ES 16 | ES 16 | ES 14 | E | ES 16 | E | ES 15 | ES 15 | 17 | 19 | 17 | 18 | 19 | 18 | 17 | ES 18 | ES 15 | ES 16 | ES 16 | ES 17 | ES 15 | ES 14 | ES 15 | ES 16 |
| 31 | ES 17 | ES 17 | ES 15 | ES 14 | ES 15 | ES 16 | ES 16 | ES 15 | ES 17 | 17 | 18 | 19 | 19 | 19 | 17 | ES 19 | ES 15 | ES 15 | ES 15 | ES 16 | ES 17 | ES 17 | ES 16 | ES 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 | 30 | 31 | 31 | 31 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 15 | 17 | 18 | 18 | 20 | 20 | 20 | 19 | ES 19 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 15 |
| UQ | ES 16 | ES 16 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | 18 | 20 | 20 | 23 | 24 | 24 | 21 | 20 | ES 17 | ES 17 | ES 17 | ES 17 | ES 17 | ES 16 | ES 16 | ES 16 |
| LQ | ES 15 | ES 15 | ES 15 | ES 14 | ES 12 | ES 15 | ES 15 | ES 15 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | ES 17 | ES 15 | ES 15 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |

DEC. 1986 | FMIN (0.1 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | M(3000)F2 (0.01) | 135° E Mean Time (G.M.T. + 9h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 305 | 305 | 295 | 290 | 310 | 305 | 320 | 350 | 365 | 330 | 350 | 345 | 360 | 350 | 365 | 360 | 340 | 310 | 335 | 315 | 320 | 290 | 280 | F 305 |
| 2 | F | F | F | F | F 300 | F 335 | 315 | 365 | 365 | 345 | 345 | 345 | 330 | 345 | C | C | C | 325 | 320 | 320 | 315 | 305 | 315 | F |
| 3 | F | F | F | F | F | 310 | 325 | 355 | 350 | 350 | C | 360 | 355 | 345 | 370 | 370 | 335 | 325 | 345 | F 335 | F 315 | F | F | F |
| 4 | F | F | F | F 295 | F | F 315 | F | 340 | 335 | 370 | 360 | 365 | 370 | 345 | 365 | 375 | 325 | 340 | 310 | F 325 | F | F | F 325 | F 295 |
| 5 | F | F 310 | 300 | 310 | 320 | S 320 | S 315 | S 340 | 345 | 360 | 350 | 355 | H 340 | 360 | 360 | 370 | 365 | 305 | 310 | F 325 | F | F | F | F |
| 6 | F | F | F | F | F | F 340 | F | 350 | 360 | 330 | 360 | 370 | 360 | 360 | 355 | 370 | 350 | 330 | 340 | 335 | F 310 | 285 | F 305 | F |
| 7 | F | F 295 | F | F | F | 335 | 325 | 330 | 365 | 355 | 350 | 375 | 350 | 355 | 345 | 360 | 345 | 305 | 335 | 310 | F | 305 | F | F |
| 8 | F | F | F | F | F | F | F 315 | 330 | 355 | 355 | 370 | 385 | 370 | 365 | 365 | 385 | 350 | 335 | 320 | 320 | 300 | 310 | F | F |
| 9 | F 310 | F 315 | F 315 | F | F | 325 | 320 | S 360 | 370 | 360 | 350 | 345 | 355 | 365 | 365 | 345 | 345 | 325 | 320 | 335 | 335 | F 305 | 310 | F 305 |
| 10 | 305 | 300 | 295 | F 320 | F | F | 340 | 350 | 375 | 335 | 355 | 360 | 365 | 350 | 365 | 365 | 330 | 345 | 305 | 320 | 315 | 295 | 305 | 305 |
| 11 | 305 | 325 | 320 | 315 | 315 | 320 | 320 | 325 | 340 | H 335 | 375 | 365 | 365 | 370 | 370 | 380 | 360 | 330 | 320 | 335 | 310 | 280 | 305 | 310 |
| 12 | 310 | 315 | 315 | F | F 360 | 325 | 310 | 350 | 360 | 365 | 330 | 365 | 375 | 360 | 345 | 375 | 365 | 335 | 335 | 350 | 345 | 360 | 310 | 310 |
| 13 | 305 | 315 | 310 | 315 | F 335 | 380 | F | F | 370 | 370 | 380 | 340 | 375 | 360 | 360 | 360 | 370 | 320 | 310 | 335 | 340 | F | F | F |
| 14 | F | F | F | F | F 315 | F | F 320 | 325 | 360 | 330 | 320 | 340 | 365 | 370 | 355 | 325 | 310 | 325 | 365 | 335 | 285 | 285 | F | F |
| 15 | F | F | F | F | F | F | F 310 | 345 | 370 | 355 | 345 | 365 | 360 | 345 | 335 | 370 | 350 | 295 | 315 | 325 | 325 | F 320 | F | 315 |
| 16 | 320 | 315 | 325 | 310 | 330 | S 330 | 335 | 345 | 370 | 370 | 350 | 350 | 355 | 345 | 375 | 365 | 335 | 290 | 305 | 310 | 335 | F | F | F |
| 17 | F | F | F | F 325 | F | F | F 335 | 350 | 385 | 370 | 360 | 345 | 350 | 350 | 355 | 365 | 335 | 330 | 335 | 335 | 365 | F | F | U F 335 |
| 18 | F | F | F | F | F | F | F 320 | 370 | 380 | 375 | 340 | 355 | 355 | 345 | 370 | 350 | 355 | 325 | F 305 | F 335 | F 360 | F | F | 315 |
| 19 | F | F | F | F | F | F | F | 310 | 360 | 340 | 360 | 360 | 370 | 350 | 350 | 365 | 350 | 325 | F 300 | F 335 | F | F | F | F |
| 20 | F | F | F | F | F | F | F | F | 345 | 335 | 350 | 350 | 365 | 345 | 365 | 365 | 350 | 335 | 330 | 335 | 325 | 325 | F | F |
| 21 | F | F | F 300 | F | F | F | F | 335 | 375 | 360 | 345 | 355 | 375 | 350 | 365 | 365 | 380 | 335 | 335 | 345 | 310 | F | 300 | 310 |
| 22 | F | F | F | 335 | F | F 325 | F | 325 | 350 | 355 | 340 | H 320 | 360 | 330 | 365 | 355 | 365 | 325 | 320 | 335 | A | F 275 | F | F |
| 23 | 295 | 280 | 290 | 300 | F | 330 | F 350 | 335 | 365 | 345 | 335 | 340 | 330 | H 335 | 350 | 375 | 365 | 350 | 300 | 355 | 270 | F | F | F 275 |
| 24 | F 290 | F | F | F | F | F | F | 345 | 340 | 355 | 365 | 350 | H 350 | 370 | 360 | 360 | 350 | 330 | 320 | 340 | 305 | 310 | 305 | 300 |
| 25 | F 305 | F | F 300 | F | 285 | 285 | 280 | 330 | 360 | 355 | 370 | A | 350 | 340 | 360 | 365 | 360 | 295 | 320 | 355 | 290 | 300 | 295 | F 280 |
| 26 | F 300 | F 305 | 305 | F | F | F | F | 320 | 355 | 365 | 350 | 350 | 350 | H 320 | 345 | 370 | 330 | 315 | 325 | 345 | 295 | 285 | F 325 | 300 |
| 27 | 290 | 305 | 305 | F | F | F | F | 340 | 345 | 355 | 365 | 350 | 370 | 370 | 360 | 345 | 330 | A | 340 | 325 | A | 310 | 315 | 320 |
| 28 | 310 | F | F | F 330 | 325 | 335 | 325 | 335 | 355 | 320 | 360 | 365 | 370 | 365 | 360 | 360 | 345 | 335 | 325 | 340 | 335 | 300 | 320 | F 320 |
| 29 | F 310 | F 310 | F 295 | 305 | 320 | 315 | 305 | 345 | 370 | 360 | 340 | 370 | 365 | 380 | 365 | 395 | 340 | 320 | 305 | 335 | 345 | 315 | 295 | 310 |
| 30 | F 285 | F 325 | 320 | 345 | F 315 | F 335 | F 320 | 340 | 350 | 360 | 370 | 365 | 365 | 365 | 375 | 380 | 345 | 335 | 330 | 350 | 330 | F 300 | F 320 | F |
| 31 | F | F | F | F | F | F | F | F 320 | 360 | 360 | 350 | 360 | 370 | H 360 | 385 | H 350 | 345 | 335 | 325 | 335 | 345 | F 305 | F | F |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 15 | 14 | 15 | 13 | 12 | 18 | 20 | 29 | 31 | 31 | 30 | 30 | 31 | 31 | 30 | 30 | 30 | 30 | 31 | 31 | 25 | 21 | 16 | 17 |
| MED | 305 | 310 | 305 | 315 | 318 | 325 | 320 | 340 | 360 | 355 | 350 | 355 | 360 | 350 | 362 | 365 | 348 | 325 | 320 | 335 | 320 | 305 | 308 | 310 |
| UQ | 310 | 315 | 315 | 325 | 328 | 335 | 325 | 350 | 370 | 360 | 360 | 365 | 370 | 365 | 365 | 370 | 360 | 335 | 335 | 338 | 335 | 310 | 318 | 315 |
| LQ | 298 | 305 | 298 | 305 | 312 | 315 | 315 | 330 | 350 | 342 | 345 | 345 | 352 | 345 | 355 | 360 | 335 | 320 | 310 | 325 | 310 | 290 | 302 | F 300 |

DEC. 1986 | M(3000)F2 (0.01)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | M(3000)F1 (0.01) | 135° E Mean Time (G.M.T. + 9h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 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 370 | A | L | | | | | | | | | | |
| 2 | | | | | | | | | | | | 390 | | L | C | | | | | | | | | |
| 3 | | | | | | | | | | | C | L | L | | | | | | | | | | | |
| 4 | | | | | | | | | | | | L | | | | | | | | | | | | |
| 5 | | | | | | | | | | | L | 380 | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | L | L | L 395 | | | | | | | | | | | |
| 8 | | | | | | | | | | L | L | L | | | | | | | | | | | | |
| 9 | | | | | | | | | | | L | L | L 390 | | | | | | | | | | | |
| 10 | | | | | | | | | | | | L | L | | | | | | | | | | | |
| 11 | | | | | | | | | | | | L | L | | | | | | | | | | | |
| 12 | | | | | | | | | | | L | | L | | | | | | | | | | | |
| 13 | | | | | | | | | | | L | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | L | L | L | | | | | | | | | | | |
| 15 | | | | | | | | | | | | L | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | A | A | L | | | | | | | | | | |
| 17 | | | | | | | | | | | | L | L | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | L | L | | | | | | | | | | |
| 19 | | | | | | | | | | | | L | L | L | | | | | | | | | | |
| 20 | | | | | | | | | | | L | L | | L | | | | | | | | | | |
| 21 | | | | | | | | | | | | 370 | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | L | | | | | | | | | | | |
| 23 | | | | | | | | | | L | | L | L | | | | | | | | | | | |
| 24 | | | | | | | | | | | L | L | L | L | | | | | | | | | | |
| 25 | | | | | | | | | | | A | A | L 385 | | | | | | | | | | | |
| 26 | | | | | | | | | | | L | L | L | | | | | | | | | | | |
| 27 | | | | | | | | | | | L | | L | L | | | | | | | | | | |
| 28 | | | | | | | | | | | L | L | L | L | | | | | | | | | | |
| 29 | | | | | | | | | | | L | L | L | | | | | | | | | | | |
| 30 | | | | | | | | | | | | L | L | | | | | | | | | | | |
| 31 | | | | | | | | | | | | 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 | 3 | | | | | | | | | | | |
| MED | | | | | | | | | | | | 375 | L 390 | | | | | | | | | | | |
| UQ | | | | | | | | | | | | 385 | L 392 | | | | | | | | | | | |
| LQ | | | | | | | | | | | | 370 | L 388 | | | | | | | | | | | |

DEC. 1986 | M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | H'F2 (KM) | 135° E Mean Time (G.M.T. + 9h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | 250 | 245 | 225 | 245 | | | | | | | | | | |
| 2 | | | | | | | | | | | | 225 | | 230 | C | | | | | | | | | |
| 3 | | | | | | | | | | | C | 225 | 225 | | | | | | | | | | | |
| 4 | | | | | | | | | | | | 235 | | | | | | | | | | | | |
| 5 | | | | | | | | | | | 245 | 225 | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | 240 | 220 | 225 | | | | | | | | | | | |
| 8 | | | | | | | | | | 230 | 220 | 215 | | | | | | | | | | | | |
| 9 | | | | | | | | | | | 245 | 225 | 235 | | | | | | | | | | | |
| 10 | | | | | | | | | | | | 220 | 215 | | | | | | | | | | | |
| 11 | | | | | | | | | | | | 230 | 225 | | | | | | | | | | | |
| 12 | | | | | | | | | | | 225 | | 220 | | | | | | | | | | | |
| 13 | | | | | | | | | | | 235 | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | 260 | 220 | 210 | | | | | | | | | | | |
| 15 | | | | | | | | | | | | 230 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | 245 | 235 | 240 | | | | | | | | | | |
| 17 | | | | | | | | | | | | 250 | 220 | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | 215 | 250 | | | | | | | | | | |
| 19 | | | | | | | | | | | | 225 | 220 | 225 | | | | | | | | | | |
| 20 | | | | | | | | | | | 240 | 225 | | 250 | | | | | | | | | | |
| 21 | | | | | | | | | | | | 230 | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | 225 | | | | | | | | | | | |
| 23 | | | | | | | | | | 250 | | 235 | 220 | | | | | | | | | | | |
| 24 | | | | | | | | | | | 220 | 245 | 225 | 210 | | | | | | | | | | |
| 25 | | | | | | | | | | | 230 | A | 240 | | | | | | | | | | | |
| 26 | | | | | | | | | | | 230 | 225 | 225 | | | | | | | | | | | |
| 27 | | | | | | | | | | | 220 | | 230 | 225 | | | | | | | | | | |
| 28 | | | | | | | | | | | 225 | 225 | 220 | 210 | | | | | | | | | | |
| 29 | | | | | | | | | | | 235 | 225 | 230 | | | | | | | | | | | |
| 30 | | | | | | | | | | | | 235 | 245 | | | | | | | | | | | |
| 31 | | | | | | | | | | | | 235 | 225 | | | | | | | | | | | |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | | | | | | | | | | 2 | 15 | 24 | 22 | 9 | | | | | | | | | | |
| MED | | | | | | | | | | 240 | 235 | 225 | 225 | 230 | | | | | | | | | | |
| UQ | | | | | | | | | | | 242 | 235 | 230 | 245 | | | | | | | | | | |
| LQ | | | | | | | | | | | 225 | 225 | 220 | 225 | | | | | | | | | | |

DEC. 1986 | H'F2 (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | H'F (KM) | 135° E Mean Time (G.M.T. + 9h)

Station WAKKANAI Lat. 45° 23.5' N, Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 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 | A | A 325 | 305 | 255 | A 300 | 265 | 220 | 215 | 225 | 240 | 200 | A | 200 | 220 | 210 | A | 260 | 230 | 235 | 240 | 250 | 285 | 255 |
| 2 | A | 275 | 270 | 255 | 250 | 220 | 220 | 215 | 210 | 225 | 225 | 205 | H 205 | 215 | C | C | C | 240 | 250 | 240 | 255 | 255 | 250 | 225 |
| 3 | 295 | 275 | 275 | 275 | 250 | 250 | 240 | 210 | 210 | 235 | C | 220 | 210 | H 205 | 220 | 210 | 200 | 250 | 245 | 240 | 280 | 250 | 295 | 285 |
| 4 | 295 | 240 | 255 | 255 | 255 | 250 | 230 | 210 | 225 | 225 | H 215 | 220 | 220 | 230 | 225 | 210 | 205 | 210 | 275 | 230 | 235 | 255 | 275 | 265 |
| 5 | 255 | 245 | 250 | 220 | 205 | 210 | 255 | 220 | A | 210 | 240 | 210 | H 200 | 240 | H 225 | 210 | 200 | 235 | 230 | 235 | 265 | 290 | 270 | 255 |
| 6 | 230 | 235 | 250 | 240 | 240 | 215 | 235 | 215 | 205 | 215 | 215 | H 220 | 225 | 225 | 220 | 220 | 200 | 220 | 230 | 220 | 250 | 275 | 270 | 285 |
| 7 | 285 | 280 | 250 | 240 | 215 | 235 | 250 | 205 | 205 | 230 | 220 | 220 | 200 | H 205 | 225 | 210 | 215 | 250 | 235 | 240 | 240 | 240 | 255 | 260 |
| 8 | 295 | 250 | 250 | 220 | 240 | 250 | 260 | 220 | 215 | 225 | 220 | 215 | H 200 | H 200 | 220 | 205 | 205 | 235 | 250 | 235 | 250 | 275 | 250 | 250 |
| 9 | 235 | 240 | 250 | 245 | 250 | 235 | 250 | 220 | 200 | 225 | 205 | 205 | 200 | 200 | 220 | 210 | 200 | 250 | 250 | 245 | 225 | 255 | 240 | 240 |
| 10 | 250 | 275 | 250 | 235 | 275 | 225 | 240 | 200 | 200 | 215 | 215 | 210 | 205 | 230 | 215 | 210 | 205 | 220 | 250 | 250 | 250 | 270 | 255 | 250 |
| 11 | 250 | 230 | 230 | 255 | 250 | 250 | 250 | 225 | 205 | 205 | 220 | 220 | 225 | H 230 | H 200 | 205 | 200 | 225 | 250 | 230 | 245 | 330 | 290 | 250 |
| 12 | 255 | 275 | 235 | 245 | 195 | 225 | 250 | 205 | 200 | 225 | 210 | 225 | 205 | 220 | 225 | 205 | 200 | 245 | 230 | 210 | 220 | 220 | 270 | 255 |
| 13 | 260 | 275 | 270 | 270 | 250 | 200 | 230 | 200 | 200 | 210 | 225 | 230 | 215 | 225 | H 210 | 205 | 200 | 230 | 225 | 205 | 230 | 270 | 260 | 290 |
| 14 | 300 | 265 | 235 | 255 | 250 | 240 | 215 | 210 | 210 | 215 | 230 | 220 | 205 | 215 | 230 | 220 | 245 | 250 | A | A 260 | 270 | A 300 | 265 | 285 |
| 15 | 280 | 275 | 270 | 250 | 205 | 240 | 240 | 215 | 205 | 215 | 215 | 220 | 215 | 225 | 210 | 205 | 200 | A | 265 | 250 | 245 | 250 | 280 | 260 |
| 16 | 250 | 265 | 250 | 255 | 245 | 225 | 220 | 215 | 210 | 205 | 240 | A | A | 225 | 220 | 210 | 195 | S 285 | A | A | 240 | 230 | A 320 | 275 |
| 17 | 250 | 250 | 300 | 265 | 250 | 270 | 220 | 215 | H 200 | A 220 | 225 | 230 | 210 | 230 | 215 | 205 | 205 | 230 | 260 | 225 | 200 | 300 | 285 | 225 |
| 18 | 250 | 260 | 260 | 270 | 250 | 215 | 240 | 200 | 205 | 200 | 220 | 220 | 205 | 195 | 210 | 210 | 200 | 220 | 255 | 240 | 220 | 245 | 250 | 255 |
| 19 | 290 | 260 | 290 | 250 | 200 | 245 | 230 | 220 | 205 | 220 | H 210 | 225 | 215 | 200 | H 205 | 225 | 200 | 250 | 270 | 245 | 215 | 220 | 265 | 250 |
| 20 | 255 | 250 | 260 | 255 | 250 | 220 | 215 | 200 | 210 | 215 | 240 | 220 | 215 | 200 | 205 | 210 | 205 | 200 | 230 | 240 | A 265 | 250 | 260 | 260 |
| 21 | 275 | 300 | 280 | 250 | 220 | 200 | A 305 | 220 | 200 | 220 | 215 | 230 | H 200 | 220 | 220 | 210 | 205 | A | 250 | A 250 | 230 | 270 | 290 | 285 |
| 22 | 285 | 300 | 275 | 240 | 185 | 240 | 275 | 245 | 220 | 220 | 215 | 215 | 225 | 210 | H 205 | 205 | 200 | 200 | 240 | 225 | A | 275 | 300 | 300 |
| 23 | 300 | 305 | 300 | 275 | 280 | 240 | 215 | 220 | A | 225 | 225 | 230 | 205 | H 205 | 220 | 205 | 200 | 215 | 250 | 220 | 250 | 300 | 300 | 300 |
| 24 | 300 | 265 | 250 | 255 | 205 | 295 | 300 | 220 | 240 | 225 | 205 | 205 | 225 | 205 | H 200 | 220 | 210 | 225 | 275 | 245 | 260 | 260 | S 270 | 280 |
| 25 | 300 | 295 | 265 | 255 | 230 | 230 | S 260 | 235 | 220 | 240 | A | A | 215 | H 195 | 215 | 205 | 200 | 260 | 255 | 225 | A | A 350 | 290 | 300 |
| 26 | 290 | 265 | 275 | 275 | 300 | 300 | 250 | 230 | 200 | 225 | 225 | 215 | 210 | 210 | H 200 | 215 | 205 | 265 | 245 | 220 | 265 | 270 | 280 | 275 |
| 27 | 285 | 265 | 275 | 255 | 225 | 245 | 265 | 220 | 225 | 230 | 220 | 230 | 225 | 215 | 230 | 205 | 225 | A | 260 | A 300 | A | 275 | 300 | 265 |
| 28 | 260 | 270 | 260 | 225 | 235 | 215 | 225 | 210 | 220 | 225 | 225 | 210 | 200 | 210 | 215 | H 200 | 205 | 245 | 250 | 235 | 245 | 275 | 255 | 235 |
| 29 | 250 | 265 | 275 | 290 | 265 | 260 | 270 | 220 | 205 | 235 | 235 | 215 | 205 | 220 | 235 | 205 | 205 | 250 | 250 | 235 | 235 | 275 | 300 | 260 |
| 30 | 280 | 275 | 265 | 225 | 250 | 225 | 230 | 210 | 205 | 235 | 220 | 235 | 200 | H 220 | 220 | 210 | 200 | 235 | 250 | 210 | 245 | 255 | 260 | 250 |
| 31 | 295 | 260 | 250 | 260 | 250 | 280 | 230 | 225 | 215 | 220 | 225 | 220 | 210 | 215 | 210 | 200 | 205 | 215 | 260 | 250 | 245 | 270 | 250 | 290 |
| | 00 | 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 | 31 | 31 | 31 | 31 | 29 | 31 | 29 | 29 | 29 | 31 | 30 | 30 | 29 | 28 | 29 | 30 | 28 | 31 | 31 | 31 |
| MED | 280 | 265 | 260 | 255 | 250 | 240 | 240 | 215 | 205 | 225 | 220 | 220 | 210 | 215 | 220 | 210 | 200 | 235 | 250 | 235 | 245 | 270 | 270 | 260 |
| UQ | 295 | 275 | 275 | 262 | 250 | 250 | 258 | 220 | 215 | 225 | 225 | 225 | 215 | 225 | 220 | 210 | 205 | 250 | 255 | 245 | 252 | 275 | 290 | 285 |
| LQ | 250 | 250 | 250 | 242 | 222 | 222 | 230 | 210 | 205 | 215 | 215 | 215 | 205 | 205 | 210 | 205 | 200 | 220 | 240 | 225 | 232 | 250 | 258 | 250 |

DEC. 1986 | H'F (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | H'E (KM) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | S | A | A | A | A | A | B | A | A | S | | | | | | | |
| 2 | | | | | | | | A | B | B | B 140 | A | B | B | C | C | C | | | | | | | |
| 3 | | | | | | | | S | 110 | B | C | A | B | 130 | 130 | S | S | | | | | | | |
| 4 | | | | | | | | S | 140 | B | B | B | B | B | B | B | S | | | | | | | |
| 5 | | | | | | | | S | A | A | A | B | B | B | B | B | S | | | | | | | |
| 6 | | | | | | | | S | A | 130 | 130 | A | A | B | B | B | S | | | | | | | |
| 7 | | | | | | | | S | A | 115 | 120 | 120 | A | 125 | 125 | A | S | | | | | | | |
| 8 | | | | | | | | E | 125 | 125 | A 125 | 115 | A | 120 | 120 | S | S | | | | | | | |
| 9 | | | | | | | | S | A | 115 | 115 | 115 | 115 | 120 | 125 | S | S | | | | | | | |
| 10 | | | | | | | | S | B | 120 | 120 | 120 | 120 | 120 | 120 | S | S | | | | | | | |
| 11 | | | | | | | | S | A | 115 | A | 115 | 120 | 120 | 120 | S | S | | | | | | | |
| 12 | | | | | | | | S | B | 120 | 120 | A | 130 | B | B | S | S | | | | | | | |
| 13 | | | | | | | | S | 150 | 135 | 135 | B | 125 | 130 | 125 | B | S | | | | | | | |
| 14 | | | | | | | | E | 130 | A | A | A | 125 | A | A | S | | | | | | | | |
| 15 | | | | | | | | S | B | A | A | 120 | A | A | A | A | S | | | | | | | |
| 16 | | | | | | | | S | A | A | B | B | A | A | A | B | S | | | | | | | |
| 17 | | | | | | | | A | A | A | A | A | B | B | 130 | S | S | | | | | | | |
| 18 | | | | | | | | S | S | 120 | 115 | 115 | 115 | 125 | 120 | S | S | | | | | | | |
| 19 | | | | | | | | S | 135 | 120 | 120 | 125 | 120 | 120 | 120 | S | S | | | | | | | |
| 20 | | | | | | | | S | S | 125 | 125 | 120 | 120 | 115 | 120 | 140 | S | | | | | | | |
| 21 | | | | | | | | S | 130 | 125 | A | 120 | 125 | 120 | 120 | S | A | | | | | | | |
| 22 | | | | | | | | S | B 140 | 130 | 130 | 125 | 120 | 120 | 125 | S | S | | | | | | | |
| 23 | | | | | | | | E | A | A | A | 120 | 125 | 125 | 125 | 150 | S | | | | | | | |
| 24 | | | | | | | | S | B | 120 | 120 | 120 | 120 | 120 | 135 | S | S | | | | | | | |
| 25 | | | | | | | | S | S | 125 | B 125 | A | A | 125 | 150 | S | S | | | | | | | |
| 26 | | | | | | | | S | S | 130 | A | 125 | 130 | 130 | 120 | S | S | | | | | | | |
| 27 | | | | | | | | S | A | B | B | B | B | B | B | B | S | | | | | | | |
| 28 | | | | | | | | A | B 150 | 135 | 130 | 130 | 130 | 130 | 120 | S | S | | | | | | | |
| 29 | | | | | | | | S | S | 130 | 125 | B | B | B | B | B | S | | | | | | | |
| 30 | | | | | | | | S | 145 | 150 | 130 | 125 | 125 | 125 | 125 | S | S | | | | | | | |
| 31 | | | | | | | | S | S | A | 125 | 120 | 125 | 120 | 125 | 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 | | | | | | | | | 10 | 19 | 18 | 17 | 17 | 19 | 20 | 2 | | | | | | | | |
| MED | | | | | | | | | 138 | 125 | 125 | 120 | 125 | 120 | 125 | 145 | | | | | | | | |
| UQ | | | | | | | | | 145 | 130 | 130 | 125 | 125 | 125 | 125 | | | | | | | | | |
| LQ | | | | | | | | | 130 | 120 | 120 | 120 | 120 | 120 | 120 | | | | | | | | | |

The Radio Research Laboratory, Japan

DEC. 1986 | H'E (KM)

# IONOSPHERIC DATA

DEC. 1986 | H'ES (KM) | 135° E Mean Time (G.M.T. + 9h)

Station WAKKANAI Lat. 45° 23.5' N. Long. 141° 41.2' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 105 | 100 | 100 | 105 | S | 100 | 105 | 110 | 105 | 105 | 105 | 100 | 100 | B | 100 | 100 | 100 | 100 | 100 | S | S | S | S | 100 |
| 2 | 100 | 100 | S | S | E | S | S | 115 | B | B | G | 100 | B | B | C | C | C | S | 110 | S | S | 110 | S | S |
| 3 | S | S | S | S | E | S | E | S | G | B | C | 105 | B | G | 115 | S | S | 105 | 100 | S | 110 | 105 | 105 | 100 |
| 4 | 100 | 105 | S | S | S | 130 | S | S | 160 | B | B | B | B | B | B | B | S | S | 105 | S | 105 | 105 | 105 | S |
| 5 | S | 100 | 100 | S | E | S | S | 110 | 105 | 105 | 100 | B | B | B | B | B | S | S | S | 105 | S | 105 | 100 | 105 |
| 6 | 100 | S | S | S | 100 | S | 120 | 120 | 105 | G | G | 105 | 100 | B | B | B | S | S | S | S | S | E | S | 100 |
| 7 | 105 | 100 | 100 | 100 | 100 | 100 | S | S | 105 | G | G | G | 100 | 100 | G | 100 | 100 | 100 | S | S | S | S | S | S |
| 8 | 100 | 100 | S | E | S | S | S | 130 | G | G | 100 | G | 100 | G | G | S | 100 | S | S | E | S | S | S | S |
| 9 | S | 100 | S | S | S | S | S | S | 110 | G | G | G | G | 100 | G | S | S | S | S | S | S | 105 | S | S |
| 10 | S | 100 | 100 | S | S | S | S | S | B | G | G | G | G | G | G | G | S | S | 110 | S | S | 115 | 110 | 105 |
| 11 | S | S | S | S | S | S | S | S | 145 | 120 | 115 | G | G | G | G | S | S | S | S | S | 110 | 120 | 105 | 110 |
| 12 | S | S | S | S | S | S | S | S | 150 | 145 | G | 105 | 110 | B | B | S | S | S | S | S | S | 105 | S | S |
| 13 | S | S | S | S | S | S | S | S | G | G | G | 125 | G | G | G | B | S | S | S | 115 | 115 | 120 | 115 | S |
| 14 | 110 | S | S | S | S | S | S | 155 | G | 115 | 120 | 115 | G | 115 | 110 | S | S | S | 115 | 115 | 115 | 110 | S | 120 |
| 15 | 110 | S | 130 | E | S | S | S | S | G | 110 | 105 | 100 | 105 | 105 | 105 | 120 | 100 | 115 | 115 | 115 | S | S | 105 | 105 |
| 16 | S | S | S | S | E | S | S | S | 105 | 105 | 165 | 105 | 105 | 105 | 100 | 125 | 110 | 105 | 105 | 105 | S | 105 | 125 | 105 |
| 17 | 105 | 105 | 100 | 100 | S | S | S | 110 | 105 | 105 | 105 | 105 | B | B | G | 150 | S | S | S | 110 | 115 | 110 | 105 | 105 |
| 18 | S | S | S | E | S | S | S | S | S | G | G | G | G | 105 | G | S | S | S | S | S | S | S | S | S |
| 19 | S | S | S | S | S | S | S | S | G | G | G | G | G | G | G | G | S | S | S | S | S | E | S | S |
| 20 | S | S | S | S | S | S | S | S | 175 | 155 | G | G | G | G | G | G | S | E | S | S | 105 | S | S | S |
| 21 | S | S | S | S | S | E | 155 | S | G | G | 120 | G | G | G | 120 | G | 105 | 105 | 105 | 105 | 100 | S | 100 | S |
| 22 | S | S | E | E | E | S | S | S | G | 140 | 100 | 105 | 130 | 125 | G | S | S | S | 120 | 105 | 105 | S | 105 | 100 |
| 23 | 100 | S | S | S | 110 | 105 | 115 | 110 | 105 | 105 | 105 | G | G | G | G | G | S | S | 120 | S | S | S | S | E |
| 24 | S | S | S | S | S | S | S | S | G | G | G | G | G | G | G | G | S | S | S | S | S | S | 110 | 110 |
| 25 | 110 | S | S | E | S | S | S | S | 135 | 120 | 120 | 110 | 110 | G | G | 155 | 105 | S | 110 | 105 | 105 | 100 | S | S |
| 26 | S | S | S | E | S | S | S | S | S | G | 105 | G | 130 | 130 | G | S | 105 | 110 | 105 | 105 | S | E | S | S |
| 27 | S | S | S | S | S | S | S | S | 105 | 160 | 135 | 120 | B | B | B | 120 | 120 | 115 | 115 | 110 | 110 | 110 | 105 | 110 |
| 28 | S | S | S | E | S | S | S | 105 | G | G | G | G | G | G | G | S | S | S | S | S | S | S | S | S |
| 29 | 105 | 100 | S | S | S | S | S | S | S | G | G | B | B | B | B | B | S | S | S | S | S | S | S | S |
| 30 | S | S | S | E | S | E | S | S | G | 150 | 145 | 130 | 130 | 125 | 125 | 120 | S | S | S | 105 | 105 | S | S | 100 |
| 31 | 105 | 100 | 100 | S | S | S | S | S | 150 | 105 | G | G | G | G | G | S | S | S | 110 | 110 | 110 | 110 | 115 | 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 | 13 | 11 | 7 | 3 | 3 | 4 | 4 | 9 | 15 | 15 | 15 | 14 | 11 | 9 | 7 | 8 | 9 | 8 | 15 | 13 | 13 | 15 | 14 | 15 |
| MED | 105 | 100 | 100 | 100 | 100 | 102 | 118 | 110 | 105 | 115 | 105 | 105 | 105 | 105 | 110 | 120 | 105 | 105 | 110 | 105 | 110 | 110 | 105 | 105 |
| UQ | 105 | 100 | 100 | 102 | 105 | 118 | 138 | 120 | 148 | 142 | 120 | 115 | 120 | 125 | 118 | 138 | 105 | 112 | 115 | 110 | 110 | 110 | 110 | 108 |
| LQ | 100 | 100 | 100 | 100 | 100 | 100 | 110 | 110 | 105 | 105 | 105 | 105 | 100 | 105 | 102 | 110 | 100 | 102 | 105 | 105 | 105 | 105 | 105 | 100 |

DEC. 1986 | H'ES (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | TYPES OF ES | 135° E Mean Time (G.M.T. + 9h)

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

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

The Radio Research Laboratory, Japan

DEC. 1986 | TYPES OF ES

# IONOSPHERIC DATA

DEC. 1986 | FXI (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | X 36 | X 36 | X 36 | A | X 38 | X 34 | X 32 | | | | | | | | | | | X 44 | X 44 | X 44 | 44 | 41 | 42 | 44 |
| 2 | 44 | 45 | 44 | X 42 | 55 | 55 | 45 | | | | | | | | | | | X 37 | X 38 | 48 | 47 | 47 | X 40 | 44 |
| 3 | 45 | 50 | 52 | 47 | 43 | 40 | X 34 | | | | | | | | | | | X 37 | X 42 | X 33 | X 34 | 40 | 42 | 44 |
| 4 | 44 | 40 | 39 | 36 | 35 | 37 | 34 | | | | | | | | | | | X 38 | X 38 | X 40 | 39 | 40 | 39 | 40 |
| 5 | 51 | 41 | 48 | 40 | 46 | 47 | 45 | | | | | | | | | | | 42 | 33 | 44 | 38 | 46 | 50 | 50 |
| 6 | 45 | 40 | 40 | 39 | 38 | 38 | 38 | | | | | | | | | | | X 34 | X 37 | X 35 | X 35 | 40 | 49 | 52 |
| 7 | 53 | 59 | 52 | 49 | 39 | 39 | 40 | | | | | | | | | | | X 33 | X 34 | X 40 | X 39 | X 38 | 40 | 46 |
| 8 | 40 | 52 | 52 | 49 | 48 | 40 | 36 | | | | | | | | | | | X 34 | X 32 | X 32 | X 35 | X 38 | X 43 | 51 |
| 9 | 47 | 49 | 43 | 40 | 40 | 40 | 40 | | | | | | | | | | | X 34 | X 33 | X 38 | X 44 | 46 | 50 | 54 |
| 10 | 40 | 51 | 52 | 49 | 50 | 50 | 47 | | | | | | | | | | | X 36 | X 32 | X 37 | X 42 | X 39 | 48 | X 42 |
| 11 | 40 | 48 | 47 | X 37 | X 38 | 44 | 49 | | | | | | | | | | | X 41 | X 37 | X 35 | X 36 | X 36 | 43 | 45 |
| 12 | 41 | 45 | 48 | X 42 | X 39 | X 39 | X 37 | | | | | | | | | | | X 39 | X 41 | X 44 | X 32 | X 31 | X 33 | 39 |
| 13 | X 37 | X 38 | 43 | 43 | 50 | X 42 | X 30 | | | | | | | | | | | X 37 | X 41 | 50 | 47 | 53 | 60 | 62 |
| 14 | 59 | 62 | 57 | 62 | 50 | 46 | 44 | | | | | | | | | | | X 50 | X 61 | X 36 | 40 | 49 | 53 | 53 |
| 15 | 48 | 50 | 49 | 49 | 42 | 39 | 40 | | | | | | | | | | | X 32 | X 39 | X 46 | X 40 | X 38 | 51 | 62 |
| 16 | 58 | 59 | 59 | 59 | 50 | X 37 | 38 | | | | | | | | | | | X 31 | X 37 | 40 | 49 | 38 | 40 | 40 |
| 17 | 41 | 40 | 42 | 44 | 40 | 38 | 44 | | | | | | | | | | | X 42 | X 44 | X 54 | 46 | 40 | 50 | 49 |
| 18 | 44 | 44 | 49 | 51 | 47 | 38 | 40 | | | | | | | | | | | X 41 | X 32 | X 34 | X 37 | 40 | 50 | 53 |
| 19 | 50 | 51 | 50 | 49 | 39 | 31 | 39 | | | | | | | | | | | X 41 | X 31 | 40 | 42 | 40 | 51 | 46 |
| 20 | 52 | 51 | 53 | 53 | 50 | 40 | 50 | | | | | | | | | | | X 41 | X 41 | X 40 | X 30 | 40 | 40 | 51 |
| 21 | 52 | 57 | 59 | 64 | 53 | 37 | 34 | | | | | | | | | | | X 39 | X 38 | X 37 | X 36 | 36 | 40 | 40 |
| 22 | 40 | 40 | 40 | 50 | X 31 | X 28 | X 28 | | | | | | | | | | | X 43 | X 39 | X 37 | X 34 | X 35 | 38 | 40 |
| 23 | 38 | 37 | 38 | 38 | 40 | A | 35 | | | | | | | | | | | X 39 | X 38 | X 36 | 38 | 39 | 40 | 40 |
| 24 | 40 | 43 | 40 | 46 | 36 | 30 | 30 | | | | | | | | | | | X 38 | X 31 | X 32 | X 32 | 31 | 33 | 38 |
| 25 | 36 | 39 | 39 | 40 | 34 | X 31 | X 30 | | | | | | | | | | | X 38 | X 37 | X 37 | X 36 | 34 | 40 | 40 |
| 26 | 40 | 43 | 44 | 40 | 38 | 38 | 33 | | | | | | | | | | | A | X 42 | X 52 | X 36 | X 33 | X 36 | 40 |
| 27 | 41 | 40 | X 39 | 44 | 38 | 33 | 35 | | | | | | | | | | | X 35 | X 36 | 40 | 40 | 40 | 39 | 39 |
| 28 | 40 | 41 | 42 | 48 | 38 | 40 | 39 | | | | | | | | | | | X 39 | X 40 | X 40 | X 35 | X 35 | 39 | X 36 |
| 29 | X 31 | X 32 | X 32 | X 33 | X 32 | X 32 | X 30 | | | | | | | | | | | X 36 | X 35 | X 34 | X 39 | X 32 | X 32 | 35 |
| 30 | X 33 | X 34 | X 36 | X 37 | X 32 | X 33 | X 32 | | | | | | | | | | | X 42 | X 38 | X 39 | X 33 | X 36 | 41 | 39 |
| 31 | 40 | 48 | 49 | 47 | 47 | 53 | 50 | | | | | | | | | | | X 44 | X 39 | 48 | 40 | 34 | 40 | 48 |
| | 00 | 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 | 30 | 31 | | | | | | | | | | | 30 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED | 41 | 44 | 47 | 45 | 40 | 38 | 38 | | | | | | | | | | | X 38 | X 38 | X 40 | X 38 | 39 | 40 | 44 |
| UQ | 48 | 50 | 51 | 49 | 48 | 40 | 42 | | | | | | | | | | | X 41 | X 40 | X 44 | 41 | 40 | 50 | 50 |
| LQ | 40 | 40 | 40 | 40 | 38 | 34 | 34 | | | | | | | | | | | X 36 | X 34 | X 36 | X 35 | X 36 | 40 | 40 |

DEC. 1986 | FXI (0.1 MHZ)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | FOF2 (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station AKITA | Lat. 39° 43.5' N, | Long. 140° 08.0' E | Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

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

The Radio Research Laboratory, Japan

DEC. 1986 | FOF2 (0.1 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FOF1 (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station AKITA Lat. 39° 43.5' N. Long. 140° 08.0' E Sweep 1 MHz to 25 MHz in 2 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 | | | | | | | | | | L | L | A | L | L | L | | | | | | | | | |
| 2 | | | | | | | | | | L | L | L | L | L | L | | | | | | | | | |
| 3 | | | | | | | | | | | L | L | L | L | L | | | | | | | | | |
| 4 | | | | | | | | | | L | L | L | L 360 | L | | | | | | | | | | |
| 5 | | | | | | | | | | A | L | 400 | L | A | L | | | | | | | | | |
| 6 | | | | | | | | | | L | L | 380 | L | L 330 | 300 | | | | | | | | | |
| 7 | | | | | | | | | | L | L 370 | 380 | L | L 360 | | | | | | | | | | |
| 8 | | | | | | | | | | L | L | L | L | L | L | | | | | | | | | |
| 9 | | | | | | | | | | L | L | L | L 370 | L | | | | | | | | | | |
| 10 | | | | | | | | | | L | L | L | L | L | L | | | | | | | | | |
| 11 | | | | | | | | | | | L | L | L 380 | L | L | | | | | | | | | |
| 12 | | | | | | | | | | L | L | L 380 | L | L 360 | L | | | | | | | | | |
| 13 | | | | | | | | | | L | L | L | L | 350 | | | | | | | | | | |
| 14 | | | | | | | | | | | L | 400 | L | L | L | | | | | | | | | |
| 15 | | | | | | | | | | | L | L | L | L | L | | | | | | | | | |
| 16 | | | | | | | | | | | C | C | C | L | L | | | | | | | | | |
| 17 | | | | | | | | | | | L | L | L | L | L | | | | | | | | | |
| 18 | | | | | | | | | | L | 400 | 400 | 390 | L | L | | | | | | | | | |
| 19 | | | | | | | | | | | L | L | L | L | L | | | | | | | | | |
| 20 | | | | | | | | | | L | L | L | L 360 | L | L | | | | | | | | | |
| 21 | | | | | | | | | | L | L | L | L 380 | L 360 | L | | | | | | | | | |
| 22 | | | | | | | | | | L | L | L | L | L | L | L | | | | | | | | |
| 23 | | | | | | | | | | L 390 | L | 400 | L | L | | | | | | | | | | |
| 24 | | | | | | | | | | L | L | L | L | L | L | | | | | | | | | |
| 25 | | | | | | | | | | 310 | L | L | A | 390 | L | | | | | | | | | |
| 26 | | | | | | | | | | | L | L | L 390 | L | L | | | | | | | | | |
| 27 | | | | | | | | | | | | L | L | L | L | L | | | | | | | | |
| 28 | | | | | | | | | | | L 380 | L | L | L | | | | | | | | | | |
| 29 | | | | | | | | | | | L 380 | 380 | L 390 | L | L | | | | | | | | | |
| 30 | | | | | | | | | | | | L | L | L | L | | | | | | | | | |
| 31 | | | | | | | | | | L | L | L | L | L | L | | | | | | | | | |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | | | | | | | | | | 2 | 4 | 8 | 8 | 6 | 1 | | | | | | | | | |
| MED | | | | | | | | | | 350 | L 380 | 390 | L 380 | L 360 | 300 | | | | | | | | | |
| UQ | | | | | | | | | | | 390 | 400 | L 390 | L 360 | | | | | | | | | | |
| LQ | | | | | | | | | | | L 375 | 380 | L 365 | L 350 | | | | | | | | | | |

DEC. 1986 | FOF1 (0.01 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FOE (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.0' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| 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 | A | A | A | A | A | 260 | 240 | 200 | S | | | | | | | |
| 2 | | | | | | | | S | A | 245 | 260 | 275 | 280 | A | A | 200 | S | | | | | | | |
| 3 | | | | | | | | S | 215 | A | 270 | 285 | 280 | 270 | 250 | 210 | S | | | | | | | |
| 4 | | | | | | | | S | 205 | 240 | 260 | I B 285 | 280 | 260 | 245 | B | S | | | | | | | |
| 5 | | | | | | | | S | A | A | A | A | 280 | A | A | A | S | | | | | | | |
| 6 | | | | | | | | S | A | 235 | A | 270 | 280 | 275 | 245 | 205 | S | | | | | | | |
| 7 | | | | | | | | S | 215 | A | 265 | 275 | 280 | 260 | 240 | 200 | S | | | | | | | |
| 8 | | | | | | | | S | A | A | 270 | 275 | 270 | 260 | A | A | S | | | | | | | |
| 9 | | | | | | | | S | A | A | A | A | 270 | A | 250 | 200 | S | | | | | | | |
| 10 | | | | | | | | S | A | A | 280 | 285 | 285 | 275 | 245 | 200 | S | | | | | | | |
| 11 | | | | | | | | S | A | A | A | A | A | A | A | A | S | | | | | | | |
| 12 | | | | | | | | S | 205 | 245 | A | A | 280 | 270 | 245 | 205 | S | | | | | | | |
| 13 | | | | | | | | S | 185 | A | 280 | 285 | 285 | 275 | 250 | 210 | S | | | | | | | |
| 14 | | | | | | | | S | A | A | A | 275 | 275 | 265 | 245 | 210 | S | | | | | | | |
| 15 | | | | | | | | S | 190 | 250 | A | 270 | 270 | A | 250 | A | S | | | | | | | |
| 16 | | | | | | | | S | A | A | C | C | C | A | A | 200 | S | | | | | | | |
| 17 | | | | | | | | S | 200 | 245 | 260 | 280 | 280 | 260 | 250 | A | S | | | | | | | |
| 18 | | | | | | | | S | 200 | 240 | 255 | A | 275 | 260 | 235 | A | S | | | | | | | |
| 19 | | | | | | | | S | A | A | 275 | 290 | A | A | 245 | 205 | S | | | | | | | |
| 20 | | | | | | | | S | A | 245 | A | 280 | 280 | 270 | 250 | 195 | S | | | | | | | |
| 21 | | | | | | | | S | 205 | 250 | A | A | A | A | A | 205 | S | | | | | | | |
| 22 | | | | | | | | S | 205 | A | 285 | A | A | A | A | A | S | | | | | | | |
| 23 | | | | | | | | S | A | A | A | A | A | A | 240 | A | S | | | | | | | |
| 24 | | | | | | | | S | A | A | 250 | 255 | 260 | 255 | 240 | 210 | S | | | | | | | |
| 25 | | | | | | | | S | 200 | A | A | A | A | A | A | 220 | S | | | | | | | |
| 26 | | | | | | | | S | 200 | 230 | A | A | 285 | 270 | 250 | A | S | | | | | | | |
| 27 | | | | | | | | S | 195 | 230 | 260 | A | 275 | 260 | 245 | 215 | S | | | | | | | |
| 28 | | | | | | | | S | 190 | A | 255 | A | 280 | 270 | A | A | S | | | | | | | |
| 29 | | | | | | | | S | 190 | 230 | 260 | 290 | 275 | 265 | 235 | 210 | S | | | | | | | |
| 30 | | | | | | | | S | 185 | 230 | A | 265 | 265 | 260 | A | 215 | S | | | | | | | |
| 31 | | | | | | | | S | 190 | 230 | 250 | 280 | A | 255 | 240 | 215 | 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 | | | | | | | | | 17 | 14 | 16 | 17 | 22 | 20 | 21 | 20 | | | | | | | | |
| MED | | | | | | | | | 200 | 240 | 260 | 280 | 280 | 262 | 245 | 205 | | | | | | | | |
| UQ | | | | | | | | | 205 | 245 | 272 | 285 | 280 | 270 | 250 | 210 | | | | | | | | |
| LQ | | | | | | | | | 190 | 230 | 258 | 275 | 275 | 260 | 240 | 200 | | | | | | | | |

DEC. 1986 | FOE (0.01 MHZ)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | FOES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | JA 32 | JA 37 | JA 40 | JA 36 | JA 41 | JA 30 | JA 21 | JA 25 | JA 24 | JA 40 | JA 36 | JA 60 | JA 74 | G | G | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 2 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | JA 44 | G | JA 32 | G 23 | 31 | JA 32 | JA 37 | G | JA 28 | JA 24 | JA 32 | JA 28 | JA 38 | JA 24 | ES 15 | ES 15 |
| 3 | ES 15 | ES 15 | JA 26 | ES 14 | ES 14 | ES 15 | ES 15 | ES 17 | G | JA 32 | G | G | G | G | G | G | JA 28 | ES 15 | JA 21 | JA 24 | JA 20 | ES 15 | ES 15 | ES 15 |
| 4 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | 23 | 26 | G | G | EB 30 | G | G | G | E 21 | JA 36 | JA 45 | JA 29 | JA 24 | JA 18 | JA 24 | ES 15 | ES 15 |
| 5 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 17 | JA 28 | JA 88 | JA 35 | JA 39 | JA 50 | JA 45 | JA 28 | 23 | JA 44 | JA 24 | ES 15 | JA 25 | ES 16 | JA 26 | JA 19 | JA 21 |
| 6 | JA 25 | ES 16 | JA 20 | JA 24 | JA 24 | JA 21 | ES 16 | JA 32 | JA 24 | G 21 | JA 45 | JA 50 | G | G | G | G | JA 32 | JA 20 | ES 15 | ES 15 | ES 15 | ES 16 | ES 15 | ES 15 |
| 7 | ES 15 | JA 24 | JA 19 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | G | JA 29 | G | G | G | G | G 20 | G | JA 22 | JA 19 | JA 18 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 8 | ES 15 | JA 29 | JA 24 | JA 22 | ES 15 | ES 15 | ES 15 | ES 16 | JA 25 | JA 27 | G | G | G | 27 | JA 24 | JA 26 | JA 22 | ES 16 | JA 19 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 9 | ES 15 | JA 24 | JA 24 | JA 24 | ES 16 | ES 15 | ES 15 | ES 16 | 25 | JA 28 | JA 32 | JA 32 | G | JA 29 | JA 28 | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | JA 20 | JA 20 |
| 10 | ES 16 | JA 21 | ES 15 | JA 20 | ES 15 | ES 15 | ES 15 | ES 16 | JA 25 | JA 29 | G | G | G | G | G | G | ES 16 | ES 15 | JA 43 | ES 16 | JA 18 | ES 15 | ES 15 | ES 16 |
| 11 | ES 15 | JA 19 | ES 16 | ES 15 | JA 18 | ES 16 | ES 15 | ES 16 | JA 29 | JA 33 | JA 35 | JA 54 | JA 30 | JA 42 | JA 33 | JA 36 | JA 29 | ES 15 | ES 16 | JA 24 | ES 16 | JA 24 | JA 33 | JA 27 |
| 12 | JA 42 | JA 25 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | G | 30 | JA 72 | JA 50 | JA 32 | G | G | JA 29 | ES 17 | ES 16 | ES 16 | ES 15 | ES 15 | JA 32 | JA 20 | ES 15 |
| 13 | ES 15 | ES 15 | ES 15 | ES 15 | JA 20 | ES 16 | ES 15 | ES 16 | G | 32 | 32 | G | G | JA 42 | G | G | JA 25 | JA 26 | ES 15 | JA 22 | JA 22 | ES 15 | ES 15 | JA 37 |
| 14 | JA 30 | JA 24 | JA 24 | ES 15 | ES 15 | ES 15 | JA 26 | JA 22 | JA 26 | JA 52 | JA 53 | G | G | G | G | G | ES 16 | ES 16 | ES 15 | ES 16 | JA 27 | JA 29 | JA 28 | JA 26 |
| 15 | JA 27 | ES 15 | ES 15 | ES 15 | JA 24 | JA 20 | ES 15 | ES 16 | G | G | JA 44 | G | G | 30 | JA 50 | JA 29 | JA 26 | JA 96 | JA 26 | JA 24 | JA 31 | JA 21 | ES 16 | JA 25 |
| 16 | ES 15 | ES 15 | ES 15 | ES 15 | JA 20 | JA 19 | ES 15 | ES 15 | JA 26 | JA 43 | C | C | C | JA 40 | JA 44 | 27 | JA 30 | ES 15 | ES 16 | JA 23 | ES 15 | ES 15 | ES 15 | JA 27 |
| 17 | JA 25 | JA 21 | JA 21 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | G | G | G | 32 | G | G | 27 | 27 | JA 24 | JA 23 | JA 29 | JA 24 | JA 36 | JA 20 | JA 29 | JA 40 |
| 18 | JA 49 | JA 25 | JA 24 | JA 24 | JA 18 | JA 19 | JA 18 | ES 15 | G | G | 32 | JA 40 | G | 31 | G | JA 24 | JA 24 | JA 51 | JA 24 | JA 20 | ES 15 | ES 15 | ES 15 | ES 15 |
| 19 | ES 16 | ES 15 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | JA 30 | JA 32 | G | G | JA 30 | JA 30 | G | G | ES 17 | ES 15 | ES 15 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 |
| 20 | ES 16 | ES 15 | ES 15 | JA 20 | ES 15 | ES 15 | ES 15 | ES 16 | JA 26 | G | JA 31 | G | G | G | G | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | JA 21 |
| 21 | JA 20 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | G | G | JA 32 | JA 32 | 30 | 30 | 31 | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | JA 19 | JA 24 | ES 15 |
| 22 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | JA 70 | ES 15 | G | JA 26 | 30 | 35 | JA 36 | JA 52 | JA 44 | JA 26 | JA 23 | JA 24 | ES 16 | ES 16 | ES 16 | ES 16 | JA 24 | JA 51 |
| 23 | ES 16 | JA 24 | JA 33 | JA 30 | JA 42 | JA 52 | JA 52 | JA 42 | JA 42 | JA 30 | JA 63 | JA 44 | JA 50 | JA 32 | JA 26 | JA 25 | JA 27 | JA 23 | ES 15 | ES 15 | JA 25 | JA 24 | ES 15 | ES 15 |
| 24 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | JA 26 | JA 29 | 30 | G | G | G | G | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 25 | ES 15 | JA 36 | ES 15 | JA 18 | JA 24 | ES 15 | ES 15 | ES 15 | G | 29 | JA 32 | 30 | JA 50 | JA 32 | JA 26 | G | ES 17 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 26 | JA 41 | JA 31 | JA 24 | JA 24 | JA 44 | JA 20 | ES 16 | JA 18 | G | JA 28 | JA 37 | JA 72 | G | G | G | JA 36 | JA 39 | JA 116 | JA 28 | JA 29 | JA 29 | JA 34 | JA 21 | JA 20 |
| 27 | JA 24 | JA 18 | ES 15 | ES 15 | JA 26 | JA 24 | JA 24 | ES 15 | G | G | G | JA 45 | G 26 | JA 27 | G | G | JA 32 | JA 25 | JA 25 | JA 24 | ES 15 | JA 52 | JA 24 | JA 28 |
| 28 | JA 29 | JA 21 | JA 24 | JA 23 | ES 15 | ES 15 | ES 15 | ES 15 | G | JA 32 | 30 | JA 40 | G | 30 | 29 | 25 | ES 17 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | JA 23 |
| 29 | ES 15 | ES 15 | JA 25 | JA 24 | JA 20 | ES 15 | ES 15 | ES 15 | G | 31 | 31 | G | G | G | G | G | JA 29 | JA 28 | JA 28 | JA 24 | ES 15 | ES 15 | ES 15 | ES 15 |
| 30 | ES 15 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | JA 29 | 30 | JA 32 | G | 30 | 31 | JA 36 | G | ES 16 | ES 15 | JA 22 | JA 21 | ES 15 | JA 24 | JA 25 | ES 15 |
| 31 | JA 24 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | JA 25 | 31 | 29 | JA 29 | JA 29 | JG 24 | 25 | G | ES 16 | JA 23 | JA 19 | JA 20 | JA 21 | JA 28 | JA 24 | JA 24 |
| | 00 | 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 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED | ES 16 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | 24 | JA 29 | 32 | 30 | G | 27 | G 20 | G | JA 23 | ES 16 | ES 16 | ES 16 | ES 15 | ES 16 | ES 15 | ES 15 |
| UQ | JA 25 | JA 24 | JA 24 | JA 22 | JA 20 | 18 | ES 16 | ES 16 | JA 26 | JA 32 | JA 35 | JA 40 | JA 30 | JA 32 | JA 28 | 26 | JA 28 | JA 24 | JA 24 | JA 24 | JA 20 | JA 24 | JA 22 | JA 24 |
| LQ | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | G | EG 21 | G | G | G | G | G | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |

DEC. 1986 | FOES (0.1 MHZ)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | FBES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

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

| 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 | 23 | 21 | 22 | AA 36 | 28 | 20 | ES 15 | 20 | 23 | 26 | 26 | 40 | 30 | G | G | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 2 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | 22 | G | G 24 | G 21 | G 22 | 30 | 25 | G | ES 16 | 20 | ES 16 | ES 15 | 23 | ES 15 | ES 15 | ES 15 |
| 3 | ES 15 | ES 15 | 19 | ES 14 | ES 14 | ES 15 | ES 15 | ES 17 | G | 26 | G | G | G | G | G | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 4 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | 17 | 25 | G | G | EB 30 | G | G | G | EB 21 | 31 | 29 | 27 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 5 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 17 | 24 | 50 | 29 | 29 | 22 | 34 | 26 | 23 | 25 | ES 15 | ES 15 | ES 15 | ES 16 | ES 15 | ES 15 | ES 15 |
| 6 | ES 15 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | 18 | 23 | G 21 | 29 | G 20 | G | G | G | G | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | ES 16 | ES 15 | ES 15 |
| 7 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | G | 25 | G | G | G | G | G 20 | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 8 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | 23 | 25 | G | G | G | G 18 | 24 | 24 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 9 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 15 | ES 15 | ES 16 | 24 | 26 | 28 | 28 | G | 27 | G 19 | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 10 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | 22 | 26 | G | G | G | G | G | G | ES 16 | ES 15 | 22 | ES 16 | ES 15 | ES 15 | ES 15 | ES 16 |
| 11 | ES 15 | ES 15 | ES 16 | ES 15 | ES 15 | ES 16 | ES 15 | ES 16 | 25 | 28 | 29 | 30 | 29 | 28 | 24 | 23 | ES 16 | ES 15 | ES 16 | ES 15 | ES 16 | 18 | 18 | ES 16 |
| 12 | 25 | ES 15 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | G | 29 | 38 | 29 | G 24 | G | G | ES 16 | ES 17 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 13 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 15 | ES 16 | G | 30 | 31 | G | G | 29 | G | G | 20 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | 22 |
| 14 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | 22 | 28 | 28 | G | G | G | G | G | ES 16 | ES 16 | ES 15 | ES 16 | 21 | ES 15 | ES 15 | ES 15 |
| 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | G | G | 27 | G | G | 29 | G 22 | 23 | 20 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 15 |
| 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | 24 | 26 | C | C | C | 29 | 29 | 25 | 20 | ES 15 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 17 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | G | G | G | 30 | G | G | 27 | 24 | 19 | ES 16 | 23 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 18 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | G | G | 32 | 30 | G | 30 | G | 24 | 21 | 28 | 21 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 19 | ES 16 | ES 15 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | 23 | 28 | G | G | 30 | 28 | G | G | ES 17 | ES 15 | ES 15 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 |
| 20 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | 24 | G | 31 | G | G | G | G | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 21 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | G | G | 30 | 30 | 30 | 29 | 28 | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 22 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | G | 25 | 30 | 34 | 19 | 28 | 17 | 23 | 18 | 18 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 15 |
| 23 | ES 16 | ES 15 | 24 | ES 15 | 22 | AA 52 | 20 | AA 42 | 23 | 25 | 26 | 28 | 30 | 29 | 21 | 21 | 19 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 24 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | 23 | 24 | 30 | G | G | G | G | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 25 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | G | 25 | 28 | 29 | 39 | 28 | 25 | G | ES 17 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 26 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 15 | G | 27 | 29 | 30 | G | G | G | 28 | 30 | AA 116 | 19 | ES 15 | ES 15 | 22 | ES 15 | ES 15 |
| 27 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | 20 | ES 15 | G | G | G | 30 | G 20 | G 23 | G | G | 18 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 28 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | G | 29 | 29 | 29 | G | 30 | 29 | 24 | ES 17 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 29 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | G | 29 | 31 | G | G | G | G | G | 19 | 18 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 30 | ES 15 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 15 | 30 | 30 | G | 30 | 30 | 32 | G | ES 16 | ES 15 | 22 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 31 | ES 16 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | 29 | 28 | G 24 | 28 | G 20 | G 18 | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | 16 | 26 | 28 | U 24 | G | G 23 | G 17 | G | ES 17 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| UQ | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | 23 | 28 | 30 | 30 | 28 | 29 | 24 | 23 | 19 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| LQ | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | G | EG 21 | G | G | G | G | G | G | ES 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |



The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | FMIN (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station AKITA | Lat. 39° 43.5' N, | Long. 140° 08.0' E | Sweep 1 MHz to 25 MHz in 2.4sec in automatic operation

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

DEC. 1986 | FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | M(3000)F2 (0.01) | 135° E Mean Time (G.M.T. + 9h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.0' E Sweep 1 MHz to 25 MHz in 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 | 300 | 300 | 300 | A | 330 | 340 | 305 | 355 | 385 | 350 | 340 | 355 | 355 | 385 | 370 | 380 | 360 | 320 | 340 | 330 | F | F | F | F 325 |
| 2 | F 315 | F 320 | F 310 | 335 | F | F | F 330 | 375 | 375 | 360 | 365 | 365 | 360 | 355 | 360 | 375 | 360 | 315 | 330 | F | F | F | 340 | F |
| 3 | F 310 | F | F | F | F | F 315 | 330 | 360 | 375 | 365 | 360 | 370 | 375 | 365 | 365 | 375 | 370 | 310 | 365 | 335 | 305 | F | F | F |
| 4 | F | F | F | F | F | F | F | 365 | 390 | 365 | 370 | 370 | 360 | 380 | 360 | H 360 | 370 | 335 | 355 | 345 | F 340 | F 320 | F 320 | F |
| 5 | F | F 325 | F | F | F | F 305 | F 320 | S 375 | 355 | 360 | 365 | 375 | 355 | 350 | 350 | 390 | 370 | F | F 350 | F | F 340 | F | F | F |
| 6 | F | F | F | F | F 345 | F | F | 370 | 370 | 360 | 350 | 375 | 355 | 375 | 370 | 360 | 360 | 345 | 355 | 330 | 355 | F 315 | F | F |
| 7 | F | F | F | F | F 335 | F 330 | F | 375 | 360 | 345 | 360 | 375 | 380 | 355 | 335 | 370 | 380 | 340 | 320 | 330 | 355 | 310 | F 310 | F |
| 8 | F | F | F | F | F | F | F | 375 | 365 | 340 | 360 | 365 | 380 | 360 | 350 | 370 | 380 | 340 | 345 | 345 | 325 | 310 | 330 | F 365 |
| 9 | F | F | F | F 330 | F | F | F | 380 | 385 | 330 | 365 | 360 | 370 | 380 | 355 | 380 | 385 | 355 | 335 | 315 | 340 | F 335 | F | F |
| 10 | F | F | F | F | F | F | F | 380 | 390 | 345 | 350 | 375 | 360 | H 360 | 365 | 370 | 365 | 345 | 365 | 320 | 335 | 335 | F 325 | 335 |
| 11 | F 310 | F 340 | F 340 | 360 | 300 | F | F | 385 | 385 | 385 | 380 | 345 | 370 | 370 | 370 | 385 | 350 | 345 | 320 | 315 | 300 | 300 | F | F |
| 12 | F 345 | F | F 335 | 340 | 335 | 330 | 325 | 375 | 370 | 350 | 370 | H 330 | 365 | 390 | 385 | 365 | 360 | 355 | 345 | 385 | 370 | 310 | 320 | F 315 |
| 13 | 310 | 295 | F 325 | F 315 | F | 385 | 375 | 380 | 375 | 360 | 355 | 350 | 365 | 380 | 370 | 380 | 370 | 330 | 340 | F | F | F | F | F |
| 14 | F | F | F | F | F 350 | F | F | 365 | 355 | 310 | 300 | 385 | 365 | 380 | 340 | 375 | 375 | 310 | 355 | 365 | F 300 | F 300 | F | F |
| 15 | F | F | F | F | F | F | F | 345 | 355 | 330 | 345 | 370 | 365 | H 345 | 355 | 370 | 355 | 310 | 330 | 350 | 350 | 285 | F 305 | F |
| 16 | F | F | F | F | F | 350 | F 335 | 370 | 385 | 375 | C | C | C | 360 | 360 | 380 | 385 | 295 | 340 | F 330 | F | F | F | F |
| 17 | F | F | F | F | F | F | F | 355 | 355 | 380 | 350 | 365 | 355 | 370 | 335 | 380 | 350 | 335 | 345 | 355 | F | F | F | F |
| 18 | F | F | F | F | F | F | F 365 | 370 | 390 | 375 | 335 | 340 | 380 | 385 | 360 | 395 | 340 | 390 | 345 | 335 | 360 | F | F | F |
| 19 | F | F | F | F | F 370 | F 335 | F 340 | 335 | 375 | 370 | 355 | 350 | 365 | 355 | 355 | 360 | 380 | 360 | 310 | F 340 | F | F | F | F |
| 20 | F | F | F | F | F | F | F | 380 | 390 | 335 | 340 | 370 | 365 | H 355 | 345 | 355 | 360 | 315 | 340 | 360 | 330 | F 330 | F | F |
| 21 | F | F | F | F | F | F 345 | F 335 | 360 | 375 | 345 | 350 | 355 | 350 | 380 | R 360 | H 360 | 385 | 340 | 340 | 330 | 335 | F | F | F |
| 22 | F | F | F | F | 325 | 320 | 320 | 365 | 350 | 355 | 360 | 350 | 360 | 345 | 340 | 365 | 370 | 315 | 340 | 360 | 305 | 305 | F 315 | F 305 |
| 23 | F 295 | F 295 | F | F 305 | F | A | F | A | 360 | 350 | 340 | 355 | 360 | 365 | 340 | 385 | 355 | 320 | 345 | 330 | F 330 | F 305 | F 295 | F |
| 24 | F 300 | F 305 | F 335 | F | F 350 | F 290 | F 275 | 345 | 345 | 325 | 370 | 375 | 375 | 385 | 380 | 345 | 370 | 365 | 325 | 330 | 325 | F 315 | F 330 | F |
| 25 | F | F | F | F 325 | F 325 | 305 | 305 | 360 | 360 | 365 | 315 | 365 | 345 | H 360 | 365 | 385 | 355 | 335 | 315 | 340 | 365 | F | F | F |
| 26 | F | F | F | F | F | F 290 | F 300 | 360 | 370 | 365 | 350 | 360 | 350 | 385 | 350 | 360 | 370 | A | 325 | 350 | 330 | 335 | 315 | F |
| 27 | F | F 310 | 325 | F | F | F 325 | F 315 | 355 | 375 | 335 | 385 | 395 | 350 | 380 | 360 | 350 | 370 | 310 | 315 | F 330 | F | F | F | F |
| 28 | F 330 | F 315 | F 325 | F | F 335 | F | F 330 | 345 | 370 | 355 | 355 | 375 | 385 | 370 | 395 | 360 | 375 | 340 | 325 | 325 | 325 | 310 | F 320 | 365 |
| 29 | 330 | 320 | 305 | 325 | 325 | 335 | 320 | 340 | 375 | 340 | 350 | 365 | 380 | 385 | 370 | 370 | 385 | 335 | 335 | 315 | 365 | 345 | 300 | F 305 |
| 30 | 315 | 300 | 320 | 355 | 305 | 330 | 350 | 375 | 380 | 380 | 345 | 370 | 350 | 365 | 385 | 365 | 380 | 365 | 335 | 325 | 335 | 305 | F 335 | F |
| 31 | F 320 | F | F | F 335 | F | F | F | 350 | 390 | 365 | 350 | 380 | 365 | 390 | 380 | 365 | 340 | 335 | 335 | F 345 | F 340 | F | F | F |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 12 | 11 | 10 | 10 | 13 | 16 | 18 | 30 | 31 | 31 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 29 | 31 | 28 | 24 | 18 | 14 | 7 |
| MED | F 312 | F 310 | F 325 | 332 | F 335 | 330 | F 328 | 365 | 375 | 355 | 352 | 365 | 365 | 370 | 360 | 370 | 370 | 335 | 340 | 332 | 335 | 310 | F 320 | F 325 |
| UQ | F 325 | F 320 | F 335 | 340 | F 345 | 338 | F 335 | 375 | 385 | 365 | 365 | 375 | 370 | 380 | 370 | 380 | 378 | 345 | 345 | 348 | 352 | F 330 | F 330 | 350 |
| LQ | F 305 | 300 | 310 | F 325 | 325 | F 310 | 315 | 355 | 360 | 342 | 345 | 355 | 355 | 360 | 350 | 360 | 360 | 315 | 328 | 330 | 325 | 305 | F 310 | F 310 |

DEC. 1986 | M(3000)F2 (0.01)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | M(3000)F1 (0.01) | 135° E Mean Time (G.M.T. + 9h)

Station AKITA Lat. 39° 43.5' N. Long. 140° 08.0' E Sweep 1 MHz to 25 MHz in 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 | A | L | L | L | | | | | | | | | |
| 2 | | | | | | | | | | L | L | L | L | L | L | | | | | | | | | |
| 3 | | | | | | | | | | | L | L | L | L | L | | | | | | | | | |
| 4 | | | | | | | | | | L | L | L | L 415 | L | | | | | | | | | | |
| 5 | | | | | | | | | | A | L | 400 | L | A | L | | | | | | | | | |
| 6 | | | | | | | | | | L | L | 395 | L | L 420 | 435 | | | | | | | | | |
| 7 | | | | | | | | | | L | L 405 | 390 | L | L 410 | | | | | | | | | | |
| 8 | | | | | | | | | | L | L | L | L | L | L | | | | | | | | | |
| 9 | | | | | | | | | | L | L | L | L 405 | L | | | | | | | | | | |
| 10 | | | | | | | | | | L | L | L | L | L | L | | | | | | | | | |
| 11 | | | | | | | | | | | L | L | L 395 | L | L | | | | | | | | | |
| 12 | | | | | | | | | | L | L | L 420 | L | L 420 | L | | | | | | | | | |
| 13 | | | | | | | | | | L | L | L | L | 430 | | | | | | | | | | |
| 14 | | | | | | | | | | | L | 380 | L | L | L | | | | | | | | | |
| 15 | | | | | | | | | | | L | L | L | L | L | | | | | | | | | |
| 16 | | | | | | | | | | | C | C | C | L | L | | | | | | | | | |
| 17 | | | | | | | | | | | L | L | L | L | L | | | | | | | | | |
| 18 | | | | | | | | | | L | 375 | 375 | 395 | L | L | | | | | | | | | |
| 19 | | | | | | | | | | | L | L | L | L | L | | | | | | | | | |
| 20 | | | | | | | | | | L | L | L | L 420 | L | L | | | | | | | | | |
| 21 | | | | | | | | | | L | L | L | L 395 | L 415 | L | | | | | | | | | |
| 22 | | | | | | | | | | L | L | L | L | L | L | L | | | | | | | | |
| 23 | | | | | | | | | | L 360 | L | 370 | L | L | | | | | | | | | | |
| 24 | | | | | | | | | | L | L | L | L | L | L | | | | | | | | | |
| 25 | | | | | | | | | | 430 | L | L | A | 400 | L | | | | | | | | | |
| 26 | | | | | | | | | | | L | L | L 390 | L | L | | | | | | | | | |
| 27 | | | | | | | | | | | | L | L | L | L | L | | | | | | | | |
| 28 | | | | | | | | | | | L 375 | L | L | L | | | | | | | | | | |
| 29 | | | | | | | | | | | L 395 | 405 | L 390 | L | L | | | | | | | | | |
| 30 | | | | | | | | | | | | L | L | L | L | | | | | | | | | |
| 31 | | | | | | | | | | L | L | L | L | L | L | | | | | | | | | |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | | | | | | | | | | 2 | 4 | 8 | 8 | 6 | 1 | | | | | | | | | |
| MED | | | | | | | | | | 395 | L 385 | 392 | L 395 | L 418 | 435 | | | | | | | | | |
| UQ | | | | | | | | | | | L 400 | 402 | L 410 | L 420 | | | | | | | | | | |
| LQ | | | | | | | | | | | 375 | 378 | L 392 | L 410 | | | | | | | | | | |

The Radio Research Laboratory, Japan

DEC. 1986 | M(3000)F1 (0.01)

# IONOSPHERIC DATA

DEC. 1986 | H'F2 (KM) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | 235 | 240 | 235 | 245 | 230 | 225 | | | | | | | | | |
| 2 | | | | | | | | | | 230 | 240 | 235 | 240 | 245 | 240 | | | | | | | | | |
| 3 | | | | | | | | | | | 230 | 230 | 230 | 230 | 235 | | | | | | | | | |
| 4 | | | | | | | | | | 245 | 235 | 225 | 230 | 230 | | | | | | | | | | |
| 5 | | | | | | | | | | 230 | 240 | 220 | 230 | 250 | 240 | | | | | | | | | |
| 6 | | | | | | | | | | 245 | 260 | 230 | 245 | 230 | 240 | | | | | | | | | |
| 7 | | | | | | | | | | 240 | 245 | 225 | 230 | 245 | | | | | | | | | | |
| 8 | | | | | | | | | | 230 | 240 | 225 | 230 | 235 | 240 | | | | | | | | | |
| 9 | | | | | | | | | | 230 | 235 | 235 | 235 | 225 | | | | | | | | | | |
| 10 | | | | | | | | | | 225 | 240 | 230 | 240 | 220 | 230 | | | | | | | | | |
| 11 | | | | | | | | | | | 235 | 250 | 240 | 235 | 230 | | | | | | | | | |
| 12 | | | | | | | | | | 260 | 240 | 220 | 225 | 225 | 220 | | | | | | | | | |
| 13 | | | | | | | | | | 250 | 245 | 245 | 240 | 225 | | | | | | | | | | |
| 14 | | | | | | | | | | | 310 | 220 | 225 | 220 | 230 | | | | | | | | | |
| 15 | | | | | | | | | | | 245 | 230 | 230 | 220 | 240 | | | | | | | | | |
| 16 | | | | | | | | | | | C | C | C | 240 | 235 | | | | | | | | | |
| 17 | | | | | | | | | | | 245 | 230 | 260 | 230 | 220 | | | | | | | | | |
| 18 | | | | | | | | | | 230 | 290 | 255 | 230 | 230 | 230 | | | | | | | | | |
| 19 | | | | | | | | | | | 250 | 230 | 240 | 235 | 240 | | | | | | | | | |
| 20 | | | | | | | | | | 240 | 255 | 220 | 245 | 230 | 230 | | | | | | | | | |
| 21 | | | | | | | | | | 250 | 240 | 250 | 245 | 230 | 260 | | | | | | | | | |
| 22 | | | | | | | | | | 230 | 250 | 245 | 245 | 255 | 240 | 225 | | | | | | | | |
| 23 | | | | | | | | | | 260 | 255 | 245 | 240 | 230 | | | | | | | | | | |
| 24 | | | | | | | | | | 245 | 230 | 235 | 230 | 220 | 220 | | | | | | | | | |
| 25 | | | | | | | | | | 230 | 270 | 220 | 250 | 225 | 240 | | | | | | | | | |
| 26 | | | | | | | | | | | 260 | 240 | 250 | 225 | 230 | | | | | | | | | |
| 27 | | | | | | | | | | | | 220 | 250 | 225 | 235 | 230 | | | | | | | | |
| 28 | | | | | | | | | | | 255 | 225 | 230 | 230 | | | | | | | | | | |
| 29 | | | | | | | | | | | 250 | 240 | 235 | 230 | 240 | | | | | | | | | |
| 30 | | | | | | | | | | | | 245 | 280 | 245 | 220 | | | | | | | | | |
| 31 | | | | | | | | | | 250 | 245 | 230 | 240 | 220 | 230 | | | | | | | | | |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | | | | | | | | | | 19 | 28 | 30 | 30 | 31 | 25 | 2 | | | | | | | | |
| MED | | | | | | | | | | 240 | 245 | 230 | 240 | 230 | 235 | 228 | | | | | | | | |
| UQ | | | | | | | | | | 248 | 255 | 240 | 245 | 235 | 240 | | | | | | | | | |
| LQ | | | | | | | | | | 230 | 240 | 225 | 230 | 225 | 230 | | | | | | | | | |

The Radio Research Laboratory, Japan

DEC. 1986 | H'F2 (KM)

# IONOSPHERIC DATA

DEC. 1986 | H'F (KM) | 135° E Mean Time (G.M.T. + 9h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.0' E Sweep 1 MHz to 25 MHz in 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 | A | A | A | A | A | A 240 | 275 | 230 | 205 | 200 | 230 | A | 235 | 230 | 200 | 205 | 220 | 225 | 225 | 230 | 230 | E S 280 | E S 255 | 250 |
| 2 | 270 | 260 | 260 | 250 | 245 | 245 | 240 | 205 | 210 | 220 | 210 | 205 | 200 | 210 | 225 | 225 | 200 | A 225 | 235 | 240 | A | 225 | 225 | 245 |
| 3 | 280 | 280 | 280 | 260 | 275 | 245 | 235 | 205 | H 200 | 240 | 230 | 200 | 200 | 220 | 205 | 220 | 205 | 245 | 220 | 220 | 250 | 250 | 270 | 240 |
| 4 | 245 | 250 | 255 | 220 | 250 | 240 | E S 250 | 230 | 205 | 220 | 230 | 225 | 200 | 210 | 220 | 205 | 210 | A | A | 230 | 230 | 235 | 240 | 255 |
| 5 | 260 | 220 | 240 | 220 | 230 | 230 | 245 | 210 | H 210 | A | 240 | 210 | 200 | A | 225 | 210 | 210 | 230 | 230 | 225 | 210 | 255 | 250 | 290 |
| 6 | 245 | 255 | 250 | 245 | 225 | 220 | 250 | 220 | 220 | H 200 | 225 | 210 | 220 | 200 | 200 | 220 | 205 | 215 | 235 | 215 | 220 | 255 | 270 | 220 |
| 7 | 270 | 250 | 235 | 205 | 230 | 250 | 225 | 205 | 220 | 220 | 220 | 210 | 210 | 200 | 230 | 230 | 210 | 240 | 230 | 245 | 205 | 235 | 280 | 260 |
| 8 | 230 | 270 | 230 | 225 | 220 | 225 | 245 | 205 | 220 | 215 | 225 | 210 | 200 | 200 | 200 | 220 | 200 | 235 | 230 | 225 | 245 | 250 | 250 | 210 |
| 9 | 245 | 240 | 225 | 250 | 265 | 250 | 240 | 200 | 200 | 200 | 235 | 210 | 200 | 220 | 205 | 220 | 205 | 205 | 225 | 245 | 220 | 250 | 240 | 225 |
| 10 | 220 | 270 | 260 | 270 | 265 | 255 | 210 | 200 | 200 | 220 | 220 | 220 | 205 | H 200 | 220 | 220 | 210 | 210 | A | 250 | 240 | 235 | 270 | 250 |
| 11 | 255 | 250 | 230 | 210 | 270 | 265 | 245 | 205 | 200 | 225 | 230 | 205 | 220 | 220 | 235 | H 210 | 205 | 220 | 245 | 225 | 230 | 285 | 290 | 250 |
| 12 | A | 280 | 245 | 230 | 240 | 240 | 230 | 215 | 200 | 235 | A | 205 | 225 | 205 | 210 | 210 | 205 | 200 | 235 | 200 | 205 | E S 280 | 250 | 275 |
| 13 | 275 | 285 | 260 | 255 | 220 | 200 | 205 | 200 | 200 | 245 | 235 | 235 | 220 | 200 | 225 | 210 | 200 | 210 | 210 | 220 | 220 | 245 | 260 | A 290 |
| 14 | 255 | 250 | 255 | 230 | 220 | 225 | 240 | 200 | 220 | 220 | 240 | 230 | 220 | 215 | 220 | 225 | 210 | 245 | 220 | 200 | A | 260 | 280 | 230 |
| 15 | 300 | 290 | 270 | 220 | 210 | 240 | 235 | 225 | 210 | 210 | 200 | 200 | 230 | 210 | 205 | 220 | 205 | E S 250 | 245 | 225 | 205 | H 240 | 255 | 260 |
| 16 | 240 | 225 | 245 | 230 | 240 | 220 | 240 | 205 | 210 | 230 | C | C | C | 230 | 220 | 210 | 200 | E S 280 | 240 | 250 | 225 | 200 | E S 300 | 260 |
| 17 | 270 | 255 | 280 | 255 | E S 300 | 275 | 200 | 205 | 200 | 220 | 200 | 220 | 200 | 200 | 200 | 220 | 205 | 230 | A 235 | 215 | 195 | 210 | 280 | E S 290 |
| 18 | 260 | 290 | 280 | 270 | 235 | 210 | 210 | 205 | 200 | 200 | 230 | 220 | 220 | 220 | 220 | 210 | 205 | 220 | A | 245 | 220 | E S 270 | 250 | 250 |
| 19 | 270 | 265 | 275 | 240 | 200 | 200 | 230 | 230 | 210 | 220 | 240 | 215 | 200 | H 200 | 205 | 230 | 210 | 205 | 230 | 235 | 210 | 225 | 255 | 230 |
| 20 | 260 | 280 | 265 | 240 | 225 | 220 | 220 | 195 | 200 | 200 | 245 | 230 | 200 | 220 | 200 | 240 | 200 | 225 | 220 | 205 | 205 | 230 | 270 | 240 |
| 21 | 230 | 280 | 270 | 215 | 195 | 235 | 240 | 205 | 220 | 225 | 220 | 230 | 205 | 210 | 200 | 200 | 205 | 200 | 230 | 225 | 215 | 245 | 270 | 285 |
| 22 | 290 | 290 | 280 | 205 | E S 230 | 270 | 270 | 205 | 230 | 220 | 240 | A | 225 | 220 | 210 | 200 | 205 | 230 | 220 | 215 | 240 | 245 | 260 | 295 |
| 23 | 300 | 310 | A | 290 | A | A | A | A | 200 | 220 | 200 | 200 | 200 | 210 | 220 | 210 | 215 | 230 | 215 | 240 | 240 | 270 | 320 | 275 |
| 24 | 280 | 270 | 250 | 240 | 210 | E S 310 | E S 350 | 240 | 210 | 200 | 230 | H 195 | H 200 | 230 | 200 | 225 | 205 | 200 | 230 | 225 | 235 | E S 250 | 250 | E S 330 |
| 25 | E S 290 | 285 | 255 | 245 | 240 | 270 | 275 | 220 | 220 | 200 | 220 | 225 | A | 205 | 200 | 205 | 210 | 225 | 230 | 220 | 210 | E S 255 | E S 280 | E S 300 |
| 26 | E S 300 | 275 | 265 | 255 | E S 300 | E S 300 | E S 280 | 210 | 205 | 230 | 220 | 220 | 220 | 220 | 200 | 225 | 220 | A | A 270 | 230 | 230 | A | 250 | E S 305 |
| 27 | 270 | 260 | 250 | 235 | 235 | 250 | E A 300 | 225 | 210 | 230 | 230 | 215 | 205 | 225 | 200 | 200 | 200 | 250 | 225 | 230 | 255 | 240 | 260 | 275 |
| 28 | 260 | 260 | 255 | 230 | 220 | 245 | 245 | 210 | 215 | 230 | 230 | 230 | 210 | 210 | 220 | 230 | 205 | 240 | 245 | 230 | 245 | 255 | 260 | 210 |
| 29 | 235 | 265 | 295 | 270 | 250 | 255 | 260 | 230 | 215 | 240 | 235 | 215 | 220 | 200 | 200 | 220 | 200 | 235 | 240 | 250 | 225 | 225 | 285 | 290 |
| 30 | 270 | 280 | 255 | 220 | 240 | 250 | 230 | 200 | 200 | 225 | 230 | 250 | 220 | 220 | A | 205 | 205 | 205 | A 240 | 220 | 220 | 250 | 250 | 225 |
| 31 | 260 | 270 | 240 | 220 | 245 | 210 | 255 | 225 | 220 | 230 | 220 | 230 | 220 | 220 | 200 | 230 | 220 | 220 | 220 | 215 | 220 | 215 | 275 | 290 |
| | 00 | 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 | 29 | 30 | 29 | 30 | 30 | 30 | 31 | 30 | 29 | 28 | 29 | 30 | 30 | 31 | 31 | 29 | 28 | 31 | 29 | 30 | 31 | 31 |
| MED | 260 | 270 | 255 | 238 | 232 | 241 | 239 | 205 | 210 | 220 | 230 | 215 | 210 | 210 | 205 | 220 | 205 | 225 | 230 | 225 | 220 | 243 | 260 | 255 |
| UQ | 272 | 280 | 270 | 255 | 248 | 252 | 250 | 225 | 218 | 230 | 235 | 228 | 220 | 220 | 220 | 225 | 210 | 232 | 238 | 238 | 235 | 252 | 274 | 282 |
| LQ | 245 | 255 | 245 | 220 | 220 | 225 | 230 | 205 | 200 | 210 | 220 | 208 | 200 | 200 | 200 | 210 | 205 | 210 | 222 | 220 | 210 | 235 | 250 | 240 |

DEC. 1986 | H'F (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | H'E (KM) | 135° E Mean Time (G.M.T. + 9h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.0' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| 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 | A | A | A | A | A | E B 125 | E B 120 | S | S | | | | | | | |
| 2 | | | | | | | | S | A | 110 | A | A | A | A | A | 110 | S | | | | | | | |
| 3 | | | | | | | | S | 110 | 110 | 105 | 105 | 110 | 110 | 110 | E S 120 | S | | | | | | | |
| 4 | | | | | | | | S | 110 | E B 125 | E B 155 | B | E B 130 | E B 120 | E B 120 | B | S | | | | | | | |
| 5 | | | | | | | | S | A | A | A | A | A | A | A | A | S | | | | | | | |
| 6 | | | | | | | | S | A | A | A | 110 | 105 | 110 | 115 | 115 | S | | | | | | | |
| 7 | | | | | | | | S | 110 | A | 105 | 105 | 105 | 105 | 110 | 110 | S | | | | | | | |
| 8 | | | | | | | | S | 115 | 110 | 110 | 110 | 110 | 110 | A | A | S | | | | | | | |
| 9 | | | | | | | | S | S | 110 | 105 | A | 105 | A | A | S | S | | | | | | | |
| 10 | | | | | | | | S | A | 105 | 105 | 105 | 105 | 110 | 110 | 110 | S | | | | | | | |
| 11 | | | | | | | | S | S | 115 | 110 | A | 110 | A | A | A | S | | | | | | | |
| 12 | | | | | | | | S | S | 110 | A | A | A | 110 | 110 | S | S | | | | | | | |
| 13 | | | | | | | | S | S | 115 | 110 | 110 | 110 | 110 | 110 | S | S | | | | | | | |
| 14 | | | | | | | | S | 115 | 110 | A | 110 | 110 | 110 | 110 | S | S | | | | | | | |
| 15 | | | | | | | | S | 110 | 110 | 110 | 110 | 105 | A | A | A | S | | | | | | | |
| 16 | | | | | | | | S | A | A | C | C | C | A | A | 105 | S | | | | | | | |
| 17 | | | | | | | | S | 110 | 110 | 110 | 110 | 105 | 110 | 110 | S | S | | | | | | | |
| 18 | | | | | | | | S | S | 110 | 110 | A | 105 | 105 | 105 | A | S | | | | | | | |
| 19 | | | | | | | | S | 110 | 110 | 110 | 110 | 110 | A | 110 | 115 | S | | | | | | | |
| 20 | | | | | | | | S | 110 | 110 | 110 | 110 | 105 | 110 | 110 | 115 | S | | | | | | | |
| 21 | | | | | | | | S | S | 110 | 110 | 110 | 105 | 110 | 110 | 110 | S | | | | | | | |
| 22 | | | | | | | | S | 115 | 115 | 110 | 110 | 105 | A | 110 | S | S | | | | | | | |
| 23 | | | | | | | | S | S | A | A | A | A | A | A | A | S | | | | | | | |
| 24 | | | | | | | | S | 110 | 110 | 110 | 110 | 105 | 110 | 110 | S | S | | | | | | | |
| 25 | | | | | | | | S | 110 | 110 | 115 | 110 | A | 105 | A | S | S | | | | | | | |
| 26 | | | | | | | | S | S | 110 | 110 | 110 | 110 | 110 | 110 | S | S | | | | | | | |
| 27 | | | | | | | | S | S | 115 | 115 | 110 | A | A | E B 120 | E B 130 | S | | | | | | | |
| 28 | | | | | | | | S | S | 110 | 110 | 115 | 115 | 115 | 120 | S | S | | | | | | | |
| 29 | | | | | | | | S | 110 | 110 | 110 | 110 | 110 | 110 | 105 | 110 | S | | | | | | | |
| 30 | | | | | | | | S | S | 115 | 115 | 120 | 110 | 110 | 110 | 120 | S | | | | | | | |
| 31 | | | | | | | | S | S | 110 | 105 | A | A | 110 | 110 | 115 | 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 | | | | | | | | | 13 | 25 | 23 | 20 | 22 | 21 | 22 | 13 | | | | | | | | |
| MED | | | | | | | | | 110 | 110 | 110 | 110 | 106 | 110 | 110 | 112 | | | | | | | | |
| UQ | | | | | | | | | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 115 | | | | | | | | |
| LQ | | | | | | | | | 110 | 110 | 110 | 110 | 105 | 110 | 110 | 110 | | | | | | | | |

The Radio Research Laboratory, Japan

DEC. 1986 | H'E (KM)

# IONOSPHERIC DATA

DEC. 1986 | H'ES (KM) | 135° E Mean Time (G.M.T. + 9h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.0' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 105 | 100 | 100 | 100 | G | G | G | S | S | S | S | S | S | S | S |
| 2 | S | S | S | S | S | S | S | S | 105 | G | 100 | 100 | 105 | 100 | 95 | G | 100 | 105 | 125 | 110 | 105 | 110 | S | S |
| 3 | S | S | 100 | S | S | S | S | S | G | 115 | G | G | G | G | G | G | 105 | S | 105 | 105 | 105 | S | S | S |
| 4 | S | S | S | S | S | S | S | 130 | 150 | G | G | B | G | G | G | B | 100 | 95 | 100 | 100 | 100 | 100 | S | S |
| 5 | S | S | S | S | S | S | S | S | 100 | 100 | 100 | 100 | 100 | 95 | 100 | 95 | 95 | 100 | S | 105 | S | 100 | 100 | 100 |
| 6 | 100 | S | 100 | 100 | 100 | 100 | S | 105 | 105 | 100 | 100 | 105 | G | G | G | G | 100 | 95 | S | S | S | S | S | S |
| 7 | S | 105 | 100 | S | S | S | S | S | G | 105 | G | G | G | G | 100 | G | 100 | 100 | 105 | S | S | S | S | S |
| 8 | S | 100 | 100 | 100 | S | S | S | S | 115 | 115 | G | G | G | 100 | 95 | 95 | 100 | S | 120 | S | S | S | S | S |
| 9 | S | 100 | 100 | 100 | S | S | S | S | 110 | 110 | 110 | 105 | G | 100 | 100 | G | S | S | S | S | S | S | 100 | 100 |
| 10 | S | 100 | S | 100 | S | S | S | S | 105 | 110 | G | G | G | G | G | G | S | S | 110 | S | 115 | S | S | S |
| 11 | S | 105 | S | S | 105 | S | S | S | 120 | 120 | 110 | 105 | 110 | 100 | 105 | 105 | 110 | S | S | 105 | S | 105 | 105 | 105 |
| 12 | 100 | 100 | S | S | S | S | S | S | G | 145 | 105 | 105 | 100 | G | G | 100 | S | S | S | S | S | 105 | 105 | S |
| 13 | S | S | S | S | 105 | S | S | S | G | 155 | 145 | G | G | 110 | G | G | 100 | 120 | S | 100 | 100 | S | S | 105 |
| 14 | 105 | 105 | 105 | S | S | S | 110 | 100 | 120 | 110 | 105 | G | G | G | G | G | S | S | S | S | 110 | 110 | 110 | 120 |
| 15 | 105 | S | S | S | 100 | 105 | S | S | G | G | 110 | G | G | 150 | 105 | 100 | 120 | 110 | 115 | 110 | 100 | 100 | S | 95 |
| 16 | S | S | S | S | 105 | 105 | S | S | 105 | 105 | C | C | C | 105 | 100 | 125 | 110 | S | S | 110 | S | S | S | 100 |
| 17 | 105 | 100 | 100 | S | S | S | S | S | G | G | G | 140 | G | G | 150 | 120 | 100 | 100 | 120 | 100 | 105 | 105 | 100 | 100 |
| 18 | 105 | 100 | 100 | 100 | 100 | 100 | 100 | S | G | G | 150 | 105 | G | 145 | G | 100 | 105 | 100 | 100 | 100 | S | S | S | S |
| 19 | S | S | S | S | S | S | S | S | 110 | 115 | G | G | 125 | 100 | G | G | S | S | S | S | S | S | S | S |
| 20 | S | S | S | 100 | S | S | S | S | 110 | G | 120 | G | G | G | G | G | S | S | S | S | S | S | S | 105 |
| 21 | 110 | S | S | S | S | S | S | S | G | G | 120 | 120 | 120 | 120 | 110 | G | S | S | S | S | S | 100 | 100 | S |
| 22 | S | S | S | S | S | S | 110 | S | G | 125 | 155 | 125 | 120 | 100 | 100 | 105 | 100 | 100 | S | S | S | S | 105 | 105 |
| 23 | S | 100 | 110 | 100 | 100 | 100 | 100 | 105 | 105 | 105 | 100 | 100 | 100 | 95 | 95 | 100 | 95 | 95 | S | S | 105 | 110 | S | S |
| 24 | S | S | S | S | S | S | S | S | 110 | 110 | 150 | G | G | G | G | G | S | S | S | S | S | S | S | S |
| 25 | S | 105 | S | 105 | 100 | S | S | S | G | 120 | 120 | 110 | 105 | 125 | 105 | G | S | S | S | S | S | S | S | S |
| 26 | 110 | 105 | 110 | 105 | 100 | 105 | S | 100 | G | 130 | 120 | 110 | G | G | G | 110 | 110 | 105 | 105 | 105 | 105 | 100 | 110 | 105 |
| 27 | 100 | 100 | S | S | 105 | 100 | 100 | S | G | G | G | 115 | 105 | 100 | G | G | 100 | 100 | 100 | 100 | S | 110 | 110 | 115 |
| 28 | 105 | 110 | 105 | 105 | S | S | S | S | G | 115 | 130 | 120 | G | 125 | 120 | 120 | S | S | S | S | S | S | S | 105 |
| 29 | S | S | 100 | 100 | 100 | S | S | S | G | 155 | 145 | G | G | G | G | G | 100 | 100 | 100 | 100 | S | S | S | S |
| 30 | S | S | S | S | S | S | S | S | 100 | 140 | 130 | G | 145 | 130 | 110 | G | S | S | 105 | 105 | S | 100 | 100 | S |
| 31 | 100 | S | S | S | S | S | S | S | 105 | 140 | 145 | 105 | 100 | 100 | 100 | G | S | 100 | 100 | 100 | 105 | 110 | 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 | 12 | 15 | 13 | 12 | 12 | 8 | 6 | 6 | 17 | 23 | 22 | 17 | 13 | 18 | 16 | 12 | 18 | 15 | 14 | 15 | 11 | 14 | 12 | 14 |
| MED | 105 | 100 | 100 | 100 | 100 | 100 | 100 | 102 | 105 | 115 | 120 | 105 | 105 | 100 | 100 | 102 | 100 | 100 | 105 | 105 | 105 | 105 | 105 | 105 |
| UQ | 105 | 105 | 105 | 102 | 105 | 105 | 110 | 105 | 110 | 128 | 145 | 115 | 120 | 125 | 108 | 115 | 105 | 102 | 115 | 105 | 105 | 110 | 108 | 105 |
| LQ | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 105 | 108 | 105 | 105 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 102 | 100 | 100 | 100 |

DEC. 1986 | H'ES (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | TYPES OF ES | 135° E Mean Time (G.M.T. + 9h)

Station AKITA | Lat. 39° 43.5' N. | Long. 140° 08.0' E | Sweep 1 MHz to 25 MHz in 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 4 | F 3 | F 5 | F 4 | F 3 | F 2 | L 2 | L 1 | L 1 | L 1 | L 2 | L 1 | | | | | | | | | | | |
| 2 | | | | | | | | | L 1 | | L 1 | L 1 | L 1 | L 2 | L 2 | | L 1 | F 2 | F 1 | F 2 | F 2 | F 1 | | |
| 3 | | | F 3 | | | | | | | C 1 | | | | | | | L 1 | | F 1 | F 1 | F 1 | | | |
| 4 | | | | | | | | C 1 | H 1 | | | | | | | | L 2 | F 4 | F 3 | F 1 | F 1 | F 1 | | |
| 5 | | | | | | | | | L 2 | L 3 | L 2 | L 1 | L 1 | L 2 | L 1 | L 1 | L 2 | F 1 | | F 1 | | F 2 | F 2 | F 2 |
| 6 | F 2 | | F 2 | F 2 | F 2 | F 2 | | L 2 | L 1 | L 2 | L 2 | L 1 | | | | | L 1 | F 1 | | | | | | |
| 7 | | F 1 | F 1 | | | | | | | L 3 | | | | | L 2 | | L 1 | F 1 | F 1 | | | | | |
| 8 | | F 2 | F 2 | F 1 | | | | | C 2 | C 2 | | | | L 1 | L 2 | L 2 | L 1 | | F 1 | | | | | |
| 9 | | F 2 | F 1 | F 1 | | | | | C 3 | C 3 | C 3 | L 1 | | L 1 | L 1 | | | | | | | | F 1 | F 1 |
| 10 | | F 1 | | F 1 | | | | | L 3 | C 1 | | | | | | | | | F 4 | | F 2 | | | |
| 11 | | F 1 | | | F 1 | | | | C 2 | C 3 | C 3 | L 2 | C 1 | L 2 | L 1 | L 2 | C 1 | | | F 1 | | F 7 | F 2 | F 2 |
| 12 | F 3 | F 1 | | | | | | | | H 2 | L 2 | L 1 | L 1 | | | L 1 | | | | | | F 1 | F 1 | |
| 13 | | | | | F 1 | | | | | H 1 | H 1 | | | C 1 | | | L 1 | F 1 | | F 2 | F 1 | | | F 3 |
| 14 | F 1 | F 1 | F 1 | | | | F 1 | L 1 | C 1 | C 2 | L 2 | | | | | | | | | | F 2 | F 1 | F 1 | F 1 |
| 15 | F 2 | | | | F 1 | F 1 | | | | | C 1 | | | HL 11 | L 1 | L 1 | C 2 | F 2 | F 1 | F 1 | F 2 | F 1 | | F 1 |
| 16 | | | | | F 1 | F 1 | | | L 1 | L 1 | | | | L 1 | L 1 | C 1 | C 2 | | | F 1 | | | | F 1 |
| 17 | F 1 | F 1 | F 1 | | | | | | | | | H 1 | | | H 1 | C 2 | L 1 | F 1 | F 3 | F 1 | F 1 | F 1 | F 1 | F 2 |
| 18 | F 1 | F 1 | F 1 | F 2 | F 2 | F 2 | F 1 | | | | H 2 | L 3 | | H 2 | | L 2 | L 2 | F 4 | F 3 | F 1 | | | | |
| 19 | | | | | | | | | C 1 | C 1 | | | C 1 | L 1 | | | | | | | | | | |
| 20 | | | | F 1 | | | | | C 1 | | C 1 | | | | | | | | | | | | | F 1 |
| 21 | F 1 | | | | | | | | | | C 1 | C 1 | C 2 | C 1 | C 2 | | | | | | | F 1 | F 1 | |
| 22 | | | | | | | F 1 | | | C 2 | H 2 | C 2 | C 2 | LC 22 | LC 12 | C 3 | L 2 | F 2 | | | | | F 1 | F 2 |
| 23 | | F 2 | F 6 | F 3 | F 2 | F 7 | F 6 | L 4 | L 3 | LH 21 | L 2 | L 2 | L 2 | L 3 | L 1 | LH 11 | L 1 | F 1 | | | F 1 | F 1 | | |
| 24 | | | | | | | | | C 2 | C 1 | H 2 | | | | | | | | | | | | | |
| 25 | | F 2 | | F 1 | F 2 | | | | | C 1 | C 1 | C 2 | L 2 | C 1 | L 1 | | | | | | | | | |
| 26 | F 2 | F 2 | F 2 | F 1 | F 2 | F 1 | | L 1 | | C 1 | C 1 | C 2 | | | | C 2 | C 2 | F 2 | F 2 | F 2 | F 2 | F 2 | F 1 | F 1 |
| 27 | F 1 | F 2 | | | F 2 | F 2 | F 3 | | | | | C 1 | L 1 | L 1 | | | L 1 | F 1 | F 1 | F 1 | | F 2 | F 2 | F 1 |
| 28 | F 1 | F 1 | F 1 | F 1 | | | | | | C 1 | C 1 | C 1 | | C 2 | C 1 | C 1 | | | | | | | | F 1 |
| 29 | | | F 1 | F 1 | F 1 | | | | | H 2 | H 1 | | | | | | L 1 | F 1 | F 1 | F 1 | | | | |
| 30 | | | | | | | | | L 1 | H 2 | C 2 | | H 1 | C 1 | C 2 | | | | F 2 | F 2 | | F 3 | F 1 | |
| 31 | F 2 | | | | | | | | L 1 | H 2 | H 2 | L 1 | L 2 | L 1 | L 1 | | | F 1 | F 2 | F 1 | F 1 | F 1 | F 1 | 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 | | | | | | | | | | | | | | | | | | | | | | | | |

The Radio Research Laboratory, Japan

DEC. 1986 | TYPES OF ES

# IONOSPHERIC DATA

DEC. 1986 | FXI (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | X 34 | X 35 | X 35 | X 35 | X 38 | X 35 | | | | | | | | | | | | | X 45 | X 47 | X 41 | 36 | X 37 | X 37 |
| 2 | X 38 | X 38 | X 39 | 43 | X 38 | 40 | | | | | | | | | | | | | X 38 | X 42 | U X 48 | X 42 | X 39 | X 36 |
| 3 | X 38 | 41 | 45 | 39 | X 36 | X 34 | | | | | | | | | | | | | X 39 | X 34 | X 34 | X 35 | X 39 | X 39 |
| 4 | 43 | 40 | X 37 | X 32 | X 30 | X 29 | | | | | | | | | | | | | X 42 | X 38 | X 34 | X 37 | X 38 | X 36 |
| 5 | X 38 | X 37 | X 36 | X 35 | X 32 | X 39 | | | | | | | | | | | | | X 39 | X 38 | X 35 | X 36 | X 40 | S |
| 6 | X 40 | X 39 | X 37 | X 33 | X 34 | X 28 | | | | | | | | | | | | | X 32 | X 39 | X 34 | X 32 | 34 | 40 |
| 7 | 40 | 40 | 40 | X 36 | 32 | 33 | 36 | | | | | | | | | | | | X 31 | X 38 | X 40 | X 35 | X 37 | X 38 |
| 8 | 40 | X 41 | X 42 | X 41 | X 33 | X 32 | | | | | | | | | | | | | X 34 | X 34 | X 34 | X 35 | X 40 | X 41 |
| 9 | X 38 | X 35 | X 36 | X 34 | X 37 | X 38 | | | | | | | | | | | | | X 34 | X 33 | X 38 | X 39 | X 37 | X 42 |
| 10 | X 35 | X 34 | X 34 | X 34 | X 34 | X 32 | | | | | | | | | | | | | X 32 | X 34 | X 39 | X 36 | 39 | X 36 |
| 11 | X 34 | X 37 | X 39 | X 32 | X 29 | 34 | 35 | | | | | | | | | | | | X 36 | X 35 | X 35 | X 34 | X 37 | X 38 |
| 12 | X 39 | X 40 | X 41 | X 37 | X 37 | X 37 | | | | | | | | | | | | | X 40 | X 40 | X 31 | X 29 | X 34 | X 37 |
| 13 | X 37 | X 36 | X 37 | X 38 | X 41 | X 34 | | | | | | | | | | | | | X 40 | 40 | X 40 | X 33 | X 37 | X 39 |
| 14 | 36 | 38 | 46 | 55 | 51 | 37 | | | | | | | | | | | | | X 55 | X 44 | X 35 | X 39 | X 44 | 45 |
| 15 | 40 | 42 | X 47 | X 50 | X 30 | 28 | | | | | | | | | | | | | X 36 | X 40 | X 40 | 35 | X 44 | X 46 |
| 16 | X 45 | X 44 | 45 | 45 | X 42 | X 38 | | | | | | | | | | | | | X 37 | X 43 | 41 | X 34 | 33 | 37 |
| 17 | X 38 | X 37 | X 37 | 38 | 35 | 34 | | | | | | | | | | | | | X 42 | X 41 | X 35 | X 31 | X 33 | 40 |
| 18 | X 34 | X 34 | X 34 | X 36 | X 37 | X 32 | | | | | | | | | | | | | X 40 | X 33 | X 35 | X 34 | 40 | X 46 |
| 19 | 50 | 45 | 48 | 49 | X 40 | 27 | 32 | | | | | | | | | | | | X 34 | X 35 | X 39 | X 36 | X 34 | X 37 |
| 20 | X 39 | X 39 | 40 | X 40 | X 39 | X 36 | | | | | | | | | | | | | X 41 | X 42 | X 33 | X 29 | X 31 | 40 |
| 21 | 50 | 50 | 56 | 60 | 46 | 34 | 36 | | | | | | | | | | | | X 39 | X 36 | X 34 | X 31 | 33 | 36 |
| 22 | X 33 | 36 | 36 | X 36 | X 28 | X 27 | | | | | | | | | | | | | X 42 | X 34 | X 33 | X 34 | X 34 | X 37 |
| 23 | X 35 | X 34 | X 36 | X 36 | X 34 | X 34 | | | | | | | | | | | | | X 41 | X 32 | X 37 | X 32 | X 34 | X 41 |
| 24 | X 38 | 40 | X 46 | X 41 | 30 | X 29 | 28 | | | | | | | | | | | | X 36 | X 33 | X 33 | X 29 | X 29 | X 31 |
| 25 | 33 | X 34 | X 35 | X 36 | X 30 | X 29 | | | | | | | | | | | | | X 36 | X 37 | X 34 | X 31 | X 32 | 0 X 32 |
| 26 | X 35 | X 36 | X 36 | X 36 | X 35 | X 31 | | | | | | | | | | | | | X 42 | X 48 | X 41 | X 34 | X 32 | A |
| 27 | X 39 | X 40 | 44 | 44 | X 37 | X 31 | | | | | | | | | | | | | X 38 | X 36 | 38 | 40 | X 34 | 37 |
| 28 | 40 | 41 | X 39 | X 41 | X 33 | X 32 | | | | | | | | | | | | | X 39 | X 39 | X 37 | X 35 | X 37 | X 35 |
| 29 | X 30 | X 31 | X 32 | X 33 | X 33 | X 30 | | | | | | | | | | | | | X 31 | X 34 | X 38 | X 34 | X 29 | X 31 |
| 30 | X 32 | X 33 | X 35 | X 34 | X 31 | X 29 | | | | | | | | | | | | | X 35 | X 34 | X 35 | X 32 | X 33 | X 35 |
| 31 | X 36 | X 38 | 40 | X 43 | 39 | 40 | 41 | | | | | | | | | | | | X 41 | X 42 | X 43 | X 34 | X 34 | 40 |
| | 00 | 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 | 6 | | | | | | | | | | | | 31 | 31 | 31 | 31 | 31 | 29 |
| MED | X 38 | X 38 | X 39 | X 37 | X 35 | X 33 | 36 | | | | | | | | | | | | X 39 | X 38 | X 35 | X 34 | X 34 | X 37 |
| UQ | X 40 | 40 | 43 | 42 | X 38 | X 36 | 36 | | | | | | | | | | | | X 41 | X 40 | X 40 | X 36 | X 38 | X 40 |
| LQ | X 35 | X 36 | X 36 | X 35 | X 32 | X 30 | 32 | | | | | | | | | | | | X 36 | X 34 | X 34 | X 32 | X 33 | X 36 |

DEC. 1986 | FXI (0.1 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FOF2 (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 28 | 29 | 29 | 29 | 32 | 29 | 28 | 52 | 68 | S 75 | 81 | 82 | S 86 | J R 77 | 60 | 57 | 53 | 38 | 39 | S 41 | S 35 | F 24 | S 31 | S 31 |
| 2 | 32 | 32 | S 33 | F 33 | S 32 | F 30 | S 33 | S 59 | 53 | 65 | 72 | S 76 | 66 | 62 | 71 | 64 | 49 | 35 | 32 | 36 | U S 42 | S 36 | S 33 | S 30 |
| 3 | 32 | F 35 | F | F 33 | 30 | 28 | 29 | 52 | 57 | 64 | S 78 | 76 | 67 | 61 | 60 | 55 | 48 | 32 | 33 | 28 | 28 | 29 | S 33 | S 33 |
| 4 | F | F | S 31 | S 26 | S 24 | S 23 | 23 | 50 | 55 | 67 | 79 | J R 80 | 65 | 62 | 53 | 54 | 49 | 34 | 36 | 32 | 28 | 31 | S 32 | 30 |
| 5 | 32 | 31 | 30 | 29 | 26 | S 33 | S 42 | S 60 | 57 | 69 | 70 | 64 | 54 | 59 | 68 | 65 | C | 33 | 33 | 32 | 29 | S 30 | S 34 | S |
| 6 | S 34 | S 33 | 31 | 27 | 28 | S 22 | 23 | 45 | 51 | 61 | 68 | S 74 | 66 | 58 | C | C | C | 32 | 26 | S 33 | S 28 | S 26 | F | F |
| 7 | F | F | F | S 30 | F 26 | F | F | S 44 | 51 | 63 | 71 | 69 | 57 | 54 | 55 | 60 | 49 | 33 | 25 | 32 | 34 | 29 | S 31 | S 32 |
| 8 | F | S 35 | S 36 | 35 | S 27 | S 26 | S 26 | 44 | 48 | 62 | S 79 | 81 | 59 | 52 | 54 | 49 | 43 | 30 | 28 | 28 | 28 | 29 | S 34 | S 35 |
| 9 | 32 | S 29 | S 30 | S 28 | S 31 | S 32 | S 34 | 55 | 49 | 50 | 67 | S 75 | 64 | 58 | 49 | 49 | 43 | 32 | 28 | S 27 | S 32 | S 33 | S 31 | S 36 |
| 10 | S 29 | S 28 | 28 | S 28 | 28 | 26 | S 33 | 45 | 49 | 54 | 65 | 68 | 67 | 58 | 52 | 53 | 49 | 32 | 26 | 28 | 33 | 30 | F 30 | 30 |
| 11 | 28 | 31 | S 33 | S 26 | 23 | F | F | S 49 | 54 | 58 | 65 | S 74 | 65 | 62 | 53 | 54 | 42 | 36 | 30 | 29 | 29 | 28 | S 31 | S 32 |
| 12 | S 33 | S 34 | S 35 | 31 | S 31 | S 31 | S 33 | 48 | 59 | S 64 | S 81 | S 79 | S 73 | 62 | 57 | 55 | 50 | 42 | 34 | 34 | 25 | 23 | 28 | S 31 |
| 13 | S 31 | S 30 | S 31 | 32 | S 35 | 28 | 24 | 39 | 45 | 53 | 72 | 75 | 73 | 62 | 62 | 56 | 54 | 31 | 34 | F | S 34 | 27 | 31 | S 33 |
| 14 | F | F | F | F | F | F 31 | S 33 | 42 | 46 | 55 | 72 | 123 | 63 | 58 | 53 | 57 | 53 | 35 | 49 | S 38 | S 29 | 33 | S 38 | F |
| 15 | F | F | S 41 | S 44 | S 24 | F | S 26 | 46 | 57 | 59 | 73 | 70 | 65 | 69 | 50 | 52 | 43 | 34 | 30 | S 34 | S 34 | F 29 | S 38 | S 40 |
| 16 | S 39 | S 38 | F | F | S 36 | S 32 | S 34 | S 51 | 51 | 51 | 52 | 64 | 61 | 62 | 65 | 55 | 43 | 28 | 31 | S 37 | F 35 | S 28 | F 24 | F 31 |
| 17 | S 32 | S 31 | 31 | F | F | F | S 30 | 43 | 52 | 55 | 65 | 69 | 59 | 60 | 54 | 51 | 49 | 39 | 36 | S 35 | S 29 | 25 | S 27 | F |
| 18 | S 28 | S 28 | S 28 | 30 | S 31 | S 26 | S 32 | S 44 | 49 | 49 | 55 | S 76 | 68 | 58 | 54 | 51 | 47 | S 43 | 34 | 27 | 29 | S 28 | F | S 40 |
| 19 | F | F | F | F | S 34 | F | F | S 41 | 58 | 48 | 67 | 84 | 63 | 61 | 60 | 58 | 54 | H 45 | 28 | 29 | S 33 | S 30 | 28 | S 31 |
| 20 | S 33 | S 33 | F | S 34 | S 33 | S 30 | S 36 | S 44 | S 50 | 50 | 60 | 81 | 65 | 61 | 59 | 49 | 53 | 36 | 35 | 36 | 27 | S 23 | S 25 | F |
| 21 | F | F | F | F | F | F | F | S 40 | 49 | 48 | 61 | 68 | S 74 | 60 | 55 | 55 | 48 | 39 | 33 | 30 | 28 | 25 | F 24 | F |
| 22 | S 27 | F 27 | F 27 | 30 | 22 | S 21 | 22 | S 39 | 49 | 59 | 65 | 66 | 71 | 69 | 60 | 59 | 48 | 37 | 36 | 28 | 27 | 28 | 28 | S 31 |
| 23 | S 29 | S 28 | S 30 | 30 | 28 | S 28 | 28 | S 40 | 46 | 55 | J S 74 | S 82 | S 75 | 59 | 65 | 54 | 47 | 36 | 35 | S 26 | S 31 | 26 | S 28 | S 35 |
| 24 | S 32 | F | S 40 | S 35 | F | S 23 | F 22 | 45 | 57 | 59 | 66 | 64 | 71 | 61 | 55 | 51 | 48 | 38 | 30 | 27 | 27 | 23 | 23 | 25 |
| 25 | F | S 28 | S 29 | 30 | 24 | 23 | S 23 | S 44 | 46 | 60 | 67 | S 80 | 85 | S 81 | 57 | 53 | 45 | S 38 | 30 | 31 | 28 | 25 | S 26 | S 26 |
| 26 | 29 | 30 | 30 | 30 | 29 | 25 | 23 | 44 | 50 | 56 | 54 | 70 | 66 | 64 | 51 | 54 | 50 | 36 | 36 | S 42 | S 35 | S 28 | 26 | A |
| 27 | S 33 | S 34 | F | F 34 | 31 | S 25 | S 30 | S 43 | 55 | 54 | S 73 | S 69 | 54 | 56 | 51 | 51 | 44 | 31 | 32 | 30 | F | F | S 28 | F |
| 28 | F | F 32 | S 33 | 35 | 27 | S 26 | S 27 | S 40 | 50 | 51 | 58 | 69 | 60 | 53 | 50 | 54 | 51 | 34 | 33 | 33 | 31 | 29 | S 31 | 29 |
| 29 | 24 | 25 | 26 | 27 | 27 | 24 | 22 | 39 | H 60 | H 51 | 67 | 71 | 63 | 56 | 52 | 55 | 45 | 33 | 25 | 23 | 32 | 28 | 23 | 25 |
| 30 | 26 | 27 | 29 | 28 | 25 | 23 | 23 | 41 | 48 | 45 | 55 | 56 | 60 | 54 | 52 | 50 | 42 | 43 | 29 | 28 | S 29 | 26 | S 27 | 29 |
| 31 | 30 | S 32 | F | S 37 | F | F | F | S 44 | 49 | 46 | 62 | 60 | 53 | 57 | 49 | 47 | 45 | 39 | 35 | 36 | S 37 | 28 | S 28 | F |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 22 | 24 | 22 | 26 | 26 | 24 | 26 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 30 | 30 | 29 | 31 | 31 | 30 | 30 | 30 | 29 | 22 |
| MED | S 32 | S 31 | S 30 | 30 | 28 | S 26 | S 28 | 44 | 51 | 55 | 67 | 74 | 65 | 60 | 55 | 54 | 48 | 35 | 33 | 32 | 29 | 28 | S 28 | S 31 |
| UQ | S 32 | S 33 | S 33 | 34 | S 31 | S 30 | S 33 | 48 | 56 | 62 | 72 | 80 | 70 | 62 | 60 | 56 | 50 | 38 | 35 | 35 | S 34 | 29 | S 31 | S 33 |
| LQ | 28 | S 28 | 29 | 28 | 26 | S 24 | 23 | S 42 | 49 | 51 | 64 | 68 | 60 | 58 | 52 | 51 | 45 | 32 | 30 | 28 | 28 | 26 | 27 | 30 |

The Radio Research Laboratory, Japan

DEC. 1986 | FOF2 (0.1 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FOF1 (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N. Long. 139° 29.3' E Sweep 1 MHz to 20 MHz in 20sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | L | L | L | L 410 | L | L | L | L | | | | | | | | |
| 2 | | | | | | | | | | L | L | L | L 390 | L | L | | | | | | | | | |
| 3 | | | | | | | | | | L | L | L | L | L | L | L | | | | | | | | |
| 4 | | | | | | | | | L | | L | L | L | L | L | | | | | | | | | |
| 5 | | | | | | | | | L | | L | L | L 390 | L 340 | L | | | | | | | | | |
| 6 | | | | | | | | | L 290 | L | L 390 | L 400 | L 390 | L | C | C | | | | | | | | |
| 7 | | | | | | | | | | L | L 390 | L 400 | L 400 | L | L | | | | | | | | | |
| 8 | | | | | | | | | | L | L 410 | L 400 | L | U L 360 | L | | | | | | | | | |
| 9 | | | | | | | | | | | L 410 | U L 410 | L 400 | L 390 | L | | | | | | | | | |
| 10 | | | | | | | | | L | | L | L | L | L | L | | | | | | | | | |
| 11 | | | | | | | | | | | L | L | L | L | L | | | | | | | | | |
| 12 | | | | | | | | | | L | L | U A 400 | L 420 | L 390 | L | L | | | | | | | | |
| 13 | | | | | | | | | | | L | L | L 400 | L | L | | | | | | | | | |
| 14 | | | | | | | | | | | L | L | L | L | | | | | | | | | | |
| 15 | | | | | | | | | | L 330 | L | L | L | L | L | | | | | | | | | |
| 16 | | | | | | | | | | | L | L 400 | L | L | L | L | L 210 | | | | | | | |
| 17 | | | | | | | | | L | | L | L | L | L | L | L | | | | | | | | |
| 18 | | | | | | | | | | L 330 | U L 430 | 380 | L 400 | L | L | | | | | | | | | |
| 19 | | | | | | | | | | L | L 420 | L | L | L 400 | L | L | L 210 | | | | | | | |
| 20 | | | | | | | | | 260 | L | L | L | L 400 | L | L | L | | | | | | | | |
| 21 | | | | | | | | | | | L | L 410 | L | L | L | L 300 | | | | | | | | |
| 22 | | | | | | | | | | L 320 | L | L 410 | L | L 390 | L 370 | L | | | | | | | | |
| 23 | | | | | | | | | | | L 390 | L 410 | L 410 | L | 350 | L | | | | | | | | |
| 24 | | | | | | | | | | L | L | L 400 | L 390 | L 340 | | | | | | | | | | |
| 25 | | | | | | | | | L | L | L 400 | L 400 | L 400 | L 410 | A | A | | | | | | | | |
| 26 | | | | | | | | | | | | L 400 | L | L | L | L | | | | | | | | |
| 27 | | | | | | | | | | L | L 390 | L | L | L | L | L | | | | | | | | |
| 28 | | | | | | | | | | | L | L 400 | L 390 | L 390 | L | 260 | | | | | | | | |
| 29 | | | | | | | | | L | | L 390 | L 400 | L 410 | L 400 | L | L | | | | | | | | |
| 30 | | | | | | | | | | | L | | L | L | L | L | | | | | | | | |
| 31 | | | | | | | | | | L | L 370 | L | U L 400 | L | L | 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 | | | | | | | | | 2 | 3 | 11 | 16 | 15 | 10 | 2 | 3 | 2 | | | | | | | |
| MED | | | | | | | | | 275 | L 330 | L 390 | L 400 | L 400 | L 390 | 360 | 280 | L 210 | | | | | | | |
| UQ | | | | | | | | | | L 330 | L 410 | L 410 | L 400 | L 400 | | 290 | | | | | | | | |
| LQ | | | | | | | | | | L 325 | L 390 | L 400 | L 390 | L 360 | | 270 | | | | | | | | |

DEC. 1986 | FOF1 (0.01 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FOE (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | S | S | 230 | 260 | R | A | A | A | 260 | 220 | S | S | | | | | | |
| 2 | | | | | | | S | S | 220 | A | 280 | 290 | 295 | 280 | 260 | 225 | S | S | | | | | | |
| 3 | | | | | | | S | S | 240 | 275 | A | 295 | 300 | 280 | 270 | 240 | S | S | | | | | | |
| 4 | | | | | | | S | S | 240 | 275 | 280 | R 290 | 290 | R 280 | 260 | A | A | S | | | | | | |
| 5 | | | | | | | S | S | 205 | 255 | 270 | 280 | 285 | 275 | 260 | 230 | C | S | | | | | | |
| 6 | | | | | | | S | S | A | 255 | 275 | 290 | 290 | 270 | C | C | C | S | | | | | | |
| 7 | | | | | | | S | S | 235 | 265 | A | A | 295 | 285 | 260 | A | S | S | | S | | | | |
| 8 | | | | | | | S | S | A | A | A | 295 | 295 | 285 | 255 | 230 | B | S | S | | | | | |
| 9 | | S | S | S | S | | S | S | A | A | A | A | 290 | 285 | 265 | 230 | S | S | | S | S | | | |
| 10 | | | | | | | S | S | A | U A 260 | 295 | 300 | 300 | 290 | 265 | 230 | S | S | | | | | | |
| 11 | | | | | | | S | S | 230 | A | A | 300 | A | A | A | 230 | S | S | | | | | | |
| 12 | | | | | | | S | S | 220 | U A 270 | A | A | A | A | 265 | 230 | S | S | | | | | | |
| 13 | | | | | | | S | S | 220 | 260 | 285 | 300 | A | 290 | 270 | 240 | A | S | | | | | | |
| 14 | | | | | | | S | S | A | A | A | A | A | 275 | 255 | 230 | 160 | S | | | | S | | |
| 15 | | | | | | | S | S | 210 | A | A | A | A | A | H 250 | A | S | S | | | | | | |
| 16 | | | | | | | S | S | 200 | 260 | H 275 | 290 | 290 | 280 | 260 | 220 | S | S | | | | | | |
| 17 | | | | | | | S | S | 215 | 265 | 285 | 295 | 295 | 280 | 250 | A | A | S | | | | | | |
| 18 | | | | | | | S | S | A | 260 | 280 | 290 | 295 | U A 280 | U A 260 | 220 | A | S | | | S | S | | |
| 19 | | | | | | | S | S | H 220 | U A 265 | A | 295 | 300 | 285 | A | 230 | S | S | | S | | S | | |
| 20 | | | | | | | S | S | A | U A 265 | 290 | 300 | 295 | 285 | 255 | A | A | S | | | | | | |
| 21 | | | | | | | S | S | 210 | H 260 | H 280 | 290 | A | A | 265 | 235 | S | S | | | | S | | |
| 22 | | | | | | | S | S | A | A | 290 | 295 | 295 | 285 | 265 | 240 | A | S | | | | S | S | |
| 23 | | | | | | | S | S | A | U A 260 | A | 280 | 285 | 280 | A | H 240 | S | S | | | | | | |
| 24 | | | | | | | S | S | 210 | U A 260 | A | 285 | 280 | 270 | 250 | 220 | S | B | | | | | | |
| 25 | | | | | | | S | S | A | A | A | A | A | A | A | A | A | S | | | | | | |
| 26 | | | | | | | S | S | H 220 | H 260 | A | A | 290 | A | 265 | 230 | S | S | | | | | | |
| 27 | | | | | | | S | S | 205 | H 250 | 270 | 290 | 295 | 280 | 265 | 220 | A | S | | | | | | |
| 28 | | | | | | | S | S | 200 | 250 | 265 | 275 | 300 | 290 | 275 | A | 160 | S | | | | | | |
| 29 | | | | | | | S | S | 205 | 255 | 275 | 295 | A | 280 | A | A | S | S | | | | | | |
| 30 | | | | | | | S | S | 205 | 250 | 270 | 290 | 285 | 280 | 260 | 230 | 165 | S | | | | S | | |
| 31 | | | | | | | S | S | H 205 | 260 | 270 | 280 | 285 | 275 | 260 | 230 | S | S | | | S | | | |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | | | | | | | | | 21 | 23 | 17 | 23 | 22 | 24 | 25 | 22 | 3 | | | | | | | |
| MED | | | | | | | | | 215 | 260 | 280 | 290 | 295 | 280 | 260 | 230 | 160 | | | | | | | |
| UQ | | | | | | | | | 220 | 265 | 285 | 295 | 295 | 285 | 265 | 230 | 162 | | | | | | | |
| LQ | | | | | | | | | 205 | 258 | 270 | 290 | 290 | 280 | 260 | 225 | 160 | | | | | | | |

The Radio Research Laboratory, Japan

DEC. 1986 | FOE (0.01 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FOES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 20 MHz in 20sec 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 | 19 | ES 14 | ES 14 | EB 13 | ES 14 | 20 | 22 | JA 19 | G 18 | 28 | G 27 | JA 34 | 37 | JA 39 | G 24 | G | ES 14 | ES 14 | ES 14 | ES 14 | 19 | 19 | ES 15 | ES 14 |
| 2 | ES 14 | EB 13 | ES 14 | ES 14 | ES 14 | ES 14 | ES 14 | ES 14 | G | JA 29 | G | G | G | G 22 | JA 27 | 24 | ES 14 | 24 | 23 | 19 | 20 | ES 16 | 24 | ES 15 |
| 3 | ES 15 | JA 21 | 24 | 24 | ES 15 | ES 15 | ES 16 | ES 16 | G | JA 29 | JA 40 | G | G 25 | G 25 | G 24 | 25 | 23 | JA 32 | JA 18 | JA 23 | JA 20 | ES 15 | ES 15 | ES 15 |
| 4 | ES 15 | ES 14 | ES 14 | ES 14 | ES 14 | ES 15 | ES 14 | 22 | 26 | 32 | 30 | 31 | 30 | G | G | JA 36 | JA 25 | JA 28 | JA 25 | JA 19 | 23 | 19 | 20 | ES 15 |
| 5 | ES 15 | ES 14 | ES 14 | ES 14 | ES 15 | 17 | 17 | 21 | G 18 | G 22 | G 22 | 33 | G | G | G | G 22 | C | ES 14 | JA 18 | JA 23 | 19 | 23 | JA 22 | JA 31 |
| 6 | JA 20 | ES 15 | ES 14 | JA 33 | 18 | 18 | 20 | JA 24 | JA 24 | 30 | 31 | G | G 18 | G 19 | C | C | C | JA 18 | 19 | 18 | 19 | 18 | ES 15 | ES 15 |
| 7 | ES 15 | ES 14 | JA 35 | EB 13 | ES 14 | ES 15 | ES 15 | ES 15 | G 21 | G 26 | 32 | 31 | G 28 | G | JA 30 | JA 30 | ES 14 | 25 | ES 15 | ES 15 | 18 | ES 14 | ES 14 | ES 15 |
| 8 | ES 15 | ES 15 | ES 14 | EB 13 | ES 15 | ES 15 | 21 | 19 | JA 33 | 29 | 30 | G 27 | G 28 | 29 | JA 29 | JA 23 | JA 24 | ES 16 | 18 | 19 | JA 22 | JA 18 | 17 | 21 |
| 9 | 23 | ES 14 | ES 15 | ES 14 | ES 15 | 19 | 20 | 22 | 30 | JA 33 | 34 | JA 33 | G 25 | G | G 23 | G 22 | JA 25 | 19 | 19 | 18 | 18 | 19 | 19 | 22 |
| 10 | ES 15 | ES 15 | 23 | 19 | ES 14 | ES 14 | ES 14 | 17 | JA 44 | JA 30 | 33 | JA 33 | G 27 | G 24 | G | G | ES 14 | ES 14 | ES 15 | JA 33 | JA 26 | JA 38 | 24 | 22 |
| 11 | 19 | ES 14 | 20 | 18 | 20 | 20 | 19 | ES 15 | G | 34 | JA 32 | JA 43 | JA 55 | JA 37 | 28 | G | ES 15 | ES 15 | ES 15 | ES 15 | 19 | 24 | JA 31 | 19 |
| 12 | 23 | 20 | JA 20 | 21 | ES 15 | ES 15 | 18 | ES 14 | G | 30 | JA 30 | JA 52 | JA 54 | JA 31 | G 20 | G 18 | ES 15 | JA 18 | 18 | ES 15 | ES 15 | ES 15 | ES 14 | JA 27 |
| 13 | JA 27 | ES 15 | ES 14 | ES 14 | 19 | ES 15 | ES 14 | ES 15 | G | 32 | 35 | G | 33 | JA 33 | JA 37 | JA 34 | JA 26 | 19 | JA 21 | JA 23 | ES 15 | 19 | ES 15 | ES 14 |
| 14 | JA 35 | 24 | JA 29 | JA 21 | 17 | ES 15 | 22 | JA 19 | 25 | JA 33 | JA 82 | JA 51 | JA 50 | G | G | G | G | ES 14 | 22 | EB 13 | 18 | 17 | JA 32 | JA 29 |
| 15 | JA 31 | JA 26 | 22 | EB 13 | EB 13 | ES 15 | ES 15 | ES 14 | G | 30 | JA 47 | JA 51 | JA 65 | JA 34 | 33 | JA 41 | JA 34 | JA 19 | JA 52 | JA 32 | JA 24 | ES 15 | JA 19 | ES 14 |
| 16 | ES 16 | ES 15 | ES 14 | 23 | 22 | 22 | 20 | 22 | G 18 | G 23 | 32 | 32 | 32 | 35 | 30 | G | 18 | JA 18 | 23 | JA 20 | 27 | 24 | JA 21 | JA 19 |
| 17 | ES 15 | JA 20 | 18 | ES 15 | ES 15 | ES 14 | 21 | 23 | G | G | 36 | G | G | 30 | 31 | 29 | JA 31 | JA 29 | JA 19 | 23 | 22 | 18 | ES 16 | JA 21 |
| 18 | ES 14 | ES 14 | 20 | JA 19 | JA 22 | 21 | JA 31 | 20 | 23 | G | 33 | 34 | 33 | JA 48 | 31 | 30 | 21 | JA 22 | JA 24 | ES 16 | ES 16 | ES 15 | 22 | ES 15 |
| 19 | ES 15 | ES 15 | ES 14 | ES 14 | ES 14 | ES 15 | ES 14 | ES 14 | G | 30 | JA 51 | 32 | G 29 | G 27 | 29 | G | ES 15 | JA 20 | 19 | ES 15 | ES 14 | ES 14 | ES 15 | ES 14 |
| 20 | ES 15 | ES 15 | ES 14 | ES 14 | 21 | 23 | ES 14 | ES 16 | 26 | JA 32 | JA 29 | G | G | G 17 | G 24 | JA 31 | JA 25 | 19 | 20 | 19 | EB 13 | ES 15 | ES 15 | 19 |
| 21 | ES 15 | ES 15 | ES 14 | ES 14 | ES 14 | ES 15 | ES 15 | ES 14 | G 19 | G | 33 | 32 | 33 | JA 39 | 28 | G 17 | JA 24 | JA 25 | 18 | 18 | 20 | 18 | 18 | 23 |
| 22 | 20 | 22 | 20 | 18 | 18 | ES 14 | 24 | ES 15 | JA 23 | 28 | 33 | 32 | 32 | 31 | 29 | JA 25 | 18 | JA 19 | JA 20 | 20 | 19 | ES 15 | ES 15 | ES 15 |
| 23 | JA 20 | 19 | 22 | JA 32 | 20 | 19 | 22 | ES 15 | JA 23 | JA 37 | JA 65 | 30 | G 28 | 30 | JA 40 | JA 24 | JA 29 | 18 | 19 | ES 15 | JA 22 | JA 23 | JA 34 | JA 51 |
| 24 | JA 24 | 20 | ES 14 | ES 14 | ES 15 | ES 15 | ES 16 | 20 | G | JA 32 | JA 30 | G 24 | G | G | G | 26 | 19 | EB 13 | 19 | 17 | 18 | ES 15 | 20 | 20 |
| 25 | 20 | 23 | 23 | 19 | ES 14 | ES 14 | ES 16 | 25 | JA 21 | 27 | JA 36 | JA 39 | JA 50 | JA 47 | JA 54 | JA 49 | JA 40 | JA 25 | ES 15 | 22 | ES 14 | ES 14 | 22 | JA 26 |
| 26 | JA 27 | JA 20 | 19 | ES 15 | ES 16 | 19 | 19 | 21 | G | 29 | 30 | 30 | G 28 | JA 33 | G 25 | G 21 | ES 14 | ES 14 | ES 14 | JA 53 | JA 53 | JA 32 | JA 42 | JA 51 |
| 27 | JA 30 | ES 14 | ES 15 | JA 26 | JA 27 | JA 25 | JA 22 | 22 | G | 27 | 31 | G | G | G | JA 29 | 25 | JA 26 | JA 34 | JA 19 | 18 | ES 14 | 19 | 22 | JA 21 |
| 28 | 23 | JA 34 | 24 | EB 13 | 20 | 19 | 19 | ES 15 | G | 30 | 34 | JA 36 | G | 32 | G | 24 | G | 19 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 | ES 15 |
| 29 | ES 14 | 19 | 19 | 18 | 19 | 19 | 19 | ES 15 | G 18 | JA 27 | G 24 | G | JA 33 | JA 35 | JA 44 | JA 24 | JA 23 | 25 | 20 | 19 | ES 14 | ES 14 | ES 15 | ES 15 |
| 30 | ES 15 | ES 14 | ES 14 | ES 14 | ES 15 | ES 15 | ES 15 | 19 | G | 30 | 32 | 34 | 33 | 31 | 29 | 25 | G | ES 14 | ES 14 | ES 14 | JA 33 | 23 | 19 | 20 |
| 31 | 19 | 20 | ES 15 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 | G | 27 | 29 | G | G 23 | 30 | G 23 | G | ES 15 | ES 15 | 19 | ES 15 | ES 15 | 17 | ES 15 | JA 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 | 29 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED | 19 | ES 15 | ES 15 | E 15 | ES 15 | ES 15 | 18 | 17 | G 18 | 29 | 32 | 32 | G 28 | 30 | 28 | 24 | 19 | 19 | 19 | 18 | 19 | 18 | 19 | 19 |
| UQ | 23 | 20 | 21 | 19 | 19 | 19 | 20 | 21 | 23 | 31 | 34 | JA 34 | 33 | JA 34 | 30 | JA 29 | JA 25 | JA 24 | 20 | 21 | 22 | 19 | 22 | JA 22 |
| LQ | ES 15 | ES 14 | ES 14 | ES 14 | ES 14 | ES 15 | ES 15 | ES 15 | G | 27 | 30 | G | G 20 | G 18 | G 23 | G 17 | ES 14 | ES 15 | 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |

# IONOSPHERIC DATA

DEC. 1986 | FBES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ES 15 | ES 14 | ES 14 | EB 13 | ES 14 | ES 14 | ES 14 | ES 14 | G 16 | 23 | G 27 | 31 | 35 | 32 | G 24 | G | ES 14 | ES 14 | ES 14 | ES 14 | ES 14 | ES 14 | ES 15 | ES 14 |
| 2 | ES 14 | EB 13 | ES 14 | ES 14 | ES 14 | ES 14 | ES 14 | ES 14 | G | 26 | G | G | G | G 22 | G 24 | G 21 | ES 14 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 15 |
| 3 | ES 15 | ES 16 | ES 15 | ES 14 | ES 15 | ES 13 | ES 16 | ES 16 | G | G 26 | 29 | G | G 25 | G 25 | G 23 | G 23 | 22 | ES 15 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 | ES 15 |
| 4 | ES 15 | ES 14 | ES 14 | ES 14 | ES 14 | ES 15 | ES 14 | 20 | 25 | 29 | 30 | 31 | G 25 | G | G | 26 | 22 | 16 | 20 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 5 | ES 15 | ES 14 | ES 14 | ES 14 | ES 15 | ES 16 | ES 15 | ES 15 | G 18 | G 21 | G 21 | 32 | G | G | G | G 22 | C | ES 14 | ES 15 | ES 15 | ES 14 | ES 15 | 21 | 21 |
| 6 | ES 15 | ES 15 | ES 14 | ES 14 | ES 14 | ES 15 | ES 15 | 18 | 21 | 30 | 31 | G | G 17 | G 19 | C | C | C | ES 15 | ES 14 | ES 14 | ES 14 | ES 15 | ES 15 | ES 15 |
| 7 | ES 15 | ES 14 | 15 | EB 13 | ES 14 | ES 15 | ES 15 | ES 15 | G 21 | G 25 | 30 | 30 | G 25 | G | G 24 | 27 | ES 14 | 19 | ES 15 | ES 15 | ES 15 | ES 14 | ES 14 | ES 15 |
| 8 | ES 15 | ES 15 | ES 14 | EB 13 | ES 15 | ES 15 | ES 14 | 18 | 25 | 29 | 29 | G 27 | G 26 | G 26 | G 24 | G 20 | 19 | ES 16 | ES 15 | ES 15 | ES 15 | ES 14 | ES 15 | ES 15 |
| 9 | ES 15 | ES 14 | ES 15 | ES 14 | ES 15 | ES 14 | ES 15 | ES 14 | 27 | 31 | 31 | 29 | G 25 | G | G 17 | G 17 | ES 15 | ES 14 | ES 14 | ES 14 | ES 14 | ES 15 | ES 15 | ES 16 |
| 10 | ES 15 | ES 15 | EB 13 | ES 14 | ES 14 | ES 14 | ES 14 | 15 | 25 | 26 | G | G 26 | G 25 | G 23 | G | G | ES 14 | ES 14 | ES 15 | ES 15 | 22 | 22 | ES 15 | ES 15 |
| 11 | ES 15 | ES 14 | ES 14 | ES 14 | ES 15 | ES 14 | ES 16 | ES 15 | G | 31 | 29 | G 26 | 34 | 30 | 27 | G | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | 21 | ES 15 |
| 12 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 14 | G | 29 | 30 | 40 | 31 | 30 | G 20 | G 17 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 14 | ES 15 |
| 13 | 16 | ES 15 | ES 14 | ES 14 | ES 14 | ES 15 | ES 14 | ES 15 | G | 31 | 32 | G | 30 | G 26 | G 24 | G 19 | 24 | 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 14 |
| 14 | ES 15 | ES 15 | 17 | 15 | 14 | ES 15 | ES 15 | ES 15 | 24 | 30 | 30 | 31 | 32 | G | G | G | G | ES 14 | ES 14 | EB 13 | ES 14 | ES 15 | ES 15 | ES 15 |
| 15 | ES 15 | 14 | ES 15 | EB 13 | EB 13 | ES 15 | ES 15 | ES 14 | G | 27 | 31 | 29 | 34 | 28 | 33 | 28 | 21 | 15 | 16 | ES 15 | ES 14 | ES 15 | ES 15 | ES 14 |
| 16 | ES 16 | ES 15 | ES 14 | ES 15 | ES 14 | ES 14 | ES 15 | ES 15 | G 18 | G 21 | 32 | 32 | 32 | 35 | 29 | G | 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 14 | ES 15 |
| 17 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 | ES 14 | ES 14 | ES 14 | G | G | 35 | G | G | 30 | 30 | 25 | 21 | 17 | ES 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 15 |
| 18 | ES 14 | ES 14 | ES 15 | 14 | ES 14 | ES 15 | ES 15 | ES 15 | 23 | G | 32 | 33 | 32 | 28 | 31 | 29 | 21 | 21 | 20 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 |
| 19 | ES 15 | ES 15 | ES 14 | ES 14 | ES 14 | ES 15 | ES 14 | ES 14 | G | 28 | 30 | G | G 28 | G 27 | 27 | G | ES 15 | ES 15 | ES 15 | ES 15 | ES 14 | ES 14 | ES 15 | ES 14 |
| 20 | ES 15 | ES 15 | ES 14 | ES 14 | EB 13 | ES 14 | ES 14 | ES 16 | 23 | 27 | G 26 | G | G | G 17 | G 23 | 24 | 20 | ES 15 | ES 15 | ES 15 | EB 13 | ES 15 | ES 15 | ES 15 |
| 21 | ES 15 | ES 15 | ES 14 | ES 14 | ES 14 | ES 15 | ES 15 | ES 14 | G 16 | G | 31 | 31 | 31 | 34 | 28 | G 17 | 17 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 22 | ES 15 | ES 15 | ES 15 | EB 13 | ES 15 | ES 14 | ES 15 | ES 15 | 23 | 26 | 31 | 31 | 31 | 31 | 28 | G 23 | 16 | ES 15 | 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| 23 | ES 15 | ES 14 | ES 15 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 | 22 | 26 | 28 | 30 | G 28 | 29 | 33 | G 16 | 16 | ES 14 | ES 15 | ES 15 | ES 15 | ES 14 | 21 | 27 |
| 24 | ES 15 | ES 16 | ES 14 | ES 14 | ES 15 | ES 15 | ES 16 | ES 15 | G | 26 | 27 | G 24 | G | G | G | 25 | 18 | EB 13 | ES 15 | ES 15 | ES 14 | ES 15 | ES 14 | ES 15 |
| 25 | ES 15 | ES 15 | EB 13 | ES 14 | ES 14 | ES 14 | ES 16 | ES 15 | 20 | 26 | 28 | 31 | 29 | 40 | 39 | 30 | 29 | 18 | ES 15 | ES 15 | ES 14 | ES 14 | ES 15 | 24 |
| 26 | 19 | 16 | ES 14 | ES 15 | ES 16 | ES 14 | ES 15 | ES 15 | G | 29 | 30 | 30 | G 27 | 30 | G 25 | G 21 | ES 14 | ES 14 | ES 14 | 27 | 24 | 18 | 17 | AA 51 |
| 27 | 16 | ES 14 | ES 15 | 15 | 17 | 20 | ES 15 | 15 | G | 27 | 31 | G | G | G | G 24 | 25 | 22 | 19 | 18 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 |
| 28 | ES 14 | 20 | ES 14 | EB 13 | EB 13 | ES 14 | ES 15 | ES 15 | G | 28 | 32 | 31 | G | 32 | G | 24 | G | ES 15 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 | ES 15 |
| 29 | ES 14 | ES 15 | ES 14 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 | G 18 | G 21 | G 24 | G | 31 | G 23 | 27 | 24 | 18 | ES 15 | ES 15 | ES 15 | ES 14 | ES 14 | ES 15 | ES 15 |
| 30 | ES 15 | ES 14 | ES 14 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | G | 30 | 32 | 33 | 33 | 31 | 29 | 25 | G | ES 14 | ES 14 | ES 14 | ES 14 | ES 15 | ES 15 | ES 14 |
| 31 | ES 15 | ES 15 | ES 15 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 | G | 27 | 29 | G | G 23 | 30 | G 20 | G | ES 15 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 30 | 30 | 29 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED | ES 15 | ES 15 | ES 14 | ES 14 | ES 14 | ES 15 | ES 15 | ES 15 | G 16 | 27 | 30 | 29 | G 27 | G 27 | G 24 | G 22 | 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| UQ | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | 22 | 29 | 31 | 31 | 31 | 30 | 28 | 25 | 21 | 16 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 | ES 15 |
| LQ | ES 15 | ES 14 | ES 14 | ES 14 | ES 14 | ES 14 | ES 14 | ES 14 | G | 26 | 28 | G | G 20 | G 18 | G 20 | G 16 | ES 14 | ES 14 | ES 14 | ES 15 | ES 14 | ES 15 | ES 15 | ES 15 |

The Radio Research Laboratory, Japan

DEC. 1986 | FBES (0.1 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FMIN (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N. Long. 139° 29.3' E Sweep 1 MHz to 20 MHz in 20sec in automatic operation

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

# IONOSPHERIC DATA

DEC. 1986 | M(3000)F2 (0.01) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 290 | 290 | 285 | 285 | 320 | 310 | 300 | 335 | 345 | S 320 | 345 | 340 | S 340 | J R 360 | 360 | 350 | 355 | 320 | 310 | S 330 | S 320 | F 270 | S 290 | S 300 |
| 2 | 290 | 300 | S 300 | F 300 | S 290 | F 310 | S 330 | S 370 | 355 | 360 | 350 | S 355 | 345 | 330 | 340 | 355 | 355 | 330 | 320 | 320 | U S 310 | S 320 | S 340 | S 305 |
| 3 | 290 | F 295 | F | F 285 | 290 | 320 | 325 | 355 | 365 | 340 | S 345 | 355 | 350 | 345 | 355 | 355 | 360 | 340 | 330 | 330 | 320 | 310 | S 300 | S 330 |
| 4 | F | F | S 325 | S 310 | S 310 | S 300 | 300 | 340 | 355 | 355 | 340 | J R 360 | 355 | 325 | 355 | 360 | 360 | 320 | 340 | 330 | 320 | 320 | S 330 | 300 |
| 5 | 310 | 320 | 320 | 320 | 310 | S 300 | S 325 | S 355 | 355 | 345 | 345 | 360 | 355 | 340 | 345 | 360 | C | 340 | 350 | 310 | 340 | S 295 | S 320 | S |
| 6 | S 300 | S 310 | 325 | 340 | 360 | S 310 | 330 | 350 | 340 | 340 | 345 | S 350 | 350 | 355 | C | C | C | 340 | 330 | S 345 | S 300 | S 290 | F | F |
| 7 | F | F | F | S 320 | F 340 | F | F | S 325 | 350 | 340 | 350 | 340 | 355 | 350 | 345 | 350 | 360 | 360 | 310 | 310 | 320 | 300 | S 310 | S 300 |
| 8 | F | S 320 | S 330 | 345 | S 320 | S 330 | S 320 | 350 | 355 | 325 | S 330 | 350 | 360 | 345 | 360 | 355 | 355 | 330 | 350 | 330 | 315 | 310 | S 325 | S 330 |
| 9 | 325 | S 320 | S 325 | S 310 | S 310 | S 300 | S 320 | 380 | 360 | 335 | 340 | S 345 | 360 | 360 | 355 | 330 | 355 | 345 | 340 | S 320 | S 310 | S 310 | S 290 | S 320 |
| 10 | S 330 | S 300 | 320 | S 300 | 310 | 305 | S 360 | 380 | 360 | 350 | 350 | 350 | 360 | 355 | 360 | 350 | 350 | 350 | 340 | 310 | 325 | 270 | F 290 | 320 |
| 11 | 300 | 305 | S 330 | S 350 | 290 | F | F | S 355 | 370 | 320 | 350 | S 330 | 360 | 365 | 340 | 355 | 360 | 340 | 340 | 350 | 330 | 300 | S 290 | S 300 |
| 12 | S 320 | S 290 | S 330 | 340 | S 315 | S 310 | S 335 | 350 | 350 | S 350 | S 340 | S 355 | S 355 | 355 | 360 | 360 | 350 | 345 | 330 | 360 | 355 | 340 | 320 | S 310 |
| 13 | S 310 | S 300 | S 310 | 320 | S 350 | 350 | 360 | 350 | 360 | 330 | 340 | 350 | 350 | 370 | 350 | 360 | 370 | 350 | 345 | F | S 340 | 300 | 300 | S 275 |
| 14 | F | F | F | F | F | F 290 | S 275 | 370 | 360 | 340 | 295 | 355 | 355 | 360 | 350 | 345 | 360 | 280 | 345 | S 340 | S 280 | 305 | S 300 | F |
| 15 | F | F | S 300 | S 360 | S 340 | F | S 275 | 350 | 360 | 360 | 345 | 350 | 355 | 340 | 350 | 355 | 350 | 350 | 330 | S 320 | S 340 | F 290 | S 275 | S 285 |
| 16 | S 300 | S 310 | F | F | S 330 | S 300 | S 330 | S 345 | 355 | 370 | 355 | 350 | 350 | 350 | 355 | 350 | 360 | 340 | 310 | S 310 | F 330 | S 325 | F 275 | F 290 |
| 17 | S 310 | S 300 | 300 | F | F | F | S 325 | 360 | 355 | 360 | 355 | 350 | 350 | 360 | 360 | 350 | 350 | 340 | 360 | S 330 | S 345 | 300 | S 310 | F |
| 18 | S 290 | S 290 | S 300 | 320 | S 340 | S 320 | S 360 | S 365 | 350 | 370 | 330 | S 345 | 360 | 370 | 350 | 365 | 350 | S 320 | 360 | 320 | 320 | S 320 | F | S 310 |
| 19 | F | F | F | F | S 345 | F | F | S 330 | 355 | 370 | 320 | 345 | 340 | 340 | 345 | 350 | 345 | H 325 | 355 | 290 | S 330 | S 325 | 300 | S 300 |
| 20 | S 310 | S 310 | F | S 310 | S 350 | S 350 | S 340 | S 340 | S 355 | 340 | 320 | 345 | 355 | 355 | 340 | 360 | 360 | 345 | 320 | 370 | 355 | S 320 | S 300 | F |
| 21 | F | F | F | F | F | F | F | S 355 | 355 | 335 | 345 | 340 | S 360 | 360 | 370 | 355 | 360 | 340 | 345 | 340 | 340 | 300 | F 310 | F |
| 22 | S 265 | F 275 | F 290 | 350 | 390 | S 300 | 330 | S 340 | 330 | 345 | 355 | 355 | 350 | 350 | 355 | 355 | 360 | 340 | 360 | 340 | 350 | 320 | 310 | S 290 |
| 23 | S 285 | S 285 | S 310 | 320 | 310 | S 320 | 350 | S 330 | 340 | 330 | J S 320 | S 350 | S 345 | 355 | 355 | 355 | 380 | 345 | 340 | S 320 | S 325 | 290 | S 290 | S 310 |
| 24 | S 285 | F | S 330 | S 340 | F | S 270 | F 280 | 350 | 360 | 340 | 350 | 355 | 335 | 340 | 330 | 325 | 310 | 350 | 340 | 330 | 325 | 335 | 275 | 290 |
| 25 | F | S 300 | S 320 | 325 | 300 | 300 | S 300 | S 350 | 350 | 330 | 325 | S 320 | 340 | S 350 | 360 | 350 | 350 | S 350 | 320 | 350 | 345 | 310 | S 300 | S 290 |
| 26 | 295 | 300 | 315 | 320 | 320 | 290 | 300 | 350 | 350 | 375 | 330 | 350 | 355 | 365 | 360 | 350 | 350 | 330 | 325 | S 330 | S 350 | S 325 | 290 | A |
| 27 | S 290 | S 290 | F | F 325 | 315 | S 305 | S 300 | S 340 | 360 | 350 | S 335 | S 365 | 350 | 360 | 355 | 350 | 360 | 335 | 320 | 325 | F | F | S 310 | F |
| 28 | F | F 300 | S 320 | 340 | 310 | S 320 | S 310 | S 355 | 360 | 325 | 345 | 350 | 360 | 360 | 360 | 365 | 350 | 330 | 330 | 330 | 325 | 330 | S 320 | 335 |
| 29 | 290 | 310 | 320 | 330 | 325 | 310 | 300 | 330 | H 340 | H 335 | 340 | 350 | 360 | 350 | 340 | 370 | 360 | 340 | 305 | 330 | 325 | 350 | 305 | 300 |
| 30 | 300 | 310 | 330 | 350 | 335 | 310 | 325 | 360 | 375 | 380 | 350 | 290 | 360 | 375 | 360 | 365 | 345 | 360 | 325 | 330 | S 320 | 340 | S 335 | 315 |
| 31 | 310 | S 300 | F | S 355 | F | F | F | S 335 | 375 | 370 | 350 | 350 | 360 | 360 | 360 | 370 | 355 | 340 | 330 | 335 | S 355 | 335 | S 300 | F |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 22 | 24 | 22 | 26 | 26 | 24 | 26 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 30 | 30 | 29 | 31 | 31 | 30 | 30 | 30 | 29 | 22 |
| MED | S 300 | S 300 | S 320 | 322 | 320 | S 310 | S 325 | 350 | 355 | 340 | 345 | 350 | 355 | 355 | 355 | 355 | 355 | 340 | 330 | 330 | 325 | 310 | S 300 | S 300 |
| UQ | S 310 | S 310 | S 325 | 340 | S 340 | S 320 | S 330 | 355 | 360 | 360 | 350 | 355 | 360 | 360 | 360 | 360 | 360 | 345 | 345 | 340 | 340 | 325 | S 310 | S 315 |
| LQ | 290 | S 292 | S 300 | 310 | 310 | S 300 | S 300 | S 340 | 350 | 335 | 332 | 345 | 350 | 348 | 345 | 350 | 350 | 330 | 322 | 320 | 320 | 300 | S 290 | S 290 |

DEC. 1986 | M(3000)F2 (0.01)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | M(3000)F1 (0.01) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | L | L | L | L 375 | L | L | L | L | | | | | | | | |
| 2 | | | | | | | | | | L | L | L | L 375 | L | L | | | | | | | | | |
| 3 | | | | | | | | | | L | L | L | L | L | L | L | | | | | | | | |
| 4 | | | | | | | | | L | | L | L | L | L | L | | | | | | | | | |
| 5 | | | | | | | | | L | | L | L | L 400 | L 420 | L | | | | | | | | | |
| 6 | | | | | | | | | L 420 | L | L 360 | L 375 | L 380 | L | C | C | | | | | | | | |
| 7 | | | | | | | | | | L | L 360 | L 370 | L 380 | L | L | | | | | | | | | |
| 8 | | | | | | | | | | L | L 360 | L 370 | L | U L 410 | L | | | | | | | | | |
| 9 | | | | | | | | | | | L 370 | U L 360 | L 370 | L 370 | L | | | | | | | | | |
| 10 | | | | | | | | | L | | L | L | L | L | L | | | | | | | | | |
| 11 | | | | | | | | | | | L | L | L | L | L | | | | | | | | | |
| 12 | | | | | | | | | | L | L | A | L 360 | L 385 | L | L | | | | | | | | |
| 13 | | | | | | | | | | | L | L | L 370 | L | L | | | | | | | | | |
| 14 | | | | | | | | | | | L | L | L | L | | | | | | | | | | |
| 15 | | | | | | | | | | L 400 | L | L | L | L | L | | | | | | | | | |
| 16 | | | | | | | | | | | L | L 360 | L | L | L | L | | | | | | | | |
| 17 | | | | | | | | | L | | L | L | L | L | L | L | | | | | | | | |
| 18 | | | | | | | | | | L 400 | U L 360 | 380 | L 390 | L | L | | | | | | | | | |
| 19 | | | | | | | | | | L | L 360 | L | L | L 360 | L | L | L 395 | | | | | | | |
| 20 | | | | | | | | | 420 | L | L | L | L 370 | L | L | L | | | | | | | | |
| 21 | | | | | | | | | | | L | L 380 | L | L | L | L 405 | | | | | | | | |
| 22 | | | | | | | | | | L 410 | L | L 380 | L | L 390 | L 400 | L | | | | | | | | |
| 23 | | | | | | | | | | | L 355 | L 365 | L 365 | L | | L | | | | | | | | |
| 24 | | | | | | | | | | L | L | L 375 | L 360 | L 410 | | | | | | | | | | |
| 25 | | | | | | | | | L | L | L 355 | L 370 | L 350 | A | A | A | | | | | | | | |
| 26 | | | | | | | | | | | | L 370 | L | L | L | L | | | | | | | | |
| 27 | | | | | | | | | | L | L 350 | L | L | L | L | L | | | | | | | | |
| 28 | | | | | | | | | | | L | L 365 | L 370 | L 370 | L | 405 | | | | | | | | |
| 29 | | | | | | | | | L | | L 355 | L 365 | L 380 | L 375 | L | L | | | | | | | | |
| 30 | | | | | | | | | | | L | | L | L | L | L | | | | | | | | |
| 31 | | | | | | | | | | L | L 375 | L | U L 370 | L | 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 | | | | | | | | | 2 | 3 | 11 | 15 | 15 | 9 | 1 | 3 | 1 | | | | | | | |
| MED | | | | | | | | | 420 | L 400 | L 360 | L 370 | L 370 | L 385 | L 400 | 405 | L 395 | | | | | | | |
| UQ | | | | | | | | | | L 405 | L 360 | L 375 | L 380 | L 410 | | 408 | | | | | | | | |
| LQ | | | | | | | | | | L 400 | L 355 | L 365 | L 368 | L 370 | | 405 | | | | | | | | |

DEC. 1986 | M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | H'F2 (KM) | 135° E Mean Time (G.M.T. + 9h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N. Long. 139° 29.3' E Sweep 1 MHz to 20 MHz in 20sec 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 | | | | | | | | | 235 | 255 | 235 | 245 | 255 | 220 | 220 | 230 | | | | | | | | |
| 2 | | | | | | | | | | 230 | 235 | 235 | 240 | 245 | 235 | | | | | | | | | |
| 3 | | | | | | | | | | 230 | 245 | 235 | 245 | 250 | 230 | 230 | | | | | | | | |
| 4 | | | | | | | | | 215 | | 245 | 235 | 245 | 240 | 240 | | | | | | | | | |
| 5 | | | | | | | | | 220 | | 235 | 230 | 250 | 250 | 250 | | | | | | | | | |
| 6 | | | | | | | | | 240 | 245 | 250 | 230 | 230 | 250 | C | C | | | | | | | | |
| 7 | | | | | | | | | | 245 | 240 | 235 | 230 | 255 | 250 | | | | | | | | | |
| 8 | | | | | | | | | | 255 | 255 | 235 | 230 | 240 | 240 | | | | | | | | | |
| 9 | | | | | | | | | | | 255 | 245 | 235 | 240 | 230 | | | | | | | | | |
| 10 | | | | | | | | | 220 | | 255 | 235 | 230 | 240 | 225 | | | | | | | | | |
| 11 | | | | | | | | | | | 240 | 215 | 240 | 225 | 220 | | | | | | | | | |
| 12 | | | | | | | | | | 240 | 230 | 235 | 245 | 230 | 230 | 220 | | | | | | | | |
| 13 | | | | | | | | | | | 260 | 245 | 230 | 225 | 255 | | | | | | | | | |
| 14 | | | | | | | | | | | 310 | 230 | 230 | 225 | | | | | | | | | | |
| 15 | | | | | | | | | | 230 | 250 | 245 | 245 | 250 | 230 | | | | | | | | | |
| 16 | | | | | | | | | | | 255 | 255 | 255 | 245 | 235 | 230 | 205 | | | | | | | |
| 17 | | | | | | | | | 225 | | 245 | 230 | 245 | 230 | 235 | 230 | | | | | | | | |
| 18 | | | | | | | | | | 225 | 295 | 245 | 230 | 230 | 240 | | | | | | | | | |
| 19 | | | | | | | | | | 220 | 280 | 235 | 240 | 250 | 240 | 230 | 215 | | | | | | | |
| 20 | | | | | | | | | 220 | 245 | 275 | 245 | 240 | 240 | 255 | 225 | | | | | | | | |
| 21 | | | | | | | | | | | 240 | 245 | 235 | 235 | 225 | 225 | | | | | | | | |
| 22 | | | | | | | | | | 240 | 240 | 240 | 250 | 250 | 225 | 230 | | | | | | | | |
| 23 | | | | | | | | | | | 275 | 230 | 255 | 230 | 230 | 215 | | | | | | | | |
| 24 | | | | | | | | | | 245 | 235 | 240 | 240 | 235 | | | | | | | | | | |
| 25 | | | | | | | | | 220 | 235 | 285 | 280 | 255 | 220 | 240 | 220 | | | | | | | | |
| 26 | | | | | | | | | | | | 245 | 240 | 235 | 230 | 225 | | | | | | | | |
| 27 | | | | | | | | | | 235 | 255 | 215 | 245 | 235 | 230 | 225 | | | | | | | | |
| 28 | | | | | | | | | | | 250 | 240 | 235 | 245 | 235 | 230 | | | | | | | | |
| 29 | | | | | | | | | 220 | | 260 | 240 | 235 | 235 | 245 | 220 | | | | | | | | |
| 30 | | | | | | | | | | | 265 | | 240 | 225 | 235 | 220 | | | | | | | | |
| 31 | | | | | | | | | | 220 | 240 | 240 | 250 | 235 | 225 | 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 | | | | | | | | | 9 | 16 | 30 | 30 | 31 | 31 | 28 | 17 | 2 | | | | | | | |
| MED | | | | | | | | | 220 | 238 | 250 | 238 | 240 | 235 | 235 | 225 | 210 | | | | | | | |
| UQ | | | | | | | | | 225 | 245 | 260 | 245 | 245 | 245 | 240 | 230 | | | | | | | | |
| LQ | | | | | | | | | 220 | 230 | 240 | 235 | 235 | 230 | 230 | 220 | | | | | | | | |

The Radio Research Laboratory, Japan

DEC. 1986 | H'F2 (KM)

# IONOSPHERIC DATA

DEC. 1986 | H'F (KM) | 135° E Mean Time (G.M.T. + 9h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N. Long. 139° 29.3' E Sweep 1 MHz to 20 MHz in 20sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 310 | 290 | 305 | 290 | 260 | 240 | 265 | 225 | 195 | 235 | H 210 | 215 | 235 | 230 | 215 | 215 | 210 | 230 | 240 | 230 | 235 | 250 | 285 | 265 |
| 2 | 290 | 275 | 275 | 280 | 265 | 275 | 255 | 205 | 210 | H 175 | 225 | 215 | 200 | 210 | 220 | H 220 | 200 | 215 | 245 | 245 | 250 | 265 | 225 | 260 |
| 3 | 275 | 265 | 290 | 260 | 270 | 265 | 245 | 215 | 220 | H 195 | 200 | H 200 | 220 | 225 | 225 | 230 | 220 | 205 | 250 | 240 | 245 | 260 | 260 | 230 |
| 4 | 235 | 265 | 255 | 260 | 255 | 260 | 280 | 235 | 210 | H 230 | 230 | 230 | H 195 | 225 | 215 | 225 | 220 | 225 | 240 | 235 | 235 | 250 | 255 | 280 |
| 5 | 260 | 245 | 240 | 240 | H 260 | 260 | 240 | H 225 | 215 | H 235 | H 205 | 225 | 190 | 205 | H 205 | H 225 | C | 210 | 215 | 240 | 220 | 270 | 260 | E A 255 |
| 6 | 275 | 265 | 240 | 230 | 210 | 275 | 250 | 220 | H 180 | 230 | 230 | 205 | 200 | H 200 | C | C | C | 205 | 235 | 230 | 245 | 275 | 280 | 250 |
| 7 | 265 | 250 | 260 | 220 | 210 | 260 | 245 | 215 | 225 | 230 | 225 | 220 | 195 | 200 | 195 | H 245 | 215 | 215 | H 255 | 255 | 215 | 250 | 285 | 280 |
| 8 | 285 | 250 | 230 | 210 | H 205 | 250 | 245 | 210 | 220 | 210 | 220 | H 215 | 215 | 190 | 200 | 215 | 215 | 225 | 225 | 245 | 260 | 275 | 245 | 230 |
| 9 | 235 | 250 | 235 | 250 | 265 | 270 | 235 | 205 | H 205 | A 240 | 210 | H 200 | H 195 | 210 | H 205 | 225 | 215 | 205 | 220 | 260 | 270 | 270 | 295 | 250 |
| 10 | 240 | 275 | 280 | 300 | 260 | 275 | 210 | 195 | 205 | 225 | 220 | 220 | H 210 | 225 | 215 | H 210 | 210 | 210 | 230 | 260 | E A 275 | E A 275 | 300 | 270 |
| 11 | 265 | 285 | 245 | 205 | 300 | 305 | 280 | H 200 | 210 | 215 | H 215 | H 215 | A 230 | H 210 | 205 | H 220 | 215 | 215 | 210 | 225 | 230 | 280 | E A 325 | 290 |
| 12 | 250 | 270 | 245 | 215 | 245 | 240 | 220 | 200 | 220 | H 200 | 225 | A | 225 | 205 | H 200 | 210 | 210 | 205 | 235 | 200 | 200 | E S 280 | 270 | 285 |
| 13 | 305 | 295 | 275 | 265 | 230 | 200 | 200 | 195 | 230 | 240 | 240 | 225 | 220 | 205 | 195 | H 220 | 205 | 215 | 220 | 230 | 220 | 270 | 285 | 285 |
| 14 | 265 | 235 | 290 | 245 | 205 | 255 | 225 | 200 | H 195 | 230 | H 250 | 235 | A 220 | 210 | H 225 | 235 | 215 | 210 | 220 | 205 | 220 | 260 | 265 | 230 |
| 15 | 305 | 325 | 260 | 205 | 220 | 260 | 260 | 225 | H 225 | 200 | 225 | H 190 | E A 245 | H 185 | 210 | 210 | 230 | 210 | 255 | 240 | 210 | 230 | 265 | 265 |
| 16 | 255 | 265 | 270 | 250 | 220 | 215 | 230 | 220 | H 195 | H 225 | 220 | 215 | H 220 | E A 240 | 220 | 205 | 185 | 225 | 255 | 250 | 220 | 245 | 305 | 300 |
| 17 | 265 | 260 | 300 | 255 | 270 | 270 | 220 | 200 | H 200 | 235 | 250 | 210 | 235 | 215 | 215 | 220 | 220 | 220 | 210 | 215 | 205 | E S 260 | E S 280 | 310 |
| 18 | 300 | 290 | 290 | 260 | 230 | 255 | 215 | 205 | H 210 | H 200 | H 215 | H 205 | 225 | 225 | 215 | 220 | 220 | A 225 | 215 | 240 | 230 | 220 | 260 | 240 |
| 19 | 270 | 270 | 255 | 235 | 205 | E S 280 | 270 | 235 | 225 | 215 | 225 | 225 | 210 | 205 | 205 | 220 | 195 | 205 | 215 | 270 | 225 | 240 | 245 | 265 |
| 20 | 265 | 270 | 275 | 250 | 215 | 205 | 225 | 210 | H 195 | 225 | H 190 | 230 | 215 | 230 | 210 | H 200 | 220 | 215 | 235 | 210 | 210 | 260 | 295 | 250 |
| 21 | 255 | 270 | 290 | 245 | 190 | 300 | 225 | 215 | 225 | 220 | 235 | 215 | 235 | E A 235 | H 200 | 195 | 205 | 220 | 215 | 230 | 215 | 225 | 295 | 265 |
| 22 | 355 | 315 | 290 | 210 | 190 | 275 | 250 | 225 | H 200 | H 190 | 230 | 220 | H 190 | 210 | 200 | 220 | H 210 | 220 | 215 | 220 | 230 | 255 | 255 | 285 |
| 23 | 315 | 305 | 295 | 270 | 235 | 250 | 220 | 220 | 205 | 230 | H 180 | 225 | 205 | 215 | E A 230 | 215 | 200 | 225 | 230 | 235 | 245 | 300 | E A 350 | 280 |
| 24 | 300 | 280 | 220 | 210 | 255 | E S 330 | E S 355 | 235 | H 225 | 235 | H 205 | H 205 | H 205 | 190 | H 235 | H 225 | 215 | 210 | 215 | 235 | 225 | 250 | E S 305 | 315 |
| 25 | 315 | 275 | 270 | 245 | 230 | 290 | 280 | 230 | 205 | H 195 | 210 | 210 | H 210 | A | A | A | 220 | 215 | 225 | 220 | 220 | 305 | 335 | E A 375 |
| 26 | E A 315 | E A 290 | 260 | 265 | 250 | 320 | 285 | 225 | 230 | H 235 | 215 | H 205 | H 210 | H 205 | 205 | 225 | 210 | 220 | 250 | 270 | 220 | 270 | 330 | A |
| 27 | 300 | 260 | 245 | 250 | 260 | E A 310 | 270 | 230 | 225 | H 210 | 230 | 220 | H 215 | 220 | 210 | 210 | 210 | 215 | 250 | 240 | 280 | 235 | 250 | 310 |
| 28 | 285 | 290 | 260 | 235 | 210 | 270 | 255 | 220 | 225 | 225 | 235 | 225 | 225 | 215 | 215 | 205 | 230 | 220 | 255 | 240 | 230 | 245 | 240 | 225 |
| 29 | 275 | 295 | 275 | 245 | 255 | 270 | 300 | 240 | 225 | H 175 | 230 | 215 | 210 | 215 | 215 | H 190 | 205 | 210 | 240 | 240 | 250 | 225 | 280 | 285 |
| 30 | 295 | 285 | 255 | 230 | 235 | 290 | 255 | 215 | H 215 | 215 | H 195 | 225 | 255 | 225 | 210 | 210 | H 200 | 205 | 220 | 220 | H 235 | 245 | 235 | 255 |
| 31 | 255 | 275 | 275 | 215 | 250 | 245 | 265 | 220 | 210 | 210 | H 225 | H 205 | H 220 | H 220 | 210 | 190 | 230 | 210 | 230 | 230 | 215 | 230 | 255 | 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 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 30 | 31 | 30 | 29 | 29 | 29 | 31 | 31 | 31 | 31 | 31 | 31 | 30 |
| MED | 275 | 275 | 270 | 245 | 235 | 265 | 248 | 220 | 210 | 225 | 225 | 215 | 215 | 211 | 210 | 220 | 215 | 215 | 230 | 235 | 228 | 255 | 270 | 266 |
| UQ | 300 | 290 | 285 | 260 | 260 | 276 | 266 | 225 | 225 | 230 | 230 | 225 | 224 | 222 | 215 | 225 | 220 | 220 | 242 | 242 | 242 | 270 | 290 | 285 |
| LQ | 262 | 265 | 250 | 225 | 212 | 252 | 225 | 205 | 205 | 205 | H 210 | H 205 | 205 | 205 | 205 | 210 | 205 | 210 | 218 | 228 | 220 | 244 | 255 | 250 |

DEC. 1986 | H'F (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | H'E (KM) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | S | S | A 120 | A | A | A | A | A | E A 130 | E B 125 | S | S | | | | | | |
| 2 | | | | | | | S | S | 120 | A | 110 | 115 | 115 | A 125 | E A 120 | E A 120 | S | S | | | | | | |
| 3 | | | | | | | S | S | 120 | A | A | 120 | E A 130 | A 120 | E A 125 | E A 130 | S | S | | | | | | |
| 4 | | | | | | | S | S | 130 | E B 130 | E B 125 | E B 130 | E A 130 | E B 125 | 120 | A | A | S | | | | | | |
| 5 | | | | | | | S | S | E A 125 | A 125 | A 120 | E A 130 | 120 | 120 | 115 | A 120 | C | S | | | | | | |
| 6 | | | | | | | S | S | A | A 115 | 110 | 110 | A 110 | A 115 | C | C | C | S | | | | | | |
| 7 | | | | | | | S | S | E A 135 | E A 135 | A | A | E A 130 | 105 | E A 125 | A | S | S | | S | | | | |
| 8 | | | | | | | S | S | 115 | 115 | 110 | E A 130 | E A 120 | E A 130 | E A 125 | E A 125 | B | S | S | | | | | |
| 9 | | S | S | S | S | | S | S | A | A | A | A | A 125 | 105 | A 120 | 125 | S | S | | S | S | | | |
| 10 | | | | | | | S | S | A | A | A | A 120 | A 120 | A 120 | 110 | 115 | S | S | | | | | | |
| 11 | | | | | | | S | S | 115 | A | A | A 130 | A | A | A | 110 | S | S | | | | | | |
| 12 | | | | | | | S | S | 115 | A | A | A | A | A | A 110 | A 120 | S | S | | | | | | |
| 13 | | | | | | | S | S | 120 | 110 | 110 | 110 | A | E A 130 | E A 125 | E A 130 | A | S | | | | | | |
| 14 | | | | | | | S | S | 115 | A | A | A | A | 110 | 115 | 120 | 125 | S | | | | S | | |
| 15 | | | | | | | S | S | 120 | A | A | A | A | A | A 115 | 120 | S | S | | | | | | |
| 16 | | | | | | | S | S | E A 135 | E A 130 | 120 | 120 | A 120 | 120 | 120 | 120 | S | S | | | | | | |
| 17 | | | | | | | S | S | 115 | 115 | 115 | 110 | 110 | A 115 | A 120 | A | A | S | | | | | | |
| 18 | | | | | | | S | S | A | 110 | 110 | E A 140 | E A 130 | A | A | E A 135 | A | S | | | S | S | | |
| 19 | | | | | | | S | S | 115 | A | A | E A 135 | E A 135 | E A 130 | A | 110 | S | S | | S | | S | | |
| 20 | | | | | | | S | S | 115 | A | E A 130 | 110 | 110 | A 115 | A 120 | A | A | S | | | | | | |
| 21 | | | | | | | S | S | A 115 | 110 | 110 | 110 | 110 | A | E A 130 | A 120 | S | S | | | | S | | |
| 22 | | | | | | | S | S | 120 | 110 | 110 | 110 | A 125 | A 115 | A 115 | E A 125 | A | S | | | | S | S | |
| 23 | | | | | | | S | S | 115 | A | A | E A 130 | E A 130 | E A 135 | A | E A 120 | S | S | | | | | | |
| 24 | | | | | | | S | S | 115 | A | A | A 120 | 105 | 105 | 110 | 115 | S | B | | | | | | |
| 25 | | | | | | | S | S | A | A | A | A | A | A | A | A | A | S | | | | | | |
| 26 | | | | | | | S | S | 120 | 115 | 115 | A | E A 135 | A | A | E A 130 | S | S | | | | | | |
| 27 | | | | | | | S | S | 125 | A 115 | 115 | 120 | 115 | 120 | E A 130 | E A 130 | A | S | | | | | | |
| 28 | | | | | | | S | S | 125 | 115 | 115 | 115 | 120 | 120 | 120 | A | E S 125 | S | | | | | | |
| 29 | | | | | | | S | S | E A 125 | E A 125 | A 125 | 110 | A | A 120 | A | A | S | S | | | | | | |
| 30 | | | | | | | S | S | 120 | 115 | 115 | 110 | 115 | 115 | 115 | 115 | E S 120 | S | | | | S | | |
| 31 | | | | | | | S | S | 120 | E A 140 | A 125 | 110 | A 120 | 105 | A 120 | 115 | S | S | | | S | | | |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | | | | | | | | | 26 | 17 | 18 | 23 | 23 | 23 | 23 | 23 | 3 | | | | | | | |
| MED | | | | | | | | | 118 | 112 | 114 | 115 | A 115 | A 118 | A 118 | A 115 | E S 125 | | | | | | | |
| UQ | | | | | | | | | 122 | E A 125 | 118 | A 125 | E A 130 | A 121 | E A 125 | E A 125 | 125 | | | | | | | |
| LQ | | | | | | | | | 115 | 115 | 110 | 110 | 114 | 115 | 115 | 116 | E S 122 | | | | | | | |

DEC. 1986 | H'E (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | H'ES (KM) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 100 | S | S | B | S | 110 | 105 | 105 | 105 | E G 175 | 110 | 115 | 110 | 110 | 115 | G | S | S | S | S | 100 | 100 | S | S |
| 2 | S | B | S | S | S | S | S | S | G | 110 | G | G | G | 115 | 100 | 110 | S | 100 | 100 | 100 | 100 | S | 110 | S |
| 3 | S | 105 | 105 | 100 | S | S | S | S | G | 115 | 115 | G | 120 | 115 | 115 | 110 | 105 | 105 | 115 | 105 | 105 | S | S | S |
| 4 | S | S | S | S | S | S | S | 170 | 155 | 150 | 135 | 160 | 105 | G | G | 100 | 100 | 100 | 105 | 105 | 105 | 105 | 100 | S |
| 5 | S | S | S | S | S | 110 | 110 | 120 | 110 | 105 | 100 | 155 | G | G | G | 110 | C | S | 110 | 105 | 110 | 105 | 100 | 100 |
| 6 | 100 | S | S | 105 | 105 | 105 | 115 | 105 | 105 | 150 | 150 | G | 105 | 110 | C | C | C | 100 | 100 | 100 | 105 | 110 | S | S |
| 7 | S | S | 100 | B | S | S | S | S | 115 | 110 | 110 | 105 | 105 | G | 105 | 100 | S | 100 | S | S | 100 | S | S | S |
| 8 | S | S | S | B | S | S | 105 | 125 | 115 | 115 | 115 | 110 | 110 | 105 | 105 | 105 | 105 | S | 105 | 115 | 115 | 100 | 100 | 105 |
| 9 | 105 | S | S | S | S | 105 | 105 | 100 | 115 | 105 | 105 | 105 | 110 | G | 105 | 105 | 100 | 105 | 105 | 110 | 105 | 110 | 105 | 100 |
| 10 | S | S | 105 | 100 | S | S | S | 110 | 110 | 110 | 150 | 110 | 110 | 105 | G | G | S | S | S | 115 | 110 | 105 | 110 | 100 |
| 11 | 110 | S | 110 | 105 | 105 | 100 | 100 | S | G | 110 | 110 | 110 | 105 | 110 | 110 | G | S | S | S | S | 105 | 105 | 105 | 120 |
| 12 | 105 | 105 | 100 | 100 | S | S | 105 | S | G | 170 | 110 | 105 | 105 | 105 | 105 | 105 | S | 100 | 95 | S | S | S | S | 105 |
| 13 | 100 | S | S | S | 100 | S | S | S | G | 155 | 140 | G | 110 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | S | 100 | S | S |
| 14 | 105 | 110 | 105 | 105 | 105 | S | 105 | 105 | 115 | 110 | 105 | 105 | 105 | G | G | G | G | S | 105 | B | 105 | 105 | 105 | 105 |
| 15 | 105 | 110 | 110 | B | B | S | S | S | G | 110 | 110 | 110 | 105 | 105 | 125 | 125 | 115 | 105 | 115 | 105 | 105 | S | 100 | S |
| 16 | S | S | S | 105 | 105 | 105 | 105 | 110 | 110 | 110 | 165 | 165 | 165 | 130 | 130 | G | 110 | 105 | 105 | 115 | 120 | 120 | 100 | 100 |
| 17 | S | 100 | 100 | S | S | S | 105 | 105 | G | G | 145 | G | G | 150 | 130 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | S | 120 |
| 18 | S | S | 105 | 100 | 120 | 100 | 110 | 100 | 110 | G | 165 | 160 | 150 | 110 | 140 | 125 | 110 | 105 | 100 | S | S | S | 110 | S |
| 19 | S | S | S | S | S | S | S | S | G | 145 | 110 | 150 | 115 | 110 | 110 | G | S | 100 | 100 | S | S | S | S | S |
| 20 | S | S | S | S | 120 | 100 | S | S | 120 | 110 | 110 | G | G | 105 | 105 | 100 | 100 | 100 | 100 | 100 | B | S | S | 125 |
| 21 | S | S | S | S | S | S | S | S | 110 | G | 150 | 130 | 115 | 110 | 145 | 110 | 100 | 100 | 100 | 110 | 105 | 105 | 100 | 100 |
| 22 | 100 | 100 | 100 | 100 | 105 | S | 120 | S | 120 | 120 | 130 | 135 | 130 | 130 | 125 | 105 | 100 | 100 | 100 | 100 | 100 | S | S | S |
| 23 | 110 | 110 | 105 | 110 | 105 | 110 | 110 | S | 115 | 110 | 110 | 150 | 105 | 155 | 95 | 100 | 95 | 95 | 100 | S | 115 | 105 | 100 | 105 |
| 24 | 105 | 105 | S | S | S | S | S | 100 | G | 110 | 110 | 105 | G | G | G | 150 | 140 | B | 105 | 100 | 100 | S | 105 | 100 |
| 25 | 120 | 110 | 110 | 110 | S | S | S | 120 | 120 | 110 | 110 | 110 | 110 | 110 | 105 | 105 | 105 | 105 | S | 100 | S | S | 100 | 100 |
| 26 | 100 | 100 | 105 | S | S | 100 | 105 | 105 | G | 155 | 135 | 120 | 115 | 110 | 110 | 120 | S | S | S | 105 | 105 | 100 | 100 | 100 |
| 27 | 100 | S | S | 100 | 100 | 100 | 100 | 100 | G | 155 | 125 | G | G | G | 100 | 115 | 100 | 95 | 100 | 100 | S | 100 | 115 | 120 |
| 28 | 115 | 105 | 105 | B | 105 | 105 | 105 | S | G | 145 | 125 | 120 | G | 130 | G | 120 | G | 105 | S | S | S | S | S | S |
| 29 | S | 100 | 100 | 100 | 100 | 100 | 100 | S | 120 | 110 | 115 | G | 105 | 105 | 100 | 100 | 100 | 100 | 100 | 100 | S | S | S | S |
| 30 | S | S | S | S | S | S | S | 100 | G | 160 | 150 | 145 | 140 | 130 | 125 | 115 | G | S | S | S | 105 | 105 | 135 | 100 |
| 31 | 100 | 100 | S | S | S | S | S | S | G | 145 | 145 | G | 105 | 165 | 100 | G | S | S | 105 | S | S | 100 | 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 | 16 | 13 | 15 | 13 | 12 | 13 | 17 | 16 | 17 | 23 | 30 | 22 | 24 | 24 | 24 | 23 | 17 | 21 | 23 | 20 | 21 | 18 | 18 | 18 |
| MED | 105 | 105 | 105 | 100 | 105 | 105 | 105 | 105 | 115 | 111 | 115 | 118 | 110 | 110 | 108 | 105 | 100 | 100 | 100 | 105 | 105 | 105 | 102 | 102 |
| UQ | 108 | 110 | 105 | 105 | 105 | 105 | 110 | 115 | 120 | 149 | 145 | 150 | 115 | 130 | 125 | 115 | 105 | 105 | 105 | 108 | 105 | 105 | 110 | 105 |
| LQ | 100 | 100 | 100 | 100 | 102 | 100 | 105 | 100 | 110 | 110 | 110 | 110 | 105 | 105 | 105 | 102 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

DEC. 1986 | H'ES (KM)

# IONOSPHERIC DATA

DEC. 1986 | TYPES OF ES | 135° E Mean Time (G.M.T. + 9h)

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

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



The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | FXI (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

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

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

DEC. 1986 | FXI (0.1 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FOF2 (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 27 | 28 | 28 | 30 | 32 | 32 | 34 | 40 | 65 | 65 | 67 | I C 77 | 80 | 75 | 63 | 67 | 62 | 54 | S 50 | 40 | 28 | 31 | 27 | 26 |
| 2 | 28 | 30 | 30 | 30 | 31 | 26 | 28 | 43 | 53 | 58 | H 68 | 86 | 75 | 77 | 77 | 76 | 79 | 48 | 35 | 32 | F | F 33 | 25 | 25 |
| 3 | 27 | 29 | 30 | 31 | 30 | 25 | 24 | 42 | 58 | 57 | 62 | 91 | 83 | H 82 | 67 | 61 | 60 | 53 | 31 | 28 | 28 | 30 | 30 | F |
| 4 | 30 | 29 | F | F 29 | F 28 | I C 22 | 20 | 33 | 69 | 70 | 77 | 80 | 73 | 69 | 63 | 61 | 54 | 50 | 35 | 33 | 29 | F 26 | F | F |
| 5 | 31 | 30 | 28 | 32 | 21 | 21 | 25 | 42 | 53 | 54 | 58 | 65 | 59 | 62 | 62 | 63 | 56 | 44 | 37 | 28 | 28 | 25 | 30 | 30 |
| 6 | 27 | 27 | 26 | 29 | 29 | 21 | H 22 | 37 | 53 | 62 | 70 | 70 | 77 | 63 | 56 | 59 | 59 | 46 | 27 | 27 | 31 | 26 | 25 | F |
| 7 | F | F | F 30 | F 31 | 27 | 19 | 20 | 35 | 48 | 52 | 65 | 75 | 68 | 62 | 62 | 62 | 62 | 44 | 29 | 28 | 32 | 29 | 27 | F |
| 8 | F 29 | 32 | 38 | 35 | 23 | J F 21 | 22 | 35 | 52 | 50 | 69 | R 94 | 98 | 62 | 56 | 52 | H 47 | 46 | 35 | 30 | F 28 | A | U S 28 | F |
| 9 | 34 | 24 | 28 | 26 | 25 | 24 | F 23 | 39 | 56 | 46 | 52 | 74 | 86 | 69 | 54 | 48 | 55 | S 44 | 31 | 32 | 26 | 30 | 30 | 29 |
| 10 | F 30 | 30 | J 28 | 29 | S 30 | S | F | S 40 | 52 | 50 | 59 | 72 | 75 | 67 | 54 | H 55 | 63 | 47 | 36 | 31 | 30 | 31 | F 28 | J S 20 |
| 11 | 27 | 27 | 28 | 29 | 26 | J F 24 | F | 38 | 50 | 58 | 55 | 89 | H 81 | 63 | 60 | 57 | 54 | 48 | A | 30 | 30 | 23 | 24 | 26 |
| 12 | 29 | 30 | 30 | F 34 | F 30 | 20 | 24 | 32 | 56 | 65 | 59 | 70 | 70 | 71 | 60 | C | 55 | 53 | 40 | 31 | 28 | 22 | 21 | 25 |
| 13 | 25 | 26 | 26 | F 28 | 32 | 26 | 20 | 30 | 44 | 43 | 50 | 74 | 72 | 61 | 56 | 60 | 53 | 45 | 28 | A | 27 | 26 | 26 | S |
| 14 | F | F | F | F 30 | 35 | F 24 | F | 38 | 44 | 49 | 59 | 124 | 76 | 60 | 55 | 53 | 70 | 49 | 35 | S 37 | 32 | 29 | 31 | 29 |
| 15 | F 31 | 33 | S 37 | S 39 | 32 | F 22 | F 23 | 33 | 55 | 56 | 57 | 79 | 74 | H 74 | 62 | 52 | 47 | 45 | 35 | 27 | 32 | 30 | 24 | 26 |
| 16 | 29 | 30 | 29 | F 27 | 27 | 24 | 24 | 35 | 49 | 54 | 54 | 53 | 55 | 71 | 62 | 56 | 56 | 45 | 30 | 32 | 34 | 26 | 26 | 24 |
| 17 | 26 | 29 | S 27 | F 26 | F | J S 26 | F | F 31 | 50 | 55 | 56 | 67 | 69 | 63 | 59 | 53 | 56 | 56 | 39 | 29 | 27 | 27 | 22 | 24 |
| 18 | S 26 | 27 | F | F 27 | U F 31 | 30 | 20 | 31 | 49 | 61 | 59 | 63 | R 77 | 69 | 55 | 58 | 54 | 56 | 43 | 26 | 24 | 25 | 25 | F 26 |
| 19 | F 27 | U F 28 | F 26 | F | F 35 | 19 | S 17 | 29 | 50 | 52 | 54 | 67 | H 68 | 72 | 63 | 56 | 63 | 68 | 44 | 28 | S 31 | 26 | 26 | 24 |
| 20 | 25 | 28 | 29 | 29 | F 30 | 21 | 20 | 28 | 45 | 54 | 58 | 59 | 71 | 61 | 74 | H 58 | 54 | 62 | 41 | 32 | 28 | 25 | 22 | 22 |
| 21 | 25 | F 26 | F 27 | 28 | 39 | 18 | 19 | 28 | 47 | 49 | 55 | 62 | 76 | 66 | 65 | 52 | 52 | 49 | 38 | 32 | 26 | 25 | 26 | 26 |
| 22 | 27 | 28 | 27 | 34 | 26 | 18 | 20 | 29 | 48 | 56 | 60 | 65 | 75 | 82 | 75 | 60 | 54 | 49 | 38 | 27 | 26 | 26 | 27 | 26 |
| 23 | 25 | 26 | 27 | 31 | 35 | 21 | 23 | 30 | 49 | 58 | 66 | 71 | 73 | 86 | 65 | 57 | 52 | 42 | 50 | 32 | 27 | 25 | 25 | 29 |
| 24 | 28 | 29 | 34 | 34 | 23 | 21 | 19 | 29 | 55 | 57 | 76 | 67 | 79 | 73 | 55 | H 57 | 60 | 43 | 36 | 34 | 32 | 29 | F | 21 |
| 25 | 24 | 27 | 31 | 29 | 30 | 22 | 22 | 31 | 47 | 52 | 57 | 71 | 100 | 80 | 61 | 51 | 61 | 44 | 35 | A | A | 23 | 23 | 27 |
| 26 | 28 | 31 | 31 | 31 | 30 | 29 | 25 | 32 | 49 | 49 | 57 | 63 | 62 | 66 | 61 | 55 | 53 | 50 | 39 | 43 | S 38 | 24 | 22 | 26 |
| 27 | 30 | 33 | 37 | 30 | 30 | 30 | 31 | 30 | 49 | C | C | 58 | 53 | 58 | H 59 | 53 | 59 | 47 | 40 | 31 | 26 | 27 | F | F 25 |
| 28 | F 26 | 29 | 30 | 27 | 29 | 21 | 20 | 25 | 53 | 47 | 66 | 59 | H 68 | 61 | 53 | 53 | 58 | 55 | 29 | 31 | 31 | 32 | 30 | 26 |
| 29 | 25 | 26 | 26 | 25 | 27 | 22 | 19 | 24 | 51 | S 55 | 60 | 71 | 69 | 58 | 56 | 55 | 47 | 44 | 35 | 28 | S 31 | 33 | 25 | 24 |
| 30 | 24 | 26 | 26 | 26 | 26 | H 20 | 20 | 27 | 43 | 50 | 51 | 54 | 56 | 58 | 51 | 49 | 49 | 43 | 36 | 31 | S 32 | 26 | 23 | 25 |
| 31 | 25 | 25 | 26 | 30 | 29 | 28 | 27 | 30 | 44 | 45 | 54 | 70 | H 57 | 56 | 54 | 50 | 50 | 49 | 34 | 35 | S 39 | S 31 | 24 | 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 | 29 | 29 | 28 | 30 | 30 | 30 | 27 | 31 | 31 | 30 | 30 | 31 | 31 | 31 | 31 | 30 | 31 | 31 | 30 | 29 | 29 | 30 | 28 | 25 |
| MED | 27 | 28 | 28 | 30 | 30 | 22 | 22 | 32 | 50 | 54 | 59 | 70 | 73 | 66 | 60 | 56 | 55 | 48 | 36 | 31 | 29 | 26 | 26 | 26 |
| UQ | 29 | 30 | 30 | 31 | 31 | 26 | 24 | 38 | 53 | 58 | 66 | 76 | 77 | 72 | 63 | 60 | 60 | 52 | 39 | 32 | 32 | 30 | 28 | 26 |
| LQ | 25 | 27 | 27 | 28 | 27 | 21 | 20 | 30 | 48 | 50 | 55 | 64 | 68 | 62 | 56 | 53 | 53 | 45 | 34 | 28 | 27 | 25 | 24 | 24 |



The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | FOF1 (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | L | L | C | L | L | L | L | L | | | | | | | |
| 2 | | | | | | | | | | L | L | L | L | L | L | L | | | | | | | | |
| 3 | | | | | | | | | | L | L | L | L | L | L | L | | | | | | | | |
| 4 | | | | | | | | | L | L | L | L | L | L | L | L | | | | | | | | |
| 5 | | | | | | | | | | L | L | L | L | L | L | L | L | | | | | | | |
| 6 | | | | | | | | | | L | L | L | L 410 | L | L | L | L | | | | | | | |
| 7 | | | | | | | | | | | L | U L 420 | L 420 | L | L | L | | | | | | | | |
| 8 | | | | | | | | | 300 | L 410 | L | 410 | 410 | 410 | L | 320 | 250 | | | | | | | |
| 9 | | | | | | | | | L | L | 410 | 400 | 420 | 410 | L | L | 250 | | | | | | | |
| 10 | | | | | | | | | L | L | L | L | L | L | L | L | A | | | | | | | |
| 11 | | | | | | | | | 270 | L | 460 | A | 410 | L | L | L | 260 | | | | | | | |
| 12 | | | | | | | | | | L | A | 400 | 420 | L | L | C | A | | | | | | | |
| 13 | | | | | | | | | | | L | L | L | L | L | L | A | | | | | | | |
| 14 | | | | | | | | | L | H 310 | 410 | L | L | 400 | L | L | L | | | | | | | |
| 15 | | | | | | | | | | L | L | L 410 | L 420 | U L 410 | A | L | L | | | | | | | |
| 16 | | | | | | | | | L | L | U L 400 | U L 410 | U L 400 | L 410 | L | 330 | 240 | | | | | | | |
| 17 | | | | | | | | | L | L | L | L 410 | U L 430 | L 410 | L | L 340 | L 260 | | | | | | | |
| 18 | | | | | | | | | | L | L 390 | L 390 | L 430 | U L 420 | L | L | 280 | | | | | | | |
| 19 | | | | | | | | | | | L | L 410 | L 430 | L 420 | L | L | L | | | | | | | |
| 20 | | | | | | | | | | L | L | L 410 | 410 | U L 420 | L 400 | L | L | | | | | | | |
| 21 | | | | | | | | | | L | U L 390 | U L 410 | U L 420 | L 420 | 400 | U L 460 | U L 280 | | | | | | | |
| 22 | | | | | | | | | | | L | L | L 420 | L 420 | L 400 | L | L | | | | | | | |
| 23 | | | | | | | | | | L | L | L | L | L | L 400 | L | | | | | | | | |
| 24 | | | | | | | | | | L | L | L 400 | L | L | L | L | | | | | | | | |
| 25 | | | | | | | | | | | L | L 410 | U L 400 | L | L | U L 400 | | | | | | | | |
| 26 | | | | | | | | | | | L | L | L | L 400 | A | L | | | | | | | | |
| 27 | | | | | | | | | | C | C | A | L | L | L | L | | | | | | | | |
| 28 | | | | | | | | | | L | L | A | L | L | L | L | L | | | | | | | |
| 29 | | | | | | | | | L | L | 400 | 400 | 420 | 410 | L | L | L | | | | | | | |
| 30 | | | | | | | | | | | L | L | 410 | L | L | L | 280 | | | | | | | |
| 31 | | | | | | | | | L | | 350 | 400 | 400 | 400 | 400 | 370 | 250 | | | | | | | |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | | | | | | | | | 2 | 2 | 8 | 15 | 18 | 14 | 5 | 6 | 9 | | | | | | | |
| MED | | | | | | | | | 285 | 360 | 400 | L 410 | L 420 | L 410 | L 400 | 355 | 260 | | | | | | | |
| UQ | | | | | | | | | | | 410 | L 410 | L 420 | L 420 | L 400 | U L 400 | 280 | | | | | | | |
| LQ | | | | | | | | | | | 390 | 400 | 410 | L 410 | L 400 | 330 | 250 | | | | | | | |

DEC. 1986 | FOF1 (0.01 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FOE (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station YAMAGAWA Lat. 31° 12' 1" N. Long. 130° 37' 1" E Sweep 1 MHz to 25 MHz in 24sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | S | 205 | 265 | 275 | C | A | A | A | A | A | S | | | | | | |
| 2 | | | | | | | | S | 185 | 250 | 280 | 300 | 305 | 300 | A | A | A | S | | | | | | |
| 3 | | | | | | | | S | 200 | A | A | A | A | A | 280 | 265 | A | S | | | | | | |
| 4 | | | | | | | | S | 210 | A | A | A | 300 | 295 | 280 | 255 | 220 | S | | | | | | |
| 5 | | | | | | | | S | 200 | A | A | 300 | 310 | 300 | A | A | A | S | | | | | | |
| 6 | | | | | | | | S | A | A | A | 295 | 300 | 295 | 275 | 255 | 220 | S | | | | | | |
| 7 | | | | | | | | S | 200 | 245 | A | A | 300 | A | A | 250 | 220 | S | | | | | | |
| 8 | | | | | | | | S | 190 | 245 | A | A | A | A | 280 | A | A | A | | | | | | |
| 9 | | | | | | | | S | 200 | 235 | A | A | A | A | 290 | 255 | A | A | | | | | | |
| 10 | | | | | | | | S | A | 250 | A | A | A | 305 | A | A | A | A | | | | | | |
| 11 | | | | | | | | S | 220 | 250 | A | A | A | 295 | A | 260 | 230 | A | | | | | | |
| 12 | | | | | | | | S | 210 | 250 | A | A | A | A | A | C | A | A | | | | | | |
| 13 | | | | | | | | S | S | 250 | 295 | A | A | A | A | 265 | A | A | | | | | | |
| 14 | | | | | | | | S | 200 | 250 | A | A | A | A | 280 | 255 | 215 | A | | | | | | |
| 15 | | | | | | | | S | UA 170 | 230 | 265 | 295 | UA 290 | 295 | UA 290 | UA 265 | A | S | | | | | | |
| 16 | | | | | | | | S | 190 | 245 | UA 270 | 280 | 295 | A | A | A | 220 | S | | | | | | |
| 17 | | | | | | | | S | 190 | 250 | 275 | 280 | 300 | 290 | 280 | H 260 | 215 | S | | | | | | |
| 18 | | | | | | | | S | 185 | A | A | A | UA 290 | A | 280 | 245 | 220 | S | | | | | | |
| 19 | | | | | | | | S | 195 | 255 | A | A | A | A | 290 | 265 | 225 | A | | | | | | |
| 20 | | | | | | | | S | UA 195 | UA 250 | UA 275 | UA 295 | UA 300 | 295 | 280 | 245 | 215 | 150 | | | | | | |
| 21 | | | | | | | | S | H 180 | 250 | 285 | A | A | 300 | 275 | 250 | 230 | S | | | | | | |
| 22 | | | | | | | | S | 170 | 250 | 280 | 300 | A | A | 280 | 265 | 235 | S | | | | | | |
| 23 | | | | | | | | S | 195 | 235 | 215 | 295 | A | A | A | A | A | S | | | | | | |
| 24 | | | | | | | | S | 195 | 250 | 265 | A | 295 | 290 | 270 | 250 | 215 | S | | | | | | |
| 25 | | | | | | | | S | A | A | A | A | A | A | A | A | A | S | | | | | | |
| 26 | | | | | | | | S | 180 | 245 | A | A | A | A | A | A | A | S | | | | | | |
| 27 | | | | | | | | S | 175 | C | C | A | A | A | A | A | A | S | | | | | | |
| 28 | | | | | | | | S | 190 | 245 | 280 | 295 | A | A | A | 280 | 225 | S | | | | | | |
| 29 | | | | | | | | S | 200 | 250 | 270 | 290 | 300 | 300 | 285 | 255 | 210 | S | | | | | | |
| 30 | | | | | | | | S | S | 250 | 265 | 290 | 300 | 295 | 290 | A | A | 165 | | | | | | |
| 31 | | | | | | | | S | 200 | 245 | A | 285 | A | 295 | 280 | 250 | S 225 | 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 | 24 | 14 | 13 | 13 | 14 | 17 | 19 | 16 | 2 | | | | | | |
| MED | | | | | | | | | 195 | 250 | 275 | 295 | 300 | 295 | 280 | 255 | 220 | 158 | | | | | | |
| UQ | | | | | | | | | 200 | 250 | 280 | 295 | 300 | 300 | 285 | 265 | 225 | | | | | | | |
| LQ | | | | | | | | | 185 | 245 | 265 | 290 | 295 | 295 | 280 | 250 | 215 | | | | | | | |

The Radio Research Laboratory, Japan

DEC. 1986 | FOE (0.01 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FOES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | 25 | G | 33 | C | 33 | J A 47 | J A 43 | J A 38 | J A 26 | J A 22 | 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 | J A 16 | E S 16 | J A 16 | 24 | 28 | G | G | G | J A 31 | 31 | J A 32 | J A 25 | J A 23 | J A 24 | J A 19 | J A 17 | E S 16 | E S 16 | E S 16 |
| 3 | J A 33 | J A 17 | J A 21 | E S 16 | J A 18 | J A 17 | J A 21 | J A 17 | G | 27 | 29 | 32 | 33 | J A 38 | G | G | J A 33 | J A 30 | E S 15 | E S 16 | J A 21 | J A 26 | J A 21 | E S 16 |
| 4 | J A 16 | E S 16 | E S 16 | E S 16 | E S 16 | C | E S 16 | J A 17 | G | 30 | J A 41 | J A 35 | G | G | G | G | G | J A 23 | J A 21 | J A 17 | E S 16 | E S 16 | E S 16 | E S 16 |
| 5 | E S 16 | E S 16 | E S 16 | J A 17 | E S 16 | E S 16 | E S 16 | J A 24 | 28 | 28 | 30 | G | G | G | J A 32 | J A 42 | J A 29 | J A 45 | J A 24 | J A 22 | E S 16 | E S 16 | E S 16 | E S 16 |
| 6 | J A 17 | J A 20 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | J A 20 | J A 22 | J A 31 | J A 33 | G 22 | 34 | G | 30 | G | G | E S 16 | E S 16 | E S 16 | E S 16 | J A 17 | E S 16 | E S 16 |
| 7 | J A 16 | E S 16 | E S 16 | E S 16 | E S 16 | J A 17 | E S 16 | E S 16 | 24 | 29 | J A 33 | J A 33 | G 28 | J A 36 | J A 31 | G | G | J A 17 | 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 | G | 28 | 31 | J A 43 | 32 | 33 | J A 33 | J A 29 | J A 28 | J A 25 | 26 | J A 40 | J A 29 | J A 29 | J A 65 | J A 33 | J A 29 |
| 9 | J A 26 | J A 17 | J A 22 | E S 16 | J A 26 | 35 | J A 23 | G | 24 | 34 | 31 | J A 43 | J A 40 | J A 46 | J A 33 | 26 | J A 29 | J A 29 | J A 31 | J A 33 | J A 24 | E S 16 | E S 16 | J A 17 |
| 10 | J A 32 | J A 22 | J A 21 | J A 19 | E S 16 | E S 16 | E S 16 | G | 24 | J A 25 | J A 36 | J A 35 | J A 34 | J G 30 | J A 44 | J A 39 | J A 36 | J A 29 | J A 42 | J A 18 | 19 | E S 16 | J A 34 | 39 |
| 11 | J A 34 | J A 25 | J A 19 | J A 29 | E S 16 | E S 16 | J A 21 | G | G | 34 | J A 51 | 54 | J A 48 | J A 31 | J A 36 | 27 | G | J A 23 | J A 50 | J A 43 | J A 37 | J A 26 | J A 23 | J A 22 |
| 12 | J A 34 | J A 30 | J A 31 | J A 29 | J A 20 | E S 16 | J A 19 | G | 23 | 30 | J A 60 | 84 | 42 | J A 61 | J A 64 | C | J A 36 | J A 33 | J A 30 | J A 33 | J A 33 | J A 22 | J A 22 | 21 |
| 13 | E S 16 | 20 | J A 19 | J A 19 | J A 25 | J A 22 | J A 19 | J A 21 | G | 42 | 32 | 35 | J A 43 | J A 36 | J A 54 | J A 39 | J A 51 | J A 44 | J A 37 | 43 | J A 24 | J A 22 | J A 17 | E S 16 |
| 14 | E S 16 | J A 19 | E S 16 | J A 20 | E S 16 | 23 | 20 | G | G | G | J A 39 | J A 47 | J A 62 | J A 77 | G 27 | G | G 20 | J A 23 | J A 29 | J A 18 | E S 16 | E S 16 | E S 16 | E S 16 |
| 15 | 21 | E S 16 | J A 18 | J A 25 | J A 21 | J A 18 | E S 16 | J A 21 | 25 | 26 | 30 | 39 | 37 | J A 39 | J A 47 | J A 38 | J A 27 | 20 | J A 18 | 21 | 20 | E S 16 | E S 16 | 21 |
| 16 | 22 | 21 | E S 16 | E S 16 | 18 | 22 | J A 18 | 22 | G | G | 30 | 34 | 34 | J A 44 | J A 33 | J A 35 | J G 21 | E S 16 | 21 | J A 17 | 23 | 23 | 20 | J A 21 |
| 17 | 22 | 23 | 22 | E S 16 | E S 16 | E S 16 | 22 | 21 | G | J A 27 | 34 | J A 43 | 35 | 35 | J A 64 | 27 | G | 21 | E S 15 | J A 17 | J A 30 | J A 17 | J A 21 | E S 16 |
| 18 | 19 | E S 16 | E S 16 | 23 | 18 | E S 16 | E S 16 | E S 16 | G | 28 | J A 33 | J A 41 | J A 35 | J A 39 | J A 36 | 31 | G 17 | E S 16 | E S 16 | J A 17 | J A 17 | 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 | 22 | E S 16 | 23 | J A 33 | J A 37 | J A 37 | J A 42 | J A 33 | G | G | G | J A 19 | J A 17 | 22 | 18 | 22 | 21 | 18 |
| 20 | E S 16 | E S 16 | E S 16 | E S 16 | J A 18 | E S 16 | E S 16 | E S 16 | 26 | 31 | 33 | J A 46 | J A 39 | 33 | 32 | 27 | G | G | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | 18 |
| 21 | J A 22 | 21 | E S 16 | E S 16 | E S 16 | J A 36 | 17 | 20 | 22 | 29 | 35 | 35 | J A 33 | G | 30 | 27 | G | E S 16 | J A 18 | 23 | 17 | 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 | J A 21 | J A 17 | J A 17 | 24 | 30 | 34 | J A 34 | J A 51 | J A 37 | G | G | G 21 | J A 20 | J A 25 | 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 | J A 17 | J A 21 | J A 22 | G | 33 | 31 | 32 | J A 32 | J A 32 | J A 37 | J A 35 | 23 | J A 21 | J A 26 | J A 24 | J A 19 | J A 17 | J A 17 | J A 17 |
| 24 | E S 16 | J A 34 | J A 32 | J A 23 | J A 18 | E S 16 | E S 16 | E S 16 | G | G | G | J A 33 | 35 | G | 32 | 28 | G 18 | J A 18 | J A 19 | J A 17 | J A 17 | E S 16 | J A 17 | J A 17 |
| 25 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | J A 17 | J A 17 | E S 16 | J A 22 | J A 28 | J A 32 | J A 35 | J A 36 | J A 45 | J A 79 | J A 35 | J A 47 | J A 21 | J A 35 | J A 42 | J A 52 | J A 25 | J A 20 | J A 17 |
| 26 | J A 19 | E S 16 | E S 16 | J A 19 | J A 17 | J A 17 | J A 19 | J A 17 | 53 | G | 36 | J A 53 | J A 48 | J A 47 | J A 54 | J A 71 | J A 52 | J A 29 | J A 18 | 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 | J A 17 | E S 16 | J A 18 | J A 17 | 20 | C | C | J A 54 | J A 35 | J A 40 | J A 38 | J A 37 | J A 38 | 20 | E S 16 | J A 21 | J A 23 | E S 16 | J A 21 | J A 29 |
| 28 | J A 26 | J A 28 | J A 34 | J A 19 | J A 17 | J A 17 | E S 16 | E S 16 | G | 28 | 36 | J A 54 | J A 38 | J A 41 | J A 37 | G | G 19 | J A 17 | J A 17 | J A 17 | J A 17 | E S 16 | E S 16 | J A 17 |
| 29 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | J A 29 | G | 20 | 36 | 30 | 31 | J G 27 | 31 | 30 | 28 | 24 | G | 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 | J A 22 | J A 18 | E S 16 | E S 16 | E S 16 | G | G | 28 | 33 | 35 | 33 | 32 | 33 | 30 | 27 | G | J A 22 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 |
| 31 | J A 18 | J A 18 | E S 16 | E S 16 | J A 17 | E S 16 | E S 16 | G | G | 29 | 31 | 30 | J A 31 | J A 33 | 29 | 26 | 23 | J A 27 | J A 25 | 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 | 30 | 30 | 30 | 31 | 31 | 31 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED | 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | 17 | 16 | 22 | 28 | 33 | 35 | J A 35 | J A 35 | J A 33 | 28 | 23 | J A 21 | J A 21 | J A 17 | 17 | E S 16 | E S 16 | E S 16 |
| UQ | J A 22 | J A 20 | J A 20 | J A 19 | J A 18 | J A 17 | J A 20 | J A 18 | 24 | 31 | J A 36 | J A 43 | J A 40 | J A 40 | J A 40 | J A 35 | J A 29 | J A 26 | J A 28 | J A 22 | J A 23 | J A 20 | J A 20 | J A 18 |
| LQ | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | G | G | 27 | 31 | 32 | 33 | 31 | 30 | G | E G 17 | 17 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 |



DEC. 1986 | FOES (0.1 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FBES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

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

| 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 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 24 | G | 30 | C | 32 | 32 | 35 | 26 | 23 | 18 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 2 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 23 | 27 | G | G | G | 28 | 29 | 30 | 23 | 21 | 19 | 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 | ES 16 | G | 26 | 29 | 30 | 31 | 31 | G | G | 28 | 20 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 4 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | C | ES 16 | ES 16 | G | 26 | 30 | 30 | G | G | G | G | G | 17 | 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 | ES 16 | 26 | 27 | 30 | G | G | G | 28 | 25 | 22 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 6 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 19 | 22 | 25 | 29 | G 22 | 33 | G | 30 | G | G | ES 16 | ES 16 | 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 | ES 16 | 24 | 29 | 30 | 30 | G 28 | 20 | 29 | G | G | ES 16 | 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 | G | 26 | 29 | 29 | 30 | 32 | 30 | G 26 | 25 | 21 | 18 | 21 | 25 | 21 | A A 65 | 20 | 17 |
| 9 | 20 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | 24 | 32 | 30 | 36 | 31 | 35 | 29 | 26 | 23 | ES 16 | 25 | 27 | 20 | ES 16 | ES 16 | ES 16 |
| 10 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | 20 | ES 16 | 30 | 30 | 31 | G 26 | 29 | 31 | 29 | 24 | 26 | E 16 | ES 16 | ES 16 | ES 16 | 19 |
| 11 | 18 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | G | 32 | 44 | 44 | 35 | 30 | 29 | 26 | G | 17 | A A 50 | 20 | 25 | ES 16 | ES 16 | ES 16 |
| 12 | ES 16 | ES 16 | 23 | 20 | ES 16 | ES 16 | ES 16 | G | G | 27 | 48 | 33 | 33 | 35 | 35 | C | 28 | 20 | ES 16 | 19 | 25 | 20 | ES 16 | ES 16 |
| 13 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | 22 | 31 | 34 | 31 | 30 | 30 | G 25 | 28 | 34 | 25 | A A 43 | 20 | 19 | ES 16 | ES 16 |
| 14 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | G | G | 34 | 31 | 30 | 32 | G 25 | G | G 19 | 20 | 20 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 15 | ES 16 | ES 16 | ES 16 | ES 15 | ES 15 | ES 16 | ES 16 | G | 25 | 26 | 30 | 35 | 33 | 34 | 41 | 31 | 24 | 20 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | G | G | 29 | 33 | 33 | 32 | 29 | 26 | G | ES 16 | ES 16 | 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 | G | G | G | 32 | 36 | 34 | 34 | 38 | 27 | G | 19 | ES 15 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 |
| 18 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | 28 | 31 | 32 | 34 | 32 | 31 | 28 | G 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 19 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 23 | 30 | 30 | 32 | 32 | 31 | G | G | G | 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 20 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 25 | 28 | 32 | 30 | 30 | 33 | 31 | 27 | G | G | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 21 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | 22 | 29 | G | 33 | 31 | G | G | G | G | ES 16 | 18 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 22 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | 29 | 31 | 32 | 38 | 32 | G | G | G 20 | 18 | 19 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 23 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | 32 | 30 | 32 | 30 | 30 | 32 | 32 | 22 | 18 | 25 | 17 | 17 | ES 16 | ES 16 | ES 16 |
| 24 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | G | G | 30 | 34 | G | 32 | 28 | G 17 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 25 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 18 | 24 | 29 | 29 | 33 | 37 | 40 | 32 | 25 | 17 | ES 16 | A A 42 | A A 52 | 20 | ES 16 | 17 |
| 26 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 52 | G | 33 | 30 | 37 | 37 | 44 | 33 | 28 | 20 | 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 | ES 16 | 19 | C | C | 44 | 30 | 31 | 32 | 30 | 25 | 20 | ES 16 | ES 16 | 19 | ES 16 | 18 | ES 16 |
| 28 | ES 16 | ES 16 | ES 16 | 17 | ES 16 | ES 16 | ES 16 | ES 16 | G | 27 | 34 | 40 | 34 | 37 | 32 | G | G 19 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 29 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | 20 | G | 29 | 31 | G 26 | 31 | 30 | 26 | 23 | G | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 30 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | G | 28 | 31 | 34 | 32 | 31 | 31 | 29 | 26 | G | 20 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 31 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | G | G | 29 | 31 | 30 | 30 | G 28 | 29 | 25 | ES 16 | 20 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 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 | 30 | 30 | 30 | 31 | 31 | 31 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 18 | 27 | 30 | 32 | 32 | 31 | 30 | 26 | 21 | 17 | ES 16 | 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 | ES 16 | 24 | 29 | 31 | 34 | 33 | 32 | 32 | 29 | 24 | 20 | 20 | E 16 | 16 | ES 16 | ES 16 | ES 16 |
| LQ | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | G | 16 | 29 | 30 | 30 | 28 | 28 | G | G | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |

# IONOSPHERIC DATA

DEC. 1986 | FMIN (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| Hour / Day | 00 | 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 | ES 16 | 16 | 16 | 17 | C | 18 | 18 | 16 | 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 2 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 17 | 16 | 17 | 15 | 16 | 17 | 16 | 16 | ES 15 | ES 15 | 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 | ES 16 | 16 | 17 | 17 | 18 | 18 | 17 | 17 | 16 | 15 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 4 | ES 16 | ES 16 | ES 16 | ES 16 | ES | C | ES 16 | ES 16 | 16 | 16 | 16 | 16 | 17 | 18 | 17 | 16 | ES 16 | ES 16 | 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 | ES 16 | 15 | 16 | 15 | 15 | 15 | 15 | 16 | 15 | 16 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 6 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 15 | 16 | 15 | 15 | 15 | 16 | 16 | 15 | ES 16 | ES 16 | ES 16 | 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 | ES 16 | 16 | 15 | 16 | 16 | 15 | 15 | 16 | 15 | ES 16 | ES 16 | 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 | ES 16 | ES 16 | ES 16 | ES 16 | 15 | 15 | 15 | ES 16 | ES 16 | ES 16 | ES 16 | 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 | ES 16 | ES 16 | ES 16 | ES 16 | 15 | 15 | 13 | ES 16 | 14 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 10 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | ES 16 | ES 16 | 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 | ES 16 | ES 16 | ES 16 | 13 | 15 | 15 | 15 | 15 | 15 | 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 12 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 15 | 15 | 15 | 16 | 15 | 15 | C | 15 | ES 16 | ES 16 | 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 | ES 16 | ES 16 | 15 | 15 | 18 | 16 | 17 | 15 | 15 | 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 14 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 15 | 15 | 16 | 16 | 16 | 16 | 15 | 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 15 | ES 16 | ES 16 | ES 15 | ES 15 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | 12 | 13 | 15 | 17 | 15 | 12 | 15 | 14 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 15 | ES 16 | ES 16 | 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 | ES 16 | ES 16 | ES 16 | 16 | 15 | 15 | 14 | 15 | 14 | 15 | ES 15 | ES 15 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 |
| 18 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 13 | 15 | 15 | 14 | 12 | 14 | 18 | 12 | ES 16 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 |
| 19 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 16 | 16 | 15 | 15 | 15 | 15 | 14 | 14 | 12 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 20 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 14 | 14 | 13 | 15 | 15 | 15 | 15 | ES 16 | 13 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 21 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 15 | 16 | 15 | 15 | 15 | 15 | 15 | 14 | 14 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 22 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 16 | 16 | 16 | 16 | 16 | 15 | 15 | 15 | 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 23 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 15 | 15 | 15 | 18 | 16 | 16 | 16 | 16 | 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 24 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 16 | 16 | 15 | 15 | 15 | 16 | 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 25 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 26 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 15 | 15 | 16 | 17 | 16 | 17 | 16 | ES 16 | ES 16 | 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 | ES 16 | ES 16 | C | C | 16 | 17 | 17 | 17 | 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 28 | ES 16 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 16 | 15 | 16 | 16 | 16 | 15 | 17 | 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 29 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 14 | 15 | 15 | 15 | 14 | 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 30 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 15 | 16 | 16 | 16 | 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 31 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 16 | 15 | 16 | 15 | 19 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 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 | 30 | 30 | 30 | 31 | 31 | 31 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 16 | 15 | 15 | 16 | 15 | 16 | 15 | 16 | ES 16 | ES 16 | 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 | ES 16 | ES 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| LQ | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |

DEC. 1986 | FMIN (0.1 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | M(3000)F2 (0.01) | 135° E Mean Time (G.M.T. + 9h)

Station YAMAGAWA Lat. 31° 12.1' N. Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 295 | 305 | 305 | 300 | 310 | 310 | 325 | 325 | 355 | 355 | 350 | I C 350 | 350 | 360 | 365 | 350 | 355 | 340 | S 290 | 360 | 320 | 320 | 315 | 305 |
| 2 | 305 | 300 | 300 | 300 | 340 | 305 | 320 | 360 | 385 | 360 | H 310 | 350 | 345 | 335 | 335 | 350 | 365 | 365 | 355 | 310 | F | F 350 | 320 | 300 |
| 3 | 295 | 295 | 335 | 320 | 335 | 340 | 335 | 355 | 380 | 370 | 320 | 360 | 350 | H 340 | 360 | 360 | 350 | 375 | 355 | 320 | 320 | 335 | 335 | F |
| 4 | 335 | 310 | F | F 325 | F 320 | I C 335 | 325 | 335 | 375 | 350 | 345 | 360 | 370 | 370 | 340 | 370 | 370 | 360 | 355 | 350 | 325 | F 325 | F | F |
| 5 | 320 | 335 | 305 | 360 | 355 | 310 | 320 | 345 | 365 | 370 | 370 | 355 | 355 | 345 | 355 | 340 | 375 | 365 | 335 | 390 | 320 | 340 | 315 | 335 |
| 6 | 335 | 335 | 325 | 345 | 360 | 335 | H 340 | 350 | 375 | 370 | 365 | 365 | 365 | 365 | 350 | 355 | 355 | 370 | 390 | 335 | 355 | 345 | 300 | F |
| 7 | F | F | F 315 | F 340 | 390 | 315 | 325 | 340 | 365 | 345 | 355 | 355 | 375 | 340 | 345 | 345 | 370 | 385 | 380 | 320 | 345 | 345 | 315 | F |
| 8 | F 345 | 310 | 340 | 370 | 370 | F | 320 | 340 | 365 | 320 | 320 | R 350 | 365 | 355 | 355 | 345 | H 350 | 370 | 370 | 335 | F 285 | A | U S 305 | F |
| 9 | 340 | 310 | 305 | 325 | 320 | 290 | F 305 | 360 | 390 | 380 | 325 | 335 | 350 | 375 | 370 | 345 | 365 | S 340 | 370 | 360 | 290 | 315 | 335 | 345 |
| 10 | F 315 | 300 | F | 325 | S 350 | S | F | S 375 | 385 | 360 | 320 | 360 | 360 | 365 | 350 | H 320 | 365 | 360 | 360 | 355 | 300 | 355 | F 340 | S |
| 11 | 295 | 315 | 320 | 325 | 325 | F | F | 340 | 400 | 360 | 290 | 360 | H 360 | 380 | 360 | 350 | 350 | 355 | A | 315 | 365 | 305 | 290 | 290 |
| 12 | 310 | 335 | 315 | F 350 | F 350 | 350 | 290 | 330 | 355 | 385 | 370 | 385 | 350 | 365 | 340 | C | 355 | 350 | 360 | 340 | 355 | 320 | 285 | 280 |
| 13 | 320 | 305 | 305 | F 320 | 345 | 385 | 350 | 335 | 365 | 355 | 340 | 365 | 355 | 385 | 340 | 350 | 360 | 375 | A | A | 315 | 325 | 325 | S |
| 14 | F | F | F | F 315 | 355 | F 290 | F | 370 | 350 | 335 | 290 | 355 | 370 | 360 | 345 | 330 | 355 | 365 | 340 | S 335 | 330 | 310 | 340 | 295 |
| 15 | F 290 | 305 | S 310 | S 370 | 345 | F 295 | F 305 | 335 | 365 | 355 | 350 | 360 | 360 | H 325 | 355 | 365 | 340 | 355 | 340 | 295 | 330 | 385 | 310 | 290 |
| 16 | 295 | 300 | 310 | F 315 | 315 | 310 | 310 | 340 | 365 | 360 | 360 | 340 | 335 | 345 | 355 | 340 | 375 | 375 | 350 | 295 | 340 | 305 | 365 | 290 |
| 17 | 305 | 295 | S 315 | F 305 | F | S | F | F 370 | 360 | 365 | 355 | 360 | 345 | 355 | 370 | 350 | 355 | 355 | 370 | 345 | 295 | 335 | 320 | 290 |
| 18 | S 305 | 315 | F | F 335 | U F 340 | 365 | 350 | 340 | 355 | 350 | 355 | 375 | R 335 | 360 | 365 | 335 | 350 | 355 | 350 | 365 | 310 | 340 | 340 | F 290 |
| 19 | F 315 | U F 305 | F 325 | F | F 315 | 395 | S | 325 | 360 | 365 | 360 | 360 | H 330 | 325 | 355 | 340 | 380 | 365 | 365 | 320 | S 340 | 325 | 325 | 290 |
| 20 | 300 | 265 | 310 | 325 | F 335 | 380 | 350 | 320 | 365 | 350 | 345 | 345 | 350 | 320 | 335 | H 325 | 340 | 355 | 365 | 345 | 340 | 300 | 320 | 295 |
| 21 | 300 | F 305 | F 295 | 320 | 385 | 360 | 315 | 320 | 360 | 365 | 345 | 340 | 350 | 355 | 355 | 365 | 345 | 355 | 355 | 360 | 305 | 320 | 305 | 325 |
| 22 | 295 | 305 | 315 | 350 | 345 | 335 | 325 | 325 | 345 | 350 | 350 | 330 | 335 | 340 | 365 | 360 | 370 | 365 | 380 | 335 | 305 | 345 | 335 | 345 |
| 23 | 300 | 290 | 275 | 305 | 385 | 355 | 305 | 335 | 355 | 355 | 325 | 345 | 330 | 375 | 370 | 370 | 355 | 320 | 360 | 360 | 295 | 340 | 300 | 325 |
| 24 | 285 | 295 | 325 | 365 | 345 | 310 | 315 | 345 | 365 | 350 | 370 | 350 | 305 | 320 | 355 | H 350 | 360 | 375 | 345 | 340 | 360 | 325 | F | 285 |
| 25 | 290 | 315 | 320 | 345 | 365 | 295 | 295 | 340 | 360 | 345 | 335 | 340 | 350 | 375 | 385 | 335 | 385 | 365 | 340 | A | A | 305 | 305 | 315 |
| 26 | 305 | 320 | 320 | 320 | 335 | 310 | 300 | 330 | 365 | 375 | 360 | 285 | 355 | 370 | 360 | 335 | 330 | 360 | 335 | 350 | S 355 | 335 | 295 | 325 |
| 27 | 335 | 320 | 335 | 335 | 335 | 335 | 340 | 335 | 355 | C | C | 380 | 375 | 355 | H 355 | 350 | 370 | 370 | 335 | 305 | 325 | 350 | F | F 340 |
| 28 | F 345 | 310 | 335 | 315 | 345 | 285 | 300 | 340 | 360 | 340 | 325 | 340 | H 375 | 375 | 375 | 320 | 325 | 370 | 325 | 340 | 340 | 345 | 385 | 305 |
| 29 | 320 | 305 | 305 | 320 | 335 | 340 | 315 | 310 | 350 | S 380 | 350 | 365 | 375 | 355 | 375 | 365 | 360 | 365 | 355 | 305 | S 320 | 335 | 360 | 335 |
| 30 | 290 | 305 | 305 | 325 | 365 | H 300 | 325 | 335 | 370 | 370 | 370 | 325 | 355 | 380 | 380 | 355 | 365 | 350 | 360 | 320 | S 310 | 345 | 325 | 360 |
| 31 | 320 | 320 | 305 | 335 | 380 | 305 | 295 | 315 | 365 | 365 | 335 | 355 | H 370 | 375 | 350 | 350 | 340 | 365 | 350 | 315 | S 335 | S 340 | 355 | 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 | 29 | 29 | 27 | 30 | 30 | 27 | 26 | 31 | 31 | 30 | 30 | 31 | 31 | 31 | 31 | 30 | 31 | 31 | 29 | 29 | 29 | 30 | 28 | 24 |
| MED | 305 | 305 | 315 | 325 | 345 | 315 | 320 | 340 | 365 | 360 | 348 | 355 | 355 | 360 | 355 | 350 | 355 | 365 | 355 | 335 | 325 | 335 | 320 | 305 |
| UQ | 320 | 315 | 322 | 345 | 360 | 345 | 325 | 345 | 368 | 370 | 360 | 360 | 365 | 372 | 365 | 355 | 368 | 370 | 365 | 350 | 340 | 345 | 338 | 330 |
| LQ | 295 | 300 | 305 | 320 | 335 | 305 | 305 | 330 | 358 | 350 | 325 | 342 | 348 | 342 | 350 | 340 | 350 | 355 | 340 | 320 | 310 | 320 | 305 | 290 |

The Radio Research Laboratory, Japan

DEC. 1986 | M(3000)F2 (0.01)

# IONOSPHERIC DATA

DEC. 1986 | M(3000)F1 (0.01) | 135° E Mean Time (G.M.T. + 9h)

Station YAMAGAWA Lat. 31° 12' 1" N. Long. 130° 37' 1" E Sweep 1 MHz to 25 MHz in 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 | C | L | L | L | L | L | | | | | | | |
| 2 | | | | | | | | | | L | L | L | L | L | L | L | | | | | | | | |
| 3 | | | | | | | | | | L | L | L | L | L | L | L | | | | | | | | |
| 4 | | | | | | | | | L | L | L | L | L | L | L | L | | | | | | | | |
| 5 | | | | | | | | | | L | L | L | L | L | L | L | L | | | | | | | |
| 6 | | | | | | | | | | L | L | L | L 400 | L | L | L | L | | | | | | | |
| 7 | | | | | | | | | | | L | U L 380 | L 380 | L | L | L | | | | | | | | |
| 8 | | | | | | | | | A | L 365 | L | 365 | 365 | 390 | L | 405 | 440 | | | | | | | |
| 9 | | | | | | | | | L | L | 380 | A | 380 | A | L | L | 640 | | | | | | | |
| 10 | | | | | | | | | L | L | L | L | L | L | L | L | A | | | | | | | |
| 11 | | | | | | | | | 445 | L | A | A | A | L | L | L | 425 | | | | | | | |
| 12 | | | | | | | | | | L | A | 375 | 380 | L | L | C | A | | | | | | | |
| 13 | | | | | | | | | | | L | L | L | L | L | L | A | | | | | | | |
| 14 | | | | | | | | | L | H 420 | 340 | L | L | 400 | L | L | L | | | | | | | |
| 15 | | | | | | | | | | L | L | L 355 | L 380 | U L 390 | A | L | L | | | | | | | |
| 16 | | | | | | | | | L | L | U L 385 | U L 380 | U L 385 | L 365 | L | 395 | 460 | | | | | | | |
| 17 | | | | | | | | | L | L | L | A | U L 350 | L 380 | A | L 410 | L 460 | | | | | | | |
| 18 | | | | | | | | | | L | L 370 | L 370 | L 370 | U L 370 | L | L | 375 | | | | | | | |
| 19 | | | | | | | | | | | L | L 365 | L 370 | L 370 | L | L | L | | | | | | | |
| 20 | | | | | | | | | | L | L | L 390 | 380 | U L 370 | L 360 | L | L | | | | | | | |
| 21 | | | | | | | | | | L | U L 385 | U L 380 | U L 355 | L 370 | 360 | U L 305 | U L 410 | | | | | | | |
| 22 | | | | | | | | | | | L | L | A | L 380 | L 375 | L | L | | | | | | | |
| 23 | | | | | | | | | | L | L | L | L | L | L 400 | L | | | | | | | | |
| 24 | | | | | | | | | | L | L | L 385 | L | L | L | L | | | | | | | | |
| 25 | | | | | | | | | | | L | L 365 | U L 360 | L | L | U L 400 | | | | | | | | |
| 26 | | | | | | | | | | | L | L | L | L 385 | A | L | | | | | | | | |
| 27 | | | | | | | | | | C | C | A | L | L | L | L | | | | | | | | |
| 28 | | | | | | | | | | L | L | A | L | L | L | L | L | | | | | | | |
| 29 | | | | | | | | | L | L | 375 | H 385 | H 380 | 415 | L | L | L | | | | | | | |
| 30 | | | | | | | | | | | L | L | 380 | L | L | L | A | | | | | | | |
| 31 | | | | | | | | | L | | 400 | 375 | 400 | 375 | 375 | 380 | 460 | | | | | | | |
| | 00 | 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 | 2 | 7 | 13 | 16 | 13 | 5 | 6 | 8 | | | | | | | |
| MED | | | | | | | | | 445 | 392 | 380 | L 375 | L 380 | L 380 | L 375 | 398 | 450 | | | | | | | |
| UQ | | | | | | | | | | | 385 | L 380 | 380 | L 390 | L 375 | L 405 | 460 | | | | | | | |
| LQ | | | | | | | | | | | 372 | L 365 | L 368 | L 370 | 360 | 380 | 418 | | | | | | | |

DEC. 1986 | M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | H*F2 (KM) | 135° E Mean Time (G.M.T. + 9h)

Station YAMAGAWA Lat. 31° 12.1' N. Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 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 | | | | | | | | | | 240 | 240 | C | 250 | 245 | 240 | 245 | 235 | | | | | | | |
| 2 | | | | | | | | | | 230 | 260 | 240 | 240 | 250 | 255 | 245 | | | | | | | | |
| 3 | | | | | | | | | | 230 | 240 | 250 | 250 | 240 | 245 | 235 | | | | | | | | |
| 4 | | | | | | | | | 230 | 240 | 240 | 230 | 230 | 240 | 235 | 230 | | | | | | | | |
| 5 | | | | | | | | | | 225 | 235 | 250 | 250 | 265 | 250 | 245 | 230 | | | | | | | |
| 6 | | | | | | | | | | 250 | 240 | 240 | 255 | 240 | 240 | 250 | 240 | | | | | | | |
| 7 | | | | | | | | | | | 250 | 250 | 240 | 280 | 245 | 260 | | | | | | | | |
| 8 | | | | | | | | | 230 | 305 | 280 | 250 | 230 | 235 | 250 | 240 | 215 | | | | | | | |
| 9 | | | | | | | | | 210 | 230 | 300 | 265 | 250 | 235 | 235 | 240 | 230 | | | | | | | |
| 10 | | | | | | | | | 210 | 230 | 280 | 250 | 245 | 245 | 240 | UL 270 | 240 | | | | | | | |
| 11 | | | | | | | | | 200 | 240 | 360 | 245 | 235 | 235 | 240 | 240 | 220 | | | | | | | |
| 12 | | | | | | | | | | 230 | A 230 | 240 | 260 | 240 | 245 | C | 240 | | | | | | | |
| 13 | | | | | | | | | | | 270 | 240 | 250 | 220 | 250 | 245 | 225 | | | | | | | |
| 14 | | | | | | | | | 230 | 240 | 345 | 250 | 220 | 240 | 250 | 230 | 240 | | | | | | | |
| 15 | | | | | | | | | | 240 | 255 | 250 | 245 | 250 | 235 | 230 | 220 | | | | | | | |
| 16 | | | | | | | | | 225 | 245 | 245 | L 260 | L 255 | 260 | 245 | 235 | 220 | | | | | | | |
| 17 | | | | | | | | | 225 | 240 | 230 | 240 | 260 | 245 | 245 | 235 | 240 | | | | | | | |
| 18 | | | | | | | | | | 245 | 250 | 270 | 240 | 245 | 235 | L 260 | 230 | | | | | | | |
| 19 | | | | | | | | | | | 245 | 255 | 260 | 255 | 240 | L 245 | 245 | | | | | | | |
| 20 | | | | | | | | | | 240 | 255 | 250 | 245 | L 280 | 255 | 245 | 235 | | | | | | | |
| 21 | | | | | | | | | | 245 | 280 | 255 | 260 | 245 | 250 | 230 | 230 | | | | | | | |
| 22 | | | | | | | | | | | 245 | 270 | 275 | 255 | 240 | 245 | 230 | | | | | | | |
| 23 | | | | | | | | | | 260 | 275 | 265 | 275 | 240 | 250 | 230 | | | | | | | | |
| 24 | | | | | | | | | | 240 | 240 | 250 | 240 | 225 | 240 | 250 | | | | | | | | |
| 25 | | | | | | | | | | | 280 | 270 | 255 | 235 | 230 | 275 | | | | | | | | |
| 26 | | | | | | | | | | | 240 | 240 | 255 | 240 | 245 | 230 | | | | | | | | |
| 27 | | | | | | | | | | C | C | 230 | 230 | 265 | 240 | 240 | | | | | | | | |
| 28 | | | | | | | | | | 250 | 250 | 260 | 225 | 240 | 240 | 265 | 250 | | | | | | | |
| 29 | | | | | | | | | 230 | 220 | 240 | 240 | 260 | 250 | 245 | 240 | 215 | | | | | | | |
| 30 | | | | | | | | | | | 245 | UL 300 | 255 | 235 | 240 | L 240 | 220 | | | | | | | |
| 31 | | | | | | | | | 215 | | 245 | 245 | 245 | 250 | 260 | 250 | 225 | | | | | | | |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | | | | | | | | | 10 | 22 | 30 | 30 | 31 | 31 | 31 | 30 | 22 | | | | | | | |
| MED | | | | | | | | | 225 | 240 | 248 | 250 | 250 | 245 | 245 | 245 | 230 | | | | | | | |
| UQ | | | | | | | | | 230 | 245 | 275 | 260 | 255 | 250 | 250 | 250 | 240 | | | | | | | |
| LQ | | | | | | | | | 210 | 230 | 240 | 240 | 240 | 240 | 240 | 235 | 220 | | | | | | | |



DEC. 1986 | H*F2 (KM)

# IONOSPHERIC DATA

DEC. 1986 | H°F (KM) | 135° E Mean Time (G.M.T. + 9h)

Station YAMAGAWA Lat. 31° 12.1' N. Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 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 | ES 305 | ES 315 | ES 295 | ES 300 | ES 270 | ES 270 | S 250 | 250 | 240 | 235 | 230 | C | 225 | 215 | A | 210 | A | 230 | 200 | 205 | ES 250 | ES 255 | ES 240 | ES 260 |
| 2 | ES 290 | ES 280 | ES 270 | ES 295 | S 240 | ES 305 | ES 255 | 230 | 210 | 220 | 210 | 205 | H 200 | H 190 | H 195 | A 230 | 230 | 205 | A 220 | ES 215 | ES 255 | 205 | 225 | ES 300 |
| 3 | ES 280 | ES 290 | ES 280 | ES 270 | 245 | 230 | ES 255 | 230 | 220 | H 200 | H 200 | H 195 | H 200 | 220 | 215 | 215 | 230 | 200 | 205 | S 230 | ES 250 | ES 265 | ES 240 | ES 245 |
| 4 | ES 245 | ES 260 | ES 260 | ES 260 | 240 | C | S | ES 250 | 230 | 225 | 225 | H 200 | H 180 | 220 | 210 | H 200 | H 200 | 205 | 205 | 220 | 220 | ES 270 | S 240 | S 255 |
| 5 | ES 275 | S 250 | S 250 | 230 | 220 | ES 315 | ES 265 | 240 | 215 | 220 | 220 | 210 | 205 | H 195 | 205 | 210 | H 200 | 215 | 205 | 200 | 220 | ES 240 | ES 270 | S 245 |
| 6 | ES 250 | S 230 | ES 250 | ES 250 | 215 | ES 265 | ES 240 | 240 | 230 | 230 | 220 | 220 | H 195 | H 180 | 220 | 210 | H 190 | 220 | 200 | ES 250 | 230 | ES 250 | ES 300 | ES 290 |
| 7 | 250 | 245 | S 250 | 230 | 210 | ES 310 | ES 300 | 230 | 225 | 230 | 230 | 220 | 205 | H 190 | 210 | H 200 | 230 | 200 | 200 | ES 245 | ES 250 | 225 | ES 270 | ES 300 |
| 8 | S 255 | S 265 | S 235 | S 205 | S 200 | ES 310 | ES 285 | 230 | A | 205 | 195 | 210 | EA 230 | 210 | 200 | 195 | 185 | 210 | 215 | A | A | A | A | EA 270 |
| 9 | EA 235 | ES 280 | ES 270 | ES 245 | ES 280 | ES 315 | ES 290 | 230 | 220 | A 215 | 210 | A | 180 | A 240 | 210 | 200 | 200 | 205 | A | A | A | ES 270 | ES 245 | ES 235 |
| 10 | ES 280 | ES 290 | ES 285 | ES 255 | ES 240 | S 265 | ES 250 | 210 | 225 | 190 | H 180 | 200 | 200 | H 195 | 205 | EA 230 | A | 215 | A 240 | S 220 | ES 255 | ES 230 | ES 240 | A |
| 11 | EA 320 | ES 300 | ES 285 | ES 245 | ES 280 | ES 325 | A | 220 | 200 | 230 | A | A | EA 220 | 235 | 210 | 200 | 200 | 220 | A | A | A | A | ES 310 | ES 330 |
| 12 | ES 295 | ES 265 | A | A 255 | S 240 | S | ES 270 | S 250 | 230 | 240 | A | 205 | 200 | 225 | EA 225 | C | A | 225 | A 205 | EA 230 | A | A | S | ES 320 |
| 13 | ES 305 | ES 300 | ES 300 | ES 220 | S 235 | ES 210 | S | 230 | 225 | 235 | 235 | 240 | 210 | 220 | 200 | 215 | A | A 220 | A | A | EA 280 | EA 270 | ES 240 | S 290 |
| 14 | S 285 | S 310 | S 280 | S 245 | S 225 | S | ES 290 | 210 | H 195 | 190 | 265 | 250 | 215 | 210 | 200 | 210 | 240 | 205 | EA 245 | S 230 | ES 220 | ES 240 | ES 240 | ES 240 |
| 15 | ES 300 | ES 295 | 260 | 225 | 230 | ES 275 | ES 300 | 245 | 225 | H 180 | H 190 | A 250 | 220 | 235 | A | A 220 | A 220 | 220 | 210 | ES 235 | ES 250 | 220 | ES 270 | ES 300 |
| 16 | ES 290 | ES 275 | ES 275 | 280 | 275 | ES 250 | ES 270 | 230 | H 180 | H 175 | 220 | H 220 | 210 | 190 | 245 | 200 | 185 | H 215 | 205 | ES 270 | 230 | ES 265 | 230 | ES 315 |
| 17 | ES 280 | ES 280 | ES 285 | ES 320 | 295 | 210 | 260 | 210 | 225 | H 195 | 220 | A | 235 | 230 | A | 185 | 175 | 220 | 195 | ES 225 | ES 270 | ES 235 | ES 250 | ES 305 |
| 18 | ES 290 | ES 290 | ES 295 | ES 265 | 245 | 210 | ES 225 | ES 225 | H 170 | 235 | 220 | 205 | 220 | H 200 | 220 | 205 | 200 | H 170 | 200 | 200 | ES 265 | ES 235 | ES 230 | ES 305 |
| 19 | 260 | ES 270 | ES 280 | ES 285 | 245 | ES 185 | ES 385 | ES 230 | 230 | 230 | 230 | 220 | 205 | 210 | 215 | 200 | H 195 | 220 | 195 | ES 230 | 225 | ES 230 | 240 | ES 310 |
| 20 | ES 320 | ES 275 | ES 270 | 250 | 250 | ES 185 | ES 235 | ES 245 | 230 | 235 | 225 | 220 | 230 | 220 | 210 | 220 | 230 | 225 | 195 | 210 | 230 | ES 250 | ES 275 | ES 315 |
| 21 | ES 300 | ES 305 | ES 305 | 270 | 205 | ES 235 | ES 320 | ES 230 | 220 | 235 | H 200 | 230 | H 195 | 195 | H 185 | 195 | H 185 | H 195 | 200 | 220 | ES 225 | ES 245 | ES 255 | ES 245 |
| 22 | ES 290 | S | ES 280 | 230 | 215 | ES 250 | ES 300 | ES 245 | 230 | 240 | 245 | 230 | A | 215 | 205 | H 200 | 220 | 220 | 205 | 220 | ES 260 | ES 250 | ES 240 | S 230 |
| 23 | ES 300 | S | S | ES 290 | 210 | ES 230 | ES 280 | S 230 | H 190 | A 250 | 240 | 225 | H 190 | H 190 | 200 | A | H 200 | 230 | 210 | 225 | EA 290 | 225 | ES 275 | ES 265 |
| 24 | S | S | ES 270 | 205 | S 230 | S | S | S 245 | H 200 | H 205 | H 185 | H 190 | 240 | H 200 | 215 | 220 | 230 | 205 | 210 | 215 | 215 | S 225 | ES 250 | S |
| 25 | ES 310 | ES 290 | S 250 | ES 250 | 225 | S | ES 300 | S 230 | H 200 | H 180 | H 190 | H 190 | EA 245 | A | A | H 200 | 230 | H 190 | 210 | A | A | A | ES 290 | ES 290 |
| 26 | ES 300 | ES 270 | ES 270 | ES 275 | ES 270 | ES 280 | ES 310 | S 250 | 225 | 220 | 225 | H 195 | A 230 | A | A | EA 245 | 220 | 215 | 225 | 215 | 200 | ES 245 | ES 305 | ES 280 |
| 27 | ES 260 | ES 255 | S 240 | 230 | ES 250 | ES 280 | ES 270 | ES 250 | H 200 | C | C | A | H 190 | 210 | A | 215 | H 205 | 220 | 215 | ES 240 | EA 250 | S 230 | EA 250 | ES 280 |
| 28 | ES 295 | ES 300 | ES 260 | EA 280 | ES 245 | S | S | ES 260 | 240 | 225 | EA 245 | A | A | A | 215 | H 205 | H 190 | 210 | 205 | ES 240 | 215 | S 225 | 200 | ES 270 |
| 29 | ES 285 | ES 290 | ES 285 | ES 295 | ES 250 | ES 240 | S | ES 265 | 235 | 235 | 205 | 200 | H 190 | 200 | 220 | H 185 | 200 | 220 | S 200 | ES 255 | S 255 | S 235 | ES 235 | ES 255 |
| 30 | ES 300 | ES 300 | S 280 | S 250 | ES 225 | S | ES 300 | S 240 | 210 | 235 | 230 | 215 | 220 | 220 | 205 | 200 | A | 220 | A 205 | ES 240 | ES 240 | ES 235 | ES 250 | ES 265 |
| 31 | ES 290 | ES 295 | ES 300 | ES 260 | ES 220 | ES 250 | ES 295 | ES 240 | 240 | 220 | 210 | H 200 | 225 | 220 | 205 | 190 | 185 | 215 | 215 | ES 255 | S 220 | ES 225 | ES 215 | ES 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 | 30 | 28 | 29 | 31 | 31 | 24 | 25 | 31 | 30 | 30 | 28 | 25 | 29 | 28 | 25 | 29 | 26 | 31 | 28 | 26 | 26 | 27 | 29 | 29 |
| MED | ES 290 | ES 285 | ES 275 | ES 255 | US 228 | ES 258 | ES 280 | S 230 | 225 | 225 | 220 | 210 | 208 | 210 | 210 | 202 | 200 | 215 | 205 | US 214 | ES 245 | ES 235 | ES 245 | ES 280 |
| UQ | ES 300 | ES 298 | ES 285 | ES 278 | S 245 | ES 292 | ES 300 | S 240 | 230 | 235 | 230 | 220 | 222 | 220 | 215 | 212 | 230 | 220 | 211 | ES 240 | ES 255 | ES 250 | ES 270 | ES 300 |
| LQ | ES 275 | ES 268 | ES 260 | US 226 | 218 | ES 230 | ES 255 | 230 | 200 | 205 | 202 | 200 | H 200 | H 195 | 205 | 200 | 190 | 205 | 200 | 215 | 220 | S 220 | ES 240 | ES 255 |



The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | H'E (KM) | 135° E Mean Time (G.M.T. + 9h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 2 4sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | S | E S 125 | 115 | A | C | 110 | 115 | 110 | A | A | S | | | | | | |
| 2 | | | | | | | | S | E S 140 | 115 | 115 | 110 | 115 | 115 | 115 | 110 | A | S | | | | | | |
| 3 | | | | | | | | S | S 125 | 120 | 120 | 120 | 115 | 115 | 110 | 110 | A | S | | | | | | |
| 4 | | | | | | | | S | 125 | 120 | 115 | 115 | 115 | 110 | 110 | 115 | 115 | S | | | | | | |
| 5 | | | | | | | | S | 120 | 110 | 110 | 110 | 110 | 110 | 110 | A | 115 | S | | | | | | |
| 6 | | | | | | | | S | 110 | A | A | A | 110 | 110 | 110 | 110 | 110 | S | | | | | | |
| 7 | | | | | | | | S | 115 | 110 | A | A | A | A | A | 110 | 110 | S | | | | | | |
| 8 | | | | | | | | S | S | A | 110 | 105 | 110 | 110 | A | A | A | A | | | | | | |
| 9 | | | | | | | | S | 110 | 110 | 110 | 105 | 105 | A | A | A | A | A | | | | | | |
| 10 | | | | | | | | S | 115 | A | A | A | A | A | A | A | A | A | | | | | | |
| 11 | | | | | | | | S | 115 | 115 | 105 | 105 | A | A | A | A | 115 | A | | | | | | |
| 12 | | | | | | | | S | S | 110 | 110 | A | A | A | A | C | A | A | | | | | | |
| 13 | | | | | | | | S | S | A | 110 | 115 | 110 | A | A | A | A | A | | | | | | |
| 14 | | | | | | | | S | 125 | 110 | 110 | 110 | A | A | A | A | A | A | | | | | | |
| 15 | | | | | | | | S | A | E A 125 | E A 120 | A | A | A | A | A | A | S | | | | | | |
| 16 | | | | | | | | S | E S 135 | 115 | 110 | 110 | A | A | A | A | 115 | S | | | | | | |
| 17 | | | | | | | | S | E S 125 | 115 | 105 | 110 | E A 120 | 110 | 110 | 110 | 120 | S | | | | | | |
| 18 | | | | | | | | S | E S 125 | 110 | 110 | A | A | 110 | 110 | 110 | 115 | S | | | | | | |
| 19 | | | | | | | | S | E A 130 | 115 | A | 105 | 110 | A | 110 | 105 | 105 | A | | | | | | |
| 20 | | | | | | | | S | A | A | A | A | A | 110 | 115 | 110 | 110 | 130 | | | | | | |
| 21 | | | | | | | | S | E S 120 | 115 | 115 | 110 | 110 | 110 | 110 | 115 | 115 | S | | | | | | |
| 22 | | | | | | | | S | S 120 | 115 | 110 | 110 | 105 | 105 | 105 | 105 | A | S | | | | | | |
| 23 | | | | | | | | S | 115 | 110 | 110 | 110 | 110 | A | A | A | 110 | S | | | | | | |
| 24 | | | | | | | | S | S 125 | 110 | 105 | 110 | 110 | 105 | 105 | 105 | A | S | | | | | | |
| 25 | | | | | | | | S | S 120 | 110 | 105 | 105 | 105 | 105 | 110 | 115 | A | S | | | | | | |
| 26 | | | | | | | | S | S 120 | 110 | 110 | 110 | 110 | A | A | A | A | S | | | | | | |
| 27 | | | | | | | | S | S 125 | C | C | 110 | 110 | A | A | A | A | S | | | | | | |
| 28 | | | | | | | | S | E S 130 | 115 | 110 | 115 | 110 | 110 | 110 | 110 | 115 | S | | | | | | |
| 29 | | | | | | | | S | A | A | 110 | A | A | 105 | A | 110 | A | S | | | | | | |
| 30 | | | | | | | | S | S | 115 | 110 | 110 | H 105 | 110 | 110 | 115 | A | S | | | | | | |
| 31 | | | | | | | | S | S | 115 | 110 | 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 | | | | | | | | | 23 | 24 | 24 | 21 | 20 | 17 | 16 | 16 | 13 | 1 | | | | | | |
| MED | | | | | | | | | S 120 | 115 | 110 | 110 | 110 | 110 | 110 | 110 | 115 | 130 | | | | | | |
| UQ | | | | | | | | | E S 125 | 115 | 110 | 110 | 110 | 110 | 110 | 112 | 115 | | | | | | | |
| LQ | | | | | | | | | 116 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | | | | | | | |

DEC. 1986 | H'E (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | H'ES (KM) | 135° E Mean Time (G.M.T. + 9h)

Station YAMAGAWA Lat. 31° 12.1' N. Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | S | S | S | S | S | S | S | S | 165 | G | 125 | C | 120 | 115 | 105 | 105 | 105 | 100 | S | S | S | S | S | S |
| 2 | S | S | S | S | S | 105 | S | 105 | 150 | 150 | G | G | G | 120 | 110 | 110 | 105 | 100 | 100 | 100 | 100 | S | S | S |
| 3 | 110 | 110 | 100 | S | 100 | 100 | 100 | 100 | G | 125 | 125 | 125 | 120 | 115 | G | G | 100 | 100 | S | S | 100 | 100 | 100 | S |
| 4 | 105 | S | S | S | S | C | S | 150 | G | 125 | 110 | 115 | G | G | G | G | G | 100 | 105 | 100 | S | S | S | S |
| 5 | S | S | S | 100 | S | S | S | 130 | 135 | 170 | 150 | G | G | G | 120 | 105 | 120 | 110 | 110 | 105 | S | S | S | S |
| 6 | 100 | 100 | S | S | S | S | S | 140 | 120 | 105 | 105 | 100 | 150 | G | 160 | G | G | S | S | S | S | 110 | S | S |
| 7 | 100 | S | S | S | S | 110 | S | S | 160 | 150 | 105 | 105 | 105 | 100 | 100 | G | G | 100 | S | S | S | S | S | S |
| 8 | S | S | S | S | S | S | S | G | 120 | 120 | 115 | 115 | 110 | 110 | 110 | 105 | 105 | 105 | 100 | 100 | 110 | 110 | 110 | 110 |
| 9 | 105 | 105 | 110 | S | 125 | 105 | 155 | G | 120 | 110 | 110 | 110 | 105 | 100 | 100 | 160 | 100 | 100 | 100 | 100 | 100 | S | S | 130 |
| 10 | 100 | 100 | 100 | 100 | S | S | S | G | 150 | 100 | 110 | 105 | 105 | 105 | 105 | 100 | 105 | 105 | 105 | 110 | 105 | S | 100 | 100 |
| 11 | 110 | 105 | 130 | 120 | S | S | 110 | G | G | 180 | 110 | 110 | 105 | 105 | 100 | 150 | G | 105 | 100 | 100 | 100 | 100 | 100 | 100 |
| 12 | 100 | 105 | 95 | 95 | 100 | S | 100 | G | 155 | 160 | 110 | 105 | 105 | 115 | 100 | C | 100 | 95 | 100 | 95 | 95 | 95 | 95 | 100 |
| 13 | S | 100 | 110 | 105 | 100 | 100 | 100 | 110 | G | 115 | 150 | 120 | 110 | 110 | 120 | 100 | 100 | 100 | 95 | 95 | 95 | 95 | 100 | S |
| 14 | S | 110 | S | 100 | S | 100 | 100 | G | G | G | 115 | 110 | 145 | 130 | 105 | G | 100 | 100 | 95 | 100 | S | S | S | S |
| 15 | 100 | S | 100 | 105 | 100 | 110 | S | 100 | 170 | 150 | 175 | 140 | 140 | 110 | 120 | 120 | 125 | 145 | 105 | 100 | 100 | S | S | 100 |
| 16 | 100 | 100 | S | S | 105 | 100 | 105 | 105 | G | G | 160 | 175 | 165 | 105 | 105 | 105 | 105 | S | 105 | 100 | 100 | 100 | 100 | 95 |
| 17 | 95 | 100 | 95 | S | S | S | 105 | 100 | G | 125 | 150 | 120 | 155 | 140 | 115 | 130 | G | 145 | S | 115 | 105 | 105 | 105 | S |
| 18 | 100 | S | S | 105 | 105 | S | S | S | G | 185 | 115 | 105 | 135 | 130 | 130 | 130 | 105 | S | S | 120 | 95 | S | S | S |
| 19 | S | S | S | S | S | S | 120 | S | 160 | 145 | 130 | 120 | 115 | 105 | G | G | G | 105 | 105 | 105 | 105 | 105 | 100 | 100 |
| 20 | S | S | S | S | 105 | S | S | S | 165 | 150 | 150 | 110 | 105 | 150 | 155 | 150 | G | G | S | S | S | S | S | 140 |
| 21 | 100 | 140 | S | S | S | 105 | 105 | 100 | 160 | 180 | 145 | 180 | 115 | G | 150 | 130 | G | S | 100 | 100 | 120 | S | S | S |
| 22 | S | S | S | S | S | 105 | 110 | 100 | 160 | 155 | 150 | 125 | 115 | 110 | G | G | 100 | 100 | 100 | S | S | S | S | S |
| 23 | S | S | S | S | S | 100 | 100 | 100 | G | 155 | 150 | 130 | 110 | 105 | 100 | 110 | 115 | 110 | 105 | 100 | 100 | 100 | 100 | 100 |
| 24 | S | 110 | 105 | 100 | 105 | S | S | S | G | G | G | 110 | 155 | G | 175 | 170 | 100 | 100 | 100 | 100 | 100 | S | 100 | 100 |
| 25 | S | S | S | S | S | 100 | 100 | S | 125 | 120 | 115 | 110 | 110 | 105 | 105 | 105 | 100 | 95 | 125 | 100 | 100 | 100 | 100 | 100 |
| 26 | 100 | S | S | 100 | 100 | 100 | 100 | 100 | 150 | G | 120 | 115 | 110 | 105 | 100 | 100 | 120 | 115 | 100 | S | S | S | S | S |
| 27 | S | S | S | S | 100 | S | 100 | 100 | 140 | C | C | 115 | 115 | 105 | 105 | 105 | 105 | 125 | S | 130 | 105 | S | 105 | 105 |
| 28 | 110 | 100 | 100 | 100 | 100 | 100 | S | S | G | 150 | 130 | 120 | 120 | 115 | 110 | G | 100 | 100 | 100 | 100 | 100 | S | S | 100 |
| 29 | S | S | S | S | S | S | 105 | G | 170 | 165 | 135 | 145 | 105 | 160 | 145 | 145 | 165 | G | S | S | S | S | S | S |
| 30 | S | S | 105 | 115 | S | S | S | G | G | 160 | 130 | 120 | 120 | 120 | 115 | 110 | 110 | G | 105 | S | S | S | S | S |
| 31 | 100 | 100 | S | S | 100 | S | S | G | G | 165 | 165 | 160 | 105 | 100 | 170 | 190 | 105 | 135 | 120 | S | S | S | S | S |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 16 | 14 | 11 | 12 | 13 | 14 | 16 | 14 | 18 | 25 | 28 | 28 | 28 | 26 | 27 | 22 | 23 | 24 | 22 | 21 | 19 | 11 | 13 | 14 |
| MED | 100 | 102 | 100 | 100 | 100 | 100 | 102 | 100 | 152 | 150 | 128 | 115 | 115 | 110 | 110 | 110 | 105 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| UQ | 105 | 110 | 108 | 105 | 105 | 105 | 108 | 110 | 160 | 160 | 150 | 125 | 128 | 120 | 125 | 145 | 108 | 110 | 105 | 105 | 105 | 105 | 100 | 105 |
| LQ | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 135 | 125 | 112 | 110 | 105 | 105 | 105 | 105 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

DEC. 1986 | H'ES (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | TYPES OF ES | 135° E Mean Time (G.M.T. + 9h)

Station YAMAGAWA Lat. 31° 12.1' N. Long. 130° 37.1' E Sweep 1 MHz to 25 MHz in 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 | | | | | | | | | H 3 | | CL 11 | | C 1 | C 2 | C 2 | L 3 | L 3 | L 2 | | | | | | |
| 2 | | | | | | F 2 | | C 1 | H 2 | H 2 | | | | C 1 | C 3 | C 3 | L 4 | L 5 | F 5 | F 2 | F 2 | | | |
| 3 | F 3 | F 2 | F 2 | | F 2 | F 2 | F 2 | L 1 | | C 2 | C 1 | C 1 | C 1 | C 2 | | | L 3 | L 3 | | | F 2 | F 2 | F 1 | |
| 4 | F 1 | | | | | | | H 1 | | C 2 | C 2 | C 2 | | | | | | L 3 | F 1 | F 1 | | | | |
| 5 | | | | F 1 | | | | H 5 | H 4 | HC 32 | HC 22 | | | | C 2 | L 3 | C 3 | C 2 | F 3 | F 1 | | | | |
| 6 | F 1 | F 2 | | | | | | H 4 | C 2 | LH 31 | L 3 | L 2 | H 2 | | H 2 | | | | | | | F 2 | | |
| 7 | F 2 | | | | | F 1 | | | H 2 | H 2 | L 3 | L 2 | L 3 | L 3 | L 3 | | | L 2 | | | | | | |
| 8 | | | | | | | | | C 4 | CL 41 | C 2 | C 2 | C 3 | C 3 | L 3 | L 5 | L 7 | L 7 | F 7 | F 7 | FF 33 | FF 75 | FF 71 | F 7 |
| 9 | F 4 | F 2 | F 2 | | F 1 | F 2 | F 1 | | C 4 | C 4 | C 3 | C 3 | C 4 | L 4 | LH 21 | HL 12 | L 3 | L 2 | F 7 | F 7 | F 8 | | | F 1 |
| 10 | F 3 | F 2 | F 2 | F 2 | | | | | H 1 | L 1 | L 2 | L 2 | L 1 | L 2 | LH 21 | L 4 | L 3 | L 6 | F 4 | F 1 | F 3 | | F 2 | F 4 |
| 11 | F 5 | F 2 | F 2 | FF 22 | | | F 1 | | | HC 34 | C 4 | C 5 | L 3 | L 2 | L 2 | HL 11 | | L 3 | F 5 | F 5 | F 4 | F 3 | F 2 | F 2 |
| 12 | F 4 | FF 22 | F 3 | F 3 | F 1 | | F 1 | | H 1 | H 2 | C 5 | L 3 | L 3 | CL 13 | L 3 | | L 4 | L 4 | F 1 | F 3 | F 4 | F 2 | F 3 | F 1 |
| 13 | | F 1 | F 1 | F 1 | F 2 | F 3 | F 1 | L 1 | | LH 12 | H 1 | C 2 | C 2 | CL 22 | CL 13 | L 2 | L 4 | L 4 | F 4 | F 4 | F 3 | F 5 | F 1 | |
| 14 | | F 1 | | F 2 | | F 2 | F 2 | | | | C 3 | C 2 | HL 12 | HL 12 | L 2 | | L 2 | L 3 | F 2 | F 1 | | | | |
| 15 | F 1 | | F 1 | F 2 | F 2 | F 1 | | L 2 | HL 23 | HL 12 | HL 11 | HL 32 | HL 11 | LHL 22 | CLL 32 | CLL 33 | CL 22 | HCL 22 | F 1 | F 1 | F 1 | | | F 1 |
| 16 | F 1 | F 1 | | | F 1 | F 1 | F 1 | L 1 | | | HC 12 | H 2 | HL 12 | L 3 | L 2 | L 3 | L 1 | | F 1 | F 1 | F 2 | F 1 | F 1 | F 3 |
| 17 | F 2 | F 2 | F 2 | | | | F 2 | L 1 | | C 1 | H 2 | C 2 | HL 22 | HL 21 | C 5 | HL 22 | | HL 22 | | F 1 | F 2 | F 1 | F 2 | |
| 18 | F 1 | | | F 2 | F 2 | | | | | HC 12 | CH 21 | LH 22 | HL 22 | C 2 | C 2 | C 2 | L 1 | | | F 1 | F 2 | | | |
| 19 | | | | | | | FF 11 | | HL 21 | H 3 | CL 22 | C 2 | C 2 | L 2 | | | | L 2 | F 1 | F 1 | F 1 | F 1 | F 1 | F 1 |
| 20 | | | | | F 1 | | | | HL 24 | HL 23 | HL 23 | LH 21 | LH 21 | HL 21 | HL 22 | HL 21 | | | | | | | | F 1 |
| 21 | FF 11 | FF 11 | | | | FF 11 | F 1 | L 2 | H 3 | H 2 | H 2 | HC 12 | C 2 | | H 1 | HL 22 | | | F 2 | F 3 | F 1 | | | |
| 22 | | | | | | F 1 | F 2 | L 2 | H 4 | H 3 | H 2 | C 2 | C 4 | C 3 | | | L 2 | L 2 | F 3 | | | | | |
| 23 | | | | | | F 2 | F 1 | L 1 | | H 5 | H 3 | H 2 | C 3 | L 3 | L 4 | CL 32 | C 3 | C 3 | F 6 | F 4 | F 4 | F 3 | F 3 | F 2 |
| 24 | | F 3 | F 2 | F 2 | F 3 | | | | | | | C 2 | H 2 | | H 2 | H 3 | L 2 | L 1 | F 2 | F 2 | F 2 | | F 1 | F 1 |
| 25 | | | | | | F 2 | F 2 | | C 3 | C 3 | C 3 | C 2 | C 3 | C 3 | C 4 | C 5 | L 4 | L 2 | F 1 | F 5 | F 5 | F 5 | F 3 | F 2 |
| 26 | F 1 | | | F 1 | F 2 | F 2 | F 3 | L 2 | H 3 | | C 4 | C 2 | C 3 | L 3 | L 4 | L 3 | CL 13 | CL 13 | F 1 | | | | | |
| 27 | | | | | F 2 | | F 2 | L 2 | H 3 | | | C 3 | C 2 | L 2 | L 3 | L 3 | L 2 | C 2 | | F 1 | F 4 | | F 2 | F 2 |
| 28 | F 2 | F 2 | F 4 | F 6 | F 1 | F 1 | | | | H 4 | H 3 | C 5 | C 2 | C 3 | C 2 | | L 2 | L 2 | F 3 | F 2 | F 1 | | | F 1 |
| 29 | | | | | | | F 1 | | HL 33 | HHL 11 | H 1 | HL 22 | L 2 | H 1 | HL 11 | H 2 | HL 21 | | | | | | | |
| 30 | | | F 1 | F 1 | | | | | | H 3 | H 3 | C 3 | C 2 | C 2 | C 3 | C 3 | L 3 | | F 6 | | | | | |
| 31 | F 2 | F 2 | | | F 1 | | | | | H 2 | H 2 | HL 12 | L 4 | LH 31 | HL 11 | HL 11 | L 1 | HL 41 | FF 51 | | | | | |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | | | | | | | | | | | | | | | | | | | | | | | | |
| MED | | | | | | | | | | | | | | | | | | | | | | | | |
| UQ | | | | | | | | | | | | | | | | | | | | | | | | |
| LQ | | | | | | | | | | | | | | | | | | | | | | | | |

The Radio Research Laboratory, Japan

DEC. 1986 | TYPES OF ES

# IONOSPHERIC DATA

DEC. 1986 | FXI (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station OKINAWA Lat. 26° 16' 9" N, Long. 127° 48' 4" E Sweep 1 MHz to 25 MHz in 24sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | X 43 | X 40 | X 43 | X 43 | X 42 | X 44 | X 48 | | | | | | | | | | | | X 85 | X 61 | X 48 | X 51 | X 53 | X 38 |
| 2 | X 38 | X 37 | 40 | X 36 | X 37 | X 38 | X 32 | | | | | | | | | | | | X 69 | X 55 | X 58 | U X 50 | X 40 | X 34 |
| 3 | X 34 | X 34 | X 36 | X 39 | X 43 | 34 | 35 | | | | | | | | | | | | X 56 | X 42 | X 46 | X 43 | X 35 | X 32 |
| 4 | X 33 | X 33 | 36 | X 40 | X 37 | 24 | 24 | | | | | | | | | | | | X 55 | X 41 | U X 46 | X 44 | 49 | 40 |
| 5 | 35 | 39 | X 41 | U X 43 | X 26 | X 26 | X 25 | | | | | | | | | | | | X 48 | X 46 | X 36 | X 39 | X 33 | X 34 |
| 6 | X 35 | X 37 | X 36 | X 40 | X 28 | O X 28 | X 24 | | | | | | | | | | | | X 45 | X 30 | X 34 | U X 32 | X 31 | U X 31 |
| 7 | X 34 | X 36 | X 32 | X 38 | X 27 | X 24 | O X 26 | | | | | | | | | | | | X 51 | X 36 | X 30 | 41 | 38 | 39 |
| 8 | 40 | 36 | 40 | X 40 | A | A | A | | | | | | | | | | | | X 47 | X 40 | X 36 | X 36 | 36 | 40 |
| 9 | 38 | A | 38 | A | A | A | A | | | | | | | | | | | | X 47 | X 37 | X 35 | X 34 | X 36 | X 34 |
| 10 | X 34 | X 29 | 32 | 32 | 32 | 29 | X 24 | | | | | | | | | | | | X 57 | X 44 | X 40 | X 42 | X 34 | X 27 |
| 11 | 28 | 28 | X 31 | X 31 | X 32 | 22 | 23 | | | | | | | | | | | | X 59 | X 43 | U X 40 | X 39 | X 34 | X 31 |
| 12 | X 33 | X 38 | X 39 | X 39 | X 36 | X 24 | S | | | | | | | | | | | | X 69 | U X 39 | X 38 | X 41 | X 30 | X 29 |
| 13 | X 33 | X 34 | X 38 | X 37 | X 48 | X 38 | X 26 | | | | | | | | | | | | X 44 | X 33 | X 33 | X 34 | X 37 | X 27 |
| 14 | X 30 | 31 | 36 | 43 | 45 | 35 | S | | | | | | | | | | | | X 45 | X 42 | X 39 | X 48 | X 46 | O X 26 |
| 15 | 33 | X 37 | X 42 | X 48 | X 31 | 29 | X 27 | | | | | | | | | | | | X 48 | X 38 | X 37 | X 38 | X 36 | X 30 |
| 16 | X 31 | X 34 | X 36 | X 37 | X 34 | X 31 | X 25 | | | | | | | | | | | | X 47 | X 38 | X 47 | 42 | X 30 | X 27 |
| 17 | X 27 | X 28 | 31 | 28 | 29 | 27 | 23 | | | | | | | | | | | | X 60 | X 45 | X 38 | X 38 | X 33 | X 30 |
| 18 | X 31 | X 32 | X 36 | X 36 | X 38 | U X 34 | X 27 | | | | | | | | | | | | X 64 | X 49 | X 38 | X 34 | X 31 | X 28 |
| 19 | X 30 | X 33 | X 34 | X 36 | X 49 | X 26 | X 24 | | | | | | | | | | | | U X 105 | X 66 | X 45 | X 47 | X 35 | X 34 |
| 20 | X 31 | X 33 | X 34 | X 36 | X 36 | U X 28 | X 24 | | | | | | | | | | | | X 77 | X 53 | X 44 | X 39 | X 33 | X 28 |
| 21 | X 29 | X 31 | X 32 | 35 | X 43 | X 29 | O X 26 | | | | | | | | | | | | X 55 | X 45 | X 39 | X 36 | X 34 | X 35 |
| 22 | X 33 | X 34 | 36 | X 45 | O X 35 | O X 29 | X 25 | | | | | | | | | | | | X 56 | X 39 | X 39 | X 40 | X 35 | X 29 |
| 23 | X 27 | X 28 | X 28 | 33 | X 43 | X 28 | O X 28 | | | | | | | | | | | | X 65 | X 48 | X 43 | X 42 | X 36 | X 34 |
| 24 | X 34 | X 36 | X 40 | X 49 | X 27 | X 27 | A | X 32 | | | | | | | | | | | X 53 | X 52 | X 40 | X 34 | X 30 | X 30 |
| 25 | X 31 | X 36 | X 38 | X 42 | X 32 | X 26 | X 27 | X 35 | | | | | | | | | | | X 54 | X 53 | X 52 | X 37 | X 39 | X 39 |
| 26 | X 40 | X 41 | X 43 | X 42 | X 42 | X 38 | X 31 | X 34 | | | | | | | | | | | X 57 | X 48 | X 39 | 33 | 32 | 32 |
| 27 | 35 | 35 | X 37 | X 34 | X 31 | X 29 | X 31 | X 31 | | | | | | | | | | | X 54 | X 41 | X 38 | X 38 | A | X 31 |
| 28 | 32 | 33 | 35 | 32 | 35 | 30 | 28 | X 28 | | | | | | | | | | | X 52 | X 45 | 48 | 38 | X 33 | 25 |
| 29 | X 28 | X 30 | X 31 | X 29 | X 30 | X 25 | X 25 | X 28 | | | | | | | | | | | X 48 | X 40 | X 43 | X 48 | X 47 | X 31 |
| 30 | X 29 | X 30 | X 31 | X 33 | X 31 | X 26 | X 25 | X 30 | | | | | | | | | | | X 54 | X 41 | 47 | X 51 | X 39 | X 26 |
| 31 | X 30 | X 29 | X 29 | X 31 | X 36 | X 30 | X 28 | X 29 | | | | | | | | | | | X 49 | X 40 | X 54 | X 57 | X 36 | X 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 | 31 | 30 | 31 | 30 | 29 | 29 | 26 | 8 | | | | | | | | | | | 31 | 31 | 31 | 31 | 30 | 31 |
| MED | X 33 | X 34 | X 36 | X 37 | X 35 | X 29 | X 26 | X 30 | | | | | | | | | | | X 54 | X 42 | X 40 | X 39 | X 35 | X 31 |
| UQ | X 34 | X 36 | X 38 | X 42 | X 42 | X 31 | X 28 | X 33 | | | | | | | | | | | X 60 | X 48 | X 46 | X 44 | X 38 | X 34 |
| LQ | X 30 | X 31 | X 32 | X 33 | X 31 | X 26 | X 24 | X 28 | | | | | | | | | | | X 48 | X 40 | X 38 | X 36 | X 33 | X 28 |

DEC. 1986 | FXI (0.1 MHZ)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | FOF2 (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station OKINAWA Lat. 26° 16.9' N. Long. 127° 48.4' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 37 | 34 | 37 | 37 | 36 | 38 | 42 | 43 | 82 | 82 | 75 | 78 | 92 | 81 | 84 | 78 | 85 | 89 | 79 | 55 | S 42 | 45 | 47 | 32 |
| 2 | 32 | 31 | F | 30 | 31 | 32 | 26 | 40 | 66 | 63 | 79 | 97 | 96 | 107 | 108 | U R 136 | R 142 | 124 | S 63 | 47 | S 52 | U S 44 | 34 | 28 |
| 3 | 28 | 28 | 30 | 33 | 37 | F | F | 37 | 62 | 60 | 70 | 91 | 109 | 134 | R 136 | R 116 | 85 | 64 | 50 | 36 | 40 | 37 | 29 | 26 |
| 4 | 27 | 27 | F | 34 | U S 31 | F | F | 32 | 67 | R 103 | 90 | 94 | R 103 | U R 119 | U R 108 | U R 84 | R 76 | 63 | 49 | 35 | U S 40 | 38 | F | F |
| 5 | F | F | 35 | U S 37 | 20 | 20 | 19 | 37 | 65 | 57 | 66 | 68 | 96 | R 91 | R 72 | 72 | 70 | 55 | 42 | 40 | S 30 | S 33 | S 27 | 28 |
| 6 | 29 | 31 | 30 | 34 | 22 | 22 | S 18 | 32 | 57 | R 73 | 77 | 80 | R 81 | 100 | R 95 | U R 75 | 60 | 58 | 39 | 24 | 28 | U S 26 | 25 | U S 25 |
| 7 | 28 | S 30 | 26 | 32 | S 21 | 18 | 20 | 31 | 50 | 59 | R 72 | 88 | 89 | 85 | U R 95 | R 95 | R 85 | J R 65 | U S 45 | 30 | S 24 | F | F | F |
| 8 | F | F 27 | F | S 34 | A | A | A | A | C | C | C | C | C | 130 | 92 | 71 | R 61 | 57 | 41 | 34 | S 30 | S 30 | F 27 | F |
| 9 | F 29 | A | F 29 | A | A | A | A | A | 54 | 58 | 56 | 67 | 80 | 86 | 85 | R 61 | R 60 | 54 | 41 | S 31 | 29 | 28 | 30 | 28 |
| 10 | 28 | 23 | F 23 | F | F | F 19 | S 18 | 33 | 50 | 54 | 50 | 70 | R 71 | 71 | 69 | 56 | 62 | 65 | S 51 | 38 | 34 | S 36 | 28 | 21 |
| 11 | F | F | 25 | U S 25 | S 26 | F | F | 35 | 60 | 53 | 59 | R 83 | 92 | 77 | 70 | 64 | R 63 | R 57 | 53 | 37 | U S 34 | 33 | 28 | 25 |
| 12 | S 27 | 32 | S 33 | 33 | 30 | 18 | S | R 29 | R 61 | 62 | 66 | 62 | 70 | 84 | 73 | R 70 | R 67 | 61 | 63 | S 33 | S 32 | 35 | S 24 | S 23 |
| 13 | 27 | 28 | 32 | 31 | 42 | 32 | 20 | 31 | 48 | 53 | 58 | 66 | 75 | 68 | 67 | 61 | 59 | 55 | 38 | 27 | S 27 | 28 | S 31 | 21 |
| 14 | U S 24 | F | F | F | F | F | A | 32 | 50 | 52 | 55 | 103 | 104 | 75 | R 67 | U R 68 | 71 | R 72 | 39 | 36 | J S 33 | 42 | J S 40 | 20 |
| 15 | F | 31 | 36 | 42 | S 25 | F | S 21 | 30 | 52 | 68 | 67 | 67 | 102 | 88 | 72 | 63 | 54 | 50 | 42 | 32 | 31 | 32 | 30 | 24 |
| 16 | 25 | 28 | S 30 | 31 | 28 | 25 | 19 | 29 | 48 | 54 | 68 | 55 | 56 | 62 | 76 | 75 | 70 | 59 | 41 | 32 | S 41 | F | 24 | 21 |
| 17 | 21 | 22 | F | F | F | F | F | 27 | 50 | 58 | 69 | 58 | 69 | 80 | 83 | 79 | 85 | 84 | 54 | 39 | 32 | 32 | 27 | 24 |
| 18 | S 25 | U S 26 | 30 | 30 | 32 | U S 28 | S 21 | R 29 | 48 | 61 | R 82 | 57 | 72 | 69 | 78 | 70 | R 74 | 65 | R 58 | S 43 | S 32 | 28 | S 25 | 22 |
| 19 | 24 | 27 | 28 | S 30 | S 43 | S 20 | 18 | 27 | 48 | 54 | 57 | 62 | 77 | R 92 | 105 | U R 104 | 114 | U R 122 | U S 99 | 60 | 39 | 41 | S 29 | 28 |
| 20 | 25 | 27 | 28 | 30 | 30 | 22 | 18 | 28 | 45 | 56 | 66 | 67 | 68 | 91 | R 119 | R 112 | U R 81 | R 79 | S 71 | S 47 | S 38 | S 33 | 27 | 22 |
| 21 | S 23 | 25 | 26 | F | 37 | 23 | 20 | J R 25 | 43 | 56 | 62 | R 60 | 73 | 91 | 78 | 67 | 56 | 65 | 49 | 39 | S 33 | 30 | 28 | S 29 |
| 22 | 27 | 28 | F | 39 | 29 | 20 | S 19 | 28 | R 48 | 61 | 62 | 56 | 69 | 90 | 82 | 85 | 79 | 57 | 50 | 33 | S 33 | U S 34 | 29 | 23 |
| 23 | 21 | 22 | 22 | F | S 37 | 22 | 22 | 27 | 50 | 54 | 72 | R 64 | 75 | R 98 | 85 | 55 | 58 | 50 | 59 | S 42 | 37 | 36 | 30 | 28 |
| 24 | 28 | 30 | 34 | S 43 | 21 | S 21 | A | 26 | 54 | 70 | 86 | U R 80 | 78 | 85 | H 87 | 85 | 68 | 69 | 47 | S 46 | 34 | S 28 | S 24 | 24 |
| 25 | S 25 | 30 | 32 | 36 | S 26 | 20 | 21 | 29 | 52 | 57 | 63 | 76 | 84 | 94 | 90 | 78 | 65 | 65 | 48 | 47 | 46 | 31 | 33 | 33 |
| 26 | 34 | 35 | 37 | 36 | 36 | 32 | 25 | 28 | 50 | 58 | 56 | 59 | 59 | U S 64 | 57 | 62 | 64 | 64 | 51 | 42 | S 33 | F | F | F |
| 27 | F | F | 31 | 28 | 25 | S 23 | S 25 | S 25 | 54 | 66 | 70 | 67 | 68 | 60 | 78 | 57 | 56 | 60 | 48 | 35 | 32 | 32 | A | S 25 |
| 28 | F | F | F | F | F | F | F | 22 | 52 | 56 | 54 | 61 | 66 | 61 | 60 | 62 | 69 | U R 74 | S 46 | 39 | F | F | 27 | F |
| 29 | 22 | 24 | 25 | 23 | 24 | 19 | 19 | 22 | 51 | 68 | 90 | 58 | 71 | 85 | 80 | 57 | 56 | 54 | 42 | 34 | 37 | 42 | U S 41 | S 25 |
| 30 | 23 | 24 | 25 | 27 | 25 | 20 | 19 | S 24 | 48 | 50 | 58 | R 57 | 61 | 57 | 58 | 57 | 48 | 50 | 48 | U S 35 | F | 45 | 33 | S 20 |
| 31 | 24 | 23 | 23 | 25 | 30 | 24 | 22 | S 23 | 48 | 47 | 52 | 59 | 58 | 56 | 66 | 62 | 57 | 56 | S 43 | 34 | 48 | S 51 | 30 | 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 | 25 | 25 | 24 | 24 | 25 | 22 | 21 | 29 | 30 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 29 | 27 | 27 | 26 |
| MED | 27 | 28 | 30 | 32 | 30 | 22 | 20 | 29 | 50 | 58 | 66 | 67 | 75 | 85 | 80 | 70 | 67 | 63 | 48 | 36 | S 33 | 33 | 29 | 25 |
| UQ | 28 | 30 | 32 | 36 | 36 | 25 | 22 | 32 | 57 | 63 | 72 | 80 | 92 | 92 | 91 | 82 | 78 | 67 | 54 | 42 | 39 | 40 | 30 | 28 |
| LQ | 24 | 25 | 26 | 30 | 25 | 20 | 19 | 27 | 48 | 54 | 58 | 59 | 69 | 70 | 71 | 62 | 60 | 56 | 42 | 34 | S 32 | 30 | 27 | 22 |

DEC. 1986 | FOF2 (0.1 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FOF1 (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station OKINAWA Lat. 26° 16.9' N, Long. 127° 48.4' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | L | L | L 430 | U L 430 | L | L | L | L | | | | | | | |
| 2 | | | | | | | | | | L | L | U L 430 | U L 450 | U L 440 | L | L | | | | | | | | |
| 3 | | | | | | | | | | L | L | U L 450 | U L 450 | L | L | L | | | | | | | | |
| 4 | | | | | | | | | L | L | U L 410 | L | U L 460 | 420 | U L 410 | L | A | | | | | | | |
| 5 | | | | | | | | | A | L | L | U L 420 | 430 | 420 | L | L | A | A | | | | | | |
| 6 | | | | | | | | | L | L | L | U L 420 | U L 430 | U L 420 | L | L | L | | | | | | | |
| 7 | | | | | | | | | | L | L 410 | 420 | 420 | 420 | 420 | 400 | L | | | | | | | |
| 8 | | | | | | | | A | C | C | C | C | C | L 430 | L 410 | A | | | | | | | | |
| 9 | | | | | | | | A | | L | L | L | L | U L 420 | A | A | L | | | | | | | |
| 10 | | | | | | | | | L | L | U L 400 | L 410 | L | U L 430 | U L 420 | L | L | | | | | | | |
| 11 | | | | | | | | | | L | L | A | A | U L 430 | A | L | L | A | | | | | | |
| 12 | | | | | | | | | | L | L | A | L | L | L | U L 410 | L | | | | | | | |
| 13 | | | | | | | | | L | L | L | U L 420 | 430 | 430 | L 420 | L | L | | | | | | | |
| 14 | | | | | | | | | | L | L | U L 410 | L | 420 | U L 420 | L | L | | | | | | | |
| 15 | | | | | | | | | | | L | U L 420 | L 420 | U L 420 | U L 420 | L | | | | | | | | |
| 16 | | | | | | | | | | | L | L | L | L 430 | L 410 | L | L | | | | | | | |
| 17 | | | | | | | | | | L | 400 | L | L 430 | U L 430 | U L 420 | U L 390 | | | | | | | | |
| 18 | | | | | | | | | | L | L | L | 420 | U L 450 | 420 | U L 400 | L | | | | | | | |
| 19 | | | | | | | | | | L | L | U L 430 | 440 | 430 | 420 | 410 | 400 | | | | | | | |
| 20 | | | | | | | | | | L | L 410 | U L 410 | 420 | 430 | 410 | 400 | L | | | | | | | |
| 21 | | | | | | | | | | L | L | U L 430 | A | 430 | 420 | U L 400 | L | | | | | | | |
| 22 | | | | | | | | | | L | L | L | 430 | 420 | U L 430 | L 400 | L | | | | | | | |
| 23 | | | | | | | | | | L | U L 400 | L | 430 | 430 | 420 | L | L | | | | | | | |
| 24 | | | | | | | | | | L | U L 410 | L | L | L 440 | L 410 | L | L | | | | | | | |
| 25 | | | | | | | | | | L | L 410 | L 420 | U L 440 | U L 440 | L 440 | L | | | | | | | | |
| 26 | | | | | | | | | | | L | L | L | A | L | L | L | | | | | | | |
| 27 | | | | | | | | | | L | L | 410 | L 420 | L | L 420 | L | L | | | | | | | |
| 28 | | | | | | | | | | L | L | L | L 430 | L 410 | L | L | L | | | | | | | |
| 29 | | | | | | | | | L | L | L | L | U L 430 | L 430 | L 410 | L | | | | | | | | |
| 30 | | | | | | | | | | L | L | L | U L 420 | U L 420 | 410 | L | L | | | | | | | |
| 31 | | | | | | | | | | | L | U L 410 | 420 | 410 | 400 | A | 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 | | | | | | | | | | | 8 | 16 | 21 | 26 | 21 | 8 | 1 | | | | | | | |
| MED | | | | | | | | | | | L 410 | U L 420 | L 430 | L 430 | L 420 | L 400 | 400 | | | | | | | |
| UQ | | | | | | | | | | | L 410 | U L 430 | U L 430 | L 430 | L 420 | 405 | | | | | | | | |
| LQ | | | | | | | | | | | L 400 | U L 410 | 420 | 420 | 410 | L 400 | | | | | | | | |

DEC. 1986 | FOF1 (0.01 MHZ)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | FOE (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | S | 210 | A | A | A | A | A | A | A | A | A | | | | | | |
| 2 | | | | | | | | S | 220 | 265 | 275 | A | A | A | A | A | A | S | | | | | | |
| 3 | | | | | | | | S | 210 | A | A | A | A | A | A | A | A | S | | | | | | |
| 4 | | | | | | | | S | 200 | 230 | R 280 | A | A | A | A | A | A | A | | | | | | |
| 5 | | | | | | | | S | 190 | A | A | A | A | A | A | A | A | A | | | | | | |
| 6 | | | | | | | | S | R 190 | A | A | U A 300 | A | A | 300 | 275 | 240 | 190 | | | | | | |
| 7 | | | | | | | | S | 200 | A | A | A | A | A | A | A | A | 190 | | | | | | |
| 8 | | | | | | | | A | C | C | C | C | C | 300 | A | A | A | A | | | | | | |
| 9 | | | | | | | | A | A | A | A | A | A | A | A | A | A | S | | | | | | |
| 10 | | | | | | | | S | R 215 | A | A | A | A | A | A | A | A | A | | | | | | |
| 11 | | | | | | | | S | 190 | A | A | A | A | A | A | A | A | A | | | | | | |
| 12 | | | | | | | | S | 190 | R 250 | A | A | A | A | A | A | A | A | | | | | | |
| 13 | | | | | | | | S | 195 | 250 | 290 | A | A | A | A | A | 245 | 190 | | | | | | |
| 14 | | | | | | | | S | 190 | A | A | A | A | A | A | A | A | A | | | | | | |
| 15 | | | | | | | | S | S | 230 | 280 | R 295 | 300 | 305 | 300 | A | 230 | A | | | | | | |
| 16 | | | | | | | | S | S | 220 | A | A | A | A | A | A | A | S | | | | | | |
| 17 | | | | | | | | S | S | 250 | A | 310 | A | A | 300 | 280 | 260 | 180 | | | | | | |
| 18 | | | | | | | | S | 190 | U A 250 | A | A | A | A | A | A | A | 190 | | | | | | |
| 19 | | | | | | | | S | 195 | A | A | A | A | A | A | A | 250 | A | | | | | | |
| 20 | | | | | | | | S | A | A | U A 290 | U A 305 | A | A | A | A | A | A | | | | | | |
| 21 | | | | | | | | S | 195 | R 250 | 285 | A | A | A | A | A | A | A | | | | | | |
| 22 | | | | | | | | S | 195 | A | 300 | 305 | A | A | A | 280 | 245 | A | | | | | | |
| 23 | | | | | | | | S | 190 | U A 250 | U A 285 | 305 | A | A | A | A | A | 190 | | | | | | |
| 24 | | | | | | | | | 175 | R 245 | A | A | A | A | A | A | 250 | A | | | | | | |
| 25 | | | | | | | | | 185 | 240 | A | A | A | A | A | A | R 240 | R 195 | | | | | | |
| 26 | | | | | | | | | S | 270 | R 300 | A | A | A | A | R 285 | 260 | A | | | | | | |
| 27 | | | | | | | | S | S | 250 | 280 | 290 | A | A | A | A | 260 | A | | | | | | |
| 28 | | | | | | | | | S | 230 | 280 | A | A | A | A | A | A | A | | | | | | |
| 29 | | | | | | | | | 190 | A | A | A | A | A | A | A | 240 | A | | | | | | |
| 30 | | | | | | | | | 200 | R 250 | R 285 | A | 300 | A | A | A | A | 200 | | | | | | |
| 31 | | | | | | | | | 190 | 250 | A | A | A | A | U A 295 | A | A | 200 | | | | | | |
| | 00 | 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 | 17 | 12 | 7 | 2 | 2 | 4 | 4 | 11 | 9 | | | | | | |
| MED | | | | | | | | | 192 | 250 | 285 | 305 | 300 | 302 | 300 | 280 | 245 | 190 | | | | | | |
| UQ | | | | | | | | | 200 | 250 | 290 | 305 | | | 300 | 282 | 255 | 195 | | | | | | |
| LQ | | | | | | | | | 190 | 240 | 280 | 298 | | | 298 | 278 | 240 | 190 | | | | | | |



DEC. 1986 | FOE (0.01 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FOES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station OKINAWA Lat. 26° 16' 9" N. Long. 127° 48' 4" E Sweep 1 MHz to 25 MHz in 24sec in automatic operation

| 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 | E S 16 | E S 16 | E S 16 | E S 16 | 27 | J A 32 | J A 37 | J A 42 | J A 37 | 41 | J A 40 | J A 44 | J A 34 | J A 34 | J A 22 | J A 23 | E S 16 | E S 16 | E S 16 | J A 17 |
| 2 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | G | G | G | J A 34 | J A 60 | 34 | 33 | 31 | J A 28 | E S 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 | J A 26 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | 28 | J A 36 | J A 35 | J A 39 | J A 36 | J A 38 | 32 | J A 52 | J A 37 | J A 54 | J A 22 | J A 22 | J A 22 | J A 17 | J A 25 | J A 24 |
| 4 | 21 | E S 16 | E S 16 | E S 16 | 21 | E S 16 | E S 16 | E S 16 | 25 | 28 | 32 | J A 37 | J A 35 | 34 | 34 | J A 31 | J A 43 | J A 27 | J A 25 | J A 24 | J A 26 | J A 24 | 23 | E S 16 |
| 5 | E S 16 | E S 16 | 19 | E S 16 | E S 16 | E S 16 | E S 16 | 23 | 30 | J A 30 | 32 | J A 37 | J A 37 | 33 | J A 37 | J A 52 | J A 52 | J A 40 | J A 25 | J A 23 | J A 24 | 21 | E S 16 | E S 16 |
| 6 | E S 16 | E S 15 | 22 | E S 16 | E S 16 | E S 16 | 20 | E S 16 | 23 | 28 | 32 | 36 | J A 33 | J A 33 | G | G | G | G | 22 | 22 | J A 21 | J A 24 | 22 | 20 |
| 7 | 18 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | G | J A 32 | J A 35 | J A 38 | J A 39 | J A 36 | J A 33 | J A 31 | J A 25 | G | 18 | E S 16 | 22 | J A 21 | J A 21 | E S 16 |
| 8 | J A 22 | E S 16 | J A 24 | J A 24 | J A 34 | J A 24 | J A 37 | J A 82 | C | C | C | C | C | 37 | J A 37 | J A 50 | J A 74 | J A 22 | J A 24 | J A 76 | J A 24 | 22 | J A 32 | J A 28 |
| 9 | J A 42 | J A 38 | J A 64 | J A 42 | J A 37 | J A 33 | J A 30 | J A 54 | J A 40 | J A 33 | J A 47 | J A 41 | J A 48 | J A 50 | J A 79 | J A 85 | J A 65 | J A 21 | 22 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 |
| 10 | E S 16 | E S 16 | J A 33 | J A 24 | J A 21 | J A 22 | E S 16 | E S 16 | G | J A 32 | J A 40 | J A 43 | J A 75 | J A 38 | J A 36 | J A 44 | J A 37 | J A 41 | J A 29 | J A 21 | J A 31 | J A 32 | 22 | E S 16 |
| 11 | 20 | J A 20 | J A 22 | J A 20 | J A 20 | 23 | 22 | E S 16 | G | J A 30 | J A 37 | J A 56 | J A 106 | J A 64 | J A 65 | J A 64 | J A 77 | J A 44 | J A 47 | J A 21 | 21 | 22 | 21 | E S 16 |
| 12 | E S 16 | E S 16 | E S 16 | E S 15 | E S 16 | E S 16 | S | E S 16 | G | 30 | J A 35 | J A 70 | J A 75 | J A 75 | J A 77 | J A 76 | J A 34 | J A 35 | J A 65 | J A 33 | J A 25 | J A 20 | J A 21 | E S 16 |
| 13 | E S 16 | E S 16 | E S 16 | J A 21 | J A 25 | J A 29 | 22 | J A 21 | 28 | 31 | 32 | J A 37 | J A 40 | 35 | J A 50 | J A 37 | G | 28 | J A 26 | 23 | E S 16 | E S 16 | E S 16 | E S 16 |
| 14 | 22 | 20 | E S 16 | J A 21 | J A 25 | J A 20 | J A 25 | J A 22 | G | J A 30 | J A 33 | J A 40 | J A 41 | J A 32 | J A 72 | J A 75 | J A 40 | J A 36 | J A 36 | J A 30 | J A 33 | J A 25 | J A 26 | J A 26 |
| 15 | E S 16 | E S 16 | J A 25 | E S 16 | J A 26 | E S 16 | E S 16 | E S 16 | J A 24 | 29 | 32 | G | 37 | 37 | 38 | J A 39 | G | J A 32 | J A 34 | J A 17 | J A 30 | 21 | E S 16 | E S 16 |
| 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | 20 | J A 17 | 19 | E S 16 | G | 32 | 32 | 35 | J A 34 | J A 39 | J A 44 | J A 28 | E S 16 | J A 21 | J A 18 | E S 16 | E S 16 | E S 16 | E S 16 |
| 17 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | G | 38 | 37 | J A 44 | 40 | G | G | G 22 | 27 | E S 16 | J A 52 | J A 17 | J A 24 | E S 16 | E S 16 |
| 18 | E S 16 | E S 16 | E S 16 | J A 22 | 20 | 23 | E S 16 | E S 16 | J A 26 | 31 | J A 35 | J A 36 | J A 43 | J A 44 | J A 34 | J A 37 | J A 27 | J A 27 | J A 21 | 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 15 | E S 16 | E S 16 | 21 | G | J A 35 | J A 40 | J A 42 | J A 41 | J A 44 | J A 43 | J A 30 | G | J A 25 | 23 | 20 | E S 16 | E S 16 | E S 16 | E S 16 |
| 20 | E S 16 | E S 16 | E S 16 | E S 15 | E S 16 | E S 16 | E S 16 | E S 16 | J A 24 | J A 32 | 37 | 33 | J A 35 | J A 31 | J A 39 | J A 42 | J A 30 | J A 26 | J A 24 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 |
| 21 | E S 16 | E S 16 | 18 | E S 16 | 18 | E S 16 | E S 16 | E S 16 | 26 | 30 | 33 | J A 32 | J A 53 | J A 54 | J A 32 | J A 28 | J A 33 | J A 26 | 22 | 19 | 22 | E S 16 | E S 16 | E S 16 |
| 22 | E S 16 | E S 16 | E S 16 | E S 15 | E S 16 | E S 16 | E S 16 | E S 16 | G | 32 | 32 | 33 | J A 39 | J A 35 | J A 31 | 31 | G | J A 22 | 23 | 22 | 22 | 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 | 20 | E S 16 | G | 30 | 32 | G | J A 44 | J A 36 | J A 32 | J A 30 | J A 25 | G | E S 16 | E S 16 | J A 21 | 22 | 18 | E S 16 |
| 24 | E S 16 | E S 16 | 23 | J A 30 | J A 31 | J A 26 | J A 23 | 21 | G | G | J A 37 | J A 37 | J A 37 | J A 42 | J A 54 | J A 33 | G | J A 26 | J A 24 | J A 22 | J A 29 | J A 24 | J A 21 | 21 |
| 25 | E S 16 | E S 16 | E S 16 | E S 16 | E S 15 | 22 | J A 22 | 22 | 24 | G | J A 37 | J A 41 | J A 40 | J A 41 | J A 75 | J A 36 | G | G | J A 28 | J A 24 | J A 33 | J A 25 | 22 | E S 16 |
| 26 | E S 16 | E S 16 | J A 18 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | G | G | J A 42 | J A 85 | J A 75 | J A 40 | G | G | J A 32 | J A 32 | J A 24 | 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 | J A 23 | J A 22 | E S 16 | E S 16 | G | G | J A 37 | J A 46 | J A 97 | J A 44 | J A 43 | G | J A 29 | J A 25 | J A 22 | J A 30 | J A 32 | J A 28 | 22 |
| 28 | J A 17 | J A 24 | J A 26 | J A 24 | J A 25 | J A 22 | E S 16 | E S 16 | E S 16 | 30 | J A 34 | 40 | J A 41 | J A 37 | 37 | J A 32 | J A 27 | J A 25 | J A 24 | J A 17 | 20 | E S 16 | E S 16 | E S 16 |
| 29 | E S 16 | J A 33 | J A 25 | J A 36 | J A 22 | E S 16 | E S 16 | E S 16 | 24 | 29 | 31 | J A 33 | J A 33 | J A 64 | J A 35 | J A 35 | G | J A 26 | J A 25 | J A 17 | E S 16 | E S 16 | E S 16 | E S 16 |
| 30 | E S 16 | 20 | 20 | 20 | E S 16 | E S 16 | E S 16 | E S 16 | G | 29 | 32 | 37 | 38 | 38 | 33 | 30 | J A 25 | G | J A 25 | 20 | 22 | 22 | 22 | 21 |
| 31 | 22 | J A 24 | E S 16 | J A 20 | E S 16 | 20 | 22 | E S 16 | G | 28 | 33 | 32 | 33 | 33 | 35 | J A 35 | J A 25 | G | J A 20 | E S 16 | 21 | J A 24 | J A 25 | 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 | 30 | 31 | 30 | 30 | 30 | 30 | 30 | 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 | 30 | 33 | J A 37 | J A 40 | J A 38 | J A 37 | J A 36 | J A 27 | J A 26 | J A 24 | J A 21 | 21 | 21 | E S 16 | E S 16 |
| UQ | 16 | E S 16 | J A 22 | J A 21 | J A 22 | 22 | 22 | 20 | 25 | J A 32 | J A 37 | J A 41 | J A 46 | J A 44 | J A 44 | J A 44 | J A 36 | J A 32 | J A 26 | J A 23 | J A 24 | J A 24 | 22 | 18 |
| LQ | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | G | 28 | 32 | 33 | J A 37 | 34 | 33 | J A 31 | G | 18 | 22 | 17 | E S 16 | E S 16 | E S 16 | E S 16 |

DEC. 1986 | FOES (0.1 MHZ)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | FBES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station OKINAWA Lat. 26° 16.9' N. Long. 127° 48.4' E Sweep 1 MHz to 25 MHz in 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 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 26 | 29 | 32 | 33 | 34 | 39 | 37 | 36 | 29 | 30 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 2 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | G | G | 31 | 31 | 31 | 31 | 29 | 27 | ES 16 | 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 | ES 16 | 27 | 27 | 31 | 32 | 32 | 33 | 21 | 37 | 28 | 29 | 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 | ES 16 | ES 16 | 25 | 23 | 32 | 33 | 33 | 32 | 34 | 30 | 42 | 22 | 20 | 21 | 20 | ES 16 | ES 16 | ES 16 |
| 5 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 18 | 30 | 28 | 32 | 32 | 32 | 32 | 32 | 38 | 45 | 33 | 22 | 20 | 19 | ES 16 | ES 16 | ES 16 |
| 6 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 23 | 28 | 31 | 34 | 32 | 33 | G | G | G | G | ES 16 | ES 16 | 20 | 20 | ES 16 | ES 16 |
| 7 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | 30 | 32 | 31 | 31 | 32 | 32 | 29 | 25 | G | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 8 | ES 16 | ES 16 | ES 15 | ES 16 | AA 34 | AA 24 | AA 37 | AA 32 | C | C | C | C | C | 33 | 33 | 38 | 32 | 22 | 17 | 27 | 18 | ES 16 | ES 16 | 24 |
| 9 | 18 | AA 38 | 20 | AA 42 | AA 37 | AA 33 | AA 30 | AA 54 | 25 | 30 | 38 | 39 | 39 | 37 | 48 | 50 | 29 | 20 | 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 10 | ES 16 | ES 16 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | G | 28 | 33 | 32 | 39 | 34 | 33 | 33 | 21 | 27 | 28 | 18 | ES 16 | 25 | ES 16 | ES 16 |
| 11 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | 30 | 32 | 45 | 50 | 39 | 54 | 35 | 32 | 39 | 32 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 12 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | S | ES 16 | G | 28 | 32 | 45 | 40 | 39 | 33 | 34 | 25 | 28 | 40 | 25 | 18 | ES 16 | ES 16 | ES 16 |
| 13 | ES 16 | ES 16 | ES 16 | ES 16 | 18 | 20 | ES 16 | 18 | 28 | 31 | 32 | 35 | 35 | 35 | 32 | 28 | G | 23 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 14 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | AA 25 | 17 | G | 29 | 30 | 35 | 33 | 32 | 30 | 34 | 26 | 25 | 28 | 21 | 25 | 25 | 21 | ES 16 |
| 15 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 20 | 29 | 31 | G | 33 | 36 | 33 | 29 | G | 20 | ES 16 | ES 16 | 24 | ES 16 | ES 16 | ES 16 |
| 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 18 | ES 16 | ES 16 | ES 16 | G | 31 | 31 | 34 | 34 | 30 | 34 | 23 | ES 16 | 18 | 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 | ES 16 | ES 16 | G | 34 | 33 | 41 | 38 | G | G | G 21 | 25 | ES 16 | ES 16 | ES 16 | 20 | ES 16 | ES 16 |
| 18 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 25 | 31 | 35 | 36 | 39 | 34 | 32 | 29 | 25 | 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 19 | ES 16 | ES 16 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | 18 | G | 20 | 33 | 35 | 34 | 33 | 37 | 28 | G | 20 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 |
| 20 | ES 16 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | 24 | 30 | 35 | 33 | 32 | 31 | 35 | 32 | 28 | 20 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 21 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 26 | 30 | 33 | 32 | 45 | 38 | 32 | 28 | 26 | 22 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 22 | ES 16 | ES 16 | ES 16 | ES 15 | ES 16 | ES 16 | ES 16 | ES 16 | G | 29 | 32 | 33 | 36 | 33 | 31 | 31 | G | 20 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 23 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | 30 | 32 | G | 40 | 37 | 31 | 29 | 25 | G | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 24 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | AA 23 | ES 16 | G | G | 34 | 36 | 36 | 33 | 37 | 30 | G | 20 | 20 | ES 16 | 29 | 20 | 19 | ES 16 |
| 25 | ES 16 | ES 16 | ES 16 | ES 16 | ES 15 | ES 15 | ES 16 | ES 16 | 24 | G | 31 | 33 | 35 | 34 | 40 | 33 | G | G | 23 | 18 | 18 | ES 16 | ES 16 | ES 16 |
| 26 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | G | 34 | 32 | 43 | 30 | G | G | 21 | 18 | 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 | ES 16 | ES 16 | G | G | 35 | 40 | 32 | 30 | 29 | G | 21 | ES 16 | ES 16 | 21 | ES 16 | AA 28 | ES 16 |
| 28 | ES 16 | ES 16 | ES 16 | ES 16 | 20 | ES 16 | ES 16 | ES 16 | ES 16 | 28 | 32 | 40 | UY 41 | 32 | 32 | 28 | 26 | 21 | 18 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 29 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | 23 | 28 | 29 | 31 | 33 | 35 | 32 | 32 | G | 22 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 30 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | 28 | 32 | 37 | 38 | 37 | 32 | 29 | 25 | G | 20 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |
| 31 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | 23 | 33 | 32 | 33 | 33 | 33 | 35 | 25 | G | 20 | ES 16 | ES 16 | ES 16 | ES 16 | 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 | 30 | 31 | 30 | 30 | 30 | 30 | 30 | 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 | ES 16 | 16 | 28 | 32 | 33 | 34 | 34 | 32 | 30 | 25 | 21 | ES 16 | 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 | ES 16 | 25 | 30 | 33 | 35 | 39 | 37 | 34 | 34 | 28 | 24 | 20 | ES 16 | 18 | ES 16 | ES 16 | ES 16 |
| LQ | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | G | 20 | 31 | 32 | 33 | 32 | 31 | 29 | G | 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 | ES 16 |



DEC. 1986 | FBES (0.1 MHZ)

# IONOSPHERIC DATA

DEC. 1986 | FMIN (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9h)

Station OKINAWA Lat. 26° 16.9' N. Long. 127° 48.4' E Sweep 1 MHz to 25 MHz in 2.4sec in automatic operation

| Hour / Day | 00 | 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 | E S 16 | 15 | 15 | 14 | 16 | 22 | 17 | 14 | 17 | 16 | 14 | E S 15 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 |
| 2 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | 14 | 14 | 16 | 16 | 16 | 17 | 16 | 17 | 16 | E S 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 | E S 16 | 15 | 16 | 14 | 20 | 18 | 16 | 17 | 18 | 16 | E S 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 | E S 16 | 16 | 16 | 16 | 15 | 16 | 15 | 16 | 15 | 15 | 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 | 14 | 14 | 14 | 15 | 16 | 15 | 15 | 15 | 15 | 14 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 |
| 6 | E S 16 | E S 15 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | 15 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 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 | 14 | 14 | 15 | 14 | 16 | 15 | 15 | 14 | 15 | 16 | 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 15 | E S 16 | E S 16 | E S 16 | E S 16 | 15 | C | C | C | C | C | 16 | 14 | 14 | 13 | 13 | E S 14 | E S 15 | E S 16 | E S 16 | E S 16 | E S 16 |
| 9 | E S 16 | E S 15 | E S 14 | E S 14 | E S 16 | E S 16 | E S 16 | 16 | 16 | 16 | 16 | 14 | 14 | 15 | 15 | 14 | 13 | E S 15 | E S 14 | 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 15 | E S 16 | E S 16 | E S 16 | 14 | 14 | 16 | 14 | 17 | 15 | 14 | 14 | 14 | 15 | E S 15 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 |
| 11 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | 15 | 16 | 15 | 15 | 15 | 16 | 16 | 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 15 | E S 16 | E S 16 | S | E S 16 | 16 | 16 | 16 | 16 | 16 | 15 | 15 | 14 | 15 | 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 | 16 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 14 | 15 | 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 | 15 | 14 | 15 | 14 | 16 | 18 | 17 | 14 | 14 | 15 | E S 16 | E S 16 | E S 15 | E S 15 | 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 | E S 15 | 14 | 15 | 14 | 15 | 14 | 14 | 17 | 16 | 15 | 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 | E S 16 | 14 | 14 | 17 | 16 | 17 | 16 | 16 | 14 | E S 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 | E S 16 | 15 | 14 | 14 | 17 | 17 | 18 | 16 | 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 15 | E S 16 | E S 16 | E S 16 | E S 16 | 15 | 15 | 16 | 16 | 15 | 15 | 15 | 15 | 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 15 | E S 16 | E S 16 | E S 16 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 14 | 15 | 14 | E S 16 | E S 15 | E S 16 | E S 16 | E S 16 | E S 16 |
| 20 | E S 16 | E S 16 | E S 16 | E S 15 | E S 16 | E S 16 | E S 16 | E S 16 | 15 | 15 | 15 | 15 | 15 | 14 | 14 | 14 | 15 | 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 | 16 | 15 | 15 | 15 | 16 | 15 | 15 | 15 | 15 | 15 | 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 15 | E S 16 | E S 16 | E S 16 | E S 16 | 16 | 15 | 15 | 15 | 16 | 14 | 15 | 15 | 15 | 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 | E S 16 | 16 | 15 | 15 | 15 | 16 | 15 | 15 | 16 | 15 | 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 | 15 | 16 | 15 | 13 | 18 | 14 | 14 | 14 | 13 | 13 | E S 16 | E S 16 | E S 15 | E S 15 | E S 16 | E S 16 |
| 25 | E S 16 | E S 16 | E S 16 | E S 16 | E S 15 | E S 15 | E S 16 | E S 16 | 14 | 13 | 13 | 14 | 16 | 16 | 13 | 14 | 13 | 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 | E S 16 | 15 | 15 | 17 | 14 | 18 | 16 | 16 | 16 | 16 | E S 15 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 |
| 27 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | 14 | 16 | 16 | 17 | 27 | 27 | 17 | 16 | 16 | E S 14 | E S 15 | E S 15 | 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 | E S 16 | 14 | 16 | 16 | 16 | 15 | 16 | 14 | 14 | 14 | E S 15 | 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 | 14 | 16 | 16 | 14 | 15 | 15 | 14 | 14 | 15 | 14 | E S 15 | 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 | 15 | 16 | 15 | 15 | 15 | 15 | 16 | 15 | 15 | 15 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 |
| 31 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 | 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 | 30 | 31 | 30 | 30 | 30 | 30 | 30 | 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 | 15 | 15 | 15 | 15 | 16 | 15 | 15 | 15 | 15 | 15 | 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 | E S 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 15 | 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 | 14 | 14 | 14 | 15 | 15 | 14 | 14 | 14 | 14 | E S 15 | E S 16 | E S 16 | E S 16 | E S 16 | E S 16 |

DEC. 1986 | FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | M(3000)F2 (0.01) | 135° E Mean Time (G.M.T. + 9h)

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

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 295 | 295 | 310 | 310 | 305 | 290 | 335 | 300 | 355 | 365 | 345 | 335 | 355 | 360 | 345 | 345 | 330 | 335 | 355 | 365 | S 310 | 310 | 350 | 315 |
| 2 | 310 | 320 | F | 315 | 320 | 345 | 345 | 350 | 365 | 350 | 315 | 340 | 335 | 320 | 315 | U R 310 | R 340 | 355 | S 350 | 285 | S 305 | U S 365 | 365 | 320 |
| 3 | 320 | 320 | 315 | 365 | 405 | F | F | 335 | 365 | 365 | 340 | 330 | 330 | 345 | R 340 | R 345 | 345 | 375 | 360 | 335 | 300 | 350 | 345 | 345 |
| 4 | 315 | 295 | F | 350 | U S 365 | F | F | 310 | 345 | R 330 | 345 | 360 | R 310 | U R 335 | U R 340 | U R 300 | R 340 | 365 | 365 | 340 | U S 335 | 315 | F | F |
| 5 | F | F | 340 | U S 365 | 350 | 325 | 315 | 350 | 360 | 360 | 340 | 320 | 345 | R 330 | R 335 | 345 | 330 | 365 | 355 | 350 | S 335 | S 305 | S 295 | 320 |
| 6 | 345 | 355 | 335 | 365 | 365 | 340 | S 360 | 345 | 350 | R 360 | 365 | 360 | R 310 | 340 | R 345 | U R 320 | 315 | 335 | 365 | 355 | 340 | U S 345 | 340 | U S 320 |
| 7 | 285 | S 300 | 345 | 365 | S 365 | 335 | 300 | 355 | 360 | 365 | R 335 | 350 | 335 | 325 | U R 325 | R 345 | R 350 | J R 355 | U S 365 | 355 | S 325 | F | F | F |
| 8 | F | F 335 | F | S 365 | A | A | A | A | C | C | C | C | C | 325 | 360 | 340 | R 345 | 360 | 365 | 350 | S 315 | S 300 | F 335 | F |
| 9 | F 360 | A | F 345 | A | A | A | A | A | 360 | 360 | 340 | 330 | 310 | 350 | 365 | R 360 | R 340 | 360 | 355 | S 355 | 360 | 305 | 335 | 340 |
| 10 | 340 | 325 | F 345 | F | F | F 340 | S 335 | 350 | 340 | 360 | 360 | 355 | R 345 | 360 | 335 | 355 | 345 | 360 | S 360 | 365 | 325 | S 335 | 355 | 310 |
| 11 | F | F | 320 | U S 340 | S 345 | F | F | 355 | 365 | 355 | 340 | R 335 | 360 | 350 | 340 | 350 | R 340 | R 360 | 360 | 350 | U S 325 | 305 | 345 | 300 |
| 12 | S 315 | 330 | S 335 | 350 | 365 | 360 | S | R 345 | R 360 | 360 | 360 | 340 | 330 | 345 | 360 | R 330 | R 315 | 350 | 365 | S 365 | S 310 | 355 | S 335 | 300 |
| 13 | 295 | 320 | 345 | 320 | 335 | 365 | 350 | 340 | 355 | 340 | 360 | 340 | 360 | 350 | 345 | 360 | 355 | 365 | 360 | 315 | S 315 | 320 | S 320 | 350 |
| 14 | U S 335 | F | F | F | F | F | A | 345 | 365 | 355 | 325 | 330 | 365 | 365 | R 330 | U R 310 | 340 | R 360 | 335 | 305 | J S 320 | 335 | J S 350 | 350 |
| 15 | F | 305 | 335 | 390 | S 340 | F | S 310 | 335 | 345 | 360 | 360 | 320 | 350 | 340 | 345 | 340 | 350 | 340 | 355 | 345 | 340 | 330 | 335 | 335 |
| 16 | 320 | 320 | S 315 | 355 | 320 | 360 | 340 | 345 | 375 | 350 | 375 | 365 | 320 | 320 | 340 | 335 | 355 | 370 | 390 | 280 | S 340 | F | 375 | 380 |
| 17 | 310 | 320 | F | F | F | F | F | 335 | 360 | 360 | 370 | 380 | 335 | 310 | 335 | 305 | 330 | 380 | 380 | 410 | 330 | 330 | 335 | 335 |
| 18 | S 320 | U S 325 | 335 | 315 | 330 | U S 340 | S 335 | R 345 | 345 | 330 | R 365 | 350 | 335 | 345 | 360 | 340 | R 330 | 355 | R 360 | S 350 | S 345 | 320 | S 340 | 320 |
| 19 | 335 | 315 | 320 | S 335 | S 360 | S 365 | 335 | 335 | 355 | 360 | 350 | 345 | 325 | R 325 | 340 | U R 290 | 325 | U R 325 | U S 355 | 365 | 305 | 315 | S 345 | 340 |
| 20 | 320 | 315 | 305 | 335 | 335 | 365 | 335 | 340 | 365 | 350 | 350 | 345 | 310 | 320 | R 325 | R 320 | U R 345 | R 350 | S 360 | S 295 | S 330 | S 355 | 350 | 320 |
| 21 | S 325 | 300 | 325 | F | 365 | 365 | 360 | J R 360 | 325 | 355 | 360 | R 335 | 330 | 350 | 360 | 340 | 355 | 355 | 355 | 350 | S 335 | 315 | 355 | S 345 |
| 22 | 315 | 305 | F | 365 | 365 | 325 | S 315 | 320 | R 355 | 360 | 360 | 355 | 320 | 345 | 335 | 350 | 365 | 350 | 360 | 365 | S 305 | U S 325 | 345 | 360 |
| 23 | 310 | 320 | 320 | F | S 350 | 365 | 320 | 335 | 350 | 350 | 345 | R 335 | 320 | 325 | 350 | 365 | 360 | 360 | 340 | S 355 | 350 | 345 | 335 | 320 |
| 24 | 285 | 285 | 315 | S 360 | 290 | S 285 | A | 325 | 350 | 330 | 350 | U R 360 | 345 | 345 | H 300 | 330 | 345 | 355 | 320 | S 360 | 365 | S 355 | S 290 | 310 |
| 25 | S 300 | 300 | 330 | 345 | S 365 | 325 | 310 | 325 | 365 | 350 | 340 | 340 | 340 | 350 | 320 | 350 | 300 | 360 | 335 | 340 | 335 | 305 | 305 | 305 |
| 26 | 310 | 315 | 325 | 320 | 345 | 345 | 320 | 285 | 350 | 370 | 375 | 370 | 365 | U S 335 | 305 | 355 | 350 | 345 | 350 | 335 | S 365 | F | F | F |
| 27 | F | F | 320 | 355 | 340 | S 345 | S 320 | S 340 | 350 | 350 | 365 | 375 | 350 | 350 | 345 | 360 | 355 | 365 | 365 | 340 | 330 | 345 | A | S 320 |
| 28 | F | F | F | F | F | F | F | 340 | 365 | 385 | 350 | 360 | 310 | 335 | 365 | 340 | 345 | U R 365 | S 370 | 360 | F | F | 335 | F |
| 29 | 320 | 335 | 320 | 325 | 335 | 315 | 340 | 320 | 350 | 350 | 365 | 345 | 340 | 340 | 360 | 370 | 355 | 370 | 380 | 365 | 295 | 310 | U S 355 | S 360 |
| 30 | 325 | 310 | 320 | 350 | 360 | 350 | 315 | S 355 | 355 | 340 | 360 | R 365 | 360 | 360 | 360 | 360 | 355 | 360 | 355 | U S 340 | F | 345 | 365 | S 325 |
| 31 | 355 | 325 | 315 | 320 | 350 | 355 | 320 | S 345 | 355 | 360 | 315 | 355 | 340 | 340 | 350 | 355 | 350 | 365 | S 365 | 310 | 320 | S 345 | 335 | 340 |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 25 | 25 | 24 | 24 | 25 | 22 | 21 | 29 | 30 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 29 | 27 | 27 | 26 |
| MED | 320 | 320 | 322 | 350 | 350 | 345 | 335 | 340 | 355 | 358 | 350 | 345 | 335 | 340 | 340 | 345 | 345 | 360 | 360 | 350 | S 330 | 330 | 340 | 322 |
| UQ | 325 | 325 | 335 | 365 | 365 | 360 | 340 | 345 | 365 | 360 | 360 | 360 | 350 | 350 | 355 | 355 | 352 | 365 | 365 | 360 | 340 | 345 | 350 | 345 |
| LQ | 310 | 305 | 318 | 322 | 335 | 325 | 315 | 335 | 350 | 350 | 340 | 335 | 320 | 328 | 335 | 330 | 335 | 352 | 355 | 338 | S 315 | 312 | 335 | 320 |

DEC. 1986 | M(3000)F2 (0.01)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | M(3000)F1 (0.01) | 135° E Mean Time (G.M.T. + 9h)

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

| 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 | L 395 | U L 370 | L | L | L | L | | | | | | | |
| 2 | | | | | | | | | | L | L | U L 395 | U L 375 | U L 385 | L | L | | | | | | | | |
| 3 | | | | | | | | | | L | L | U L 375 | U L 355 | L | L | L | | | | | | | | |
| 4 | | | | | | | | | L | L | U L 415 | L | U L 390 | 405 | U L 415 | L | A | | | | | | | |
| 5 | | | | | | | | | A | L | L | U L 405 | 395 | 405 | L | L | A | A | | | | | | |
| 6 | | | | | | | | | L | L | L | U L 400 | U L 395 | U L 405 | L | L | L | | | | | | | |
| 7 | | | | | | | | | | L | L 380 | 390 | 405 | 405 | 390 | 375 | L | | | | | | | |
| 8 | | | | | | | | A | C | C | C | C | C | L 370 | L 390 | A | | | | | | | | |
| 9 | | | | | | | | A | | L | L | L | L | U L 380 | A | A | L | | | | | | | |
| 10 | | | | | | | | | L | L | U L 400 | L 400 | L | U L 385 | U L 370 | L | L | | | | | | | |
| 11 | | | | | | | | | | L | L | A | A | U L 395 | A | L | L | A | | | | | | |
| 12 | | | | | | | | | | L | L | A | L | L | L | U L 390 | L | | | | | | | |
| 13 | | | | | | | | | L | L | L | U L 405 | 395 | 395 | L 405 | L | L | | | | | | | |
| 14 | | | | | | | | | | L | L | U L 395 | L | 405 | U L 390 | L | L | | | | | | | |
| 15 | | | | | | | | | | | L | U L 380 | L 380 | U L 405 | U L 380 | L | | | | | | | | |
| 16 | | | | | | | | | | | L | L | L | L 395 | L 390 | L | L | | | | | | | |
| 17 | | | | | | | | | | L | 400 | L | A | U L 395 | U L 405 | U L 410 | | | | | | | | |
| 18 | | | | | | | | | | L | L | L | 405 | U L 395 | 380 | U L 400 | L | | | | | | | |
| 19 | | | | | | | | | | L | L | U L 395 | 385 | 385 | 380 | 390 | 385 | | | | | | | |
| 20 | | | | | | | | | | L | L 400 | U L 400 | 415 | 395 | 390 | 400 | L | | | | | | | |
| 21 | | | | | | | | | | L | L | U L 395 | A | 395 | 390 | U L 390 | L | | | | | | | |
| 22 | | | | | | | | | | L | L | L | 395 | 405 | U L 395 | L 400 | L | | | | | | | |
| 23 | | | | | | | | | | L | U L 385 | L | 395 | 390 | 405 | L | L | | | | | | | |
| 24 | | | | | | | | | | L | U L 380 | L | L | L 375 | L 390 | L | L | | | | | | | |
| 25 | | | | | | | | | | L | L 380 | L 380 | U L 375 | U L 385 | L 385 | L | | | | | | | | |
| 26 | | | | | | | | | | | L | L | L | A | L | L | L | | | | | | | |
| 27 | | | | | | | | | | L | L | 415 | A | L | L 370 | L | L | | | | | | | |
| 28 | | | | | | | | | | L | L | L | L 395 | L 390 | L | L | L | | | | | | | |
| 29 | | | | | | | | | L | L | L | L | U L 395 | L 395 | L 390 | L | | | | | | | | |
| 30 | | | | | | | | | | L | L | L | U L 405 | U L 405 | 400 | L | L | | | | | | | |
| 31 | | | | | | | | | | | L | U L 390 | 390 | 415 | 400 | A | 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 | | | | | | | | | | | 8 | 16 | 19 | 26 | 21 | 8 | 1 | | | | | | | |
| MED | | | | | | | | | | | L 392 | U L 395 | L 395 | L 395 | L 390 | L 395 | 385 | | | | | | | |
| UQ | | | | | | | | | | | L 400 | U L 400 | 395 | 405 | L 400 | L 400 | | | | | | | | |
| LQ | | | | | | | | | | | L 380 | U L 390 | U L 382 | L 385 | L 385 | 390 | | | | | | | | |

DEC. 1986 | M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | H'F2 (KM) | 135° E Mean Time (G.M.T. + 9h)

Station OKINAWA Lat. 26° 16.9' N, Long. 127° 48.4' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

| Hour / Day | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | 225 | 245 | 275 | 245 | 240 | 255 | 245 | 240 | | | | | | | |
| 2 | | | | | | | | | | 240 | 255 | 250 | 260 | 270 | 260 | 255 | | | | | | | | |
| 3 | | | | | | | | | | 230 | 250 | 265 | 265 | 250 | 240 | 230 | | | | | | | | |
| 4 | | | | | | | | | 240 | 240 | 240 | 235 | 260 | 240 | 220 | 240 | 240 | | | | | | | |
| 5 | | | | | | | | | 225 | 230 | 250 | 260 | 260 | 240 | 245 | 260 | 240 | 230 | | | | | | |
| 6 | | | | | | | | | 260 | 235 | 240 | 240 | 270 | 240 | 235 | 230 | 230 | | | | | | | |
| 7 | | | | | | | | | | 240 | 275 | 245 | 250 | 245 | 245 | 240 | 235 | | | | | | | |
| 8 | | | | | | | | A | C | C | C | C | C | 230 | 230 | 250 | | | | | | | | |
| 9 | | | | | | | | A | | 240 | 270 | 275 | 280 | 245 | 245 | 250 | 255 | | | | | | | |
| 10 | | | | | | | | | 220 | 240 | 235 | 255 | 255 | 240 | 270 | 240 | 250 | | | | | | | |
| 11 | | | | | | | | | | 225 | 250 | 265 | 220 | 255 | A | 240 | 250 | 230 | | | | | | |
| 12 | | | | | | | | | | 235 | 240 | A | 260 | 250 | 235 | 265 | 240 | | | | | | | |
| 13 | | | | | | | | | 240 | 250 | 250 | 260 | 240 | 250 | 250 | 240 | 240 | | | | | | | |
| 14 | | | | | | | | | | 240 | 260 | 270 | 230 | 230 | 250 | 265 | 240 | | | | | | | |
| 15 | | | | | | | | | | | 250 | 280 | 250 | 240 | 255 | 245 | | | | | | | | |
| 16 | | | | | | | | | | | 245 | 220 | 270 | 295 | 250 | 250 | 235 | | | | | | | |
| 17 | | | | | | | | | | 250 | 245 | 235 | 295 | 260 | 240 | 260 | | | | | | | | |
| 18 | | | | | | | | | | 250 | 230 | 250 | 260 | 250 | 260 | 250 | 250 | | | | | | | |
| 19 | | | | | | | | | | 230 | 260 | 275 | 270 | 270 | 250 | 250 | 250 | | | | | | | |
| 20 | | | | | | | | | | 250 | 260 | 250 | 275 | 280 | 260 | 230 | 235 | | | | | | | |
| 21 | | | | | | | | | | 250 | 240 | 260 | 280 | 250 | 240 | 290 | 250 | | | | | | | |
| 22 | | | | | | | | | | 250 | 245 | 250 | 300 | 250 | 260 | 245 | 235 | | | | | | | |
| 23 | | | | | | | | | | 240 | 260 | 265 | 270 | 255 | 240 | 230 | 230 | | | | | | | |
| 24 | | | | | | | | | | 255 | 250 | 230 | 245 | 255 | 250 | 235 | 230 | | | | | | | |
| 25 | | | | | | | | | | 245 | 280 | 245 | 250 | 255 | 250 | 230 | | | | | | | | |
| 26 | | | | | | | | | | | 240 | 220 | 250 | 250 | L 250 | 235 | 250 | | | | | | | |
| 27 | | | | | | | | | | 250 | 240 | 225 | 250 | U L 265 | 260 | L 245 | 235 | | | | | | | |
| 28 | | | | | | | | | | 235 | 240 | 250 | 310 | 260 | 240 | 255 | 260 | | | | | | | |
| 29 | | | | | | | | | 260 | 250 | 230 | 250 | 260 | 250 | 225 | 230 | | | | | | | | |
| 30 | | | | | | | | | | 240 | 240 | 240 | 250 | 250 | 265 | 240 | 240 | | | | | | | |
| 31 | | | | | | | | | | | 250 | 270 | 265 | 260 | 250 | 240 | 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 | | | | | | | | | 6 | 26 | 30 | 29 | 30 | 31 | 30 | 31 | 24 | 2 | | | | | | |
| MED | | | | | | | | | 240 | 240 | 248 | 250 | 260 | 250 | 250 | 245 | 240 | 230 | | | | | | |
| UQ | | | | | | | | | 260 | 250 | 255 | 265 | 270 | 258 | 255 | 250 | 250 | | | | | | | |
| LQ | | | | | | | | | 225 | 235 | 240 | 240 | 250 | 242 | 240 | 238 | 235 | | | | | | | |

DEC. 1986 | H'F2 (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | H'F (KM) | 135° E Mean Time (G.M.T. + 9h)

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

| 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 | 275 | 300 | 275 | 265 | 285 | 250 | 245 | 260 | 250 | 230 | 220 | 210 | 240 | A | A | A | A | 220 | 210 | 200 | 210 | 260 | 205 | 295 |
| 2 | 290 | 295 | 285 | 290 | 265 | 240 | 240 | 245 | 230 | 205 | 205 | 190 | 190 | 185 | 210 | 220 | 220 | 205 | 195 | 220 | 225 | 220 | 210 | S 280 |
| 3 | 275 | 265 | 290 | 245 | 205 | S | S | 230 | 220 | 200 | 200 | 190 | 175 | 235 | 215 | A | 225 | 200 | 200 | 200 | 260 | 210 | 250 | 245 |
| 4 | S 260 | E S 280 | 240 | 240 | 205 | S | S | 245 | 225 | 220 | 215 | 210 | 200 | 200 | A | 210 | A | 210 | 205 | 210 | 220 | 230 | 215 | 210 |
| 5 | S 275 | E S 280 | 250 | 210 | S | S | S | 230 | A | 220 | 210 | 210 | 210 | 210 | 210 | A | A | A | 210 | 210 | A | S 250 | S 250 | E S 270 |
| 6 | 260 | 240 | 240 | 210 | S 225 | S | S | 250 | A 240 | 230 | 210 | 205 | 200 | 210 | H 190 | 210 | 210 | 220 | 200 | 220 | E A 260 | A | E S 260 | S |
| 7 | E S 280 | S 250 | S 260 | 210 | 210 | S | S | 260 | 235 | 210 | A 230 | 200 | 200 | 200 | 210 | 200 | H 200 | 210 | 200 | 200 | S 230 | S 260 | 240 | S 260 |
| 8 | 270 | 270 | 255 | 200 | A | A | A | A | C | C | C | C | C | 220 | 205 | A | 245 | 220 | 205 | E A 245 | 225 | 250 | 270 | 260 |
| 9 | 240 | A | A 265 | A | A | A | A | A | 220 | 220 | A 250 | A 250 | A 245 | A 245 | A | A | 230 | 215 | 200 | 200 | 205 | S 270 | 245 | 235 |
| 10 | 250 | 225 | 265 | 300 | 270 | S 270 | S | 205 | 200 | 200 | 215 | 200 | A | 220 | 220 | 220 | 200 | 220 | 215 | 195 | 225 | A 260 | 205 | S |
| 11 | S | S | S 280 | S 260 | S 245 | S | S | 240 | 220 | 210 | 210 | A | A | A | A | A | A | A | 220 | 210 | S 230 | S 225 | S 230 | S |
| 12 | E S 295 | S 270 | S 280 | 230 | 210 | S | S | 250 | 240 | 220 | 210 | A | A | A | A | A 220 | A 220 | 220 | 220 | 220 | S 250 | S 240 | S 250 | S |
| 13 | E S 300 | S 275 | 240 | S 260 | 240 | A 250 | S | 240 | A 235 | A 240 | A 230 | A 220 | 215 | 205 | 200 | 200 | 210 | 215 | 200 | S 230 | 250 | S 250 | 240 | S 230 |
| 14 | E S 300 | S | E S 305 | 245 | 210 | S | A | 220 | 230 | A 230 | 210 | A | A 230 | 210 | 200 | A | A | 230 | 230 | E A 260 | A | A 250 | 215 | S |
| 15 | S | 300 | 255 | 205 | 250 | 250 | S | 250 | 230 | 245 | 230 | 220 | 215 | 215 | 210 | 195 | 225 | 215 | 210 | 210 | A | 220 | 215 | S 270 |
| 16 | 325 | 270 | 265 | 240 | 250 | 225 | S | 240 | 230 | 240 | 240 | 200 | 215 | 205 | 200 | A | 200 | 210 | 195 | 210 | 250 | 215 | 220 | 245 |
| 17 | S | 305 | 300 | E S 350 | 290 | S | S | 240 | 225 | 180 | 240 | 210 | A | 245 | 200 | 190 | 250 | 210 | 200 | 190 | 220 | 250 | 225 | 260 |
| 18 | E S 305 | E S 300 | 260 | 260 | 250 | 220 | S | E S 280 | E A 280 | A | A | A 220 | A | 210 | 200 | 200 | 200 | 220 | 200 | 190 | 220 | S | S 250 | S |
| 19 | E S 300 | E S 300 | S 275 | 255 | 210 | S | S | A 270 | 230 | A | A 230 | 210 | 210 | 205 | A | 200 | 200 | 215 | 200 | 240 | 200 | 230 | 210 | S 240 |
| 20 | E S 305 | E S 290 | S 260 | 250 | 220 | 220 | S | 240 | 225 | A | A 230 | 210 | 200 | 200 | A 220 | A 220 | A | 235 | 200 | 190 | 220 | S 260 | E S 270 | S |
| 21 | S | E S 310 | E S 300 | S 280 | 210 | S 225 | S | S 230 | 235 | A | A 230 | 200 | A | A | 200 | A 240 | 200 | 230 | 200 | 210 | 230 | S 235 | S 240 | S 250 |
| 22 | S 275 | S | E S 290 | 210 | 190 | 190 | S | S 240 | 240 | A | A | 220 | 200 | 215 | 200 | 210 | 210 | 220 | 200 | 200 | S 260 | 240 | S 250 | 210 |
| 23 | S | S | E S 270 | 250 | 230 | 200 | S | 260 | 240 | A | A 230 | 230 | A | A | 205 | 205 | 205 | 230 | 210 | 200 | 200 | 230 | S 245 | S 270 |
| 24 | S 285 | 325 | 275 | 205 | S | S | A | 270 | 240 | 225 | 225 | A 250 | 220 | 200 | A 230 | 230 | 225 | 220 | 200 | 215 | A 225 | 215 | A 265 | S 250 |
| 25 | S 320 | 285 | 250 | 230 | 200 | E S 290 | S | 255 | 230 | 230 | 230 | 225 | 230 | 200 | A 235 | A 240 | 210 | 205 | 220 | 225 | 205 | E S 265 | S 255 | 250 |
| 26 | 275 | 290 | 260 | 255 | 250 | 230 | 300 | 265 | 225 | 240 | 225 | 215 | 180 | A | 175 | 215 | 220 | 220 | 205 | 210 | 195 | 245 | 245 | 295 |
| 27 | 255 | 260 | 250 | 240 | 245 | 275 | 270 | 260 | 240 | 205 | 205 | 215 | A | 200 | 200 | 195 | 215 | 230 | 205 | 210 | 250 | 250 | A | 275 |
| 28 | 300 | 310 | 260 | 295 | 250 | 250 | S 305 | S 275 | 240 | 225 | 215 | A | A | 200 | 210 | 195 | 190 | 235 | 205 | 215 | 245 | 205 | 235 | S |
| 29 | 300 | 300 | 300 | 310 | 255 | S | S | S 190 | 240 | 225 | 210 | 200 | 200 | 210 | 205 | 220 | 230 | 220 | 200 | 200 | 245 | 250 | 205 | 240 |
| 30 | S 310 | S 300 | S 280 | S 250 | 220 | S 250 | S | S 255 | 230 | 220 | 230 | A 225 | A 225 | 215 | 200 | 205 | 205 | 220 | 210 | 200 | E S 260 | 210 | 220 | S |
| 31 | 250 | E S 300 | E S 300 | E S 290 | 230 | S 240 | S | S 260 | 225 | 230 | A 230 | 210 | 200 | A 220 | 215 | A | H 200 | 225 | 200 | S 250 | 240 | 210 | 230 | 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 | 26 | 31 | 30 | 27 | 17 | 5 | 29 | 29 | 24 | 28 | 26 | 21 | 25 | 25 | 22 | 25 | 29 | 31 | 31 | 28 | 29 | 30 | 21 |
| MED | 274 | 280 | 262 | 248 | 230 | 240 | 270 | 248 | 230 | 222 | 225 | 210 | 210 | 210 | 205 | 210 | 210 | 220 | 200 | 210 | 226 | 240 | 236 | 250 |
| UQ | S 292 | 300 | S 278 | 262 | 250 | 250 | 300 | 260 | 240 | 230 | A 230 | 220 | 220 | 215 | 210 | 220 | 225 | 220 | 210 | 218 | 248 | 250 | S 250 | S 270 |
| LQ | 265 | 265 | 258 | 230 | 210 | 225 | 245 | 240 | 225 | 210 | 210 | 200 | 200 | 200 | 200 | 200 | 200 | 215 | 200 | 200 | 220 | 220 | 215 | 240 |

DEC. 1986 | H'F (KM)

# IONOSPHERIC DATA

DEC. 1986 | H'E (KM) | 135° E Mean Time (G.M.T. + 9h)

Station OKINAWA Lat. 26° 16.9' N. Long. 127° 48.4' E Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

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

DEC. 1986 | H'E (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

DEC. 1986 | H'ES (KM) | 135° E Mean Time (G.M.T. + 9h)

Station OKINAWA Lat. 26° 16.9' N. Long. 127° 48.4' E Sweep 1 MHz to 25 MHz in 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 | S | S | S | S | S | S | S | 145 | 150 | 110 | 110 | 110 | 105 | 105 | 100 | 105 | 100 | 100 | 100 | S | S | S | 110 |
| 2 | S | S | S | S | S | S | S | S | G | G | G | 110 | 110 | 110 | 105 | 105 | 100 | S | S | S | S | S | S | S |
| 3 | S | S | 110 | S | S | S | S | S | 140 | 115 | 110 | 110 | 110 | 110 | 110 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 4 | 100 | S | S | S | 100 | S | S | S | 140 | 140 | 130 | 120 | 115 | 115 | 115 | 110 | 110 | 110 | 110 | 110 | 100 | 100 | 100 | S |
| 5 | S | S | 100 | S | S | S | S | 130 | 130 | 125 | 120 | 110 | 110 | 120 | 120 | 115 | 115 | 110 | 110 | 110 | 100 | 100 | S | S |
| 6 | S | S | 100 | S | S | S | 100 | S | 120 | 115 | E G 150 | 140 | 110 | 110 | G | G | G | G | 100 | 110 | 110 | 105 | 105 | 105 |
| 7 | 100 | S | S | S | S | S | S | S | G | 125 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | G | 100 | S | 110 | 110 | 110 | S |
| 8 | 110 | S | 110 | 110 | 105 | 105 | 110 | 110 | C | C | C | C | C | 120 | 105 | 105 | 105 | 105 | 100 | 105 | 105 | 105 | 100 | 100 |
| 9 | 110 | 110 | 110 | 105 | 100 | 100 | 105 | 105 | 105 | 110 | 105 | 105 | 105 | 100 | 100 | 100 | 100 | 125 | 115 | S | S | S | S | S |
| 10 | S | S | 100 | 95 | 100 | 100 | S | S | G | 120 | 120 | 105 | 105 | 105 | 105 | 100 | 100 | 100 | 100 | 105 | 105 | 100 | 100 | S |
| 11 | 100 | 100 | 110 | 105 | 105 | 100 | 100 | S | G | 110 | 110 | 110 | 105 | 105 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | S |
| 12 | S | S | S | S | S | S | S | S | G | 150 | 110 | 110 | 110 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | S |
| 13 | S | S | S | 110 | 100 | 100 | 100 | 100 | 140 | 140 | 140 | 125 | 125 | 120 | 115 | 110 | G | 115 | 110 | 105 | S | S | S | S |
| 14 | 100 | 100 | S | 100 | 100 | 100 | 100 | 100 | G | 115 | 120 | 115 | 110 | 110 | 110 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 15 | S | S | 155 | S | 100 | S | S | S | 100 | 160 | 150 | G | 125 | 140 | 120 | 105 | G | 100 | 100 | 100 | 100 | 95 | S | S |
| 16 | S | S | S | S | S | 100 | 100 | 100 | S | G | 160 | 110 | 165 | 110 | 105 | 100 | 105 | S | 135 | 115 | S | S | S | S |
| 17 | S | S | S | S | S | S | S | S | S | G | 150 | 130 | 110 | 140 | G | G | 105 | 140 | S | 110 | 100 | 100 | S | S |
| 18 | S | S | S | 105 | 105 | 105 | S | S | 100 | 155 | 110 | 110 | 110 | 110 | 110 | 105 | 110 | 100 | 110 | S | S | S | S | S |
| 19 | S | S | S | S | S | S | S | 150 | G | 125 | 125 | 110 | 120 | 120 | 110 | 110 | G | 100 | 105 | 110 | S | S | S | S |
| 20 | S | S | S | S | S | S | S | S | 110 | 110 | 140 | 150 | 110 | 110 | 100 | 100 | 100 | 100 | 100 | S | S | S | S | S |
| 21 | S | S | 110 | S | 110 | S | S | S | 160 | 150 | 140 | 120 | 115 | 110 | 110 | 110 | 110 | 110 | 100 | 100 | 100 | S | S | S |
| 22 | S | S | S | S | S | S | S | S | G | 125 | 150 | E G 160 | 110 | 110 | 110 | E G 160 | G | 100 | 100 | 100 | 100 | S | S | S |
| 23 | S | S | S | S | S | S | 110 | S | G | E G 165 | 160 | G | 115 | 110 | 110 | 110 | 110 | G | S | S | 100 | 100 | 100 | S |
| 24 | S | S | 105 | 105 | 100 | 100 | 100 | 100 | G | G | 120 | 105 | 100 | 100 | 100 | 100 | G | 100 | 100 | 100 | 100 | 95 | 95 | 95 |
| 25 | S | S | S | S | S | 105 | 100 | 100 | 115 | G | 105 | 105 | 105 | 105 | 105 | 105 | G | G | 100 | 95 | 100 | 95 | 100 | S |
| 26 | S | S | 100 | S | S | S | S | S | S | G | G | 110 | 105 | 100 | 105 | G | G | 105 | 100 | 100 | S | S | S | S |
| 27 | S | S | S | S | S | 100 | 100 | S | S | G | G | 125 | 110 | 110 | 110 | 110 | G | 105 | 105 | 105 | 100 | 100 | 100 | 100 |
| 28 | 100 | 110 | 105 | 100 | 100 | 100 | S | S | S | 115 | 125 | 110 | 105 | 105 | 110 | 100 | 100 | 100 | 100 | 100 | 100 | S | S | S |
| 29 | S | 105 | 120 | 110 | 120 | S | S | S | 160 | 105 | 105 | 105 | 105 | 100 | 100 | 100 | G | 100 | 100 | 100 | S | S | S | S |
| 30 | S | 110 | 110 | 100 | S | S | S | S | G | 150 | 125 | 125 | 125 | 115 | 115 | 115 | 110 | G | 110 | 110 | 110 | 110 | 110 | 110 |
| 31 | 110 | 110 | S | 100 | S | 100 | 100 | S | G | E G 165 | 150 | 120 | 115 | 115 | 150 | 110 | 110 | G | 115 | S | 100 | 100 | 105 | 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 | 8 | 7 | 14 | 12 | 13 | 13 | 12 | 9 | 13 | 23 | 27 | 28 | 30 | 31 | 29 | 28 | 21 | 23 | 28 | 24 | 21 | 18 | 15 | 9 |
| MED | 100 | 110 | 110 | 105 | 100 | 100 | 100 | 100 | 130 | 125 | 122 | 110 | 110 | 110 | 110 | 105 | 105 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| UQ | 110 | 110 | 110 | 108 | 105 | 100 | 102 | 110 | 140 | 148 | 142 | 121 | 115 | 115 | 113 | 110 | 110 | 108 | 110 | 110 | 100 | 100 | 102 | 105 |
| LQ | 100 | 102 | 100 | 100 | 100 | 100 | 100 | 100 | 110 | 115 | 110 | 110 | 105 | 105 | 105 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

DEC. 1986 | H'ES (KM)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

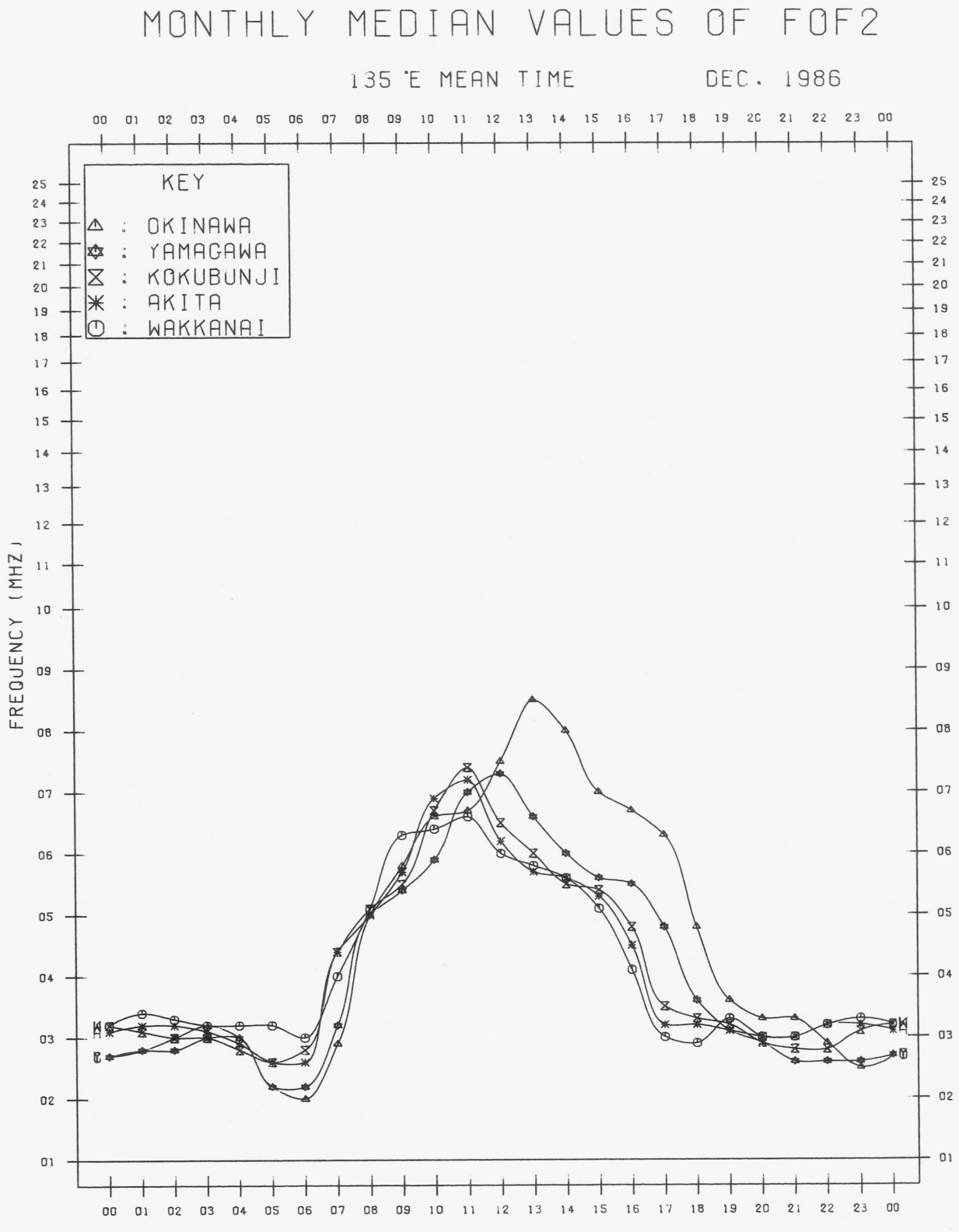
DEC. 1986 | TYPES OF ES | 135° E Mean Time (G.M.T. + 9h)

Station OKINAWA Lat. 26° 16.9' N, Long. 127° 48.4' E Sweep 1 MHz to 25 MHz in 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 | | | | | | | | | H 2 | HL 11 | CL 11 | L 1 | L 1 | L 3 | LL 21 | L 4 | L 2 | L 4 | F 1 | F 1 | | | | F 1 |
| 2 | | | | | | | | | | | | L 1 | L 1 | L 2 | L 3 | L 2 | L 2 | | | | | | | |
| 3 | | | F 2 | | | | | | H 2 | C 2 | C 2 | L 2 | L 2 | L 2 | C 2 | L 5 | L 3 | L 4 | F 1 | F 1 | F 2 | F 1 | F 2 | F 3 |
| 4 | F 1 | | | | F 1 | | | | H 2 | H 2 | C 2 | C 2 | C 2 | C 2 | C 2 | L 2 | L 5 | L 4 | F 2 | F 2 | F 2 | F 2 | F 1 | |
| 5 | | | F 1 | | | | | C 2 | C 3 | C 2 | C 2 | L 2 | L 2 | C 1 | C 2 | C 3 | C 6 | L 6 | F 5 | F 8 | F 4 | F 2 | | |
| 6 | | | F 1 | | | | F 1 | | C 3 | C 2 | HL 21 | HL 21 | L 2 | L 1 | | | | | F 1 | F 1 | F 2 | F 6 | F 1 | F 1 |
| 7 | F 1 | | | | | | | | | C 2 | L 2 | L 2 | L 1 | L 2 | L 1 | L 2 | L 2 | | F 1 | | F 2 | F 1 | F 1 | |
| 8 | F 3 | | F 3 | F 1 | F 3 | F 3 | F 4 | L 4 | | | | | | C 2 | L 3 | L 5 | L 4 | L 3 | F 5 | F 5 | F 4 | F 2 | F 3 | F 4 |
| 9 | F 3 | F 6 | F 3 | F 6 | F 6 | F 4 | F 4 | L 3 | L 5 | L 3 | L 5 | L 4 | L 4 | L 4 | L 5 | L 7 | L 5 | C 2 | F 1 | | | | | |
| 10 | | | F 2 | F 3 | F 2 | F 1 | | | | C 2 | C 2 | L 2 | L 3 | L 2 | L 1 | L 2 | L 2 | L 2 | F 5 | F 3 | F 5 | F 5 | F 3 | |
| 11 | F 1 | F 1 | F 1 | F 2 | F 1 | F 2 | F 2 | | | L 1 | L 2 | L 4 | L 4 | L 3 | L 4 | L 3 | L 3 | L 3 | F 3 | F 1 | F 1 | F 1 | F 1 | |
| 12 | | | | | | | | | | H 1 | L 2 | L 2 | L 3 | L 2 | L 3 | L 2 | L 1 | L 2 | F 4 | F 3 | F 2 | F 1 | F 1 | |
| 13 | | | | F 1 | F 2 | F 2 | F 2 | L 2 | H 2 | H 2 | H 2 | C 2 | C 2 | C 2 | C 3 | L 2 | | C 2 | F 1 | F 1 | | | | |
| 14 | F 1 | F 1 | | F 1 | F 1 | F 1 | F 3 | L 1 | | C 2 | C 2 | C 3 | L 2 | L 2 | L 1 | L 3 | L 2 | L 2 | F 3 | F 3 | F 3 | F 3 | F 1 | F |
| 15 | | | F 1 | | F 1 | | | | L 1 | H 2 | H 2 | | H 1 | H 2 | C 2 | L 2 | | L 1 | F 2 | F 3 | F 3 | F 2 | | |
| 16 | | | | | | F 3 | F 2 | F 2 | | | HL 11 | L 1 | HL 11 | L 1 | L 2 | L 4 | L 1 | | FF 22 | FF 21 | | | | |
| 17 | | | | | | | | | | | HC 21 | H 2 | CL 32 | HL 13 | | | L 1 | H 3 | | F 3 | F 1 | F 2 | | |
| 18 | | | | F 2 | F 1 | F 2 | | | L 2 | HL 12 | L 1 | L 1 | L 2 | L 2 | L 3 | L 2 | L 2 | L 1 | F 1 | | | | | |
| 19 | | | | | | | | H 1 | | C 2 | C 2 | L 1 | C 2 | C 2 | L 3 | L 2 | | L 1 | F 1 | F 2 | | | | |
| 20 | | | | | | | | | L 1 | L 1 | HL 21 | HL 31 | L 2 | L 1 | L 3 | L 3 | L 2 | L 2 | F 1 | | | | | |
| 21 | | | F 1 | | F 1 | | | | H 2 | H 2 | H 2 | C 2 | C 4 | L 2 | L 2 | L 2 | L 3 | L 1 | F 1 | F 1 | F 1 | | | |
| 22 | | | | | | | | | | C 1 | H 2 | H 1 | L 2 | L 3 | L 2 | H 1 | | L 2 | F 1 | F 1 | F 2 | | | |
| 23 | | | | | | | F 1 | | | HL 21 | HL 21 | | C 2 | L 3 | L 2 | L 1 | L 2 | | | | F 1 | F 3 | F 1 | |
| 24 | | | F 2 | F 3 | F 4 | F 3 | F 2 | F 2 | | | C 2 | L 2 | L 3 | L 2 | L 5 | L 4 | | L 3 | F 3 | F 2 | F 3 | F 3 | F 2 | F 3 |
| 25 | | | | | | F 2 | F 3 | F 2 | C 2 | | L 2 | L 2 | L 2 | L 3 | L 4 | L 3 | | | F 2 | F 2 | F 3 | F 3 | F 1 | |
| 26 | | | F 2 | | | | | | | | | L 2 | L 3 | L 3 | L 1 | | | L 2 | F 2 | F 1 | | | | |
| 27 | | | | | | F 2 | F 1 | | | | | H 2 | C 4 | C 2 | C 2 | L 1 | | L 1 | F 2 | F 2 | F 3 | F 2 | F 3 | F 2 |
| 28 | F 2 | F 2 | F 2 | F 2 | F 2 | F 2 | | | | C 2 | H 2 | C 4 | L 5 | L 2 | L 2 | L 2 | L 2 | L 2 | F 3 | F 2 | F 2 | | | |
| 29 | | F 2 | F 2 | F 3 | F 1 | | | | HL 31 | L 2 | L 2 | L 2 | L 3 | L 2 | L 2 | LH 11 | | L 2 | F 1 | F 1 | | | | |
| 30 | | F 1 | F 2 | F 2 | | | | | | H 2 | C 3 | C 2 | C 3 | C 3 | C 2 | C 2 | L 3 | | F 3 | F 1 | F 2 | F 2 | F 1 | F 2 |
| 31 | F 2 | F 2 | | F 2 | | F 1 | F 2 | | | H 2 | H 2 | C 2 | C 2 | C 3 | HL 21 | L 3 | L 2 | | F 4 | | F 1 | F 4 | F 3 | 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 | | | | | | | | | | | | | | | | | | | | | | | | |

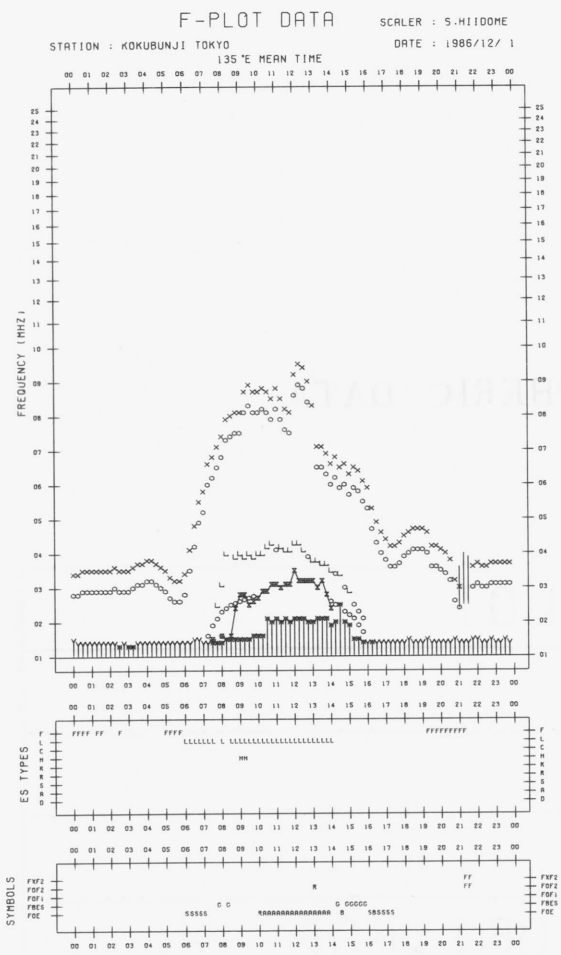
DEC. 1986 | TYPES OF ES

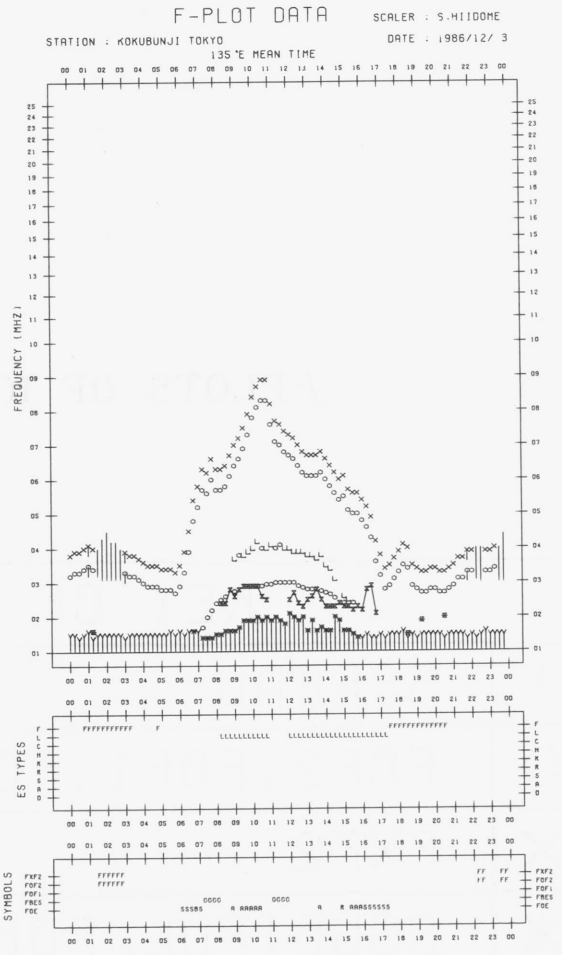
The Radio Research Laboratory, Japan

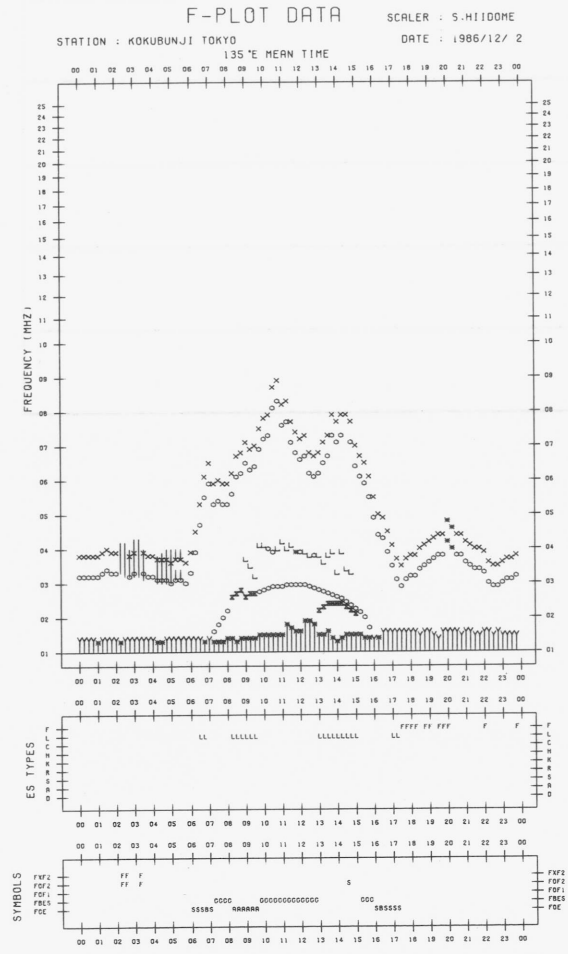

MONTHLY MEDIAN VALUES OF FOF2
135 °E MEAN TIME
DEC. 1986
KEY
△ : OKINAWA
✡ : YAMAGAWA
⧖ : KOKUBUNJI
✳ : AKITA
◷ : WAKKANAI
FREQUENCY (MHZ)
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 00
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

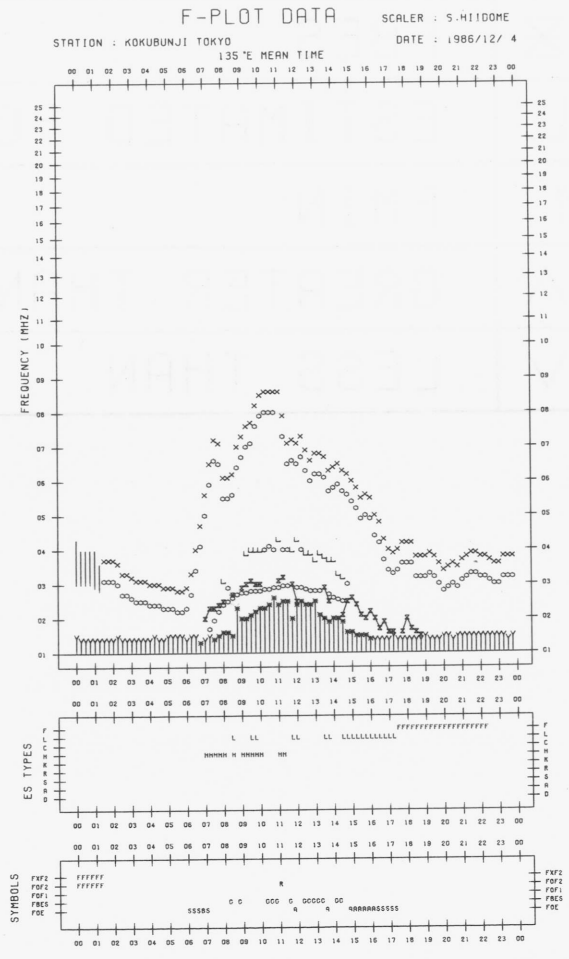
# *f*-PLOTS OF IONOSPHERIC DATA

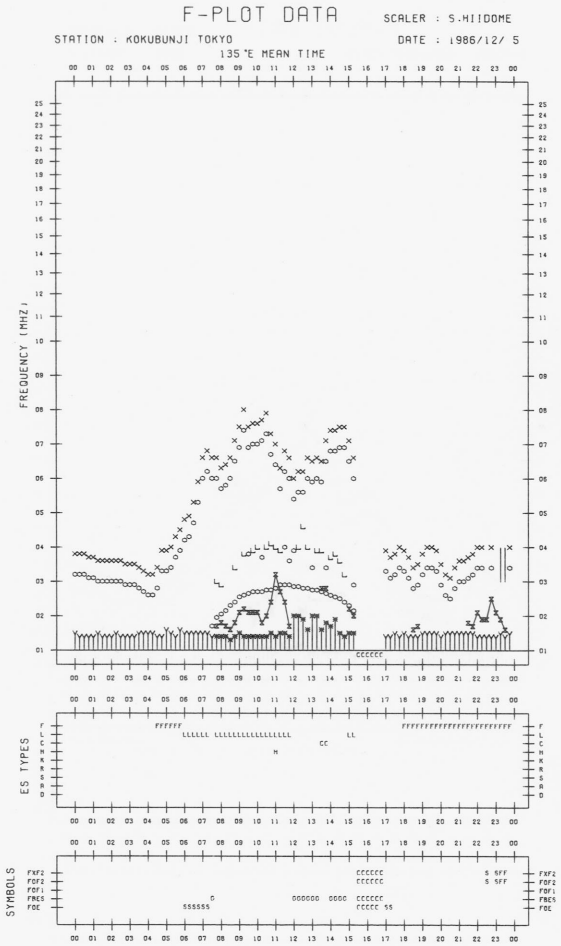
| KEY OF F-PLOT | |
|---|---|
| I | SPREAD |
| ⬡ | FOF2, FOF1, FOE |
| X | FXF2 |
| ✳ | DOUBTFUL FOF2, FOF1, FOE |
| ⧖ | FBES |
| L | ESTIMATED FOF1 |
| ↑, Y | FMIN |
| ∧ | GREATER THAN |
| ∨ | LESS THAN |

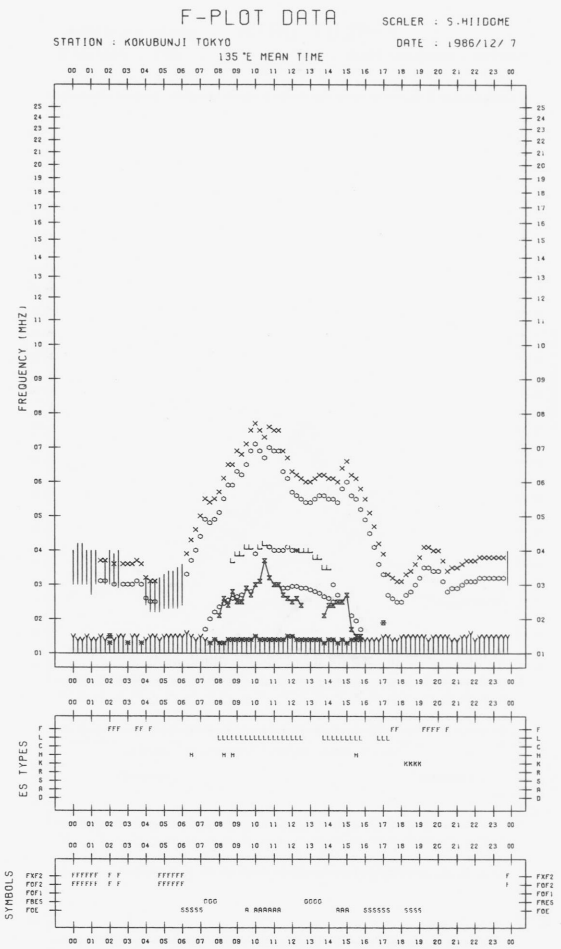

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/ 1
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FBES
FDE

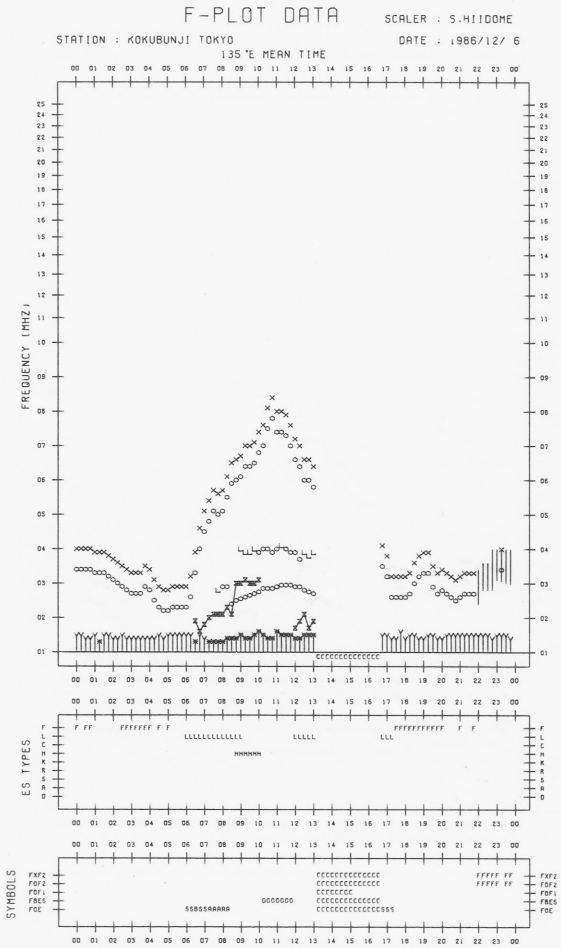

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/ 3
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FBES
FDE

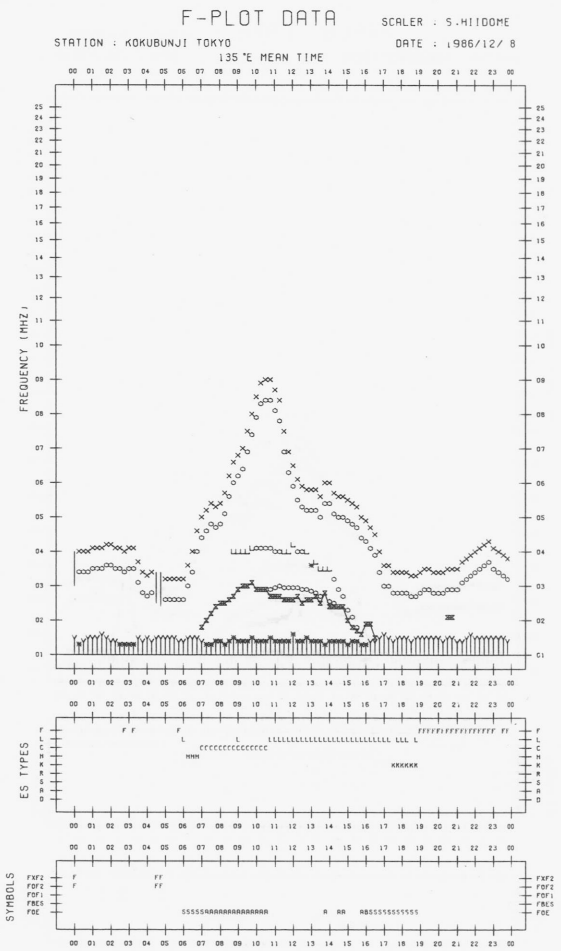

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/ 2
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FBES
FDE

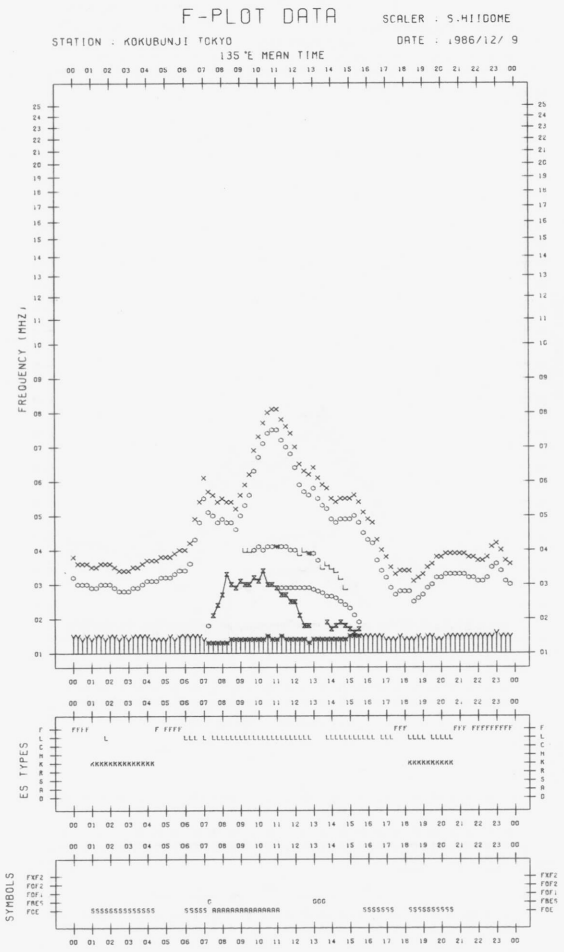

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/ 4
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FDF2
FDF1
FBES
FDE

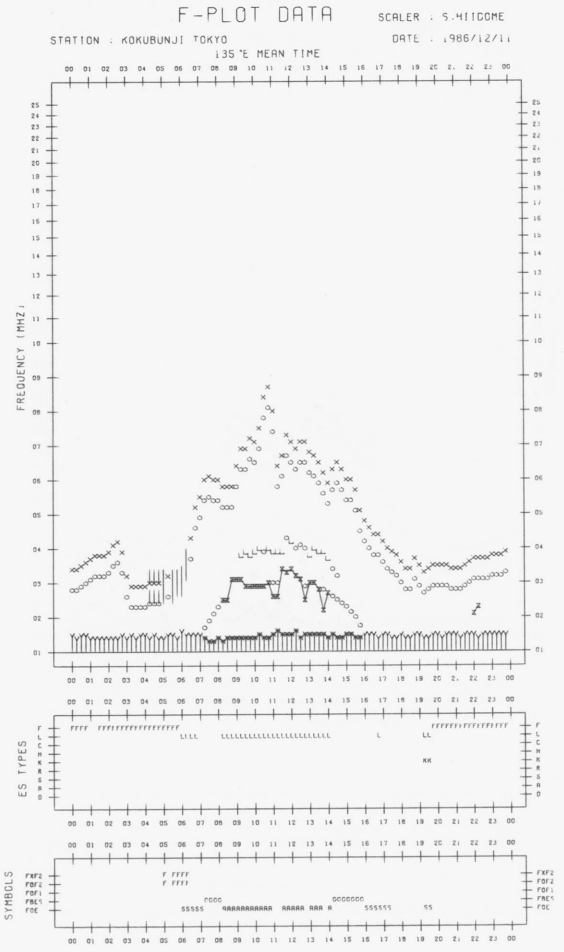

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/ 5
135 °E MEAN TIME
FREQUENCY ( MHZ )
ES TYPES
SYMBOLS

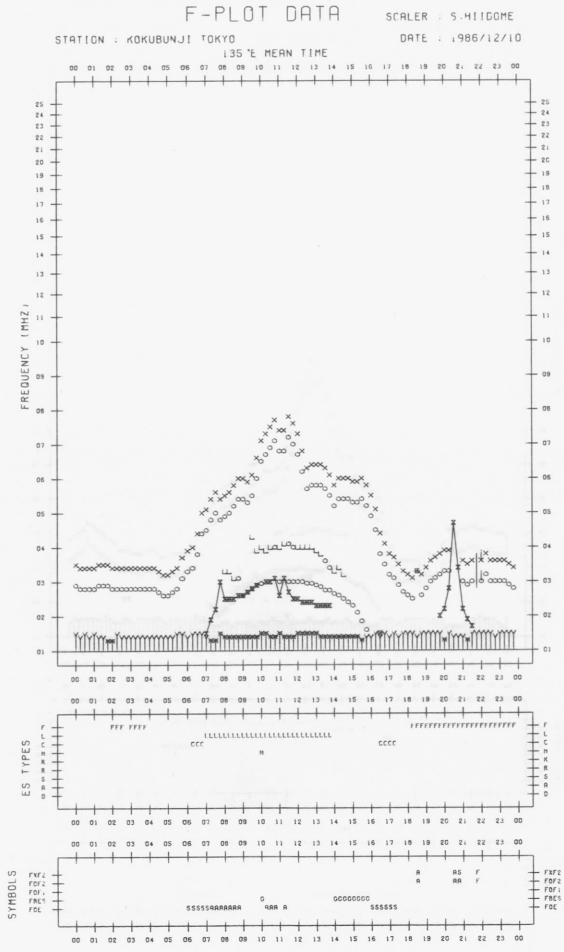

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/ 7
135 °E MEAN TIME
FREQUENCY ( MHZ )
ES TYPES
SYMBOLS

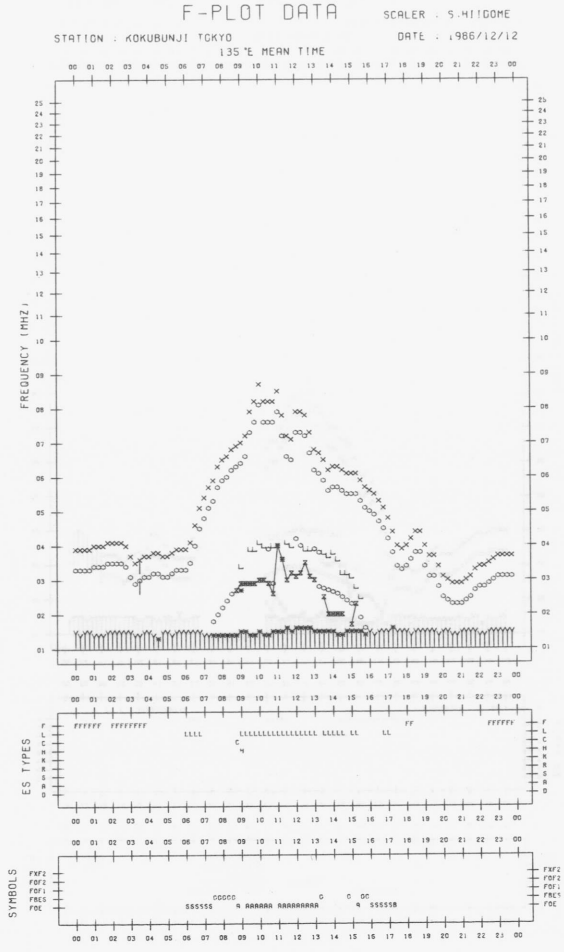

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/ 6
135 °E MEAN TIME
FREQUENCY ( MHZ )
ES TYPES
SYMBOLS

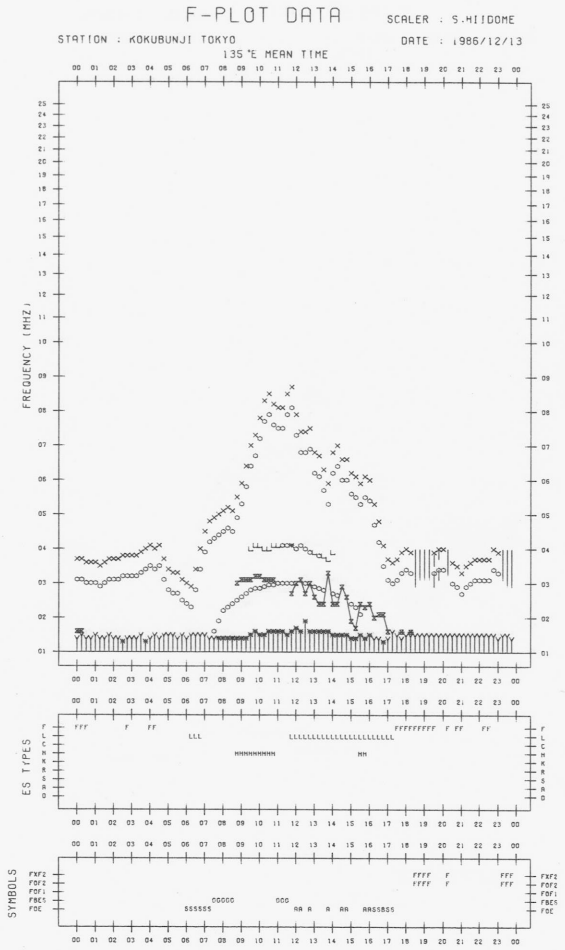

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/ 8
135 °E MEAN TIME
FREQUENCY ( MHZ )
ES TYPES
SYMBOLS

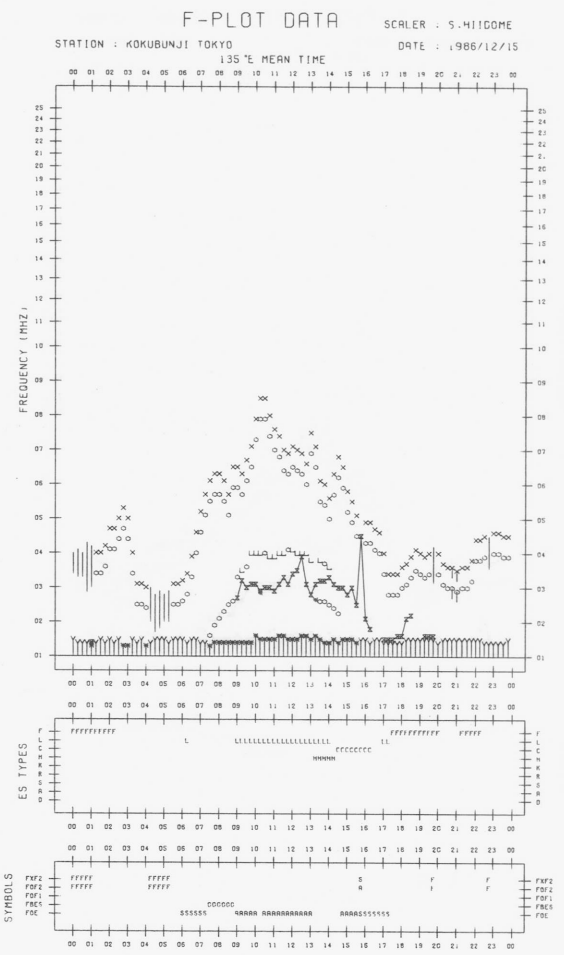

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/ 9
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

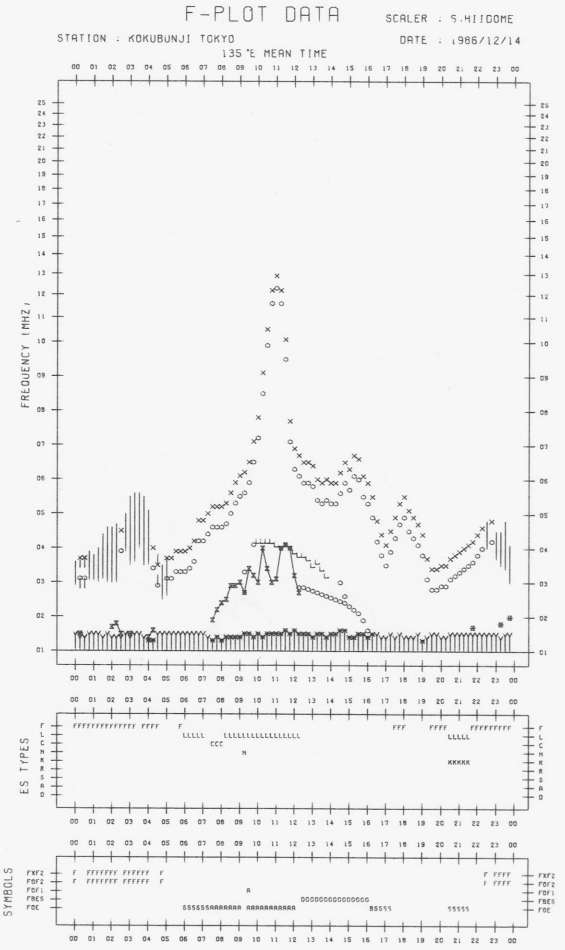

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/11
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

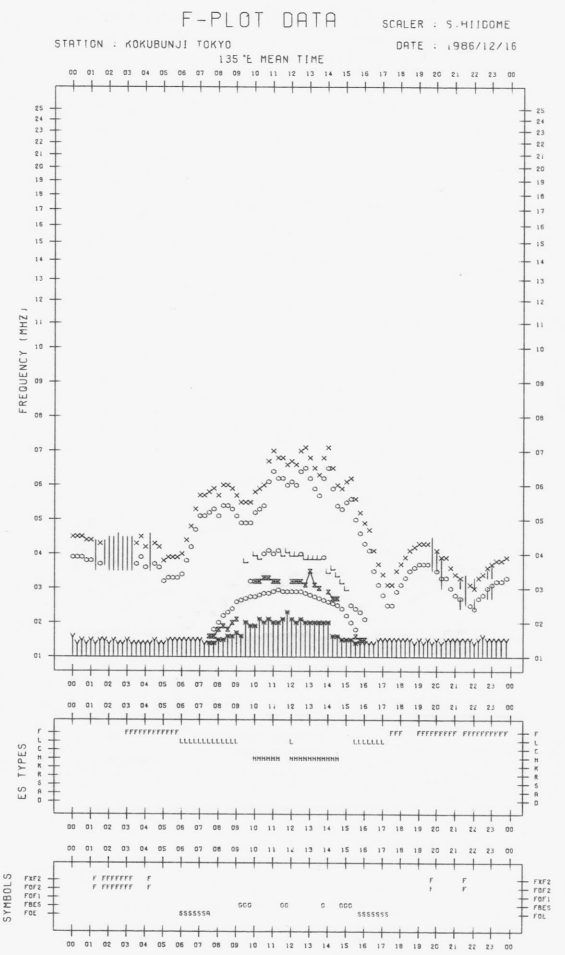

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/10
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

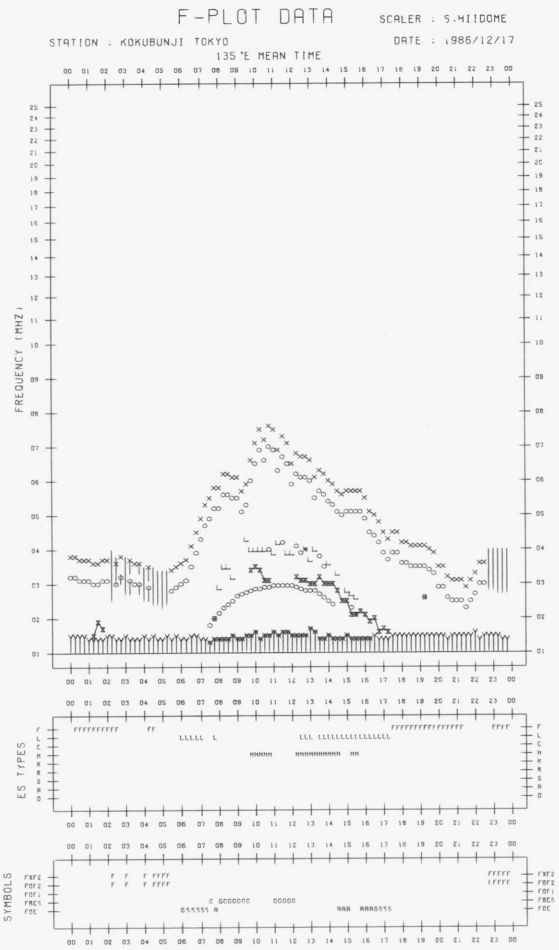

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/12
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

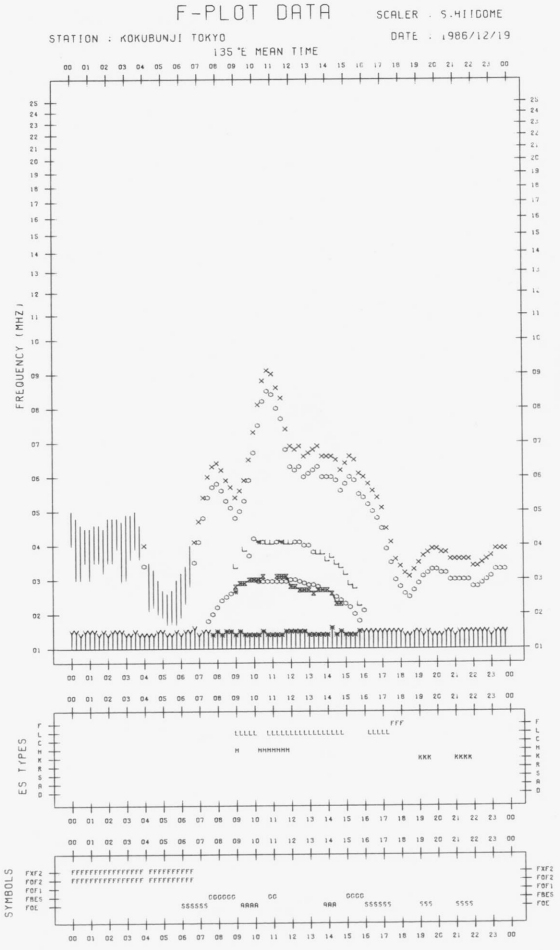

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/13
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

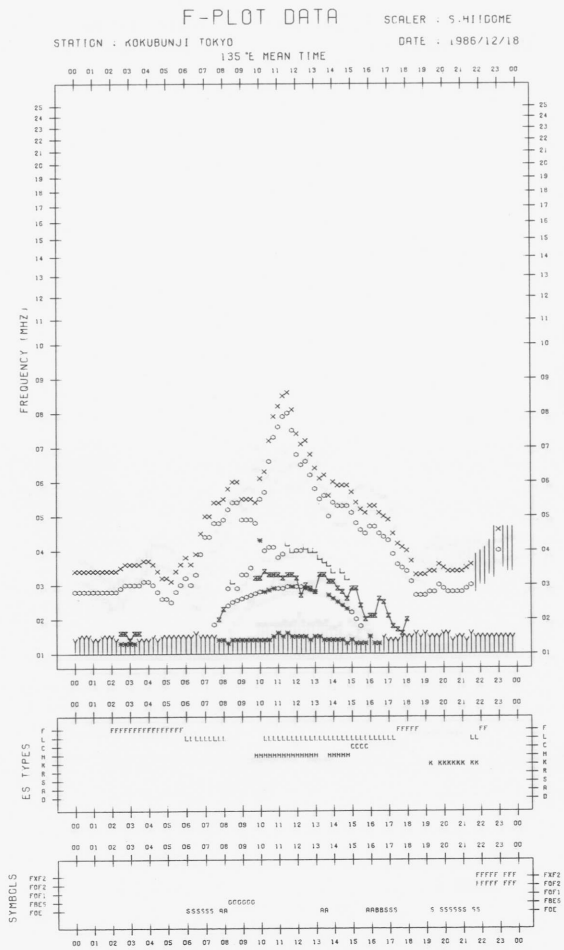

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/15
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

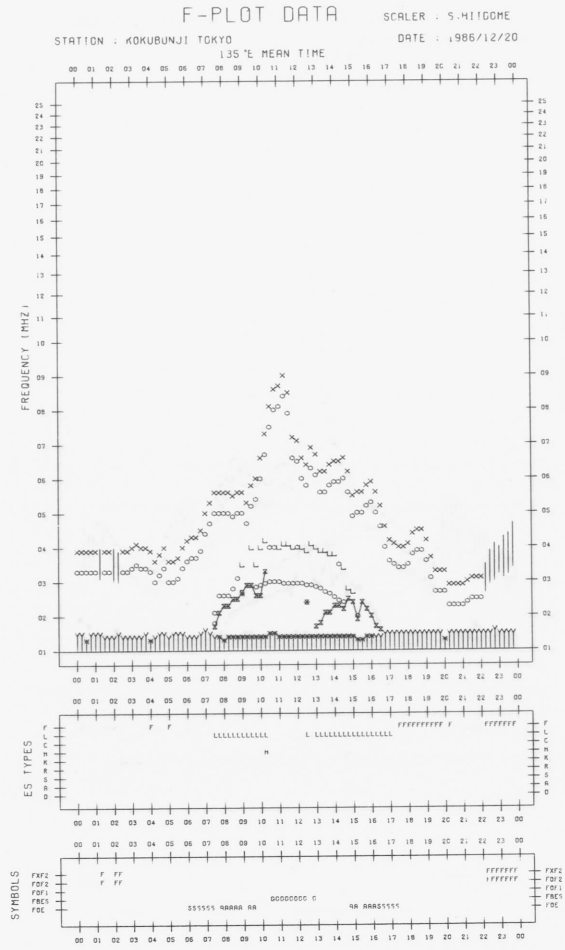

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/14
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

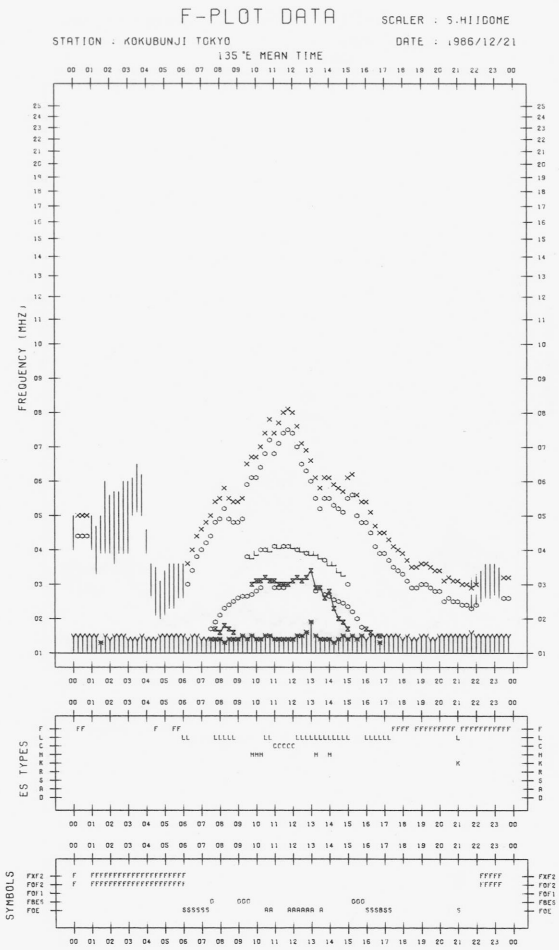

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/16
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

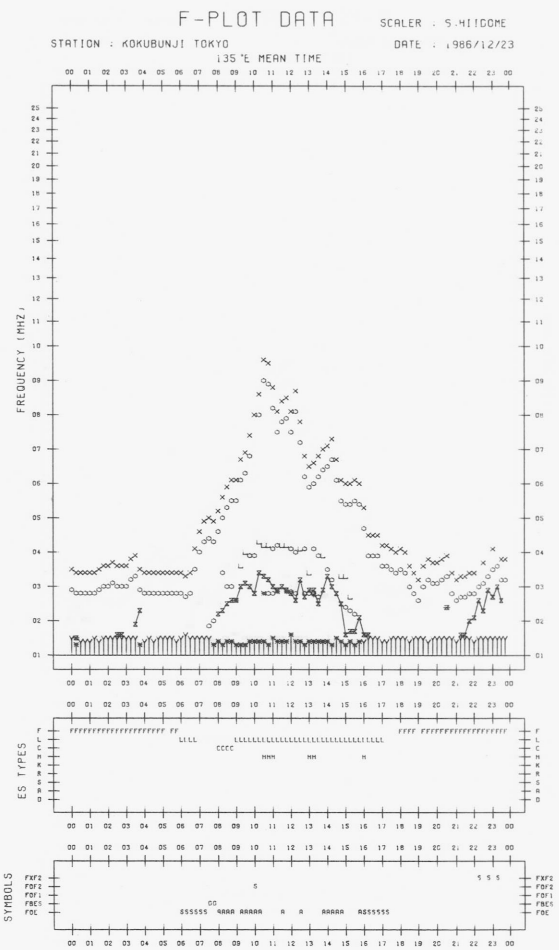

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/17
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

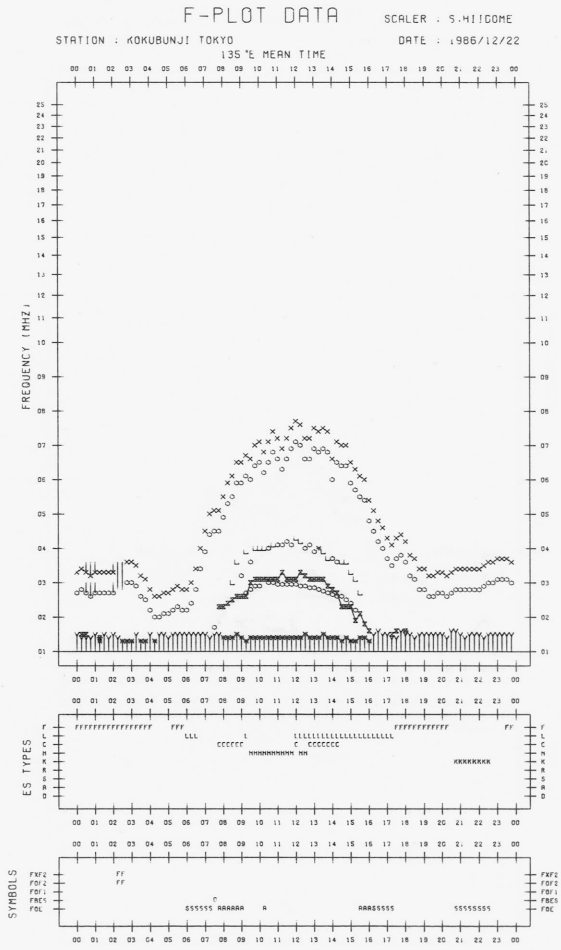

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/19
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

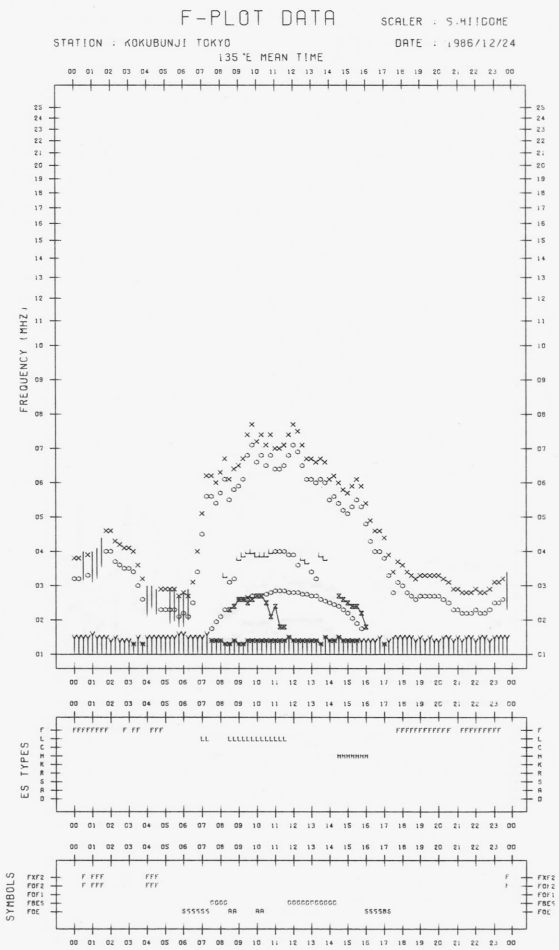

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/18
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

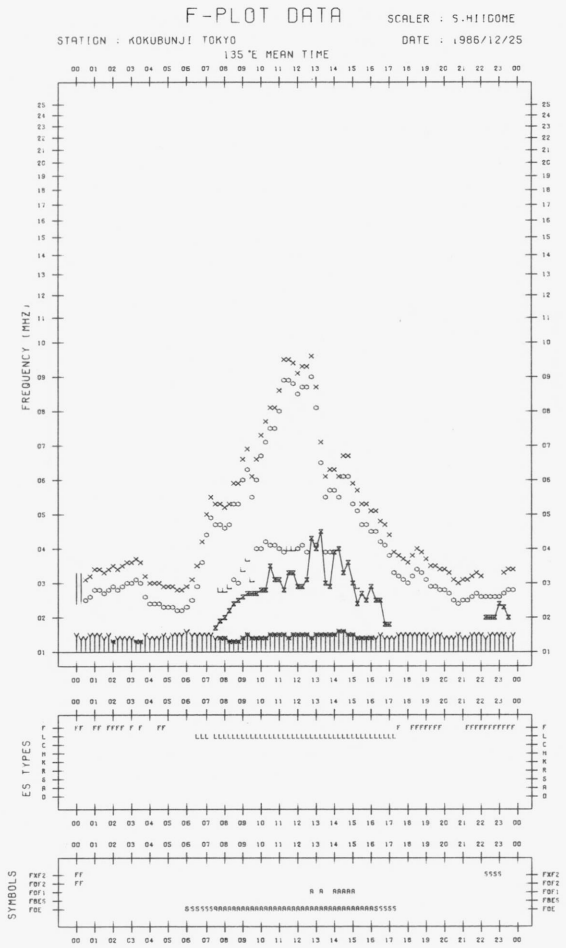

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/20
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

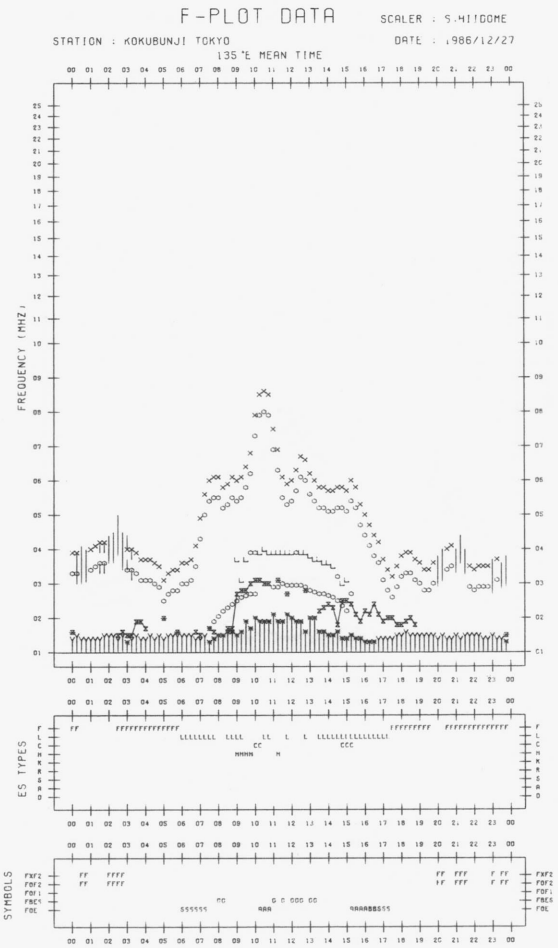

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/21
135°E MEAN TIME
FREQUENCY (MHz)
ES TYPES
SYMBOLS

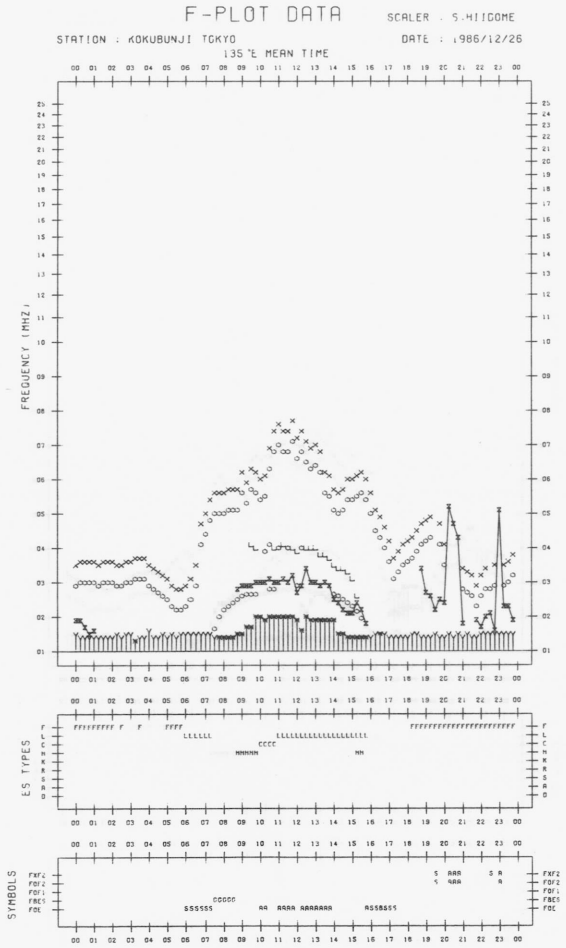

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/23
135°E MEAN TIME
FREQUENCY (MHz)
ES TYPES
SYMBOLS

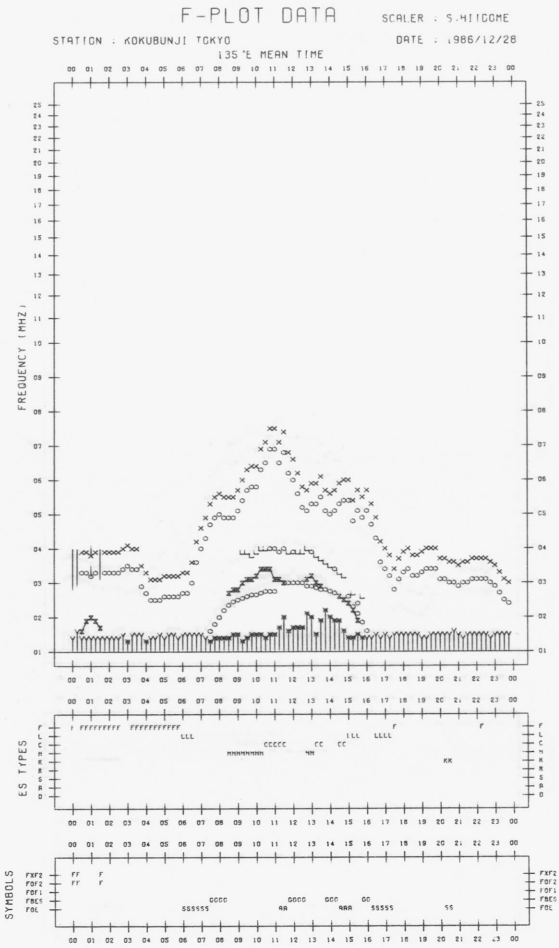

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/22
135°E MEAN TIME
FREQUENCY (MHz)
ES TYPES
SYMBOLS

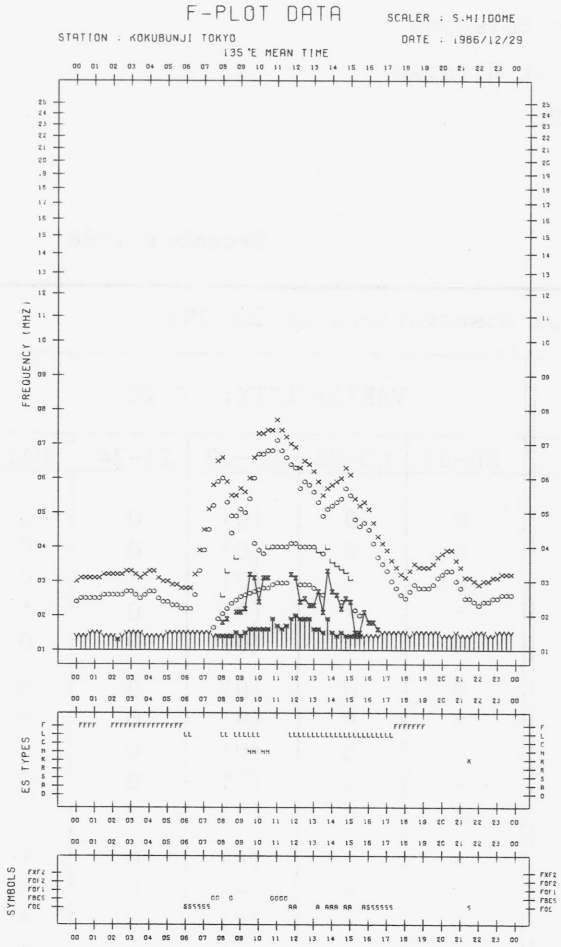

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/24
135°E MEAN TIME
FREQUENCY (MHz)
ES TYPES
SYMBOLS

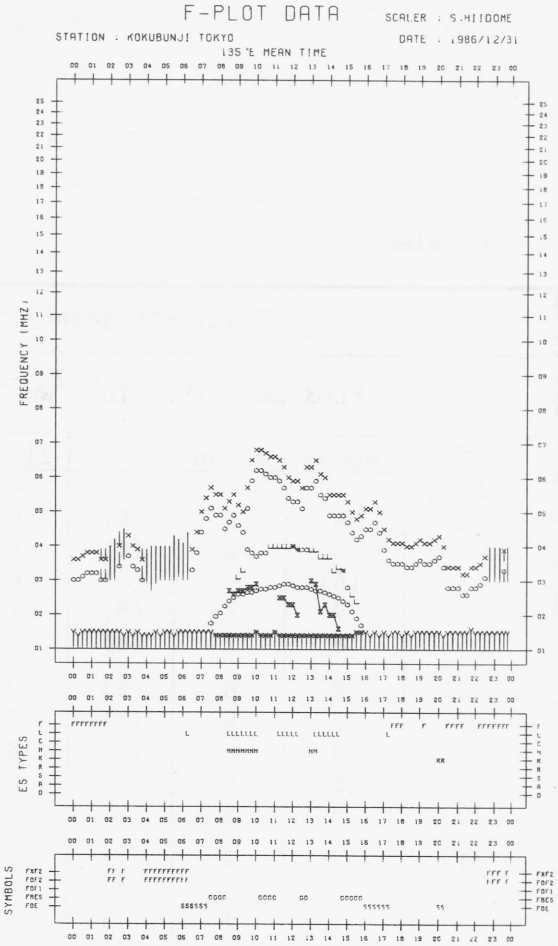

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/25
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

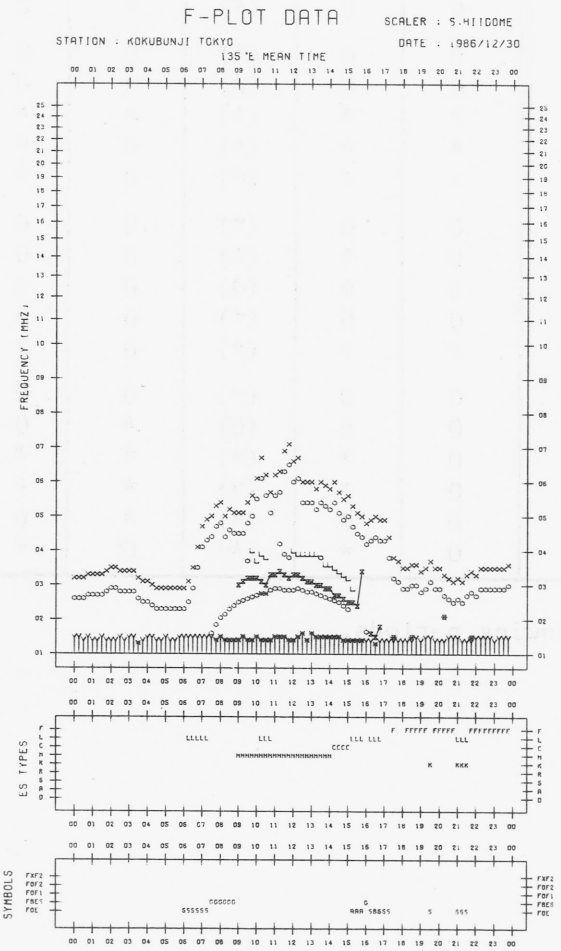

F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/27
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/26
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/28
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/29
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/31
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : S.HIIDOME
STATION : KOKUBUNJI TOKYO
DATE : 1986/12/30
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

B. Solar Radio Emission

a. Daily Data at Hiraiso

200 MHz

Hiraiso December 1986

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

Notes: 1. No observations during the following periods.

3rd 0055 - 0545
14th 2140 - 15th 0105

2. (q) likely quiet.

3. (*) interference.

B. Solar Radio Emission

a. Daily Data at Hiraiso

500 MHz

Hiraiso December 1986

| Single-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 | 27 | 27 | (26) | 27 | 27 |
| 2 | 27 | 27 | (27) | 26 | 27 |
| 3 | 26 | 26 | (26) | 26 | 26 |
| 4 | 27 | 26 | (26) | 26 | 26 |
| 5 | 26 | 26 | (25) | 25 | 26 |
| 6 | 25 | 25 | (25) | 25 | 25 |
| 7 | 25 | 25 | (25) | - | 25 |
| 8 | 25 | 25 | - | - | 25 |
| 9 | 25 | 25 | (25) | 25 | 25 |
| 10 | 25 | 25 | (25) | 26 | 25 |
| 11 | 26 | 26 | (26) | 26 | 26 |
| 12 | 26 | 26 | (26) | - | 26 |
| 13 | 26 | 26 | (26) | 26 | 26 |
| 14 | 26 | 26 | (26) | - | 26 |
| 15 | 26 | 26 | (26) | 27 | 26 |
| 16 | 27 | 26 | (26) | 27 | 27 |
| 17 | 27 | 27 | (27) | 27 | 27 |
| 18 | 27 | 27 | (27) | - | 27 |
| 19 | 27 | 27 | (27) | 28 | 27 |
| 20 | 28 | 27 | (27) | 27 | 28 |
| 21 | 27 | 27 | (26) | 27 | 27 |
| 22 | 27 | 27 | (27) | 27 | 27 |
| 23 | 27 | 27 | (27) | 27 | 27 |
| 24 | 27 | 27 | (26) | - | 27 |
| 25 | 26 | 26 | (26) | 26 | 26 |
| 26 | 27 | 26 | (26) | 26 | 26 |
| 27 | 26 | 26 | (25) | 25 | 26 |
| 28 | 25 | 25 | (24) | 26 | 25 |
| 29 | 26 | 25 | (25) | 24 | 26 |
| 30 | 25 | 25 | (25) | 26 | 25 |
| 31 | 26 | 26 | (25) | 25 | 26 |

Note: No observations during the following periods.

| | | | | | |
|---|---|---|---|---|---|
| 3rd | 0518 - 0542 | | 12th | 2141 - 2345 | |
| 7th | 2135 - 2340 | | 14th | 2200 - 15th | 0104 |
| 8th | 0523 - 0647 | | 18th | 2145 - 2345 | |
| 8th | 2135 - 2345 | | 24th | 2150 - 2345 | |

B. Solar Radio Emission

b. Outstanding Occurrences at Hiraiso

Hiraiso December 1986

Single-frequency observations

Normal observing period: 2145 - 0730 U.T. (sunrise to sunset)

| DEC 1986 | 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 |
|---|---|---|---|---|---|---|---|---|
| No outstanding occurrences. | | | | | | | | |

C. Radio Propagation

a. HF Field Strength at Hiraiso

WWV 15 MHz

December 1986

| 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 | ES -24 | ES -1 | ES 6 | ES -3 | ES 1 | ES -4 | ES -3 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | -20 | ES -24 | ES -24 | -9 | -5 | -3 |
| 2 | ES -24 | ES -6 | ES -4 | ES -4 | ES -15 | ES -9 | 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 | -4 | -4 | -3 |
| 3 | -2 | C | C | C | C | C | ES -24 | ES -24 | ES -24 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | -10 | 0 | 4 |
| 4 | ES -4 | ES -4 | ES -4 | ES 5 | ES -25 | ES 0 | ES -10 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | 0 | -3 | -3 |
| 5 | -11 | ES -4 | ES -6 | ES -3 | ES -9 | ES -9 | ES -1 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | -4 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | -3 | 0 |
| 6 | -2 | ES 3 | ES -3 | ES -3 | ES -15 | 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 | -3 | 2 |
| 7 | -4 | ES -4 | ES 2 | ES -6 | ES -15 | ES -9 | 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 | -15 | -4 | 3 |
| 8 | 3 | ES -6 | ES -9 | ES -9 | ES -9 | 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 | -6 | -4 | -11 |
| 9 | 1 | ES -9 | ES 6 | ES 7 | ES 1 | ES -9 | 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 | -5 | 1 | US 2 |
| 10 | 5 | ES -4 | ES 2 | ES 1 | 3 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | -1 | 1 | 3 |
| 11 | ES -24 | ES -3 | ES -3 | ES -3 | ES -2 | ES 0 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | -3 | -1 |
| 12 | ES -24 | ES 8 | ES 2 | ES 4 | ES 5 | ES -3 | ES 3 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | 2 | ES -24 | 1 | -3 | -3 |
| 13 | ES -23 | ES -8 | ES 12 | ES 2 | ES -8 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | -15 | -3 | -3 |
| 14 | -1 | ES 2 | 2 | ES -15 | ES -24 | ES -24 | ES 4 | ES 6 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | -4 | -9 | 1 |
| 15 | -1 | ES -9 | ES -9 | ES -2 | ES -9 | ES -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 | -12 | ES -24 | ES -24 | 2 | 3 |
| 16 | ES -24 | ES -24 | ES -3 | ES 8 | ES -9 | ES -5 | ES -5 | ES 3 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | -9 | -6 |
| 17 | ES -23 | ES -8 | ES 0 | ES -5 | ES -14 | ES 6 | ES -8 | ES -14 | ES -14 | 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 | -3 | -8 |
| 18 | ES -23 | ES -23 | ES -8 | ES -2 | ES 1 | 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 | ES -23 | ES -23 | ES -23 | 3 | 4 |
| 19 | 3 | ES -5 | ES 0 | ES -5 | ES -23 | ES -14 | ES -14 | ES -14 | ES -14 | 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 | 4 | 3 |
| 20 | 3 | 2 | ES -23 | ES -5 | ES 0 | ES -14 | ES -2 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | 9 | 5 |
| 21 | -5 | ES -8 | ES -2 | ES -1 | ES -5 | ES -14 | ES 0 | 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 -23 | 4 | 4 |
| 22 | 8 | ES -15 | ES -15 | ES -15 | ES -15 | ES -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 | -15 | -9 | 3 | 4 |
| 23 | 1 | ES 3 | ES -3 | ES -1 | ES -3 | ES -3 | ES -9 | ES -9 | ES -9 | 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 | 7 | 9 |
| 24 | 7 | ES -3 | ES -1 | ES -1 | ES -2 | ES -3 | ES -9 | 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 | 5 | 1 |
| 25 | ES -24 | ES -3 | ES -1 | ES 1 | ES -3 | ES -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 | ES -24 | ES -24 | 1 | -2 |
| 26 | -8 | C | 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 -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | 6 | 3 |
| 27 | ES -24 | ES -1 | ES -1 | ES -6 | ES -9 | ES -15 | -1 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | -6 | 8 |
| 28 | ES -24 | 1 | ES -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 | ES -24 | 6 | 7 |
| 29 | -6 | 1 | ES -3 | ES -3 | ES -24 | ES -15 | 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 | 3 | 4 |
| 30 | ES -15 | ES -9 | ES -24 | ES -24 | ES -6 | 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 | 3 | 3 |
| 31 | ES -9 | ES 4 | ES -1 | ES -24 | ES -24 | ES -24 | ES -9 | 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 | 3 | 5 |
| CNT | 31 | 29 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED | US -6 | ES -4 | ES -2 | ES -3 | ES -9 | ES -9 | 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 -23 | 1 | 3 |
| UD | 5 | ES 3 | ES 6 | ES 5 | ES 1 | ES 0 | ES 0 | ES -8 | ES -14 | 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 | 6 | 7 |
| LD | ES -24 | ES -15 | ES -15 | 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 | -6 |

C. Radio Propagation

a. HF Field Strength at Hiraiso

WWVH 15 MHz

December 1986

| 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 | 15 | 13 | 15 | 20 | 12 | ES 1 | ES 1 | ES -24 | ES -24 | 5 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | -15 | ES -24 | 12 | 16 | 9 | 16 |
| 2 | 12 | 18 | 7 | 15 | 7 | ES -6 | 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 | 8 | 12 | 8 | 18 |
| 3 | C | C | C | C | C | ES -24 | ES -24 | ES -24 | ES -24 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | 18 | 19 | 15 | 16 |
| 4 | 17 | 15 | 16 | 12 | 8 | 0 | -16 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | ES -25 | 10 | 21 | 23 | 18 |
| 5 | 19 | 17 | 19 | 21 | 26 | ES -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 | 4 | 12 | 12 | 17 |
| 6 | 19 | 16 | 21 | 17 | 13 | 11 | 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 | 8 | 16 | 18 |
| 7 | 15 | 17 | 18 | 18 | 12 | 11 | 11 | 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 | -9 | 13 | 16 | 21 |
| 8 | 18 | 19 | 16 | 17 | 12 | -3 | ES -24 | -15 | -16 | -12 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | 14 | 7 | 11 | 11 |
| 9 | 12 | 21 | 13 | 19 | 17 | ES -9 | 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 | -9 | 16 | 14 | 12 |
| 10 | 14 | 13 | 16 | 21 | 13 | ES -24 | ES -24 | -15 | -9 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | -15 | 10 | 17 | 13 |
| 11 | 20 | 13 | 19 | 18 | 21 | 5 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | 9 | 10 | 13 |
| 12 | 12 | 15 | 15 | 17 | 14 | 10 | ES -4 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | 3 | 1 | 9 | 7 | 15 | 14 |
| 13 | 10 | 11 | 9 | 19 | 15 | -1 | -1 | ES -23 | ES -23 | ES -23 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | 13 | 17 | 16 |
| 14 | 12 | 15 | 19 | 16 | 6 | 9 | ES 2 | ES -24 | 7 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | 9 | 3 | 18 | 13 |
| 15 | 21 | 13 | 14 | 16 | 9 | 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 | 11 | 14 | 16 | 15 |
| 16 | 11 | 15 | 13 | 18 | 9 | ES -5 | ES -1 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | 6 | 12 | 12 | 17 |
| 17 | 17 | 12 | 14 | 19 | 17 | ES -8 | 2 | ES -14 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | 7 | 14 | 12 | 14 |
| 18 | 19 | 16 | 17 | 14 | ES -14 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | -9 | 18 | 24 | 19 |
| 19 | 20 | 20 | 23 | 25 | 20 | 19 | 5 | ES -14 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | 3 | 17 | 17 | 14 |
| 20 | 19 | 18 | 24 | 22 | 19 | 8 | -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 -23 | 14 | 9 | 15 |
| 21 | 18 | 22 | 24 | 24 | 6 | 7 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | 2 | 13 | 21 |
| 22 | 23 | 21 | 17 | 20 | 9 | ES -3 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | -12 | 12 | 17 | 18 |
| 23 | 21 | 26 | 18 | 21 | 23 | 1 | ES -9 | ES -9 | ES -9 | ES -9 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | -2 | 15 | 22 | 22 |
| 24 | 22 | 19 | 17 | 16 | 9 | -1 | ES -9 | 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 | 14 | 20 | 16 |
| 25 | 20 | 21 | 17 | 17 | 16 | 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 | 7 | 12 | 17 | 14 |
| 26 | 18 | 14 | 18 | 19 | -2 | -3 | -2 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | 8 | 16 | 13 |
| 27 | 16 | 19 | 17 | 17 | 7 | 2 | ES -3 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | 7 | 14 | 12 |
| 28 | 15 | 17 | 18 | 17 | 4 | 3 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | 20 | 19 | 13 |
| 29 | 14 | 18 | 21 | 16 | -1 | 8 | 8 | 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 | 10 | 11 | 10 |
| 30 | 20 | 12 | 18 | 18 | 20 | -9 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | -9 | ES -24 | ES -24 | ES -24 | 4 | 19 | 18 |
| 31 | 14 | 16 | 19 | 21 | 15 | 2 | ES -9 | ES -9 | ES -24 | -6 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | ES -24 | 16 | 14 | 20 |
| CNT | 30 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| MED | 18 | 16 | 17 | 18 | 12 | US 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 | -9 | 12 | 16 | 16 |
| UD | 21 | 21 | 23 | 22 | 21 | 11 | 5 | ES -9 | ES -9 | ES -9 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | ES -23 | 12 | 19 | 22 | 21 |
| LD | 12 | 12 | 13 | 14 | -1 | 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 | 7 | 9 | 12 |

## C. Radio Propagation

### b. Radio Propagation Quality Figures at Hiraiso

Hiraiso

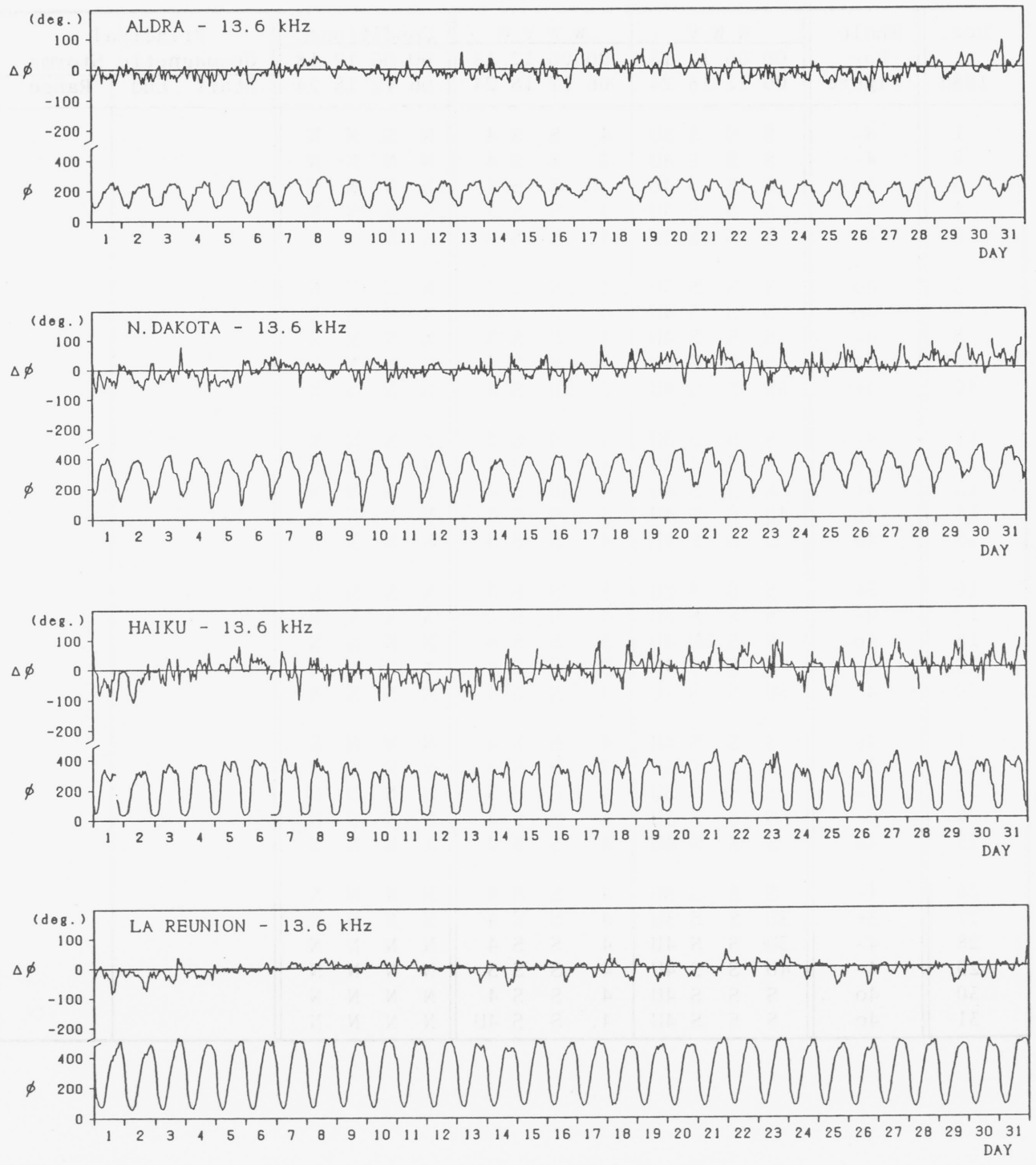
Time in U.T.

| Dec. 1986 | 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 06 12 18 / 06 12 18 24 | Principal Geomagnetic Storms Start | End | Range |
|---|---|---|---|---|---|---|---|
| 1 | 4- | S S S 3U | 4 S S 4 | N N N N | | | |
| 2 | 4- | S S S 4U | 3 S S 4 | N N N N | | | |
| 3 | 4o | C S S 4U | C S S 4 | N N N N | | | |
| 4 | 4+ | S S S 4U | 4 S S 5 | N N N N | | | |
| 5 | 4o | S S S 4U | 4 S S 4 | N N N N | | | |
| 6 | 4o | S S S 4U | 4 S S 4 | N N N N | | | |
| 7 | 4o | S S S 4U | 4 S S 4 | N N N N | | | |
| 8 | 4- | S S S 4U | 4 S S 3 | N N N N | | | |
| 9 | 4o | S S S 4U | 4 S S 4 | N N N N | | | |
| 10 | 4+ | 5U S S 4U | 3 5U S 4 | N N N N | | | |
| 11 | 4- | S S S 3U | 4 S S 4 | N N N N | | | |
| 12 | 4o | S S S 4U | 4 S S 4 | N N N N | | | |
| 13 | 4+ | S S S 4U | 4 5U S 4 | N N N N | | | |
| 14 | 4o | 4U S S 4U | 4 S S 4 | N N N N | | | |
| 15 | 4o | S S S 4U | 4 S S 4 | N N N N | | | |
| 16 | 3+ | S S S 3U | 3 S S 4 | N N N N | | | |
| 17 | 4- | S S S 3U | 4 S S 4 | N N N N | | | |
| 18 | 4o | S S 5U 4U | 3 S S 4 | N N N N | | | |
| 19 | 4+ | S S S 4U | 5 S S 4 | N N N N | | | |
| 20 | 4+ | 5U S S 4U | 4 S S 4 | N N N N | | | |
| 21 | 4o | S S S 4U | 4 S S 4 | N N N N | | | |
| 22 | 4o | S S S 5U | 4 S S 4 | N N N N | | | |
| 23 | 5- | S S S 5U | 4 S S 5 | N N N N | | | |
| 24 | 4- | S S S 3U | 4 S S 4 | N N N N | | | |
| 25 | 4o | S S S 4U | 4 S S 4 | N N N N | | | |
| 26 | 4- | S S S 3U | 4 S S 4 | N N N N | | | |
| 27 | 3+ | 3U S S 3U | 4 S S 4 | N N N N | | | |
| 28 | 4- | 3U S S 4U | 4 S S 4 | N N N N | | | |
| 29 | 4- | 4U S S 4U | 4 S S 3 | N N N N | | | |
| 30 | 4o | S S S 4U | 4 S S 4 | N N N N | | | |
| 31 | 4o | S S S 4U | 4 S S 4U | N N N N | | | |

# C. Radio Propagation

## c. Phase Variations in OMEGA Radio Waves at Inubo

Inubo December 1986




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

NONE

C. Radio Propagation

d. Sudden Ionospheric Disturbance

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

Hiraiso

Time in U.T.

| Dec. 1986 | 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

| Dec. 1986 | S P A | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Phase Advance (degrees) | | | | | Time (U.T.) | | |
| Date | GBR | Ω/LR | NWC | Ω/H | Ω/ND | Start | End | Maximum |
| | | | | None | | | | |

IONOSPHERIC DATA IN JAPAN FOR DECEMBER 1986

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