

IONOSPHERIC DATA IN JAPAN

FOR NOVEMBER 1986

VOL. 38 NO. 11

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BRIEFING

This Series contains data on ionosphere (I), solar radio emis-

sion (S) and radio propagation (P) obtained at the following stations under the Radio Research Laboratory, Ministry of Posts and Telecommunications of Japan.

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

A. IONOSPHERE

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

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

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

a. Characteristics of Ionosphere

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

b. Symbols

(i) Descriptive Letters

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

- A Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example Es .
- B Measurement influenced by, or impossible because of, absorption in the vicinity of $fmin$.
- C Measurement influenced by, or impossible because of, any non-ionospheric reason.
- D Measurement influenced by, or impossible because of, the upper limit of the normal frequency range in use.
- E Measurement influenced by, or impossible because of, the lower limit of the normal frequency range in use.
- F Measurement influenced by, or impossible because of, the presence of spread echoes.
- G Measurement influenced or impossible because the ionization density of the layer is too small to enable it to be made accurately.
- H Measurement influenced by, or impossible because of, the presence of a stratification.
- K Presence of particle E layer.
- L Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.
- M Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.
- N Conditions are such that the measurement cannot be interpreted.

- O Measurement refers to the ordinary component.
- P Man-made perturbations of the observed parameter; or spur type spread F present.
- Q Range spread present.
- R Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.
- S Measurement influenced by, or impossible because of, interference or atmospheric.
- T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
- V Forked trace which may influence the measurement.
- W Measurement influenced or impossible because the echo lies outside the height range recorded.
- X Measurement refers to the extraordinary component.
- Y Lacuna phenomena, severe layer tilt.
- Z Third magneto-electronic component present.

(ii) Qualifying Letters

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

- A Less than. Used only when $fbEs$ is deduced from $foEs$ because total blanketing of higher layer is present.
- D Greater than.
- E Less than.
- I Missing value has been replaced by an interpolated value.
- J Ordinary component characteristic deduced from the extraordinary component.
- M Mode interpretation uncertain.
- O Extraordinary component characteristic deduced from the ordinary component. (Used for x-characteristics only.)
- T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
- U Uncertain or doubtful numerical value.
- Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of Es

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

The types are:

- f An Es trace which shows no appreciable increase of height with frequency.
- l A flat Es trace at or below normal E layer minimum virtual height or below the particle E layer minimum virtual height.
- c An Es trace showing a relatively symmetrical cusp at or below foE . (Usually a daytime type.)
- h An Es trace showing a discontinuity in height with the normal E layer trace at or above foE . The cusp is not symmetrical, the low frequency end of the Es trace lying clearly above the high frequency end of the normal E trace. (Usually a daytime type.)
- q An Es trace which is diffuse and non-blanketing over a wide frequency range.
- r An Es trace showing an increase in virtual height at the high frequency end similar to group retardation.
- a An Es trace having a well-defined flat or gradually rising lower edge with stratified and diffuse traces

present above it.

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

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

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

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

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

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

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

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

B. SOLAR RADIO EMISSION

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

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

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

a. Daily Data at Hiraiso

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

Variability. The three-hourly and daily mean values are given at 200 MHz only.

Variability is expressed in the following four grades.

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

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

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

b. Outstanding Occurrences at Hiraiso

The phenomena are picked up on the following criteria:

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

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

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

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

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

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

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

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

C. RADIO PROPAGATION

a. H.F. Field Strength at Hiraiso

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

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

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

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

b. Radio Propagation Quality Figures at Hiraiso

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

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

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

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

C	artificial accident,
S	propagation accident,
U	inaccurate.

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

N	normal,
U	unstable,
W	disturbed

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

Data on a *geomagnetic storm* correlated with a radio propagation disturbance are tabulated from observation at Kakioka Magnetic Observatory, Japan Meteorological Agency. *Time* (U.T.) is expressed in unit of hour and minute (or tenth of hour), and *range* in nanotesla. When they are uncertain quantitatively, /s are used to replace the numerical values. Continuation of a geomagnetic storm is denoted by - - -.

c. Phase Variations in OMEGA Radio Waves at Inubo

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

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

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

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

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

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

d. Sudden Ionospheric Disturbances

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

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

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

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

Types of fade-out are as follows:

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

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

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

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

(ii) Sudden Phase Anomaly (SPA) at Inubo

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

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

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

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

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

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

Transmitting Stations						
Name	Location (Geographic Coordinate)		Call Sign	Frequency (kHz)	Radiation Power (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

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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 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	59	60	59	60	56	56	60											X	X	X	X	X	X	X
2	X	X	X	X	X	X	X											X	X	X	X	X	X	X
3	X	X	A	X	X	X	X											X	X	X	X	X	X	X
4	X	X	X	X	X	X	X											X	X	X	X	X	X	X
5	X	X	X	X	X	X	A											X	X	X	X	X	X	X
6	X	X	X	X	X	X	X											X	X	X	X	X	X	X
7	X	40	X	X	X	X	40											X	X	X	X	X	X	X
8	40	41	42	40	42	38	40											X	X	X	X	X	X	X
9	40	X	X	44	50	42	39											X	X	X	X	X	X	X
10	37	40	X	X	40	42	X											X	X	X	X	X	X	X
11	X	X	X	X	X	X	X											X	X	X	X	X	X	X
12	X	X	X	X	46	40	41											X	X	X	X	X	X	X
13	X	X	X	X	40	41	39											C	C	C	C	C	X	45
14	45	46	40	40	44	X	30											X	A	X	X	X	X	41
15	X	X	X	X	X	X	X											X	X	X	X	X	X	46
16	45	42	42	37	40	X	X											X	X	X	X	X	X	48
17	48	42	40	40	44	45	X											X	A	A	X	40	40	40
18	X	X	X	X	X	X	X											X	X	X	X	X	45	40
19	X	X	46	46	46	35	36											X	X	X	X	X	39	38
20	40	40	47	37	X	X	X											X	X	X	X	40	42	40
21	37	37	40	37	40	45	42											X	X	X	X	X	X	40
22	X	47	X	X	X	X	X											X	X	X	X	X	47	X
23	X	X	X	X	50	35	40											X	X	X	X	X	X	41
24	X	X	X	X	X	53	40											X	X	X	X	50	51	55
25	X	X	X	X	X	X	X											X	X	X	X	S	X	60
26	68	66	66	72	53	50	X											X	X	X	X	X	X	X
27	X	X	50	40	42	43	42											X	A	A	X	35	38	42
28	45	44	40	40	X	X	X											S	X	X	A	X	X	37
29	40	X	X	X	X	X	X											X	X	X	X	X	X	A
30	X	41	43	43	X	X	X											X	X	X	A	A	X	X
31																		X	X	X			X	X
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	29	30	30	30	29											28	26	27	27	27	30	29
MED	X	X	X	X	X	X	X											X	X	X	X	X	X	X
UQ	X	X	X	X	46	44	41											X	X	X	X	X	X	X
LQ	X	41	40	40	X	X	X											X	X	X	X	X	X	X

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FXI (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

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FOF2 (0.1 MHz)

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

Station	WAKKANAI																							
Lat.	45 23.5 N.											Long.141 41.2 E												
Sweep 1	MHz to 25 MHz in 24sec in automatic operation																							
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F	F	F	F	F	F ₄₁	F ₄₇	58	70	81	92	84	H ₆₉	72	70	64	62	44	43	44	40	40	40	44
2	38	44	46	43	43	40	43	60	76	81	101	91	70	70	60	62	56	42	35	34	34	38	38	37
3	38	40	A	39	39	33	39	65	67	76	68	74	74	H ₇₄	65	63	53	38	39	37	34	36	35	35
4	35	38	37	36	37	40	43	55	65	65	79	85	81	81	80	57	79	51	34	25	30	31	33	32
5	H ₃₃	36	23	33	26	24	A	52	55	81	83	74	90	85	94	76	61	54	40	36	36	32	34	33
6	36	39	37	32	35	24	30	54	64	66	71	75	100	72	C	C	C	34	34	34	32	30	31	33
7	31	F ₃₁	F ₃₁	30	32	30	F ₃₀	54	66	66	67	74	81	66	61	59	53	40	30	34	33	F	F	F
8	F	F ₃₀	F ₃₀	F ₃₃	F ₃₀	31	33	51	65	66	63	81	79	64	59	66	56	33	35	31	34	33	35	37
9	F	37	30	F	F ₃₆	F ₃₅	32	53	68	65	67	75	72	65	66	58	48	35	31	24	30	29	F ₃₀	F ₃₀
10	F ₃₀	F ₂₉	28	29	F ₂₉	35	31	45	63	69	78	68	65	58	50	53	72	32	24	26	23	26	31	33
11	36	F ₃₅	F ₄₀	33	34	34	29	48	64	H ₆₄	58	78	77	67	51	59	65	44	48	32	29	30	35	40
12	40	40	41	38	F	33	34	53	64	67	65	69	72	62	55	C	C	31	30	33	32	34	32	34
13	33	33	34	34	33	34	32	47	53	66	81	77	70	61	C	C	C	C	C	C	C	C	31	F
14	F ₃₅	F	F ₃₃	F ₂₉	F	30	23	46	56	62	C	71	70	57	C	58	58	35	A	33	35	34	31	34
15	34	35	35	33	32	31	30	50	55	63	63	H ₆₄	75	54	57	57	H ₅₀	37	27	30	32	F	F	F
16	F	F	F	F ₃₀	F ₃₀	32	22	43	60	67	63	70	64	57	60	67	47	33	28	31	37	F ₃₉	37	F
17	F	F	F	F	F	F	31	49	59	60	66	72	75	60	60	59	48	34	A	A	31	F ₂₈	F	F ₃₀
18	30	31	30	30	29	28	28	46	56	58	H ₆₀	67	67	62	50	57	55	33	24	26	25	29	F	F ₃₀
19	31	35	F	F	F	28	29	53	69	64	57	C	65	66	55	47	43	25	25	28	26	28	F	F
20	F	F	F	F ₂₇	27	26	24	44	57	66	67	61	67	64	56	57	46	33	30	28	30	F	F	F
21	F	F	F	F ₂₃	F ₂₅	F ₃₃	35	49	58	60	57	68	64	70	54	54	54	28	30	32	30	31	32	33
22	35	F	34	33	31	32	28	50	58	60	64	68	69	59	63	50	45	32	29	30	33	36	F	40
23	37	S ₃₈	44	36	U ₄₃	S ₂₇	F ₃₃	50	60	63	63	72	72	C	62	56	50	28	28	36	30	31	32	34
24	35	35	35	34	37	33	45	54	70	80	100	81	78	57	59	56	50	40	30	40	S ₄₃	44	48	
25	S ₄₈	40	41	40	S ₃₆	S ₃₇	62	36	53	71	86	86	98	92	86	70	63	51	51	F ₄₅	48	S	50	F
26	F	F	F	F	F	F	30	50	91	103	106	110	81	90	71	68	54	37	33	36	38	37	39	40
27	44	34	F	F	F	F	35	49	61	86	73	83	84	67	68	57	45	30	A	A	30	F ₂₆	F ₃₁	F ₃₅
28	F	F	F	F ₂₈	26	26	28	53	63	61	71	64	65	74	58	58	46	S	29	27	A	29	30	F ₃₀
29	F ₃₁	33	33	34	31	32	31	45	70	72	68	71	72	60	62	55	42	35	29	31	32	31	32	A
30	34	F ₃₄	F ₃₆	F ₃₃	33	36	29	47	59	80	73	73	61	59	67	63	50	28	29	33	A	A	31	33
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	21	20	24	23	26	29	30	30	30	29	29	30	29	27	27	27	28	26	27	27	24	23	22
MED	35	35	34	33	32	32	31	50	62	66	68	74	72	66	60	58	53	34	30	32	32	31	32	34
UQ	37	38	38	35	36	35	34	53	66	72	79	81	81	72	66	63	57	41	35	34	34	36	36	37
LQ	33	33	30	30	30	28	29	46	57	63	63	69	67	60	56	57	48	32	29	29	30	29	31	33

NOV. 1986

FOF2 (0.1 MHz)

IONOSPHERIC DATA

NOV. 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											430	L	410	390										
2											L	390	L	410	L	400								
3											L	390	L	410	L	400								
4											L	400	380	L	410	L								
5											L	370	L	410	380	L								
6													L	400	L	C								
7													L	L										
8												L	400	L										
9												L	L	L										
10												370	L	L										
11												L	L	L	L									
12											L	L	400											
13											L	380	L	380		C								
14												C	L		C									
15											L		L											
16													L	390	H	370								
17													L	L										
18													L	390	L									
19													C											
20																								
21													L	A										
22												L	350	L										
23													L	L	C									
24													L		A									
25												L	L	L										
26											390		L	390	L		L							
27												A	A											
28																								
29													A	A										
30												L	A											
31																								
CNT											2	7	6	11	2									
MED											410	390	405	390	375									
UQ											L	395	L	410	L	400								
LQ												375	380	390	L									

NOV. 1986

FOF1 (0.01 MHz)

IONOSPHERIC DATA

NOV. 1936

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								C	235	255		C	C	C	C	A	C							
2								S	240	A	275	A	280	275	250	210		S						
3								S	A	260	280	295	290	275	C	210		S						
4								155	235	255	270	285	C	260	245	210		S						
5								A	A	A	A	A	A	A	A	215		S						
6								S	A	270	275	285	290	280	S	C	C	C						
7								S	230	255	275	280	275	C	A	A	A							
8								C	A	260	A	A	280	270	C	220		S						
9								S	235	270	280	290	B	270	B		S	S						
10								S	235	265	280	285	285	255	235		A	A						
11								175	235	255	290	290	285	265	230		B	S						
12								S	225	A	A	275	B	B	245		C	C						
13								S	225	255	280	285	280	C	C	C	C							
14								S	225	255	C	A	A	A	C	A	S							
15								S	230	255	260	275	270	A	235	200		S						
16								185	220	260	270	275	275	260	240	200		S						
17								S	A	A	270	285	285	A	A	A	A							
18								S	215	245	260	280	275	265	230	190		S						
19								S	220	240	260	C	285	260	230	195		E						
20								S	210	240	255	275	275	255	235	205		S						
21								S	205	250	270	285	275	250	A	A	S							
22								130	215	240	260	A	280	275	A	200		S						
23								S	215	260	275	280	280	C	225	200		S						
24								S	220	250	A	A	280	A	A	200		S						
25								135	200	A	A	270	265	250	220		S	S						
26								130	185	240	A	250	255	B	B	190		S						
27								S	215	A	A	A	270	B	B	B	S							
28								S	A	250	255	B	B	B	B	B	S							
29								S	S	A	A	A	A	250	A	B	S							
30								S	B	A	A	A	A	A	B	B	S							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								6	22	22	19	18	21	16	12	14	1							
MED								150	222	255	270	282	280	262	235	200		E						
UQ								175	235	260	278	285	285	272	242	210								
LQ								130	215	250	260	275	275	255	230	200								

NOV. 1936

FOE (0.01 MHz)

IONOSPHERIC DATA

NOV. 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 2sec in automatic operation																							
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	00	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 12	E S 16	E S 15	E S 22	G	G	E C 29	E C 33	E C 32	E C 30	E C 31	E C 23	36	E C 20	E S 18	E S 16	E S 18	E S 17	E S 16	E S 16	E S 16	J A 28																																																																										
2		J A 20	J A 23	E S 17	E S 19	J A 23	J A 24	E S 23	E S 21	G	G	G	G	G	G	G	E S 17	E S 18	J A 25	E S 26	E S 16	E S 13	E S 17	E S 15																																																																										
3	J A 48	J A 28	J A 51	J A 38	J A 49	J A 39	J A 33	31	34	G	G	G	G	E C 18	25	E S 17	E S 16	E S 16	E S 15	E S 16	E S 17	E S 12	E S 16																																																																											
4	E S 17	E S 16	E S 16	E S 17	E S 17	E S 16	22	G	G	G	G	E C 31	G	G	G	E S 19	E S 16	E S 15	E S 15	E S 15	E S 16	E S 13	E S 16																																																																											
5	E S 20	E S 16	11	E S 16	E S 19	E S 16	39	J A 42	36	27	J A 37	J A 36	J A 35	J A 37	32	G	J A 48	J A 56	J A 23	25	J A 37	J A 33	26	J A 25																																																																										
6	J A 29	25	21	E S 13	E S 16	E S 16	30	J A 42	G	G	G	31	G	C	C	C	E S 16	E S 17	27	E S 15	E S 17	E S 17	E S 14																																																																											
7	E S 16	E S 15	E S 15	E S 12	E S 16	E S 15	26	G	31	G	G	G	E C 23	E C 30	40	26	21	E S 16	E S 17	E S 15	J A 43	E S 15	36	28																																																																										
8	31	30	E S 15	E S 15	E S 15	E S 11	E C 20	J A 43	G	30	40	G	G	E C 30	G	E S 16	E S 17	30	E S 15	E S 18	E S 18	31	E S 16																																																																											
9	E S 15	E S 16	E S 15	E S 16	E S 15	E S 15	E S 17	E S 19	37	G	G	G	E B 30	G	E B 26	25	E S 16	E S 15	35	30	23	E S 16	23	31																																																																										
10	E S 17	38	28	21	E S 16	25	E S 20	36	G	G	G	G	G	G	G	31	31	31	E S 17	E S 17	E S 17	E S 16	E S 17	E S 16																																																																										
11	E S 15	E	25	21	E S 15	E S 16	E S 16	G	G	30	G	G	G	G	G	E B 25	E S 17	E S 17	E S 17	E S 17	E S 16	30	E S 17	27																																																																										
12	E S 16	E S 15	E S 11	E S 14	E S 16	E S 15	E S 15	E S 20	G	40	41	G	E B 30	E B 30	30	C	C	31	E S 17	E S 17	E S 17	E S 16	E S 17	E S 18																																																																										
13	E S 17	E S 12	E S 17	E S 12	E S 11	E S 16	E S 17	E S 20	G	30	G	J A 85	G	E C 30	C	C	C	C	C	C	C	C	C	E S 15	E S 15																																																																									
14	E S 15	E S 15	E S 15	E S 15	E S 16	26	25	26	30	31	C	31	34	35	C	J A 48	E S 16	23	J A 73	E S 16	E S 16	24	J A 30																																																																											
15	28	28	E S 16	E S 15	E S 15	E S 12	E S 19	G	32	30	G	31	32	G	G	E S 17	20	20	32	E S 15	E S 16	E S 15	E S 15																																																																											
16	E S 15	E S 16	E S 15	E S 16	E S 16	E S 15	G	G	G	G	G	G	G	G	G	G	J A 30	J A 33	33	35	33	40	35	E																																																																										
17	E S 15	E S 15	E S 12	E	E S 15	E S 15	E S 19	J A 38	32	G	G	G	G	43	40	J A 60	40	J A 72	J A 56	J A 55	J A 52	31	33	E S 15																																																																										
18	E S 15	E S 15	E S 15	E S 12	E	22	E S 15	E S 20	G	G	G	30	31	G	G	26	39	30	30	30	30	E S 16	E S 16	E S 16																																																																										
19	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	E S 18	G	G	G	C	G	30	26	27	18	E S 15	E S 16	E	30	J A 33	E S 15	E S 15																																																																											
20	E S 16	E S 15	E S 15	E S 16	E S 16	E S 15	20	G	34	33	31	G	30	30	G	E S 17	E S 15	E S 16	E S 16	E S 12	E S 15	E S 15	E S 15																																																																											
21	22	E S 15	E S 15	E	20	E S 15	E S 19	G	30	G	G	J A 45	35	30	31	32	20	E S 15	E S 16	E S 16	E S 12	E S 17	E S 17																																																																											
22	E S 15	E	E S 15	E S 15	E S 16	E S 15	G	G	G	G	35	G	G	43	G	E S 20	E S 16	E S 15	E S 15	E S 15	E	E S 15	E S 15																																																																											
23	E S 15	36	E S 16	E S 16	E S 15	E S 16	21	29	G	J A 43	G	G	C	G	G	21	30	E S 15	E S 15	32	32	28	23																																																																											
24	E S 15	E S 15	E S 12	E	30	26	E S 16	E S 17	G	31	J A 60	41	29	J A 53	J A 45	G	E S 15	27	23	30	E S 15	E S 20	25	E S 15																																																																										
25	E	E S 12	E S 16	E S 15	E S 15	E S 11	E S 15	40	28	43	32	G	G	G	E S 20	E S 15	E S 16	E S 17	E S 16	E S 15	E S 16	27	28																																																																											
26	E S 12	E S 11	E S 15	E S 15	E S 15	E S 15	16	25	26	G	J A 55	J A 43	32	29	E B 24	G	E S 17	E S 16	E S 16	E S 16	E S 15	E S 11	E S 16	E S 16																																																																										
27	E S 15	E S 13	E S 16	E S 15	27	E S 15	E S 15	E S 17	31	J A 65	J A 76	50	G	E B 27	E B 26	E B 24	27	J A 35	J A 61	J A 41	36	J A 33	J A 64	J A 40																																																																										
28	40	37	E S 16	E	E S 16	E S 16	E S 16	J A 31	36	G	G	E B 25	32	E B 28	E B 25	24	26	S	30	35	J A 51	43	J A 50	36																																																																										
29	E S 16	E S 14	E S 17	E S 17	20	31	E S 16	20	E S 22	J A 35	J A 63	J A 55	J A 88	31	42	22	E S 15	E S 16	E S 15	E S 16	E S 15	34	J A 52	J A 58																																																																										
30	32	J A 33	E S 17	E S 17	E S 15	E S 13	E S 16	39	J A 90	J A 71	J A 50	J A 63	43	50	E B 24	E B 22	E S 18	E S 16	E S 17	E S 17	42	J A 43	31	33																																																																										
31																																																																																																		
CNT	30	30	30	30	30	30	30	30	30	30	29	29	30	29	27	27	27	28	29	29	29	29	30	30																																																																										
MED	E S 16	E S 15	E S 15	E S 15	E S 15	E S 16	E S 16	E G 20	E G 22	30	G	E G 25	E G 26	E G 29	E G 26	E G 22	E S 18	E S 18	E S 17	E S 17	E S 17	E S 16	E S 17	E S 16																																																																										
UQ	20	25	E S 16	E S 16	E S 17	E S 16	E S 16	26	36	32	37	40	31	31	30	26	26	30	30	30	32	32	31	28																																																																										
LQ	E S 15	E S 15	E S 12	E S 12	E S 15	E S 15	E S 19	G	G	G	G	G	G	G	G	G	E S 17	E S 16	E S 16	E S 15	E S 15	E S 16	E S 15	E S 15																																																																										

NOV. 1986

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

NOV. 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 2sec in automatic operation													
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E S 15	E S 15	E S 12	E S 12	E S 16	E S 15	E C 22	G	G	E C 24	E C 33	E C 32	E C 30	E C 31	E C 28	29	E C 20	E S 18	E S 16	E S 18	E S 17	E S 16	E S 16	22	
2	19	18	E S 17	E S 19	E S 16	19	17	E S 21	G	28	25	36	G	G	G	G	E S 17	E S 18	E S 16	18	E S 16	E S 15	E S 17	E S 15	
3	20	E S 16	A A 51	32	24	23	24	23	25	G	G	G	G	E C 18	G	G	E S 17	E S 16	E S 16	15	E S 16	E S 17	E S 12	E S 16	
4	E S 17	E S 16	E S 16	E S 17	E S 17	E S 16	G	G	G	G	G	E C 31	G	G	G	G	E S 19	E S 16	E S 15	15	E S 15	E S 16	E S 13	E S 16	
5	E S 20	E S 16	E S 11	E S 16	E S 19	E S 16	A A 39	39	33	25	32	33	34	30	31	G	30	49	E S 16	23	31	20	E S 17	20	
6	19	E S 15	E S 16	E S 13	E S 16	E S 16	24	31	G	G	G	G	G	C	C	C	E S 16	E S 17	E S 15	E S 15	E S 17	E S 17	E S 14	14	
7	E S 16	E S 15	E S 15	E S 12	E S 16	E S 15	G	G	G	G	G	E C 23	30	30	22	20	E S 16	E S 17	E S 15	20	E S 15	E S 17	17	17	
8	15	E S 17	E S 15	E S 15	E S 15	E S 11	E C 20	43	G	30	30	G	G	E C 30	G	E S 16	E S 17	23	E S 15	E S 13	E S 18	E S 17	E S 16		
9	E S 15	E S 16	E S 15	E S 16	E S 15	E S 17	E S 19	G	G	G	G	E B 30	G	E B 26	G	E S 16	E S 15	24	22	16	E S 16	E S 16	E S 12	12	
10	E S 17	20	13	12	E S 16	E S 16	E S 20	G	G	G	G	G	G	G	G	22	21	21	E S 17	E S 17	E S 17	E S 16	E S 17	E S 16	
11	E S 15	E S 12	E S 15	E S 15	E S 16	E S 16	G	G	G	G	G	G	G	G	E B 25	E S 17	E S 17	E S 17	E S 17	E S 16	21	E S 17	E S 18	18	
12	E S 16	E S 15	E S 11	E S 14	E S 16	E S 15	E S 20	G	28	29	G	E B 30	E B 30	G	C	C	20	E S 17	E S 17	E S 17	E S 16	E S 17	E S 18	18	
13	E S 17	E S 12	E S 17	E S 12	E S 11	E S 16	E S 20	G	G	G	G	G	E C 30	C	C	C	C	C	C	C	C	C	E S 15	E S 15	
14	E S 15	E S 15	E S 15	E S 15	E S 16	E S 16	25	G	G	C	30	29	35	C	47	E S 16	19	A A 73	E S 16	E S 16	E S 16	E S 16	E S 20	20	
15	19	18	E S 16	E S 15	E S 15	E S 12	E S 19	G	G	G	G	G	G	G	G	E S 17	19	17	E S 16	E S 15	E S 16	E S 15	E S 15	15	
16	E S 15	E S 16	E S 15	E S 16	E S 16	E S 15	G	G	G	G	G	G	G	G	G	28	20	25	17	17	23	16	E	E	
17	E S 15	E S 15	E S 12	E	E S 15	E S 15	E S 19	24	28	G	G	G	G	30	23	50	15	25	A A 56	A A 55	24	17	E S 16	E S 15	
18	E S 15	E S 15	E S 15	E S 12	E S 15	E S 15	E S 20	G	G	G	G	G	22	G	G	G	25	E S 15	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	
19	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	E S 18	G	G	G	C	G	G	G	G	15	E S 15	E S 16	E	E S 15	20	E S 15	E S 15	15	
20	E S 16	E S 15	E S 15	E S 16	E S 16	E S 15	19	G	G	G	G	G	G	G	G	E S 17	E S 15	E S 16	E S 16	E S 16	E S 12	E S 15	E S 15	E S 15	
21	E S 15	E S 15	E S 15	E	E S 15	E S 15	E S 19	G	G	G	G	G	45	34	28	23	22	15	E S 15	E S 16	E S 16	E S 12	E S 17	17	
22	E S 15	E	E S 15	E S 15	E S 16	E S 15	G	G	G	G	G	G	30	G	27	G	E S 20	E S 16	E S 15	E S 15	E S 15	E	E S 15	15	
23	E S 15	E S 14	E S 15	E S 16	E S 15	E S 16	G	G	G	38	G	G	C	G	G	G	E S 15	E S 15	E S 15	E S 15	21	24	E S 16	E S 17	
24	E S 15	E S 15	E S 12	E	E S 16	E S 16	E S 17	G	G	32	28	24	49	29	G	E S 15	18	17	19	E S 15	E S 20	E S 17	E S 15	15	
25	E	E S 12	E S 16	E S 15	E S 15	E S 11	E S 30	26	38	26	G	G	G	G	E S 20	E S 15	E S 16	E S 17	E S 16	E S 15	E S 16	22	17	17	
26	E S 12	E S 11	E S 15	E S 15	E S 15	16	20	G	G	35	32	G	28	E B 24	G	E S 17	E S 16	E S 16	E S 16	E S 15	E S 11	E S 16	E S 16	16	
27	E S 15	E S 13	E S 16	E S 15	17	E S 15	E S 17	G	30	45	39	G	E B 27	E B 26	E B 24	22	27	A A 61	A A 41	21	18	23	17	17	
28	21	22	E S 16	E S 16	E S 16	E S 16	26	25	G	G	E B 25	G	E B 28	E B 25	G	20	S	19	23	A A 51	26	25	23	23	
29	E S 16	E S 14	E S 17	E S 17	20	22	E S 17	E S 22	25	37	48	64	E B 22	38	E B 22	E S 15	E S 16	E S 15	E S 16	E S 15	20	E S 16	A A 58	58	
30	20	16	E S 17	E S 17	E S 15	E S 13	E S 16	23	45	29	26	39	34	34	E B 24	E B 22	E S 18	E S 16	E S 17	E S 17	A A 42	A A 43	21	21	
31																									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	29	29	30	29	27	27	27	28	29	29	29	29	30	30	30
MED	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	E S 20	G	G	G	G	G	E G 22	E G 24	G	E S 17	E S 16	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	
UQ	E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	22	24	25	30	30	26	U	28	28	E G 22	20	19	17	18	18	20	E S 17	18	
LQ	E S 15	E S 14	E S 12	E S 12	E S 15	E S 15	E G 17	G	G	G	G	G	G	G	G	E S 16	E S 16	E S 16	E S 15	E S 15	E S 16	E S 15	E S 15	E S 15	

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FBES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1986

FMIN (0.1 MHz)

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

Station		WAKKANAI							Lat. 45	23.5	41.2	Sweep 1 MHz to 25 MHz in 2sec in automatic operation														
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		E 15	E 15	E 15	E 12	E 16	E 15	E 15	E 22	18	19	E C 33	E C 32	E C 30	E C 31	E C 23	18	E C 20	E S 18	E S 16	E S 18	E S 17	E S 16	E S 16	E S 16	
2		E S 18	E S 16	E S 17	E S 19	E S 16	E S 16	E S 12	E S 21	16	18	19	19	23	22	22	18	E S 17	E S 18	E S 16	E S 16	E S 16	E S 13	E S 17	E S 15	
3		E S 16	E S 16	E S 17	E S 18	E S 16	E S 16	E S 15	E S 18	18	18	20	22	23	18	E C 18	16	E S 17	E S 16	E S 16	E S 15	E S 16	E S 17	E S 12	E S 16	
4		E S 17	E S 16	E S 16	E S 17	E S 17	E S 16	E S 16	E S 15	16	16	19	18	E C 31	18	18	16	E S 19	E S 16	E S 15	E S 15	E S 15	E S 16	E S 15	E S 16	
5		E S 20	E S 16	E S 11	E S 16	E S 19	E S 16	E S 16	E S 16	16	16	16	18	19	18	17	18	E S 16	E S 15	E S 16	E S 16	E S 16	E S 18	E S 17	E S 16	
6		E S 16	E S 15	E S 16	E S 13	E S 16	E S 16	E S 16	E S 19	17	19	19	19	19	20	C	C	C	E S 16	E S 17	E S 15	E S 15	E S 17	E S 17	E S 14	
7		E S 16	E S 15	E S 15	E S 12	E S 16	E S 15	E S 15	E S 22	17	18	18	19	19	E C 30	13	18	E S 15	E S 16	E S 17	E S 15	E S 17	E S 15	E S 17	E	
8		E S 17	E S 15	E S 15	E S 13	E S 15	E S 15	E S 11	E S 20	16	17	19	18	19	20	E C 30	18	E S 16	E S 17	E S 12	E S 15	E S 18	E S 18	E S 17	E S 16	
9		E S 15	E S 16	E S 15	E S 16	E S 15	E S 15	E S 17	E S 19	17	19	20	24	30	20	26	E S 19	E S 16	E S 15	E S 15	E S 17	E S 16	E S 16	E S 12	E S 12	
10		E S 17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 20	E S 20	11	17	17	19	19	20	17	16	E S 15	E S 17	E S 17	E S 17	E S 17	E S 16	E S 17	E S 16	
11		E S 15	E S 12	E S 15	E S 15	E S 16	E S 16	E S 12	E S 12	18	19	19	19	18	19	19	25	E S 17	E S 17	E S 17	E S 17	E S 16	E S 18	E S 17	E S 18	
12		E S 16	E S 15	E S 11	E S 14	E S 16	E S 15	E S 15	E S 20	18	18	19	19	30	30	19	C	C	E S 16	E S 17	E S 17	E S 17	E S 16	E S 17	E S 18	
13		E S 17	E S 12	E S 17	E S 12	E S 11	E S 16	E S 17	E S 20	19	19	19	19	24	E C 30	C	C	C	C	C	C	C	C	C	E S 15	E S 15
14		E S 15	E S 15	E S 15	E S 15	E S 16	E S 14	E S 16	E S 16	16	19	C	23	23	20	C	17	E S 16	E S 15	E S 17	E S 16	E S 16	E S 16	E S 17	E S 17	
15		E S 17	E S 16	E S 15	E S 15	E S 15	E S 12	E S 19	E S 19	17	19	23	19	21	19	17	17	E S 17	E S 17	E S 16	E S 16	E S 15	E S 16	E S 15	E S 15	
16		E S 15	E S 16	E S 15	E S 16	E S 16	E S 15	E S 17	E S 17	19	17	19	17	24	17	17	17	E S 16	E S 16	E S 17	E S 15	E S 11	E S 16	E S 16	E	
17		E S 15	E S 15	E S 12	E S 12	E S 15	E S 15	E S 19	E S 19	17	18	17	17	17	17	17	15	E S 16	E S 16	E S 17	E S 16	E S 16	E S 16	E S 15	E S 15	
18		E S 15	E S 15	E S 15	E S 12	E S 15	E S 15	E S 20	E S 20	11	17	17	22	11	17	15	17	E S 15	E S 15	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	
19		E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	E S 18	E S 18	17	17	19	C	23	18	17	E S 17	E S 15	E S 16	E S 16	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 16	E S 16	E S 15	E S 15	E S 15	10	17	17	17	20	17	17	16	E S 17	E S 15	E S 16	E S 16	E S 12	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 19	E S 19	16	17	17	18	17	17	17	10	E S 15	E S 15	E S 16	E S 16	E S 16	E S 12	E S 17	E S 17	
22		E S 15	E S 15	E S 15	E S 15	E S 16	E S 15	E S 15	E S 15	12	13	17	19	16	22	16	17	E S 20	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	
23		E S 15	E S 14	E S 15	E S 16	E S 15	E S 16	E S 15	E S 15	16	17	17	22	20	C	17	17	E S 15	E S 15	E S 15	E S 15	E S 16	E S 16	E S 17	E S 17	
24		E S 15	E S 15	E S 12	E S 12	E S 16	E S 16	E S 17	E S 17	10	16	17	17	17	23	17	16	E S 15	E S 15	E S 12	E S 15	E S 20	E S 17	E S 15	E S 15	
25		E S 12	E S 16	E S 15	E S 15	E S 11	E S 15	E S 15	E S 15	10	17	19	18	17	19	17	20	E S 15	E S 16	E S 17	E S 16	E S 15	E S 16	E S 15	E	
26		E S 12	E S 11	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	11	19	23	22	22	23	24	E S 18	E S 17	E S 16	E S 16	E S 16	E S 15	E S 11	E S 16	E S 16	
27		E S 15	E S 15	E S 16	E S 15	E S 16	E S 15	E S 17	E S 17	18	18	20	23	24	27	26	24	E S 17	E S 16	E S 16	E S 17	E S 16	E S 17	E S 17	E	
28		E S 16	E S 17	E S 16	E S 16	E S 16	E S 16	E S 17	E S 17	20	20	23	25	25	28	25	20	E S 19	E S 15	E S 16	E S 16	E S 14	E S 14	E S 17	E	
29		E S 16	E S 14	E S 17	E S 17	E S 15	E S 16	E S 15	E S 15	E S 22	18	20	23	24	22	23	22	E S 15	E S 16	E S 15	E S 16	E S 15	E S 17	E S 16	E S 15	
30		E S 14	E S 14	E S 17	E S 17	E S 15	E S 13	E S 16	E S 17	22	23	22	23	22	22	24	22	E S 18	E S 16	E S 17	E S 17	E S 22	E S 17	E S 13	E S 13	
31																										
CNT		30	30	30	30	30	30	30	30	30	30	29	29	30	29	27	27	27	28	29	29	29	29	30	30	
MED		E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 18	E S 18	16	18	19	19	21	20	18	17	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	
UQ		E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 20	E S 20	18	19	20	22	24	22	22	18	E S 17	E S 16	E S 17	E S 17	E S 16	E S 17	E S 17	E S 16	
LQ		E S 15	E S 14	E S 12	E S 12	E S 15	E S 15	E S 15	E S 15	16	17	17	18	19	18	17	16	E S 15	E S 15	E S 15	E S 15	E S 15	E S 12	E S 15	E S 14	

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FMIN (0.1 MHz)

IONOSPHERIC DATA

NOV. 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 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	F	F	F	F	F	F	345	330	335	355	355	290 ^H	325	345	345	345	320	315	290	280	300	300	310		
2	285	275	285	290	295	305	325	345	340	335	350	360	340	350	350	355	355	310	325	295	295	300	295	300		
3	315	305	A	300	300	335	315	365	360	345	340	340	355	320 ^H	345	350	360	295	320	310	310	305	290	285		
4	300	300	310	305	320	300	335	360	370	340	335	345	335	325	355	335	345	355	310	280	265	265	270	285		
5	305 ^H	315	305	335	305	270	A	350	350	325	325	305	320	320	340	345	325	A	320	305	A	280	295	305		
6	300	300	325	310	335	335	310	335	340	350	330	325	360	360	C	C	C	315	315	325	315	315	305	320		
7	290	290	305	300	330	340	335	350	370	335	330	340	360	335	355	340	350	350	300	325	325	F	F	F		
8	F	F	F	F	F	F	F	360	370	330	340	360	340	360	355	365	355	335	330	295	305	335	300	300		
9	F	310	335	F	F	F	F	330	365	355	340	350	335	360	325	350	360	375	320	330	A	315	310	300	335	
10	F	F	300	310	F	F	F	360	340	345	370	325	360	350	375	340	335	355	335	305	310	310	305	310		
11	315	315	F	F	295	325	325	350	360	310 ^H	345	345	365	360	370	340	355	315	310	355	310	285	285	300		
12	300	305	300	300	F	310	315	350	360	375	325	345	345	340	365	C	C	355	315	320	310	325	310	300		
13	305	305	300	310	305	330	315	370	360	355	350	345	350	355	C	C	C	C	C	C	C	C	C	F		
14	295	F	F	F	F	F	F	350	305	370	365	355	C	345	355	355	C	350	360	350	A	335	320	330	315	295
15	295	300	310	305	310	330	315	370	370	365	365	315 ^H	365	355	345	370	340 ^H	345	335	310	315	F	F	F		
16	F	F	F	F	F	F	F	345	355	350	335	360	315	340	345	370	335	365	340	335	320	305	310	310	F	
17	F	F	F	F	F	F	F	330	365	355	350	325	345	360	350	335	360	355	335	A	A	320	F	F	300	
18	300	300	300	300	310	355	330	370	370	360	330 ^H	345	360	370	360	340	365	335	310	345	330	295	F	F	300	
19	320	300	F	F	F	320	320	360	380	335	350	C	355	365	365	370	340	305	320	355	305	305	F	F		
20	F	F	F	F	295	300	345	335	345	375	365	350	330	330	360	350	355	370	335	340	320	320	F	F	F	
21	F	F	F	F	F	F	F	345	355	350	335	360	360	350	320	370	375	350	370	305	335	330	325	320	295	315
22	315	F	315	310	340	345	320	370	375	365	365	340	360	355	370	385	375	320	335	315	305	310	F	320		
23	305	305	325	335	325	335	310	350	355	350	350	345	345	C	340	355	360	355	305	335	305	320	315	295		
24	315	315	305	310	305	F	340	245	350	330	345	335	345	360	335	340	350	340	325	335	285	310 ^S	300	310		
25	335 ^S	300	295	300	285 ^S	320 ^S	355	325	350	315	335	320	335	325	340	330	315	300	315	290 ^F	320	S	300	F		
26	F	F	F	F	F	F	F	300	300	330	340	340	330	350	360	350	350	350	325	335	310	310	310	295	300	
27	320	325	F	F	F	F	F	315	345	320	350	340	355	350	350	345	340	355	345	A	A	300	280	F	F	285
28	F	F	F	F	305	300	305	285	360	380	345	365	355	340	365	350	330	375	S	325	305	A	285	300	300	
29	F	305	305	325	320	325	325	335	370	360	350	340	360	350	355	360	345	340	310	320	310	320	310	A		
30	325	295	F	F	F	325	310	345	340	340	340	360	355	340	350	355	370	280	310	320	A	A	315	305		
31																										
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	21	21	20	24	23	26	29	30	30	30	29	29	30	29	27	27	27	27	26	26	26	24	23	22		
MED	305	300	305	305	310	330	325	350	360	345	345	345	350	355	350	350	355	335	320	318	310	310	300	300		
UQ	315	305	310	310	325	340	335	365	370	360	350	345	360	360	358	360	362	345	330	330	320	318	310	310		
LQ	300	300	300	300	300	315	315	345	340	335	335	335	340	340	345	340	345	315	310	305	305	298	295	300		

The Radio Research Laboratory, Japan

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M(3000)F2 (0.01)

IONOSPHERIC DATA

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M(3000)F1 (0.01)

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

Station	WAKKANAI																								Lat.	45 23.5 N		Long.	141 41.2 E		Sweep 1		MHz to 25 MHz		in 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										355	L	365	405																											
2										L	L	A	360																											
3										L	L	L	385	390	355																									
4										L	L	L	360	380	370	L																								
5										L	A		A	L	370																									
6												L	380	L	C																									
7												L	L																											
8											L	415	L																											
9											L	L	L																											
10											380		L	L																										
11											L	L	L	360	L																									
12										L	L	375																												
13										L	375	L	L	385	C																									
14											C		L	C																										
15										L			L																											
16												L	380	390	H																									
17												L	L																											
18												L	L	385	L																									
19												C																												
20																																								
21												L	A																											
22											L	400	L																											
23												L	L	C																										
24												L		A																										
25											L	L	L																											
26										365		L	L	375	L																									
27											A	A																												
28																																								
29												A	A																											
30											L	A																												
31																																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																
CNT										2	6	5	10	2																										
MED										360	378	380	378	380																										
UQ											L	385	390	385																										
LQ											L	360	375	360																										

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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H*F2 (KM)

135° E Mean Time (G.M.T. + 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										255	235	225	225											
2										230	240	220	235											
3										220	240	245	240											
4											250	255	250	255										
5										255	245		255	255										
6												240	240	220		C								
7												260	250											
8											235		245											
9											250	245	230											
10											220		220	230										
11											250	235	225	230										
12										220	230	245												
13										235	250	225	215			C								
14											C		220			C								
15										225			225											
16											240	230	220											
17											230	230												
18											245	225	215											
19												C												
20																								
21											235	240												
22											230	220	230											
23											245	225			C									
24											250		220											
25											250	255	235											
26										250		250	230		220									
27											250	225												
28																								
29												235		A										
30											220	225												
31																								
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									8	15	22	22	8	1										
MED									232	240	240	230	225	220										
UQ									252	250	245	240	242											
LQ									222	232	225	225	220											

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H*F2 (KM)

IONOSPHERIC DATA

NOV. 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 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	280	270	275	230	220	225	220	225	205	235	225	200	215 ^H	230	225	215	205	250	250	255	265	250	255																									
2	310	290	255	260	255	255	245	225	220	220	205		205	225 ^H	230	230	205	210	220	295	285	255	255	250																									
3	260	255	A	A	290 ^A	225 ^A	255 ^A	215	205 ^H	215	200	200 ^H	200	235	230	230	205	205	250	250	265	270	295	300																									
4	275	255	250	250	250	255	205	205	210	220	210	205	225	225	220	230	225	200	255	245	355	345	310	290																									
5	325	260	230	255	300	325		A	A	225	220		A	245	A	A	230	245	230	225		A	230	295 ^A																									
6	295	260	245	250	230	225	230	220	220	225	230	230	220	220		C	C	C	245	245	240	250	265	275	250																								
7	300	315	280	280	250	215	235	215	205	205	225	230	200	230	220	225	200	200	270	250	270	270	285	325																									
8	300	300	270	250	220	245	215	235	A	215	200	200 ^H	220	225	225	220	205	200	250	250	260	240	270	280																									
9	300	250	250	280	250	220	230	220	215	210 ^H	205	200	225	205 ^H	225 ^H	215	205	220	250		A	255	255	285	275																								
10	270	300 ^A	255	250	255	230	235	205	230	215 ^H	215	210 ^H	205	210	215	215	210	215	230	260	270	280	285	280																									
11	250	255	245	255	275	230	225	215	210	200 ^H	200	230	220	220	210	250	215	230	235	205	250	300	310	275																									
12	250	255	250	250	290	260	255	230	225	220	200	210	200 ^H	225	210		C	C	215	270	250	255	250	260	285																								
13	275	285	290	270	270	230	230	210	205	220	200	225	205	230		C	C	C	C	C	C	C	C	225	280																								
14	280	295	275	295	250	205	255	210	210	210 ^H		C	220	220		A	C	A	205	205		A	225	230	225	250	300																						
15	290	295	270	275	270	225	230	210	205	215	210 ^H	210	200	205 ^H	215	210	205	205	230	245	250	265	300	275																									
16	250	275	290	300	275	210	205	215	240	220	205 ^H	230	215	200	230	225	225 ^A	250		A	270	245	255	265	270																								
17	300	300	280	275	250	225	225	210	210	200 ^H	240	230	220	225	220		A	215	250 ^A		A	A	A	295	285	290	270																						
18	280	280	270	270	270	225	235	210	215	200 ^H	230 ^H	235	225	215	200 ^H	215	215	205	250	225	240	270	325	300																									
19	280	265	250	255	250	240	250	225	210	200 ^H	225		C	230	225	220	205	200	215	250	205	255	270	255	300																								
20	290	290	275	265	250	230	230	205	210	220	220 ^H	220	215	235	215 ^H	225	210	215	230	250	250	250	300	325																									
21	250	300	270	275	265	240	220	220	205	220	200	235		A	225	210	220	215	220	235	245	230	270	300	275																								
22	250	275	265	265	230	225	225	210	210	210	215	200	205	205 ^H	220	205	200	240	245	250	260	250	305	250																									
23	250	265	235	205	205	200	245	210	205	215	215	215	200		C	215	210	210	205	260	225	275	295 ^A	255	290																								
24	270	280	250	250	255	205	210	205	215	215	220	210	225		A	215	225	205	215	235	250	275	270	270	240																								
25	220	220	250	265	325	235	200		A	220	205	235	225	220	215	225	220	220	225	245	255	230	275	265	255																								
26	255	280	245	210	225	265	245	275	250	210	255	230	225	220	215	210	200	220	250	240	245	250	275	280																									
27	250	225	225	265	270	230	245	210	210	250		A	A	225	210	210	220	205		A	A	A	305	290 ^A	A	305																							
28	280	275	260	250	265	265	250	225	200	205	215	215	220	225	220	205	200		S	265		A	A	A	A	300																							
29	295	265	280	250	255	275	250	215	205	205		A	A	A	215	220	210	200	210	255	255	275	255	280	A																								
30	250	275	275	285	300	225	250	235		A	240	210		A	215	225	245	215	200	300	250	265		A	A	320	315																						
31																																																	
CNT	30	30	29	29	30	30	29	28	28	30	26	25	27	27	27	25	27	26	25	25	26	27	28	29																									
MED	278	275	260	265	255	230	230	212	210	215	215	220	220	225	220	220	205	215	250	250	255	270	282	280																									
UQ	295	290	275	275	270	245	245	220	220	220	225	230	222	225	225	225	215	225	250	255	275	278	300	300																									
LQ	250	260	250	250	250	225	225	210	205	205	205	210	205	215	215	210	202	205	235	240	250	255	262	270																									

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H*F (KM)

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IONOSPHERIC DATA

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H^oE (KM)

135° E Mean Time (G.M.T. + 9h)

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

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

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H^oE (KM)

IONOSPHERIC DATA

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H^oES (KM)

135° E Mean Time (G.M.T. + 9h)

Station		WAKKANAI											Lat. 45 23.5 N, Long.141 41.2 E											Sweep 1 MHz to 25 MHz in 24sec in automatic operation										
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
1		S	S	E	S	E	S	S	C	G	110	C	C	C	C	C	105	C	S	S	S	S	S	S	105									
2		105	105	S	S	105	105	105	S	G	115	110	105	G	G	G	G	S	S	105	105	S	S	S	S									
3		105	105	105	105	105	105	105	105	G	G	G	G	G	C	135	S	S	S	S	S	S	S	S	S									
4		S	S	S	E	S	S	S	145	G	G	G	G	C	G	G	G	S	S	S	S	S	S	S	S									
5		S	S	S	S	S	S	115	105	105	120	105	100	105	100	105	G	110	105	110	110	105	105	105	105									
6		100	105	100	S	E	S	S	150	105	G	G	G	150	G	C	C	C	S	S	105	S	S	S	S									
7		S	S	S	S	S	E	S	145	G	120	G	G	105	C	105	105	105	S	S	S	105	S	110	110									
8		105	105	S	S	S	S	S	C	105	G	105	105	G	G	C	G	S	S	100	S	S	105	S										
9		S	S	S	S	S	S	S	S	125	G	G	G	B	G	B	150	S	S	105	105	105	S	110	110									
10		S	110	105	105	E	S	110	S	120	G	G	G	G	G	G	100	100	100	S	S	S	S	S	S									
11		S	E	115	105	S	S	S	G	G	120	G	G	G	G	G	B	S	S	S	S	S	105	S	105									
12		S	S	S	S	S	S	S	S	G	105	100	G	B	B	150	C	C	110	S	S	S	S	S	S									
13		S	S	S	S	S	S	S	S	G	130	G	120	G	C	C	C	C	C	C	C	C	C	C	S	S								
14		S	S	E	S	S	105	155	150	145	135	C	115	115	115	C	105	S	115	110	E	S	S	105	100									
15		100	100	S	S	S	S	S	S	G	125	135	G	125	115	G	G	S	115	115	105	S	S	S	S									
16		S	S	S	S	S	S	S	G	G	G	G	G	G	G	G	G	110	110	105	110	105	105	105	E									
17		S	S	S	E	E	S	S	S	110	105	G	G	G	105	105	110	105	105	105	105	105	105	105	S									
18		S	S	S	S	E	115	S	S	G	G	G	155	140	G	G	125	110	120	110	110	105	S	S	S									
19		S	S	S	S	S	S	S	S	G	G	G	C	G	150	150	125	125	S	S	E	120	105	S	S									
20		S	S	S	S	E	S	S	150	G	145	120	125	G	140	135	G	S	S	S	S	S	S	S	S									
21		100	S	S	E	100	S	E	S	G	150	G	G	120	115	105	100	100	100	S	S	S	S	E	S									
22		S	E	E	S	E	S	S	G	G	G	G	115	G	G	100	G	S	S	S	S	S	E	E	S									
23		S	110	S	S	E	S	S	150	145	G	125	G	G	C	G	G	S	S	110	105	S	110	110	110	105								
24		S	S	S	E	110	105	S	S	G	145	115	115	110	100	110	G	S	105	105	105	S	S	120	S									
25		E	S	S	S	S	S	S	130	120	115	110	G	G	G	G	S	S	S	S	S	S	S	130	130									
26		S	S	S	S	S	S	130	125	125	G	110	115	120	115	B	G	S	S	S	S	S	S	S	S									
27		S	S	S	S	105	S	S	S	130	115	105	105	G	B	B	B	125	115	110	110	110	115	110	105									
28		100	100	S	E	S	S	S	115	110	G	G	B	165	B	B	130	120	S	110	105	105	105	105	105									
29		S	S	S	S	100	100	S	110	S	110	105	100	100	110	105	B	S	S	S	S	S	105	110	105									
30		105	105	E	S	S	S	S	110	105	105	105	105	100	100	B	B	S	S	S	S	105	105	110	110									
31																																		
CNT		8	9	4	3	6	6	6	13	14	17	13	13	12	11	10	11	11	12	12	11	11	10	14	12									
MED		102	105	105	105	105	105	112	130	115	120	110	115	118	115	105	110	110	108	108	105	105	105	110	105									
UQ		105	105	110	105	105	105	130	150	125	130	115	115	132	115	135	128	115	115	110	110	108	105	110	110									
LQ		100	105	102	105	100	105	105	110	105	110	105	105	105	102	105	105	105	105	105	105	105	105	105	105									

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H^oES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

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TYPES OF ES

135° E Mean Time (G.M.T. + 9h)

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

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

The Radio Research Laboratory, Japan

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TYPES OF ES

IONOSPHERIC DATA

NOV. 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	63	68	69	74	74	55	65	73										51	X	X	X	X	X	X
2	X	X	X	X	X	X												48	45	44	42	46	46	47
3	X	X	X	X	X	X												45	38	42	42	40	38	40
4	X	X	X	X	X	X												62	42	36	35	U	S	X
5	H	X	X	X	X	X												64	51	46	46	X	41	X
6	X	X	X	X	X	X												42	40	A	A	33	33	36
7	X	X	X	X	X	X												45	38	41	42	36	A	40
8	38	X	X	X	X	X												45	36	39	38	35	34	40
9	40	40	36	39	39	38												42	39	40	36	36	35	33
10	X	X	X	X	X	X												53	35	32	34	X	35	39
11	X	X	X	X	X	X	X											64	45	49	32	34	36	41
12	X	X	X	X	X	X	X											47	34	41	37	39	36	38
13	X	X	X	X	X	X	X											44	A	40	39	40	36	38
14	40	40	40	36	35	30	35											51	34	41	44	35	35	36
15	37	X	X	X	40	36	40											43	35	35	38	35	33	40
16	39	X	X	X	X	X	X											A	X	X	X	X	X	53
17	43	45	43	42	40	32	34											40	34	32	36	34	31	38
18	X	X	X	X	X	X	X											42	32	33	32	32	35	40
19	40	37	40	37	38	32	35											40	36	34	A	33	37	39
20	38	39	38	X	39	32	X											47	X	32	35	S	40	40
21	40	39	38	39	39	38	39											42	34	35	37	34	39	39
22	40	40	41	36	X	31	32											39	35	38	39	A	44	47
23	47	49	50	47	44	36	36											48	33	38	41	37	39	42
24	47	42	41	41	42	39	39											56	A	40	44	49	56	61
25	54	44	43	47	47	50	46											59	57	54	57	48	51	54
26	55	X	X	X	51	52	38											48	47	41	41	42	41	42
27	X	X	X	X	40	39	36											38	33	35	37	40	40	43
28	49	39	39	40	40	39	42											36	35	44	35	32	37	38
29	X	X	X	X	X	X	X											39	38	36	39	44	S	41
30	X	X	X	X	X	X	X											35	34	38	44	31	31	34
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	21	1										29	28	29	28	29	29	30
MED	40	40	40	39	39	36	37	73										45	36	39	38	37	37	40
UQ	46	44	43	41	41	39	39											51	41	41	42	40	40	42
LQ	39	X	X	X	X	X	X											42	34	35	36	34	35	38

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FXI (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

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FOF2 (0.1 MHZ)

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

Station	AKITA																							
	Lat. 39 43.5 N												Long. 140 08.0 E											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F	F	F	F	F	F	F	F	R ₇₆	86	83	84	76	68	80	70	66	H ₄₅	44	47	44	40	43	40
2	42	44	44	42	42	39	45	68	80	94	89	84	77	62	64	66	62	42	39	38	36	40	40	41
3	38	38	38	38	35	34	38	70	81	70	81	68	75	74	70	70	55	39	32	36	36	33	32	34
4	34	34	35	34	32	29	42	54	64	79	78	90	86	86	83	57	78	56	36	30	29	S ₃₁	33	35
5	H ₂₉	31	38	20	24	22	40	49	59	78	99	83	89	93	99	86	61	58	45	40	40	36	35	33
6	36	39	42	35	30	24	30	51	H ₇₁	75	67	80	89	86	69	62	63	36	34	A	A	F	27	30
7	29	29	30	30	35	26	36	51	63	62	72	81	77	H ₈₄	68	66	50	39	32	35	36	F ₂₈	A ₃₂	F ₃₂
8	F ₂₉	30	31	31	25	25	32	52	55	68	72	78	71	67	69	57	54	39	30	33	F ₂₉	29	28	F
9	F	F	30	F	F	F ₂₉	31	51	66	80	67	67	77	67	67	56	48	36	33	34	30	30	29	27
10	29	30	30	29	29	30	29	51	60	69	76	67	69	66	59	53	52	47	29	26	28	28	29	F
11	33	33	34	29	30	30	30	50	57	66	67	63	78	69	59	51	67	58	39	43	26	28	30	35
12	37	35	35	33	32	29	31	61	69	70	65	66	66	59	55	55	64	41	28	35	31	33	30	32
13	34	32	33	33	33	33	32	60	64	55	69	77	80	66	54	56	56	38	A	34	33	F ₃₂	30	32
14	F ₃₂	F	F	30	29	24	29	52	H ₅₆	61	72	67	H ₆₆	61	59	60	56	45	28	35	38	29	F ₂₈	F
15	F ₂₉	29	30	31	F ₃₁	30	34	53	58	54	68	66	H ₆₅	66	54	68	54	37	29	29	32	29	27	F
16	F ₃₀	29	28	27	30	29	26	49	53	68	72	74	67	59	59	57	56	A	30	28	32	34	31	F
17	F	F	F	F	F	26	28	55	64	H ₅₈	69	84	73	64	65	54	56	34	28	26	30	28	25	F
18	26	29	30	29	30	27	27	51	61	59	65	67	69	60	56	57	53	36	26	27	26	26	29	F ₃₁
19	F ₃₁	31	34	31	32	26	29	59	61	64	65	72	64	60	62	53	46	34	30	28	A	27	F	F
20	F	F ₂₉	F ₂₉	29	F	F ₂₄	27	49	56	60	67	H ₇₅	61	64	66	54	53	41	31	26	29	S ₃₁	F	F
21	F	F ₃₁	F ₂₈	F	F ₂₉	F ₂₆	F ₃₀	51	57	60	61	62	68	62	55	56	55	36	28	29	31	28	F ₃₀	F
22	F ₃₁	F ₃₂	F ₃₂	30	30	25	26	56	57	56	60	72	68	70	54	56	42	33	29	32	33	A	F	F ₃₈
23	F ₃₆	F ₄₁	F ₃₉	F ₃₈	F	30	30	51	63	69	70	76	H ₇₆	H ₇₀	66	64	57	42	27	32	34	31	33	F
24	F ₃₆	36	35	35	36	33	33	51	58	64	85	87	84	75	62	A	57	50	A	F	F	43	F ₄₄	F ₅₁
25	F ₄₆	F ₃₅	F ₃₆	F ₃₈	F ₃₈	44	40	44	54	66	97	95	90	82	85	76	61	53	51	48	51	42	45	48
26	F ₄₆	44	F ₅₃	57	F	F	F ₂₈	50	112	108	116	116	103	95	79	76	68	42	41	35	35	36	35	36
27	40	37	29	30	34	33	30	60	70	76	99	101	92	H ₇₆	H ₇₀	65	65	32	27	29	31	F ₃₂	F ₃₂	F ₃₅
28	F	33	33	34	F ₃₂	33	F ₃₃	59	70	63	78	76	53	77	76	59	49	30	29	38	29	26	31	32
29	33	36	35	35	34	34	33	54	71	76	70	71	60	65	61	56	50	33	32	30	33	38	S ₃₂	35
30	33	34	33	32	31	33	26	57	61	76	H ₇₉	H ₇₂	67	62	52	72	66	29	28	32	38	25	25	28
31																								
CNT	24	26	27	26	24	28	29	29	30	30	30	30	30	30	30	29	30	29	28	28	27	28	26	20
MED	33	33	33	32	32	29	30	52	62	68	72	76	74	67	64	57	56	39	30	32	32	31	30	34
UQ	36	36	36	35	34	33	33	57	70	76	81	84	80	76	70	66	63	45	35	36	36	35	33	37
LQ	30	30	30	30	30	26	29	51	57	61	67	67	67	62	59	56	53	36	28	29	30	28	29	32

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FOF2 (0.1 MHZ)

IONOSPHERIC DATA

NOV. 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				
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1										L	L	L	L	L	L	L									
2										L	L	L	L	L	L	L									
3										L	L	L	L	L	L	L									
4										L	L	L	L	L	L	L									
5											L	L	L	A	A	A									
6										L	A	L	L	L	L	L									
7											L	L	L	L	L	A									
8										L	L	L	L	A	L	L									
9										L	L	L	L	L	L	L									
10										L	L	L	L	L	L	L									
11										L	L	L	L	L	L	L									
12										L	L	L	L	L	L	L									
13										L	L	L	L	L	L	L									
14											L	L	L	L	L	L									
15										L	L	L	L	A	A	L									
16										L	L	L	L	L	L	L									
17										L	L	L	L	L	L	L									
18										L	L	L	L	L	L	L									
19										L	L	L	L	L	L	L									
20										L	L	L	L	L	L	L									
21										L	L	L	L	L	L	L									
22										L	L	L	L	L	L	L									
23										L	L	L	L	L	L	L									
24										L	L	L	L	L	L	L									
25										L	L	L	L	L	L	L									
26										L	L	L	L	L	L	L									
27										L	L	L	L	L	L	L									
28										L	L	L	L	L	L	L									
29										L	L	L	L	L	L	L									
30										L	L	L	L	L	L	L									
31										L	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									1	1	4	8	7		1										
MED									L	310	350	400	385	400		320									
UQ											400	400	L	410											
LQ											385	360	400												

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FOF1 (0.01 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

NOV. 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																	
Hour Day	00	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	200	245	285	300	300	305	300	285	250	S							
2							S	210	A	A	A	305	310	290	270	250	S							
3							S	A	A	285	300	310	300	A	A	A	S							
4							S	205	255	285	295	300	300	290	275	235	S							
5							S	175	A	A	A	A	A	A	A	A	S							
6							S	180	230	270	290	295	295	290	260	225	S							
7							S	S	245	260	A	295	295	285	260	235	S							
8							S	190	A	275	A	295	295	A	275	220	A							
9							S	A	A	A	A	300	300	280	A	A	S							
10							S	180	A	A	285	290	290	275	250	210	S							
11								215	250	A	290	295	295	280	260	215	S							
12							S		230	260	270	280	280	270	255	220	S							
13							S		220	265	A	290	A	A	255	A	S							
14							A	A	280	295	A	A	A	A	A	A	S							
15							S		245	260	280	A	A	A	A	A	S							
16							S		220	260	280	A	295	280	A	245	S							
17							S		220	260	A	A	A	A	A	A	S							
18							S	A	255	265	275	280	275	A	250	S								
19							S		225	255	275	285	290	275	250	215	S							
20							S		235	A	280	285	285	280	255	220	S							
21							S	A	255	280	285	285	275	250	215	S								
22							S	A	A	270	A	A	275	A	220	S								
23							S		230	265	A	A	300	A	A	A	S							
24							S		215	260	285	A	A	A	A	A	S							
25							S		A	A	A	A	A	A	A	A	S							
26							S	A	245	A	A	A	A	A	A	A	S							
27							S	A	A	A	A	A	265	A	A	A	S							
28							S	A	A	A	A	A	265	250	220	S								
29							S	A	245	265	280	285	265	250	210	S								
30							S	A	240	260	A	A	A	A	A	A	S							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								8	14	20	18	17	18	18	15	17								
MED								195	230	260	280	295	295	278	255	220								
UQ								208	245	272	290	300	300	285	265	235								
LQ								180	220	255	270	285	285	275	250	215								

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FOE (0.01 MHz)

IONOSPHERIC DATA

NOV. 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 2sec in automatic operation									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E 15	E 15	E 15	J A 24	E 15	E 15	E 16	J A 29	G	J A 40	G	G	G	G	G	20	E 15	E 16	J A 26	J A 23	E 16	J A 22	E 16		
2	E 16	E 16	E 16	E 15	E 16	E 16	E 16	25	26	28	J A 39	G	G	G	J A 29	J A 50	J A 22	E 16	J A 20	J A 24	J A 24	J A 22	E 16		
3	J A 19	J A 24	E 15	E 16	E 16	E 15	J A 29	J A 30	J A 44	J A 40	G	G	G	39	30	30	23	J A 22	J A 40	J A 19	E 16	E 16	E 16		
4	E 16	E 16	E 15	E 16	E 15	E 16	E 16	G	G	G	G	G	G	G	G	E 18	E 16	E 16	E 16	E 16	E 16	E 17	E 16		
5	E 16	E 16	E 16	J A 18	E 16	E 16	E 16	24	J A 43	J A 54	J A 39	J A 32	J A 34	J A 66	J A 60	J A 29	J A 42	J A 51	J A 30	J A 32	J A 37	E 16	J A 27		
6	J A 28	J A 29	J A 19	E 16	E 16	J A 18	E 16	27	31	32	41	40	36	J A 38	G	G	J A 26	J A 24	J A 37	J A 34	J A 44	J A 22	E 16		
7	E 16	E 15	E 16	J A 24	E 15	E 15	J A 20	E 16	G	J A 34	35	J A 31	J A 33	32	J A 54	J A 44	J A 27	J A 26	J A 37	J A 29	J A 28	J A 44	J A 28		
8	J A 29	J A 23	J A 21	E 16	J A 22	E 16	E 15	23	26	G	J A 32	G	G	J A 46	J A 28	J A 26	J A 31	J A 49	J A 29	E 16	E 16	E 15	J A 24		
9	J A 20	E 16	J A 21	E 16	E 15	E 15	E 16	J A 29	29	J A 37	J A 42	G	G	G	J A 28	J A 50	J A 32	J A 33	E 16	J A 18	J A 21	J A 19	E 15		
10	E 16	E 15	E 15	E 15	E 15	E 15	E 16	G	J A 26	J A 29	G	G	G	G	G	E 16	J A 21	E 15	E 15	E 15	E 15	E 15	E 15		
11	J A 18	E 16	E 16	E 16	E 16	E 16	E 16	G	G	J A 32	G	G	G	G	G	E 16	J A 21	E 16	E 15	E 15	E 15	E 15	J A 19		
12	J A 20	J A 24	J A 18	E 15	J A 18	E 15	E 15	23	27	G	G	G	J A 33	G	G	32	22	E 15	J A 41	J A 18	E 15	J A 20	E 15		
13	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 17	G	31	J A 35	32	32	32	G	24	E 17	E 16	J A 44	J A 30	E 15	E 15	E 15		
14	E 15	E 15	J A 21	J A 18	J A 20	E 16	E 16	24	J A 36	37	40	J A 38	J A 46	30	31	J A 24	20	E 16	J A 19	J A 44	J A 84	J A 50	J A 21		
15	E 15	E 16	E 15	E 15	E 15	J A 24	E 15	J A 22	G	G	35	32	35	J A 42	J A 53	J A 45	E 17	E 15	J A 64	J A 30	J A 22	J A 25	J A 23		
16	E 15	E 15	E 15	J A 20	E 15	E 15	E 15	E 17	G	31	32	J A 35	G	G	J A 40	G	J A 26	J A 50	J A 24	E 15	E 15	E 15	J A 48		
17	J A 25	J A 24	E 15	E 12	E 15	E 15	E 15	J A 25	G	G	J A 46	J A 44	J A 43	J A 50	J A 44	J A 32	E 17	J A 22	J A 18	E 16	E 16	E 16	J A 18		
18	J A 21	J A 24	J A 24	E 15	J A 18	J A 22	J A 24	J A 29	J A 26	G	G	G	33	31	32	G	20	J A 18	J A 21	J A 18	J A 21	E 15	E 15		
19	E 15	E 16	E 15	E 15	E 15	E 15	E 15	E 17	G	G	G	20	32	G	31	G	G	25	E 16	J A 20	J A 18	J A 25	J A 33		
20	E 15	E 15	E 16	E 15	E 15	E 15	E 15	21	G	J A 23	37	32	32	30	G	G	E 17	E 15	E 15	E 15	E 15	J A 24	E 16		
21	E 15	J A 24	E 15	E 15	E 15	E 15	E 16	E 17	J A 30	G	G	32	33	G	G	G	E 17	E 15	E 15	E 15	E 15	E 15	E 15		
22	J A 20	J A 21	J A 22	J A 24	E 16	E 15	E 15	E 17	29	J A 29	32	J A 42	31	G	J A 29	J A 28	J A 28	J A 40	J A 19	J A 24	J A 50	J A 52	J A 19		
23	E 15	E 15	E 15	J A 20	E 15	E 15	E 15	E 17	G	30	J A 32	J A 33	G	J A 44	J A 29	J A 28	J A 24	E 16	J A 20	J A 28	J A 33	J A 29	J A 24		
24	J A 27	E 16	E 15	E 15	J A 23	J A 21	J A 20	21	26	G	33	J A 41	J A 64	J A 52	J A 46	J A 69	J A 37	J A 44	J A 52	J A 32	J A 18	J A 16	J A 21		
25	J A 24	J A 18	J A 20	J A 19	E 16	E 16	E 15	21	26	J A 31	J A 85	J A 88	J A 43	J A 50	J A 29	J A 26	E 17	J A 24	E 17	E 16	E 15	J A 21	E 16		
26	E 16	E 15	E 15	E 15	E 16	E 16	E 16	22	J A 30	J A 46	J A 65	J A 130	32	J A 57	J A 50	J A 53	J A 64	J A 23	E 15	J A 23	E 15	J A 26	E 15		
27	E 15	E 16	E 15	E 15	J A 20	E 16	J A 23	E 16	J A 40	J A 50	J A 40	J A 45	J A 44	G	J A 52	J A 32	J A 36	J A 32	J A 50	E 15	E 15	E 15	J A 24		
28	J A 24	J A 29	J A 24	J A 28	J A 31	J A 28	E 15	J A 41	J A 43	J A 50	J A 34	J A 54	J A 83	32	G	G	J A 20	E 16	J A 27	J A 29	J A 38	J A 26	J A 21		
29	J A 19	E 15	J A 24	E 15	E 15	E 15	E 15	E 16	J A 26	G	G	G	J A 27	J A 32	G	G	E 17	E 15	E 15	E 15	E 15	J A 23	J A 47		
30	J A 24	J A 21	E 15	J A 20	E 15	J A 25	E 15	E 16	J A 84	G	J A 44	J A 85	J A 77	J A 70	J A 53	J A 44	J A 32	J A 21	E 15	E 15	E 15	E 15	J A 21		
31																									
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MED	E 16	E 16	E 16	E 16	E 16	E 16	E 16	21	26	29	34	32	32	31	28	26	22	J A 21	J A 20	J A 18	17	J A 20	E 16		
UQ	J A 21	J A 23	J A 20	J A 19	E 16	E 16	E 16	25	J A 30	J A 37	J A 40	J A 41	J A 36	J A 44	J A 40	J A 32	J A 31	J A 27	J A 37	J A 29	J A 25	J A 26	J A 24		
LQ	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 17	G	G	G	G	G	G	G	G	E 17	E 16	E 16	E 15	E 15	E 15	E 15		

NOV. 1986

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

NOV. 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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E 15	E 15	E 15	E 15	E 15	E 15	E 16	24	G	29	G	G	G	G	G	G	19	E 15	E 16	E 15	E 15	E 16	E 15	E 16	
2	E 16	E 16	E 16	E 15	E 16	E 16	E 16	23	26	28	30	G	G	G	G	26	18	E 16	E 16	E 16	E 16	19	18	E 16	E 16
3	E 16	E 15	E 15	E 16	E 16	E 15	19	21	30	30	G	G	G	34	28	28	21	E 16	E 15	E 16	E 16	E 16	E 15	E 16	E 16
4	E 16	E 16	E 15	E 16	E 15	E 16	E 16	G	G	G	G	G	G	G	G	G	E 18	E 16	E 16	E 16	E 16	E 16	E 17	E 16	E 16
5	E 16	E 16	E 16	E 16	E 16	E 16	E 16	24	27	43	32	31	34	48	60	58	25	38	19	17	20	E 16	E 16	25	
6	23	24	E 16	E 16	E 16	E 15	E 16	26	19	31	40	38	35	35	G	G	21	E 15	19	34	A 44	A 44	E 16	E 16	E 16
7	E 16	E 15	E 16	E 15	E 15	E 15	19	E 16	G	G	29	35	25	26	31	47	22	E 16	E 15	22	23	E 15	A 44	22	
8	E 15	E 15	E 15	E 16	E 15	E 16	E 15	22	26	G	30	G	G	46	25	19	23	30	20	E 16	E 16	E 15	E 15	E 15	
9	E 15	E 16	E 15	E 16	E 15	E 15	E 16	21	25	30	37	G	G	G	27	24	19	29	E 16	E 15	E 15	E 15	E 16	E 15	
10	E 16	E 15	E 15	E 15	E 15	E 15	E 16	G	25	29	G	G	G	G	G	G	E 16	E 15	E 15	E 15	E 15	E 15	E 15	E 15	
11	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	30	G	G	G	G	G	G	E 16	E 15	E 16	E 15	E 15	E 15	E 15	E 15	
12	E 15	E 15	E 15	E 15	E 15	E 15	E 15	22	27	G	G	G	21	G	G	29	19	E 15	E 15	E 15	E 15	E 15	E 15	E 15	
13	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 17	G	30	31	32	31	30	G	24	E 17	E 16	A 44	19	E 15	E 15	E 15	E 15	
14	E 15	E 15	E 15	E 15	E 15	E 16	E 16	22	34	34	38	34	35	30	30	24	19	E 16	E 15	19	31	E 15	E 15	E 15	
15	E 15	E 16	E 15	E 15	E 15	20	E 15	19	G	G	31	32	31	37	39	26	E 17	E 15	18	E 15	E 15	E 15	19	E 16	
16	E 15	E 15	E 15	E 16	E 15	E 15	E 15	E 17	G	29	30	30	G	G	27	G	21	A 50	E 15	E 15	E 15	E 15	E 15	E 15	
17	22	E 15	E 15	E 12	E 15	E 15	E 15	E 17	G	G	29	31	30	31	28	23	E 17	E 15	E 15	E 16	E 16	E 16	18	E 15	
18	20	20	E 15	E 15	E 15	E 15	E 15	19	25	G	G	G	32	29	29	G	18	E 15	E 15	E 15	E 15	E 15	E 15	E 15	
19	E 15	E 16	E 15	E 15	E 15	E 15	E 15	E 17	G	G	19	32	G	30	G	G	19	E 16	E 15	E 15	A 25	E 15	E 15	E 15	
20	E 15	E 15	E 16	E 15	E 15	E 15	E 15	19	G	28	32	32	31	30	G	G	E 17	E 15	E 15	E 15	E 15	24	E 15	E 16	
21	E 15	E 15	E 15	E 15	E 15	E 15	E 16	E 17	25	G	G	32	32	G	G	G	E 17	E 15	E 15	E 15	E 15	E 15	E 16	E 15	
22	E 15	E 15	E 15	E 15	E 16	E 15	E 15	E 17	28	29	31	41	31	G	29	20	22	E 16	E 15	E 15	19	A 52	23	E 15	
23	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 17	G	30	30	31	G	34	29	26	17	E 16	E 15	E 15	E 15	E 15	E 16	E 15	
24	E 15	E 16	E 15	E 15	E 15	E 15	18	21	19	G	30	31	56	30	45	A 69	36	41	A 52	E 15	E 15	E 16	E 15	E 15	
25	19	E 15	E 15	E 15	E 16	E 16	E 15	19	24	28	47	38	30	26	26	23	E 17	E 17	E 17	E 16	E 15	E 15	E 16	E 16	
26	E 16	E 15	E 15	E 15	E 16	E 16	E 16	20	22	34	32	45	30	45	39	45	30	20	E 15	E 15	E 15	E 15	E 15	E 15	
27	E 15	E 16	E 15	E 15	E 15	E 16	E 15	E 16	24	32	29	29	30	G	26	23	25	E 15	22	E 15	E 15	E 15	E 15	E 15	
28	20	21	20	25	21	18	E 15	33	23	28	28	30	37	31	G	G	19	E 16	24	22	24	20	18	E 15	
29	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 16	24	G	G	G	G	G	G	G	E 17	E 15	E 15	E 15	E 15	E 15	E 15	E 15	
30	E 15	E 15	E 15	E 15	E 15	E 15	E 16	E 16	23	G	28	28	40	30	32	28	24	E 16	E 15	E 15	E 15	E 15	E 15	22	
31																									
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E 15	E 15	E 15	E 15	E 15	E 15	E 15	19	23	28	30	30	30	30	26	23	19	E 16	E 15	E 15	E 15	E 15	E 15	E 15	E 15
UQ	E 16	E 16	E 15	E 16	E 16	E 16	E 16	22	25	30	31	32	32	31	29	26	22	E 16	18	E 16	19	E 16	E 16	E 16	E 16
LQ	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 17	G	G	G	G	G	G	G	G	E 17	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 15

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FBES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

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FMIN (0.1 MHz)

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

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

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FMIN (0.1 MHz)

IONOSPHERIC DATA

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M(3000)F2 (0.01)

135° E Mean Time (G.M.T. + 9h)

Station	AKITA																								
Lat.	39° 43.5' N, Long. 140° 08.0' E																								
Sweep	1 MHz to 25 MHz in 2 sec in automatic operation																								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F	F	F	F	F	F	F	F	R									H							
2	290	290	305	310	285	295	335	350	350	340	360	355	355	345	360	355	380	350	305	315	310	300	305	315	
3	310	305	305	330	300	335	315	360	370	340	345	345	355	340	345	355	390	335	285	325	320	335	295	295	
4	295	325	320	325	310	305	355	370	375	355	320	350	315	325	350	355	335	340	375	285	250	285	295	290	
5	H																								
6	300	290	315	345	335	375	315	350	H											A	A	F	305	315	
7	310	310	325	315	370	355	370	350	370	370	350	350	325	H								F	A	F	
8	F																					F		F	
9	F	F																							
10	320	335	325	320	335	360	345	360	375	345	365	355	360	345	370	375	360	385	340	345	340	330	315	F	
11	305	325	325	340	320	325	335	370	335	345	380	335	370	360	370	345	340	380	315	350	355	295	300	320	
12	325	340	340	325	305	310	330	375	360	365	355	350	385	360	365	360	365	355	315	335	320	325	310	315	
13	330	310	335	305	330	335	340	375	370	375	360	360	370	380	365	375	380	355	A		340	340	315	305	330
14	F	F	F						H															F	
15	320	315	325	325	F									H										F	
16	F																		A					F	
17	F	F	F	F	F																			F	
18	315	310	315	325	335	370	345	360	375	345	360	360	360	360	355	335	375	385	365	315	365	340	305	310	
19	F																					A		F	F
20	F	F	F	F	F																			F	F
21	F	F	F	F	F																			F	F
22	330	335	310	325	340	370	345	360	390	390	355	390	355	370	380	370	375	395	335	315	305	A	F	F	
23	335	355	350	350	F																			F	F
24	325	335	315	330	340	325	350	375	365	355	350	335	345	360	320		A				F	F	F	F	
25	F	F	F	F	F																			F	F
26	325	330	335	345	F																			F	F
27	330	375	325	325	325	365	325	360	375	350	380	360	380	H	H								F	F	
28	F																							F	F
29	315	310	325	320	330	330	340	360	375	360	370	360	365	380	375	375	380	315	380	305	305	330	350	320	
30	330	315	300	305	295	335	325	370	360	370	H	H												F	F
31																									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	24	26	27	26	24	28	29	29	30	30	30	30	30	30	30	29	30	29	28	28	27	28	26	20	
MED	318	315	325	325	335	335	340	360	368	358	355	355	360	355	365	365	365	360	332	325	335	330	308	315	
UQ	F																							F	F
LQ	305	310	315	315	312	328	335	360	360	345	345	350	350	345	350	355	360	340	315	315	312	308	300	302	

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M(3000)F2 (0.01)

IONOSPHERIC DATA

NOV. 1986

M(3000)F1 (0.31)

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

Station	AKITA							Lat. 39 43.5 N.	Long. 140 08.0 E	Sweep 1 MHz to 25 MHz in 2sec in automatic operation														
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L 405	L	L	L	L								
2									L	L	L	L	L 390	L	L									
3									L	L	L	L	L 385	L	L									
4										L	L	L	L	L	L									
5											L	L	L	A	A	A								
6									L	A	L	L	L 380	L	L									
7									430		L	L	L	L	L	A								
8									L	L	L	L	L 380	L	A	L	L							
9									L	L	L	L	L	L	L									
10										L	L	L	L	L	L									
11									L	L	L	L	L 390	L	L									
12										L	L	L	L	L	L									
13									L	L	L	L	L	L	L	L								
14											L	L	L	L	L									
15										L	L	L	L	A	A									
16										L	L	L	L	L	L									
17										L	L	L	L	L	L									
18										L	L	L	L	L	L	L								
19										L	L	L	L	L	L	L 435								
20										L	L	L	L	L	L									
21									L	L	L	L	L 400	L	L									
22										L	L	A	L	L	L									
23										L	L	L	L	L	L									
24										L	L	L	A	L	A									
25										L	A	L	L	L										
26										L	L	L	A	L	A	A								
27										L	L	L	L	L	L									
28										L	L	L	L	L										
29										L	L	L	L 435	L	L	L								
30											L	L	A	L	L									
31												L 425												
Hour Day	00	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	1	4	8	7		1									
MED									L 420	430	400	412	390		435									
UQ											400	430	392											
LQ											398	395	382											

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M(3000)F1 (0.31)

IONOSPHERIC DATA

NOV. 1936

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 2 sec in automatic operation			
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1										240	245	230	240	250	250	240										
2										235	245	230	230	235	230	240										
3										230	240	230	230	250	250	240										
4										250	260	240	260	255	230											
5										260	240	275	260	250	240											
6										235	245	240	250	240	240											
7										230	260	255	275	250	245	225										
8										240	240	255	225	260	240	225										
9										230	225	270	240	245	245											
10										235	240	225	250	240	240											
11										250	230	240	230	250	245											
12										235	240	245	225	230	235											
13										235	230	240	230	240	230	230	220									
14										245	240	250	240	230												
15										230	230	240	230	255	240											
16										250	250	240	230	245												
17										250	275	240	235	245	240											
18										230	245	245	245	240	230	240										
19										245	245	240	230	250	240											
20										230	245	240	220	240	240											
21										210	225	245	240	240	245	225										
22										215	250	220	250	230	220											
23										235	240	240	235	235	235											
24										240	255	250	240	230	A											
25										250	260	245	240	240												
26										220	235	255	245	235	210											
27										240	225	240	220	220	230											
28										210	240	220	225	250												
29										230	230	240	220	220	220											
30										240	220	220	245	240												
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT										4	27	30	30	30	30	26	6									
MED										232	235	242	240	240	242	240	232									
UQ										235	242	250	245	250	250	240	240									
LQ										220	230	235	230	230	235	230	225									

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H*F2 (KM)

IONOSPHERIC DATA

NOV. 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												
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	270	270	255	230	220	210	240	225	230	200	225	205	195	205	220	230	215	200	250	250	245	265	260	245	
2	275	275	255	240	240	250	245	235	225	210	200	200	200	230	240	235	220	205	260	245	280	280	260	250	
3	250	255	250	230	240	230	250	225	230	195	195	210	230	230	220	230	200	205	245	255	245	260	275	290	
4	280	275	250	240	250	275	210	210	220	200	225	225	225	230	235	225	250	210	200	290	390	350	310	280	
5	255	260	240	430	290	275	235	220	235	270	245	215	250	A	A	A	215	240	260	240	270	255	290	300	
6	A	A	240	225	245	215	250	220	230	210	A	235	215	240	230	230	215	195	255	A	A	270	315	295	
7	295	295	270	275	210	275	210	200	210	200	210	A	215	245	230	A	200	200	240	A	230	250	A	A	
8	300	280	270	210	235	255	220	210	205	220	200	200	195	H	A	230	210	210	225	A	210	275	250	235	E S 325
9	255	275	250	260	255	225	230	215	225	230	A	200	200	195	H	220	210	200	A	250	225	260	245	245	245
10	255	270	260	270	250	215	235	210	215	210	200	205	200	200	H	210	205	205	200	235	225	255	240	285	280
11	255	250	230	230	260	240	255	210	230	225	225	200	200	200	205	220	235	200	260	205	220	275	300	280	
12	255	230	245	250	285	285	240	230	230	220	210	195	210	225	225	235	210	205	270	245	240	250	270	270	
13	260	275	270	270	255	235	230	225	210	200	200	230	200	200	200	220	205	200	A	250	220	245	245	255	
14	285	285	295	270	240	240	225	210	205	220	A	200	220	220	220	225	210	200	240	240	A	205	E S 300	290	
15	275	280	270	255	240	255	225	205	220	200	200	210	200	A	A	210	210	200	210	245	235	240	E A 290	300	
16	270	260	300	310	245	200	245	215	220	200	200	200	200	215	240	220	200	A	225	240	240	230	245	280	
17	A	280	290	265	240	220	220	225	220	H	210	H	H	220	220	220	205	205	230	225	245	240	E A 305	E S 295	
18	E A 310	E A 300	275	275	240	220	225	225	225	200	225	210	225	230	210	210	205	200	220	245	225	250	280	295	
19	280	280	235	235	220	255	260	230	210	H 200	240	235	230	200	200	220	210	210	210	215	A	225	240	235	
20	300	275	260	250	250	235	225	200	220	210	235	220	220	210	220	220	205	200	230	205	245	A 240	270	260	
21	270	250	225	270	245	240	240	210	200	200	215	220	220	215	220	220	205	205	230	215	230	235	270	310	
22	255	250	280	270	245	205	240	225	205	200	200	A	200	230	210	215	200	200	245	230	255	A	A	255	
23	230	230	220	210	210	200	240	220	230	215	200	200	210	225	220	220	205	200	235	240	220	260	250	265	
24	275	260	255	245	240	210	225	205	220	H 200	205	225	A	220	A	A	220	A	A	275	280	275	250	230	
25	210	220	280	260	255	240	220	215	225	225	A	A	220	205	240	225	205	240	230	240	240	245	275	255	
26	250	220	240	225	290	255	215	255	245	A	230	A	220	A	A	220	220	220	210	230	235	230	290	285	
27	255	205	250	260	245	220	250	230	220	220	225	250	195	210	H 205	220	220	200	A	260	230	270	285	275	
28	245	A 260	A 280	A	A 280	250	250	230	205	200	220	200	A	245	230	210	205	195	A	225	A 310	E A 290	A 270		
29	265	270	260	255	250	250	250	230	225	230	220	200	200	220	200	220	205	230	205	265	260	245	230	255	
30	240	270	295	280	300	245	235	225	220	230	200	200	A	215	A	220	220	220	275	255	220	225	E S 280	A	
31																									
CNT	29	29	30	29	30	30	30	30	30	29	26	26	27	26	25	27	30	27	25	28	26	29	28	28	
MED	262	270	253	255	245	240	235	220	220	210	210	205	210	220	220	220	208	200	235	240	242	248	270	274	
UQ	278	275	275	270	255	255	245	225	230	220	225	220	220	230	230	225	215	210	250	250	260	262	288	290	
LQ	255	250	245	235	240	220	225	210	210	200	200	200	200	205	210	218	205	200	225	225	230	240	250	255	

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H*F (KM)

IONOSPHERIC DATA

NOV. 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 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	110	110	A	105	110	105	105	110	110	S							
2							S	S			A	110	110	110	110	115	S							
3							S	S		A	110	110	110	110	110	110	S							
4							S	S			110	110	110	110	110	110	S							
5							S	S	A	A	A	A	A	A	A	A	S							
6							S	S	115	110	110	110	110	110	110	110	S							
7							S	S			A	105	110		A	110	110	S						
8							S	105	105	105	105	105	105		A	A	A	S						
9							S	110	110	110	105	110	105	110		A	A	S						
10							S	115	110	110	110	110	110	110	110	110	S							
11							S	115	110	110	105	100	110	110	110	110	S							
12							S	110	105	110	100	105	110	110	110	E B 125	S							
13							S	110	105	105	100	105	110	110		S	S							
14							S	110	110	110	110	110	110	110	110	110	S							
15							S	115	110	110	110	110	105		A	A	S							
16							S	110	110	110	110	105	110	110	110	110	S							
17							S	110	105		A	A	A	A	A	A	S							
18							S	A	105	110	110	105	105	105	105	115	S							
19							S	115	110	110	105	105	105	110	110	110	S							
20							S	110	105	105	105	105	105	110	110	E S 120	S							
21							S	115	115	105	110	110	105	110		S	S							
22							S	110	110	105	110	105	110		A	A	S							
23							S	115	110	105	110	105	110	110		A	S							
24							S	A	110	110	110		A	A	A	A	S							
25							S	E S 125	110		A	A	A	A	A	A	S							
26							S	110	110	110		S	110		A	A	S							
27							S	110	110	105		A	A	105		A	S							
28							S	A	A	A	A	A	A		105	105	S							
29							S	110	110	110		A	A	E B 120	E B 120	E B 125	S							
30							S	A	110	105		A	A	A	A	A	S							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								4	25	26	24	22	22	21	19	16								
MED								110	110	110	110	110	105	110	110	110								
UQ								112	112	110	110	110	110	110	110	112								
LQ								108	110	110	105	105	105	105	110	110								

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H*E (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

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H°ES (KM)

135° E Mean Time (G.M.T. + 9h)

Station	AKITA				Lat. 39° 43' 5" N	Long. 140° 08' 0" E	Sweep 1 MHz to 25 MHz in 2 sec in automatic operation																		
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	S	S	S	110	S	S	S	115	G	125	G	G	G	G	G	125	S	S	110	110	S	100	S		
2	S	S	S	S	S	S	S	135	115	110	100	G	G	G	G	130	130	120	S	105	100	100	105	S	
3	100	100	S	S	S	S	105	100	125	100	G	G	G	115	115	115	120	100	110	110	S	100	S	S	
4	S	S	S	S	S	S	S	G	G	G	G	G	G	G	G	S	S	S	S	S	S	S	S	S	
5	S	S	S	105	S	S	S	135	105	100	100	100	105	105	105	110	115	110	110	105	100	100	S	100	
6	100	100	105	S	S	S	105	145	140	130	130	130	130	130	G	G	120	120	110	140	130	155	105	S	
7	S	S	S	110	S	S	145	S	G	G	105	145	100	100	145	120	110	100	135	105	100	105	100	105	
8	105	100	100	S	95	S	S	130	120	G	110	G	G	G	100	100	100	100	95	95	S	S	S	105	105
9	105	S	100	S	S	S	S	120	110	110	105	G	G	G	100	100	100	100	S	110	105	105	S	S	
10	S	S	S	S	S	S	S	G	110	110	G	G	G	G	G	S	100	S	S	S	S	S	S	S	
11	100	S	S	S	S	S	S	G	G	G	G	G	G	G	G	S	100	S	S	S	S	S	S	100	
12	100	100	100	S	100	S	S	150	150	G	G	G	100	G	G	140	120	S	105	105	S	100	S	S	
13	S	S	S	S	S	S	S	S	G	125	125	120	120	120	G	120	S	S	100	100	S	S	S	S	
14	S	S	110	105	105	S	S	140	135	130	120	120	110	110	115	110	135	S	100	110	110	105	105	100	
15	S	S	S	S	S	100	S	120	G	G	130	110	110	110	105	135	S	S	105	105	110	100	100	S	
16	S	S	S	100	S	S	S	S	G	135	135	115	G	G	120	G	110	110	105	S	S	S	S	100	
17	105	100	S	S	S	S	S	100	G	G	105	105	105	105	105	105	S	105	100	S	S	S	100	S	
18	100	100	100	S	110	110	110	100	105	G	G	G	130	125	115	G	110	100	100	100	100	S	S	S	
19	S	S	S	S	S	S	S	S	G	G	100	150	G	150	G	G	120	S	105	130	120	105	S	S	
20	S	S	S	S	S	S	S	150	G	110	145	140	150	140	G	G	S	S	S	S	S	S	120	S	S
21	S	110	S	S	S	S	S	S	120	G	G	130	120	G	G	G	S	S	S	S	S	S	S	S	S
22	130	100	105	100	S	S	S	S	145	110	130	120	120	G	100	100	120	115	100	105	105	100	100	110	
23	S	S	S	105	S	S	S	S	G	150	120	120	G	110	110	105	105	S	100	110	110	110	S	100	
24	110	S	S	S	100	100	100	135	100	G	130	120	105	105	105	100	100	100	100	100	100	S	S	100	
25	105	105	105	105	S	S	S	140	130	110	105	100	100	100	100	100	S	100	S	S	S	S	105	S	S
26	S	S	S	S	S	S	S	130	120	120	120	110	110	105	100	100	100	100	S	105	S	105	S	S	S
27	S	S	S	S	105	S	105	S	110	110	110	105	105	G	105	105	100	105	115	S	S	S	100	105	
28	105	100	100	100	100	100	S	110	105	100	105	100	100	150	G	G	100	S	100	100	100	100	100	100	100
29	100	S	105	S	S	S	S	S	120	G	G	100	100	G	G	G	S	S	S	S	100	S	110	105	
30	105	100	S	100	S	105	S	S	105	G	110	100	100	100	100	100	100	100	S	S	S	S	100	100	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	14	11	10	10	7	6	5	17	19	18	21	20	19	18	17	18	20	18	18	18	15	16	13	13	
MED	105	100	102	105	100	102	105	130	120	110	110	118	105	110	105	105	110	100	102	105	105	105	100	100	
UQ	105	100	105	105	105	105	110	140	128	125	130	125	120	125	115	120	120	110	110	110	110	105	105	105	
LQ	100	100	100	100	100	100	105	115	108	110	105	102	100	105	100	100	100	100	100	105	100	100	100	100	

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H°ES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

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TYPES OF ES

135° E Mean Time (G.M.T. + 9h)

Station	AKITA																								
Lat.	39 43.5 N																								
Long.	140 08.0 E																								
Sweep	1 MHz to 25 MHz in 2 sec in automatic operation																								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1				F1				C1		CL12							C2			F2	F1		F1		
2								H1	C2	C2	L1					C1	C1	F1		F1	F2	F1	F1		
3	F1	F2					L2	L3	C2	L2				C1	C1	C1	C3	F1	F1	F1			F1		
4																									
5				FF12				H3	L3	L3	L2	L2	L2	L4	L5	L4	C3	F7	F5	F3	F2	F2		F5	
6	F2	F3	F2			F1		H3	H2	C2	C2	C2	C2	C2			C3	F3	FF21	F5	F6	F1	F1		
7				F1				H1			L3	H1	L2	L1	H2	C3	C3	F1	F1	F3	F3	F2	F3	F3	
8	F2	F2	F2		F2			C1	C2		C2			L3	L2	LH21	L2	F3	F2				F1	F2	
9	F1		F2					C1	C2	C2	C2				L2	L2	L2	F3		F1	F2	F1			
10									C2	C2								F1							
11	F2								C1									F1						F1	
12	F1	F2	F1		F1			H2	H1				L1			H3	C2		F2	F1		F2			
13									C2	C1	C2	C1	C2			C2			F3	F3					
14			F1	F1	F2			H2	H4	C3	C3	C1	C2	C2	C3	C2	H1		F2	F3	F3	F1	F1	F1	
15					F3			C1			C2	C2	C2	C3	L2	HL12			F2	F2	F1	F1	F2		
16				F3					H2	H1	C1				C1		C4	F3	F2					F2	
17	F2	F2						L1			L2	L2	L2	L2	L2	L2		F1	F2				F2		
18	F3	F3	F2		F2	F1	F2	L2	L1				C1	C1	C2		C1	F1	F2	F2	F1				
19											L1	H1		H1			C2		FF11	F2	F5	F2			
20								H2		C1	H2	H2	H1	H1								F2			
21		F1							C2			C1	C2												
22	F1	F2	F2	F2				HC22	C2	C1	C2	C2			L2	L1	CL21	F1	F1	F1	F2	F3	F3	F1	
23				F1					H1	C1	C1			C2	C2	L2	L2		F2	F2	F2	F2		F2	
24	F2				F3	F2	F2	HL22	L1		C2	C1	L3	L2	L4	L3	L4	F4	F4	F2	F2			F1	
25	F2	F1	F2	F1				H2	C2	C3	L3	L2	L2	L2	L2	L2		F1				F2			
26								C2	C1	C2	C2	C2	C1	L2	L2	L2	L3	F2		F1			F1		
27					F1		F1		C1	C2	C1	L2	L2		L1	L1	L2	F1	F2				F2	F1	
28	F3	F3	F4	F6	F3	F2		C2	L1	L2	L1	L2	L2	HL11			L1		F2	F3	F2	F2	F1	F1	
29	F1		F1						C1			L1	L1								F1		F2	F2	
30	F1	F1		F1		F1			L1		C1	L1	L2	L2	L2	L2	L2	F1					F1	F3	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
UQ																									
LQ																									

NOV. 1986

TYPES OF ES

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

NOV. 1986

FXI (0.1 MHz)

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

Station **OKUBUNJI TOKYO** Lat. **35 42.4 N**, Long. **139 29.3 E** Sweep **1 MHz to 20 MHz** in **2 sec** in **automatic operation**

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	51	X	X		X	X													X	X	X	X	X	X
2	X	X	X	X	X	X													X	X	X	X	X	X
3	X	X	X	X	X	X													X	X	X	X	X	X
4	X	X	X	X	X	X													X	X	X	X	X	X
5	X	X	X	X	X	X													X	X	X	X	X	X
6	X	X	X	X	X	X													X	X	X	X	X	X
7	X	X	X	X	X	X													X	X	X	X	X	X
8	X	X	X	X	X	X													X	X	X	X	X	X
9	X	X	X	X	X	X													X	X	X	X	X	X
10	X	X	X	X	X	X													X	X	X	X	X	X
11	X	X	X	X	X	X													X	X	X	X	X	X
12	X	X	X	X	X	X													X	X	X	X	X	X
13	X	X	X	X	X	X													X	X	X	X	X	X
14	X	X	X	X	X	X													X	X	X	X	X	X
15	X	X	X	X	X	X													X	X	X	X	X	X
16	X	X	X	X	X	X													X	X	X	X	X	X
17	X	X	X	X	X	X													X	X	X	X	X	X
18	X	X	X	X	X	X													X	X	X	X	X	X
19	X	X	X	X	X	X													X	X	X	X	X	X
20	X	X	X	X	X	X													X	X	X	X	X	X
21	X	X	X	X	X	X													X	X	X	X	X	X
22	X	X	X	X	X	X													X	X	X	X	X	X
23	X	X	X	X	X	X													X	X	X	X	X	X
24	X	X	X	X	X	X													X	X	X	X	X	X
25	X	X	X	X	X	X													X	X	X	X	X	X
26	X	X	X	X	X	X													X	X	X	X	X	X
27	X	X	X	X	X	X													X	X	X	X	X	X
28	X	X	X	X	X	X													X	X	X	X	X	X
29	X	X	X	X	X	X													X	X	X	X	X	X
30	X	X	X	X	X	X													X	X	X	X	X	X
31																			X	X	X	X	X	X
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	30	30													29	30	30	30	30	30
MED	X	X	X	X	X	X													X	X	X	X	X	X
UQ	X	X	X	X	X	X													X	X	X	X	X	X
LQ	X	X	X	X	X	X													X	X	X	X	X	X

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FXI (0.1 MHz)

IONOSPHERIC DATA

NOV. 1986

FOF1 (0.01 MHz)

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

Station **OKUBUNJI TOKYO** Lat. **35 42.4 N.** Long **139 29.3 E** Sweep 1 MHz to 20 MHz in 2 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	440	400	470	L										
2									L	L	440	L	420											
3									L	L	520	410	L	420	L	L								
4									440	L	L	L	L	L	380									
5										L	L	L	U L 460	L	A	A								
6									L	L	L	L	U A 440	A	L	L								
7											L	L	L	L	L	A								
8										L	L	U L 430	390	L	410									
9									L	L	L	L	420	410	400	L	L							
10									320	L	L	400	400	400	L									
11									L	L	L	420	420	400	L	L								
12										410	400	L	L	360	L	280								
13									L	L	L	400	400	410	L	L	L							
14									L	L	A	L	390	L	L	A								
15										360	400	420	360	L	L									
16									L	U L 430	430	L	L											
17									L	L	U L 430	L	L	L	L									
18									L	L	L	410	L	410	L									
19										L	L	420	400	L	L									
20										L	420	330	L	370	L	L								
21									L	L	390	400	400	410	L	L								
22									L	370	L	400	L	360	L									
23										L	U L 430	L	L	L	L	L								
24										L	400	L	L	L	L									
25										L	L	L	L	A	L									
26									L	L	L	L	L	L	L	A								
27										L	L	L	L	L	L	L								
28									L	340	L	L	L	L	L	A								
29									L	L	400	L	420	L	L	L								
30									L	L	L	L	L	L	L	L	340							
31																								
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								2	6	14	13	14	8	2	2									
MED								330	390	420	410	405	400	395	310									
UQ								430	430	420	420	410												
LQ								370	400	400	400	365												

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FOF1 (0.01 MHz)

IONOSPHERIC DATA

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FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9h)

Station **OKUBUNJI TOKYO** Lat. **35 42.4 N**, Long. **139 29.3 E** Sweep 1 MHz to 20 MHz in 2 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							S	200	260	285	310	310	325	305	285	255	H	190	S						
2							S	210	255	290	310	320	H	A	290	250	170	S							
3							S	H	H									A	S						
4							S	210	260	295	310	310	315	310	290	250	H	H	A	S			S	S	S
5	S	S	S				S	200	260	285	300	310	320	290	270	250	A	A	A	A	A	A	S		
6		S					S	190	250	280	300	A	A	A	A	A	A	A	S						
7							S	180	250	280	295	300	305	295	275	245	H	190	S				S		
8							S	190	260	275	295	300	300	290	275	245	A	S							
9							S	H	A								S	S							
10							S	195	260		300	305	310	300	280	250	A	A	S						
11							S	A	A	A	A	A	310	300	270	240	S	S							
12							S	200	A	280	295	300	295	285	260	235	S	S							
13	S	S	S	B			S	A	260	280	295	300	300	295	270	230	S	S					S		
14							S	170	240	270	290	295	290	280	H	240	170	B							
15							S	175	240	270	300	290	295	290	270	240	A	S						S	
16							S	180	250	270	295	305	A	A	A	A	A	A	S						
17		S	S				S	190	250	280	295	A	A	295	290	A	A	A	S						
18							S	180	255	280	300	A	A	290	A	240	A	A	S						
19							S	A	A	A	280	300	295	285	265	A	A	S				S			
20							S	S	230	H	270	290	300	300	290	270	230	170	S				S		
21							S	165	A	275	290	300	295	285	260	240	S	S							
22							S	A	R	A	A	A	295	285	260	240	165	S							
23							S	A	A	H	295	A	290	A	270	250	A	A	S						
24							S	A	A	U	A	290	295	290	300	A	240	A	S						
25							S	180	250	275	295	A	A	A	A	250	A	A	S						
26	S	S	S	S	S		S	155	240	270	285	A	A	A	A	240	A	A	S						
27							S	230	260	275	A	A	A	A	A	A	A	S	B						
28							S	A	A	A	A	A	290	A	A	A	A	A	S						
29							S	A	A	260	285	285	A	A	A	A	A	A	S						
30							S	150	240	265	290	295	295	285	260	220	S	S							
31							S	S	A	260	280	290	290	280	260	230	A	S							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								19	21	26	26	20	21	20	21	22	6								
MED								180	250	275	295	300	295	290	270	240	170								
UQ								198	260	280	300	305	310	298	280	250	190								
LQ								178	240	270	290	295	295	285	265	240	170								

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FOE (0.01 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

NOV. 1986

FOES (0.1 MHz)

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

Station **OKUBUNJI TOKYO** Lat. **35 42.4 N**, Long. **139 29.3 E** Sweep 1 MHz to 20 MHz in 2 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	E S 14	E B 13	E S 14	E B 13	E S 14	23	24	G	G	32	34	36	G	G	G	G	24	J A 32	23	25	J A 22	J A 35	E S 14	E S 15			
2	E S 14	E S 14	E B 13	E B 13	E B 13	E S 14	E S 15	19	G	G	24	22	G	25	32	G	31	33	29	27	16	E S 14	18	E B 13	E S 14	E S 14	E S 14
3	E S 14	E B 13	E B 13	E S 14	E B 13	E S 14	E S 14	G	G	G	G	G	G	36	36	J A 44	33	J A 26	E S 14	18	J A 22	E S 14	E S 14	E S 14	19		
4	19	E S 14	E B 13	E S 14	E B 13	E S 14	E S 14	G	G	G	16	G	20	G	39	G	G	31	25	24	J A 33	E S 14	E S 14	E S 15	E S 15	E S 15	
5	E S 14	17	E S 14	E B 13	J A 19	E S 14	17	33	33	J A 43	G	J A 28	J A 41	J A 42	J A 51	J A 53	J A 29	J A 23	J A 37	J A 22	23	22	J A 29	J A 22			
6	23	24	J A 20	J A 19	17	18	J A 22	24	29	33	38	40	45	44	G	G	G	J A 23	22	22	18	E S 14	31	J A 21			
7	E S 14	E S 14	17	J A 26	E B 13	E S 15	E S 14	G	G	G	39	38	38	36	35	J A 42	J A 47	J A 26	J A 30	J A 26	24	J A 18	J A 26	J A 27			
8	J A 23	20	21	20	J A 24	22	E S 15	24	23	30	23	35	G	G	G	17	G	23	E S 15	J A 24	J A 18	20	E S 14	E S 15	22	J A 19	
9	J A 29	E S 14	E S 15	23	E B 13	E S 14	E S 14	J A 31	J A 31	33	J A 39	J A 35	29	27	G	J A 29	26	23	J A 20	20	J A 33	22	22	24	23		
10	E S 14	E S 14	E B 13	E S 14	E S 14	E S 14	E S 15	G	J A 27	G	G	G	G	G	G	G	E S 15	18	19	E S 14	E S 14	J A 21	19	E S 14			
11	E S 14	E S 14	E S 14	21	E S 14	E S 14	E S 14	J A 25	30	27	32	G	G	16	18	G	G	E S 14	J A 17	17	E S 14	15	E S 15	21	E S 14		
12	E S 14	E S 14	E S 14	18	19	E S 14	E S 14	G	28	29	31	35	G	G	18	G	G	25	15	E S 14	23	25	24	17	20		
13	E S 14	E S 14	E B 13	19	E S 14	E S 14	E S 15	G	29	G	34	37	37	37	30	G	J A 29	E S 14	E S 14	E S 15	18	E S 15	E S 14	E S 15			
14	E S 14	E S 14	19	E S 15	19	19	18	24	29	41	47	J A 48	39	J A 39	J A 42	J A 43	J A 28	J A 23	J A 27	22	J A 30	J A 33	J A 51	J A 41			
15	J A 24	J A 24	J A 23	23	20	18	E S 14	G	G	24	30	G	33	32	G	29	G	J A 43	J A 51	J A 35	J A 25	24	19	19	E S 14	20	
16	E S 14	E S 14	E S 14	E S 14	19	16	18	23	G	35	J A 50	35	31	31	G	25	29	J A 26	25	J A 22	21	18	18	E S 14			
17	E S 14	J A 29	J A 21	J A 22	19	J A 20	19	G	G	20	G	G	29	31	J A 46	29	J A 30	23	25	22	J A 19	J A 19	J A 20	E S 15			
18	18	20	23	E S 14	E S 15	J A 31	J A 23	J A 26	J A 36	J A 32	28	33	33	36	36	J A 28	18	J A 22	22	22	19	E S 14	E S 14	E S 14			
19	E S 14	E S 14	E S 14	18	E S 14	E S 14	16	19	G	G	35	36	36	36	37	26	23	J A 23	J A 22	J A 24	E S 15	22	J A 32	18			
20	E S 15	E S 14	E S 14	E S 15	E S 14	E S 15	E S 15	G	J A 25	35	G	28	36	36	33	30	G	E S 14	22	18	18	E S 14	19	19	19		
21	17	21	18	16	E S 14	E S 14	19	19	G	25	30	33	33	18	G	G	26	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14		
22	E S 15	E S 14	E S 14	18	E S 14	E S 14	E S 15	17	28	33	32	J A 50	40	34	J A 31	39	J A 48	J A 35	J A 33	J A 45	J A 30	J A 31	23	24			
23	23	J A 19	E S 14	E S 14	E S 14	19	E S 14	18	J A 27	30	31	31	32	25	J A 35	17	J A 46	J A 43	J A 33	J A 19	20	J A 54	J A 29	54			
24	J A 34	23	J A 19	21	25	21	E S 15	G	G	29	33	36	33	31	J A 42	22	25	E S 14	E S 23	J A 24	J A 20	23	23	20			
25	22	J A 23	J A 24	E S 14	E S 14	E S 15	21	27	J A 40	37	35	36	J A 49	J A 47	G	J A 26	J A 24	E S 14	E S 15	J A 27	J A 30	23	20				
26	23	17	E S 15	E S 14	E S 14	E S 15	E S 15	24	32	35	J A 80	J A 51	J A 47	J A 51	29	J A 37	J A 30	J A 29	22	J A 19	J A 18	J A 19	E S 14	E S 14			
27	24	21	J A 30	J A 43	J A 32	19	19	J A 23	J A 27	23	J A 47	J A 40	30	J A 30	27	J A 34	J A 31	J A 34	J A 23	J A 21	J A 24	J A 25	J A 28	J A 18			
28	E S 14	E S 14	E S 14	18	E B 13	E S 14	18	18	24	J A 51	G	J A 25	J A 34	J A 38	J A 55	J A 46	J A 29	J A 35	J A 44	J A 40	J A 29	J A 25	J A 18	J A 20	J A 19		
29	J A 19	23	23	J A 20	E S 14	E S 14	E S 14	G	J A 28	24	G	G	G	G	G	G	20	17	E S 14	E S 15	E S 14	E S 14	E S 14	E S 14			
30	E S 14	E S 14	E S 14	24	E S 14	E S 14	22	J A 18	29	G	G	G	G	G	G	G	J A 25	J A 31	J A 27	22	21	21	19	18			
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30			
MED	E S 14	E S 14	E S 14	18	E S 14	E S 14	E S 15	18	27	30	32	35	33	31	30	26	25	J A 23	22	22	20	19	19	18			
UQ	23	21	20	21	19	19	18	24	29	33	37	37	38	36	J A 36	J A 33	J A 29	J A 29	J A 27	J A 24	J A 24	J A 23	J A 24	20			
LQ	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	G	G	G	G	G	G	G	G	17	G	17	18	17	18	18	E S 14	E S 15	E S 14	E S 14

NOV. 1986

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

NOV. 1986

FBES (0.1 MHz)

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

Station **R**OKUBUNJI TOKYO Lat. 35 42.4 N Long.139 29.3 E Sweep 1 MHz to 20 MHz in 2 sec in automatic operation

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

The Radio Research Laboratory, Japan

NOV. 1986

FBES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1986

FMIN (0.1 MHz)

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

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

NOV. 1986

FMIN (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

NOV. 1986

M(3000)F2 (0.01)

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

Station		OKUBUNJI TOKYO Lat. 35 42.4 N, Long. 139 29.3 E											Sweep 1 MHz to 20 MHz in 2 sec in automatic operation													
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		F	S ₂₄₅	S ₂₉₀	F	S ₃₃₅	S ₃₀₀	S ₃₀₅	S ₃₂₀	S ₃₄₅	S ₃₅₀	J ₃₅₀	R ₃₃₀	S ₃₃₀	S ₃₃₀	S ₃₄₀	S ₃₅₀	S ₃₂₅	S ₂₉₀	S ₃₂₅	S ₂₈₅	S ₂₉₅	S ₃₀₀	S ₂₉₅		
2		S ₂₉₅	S ₃₀₀	S ₃₀₀	S ₃₃₀	S ₃₀₀	S ₂₈₀	S ₃₂₅	S ₃₄₀	S ₃₅₀	S ₃₅₀	S ₃₅₅	S ₃₂₀	S ₃₄₀	S ₃₂₀	S ₃₄₀	S ₃₅₅	S ₃₆₅	S ₃₄₀	S ₂₉₀	S ₃₁₀	S ₃₀₅	S ₂₉₀	S ₃₁₀	S ₃₂₅	
3		S ₃₂₀	S ₃₁₀	S ₃₁₀	S ₃₁₅	S ₃₅₅	S ₃₀₀	S ₃₂₀	S ₃₄₀	S ₃₂₅	S ₃₄₀	S ₃₂₅	S ₃₃₀	S ₃₃₀	S ₃₄₀	S ₃₅₀	S ₃₆₀	S ₃₆₀	S ₃₄₀	S ₂₉₀	S ₃₀₀	S ₃₂₅	S ₃₂₀	S ₃₀₀	S ₂₈₅	
4		S ₃₀₀	S ₃₀₀	S ₃₀₅	S ₃₄₀	S ₃₄₀	S ₃₀₀	S ₃₄₅	S ₃₅₀	S ₃₄₅	S ₃₃₅	S ₃₂₅	S ₃₂₀	S ₃₂₀	S ₃₂₀	S ₃₅₅	S ₃₅₀	S ₃₀₀	S ₃₃₀	S ₃₄₀	S ₂₈₀	S ₂₅₀	S ₂₇₀	S ₂₇₀	S ₃₀₀	
5		S ₃₀₀	S ₂₉₀	S ₃₀₅	S ₂₅₀	S ₂₈₀	S ₃₃₀	S ₃₀₀	S ₃₂₀	S ₃₃₀	S ₃₁₀	S ₃₁₀	S ₃₃₀	S ₃₀₀	S ₃₁₀	S ₃₃₅	S ₃₄₅	S ₃₃₀	S ₃₂₀	S ₃₁₀	S ₃₃₀	S ₂₇₀	S ₂₉₀	S ₃₀₀	S ₂₉₅	
6		S ₃₀₀	S ₃₂₀	S ₃₂₀	S ₃₅₀	S ₃₂₅	S ₃₃₀	S ₃₃₀	S ₃₄₀	S ₃₄₀	S ₃₂₅	S ₃₄₀	S ₃₄₅	S ₃₃₅	S ₃₂₀	S ₃₅₀	S ₃₅₀	S ₃₆₀	S ₃₅₅	S ₃₂₀	S ₃₂₀	S ₃₄₀	S ₃₀₅	S ₂₇₅	S ₂₇₅	
7		S ₂₈₅	S ₃₀₀	S ₃₁₀	S ₃₂₅	S ₃₅₀	S ₃₆₀	S ₃₄₀	S ₃₆₀	S ₃₆₀	S ₃₄₀	S ₃₂₀	S ₃₄₀	S ₃₃₀	S ₃₃₅	S ₃₅₅	S ₃₅₀	S ₃₆₀	S ₃₂₀	S ₃₂₀	S ₃₄₀	S ₃₂₀	S ₂₉₅	S ₃₁₀	S ₂₉₀	
8		S ₃₀₀	S ₂₉₀	S ₂₉₀	S ₂₉₀	S ₂₉₀	S ₂₇₀	S ₃₄₀	S ₃₅₅	S ₃₅₀	S ₃₃₅	S ₃₄₀	S ₃₂₀	S ₃₄₅	S ₃₄₀	S ₃₄₅	S ₃₄₅	S ₃₇₀	S ₃₄₀	S ₃₄₀	S ₃₂₀	S ₃₃₀	S ₃₀₀	S ₃₀₀	S ₂₈₀	
9		S ₂₈₅	S ₃₁₅	S ₃₁₀	S ₃₃₀	S ₃₃₅	S ₃₂₀	S ₃₃₀	S ₃₅₅	S ₃₅₀	S ₃₄₀	S ₃₅₀	S ₃₃₅	S ₃₃₀	S ₃₄₀	S ₃₅₅	S ₃₆₀	S ₃₆₀	S ₃₄₅	S ₃₂₀	S ₃₃₀	S ₃₂₀	F	S ₃₂₀	S ₃₂₀	
10		S ₃₀₀	S ₃₁₀	S ₃₁₀	S ₃₁₀	S ₃₄₀	S ₃₄₅	S ₃₂₀	S ₃₄₅	S ₃₅₀	S ₃₆₀	S ₃₆₀	S ₃₄₀	S ₃₆₀	S ₃₅₀	S ₃₆₀	S ₃₇₅	S ₃₆₀	S ₃₅₀	S ₃₄₀	S ₃₄₀	S ₃₂₀	S ₃₂₀	S ₃₁₀	S ₂₉₀	
11		S ₃₀₅	S ₃₂₀	S ₃₂₅	S ₃₁₅	S ₃₄₀	S ₂₉₀	S ₃₃₀	S ₃₆₀	S ₃₂₅	S ₃₂₅	S ₃₄₅	S ₃₅₀	S ₃₄₀	S ₃₅₀	S ₃₅₀	S ₃₅₀	S ₃₄₀	S ₃₄₀	S ₂₉₀	S ₃₃₀	S ₃₄₀	S ₃₀₀	S ₂₈₅	S ₃₀₀	
12		S ₃₂₀	S ₃₄₀	S ₃₂₀	S ₃₀₀	S ₃₀₀	S ₂₉₀	S ₃₂₅	S ₃₅₅	S ₃₅₀	S ₃₃₅	S ₃₄₅	S ₃₅₅	S ₃₆₀	S ₃₅₀	S ₃₄₅	S ₃₇₀	S ₃₅₀	S ₃₅₅	S ₃₄₀	S ₃₁₀	S ₃₃₅	S ₃₀₀	S ₃₁₀	S ₃₀₀	
13		S ₃₁₀	S ₃₁₅	S ₃₁₀	S ₃₂₀	S ₃₂₅	S ₃₁₀	S ₃₄₀	S ₃₄₅	S ₃₇₀	S ₃₅₅	S ₃₃₀	S ₃₃₀	S ₃₃₀	S ₃₅₀	S ₃₆₀	S ₃₇₀	S ₃₄₀	S ₃₆₀	S ₃₁₀	S ₃₂₀	S ₃₁₅	S ₃₃₀	S ₃₂₅	S ₂₉₀	
14		S ₃₀₀	S ₃₀₀	S ₂₈₀	S ₃₀₀	S ₃₅₅	S ₃₃₀	S ₃₅₀	S ₃₅₅	S ₃₇₅	S ₃₃₅	S ₃₅₀	S ₃₄₅	S ₃₄₅	S ₃₄₀	S ₃₅₅	S ₃₄₅	S ₃₅₀	S ₃₅₀	S ₃₄₅	S ₃₃₀	S ₃₆₀	S ₃₁₀	S ₂₇₀	F	
15		S ₂₆₅	S ₃₀₀	S ₃₀₀	S ₃₁₀	S ₃₅₀	S ₃₁₀	S ₃₄₀	S ₃₆₀	S ₃₆₀	S ₃₃₀	S ₃₄₀	S ₃₂₅	S ₃₃₀	S ₃₂₅	S ₃₅₀	S ₃₆₅	S ₃₅₀	S ₃₂₀	S ₃₄₀	S ₃₄₀	S ₃₄₀	S ₃₁₅	S ₃₁₅	S ₃₀₀	
16		S ₃₀₀	S ₃₁₀	S ₂₈₀	S ₃₀₀	S ₃₃₀	S ₃₄₀	S ₃₀₀	S ₃₆₀	S ₃₄₀	S ₃₂₅	S ₃₄₀	S ₃₆₀	S ₃₅₅	S ₃₄₀	S ₃₅₀	S ₃₅₀	S ₃₄₅	S ₃₆₀	S ₃₁₀	S ₃₁₀	S ₃₁₀	S ₃₁₀	S ₃₁₅	S ₃₁₀	
17		S ₃₁₀	S ₃₁₀	S ₂₈₀	S ₃₁₀	S ₃₃₀	S ₃₂₀	S ₃₄₀	S ₃₅₀	S ₃₅₅	S ₃₆₀	S ₃₃₅	S ₃₃₅	S ₃₅₀	S ₃₄₅	J ₃₅₀	S ₃₆₀	S ₃₄₅	S ₃₅₀	S ₃₄₀	S ₃₄₀	S ₃₂₀	S ₃₁₅	S ₃₀₀	S ₃₀₀	
18		S ₃₀₀	S ₃₁₀	S ₃₂₀	S ₃₂₅	S ₃₃₀	S ₃₅₀	S ₃₁₀	S ₃₄₅	S ₃₅₅	S ₃₅₀	S ₃₄₅	S ₃₅₀	S ₃₄₅	S ₃₅₀	S ₃₅₅	S ₃₅₅	S ₃₅₀	S ₃₁₅	S ₃₄₀	S ₃₅₀	S ₃₁₀	S ₃₀₀	S ₂₉₅	S ₃₀₀	
19		S ₃₀₀	S ₃₀₅	S ₃₁₅	S ₃₂₅	S ₃₃₀	S ₃₁₀	S ₃₁₅	S ₃₅₀	S ₃₅₀	S ₃₅₀	S ₃₃₀	S ₃₄₀	S ₃₅₅	S ₃₅₀	S ₃₄₅	S ₃₄₀	S ₃₀₀	H ₃₃₀	S ₃₅₀	S ₃₅₀	S ₃₃₀	S ₃₂₀	S ₃₁₅	S ₂₇₅	
20		S ₂₈₀	S ₃₀₀	S ₃₂₀	S ₃₃₀	S ₃₅₀	S ₃₂₅	S ₃₂₅	S ₃₆₀	S ₃₅₀	S ₃₃₀	S ₃₃₀	S ₃₅₅	S ₃₄₀	S ₃₆₀	S ₃₅₀	S ₃₅₅	S ₃₇₀	S ₃₅₅	S ₃₆₀	S ₃₄₀	H ₃₀₀	F	F	F	
21		S ₃₁₅	S ₃₀₀	S ₃₃₀	S ₂₈₅	S ₃₀₀	S ₃₁₀	S ₃₂₅	S ₃₅₅	S ₃₅₅	S ₃₅₅	H ₃₄₀	S ₃₅₀	S ₃₆₀	S ₃₅₅	S ₃₆₀	S ₃₅₀	S ₃₅₀	S ₃₆₀	S ₃₀₀	S ₃₀₀	S ₃₃₀	S ₃₂₀	S ₂₉₀	F	
22		F	S ₃₂₀	S ₃₀₀	S ₃₁₀	S ₃₄₀	S ₃₁₀	S ₃₂₀	S ₃₅₀	S ₃₆₀	S ₃₄₀	S ₃₅₀	S ₃₅₅	S ₃₅₅	S ₃₄₅	S ₃₆₀	S ₃₇₀	S ₃₆₀	S ₃₂₀	S ₃₂₀	S ₃₁₅	S ₃₁₀	S ₂₇₅	F	S ₃₀₅	
23		S ₃₂₀	S ₃₃₀	S ₃₂₅	S ₃₃₀	S ₃₂₀	S ₃₁₅	S ₃₀₀	S ₃₅₅	S ₃₄₅	S ₃₅₀	S ₃₃₅	S ₃₄₅	S ₃₄₀	S ₃₂₀	S ₃₅₅	S ₃₅₀	S ₃₅₀	S ₃₆₀	S ₃₅₀	S ₃₁₀	S ₃₂₅	S ₃₀₀	S ₃₀₀	S ₃₀₀	
24		S ₂₉₀	F	F	S ₃₁₅	S ₃₁₀	S ₃₀₅	S ₃₂₀	S ₃₅₅	S ₃₆₀	S ₃₅₀	S ₃₃₀	S ₃₅₀	S ₃₄₀	S ₃₄₅	S ₃₄₅	S ₃₃₅	S ₃₄₀	S ₃₁₀	S ₃₂₅	S ₂₉₀	S ₂₈₀	S ₂₉₀	S ₃₀₀	S ₃₂₀	
25		S ₃₂₀	S ₃₁₀	S ₂₈₀	S ₂₉₀	S ₃₃₀	S ₃₂₀	S ₂₈₀	S ₃₅₀	S ₃₄₅	S ₃₁₀	S ₃₃₀	S ₃₅₅	S ₃₃₀	S ₃₂₅	S ₃₂₀	S ₃₃₅	S ₃₃₀	S ₃₁₅	S ₃₁₀	S ₃₁₀	S ₃₂₀	S ₃₂₀	S ₂₈₅	S ₃₀₀	
26		S ₃₁₅	S ₃₃₀	S ₃₀₀	S ₂₉₀	S ₃₀₀	S ₂₉₀	S ₃₄₀	S ₂₉₀	S ₃₃₀	S ₃₃₅	S ₃₃₀	S ₃₂₀	S ₃₃₀	S ₃₄₀	S ₃₃₅	S ₃₄₀	S ₃₅₀	S ₃₃₀	S ₃₅₅	S ₃₂₀	S ₃₂₀	S ₃₀₅	S ₂₉₀	S ₃₀₀	
27		S ₃₀₀	S ₃₃₀	S ₂₉₀	A	S ₃₁₀	S ₃₁₅	S ₃₁₀	S ₃₄₀	S ₃₃₀	S ₃₃₀	S ₃₃₀	S ₃₅₅	S ₃₅₀	S ₃₅₅	S ₃₄₀	S ₃₅₅	S ₃₅₀	S ₃₄₀	S ₃₄₀	S ₃₀₀	S ₃₀₅	S ₃₁₀	S ₂₉₀	S ₃₀₀	
28		S ₃₁₀	H ₂₉₀	S ₂₉₀	S ₃₀₀	S ₃₀₅	S ₃₀₀	S ₃₂₀	S ₃₆₀	S ₃₅₅	S ₃₄₀	S ₃₃₅	S ₃₅₀	S ₃₆₀	S ₃₂₀	S ₃₅₀	S ₃₆₅	S ₃₆₀	S ₃₄₀	A	S ₃₄₅	S ₃₆₅	S ₃₀₀	S ₃₀₀	S ₃₀₀	
29		S ₃₀₀	S ₃₀₀	S ₃₁₀	S ₃₂₀	S ₃₀₅	S ₃₀₀	S ₃₁₅	S ₃₅₀	S ₃₄₅	S ₃₄₀	S ₃₅₅	S ₃₆₀	S ₃₃₀	S ₃₅₀	S ₃₄₅	S ₃₅₅	S ₃₇₀	S ₃₂₀	S ₃₄₀	S ₃₁₀	S ₃₁₅	S ₃₁₅	S ₃₂₀	S ₃₀₀	
30		S ₃₁₀	S ₂₉₀	S ₂₈₅	S ₃₀₀	S ₂₈₀	S ₂₉₅	S ₃₄₅	S ₃₄₀	S ₃₆₀	S ₃₂₀	S ₃₄₅	S ₃₃₅	S ₃₅₅	S ₃₆₀	S ₃₂₀	S ₃₂₀	S ₃₆₀	S ₃₆₅	S ₂₈₅	S ₃₀₅	S ₃₄₅	S ₂₇₀	S ₃₀₀	S ₂₉₀	
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		28	29	29	28	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	28	28	27	
MED		S ₃₀₀	S ₃₁₀	S ₃₀₅	S ₃₁₂	S ₃₃₀	S ₃₁₀	S ₃₂₅	S ₃₅₀	S ₃₅₀	S ₃₄₀	S ₃₄₀	S ₃₄₂	S ₃₄₀	S ₃₄₀	S ₃₅₀	S ₃₅₀	S ₃₅₀	S ₃₄₀	S ₃₂₅	S ₃₂₀	S ₃₂₀	S ₃₀₂	S ₃₀₀	S ₃₀₀	
UQ		S ₃₁₀	S ₃₁₅	S ₃₁₅	S ₃₂₅	S ₃₄₀	S ₃₂₅	S ₃₄₀	S ₃₅₅	S ₃₅₅	S ₃₅₀	S ₃₄₅	S ₃₅₀	S ₃₅₅	S ₃₅₀	S ₃₅₅	S ₃₆₀	S ₃₆₀	S ₃₅₅	S ₃₄₀	S ₃₄₀	S ₃₃₀	S ₃₁₅	S ₃₁₀	S ₃₀₀	
LQ		S ₃₀₀	S ₃₀₀	S ₂₉₀	S ₃₀₀	S ₃₀₅	S ₃₀₀	S ₃₁₅	S ₃₄₀	S ₃₄₅	S ₃₃₀	S ₃₃₀	S ₃₃₀	S ₃₃₀	S ₃₂₅	S ₃₄₅	S ₃₄₅	S ₃₄₅	S ₃₂₀	S ₃₁₀	S ₃₁₀	S ₃₁₀	S ₂₉₅	S ₂₉₀	S ₂₉₀	

The Radio Research Laboratory, Japan

NOV. 1986

M(3000)F2 (0.01)

IONOSPHERIC DATA

NOV. 1936

M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9h)

Station OKUBUNJI TOKYO Lat. 35 42.4 N. Long. 139 29.3 E Sweep 1 MHz to 20 MHz in 2 sec in automatic operation		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Hour	Day																								
1											L	L	L	L											
2										L	L	L	L	L											
3										L	L	L	L	L	L	L	L								
4											L	L	L	L	L	L	L								
5											L	L	L	L	L	L	L								
6										L	L	L	L	L	L	L	L								
7												L	L	L	L	L	L								
8											L	L	L	L	L	L	L								
9										L	L	L	L	L	L	L	L								
10										L	L	L	L	L	L	L	L								
11										L	L	L	L	L	L	L	L								
12										L	L	L	L	L	L	L	L								
13										L	L	L	L	L	L	L	L								
14										L	L	L	L	L	L	L	L								
15										L	L	L	L	L	L	L	L								
16										L	L	L	L	L	L	L	L								
17										L	L	L	L	L	L	L	L								
18										L	L	L	L	L	L	L	L								
19										L	L	L	L	L	L	L	L								
20										L	L	L	L	L	L	L	L								
21										L	L	L	L	L	L	L	L								
22										L	L	L	L	L	L	L	L								
23										L	L	L	L	L	L	L	L								
24										L	L	L	L	L	L	L	L								
25										L	L	L	L	L	L	L	L								
26										L	L	L	L	L	L	L	L								
27										L	L	L	L	L	L	L	L								
28										L	L	L	L	L	L	L	L								
29										L	L	L	L	L	L	L	L								
30										L	L	L	L	L	L	L	L								
31																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										2	6	14	13	13	3	2	2								
MED										395	375	380	380	380	378	370	388								
UQ										400	385	390	390	415											
LQ										360	370	375	380	365											

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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H*F2 (KM)

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

Station	OKUBUNJI TOKYO							Lat.	35 42.4 N			Long.	139 29.3 E			Sweep 1 MHz to 20 MHz in 2 sec in		automatic operation							
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1										235	235	255	260	245											
2										245	240	235	245	240											
3										230	245	295	250	230	265	245	225								
4										265	275	235	280	260	225										
5										310	285	255	305	275	250	240									
6										260	235	260	250	245	260	230	230								
7											280	240	260	250	245	230									
8										270	235	250	255	255	245										
9										235	235	245	250	255	255	235	225								
10										230	240	240	240	235	255	230									
11										320	265	245	250	255	240	240									
12										260	240	225	240	240	250	225									
13										220	230	255	255	235	225	240	225								
14										220	250	240	230	250	240	220	235								
15										225	245	250	240	250	240										
16										230	270	245	235	245											
17										230	235	260	245	235	245	235									
18										230	240	250	245	255	255	240									
19										245	245	240	230	245	250										
20										290	260	235	235	245	235	230									
21										225	225	260	240	220	255	235	225								
22										215	240	235	205	225	240	235									
23										235	255	240	260	250	235	230									
24										240	260	230	245	235	240										
25										310	265	235	250	245	250										
26										260	220	225	255	245	240	230	215								
27										245	255	225	235	235	230	220									
28										225	225	245	230	225	285	230									
29										220		225	235	255	240	220	210								
30										220	250	235	240	225	215	310	265								
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT										17	28	30	30	30	28	27	15								
MED									230	240	245	240	245	245	235	225									
UQ									235	262	260	250	255	255	245	230									
LQ									220	235	240	235	235	240	230	225									

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H*F2 (KM)

IONOSPHERIC DATA

NOV. 1986

H^oF (KM)

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

Station **OKUBUNJI TOKYO** Lat. **35 42.4 N** Long. **139 29.3 E** Sweep 1 MHz to 20 MHz in 2sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	280	275	260	220	210	215	235	240	H 230	220	210	185	215	H 220	H 210	240	230	210	220	235	235	E A 305	260	290	
2	275	275	255	225	235	280	255	235	230	220	200	190	190	H 180	245	230	220	215	225	255	260	285	255	245	
3	250	245	250	240	215	260	245	220	200	220	H 200	H 195	225	210	A	230	220	210	255	280	250	250	285	300	
4	295	275	265	235	220	270	215	205	H 215	H 210	240	220	H E A 260	H 205	H 220	220	H 265	210	E A 245	305	385	325	345	270	
5	235	290	265	425	345	270	210	235	245	E A 280	215	E A 255	E A 240	A	A	A	230	215	260	230	290	245	255	260	
6	260	255	250	215	220	255	235	220	240	225	225	E A 250	A	A	235	215	210	205	225	220	235	E S 270	315	315	
7	305	305	270	265	210	225	205	215	H 225	H 240	E A 250	E A 245	245	E A 260	A	A	215	255	260	230	240	265	A	330	
8	315	310	260	230	H 220	240	220	215	H 225	H 200	H 200	210	190	195	220	H 230	215	215	210	220	235	290	260	300	
9	310	250	245	235	235	265	220	215	220	215	220	210	195	215	H 205	230	205	200	250	235	235	310	230	255	
10	280	265	265	270	230	225	255	225	H 195	H 185	H 185	H 205	H 185	210	H 210	H 220	H 195	225	220	225	240	275	270	285	
11	285	245	245	260	235	260	225	210	225	H 185	215	185	175	H 215	H 205	H 220	225	215	225	225	210	265	305	290	
12	255	230	240	270	265	305	250	225	H 225	215	205	220	215	195	H 220	210	215	205	215	250	230	275	260	280	
13	265	255	265	260	245	265	225	240	220	210	220	210	215	225	230	210	H 225	A 205	250	280	255	240	250	285	
14	280	305	315	280	205	260	220	215	215	225	A	A	200	240	A	A	A 220	A 220	235	260	210	240	E A 315	315	
15	285	290	270	255	220	255	225	205	H 215	200	H 190	H 190	185	175	H 230	215	E A 260	A	A	235	230	215	260	270	300
16	285	255	315	290	225	225	235	220	205	230	215	215	190	H 230	H 230	230	220	210	245	225	250	230	250	265	
17	265	280	330	270	225	245	220	225	H 215	215	H 185	H 180	230	220	235	225	220	200	230	230	255	265	280	305	
18	295	270	270	250	230	215	260	230	235	H 180	230	230	225	H E A 250	E A 230	H 230	H 220	H 210	A 220	215	245	250	270	285	
19	270	275	260	230	215	255	260	220	H 210	250	230	235	215	240	E A 240	215	215	210	E A 240	230	245	250	260	330	
20	315	290	275	260	215	245	240	215	H 200	225	H 185	E A 235	210	195	H 200	235	H 205	205	200	215	275	245	230	280	
21	275	260	235	285	255	245	225	240	220	215	180	H 205	205	190	H 200	230	210	205	220	240	240	240	280	320	
22	305	245	260	270	220	230	250	220	H 200	205	180	H 205	220	195	210	220	H 220	255	E A 295	245	240	255	300	245	
23	245	225	220	210	230	225	250	220	230	235	225	205	215	185	230	215	235	E A 230	E A 235	240	235	270	E A 315	275	
24	290	260	260	245	250	230	250	210	225	225	H 200	230	230	215	E A 235	230	230	215	230	E A 305	E A 315	280	260	235	
25	215	E A 300	E A 335	265	235	250	240	220	230	230	240	220	215	A	230	235	225	225	240	235	235	230	295	270	
26	255	230	250	235	255	285	225	245	235	A	A	235	220	210	210	A	230	220	220	230	255	255	260	280	
27	280	205	A	A	260	225	255	225	220	H 225	H 205	H 200	180	H 205	185	215	220	205	220	255	H 275	E A 270	325	265	
28	260	210	275	270	265	265	255	225	H 205	220	220	180	215	185	A	220	205	A	A	240	220	H 270	310	280	
29	290	280	255	240	260	260	260	220	H 205	225	205	190	H 210	200	H 210	215	205	215	225	235	265	265	220	260	
30	255	285	305	270	315	280	210	220	H 225	H 190	230	210	210	220	H 210	H 190	205	220	E A 300	265	220	235	265	305	
31																									
CNT	30	30	29	29	30	30	30	30	30	29	28	29	29	27	25	26	30	28	29	30	30	30	29	30	
MED	280	265	260	260	230	255	235	220	220	220	210	208	212	208	215	220	220	211	228	235	240	260	265	282	
UQ	290	282	270	270	255	265	250	225	230	225	224	222	218	219	230	230	225	219	240	252	255	272	292	300	
LQ	260	245	250	235	220	230	220	215	H 210	H 210	H 200	H 195	195	195	210	215	210	205	220	230	235	245	260	265	

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H^oF (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

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H^oE (KM)

135° E Mean Time (G.M.T. + 9h)

Station: ROKUBUNJI TOKYO Lat. 35 42.4 N Long. 139 29.3 E Sweep 1 MHz to 20 MHz in 2 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							S	120	110	110	110	110	E A 130	115	115	E A 125	120	S							
2							S	E A 130	E A 125	A 115	A 120	E A 130	110	115	115	115	120	S							
3							S	110	110	115	115	115	115	115	115	120	120	S							
4							S	125	125	A 115	A 115	115	115	115	115	115	A	S				S	S	S	
5	S	S	S				S	125	115	E A 125	E A 125	A	A	115	A	A	A	S							
6		S					S	E S 135	110	110	110	110	110	110	110	115	125	S				S			
7							S	120	110	110	120	A 105	110	115	110	115	125	S							
8							S	110	125	A 115	A 115	115	115	120	115	120	A	S	S						
9							S	A	A	110	A	A	E A 125	E A 120	A 120	A 115	A	S	S						
10							S	115	A	110	110	105	110	110	115	110	A	S	S						
11							S	120	110	E A 130	E A 130	110	115	110	A 110	115	S	S					S		
12	S	S	S	B			S	120	A 120	A 120	115	A 115	110	110	A 125	115	S	B							
13							S	E A 120	E A 130	110	110	E A 130	E A 120	E A 120	110	120	A	S						S	
14							S	A	115	110	110	105	110	A	A	A	A	S							
15							S	120	E A 130	110	110	105	110	E A 140	110	A	A	S						S	
16		S	S				S	125	115	115	110	110	A	A	115	A	A	S					S		
17							S	E S 125	A 125	E A 120	E A 130	A	A	E A 130	A 130	E A 130	A	S							
18							S	A	A	A	E A 125	E A 120	120	115	E A 120	A	A	S				S			
19							S	S	110	110	105	120	A 110	110	A 110	110	E A 145	S					S		
20							S	E S 125	A	A	E A 125	E A 120	105	115	A 115	110	A	S	S						
21							S	125	A	110	105	115	110	A 110	105	110	110	130	S						
22							S	A	115	110	110	110	110	110	E A 120	E A 120	A	S							
23							S	125	A	A	E A 130	110	110	125	A	A	A	S							
24							S	130	115	110	120	A 120	110	110	A	A	A	S							
25					S	S	S	E S 135	120	115	110	110	105	A	A	E A 125	A	S							
26	S	S	S	S	S		S	S	115	120	A 110	110	115	115	A	A	S	B							
27							S	A	A	E A 135	A	A	A	A	A	A	A	S	S						
28							S	A	A	A	E A 125	115	125	A	A	A	A	A	S						
29							S	E S 120	A	A	E A 130	115	E A 125	120	120	E A 125	A	S	S						
30							S	S	A	115	115	115	120	120	120	120	A	S							
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								21	20	27	28	26	25	25	21	22	7								
MED								122	115	112	112	112	110	112	115	116	122								
UQ								125	122	A 118	A 118	A 118	115	118	120	A 120	126								
LQ								120	110	110	110	110	110	110	110	115	120								

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H^oE (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

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H°ES (KM)

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

Station **OKUBUNJI TOKYO** Lat. **35 42.4 N** Long. **139 29.3 E** Sweep 1 MHz to 20 MHz in 2 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	B	S	B	S	120	100	G	G	150	150	150	105	G	G	110	125	115	115	105	110	100	S	S
2	S	S	B	B	B	S	S	120	110	105	105	110	G	140	165	150	130	120	S	105	B	S	S	S
3	S	B	B	S	B	S	S	G	G	G	G	G	145	125	120	120	115	S	150	105	S	S	S	105
4	100	S	B	S	B	S	S	G	G	110	105	G	155	G	G	135	115	110	105	S	S	S	S	S
5	S	155	S	B	110	S	150	135	135	120	110	110	115	115	110	110	110	115	110	115	105	125	105	105
6	105	105	105	105	105	105	110	145	140	140	125	130	125	125	G	G	G	110	160	145	115	S	110	105
7	S	S	105	100	B	S	S	G	G	G	145	140	140	140	150	125	120	115	110	105	110	105	100	100
8	100	100	100	100	105	105	S	135	115	110	105	160	G	105	G	110	S	100	100	100	S	S	105	105
9	105	S	S	100	B	S	S	115	115	115	110	110	110	105	105	155	135	105	125	110	105	105	105	105
10	S	S	B	S	S	S	S	G	115	G	G	G	G	G	G	G	S	100	120	S	S	110	110	S
11	S	S	S	105	S	S	S	120	160	110	160	G	105	105	G	G	S	100	100	S	135	S	130	S
12	S	S	S	105	100	S	S	G	160	155	150	160	G	G	110	G	135	125	S	105	105	100	105	100
13	S	S	B	100	S	S	S	G	155	G	150	120	125	120	120	G	105	S	S	S	105	S	S	S
14	S	S	120	S	110	110	110	140	145	125	120	115	115	105	105	100	110	105	105	105	110	115	105	110
15	105	125	120	105	100	110	S	G	115	150	G	130	115	110	G	110	110	110	105	105	100	105	S	100
16	S	S	S	S	110	100	105	135	G	155	120	120	115	110	G	115	115	110	110	115	105	105	100	S
17	S	100	100	100	100	100	105	G	115	110	115	110	110	110	110	110	150	110	105	105	105	100	S	S
18	105	100	100	S	S	110	105	105	105	105	105	170	130	120	115	120	110	105	100	110	105	S	S	S
19	S	S	S	100	S	S	115	110	G	G	155	135	130	130	115	155	170	100	130	125	S	105	105	105
20	S	S	S	S	S	S	S	G	110	175	110	140	130	125	120	G	S	100	100	125	S	125	105	105
21	100	110	110	115	S	S	110	125	120	115	115	120	105	G	G	145	G	S	S	S	S	S	S	S
22	S	S	S	105	S	S	S	120	160	150	145	115	120	115	100	125	120	115	110	110	110	105	105	100
23	105	100	S	S	110	S	125	115	150	140	135	125	110	110	110	100	105	110	110	110	110	110	110	105
24	110	100	110	110	105	105	S	G	G	130	135	125	120	120	110	110	105	S	105	100	100	100	100	100
25	105	105	105	S	S	S	S	140	135	115	115	120	110	110	105	100	100	100	S	S	105	105	130	125
26	110	120	S	S	S	S	S	130	125	120	120	120	115	115	105	105	105	105	110	105	105	100	S	S
27	105	105	100	100	100	100	105	115	110	110	110	110	110	110	105	110	105	105	115	105	105	105	100	115
28	S	S	S	100	B	S	100	115	110	110	105	105	100	110	100	100	100	100	100	100	105	100	100	95
29	95	95	95	95	S	S	S	G	115	115	120	G	105	G	G	105	155	S	S	S	S	S	S	S
30	S	S	S	105	S	S	115	120	105	G	G	G	G	G	G	G	100	100	100	105	100	100	100	100
31																								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	13	13	12	17	10	11	12	18	23	24	26	24	25	23	19	23	24	25	24	23	21	20	19	18
MED	105	105	105	100	105	105	108	122	115	118	120	120	115	115	110	110	112	105	110	105	105	105	105	105
UQ	105	110	110	105	110	110	112	135	138	150	145	136	125	122	118	125	128	110	115	110	110	108	108	105
LQ	100	100	100	100	100	102	105	115	112	110	110	112	110	110	105	110	105	100	102	105	105	100	100	100

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H°ES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

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TYPES OF ES

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

Station **OKUBUNJI TOKYO** Lat. 35 42.4 N Long. 139 29.3 E Sweep 1 MHz to 20 MHz in 2 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1					F1	L1			H1	H1	H1	L1				L1	C3	C1	F1	F1	FF11	F2			
2							L2	L2	L2	L1	L1			C1	H1	H1	C3	C5		F1					
3													H1	H2	C2	C3	C2		F2	FF22				F1	
4	F2						H1		L1	L1			H1			H2	L3	LL31	F4			K1	K1	K1	
5		HK11	K1	F1	FF11	F1	H1	H4	H3	HL32	L2	L3	L3	C4	L3	L5	L5	L5	F4	F1	F2	FF12	F3	F3	
6	F2	LK21	F2	F1	F2	F2	L1	H3	H2	H2	H2	H2	H2	H2				C3	F1	F1	LK11		F2	F2	
7			F1	F3							HL22	H2		H2	H2	C4	CL41	CL31	F5	F3	F2	F2	F4	F2	
8	F3	F2	F2	F1	F2	F2		H3	LL22	CL22	L1	H1		L1		L2		L2	F1	F1			F2	F2	
9	F2			F2				L3	L2	C2	L2	L2	L2	L2	L3	HL23	HL21	L1	F1	F3	F2	F1	F1	F1	
10									L3									L1	F1			F2	F1		
11				F2				C2	H2	L2	HLL11		L1	L1				L1	F1		F1	K1	FF21		
12	K1	K1	K1	LK11	F2				HL12	HL13	HL12	HL21			L2		C3	C1		F3	F3	F2	F1	F2	
13				F1					HL23		H1	CL21	CL32	CL21	C2		L5				F1			K1	
14			F1		F1	F1	L1	HL21	H3	C2	C3	C2	C2	L2	L3	L5	CL32	L3	FF61	F2	F6	F2	F3	F3	
15	F2	FF42	F3	F3	F3	F1			LL22	H1		C2	C2	L2		L4	L6	L7	F3	F1	F2	F1	K1	F1	
16		K1	K1		F1	F2	L1	H2		HC21	C2	C2	L2	L2		L2	LL43	L6	F3	F2	F2	LK21	F1		
17		F4	F4	F2	F2	F1	L1		L2	L3	L2	L2	L2	L2	L2	L2	HL21	L1	F2	F2	F2	F3			
18	F1	F2	F1		F1	L3	L3		L2	L2	L2	HL12	HL21	CL22	CL32	CL22	L3	L3	F3	FF11	LK11				
19				F1			L1	L1			H2	HL21	H2	HL21	C3	H2	HL11	LH22	F6	F6		LK21	F2	F1	
20									L2	HL22	L2	HL12	C2	CL21	CL22			L2	F1	F3		F1	F1	F1	
21	F1	F1	F1	F1			L1	C3	C3	C2	C3	CL22	L1			H1									
22				F1			L2		H2	H2	H1	C2	C2	C2	L1	CL31	CL32	CL62	FF32	F2	F2	F3	F2	F2	
23	F2	F3			F1				L2	HL12	HL12	C1	C2	L2	L2	L1	L5	L4	F3	F2	F1	F3	F7	F3	
24	FF22	F2	FF22	F2	F4	F2				C2	CL22	CL21	C1	C3	L3	L2	L2		F2	F4	F4	F2	F2	F1	
25	F2	F2	F2		HK11	K1	H1	H4	H3	C3	C2	C2	C2	CL22	LL22	L3	L1	L3			F3	F3	FF22	FF21	
26	LK21	LK11	K1	K1	K1	F1	H1	C3	C3	CL22	C3	C2	C1	C2	L2	L3	L2	L5	F1	F2	F3	F3			
27	F1	F1	F3	F3	F2	F1	L1	L1	L1	L2	L2	L2	L1	L1	L2	L1	L2	L2	F1	F1	F2	F3	F2	F1	
28				F1			L1	L1	L1	L1	L1	L2	L1	LL11	L2	LH11	L2	L4	F4	F2	F3	F2	F2	F2	
29	F3	F2	F2	F2					L1	L1	L1		L1			L1	H1								
30				F1			L1	L1	L2								L1	L2	F2	F1	F1	F1	F1	F1	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
UQ																									
LQ																									

The Radio Research Laboratory, Japan

NOV. 1986

TYPES OF ES

IONOSPHERIC DATA

NOV. 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 40	X 42	X 45	X 48	X 59	X 40	X 36											X 60	X 54	X 46	X 41	X 39	X 39	
2	X 40	X 44	X 42	X 40	X 40	X 30	X 33											X 48	X 50	X 50	X 44	X 46	X 42	
3	X 40	X 39	X 40	X 40	X 46	X 28	X 30											X 42	X 43	X 47	X 50	X 44	X 35	
4	X 37	X 40	X 39	X 41	X 41	X 27	X 32											X 53	X 50	X 52	X 52	X 56	C	
5	X 62	X 37	X 40	C	X 34	X 40	X 33											X 66	X 57	X 48	X 52	X 44	X 39	
6	X 40	X 42	X 45	X 41	X 32	X 25	X 26											X 45	X 43	X 36	X 38	X 34	X 31	
7	X 33	X 34	X 35	X 38	X 45	X 26	X 27											X 56	X 50	X 32	X 32	X 36	X 36	
8	X 34	X 37	X 36	X 39	X 42	X 29	X 28											X 50	X 40	X 37	X 30	X 31	X 34	
9	X 36	X 36	X 38	X 39	X 39	X 29	X 31											X 42	X 39	X 44	X 36	X 36	X 35	
10	X 35	X 37	X 37	X 36	X 38	X 32	X 28											X 48	X 43	X 41	X 38	X 34	X 34	
11	X 35	X 37	X 35	X 34	X 40	X 30	X 28											X 57	X 55	X 43	X 35	X 36	X 36	
12	X 39	X 42	X 36	X 37	X 38	X 36	X 37											X 50	X 34	X 38	X 34	X 35	X 34	
13	X 37	X 37	X 37	X 36	X 40	X 32	X 34											X 40	X 35	X 37	X 40	X 37	X 33	
14	X 33	X 33	X 34	X 37	X 39	X 31	X 31											X 48	X 37	X 37	X 38	X 28	X 26	
15	X 33	X 35	X 35	X 35	X 44	X 31	X 27											X 45	X 39	X 36	X 35	X 37	X 35	
16	X 35	X 38	X 37	X 39	X 65	X 29	X 29											X 42	X 43	X 45	X 33	X 33	X 33	
17	X 35	X 36	X 35	X 40	X 46	X 27												X 54	X 45	X 36	X 33	X 33	X 34	
18	X 34	X 36	X 38	X 39	X 54	X 23	X 25											X 49	X 37	X 30	X 31	X 30	X 31	
19	X 34	X 34	X 34	X 36	X 44	X 26	X 28											X 40	X 33	X 34	X 34	X 34	X 34	
20	X 32	X 34	X 34	X 35	X 38	X 32	X 28											X 47	X 41	X 37	S	X 35	X 35	
21	X 32	X 35	X 35	X 35	X 35	X 33	X 32											X 49	X 39	X 34	X 39	X 35	X 35	
22	X 34	X 35	X 37	X 41	X 40	X 30	X 28											X 40	X 35	X 36	X 39	X 40	X 44	
23	X 41	X 39	X 37	X 40	X 32	X 29	X 30											X 50	X 37	X 31	X 37	X 37	X 33	
24	X 34	X 35	X 39	X 37	X 38	X 35	X 34											X 49	X 47	X 42	X 45	X 45	X 45	
25	X 32	X 32	X 31	X 33	X 39	X 34	X 26											X 64	X 61	X 52	X 50	X 45	X 48	
26	X 48	X 56	X 35	X 40	X 36	X 31	X 32											X 64	X 38	X 36	X 37	X 40	X 34	
27	X 38	X 42	X 30	X 32	X 32	X 29												A	A	A	A	X 40	X 40	
28	X 41	X 43	X 39	X 36	X 40	X 37	X 36											X 40	X 45	X 45	X 32	X 31	X 32	
29	X 35	X 37	X 40	X 39	X 40	X 35	X 35											X 42	X 39	X 36	X 39	X 42	X 35	
30	X 33	X 35	X 36	X 36	X 35	X 37	X 38											X 40	X 41	X 50	X 45	X 34	X 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	30	30	30	29	30	29	30												29	29	29	28	30	29
MED	X 35	X 37	X 37	X 38	X 40	X 31	X 30												X 48	X 41	X 37	X 38	X 36	X 35
UQ	X 40	X 40	X 39	X 40	X 44	X 34	X 33												X 53	X 47	X 45	X 42	X 40	X 36
LQ	X 34	X 35	X 35	X 36	X 38	X 29	X 28												X 42	X 38	X 36	X 34	X 34	X 33

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FXI (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

NOV. 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 2sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	35	36	39	42	S	F	S	S																
2	35	37	36	34	34	25	27	60	S															
3	34	33	34	34	40	22	24	51	74	85	102	108	99	83	92	84	65	58	36	37	41	S	44	
4	31	34	33	35	35	21	26	48	56	65	U	R	123	U	R	138	142	H	77	52	U	R	100	
5	56	31	34	I	C	27	28	34	27	I	C	44	I	C	61	65	U	R	96	106	77	96	103	81
6	34	U	S	36	39	35	26	19	20	48	H	54	76	88	80	77	69	84	79	60	54	39	37	
7	27	28	29	32	39	20	21	48	58	65	70	87	91	102	84	84	59	48	50	44	26	26	30	
8	28	31	30	33	36	23	22	47	53	67	89	66	66	67	83	74	63	51	44	34	31	24	25	
9	30	30	32	33	33	23	25	52	63	60	79	84	73	72	78	78	63	47	36	33	33	30	30	
10	29	31	31	30	32	26	22	45	66	66	73	I	C	76	86	I	C	71	87	68	49	I	C	46
11	29	S	31	28	28	34	24	22	42	54	S	62	71	81	62	71	72	63	55	47	51	49	37	
12	33	36	S	30	31	32	30	31	54	60	72	79	82	71	60	60	66	57	71	44	H	28	32	
13	31	31	31	30	S	33	26	28	54	65	69	70	76	R	86	83	83	78	65	54	34	29	31	
14	27	27	28	31	33	F	25	50	R	63	60	66	77	85	75	93	75	62	51	42	31	31	22	
15	F	F	29	29	38	25	21	47	57	65	63	78	U	R	77	69	73	H	67	66	55	39	U	S
16	29	32	31	33	U	H	59	23	23	43	64	79	89	80	U	H	65	U	H	70	U	H	71	
17	29	30	29	F	40	A	21	44	S	57	70	81	85	75	H	81	77	71	60	54	47	39	30	
18	28	30	S	32	S	33	47	17	20	40	60	76	66	70	70	68	68	H	60	56	49	42	30	
19	28	28	U	S	28	30	37	21	22	41	58	66	76	J	R	79	78	69	65	67	56	52	34	
20	S	28	28	29	32	25	22	44	60	62	68	76	80	69	76	76	66	54	41	35	S	31	S	
21	26	28	30	30	29	27	27	49	57	56	60	76	65	61	71	71	60	48	42	33	23	33	29	
22	28	28	31	35	34	F	20	22	40	54	60	64	74	75	70	82	61	53	46	34	29	30	32	
23	F	30	32	31	F	30	26	22	24	44	58	66	72	84	85	72	69	68	66	60	44	S	31	
24	28	29	33	31	32	29	28	49	60	60	71	86	75	71	74	73	75	57	43	41	36	39	39	
25	26	26	25	27	33	28	20	42	54	72	96	R	95	75	81	33	89	80	65	58	55	46	44	
26	S	42	50	29	34	30	25	26	41	94	93	U	R	96	92	105	104	95	U	R	82	71	83	
27	32	36	24	26	26	26	23	47	71	77	R	84	98	97	83	U	R	75	81	63	55	A	A	
28	35	38	33	30	F	30	31	30	45	68	H	76	68	72	67	68	86	73	59	52	34	39	39	
29	29	31	34	33	F	31	29	29	46	68	64	69	70	72	61	64	61	58	48	36	33	30	33	
30	27	29	30	30	29	31	32	45	61	77	R	85	R	79	107	65	68	58	71	65	H	34	35	
31																								
CNT	30	29	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	29	29	29	28	29	
MED	29	31	31	31	33	25	24	46	60	66	76	80	77	71	80	74	62	54	42	35	31	32	30	
UQ	33	34	33	33	37	28	27	49	66	76	89	87	86	83	87	79	66	60	47	41	39	36	34	
LQ	28	29	29	30	30	22	22	44	57	64	69	76	72	69	71	68	57	49	36	32	30	28	28	

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FOF2 (0.1 MHz)

IONOSPHERIC DATA

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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	24	sec	in	automatic	operation
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1									L	L	L	A	460	L	L	A										
2								L	L	410	430	460	440	430	L	400	A									
3										L	L	L	L	L	L	L										
4									L	L	450	440	L	L	L	A	L									
5								C	C	A	L	L	L	A	A	A	A	A								
6									L	L	L	L	L	U L	L	L	L									
7										L	L	U L	L	L	L	A	A	A								
8									L	L	L	450	U L	L	L	L	L									
9										L	L	L	L	U L	L	L										
10									L	L	U L	C	U L	C	U L	L	A	C								
11										L	410	U L	390	430	L	U L	L									
12									L	U L	U L	L	410	400	L	A	L									
13										L	U L	L	L	410	390	370										
14											L	420	L	450	410	U L	L									
15									L	L	L	440	U L	U L	360	L	L									
16										L	U L	A	L	410	L	L	L									
17									L	L	410	430	L	L	L	L	L									
18										L	L	L	430	400	A	A	A									
19							190			L	L	L	L	410	L	L										
20										L	L	L	L	L	L	L	L									
21									L	L	L	420	L	430	H	440	L									
22								270		L	L	L	A	450	410	A	L									
23									L	L	L	L	L	L	L	L	H	260								
24										L	L	U L	U L	L	L	L										
25										L	L	U L	U L	U L	L	L	A									
26											L	460	L	L	L	L	L									
27										L	450	U L	L	L	A	A										
28									L	400	L	430	L	U L	U L	L										
29									L		L	U L	U L	410	L	400	L	L								
30									L	L	U L	U L	L	410	L	L	L									
31											420	530	L	410	310											
	00	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	1	3	11	16	11	17	9	4	1									
MED							190	270	400	420	430	430	420	410	380	260										
UQ									405	440	440	435	430	410	395											
LQ									385	410	430	420	410	390	365											

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FOF1 (0.01 MHz)

IONOSPHERIC DATA

NOV. 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 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	245	280	305	315	320	310	300	A	A	S							
2								S	240	A	305	315	325	305	300	265	230	A							
3								180	240	260	290	320	320	310	300	280	230	S							
4								A	240	A	300	320	320	315	300	275	A	S							
5								C	C	A	A	A	A	A	A	A		S							
6								S	230	275	300	310	315	310	295	275	235	170							
7								170	245	280	300	305	310	305	300	275	200	S							
8								S	230	275	300	310	310	A	A	A	A	S							
9								S	A	A	A	A	315	310	295	280	240	S							
10								S	A	U A	A	I C	R	C	295	265	210	C							
11								S	240	285	U A	U A	U A	R	285	U R	U R	S							
12								S	225	255	280	295	300	295	290	270	A	S							
13								S	210	245	280	300	305	295	285	270	A	S							
14								S	240	A	A	305	A	A	A	A	A	S							
15								S	250	U A	A	A	A	A	295	A	A	S							
16								S	225	U A	U A	305	310	A	A	265	220	S							
17								S	245	265	A	A	A	A	A	A	A	A							
18								S	230	260	285	U A	A	A	A	260	A	A							
19								S	230	260	290	300	305	300	290	255	210	S							
20								S	220	265	290	300	310	300	290	260	210	S							
21								S	A	250	290	300	300	300	295	255	210	S							
22								S	245	250	290	H	305	A	300	295	265	230	S						
23								S	220	U A	U A	A	300	A	A	A	240	S							
24								S	245	A	275	A	A	A	A	A	U A	S							
25								S	A	A	290	A	A	A	A	A	A	S							
26								A	A	H	260	280	295	305	A	285	265	210	S						
27								S	200	250	A	300	A	A	A	A	A	S							
28								S	A	250	A	290	300	295	285	U A	A	S							
29								S	200	H	250	285	295	300	305	290	260	H	S						
30								S	215	260	280	305	305	285	260	H	210	170							
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								2	23	24	23	23	22	17	20	20	18	2							
MED								175	230	260	290	305	305	305	295	265	220	170							
UQ									242	270	300	308	315	310	298	272	230								
LQ									222	252	288	300	300	300	288	260	210								

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FOE (0.01 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

NOV. 1986

FOES (0.1 MHz)

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

Station		YAMAGAWA							Lat.	31	12	1	4	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	J A 17	J A 34	J A 32	J A 36	J A 49	J A 43	G	J A 36	J A 53	J A 32	G	J A 29	J A 39	J A 23	J A 17	J A 37	J A 17	
2	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	21	26	31	31	33	33	33	36	36	39	J A 23	J A 25	J A 24	J A 17	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	G	G	28	G	41	36	J A 44	42	36	28	20	J A 16	J A 21	J A 20	E S 16	E S 16	E S 16	
4	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 15	21	29	28	G	37	G	G	35	40	J A 40	J A 30	J A 17	J A 27	J A 20	J A 22	J A 24	C		
5	J A 17	E S 16	E S 16	C	J A 16	J A 16	E S 16	C	C	J A 44	32	35	39	J A 71	J A 66	J A 84	J A 51	J A 44	J A 53	J A 31	J A 25	J A 22	J A 17	J A 17		
6	J A 16	J A 16	J A 16	J A 21	J A 21	J A 17	J A 17	19	G	G	34	35	36	33	G	31	28	23	E S 16	E S 16	J A 34	J A 22	J A 16	E S 16		
7	E S 16	E S 16	J A 34	J A 26	J A 17	J A 17	E S 16	22	G	34	34	36	35	40	33	J A 43	J A 64	J A 45	J A 63	J A 30	J A 17	J A 17	J A 16	E S 16		
8	J A 20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	28	35	G	G	33	J A 33	J A 38	30	J A 25	J A 18	J A 17	E S 16	J A 21	J A 22	J A 23	J A 21		
9	J A 21	J A 18	E S 16	J A 16	E S 16	E S 16	E S 16	19	28	J A 50	J A 33	J A 33	G	G	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16		
10	22	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	21	J A 29	29	24	C	G	C	32	33	J A 33	C	J A 18	22	E S 16	E S 16	E S 16		
11	E S 16	E S 16	E S 16	22	22	E S 16	E S 16	E S 16	27	32	34	36	33	33	23	G	G	22	J A 18	J A 18	18	E S 16	19	18	19	
12	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	25	28	G	34	34	36	42	J A 44	24	J A 31	J A 35	23	E S 16	17	18	J A 22		
13	E S 16	21	E S 16	E S 16	E S 16	20	E S 16	E S 16	26	31	35	33	33	33	30	G	J A 30	J A 20	21	J A 21	18	18	E S 16	E S 16		
14	E S 16	E S 16	E S 16	E S 16	22	21	18	18	26	J A 34	J A 35	39	J A 47	J A 41	36	J A 35	J A 29	J A 26	J A 30	J A 24	J A 19	J A 19	J A 21	J A 18		
15	J A 22	J A 25	J A 38	J A 22	J A 21	E S 16	E S 16	E S 16	G	J A 31	J A 34	J A 34	J A 44	J A 42	31	J A 33	J A 33	J A 30	23	J A 23	J A 24	E S 16	E S 16	J A 19		
16	22	E S 16	E S 16	E S 16	E S 16	J A 18	E S 16	E S 16	28	33	33	50	41	51	J A 39	J A 36	28	23	21	E S 15	E S 16	E S 16	E S 16	J A 21		
17	E S 16	E S 16	E S 16	E S 16	E S 16	J A 33	J A 27	J A 18	J A 22	G	J A 32	29	34	J A 41	33	J A 31	J A 30	J A 33	J A 33	J A 32	J A 18	E S 16	E S 16	E S 16		
18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	J A 23	27	30	34	37	J A 45	J A 41	J A 64	J A 58	J A 45	24	J A 32	E S 16	E S 16	E S 16	E S 16	E S 16		
19	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	21	G	20	G	34	38	36	36	34	32	28	23	J A 18	J A 25	E S 16	E S 16	J A 25		
20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	26	30	36	40	35	31	30	24	G	22	21	J A 18	J A 27	J A 24	J A 25	J A 20		
21	E S 16	E S 16	E S 16	E S 16	J A 18	E S 16	E S 16	G	26	27	33	44	31	25	24	23	25	18	16	16	E S 16	E S 16	E S 16	E S 16		
22	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	31	36	39	J A 45	35	32	40	J A 27	G	18	J A 20	E S 16	J A 26	J A 19	J A 37		
23	E S 16	J A 34	J A 25	J A 22	J A 18	E S 16	J A 20	J A 22	26	J A 36	35	J A 38	39	54	J A 36	J A 30	J G	G	E C	E S 16	J A 18	E S 16	E S 16	J A 22		
24	22	J A 22	J A 19	J A 27	J A 23	J A 20	E S 16	E S 16	G	30	J A 35	J A 39	J A 39	J A 51	J A 71	J A 54	J A 30	21	J A 25	J A 41	J A 30	J A 22	J A 33	J A 28		
25	19	20	20	18	J A 19	J A 19	21	E S 16	J A 32	J A 32	J A 35	J A 41	J A 36	J A 30	J A 33	J A 54	J A 46	J A 25	25	16	18	19	19	J A 17		
26	J A 21	J A 26	J A 22	21	23	E S 16	23	24	J A 28	J A 33	J A 37	J A 41	J A 36	J A 33	J A 35	J G	J G	J A 19	J A 18	22	19	22	22	E S 16	19	
27	22	E S 16	E S 16	E S 16	21	20	E S 16	J A 17	23	G	J A 54	20	G	31	32	J A 41	J A 50	J A 54	J A 52	71	J A 92	J A 85	J A 41	31	J A 29	
28	J A 22	J A 20	21	J A 23	J A 20	J A 22	23	23	20	G	33	22	G	26	24	27	J A 48	J A 35	J A 25	J A 22	J A 25	J A 24	J A 24	J A 18	J A 17	
29	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	31	G	G	32	G	G	26	G	19	25	20	19	J A 17	E S 16	E S 16	E S 16	
30	E S 16	E S 16	J A 22	18	22	J A 18	J A 18	J A 19	24	J G	18	33	G	G	31	G	G	J A 20	J A 21	J A 21	J A 20	23	E S 16	E S 16	E S 16	
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		30	30	30	29	30	30	30	29	29	30	30	29	30	29	30	30	30	29	30	30	30	30	30	29	
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	17	26	31	34	36	36	33	34	34	J A 28	J A 23	J A 21	J A 22	J A 18	18	16	J A 17	
UQ	21	18	19	21	J A 21	J A 18	18	21	28	J A 33	35	39	J A 39	J A 41	J A 38	J A 44	J A 35	J A 26	J A 29	J A 27	J A 23	J A 22	J A 21	J A 21		
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	31	33	32	31	30	26	25	18	J A 18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	

NOV. 1986

FOES (0.1 MHz)

IONOSPHERIC DATA

NOV. 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																	
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S	E S	E S	E S	E S	E S	E S	E S	G	30	34	48	43	G	35	43	30	G	E S	E S	E S	E S	E S	E S
2	E S	E S	E S	E S	E S	E S	E S	20	25	30	30	33	31	33	35	36	36	18	20	E S	E S	E S	E S	E S
3	E S	E S	E S	E S	E S	E S	E S	G	G	23	G	40	25	41	35	35	28	G	E S	E S	E S	E S	E S	E S
4	E S	E S	E S	E S	E S	E S	E S	20	28	28	G	G	G	G	34	40	30	25	E S	E S	E S	E S	E S	C
5	E S	E S	E S	E S	E S	E S	E S	C	C	43	30	32	39	70	62	57	50	44	25	30	19	E S	E S	E S
6	E S	E S	E S	E S	E S	E S	E S	18	G	G	34	35	35	33	G	30	28	20	E S	E S	E S	E S	E S	E S
7	E S	E S	E S	E S	E S	E S	E S	18	G	31	32	33	33	39	31	41	54	44	40	27	E S	E S	E S	E S
8	E S	E S	E S	E S	E S	E S	E S	E S	25	32	G	G	32	32	32	30	24	18	E S	E S	E S	E S	E S	E S
9	E S	E S	E S	E S	E S	E S	E S	18	28	32	30	32	G	G	G	G	G	E S	E S	E S	E S	E S	E S	E S
10	E S	E S	E S	E S	E S	E S	E S	G	25	29	G	C	G	C	32	31	31	C	E S	E S	E S	E S	E S	E S
11	E S	E S	E S	E S	E S	E S	E S	E S	27	G	32	33	32	33	23	21	G	G	E S	E S	E S	E S	E S	E S
12	E S	E S	E S	E S	E S	E S	E S	G	G	G	G	34	33	G	36	41	24	25	33	E S	E S	E S	E S	17
13	E S	E S	E S	E S	E S	E S	E S	E S	G	31	34	32	32	G	G	G	24	G	E S	E S	E S	E S	E S	E S
14	E S	E S	E S	E S	E S	E S	E S	G	G	28	33	35	41	39	34	33	28	24	27	21	E S	E S	E S	E S
15	E S	E S	E S	E S	E S	E S	E S	E S	G	27	31	32	38	34	30	29	25	29	E S	E S	E S	E S	E S	E S
16	E S	E S	E S	E S	E S	E S	E S	E S	26	31	32	48	38	32	29	26	25	23	E S	E S	E S	E S	E S	E S
17	E S	E S	E S	E S	E S	E S	E S	E S	G	31	29	31	34	32	30	31	22	25	23	30	E S	E S	E S	E S
18	E S	E S	E S	E S	E S	E S	E S	E S	21	29	34	35	38	34	55	41	42	23	25	E S	E S	E S	E S	E S
19	E S	E S	E S	E S	E S	E S	E S	G	19	22	34	37	35	35	33	31	26	21	E S	E S	E S	E S	E S	E S
20	E S	E S	E S	E S	E S	E S	E S	E S	25	29	34	38	34	31	30	24	G	22	E S	E S	E S	E S	E S	E S
21	E S	E S	E S	E S	E S	E S	E S	G	24	27	33	42	31	25	24	22	25	E S	E S	E S	E S	E S	E S	E S
22	E S	E S	E S	E S	E S	E S	E S	G	G	30	33	35	43	32	32	39	26	G	E S	E S	E S	E S	E S	19
23	E S	E S	E S	E S	E S	E S	E S	E S	G	26	G	30	35	37	31	28	G	G	E S	E S	E S	E S	E S	E S
24	E S	E S	E S	E S	E S	E S	E S	E S	G	G	G	32	32	37	34	29	22	20	19	33	29	E S	E S	26
25	E S	E S	E S	E S	E S	E S	E S	E S	28	27	G	33	31	30	30	26	34	24	19	E S	E S	E S	E S	E S
26	E S	E S	E S	E S	E S	E S	E S	E S	25	29	31	36	33	30	G	G	G	G	E S	E S	E S	E S	E S	E S
27	E S	E S	E S	E S	E S	E S	E S	G	23	G	30	20	G	31	31	38	43	39	48	A A	A A	A A	A A	E S
28	E S	E S	E S	E S	E S	E S	E S	G	20	G	32	G	G	G	G	25	23	23	19	20	22	17	E S	E S
29	E S	E S	E S	E S	E S	E S	E S	E S	G	30	G	G	32	G	G	G	23	19	23	18	E S	E S	E S	E S
30	E S	E S	E S	E S	E S	E S	E S	E S	23	G	30	G	G	G	G	G	G	G	G	17	19	E S	E S	E S
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	30	30	30	29	29	30	30	29	30	29	30	30	30	29	30	30	30	30	30	29
MED	E S	E S	E S	E S	E S	E S	E S	E S	G	20	28	30	33	32	32	31	30	25	20	E S	E S	E S	E S	E S
UQ	E S	E S	E S	E S	E S	E S	E S	E S	25	30	33	35	35	34	34	39	30	24	23	21	E S	E S	E S	E S
LQ	E S	E S	E S	E S	E S	E S	E S	E S	G	G	G	G	G	G	G	G	G	G	G	E S	E S	E S	E S	E S

The Radio Research Laboratory, Japan

NOV. 1986

FBES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1986

FMIN (0.1 MHZ)

135° E Mean Time (G.M.T. + 9h)

Station	YAMAGAWA				Lat. 31° 12' N	Long. 130° 37' 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	E S	E S	E S	E S	E S	E S	E S	E S	15	15	16	17	18	17	16	15	E S	E S	E S	E S	E S	E S	E S	E S
2	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	15	16	17	17	16	15	15	E S	E S	E S	E S	E S	E S	E S	E S
3	E S	E S	E S	E S	E S	E S	E S	E S	16	15	16	17	17	18	16	16	E S	E S	E S	E S	E S	E S	E S	E S	E S
4	E S	E S	E S	E S	E S	E S	E S	E S	15	15	16	17	18	17	16	16	15	E S	E S	E S	E S	E S	E S	E S	C
5	E S	E S	E S	E S	E S	E S	E S	E S	C	C	15	16	16	17	18	16	16	15	E S	E S	E S	E S	E S	E S	E S
6	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	17	16	17	18	16	15	E S	E S	E S	E S	E S	E S	E S	E S
7	E S	E S	E S	E S	E S	E S	E S	E S	16	15	16	16	16	17	16	16	E S	E S	E S	E S	E S	E S	E S	E S	E S
8	E S	E S	E S	E S	E S	E S	E S	E S	16	15	16	16	16	15	16	16	16	E S	E S	E S	E S	E S	E S	E S	E S
9	E S	E S	E S	E S	E S	E S	E S	E S	16	15	16	16	16	16	15	15	E S	E S	E S	E S	E S	E S	E S	E S	E S
10	E S	E S	E S	E S	E S	E S	E S	E S	12	E S	14	C	16	C	14	16	14	C	E S	E S	E S	E S	E S	E S	E S
11	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	16	13	15	13	15	14	15	E S	E S	E S	E S	E S	E S	E S	E S
12	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	13	16	15	16	16	16	16	E S	E S	E S	E S	E S	E S	E S	E S
13	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	14	15	15	14	16	12	14	E S	E S	E S	E S	E S	E S	E S	E S
14	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	16	15	15	16	14	14	14	E S	E S	E S	E S	E S	E S	E S	E S
15	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	14	17	16	16	16	15	12	E S	E S	E S	E S	E S	E S	E S
16	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	14	15	15	14	15	14	E S	E S	E S	E S	E S	E S	E S	E S
17	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	15	15	16	15	12	E S	E S	E S	E S	E S	E S	E S	E S	E S
18	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	15	15	15	15	15	E S	E S	E S	E S	E S	E S	E S	E S	E S
19	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	15	15	15	13	15	E S	E S	E S	E S	E S	E S	E S	E S	E S
20	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	15	15	15	15	15	E S	E S	E S	E S	E S	E S	E S	E S	E S
21	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	15	15	15	14	15	E S	E S	E S	E S	E S	E S	E S	E S	E S
22	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	15	15	15	15	16	15	E S	E S	E S	E S	E S	E S	E S	E S	E S
23	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	15	16	15	15	15	E S	E S	E S	E S	E S	E S	E S	E S	E S
24	E S	E S	E S	E S	E S	E S	E S	E S	E S	12	14	16	15	14	15	15	E S	E S	E S	E S	E S	E S	E S	E S	E S
25	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	14	15	14	16	15	14	15	E S	E S	E S	E S	E S	E S	E S	E S
26	E S	E S	E S	E S	E S	E S	E S	E S	16	15	13	14	16	15	15	15	16	E S	E S	E S	E S	E S	E S	E S	E S
27	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	15	15	17	15	17	17	15	E S	E S	E S	E S	E S	E S	E S	E S
28	E S	E S	E S	E S	E S	E S	E S	E S	14	15	16	17	17	16	16	16	16	E S	E S	E S	E S	E S	E S	E S	E S
29	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	17	18	18	17	17	16	E S	E S	E S	E S	E S	E S	E S
30	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	15	16	18	18	17	17	16	E S	E S	E S	E S	E S	E S	E S	E S
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	29	30	30	30	29	29	30	30	29	30	29	30	30	30	29	30	30	30	30	30	29	29
MED	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	15	15	16	16	16	15	15	E S	E S	E S	E S	E S	E S	E S	E S
UQ	E S	E S	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	17	16	16	E S	E S	E S	E S	E S	E S	E S	E S	E S
LQ	E S	E S	E S	E S	E S	E S	E S	E S	E S	15	15	15	15	15	15	15	15	E S	E S	E S	E S	E S	E S	E S	E S

NOV. 1986

FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

NOV. 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 2sec in		automatic operation		
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	285	290	305	310 ^S	335 ^F	385	300 ^S	320	360	380	330	335	330	320 ^H	330	340	350	350	325	350	310	285	305	280
2	300	310	305	325	350	300	295	360 ^S	350	360	345 ^R	^S	325	315	335	360	375	370 ^H	305	305	295	300	310	335
3	325	320	325	340	375	365	290	335	335	325	325	335	340	320	330	370	355	380	320	295	315	330 ^S	355	295
4	290	325	335	340	370	380	305	365	355	305	305	340	295 ^{U R}	295 ^{U R}	340	350 ^H	300	355 ^{U R}	330	295	270 ^S	280	280	305 ^{I C}
5	330	355	310	285 ^{I C}	340	340	335	340 ^{I C}	345 ^{I C}	315	315 ^{U R}	330	310	315	330	345	340	350	325	315	285	315	330	305
6	310	305 ^{U S}	335	355	365	340	300	365	335 ^H	335	365	360	350	310	345	355	365	360	335	380	315	330	375	300
7	295	285	310	345	385	375	310	355	360	345	330	335	330	340	335	365	380	345	350	350	325	305	335	300
8	320	305	335	350	345	345	320	370	360	335	370	325	340	330	345	365	355	370	350	325	355	310	320	320
9	300	315	345	335	365	305	320	355	380	350	350	355	355	345	345	365	375	370	345	350	340	300	335	360
10	310	320	320	300	330	325	295	345	350	350	355	340 ^{I C}	370	330 ^{I C}	355	380	375	340 ^{I C}	335	335	340 ^S	310 ^S	340	320
11	310	320 ^S	340	320	340	355	295	345	350	345 ^S	345	370	355	340	345	350	370	360	335	315	335	310	300	285 ^S
12	285	335	335 ^S	305	330	300	305	370	350	345	335	360	360	335	315	355	350	360	340	285 ^H	310	320	325	305
13	305	320	305	315	335 ^S	305	305	340	360	360	355	330	330	325	330	335	360	350	365	310	305	325	340	295
14	295	295	305	320	350	340 ^F	320	360	375 ^R	325	355	345	345	325	345	375	360	345	345	340	340	355	320	300
15	290 ^F	^F	310	325	355	380	310	360	385	360	340	340	330 ^{U R}	310	335	315 ^H	355	345	335	365 ^{U S}	335	325	305	295
16	295	310	305	305	255 ^{U H}	325	280	335	345	340	355	355	300 ^{U H}	315 ^{U H}	325 ^{U H}	375	315	345 ^{U H}	335	310 ^S	345	390	315	315
17	275	265	275	285 ^F	325	^A	310	340 ^S	370	340	360	350	335	310 ^H	350	365	390	335	320	360	335	315	305	285
18	285	300	310 ^S	335 ^S	380	350	300	325	340	350	350	340	340	340	350	350 ^H	355	365	355	350	310 ^H	320 ^S	335	300
19	305	320	320 ^{U S}	335	365	355	320	340	360	350	335	^R	360	345	340	360	355	355	350	305	335	340	315	320
20	305 ^S	285	305	310	345	380	320	365	365	340	345	340	360	335	330	375	365	370	340	330	320 ^S	^S	345	310
21	305	320	315	315	325	370	315	365	370	340	350	370	355	360	330 ^H	350	360	355	370	365	285	335	345	310
22	320	320	305	340	365	350 ^F	340	350	350	340	345	345	345	340	355	375	360	345	340	310	335	310	^F	340
23	335 ^F	345	340	335 ^F	385	320	310	340	355	350	335	345	350	360	345	350	365	385	365	370 ^S	290	320	340	295
24	265	310	320	340	310	295	320	355	365	360	340	365	335	325	325	335	335	350	325	330	275	320	335	335
25	305	305	300	295	335	305	350	345	335	275	340	365 ^R	335	325	325	335	325	330	310	320	315	340	270	275 ^S
26	295 ^S	350	295	310	350	280	270	290	340	355	395 ^{U R}	325	335	315	355	315 ^{U R}	345	345	370	310	285	290	325	285
27	295	345	355	290	305	325	325	340	360	330 ^R	350	355	300	350	320 ^{U R}	370	375	345	^A	^A	^A	^A	315 ^S	310 ^F
28	330	340	320	335	300 ^F	275	285	345	365	340 ^H	360	370	365	310	350	370	365	355	340	320	345	325	300	290
29	325	290	310	320	320 ^F	310	295	335	390	375	360	355	360	345	375	385	300	365	320	350	285	320	355	345
30	315	295	285	300	295	275	330	335	345	335	335 ^R	290 ^R	380	360	380	360	365	355	340 ^H	300	305	330	340	290
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	30	30	29	30	30	30	30	30	28	30	30	30	30	30	30	29	29	29	28	29	30
MED	305	315	310	320	342	340	310	345	358	342	345	345	340	328	340	360	360	355	340	325	315	320	325	302
UQ	315	320	335	335	365	355	320	360	365	350	355	358	355	340	350	370	365	365	350	350	335	330	340	320
LQ	295	300	305	305	325	305	295	340	345	335	335	335	330	315	330	350	350	345	325	310	295	310	310	295

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M(3000)F2 (0.01)

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M(3000)F1 (0.01)

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

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									L	L	L	A	A	L	L	A									
2									L	L	390	385	380	385	395	L	A	A							
3											L	L	L	L	L	L									
4									L	L	355	375	L	L	L	A	L								
5									C	C	A	L	L	L	A	A	A	A	A						
6									L	L	L	L	L	L	U L 385	L	L	L							
7											L	L	U L 365	L	L	L	A	A	A						
8									L	L	L	390	U L 375	L	L	L	L								
9											L	L	L	L	U L 380	L	L								
10									L	L	U L 365	C	U L 370	C	U L 340	L	A	C							
11											L	U L 365	U L 370	410	370	L	U L 375	L							
12									L	U L 390	U L 395	L	390	425	L	A	L								
13											L	U L 380	365	L	390	395	405								
14											L	380	L	365	365	U L 370	L								
15									L	L	L	375	A	U L 390	400	L	L								
16											L	U L 360	A	L	365	L	L	L							
17									L	L	365	370	L	L	L	L	L								
18											L	L	L	A	375	A	A	A							
19									370		L	L	L	L	390	L	L								
20											L	L	L	L	L	L	L								
21									L	L	L	380	L	395	H 340	L									
22									445		L	L	L	A	375	365	A	L							
23									L	L	L	L	L	L	L	L	L	H 425							
24											L	L	U L 360	U L 370	L	L	L								
25											L	L	U L 360	U L 370	U L 370	L	L	A							
26											L	360	L	L	L	L	L								
27											L	365	U L 385	L	L	A	A								
28									L	360	L	U L 370	L	U L 405	U L 370	L									
29											L	U L 385	U L 380	390	360	L	L								
30									L	L	U L 380	U L 360	L	380	L	450	L	L							
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								1	1	3	11	16	8	17	9	3	1								
MED								370	445	390	L 365	372	U L 378	385	365	U L 375	425								
UQ										390	U L 380	380	388	390	395	390									
LQ										L 375	L 362	U L 365	U L 370	375	L 360	U L 372									

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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H^oF₂ (KM)

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

Station	YAMAGAWA				Lat. 31 12.1 N	Long. 130 37.1 E	Sweep 1 MHz to 25 MHz in 2.5 sec in automatic operation																	
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									240	230	265	250	260	265	260	240								
2								240	250	240	250	240	250	260	260	240	225							
3									240	270	250	250	275	255	235									
4									230	250	300	240	250	290	230	230	255							
5								C	C	255	290	255	265	E A 300	270	250	250	240						
6									225	250	245	240	250	260	260	245	225							
7									275	275	270	270	260	250	240									
8									225	275	245	265	270	280	250	245	230							
9									240	260	245	230	250	260	230									
10									245	240	245	I C 265	230	C	245	225	220	C						
11									250	265	235	235	270	255	240	220								
12									235	240	250	240	235	260	255	235	235							
13									235	245	275	235	245	260	235									
14									240	255	260	275	245	230	210									
15									210	245	240	265	230	300	250	230	225							
16									245	240	240	235	245	240	230	220								
17									230	260	240	255	250	255	245	245	215							
18									250	245	270	255	275	E A 260	240	E A 240								
19								240	255	255	240	245	250	280	235									
20									270	260	270	235	250	275	230	230								
21									210	255	250	245	240	250	260	235								
22									220	250	280	255	235	280	240	235	220							
23									230	250	255	255	240	245	250	240	240							
24									235	L 245	245	250	245	250	250									
25									285	250	235	255	L 255	255	250	245								
26									285	275	250	255	230	230	230	230								
27									235	255	235	260	235	235	230									
28									215	235	235	230	240	L 255	245	220								
29									215	235	235	235	245	230	225	230								
30									220	250	230	295	235	245	235	235	235							
31																								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	15	27	30	30	30	29	30	30	20	1						
MED								240	225	250	250	250	248	255	250	235	229	240						
UQ									232	255	265	265	255	272	260	240	236							
LQ									218	240	245	240	235	250	245	230	220							

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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 2sec in automatic operation																							
	Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23											
1	E S	305	E S	295	E S	260	245	S	235	S	195	E S	270	225	240	230	215	A	A	250	230	A	235	215	245	A	230	S	E S	220	E S	280	E S	270	E S	315
2	S	295	S	280	S	250	240	S	220	E S	250	E S	295	240	225	220	200	190	195	180	240	A	A	210	E A	240	S	235	S	255	E S	270	250	S	235	
3	E S	250	E S	250	240	230	210	230	E S	295	210	H	200	190	180	E A	240	230	E A	250	240	A	230	210	210	E S	260	E S	260	240	S	225	S			
4	S	E S	270	240	230	210	220	E S	270	210	215	H	180	H	200	H	205	180	A	A	A	A	230	210	E A	270	E A	290	E S	300	A	C				
5	235	215	E S	285	C	E S	300	E S	240	230	C	C	A	230	230	E A	240	A	A	A	A	A	A	A	235	E A	260	E A	270	E S	270	230	E S	270		
6	E S	275	E S	265	E S	250	225	205	E S	280	S	230	210	190	H	220	230	220	200	H	190	E A	240	E A	230	210	220	200	E S	280	E S	250	225	S	300	
7	S	E S	325	E S	300	E A	250	200	220	A	310	220	225	220	240	230	220	E A	250	215	A	A	A	A	250	230	220	E S	260	E S	260	E S	275			
8	E S	270	E S	280	E S	270	E S	250	205	245	E S	280	215	205	240	180	200	190	200	240	225	225	210	215	205	210	E S	270	E S	270	E S	260				
9	S	E S	270	E S	250	240	210	E S	280	E S	270	225	230	215	210	215	190	H	190	H	H	H	220	200	220	220	245	220	240	S	230					
10	E S	300	270	245	E S	275	245	195	E S	305	230	195	205	220	I C	200	190	H	C	225	225	A	I C	210	215	230	240	240	225	E S	255					
11	E S	255	255	245	250	245	210	E S	320	170	H	240	240	210	H	230	200	210	195	H	200	H	195	220	235	230	205	E S	270	E S	275	E S	295			
12	E S	290	250	210	255	250	E S	270	270	225	225	200	195	240	200	190	H	E A	250	A	225	230	230	A	E A	225	255	240	250	E A	280					
13	280	270	270	270	245	E S	245	250	235	225	225	220	210	190	195	190	195	230	200	200	245	E A	260	245	245	E S	255									
14	E S	310	E S	300	E S	295	255	220	235	E S	255	225	215	210	220	210	A	A	255	240	A	230	A	205	225	A	E S	240	225	E S	275	E S	275			
15	E S	335	325	E A	E A	280	225	200	E S	300	220	195	180	190	190	A	H	185	190	210	225	210	210	220	A	E A	240	245	E S	245	E S	285				
16	E S	300	E S	270	E S	285	E S	215	E S	230	E S	315	235	240	235	220	A	E A	230	H	200	245	235	220	215	200	245	220	205	E S	275	E S	270			
17	E S	285	E S	260	E S	295	E S	280	220	S	A	E S	290	235	205	225	190	190	225	220	205	225	230	210	215	245	E S	250	E S	265	E S	275	E S	295		
18	E S	305	E S	290	E S	270	245	205	S	S	240	240	235	230	240	A	E A	250	A	A	A	A	205	E A	215	E S	255	E S	265	E S	270	E S	300			
19	E S	280	E S	265	E S	265	250	220	E S	210	E S	290	E S	205	230	235	230	235	A	230	205	230	230	210	215	E A	245	E S	220	E S	245	E S	280			
20	E S	290	E S	300	E S	295	255	230	E S	205	E S	240	205	225	200	215	E A	250	240	200	195	245	230	200	205	E S	250	E A	240	E S	290	E S	245	E S	260	
21	E S	285	E S	285	E S	250	E S	270	E S	265	220	E S	260	220	210	210	215	200	205	180	185	230	225	205	205	E S	210	E S	275	250	S	205	E S	250		
22	E S	270	E S	295	E S	270	240	215	E S	230	E S	245	205	200	230	A	235	A	190	195	H	A	215	205	220	S	E S	235	E S	260	E S	265	240	S	E A	245
23	E S	240	E S	255	E S	255	240	205	E S	270	E S	275	230	225	225	235	210	230	E A	230	210	205	205	210	200	200	E S	280	E S	270	E S	210	E S	270		
24	E S	320	275	A	250	270	270	E S	245	250	220	220	225	210	220	205	230	A	A	245	245	205	240	E A	290	E A	350	255	255	245						
25	S	250	E S	255	E S	295	E S	290	245	E S	285	E S	245	H	240	235	245	220	205	205	220	230	A	220	235	245	230	230	E S	300	E S	305				
26	305	230	225	E S	270	220	340	E S	325	E S	270	250	H	220	220	245	220	205	225	220	205	220	200	200	E S	255	E S	285	E S	245	E S	300				
27	E S	290	225	225	E S	290	E S	275	E S	245	E S	260	235	220	195	H	205	205	200	210	A	A	215	E A	255	A	A	A	A	A	A	A	A	E S	285	
28	265	235	245	260	290	270	235	230	215	200	215	170	180	185	180	H	185	H	H	H	225	220	205	205	255	220	E A	240	E S	255	E S	305				
29	255	E S	270	E S	275	245	E S	270	E S	250	E S	290	240	215	220	H	205	H	180	220	195	195	185	H	230	210	A	225	E S	255	E S	275	220	235		
30	E S	270	E S	300	E S	300	E S	290	E S	290	E S	300	235	240	210	195	H	210	H	H	H	200	200	205	195	225	190	E S	275	240	215	220	E S	320		
31																																				
CNT	27	30	30	29	30	28	28	29	29	29	29	28	24	28	26	20	22	28	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28		
MED	E S	285	E S	270	E S	262	U S	242	220	E S	242	E S	270	225	220	220	215	211	204	199	206	225	225	210	215	U	215	E S	245	E S	255	E S	275			
UQ	E S	300	E S	290	E S	285	E S	270	242	E S	270	E S	295	235	230	230	220	231	221	U	219	230	230	230	216	228	E A	245	E S	260	E S	270	E S	270	E S	298
LQ	E S	268	E S	255	235	242	S	210	U	209	E S	250	215	210	200	205	200	192	190	195	205	215	205	205	220	220	232	225	E S	255						

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H*F (KM)

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H^oE (KM)

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

Station YAMAGAWA Lat. 31 12.1 N Long. 130 37.1 E Sweep 1 MHz to 25 MHz in 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	105	105	A	A	A	A	A	A	S						
2								S	A	110	A	110	105	H	A	A	105	A	A					
3								E S	A	115	110	110	110	110	110	110	115			S				
4								E S		115	110	110	110	115	110	110	110	110		S				
5								C	C	110	110	110	110	110	110	110	115		S					
6								S		115	110	110	110	105	105	105	110	115		S				
7								E S	A	110	105	105	105	105	105	110	115		S					
8								S		115	105	105	100	110	A	A	115	115		S				
9								S		115	A	A	A	105	H	110	105	110	115		S			
10								S		105	A	A	I C	105	I C	115	110	110	115		C			
11								S		110	110	105	105	110	A	A	A	A		S				
12								S		110	105	105	110	105	105	110	110	115		S				
13								S	A	105	115	110	E A	E A	125	130	110	110	A	S				
14								S		115	115	105	105	105	110	110	110	A	S					
15								S		115	A	105	105	115	115	115	115	115		S				
16								S		115	110	105	110	110	110	110	A	110		S				
17								S		115	110	110	110	105	110	110	110	A	A					
18								S	A	110	A	A	A	A	A	A	105	A	A					
19								S	A	A	A	A	A	A	A	A	A	A	S					
20								S	A	110	105	105	H	105	A	A	A	A	S					
21								S	A	A	A	A	A	A	A	A	A	A	S					
22								S		115	110	105	105	105	105	110	110	120		S				
23								S	A	A	A	A	A	A	A	A	110	A	S					
24								S		115	105	105	105	105	105	A	A	A	S					
25								S		105	105	105	105	A	A	A	A	A	S					
26								A	E S	120	105	105	110	105	105	A	105	110		S				
27								S	E S	120	105	110	110	105	105	A	A	A	S					
28								S	A	110	110	110	E A	A	A	115	A	A	S					
29								S		120	115	115	115	110	115	110	E G	E A	S					
30								S	A	115	E A	125	105	115	115	115	115	E A	S					
31																								
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							3	18	23	23	24	24	21	18	20	15								
MED							E S	115	110	105	110	106	110	110	110	115								
UQ							E S	115	110	110	110	110	115	110	110	115								
LQ							E S	115	105	105	105	105	105	105	110	110	115							

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H^oE (KM)

IONOSPHERIC DATA

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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 2sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	S	S	S	S	S	115	140	150	150	130	130	G	190	100	105	G	110	105	110	110	100	100
2	S	S	S	S	S	S	S	160	150	115	120	140	135	130	160	130	130	100	100	110	100	S	S	S
3	S	S	S	S	S	S	S	G	G	125	G	140	160	125	120	120	120	150	105	100	110	S	S	S
4	S	S	S	S	S	S	S	130	125	110	G	125	G	G	165	130	110	110	115	105	100	100	100	C
5	100	S	S	C	155	150	S	C	C	120	125	120	115	110	110	110	125	120	110	105	100	110	100	105
6	100	100	100	105	100	100	100	150	G	G	150	140	130	140	G	160	140	170	S	S	100	105	110	S
7	S	S	100	100	100	105	S	175	G	160	150	130	130	140	130	120	110	105	100	100	110	100	105	S
8	100	S	S	S	S	S	S	S	160	130	G	G	130	100	100	125	120	125	115	S	115	105	100	100
9	115	105	S	100	S	S	S	125	120	105	105	105	G	G	G	G	G	S	S	S	S	S	S	S
10	105	S	S	S	S	S	105	105	105	155	165	C	105	C	175	135	120	C	95	130	S	S	S	S
11	S	S	S	100	100	S	S	S	180	160	185	155	155	165	105	100	E G 145	95	95	100	S	105	145	130
12	S	S	S	S	S	S	S	105	140	135	G	185	150	120	160	135	120	110	110	105	S	105	105	100
13	S	105	S	S	S	125	S	S	160	160	135	135	125	135	E G 140	100	95	105	100	120	95	100	S	S
14	S	S	S	S	110	105	115	105	E G 150	145	125	120	115	110	110	110	110	105	105	105	100	100	105	105
15	105	105	105	100	100	S	S	S	G	110	110	105	115	115	125	125	110	110	110	105	110	S	S	105
16	95	S	S	S	S	120	S	S	155	140	140	120	120	110	120	110	125	110	115	S	S	S	S	105
17	S	S	S	S	100	100	100	95	G	120	110	115	105	120	115	150	105	100	100	100	100	S	S	S
18	S	S	S	S	S	S	S	110	115	170	170	150	130	105	115	115	110	105	100	S	S	S	S	S
19	S	S	S	S	S	S	110	G	105	105	165	145	145	155	150	155	175	150	100	130	S	S	105	105
20	S	S	S	S	S	S	S	G	165	170	150	120	140	135	130	105	165	170	105	130	110	105	110	100
21	S	S	S	S	110	S	S	G	170	135	145	120	175	100	100	100	145	100	S	S	S	S	S	S
22	S	S	S	S	S	S	S	G	G	170	160	130	120	135	165	125	130	G	110	110	S	100	95	105
23	S	100	100	100	105	S	105	105	170	105	145	105	115	105	100	120	100	G	C	S	110	S	S	105
24	115	105	105	105	105	115	S	S	G	125	125	110	110	105	105	105	105	160	145	135	120	105	100	100
25	100	100	105	105	105	105	105	S	115	110	110	110	105	110	105	105	95	95	95	S	95	140	130	110
26	110	105	105	110	110	S	145	130	130	125	120	120	120	120	105	100	100	105	105	100	100	100	S	135
27	100	S	S	S	105	105	S	135	160	G	115	105	115	115	105	105	105	105	100	100	95	95	100	105
28	100	100	100	95	95	95	95	95	100	G	175	105	105	105	105	105	100	100	100	95	95	95	95	95
29	S	S	S	S	S	S	S	S	G	165	G	G	180	G	G	105	105	100	105	105	105	S	S	S
30	S	S	100	105	105	100	105	145	145	110	140	G	105	150	105	100	100	105	95	95	100	100	S	S
31																								
CNT	12	9	9	11	15	12	10	16	21	27	25	26	28	25	27	29	29	25	26	22	21	18	16	17
MED	100	105	100	100	105	105	105	112	142	130	140	120	122	120	115	110	110	105	105	105	100	102	102	105
UQ	108	105	105	105	108	118	110	138	160	158	150	140	138	135	145	125	125	120	110	110	110	105	108	105
LQ	100	100	100	100	100	100	100	105	120	112	120	110	115	110	105	105	105	100	100	100	100	100	100	100

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H°ES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

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TYPES OF ES

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

Station		YAMAGAWA							Lat. 31 12.1 N			Long. 130 37.1 E			Sweep 1 MHz to 25 MHz in 2 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 1	CHL 12	HC 11	H 1	HL 31	HL 21		HL 11	L 4	L 3		FFF 23	F 5	F 2	F 1	F 2	F 1	
2									H 2	HL 13	C 2	L 1	H 1	L 1	HL 11	HCL 21	H 2	HL 33	LH 31	F 4	FF 32	F 1				
3										CL 22		HC 31	H 3	C 2	CL 22	C 3	C 2	H 2	F 1	F 3	F 2					
4									C 5	C 5	C 3		C 1			H 1	H 4	C 3	C 6	F 2	F 4	F 2	F 5	F 5		
5		F 3				F 1	F 3			C 5	C 1	C 2	C 2	C 6	C 6	C 6	C 6	C 7	F 5	F 6	F 7	F 3	F 3	F 2		
6		F 3	F 2	F 3	F 3	F 1	F 2	F 3	HL 31			H 2	H 1	H 2	H 1		H 1	H 3	H 3			F 2	F 2	F 1		
7				F 2	F 4	F 3	F 3		H 4		H 2	H 2	H 2	H 1	H 2	H 1	C 4	C 3	C 7	F 8	F 6	F 2	F 2	F 1		
8		F 2								H 2	H 2			H 1	L 2	L 3	C 2	C 3	C 2	F 1		F 1	F 4	F 2	F 3	
9		F 2	F 2		F 2				C 3	C 4	L 2	L 2	L 2													
10		F 1					F 1	LC 11		C 5	HL 23	HL 32		L 2		H 1	H 2	C 4		F 2	F 1					
11					F 2	F 2				H 1	H 2	HC 11	HC 21	HL 12	HL 13	L 2	L 3	HL 11	L 1	F 2	F 1		F 1	F 1	F 1	
12									L 1	H 1	H 2		HL 22	H 2	C 1	HL 31	HL 51	L 3	LL 61	F 3	F 2		F 1	F 1	F 3	
13			F 1				F 1			HL 23	HL 21	HL 32	HL 12	CL 22	HL 11	HL 12	L 1	L 4	L 1	F 1	FF 31	F 2	F 1			
14					F 1	F 2	F 1	L 1	H 2	HC 11	C 3	C 3	C 3	C 3	CL 41	C 4	C 5	L 7	F 7	F 6	F 3	F 1	F 2	F 2		
15		F 4	F 5	F 5	F 3	F 2				C 4	C 4	C 2	CL 31	CL 21	CL 21	C 2	C 3	L 7	FF 12	F 4	F 2			F 1		
16		F 3					F 1			H 2	H 3	HC 21	C 4	C 5	C 2	CH 21	LH 11	C 2	L 4	F 1				F 1		
17					F 3	F 6	F 2	L 2		C 2	C 3	C 1	LHC 11	C 1	C 2	HC 13	L 3	L 5	F 7	F 8	F 2					
18								L 1	L 1	H 2	HL 23	HL 23	CL 13	L 3	CL 64	C 5	CL 52	L 6	F 4							
19							F 1			L 2	L 3	HL 22	HL 32	HL 22	HL 22	HL 13	HL 23	HL 22	HL 41	F 2	FF 62			F 3	F 2	
20										HL 23	H 2	H 2	C 3	H 1	HL 12	HL 22	L 3	HL 12	HL 22	F 2	F 6	F 3	F 5	FF 22	F 2	
21					F 1					HCL 23	HL 22	HL 22	CL 22	HL 22	L 2	L 3	L 5	HL 33	LH 14							
22											HH 22	H 2	C 2	C 3	H 1	H 1	C 4	C 2		F 1	F 2		F 2	F 2	H 2	
23			F 3	F 3	F 2	F 1		F 2	L 3	HL 24	LH 32	HL 23	LH 21	CL 22	L 3	L 3	H 1	L 1				F 3			F 2	
24		FF 22	F 3	F 3	F 3	F 2	F 1			C 1	C 1	C 2	C 2	C 3	L 3	L 3	LH 32	HL 31	FF 32	FF 62	FF 71	FF 23	F 5	F 4		
25		F 2	F 1	F 2	F 1	F 2	F 2			C 4	C 1	C 1	C 2	L 2	L 2	L 2	L 2	L 5	L 5	F 4		F 1	F 1	F 2	F 3	
26		F 6	F 4	F 2	F 2	F 1		F 4	L 6	C 3	C 3	C 2	CL 31	C 2	C 1	L 2	L 1	L 1	L 1	F 1	F 1	F 1	F 1		F 1	
27		F 1				F 1	F 1		L 2	H 3		CL 21	L 1	C 1	C 1	L 4	L 5	L 6	L 6	F 4	F 5	F 5	F 4	F 2	F 2	
28		F 2	F 2	F 1	F 2	F 2	F 2	L 2		L 1		HCL 21	L 1	L 1	L 1	L 1	LH 11	L 2	L 3	F 3	F 4	F 4	F 3	F 2	F 1	
29										H 2					H 1			L 1	L 1	L 2	F 3	F 2	F 1			
30				F 2	F 1	F 2	F 2	F 2	H 1	HL 22	L 1	HL 12		L 1	HL 11	L 1	L 2	L 2	L 1	F 2	F 3	F 1	F 1			
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																										
MED																										
UQ																										
LQ																										

The Radio Research Laboratory, Japan

NOV. 1986

TYPES OF ES

IONOSPHERIC DATA

NOV. 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 36	X 37	X 38	X 42	X 47	X 33	X 28											X 34	X 84	X 64	X 70	X 57	X 46	
2	X 47	X 50	X 50	X 49	X 41	X 24	X 28											X 66	X 62	X 52	X 48	X 48	X 46	
3	X 40	X 40	X 42	X 38	X 40	X 24	X 25											X 62	X 54	X 57	X 60	X 51	X 40	
4	X 39	X 41	X 44	X 43	X 33	X 28	X 28											X 71	X 72	X 73	X 61	X 66	X 67	
5	X 83	X 50	X 43	X 42	X 47	X 63	X 48											X 67	X 61	X 54	X 52	U 54	U 44	
6	X 42	X 43	X 45	X 37	X 26	X 27	X 26											X 59	X 48	X 40	X 43	X 46	X 34	
7	X 33	X 34	X 37	X 41	X 41	X 24	X 24											X 84	X 68	X 61	X 44	X 40	X 40	
8	X 38	X 37	X 41	X 45	X 33	X 25	X 28											X 73	X 61	X 45	X 42	X 35	X 34	
9	X 35	X 36	X 38	X 41	X 34	X 28	X 28											X 56	X 49	X 55	X 56	X 41	X 34	
10	X 36	X 34	X 36	X 36	X 38	X 27	X 26											X 64	X 69	X 60	X 62	X 52	X 36	
11	X 33	X 35	X 34	X 33	X 38	X 25	X 24											X 61	X 68	X 66	X 42	X 37	X 37	
12	X 37	X 38	X 44	X 30	X 33	X 31	X 33											X 75	X 57	X 46	X 44	X 38	X 37	
13	X 37	X 37	X 38	X 35	X 38	X 32	X 28											X 60	X 50	X 48	X 50	X 46	X 43	
14	X 36	X 37	X 36	X 39	X 42	X 36	X 24											X 66	X 60	X 46	X 48	X 39	X 39	
15	X 37	U 40	X 41	X 42	X 47	X 28	A											X 68	X 64	X 51	X 50	X 45	X 44	
16	U 41	X 46	X 44	U 51	X 61	X 26	X 28											X 61	X 48	X 49	X 52	X 41	X 37	
17	X 34	X 37	X 35	X 36	X 46	X 24	S											X 72	X 63	X 60	X 48	X 45	X 40	
18	X 39	X 39	X 40	X 48	X 48	X 24	X 23											X 54	X 47	X 49	X 36	X 31	X 32	
19	X 36	A	X 36	X 35	X 43	X 24	X 25											X 57	A	X 44	X 44	A	X 33	
20	X 32	X 32	X 32	X 32	X 34	X 38	X 24											X 66	X 61	X 46	X 35	X 34	X 35	
21	X 34	X 35	X 36	X 38	X 39	X 34	X 33											X 60	X 63	X 52	X 44	X 46	X 38	
22	X 37	X 35	X 36	X 40	X 47	X 28	X 24											X 54	X 50	U 46	X 47	X 48	U 47	
23	X 44	X 43	X 45	X 37	X 29	U 27	U 27											X 73	X 57	X 47	X 46	X 50	X 44	
24	X 41	X 44	X 46	X 44	X 40	X 39	X 37											X 71	X 72	X 64	X 56	X 47	X 39	
25	X 32	X 36	X 36	X 33	X 34	X 27	X 30											X 80	X 67	X 57	X 54	X 46	X 48	
26	X 50	X 64	X 33	X 28	X 31	X 28	X 27											X 88	X 46	X 41	X 39	X 44	X 41	
27	X 31	X 38	X 34	X 29	X 30	X 31	X 27											X 58	X 56	X 41	X 45	X 48	X 43	
28	X 43	X 40	X 41	X 36	X 35	X 33	X 31											X 66	X 47	X 61	X 39	X 34	X 31	
29	X 34	X 35	X 37	X 36	X 34	X 33	X 33											X 52	X 56	X 46	X 46	X 53	X 45	
30	X 36	X 36	X 38	X 39	X 41	X 45	X 45											X 89	U 72	X 71	X 75	X 49	X 50	
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	30	30	30	28											30	29	30	30	29	30	
MED	X 37	X 37	X 38	X 38	X 38	X 28	X 28											X 66	X 61	X 52	X 48	X 46	X 40	
UQ	X 41	X 41	X 43	X 42	X 43	X 33	X 30											X 73	X 67	X 60	X 54	X 49	X 44	
LQ	X 34	X 36	X 36	X 35	X 34	X 25	X 25											X 60	X 50	X 46	X 44	X 40	X 36	

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FXI (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

NOV. 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	30	31	32	36	41	27	22	54	70	79	94	122	134	150	153	118	105	102	78	78	53	64	51	40	
2	41	44	44	43	35	18	22	54	82	94	106	110	127	151	150	125	106	86	60	56	46	42	42	40	
3	34	34	36	32	34	18	19	46	69	78	109	139	145	134	125	103	89	73	56	48	51	54	45	34	
4	33	35	38	37	27	22	22	52	63	63	104	160	130	139	131	92	78	111	65	66	67	55	60	61	
5	F 72	S 44	S 37	S 36	41	S 57	S 42	55	61	C	R 96	R 114	91	98	103	95	79	72	61	55	S 48	S 46	S 48	S 38	
6	36	37	39	31	20	F	20	48	64	70	92	92	82	82	91	95	78	62	53	42	34	37	40	28	
7	27	28	S 31	S 35	35	F	S 18	47	54	57	73	93	110	132	140	130	127	U 102	R 78	62	45	38	34	34	
8	S 32	31	35	39	27	19	22	43	60	63	82	93	90	94	U 120	R 118	35	R 85	67	55	39	36	29	28	
9	29	30	S 32	S 35	28	22	22	48	62	62	80	106	95	R 92	94	102	R 39	R 73	50	U 43	S 49	S 50	35	28	
10	30	28	30	30	32	21	20	42	70	73	74	J 99	R 117	R 120	R 118	114	71	58	58	S 63	54	56	46	30	
11	27	29	28	27	32	19	18	39	55	62	80	80	68	68	83	80	65	56	55	62	60	36	31	31	
12	31	32	38	S 24	F	F	27	44	62	70	81	90	87	70	71	76	34	54	69	51	40	38	32	31	
13	31	31	32	29	32	26	22	47	66	67	R 92	R 113	R 114	134	131	135	102	78	54	S 44	S 42	44	40	37	
14	30	31	30	33	36	F	18	48	62	64	75	R 91	R 120	R 146	R 136	U 120	86	64	60	54	40	42	33	F	
15	S 31	U 34	S 35	F	S 41	22	A	42	60	65	90	104	122	U 130	R 118	109	102	R 83	62	58	45	44	39	38	
16	35	40	38	45	55	20	22	38	70	89	105	109	105	106	121	92	65	58	55	U 42	S 43	S 46	35	31	
17	28	S 31	S 29	30	U 40	S 18	S	40	63	86	96	101	R 102	R 119	134	R 105	R 94	73	66	57	54	42	39	34	
18	33	33	34	42	42	18	17	37	59	87	95	U 101	R 116	112	R 128	111	62	56	48	41	43	30	25	26	
19	30	A	30	29	37	S 18	19	41	58	67	90	107	123	124	104	105	81	60	51	A	33	38	A	27	
20	26	26	26	26	28	32	18	41	55	64	R 72	82	90	103	110	U 120	86	71	60	55	40	S 29	28	29	
21	28	29	30	32	33	28	27	47	53	59	69	79	69	82	94	117	95	U 74	R 54	57	46	38	40	32	
22	31	S 29	S 30	34	S 41	22	S 18	39	54	70	81	R 86	100	R 113	109	89	69	R 57	48	S 44	S 40	41	F 38	41	
23	S 38	F	F 36	F 28	U 23	S 21	U 21	40	57	63	77	R 98	103	110	R 104	R 110	R 105	R 88	67	51	S 41	40	44	S 38	
24	S 35	38	40	38	34	F	31	48	67	61	76	75	79	90	94	R 105	116	88	65	S 66	58	S 50	41	33	
25	26	30	30	27	S 28	21	24	S 40	56	73	U 98	R 88	71	80	86	95	94	91	S 74	61	51	48	40	S 42	
26	S 44	F	27	22	25	S 22	21	45	88	116	73	90	111	98	110	95	74	89	82	40	35	S 33	38	35	
27	25	32	28	23	24	S 25	21	42	65	90	88	85	77	89	82	80	I 72	C 64	52	50	35	39	42	37	
28	37	34	35	S 30	29	27	25	R 45	68	80	70	75	U 84	R 70	78	R 87	77	U 79	R 60	S 41	55	S 33	28	25	
29	28	29	31	30	28	27	27	45	71	R 66	63	72	84	75	U 71	61	71	71	46	50	S 40	S 40	47	S 39	
30	30	30	S 32	S 33	35	F	F	R 50	66	72	R 91	70	R 98	88	80	77	R 70	R 94	R 83	U 66	S 65	S 69	43	U 44	
31																									
CNT	30	27	30	29	29	24	27	30	30	29	30	30	30	30	30	30	30	30	30	29	30	30	29	29	
MED	31	31	32	32	33	22	22	45	62	70	85	93	101	104	110	104	84	76	60	55	45	42	40	34	
UQ	35	34	36	36	37	26	23	48	68	79	95	107	117	R 130	128	117	95	88	67	61	54	S 48	43	S 38	
LQ	28	30	30	29	28	19	19	41	58	63	75	85	84	88	91	92	72	62	54	44	40	38	34	30	

The Radio Research Laboratory, Japan

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FOF2 (0.1 MHz)

IONOSPHERIC DATA

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

NOV. 1986

FOF1 (0.01 MHz)

IONOSPHERIC DATA

NOV. 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	R ¹ 240	R ¹ 285	R ¹ 315	R ¹ 325	330	335	A ¹	300	R ¹ 270	R ¹ 210								
2								S	R ¹ 245	A ¹	A ¹	A ¹	R ¹ 335	R ¹ 335	R ¹ 320	A ¹	U A ¹ 270	R ¹ 190								
3								R ¹ 180	255	270	300	U A ¹ 320	R ¹ 340	A ¹	R ¹ 320	R ¹ 300	R ¹ 260	R ¹ 195								
4								S	245	295	305	320	325	325	315	290	255	180								
5								S	R ¹ 245	C ¹	300	R ¹ 320	A ¹	A ¹	305	275	R ¹ 250	R ¹ 190								
6								S	220	260	300	310	320	320	305	280	240	190								
7								S	225	270	305	310	A ¹	A ¹	305	R ¹ 280	A ¹	A ¹								
8								R ¹ 180	230	280	U A ¹ 300	A ¹	320	A ¹	310	A ¹	A ¹	200								
9								S	220	A ¹	A ¹	A ¹	A ¹	A ¹	305	280	250	200								
10								S	U A ¹ 230	U A ¹ 280	300	R ¹ 305	R ¹ 320	R ¹ 320	300	280	240	S ¹								
11								S	R ¹ 220	R ¹ 270	J R ¹ 300	A ¹	U A ¹ 320	A ¹	A ¹	A ¹	A ¹	A ¹								
12								S	230	A ¹	U R ¹ 280	U A ¹ 300	U A ¹ 315	R ¹ 300	R ¹ 290	280	240	180								
13								S	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	250	195								
14								S	230	280	300	A ¹	R ¹ 320	A ¹	A ¹	R ¹ 280	245	S ¹								
15								S	R ¹ 225	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	R ¹ 300	A ¹	A ¹	S ¹							
16								S	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	S ¹							
17								S	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	250	S ¹							
18								S	A ¹	275	300	U A ¹ 310	U A ¹ 315	A ¹	300	280	A ¹	A ¹	S ¹							
19								S	230	280	295	U A ¹ 310	315	310	305	A ¹	A ¹	A ¹	S ¹							
20								S	230	270	295	305	320	U A ¹ 310	300	280	R ¹	A ¹	S ¹							
21								S	A ¹	R ¹ 270	R ¹ 300	A ¹	A ¹	A ¹	300	280	240	S ¹								
22								S	210	R ¹ 275	285	300	R ¹ 305	R ¹ 310	R ¹ 310	A ¹	U R ¹ 245	A ¹								
23								A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	175								
24								S	A ¹	255	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹								
25								S	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	195							
26								S	215	270	A ¹	A ¹	A ¹	A ¹	A ¹	A ¹	250	A ¹								
27								S	230	270	U A ¹ 290	305	A ¹	A ¹	A ¹	A ¹	A ¹	C ¹	A ¹							
28								S	225	A ¹	295	300	310	305	305	A ¹	A ¹	A ¹								
29								S	220	270	295	300	A ¹	A ¹	300	280	250	195								
30								S	210	265	U A ¹ 290	300	A ¹	310	A ¹	280	250	S ¹								
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT								2	22	19	20	16	15	12	18	15	17	13								
MED								180	230	270	300	308	320	315	305	280	250	195								
UQ								230	280	300	315	322	322	310	280	250	195									
LQ								220	270	295	300	315	310	300	280	245	190									

NOV. 1986

FOE (0.01 MHz)

IONOSPHERIC DATA

NOV. 1986

FOES (0.1 MHz)

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

Station	OKINAWA							Lat. 26 16.9 N	Long. 127 48.4 E	Sweep 1 MHz to 25 MHz in 2sec in automatic operation														
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A 32	E S 23	E S 16	E S 16	E S 16	E S 16	E S 16	J A 24	33	39	40	43	43	G	J A 39	G	34	J A 37	J A 32	J A 32	22	22	J A 22	E S 16
2	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 15	21	29	J A 40	J A 33	J A 34	G	G	G	J A 32	29	23	J A 27	J A 24	E S 16	E S 15	E S 16	E S 16
3	E S 15	E S 16	E S 16	E S 16	E S 15	E S 15	E S 16	22	28	30	G	38	37	J A 37	38	33	32	26	J A 25	J A 48	23	22	E S 16	E S 16
4	E S 16	E S 16	E S 15	E S 15	E S 16	E S 15	E S 16	J A 20	29	37	38	37	39	38	G	38	J A 42	28	J A 37	J A 84	J A 33	J A 22	E S 16	E S 16
5	J A 21	21	20	23	22	22	E S 16	17	G	C	J A 58	J A 55	J A 73	J A 51	G	J A 52	J A 38	J A 47	J A 42	J A 36	J A 88	J A 66	J A 64	J A 33
6	22	22	21	22	22	22	22	J A 22	28	30	33	33	35	38	38	32	25	23	20	21	20	J A 21	J A 31	22
7	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	J A 30	32	40	39	35	J A 50	J A 42	J A 61	J A 52	J A 37	J A 30	J A 26	J A 25	E S 16	E S 16	E S 16
8	22	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	32	36	32	G	J A 32	G	28	J A 30	G	J A 20	E S 16	E S 16	E S 16	E S 16	20
9	J A 21	E S 16	J A 25	21	E S 16	E S 16	E S 16	19	25	J A 32	32	J A 35	J A 34	J A 34	J A 35	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
10	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	30	38	36	G	G	G	G	J A 33	31	23	J A 25	J A 21	J A 24	J A 25	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	G	G	J A 38	J A 42	J A 49	38	J A 44	J A 42	J A 30	22	J A 21	E S 16	E S 16	E S 16	E S 16	E S 16
12	J A 20	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	G	37	38	34	40	43	36	32	J A 36	J A 22	J A 32	E S 16	E S 16	J A 22
13	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	26	28	33	33	J A 33	J A 40	J A 34	J A 30	G	G	J A 47	J A 24	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	G	G	33	J A 35	38	38	36	32	30	J A 27	J A 25	22	E S 16	E S 16	E S 16	E S 16
15	22	21	20	J A 20	E S 16	21	J A 26	E S 16	30	J A 34	35	J A 40	J A 42	J A 87	J A 56	J A 41	30	J A 26	J A 77	J A 32	J A 24	J A 20	J A 20	20
16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	J A 30	J A 34	39	40	J A 46	J A 41	J A 64	J A 65	J A 60	J A 50	J A 38	J A 30	23	22	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	D S 20	J A 18	J A 26	32	31	36	37	36	32	J A 34	32	J A 26	J A 33	J A 25	J A 21	22	E S 16	E S 16
18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	J A 41	G	G	37	43	J A 44	J A 54	J A 46	J A 76	J A 50	J A 67	J A 42	J A 24	E S 16	E S 16	E S 16
19	E S 16	J A 43	E S 16	E S 16	J A 21	E S 16	E S 16	E S 16	G	J A 33	G	38	38	40	39	J A 44	J A 53	J A 64	J A 54	J A 54	20	E S 16	J A 42	E S 16
20	E S 16	E S 16	E S 15	E S 16	E S 16	J A 20	E S 16	E S 16	G	G	37	42	J A 44	40	J A 43	G	32	J A 22	E S 16	J A 17	E S 16	J A 20	J A 17	22
21	23	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	J A 30	G	37	J A 36	37	J A 33	G	G	J A 30	E S 16	J A 17	E S 16	E S 16	E S 16	E S 16	E S 16
22	E S 16	E S 15	E S 15	E S 16	E S 15	E S 15	E S 16	E S 16	24	33	36	J A 45	J A 44	41	36	J A 42	J A 41	J A 27	J A 26	J A 27	J A 34	J A 21	E S 16	E S 16
23	E S 16	J A 22	J A 26	J A 22	E S 16	E S 15	E S 16	22	J A 26	J A 36	J A 32	J A 50	J A 53	J A 36	J A 32	J A 38	J A 27	G	J A 18	E S 16	23	21	E S 16	E S 16
24	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	E S 15	J A 17	J A 27	34	J A 46	J A 48	J A 43	J A 44	J A 42	J A 32	J A 41	J A 43	J A 40	J A 32	23	J A 33	E S 16	E S 16
25	E S 16	J A 26	E S 16	E S 16	E S 15	E S 16	E S 16	17	J A 30	J A 41	J A 76	J A 43	J A 37	J A 42	J A 42	J A 34	J A 75	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
26	E S 16	J A 25	J A 19	20	E S 16	E S 16	E S 16	J A 25	J A 32	J A 42	J A 36	J A 78	J A 41	J A 50	J A 35	J A 31	G	J A 31	J A 25	J A 22	22	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	20	G	G	32	G	J A 33	J A 25	J A 60	J A 37	C	J A 30	J A 50	J A 32	J A 31	J A 25	23	E S 16
28	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	G	J A 25	G	G	G	G	G	J A 37	J A 32	J A 33	J A 25	J A 25	J A 21	E S 16	20	20
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	G	31	34	35	35	32	G	G	G	G	E S 16	E S 16	E S 16	E S 16	J A 22	22
30	E S 16	20	E S 16	E S 16	E S 16	19	22	E S 16	26	29	32	34	32	37	J A 44	G	G	32	E S 16	E S 16	J A 24	22	22	J A 21
31																								
CNT	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	29	30	30	30	30	30	30	30
MED	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	18	26	32	34	37	38	38	37	J A 34	32	26	J A 26	J A 24	22	18	E S 16	E S 16
UQ	20	21	E S 16	E S 16	E S 16	E S 16	E S 16	22	30	J A 34	38	42	J A 43	J A 41	J A 42	J A 42	J A 41	J A 33	J A 38	J A 32	J A 24	J A 22	20	20
LQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	28	32	34	34	33	G	30	29	22	J A 20	E S 16	E S 16	E S 16	E S 16	E S 16

NOV. 1986

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

NOV. 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	24	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	20	28	35	38	41	38	G	33	G	34	31	31	24	E S 16	E S 16	18	E S 16	
2	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 15	20	26	30	32	34	G	G	G	32	29	22	25	E S 16	E S 16	E S 15	E S 16	E S 16	
3	E S 15	E S 16	E S 16	E S 16	E S 15	E S 15	E S 16	19	27	30	G	38	37	37	33	31	32	26	25	37	E S 15	E S 16	E S 16	E S 16	
4	E S 16	E S 16	E S 15	E S 15	E S 16	E S 15	E S 16	16	27	32	33	33	37	38	G	37	38	26	24	47	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	G	C	52	42	57	47	G	37	37	42	37	27	23	26	37	19	
6	E S 16	E S 16	18	18	E S 16	E S 16	E S 16	18	25	30	32	33	35	38	38	32	25	20	E S 16	E S 16	E S 16	E S 16	20	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	22	18	G	32	38	39	33	49	40	57	42	35	28	26	25	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	G	32	36	32	G	32	G	28	26	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	
9	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	19	25	28	32	35	34	34	25	G	G	G	G	E S 16	E S 16	E S 16	E S 16	E S 16	
10	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	29	33	33	G	G	G	G	31	29	23	24	19	22	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	G	G	35	37	38	37	35	35	28	20	20	E S 16	E S 16	E S 16	E S 16	E S 16	
12	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	28	G	33	34	32	30	42	32	27	E S 16	18	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	18	26	28	33	33	32	40	34	30	G	G	33	20	E S 16	E S 16	E S 16	E S 16	
14	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	G	G	33	34	38	38	36	32	30	27	20	E S 16	E S 16	E S 16	E S 16	E S 16	
15	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	A A 26	E S 16	27	31	30	35	39	36	41	30	28	25	20	28	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	19	28	30	32	33	45	35	37	36	45	32	36	30	E S 16	18	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	D 20	E S 16	24	30	31	34	36	35	31	32	28	22	32	19	E S 16	E S 16	E S 16	E S 16	
18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	24	G	G	35	37	39	35	40	57	40	43	29	E S 16	E S 16	E S 16	E S 16	
19	E S 16	A A 43	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	22	G	37	37	37	33	37	49	27	47	A A 54	E S 15	E S 16	A A 42	E S 16	
20	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	G	G	35	42	40	35	36	G	27	20	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	25	G	33	35	35	33	G	G	18	G	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	
22	E S 16	E S 15	E S 15	E S 16	E S 15	E S 15	E S 16	E S 16	24	30	34	41	43	38	35	33	39	25	E S 16	26	29	18	E S 16	E S 16	
23	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	16	26	30	32	40	36	32	31	36	27	G	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	
24	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	E S 15	16	26	33	39	40	33	38	34	32	28	40	37	29	E S 16	19	E S 16	E S 16	
25	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	16	24	36	37	35	32	33	38	30	37	G	E S 16	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	25	30	33	33	33	38	34	32	28	G	20	25	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	18	G	G	30	G	31	25	30	37	C	25	25	18	25	19	E S 16	E S 16	
28	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	19	G	25	G	G	G	G	G	28	26	22	E S 16	24	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	G	30	34	35	34	32	G	G	G	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	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	26	28	30	32	32	35	32	G	G	25	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	
31																									
CNT	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30
MED	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	16	24	30	33	35	36	35	32	32	28	24	22	18	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	19	26	32	35	38	38	38	36	36	37	27	31	27	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	G	25	30	33	32	32	G	28	26	20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	

NOV. 1986

FBES (0.1 MHz)

IONOSPHERIC DATA

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

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FMIN (0.1 MHz)

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IONOSPHERIC DATA

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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 2sec in automatic operation																								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	285	340	310	335	365	365	320	360	340	335	315	320	315	315	320	330	320	330	320	360	300	310	315	300	
2	280	320	320	325	340	360	320	335	335	345	345	315	305	315	330	320	U	R	H	315	310	295	310	325	
3	340	325	345	330	365	360	340	335	355	295	310	330	325	325	330	335	335	365	340	290	305	315	335	325	
4	305	315	340	365	350	320	295	355	365	310	285	310	305	305	335	320	280	335	315	310	305	280	275	285	
5	F	S	285	305	270	S	S	335	335	C	R	R	320	295	315	315	350	345	335	310	S	S	S	S	
6	320	310	360	365	360	F	350	345	360	330	345	335	315	305	320	325	360	R	345	350	S	295	310	S	
7	315	305	S	355	360	F	S	350	360	350	330	320	320	325	320	325	330	U	R	335	355	320	315	S	
8	S	305	340	360	335	315	320	350	360	340	340	355	320	295	U	R	350	315	R	335	345	340	345	S	
9	325	300	S	355	355	320	320	355	360	340	335	350	355	315	320	345	335	R	R	U	S	S	S	S	
10	335	340	315	335	360	360	325	335	365	360	340	J	R	335	U	R	345	R	360	365	345	345	S	315	
11	335	325	320	335	375	370	335	360	365	340	360	360	365	325	340	360	355	340	310	315	360	335	320	320	
12	305	330	340	S	F	F	335	340	365	355	345	335	360	340	325	340	380	370	360	370	325	340	345	320	
13	320	305	330	345	360	345	340	330	365	350	335	S	315	320	330	340	360	360	335	S	295	285	S	320	
14	300	290	300	335	365	F	365	355	350	325	335	295	315	R	R	325	U	R	360	365	365	335	360	S	
15	S	U	S	315	F	S	365	A	335	365	340	335	345	325	U	R	345	300	330	350	R	340	360	310	
16	285	285	330	310	365	350	320	330	330	335	320	340	325	320	320	360	370	345	365	S	U	S	S	300	
17	305	S	S	300	U	S	335	S	325	335	345	350	340	R	310	345	335	335	R	330	365	340	325	340	
18	305	320	325	360	400	S	S	325	320	335	345	U	R	330	310	345	360	370	355	335	340	350	365	300	
19	335	A	335	345	380	S	360	340	340	345	335	320	335	325	340	325	340	370	365	370	A	330	315	A	
20	325	325	325	325	340	390	335	340	365	345	325	R	355	335	330	310	U	R	345	360	380	350	345	410	
21	320	310	315	330	335	340	335	380	375	365	355	375	345	315	330	340	340	U	R	335	325	340	345	300	
22	305	S	S	340	S	S	333	345	350	330	365	325	R	330	325	330	335	360	R	335	S	330	325	S	
23	S	F	F	F	U	S	U	S	350	360	340	325	R	335	345	320	R	320	R	340	350	350	S	305	
24	S	315	310	340	350	F	290	365	365	350	355	360	340	335	310	315	335	330	300	S	300	325	S	300	
25	305	315	315	315	S	335	310	S	355	335	U	R	350	315	320	320	315	320	330	S	335	325	325	310	
26	S	F	360	330	340	S	295	285	310	330	360	340	320	325	335	350	335	335	335	360	365	315	S	295	
27	320	345	355	325	335	S	360	360	355	340	345	320	365	350	325	340	365	I	C	360	360	345	340	300	
28	310	350	340	S	325	350	340	S	360	365	365	360	U	R	345	340	320	345	R	335	U	R	345	S	
29	305	325	320	350	320	295	315	355	365	365	335	345	345	345	350	345	350	365	345	320	S	310	S	S	
30	315	315	S	335	300	F	F	R	350	335	350	R	340	335	340	310	355	320	R	R	360	U	S	295	
31																									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	27	30	29	29	23	26	30	30	29	30	30	30	30	30	30	30	30	30	29	30	30	29	29	
MED	312	315	322	335	355	350	334	342	360	340	338	338	325	325	325	340	350	345	340	335	310	315	330	320	
UQ	325	325	340	355	365	360	340	355	365	350	350	355	340	340	335	355	360	360	350	350	330	335	340	335	
LQ	305	310	315	325	335	328	320	335	340	335	325	325	315	315	320	325	335	335	335	310	300	310	320	310	

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M(3000)F2 (0.01)

IONOSPHERIC DATA

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M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9h)

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

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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H^oF₂ (KM)

135° E Mean Time (G.M.T. + 9h)

Station 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									240	270	280	270	245	270	235									
2									245	265	250	235	270	270	245	245	230							
3									245	310	290	250	250	255	250	230								
4									225	310 ^L	325	270	250	285	240	245								
5										C	300	255	275	295	285	255								
6									240	265	270	260	280	260	280	250	230							
7									230	245	280	290	265	260	240	A	240	210						
8									240	260	270	260	260	275	260	225	230							
9									235	240	270	250	250	255	250	240	225							
10									245	250	250	265	255	225	250	225	210							
11										275	250	250	250	280	250	230	230							
12									235	250	255	255	240	250	265	260	220							
13									235	230	265	245	240	260	240	240	225							
14									230	260	255	265	270	240	245	220	225							
15									235	270	250	240	265	235	240	240	230							
16									250	260	255	240	250	265	240	240	A	A	230	240				
17									250	260	245	230	275	270	240	245	210							
18									U ^L	285	270	250	260	260	265	250	220	250						
19										L	260	265	250	250	235	255	245	220						
20											255	260	255	270	260	265	235	220						
21									210	250	260	240	260	250	270	240	220							
22										255	235	260	270	235	255	235								
23										250	270	260	250	245	250	255	225							
24										235	250	240	255	265	270	270	235							
25										270	250	245	250	270	280	270								
26									270	220	240	280	260	255	265	240	240							
27									240	250	240	270	260	250	240	230	I ^C	220						
28									220	230	240	245	240	240	235	245	225							
29										220	245	260	250	245	240	245	245							
30										270	240	250	260	240	240	240	240							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									20	29	30	30	30	30	30	28	24	2						
MED									240	260	255	255	258	258	250	240	228	225						
UQ									245	270	270	260	265	270	265	245	232							
LQ									232	250	250	245	250	245	240	232	220							

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H^oF₂ (KM)

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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										
Hour Day	00	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 370	310	270	245	220	210	S 310	S 230	220	225	230	A 235	230	190	A 240	240	240	220	220	220	S 230	220	245	S 270	
2	290	260	245	230	225	S 245	S 320	245	230	220	200	200	230	245	225	225	230	220	210	235	210	265	235	235	
3	240	255	240	250	200	E 260	S	235	225	230	245	240	230	205	200	190	230	220	205	A	245	245	220	230	
4	285	265	240	200	205	S 280	S 305	230	220	205	215	205	220	220	235	230	250	235	220	A 280	250	320	280	230	
5	245	205	230	255	290	230	205	220	235	C	A	A 260	A	A	255	240	250	230	245	250	285	295	280	260	
6	270	255	230	210	S	S	S 260	S 235	A 230	230	220	210	215	220	A	210	S 230	A 210	210	210	S 240	S 270	A 250	S 260	
7	290	S	S 275	240	210	215	200	230	210	225	A	A	210	A	A	A	A	A	210	220	A 240	S 230	S 260	S 240	
8	250	S 275	250	215	200	S	S	225	200	230	A 225	200	210	200	220	200	225	225	200	200	240	235	260	S 270	
9	265	S 270	240	220	210	S 240	S	240	220	210	200	220	200	200	200	200	A 220	210	240	220	240	225	210	E 250	
10	250	250	255	250	225	S 250	S	250	240	230	215	195	200	190	H 175	210	205	205	210	210	220	210	200	200	
11	265	255	275	250	225	200	S	240	240	245	225	225	A	210	220	220	210	210	225	250	200	220	250	265	
12	280	275	225	205	270	255	250	230	210	200	210	205	200	200	180	A	A	205	220	200	250	235	240	250	
13	S 280	S 275	260	225	220	215	S	225	220	220	210	200	200	A	A	200	210	210	E 240	A	S 230	240	240	220	
14	E 280	S 290	S 270	240	210	S	S	220	A	210	210	200	200	A	230	A	210	A	210	210	200	210	225	S 230	S
15	S 280	S 280	260	260	215	200	A	240	220	200	220	210	210	200	A	205	A 225	210	210	210	210	210	230	240	235
16	E 300	S 280	S 250	240	200	S	S	240	A 240	A	220	210	A	210	A	A	A	A	225	210	S 240	210	S 235	S 250	
17	S 290	260	255	285	205	S	A	250	220	215	205	200	200	220	240	250	A 225	A 215	210	205	205	220	245	S 270	
18	290	275	255	220	200	S	S	240	240	250	220	235	230	245	240	A	A	230	A	245	240	200	250	275	
19	260	A	245	250	205	S	S	240	225	225	210	230	210	210	210	A	A	215	A	A	245	225	A	250	
20	270	290	295	300	260	200	S	205	210	H 190	240	A	A	215	H 205	225	210	205	200	205	195	230	255	250	
21	280	275	290	250	250	220	250	220	205	210	200	210	200	200	180	H 175	210	205	200	210	205	240	240	210	
22	265	290	280	245	200	225	S	230	220	225	225	250	A 250	A 240	220	230	225	215	205	240	265	255	230	230	
23	245	245	230	205	E 250	E 290	E 290	220	225	225	220	250	A	220	200	200	245	225	220	200	195	225	S 230	230	225
24	220	265	260	205	225	270	275	220	225	220	A 240	A 240	200	230	200	215	A 245	220	250	230	230	230	220	210	
25	265	270	245	255	220	S 255	S 250	220	230	255	255	A 220	210	200	250	235	250	230	215	230	220	235	270	310	
26	285	240	205	S	260	S	S	260	250	A	225	210	230	200	200	220	220	230	205	190	240	E 300	250	220	
27	S 305	255	220	S	E 270	S 240	S 230	240	210	210	210	260	A	200	220	200	A 220	I 210	C 210	230	240	A 260	A 265	240	S 260
28	250	250	255	260	S 250	240	E 265	240	210	H 200	210	210	190	200	190	190	220	220	200	A	210	210	240	S	
29	S 280	S 260	S 260	240	250	S	S	245	220	205	200	200	200	200	210	190	230	225	190	210	210	E 270	S 225	215	
30	S 250	S	E 290	S 280	S 280	S	S	260	240	225	205	210	200	200	225	A 220	A 210	H 200	H 230	210	190	S 260	205	S 245	235
31																									
CNT	30	27	30	28	29	20	14	30	29	27	28	28	26	26	25	24	25	28	28	27	30	30	29	28	
MED	272	265	254	242	220	234	S 255	235	220	220	218	210	210	208	210	218	225	218	210	210	235	230	240	240	
UQ	S 285	275	265	252	250	S 252	S 290	240	230	228	225	S 235	220	220	230	230	230	225	221	232	245	248	250	260	
LQ	250	255	240	220	205	215	250	225	220	208	210	200	200	200	200	200	210	210	205	202	210	220	230	228	

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H*F (KM)

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H^oE (KM)

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

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

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

NOV. 1986

H^oE (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

NOV. 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																								
Hour Day	00	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	S	S	S	S	S	105	130	130	135	130	130	G	105	G	125	150	135	105	105	100	95	S	
2	S	S	S	S	S	S	S	150	150	125	105	105	G	G	G	105	E G 155	145	115	110	S	S	S	S	
3	S	S	S	S	S	S	S	150	E G 175	145	G	155	E G 170	105	120	120	120	145	120	120	110	105	S	S	
4	S	S	S	S	S	S	S	130	125	120	120	120	125	120	G	145	120	130	110	105	105	100	S	S	
5	100	100	145	145	145	130	S	145	G	C	120	115	105	105	G	130	125	115	105	105	105	105	100	100	
6	110	110	110	110	110	110	110	120	E G 135	130	130	E G 140	130	E G 165	125	120	120	110	110	110	110	110	110	110	
7	S	S	S	S	S	S	S	140	100	E G 160	140	130	125	120	120	115	115	110	110	110	105	S	S	S	
8	110	S	S	S	S	S	S	G	G	E G 165	E G 155	115	G	115	G	115	105	G	100	S	S	S	S	100	
9	110	S	100	100	S	S	S	150	120	110	120	110	110	120	100	G	G	G	S	S	S	S	S	S	
10	S	S	S	S	S	S	S	150	145	125	140	G	G	G	G	140	115	110	140	135	115	105	S	S	
11	S	S	S	S	S	S	S	S	G	G	150	140	130	145	120	100	100	100	100	S	S	S	S	S	
12	100	S	S	S	S	S	S	S	G	105	G	125	145	120	155	140	140	125	110	105	105	S	S	100	
13	S	S	S	S	S	S	S	110	120	120	120	120	120	120	110	110	G	G	100	100	S	S	S	S	
14	S	S	S	S	S	S	S	S	G	G	120	120	120	120	120	120	120	110	110	110	S	S	S	S	
15	105	100	100	100	S	110	100	S	120	120	120	120	120	115	115	115	115	110	110	105	110	110	100	100	
16	S	S	S	S	S	S	S	125	110	110	120	125	120	120	115	110	100	100	100	100	100	100	S	S	
17	S	S	S	S	S	S	S	100	E G 170	105	115	115	115	110	105	110	105	150	120	100	105	100	100	S	S
18	S	S	S	S	S	S	S	S	100	G	G	150	140	115	110	110	110	105	105	110	105	S	S	S	
19	S	110	S	S	110	S	S	S	G	100	G	150	150	130	125	110	110	110	100	105	100	S	100	S	
20	S	S	S	S	S	100	S	S	G	G	150	125	125	145	120	G	100	100	S	130	S	105	100	100	
21	100	S	S	S	S	S	S	S	G	105	145	120	110	115	G	G	100	S	100	S	S	S	S	S	
22	S	S	S	S	S	S	S	S	150	150	130	120	120	120	145	120	115	105	110	105	100	100	S	S	
23	S	105	105	105	S	S	S	105	110	105	105	105	100	105	105	105	110	G	100	S	100	100	S	S	
24	S	S	S	S	S	S	S	140	120	115	110	105	105	105	105	100	100	100	100	95	95	100	S	S	
25	S	105	S	S	S	S	S	130	120	115	105	110	105	110	105	105	105	G	S	S	S	S	S	S	
26	S	110	110	110	S	S	S	130	130	130	125	120	120	120	100	110	G	110	100	100	100	S	S	S	
27	S	S	S	S	S	S	S	105	G	G	E G 150	G	115	115	110	110	C	100	100	100	100	100	100	S	
28	S	S	S	S	S	S	S	100	G	110	G	G	G	G	G	100	100	100	100	100	100	100	S	100	100
29	S	S	S	S	S	S	S	S	G	E G 150	E G 155	145	125	115	G	G	G	G	S	S	S	S	S	100	100
30	S	100	S	S	S	105	105	S	145	140	140	140	130	130	100	G	G	140	S	S	105	100	100	100	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	8	9	6	6	5	5	4	18	20	23	25	27	26	26	22	24	24	23	25	22	20	15	10	9	
MED	102	105	108	108	110	110	102	130	120	118	122	120	120	120	111	110	114	110	105	105	105	100	100	100	
UQ	110	110	110	110	128	110	108	148	134	132	138	130	128	120	120	120	120	122	110	110	105	105	100	100	
LQ	100	100	100	100	110	105	100	110	110	112	120	115	110	115	105	105	102	102	100	100	100	100	100	100	

NOV. 1986

H°ES (KM)

IONOSPHERIC DATA

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

The Radio Research Laboratory, Japan

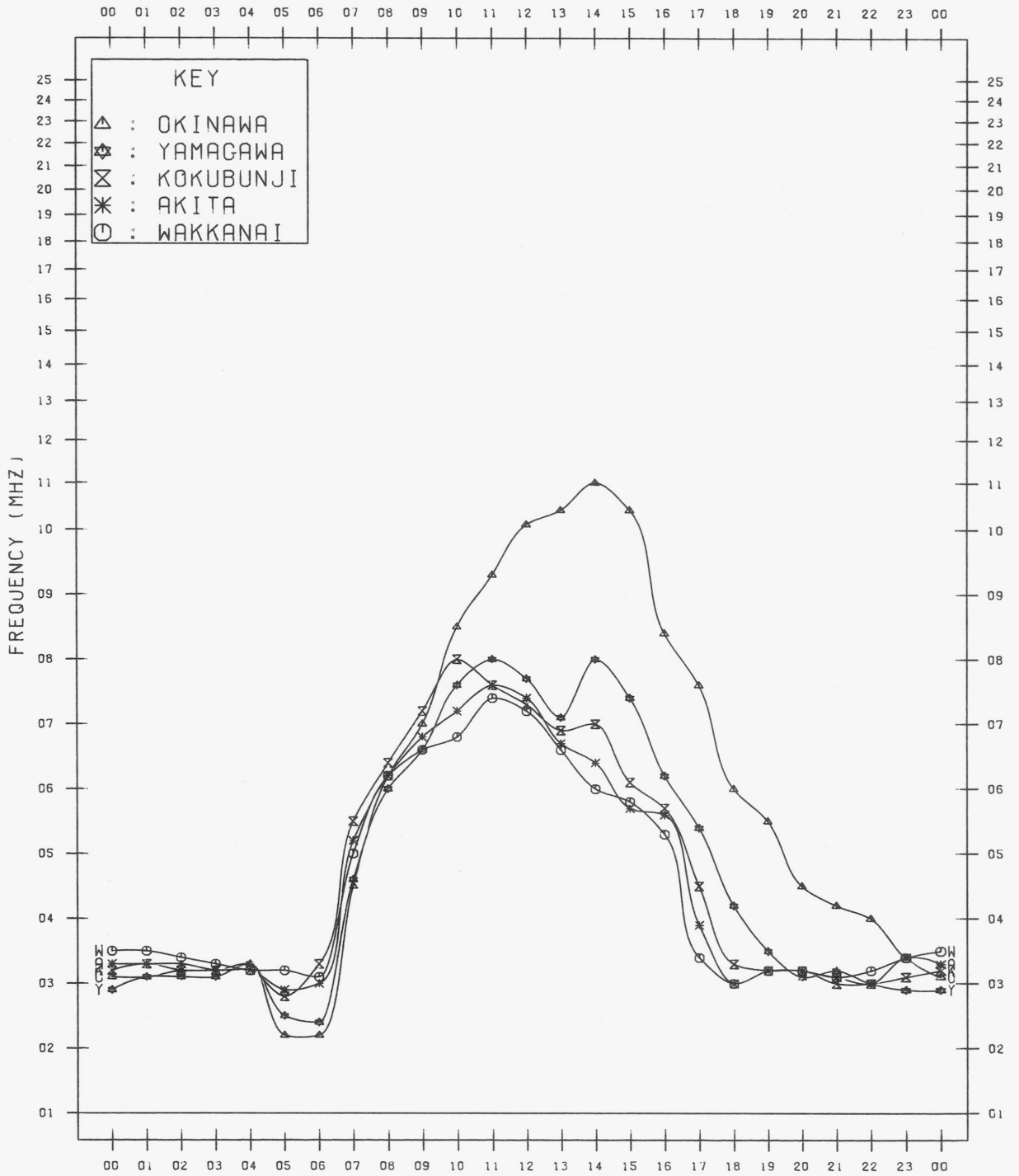
NOV. 1986

TYPES OF ES

MONTHLY MEDIAN VALUES OF FOF2

135 °E MEAN TIME

NOV. 1986



f-PLOTS OF IONOSPHERIC DATA

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

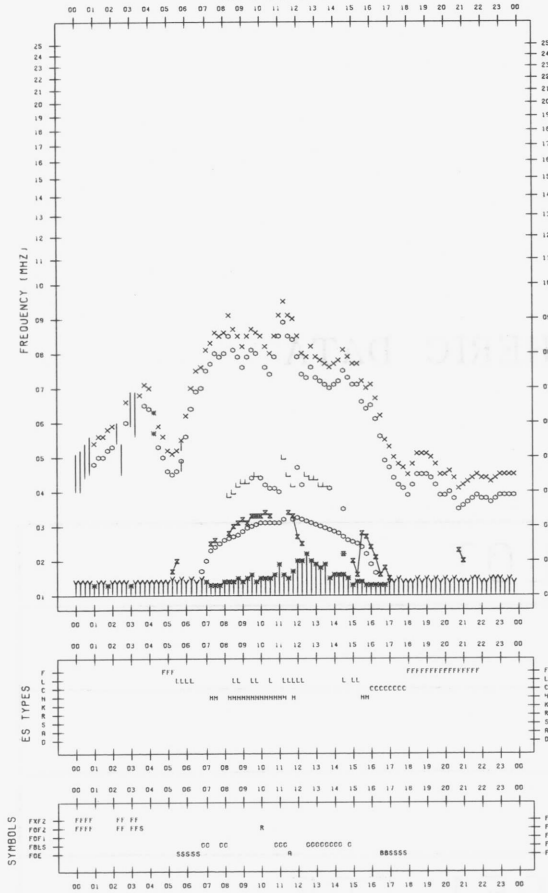
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1986/11/1

135°E MEAN TIME



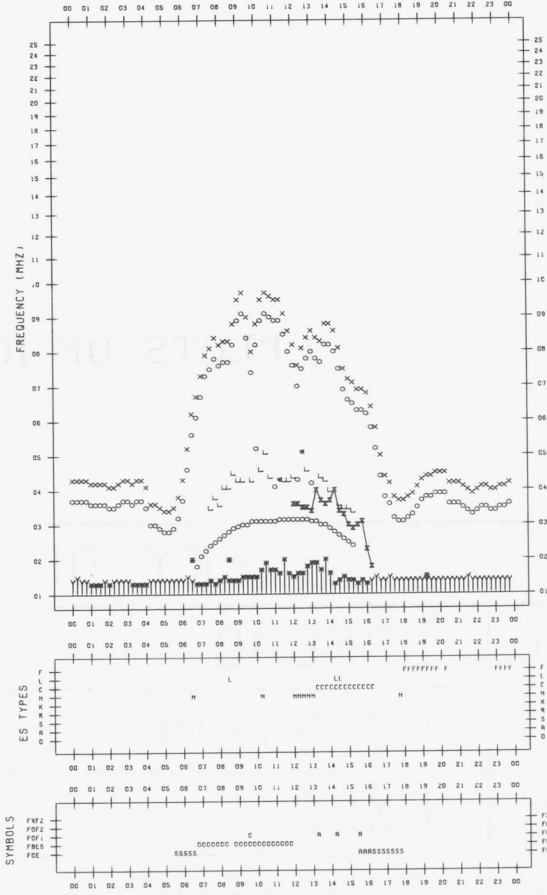
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1986/11/3

135°E MEAN TIME



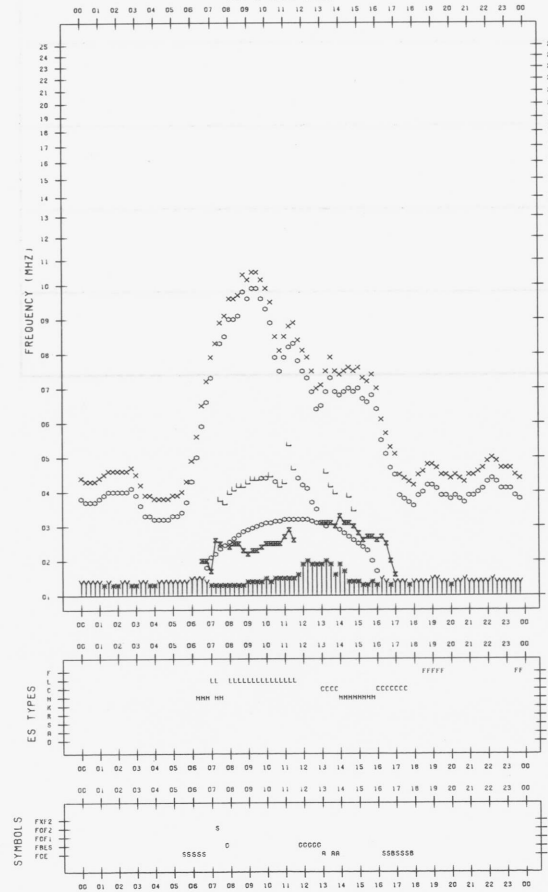
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1986/11/2

135°E MEAN TIME



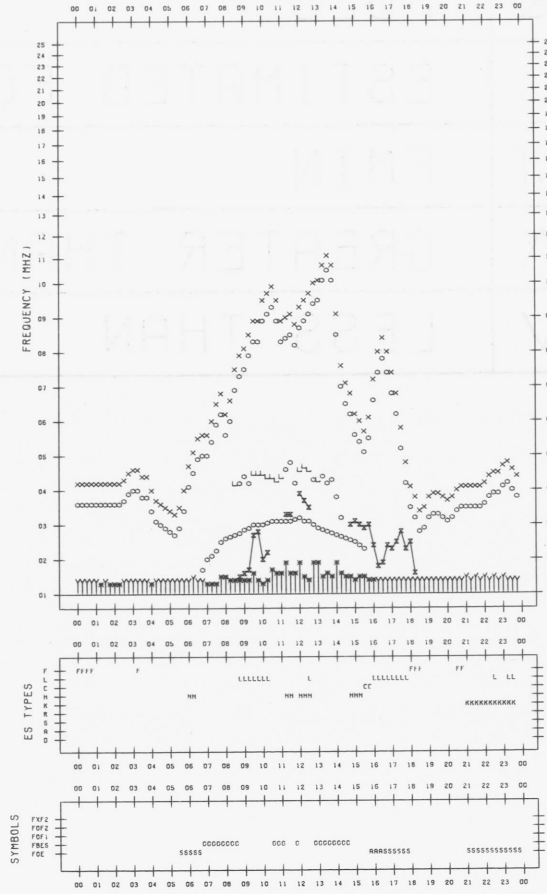
F-PLOT DATA

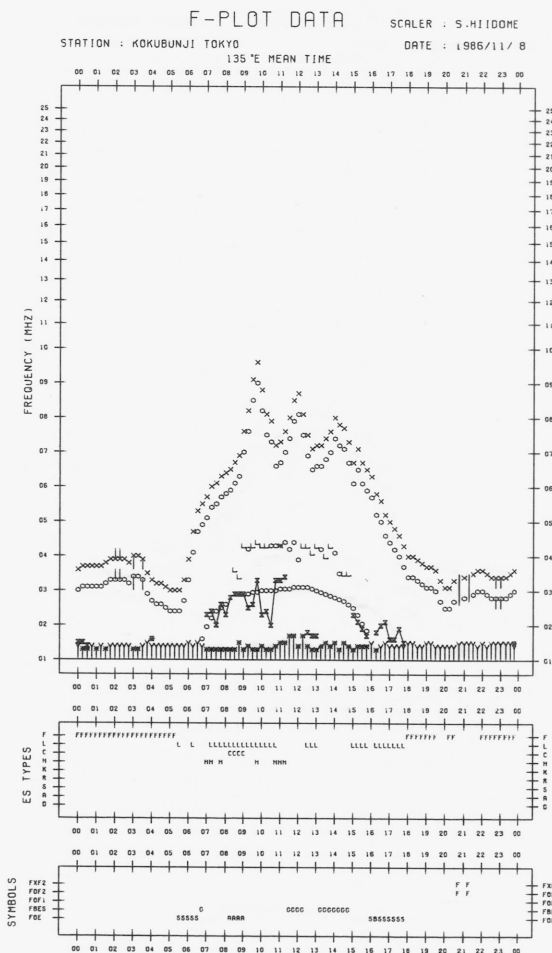
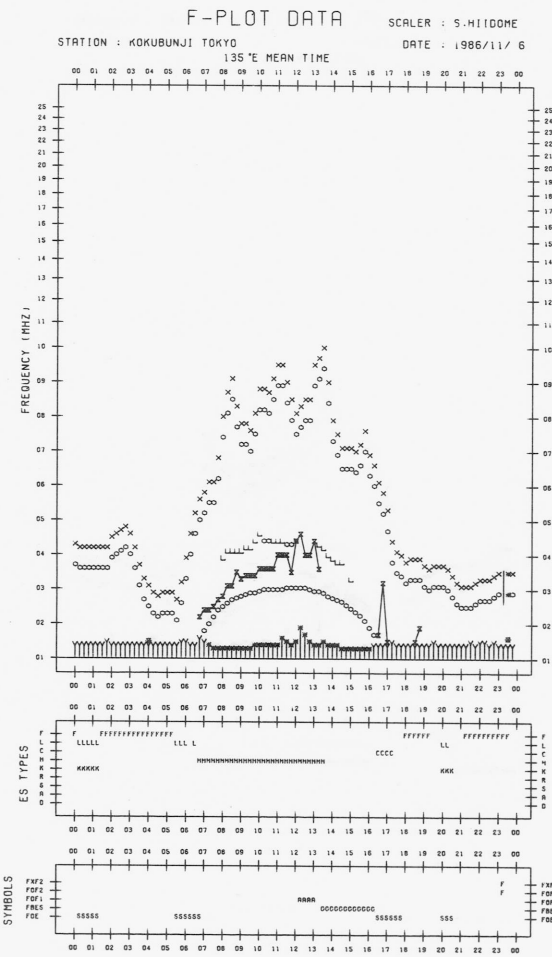
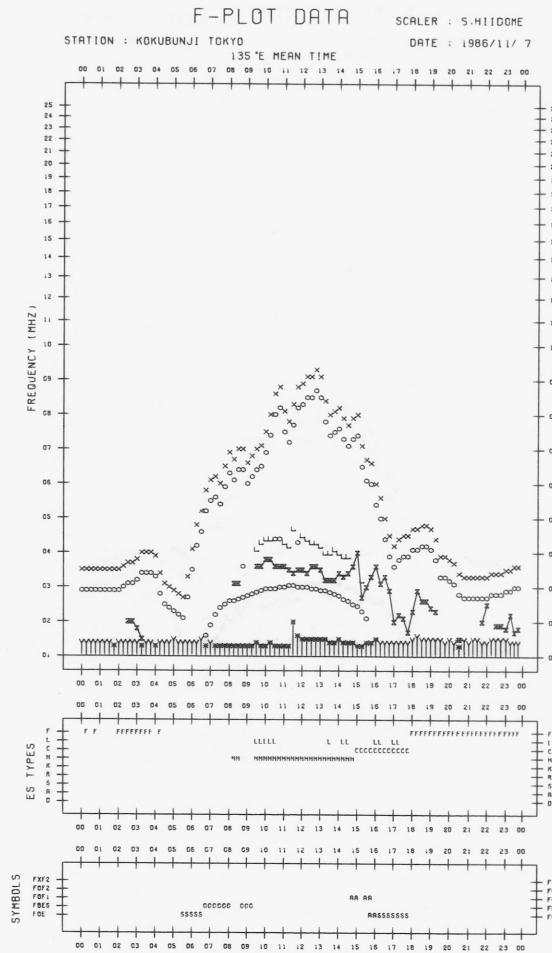
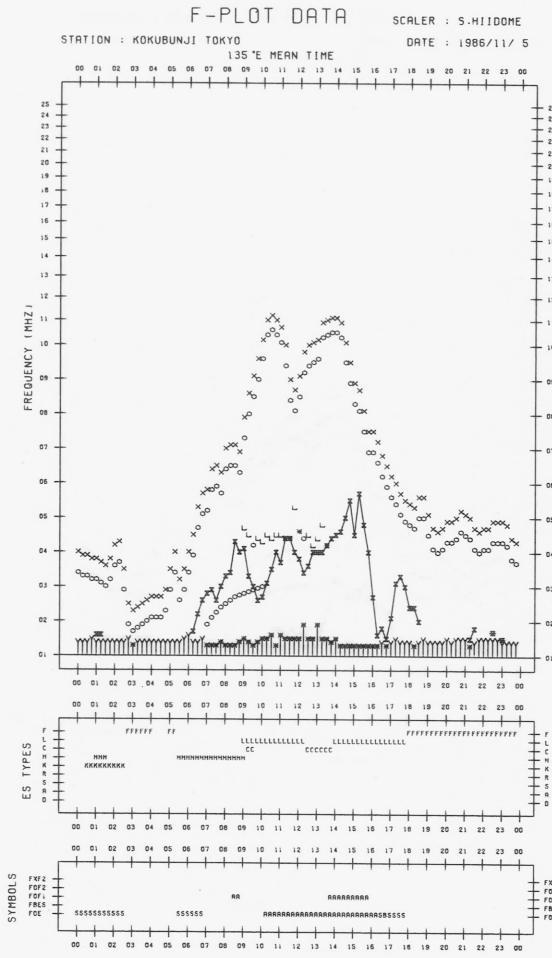
SCALER : S.HIIDOME

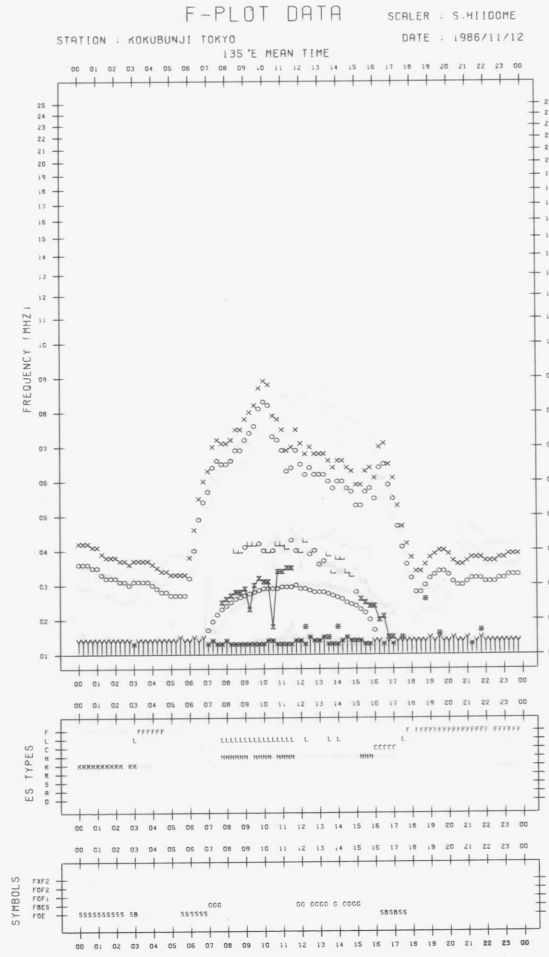
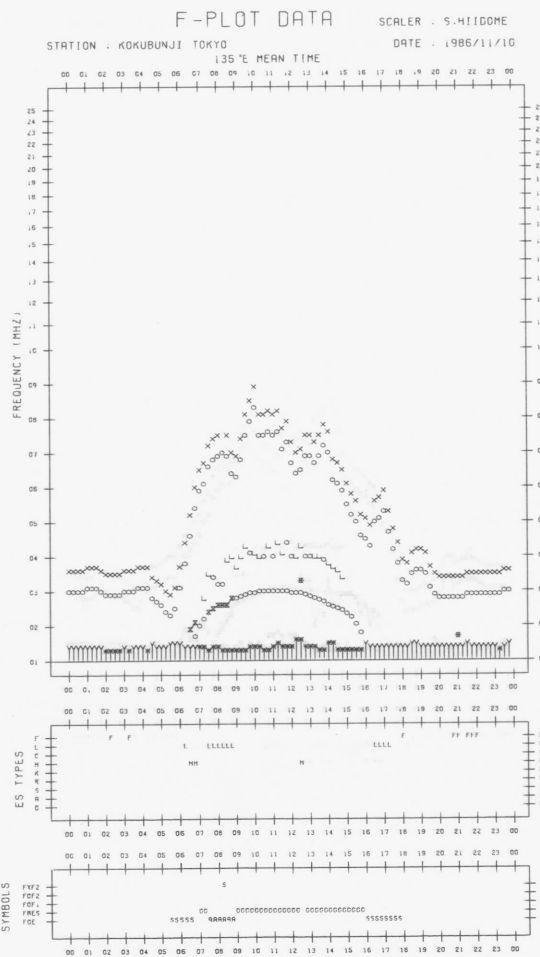
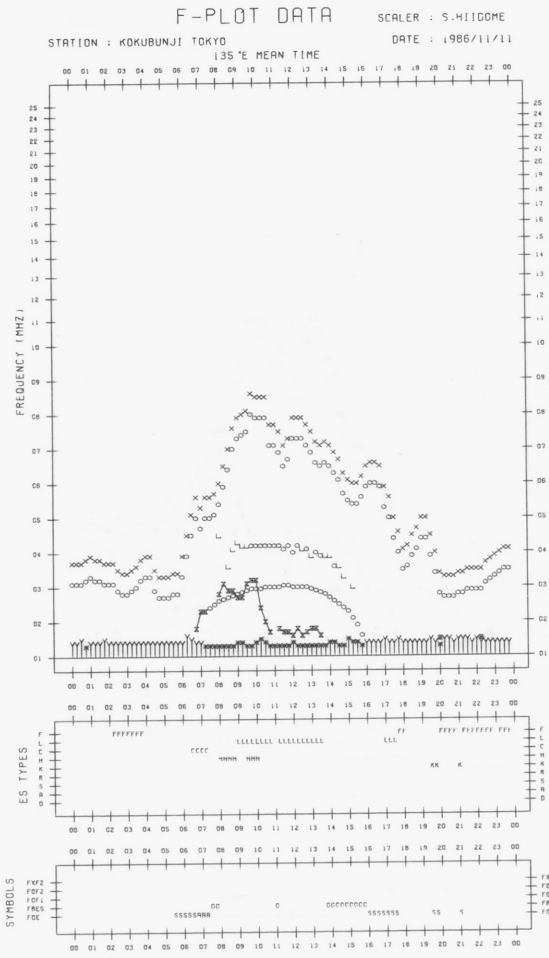
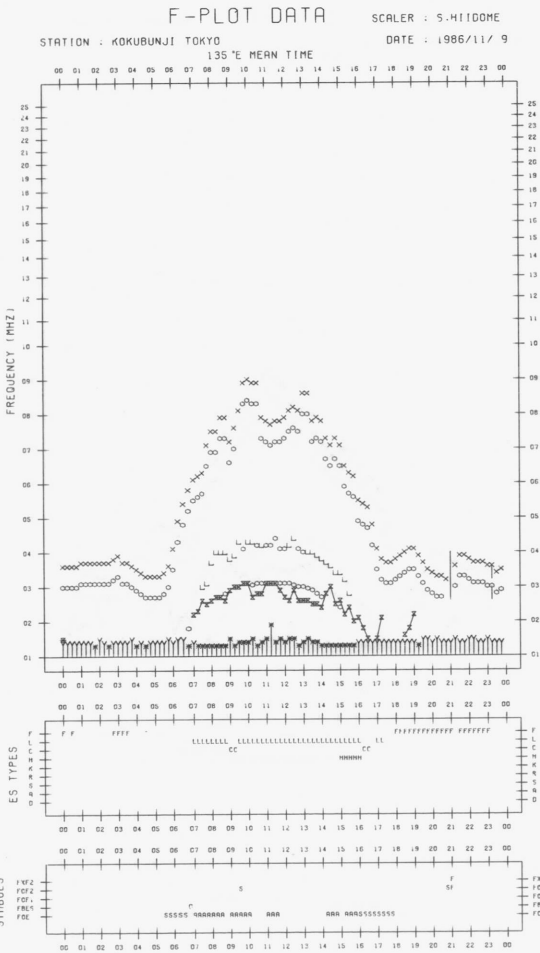
STATION : KOKUBUNJI TOKYO

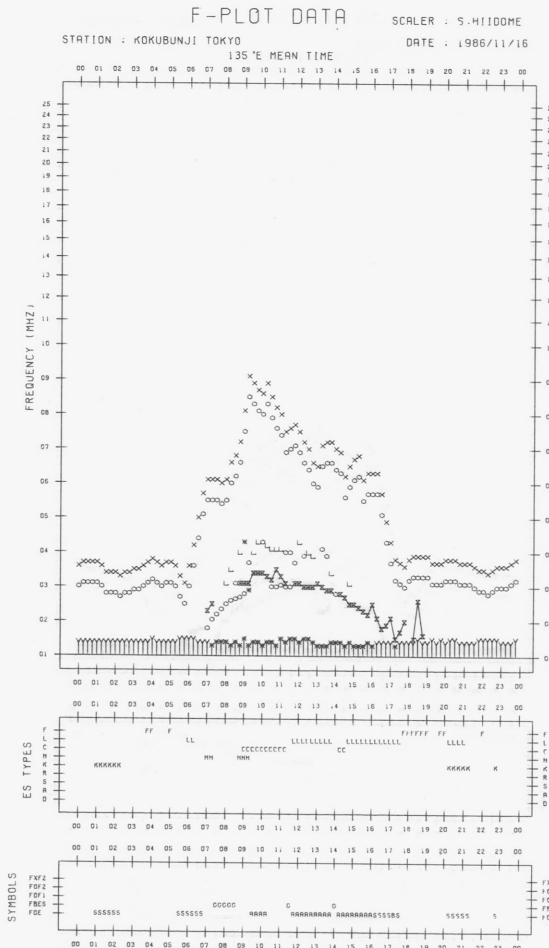
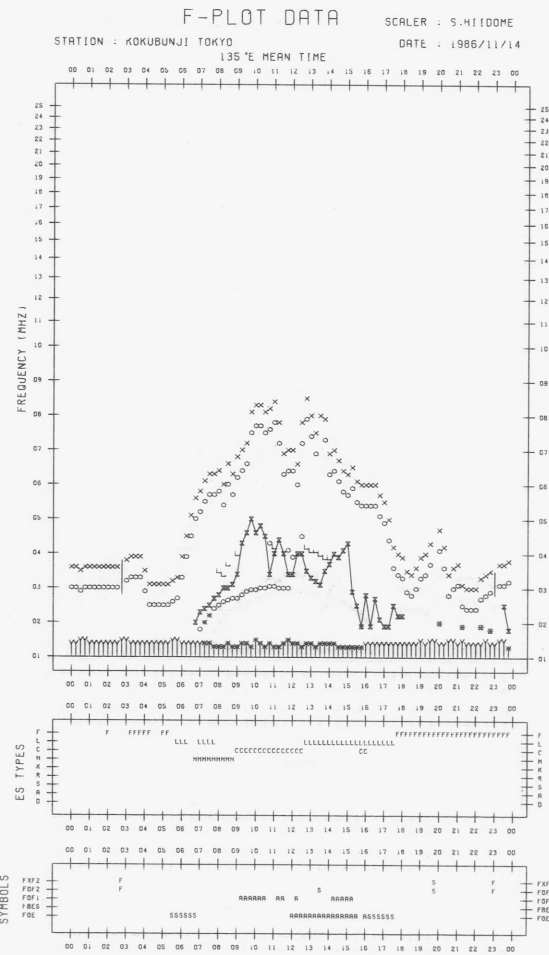
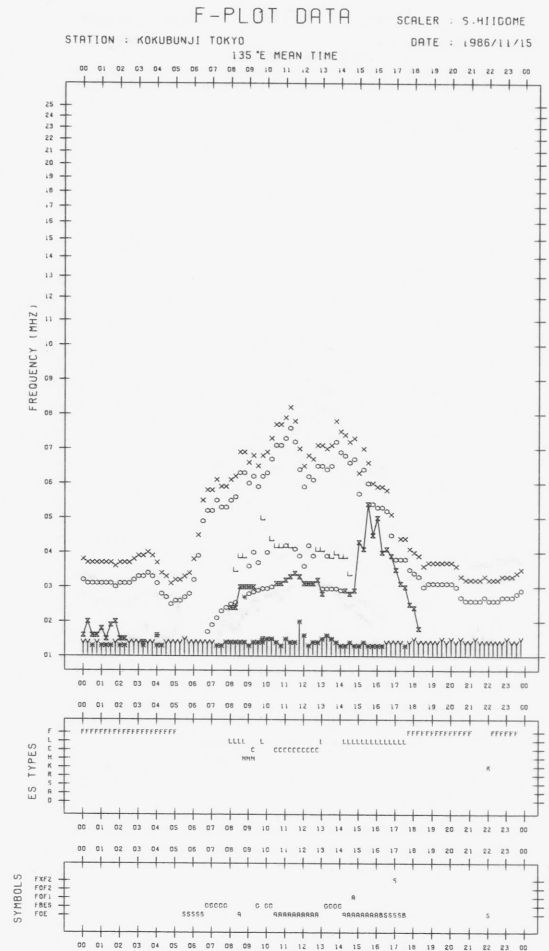
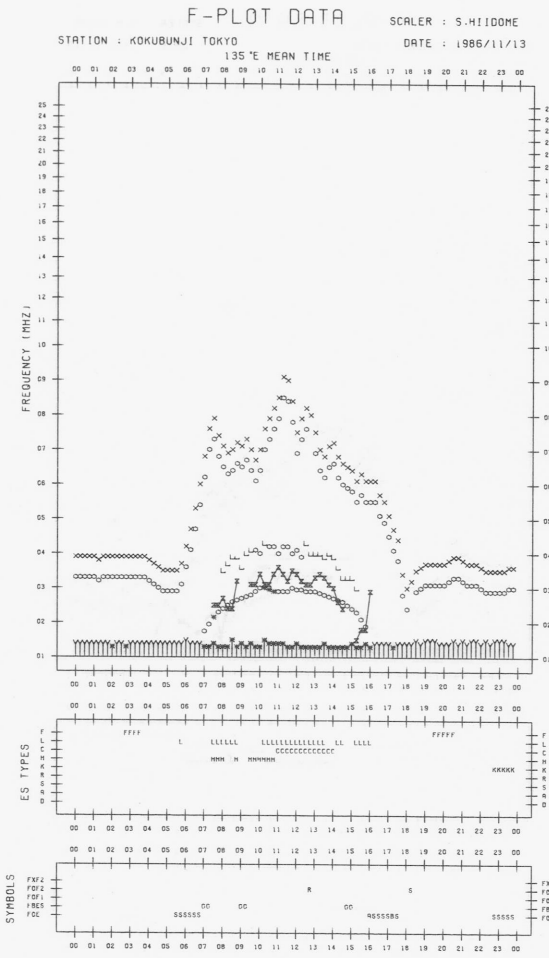
DATE : 1986/11/4

135°E MEAN TIME







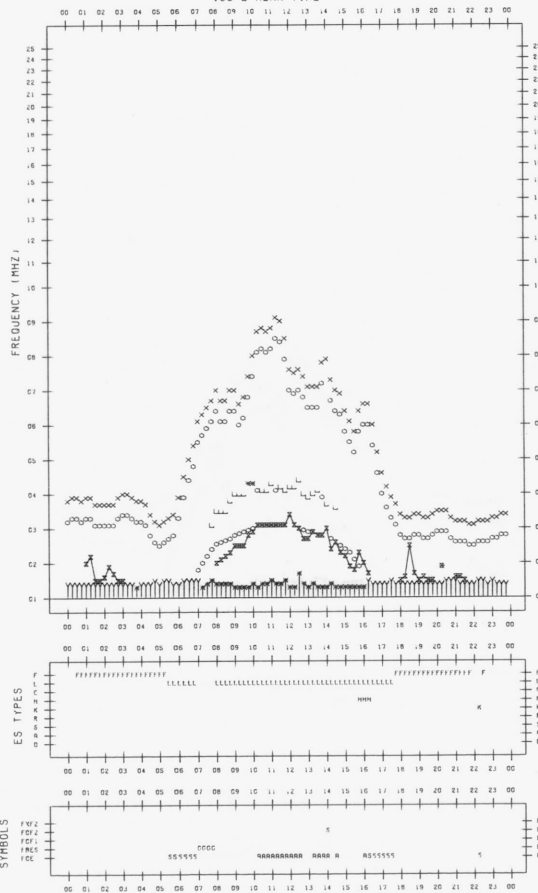


F-PLOT DATA

SCALER : 5.41100ME

STATION : KOKUBUNJI TOKYO DATE : 1986/11/17

135°E MEAN TIME

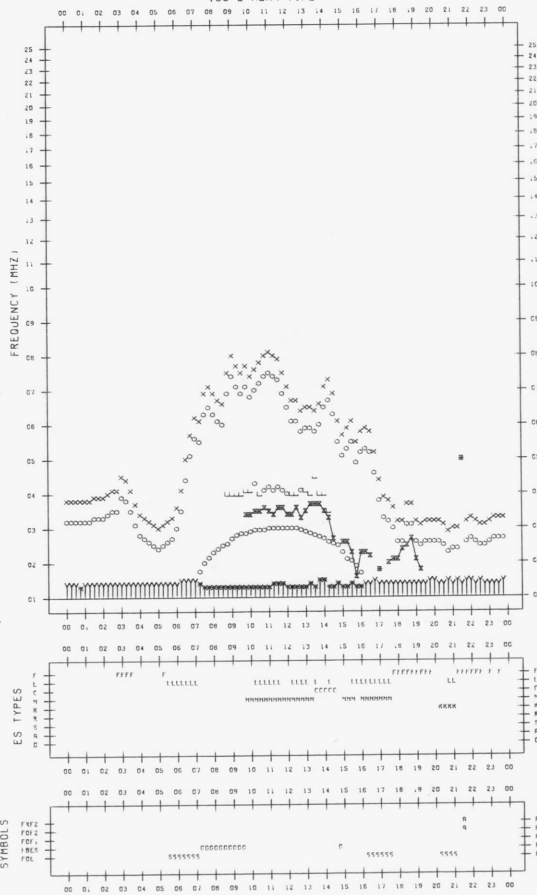


F-PLOT DATA

SCALER : 5.41100ME

STATION : KOKUBUNJI TOKYO DATE : 1986/11/19

135°E MEAN TIME

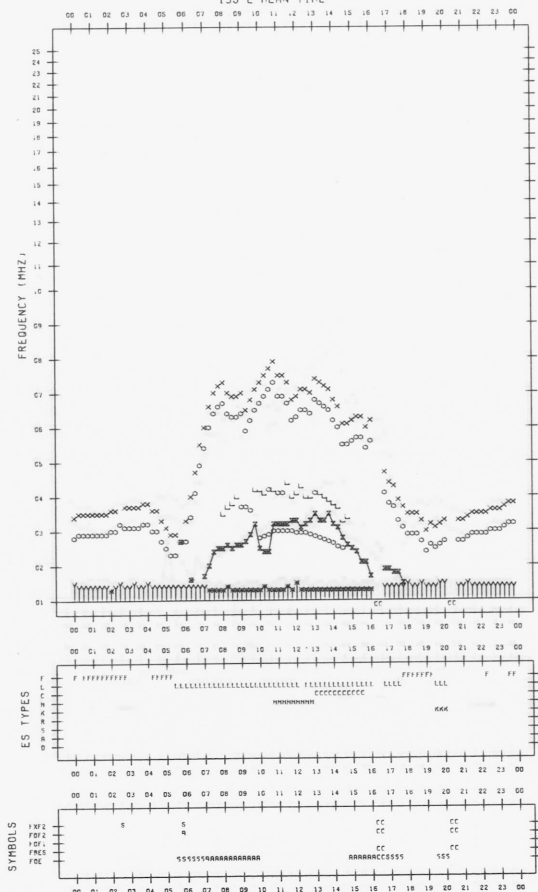


F-PLOT DATA

SCALER : 5.41100ME

STATION : KOKUBUNJI TOKYO DATE : 1986/11/18

135°E MEAN TIME

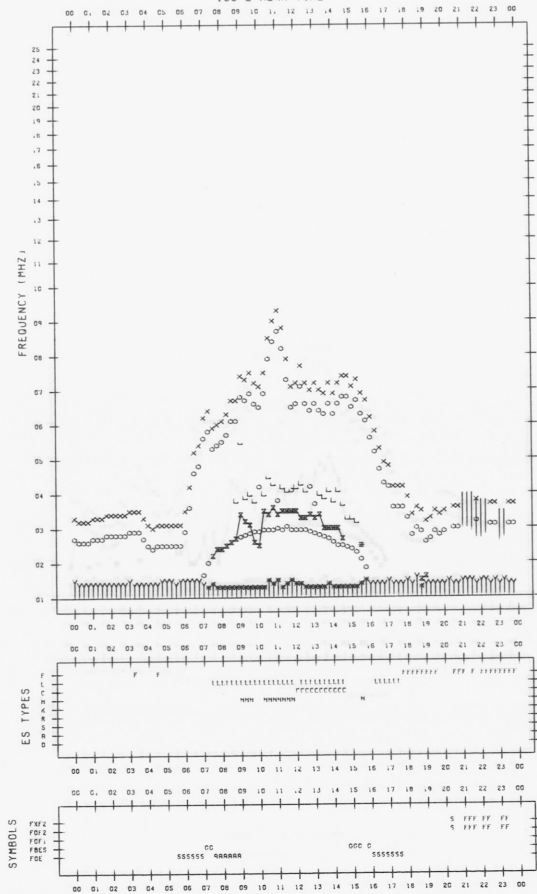


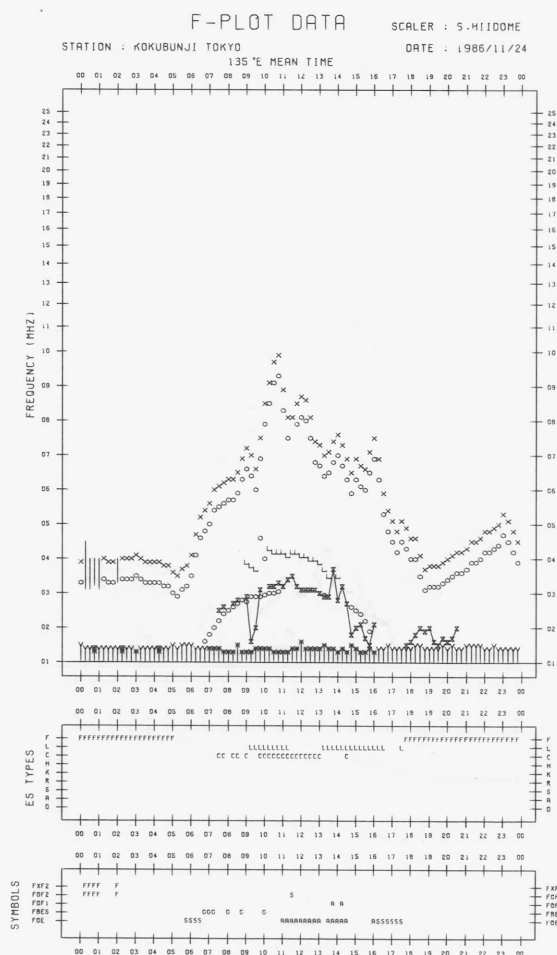
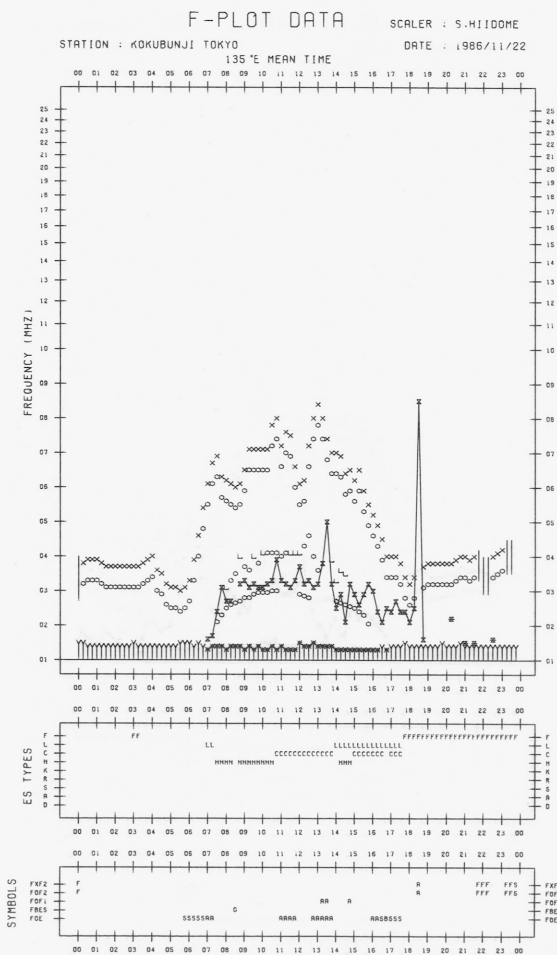
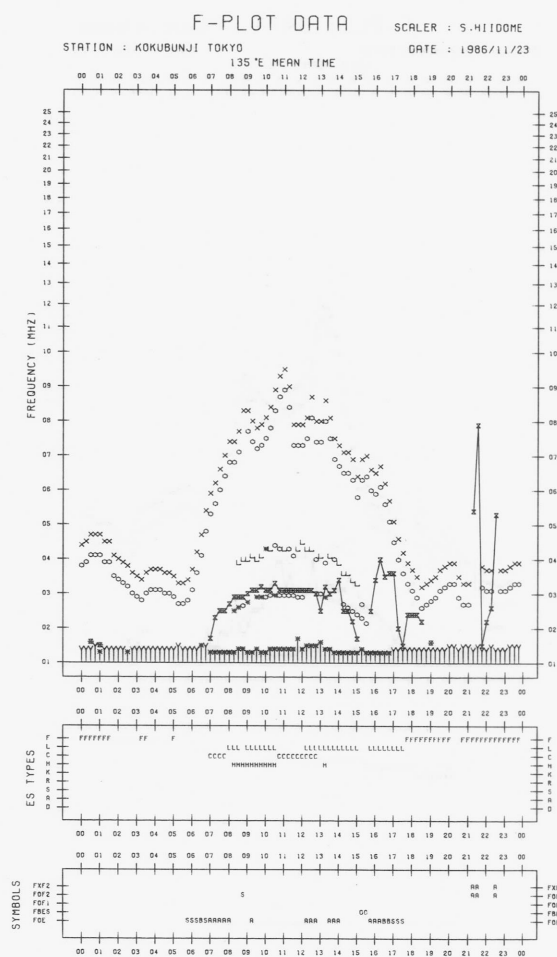
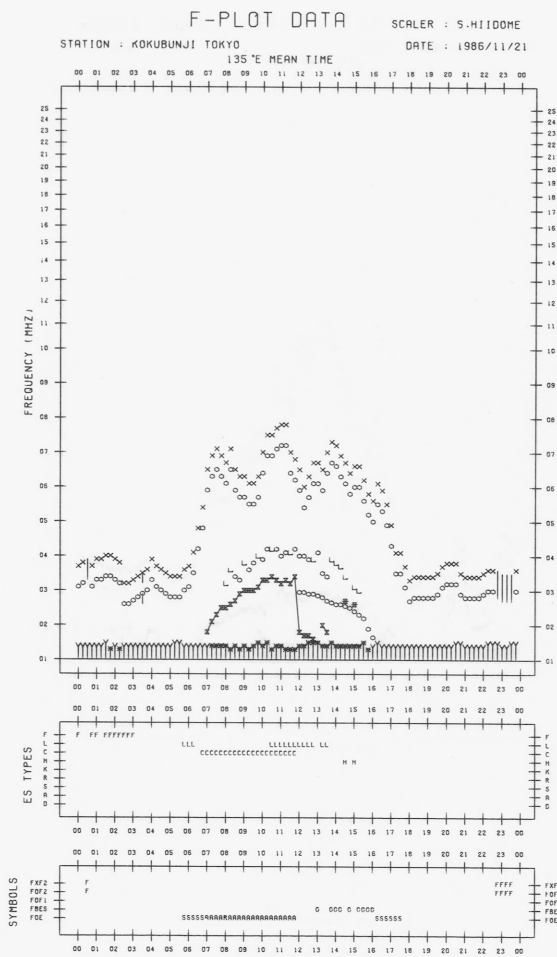
F-PLOT DATA

SCALER : 5.41100ME

STATION : KOKUBUNJI TOKYO DATE : 1986/11/20

135°E MEAN TIME



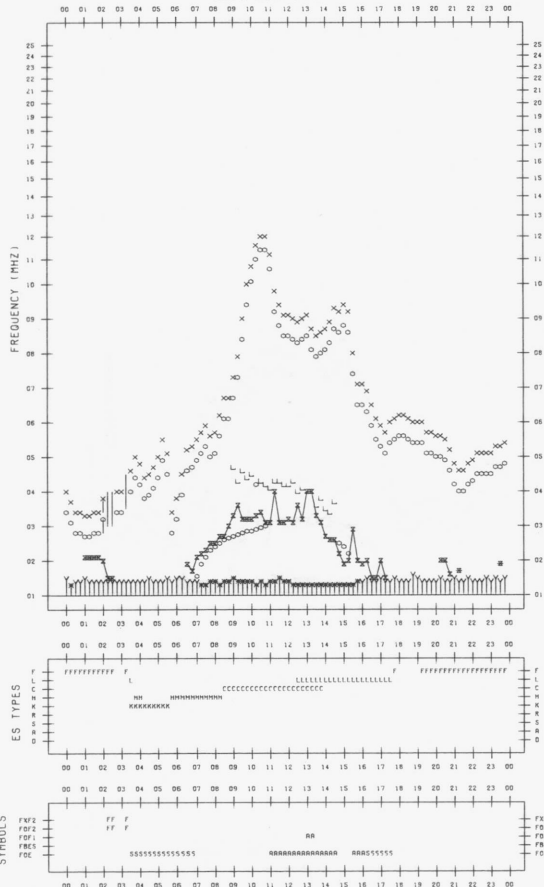


F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO DATE : 1986/11/25

135°E MEAN TIME

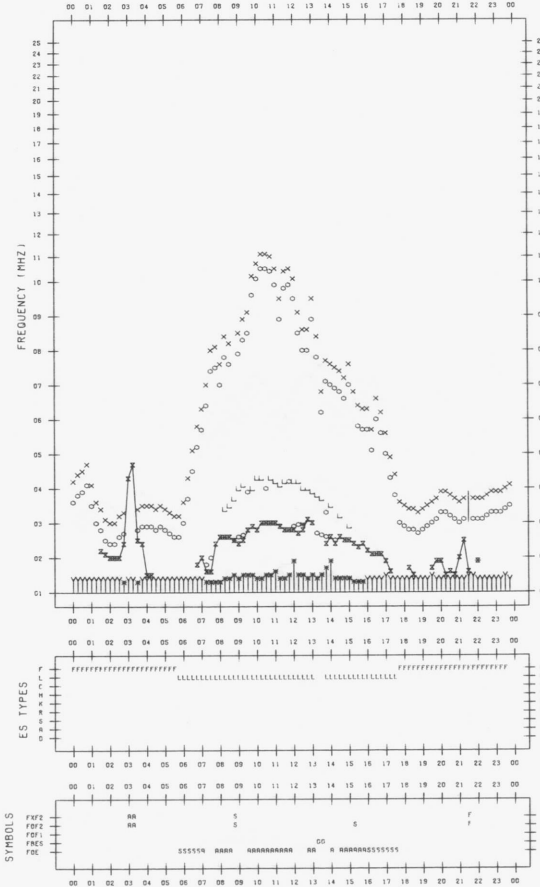


F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO DATE : 1986/11/27

135°E MEAN TIME

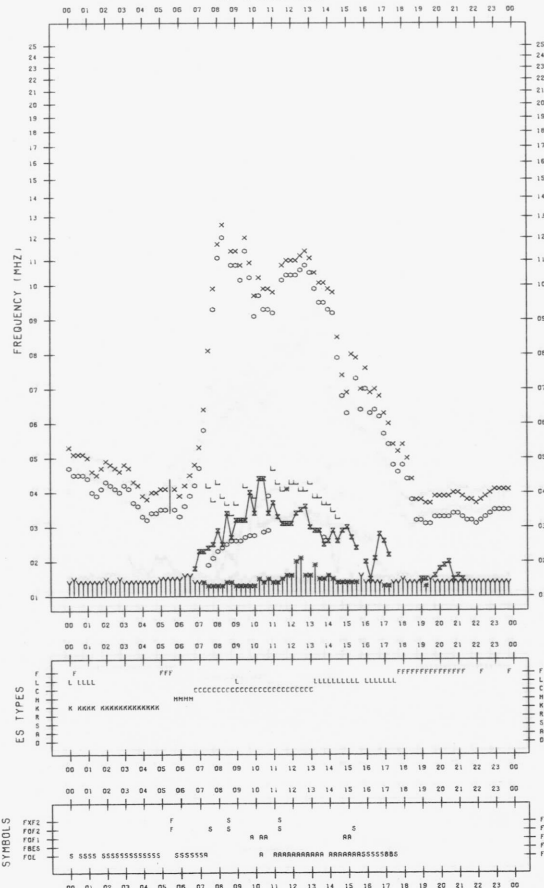


F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO DATE : 1986/11/26

135°E MEAN TIME

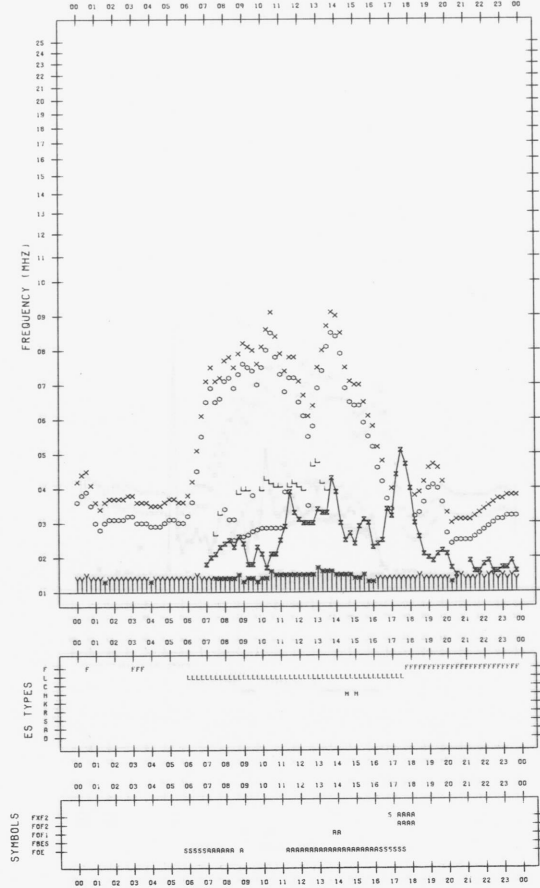


F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO DATE : 1986/11/28

135°E MEAN TIME



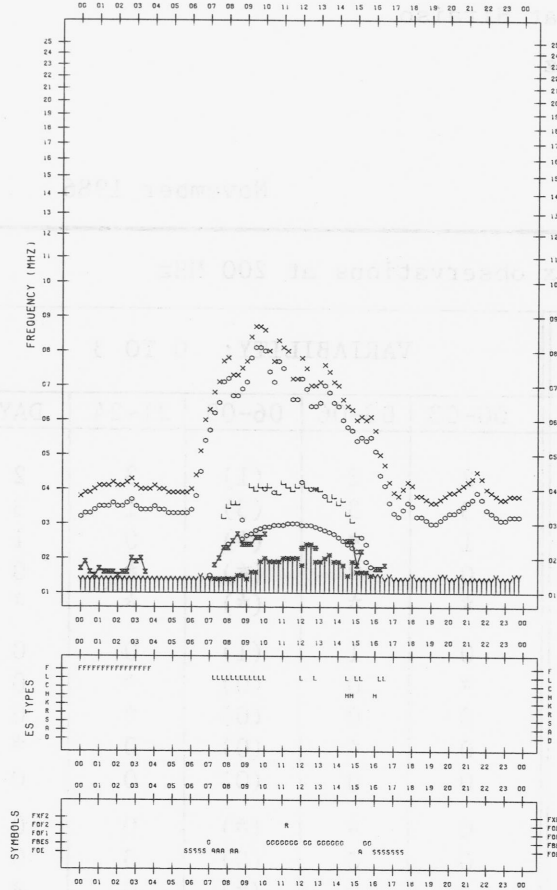
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1986/11/29

135°E MEAN TIME



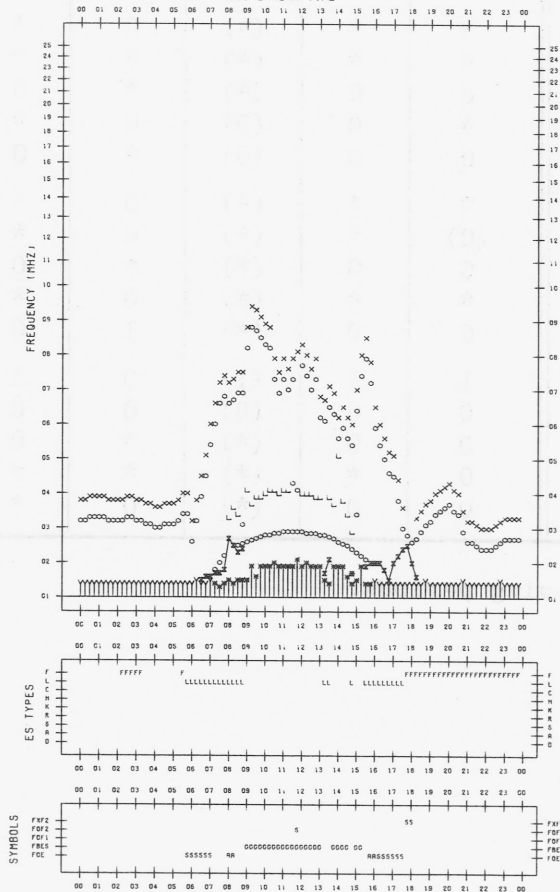
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1986/11/30

135°E MEAN TIME



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

Hiraiso

November 1986

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

Notes: 1. No observations during the following periods.

22nd 0100 - 0240

2. (q) likely quiet.

3. (*) interference.

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

Hiraiso

November 1986

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

Note: No observations during the following periods.

1st	0000 - 0100	13th	0450 - 0725
1st	2300 - 2nd	13th	2315 - 14th
7th	0000 - 0120	14th	0515 - 0725
7th	2300 - 2400	15th	0607 - 0725
11th	0440 - 0725	15th	2120 - 16th
12th	0300 - 0417	26th	2128 - 2336
12th	2300 - 13th	27th	2128 - 2339
	0150		

B. Solar Radio Emission
 b. Outstanding Occurrences at Hiraiso

Hiraiso

November 1986

Single-frequency observations								
Normal observing period: 2120 - 0735 U.T. (sunrise to sunset)								
NOV 1986	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY ($10^{-22} W_m^{-2} Hz^{-1}$)		POLARIZATION REMARKS
						PEAK	MEAN	
1	200	44 NS	2100E	0030	660D	40	25	MR
2	200	44 NS	2100E	2236	300D	7	4	WR
6	200	46 C	0220.1	0221.1	2.0	1700	230	0
	100	46 C	0220.5	0221.1	1.3	1000D	430D	-
	500	45 C	0220.7	0220.7	1.5	3	1	WR
	200	43 NS	0240	0546	280D	10	5	WR
	100	46 C	2158.7	2201.5	5.2	670	120	-
	200	41 F	2200.0	2200.7	4.8	570	-	0
	500	45 C	2202.5	2203.0	1.5	18	4	WR
	7	200	42 SER	0622.4	0623.4	4.0	74	-
100		45 C	0622.5	0623.6	2.0	820	390	-
8	500	8 S	0627.1	0627.6	0.6	18	-	0
9	500	8 S	0305.1	0305.1	0.9	6	-	0
25	200	44 NS	2136E	2346	580D	12	8	0

200	44 NS	2100E	0030	660D	40	25	MR
200	44 NS	2100E	2236	300D	7	4	WR
200	46 C	0220.1	0221.1	2.0	1700	230	0
100	46 C	0220.5	0221.1	1.3	1000D	430D	-
500	45 C	0220.7	0220.7	1.5	3	1	WR
200	43 NS	0240	0546	280D	10	5	WR
100	46 C	2158.7	2201.5	5.2	670	120	-
200	41 F	2200.0	2200.7	4.8	570	-	0
500	45 C	2202.5	2203.0	1.5	18	4	WR
200	42 SER	0622.4	0623.4	4.0	74	-	0
100	45 C	0622.5	0623.6	2.0	820	390	-
500	8 S	0627.1	0627.6	0.6	18	-	0
500	8 S	0305.1	0305.1	0.9	6	-	0
200	44 NS	2136E	2346	580D	12	8	0

Notes: No observations during the following periods:
 1st 0000 - 0100
 1st 0100 - 0150
 1st 0150 - 0200
 1st 0200 - 0230
 1st 0230 - 0245
 1st 0245 - 0300
 1st 0300 - 0315
 1st 0315 - 0330
 1st 0330 - 0345
 1st 0345 - 0400
 1st 0400 - 0415
 1st 0415 - 0430
 1st 0430 - 0445
 1st 0445 - 0500
 1st 0500 - 0515
 1st 0515 - 0530
 1st 0530 - 0545
 1st 0545 - 0600
 1st 0600 - 0615
 1st 0615 - 0630
 1st 0630 - 0645
 1st 0645 - 0700
 1st 0700 - 0715
 1st 0715 - 0730
 1st 0730 - 0745
 1st 0745 - 0800
 1st 0800 - 0815
 1st 0815 - 0830
 1st 0830 - 0845
 1st 0845 - 0900
 1st 0900 - 0915
 1st 0915 - 0930
 1st 0930 - 0945
 1st 0945 - 1000
 1st 1000 - 1015
 1st 1015 - 1030
 1st 1030 - 1045
 1st 1045 - 1100
 1st 1100 - 1115
 1st 1115 - 1130
 1st 1130 - 1145
 1st 1145 - 1200
 1st 1200 - 1215
 1st 1215 - 1230
 1st 1230 - 1245
 1st 1245 - 1300
 1st 1300 - 1315
 1st 1315 - 1330
 1st 1330 - 1345
 1st 1345 - 1400
 1st 1400 - 1415
 1st 1415 - 1430
 1st 1430 - 1445
 1st 1445 - 1500
 1st 1500 - 1515
 1st 1515 - 1530
 1st 1530 - 1545
 1st 1545 - 1600
 1st 1600 - 1615
 1st 1615 - 1630
 1st 1630 - 1645
 1st 1645 - 1700
 1st 1700 - 1715
 1st 1715 - 1730
 1st 1730 - 1745
 1st 1745 - 1800
 1st 1800 - 1815
 1st 1815 - 1830
 1st 1830 - 1845
 1st 1845 - 1900
 1st 1900 - 1915
 1st 1915 - 1930
 1st 1930 - 1945
 1st 1945 - 2000
 1st 2000 - 2015
 1st 2015 - 2030
 1st 2030 - 2045
 1st 2045 - 2100
 1st 2100 - 2115
 1st 2115 - 2130
 1st 2130 - 2145
 1st 2145 - 2200
 1st 2200 - 2215
 1st 2215 - 2230
 1st 2230 - 2245
 1st 2245 - 2300
 1st 2300 - 2315
 1st 2315 - 2330
 1st 2330 - 2345
 1st 2345 - 2400
 1st 2400 - 2415
 1st 2415 - 2430
 1st 2430 - 2445
 1st 2445 - 2500
 1st 2500 - 2515
 1st 2515 - 2530
 1st 2530 - 2545
 1st 2545 - 2600
 1st 2600 - 2615
 1st 2615 - 2630
 1st 2630 - 2645
 1st 2645 - 2700
 1st 2700 - 2715
 1st 2715 - 2730
 1st 2730 - 2745
 1st 2745 - 2800
 1st 2800 - 2815
 1st 2815 - 2830
 1st 2830 - 2845
 1st 2845 - 2900
 1st 2900 - 2915
 1st 2915 - 2930
 1st 2930 - 2945
 1st 2945 - 3000

C. Radio Propagation

b. Radio Propagation Quality Figures at Hiraiso

Hiraiso

Time in U.T.

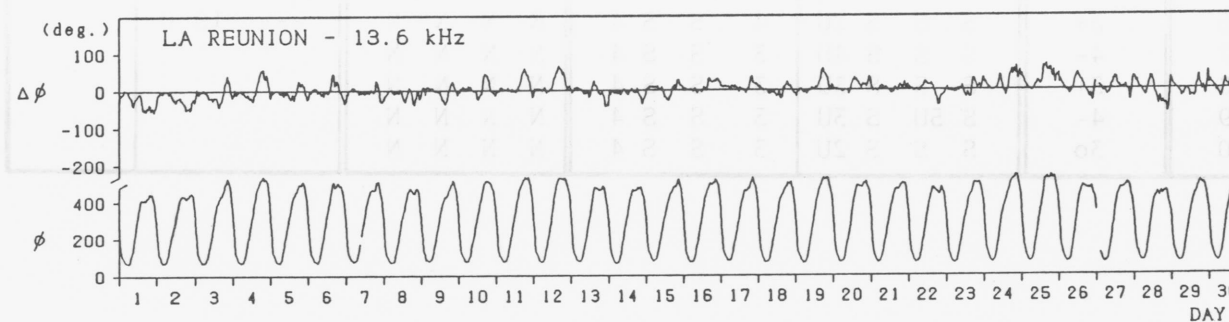
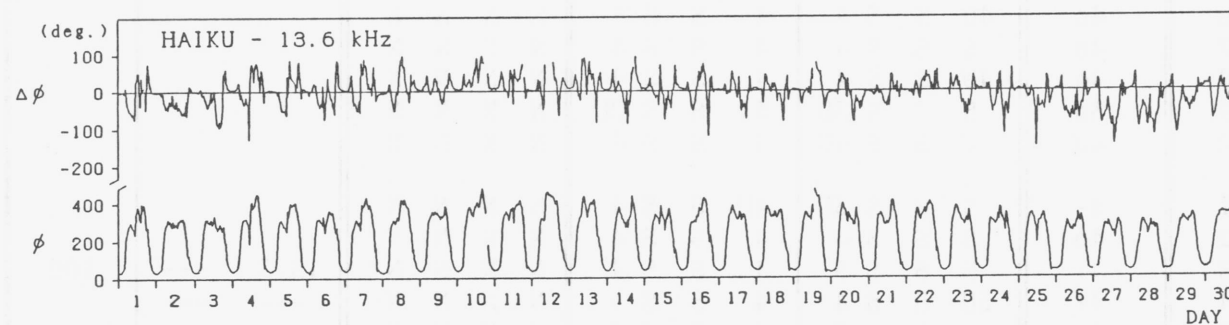
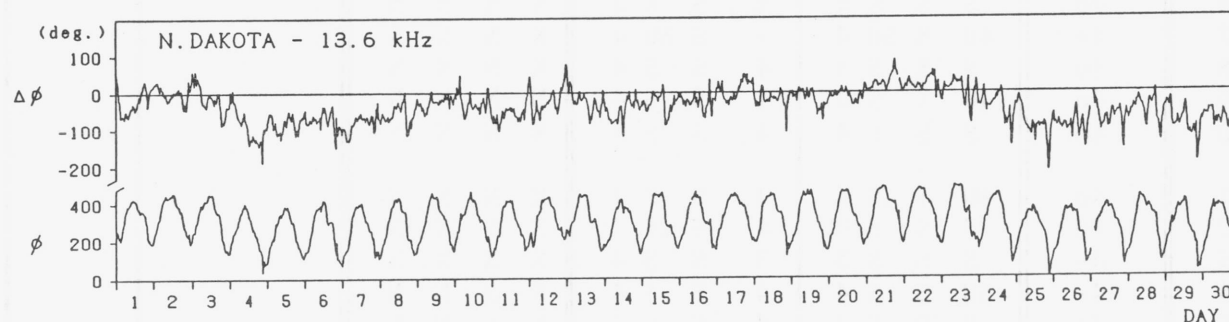
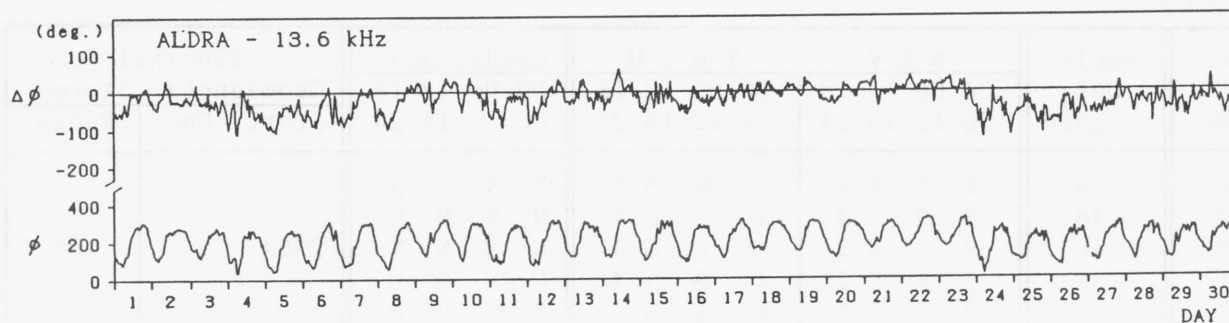
Nov. 1986	Whole Day Figure	W W V				W W V H				Conditions				Principal Geomagnetic Storms		
		00	06	12	18	00	06	12	18	00	06	12	18	Start	End	Range
		06	12	18	24	06	12	18	24	06	12	18	24			
1	4o	S	S	S	4	3	5U	S	4	N	N	N	N			
2	4o	S	S	S	4	4	S	S	4	N	N	N	N			
3	4o	S	C	C	4	C	C	C	4	N	N	N	N	2354	---	173
4	3+	S	S	S	2U	4	S	S	4	U	U	U	U	---	---	
5	4+	4U	S	S	4	4	5U	S	4	U	U	U	U	---	15.0	
6	4o	S	S	S	4	4	S	S	4	N	N	N	N			
7	4+	4U	S	5U	4	4	S	5U	4	N	N	N	N			
8	4o	S	S	S	4	4	S	S	4	N	N	N	N			
9	4o	4U	S	S	4	4	S	S	4	N	N	N	N			
10	4o	S	S	S	4	4	S	S	4	N	N	N	N			
11	4o	4U	S	S	4	4	S	S	4	N	N	N	N			
12	4o	S	S	S	4	4	S	S	4	N	N	N	N			
13	4-	S	S	S	3	4	S	S	4	N	N	N	N			
14	4-	3U	S	S	4	4	S	S	4	N	N	N	N			
15	4o	S	S	S	4	4	S	S	4	N	N	N	N			
16	4o	4U	S	S	4	4	S	S	4	N	N	N	N			
17	4o	S	S	S	4	4	S	S	4	N	N	N	N			
18	4o	4U	S	S	4	4	S	S	4	N	N	N	N			
19	3o	S	S	S	3U	4	S	S	2U	N	N	N	N			
20	4o	C	S	S	4U	4	S	S	4	N	N	N	N			
21	4-	S	S	S	3U	4U	S	S	4	N	N	N	N			
22	4o	S	S	S	4	4	S	S	4	N	N	N	N			
23	4+	S	S	S	5	4	S	S	4	N	N	N	N	13.3	---	100
24	4+	5U	S	S	4	4	S	S	4	N	N	N	N	---	---	
25	4-	S	S	S	3	4	S	S	4	N	N	N	N	---	---	
26	3+	S	S	S	2U	4	S	S	4	N	N	N	N	---	19.0	
27	4-	S	S	S	4U	3	S	S	4	N	N	N	N			
28	3+	S	S	S	3U	3	S	S	4	N	N	N	N			
29	4-	S	5U	S	3U	3	S	S	4	N	N	N	N			
30	3o	S	S	S	2U	3	S	S	4	N	N	N	N			

C. Radio Propagation

c. Phase Variations in OMEGA Radio Waves at Inubo

Inubo

November 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.

Nov. 1986	S W F					Correspondence					
	Drop-out Intensities (dB)				Start	Duration	Type	Imp.	Solar Flare	Solar Noise	Geomag. Crochet
	CO	HA	1)	2)							
						None					

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

(ii) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Nov. 1986	S P A					Time (U.T.)		
	Phase Advance (degrees)					Start	End	Maximum
Date	GBR	Ω /LR	NWC	Ω /H	Ω /ND			
1		18				0803	0914	0816
2		11				0737	0810	0739
6		11	8			0536	0614	0539
9		—	7	—	—	0306	0333	0315
13		7				0942	1000	0946
20		19				1000	1056	1011

IONOSPHERIC DATA IN JAPAN FOR NOVEMBER 1986

F-455 Vol. 38 No. 11 (Not for Sale)

電離層月報 (1986年11月)

第38卷 第11号 (非売品)

1987年2月23日 印刷

1987年2月27日 発行

編集兼 郵 政 省 電 波 研 究 所

発行所 〒184 東京都小金井市貫井北町4丁目2-1

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