

# IONOSPHERIC DATA IN JAPAN

FOR JULY 1986

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 TOKYO, JAPAN

## 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

$f_xI$	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 <sup>+</sup>
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 <sup>+</sup>

*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 atmospherics.

#### b. Radio Propagation Quality Figures at Hiraiso

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

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

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

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

C	artificial accident,
S	propagational accident,
U	inaccurate.

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

N	normal,
U	unstable,
W	disturbed

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

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

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

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

In each of the four figures, variations in phase ( $\phi$ ) and those in phase deviation ( $\Delta\phi$ ) are shown in the lower part and the upper one, respectively. Variations in phase ( $\phi$ ) are expressed by relative values at intervals of 30 minutes within every day (U.T.) (48 dots). An increasing value in this case denotes a phase delay. On the other hand, variations in phase deviation ( $\Delta\phi$ ) 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 those 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	$\Omega$ /N	13.6	10	7820
North Dakota	46° 22'N	098° 21'W	$\Omega$ /ND	13.6	10	9140
Haiku	21° 24'N	157° 50'W	$\Omega$ /H	13.6	10	6100
La Reunion	20° 58'S	055° 17'E	$\Omega$ /LR	13.6	10	10970

# IONOSPHERIC DATA

JUL. 1986

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	WAKKANAI				Lat. 45 23.5 N	Long. 141 41.2 E	Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																							
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
1	X 50	X 45	X 42	X 42	41																A	A	A	A						
2	X 45	X 41	X 43	50	50	55															X 67	X 63	X 60	X 57						
3	X 40	X 38	A	40	37																X 61	X 57	X 56	X 53						
4	X 48	X 46	X 48	X 48																	X 59	X 59	X 56	X 55						
5	X 50	X 42	X 43	X 44																	X 66	X 63	X 61	X 54						
6	X 49	X 45	X 43	X 44	45																X 70	A	A	X 47						
7	X 41	X 40	X 42	X 48																	X 65	X 62	X 55	X 48						
8	A	A	X 45	X 45																	A	X 71	X 68	X 62						
9	X 57	X 55	X 56	X 55																	A	X 65	A	A						
10	A	X 50	X 47	X 48																	X 65	X 66	X 67	X 58						
11	X 51	X 45	X 42	X 45																	X 75	X 73	X 65	X 59						
12	X 56	X 49	X 48	X 46																	X 69	X 68	X 63	X 58						
13	X 52	X 48	X 48	X 46																	A	X 60	X 57	X 59						
14	X 54	X 55	X 47	X 45																	X 72	A	A	X 60						
15	X 53	X 48	X 49	X 45																	X 77	A	A	A						
16	A	A	A	A																	X 62	X 65	A	X 48						
17	X 45	A	X 44	X 40																	X 68	X 60	X 59	X 50						
18	X 47	X 46	X 44	X 43																	X 67	A	A	A						
19	A	A	A	44	40																X 68	X 65	X 61	X 51						
20	A	A	X 39	X 43																	X 72	X 67	X 64	X 57						
21	X 51	X 45	X 46	X 42																	X 79	X 72	X 56	A						
22	X 42	X 48	X 46	X 48																	X 82	A	X 73	X 71						
23	X 59	X 56	X 57	X 56																	X 65	X 66	X 63	X 60						
24	X 57	X 58	X 57	X 48	43																X 67	X 67	X 60	X 57						
25	X 51	X 50	X 55	X 57	50																X 67	X 54	X 51	X 51						
26	X 49	X 46	X 44	X 46																	X 71	X 68	A	X 46						
27	A	X 44	X 43	X 43																	X 65	X 67	X 62	X 52						
28	X 50	X 43	X 42	X 40																	X 62	X 60	A	A						
29	A	A	A	38	42																X 60	X 57	A	A						
30	X 50	X 45	A	X 40																	X 68	X 61	X 57	X 47						
31	X 44	X 47	X 46	X 45																	X 48	X 50	X 51	X 51						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	24	25	26	30	8	1															27	25	21	24						
MED	X 50	X 46	X 46	X 45	42	55															X 67	X 65	X 60	X 54						
UQ	X 52	X 42	X 43	X 48	48																X 70	X 67	X 63	X 58						
LQ	X 46	X 45	X 43	X 43	40																X 65	X 60	X 56	X 50						

JUL. 1986

FXI (0.1 MHz)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JUL. 1986

FOF2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	WAKKANAI																							
Lat.	45° 23.5' N											Long 141° 41.2' E												
Sweep	1 MHz to 25 MHz in 24 sec in automatic operation																							
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	43	38	35	35	F 35	40	48	55	46	A	A	49	51	A	45	A	44	47	47	45	A	A	A	A
2	38	34	36	F 38	F 43	50	A	A	48	46	A	46	A	A	48	50	A	A	54	60	F 52	F 50	F 50	
3	F 32	31	A	F 26	A	A	46	54	R	A	A	R	A	A	49	A	A	42	45	53	54	50	49	46
4	41	39	41	41	42	42	44	A	A	A	A	44	E G 41	A	A	A	A	A	A	A	52	52	49	48
5	43	35	36	37	39	40	43	41	43	47	48	46	A	R	44	45	44	45	49	58	59	56	54	47
6	42	38	36	37	F 38	39	42	41	A	56	54	46	49	50	49	44	A	50	50	51	63	A	A	40
7	34	33	35	41	45	45	47	42	A	R	A	53	50	46	43	43	43	43	49	51	58	55	48	41
8	A	A	38	38	37	42	45	A	47	56	56	A	49	A	R	A	45	46	50	54	A	64	61	55
9	50	48	49	48	47	48	56	67	59	51	46	46	A	52	A	49	46	45	A	A	A	58	A	A
10	A	43	40	41	43	40	41	A	A	A	A	48	A	46	46	R	43	43	44	53	58	59	60	51
11	44	38	35	38	38	40	44	50	50	53	51	A	51	50	A	51	45	45	45	56	68	66	58	52
12	49	42	41	39	39	43	41	A	44	A	55	49	49	50	47	45	45	44	49	55	62	61	56	51
13	45	41	41	39	38	44	47	52	51	54	A	49	49	55	A	A	A	A	50	53	A	53	50	52
14	47	48	40	38	36	41	47	44	52	49	52	49	A	46	A	A	44	49	55	64	65	A	A	53
15	46	41	F 38	F 35	40	42	A	A	A	A	A	A	50	52	A	A	A	A	A	A	70	A	A	A
16	A	A	A	A	A	45	43	A	A	49	A	52	53	46	49	49	A	A	A	A	55	58	A	41
17	38	A	37	33	34	A	A	54	A	A	A	A	50	57	A	A	A	53	53	64	61	53	52	43
18	40	39	37	36	39	51	A	57	A	49	49	A	49	A	A	46	49	A	A	A	60	A	A	A
19	A	A	A	F 36	F 36	A	50	61	A	A	50	53	V 53	52	49	48	44	47	51	57	61	58	54	44
20	A	A	32	36	38	A	51	59	62	55	54	A	A	52	50	A	A	A	A	61	65	60	57	50
21	44	38	F 37	35	36	43	A	A	A	51	52	56	49	52	51	49	49	A	A	66	72	65	49	A
22	35	F 36	F 41	42	49	57	65	68	A	50	48	A	48	46	50	A	52	57	67	75	A	66	64	
23	52	49	50	49	50	48	48	A	53	A	53	A	A E G 42	43	A	47	47	50	51	58	F 58	F 50	F 50	
24	F 36	F 36	F 36	F 36	F 36	42	A	A	A	46	A	A	45	45	R	43	44	45	43	A	60	60	53	F 50
25	F 42	F 42	F 42	F 42	F 41	40	50	53	A	56	A	51	50	53	50	44	47	47	45	55	60	47	44	44
26	42	39	37	39	39	49	43	A	53	54	52	61	52	46	45	48	A	A	52	59	64	61	A	39
27	A	37	36	36	36	33	R	44	43	48	A	47	A	A	A	48	46	50	A	57	58	60	55	45
28	43	36	35	33	29	A	39	45	41	A E G 41	A	A	A	A	A	A	A	A	A	55	53	A	A	
29	A	A	A	F 33	F 33	37	44	A	A	A	A	R	50	56	50	49	A	45	52	53	F 53	A	A	
30	43	38	A	33	32	35	40	A	45	44	R	49	48	46	51	45	51	53	48	56	61	54	50	40
31	37	40	39	38	34	37	A	A	42	E G 41	E G 41	A	43	43	45	45	A	49	A	44	41	43	44	44
CNT	22	23	24	23	28	26	24	18	17	18	17	18	20	22	18	19	19	20	20	24	27	23	19	22
MED	43	39	37	38	38	42	44	51	50	50	51	49	49	50	48	48	45	47	49	55	60	58	53	46
UQ	45	42	40	40	40	45	49	57	53	54	53	52	50	52	50	49	48	50	50	58	64	60	56	51
LQ	38	38	36	36	36	40	42	44	44	48	48	47	48	46	45	45	44	45	45	52	58	53	49	43

The Radio Research Laboratory, Japan

JUL. 1986

FOF2 (0.1 MHz)

# IONOSPHERIC DATA

JUL. 1986

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	WAKKANAI				Lat. 45° 23.5' N	Long 141° 41.2' E						Sweep 1	MHz to 25 MHz in 24 sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						320	U A 350	A	A	A	A	410	410	A	410	A	390	A	A					
2					250	A	360	A	A	410	410	A	U A 420	A	A	U A 400	U A 380	A	A					
3						A	A	A	U A 400	410	A	A	410	A	400	A	A	L 360	320					
4							350	A	A	A	A	400	410	A	A	A	A	A	A					
5						320	350	370	390	U A 400	420	420	A	410	400	400	380	U A 350	330					
6							360	380	A	A	410	410	410	410	410	400	A	U A 360	340					
7							360	380	A	420	A	410	420	420	410	400	380	350	340					
8							U A 350	A	A	A	A	A	U A 430	A	420	A	A	U A 360	A					
9					240	310	A	A	410	410	430	420	A	A	A	400	390	A	A	A				
10							350	A	A	A	A	410	A	410	410	410	390	360	330	A				
11						330	350	390	A	A	420	A	430	420	A	400	390	370	340					
12							370	A	A	A	A	A	420	420	430	410	410	L 370	A					
13							H 360	A	A	A	A	A	A	A	A	A	A	A	320					
14							360	390	400	410	420	420	A	430	A	A	400	U A 380	A					
15							360	A	A	A	A	A	A	430	A	A	A	A	A					
16							360	A	A	A	A	430	A	430	420	A	A	A	A					
17							A	A	A	A	A	A	420	420	A	A	A	A	340					
18							A	A	A	A	A	420	A	430	A	A	410	U A 390	A	A				
19							A	360	390	A	A	A	A	430	H 430	410	410	380	U A 360	A				
20							A	A	A	A	A	A	A	430	420	A	A	A	A					
21							A	A	A	A	420	A	A	430	430	420	420	A	A	A				
22						320	A	A	A	A	A	A	A	A	420	A	A	A	A					
23							A	360	A	A	A	A	A	420	410	A	390	U A 370	330					
24							A	A	A	A	420	A	A	410	410	400	400	380	U A 360	A				
25							320	A	A	A	A	A	420	U A 420	410	410	400	390	360	L 330				
26							390	A	U A 400	U A 420	410	A	430	410	410	400	A	A	A					
27							330	350	A	410	A	420	A	A	A	U A 400	A	350	A					
28							A	330	350	L 360	A	410	A	A	A	A	A	A	A					
29								370	A	A	A	A	430	410	400	400	390	A	320					
30							U A 290	340	A	390	A	410	420	410	420	H 410	400	H 390	360	A				
31							290	A	A	390	410	410	A	410	410	400	400	A	350	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					2	8	20	9	8	12	12	12	19	20	19	18	16	16	11					
MED					245	320	360	380	395	410	415	420	420	420	410	400	390	360	330					
UQ					320	360	390	400	420	420	420	420	430	425	415	410	390	365	340					
LQ					300	350	370	390	410	410	410	410	410	410	405	400	380	355	325					

JUL. 1986

FOF1 (0.01 MHz)

# IONOSPHERIC DATA

JUL. 1986

FOE (0.01 MHz)

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

Station		WAKKANAI							Lat. 45° 23' 5" N		Long 141° 41' 2" E		Sweep 1		MHz to 25		MHz in 24		sec in		automatic operation				
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						S	195	240	275	285	300	300	305	A	A	A	A	A	A	A	A				
2						A	A	225	285	295	305	320	315	315	A	310	A	A	A	205	130				
3						A	A	220	270	285	A	A	A	A	325	315	300	275	235	195	A				
4						A	A	235	270	290	305	310	320	315	310	A	A	A	A	195	A				
5						S	185	225	270	290	300	310	A	A	A	310	290	275	230	175	A				
6						A	185	245	275	285	300	305	310	310	305	300	270	A	A	A	S				
7						S	165	245	275	295	310	320	325	330	325	315	305	270	240	200	S				
8						A	190	250	280	295	300	310	A	A	A	310	A	290	245	175	A				
9						S	180	240	260	285	300	315	325	A	320	310	290	275	A	A	A				
10						S	175	225	260	280	300	310	A	A	A	300	290	275	250	210	A				
11						S	210	250	275	290	305	310	315	320	A	A	300	A	A	A	A				
12						S	200	235	260	290	305	315	320	A	A	A	305	275	240	210	S				
13						S	A	250	280	295	310	320	325	330	320	A	A	A	A	A	A				
14						S	190	240	275	290	305	315	335	335	325	310	300	285	255	200	A				
15						S	190	240	285	295	300	310	305	A	315	305	A	A	A	A	A				
16						A	A	A	265	285	300	310	320	A	A	A	A	A	A	A	A				
17						A	180	245	280	295	305	310	315	310	A	A	A	A	A	200	145				
18						A	195	240	265	285	300	310	315	320	A	A	305	290	250	190	S				
19						A	170	230	270	295	305	310	315	320	315	310	295	275	240	210	A				
20						A	175	215	260	280	305	A	A	A	315	310	300	290	245	185	A				
21						A	185	235	255	290	305	310	A	A	315	310	300	280	240	185	S				
22						S	185	240	275	285	305	310	A	A	A	315	310	290	235	180	S				
23						S	200	240	265	290	300	310	315	310	A	310	305	290	245	190	A				
24						A	190	220	260	290	300	310	A	A	A	320	300	285	235	190	A				
25						A	A	240	260	290	300	310	A	A	A	300	290	275	A	A	A				
26						S	155	225	275	290	305	A	A	A	A	A	A	285	240	185	A				
27						S	170	220	250	A	A	A	A	A	A	A	A	A	A	A	A				
28						S	165	215	250	280	300	305	310	310	A	A	A	275	230	190	S				
29						A	A	A	A	A	A	A	A	A	330	305	295	275	230	A	A				
30						A	150	210	250	285	300	305	310	315	315	300	290	280	235	185	S				
31						E	A	205	250	A	305	A	A	A	A	305	300	275	225	A	A				
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	23	29	30	28	28	25	18	13	13	20	20	21	19	20	2				
MED						E	185	235	270	290	302	310	315	315	315	310	300	275	240	190	138				
UQ							190	240	275	292	305	310	320	320	325	310	302	285	245	200					
LQ							172	225	260	285	300	310	310	310	315	305	290	275	235	185					

The Radio Research Laboratory, Japan

JUL. 1986

FOE (0.01 MHz)



# IONOSPHERIC DATA

JUL. 1986

FOES (0.1 MHZ)

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

Station	WAKKANAI				Lat. 45	23.5 N	Long 141	41.2 E	Sweep 1	MHz to 25 MHz in 24 sec in automatic operation															
	Hour Day	00	01	02						03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
1	J A 49	J A 32	26	32	J A 29	31	36	J A 59	J A 45	J A 76	60	34	35	62	40	J A 61	47	50	J A 52	J A 40	J A 98	J A 73	J A 61	58	
2	31	32	J A 31	34	30	42	43	J A 63	J A 64	G	G	54	44	J A 56	57	J A 42	40	60	J A 65	J A 50	50	52	J A 51	36	
3	35	30	J A 58	J A 33	31	50	J A 63	J A 60	J A 62	40	J A 70	J A 71	J A 58	J A 115	J A 118	J A 57	J A 49	J A 71	26	J A 47	J A 48	J A 63	J A 50	J A 46	
4	J A 28	J A 37	J A 25	J A 33	J A 35	J A 27	32	J A 53	J A 67	J A 83	J A 72	G	41	J A 57	J A 69	J A 87	J A 108	J A 145	J A 135	J A 57	J A 37	J A 25	J A 32	30	
5	31	20	23	E S 12	20	28	33	33	39	J A 59	J A 50	45	J A 68	35	G	35	32	J A 55	J A 57	J A 35	29	J A 25	31	27	
6	26	J A 28	J A 49	J A 35	26	27	34	45	J A 64	J A 57	40	39	J A 50	43	42	37	J A 64	J A 43	J A 56	J A 32	31	J A 77	J A 85	30	
7	J A 49	J A 26	J A 35	30	24	32	J A 37	J A 50	J A 63	39	J A 63	43	G	G	G	G	G	G	G	33	24	26	24	27	J A 27
8	J A 49	J A 64	J A 49	J A 61	J A 31	G	38	J A 58	48	J A 49	J A 67	J A 123	J A 47	J A 60	G	J A 65	J A 98	J A 65	J A 137	J A 97	J A 109	J A 75	J A 64	J A 49	
9	27	26	E S 14	23	E S 16	G	J A 54	52	J A 53	J A 54	J A 64	G	55	J A 72	58	38	38	J A 63	J A 69	J A 86	J A 97	J A 60	J A 119	J A 73	
10	J A 52	J A 30	J A 34	36	31	26	33	J A 58	J A 57	54	J A 78	38	47	36	34	G	34	29	30	38	26	22	21	26	
11	24	E S 11	E S 13	E S 16	G	15	32	43	J A 57	J A 58	40	55	41	J A 50	J A 65	35	40	40	J A 60	J A 50	J A 46	J A 60	23	32	
12	30	J A 35	J A 36	J A 25	J A 25	23	34	J A 50	45	J A 73	J A 53	J A 59	J A 68	47	46	17	34	42	37	J A 50	J A 44	J A 35	J A 36	26	
13	31	24	26	J A 28	J A 29	J A 28	32	J A 47	J A 57	J A 47	J A 57	52	55	J A 71	J A 67	J A 77	J A 104	J A 85	J A 87	J A 73	J A 80	J A 49	J A 28	31	
14	29	J A 25	J A 25	24	28	24	32	J A 53	34	40	G	44	J A 93	56	112	53	J A 76	J A 43	J A 63	J A 63	J A 85	J A 144	J A 96	J A 60	
15	J A 63	J A 70	J A 62	J A 33	34	28	38	57	J A 83	J A 96	J A 65	J A 55	45	37	J A 52	J A 57	J A 93	J A 74	J A 128	J A 86	J A 67	J A 85	J A 60	J A 62	
16	J A 62	J A 49	J A 66	J A 73	J A 51	J A 49	J A 31	J A 66	J A 96	J A 68	J A 76	40	J A 54	40	J A 57	J A 75	J A 71	J A 102	J A 119	J A 151	J A 107	J A 133	J A 83	J A 119	
17	J A 64	J A 53	J A 59	J A 49	29	J A 50	J A 61	J A 58	J A 96	J A 65	J A 59	56	44	43	67	67	J A 67	J A 67	J A 54	30	23	32	J A 36	J A 53	J A 32
18	J A 40	J A 31	J A 45	J A 31	J A 25	44	J A 66	J A 67	J A 134	J A 94	J A 51	J A 52	50	J A 90	J A 80	34	J A 55	58	J A 86	J A 90	J A 83	J A 133	J A 130	J A 123	
19	J A 61	J A 70	J A 56	J A 52	32	48	32	34	J A 78	J A 85	J A 68	J A 78	G	G	40	J A 60	34	37	J A 59	25	J A 86	J A 85	J A 52	J A 48	
20	J A 60	J A 49	J A 32	26	35	J A 123	J A 49	J A 58	J A 67	J A 54	43	J A 67	J A 88	J A 59	J A 46	51	J A 69	J A 70	J A 64	J A 70	J A 77	J A 61	J A 56	J A 37	
21	J A 28	J A 36	J A 35	24	26	41	J A 65	J A 108	J A 107	J A 47	J A 60	J A 64	43	35	39	40	J A 48	J A 67	J A 65	J A 46	J A 50	J A 59	J A 51	J A 63	
22	J A 59	J A 56	J A 35	27	24	25	46	73	51	65	66	83	76	57	38	43	J A 65	J A 58	J A 97	J A 130	J A 49	J A 86	J A 76	J A 30	
23	J A 35	22	E S 16	24	E S 16	35	42	J A 64	J A 66	J A 61	43	J A 57	J A 56	42	40	J A 131	J A 63	40	J A 46	J A 60	J A 80	37	J A 60	36	
24	26	30	30	24	24	42	60	53	J A 63	38	48	J A 71	43	42	45	G	35	40	J A 59	J A 77	J A 25	J A 49	J A 36	J A 33	
25	26	26	J A 25	J A 25	J A 29	J A 25	J A 43	J A 64	J A 67	J A 59	J A 60	J A 67	J A 58	J A 42	22	G	G	J A 48	J A 56	J A 33	J A 27	J A 36	J A 50	J A 48	
26	27	27	J A 45	26	21	24	33	J A 55	42	J A 51	J A 43	J A 45	J A 74	42	42	44	J A 53	J A 55	J A 64	J A 51	J A 49	J A 49	J A 61	J A 34	
27	J A 49	30	30	26	24	24	33	J A 84	J A 60	J A 96	J A 37	43	65	76	84	55	J A 56	J A 54	J A 75	34	24	31	23	E S 16	
28	E S 16	20	26	J A 25	24	39	J A 35	33	34	J A 83	45	J A 75	J A 57	J A 63	J A 56	J A 83	J A 95	J A 94	J A 114	J A 60	J A 55	39	J A 74	J A 80	
29	J A 61	J A 50	J A 53	J A 35	40	33	27	38	J A 95	J A 70	J A 130	J A 66	37	37	55	43	J A 88	J A 85	J A 50	J A 44	44	32	J A 63	J A 52	
30	J A 52	J A 34	J A 53	35	22	29	37	54	J A 49	42	36	37	J A 53	36	40	G	33	J A 83	J A 63	J A 30	J A 30	37	40	21	
31	31	J A 40	27	J A 53	J A 46	30	J A 83	J A 50	J A 50	G	34	J A 87	40	35	43	45	J A 50	37	J A 65	J A 60	26	J A 41	30	31	
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J A 35	J A 31	J A 33	J A 30	28	29	37	J A 55	J A 62	J A 58	J A 59	55	50	43	46	44	J A 53	J A 55	J A 63	J A 50	J A 49	J A 49	J A 52	J A 36	
UQ	J A 52	J A 44	J A 49	J A 35	32	42	48	62	J A 67	J A 72	66	J A 67	J A 58	J A 60	J A 62	J A 60	J A 70	J A 70	J A 80	J A 72	J A 80	J A 74	J A 64	J A 55	
LQ	28	26	26	25	24	25	33	50	J A 50	47	43	43	43	37	40	35	36	42	J A 54	J A 36	30	J A 36	J A 34	30	

JUL. 1986

FOES (0.1 MHZ)

# IONOSPHERIC DATA

JUL. 1986

FBES (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	WAKKANAI				Lat.	45 23.5 N				Long.	141 41.2 E				Sweep	1 MHz to 25 MHz				in 24 sec in automatic operation					
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	30	25	24	21	19	29	35	52	44	A A 76	A A 60	G	34	A A 62	34	A A 61	36	41	40	36	A A 98	A A 73	A A 61	A A 58	
2	22	29	27	19	20	36	34	A A 63	A A 64	G	G	A A 54	42	A A 56	A A 57	40	38	A A 60	A A 65	41	47	22	30	26	
3	19	16	A A 58	19	17	A A 50	A A 63	40	40	39	A A 70	A A 71	38	A A 115	35	A A 57	A A 49	31	25	46	38	24	26	40	
4	17	16	24	22	22	16	G	A A 53	A A 67	A A 83	A A 72	G	38	A A 57	A A 69	A A 87	A A 108	A A 145	A A 135	A A 57	20	23	20	20	
5	21	E S 16	E S 12	E S 12	16	G	32	G	37	40	40	40	A A 68	34	G	G	G	35	30	22	17	20	16	16	
6	17	16	20	17	16	G	33	37	A A 64	54	G	37	40	40	36	37	A A 64	36	28	25	23	A A 77	A A 85	E S 16	
7	14	16	20	16	21	32	33	G	A A 63	36	A A 63	39	G	G	G	G	G	G	30	23	22	16	16	17	
8	A A 49	A A 64	31	16	25	G	35	A A 58	46	48	54	A A 123	43	A A 60	G	A A 65	43	36	41	44	A A 109	55	23	E S 16	
9	16	E S 11	E S 14	E S 12	E S 16	G	41	47	35	40	G	G	A A 55	47	A A 58	38	26	43	A A 69	A A 86	A A 97	46	A A 119	A A 73	
10	A A 52	24	29	30	21	G	G	A A 58	A A 57	A A 54	A A 78	38	A A 47	36	G	G	34	G	29	33	17	16	E S 16	E S 16	
11	16	E S 11	E S 13	E S 16	E S 15	G	G	36	46	45	36	A A 55	39	41	A A 65	35	32	32	31	36	23	32	E S 16	18	
12	18	25	16	25	16	15	34	A A 50	43	A A 73	46	46	39	40	36	17	33	34	34	32	40	32	30	16	
13	16	16	16	20	28	24	30	44	49	47	A A 57	46	48	54	A A 67	A A 77	A A 104	A A 85	28	39	A A 80	24	23	17	
14	18	17	13	E S 11	E S 14	G	30	G	G	37	G	G	A A 93	39	A A 112	A A 53	38	38	52	62	54	A A 144	A A 96	29	
15	27	22	28	21	20	28	33	A A 57	A A 83	A A 96	A A 65	A A 55	45	37	A A 52	A A 57	A A 93	A A 74	A A 128	A A 86	61	A A 85	A A 60	A A 62	
16	A A 62	A A 49	A A 66	A A 73	A A 51	31	30	A A 66	A A 96	45	A A 76	40	46	37	40	46	A A 71	A A 102	A A 119	A A 151	46	41	A A 83	30	
17	27	A A 53	33	17	16	A A 50	A A 61	46	A A 96	A A 65	A A 59	A A 56	40	39	A A 67	A A 67	A A 67	52	29	20	23	31	50	16	
18	20	20	20	16	16	37	A A 66	51	A A 134	47	40	A A 52	43	A A 90	A A 80	G	39	A A 58	A A 86	A A 90	31	A A 133	A A 130	A A 123	
19	A A 61	A A 70	A A 56	16	16	A A 48	30	34	A A 78	A A 85	43	46	G	G	G	G	G	36	34	23	51	50	41	21	
20	A A 60	A A 49	19	16	24	A A 123	46	56	55	41	34	A A 67	A A 88	36	46	A A 51	A A 69	A A 70	A A 64	43	50	32	47	32	
21	24	24	20	16	16	38	A A 65	A A 108	A A 107	34	46	46	39	G	37	35	46	A A 67	A A 65	44	40	28	41	A A 63	
22	25	28	16	E S 16	16	G	46	63	48	A A 65	46	47	A A 76	46	G	41	A A 65	50	54	55	32	A A 86	32	16	
23	33	E S 13	E S 16	E S 16	E S 16	31	34	A A 64	51	A A 61	43	A A 57	A A 56	33	36	A A 131	G	37	30	29	40	29	45	19	
24	16	16	16	16	16	37	A A 60	A A 53	A A 63	36	48	71	37	37	37	G	G	36	41	A A 77	21	30	29	30	
25	22	E S 16	16	16	23	20	41	47	A A 67	46	A A 60	40	42	35	22	G	G	G	34	29	31	18	25	24	38
26	E S 16	E S 13	16	E S 16	E S 16	G	28	A A 55	40	42	40	42	37	37	34	38	A A 53	A A 55	49	32	39	33	A A 61	33	
27	A A 49	16	17	16	E S 16	G	30	32	40	38	A A 87	40	A A 65	A A 76	A A 84	40	40	31	A A 75	26	16	20	E S 16	E S 16	
28	E S 16	E S 16	E S 16	16	17	A A 39	29	30	34	A A 83	38	A A 75	A A 57	A A 63	A A 56	A A 83	A A 95	A A 94	A A 114	A A 60	34	30	A A 74	A A 80	
29	A A 61	A A 50	A A 53	25	22	27	24	35	A A 95	A A 70	A A 130	A A 66	34	37	36	38	35	A A 85	30	40	40	19	A A 63	A A 52	
30	30	32	A A 53	27	18	27	34	A A 54	37	42	G	G	G	G	G	G	G	G	40	23	30	23	21	E S 13	
31	17	30	14	20	19	25	A A 83	A A 50	31	G	34	A A 87	33	33	G	37	A A 50	31	A A 65	30	16	22	18	20	
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	22	20	20	16	17	27	34	50	51	46	46	46	42	39	36	38	39	38	41	39	38	30	32	21	
UQ	32	30	28	20	21	36	44	A A 56	A A 67	A A 65	A A 62	A A 56	A A 52	55	A A 58	A A 57	A A 64	A A 64	A A 65	56	48	48	A A 61	39	
LQ	17	16	16	16	16	G	30	36	40	40	37	40	38	36	E G 22	G	29	34	30	30	22	23	22	16	

JUL. 1986

FBES (0.1 MHz)

# IONOSPHERIC DATA

JUL. 1986

FMIN (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

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

JUL. 1986

FMIN (0.1 MHz)

The Radio Research Laboratory, Japan

### IONOSPHERIC DATA

JUL. 1986

M(3000)F2 (0.01)

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

Station		WAKKANAI								Lat.	45 23.5 N			Long	141 41.2 E			Sweep	1 MHz to 25 MHz		in 24 sec		in automatic operation		
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		305	300	315	315	F 290	300	305	A	A	A	A	295	305	A	365	A	285	310	310	320	A	A	A	A
2		315	295	310	F	F 305	F 325	300	A	A	310	320	A	260	A	A	310	330	A	A	315	320	F 290	F	F 330
3		F 310	300	A	F	F 300	A	A	310	350	R	A	A	R	A	A	A	280	295	325	320	305	300	295	
4		290	290	295	300	310	310	300	A	A	A	A	245	G	A	A	A	A	A	A	A	305	305	300	295
5		290	300	305	300	305	295	310	280	265	305	335	280	A	R	260	290	285	310	295	320	320	315	330	310
6		295	315	310	300	F 315	310	305	265	A	A	335	265	285	310	310	270	A	320	320	295	315	A	A	325
7		310	310	315	305	335	375	330	275	A	R	A	325	335	310	245	275	290	290	310	310	320	330	310	295
8		A	A	310	315	310	355	355	A	A	340	A	A	285	A	R	A	A	305	300	305	A	300	325	310
9		320	300	295	290	295	290	295	315	320	335	265	295	A	315	A	305	310	A	A	A	A	325	A	A
10		A	285	300	295	300	305	265	A	A	A	A	310	A	280	285	R	280	290	290	300	310	310	325	315
11		320	295	295	295	320	305	320	315	310	340	335	A	310	320	A	350	335	310	290	295	295	325	305	305
12		310	310	300	310	315	355	245	A	A	A	345	315	285	320	275	285	270	305	305	315	320	320	325	330
13		315	290	300	300	310	335	295	330	A	350	A	280	A	A	A	A	A	A	320	300	A	320	295	310
14		295	310	300	305	305	290	300	315	325	265	325	310	A	290	A	A	270	305	310	A	305	A	A	300
15		305	305	F 300	F	325	325	315	A	A	A	A	A	295	330	A	A	A	A	A	A	330	A	A	A
16		A	A	A	A	A	355	305	A	A	325	A	315	340	245	295	305	A	A	A	A	310	325	A	290
17		310	A	A	305	345	A	A	315	A	A	A	A	275	315	A	A	A	A	300	315	320	305	A	290
18		300	300	320	315	300	315	A	310	A	A	290	A	305	A	A	280	295	A	A	A	320	A	A	A
19		A	A	A	F	F	A	290	325	A	A	290	320	285	V 330	305	290	275	310	320	325	310	325	335	295
20		A	A	280	310	310	A	A	A	340	325	355	A	A	325	310	A	A	A	A	310	305	335	340	325
21		300	315	F 325	315	300	280	A	A	A	315	305	340	270	305	290	285	A	A	A	300	325	345	335	A
22		295	F 315	F 310	305	305	290	300	A	340	A	310	A	A	A	290	300	A	A	A	295	305	A	320	320
23		330	325	310	F 285	300	305	290	A	A	A	330	A	A	G	270	A	320	300	300	315	320	F	F	F
24		F	F	F	F	F 285	295	A	A	A	345	A	A	290	290	R	270	285	315	A	A	310	335	320	F
25		F	F 295	F	F	F 290	315	300	300	A	355	A	295	280	320	310	270	295	320	310	320	320	295	290	295
26		310	300	310	300	305	340	280	A	340	300	275	315	325	290	250	285	A	A	A	305	305	340	A	300
27		A	295	300	305	305	350	R	305	265	355	A	295	A	A	A	310	290	300	A	305	280	295	310	290
28		300	315	300	310	305	A	270	315	340	A	G	A	A	A	A	A	A	A	A	A	310	305	A	A
29		A	A	A	F	F	340	325	305	A	A	A	A	R	300	340	315	305	A	310	325	320	F	A	A
30		300	290	A	305	320	300	295	A	315	260	R	285	295	280	295	280	310	340	295	310	325	300	300	310
31		295	295	300	315	315	325	A	A	265	G	G	A	260	260	270	310	A	325	A	335	290	295	285	295
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		22	23	23	23	28	26	23	15	12	16	16	17	19	20	18	19	17	17	17	23	27	23	18	22
MED		305	300	300	305	305	312	300	310	322	325	315	295	285	308	292	290	290	310	305	310	315	315	315	302
UQ		310	310	310	310	315	340	308	315	340	342	335	315	305	320	310	308	310	315	310	320	320	325	325	315
LQ		295	295	300	300	300	300	292	302	288	302	282	285	278	285	270	280	285	300	295	302	305	302	300	295

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M(3000)F2 (0.01)

# IONOSPHERIC DATA

JUL. 1986

M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station	WAKKANAI																							Lat.	45° 23.5' N		Long.	141° 41.2' E		Sweep	1	MHz to	25	MHz in	24	sec in	automatic operation							
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																				
1						A	A	A	A	A	A	A	415	400	A	390	A	A	A	A																								
2					320	A	A	A	A	395	415	A	A	A	A	A	A	A	A	A																								
3						A	A	A	A	A	A	A	390	A	380	A	A	L	335	335																								
4							350	A	A	A	A	425	A	A	A	A	A	A	A	A																								
5					345	A	385	A	A	A	A	A	A	390	405	385	395	A	A																									
6						A	A	A	A	415	385	A	A	390	A	A	A	A	A																									
7						A	370	A	380	A	A	A	380	405	390	385	380	375	A																									
8						A	A	A	A	A	A	A	A	A	355	A	A	A	A																									
9					325	330	A	A	390	A	420	405	A	A	A	A	360	A	A	A																								
10							370	A	A	A	A	A	A	390	390	380	385	365	A	A																								
11					335	355	A	A	A	405	A	A	420	A	A	375	370	350	A																									
12						A	A	A	A	A	A	A	A	A	375	380	365	A	A																									
13						H	360	A	A	A	A	A	A	A	A	A	A	A	A																									
14						360	370	400	415	415	415	A	A	A	A	A	A	A	A																									
15						A	A	A	A	A	A	A	A	370	A	A	A	A	A																									
16							375	A	A	A	A	A	A	390	A	A	A	A	A																									
17						A	A	A	A	A	A	A	A	A	A	A	A	A	A																									
18						A	A	A	A	A	A	A	A	A	A	365	A	A	A																									
19						A	350	370	A	A	A	A	395	400	H	390	390	390	A	A																								
20						A	A	A	A	A	415	A	A	390	A	A	A	A	A																									
21						A	A	A	A	405	A	A	400	395	A	375	A	A	A																									
22						345	A	A	A	A	A	A	A	A	380	A	A	A	A																									
23						A	A	A	A	A	A	A	A	390	380	A	360	A	A																									
24						A	A	A	A	405	A	A	390	390	A	375	340	A	A																									
25						345	A	A	A	A	A	A	A	390	390	375	360	A	A																									
26							370	A	A	A	A	A	350	A	360	A	A	A	A																									
27							A	A	A	A	A	A	A	A	A	A	A	A	A																									
28						A	A	370	A	A	A	A	A	A	A	A	A	A	A																									
29								A	A	A	A	A	390	A	375	A	A	A	A																									
30						A	A	A	A	A	415	380	390	375	H	360	370	H	335	360	A																							
31						A	A	A	380	375	395	A	425	375	395	A	A	A	A																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																				
CNT					2	5	8	5	3	6	8	6	11	13	16	11	11	5	1																									
MED					322	345	360	370	390	400	415	410	390	390	385	375	365	360	335																									
UQ					345	370	370	395	405	415	415	400	390	390	382	382	365																											
LQ					335	352	370	385	380	410	385	390	390	375	375	360	350																											

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M(3000)F1 (0.01)

# IONOSPHERIC DATA

JUL. 1986

H<sup>o</sup>F<sub>2</sub> (KM)

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

Station	WAKKANAI				Lat. 45° 23' 5" N				Long 141° 41' 2" E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation											
	Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22
1						340	325	A	A	A	A	490	360	A	550	A	370	320	305					
2					310	315	A	350	A	A	350	350	A	490	A	A	365	305	A	A				
3						A	A	330	280	R	A	A	R	A	330	A	A	L	370	330				
4						330	A	A	A	A	A	565	G	A	A	A	A	A	A	A				
5						350	330	440	475	360	310	440	A	R	505	390	405	340	320					
6						345	510	A	A	300	480	400	350	335	455	A	360	290						
7						300	445	A	R	A	320	325	375	550	450	400	380	300						
8						260	A	A	300	A	A	400	A	R	A	A	350	320						
9					305	340	330	300	260	305	455	400	A	355	A	350	345	A	A	A				
10						455	A	A	A	A	A	365	A	435	400	R	355	385	355	295				
11						340	325	305	350	310	345	A	355	345	A	300	305	350	350					
12						555	A	A	A	285	350	A	415	345	450	400	420	315	300					
13						350	300	A	305	A	425	A	A	A	A	A	A	A	290					
14						330	345	320	430	350	350	A	400	A	A	450	340	A						
15						325	A	A	A	A	A	375	315	A	A	A	A	A	A					
16						345	A	A	335	A	355	310	560	375	350	A	A	A	A					
17						A	A	330	A	A	A	A	435	340	A	A	A	A	305					
18					300	A	310	A	A	400	A	355	A	A	425	360	A	A						
19						A	355	285	A	A	395	340	380	325	355	395	425	325	295					
20						A	A	A	A	305	290	A	A	340	350	A	A	A	A					
21						A	A	A	A	345	375	290	435	355	385	410	A	A	A					
22						310	A	A	260	A	355	A	A	A	405	360	A	A	A					
23						300	325	A	A	A	305	A	A	G	500	A	325	350	300					
24						A	A	A	A	310	A	A	445	425	R	480	400	315	A					
25						270	335	A	A	260	A	375	400	335	350	460	380	310	310					
26						435	A	295	355	410	305	340	405	555	400	A	A	A						
27						R	350	475	295	A	395	A	A	A	350	380	325	A						
28						A	455	330	305	A	G	A	A	A	A	A	A	A						
29							355	A	A	A	A	R	365	315	350	345	A	310						
30						365	400	A	345	A	R	400	370	430	350	455	340	265	300					
31						305	A	A	515	G	G	A	530	515	450	370	A	290	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					2	11	21	14	11	15	16	17	19	20	18	19	17	17	16	1				
MED					308	315	335	330	320	310	352	375	400	360	392	395	370	340	305	295				
UQ					340	355	355	412	352	405	425	435	428	500	438	400	350	320						
LQ					302	325	305	288	305	308	350	358	342	350	355	345	315	300						

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H<sup>o</sup>F<sub>2</sub> (KM)

# IONOSPHERIC DATA

JUL. 1986

H'F (KM)

135° E Mean Time (G.M.T. + 9 h)

Station		WAKKANAI							Lat.	45° 23.5' N			Long	141° 41.2' E			Sweep 1 MHz to 25 MHz in 24 sec in automatic operation										
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	A	A	A	270	255	A	A	A	A	A	A	200	200	A	215	A	A	A	A	A	A	A	A	A			
2	280	300	300	275	A	A	A	A	A	210	200	A	A	A	A	A	A	A	A	A	A	285	A	245			
3	250	280	A	275	250	A	A	A	A	A	A	A	230	A	230	A	A	250	250	A	A	260	295	A			
4	245	295	285	270	260	200	250	A	A	A	A	195	A	A	A	A	A	A	A	A	270	255	265	255			
5	255	260	260	255	250	215	A	205	A	A	A	A	A	200	200	205	220	A	A	250	230	255	235	240			
6	250	250	260	285	230	210	A	A	A	A	200	200	A	A	210	A	A	A	A	285	250	A	A	215			
7	255	275	275	255	235	235	A	220	A	210	A	A	205	200	200	200	220	205	A	260	250	215	225	250			
8	A	A	A	245	255	225	A	A	A	A	A	A	A	A	A	H	200	A	A	A	A	A	240	240			
9	235	245	245	255	255	250	A	A	205	A	195	205	A	A	A	A	230	A	A	A	A	A	A	A			
10	A	290	A	A	280	240	215	A	A	A	A	A	A	235	200	220	215	220	A	A	250	255	235	220			
11	235	240	240	250	245	225	225	A	A	A	205	A	190	A	A	240	225	210	A	A	265	240	240	250			
12	245	290	275	250	245	205	A	A	A	A	A	A	A	A	225	200	240	A	A	270	A	250	255	235			
13	245	255	255	255	A	220	240	A	A	A	A	A	A	A	A	A	A	A	A	A	A	250	290	260			
14	255	245	250	250	250	250	240	220	205	205	200	205	A	A	A	A	A	A	A	A	A	A	A	A			
15	A	260	A	255	245	A	A	A	A	A	A	A	A	210	A	A	A	A	A	A	A	A	A	A			
16	A	A	A	A	A	255	210	A	A	A	A	A	A	A	215	A	A	A	A	A	A	A	A	A			
17	300	A	A	290	240	A	A	A	A	A	A	A	A	A	A	A	A	A	A	235	225	290	A	285			
18	280	260	255	255	250	A	A	A	A	A	A	A	A	A	A	235	A	A	A	A	A	A	A	A			
19	A	A	A	250	255	A	230	230	A	A	A	A	205	200	200	220	220	A	A	250	A	A	A	270			
20	A	A	A	285	275	300	A	A	A	A	195	A	A	205	A	A	A	A	A	A	A	235	A	255			
21	250	A	260	250	255	A	A	A	A	195	A	A	A	215	200	A	235	A	A	A	A	255	220	A			
22	A	A	275	250	250	240	A	A	A	A	A	A	A	A	200	A	A	A	A	A	265	A	250	240			
23	A	235	240	230	270	A	A	A	A	A	A	A	A	200	225	A	215	A	A	265	A	255	A	250			
24	250	260	255	225	300	A	A	A	A	205	A	A	A	215	225	A	H	225	A	A	A	255	250	275	250		
25	230	250	265	250	275	230	A	A	A	A	A	A	A	205	205	225	210	A	A	A	230	280	295	A			
26	240	255	275	255	250	220	215	A	A	A	A	A	A	250	A	215	A	A	A	A	285	A	A	A			
27	A	260	270	285	245	230	A	A	A	A	A	A	A	A	A	A	A	A	A	A	270	255	250	260			
28	250	265	255	250	295	A	A	225	A	A	A	A	A	A	A	A	A	A	A	A	A	A	275	A			
29	A	A	A	A	270	A	225	A	A	A	A	A	200	A	220	A	A	A	A	A	A	A	275	A			
30	A	A	A	A	265	A	A	A	A	A	200	215	215	220	205	225	240	215	A	275	245	265	275	225			
31	280	A	270	280	265	A	A	A	215	195	200	A	190	205	H	225	A	A	A	A	250	260	290	280	280		
CNT	23	21	21	27	28	16	9	5	3	6	8	6	11	13	16	11	11	5	1	10	17	21	15	20			
MED	250	260	260	255	255	228	225	220	205	205	200	202	205	205	208	220	220	215	250	262	255	255	255	250			
UQ	265	275	275	272	268	240	240	225	210	210	200	205	215	215	222	230	228	220		275	265	275	278	260			
LQ	245	250	255	250	248	218	215	220	205	195	198	200	200	200	200	202	218	210		250	250	250	240	240			

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H'F (KM)

The Radio Research Laboratory, Japan

### IONOSPHERIC DATA

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H<sup>o</sup>E (KM)

135° E Mean Time (G.M.T. + 9 h)

Station		WAKKANAI				Lat.	45° 23.5' N					Long 141° 41.2' E					Sweep 1 MHz to 25 MHz in 24 sec in automatic operation								
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						S	130	110	105	105	105	105	110	A	A	A	105	A	A	A	A				
2						A	A	A	110	110	110	105	110	105	105	105	105	105		A	110	115			
3						A	A	110	105	105	105	105	A	A	105	105	105	105	115	115	A				
4						A	A	120	105	105	105	110	105	110	105	105	A	A	A	110	A				
5						S	110	105	105	105	105	105	105	105	A	105	A	105	105	105	A				
6						A	120	110	105	105	105	105	110	105	105	105	105	A	A	A	S				
7						S	110	105	105	105	105	105	105	105	105	105	105	105	105	110	S				
8						A	105	105	105	105	105	105	105	105	105	105	115	115	105	110	A				
9						S	120	105	105	105	105	105	105	105	105	105	110	A	A	A	A				
10						S	105	105	105	105	105	110	105	A	105	105	105	105	105	110	A				
11						S	125	105	105	105	110	105	105	105	A	A	110	A	A	A	A				
12						S	135	105	105	105	105	105	105	A	105	105	105	105	115	A	S				
13						S	A	105	105	105	105	105	105	105	110	105	105	A	A	A	A				
14						S	110	105	105	105	105	105	105	105	105	110	110	105	110	115	A				
15						S	115	110	110	105	110	105	105	105	105	105	A	A	A	A	A				
16						A	A	A	105	105	105	105	105	105	105	A	A	A	A	A	A				
17						A	115	105	105	105	105	105	105	105	A	A	A	A	A	120	110				
18						A	110	105	105	105	110	110	105	105	A	A	105	110	105	110	S				
19						A	115	105	105	105	105	105	105	105	105	110	110	110	110	110	A				
20						A	110	105	105	105	105	105	105	A	105	105	105	105	105	110	A				
21						A	115	115	105	105	105	105	A	A	A	100	105	110	110	110	S				
22						S	125	110	110	105	105	105	105	A	A	105	105	115	105	110	S				
23						S	115 <sup>H</sup>	105	105	105	110	110	110	110	110	110	110	110	110	110	A				
24						A	115	110	105	105	105	105	105	105	A	A	105	A	105	110	A				
25						A	A	110	105	105	105	105	105	105	105	110	115	125	A	A	A	A			
26						S	110	110	105	105	105	105	105	A	A	A	A	105	105	105	A				
27						S	110	105	105	105	A	A	A	A	A	A	A	A	A	A	A				
28						S	115	110	105	105	110	105	110	110	105	A	A	110	110	110	S				
29						A	A	A	A	A	A	A	A	A	105	110	105	105	110	A	A				
30						A	115	110	110	110	110	105	110	110	110	115	110	110	110	110	S				
31						E	115	110	110	105	110	105	A	A	A	105	110	110	110	A	A				
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							24	28	30	30	29	29	26	21	19	22	23	20	19	19	2				
MED							115	105	105	105	105	105	105	105	105	105	105	108	110	110	112				
UQ							118	110	105	105	110	105	110	105	105	110	110	110	110	110					
LQ							110	105	105	105	105	105	105	105	105	105	105	105	105	110					

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H<sup>o</sup>E (KM)



### IONOSPHERIC DATA

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H°ES (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	WAKKANAI				Lat. 45° 23' 5" N				Long 141° 41' 2" E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																	
	Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1		105	105	100	100	100	125	115	110	105	105	105	110	105	105	105	105	105	100	100	115	120	115	105	105					
2		105	100	100	100	100	100	100	115	115	110		G	G					105	115	120	115	110	105	110	105				
3		105	105	100	105	105	115	110	110	105	110	105	100	110	115	115	110	110	105	110	120	115	110	110	105					
4		105	100	100	100	100	100	125	115	110	110	105		G					105	105	105	105	115	120	115	115	105	105	105	105
5		100	105	105		S				120	125	125	130	125	105	105	105													
6		105	105	100	100	100	125	110	110	105	105	110	110	105	105	105	105	105	130	125	115	120	120	105	105					
7		105	100	100	100	125	115	120	115	105	115	105	105		G	G	G	G	G	G		115	110	115	115	110	105			
8		105	105	100	120	100	G			125	115	110	110	105	105	105	105		G		120	115	110	110	105	110	110	105	110	
9		105	105		S	105	S	G		110	105	110	115	125		G					115	105	100	105	120	120	110	105		
10		105	100	100	100	100	105	115	110	110	105	105	105	105	175	155				G	125	140	115	110	110	110	110	105		
11		105		S	E	S	S			105	120	120	110	110	110	105	105	105	105	110	105	105	110	110	105	105	100	105		
12		105	105	105	100	105	100	125	120	115	110	105	105	105	105	105	105	100	140	120	115	105	110	110	105	105				
13		105	100	100	100	100	100	125	125	115	110	110	110	115	105	105	105	100	100	110	105	100	100	100	110					
14		105	105	105	125	100	150	130	115	110	115		G		140	120	120	115	120	115	115	110	105	105	105	105	105			
15		110	110	105	100	105	115	125	120	105	110	105	105	105	105	120	105	100	110	100	110	110	110	110	110	110	105			
16		105	105	100	110	100	100	105	110	105	105	105	105	105	105	105	100	115	120	110	110	110	115	110	105	110				
17		130	105	105	120	100	115	115	115	105	105	105	105	105	105	105	125	120	120	120	115	125	110	110	105	105				
18		105	105	105	105	105	120	110	110	105	110	110	110	110	105	110	130	125	120	115	110	110	115	110	115	115				
19		105	110	105	105	100	120	115	115	110	105	105	105		G	G			125	125	140	125	110	110	105	105	105	105		
20		105	100	100	100	120	105	115	105	105	105	105	105	105	105	105	105	130	125	115	110	105	105	105	100	105				
21		100	105	100	100	100	120	110	105	105	105	105	100	100	100	145	135	120	110	110	105	105	115	100	100	100				
22		120	105	125	105	105	125	115	110	105	105	105	105	100	105	115	135	120	120	110	105	110	110	120	105					
23		100	105		S	105	S			125	125	115	110	110	110	110	110	110	110	125	115	120	115	110	105	110	110	105	105	
24		100	100	100	105	105	120	115	115	110	105	105	105	105	100	135			G	135	125	110	105	105	105	105	105			
25		105	105	100	100	100	100	115	110	105	105	105	105	105	105	105	105	105	100	100	100	115	110	105	105	105				
26		105	105	105	105	110	125	115	110	110	105	105	105	105	105	105	100	100	125	110	110	105	105	105	105	105				
27		100	100	105	105	105	130	125	110	105	135	105	105	105	115	105	100	100	100	100	120	110	105	105		S				
28		S				135	125	125	125	115	115	125	125	115	115	110	110	105	105	125	115	110	110	110	110	105	105	105		
29		100	110	105	105	100	100	100	115	115	110	110	105	105	165	110	110	110	110	105	105	110	120	110	105	105				
30		105	100	100	105	105	115	115	115	115	115	115	115	115	120	115			G	125	120	110	115	110	110	105	100			
31		105	100	120	115	115	115	110	115	110		G		105	105	105	100	120	115	120	115	105	105	115	105	105	105			
CNT		30	30	28	29	28	29	31	31	31	29	29	29	29	29	29	28	27	30	30	31	31	31	31	31	31	30			
MED		105	105	100	105	102	115	115	115	110	110	105	105	105	105	105	110	118	112	110	110	110	110	110	105	105				
UQ		105	105	105	105	105	125	125	115	110	110	110	110	110	110	118	120	125	120	112	115	110	110	110	105	105				
LQ		105	100	100	100	100	105	112	110	105	105	105	105	105	105	105	105	110	105	110	105	105	105	105	105	105				

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H°ES (KM)

# IONOSPHERIC DATA

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TYPES OF ES

135° E Mean Time (G.M.T. + 9 h)

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

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TYPES OF ES

# IONOSPHERIC DATA

JUL. 1936

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	AKITA				Lat. 39 43.5 N	Long. 140 08.0 E	Sweep 1 MHz to 25 MHz in 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	43	A	38	40																X 58	A	A	50	
2	A	A	A	A	A															62	A	73	73	65	
3	62	60	59	55	40																X 66	X 57	X 56	52	
4	52	A	54	52	50	50															62	62	60	60	
5	57	51	48	X 45	X 44																X 65	X 65	X 57	X 52	
6	X 46	X 44	44	44	41																X 63	63	A	60	
7	50	50	50	46	50																X 66	X 60	X 53	X 50	
8	X 46	52	50	50	48																X 65	63	63	59	
9	60	51	48	51	52	52															68	60	A	53	
10	A	A	A	48	40	46															X 66	X 66	X 62	X 59	
11	X 50	X 47	X 44	X 41	42																	74	74	60	62
12	52	59	53	53	46																X 75	65	62	60	
13	A	51	A	50	48																X 64	X 61	X 60	62	
14	55	58	58	56	52	50															X 66	A	62	62	
15	58	57	58	53	50																X 62	A	A	A	
16	A	A	A	A	A															60	73	60	50	A	
17	A	A	43	43	A																64	A	59	52	
18	A	A	48	39	A																63	54	50	52	
19	50	50	50	44	42																X 66	60	62	63	
20	50	A	44	41	50																72	71	A	69	
21	64	53	54	52	43				61												86	77	64	46	
22	50	44	51	53	53	54	62	74													81	80	80	70	
23	62	53	60	60	58	54	58	60													X 71	X 51	53	52	
24	54	59	54	53	50	49															X 63	64	61	60	
25	A	A	A	62	58																X 63	X 54	59	62	
26	A	50	A	50	49																X 76	X 70	64	59	A
27	A	53	49	40	40																X 66	X 61	69	67	59
28	53	53	48	47	40																A	A	62	A	61
29	A	A	51	53	39																X 58	X 53	48	50	52
30	52	52	49	40	40																X 62	68	62	61	59
31	54	52	53	49	44	53															X 47	X 46	X 47	X 46	49
	00	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	22	24	29	27	7	3	2	1											7	29	27	25	28	
MED	52	52	50	50	46	50	58	67	61												X 62	X 66	62	60	59
UQ	58	58	54	53	50	53	60														X 64	X 70	66	62	62
LQ	50	50	43	44	40	50	56														X 59	X 63	60	56	52

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FXI (0.1 MHz)

### IONOSPHERIC DATA

JUL. 1986

F0F2 (0.1 MHz)

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

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

JUL. 1986

F0F2 (0.1 MHz)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JUL. 1986

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	AKITA				Lat.	39 43.5 N		Long	140 08.0 E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation													
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	A	390	A	A	A	A	A	A	A	A	A	A					
2							A	A	A	A	A	A	420	420	A	A	A	A	A					
3							A	A	A	A	A	A	A	A	A	A	A	A	A					
4									A	A	A	A	A	A	A	A	A	A	A					
5									310	350	380	400	410	410	A	A	A	A	A	A				
6									360	A	A	A	A	A	A	400	A	A	330					
7									A	A	A	420	A	A	A	A	390	A	320					
8							L	380	A	A	A	A	A	430	A	A	410	400	360	A				
9									290	340	360	A	430	A	A	A	A	A	L					
10										340	A	A	A	A	A	420	A	400	390	360	A			
11									330	A	400	A	A	A	450	A	A	410	A	380	A			
12									360	390	A	A	A	A	430	A	430	390	360	L				
13									360	A	A	A	A	A	A	A	400	370	A					
14							L	L	A	A	A	420	430	A	A	A	410	390	A	A				
15									A	A	380	A	410	A	A	A	A	390	A	330				
16									L	380	A	A	A	A	A	A	A	A	A	A				
17									A	A	A	A	A	A	A	A	A	A	A	A				
18									A	A	A	A	A	A	A	A	400	390	380	330				
19									300	360	A	A	A	A	440	420	430	430	A	A	370	A		
20									320	350	A	410	A	A	430	430	A	420	400	A	A	A		
21							L	A	A	420	A	A	A	430	430	420	430	A	360	A				
22							L	A	A	A	A	A	430	A	430	420	410	A	A	A				
23									A	A	A	A	A	430	A	A	400	390	360	A				
24									330	A	A	A	A	420	420	A	420	A	A	A				
25									A	A	A	A	A	A	430	A	A	380	360	310				
26									L	A	390	A	A	A	A	A	410	400	370	A	A			
27									330	360	A	A	A	420	A	A	410	400	380	360	A			
28									260	330	370	A	A	A	A	A	A	A	A	A				
29									320	360	390	390	A	420	410	420	410	A	A	350	A			
30									A	A	A	L	410	410	A	A	A	400	390	380	A	L		
31									A	340	A	390	400	A	A	A	A	A	370	350	L			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						5	16	8	8	7	3	7	10	8	9	14	14	13	5					
MED						300	345	375	395	410	410	430	430	430	420	400	390	360	330					
UQ						310	360	380	405	415	415	430	430	430	420	410	390	370	330					
LQ						290	330	360	390	405	410	420	420	420	410	400	380	360	320					

JUL. 1986

FOF1 (0.01 MHz)

# IONOSPHERIC DATA

JUL. 1986

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station AKITA Lat. 39° 43.5' N Long 140° 08.0' E Sweep 1 MHz to 25 MHz in 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	220	255	A	A	A	A	A	A	A	A	A	A	A	A	S				
2					S	A	A	A	A	A	A	A	335	A	A	A	A	A	A	S				
3					S	210	A	A	A	A	A	A	A	310	295	275	A	A	S					
4					S	215	255	A	A	A	A	A	A	A	A	A	A	A	A	S				
5					S	220	255	A	A	A	A	A	A	A	A	A	A	A	A	S				
6					S	230	260	A	A	A	A	A	A	A	A	A	A	A	A	S				
7					S	220	A	295	A	A	A	A	A	A	A	A	A	A	A	S				
8					180	A	A	A	A	A	A	A	A	A	A	A	295	255	A	S				
9					S	A	A	A	A	A	A	A	A	A	A	A	A	A	A	S				
10					S	A	A	A	A	A	A	A	A	A	A	A	280	250	190	S				
11					S	A	270	A	A	A	A	A	A	A	A	A	A	A	A	S				
12					A	220	260	295	315	A	A	A	A	A	A	A	A	245	A	S				
13					A	230	A	A	A	A	335	A	A	A	A	A	A	A	A	S				
14					185	230	A	A	A	A	A	A	A	A	A	305	295	A	A	S				
15					A	A	A	A	A	A	A	A	A	335	325	305	290	245	A	S				
16					S	A	A	A	A	A	A	A	A	A	A	A	A	A	A	S				
17					S	A	A	A	A	A	A	A	A	A	A	A	A	A	A	S				
18					A	A	A	A	305	315	A	A	A	A	305	275	240	A	S					
19					S	205	255	295	A	325	A	A	335	325	305	280	240	A	S					
20					S	A	A	A	A	A	A	A	A	A	330	305	A	240	A	S				
21					S	A	A	A	A	A	A	A	A	335	305	280	240	A	S					
22					S	A	A	A	A	A	A	A	A	320	315	275	245	A	S					
23					S	210	A	A	305	A	A	A	A	A	305	A	A	A	S					
24					S	220	A	A	A	A	A	A	A	A	A	A	A	A	S					
25					S	A	A	A	A	A	A	A	A	A	A	A	280	A	S	S				
26					S	210	255	A	A	A	A	A	A	A	305	280	A	A						
27					S	210	250	A	A	A	340	345	340	A	A	A	A	A						
28					S	205	250	280	300	310	A	A	A	A	305	275	A	A						
29					S	A	A	A	A	A	A	335	330	A	A	A	A	A						
30					S	A	A	A	305	A	320	330	A	A	A	A	A	A						
31					S	A	A	A	A	A	A	A	A	A	315	A	A	A	S					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	15	10	4	5	3	3	4	4	7	11	12	9	1					
MED						182	220	255	295	305	315	335	335	335	325	305	280	245	190					
UQ						220	260	295	305	320	338	340	338	328	305	285	245							
LQ						210	255	288	305	312	328	332	332	318	305	275	240							

JUL. 1986

FOE (0.01 MHz)



# IONOSPHERIC DATA

JUL. 1986

FBES (0.1 MHZ)

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	A 50	A 18	A 44	A 23	A 18	A 25	A 32	A 78	A 37	A 59	A 106	A 49	A 48	A 66	A 74	A 84	A 42	A 43	A 38	A 20	A 19	A 60	A 65	A 25	
2	A 44	A 82	A 73	A 75	A 73	A 33	A 40	A 56	A 136	A 76	A 62	A 47	G	36	46	66	A 127	A 104	A 81	A 29	A 95	A 42	E 15	E 15	
3	28	27	28	E 15	E 15	29	A 70	A 122	44	A 176	A 180	A 64	A 75	A 124	A 126	A 94	A 84	36	33	24	30	23	22	19	
4	27	A 54	18	19	18	20	26	38	A 54	A 92	A 55	A 77	A 105	A 87	A 66	A 74	A 84	A 84	A 84	A 89	A 102	36	25	22	E 15
5	18	E 15	E 15	E 15	17	E 16	27	33	36	35	36	A 47	A 52	A 71	A 65	A 63	A 66	A 76	42	20	29	25	23	E 15	
6	18	24	E 15	23	21	20	30	39	A 65	48	A 60	A 99	43	54	43	36	A 84	43	27	33	33	42	A 76	28	
7	24	E 15	E 15	20	E 15	25	38	A 64	G 21	36	43	71	A 61	43	A 54	A 65	33	37	23	28	21	24	26	E 15	
8	E 15	E 15	E 15	26	E 15	E 16	31	A 66	47	A 64	A 165	53	37	A 49	A 70	33	36	33	43	A 65	E 15	21	36	22	
9	20	E 15	E 15	E 15	E 15	20	32	34	54	40	A 40	A 54	50	49	A 86	A 110	42	43	23	34	42	32	A 54	31	
10	A 44	A 54	A 50	23	25	28	25	37	A 72	A 68	A 54	A 57	A 54	37	A 47	36	35	30	A 65	20	E 15	27	E 15	E 15	
11	E 15	E 15	E 15	E 15	E 15	20	30	47	33	43	A 60	A 53	41	43	47	37	A 65	31	A 91	36	30	32	30	43	
12	19	E 15	E 15	E 15	E 15	25	34	36	45	A 60	43	A 143	44	36	43	35	30	32	25	18	26	37	21	33	
13	A 74	25	A 52	E 15	E 15	21	28	40	50	A 74	A 61	A 65	A 82	45	43	43	36	34	A 65	20	20	26	22	20	
14	E 15	23	28	E 15	E 15	20	28	39	43	44	37	37	A 58	A 66	A 104	38	33	43	A 93	35	45	A 95	26	33	
15	19	23	26	E 15	E 15	A 44	37	33	45	36	A 61	A 61	46	A 61	A 100	43	34	A 44	26	45	51	A 60	A 57	A 84	
16	A 53	A 73	A 50	A 49	A 37	30	30	34	A 138	A 110	52	A 135	A 82	A 108	A 107	43	41	43	A 182	33	40	E 15	27	A 76	
17	A 166	A 86	E 15	E 15	A 57	18	A 67	A 87	56	46	A 87	A 100	A 78	A 94	54	A 112	47	51	40	43	40	A 60	33	E 15	
18	A 64	A 65	20	E 15	A 64	19	A 86	46	75	A 94	A 66	A 76	36	A 80	A 106	34	30	28	25	20	E 15	E 15	E 15	E 15	
19	23	26	E 15	E 15	E 15	20	25	40	41	43	45	38	37	40	G	A 48	43	32	32	21	25	30	30	34	
20	E 15	A 54	22	E 15	E 15	24	27	39	40	43	A 68	37	36	46	37	35	40	37	43	18	35	30	A 81	40	
21	33	40	21	20	E 15	24	43	43	34	A 169	45	44	37	36	G 27	37	50	33	52	41	37	21	25	25	
22	23	19	E 15	18	20	22	43	50	63	A 80	A 65	40	44	37	G	G	50	43	37	21	26	36	29	30	
23	22	27	E 15	22	30	27	41	41	41	52	47	A 84	35	A 104	43	33	33	31	37	45	32	E 15	21	E 15	
24	36	20	23	30	E 15	21	28	A 91	A 87	A 54	A 52	35	36	44	37	A 74	40	41	A 124	A 94	21	20	36	22	
25	A 50	A 50	A 42	24	E 15	19	42	56	A 84	48	A 139	A 137	47	36	48	41	G 21	25	20	18	19	24	32	18	
26	A 84	E 15	A 72	22	28	21	26	43	35	47	46	44	43	A 66	36	36	31	37	32	27	30	30	E 15	A 48	
27	A 73	27	18	E 15	E 15	18	29	30	45	41	A 92	37	A 90	47	35	33	30	28	39	18	E 15	23	E 15	E 15	
28	E 15	E 15	E 14	E 14	E 15	18	30	G 18	38	A 57	A 72	A 76	A 84	A 54	A 74	A 50	A 69	A 110	35	A 86	A 84	35	A 75	42	
29	A 64	A 60	29	20	E 15	19	23	34	37	32	45	37	35	35	35	43	43	30	35	30	33	23	E 16	28	
30	20	E 15	E 15	E 15	E 15	28	37	43	43	35	36	46	46	44	33	32	28	A 66	25	22	19	22	E 15	E 15	
31	E 15	E 15	18	E 15	23	A 97	30	A 84	32	35	A 58	A 84	A 76	A 50	A 74	46	32	26	23	18	E 15	E 15	E 15	E 15	
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	24	24	18	E 15	E 15	21	30	41	45	48	A 58	A 54	46	49	47	43	40	37	37	28	30	26	26	22	
UQ	A 50	A 52	28	22	22	26	39	56	60	A 71	A 67	A 76	A 68	A 66	A 74	A 64	50	43	58	38	36	36	34	33	
LQ	18	E 15	E 15	E 15	E 15	20	28	36	38	42	45	44	37	42	37	36	33	32	26	20	20	22	18	E 15	

JUL. 1986

FBES (0.1 MHZ)



# IONOSPHERIC DATA

JUL. 1986

FMIN (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

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

Station	AKITA				Lat.	39° 43' 5" N			Long.	140° 08' 0" E			Sweep	1 MHz to 25 MHz		in 24 sec		in automatic operation								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	F	A	F	F	310	305	A	350	A	A	A	325	A	A	A	310	300	315	325	320	A	A	F		
2	A	A	A	A	A	310	340	A	A	A	A	A	300	320	300	A	A	A	A	F	A	F	F	F		
3	F	F	F	F	F	350	A	A	360	A	A	A	A	A	A	A	A	310	305	320	335	300	320	F		
4	F	A	F	F	F	F	325	325	A	A	A	A	A	A	A	A	A	A	A	A	F	F	F	F		
5	F	F	F	F	F	320	315	320	315	335	330	295	335	330	A	A	A	A	A	330	310	315	340	310	300	
6	315	315	F	F	F	340	335	G	280	A	340	A	A	260	A	350	295	A	300	325	325	335	F	A	F	
7	F	F	F	F	F	340	315	A	295	325	340	A	A	310	A	A	285	315	330	315	335	315	310	315		
8	310	F	F	F	F	365	340	A	A	A	A	A	320	A	A	255	280	325	310	A	330	F	F	F		
9	F	F	F	F	F	F	300	335	375	380	A	A	A	325	A	A	280	315	315	320	F	F	A	F		
10	A	A	A	F	F	360	315	325	300	A	A	A	A	275	A	275	275	280	A	300	310	315	315	320		
11	325	315	315	330	F	340	325	325	340	340	365	A	A	300	265	325	335	A	280	A	305	F	F	F	F	
12	F	F	F	F	F	360	330	275	305	A	340	A	A	305	330	340	295	255	290	300	310	335	335	F	F	F
13	A	F	A	F	F	330	340	350	380	A	A	A	A	300	320	315	335	340	A	315	325	300	305	F		
14	F	F	F	F	F	F	320	340	330	315	375	335	A	A	A	270	300	320	A	325	335	A	F	F		
15	F	F	F	F	F	A	310	345	340	320	A	A	300	A	A	295	295	A	315	335	350	A	A	A		
16	A	A	A	A	A	350	340	270	A	A	A	A	A	A	A	320	290	300	A	F	F	F	F	A		
17	A	A	F	F	A	345	A	A	A	365	A	A	A	A	A	325	A	A	315	315	340	F	A	F	F	
18	A	A	F	F	A	330	A	315	A	A	A	A	280	A	A	305	305	305	320	335	F	F	F	F		
19	F	F	F	F	F	280	300	335	350	325	290	250	335	310	295	A	300	320	335	320	325	F	F	F		
20	F	A	F	F	F	310	290	335	365	375	A	275	295	345	305	310	315	295	305	315	330	F	F	A	F	
21	F	F	F	F	F	320	355	325	F	A	350	320	295	295	305	300	A	320	300	310	F	F	F	F		
22	F	F	F	F	F	F	F	F	335	A	A	285	330	305	270	275	300	310	305	310	F	F	F	F		
23	F	F	F	F	F	F	F	F	290	305	330	345	A	290	A	305	300	290	305	305	330	345	335	F	F	
24	F	F	F	F	F	F	295	A	A	A	A	G	280	290	280	A	310	305	A	A	315	F	F	F		
25	A	A	A	F	F	335	290	A	A	325	A	A	305	305	310	310	305	330	315	330	345	295	F	F		
26	A	F	A	F	F	360	360	355	310	300	350	285	335	A	260	280	285	310	305	320	335	F	F	A		
27	A	F	F	F	F	310	360	300	305	345	325	275	A	280	335	325	320	310	320	340	295	F	F	F		
28	F	F	F	F	F	310	325	315	290	295	340	300	A	A	A	A	A	A	A	300	A	A	F	A	F	
29	A	A	F	F	F	310	295	305	330	320	A	G	G	290	305	320	320	335	320	325	325	F	F	F		
30	F	F	F	F	F	355	295	A	330	315	290	285	305	310	305	305	315	335	A	320	305	F	F	F	F	
31	F	F	F	F	F	A	330	F	A	G	305	A	A	A	A	A	305	325	340	350	345	295	300	305	F	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	4	3	3	3	8	23	25	21	20	17	9	10	18	16	17	20	22	25	23	25	20	12	7	3		
MED	312	315	315	325	330	330	320	330	332	325	340	280	300	305	305	302	300	310	315	320	330	315	310	315		
UQ	320	322	318	328	348	348	335	340	350	340	350	305	320	315	325	315	315	320	320	330	335	335	312	318		
LQ	310	315	312	320	318	310	300	305	305	320	330	250	290	290	300	288	285	300	305	310	318	300	305	308		

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M(3000)F2 (0.01)

# IONOSPHERIC DATA

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M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station	AKITA				Lat. 39° 43.5' N	Long. 140° 08.0' E	Sweep 1	MHz to 25 MHz in 24 sec in automatic operation																
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	A	A	A	A	A	A	A	A	A	A	A	A					
2							A	A	A	A	A	A	430	385	A	A	A	A	A					
3							A	A	A	A	A	A	A	A	A	A	A	A	A					
4							380	A	A	A	A	A	A	A	A	A	A	A	A					
5						350	370	395	415	405	415	A	A	A	A	A	A	A	A					
6							385	A	A	A	A	A	A	A	A	385	A	A	365					
7							A	A	A	400	A	A	A	A	A	A	375	A	370					
8						L	350	A	A	A	A	A	435	A	A	390	365	A	A					
9						345	390	A	A	415	A	A	A	A	A	A	A	A	L					
10							390	A	A	A	A	A	A	395	A	380	390	390	A					
11							380	A	395	A	A	A	A	A	A	385	A	360	A					
12							385	385	A	A	A	A	A	395	A	360	380	360	L					
13							380	A	A	A	A	A	A	A	A	A	380	A	A					
14						L	L	A	A	A	430	425	A	A	A	A	400	A	A					
15						A	A	390	A	410	A	A	A	A	A	A	365	A	335					
16						L	420	A	A	A	A	A	A	A	A	A	A	A	A					
17							A	A	A	A	A	A	A	A	A	A	A	A	A					
18							A	A	A	A	A	A	370	A	A	395	380	370	370					
19						340	365	A	A	A	A	415	430	370	375	A	A	A	A					
20						335	390	A	A	A	A	435	410	A	400	395	A	A	A					
21						L	A	A	380	A	A	A	420	410	380	370	A	A	A					
22						L	A	A	A	A	A	420	A	400	410	375	A	A	A					
23							A	A	A	A	A	A	415	A	A	380	375	360	A					
24							370	A	A	A	A	415	420	A	375	A	A	A	A					
25							A	A	A	A	A	A	A	375	A	A	390	380	355					
26						L	A	405	A	A	A	A	A	400	375	395	A	A						
27							370	400	A	A	A	415	A	A	405	380	395	385	A					
28						350	380	380	A	A	A	A	A	A	A	A	A	A	A					
29							350	A	A	460	A	420	435	405	380	A	A	390	A					
30							A	A	A	410	415	A	A	A	400	380	370	A	L					
31						A	365	A	385	405	A	A	A	A	A	A	395	375	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						5	16	6	5	7	3	7	9	8	9	13	14	9	5					
MED					345	380	392	395	410	415	420	420	395	400	380	380	375	365						
UQ					350	385	400	405	412	422	422	430	402	400	385	395	385	370						
LQ					340	368	385	385	405	415	415	415	415	380	380	375	375	360	355					

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M(3000)F1 (0.01)

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H<sup>o</sup>F<sub>2</sub> (KM)

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

Station	AKITA				Lat. 39 43.5 N	Long 140 08.0 E	Sweep 1	MHz to 25	MHz in 24	sec in	automatic operation														
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							320	A	285	A	A	A	330	A	A	A	355	A	A						
2							275	A	A	A	A	A	385	320	A	A	A	A	A						
3							A	A	280	A	A	A	A	A	A	A	A	345	320						
4							300	310	A	A	A	A	A	A	A	A	A	A	A						
5						360	300	300	400	300	325	A	A	A	A	A	A	A	A						
6						G	435	A	280	A	A	A	475	A	295	405	A	A	280						
7							A	A	375	310	300	A	A	360	A	A	430	340	280						
8						265	310	A	A	A	A	A	345	A	A	520	420	310	A						
9						355	335	285	245	255	A	A	A	330	A	A	A	A	290						
10							335	370	A	A	A	A	A	455	A	450	440	430	A						
11							310	A	300	270	A	A	370	505	340	300	A	405	A						
12							320	460	340	A	300	A	380	325	300	385	480	360	330						
13							270	280	250	A	A	A	A	360	325	330	290	290	A						
14						325	300	280	330	345	260	320	A	A	A	490	355	320	A						
15						A	370	290	290	340	A	A	360	A	A	390	410	A	300						
16							270	500	A	A	A	A	A	A	A	320	395	A	A						
17							A	A	A	270	A	A	A	A	A	300	A	A	A	295					
18							A	A	A	A	A	A	440	A	A	355	365	335	290						
19						450	340	290	280	325	420	535	320	345	395	A	370	315	280						
20						380	375	275	250	250	A	490	390	295	360	360	350	380	310						
21						305	270	305	300	A	290	345	370	390	360	355	A	310	A						
22						350	A	305	A	A	A	390	325	355	490	435	A	320	295						
23							340	360	350	A	280	A	410	A	375	360	395	335	300						
24							385	A	A	A	A	G	450	400	420	A	360	355	A						
25							A	A	A	A	A	A	350	310	A	355	355	300	285						
26							240	A	350	A	280	390	300	A	490	395	375	315	280						
27							400	355	275	310	A	455	A	430	310	310	320	310	290						
28						420	360	310	A	A	A	A	A	A	A	A	A	A	350						
29							415	360	310	360	A	G	G	395	345	310	320	300	275						
30							A	320	330	400	400	360	345	370	345	330	300	A	280						
31						A	300	A	G	370	A	A	A	A	A	350	300	285	245						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT						9	24	19	19	14	9	10	18	16	15	20	20	20	19						
MED						355	320	310	300	310	300	422	370	360	345	358	362	320	290						
UQ						380	365	360	345	345	325	535	410	398	385	400	402	350	300						
LQ						325	300	290	280	270	280	360	345	328	318	330	335	310	280						

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H<sup>o</sup>F<sub>2</sub> (KM)

# IONOSPHERIC DATA

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H<sup>o</sup>F (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	AKITA																							Lat.	39 43.5 N		Long	140 08.0 E		Sweep	1		MHz to 25		MHz in 24		sec in		automatic operation	
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																
1	A	270	A	A	275	A	A	A	A	A	A	A	A	A	A	A	A	A	A	255	230	A	A	A																
2	A	A	A	A	A	A	A	A	A	A	A	A	195	220	A	A	A	A	A	A	A	A	245	260																
3	A	A	A	205	E S 290	A	A	A	A	A	A	A	A	A	A	A	A	A	A	260	A	A	250	250																
4	A	A	260	240	240	225	230	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E S 300																
5	230	275	260	255	240	220	230	230	210	200	205	A	A	A	A	A	A	A	A	A	A	255	A	240	250	250														
6	260	A	265	A	A	230	230	A	A	A	A	A	A	A	A	220	A	A	A	255	250	A	A	A																
7	A	E S 300	250	235	240	230	A	A	A	220	A	A	A	A	A	A	220	A	230	255	235	250	A	265																
8	265	265	275	A	230	220	220	A	A	A	A	A	200	A	A	210	A	A	A	A	A	220	A	A	A															
9	270	255	270	270	280	250	A	A	A	210	A	A	A	A	A	A	A	A	225	A	A	A	A	A																
10	A	A	A	A	A	A	240	A	A	A	A	A	A	205	A	A	220	225	A	255	250	A	245	240																
11	240	255	260	240	255	235	A	A	210	A	A	A	A	A	A	240	A	240	A	A	A	A	A	A																
12	250	275	265	245	230	240	A	A	A	A	A	A	A	225	A	225	230	A	230	255	230	A	240	A																
13	A	A	A	275	270	245	230	A	A	A	A	A	A	A	A	A	A	A	A	260	240	A	A	275																
14	270	A	A	250	250	250	240	A	A	A	205	200	A	A	A	A	225	A	A	250	A	A	A	A																
15	240	A	A	255	210	A	A	A	A	220	A	A	A	A	A	A	240	A	A	A	A	A	A	A																
16	A	A	A	A	A	A	200	200	A	A	A	A	A	A	A	A	A	A	A	A	A	A	215	A	A															
17	A	A	E S 320	250	A	240	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E S 290																
18	A	A	A	255	A	235	A	A	A	A	A	A	230	A	A	210	205	205	A	245	210	240	270	260																
19	A	A	270	245	270	225	225	A	A	A	A	200	200	A	210	A	A	A	A	240	230	A	A	A																
20	225	A	A	245	270	240	205	A	A	A	A	200	210	A	205	220	A	A	A	255	A	A	A	A																
21	A	A	A	A	260	235	A	A	200	A	A	A	210	200	220	A	A	A	A	A	A	235	225	210	A															
22	A	E S 300	E S 290	260	255	240	A	A	A	A	A	200	A	205	205	220	A	A	A	260	245	A	A	A																
23	A	A	240	275	A	A	A	A	A	A	A	A	195	A	A	220	225	A	A	A	A	A	A	270																
24	A	A	A	A	E S 275	A	240	A	A	A	A	200	210	A	235	A	A	A	A	A	255	225	A	210																
25	A	A	A	A	280	240	A	A	A	A	A	A	A	220	A	A	230	230	220	250	220	A	A	265																
26	A	E S 280	A	A	A	245	225	A	200	A	A	A	A	A	230	A	240	A	A	255	230	230	E S 290	A																
27	A	A	255	230	285	245	A	240	A	A	A	205	A	A	200	230	210	220	A	240	250	305	250	245																
28	250	270	280	260	290	250	A	225	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A																
29	A	A	A	225	250	255	230	A	A	200	A	200	200	200	225	A	A	225	A	A	A	A	290	A																
30	A	290	260	240	235	A	A	A	A	200	200	A	A	A	220	220	205	A	A	250	260	230	260	250																
31	275	275	275	260	A	A	A	A	200	200	A	A	A	A	A	A	225	220	A	235	270	275	280	255																
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																
CNT	11	12	16	21	22	21	13	4	5	7	3	7	9	7	9	10	12	7	4	18	18	12	12	15																
MED	250	272	262	250	255	240	230	228	200	200	205	200	200	205	220	220	225	225	228	255	235	235	250	255																
UQ	268	280	272	260	272	245	230	235	210	215	205	200	210	220	225	225	230	228	230	255	250	245	270	265																
LQ	240	268	260	240	240	230	225	212	200	200	202	200	200	202	205	220	215	220	222	250	230	225	245	250																

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H<sup>o</sup>F (KM)

IONOSPHERIC DATA

JUL. 1986

H°E (KM)

135° E Mean Time (G.M.T. + 9 h)

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

The Radio Research Laboratory, Japan

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H°E (KM)

# IONOSPHERIC DATA

JUL. 1986

H°ES (KM)

135° E Mean Time (G.M.T. + 9 h)

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

JUL. 1986

H°ES (KM)

# IONOSPHERIC DATA

JUL. 1986

TYPES OF ES

135° E Mean Time (G.M.T. + 9 h)

Station		AKITA											Lat. 39° 43.5' N · Long. 140° 08.0' E											Sweep 1 MHz to 25 MHz in 24 sec in automatic operation			
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	F5	F2	F5	F3	F2	C2	C3	C5	C2	C3	C3	C2	L3	L3	L3	L4	L3	L3	L2	L1	F2	F6	F3	F5			
2	F7	F5	F3	F4	FF14	L4	L3	C4	C3	C4	C3	C2		C1	C3	C4	L3	L5	L6	L3	F7	F7	F2	F2			
3	F3	F4	F3	F1	F2	L2	C3	C3	C3	C3	L4	L2	CL31	C3	C3	C3	CL32	CL32	CL22	C3	F3	F2	F2	F4			
4	F7	F7	F2	F3	F1	L1	H1	C2	C3	C4	C3	C3	C5	C5	C4	C6	L4	L4	L3	CL23	F4	F4	F6	F2			
5	F7	F2	F2	F1	FF21	LC13	C2	C2	C2	C2	C1	C3	L2	L2	L2	L3	CL43	CL42	CL32	L4	F3	F4	F3	F2			
6	F3	F4	F2	F3	F2	L1	C3	C3	C3	C3	C3	C3	C2	C3	C2	C2	L3	L3	L3	L5	F4	F3	F7	F3			
7	F2	F2	F2	F4	F2	CL31	C4	C4	LC12	C1	C2	C4	C3	L2	L3	L4	L2	L4	L2	CL32	F2	F2	F2	F1			
8	F1	F2	F2	F3	F2	C1	C3	C4	C3	C4	C3	L3	C2	C2	C2	C2	C2	C3	C4	C3	F2	F2	F4	F4			
9	F5	F2	F2	F2	F2	C2	C2	C2	C2	C1	C2	C1	C3	C2	C3	L3	L2	L3	L2	L5	F3	F2	F6	F6			
10	F5	F7	F5	F2	F3	L4	L2	C3	C3	C4	C4	C3	L2	L2	L2	L3	C1	C3	C3	CL21	F1	F6	F1	F1			
11	F3	F1	F2	F2	F1	H2	C2	C2	C1	C2	C3	C2	C2	C2	C2	C2	L3	L3	CL54	CL13	F3	F3	F7	F7			
12	F3	F2	F2	F2	F2	C2	C2	C2	C2	C3	C2	C3	C2	C1	C2	C2	C1	C2	CL22	L1	F5	F4	F3	F4			
13	F3	F3	F4	F2	F2	L2	H2	C4	C3	C5	C3	C3	C3	C2	C2	C3	L2	L2	L3	L2	F4	F2	F4	F2			
14	F2	F5	F5	F2	F2	H1	C2	C2	C3	C2	C1	HL12	C3	C2	C2	C2	C2	C4	C4	L3	F3	F3	F2	F3			
15	F2	F3	FF13	F2	F1	C4	C3	C2	C3	C2	C3	C2	C3	C3	C6	C3	C2	CL42	CL32	C2	F6	F4	F6	F5			
16	F4	F7	F6	F6	F7	L3	L4	C2	C3	C2	C4	C4	C3	L3	L3	L2	CL22	C3	C3	C2	F3	F1	F5	F3			
17	F3	F3	F3	F2	F3	C2	C4	C5	C3	C3	C3	L4	L4	L5	CL22	CL32	CL23	CL32	CL32	CL32	F5	F6	F5	F3			
18	F5	F5	F2	F2	F4	C2	C3	C5	C4	C4	C4	C3	C1	C2	C2	H1	C1	C2	C2	C2	F1	F1	F1	F2			
19	F3	F3	F2	F3	F2	C2	C2	C3	C2	C2	C2	C2	C2	H1		C4	H1	C2	C3	C2	F2	F2	F3	F4			
20	F3	F7	F3	F2	F1	C2	C2	C2	C2	C2	C3	C1	C1	C3	H1	H1	C1	C3	C2	C2	F2	F2	F3	F4			
21	F3	F4	F4	F2	F1	C3	C3	C3	C2	L2	C2	C2	L1	L1	L1	H1	C3	C3	C2	C4	F4	F2	F2	F3			
22	F2	F2	F2	F1	F1	C3	C5	C3	C2	C4	C3	C1	L2	L2			C2	C2	C5	C6	F2	F3	F4	F4			
23	F5	F2	F2	F2	F4	C3	C5	C3	C3	C3	C3	L3	C1	C3	C2	H1	C2	C3	C6	C4	F3	F1	F2	F2			
24	F7	F3	F3	F5	F2	H2	C4	C5	C4	C4	C2	C2	C1	C2	C2	L4	CL32	C3	CL33	C4	FF32	F2	F3	F2			
25	F4	F3	F4	F5	F2	C1	C4	C4	C4	C3	L4	L3	L3	L1	L3	L3	L2	L1	L1	L2	F3	F5	F6	F2			
26	F6	F7	F3	F4	F2	L2	C2	C4	C2	C3	C3	C2	C2	L2	C3	C1	H2	C2	C6	F3	F4	F5	F2	F4			
27	F5	F4	F2	F2	F1	LH11	C2	C2	C2	C2	C5	CH21	CH21	C2	C1	C1	C1	C3	C4	F2	F2	F5	F2	F2			
28	F3	F2			F1	C2	C3	LC12	C3	C2	C3	C3	C2	C3	C3	C2	C2	C3	C3	F4	F6	F3	F4	F6			
29	F5	F3	F3	F2	F2	L2	C1	L2	L2	L1	L3	L1	C1	H1	C1	C2	C2	C2	C3	F2	F3	F4	F4	F4			
30	F4	F2	F2	F2	F2	C5	C5	C2	C2	C1	C1	C2	C4	C2	C1	C1	C2	C2	C3	F3	F2	F3	F2	F2			
31	F2	F2	F2	F2	FF22	C3	C3	C4	C2	C2	L2	L3	L3	CL22	C3	C3	C2	C2	L3	F2	F2	F1	F1	F2			
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT																											
MED																											
UQ																											
LQ																											

The Radio Research Laboratory, Japan

JUL. 1986

TYPES OF ES





# IONOSPHERIC DATA

JUL. 1986

FOF2 (0.1 MHz)

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

Station		ROKUBUNJI TOKYO		Lat.	35 42.4 N		Long	139 29.3 E		Sweep 1 MHz to 20 MHz in 20sec in automatic operation																						
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
1	I	S	S	S	31	31	36	45	A	A	A	A	A	A	A	56	56	A	51	50	50	56	S	S	S							
2		40	A	A	A	A	S	55	S	A	A	A	A	A	A	A	46	51	52	S	S	A	A	A								
3	A	S	A	I	S	F	35	39	S	49	46	E	A	A	A	50	48	49	48	53	53	53	45	42								
4	A	S	A	F	S	S	S	44	S	55	50	49	51	A	R	A	59	57	51	54	50	J	F	A	I	S						
5	U	S	S	S	S	S	S	40	S	53	50	U	R	A	A	46	49	56	55	A	A	A	S	S	U	S	U	S				
6	A	S	S	S	34	A	35	S	A	56	56	A	A	A	A	51	A	50	S	A	S	A	S	A	F							
7	S	S	A	A	F	40	41	S	A	52	S	55	53	A	A	A	A	A	A	58	69	S	53	S	S	S						
8	A	41	40	S	36	34	38	43	45	55	64	56	54	49	45	47	48	50	52	53	58	56	S	F	A							
9	A	F	41	F	F	S	46	S	S	55	A	A	A	58	58	A	49	52	54	47	55	55	A	S	F							
10	A	A	S	A	S	31	31	43	49	S	48	49	A	A	A	A	S	A	A	S	44	47	55	65	S	S	S	S				
11	S	S	F	F	S	33	37	S	54	A	R	54	R	51	47	55	S	A	A	54	65	A	U	S	F	S						
12	S	S	S	F	S	27	36	A	A	53	58	56	A	A	A	60	57	50	J	R	A	S	70	S	S	S						
13	A	A	S	F	35	39	45	A	54	A	A	A	A	A	A	59	72	56	48	45	51	56	55	53	50							
14	S	S	A	A	S	35	37	47	57	R	51	49	49	R	A	A	50	R	63	A	65	U	A	F	F							
15	F	S	F	S	F	36	44	S	55	50	45	49	47	53	57	55	50	49	52	60	S	S	A	A	A							
16	A	A	U	A	F	37	47	A	A	A	A	A	A	R	A	A	A	53	R	55	67	70	S	A	A	F						
17	F	S	F	S	S	30	33	49	57	A	A	48	A	A	62	71	61	61	65	70	74	56	A	A	J	S						
18	S	U	S	A	A	S	35	45	60	63	A	51	S	J	R	R	54	J	R	R	51	51	52	55	65	74	51	U	S	U	S	S
19	S	U	S	F	F	A	47	57	A	49	50	A	A	R	62	56	A	A	A	A	70	59	47	S	S	A						
20	A	A	34	S	S	33	34	45	65	61	52	46	51	53	56	54	49	48	50	60	S	70	67	U	S	S	A					
21	F	F	F	F	S	33	40	49	55	65	A	R	A	50	55	63	68	69	S	S	83	J	S	U	S	A	A					
22	S	S	F	F	F	S	A	S	S	S	71	A	A	A	56	52	48	49	55	63	68	J	S	J	S	S	S	S				
23	A	S	A	A	S	39	34	47	55	60	62	66	64	58	55	53	50	55	58	67	J	S	J	S	41	32	35					
24	S	F	S	F	F	H	S	A	A	A	A	A	R	47	A	A	A	J	A	48	A	S	U	S	53	54	S	A				
25	S	S	A	F	A	S	A	60	65	A	A	A	A	60	73	64	58	56	57	70	68	S	S	A	S	S	40					
26	S	U	S	S	F	S	40	47	46	46	58	54	52	59	50	53	58	62	69	J	S	81	J	S	A	S	S	S				
27	A	S	S	F	F	S	37	44	50	R	56	49	46	R	A	54	58	65	S	R	49	59	S	49	A	F	48					
28	S	S	S	S	S	S	32	46	40	S	A	A	47	A	A	46	48	48	47	J	R	44	53	54	F	F	J	S				
29	S	S	S	S	S	S	30	32	41	R	45	48	47	49	J	R	A	57	67	61	64	58	55	48	40	37	38					
30	S	S	S	F	F	S	30	30	43	49	S	E	G	A	A	A	64	A	A	A	62	61	56	58	58	56	A	A	A			
31	A	S	F	U	S	40	34	34	A	E	G	36	A	50	A	A	A	A	A	A	S	63	S	64	50	44	43	38	37	40		
CNT		14	15	14	12	19	30	27	24	23	18	19	15	16	17	21	23	25	26	25	30	28	20	16	18							
MED		S	S	S	S	S	33	36	45	54	55	50	51	51	53	55	55	55	55	54	58	65	56	53	46	S	S	S				
UQ		S	S	S	S	S	34	38	47	57	58	58	54	54	58	58	57	60	57	63	65	S	S	S	S	S	S	S				
LQ		S	S	S	S	S	30	34	43	48	50	48	48	48	R	50	51	51	50	50	50	55	54	42	36	40						

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JUL. 1986

FOF2 (0.1 MHz)

# IONOSPHERIC DATA

JUL. 1986

FOF1 (0.01 MHz)

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

Station		Tokubunji Tokyo											Lat. 35 42.4 N, Long. 139 29.3 E											Sweep 1 MHz to 20 MHz in 20sec in automatic operation										
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
1						L	A	A	A	A	A	A	A	A	A	U A 430	U A 400	A	L	L														
2						A	U L 360	A	A	A	A	A	A	A	A	A	U A 410	350	330	L														
3						U A 330	U A 360	390	410	440		A	A	A	A	A	U A 400	A	U L 320															
4						360	L	400	400	440	R	U A 440	A	U A 440	A	A	A	U A 370	A															
5						L	L 350	L 380	400	430		A	U A 440	A	U A 430	A	A	A	A	A	A													
6						360	A	U A 400	A	A	A	A	A	A	U A 440	A	U A 400	A	A															
7						L	A	A	A	430	U A 450		A	A	A	A	A	A	A															
8						L	350	390	A	U A 440	440	430	440	R	430	420	410	U A 410	360	A	A													
9						300	360	370	400	A	A	A	U A 440	440	A	410	A	A	A	L														
10						340	U A 400	400	430		A	A	A	A	A	A	A	U A 350	340	L														
11						A	A	A	U A 430	U A 440	U A 450	U A 440	U A 450	U A 440	A	A	A	A	A	A														
12						A	A	A	A	U A 430	A	A	A	A	A	U A 430	U A 400	A	A															
13							A	410	A	A	A	A	A	A	U A 450	U A 430	400	390	350	L														
14						L	360	A	A	A	U A 450	A	A	A	A	A	R	420	450	360	A													
15						L	L 350	390	410	440	430	440	U A 440	R	440	420	420	400	370	330														
16						A	A	A	A	A	A	A	A	A	A	A	A	360	310															
17						U A 350	A	A	A	440	A	A	A	A	U A 440	430	U A 430	A	A															
18						350	390	A	A	440	440	440	440	R	440	430	A	380	330	L														
19						A	A	A	L	440	440	A	A	A	440	A	A	A	A	A														
20						260	350	380	410	430	L	430	430	440	420	410	A	390	A															
21						U L 370	U A 400	U A 400	A	A	A	440	A	440	R	A	A	A	A															
22						L	A	A	A	A	A	A	U A 440	440	430	420	400	U A 390	A															
23						A	360	A	U A 430	A	U A 450	U A 450	430	430	420	390	360	320	U A															
24						340	A	A	A	A	A	A	440	A	A	A	A	370	A															
25						A	A	A	A	A	A	A	A	U A 440	420	410	390	370	L															
26						A	A	400	400	430	430	430	430	410	410	U A 400	U A 400	A																
27						340	L 380	400	410	420	U A 440	A	U A 440	U A 410	A	U A 390	L	L																
28						L	260	330	360	390	A	A	A	A	A	400	U A 400	350	A	A														
29						L	340	360	390	410	430	U A 450	R	430	A	U A 420	400	400	360	A														
30						L	A	400	420	430	U A 430	A	430	A	A	U A 430	380	370	L	L														
31						A	360	A	400	A	A	A	A	A	A	A	U A 400	A	L															
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
CNT						3	18	14	15	16	14	12	13	13	17	17	18	19	10															
MED						260	350	380	400	430	440	U A 440	440	440	430	420	U A 400	370	330	L														
UQ						280	L 360	390	400	430	440	U A 450	U A 440	440	U A 440	430	U A 400	375	340	L														
LQ						260	340	360	400	410	430	435	430	430	420	410	400	360	320	L														

JUL. 1986

FOF1 (0.01 MHz)

IONOSPHERIC DATA

JUL. 1986

FOE (0.01 MHz)

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

Station	KOKUBUNJI TOKYO				Lat.	35 42.4 N		Long.	139 29.3 E		Sweep	1 MHz to 20 MHz		in 20 sec		in automatic operation								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						S	A	A	A	A	A	A	A	A	A	A	275	A	A	S				
2						A	U A	230	255	290	A	A	A	A	A	A	A	A	A	180	S			
3						S	A	A	A	A	A	U A	U A	A	U A	300	280		A	A	S			
4						S	A	A	300	A	A	A	340	A	U A	330	310	280	A	A	S			
5						S		220	255	A	A	A	A	A	A	A	A	A	A	A	S			
6						B	A		260	A	A	A	A	A	A	A	A	A	A	A	S			
7						S		230	A	A	A	A	A	A	A	A	A	A	A	A	S			
8						S		240	A	A	A	A	A	A	U A	350	310	290	250	A	S			
9						S		240	A	A	A	A	A	A	A	305	A	A	A	S				
10						S		240	265	A	A	A	A	A	A	A	A	A	A	S				
11						S	A	A	300	A	A	A	A	A	A	A	A	A	A	S				
12						S		220	260	A	A	A	340	A	335	A	A	290	250	A	S			
13						S		250	270	300	320	335	A	A	A	A	A	A	A	B				
14							170	A	A	A	A	A	A	370	350	340	320	295	250	A	S			
15						B	A	A	A	U A	A	A	350	350	350	330	310	280	245	A	S			
16						S	A	A	A	A	330	345	A	A	A	A	A	290	250	A	S			
17						S	A	A	A	A	A	A	A	A	A	U A	320	295	255	A	S			
18						S	A		280	A	A	A	A	U A	350	340	330	310	290	250	A	S		
19						S	A	A	A	A	A	A	A	A	A	315	285	250	A	S				
20						S	A	A	A	A	A	A	350	340	A	310	295	250	A	S				
21						S	A	A	A	A	A	A	A	A	A	315	285	250	A	S				
22						S	A		260	A	A	A	A	A	A	R	315	280	250	A	S			
23						S		225	260	290	A	330	A	A	A	A	295	A	A	S				
24						S	A	A	A	A	A	A	A	A	A	A	A	A	A	S				
25						S		220	260	A	A	A	A	A	A	A	305	285	250	A	S			
26						S	A		250	A	A	A	A	A	340	330	310	285	250	175	S			
27						S		215	A	275	310	H	A	A	A	A	A	A	A	S				
28						S		200	250	290	310	315	325	330	330	325	300	280	240	A	S			
29						S	A	A	A	A	A	A	340	340	R	330	320	300	280	A	S			
30						S	A	A		285	315	330	335	A	A	A	A	A	A	S				
31						S	A	A	A	A	A	U A	340	A	345	320	300	A	A	A	S		S	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	12	12	8	5	5	8	8	10	10	17	19	14	2					
MED						170	228	260	290	315	330	340	345	340	330	310	285	250	178					
UQ						240	262	300	320	330	342	350	345	330	315	290	250							
LQ						220	255	288	310	330	338	340	335	320	305	280	250							

The Radio Research Laboratory, Japan

JUL. 1986

FOE (0.01 MHz)

IONOSPHERIC DATA

JUL. 1986

FOES (0.1 MHZ)

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

Station		OKUBUNJI TOKYO												Lat. 35 42.4 N		Long 139 29.3 E		Sweep 1 MHz to 20 MHz in 20sec in automatic operation																	
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23										
1		J A 50	J A 47	31	J A 22	J A 31	22	J A 44	J A 77	85	75	J A 80	J A 86	76	J A 57	J A 52	J A 53	75	33	23	J A 21	J A 30	J A 60	J A 52	40										
2		J A 31	J A 51	J A 58	J A 54	J A 84	J A 69	J A 53	J A 47	J A 80	J A 85	57	59	J A 110	J A 150	J A 93	J A 128	J A 67	J A 27	24	J A 80	90	J A 86	J A 81	J A 63										
3		J A 50	J A 24	J A 52	J A 50	J A 24	J A 27	J A 51	J A 48	J A 33	39	J A 46	J A 54	J A 67	J A 63	J A 79	J A 54	J A 65	J A 64	J A 29	33	J A 38	J A 34	19	J A 26										
4		J A 77	J A 54	J A 50	J A 53	J A 34	J A 18	J A 55	J A 30	27	J A 45	J A 52	J A 52	J A 64	J A 111	J A 63	J A 66	54	50	54	J A 74	J A 106	55	42	J A 31										
5		J A 35	J A 27	J A 30	J A 24	20	22	31	35	33	J A 41	J A 62	J A 46	J A 51	J A 50	J A 49	J A 52	J A 53	J A 65	J A 83	J A 81	J A 53	J A 37	J A 54	J A 30										
6		J A 44	J A 53	J A 50	J A 42	J A 41	J A 31	28	J A 54	J A 63	60	J A 66	J A 76	J A 57	J A 112	J A 93	J A 91	J A 59	62	J A 78	J A 63	J A 66	J A 41	J A 51	J A 35										
7		J A 52	J A 84	J A 55	57	J A 29	J A 23	32	50	124	J A 62	35	J A 49	J A 65	J A 83	J A 73	73	J A 88	J A 66	J A 62	J A 53	J A 55	J A 44	J A 54	J A 52										
8		J A 53	J A 77	J A 25	J A 20	J A 18	19	28	33	J A 52	J A 63	J A 53	J A 52	40	J A 48	40	J A 68	J A 85	J A 53	40	J A 50	J A 81	J A 80	J A 38	J A 52										
9		J A 55	J A 34	J A 31	J A 30	22	J A 29	J A 25	36	J A 38	J A 68	J A 54	J A 91	J A 46	J A 48	J A 85	J A 51	J A 50	J A 53	J A 34	J A 65	J A 28	39	J A 23	J A 29										
10		J A 46	J A 63	J A 76	J A 39	J A 27	J A 35	28	J A 42	39	J A 45	J A 64	J A 126	J A 109	58	51	60	J A 66	J A 46	J A 29	J A 93	37	J A 32	J A 44	J A 38										
11		J A 28	J A 32	J A 29	J A 25	J A 32	J A 21	J A 66	J A 45	J A 66	44	J A 54	60	J A 53	J A 45	39	64	98	J A 82	J A 66	J A 64	J A 83	J A 55	J A 53	39										
12		J A 59	J A 51	J A 44	J A 27	J A 27	J A 34	J A 54	J A 52	J A 51	45	61	J A 64	J A 64	J A 54	J A 85	53	J A 55	J A 54	J A 143	J A 84	J A 50	24	J A 34	50										
13		J A 52	J A 52	J A 25	J A 21	J A 29	J A 27	34	J A 73	J A 50	118	100	J A 79	J A 105	79	J A 75	J A 69	J A 65	J A 84	J A 41	J A 24	J A 48	J A 31	J A 21	J A 24										
14		J A 25	J A 29	J A 46	J A 52	J A 34	G	29	J A 53	J A 52	J A 108	J A 132	J A 54	50	J A 66	J A 55	39	J A 54	J A 44	J A 79	91	J A 86	J A 102	J A 53	J A 37										
15		J A 33	J A 22	24	J A 23	E S 15	J A 24	26	J A 34	35	35	45	39	44	39	36	39	35	27	25	25	J A 33	J A 52	J A 50	J A 64										
16		J A 53	J A 41	J A 50	J A 51	J A 30	E A 35	J A 54	J A 64	J A 107	J A 145	100	J A 51	139	J A 124	J A 134	J A 144	J A 64	J A 170	58	J A 45	J A 76	J A 84	J A 78	J A 33										
17		J A 31	J A 63	J A 49	J A 25	J A 27	J A 35	J A 42	60	J A 111	J A 114	J A 53	J A 62	J A 55	J A 50	J A 45	38	47	80	J A 83	J A 39	J A 53	75	J A 61	J A 51										
18		J A 56	J A 53	J A 65	J A 49	J A 36	J A 54	J A 29	35	J A 60	J A 94	J A 74	J A 47	48	J A 65	J A 44	35	J A 54	J A 70	36	J A 51	J A 29	J A 42	J A 29	J A 33										
19		21	17	E S 16	19	J A 37	J A 48	J A 53	J A 87	J A 98	35	J A 80	J A 99	J A 89	J A 63	J A 52	J A 65	J A 84	90	J A 107	J A 83	J A 84	J A 44	J A 30	J A 53										
20		J A 77	J A 53	J A 66	J A 30	J A 27	17	31	J A 43	J A 46	J A 52	J A 34	36	36	40	39	J A 56	J A 53	J A 44	J A 53	J A 29	J A 51	J A 53	J A 51	J A 49										
21		J A 33	J A 50	J A 27	J A 21	J A 30	J A 33	J A 38	J A 54	J A 54	J A 73	J A 53	J A 63	J A 39	J A 52	40	50	J A 53	J A 54	J A 64	J A 54	J A 51	56	J A 87	J A 66										
22		J A 47	J A 32	21	J A 25	E S 14	16	J A 54	J A 53	J A 74	J A 84	69	J A 143	J A 65	J A 41	G 31	G	37	44	71	53	J A 52	J A 63	J A 50	J A 77										
23		J A 52	J A 45	J A 53	J A 56	J A 49	J A 32	J A 42	35	J A 53	J A 74	J A 83	J A 99	108	37	37	36	G	J A 29	J A 30	19	E S 15	E S 15	18	J A 23										
24		J A 35	J A 21	19	17	19	E S 16	30	J A 79	J A 194	J A 130	J A 75	J A 49	J A 50	J A 65	J A 75	J A 56	J A 53	34	55	J A 40	J A 85	J A 53	J A 65	J A 85										
25		J A 54	J A 69	J A 49	J A 30	J A 63	36	J A 53	J A 46	J A 66	J A 78	J A 113	J A 96	J A 85	J A 61	J A 48	30	G 24	G 30	J A 30	J A 28	J A 30	20	42	J A 44										
26		J A 38	J A 45	J A 33	J A 22	24	19	34	44	J A 49	33	J A 56	J A 35	J A 46	39	35	35	J A 43	48	J A 55	46	J A 71	J A 51	J A 34	J A 36										
27		J A 65	J A 24	J A 26	J A 22	J A 20	21	30	27	33	J A 51	J A 49	J A 54	J A 61	44	J A 48	J A 93	J A 87	28	J A 23	J A 29	23	J A 51	J A 36	J A 33										
28		J A 30	J A 42	J A 20	J A 31	J A 41	20	24	32	36	43	61	60	J A 51	45	J A 88	41	J A 51	J A 54	J A 51	J A 52	24	J A 49	J A 50	J A 23										
29		J A 33	40	J A 36	J A 21	J A 26	27	29	J A 36	J A 34	J A 34	38	J A 82	40	J A 56	45	J A 44	J A 51	J A 40	J A 35	J A 39	J A 24	J A 20	E S 15	E S 15										
30		J A 24	J A 31	J A 51	24	J A 19	17	J A 37	J A 44	J A 52	J A 64	J A 64	J A 83	J A 65	J A 86	82	71	J A 46	J A 33	J A 54	J A 86	J A 84	J A 52	J A 78	J A 54										
31		J A 54	J A 45	J A 34	J A 24	23	J A 60	J A 82	J A 46	J A 49	J A 35	J A 50	J A 55	J A 64	J A 65	60	107	J A 174	J A 113	J A 44	J A 50	25	E S 15	25	24										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23										
CNT		31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31										
MED		J A 47	J A 45	J A 36	J A 25	J A 27	J A 26	J A 34	J A 46	J A 52	J A 62	J A 61	J A 60	J A 61	J A 57	J A 52	J A 54	J A 54	J A 53	J A 53	J A 51	J A 51	J A 51	J A 50	J A 38										
UQ		J A 54	J A 53	J A 50	J A 46	J A 34	J A 34	J A 53	J A 54	J A 70	J A 81	J A 74	J A 82	J A 72	J A 66	J A 78	J A 68	J A 66	J A 66	J A 65	J A 70	J A 78	J A 56	J A 54	J A 52										
LQ		J A 33	J A 32	J A 26	J A 22	J A 22	20	29	36	J A 38	44	J A 52	J A 52	J A 49	J A 46	42	40	J A 50	J A 37	J A 32	J A 36	J A 30	J A 36	J A 32	J A 30										

JUL. 1986

FOES (0.1 MHZ)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JUL. 1986

FBES (0.1 MHz)

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

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	24	27	22	16	20	21	40	A A 77	A A 85	A A 75	A A 80	A A 86	A A 76	A A 57	43	40	A A 75	30	22	17	29	48	24	25
2	20	A A 51	A A 58	A A 54	A A 84	31	29	44	A A 80	A A 85	A A 57	A A 59	A A 110	A A 150	A A 93	A A 128	41	25	24	27	20	A A 86	A A 81	A A 63
3	A A 50	20	A A 52	19	E S 15	25	33	36	32	32	41	A A 54	A A 67	A A 63	A A 79	45	40	44	27	25	28	21	E S 16	E S 16
4	A A 77	31	A A 50	20	20	16	32	27	G 26	37	40	44	A A 64	44	A A 63	52	43	37	50	29	40	28	A A 42	26
5	30	20	25	20	E S 15	19	28	33	32	34	45	44	A A 51	43	45	45	46	A A 65	A A 83	A A 81	25	35	26	24
6	A A 44	E S 16	35	27	A A 41	26	28	A A 54	40	53	A A 66	A A 76	A A 57	A A 112	44	A A 91	40	44	A A 78	44	A A 66	32	A A 51	19
7	E S 15	29	A A 55	A A 57	25	20	28	A A 50	45	59	34	45	A A 65	A A 83	A A 78	A A 73	A A 88	A A 66	55	26	40	40	30	35
8	A A 53	17	16	19	E S 15	E S 16	26	30	47	44	41	40	40	35	36	35	41	28	40	42	20	50	33	A A 52
9	A A 55	18	17	20	E S 15	24	G 23	29	32	A A 68	A A 54	A A 91	44	40	A A 85	33	45	51	26	30	20	A A 39	E S 15	26
10	A A 46	A A 63	E S 15	A A 39	19	26	26	40	35	40	A A 64	A A 126	A A 109	A A 58	45	A A 60	A A 66	35	26	29	20	E S 16	20	21
11	16	20	E S 15	17	26	19	41	41	A A 66	43	44	45	44	45	U Y 39	50	A A 98	A A 82	48	51	A A 83	49	50	25
12	18	19	20	19	20	34	A A 54	A A 52	47	43	53	A A 64	A A 64	51	55	43	40	52	A A 143	20	E S 15	E S 15	30	31
13	A A 52	A A 52	E S 15	E S 16	15	E S 15	28	A A 73	40	A A 118	A A 100	A A 79	A A 105	A A 79	45	43	34	34	24	20	42	24	E S 16	E S 16
14	E S 15	E S 15	A A 46	A A 52	20	G	27	50	45	52	45	45	46	A A 66	A A 55	35	44	34	A A 79	43	30	A A 102	44	28
15	E S 16	19	E S 16	E S 15	E S 15	16	25	34	35	34	35	39	44	39	36	39	35	26	24	24	25	A A 52	A A 50	A A 64
16	A A 53	A A 41	23	A A 51	21	25	40	A A 64	A A 107	A A 145	A A 100	A A 51	47	A A 124	A A 134	A A 144	47	31	21	28	55	A A 84	A A 78	21
17	19	17	E S 15	E S 15	E S 14	20	35	44	A A 111	A A 114	37	A A 62	A A 55	50	44	38	43	55	61	38	43	A A 75	A A 61	33
18	E S 15	26	A A 65	A A 49	22	32	G 23	35	55	94	40	44	44	35	44	34	44	31	21	E S 16	E S 16	25	16	20
19	E S 15	E S 15	E S 16	16	E S 15	A A 48	42	53	A A 98	34	40	A A 99	A A 89	50	40	A A 65	A A 84	A A 90	A A 107	15	21	25	19	A A 53
20	A A 77	A A 53	19	16	19	16	30	30	33	40	34	35	35	40	39	38	45	32	43	28	E S 15	E S 15	40	A A 49
21	24	19	18	E S 15	16	27	34	40	40	A A 73	49	A A 63	39	45	34	50	52	50	44	50	44	25	A A 87	A A 66
22	23	22	E S 15	E S 15	E S 14	15	A A 54	50	61	A A 84	A A 69	A A 143	44	40	31	G	37	39	65	48	28	50	23	30
23	A A 52	45	A A 53	A A 56	30	26	40	32	50	43	45	45	45	36	35	34	G	26	20	17	E S 15	E S 15	E S 15	E S 16
24	E S 15	E S 15	E S 15	E S 15	E S 14	E S 16	24	A A 79	A A 194	A A 130	A A 75	45	35	A A 65	A A 75	A A 56	E S 52	34	A A 55	40	50	45	44	A A 85
25	20	20	A A 49	16	A A 63	17	A A 53	44	52	A A 78	A A 113	A A 96	51	44	34	G 27	G 23	G 21	25	19	19	E S 16	A A 42	30
26	24	28	19	16	E S 15	19	32	39	36	33	34	35	40	39	G	35	40	40	44	44	59	A A 51	22	26
27	A A 65	16	17	17	E S 15	E S 15	30	27	32	40	37	44	A A 61	44	41	62	39	27	23	21	E S 16	A A 51	30	20
28	20	16	E S 15	E S 15	E S 15	19	23	29	35	A A 43	A A 61	45	A A 51	A A 45	45	34	40	34	35	43	19	30	30	E S 16
29	19	28	20	E S 15	E S 15	19	28	34	30	31	35	45	40	A A 56	42	35	35	33	33	37	23	17	E S 15	E S 15
30	E S 15	17	20	E S 15	E S 15	E S 16	30	44	34	35	43	A A 83	40	A A 86	A A 82	43	33	30	25	35	E S 15	A A 52	A A 78	A A 54
31	A A 54	30	21	18	E S 15	28	A A 82	28	A A 49	34	A A 50	A A 55	A A 64	A A 65	A A 60	A A 107	40	44	20	25	E S 16	E S 15	E S 16	E S 15
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	24	20	20	17	15	19	30	40	45	43	45	A A 51	51	50	44	43	41	34	35	29	25	35	30	26
UQ	A A 52	30	40	24	20	26	40	50	58	A A 76	A A 62	A A 78	A A 64	A A 65	A A 62	58	46	47	55	42	41	A A 50	A A 47	42
LQ	17	17	E S 16	E S 16	E S 15	16	28	32	34	36	40	44	44	42	39	35	40	30	24	22	19	22	20	20

The Radio Research Laboratory, Japan

JUL. 1986

FBES (0.1 MHz)

# IONOSPHERIC DATA

JUL. 1986

FMIN (0.1 MHZ)

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

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

JUL. 1986

FMIN (0.1 MHZ)

# IONOSPHERIC DATA

JUL. 1986

M(3000)F2 (0.01)

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

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	I S 305	S 320	S 305	290	310	305	320	A	A	A	A	A	A	A	315	320	A	325	315	310	330	S 340	S 320	S 290	
2	315	A	A	A	A	S 305	S 315	S 335	A	A	A	A	A	A	A	A	290	315	305	S 305	S	A	A	A	
3	A	S	A	I S 275	F	325	S 310	S 330	S 330	S 330	G	A	A	A	A	320	R 310	320	315	315	330	320	320	300	
4	A	S 290	A	F	S 325	S 320	S 310	S 320	S 330	S 300	285	300	A	R 270	A	310	315	315	330	320	J S 300	F	A	I S 290	
5	U S 295	S 310	S 310	S 330	S 320	S 315	290	300	330	300	U R 325	320	A	265	270	320	320	A	A	A	S 320	S 315	S 300	S 305	
6	A	S 305	S 330	S 325	A	340	S 260	A	340	335	A	A	A	A	330	A	295	290	A	S 335	A	S 305	A	F	
7	S 320	S 310	A	A	F	S 335	S 280	A	280	340	S 340	300	A	A	A	A	A	A	A	315	305	S 300	S 305	S 300	S 305
8	A	S 320	S 315	S 320	S 320	S 320	S 315	290	S 320	S 320	S 305	265	265	R 250	270	315	310	320	325	310	315	S 330	F	A	
9	A	F	S 285	F	F	S 265	S 290	S 330	S 330	A	A	A	340	320	A	280	275	325	315	340	340	A	S 285	F	
10	A	A	S	A	S 270	S 325	S 320	S 325	S 280	295	A	A	A	A	S 255	A	A	A	S 300	305	S 300	S 325	S 320	S 315	S 310
11	S 315	S	F	F	S 310	S 330	S 315	340	A	R 280	S 320	S 340	S 310	260	330	S 325	A	A	285	S 310	A	U S 295	F	S	
12	S	S	S 290	F	S 320	S 330	A	A	S 320	S 335	S 320	A	A	S 320	A	315	R	A	A	S	S 325	S 325	S 320	S 325	S 315
13	A	A	S 290	F	S 305	S 335	S 310	A	350	A	A	A	A	A	290	S 330	S 325	310	S 305	S 320	S 305	S 320	S 305	S 305	
14	S	S	A	A	S 300	S 310	S 320	S 340	345	R	R 330	S 310	S 320	A	A	290	R	S 320	A	S 315	U S 330	A	F	F	
15	F	S 310	F	S 335	F	S 320	S 315	S 340	S 335	275	300	280	300	310	310	295	280	325	325	S 340	S 300	A	A	A	
16	A	A	U S 320	A	F	340	340	A	A	A	A	A	S 315	A	A	A	320	R	315	310	S 335	A	A	F	
17	F	S	F	S 300	S 300	S 300	S 330	340	A	A	305	A	A	305	315	290	295	300	320	325	325	A	A	J S 310	
18	S 330	U S 320	A	A	S	S 320	300	S 325	350	A	R 280	S 315	S 310	R	S 295	S 300	310	310	320	S 330	340	U S 285	U S 280	S 300	
19	S 305	U S 295	F	F	F	A	310	310	A	300	300	A	A	A	310	A	A	A	A	325	S 320	S 310	S	A	
20	A	A	S 310	S 300	S 300	S 285	310	S 340	S 360	S 325	S 310	S 325	S 305	S 305	S 320	S 295	280	300	315	S 310	S 315	U S 300	S 320	A	
21	F	F	F	F	S 315	S 330	S 310	S 320	S 360	A	R 325	A	S 280	S 280	S 300	S 300	S 285	S 285	S 310	S 310	S 320	J S 315	U S 330	A	A
22	S 305	S 300	F	F	F	S 290	A	S 315	S 335	A	A	A	S 320	S 280	S 270	S 270	S 285	S 300	S 300	S 320	J S 310	S 340	S 320	S 325	
23	A	S	A	A	S 290	S 320	S 300	S 290	S 285	S 335	S 320	S 330	S 315	S 300	S 285	S 260	S 320	S 305	S 310	J S 320	J S 350	S 320	S 300	S 275	
24	S 290	F	S	F	F	H 280	S 280	A	A	A	A	A	A	265	A	A	A	A	310	A	S 310	U S 310	S 290	S 340	A
25	S	S 270	A	F	A	S 300	A	S 330	S 330	A	A	A	A	275	S 320	S 290	S 300	S 300	S 295	S 335	S 340	S 315	S 295	A	S 285
26	S 300	U S 275	S 280	F	S 310	S 320	S 340	S 350	S 300	S 320	S 285	S 250	S 310	S 270	S 270	S 290	S 280	S 295	J S 315	S 340	J S 345	A	S 290	S 250	
27	A	S	S	F	S 285	S 325	S 325	S 335	S 355	S 310	S 310	S 250	A	S 300	S 320	S 330	S 320	S 315	S 320	S 330	S 285	A	F	S 290	
28	S 315	S 290	S 280	S 275	S 295	S 270	S 320	S 270	S 280	A	A	S 320	A	A	A	S 285	S 295	S 310	J R 290	S 315	S 330	F	F	J S 280	
29	S 280	S 290	S 285	S 320	S 310	S 325	S 310	S 325	S 305	S 305	S 275	S 305	R	A	S 300	S 320	S 310	S 320	S 315	S 330	S 325	S 285	S 280	S 275	
30	S 275	S 275	S 300	S 300	F	S 275	S 310	S 330	S 325	S 340	G	S 295	A	S 335	A	A	S 320	S 325	S 320	S 330	S 320	S 320	A	A	A
31	A	S	F	U S 320	S 315	S 355	A	G	A	310	A	A	A	A	A	A	S 305	S 310	S 335	S 340	S 290	S 285	S 290	S 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	14	15	14	12	19	30	27	24	23	18	19	14	15	15	19	23	23	25	25	30	28	20	16	18	
MED	S 305	S 300	S 295	S 310	S 310	S 320	S 310	S 325	S 330	S 310	S 305	S 308	S 310	S 300	S 300	S 300	S 305	S 310	S 315	S 320	S 320	S 312	S 302	S 300	
UQ	S 315	S 310	S 310	S 322	S 315	S 330	S 320	S 338	S 342	S 330	S 320	S 320	S 318	S 308	S 315	S 320	S 318	S 320	S 320	S 330	S 330	S 320	S 320	S 310	
LQ	S 290	S 290	S 285	S 295	S 298	S 305	S 312	S 312	S 300	S 290	S 280	S 290	S 270	S 278	S 290	S 288	S 300	S 310	S 310	S 310	S 310	S 295	S 290	S 285	

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M(3000)F2 (0.01)



# IONOSPHERIC DATA

JUL. 1986

M(3000)F1 (0.01)

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

Station: TOKUBUNJI TOKYO Lat. 35 42.4 N Long 139 29.3 E Sweep 1 MHz to 20 MHz in 20sec 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	A	A	A	A	A	A	A	A	A	A	A	L	L					
2							A	U	L	A	A	A	A	A	A	A	A	A	390	L					
3								A	A	380	390	A	A	A	A	A	A	A	A	U	L				
4								340	L	385	400	380	R	A	A	A	A	A	A	A	A				
5							L	L	L	360	380	380	400	A	A	A	A	A	A	A	A	A			
6								370	A	A	A	A	A	A	A	A	A	A	A	A	A				
7								L	A	A	A	400	A	A	A	A	A	A	A	A	A				
8								L	370	370	A	A	395	405	380	410	390	380	A	360	A	A			
9								330	350	380	390	A	A	A	A	370	A	360	A	A	L				
10								350	A	380	390	A	A	A	A	A	A	A	A	A	L				
11								A	A	A	A	A	A	A	A	Y	A	A	A	A	A				
12								A	A	A	A	A	A	A	A	A	A	A	A	A	A				
13									A	A	A	A	A	A	A	A	A	365	360	345	L				
14								L	350	A	A	A	A	A	A	A	R	370	A	375	A				
15								L	L	360	380	390	400	410	380	A	R	370	380	365	380	370	360		
16								A	A	A	A	A	A	A	A	A	A	A	360	345					
17								A	A	A	A	405	A	A	A	A	360	A	A	A					
18								350	370	A	A	360	A	A	R	380	A	375	A	350	340	L			
19								A	A	A	L	400	A	A	A	355	A	A	A	A					
20								330	370	390	400	L	380	400	400	A	350	A	335	A					
21								U	L	360	A	A	A	A	A	400	A	R	380	A	A	A			
22								L	A	A	A	A	A	A	A	360	360	370	350	A	A				
23								A	360	A	A	A	A	A	A	380	380	360	350	355	A				
24								345	A	A	A	A	A	A	380	A	A	A	A	350	A				
25								A	A	A	A	A	A	A	A	360	370	330	350	L					
26								A	A	380	400	380	370	390	400	380	360	A	A	A					
27								360	L	350	375	A	420	A	A	A	A	A	350	L	L				
28								L	330	340	370	360	A	A	A	A	370	A	A	A	A				
29								L	360	355	400	385	420	A	R	375	A	350	355	360	A				
30								L	A	360	395	A	A	A	A	A	A	365	360	L	L				
31								A	400	A	405	A	A	A	A	A	A	A	A	A	L				
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	16	11	11	11	10	4	7	8	8	13	7	14	9					
MED							330	360	370	380	400	400	380	380	380	380	365	355	360	350	L				
UQ							330	L	360	380	388	400	410	392	395	400	380	370	365	360	350	L			
LQ							330	350	365	378	390	380	375	378	370	360	360	350	350	345	L				

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M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

### IONOSPHERIC DATA

JUL. 1986

H<sup>o</sup>F<sub>2</sub> (KM)

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						340	A 300	A	A	A	A	A	A	A	345	315	A	285	290					
2						E A 350	260	E A 295	A	A	A	A	A	A	A	A	400	320	315					
3							375	290	295	320	G	A	A	A	A	E A 325	340	E A 350	305					
4							340	270	295	365	420	370		420	A	E A 330	335	320	E 310					
5							295	375	330	295	340	300	360		495	460	320	320	A	A	A			
6							515	A	265	E A 310	A	A	A	A	325	A	375	325	A					
7							365	L A	385	A 250	320	370		A	A	A	A	A	A					
8							325	380	335	310	350	350	475	530	450	380	365	315	A 295	275				
9							440	345	255	280	A	A	A	305	325	A	410	E A 340	E A 330	325				
10							340	300	410	395		A	A	A	A	E A 500	A	A	390	335				
11							E A 345	280	A	435	345	275	350	490	330	345	A	A	E A 380	E A 295				
12							E A 345	A	A	330	285	340	A	A	320	E A 360	330	R	A	A				
13								A	280	A	A	A	A	A	355	270	305	350	320					
14							320	E A 285	280	275	325	E A 345	370	A	A	405	R	300	A					
15							310	325	290	290	450	390	455	375	350	335	400	355	315	285				
16							280	A	A	A	A	A	380	A	A	A	340	R	305					
17							305	265	A	A	290	A	A	345	325	335	355	E A 340	E A 310					
18							355	290	E A 270	A	395	360	365	R	380	390	345	340	290					
19							E A 350	E A 300	A	365	370	A	A	A	320	A	A	A	A					
20							385	355	260	240	290	395	350	370	360	335	395	E A 415	365	E A 295				
21							315	310	245	A	320	A	430	405	360	330	E A 350	305	270					
22							375	A	295	E A 285	A	A	A	340	410	445	460	380	320	A				
23							E A 350	310	E A 350	285	320	295	330	355	405	480	350	330	290					
24							405	A	A	A	A	E A 475	480	A	A	A	A	350	A					
25							A	285	E A 285	A	A	A	E A 395	290	325	345	335	345	260					
26							245	280	370	305	380	485	300	445	415	375	350	310	260					
27							305	285	265	365	405	560	A	360	325	A	290	330	265					
28							385	320	440	445	A	A	375	A	A	E A 430	410	355	345	E A 345	E A 315			
29							340	300	375	385	470	405	R	A	355	300	315	285	255					
30							285	305	290	G	410	A	300	A	A	310	290	280	275					
31							A	G	A	355	A	A	A	A	A	A	310	265	240					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						9	26	24	23	19	19	15	15	15	21	22	23	25	23	3				
MED						350	331	291	290	340	370	365	368	360	345	345	342	322	285	E A 295				
UQ						385	355	308	337	375	400	410	383	432	398	400	355	342	306	E A 305				
LQ						U 318	305	281	272	293	322	350	335	348	330	320	323	310	270	280				

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H<sup>o</sup>F<sub>2</sub> (KM)

# IONOSPHERIC DATA

JUL. 1986

H<sup>+</sup>F (KM)

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

Station	ROKUBUNJI TOKYO																									
	Lat. 35 42.4 N												Long 139 29.3 E													
	Sweep 1 MHz to 20 MHz in 20sec in automatic operation																									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	255	E A 310	E A 320	300	285	220	A	A	A	A	A	A	A	A	A	A	A	E A 240	225	235	250	E A 265	280	E A 305		
2	275	A	A	A	A	A	225	A	A	A	A	A	A	A	A	A	A	200	245	265	295	A	A	A		
3	A	E A 335	A	285	300	275	A	A	210	200	A	A	A	A	A	A	A	A	E A 265	255	245	255	230	265		
4	A	E A 340	A	250	225	240	A	H 190	205	200	E A 260	A	A	A	A	A	A	A	A	E A 250	A	E A 305	A	E A 305		
5	E A 320	295	E A 305	230	255	225	E A 240	215	220	200	A	A	A	A	A	A	A	A	A	A	A	E A 295	E A 275	275		
6	A	250	E A 305	E A 300	A	E A 255	215	A	A	A	A	A	A	A	A	A	A	A	A	250	A	E A 320	A	330		
7	265	E A 325	A	A	E A 300	225	210	A	A	A	200	A	A	A	A	A	A	A	A	A	230	E A 280	E A 305	E A 310		
8	A	255	265	255	260	230	215	225	A	A	215	195	215	180	200	220	A	240	A	A	250	E A 275	A	A		
9	A	260	270	310	275	265	220	220	195	A	A	A	A	230	A	215	A	A	H 225	250	210	A	315	E A 350		
10	A	A	295	A	225	E A 280	245	A	215	220	A	A	A	A	A	A	A	A	E A 265	E A 285	250	235	240	265		
11	230	295	230	250	E A 300	240	A	A	A	A	A	A	A	A	Y	A	A	A	A	A	A	E A 290	E A 325	330		
12	285	270	E A 300	225	295	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	260	220	220	E A 270		
13	A	A	E A 265	255	260	250	220	A	A	A	A	A	A	A	A	A	A	225	225	245	255	E A 305	270	260	255	
14	290	265	A	A	300	H 250	220	A	A	A	A	A	A	A	A	E A 250	A	E A 255	A	E A 270	255	A	E A 340	305		
15	260	270	230	265	230	255	H 205	220	200	180	H 180	210	A	240	215	E A 255	220	H 205	220	215	235	A	A	A		
16	A	A	280	A	E A 320	255	A	A	A	A	A	A	A	A	A	A	A	E A 235	H 195	255	E A 255	A	A	305		
17	300	320	300	255	270	H 245	A	A	A	A	205	A	A	A	A	E A 245	A	A	A	245	E A 270	A	A	E A 305		
18	245	265	A	A	E A 320	A	230	E A 245	A	A	E A 250	A	A	200	A	220	A	E A 255	220	235	195	E A 300	305	280		
19	265	290	275	260	270	A	A	A	A	H 210	205	A	A	A	E A 260	A	A	A	A	A	235	215	E A 240	265	A	
20	A	A	270	265	285	240	E A 245	205	205	215	H 175	H 185	195	210	A	A	A	A	275	A	255	220	240	E A 270	A	
21	280	270	275	300	280	280	E A 270	A	A	A	A	A	190	A	200	A	A	A	A	A	E A 250	235	215	A	A	
22	E A 310	305	270	275	265	245	A	A	A	A	A	A	A	230	H 190	H 195	E A 270	A	A	E A 275	280	255	210	E A 255		
23	A	A	A	A	E A 315	E A 305	A	240	A	A	A	A	A	205	220	220	235	230	A	240	200	210	255	330		
24	290	305	275	290	295	H 230	245	A	A	A	A	A	A	H 185	A	A	A	A	A	A	E A 290	A	A	E A 240	A	
25	270	E A 330	E A 330	285	A	240	A	A	A	A	A	A	A	A	A	H 185	210	H 235	230	E A 260	235	240	250	E A 345		
26	E A 290	A	305	265	230	220	A	A	E A 235	H 185	H 185	225	230	H 185	220	245	A	A	A	235	230	A	350	E A 330		
27	A	325	295	330	305	255	E A 275	230	215	A	190	A	A	A	A	A	A	A	230	H 240	225	270	A	305	270	
28	260	265	290	260	275	260	230	220	E A 250	A	A	A	A	A	A	230	A	A	A	A	230	E A 295	275	260		
29	285	325	295	240	285	265	245	A	195	H 180	H 180	A	E A 250	A	A	H 245	E A 245	260	A	E A 250	235	265	300	300		
30	325	320	280	275	290	250	E A 265	A	H 220	210	A	A	E A 290	A	A	A	A	A	235	245	255	240	225	A	A	A
31	A	E A 345	310	255	245	250	A	H 190	A	200	A	A	A	A	A	A	A	A	A	220	245	265	280	295	275	
CNT	19	24	24	24	28	27	18	11	12	11	11	4	7	8	8	12	7	14	13	27	27	21	21	23		
MED	272	U 284	280	264	275	248	224	220	208	200	192	202	U 202	208	204	222	230	233	230	242	240	U 240	268	U 285		
UQ	288	315	297	286	292	256	E A 245	225	218	210	206	218	U 228	230	219	238	238	255	E A 255	252	259	E A 290	300	E A 320		
LQ	262	268	272	255	260	240	220	210	202	192	182	190	192	192	195	218	230	228	220	235	228	238	252	268		

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H<sup>+</sup>F (KM)

The Radio Research Laboratory, Japan

### IONOSPHERIC DATA

JUL. 1986

H<sup>o</sup>E (KM)

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						S	110	105	105	A	A	A	A	A	A	A	105	110	A	S				
2						A	A	105	105	110	110	105	A	A	A	A	A	A	E A	S				
3						S	110	A	A	105	A	A	A	A	A	E A	120	105	110	120	S			
4						S	A	A	E A	125	105	105	105	105	105	A	E A	125	E A	A	A	S		
5						S	105	105	105	A	A	A	A	A	A	A	A	A	A	A	S			
6						B	A	105	105	105	105	105	105	105	A	A	A	A	A	S				
7						S	120	105	105	105	A	A	A	A	A	A	A	A	A	S				
8						S	E A	A	A	A	A	A	A	A	A	105	105	110	120	S				
9						S	A	A	A	A	A	A	A	105	105	110	A	A	A	S				
10						S	110	105	105	A	A	A	A	A	A	A	A	A	A	S				
11						S	A	A	105	105	A	A	A	A	A	A	A	A	A	S				
12						S	110	E A	A	A	A	105	105	110	105	100	105	110	120	S				
13						S	115	110	105	105	105	105	105	110	A	A	A	A	B					
14						E S	A	105	105	A	A	A	105	105	105	110	105	110	115	S				
15						B	A	A	A	A	105	A	A	A	A	E A	135	E A	A	A	S			
16						S	A	A	A	105	105	105	105	A	A	A	105	105	120	S				
17						S	A	A	A	A	A	A	A	A	A	A	A	E A	A	S				
18						S	A	105	105	A	A	A	A	105	105	105	105	110	120	S				
19						S	A	105	105	105	105	A	A	A	A	105	105	105	115	S				
20						S	115	105	105	A	A	A	E A	125	105	A	110	105	105	125	S			
21						S	110	A	A	A	A	A	A	A	A	A	120	105	105	A	S			
22						S	115	110	105	A	A	A	A	A	A	105	105	110	120	S				
23						S	110	105	105	105	105	105	A	105	105	105	110	110	A	S				
24*						S	110	A	A	A	A	A	A	A	A	A	A	A	A	S				
25						S	110	105	105	A	A	A	A	A	A	E A	125	E A	E A	A	S			
26						S	A	105	A	A	A	A	110	105	105	105	105	110	115	S				
27						S	115	105	105	105	A	A	A	A	A	A	105	110	A	S				
28						S	115	105	120	120	A	E A	130	130	110	130	105	105	110	115	S			
29						S	115	A	A	A	A	A	115	110	115	105	110	115	110	A	S			
30						S	115	110	105	105	105	105	105	105	105	105	105	A	115	S				
31						S	A	A	A	A	A	A	A	E A	125	105	105	A	A	A	S		S	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	18	19	19	13	9	10	11	14	10	19	20	19	13					
MED						E S	135	111	105	105	105	105	105	105	105	105	105	110	120					
UQ							115	105	105	105	105	105	108	110	105	112	106	110	120					
LQ							110	105	105	105	105	105	105	105	105	105	105	110	115					

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H<sup>o</sup>E (KM)

The Radio Research Laboratory, Japan

### IONOSPHERIC DATA

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H<sup>+</sup>ES (KM)

135° E Mean Time (G.M.T. + 9 h)

Station <b>OKUBUNJI TOKYO</b>		Lat. 35° 42.4' N		Long 139° 29.3' E		Sweep 1 MHz to 20 MHz in 20sec in automatic operation																			
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	105	100	95	95	95	120	115	105	105	105	105	100	100	100	100	105	110	110	110	105	105	105	110	110	
2	105	100	100	130	115	100	125	120	115	115	115	110	105	105	105	105	105	110	115	115	115	115	110	100	100
3	110	110	105	105	130	115	110	105	105	115	105	125	120	120	115	115	115	110	110	105	105	105	110	115	
4	105	100	100	100	100	105	100	100	105	110	130	110	120	110	120	115	120	120	100	100	120	115	110	105	
5	105	105	95	95	100	120	120	120	110	105	105	100	100	100	100	100	100	120	115	110	105	105	125	105	
6	105	100	100	95	95	95	125	115	110	110	110	110	110	105	105	100	100	100	100	100	100	100	115	115	
7	110	105	105	100	95	95	125	120	110	110	105	100	105	100	100	105	100	100	100	100	100	100	120	110	
8	105	105	100	95	100	100	165	105	105	105	105	105	105	105	130	130	125	125	115	110	105	105	105	105	
9	105	100	100	95	95	115	110	105	105	105	105	105	105	120	105	125	105	105	105	100	100	125	125	115	
10	110	110	105	100	100	105	130	120	115	105	105	105	100	100	100	100	100	100	100	115	110	110	110	110	
11	105	105	100	105	95	105	105	125	115	110	105	100	105	105	105	125	120	100	100	100	100	120	110	115	
12	110	110	105	105	105	100	125	125	120	120	115	115	110	115	115	115	125	120	115	115	110	110	105	105	
13	105	105	100	100	100	105	130	115	120	110	110	110	105	105	105	105	100	100	100	100	100	100	100	100	
14	115	105	105	105	105	G	125	110	110	105	105	105	130	120	120	135	120	120	115	110	105	100	100	100	
15	100	100	100	105	S	115	105	105	105	170	125	145	135	135	135	125	120	125	125	120	115	110	110	105	
16	105	105	100	100	100	100	100	100	110	115	110	125	110	105	100	120	125	115	115	110	110	110	110	105	
17	110	110	110	110	110	105	110	105	105	105	105	105	105	105	105	135	130	120	115	115	115	110	105	105	
18	105	105	100	105	105	105	110	120	110	105	105	105	130	130	125	140	125	120	120	115	120	105	105	110	
19	110	110	S	105	105	115	110	105	105	115	110	105	105	105	125	130	120	115	115	115	110	110	110	105	
20	105	105	105	105	105	125	115	115	110	105	105	105	150	130	150	130	125	125	120	115	110	110	105	105	
21	105	100	100	100	105	115	110	105	105	105	105	105	105	100	100	145	120	115	110	105	100	110	105	100	
22	100	95	110	100	S	115	115	110	105	105	105	100	100	100	105	G	130	125	115	110	115	115	110	105	
23	105	105	100	100	105	105	120	125	115	110	115	105	105	120	115	120	G	125	110	115	S	S	110	110	
24	105	100	100	100	100	S	115	105	105	105	105	105	105	105	105	105	105	105	120	110	110	110	105	105	
25	105	105	105	105	105	115	115	110	105	105	105	100	100	100	100	100	100	100	95	95	95	100	105	105	
26	100	100	100	100	105	130	125	115	110	105	105	105	125	165	160	150	125	115	115	110	105	105	110	105	
27	105	105	100	100	100	100	125	150	130	125	105	105	100	120	120	110	110	110	105	100	100	105	105	105	
28	105	105	105	105	105	125	120	125	120	125	115	115	130	130	120	120	125	120	115	110	110	110	105	105	
29	105	100	100	95	100	140	130	110	105	100	100	120	130	115	120	120	115	115	110	110	105	105	S	S	
30	100	100	100	105	100	125	120	115	125	120	115	115	115	110	110	105	105	110	115	110	110	110	105	105	
31	105	100	115	95	95	110	110	105	105	105	100	125	100	115	120	110	105	105	115	105	110	S	110	110	
CNT	31	31	30	31	29	29	31	31	31	31	31	31	31	31	31	30	30	31	31	31	30	29	30	30	
MED	105	105	100	100	100	110	115	110	110	105	105	105	105	105	110	118	118	115	115	110	108	110	110	105	
UQ	105	105	105	105	105	115	125	120	115	115	110	112	120	120	120	130	125	120	115	115	110	110	110	110	
LQ	105	100	100	100	100	105	110	105	105	105	105	105	105	105	105	105	105	105	105	102	100	105	105	105	

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H<sup>+</sup>ES (KM)

# IONOSPHERIC DATA

JUL. 1986

TYPES OF ES

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	FF33	FF23	F4	F3	F3	C2	C4	C4	C4	L3	L2	L2	L2	LL31	LL21	L2	C4	C2	L3	L3	F5	FF42	F4	F6
2	F4	F6	F5	FF24	FF23	LC32	CL54	C2	C4	C3	C2	C2	L3	L3	L2	L3	L3	L2	CL31	C2	FF22	FF13	FF23	F3
3	FF31	F3	F6	F5	FF22	C6	C3	L3	L2	C2	L2	CL21	CL21	CL22	CL31	CL21	C3	C4	C3	L5	F6	F3	F1	F2
4	F5	F5	F3	F2	F2	L1	L4	L2	L1	C1	HC12	C1	C2	C2	CL21	CL32	CL32	CL33	L4	L2	FF14	F7	F6	F5
5	F7	F4	F4	F2	F1	C2	C5	C3	C2	L2	L2	L2	L2	L2	L2	L2	L3	CL33	CL42	CL41	F4	F5	FF14	F5
6	F5	F2	F3	F3	F4	L5	CL32	C4	C2	C3	C3	C3	C2	C2	L2	L2	L3	L3	L4	L2	F4	F5	FF33	F4
7	F3	F3	F5	F3	F4	L2	C3	C3	C3	C3	L1	L2	L3	L3	L3	L3	L3	L3	L3	L2	F2	F3	FF11	FF32
8	F4	F3	F2	F2	F1	L1	HL22	L3	L3	L2	L2	L2	L2	L1	HL11	H1	H2	C2	C4	C5	F3	F3	F4	F5
9	F3	F5	F2	F2	F2	CL21	LL11	L1	L2	L2	L2	L2	L2	C1	C3	CL21	L2	L4	L3	L2	F4	FF26	F2	F4
10	F6	F6	F4	F4	F2	L3	H2	C3	C2	L2	L2	L3	L3	L3	L2	L2	L3	L3	LC33	CL22	FF12	FF11	FF22	FF21
11	F2	FF22	F2	F2	F2	L1	L4	CL33	C4	C2	L1	L1	L2	L2	L1	HL22	CL34	L4	L3	L3	F3	FF24	F4	F7
12	F5	F5	F5	F4	FF52	L5	C3	CL22	CL32	CL22	CL21	C2	C2	C2	C3	C2	H2	C3	C2	C3	F1	F1	F5	F4
13	FF54	FF32	F2	F1	F2	LC11	H3	C4	C2	C2	C3	C3	C2	C3	L2	L2	L5	L2	L3	L2	F5	F5	F2	F2
14	FF22	F4	F5	F4	F4		CL42	C2	C2	L2	L2	L2	H1	H2	C2	H3	C2	C3	C3	L2	F3	F4	F3	F2
15	F1	F1	F1	F1		C3	L4	L2	L2	HL11	C1	HL11	HL11	HL11	HL12	HL11	CL22	CL13	CL23	CL61	FF22	F5	F4	F4
16	F6	F5	F5	F4	F3	L2	L3	L3	CL32	C3	C3	C1	C2	L2	L2	CL22	H2	C2	C1	C3	F5	FF41	F3	F2
17	F2	F3	FF21	F1	F2	L2	L4	L3	L3	L2	L2	L2	L4	L2	L2	HL22	HL23	CL42	CL31	CL31	FF61	FF62	F4	F6
18	F4	F4	F3	F6	F4	L3	L2	C2	C3	L2	L1	L2	HL11	H1	H1	H1	H3	C2	C2	C1	F2	F3	F2	F3
19	F1	F1		F4	F5	CL23	L5	C4	C5	C1	C2	L3	L3	L3	CL12	H1	C3	C5	C3	C2	FF22	FF32	FF23	F6
20	F6	F6	F4	F3	F4	C2	C3	C3	C2	L2	L1	L1	HL11	H1	HL11	H2	C2	C3	C4	C5	FF11	FF22	F3	F3
21	F3	F2	F2	F1	F2	C4	C4	L2	L2	L3	L2	L1	L1	L2	L1	HL21	C2	C4	C3	L4	F4	FF14	F3	F3
22	F3	F2	FF11	F1		C1	C4	C3	C3	L2	L2	L2	L1	L2	L1		H2	C4	C5	C3	F5	F6	F6	F4
23	F3	F3	F5	F7	F5	L2	C3	C2	C3	C2	C2	C2	L2	C1	C1	C2		C2	LH31	C3			F1	F2
24	F2	F2	F1	F1	F2		C5	L4	L5	L5	L5	L2	L2	L3	L2	L3	L3	L5	CL75	CL62	FF71	F5	F3	F3
25	F2	FF34	FF52	FF52	FF41	C2	C4	C3	C3	L3	L3	L2	L2	L1	L2	L2	L1	L2	L4	L4	F2	F1	F7	F6
26	F5	F4	F2	F2	F2	CL42	CL34	C3	CL22	L2	LL22	L1	HCL12	H1	H1	H1	H2	C5	C6	C7	F4	F6	F4	F7
27	F3	F3	F2	F2	FF21	LH13	H3	HC11	C2	C2	L2	L2	CL22	CL22	CL11	CL21	C2	C3	L3	L2	FF23	FF41	F5	F4
28	F3	F4	F2	F3	F5	C3	C3	C2	CL22	CL21	CL32	C2	HL21	H2	HL21	C1	C3	C3	C4	C6	F4	F4	F3	F2
29	F4	F4	F2	F2	F2	H3	HL22	LL22	L3	L2	L1	CL11	CL11	CL21	C1	C1	C2	C2	L2	L4	F5	F2		
30	FF32	F4	F2	F2	F2	CL11	C5	C3	C3	C2	C2	C2	C2	C3	C4	C2	C3	L3	C4	L4	F4	F6	F4	F3
31	F3	F3	FF26	F2	F1	L4	L3	L3	L2	L2	L2	CL22	L2	CL21	C3	C2	L2	L2	L1	L3	F3	K1	F2	F2

CNT	-----																							
MED	-----																							
UQ	-----																							
LQ	-----																							

JUL. 1986

TYPES OF ES

# IONOSPHERIC DATA

JUL. 1986

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA				Lat. 31° 12' 1" N		Long. 130° 37' 1" E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																
	Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		65	55	50	47	S	40															X	X	X	X
2		44	S	35	S	45	S															68	50	40	40
3		S	X	35	39	S	S	X	40	55												X	X	X	X
4		44	X	39	44	S	A	36														X	X	S	54
5		58	45	S	45	44	40															X	X	X	49
6		X	X	X	40	41	45	X	36													S	S	X	56
7		44	43	38	35	S	A	S	28													58	58	50	A
8		A	S	46	A	40	S	36	A													X	X	X	A
9		A	40	39	40	39	39															X	X	X	41
10		A	39	35	40	31	30															X	X	X	57
11		X	44	41	40	40	38															X	X	49	57
12		A	A	A	A	A	38															X	X	60	58
13		58	49	50	49	55	44															X	X	X	X
14		X	X	50	52	58	50															70	70	58	65
15		63	62	60	55	55	58															A	X	A	A
16		A	A	A	A	A	36															X	60	A	38
17		A	40	38	40	35	A															X	X	X	59
18		52	54	46	39	X	X	33	30													X	X	X	X
19		46	50	43	42	A	X	33														X	X	50	45
20		A	50	40	38	A	X	35														X	X	X	58
21		60	X	X	46	40	40															X	X	X	A
22		A	45	43	49	S	40															X	X	S	X
23		S	44	45	S	X	39															X	X	A	X
24		X	X	X	X	X	X	35														X	X	X	A
25		A	A	X	X	47	48	43	59													C	C	C	C
26		C	C	C	C	C	C															X	A	X	35
27		S	S	S	S	S	S															X	X	X	54
28		52	50	53	51	U	S	40	44													X	U	S	A
29		32	43	38	39	41	35															A	A	X	X
30		X	X	X	S	X	X	27	28													U	S	X	X
31		46	45	42	X	X	X	39	29													U	S	X	X
CNT	18	25	25	23	20	26	1	1													27	27	24	25	
MED	46	44	40	41	40	38	55	59													X	X	X	47	
UQ	58	49	48	47	45	40															X	X	54	57	
LQ	44	40	38	40	35	35															X	X	X	40	

JUL. 1986

FXI (0.1 MHz)

# IONOSPHERIC DATA

JUL. 1986

FOF2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

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

JUL. 1986

FOF2 (0.1 MHz)



# IONOSPHERIC DATA

JUL. 1986

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA				Lat. 31° 12' 1" N	Long. 130° 37' 1" E	Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																	
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	L	U L	410	430	410	420	430	420	400	400	370	360	L	L			
2							L	360	410	H	A	A	A	A	420	410	400	380	350	L				
3							L	A	390	A	A	A	A	A	A	A	A	A	A	A				
4								360	400	H	R	U A	A	U R	U A	U A	S	380	340	230				
5							U L	A	390	A	A	A	A	A	U A	A	A	A	A	A				
6								300	400	400	A	A	A	A	A	A	A	A	A	A				
7								A	A	A	A	A	A	A	A	A	A	390	A	A				
8							A	U L	A	420	420	440	430	420	420	410	A	380	350	L	280			
9							L	L	A	A	A	440	420	A	A	A	400	380	340	L				
10								380	390	410	A	A	A	A	A	A	A	A	A	A				
11								U L	400	A	U A	A	430	430	420	420	400	380	350					
12								A	A	A	A	A	A	A	A	430	400	A	A	A				
13							A	L	A	L	A	A	A	A	A	A	A	A	A	360				
14							L	L	A	A	A	440	A	A	A	A	A	A	A	L	A			
15							L	410	A	A	U A	430	430	430	420	410	410	A	A	A				
16							U L	L	420	U A	430	430	430	430	A	I	U L	A	L					
17							L	A	U A	A	A	A	A	A	A	A	A	A	A					
18							L	L	420	L	430	430	440	430	L	430	A	380	L	L				
19							L	400	430	430	440	430	420	430	420	410	400	L	L	L				
20							L	U L	A	L	420	440	430	430	420	410	A	A	A					
21							A	380	400	A	A	A	A	A	440	410	400	380	350	270				
22							U L	410	350	400	420	A	A	A	440	420	410	400	390	350	L			
23							L	A	A	A	A	A	A	A	440	A	A	A	350	A				
24							A	A	510	410	A	A	A	A	A	A	A	A	350	A				
25								310	360	400	C	C	C	C	C	C	C	C	C	C				
26							C	C	C	410	A	A	A	440	430	420	410	H	A	A	A			
27							L	L	390	400	430	440	440	A	A	410	400	A	A	A				
28								350	380	A	420	A	420	A	A	410	A	A	A	A				
29							L	390	A	U A	430	420	420	420	A	A	A	370	340					
30							L	A	410	A	A	A	430	420	A	U A	390	370	330					
31							A	A	A	A	A	A	A	A	A	A	A	U A	L	L				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							4	12	21	14	10	11	14	13	14	17	16	13	15	3				
MED							310	375	400	420	430	430	430	430	425	410	400	380	350	270				
UQ							U L	360	385	400	420	430	440	430	430	420	410	380	350	275				
LQ							305	360	390	410	420	425	420	420	420	410	400	380	340	250				

JUL. 1986

FOF1 (0.01 MHz)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JUL. 1936

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	210	255	A	A	A	A	A	325	310	295	250	A	S				
2							S	A	290	A	A	A	330	320	310	305	295	265	200		S			
3							S	A	A	310	310	340	340	R	H	335	310	300	260	215		S		
4							S	A	U A	A	A	320	R	340	320	305	300	260	215		S			
5							S	235	A	A	295	A	A	A	A	A	A	A	A	A	S			
6							S	A	A	A	320	320	325	R	315	300	A	A	A	A	S			
7							A	255	295	300	A	A	A	A	A	A	A	A	A	A	A			
8							A	A	A	A	A	325	340	R	R	320	310	300	270	220		A		
9							A	A	U A	295	A	A	350	R	R	320	310	A	U A	A	A			
10							210	H	245	305	U A	320	A	A	A	295	A	A	A	A	S			
11							170	235	A	305	310	A	A	A	A	C	325	A	270	A	A			
12							190	240	285	295	310	325	330	340	R	H	330	320	300	270	220			A
13							A	A	280	A	U S	310	340	350	S	330	A	A	A	A	A			
14							S	A	A	A	A	A	A	A	A	A	325	305	270	220		S		
15							J S	80	240	A	A	330	345	355	A	A	A	A	A	A	S			
16							170	A	A	A	A	A	U R	R	R	345	350	345	A	A	A	A	S	
17							C	A	A	A	A	A	A	A	A	A	A	A	A	A	A	S		
18							S	A	A	A	A	350	R	350	340	330	325	300	R	A	A	S		
19							S	A	A	A	A	A	350	R	330	A	A	A	A	A	S			
20							S	A	A	A	A	A	U R	R	R	350	345	330	325	U R	290	260	200	S
21							165	A	A	280	A	C	A	A	A	A	A	300	A	A	A	S		
22							S	A	250	A	A	C	A	A	A	A	A	300	265		A	S		
23							S	H	235	290	300	310	C	C	C	C	U R	320	300	260	A	S		
24							S	A	A	300	A	C	A	C	A	A	A	A	A	A	A			
25							S	A	255	C	C	C	C	C	C	C	C	C	C	C	C			
26							C	C	C	A	A	A	A	A	330	315	300	250	200		S			
27							S	210	255	300	315	330	345	315			A	A	A	A	A	S		
28							180	U A	240	260	280	305	U A	320	U R	330	U A	320	310	300	260	210		A
29							S	U A	220	U A	265	290	295	320	340	335	325	310	295	265		A	S	
30							S	230	270	300	310	320	C	A	A	310	305	A	260	A	S			
31							S	A	250	A	A	C	A	C	C	C	305	295	245		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							7	12	16	13	12	12	15	13	16	18	16	17	9					
MED							170	235	275	300	310	325	345	330	325	310	300	260	215					
UQ							185	240	290	300	312	340	350	340	330	320	300	265	220					
LQ							168	225	255	295	308	320	335	330	320	305	295	260	200					

The Radio Research Laboratory, Japan

JUL. 1986

FOE (0.01 MHz)

## IONOSPHERIC DATA

JUL. 1986

FOES (0.1 MHz)

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

Station	YAMAGAWA				Lat.	31 12.1 N				Long.	130 37.1 E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E 16	E 16	E 16	E 16	E 16	E 16	J A 25	J A 43	J A 74	J A 56	J A 53	J A 45	37	35	37	39	40	35	J A 43	24	J A 27	E 16	J A 27	J A 46
2	J A 47	J A 53	J A 30	J A 30	J A 34	J A 30	J A 40	J A 44	J A 37	J A 64	J A 108	J A 64	J A 82	J A 74	J A 66	J A 40	J A 31	J A 78	J A 27	J A 25	J A 17	J A 23	E 16	J A 20
3	J A 41	J A 36	J A 36	J A 41	J A 53	J A 44	J A 40	J A 60	J A 44	J A 45	J A 58	J A 110	J A 98	J A 66	J A 52	J A 65	J A 72	J A 66	J A 75	J A 64	J A 69	J A 39	J A 38	J A 66
4	J A 22	J A 46	J A 29	J A 64	J A 38	J A 24	J A 20	J A 43	J A 64	J A 70	J A 58	J A 63	J A 63	J A 51	J A 50	J A 45	J A 44	J A 35	J A 31	J A 30	J A 24	J A 22	J A 27	J A 25
5	J A 33	J A 50	J A 43	J A 38	J A 37	J A 20	J A 32	J A 48	J A 46	J A 63	J A 54	J A 76	J A 84	J A 62	J A 47	J A 145	J A 139	J A 133	J A 143	J A 153	J A 143	J A 34	J A 45	J A 41
6	J A 29	J A 24	J A 64	J A 35	J A 33	J A 39	J A 29	J A 30	J A 43	J A 59	J A 75	J A 86	J A 57	J A 64	J A 143	J A 129	J A 144	J A 129	J A 108	J A 85	J A 84	J A 65	J A 33	J A 32
7	J A 51	J A 54	J A 45	J A 30	J A 40	J A 22	J A 25	J A 60	J A 59	J A 86	J A 85	J A 104	J A 93	J A 62	J A 63	J A 55	J A 84	J A 44	J A 65	J A 61	J A 60	J A 65	J A 84	
8	J A 84	J A 95	J A 110	J A 33	J A 86	J A 79	J A 92	J A 72	J A 45	J A 36	J A 39	J A 54	J A 54	J A 54	J A 87	J A 66	J A 81	J A 41	J A 41	J A 41	J A 33	J A 60	J A 31	J A 80
9	J A 64	J A 33	J A 22	J A 20	J A 24	J A 23	J A 25	J A 41	J A 61	J A 53	J A 89	J A 69	J A 41	J A 87	J A 100	J A 54	J A 63	J A 35	J A 25	J A 20	J A 18	J A 34	J A 24	J A 33
10	J A 47	J A 25	J A 43	J A 29	J A 18	J A 20	J A 26	J A 31	J A 37	J A 39	J A 70	J A 132	J A 107	J A 76	J A 73	J A 85	J A 54	J A 149	J A 72	J A 86	J A 76	J A 84	J A 43	J A 25
11	J A 45	J A 52	J A 53	J A 23	J A 22	J A 25	J A 27	J A 31	J A 44	J A 61	J A 75	J A 58	J A 94	J A 36	J A 40	J A 36	J A 33	J A 29	J A 27	J A 52	J A 33	J A 32	J A 65	J A 41
12	J A 52	J A 52	J A 65	J A 72	J A 84	J A 30	J A 27	J A 40	J A 71	J A 136	J A 123	J A 94	J A 100	J A 74	J A 75	J A 40	J A 42	J A 64	J A 78	J A 61	J A 100	J A 84	J A 58	J A 59
13	J A 52	J A 59	J A 53	J A 53	J A 25	J A 26	J A 83	J A 153	J A 84	J A 75	J A 63	J A 86	J A 82	J A 151	J A 142	J A 87	J A 80	J A 61	J A 54	J A 33	J A 20	J A 17	J A 20	J A 17
14	J A 28	J A 26	J A 33	J A 39	J A 84	J A 67	J A 36	J A 38	J A 59	J A 53	J A 84	J A 87	J A 50	J A 83	J A 55	J A 94	J A 75	J A 54	J A 43	J A 73	J A 76	E 16	E 16	J A 28
15	J A 41	E 16	J A 17	J A 34	E 16	E 16	J A 24	J A 35	J A 50	J A 69	J A 81	J A 54	J A 44	J A 47	J A 40	J A 36	J A 36	J A 76	J A 54	J A 62	J A 50	J A 31	J A 81	J A 82
16	J A 51	J A 74	J A 50	J A 41	J A 29	J A 26	J A 25	J A 35	J A 81	J A 106	J A 59	J A 65	J A 42	J A 67	J A 168	J A 62	J A 48	J A 89	J A 56	J A 88	J A 51	J A 34	J A 51	J A 41
17	J A 40	J A 30	J A 84	J A 84	J A 65	J A 60	J A 53	J A 84	J A 87	J A 73	J A 145	J A 108	J A 83	J A 102	J A 95	J A 70	J A 76	J A 66	J A 83	J A 30	J A 34	J A 36	J A 33	J A 50
18	J A 64	J A 85	J A 84	J A 60	J A 21	J A 44	J A 33	J A 44	J A 43	J A 33	J A 39	J A G	J A 39	J A 38	J A 44	J A 39	J A 46	J A 110	J A 77	J A 84	J A 17	J A 38	J A 38	J A 23
19	J A 25	J A 36	J A 20	J A 31	J A 38	J A 28	J A 24	J A 39	J A 35	J A 41	J A 42	J A 35	J A G	J A 37	J A 46	J A 44	J A 52	J A 85	J A 64	J A 54	J A 87	J A 110	J A 41	J A 45
20	J A 79	J A 80	J A 53	J A 53	J A 59	J A 65	J A 53	J A 52	J A 42	J A 145	J A 51	J A 36	J A 42	J A 41	J A 43	J A 39	J A 42	J A 57	J A 175	J A 29	J A 86	J A 73	J A 34	J A 31
21	J A 61	J A 67	J A 39	J A 24	J A 23	J A 18	J A 49	J A 65	J A 145	J A 127	J A 116	J A 55	J A 75	J A 75	J A 41	J A 39	J A 43	J A 36	J A 28	J A 41	J A 33	J A 55	J A 59	J A 44
22	J A 64	J A 61	E 16	E 16	E 16	J A 29	J A 33	J A 32	J A 43	J A 53	J A 51	J A 57	J A 55	J A 59	J A 39	J A 51	J A 33	J A 30	J A 24	J A 24	J A 33	J A 174	J A 84	J A 41
23	J A 52	J A 33	J A 32	J A 39	J A 26	J A 32	J A 29	J A 44	J A 53	J A 110	J A 93	J A 54	J A 71	J A 69	J A 57	J A 63	J A 64	J A 58	J A 34	J A 38	J A 38	J A 34	J A 26	J A 32
24	J A 19	J A 25	J A 35	J A 38	E 16	E 16	J A 35	J A 77	J A 61	J A 48	J A 104	J A 75	J A 99	J A 88	J A 51	J A 123	J A 58	J A 45	J A 32	J A 54	J A 43	J A 32	J A 28	J A 42
25	J A 69	J A 65	J A 53	J A 17	E 16	J A 25	J A 44	J A 25	J A 41	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	J A 82	J A 46	J A 100	J A 48	J A 55	J A 43	J A 36	J A 33	J A 49	J A 80	J A 105	J A 84	J A 65	J A 49	J A 74	
27	J A 50	J A 71	J A 36	J A 35	J A 23	J A 25	J A 35	J A 41	J A 89	J A 65	J A 55	J A 59	J A 75	J A 102	J A 110	J A 64	J A 46	J A 70	J A 79	J A 80	J A 44	J A 27	J A 19	J A 24
28	J A 50	J A 61	J A 20	J A 35	J A 24	J A 19	J A 24	J A 26	J A 40	J A 67	J A 36	J A 87	J A 35	J A 64	J A 64	J A 53	J A 86	J A 74	J A 62	J A 52	J A 40	J A 47	J A 65	J A 30
29	J A 39	J A 20	J A 22	J A 22	J A 18	J A 20	J A 18	J A 29	J A 34	J A 100	J A 86	J A 41	J A 39	J A 51	J A 62	J A 67	J A 65	J A 48	J A 40	J A 40	J A 65	J A 38	J A 16	J A 19
30	J A 30	J A 18	J A 21	E 16	J A 17	J A 36	J A 30	J A 30	J A 58	J A 40	J A 62	J A 95	J A 43	J A 48	J A 110	J A 49	J A 41	J A 48	J A 40	J A 120	J A 51	J A 38	J A 29	J A 50
31	J A 21	J A 31	J A 22	J A 20	E 16	E 16	J A 29	J A 42	J A 75	J A 88	J A 65	J A 52	J A 74	J A 87	J A 87	J A 83	J A 64	J A 53	J A 63	J A 41	J A 84	J A 34	J A 22	J A 32
	00	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	J A 47	J A 51	J A 36	J A 34	J A 24	J A 26	J A 30	J A 42	J A 52	J A 64	J A 64	J A 64	J A 60	J A 65	J A 60	J A 58	J A 53	J A 60	J A 54	J A 53	J A 47	J A 37	J A 34	J A 41
UQ	J A 52	J A 65	J A 53	J A 41	J A 38	J A 36	J A 40	J A 52	J A 71	J A 86	J A 86	J A 87	J A 83	J A 83	J A 87	J A 70	J A 72	J A 78	J A 77	J A 80	J A 76	J A 60	J A 51	J A 50
LQ	J A 30	J A 26	J A 22	J A 23	J A 18	J A 20	J A 25	J A 32	J A 43	J A 53	J A 53	J A 54	J A 42	J A 51	J A 44	J A 40	J A 42	J A 45	J A 34	J A 33	J A 33	J A 32	J A 26	J A 28

JUL. 1986

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JUL. 1986

FBES (0.1 MHz)

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

Station	YAMAGAWA				Lat.	31 12.1 N				Long.	130 37.1 E				Sweep 1 MHz to 25 MHz in 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 16	E 16	E 16	E 16	E 16	E 16	20	27	37	40	34	34	37	35	35	37	39	34	30	G	E 16	E 16	E 16	E 16	
2	S	29	E 16	25	19	S	25	34	30	A 64	A 108	A 64	46	A 74	39	34	31	29	27	19	E 16	E 16	E 16	E 16	
3	23	24	23	E 16	E 16	21	24	A 60	32	41	A 58	A 110	A 98	46	50	44	44	49	40	A 64	51	E 16	19	E 16	
4	E 16	E 16	20	36	A 38	E 16	18	27	31	35	39	44	51	38	41	44	35	34	G	22	20	18	E 16	19	
5	25	30	S	20	20	18	27	41	34	A 63	A 54	A 76	A 84	A 62	44	A 145	A 139	A 135	A 143	A	36	43	31	21	29
6	18	E 16	E 16	E 16	19	25	25	29	35	44	A 75	A 86	54	A 64	A 143	A 129	A 144	59	45	A 85	32	S	26	17	
7	18	E 16	E 16	23	A 40	20	25	A 60	42	71	A 85	A 104	A 93	50	53	49	37	A 84	35	A 65	32	32	29	A 84	
8	A 84	29	A 110	E 16	E 16	A 79	A 92	31	38	32	37	36	41	40	37	35	42	G	27	E 16	E 16	31	20	A 80	
9	A 64	25	21	E 16	E 16	E 16	23	34	43	41	A 89	35	38	A 87	A 100	51	34	28	23	E 16	E 16	E 16	E 16	E 16	
10	A 47	E 16	E 16	E 16	E 16	E 16	23	31	34	34	A 70	A 132	A 107	A 76	A 75	A 85	A 54	A 149	A 72	A	43	37	42	20	E 16
11	23	25	E 16	E 16	E 16	E 16	23	27	38	45	42	A 58	37	35	40	35	32	G	23	24	30	28	E 16	30	
12	A 52	A 52	A 65	A 72	A 84	E 16	25	33	A 71	A 136	A 123	44	A 100	A 74	52	34	G	59	66	59	57	17	37	E 16	
13	38	20	33	27	E 16	E 16	47	33	42	S	51	A 86	A 82	A 151	A 142	53	A 80	48	29	20	E 16	E 16	E 16	E 16	
14	20	19	28	19	23	23	30	35	35	45	A 84	46	38	A 83	A 55	A 94	50	50	33	A 73	26	E 16	E 16	E 16	
15	18	E 16	E 16	E 16	E 16	E 16	22	29	32	A 69	A 81	43	40	43	35	35	33	55	49	A 62	A 50	28	A 81	A 82	
16	A 51	A 74	A 50	A 41	A 29	17	21	25	32	34	43	37	40	43	47	34	30	A 89	23	24	E 16	E 16	A 51	E 16	
17	A 40	E 16	19	E 16	E 16	A 60	30	34	A 87	42	A 145	A 108	A 83	A 102	A 95	53	A 76	52	38	20	32	22	20	35	
18	25	25	E 16	E 16	E 16	E 16	20	25	31	32	36	G	31	37	41	38	45	34	30	22	E 16	26	20	E 16	
19	20	23	E 16	E 16	A 38	20	17	32	31	34	40	35	G	36	33	40	33	35	32	40	24	29	21	33	
20	A 79	21	19	E 16	A 59	E 16	30	51	30	35	48	34	42	41	40	39	40	57	56	22	52	41	E 16	18	
21	30	21	37	E 16	E 16	E 16	31	35	39	A 127	A 116	A 55	A 75	A 75	39	39	35	30	27	26	19	32	28	A 44	
22	A 64	E 16	E 16	E 16	E 16	E 16	25	34	38	47	50	47	38	35	39	29	28	23	21	25	43	41	39		
23	S	17	E 16	S	25	S	25	38	44	A 110	A 93	49	59	61	43	49	40	54	31	36	35	28	A 26	E 16	
24	E 16	20	22	17	E 16	E 16	31	A 77	50	38	A 104	A 75	A 99	A 88	49	A 123	57	44	27	31	35	30	19	A 42	
25	A 69	A 65	E 16	E 16	E 16	20	30	25	35	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
26	C	C	C	C	C	C	C	C	C	40	45	A 100	48	39	39	35	30	41	76	A 105	19	A 65	22	E 16	
27	E 16	S	S	S	E 16	E 16	20	27	32	36	39	41	40	A 102	61	35	37	50	A 79	47	42	25	19	E 16	
28	E 16	E 16	E 16	E 16	E 16	E 16	G	26	36	A 67	35	A 87	G	A 64	A 64	38	52	A 74	A 62	A 52	39	46	65	E 16	
29	E 16	E 16	E 16	E 16	E 16	E 16	18	25	28	A 100	43	33	36	41	47	44	47	33	26	39	A 65	A 38	E 16	E 16	
30	E 16	E 16	E 16	E 16	E 16	21	23	29	A 58	37	A 62	51	38	39	A 110	41	28	36	23	44	42	31	27	25	
31	E 16	25	18	19	E 16	E 16	29	34	46	A 88	A 65	A 52	A 74	A 87	A 87	45	44	39	26	E 16	43	21	19	E 16	
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	28	29	28	28	30	28	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	29	30	30	
MED	23	20	E 16	E 16	E 16	E 16	24	32	35	41	A 56	50	46	56	47	40	40	46	30	34	32	28	20	E 16	
UQ	A 49	25	22	20	23	20	30	35	42	A 67	A 85	A 86	A 82	A 76	A 64	51	50	57	49	52	42	32	27	33	
LQ	E 16	E 16	E 16	E 16	E 16	E 16	20	27	32	36	42	37	38	39	39	35	33	34	26	21	19	17	E 16	E 16	

The Radio Research Laboratory, Japan

JUL. 1986

FBES (0.1 MHz)

# IONOSPHERIC DATA

JUL. 1986

FMIN (0.1 MHZ)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA							Lat. 31° 12' N	Long 130° 37' E	Sweep 1	MHz to 25 MHz in 24 sec in automatic operation														
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E S	E S	E S	E S	E S	E S	E S	15	15	15	16	16	18	17	18	16	16	14	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	15	16	15	17	20	17	18	18	16	16	15	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	15	15	16	16	16	16	16	17	16	16	15	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	15	15	15	17	17	20	18	19	18	15	15	E S	E S	E S	E S	E S	E S	
5	E S	E S	E S	E S	E S	E S	E S	15	15	17	21	16	18	18	18	17	15	15	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	15	16	18	17	19	19	17	17	16	15	15	E S	E S	E S	E S	E S	E S	
7	E S	E S	E S	E S	E S	E S	E S	16	17	15	17	20	18	18	16	16	14	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	16	17	17	16	16	21	17	17	17	16	14	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	16	16	16	17	17	17	18	17	16	16	13	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	16	16	16	17	18	17	17	18	18	18	16	14	E S	E S	E S	E S	E S	
11	E S	E S	E S	E S	E S	E S	E S	15	16	16	16	18	20	21	E C	37	17	17	17	E S	12	E S	E S	E S	
12	E S	E S	E S	E S	E S	E S	E S	15	17	17	17	17	17	17	21	18	16	16	16	E S	E S	E S	E S	E S	
13	E S	E S	E S	E S	E S	E S	E S	16	16	17	19	21	22	E S	38	20	17	17	17	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	16	17	20	21	22	18	19	17	16	16	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	16	16	16	17	18	20	17	16	17	15	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	16	16	22	18	24	21	18	20	16	18	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	16	16	17	17	18	18	23	18	16	17	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	16	16	16	E C	28	17	18	18	22	21	15	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	16	17	19	17	18	18	18	17	16	17	16	E S	E S	E S	E S	E S	E S	
20	E S	E S	E S	E S	E S	E S	E S	16	17	20	18	18	20	18	17	18	16	16	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	16	16	16	E C	26	18	20	19	21	15	15	15	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	15	16	16	22	E C	30	21	19	20	17	16	15	15	E S	E S	E S	E S	
23	E S	E S	E S	E S	E S	E S	E S	15	16	16	E C	22	E C	27	E C	28	36	22	17	16	16	E S	E S	E S	
24	E S	E S	E S	E S	E S	E S	E S	14	16	18	E C	32	E C	22	E C	24	18	19	17	16	18	E S	E S	E S	
25	E S	E S	E S	E S	E S	E S	E S	17	16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
26	C	C	C	C	C	C	C	C	C	16	16	17	17	16	16	16	16	15	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	15	16	16	18	16	17	20	17	15	15	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	15	17	17	17	20	17	16	17	16	15	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	16	15	16	17	21	19	19	17	17	16	13	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	17	18	22	20	19	E C	32	18	20	21	15	17	17	E S	E S	E S	E S	
31	E S	E S	E S	E S	E S	E S	E S	17	18	17	E C	20	E C	25	21	E C	36	E C	34	19	16	16	13	E S	E 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	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	18	18	18	18	17	16	16	E S	E S	E S	E S	E S	E S	
UQ	E S	E S	E S	E S	E S	E S	E S	E S	16	17	19	20	20	20	20	18	17	16	E S	E S	E S	E S	E S	E S	
LQ	E S	E S	E S	E S	E S	E S	E S	E S	15	16	16	17	17	18	17	17	16	15	14	E S	E S	E S	E S	E S	

JUL. 1986

FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

JUL. 1986

M(3000)F2 (0.01)

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

Station	YAMAGAWA				Lat. 31 12.1 N				Long 130 37.1 E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation														
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	F	F	F	F	S	F	J R	320	305	285	395	330	285	265	H	270	310	310	320	310	315	335	365	310	295		
2	F	S	300	S	F	S	355	355	355	A	A	A	300	A	H	295	305	335	J R	275	310	310	J F	315	355	300	F
3	S	300	F	S	S	350	355	A	335	365	A	A	A	305	A	305	310	325	325	A	335	370	S	F	F		
4	F	J S	F	S	A	F	365	345	390	R	295	300	300	285	300	325	330	250	335	300	310	350	S	S	F		
5	F	F	S	F	F	F	345	320	285	310	340	A	A	A	A	A	A	A	A	A	H	295	S	355	355	F	F
6	290	U S	325	315	F	335	340	320	345	345	A	A	310	A	A	A	A	315	345	A	S	S	S	290	F		
7	F	U F	F	345	A	A	345	A	320	295	A	A	A	300	305	300	320	A	335	A	F	F	F	F	A		
8	A	310	A	350	335	A	A	290	335	335	340	260	260	R	280	310	300	320	340	R	310	325	330	F	U S	A	
9	A	310	F	F	F	F	330	345	385	370	R	A	320	320	A	A	310	305	300	335	350	320	300	U S	295	F	
10	A	U F	U F	F	F	U F	305	335	305	355	300	A	A	A	A	A	A	A	A	A	A	A	F	U S	340	U F	315
11	305	U S	320	335	F	325	335	310	290	315	330	A	305	275	315	290	310	290	R	315	295	S	335	305	315	F	
12	A	A	A	A	A	350	365	340	A	A	A	280	A	A	305	295	U B	275	A	A	S	345	350	F	F		
13	F	F	U F	F	F	F	320	A	375	325	315	320	A	A	A	A	295	A	300	295	300	295	295	U S	305	U S	
14	330	295	F	F	F	F	325	340	345	315	R	A	335	320	A	A	A	310	320	315	A	F	F	F	F		
15	F	F	F	F	F	F	345	380	365	335	A	A	275	290	310	295	330	310	330	375	A	A	300	A	A		
16	A	A	A	A	A	F	365	360	330	345	315	290	290	310	305	305	275	A	300	340	355	370	F	A	F		
17	A	F	F	F	F	A	355	370	A	360	A	A	A	A	A	280	A	290	335	335	335	315	305	F			
18	F	F	F	F	355	350	310	310	340	340	310	300	305	310	320	290	280	305	310	345	340	320	315	300	300		
19	F	F	F	F	345	A	335	H	315	365	365	295	275	270	275	305	285	290	315	305	330	340	S	315	F	F	
20	A	F	F	F	A	325	330	365	350	355	A	315	285	300	285	285	295	A	325	315	325	335	325	F	F		
21	F	H	315	F	F	320	340	U R	225	375	A	A	A	A	A	275	280	290	310	325	325	360	335	295	R	A	
22	A	F	F	F	S	F	325	340	370	335	310	A	295	270	285	285	275	H	295	290	315	320	340	S	S		
23	S	300	310	S	A	F	335	330	A	A	A	295	310	270	270	270	H	285	300	315	335	365	340	S	A	290	
24	305	305	290	280	320	F	295	A	265	320	A	A	A	A	275	A	A	305	325	H	S	300	310	355	355	A	
25	A	A	305	F	F	F	325	305	310	F	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
26	C	C	C	C	C	C	C	C	C	335	290	A	H	300	260	315	380	275	290	325	A	395	A	285	F		
27	S	S	S	S	S	S	380	340	345	320	310	A	280	A	315	340	315	295	A	275	290	285	305	300			
28	F	U F	U F	F	U S	U F	330	335	U R	320	A	R	A	G	A	A	275	300	A	A	A	330	375	S	A	F	
29	F	U F	F	F	F	F	360	330	335	A	R	290	265	265	290	285	290	U H	310	330	360	A	A	270	290		
30	280	290	300	335	310	A	365	315	A	255	A	310	295	275	A	U R	295	290	320	340	330	U S	285	300	290	F	
31	F	U F	305	J S	350	325	J R	U R	345	345	325	A	A	A	A	A	275	300	340	315	325	S	315	U S	295	280	280
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	6	17	15	12	8	17	28	27	26	20	12	14	20	15	20	25	24	23	25	23	25	25	19	8			
MED	298	305	305	335	340	325	338	340	338	320	312	298	295	285	290	295	302	305	325	315	325	335	305	298			
UQ	305	310	318	345	348	335	358	350	355	345	335	315	308	305	305	310	310	320	335	335	345	355	308	308			
LQ	280	295	295	310	315	320	325	318	325	305	298	280	282	270	282	285	290	295	315	300	315	305	292	290			

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M(3000)F2 (0.01)

IONOSPHERIC DATA

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M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA				Lat.		31 12·1 N		Long 130 37·1 E		Sweep 1		MHz to 25		MHz in 24		sec in		automatic operation							
	Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1								L	L	A	A						A	A	A	L	L					
2								L	A	H	A	A	A	A	A		400	H	U	L		L				
3								L	A		A	A	A	A	A	A	A	A	A	A	A					
4										390	H	R	415	A	A	A	A	A	A	370	365	435				
5								U	L	A		A	A	A	A	A	A	A	A	A	A					
6								365	350		A	A	A	A	A	A	A	A	A	A	A					
7										A	A	A	A	A	A	A	A	305		A		A				
8								A	U	L	A	380	405	385	420	380	405	380	A	380	L	355	355			
9								L	L	A	A	A		375	430	A	A	A	375	370	380		L			
10										355	410	415	A	A	A	A	A	A	A	A	A					
11								U	L	A	A	A	A		370	370	380	390	400	370	355					
12										A	A	A	A	A	A	A	350	375		A	A	A				
13								A	L	A	L	A	A	A	A	A	A	A	A	A	345					
14									A	410	A	A	A		395	A	A	A	A	A	L	A				
15								L	L	390	A	A	A		395	A	L	400	L	390	A	A	A			
16								U	L	380	L	395	390	A	405	L	405	A	A	395	U	L	A	380		
17								L	A	A	A	A	A	A	A	A	A	A	A	A	A					
18								L	L	380	L	390	L	395	405	L	395	395	A	385	A	A	L			
19								L	L	400	U	L	395	405	395	L	405	415	L	395	A	365	A	A		
20										385	U	L	A	415	A	370	395	L	A	A	A	A				
21								A	A	A	A	A	A	A	A	A	A	A	385	370	370		A			
22								U	L	270	370	375	405	A	A	A	410	405	A	H	375	360	355		L	
23								L	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
24								A	A	A	400	A	A	A	A	A	A	A	A	A	355	A				
25								A		360	A	C	C	C	C	C	C	C	C	C	C	C				
26								C	C	C	A	A	A	A	A		370	380	H	365	A	A	A			
27								L	L		410	450	370	A	A	A	A	365	A	A	A	A				
28										340	A	A	380	A	405	A	A	A	A	A	A	A				
29								L		360	A	A	405	430	A	A	A	A	A	350	365					
30								L	A	A	A	A	A		360	380	A	A	385	A	365					
31								A	A	A	A	A	A	A	A	A	A	A	A	A	L	350		L		
CNT										3	10	14	10	7	8	12	8	8	9	12	8	14	2			
MED								U	L	320	360	390	392	395	405	405	388	400	385	375	370	355	395			
UQ								342	380	400	405	405	410	425	402	405	395	L	385	370	365					
LQ								U	L	295	350	380	390	382	390	395	375	382	380	370	365	350				

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M(3000)F1 (0.01)

# IONOSPHERIC DATA

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H<sup>o</sup>F2 (KM)

135° E Mean Time (G.M.T. + 9 h)

Hour Day	Station YAMAGAWA				Lat. 31 12.1 N		Long. 130 37.1 E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation															
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						295	295	345	380	295	300	400	450	400	300	290	285	320	250					
2						250	220	290	A	A	A	A	A	360	360	300	335	330	250					
3						240	A	295	290	A	A	A	365	A	355	350	310	285	A					
4							265	245	R	415	390	A	395	355	290	285	350	260	250					
5						U L 415	A	250	A	A	A	A	A	320	A	A	A	A	E A 300					
6						290	300	280	290	A	A	A	A	A	A	A	E A 305	250	A					
7							A	305	E A 370	A	A	A	E A 380	E A 380	E A 360	320	A		A					
8						A	395	280	295	275	600	530	630	425	350	325	295	275	295					
9						L 260	260	220	E A 260	A	300	310	A	A	E A 345	325	310	250	220					
10							360	260	370	A	A	A	A	A	A	A	A	A						
11							L 295	375	305	255	A	355	450	350	405	355	330	275						
12									A	A	A	435	A	A	345	345	345	E A 435	A	A				
13						A	225	320	345	A	A	A	A	A	E A 365	A	330	300						
14							280	270	A	A	A	370	A	A	A	320	300	280	A					
15							270	330	A	A	450	390	370	365	300	320	300	240	A					
16							270	320	280	365	430	420	345	350	365	390	A	300						
17							250	A	280	A	A	A	A	A	A	A	E A 330							
18							280	275	340	390	360	330	340	405	430	355	320	250						
19							255	250	320	460	470	430	340	375	370	305	300	265						
20								225	320	A	370	440	380	415	380	380	A	A						
21							270	295	245	A	A	A	A	A	390	350	330	285	255	250				
22						U L 305	280	245	290	A	A	370	420	380	385	370	320	295	265					
23							285	290	A	A	A	340	E A 330	A	380	350	330	295	275	235				
24							A	A	S	325	A	A	A	A	A	A	325	280	E A 285					
25							300	305	300	C	C	C	C	C	C	C	C	C	C					
26							C	C	C	300	400	A	330	420	395	350	340	325	A	A				
27						U L 250	255	285	340	340	A	410	A	A	270	310	A	A	A					
28							325	305	A	330	A	G	A	A	400	E A 380	A	A	A					
29							L 295	295	A	510	410	475	465	400	370	350	295	260						
30							L	A	510	A	330	330	340	A	310	320	285	250						
31							E A 280	A	A	A	A	A	A	A	380	325	255	270	245					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						11	23	25	19	11	13	17	15	18	24	24	23	21	12					
MED						285	280	285	312	365	390	390	380	380	354	326	305	275	250					
UQ						298	295	305	341	408	435	430	435	400	375	351	325	285	274					
LQ						255	260	250	290	312	340	330	348	352	345	320	295	255	248					

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H<sup>o</sup>F2 (KM)



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H\*F (KM)

135° E Mean Time (G.M.T. + 9 h)

Station		YAMAGAWA							Lat.	31 12.1 N			Long.	130 37.1 E			Sweep	1 MHz to 25 MHz		in 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	S	S	E S	E S	245	210	A	A	195	180	195	205	200	A	A	A	A	220	210	195	E S	S				
2		S	A	E S	A	A	A	230	225	195	A	A	A	A	A	A	190	195	235	225	235	240	210	S	S				
3		E A	A	A	S	E S	E A	220	A	A	A	A	A	A	A	A	A	A	A	A	A	A	205	A	E S				
4		S	E S	E A	A	A	E S	235	215	195	200	E A	A	A	E A	A	A	A	A	A	230	A	A	E S	E S				
5		E A	A	S	E A	E A	E A	300	A	225	A	A	A	A	A	A	A	A	A	A	A	E A	E A	E A	A				
6		E A	E S	E S	E S	E A	A	E A	H	A	A	A	A	A	A	A	A	A	A	A	A	A	S	E A	A				
7		A	255	255	255	A	E A	270	A	A	A	A	A	A	A	A	A	A	A	A	250	A	270	A	300	A			
8		A	A	A	245	E S	A	A	A	195	225	185	H	205	255	205	200	H	A	215	245	270	235	235	E A	A			
9		A	E A	E A	E S	E S	260	220	250	A	A	A	A	200	180	A	A	A	A	225	205	215	215	210	250	275	E S		
10		A	E S	E S	245	245	E S	245	235	200	195	A	A	A	A	A	A	A	A	A	A	350	275	265	270	245			
11		E A	E A	275	235	265	270	230	220	A	A	A	A	H	H	A	200	195	195	H	225	255	245	270	255	E A	305		
12		A	A	A	A	A	245	240	245	A	A	A	A	A	A	A	A	A	A	200	250	A	A	A	E A	210	E A	300	245
13		A	A	E A	E A	E S	265	A	225	A	E S	A	A	A	A	A	A	A	A	A	A	A	230	245	265	265	255	240	
14		230	E A	E A	E A	E S	E A	E A	A	205	A	A	A	A	H	A	A	A	A	A	A	E A	A	E A	230	235	E S	265	
15		E A	250	245	E S	250	220	215	215	190	H	A	A	A	E A	A	190	220	220	A	A	A	A	A	E A	A	A	A	
16		A	A	A	A	A	A	240	230	200	205	220	A	190	H	H	A	A	210	190	A	230	235	225	200	A	E S	310	
17		A	E S	E A	E S	E S	A	E A	230	A	A	A	A	A	A	A	A	A	A	A	A	250	240	E A	E A	E A	E A	A	
18		A	E A	S	S	240	E S	230	225	210	195	H	180	H	H	200	210	A	220	A	A	E A	E A	200	E A	E A	E A	E S	
19		E A	E A	E S	E S	A	E A	240	E A	220	H	A	A	H	200	H	A	220	E A	E A	E A	220	E A	E A	E A	E A	E A	E A	
20		A	E A	E A	E S	A	250	290	A	210	200	H	180	A	E A	E A	E A	A	A	A	A	E A	A	E A	260	240	E A	290	
21		A	A	A	E S	270	E S	A	A	A	A	A	A	A	A	A	A	A	A	230	235	230	A	210	240	A	A	A	
22		A	E S	S	E S	E S	E S	225	220	220	205	A	A	A	A	A	A	A	H	215	225	240	E A	240	E A	E A	A	A	
23		S	305	E S	S	A	S	E A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
24		E A	A	A	A	E S	E S	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E A	A	E A	A	A	A	A	
25		A	A	E S	E S	270	E S	A	H	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
26		C	C	C	C	C	C	C	C	C	A	A	A	A	A	E A	235	230	200	A	A	A	A	A	A	E A	E S	290	
27		S	S	S	S	E S	E S	240	245	215	E A	A	A	A	A	A	A	230	A	A	A	A	A	A	A	A	A	A	
28		300	260	290	295	280	250	220	250	A	A	200	A	180	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
29		E S	E S	255	E S	220	230	220	215	210	A	A	195	190	A	A	A	A	A	A	255	230	225	A	A	A	E S	E S	
30		E S	E S	E S	E S	E S	A	230	230	A	A	A	A	240	240	A	A	210	A	225	E A	E A	E A	E A	E A	E A	E A	E A	
31		E S	E S	E S	E S	225	E S	210	A	A	A	A	A	A	A	A	A	A	A	A	200	245	E A	E A	E A	E S	E S	295	
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT		15	21	22	23	22	24	25	21	14	10	6	8	12	9	8	10	12	8	17	16	24	27	22	22				
MED		E A	E S	E S	E S	E S	E S	230	225	210	199	202	188	195	202	196	210	218	225	230	234	U A	U A	E A	E S				
UQ		E A	E A	E A	E A	E S	E S	242	240	215	208	220	198	201	225	U A	U A	225	228	238	235	E A	E A	E A	E A	E A	E A	E S	
LQ		E A	E S	S	U	U	U	222	220	200	H	195	180	185	198	190	200	198	210	225	232	218	215	248	E S	E S	250		

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H\*F (KM)

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# IONOSPHERIC DATA

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H<sup>o</sup>E (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA				Lat. 31° 12' 1" N				Long. 130° 37' 1" E				Sweep 1 MHz to 25 MHz in 24 sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	110	105	A	105	110	110	A	110	110	110	110	115	S				
2							S	A	105	110	110	110	110	110	110	110	110	110	110	S				
3							S	A	A	A	105	105	105	105	105	110	110	115	S					
4							S	A	A	105	110	110	110	110	110	A	A	A	A	S				
5							S	110	105	105	110	110	110	A	A	A	A	A	A	S				
6							S	A	A	A	110	110	110	110	105	A	A	A	S					
7							A	105	105	105	105	A	A	A	A	A	A	A	A	A				
8							A	A	A	105	105	105	105	105	105	105	105	105	105	A				
9							A	105	A	105	A	A	105	105	105	105	A	A	A	A				
10							145	A	A	A	105	105	105	105	105	A	A	A	A	S				
11							125	105	A	105	105	105	A	A	C	105	105	110	H	A	A			
12							135	A	105	105	105	105	105	105	105	105	E	A	125	105	110	A		
13							A	A	105	105	105	105	105	S	105	105	105	A	A	A				
14							S	A	A	105	105	105	110	A	A	110	A	A	115	S				
15							S	115	110	105	105	105	105	105	A	A	A	A	A	S				
16							S	105	105	105	110	105	105	110	105	105	110	110	A	S				
17							C	A	A	A	A	A	A	A	A	A	A	A	A	S				
18							S	A	105	105	105	E	C	115	105	105	A	110	110	105	115	S		
19							S	110	115	110	105	105	105	105	105	A	A	A	A	S				
20							S	110	105	A	A	110	110	110	105	110	110	105	115	S				
21							S	110	A	110	A	C	A	A	110	A	105	A	A	S				
22							S	A	110	110	A	C	115	110	A	A	A	105	105	S				
23							S	110	110	110	110	C	C	C	C	115	115	115	B	S				
24							S	110	H	110	105	110	C	110	C	A	A	A	A	A				
25							S	A	110	C	C	C	C	C	C	C	C	C	C	C				
26							C	C	C	A	A	A	A	A	A	105	A	110	115	S				
27							S	A	105	105	105	110	H	105	105	A	A	A	A	S				
28							E	S	135	105	105	105	105	A	A	A	105	105	105	105	E	S	115	
29							S	A	A	105	105	105	115	105	105	105	105	105	110	S				
30							S	105	115	110	110	105	C	105	105	105	105	105	A	S				
31							S	105	105	105	105	C	A	C	C	C	105	105	110	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							4	15	19	23	24	20	21	17	17	18	16	16	13					
MED							135	110	105	105	105	105	105	105	105	105	106	105	115					
UQ							140	110	110	108	110	110	110	110	110	110	110	110	115					
LQ							128	105	105	105	105	105	105	105	105	105	105	105	110					

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H<sup>o</sup>E (KM)

# IONOSPHERIC DATA

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H°ES (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA																								Lat.	31° 12' 1" N				Long.	130° 37' 1" E				Sweep	1 MHz to 25 MHz		in 24 sec		in automatic operation	
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																	
1	S	S	S	S	S	S	125	110	120	105	105	105	180	150	130	120	115	110	110	110	105	S	120	115																	
2	105	125	100	100	100	100	120	105	120	110	110	110	125	125	120	130	140	110	115	110	110	105	S	100																	
3	120	110	110	110	105	105	100	105	105	125	115	115	115	120	120	120	120	115	110	110	110	105	105	105																	
4	130	105	100	100	100	100	135	130	130	115	115	110	110	120	125	125	120	120	110	115	100	100	100	120																	
5	105	100	100	105	105	120	130	120	120	105	105	105	100	100	140	120	125	120	110	110	105	100	105	110																	
6	110	105	105	105	100	100	100	130	120	120	115	110	115	110	110	105	105	100	100	100	100	100	100	100																	
7	105	110	100	95	115	95	125	125	120	110	105	105	105	100	105	100	100	100	100	115	100	110	120	115																	
8	110	110	110	110	125	105	130	105	105	115	105	120	120	130	125	120	115	135	115	110	110	105	100	105																	
9	105	100	100	125	115	120	115	110	120	110	105	105	155	120	115	115	105	100	120	100	100	130	110	110																	
10	110	100	110	105	100	100	145	145	145	145	110	105	105	105	100	120	125	120	120	120	120	120	135	110																	
11	105	105	105	105	100	105	130	125	115	115	115	105	115	110	160	135	125	155	100	100	95	95	110	110																	
12	110	110	105	105	105	105	130	130	120	110	110	110	110	110	125	135	125	120	115	110	110	105	105	105																	
13	105	105	100	105	105	125	110	110	110	115	110	105	105	105	105	105	105	105	100	100	100	100	100	100																	
14	100	100	105	100	105	105	105	100	100	115	110	110	110	100	120	115	120	115	115	105	100	S	S	105																	
15	105	S	110	105	S	S	125	120	115	110	120	125	125	120	105	160	100	100	100	100	110	100	110	105																	
16	105	100	100	100	100	100	140	120	115	120	115	110	130	125	115	120	125	110	130	115	115	110	105	110																	
17	110	110	110	105	105	105	105	105	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	105																	
18	105	105	105	105	105	105	105	105	115	115	125	G	150	170	130	135	120	110	110	110	120	120	105	105																	
19	100	100	100	105	100	100	110	105	110	110	105	110	G	150	105	100	100	100	100	115	115	110	100	105																	
20	105	105	105	105	105	105	105	110	110	100	100	110	145	140	140	155	140	130	120	120	120	110	110	110																	
21	110	105	110	115	155	130	115	110	130	105	105	105	105	105	110	150	135	130	125	115	110	100	100	105																	
22	100	100	S	S	S	115	115	115	110	110	105	105	105	105	105	100	105	140	125	105	110	110	110	110																	
23	105	100	100	105	110	105	105	120	120	115	110	115	115	115	120	115	120	115	110	110	110	105	110	120																	
24	120	105	100	105	S	S	115	110	110	105	105	105	105	105	105	100	100	100	100	100	100	100	115	115																	
25	115	110	105	100	S	115	110	110	105	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C																	
26	C	C	C	C	C	C	C	C	C	110	110	100	140	120	120	170	145	110	120	115	115	115	130	105																	
27	105	105	100	100	100	100	115	120	120	105	120	120	115	110	105	105	105	100	100	100	100	95	100	110																	
28	105	110	105	105	110	110	145	125	125	115	130	120	E	G	150	125	120	140	120	115	110	110	110	105	110																
29	105	105	105	100	120	140	155	125	120	110	105	120	140	120	115	110	110	110	105	105	105	S	125																		
30	120	120	105	S	105	125	135	145	120	120	110	110	110	110	110	110	110	110	105	100	100	100	100	105																	
31	115	100	95	100	S	S	110	110	110	105	105	105	100	120	115	110	110	110	105	110	105	105	105	115																	
CNT	29	28	28	27	24	26	30	30	30	30	30	29	29	30	30	30	30	30	30	30	30	28	27	30																	
MED	105	105	105	105	105	105	115	112	118	110	110	110	115	118	115	120	118	110	110	110	108	105	105	110																	
UQ	110	110	105	105	110	115	130	125	120	115	115	110	128	125	125	135	125	120	115	115	110	110	110	110																	
LQ	105	100	100	100	100	100	110	110	110	105	105	105	105	105	105	105	105	100	100	100	100	100	100	105																	

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H°ES (KM)

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IONOSPHERIC DATA

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TYPES OF ES

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

Station	YAMAGAWA							Lat. 31 12 · 1 N · Long 130 37 · 1 E		Sweep 1		MHz to 25		MHz in 24		sec in		automatic operation						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							C 3	C 3	HC 25	L 3	C 2	C 2	HL 11	HL 11	H 1	C 2	C 3	C 3	C 4	C 3	F 1		F 2	FF 22
2	F 5	F 7	F 2	F 6	F 6	F 5	HL 13	CL 23	H 2	C 4	C 5	C 3	C 2	C 4	C 2	H 2	H 1	C 3	C 2	C 2	F 2	F 2		F 2
3	FF 26	F 4	F 7	F 5	F 3	F 3	L 3	L 3	L 3	HL 31	C 3	C 4	C 5	C 3	C 3	C 3	C 4	C 6	C 7	C 7	F 5	F 3	F 7	F 3
4	F 2	F 4	F 4	F 5	F 3	F 2	H 1	HL 13	H 2	C 2	C 2	C 3	C 3	C 2	C 2	CL 31	CL 23	CL 32	CL 23	CL 23	F 4	F 6	F 5	F 4
5	F 7	F 5	F 5	F 4	F 5	F 2	H 6	C 6	C 3	C 3	C 3	C 5	C 5	L 3	HL 22	CL 43	CL 52	CL 63	CL 55	CL 33	FF 62	F 3	F 2	F 5
6	F 4	F 4	F 3	F 2	F 3	F 4	L 4	HL 23	CL 24	CL 32	C 5	C 6	C 4	C 4	C 5	C 6	L 4	L 4	L 4	L 8	F 6	F 3	F 5	F 4
7	F 3	F 3	F 2	F 8	FF 36	F 3	CL 31	C 5	C 5	C 5	L 4	L 2	L 4	L 4	L 5	L 2	L 6	L 5	CL 47	F 6	FF 13	FF 42	F 4	
8	F 6	FF 22	F 7	F 6	FF 12	F 5	CL 36	L 2	L 3	C 1	C 2	C 1	C 1	C 1	C 2	C 1	C 2	C 1	C 2	F 3	F 3	F 4	F 4	
9	F 4	F 7	F 6	FF 12	FF 11	F 2	C 4	C 2	CL 32	C 4	L 3	L 2	H 1	C 4	C 5	C 2	C 2	LC 11	CL 12	L 1	F 2	FF 31	F 2	F 2
10	F 6	F 2	FF 23	FF 22	F 1	FF 11	H 2	HL 32	HL 33	HL 13	C 4	C 6	C 7	C 5	C 6	CL 64	CLL 23	CLL 44	CL 56	LL 56	FF 25	FF 62	FF 13	F 3
11	F 5	F 4	F 3	F 2	F 1	FF 13	C 3	C 2	CL 32	C 4	C 3	C 4	CL 21	L 1	H 1	H 2	C 1	HL 12	L 4	L 3	F 6	F 5	FF 22	F 5
12	E 5	F 6	F 5	F 5	F 3	C 5	CL 43	C 5	C 4	C 4	C 2	C 7	C 4	C 4	H 1	CHL 11	C 6	C 6	L 5	F 5	F 2	F 6	F 4	
13	F 5	F 3	F 4	FF 22	FF 22	FF 21	L 6	C 3	C 3	C 2	C 3	C 5	C 3	C 7	C 5	C 4	C 4	C 6	L 3	L 2	F 2	F 2	F 2	F 2
14	F 3	F 3	F 3	F 2	F 2	F 4	L 3	L 3	L 3	C 3	C 4	C 2	C 1	L 2	CL 21	C 5	CL 22	CL 52	C 4	L 4	F 2			F 1
15	F 2		F 3	F 2			C 3	C 3	C 2	C 3	C 4	C 2	C 2	C 2	C 2	HL 12	L 2	L 4	L 5	L 6	FF 45	F 5	FF 33	F 6
16	F 6	F 4	F 5	F 4	F 5	F 3	HL 11	C 2	C 2	C 2	C 2	C 1	C 1	C 1	C 2	C 1	C 1	C 4	CL 22	C 2	F 1	F 1	F 6	F 2
17	F 4	F 2	F 4	F 3	F 3	F 4	L 4	C 3	L 5	L 3	L 5	L 4	L 4	L 4	L 5	L 5	L 5	L 5	L 4	F 3	F 3	F 3	F 6	
18	F 4	F 7	F 3	F 2	F 3	F 2	L 4	L 2	C 1	C 1	CC 11		H 1	H 1	H 2	H 1	C 4	C 3	C 4	C 4	F 2	F 6	F 4	F 2
19	F 2	F 2	F 1	F 2	F 5	F 5	C 2	C 4	C 2	C 2	C 3	C 1		H 1	CH 21	L 3	L 3	L 3	L 2	CL 23	FF 23	FF 32	F 2	F 4
20	FF 32	F 4	F 4	F 4	F 5	F 2	C 4	C 4	C 3	L 2	L 3	C 2	H 1	H 1	H 2	H 2	H 2	H 4	C 4	C 6	F 6	F 5	F 1	F 2
21	F 4	F 2	F 7	FF 21	F 1	F 1	C 5	C 4	CL 14	C 6	L 5	L 2	L 3	L 4	C 2	HC 11	H 2	HL 23	HL 21	CL 61	FF 53	F 4	F 2	F 2
22	F 4	F 4			F 2	CL 22	L 3	C 5	C 3	L 3	L 2	C 3	C 2	L 1	L 2	L 2	H 1	H 1	L 5	F 3	F 4	F 6	F 6	
23	F 6	F 3	F 2	F 4	F 5	F 7	L 5	C 4	C 6	C 7	C 5	C 3	C 3	C 2	C 2	C 3	C 4	C 2	L 5	L 7	F 7	F 6	F 3	F 1
24	F 1	F 4	F 3	F 3			C 5	C 7	C 4	C 4	C 4	C 5	C 6	C 4	L 3	L 4	L 5	L 4	L 4	L 4	F 6	F 5	F 2	F 3
25	F 4	F 6	FF 41	F 1	F 5	C 5	L 2	C 3																
26									CL 32	CL 32	L 6	HL 22	CL 21	CL 12	H 1	HL 22	C 4	CC 56	CL 62	F 7	F 6	FF 26	F 2	
27	F 3	F 6	F 3	F 6	F 2	F 3	CH 13	HL 21	C 2	CH 13	C 2	C 3	C 3	C 7	L 3	L 2	L 3	L 4	L 7	L 8	F 7	F 6	F 2	F 2
28	F 3	FF 22	F 2	F 2	F 3	F 1	HL 11	HC 22	C 3	C 4	C 1	CL 32	HL 11	CL 32	C 6	C 2	C 4	C 6	C 7	LL 61	FF 51	F 6	F 7	F 3
29	F 3	F 2	F 2	F 2	F 1	F 1	H 1	CL 22	CHL 11	C 5	C 3	CH 11	HL 11	C 3	C 3	C 2	C 3	C 2	C 3	L 6	F 4	F 4		F 2
30	F 2	F 1	F 1		F 2	FF 11	CL 21	H 3	C 4	C 2	C 5	C 3	C 1	C 2	C 4	C 3	C 1	C 4	L 2	L 6	F 2	F 5	F 4	FF 31
31	F 1	F 5	F 2	F 1			L 5	C 6	C 4	C 5	C 4	C 3	L 3	C 2	C 4	C 3	C 3	C 4	C 3	L 2	F 2	F 2	F 2	F 1
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

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TYPES OF ES

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# IONOSPHERIC DATA

JUL. 1986

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station		OKINAWA								Lat.	26° 16.9' N		Long.	127° 48.4' E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 56	50	X 50	40	40	36															X 63	X 36	X 36	X 37	
2	X 36	X 34	X 32	32	26	34															X 75	X 55	X 44	X 41	
3	X 41	36	A	43	48	0 X 29															X 61	X 51	X 57	47	
4	38	40	39	40	A	33															S 61	X 47	X 42	X 40	
5	X 38	X 38	36	39	A	A															X 66	A	A	A	
6	A	A	X 37	33	A	A															U 43	A	A	40	
7	X 39	A	41	A	A	A															X 58	55	52	47	
8	A	A	39	A	A	A															X 63	X 58	A	32	
9	X 31	23	28	28	30	28															X 45	X 45	44	44	
10	53	35	33	38	32	28															X 77	55	A	60	
11	A	43	33	A	33	A															U 65	X 64	X 55	X 50	
12	A	A	A	42	33	A															X 98	60	A	A	
13	A	62	A	A	34	A															X 73	X 70	X 69	X 62	
14	X 53	X 48	X 46	A	A	37															X 69	X 70	X 60	63	
15	64	65	59	X 54	X 46	42															46	A	A	X 38	
16	A	A	38	36	34	23															X 91	X 48	X 33	31	
17	32	31	33	34	36	36															X 73	60	X 56	58	
18	57	58	59	58	36	X 28															X 52	X 53	X 48	X 45	
19	43	41	42	44	43	36															X 67	X 56	X 38	32	
20	A	A	A	A	U 33	X A															X 78	U 50	47	43	
21	43	39	40	36	36	35	42	67													X 69	X 60	X 36	X 32	
22	32	33	32	31	33	36															X 91	X 75	U 43	A	
23	39	A	A	39	33	32															X 75	X 37	X 31	30	
24	29	32	30	30	29	30															X 79	X 59	X 28	X 28	
25	X 28	X 28	A	A	32	A															X 53	X 48	X 48	X 45	
26	X 42	44	38	41	38	30															X 38	X 35	33	27	
27	30	30	33	32	30	34															X 82	X 62	63	X 49	
28	X 45	47	40	41	X 42	X 36															X 76	A	A	A	
29	A	A	A	X 33	37	28															A	X 38	X 34	X 33	
30	A	32	36	35	A	A															A	X 47	A	33	
31	34	32	37	39	X 39	A															X 69	48	49	50	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	22	23	24	24	24	20	1	1													29	27	23	27	
MED	39	38	38	38	34	34	42	67													X 69	X 55	X 44	41	
UQ	X 45	46	40	41	38	36															X 76	X 60	X 54	X 48	
LQ	32	32	33	33	32	28															X 61	X 48	X 36	32	

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FXI (0.1 MHz)

# IONOSPHERIC DATA

JUL. 1986

FOF2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA				Lat. 26° 16.9' N		Long. 127° 48.4' E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation																
	Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	50	U S 44	S 44	F 30	F 32	F 27	39	44	46	62	75	54	49	40	67	76	77	69	66	R 76	S 58	30	30	31	
2	30	U S 28	F	F	F	F	44	42	50	47	52	57	A	A	A	64	60	64	68	67	69	49	S 38	35	
3	35	F	A	F	F	23	33	J R 45	U R 57	A	A	A	A	58	58	56	70	76	68	62	55	45	S 41	F	
4	F	F	F	F	A	F	37	53	43	47	49	A	A	55	64	70	73	66	65	64	60	S 41	36	34	
5	32	32	F	F	A	A	29	53	A	A	A	A	A	57	A	R 58	A	A	R 69	R 62	60	A	A	A	
6	A	A	31	F	A	A	R 38	J R 49	R 54	49	A	59	A	A	A	A	80	86	U R 82	U R 65	U S 37	A	A	F	
7	S 33	A	F	A	A	A	A	A	A	65	E G 43	49	A	A	R 82	A	A	R 77	70	47	S 52	F	F	F	
8	A	A	F	A	A	A	31	44	54	60	57	47	A	49	52	62	63	64	50	48	S 57	S 52	A	F	
9	25	F	F	F	F	F	45	50	52	A	57	R 68	52	52	54	63	70	92	U R 33	39	39	39	F	F	
10	F	F	F	F	F	F	33	50	R 54	54	52	50	R 49	U R 48	55	60	59	51	51	R 61	S 71	F	A	F	
11	A	F	F	A	F	A	33	44	R 52	66	58	48	R 51	H 64	64	64	R 72	85	79	R 62	S 59	58	49	44	
12	A	A	A	F	F	A	R 37	44	R 46	54	56	48	53	58	68	A	R 74	73	A	84	92	54	A	A	
13	A	F	A	A	F	A	R 44	A	A	54	R 61	A	A	A	A	64	69	A	84	78	72	67	64	63	56
14	47	42	S 40	A	A	F	37	A	U R 57	A	56	56	A	A	A	A	62	A	73	68	63	64	54	F	
15	F	F	F	48	40	F	39	48	48	J R 43	J R 52	55	56	58	C	C	84	70	52	50	F	A	A	S 32	
16	A	A	F	F	F	F	35	A	58	R 60	E G 42	52	55	72	70	65	71	82	95	92	85	J S 42	27	F	
17	F	F	F	F	F	F	41	47	56	A	54	A	78	94	100	U R 100	95	104	117	81	67	54	J S 50	F	
18	F	F	F	F	F	22	34	52	55	53	56	61	74	72	65	65	R 73	R 86	87	68	S 46	S 47	42	39	
19	F	F	F	F	F	F	38	R 60	48	49	53	50	56	59	65	75	82	81	80	R 72	U S 61	S 50	S 32	F	
20	A	A	A	A	U S 27	A	R 36	57	52	50	61	62	A	A	55	60	R 64	78	73	77	S 72	U S 44	F 38	F	
21	F	F	F	F	F	F	F	F	57	A	R 54	E G 44	E G 44	A	A	A	76	38	U R 98	U R 100	90	S 63	54	30	26
22	F	F	F	F	F	F	R 35	58	58	52	51	48	54	60	64	71	74	79	86	91	85	69	37	A	
23	F	A	A	F	F	F	A	47	58	55	A	A	67	76	A	89	99	105	112	127	69	31	U S 25	F	
24	F	F	F	F	F	F	33	51	59	51	48	48	48	52	A	70	76	74	66	R 64	U S 73	S 53	S 22	S 22	
25	22	22	A	F	A	A	35	46	53	52	53	50	53	67	70	70	80	77	90	75	47	S 42	42	39	
26	36	F	F	F	F	F	35	R 48	52	R 51	50	52	57	70	77	85	89	90	C	C	32	S 29	F	F	
27	F	F	F	F	F	F	R 36	42	50	R 57	R 53	P 49	R 52	59	A	R 92	U R 100	U R 99	81	R 68	U S 76	56	F	U S 43	
28	39	F	F	F	36	30	30	50	S 55	U R 49	R 49	A	A	54	60	65	70	80	77	63	70	A	A	A	
29	A	A	A	J S 27	F	F	30	44	R 53	43	R 49	49	56	56	57	66	R 72	78	89	62	A	S 32	28	27	
30	A	F	F	J S 26	J S 29	A	A	32	44	43	53	62	57	65	81	81	87	87	82	78	54	A	U S 41	A	F
31	F	F	F	F	U S 33	A	28	42	74	52	46	J A 50	52	64	65	65	78	74	R 82	84	S 63	F	F	F	
CNT	11	7	4	5	5	4	28	27	27	25	27	24	20	24	22	26	28	29	29	30	28	24	18	12	
MED	33	28	36	30	33	25	35	48	53	53	53	50	54	59	65	68	74	79	78	68	63	48	38	34	
UQ	38	37	S 42	F 30	36	28	38	52	56	55	56	56	56	68	70	76	83	86	86	77	70	54	42	41	
LQ	28	24	28	J S 29	U S 32	22	33	44	50	49	50	48	52	55	58	64	70	74	68	62	S 55	S 41	30	29	

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FOF2 (0.1 MHz)

# IONOSPHERIC DATA

JUL. 1986

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA				Lat. 26 16.9 N		Long 127 48.4 E		Sweep 1 MHz to 25 MHz in 24 sec in automatic operation															
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L 320	L 390	400	410	430	U R 430	420	A	L 410	A	370	A					
2								L	L	L		U A 430	A	A	A	410	400	380	L					
3								L	U A 350	A	A	A	A	U A 450	A	A	A	A	A	A				
4								A	A	L	L	A	A	A		430	410	U A 420	A	A	A			
5								A	A	A	A	A	A	A	A	A	A	A	A	A				
6								A	L 390	A	A	A	A	A	A	A	A	A	A					
7						A	A	A	A	A			A	A	A	A	A	A	A	L				
8								L	L 390	A	A	430	A	A	420	410	A	380	L					
9								L	A	A	U A 410	430	430	U A 430	420	410	400	380	L					
10								L	L	A	420	430	420	U A 430	420	410	410	L	350	L				
11									400	410	L 420	L 430	450	440	U A 440	420	410	U A 390	L	L				
12									A	L 410	L 430	L	A	U A 440	A	A	400	A	A	L				
13								A	A	A	U A 420	A	A	A	A	A	A	A	L					
14								A	A	A	420	A	A	A	A	A	U A 420	A	A	L				
15								L	L	L	430	430	430	U A 430	C	C	400	390	L	A				
16								A	U A 390	420	420	U A 450	U L 440	430	U L 430	420	410	380	350	A				
17								A	L	A	420	A	A	A	A	440	A	A	A					
18								L	L	430	430	L 420	U A 450	U A 450	A	A	U A 440	A	A					
19								L	L	L	430	430	430	430	420	420	A	A	350					
20								L	L	L 420	430	440	A	A	430	420	400	390	360	L				
21								L	A	L 420	440	440	A	A	A	U A 420	400	380	A	L				
22								L	L 360	L 400	A	420	440	440	440	420	400	380	350	L				
23						A		L	A	A	A	A	A	A	A	A	A	U A 400	A	L				
24								L	L 390	A	420	U A 420	430	430	A	U A 430	U A 430	L 380	L 340					
25								A	A	L 410	430	U A 430	430	430	430	420	400	390	L 440					
26								L	L	L	L	A U 440	430	430	420	420	410	380	C	C				
27								L	L	L	L	A	A	A	A	A	A	A	L	L				
28								L	A	L	L	A	A	420	A	U A 430	U A 420	380	340	A				
29									L	L	L 380	L 420	L 430	A	430	430	A	L 370	A					
30									L	A	A	L 430	430	430	A	A	400	A	A					
31								U L 370	A	U L 400	L	A	430	430	430	R 430	A	A	L 390	L 350	A			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								4	9	9	20	19	14	18	14	16	18	17	10					
MED								L 365	L 390	L 410	420	430	430	430	430	420	405	380	350					
UQ								L 370	L 390	L 420	430	435	440	U A 440	430	420	U A 420	390	360					
LQ								L 340	L 390	L 410	420	430	430	430	420	410	400	380	350					

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FOF1 (0.01 MHz)

# IONOSPHERIC DATA

JUL. 1986

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA				Lat. 26 16.9 N	Long 127 48.4 E	Sweep 1 MHz to 25 MHz in 24sec in automatic operation																		
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							S	A	A	A	A	A	R	R	335	A	R	A	A	A					
2							S	A	A	A	U	U	340	340	A	A	320	300	270	215				A	
3							S	A	A	A	A	A	A	A	U	A	A	290	270	220				A	
4							S	A	A	A	A	A	A	A	A	R	315	295		A	A		A		
5							S	A	A	A	A	A	A	A	A	A	A	A	A	A				A	
6							A	A	A	A	A	A	A	A	A	A	R	235		A	A		A		
7							A		A	A	U	R		A	A	A	A	A	A	A				A	
8							A	A	A	A	A	A	R	R	340	335	A	A	270		A	S			
9							S	A	A	A	A	A	U	U	A	A	A	A	A	A				A	
10							S	A	A	A	A	R	R	R	340	340	335	330	310	270	230			A	
11							A	A	A	A	A	A	A	A	A	R	325	300	275		A	A			
12							A	A	A	A	A	R	R	R	340	340	335	335	320	305	280	220		A	
13							S		A	A	A	A	R	R	345	350	A	A	A	A				A	
14							A	A	A	A	A	A	A	A	A	A	A	300	270		A	A			
15							S	A	A	A	A	A	A	A	A	C	C	A	A	A				A	
16							S	A	A	A	A	A	A	A	A	A	A	A	A	A				A	
17							S	A	A	A	A	A	A	A	A	A	A	A	A	A				A	
18							S	A	A	A	A	A	U	U	A	R	U	A	A	A				A	
19							S	A	A	A	A	A	A	A	A	A	A	A	A	A				A	
20							A	A	A	A	A	A	A	A	A	A	325	305		A	225		S		
21							A	A	A	A	A	A	A	A	A	A	A	300	265		A	A			
22							S	A	A	A	A	A	A	A	A	A	A	310	275	225		R	A		
23							S	A		A	R	A	A	A	340	330	325	300	270		A	A			
24							S	A	A	A	A	A	A	A	A	A	A	A	A	A				A	
25							S	A	A	A	A	A	A	R	340	330	A	A	A	A				A	
26							S	A	A	A	A	U	A	U	A	U	R	340	345	340	320	300	275	C	C
27							S	R	A	A	A	A	A	A	A	A	A	A	A	A				A	
28							S		A	A	320	330	340		A	A	A	A	A	210				A	
29							S	R	R	A		R	R	R	335	335	330	A	R	A	A			A	
30							E	S	R	R	A		A	A	A	A	325	295	A	A				A	
31							E	S	A	A	A	A	A	A	A	R	R	A	A	A				A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							2	6	4	1	6	7	11	11	11	11	16	11	7						
MED							E	S	R	R			R	R											
UQ							140	220	265	300	320	330	340	340	335	325	300	270	220						
LQ							225	270		U	R		340	348	338	325	302	275	225						
							P	R																	
							215	262		315	330	340	338	330	320	298	270	218							

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FOE (0.01 MHz)



IONOSPHERIC DATA

JUL. 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 24 sec in automatic operation												
	Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		22	ES 16	ES 16	ES 16	ES 15	ES 16	20	JA 32	JA 38	JA 51	JA 65	JA 34	JA 40	JA 77	44	JA 44	JA 47	JA 50	JA 52	JA 33	JA 24	JA 28	JA 32	JA 22
2		JA 42	22	JA 19	20	23	20	20	JA 30	JA 30	JA 32	40	43	JA 50	JA 70	67	JA 40	JA 34	JA 34	25	JA 27	JA 39	JA 33	JA 33	JA 28
3		JA 25	JA 36	JA 64	JA 30	JA 23	21	23	JA 32	JA 40	JA 77	JA 70	JA 101	JA 120	JA 75	JA 80	JA 64	JA 53	JA 50	JA 40	JA 37	JA 34	JA 51	JA 30	JA 32
4		JA 31	JA 50	18	20	JA 27	JA 37	JA 29	JA 41	JA 40	JA 84	JA 64	JA 62	JA 73	JA 54	JA 57	JA 44	JA 41	JA 50	JA 40	JA 32	JA 30	JA 37	22	22
5		22	21	JA 26	JA 30	JA 30	26	23	JA 40	JA 70	JA 94	JA 76	JA 146	JA 77	JA 50	JA 108	JA 66	JA 96	JA 101	JA 194	JA 79	JA 40	JA 80	JA 84	JA 41
6		JA 54	JA 84	ES 16	JA 84	JA 85	JA 53	JA 38	JA 42	JA 44	JA 48	JA 87	JA 72	JA 74	JA 74	JA 144	JA 162	JA 63	JA 85	JA 85	JA 54	JA 33	JA 53	JA 53	28
7		JA 36	JA 46	JA 30	JA 30	JA 53	JA 31	JA 36	60	JA 85	JA 110	JA 227	44	JA 128	JA 89	JA 65	JA 172	JA 162	JA 111	44	JA 52	JA 41	JA 37	JA 30	JA 30
8		JA 42	JA 51	JA 36	JA 85	JA 40	JA 41	31	JA 42	JA 44	JA 57	JA 56	41	JA 52	JA 50	JA 57	JA 54	JA 71	G	32	JA 42	JA 84	JA 33	JA 33	JA 25
9		JA 20	JA 30	JA 21	JA 30	JA 24	JA 22	22	JA 40	JA 119	JA 72	JA 42	JA 50	40	43	40	JA 64	JA 52	JA 30	JA 25	JA 30	JA 35	JA 32	JA 23	JA 24
10		JA 60	JA 54	JA 40	JA 30	JA 29	JA 28	JA 25	JA 40	JA 41	JA 46	JA 51	40	41	46	40	35	G	G	25	JA 30	JA 84	JA 52	JA 41	JA 42
11		JA 85	JA 52	JA 36	JA 32	ES 16	JA 33	JA 23	JA 37	JA 33	JA 41	JA 44	JA 38	JA 44	JA 50	46	G	41	JA 53	JA 54	22	JA 26	JA 30	JA 22	22
12		JA 40	JA 52	JA 42	JA 64	JA 53	JA 43	JA 38	JA 42	JA 65	JA 63	JA 55	JA 77	JA 70	JA 75	JA 73	JA 103	JA 42	JA 77	JA 104	JA 21	JA 22	JA 42	JA 86	JA 78
13		JA 84	JA 84	60	JA 64	JA 54	JA 84	JA 54	JA 84	JA 162	JA 78	JA 57	JA 75	JA 88	JA 111	JA 84	JA 85	JA 108	JA 84	JA 65	JA 53	JA 40	JA 42	JA 33	JA 30
14		JA 25	JA 24	ES 16	JA 43	JA 46	JA 25	JA 36	JA 72	JA 42	JA 65	JA 65	JA 56	JA 110	71	JA 84	JA 111	JA 64	JA 70	JA 105	JA 30	JA 24	ES 16	JA 24	JA 26
15		23	22	ES 16	ES 16	ES 16	JA 46	ES 16	27	JA 37	JA 40	JA 70	JA 54	45	46	C	C	JA 40	JA 40	JA 72	JA 42	JA 49	JA 57	JA 70	JA 64
16		JA 65	JA 52	JA 52	JA 48	JA 24	22	JA 40	JA 104	JA 51	JA 43	37	JA 56	JA 55	JA 53	JA 87	JA 160	JA 52	JA 85	JA 107	JA 41	JA 32	20	JA 26	JA 32
17		JA 30	JA 33	JA 22	JA 46	JA 21	20	JA 32	JA 42	JA 40	JA 70	JA 82	JA 83	JA 90	JA 87	JA 57	JA 173	JA 84	JA 110	JA 30	JA 30	JA 23	JA 21	JA 22	19
18		JA 40	JA 36	JA 64	JA 32	JA 50	JA 50	JA 24	JA 52	JA 36	JA 37	JA 43	38	45	48	50	45	JA 46	JA 94	JA 80	JA 32	JA 33	JA 30	JA 33	JA 30
19		JA 23	20	ES 16	ES 16	JA 38	JA 36	JA 31	JA 30	JA 37	JA 42	JA 41	JA 40	JA 42	JA 39	JA 37	35	JA 53	JA 71	JA 54	JA 40	JA 32	JA 27	JA 21	JA 87
20		JA 41	JA 52	JA 46	JA 83	JA 53	JA 82	JA 85	JA 32	JA 36	JA 50	JA 60	JA 44	JA 52	JA 57	JA 44	38	36	JA 34	31	JA 30	JA 32	JA 44	JA 33	JA 83
21		JA 26	JA 33	JA 24	JA 24	JA 50	JA 21	JA 38	JA 41	JA 84	JA 83	JA 63	JA 78	JA 90	JA 111	JA 94	JA 54	37	31	JA 39	JA 26	JA 19	20	JA 22	22
22		ES 16	JA 22	ES 16	ES 16	ES 16	JA 21	23	JA 53	JA 110	JA 64	JA 41	JA 58	JA 44	JA 56	JA 54	36	33	30	26	JA 24	22	JA 31	JA 28	JA 61
23		JA 33	JA 42	JA 44	32	JA 24	JA 17	JA 42	JA 32	JA 37	JA 44	JA 83	JA 73	JA 76	JA 74	JA 91	JA 57	JA 51	JA 44	JA 37	JA 24	ES 16	JA 26	JA 23	JA 33
24		JA 24	ES 16	JA 30	21	21	JA 32	23	JA 32	JA 34	JA 58	JA 65	JA 72	JA 80	JA 77	JA 110	JA 88	JA 54	JA 42	JA 42	JA 52	JA 33	ES 16	JA 25	JA 28
25		JA 21	ES 16	JA 40	JA 53	JA 27	JA 29	JA 37	JA 53	JA 62	JA 52	JA 51	JA 54	JA 57	G	38	40	JA 42	34	JA 38	JA 32	JA 24	22	22	ES 16
26		JA 22	JA 29	JA 76	JA 49	JA 34	21	JA 64	JA 31	JA 41	JA 42	42	45	44	40	36	45	32	JA 54	C	C	22	JA 36	JA 27	JA 60
27		JA 84	JA 32	JA 53	JA 30	JA 30	20	22	30	33	35	50	JA 77	JA 77	JA 74	JA 146	JA 140	JA 57	JA 83	JA 77	JA 40	22	JA 21	22	ES 16
28		ES 16	JA 31	JA 20	JA 38	JA 29	22	JA 53	31	40	40	40	56	56	39	JA 54	JA 44	JA 53	JA 32	JA 34	JA 31	JA 34	JA 41	JA 40	JA 34
29		JA 51	JA 26	JA 30	JA 22	JA 20	ES 16	ES 16	JA 38	JA 51	JA 40	JA 44	JA 48	JA 60	44	JA 44	JA 58	JA 77	JA 78	JA 64	JA 38	JA 50	JA 31	ES 16	JA 26
30		JA 34	JA 24	JA 22	JA 23	JA 26	JA 26	20	30	JA 38	JA 53	JA 78	JA 78	JA 75	JA 78	JA 73	JA 86	JA 84	JA 74	JA 145	JA 140	JA 84	JA 54	JA 77	JA 42
31		JA 77	JA 84	JA 37	JA 41	JA 28	JA 27	JA 18	JA 38	JA 85	JA 83	JA 78	JA 53	JA 37	JA 41	JA 44	JA 54	JA 65	JA 54	JA 84	JA 33	JA 77	JA 38	JA 33	JA 41
CNT		31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	30	30	31	31	31	31
MED		JA 33	JA 33	JA 30	JA 30	JA 28	JA 26	JA 29	JA 40	JA 41	JA 52	JA 57	JA 56	JA 57	JA 56	JA 57	JA 56	JA 52	JA 53	JA 48	JA 32	JA 33	JA 33	JA 30	JA 30
UQ		JA 46	JA 52	JA 43	JA 47	JA 43	JA 36	JA 38	JA 42	JA 64	JA 71	JA 70	JA 74	JA 77	JA 75	JA 84	JA 88	JA 64	JA 80	JA 80	JA 42	JA 40	JA 42	JA 35	JA 42
LQ		JA 23	JA 23	JA 20	22	JA 23	21	22	JA 32	JA 37	JA 42	JA 44	JA 44	JA 44	JA 46	JA 44	JA 44	JA 41	JA 34	JA 34	JA 30	JA 24	JA 26	JA 22	JA 24

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FOES (0.1 MHz)

# IONOSPHERIC DATA

JUL. 1986

FBES (0.1 MHz)

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

Station		OKINAWA				Lat. 26 16.9 N		Long. 127 48.4 E				Sweep 1		MHz to 25		MHz in 24		sec in		automatic operation						
		00	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	17	27	32	33	34	34	37	38	44	41	43	33	40	33	E S	E S	E S	E S	
2	18	E S	E S	E S	E S	E S	E S	19	24	30	32	39	43	A A	A A	A A		32	32	23	27	39	25	18	E S	
3	18	E S	A A	E S	E S	23	20	22	30	35	A A	A A	A A	A A	44	54	52	52	48	37	36	34	19	24	22	
4	20	E S	E S	E S	A A	E S		27	38	40	38	38	A A	50	U A	38	38	41	49	37	32	27	35	E S	E S	
5	E S	E S	E S	E S	A A	A A		23	35	A A	A A	A A	A A	A A	50	A A	108	56	A A	A A	40	35	35	A A	A A	A A
6	A A	A A	E S	E S	A A	A A		20	36	36	41	A A	51	A A	A A	A A	A A	43	62	68	52	31	A A	A A	24	
7	27	A A	25	A A	A A	A A	A A	A A	A A	A A		G	39	A A	A A	58	A A	A A	60	37	32	33	33	26	20	
8	A A	A A	26	A A	A A	A A	A A	22	34	38	48	50	38	A A	47	40	37	46	G	30	28	39	E S	A A	E S	
9	E S	18	E S	20	18	E S		18	32	43	A A	41	39	40	43	37	35	33	30	25	20	20	21	20	E S	
10	20	E S	20	E S	E S	E S		19	30	28	44	37	39	39	43	38	35	G	G		25	23	53	23	A A	30
11	A A	24	20	A A	E S	A A		19	25	30	34	39	38	39	40	44	G	38	39	32	17	22	27	20	E S	
12	A A	A A	A A	21	22	A A		28	35	38	40	40	38	50	44	50	A A	38	50	A A	18	E S	41	A A	A A	
13	A A	21	A A	A A	E S	A A		41	A A	A A	51	42	A A	A A	A A	57	61	A A	68	31	52	30	40	25	23	
14	E S	E S	E S	A A	A A	E S		22	A A	38	A A	40	51	A A	A A	A A	42	A A	56	21	E S	E S	E S	19		
15	E S	E S	E S	E S	E S	E S		27	28	35	40	38	40	43	C	C		35	31	33	41	30	A A	A A	18	
16	A A	A A	E S	E S	E S	E S		20	A A	39	34	37	45	40	40	40	33	32	32	30	32	27	20	E S	E S	
17	20	18	E S	21	E S	E S		24	34	30	A A	38	A A	53	67	40	60	46	60	30	28	E S	E S	22	E S	
18	28	20	E S	E S	20	E S		21	32	28	33	35	36	45	45	43	U A	44	65	73	25	28	E S	18	23	
19	17	E S	E S	E S	E S	24		30	30	30	36	38	37	40	38	37	35	45	44	30	25	27	27	20	E S	
20	A A	A A	A A	A A	A A	A A		17	24	29	39	37	38	A A	A A	39	38	33	34	30	27	31	33	27	17	
21	24	25	E S	16	E S	20		20	30	A A	37	41	40	A A	A A	A A	42	34	31	37	22	19	16	16	E S	
22	E S	E S	E S	E S	E S	E S		34	30	46	34	44	37	36	39	36	32	29	26	19	E S	17	20	A A	61	
23	22	A A	A A	E S	E S	E S		26	32	41	A A	A A	57	59	A A	49	48	40	36	20	E S	E S	20	E S		
24	E S	E S	E S	E S	E S	E S		20	26	31	A A	40	42	40	41	A A	43	43	33	23	26	24	E S	18	20	
25	E S	E S	A A	A A	19	A A		25	21	50	39	40	43	37	G	37	34	36	29	30	29	21	19	E S	E S	
26	17	E S	E S	E S	17	E S		23	25	30	35	34	44	38	38	36	37	32	32	C	C	E S	E S	20	18	
27	20	18	E S	18	E S	E S		18	25	30	33	40	43	46	45	A A	68	42	65	30	19	E S	E S	E S	E S	
28	E S	E S	E S	E S	E S	E S		18	29	40	39	38	A A	A A	39	50	43	42	31	31	31	34	A A	A A	A A	A A
29	A A	A A	A A	E S	E S	E S		33	36	30	40	38	49	36	39	48	54	36	58	J	30	A A	E S	E S	E S	
30	A A	E S	E S	19	A A	A A		18	25	32	48	48	41	37	41	54	64	38	46	64	30	A A	37	A A	E S	
31	18	E S	E S	23	E S	A A		16	30	42	32	39	A A	36	39	40	47	46	36	29	26	36	E S	20	16	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	30	30	31	31	31	31	
MED	20	E S	E S	E S	E S	E S		20	30	35	39	40	43	49	44	46	43	42	36	32	28	27	20	20	16	
UQ	A A	26	26	22	22	A A		24	34	40	50	41	52	A A	58	A A	60	46	55	40	32	34	34	30	22	
LQ	E S	E S	E S	E S	E S	E S		18	26	30	34	38	38	40	40	39	36	34	32	30	22	18	E S	17	E S	

JUL. 1986

FBES (0.1 MHz)

## IONOSPHERIC DATA

JUL. 1986

FMIN (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA				Lat. 26 16.9 N	Long 127 48.4 E	Sweep 1 MHz to 25 MHz in 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 15	E S 16	E S 15	13	13	16	17	17	23	19	17	18	15	14	14	14	E S 16	E S 16	E S 16	E S 16
2	E S 16	E S 16	E S 15	E S 15	E S 16	E S 16	E S 16	14	14	15	15	15	19	18	15	15	15	15	14	14	E S 16	E S 16	E S 16	E S 16
3	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	14	14	14	18	15	18	17	15	18	14	15	14	14	E S 16	E S 16	E S 15	E S 16
4	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	18	18	17	17	15	17	14	14	14	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 15	E S 16	14	14	15	15	16	15	21	16	15	16	15	15	15	E S 15	E S 15	E S 15	E S 16
6	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	14	14	14	16	18	23	22	19	18	17	16	14	15	E S 15	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	14	14	14	14	15	20	22	26	23	18	18	14	14	14	E S 15	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	14	14	14	16	20	20	22	22	23	16	15	14	14	E S 16	E S 15	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	14	14	15	15	22	20	20	18	15	15	14	14	14	E S 16	E S 16	E S 16	E S 16
10	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	14	15	16	17	18	21	21	15	17	17	14	14	14	E S 16	E S 16	E S 16	E S 16
11	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	14	14	14	19	21	18	23	27	28	27	21	16	14	14	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	16	14	14	16	16	17	18	19	22	16	16	14	14	14	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	16	16	18	21	22	23	26	22	18	16	16	14	14	E S 16	E S 14	E S 15	E S 16
14	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	16	16	14	16	21	27	24	22	13	18	16	15	14	14	E S 15	E S 16	E S 16	E S 16
15	E S 16	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	15	15	15	15	20	18	22	C	C	17	15	14	15	E S 16	E S 16	E S 15	E S 15
16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	14	14	16	18	19	21	24	23	15	17	16	14	15	E S 16	E S 16	E S 16	E S 16
17	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	15	15	15	15	18	22	24	24	17	20	16	14	14	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 15	E S 16	14	15	16	15	23	22	20	24	20	23	15	15	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	14	14	16	16	22	21	20	22	17	15	15	14	14	E S 15	E S 16	E S 16	E S 16
20	E S 16	E S 16	E S 15	E S 15	E S 15	E S 14	E S 14	14	15	16	17	23	23	22	22	17	16	15	13	E S 16	E S 16	E S 16	E S 16	
21	E S 15	E S 16	E S 16	E S 14	E S 16	E S 16	E S 15	13	13	16	17	17	22	23	24	17	16	13	13	14	E S 15	E S 15	E S 15	E S 16
22	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	15	15	16	18	24	23	20	18	17	17	15	13	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 16	E S 16	14	14	14	16	22	22	22	22	18	17	14	14	14	E S 16	E S 16	E S 16	E S 16
24	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	14	14	18	18	16	22	21	18	16	15	14	14	15	E S 16	E S 16	E S 16	E S 16
25	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	14	14	16	16	18	23	22	19	17	18	14	14	15	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	14	14	15	15	15	16	15	22	15	15	14	C	C	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	15	15	14	17	16	18	17	18	16	16	15	14	15	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	15	15	15	15	16	17	15	15	16	16	15	14	15	E S 16	E S 16	E S 16	E S 16
29	E S 16	E S 16	E S 14	E S 16	E S 16	E S 16	E S 16	14	14	15	17	18	24	18	18	16	16	14	14	14	E S 15	E S 16	E S 16	E S 16
30	E S 16	E S 16	E S 15	E S 14	E S 15	E S 15	E S 14	13	13	17	22	18	21	17	17	17	16	15	13	14	E S 16	E S 16	E S 15	E S 16
31	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	E S 14	14	13	14	23	25	23	23	22	18	17	16	13	14	E S 16	E S 16	E S 16	E S 15
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	30	30	31	31	31	31
MED	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	14	14	16	17	18	22	21	19	17	16	15	14	14	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	14	15	16	18	22	23	22	22	18	17	15	14	15	E S 16	E S 16	E S 16	E S 16
LQ	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	E S 15	14	14	15	15	17	18	18	17	16	16	14	14	14	E S 16	E S 16	E S 16	E S 16

JUL. 1986

FMIN (0.1 MHz)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JUL. 1986

M(3000)F2 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA				Lat. 26 16.9 N		Long 127 48.4 E		Sweep 1 MHz to 25 MHz in 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	290	U S 305	S 320	F 350	F 310	F 335	345	330	280	320	325	305	265	335	285	315	305	320	310	R 330	S 380	300	285	305	
2	315	U S 320	F	F	F	F	365	355	320	295	305	310	A	A	A	310	300	295	315	315	335	335	310	S 315	
3	315	F	A	F	F	345	350	J R 310	U R 305	A	A	A	A	295	265	330	305	315	340	320	325	310	S 305	F	
4	F	F	F	F	A	F	350	365	360	320	295	A	290	295	315	315	300	285	330	335	345	S 305	305	295	
5	310	310	F	F	A	A	345	340	A	A	A	A	A	315	A	R 310	A	A	R 320	R 340	335	A	A	A	
6	A	A	355	F	A	A	R 340	J R 365	R 335	325	A	320	A	A	A	A	295	325	U R 355	U R 355	U S 295	A	A	F	
7	S 335	A	F	A	A	A	A	A	A	370	G	245	A	A	R 280	A	A	R 330	355	330	S 305	F	F	F	
8	A	A	F	A	A	A	355	320	335	340	335	295	A	275	290	305	315	330	320	310	S 335	S 375	A	F	
9	320	F	F	F	F	F	365	360	365	A	320	350	R 360	290	285	295	315	325	U R 360	335	335	305	F	F	
10	F	F	F	F	F	F	335	340	R 360	335	325	280	R 275	U R 270	290	310	305	285	315	R 325	S 345	F	A	F	
11	A	F	F	A	F	A	335	320	R 325	295	355	310	R 275	H 265	295	265	290	R 315	285	R 320	S 320	325	315	340	
12	A	A	A	F	F	A	R 335	340	R 370	335	340	290	300	275	300	A	R 285	290	A	310	360	370	A	A	
13	A	F	A	A	F	A	365	A	A	315	350	R 350	A	A	A	A	290	A	295	305	290	300	305	315	310
14	310	295	S 300	A	A	F	350	A	U R 335	A	340	330	A	A	A	A	320	A	300	310	300	310	295	F	
15	F	F	F	335	325	F	360	355	320	J R 310	J R 305	310	295	295	C	C	335	330	325	360	F	A	A	S 295	
16	A	A	F	F	F	F	355	A	355	365	R 365	G	275	270	300	280	285	280	305	325	340	365	J S 300	F	
17	F	F	F	F	F	F	365	350	355	A	285	A	290	320	290	U R 290	295	300	340	345	320	295	J S 320	F	
18	F	F	F	F	F	340	325	310	325	295	285	260	295	290	290	285	295	R 325	R 345	350	S 325	S 310	320	305	
19	F	F	F	F	F	F	340	R 350	335	300	305	270	295	290	275	280	305	320	325	R 345	U S 345	360	S 345	F	
20	A	A	A	A	U S 295	A	R 335	370	365	330	260	265	A	A	290	265	R 320	315	310	330	S 355	U S 350	330	F	
21	F	F	F	F	F	F	F	360	A	R 360	G	G	A	A	A	280	295	U R 320	R 335	355	S 335	350	315	290	
22	F	F	F	F	F	F	R 340	360	355	355	315	260	275	265	265	275	275	290	315	330	350	335	335	A	
23	F	A	A	F	F	F	A	360	360	345	A	A	285	275	A	280	295	315	320	R 365	370	320	U S 300	F	
24	F	F	F	F	F	F	335	350	365	A	315	270	250	250	A	285	300	315	320	R 310	U S 355	385	S 320	S 320	
25	320	320	A	A	F	A	340	315	330	365	310	270	265	300	280	285	300	300	320	360	360	S 310	295	305	
26	305	F	F	F	F	F	360	R 355	365	R 335	300	290	275	270	280	295	305	290	C	C	345	S 295	F	F	
27	F	F	F	F	F	F	R 360	330	320	R 350	R 320	R 315	R 290	280	A	R 315	U R 300	U R 305	335	295	R 290	U S 290	295	F	U S 350
28	305	F	F	F	335	365	335	340	R 360	U R 335	R 325	A	A	285	300	290	330	320	310	315	340	A	A	A	
29	A	A	A	J S 370	F	F	335	340	R 350	360	R 305	275	295	275	270	265	R 290	305	330	360	A	S 280	285	295	
30	A	F	F	J S 360	A	A	360	350	290	300	330	290	270	290	290	305	315	325	350	360	A	U S 305	A	F	
31	F	F	F	F	U S 335	365	A	340	310	310	365	335	285	270	310	275	270	300	325	R 315	325	S 350	F	F	F
CNT	11	7	4	5	5	4	28	27	27	25	27	24	20	24	21	26	28	29	29	30	28	24	18	12	
MED	315	310	322	350	325	342	345	350	335	335	315	288	280	290	285	290	300	315	320	330	338	310	312	305	
UQ	320	320	340	J S 360	335	355	360	358	360	355	328	310	295	298	290	310	310	325	335	350	352	350	320	318	
LQ	308	308	S 310	F 335	310	338	335	330	322	315	298	270	270	275	280	280	295	300	315	315	322	305	300	295	

JUL. 1986

M(3000)F2 (0.01)

IONOSPHERIC DATA

JUL. 1986

M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9 h)

Station		OKINAWA							Lat.	26 16.9 N				Long.	127 48.4 E				Sweep 1		MHz to 25		MHz in 24sec in		automatic operation		
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1									L 405	L 385	L 400	L 415	L 395	U R 420	A 405	A	A	A	A	A	A						
2									L	L	L	L	L	A	A	A	A	440	400	395					L		
3									L	A	A	A	A	A	A	A	A	A	A	A	A	A			A		
4									A	A	L	L	A	A	A	A	420	440		A	A	A	A		A		
5									A	A	A	A	A	A	A	A	A	A	A	A	A	A			A		
6									A	L 385	A	A	A	A	A	A	A	A	A	A	A						
7								A	A	A	A	L 420	L 395	A	A	A	A	A	A	A	A	L					
8									L	A	A	A	A	420	A	A	430	440	A	395	L						
9									L	A	A	A	A	420	440	A	405	415	425	395	L						
10									L	L	A	L 450	L 440	L 430	A	L 430	L 415	L 390	L 385	L							
11										L 375	L 400	L A	L 430	L 410	L 410	A	L 440	L 415	L A	L L	L						
12										A	A	L 370	L	A	A	A	A	400	A	A	L						
13									A	A	A	A	A	A	A	A	A	A	A	A	L						
14									A	A	A	L 405	A	A	A	A	A	A	A	A	A	L					
15									L	L	L	L 395	L 420	L 420	A	C	C	400	410	L	A						
16									A	A	L 405	L 430	L A	U L 430	L 440	U L 410	L 415	L 415	L 410	L 385	A						
17									A	L	A	L 430	A	A	A	385	A	A	A	390							
18									L	L	L 420	L 430	L 430	A	A	A	A	A	A	A							
19									L	L	L	L 400	L 420	L 420	L 420	L 430	L 405	A	A	370							
20									L	L	L 405	L 350	L 350	A	A	L 385	L 405	L 385	L 370	L 360	L						
21									L 380	L A	L 370	L 410	L 395	A	A	A	A	385	370	A	L						
22									L 390	L 385	L A	L 335	A	L 410	L 395	L 410	L 405	L 375	L 380	L 370	L						
23									A	L	A	A	A	A	A	A	A	A	A	A	L						
24									L	L 385	L A	L 405	A	L 395	L 420	A	A	A	L 370	L 380							
25									A	A	L 400	L 405	A	L 420	L 420	L 395	L 405	L 375	L 360	L 270							
26									L	L	L	L	A	L 420	L 420	L 405	L 405	L 390	L 360	C	C						
27										L	L	L	A	A	A	A	A	A	A	L	L						
28									L	A	L	L	A	A	L 405	A	A	A	390	395	A						
29										L	L	L 380	L 385	A	L 395	L 395	A	A	L 380	A							
30										L	A	A	L 370	L 395	L 385	A	A	375	A	A							
31									U L 380	A	U L 385	L	A	L 405	L 395	L 370	R A	A	A	L 395	L 355	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT								4	6	3	17	13	13	12	13	12	13	15	10								
MED								L 385	L 385	L 400	L 405	L 420	L 420	L 408	L 405	L 415	L 390	L 380	L 375								
UQ								L 398	L 385	L 405	L 420	L 420	L 420	L 420	L 420	L 440	L 400	L 395	L 385								
LQ								L 380	L 375	L 392	L 395	L 395	L 410	L 395	L 395	L 405	L 385	L 370	L 360								

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M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

# IONOSPHERIC DATA

JUL. 1986

H<sup>o</sup>F<sub>2</sub> (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA										Sweep 1 MHz to 25 MHz in 24 sec in automatic operation													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							270	400	305	280	340	L 470	470	370	290	295	270	295						
2							220	290	300	340	305	A	A	A	330	310	325	270						
3							320	260	A	A	A	A	360	A	A	A	A	245	A					
4							A	A	315	380	A	A	350	325	305	350	A	280	A					
5							A	A	A	A	A	A	A	A	A	A	A	A	A					
6							240	290	305	A	310	A	A	A	A	315	290	255						
7						A	A	A	250	G	560	A	A	345	A	A	275	225						
8							340	290	290	300	425	A	A	410	335	315	295	300						
9							260	230	A	320	260	560	410	450	360	370	280	210						
10							275	255	A	320	460	540	565	400	350	340	400	340	270					
11							315	260	275	365	450	360	340	400	340	300	260	240						
12							260	310	300	U L 400	A	400	340	A	340	340	A	275						
13							A	A	A	275	A	A	A	A	360	A	325	285						
14							A	250	A	315	325	A	A	A	A	325	A	310	270					
15							220	L 280	360	340	360	390	360	C	C	270	260	L 280	A					
16							A	260	250	G	500	460	340	360	375	380	330	270	240					
17							A	265	A	460	A	A	A	325	A	360	A	240						
18							260	270	390	390	440	340	340	300	370	330	A	A						
19							245	L 250	380	330	525	365	400	380	340	290	275	265						
20							250	250	295	360	350	A	A	390	425	350	290	285	255					
21							250	A	265	G	G	A	A	A	370	320	275	250	235					
22							L 290	250	250	280	370	535	430	445	420	375	355	340	280	250				
23							A	250	275	A	A	A	375	360	A	365	330	300	275	225				
24							275	250	A	350	460	550	490	A	350	310	290	285						
25							A	A	260	345	455	480	340	350	350	310	300	265						
26							240	240	300	450	430	425	400	375	340	330	330	c	c					
27							310	280	315	A	A	A	A	A	A	300	A	260	250					
28							240	240	300	300	A	A	400	A	350	350	280	260	A 260					
29							275	L 235	385	450	390	385	420	395	330	290	270							
30							L 400	A 370	305	470	400	340	330	330	290	275	260							
31							L 330	255	245	L 250	A	445	325	355	370	290	270	270	245					
CNT							1	17	25	23	27	22	16	20	19	22	27	24	27	12				
MED							L 290	250	260	295	340	435	438	372	360	355	330	290	270	250				
UQ							275	290	308	382	470	475	405	395	370	345	325	282	265					
LQ							240	250	262	302	350	390	345	340	340	310	275	260	240					

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H<sup>o</sup>F<sub>2</sub> (KM)

# IONOSPHERIC DATA

JUL. 1986

H\*F (KM)

135° E Mean Time (G.M.T. + 9 h)

Station		OKINAWA							Lat.	26 16.9 N		Long	127 48.4 E		Sweep	1 MHz to 25 MHz		in 24 sec		in automatic operation							
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		270	280	250	220	S 275	235	230	205	215	220	200	205	195	215	A	A	A	A	230	A	225	190	S 260	S 300	290	
2		E A 290	E S 285	S	S	S	260	210	200	190	H 190	A	A	A	A	A	200	200	H 200	210	260	A	220	E A 280	260		
3		E A 280	S	A	S 270	220	210	E A 240	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	255	E A 260	A	A
4		A	E S 300	S 260	210	A	S	A	A	A	A	210	A	A	A	210	220	A	A	A	A	A	A	A	S 260	E S 300	
5		E S 300	270	E S 290	250	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
6		A	A	215	270	A	A	225	A	E A 250	A	A	A	A	A	A	A	A	A	A	A	250	A	A	A	A	
7		A	A	A	250	A	A	A	A	A	A	195	E A 230	A	A	A	A	A	A	A	A	A	A	A	A	A	
8		A	A	A	260	A	A	A	250	A	A	A	A	200	A	A	230	225	A	210	245	255	250	200	A	295	
9		E S 300	A	S	A	A	E S 260	230	A	A	A	A	210	210	A	225	210	200	215	210	200	A	A	A	280		
10		A	S	A	E S 270	E S 270	E S 250	240	A	A	A	205	200	A	A	200	210	H 200	210	230	A	A	E A 260	A	A		
11		A	280	210	A	250	A	A	240	220	210	215	A	175	200	220	A	195	A	A	A	250	210	225	250	260	225
12		A	A	A	250	A	A	250	250	A	A	A	A	200	A	A	A	A	U A 240	A	A	245	215	215	A	A	
13		A	275	A	A	290	A	A	A	A	A	A	A	A	A	A	A	A	A	A	255	310	265	300	260	250	
14		250	275	295	A	A	270	240	A	A	A	A	A	A	A	A	A	A	A	A	A	225	240	230	260	280	
15		260	230	250	235	240	230	210	200	200	200	A	220	A	A	C	C	A	A	A	A	A	A	A	A	A	
16		A	A	S 280	S	S	255	220	A	A	210	200	A	200	200	A	H 200	200	A	225	A	205	200	E S 290	S		
17		A	A	260	A	E S 280	240	230	A	190	A	200	A	A	A	A	A	A	A	A	A	225	210	230	E A 260	S 280	
18		A	A	255	250	250	A	E S 270	240	A	200	190	200	A	A	A	A	A	A	A	A	220	A	260	260	E A 310	
19		E A 310	S	E S 300	260	255	A	A	A	220	200	200	230	200	210	200	200	H 190	A	A	A	230	250	260	205	E A 250	S
20		A	A	A	A	255	A	230	205	200	240	A	265	A	A	230	220	230	220	225	A	220	245	280	255		
21		325	300	280	280	275	250	225	205	A	230	225	220	A	A	A	A	205	230	A	230	205	200	230	200	300	
22		320	320	315	315	280	270	225	A	190	A	A	A	200	190	200	200	215	215	220	220	210	200	200	A	A	
23		315	A	A	250	260	255	A	220	225	A	A	A	A	A	A	A	A	A	A	225	200	200	A	S		
24		S 340	300	305	300	315	315	250	220	210	A	220	A	A	A	A	A	A	A	A	220	270	230	200	A	A	
25		320	305	A	A	300	A	255	A	A	A	A	A	200	190	220	200	E A 250	220	A	220	225	260	265	280		
26		A	E S 290	S	255	230	S 260	A	205	210	200	200	A	200	200	205	225	A	200	A	C	C	200	S	A	A	
27		A	A	S	A	S	250	220	210	210	200	A	A	A	A	A	A	A	A	A	A	A	S 240	270	260	240	
28		270	E S 300	E S 280	E S 280	250	230	240	A	A	A	200	A	A	200	A	A	A	A	220	A	A	A	A	A	A	
29		A	A	A	265	240	215	245	270	A	195	240	230	A	200	210	A	A	E A 265	A	210	A	S 295	320	S 345		
30		A	S	325	270	220	A	A	225	230	A	A	A	E A 265	200	A	A	A	250	A	A	220	A	A	A	S 340	
31		315	S 375	340	270	210	A	250	275	A	205	235	A	205	220	265	A	A	A	250	245	A	230	270	300	305	
		00	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	16	19	19	19	18	25	15	14	13	14	13	10	10	11	12	11	12	12	20	24	23	19	18		
MED	U	285	286	265	255	252	248	240	220	202	200	202	205	200	200	210	205	202	219	228	225	230	238	260	282		
UQ		315	302	286	270	276	260	240	225	210	215	225	225	205	215	228	220	228	228	245	252	245	260	290	300		
LQ		265	275	252	250	245	232	225	205	200	200	200	200	200	200	202	200	200	212	220	220	210	202	260	260		

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H\*F (KM)

# IONOSPHERIC DATA

JUL. 1986

H°E (KM)

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

Station	OKINAWA				Lat. 26 16.9 N	Long. 127 48.4 E	Sweep 1	MHz to 25	MHz in 24	sec in	automatic operation													
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	105	A	A	A	A	A	A	105	105	105	A	A	A				
2							S	A	A	A	A	A	110	110	110	110	110	110	110		A			
3							S	A	A	A	A	A	A	A	A	110	110	110	110		A			
4							S	A	A	A	A	110	110	110	105	105	105		A	A	A			
5							S	A	A	A	A	A	A	A	A	A	A	A	A	A				
6							A	A	A	A	A	A	A	A	A	A	110	A	A	A				
7							A	110	110	A	110	110	A	A	A	A	A	A	A	A				
8							A	A	A	A	110	A	110	110	110	110	110	110	110		S			
9							S	A	A	A	A	A	A	A	110	110	110		A	A	A			
10							S	A	A	A	110	110	110	110	110	110	110	110	110		A			
11							A	A	A	A	A	A	A	A	A	110	110	110		A	A			
12							A	A	A	A	110	110	110	110	110	110	110	110	110		A			
13							S	110	110	110	110	110	110	110	A	A	A	A	A	A				
14							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
15							S	110	A	A	A	A	A	110	C	C	A	A	A	A				
16							S	110	110	110	A	A	A	110	110	110		A	A	A	A			
17							S	A	A	A	A	A	A	A	A	A	A	A	A	A				
18							S	A	A	A	A	110	A	A	110	A	110	110	110		A			
19							S	A	A	110	A	A	A	A	A	A	A	A	A	A				
20							A	A	A	A	A	A	A	A	A	A	A	A	110		S			
21							A	110	A	A	A	A	A	A	A	A	A	A	A	A				
22							S	A	A	A	A	A	A	A	A	A		100	105	100	100			
23							S	A	110	105	105	A	A	110	110	110	110	105		A	A			
24							S	A	A	A	A	A	A	A	A	A	A	A	A	A				
25							S	A	A	A	A	A	A	110	105	A	A	A	A	A				
26							S	A	A	A	A	A	125	120	110	110	110	110		C	C			
27							S	110	110	120	110	110	110	110	110	110		A	A	A	A			
28							S	110	A	110	110	110	120	A	A	A	110	110	110		A			
29							S	105	105	105	105	105	105	100	100	105	110		A	A	A			
30							S	115	110	105	110	A	A	A	105	105	105		A	A	A			
31							S	A	A	A	A	A	105	A	105	105		A	A	A	A			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								10	7	8	10	9	11	13	16	16	17	11	9	1				
MED								110	110	110	110	110	110	110	110	110	110	110	110	110	100			
UQ								110	110	110	110	110	110	110	110	110	110	110	110	110				
LQ								110	110	105	110	110	110	110	105	105	110	110	110					

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H°E (KM)



IONOSPHERIC DATA

JUL. 1986

H°ES (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA				Lat. 26 16.9 N				Long 127 48.4 E				Sweep 1 MHz to 25 MHz in 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	S	S	S	S	S		115	120	105	105	105	105	135	105	120	115	115	110	105	105	105	105	105
2	100	100	100	100	100	100	100	100	110	160	140	125	120	120	130	125	125	120	110	110	110	110	110	110
3	105	105	105	105	105	105	100	100	100	100	125	120	120	120	120	120	115	115	110	105	105	105	105	105
4	105	125	110	105	100	100	105	100	110	125	110	120	120	120	125	125	125	120	120	110	110	110	100	100
5	110	110	110	110	110	110	130	125	120	110	110	115	115	100	120	100	115	115	110	110	110	110	110	110
6	110	110	S	110	105	100	100	100	100	105	105	110	110	110	105	105	105	100	100	100	100	100	100	100
7	100	100	100	100	105	110	135	129	115	110	125	120	100	100	100	115	110	110	110	100	100	100	115	110
8	110	110	110	110	105	105	105	105	105	120	115	145	130	125	120	120	110	G	120	110	110	110	110	110
9	100	110	100	100	100	110	120	110	115	115	100	100	140	E G 150	120	120	130	110	110	100	110	110	100	110
10	115	130	110	100	100	110	110	110	110	110	120	145	140	140	140	E G 170	G	G	E G 150	100	100	115	110	110
11	100	105	105	100	S	100	105	105	105	105	105	110	105	105	105	G	110	110	105	100	100	100	100	100
12	110	105	105	105	105	100	100	100	115	110	115	115	125	125	125	110	130	110	110	100	100	110	110	105
13	130	120	110	105	105	105	115	110	110	110	110	110	110	110	105	100	100	100	100	100	100	100	100	100
14	100	100	S	100	100	100	105	100	100	100	110	110	110	110	110	115	110	120	115	110	100	100	S	110
15	110	110	S	S	S	110	S	115	110	110	130	130	125	125	C	C	100	125	120	100	115	110	115	115
16	110	110	110	110	100	100	125	115	120	125	160	135	135	130	120	120	110	110	110	105	105	105	110	110
17	110	110	110	110	110	110	110	110	110	110	110	105	100	100	105	115	100	100	100	100	110	110	100	100
18	110	110	110	110	110	110	110	110	105	110	110	120	140	140	140	140	120	115	115	110	110	110	110	100
19	100	100	S	S	110	110	110	110	110	125	110	110	110	110	110	E G 145	100	100	100	100	100	100	100	110
20	110	105	105	105	110	105	110	105	105	100	100	105	105	105	105	155	150	100	125	120	115	105	110	105
21	115	105	105	105	105	120	105	115	105	105	105	100	105	100	100	100	150	E G 165	95	95	95	100	95	95
22	S	100	S	S	S	110	115	105	115	100	105	100	105	100	100	100	E G 180	E G 165	125	110	100	105	110	105
23	105	105	105	100	100	110	100	105	115	115	110	110	110	110	110	110	110	110	105	100	S	110	105	115
24	115	S	110	105	105	110	115	110	110	105	105	100	105	105	100	100	100	100	100	100	100	S	100	105
25	105	S	110	110	110	110	105	100	100	100	100	100	100	G	160	100	100	100	100	100	100	100	110	S
26	110	110	110	110	110	110	120	125	125	125	E G 135	135	135	E G 160	E G 150	135	E G 160	120	C	C	100	110	110	110
27	110	110	110	110	110	115	115	130	120	130	125	120	120	120	115	115	110	100	100	100	110	100	100	S
28	S	110	110	110	110	110	110	140	135	125	135	135	135	E G 145	125	135	125	125	115	110	110	110	110	110
29	120	105	100	105	105	S	S	120	120	120	120	120	120	120	125	120	115	110	105	105	105	105	S	120
30	115	105	100	100	100	100	135	140	125	120	115	110	110	110	120	115	110	110	105	105	100	105	105	105
31	115	110	105	105	105	105	110	105	105	105	105	105	115	105	120	115	110	110	110	110	110	105	100	100
CNT	29	28	25	27	27	29	29	31	31	31	31	31	31	30	30	29	30	29	30	30	30	29	30	29
MED	110	110	110	105	105	110	110	110	110	110	110	110	115	110	120	115	111	110	110	100	105	105	108	105
UQ	110	110	110	110	110	110	115	118	115	120	119	122	128	122	122	122	122	115	115	110	110	110	110	110
LQ	105	105	105	100	100	100	105	105	105	105	105	105	108	105	105	110	110	100	100	100	100	100	100	100

JUL. 1986

H°ES (KM)

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# IONOSPHERIC DATA

JUL. 1986

TYPES OF ES

135° E Mean Time (G.M.T. + 9 h)

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

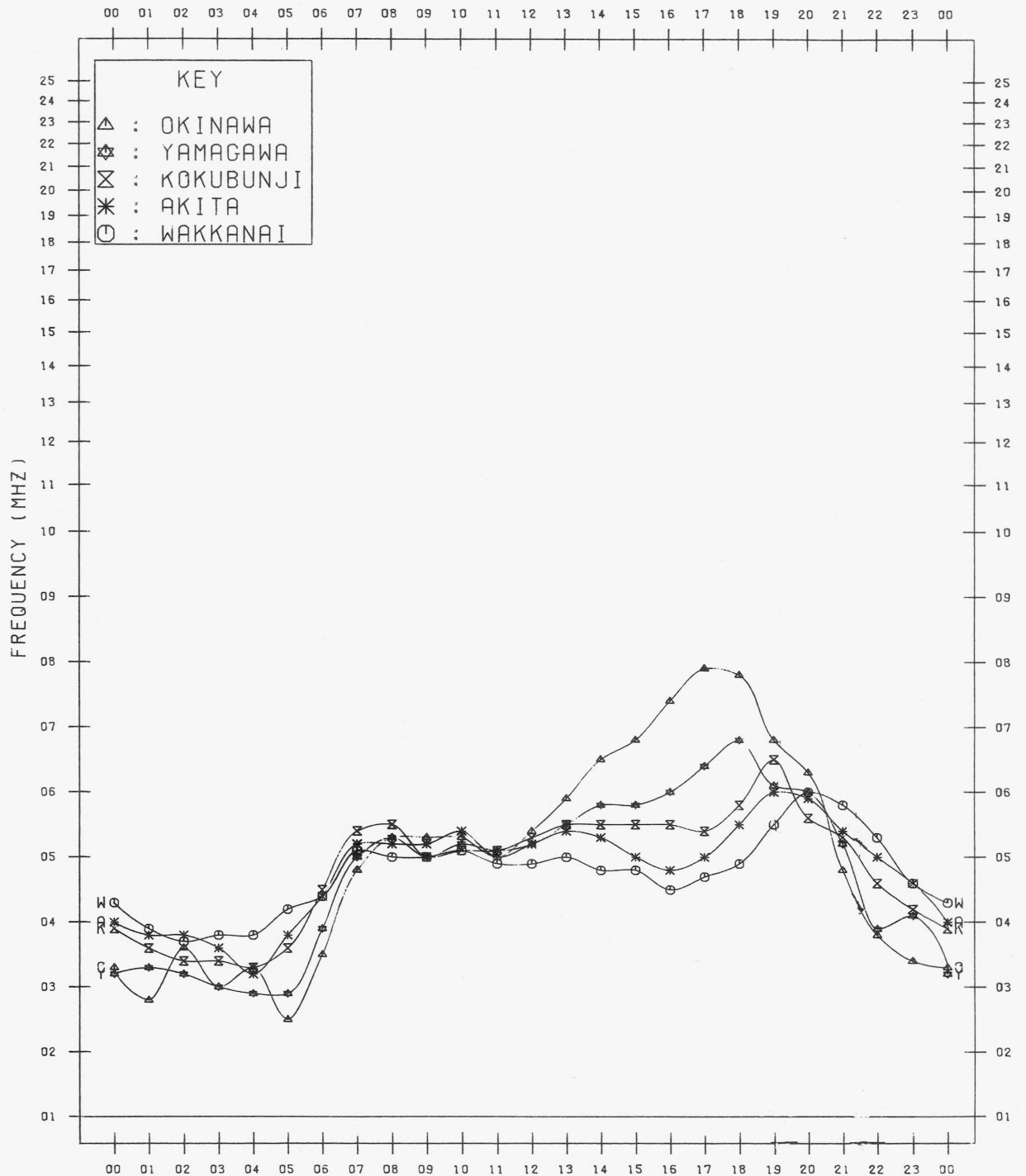
JUL. 1986

TYPES OF ES

# MONTHLY MEDIAN VALUES OF FOF2

135°E MEAN TIME

JUL. 1986



*f*-PLOTS OF IONOSPHERIC DATA

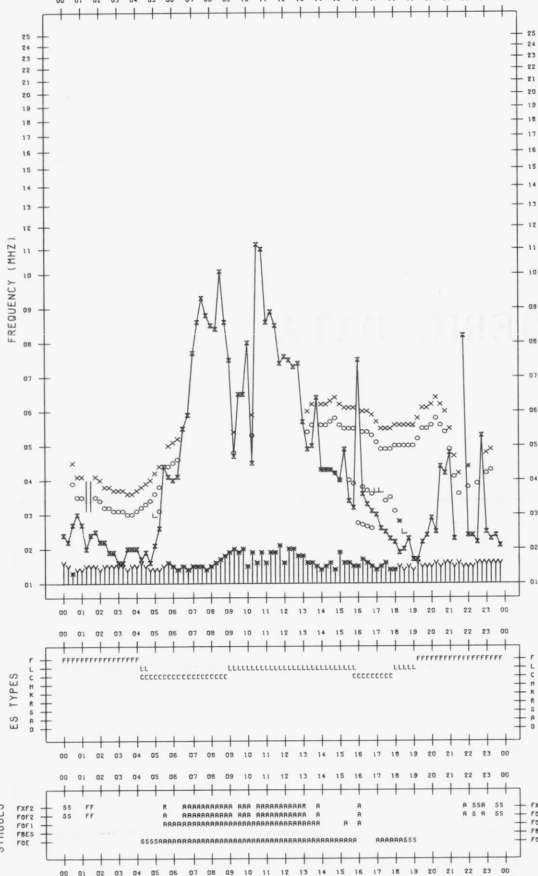
KEY OF F-PLOT	
I	SPREAD
◇	F <sub>0</sub> F <sub>2</sub> , F <sub>0</sub> F <sub>1</sub> , F <sub>0</sub> E
×	F <sub>X</sub> F <sub>2</sub>
*	DOUBTFUL F <sub>0</sub> F <sub>2</sub> , F <sub>0</sub> F <sub>1</sub> , F <sub>0</sub> E
⊗	FBES
L	ESTIMATED F <sub>0</sub> F <sub>1</sub>
* <sub>1</sub>	F <sub>MIN</sub>
^	GREATER THAN
v	LESS THAN

F-PLOT DATA

SCALER : S-HIIDOME

STATION : KOKUBUNJI TOKYO 135°E MEAN TIME

DATE : 1986/ 7/ 1

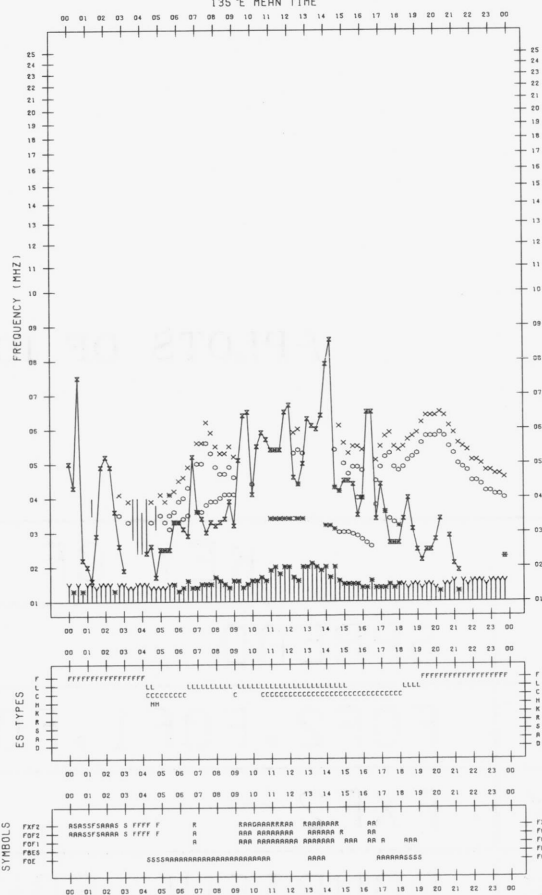


F-PLOT DATA

SCALER : S-HIIDOME

STATION : KOKUBUNJI TOKYO 135°E MEAN TIME

DATE : 1986/ 7/ 3

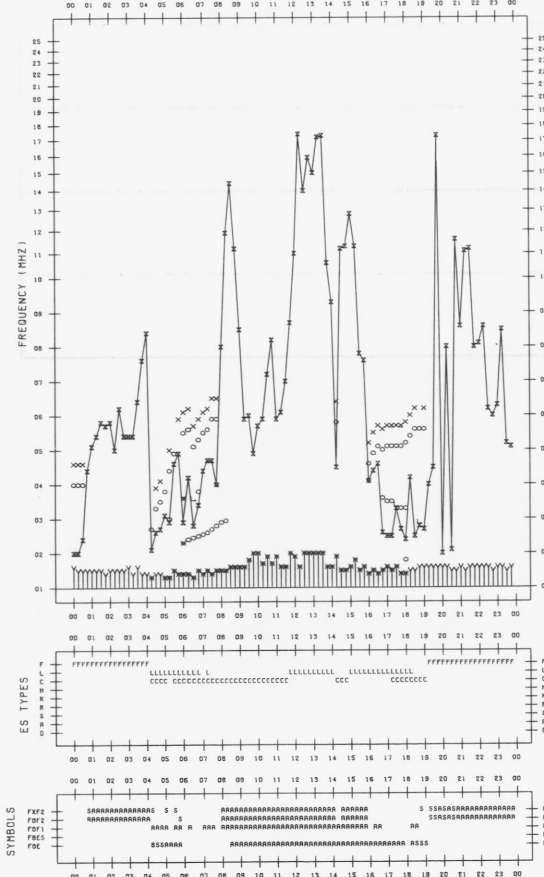


F-PLOT DATA

SCALER : S-HIIDOME

STATION : KOKUBUNJI TOKYO 135°E MEAN TIME

DATE : 1986/ 7/ 2

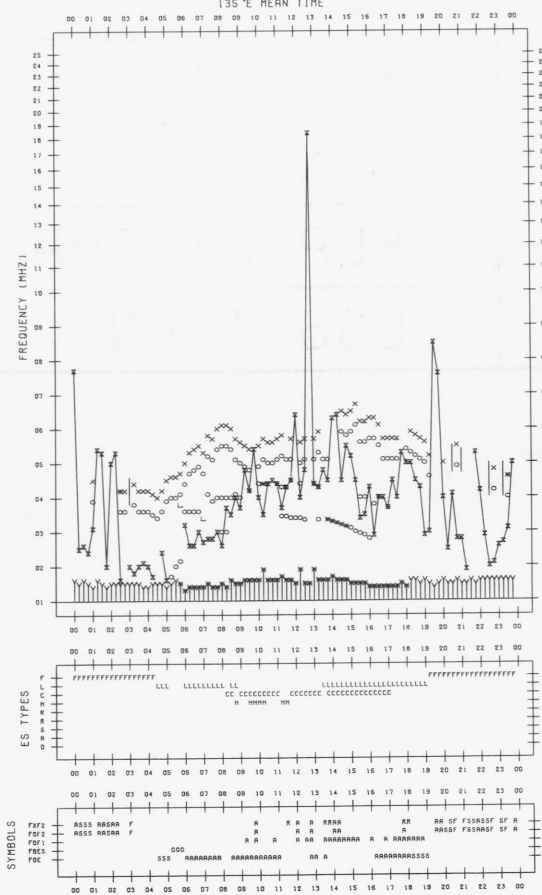


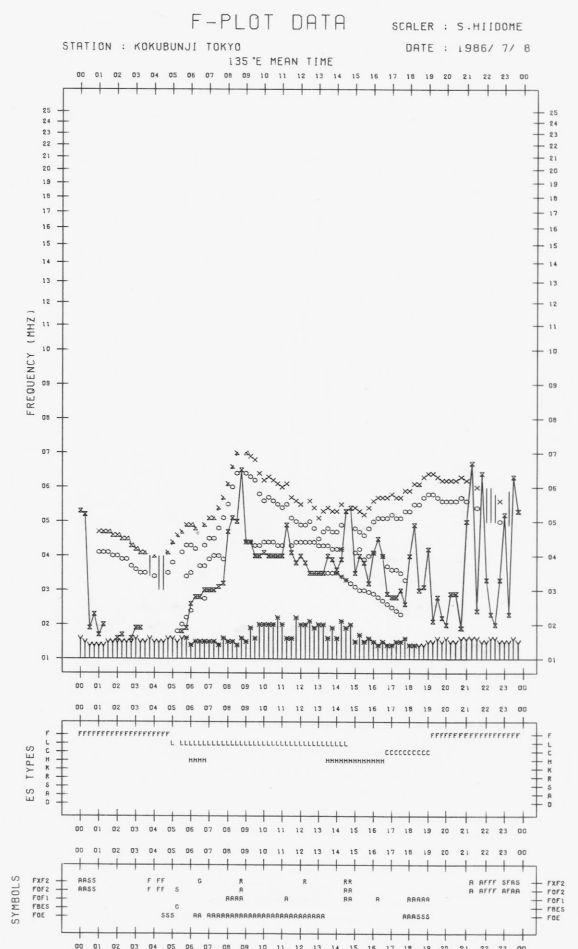
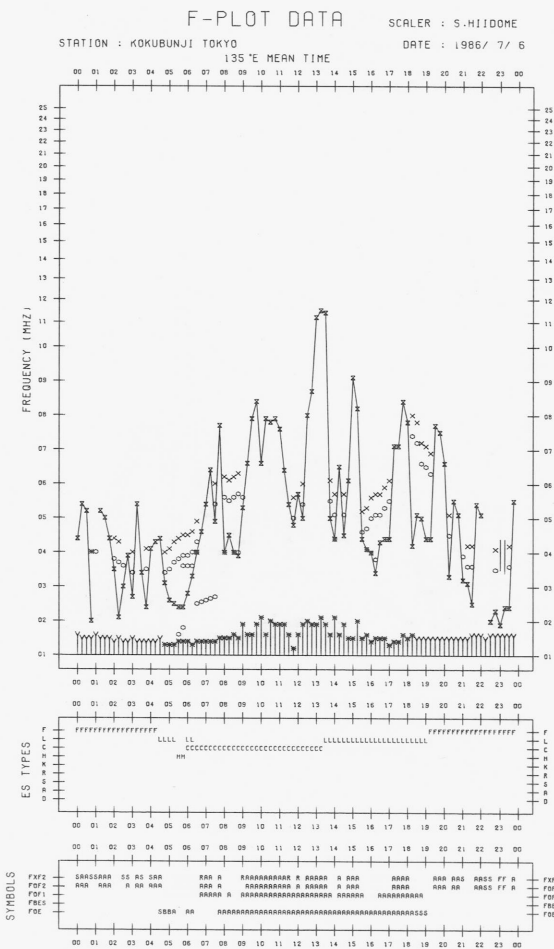
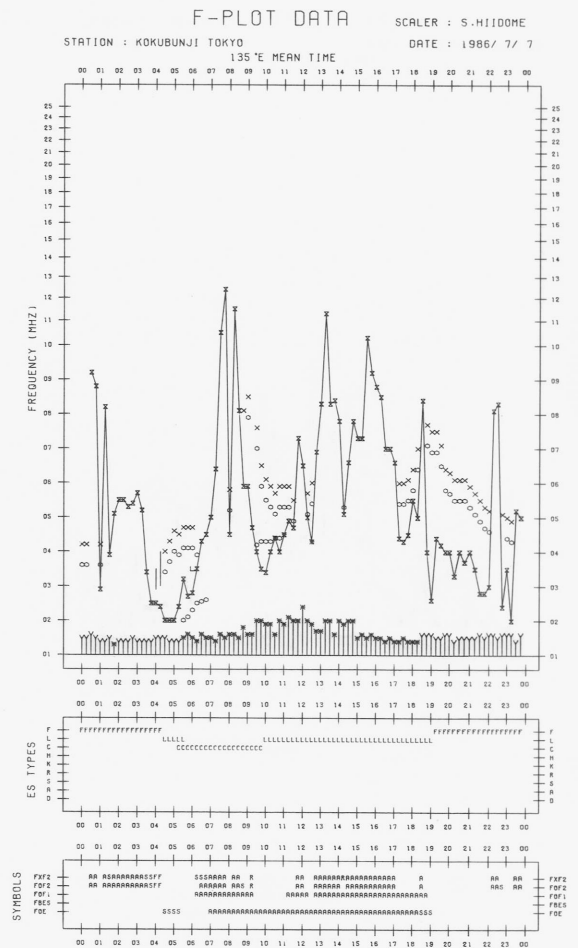
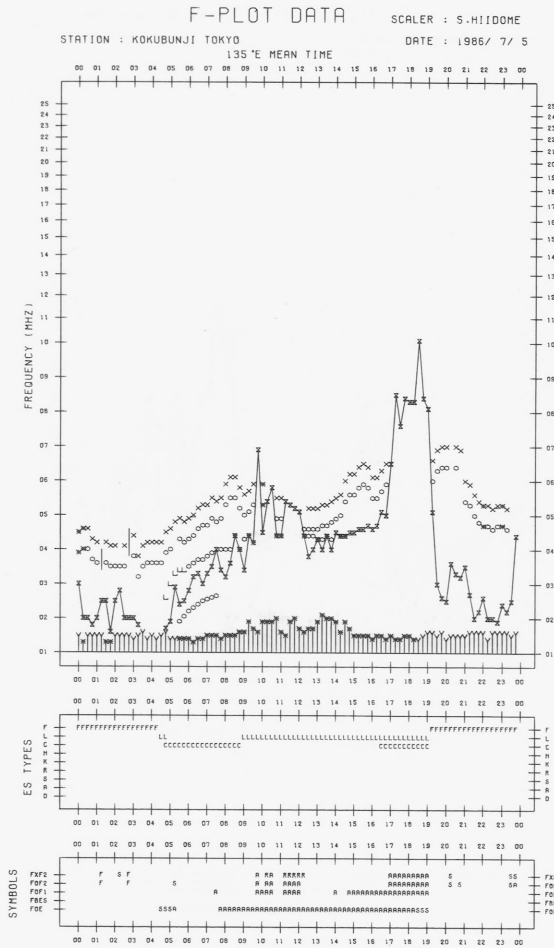
F-PLOT DATA

SCALER : S-HIIDOME

STATION : KOKUBUNJI TOKYO 135°E MEAN TIME

DATE : 1986/ 7/ 4





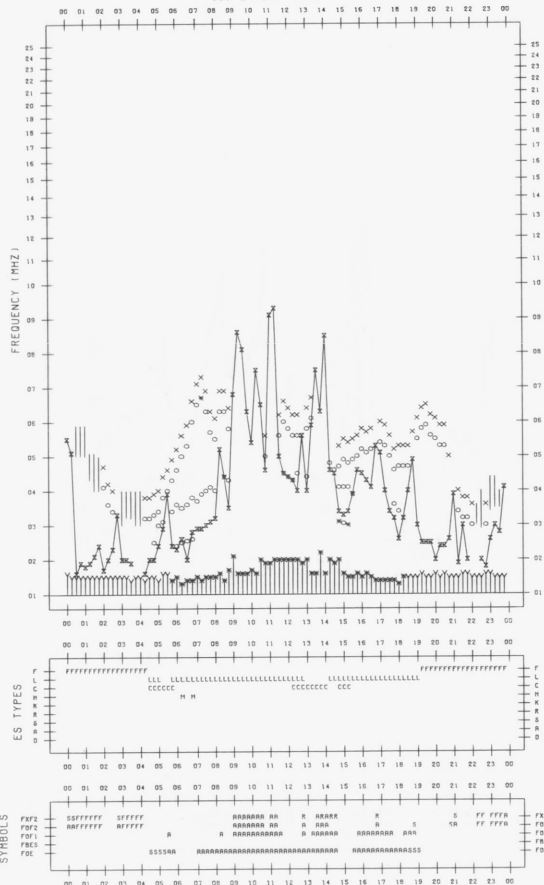
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1986/ 7/ 9

135°E MEAN TIME



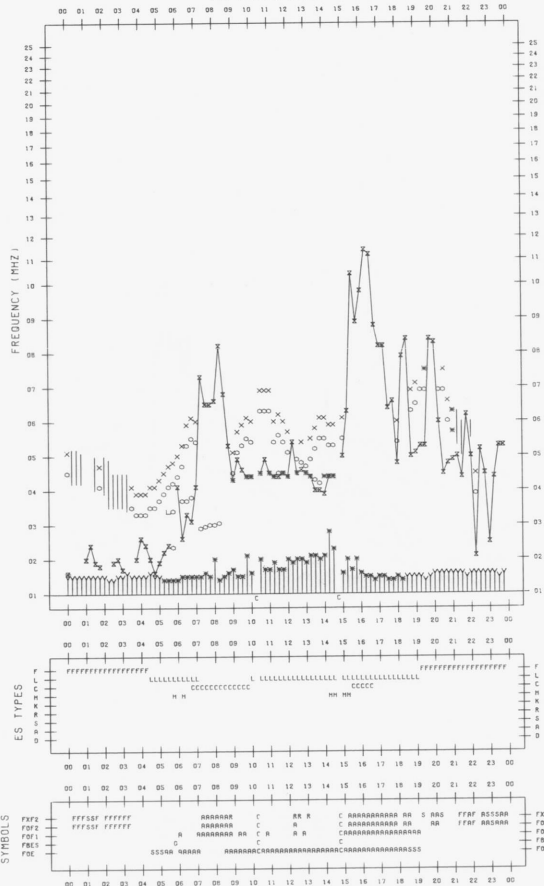
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1986/ 7/11

135°E MEAN TIME



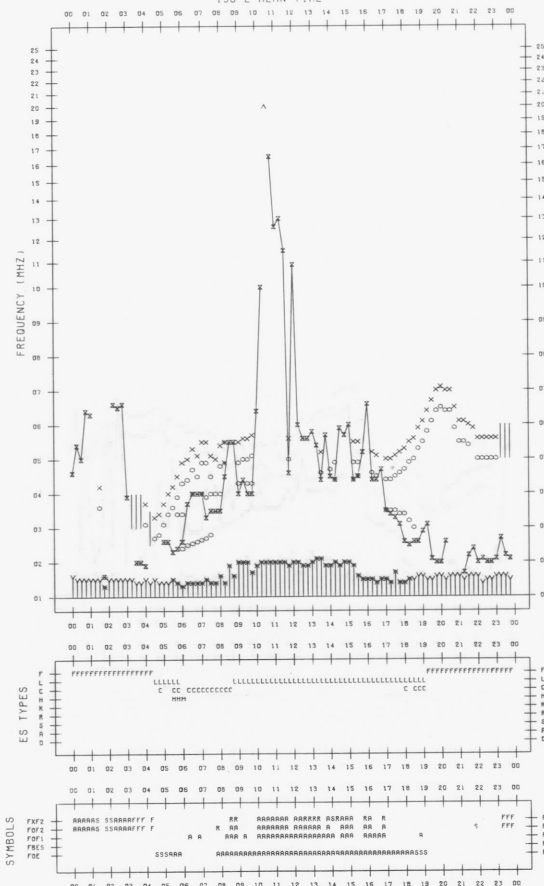
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1986/ 7/10

135°E MEAN TIME



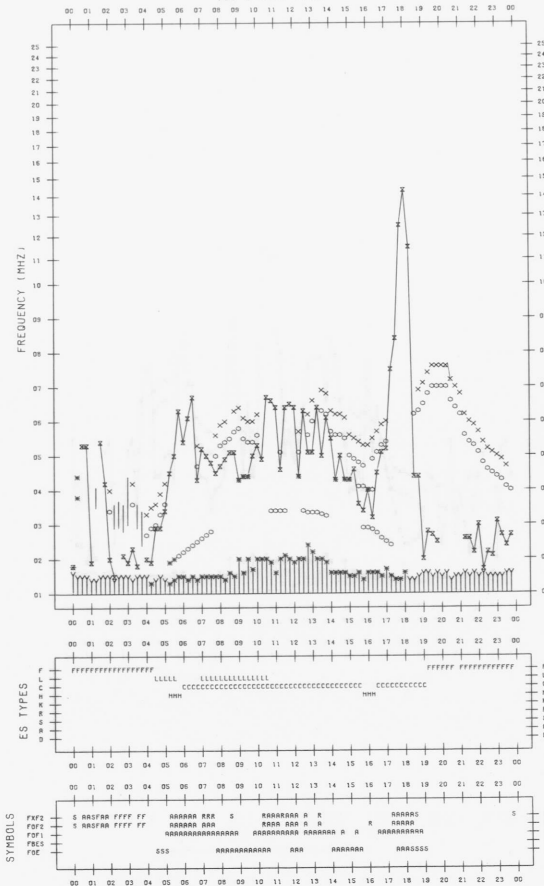
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1986/ 7/12

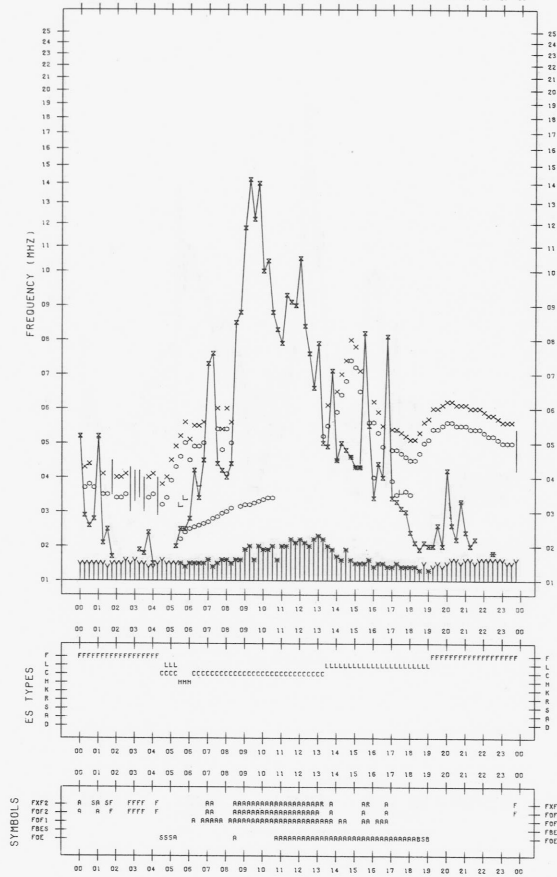
135°E MEAN TIME



F-PLOT DATA

SCALER : S.HIJDOME

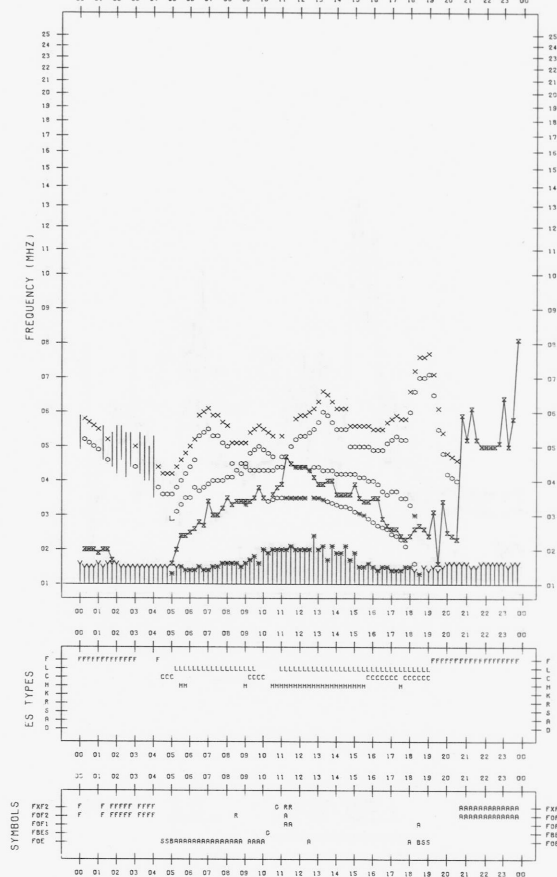
STATION : KOKUBUNJI TOKYO DATE : 1986/ 7/13  
135°E MEAN TIME



F-PLOT DATA

SCALER : S.HIJDOME

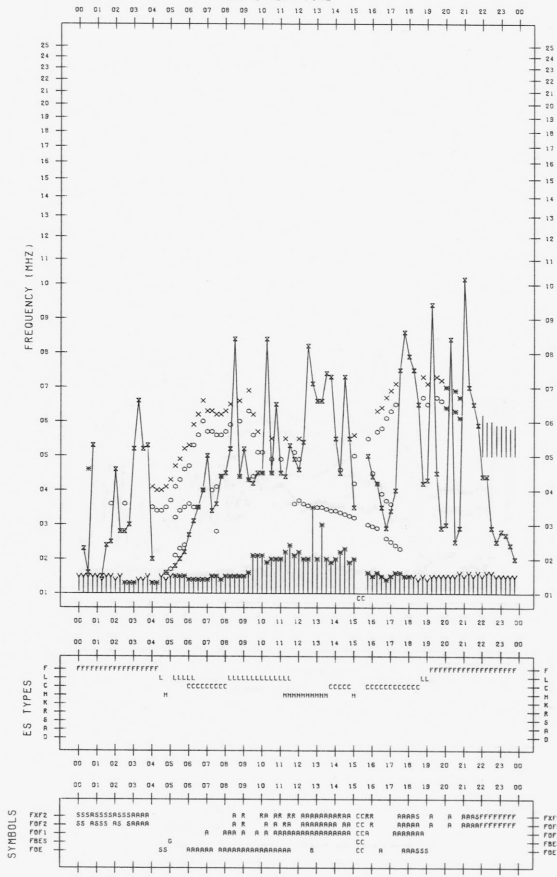
STATION : KOKUBUNJI TOKYO DATE : 1986/ 7/15  
135°E MEAN TIME



F-PLOT DATA

SCALER : S.HIJDOME

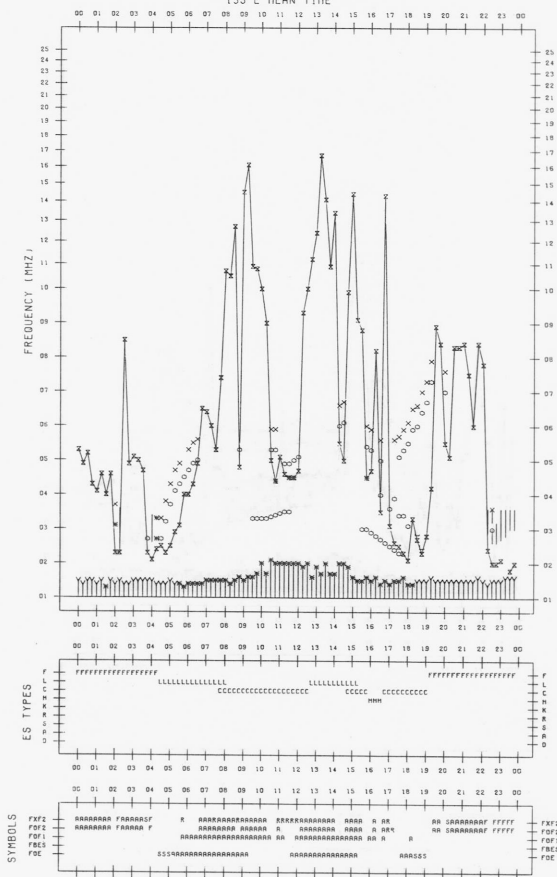
STATION : KOKUBUNJI TOKYO DATE : 1986/ 7/14  
135°E MEAN TIME



F-PLOT DATA

SCALER : S.HIJDOME

STATION : KOKUBUNJI TOKYO DATE : 1986/ 7/16  
135°E MEAN TIME

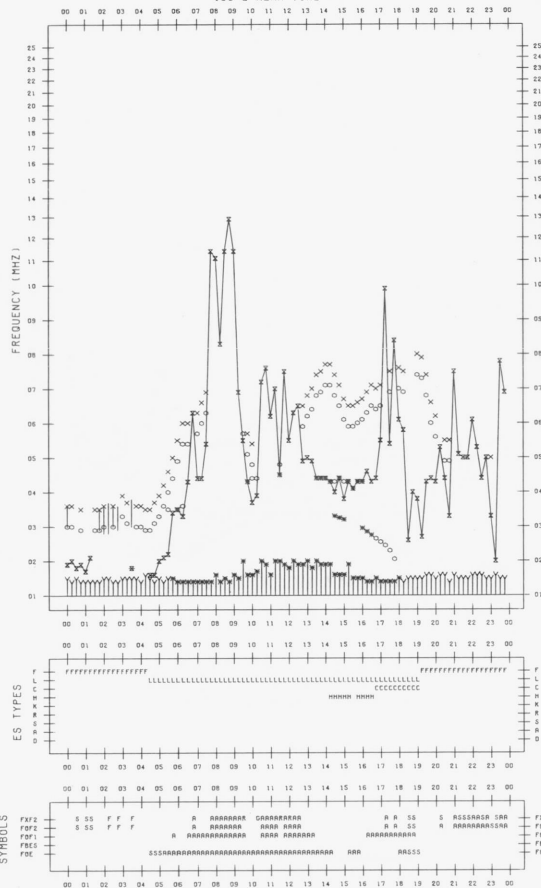




F-PLOT DATA

SCALER : S.HIIDOME

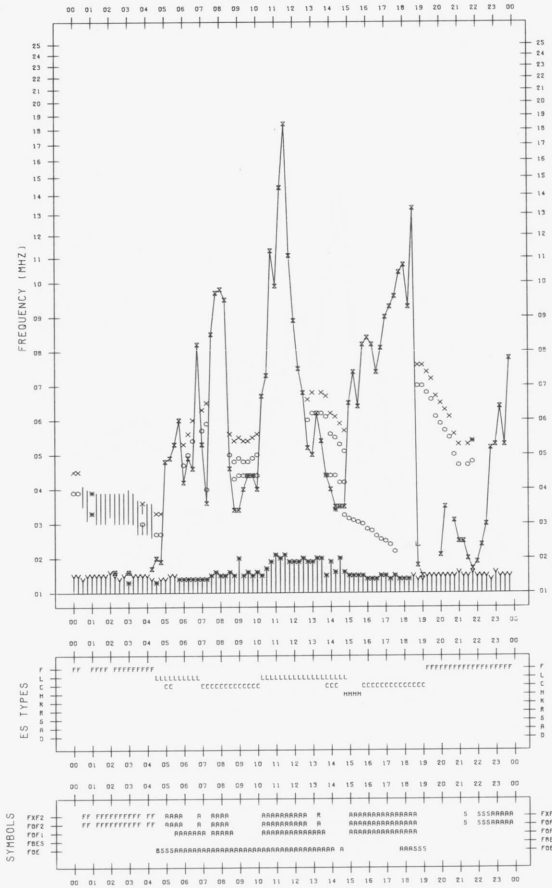
STATION : KOKUBUNJI TOKYO DATE : 1986/ 7/17  
135°E MEAN TIME



F-PLOT DATA

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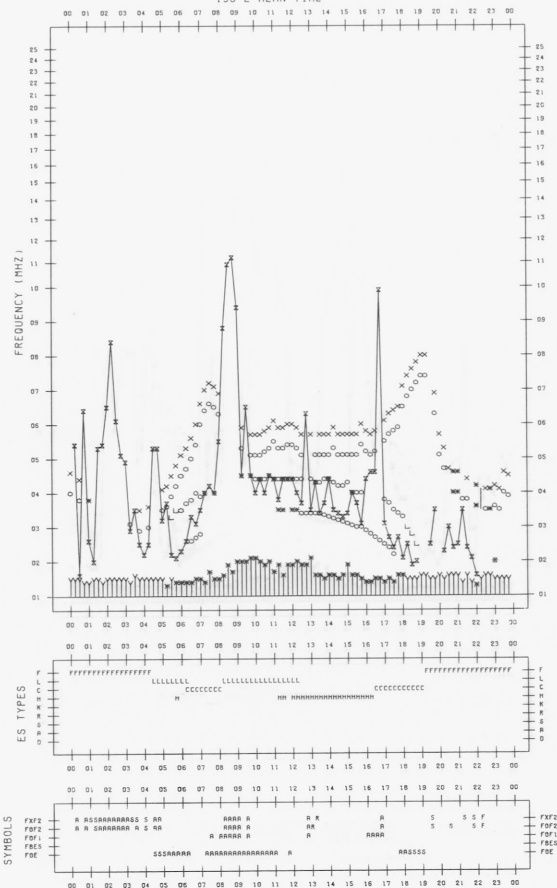
STATION : KOKUBUNJI TOKYO DATE : 1986/ 7/19  
135°E MEAN TIME



F-PLOT DATA

SCALER : S.HIIDOME

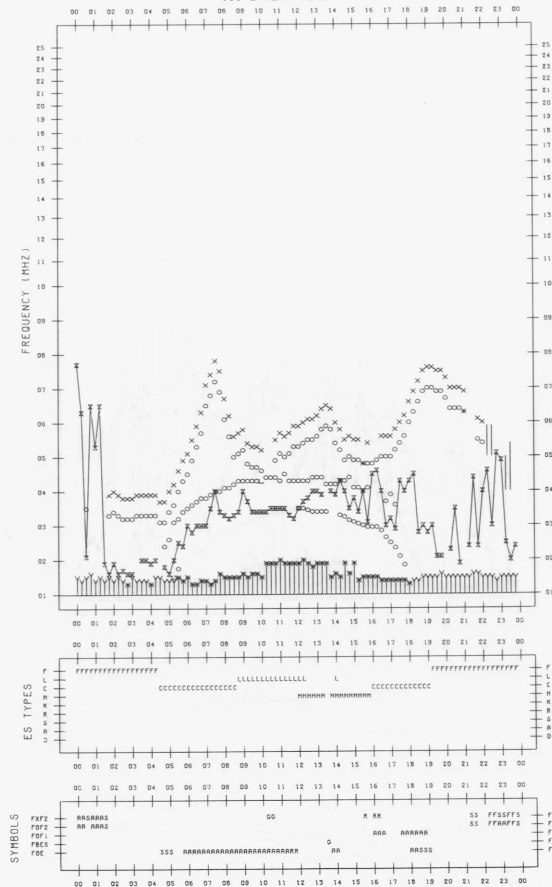
STATION : KOKUBUNJI TOKYO DATE : 1986/ 7/18  
135°E MEAN TIME

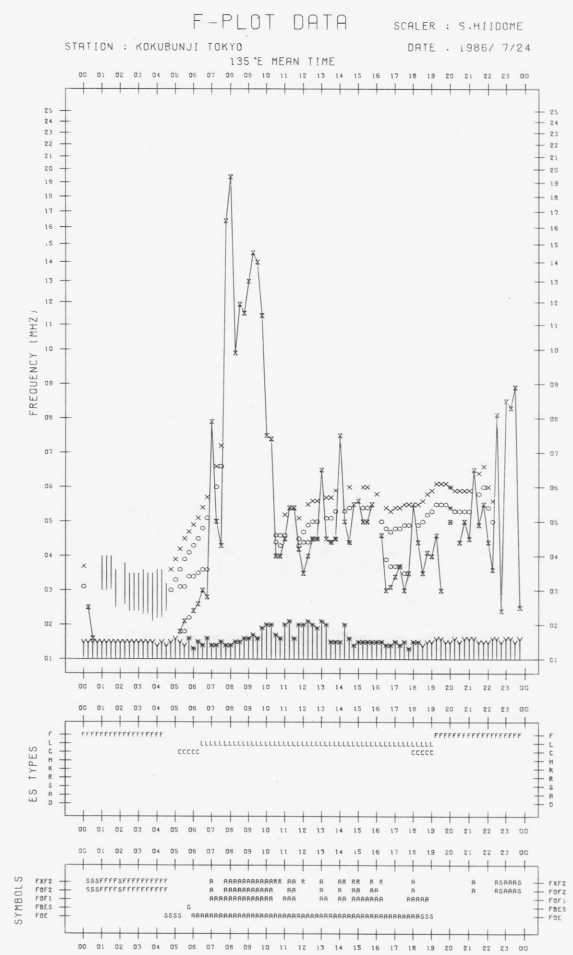
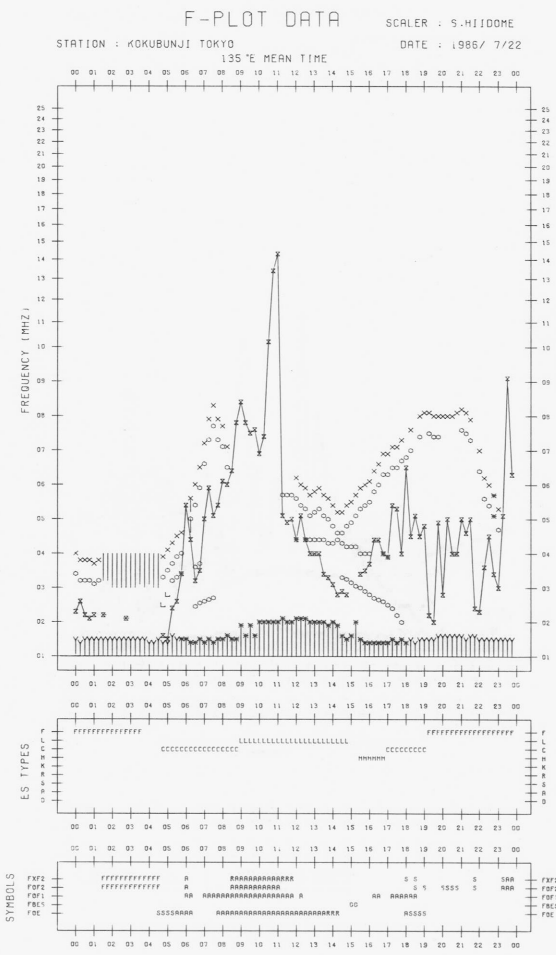
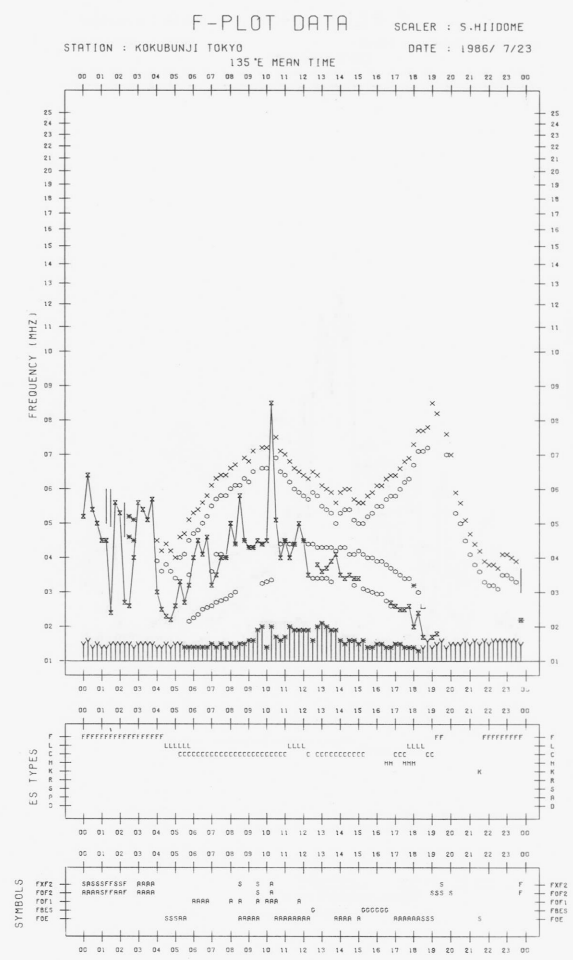
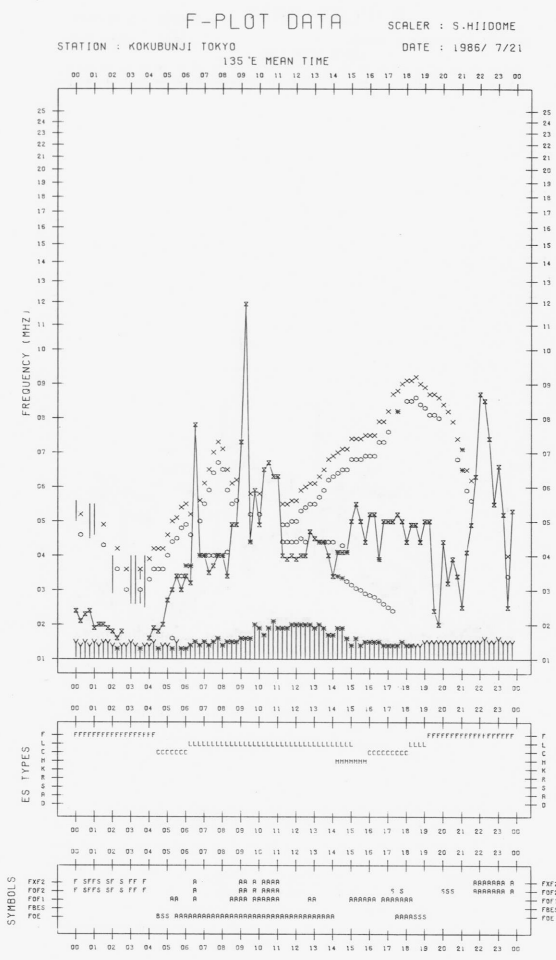


F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO DATE : 1986/ 7/20  
135°E MEAN TIME





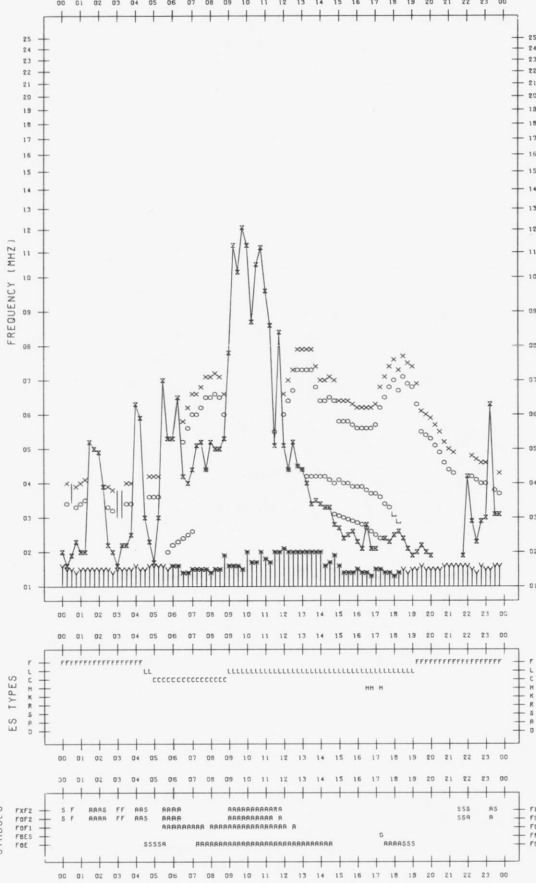
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1986/ 7/25

135°E MEAN TIME



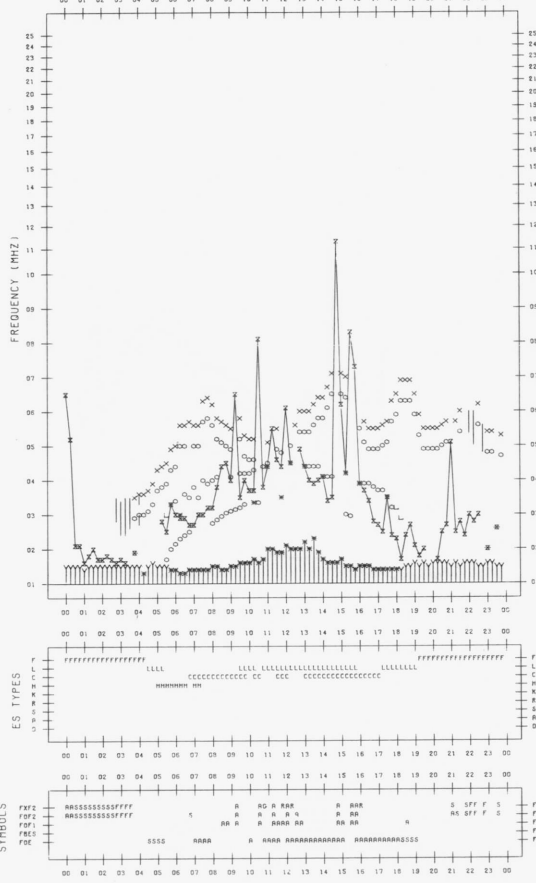
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1986/ 7/27

135°E MEAN TIME



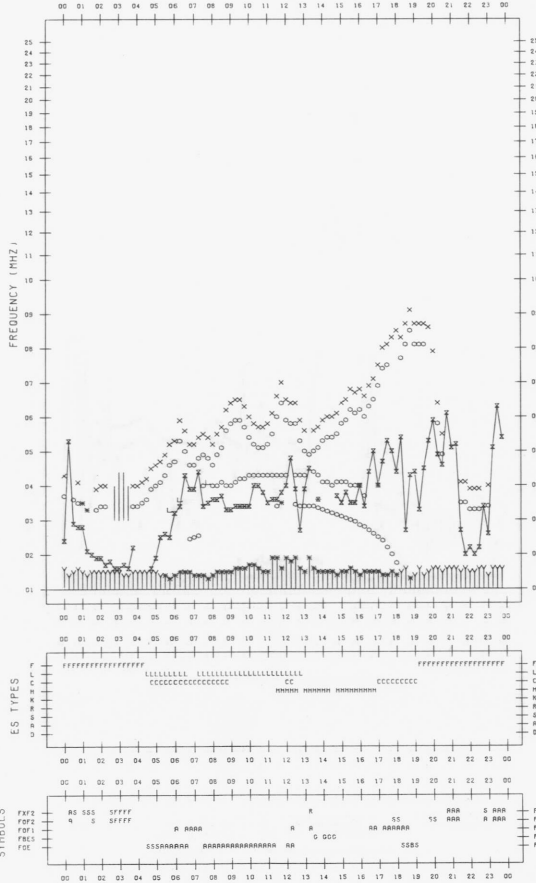
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1986/ 7/26

135°E MEAN TIME



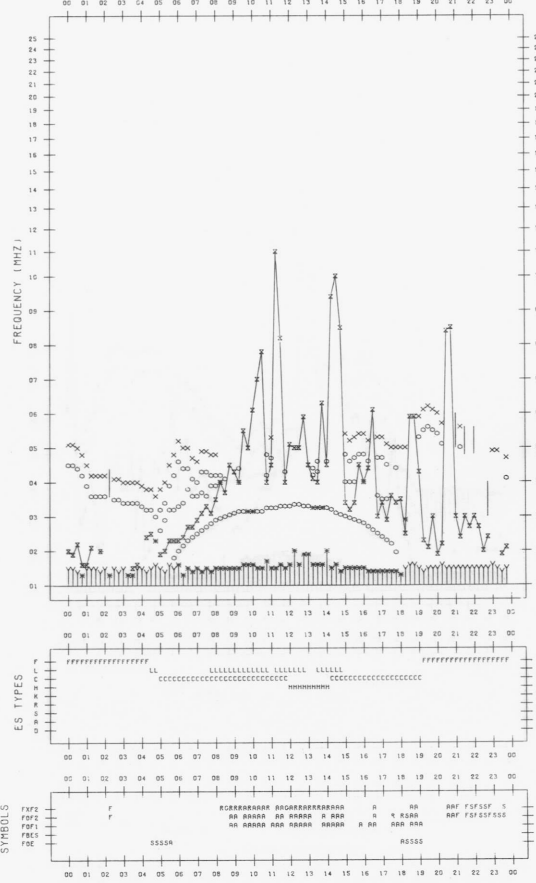
F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO

DATE : 1986/ 7/28

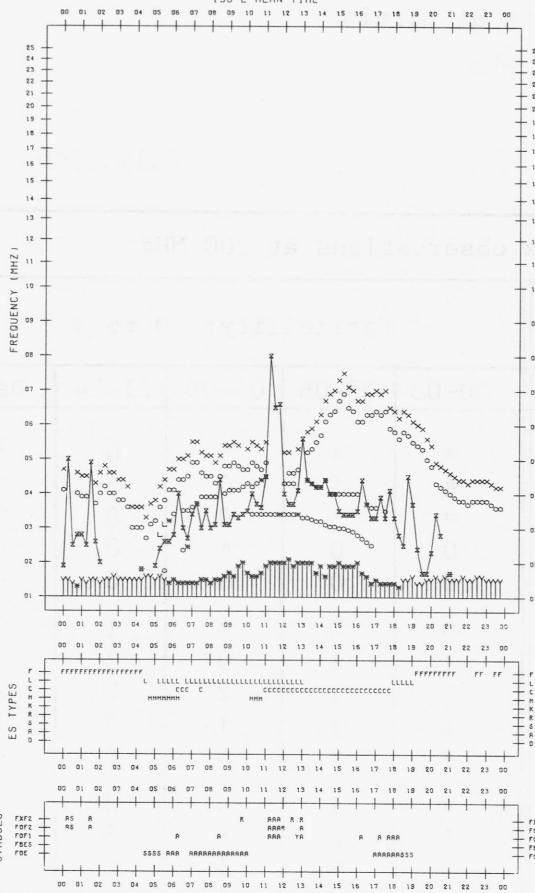
135°E MEAN TIME



F-PLOT DATA

SCALER : S.HIIDOME

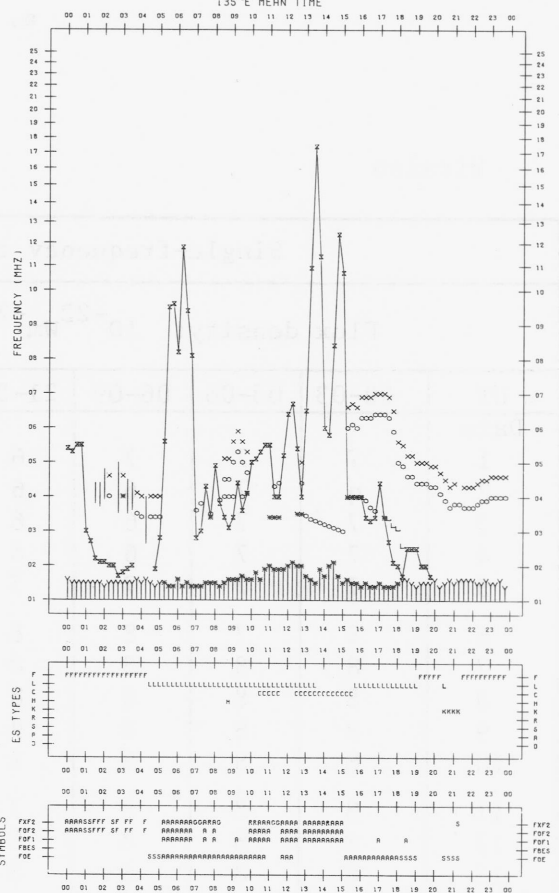
STATION : KOKUBUNJI TOKYO DATE : 1986/ 7/29



F-PLOT DATA

SCALER : S.HIIDOME

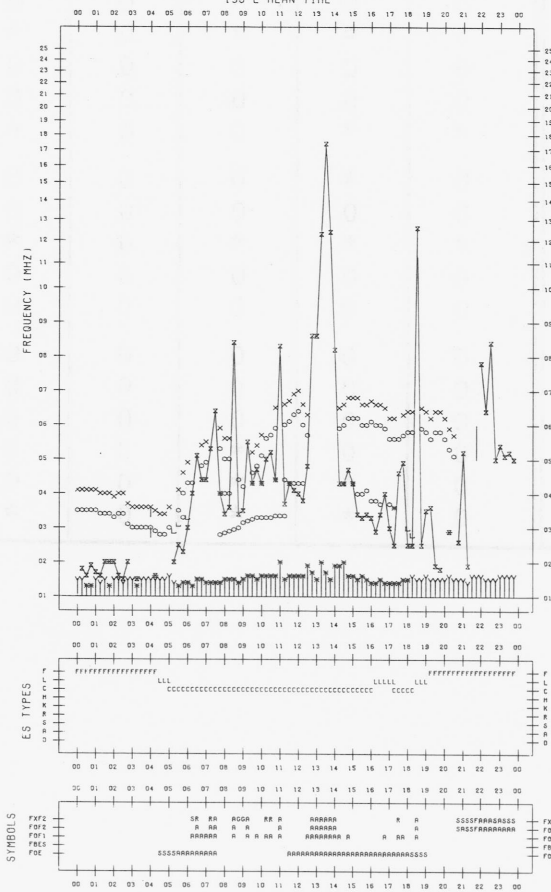
STATION : KOKUBUNJI TOKYO DATE : 1986/ 7/31



F-PLOT DATA

SCALER : S.HIIDOME

STATION : KOKUBUNJI TOKYO DATE : 1986/ 7/30



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

Hiraïso

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

q: likely quiet.

\*: interference.

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

Hiraiso

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

Note No observations during the following periods:

7th	0900 - 1000	17th	0300 - 0407
7th	1935 - 2343	27th	0300 - 0940
12th	0143 - 0205	27th	1950 - 2345
12th	0240 - 0253	28th	1950 - 2337

B. Solar Radio Emission  
 b. Outstanding Occurrences at Hiraiso

Hiraiso

July 1986

Outstanding Occurrences									
(single-frequency observations)									
Normal observing period: 1935 - 0955 (sunrise to sunset)									
JUL 1986	FREQ STATION	TYPE	START TIME UT	TIME OF MAXIMUM UT	DUR  MIN	FLUX DENSITY		POLARIZATION POSITION REMARKS	
						PEAK	MEAN		
4	500 HIRA	8 S	0104.5	0104.6	0.1	1	-	WL	
	500	8 S	0720.0	0720.1	0.5	5	-	WR	
6	500	8 S	0326.1	0326.5	0.6	4	-	O	
7	200	24 R	1940E	0709	850D	14	11	WR	
8	200	24 R	1940E	0100	850D	11	10	O	
10	500	42 SER	0004.6	0010.1	6.2	325	-	WL	
	200	46 C	0100	0106.3	9.2	40	12	WL	
11	500	8 S	0221.9	0221.9	0.6	10	-	O	
	500	8 S	0303.3	0303.5	0.4	20	-	WR	
	200	46 C	0440.3	0451.5	79	170	13	WR	
12	500	46 C	0443.1	0454.6	76	325	50	ML	
				0539.6		175		ML	
	500	46 C	0606.2	0613.8	43	12	4	ML	
	500	45 C	0654.5	0700.0	15.5	54	20	ML	
	500	27 RF	0032	0120.4	72D	4	1U	O	
	200	27 RF	0342.9	0443	160	47	15	WR	
	500	46 C	0343.7	0359.3	47	49	10	ML	
	500	42 SER	0457.6	0513.9	58	3	-	WL	
	200	44 NS	1940E	2340	850D	15	5	O	
	13	500	7 C	0059.3	0101.1	2.4	104	15	WR
200		46 C	0117.8	0150	59	79	24	WR	
500		6 S	0132.0	0133.0	1.6	9	4	O	
500		6 S	0134.9	0135.6	2.0	5	2	WR	
500		28 PRE	0138.2	0147.2	10.1	7	3	O	
500		46 C	0148.3	0224.0	77	325	30	WL	
				0154.5			65		WL
				0239.0			115		WL
				0246.5			235		WL
14		500	45 C	0556.5	0600.4	8.3	4	2	WR
	200	27 RF	2355	0030	72	84	12	O	
	100	27 RF	0027	0049	83	62	10	-	
15	500	8 S	0316.4	0316.4	0.2	2	-	WR	
26	500	8 S	2350.2	2350.2	0.5	1	-	WL	





C. Radio Propagation

a. H.F. Field Strength at Hiraio

WWVH 15 MHz

July 1986

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

## C. Radio Propagation

## b. Radio Propagation Quality Figures at Hiraiso

Hiraiso

Time in U.T.

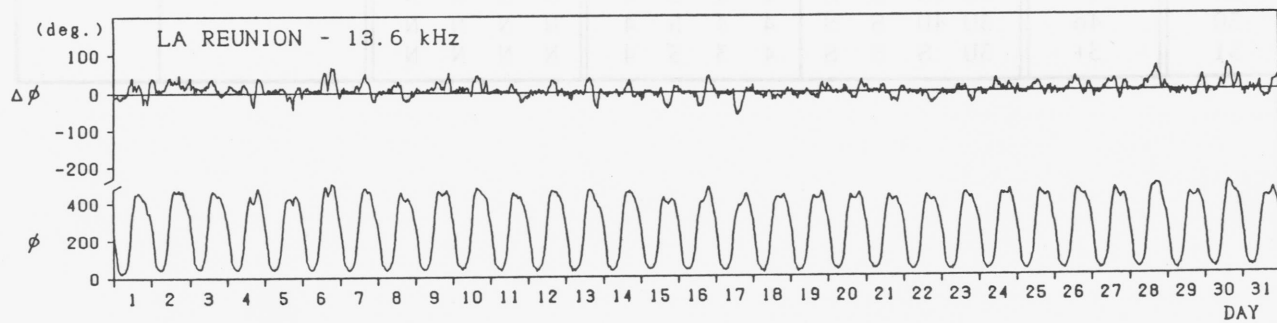
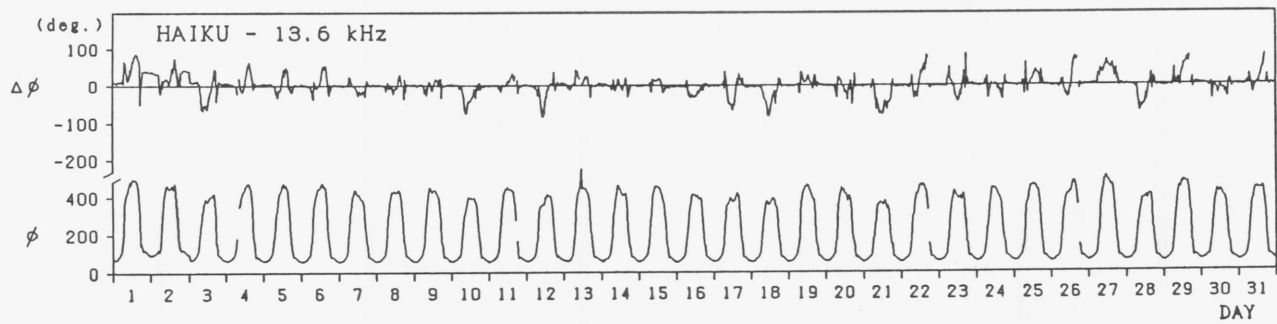
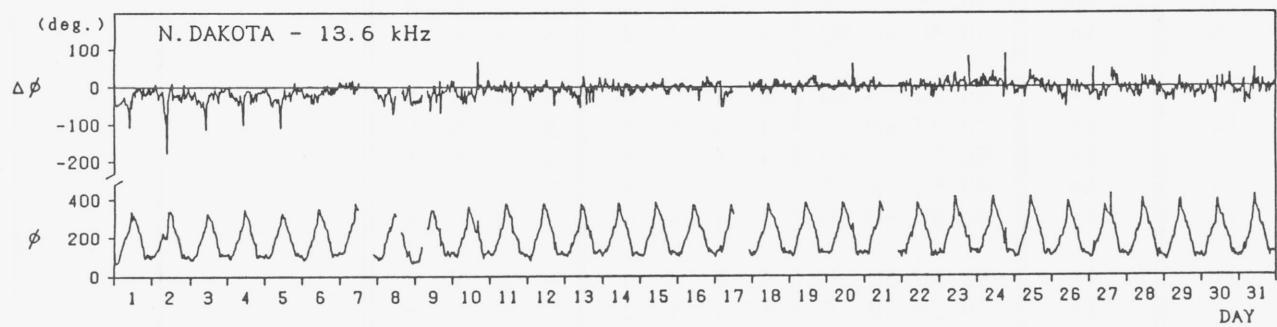
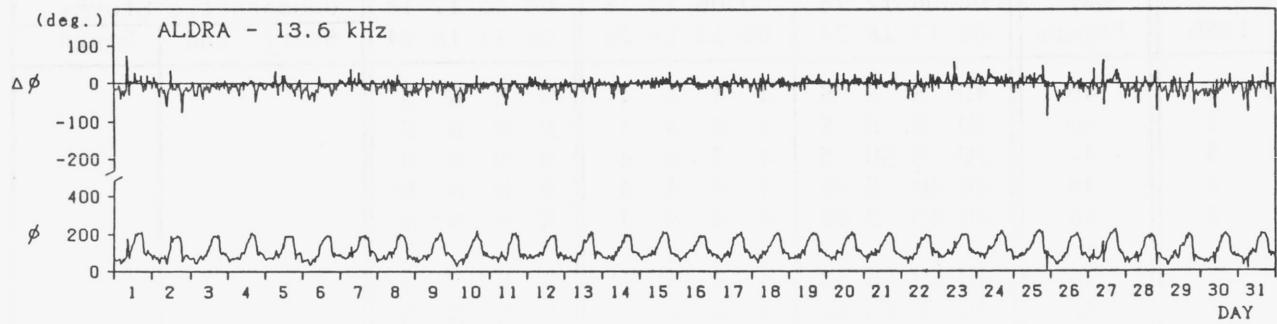
Jul. 1986	Whole Day Figure	W W V				W W V H				Conditions				Principal Geomagnetic Storms		
		00	06	12	18	00	06	12	18	00	06	12	18	Start	End	Range
		06	12	18	24	06	12	18	24	06	12	18	24			
1	4o	4U	S	S	S	4	4	4	4	N	N	N	N			
2	4o	4U	S	S	S	4	4	4	4	N	N	N	N			
3	4-	3U	S	5U	S	4	3	4	4	N	N	N	N			
4	4o	4U	4U	S	4U	4	4	4	4	N	N	N	N			
5	4o	4U	4U	S	4U	4	4	4	4	N	N	N	N			
6	5-	4U	5U	5U	5U	4	4	5	5	N	N	N	N			
7	4o	4U	S	5U	5U	4	4	4	3	N	N	N	N			
8	4o	4U	4U	4U	5U	4	4	3	4	N	N	N	N			
9	4o	4U	S	S	S	4	4	4	4	N	N	N	N			
10	4o	3U	4U	5U	5U	4	4	4	4	N	N	N	N			
11	4+	4U	5U	S	5U	4	4	4	4	N	N	N	N			
12	4+	4U	4U	5U	5U	4	4	4	4	N	N	N	N			
13	4+	5U	5U	S	5U	4	4	4	4	N	N	N	N			
14	4o	4U	5U	S	S	3	4	4	4	N	N	N	N			
15	4+	4U	5U	5U	5U	4	4	4	4	N	N	N	N			
16	4+	5U	5U	5U	5U	4	4	4	4	N	N	N	N			
17	4+	5U	5U	5U	S	4	4	4	4	N	N	N	N			
18	4+	5U	5U	S	S	4	4	4	4	N	N	N	N			
19	4+	5U	5U	5U	5U	4	4	3	4	N	N	N	N			
20	4+	5U	5U	5U	5U	4	4	4	4	N	N	N	N			
21	4o	5U	5U	S	S	4	4	3	4	N	N	N	N			
22	4+	5U	4U	5U	S	4	4	5	4	N	N	N	N			
23	4+	4U	5U	S	5U	4	5	4	4	N	N	N	N			
24	4-	3U	S	S	S	4	4	3	4	N	N	N	N			
25	4o	4U	S	S	5U	4	4	3	4	N	N	N	N			
26	4-	4U	S	S	S	4	4	3	3	N	N	N	N			
27	3o	4U	S	S	S	4	2	2U	3	N	N	N	N			
28	4-	4U	S	S	S	3	4	3	4	U	U	U	U			
29	4-	4U	4U	S	S	4	4	3	4	U	N	N	N			
30	4o	3U	4U	S	S	4	4	5	4	N	N	N	N			
31	3+	3U	S	S	S	4	3	3	4	N	N	N	N			

C. Radio Propagation

c. Phase Variations in OMEGA Radio Waves at Inubo

Inubo

July 1986



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

NONE

## C. Radio Propagation

## d. Sudden Ionospheric Disturbances

## (i) Short Wave Fade-out (SWF) at Hiraíso

Hiraíso

Time in U.T.

Jul. 1986	S W F					Correspondence						
	Drop-out Intensities(dB)					Start	Duration	Type	Imp.	Solar Flare	Solar Noise	Geomag. Crochet
	CO	HA	1)	2)	3)							
						None						

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

## (ii) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Jul. 1986	S P A					Time (U.T.)		
	Phase Advance (degrees)					Time (U.T.)		
Date	$\Omega/N$	$\Omega/LR$	NWC	$\Omega/H$	$\Omega/ND$	Start	End	Maximum
11		<u>63</u>	51	20	25	0453	0650	0505
13			<u>16</u>	11		0200	0300	0220
13		29	<u>24</u>	14		0353	0450	0406

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IONOSPHERIC DATA IN JAPAN FOR JULY 1986

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