

IONOSPHERIC DATA IN JAPAN

FOR AUGUST 1987

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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

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

b. Symbols

(i) Descriptive Letters

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

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

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

(ii) Qualifying Letters

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

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

(iii) Description of Types of Es

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

The types are:

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

present above it.

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

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

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

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

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

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

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

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

B. SOLAR RADIO EMISSION

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

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

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

a. Daily Data at Hiraiso

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

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

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

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

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

b. Outstanding Occurrences at Hiraiso

The phenomena are picked up on the following criteria:

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

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

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

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

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

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

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

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

C. RADIO PROPAGATION

a. H.F. Field Strength at Hiraiso

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

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

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

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

b. Radio Propagation Quality Figures at Hiraiso

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

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

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

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

C	artificial accident,
S	propagational accident,
U	inaccurate.

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

N	normal,
U	unstable,
W	disturbed

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

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

c. Phase Variations in OMEGA Radio Waves at Inubo

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

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

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

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

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

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

d. Sudden Ionospheric Disturbances

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

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

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

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

Types of fade-out are as follows:

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

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

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

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

(ii) Sudden Phase Anomaly (SPA) at Inubo

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

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

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

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

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

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

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

IONOSPHERIC DATA

AUG. 1987

FXI (0.1 MHz)

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

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

AUG. 1987

FXI (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987

FOF2 (0.1 MHz)

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

Station		WAKKANAI										Lat. 45 23.5 N		Long. 141 41.2 E		Sweep 1 MHz to 25 MHz in 24sec in automatic operation												
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1		A	35	36	36	37	44	54	57	55	A	50	55	51	51	53	55	63	53	55	53	57	59	56	F			
2		47	44	42	41	36	42	51	65	51	58	57	54	54	55	52	51	51	52	A	65	69	71	68	A			
3		A	F	F	F	34	36	34	46	57	61	53	55	57	55	A	A	A	57	53	55	63	63	61	A	52		
4		F	49	48	50	43	F	F	44	A	50	A	A	A	A	A	49	48	52	49	50	A	55	58	64	A	F	
5		F	F	F	F	F	F	38	46	49	50	A	A	A	A	A	A	50	46	45	A	A	J	S	71	68	59	44
6		40	38	37	38	36	44	48	A	A	51	R	A	A	A	A	A	46	43	A	52	56	A	A	A	A		
7		41	F	A	37	36	34	39	A	51	A	A	A	A	A	A	44	46	A	A	60	60	60	59	F	48		
8		F	40	39	39	39	43	48	54	53	52	49	50	50	54	53	51	51	A	57	74	72	65	55	F			
9		F	40	36	41	35	37	A	45	A	50	R	R	A	A	R	A	A	A	51	58	59	A	63	49			
10		39	37	F	36	34	32	39	A	A	48	A	R	R	A	A	A	R	44	A	49	53	60	59	57	F		
11		F	41	39	39	36	39	50	63	63	A	A	57	57	56	53	53	50	49	49	53	61	61	56	52			
12		44	43	40	41	40	48	64	63	72	64	53	58	54	55	57	58	A	54	60	72	70	67	62	58			
13		57	F	F	F	F	48	50	A	63	68	A	62	60	59	61	63	65	61	61	66	79	89	73	67	53		
14		43	38	37	34	F	36	43	50	50	61	50	R	52	53	A	58	A	60	60	52	58	F	59	F	F		
15		F	F	F	39	F	43	48	A	53	A	A	A	56	A	57	60	55	61	58	66	72	64	64	61			
16		54	49	43	38	40	41	46	48	52	49	53	54	52	54	54	51	54	55	A	59	60	60	57	54			
17		54	52	45	40	F	44	39	44	52	51	60	59	56	53	57	54	54	56	56	57	64	65	64	50	F		
18		52	45	38	42	40	40	50	62	55	56	54	53	60	62	56	56	57	57	57	A	63	68	57	44			
19		44	43	40	40	42	46	52	60	62	61	49	56	60	66	60	60	58	53	52	63	61	58	54	53			
20		50	51	50	41	H	36	41	A	60	67	62	A	56	59	A	59	56	61	A	57	68	65	F	60	F		
21		F	F	43	39	40	44	60	69	69	H	64	56	57	61	61	64	64	61	A	59	63	63	64	54	52		
22		A	A	F	42	A	44	59	78	81	66	58	A	62	60	A	A	A	59	61	A	64	F	F	A			
23		F	F	F	45	35	36	42	57	64	60	59	51	58	58	57	59	61	59	54	56	67	70	71	A	F		
24		44	43	41	F	41	44	42	52	A	62	60	52	53	60	59	58	53	52	J	A	46	59	60	61	F	54	
25		F	F	47	34	30	37	48	51	A	62	62	54	56	58	53	55	53	53	47	52	63	59	59	60			
26		48	23	22	F	F	20	28	34	H	35	G	G	G	G	A	G	43	44	48	45	46	F	F	37	36	33	35
27		29	F	F	31	F	31	46	56	64	56	56	57	58	59	55	51	50	51	59	70	73	67	51	46			
28		41	39	F	F	F	31	35	51	50	49	53	56	57	62	62	59	50	52	51	54	60	63	61	53	54		
29		F	35	F	F	F	33	36	43	59	57	59	53	49	58	54	51	52	A	53	A	67	63	59	F	F		
30		F	F	F	F	F	39	43	54	63	64	A	A	57	52	53	54	52	56	53	A	66	61	A	55	36		
31		34	34	34	33	31	36	36	43	53	51	A	57	51	A	55	52	56	54	55	58	A	57	56	45			
CNT		22	22	25	29	27	31	26	27	26	22	19	23	24	21	24	25	27	25	23	28	30	26	24	21			
MED		46	41	39	39	36	41	48	57	56	58	55	56	56	57	56	53	54	53	56	63	63	61	57	52			
UQ		51	45	43	41	40	44	52	63	64	62	58	57	59	60	59	58	58	56	58	68	69	67	60	53			
LQ		41	38	37	34	34	37	46	50	51	51	52	54	53	54	53	51	50	51	52	52	60	59	56	45			

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FOF2 (0.1 MHz)

IONOSPHERIC DATA

AUG. 1987

FOF1 (0.01 MHz)

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

Station	WAKKANAI																							
	Lat. 45 23.5 N												Long. 141 41.2 E											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						L	A	A	A		430	440	430	430	A	A	400	380	A					
2						L	A	A	A		430	430	430	430	430	420	A	390	A					
3						L	390	420	A	A	A	H	A	A	A	A	A	A						
4						A	A	A	A	A	A	A	A	420	420	410	400	H	A	A				
5							390	410	A	A	A	A	A	A	A	A	400	L	A	A	A			
6							A	A	A		420	A	A	A	A	A	U	A	L	A				
7						A	A	A	A	A	A	A	A	A	A	400	380	A	A					
8						L	L	390	420	A	440	440	430	430	H	H	400	A						
9						300	A	390	A	A	420	410	A	A	410	A	A	A						
10						A	A	U	A	A	420	420	A	A	A	420	H	U	A					
11						L	370	400	A	A	A	430	440	A	430	420	L	L						
12						360	U	A	A	440	430	440	440	440	440	420	A	L	L					
13								420	A	430	A	L	A	A	430	A	420	L	L					
14						A	A	A	A	440	430	A	A	A	A	A	A	350						
15						A	A	A	A	A	A	A	460	A	430	A	400	A						
16						270	350	400	A	430	430	440	430	420	440	430	410	L	L					
17						L	A	420	420	430	430	430	430	440	440	L	H	L						
18						360	370	430	430	430	450	430	430	480	420	400	380							
19						L	400	420	A	440	430	430	440	440	H	A	A	A						
20						A	A	A	A	A	430	A	A	A	A	420	A	A	A					
21						L	L	430	440	440	460	A	450	450	A	A	A	A						
22						L	A	A	440	430	A	A	A	A	A	A	A	A						
23						L	A	A	A	A	440	450	440	A	A	410	A							
24						U	A	A	420	430	430	430	450	A	A	A	A	A						
25						L	A	A	A	A	430	440	430	A	A	L								
26							L	L	400	410	410	A	400	400	330	A	340							
27						L	390	390	450	440	430	450	440	A	L	L								
28						330	L	A	430	440	A	430	440	430	440	L	L							
29						350	390	410	420	430	L	A	430	420	A	A	A							
30						A	A	A	A	A	A	A	A	A	430	A	A	A						
31						A	A	A	A	A	430	A	A	A	A	A	390	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	14	15	12	11	20	20	17	17	17	14	17	10	3						
MED					290	360	390	420	430	430	430	430	430	430	420	400	370	320						
UQ					320	360	400	420	440	440	440	450	440	440	420	400	380	325						
LQ					275	350	390	410	420	430	430	430	430	430	410	400	350	310						

AUG. 1987

FOF1 (0.01 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987 F0E (0.01 MHz)

135° E Mean Time (G.M.T. + 9h)

Station	WAKKANAI				Lat.	45° 23.5' N						Long.	141° 41.2' E						Sweep 1 MHz to 25 MHz in 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	220	275	295	305	A	305	A	A	A	A	A	A	190	S								
2					S	S	230	270	295	310	325	330	A	325	320	305	A	A	200	A								
3					S	190	230	270	290	300	305	A	A	A	A	A	A	A	A	S								
4					S	A	220	260	285	305	310	310	A	A	310	295	285	240	A	S								
5					S	S	220	260	295	305	310	320	A	A	A	A	A	240	130	S								
6					S	165	220	265	275	300	310	315	A	A	A	A	A	235	160	S								
7					S	S	215	255	275	300	A	A	A	A	A	300	275	245	S	S								
8					S	160	210	250	280	300	A	A	A	A	310	300	285	A	A	S								
9					S	S	210	250	275	295	300	A	A	A	A	310	290	240	180	S								
10					S	155	210	250	280	295	315	325	A	A	A	A	275	240	135	S								
11						160	225	275	295	310	U A	320	A	A	A	A	A	A	A	175								
12					S	225	280	300	305	A	A	A	A	A	325	315	275	240	180									
13					S	225	265	290	300	A	A	A	A	A	320	A	A	H	180									
14						160	220	260	290	300	310	A	A	A	A	310	285	245	180									
15					U A	160	220	260	280	300	305	A	340	A	A	310	230	240	175									
16					S	210	245	280	A	A	330	330	A	320	305	295	245	165										
17					S	225	270	290	300	310	B	A	A	A	A	A	A	225	S									
18					S	225	250	270	285	295	310	310	A	A	300	A	240	175										
19					S	215	245	270	A	A	345	345	340	325	300	230	230	S										
20					S	210	250	275	290	A	A	A	A	A	A	315	270	230	150									
21						125	210	245	280	A	A	B	B	A	320	310	285	225	S									
22					S	205	255	280	300	A	A	310	305	A	A	A	205	S										
23					S	205	A	A	A	A	A	355	350	335	315	280	225	A										
24					S	205	250	280	305	A	345	345	340	315	305	270	215	A										
25					S	205	250	285	300	310	320	320	320	A	A	A	205	S										
26						K	K	K	S	200	240	260	300	310	A	A	A	300	290	250	205							
27					S	205	245	280	300	A	330	330	325	310	300	255	210	S										
28					S	200	250	275	A	A	A	320	315	A	275	250	A	S										
29					S	210	240	260	270	300	A	A	A	A	300	260	210	S										
30					S	205	245	275	295	300	U A	A	A	A	A	A	A	A	S									
31					S	195	235	275	295	A	A	A	A	A	A	A	A	A	S									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT			1	1	1	8	31	30	30	26	16	12	10	8	12	19	18	23	14									
MED			K	K	K	160	160	210	250	280	300	310	322	330	325	320	305	278	235	180								
UQ						162	220	265	290	305	310	330	345	340	322	310	235	240	130									
LQ						158	205	245	275	295	302	312	320	318	310	300	270	220	175									

AUG. 1987 F0E (0.01 MHz)

IONOSPHERIC DATA

AUG. 1987

FOES (0.1 MHz)

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

Station	WAKKANAI				Lat.	45 23' 5" N				Long.	141 41' 2" E				Sweep	1 MHz to	25 MHz in	2 sec in	automatic operation						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	J A 54	37	36	35	E S 35	17	J A 35	J A 49	J A 50	54	43	40	41	36	55	54	J A 35	29	40	42	J A 51	J A 49	36	22	
2	J A 29	28	28	E S 15	30	37	33	J A 50	J A 60	J A 50	40	38	39	G	G	J A 53	J A 50	31	J A 59	J A 50	J A 64	J A 58	45	J A 83	
3	J A 80	36	36	28	32	29	J A 32	J A 37	39	J A 65	J A 55	60	J A 57	J A 77	J A 87	J A 69	J A 50	48	33	J A 50	43	J A 60	J A 33	J A 66	
4	42	36	31	E S 16	22	38	83	54	64	83	80	141	100	57	45	37	J A 43	70	83	31	J A 50	J A 73	83	J A 50	
5	32	32	23	31	25	23	29	J A 35	J A 49	J A 76	J A 98	76	167	124	165	J A 68	J A 34	44	J A 65	J A 95	J A 69	J A 56	32	25	
6	31	27	26	22	20	27	52	J A 55	J A 49	52	41	68	63	96	83	68	J A 81	163	92	75	J A 69	136	136	J A 96	
7	J A 92	J A 57	J A 51	J A 45	30	23	39	J A 67	J A 59	74	J A 78	90	J A 168	J A 83	J A 80	35	36	J A 100	J A 97	J A 63	J A 59	J A 53	63	J A 51	
8	J A 53	31	27	31	E S 16	24	31	J A 38	40	J A 59	36	35	38	37	G	G	37	56	43	37	36	39	36	J A 36	
9	24	J A 40	J A 36	J A 33	J A 33	25	56	J A 80	J A 76	45	39	33	52	J A 58	42	J A 56	J A 106	77	51	44	J A 50	J A 81	J A 56	J A 25	
10	J A 22	J A 25	J A 28	J A 28	E S 13	29	J A 77	J A 52	J A 49	54	J A 92	41	J A 74	J A 53	J A 53	J A 63	J A 46	54	31	31	E S 16	37	40	J A 60	
11	34	43	42	27	26	21	28	37	J A 53	J A 60	65	42	41	53	36	35	37	34	J A 49	J A 37	J A 26	J A 53	J A 60	J A 31	
12	J A 29	24	26	20	E S 16	25	31	42	J A 48	J A 41	39	37	37	41	36	40	J A 51	J A 35	J A 28	32	E S 16	E S 15	27	33	
13	24	22	27	31	E S 15	J A 37	J A 59	J A 60	35	J A 139	42	61	39	J A 57	G	J A 49	44	30	G	J A 61	J A 31	J A 28	J A 57	27	
14	J A 28	24	J A 35	J A 25	E S 16	27	J A 39	J A 50	52	54	36	36	45	J A 67	56	57	J A 58	29	35	51	J A 55	J A 35	71	25	
15	63	36	33	J A 33	37	25	J A 43	52	J A 45	J A 97	J A 71	J A 75	J A 53	J A 70	J A 45	J A 45	34	J A 57	J A 114	J A 32	J A 35	J A 28	E S 16	21	
16	E S 16	26	24	E S 16	E S 16	20	31	J A 36	J A 46	J A 43	48	G	G	G	G	G	G	G	G	56	18	24	23	E S 16	
17	24	E S 16	23	26	J A 24	E S 18	30	53	35	35	35	35	36	37	39	41	36	27	36	48	35	J A 24	32	36	
18	31	33	29	J A 28	35	42	32	J A 36	33	37	35	35	41	37	32	G	J A 35	J A 36	J A 40	70	58	35	J A 29	22	
19	E S 16	E S 16	E S 15	22	E S 16	E S 17	32	34	57	J A 66	J A 48	G	G	G	37	45	56	J A 43	28	J A 23	J A 39	J A 33	J A 50	J A 56	
20	J A 48	J A 31	J A 49	J A 32	J A 42	J A 39	J A 53	J A 74	J A 51	J A 49	53	35	51	J A 71	J A 50	36	J A 55	J A 71	84	J A 56	J A 65	J A 46	J A 81	J A 60	
21	J A 50	J A 48	37	35	E S 15	33	36	43	45	42	42	39	52	41	G	J A 64	J A 83	73	45	59	J A 73	61	60	J A 84	
22	J A 73	J A 59	J A 56	J A 44	J A 48	E S 16	J A 55	J A 57	J A 45	44	41	J A 69	J A 59	J A 61	J A 87	69	J A 76	J A 41	26	71	86	35	61	J A 83	
23	J A 24	J A 28	J A 35	J A 52	J A 62	42	J A 36	J A 50	J A 49	87	47	41	42	43	53	49	35	45	43	28	J A 46	J A 29	J A 35	J A 48	
24	J A 33	J A 26	J A 29	J A 44	J A 28	27	30	J A 46	J A 56	43	34	G	G	J A 43	J A 61	70	J A 77	119	51	71	J A 60	J A 33	J A 72	J A 43	
25	36	36	23	25	J A 58	42	29	39	58	J A 61	J A 45	G	G	G	J A 61	J A 45	J A 56	28	27	J A 20	22	E S 16	E S 16	23	
26	E S 15	E S 16	25	28	22	22	26	29	30	G	G	34	52	35	G	J A 34	J A 56	31	J A 27	J A 27	J A 27	26	J A 28	E S 15	
27	23	J A 24	27	E S 16	29	33	31	G	33	35	34	G	G	G	32	50	G	30	33	J A 28	J A 31	J A 24	24	J A 28	J A 27
28	J A 23	J A 28	26	E S 15	J A 28	J A 31	31	33	53	33	40	52	G	G	34	G	G	J A 20	56	20	20	40	43	J A 51	J A 65
29	32	J A 51	32	33	32	32	31	30	35	40	37	40	J A 50	43	J A 43	J A 54	175	J A 50	J A 69	27	144	72	J A 45	J A 65	
30	33	35	J A 50	J A 31	J A 30	25	46	56	53	J A 67	65	61	J A 50	J A 50	45	50	50	J A 52	56	35	36	64	50	J A 32	
31	J A 34	J A 22	24	20	E S 15	E S 17	41	43	51	J A 52	J A 88	52	52	J A 63	J A 55	J A 59	J A 33	J A 36	J A 74	J A 94	J A 60	J A 42	J A 31	21	
00	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	32	31	29	28	25	27	33	46	49	52	42	40	45	43	45	49	J A 46	J A 44	J A 43	J A 42	J A 46	J A 39	J A 50	J A 36	
UQ	J A 45	36	36	J A 33	32	33	J A 42	J A 54	J A 53	66	60	60	J A 52	J A 62	J A 56	58	J A 57	J A 56	J A 62	J A 60	J A 60	J A 57	J A 62	J A 60	
LQ	24	24	26	22	E S 16	22	31	36	42	42	38	35	38	37	35	36	35	32	30	31	33	28	32	25	

AUG. 1987

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987

FBES (0.1 MHZ)

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

Station	WAKKANAI				Lat. 45 23.5 N	Long. 141 41.2 E	Sweep 1	MHz to 25	MHz in 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 54	20	E S 17	17	20	E S 17	34	47	49	A A 54	40	39	37	35	47	45	29	29	33	36	23	22	E S 17	E S 16		
2	18	18	E S 15	15	E S 16	26	30	46	49	49	38	38	39	G	G	40	45	29	A A 59	48	46	34	36	A A 83		
3	A A 80	25	E S 16	16	17	G	29	34	38	48	47	47	39	A A 77	A A 87	A A 69	46	42	25	23	24	34	A A 23	41		
4	37	23	E S 16	16	E S 16	33	A A 83	46	A A 64	A A 83	A A 80	A A 141	A A 100	35	38	36	G	47	A A 83	20	21	50	A A 83	25		
5	E S 17	E S 14	E S 15	15	E S 17	20	27	35	40	A A 76	A A 98	A A 76	A A 167	A A 124	A A 165	44	32	36	A A 65	A A 95	52	24	E S 17	E S 15		
6	E S 17	E S 16	E S 16	16	E S 16	27	46	A A 55	A A 49	A A 45	38	68	A A 63	A A 96	A A 83	68	40	36	A A 92	41	E S 16	A A 136	A A 136	A A 96		
7	22	35	A A 51	24	E S 12	21	38	A A 67	45	74	78	90	168	88	80	35	33	A A 100	A A 97	27	49	41	27	30		
8	38	E S 16	E S 15	18	E S 16	G	31	38	39	45	36	35	38	37	G	G	G	A A 26	A A 56	38	22	30	30	17	24	
9	E S 17	20	27	18	19	20	A A 56	36	A A 76	44	38	37	A A 52	A A 58	39	56	A A 106	77	50	37	50	A A 81	21	20		
10	E S 16	E S 16	E S 16	19	E S 13	29	A A 77	A A 52	41	A A 54	39	41	A A 74	A A 58	A A 53	34	40	A A 54	28	27	E S 16	E S 15	19	45		
11	E S 16	32	32	18	E S 17	G	G	37	51	A A 60	A A 65	41	40	47	34	35	30	26	23	34	24	19	25	22		
12	25	E S 17	E S 17	16	E S 16	19	30	40	45	41	39	37	37	41	36	38	A A 61	33	28	24	E S 16	E S 15	18	24		
13	E S 15	E S 15	E S 15	15	E S 15	36	A A 59	54	33	A A 139	41	50	39	53	G	46	39	G	G	61	29	25	41	22		
14	E S 16	E S 17	E S 15	18	E S 16	25	39	49	48	46	36	36	45	A A 67	54	A A 57	41	25	34	51	50	25	47	E S 16		
15	19	20	19	20	22	22	A A 43	52	45	A A 97	A A 71	A A 75	42	A A 70	40	45	33	38	30	31	30	19	E S 16	E S 16		
16	E S 16	E S 16	E S 16	16	E S 16	19	30	35	44	40	36	G	G	40	G	G	G	G	A A 56	18	E S 16	E S 16	E S 16	E S 16		
17	E S 16	E S 16	E S 16	16	E S 16	18	30	46	34	35	35	35	36	37	30	34	32	27	28	40	27	20	19	19		
18	21	24	22	16	21	31	29	32	32	37	35	35	41	37	32	G	35	31	39	A A 70	31	25	28	E S 16		
19	E S 16	E S 16	E S 15	15	E S 16	E S 17	28	34	33	56	41	G	G	G	37	43	49	40	27	17	26	24	43	30		
20	30	33	41	E S 16	25	31	A A 58	59	46	45	A A 53	35	48	A A 71	46	35	50	A A 71	54	47	40	45	26	18		
21	35	30	18	19	E S 15	22	33	37	39	41	39	39	50	41	G	61	49	A A 78	41	22	24	43	46	50		
22	A A 75	A A 59	35	31	A A 48	E S 16	33	52	45	38	41	A A 69	56	56	A A 87	A A 68	A A 76	41	24	A A 71	20	33	30	A A 83		
23	21	E S 16	18	18	32	38	33	47	45	56	47	41	41	39	46	44	35	38	41	20	35	26	A A 35	31		
24	28	E S 16	22	23	25	24	G	39	A A 56	40	32	G	G	42	51	45	45	50	51	40	34	25	33	E S 17		
25	23	28	18	E S 16	20	25	G	39	A A 58	45	45	G	G	G	46	40	30	G	20	26	18	E S 15	E S 16	E S 16		
26	E S 15	E S 16	G	G	G	19	25	G	30	G	G	33	A A 52	34	G	G	46	G	20	18	18	E S 16	E S 16	E S 15		
27	E S 15	E S 16	E S 16	16	E S 17	24	27	G	G	35	G	G	G	32	45	G	G	29	23	31	16	E S 15	21	24		
28	E S 16	19	E S 16	15	24	28	30	31	46	30	40	45	G	G	29	31	23	G	20	29	18	16	30	33	20	20
29	20	16	15	E S 17	E S 16	18	G	G	35	36	35	35	50	40	38	44	A A 175	48	A A 69	18	32	28	45	18		
30	E S 17	17	20	28	20	20	46	54	53	A A 67	A A 65	54	48	43	36	45	45	50	A A 56	33	19	A A 64	41	25		
31	26	20	E S 16	16	E S 15	E S 17	34	35	49	47	A A 88	40	45	A A 63	42	45	31	26	46	32	A A 60	28	22	E S 16		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
MED	19	17	E S 16	E S 16	E S 16	21	31	39	45	45	40	39	41	41	39	43	39	38	38	31	27	25	26	22		
UQ	27	24	20	18	20	26	41	50	49	A A 56	50	48	51	A A 60	49	45	46	49	55	40	34	34	42	30		
LQ	E S 16	E S 16	E S 16	E S 16	E S 16	18	28	35	38	40	36	35	37	36	32	34	30	28	26	21	20	20	18	E S 16		

AUG. 1987

FBES (0.1 MHZ)

IONOSPHERIC DATA

AUG. 1987

FMIN (0.1 MHz)

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

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

AUG. 1987

FMIN (0.1 MHz)

IONOSPHERIC DATA

AUG. 1987 M(3000)F2 (0.01)

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

Station	WAKKANAI																							Lat.	45 23.5 N		Long.	141 41.2 E		Sweep	1 MHz to 25 MHz		in 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	285	295	285	310	300	325	335	310	A	315	280	290	270	260	270	305	310	330	305	290	305	300	F												
2		295	290	290	300	295	295	300	325	A	330	320	315	285	325	295	330	280	325	A	295	285	295	A												
3	A	F	F	F	295	320	340	345	340	340	340	305	335	310	A	A	A	325	310	325	305	310	310	A												
4	F	290	275	295	285	F	F	280	A	A	A	A	A	A	305	295	270	290	A	A	310	295	300	F												
5	F	295	F	F	F	F	300	355	290	300	A	A	A	A	A	A	295	280	275	A	A	J S 290	315	325	295											
6	305	285	295	300	305	320	A	A	A	315	R	A	A	A	A	A	305	265	A	320	305	A	A	A												
7	285	F	A	290	F	300	A	A	335	A	A	A	A	A	A	A	285	280	A	A	315	310	310	F												
8	F	300	295	305	305	315	310	340	350	355	335	305	295	320	320	290	290	A	305	305	320	305	310	F												
9	F	275	290	280	285	305	A	310	A	305	R	R	A	A	R	A	A	A	A	310	310	A	305	325												
10	305	295	F	295	285	300	A	A	335	A	R	R	A	A	A	R	270	A	315	300	310	315	315	F												
11	F	330	300	305	305	280	305	340	345	A	A	320	330	335	300	315	300	305	300	310	305	310	320	315												
12	295	285	300	290	300	295	330	305	335	345	285	325	310	310	315	310	A	300	305	310	300	300	305	300												
13	300	F	F	F	F	295	320	A	315	320	310	285	295	300	305	315	320	310	285	290	315	300	305	340												
14	285	290	300	295	F	300	345	A	320	305	R	275	305	A	A	A	325	325	315	295	F	310	F	F												
15	F	F	F	295	F	300	A	A	325	A	A	A	335	A	300	305	305	320	310	285	300	305	300	310												
16	315	300	280	310	300	300	300	295	330	345	285	320	290	305	320	280	310	325	A	305	300	305	300	295												
17	315	310	310	290	F	310	315	325	290	325	340	330	320	320	315	305	320	305	315	300	305	305	295	F												
18	305	285	285	290	285	315	335	330	320	330	340	340	315	315	300	340	320	330	330	A	305	310	320	300												
19	295	290	285	300	295	345	330	340	340	355	325	315	305	320	320	320	325	320	315	315	310	305	295	285												
20	285	295	300	295	H	305	295	A	A	330	330	A	310	315	A	325	315	325	A	A	300	305	F	F												
21	F	F	285	300	280	270	315	320	350	305	335	320	320	315	305	A	325	A	320	305	310	335	315	A												
22	A	A	F	285	A	295	320	305	345	335	315	H	A	325	A	A	A	A	320	325	A	300	F	F	A											
23	F	F	F	310	A	A	335	330	330	A	A	A	325	320	320	305	325	320	335	320	295	305	325	A	F											
24	295	285	290	285	F	290	315	335	345	A	335	335	300	300	305	320	330	345	A	A	295	310	305	F	F											
25	F	F	300	330	315	265	305	300	310	A	315	340	335	305	335	325	335	325	325	295	285	280	285	305	275											
26	310	250	240	260	F	F	F	H	335	G	G	G	G	A	G	230	250	A	295	280	F	F	275	270	300											
27	305	F	F	275	F	260	265	280	305	330	290	315	320	325	305	345	295	300	305	305	285	300	315	295	285											
28	280	290	280	270	F	F	A	350	355	A	330	310	315	310	315	335	305	325	320	305	300	305	315	320												
29	F	305	295	285	F	F	285	295	285	330	335	330	340	290	325	330	335	310	A	315	A	310	310	F	F											
30	F	280	290	290	F	F	295	300	335	340	360	A	A	A	A	330	330	315	325	A	A	295	315	A	335	315										
31	300	295	295	305	295	325	A	325	A	330	A	340	290	A	335	325	335	335	325	295	A	300	305	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	22	22	25	29	26	30	22	24	23	21	18	22	23	20	23	24	26	22	20	28	30	26	24	20												
MED	295	290	295	295	295	300	322	328	330	330	318	318	310	315	315	310	320	318	315	300	305	305	305	300												
UQ	305	295	300	300	305	315	335	340	340	335	335	325	320	322	325	322	325	325	322	310	310	310	315	315												
LQ	285	285	285	285	285	295	305	310	320	315	310	300	298	305	300	292	300	305	305	295	300	300	298	292												

AUG. 1987 M(3000)F2 (0.01)

IONOSPHERIC DATA

AUG. 1987

M(3000)F1 (0.01)

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

Station	WAKKANAI				Lat.	45 23.5 N				Long.	141 41.2 E				Sweep	1 MHz to 25 MHz		in 2 sec in		automatic operation				
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	A	A	A	420	385	370	365	A	A	355	335	A					
2						L	340	A	A	A	385	430	A	405	370	A	A	340	A					
3						L	335	335	A	A	A	A	H	390	A	A	A	A	A	340				
4							A	A	A	A	A	A	A	400	405	370	350	H	A	A				
5								A	A	A	A	A	A	A	A	A	L	355	A	A	A			
6								A	A	A	430	A	A	A	A	A	A	L	A					
7							A	A	A	A	A	A	A	A	A	360	A	A	A					
8						L	365	A	A	A	A	395	410	405	370	375	355	H	A	A				
9						315	A	A	A	A	405	440	A	A	A	A	A	A	A					
10							A	A	A	A	A	A	A	A	A	A	H	340	A	A	A			
11						L	310	335	A	A	A	A	A	A	A	370	355	340	L	335				
12							355	A	A	A	425	410	395	A	365	A	A	A	A					
13									370	A	A	A	L	360	A	380	A	A	L	330	L			
14							A	A	A	A	395	415	A	A	A	A	A	A	340					
15							A	A	A	A	A	A	A	A	A	A	350	A						
16						325	A	A	A	A	400	390	400	A	385	350	325	360	L					
17						L	345	A	L	380	390	405	420	390	390	375	335	H	305	L				
18							335	380	355	405	425	435	A	370	335	350	355	355						
19						L	365	360	370	A	A	425	400	385	370	H	A	A	A					
20							A	A	A	A	A	420	A	A	A	A	355	A	A	A				
21							A	A	A	A	410	370	A	A	355	A	A	A						
22							L	A	A	390	A	A	A	A	A	A	A	A	A					
23							A	A	A	A	A	A	A	A	385	A	A	A						
24								A	A	A	355	420	400	A	A	A	A	A	A					
25							L	A	A	A	A	360	385	370	A	A	L							
26							L	L	L	390	375	390	390	A	370	350	340	A	330					
27							L	L	L	360	385	360	385	395	350	365	A	L	370					
28							A	L	A	390	365	A	A	380	360	370	335	L	380					
29							330	340	365	380	380	L	A	A	A	A	A	A	A					
30							A	A	A	A	A	A	A	A	350	A	A	A						
31							A	A	A	A	A	A	A	A	A	A	335	340	L					
CNT						4	9	7	7	7	15	16	12	12	14	12	12	9	1					
MED						320	335	360	370	380	400	412	390	370	370	352	350	340	340					
UQ						345	345	370	382	390	415	422	400	388	375	358	355	340						
LQ						312	335	350	363	370	388	390	375	363	355	340	338	335						

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M(3000)F1 (0.01)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987

H^oF₂ (KM)

135° E Mean Time (G.M.T. + 9h)

Station	WAKKANAI				Lat.	45° 23' 5" N						Long.	141° 41' 2" E						Sweep 1 MHz to 25 MHz in 24sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
1							275	290	345	A	A	360	380	395	455	450	405	300	325	275										
2							325	280	A	A	290	320	360	410	335	375	335	390	300	A										
3							295	295	270	300	355	305	360		A	A	A	310	325	285										
4							A	A	A	A	A	A	A	375	390	455	370	A	A											
5							370	360	A	A	A	A	A	A	A	370	360	375	A	A	A									
6							A	A	A	R	A	A	A	A	A	A	355	430	L	A										
7							A	A	320	A	A	A	A	A	A	460	400	A	A											
8						285	275	290	265	285	325	370	390	350	340	390	375	A												
9						370	A	350	A	350	R	R	A	A	R	A	A	A												
10							A	A	305	A	R	R	A	A	A	R	460	A	285											
11						400	320	255	270	A	A	340	320	320	380	345	325	305												
12							250	300	250	265	400	310	375	360	350	335	A	315	300											
13									275	A	300	360	350	355	325	300	300	300	295											
14							295	A	300	355	R	445	375	A	A	A	300	280												
15							A	A	325	A	A	A	300	A	355	340	300	280												
16						320	345	350	325	305	400	350	395	360	340	415	340	295												
17							330	330	375	300	270	320	345	330	360	350	305	290												
18							280	280	325	325	300	325	350	310	400	290	300	280												
19							275	255	260	A	305	350	355	305	305	305	300	A	275											
20							A	A	265	280	A	350	330	A	300	325	290	A	A	A										
21							280	265	250	285	290	345	320	325	325	A	290	A	A											
22							290	280	235	255	305	A	A	A	A	A	A	A	275											
23							250	270	280	A	A	310	345	320	325	300	300	285												
24							310	A	285	295	350	370	315	310	300	290	A													
25							285	340	A	305	260	305	350	300	315	305	290													
26							275	G	G	G	G	A	G	600	450	H	A	350												
27							355	315	275	405	360	325	315	340	300	300	H	305												
28							260	245	A	285	350	335	325	305	275	340	270													
29							380	280	280	290	305	400	L	320	315	315	325	A	A	A										
30							A	A	A	A	A	A	A	305	330	340	300	A	A											
31							A	295	A	A	A	295	380	A	305	305	235	285												
	00	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	19	22	23	20	18	22	22	20	23	24	26	13	5											
MED						345	290	290	280	300	312	348	350	328	330	338	300	298	285											
UQ						385	322	315	325	338	360	360	375	358	368	380	355	325	295											
LQ						302	275	275	265	285	300	320	325	312	312	305	300	280	285											

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H^oF₂ (KM)

IONOSPHERIC DATA

AUG. 1987

H^oF (KM)

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

Station	WAKKANAI				Lat.	45 23.5 N				Long.	141 41.2 E				Sweep	1 MHz to 25 MHz in 2 sec in		automatic operation									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	A	300	275	305	280	230	A	A	A	A	200	215	205	200	A	A	215	230	A	A	300	255	260	250			
2	260	270	260	245	280	270	230	A	A	A	215	190	A	200	210	A	A	H	A	A	320	290	250	A			
3	A	260	225	270	250	245	240	245	A	A	A	A	A	A	A	A	A	A	245	260	270	280	A	A			
4	A	340	300	280	270	280	A	A	A	A	A	A	A	A	210	210	220	A	A	A	250	255	A	A	300		
5	255	270	235	205	230	250	240	H	A	A	A	A	A	A	A	A	240	A	A	A	A	230	240	235			
6	240	270	260	255	270	265	A	A	A	A	200	A	A	A	A	A	A	A	A	A	A	280	A	A	A		
7	305	A	A	A	300	240	A	A	A	A	A	A	A	A	A	220	A	A	A	A	260	A	A	245	245		
8	A	270	270	250	255	250	A	A	A	A	200	200	225	230	200	225	A	A	A	300	255	250	250	235	280		
9	265	305	325	325	295	265	A	A	A	A	215	200	A	A	A	A	A	A	A	A	A	A	A	265	230		
10	250	280	245	310	275	A	A	A	A	A	A	A	A	A	A	235	A	A	A	A	265	250	255	250	A		
11	250	A	A	265	275	250	225	A	A	A	A	A	A	A	205	225	220	235	250	275	260	255	255	250			
12	255	285	255	250	295	250	240	A	A	A	A	205	200	210	A	225	A	A	A	A	255	245	240	240	260		
13	265	270	295	275	260	280	A	A	A	210	A	A	A	230	A	225	A	A	250	250	A	250	260	260	215		
14	275	285	290	315	280	255	A	A	A	A	195	200	A	A	A	A	A	A	240	295	A	A	265	A	265		
15	280	260	290	300	285	250	H	A	A	A	A	A	A	A	A	A	240	A	230	290	280	255	250	250			
16	240	270	250	250	250	255	A	A	A	A	205	200	200	A	205	210	225	240	A	255	250	260	260	265			
17	250	260	240	280	295	250	250	A	A	215	205	200	195	205	200	215	225	215	240	260	300	265	260	270	290		
18	250	300	330	285	300	300	270	205	220	200	195	190	A	225	215	220	235	250	260	A	265	245	245	245			
19	260	260	285	280	260	240	215	225	205	A	A	200	205	215	230	A	A	A	260	235	275	275	A	300			
20	330	310	A	A	225	325	305	A	A	A	A	A	200	A	A	A	230	A	A	A	A	290	280	325	255	255	
21	A	A	320	290	275	275	260	A	A	A	A	205	230	A	A	210	A	A	A	A	250	255	260	A	A		
22	A	A	A	A	330	A	250	A	A	A	200	A	A	A	A	A	A	A	A	255	A	250	290	255	A		
23	290	275	255	275	A	A	A	A	A	A	A	A	A	A	A	215	A	A	250	A	255	285	240	A	A		
24	310	300	300	310	300	285	235	A	A	A	210	200	200	A	A	A	A	A	A	A	310	300	275	300	300		
25	275	275	230	250	350	330	240	A	A	A	A	H	200	205	205	A	A	230	235	260	300	290	290	250	275		
26	255	E S	360	395	385	415	350	265	245	225	210	220	220	A	230	225	245	A	260	285	295	330	315	305	290		
27	290	280	260	290	E A	A	A	A	265	225	205	230	210	200	220	H	230	A	225	235	265	290	285	250	240	255	300
28	295	295	300	305	A	A	A	A	A	A	215	A	A	225	210	215	210	220	260	260	250	275	280	265	250		
29	245	270	320	280	300	280	245	230	220	205	200	200	A	A	A	A	A	A	A	A	240	265	270	A	245		
30	260	265	305	A	280	275	A	A	A	A	A	A	A	A	A	245	A	A	A	A	275	235	A	A	A		
31	A	305	290	290	290	245	A	A	A	A	A	A	A	A	A	A	A	250	250	A	A	310	255	245			
CNT	25	28	27	30	29	28	13	7	7	7	15	17	12	12	14	12	13	13	14	24	26	27	23	24			
MED	260	276	280	280	280	258	240	225	215	205	205	200	208	212	215	225	230	250	260	270	265	260	255	258			
UQ	290	300	298	305	300	282	250	238	220	212	210	200	222	228	225	228	240	250	280	288	280	285	262	290			
LQ	250	270	255	255	275	250	235	225	208	202	200	200	205	202	210	220	220	240	255	255	250	255	250	245			

AUG. 1987

H^oF (KM)

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IONOSPHERIC DATA

AUG. 1937
H⁺E (KM)
135° E Mean Time (G.M.T. + 9h)

Station	WAKKANAI				Lat. 45° 23' 5" N				Long. 141° 41' 2" E				Sweep	1 MHz to 25 MHz		in 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					S	S	H					A	A	A	A	A				S				
2					S	S						A		105	105	105	110	A	A	A				
3					S	S					A			A	A	A	A	A	A	S				
4					S	A						A		A	115	110	115	120	A	S				
5					S	S								A	A	A	A			S				
6					S	S								A	A		A		S	S				
7					S	S						A	A	A	A				S	S				
8					S							A	A	A		110	105	130	A	A	A	S		
9					S	S						A	A	A		110	125	115	130	S				
10					S							A	A	A	A				S	S				
11					S							A	A	A	A	A	A							
12					S							A	A	A	A	A	A							
13					S							A		115	115	110		A	A	S				
14					S	H						A	A	A	A	120	115	115	125					
15					S									A	A					S				
16					S									A						S				
17					S									A	A					S				
18					S									A	A					S				
19					S									A						S				
20					S									A	A					S				
21					S									A	A					S				
22					S									A						S				
23					S									A						S				
24					S									A						S				
25					S									A						S				
26					S									A						S				
27					S									A						S				
28					S									A						S				
29					S									A						S				
30					S									A						S				
31					S									A						S				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT			1	1	1	7	31	31	30	30	24	20	15	11	13	23	21	24	12					
MED																								
UQ																								
LQ																								

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H⁺ES (KM)

135° E Mean Time (G.M.T. + 9h)

Station	WAKKANAI																							Lat.	45° 23' 5" N		Long.	141° 41' 2" E		Sweep 1 MHz to 25 MHz in 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	105	105	105	105	100	S	125	120	120	110	120	115	115	115	115	130	110	130	125	115	115	105	105	110																												
2	110	110	110	S	110	110	125	120	110	110	120	120	115	G	G	115	115	120	120	120	120	110	115	105																												
3	100	100	100	105	105	155	130	125	125	115	120	110	110	105	100	105	105	100	105	115	115	115	110	110																												
4	110	105	105	S	115	130	120	115	115	115	110	110	105	120	120	125	130	120	115	125	115	115	110	105																												
5	105	105	125	105	115	160	135	125	120	115	115	110	105	100	100	110	105	125	120	110	110	110	110	110																												
6	105	105	120	115	120	130	120	115	120	115	110	105	105	105	105	105	115	110	110	110	105	105	105	105																												
7	125	105	105	100	135	125	120	110	110	110	110	105	105	105	105	140	125	115	110	110	105	105	105	100																												
8	100	100	100	100	S	125	115	115	110	110	115	110	180	115	G	G	125	115	100	105	100	105	105	110																												
9	105	105	105	105	100	120	110	110	110	110	110	110	110	120	105	125	120	115	110	110	105	110	105	105																												
10	100	100	105	105	S	125	115	115	120	115	120	115	110	105	100	100	125	120	115	115	S	110	105	105																												
11	105	100	100	100	100	135	125	120	115	110	105	110	110	105	105	105	105	105	110	110	110	110	105	105																												
12	105	100	100	100	S	130	130	115	110	110	110	105	170	100	150	125	115	115	115	110	S	S	105	105																												
13	110	105	105	100	S	120	115	110	115	105	110	105	150	105	G	110	105	140	G	125	110	110	105	100																												
14	100	105	130	140	S	130	125	120	110	115	115	115	110	105	105	125	125	125	120	110	110	110	110	105																												
15	105	100	100	100	105	130	125	120	120	110	105	105	120	110	105	125	125	115	115	110	110	105	S	105																												
16	S	105	110	S	S	130	120	110	110	110	110	G	G	105	G	G	G	G	G	120	125	120	110	105	S																											
17	105	S	100	105	105	S	125	115	115	125	120	115	110	110	115	110	115	130	100	100	100	100	100	115																												
18	110	105	110	105	110	125	120	110	115	110	110	125	170	110	105	G	125	120	110	115	110	110	105	105																												
19	S	S	S	125	S	S	110	105	110	105	105	G	G	G	140	120	115	120	115	120	105	105	105	105																												
20	100	100	100	105	100	120	115	110	105	110	110	115	110	110	105	150	125	120	115	115	110	110	105	100																												
21	100	100	105	110	S	120	115	115	115	110	110	110	110	105	G	115	115	120	110	105	105	125	105	105																												
22	105	105	105	105	105	S	115	110	105	110	110	105	110	105	105	110	105	110	105	110	105	110	105	105																												
23	105	105	125	115	105	110	110	105	105	105	180	155	150	140	130	135	130	125	110	110	105	105	105	110																												
24	100	105	105	115	110	110	120	110	105	110	120	G	G	140	130	120	125	115	120	120	115	105	105	105																												
25	100	100	100	110	130	125	125	125	115	115	110	G	G	G	100	100	105	105	125	120	135	S	S	115																												
26	S	S	135	130	130	120	120	130	125	G	G	110	110	110	G	140	125	120	120	110	125	110	110	S																												
27	110	105	135	S	125	120	115	G	120	120	115	G	G	105	135	G	140	120	115	105	105	105	105	100																												
28	105	100	100	S	125	115	115	110	110	115	110	105	G	115	120	105	105	100	110	105	110	110	105	105																												
29	105	105	105	105	105	110	140	120	115	115	115	110	110	110	110	120	110	115	110	115	105	105	105	105																												
30	105	105	105	100	100	105	120	115	110	110	105	105	105	105	100	125	130	125	110	110	110	110	105	105																												
31	105	105	100	105	S	S	115	110	110	105	105	130	105	105	105	105	105	105	110	115	110	110	105	115																												
CNT	28	28	30	26	22	26	31	30	31	30	30	26	25	28	25	27	30	30	30	31	29	29	29	29																												
MED	105	105	105	105	108	125	120	115	115	110	110	110	110	105	105	120	115	120	112	110	110	110	105	105																												
UQ	105	105	110	110	120	130	125	120	118	115	115	115	115	112	120	125	125	120	120	115	115	110	105	110																												
LQ	100	100	100	100	105	120	115	110	110	110	110	105	110	105	105	108	105	115	110	110	105	105	105	105																												

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H⁺ES (KM)

IONOSPHERIC DATA

AUG. 1987

TYPES OF ES

135° E Mean Time (G.M.T. + 9h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F4	F3	F2	F3	L3		C2	C2	C2	C2	C1	C1	L1	L1	L2	CL22	L2	CL11	C3	L3	F2	F2	F4	F2
2	F3	F3	F2		L2	L2	C1	C2	C2	C2	C1	C1	L2			C2	C2	CL12	C4	L5	F4	F7	F7	F5
3	F4	F4	F2	F2	L2	H2	C2	C1	C1	C2	C1	L2	C2	L4	L3	L2	L2	L3	L2	L3	F7	F7	F3	F4
4	F5	F6	F3		L1	L4	C5	C2	C2	C3	C3	C3	L3	CL11	C1	C2	C1	C3	L2	C3	F2	F7	F7	F3
5	F4	F3	F1	F2	L1	H1	C2	C3	C2	C3	C3	C2	C7	L4	L6	L3	L3	C2	C5	L5	F4	F3	F3	F3
6	F3	F2	F2	F1	L1	C1	C3	C2	C2	C2	C1	C4	C3	L2	L2	C3	CL22	C4	C6	L4	F3	F5	F3	FF33
7	FF13	F3	F3	F3	L1	C3	C2	C6	C2	C4	L3	L2	L3	L3	L3	H1	C2	C6	L7	L3	F6	F6	F7	F3
8	F6	F2	F2	F2		C2	C5	C3	C2	C2	L1	L1	HL11	L1			CL22	CL34	L2	L2	F2	F5	F4	F7
9	F2	F2	F3	F3	L2	L3	C4	C2	C3	C2	C1	C1	L2	CL21	L2	C2	CL42	C6	C3	L5	F7	F6	F6	F5
10	F2	F2	F2	F2		C4	C6	C3	C3	C3	CH11	C2	L2	L2	L2	L2	C1	C3	C3	L6		F4	F3	F7
11	F2	F4	F4	F1	F1	C1	C2	C2	C2	C3	C2	C2	L2	L2	L2	L2	L3	L4	C2	F6	F3	F3	F3	F6
12	F5	F2	F2	F1		C1	C3	C2	C2	C2	C2	CH21	HL11	L2	HL12	CL22	CL42	C3	L3	F3			F2	F4
13	F2	F2	F2	F1		C4	C4	C3	C2	C5	L2	C2	HL12	C3		C2	L4	CL12		F4	F5	F6	F4	F3
14	F4	F2	F2	FF22		C2	C3	C3	C2	C2	C1	L1	L1	L2	L2	C1	C2	C1	C3	F7	F7	F5	F5	F2
15	F3	F2	F2	F2	F3	C2	C3	C2	C4	C6	C3	C3	C2	CL32	L2	CL22	C2	C4	C6	F3	F7	F3		F1
16		F2	F2			C2	C3	C3	C2	C2	C2			L2					C5	F2	F2	F2	F2	
17	F2		F4	F1	F2		C2	C2	C3	C2	C1	C1	L2	L1	C1	C3	CL12	C1	L3	F6	F5	F2	FF22	F2
18	F4	F6	F6	F2	F2	C6	C3	C4	C2	C2	C1	C1	HC11	L1	L2		CL22	C2	C7	F3	F5	F7	F5	F1
19				F1			C3	C3	C2	C3	L2				CL12	C2	C4	C3	C2	F2	F3	F7	F7	F5
20	F4	F5	F6	F2	F2	C3	C4	C4	C2	C2	C2	L1	C1	L2	L2	H1	C2	C7	C3	F7	F3	F7	F3	F7
21	F5	F4	F4	F3		C3	C4	C2	C2	C2	C2	C1	C2	L2		C2	C2	C2	L3	F3	F4	FF24	F7	F5
22	F7	F5	F5	F3	F5		C3	C3	C2	C2	C2	L2	C3	C2	C5	C3	C5	C6	L3	F6	F3	F7	F4	F7
23	F7	F2	FF12	F4	F4	L5	C4	C3	L3	L3	HL12	HL12	H1	H1	C2	C2	C3	C5	L6	F2	F4	F5	F5	FF14
24	F5	F2	F4	F4	F5	L2	C4	C3	C3	C2	C1			H2	C2	C2	C3	C4	L5	F4	F6	F6	F5	F2
25	F3	F4	F3	F1	F5	L3	C2	C1	C3	C2	C2				L2	L3	L2	L3	C5	F2	F1			F2
26			CK33	CK33	CK22	L5	C2	C2	C1			C1	C1	C2		C1	C4	C2	C4	F3	F6	F2	F3	F3
27	F2	F2	F1		F3	C4	C3		C1	C2	C2			L1	CL21		C1	C4	C2	F7	F3	F3	F6	F4
28	F2	F3	F2		F6	C5	C2	C2	C2	C1	C2	L2		L1	L1	L2	L1	L3	L2	F1	F7	F7	F4	F5
29	F5	F5	F4	F2	F2	L1	C1	C1	C2	C2	C1	C2	L2	C2	L2	C3	C2	C4	L3	F3	F3	F5	F6	F3
30	F5	F4	F2	F4	F2	F2	C4	C2	C2	C4	C4	C2	L2	L2	L2	CL22	CL23	CL42	CL51	F3	F3	F6	F6	F6
31	F6	F6	F2	F1			C4	C2	C2	C2	C3	CL12	L3	L3	L2	L2	L3	L2	CL33	FF23	F5	F5	F6	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																								

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TYPES OF ES

IONOSPHERIC DATA

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FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station	AKITA				Lat. 39 43 5 N	Long. 140 08 0 E	Sweep 1 MHz to 25 MHz in 24sec in automatic operation																						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	A	A	A	45	A															X	66	60	58	65	65				
2		59	59	57	52	46														X	71	X	72	72	79				
3		73	60	59	53	47														X	79	72	61	62	64				
4		60	62	58	52	47														X	62	X	63	62	63	63			
5		58	58	54	52	42														X	67	72	72	73	68				
6		59	50	53	48	49	50													X	62	X	61	X	54	50			
7		49	51	48	52	47														X	69	A	67	70	63				
8		60	55	53	52	52														X	86	X	81	X	55	X			
9	A	A		57	58	A														X	71	X	59	68	60	59			
10	A		59	57	55	52														X	65	X	59	64	62	60			
11	A		44	48	48	45														X	70	72	X	68	61	A			
12		58	52	52	52	49														X	86	X	82	X	70	X	64		
13	X	X	X	X	X	X														X	87	X	91	X	86	87	A		
14		55	49	49	52	49														X	66	X	69	68	62	62			
15		62	58	50	53	58	57													X	71	X	73	X	71	X	64		
16	X	X	X	X	X	X														X	68	X	62	X	64	52			
17	X	57	56	53	54	54														X	72	X	75	X	69	X	61		
18		64	C	53	53	52	50													X	73	X	76	73	65	62			
19		57	57	55	55	53	59													X	80	59	X	51	60	60			
20		61	59	60	53	47	50													X	79	76	74	75	73				
21		56	59	56	53	52														X	76	76	63	58	58				
22		58	A	55	55	55	56													X	76	X	78	X	64	59	64		
23		62	61	61	53	51	56													X	80	80	72	59	58				
24		58	C	50	48	52	52													X	64	69	69	68	68				
25		62	X	X	X	X														X	67	X	72	X	X	X	56		
26	X	X	X	X	X	X														X	55	64	63	52	59				
27		54	48	52	43	46	40													X	79	X	77	X	60	X	51		
28		56	55	X	X	48	48													X	76	X	75	X	58	60			
29		54	48	41	48	A	44													X	76	X	71	X	59	69	63		
30		58	52	51	53	51	50													X	70	X	70	X	52	62	A		
31		47	43	50	47	43														X	65	X	63	A	72	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	27	26	30	31	28	13	1													X	31	30	30	31	27				
MED	58	56	53	52	49	50	43													X	71	72	63	63	62				
UQ	60	59	57	53	52	56														X	78	76	72	70	64				
LQ	56	50	50	48	46	48														X	66	X	63	X	60	59			

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FXI (0.1 MHz)

IONOSPHERIC DATA

AUG. 1937

FOF2 (0.1 MHZ)

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

Station		AKITA											Lat. 39 43.5 N Long. 140 08.0 E											Sweep 1 MHz to 25 MHz in 24sec in automatic operation										
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
1		A	A	A	F	A	42	53	65	58	61	56	60	54	55	60	64	75	64	66	60		F	F	F	F								
2		F	F	F	F	F	41	54	60	A	60	55	56	55	56	A	54	56	56	60	65	66	F	F	F									
3		F	F	F	F	F	39	46	55	A	A	59	56	55	58	65	58	60	60	A	73	63	F	F	F									
4		F	F	F	F	F	39	51	66	59	47	A	50	52	52	47	47	A	47	49	56	57	F	F	F									
5		F	F	F	F	F	41	45	A	56	60	69	53	51	53	49	54	51	47	52	61	F	F	F	F									
6		F	F	F	F	F	37	42	44	A	A	50	49	A	A	E G 43	A	A	54	48	50	56	55	45	F	F								
7		F	F	F	F	F	37	32	40	50	54	52	50	50	47	46	49	46	47	50	53	63	A	59	F	F								
8		F	F	F	F	F	47	58	60	62	57	50	A	51	55	54	52	A	58	69	80	75	58	49	46									
9		A	A	F	F	A	36	A	58	A	A	A	A	A	53	50	48	A	A	A	65	53	59	F	F									
10		A	F	F	F	F	43	39	A	56	48	A	A	A	E G 44	49	50	51	52	54	58	59	53	56	F	F								
11		A	F	F	F	F	36	35	58	69	A	A	A	A	A	A	59	A	52	A	A	F	F	F	F	A								
12		F	F	F	F	F	40	44	57	73	62	A	A	56	A	54	60	56	A	A	70	80	76	71	64	58								
13		53	52	49	50	50	52	50	65	73	76	A	A	64	69	A	70	69	65	73	81	85	80	F	A									
14		F	F	F	F	F	40	51	50	61	57	A	56	59	61	59	60	66	66	A	60	63	58	F	F									
15		F	F	F	F	F	48	48	48	61	66	A	A	A	55	56	69	70	67	56	65	67	65	65	58									
16		51	50	47	44	44	46	54	48	50	56	55	60	A	55	57	57	61	64	58	62	56	56	F	F									
17		51	F	F	F	F	45	44	46	54	61	62	61	A	A	A	A	59	61	60	64	66	69	63	60	55								
18		F	C	F	F	F	50	61	72	59	56	51	57	65	A	62	62	62	65	67	70	F	F	F	F									
19		F	F	F	F	F	45	51	A	59	67	59	A	59	61	66	A	60	65	67	73	74	50	55	51	F								
20		F	F	F	F	F	48	A	80	69	A	59	A	65	61	62	61	62	A	F	F	F	F	F	61									
21		F	F	F	F	F	42	52	65	84	58	56	59	62	65	70	70	67	66	61	70	67	F	F	F	44								
22		F	A	F	F	F	60	80	76	66	56	A	61	C	C	65	63	65	66	70	72	58	F	F	F									
23		F	F	F	F	F	57	A	75	63	A	55	59	62	57	62	66	54	61	74	F	F	F	F	F									
24		F	C	F	F	F	41	59	67	49	61	57	61	59	62	63	58	53	50	58	60	F	F	F	F									
25		F	52	52	30	28	33	50	52	60	56	61	54	62	58	63	56	52	55	57	61	66	66	62	50									
26		46	40	38	31	23	28	36	43	43	44	46	E G 40	E G 42	E G 41	45	44	50	46	49	49	F	F	F	F									
27		44	40	F	F	F	33	53	72	53	55	53	58	59	56	63	56	51	A	58	73	71	60	54	45									
28		45	44	42	35	35	55	58	54	59	59	60	65	69	62	60	50	50	55	70	70	60	52	F	F									
29		F	F	F	F	A	35	48	66	57	55	54	54	A	A	A	A	56	60	60	70	65	53	F	F									
30		F	F	F	F	F	50	67	61	A	A	A	A	A	A	A	A	60	57	53	64	64	46	F	A									
31		F	F	F	F	F	35	34	41	44	A	A	A	56	65	A	56	58	60	56	59	57	A	F	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		12	10	10	9	14	24	28	27	25	24	18	21	21	25	22	27	27	27	25	31	25	20	9	9									
MED		48	41	42	42	38	40	50	59	61	58	56	56	59	56	53	58	60	58	58	65	65	59	54	55									
UQ		51	50	47	44	44	44	54	66	67	62	59	59	61	62	62	62	64	64	65	70	70	64	62	58									
LQ		46	40	38	35	35	35	46	53	56	55	53	54	52	53	50	54	52	54	53	60	57	56	51	46									

AUG. 1937

FOF2 (0.1 MHZ)

IONOSPHERIC DATA

AUG. 1987

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9h)

Station	AKITA				Lat.	39° 43' 5" N				Long.	140° 08' 0" E				Sweep 1 MHz to 25 MHz in 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	U A	450	450	450	A	420	U A	410	370				
2							L			A	U A	430	A	450	450	U A	A	A	410	390				
3							A	A	A	A	A	A	450	450	460		A	A	420	380				
4							A					A	430	U A	430	430	U A	A	L	370				
5							L	A					420	430	430	450	440	A	A	A	L	360		
6							340		A	A	A	410		A	A		A	A	A	380				
7							330	390	U A	410	420	430	440	U A	L	410	L	390	A	A				
8							A		U A	420	A	L	A	L	U A	U A	A	A	A					
9							A	A	A	A	A	A	A	U A	430	430	A	A	A					
10							A		400	410	A	A	A		A	A	410	390	A					
11							L	A	A	A	A	A	A	A	A	430	A	410	A					
12							L		360	410	A	A	A	A	A	440	A	420	A	A	L			
13							A	A	A	A	A	A	A	A	A	A	A	A	L	L	L			
14							A	A	A	A	A	A	A	A	A	480	A	A	A					
15								A	A	A	A	A	A	A	A	490	460	430	410	A	A			
16							340		A	410	A	A	460	A	A	450	450	410	A	A				
17								A	A	A	450	A	A	A	A	A	A	410	A	A				
18							L	370	390	A	A	A	460	U A	450	450	A	A	L	430	410			
19							A	L		430	450	A	450	460	A	A	A	A	A	A				
20							A	A	A	A	A	A	A	A	470	450	450	420	A					
21							A		410	420	450	470	460	460	460	450	A	A	L					
22							L		360	410	A	A	450	A	C	C	450	A	L	A				
23							L	A	A	A	A	A	L	A	450	L	430	L	A	A				
24								410	420	A	440	460	460	460	440	430	A	L						
25							L		400	410	A	A	460	460	460	430	430	L	L					
26							300	360	360	400	410	400	420	410	400	390	370	L						
27							L		380	A	430	L	450	A	440	460	L	L	A					
28							L	L	L	380	410	430	A	440	440	450	440	410	L	L				
29							330	A		410	430	L	440	A	A	A	A	L	L					
30							L		380	A	A	A	A	A	A	A	A	A	A					
31								L		A	A	A	A	A	A	A	400	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							9	15	13	12	9	16	16	18	15	13	14	7						
MED							340	390	410	430	440	450	450	450	440	430	410	380						
UQ							360	405	420	440	450	460	460	460	450	430	410	385						
LQ							330	380	410	430	430	440	440	440	430	410	400	370						

AUG. 1987

FOF1 (0.01 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9h)

Station	AKITA				Lat.	39° 43' 5" N							Long.	140° 08' 0" E							Sweep	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23															
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23											
1					S		220	A	A	A	A	A	A	A	A	A	A	A	A	A																																							
2					S		235	A	A	A	A	A	A	A	A	A	A	A	A	A	290	250	A																																				
3					S		210	255	295	A	A	A	A	A	A	A	A	A	A	A	290	245	A																																				
4					S	A	A	A	A	A	A	A	A	355	355	335	305	270	235	A																																							
5					S		215	260	A	A	A	A	A	A	A	A	A	A	A	A	285	255	A																																				
6					S		215	255	A	A	A	A	A	A	355	330	310	285	245	A																																							
7					S	A	A	A	A	A	A	A	A	A	350	320	305	275	230	A																																							
8					S		210	A	290	A	A	A	A	A	A	A	A	A	A	A	A	A	S																																				
9					S	A	A	A	A	A	A	A	A	A	A	340	305	290	A	S																																							
10					S	A	A	A	A	A	A	A	A	350	345	325	305	290	240	A																																							
11					S		215	A	A	315	330	A	A	A	A	A	A	A	A	A	A	A	S																																				
12					S		215	280	A	A	A	A	A	A	A	A	A	A	A	A	240	A																																					
13					S	A	A	A	300	A	320	A	A	A	A	A	A	A	A	A	240	A																																					
14					S		210	255	285	A	A	A	A	A	A	A	315	290	250	A																																							
15					S		205	260	295	305	A	A	A	345	340	330	315	290	245	A																																							
16					S		205	255	295	A	A	A	A	A	A	A	A	A	A	A	295	245	A																																				
17					S		210	255	290	300	A	A	A	A	A	A	A	A	A	A	A	A	S																																				
18					S	A	255	A	A	A	A	A	A	A	350	335	310	285	240	A																																							
19					S	A	A	A	A	A	A	A	A	A	350	340	305	280	235	A																																							
20					S	A	255	A	A	A	A	A	A	A	350	325	305	280	235	S																																							
21					S		205	250	A	A	A	A	A	A	A	A	330	285	240	S																																							
22					S		205	A	A	A	A	A	A	A	C	C	320	A	A	S																																							
23					S	A	A	A	A	A	A	A	A	A	A	A	300	280	225	S																																							
24					S		205	A	A	A	A	A	A	A	345	335	320	275	225	S																																							
25					S		200	260	295	305	A	A	A	R	355	350	A	300	280	235	S																																						
26					S		195	245	290	A	320	A	A	A	340	315	300	255	210	S																																							
27					S	A	A	A	A	A	A	A	A	A	A	320	300	260	A	S																																							
28					S	A	A	A	A	A	A	A	A	A	A	310	295	260	220	S																																							
29					S		195	245	265	280	A	A	A	A	A	320	300	260	220	S																																							
30					S	A	250	285	A	A	A	A	A	A	A	A	A	A	A	A	A	A	S																																				
31					S	A	240	270	A	A	A	A	A	A	A	A	A	A	A	A	A	A	S																																				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23											
CNT							18	16	12	7	3			4	12	14	19	23	23																																								
MED							210	255	290	305	320			352	350	328	305	280	240																																								
UQ							215	258	295	310	325			355	350	335	312	290	245																																								
LQ							205	250	285	302	320			348	342	320	300	275	230																																								

AUG. 1987

FOE (0.01 MHz)

IONOSPHERIC DATA

AUG. 1987

FOES (0.1 MHZ)

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

Station		AKITA				Lat.	39 43.5 N				Long.	140 08.0 E				Sweep 1		MHz to 25		MHz in 2sec in		automatic operation																												
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																									
1	J A	62	J A	53	J A	60	J A	44	J A	42	J A	25	J A	53	J A	65	J A	73	J A	64	J A	65	J A	66	J A	64	J A	46	J A	66	J A	74	J A	50	J A	50	J A	29	J A	44	J A	127	J A	41	J A	36	J A	31		
2	E S	15	J A	44	J A	34	J A	45	J A	44	J A	24	G	50	J A	160	J A	62	J A	133	J A	76	J A	50	J A	66	J A	114	J A	84	G	G	J A	60	J A	54	J A	52	J A	34	J A	76	J A	60						
3	J A	65	J A	84	J A	54	J A	54	J A	51	J A	36	J A	42	J A	50	J A	87	J A	68	J A	106	J A	66	J A	84	J A	48	J A	108	J A	60	J A	35	J A	46	J A	84	J A	40	J A	75	J A	52	J A	50	J A	41		
4	J A	40	J A	29	J A	24	J A	25	J A	42	J A	25	J A	36	J A	34	J A	32	J A	44	J A	74	J A	49	J A	46	G	42	J A	47	J A	65	J A	60	J A	54	J A	38	J A	29	J A	27	J A	125	J A	84				
5	J A	74	J A	65	J A	30	E S	15	E S	15	J A	21	J A	32	J A	84	J A	41	J A	38	J A	37	J A	36	J A	40	J A	68	J A	54	J A	57	J A	32	J A	36	J A	32	J A	60	J A	139	J A	50	J A	98	J A	52		
6	J A	50	J A	21	J A	24	J A	24	J A	28	J A	26	J A	32	J A	87	J A	87	J A	65	J A	36	J A	94	J A	62	J A	46	J A	119	J A	78	J A	195	J A	29	J A	38	J A	29	J A	50	J A	40	J A	52	J A	54		
7	J A	52	J A	51	J A	47	J A	40	J A	52	J A	26	J A	53	J A	111	J A	66	J A	44	J A	52	J A	46	J A	54	J A	43	G	40	J A	38	J A	41	J A	52	J A	77	J A	109	J A	88	J A	41	J A	73				
8	J A	52	J A	44	J A	25	J A	33	J A	44	J A	29	J A	52	J A	42	J A	53	J A	129	J A	53	J A	75	J A	40	J A	45	J A	58	J A	57	J A	73	J A	61	J A	51	J A	42	J A	42	J A	52	J A	64	J A	51		
9	J A	100	J A	53	J A	44	J A	53	J A	52	J A	26	J A	154	J A	53	D D	250	J A	87	J A	145	J A	133	J A	124	J A	65	J A	40	J A	75	J A	184	J A	137	J A	160	J A	208	J A	106	J A	83	J A	85	J A	40		
10	J A	84	J A	44	J A	25	J A	82	J A	65	J A	29	J A	53	J A	42	J A	44	J A	75	J A	89	J A	107	J A	42	J A	51	J A	74	J A	39	J A	62	J A	44	J A	62	J A	45	J A	52	J A	36	J A	65				
11	J A	115	J A	72	J A	36	J A	39	J A	33	J A	21	J A	35	J A	61	J A	74	J A	66	J A	74	J A	83	J A	84	J A	107	J A	75	J A	54	J A	34	J A	67	J A	60	J A	66	J A	52	J A	73	J A	84	J A	83		
12	J A	43	J A	19	J A	23	E S	15	J A	18	J A	25	J A	34	J A	44	J A	65	J A	76	J A	110	J A	70	J A	76	J A	54	J A	170	J A	60	D D	250	J A	110	J A	53	J A	16	J A	33	E S	16	J A	20				
13	E S	16	J A	32	J A	21	J A	21	J A	84	J A	29	J A	50	J A	54	J A	54	J A	50	J A	64	J A	66	J A	76	J A	116	J A	99	J A	50	J A	34	G	27	J A	31	J A	29	J A	53	J A	64	J A	89				
14	J A	104	J A	64	J A	43	J A	21	E S	15	E S	16	J A	36	J A	50	J A	50	J A	54	J A	58	J A	54	J A	84	J A	66	J A	48	J A	54	J A	51	J A	60	J A	79	J A	44	J A	50	J A	74	J A	87	J A	60		
15	J A	112	J A	44	J A	96	J A	132	J A	134	J A	29	J A	27	J A	50	J A	55	J A	64	J A	92	J A	102	J A	84	J A	45	J A	54	J A	39	J A	39	J A	40	J A	48	J A	76	J A	36	J A	32	J A	84	J A	20		
16	J A	21	J A	20	E S	16	E S	15	J A	20	J A	21	J A	36	J A	41	J A	48	J A	54	J A	53	J A	74	J A	87	J A	101	J A	44	J A	36	G	J A	50	J A	66	J A	51	J A	40	J A	25	J A	50	J A	31			
17	J A	29	J A	24	J A	60	J A	29	J A	29	J A	24	J A	27	J A	50	J A	59	J A	60	J A	40	J A	84	J A	73	J A	74	J A	66	J A	46	J A	34	J A	50	J A	64	J A	30	J A	40	J A	44	J A	29	J A	40		
18	J A	41	C	J A	42	J A	31	J A	28	J A	23	J A	32	J A	36	J A	56	J A	74	J A	54	J A	45	J A	45	J A	41	J A	76	J A	52	J A	35	J A	40	J A	50	J A	41	J A	84	J A	44	J A	52	J A	34			
19	J A	33	J A	62	J A	44	J A	19	J A	44	J A	33	J A	64	J A	50	J A	50	J A	42	J A	57	J A	94	J A	42	J A	60	J A	84	J A	65	J A	49	J A	64	J A	50	J A	32	J A	62	J A	40	J A	37	J A	38		
20	J A	29	J A	25	J A	25	J A	29	J A	24	J A	29	J A	44	J A	76	J A	64	J A	54	J A	113	J A	80	J A	97	G	G	G	J A	30	J A	53	J A	44	J A	84	J A	119	J A	43	J A	46	J A	50	J A	40			
21	J A	83	J A	77	J A	52	J A	77	J A	43	J A	25	J A	41	J A	32	J A	54	J A	35	J A	34	J A	38	J A	44	J A	60	J A	37	J A	50	J A	57	J A	32	J A	53	J A	53	J A	80	J A	51	J A	80	J A	84		
22	J A	42	J A	77	J A	88	J A	54	J A	53	E S	15	J A	30	J A	33	J A	56	J A	50	J A	44	J A	74	J A	42	C	C	J A	48	J A	46	J A	53	J A	36	J A	84	J A	29	J A	45	J A	54	J A	38				
23	J A	41	J A	24	J A	24	J A	103	J A	60	J A	36	J A	38	J A	163	J A	88	J A	67	J A	77	J A	60	J A	57	J A	54	J A	37	G	36	J A	54	J A	50	J A	36	J A	57	J A	42	J A	32	J A	32				
24	J A	32	C	J A	37	J A	26	J A	24	J A	26	J A	26	J A	30	J A	36	J A	50	J A	44	J A	65	J A	64	J A	42	J A	39	J A	38	J A	56	J A	30	J A	31	J A	19	J A	44	J A	53	J A	40	J A	50			
25	J A	21	J A	22	J A	20	E S	16	J A	25	J A	31	J A	85	J A	31	J A	54	J A	48	J A	42	J A	50	J A	41	G	J A	50	J A	41	G	38	G	J A	24	J A	19	J A	24	J A	24	J A	24						
26	J A	E S	E S	E S	E S	24	E S	15	J A	20	J A	25	J A	31	J A	33	J A	44	G	J A	43	J A	39	G	G	G	33	J A	40	J A	32	J A	22	J A	46	J A	76	J A	44	J A	18	J A	23							
27	J A	E S	16	J A	24	J A	19	J A	28	J A	26	J A	32	J A	32	J A	41	J A	44	J A	47	J A	36	J A	83	J A	54	J A	42	J A	46	G	J A	116	J A	60	J A	18	J A	26	J A	37	J A	32	J A	40				
28	J A	33	J A	23	E S	15	E S	15	J A	20	J A	34	J A	36	J A	32	J A	32	J A	35	J A	47	J A	35	J A	38	J A	52	G	G	G	25	J A	26	J A	18	J A	15	J A	21	J A	51	J A	84						
29	J A	29	J A	48	J A	53	J A	54	J A	50	J A	19	J A	27	J A	44	J A	46	J A	46	J A	79	J A	76	J A	72	J A	112	J A	76	J A	86	J A	36	J A	30	J A	83	J A	75	J A	24	J A	77	J A	40				
30	J A	30	J A	112	J A	24	J A	21	E S	15	E S	16	J A	23	J A	40	J A	64	J A	35	J A	105	J A	108	J A	136	J A	216	J A	127	J A	87	J A	74	J A	64	J A	44	J A	62	J A	50	J A	77	J A	52	J A	94		
31	J A	40	J A	36	J A	46	J A	28	J A	23	E S	15	J A	30	J A	30	J A	52	J A	80	J A	66	J A	55	J A	52	J A	98	J A	49	J A	86	J A	36	J A	44	J A	74	J A	53	J A	84	J A	109	J A	65	J A	52		
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																									
CNT		31	29	31	31	31	31	31	31	31	31	31	31	31	30	30	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	J A	41	J A	44	J A	34	J A	29	J A	33	J A	25	J A	36	J A	44	J A	54	J A	54	J A	58	J A	66	J A	62	J A	54	J A	50	J A	38	J A	46	J A	50	J A	46	J A	50	J A	44	J A	52	J A	41				
UQ	J A	64	J A	62	J A	46	J A	49	J A	50	J A	29	J A	47	J A	54	J A	66	J A	63	J A	84	J A	82	J A	84	J A	63	J A	76	J A	70	J A	54	J A	60	J A	62	J A	62	J A	76	J A	52	J A	76	J A	62		
LQ	J A	29	J A	24	J A	24	J A	21	J A	24	J A	21	J A	30	J A	34	J A	45	J A	45	J A	47	J A	43	J A	43	J A	45	J A	40	J A	39	J A	34	J A	32	J A	34	J A	34	J A	33	J A	36	J A	36	J A	36		

AUG. 1987

FOES (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987
FBES (0.1 MHz)
135° E Mean Time (G.M.T. + 9h)

Station	AKITA				Lat. 39° 43' 5" N				Long. 140° 08' 0" E				Sweep 1 MHz to 25 MHz in 24sec in automatic operation												
	Hour	00	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 A	A A																				E S
2	E S	E S	E S	E S																					E S
3	E S																								E S
4																									E S
5																									E S
6																									E S
7																									E S
8																									E S
9	A A	A A	A A	A A	A A																				E S
10	A A	E S																							E S
11	A A																								E S
12																									E S
13	E S																								E S
14																									E S
15	E S																								E S
16																									E S
17																									E S
18																									E S
19																									E S
20																									E S
21																									E S
22	E S	A A																							E S
23	E S	E S	E S	E S																					E S
24																									E S
25	E S																								E S
26	E S	E S	E S	E S	E S	E S																			E S
27																									E S
28																									E S
29	E S																								E S
30	E S	E S	E S	E S	E S	E S																			E S
31																									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	31	29	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31
MED	21	20	19	19	E S	19	31	38	46	48	49	41	45	44	44	43	37	36	40	25	31	25	25	25	
UQ	27	25	25	22	25	23	38	46	54	56	A A	A A	A A	A A	A A	50	42	44	51	42	37	36	34	32	
LQ	E S	E S	E S	E S	E S	E S																			E S

IONOSPHERIC DATA

AUG. 1987

FMIN (0.1 MHz)

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

Station	AKITA				Lat.	39 43.5 N				Long.	140 08.0 E				Sweep 1 MHz to 25 MHz in 2 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 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	16	16	18	19	20	21	21	19	20	18	16	16	15	16	E 1.5	E 1.5	E 1.5	E 1.5
2	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	16	17	16	19	20	19	21	20	19	17	16	16	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
3	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	16	16	17	13	18	20	19	20	20	17	16	17	E 1.6	E 1.6	E 1.5	E 1.6	E 1.5	E 1.5
4	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	16	16	17	13	18	22	18	20	17	17	17	17	E 1.5	E 1.6	E 1.6	E 1.5	E 1.5	E 1.6
5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	17	17	17	13	20	18	22	20	16	20	16	16	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
6	E 1.6	E 1.6	E 1.6	E 1.6	E 1.6	E 1.6	16	16	16	17	18	19	20	19	19	18	16	16	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
7	E 1.6	E 1.5	E 1.6	E 1.6	E 1.6	E 1.6	16	16	18	17	18	19	20	20	20	19	17	16	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
8	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	16	16	17	20	20	27	21	23	20	17	16	16	E 1.7	E 1.6	E 1.6	E 1.6	E 1.5	E 1.6
9	E 1.6	E 1.6	E 1.6	E 1.6	E 1.5	E 1.6	16	18	16	16	19	21	20	24	19	16	17	16	E 1.6	E 1.6	E 1.6	E 1.6	E 1.6	E 1.6
10	E 1.5	E 1.5	E 1.6	E 1.5	E 1.5	E 1.6	16	18	18	17	19	20	26	20	19	18	16	18	E 1.6	E 1.6	E 1.5	E 1.6	E 1.6	E 1.6
11	E 1.6	E 1.6	E 1.6	E 1.6	E 1.6	E 1.6	16	18	18	13	20	20	26	17	19	17	17	17	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
12	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	E 1.6	17	17	17	19	19	24	20	18	17	17	17	E 1.6	E 1.5	E 1.6	E 1.5	E 1.6	E 1.5
13	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	16	16	16	20	20	20	21	21	18	18	17	16	E 1.6	E 1.5	E 1.6	E 1.5	E 1.5	E 1.5
14	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	16	16	16	17	19	20	21	20	20	19	18	17	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
15	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	16	17	16	17	20	19	23	18	18	18	17	16	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
16	E 1.6	E 1.6	E 1.6	E 1.6	E 1.6	E 1.6	16	17	16	17	19	20	22	19	17	18	16	17	E 1.6	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5
17	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	E 1.6	16	18	21	19	20	20	18	19	17	17	16	E 1.6	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5
18	E 1.6	C	E 1.5	E 1.5	E 1.5	E 1.6	15	16	17	17	20	18	20	18	18	17	16	16	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
19	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	16	16	18	19	17	20	18	20	19	18	16	16	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
20	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	E 1.6	16	18	16	20	18	20	18	18	17	16	16	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
21	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	16	16	17	17	19	20	20	18	19	17	17	17	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
22	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	16	16	17	17	21	20	20	C	C	23	17	16	E 1.6	E 1.6	E 1.6	E 1.5	E 1.5	E 1.5
23	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	16	17	17	17	17	17	21	18	19	17	17	16	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
24	E 1.5	C	E 1.5	E 1.5	E 1.5	E 1.6	16	17	20	13	19	20	20	20	20	18	16	16	E 1.6	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5
25	E 1.6	E 1.5	E 1.5	E 1.6	E 1.5	E 1.5	E 1.6	17	17	17	18	20	22	18	17	17	16	16	E 1.6	E 1.5	E 1.6	E 1.5	E 1.5	E 1.5
26	E 1.5	E 1.6	E 1.6	E 1.6	E 1.5	E 1.6	16	16	17	17	20	20	20	20	20	17	17	16	E 1.6	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5
27	E 1.5	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	16	16	16	16	18	21	18	20	19	16	17	16	E 1.6	E 1.6	E 1.6	E 1.5	E 1.5	E 1.6
28	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	16	16	18	16	18	18	22	18	17	16	16	16	E 1.6	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5
29	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	16	16	16	17	20	19	23	20	20	16	16	16	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
30	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	16	16	17	17	20	20	18	17	17	17	16	16	E 1.6	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5
31	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	16	16	13	17	20	19	19	17	17	17	16	16	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	29	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31
MED	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	16	16	17	17	19	20	20	20	19	17	16	16	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5
UQ	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	16	16	17	18	13	20	20	22	20	18	17	16	E 1.6	E 1.6	E 1.6	E 1.5	E 1.5	E 1.5
LQ	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5	E 1.6	16	16	17	18	19	20	18	18	17	16	16	16	E 1.6	E 1.5	E 1.5	E 1.5	E 1.5	E 1.5

AUG. 1987

FMIN (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987

M(3000)F2 (0.01)

135° E Mean Time (G.M.T. + 9h)

Station		AKITA								Lat. 39° 43' 5" N			Long. 140° 08' 0" E			Sweep 1 MHz to 25 MHz in 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	F	A	310	320	325	305	315	300	320	275	270	285	270	310	315	320	315		F	F	F	F		
2	F	F	F	F	F	315	315	330	A	325	340	315	290	300	A	295	320	315	315	305	305		F	F	F		
3	F	F	F	F	F	325	330	330	A	A	330	305	290	285	310	295	305	310	A	325	F	F	F	F			
4	F	F	F	F	F	325	305	355	330	335	A	270	300	305	280	310	A	320	290	305	300		F	F	F		
5	F	F	F	F	F	335	305	A	305	300	335	315	275	285	265	320	325	300	300	295		F	F	F	F		
6	F	F	F	F	F	315	315	325	A	A	320	315	A	A	G	A	A	300	315	320	310	310	300		F	F	
7	F	F	F	F	F	325	305	265	300	315	315	300	285	270	270	305	255	300	290	300	295	A	F	F	F		
8	F	F	F	F	F	320	330	335	340	340	340	A	285	310	300	A	A	300	305	310	345	325	305	295			
9	A	A	F	F	A	335	A	275	A	A	A	A	A	A	300	295	A	A	A	A	305	285	305	F	F	F	
10	A	F	F	F	F	295	310	A	310	330	A	A	A	G	A	A	295	305	A	325	340	320	F	F	F		
11	A	F	F	F	F	300	345	360	A	A	A	A	A	A	A	A	320	320	A	A	F	F	F	F	A		
12	F	F	F	F	F	300	320	305	330	345	A	A	320	A	275	310	305	A	A	295	300	320	305	305	300		
13	305	280	280	290	310	335	300	305	310	330	A	A	290	310	A	315	305	295	285	290	305	335		F	A		
14	F	F	F	F	F	335	335	305	340	340	A	305	315	315	285	300	305	315	A	300	305	300		F	F	F	
15	F	F	F	F	F	320	325	A	315	335	A	A	A	285	275	305	315	335	310	295	295	295	310	305			
16	300	290	285	300	285	325	335	355	275	340	290	330	A	290	305	300	315	320	325	315	305	270		F	F		
17	300	F	F	F	F	305	310	320	315	A	340	325	A	A	A	A	310	315	320	305	305	300	310	290	295		
18	F	C	F	F	F	F	305	325	345	355	355	310	300	320	A	310	315	320	305	300	310		F	F	F		
19	F	F	F	F	F	300	325	A	335	360	350	A	305	315	325	A	300	310	325	315	335	325	285	300	F	F	
20	F	F	F	F	F	305	F	A	A	320	325	A	305	A	300	315	315	320	315	A	F	F	F	F	F		
21	F	F	F	F	F	310	310	320	365	355	330	315	310	310	315	315	330	335	325	315	330	F	F	F	F		
22	F	A	F	F	F	F	315	335	345	360	360	A	315	C	C	305	315	315	320	310	315	345		F	F		
23	F	F	F	F	F	F	350	A	355	360	A	305	325	320	290	310	330	300	305	295		F	F	F	F		
24	F	C	F	F	F	F	335	300	345	A	325	345	320	310	320	315	345	330	310	295	300		F	F	F		
25	F	305	325	310	305	A	320	305	350	335	340	300	325	315	325	325	300	325	315	280	285	285	295	300			
26	280	325	315	285	255	260	265	280	260	250	250	G	G	G	250	265	295	285	295	285		F	F	F	F		
27	F	F	F	F	F	F	315	345	350	350	300	330	305	315	305	340	335	A	295	305	330	320	315	275			
28	F	F	F	F	F	F	345	360	320	320	330	310	320	325	325	350	325	310	305	310	320	320	305	F			
29	F	F	F	F	A	F	290	325	365	345	340	290	300	A	A	A	A	320	320	310	310	320	315		F	F	
30	F	F	F	F	F	F	320	360	A	A	A	A	A	A	A	A	A	325	340	300	310	315	325		F	A	
31	F	F	F	F	F	315	325	340	330	A	A	A	315	335	A	325	330	325	335	A	305	315	A	F	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		12	10	10	9	14	23	27	26	23	23	18	21	21	24	21	25	27	26	25	31	25	20	9	9		
MED	F	F	295	300	302	320	320	330	340	335	328	310	300	302	305	310	315	315	305	305	310	308	305	300			
UQ	F	F	F	F	F	F	325	332	345	345	345	340	315	315	315	315	325	325	315	310	320	320	305	320	F		
LQ	F	F	F	F	F	F	310	308	305	315	322	300	305	285	285	285	300	305	310	300	298	300	300	300	295		

AUG. 1987

M(3000)F2 (0.01)

IONOSPHERIC DATA

AUG. 1987

M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9h)

Station	AKITA				Lat. 39° 43' 5" N				Long. 140° 08' 0" E				Sweep 1 MHz to 25 MHz in 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							A	A	A	A	A	A	A	400	385	A	360	A	365	L					
2							L	A	A	A	A	A	395	420	A	A	A	365	345	A					
3							A	A	A	A	A	A	390	395	A	A	A	355	355	A					
4							A	405	380	A	A	410	A	395	385	A	A	L	L						
5							L	A	355	395	405	380	400	A	A	A	L	A	L						
6							365	A	A	A	425	A	A	A	A	A	A	355	L						
7							A	340	A	410	420	410	A	L	400	L	A	A	A						
8							A	A	A	A	L	A	L	A	A	A	A	A							
9							A	A	A	A	A	A	A	A	A	350	A	A	A						
10							A	A	415	A	A	A	A	A	A	A	385	A	A						
11							L	A	A	A	A	A	A	A	A	390	A	360	A						
12							L	370	370	A	A	A	A	A	390	A	380	A	A	L					
13							A	A	A	A	A	A	A	A	A	A	A	L	L	L					
14							A	A	A	A	A	A	A	A	A	A	A	A	A						
15							A	A	A	A	A	A	A	A	365	A	355	365	A	A					
16							A	A	380	A	A	375	A	A	355	345	345	A	A						
17							A	A	A	390	A	A	A	A	A	A	360	A	A						
18							L	355	370	A	A	A	435	A	A	A	A	L	350	350	A				
19							A	L	370	390	A	415	385	A	A	A	A	A	A						
20							A	A	A	A	A	A	A	A	360	375	360	A	A						
21							A	365	400	375	405	A	A	375	A	A	L	A	A						
22							L	370	365	A	A	395	A	390	C	C	360	A	L	A					
23							L	A	A	A	A	L	A	400	L	370	L	A	A						
24							370	405	A	A	385	380	365	355	360	A	L								
25							L	375	390	A	A	L	375	375	A	395	385	L	L	L					
26							315	365	415	385	390	425	385	380	375	380	370	L							
27							L	375	A	395	L	375	A	380	A	L	L	A							
28							L	L	L	390	380	395	A	405	390	370	380	380	L	L					
29							515	A	A	A	L	385	A	A	A	A	A	L	L						
30							L	A	A	A	A	A	A	A	A	A	A	A	A						
31							L	A	A	A	A	A	A	A	A	A	A	A	A						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							7	11	9	7	8	15	11	10	11	12	10	6							
MED							L	370	370	380	395	395	395	390	380	375	365	360	355						
UQ							L	370	375	405	398	412	410	400	390	388	380	365	365						
LQ							360	365	380	392	390	382	385	365	365	360	355	350							

AUG. 1987

M(3000)F1 (0.01)

IONOSPHERIC DATA

AUG. 1987

H^oF₂ (KM)

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

Station		AKITA		Lat. 39 43.5 N		Long. 140 08.0 E		Sweep 1 MHz to 25 MHz in 24sec in automatic operation																				
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1								310	285	310	320	A	310	410	430	380	375	295	280	275								
2								300	275	A	310	300	345	380	360	A	A	320	310	A								
3								270	305	A	A	310	370	390	390	310	A	345	305	A								
4								315	260	285	330	A	450	370	360	440	360	A	295	320	L							
5								320	A	330	345	285	345	450	400	455	335	285	345	310								
6								305	A	A	330	345	A	A	G	A	A	340	320	285								
7								450	350	325	335	390	415	480	450	375	505	360	350	A								
8								A	260	280	A	295	A	390	350	370	A	A	330									
9								A	A	A	A	A	A	A	A	360	390	A	A	A								
10								A	305	300	A	A	A	G	A	A	365	325	A									
11								265	A	A	A	A	A	A	A	320	A	325	A									
12								285	275	285	A	A	A	A	400	340	360	A	A	300								
13								A	305	290	260	A	A	375	310	A	300	300	300	300								
14								295	A	290	300	A	380	330	A	390	350	320	295	A								
15								A	320	285	A	A	A	A	410	405	315	295	260	A								
16								270	270	420	285	395	300	A	385	355	355	300	280	A								
17								310	A	295	310	A	A	A	A	A	305	305	285	A								
18								300	285	255	270	275	360	350	310	A	310	305	280	270								
19								A	275	255	250	A	350	325	300	A	345	310	280	255								
20								A	A	270	290	A	310	A	345	325	330	300	295									
21								A	270	240	255	320	335	345	330	305	295	280	275									
22								295	255	245	250	280	A	350	C	C	330	295	285	265								
23								250	A	250	255	A	335	320	310	390	325	285	A	A								
24								295	245	A	320	290	315	350	320	300	260	255										
25								305	330	265	A	295	345	300	345	300	305	310	280	L								
26								470	420	495	530	530	G	G	G	540	490	360	350									
27								300	255	250	270	355	310	335	345	320	295	300	A									
28								270	250	300	310	295	330	310	300	295	270	260	300	L	L							
29								295	245	275	290	300	360	A	A	A	A	295	285									
30								290	240	A	A	A	A	A	A	A	A	295	265									
31								290	L	A	A	A	350	290	A	310	305	295	275									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT								20	23	23	21	17	20	21	23	21	23	27	25	9								
MED								298	275	285	290	310	345	350	360	355	330	300	285	285								
UQ								308	305	305	320	345	365	390	400	390	358	320	305	300								
LQ								278	260	255	270	295	320	325	338	320	305	295	280	270								

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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 2 sec in automatic operation												
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	A	A	A	A	A	250	A	A	A	A	A	A	210	220	A	225	A	210	255	240	A	A	A	260		
2	250	270	240	A	A	250	220	A	A	A	A	205	200	A	A	A	220	240	A	A	A	255	260	A	A	245
3	255	A	A	A	A	A	A	A	A	A	A	220	200	A	A	A	230	220	A	245	240	A	A	A	A	
4	A	295	270	240	E S	300	280	A	210	210	A	A	220	A	205	240	A	A	225	235	255	240	230	290	A	
5	A	280	240	220	230	245	240	A	A	210	200	220	210	A	A	A	235	A	A	A	245	A	270	240	A	
6	250	255	265	260	250	240	245	A	A	A	200	A	A	A	A	A	A	225	A	250	230	270	A	A	A	
7	A	A	A	A	255	A	A	A	230	230	200	220	A	A	200	A	A	A	A	255	A	A	A	A	A	
8	A	290	285	275	A	A	A	A	A	A	210	A	195	A	A	A	A	A	A	245	225	A	A	A	A	
9	A	A	A	A	A	240	A	A	A	A	A	A	A	A	265	A	A	A	A	A	A	A	A	A	A	
10	A	245	290	270	285	245	A	A	205	A	A	A	E A	250	A	A	245	A	A	265	A	A	A	A	A	
11	A	285	A	275	275	245	A	A	A	A	A	A	A	A	210	A	210	A	A	A	265	225	240	A	A	
12	A	240	260	265	280	250	A	A	A	A	A	A	A	220	A	225	A	A	A	250	230	250	220	270	A	
13	240	A	290	275	250	240	A	A	A	A	A	A	A	A	A	A	A	240	A	275	270	A	A	A	A	
14	A	A	E S	295	275	255	240	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	245	270	
15	290	A	A	E S	320	280	245	230	A	A	A	A	A	220	A	240	210	A	A	A	A	A	280	280	245	240
16	250	275	275	245	255	250	A	A	220	A	A	220	A	A	A	215	200	A	A	A	A	260	300	A	290	
17	270	250	A	A	285	255	255	230	A	A	A	200	A	A	A	A	230	A	A	255	260	245	270	255	A	
18	275	I C	280	290	300	300	265	225	225	A	A	A	200	A	A	A	240	A	A	A	A	A	245	270	A	
19	290	280	280	260	255	245	A	210	220	210	A	200	210	A	A	A	A	A	A	220	A	270	290	270	A	
20	270	270	250	250	250	260	A	A	A	A	A	A	A	200	220	200	A	A	A	255	A	250	A	225	A	
21	A	A	A	A	A	255	A	210	A	200	195	200	A	A	220	A	A	A	A	A	240	225	250	240	A	
22	255	A	A	A	A	250	240	220	A	A	220	A	210	C	C	A	A	210	A	250	225	230	270	290	A	
23	275	275	270	A	A	255	A	A	A	A	A	200	A	210	225	225	A	A	A	A	250	245	240	A	A	
24	245	C	A	290	300	270	240	220	220	A	A	220	220	A	A	225	A	220	245	255	A	A	290	275	A	
25	255	260	230	235	340	A	240	220	220	A	A	210	200	A	205	205	A	245	260	290	280	285	275	210	A	
26	320	210	245	A	E S	425	E S	350	A	235	225	225	220	200	230	225	230	A	240	A	275	A	A	310	280	280
27	220	290	250	260	320	A	A	220	A	210	200	200	A	205	A	A	225	A	A	250	230	270	260	A	A	
28	A	320	290	270	280	290	A	A	220	210	200	A	200	200	205	230	220	215	245	255	250	235	245	A	A	
29	240	A	E A	350	290	A	280	240	A	A	A	220	205	A	A	A	A	A	A	255	245	A	225	A	A	
30	230	245	250	300	280	260	240	A	A	A	A	A	A	A	A	A	A	A	A	270	260	230	210	A	A	
31	A	A	A	A	280	260	230	255	235	A	A	A	A	A	A	A	240	A	A	A	A	A	A	A	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	19	19	20	23	22	25	12	12	8	7	10	16	12	9	10	10	12	10	9	18	19	19	16	16		
MED	255	275	266	272	268	250	240	220	220	210	200	205	208	210	222	225	228	225	255	250	240	250	265	265		
UQ	275	282	283	281	292	258	240	228	220	218	220	220	212	220	230	225	238	240	265	255	260	270	278	272		
LQ	248	252	250	260	255	245	230	215	210	205	200	200	200	205	210	215	212	220	255	245	230	230	245	240		

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H^oE (KM)
135° E Mean Time (G.M.T. + 9h)

Station	AKITA				Lat. 39° 43' 5" N	Long. 140° 08' 0" E	Sweep 1	MHz to 25	MHz in 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	110	105	110	105	A	105	105	105	A	A	A	A					
2					S		105	105	105	105	A	A	105	100	100	100	100	100		S				
3					S		110	105	105	105	105	105	105	105	A	105	110	110	E	S				
4					S	E S	120	105	105	105	A	A	105	105	105	105	105	115		S				
5					S		110	110	105	105	105	105	110	A	A	A	105	110		S				
6					S		115	105	105	105	105	105	105	105	105	105	105	110		S				
7					S	A	A		105	105	105	105	105	105	105	105	105	105		S				
8					S		110	105	105	105	105	105	105	A	A	A	A	A		S				
9					S		110	110	105	105	105	105	105	A	110	105	105	110		S				
10					S		110	105	105	105	105	105	E B	115	110	110	115	110	110		S			
11					S		110	110	110	105	105	105	E B	110	A	A	A	A	A		S			
12					S	E S	120	110	105	105	A	A	A	A	A	A	A	A	105		S			
13					S		110	105	105	105	105	105	A	A	A	A	A	A		S				
14					S		110	105	105	105	105	105	105	105	110	105	105	110		S				
15					S		110	105	105	105	105	105	105	105	105	105	105	105		S				
16					S		110	105	105	105	105	A	A	A	A	A	A	100	110		S			
17					S	E S	120	110	105	105	105	A	A	A	A	A	A	A	A		S			
18					S	A		105	105	105	105	105	105	105	105	105	105	110		S				
19					S	S	A		105	105	A	A	105	105	105	105	105	105	110		S			
20					S	E S	120	110	105	105	105	105	A	105	105	A	105	100		S				
21					S	E S	120	110	105	110	105	105	A	A	105	105	105	110		S				
22					S		110	110	105	105	105	105	105	C	C	110	105	105		S				
23					S	A	A	A	A	A	A	A	A	105	105	105	105	110		S				
24					S		115	110	105	105	105	105	105	105	110	105	105	110		S				
25					S	E S	120	110	110	105	105	105	105	105	A	105	A	105		S				
26					S	E S	120	110	105	110	110	105	105	105	105	105	105	115		S				
27					S	S		105	105	105	105	105	A	A	105	105	105	110		S				
28					S	S		105	110	105	105	A	A	A	105	105	105	105		S				
29					S	S		110	105	105	105	105	E B	110	105	105	105	110	115		S			
30					S	S		110	110	105	105	105	A	A	A	A	A	A		S				
31					S	S		105	105	105	105	105	105	105	100	105	A	110	115		S			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							22	28	30	30	26	22	21	18	20	20	23	26	1					
MED							110	108	105	105	105	105	105	105	105	105	105	110	E S					
UQ							E S	120	110	105	105	105	105	105	105	105	105	110						
LQ							110	105	105	105	105	105	105	105	105	105	105	105						

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H⁺ES (KM)

135° E Mean Time (G.M.T. + 9h)

Station	AKITA				Lat. 39 43.5 N				Long. 140 08.0 E				Sweep 1 MHz to 25 MHz in 2 sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	105	100	100	100	100	130	125	110	110	110	105	100	105	110	105	105	100	100	105	110	110	110	105	
2	S	105	100	100	100	105	G	110	105	105	105	105	110	110	110	105	G	G	110	110	105	110	105	
3	100	100	100	100	100	125	120	110	110	110	110	110	110	110	100	110	125	120	110	110	105	110	105	
4	100	100	100	100	120	135	120	110	110	105	100	105	125	G	125	120	115	125	120	115	110	120	110	
5	105	105	105	S	S	150	135	120	125	105	110	105	110	105	100	100	135	120	115	110	110	110	100	
6	105	100	100	100	100	100	125	110	110	110	115	105	120	135	120	120	110	120	110	110	105	105	100	
7	100	100	100	100	105	120	105	105	105	110	105	105	105	130	G	130	130	115	110	110	110	110	105	
8	100	100	100	100	100	120	110	110	110	105	105	105	105	100	100	105	100	100	100	100	105	105	105	
9	105	105	105	100	100	125	110	110	105	105	105	105	105	125	150	130	115	110	110	105	110	105	105	
10	105	100	100	110	105	125	115	115	110	105	105	105	130	125	120	145	130	115	115	110	110	110	105	
11	100	100	100	95	95	125	120	115	110	110	110	105	105	100	100	100	100	100	100	100	105	105	105	
12	105	105	100	S	105	120	120	120	105	105	100	100	100	110	100	120	120	110	110	105	S	105	S	
13	S	100	100	100	100	120	115	110	110	110	105	105	100	100	100	105	100	G	135	120	110	110	105	
14	100	100	95	105	S	S	130	115	110	105	105	105	105	105	125	130	120	120	115	110	110	110	105	
15	100	100	100	105	100	130	125	120	110	110	105	105	110	120	120	135	125	115	110	110	115	110	105	
16	100	100	S	S	100	125	115	110	110	105	105	100	100	100	100	100	G	120	110	110	110	110	105	
17	100	100	100	100	100	110	125	110	105	105	110	105	105	105	100	100	100	100	100	100	100	100	105	
18	110	C	105	105	105	110	105	110	105	105	105	105	110	145	125	120	130	120	110	110	110	110	105	
19	130	110	100	100	110	110	105	100	105	105	100	105	110	120	115	115	120	110	110	110	105	100	100	
20	100	100	100	100	110	120	110	110	105	105	105	105	100	G	G	100	125	120	110	110	110	105	100	
21	100	100	105	105	105	120	110	110	105	110	110	110	105	100	115	120	120	120	110	105	105	105	105	
22	105	105	105	105	105	S	110	110	105	105	110	105	125	C	C	120	115	110	110	100	100	100	100	
23	100	100	100	110	105	105	105	100	100	100	100	100	105	105	110	G	130	115	120	110	105	100	100	
24	95	C	100	100	110	110	120	115	110	105	105	110	105	130	135	130	110	120	115	110	110	110	105	
25	105	95	95	S	130	125	100	125	120	105	105	105	G	135	100	G	140	G	100	110	120	110	105	
26	105	S	S	S	S	120	120	115	115	120	G	110	120	G	G	140	140	120	120	110	105	105	105	
27	100	S	105	135	130	120	110	110	105	105	105	105	100	100	140	130	G	110	105	115	105	105	100	
28	100	100	S	S	120	115	110	105	110	105	105	100	100	100	G	G	G	140	110	105	S	110	105	
29	105	105	100	100	100	110	120	110	110	110	105	105	105	105	115	110	125	115	110	105	105	105	110	
30	105	100	120	100	S	S	120	120	110	110	105	105	100	100	100	95	95	95	95	110	110	110	105	
31	100	100	100	100	105	S	115	115	110	105	105	105	105	105	105	100	135	120	110	110	110	110	105	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	27	28	26	27	27	30	31	31	31	30	31	30	27	26	28	27	28	31	31	29	31	30	31
MED	100	100	100	100	105	120	115	110	110	105	105	105	105	105	110	118	120	115	110	110	110	110	105	105
UQ	105	102	102	105	108	125	120	115	110	110	105	105	110	122	120	130	130	120	112	110	110	110	110	105
LQ	100	100	100	100	100	110	110	110	105	105	105	105	105	100	100	102	110	110	110	105	105	105	105	100

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H⁺ES (KM)

IONOSPHERIC DATA

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TYPES OF ES

135° E Mean Time (G.M.T. + 9h)

Station	AKITA				Lat. 39° 43' 5" N			Long. 140° 08' 0" E				Sweep 1 MHz to 25 MHz in 2 sec in		automatic operation										
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F6	F3	F3	F3	F4	CL11	C3	C4	C2	C2	C2	L2	C1	C2	C3	L2	L2	L4	F3	F3	F7	F7	F2	
2		F2	F2	F3	F3	L1		C2	C2	C2	L2	L1	C1	C2	C3	C2			C5	F3	F2	F3	F4	F3
3	F2	F4	F4	F4	F3	C5	C3	CL31	C3	C3	C2	C1	C2	C2	L2	C2	C1	C2	C4	F3	F2	F3	F3	F3
4	F7	F2	F2	F1	F1	H2	C3	C1	C1	C2	L2	L1	C2		C1	C2	C2	C1	C2	F2	F4	F1	F2	F5
5	F4	F2	F4			H2	H2	C4	C1	C2	C1	C1	C1	L2	L2	L2	H1	C2	C4	F6	F2	F2	F3	F3
6	F2	F2	F2	F2	F2	L1	C2	C5	C2	C2	C1	C3	C2	H1	C3	C3	C3	C2	C2	F2	F2	F2	F2	F3
7	F3	F3	F3	F2	F2	C2	L4	L2	C2	C2	C1	C2	C2	C1		C1	C1	C2	C4	F3	F6	F6	F5	F4
8	F3	F2	F2	F2	F4	C4	C6	C3	C3	C3	C2	C3	C1	L1	L3	L5	L3	L2	L2	F4	F4	F6	F5	F6
9	F7	F7	F2	F3	F4	C2	C5	C3	C5	C5	C5	C3	C4	CL11	H1	C3	C3	C4	C4	F4	F5	F5	F5	F2
10	F7	F2	F2	F2	F4	C3	C4	C4	C2	C4	C3	C2	C1	C2	C2	HL21	C2	C2	C5	F4	F5	F6	F7	F4
11	F3	F2	F3	F2	F2	C1	C4	C3	C5	C3	C5	C4	C3	L4	L2	L3	L3	L4	L5	F5	F2	F2	F2	F3
12	F4	F1	F1		F1	C2	C2	C2	C3	C3	L4	L3	L3	CL12	L2	CL22	CL22	C2	C3	F3		F6		F2
13		F4	F1	F1	F1	C3	C3	C3	C3	C2	C3	C3	L3	L2	L4	L2	L2		H2	F4	F2	F4	F4	F5
14	F3	F2	F3	F2			C2	C2	C2	C3	C3	C3	C3	C3	C2	C3	C2	C3	C5	F3	F4	F3	F3	F2
15	F2	F4	F3	F3	F3	CL11	C2	C3	C3	C3	C3	C3	C3	C2	C2	H1	C2	C2	C4	F5	F6	F3	F2	F2
16	F3	F2			F2	C1	C4	C2	C2	C5	C2	L2	L2	L2	L2	L2		C5	C5	F7	F3	F3	F7	F5
17	F4	F2	F3	F2	F2	C1	C2	C3	C3	C3	C1	L3	L3	L4	L6	L3	L2	L2	L4	F3	F3	F4	F3	F2
18	F2		F3	F3	F4	C1	L4	C2	C2	C3	C3	C2	C1	H1	C5	C3	C2	C3	C3	F6	F3	F6	F4	F2
19	FF22	F2	F1	F2	F2	C3	C4	L1	C2	C2	L2	L2	C1	C2	C4	C4	C3	C3	C4	F2	F4	F3	F3	F2
20	F3	F2	F1	F1	F2	C5	C3	C4	C3	C2	C3	C3	L3			L2	C2	C3	C5	F3	F6	F4	F3	F2
21	F3	F3	F3	F3	F3	C3	C3	C2	C3	C1	C1	C1	L2	L2	C1	C2	C2	C3	C3	F4	F2	F3	F2	F3
22	F2	F5	F3	F5	F4		C3	C2	C3	C3	C2	C3	C1			C1	C2	C3	C3	F2	F2	F4	F2	F2
23	F1	F2	F2	F3	F3	L3	L3	L3	L3	L3	L4	L2	L2	C1	C1		C2	C5	C5	F2	F3	F4	F3	F3
24	F2		F5	F7	F4	C4	C2	C2	C1	C2	C2	C1	C2	C1	H1	C1	C4	C2	C3	F2	F5	F2	F3	F2
25	F2	F2	F4		F2	C5	LC11	C2	C2	C2	C2	C2		H1	L2		HL22		L2	F3	F1	F4	F3	F2
26	F2			F3		C2	C2	C2	C1	C1		C1	C1		H1	H1	H1	C3	C3	F3	F4	F2	F2	F2
27	F4		F1	F2	F3	C4	C3	CL31	C2	C1	C2	C1	L3	L2	H2	C2		C4	C3	F2	F2	F7	F3	F4
28	F3	F1			F2	C4	C6	C2	C2	C1	C2	L1	L1	L1				H1	C1	F1		F2	F7	F3
29	F2	F2	F3	F2	F3	C1	C2	C3	C3	C2	C2	C2	C2	C4	C2	C4	C3	C4	C2	F3	F4	F2	F4	F7
30	F2	F2	FF21	F1			C2	C3	C2	C4	C3	C5	L3	L3	L4	L3	L2	L3	L2	F4	F2	F3	F4	F3
31	F3	F2	F3	F2	F2		C3	C2	C2	C3	C3	C2	C3	C4	C2	L3	H1	C2	C4	F3	F7	F3	F7	F4
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

AUG. 1987

TYPES OF ES

IONOSPHERIC DATA

AUG. 1987

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station		Rokubunji Tokyo								Lat. 35° 42' 4" N		Long. 139° 29' 3" E		Sweep 1 MHz to 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		C	C	C	C	C															C	C	C	C	C
2		C	C	C	C	C															C	C	C	C	C
3		C	C	C	C	C															C	C	C	C	C
4		C	C	C	C	C															C	C	C	C	C
5		C	C	C	C	C															C	C	C	C	C
6		X 55	X 46	X 48	X 44	X 45															C	C	C	C	X 44
7		X 45	X 44	X 43	X 42	X 44															X 71	X 77	X 64	X 54	X 63
8		X 58	X 55	X 53	X 55	X 46															X 91	X 79	X 57	X 50	X A
9		X 51	X 50	X 53	X 41	X 44															X 69	X 67	X 60	X 59	X 63
10		X 61	X 61	X 59	X 58	X 55															X 66	X 55	X 56	X 59	X A
11		X 52	X 56	X 50	X 44	X 40	X 47														X 69	X 69	X 65	X 59	X 49
12		A	X 54	X 49	X 43	X 45															X 90	X 90	X 80	X A	X S
13		X 61	X 57	X 62	X 62	X 51															X 92	X 88	X 92	X 75	X A
14		A	A	X 51	X 50	X 43															X 76	X 73	X 62	X 63	X 58
15		X 60	X 53	X 53	X 54	X 54															X 73	X 76	X 76	X 74	X 60
16		X 59	X 56	X 54	X 51	X 52															X 72	X 60	X 61	X 65	X 65
17		X 61	X 59	X 58	X 59	X 61	X 61														X 75	X 73	X 67	X 62	X 61
18		X 62	X 62	X 56	X 55	X 50	X 50														X 74	X S	X 60	X 61	X 61
19		X 64	X 61	X 52	X 52	X 49															X 83	X 53	X 58	X 60	X 59
20		X 61	X 55	X 56	X 50	X 46															X 84	X 74	X 76	X 70	X 68
21		X 62	X 57	X 63	X 58	X 55	X 44														X 87	X 59	X 57	X 55	X 48
22		X 54	X 56	X 54	X 50	X A															X 84	X 83	X 58	X 56	X 54
23		X 55	X 53	X 48	X 47	X 45	X 50														X 87	X 82	X 65	X 63	X 60
24		X 50	X 58	X 58	X 50	X 49															X 65	X 70	X 67	X 69	X 65
25		X 64	X 59	X 59	X 39	X 36															X 72	X 72	X 72	X 70	X 65
26		X 58	X 69	X 59	X 48	X 52	X 46														X 58	X 56	X 53	X 54	X 54
27		X 51	X 52	X 50	X 50	X 39															X 86	X 75	X 60	X 58	X 52
28		X 50	X 51	X 49	X 43	X 41															X 76	X 79	X 63	X 60	X 59
29		A	X 43	X 42	X 42	X 39	X 42														X 79	X 73	X 57	X 51	X 51
30		X 51	X 51	X 46	X 41	X 42															X 69	X 69	X 62	X 49	X 55
31		A	X 40	X 42	X 42	X 39															C	C	C	C	C
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		22	25	26	26	25	7														25	24	25	24	22
MED		58	55	53	50	45	47														75	73	62	60	60
UQ		61	58	53	54	51	50														84	78	67	64	63
LQ		X 52	X 51	X 49	X 43	X 42	X 45														X 69	X 68	X 58	X 56	X 54

AUG. 1987

FXI (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987

FOF2 (0.1 MHZ)

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

Station	Rokubunji Tokyo																										
	Lat. 35 42.4 N												Long. 139 29.3 E														
	Sweep 1 MHz to 25 MHz in 2 sec in automatic operation																										
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
5	C	C	C	C	C	C	C	C	C	C	D C 60	51	54	52	56	62	A	51	52	61	59	59	51	F			
6	49	40	40	38	39	35	48	49	56	51	A	A	A	54	A	A	I C 56	59	51	I C 56	I C 56	I C 46	I C 41	38			
7	39	38	F	F	F	30	43	48	59	57	49	E G 44	49	48	49	50	I C 49	49	53	65	71	58	43	F 53			
8	F	F	F	F	J F	36	39	54	56	58	58	51	53	50	A	57	55	60	66	R J S 73	85	73	51	44	A		
9	45	44	F	F	F	38	41	55	A	49	52	50	52	J R 49	51	55	50	53	59	62	63	61	54	49	54		
10	F	F	F	F	F	49	35	Z 50	A	50	A	46	47	A	A	A	56	58	60	65	60	50	50	F	A		
11	F	F	F	F	F	31	38	62	66	A	A	A	A	56	59	A	60	59	53	57	63	63	54	53	43		
12	A	F	F	F	37	39	43	51	72	63	50	55	58	58	58	61	60	54	61	74	84	83	F	A	S		
13	55	51	F	F	F	45	47	52	A	74	A	63	53	69	79	74	78	77	71	78	86	82	86	59	A		
14	A	A	F	F	F	40	35	42	47	58	55	A	57	A	A	A	66	71	71	74	75	70	67	52	57	52	
15	F	47	F	F	F	48	49	44	50	65	71	A	53	61	60	62	76	78	76	A	67	70	70	64	54		
16	F	50	48	45	46	48	54	45	55	64	61	63	54	55	65	68	72	71	73	S	66	54	55	56	55		
17	F	F	F	F	F	46	44	48	57	70	64	57	56	A	A	A	67	66	67	72	69	67	61	56	55		
18	56	53	F	F	F	42	54	62	75	65	57	55	60	66	66	69	67	66	68	68	I S 69	54	F	F			
19	F	F	S	S	43	41	53	63	R	70	60	57	58	66	64	65	63	74	80	85	77	47	49	F	49		
20	F	F	F	F	F	38	50	72	87	A	69	A	57	66	70	71	68	67	J A 70	78	64	F	F	F	60		
21	56	51	F	F	F	47	37	53	70	70	64	A	A	65	72	74	82	80	73	75	S	81	63	51	42	42	
22	F	F	F	44	A	A	S	56	78	71	68	58	52	61	70	69	75	71	71	69	73	S	77	52	50	43	
23	49	47	42	41	39	40	56	80	A	62	A	A	A	61	66	66	62	67	81	76	59	F	54	F	F		
24	F	F	F	F	43	40	52	81	V	60	51	60	71	60	61	64	I C 66	65	C	A	59	64	59	60	F		
25	58	53	53	33	30	30	50	66	67	53	53	59	62	64	63	59	53	61	66	66	66	66	66	64	59		
26	52	63	53	42	42	36	47	50	J R	41	55	E G	43	42	E G	E G	41	47	44	51	46	50	52	50	47	43	43
27	45	F	J R	U S	33	30	56	J S	A	A	51	59	59	57	46	63	52	52	62	80	70	54	52	46			
28	44	45	43	37	35	33	54	58	55	53	63	60	65	73	77	56	51	49	57	70	73	57	F	F	47		
29	A	F	F	F	F	F	34	52	63	67	A	60	A	58	61	61	58	59	A	66	73	67	51	45	45		
30	F	F	40	35	36	37	J R	J R	62	63	59	51	57	57	58	58	65	67	58	63	63	56	43	46	F		
31	A	34	36	36	33	32	40	43	55	55	55	61	70	67	62	65	62	C	C	C	C	C	C	C	C		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	19	23	23	26	24	25	26	23	23	19	22	20	23	22	23	26	26	24	24	26	26	25	22	13			
MED	50	47	45	42	38	38	52	62	62	53	57	56	59	60	63	63	64	64	66	68	66	54	52	48			
UQ	54	51	46	46	44	42	54	68	70	64	60	59	62	66	66	69	71	71	73	73	71	59	56	54	F		
LQ	45	44	42	36	35	35	48	53	55	53	51	52	55	55	60	58	56	58	58	63	61	51	43	46			

AUG. 1987

FOF2 (0.1 MHZ)

IONOSPHERIC DATA

AUG. 1987

FOF1 (0.01 MHZ)

135° E Mean Time (G.M.T. + 9h)

Station		ROKUBUNJI TOKYO		Lat.	35° 42' 4" N		Long.	139° 29' 3" E		Sweep 1 MHz to 25 MHz in 2 sec in automatic operation															
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								C	C	C	C	C	C	C	C	C	C	C	C	C					
2								C	C	C	C	C	C	C	C	C	C	C	C	C					
3								C	C	C	C	C	C	C	C	C	C	C	C	C					
4								C	C	C	C	C	C	C	C	C	C	C	C	C					
5								C	C	C	C	A	A	L	460	460	440	420	A	A	A				
6								A	370	420	420	A	A	A	A	A	A	I	C	L	A				
7								350	380	410	H	410	430	440	H	440	430	A	C	A	A				
8								L	A	A	A	420	450	440	A	A	U	A	A	A					
9								L	A	A	A	A	440	450	A	A	430	430	400	370	L				
10								A	A	A	A	A	430	440	A	A	A	430	410	380	L				
11								A	A	A	A	A	A	U	A	A	A	A	A	A	L				
12								400	430	A	450	450	450	450	A	A	U	A	A	380	310	L			
13								A	A	A	A	470	490	450	460	U	A	A	A	400	L				
14								A	A	A	A	460	A	A	A	A	460	440	430	A	A				
15								A	L	U	A	A	A	460	470	A	470	440	430	A	A				
16								L	A	A	U	A	A	440	470	450	450	450	400	380	A				
17								L	410	430	A	H	L	460	480	L	A	A	A	A	L				
18								L	L	430	430	A	U	A	470	470	440	470	A	A	A				
19								A	A	430	450	L	470	460	A	A	A	A	A	A					
20								A	A	A	A	A	A	460	470	H	450	430	A	A	A				
21								A	A	460	A	A	A	470	470	470	450	A	A	A					
22								A	L	L	L	440	450	470	L	470	450	470	U	A	A	L			
23								A	A	A	L	A	A	U	A	A	450	440	A	A	A				
24								L	A	A	A	U	A	450	460	A	460	U	A	C	A	C	A		
25								L	360	390	430	440	L	A	A	A	450	450	440	L	L	A			
26								H	300	360	380	400	430	410	430	410	410	410	380	360	L				
27								A	A	A	A	450	460	440	440	440	420	400	L	L	A				
28								A	L	L	L	410	430	440	A	450	440	440	430	L	L	L			
29								A	A	L	A	A	A	A	450	450	A	A	A	A					
30								L	A	A	A	440	480	A	430	430	440	A	A	A					
31								L	400	420	A	A	A	450	A	450	430	400	C	C					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							3	7	12	12	13	15	18	16	13	17	11	10	1						
MED							350	390	420	430	450	460	460	450	450	430	400	375	310	L					
UQ							355	400	430	440	450	470	470	460	460	440	425	380							
LQ							325	375	410	420	440	445	450	440	440	430	400	370	L						

AUG. 1987

FOF1 (0.01 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987

FOE (0.01 MHz)

135° E Mean Time (G.M.T. + 9h)

Station **ROKUBUNJI TOKYO** Lat. **35 42.4 N** Long. **139 29.3 E** Sweep 1 MHz to 25 MHz in 2 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
2						C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
3						C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
4						C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
5						C	C	C	C	A	A	A	A	A	A	A	A	A	A	A				
6						B	A	A	A	A	A	A	350	350	330	310	I C	230	240	A				
7						A	A	A	A	A	A	A	345	340	330	315	C	245	A					
8						A	205	255	A	A	A	A	A	A	A	A	A	A	250	A				
9						B	A	A	A	A	340	345	350	365	B	320	235	245	A					
10						B	A	A	A	A	A	340	365	355	335	315	290	260	A					
11						B	210	275	310	A	A	A	A	A	A	A	A	A	A					
12						B	A	270	A	A	A	345	360	355	350	330	295	260	180					
13						B	A	A	A	A	A	330	A	A	A	A	A	A	A					
14						B	220	270	305	A	A	A	A	A	A	A	340	300	260	A				
15						B	220	270	295	320	340	350	360	350	345	330	300	250	185					
16						B	200	255	290	295	A	A	A	360	A	A	305	260	A					
17						B	210	260	A	A	A	A	A	A	A	A	A	A	A					
18						B	205	A	A	A	A	A	A	360	340	325	290	A	B					
19						B	A	A	A	A	A	A	A	355	340	315	235	235	B					
20						A	A	A	A	A	A	A	A	A	340	325	290	A	A					
21						B	210	255	280	A	A	A	A	A	A	330	295	240	B					
22						B	225	A	A	330	345	360	360	350	340	335	290	230	A					
23						B	A	A	A	A	A	A	A	A	A	325	290	240	A					
24						B	A	250	A	A	A	A	A	A	I C	345	320	285	C	B				
25						B	200	265	300	315	A	A	A	350	A	A	230	240	A					
26						B	200	245	290	305	330	330	345	340	325	305	270	220	A					
27						B	200	A	A	A	A	A	A	345	330	305	275	215	B					
28						B	185	A	A	A	A	A	A	A	A	295	270	230	A					
29						B	190	245	275	300	A	A	350	340	330	310	270	A	B					
30						B	195	250	A	A	A	330	330	345	330	310	A	A	A					
31						B	200	255	285	310	A	325	A	A	335	310	280	C	C					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							16	14	9	8	5	8	10	15	15	20	20	17	2					
MED							202	255	290	310	340	342	350	350	335	318	288	240	182					
UQ							210	270	300	318	340	348	360	355	340	328	292	250						
LQ							200	250	285	302	330	330	345	345	330	310	280	235						

AUG. 1987

FOE (0.01 MHz)

IONOSPHERIC DATA

AUG. 1987

FOES (0.1 MHZ)

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

Station		RUKUBUNJI TOKYO		Lat.	35 42.4 N		Long.	139 29.3 E		Sweep 1 MHz to 25 MHz in 2 sec in automatic operation																		
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
2		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
3		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
4		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
5		C	C	C	C	C	C	C	C	C	D	C	J	A	J	A	J	A	J	A	J	A	J	A	J	A	58	
6		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	22
7		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	49
8		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	87
9		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	41
10		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	69
11		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	32
12		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	30
13		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	83
14		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	59
15		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	51
16		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	33
17		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	51
18		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	55
19		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	44
20		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	43
21		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	59
22		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	19
23		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	43
24		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	40
25		E	B	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	26
26		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	33
27		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	33
28		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	60
29		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	50
30		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	43
31		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	C
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT		26	26	26	26	26	26	26	26	26	27	27	27	27	27	27	26	25	25	26	25	25	25	25	26			
MED		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	44
UQ		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	58
LQ		J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	33

AUG. 1987

FOES (0.1 MHZ)

IONOSPHERIC DATA

AUG. 1987

FBES (0.1 MHz)

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

Station	Rokubunji Tokyo											Lat. 35 42.4 N Long. 139 29.3 E											Sweep 1 MHz to 25 MHz in 2 sec in automatic operation										
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C									
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C									
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C									
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C									
5	C	C	C	C	C	C	C	C	C	58	51	44	38	36	36	36	A A 61	37	48	45	29	30	30	16									
6	24	16	17	E B 14	E B 14	22	35	35	37	40	A A 62	A A 62	A A 52	50	A A 50	A A 62	C	31	36	C	C	C	E B 14										
7	15	19	19	21	E B 15	16	26	28	30	37	34	34	39	40	42	37	C	45	39	24	E B 13	22	32	39									
8	24	20	23	21	15	19	22	45	47	39	40	40	45	A A 71	42	46	45	29	53	18	27	32	22	A A 87									
9	32	19	22	19	22	25	25	A A 65	44	49	G	40	51	46	E B 35	34	34	34	25	28	22	17	20	17									
10	19	25	21	18	20	27	39	A A 75	44	A A 60	37	41	A A 50	A A 59	A A 62	36	35	26	25	15	21	26	39	A A 69									
11	24	19	E B 15	21	20	23	35	40	A A 62	A A 71	A A 72	A A 86	45	49	93	46	43	40	22	20	19	29	26	20									
12	A A 86	20	17	16	E B 14	18	22	32	36	42	43	37	40	41	47	57	43	27	21	32	36	34	A A 60	25									
13	19	E B 14	21	E B 14	E B 15	16	39	A A 79	51	A A 109	43	44	45	41	55	58	43	25	19	52	31	20	44	A A 83									
14	A A 107	A A 61	E B 14	E B 14	E B 15	E B 15	25	42	51	A A 80	44	A A 74	A A 102	A A 119	43	34	35	52	61	23	54	26	20	27									
15	24	E B 14	25	21	31	16	36	36	42	45	A A 111	41	41	49	44	38	41	54	A A 71	23	17	43	30	30									
16	19	E B 14	16	21	19	E B 14	26	39	50	44	54	48	42	38	33	31	23	G	G	44	31	23	19	36	24								
17	28	30	21	18	E B 13	E B 15	24	35	38	54	35	40	A A 37	A A 116	A A 81	62	59	42	23	E B 14	23	E B 14	E B 13	E B 13									
18	E B 14	29	23	16	E B 14	E B 14	23	27	34	39	49	47	45	39	36	45	54	45	36	24	55	47	36	26									
19	26	E B 14	E B 15	E B 15	29	24	38	47	33	37	39	45	39	50	54	53	44	42	37	35	16	19	37	26									
20	40	36	37	23	18	23	38	61	74	A A 113	64	A A 81	42	35	38	G 29	40	52	U A 44	41	23	40	30	28									
21	E B 14	23	21	26	E B 15	20	30	53	48	41	A A 90	A A 88	41	45	41	37	52	62	39	43	33	30	21	18									
22	18	33	E B 14	E B 15	A A 58	A A 51	G	26	32	41	37	37	38	38	41	45	32	33	18	20	E B 15	19	E B 15	E B 14									
23	E B 15	15	E B 14	E B 15	E B 15	22	44	56	A A 84	43	A A 64	A A 112	47	66	36	36	45	32	39	34	41	41	42	29									
24	27	19	18	20	E B 15	20	22	54	43	48	45	37	49	39	45	C	45	C	A A 60	51	E B 15	34	26	26									
25	E B 14	E B 14	23	E B 14	21	18	29	32	39	41	39	46	49	38	34	31	29	26	37	18	15	24	18	24									
26	21	E B 15	E B 14	17	E B 14	16	20	28	33	33	36	35	36	36	G	35	28	29	22	34	20	20	18	19									
27	E B 14	21	20	E B 13	E B 15	20	34	40	A A 74	A A 59	39	36	36	29	G	G	35	33	30	40	43	E B 14	26	21	22								
28	E B 13	E B 15	E B 14	E B 13	17	23	31	31	34	33	34	47	38	41	32	21	G 18	G 25	19	15	E B 14	E B 14	26	21									
29	A A 64	18	E B 14	17	14	E B 15	32	39	35	A A 54	53	A A 85	38	37	47	50	42	A A 74	27	E B 14	26	42	20	24									
30	28	20	E B 13	18	17	E B 15	22	31	41	51	40	40	46	37	37	30	44	48	37	39	24	20	26	27									
31	A A 81	24	21	17	E B 14	E B 14	20	31	35	40	51	47	41	60	35	32	32	C	C	C	C	C	C	C									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
CNT	26	26	26	26	26	26	26	26	26	27	27	27	27	27	27	26	25	25	26	25	25	25	25	26									
MED	24	19	18	17	15	18	28	39	42	44	43	44	42	41	41	36	42	37	37	28	23	26	26	24									
UQ	28	24	21	21	20	23	35	53	50	56	54	55	48	50	47	46	45	45	44	39	29	34	36	28									
LQ	15	E B 15	E B 14	E B 15	E B 14	E B 15	22	31	35	40	38	40	39	38	36	34	33	29	23	20	16	20	20	19									

The Radio Research Laboratory, Japan

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FBES (0.1 MHz)

IONOSPHERIC DATA

AUG. 1987

FMIN (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

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

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FMIN (0.1 MHz)

IONOSPHERIC DATA

AUG. 1987

M(3000)F2 (0.01)

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

Station		Tokubunji Tokyo								Lat. 35 42.4 N		Long. 139 29.3 E		Sweep 1 MHz to 25 MHz in 2 sec in automatic operation																
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C					
2		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C					
3		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C					
4		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C					
5		C	C	C	C	C	C	C	C	C	C	C	270	265	240	275	305	A	320	A	330	320	305	310	F	F				
6		320	310	F	320	340	335	330	310	330	305	A	A	A	A	A	A	C	330	325	C	C	C	C	295					
7		300	295	F	290	F	305	300	265	270	295	320	270	G	265	260	260	290	C	A	295	310	335	335	305	290	F			
8		F	F	F	F	J	F	310	330	325	335	325	335	300	305	A	A	295	280	295	R	J	S	320	335	320	305	A		
9		295	300	F	295	F	305	320	340	A	A	A	270	285	235	A	300	260	280	295	315	325	310	320	295	290	F	F		
10		F	F	F	F	F	F	Z	A	250	A	230	250	A	A	A	280	295	310	330	340	320	310	315	F	A	F			
11		F	F	F	F	F	F	325	355	A	A	A	A	285	A	A	295	315	315	320	315	320	315	320	315	320	310	F		
12		A	300	F	310	305	305	325	330	330	340	320	315	280	295	280	295	A	280	285	305	300	325	F	F	A	S			
13		330	295	F	295	325	335	300	A	320	A	305	255	290	295	305	295	305	295	295	290	285	330	305	A	A	F			
14		A	A	F	300	300	310	325	350	335	A	A	320	A	A	A	285	300	290	305	320	305	310	310	305	305	F			
15		F	315	F	285	F	295	325	335	345	295	325	315	A	330	295	295	280	300	300	320	A	305	300	300	295	F	350		
16		F	290	300	305	295	325	350	345	325	A	310	300	330	320	265	295	300	310	320	S	325	320	325	285	295	F	F		
17		F	285	F	300	F	295	310	310	315	305	325	325	305	295	A	A	A	A	A	315	315	325	315	325	315	305	F		
18		320	270	F	F	F	F	305	325	325	335	320	300	290	290	305	295	310	310	320	325	315	S	A	285	F	F			
19		F	300	F	S	S	300	325	340	275	340	325	280	285	305	305	300	285	305	315	330	345	325	300	F	F	F			
20		F	280	F	290	F	305	F	315	300	295	300	335	A	A	A	300	295	295	315	315	315	A	325	310	305	F	F		
21		305	300	F	F	F	F	335	330	365	330	A	A	295	295	295	295	305	320	320	330	S	345	305	320	325	F			
22		F	305	F	285	F	305	A	A	S	335	325	305	320	325	305	300	290	305	315	315	325	320	340	S	330	300	295		
23		300	315	315	305	325	305	350	335	A	335	A	A	295	A	300	310	315	320	305	325	325	325	295	F	F	F			
24		F	290	F	305	F	290	305	295	315	340	340	A	295	320	305	300	295	I	C	325	335	C	A	A	315	290	295	F	
25		310	315	325	325	305	320	300	350	350	330	260	310	300	320	305	315	305	305	325	300	285	285	285	320	F	F	F		
26		270	330	320	290	F	F	270	270	270	320	J	R	H	G	G	G	245	210	290	270	300	315	315	275	285	295	F		
27		320	290	F	J	R	U	S	305	305	280	315	J	S	A	A	330	300	305	285	310	330	305	285	290	320	335	325	315	285
28		285	300	320	310	305	270	325	330	335	320	310	310	290	310	320	R	315	325	295	300	315	325	325	F	F	F	F		
29		A	F	F	300	295	300	315	335	330	330	A	300	A	300	325	320	320	310	A	310	330	335	305	320	305	320	305	F	
30		F	F	310	320	310	300	325	J	R	J	R	330	335	320	345	220	305	305	295	295	305	320	320	305	305	340	320	285	F
31		A	315	315	325	315	325	345	315	340	325	A	295	315	A	310	320	320	C	C	C	C	C	C	C	C	C	C	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		19	23	23	26	24	25	26	23	20	17	19	20	22	18	23	24	23	23	22	24	24	23	21	18					
MED		300	300	300	302	308	315	325	330	332	320	300	292	295	295	295	300	305	315	318	320	320	310	305	305					
UQ		312	310	312	310	325	325	340	335	340	325	312	310	305	305	302	315	315	320	325	325	330	325	315	320					
LQ		F	F	F	F	F	F	305	300	305	312	325	315	275	262	290	280	292	292	298	300	305	308	310	300	295	295	F		

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M(3000)F2 (0.01)

IONOSPHERIC DATA

AUG. 1987

M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9h)

Station		ROKUBUNJI TOKYO		Lat. 35 42 4 N		Long. 139 29 3 E		Sweep 1 MHz to 25 MHz in 2 sec in automatic operation																	
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							C	C	C	C	C	C	C	C	C	C	C	C	C	C					
2							C	C	C	C	C	C	C	C	C	C	C	C	C	C					
3							C	C	C	C	C	C	C	C	C	C	C	C	C	C					
4							C	C	C	C	C	C	C	C	C	C	C	C	C	C					
5							C	C	C	C	A	A	L	390	395	400	405	A	A	A					
6							A	400	395	395	A	A	A	A	A	A	A	C	L	A					
7							345	370	400	H	370	405	395	H	380	370	A	380	C	A	A				
8							L	A	A	A	380	355	A	A	A	A	A	A	350	A					
9							L	A	A	A	395	395	A	A	385	380	395	A	L						
10							A	A	A	A	395	A	A	A	A	360	345	375	L						
11							A	A	A	A	A	A	A	A	A	A	A	A	A	L					
12							395	385	A	A	A	A	365	A	A	A	A	A	370	365	L				
13							A	A	A	A	365	A	A	365	A	A	A	A	375	L					
14							A	A	A	A	A	A	A	A	A	390	360	A	A						
15							A	L	A	A	A	385	355	A	A	A	A	A	A						
16							L	A	A	A	A	A	A	355	395	380	385	390	380	A					
17							L	350	A	A	H	L	A	A	A	A	A	A	A	L					
18							L	L	370	390	A	A	A	365	360	A	A	A	A						
19							A	A	395	395	L	A	385	A	A	A	A	A	A						
20							A	A	A	A	A	A	A	425	H	365	385	A	A	A					
21							A	A	365	A	A	A	370	A	350	355	A	A	A						
22							A	L	L	390	L	365	400	390	L	385	390	360	A	380	A	L			
23							A	A	A	L	A	A	A	A	A	365	350	A	A	A					
24							L	A	A	A	A	425	A	370	A	C	A	C	A						
25							L	340	370	A	A	L	A	A	375	335	380	L	L	L	A				
26							H	350	360	365	390	385	385	385	370	375	350	370	340	L					
27							A	A	A	A	385	380	395	395	395	350	365	L	L	A					
28							A	L	L	L	380	395	395	A	385	A	395	390	L	L	L				
29							A	A	L	A	A	A	375	385	A	A	A	A	A						
30							L	A	A	A	A	A	A	395	365	A	A	A	A						
31							L	360	A	A	A	A	A	A	A	370	375	360	C	C					
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	7	9	8	9	9	12	13	14	14	8	8	1						
MED							345	370	380	390	395	390	380	385	372	380	368	372	365	L					
UQ							348	392	395	395	395	395	385	395	335	335	385	373							
LQ							342	365	370	363	385	385	363	370	365	355	360	353							

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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H^oF₂ (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	OKUBUNJI TOKYO				Lat.	35 42.4 N							Long.	139 29.3 E							Sweep 1 MHz to 25 MHz in 24 sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
1						C	C	C	C	C	C	C	C	C	C	C	C	C	C													
2						C	C	C	C	C	C	C	C	C	C	C	C	C	C													
3						C	C	C	C	C	C	C	C	C	C	C	C	C	C													
4						C	C	C	C	C	C	C	C	C	C	C	C	C	C													
5						C	C	C	C	310	330	L	425	530	360	305	A	305	A													
6							330	345	280	305	A	A	A	E A	A	A	I C	330	305	E A												
7							420	410	335	295	380	G	420	440	440	365	C	A	320													
8							265	E A	E A	290	265	325	335	E A	A	355	395	340	315	E A												
9							260	A	E A	350	A	415	375	545	A	345	425	385	335	295												
10							365	A	465	A	L	470	A	A	A	390	340	295	260													
11							270	240	A	A	A	A	375	A	A	355	310	310	285													
12							260	265	310	320	375	355	390	355	A	390	335	290														
13							310	A	285	A	325	460	355	325	325	330	290	315	290													
14							270	A	A	310	A	A	A	A	360	315	325	305	E A													
15							E A	L	285	300	A	295	360	355	335	310	305	285	A													
16							260	E A	A	305	E A	280	305	425	340	330	305	280	E A													
17							305	L	320	275	295	315	355	A	A	A	A	E A	285	270												
18							270	L	275	260	245	A	365	365	320	335	310	E A	290	270												
19							255	265	260	275	380	L	375	320	325	E A	E A	310	285													
20							E A	E A	A	A	A	A	350	350	325	305	305	E A	A													
21							265	230	270	A	A	340	325	325	310	295	E A	A														
22						A	310	255	260	270	290	280	335	315	325	305	285	270	255													
23							E A	A	A	270	A	A	355	A	340	310	300	285	300													
24							L	255	255	A	350	290	325	330	330	C	270	C	A													
25							330	245	250	285	L	325	345	305	325	305	310	300	260													
26							375	300	760	365	G	L	G	G	475	610	365	405														
27							285	250	A	A	340	325	370	315	280	315	350	L	E A													
28							275	265	275	L	310	310	350	300	275	220	L	L	L													
29							260	265	260	A	E A	340	A	345	305	300	E A	A														
30							255	260	305	265	580	335	330	350	340	305	290	275														
31							310	265	290	A	350	295	E A	305	315	290	280	C	C													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
CNT							21	22	21	17	16	18	23	20	23	23	25	22	19													
MED							280	264	270	295	325	352	350	329	335	310	308	300	280													
UQ							320	288	282	305	365	375	366	394	355	354	328	315	295													
LQ							262	255	260	270	312	310	335	318	325	305	300	285	270													

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H^oF₂ (KM)

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H^oF (KM)

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

Station		R ^o KUBUNJI TOKYO										Lat. 35 42.4 N		Long. 139 29.3 E		Sweep 1		MHz to 25		MHz in 2		sec in		automatic operation	
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5		C	C	C	C	C	C	C	C	C	A	A	A	200	220	200	220	A	A	A	A	A	E	A	A
6		250	270	290	270	230	250	A	A	230	E	A	A	A	A	A	A	C	A	A	C	C	C	I	C
7		300	320	330	320	280	280	255	215	200	H	H	230	200	185	H	235	240	A	E	A	260	C	A	A
8		E	A	300	330	275	280	295	225	A	A	A	225	E	A	260	A	A	A	A	A	E	A	260	A
9		E	A	340	315	E	A	295	E	A	330	310	275	230	A	A	A	A	H	190	210	A	A	225	235
10		315	E	A	345	330	280	255	E	A	360	A	A	A	A	A	210	A	A	A	A	240	E	A	265
11		285	275	275	325	E	A	335	E	A	305	A	A	A	A	A	A	A	A	A	A	A	240	255	255
12		A	A	280	285	290	265	220	210	220	A	A	170	E	A	240	A	A	A	A	A	240	235	E	275
13		250	305	325	285	235	250	A	A	A	A	A	E	A	245	A	A	E	A	270	A	A	230	265	A
14		A	A	290	280	260	260	230	A	A	A	A	A	A	A	A	A	E	A	250	A	A	A	285	A
15		E	A	355	265	E	A	345	305	E	A	260	245	A	E	A	270	A	A	A	A	A	A	265	270
16		A	315	275	270	310	250	230	235	A	A	A	A	A	E	A	260	200	220	220	215	225	A	265	240
17		E	A	350	A	E	A	295	300	260	255	230	E	A	255	A	A	195	220	A	A	A	A	A	260
18		255	E	A	395	295	310	300	270	220	235	230	210	A	A	A	E	A	245	255	A	A	A	A	255
19		310	280	285	265	E	A	315	260	A	A	A	215	205	205	A	220	A	A	A	A	A	255	235	
20		A	A	A	E	A	305	300	310	A	A	A	A	A	A	A	A	185	H	240	225	A	A	A	255
21		270	A	305	305	305	250	E	A	290	E	A	245	A	A	E	A	240	A	A	A	230	A	E	A
22		285	A	265	275	A	A	240	215	215	E	A	245	205	215	210	215	E	A	260	A	225	A	240	
23		280	260	260	280	255	290	A	A	A	A	E	A	260	A	A	A	235	255	A	A	A	A	A	255
24		E	A	335	320	285	280	285	305	230	A	A	A	A	185	A	235	A	C	A	C	A	A	A	235
25		255	255	245	240	E	A	325	295	E	A	280	230	A	E	A	260	215	A	A	230	215	220	235	240
26		A	350	240	245	315	330	375	250	H	245	235	215	215	220	220	230	230	265	A	240	E	A	280	
27		240	E	A	330	280	265	295	E	A	360	A	A	A	A	230	210	225	210	205	H	260	E	A	240
28		315	295	260	275	300	A	A	A	235	230	215	205	A	225	A	215	220	215	235	265	250	235	235	
29		A	280	290	325	310	280	A	A	A	230	A	A	A	230	220	A	A	A	A	A	270	220	240	
30		E	A	360	285	255	295	305	250	240	230	A	A	A	380	A	205	235	A	A	A	A	E	A	
31		A	E	A	E	A	315	300	260	265	270	230	245	E	A	250	A	A	A	A	H	230	230	255	C
CNT		21	22	25	26	25	24	15	11	10	10	12	11	12	13	14	14	10	9	9	22	23	22	22	
MED		U	282	288	285	282	275	266	230	232	228	220	206	212	224	218	226	226	U	228	235	258	254	252	
UQ		E	A	A	295	308	302	290	240	240	A	A	230	E	A	245	218	219	234	232	238	260	E	A	
LQ		270	275	270	275	260	255	230	222	215	215	202	198	220	210	215	220	220	235	240	250	235	240	265	262

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H^oF (KM)

IONOSPHERIC DATA

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H^oE (KM)

135° E Mean Time (G.M.T. + 9h)

Station	ROKUBUNJI TOKYO				Lat.	35° 42' 4" N				Long.	139° 29' 3" E				Sweep 1 MHz to 25 MHz in 2.4 sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1						C	C	C	C	C	C	C	C	C	C	C	C	C	C							
2						C	C	C	C	C	C	C	C	C	C	C	C	C	C							
3						C	C	C	C	C	C	C	C	C	C	C	C	C	C							
4						C	C	C	C	C	C	C	C	C	C	C	C	C	C							
5						C	C	C	C	A	A	A	A	A	A	A	A	A	A							
6						B	A	A	A									C		A						
7						A												C								
8						A	120	115	120	115	115	115	115	115	115	115	A	A	A	A						
9						B	115	110	110	110	115	110	115	E B	135	B	115	120	115							
10						B	120	110	115	110	115		A E B	130	115	115	120	115	125							
11						B	125	120	115	115	115	115	110	115		A	A	A	A	A						
12						B	A	115	115	115		A	115	115	110	115	110	115	115	125						
13						B	A	110	110	115	115	110	115		A	A	A	A	A	A						
14						B	115	115	115		A	A	A		115	115	115	115	120	120	125					
15						B	120	110	115	110	115	110	115	115	115	115	E A	125	115	120						
16						B	120	115	115	115	110	A	A		A	A	E A	125	120	120						
17						B	120	115	110	115		A	A	A	A	A	A	A	A	A						
18						B	A	A	A	A		330	110	115	110	115	115	110	115				B			
19						B	110	110		A	A	115	115	A	115	110	115	115	115				B			
20						A	115	110	110	110	115		A	A	E A	E A	E A	E A	A	A						
21						B	115	110	110	110		A	A	A	A	A	115	110	115				B			
22						B	120	115	110	115	115	115	120	120	115	115	115	110	115							
23						B	A	A	A	A	A	A	A	A	A		110	110	125	E A	A					
24						B	115	110	115	115	115	110	115	110	115		C	115	C	B						
25						B	120	110	115	115	110	115	110		A	A	A	E A	E A	A						
26						B	120	110	115	110	115	110	115	115	115	110	115	115	120							
27						B	120	115	110	115	115	110	115	E A	130	115	110	115	115				E			
28						B	120	115	110		A	A	A	A	A		120	115	130	E A	A					
29						B	120	115	115	110	110	115	120	115	115	115	115	115	115				B			
30						B	120	115	120	115	115	120	110	115	E A	A	A	A	A				A			
31						B	120	115	110	115	115	115	110		A	115	110	E A	C	C						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT							21	23	22	21	19	18	19	17	17	18	19	18	7							
MED							120	115	115	115	115	115	115	115	115	115	115	115	120							
UQ							120	115	115	115	115	115	115	115	115	115	118	118	125							
LQ							115	110	110	110	112	110	115	110	115	110	115	115	120							

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H^oE (KM)

IONOSPHERIC DATA

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H°ES (KM)

135° E Mean Time (G.M.T. + 9h)

Station ROKUBUNJI TOKYO		Lat. 35° 42' 4" N		Long. 139° 29' 3" E		Sweep 1 MHz to 25 MHz in 2 sec in automatic operation																						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
6	110	110	110	105	110	110	125	120	120	110	110	110	120	130	130	120	C	120	120	C	C	C	C	115				
7	110	110	115	110	115	125	115	115	115	110	115	115	E G 165	145	140	135	C	120	115	120	125	115	115	115				
8	110	110	105	115	120	125	120	115	115	115	110	110	115	110	115	125	125	120	110	110	110	110	110	110				
9	110	110	110	110	115	120	110	115	115	115	G	150	130	125	B	140	130	120	120	115	110	115	110	115				
10	110	110	110	110	125	125	120	115	115	110	120	160	145	130	125	140	130	135	125	120	110	110	115	105				
11	105	105	125	110	115	120	120	120	120	110	115	110	110	110	105	105	105	105	110	105	105	110	115	110				
12	115	125	110	100	105	110	115	115	115	115	110	120	155	150	130	120	125	130	120	110	115	115	110	105				
13	105	110	105	105	130	125	115	110	110	110	115	110	110	110	105	110	105	105	110	115	115	115	115	115				
14	110	110	110	120	110	B	135	130	115	115	115	110	110	115	115	160	140	125	115	120	120	120	115	105				
15	110	110	110	110	110	135	130	120	120	115	115	125	130	125	140	145	130	115	120	115	115	115	110	110				
16	110	100	105	105	110	100	120	115	115	115	105	105	110	125	105	105	105	G	115	110	110	120	110	110				
17	100	100	100	100	B	105	125	110	115	110	110	110	110	110	105	105	105	100	105	100	115	130	115	115				
18	110	110	105	110	B	120	160	110	110	115	110	110	110	160	160	130	120	120	120	115	120	110	110	110				
19	110	130	120	120	110	115	110	110	110	115	110	110	155	125	120	120	120	120	110	110	110	110	105	105				
20	110	105	110	105	110	115	115	110	110	110	110	110	105	110	145	110	125	120	115	110	115	110	110	110				
21	105	100	110	115	115	105	115	110	110	110	110	110	105	110	110	140	120	115	115	115	110	105	115	115				
22	110	110	110	110	110	G	115	115	E G 190	145	145	135	135	130	120	125	110	110	105	100	105	115	110					
23	105	105	100	100	110	115	110	110	105	110	110	105	105	105	110	145	115	120	115	110	110	110	105	110				
24	110	105	125	110	120	110	120	110	110	110	110	110	115	115	130	C	115	C	115	115	110	115	115	110				
25	B	110	110	120	130	130	125	120	115	115	115	110	110	145	110	105	E G 195	140	115	115	115	115	110	110				
26	110	110	155	130	135	125	130	115	125	120	120	130	155	145	G	125	155	120	115	115	110	115	105	105				
27	115	110	110	115	125	125	115	115	110	115	115	115	110	110	G	140	125	115	115	110	100	105	100	100				
28	100	105	105	110	115	110	115	110	105	115	110	105	105	105	115	110	105	145	130	120	115	105	115	110				
29	110	110	110	105	115	125	120	115	120	110	110	105	125	130	120	115	115	115	110	115	105	105	105	110				
30	105	105	105	100	100	105	120	115	120	115	120	125	115	150	145	110	105	105	105	105	120	115	110	110				
31	110	105	105	105	105	115	125	120	120	115	115	115	115	110	E G 175	145	130	C	C	C	C	C	C	C				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	25	26	26	26	24	25	25	26	26	27	26	27	27	27	24	26	25	24	26	25	25	25	25	26				
MED	110	110	110	110	115	115	120	115	115	115	110	110	112	125	119	120	120	120	115	115	110	110	110	110				
UQ	110	110	110	115	120	125	125	115	120	115	115	118	129	132	132	140	128	120	120	115	115	115	115	110				
LQ	105	105	105	105	110	110	115	110	110	110	110	110	110	110	110	110	110	112	110	110	110	110	110	110				

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H°ES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987

TYPES OF ES

135° E Mean Time (G.M.T. + 9h)

Station		Rokubunji							Tokyo							Lat. 35° 42' 4" N		Long. 139° 29' 3" E		Sweep 1		MHz to 25		MHz in 2		sec in		automatic operation	
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1																													
2																													
3																													
4																													
5										C2	C2	C2	C1	C2	C1	C2	C3	C2	L2	F5	F5	F4	F4	F5					
6		F4	F3	F3	F2	F1	L2	C3	C2	C2	C2	C2	C1	H1	H1	H2		C3	C2					F2					
7		F2	F2	F2	F3	F2	L2	C3	C2	C2	C2	C1	C1	H1	H1	H2		C3	C4	F5	F1	F2	F5	F5					
8		F4	F4	F4	F3	F3	L1	C2	C4	C2	C3	C3	C2	C2	C3	CL22	CL24	CL23	C3	F2	F3	F4	F4	F3					
9		F4	F3	F4	F3	F4	L4	C4	C3	C3	C2		H1	H2	H1	H2	H2	H4	C3	F4	F4	F5	F4	F4					
10		F4	F4	F4	F3	F2	C2	C4	C4	C4	C3	C2	HC11	H2	H3	H2	H2	H3	C1	C2	F1	F5	F5	F6	F5				
11		F3	F2	FF22	FF21	FF32	C4	C4	C4	C4	C3	C3	C4	C2	C3	L3	L3	L3	L3	L2	F4	F3	F3	F4					
12		F4	FF3	F3	F3	F2	LC12	L2	C3	C3	C2	C2	C1	H1	H1	H2	H3	H3	H3	C3	F4	F4	F4	FF23	F2				
13		F2	F2	F3	F2	FF11	C1	C4	C4	C3	C3	C2	C3	C2	L2	L3	L4	L4	L2	L2	F4	FF42	FF32	F4	F5				
14		F4	F3	F2	F1			H2	H3	C2	C2	C2	C2	C4	C3	C2	H1	H2	H4	C4	F3	F5	F4	F4	F4				
15		F4	F3	F4	F3	F5	LC11	C3	C3	C3	C3	C1	C1	H2	H2	H1	HH21	C4	C5	F3	F3	F4	F4	F4					
16		F3	F2	F2	F4	FF13	L2	C3	C3	C3	C3	C3	L2	L2	C1	L2	L2	L1		C3	F3	F3	F4	F5	F3				
17		F5	FF13	F3	F3		L1	H1	C4	C3	C3	L2	L2	L3	L3	L3	L4	L4	L5	L3	F2	F5	FF11	F3	F3				
18		F4	F4	F4	F4		L1	HL12	L3	L3	C2	C3	C3	C2	HC11	H1	HL21	C3	C3	C4	F4	FF42	F4	F4	F4				
19		F3	FF12	FF21	F2	F3	C2	C3	C3	L2	C1	C2	C3	HC11	H2	H3	H3	C4	C4	C4	F5	F4	F3	FF24	F3				
20		F5	F5	F4	F4	F5	L5	C5	C4	C4	C3	C3	C3	L2	L2	HL12	L2	HL32	CL43	CL53	FF53	F4	F4	F5	F5				
21		F3	F4	F4	F5	FF24	L3	C4	CL41	C4	C2	L3	L3	L2	L3	L2	C2	C4	C4	C6	FF42	F3	F4	FF32	F3				
22		F3	F5	F3	F3	F3	L3		C2	C1		H1	H1	H1	H1	H2	C2	H2	C4	C2	F3	F2	F2	F2	F2				
23		F2	F4	F2	F3	FF22	L3	L4	L4	L3	L2	L4	L3	L3	L4	L2	H2	C3	CL32	CL23	FF24	FF25	F5	F4	F5				
24		FF24	F4	FF13	F5	F2	L3	C2	C4	C2	C3	C3	C2	C3	C2	H2		C3		C4	F4	F3	F4	F4	F3				
25			F2	F4	F2	F4	C2	C3	C3	C3	C2	C2	C3	C3	HL12	L3	L2	HL12	HL22	CL42	F4	F2	F5	F4	F4				
26		F4	F3	F1	F4	F2	C1	C2	C3	C2	C1	C1	C1	H1	H1		H2	H1	H4	C4	F5	F5	F4	F5	F3				
27		F2	F3	F3	F2	F2	L2	C4	C3	C3	C2	C2	C2	C2	L2		H2	C2	C3	C5	F4	F2	F5	F4	F4				
28		F3	F2	F1	F1	F3	L5	C4	C4	C4	L2	L2	L3	L3	L2	L1	L2	L2	HL22	HL12	F2	F1	F3	F5	F5				
29		F5	F5	F2	F3	F2	C2	C4	C4	C3	C3	C3	C3	C1	C1	C2	C2	C4	C3	C5	F2	F4	F4	F4	F3				
30		F4	F3	F2	F3	F3	L1	C1	C1	C2	C2	C1	C1	C2	H1	HL11	LH31	L4	L3	L3	F3	FF24	FF23	F4	F5				
31		F5	F3	F3	F3	F3	L1	C1	C3	C3	C3	C3	C3	C2	L3	H1	H1	HL21											
		00	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																													

AUG. 1987

TYPES OF ES

IONOSPHERIC DATA

AUG. 1987

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station Hour Day	YAMAGAWA				Lat.	31 12 1 N Long 130 37 1 E						Sweep 1 MHz to 25 MHz in 24sec 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	X 52	A		53	47	46	X 36														X 63	X 58	X 57	X 59	
2	X 61	X 59	X 56		50	47	45														X 71	X 65	X 61	X 62	
3	X 58	56	60		53	50	46														X 68	X 58		60	57
4	56	55	50		47	44	X 54						81								X 68	X 69	X 65	X 61	
5	X 55	X 56	X 59	X 47	X 47	X 39	X 34														X 66	X 59	X 54	55	
6	A		64	52	55	51	X 36														X 62	X 61	X 55	X 49	
7	X 50	X 50	X 46	X 44	A	X 38															X 75	X 62	X 43	50	
8	X 43	48	43	X 42	X 38	X 36															X 76	X 59	A	A	
9	A		46	44	47	44	X 44														X 80	X 64	X 54	X 56	
10	55	54	55		X 47	X 49	X 43														X 63	X 58	X 57	55	
11	52	47	40	40	40	36	56														X 83	X 62	X 53	50	
12	53	55	51	45	44	40															X 79	70	67	72	
13	70	69	60	60	64	56															X 91	X 97	X 56	A	
14	A		45	43	S	50	A														X 69	70	79	71	
15	71	69	60	60	X 37	X 36	44					89									X 86	X 81	X 64	65	
16	70	60	65	68	63	58															X 69	U 63	X 64	X 47	
17	53	55	54	52	50	X 39															X 79	X 71	X 60	X 59	
18	X 56	54	62	56	60	56															X 71	X 59	X 53	X 51	
19	55	56	54	53	45	47															X 59	X 57	X 58	X 54	
20	X 56	X 49	X 49	52	47	X 43															X 86	X 62	60	63	
21	64	60	63	53	50	44															X 64	X 49	X 46	X 45	
22	52	50	50	48	46	45															X 83	X 63	X 58	X 58	
23	X 56	X 55	X 55	X 51	X 50	X 42															X 80	X 45	A	48	
24	X 48	X 47	X 50	X 46	X 42	X 47															X 69	X 70	X 70	X 66	X 63
25	75	X 69	X 65	X 60	X 52	X 44															X 85	X 77	X 78	X 80	X 80
26	X 68	X 93	X 54	U 42	X 61	X 60	61	50													X 63	X 56	X 49	X 50	A
27	X 55	X 46	X 45	44	50	50	61														X 101	X 81	X 60	X 50	X 47
28	X 47	X 49	X 46	X 42	X 41	X 40															X 84	X 91	X 65	X 57	X 47
29	X 46	X 44	X 40	X 39	X 38	U 40															X 93	X 75	X 51	X 50	X 44
30	50	49	46	41	40	37															X 75	X 77	X 72	X 51	54
31	40	50	60	50	46	40															X 71	X 67	X 45	X 55	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	30	31	30	30	30	4	1		1			1							7	31	31	29	28	
MED	55	54	53	48	46	43	58	50		89			81								X 84	X 75	X 62	X 57	X 55
UQ	60	59	60	53	50	47	61														X 39	X 80	X 70	X 61	X 62
LQ	51	49	46	44	42	38	50														X 72	X 68	X 58	X 53	X 50

AUG. 1987

FXI (0.1 MHz)

IONOSPHERIC DATA

AUG. 1987

FOF2 (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station	YAMAGAWA				Lat.	31 12.1 N			Long.	130 37.1 E			Sweep 1 MHz to 25 MHz in 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	46	A	F	F	F	30	39	58	A	66	A	60	70	79	89	93	97	103	92	73	57	52	51	53								
2	55	53	50	F	F	F	46	52	61	H	60	63	60	62	A	A	71	71	70	74	H	76	65	59	55	56						
3	S	F	F	F	F	F	46	52	51	64	A	A	66	75	A	68	77	91	39	67	S	62	52	F	F							
4	F	F	F	44	41	38	48	53	65	54	A	A	66	75	66	60	62	56	S	54	51	50	62	63	59	55						
5	S	S	50	53	41	33	28	38	46	72	61	A	57	59	51	53	68	65	57	A	56	60	53	S	43	F						
6	A	F	S	F	45	30	41	54	53	53	R	48	51	51	50	58	60	62	60	56	57	S	56	55	S	J	S	43				
7	44	44	40	S	A	32	39	46	54	53	51	49	55	52	55	54	54	56	59	67	69	56	37	F								
8	S	F	S	S	32	30	39	60	59	A	50	55	54	55	53	62	68	75	81	75	70	S	53	A	A							
9	A	F	S	F	F	S	38	39	55	52	54	49	53	56	61	67	63	64	68	69	69	74	S	58	49	50						
10	F	F	F	41	43	37	44	60	57	47	47	50	50	A	55	62	67	76	67	57	57	52	U	S	51	F	47					
11	F	F	F	F	U	F	J	S	F	A	53	56	U	R	54	57	62	66	78	31	83	69	67	77	U	S	J	F	41			
12	F	F	F	F	U	F	U	F	42	65	55	50	61	59	56	59	66	70	70	75	30	80	73	F	F	F						
13	F	F	F	J	F	J	F	48	44	60	A	A	53	A	64	76	81	89	90	85	89	86	34	S	91	S	A					
14	A	F	U	F	I	S	F	A	49	60	59	A	63	70	A	A	72	37	35	89	95	83	63	J	F	62	F	F				
15	F	F	F	F	31	29	F	36	50	68	F	80	59	52	56	65	69	70	77	85	85	78	80	75	53	F						
16	F	F	F	U	F	F	H	43	50	54	67	67	60	55	61	63	78	36	79	73	A	U	S	J	S	U	S	41				
17	F	F	F	F	F	33	43	60	69	I	C	70	60	57	62	60	67	H	77	81	80	81	82	73	65	54	53					
18	50	F	F	F	F	F	53	64	69	V	64	57	53	59	65	63	66	72	80	72	75	65	53	47	S	45						
19	F	F	F	F	F	F	48	54	68	66	54	62	69	62	61	67	84	94	92	67	53	51	52	48								
20	50	43	43	F	F	37	37	43	67	82	74	61	60	62	72	77	32	74	74	78	83	80	56	F	F							
21	F	F	F	F	F	F	43	71	57	A	A	H	57	A	75	80	38	93	92	102	R	U	R	96	58	43	40	S	39			
22	F	F	F	F	F	F	49	67	68	H	58	57	58	67	67	70	83	96	88	90	98	77	57	52	52							
23	50	49	49	45	44	36	47	48	62	59	54	57	61	62	65	65	74	71	73	88	74	39	S	A	F							
24	S	41	S	F	S	F	38	48	68	59	55	59	A	A	65	71	75	77	65	63	63	64	64	60	S	57						
25	F	S	S	S	S	S	46	38	44	77	H	A	A	A	A	A	61	67	74	79	79	71	72	S	75	S	76					
26	S	S	U	S	F	F	F	F	54	43	45	E	G	A	50	52	54	49	47	52	57	50	J	S	S	A						
27	S	J	S	39	33	F	F	F	65	51	55	59	69	69	64	70	30	69	H	71	76	S	75	S	55	44	41					
28	S	S	S	36	35	34	40	57	61	58	62	62	73	86	71	62	55	55	62	78	86	59	51	S	41							
29	S	40	38	34	33	32	U	S	34	41	60	65	A	61	70	61	67	71	67	63	75	81	87	70	45	44	37					
30	F	F	S	35	34	31	41	S	63	51	58	S	54	60	53	65	77	85	93	78	69	70	66	45	F							
31	F	F	U	F	F	U	F	30	36	58	61	55	52	65	72	69	74	R	70	63	66	64	65	65	U	S	S	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	16	15	22	21	15	21	29	30	28	24	25	27	26	27	28	31	31	31	30	30	31	30	25	18								
MED	48	44	43	39	35	33	43	60	60	58	57	57	61	64	67	70	72	75	77	75	69	56	50	43								
UQ	50	50	48	44	40	37	47	65	66	65	61	61	67	68	71	78	82	85	85	83	74	62	54	53								
LQ	42	40	39	36	32	30	40	54	54	53	52	54	56	60	60	62	64	67	67	67	62	52	45	S	41							

AUG. 1987

FOF2 (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987

F0F1 (0.01 MHz)

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

Station	YAMAGAWA				Lat.	31 12 1 N				Long.	130 37 1 E				Sweep	1 MHz to 25 MHz in 2 sec in				automatic operation				
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	A	A	A													
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
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31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								8	13	17	19	25	18	23	26	23	23	22	3					
MED								36.5	41.0	43.0	45.0	46.0	46.0	46.0	46.0	45.0	43.0	40.0	35.0					
UQ								40.0	42.0	43.0	45.0	47.0	47.0	47.0	47.0	45.0	44.0	41.0	35.5					
LQ								35.0	40.0	42.0	44.0	45.0	46.0	45.0	45.0	44.0	42.5	40.0	35.0					

AUG. 1987

F0F1 (0.01 MHz)

IONOSPHERIC DATA

AUG. 1987

FOE (0.01 MHZ)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA				Lat.	31 12' 1" N						Long.	130 37' 1" E						Sweep	1 MHz to 25 MHz in 2 sec in		automatic operation			
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							S	240	A	A	A	A	A	A	A	A	315	A	A	S					
2							170	240	A	A	A	A	A	A	345	330	300	A	A	S					
3							A	A	295	315	A	350	360	350	A	A	A	280	225	S					
4							S	A	A	A	A	A	U A	U A	U A	U A	300	275	210	S					
5							165	235	270	A	A	A	A	A	A	335	300	270	A	S					
6							S	H	225	260	295	A	A	P	350	345	340	330	310	A	A	S			
7							S	A	A	A	A	350	350	350	H	340	330	300	270	J A	220	S			
8							S	240	A	310	A	A	R	U A	A	A	A	A	A	A	S				
9							S	A	A	U A	320	340	U A	350	355	360	350	330	300	270	210	S			
10							S	A	225	255	A	A	U A	U R	350	360	350	H	H	300	250	200	S		
11							S	A	240	270	300	A	A	360	A	345	A	A	A	A	S				
12							S	A	A	A	A	A	U A	360	350	350	R	R	310	280	210	S			
13							S	A	A	A	A	A	A	U A	370	A	A	A	A	A	S				
14							S	H	245	285	305	A	320	A	A	A	A	305	260	215	S				
15							S	A	250	295	305	A	U A	U R	350	360	355	R	R	305	H	280	215	S	
16							S	A	275	305	320	A	A	360	365	355	R	R	305	270	215	S			
17							170	240	285	C	A	A	A	345	U R	330	325	305	275	220	S				
18							S	225	280	305	A	A	A	A	340	325	305	A	A	S					
19							S	225	A	A	A	A	A	A	A	A	340	305	260	200	S				
20							S	A	260	A	A	A	A	A	A	330	A	A	A	S					
21							S	A	A	A	A	A	A	360	350	335	310	275	A	S					
22							S	A	A	A	335	350	355	A	A	345	300	260	200	S					
23							S	A	280	A	A	A	A	A	A	A	300	255	195	S					
24							S	A	A	A	320	340	A	A	A	U A	A	A	A	S					
25							S	220	280	310	320	330	A	A	A	A	A	A	A	S					
26							S	210	270	295	310	340	355	360	R	355	320	290	250	200	S				
27							S	A	250	A	A	A	350	R	340	320	295	250	195	S					
28							S	A	A	A	A	A	A	A	A	A	A	A	250	195	S				
29							S	225	260	295	310	I R	330	B	U A	360	345	320	295	250	A				
30							S	220	H	290	A	A	A	U A	R	350	330	310	H	A					
31							S	H	220	275	A	330	A	A	A	U A	330	315	295	255	190	S			
CNT									3	17	13	12	9	10	15	16	13	22	23	21	17				
MED									170	225	275	305	320	350	355	358	345	330	300	260	210				
UQ									170	240	285	310	330	U A	350	360	360	350	335	305	275	215			
LQ									168	225	260	298	320	340	350	350	340	325	300	250	200				

AUG. 1987

FOE (0.01 MHZ)

IONOSPHERIC DATA

AUG. 1987

FOES (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

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

AUG. 1987

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987

FBES (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station	YAMAGAWA				Lat.	31	12	1	N	Long.	130	37	1	E	Sweep	1	MHz to	25	MHz in	2	sec in	automatic operation			
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		35	A A 70	32	E S 16	E S 16	20	20	32	A A 121	33	A A 130	41	40	38	36	35	34	35	29	29	34	20	25	23
2	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	22	30	38	43	43	19	40	A A 74	A A 81	44	63	33	35	26	E S 16	E S 16	19	18	
3	29	29	30	27	E S 16	E S 16	30	32	41	49	A A 85	A A 81	42	65	A A 170	44	40	35	39	25	34	36	25	32	
4	20	30	E S 16	18	E S 16	19	27	22	31	A A 73	A A 65	39	37	39	38	39	44	50	39	25	20	E S 16	18	E S 16	
5	22	E S 16	E S 16	E S 16	E S 16	19	E S 16	22	44	36	42	A A 111	41	47	45	49	44	61	44	A A 76	41	29	21	24	17
6	A A 76	25	E S 16	18	17	16	22	25	31	33	36	36	49	38	45	38	35	29	24	31	41	25	25	E S 16	
7	E S 16	E S 16	E S 16	21	A A 52	E S 16	17	24	30	32	36	37	39	40	43	37	34	39	40	31	E S 16	E S 16	E S 16	E S 16	
8	E S 16	E S 16	25	17	E S 16	E S 16	19	28	40	A A 79	44	40	39	46	40	37	42	34	41	48	40	41	A A 101	A A 64	
9	A A 58	E S 16	E S 16	E S 16	20	E S 16	18	24	34	32	37	40	51	47	43	44	39	40	31	24	29	E S 16	26	E S 16	
10	E S 16	E S 16	E S 16	E S 16	17	E S 16	18	36	44	32	37	41	49	A A 70	53	49	57	33	34	46	E S 16	17	26	E S 16	
11	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	27	31	A A 57	36	36	46	46	41	44	54	42	49	68	50	34	32	24	E S 16	
12	E S 16	E S 16	17	17	E S 16	E S 16	21	27	34	34	42	40	40	47	44	49	49	36	55	50	33	53	52	E S 16	
13	36	25	21	16	E S 16	19	35	37	A A 136	A A 107	50	A A 60	59	36	37	53	36	57	44	31	31	17	40	A A 51	
14	A A 51	25	30	17	23	A A 42	39	41	37	A A 64	54	45	A A 168	A A 83	37	39	G	G	17	E S 16	19	32	60	E S 16	
15	E S 16	E S 16	25	18	29	22	22	33	42	47	41	41	41	42	33	47	67	G 22	G	E S 16	E S 16	E S 16	26	41	
16	20	E S 16	53	16	17	21	18	27	40	52	48	39	41	35	41	G	G	39	27	A A 96	33	A A 78	E S 16	26	
17	37	21	20	E S 16	20	E S 16	19	29	32	C	34	35	36	40	33	63	51	40	24	20	E S 16	19	E S 16	E S 16	
18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	G	33	33	35	37	42	40	33	38	34	28	24	35	35	17	20	E S 16	
19	19	24	20	30	E S 16	E S 16	E S 16	29	33	49	38	44	40	41	43	40	46	56	80	50	35	30	21	28	
20	E S 16	23	25	25	E S 16	E S 16	24	43	61	41	35	42	52	50	42	G	31	35	32	25	27	24	25	32	
21	23	25	E S 16	23	18	27	21	42	50	A A 80	A A 99	45	A A 75	39	47	31	61	55	64	50	26	28	17	E S 16	
22	23	29	E S 16	E S 16	20	E S 16	E S 16	29	30	34	39	37	37	40	38	37	40	31	G	E S 16	E S 16	E S 16	18	E S 16	
23	E S 16	E S 16	E S 16	E S 16	E S 16	19	E S 16	G	40	37	45	45	53	59	59	45	34	53	41	30	20	24	A A 44	24	
24	26	26	22	26	17	20	17	64	48	46	51	A A 94	A A 88	44	43	34	45	34	35	34	E S 16	E S 16	E S 16	E S 16	
25	34	E S 16	E S 16	19	E S 16	E S 16	E S 16	49	53	A A 59	A A 77	A A 129	A A 138	A A 79	A A 86	46	40	35	25	26	E S 16	E S 16	21	21	
26	20	E S 16	23	17	22	25	34	25	30	32	36	39	A A 44	G	G	35	31	30	24	31	29	29	24	A A 84	
27	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	32	34	47	34	34	35	32	G 34	G	35	31	33	33	31	30	37	E S 16	19	
28	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	20	35	50	42	36	40	36	35	44	35	30	G 20	21	E S 16	E S 16	E S 16	E S 16	E S 16	
29	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	23	49	51	A A 83	39	46	59	39	37	35	46	46	60	50	E S 16	20	E S 16	E S 16	
30	23	20	E S 16	E S 16	E S 16	E S 16	G	25	G	32	35	33	35	G 30	38	35	31	28	20	E S 16	E S 16	E S 16	21	30	
31	18	22	22	32	E S 16	E S 16	18	G	33	37	41	41	53	41	36	34	32	26	22	25	31	18	E S 16	E S 16	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	20	E S 16	E S 16	16	E S 16	E S 16	20	30	40	42	41	41	42	41	42	38	40	35	33	31	27	20	21	E S 16	
UQ	28	25	22	18	18	19	24	36	49	52	50	45	52	47	44	44	46	42	41	44	33	30	26	27	
LQ	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	18	25	33	33	36	38	40	38	38	35	33	30	24	25	E S 16	E S 16	16	E S 16	

AUG. 1987

FBES (0.1 MHz)

IONOSPHERIC DATA

AUG. 1987

FMIN (0.1 MHZ)

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

Station	YAMAGAWA				Lat.	31 12 1 N				Long.	130 37 1 E				Sweep	1 MHz to 25 MHz in 2 sec in		automatic operation							
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	18	18	22	22	20	20	19	19	15	E S	E S	E S	E S	E S
2	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	19	20	20	20	20	18	16	16	E S	E S	E S	E S	E S	
3	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	20	20	21	19	20	20	17	16	13	E S	E S	E S	E S	E S
4	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	17	20	27	19	19	19	18	18	15	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	E S	13	16	16	17	18	22	20	21	17	18	16	16	E S	E S	E S	E S	E S
6	E S	E S	E S	E S	E S	E S	E S	E S	15	15	16	18	17	20	21	19	17	16	16	15	E S	E S	E S	E S	E S
7	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	17	21	21	23	20	19	17	16	16	E S	E S	E S	E S	E S
8	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	17	22	24	33	25	18	18	26	16	E S	E S	E S	E S	E S
9	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	19	18	20	26	20	17	17	16	16	E S	E S	E S	E S	E S
10	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	16	17	28	21	21	17	17	15	16	E S	E S	E S	E S	E S
11	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	17	20	22	20	20	18	16	16	16	E S	E S	E S	E S	E S
12	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	19	19	23	21	21	22	16	16	14	E S	E S	E S	E S	E S
13	E S	E S	E S	E S	E S	E S	E S	E S	16	16	20	17	21	22	24	20	18	16	16	16	E S	E S	E S	E S	E S
14	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	18	20	23	21	21	17	16	16	16	E S	E S	E S	E S	E S
15	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	19	20	22	21	21	21	17	15	15	E S	E S	E S	E S	E S
16	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	16	20	20	23	20	17	16	15	12	E S	E S	E S	E S	E S
17	E S	E S	E S	E S	E S	E S	E S	E S	16	16	C	18	20	22	20	20	18	16	17	15	E S	E S	E S	E S	E S
18	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	21	21	21	20	21	17	16	17	15	E S	E S	E S	E S	E S
19	E S	E S	E S	E S	E S	E S	E S	E S	16	15	16	17	18	22	22	22	18	18	16	16	E S	E S	E S	E S	E S
20	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	18	18	21	20	18	20	17	16	16	E S	E S	E S	E S	E S
21	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	18	22	21	21	20	21	16	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	E S	15	16	16	20	21	21	22	22	30	17	17	16	E S	E S	E S	E S	E S
23	E S	E S	E S	E S	E S	E S	E S	E S	16	15	17	21	22	24	21	22	17	16	16	16	E S	E S	E S	E S	E S
24	E S	E S	E S	E S	E S	E S	E S	E S	16	18	21	20	20	22	20	22	22	17	17	16	E S	E S	E S	E S	E S
25	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	17	20	13	19	13	20	16	16	16	E S	E S	E S	E S	E S
26	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	19	20	23	21	19	17	17	16	16	E S	E S	E S	E S	E S
27	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	18	21	24	21	21	18	16	16	16	E S	E S	E S	E S	E S
28	E S	E S	E S	E S	E S	E S	E S	E S	16	16	17	18	19	22	23	19	20	16	16	16	E S	E S	E S	E S	E S
29	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	20	19	34	22	20	17	16	16	E S	E S	E S	E S	E S	
30	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	19	21	20	22	13	16	16	16	E S	E S	E S	E S	E S	
31	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	17	19	20	22	17	16	16	14	E S	E S	E S	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	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	E S	E S	E S	E S	E S	E S	E S	E S	16	16	16	18	20	22	21	20	18	16	16	16	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	16	17	19	21	23	22	21	20	17	16	16	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	16	16	16	17	19	21	20	20	17	16	16	15	E S	E S	E S	E S	E S

AUG. 1987

FMIN (0.1 MHZ)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987

M(3000)F2 (0.01)

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

Station Hour Day	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	305	A	F	F	F	300	305	325		365	A	285	270	255	265	285	295	325	330	330	290	290	285	285						
2	290	300	330	F	F	F	335	325	345	H	335	290	320	A	A	310	290	290	310	300	H	315	315	300	295					
3	S	F	F	F	F	F	370	345	325	325	A	A	280	310	A		290	310	335	330	S	305	300	F	F					
4	F	F	F	285	305	275	335	330	355	365	A	A	305	305	305	290	280	320	A	325	280	290	300	305	310					
5	S	S	S	S	S	325	295	315	A	345	380	A	315	335	255	305	355	A	355	A	290	300	305	300	S	F				
6	A	F	S	F	S	355	335	345	350	315	330	R	315	A	240	295	320	320	315	325	315	S	305	310	S	J	S			
7	285	295	285	300	S	A	320	330	310	330	330	315	265	300	305	290	300	300	305	300	315	330	360	295	F	F				
8	S	F	S	S	S	325	335	335	350	355	A	330	325	280	290	285	295	300	305	320	335	330	315	S	A	A				
9	A	F	S	F	F	S	315	315	355	305	310	305	275	285	295	300	300	290	295	305	295	325	325	285	295	F				
10	F	280	F	305	315	325	350	315	360	310	340	270	A	A	290	305	300	315	345	315	300	300	U	S	S	F				
11	F	F	F	F	U	F	J	S	F	A	340	310	U	R	285	300	300	280	295	295	320	A	315	335	U	S	J	F		
12	F	F	F	F	F	U	F	J	S	F	320	325	365	360	335	315	305	270	280	265	230	280	305	320	S	F	F	F		
13	F	F	F	J	F	F	J	F	F	A	A	A	A	280	295	300	275	305	280	295	290	305	335	S	S	A	A			
14	A	F	U	F	I	S	F	A	325	360	340	A	295	305	A	A	265	300	280	295	315	320	295	J	F	F	F			
15	F	F	F	F	S	F	F	F	300	310	330	280	270	290	295	280	285	295	305	280	310	320	300	F	F	F	F			
16	F	F	F	U	F	F	F	H	350	310	340	305	330	300	320	295	295	295	310	310	320	H	A	U	S	I	S	U	S	
17	F	F	F	F	F	335	325	350	340	I	C	350	335	325	315	300	300	300	H	295	300	345	325	320	315	305	300	S	S	
18	310	F	F	F	F	F	320	360	335	V	365	335	310	290	315	300	305	305	325	320	335	315	340	295	275	S	S	S	S	
19	F	F	F	F	F	F	345	350	345	355	325	300	335	305	285	275	310	325	345	335	310	295	315	280	F	F	F	F		
20	290	300	300	F	F	310	325	315	330	360	360	325	300	290	300	305	315	325	315	315	330	350	350	F	F	F	F	F		
21	F	F	F	F	F	F	315	365	370	A	A	H	A	290	315	295		310	305	320	R	U	R	345	290	300	280	S	S	
22	F	F	F	F	F	F	335	345	365	H	380	315	310	315	315	290	290	310	320	320	330	R	330	315	300	300	S	S	S	
23	290	295	305	300	330	320	330	385	360	340	350	305	310	R	315	315	315	315	330	310	335	360	280	S	A	F	F	F		
24	S	290	275	305	290	295	335	350	355	325	305	A	A	300	300	305	310	315	325	300	295	295	300	305	S	S	S	S	S	
25	F	S	S	S	S	S	325	290	305	355	H	A	A	A	A	A	310	315	325	315	315	280	275	S	295	285	S	S	S	S
26	S	S	U	S	F	F	F	F	295	290	290	G	A	260	250	345	285	295	300	315	290	265	270	J	S	S	A	A	A	
27	S	J	S	305	305	F	F	F	355	360	325	340	335	320	295	300	325	295	280	H	280	325	S	340	320	295	280	S	S	
28	S	280	S	285	275	315	295	325	335	360	345	315	305	300	335	340	330	325	310	305	305	350	330	315	290	S	S	S	S	
29	S	300	300	310	270	295	U	S	315	340	360	A	320	330	A	305	325	300	300	315	315	320	S	350	290	295	310	F	F	
30	F	F	S	300	285	295	340	340	360	S	380	370	335	295	315	275	290	285	305	325	315	310	315	350	300	F	F	F	F	
31	F	F	U	F	F	U	F	F	350	320	345	350	370	280	315	325	295	305	330	R	325	315	320	315	305	U	S	S	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	16	15	22	21	15	22	29	29	28	24	24	27	23	27	28	30	30	30	29	30	31	30	25	18						
MED	290	295	298	305	315	320	330	350	352	340	325	305	305	300	295	300	302	312	315	315	315	315	312	300	292					
UQ	295	300	310	310	325	335	335	355	360	362	335	315	318	305	300	315	310	320	325	330	330	330	300	305						
LQ	S	288	285	285	295	295	315	325	338	325	308	288	288	290	288	290	295	295	305	305	300	295	295	280	S					

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M(3000)F2 (0.01)

IONOSPHERIC DATA

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M(3000)F1 (0.01)

135° E Mean Time (G.M.T. + 9h)

Station	YAMAGAWA				Lat. 31 12.1 N				Long. 130 37.1 E				Sweep 1 MHz to 25 MHz in 2 sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L 355	A	365	A	380	390	380	375	375	370	360		L					
2								A	A	A	380	390	A	A	A	A	L 355	A						
3							L 375	A	A	A	A	370	A	A	A	A	360		A					
4							A	355	L	A	A	420	380	375	390	345	A	A	A					
5							A	365	A	A	R 375	A	A	A	A	A	A	A	A					
6							L	355	380	385	415	A	395	A	335	370	350	370	L	A				
7							350	370	375	395	415	355	380	A	350	330	A	A						
8							L	A	A	375	365	375	A	375	375	A	360		A					
9							390	L 365	405		380	A	A	A	A	350	A	355						
10							A	A	U L 385	U L 405	L	A	A	A	A	A	350	A						
11							L	A	415	U L 370	A	A	370	A	A	A	A	A	A					
12							U L 360	U L 380	U L 405	A	420	400	A	A	A	A	A	A	A					
13								A	A	A	A	A	390	370	A	360	A	A						
14								A	A	A	A	A	A	410	345	340	345		L					
15							L	A	A	A	H 375	U L 380	330	370	A	A	340	L						
16								A	A	A	U L 370	U L 380	390	A	365	350	A	L						
17							L	L	C	410	L 400	400	390	380	A	A	A	A	L					
18							L	L	395	400		380	370	380	390	370	355	L	L					
19							L	380	A		A	380	380	330	L	A	A	A	A					
20							A	A	A	390	L 375	A	A	370	370	350	L 355	A						
21							A	A	A	A	A	A	390	A	A	A	A	A	A					
22							L	390	L 405	L 375	L 380	L 380	375	365	330	A	L	L	L					
23							L	U L 355	U L 405	A	A	A	A	A	A	350	L	A	A					
24							A	A	A	A	A	A	345	350	355	A	360	A						
25							A	A	A	A	A	A	A	A	A	330	L 345	L						
26							350	350	375	365	385	A	385	350	355	355	335	L						
27							A	A	L	L 385	380	370	380	380	355	340	335	L						
28							A	A	A	390	370	370	370	A	L 355	U L 335	U L 340	L						
29							A	A	A	365	A	A	375	375	355	A	A	A						
30							L	L	405	L 395	400	380	375	365	355	350	L 345	L						
31							L	U L 360	L 380	U L 370	400	A	L 345	375	355	350	L 335	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								7	10	13	15	19	16	20	17	17	16	17	2					
MED								355	365	395	385	380	360	380	375	355	350	350	L 362	L				
UQ								L 368	380	405	L 395	400	385	388	380	370	365	355						
LQ								L 352	L 355	L 380	L 372	L 375	L 372	L 372	L 370	L 355	L 345	L 340						

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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H^oF₂ (KM)

135° E Mean Time (G.M.T. + 9 h)

Station	YAMAGAWA				Lat. 31° 12' N				Long. 130° 37' 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									300	A	255	A	380	375	405	370	340	325	280	255					
2									270	280	300	300	375	300	A	A	310	A	315	280					
3									250	E A	280	295	A	A	370	E A	330	A	345	330	280	250			
4									260	260	245	A	A	350	330	335	375	315	325	A	275				
5									A	250	260	A	330	340	520	395	300	A	305	A					
6									245	330	300	490	345	A	545	375	310	320	295	280	265				
7									350	290	315	340	490	375	370	375	370	365	340	320					
8									250	245	A	325	330	410	400	390	350	320	305	265					
9									240	315	L	305	425	405	370	335	340	345	330	280					
10									265	250	L	305	475	A	A	A	340	345	280	245					
11									245	A	300	370	370	370	360	370	330	320	270	A					
12									230	245	255	295	350	370	430	345	375	355	325	295	A				
13									A	A	A	A	A	A	330	305	330	300	320	300					
14									260	A	360	305	A	A	395	305	330	300	260						
15									L	295	275	260	455	L	350	320	350	E A	375	300	275				
16									245	315	295	320	L	330	365	340	330	295	270	250					
17									250	275	I C	285	295	315	340	365	350	A	300	310	265				
18									245	255	250	275	400	330	350	350	310	280	275						
19									240	280	260	360	295	330	395	390	300	280	275						
20									285	240	255	315	360	390	350	330	300	300	290	275					
21									245	250	A	A	A	A	320	330	A	300	290	275					
22									250	230	240	325	350	320	320	360	320	290	265	265					
23									240	245	250	255	375	A	A	A	330	300	290	280					
24									E A	275	245	E A	350	A	A	345	335	315	280	290	270				
25									245	250	A	A	A	A	A	A	335	315	280	275					
26									480	360	390	425	G	A	475	470	325	390	345	305					
27									230	270	A	280	285	300	295	305	345	285	305	305	300				
28									290	250	270	295	325	330	280	275	285	L	305	L	280				
29									A	270	A	A	320	280	A	340	295	300	330	300	E A	290			
30									230	225	245	270	375	340	400	345	230	300	270	240					
31									255	255	245	L	325	285	320	305	285	295	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							1	26	28	23	21	25	20	26	26	29	29	30	28	1					
MED							260	250	250	272	302	350	340	350	348	330	312	292	275	265					
UQ							270	280	300	332	375	375	400	375	340	330	310	280							
LQ							245	245	255	295	325	325	330	330	305	300	280	265							

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H*F (KM)

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

Station	YAMAGAWA				Lat.	31 12 1 N				Long.	130 37 1 E				Sweep	1 MHz to 25 MHz in 2 sec in automatic operation												
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	A	A	E A	E S	E S	E A			A	A	A	H	H		A	H	E A	A	A	E A	E A	A	A					
2	E S	S	S	S	E S	E S	H		A	A	A	H		A	A	A	E A	A	A	E S	E A	E A	E A					
3	E A	280	240	E A	275	235	235	220	A	A	A	A	A	A	A	A	E A	A	A	240	270	E A	330	350				
4	300	355	295	255	295	245		245	235		195	230	230	220	275	A	A	A	E A	275	280	255	250	260				
5	300	290	235	235	245	E S	245	A	245	A	A	A	A	A	A	A	A	A	A	E A	285	360	255	270	255			
6	A	355	255	255	210	235	245	215	215	H	H	180	A	210	A	E A	230	H	235	A	E A	260	285	285				
7	310	290	290	285	A	280	235	225	H	H	H	180	240	A	245	230	A	A	A	270	245	205	265	S	E S	300		
8	300	300	E A	270	250	240	240	235	A	A	E A	235	215	A	235	220	A	265	A	250	250	E A	A	A				
9	A	305	320	270	280	275	240	215	210	200	185	220	A	A	A	A	A	A	E A	270	255	245	220	300	275			
10	275	300	295	280	260	245	225	A	A	H	195	190	245	A	A	A	A	A	255	A	E A	240	255	280	255			
11	275	245	270	280	295	255	245	235	A	200	200	A	A	230	A	A	A	A	A	E A	280	245	220	290	320			
12	265	275	295	310	300	295	240	210	200	195	E A	195	195	A	A	A	A	E A	260	A	260	245	335	E A	310	300		
13	E A	325	330	A	235	220	E A	275	A	A	A	A	A	210	205	A	A	A	A	260	265	235	220	A	A			
14	A	365	330	280	E A	A	A		E A	A	A	A	A	A	200	250	200	230	240	245	235	300	A	E A	270			
15	345	280	325	A	E A	E A	E A	245	A	A	E A	250	205	230	235	205	A	A	H	210	230	205	245	245	255	A	E A	295
16	E A	265	355	255	245	215	235	200	A	A	A	A	230	225	180	E A	210	235	A	A	280	A	225	260	A			
17	E A	E A	E A	E S	E A				I C	H	H	H	H	215	220	A	A	A	A	250	240	240	245	230	E S	270		
18	E S	S	E S	E S	E S	E S	E S	215	200	H	H	H	230	230	220	H	225	220	H	235	230	245	255	A	220	E A	E S	310
19	E A	E A	E A	E A	S	E S			A	H	A	A	240	220	240	E A	A	A	A	270	275	300	E A	E A	E A	E A	310	
20	E S	E A	E A	E A	E S	E A	E A	A	A	E A	H	H	230	A	A	230	H	220	E A	A	250	230	220	A	E A	E A	E A	355
21	E A	E A	E S	E A	E A	E A	E A	A	A	A	A	A	A	205	A	A	A	A	A	A	225	230	290	E A	E S	290		
22	E A	E A	E S	E S	E A	E S	E S	A	H	H	H	H	H	230	220	240	A	230	200	H	235	220	E S	E A	E S	E S	275	
23	E S	E S	E S	E S	E S	E A			A	A	A	A	A	A	A	E A	A	A	A	E A	245	215	A	A	E A	350		
24	E A	E A	E A	E A	300	275	240		A	A	A	A	A	A	E A	E A	A	A	A	A	250	275	255	265	270	260		
25	E A	270	275	275	250	300	245		A	A	A	A	A	A	A	A	A	A	E A	270	260	250	280	295	260	270		
26	355	230	295	350	330	330	360	245	250	225	235	240	H	A	210	230	240	230	250	270	265	280	E A	E A	E A	A		
27	275	E S	280	265	E S	295	265	A	A	A	220	200	195	190	220	200	H	225	235	245	A	255	225	A	250	270	325	
28	350	305	280	305	270	305	255		A	A	A	A	205	210	195	180	H	220	205	H	230	245	255	205	215	240	295	
29	255	270	260	325	300	300	255		A	A	A	A	230		220	225	230	A	A	A	E A	265	200	255	265	275		
30	345	350	265	325	300	245	245	225	225	200	200	250	A	200	195	225	H	230	230	235	240	240	240	215	265	275		
31	E A	E A	290	E A	255	270	245	235	235	220	220	200	A	240	220	220	220	220	225	H	245	255	255	215	280	300		
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	27	29	31	31	30	30	30	22	15	16	19	21	16	20	18	18	14	19	14	29	31	30	28	27				
MED	E E	280	280	268	U	U	242	229	218	201	200	205	208	219	220	226	228	240	244	250	245	U	U	U				
UQ	306	302	298	291	288	285	252	235	232	212	U	214	230	230	230	228	238	232	E A	250	260	264	U A	E A	E A	E E	305	
LQ	E E	268	267	264	248	235	240	225	212	200	195	195	192	208	220	220	220	220	230	235	245	232	220	260	265			

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H*F (KM)

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IONOSPHERIC DATA

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H'E (KM)

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

Station	YAMAGAWA				Lat. 31 12' 1" N				Long. 130 37' 1" E				Sweep 1		MHz to 25		MHz in 2		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							S	110	110	105	105	105	105	105	105		A	A	A	A	S					
2							S	105	A	A	A	110	105	105	110	110	105		A	A	S					
3							A	A	115	110	110	115	115	110		A	A	A		115	115	S				
4							S	A	A		110	110	A	A	A	A	A		110	115	120	S				
5							S	115	110	110		A	A	A	A	110	110	110	115		A	B				
6							S	115	110	110	110	110	115	115	115	110	110	110	110		A	S				
7							S	A	A		110	110	A	115	115	110	110	110	120		A	A	S			
8							S	110	110	110	110	110	115		A	A	A	A	A	A		S				
9							S	110	110	110	110		A	110	115	110	110	110	135	130		S				
10							S	110	105	105	105	105		E B	115	105	105	105	105	105	115	S				
11							S	115	105	105	105	105	105	105	105	110	105		A	A	S					
12							S	105	105		A	105	105	A	110	105	110	105	120	120		S				
13							S	110	105	110	110	110	110	110	110	105		A	A	A		S				
14							S	110	110	110	105	105	105	105		A	A		H			S				
15							S	110	105	105	105	105	110	105	105	110	105	115	120			S				
16							S	A	105	105	105	105	105		A	E A	135	105	E A	125	105	E A	125	S		
17							S	110	110	C	110	110	110	110	110		A		H		A	S				
18							S	105	105	105	110	110	110	105	110	105	105		A	A		S				
19							S	110	105	105	105	105	110	110		A		110	110	110	120	S				
20							S	110	105	105	105	105	105	105		A		110	A	A	A	S				
21							S	115	110	105	105	105	110	105	105	105	100		H	A	A	S				
22							S	A	A		110	110	110	110	110	110	115	105	105	120		S				
23							S	105	A		105	110	110	110	110	110	105	105	105		A	S				
24							S	110	115	115	110	110	110	115	115	110		A	A	A		S				
25							S	115	115	110	110	110	110	110		A	A	A	A	A		S				
26							S	115	110	110	110	110	110	115	110	120	120	E A	125	110	125	B				
27							S	115	110	110		A	110	E A	125	115	A	110	110	110	110	120	B			
28							S	115	110	110		A	A	A	A	A	A	A	A	A	H		S			
29							S	H	120	110	110	110	110		B	A	E A	125	110	120	120	A	A	A		
30							S	115	110		A	A	A	A	E A	E A	E A	A				A				
31							S	110	E A	120	110	110	110	110	110	105	105	E A	E A	E A	E S	S				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT								26	26	27	26	25	25	25	23	23	23	21	15							
MED								110	110	110	110	110	110	110	110	110	108	110	118							
UQ								115	110	110	110	110	110	112	110	110	110	115	120							
LQ								110	105	105	105	105	110	105	105	105	105	105	115							

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IONOSPHERIC DATA

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H°ES (KM)

135° E Mean Time (G.M.T. + 9h)

Station	YAMAGAWA				Lat. 31° 12' 1" N				Long. 130° 37' 1" E				Sweep 1		MHz to 25 MHz in 2 sec in		automatic operation								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	100	100	105	120	100	120	125	130	110	110	105	110	110	105	105	100	140	100	100	100	100	100	100	100	
2	100	s	100	s	s	s	145	125	120	120	100	115	115	115	110	120	110	120	110	100	100	100	120	115	
3	110	110	115	110	115	110	105	135	120	120	115	115	115	110	105	105	105	130	115	110	110	110	110	110	
4	110	110	110	110	s	115	125	110	105	105	110	105	155	150	170	145	130	120	120	110	110	110	110	110	
5	110	110	110	105	105	s	140	125	125	110	105	105	100	105	120	120	115	115	110	110	100	110	115	110	
6	110	105	105	95	105	130	120	120	115	115	110	110	125	145	130	125	120	120	120	110	110	115	115	115	
7	110	110	110	110	110	105	110	110	110	115	145	E G 175	E G 150	145	135	135	130	125	120	115	115	115	110	110	
8	110	110	110	110	110	s	130	130	115	110	110	110	130	130	110	130	105	105	100	115	110	110	110	110	
9	110	s	115	110	110	110	110	115	110	110	145	145	130	130	130	120	125	125	125	115	115	125	110	125	
10	s	100	s	s	110	125	125	110	105	105	105	150	135	120	125	120	115	120	120	105	100	125	105	105	
11	105	100	105	110	s	135	125	120	110	115	115	105	110	125	130	125	100	100	100	100	100	100	100	100	
12	100	110	110	105	105	105	105	105	105	120	105	105	160	125	145	125	120	120	120	110	110	105	105	120	
13	110	105	95	100	s	125	115	110	105	105	105	105	105	110	105	105	100	100	100	100	100	100	110	105	
14	105	110	110	105	105	105	135	120	120	110	110	105	105	105	110	105	G	G	105	100	100	115	110	105	
15	105	105	105	105	105	105	135	125	120	110	110	125	135	135	135	120	115	105	105	s	100	115	105	110	
16	105	105	105	105	105	105	130	130	120	110	110	105	125	110	145	G	155	135	125	110	110	110	105	105	
17	100	100	100	105	105	s	140	130	125	C	110	110	115	150	130	120	120	130	140	100	s	115	125	110	
18	110	110	105	100	105	105	125	125	130	110	115	110	110	150	130	130	100	100	100	100	100	120	115	110	
19	110	110	110	105	115	115	105	125	110	105	105	105	105	105	100	130	125	120	115	105	100	100	100	100	
20	105	100	100	105	105	s	110	110	105	105	105	105	105	105	100	G	100	100	100	100	105	120	110	110	
21	115	105	115	100	100	120	115	110	110	105	105	105	105	150	130	115	115	115	115	110	100	100	100	100	
22	110	105	115	105	105	105	105	100	105	110	125	140	145	140	165	150	120	130	G	s	s	s	s	115	s
23	s	s	s	s	s	105	110	140	105	105	105	105	110	105	105	105	130	115	110	115	100	115	110	115	
24	110	110	105	105	110	110	120	110	110	110	110	110	110	110	110	110	105	105	100	100	100	100	100	110	
25	110	110	110	110	s	s	115	115	115	110	110	110	110	105	105	105	105	100	100	100	115	110	110	105	
26	125	s	125	140	125	125	120	125	125	120	120	145	140	160	G	145	145	125	125	115	115	110	110	120	
27	110	110	110	110	s	105	115	110	110	110	120	120	110	110	G	E G 175	155	125	115	110	110	105	105	100	
28	95	s	110	130	125	120	120	110	105	105	105	105	105	105	100	100	100	105	130	s	s	s	s	s	
29	s	s	s	s	s	s	125	120	115	115	115	110	110	125	125	130	115	115	110	110	s	100	100	105	
30	105	105	100	95	s	s	G	140	G	110	110	105	105	110	125	125	E G 140	130	120	100	95	125	110	115	
31	105	105	105	105	105	105	105	140	120	115	110	110	105	105	140	145	150	150	125	115	110	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	28	25	28	27	23	23	28	31	30	30	31	31	31	31	29	29	30	30	30	28	27	29	30	28	
MED	110	105	110	105	105	110	120	120	110	110	110	110	110	110	125	120	119	120	115	110	100	110	110	110	
UQ	110	110	110	110	110	120	128	128	120	115	112	115	129	132	135	130	130	125	120	110	110	115	110	112	
LQ	105	105	105	105	105	105	110	110	105	105	105	105	105	105	105	110	105	105	100	100	100	100	105	105	

AUG. 1987

H°ES (KM)

IONOSPHERIC DATA

AUG. 1987

TYPES OF ES

135° E Mean Time (G.M.T. + 9h)

Station	YAMAGAWA							Lat. 31° 12' 1" N	Long. 130° 37' 1" E			Sweep 1		MHz to 25		MHz in 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	F3	FF36	FF12	F2	FF31	C2	C3	C3	C2	C6	C3	C1	C1	C2	L2	HL12	L2	L3	L5	F5	F4	F7	F4
2	F2		F2				H3	C3	CL32	CL32	L2	C2	C1	C4	C5	C3	C4	CL23	CL23	L5	F3	F3	FF36	F4
3	F4	F3	FF23	F4	F2	FF21	LC41	HL23	H3	C5	C4	C4	C2	C4	L4	L3	L4	H2	C4	C5	F4	F3	FF22	F4
4	F3	F5	F3	F4		F4	C4	LC34	L2	C6	C4	L2	HL12	HL11	HL12	HL21	H3	H4	C4	C5	F3	F3	F3	F3
5	F3	FF22	FF11	F1	F3		H2	H3	H4	C3	L5	L2	L3	L3	HL21	H2	C5	C3	C4	CL73	F4	F7	FF23	F2
6	F3	F5	F3	F2	FF22	F1	C5	H3	CC12	C2	C5	C2	H3	H1	H3	H2	H2	C2	C2	C4	F3	F3	F7	F2
7	F2	F2	F2	F2	F3	F2	L2	L3	L2	C2	HC12	HL11	H1	H1	H2	H1	H2	HL31	CL42	CL11	FF11	FF11	F3	F7
8	F2	F2	F5	F6	F3		H3	C2	C3	C3	C4	L2	H1	HL11	L1	HL12	L3	L4	L4	CL65	FF51	F3	F3	F3
9	F5		F2	F2	F2	F3	L2	C3	C3	CH21	HC21	HC11	H2	H2	H2	H3	H4	CL22	CL23	CL73	F5	FF13	F3	FF22
10		F2			F4	F1	CL11	C4	C2	C3	C3	HHC21	C2	C3	C3	C3	CL51	C2	C4	L5	F2	FF33	FF31	F3
11	FF11	F1	F2	F1		FF11	C5	C3	C6	C2	C1	C3	C2	CC22	H1	CC25	C3	L4	L7	L8	F8	F4	F3	F3
12	F3	FF22	FF22	FF24	F2	F4	L4	CC33	C4	CL11	L2	C2	HL12	C2	H2	C4	C4	CL21	CL42	L7	F2	F4	F3	FF12
13	FF22	FF14	F3	F1		F7	C5	C4	C7	C5	C4	C4	C4	CH11	C1	C4	L4	L5	L3	L4	F4	F4	FF42	FF35
14	FF22	F4	F5	F5	F4	F6	C3	C4	C3	C5	C4	C3	C6	C3	CL11	CL21			L1	L2	F3	F6	F7	F2
15	F2	F3	F3	F5	F4	F3	C3	C3	C3	C2	C2	CC21	H1	H1	H1	C3	C4	L2	L2		F2	FF22	FF22	F7
16	F6	F2	F4	F2	F3	F5	CL21	HL24	C3	C3	C4	C2	C2	L1	HL11		HL12	H2	CL32	L6	F4	F6	F2	F4
17	F5	F4	F4	FF22	F5		H4	H3	C2		C1	CH11	C1	H1	H1	CL32	C3	H3	HL12	L3		F7	F1	F2
18	F2	F2	F2	F3	F2	F2	S	C3	C2	C1	C1	C1	C2	C1	H1	H2	HL14	L3	L5	L7	F3	FF12	F5	FF23
19	F2	F5	F4	F6	F3	F2	LC43	C3	C3	C4	C3	C3	C2	C3	L3	C2	C3	C6	C7	C5	F6	F7	F3	F6
20	FF22	F4	F5	F5	F2		C3	C6	C7	C3	C2	C2	C3	C3	L3		L3	L5	L5	L4	FF54	FF13	FF32	F7
21	F7	F7	F2	F3	F3	FF52	C6	C6	C5	C6	C6	C2	C5	H1	H3	C5	C4	CL73	CL63	CL63	F4	F4	F2	F2
22	F5	F7	F2	F5	F3	F3	L2	L3	L3	C2	C2	H1	H1	HC11	HC11	H1	C3	C3					F6	
23					F5	C3	HC33	L2	C3	C3	C3	C3	C3	C4	C4	C3	C1	C4	CL42	CL72	F5	FF52	FF63	F7
24	F4	F5	F6	F5	F4	F7	C2	C4	C3	C3	C3	C4	C4	C2	C2	CH21	L4	L3	L5	F5	F2	F1	F2	F2
25	F6	F3	F4	F2	F3		C4	C4	C6	C5	C3	C7	C5	L4	L3	L5	L4	L2	F3	FF21	F1	F5	F3	
26	FF23		F4	F3	FF11	F7	C6	C2	H2	H1	C1	H1	H1	H1		HL11	HL11	H2	C4	F7	F3	F3	F5	FF12
27	F2	F2	F7	F2	F3	C3	C5	C5	C5	C3	CL12	C1	L1	L1		H1	H1	H2	C4	F5	F3	F3	F5	F2
28	F2		FF11	F1	F1	F2	C3	C5	C5	C5	L2	L3	L2	L2	L3	L2	L3	L1	C2	F1				
29							C3	C3	C4	C5	C2	C4	C4	HL11	HL21	H2	CL32	CL72	C6	F7		F3	F2	F2
30	F2	FF22	F1	F2			H2		L2	L2	L3	L1	L1	HL11	HL11	H1	H2	C3	F2	F2	FF12	FF32	F3	
31	F3	F7	F6	F8	F3	F2	L3	H2	CL21	C2	C2	C2	C3	C2	HC11	H1	HL12	HL11	C3	L7	F7	F3	FF21	
	00	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																								

AUG. 1987

TYPES OF ES

IONOSPHERIC DATA

AUG. 1987

FXI (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station	OKINAWA							Lat.	26 16' 9" N				Long.	127 48' 4" E				Sweep	1 MHz to 25 MHz in 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	45	58	60	48	47	43															X	X	X	U X
2	X	X	X	X	X	A															X	X	X	X
3	63	66	51	42	50	42															88	73	65	63
4	57	53	A	X	X	X	60	61													X	X	X	60
5	58	54	X	X	X	X															A	X	A	48
6	40	44	32	43	42	32															X	X	U X	U X
7	X	X	X	X	X	X															X	X	X	X
8	X	43	49	47	38	35	36														X	X	A	49
9	48	47	A	X	A	X															X	X	X	U X
10	50	55	57	53	X	X															X	U X	X	X
11	X	60	54	54	50	40															X	U X	X	X
12	X	54	X	X	X	X															X	67	63	63
13	64	59	50	43	50	38															X	X	X	X
14	X	40	X	37	36	41	35														X	X	X	63
15	62	66	63	61	53	42															X	X	X	64
16	62	63	72	62	60	42	42														X	84	A	32 34
17	38	38	36	36	40	34															X	X	X	X
18	X	56	53	58	54	53	56														X	X	X	62
19	58	58	58	48	38	38															C	C	C	C
20	C	C	C	C	C	C	C														U X	X	X	45
21	49	X	55	X	X	43	50														X	U X	X	X
22	X	70	68	66	64	61	48	59													X	X	X	62
23	66	54	63	64	54	54	56														X	X	A	50 60
24	62	61	63	60	51	50	58														X	X	X	X
25	X	61	X	65	72	64	48	45													X	X	U X	X
26	72	X	81	68	58	28	51	60	58												X	X	X	A
27	X	49	X	U X	X	X	X	X													X	X	X	X
28	65	62	56	43	41	40	42														X	X	X	X
29	X	49	X	X	X	X	X	X													X	X	X	X
30	C	C	C	C	C	C	C														C	C	C	C
31	C	C	C	C	C	C	C														X	X	X	X
CNT	28	28	26	28	27	27	11	2													14	28	27	28
MED	58	54	56	49	46	41	50	60													X	X	X	X
UQ	62	62	63	59	50	46	58														X	X	X	X
LQ	49	50	48	X	X	X	44														X	X	X	X

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FXI (0.1 MHz)

IONOSPHERIC DATA

AUG. 1987

FOF2 (0.1 MHZ)

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

Station	OKINAWA				Lat.	26 16.9 N				Long.	127 48.4 E				Sweep	1 MHz to 25 MHz		in 2 sec		in automatic operation												
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
1	F	F	F	F	F	F	41	65	70	53	A	A	A	86	97	104	102	113	A	93	83	55	56	54								
2	55	56	S	50	S	A	37	51	65	69	62	69	68	75	82	32	38	87	93	U	P	99	83	77	S	57						
3	F	F	R	F	F	F	38	45	54	64	60	65	80	72	A	30	89	A	A	A	F	F	F	F								
4	F	F	A	S	43	43	F	F	53	52	66	J	R	82	84	80	74	72	67	67	49	50	J	S	S	63	F					
5	F	F	50	44	30	25	33	51	75	E	G	45	53	61	62	58	62	78	76	63	57	A	A	55	A	F						
6	F	F	F	F	F	F	37	A	54	69	55	55	55	60	70	A	66	73	62	60	S	60	56	U	S	U	S	44				
7	47	J	S	J	S	40	35	37	47	55	57	60	53	56	58	65	68	67	63	72	77	71	S	43	35	U	S	35				
8	S	37	F	F	S	29	30	44	56	52	56	58	51	58	64	71	31	35	87	A	R	80	70	57	A	F						
9	F	F	A	S	A	S	30	39	55	54	51	54	S	63	67	74	78	72	75	33	U	R	96	80	56	46	S	42				
10	F	F	F	F	40	32	36	59	63	53	47	50	56	52	59	73	85	84	78	R	76	70	S	60	60	60	56					
11	S	54	F	F	F	F	R	38	61	55	A	53	61	63	59	74	94	R	100	94	93	93	86	60	47	46						
12	48	47	45	42	40	S	R	38	48	67	56	54	60	54	61	64	69	81	86	91	92	90	S	F	F	F						
13	F	F	F	37	44	32	37	64	64	A	A	58	63	79	32	89	97	103	R	104	R	96	90	89	49	S	S					
14	34	31	F	F	F	F	44	58	A	A	72	80	79	84	90	109	110	114	R	118	106	83	68	64	F							
15	F	F	F	F	F	F	A	50	68	75	R	62	54	60	74	74	76	84	94	102	R	104	90	70	54	F						
16	F	F	F	F	F	F	F	57	56	65	65	64	72	67	79	93	105	102	33	69	78	A	F	F								
17	F	F	F	F	F	F	34	58	68	67	60	58	R	64	76	83	R	96	100	106	111	105	S	S	70	67	55					
18	S	50	F	F	F	F	47	56	72	R	U	R	61	59	58	C	69	68	70	31	90	36	84	80	57	52	F					
19	F	F	F	F	F	32	36	52	76	72	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C					
20	C	C	C	C	C	C	C	C	C	C	C	58	60	69	79	35	35	87	93	103	U	S	96	77	53	39	F					
21	F	S	F	46	43	F	F	61	61	59	63	66	79	91	95	101	104	116	133	112	S	90	U	S	U	S	U	S	S	61		
22	S	64	62	F	F	F	S	42	53	68	60	55	58	64	70	70	81	94	100	106	120	R	114	91	70	60	F					
23	F	F	F	S	S	S	50	74	64	55	66	59	65	66	68	75	84	84	95	99	U	S	80	A	S	F						
24	F	F	F	F	F	F	41	44	52	64	63	69	A	60	72	78	R	A	90	90	90	S	73	77	64	60						
25	S	55	S	F	F	F	F	81	58	A	60	63	73	77	63	77	R	87	92	97	J	S	100	80	U	S	83	F				
26	F	75	F	F	S	F	F	F	U	R	U	R	60	46	A	U	R	E	G	45	54	67	61	50	58	61	65	44	43	40	A	
27	43	43	U	S	36	34	33	42	57	53	59	70	R	87	95	97	R	R	107	111	U	R	113	109	J	S	87	69	J	S	U	S
28	F	F	F	S	37	35	34	36	66	73	66	71	81	88	100	84	74	70	64	74	84	76	57	50	48							
29	43	40	38	37	34	30	S	38	69	64	R	63	66	72	70	88	100	94	R	35	85	94	U	S	100	64	57	44	40			
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
CNT	11	11	7	14	15	15	22	25	27	24	24	27	26	28	27	26	28	27	26	27	27	27	25	24	15							
MED	48	47	45	40	40	33	38	58	61	59	60	60	66	73	74	81	86	90	92	93	80	60	52	48								
UQ	S	54	54	48	46	42	40	44	65	68	66	66	66	73	80	85	94	100	102	103	100	84	70	62	56							
LQ	43	44	40	37	34	31	37	55	55	54	58	54	61	64	68	75	78	80	78	78	70	56	44	41								

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FOF2 (0.1 MHZ)

IONOSPHERIC DATA

AUG. 1987

FOF1 (0.01 MHz)

135° E Mean Time (G.M.T. + 9 h)

Station	OKINAWA							Lat.	26 16.9 N				Long.	127 48.4 E				Sweep	1 MHz to	25 MHz in	24sec in	automatic operation		
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	A	L	A	A	A	A	A	A	A	A	A					
2								L	400	430	460	460	500	460	A	A	A	A	L					
3								L	410	A	A	A	460	460	A	A	A	A	A					
4								L	A	A	A	A	A	A	460	450	430	A	A	A	A			
5								L	400	450	A	U A 430	450	U A 460	A	420	A	L	L	A				
6								A	L	430	450	450	440	U A 460	A	A	420	400	L					
7								L	400	420	430	440	440	440	440	430	410	U L 400	A					
8								L	U L 400	L 430	L 450	L 460	A	A	450	440	A	A	A					
9								L	L	460	460	450	440	A	440	A	440	410	L	A				
10								L	U L 400	L 440	L 450	U L 460	450	U A 460	A	U A 440	U A 440	A	A					
11								L	L	A	L 460	460	470	460	460	440	440	A	L					
12								L	L	U L 440	L 450	L 460	460	460	450	440	430	410	U L 380					
13								L	L	A	A	A	A	A	470	A	A	A	A					
14								A	A	A	L 460	L 480	L 490	480	470	460	450	A	A					
15						A		L	A	A	A	A	480	470	470	A	A	L 430	L					
16								L	L	L	A	A	480	A	470	470	460	L	A					
17								L	L	430	450	480	480	460	470	460	450	A	L					
18								L	L	U L 450	L 480	U L 480	C	A	A	450	430	410	L					
19								L	400	A	A	C	C	C	C	C	C	C	C					
20								C	C	C	L	480	480	A	A	480	450	420	350					
21								A	A	L	U L 480	490	A	A	A	A	A	420	L					
22								L	A	L	L	470	470	A	460	460	460	430	L					
23								L	L	U L 450	L 470	U L 470	490	480	470	450	A	A	A					
24								L	A	A	U L 490	U A 470	U A 480	A	A	U L 430	L	L						
25								L	A	A	460	U L 470	480	470	U L 480	A	A	420	A					
26								L	A	400	A	420	450	450	440	430	L	U L 400	L					
27								L	L	L	L	470	480	460	U L 470	430	430	L	L					
28								L	L	L	U L 470	L 480	480	470	470	460	440	L	L					
29								L	L	A	A	A	B	B	470	440	430	A	L					
30								C	C	C	C	C	C	C	C	C	C	C	C					
31								C	C	C	C	C	C	C	C	C	C	C	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									6	13	14	21	21	18	18	18	16	11	2					
MED									400	430	455	470	470	460	470	445	440	410	365					
UQ									400	450	460	L 480	480	470	470	460	450	420						
LQ									U L 400	430	450	460	450	460	450	440	430	405						

AUG. 1987

FOF1 (0.01 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987

FOE (0.01 MHZ)

135° E Mean Time (G.M.T. + 9h)

Station	OKINAWA				Lat.	26 16' 9" N			Long.	127 48' 4" E			Sweep	1	MHz to	25	MHz in	2	sec in	automatic operation				
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	R	A	A	A	A	A	A	A	A	A	A	A	A				
2							S	A	A	A	A	A	A	A	A	A	310	A	A	A				
3							S	A	A	A	A	R	A	A	A	335	A	A	220	S				
4							S	R	A	A	A	U	A	A	A	A	A	275	A	S				
5							S	220	270	A	A	A	A	A	A	335	310	270	A	A				
6							S	R	A	A	A	A	A	350	340	330	310	A	A	S				
7							S	A	A	A	A	A	A	A	A	A	310	270	220	A				
8							S	A	A	A	R	R	R	R	345	340	305	275	220	R	A			
9							A	A	A	A	A	A	A	R	R	365	345	330	315	280	230	R	A	
10							S	A	A	A	A	A	R	R	380	360	335	310	270	220	R	R	A	
11							A	A	A	A	A	A	A	A	A	340	A	A	A	A				
12							A	A	R	R	290	320	330	360	365	380	380	350	320	280	225	A		
13							A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
14							S	200	265	A	A	A	360	A	R	R	365	340	315	275	220	A		
15							A	A	R	275	300	330	A	R	380	370	A	330	310	280	A	S		
16							S	A	280	300	325	A	R	R	R	360	365	360	345	315	270	A		
17							S	220	A	A	A	A	A	A	A	A	335	315	A	A				
18							S	200	280	A	A	A	C	R	R	U	A	310	280	210				
19							S	220	A	A	A	C	C	C	C	C	C	C	C	C	C			
20							C	C	C	A	A	A	A	A	A	A	A	A	A	A				
21							A	270	A	R	R	R	330	340	350	355	360	350	320	280	A			
22							A	A	A	A	R	360	380	380	360	350	310	270	215					
23							A	A	A	A	A	A	370	370	340	A	265	A						
24							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
25							210	A	305	A	340	A	A	A	A	A	A	A	A	A				
26							200	A	A	A	A	R	350	350	A	320	A	A	R					
27							A	A	300	A	A	355	A	340	330	310	265	210						
28							A	A	A	A	A	A	A	A	A	A	300	265	200					
29							R	R	A	A	A	B	B	A	Y	300	A	A						
30							C	C	C	C	C	C	E	C	C	C	C	C	C					
31							C	C	C	C	C	C	C	C	C	C	C	C	C	205				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								11	8	5	5	7	10	12	12	18	18	16	13					
MED								220	272	300	330	R	R	R	365	360	335	310	272	220				
UQ								220	280	305	330	R	R	R	375	362	340	315	280	220				
LQ								202	268	300	325	R	R	R	352	345	330	310	270	210				

AUG. 1987

FOE (0.01 MHZ)

IONOSPHERIC DATA

AUG. 1987

FOES (0.1 MHz)

135° E Mean Time (G.M.T. + 9h)

Station	OKINAWA				Lat.	26° 16' 9" N				Long.	127° 48' 4" E				Sweep	1 MHz to	25 MHz in	24 sec in	automatic operation					
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
2	J A	E S	J A	E S	E S	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
3	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
4	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
5	J A	J A	J A	J A	E S	E S	E S	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
6	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
7	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
8	J A	J A	J A	J A	J A	E S	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
9	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
10	J A	J A	J A	J A	J A	J A	E S	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
11	J A	J A	J A	E S	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
12	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
13	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
14	J A	J A	J A	J A	J A	J A	E S	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
15	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
16	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
17	J A	J A	J A	J A	E S	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
18	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
19	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
20	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
21	J A	J A	J A	E S	E S	E S	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
22	E S	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
23	J A	J A	J A	E S	E S	E S	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
24	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
25	J A	J A	J A	J A	J A	J A	E S	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
26	J A	J A	E S	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
27	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
28	J A	J A	J A	J A	E S	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
29	J A	E S	E S	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
UQ	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
LQ	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A

AUG. 1987

FOES (0.1 MHz)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987

FBES (0.1 MHz)

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

Station	OKINAWA								Lat.	26 16' 9" N			Long.	127 48' 4" E			Sweep	1 MHz to	25 MHz in	2 sec in	automatic operation				
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	26	26	24	21	18	18	23	30	41	36	A A	A A	A A	A A	48	53	82	38	81	A A	33	30	30	23	23
2	E S	E S	20	E S	E S	A A	20	27	32	34	36	38	40	40	U A	47	55	50	47	35	38	20	E S	E S	E S
3	29	20	26	19	E S	20	30	32	33	38	54	55	40	39	A A	147	51	57	A A	A A	A A	32	53	26	50
4	24	30	A A	E S	20	E S	25	30	40	43	52	65	70	38	41	40	50	54	45	43	28	E S	20	E S	
5	E S	E S	24	20	E S	E S	E S	27	33	34	48	43	41	46	47	38	63	33	32	A A	A A	36	A A	19	
6	E S	E S	E S	E S	20	E S	20	A A	30	31	33	35	42	46	68	A A	105	40	35	33	20	45	28	19	E S
7	25	E S	E S	E S	E S	20	20	25	28	38	38	37	40	42	41	38	34	36	37	32	28	19	E S	E S	
8	E S	E S	E S	E S	E S	E S	23	28	34	34	40	43	50	48	40	37	44	52	A A	A A	60	34	28	A A	E S
9	24	22	A A	23	A A	18	24	25	32	39	36	37	40	50	42	46	36	30	41	39	E S	E S	24	29	
10	29	E S	E S	E S	26	20	E S	25	30	35	41	40	44	46	54	44	44	44	44	52	45	30	34	24	
11	E S	E S	E S	E S	E S	E S	16	24	33	A A	39	38	42	40	39	38	37	50	37	34	53	33	24	E S	
12	E S	E S	E S	E S	E S	E S	17	27	31	37	G	40	G	G	G	39	39	34	31	52	66	51	E S	24	
13	18	E S	E S	E S	E S	22	24	30	A A	A A	48	50	48	43	47	46	46	48	21	26	55	25	E S		
14	20	E S	E S	E S	E S	E S	37	A A	A A	35	45	39	42	G	G	40	45	57	51	40	46	19	25		
15	E S	49	19	29	20	22	A A	30	38	50	50	47	G	42	37	50	54	G	24	E S	E S	34	E S	24	
16	E S	E S	22	25	25	25	28	24	34	40	48	49	41	58	45	43	43	34	30	30	54	A A	20	20	
17	19	20	20	E S	E S	E S	18	28	31	33	37	38	34	43	43	38	43	60	29	19	13	20	E S	E S	
18	19	18	18	E S	21	25	20	G	31	38	43	42	C	51	47	42	36	35	27	25	22	22	20	20	
19	E S	E S	E S	E S	20	21	17	26	37	53	A A	C	C	C	C	C	C	C	C	C	C	C	C	C	
20	C	C	C	C	C	C	C	C	C	C	38	47	40	49	71	38	33	34	27	26	25	22	17	E S	
21	25	E S	E S	E S	E S	E S	25	53	40	42	43	40	51	49	55	64	53	40	32	30	20	E S	E S	E S	
22	E S	E S	23	20	21	25	26	31	41	40	42	44	46	48	44	40	39	G	G	E S	E S	E S	18	E S	
23	E S	E S	E S	E S	E S	E S	24	31	33	44	42	44	42	38	40	46	54	64	24	32	A A	22	E S		
24	E S	23	23	24	25	24	24	28	31	44	A A	44	47	48	79	A A	38	32	26	38	20	24	E S	E S	
25	18	20	19	50	34	E S	E S	28	50	A A	39	40	40	38	39	68	70	34	40	40	22	20	13	E S	
26	E S	E S	E S	E S	22	21	29	30	40	35	A A	40	40	40	37	35	33	32	28	28	27	25	E S	A A	
27	25	E S	20	18	E S	E S	E S	23	33	G	34	40	40	40	G	38	35	31	24	E S	E S	37	20	20	
28	E S	E S	E S	E S	E S	E S	19	28	36	39	41	40	38	44	37	33	G	G	23	18	E S	E S	E S	E S	
29	E S	E S	E S	E S	21	E S	E S	30	39	50	52	49	E S	E S	38	Y	38	43	24	E S	E S	41	22	E S	
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
																					E S	E S	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	28	28	28	28	28	28	28	28	28	28	29	28	27	28	28	27	28	28	29	29	29	29	29	29	29
MED	E S	E S	17	E S	17	17	20	28	34	38	42	42	40	44	42	40	40	37	32	30	26	28	19	E S	
UQ	24	20	22	20	21	22	24	30	40	47	52	47	46	48	50	50	49	48	44	40	34	37	23	23	
LQ	E S	E S	E S	E S	E S	E S	16	25	31	34	38	40	40	40	38	38	36	33	27	20	19	20	E S	E S	

AUG. 1987

FBES (0.1 MHz)

IONOSPHERIC DATA

AUG. 1987

FMIN (0.1 MHz)

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

Station	OKINAWA				Lat.	26 16.9 N				Long.	127 48.4 E				Sweep	1 MHz to 25 MHz		in 2 sec		in automatic operation				
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S	E S	E S	E S	E S	E S	E S	15	14	19	20	21	24	22	22	24	21	16	14	14	E S	E S	E S	E S
2	E S	E S	E S	E S	E S	E S	E S	16	16	17	21	23	21	22	22	21	22	18	13	14	E S	E S	E S	E S
3	E S	E S	E S	E S	E S	E S	E S	16	16	20	22	24	25	26	22	20	19	18	14	E S	E S	E S	E S	
4	E S	E S	E S	E S	E S	E S	E S	15	16	17	21	25	22	20	22	22	18	15	13	E S	E S	E S	E S	
5	E S	E S	E S	E S	E S	E S	E S	14	15	16	18	22	21	21	22	21	18	17	17	14	E S	E S	E S	E S
6	E S	E S	E S	E S	E S	E S	E S	13	15	20	22	22	22	22	25	20	23	14	13	E S	E S	E S	E S	
7	E S	E S	E S	E S	E S	E S	E S	14	14	20	20	23	25	25	22	24	18	14	15	14	E S	E S	E S	E S
8	E S	E S	E S	E S	E S	E S	E S	14	14	20	22	28	25	27	24	24	24	19	15	13	E S	E S	E S	E S
9	E S	E S	E S	E S	E S	E S	E S	15	14	14	16	23	23	26	27	25	23	20	19	13	E S	E S	E S	E S
10	E S	E S	E S	E S	E S	E S	E S	14	13	16	18	22	30	26	22	19	19	14	13	14	E S	E S	E S	E S
11	E S	E S	E S	E S	E S	E S	E S	16	14	16	17	21	23	25	22	23	21	20	18	14	E S	E S	E S	E S
12	E S	E S	E S	E S	E S	E S	E S	15	13	15	19	21	23	24	26	23	22	21	16	14	E S	E S	E S	E S
13	E S	E S	E S	E S	E S	E S	E S	15	15	14	22	23	28	29	25	27	24	20	15	16	E S	E S	E S	E S
14	E S	E S	E S	E S	E S	E S	E S	16	15	19	20	23	28	24	26	23	20	17	14	16	E S	E S	E S	E S
15	E S	E S	E S	E S	E S	E S	E S	13	15	14	20	23	25	24	25	26	24	21	16	13	E S	E S	E S	E S
16	E S	E S	E S	E S	E S	E S	E S	16	15	19	22	23	24	24	25	25	22	26	13	E S	E S	E S	E S	
17	E S	E S	E S	E S	E S	E S	E S	15	15	20	22	25	22	25	20	21	19	15	14	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	21	24	22	C	25	24	22	19	15	16	E S	E S	E S	E S	
19	E S	E S	E S	E S	E S	E S	E S	16	14	20	19	C	C	C	C	C	C	C	C	C	C	C	C	
20	C	C	C	C	C	C	C	C	C	C	C	20	24	23	24	24	21	21	15	13	E S	E S	E S	E S
21	E S	E S	E S	E S	E S	E S	E S	15	17	19	25	22	27	28	24	23	21	16	14	15	E S	E S	E S	E S
22	E S	E S	E S	E S	E S	E S	E S	14	14	17	20	25	27	21	24	29	22	17	14	E S	E S	E S	E S	
23	E S	E S	E S	E S	E S	E S	E S	14	14	20	21	24	27	26	22	21	20	16	14	E S	E S	E S	E S	
24	E S	E S	E S	E S	E S	E S	E S	14	20	20	22	23	25	24	26	22	19	14	13	E S	E S	E S	E S	
25	E S	E S	E S	E S	E S	E S	E S	16	16	16	18	21	22	22	24	22	20	19	15	15	E S	E S	E S	E S
26	E S	E S	E S	E S	E S	E S	E S	15	14	18	21	22	21	23	21	20	19	14	15	E S	E S	E S	E S	
27	E S	E S	E S	E S	E S	E S	E S	15	14	16	24	22	27	23	24	19	21	14	14	E S	E S	E S	E S	
28	E S	E S	E S	E S	E S	E S	E S	16	14	18	16	22	20	24	23	20	16	14	14	E S	E S	E S	E S	
29	E S	E S	E S	E S	E S	E S	E S	14	18	23	24	48	47	26	24	19	15	14	16	E S	E S	E S	E S	
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E S	E S	E S	E S
																					14	16	16	16
CNT	28	28	28	28	28	28	28	28	28	28	28	28	27	28	28	28	28	28	29	29	29	29	29	
MED	E S	E S	E S	E S	E S	E S	E S	15	14	19	21	23	25	24	24	22	20	16	14	E S	E S	E S	E S	
UQ	E S	E S	E S	E S	E S	E S	E S	16	16	20	22	24	27	26	25	24	21	17	14	E S	E S	E S	E S	
LQ	E S	E S	E S	E S	E S	E S	E S	14	14	17	20	22	22	22	22	20	19	14	13	14	E S	E S	E S	E S

AUG. 1987

FMIN (0.1 MHz)

IONOSPHERIC DATA

AUG. 1987

M(3000)F2 (0.01)

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

Station	OKINAWA				Lat.	26 16.9 N				Long.	127 48.4 E				Sweep	1 MHz to 25 MHz		in 2 sec		in automatic operation							
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	F	F	F	F	F	F	330	340	340	360	A	A	A	285	280	280	235	310	A	320	330	280	285	295			
2	290	295	310	350	330	A	325	335	340	335	290	325	285	280	295	290	290	295	300	U R	325	335	325	305	280		
3	F	F	R	F	F	F	360	355	325	330	300	280	285	275	A	280	290	A	A	A	F	F	F	F			
4	F	F	A	260	325	325	F	F	300	305	285	J R	280	310	300	295	305	315	335	315	310	J S	295	300	335	F	
5	F	F	320	310	300	320	335	330	365	G	285	310	305	285	280	320	330	325	300	A	A	325	A	F			
6	F	F	F	F	F	F	325	A	315	345	310	290	290	300	315	A	320	330	320	315	S	300	305	320	305		
7	285	J S	J S	315	U S	310	340	335	330	325	315	335	290	285	295	305	310	315	300	305	325	340	S	335	315	U S	
8	S	F	F	S	S	S	365	365	355	355	335	275	295	295	280	295	310	300	A	R	325	350	350	A	F		
9	F	F	A	330	A	315	360	345	360	305	305	270	R	295	285	295	305	285	295	235	U R	335	350	355	280	285	
10	F	F	F	F	335	315	335	355	365	330	320	270	305	270	290	295	315	320	320	300	R	320	315	310	305		
11	S	F	F	F	F	F	R	340	360	335	A	290	305	315	270	270	290	R	310	305	300	325	350	360	295	280	
12	280	295	300	295	310	S	R	335	375	365	340	300	295	295	275	260	265	280	295	315	320	340	S	F	F	F	
13	F	F	F	285	S	320	360	335	345	335	A	A	300	275	305	285	280	290	R	300	310	R	310	320	335	345	300
14	295	290	F	F	F	F	350	360	A	A	320	310	285	260	265	290	280	295	R	320	330	305	295	310	F		
15	F	F	F	F	F	F	A	320	340	365	R	330	315	290	305	290	275	280	290	305	R	325	335	315	295	F	
16	F	F	F	F	F	F	F	365	355	325	340	305	305	295	285	290	310	305	315	300	320	A	F	F			
17	F	F	F	F	F	F	325	325	350	345	350	295	R	295	300	290	R	300	305	315	S	S	290	315	310		
18	S	F	F	F	F	F	350	340	R	U R	345	340	310	C	320	310	300	310	320	315	335	360	300	305	F		
19	F	F	F	F	F	345	335	345	355	360	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
20	C	C	C	C	C	C	C	C	C	C	310	300	295	290	300	295	300	300	330	U S	345	350	330	295	F		
21	F	S	F	F	F	F	350	360	340	315	295	280	295	295	295	305	310	355	S	U S	U S	U S	U S	S			
22	S	275	275	F	F	F	S	300	365	365	345	310	310	300	270	285	285	300	295	R	325	340	335	315	300	F	
23	F	F	F	S	310	S	S	365	365	345	335	305	305	305	300	295	305	310	335	U S	S	360	A	S	F		
24	F	F	F	F	F	F	315	S	330	345	345	350	325	A	290	300	280	R	A	305	310	315	S	315	310	310	285
25	S	290	S	F	F	F	F	360	365	A	315	305	300	300	295	300	R	310	315	330	J S	285	U S	285	290	F	
26	F	305	F	F	S	F	F	F	U R	U R	A	U R	G	290	315	310	300	320	310	345	295	S	300	285	A		
27	280	315	U S	S	305	310	320	335	360	340	340	330	R	315	R	R	300	315	U R	R	J S	310	S	J S	U S		
28	F	F	F	S	285	300	310	320	350	365	335	310	295	280	330	320	310	320	310	R	335	340	315	320	310		
29	290	300	300	295	325	300	S	340	360	350	R	335	325	290	285	310	315	R	280	295	320	U S	335	345	335	285	285
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	11	11	7	14	15	15	22	25	27	24	24	27	26	28	27	26	28	27	26	27	27	25	24	15			
MED	290	295	310	308	315	320	335	350	350	338	315	300	295	290	295	295	305	305	315	325	330	315	300	290			
UQ	292	302	320	330	325	332	345	360	362	345	335	310	305	300	300	305	312	312	320	335	342	330	312	302			
LQ	282	292	305	295	310	312	330	340	338	325	302	290	285	280	285	290	290	295	310	318	312	300	285	285			

AUG. 1987

M(3000)F2 (0.01)

IONOSPHERIC DATA

AUG. 1987

M(3000)F1 (0.01)

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

Station	OKINAWA							Lat.	26 16.9 N				Long.	127 48.4 E				Sweep 1 MHz to 25 MHz in 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	L	A	A	A	A	A	A	A	A	A									
2								L	400	395	385	390	385	405	A	A	A	A	L									
3								L	405	A	A	A	415	410	A	A	A	A	A	A								
4								L	A	A	A	A	A	400	400	385	A	A	A	A								
5								L	400	405	A	A	400	A	A	380	A	L	L	A								
6								A	L	385	400	400	410	A	A	A	405	380	L									
7								L	385	405	405	410	410	385	385	395	390	385	A									
8								L	U L	L	L	L	A	A	A	375	375	A	A	A								
9								L	L	L	L	L	A	A	A	A	375	355	L	A								
10								L	U L	L	L	L	A	A	A	A	A	A	A	A								
11								L	L	A	L	L	405	415	390	375	365	A	L									
12								L	L	U L	L	L	415	415	400	410	370	380	U L									
13								L	L	A	A	A	A	A	A	A	A	A	A	A								
14								A	A	A	L	A	L	375	375	380	380	A	A	A								
15								A	L	A	A	A	385	A	380	A	A	L	L									
16								L	L	L	A	A	395	A	380	390	385	L	A									
17								L	L	405	410	395	335	390	380	380	375	A	L									
18								L	L	U L	L	U L	C	A	A	400	395	390	L									
19								L	410	A	A	C	C	C	C	C	C	C	C	C								
20								C	C	C	L	385	385	A	A	395	390	385	390									
21								A	A	L	U L	L	A	A	A	A	A	385	L									
22								L	A	L	L	A	A	A	A	360	335	350	L									
23								L	L	U L	L	U L	365	375	380	365	L	A	A	A								
24								L	A	A	A	A	A	A	A	U L	L	L										
25								L	A	A	405	U L	385	405	U L	A	A	385	A									
26								L	A	385	A	405	385	375	385	385	L	U L	L									
27								L	L	L	L	380	385	400	U L	385	380	L	L									
28								L	L	L	U L	L	375	385	A	370	370	365	L	L								
29								L	L	A	A	A	B	B	370	385	370	A	L									
30								C	C	C	C	C	C	C	C	C	C	C	C	C								
31								C	C	C	C	C	C	C	C	C	C	C	C	L								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT									6	13	14	17	18	12	16	17	14	11	2									
MED									392	395	392	395	385	400	380	385	375	380	372									
UQ									400	405	405	405	405	408	385	390	390	385										
LQ									U L	L	L	L	385	380	373	375	365	365										

AUG. 1987

M(3000)F1 (0.01)

IONOSPHERIC DATA

AUG. 1937

H*F2 (KM)

135° E Mean Time (G.M.T. + 9h)

Station	OKINAWA				Lat. 26° 16' 9" N				Long. 127° 48' 4" E				Sweep 1 MHz to 25 MHz in 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	260	270	A	A	A	400	A	A	A	A	A						
2							280	270	290	310	300	440	340	350	A	A	A	315						
3							300	230		A	A	340	360	A	A	A	A	A	A					
4							230	A	A	A	A	A	320	340	320	A	A	A	A					
5							310	230	G	A	340	340	410	A	305	A	305	280	A					
6							A	310	270	350	370	400	375	A	A	310	280	290						
7							240	300	310	300	400	390	380	335	315	315	325	250						
8							240	270	270	300	450	380	355	365	330	300	300	A						
9							270	230	400	350	450	365	370	330	310	345	325	320						
10							245	235	305	360	520	370	470	400	335	300	285	270						
11							230	290	A	420	350	330	450	400	330	290	300	295						
12							230	230	285	285	370	380	400	430	400	355	305	270						
13							255	230	A	A	365	400	325	350	350	330	350	280						
14							220	A	A	310	295	340	390	420	330	330	305	270						
15						A	270	245	295	300	400	320	350	355	355	330	280							
16							240	250	300	A	A	320	A	380	340	310	260	250						
17							260	260	260	270	380	375	325	340	320	310	A	270						
18							275	240	270	275	340	C	A	330	350	320	280	270						
19							250	260	A	A	C	C	C	C	C	C	C	C						
20							C	C	C	300	350	365	390	A	335	315	300	260						
21							A	230	270	320	360	A	340	325	A	305	290	240						
22							230	220	275	330	330	340	370	350	330	305	305	250						
23							245	220	245	300	325	360	350	345	325	320	280	270						
24							245	270	A	360	350	335	365	A	A	300	285	260						
25							230	A	A	300	350	330	310	360	A	A	280	A						
26							320	300	360	A	530	G	425	340	310	360	300	290						
27							220	260	260	290	270	290	290	320	310	290	275	260						
28							250	245	270	300	305	330	270	280	300	230	305	235						
29							235	250	280	305	295	360	345	295	275	305	305	270						
30							C	C	C	C	C	C	C	C	C	C	C	C						
31							C	C	C	C	C	C	C	C	C	C	C	C						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								23	25	22	20	24	24	26	23	21	22	23	24					
MED								245	250	272	300	350	362	358	350	330	310	300	270					
UQ								265	270	300	325	375	385	390	365	335	330	305	282					
LQ								230	230	270	298	315	340	325	332	310	300	282	260					

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H*F2 (KM)

IONOSPHERIC DATA

AUG. 1987 H^oF (KM) 135° E Mean Time (G.M.T. + 9h)

Station	OKINAWA							Lat.	26 16.9 N				Long.	127 48.4 E				Sweep	1 MHz to 25 MHz in 2 sec in		automatic operation						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	A	A	A	E A	E A	E A	A	A	A																		
2	S	S	240	220	240	A	260	235	220	200	205	205	200	200	A	A	A	A	A	250	240	A	A	E A			
3	A	A	A	A	S	260	220		210						A	A	A	A	A	A	A	A	A	A			
4	A	A	A	S	270	265	255	230	220	A	A	A	A	A	210	235	A	A	A	A	A	A	260	240	E S		
5	S	S	270	250	240	S	250	250	200	A	200	A	A	210	A	A	210	A	A	A	A	A	A	E A			
6	S	S	S	E S	E S	A	E S	235	A	205	190	180	190	A	A	A	A	220	A	A	255	A	A	E A			
7	A	S	280	270	280	S	255	250	255	215	200	210	210	190	200	A	A	A	220	210	A	A	A	S			
8	305	295	260	245	230	290	250	225	215	200	210	E A	250	A	A	A	225	200						330			
9	315	300	A	265	A	275	240	210	215	230	200	190	215	A	A	A	215	220	A	245	220	215	330	350			
10	330	315	295	265	245	280	270	220	220	200	A	215	A	A	A	A	A	A	A	280	250	265	270	265			
11	255	270	265	270	260	285	250	210	205	A	200	190	215	200	205	215	245	A	A	245	245	220	290	300			
12	300	280	290	280	270	270	230	230	190	210	215	200	190	190	195	A	A	220	A	255	260	300	270	330			
13	315	320	350	315	250	230	255	240	215	A	A	A	A	A	A	A	A	A	A	245	245	250	200	S			
14	305	330	320	310	250	S	235	A	A	A	195	A	200	235	200	200	A	A	A	245	250	A	235	A			
15	295	335	285	285	250	270	A	235	A	A	A	A	205	A	205	A	A	225	220	230	220	245	240	220			
16	270	270	250	280	230	240	A	220	200	A	A	A	230	A	A	A	A	250	A	260	A	A	A	A			
17	A	A	A	S	250	240	250	220	220	200	200	190	H	A	A	A	A	A	A	245	240	230	230	240	260		
18	E A	A	E A	S	A	A	220	220	220	210	225	A	C	A	A	A	220	A	A	A	A	A	A	A			
19	E S	E S	250	215	A	E A	260	220	240	A	A	A	C	C	C	C	C	C	C	C	C	C	C	C			
20	C	C	C	C	C	C	C	C	C	C	C	200	A	200	A	A	220	210	240	240	235	210	220	E A			
21	A	E S	S	S	240	235	240	A	A	A	A	200	A	A	A	A	A	A	A	A	A	A	225	200	210	270	260
22	295	300	295	295	290	290	270	230	A	A	220	A	A	A	A	A	250	A	205	220	215	200	245	265	280		
23	270	275	280	250	230	245	230	220	205	195	195	210	250	200	205		A	A	A	A					310	310	
24	320	320	285	280	300	270	245	240	230	A	A	A	A	A	A	A	A	240	A	255	245	255	235	295			
25	E A	A	E A	A	260	260	270	A	A	A	A	200	200	205	210	A	A	A	A	220	270	250	245	250			
26	S	260	E S	E S	A	A	A	A	A	A	A	230	250	220	210	220	220	A	A	A	A	A	S	A			
27	A	S	A	A	E S	260	255	A	220	200	200	200	210	210	190	220	220	230	240	240	210	A	A	A			
28	320	290	270	300	290	270	275	240	230	220	A	200	200		215	215	205	220	240	245	210	215	220	250			
29	275	255	280	285	265	270	250	A	A	A	A	A	B	B	215	245	245	A	A	245	230	200	270	270	280		
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	19	22	21	24	22	25	24	20	17	15	13	15	16	10	12	12	10	10	9	26	24	20	22	20			
MED	295	282	275	272	254	260	250	222	215	200	200	200	202	208	208	220	220	228	240	240	225	238	252	277			
UQ	312	300	290	284	268	272	256	238	220	210	210	205	215	210	215	220	220	240	240	250	245	252	270	300			
LQ	274	270	258	254	245	248	235	220	205	200	200	190	200	200	202	212	210	220	220	230	210	220	238	258			

IONOSPHERIC DATA

AUG. 1937

H⁺E (KM)

135° E Mean Time (G.M.T. + 9h)

Station	OKINAWA				Lat. 26 16.9 N				Long. 127 43.4 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			A	A	A	A	A	A	A	A	A	A	A				
2							S	A		A	A	A	A	A	110	110	105		A	A	A			
3							S	A	A		110	105	105	110	105	105	110		A	110	105		S	
4							S		110	A	A	A	A	A	A	A	A		110		A		S	
5							S		110	110	105	105		A	A	A	A		110	110	110	110		A
6							S		110	A		110	110	110		110	110	110	110	110	110		S	
7							S	A	A	A	A	A		105	A	A	A		A	A	115	115	110	A
8							S		105	105	105	105	105	105	105	105	105	105	105	105	105	105		A
9							A	A	A	A	A	A		105	105	105	105	105	105	105	105	105		A
10							S		105	105	105	105	A		110	105	105	105	105	105	105		A	
11							A	A		105	A	A	A	A		105	105	105		A	A	A	A	
12							A	A	A	A		105	105	105	105	105	105	105	105	105	105	105		A
13							A	A		105	A	A	A	A	A	A	A	A	A	A	A	A		A
14							S		105	105	A		105	105	105	A			A		100		A	
15							A	A		105	105	105	105	105	105	105	105	105	105	100	100		S	
16							S		110	110	110	110	110	110	110	110	110	110	110				A	
17							S		110	A		110	A	A	A		110	110		A	A			
18							S		110	110	A		110	110		A	A		120	110	110			
19							S		110	105	105	A	C	C	C	C	C	C	C	C	C			
20								C	C	C	A	A	A	A	A	A	A	A	A	A	A			
21								110	110	110	110	110	110	110	110	110	110	110	120		A	A		
22								A	A	A	A		105	105	105	105	105	105	105	105	105	105		
23								100	105	105	105	105	105	105	105	105			A		100		A	
24								A	A	A	A	A	A	A	A	A	A	A	A	A	A			
25								110	110	110	105	105	105		A	A	A	A	A	A				
26								110	105	105	105	105	110	110		110		110	110	110				
27								A	A		110	A	A		110	110	110	110	110	110				
28								A	A	A	A	A	A	A	A	A	A		100	100	100			
29							S		105	A	A	A	B	B	A		100	105		A	A			
30								C	C	C	C	C	C	C	C	C	C	C	C	C	C			
31								C	C	C	C	C	C	C	C	C	C	C	C	C	C			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								15	17	14	14	12	15	14	16	19	18	18	16					
MED								110	105	108	105	105	105	105	105	105	105	110	105					
UQ								110	110	110	110	108	110	110	110	110	110	110	110					
LQ								108	105	105	105	105	105	105	105	105	105	105	100	100				

AUG. 1937

H⁺E (KM)

IONOSPHERIC DATA

AUG. 1987

H°ES (KM)

135° E Mean Time (G.M.T. + 9h)

Station		OKINAWA				Lat.	26 16.9 N				Long.	127.48.4 E				Sweep	1 MHz to 25 MHz in 2 sec in		automatic operation						
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		105	100	100	100	110	110	125	120	120	110	105	105	105	100	120	115	120	115	110	100	100	100	105	
2		110	S	100	S	S	S	105	105	110	115	110	105	110	110	120	115	115	115	110	100	100	100	110	
3		110	110	110	105	110	110	105	140	140	125	120	115	115	115	115	125	115	115	110	110	110	110	110	
4		120	110	110	110	110	S	140	135	140	140	125	125	100	105	100	100	120	120	115	110	110	110	110	
5		110	110	110	100	S	S	S	135	125	125	115	125	120	125	125	135	115	115	115	110	110	110	105	
6		110	110	110	110	110	S	125	115	110	125	115	115	110	135	125	120	120	120	120	115	110	110	110	
7		110	110	110	110	110	110	110	110	110	110	110	110	115	160	110	140	140	135	125	110	110	100	110	
8		110	105	105	105	105	S	130	120	120	115	120	125	125	120	125	130	120	115	115	105	105	110	110	
9		110	115	105	105	105	105	105	105	105	105	105	105	120	130	120	120	120	135	120	110	100	105	105	
10		105	105	105	105	105	105	S	120	120	120	120	105	145	130	120	125	120	120	115	105	105	105	105	
11		100	105	110	S	100	100	100	105	120	105	105	105	135	120	120	120	100	100	100	100	100	100	95	
12		100	110	105	110	105	105	100	100	130	140	G	150	G	G	G	E G 160	155	120	125	110	105	105	95	
13		100	100	105	105	100	105	105	105	120	105	100	100	100	100	105	100	100	100	100	100	100	105	100	
14		105	105	105	105	105	105	S	125	120	105	120	115	125	115	G	G	150	130	120	110	105	100	105	
15		110	105	105	105	100	100	105	105	120	120	120	120	G	150	115	120	120	G	120	S	S	105	100	
16		110	110	110	110	110	110	100	125	140	135	130	125	125	145	160	145	140	140	125	23	110	110	110	
17		110	100	100	100	S	110	110	140	E G 155	125	110	110	110	140	125	155	135	100	100	100	100	110	S	
18		110	110	110	110	105	105	105	G	145	135	120	155	C	140	135	125	130	120	120	110	100	110	110	
19		110	110	110	110	110	110	110	130	110	115	105	C	C	C	C	C	C	C	C	C	C	C	C	
20		C	C	C	C	C	C	C	C	C	C	C	110	105	E G 160	100	100	105	105	100	100	100	100	S	
21		110	110	110	S	S	S	120	120	120	120	125	120	120	125	130	125	120	120	110	100	100	100	100	
22		S	105	105	100	100	105	100	100	100	105	110	150	145	140	135	145	125	G	G	S	S	100	110	
23		110	105	100	S	S	S	S	125	120	115	125	105	145	130	120	120	120	120	110	110	105	115	95	
24		105	105	105	100	100	105	105	105	105	105	105	105	105	100	100	100	100	100	100	95	95	95	S	
25		110	110	110	110	110	110	S	125	115	115	120	120	120	110	140	100	100	100	100	110	100	100	100	
26		100	100	S	100	120	120	120	120	115	120	125	125	140	155	110	150	150	125	125	110	110	110	110	
27		110	110	110	105	105	105	105	105	G	105	105	E G 165	E G 165	G	E G 160	150	135	130	S	110	110	110	100	
28		105	105	100	115	S	115	110	105	105	105	105	100	100	100	100	100	G	G	130	105	105	S	S	
29		100	S	S	105	100	S	115	120	115	105	105	105	B	B	100	Y	120	105	105	100	110	100	100	
30		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
31		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	120	100	105	105	
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		27	26	26	24	22	21	23	27	28	27	28	28	24	26	25	26	27	25	28	26	27	28	28	25
MED		110	108	105	105	105	105	105	120	120	115	112	112	119	124	120	120	120	120	115	108	105	105	102	105
UQ		110	110	110	110	110	110	118	125	121	125	120	125	132	140	125	135	132	120	120	110	110	110	110	110
LQ		105	105	105	102	100	105	105	105	110	105	105	105	110	110	110	115	118	105	108	100	100	100	100	100

AUG. 1987

H°ES (KM)

The Radio Research Laboratory, Japan

IONOSPHERIC DATA

AUG. 1987

TYPES OF ES

135° E Mean Time (G.M.T. + 9h)

Station		OKINAWA							Lat. 26° 16' 9" N	Long. 127° 48' 4" E	Sweep 1 MHz to 25 MHz in 2 sec in automatic operation														
Hour	Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F7	F2	F5	F4	FF12	F1	CL41	C4	C4	L4	L6	L5	L4	L3	CL42	CL62	CL63	CL75	L6	L5	F5	F8	F2	F6	
2	F1		F1			F6	L2	L3	C2	L1	L2	L2	L2	L1	C2	C3	C2	CL22	CL61	LL42	F1	F1	F3	FF32	
3	F7	F4	F6	F5	F2	F2	L3	HL13	HL11	C2	C4	C3	C2	C3	C5	C4	CL51	C6	C7	L4	F4	F4	F3	F7	
4	FF23	F4	F3	F2	F2		H2	H2	HL31	HL22	CL31	CL41	L4	L2	L3	L3	CL21	CL61	CL52	LL71	F7	F4	F3	F2	
5	F1	F2	F3	F1				H3	C2	C1	C3	CL11	CL11	CL22	CL31	H1	C4	C2	C4	L5	FF72	FF42	F7	F2	
6	F2	F2	F2	F2	F2		C2	C3	L1	C1	C1	C1	L2	H2	C4	C5	C3	C3	C3	C3	F6	F2	F3	F2	
7	F5	F1	F1	F2	F2	F2	L3	L2	L1	L2	L1	L1	C1	HL11	L2	HL12	HL11	HL22	C3	LL13	F7	F1	F2	F2	
8	F2	F5	F5	F2	F3		C4	C3	C3	C2	C2	C2	C2	C2	C1	C1	C2	C4	C6	L3	F7	F7	F4	F2	
9	F4	F7	F7	F5	F4	F3	L7	L2	L3	L3	L2	L1	CH11	C2	C2	C2	C2	C1	C6	L3	F2	F7	F5	F7	
10	F7	F4	F4	F4	F4	F5		C3	C2	C2	C1	LH21	H1	C2	C3	C2	C2	C4	C7	L7	F7	F5	F7	F3	
11	F2	F3	F1		F2	F2	L1	L1	C4	L5	L3	L2	HL11	C1	C1	C1	L3	L4	L5	L3	F6	F7	F3	F3	
12	F2	F3	F2	F2	F2	F3	L2	L3	CL12	HL11		H1				H1	H2	C2	C3	L4	F3	F4	F4	F4	
13	F2	F2	F2	F3	F3	F3	L2	L4	C2	L5	L6	L4	L2	L3	L2	L3	L4	L4	L4	L4	F2	F4	F2	F3	
14	F3	F3	F3	F3	F6	F3		C4	C7	L7	C1	C2	C1	CL12			H2	CL32	C3	LL74	F7	F4	F4	L3	
15	F3	F7	F3	F5	F4	F4	L7	L5	C3	C3	C3	CL11		H1	C1	C2	C3		C2			F7	F2	F6	
16	F2	F3	F2	F4	F3	F2	L7	C1	H2	H2	H2	C2	C1	H2	H1	H2	H2	H2	CL32	FF22	FF41	F4	F3	F2	
17	F3	F3	F3	F1		F2	L2	H2	HL11	C2	L1	L1	L1	HL11	CL21	H1	H2	L6	L5	F2	F1	F2	F2		
18	F2	F2	F2	F2	F2	F3	L2		H1	HL11	C1	HL11		H2	H1	CL21	CL11	C2	C2	FF31	F1	FF61	F2	F2	
19	F2	F2	F2	F1	F3	F6	L1	C3	C3	C6	L6														
20											L2	L2	HL11	L3	L4	L2	L2	L5	L2	F3	F5	F3	F1		
21	F3	F2	F2			F3	C5	C3	C2	C2	C2	C2	C2	C2	C3	C4	C4	CL21	LL32	F5	F1	F1	F2	F1	
22		F3	F4	F3	F4	F7	F4	L3	L4	L3	L1	H1	H1	H2	H2	H1	C2					F2	F3	F2	
23	F3	F3	F2					C2	C1	C1	C1	L1	HL11	C1	C1	C1	CL32	C7	LL43	FF74	FF24	FF36	F4	F4	
24	F3	F5	F5	F5	F7	F7	F6	L3	L2	L3	L6	L2	L2	L2	L6	L7	L2	L4	L6	F7	F4	F3	F2		
25	F2	F1	F2	F4	F4	F3		C2	C4	C5	C1	C1	C1	L1	HL11	L5	L6	L4	L4	FF45	F3	F2	F2	F2	
26	F1	F1		F2	F2	F5	F4	C6	C5	C2	C1	C1	H1	H2	L1	HL12	HL11	C2	C3	F4	F4	F3	F2	F3	
27	F4	F3	F3	F5	F2	F1	F2	L3	L5		L2	L2	H1	HL11		H1	H1	H3	C2		F1	F3	F4	F2	
28	F3	F3	F2	F3		F3	F3	L3	L5	L3	L4	L3	L2	L3	L2	L2			C1	F3	F1				
29	F2			F2	F7		F3	C6	C3	L4	L4	L1			L1		C2	L5	L3	F2	F1	F4	F4	F3	
30																									
31																				C4	F1	F2	F4	F2	F1
	00	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																									

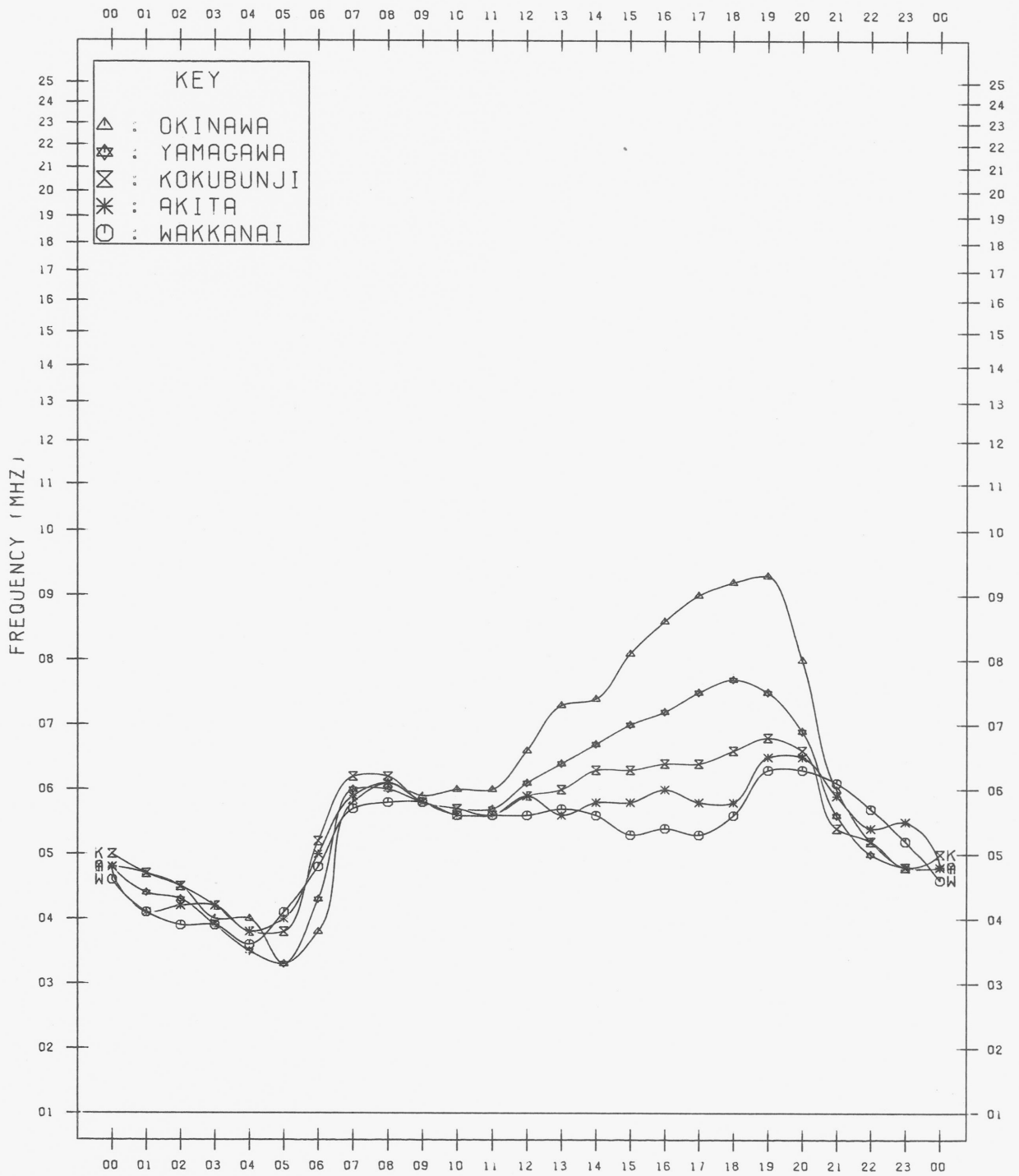
AUG. 1987

TYPES OF ES

MONTHLY MEDIAN VALUES OF FOF2

135 °E MEAN TIME

AUG. 1987



f-PLOTS OF IONOSPHERIC DATA

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

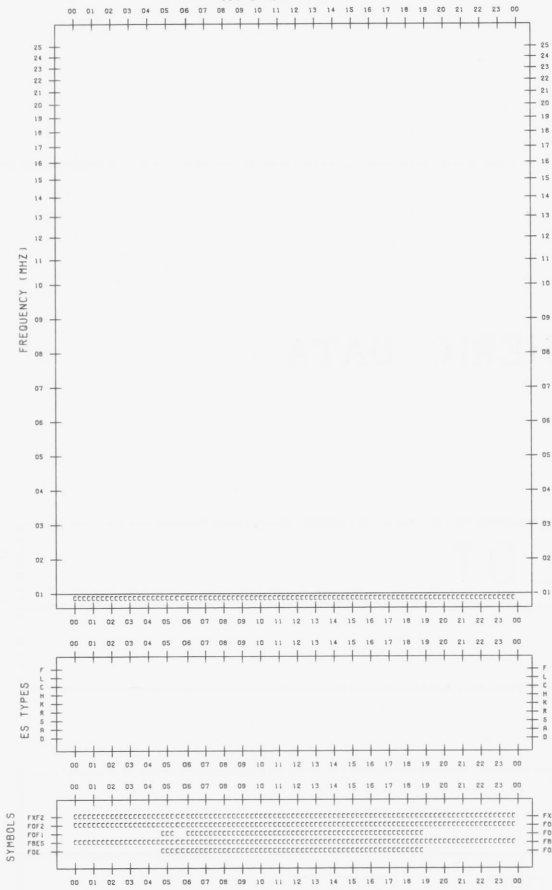
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 8/ 1

135°E MEAN TIME



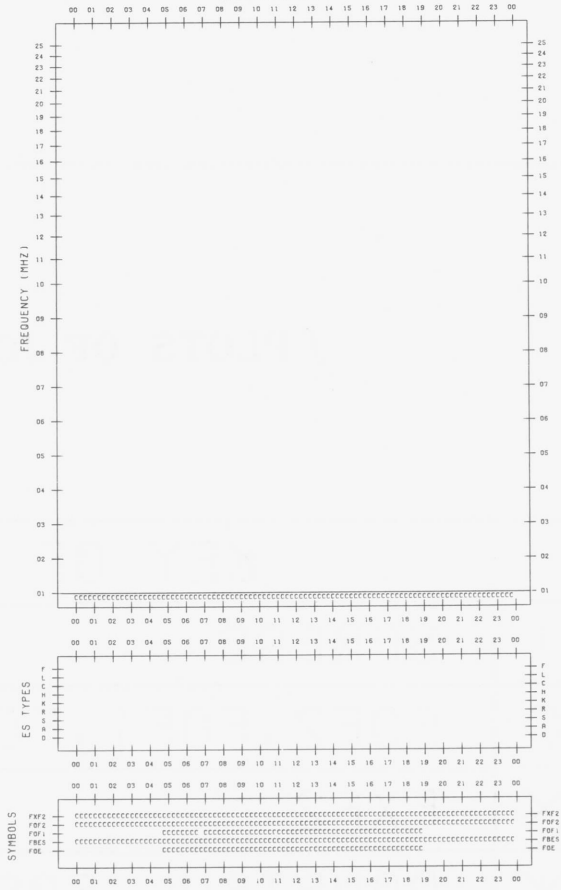
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 8/ 3

135°E MEAN TIME



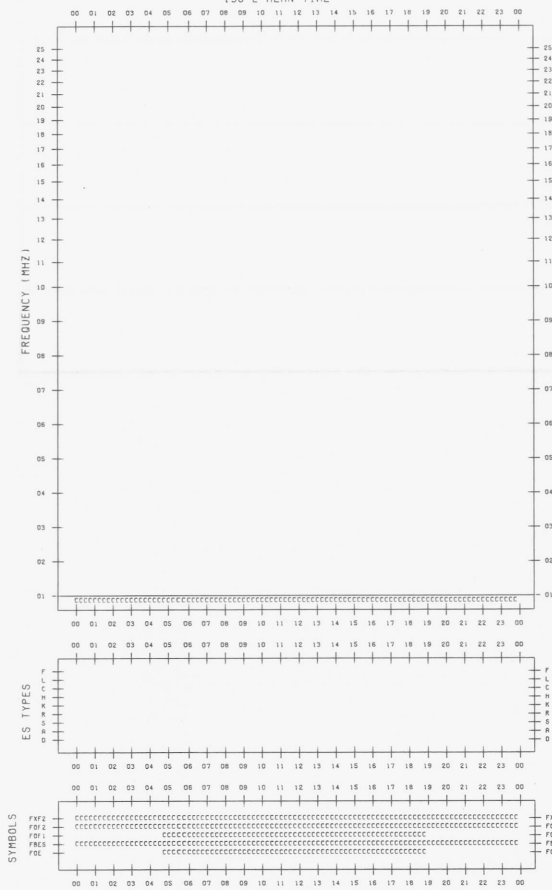
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 8/ 2

135°E MEAN TIME



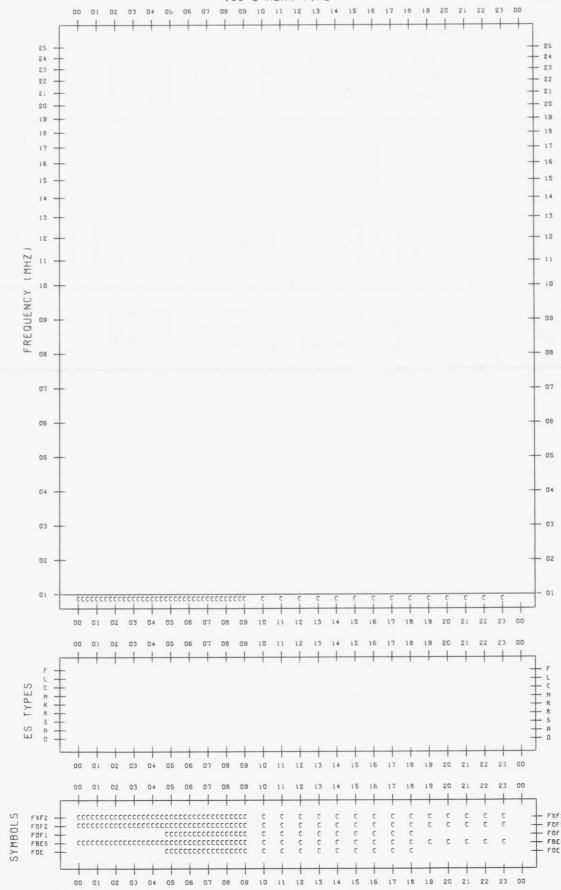
F-PLOT DATA

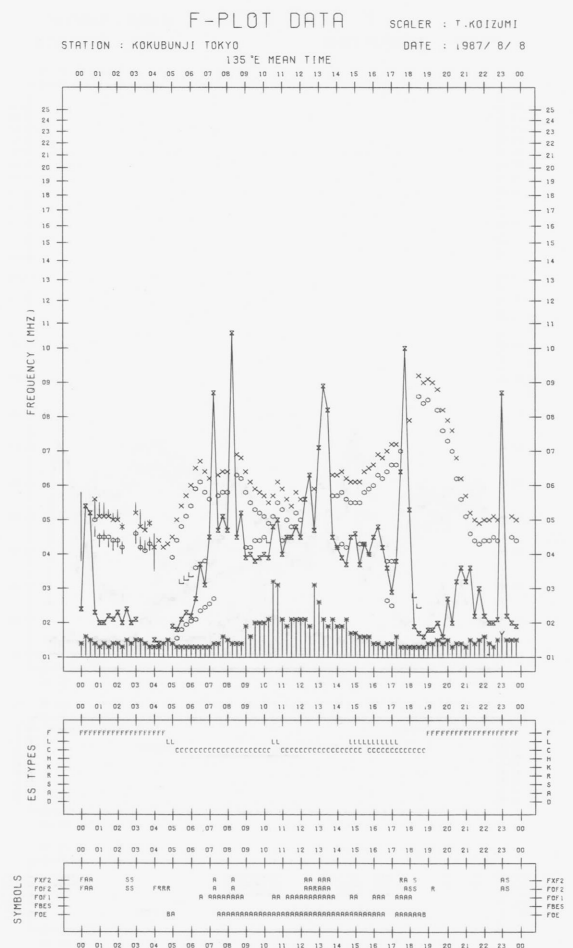
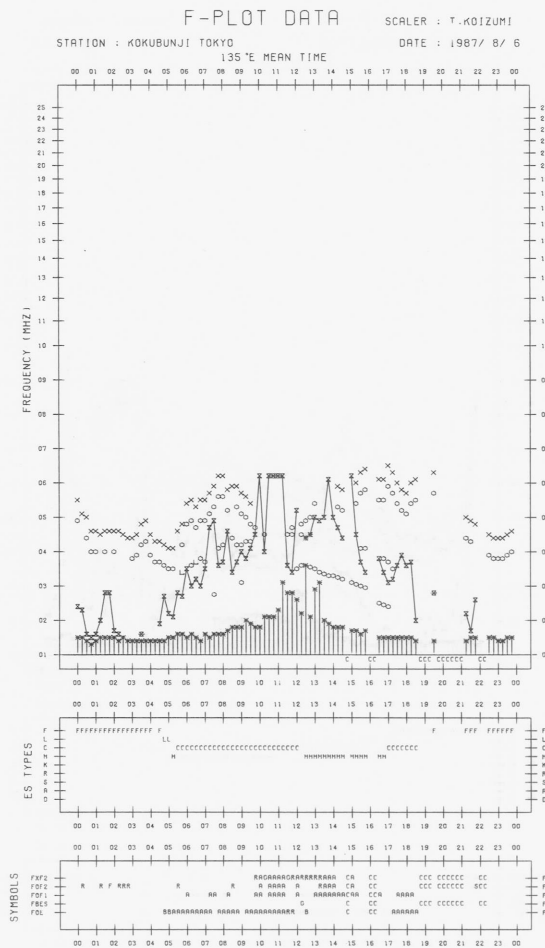
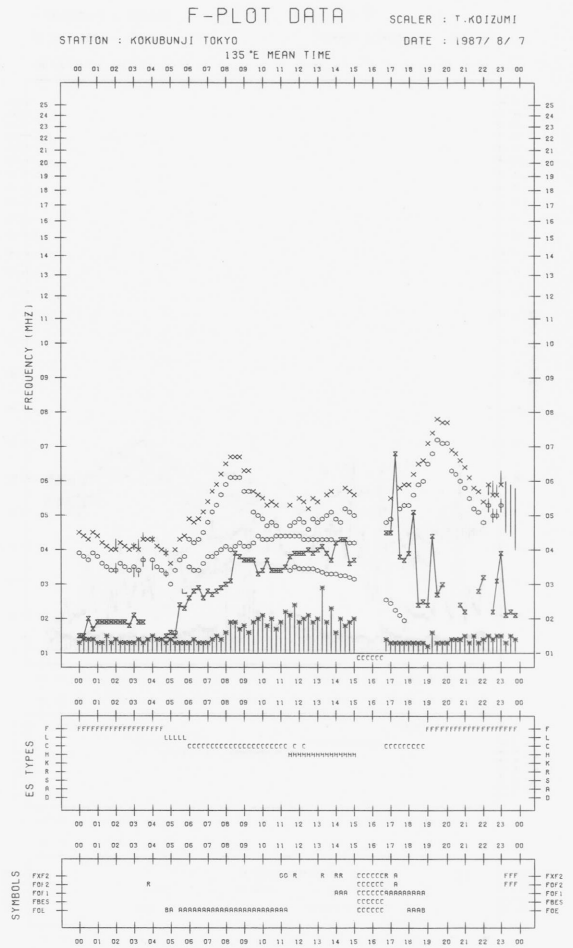
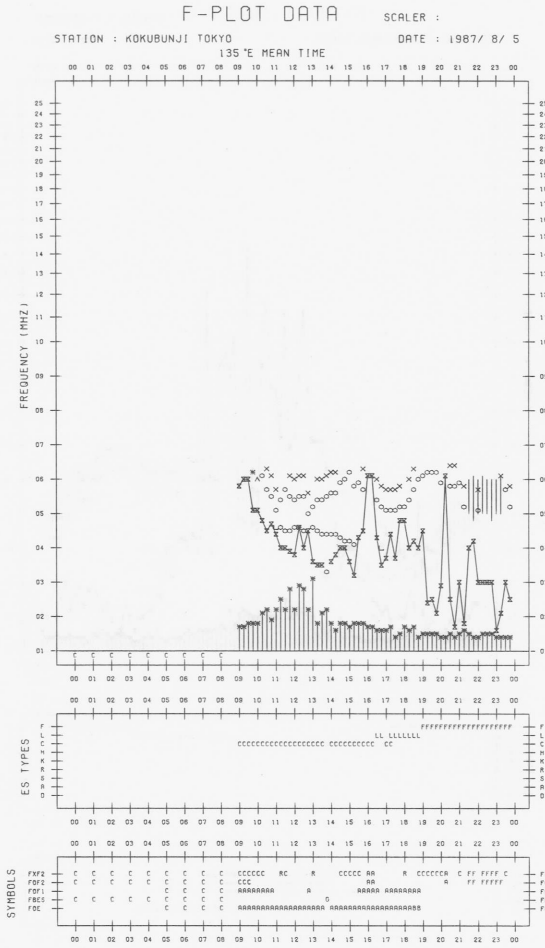
SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 8/ 4

135°E MEAN TIME





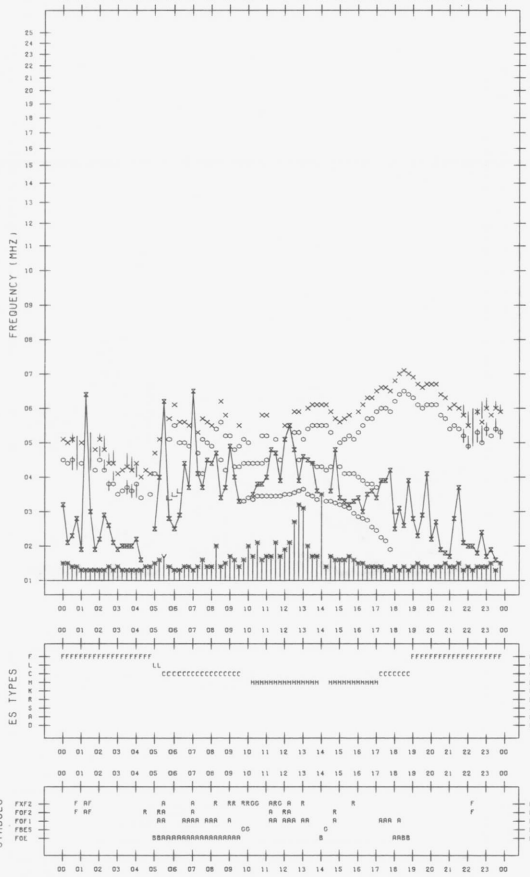
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 8/ 9

135°E MEAN TIME



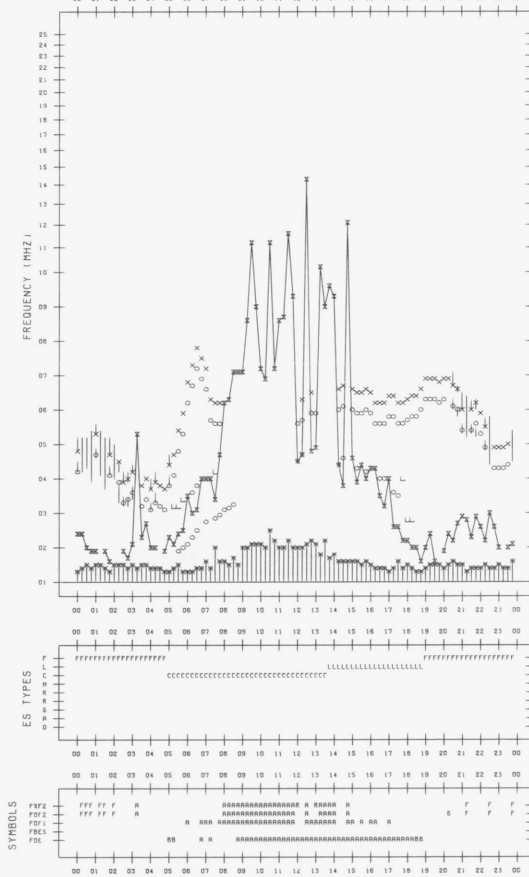
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 8/11

135°E MEAN TIME



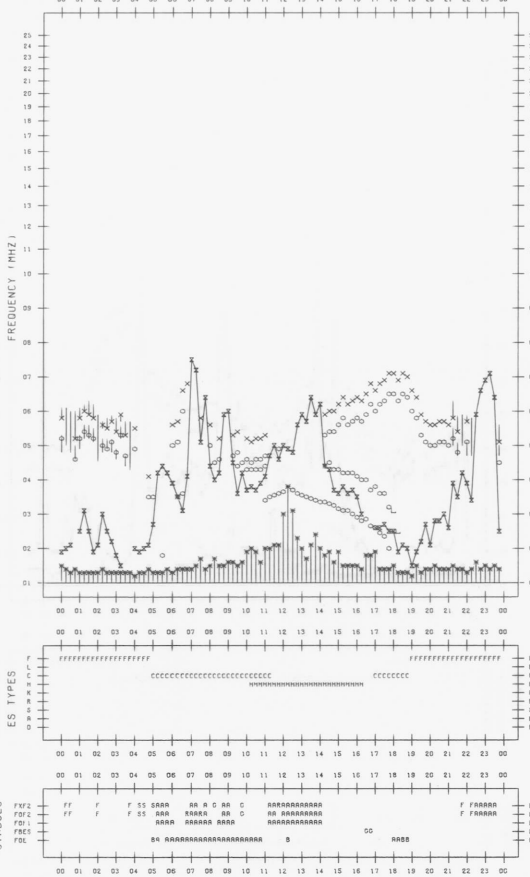
F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 8/10

135°E MEAN TIME



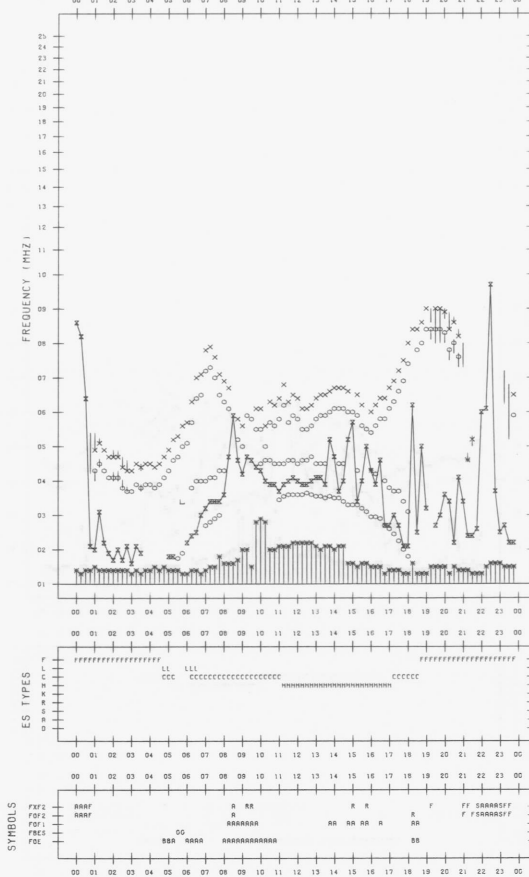
F-PLOT DATA

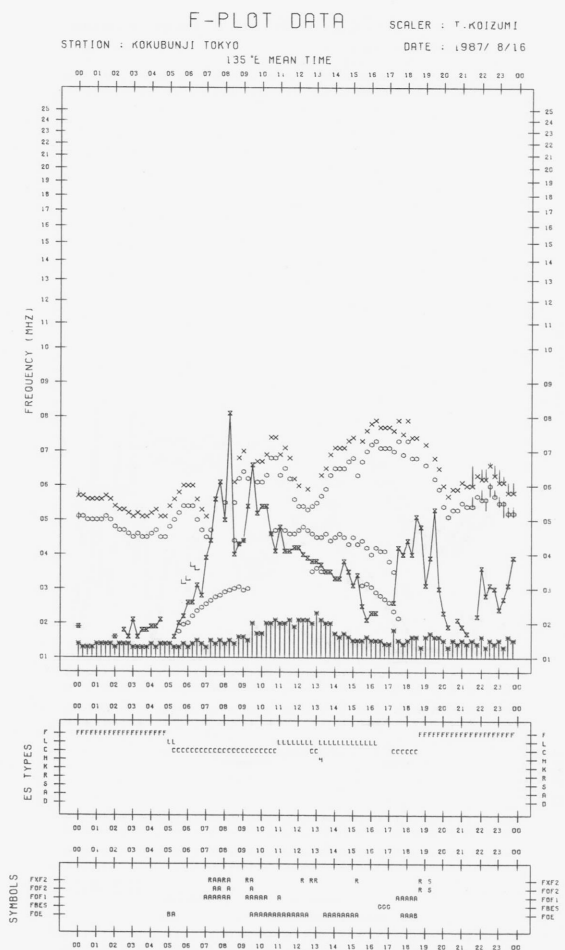
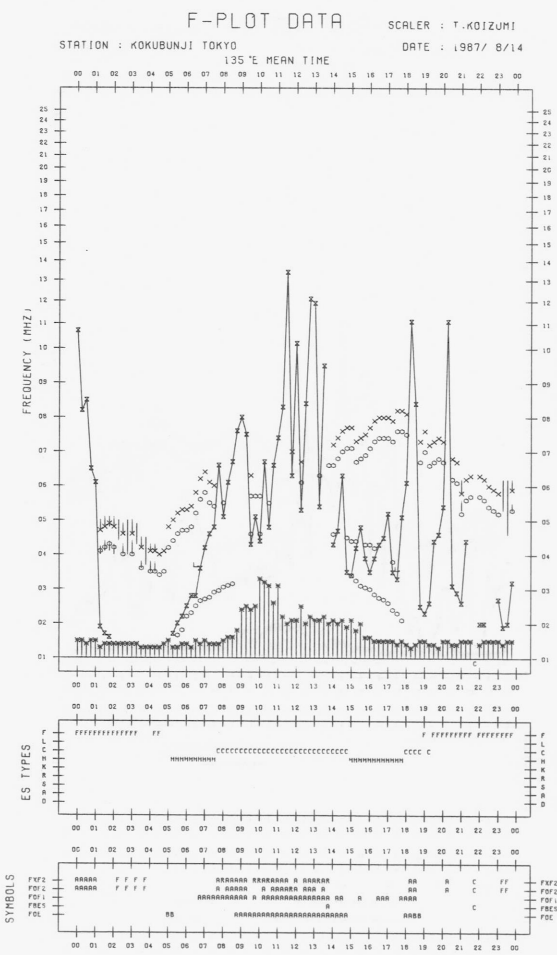
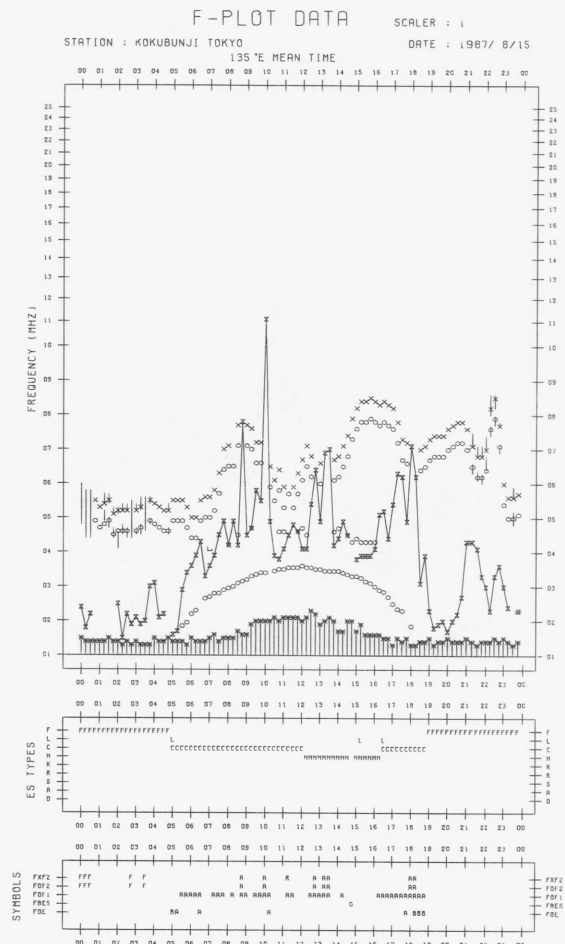
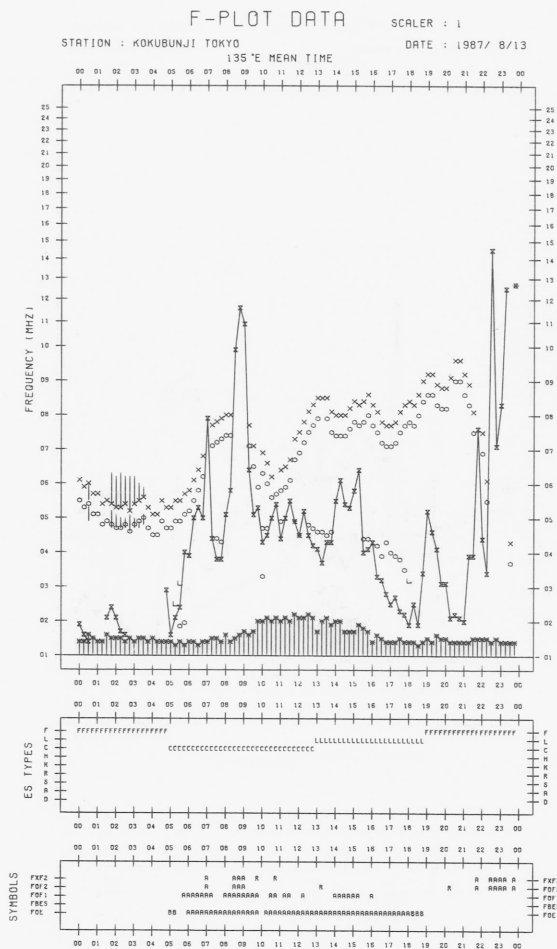
SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO

DATE : 1987/ 8/12

135°E MEAN TIME

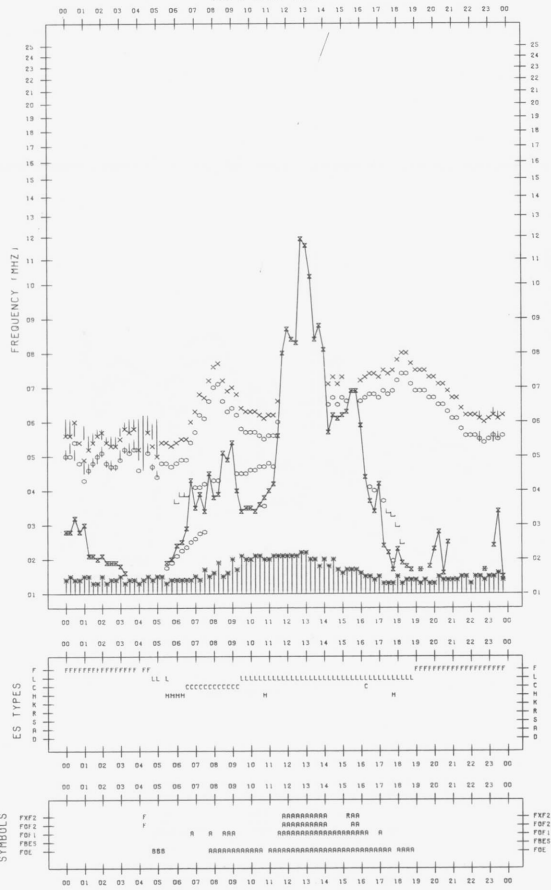




F-PLOT DATA

SCALER : T.KOIZUMI

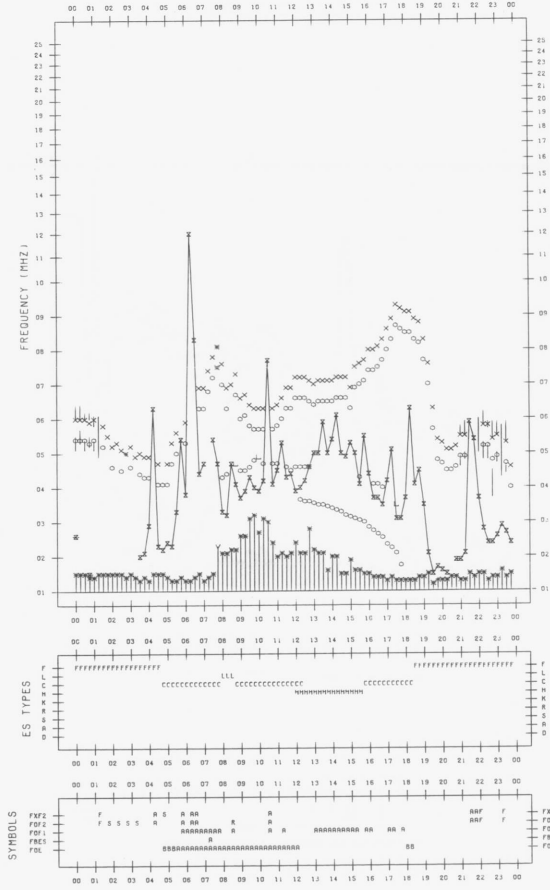
STATION : KOKUBUNJI TOKYO DATE : 1987/ 8/17
135°E MEAN TIME



F-PLOT DATA

SCALER : T.KOIZUMI

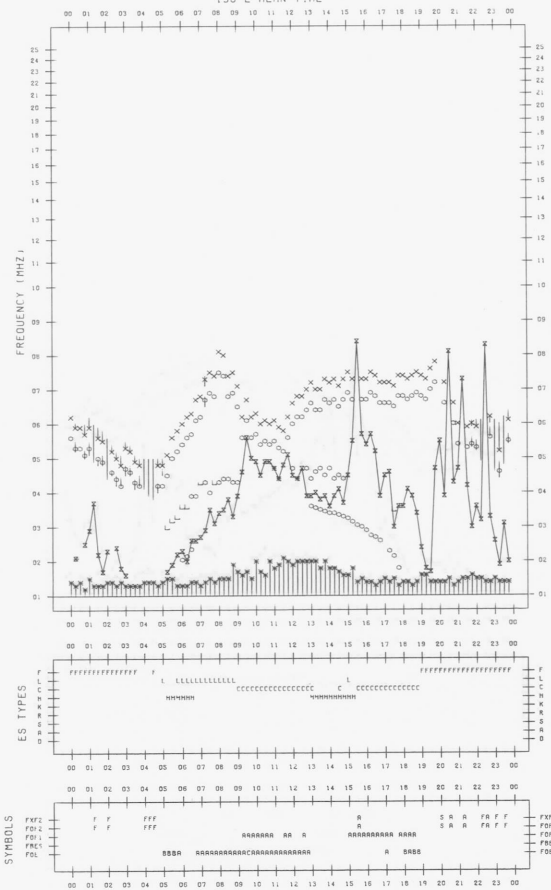
STATION : KOKUBUNJI TOKYO DATE : 1987/ 8/19
135°E MEAN TIME



F-PLOT DATA

SCALER : T.KOIZUMI

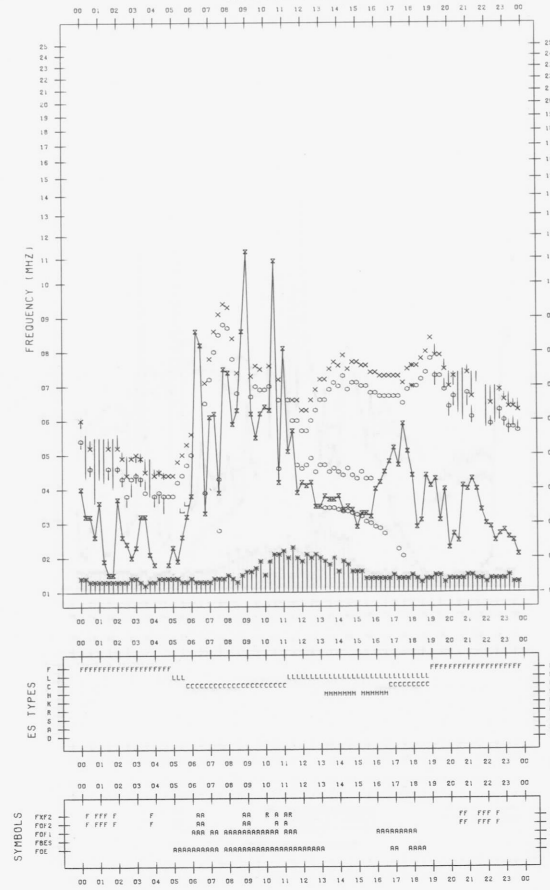
STATION : KOKUBUNJI TOKYO DATE : 1987/ 8/18
135°E MEAN TIME

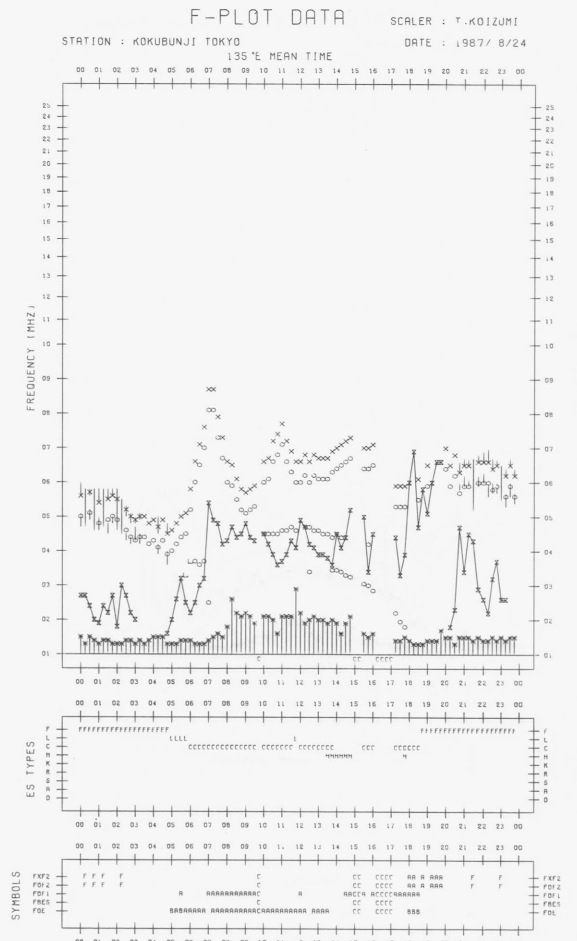
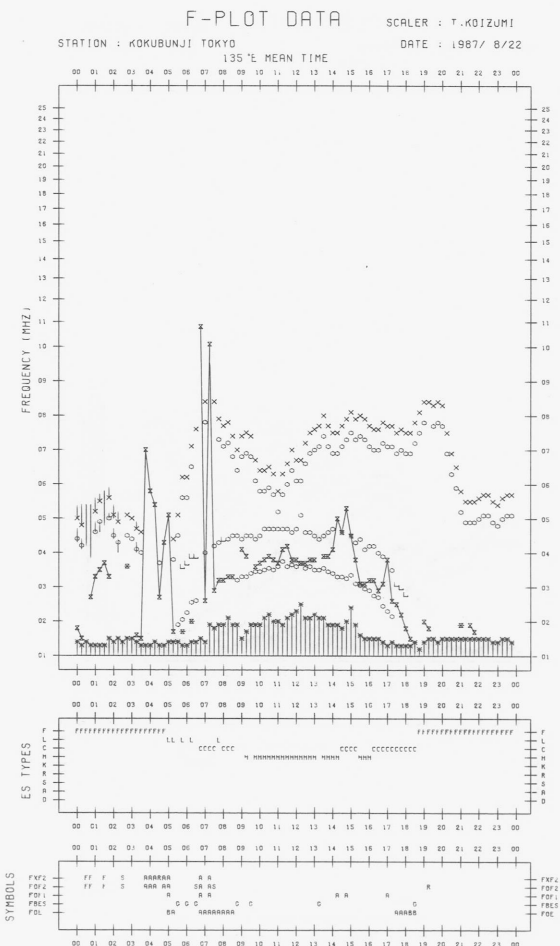
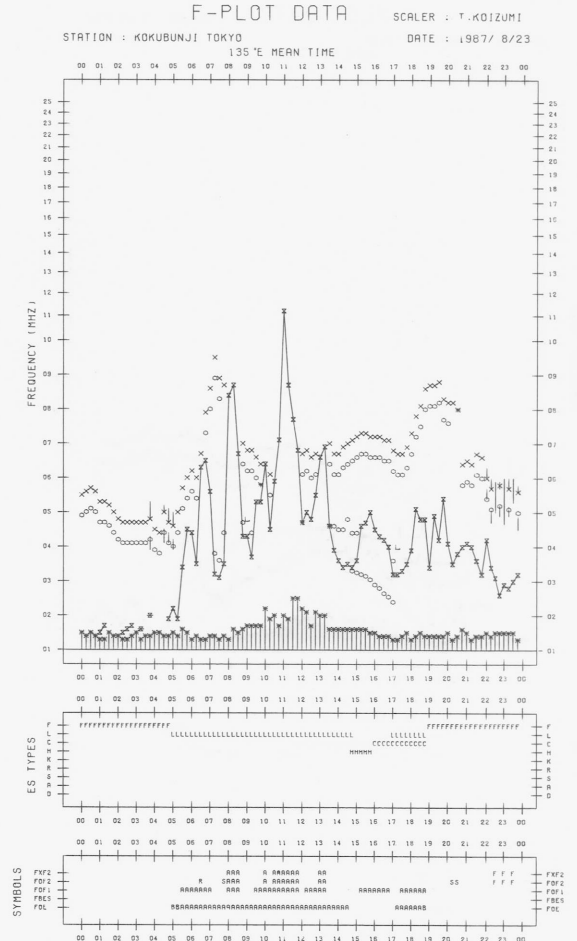
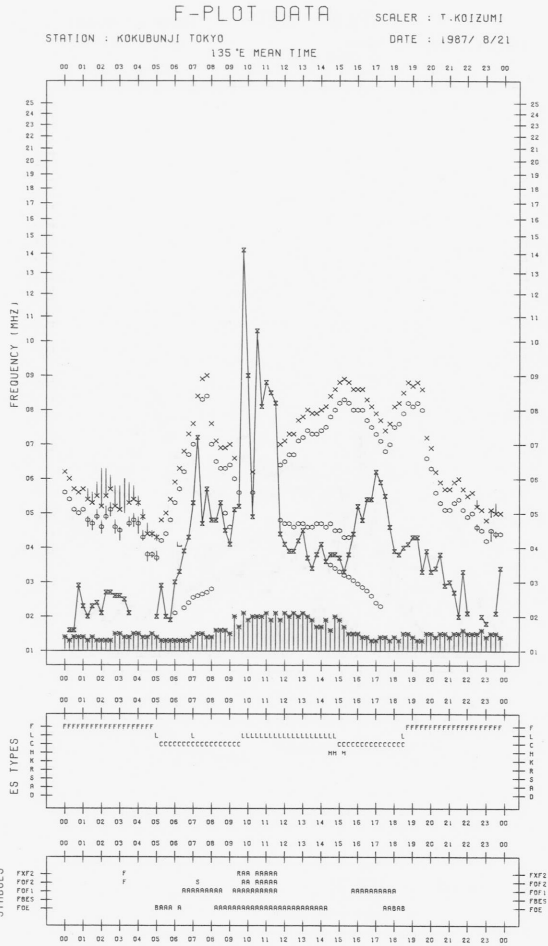


F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO DATE : 1987/ 8/20
135°E MEAN TIME

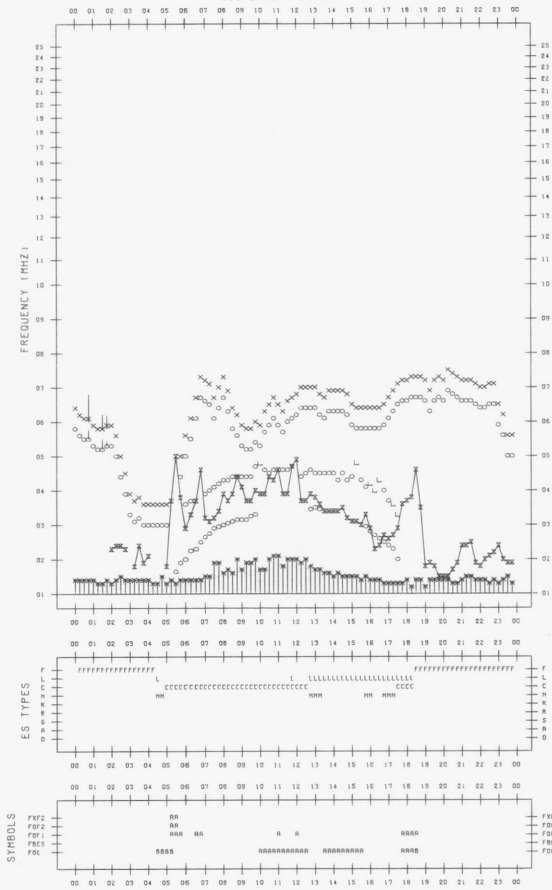




F-PLOT DATA

SCALER : T.KOIZUMI

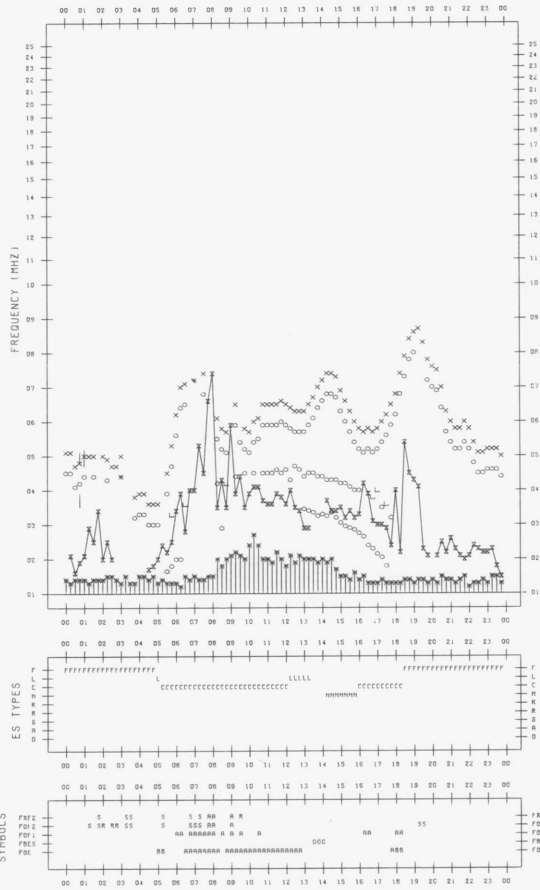
STATION : KOKUBUNJI TOKYO 135°E MEAN TIME DATE : 1987/ 8/25



F-PLOT DATA

SCALER : T.KOIZUMI

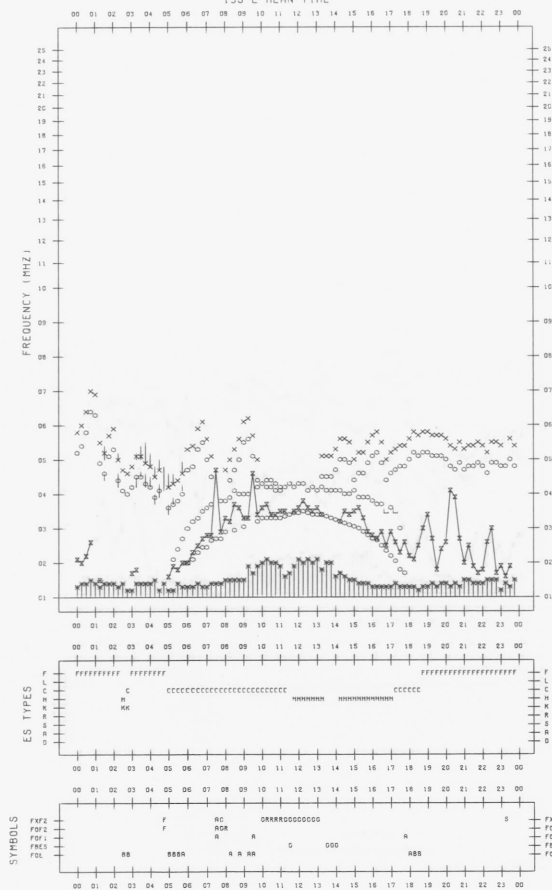
STATION : KOKUBUNJI TOKYO 135°E MEAN TIME DATE : 1987/ 8/27



F-PLOT DATA

SCALER : T.KOIZUMI

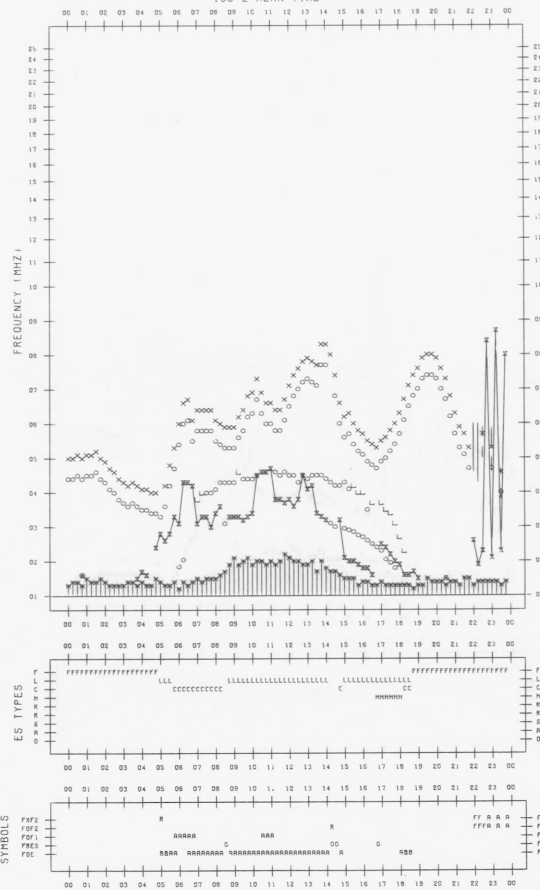
STATION : KOKUBUNJI TOKYO 135°E MEAN TIME DATE : 1987/ 8/26

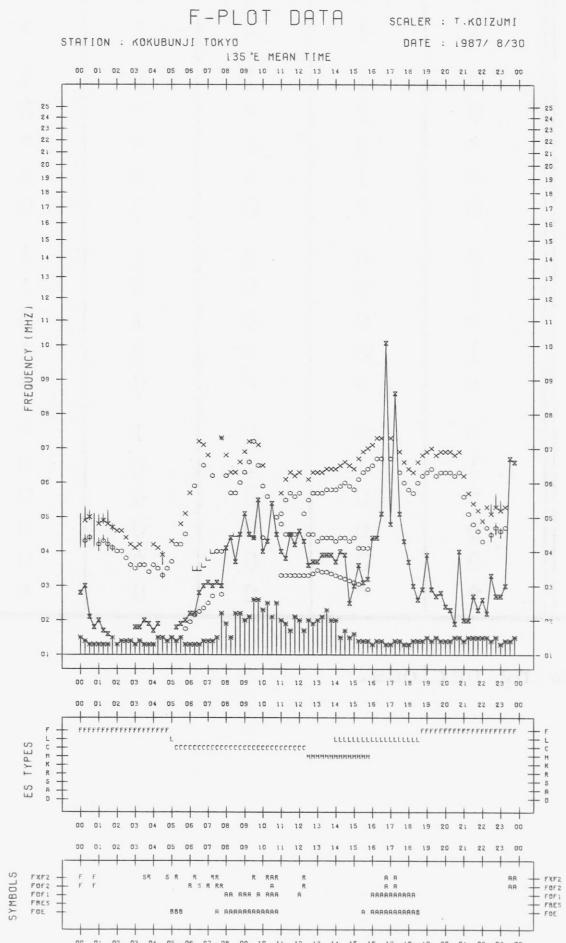
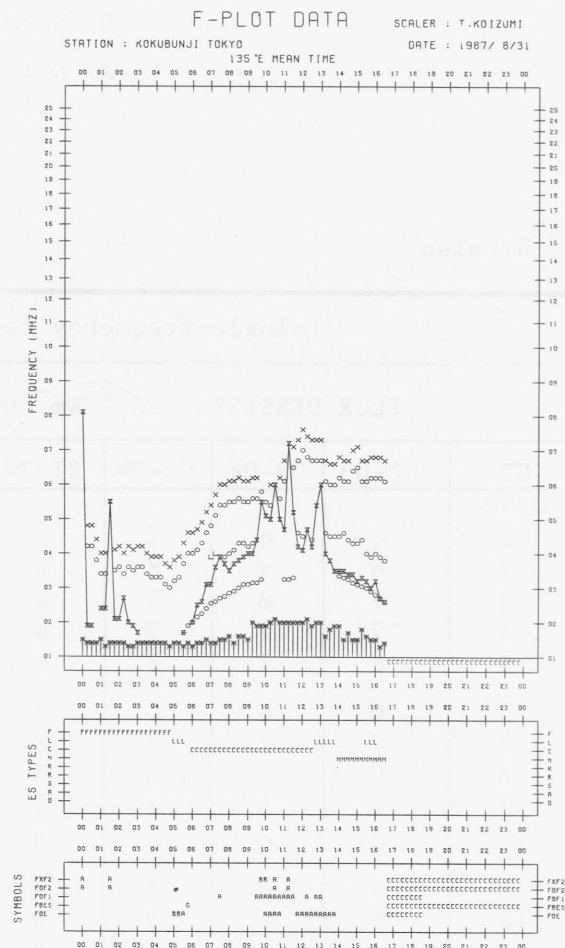
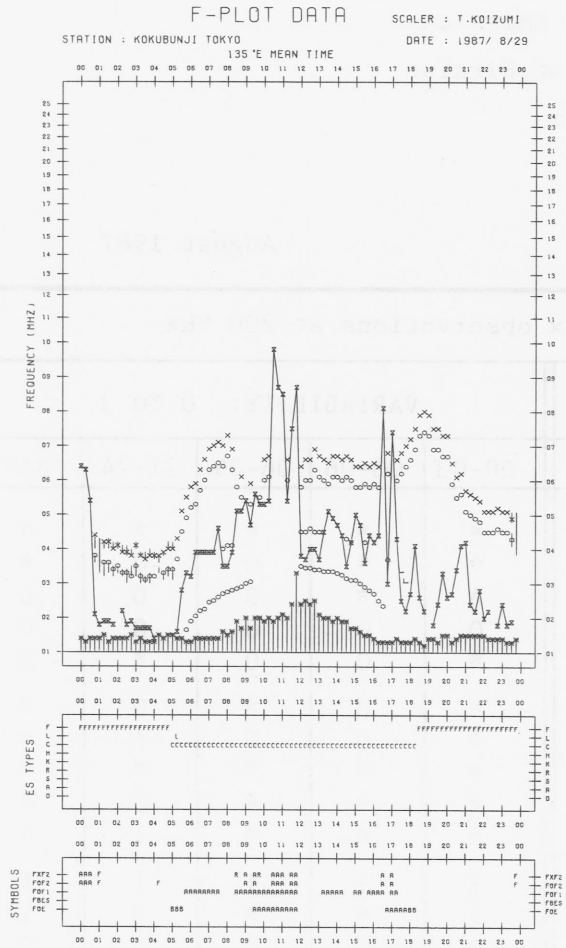


F-PLOT DATA

SCALER : T.KOIZUMI

STATION : KOKUBUNJI TOKYO 135°E MEAN TIME DATE : 1987/ 8/28





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

Hiraïso

August 1987

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

Notes: 1. No observations during the following periods.

14th 2150 - 2357

2. (q) likely quiet.

3. (*) interference.

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

Hiraiso

August 1987

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

Note: No observations during the following periods.

9th 2000 - 2348	18th 2005 - 2349
10th 2000 - 2347	21st 2010 - 2355
11th 2000 - 2349	24th 2010 - 2343
12th 2000 - 2352	26th 2010 - 2346
13th 2000 - 2400	27th 2010 - 2348
14th 2000 - 2400	28th 2010 - 2337
17th 2005 - 2346	29th 2015 - 30th 0005
18th 0535 - 0920	30th 2015 - 2348

B. Solar Radio Emission
b. Outstanding Occurrences at Hiraiso

Hiraiso

August 1987

Single-frequency observations								
Normal observing period: 2000 - 0930 U.T. (sunrise to sunset)								
AUG 1987	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY ($10^{-22} \text{Wm}^{-2} \text{Hz}^{-1}$)		POLARIZATION REMARKS
						PEAK	MEAN	
9	200	42 SER	2250.8	2252.8	2.8	330	-	0
	100	42 SER	2250.8	2253.1	2.4	230	-	-
10	200	46 C	0131.6	0132.1	2.6	68	15	0
	100	46 C	0131.7	0132.3	1.0	570	180	-
	500	6 S	0304.0	0306.4	4.0	17	6	WR
	200	46 C	0304.9	0305.9	3.2	49	7	0
	200	44 NS	1950E	0505	840D	8	4	0
	200	42 SER	2041.7	2043.0	14.5	57	-	WL
11	200	44 NS	1950E	2340	840D	10	4	WL
	200	46 C	2202.6	2204.0	4.0	21	8	0
13	200	46 C	0248.8	0255.4	15.8	18	7	0
	500	46C	0249.9	0300.3	15	13	7	WL
				0250.7		11		WL
	200	8 S	2309.6	2310.3	1.0	2300	-	0
14	500	6 S	0347.6	0348.5	1.3	6	4	WL
15	200	42 SER	0215.8	0238.9	30.0	310	-	WL
	200	24 R	1950E	0620	840D	5	2	0
17	200	27 RF	0431.7	0452.8	66	15	3	WL
18	200	43 NS	0053	0153	310D	40	6	WL
	500	45 C	0058.8	0100.5	3.0	2	1	o
19	200	43 NS	0320	0523	350D	10	5	WL
20	200	43 NS	0406	0518	145	8	3	WL
	100	44 NS	2000E	2040	120D	128	13	-
	200	44 NS	2000E	2107	270D	40	21	ML
21	200	43 NS	0621	0636	130	36	9	ML
	200	44 NS	2000E	2247	420D	16	5	ML
22	500	45 C	0548.0	0550.8	8.0	70	20	WR
23	500	45 C	2248.0	2304.8	31	45	20	MR
				2310.5		40		MR
	200	46 C	2252.0	2311.9	24	26	11	0
	200	43 NS	2303	2345	198	8	3	WR
24	200	44 NS	2000E	2238	300D	6	3	0
25	500	45 C	0140.6	0141.5	3.0	400	30	MR
	200	46 C	0140.9	0140.9	3.2	750	68	0
	500	8 S	0438.4	0438.9	0.8	50	-	0
	200	42 SER	2354	2355	3.0	530	-	0
26	200	43 NS	2140	0010	660D	9	3	0
29	200	46 C	0227.0	0229.8	7.9	14	5	0
	500	46 C	0238.5	0244.0	24	7	2	0
				0241.5		5		0

RADIO PROPAGATION

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

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

MEASURED AT HIRAISSO

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	4	4	4	10	14	15	16	24	13	-2	-4	6	11	-10	ES -23	ES -23	ES -23	-2	6	10	14	8	3	8		
2	7	4	8	8	16	19	24	23	25	26	25	16	16	23	-2	3	0	ES -23	ES -23	14	8	9	4	4		
3	2	0	3	15	14	19	22	24	24	16	16	4	2	-4	-8	-4	ES -23	ES -23	ES -23	13	6	5	5	-4		
4	5	-2	3	11	14	9	19	18	17	16	18	16	14	13	9	1	-4	-8	-9	11	7	11	10	15		
5	7	3	4	13	13	13	19	24	23	18	19	21	12	9	9	ES -23	ES -23	ES -23	ES -23	22	6	5	7	7		
6	0	3	0	5	8	18	20	24	14	14	16	9	4	6	3	4	ES -23	5	3	13	8	11	12	8		
7	5	3	3	4	8	13	18	25	24	14	20	10	7	0	4	-10	ES -23	4	-3	13	19	14	13	3		
8	1	-5	5	5	23	21	25	28	20	18	13	10	-5	ES -23	ES -23	ES -23	4	ES -23	3	12	8	19	4	4		
9	6	0	3	19	13	14	14	16	19	19	20	13	-2	13	-3	ES -23	ES -23	ES -23	4	7	9	8	-5	3		
10	3	0	3	-1	10	16	13	C	11	16	9	12	3	-8	-14	-17	-4	2	-1	12	11	10	10	0		
11	0	3	9	16	16	20	24	18	19	16	14	19	17	6	-8	ES -23	ES -23	4	ES -23	14	13	12	10	3		
12	4	1	7	8	15	18	26	24	23	22	21	17	18	23	7	ES -23	ES -23	6	ES -23	10	10	10	9	9		
13	6	10	13	14	19	19	26	28	23	25	13	24	20	14	ES -23	ES -23	ES -23	ES -23	ES -23	11	13	9	3	4		
14	8	8	8	13	18	20	23	24	24	18	18	14	20	16	ES 3	-8	-6	8	-8	21	13	17	17	6		
15	UC 2	8	6	12	13	22	25	29	32	23	23	17	25	16	4	-9	7	0	ES -3	4	15	8	6	6		
16	7	6	13	13	21	18	26	30	27	22	16	6	11	3	-3	-3	6	-2	ES -24	3	10	7	12	8		
17	7	4	6	12	15	20	19	22	27	27	13	11	9	14	6	-3	-3	ES -24	ES -24	8	12	13	12	7		
18	3	4	7	20	16	18	23	27	20	22	22	12	-3	1	-3	1	ES -24	5	9	13	12	12	11	4		
19	9	7	4	16	13	20	22	25	22	24	-6	5	8	8	2	-15	3	5	7	8	15	15	12	12		
20	7	7	7	17	17	22	19	26	27	25	25	22	18	13	ES -9	ES -24	ES -24	-11	13	15	13	13	13	8		
21	2	3	8	14	15	20	23	27	23	19	17	10	19	15	4	-6	-5	-9	0	11	8	15	8	10		
22	13	9	11	14	17	24	27	21	18	23	21	1	2	ES -24	ES -24	ES -24	ES -24	-6	8	13	17	17	12	7		
23	7	6	5	14	16	22	27	27	23	21	23	23	-1	ES -24	0	ES -24	ES -24	-9	4	7	13	9	13	-1		
24	1	8	11	7	8	19	23	18	23	23	17	-3	ES 0	-9	ES -3	ES -9	ES -24	-9	-2	12	11	12	8	2		
25	2	6	13	16	17	26	21	13	13	1	-1	15	ES -9	13	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	-2	-6	9	
26	1	6	-6	3	-1	5	9	21	ES -24	1	7	9	6	-7	-9	ES -24	ES -24	ES -24	3	3	8	12	10	8		
27	9	6	13	9	19	19	19	17	16	16	12	4	9	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	9	13	7	8	7		
28	8	10	10	15	18	21	20	11	16	11	7	3	ES -24	ES -24	ES -24	ES -24	ES -24	-9	-4	2	10	2	16	5		
29	-1	-1	3	9	14	19	17	6	3	9	13	-6	-9	-7	-9	-11	ES -24	-6	ES -24	5	14	19	6	8		
30	8	4	11	10	18	23	23	24	19	8	19	10	22	13	-3	ES -24	ES -24	ES -24	ES -24	-9	4	3	3	5		
31	-1	10	8	16	18	21	22	18	21	19	23	ES -24	14	13	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	6	-1	-1	3
CNT	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	5	4	7	13	15	19	22	24	21	18	17	10	9	6	US -3	US -23	ES -23	-9	US -8	11	11	10	9	6		
UD	9	10	13	17	19	23	26	28	27	25	23	22	20	18	7	1	4	5	8	15	15	17	13	10		
LD	0	-1	3	4	8	13	14	13	11	1	-1	-3	ES -9	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	-9	6	2	-1	0		

C. Radio propagation

b. Radio Propagation Quality Figures at Hiraiso

Hiraiso

Time in U.T.

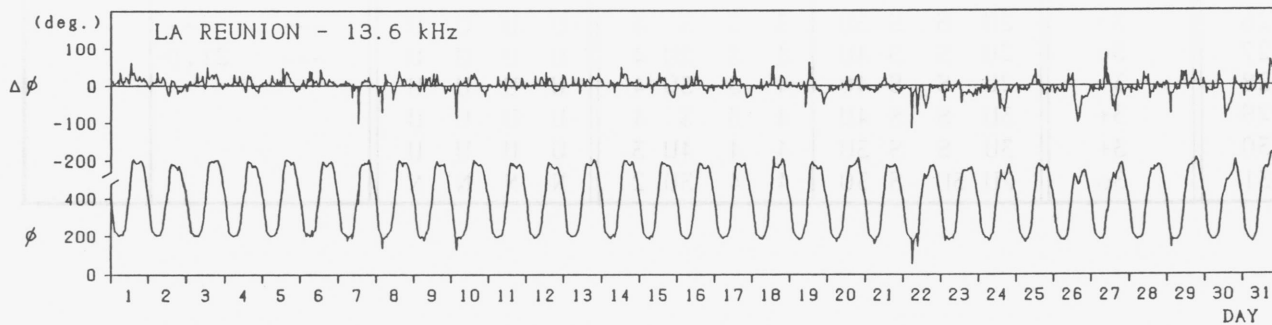
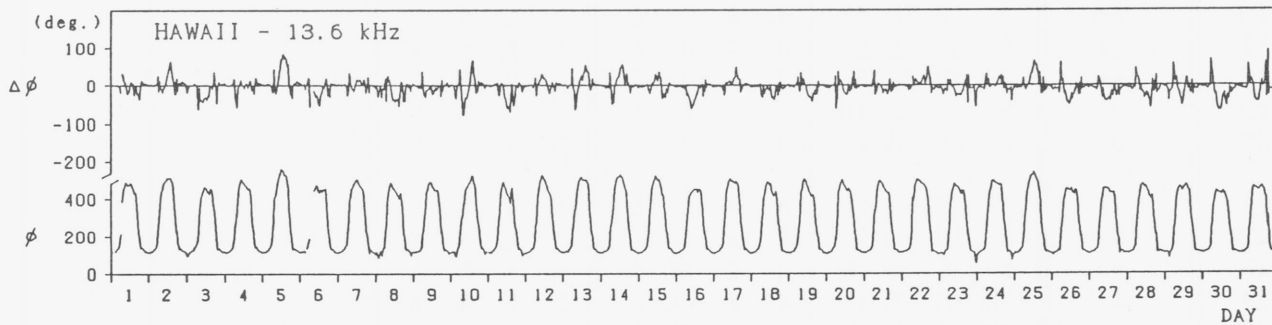
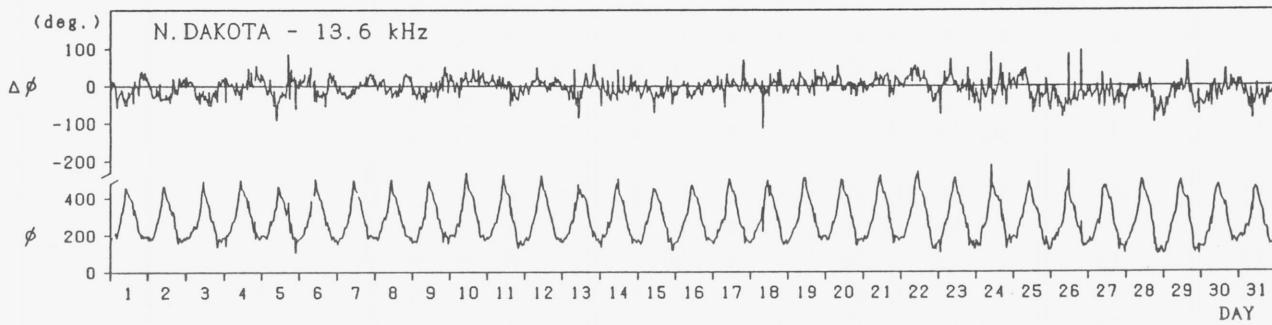
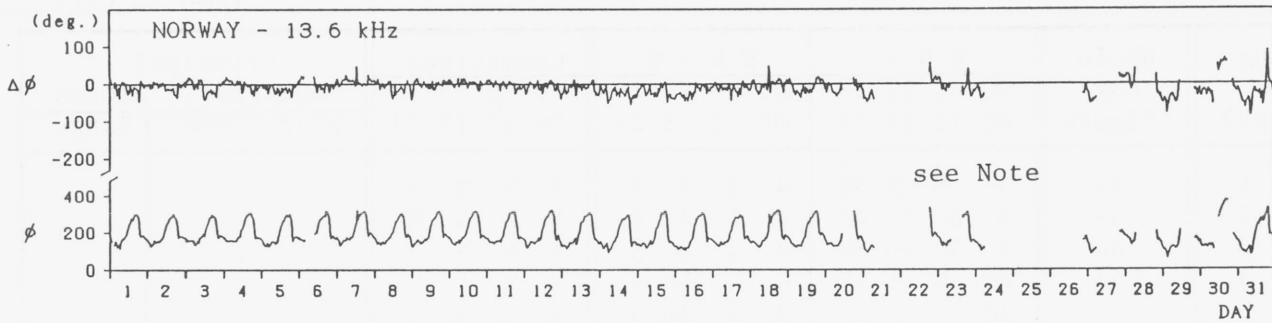
Aug. 1987	Whole Day Figure	W W V				W W V H				Conditions				Principal Geomagnetic Storms		
		00	06	12	18	00	06	12	18	00	06	12	18	Start	End	Range
		06	12	18	24	06	12	18	24	06	12	18	24			
1	4-	4	S	S	3U	4	3	4	4	N	N	N	N			
2	4+	5	5U	5U	4U	4	5	4	4	N	N	N	N			
3	4o	4	5U	5U	3U	4	4	3	3	N	N	N	N			
4	4o	3U	5U	S	3U	4	4	5	4	N	N	N	N			
5	4-	4U	S	S	3U	4	4	4U	3	N	N	N	N			
6	4-	3U	4U	S	4U	3	4	4	4	N	N	N	N			
7	4o	4U	5U	S	4U	4	4	4	4	N	N	N	N			
8	4-	3U	4U	S	3U	4	4	3U	4	N	N	N	N			
9	4-	3U	S	S	3U	4	4	4	4	N	N	N	N			
10	4o	3U	5U	S	4U	4	3	4	4	N	N	N	N			
11	4+	4	5U	5U	5U	4	4	4	4	N	N	N	N			
12	4+	5	5U	S	5U	4	4	4	4	N	N	N	N			
13	4o	5	S	S	4U	4	4	3U	4	N	N	N	N			
14	4+	4	4U	5U	4U	4	4	5	4	N	N	N	N			
15	4+	4U	4U	S	4U	4	5	5	4	N	N	N	N			
16	4o	4	S	5U	4U	4	4	4	4	N	N	N	N			
17	4+	5	5U	S	5	4	4	4	4	N	N	N	N			
18	4+	4	4U	5U	5	4	4	4	4	N	N	N	N			
19	4+	5	4U	4U	4U	4	4	5	4	N	N	N	N			
20	5-	5	5U	S	5	4	5	4	4	N	N	N	N			
21	4+	4	S	5U	5U	4	4	5	4	N	N	N	N			
22	4+	5	5U	5U	5	4	4	3U	4	N	N	N	N			
23	4o	5	S	S	4U	4	4	3U	4	N	N	N	N			
24	4-	3U	S	S	4U	4	4	4U	4	N	N	N	N			
25	3o	3U	S	S	3U	4	3	3U	2	U	U	U	U	07.0	---	101
26	3o	2U	S	S	3U	3	3	3	4	U	U	U	U	---	---	
27	3o	2U	S	S	4U	4	3	2U	4	U	U	U	U	---	21.0	
28	3+	2U	S	S	4U	4	3	3U	4	U	U	U	U			
29	3+	3U	S	S	4U	4	3	3	4	U	U	U	U			
30	3+	3U	S	S	3U	4	4	4U	3	U	U	U	U			
31	3o	2U	3U	S	3U	4	4	3U	2	N	N	N	N			

C. Radio Propagation

c. Phase Variations in OMEGA Radio Waves at Inubo

Inubo

August 1987



Note: As for NORWAY - 13.6 kHz, no record during August 21 - August 22 and August 24 - August 26, due to the maintenance of transmitter.

Polar Cap Phase Anomaly (PCPA) on Norway-Inubo Circuit
NONE

C. Radio Propagation
d. Sudden Ionospheric Disturbance
(i) Short Wave Fade-out (SWF) at Hiraiso

Hiraiso

Time in U.T.

Aug. 1987	S W F						Correspondence			
	Drop-out Intensities (dB)			Start	Duration	Type	Imp.	Solar Flare	Solar Noise	Geomag. Crochet
CO	HA	1) 2)								
8	x	x	22	0128	14	SL	2-	0119		
8			21	0334	16	S	2-	0333		
22			13	0551	18	SL	1	0503		
22			12	0927	28	S	1-	0930		
23			15	2255	44	G	1	2235		
24			15	2225	30	SL	1	2225		

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

(ii) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Aug. 1987	S P A					Time (U.T.)		
	Phase Advance (degrees)					Start	End	Maximum
Date	Ω/N	Ω/LR	NWC	Ω/H	Ω/ND			
3			21	<u>22</u>	14	0002	0042	0019
7		<u>30</u>	18			0541	0626	0558
7		14				0744	0757	0747
7		37				0835	0925	0855
7				<u>25</u>	24	1945	2033	1951
7				6		2227	2344	2233
7				13		2349	0029	2352
8	34	87	<u>104</u>	76	63	0122	0320	0134
8	36	<u>139</u>	95	56	41	0333	0453D	0340
8		<u>31</u>	18			0453E	0557	0512
8		15				0923	0951	0937
8				11		2040	2110	2048
8				<u>22</u>	15	2221	2259	2229
9		17	<u>17</u>	8		0227	0252	0236
9		<u>13</u>	13	6		0303	0325	0312
9		<u>27</u>	19	10	16	0349	0458	0402
9	12	<u>64</u>	24*			0611	0706	0633
9			24	<u>12</u>		2252	2352	2313
10	23	<u>40</u>	—	22	14	0231	0254D	0240
10	33	<u>105</u>	—	51	49	0254E	0452	0313
10				<u>23</u>	15	2146	2253	2208
11			<u>18</u>	5		0133	0223	0145
11				<u>30</u>	28*	2148	2248	2208
13		18	<u>25</u>	9		0254	0455	0307
19		46				1015	1113	1029
21	—	<u>28</u>	12			0530	0556D	0535
21	—	<u>41</u>	22			0556E	0652	0605
21	—			7		2157	2234	2201
22	—	<u>126</u>	80			0545	0737	0559
22	—	<u>120</u>				0925	1107	0935
23		61	<u>55</u>	32	29	0218	0425	0239
23		22	45	<u>72</u>	65	2251	0034	2313
24	—	22	17	<u>53</u>	53	2225	2340	2234
25	—		<u>14</u>	7		0142	0300	0149
25	—	<u>21</u>	6			0545	0620	0556
25	—	20				0950	1027	0953
26	—		<u>18</u>	9		0048	0126	0103
29	38	<u>71</u>	59	49	38	0225	0357	0249

IONOSPHERIC DATA IN JAPAN FOR AUGUST 1987

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