

# IONOSPHERIC DATA IN JAPAN

FOR FEBRUARY 1977

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RADIO RESEARCH LABORATORIES  
 MINISTRY OF POSTS AND TELECOMMUNICATIONS  
 TOKYO, JAPAN

## INTRODUCTION

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

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

Station	Geographic		Geomagnetic		Technical Method
	Latitude	Longitude	Latitude	Longitude	
Wakkanai	45°23.6'N	141°41.1'E	35.3°N	206.0	Vertical Sounding (I)
Akita	39°43.5'N	140°08.2'E	29.5°N	205.4	" (I)
Kokubunji	35°42.4'N	139°29.3'E	25.4°N	205.4	" (I)
Yamagawa	31°12.1'N	130°37.1'E	20.3°N	197.8	" (I)
Hiraiso	36°22.0'N	140°37.5'E	26.2°N	206.3	Radio Receiving (S, P)
Inubo	35°42.2'N	140°51.5'E	26.0°N	206.8	" (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".

## a. Characteristics of Ionosphere

$f_x I$	Top frequency of spread $F$ trace
$f_o F_2$	Ordinary wave critical frequency
$f_o F_1$	for the $F_2$ , $F_1$ , $E$ and $E_s$ including particle
$f_o E$	$E$ layers respectively
$f_o E_s$	
$f_b E_s$	Blanketing frequency of the $E_s$ layer, e.g. the lowest ordinary wave frequency visible through $E_s$
$f_{min}$	Lowest frequency which shows vertical ionospheric reflections
$M(3000)F_2$	Maximum usable frequency factor
$M(3000)F_1$	for a path of 3000 km for transmission by $F_2$ and $F_1$ layers respectively
$h'F_2$	Minimum virtual height on the ordinary wave for the $F_2$ , whole $F$ , $E$ and $E_s$ layers respectively
$h'F$	
$h'E$	
$h'E_s$	
Types of $E_s$	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 $E_s$ .
B	Measurement influenced by, or impossible because of, absorption in the vicinity of $f_{min}$ .
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 perturbation of parameters - Presence of polar spur traces.

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 $f_b E_s$ is deduced from $f_o E_s$ 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  $E_s$ 

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

The types are:

f	An $E_s$ trace which shows no appreciable increase of height with frequency.
l	A flat $E_s$ trace at or below normal $E$ layer minimum virtual height or below the particle $E$ layer minimum virtual height.
c	An $E_s$ trace showing a relatively symmetrical cusp at or below $f_o E$ . (Usually a daytime type.)
h	An $E_s$ trace showing a discontinuity in height with the normal $E$ layer trace at or above $f_o E$ . The cusp is not symmetrical, the low frequency end of the $E_s$ trace lying clearly above the high frequency end of the normal $E$ trace. (Usually a daytime type.)
q	An $E_s$ trace which is diffuse and non-blanketing over a wide frequency range.
r	An $E_s$ trace showing an increase in virtual height at the high frequency end similar to group retardation.
a	An $E_s$ 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 Hiraíso. Observation equipments are: a 5 meter parabolic reflector with a total-power receiver for 500 MHz and a 10 meter parabolic reflector with two polarimeters for 100 and 200 MHz. 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 Monthly Report for Solar Radio Emission, WDC-C2".

a. Daily Data

*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 parenthesis mean that observation time does not exceed one third of the period.

b. Outstanding Occurrences

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. Measurement of H. F. Field Strength

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 Hiraíso. In order to avoid interference among the same frequency waves, the upper side-band of WWV or WWVH with the audio tone 600 Hz is picked up by the use of a narrow band pass filter with 80 Hz band width. Particulars of the transmitters and the receiver are summarized in the following table.

Characteristics	Transmitter		Receiver
	WWV	WWVH	
Station Call	WWV	WWVH	Hiraíso, 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	-
Modulation	50 %	50 %	-
Antenna	$\lambda / 2$ vertical	$\lambda / 2$ vertical	4.5 m vertical rod
Bandwidth	-	-	80 Hz for upper side-band
Calibration	-	-	Every an hour

The tabulated *field strength* in dB above one microvolt per meter is the peak average of the incident upper side-band 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 are 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

The tabulated six-hourly quality figures are calculated for standard waves WWV transmitted from Fort Collins and standard waves 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 1<sub>0</sub>, 1<sub>+</sub>, 2<sub>-</sub>, 2<sub>0</sub>, 2<sub>+</sub>, 3<sub>-</sub>, 3<sub>0</sub>, 3<sub>+</sub>, 4<sub>-</sub>, 4<sub>0</sub>, 4<sub>+</sub>, 5<sub>-</sub>, 5<sub>0</sub> 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 twice per an hour from JJY Station.

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

#### c. Sudden Ionospheric Disturbances

##### (i) SWF

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<sub>-</sub>, 1, 1<sub>+</sub>, 2<sub>-</sub>, 2, 2<sub>+</sub>, 3<sub>-</sub>, 3, 3<sub>+</sub>.

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

##### (ii) SPA

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 (i) SWF and (II) SPA, *date* indicates the day to which *start-time* of event belongs.

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

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

Transmitting Stations						
Name	Location (Geographic Coordinate)		Call Sign	Frequency (kHz)	Radiation Power (kW)	Arc Distance from Inubo (km)
Rugby	52°22'N	001°11'W	GBR	16.0	40	9550
Cutler	44°38'N	067°17'W	NAA	17.8	1000	10640
Jim Creek	48°12'N	121°55'W	NPG	18.6	250	7620
North West Cape	21°48'S	114°09'E	NWC	22.3	1000	6990
Aldra	66°25'N	013°08'E	AL3	13.6	10	7820
Reunion	20°58'S	055°17'E	RE3	13.6	10	10970
North Dakota	46°22'N	098°20'W	ND3	13.6	10	9140
Haiku	21°24'N	157°50'W	HA3	13.6	10	6100

# IONOSPHERIC DATA

FEB. 1977

FXI (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45° 23.6' N, Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	42	41	41	40	40	37	30											51	37	40	35	34	40	39
2	40	41	39	41	39	38	39											43	A	46	41	43	43	43
3	42	44	37	39	37	37	36											50	43	45	36	38	42	40
4	42	40	41	40	40	40	36											55	38	41	44	41	42	43
5	43	44	45	45	45	43	40											50	A	36	39	40	41	40
6	35	37	37	37	36	36	33											44	A	37	A	A	38	39
7	39	40	38	41	42	42	40											57	53	40	42	45	49	C
8	49	51	50	C	45	44	C											52	44	39	41	44	43	40
9	42	C	38	37	40	40	40											65	45	47	47	50	52	51
10	51	50	57	51	54	41	39											55	48	43	44	42	43	45
11	41	41	43	41	33	30	30												53	53	51	51	50	48
12	47	47	44	45	44	41	36												47	43	44	44	47	43
13	43	43	43	42	44	43	42												46	41	45	42	43	42
14	43	42	43	43	45	45	42												50	57	49	47	52	55
15	56	59	60	57	54	50	41												50	44	45	46	54	55
16	58	58	54	55	50	48	41												48	45	44	47	53	53
17	53	55	55	57	58	55	51												43	48	50	51	55	53
18	56	57	57	58	C	C	C												62	44	47	51	55	57
19	57	61	66	61	C	C	C												50	54	60	54	50	45
20	43	45	47	47	47	46	49												46	50	49	43	C	43
21	45	48	50	48	45	42	44												47	47	49	47	45	43
22	43	43	43	43	41	41	40												39	38	44	47	50	54
23	58	60	58	60	50	45	47												39	40	45	44	45	48
24	50	49	51	60	55	57	58	72	82										45	45	47	50	49	48
25	49	51	48	46	41	34	35												42	41	50	54	S	58
26	60	60	61	61	59	50	50												48	46	47	50	52	60
27	57	59	60	59	60	51	49		63	68									46	44	42	43	S	S
28	52	52	50	53	51	43	45												47	42	42	45	S	S
29																								
30																								
31																								
CNT	28	27	28	27	26	26	25	1	2	1								10	25	28	27	27	24	25
MED	46	48	48	46	45	42	40	72	72	68								57	46	44	45	45	48	45
UQ	54	56	56	57	51	46	45											55	48	46	48	50	52	53
LQ	42	42	42	41	40	40	36											50	43	40	42	43	43	43

FEB. 1977

FXI (0.1 MHz)

### IONOSPHERIC DATA

FEB. 1977

FOF2 (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station		WAKKANAI										Lat. 45° 23.6' N, Long. 141° 41.1' E										Sweep 1 MHz to 20 MHz in 20 sec in automatic operation									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
1	35	34	34	33	33	30	23	43	54	60	73	66	78	73	63	63	53	44	30	33	28	27	33	32							
2	33	34	32	34	32	31	32	46	55	64	72	76	76	64	63	60	58	36	A	39	34	36	36	36							
3	35	37	30	32	30	30	29	46	71	70	66	72	67	67	65	62	59	43	36	38	29	31	35	33							
4	35	33	34	53	33	33	29	41	54	60	69	70	62	R	59	55	58	48	31	34	37	34	35	36							
5	36	37	38	38	38	36	33	43	57	59	68	64	71	65	57	58	60	43	A	30	32	33	34	33							
6	28	30	30	30	29	29	26	46	55	59	69	68	64	68	62	63	69	37	A	31	A	A	31	32							
7	32	33	31	34	35	35	33	43	63	70	71	72	66	C	74	60	59	50	46	33	35	38	42	C							
8	42	44	43	C	33	F	C	C	C	73	R	70	78	71	67	74	58	45	37	32	34	37	36	33							
9	F	C	31	30	33	33	33	48	J	53	65	64	77	81	82	76	74	C	58	38	40	40	43	45	44						
10	44	43	50	44	F	F	F	45	65	68	67	70	69	68	67	59	58	48	41	36	37	35	36	38							
11	34	F	36	34	24	23	23	45	63	74	68	83	72	64	63	64	58	57	46	46	44	44	43	41							
12	40	40	F	38	37	34	26	C	C	75	60	88	77	66	60	62	66	50	40	36	37	37	40	36							
13	36	36	36	35	37	36	35	52	68	69	65	63	86	67	60	64	61	56	39	34	38	35	36	35							
14	36	35	36	36	38	38	35	42	55	67	72	70	80	77	66	70	65	56	43	50	42	40	45	48							
15	F	F	F	47	46	43	34	A	53	80	65	72	70	67	61	61	54	50	43	37	38	39	47	48							
16	F	F	F	48	43	37	34	48	60	60	64	75	80	64	73	80	64	51	41	38	37	40	46	46							
17	46	48	48	50	F	F	41	56	65	73	70	84	72	67	63	68	60	51	36	41	43	44	48	46							
18	49	50	50	51	C	C	C	C	C	C	65	66	85	71	74	78	69	73	55	37	40	44	48	50							
19	50	F	F	F	C	C	C	52	61	68	65	70	68	75	69	64	61	48	43	47	53	47	43	38							
20	36	38	40	40	40	39	42	60	64	63	C	83	82	80	69	62	C	49	39	43	42	36	C	36							
21	38	41	38	37	F	F	37	C	59	68	75	76	69	63	60	62	C	C	40	40	42	40	38	36							
22	36	36	36	36	34	34	33	53	63	68	83	76	72	68	64	60	56	46	32	31	37	40	43	47							
23	51	53	51	53	43	38	40	57	56	68	81	78	68	69	73	70	58	44	32	33	38	37	38	41							
24	43	42	44	F	F	F	F	65	75	63	73	72	81	73	63	67	65	52	38	38	40	43	42	41							
25	42	44	41	39	34	27	28	50	59	66	57	66	77	75	74	70	59	51	35	34	43	47	S	51							
26	F	F	F	F	F	F	36	48	55	59	58	67	82	67	58	63	56	53	41	F	F	F	F	F							
27	F	F	F	F	53	44	42	48	53	59	58	66	68	63	60	61	58	50	36	33	33	33	S	S							
28	45	45	43	46	F	36	38	51	53	60	69	60	65	66	69	67	59	53	40	35	35	38	S	S							
29																															
30																															
31																															
CNT	23	21	22	23	20	21	23	23	25	27	26	28	28	26	28	28	25	27	25	27	26	26	23	24							
MED	36	38	37	37	34	34	33	48	59	67	68	71	72	68	64	63	59	50	39	36	38	38	40	38							
UQ	44	44	43	45	39	37	36	52	63	70	72	76	80	73	69	69	61	52	41	40	42	43	44	46							
LQ	35	35	34	34	33	31	29	45	55	60	65	66	68	66	60	61	58	46	36	33	35	35	36	36							

FEB. 1977

FOF2 (0.1 MHz)

# IONOSPHERIC DATA

FEB. 1977

FOF1 (0.01 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station	WAKKANAI																								
Lat.	45° 23.6' N.						Long.	141° 41.1' E						Sweep 1 MHz to 20 MHz in 20 sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1													L	L											
2												400	400	400											
3											370	410	L	400											
4											390	L	400												
5											390	L		L											
6												L	410	L	400										
7											400	400		400	L										
8												B	B	400											
9												L	420	U	420										
10										L	400	400	400	B											
11										L	400	410	400	380											
12										380		L	420	410											
13										360	370		L	410											
14										410	410	410	410	400	L										
15										410	420	430	410	400											
16										390	410		L	410	L										
17										400	L		L	L											
18										410	390		L	L	L										
19									400	410	430	400	420			L									
20											C	430	440	420	L										
21										410	410		410	U	400										
22										400	410	430	430	400	400										
23										L	400	430	420	410	400	L									
24										400	420	420	410	400											
25										400	400	430	430	420	400	L									
26										390		420	430	410	U	390									
27										400	410	400	420	410	400										
28										400	410	420	420	410	410	L									
29																									
30																									
31																									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT										9	20	19	18	21	10										
MED										400	400	410	420	410	400										
UQ										400	410	430	420	410	400										
LQ										390	395	405	400	400	400										

FEB. 1977

FOF1 (0.01 MHz)

### IONOSPHERIC DATA

FEB. 1977

FOE (0.01 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45° 23.6' N, Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								S	A	A	A	A	290	A	255	A	A							
2								S	A	A	265	290	295	280	265	230	A							
3								S	205	245	275	285	290	275	255	230	A							
4								A	210	260	B	290	B	275	B	225	A							
5								S	210	245	275	285	290	290	270	A	A							
6								C	A	245	280	290	295	275	260	225	A							
7								A	A	245	265	280	285	270	260	225	195							
8								C	C	A	B	B	B	B	265	245	190							
9								S	A	250	270	290	295	280	260	230	C							
10								A	215	A	265	B	B	B	B	B	B							
11								S	210	260	280	300	295	290	280	235	200	S						
12								C	C	A	285	295	295	285	270	235	210	S						
13								S	230	255	A	295	300	295	275	240	200	S						
14								A	A	250	280	295	290	295	265	240	190	S						
15								A	A	A	285	300	300	295	270	230	200	S						
16								S	215	255	A	300	300	295	270	235	190	S						
17								S	230	C	285	300	300	A	275	235	200	S						
18								C	C	C	285	295	300	300	290	250	A	S						
19								C	215	A	A	300	300	295	280	255	205	S						
20								150	230	280	C	305	300	300	280	260	C	S						
21								C	250	280	300	300	305	300	290	255	C	C						
22								170	230	A	295	300	300	300	280	255	215	S						
23								180	A	280	300	300	300	295	285	255	210	S						
24								190	A	C	300	300	300	300	290	255	205	S						
25								170	A	270	290	300	300	295	285	A	200	S						
26								175	225	270	295	300	305	300	280	245	205	S						
27								175	235	275	290	300	300	300	285	250	210	S						
28								S	225	270	295	305	305	300	285	260	A	S						
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								7	15	17	21	25	25	24	26	24	16							
MED								175	225	260	285	300	300	295	275	240	200							
UQ								178	230	270	295	300	300	300	285	255	208							
LQ								170	212	250	275	290	295	282	265	230	198							

FEB. 1977

FOE (0.01 MHz)



# IONOSPHERIC DATA

FEB. 1977

FOES (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45° 23.6' N. Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>18</sub>	30	32	30	35	G	G	G	G	37	27	28	J <sub>30</sub>	E <sub>18</sub>	E <sub>18</sub>	E <sub>18</sub>	E	
2	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	J <sub>20</sub>	J <sub>46</sub>	J <sub>34</sub>	G	G	G	G	G	G	30	E <sub>16</sub>	J <sub>53</sub>	E <sub>15</sub>	28	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
3	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>16</sub>	24	G	G	G	G	G	32	30	26	26	E <sub>15</sub>	30	31	27	30	29	
4	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	J <sub>32</sub>	30	23	J <sub>26</sub>	G	G	E <sub>28</sub>	G	E <sub>31</sub>	32	32	27	34	J <sub>38</sub>	30	28	29	E <sub>15</sub>	26	E <sub>15</sub>	
5	E <sub>15</sub>	24	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	20	27	G	G	G	G	33	34	30	26	32	J <sub>34</sub>	J <sub>54</sub>	30	E <sub>15</sub>	J <sub>52</sub>	32	28	
6	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E	E <sub>14</sub>	26	E <sub>20</sub>	28	25	32	G	G	G	G	G	24	J <sub>30</sub>	40	32	35	35	E <sub>18</sub>	27	
7	E <sub>16</sub>	E <sub>16</sub>	25	E <sub>14</sub>	22	23	24	J <sub>25</sub>	J <sub>35</sub>	G	18	G	G	G	G	29	G	J <sub>28</sub>	24	E <sub>15</sub>	E <sub>17</sub>	E <sub>15</sub>	E <sub>15</sub>	C	
8	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	C	E	E <sub>14</sub>	C	C	C	J <sub>31</sub>	E <sub>28</sub>	E <sub>41</sub>	E <sub>50</sub>	E <sub>31</sub>	G	28	G	20	E <sub>16</sub>	J <sub>30</sub>	E <sub>17</sub>	28	22	E <sub>15</sub>	
9	E <sub>15</sub>	C	E <sub>16</sub>	E <sub>16</sub>	22	E <sub>14</sub>	E <sub>16</sub>	J <sub>35</sub>	40	29	G	G	G	G	G	G	C	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	28	J <sub>30</sub>	25	26	
10	26	30	E <sub>16</sub>	22	E	22	22	20	G	27	G	E <sub>30</sub>	E <sub>30</sub>	E <sub>41</sub>	E <sub>31</sub>	E <sub>27</sub>	E <sub>24</sub>	26	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	
11	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>17</sub>	24	24	G	22	G	G	G	G	G	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	28	E <sub>15</sub>	E <sub>15</sub>	26	
12	24	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>15</sub>	C	C	39	G	30	32	G	G	G	G	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	25	28	33	
13	E <sub>16</sub>	23	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	28	G	G	30	G	33	G	G	G	G	23	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	
14	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E	E <sub>15</sub>	E <sub>12</sub>	E <sub>15</sub>	25	36	G	28	23	G	G	G	G	22	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>17</sub>	
15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E	E <sub>15</sub>	E <sub>15</sub>	52	J <sub>48</sub>	35	22	G	24	G	G	G	26	G	21	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	25	E <sub>14</sub>	25
16	E <sub>16</sub>	E <sub>15</sub>	27	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>18</sub>	G	29	38	25	34	23	G	28	22	E <sub>15</sub>	26	J <sub>30</sub>	38	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	
17	29	24	E <sub>16</sub>	E <sub>15</sub>	E	E <sub>14</sub>	E <sub>15</sub>	G	G	E <sub>27</sub>	G	G	G	33	G	G	G	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
18	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	C	C	C	C	C	C	G	G	G	G	G	G	22	E <sub>16</sub>	E <sub>15</sub>	J <sub>31</sub>	E <sub>16</sub>	20	E <sub>15</sub>	E <sub>16</sub>	
19	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	C	C	C	E <sub>20</sub>	25	31	34	26	G	G	G	G	G	E <sub>15</sub>	E <sub>15</sub>	25	E <sub>15</sub>	E <sub>15</sub>	28	E <sub>15</sub>	
20	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	G	G	G	C	G	G	G	G	G	C	E <sub>17</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	C	28	
21	E <sub>15</sub>	E <sub>13</sub>	E	E	E	E	E <sub>15</sub>	C	G	22	35	G	G	G	G	G	C	C	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	28	
22	33	25	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	G	G	28	G	G	G	G	G	G	G	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	
23	25	E <sub>15</sub>	28	E	E	E <sub>15</sub>	E <sub>15</sub>	G	27	G	G	G	G	G	G	G	G	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
24	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>16</sub>	G	28	40	30	G	G	G	G	G	G	E <sub>16</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	26	
25	E <sub>15</sub>	22	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>12</sub>	G	25	G	G	G	G	G	G	29	G	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
26	E <sub>15</sub>	29	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>15</sub>	G	G	G	G	G	G	G	G	G	G	E <sub>17</sub>	E <sub>16</sub>	28	E <sub>14</sub>	28	27	25	
27	24	25	E	24	E <sub>14</sub>	E <sub>12</sub>	E <sub>15</sub>	21	G	G	28	22	G	G	G	G	G	E <sub>18</sub>	27	25	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
28	E <sub>15</sub>	E <sub>12</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>14</sub>	20	21	G	G	G	G	G	G	G	25	25	25	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>14</sub>
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	27	28	27	26	26	25	24	25	27	27	28	28	28	28	28	25	27	28	28	28	28	27	27	
MED	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	20	24	22	E <sub>18</sub>	G	G	G	G	G	G	E <sub>17</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>18</sub>	
UQ	E <sub>16</sub>	22	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	25	28	30	29	22	U <sub>24</sub>	U <sub>22</sub>	G	27	24	26	25	29	22	25	24	26	
LQ	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	G	G	G	G	G	G	G	G	G	G	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	

FEB. 1977

FOES (0.1 MHz)

# IONOSPHERIC DATA

FEB. 1977

FBES (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45° 23.6' N, Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	24	26	29	32	G <sub>26</sub>	30	G <sub>20</sub>	27	26	F	E	E	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E		
2	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	18	25	27	G	G	G	G	G	20	E <sub>16</sub>	A <sub>53</sub>	A <sub>53</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>		
3	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>16</sub>	G	G	G <sub>18</sub>	G	G <sub>20</sub>	G <sub>19</sub>	G	G	21	F	E <sub>15</sub>	E	E	E	E	E		
4	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E	E	15	G	G	E <sub>28</sub>	G	E <sub>31</sub>	G	G	G	34	F	E	E	E	E <sub>15</sub>	E	E <sub>15</sub>		
5	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E	17	G	G	G	G	G	G	G	25	32	32	A <sub>54</sub>	A <sub>54</sub>	20	E <sub>15</sub>	30	E	E	
6	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E	E <sub>14</sub>	E	E <sub>20</sub>	27	20	G	G	G	G	G	G	G	28	A <sub>40</sub>	A <sub>40</sub>	24	A <sub>35</sub>	A <sub>35</sub>	E <sub>15</sub>	E	
7	E <sub>16</sub>	E <sub>16</sub>	E	E <sub>14</sub>	E	E	E	19	23	G	G <sub>17</sub>	G	G	G	G	20	G	26	E	E <sub>15</sub>	E <sub>17</sub>	E <sub>15</sub>	E <sub>15</sub>	C		
8	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	C	E	E <sub>14</sub>	C	C	C	27	E <sub>28</sub>	E <sub>41</sub>	E <sub>50</sub>	E <sub>31</sub>	G	G	G	E	E <sub>16</sub>	24	E <sub>17</sub>	E	E	E <sub>15</sub>		
9	E <sub>15</sub>	C	E <sub>16</sub>	E <sub>16</sub>	E	E <sub>14</sub>	E <sub>16</sub>	35	31	20	G	G	G	G	G	G	C	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E	E	E		
10	E	E	E <sub>16</sub>	E	E	E	E	18	G	27	G	E <sub>30</sub>	E <sub>30</sub>	E <sub>41</sub>	E <sub>31</sub>	E <sub>27</sub>	E <sub>24</sub>	E	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>		
11	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>17</sub>	G	20	G	G	G	G	G	G	G	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	E	E	
12	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	C	C	27	G	22	23	G	G	G	G	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E	E	E	E	
13	E <sub>16</sub>	E	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E	E <sub>16</sub>	S	G	G	28	G	G	G	G	G	G	G	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	
14	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E	E <sub>15</sub>	E <sub>12</sub>	E <sub>15</sub>	20	26	G	24	22	G	G	G	G	G	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>17</sub>	E <sub>17</sub>	
15	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E	E	E <sub>15</sub>	E <sub>15</sub>	A <sub>52</sub>	28	32	22	G	G	G	G	G	G	21	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>14</sub>	E	E	
16	E <sub>16</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>18</sub>	G	21	30	25	G	G	23	G	G	G	E <sub>15</sub>	E	E	34	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	
17	E	E	E <sub>16</sub>	E <sub>16</sub>	E	E <sub>14</sub>	E <sub>15</sub>	G	G	E <sub>27</sub>	G	G	G	30	G	G	G	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
18	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	C	C	C	C	C	C	G	G	G	G	G	G	22	E <sub>16</sub>	E <sub>15</sub>	30	E <sub>16</sub>	E	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	
19	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	C	C	C	E <sub>20</sub>	G	29	29	25	G	G	G	G	G	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	
20	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>15</sub>	E	E <sub>15</sub>	G	G	G	C	G	G	G	G	G	C	E <sub>17</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	C	E	E	
21	E <sub>15</sub>	E <sub>15</sub>	E	E	E	E	E <sub>15</sub>	C	G	22	G	G	G	G	G	G	C	C	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E	E	
22	E	E	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>16</sub>	G	G	27	G	G	G	G	G	G	G	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	
23	E	E <sub>15</sub>	E	E	E	E <sub>15</sub>	E <sub>16</sub>	G	25	G	G	G	G	G	G	G	G	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
24	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>16</sub>	G	25	E <sub>37</sub>	25	G	G	G	G	G	G	E <sub>16</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E	E	
25	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>12</sub>	G	24	G	G	G	G	G	G	28	G	E <sub>18</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
26	E <sub>15</sub>	E	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	G	G	G	G	G	24	G	G	E <sub>17</sub>	E <sub>16</sub>	E	E <sub>14</sub>	E	E	E	E	
27	E	E	E	E	E <sub>14</sub>	E <sub>12</sub>	E <sub>15</sub>	G	G	G	G	G	G	G	G	G	G	E <sub>18</sub>	F	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
28	E <sub>15</sub>	E <sub>12</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>14</sub>	G	G	20	G	G	G	G	G	20	20	24	24	20	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>14</sub>
29																										
30																										
31																										
CNT	28	27	28	27	26	26	25	23	25	27	27	28	28	28	28	28	25	27	28	28	28	28	27	27	27	
MED	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>16</sub>	G	E <sub>20</sub>	G	G	G	G	G	G	G	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
UQ	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	18	25	26	23	22	E <sub>20</sub>	E <sub>20</sub>	G	G	20	E <sub>18</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
LQ	E <sub>15</sub>	E	E <sub>14</sub>	E	E	E	E <sub>14</sub>	G	G	G	G	G	G	G	G	G	G	E <sub>15</sub>	E <sub>14</sub>	E	E <sub>15</sub>	E <sub>15</sub>	E	E	E	

FEB. 1977

FBES (0.1 MHz)

## IONOSPHERIC DATA

FEB. 1977

F-MIN (0.1 MHZ)

135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45° 23.6' N, Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	16	19	20	17	18	19	17	12	12	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E
2	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	13	16	16	22	18	21	18	15	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
3	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>16</sub>	15	16	14	20	13	16	16	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>
4	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>12</sub>	E <sub>15</sub>	10	17	20	28	25	31	22	26	18	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>
5	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	14	15	17	17	16	16	15	12	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
6	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E	E <sub>14</sub>	E <sub>15</sub>	E <sub>20</sub>	15	16	21	20	20	21	19	17	13	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>
7	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>14</sub>	E	E	E <sub>16</sub>	E	11	12	11	15	16	16	14	15	16	E <sub>12</sub>	E	E <sub>15</sub>	E <sub>17</sub>	E <sub>15</sub>	E <sub>15</sub>	C
8	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	C	E	E <sub>14</sub>	C	C	C	16	28	41	50	31	20	19	16	E	E <sub>16</sub>	E <sub>15</sub>	E <sub>17</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
9	E <sub>15</sub>	C	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>14</sub>	E <sub>16</sub>	E <sub>15</sub>	12	12	17	19	20	20	14	16	C	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
10	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E	E <sub>15</sub>	E <sub>14</sub>	E	12	17	20	30	30	41	31	27	24	E	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>
11	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>17</sub>	12	12	15	16	16	17	16	16	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
12	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>15</sub>	C	C	12	16	16	13	17	16	14	14	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
13	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	11	12	15	18	17	18	17	12	14	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>
14	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E	E <sub>15</sub>	E <sub>12</sub>	E <sub>15</sub>	11	14	16	18	17	16	19	20	16	15	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>17</sub>
15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E	E <sub>15</sub>	E <sub>15</sub>	11	16	17	16	18	17	19	16	15	16	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>14</sub>	E <sub>15</sub>
16	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	16	17	17	16	18	17	20	17	16	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>
17	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>14</sub>	E <sub>15</sub>	E <sub>16</sub>	16	E <sub>27</sub>	18	18	18	17	20	19	18	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
18	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	C	C	C	C	C	C	17	20	18	20	20	14	15	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>
19	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	C	C	C	E <sub>20</sub>	16	17	15	17	17	20	16	17	17	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
20	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	12	14	16	C	17	16	20	17	16	C	E <sub>17</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	C	E <sub>15</sub>
21	E <sub>15</sub>	E <sub>15</sub>	E	E	E	E	E <sub>15</sub>	C	16	18	19	16	16	16	16	15	C	C	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>
22	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	12	11	16	16	19	19	18	17	16	14	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>
23	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E	E <sub>15</sub>	E <sub>15</sub>	12	12	15	17	18	18	18	15	17	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
24	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E	E <sub>15</sub>	E <sub>16</sub>	16	15	E <sub>37</sub>	16	17	18	17	16	17	15	E <sub>16</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>
25	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>12</sub>	13	18	18	18	18	17	18	18	15	14	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
26	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>15</sub>	15	16	17	17	17	16	17	19	18	17	E <sub>17</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
27	E <sub>16</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>14</sub>	E <sub>12</sub>	E <sub>15</sub>	13	16	17	16	18	17	20	16	17	17	E <sub>18</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
28	E <sub>15</sub>	E <sub>12</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>14</sub>	E <sub>17</sub>	11	17	18	18	21	16	17	16	15	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>14</sub>
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	27	28	27	26	26	25	24	25	27	27	28	28	28	28	28	25	27	28	28	28	28	27	27
MED	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>14</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	15	16	17	18	18	18	17	16	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
UQ	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	16	17	18	20	18	20	20	17	16	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
LQ	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>12</sub>	E <sub>15</sub>	12	12	16	16	17	16	17	16	15	14	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>

FEB. 1977

F-MIN (0.1 MHZ)

## IONOSPHERIC DATA

FEB. 1977

M(3000)F2 (0.01)

135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45° 23.6' N, Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	275	295	315	305	325	315	315	350	350	365	370	335	350	360	375	365	360	340	305	335	315	265	305	305	
2	295	295	295	295	305	300	310	335	355	370	345	340	375	375	355	335	365	310	A	315	310	290	285	290	
3	285	310	310	310	300	295	305	355	370	370	370	340	370	345	370	340	370	325	340	340	315	300	335	305	
4	315	305	295	305	295	305	325	315	360	330	355	345	355	R	340	330	325	360	325	325	320	310	315	320	
5	305	305	295	315	310	320	355	350	370	365	350	360	370	355	335	345	350	370	A	320	295	300	295	335	
6	310	300	300	295	310	320	345	360	360	365	360	350	345	350	355	350	360	350	A	350	A	A	290	285	
7	290	285	300	295	315	315	320	350	365	340	380	360	350	C	365	320	355	340	330	305	315	285	305	C	
8	305	315	300	C	305	F	C	C	C	315	R	355	360	R	350	340	350	335	330	325	295	300	295	305	320
9	F	C	290	305	295	280	335	370	J S	320	355	310	330	325	340	330	350	C	365	330	330	300	300	295	295
10	285	295	320	285	F	320	F	335	355	380	355	360	360	350	355	360	335	340	325	320	325	305	295	310	
11	275	F	315	355	325	320	370	340	360	365	360	375	375	350	345	345	320	325	320	320	300	300	290		
12	300	300	F	325	325	330	325	C	C	360	325	365	360	380	350	340	345	355	315	305	320	310	305	325	
13	320	310	305	300	320	335	330	350	390	370	370	365	350	365	350	345	350	335	325	300	315	315	305	300	
14	305	315	310	300	310	305	360	320	345	365	360	345	340	340	355	360	355	340	325	340	310	325	305	295	
15	F	F	F	295	320	300	330	A	360	360	325	345	355	360	345	355	335	340	315	325	315	310	305	300	
16	F	F	F	290	300	325	350	375	365	365	360	335	360	360	330	365	360	335	315	315	300	310	315	305	
17	305	300	300	295	F	F	F	355	365	330	355	355	355	335	335	360	360	360	315	315	310	315	305	300	
18	285	280	290	295	C	C	C	C	C	C	355	335	340	340	335	340	345	360	320	330	285	295	295	280	
19	290	F	F	F	C	C	C	345	345	355	340	340	340	335	350	360	350	345	320	320	325	340	310	330	
20	295	295	295	300	300	325	335	350	375	365	C	335	335	340	355	360	C	345	315	325	335	315	C	300	
21	290	295	310	345	F	F	325	C	340	350	350	355	345	355	360	350	C	C	305	300	310	310	320	300	
22	290	305	290	305	320	325	335	340	355	340	350	355	345	365	360	345	350	370	320	300	295	300	295	300	
23	295	315	315	330	325	330	325	370	340	365	350	345	355	345	340	355	380	365	310	295	315	295	290	285	
24	280	300	295	F	F	F	F	F	F	F	F	355	355	335	335	355	340	360	385	365	325	310	300	300	290
25	300	315	305	305	350	295	320	350	355	380	345	335	340	345	350	355	360	345	340	320	300	295	S	S	295
26	F	F	F	F	F	F	350	355	355	340	310	330	340	360	360	350	345	340	340	F	F	F	F	F	
27	F	F	F	F	325	330	315	355	345	335	335	345	350	360	350	350	360	340	F	F	F	F	S	S	
28	305	305	300	305	F	335	355	370	355	355	355	315	355	350	345	365	365	355	310	325	285	315	S	S	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	23	21	22	23	20	21	23	23	25	27	26	28	28	26	28	28	25	27	25	27	26	26	23	24	
MED	295	300	300	305	312	320	325	350	355	360	355	345	350	352	350	350	355	345	325	320	310	302	305	300	
UQ	305	310	310	308	325	325	340	360	365	365	360	355	360	360	355	360	360	360	325	325	315	310	308	308	
LQ	288	295	295	295	302	305	320	348	345	345	345	335	340	345	340	345	345	340	315	305	300	295	295	292	

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M(3000)F2 (0.01)

# IONOSPHERIC DATA

FEB. 1977

M(3000)F1 (0.01)

135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45° 23.6' N, Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1													L	L										
2												400	405	410										
3											405	410	L	400										
4											380	L	410											
5											395	L		L										
6												L	395	L	375									
7											420	400		375	L									
8												B	B	385										
9												L	390	U	380									
10										L	590	410	410	B										
11										L	405	400	420	415										
12										395		L	400	410										
13										415	410		L	405										
14											405	405	390	390	400	L								
15										390	390	385	400	375										
16											410	365	L	U	405	L								
17											415	L	L	L										
18											415	L	395	L	L	L								
19										400	410	400	400	390		L								
20											C	395	385	385	L									
21											415	400		400	U	400								
22										400	395	390	385	410	385									
23										L	420	380	385	395	390	L								
24											400	380	390	390	400									
25										380	410	380	375	385	375	L								
26										385		385	350	390	U	385								
27										400	390	400	380	390	375									
28										375	400	385	380	395	390	L								
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										9	20	19	18	21	10									
MED										395	405	395	390	390	388									
UQ										400	412	400	400	405	400									
LQ										385	395	385	385	385	375									

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M(3000)F1 (0.01)

### IONOSPHERIC DATA

FEB. 1977

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

135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45° 23.6' N, Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1													250	225										
2												260	225	230										
3											225	250	235	260										
4											250	230	240											
5											245	245		250										
6												250	260	250	255									
7											220	245		265	240									
8												250	240	250										
9												260	260	250										
10										220	250	245	250	250										
11										225	240	235	225	220										
12										220		245	235	220										
13										220	215		245	235										
14											225	250	250	260	235	250								
15										245	265	250	250	250										
16										250	260	250	255	250										
17										240	245	250	250											
18										230	260	250	260	260										
19										235	240	255	260	260		235								
20											260	250	250	250										
21										245	250		240	250										
22										250	260	240	250	245	250									
23										235	255	250	250	255	250	245								
24										250	270	260	250	250										
25										235	250	275	265	260	260	250								
26										250		280	255	250	245									
27										250	270	260	260	260	250									
28										255	265	265	265	270	260	235								
29																								
30																								
31																								
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									12	20	26	25	27	14	5									
MED									235	248	250	250	250	250	245									
UQ									250	252	260	260	260	255	250									
LQ									222	235	245	245	248	250	235									

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

## IONOSPHERIC DATA

FEB. 1977

H'F (KM)

135° E Mean Time (G. M. T. + 9 h)

Station **WAKKANAI** Lat. 45° 23.6' N, Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	300	280	265	250	245	250	260	215	210	200	225	210	240	220	220	220	205	210	260	240	250	350	265	270
2	275	265	300	260	250	250	230	225	210	200	245	200	210	210	220	225	210	225	A	250	240	280	295	290
3	295	250	250	250	275	265	265	225	220	200	200	210	205	205	230	240	210	220	245	245	280	290	255	275
4	260	250	265	270	305	260	220	205	205	220	200	230	225	215	230	220	A	210	245	260	250	250	250	250
5	275	265	275	260	250	230	210	210	200	200	200	195	245	240	210	215	A	A	A	255	270	A	300	250
6	260	270	290	265	250	250	230	215	210	200	245	230	220	200	215	205	225	225	A	245	A	A	280	300
7	300	295	285	265	250	250	250	215	230	205	215	245	200	215	240	215	220	215	220	230	250	280	250	C
8	250	240	245	C	250	250	C	C	C	200	225	B	B	205	230	245	210	215	220	300	265	250	260	250
9	300	C	300	245	300	265	240	A	210	205	220	200	215	220	245	225	C	210	205	245	250	275	300	260
10	295	275	250	280	220	205	215	210	220	200	205	200	200	B	240	220	220	205	235	250	250	275	295	250
11	300	295	260	205	235	245	250	210	220	215	200	210	215	200	230	220	230	205	225	240	250	260	260	260
12	265	260	300	250	250	220	250	C	C	210	200	190	225	220	205	215	220	215	245	250	250	265	250	250
13	250	250	265	260	250	215	230	210	205	195	180	225	245	210	210	210	220	200	210	230	250	250	250	250
14	260	250	250	250	250	260	200	200	220	200	220	200	200	225	210	220	235	210	240	225	215	250	250	260
15	275	290	260	260	240	250	205	A	220	245	200	200	200	200	230	215	215	225	210	240	250	260	265	250
16	275	265	270	270	230	245	205	200	215	205	190	205	245	215	210	235	215	205	220	270	A	250	250	250
17	250	250	250	265	250	225	215	210	225	215	215	215	200	220	225	225	225	210	250	245	250	250	275	265
18	265	275	275	250	C	C	C	C	C	C	205	215	230	220	235	245	230	220	205	A	275	250	250	270
19	265	260	250	280	C	C	C	220	230	210	205	195	200	220	210	205	220	200	245	250	235	215	250	250
20	275	285	270	260	270	225	230	205	205	205	C	210	220	210	215	230	C	210	215	230	240	250	C	265
21	300	270	260	235	225	225	245	C	215	230	220	200	225	205	215	215	C	C	245	250	250	250	250	265
22	300	260	285	255	250	230	240	215	210	215	215	205	195	205	210	205	215	205	215	275	280	265	270	260
23	260	245	250	210	200	210	235	210	200	210	215	210	205	225	210	225	210	210	205	275	260	275	300	300
24	300	250	250	265	230	240	250	215	225	C	215	200	220	205	200	245	220	210	205	250	260	255	260	300
25	265	245	250	250	220	305	270	220	225	225	215	200	205	200	210	240	220	220	205	250	250	250	250	250
26	260	225	245	240	240	210	215	210	200	215	210	215	230	210	205	225	210	215	210	250	250	250	275	270
27	280	250	230	235	210	205	205	215	210	210	190	200	210	205	200	230	235	210	210	250	250	255	250	260
28	250	230	250	250	215	205	210	210	200	205	210	215	205	215	235	235	220	215	230	250	265	270	265	270
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	27	28	27	26	26	25	22	25	26	27	27	27	27	28	28	24	26	25	27	26	26	27	27
MED	275	260	260	255	250	242	230	210	210	205	210	205	215	210	215	222	220	210	220	250	250	255	260	260
UQ	298	272	275	265	250	250	250	215	220	215	218	215	225	220	230	232	222	215	245	250	260	275	275	270
LQ	260	250	250	250	230	220	215	210	205	200	200	200	202	205	210	215	212	210	210	242	250	250	250	250

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H'F (KM)

### IONOSPHERIC DATA

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H'E (KM)

135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45° 23.6' N. Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								S	A	A	A	A	115	A	110	A	A							
2								S	A	A	105	115	110	110	110	110	A							
3								S	130	115	110	110	110	110	110	110	A							
4								A	120	120	B	125	B	120	B	115	A							
5								S	115	110	105	110	105	105	110	A	A							
6								C	A	120	115	110	110	110	110	110	A							
7								A	A	105	110	105	105	105	105	120	115							
8								C	C	A	B	B	B	B	115	120	150							
9								S	A	115	110	110	110	110	110	110	C							
10								A	100	A	105	B	B	B	B	B	B							
11								S	110	115	105	105	105	110	105	110	115	S						
12								C	C	A	110	110	110	105	110	110	120	S						
13								S	105	105	A	110	110	110	110	105	110	S						
14								A	A	105	120	110	110	110	110	110	120	S						
15								A	A	A	115	110	110	110	110	110	120	S						
16								S	120	115	A	125	110	120	115	115	115	S						
17								S	115	C	110	110	105	A	110	110	135	S						
18								C	C	C	110	110	110	110	110	110	A	S						
19								C	110	A	A	110	110	110	110	110	115	S						
20									125	115	110	C	105	105	110	110	110	C	S					
21								C	120	125	115	105	110	110	110	110	C	C						
22									120	105	A	105	110	110	110	110	115	S						
23									120	A	110	110	110	110	105	110	110	S						
24									140	A	C	115	110	110	105	105	105	115	S					
25									120	A	110	110	105	110	105	110	A	115	S					
26									125	120	110	110	105	110	115	110	110	115	S					
27									125	115	110	115	110	110	110	110	110	115	S					
28									S	125	110	110	115	110	110	110	135	A	S					
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								7	15	17	21	25	25	24	26	24	16							
MED								125	115	110	110	110	110	110	110	110	115							
UQ								125	120	115	115	110	110	110	110	110	120							
LQ								120	110	110	110	110	110	110	110	110	115							

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H'E (KM)



IONOSPHERIC DATA

FEB. 1977

H<sup>1</sup>ES (KM)

135° E Mean Time (G. M. T. + 9 h)

Station	WAKKANAI																							
	Lat. 45° 23.6' N.												Long. 141° 41.1' E											
	Sweep 1 MHz to 20 MHz in 20 sec in automatic operation																							
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	S	E	E	S	S	S	105	100	100	100	100	100	100	100	100	100	100	100	S	S	S	S
2	S	S	S	S	S	S	S	105	100	100	G	G	G	G	G	G	110	S	100	S	100	S	S	S
3	S	S	S	S	S	S	S	S	145	G	100	G	100	100	110	125	100	100	S	105	100	100	100	100
4	S	S	S	S	100	100	105	100	G	G	B	G	B	120	120	115	105	105	105	105	105	S	100	S
5	S	100	S	S	S	S	105	105	G	G	G	G	150	150	145	110	110	105	105	105	S	100	100	100
6	S	S	S	E	E	S	105	C	100	100	160	G	G	G	G	G	115	105	105	100	100	100	S	100
7	S	S	100	S	110	110	105	105	100	G	100	G	G	G	G	100	G	105	105	S	S	S	S	C
8	S	S	S	C	E	S	C	C	C	100	B	B	B	B	G	165	G	155	S	115	S	105	100	S
9	S	C	S	S	100	S	S	115	105	105	G	G	G	G	G	G	C	S	S	S	105	100	100	100
10	100	100	S	100	E	110	110	105	G	105	G	B	B	B	B	B	B	100	S	S	S	S	S	S
11	S	S	S	S	S	S	S	S	120	105	G	100	G	G	G	G	G	S	S	S	105	S	S	100
12	100	S	S	S	S	S	S	C	C	105	G	100	100	G	G	G	G	S	S	E	S	105	100	100
13	S	100	S	S	S	E	S	105	G	G	105	G	160	G	G	G	G	115	S	S	S	S	S	S
14	S	S	S	E	S	S	S	100	105	G	105	100	G	G	G	G	120	S	S	S	S	S	S	S
15	S	S	S	E	E	S	S	105	105	105	105	G	105	G	G	120	G	100	S	S	S	105	S	100
16	S	S	100	S	S	S	S	S	G	105	100	100	145	100	G	115	115	S	105	105	100	S	S	S
17	100	100	S	S	E	S	S	G	G	C	G	G	G	100	G	G	G	S	S	S	S	S	S	S
18	S	E	S	S	C	C	C	C	C	C	G	G	G	G	G	G	110	S	S	105	S	105	S	S
19	S	S	S	E	C	C	C	C	130	110	105	105	G	G	G	G	G	S	S	100	S	S	105	S
20	S	S	S	S	S	E	S	G	G	G	C	G	G	G	G	G	C	S	S	S	S	S	C	100
21	S	S	E	E	E	E	S	C	G	105	150	G	G	G	G	G	C	C	S	S	S	S	S	105
22	100	110	S	S	S	E	S	G	G	105	G	G	G	G	G	G	G	S	S	S	S	S	S	S
23	100	S	100	E	E	S	S	G	115	G	G	G	G	G	G	G	G	S	S	S	S	S	S	S
24	S	S	S	S	E	S	S	G	110	110	105	G	G	G	G	G	G	S	S	S	S	S	S	105
25	S	100	S	S	S	S	S	G	110	G	G	G	G	G	G	100	G	S	S	S	S	S	S	S
26	S	100	S	S	S	S	S	G	G	G	G	G	G	100	G	G	G	S	S	105	S	100	100	100
27	100	100	E	100	S	S	S	150	G	G	100	105	G	G	G	G	G	S	100	100	S	S	S	S
28	S	S	S	S	E	S	S	150	105	G	G	105	G	100	100	100	100	100	S	S	S	S	S	S
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	8	3	2	3	3	5	11	14	14	12	8	7	8	5	10	10	11	8	11	7	9	8	11
MED	100	100	100	100	100	110	105	105	105	105	105	100	105	100	110	112	110	105	105	105	100	100	100	100
UQ	100	100	100		105	110	105	110	115	105	105	105	148	110	120	120	115	105	105	105	105	105	100	100
LQ	100	100	100		100	105	105	105	105	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

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H<sup>1</sup>ES (KM)

# IONOSPHERIC DATA

FEB. 1977

TYPES OF ES

135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45° 23.6' N, Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

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

FEB. 1977

TYPES OF ES

# IONOSPHERIC DATA

FEB. 1977

FXI (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.2' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 37	X 37	X 37	X 39	X 36	X 32													X 43	X 37	X 34	X 32	X 36	X 35	
2	X 36	X 36	X 36	X 36	X 37	X 34													X 42	X 46	X 43	X 39	X 39	X 41	
3	X 40	X 42	X 42	X 36	X 35	X 35													X 46	X 43	X 43	X 36	X 38	X 38	
4	X 38	X 39	X 39	X 42	X 38	X 37													A	X 39	X 40	X 39	X 37	X 41	
5	X 38	X 39	X 42	X 40	X 42	X 39													X 40	X 34	X 39	X 39	X 39	X 41	
6	X 37	X 38	X 37	X 35	X 35	X 32													A	A		X 38	X 32	X 34	X 36
7	X 37	X 38	X 37	X 36	X 38	X 39	X 36												X 52	X 46	X 41	X 40	X 42	X 45	
8	X 47	X 38	X 45	X 44	X 43	X 50													X 48	X 42	X 40	X 38	X 36	X 40	
9	X 36	X 36	X 36	X 40	X 35	X 42													X 51	X 45	X 42	X 43	X 44	X 44	
10	X 43	X 40	X 40	X 39	X 50	X 32													X 46	X 45	X 43	X 40	X 39	X 43	
11	X 35	X 37	X 38	X 40	X 30	X 25													X 54	X 43	X 44	X 42	X 43	X 41	
12	X 42	X 41	X 40	X 42	X 43	X 39													X 49	X 43	X 42	X 42	X 43	X 42	
13	X 39	X 42	X 39	X 38	X 38	X 36													X 47	X 42	X 42	X 44	X 40	X 39	
14	X 41	X 42	X 40	X 40	X 45	X 42													X 51	X 51	X 50	X 43	X 45	X 46	
15	X 46	X 48	X 48	X 47	X 53	X 41													X 54	X 52	X 43	X 44	X 43	X 48	
16	X 50	X 52	X 52	X 50	X 52	X 49	X 46												X 52	X 42	X 43	X 41	X 43	X 43	
17	X 45	X 44	X 45	X 45	X 45	X 43													X 48	X 44	X 46	X 48	X 47	X 50	
18	X 54	X 55	X 56	X 60	X 57	X 53													X 72	X 44	X 42	X 48	X 53	X 55	
19	X 55	X 58	X 60	X 58	X 56	X 55	X 57												X 48	X 52	X 50	X 47	X 42	X 43	
20	X 43	X 47	X 49	X 51	X 52	X 53													X 46	X 44	X 48	X 44	X 42	X 38	
21	X 39	X 39	X 42	X 42	X 38	X 32													X 42	X 43	X 47	X 46	X 45	X 40	
22	X 39	X 41	X 41	X 42	X 39	X 37													X 40	X 38	X 38	X 41	X 42	X 39	
23	X 41	X 42	X 42	X 41	X 39	X 35													X 40	X 38	X 43	X 42	X 42	X 43	
24	X 45	X 45	X 46	X 44	X 42	X 43													X 45	X 42	X 43	X 45	X 45	X 43	
25	X 44	X 47	X 43	X 43	X 38	X 34													X 40	X 38	X 39	X 39	X 40	X 60	
26	X 61	X 68	X 63	X 65	X 68	X 50	X 48												X 49	X 42	X 43	X 49	X 53	X 58	
27	X 60	X 60	X 58	X 58	X 57	X 42	X 40												X 43	X 40	X 40	X 43	X 47	X 45	
28	X 48	X 56	X 60	X 60	X 55	X 48													X 48	X 41	X 39	X 39	X 42	X 42	
29																									
30																									
31																									
CNT	28	28	28	28	28	28	5												26	27	28	28	28	28	
MED	X 42	X 42	X 42	X 42	X 42	X 39	X 46												X 48	X 43	X 42	X 42	X 42	X 42	
UQ	X 46	X 48	X 48	X 48	X 52	X 46	X 48												X 51	X 44	X 43	X 44	X 44	X 45	
LQ	X 38	X 38	X 39	X 40	X 38	X 34	X 40												X 43	X 40	X 40	X 39	X 39	X 40	

FEB. 1977

FXI (0.1 MHz)

# IONOSPHERIC DATA

FEB. 1977

FOF2 (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station **AKITA** Lat. 39° 43.5' N, Long. 140° 08.2' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

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

FEB. 1977

FOF2 (0.1 MHz)

## IONOSPHERIC DATA

FEB. 1977

FOF1 (0.01 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station	AKITA							Lat. 39° 43.5' N, Long. 140° 08.2' E		Sweep 1 MHz to 20 MHz in 20 sec in automatic operation															
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1									L	L	L	L	410	400	380	L									
2									L	L	L	450	L	390	L	L	L								
3									L	L	380	L	450	410	L	L									
4									L	L	410	L	420	L	L	L									
5									L	L	400	L	450	L	L	L									
6									L	L	380	H	420	H	410	H	440	400	L	L					
7									L	L	L	410	420	A	400	L									
8									290	L	L	420	440	410	L	A	L								
9										L	410	L	L	430	L	L	L								
10									L	L	I	C	400	I	C	440	420	L	L	L					
11									L	L	420	L	420	400	420	H	L	L							
12									L	L	410	450	L	I	C	420	L	L	L						
13									L	L	390	420	390	L	L	370	L								
14									L	L	450	440	420	470	L	L	L								
15									L	500	A	450	440	410	390	L									
16									L	L	400	460	410	440	420	L	L								
17									L	L	430	L	450	450	400	L	L								
18									L	H	370	450	L	470	L	L	380	L							
19									L	400	450	460	440	440	430	L	L								
20									L	L	400	450	450	460	440	420	L	L							
21									L	L	400	L	430	440	430	H	C	C	C						
22									L	410	420	430	430	420	L	L	L								
23									L	H	390	450	H	430	H	440	430	420	390	L					
24									L	L	400	440	H	440	430	H	430	420	L	L					
25									L	L	L	L	H	440	440	430	410	350	L						
26									L	380	420	420	H	440	420	410	L	260	210						
27									L	H	310	L	H	410	430	430	420	410	L	L	220				
28									L	380	L	430	440	430	410	L	L								
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									2	10	20	20	25	23	15	4	1	2							
MED									300	400	415	435	440	430	410	375	260	215							
UQ									400	445	450	440	435	420	385										
LQ									380	400	425	420	415	400	360										

FEB. 1977

FOF1 (0.01 MHz)

The Radio Research Laboratories, Japan

### IONOSPHERIC DATA

FEB. 1977

FOE (0.01 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station **AKITA** Lat.  $39^{\circ} 43.5' N$ , Long.  $140^{\circ} 08.2' E$  Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	B	205	245	260	280	300	285	275	245	190		R					
2							S	B	A	A	A	300	305	295	A	255	A	S						
3							S	B	210	250	275	295	305	300	280	250	A	S						
4							S	B	225	255	275	295	310	300	290	270	210	A						
5							S	B	230	260	280	295	300	295	275	240	190	R						
6							S	A	230	260	A	A	305	295	280	250	200	S						
7							S	175	225	250	270	285	A	A	A	245	195	S						
8							S	A	A	260	A	A	A	295	A	A	220	S						
9							S	B	A	A	A	295	305	300	285	265	A	A						
10							S	A	A	255	I C 275	I C 290	305	I B 300	295	265	220	S						
11							S	A	225	A	A	A	A	A	285	265	225	S						
12							S	B	215	260	A	305	315	I C 310	290	255	220	R						
13							S	A	A	A	290	300	310	310	295	275	215	B						
14							S	A	225	260	280	300	315	310	290	260	220	A						
15							S	A	A	A	A	A	315	305	290	260	A	A						
16							S	160	235	260	280	295	310	305	290	270	220	R						
17							S	A	230	260	280	A	305	310	295	270	A	R						
18							S	A	215	265	285	305	320	A	A	A	225	B						
19							S	B	220	260	A	A	A	A	305	270	A	S						
20							S	175	235	260	295	320	325	315	300	275	225	R						
21							S	185	240	270	290	310	320	310	C	C	C	160						
22							S	180	235	270	290	310	320	310	295	270	230	170						
23							S	180	245	265	280	305	320	315	300	275	230	B						
24							S	180	245	265	A	310	320	310	290	270	225	B						
25							S	170	A	A	A	300	315	310	285	260	225	B						
26							S	180	225	275	295	310	320	305	285	260	220	S						
27							S	195	235	275	295	305	315	300	290	270	220	B						
28							S	205	250	270	290	305	320	315	300	270	240	170						
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								11	21	22	18	22	24	24	23	25	21	3						
MED								180	230	260	280	300	315	305	290	265	220	170						
UQ								182	235	265	290	305	320	310	295	270	225	170						
LQ								175	225	260	275	295	305	300	285	255	215	165						

The Radio Research Laboratories, Japan

FEB. 1977

FOE (0.01 MHz)



# IONOSPHERIC DATA

FEB. 1977

FBES (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station **AKITA** Lat. 39° 43.5' N. Long. 140° 08.2' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	E	E	E	E	E	E	G	E <sub>17</sub>	G	G	34	37	36	33	29	26	23	G	17	E	E	E	E	16		
2	E	E	E	E	E <sub>15</sub>	E	G	E <sub>16</sub>	22	27	29	32	32	31	29	G	22	18	19	E <sub>15</sub>	E	E	E <sub>15</sub>	E		
3	E <sub>16</sub>	E <sub>14</sub>	E	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	18	24	G	31	31	32	G	G	28	26	20	19	E	E	E	17	E		
4	E	E	E <sub>13</sub>	E <sub>15</sub>	E	E	G	E <sub>17</sub>	G	27	34	34	34	34	G	30	29	46	A <sub>52</sub>	E	E	E	E	E		
5	E	E	E	E	E <sub>14</sub>	E	G	G	16	17	G	G	G	35	32	30	24	19	28	E	E	E	E	E		
6	E	E <sub>15</sub>	16	E <sub>15</sub>	16	E	A <sub>36</sub>	45	19	19	29	30	G	G	30	G	23	17	A <sub>85</sub>	A <sub>78</sub>	23	E	E	E		
7	E	E	E	E	E	E	G	G	G	16	G	27	32	43	31	30	25	E <sub>14</sub>	E	19	E	E	E	E		
8	E	E	15	E	E	E <sub>15</sub>	E <sub>15</sub>	19	26	31	36	37	35	23	31	37	19	17	E	E	E	18	E <sub>16</sub>			
9	E	E <sub>15</sub>	E <sub>16</sub>	E	E <sub>15</sub>	E <sub>16</sub>	G	18	28	29	34	G	G	24	19	26	G	20	25	16	E	E	20	18	20	E
10	E <sub>15</sub>	E	E	E	E	18	18	21	23	24	C	C	G	E <sub>31</sub>	G	G	17	17	E	E	E	E	E <sub>15</sub>	E <sub>15</sub>		
11	E <sub>16</sub>	E	E	E	E	E	G	20	27	31	39	32	32	30	G	24	18	20	24	18	E	E	E <sub>16</sub>	E	E	
12	E	E	E <sub>15</sub>	E <sub>14</sub>	E	E <sub>16</sub>	E <sub>16</sub>	20	24	G	33	24	G	C	G	G	G	E <sub>16</sub>	E <sub>16</sub>	E	E	E	E	E	E	
13	E	16	E	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	18	28	28	24	24	G	G	G	G	G	E <sub>16</sub>	E	24	E <sub>13</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>		
14	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>16</sub>	E <sub>15</sub>	21	25	24	25	20	G	24	G	G	G	20	22	20	18	E	19	E	E <sub>16</sub>	
15	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>14</sub>	E <sub>15</sub>	22	32	38	75	34	G	G	G	G	28	21	21	E	18	E	18	E		
16	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>16</sub>	G	G	G	G	G	G	G	G	G	G	20	E	16	18	E	20	E		
17	E	E	16	18	28	21	G	19	G	33	G	34	G	33	G	G	24	E <sub>18</sub>	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>		
18	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>16</sub>	20	G	G	G	G	G	33	33	27	G	E <sub>16</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>16</sub>	27	E <sub>16</sub>	E <sub>15</sub>		
19	20	23	E	E <sub>15</sub>	E	E <sub>13</sub>	E <sub>13</sub>	E <sub>16</sub>	24	30	35	37	36	33	25	23	G	25	23	20	E	E <sub>16</sub>	E <sub>13</sub>	E <sub>16</sub>	E <sub>14</sub>	
20	E <sub>15</sub>	E	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E	G	G	G	29	G	G	G	G	G	G	G	E <sub>16</sub>	E	E	E <sub>16</sub>	E	E	E		
21	E	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>	E <sub>15</sub>	24	27	31	34	G	35	G	C	C	C	G	E <sub>14</sub>	E <sub>16</sub>	E	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>		
22	E	E	E	E <sub>15</sub>	E <sub>14</sub>	E <sub>14</sub>	E <sub>15</sub>	G	G	G	G	G	G	G	G	G	G	G	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>		
23	E <sub>16</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>15</sub>	22	G	G	31	G	G	G	G	G	G	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E		
24	E	E	E <sub>13</sub>	E	E <sub>14</sub>	E <sub>13</sub>	E <sub>15</sub>	23	26	30	30	27	G	28	G	G	G	E <sub>16</sub>	E	E	E	E	E <sub>15</sub>	E		
25	E	17	E	E	E	E <sub>15</sub>	E <sub>15</sub>	G	26	28	30	G	G	G	G	G	G	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E	16	15	E		
26	E	E	E	E <sub>13</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	G	G	G	20	G	G	G	G	19	16	16	20	20	E	E	E <sub>15</sub>	
27	19	15	15	E	E	E	E <sub>15</sub>	G	G	G	G	G	30	G	G	G	G	E <sub>16</sub>	E	E	E	E	E	E <sub>16</sub>		
28	E <sub>15</sub>	E <sub>14</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>16</sub>	G	G	29	G	35	G	G	G	G	G	G	E	E	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>		
29																										
30																										
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	28	28	28	28	28	28	28	28	28	28	27	27	28	27	27	27	27	27	28	28	28	28	28	28	28	
MED	E	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>	E <sub>15</sub>	18	22	26	29	24	G	24	G	G	19	16	E <sub>15</sub>	E	E	E	E <sub>15</sub>	E		
UQ	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>16</sub>	20	26	30	34	33	32	32	28	24	24	20	19	16	16	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>		
LQ	E	E	E	E	E	E	G	G	G	E <sub>16</sub>	G	G	G	G	G	G	G	E <sub>16</sub>	E	E	E	E	E	E		

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FBES (0.1 MHz)





### IONOSPHERIC DATA

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M(3000)F2 (0.01)

135° E Mean Time (G. M. T. + 9 h)

Station **AKITA** Lat. 39° 43.5' N, Long. 140° 08.2' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	280	285	295	310	335	280	310	335	330	345	345	355	355	345	355	340	345	345	340	330	340	315	F	310	
2	295	290	295	305	325	315	315	345	345	355	360	335	340	360	350	350	340	315	295	320	335	285	285	290	
3	290	315	335	305	295	305	320	340	365	365	335	340	340	345	340	365	360	350	345	340	345	335	315	310	
4	310	310	310	F	305	300	320	360	360	335	335	345	350	350	330 <sup>H</sup>	335	350	I <sup>P</sup> 340	A	335	335	310	290	330	
5	315	295	305	310	305	330	315	350	360	345	340	350	330	350	355	345	355	355	350	325	315	315	305	315	
6	305	305	305	305	310	320	A	355	360	350	330	335	330 <sup>H</sup>	340	350	355	315	355	A	A	330	295	300	300	
7	285	F	300	305	315	F	305 <sup>F</sup>	350	360	335	355	350	355	325	340	360	335	345	330	330	295	310	310	F	
8	F <sup>F</sup> 320	310	F	305	315	F	300	340	340	350	335	350	340	335	335	330	340	355	345	340	315	325	310	315	
9	295	295	300	310	280	335	310	345	365	340	340	320	335	335	350	345	350	350	345	345	310	325	285	300	
10	300	295	295	295	330	330	325	355	355	355	I <sup>C</sup> 340	I <sup>C</sup> 340	345	325	350	330	350	335	330	330	330	300	285	300	
11	305	300	300	335	330	280	305	335	350	350	350	350	355	360	345	335	350	340	340	330	315	315	330	300	
12	295	290	290	315	330	325	320	350	335	335	330	315	340	I <sup>C</sup> 350	355	350	325 <sup>H</sup>	350	340	330	310	305	320	325	
13	310	315	315	295	290	325	315	350	365	365	365	365	285 <sup>H</sup>	355	350	340	350	350	320	340	310	335	320	295	
14	295	320	310	310	320	300	345	365	365	335	330	345	335	335	350	350	350	350	340	320	335	325	315	305	
15	290	290	295	300	335	285	335	330	335	330	330	320	345	350	345	345	350	345	340	335	320	310	300	310	
16	315	F	F	F	310 <sup>F</sup>	F	F	355	360	355	350	340	340	335	335	340	350	335 <sup>H</sup>	335	320	325	315	315	295	
17	315	310	300	300	310	310	320	355	335 <sup>H</sup>	340	345	335	345	340	345	345	345	360	340	295	320	315	300	310	
18	F	F	F	F	310	295	340	355	355	350	340	330	320	335	345	330	340	325	350	335	290	285	F	F	
19	F	F	F	F	F	F	F	360	350	335	325	330	340	335	335	345	355	355	325	310	310	315	310	320	
20	F	F <sup>F</sup> 290	305	300	305 <sup>F</sup>	F	325	355	355	360	335	330	335	340	345	345	350	345	340	315	320	320	310	290	
21	290	290	320	335	335	290	315	345	340	350	345	335	335	335	C	C	C	350	315	315	320	320	325	310	
22	300	305	305	310	320	310	325	345	340	335	335	345	350	340	345	360	345	350	350	315	290	300	295	300	
23	295	310	305	315	335	310	310	340	340	350	320	340	345	335	345	350	345	350	325	300	310	305	300	300	
24	300	295	300	310	305	310	320	355	350	345	330	340	345	350	340	335	355	360	340	300	300	305	300	300	
25	295	325	305	335	320	290	320	350	335	355	330	315	330	335	345	340	350	360	320	305	300	300	300	F	
26	F	F	F	F	F	F	F	360	340	330	330	325	325	340	350	345	350	340	330	315	310	320	F	F	
27	F	F	F	F	F	F	F	330 <sup>F</sup>	340	345	325	340	330	340	335	345	340	355	355	320	320	315	315	315	310
28	300	F	F	F	F	F	330	355	365	350	340	330	335	330	340	345	350	345	340	325	325	295	300	300	
29																									
30																									
31																									
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	23	21	21	21	24	20	24	28	28	28	28	28	28	28	27	27	27	28	26	27	28	28	25	24	
MED	300	300	305	310	315	310	320	350	350	348	338	338	340	340	345	345	350	350	340	325	315	315	305	302	
UQ	308	310	305	310	330	322	325	355	360	352	345	345	345	350	350	350	350	355	340	332	328	320	315	310	
LQ	295	290	300	305	305	292	312	342	340	335	330	330	335	335	340	340	345	342	325	315	310	302	300	300	

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M(3000)F2 (0.01)

# IONOSPHERIC DATA

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M(3000)F1 (0.01)

135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.2' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	L	365	370	375	L								
2									L	L	L	360	L	375	L	L	L							
3									L	L	375	L	365	375	L	L								
4									L	L	355	L	365	L	L	L								
5									L	L	380	L	365	L	L	L								
6									L	L	390 <sup>H</sup>	375 <sup>H</sup>	380 <sup>H</sup>	350 <sup>H</sup>	365	L	L							
7									L	L	L	380	375	A	380	L								
8									400	L	L	365	370	375	L	A	L							
9										L	375	L	L	375	L	L	L							
10									L	L	375 <sup>I</sup>	365 <sup>I</sup>	365	380	L	L	L							
11									L	L	A	L	385	375	375 <sup>H</sup>	L	L							
12									L	L	375	380	L	375 <sup>I</sup>	L	L	L							
13									L	L	395	400	420	L	L	375	L							
14									L	L	370 <sup>H</sup>	365	380	365	L	L	L							
15									L	360	A	370	375 <sup>H</sup>	385	375	L								
16									L	L	370	365 <sup>H</sup>	385 <sup>H</sup>	365	370	L	L							
17									L	L	380	L	375 <sup>H</sup>	370	365	L	L							
18									L	395 <sup>H</sup>	375	L	360 <sup>H</sup>	L	L	370	L							
19									L	370	370	375	375	375	360	L	L							
20									L	365	375	375	360	370	370	L	L							
21									L	380	L	375	375	375 <sup>H</sup>	C	C	C							
22									L	375	380	375	375	380	L	L	L							
23									L	385 <sup>H</sup>	375 <sup>H</sup>	370 <sup>H</sup>	370 <sup>H</sup>	370	360	365	L							
24									L	370	370 <sup>H</sup>	365	375	375 <sup>H</sup>	375	L	L							
25									L	L	L	350 <sup>H</sup>	350	360	380	380	L							
26									L	385	350	355 <sup>H</sup>	355	360	370	L	390	395						
27									400 <sup>H</sup>	L	370 <sup>H</sup>	360	350	370	360	L	L	390						
28									L	385	L	380	365	360	360	L	L							
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									2	10	19	20	25	23	15	4	1	2						
MED									400	378	375	370	370	375	370	372	390	392						
UQ									385	378	375	375	375	375	378									
LQ									370	370	365	365	368	362	368									

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M(3000)F1 (0.01)

# IONOSPHERIC DATA

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

135° E Mean Time (G. M. T. + 9 h)

Station **AKITA** Lat. 39° 43.5' N, Long. 140° 08.2' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									235	235	255	235	235	245	240	245								
2									225	220	245	280	235	225	235	230	225							
3									230	215	240	230	265	255	235	235								
4									225	245	275	230	250	235	220	235								
5									225	230	260	240	280	245	235	225								
6									220	240	245	260	255	260	250	240	225							
7									220	225	240	245	250	280	245	230								
8									225	240	255	250	270	245	235	245	230							
9									225	260	255	250	255	235	235	235								
10									215	235	240	260	250	265	235	235	225							
11									235	240	235	235	240	240	260	250	230							
12									235	250	235	270	240	240	235	230	220							
13									220	215	235	225	255	240	235	245	230							
14									235	230	260	250	250	275	240	230	235							
15									260	315	300	260	250	245	250	240								
16									225	225	235	265	265	250	250	240	230							
17									215	230	255	250	245	255	250	245	225							
18									225	235	245	265	285	250	245	260	240							
19									235	235	260	265	250	255	270	250	235							
20									230	235	255	265	260	250	255	240	230							
21										245	250	260	250	250										
22									245	260	255	245	240	255	245	230	225							
23										245	280	255	250	260	250	245	235							
24									240	240	265	245	255	240	255	255	230							
25									230	240	265	280	260	255	250	245	235							
26									230	260	270	275	260	245	250	250	245	220						
27									245	290	260	265	265	255	255	255	230	210						
28									235	240	255	280	260	275	260	240	230							
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									25	28	28	28	28	28	27	27	21	2						
MED									230	238	255	258	250	250	245	240	230	215						
UQ									235	245	260	265	260	255	250	245	235							
LQ									225	230	242	245	250	245	235	235	225							

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

### IONOSPHERIC DATA

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

135° E Mean Time (G. M. T. + 9 h)

Station	AKITA																							
Lat. 39° 43.5' N, Long. 140° 08.2' E	Sweep 1 MHz to 20 MHz in 20 sec in automatic operation																							
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	305	290	285	240	235	275	250	225	180	180 <sup>H</sup>	235	A	220	205	210	235	215	205	230	215	215	245	310	295
2	290	290	280	280	250	265	260	235	190 <sup>H</sup>	210	185 <sup>H</sup>	215	215	210	210	225	205	215	300	250	215	290	295	285
3	290	260	230	260	270	280	255	235	220	195	205	220	200	195	185 <sup>H</sup>	230	215	220	235	235	235	235	250	260
4	255	255	265	275	270	270	245	215	225	180 <sup>H</sup>	240	230	225	225	210	230	210	245	A	235	230	240	310	245
5	250	265	260	270	260	225	245	230	195	205	180	180 <sup>H</sup>	180 <sup>H</sup>	240	220	200	210	205	A	235	265	235	265	265
6	270	275	280	265	255	260	A	A	205	190 <sup>H</sup>	180 <sup>H</sup>	180 <sup>H</sup>	185 <sup>H</sup>	180 <sup>H</sup>	225	205	210	210	A	A	A	285	290	260
7	305	300	280	255	255	260	285	220	230	200	195 <sup>H</sup>	220	195	A	220	210	235	225	215	240	250	240	245	295
8	240	225	250	245	220	220	230	220	205	240	235	A	230	215	210	A	190	215	235	235	260	250	245	235
9	300	285	285	250	310	245	260	210	215	210	215	190 <sup>H</sup>	185 <sup>H</sup>	205	215	210	A	215	210	205	255	250	300	265
10	265	290	285	295	225	250	235	235	210	230	210	195 <sup>I C</sup>	225	200	235	220	215	215	230	225	250	265	315	280
11	250	310	295	220	225	350 <sup>E S</sup>	270	225	225	230	A	225	190	190	180 <sup>H</sup>	230	230	225	215	235	250	245	245	280
12	290	285	260	255	235	235	250	220	205	205 <sup>H</sup>	205	195	185 <sup>H</sup>	205 <sup>I C</sup>	210	205 <sup>H</sup>	200	235	205	235	265	265	250	240
13	260	255	250	285	270	225	250	235	215	205	200	195	185	185 <sup>H</sup>	215	210	215	215	245	245	240	225	235	285
14	280	255	245	275	240	260	220	210	230	190	185 <sup>H</sup>	210	205	215	235	225	220	220	210	245	230	235	240	285
15	275	280	275	255	225	255	225	225	240	230	A	230	210 <sup>H</sup>	205	205	220	230	205	230	230	250	235	265	255
16	245	265	280	270	245	230	200	220	200	180 <sup>H</sup>	180	180 <sup>H</sup>	180 <sup>H</sup>	200	215	210	210	200	220	220	250	250	270	285
17	250	250	265	270	A	265	235	225	190	225	180	230	180 <sup>H</sup>	205	205	230	225	220	215	230	245	240	270	260
18	280	285	275	255	240	270	210	205	215	190 <sup>H</sup>	200	195 <sup>H</sup>	190 <sup>H</sup>	230	220	215	230	225	200	205	260	A	265	255
19	275	275	260	290	275	250	215	220	205	200	200	230	210	200	195	220	230	215	235	245	220	245	255	255
20	255	285	250	270	250	235	210	210	205	200	205	185	195	200	205	210	195	215	215	245	245	230	250	275
21	290	285	250	215	235	260	255	230	235	230	240	205	205	190 <sup>H</sup>	C	C	C	220	215	255	245	245	245	245
22	275	275	265	260	235	245	240	230	220	205	205	205	200	195	190 <sup>H</sup>	215	215	215	220	255	280	280	285	290
23	270	255	240	230	215	250	240	230	235	200	190 <sup>H</sup>	190 <sup>H</sup>	210 <sup>H</sup>	210	230	215	210	180 <sup>H</sup>	215	270	270	255	270	290
24	270	285	270	255	255	285	235	215	230	215	190 <sup>H</sup>	215	190 <sup>H</sup>	205	230	230	215	205	260	265	270	260	265	265
25	255	255	260	230	245	300	265	230	210	195	195	200 <sup>H</sup>	200	215	210	200	205	210	220	255	260	260	250	280
26	225	245	235	240	220	205	245	220	200	195	195	185 <sup>H</sup>	240	220	205	210	205	210	210	245	265	245	275	270
27	A	260	240	230	200	205	235	225	190 <sup>H</sup>	180 <sup>H</sup>	200 <sup>H</sup>	200	195	205	205	205	230	220	225	240	255	245	245	245
28	255	255	245	245	220	230	240	225	235	200	180 <sup>H</sup>	220	200	200	215	190 <sup>H</sup>	215	215	210	235	245	280	265	275
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	28	28	28	27	28	27	27	28	28	26	26	28	27	27	26	26	28	25	27	27	27	28	28
MED	270	275	262	255	240	251	240	225	212	200	200	202	200	205	210	215	215	215	215	235	250	245	265	268
UQ	285	285	280	270	255	266	252	230	228	212	205	220	210	212	218	225	230	220	230	245	260	262	280	285
LQ	255	255	250	242	225	232	232	220	202	192	185 <sup>H</sup>	190 <sup>H</sup>	188	198	205	210	210	210	210	232	242	240	248	255

FEB. 1977

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

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### IONOSPHERIC DATA

FEB. 1977

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

135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.2' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	B	115	110	105	105	105	105	110	120		R						
2							S	B	A	A	A	110	110	110	110	110		S						
3							S	B	115	110	110	110	110	110	110	110	115		S					
4							S	B	115	110	110	105	110	110	110	110	115		A					
5							S	B	110	110	110	110	110	105	105	110	110		B					
6							S	A	A	110	A	110	110	110	110	110	110		S					
7							S	B	110	110	105	A	A	A	A	A	115		S					
8							S	A	A	110	A	A	A	110	A	A	A		S					
9							S	B	110	110	A	110	110	110	A	110	A	A						
10							S	A	A	A	C	C	A	B	110	115	110	110		S				
11							S	B	115	A	A	A	A	A	A	110	A		S					
12							S	B	115	A	A	A	110	C	110	110	110	110		P				
13							S	A	A	A	A	A	110	110	110	110	115		B					
14							S	B	110	A	A	110	A	110	110	110		A	A					
15							S		130	115	110	A	A	110	110	110	110		A					
16							S		120	115	115	110	110	110	110	110	110		B					
17							S	A	120	110	105	A	A	110	110	110		A	B					
18							S	B	110	110	110	110	110	A	A	A	115		B					
19							S	B	115	110	A	A	A	A	A	A	A		S					
20							S		125	115	110	110	110	105	105	105	110	115		B				
21							S		120	115	110	110	110	110		C	C	C	E	R				
22							S		125	A	110	110	110	110	110	110	110	120						
23							S		120	110	110	110	110	110	A	110	115		R					
24							S		120	115	110	110	A	A	110	110	110		B					
25							S		120	A	110	110	105	110	105	105	110		R					
26							S		120	110	110	110	105	110	105	105	110		S					
27							S		135	110	110	110	105	A	110	110	110	115		B				
28							S		120	110	110	110	110	110	110	110	110	115						
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								11	21	22	17	18	19	24	20	23	21	3						
MED								120	115	110	110	110	110	110	110	110	110	118						
UQ								125	115	110	110	110	110	110	110	110	115	128						
LQ								120	110	110	110	105	110	110	108	110	110	118						

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FEB. 1977

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

# IONOSPHERIC DATA

FEB. 1977

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

135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.2' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

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

FEB. 1977

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

The Radio Research Laboratories, Japan

# IONOSPHERIC DATA

FEB. 1977

TYPES OF ES

135° E Mean Time (G. M. T. + 9 h)

Station **AKITA** Lat.  $39^{\circ}43.5' N$ , Long.  $140^{\circ}08.2' E$  Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

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

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FEB. 1977

TYPES OF ES



# IONOSPHERIC DATA

FEB. 1977

FXI (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	35	37	39	42	32	30	28												40	41	A	33	33	37	
2	35	S	37	35	36	34	32												43	46	53	36	38	39	
3	X	40	42	45	33	35	34												42	40	43	37	34	34	
4	X	36	37	37	38	37	35												55	A	S	A	36	38	
5	X	36	35	39	38	39	35												45	35	35	36	37	37	
6	X	37	37	38	38	35	31												A	34	37	33	32	A	
7	X	35	36	37	38	40	30												62	52	46	42	40	43	
8	X	40	42	38	35	39	37												46	44	36	39	33	34	
9	X	36	36	36	37	35	38												54	45	39	39	39	43	
10	A	A	37	40	38	A	30												48	45	46	46	38	41	
11	39	38	39	45	A	26	29												53	40	43	42	42	38	
12	38	38	39	39	39	35	33												65	43	41	40	40	39	
13	X	39	40	38	38	36	35												53	46	42	44	37	36	
14	39	40	38	39	42	37	40												52	45	49	45	42	41	
15	43	45	44	44	47	33	41												51	50	43	A	43	45	
16	S	S	46	47	45	44	38												59	43	40	38	39	40	
17	X	43	46	46	48	42	41												55	44	43	46	46	48	
18	X	48	51	51	60	60	S												72	43	38	43	45	44	
19	S	48	S	52	45	45	50												47	47	43	37	40	38	
20	38	42	40	43	45	39	39												46	42	47	43	39	36	
21	X	36	39	42	38	36	31												44	41	45	43	40	38	
22	X	39	40	39	40	42	35												42	36	37	38	38	38	
23	X	37	39	39	38	37	30												42	36	40	42	40	40	
24	X	40	42	44	41	40	39												46	39	41	43	43	40	
25	X	41	41	42	39	36	31												43	36	39	39	40	S	
26	40	S	S	S	S	39	36												50	44	S	45	47	S	
27	40	S	S	S	S	34	37												46	37	37	41	43	39	
28	41	44	40	39	36	32	35												47	42	37	38	40	S	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	25	23	25	26	25	26	28												27	27	25	26	28	24	
MED	39	40	39	39	39	35	35												47	42	41	40	40	39	
UQ	40	42	42	43	42	38	38												54	44	43	43	42	41	
LQ	36	38	38	38	36	31	32												44	40	38	38	38	38	

FEB. 1977

FXI (0.1 MHz)

IONOSPHERIC DATA

FEB. 1977

FOF2 (0.1 MHZ)

135° E Mean Time (G. M. T. + 9 h)

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

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

The Radio Research Laboratories, Japan

FEB. 1977

FOF2 (0.1 MHZ)

# IONOSPHERIC DATA

FEB. 1977

FOF1 (0.01 MHz)

135° E Mean Time (G. M. T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L	400	L								
2									L	L	L	L	L	L	L	L								
3									L	L	L	L	L	L	L	L	L							
4									L	L	L	L	L	L	L	L	A							
5									L	C	L	L	L	L	L	L	A							
6									280	L	L	L	L	440	410	L	L							
7									L	L	L	L	L	L	L	L								
8									L	L	L	L	440	L	L	L	L							
9										L	L	L	L	L	L	L								
10									L	L	L	A	L	L	L	L	290							
11									L	L	L	L	L	L	380	L	L							
12									L	L	L	L	L	L	L	L	L							
13									L	L	L	430	L	L	L	L	L							
14									L	L	L	L	L	L	L	L	L							
15									L	L	L	L	450	L	L	L	L							
16									L	L	L	L	L	L	L	L	L							
17									L	L	L	L	L	L	L	L	L							
18										L	C	C	L	L	L	L	L							
19									L	L	L	450	L	L	L	L	A							
20									L	L	L	L	L	L	L	L	L							
21									L	L	L	L	L	L	L	L	L							
22									L	L	L	440	L	L	L	L	L							
23									L	L	L	L	L	L	L	L	L							
24										L	L	L	L	L	L	L	L							
25									L	L	L	L	L	L	430	L	320	210						
26									L	L	420	L	L	L	L	L	L							
27									L	L	L	L	L	L	L	L	L							
28									L	L	L	440	440	440	L	L	L	L						
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1		1	4	3	2	4		2	1						
MED									280		420	440	440	440	405		305	210						
UQ												445	445		420									
LQ												435	440		390									

FEB. 1977

FOF1 (0.01 MHz)

### IONOSPHERIC DATA

FEB. 1977

FOE (0.01 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station **KOKUBUNJI TOKYO** Lat.  $35^{\circ} 42.4' N$ , Long.  $139^{\circ} 29.3' E$  Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								S	230 <sup>C</sup>	270 <sup>C</sup>	290 <sup>C</sup>	300	320	300	290	265	215	S						
2								S	240	280	290	310	310	300	A	275	210	S						
3								S	220	270	305	310	315	310	295	260	230	S						
4								S	230	275	300	310	315	315	310	280	240	S						
5								S	235	270 <sup>C</sup>	A	A	310	310	295	A	A	A						
6								S	A	A	290	A	A	A	A	A	220	S						
7								S	240	270	290	300	310	310	290	260	220	S						
8								S	230	270	295	300	A	A	300	275	230	B						
9								S	230	A	A	A	A	A	305	A	220	S						
10								S	230	A	295	A	A	315	295	270	220	A						
11								B	A	A	A	A	A	310	300	280	245	S						
12								B	A	280	305	320	320	320	310	270	230	A						
13								180	A	A	A	A	A	320	305	280	235	S						
14								190	240	290	305	320	330	320	A	A	A	A						
15								160	250	A	A	A	320	320	300	A	A	B						
16								190	245	A	A	315	320	320	300	280	A	A						
17								S	240	280	295	310	330	320	A	280	C	A						
18								S	225 <sup>H</sup>	280 <sup>H</sup>	300 <sup>I</sup>	320 <sup>C</sup>	330	330	310	285	240 <sup>H</sup>	S						
19								180	230	275	285	A	320	330	A	290	A	A						
20								A	260 <sup>H</sup>	A	310	330	330	330	310	290	250	A						
21								180	260	290	310	A	330	335	320	290	250	190						
22								170	260 <sup>C</sup>	290	315	325	325	320	305	285	250	B						
23								180	250	A	290	310	330	320	310	285	240	170						
24								200	250	280	300	A	A	320	300	275	220	B						
25								200	A	A	A	315	320	320	300	280	235	170						
26								175	240	265	310	320	330	320	305	285	245	170						
27								210	250	280	300	A	325	320	310	280	240	S						
28								210 <sup>H</sup>	270 <sup>H</sup>	280 <sup>H</sup>	315	325	320	320	310	280	250	175						
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								13	23	18	21	17	21	25	23	23	22	5						
MED								180	240	280	300	315	320	320	305	280	235	170						
UQ								200	250	280	305	320	330	320	310	285	245	175						
LQ								180	230	270	290	310	320	315	300	275	220	170						

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FOE (0.01 MHz)

# IONOSPHERIC DATA

FEB. 1977

FOES (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	G	G	G	E <sub>18</sub>	E <sub>18</sub>	E <sub>20</sub>	E <sub>23</sub>	G	G	G	40	36	34	34	28	G	24	23	22	J <sub>51</sub>	19	25	E <sub>18</sub>		
2	E <sub>16</sub>	E <sub>16</sub>	27	21	24	E <sub>15</sub>	22	23	G	G	G	37	37	G	32	30	30	J <sub>30</sub>	J <sub>30</sub>	J <sub>68</sub>	E <sub>16</sub>	J <sub>27</sub>	22	23	
3	24	21	19	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	G	30	34	37	37	34	33	G	G	22	J <sub>64</sub>	23	J <sub>27</sub>	24	24	J <sub>24</sub>	
4	22	20	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	23	J <sub>24</sub>	J <sub>23</sub>	G	32	34	34	36	38	37	G	J <sub>54</sub>	J <sub>34</sub>	J <sub>34</sub>	J <sub>40</sub>	J <sub>32</sub>	J <sub>51</sub>	23	J <sub>32</sub>	
5	J <sub>33</sub>	25	J <sub>26</sub>	J <sub>24</sub>	E <sub>13</sub>	23	E <sub>16</sub>	E <sub>16</sub>	J <sub>25</sub>	G	J <sub>30</sub>	J <sub>46</sub>	39	39	34	34	J <sub>74</sub>	J <sub>26</sub>	J <sub>27</sub>	J <sub>30</sub>	J <sub>24</sub>	24	23	25	
6	24	22	J <sub>26</sub>	24	21	23	23	J <sub>23</sub>	26	36	30	37	35	35	37	32	33	J <sub>89</sub>	J <sub>130</sub>	117	J <sub>26</sub>	J <sub>41</sub>	48	32	
7	30	J <sub>24</sub>	23	21	23	J <sub>26</sub>	22	22	J <sub>26</sub>	25	J <sub>26</sub>	J <sub>27</sub>	J <sub>30</sub>	J <sub>30</sub>	32	31	33	J <sub>26</sub>	J <sub>21</sub>	J <sub>30</sub>	J <sub>26</sub>	22	22	19	
8	J <sub>25</sub>	J <sub>27</sub>	24	20	20	E <sub>16</sub>	19	19	J <sub>29</sub>	J <sub>30</sub>	37	36	J <sub>33</sub>	J <sub>43</sub>	J <sub>28</sub>	G	30	23	J <sub>21</sub>	J <sub>24</sub>	20	J <sub>24</sub>	J <sub>26</sub>	J <sub>24</sub>	
9	J <sub>22</sub>	22	J <sub>22</sub>	E <sub>16</sub>	21	22	E <sub>16</sub>	E <sub>16</sub>	26	J <sub>52</sub>	J <sub>51</sub>	J <sub>40</sub>	J <sub>74</sub>	J <sub>43</sub>	J <sub>27</sub>	32	J <sub>29</sub>	J <sub>38</sub>	J <sub>25</sub>	22	J <sub>30</sub>	25	23	26	
10	J <sub>44</sub>	J <sub>36</sub>	J <sub>27</sub>	E <sub>18</sub>	J <sub>20</sub>	J <sub>30</sub>	J <sub>19</sub>	J <sub>30</sub>	J <sub>28</sub>	28	J <sub>28</sub>	J <sub>51</sub>	J <sub>44</sub>	J <sub>25</sub>	29	G	J <sub>28</sub>	J <sub>29</sub>	J <sub>25</sub>	25	J <sub>24</sub>	23	23	23	
11	E <sub>16</sub>	J <sub>26</sub>	J <sub>26</sub>	J <sub>24</sub>	J <sub>31</sub>	25	J <sub>23</sub>	J <sub>27</sub>	J <sub>37</sub>	J <sub>37</sub>	J <sub>52</sub>	J <sub>50</sub>	J <sub>33</sub>	G	G	G	34	J <sub>30</sub>	J <sub>34</sub>	J <sub>30</sub>	J <sub>84</sub>	22	25	J <sub>24</sub>	
12	J <sub>26</sub>	25	23	22	24	E <sub>18</sub>	E <sub>16</sub>	E <sub>15</sub>	26	G	G	33	J <sub>33</sub>	J <sub>33</sub>	J <sub>23</sub>	24	J <sub>23</sub>	J <sub>21</sub>	J <sub>24</sub>	J <sub>22</sub>	J <sub>20</sub>	J <sub>23</sub>	J <sub>29</sub>	J <sub>24</sub>	
13	J <sub>25</sub>	25	J <sub>22</sub>	J <sub>21</sub>	23	E <sub>16</sub>	E <sub>16</sub>	G	27	31	J <sub>38</sub>	J <sub>74</sub>	J <sub>42</sub>	J <sub>40</sub>	22	G	27	21	J <sub>34</sub>	J <sub>24</sub>	J <sub>27</sub>	J <sub>24</sub>	E <sub>16</sub>	E <sub>16</sub>	
14	23	22	J <sub>22</sub>	J <sub>24</sub>	24	24	E <sub>16</sub>	G	28	G	J <sub>31</sub>	J <sub>31</sub>	J <sub>30</sub>	J <sub>26</sub>	32	J <sub>52</sub>	J <sub>33</sub>	J <sub>30</sub>	J <sub>26</sub>	J <sub>25</sub>	J <sub>65</sub>	J <sub>42</sub>	J <sub>26</sub>	24	
15	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	22	29	36	J <sub>44</sub>	J <sub>33</sub>	29	29	29	J <sub>30</sub>	24	J <sub>36</sub>	J <sub>50</sub>	J <sub>30</sub>	J <sub>33</sub>	J <sub>46</sub>	J <sub>26</sub>	J <sub>26</sub>	
16	J <sub>24</sub>	27	22	24	25	25	22	G	G	30	31	G	G	G	G	G	J <sub>31</sub>	J <sub>31</sub>	J <sub>31</sub>	25	J <sub>27</sub>	J <sub>27</sub>	J <sub>26</sub>	J <sub>22</sub>	
17	E <sub>16</sub>	J <sub>25</sub>	J <sub>30</sub>	22	24	23	23	E <sub>16</sub>	G	G	G	39	J <sub>40</sub>	J <sub>42</sub>	J <sub>39</sub>	23	24	21	25	E <sub>16</sub>	J <sub>27</sub>	E <sub>16</sub>	E <sub>16</sub>	25	
18	E <sub>16</sub>	E <sub>16</sub>	E <sub>13</sub>	22	23	23	E <sub>16</sub>	E <sub>16</sub>	G	30	C	C	G	G	G	G	G	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	21	23	24	22	
19	E <sub>15</sub>	J <sub>25</sub>	22	22	24	E <sub>14</sub>	23	22	27	32	33	35	J <sub>33</sub>	G	J <sub>55</sub>	G	J <sub>54</sub>	J <sub>30</sub>	E <sub>16</sub>	E <sub>16</sub>	J <sub>24</sub>	23	23	22	
20	E <sub>16</sub>	E <sub>14</sub>	23	E <sub>13</sub>	22	24	J <sub>27</sub>	J <sub>27</sub>	J <sub>24</sub>	31	J <sub>30</sub>	G	J <sub>29</sub>	J <sub>20</sub>	J <sub>29</sub>	G	G	J <sub>21</sub>	J <sub>27</sub>	J <sub>28</sub>	J <sub>24</sub>	J <sub>26</sub>	J <sub>26</sub>	J <sub>24</sub>	
21	E <sub>16</sub>	E <sub>16</sub>	J <sub>25</sub>	22	E <sub>15</sub>	23	E <sub>16</sub>	G	29	G	G	J <sub>33</sub>	G	G	G	G	G	G	23	E <sub>16</sub>	E <sub>16</sub>	21	J <sub>31</sub>	23	
22	22	22	J <sub>25</sub>	25	J <sub>24</sub>	E <sub>16</sub>	E <sub>16</sub>	G	24	G	J <sub>30</sub>	G	G	G	G	G	G	20	E <sub>16</sub>	E <sub>15</sub>	21	E <sub>16</sub>	20	E <sub>16</sub>	
23	E <sub>16</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>16</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>16</sub>	22	28	32	32	G	G	G	G	G	20	19	J <sub>27</sub>	J <sub>26</sub>	E <sub>16</sub>	E <sub>16</sub>	21	22	
24	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	23	G	30	36	34	33	J <sub>37</sub>	J <sub>32</sub>	J <sub>30</sub>	J <sub>30</sub>	G	19	E <sub>16</sub>	22	20	25	24	23	
25	24	22	J <sub>31</sub>	J <sub>31</sub>	J <sub>22</sub>	E <sub>15</sub>	E <sub>15</sub>	G	28	31	37	36	31	G	24	22	G	G	E <sub>16</sub>	21	J <sub>24</sub>	J <sub>30</sub>	25	23	
26	25	23	25	24	E <sub>15</sub>	22	E <sub>16</sub>	G	G	28	G	G	G	G	G	J <sub>25</sub>	G	G	J <sub>24</sub>	J <sub>26</sub>	J <sub>30</sub>	J <sub>22</sub>	25	E <sub>16</sub>	
27	J <sub>24</sub>	23	J <sub>24</sub>	J <sub>23</sub>	E <sub>15</sub>	24	E <sub>16</sub>	G	G	G	J <sub>32</sub>	J <sub>30</sub>	25	20	J <sub>28</sub>	J <sub>23</sub>	J <sub>30</sub>	24	J <sub>24</sub>	22	23	23	20		
28	21	E <sub>16</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>16</sub>	E <sub>16</sub>	G	G	30	G	G	G	J <sub>29</sub>	G	G	G	G	24	22	22	18	E <sub>16</sub>	E <sub>16</sub>	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	28	28	28	27	27	27	28	28	28	28	28	28	28	28	28	28	28	28	
MED	22	22	23	22	21	22	E <sub>16</sub>	16	26	30	31	34	33	28	28	E <sub>22</sub>	24	J <sub>24</sub>	J <sub>25</sub>	24	J <sub>24</sub>	24	24	23	
UQ	24	25	J <sub>26</sub>	24	24	24	22	22	28	32	36	38	J <sub>37</sub>	J <sub>34</sub>	32	30	32	J <sub>30</sub>	J <sub>30</sub>	J <sub>29</sub>	J <sub>28</sub>	J <sub>26</sub>	26	24	
LQ	E <sub>16</sub>	E <sub>16</sub>	20	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	G	G	E <sub>25</sub>	E <sub>26</sub>	E <sub>29</sub>	G	G	E <sub>18</sub>	G	G	20	22	22	21	22	22	21	

FEB. 1977

FOES (0.1 MHz)

### IONOSPHERIC DATA

FEB. 1977

FBES (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E	E	E	E	E <sub>18</sub>	E	E	G	G	C <sub>31</sub>	C <sub>35</sub>	38	35	33	33	28	G	G	E	17	A <sub>51</sub>	E	E	E <sub>16</sub>	
2	E <sub>16</sub>	E <sub>16</sub>	E	E	E	E <sub>15</sub>	E	G	G	G	G	33	35	G	31	G	28	G	E	30	E <sub>16</sub>	20	E	E	
3	E	E	E	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	G	G	G	35	34	G	G	G	G	19	29	E	18	E	E	E	
4	E	E	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E	16	G	G	32	33	G	35	36	34	G	40	20	20	A <sub>40</sub>	28	A <sub>51</sub>	E	E	
5	E	16	E	E	E <sub>13</sub>	19	E <sub>16</sub>	E <sub>16</sub>	19	C	29	41	29	38	33	31	40	19	17	E	E	E	E	E	
6	E	E	16	E	E	E	E	G	24	20	30	35	31	G	36	32	26	A <sub>89</sub>	A <sub>130</sub>	19	E	E	E	A <sub>32</sub>	
7	E	E	E	E	E	17	E	G	18	G	G	G	G	G	31	30	32	24	E	19	17	E	E	E	
8	17	24	16	E	E	E <sub>16</sub>	E	G	19	24	36	36	33	33	24	G	27	20	E	21	E	E	E	E	
9	E	E	E	E <sub>16</sub>	E	E	E <sub>16</sub>	E <sub>16</sub>	G	40	37	33	41	37	26	G	20	34	22	E	E	20	E	E	
10	A <sub>44</sub>	A <sub>36</sub>	23	E <sub>16</sub>	18	A <sub>30</sub>	E	26	22	28	26	48	35	22	20	G	18	20	21	E	E	E	E	E	
11	E <sub>18</sub>	E	18	E	A <sub>31</sub>	E	18	23	32	36	40	34	33	G	G	G	32	25	21	25	28	E	E	E	
12	E	E	E	E	E	E <sub>18</sub>	E <sub>18</sub>	E <sub>15</sub>	25	G	G	30	29	25	23	21	18	19	19	E	E	E	E	E	
13	E	E	E	E	E	E <sub>16</sub>	E <sub>16</sub>	G	25	29	32	34	33	30	20	G	26	19	27	E	E	E	E <sub>16</sub>	E <sub>16</sub>	
14	E	E	E	16	E	E	E <sub>16</sub>	G	26	G	27	G	G	G	31	32	27	22	24	19	27	E	18	E	
15	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	21	G	32	33	32	28	27	28	29	24	17	17	E	E	A <sub>49</sub>	16	E	
16	E	16	E	E	E	E	E	G	G	28	30	G	G	G	G	G	27	30	30	18	24	23	E	E	
17	E <sub>16</sub>	20	22	E	E	E	E	E <sub>16</sub>	G	G	G	39	28	24	33	23	23	21	17	E <sub>16</sub>	E	E <sub>16</sub>	E <sub>16</sub>	16	
18	E <sub>16</sub>	E <sub>16</sub>	E <sub>13</sub>	E	E	E	E <sub>16</sub>	E <sub>16</sub>	G	30	C	C	G	G	G	G	G	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E	E	E	E	
19	E <sub>15</sub>	17	E	E	E	E <sub>14</sub>	E	G	26	29	32	34	30	G	32	G	42	20	E <sub>16</sub>	E <sub>16</sub>	E	E	E	E	
20	E <sub>16</sub>	E <sub>14</sub>	E	E <sub>13</sub>	E	E	20	16	17	30	29	G	23	24	26	G	G	20	E	21	E	24	E	E	
21	E <sub>16</sub>	E <sub>16</sub>	17	E	E <sub>15</sub>	E	E <sub>16</sub>	G	28	G	G	33	G	G	G	G	G	G	E	E <sub>16</sub>	E <sub>16</sub>	E	E	E	
22	E	E	E	E	E	E <sub>18</sub>	E <sub>18</sub>	G	23	G	30	G	G	G	G	G	G	19	E <sub>16</sub>	E <sub>15</sub>	E	E <sub>16</sub>	E	E <sub>16</sub>	
23	E <sub>16</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>16</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>16</sub>	20	27	30	G	G	G	G	G	G	18	G	20	E	E <sub>16</sub>	E <sub>16</sub>	E	E	
24	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E	G	G	32	33	33	34	29	29	26	G	G	E <sub>16</sub>	E	E	E	E	E	
25	E	E	26	23	E	E <sub>15</sub>	E <sub>15</sub>	G	26	30	31	29	27	G	23	20	G	G	E <sub>16</sub>	E	21	28	E	E	
26	E	E	E	E	E <sub>15</sub>	E	E <sub>16</sub>	G	G	G	G	G	G	G	G	G	23	G	G	E	23	20	E	E	E <sub>16</sub>
27	E	E	16	E	E <sub>15</sub>	E	E <sub>16</sub>	G	G	G	G	32	G	G	G	G	20	19	E	E	E	E	E	E	
28	E	E	E <sub>13</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>16</sub>	E <sub>16</sub>	G	G	30	G	G	26	G	G	G	G	G	E	E	E	E	E	E	
29																									
30																									
31																									
CNT	28	28	28	28	28	28	28	28	28	27	27	27	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	E	E <sub>13</sub>	E <sub>13</sub>	E	E	E <sub>14</sub>	E <sub>16</sub>	G	18	28	29	33	28	22	24	G	20	19	16	16	E	E	E	E	
UQ	E <sub>16</sub>	E <sub>16</sub>	16	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	16	25	30	32	34	34	28	31	24	27	20	21	19	19	18	E	E <sub>16</sub>	
LQ	E	E	E	E	E	E	E	G	G	G	G	E <sub>23</sub>	G	G	G	G	G	G	E	E	E	E	E	E	

The Radio Research Laboratories, Japan

FEB. 1977

FBES (0.1 MHz)

### IONOSPHERIC DATA

FEB. 1977

F-MIN (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

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

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

FEB. 1977

F-MIN (0.1 MHz)

IONOSPHERIC DATA

FEB. 1977

M(3000)F2 (0.01)

135° E Mean Time (G. M. T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C 285	C 285	C 285	C 340	C 355	C 290	C 335	C 360	C 335	C 380	C 365	C 355	C 355	H 350	H 370	H 370	H 365	H 350	H 325	H 370	A	A 305	A 275	F
2	F 290	I S 310	F 300	320	305	360	F 340	370	345	330	335	H 340	345	370	350	335	H 345	325	325	S 360	S 360	265	280	285
3	S 295	S 300	340	315	310	295	320	355	365	345	335	335	330	370	375	370	345	370	325	340	A 325	A 305	320	305
4	300	290	305	310	330	295	310	365	365	365	350	345	350	345	340	365	385	345	375	A	I S 290	A	300	345
5	285	295	F	315	335	325	300	360	345	I S 350	C 335	340	340	345	H 370	355	R 360	375	325	345	315	320	305	300
6	310	290	305	I S 315	345	330	310	365	370	360	365	345	320	310	355	350	365	A	A	320	355	J S 295	S 285	A
7	310	300	305	325	345	335	290	365	385	365	345	330	340	335	350	370	365	355	355	J S 345	320	300	J S 295	330
8	J S 315	340	F	F 325	335	295	305	355	360	360	325	320	345	345	345	355	355	370	350	330	300	S 320	295	260
9	320	275	295	295	280	310	280	375	385	330	335	315	320	335	340	340	360	350	355	335	305	280	S 265	325
10	A	A	290	325	345	A	310	350	340	S 330	365	340	335	335	335	360	350	345	335	315	S 320	335	290	F
11	295	S 280	310	S 335	A	275	305	340	355	345	350	355	350	340	345	330	340	345	360	330	300	325	320	S 265
12	280	280	320	305	335	315	305	360	360	335	350	365	325	350	S 355	365	335	350	370	330	315	300	295	295
13	305	310	310	310	305	310	305	355	370	385	360	365	350	315	340	350	360	355	355	325	320	340	305	300
14	285	295	295	305	340	295	315	370	375	375	340	340	335	340	340	350	350	360	365	310	330	340	305	285
15	285	280	290	315	355	255	300	360	365	S 345	325	320	360	365	345	345	365	365	320	365	345	A	S 300	305
16	S	S	S 300	S 300	F	340	345	365	370	340	350	340	325	355	335	350	345	350	345	305	305	290	S 305	S 280
17	300	F	F	F	290	295	335	365	370	345	355	340	345	345	340	365	365	355	360	320	305	325	300	310
18	290	S 295	F 295	F 315	S 335	I S 300	F 340	365	355	350	I C 325	I C 320	320	340	340	335	335	345	360	325	280	295	285	315
19	S	J S 325	S	310	F 305	J S 315	340	370	360	350	335	330	350	330	325	350	355	365	345	320	350	315	F 285	S 285
20	S 300	F	F	F	F	290	335	365	365	345	340	325	330	345	340	345	360	375	335	305	315	340	S 305	275
21	285	285	320	345	320	310	295	345	360	365	345	340	350	355	355	340	350	360	340	295	300	S 325	295	310
22	285	315	300	305	335	310	325	365	345	350	330	350	365	350	345	365	360	365	340	310	S 295	S 280	S 290	S 280
23	290	295	310	320	340	310	310	350	335	360	335	315	335	345	335	355	365	365	335	300	S 305	S 305	310	280
24	295	290	S 315	320	280	280	330	375	355	335	325	S 325	H 325	335	330	345	355	365	355	305	285	295	315	295
25	290	290	305	305	315	290	295	360	365	360	330	320	S 330	R 345	355	345	365	375	330	315	305	305	S 305	I S 300
26	F	S	S	S	S	F	345	S 365	350	345	330	310	340	350	360	350	340	370	340	S 325	I S 300	F	F	S
27	U S 280	S	S	I S 320	I S 340	S 305	330	370	340	350	340	340	330	340	335	350	365	365	350	305	305	305	315	S 315
28	F	F	S 325	S 335	S 335	325	325	360	350	360	325	335	340	330	335	355	360	355	325	325	305	295	S 310	I S 300
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	21	21	25	24	26	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	25	26	24
MED	292	290	305	315	335	305	312	362	360	350	338	338	340	345	342	350	360	360	345	325	305	305	300	300
UQ	300	300	310	325	340	315	335	365	370	360	350	342	350	350	355	362	365	365	355	330	320	325	305	310
LQ	285	285	295	305	312	295	305	355	350	345	330	322	330	335	338	345	348	350	332	310	300	295	290	282

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M(3000)F2 (0.01)



# IONOSPHERIC DATA

FEB. 1977

M(3000)F1 (0.01)

135° E Mean Time (G. M. T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L	400	L								
2									L	L	L	L	L	L	L	L								
3									L	L	L	L	L	L	L	L	L							
4									L	L	L	L	L	L	L	L	A							
5									L	C	L	L	L	L	L	L	A							
6									440	L	L	L	L	370	375	L	L							
7									L	L	L	L	L	L	L	L								
8									L	L	L	L	375	L	L	L	L							
9									L	L	L	L	L	L	L	L								
10									L	L	L	A	L	L	L	L	450							
11									L	L	L	L	L	L	420	L	L							
12									L	L	L	L	L	L	L	L	L							
13									L	L	L	420	L	L	L	L	L							
14									L	L	L	L	L	L	L	L	L							
15									L	L	L	L	375	L	L	L	L							
16									L	L	L	L	L	L	L	L	L							
17									L	L	L	L	L	L	L	L	L							
18									L	C	C	L	L	L	L	L	L							
19									L	L	L	390	L	L	L	L	A							
20									L	L	L	L	L	L	L	L	L							
21									L	L	L	L	L	L	L	L	L							
22									L	L	L	385	L	L	L	L	L							
23									L	L	L	L	L	L	L	L	L							
24									L	L	L	L	L	L	L	L	L							
25									L	L	L	L	L	L	380	L	405	395						
26									L	L	380	L	L	L	L	L	L							
27									L	L	L	L	L	L	L	L	L							
28									L	L	L	395	370	385	L	L	L	L						
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1		1	4	3	2	4		2	1						
MED									440		380	392	375	378	390		428	395						
UQ												408	375		410									
LQ												388	372		378									

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M(3000)F1 (0.01)

### IONOSPHERIC DATA

FEB. 1977

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

135° E Mean Time (G. M. T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										230	245	250	250	250	250	230								
2									235	250	255	250	250	250	240	240								
3									225	225	265	260	250	240	240	230	240							
4									235	240	250	255	250	270	240	240	225							
5									240	250	245	260	255	265	245	245	235							
6									215	240	240	260	275	290	250	245	230							
7									220	245	260	260	260	285	250	235								
8									230	240	280	245	260	255	250	245	245							
9										295	275	295	255	250	255	245								
10									245	250	230	260	245	255	245	240	225							
11									235	265	250	240	250	290	265	295	240							
12									240	260	245	240	275	250	240	235	235							
13									235	225	235	245	255	295	245	240	240							
14									230	240	255	255	250	250	255	250	240							
15									240	240	290	250	250	240	250	255	235							
16									210	230	250	250	275	255	250	250	240							
17									230	270	245	250	250	255	270	250	235							
18										245	265	280	280	260	250	260	260							
19									230	255	250	265	250	270	275	250	245							
20									220	245	270	285	250	250	255	250	240							
21									245	240	250	255	255	255	265	250	245							
22									250	250	265	250	245	255	260	245	235							
23									275	240	285	295	260	250	270	245	235							
24										260	275	250	255	255	280	250	245							
25									240	240	270	290	270	250	240	250	235	215						
26									240	270	295	275	260	245	245	250	245							
27									240	255	275	260	275	265	275	250	235							
28									250	240	260	290	270	275	260	250	235	230						
29																								
30																								
31																								
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									24	28	28	28	28	28	28	28	24	2						
MED									235	245	258	258	255	255	250	248	238	222						
UQ									240	255	272	270	265	268	262	250	242							
LQ									230	240	248	250	250	250	245	240	235							

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

# IONOSPHERIC DATA

FEB. 1977

H'F (KM)

135° E Mean Time (G. M. T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C 300	C 300	C 270	C 235	C 225	E 310	E 280	C 235	C 210	C 235	C 220	E 230	A 240	210	200	230	215	210	240	205	A	E 250	E 305	330
2	320	290	270	295	255	270	E 260	250	210	H 195	190	215	200	H 195	200	200	235	225	210	E 290	210	E 350	300	300
3	290	270	225	245	280	300	250	240	H 175	205	200	200	210	210	210	230	H 190	210	E 270	220	250	240	245	260
4	275	290	275	250	245	275	250	230	H 195	240	230	210	245	250	230	240	A	225	210	A	A	A	260	250
5	300	290	300	270	240	250	260	240	205	I 190	195	A	245	220	210	210	A	215	200	220	280	250	255	275
6	270	300	275	250	235	230	250	210	195	240	210	H 225	230	230	230	240	200	A	A	270	225	E 310	E 340	A
7	H 270	290	290	250	230	240	E 290	230	205	200	230	200	250	215	230	220	230	235	220	230	250	255	E 250	245
8	270	250	260	250	230	E 250	270	240	215	200	H 250	240	220	225	H 200	220	245	220	220	240	245	245	290	350
9	260	320	290	280	290	275	E 250	215	205	250	240	200	A	240	H 225	H 200	235	240	230	230	250	300	340	260
10	A	A	350	245	225	A	250	240	220	200	200	A	220	H 195	H 200	205	200	225	230	250	245	225	275	305
11	295	300	275	235	A	E 350	325	240	A	245	E 250	205	200	H 190	200	230	A	220	220	260	300	245	245	305
12	315	325	245	275	220	250	250	230	220	200	205	200	200	200	225	220	200	215	215	245	245	250	270	280
13	280	255	250	260	260	275	250	240	H 200	205	H 180	200	195	H 200	H 200	230	240	210	225	245	245	230	250	280
14	295	270	250	280	240	260	225	220	225	215	200	200	220	H 200	205	240	240	225	215	250	250	240	255	295
15	295	290	290	250	210	270	245	220	240	220	200	H 200	210	210	200	205	225	210	240	210	220	A	270	275
16	270	275	255	270	250	230	240	H 210	210	190	H 170	225	200	220	245	205	205	235	245	235	285	300	290	300
17	270	275	300	260	250	250	240	230	215	H 190	H 185	A	235	220	225	215	220	230	225	210	240	245	260	275
18	285	300	275	245	230	265	225	200	230	200	I 210	I 200	210	225	225	235	230	235	H 200	215	E 250	280	270	260
19	285	255	260	270	275	250	235	215	200	205	H 190	210	200	200	H 195	225	A	220	205	235	220	235	260	295
20	275	295	290	280	245	280	240	220	H 200	200	200	H 190	H 200	200	200	205	225	205	210	275	260	245	270	300
21	300	295	255	210	240	250	285	240	245	H 190	230	200	H 190	H 175	225	210	215	225	205	250	250	240	270	250
22	280	260	300	260	230	250	250	235	240	220	200	205	H 200	195	200	235	215	220	225	245	275	300	300	300
23	300	280	250	245	225	275	260	240	H 205	225	200	H 200	225	225	205	220	210	H 200	240	260	285	255	270	300
24	295	295	270	240	300	300	240	205	225	215	220	215	210	200	210	235	245	H 195	200	270	295	290	250	290
25	285	270	300	275	245	290	275	225	H 200	H 200	200	195	H 195	210	215	205	205	205	210	E 250	285	E 340	255	260
26	270	255	235	230	205	240	230	225	195	H 195	200	200	H 210	230	220	205	210	H 205	220	260	265	260	275	280
27	300	275	245	240	220	250	240	215	210	200	200	H 200	H 185	200	H 190	205	235	220	205	245	260	250	240	250
28	275	275	245	240	240	245	250	230	240	215	H 190	H 175	240	H 200	H 210	200	220	205	210	235	250	275	260	270
29																								
30																								
31																								
CNT	27	27	28	28	27	27	28	28	27	28	28	25	27	28	28	28	24	27	27	27	26	26	28	27
MED	285	290	270	250	240	255	249	230	210	202	200	200	210	210	210	220	220	220	218	242	250	248	265	280
UQ	298	295	290	270	250	275	255	240	222	220	218	210	228	222	225	230	235	225	226	252	275	U 275	278	300
LQ	272	270	250	242	228	250	240	218	200	200	198	200	200	200	200	205	208	210	210	230	245	242	255	260

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H'F (KM)

### IONOSPHERIC DATA

FEB. 1977

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

135<sup>o</sup> E Mean Time (G. M. T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								S	C 120	C 100	C 100	100	105	105	105	110	H 120	S						
2								S	120	110	105	105	105	105	105	105	110	S						
3								S	115	105	105	105	105	105	105	110	110	S						
4								S	115	110	105	105	105	105	105	105	110	S						
5								S	E A 125	C	A	A	A	A	105	105	110	A						
6								S	A	110	110	A	110	105	105	A	110	S						
7								S	A	A	A	A	A	A	A	110	110	S						
8								S	A	A	100	E A 125	A	A	E A 120	110	115	R						
9								S	115	105	105	105	105	105	E A 125	A	E A 115	S						
10								S	A	110	A	A	A	E A 115	E A 110	110	E A 120	A						
11								B	110	105	105	100	A	105	105	110	E A 125	S						
12								B	110	105	105	A	A	E A 120	E A 110	E A 120	E A 120	A						
13								E B 140	110	105	A	A	A	A	E A 110	110	110	S						
14								E B 140	115	105	A	A	E A 120	E A 115	A	A	A	A						
15								E B 125	115	105	105	110	A	A	A	A	110	R						
16								130	115	105	105	110	110	105	105	105	A	A						
17								S	110	105	100	A	A	A	A	A	A	A						
18								S	H 115	110	I C 110	I C 110	110	115	110	110	115	H 115	S					
19								S	115	110	105	105	A	105	A	105	A	A						
20								A	115	105	A	105	E A 125	E A 120	E A 120	105	110	A						
21								E B 140	115	110	105	105	105	105	110	110	115	125						
22								125	110	105	A	105	105	110	110	110	115	R						
23								130	110	105	110	110	110	105	105	110	E A 115	E R 140						
24								E B 140	115	110	110	105	A	A	A	A	110	R						
25								140	110	105	105	A	A	105	A	110	115	S						
26								E S 130	110	105	105	105	E A 120	105	105	E A 120	110	E R 130						
27								130	110	105	105	105	E A 125	E A 115	E A 110	E A 120	E A 120	S						
28								140	110	105	105	105	A	A	110	110	115	120						
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								12	24	25	21	19	15	20	21	22	24	4						
MED								130	115	105	105	105	108	105	108	110	112	124						
UQ								E B 140	115	110	105	106	112	110	E A 110	110	115	E R 135						
LQ								130	110	105	105	105	105	105	105	105	110	122						

The Radio Research Laboratories, Japan

FEB. 1977

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

### IONOSPHERIC DATA

FEB. 1977

H<sup>°</sup>ES (KM)

135° E Mean Time (G. M. T. + 9 h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	100	100	100	S	100	100	100	G	165	150	130	135	145	130	150	G	100	100	100	110	100	110	S
2	S	S	115	100	100	S	120	100	G	G	G	140	130	G	105	135	110	110	110	110	S	100	100	100
3	100	100	100	S	S	S	S	S	G	130	145	140	125	130	120	G	G	150	115	110	105	105	105	100
4	100	100	S	S	S	115	100	105	G	170	150	140	150	140	135	G	110	105	105	105	105	105	105	105
5	100	105	100	100	B	110	S	S	105	C	100	100	100	145	125	120	110	110	105	105	100	100	100	100
6	100	100	105	105	125	125	125	105	110	130	130	160	125	120	150	135	130	115	110	105	105	100	100	105
7	100	100	105	110	120	115	120	105	105	105	105	100	100	100	170	145	120	110	105	105	105	105	100	100
8	100	100	100	100	100	S	115	105	105	100	175	155	100	100	100	G	190	155	145	105	110	105	135	100
9	100	100	100	S	100	105	S	S	150	105	105	105	100	100	100	120	100	120	110	105	105	100	100	105
10	105	105	105	S	120	115	120	110	105	110	105	100	100	100	100	G	100	100	100	100	100	100	100	110
11	S	100	100	100	100	105	125	110	110	105	105	105	105	G	G	G	120	115	110	105	105	100	100	100
12	100	100	100	100	100	S	S	B	115	G	G	110	105	100	100	100	100	100	100	100	100	100	100	100
13	100	100	100	100	100	S	S	G	115	110	105	100	100	100	100	G	120	110	105	100	110	100	S	S
14	100	100	95	95	95	95	S	G	160	G	100	100	100	100	120	100	100	100	100	100	105	105	100	95
15	S	S	S	S	S	S	S	155	150	115	110	110	110	105	100	100	115	110	110	110	100	100	100	100
16	100	100	100	100	100	100	100	G	G	115	120	G	G	G	G	G	100	100	100	100	100	100	100	100
17	S	100	100	100	100	100	100	S	G	G	G	165	100	100	100	100	100	100	100	S	100	S	S	100
18	S	S	B	100	100	100	S	S	G	150	C	C	G	G	G	G	G	S	S	S	100	100	100	100
19	S	100	100	100	100	B	100	100	140	130	120	115	110	G	105	G	100	100	S	S	100	100	100	100
20	S	B	110	B	100	100	100	100	100	120	105	G	105	100	100	G	G	100	100	100	100	100	100	100
21	S	S	100	100	S	100	S	G	170	G	G	110	G	G	G	G	G	G	100	S	S	100	100	100
22	100	100	100	100	100	S	S	G	115	G	105	G	G	G	G	G	G	125	S	S	100	S	100	S
23	S	B	B	S	B	S	S	140	135	120	125	G	G	G	G	G	100	105	100	100	S	S	100	100
24	S	S	S	S	S	S	100	G	140	115	115	110	100	105	100	100	G	105	S	100	100	100	100	100
25	100	100	100	100	100	S	B	G	120	115	110	105	105	G	105	100	G	G	S	105	105	100	105	100
26	100	100	100	100	B	100	S	G	G	125	G	G	105	G	G	100	G	G	100	100	100	100	100	S
27	100	100	100	100	S	100	S	G	G	G	G	110	100	100	100	100	100	100	105	100	100	100	100	100
28	100	S	B	S	B	S	S	G	G	140	G	G	105	100	100	G	G	G	100	100	100	100	S	S
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	20	22	19	17	16	13	12	18	20	20	21	23	18	21	14	18	23	23	23	25	25	25	23
MED	100	100	100	100	100	100	100	105	115	118	110	110	105	100	100	100	105	105	105	100	100	100	100	100
UQ	100	100	100	100	100	112	120	110	140	130	128	140	110	120	120	135	120	112	110	105	105	100	100	100
LQ	100	100	100	100	100	100	100	100	105	110	105	105	100	100	100	100	100	100	100	100	100	100	100	100

FEB. 1977

H<sup>°</sup>ES (KM)

The Radio Research Laboratories, Japan

# IONOSPHERIC DATA

FEB. 1977

TYPES OF ES

135° E Mean Time (G. M. T. + 9 h)

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

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

FEB. 1977

TYPES OF ES

# IONOSPHERIC DATA

FEB. 1977

FXI (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station	YAMAGAWA																							Lat.	31° 12.1' N.	Long.	130° 37.1' E	Sweep 1 MHz to 20 MHz in 20 sec in automatic operation																						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																										
1	0 <sup>S</sup> <sub>37</sub>	X <sub>37</sub>	4 <sup>X</sup> <sub>40</sub>	X <sub>35</sub>	X <sub>33</sub>	X <sub>29</sub>														4 <sup>X</sup> <sub>5</sub>	X <sub>37</sub>	X <sub>34</sub>	29	X <sub>34</sub>																										
2	X <sub>35</sub>	X <sub>37</sub>	0 <sup>S</sup> <sub>39</sub>	X <sub>38</sub>	0 <sup>S</sup> <sub>38</sub>	X <sub>39</sub>														6 <sup>X</sup> <sub>3</sub>	X <sub>54</sub>	S	0 <sup>S</sup> <sub>37</sub>	X <sub>36</sub>																										
3	0 <sup>S</sup> <sub>39</sub>	0 <sup>S</sup> <sub>40</sub>	X <sub>50</sub>	X <sub>37</sub>	X <sub>33</sub>	X <sub>34</sub>														S	S	A	S <sub>35</sub>	X <sub>35</sub>																										
4	X <sub>37</sub>	X <sub>36</sub>	X <sub>38</sub>	X <sub>37</sub>	X <sub>36</sub>	X <sub>31</sub>														4 <sup>X</sup> <sub>8</sub>	X <sub>29</sub>	X <sub>33</sub>	X <sub>35</sub>	X <sub>36</sub>																										
5	X <sub>37</sub>	X <sub>36</sub>	X <sub>36</sub>	X <sub>36</sub>	X <sub>38</sub>	X <sub>33</sub>														S	A	X <sub>39</sub>	X <sub>30</sub>	X <sub>35</sub>																										
6	X <sub>36</sub>	X <sub>37</sub>	X <sub>35</sub>	X <sub>37</sub>	X <sub>38</sub>	0 <sup>S</sup> <sub>36</sub>														3 <sup>X</sup> <sub>9</sub>	X <sub>36</sub>	X <sub>34</sub>	X <sub>30</sub>	X <sub>35</sub>																										
7	X <sub>34</sub>	0 <sup>S</sup> <sub>34</sub>	X <sub>37</sub>	X <sub>38</sub>	X <sub>39</sub>	X <sub>28</sub>	31													6 <sup>X</sup> <sub>6</sub>	0 <sup>S</sup> <sub>39</sub>	0 <sup>S</sup> <sub>31</sub>	0 <sup>S</sup> <sub>33</sub>	S																										
8	S	S	X <sub>30</sub>	X <sub>31</sub>	X <sub>31</sub>	X <sub>28</sub>														5 <sup>X</sup> <sub>0</sub>	X <sub>37</sub>	X <sub>37</sub>	X <sub>32</sub>	X <sub>34</sub>																										
9	X <sub>36</sub>	X <sub>36</sub>	0 <sup>S</sup> <sub>38</sub>	X <sub>36</sub>	X <sub>41</sub>	X <sub>38</sub>														S	0 <sup>S</sup> <sub>33</sub>	X <sub>34</sub>	X <sub>34</sub>	0 <sup>S</sup> <sub>40</sub>																										
10	0 <sup>S</sup> <sub>42</sub>	X <sub>35</sub>	X <sub>35</sub>	0 <sup>S</sup> <sub>42</sub>	X <sub>33</sub>	0 <sup>S</sup> <sub>31</sub>														5 <sup>X</sup> <sub>4</sub>	4 <sup>X</sup> <sub>8</sub>	4 <sup>X</sup> <sub>3</sub>	X <sub>36</sub>	X <sub>33</sub>																										
11	S	X <sub>36</sub>	X <sub>36</sub>	X <sub>36</sub>	X <sub>36</sub>	X <sub>28</sub>														5 <sup>X</sup> <sub>2</sub>	X <sub>38</sub>	4 <sup>X</sup> <sub>2</sub>	4 <sup>X</sup> <sub>1</sub>	0 <sup>S</sup> <sub>33</sub>																										
12	0 <sup>S</sup> <sub>37</sub>	X <sub>36</sub>	X <sub>38</sub>	X <sub>36</sub>	X <sub>37</sub>	X <sub>31</sub>														5 <sup>X</sup> <sub>6</sub>	4 <sup>X</sup> <sub>3</sub>	X <sub>39</sub>	X <sub>38</sub>	X <sub>36</sub>																										
13	X <sub>36</sub>	X <sub>36</sub>	X <sub>36</sub>	X <sub>36</sub>	X <sub>36</sub>	X <sub>36</sub>														5 <sup>X</sup> <sub>0</sub>	4 <sup>X</sup> <sub>2</sub>	4 <sup>X</sup> <sub>2</sub>	X <sub>36</sub>	0 <sup>S</sup> <sub>36</sub>																										
14	0 <sup>S</sup> <sub>34</sub>	X <sub>36</sub>	X <sub>38</sub>	X <sub>37</sub>	X <sub>38</sub>	X <sub>29</sub>														5 <sup>X</sup> <sub>2</sub>	4 <sup>X</sup> <sub>8</sub>	0 <sup>S</sup> <sub>46</sub>	X <sub>40</sub>	X <sub>38</sub>																										
15	X <sub>38</sub>	4 <sup>X</sup> <sub>40</sub>	4 <sup>X</sup> <sub>40</sub>	4 <sup>X</sup> <sub>41</sub>	4 <sup>X</sup> <sub>48</sub>	X <sub>28</sub>														6 <sup>X</sup> <sub>0</sub>	4 <sup>X</sup> <sub>1</sub>	X <sub>39</sub>	S	X <sub>38</sub>																										
16	X <sub>37</sub>	X <sub>38</sub>	X <sub>39</sub>	X <sub>39</sub>	4 <sup>X</sup> <sub>48</sub>	X <sub>38</sub>	34													6 <sup>X</sup> <sub>4</sub>	4 <sup>X</sup> <sub>2</sub>	X <sub>39</sub>	X <sub>36</sub>	X <sub>39</sub>																										
17	4 <sup>X</sup> <sub>41</sub>	4 <sup>X</sup> <sub>41</sub>	X <sub>39</sub>	X <sub>39</sub>	4 <sup>X</sup> <sub>41</sub>	X <sub>35</sub>														5 <sup>X</sup> <sub>8</sub>	4 <sup>X</sup> <sub>0</sub>	X <sub>38</sub>	0 <sup>S</sup> <sub>41</sub>	X <sub>40</sub>																										
18	0 <sup>S</sup> <sub>40</sub>	0 <sup>S</sup> <sub>39</sub>	0 <sup>S</sup> <sub>41</sub>	S	X <sub>52</sub>	X <sub>37</sub>														5 <sup>X</sup> <sub>6</sub>	X <sub>38</sub>	X <sub>38</sub>	X <sub>39</sub>	X <sub>39</sub>																										
19	X <sub>39</sub>	X <sub>39</sub>	4 <sup>X</sup> <sub>42</sub>	X <sub>52</sub>	X <sub>52</sub>	4 <sup>X</sup> <sub>43</sub>														5 <sup>X</sup> <sub>0</sub>	4 <sup>X</sup> <sub>2</sub>	4 <sup>X</sup> <sub>7</sub>	X <sub>34</sub>	X <sub>36</sub>																										
20	X <sub>36</sub>	X <sub>34</sub>	X <sub>36</sub>	X <sub>36</sub>	4 <sup>X</sup> <sub>42</sub>	X <sub>31</sub>	30													5 <sup>X</sup> <sub>1</sub>	4 <sup>X</sup> <sub>6</sub>	4 <sup>X</sup> <sub>4</sub>	X <sub>37</sub>	X <sub>38</sub>																										
21	X <sub>37</sub>	0 <sup>S</sup> <sub>38</sub>	4 <sup>X</sup> <sub>42</sub>	4 <sup>X</sup> <sub>44</sub>	X <sub>35</sub>	X <sub>29</sub>														4 <sup>X</sup> <sub>6</sub>	4 <sup>X</sup> <sub>3</sub>	4 <sup>X</sup> <sub>6</sub>	4 <sup>X</sup> <sub>2</sub>	4 <sup>X</sup> <sub>1</sub>																										
22	X <sub>38</sub>	0 <sup>S</sup> <sub>40</sub>	S	X <sub>37</sub>	4 <sup>X</sup> <sub>41</sub>	X <sub>37</sub>														4 <sup>X</sup> <sub>8</sub>	X <sub>39</sub>	X <sub>38</sub>	X <sub>39</sub>	X <sub>37</sub>																										
23	X <sub>36</sub>	X <sub>37</sub>	X <sub>38</sub>	X <sub>37</sub>	X <sub>36</sub>	X <sub>29</sub>														4 <sup>X</sup> <sub>4</sub>	X <sub>37</sub>	0 <sup>S</sup> <sub>41</sub>	X <sub>40</sub>	X <sub>35</sub>																										
24	X <sub>37</sub>	0 <sup>S</sup> <sub>37</sub>	4 <sup>X</sup> <sub>40</sub>	X <sub>36</sub>	34	0 <sup>S</sup> <sub>35</sub>														6 <sup>X</sup> <sub>1</sub>	4 <sup>X</sup> <sub>0</sub>	4 <sup>X</sup> <sub>3</sub>	S	X <sub>35</sub>																										
25	X <sub>35</sub>	X <sub>37</sub>	X <sub>39</sub>	X <sub>36</sub>	X <sub>35</sub>	X <sub>31</sub>														5 <sup>X</sup> <sub>4</sub>	4 <sup>X</sup> <sub>2</sub>	0 <sup>S</sup> <sub>41</sub>	X <sub>34</sub>	X <sub>36</sub>																										
26	X <sub>36</sub>	X <sub>36</sub>	0 <sup>S</sup> <sub>38</sub>	X <sub>38</sub>	4 <sup>X</sup> <sub>41</sub>	X <sub>28</sub>														C	4 <sup>X</sup> <sub>1</sub>	C	X <sub>39</sub>	0 <sup>S</sup> <sub>41</sub>																										
27	4 <sup>X</sup> <sub>40</sub>	C	0 <sup>S</sup> <sub>39</sub>	X <sub>38</sub>	X <sub>36</sub>	X <sub>32</sub>														4 <sup>X</sup> <sub>5</sub>	0 <sup>S</sup> <sub>37</sub>	X <sub>38</sub>	X <sub>39</sub>	X <sub>39</sub>																										
28	X <sub>38</sub>	0 <sup>S</sup> <sub>38</sub>	X <sub>37</sub>	X <sub>36</sub>	X <sub>39</sub>	X <sub>34</sub>														4 <sup>X</sup> <sub>8</sub>	X <sub>38</sub>	X <sub>37</sub>	0 <sup>S</sup> <sub>38</sub>	0 <sup>S</sup> <sub>39</sub>																										
29																																																		
30																																																		
31																																																		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																										
CNT	26	26	27	27	28	28	3													24	26	25	26	27																										
MED	X <sub>37</sub>	X <sub>37</sub>	X <sub>38</sub>	X <sub>37</sub>	X <sub>38</sub>	X <sub>32</sub>	31													5 <sup>X</sup> <sub>2</sub>	4 <sup>X</sup> <sub>0</sub>	X <sub>39</sub>	X <sub>36</sub>	X <sub>36</sub>																										
UQ	X <sub>39</sub>	X <sub>38</sub>	4 <sup>X</sup> <sub>40</sub>	X <sub>38</sub>	4 <sup>X</sup> <sub>41</sub>	X <sub>36</sub>	32													5 <sup>X</sup> <sub>7</sub>	4 <sup>X</sup> <sub>2</sub>	4 <sup>X</sup> <sub>2</sub>	X <sub>39</sub>	X <sub>39</sub>																										
LQ	X <sub>36</sub>	X <sub>36</sub>	X <sub>36</sub>	X <sub>36</sub>	X <sub>35</sub>	X <sub>29</sub>	30													4 <sup>X</sup> <sub>8</sub>	X <sub>37</sub>	X <sub>37</sub>	X <sub>34</sub>	X <sub>35</sub>																										

FEB. 1977

FXI (0.1 MHz)

IONOSPHERIC DATA

FEB. 1977

FOF2 (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	3 <sup>F</sup>	3 <sup>F</sup>	34	29	27	23	25	U <sub>38</sub>	60	79	76	75	71	72	71	72	65	54	58	39	31	28	2 <sup>F</sup>	2 <sup>S</sup>	
2	2 <sup>S</sup>	31	33	U <sub>32</sub>	32	33	32	33	67	64	77	68	88	88	91	62	59	65	67	57	U <sub>48</sub>	A	U <sub>31</sub>	U <sub>30</sub>	
3	U <sub>33</sub>	34	44	31	27	28	27	33	U <sub>62</sub>	71	65	62	85	100	70	62	67	56	55	I <sub>42</sub>	I <sub>34</sub>	A	2 <sup>S</sup>	2 <sup>S</sup>	
4	U <sub>31</sub>	30	32	J <sub>31</sub>	30	25	25	35	59	65	74	63	80	90	89	71	58	58	58	42	23	27	2 <sup>S</sup>	30	
5	31	30	30	F	32	27	25	35	57	75	82	89	96	94	78	63	58	57	50	I <sub>38</sub>	A	3 <sup>S</sup>	24	F	
6	30	F	F	F	32	30	27	35	54	56	61	60	70	77	91	87	67	56	47	33	30	28	23	F	
7	2 <sup>S</sup>	2 <sup>S</sup>	31	32	32	22	25	40	64	57	63	69	68	69	88	71	55	55	67	60	33	25	27	S	
8	S	S	2 <sup>S</sup>	25	25	23	23	35	65	62	70	90	101	91	95	84	78	66	64	44	31	31	26	28	
9	30	30	U <sub>32</sub>	30	35	32	28	J <sub>38</sub>	55	54	70	81	93	103	105	82	62	65	60	I <sub>40</sub>	27	2 <sup>S</sup>	2 <sup>S</sup>	34	
10	36	29	29	36	27	25	A	2 <sup>S</sup>	68	A	V <sub>72</sub>	70	84	91	89	92	78	57	50	J <sub>48</sub>	J <sub>42</sub>	37	30	U <sub>27</sub>	
11	I <sub>32</sub>	30	30	33	24	18	21	32	65	57	81	80	73	65	66	67	78	70	55	48	32	30	35	27	
12	31	30	32	30	31	25	23	36	56	76	88	H <sub>78</sub>	70	82	80	65	57	66	64	50	37	33	32	30	
13	30	30	30	30	30	F	F	2 <sup>S</sup>	41	73	76	74	74	62	60	101	90	73	61	54	44	36	30	30	
14	28	30	32	31	32	23	26	41	59	57	71	93	88	85	88	86	75	66	57	U <sub>48</sub>	42	40	34	32	
15	35	34	34	35	38	22	25	48	65	62	82	101	95	79	69	66	68	64	60	54	35	33	I <sub>30</sub>	32	
16	31	32	33	33	30	32	28	38	57	61	67	82	81	104	95	88	84	65	60	58	36	33	30	33	
17	35	35	33	33	35	29	30	38	63	66	68	84	93	75	75	72	70	58	53	52	34	32	35	34	
18	34	33	35	I <sub>38</sub>	46	31	31	42	55	65	77	84	91	94	97	68	79	81	74	50	32	32	33	33	
19	33	33	36	42	46	37	30	43	60	61	65	79	101	99	106	115	102	79	60	44	38	41	28	F	
20	30	28	30	30	30	25	24	41	57	62	60	76	101	98	85	84	79	62	52	45	40	38	37	32	
21	31	32	30	30	29	23	23	38	58	65	68	67	79	77	80	77	75	65	53	40	U <sub>37</sub>	40	36	35	
22	32	U <sub>32</sub>	I <sub>32</sub>	31	35	31	26	45	62	63	75	77	85	71	61	66	61	55	51	J <sub>42</sub>	33	32	33	31	
23	30	31	32	31	30	23	22	40	57	68	64	67	89	90	90	87	69	57	53	U <sub>38</sub>	U <sub>31</sub>	U <sub>35</sub>	34	29	
24	U <sub>31</sub>	U <sub>31</sub>	34	50	F	U <sub>29</sub>	31	U <sub>48</sub>	58	57	73	93	91	93	91	79	78	76	62	52	34	U <sub>37</sub>	I <sub>34</sub>	29	
25	29	31	33	30	29	25	24	46	59	62	64	81	103	118	97	85	88	61	50	48	36	35	28	30	
26	F	J <sub>30</sub>	32	32	35	23	23	42	55	I <sub>58</sub>	68	77	99	91	93	80	64	65	55	I <sub>43</sub>	35	I <sub>32</sub>	33	35	
27	34	I <sub>32</sub>	33	32	30	26	23	36	52	59	60	72	82	86	87	83	67	64	55	39	31	32	33	33	
28	32	32	31	30	33	28	23	41	54	59	65	62	83	95	80	85	75	64	54	42	32	32	32	33	
29																								63	
30																								68	
31																								72	
CNT	26	26	27	26	27	27	27	28	28	27	28	28	28	28	28	28	28	28	28	28	28	27	26	28	24
MED	31	31	32	31	32	25	25	38	59	62	70	77	86	90	88	80	70	64	55	44	34	33	30	30	
UQ	33	32	34	33	35	30	28	42	64	66	76	83	94	94	94	86	78	66	60	50	36	38	33	33	
LQ	30	30	31	30	30	23	23	35	56	58	65	68	80	77	79	68	63	57	53	47	32	32	28	29	

The Radio Research Laboratories, Japan

FEB. 1977

FOF2 (0.1 MHz)



# IONOSPHERIC DATA

FEB. 1977

FOF1 (0.01 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	U440	U450	U430	L	L							
2										L	L	L	U460	L	L	L	L							
3									L	L	L	L	L	L	L	L	A							
4										L	L	L	U450	L	U440	L	L							
5										L	L	L	U440	U450	U420	U410	L							
6										L	L	U440	U460	U440	U450	U400	L							
7									L	A	L	L	L	L	L	L	A							
8										250	L	L	U460	U460	L	L	U410	L						
9									L	A	L	U440	A	U460	L	L	L							
10									L	A	L	L	L	U450	U440	L	L	L						
11											U420	L	U440	L	L	L	L							
12										270	L	U400	L	L	U450	U440	L	L	L					
13									L	L	L	L	L	L	L	L	L	L						
14											L	L	L	L	L	L	L	L						
15											L	L	L	U460	A	U440	L	L	250					
16										270	320	L	U400	L	L	U460	L	L	A					
17											L	L	L	U470	L	U460	L	L						
18											L	L	U460	U460	U460	U430	L	L						
19										310	L	U470	U470	U450	U460	U460	U440	L	L					
20											L	L	U460	U460	U470	U470	L	L	L					
21											L	L	L	U460	L	L	L	L	L					
22											L	L	U440	U460	U440	U440	U430	L	L					
23											L	L	L	U470	U450	U460	U450	U440	L	L				
24										270	L	U450	U440	L	U470	L	U430	U410						
25											L	L	L	U460	U450	U440	U430	U390	L					
26											C	U430	U440	U450	U450	U440	U420	L	L					
27											L	L	L	U440	U450	U450	U450	U430	U390	L				
28											L	L	L	L	U440	U430	L	L	L	L				
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									5	1	6	12	19	16	18	11	3	1						
MED									270	320	435	450	450	450	440	430	390	250						
UQ									270		U450	U460	U460	U460	U460	U430	U400							
LQ									270		U420	U440	U445	U450	U440	U415	U390							

FEB. 1977

FOF1 (0.01 MHz)

### IONOSPHERIC DATA

FEB. 1977

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 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	S	180	250	280	300	310	315	310	290	255	190		S				
2							S	S	200	260	275	305	315	320	315	300	A	190		S				
3							S	S	210	250	280	310	310	310	305	295	255	180		S				
4							S	S	200	260	300	310	320	320	300	270	A	A		S				
5							S	S	A	250	280	A	315	320	A	A	250	190		S				
6							S	S	200 <sup>H</sup>	250	290	300	320	320	310	300	270	200		S				
7							S	S	200	A	A	A	A	A	A	A	A	200		S				
8							S	S	210	260	290	305	315	320	305	290	260	205		S				
9							S	S	200	250	295	315	A	A	A	305	260	195		S				
10							S	S	A	A	A	300	310	A	A	300	260	A		S				
11							S	S	180	270	285	295	300	300	300	290	250	210		S				
12							S	S	A	A	A	320	A	A	320	A	A	A		S				
13							S	S	190	250	280 <sup>R</sup>	305	320	320	315	300	A	A		S				
14							S	S	220	280	A	A	330 <sup>H</sup>	320	A	300	270 <sup>R</sup>	210		S				
15							S	S	220	A	A	A	A	A	310	A	A	210		S				
16							S	S	220	250	280	A	A	A	310	A	A	A		S				
17							S	S	220 <sup>H</sup>	270 <sup>H</sup>	300 <sup>H</sup>	310	A	330	330	310	A	A		S				
18							S	S	230 <sup>H</sup>	270 <sup>H</sup>	305 <sup>H</sup>	A	A	320	320	300	270	220		S				
19							S	S	200	250	290	310	A	A	A	300	270	210		S				
20							S	S	200	270	300	310	330	330	320	305	270	210		S				
21							S	S	220	275 <sup>H</sup>	295 <sup>H</sup>	A	A	A	320	310	280	225		S				
22							S	S	230	A	305	315	330	330	320	305	275	225		S				
23							S	S	230 <sup>H</sup>	275 <sup>H</sup>	A	A	A	A	320	300	A	A		S				
24							S	S	220 <sup>H</sup>	270 <sup>H</sup>	295 <sup>H</sup>	A	320	320	315	300	A	A		S				
25							S	S	240 <sup>H</sup>	260 <sup>H</sup>	270 <sup>R</sup>	A	A	A	320 <sup>R</sup>	300	A	A		S				
26							S	S	200	255 <sup>I</sup>	280 <sup>C</sup>	305	A	320	320	300 <sup>I</sup>	270	230		S				
27							S	S	230 <sup>H</sup>	270 <sup>R</sup>	290 <sup>I</sup>	A	320	320	320	300	260	220		S				
28							S	S	A	260	A	320	330	325	320	305	280	220		S				
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									24	23	21	17	16	18	22	23	17	19						
MED									210	260	290	310	320	320	318	300	270	210						
UQ									220	270	295	310	325	320	320	302	270	220						
LQ									200	252	280	305	312	320	310	300	260	198						

FEB. 1977

FOE (0.01 MHz)

# IONOSPHERIC DATA

FEB. 1977

FOES (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station	YAMAGAWA																							Lat. 31° 12.1' N,	Long. 130° 37.1' E	Sweep 1	MHz to 20 MHz in 20 sec in automatic operation																						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																									
1	21	21	22	21	21	21	E <sub>15</sub> S	21	35	30	33	34	34	G	G	G <sub>28</sub>	G	G	22	20	21	24	J <sub>21</sub> A	22																									
2	22	21	19	23	18	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	G	G	G	36	33	36	40	36	J <sub>30</sub> A	J <sub>27</sub> A	J <sub>22</sub> A	E <sub>15</sub> S	20	J <sub>36</sub> A	J <sub>29</sub> A	J <sub>21</sub> A																									
3	23	21	20	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	23	G	32	36	34	32	33	G	33	G	22	J <sub>24</sub> A	J <sub>32</sub> A	J <sub>50</sub> A	J <sub>25</sub> A	21																									
4	21	J <sub>21</sub> A	19	23	21	E <sub>15</sub> S	E <sub>15</sub> S	20	G	30	34	25	G <sub>28</sub>	40	37	J <sub>49</sub> A	28	18	18	23	E <sub>14</sub> S	E <sub>15</sub> S	24	E <sub>15</sub> S																									
5	J <sub>21</sub> A	27	21	E <sub>15</sub> B	J <sub>30</sub> A	J <sub>29</sub> A	J <sub>25</sub> A	J <sub>25</sub> A	J <sub>27</sub> A	27	28	30	37	42	33	J <sub>40</sub> A	G	25	20	J <sub>29</sub> A	40	35	22	E <sub>15</sub> S																									
6	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>14</sub> B	E <sub>15</sub> B	20	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>14</sub> S	G	27	33	34	37	37	34	35	33	G	21	17	25	19	J <sub>27</sub> A	J <sub>20</sub> A																									
7	21	J <sub>53</sub> A	45	21	22	J <sub>35</sub> A	20	23	16	45	30	31	31	36	45	39	33	J <sub>39</sub> A	51	40	31	30	35	24																									
8	23	17	23	26	33	E <sub>15</sub> S	E <sub>15</sub> S	22	25	22	33	37	34	35	23	G	G	28	26	J <sub>19</sub> A	J <sub>24</sub> A	J <sub>21</sub> A	24	J <sub>24</sub> A																									
9	21	J <sub>22</sub> A	J <sub>24</sub> A	J <sub>25</sub> A	20	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	G	36	41	35	J <sub>81</sub> A	J <sub>37</sub> A	J <sub>53</sub> A	33	G	26	18	22	J <sub>23</sub> A	J <sub>27</sub> A	J <sub>35</sub> A	20																									
10	J <sub>36</sub> A	17	J <sub>27</sub> A	20	E <sub>15</sub> S	J <sub>19</sub> A	J <sub>26</sub> A	J <sub>27</sub> A	J <sub>32</sub> A	J <sub>83</sub> A	J <sub>39</sub> A	J <sub>29</sub> A	J <sub>36</sub> A	J <sub>46</sub> A	J <sub>39</sub> A	J <sub>35</sub> A	28	J <sub>29</sub> A	J <sub>34</sub> A	25	19	J <sub>24</sub> A	20	E <sub>15</sub> S																									
11	19	17	E <sub>15</sub> S	18	22	22	E <sub>15</sub> S	J <sub>21</sub> A	27	31	32	34	33	34	33	31	29	20	E <sub>15</sub> S	E <sub>14</sub> S	20	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S																									
12	E <sub>15</sub> S	26	25	J <sub>30</sub> A	21	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	24	37	30	31	37	35	G	32	28	23	J <sub>21</sub> A	20	J <sub>18</sub> A	20	18	22																									
13	17	22	J <sub>24</sub> A	22	E <sub>15</sub> B	20	E <sub>15</sub> S	20	G	G	25	G <sub>29</sub>	G <sub>27</sub>	34	24	J <sub>31</sub> A	J <sub>56</sub> A	J <sub>53</sub> A	30	J <sub>19</sub> A	19	20	J <sub>24</sub> A	J <sub>23</sub> A																									
14	J <sub>21</sub> A	J <sub>21</sub> A	21	E <sub>14</sub> B	E <sub>15</sub> B	E <sub>15</sub> S	E <sub>15</sub> S	19	25	21	32	33	22	G	34	G	G	20	20	25	21	27	24	20																									
15	23	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	18	18	20	23	25	30	J <sub>50</sub> A	J <sub>50</sub> A	J <sub>48</sub> A	J <sub>54</sub> A	32	31	29	19	20	E <sub>15</sub> S	E <sub>15</sub> S	J <sub>24</sub> A	30	J <sub>29</sub> A																									
16	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>14</sub> S	E <sub>15</sub> S	E <sub>15</sub> B	E <sub>14</sub> S	21	18	G	G	35	35	J <sub>51</sub> A	J <sub>45</sub> A	37	35	31	27	29	J <sub>24</sub> A	J <sub>27</sub> A	31	27	J <sub>20</sub> A																									
17	E <sub>15</sub> S	23	J <sub>31</sub> A	J <sub>26</sub> A	21	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	G	G	32	25	33	25	G	20	28	J <sub>27</sub> A	J <sub>34</sub> A	J <sub>27</sub> A	21	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S																									
18	21	E <sub>15</sub> S	21	21	E <sub>15</sub> B	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	G	G	31	36	35	31	25	G <sub>17</sub>	G	G	E <sub>15</sub> S	E <sub>15</sub> S	J <sub>21</sub> A	25	25	E <sub>15</sub> S																									
19	E <sub>15</sub> S	17	E <sub>14</sub> S	E <sub>15</sub> S	E <sub>14</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	G	G	31	37	J <sub>54</sub> A	33	33	24	27	G	17	23	J <sub>24</sub> A	23	E <sub>15</sub> S	20																									
20	E <sub>15</sub> S	20	E <sub>14</sub> S	E <sub>15</sub> S	E <sub>14</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	20	G	30	31	33	G	G	29	25	19	16	J <sub>24</sub> A	J <sub>24</sub> A	E <sub>14</sub> S	E <sub>14</sub> S	E <sub>15</sub> S	E <sub>15</sub> S																									
21	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> B	20	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>14</sub> S	G	29	33	39	35	34	G	39	27	G	21	J <sub>24</sub> A	21	E <sub>15</sub> S	E <sub>15</sub> S	20																									
22	J <sub>24</sub> A	21	E <sub>15</sub> S	21	E <sub>15</sub> S	21	19	18	18	28	29	33	G	G	G	G	G	G	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	21	20	21																									
23	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	J <sub>19</sub> A	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	G	J <sub>30</sub> A	35	34	37	35	G	G	J <sub>30</sub> A	J <sub>36</sub> A	24	24	20	19	17	E <sub>15</sub> S																									
24	E <sub>15</sub> S	E <sub>15</sub> S	20	J <sub>23</sub> A	21	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	G	31	34	J <sub>54</sub> A	31	27	27	26	28	32	J <sub>28</sub> A	J <sub>22</sub> A	J <sub>24</sub> A	J <sub>24</sub> A	J <sub>21</sub> A	22																									
25	E <sub>15</sub> S	18	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	J <sub>20</sub> A	J <sub>23</sub> A	21	G	30	31	34	37	J <sub>45</sub> A	26	36	34	J <sub>27</sub> A	J <sub>25</sub> A	J <sub>27</sub> A	J <sub>22</sub> A	E <sub>15</sub> S	E <sub>15</sub> S	J <sub>29</sub> A																									
26	E <sub>15</sub> S	E <sub>15</sub> S	25	J <sub>25</sub> A	E <sub>15</sub> B	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	25	C	30	27	33	34	G	24	G	G	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	22	22																									
27	20	20	E <sub>15</sub> S	E <sub>15</sub> S	20	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	G	G	G	33	31	31	25	20	G	J <sub>23</sub> A	J <sub>30</sub> A	J <sub>29</sub> A	27	24	20	E <sub>15</sub> S																									
28	19	20	16	E <sub>15</sub> S	E <sub>15</sub> B	E <sub>15</sub> S	E <sub>15</sub> S	18	25	22	32	31	G	G	28	G	16	G	17	J <sub>19</sub> A	22	E <sub>15</sub> S	23	E <sub>15</sub> S																									
29																																																	
30																																																	
31																																																	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																									
CNT	28	28	28	28	28	28	28	28	28	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28																									
MED	20	20	20	20	18	E <sub>15</sub> S	E <sub>15</sub> S	18	G	28	32	34	34	34	28	30	28	22	22	22	21	22	22	20																									
UQ	21	21	24	23	21	20	17	21	25	30	34	36	37	37	34	35	30	J <sub>27</sub> A	27	J <sub>24</sub> A	24	26	25	22																									
LQ	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> B	E <sub>15</sub> S	E <sub>15</sub> S	E <sub>15</sub> S	G	G	30	31	31	29	E <sub>23</sub> G	18	G	G	18	18	19	E <sub>15</sub> S	18	E <sub>15</sub> S																									

FEB. 1977

FOES (0.1 MHz)

# IONOSPHERIC DATA

FEB. 1977

FBES (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station **YAMAGAWA** Lat. **31° 12.1' N**, Long. **130° 37.1' E** Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E	E	E	E	E	E	E <sub>15</sub>	G	G	30	33	33	G	G	G	G <sub>27</sub>	G	G	G	E	E	E	E	E	
2	E	E	E	E	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	G	35	G	G	38	G	26	18	G	E <sub>15</sub>	E	A <sub>36</sub>	A	E	
3	E	E	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	G	34	33	G	G	G	32	G	20	24	21	A <sub>50</sub>	A	E	
4	E	16	E	E	E	E <sub>15</sub>	E <sub>15</sub>	G	G	G	33	G <sub>25</sub>	G <sub>26</sub>	38	35	33	27	17	16	E	E <sub>14</sub>	E <sub>15</sub>	E	E <sub>15</sub>	
5	E	E	E	E <sub>15</sub>	E	16	G	17	26	22	25	30	36	40	33	36	G	23	G	26	A <sub>40</sub>	21	E	E <sub>15</sub>	
6	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	G	27	G	G	37	37	G	31	31	G	18	E	E	E	
7	E	20	E	E	15	E	G	G	15	43	29	30	31	34	39	29	32	35	50	31	19	21	22	19	
8	E	E	E	E	20	E <sub>15</sub>	E <sub>15</sub>	G	G	20	33	36	G	34	G <sub>22</sub>	G	G	27	25	16	22	E	E	E	
9	E	E	E	21	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	G	36	40	G	56	33	42	33	G	25	17	E	20	E	16	E	
10	30	E	21	E	E <sub>15</sub>	E	A <sub>26</sub>	25	25	A <sub>83</sub>	30	28	30	34	38	29	28	23	30	17	E	17	E	E <sub>15</sub>	
11	18	E	E <sub>15</sub>	E	E	E	E <sub>15</sub>	20	26	30	32	33	27	33	33	G	28	20	E <sub>15</sub>	E <sub>14</sub>	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
12	E <sub>15</sub>	E	E	E	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	19	27	29	30	33	33	G	32	27	22	G	17	16	16	E	E	
13	17	E	E	E	E <sub>15</sub>	E	E <sub>15</sub>	G	G	G	25	G <sub>27</sub>	G <sub>27</sub>	G	G <sub>24</sub>	27	30	27	21	18	E	E	E	20	
14	18	17	E	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	21	30	33	G <sub>22</sub>	G	34	G	G	20	G	E	E	24	18	E	
15	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	17	G	G	25	28	43	40	35	51	30	30	29	19	G	E <sub>15</sub>	E <sub>15</sub>	E	E	19	
16	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	G	G	G	G	32	32	34	34	30	35	30	27	27	20	23	23	E	E	
17	E <sub>15</sub>	E	21	17	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	32	25	33	25	G	20	28	27	32	23	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
18	E	E <sub>15</sub>	E	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	28	33	35	28	G <sub>25</sub>	G <sub>17</sub>	G	G	E <sub>15</sub>	E <sub>15</sub>	E	E	E	E <sub>15</sub>	
19	E <sub>15</sub>	E	E <sub>14</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	G	33	33	33	32	G <sub>24</sub>	25	G	G	E	17	E	E <sub>15</sub>	E	
20	E <sub>15</sub>	E	E <sub>14</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	29	G	33	G	G	G <sub>28</sub>	G <sub>25</sub>	19	G <sub>16</sub>	16	E	E <sub>14</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	
21	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	G	29	32	35	35	34	G	29	G <sub>20</sub>	G	G	20	E	E <sub>15</sub>	E <sub>15</sub>	E	
22	E	E	E <sub>15</sub>	E	E <sub>15</sub>	E	G	G	G	17	28	G <sub>28</sub>	G	G	G	G	G	G	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E	E	
23	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	16	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	33	32	34	35	G	G	28	27	21	E	E	E	E	E <sub>15</sub>	
24	E <sub>15</sub>	E <sub>15</sub>	E	E	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	G	43	G <sub>31</sub>	G <sub>27</sub>	G <sub>25</sub>	28	28	26	18	16	18	E	E	E	
25	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	20	G	G	G	G	33	35	36	G <sub>26</sub>	26	28	23	23	24	21	E <sub>15</sub>	E <sub>15</sub>	E	
26	E <sub>15</sub>	E <sub>15</sub>	18	16	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	G	27	33	29	G	G <sub>24</sub>	G	G	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E	
27	E	E	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	G	33	29	29	G <sub>25</sub>	G <sub>20</sub>	G	20	29	27	21	16	E	E <sub>15</sub>	
28	E	E	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	G	21	G <sub>22</sub>	31	G <sub>30</sub>	G	G	G <sub>28</sub>	G	G <sub>16</sub>	G	17	17	E	E <sub>15</sub>	16	E <sub>15</sub>	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	28	28	28	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	15	E	E <sub>14</sub>	15	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	G	21	29	32	32	33	G <sub>26</sub>	G <sub>25</sub>	26	20	16	16	E <sub>14</sub>	15	E	E	
UQ	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	16	28	32	33	34	34	33	30	28	24	24	20	20	18	15	E <sub>15</sub>	
LQ	E	E	E	E	E	E <sub>14</sub>	E <sub>15</sub>	G	G	G	G	G	G <sub>28</sub>	G <sub>24</sub>	G	G	G	G	G	E	E	E	E	E	

The Radio Research Laboratories, Japan

FEB. 1977

FBES (0.1 MHz)

# IONOSPHERIC DATA

FEB. 1977

F-MIN (0.1 MHz)

135° E Mean Time (G. M. T. + 9 h)

Station		YAMAGAWA							Lat. 31 12.1 N, Long. 130 37.1 E		Sweep 1 MHz to 20 MHz in 20 sec in automatic operation															
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	15	15	15	15	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>		
2	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	14	15	15	15	16	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
3	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	15	15	15	15	16	15	15	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
4	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	14	15	15	15	15	15	15	14	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
5	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	E <sub>15</sub>	E <sub>15</sub>	15	14	14	14	14	15	15	14	14	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
6	E <sub>15</sub>	E <sub>15</sub>	14	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	14	13	14	15	15	15	14	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
7	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	12	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	14	15	14	15	14	15	14	15	15	14	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
8	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	14	14	15	15	15	15	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
9	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	15	15	15	16	16	15	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
10	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	15	E <sub>17</sub>	E <sub>18</sub>	E <sub>17</sub>	E <sub>17</sub>	15	14	13	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
11	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	15	15	15	15	14	E <sub>20</sub>	15	14	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
12	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	14	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	14	13	15	15	E <sub>21</sub>	E <sub>21</sub>	E <sub>25</sub>	16	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
13	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	14	15	15	15	E <sub>17</sub>	15	15	15	15	14	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
14	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	14	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	15	16	16	E <sub>18</sub>	E <sub>17</sub>	16	16	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	15	16	E <sub>23</sub>	E <sub>23</sub>	E <sub>21</sub>	E <sub>20</sub>	16	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
16	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	15	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	14	14	15	16	16	E <sub>19</sub>	E <sub>19</sub>	15	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
17	E <sub>15</sub>	E <sub>15</sub>	15	15	13	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	14	14	14	E <sub>20</sub>	E <sub>20</sub>	15	14	15	14	15	E <sub>14</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
18	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	15	E <sub>20</sub>	E <sub>22</sub>	E <sub>20</sub>	E <sub>21</sub>	15	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
19	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	14	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	15	16	E <sub>17</sub>	E <sub>21</sub>	E <sub>21</sub>	15	14	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
20	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	14	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	14	15	15	16	E <sub>22</sub>	E <sub>25</sub>	E <sub>19</sub>	E <sub>21</sub>	15	15	E <sub>15</sub>	E <sub>14</sub>	E <sub>14</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
21	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	14	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	14	14	E <sub>17</sub>	E <sub>17</sub>	E <sub>21</sub>	E <sub>18</sub>	E <sub>17</sub>	14	15	14	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
22	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	14	14	15	15	15	15	E <sub>18</sub>	15	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
23	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	14	14	15	15	15	15	16	15	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
24	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	15	16	E <sub>17</sub>	15	15	15	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
25	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	E <sub>20</sub>	15	E <sub>21</sub>	15	E <sub>23</sub>	E <sub>23</sub>	E <sub>20</sub>	15	14	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
26	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	E <sub>22</sub>	15	E <sub>21</sub>	E <sub>17</sub>	E <sub>22</sub>	E <sub>21</sub>	15	14	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
27	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	16	E <sub>23</sub>	E <sub>22</sub>	E <sub>23</sub>	E <sub>21</sub>	15	15	14	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
28	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	E <sub>17</sub>	E <sub>23</sub>	E <sub>21</sub>	E <sub>23</sub>	E <sub>21</sub>	15	14	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
29																										
30																										
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	28	28	28	28	28	28	28	28	28	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	
MED	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	15	15	15	16	15	15	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
UQ	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	15	15	15	16	E <sub>21</sub>	E <sub>20</sub>	E <sub>21</sub>	16	15	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	
LQ	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	14	14	15	15	15	15	15	15	15	14	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	

FEB. 1977

F-MIN (0.1 MHz)

### IONOSPHERIC DATA

FEB. 1977

M(3000)F2 (0.01)

135° E Mean Time (G. M. T. + 9 h)

Station **YAMAGAWA** Lat. **31° 12.1' N**, Long. **130° 37.1' E** Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	310 <sup>S</sup>	300 <sup>S</sup>	330	325	335	280	280	U300 <sup>S</sup>	345	370	355	355	355	335	345	360	325	365	370	345	335	305	305 <sup>F</sup>	305 <sup>S</sup>	
2	310 <sup>S</sup>	305	295	U300 <sup>S</sup>	330	360 <sup>S</sup>	360	320	370	360	350	305	335	305	355	360 <sup>S</sup>	345	375	335	335	U360 <sup>S</sup>	A	U320 <sup>S</sup>	U300 <sup>S</sup>	
3	U325 <sup>S</sup>	315	335	335 <sup>F</sup>	325 <sup>S</sup>	290	290	335	U355 <sup>S</sup>	355	365	320	325	360	355 <sup>S</sup>	345	355	360	360	I355 <sup>S</sup>	I350 <sup>S</sup>	A	305 <sup>S</sup>	310 <sup>S</sup>	
4	U330 <sup>S</sup>	315	325	U350 <sup>S</sup>	345	320 <sup>S</sup>	305	330	345	355	350	315	325	335	350	365	355	345	365	370 <sup>S</sup>	280	295 <sup>S</sup>	305 <sup>S</sup>	300	
5	305	305	290	F	300 <sup>S</sup>	300	310	310 <sup>S</sup>	335 <sup>S</sup>	335	320	335	335	330	340	365	360 <sup>V</sup>	385	360	I330 <sup>S</sup>	A	365 <sup>S</sup>	335	F	
6	300	F	F	F	320 <sup>S</sup>	335	370	335 <sup>S</sup>	355	340	360	335	315	310	330	350	365	375	365	335	335	320	280	F	
7	290 <sup>S</sup>	270 <sup>S</sup>	290	315	345 <sup>S</sup>	275	295 <sup>F</sup>	325	345 <sup>S</sup>	370	345	345	340	320	330	360	365	335	350	355	320 <sup>S</sup>	300	275	S	
8	S	S	290 <sup>S</sup>	330	335	305	280	320	385	360	335	335	335	350	340	315	345	355	360	340	340	335	290	285	
9	300 <sup>S</sup>	300	U285 <sup>S</sup>	305	335	330 <sup>S</sup>	320 <sup>S</sup>	U370 <sup>S</sup>	385	345	335	315	315	325	340	350	355 <sup>S</sup>	355	370	I335 <sup>S</sup>	335	290 <sup>S</sup>	340 <sup>S</sup>	315 <sup>S</sup>	
10	325 <sup>S</sup>	325	290	320	350	325	A	360 <sup>S</sup>	345	A	315 <sup>V</sup>	345	345	330	325	335	365	355	335	325 <sup>S</sup>	360 <sup>S</sup>	345 <sup>S</sup>	340 <sup>S</sup>	295 <sup>S</sup>	
11	I335 <sup>S</sup>	300	300 <sup>S</sup>	355	350	285	290	350 <sup>S</sup>	370	350	360	365	345	325	335	345	345	355	335 <sup>S</sup>	335 <sup>S</sup>	310 <sup>S</sup>	320 <sup>S</sup>	315 <sup>S</sup>	295 <sup>S</sup>	
12	290 <sup>S</sup>	300	325 <sup>S</sup>	300	325	320	310	335	340	350	365	360 <sup>H</sup>	315	355	350	325	350	350	345	360	325	310	315	315	
13	300	305	335	335	315 <sup>F</sup>	F	295 <sup>S</sup>	315 <sup>S</sup>	370	375	355	365	355	335	335	355	375	360	350	340 <sup>S</sup>	340	335 <sup>S</sup>	315	315 <sup>S</sup>	
14	320	300	315	325	360	260	305	365 <sup>S</sup>	375	365	310	340	340	325	320	355	345	360	350	U305 <sup>S</sup>	310 <sup>S</sup>	325 <sup>S</sup>	310	290 <sup>S</sup>	
15	270 <sup>S</sup>	295 <sup>S</sup>	295 <sup>S</sup>	315 <sup>S</sup>	365 <sup>S</sup>	280	285	310 <sup>S</sup>	350 <sup>S</sup>	325	330	345	355	340	355	350	355	360	335	335	345	315	I305 <sup>S</sup>	315 <sup>S</sup>	
16	295 <sup>F</sup>	315 <sup>F</sup>	305 <sup>S</sup>	305 <sup>S</sup>	335 <sup>S</sup>	350	325 <sup>F</sup>	340	350	360	345 <sup>S</sup>	340	310	335	330	340	355	340	340 <sup>S</sup>	345	310	305	305	305 <sup>F</sup>	
17	300 <sup>S</sup>	305	305	305 <sup>S</sup>	345	295	335	345	375 <sup>S</sup>	365	345	335	340	360	345	345	355	345	350	345 <sup>S</sup>	325	285 <sup>S</sup>	300 <sup>S</sup>	295 <sup>S</sup>	
18	295 <sup>S</sup>	305	290 <sup>S</sup>	I300 <sup>S</sup>	345	325	290	345	355	355	320	335	315	320	340	325	330	345	350	340 <sup>S</sup>	315	285 <sup>S</sup>	310 <sup>S</sup>	305 <sup>S</sup>	
19	305 <sup>S</sup>	305	295 <sup>S</sup>	310 <sup>S</sup>	325 <sup>S</sup>	310	335	350 <sup>S</sup>	365	360	335	315	335	315	320	320	345	355	350	340	285 <sup>S</sup>	315	305	F	
20	300 <sup>F</sup>	285 <sup>F</sup>	285 <sup>F</sup>	315 <sup>F</sup>	340 <sup>S</sup>	320	305 <sup>F</sup>	345	370	355	335	315	325	330	320	320	335	360	350	335 <sup>S</sup>	300	345 <sup>S</sup>	300 <sup>S</sup>	295	
21	290	280	305 <sup>S</sup>	340 <sup>S</sup>	345	285	305	315	380	355	355	350	335	325	320	325	335	360	350 <sup>S</sup>	315 <sup>S</sup>	U225 <sup>S</sup>	320 <sup>S</sup>	335 <sup>S</sup>	295 <sup>S</sup>	
22	290 <sup>S</sup>	U295 <sup>S</sup>	I315 <sup>S</sup>	310	325	340	300	335 <sup>S</sup>	350 <sup>S</sup>	350	340	335	360	345	330	345	355	350	350	U335 <sup>S</sup>	340	305	300	315	
23	300	305	330 <sup>S</sup>	325	340	315	310	355	350	355	345	305	325	330	330	340	350	355	355	U340 <sup>S</sup>	U335 <sup>S</sup>	U325 <sup>S</sup>	340 <sup>S</sup>	310 <sup>S</sup>	
24	U300 <sup>S</sup>	U325 <sup>S</sup>	345 <sup>S</sup>	315	F	U285 <sup>S</sup>	315	U370 <sup>S</sup>	370	330	315	340	325	320	340	325	340	360	370	360 <sup>S</sup>	290	U310 <sup>S</sup>	I325 <sup>S</sup>	325	
25	295	290	345	340	350	300	A	340 <sup>S</sup>	380	365	330	310	320	350	335	315	350	360	360	335 <sup>S</sup>	310	320 <sup>S</sup>	300 <sup>S</sup>	300	
26	F	U300 <sup>S</sup>	I315 <sup>S</sup>	345	345 <sup>S</sup>	285	305	335	365	I340 <sup>C</sup>	340	320	335	335	340	360 <sup>C</sup>	345	360	365	I330 <sup>C</sup>	340	I300 <sup>C</sup>	310	285	
27	295 <sup>S</sup>	I295 <sup>C</sup>	310	330	335	305	325	360	365	340	350	325	330	325	335	345	360	360	365	335	325	310 <sup>S</sup>	310	305	
28	315	280 <sup>S</sup>	295 <sup>S</sup>	310	335	340	290	345	370	340	345	325	320	340	330	350	345	355	350	345 <sup>S</sup>	315 <sup>S</sup>	300 <sup>S</sup>	290 <sup>S</sup>	320 <sup>S</sup>	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	26	26	27	26	27	27	26	28	28	27	28	28	28	28	28	28	28	28	28	28	28	27	26	28	24
MED	300 <sup>S</sup>	300	305 <sup>S</sup>	318	335	305	305	338	365	355	345	335	335	330	335	345	350	358	350	338 <sup>S</sup>	325	312 <sup>S</sup>	308 <sup>S</sup>	305 <sup>S</sup>	
UQ	310 <sup>S</sup>	305	325	335	345	325	320	350	370	360	352	345	340	340	342	355	355	360	362	345 <sup>S</sup>	340	325 <sup>S</sup>	318 <sup>S</sup>	315 <sup>S</sup>	
LQ	295 <sup>S</sup>	295	292 <sup>S</sup>	310	328	285	290	322	350	342	332	318	322	325	330	325	345	352	350	335 <sup>S</sup>	310	300 <sup>S</sup>	300	295	

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M(3000)F2 (0.01)

### IONOSPHERIC DATA

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M(3000)F1 (0.01)

135° E Mean Time (G. M. T. + 9 h)

Station	YAMAGAWA																							
	Lat. 31° 12.1' N, Long. 130° 37.1' E												Sweep 1 MHz to 20 MHz in 20 sec in automatic operation											
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	L	380	375	385	L	L							
2									L	L	L	L	370	L	L	L	L							
3								L	L	L	L	L	L	L	L	L	A							
4								L	L	L	L	L	365	L	365	L	L							
5								L	L	L	L	L	365	385	380	405	L							
6								L	L	L	L	365	345	360	360	375	L							
7								L	A	L	L	L	L	L	L	L	A							
8								450	L	L	L	U L 370	U L 350	L	L	U L 380	L							
9								L	A	L	L	U L 380	A	U L 350	L	L	L							
10								L	A	L	L	L	L	365	370	L	L	L						
11										380	L	L	385	L	L	L	L							
12								405	L	U L 395	L	L	375	365	L	L	L							
13								L	L	L	L	L	L	L	415	L	L	L						
14								L	L	L	L	L	L	L	L	L	L							
15								L	L	L	L	L	390	A	385	L	L	440						
16								445	445	L	425	L	L	370	L	L	A							
17								L	L	L	L	360	L	380	L	L								
18								L	L	U L 370	U L 370	390	370	370	L	L								
19								415	L	380	385	380	390	370	365	L	L							
20								L	L	370	370	365	360	L	L	L								
21								L	L	L	L	375	L	L	L	L	L							
22								L	L	360	370	335	370	390	355	L	L							
23								L	L	L	U L 350	U L 375	365	365	360	L	L							
24								415	L	U L 375	A	L	U L 360	L	U L 375	355								
25								L	L	L	L	370	375	385	365	385	L							
26									L	370	385	355	375	385	395	L	L							
27								L	L	L	385	365	375	365	370	385	L							
28								L	L	L	L	L	400	395	L	L	L							
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									5	1	6	11	19	16	18	11	3	1						
MED									415	445	378	370	370	375	370	370	385	440						
UQ									445		380	385	378	380	385	378	385							
LQ									415		370	370	362	365	365	365	370							

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M(3000)F1 (0.01)

# IONOSPHERIC DATA

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H<sup>1</sup>F<sup>2</sup> (KM)

135° E Mean Time (G. M. T. + 9 h)

Station **YAMAGAWA** Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										235	230	250	240	255	250	240	225							
2										225	240	255	275	240	235	240	225							
3									240	230	230	280	275	235	235	245	235							
4										245	235	275	285	265	245	240	230							
5										235	255	240	255	245	245	240	230							
6										225	250	285	295	280	270	240	240							
7									225	<sup>E A</sup> 230	250	260	255	290	275	230	230							
8									220	230	265	250	250	255	250	265	240							
9									200	240	260	275	280	275	250	240	225							
10									255	<sup>A</sup>	225	250	255	270	265	250	220	220						
11										255	235	245	310	275	255	240								
12									240	255	240	235	290	250	245	240	230	255						
13									225	225	240	240	250	275	260	240	230	225						
14										225	270	255	250	270	275	250	240	225						
15										230	265	245	240	265	250	250	245	230						
16									225	225	250	245	245	255	255	245	225	225						
17										240	275	270	255	245	265	250	245							
18										250	290	260	285	255	245	275	255	230						
19									225	225	280	300	255	275	260	245	230	225						
20										245	280	295	255	250	255	270	250	225						
21										245	250	255	270	255	280	260	255	230						
22										245	245	255	255	240	260	260	255	250	230					
23										250	250	255	305	275	255	250	250	235						
24										225	240	270	255	260	270	250	260							
25										240	275	295	275	245	240	255	240	220						
26										<sup>c</sup>	270	280	255	255	250	240	250	230						
27										230	250	255	290	280	260	260	250	240	230					
28										225	250	255	305	290	250	270	250	230						
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									14	25	28	28	28	28	28	28	28	16						
MED									225	240	255	258	255	255	252	250	240	230						
UQ									240	245	270	282	278	270	265	252	250	230						
LQ									225	230	245	250	250	250	248	240	230	225						

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H<sup>1</sup>F<sup>2</sup> (KM)



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

135° E Mean Time (G. M. T. + 9 h)

Station **YAMAGAWA** Lat. **31° 12.1' N**, Long. **130° 37.1' E** Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	255	270	230	240	230	E <sub>325</sub> S	295	245	210	235	225	195 <sup>H</sup>	210	200	200	190 <sup>H</sup>	200	215	210	200	225	250	E <sub>310</sub> S	E <sub>325</sub> S
2	295	285	265	285	255	220	210	245	230	220	205 <sup>H</sup>	205	180 <sup>H</sup>	210	E <sub>250</sub> A	220	200	245	235	205	215	A	250	300
3	275	270	230	250	250	300	285	250	225	210	210	200	180 <sup>H</sup>	175 <sup>H</sup>	225	200	A	215	220	220	E <sub>240</sub> A	A	280	270
4	255	260	255	225	240	255	280	230	225	230	230	205	200	E <sub>250</sub> A	225	215	205	230	205	200	E <sub>250</sub> S	270	280	290
5	265	250	285	250	255	255	275	250	245	205	195 <sup>H</sup>	185 <sup>H</sup>	A	E <sub>240</sub> A	200	210	175 <sup>H</sup>	210	205	225	A	240	205	250
6	250	280	255	245	240	210	200	240	190 <sup>H</sup>	175	235	225	230	245	215 <sup>H</sup>	205	225	205	205	200	210	250	E <sub>300</sub> S	290
7	305	E <sub>350</sub> A	290	240	230	E <sub>275</sub> S	295	225	215	A	200 <sup>H</sup>	185 <sup>H</sup>	205	195 <sup>H</sup>	E <sub>250</sub> A	E <sub>240</sub> A	A	250	250	215	230	E <sub>320</sub> A	E <sub>350</sub> A	E <sub>320</sub> A
8	E <sub>300</sub> S	230	255	240	250	240	305	245	190	200 <sup>H</sup>	230	230	200	180 <sup>H</sup>	230	205	195 <sup>H</sup>	225	220	200	E <sub>240</sub> A	230	265	305
9	300	300	300	300	225	260	245	205	200	A	A	215	A	190 <sup>H</sup>	A	220	205	230	205	200	E <sub>255</sub> A	315	305	260
10	E <sub>300</sub> A	250	E <sub>350</sub> A	245	215	265	A	E <sub>275</sub> A	250	A	205	180 <sup>H</sup>	175 <sup>H</sup>	195	E <sub>235</sub> A	205	230	215	220	230	220	230	225	300
11	250	250	270	220	205	S	325	250	220	225	225 <sup>H</sup>	215	200	200	215	230	225 <sup>H</sup>	225	210	210	240	245	245	295
12	295	290	240	250	225	265	E <sub>250</sub> S	245	200	200 <sup>H</sup>	175 <sup>H</sup>	205 <sup>H</sup>	200	200	200	210	205	190 <sup>H</sup>	220	205	220	240	245	250
13	275	250	250	250	250	300	255	240	225	190 <sup>H</sup>	180 <sup>H</sup>	175 <sup>H</sup>	180 <sup>H</sup>	190 <sup>H</sup>	195	210	225	225	205	220	205	240	250	250
14	E <sub>280</sub> A	295	250	245	210	E <sub>300</sub> S	E <sub>290</sub> S	210	205	190 <sup>H</sup>	190 <sup>H</sup>	200	200 <sup>H</sup>	200	215	205	205 <sup>H</sup>	210	205	205	250	220	250	280
15	320	280	280	250	205	E <sub>340</sub> A	300	230	220	210	A	A	225	A	200	205	200	200	220	220	200	240	245	290
16	300	275	250	245	235	205	225	205	190	195	210	185	180 <sup>H</sup>	200 <sup>H</sup>	225	225	205 <sup>H</sup>	A	230	200	E <sub>250</sub> A	E <sub>270</sub> A	255	285
17	270	240	E <sub>300</sub> A	275	235	250	240	230	220	205 <sup>H</sup>	190 <sup>H</sup>	185 <sup>H</sup>	190 <sup>H</sup>	200 <sup>H</sup>	205	225 <sup>H</sup>	210	210	225	220	230	270	250	275
18	295	270	275	250	225	225	275	200	225	235	200 <sup>H</sup>	200 <sup>H</sup>	205	200 <sup>H</sup>	215	205	220	210 <sup>H</sup>	210	200	225	295	250	290
19	290	320	280	250	225	245	240	210	200 <sup>H</sup>	205 <sup>H</sup>	190 <sup>H</sup>	200 <sup>H</sup>	225	200 <sup>H</sup>	195	225	210	210	200 <sup>H</sup>	200	275	235	250	300 <sup>F</sup>
20	250	300	280	280	230	E <sub>250</sub> S	250	225	225	210	210	205	200	210	200	200 <sup>H</sup>	205 <sup>H</sup>	225	205	210	210	210	230	280
21	300	300	255	210	245	E <sub>295</sub> S	E <sub>280</sub> S	245	220	200 <sup>H</sup>	185 <sup>H</sup>	205	200	190 <sup>H</sup>	200	200	205	235 <sup>H</sup>	200	225	240	230	225	250
22	300	270	250	260	240	220	E <sub>275</sub> S	230	220	220	210	205	200	185	190	195	205	220	220	220	215	270	255	275
23	300	280	255	250	225	255	E <sub>290</sub> S	235	220	225	220	200	200	220	205	205	200	200	220	220	255	245	250	275
24	300	295	240	250	305	325	255	205	205	220	210	A	185 <sup>H</sup>	190	180 <sup>H</sup>	210	205	230	215	205	245	260	230	250
25	295	280	225	220	215	E <sub>290</sub> S	A	220	205	195 <sup>H</sup>	195 <sup>H</sup>	200 <sup>H</sup>	205	220	205	200	200	210	205	230	225	210	275	290
26	300	300	250	215	215	E <sub>310</sub> S	E <sub>250</sub> S	225	225	J <sub>215</sub> C	200	190 <sup>H</sup>	185 <sup>H</sup>	210	200	200	200	205	210 <sup>H</sup>	210	210	225	270	290
27	280	290	250	230	225	240	240	210	210	180 <sup>H</sup>	210	195 <sup>H</sup>	180 <sup>H</sup>	215	195 <sup>H</sup>	205	200	205	210	250	250	255	255	255
28	255	290	280	250	225	200	E <sub>260</sub> S	220	220	200 <sup>H</sup>	195 <sup>H</sup>	190 <sup>H</sup>	180 <sup>H</sup>	200	200	195 <sup>H</sup>	200 <sup>H</sup>	200	210	205	E <sub>230</sub> S	250	300	265
29																								
30																								
31																								
CNT	28	28	28	28	28	27	26	28	28	25	26	26	26	27	27	28	26	27	28	28	27	26	28	28
MED	290	280	255	250	230	U <sub>240</sub>	U <sub>255</sub>	230	220	205	205	200	200	200	202	205	205	215	210	210	225	242	250	280
UQ	300	294	279	250	242	U <sub>276</sub>	290	245	225	220	210	205	205	208	218	215	210	225	220	220	242	262	269	291
LQ	264	265	250	240	225	236	242	215	205	200 <sup>H</sup>	195 <sup>H</sup>	190 <sup>H</sup>	180 <sup>H</sup>	192 <sup>H</sup>	200	200	200	208	205	200	216	230	245	262

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

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

135° E Mean Time (G. M. T. + 9 h)

Station **YAMAGAWA** Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	S	E A 120	E A 115	E A 125	100	100	100	100	E A 125	105	110	S					
2							S	S	120	105	105	E A 125	105	105	105	105	105	120	S					
3							S	S	120	105	105	105	100	100	100	105	105	115	S					
4							S	S	120	E A 120	E A 120	E A 120	E A 110	105	100	100	100	A	S					
5							S	S	A	E A 125	E A 120	100	E A 125	100	A	A	100	115	S					
6							S	S	120	105	100	100	100	100	100	100	100	105	S					
7							S	S	125	A	100	A	A	100	A	A	A	110	S					
8							S	S	135	E A 120	E A 115	E A 120	100	100	105	105	105	110	S					
9							S	S	110	105	105	105	100	100	A	E A 120	105	105	S					
10							S	S	A	A	A	E A 120	A	A	A	E A 125	E A 115	A	S					
11							S	S	120	E A 120	100	100	E A 120	E A 110	105	105	105	E A 110	S					
12							S	S	105	100	100	A	105	105	110	100	100	105	S					
13							S	S	110	100	E A 115	E A 115	E A 110	E A 110	105	E A 120	A	A	S					
14							S	S	E A 125	E A 115	A	A	E A 110	100	A	100	105	E A 120	S					
15							S	S	E A 125	110	100	100	100	A	110	A	A	E A 120	S					
16							S	S	115	105	105	A	A	A	E A 125	A	A	A	S					
17							S	S	105	105	110	E A 120	110	110	110	110	A	A	S					
18							S	S	110	105	E A 125	105	105	E A 120	E A 120	110	100	110	S					
19							S	S	110	105	100	100	100	100	100	110	110	105	S					
20							S	S	110	100	100	100	100	105	E A 120	110	105	110	S					
21							S	S	105	105	105	A	A	A	105	E A 120	E A 120	110	S					
22							S	S	E A 120	105	135	E A 120	100	105	105	105	105	110	S					
23							S	S	110	105	105	100	100	A	105	100	A	A	S					
24							S	S	105	105	100	100	A	E A 110	E A 110	E A 115	A	A	S					
25							S	S	105	100	100	A	A	A	E A 120	E A 120	A	A	S					
26							S	S	105	I C 105	105	E A 120	A	110	105	105	105	110	S					
27							S	S	115	105	100	100	E A 120	E A 120	E A 115	105	100	E A 125	S					
28							S	S	A	E A 110	E A 115	E A 120	105	105	E A 110	100	E A 110	110	S					
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									25	26	26	22	21	22	23	24	20	20						
MED									112	105	102	102	102	102	102	102	105	110						
UQ									120	E A 110	E A 115	E A 120	E A 110	108	E A 110	E A 118	105	112						
LQ									110	105	100	100	100	100	105	102	100	110						

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

# IONOSPHERIC DATA

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

135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

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

FEB. 1977

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

# IONOSPHERIC DATA

FEB. 1977

TYPES OF ES

135° E Mean Time (G. M. T. + 9 h)

Station **YAMAGAWA** Lat. **31° 12.1' N**, Long. **130° 37.1' E** Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

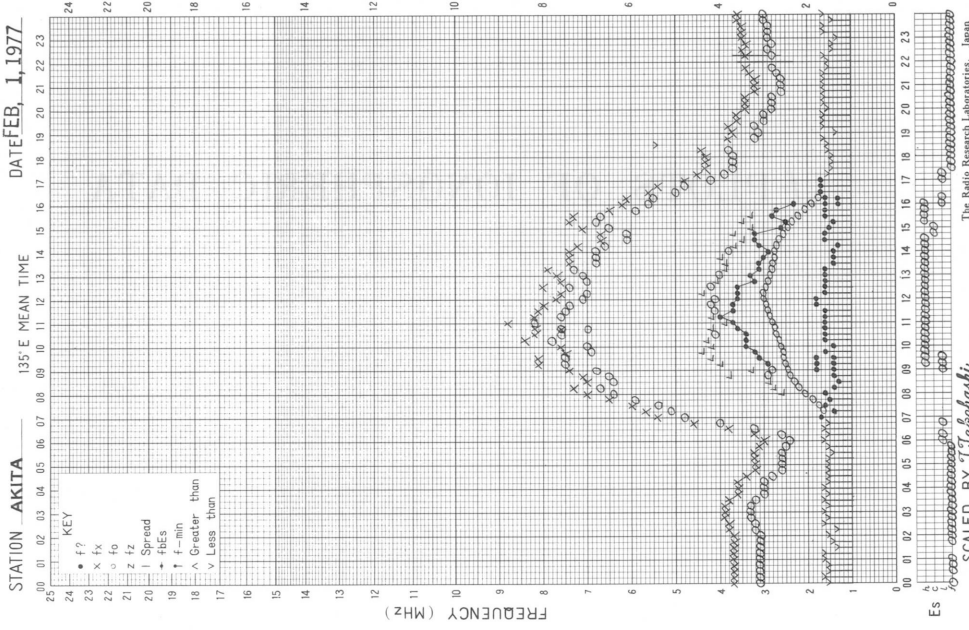
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2	F <sub>1</sub>	F <sub>1</sub>	F <sub>1</sub>	F <sub>2</sub>	F <sub>1</sub>						HL <sub>21</sub>	H <sub>1</sub>	H <sub>1</sub>	C <sub>1</sub>	C <sub>1</sub>	C <sub>1</sub>	L <sub>2</sub>	L <sub>2</sub>		F <sub>1</sub>	F <sub>5</sub>	F <sub>1</sub>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

FEB. 1977

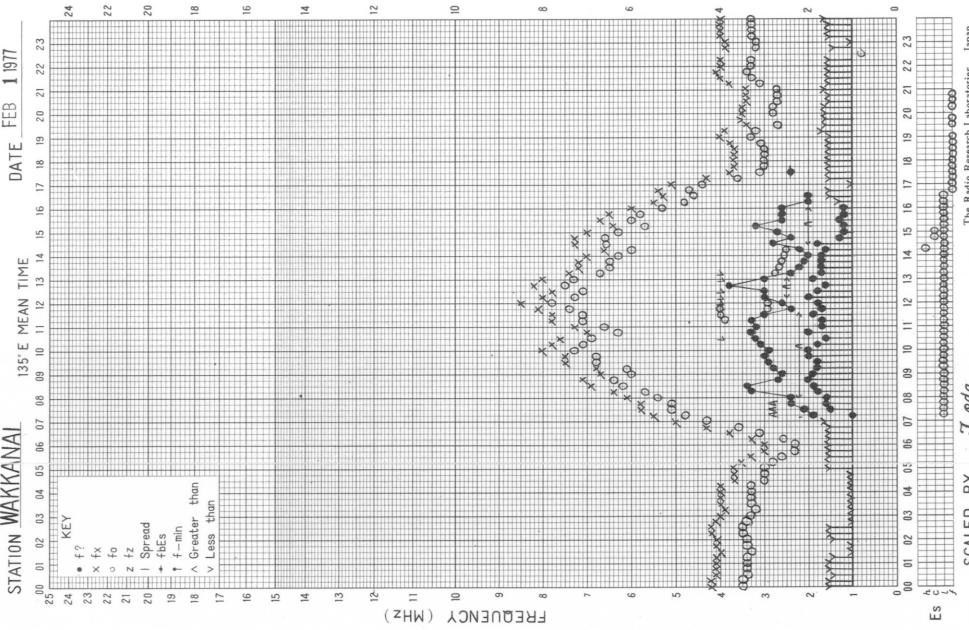
TYPES OF ES

$f$ -PLOTS OF IONOSPHERIC DATA

f-PLOT OF IONOSPHERIC DATA

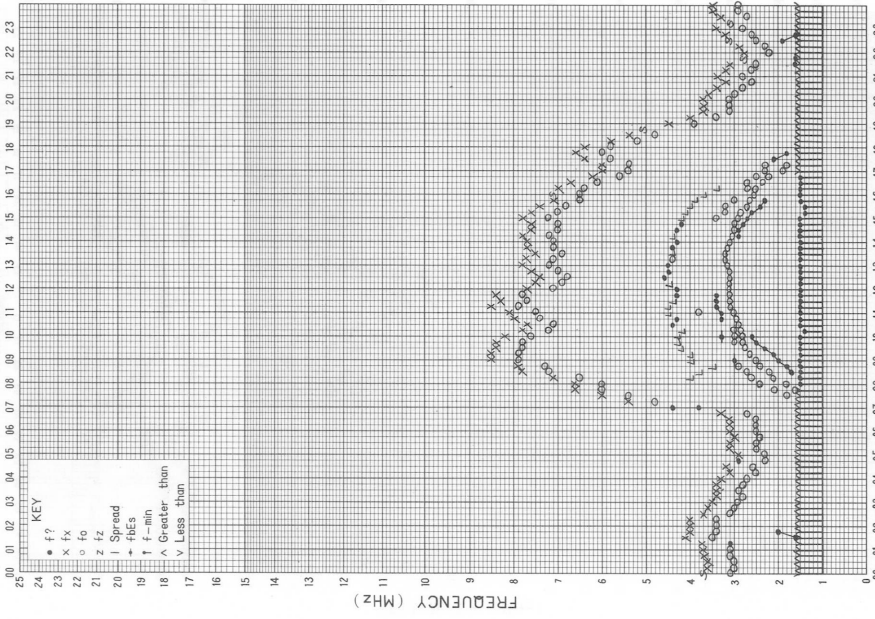


f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

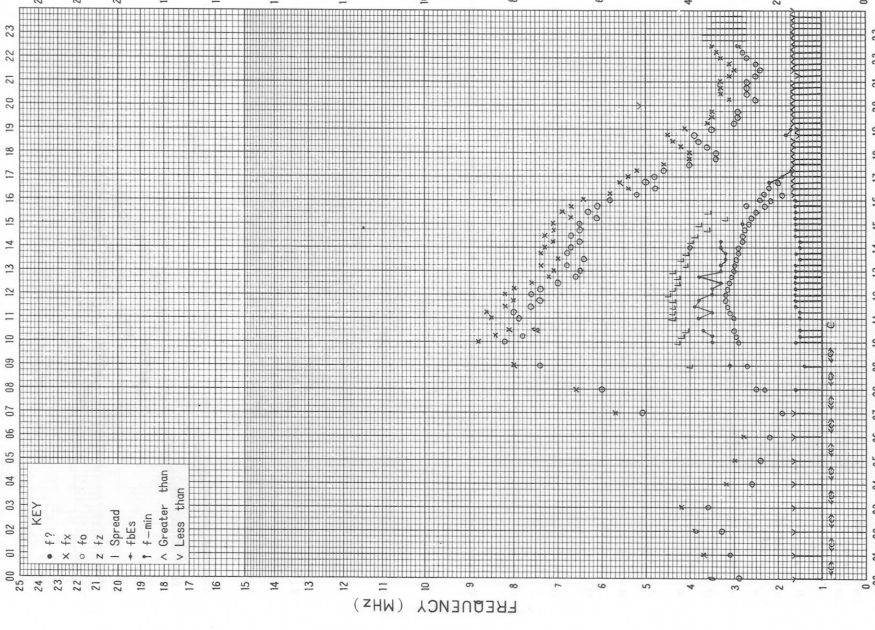
STATION YAMAGAWA 135°E MEAN TIME DATE FEB.-1, 1977



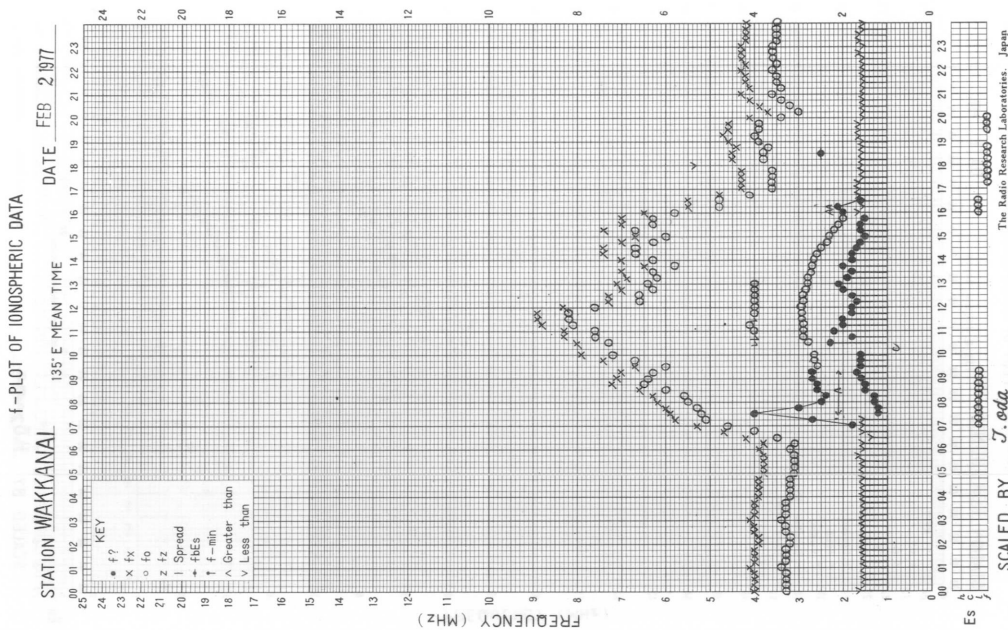
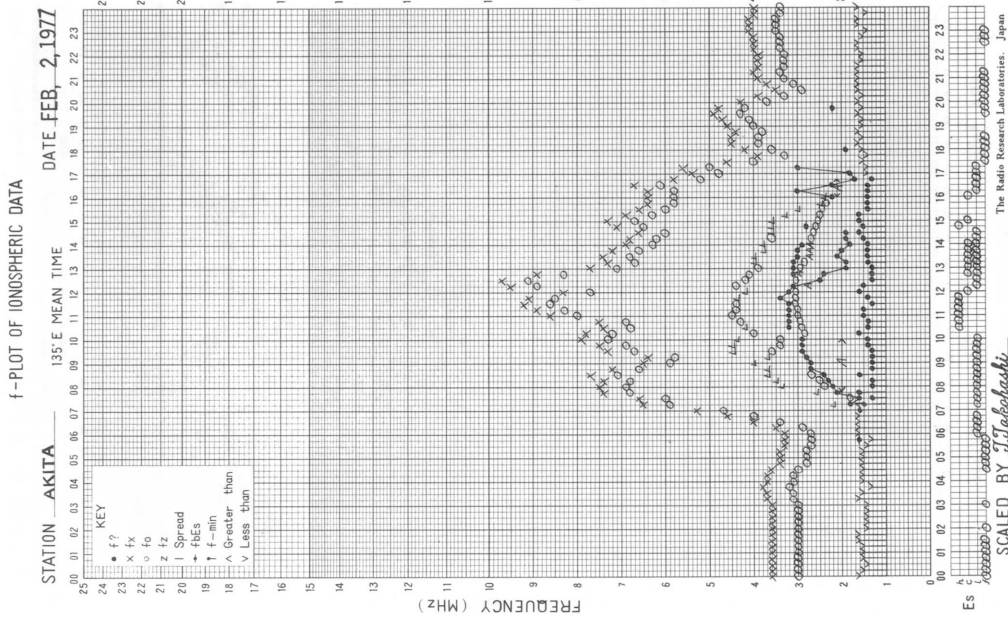
Es  
A  
C  
The Radio Research Laboratories, Japan  
SCALED BY S. Nakatama

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE FEB. 1, 1977



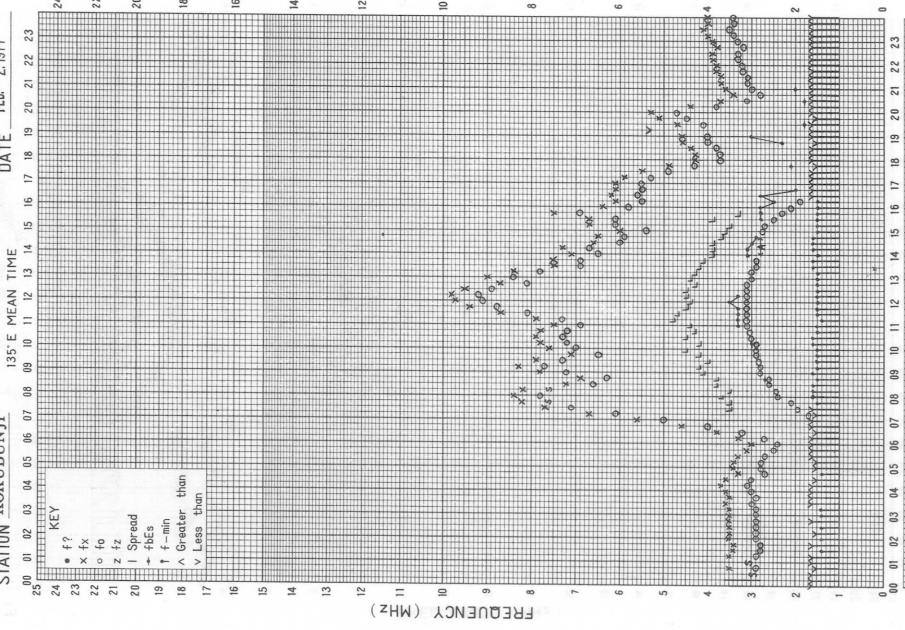
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The Radio Research Laboratories, Japan  
SCALED BY H. Ogama





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STATION KOKUBUNJI DATE FEB. 2, 1977

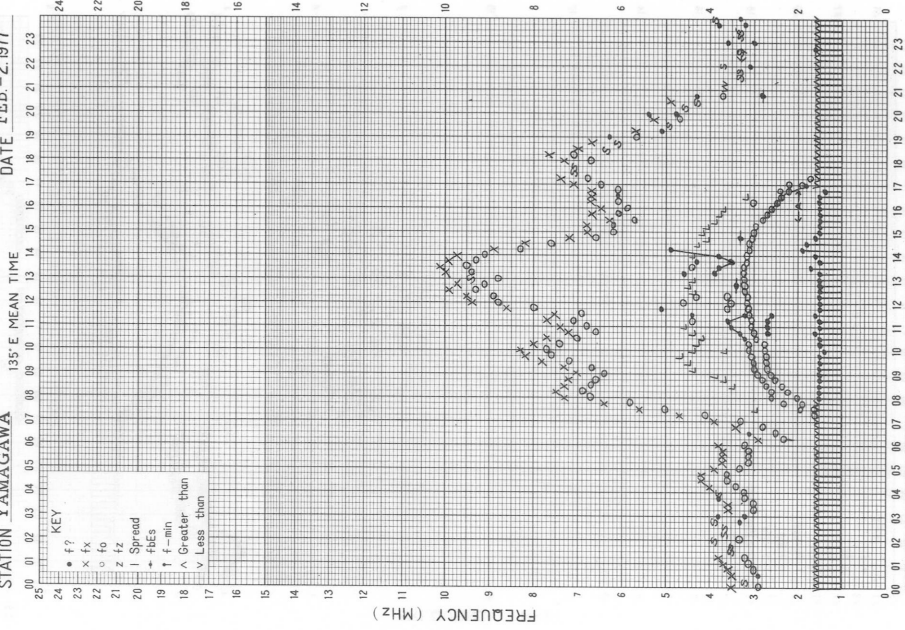


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 | Spread  
 + f<sub>min</sub>E<sub>s</sub>  
 T f<sub>min</sub>min  
 ^ Greater than  
 v Less than

ES  
 The Radio Research Laboratories, Japan  
 SCALED BY Y. Kawatani

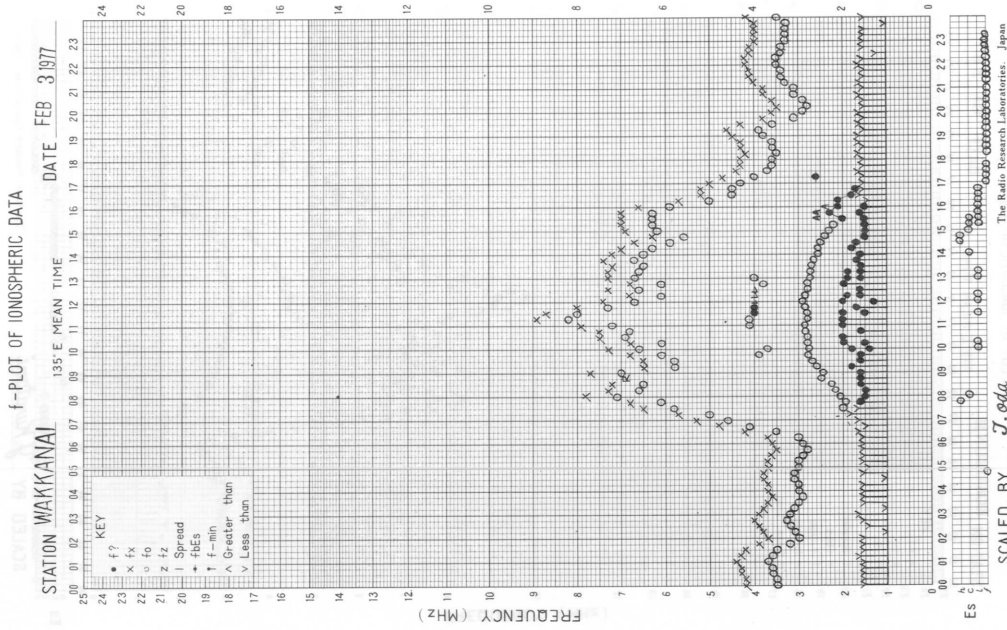
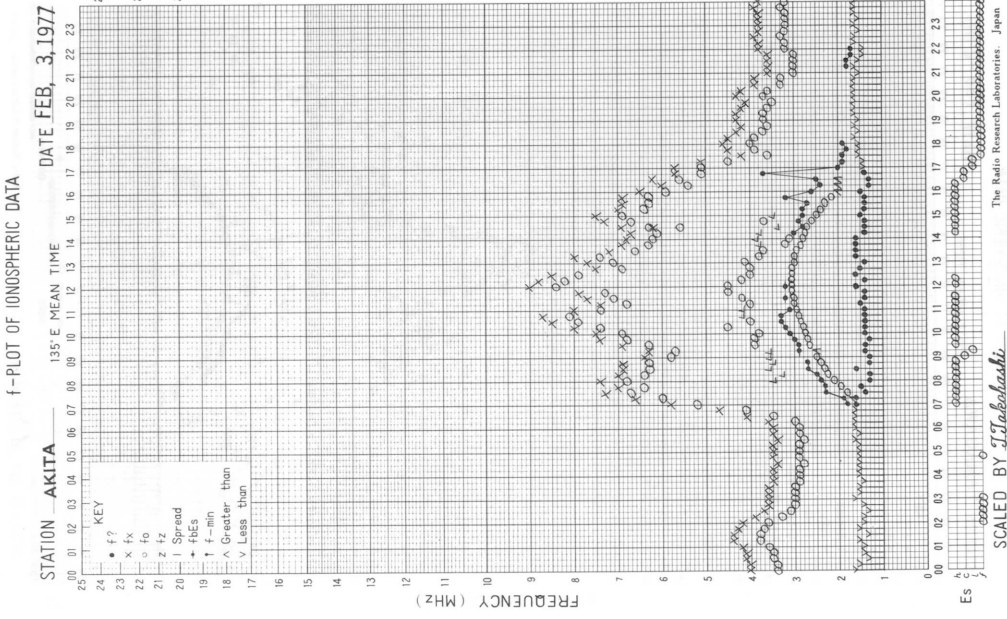
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STATION YAMAGAWA DATE FEB. -2, 1977

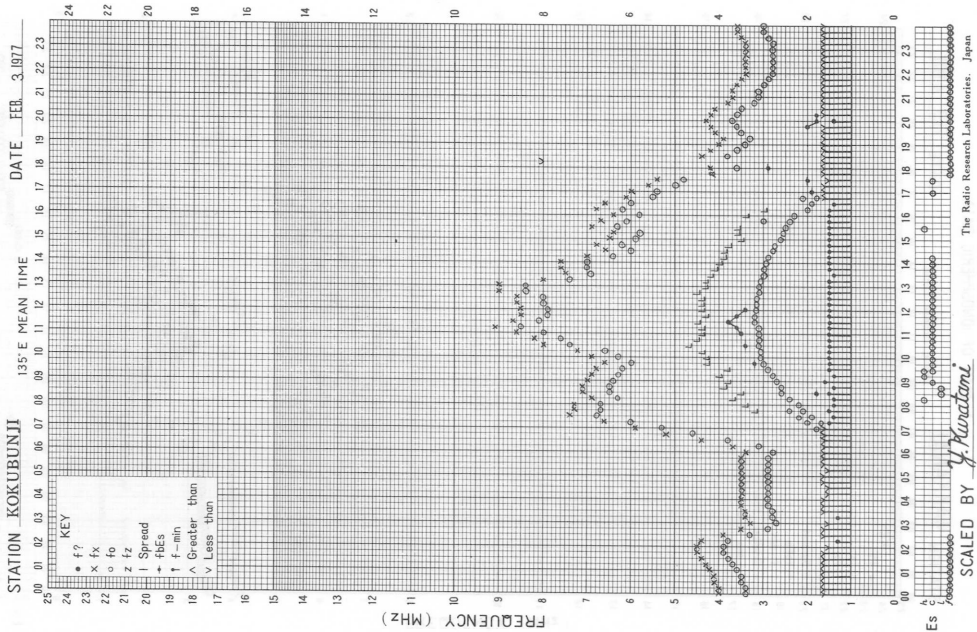


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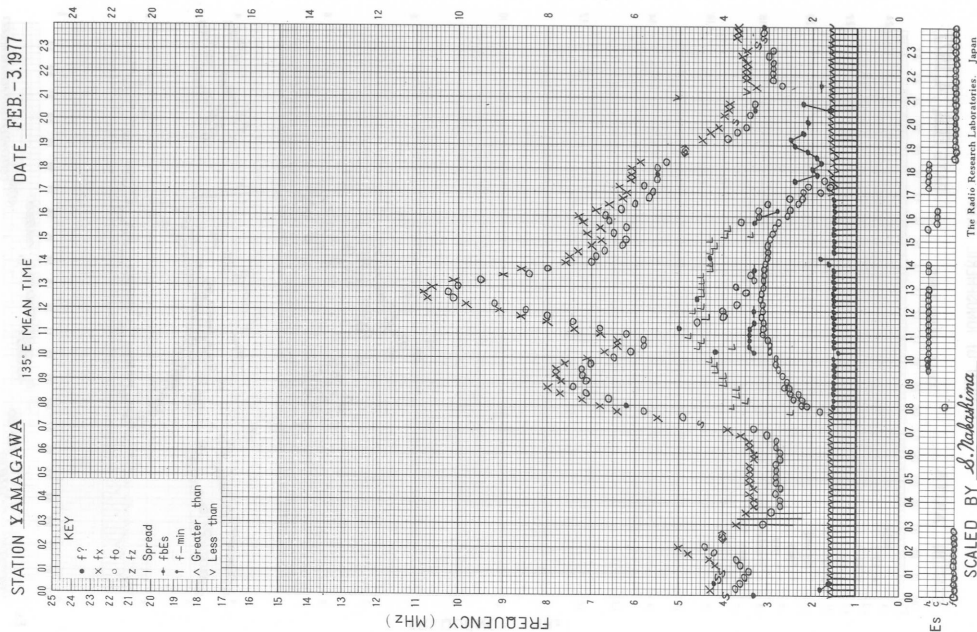
ES  
 The Radio Research Laboratories, Japan  
 SCALED BY S. Nakamura

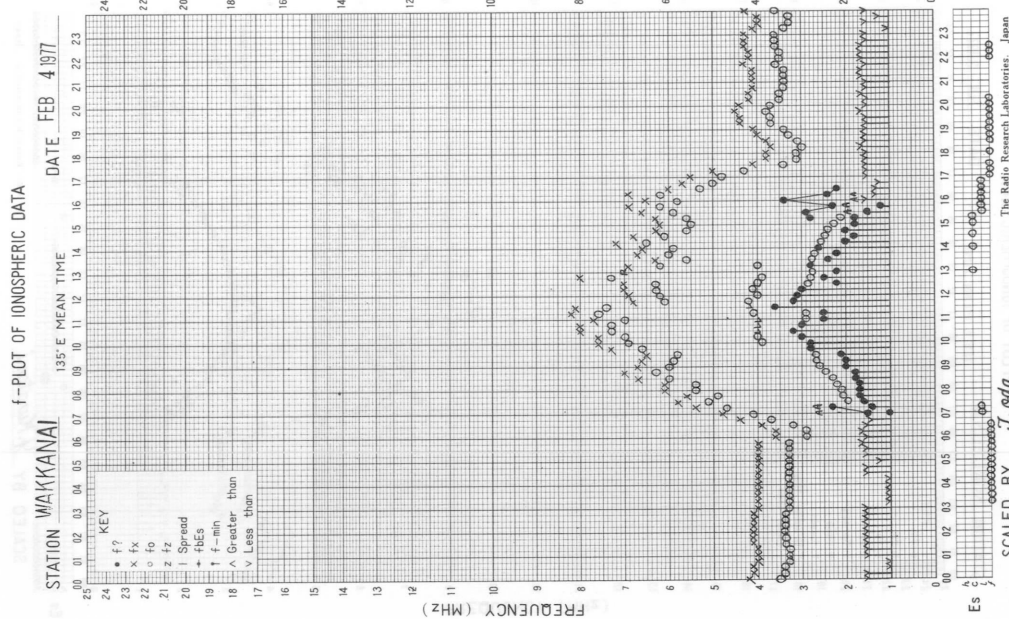
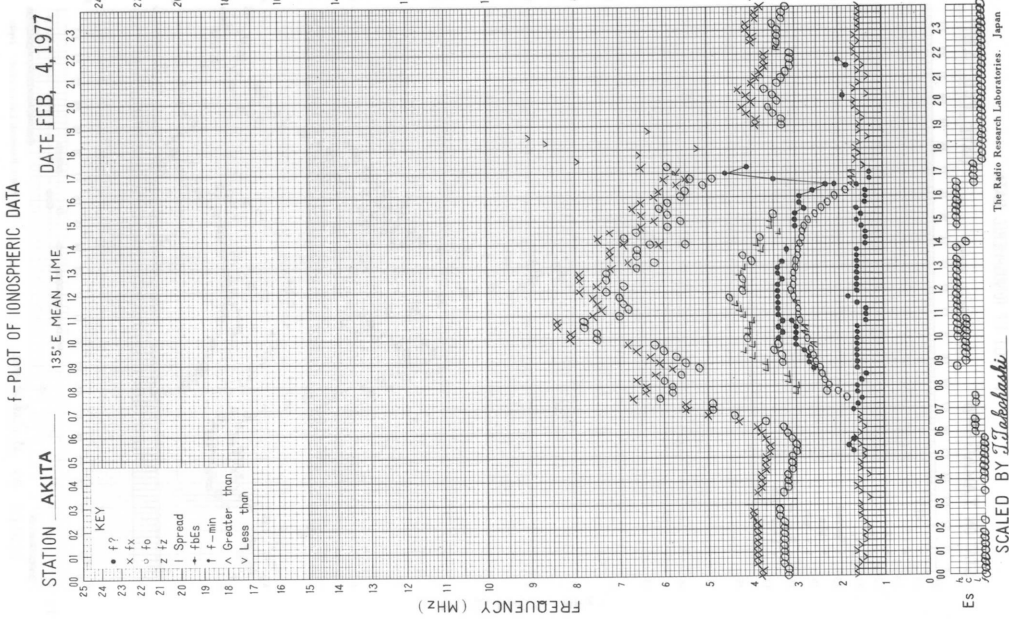


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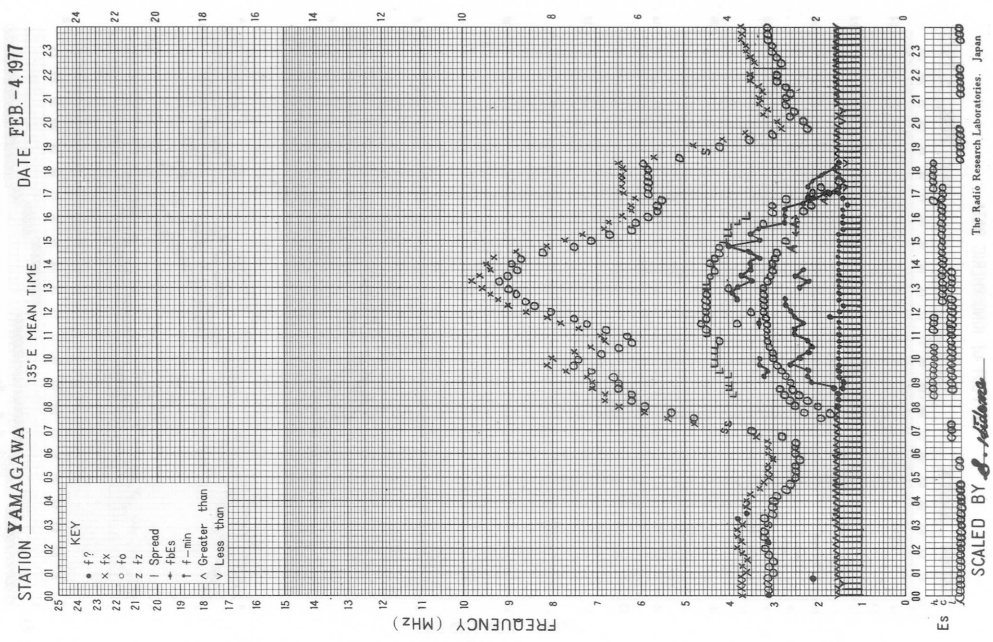


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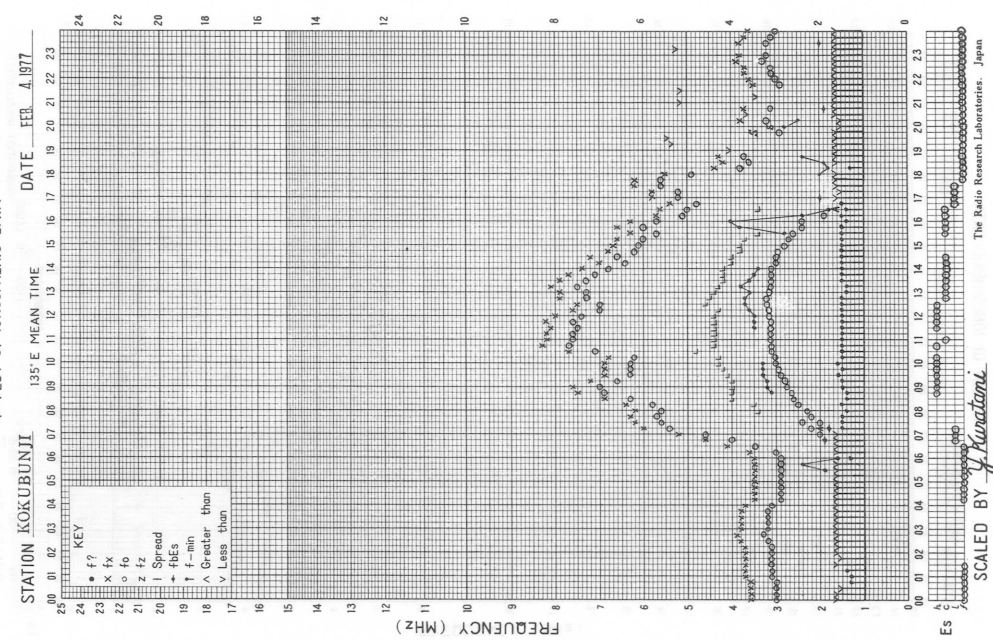




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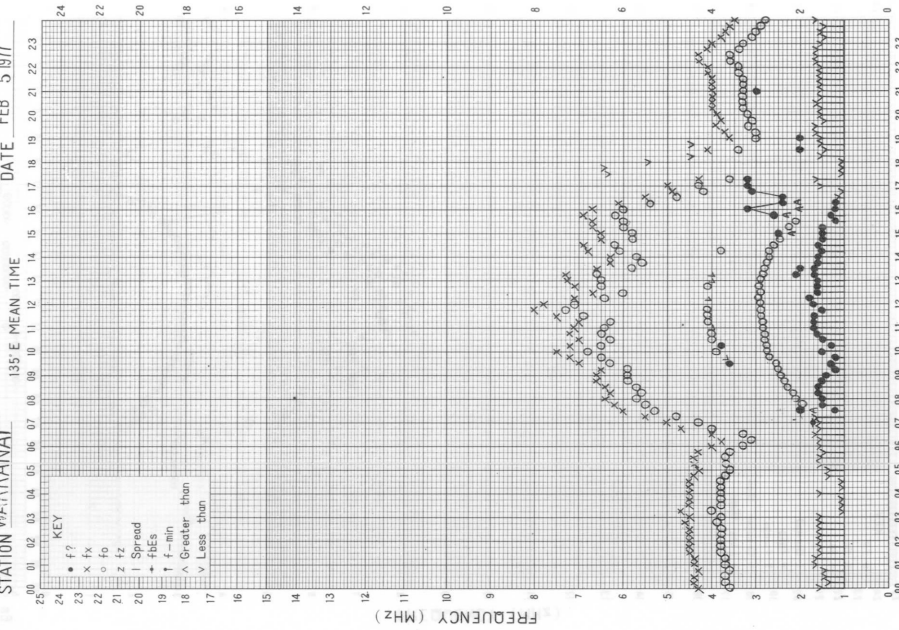


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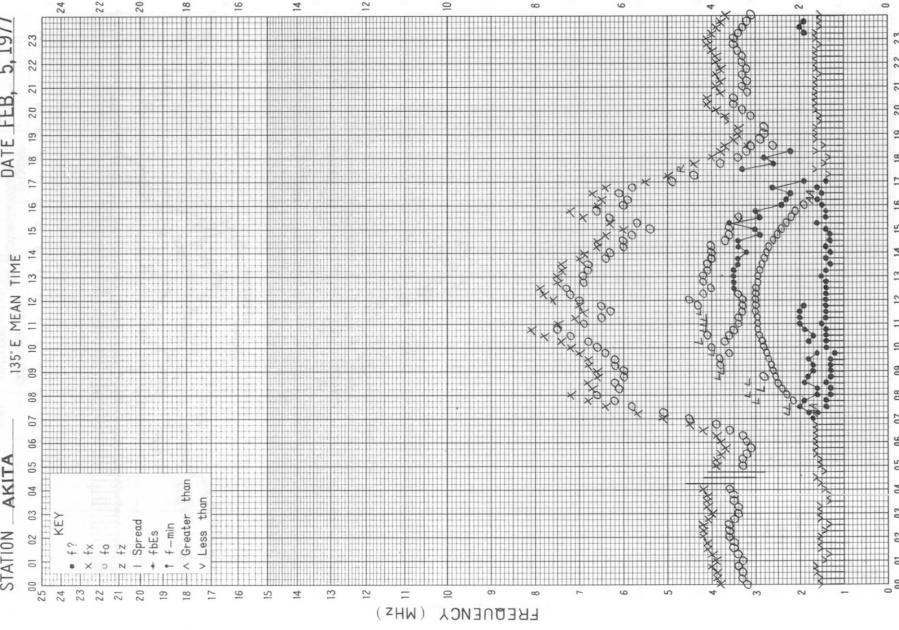
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STATION WAKKANAI DATE FEB 5 1977



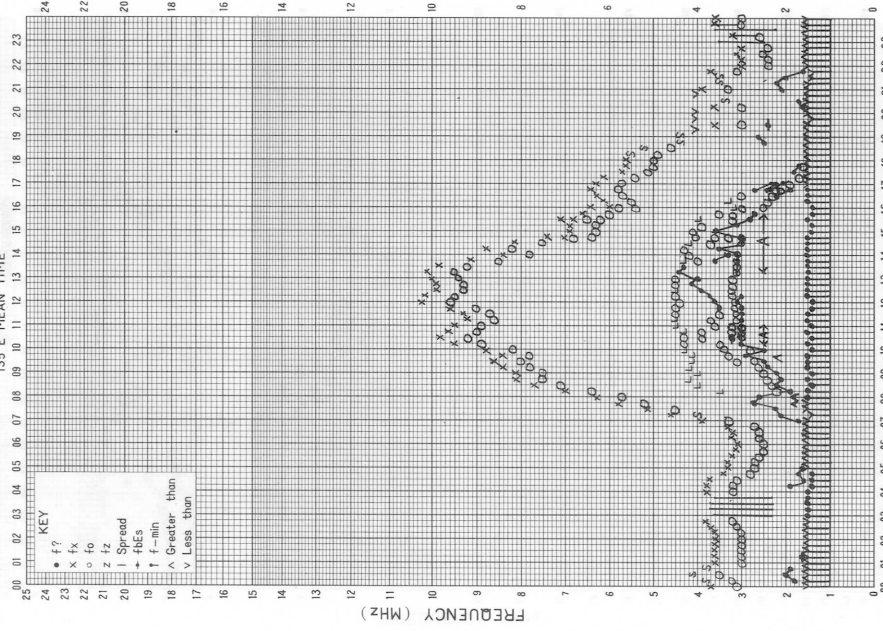
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STATION AKITA DATE FEB 5 1977



f-PLOT OF IONOSPHERIC DATA

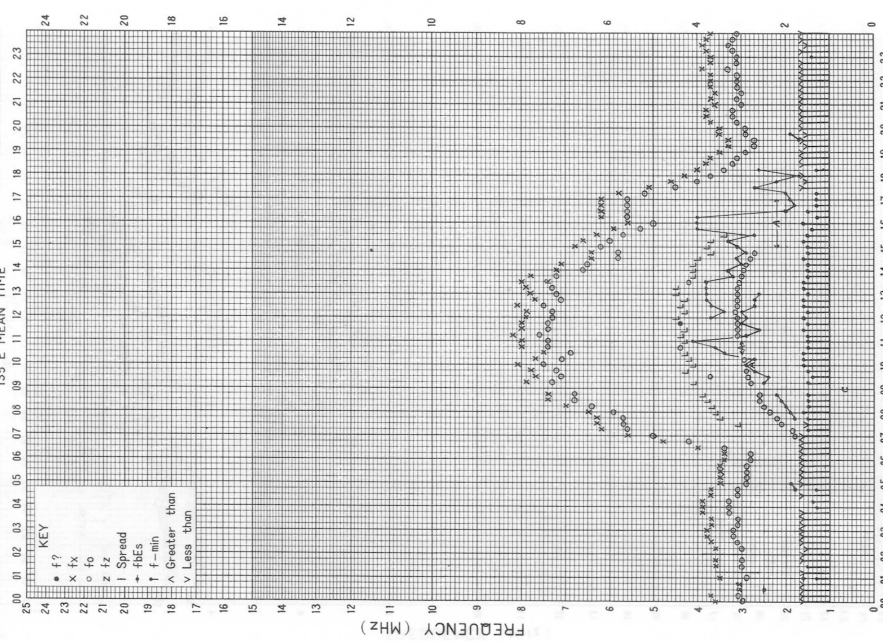
STATION YAMAGAWA 135°E MEAN TIME DATE FEB-5-1977



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C  
The Radio Research Laboratories, Japan  
SCALED BY S. HIZUMA

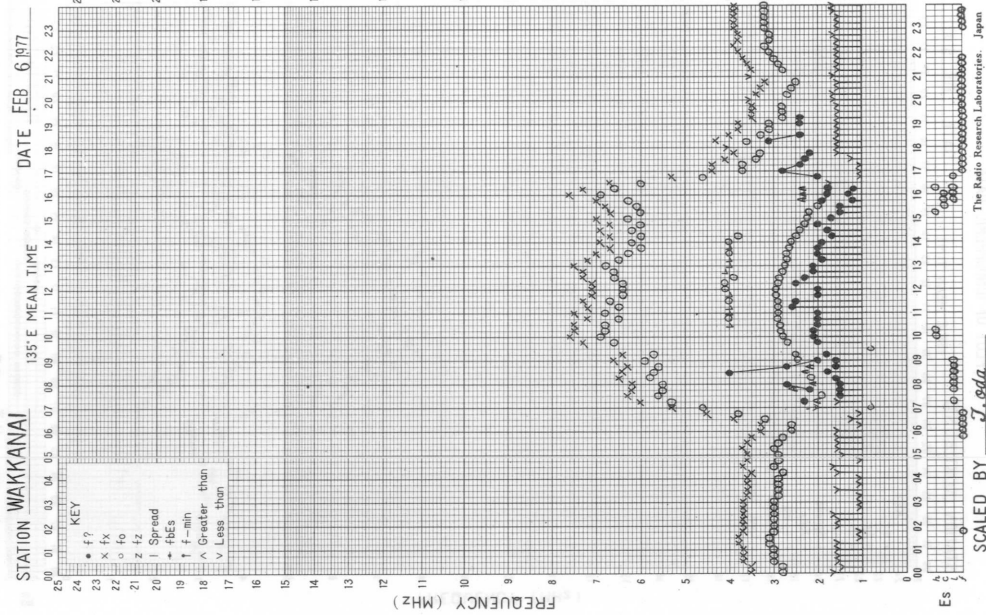
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STATION KOKUBUNJI 135°E MEAN TIME DATE FEB-5-1977

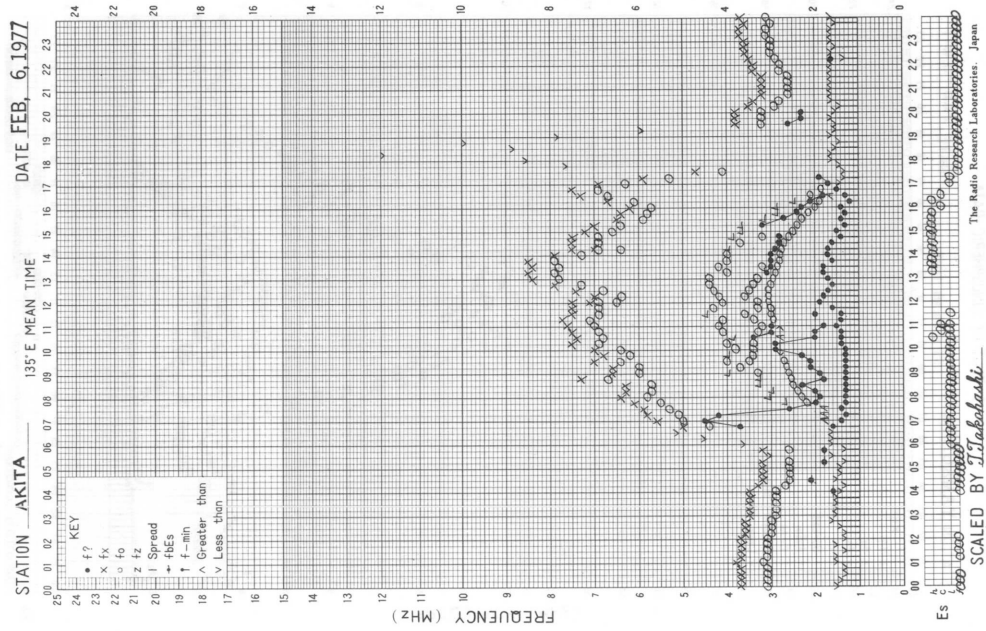


ES  
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The Radio Research Laboratories, Japan  
SCALED BY H. Oguma

f-PLOT OF IONOSPHERIC DATA

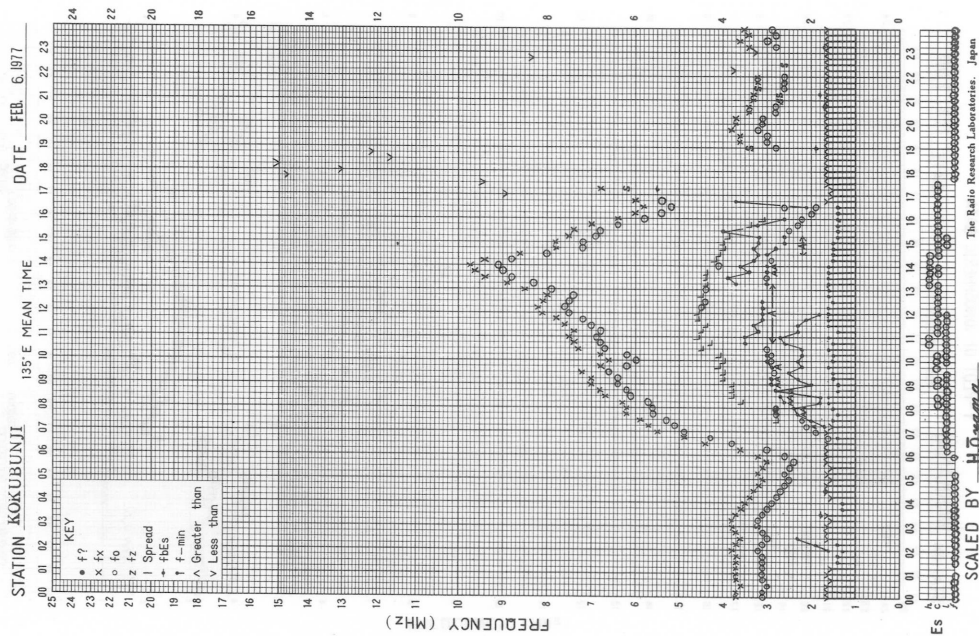


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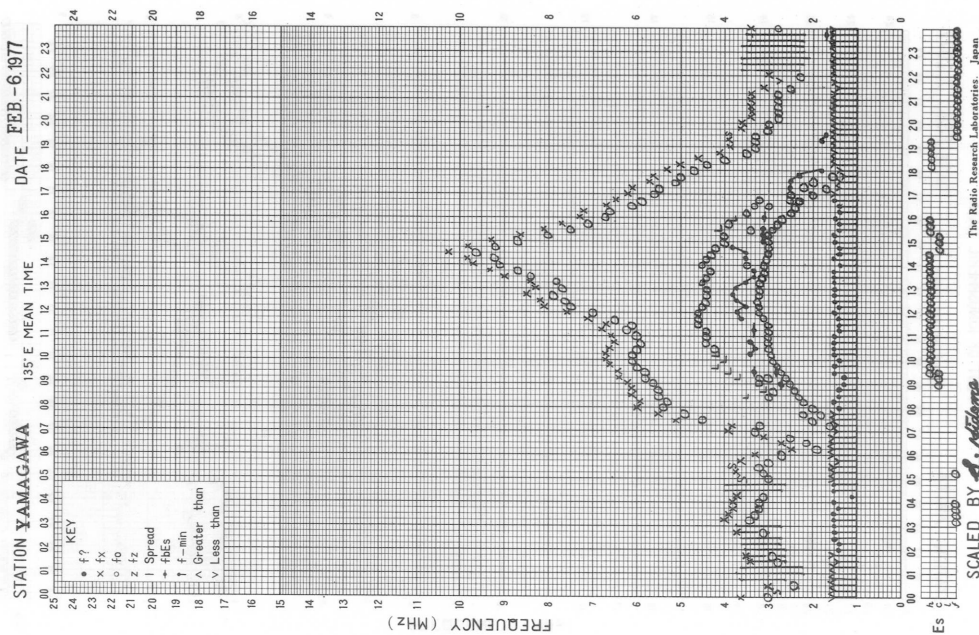




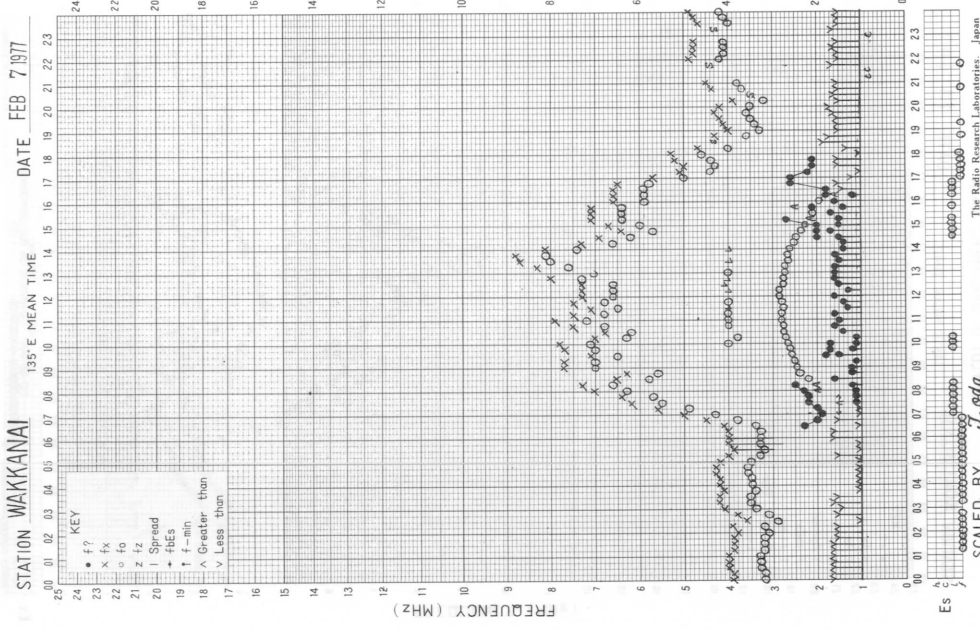
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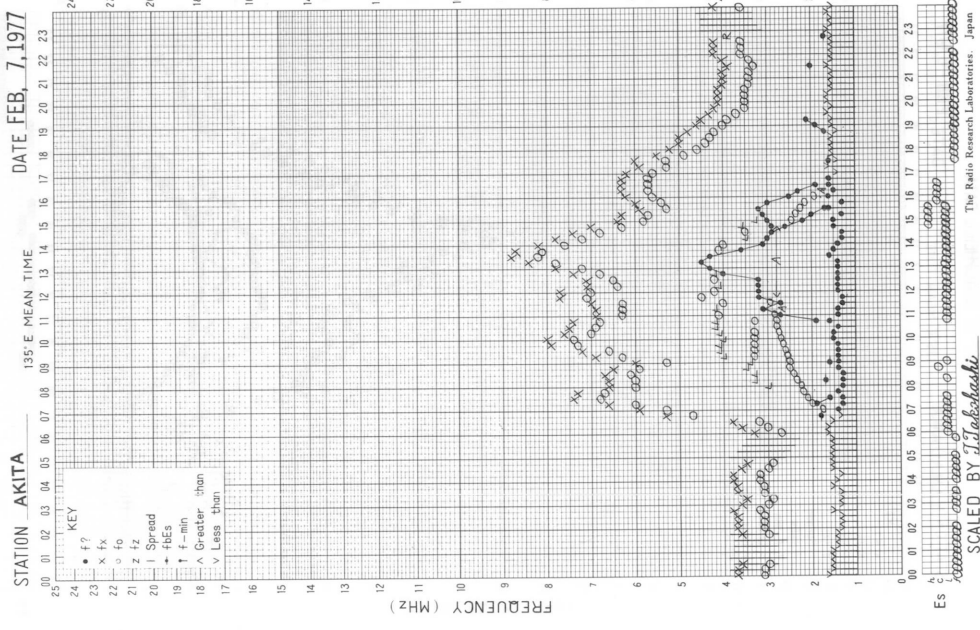
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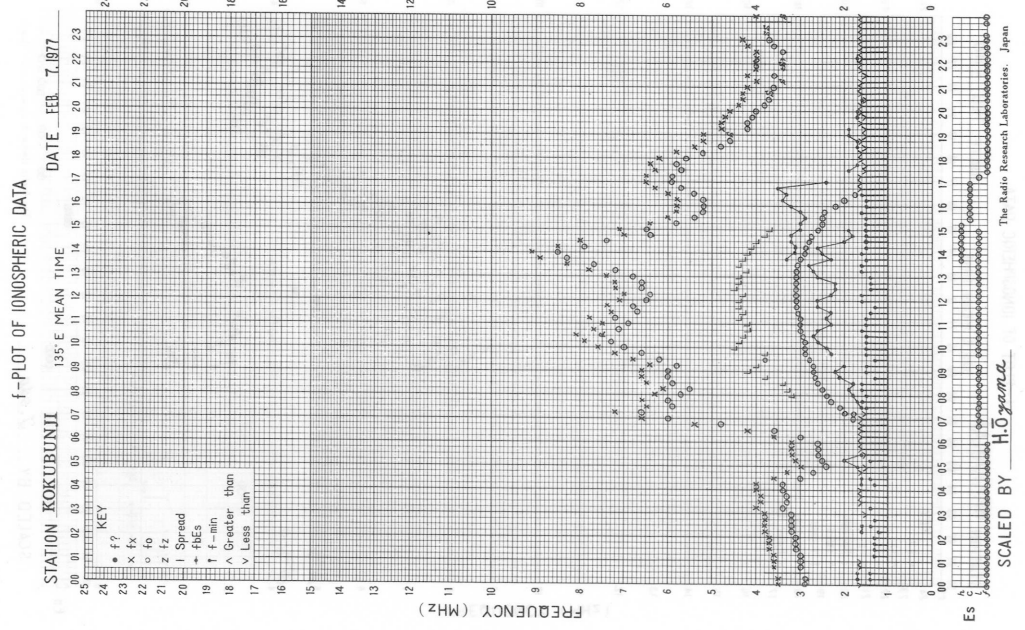
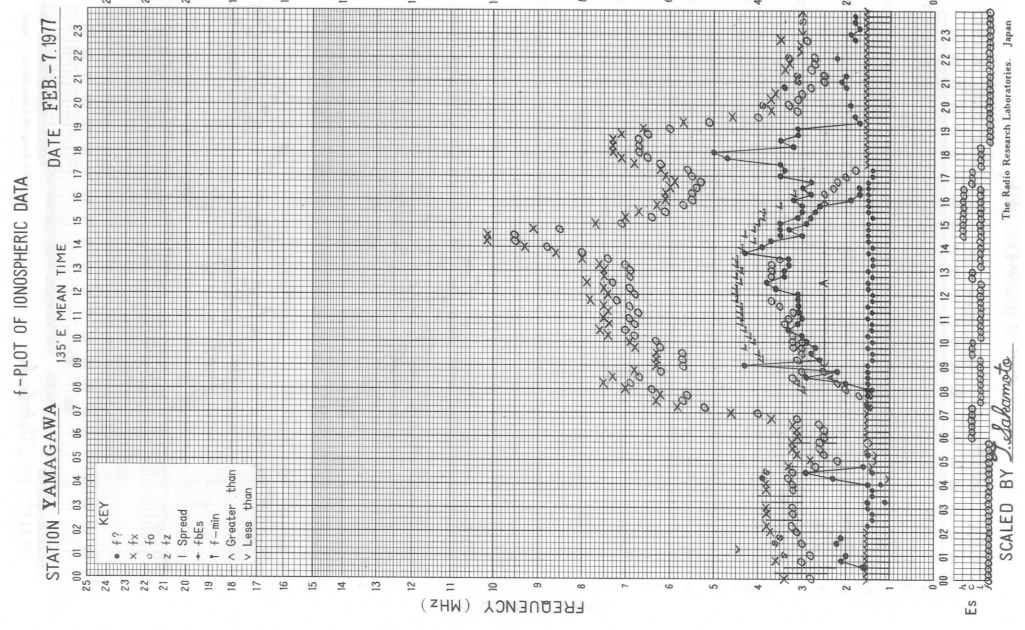


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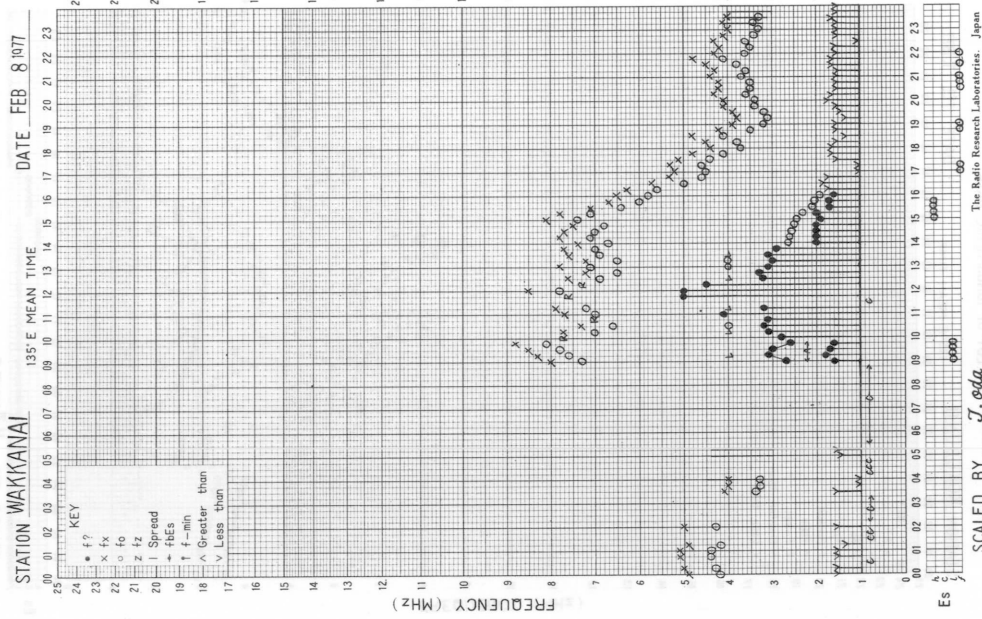


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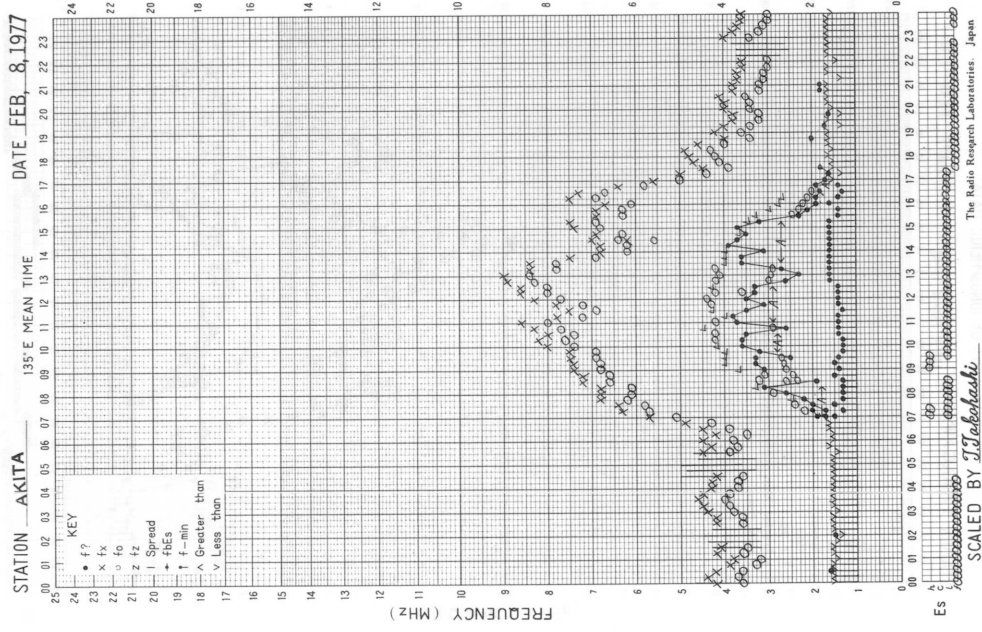




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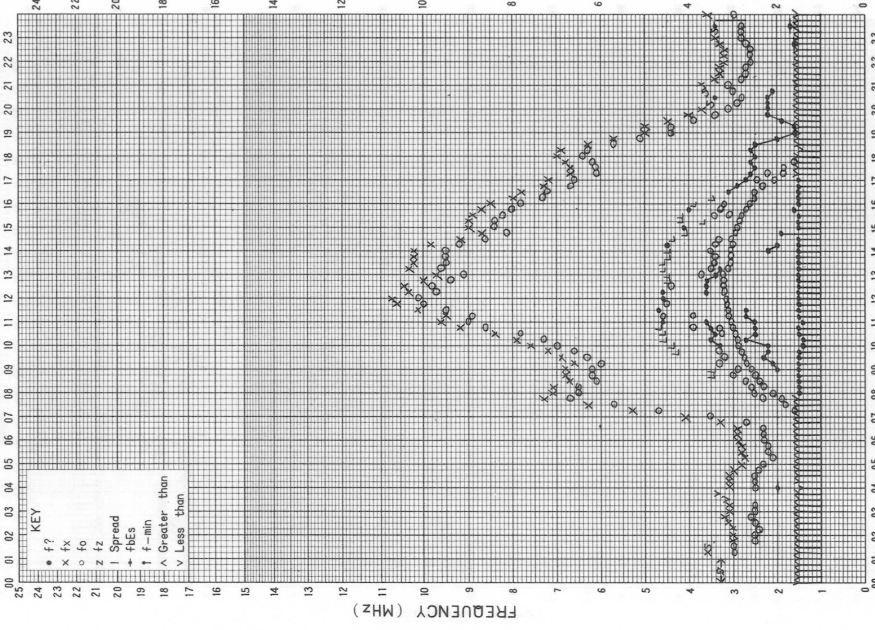


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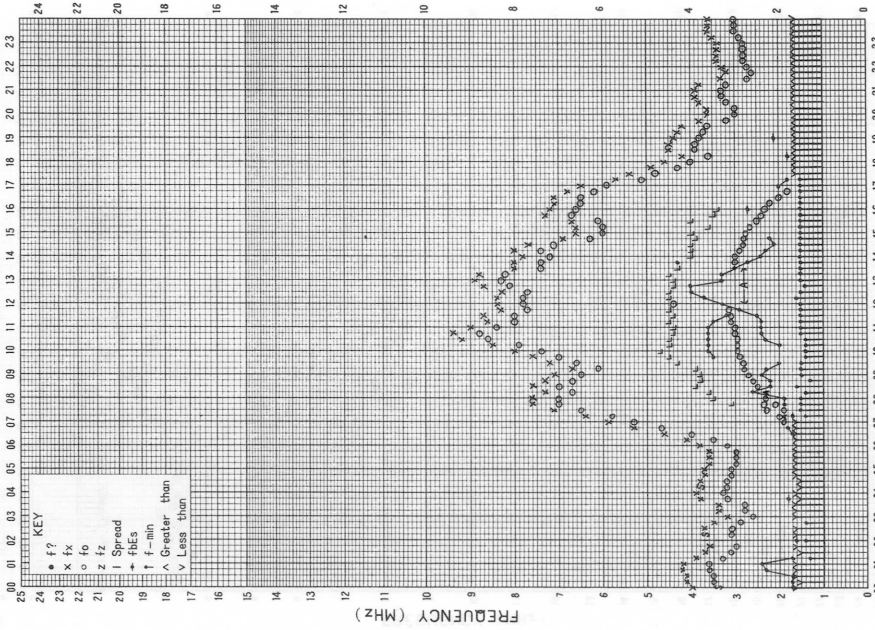
STATION YAMAGAWA 135°E MEAN TIME DATE FEB.-8.1977



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SCALED BY *S. Nakakuma*

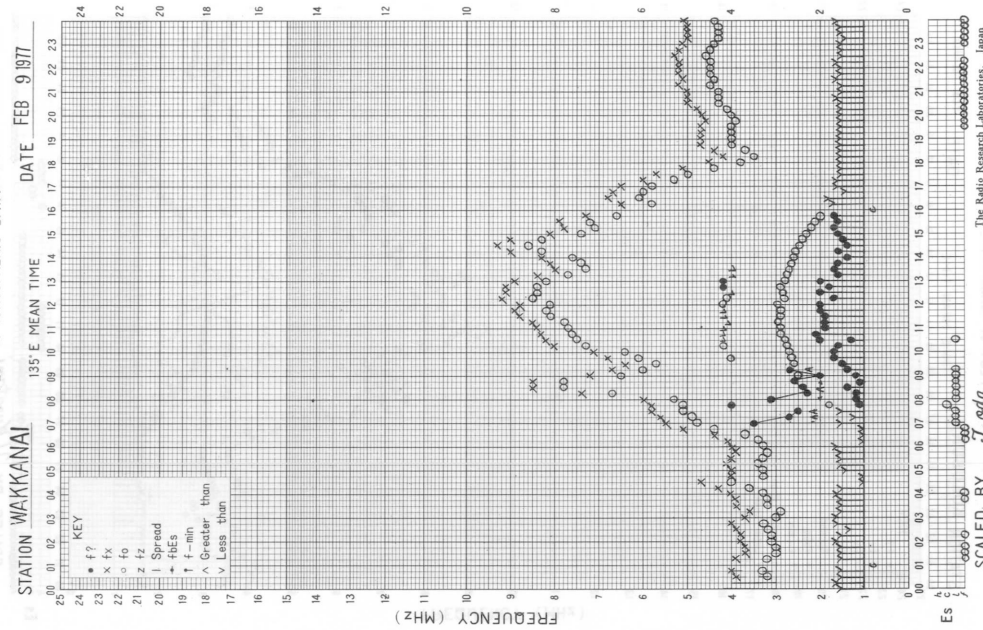
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STATION KOKUBUNJI 135°E MEAN TIME DATE FEB. 8.1977

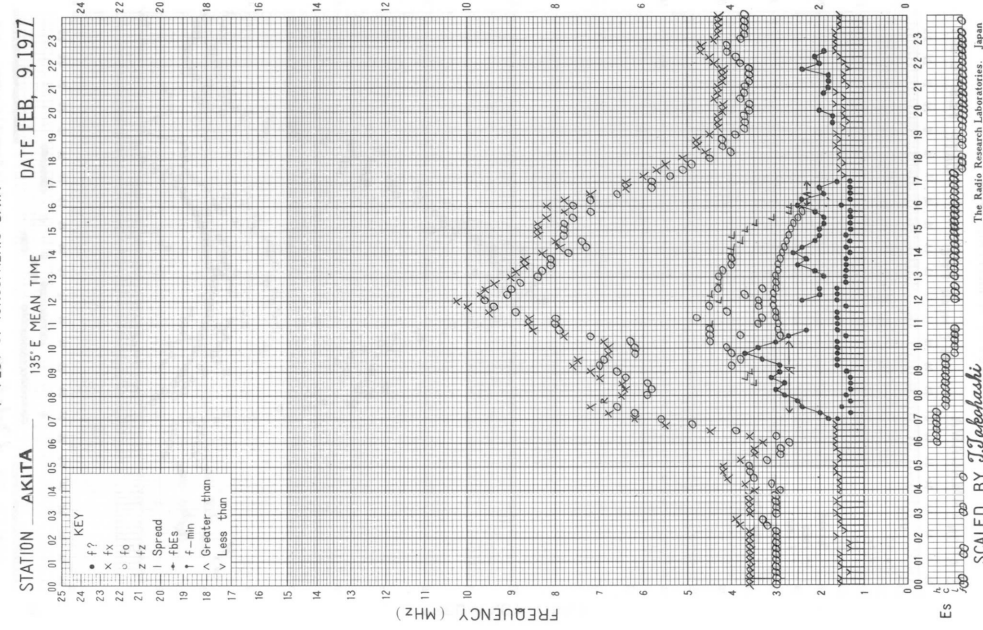


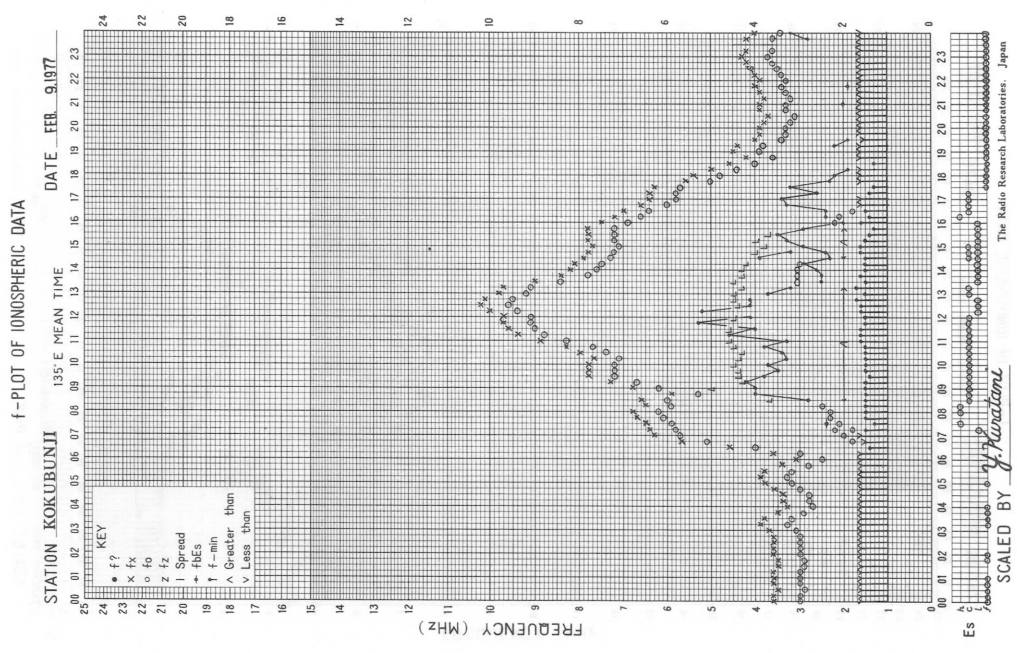
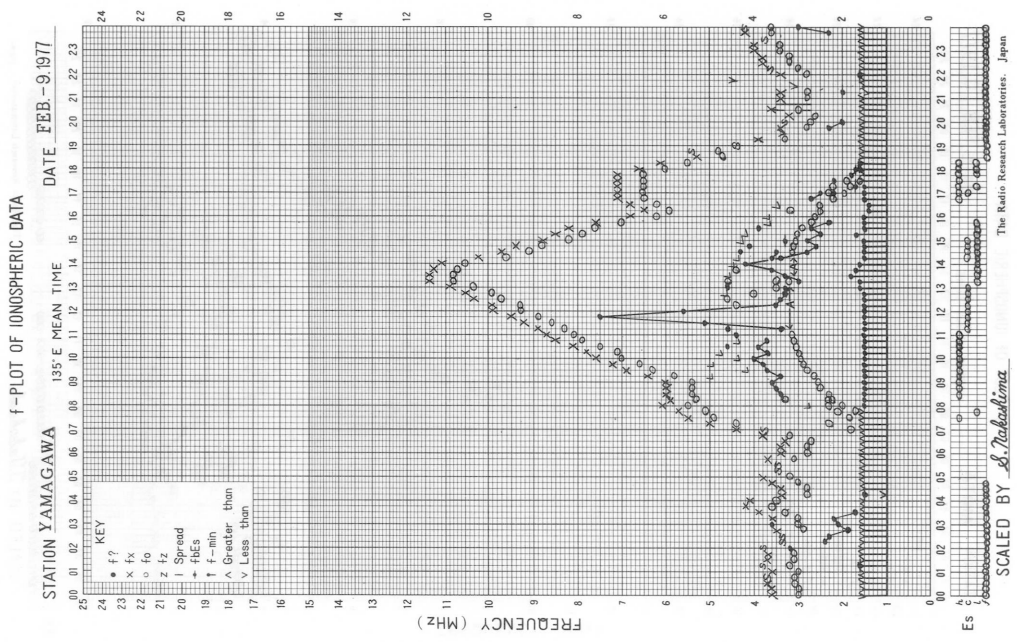
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SCALED BY *Y. Kawatani*

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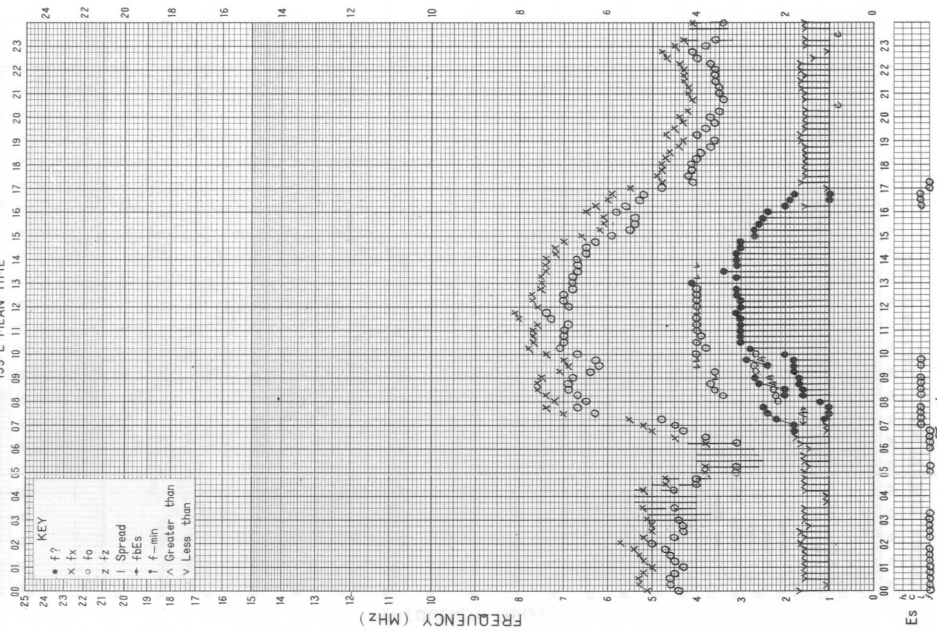
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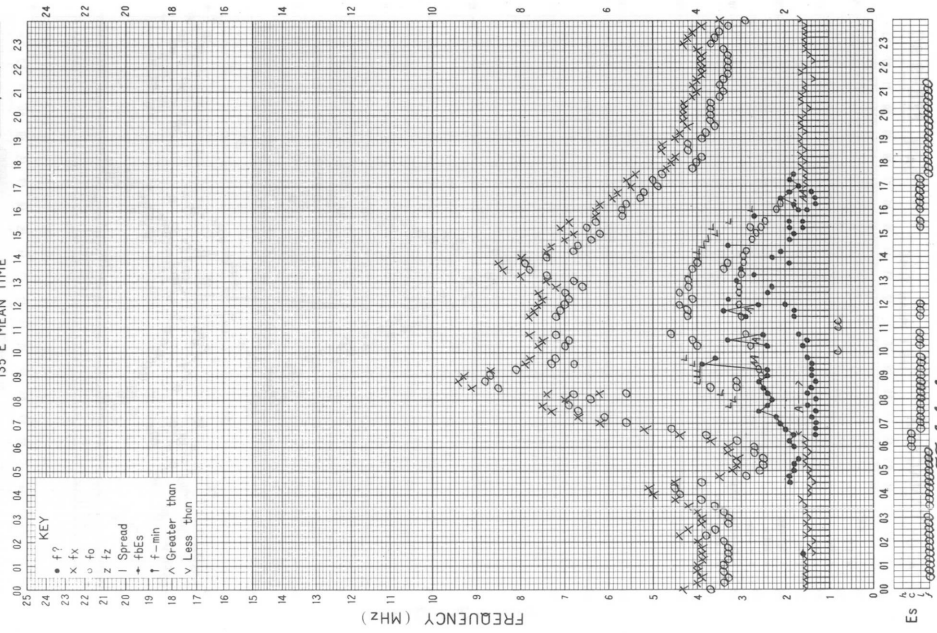
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STATION WAKKANAI 135°E MEAN TIME DATE FEB 10 1977



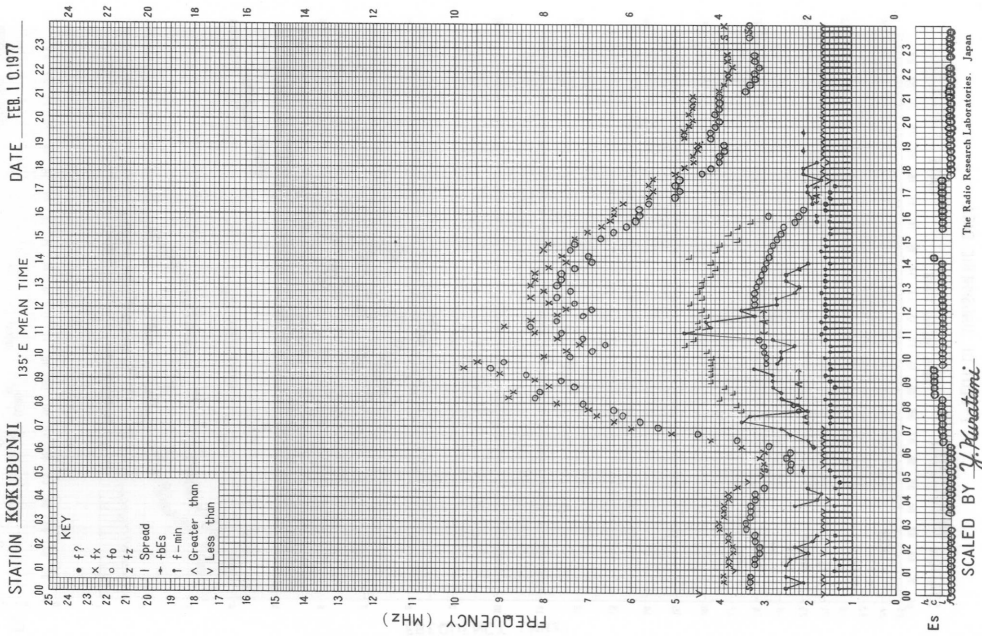
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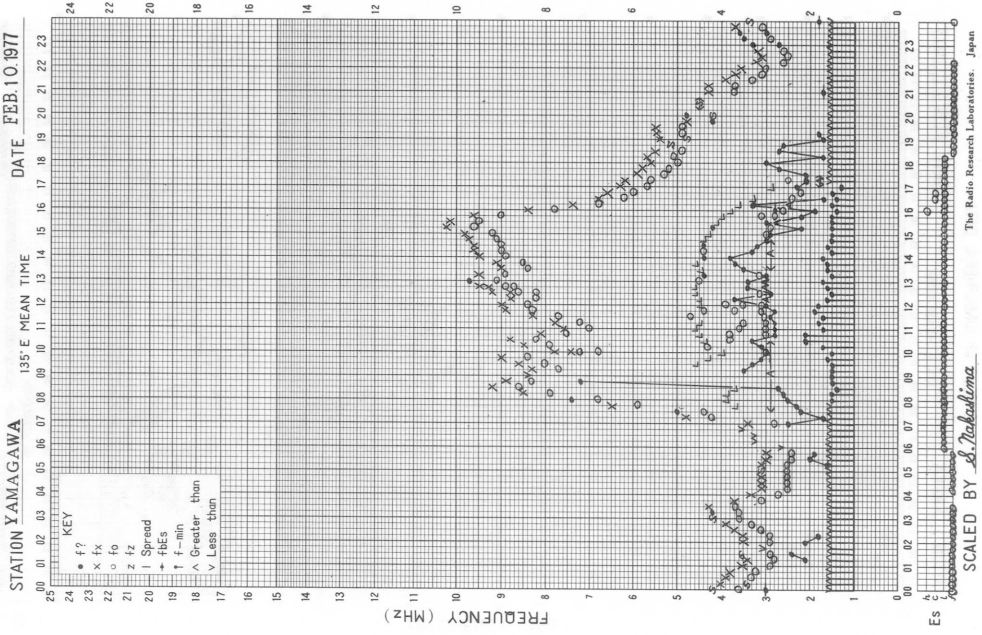


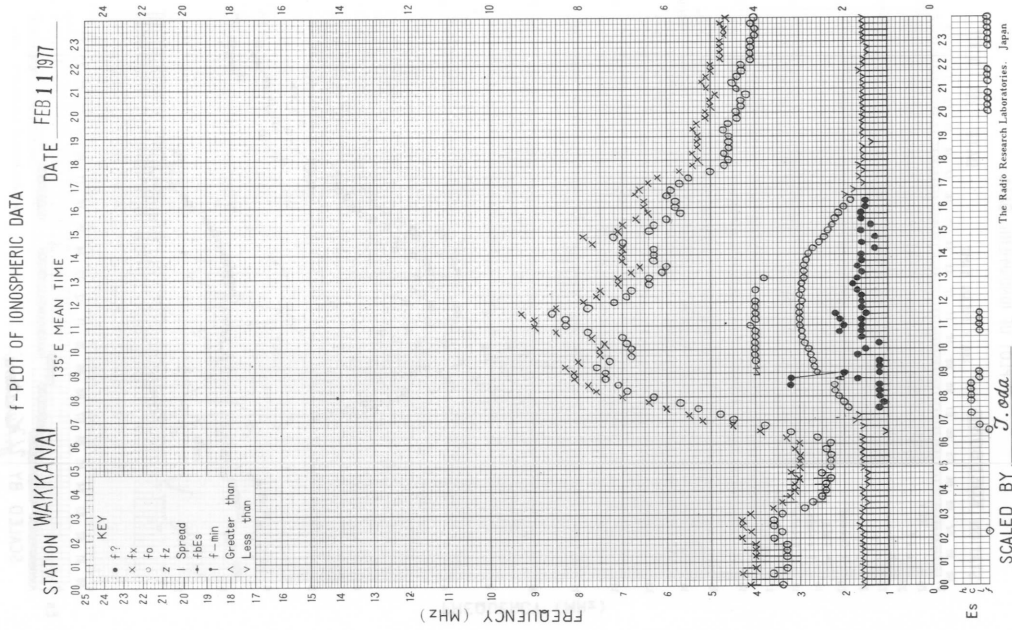
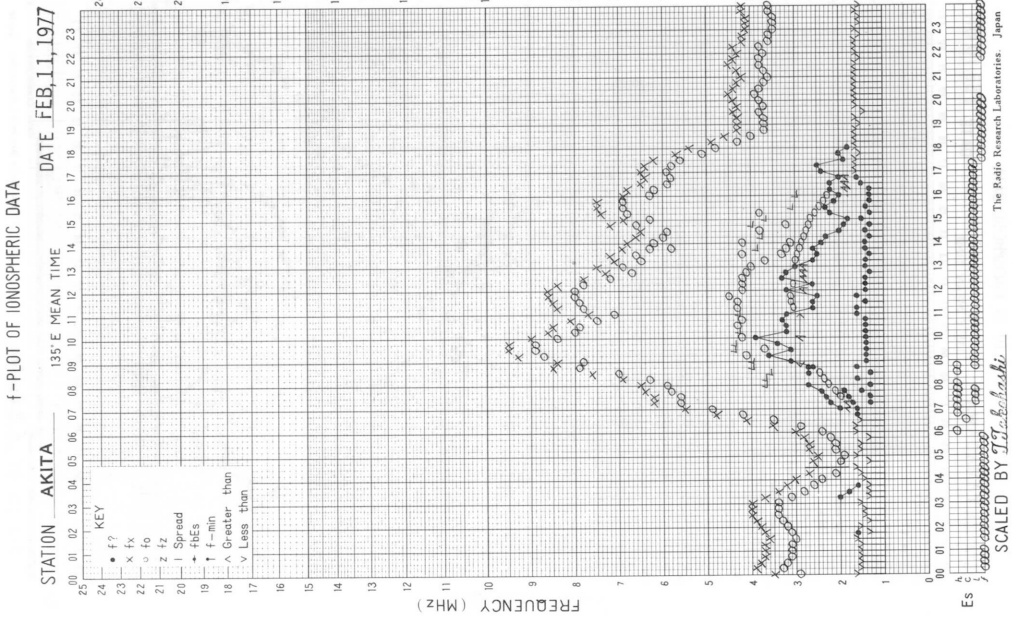


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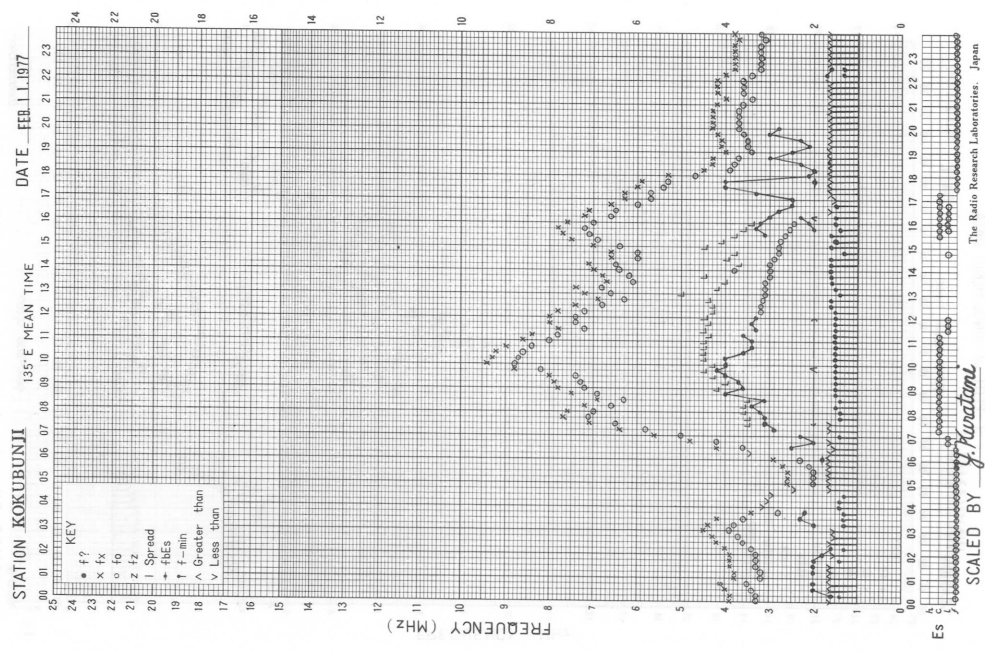


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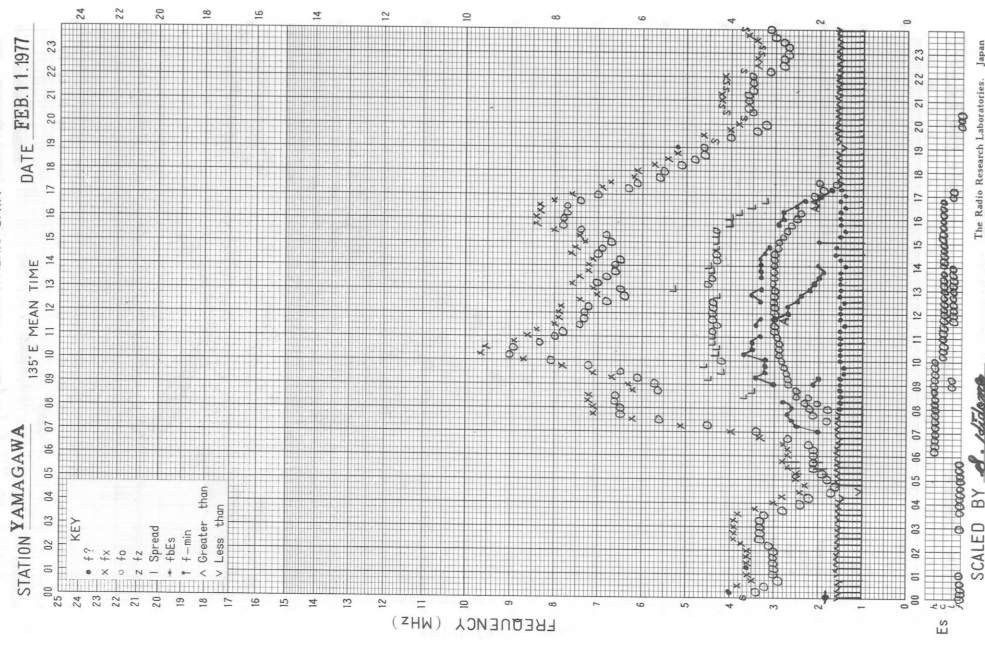




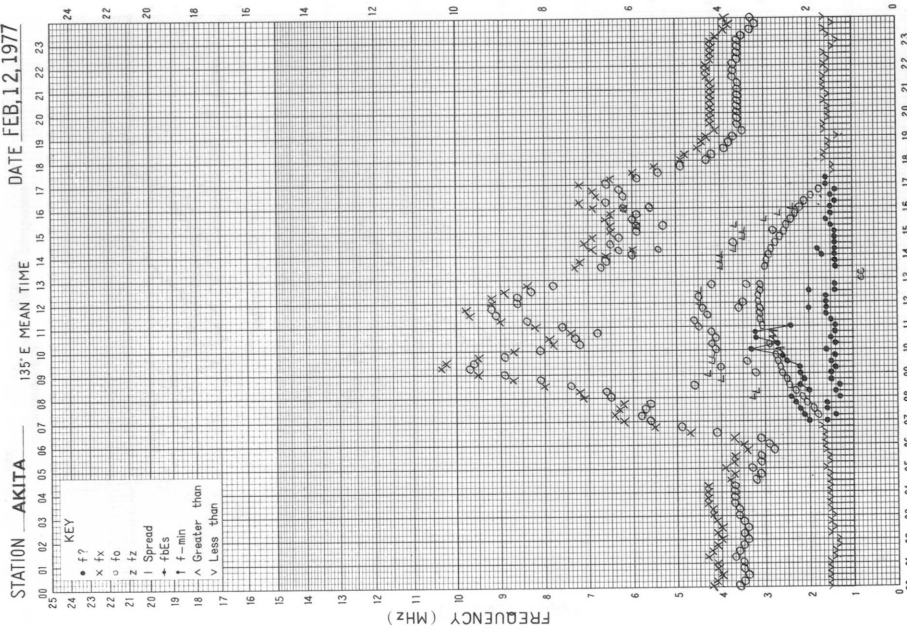
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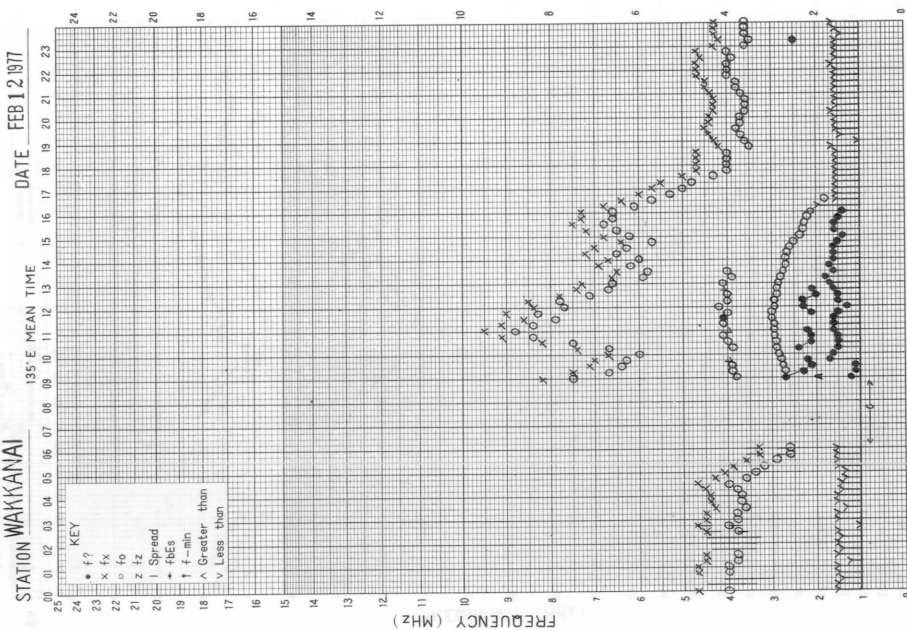
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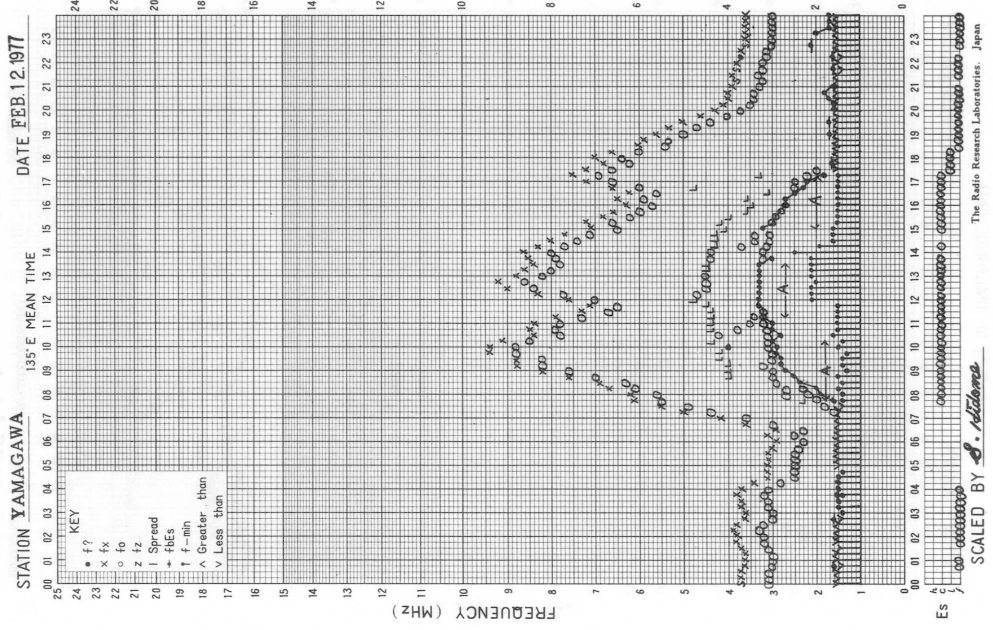
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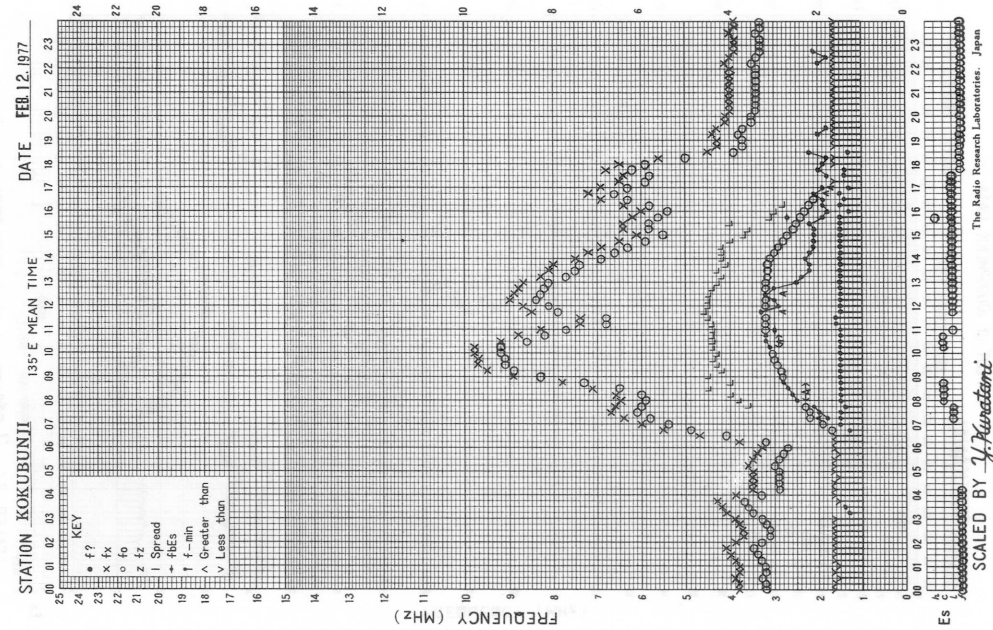
SCALED BY J. Oda

The Radio Research Laboratories, Japan

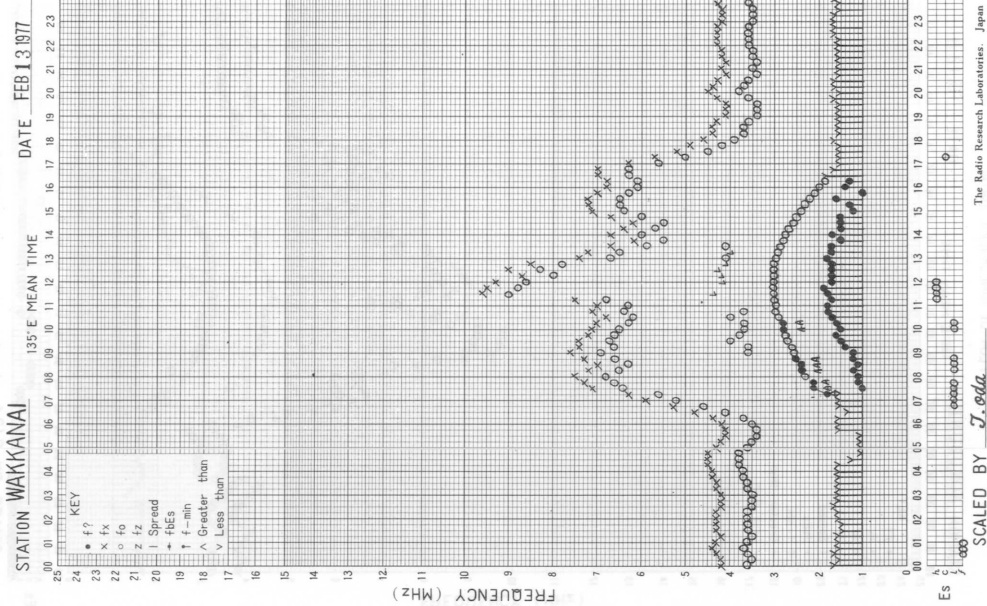
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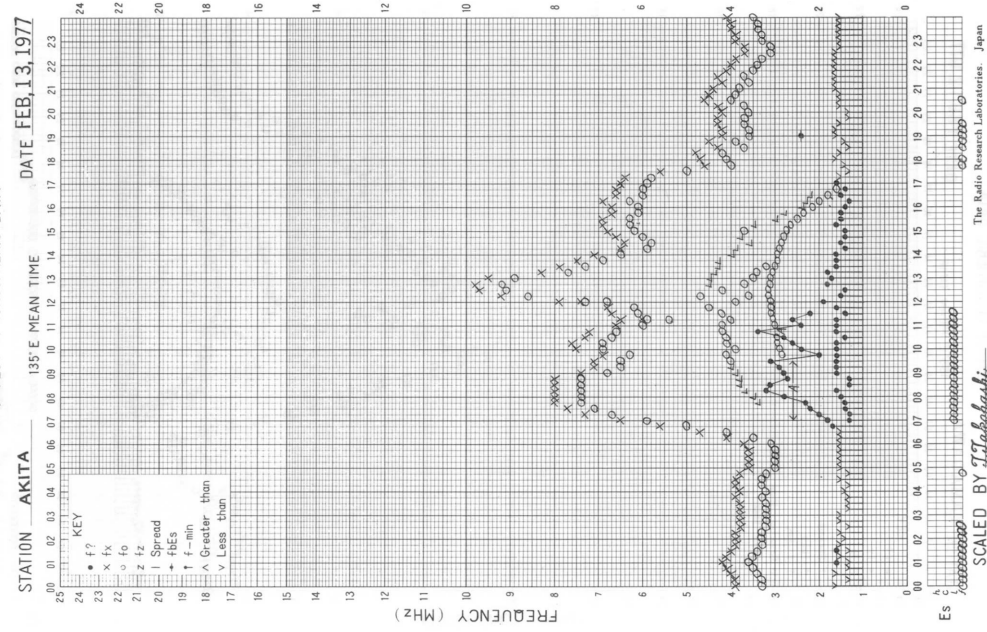
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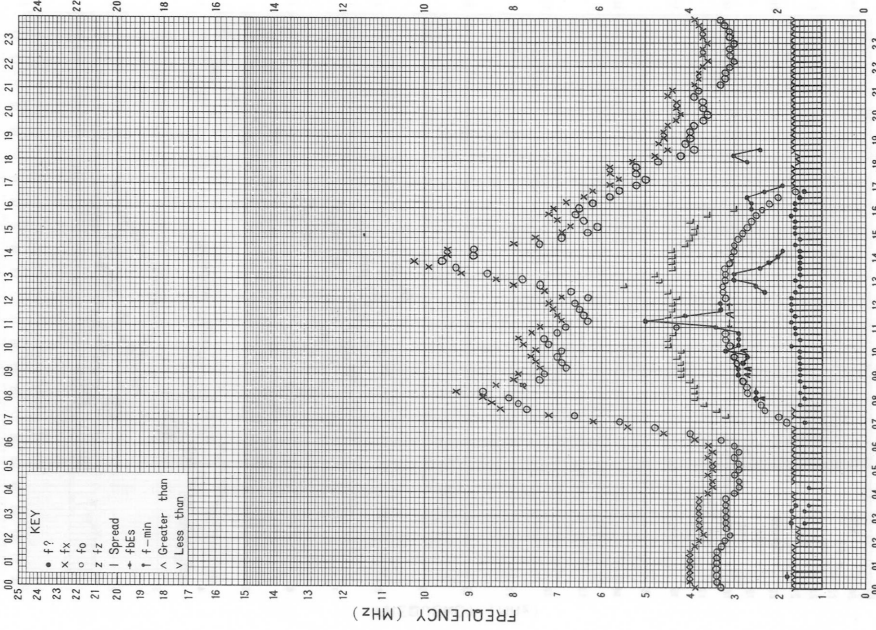


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STATION **KOKUBUNJI** 135°E MEAN TIME DATE **FEB. 13, 1977**

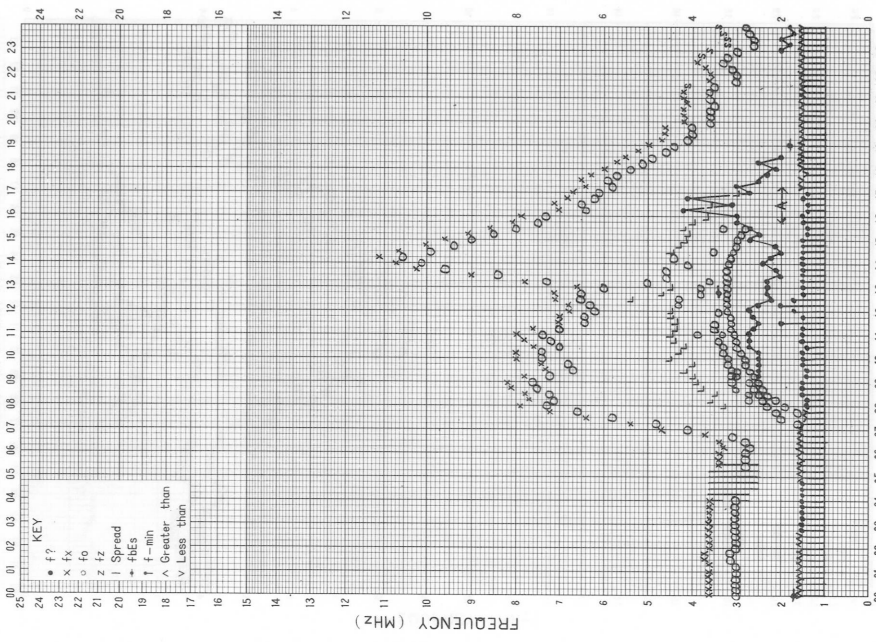


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SCALED BY **f. Kuratami**  
The Radio Research Laboratories, Japan

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STATION **YAMAGAWA** 135°E MEAN TIME DATE **FEB. 13, 1977**

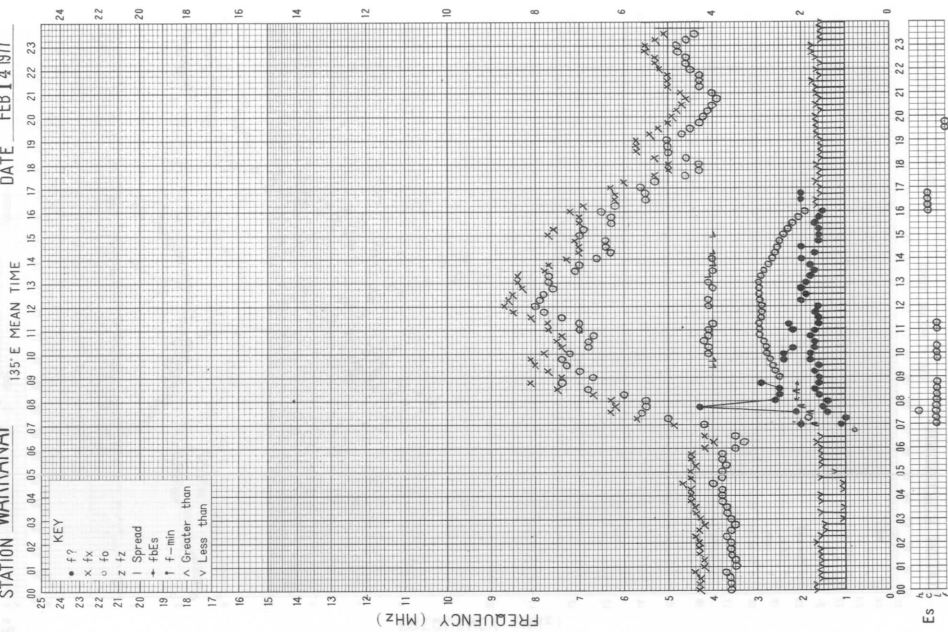


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SCALED BY **S. Nakamae**  
The Radio Research Laboratories, Japan

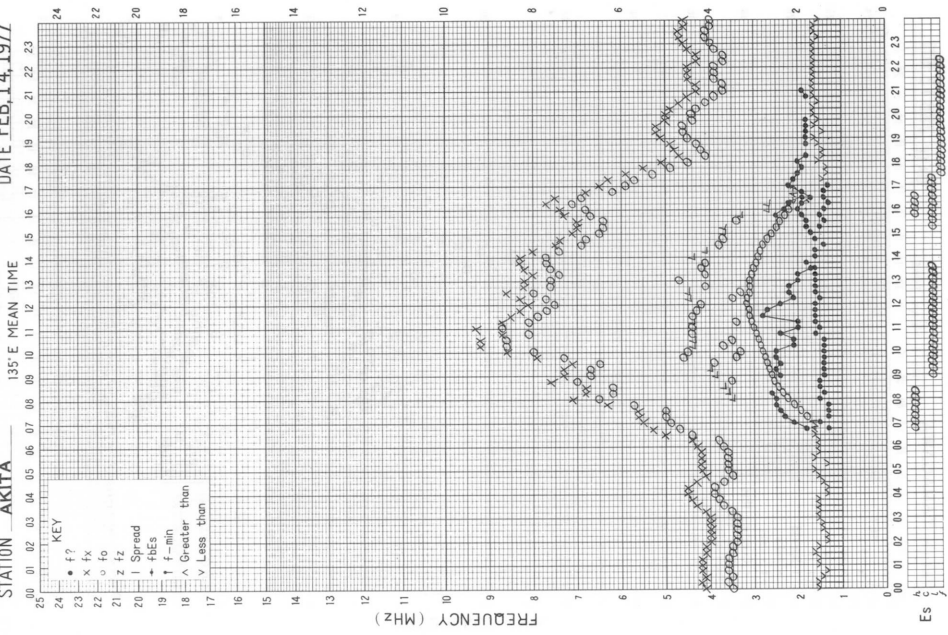
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STATION WAKKANAI DATE FEB 14 1977



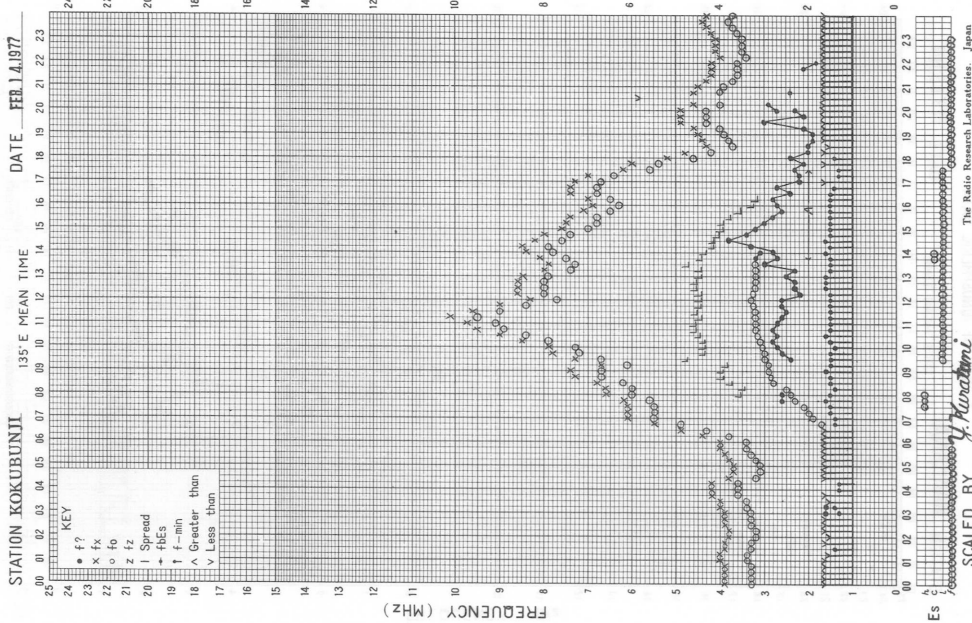
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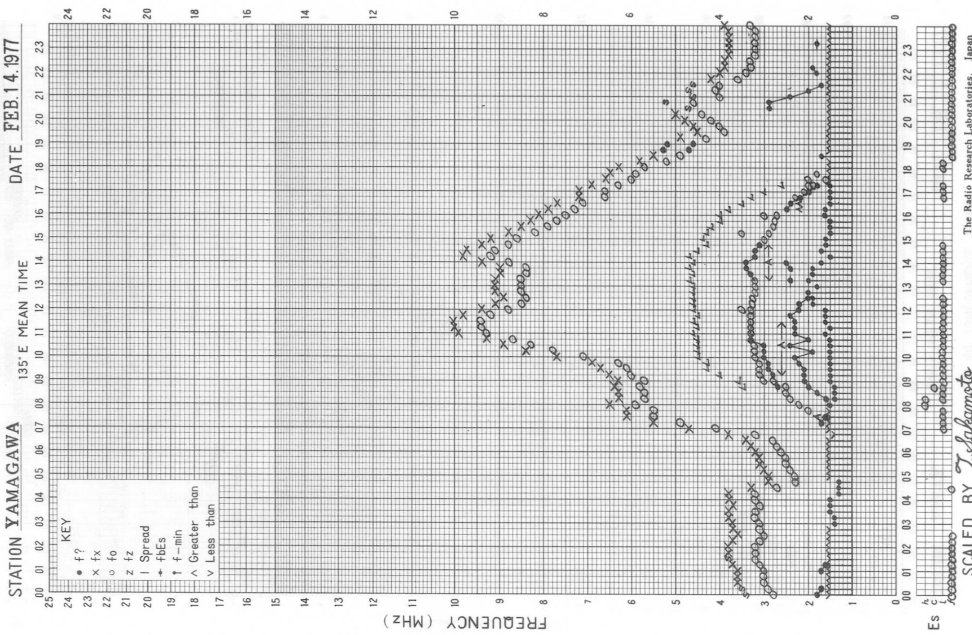




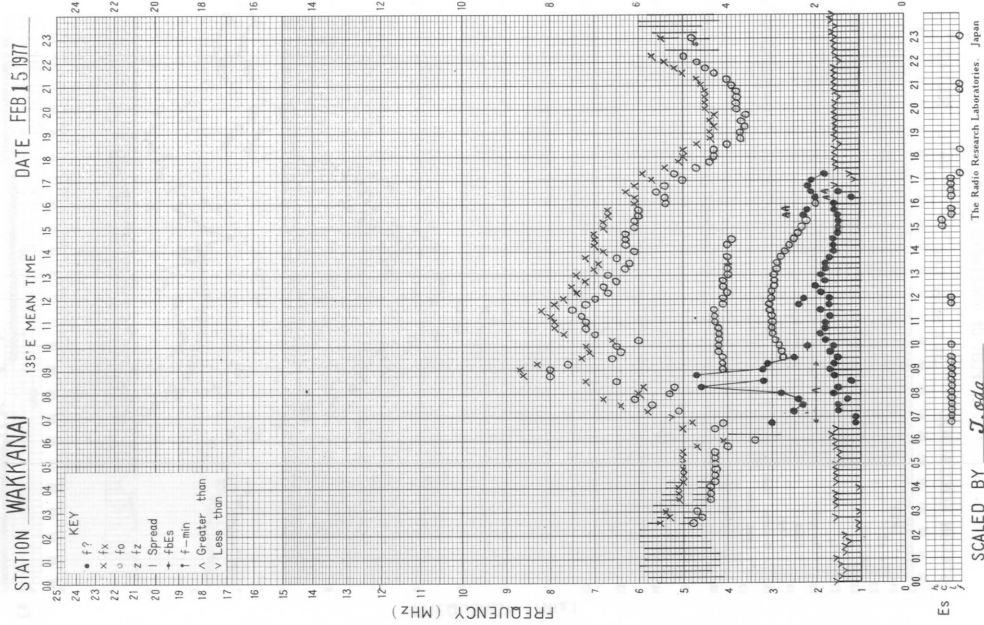
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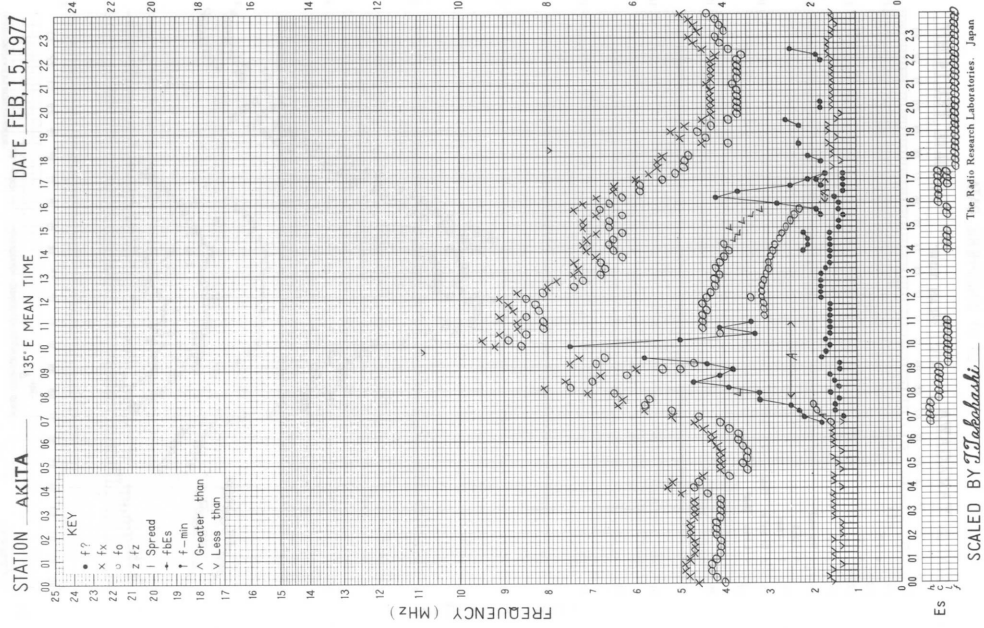
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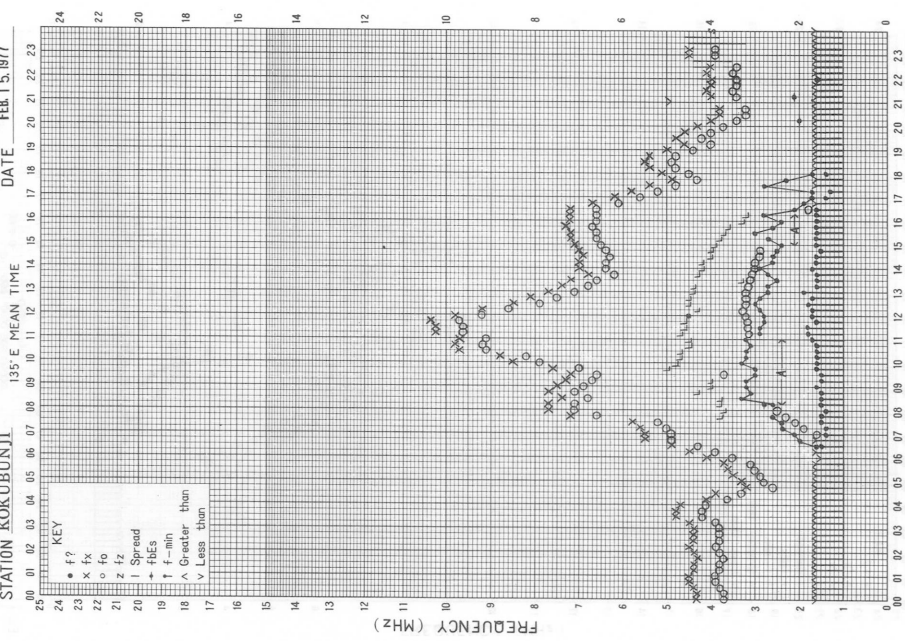


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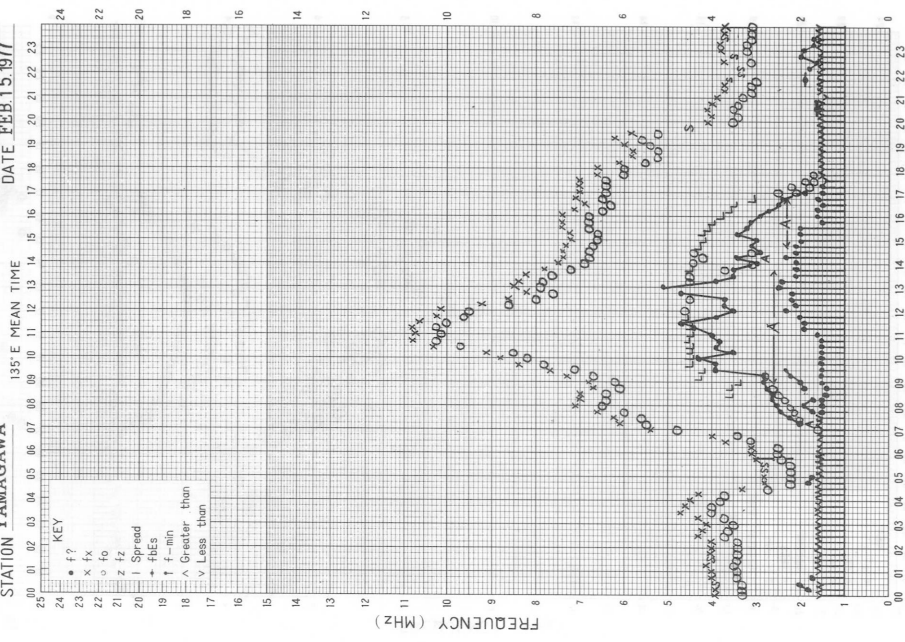
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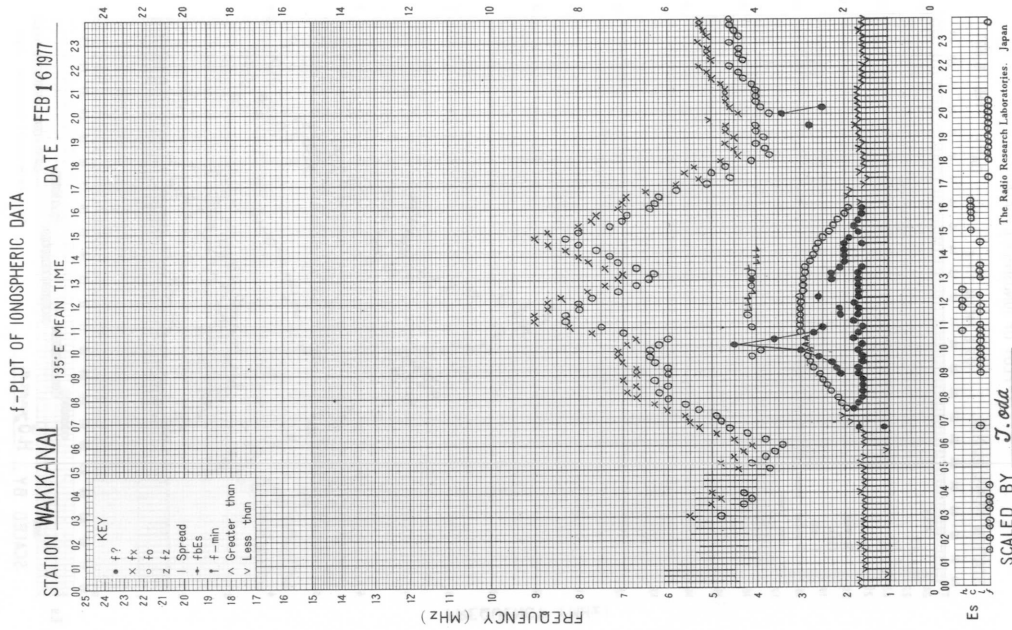
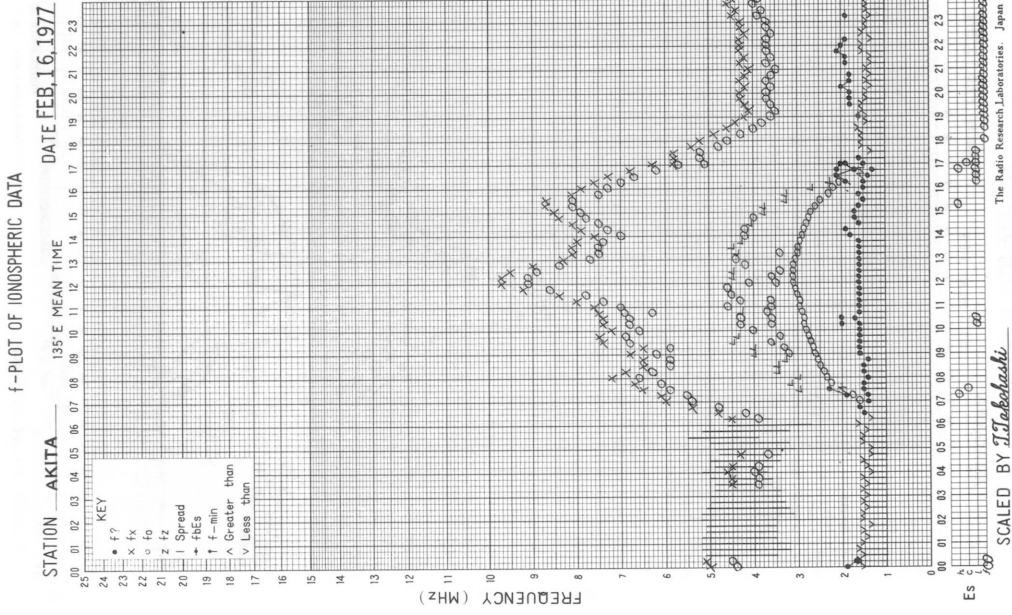
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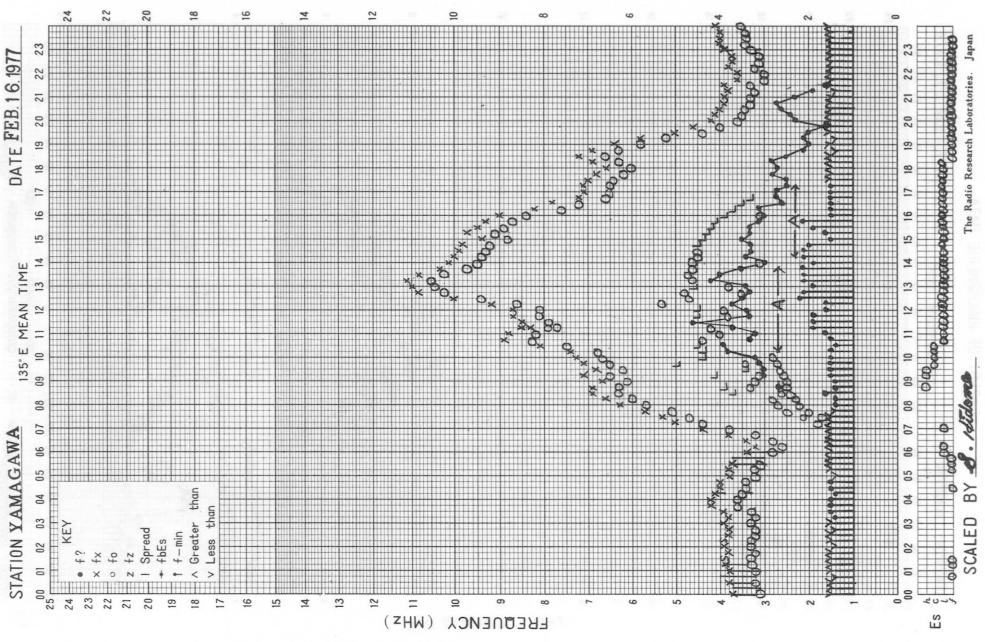
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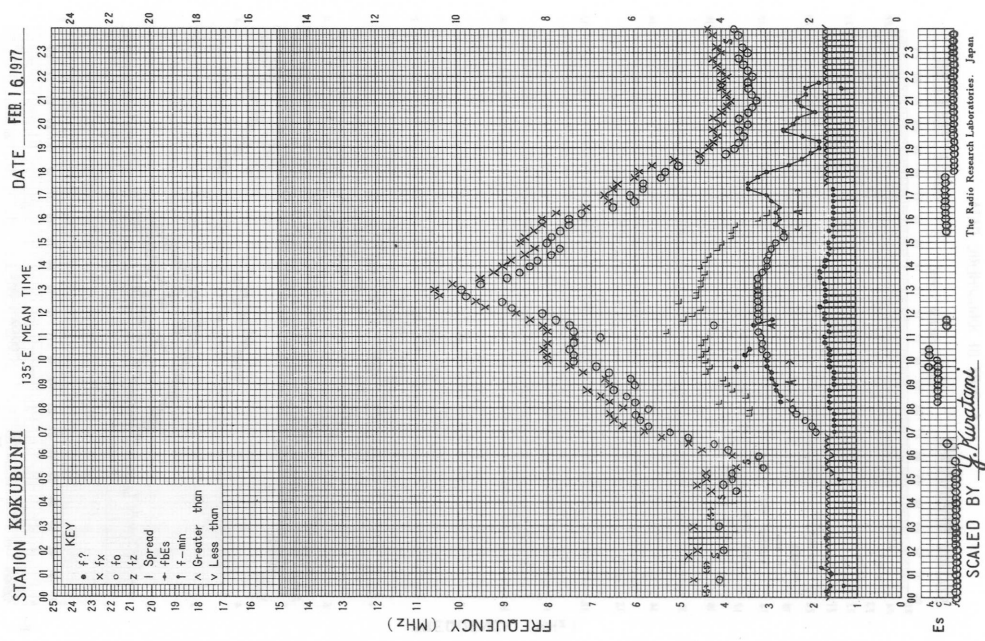


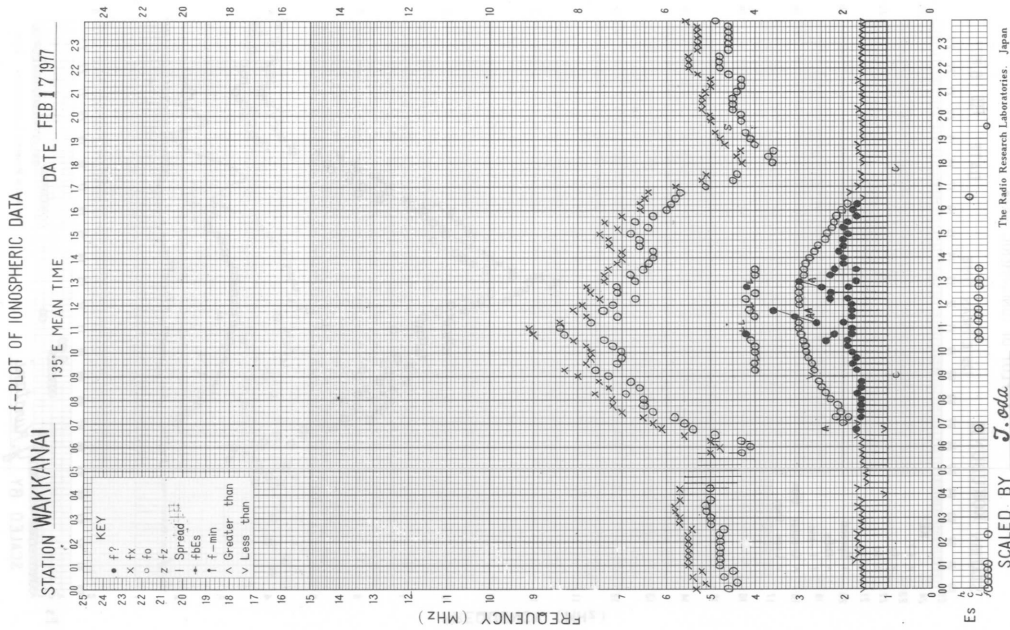
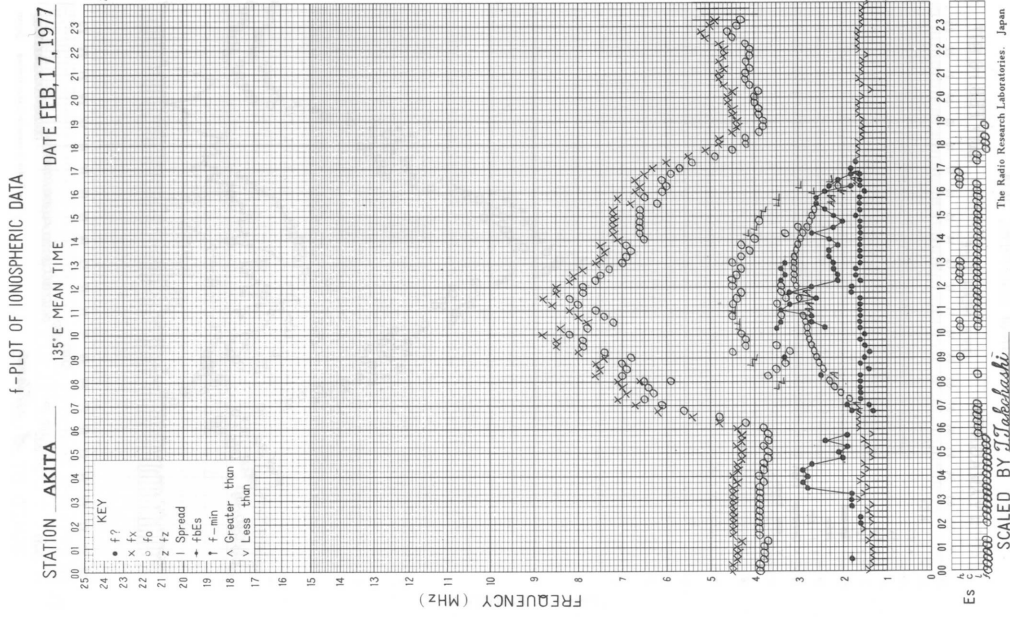


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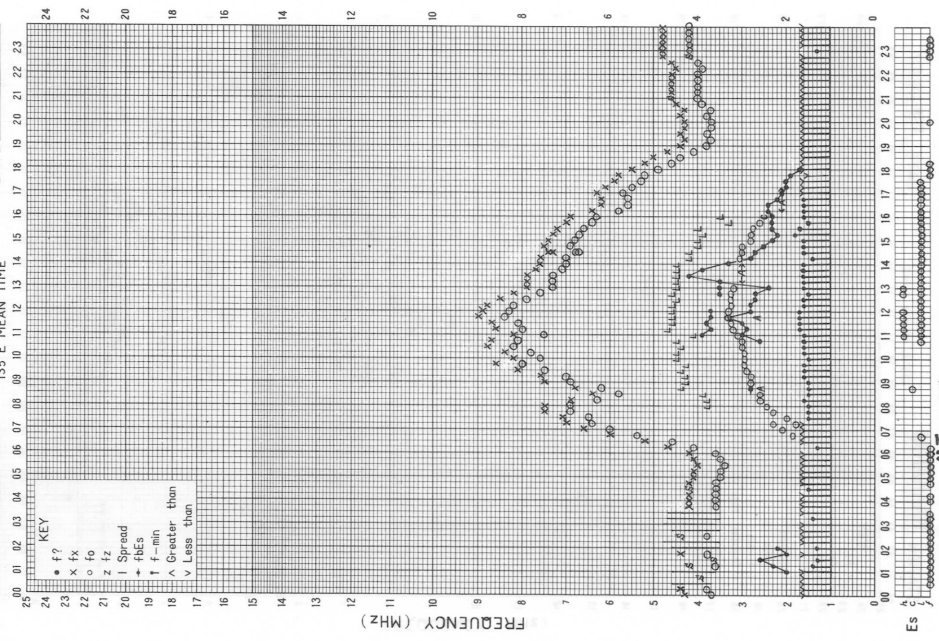
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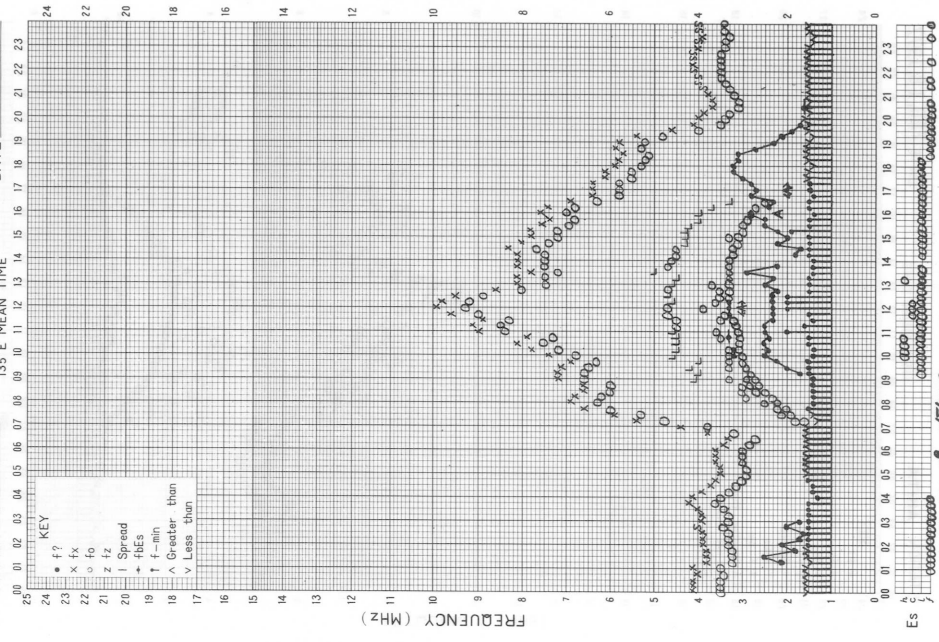
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STATION **KOKUBUNJI** 135°E MEAN TIME DATE **FEB. 17, 1977**

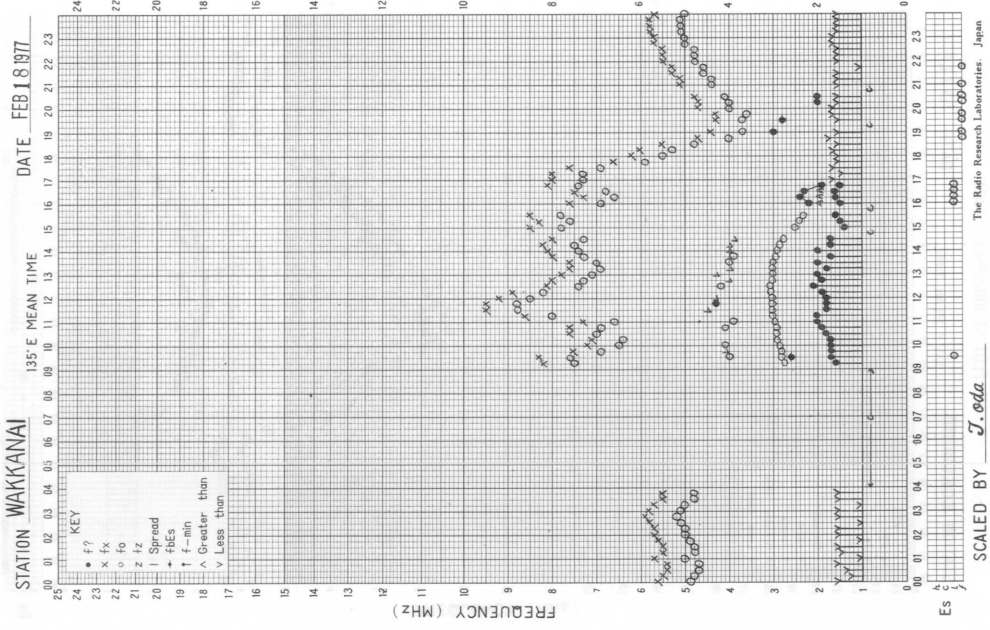


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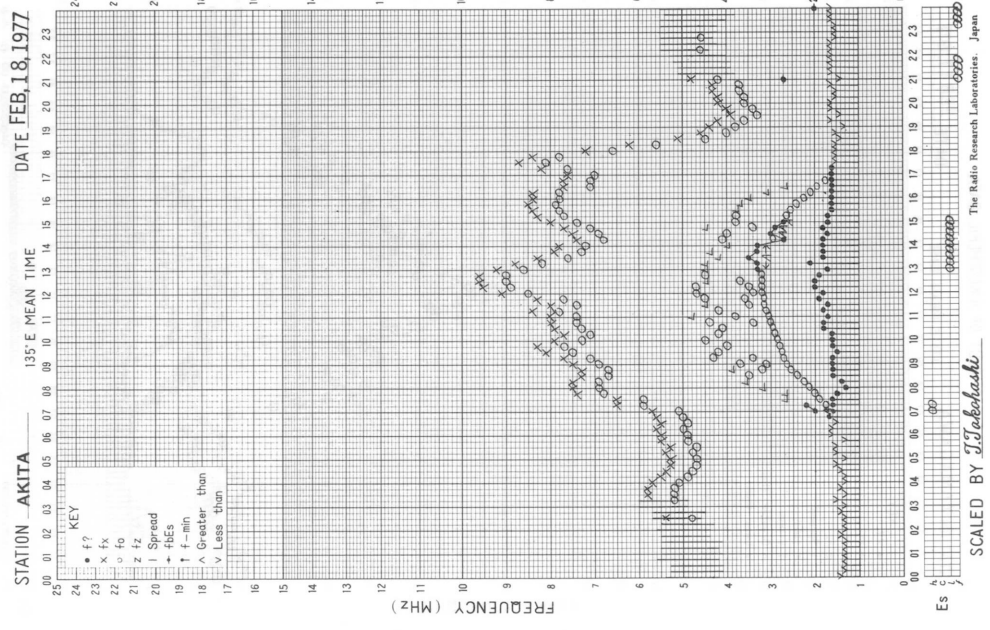
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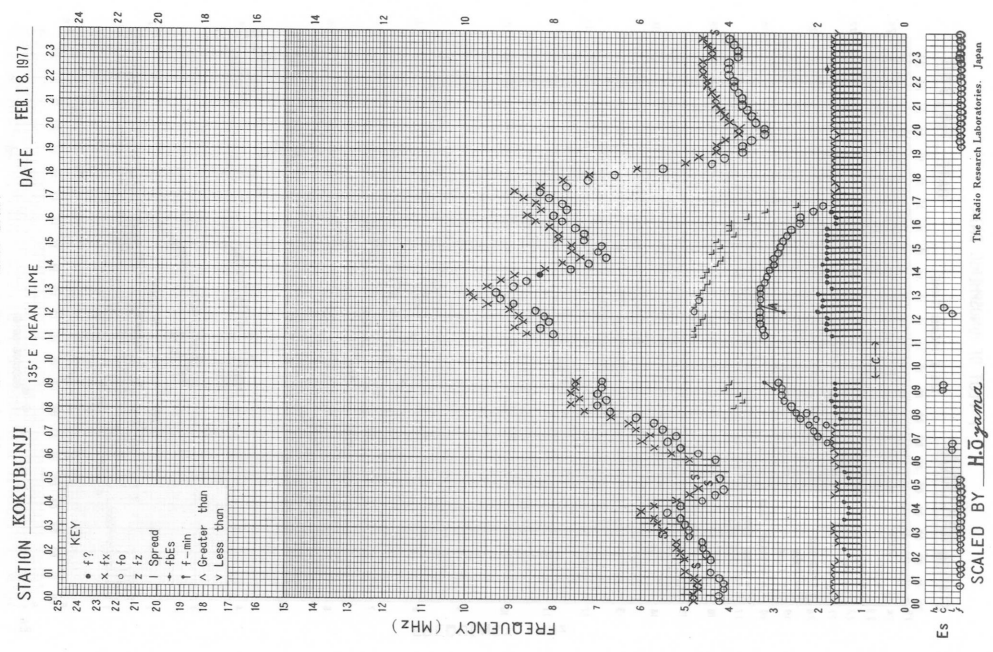


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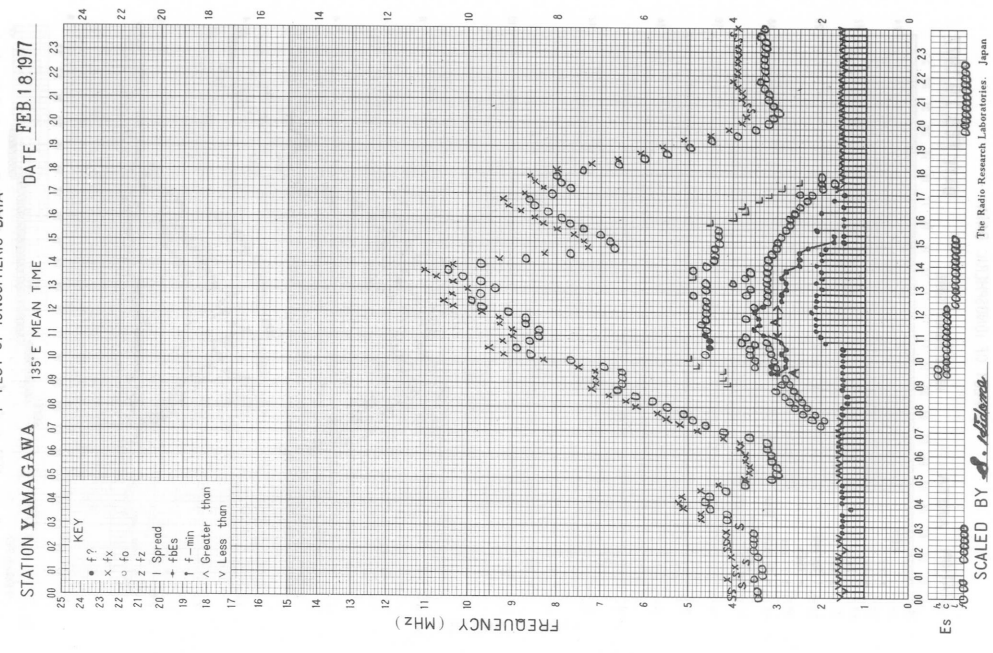




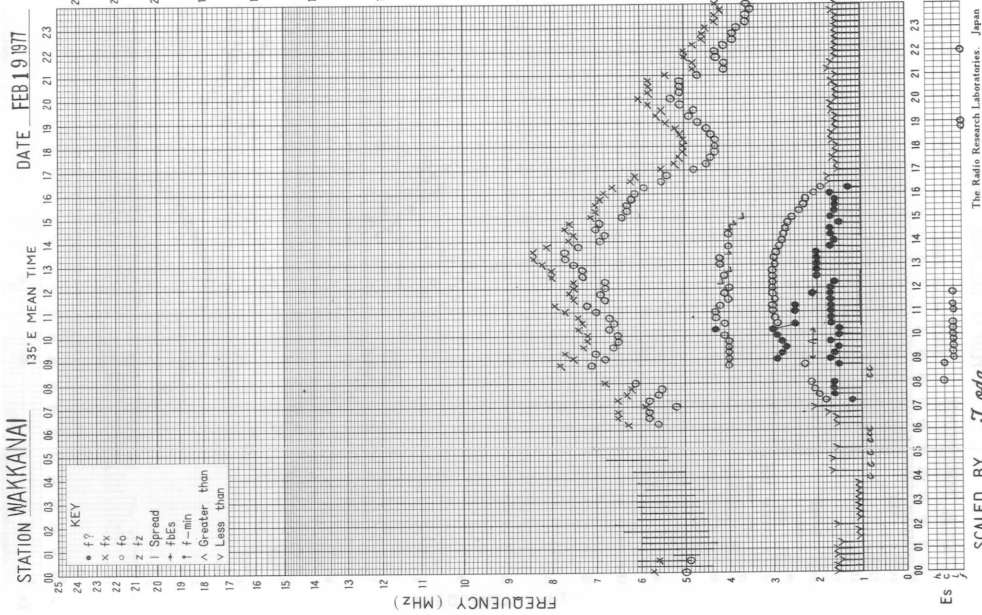
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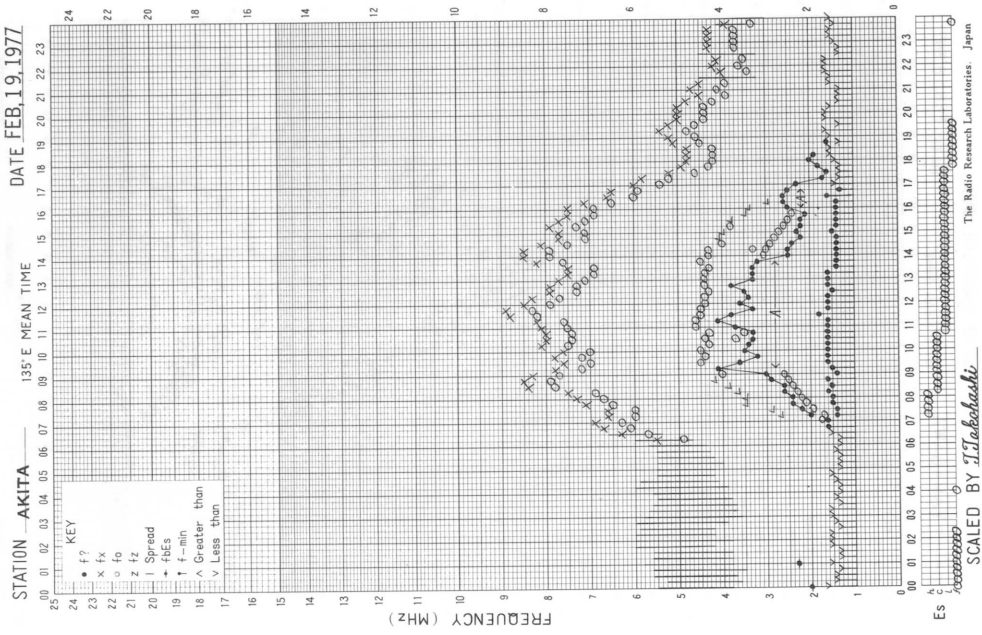
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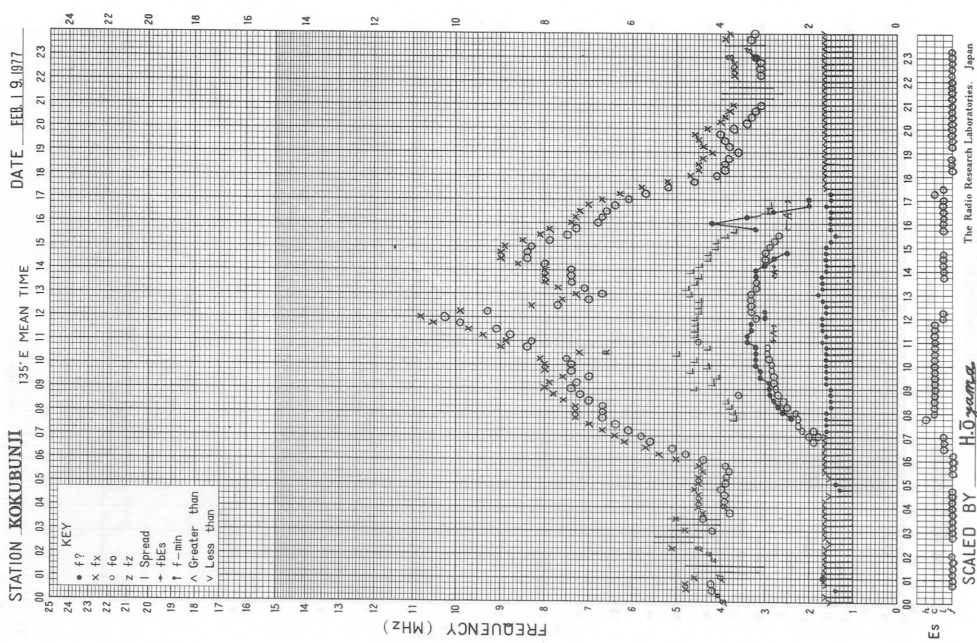
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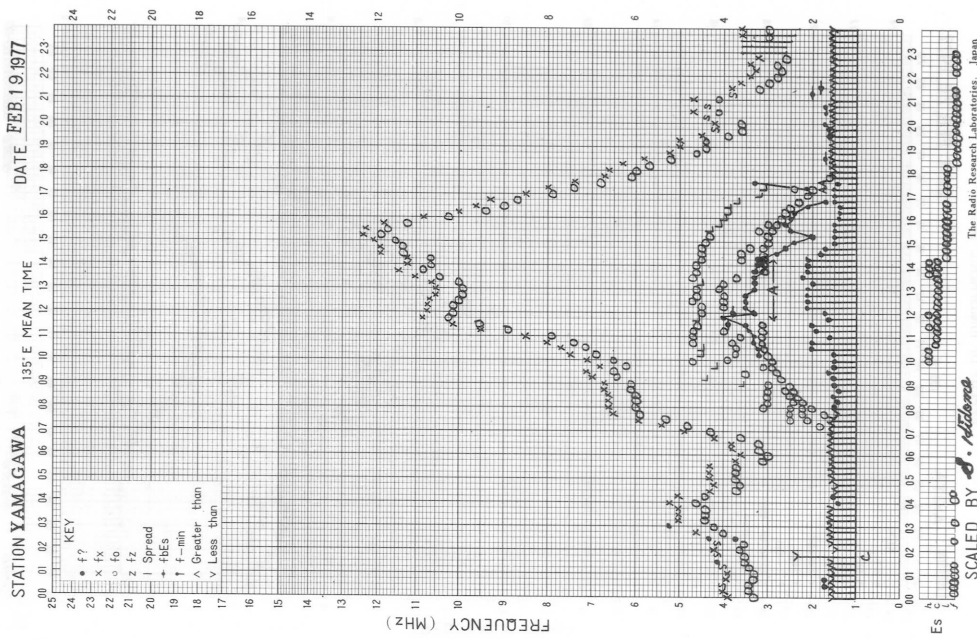
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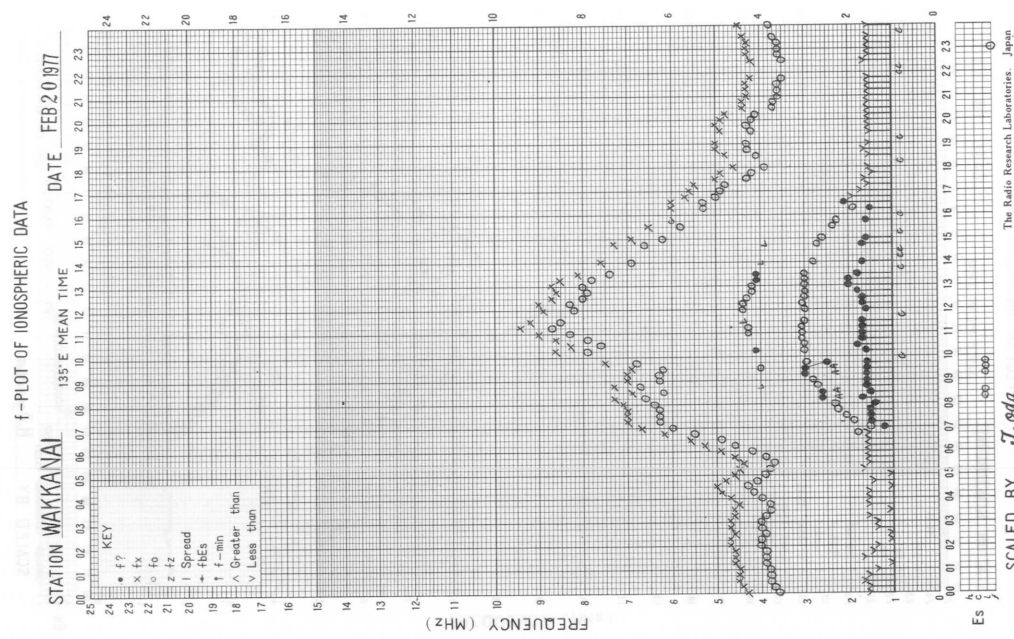
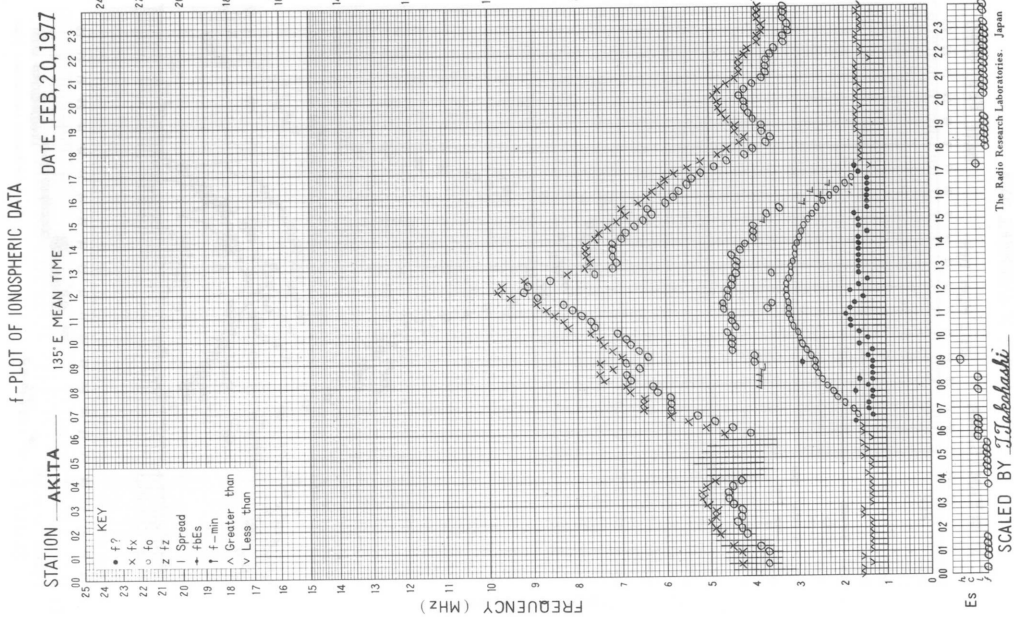


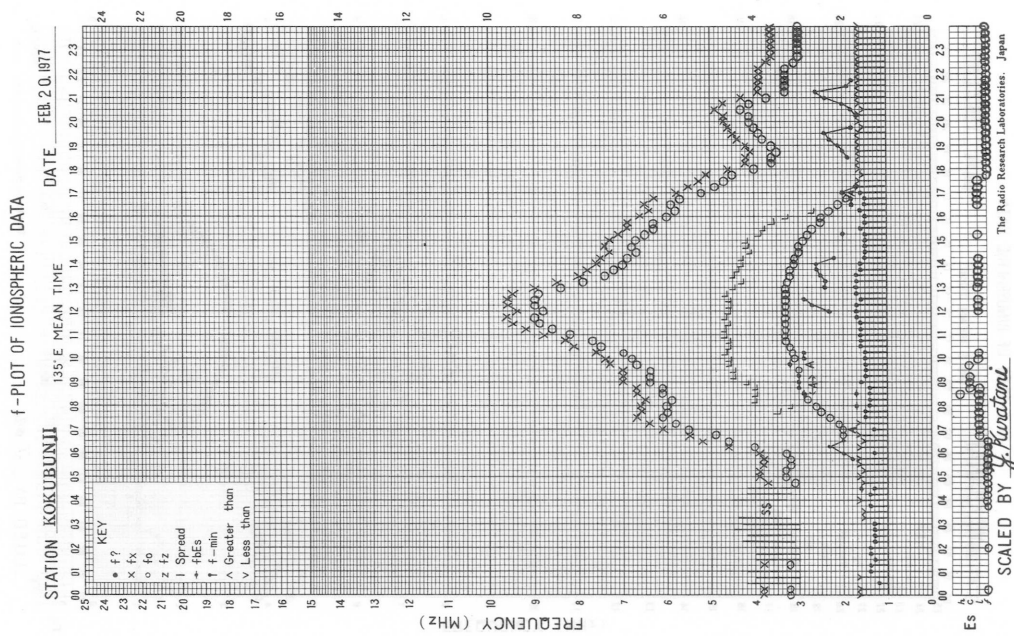
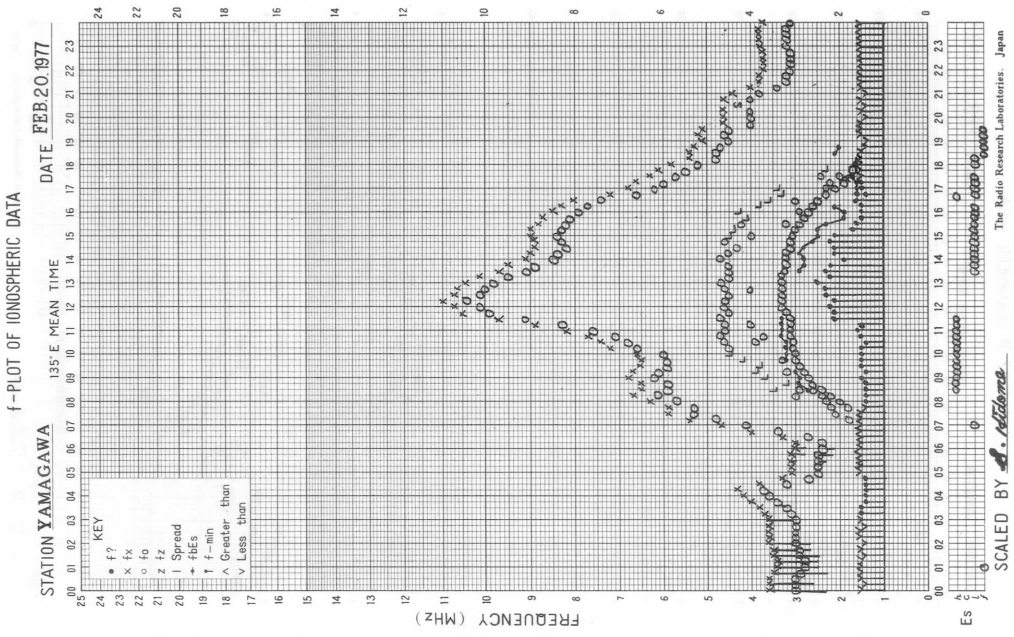
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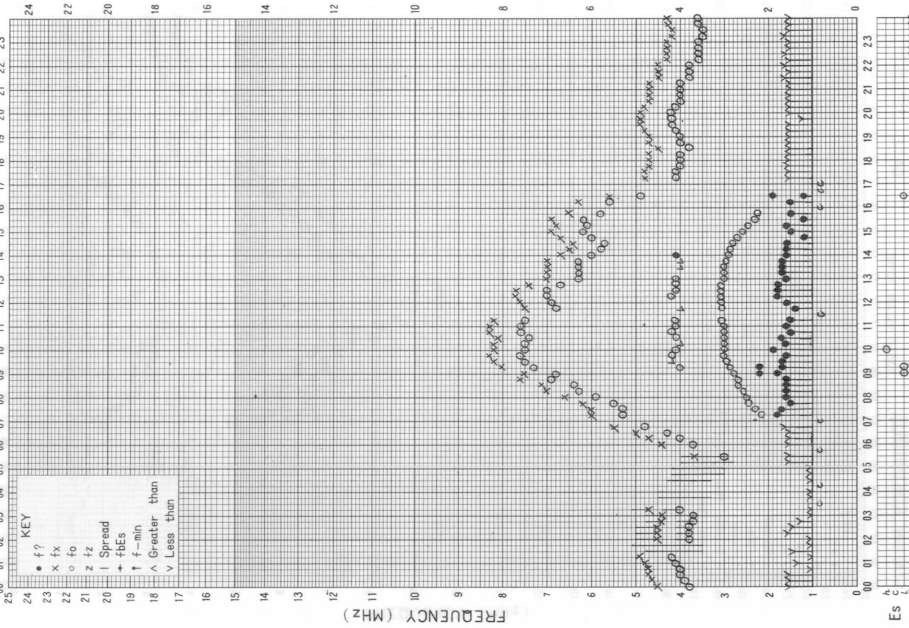






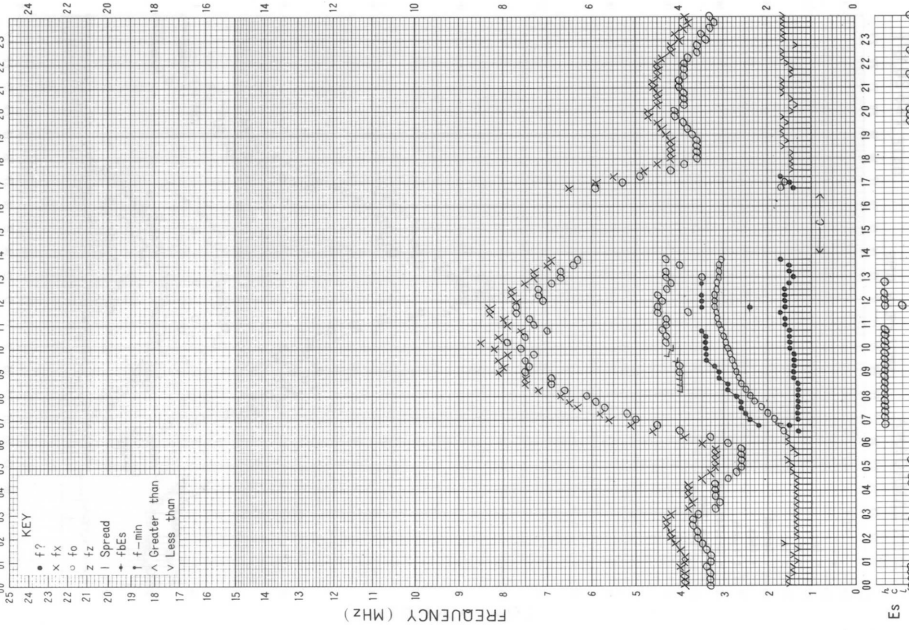
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STATION WAKKANAI 135°E MEAN TIME DATE FEB 21 1977

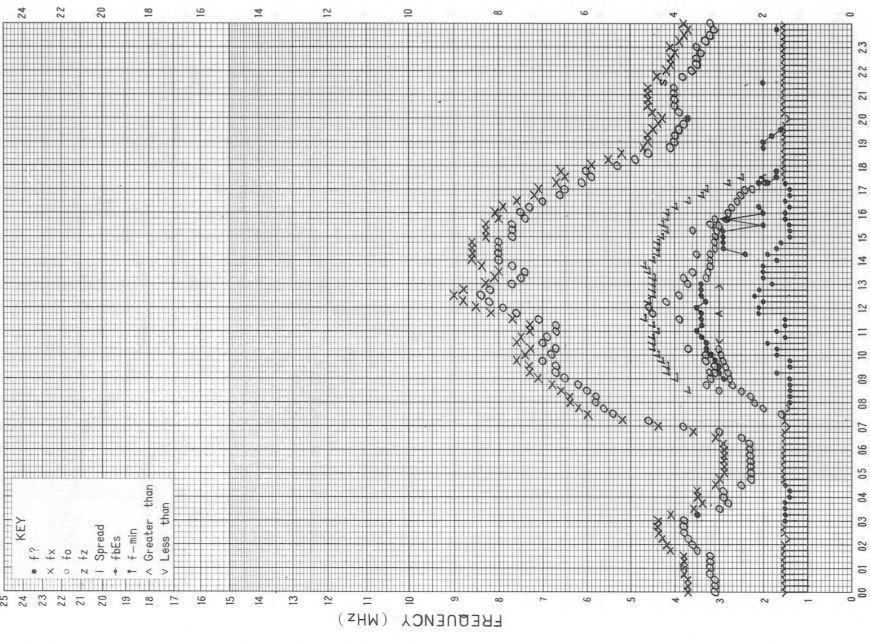


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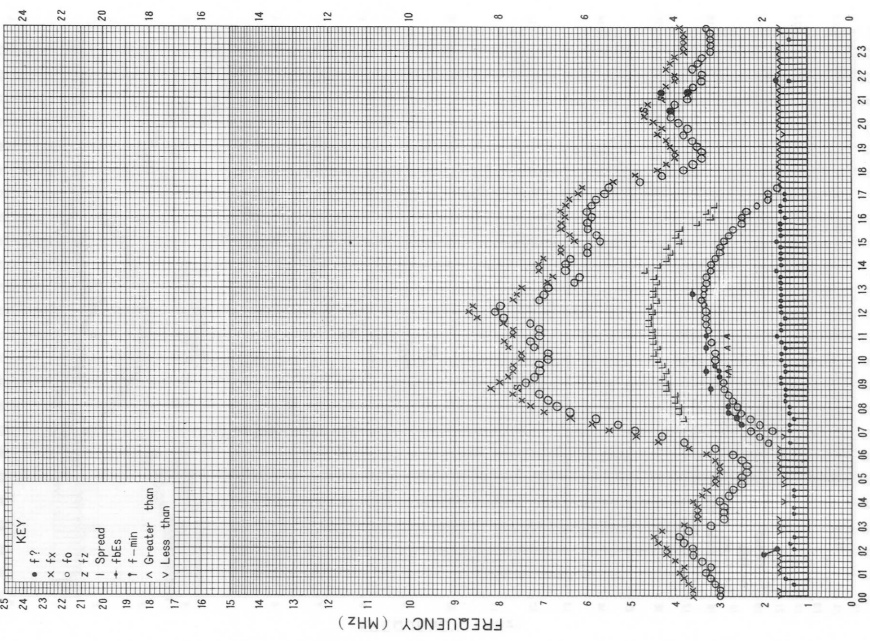
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 SCALED BY Takamasa  
 The Radio Research Laboratories, Japan

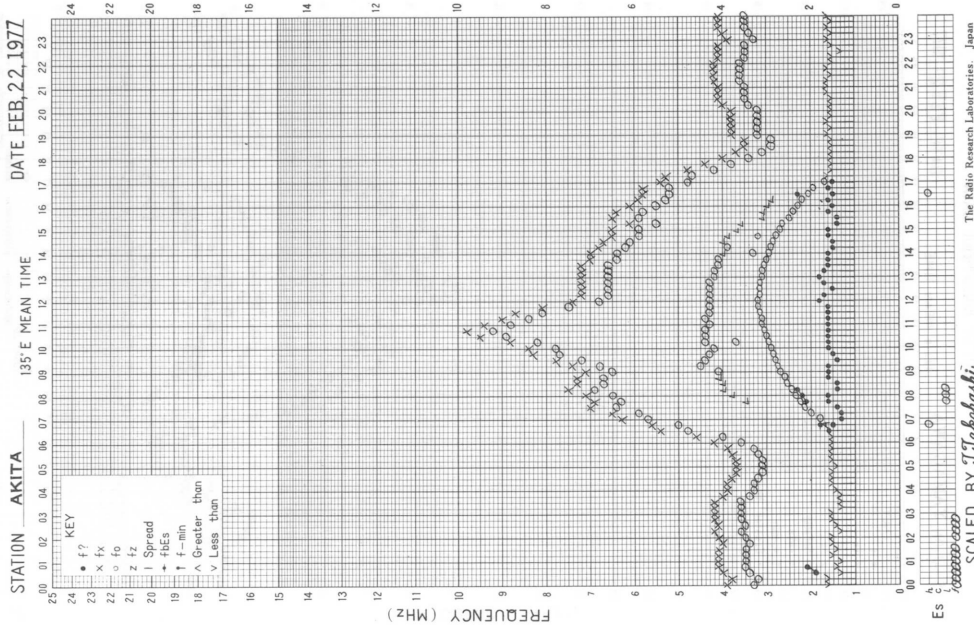
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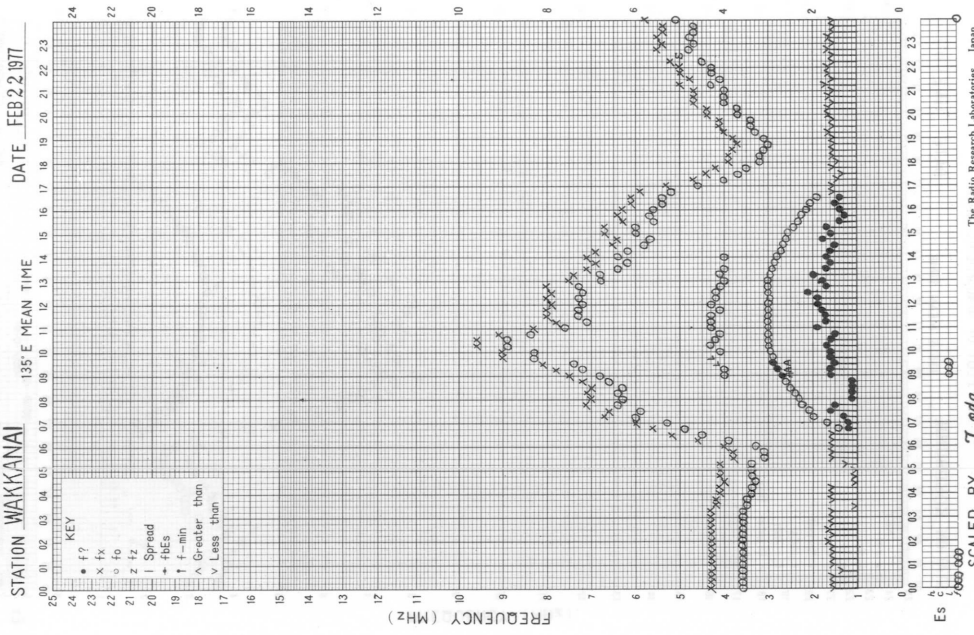
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 The Radio Research Laboratories, Japan

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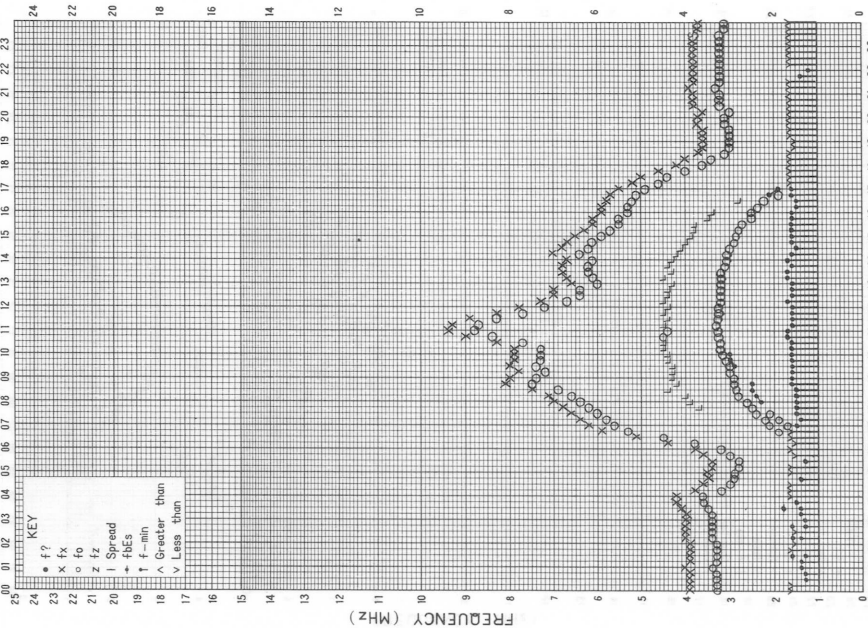
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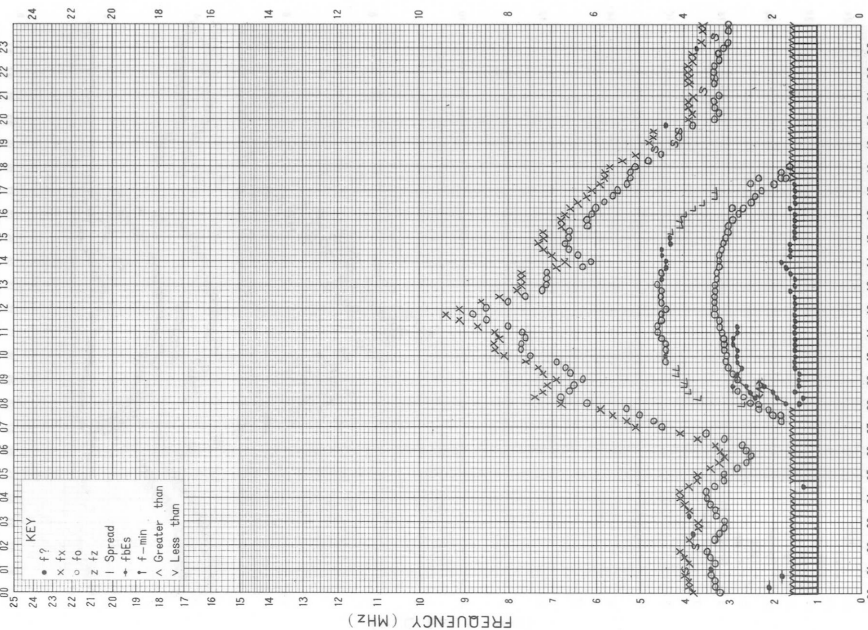
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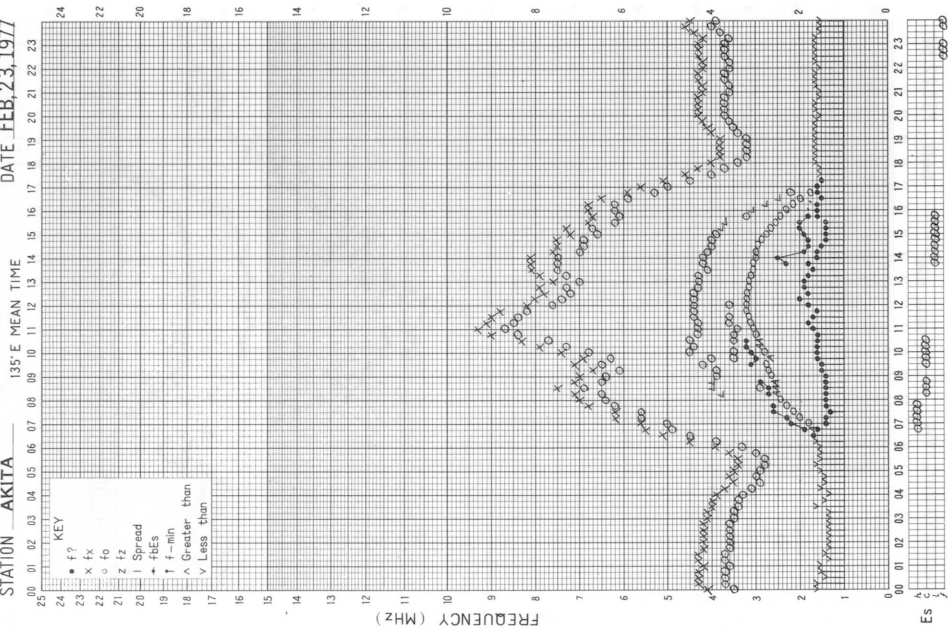
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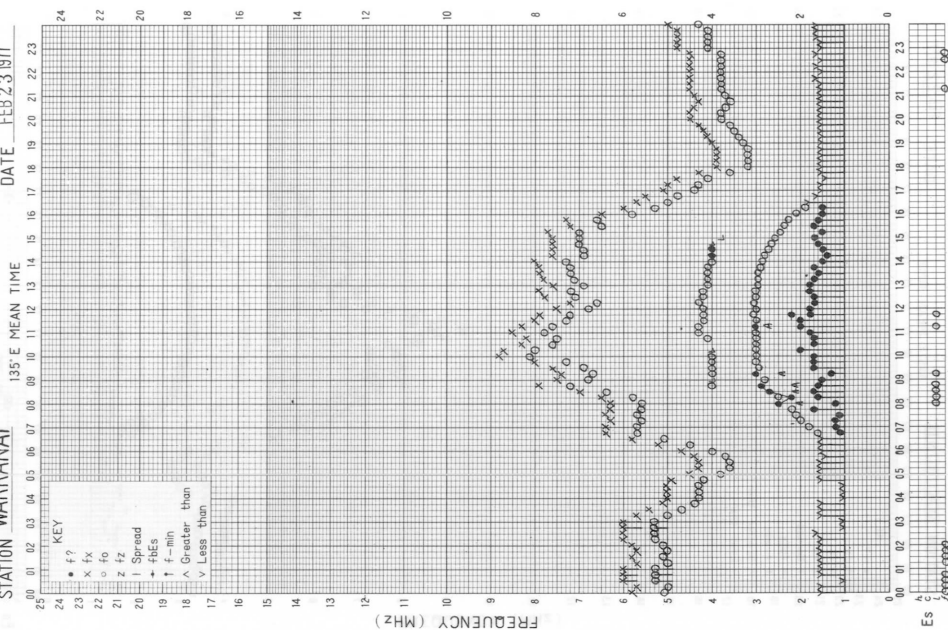
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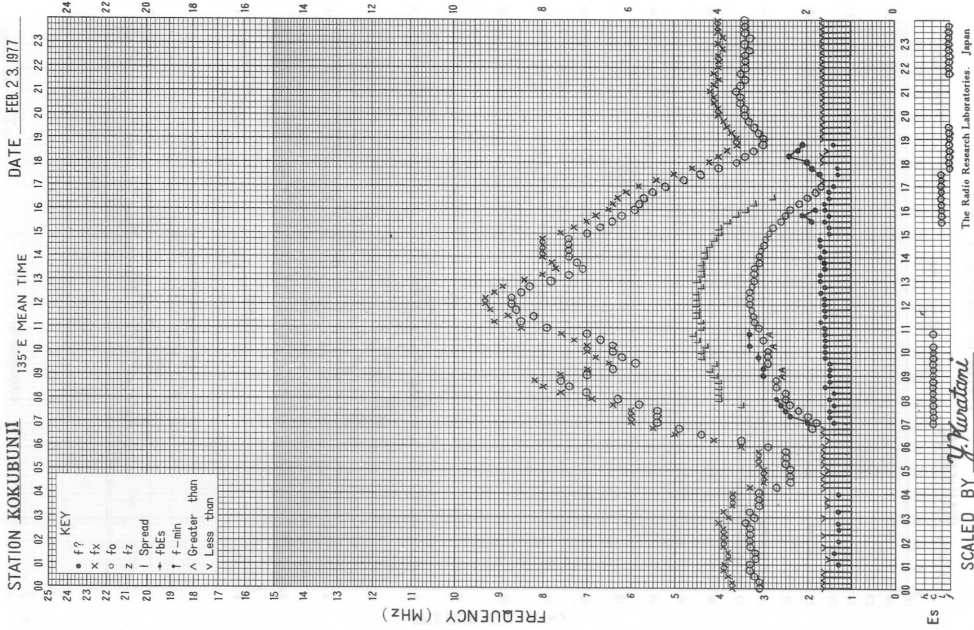


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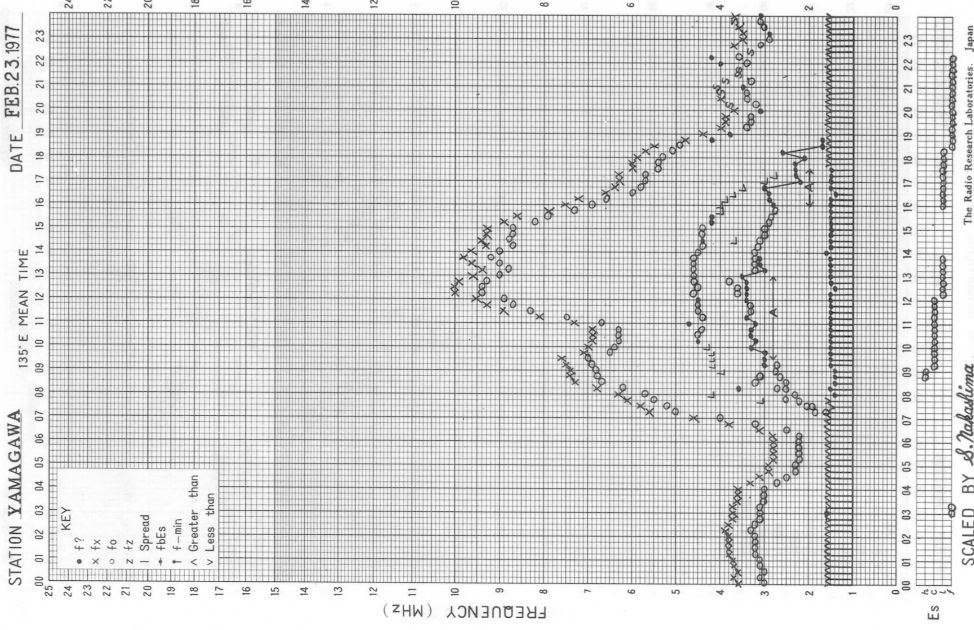
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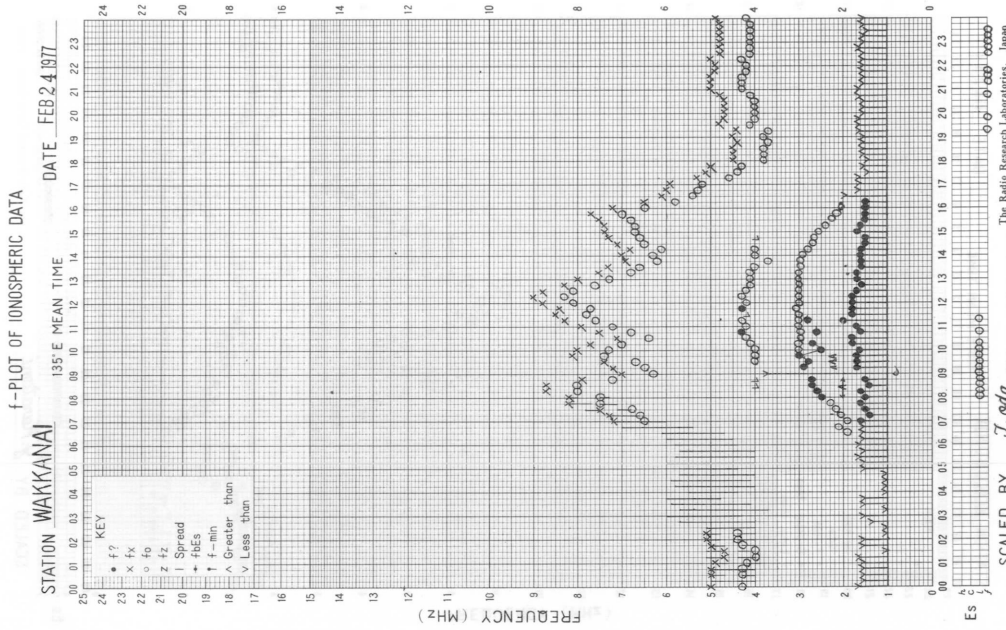
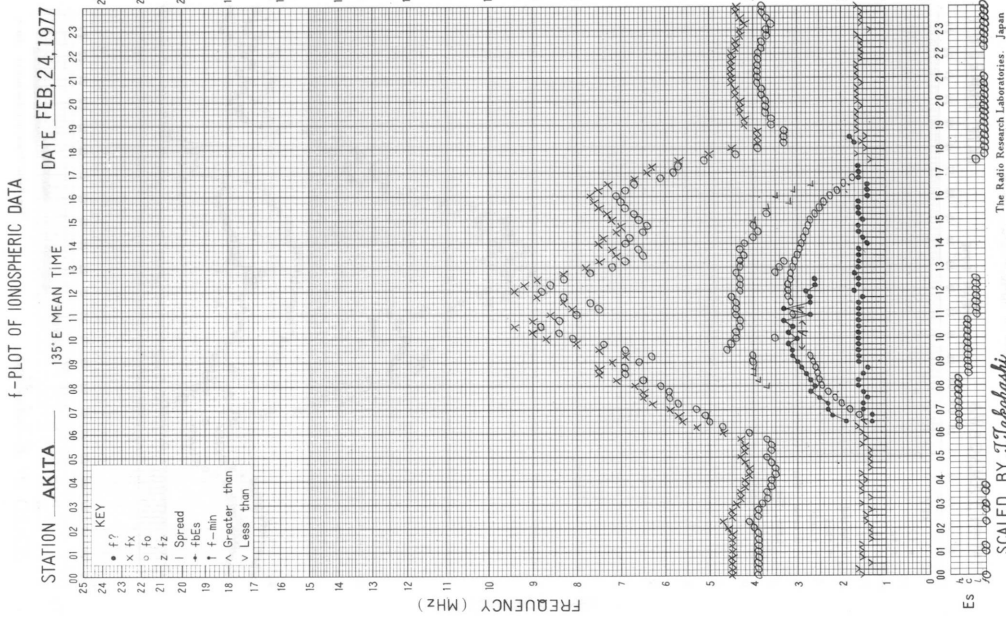


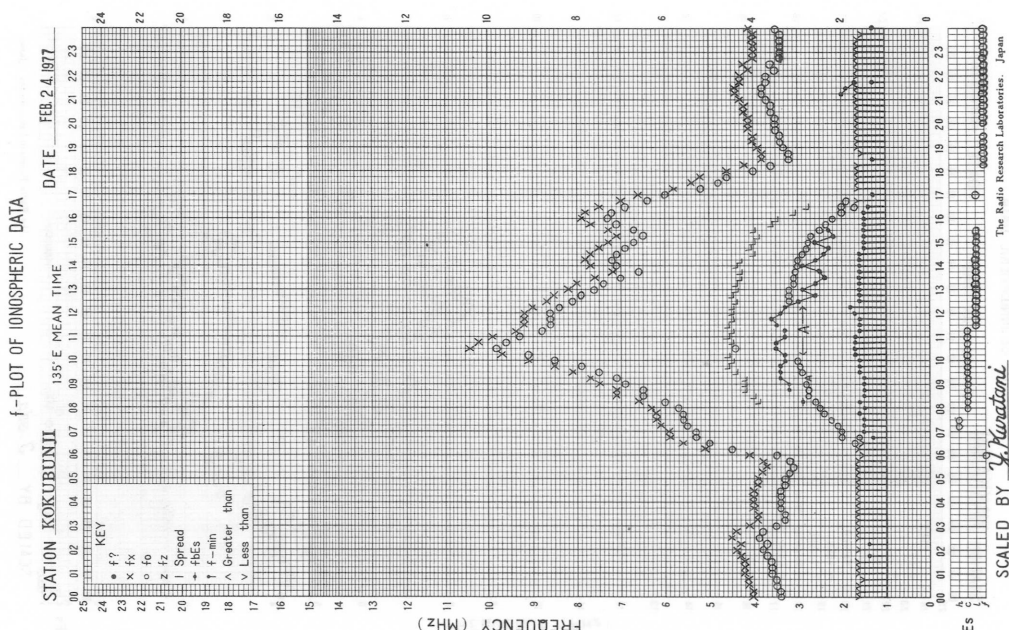
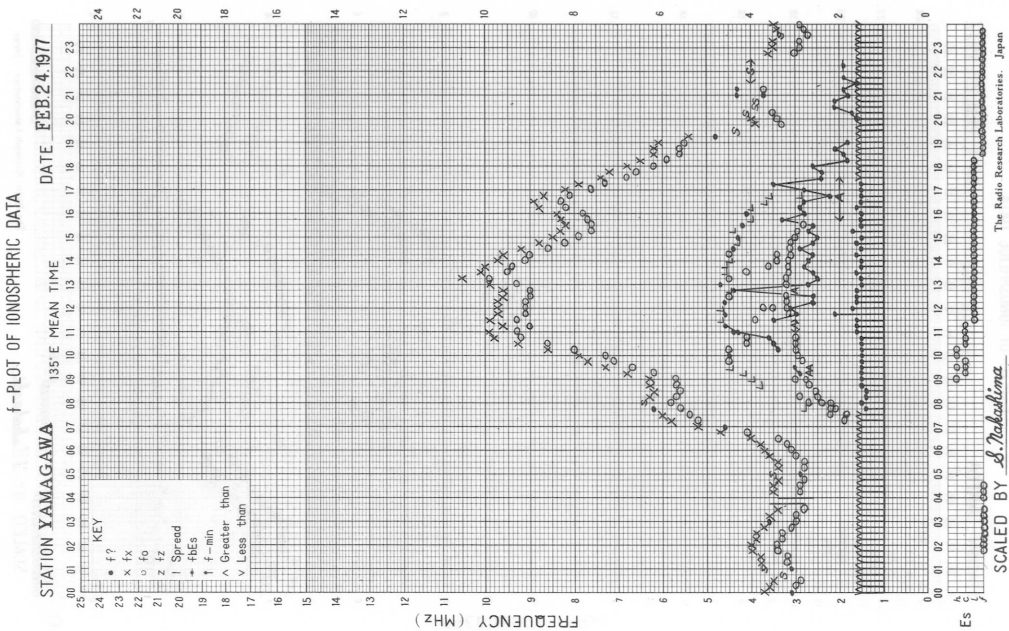
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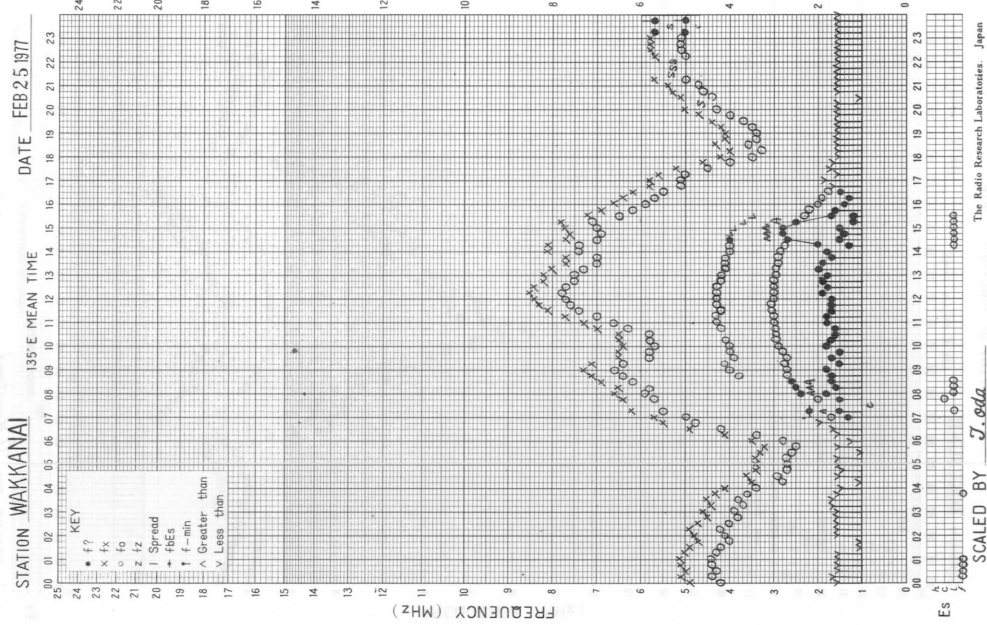
f-PLOT OF IONOSPHERIC DATA



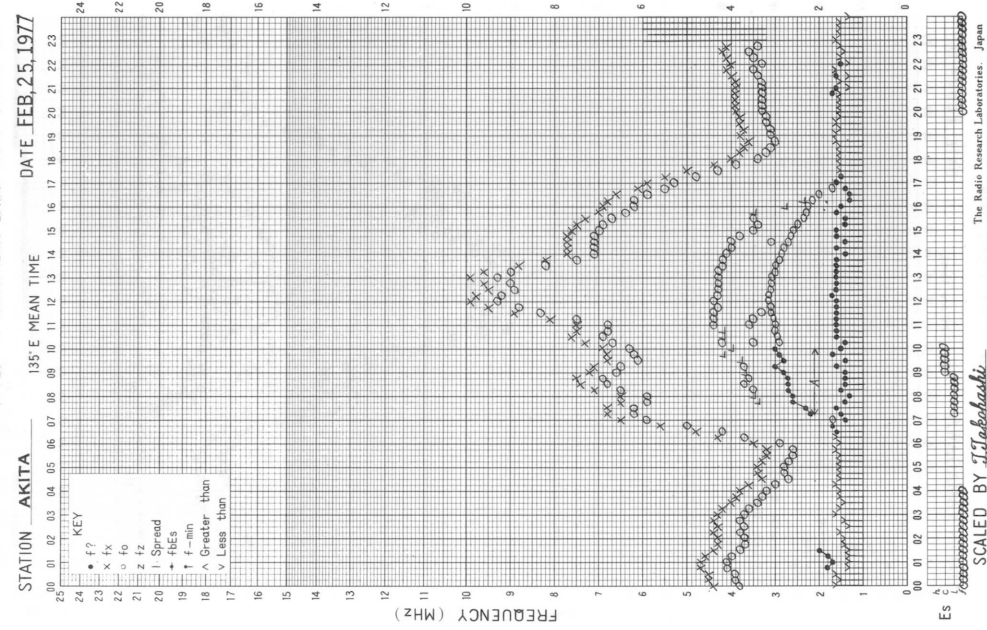




f-PLOT OF IONOSPHERIC DATA

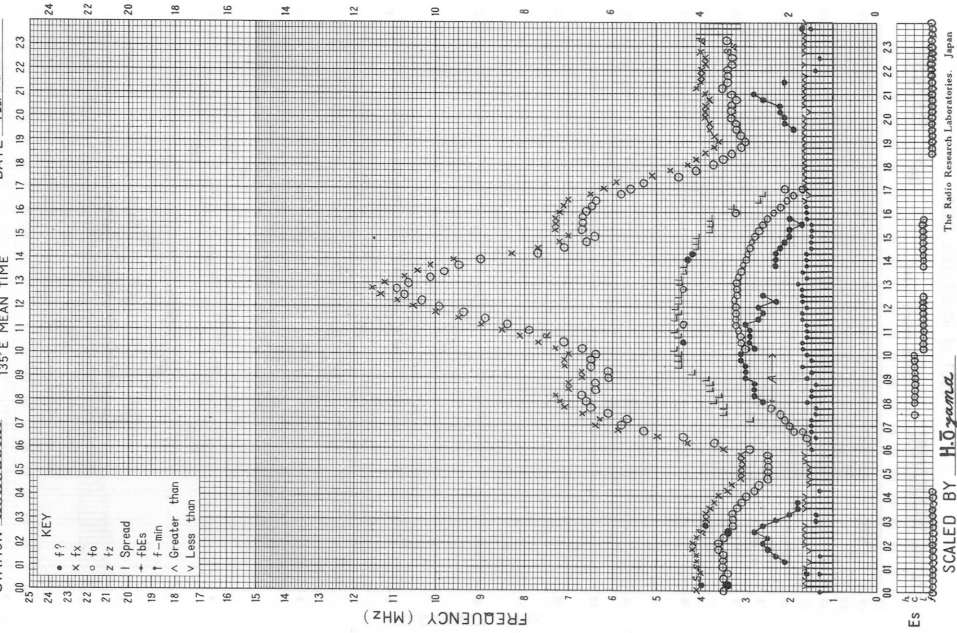


f-PLOT OF IONOSPHERIC DATA



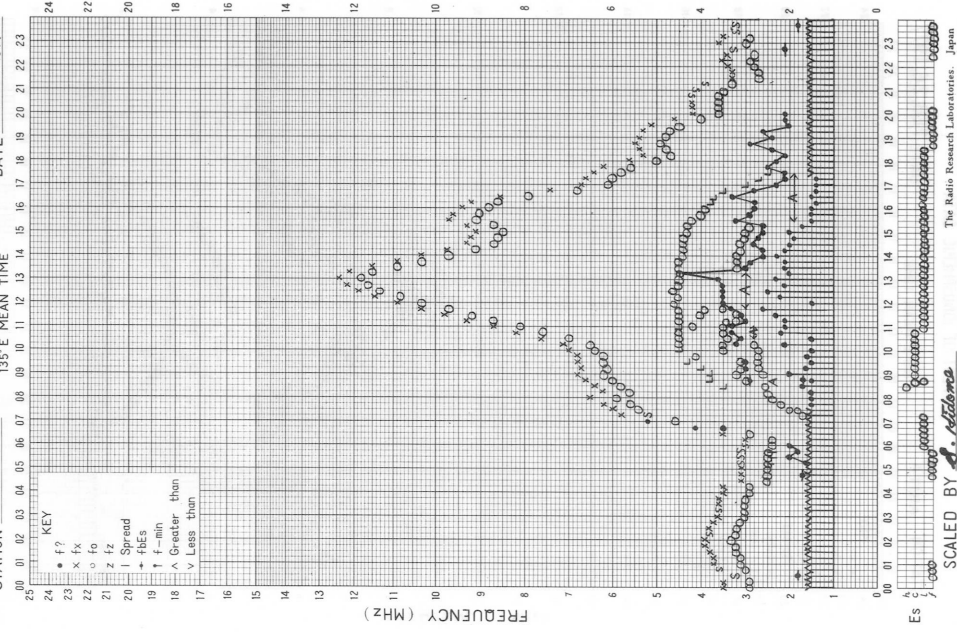
f-PLOT OF IONOSPHERIC DATA

STATION **KOKUBUNJI** 135°E MEAN TIME DATE **FEB. 25.1977**



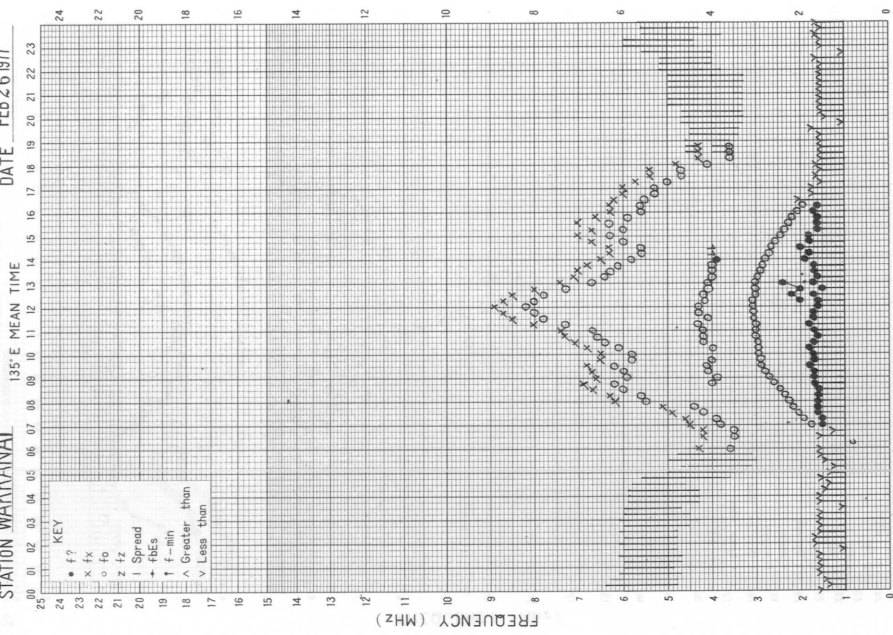
f-PLOT OF IONOSPHERIC DATA

STATION **YAMAGAWA** 135°E MEAN TIME DATE **FEB. 25.1977**



f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI DATE FEB 26 1977



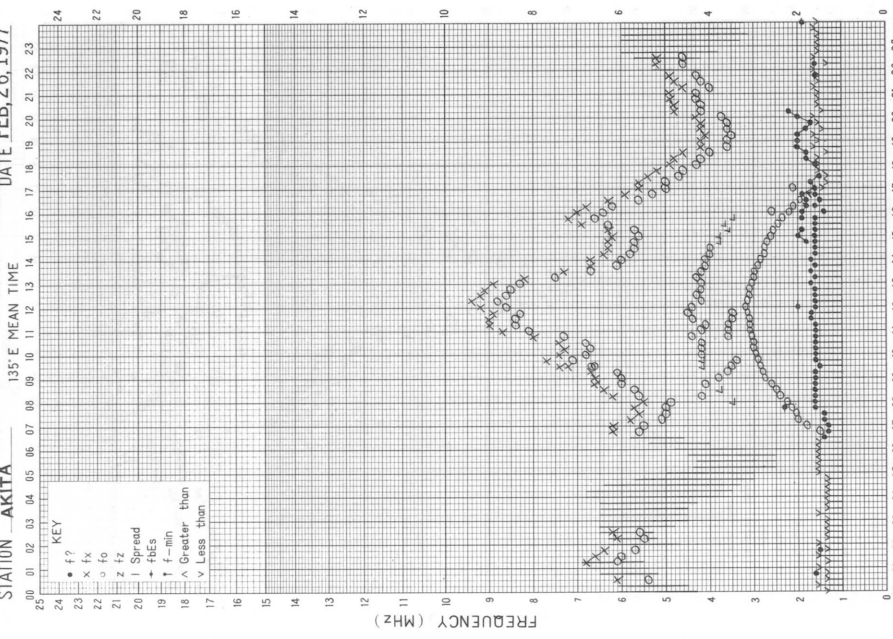
KEY  
 • f?  
 x fx  
 o fo  
 z fz  
 | Spread  
 + FEs  
 \* f-min  
 ^ Greater than  
 v Less than

ES  
 100 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23

SCALED BY J.oda  
 The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA DATE FEB 26 1977

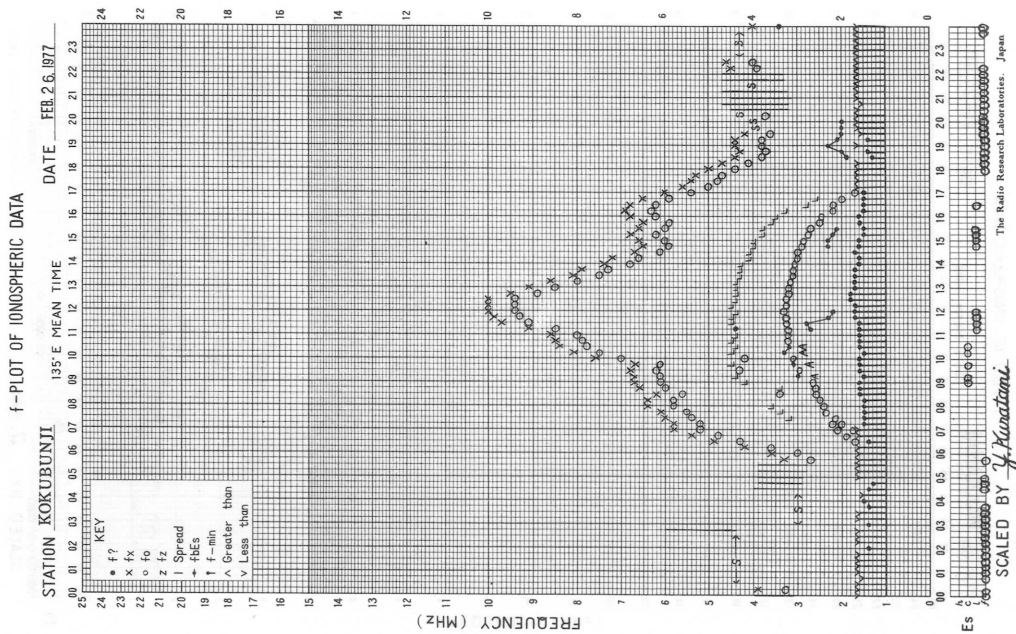
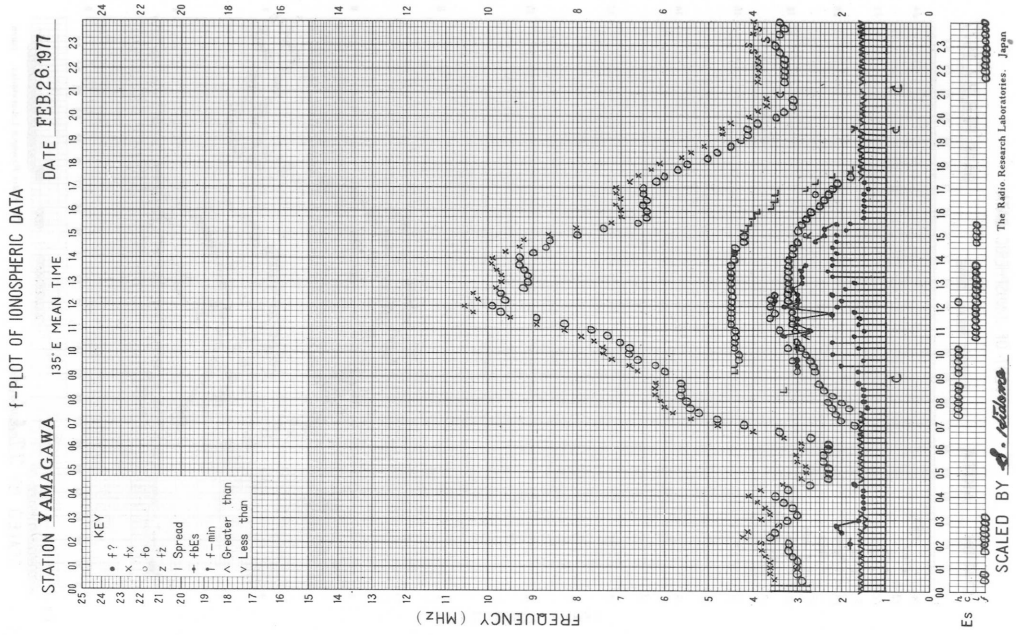


KEY  
 • f?  
 x fx  
 o fo  
 z fz  
 | Spread  
 + FEs  
 \* f-min  
 ^ Greater than  
 v Less than

ES  
 100 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23

SCALED BY T.Obokoshi  
 The Radio Research Laboratories, Japan

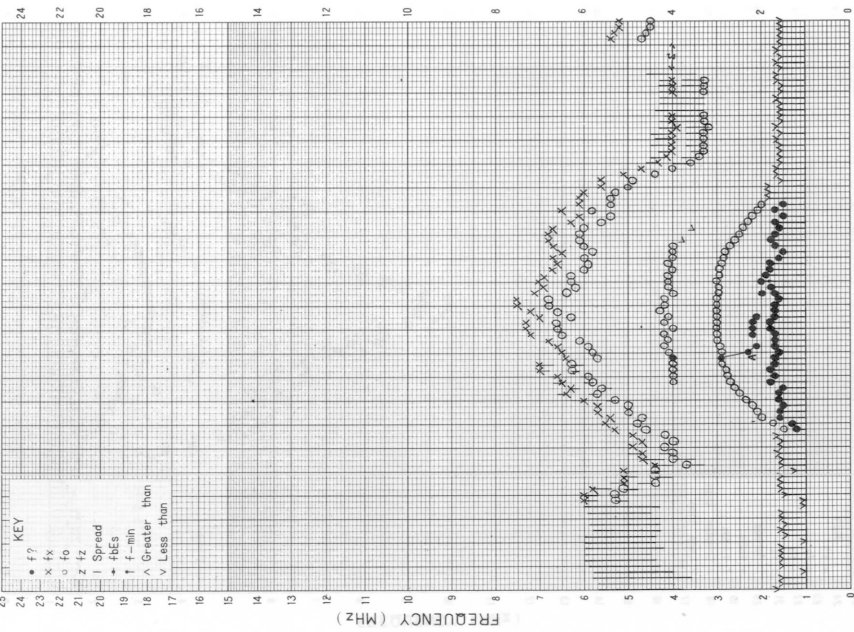




f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI DATE FEB 27 1977

135°E MEAN TIME

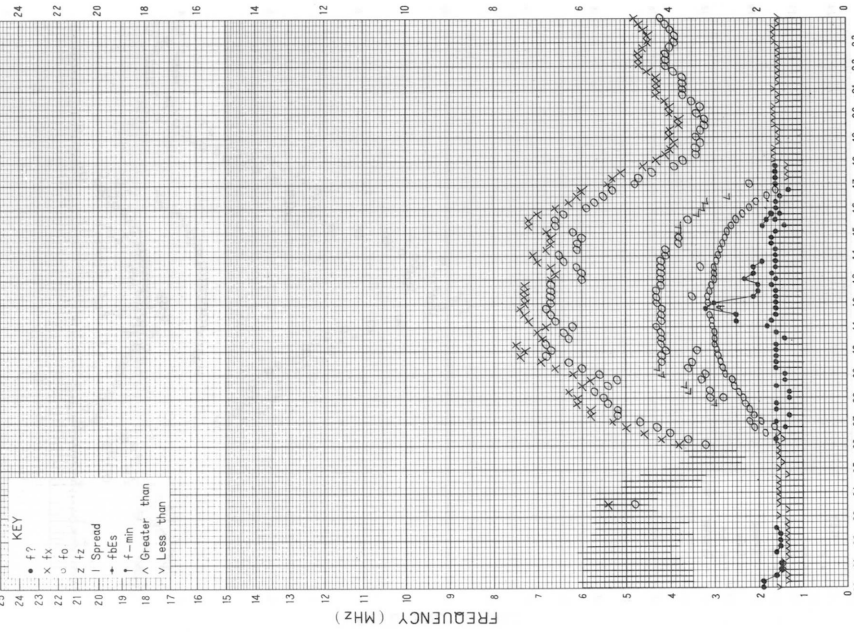


ES  
The Radio Research Laboratories, Japan  
SCALED BY J. Oda

f-PLOT OF IONOSPHERIC DATA

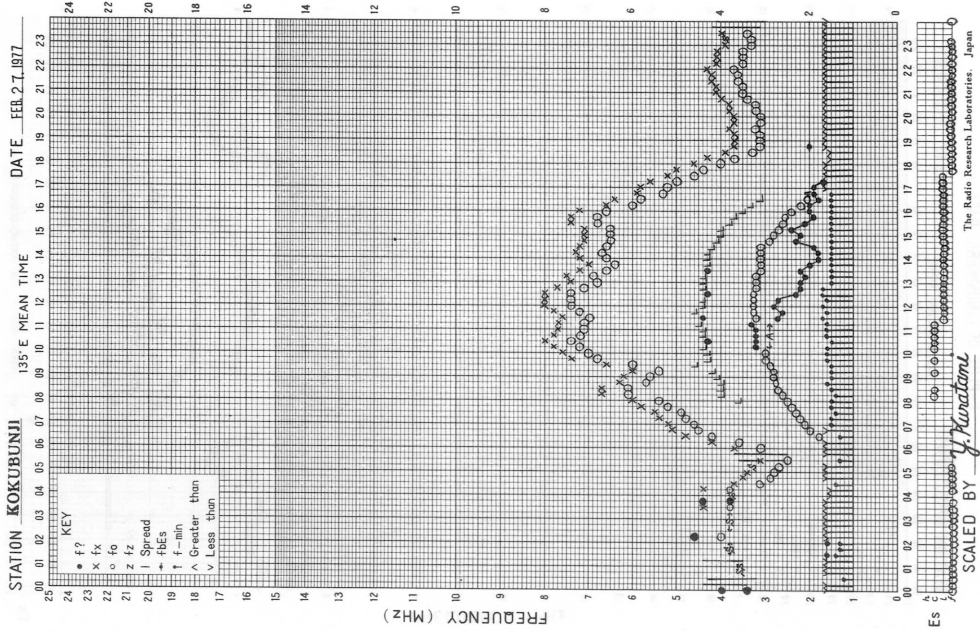
STATION AKITA DATE FEB 27, 1977

135°E MEAN TIME

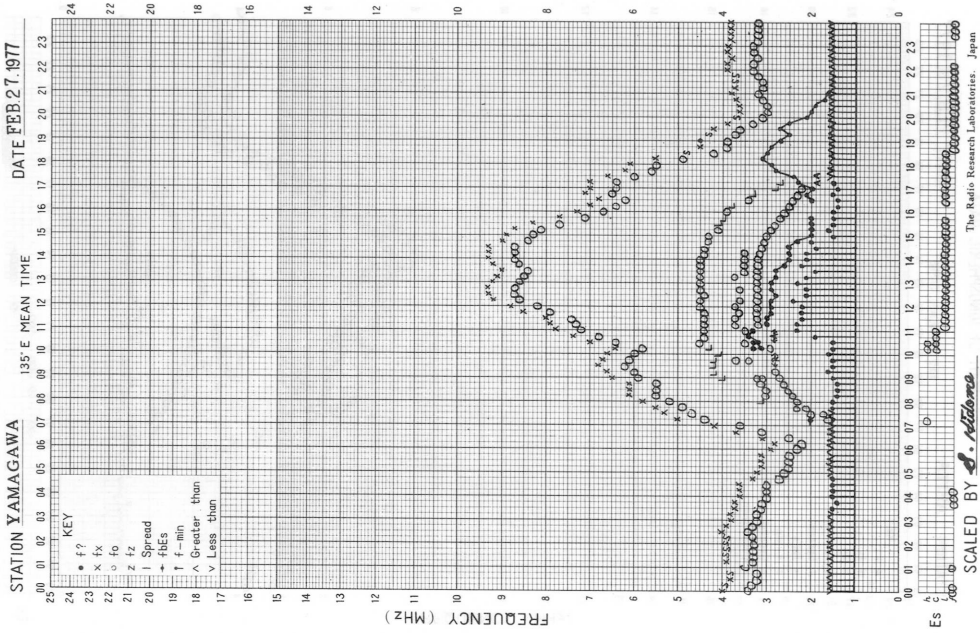


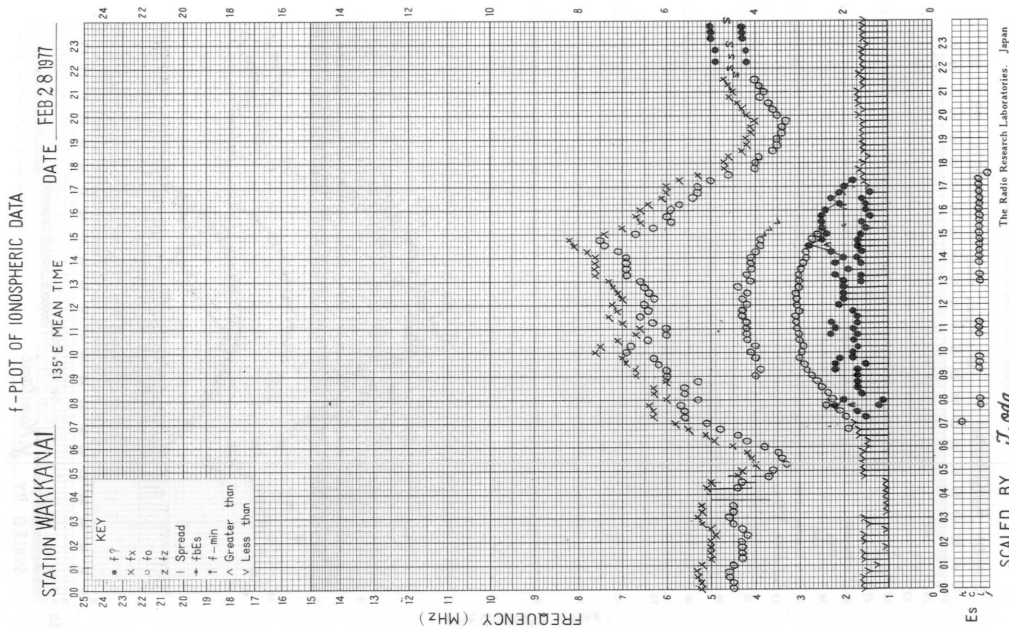
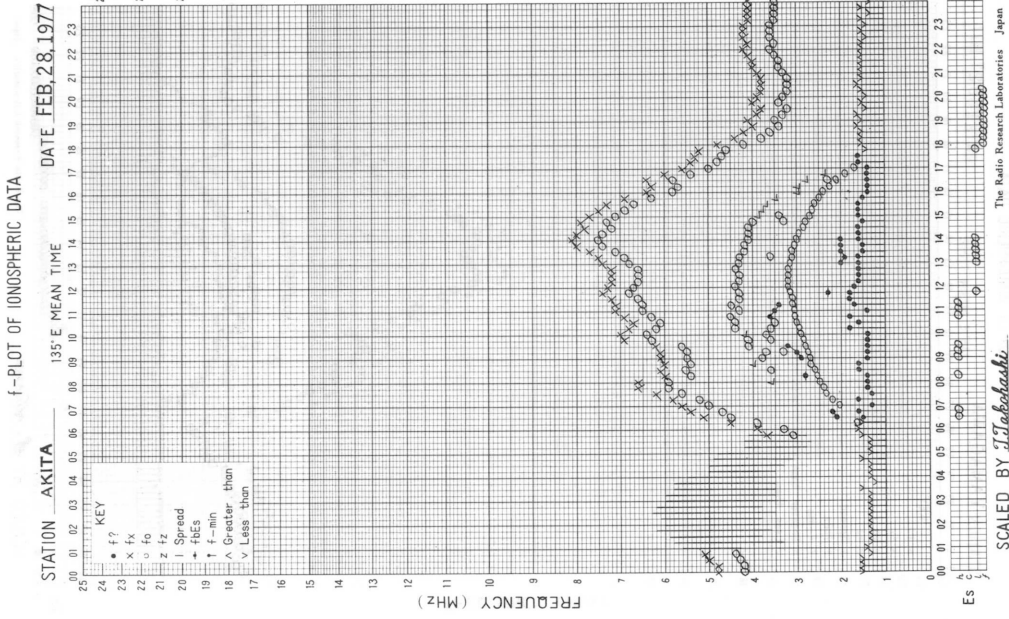
ES  
The Radio Research Laboratories, Japan  
SCALED BY T. Takahashi

f- PLOT OF IONOSPHERIC DATA



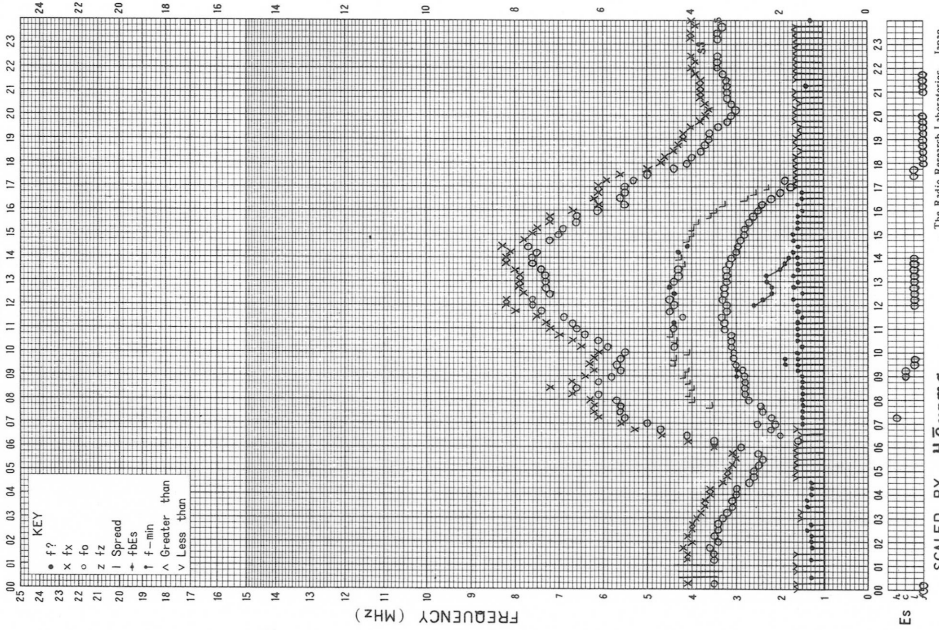
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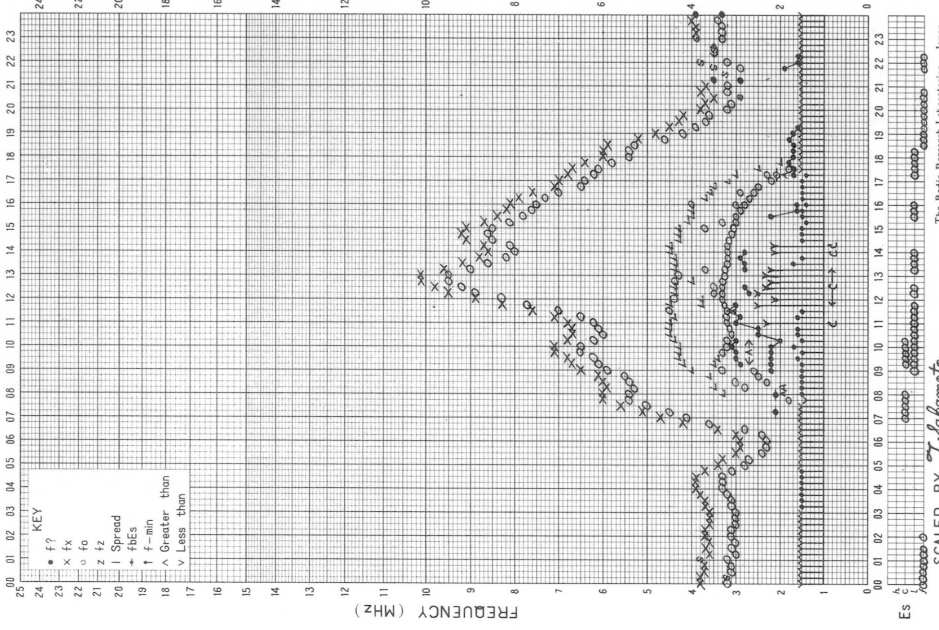
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE FEB 28 1977



f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE FEB 28 1977



SOLAR RADIO EMISSION

HIRAIISO (HIRA)

36.37N 140.62E

Hiraiso Branch, R.R.L.,  
Nakaminato, Ibaraki,  
311-12 JAPAN

February 1977

Single-frequency total flux observations at 200 MHz										
Flux density: $10^{-22} W_m^{-2} Hz^{-1}$						Variability: 0 to 3				
UT	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
Date										
1	6	7	(7)	7	7	0	0	(0)	0	0
2	6	7	(7)	7	7	0	0	(0)	0	0
3	6	6	(7)	7	6	0	0	(0)	0	0
4	7	7	(6)	q	7	0	0	(0)	0	0
5	q	q	(q)	7	q	0	0	(0)	0	0
6	7	7	(7)	8	7	0	0	(0)	0	0
7	7	7	(7)	7	7	0	0	(0)	0	0
8	7	7	(7)	12	7	0	0	(0)	1	0
9	10	10	(10)	8	11	0	1	(1)	1	0
10	8	8	(8)	6	8	0	0	(0)	0	0
11	6	6	(8)	6	6	0	1	(1)	3	0
12	6	6	(6)	6	6	2	2	(2)	2	2
13	6	6	(6)	6	6	2	2	(2)	0	2
14	6	6	(6)	9	6	1	1	(1)	0	1
15	9	9	9	8	9	1	2	1	0	1
16	8	7	8	8	8	0	0	0	1	0
17	9	8	8	8	8	1	0	0	0	0
18	8	8	8	7	8	0	0	0	0	0
19	7	7	7	7	7	0	0	0	0	0
20	6	8	8	8	7	0	0	0	1	0
21	8	8	7	7	8	1	0	0	0	0
22	7	8	8	7	8	0	0	0	0	0
23	7	7	7	7	7	0	0	0	0	0
24	7	7	7	7	7	0	0	1	0	0
25	7	7	7	8	7	0	0	0	0	0
26	8	8	8	8	8	0	0	0	0	0
27	8	8	8	8	8	0	0	0	0	0
28	8	8	7	8	8	0	0	0	0	0

Note: No observations during the following periods:

0130 - 0610  
0630 - 0730  
q: likely quiet.

## SOLAR RADIO EMISSION

HIRAISO (HIRA)

36.37N 140.62E

Hiraiso Branch, R.R.L.,  
Nakaminato, Ibaraki,  
311-12 JAPAN

February 1977

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	29	(30)	30	29
2	30	30	(31)	30	30
3	30	30	(30)	29	30
4	29	29	(29)	28	29
5	27	28	(28)	28	27
6	28	28	(28)	28	28
7	28	28	(28)	28	28
8	28	28	(29)	29	28
9	29	29	(30)	29	29
10	29	29	(30)	29	29
11	29	30	(30)	31	30
12	32	32	(32)	30	32
13	31	32	(31)	31	31
14	32	32	(32)	31	32
15	31	31	31	32	31
16	32	32	32	31	32
17	32	32	32	33	32
18	33	32	32	32	32
19	32	32	32	32	32
20	32	32	32	32	32
21	31	31	31	31	31
22	31	31	31	31	31
23	31	31	31	31	31
24	31	31	31	30	31
25	30	30	30	30	30
26	30	30	30	30	30
27	30	29	29	29	29
28	29	29	29	28	29

Note No observations during the following periods:

6th 0600 - 0610      26th 0600 - 0610  
21st 0300 - 0330      28th 0300 - 0330

## SOLAR RADIO EMISSION

HIRAISO (HIRA)

36.37N 140.62E

Hiraiso Branch, R.R.L.,  
Nakaminato, Ibaraki,  
311-12 JAPAN

February 1977

Outstanding Occurrences (single-frequency observations)									
Normal observing period: 2130 - 0820 (sunrise to sunset)									
FEB. 1977	FREQ STATION	TYPE	START TIME UT	TIME OF MAXIMUM UT	DUR MIN	FLUX DENSITY		POLARIZATION POSITION REMARKS	
						PEAK	MEAN		
8	500 HIRA	5 S	2209.3	2209.6	1.0	35	15	MR	
	200	45 C	2209.4	2209.6	0.6	780	250	MR	
	100	45 C	2209.5	-	0.5	120D	-	MRML	
11	200	45 C	0740.0	0740.3	1.2	150	20	0	
	100	45 C	0740.1	0740.3	0.9	980	150	0	
	500	45 C	0740.1	0740.8	1.5	120	80	MR	
12	200	44 NS	2135E	0135	650D	50	25	SR	
	200	44 NS	2135E	2320	650D	30	15	SR	
14	200	43 NS	0000	0200	500D	15	5	SR	
15	200	43 NS	0230	0530	240	25	5	SL	





RADIO PROPAGATION

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

FEB 1977 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

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

## RADIO PROPAGATION

## RADIO PROPAGATION QUALITY FIGURES

HIRAISO		Time in U.T.														
Feb. 1977	Whole Day Figure	W W V				W W V H				Condition				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	3+	3U	S	S	3U	4	3U	S	4	U	U	U	U			
2	4o	4U	S	S	4	4	4U	S	4	U	U	U	U			
3	4o	4U	S	S	3	4	5U	S	4	N	N	N	N			
4	4-	2U	S	S	3	4	5U	S	4	N	N	N	N			
5	4-	3U	S	S	3	4	4U	S	4	N	N	N	N			
6	4o	3U	S	S	4	4	5U	S	4	N	N	N	N			
7	4+	4U	S	S	4	4	5U	5U	4	N	N	N	N			
8	4-	4U	S	S	3	4	4U	S	4	N	N	N	N			
9	4o	3U	S	S	4	4	5U	S	4	U	U	U	U			
10	4+	5U	S	S	3	4	5U	S	4	U	U	U	U			
11	4o	4U	S	S	3	4	5U	S	4	U	U	U	U			
12	4+	4U	S	S	4	4	5U	S	4	N	N	N	N			
13	4+	4U	S	S	4	4	5U	S	4	N	N	N	N			
14	4o	4U	S	S	4	4	4U	S	4	N	N	N	N			
15	4-	4U	S	S	4	4	3U	S	3	N	N	N	N			
16	4-	4U	S	S	4	3	4U	S	4	N	N	N	N			
17	4-	3U	S	S	4	4	3U	S	4	N	N	N	N			
18	4+	5U	S	5U	5	4	4U	S	4	N	N	N	N			
19	4-	4U	S	S	4	4	3U	S	4	N	N	N	N			
20	4o	4U	S	5U	5	4	3U	S	4	N	N	N	N			
21	4+	4U	S	5U	5	4	4U	S	4	N	N	N	N			
22	4-	4U	S	5U	4	3	3U	S	4	N	N	N	N			
23	4-	4U	S	S	5	4	2U	S	4	N	N	N	N			
24	4-	4U	S	S	4	4	3U	S	3	N	N	N	N			
25	4-	4U	S	S	4	4	2U	S	4	N	N	N	N			
26	3+	4U	S	S	4	3	2U	S	4	N	N	N	N			
27	3+	4U	S	S	4	3	2U	S	3	N	N	N	N			
28	3-	3U	S	C	C	3	2U	C	C	N	N	N	N			

## RADIO PROPAGATION

## SUDDEN IONOSPHERIC DISTURBANCES

HIRAISO

Time in U.T.

Feb	S W F						Correspondence				
	Drop-out Intensities (dB)				Start	Duration	Type	Imp.	Solar Flare	Solar Noise	Geomag. Crochet
1977	CO	HA	1)	2)							
17			7		0607	23	SL	1-		x	

## NOTES

CO: Colorado (WWV)

HA: Hawaii (WWVH)

1): Australia

2): Moskva

## RADIO PROPAGATION

## Sudden Ionospheric Disturbance (SPA)

I N U B O

Feb. 1977	S P A										
	Phase Advance (degrees)								Time (U.T.)		
Date	GBR	NAA	NLK	NWC	AL3	ND3	HA3	RE3	Start	End	Maximum
11		—	31	—		39	<u>78</u>		2126	2230	2134
17	16	—		—	23			<u>81</u>	0603	0735	0616
18		—		—			7		2348	0028	2354

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IONOSPHERIC DATA IN JAPAN FOR FEBRUARY 1977

F-338 Vol.29 No. 2 (Not for Sale)

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発行所 〒184 東京都小金井市貫井北町4丁目2-1

☎ (0423) (21) 1 2 1 1 (代)

印刷所 株式会社 オートプレス

〒180 東京都武蔵野市中町3-2-17

☎ (0422) (54) 7 3 6 4 (代)

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Queries about "Ionospheric Data in Japan" should be forwarded to:  
The Radio Research Laboratories, Ministry of Posts and Telecommunications,  
2-1 Nukui-Kitamachi 4-chome, Koganei-shi, Tokyo 184 JAPAN.