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# IONOSPHERIC DATA IN JAPAN

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RADIO RESEARCH LABORATORIES

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## SITE OF THE RADIO WAVE OBSERVATORIES AND HIRAIISO BRANCH

Ionospheric observation is carried out at the following four observatories in Japan.

	Latitude	Longitude	Site
Wakkanai	45°23.6'N.	141°41.1'E.	Midori-cho, Wakkanai-shi, Hokkaido
Akita	39°43.5'N.	140°08.2'E.	Tegata Sumiyoshi-cho, Akita-shi, Akita-ken
Kokubunji	35°42.4'N.	139°29.3'E.	Nukui-Kitamachi, Koganei-shi, Tokyo-to
Yamagawa	31°12.1'N.	130°37.1'E.	Yamagawa-machi, Ibusuki-gun, Kagoshima-ken

Solar radio emission and radio propagation conditions are observed at Hiraiso Branch and Inubo Radio Wave Observatory.

	Latitude	Longitude	Site
Hiraiso	36°22.0'N.	140°37.5'E.	Isozaki-machi, Nakaminato-shi, Ibaraki-ken
Inubo	35°42.2'N.	140°51.5'E.	9912 Tennodai, Choshi-shi, Chiba-ken

## SYMBOLS AND TERMINOLOGY

### A. IONOSPHERE

All symbols and terminology in the table of ionospheric data are used in accordance with the "URSI Handbook of Ionogram Interpretation and Reduction," 1961.

#### Terminology

$f_oF2$ $f_oF1$ $f_oE$	}	The ordinary wave critical frequency for the $F2$ , $F1$ and $E$ layers, respectively.
$f_oEs$		The ordinary wave top frequency corresponding to highest frequency at which a mainly continuous trace is observed.
$f_bEs$		The lowest ordinary wave frequency at which the $Es$ layer begins to become transparent. This is usually determined from the minimum frequency at which reflections from layers at greater heights are observed.
$f$ -min		The frequency below which no echoes are observed.
$M(3000)F2$		The maximum usable frequency factor for a path of 3000 km for transmission by $F2$ layer.
$M(3000)F1$		The maximum usable frequency factor for a path of 3000 km for transmission by $F1$ layer.
$hF2$		The minimum virtual height, $hF2$ , refers to the highest, most stable stratification observed in the $F$ region and can only be scaled when such stratification is present.
$hF$		The natural and most significant $F$ region virtual height parameter is that for lowest $F$ region stratification. This will be denoted by $hF$ . Thus $hF$ is identical with the current $hF2$ when $F$ region stratification is absent, e.g., at night, and with the current $hF1$ when $F1$ stratification is present.
$h'Es$		The lowest virtual height of the trace used to give the $f_oEs$ .
$hpF2$		The virtual height of the $F2$ layer measured on the ordinary

$ypF2$  wave component at a frequency equal to  $0.834f_0F2$ .  
 The semi-thickness of the  $F2$  layer deduced from a parabolic fit to the "nose" of the electron density distribution with height and based on the observed  $h'f$  trace. (The difference between  $hpF2$  and the virtual height at  $0.969f_0F2$ ).

#### a. 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. Used in a qualifying sense, see below.
E	Measurement influenced by, or impossible because of, the lower limit of the normal frequency range. Used in a qualifying sense, see below.
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.
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.
R	Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.
S	Measurement influenced by, or impossible because of, interference or atmospherics.
T	Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
V	Forked trace which may influence the measurement.
W	Measurement influenced or impossible because the echo lies outside the height range recorded.
X	Measurement refers to the extraordinary component.
Y	Intermittent trace.
Z	Third magneto-ionic component present.

#### b. Qualifying Letters

The following letters are entered in the first column before a numerical value on

the monthly tabulation sheets.

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.
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-ionic component.

### 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.

### d. Description of Standard Types of *Es*

The eight standard types of *Es* are identified by corresponding capital letters: *F, L, C, H, Q, R, A, S*. These letters suggest the names flat, low, cusp, high, equatorial, retardation, auroral and slant, respectively. The letter '*N*' is used to designate any *Es* trace that does not correspond to any of the eight types.

<i>F</i>	An <i>Es</i> trace which shows no appreciable increase of height with frequency. The trace is usually relatively solid at most latitudes. This classification may only be used at night; apparently flat <i>Es</i> traces observed in the daytime are classified according to their virtual height: <i>H</i> or <i>L</i> .
<i>L</i>	A flat <i>Es</i> trace at or below the normal <i>E</i> layer minimum virtual height in the day or below the night <i>E</i> layer minimum virtual height at night.
<i>C</i>	An <i>Es</i> trace showing a relatively symmetrical cusp at or below $f_oE$ . This is usually continuous with the normal <i>E</i> trace, although when the deviative absorption is large, part or all of the cusp may be missing. (Usually a daytime type.)
<i>H</i>	An <i>Es</i> trace showing a discontinuity in height with the normal <i>E</i> layer trace at or above $f_oE$ . The cusp is not symmetrical, the low frequency end of the <i>Es</i> trace lying clearly above the high frequency end of the normal <i>E</i> trace. (Usually a daytime type.)
<i>Q</i>	An <i>Es</i> trace which is diffuse and non-blanketing over a wide

frequency range. The spread is most pronounced at the upper edge of the trace. (This type is common in daytime in the vicinity of the magnetic equator.)

**R** An *Es* trace showing an increase in virtual height at the high frequency end similar to group retardation but which is nonblanketing over part or all of its frequency range. This is distinguished from the usual group retardation (as in the case of an occulting thick *E* layer) by the lack of group retardation in the *F* layer traces at corresponding frequencies and the lack of complete blanketing.

**A** An *Es* having a well defined flat or gradually rising lower edge with stratified and diffuse (spread) traces present above it. These sometimes extend over several hundred kilometers of virtual height.

**S** A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace. The rising trace alone is classified as 'S'; the horizontal trace is classified separately. At high latitudes the slant trace usually starts to rise from a horizontal *Es* trace such as *Es-L*, or *Es-F*, at frequencies which greatly exceed the *E* layer critical frequency, whereas at low latitudes it usually rises from *Es-Q* *Es-C* or *Es-H* at frequencies near the regular *E* critical frequency. Type *S* is never used to determine  $f_oEs$  and  $hEs$ . The slant trace is sometimes observed to start at  $f_oE$  without echoes clearly identifiable as *Es* echoes being seen.

**N** The designation 'N' is used to denote an *Es* trace which cannot be classified into one of the standard types. When a trace appears to be intermediate between any two classes a choice should be made whenever possible even if it is uncertain. 'N' should be used sparingly.

#### e. Multiple Reflections from *Es*

When the ionogram shows the presence of multiple reflections from *Es* the number of traces seen should be recorded after the letter indicating the type.

## B. SOLAR RADIO EMISSION

Solar radio observations are carried out on 200 and 500 MHz at Hiraïso Branch. Antennas are two parabolic reflectors: 10 meter for 200 MHz and 5 meter for 500 MHz, each having the total power receiver. Observations are feasible almost from sunrise to sunset.

#### a. Time and Unit

The time is expressed as U.T.

The unit is  $10^{-22} \text{W} \cdot \text{m}^{-2} \text{Hz}^{-1}$  for both components of polarization.

#### b. 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 flux level is counted. Bracket means that observation time does not exceed one third of the period.

**c. Distinctive Events**

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.

*Starting time* and *Time of maximum* are given to nearest minute in general, but to nearest a tenth minute for short intense occurrences or clear commencements.

*Duration* is given in minutes and to nearest a tenth minute, if short or clear.

*Descriptive type* is denoted by the following symbols:

- S = Simple rise and fall of intensity;
- C = Complex variation of intensity,
- C+ = Prolonged broad-band enhancement of radiation, generally of spectral type IV;
- F = Group of bursts: multiple peaks probably belonging to the same event, but separated by relatively short period of quietness;
- RF = More or less irregular rise and fall of intensity, at metric or decimetric wavelengths;
- e = Sudden beginning of burst with steep rise of intensity;
- E = Steep rise of intensity of continuum background;
- p.i. = post-burst increase;
- onset storm = clear-cut beginning of a noise storm.

*Peak intensity* is the flux density of the highest peak reached during the occurrence, measured above the pre-burst level.

*Mean intensity* is the flux density averaged over the burst's duration, measured above the pre-burst level; therefore, multiplying the duration, the total energy of the occurrence can be estimated.

**C. RADIO PROPAGATION CONDITIONS****a. Field Strengths of WWV and WWVH**

Field Strengths observations of WWV and WWVH transmitted from Fort Collins, Colorado and Hawaii, respectively, are carried out at Hiraio Branch. In order to avoid interferences with other standard frequency waves on the same frequency, the upper side-band of 440 Hz is picked up by the use of a narrow band pass filter with

$\pm 40$  Hz bandwidth.

The *tabulated field strength* is the average of peak value of the incident upper side-band field intensity in dB above one microvolt per meter. The *duration* of observation is two minutes for WWV and three minutes for WWVH following the time indicated in universal time on the table.

Particulars of the transmitter and receiver are summarized in the following tables:

#### Transmitter

	WWV	WWVH
Location	Fort Collins, Colorado Long. 105°02'W Lat. 40°41'N	Maui, Hawaii Long. 156°28'W Lat. 20°46'N
Power	3 kW for the upper side-band	0.5 kW* for the upper side-band
Antenna	$\lambda/2$ vertical	$\lambda/2$ vertical
Distance	9150 km	6270 km

\*Reduced from the carrier power of 2 kW with amplitude modulation of 100%.

#### Receiver

Antenna	4.5 m vertical rod
Bandwidth	$\pm 40$ Hz for the upper side-band
Calibration	every half an hour

The meaning of *Descriptive symbols* is as follows:

- C : Measurement influenced by, or impossible because of, any non-propagational reasons.
- S : Measurement influenced by, or impossible because of, interferences or atmospherics.
- U : Inaccurate measurement influenced by interferences, atmospherics, or non-propagational reasons.
- E : Less than the following figure.

#### b. Radio Propagation Quality Figures

Radio propagation quality figures are usually expressed on the scale that ranges from one to five as follows:

- 1 = very poor (very disturbed)
- 2 = poor (disturbed)
- 3 = rather poor (unstable)
- 4 = normal
- 5 = good

The tabulated circuits contain Hamburg (commercial circuit), WWV (10, 15 and 20 MHz frequencies broadcast from Fort Collins, Colorado), Lima (commercial circuit) and WWVH (10 and 15 MHz frequencies broadcast from Hawaii), which are received at Hiraiso Branch.

Warnings of radio propagation which are broadcast from JJY station are expressed in three grades:

N = normal  
 U = unstable  
 W = disturbed

The letter W expresses HF propagation disturbances which are expected to occur during the following 12 hours after issue. The letter U and N also means unstable and normal conditions, respectively.

Whole day radio quality indices stand for the averages of the 6-hourly indices of the circuits of Hamburg, WWV and Lima.

Start-and end-time of principal geomagnetic storms correlated with radio propagation conditions are tabulated from observations at Kakioka Magnetic observatory.

### c. Sudden Ionospheric Disturbances (S.I.D's.)

#### (i) SWF

The data of short wave fade-out (SWF) are prepared from the records of field intensities at Hiraiso, of the following circuits. Start-time, Duration, Type and Importance are obtained from the data of a circuit whose Drop-out Intensity is underlined. Drop-out Intensities of 10, 15 and 20 MHz are indicated by ('), (none), and (''), respectively. Characteristics of the phenomenon are classified as follows.

#### *Circuits and Drop-out intensities*

CO ..... WWV 20, 15 and 10 MHz (Fort Collins, Colorado)  
 LM ..... Various frequencies of commercial circuit (Lima)  
 HA ..... WWVH 15 and 10 MHz (Hawaii)  
 TO ..... JJY 15 and 10 MHz (Tokyo)  
 SH ..... BPV 15 and 10 MHz (Shanghai)  
 HB ..... Various frequencies of commercial circuit (Hamburg)

#### *Start-time and Duration*

#### *Types*

S : sudden drop-out and gradual recovery  
 Slow : slow drop-out taking 5 to 15 minutes and gradual recovery  
 G : gradual disturbances; irregular change in both drop-out and recovery

#### *Importances*

Degrees of SWF are classified into 9 grades according to the amplitude of fade-out;

1 -	1	1 +
2 -	2	2 +
3 -	3	3 +

Besides, the time of phenomena associated with SID's, that is, solar flare, solar radio noise outburst and crochet (solar flare effect in magnetic record), are given in this table from interchange messages of IUWDS or measurements at Hiraiso.

#### (ii) SPA

The data of sudden phase anomaly (SPA) are prepared from the records of phase measurement of VLF radio wave propagation received at Inubo Radio Wave Observa-

tory. Characteristics of the VLF radio wave propagation are as the following table. In the last column, a spherical earth with a radius of 6371.2 km is assumed.

Transmitting Site					Distance (km) to Inubo along the Great Circle
Name	Location (Geographic Coordinate)	Station Call	Frequency (kHz-UTC)	Radiation Power (kW)	
Rugby	52°22'N 001°11'W	GBR	16.0	40	9550
Fort Collins	40°41'N 105°03'W	WWVL	20.0	1.8	9190
Cutler	44°39'N 067°17'W	NAA	17.8	1000	10640
North West Cape	21°49'S 114°10'E	NWC	22.3	1000	6990
Lualualei	21°26'N 158°09'W	NPM	23.4	300	6070
Jim Creek	48°12'N 121°55'W	NPG	18.6	250	7620
Haiku	21°24'N 157°50'W	HA0	10.2	2	6100
		HA2	12.2		
		HA3	13.6		
Aldra	66°25'N 013°09'E	AL0	10.2	4	7820
		AL2	12.2		
		AL3	13.6		

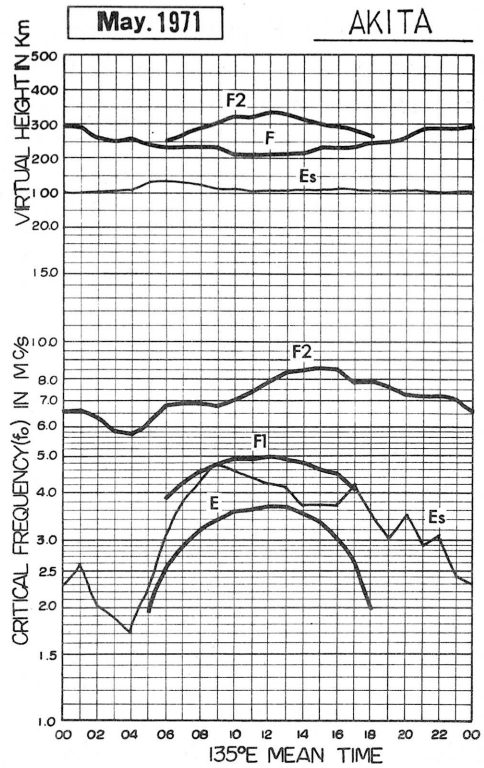
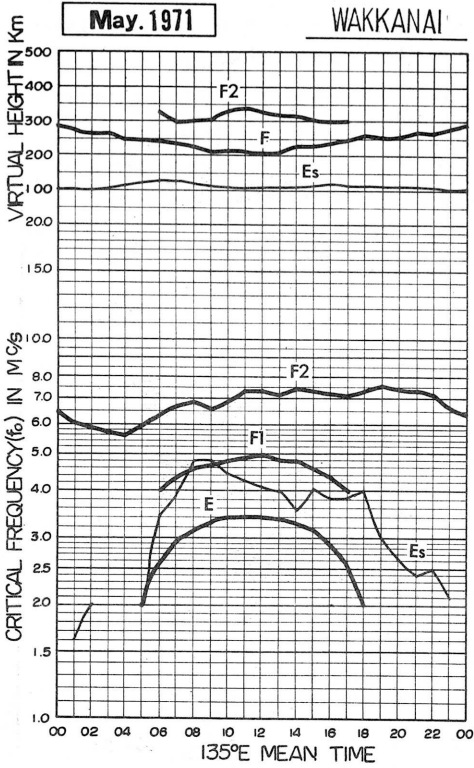
The phase advance is shown in its maximum stage. In the column 'Phase Advance', — means no transmission or no reception during the period, and blank means indistinguishable record.

Out of more than two circuits to have observed the same SPA event listed in the text, the phase advance on some circuit on which the event is the most remarkable or distinct is underlined. As for the underlined phase advance, the starting, the ending, and the maximum times are described.

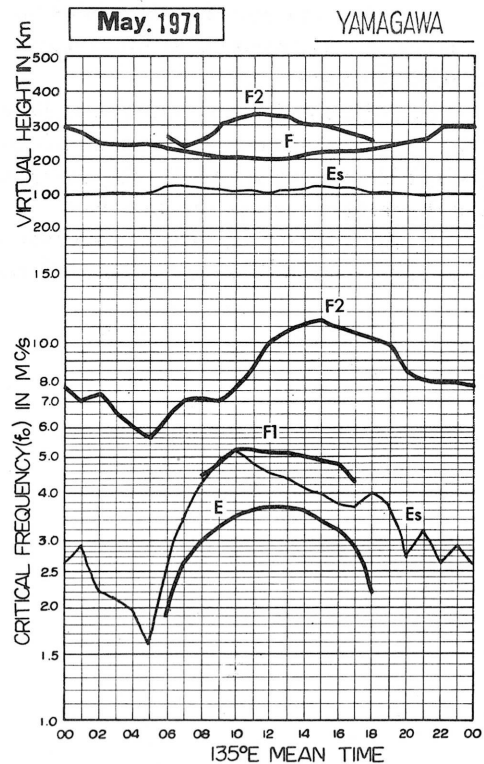
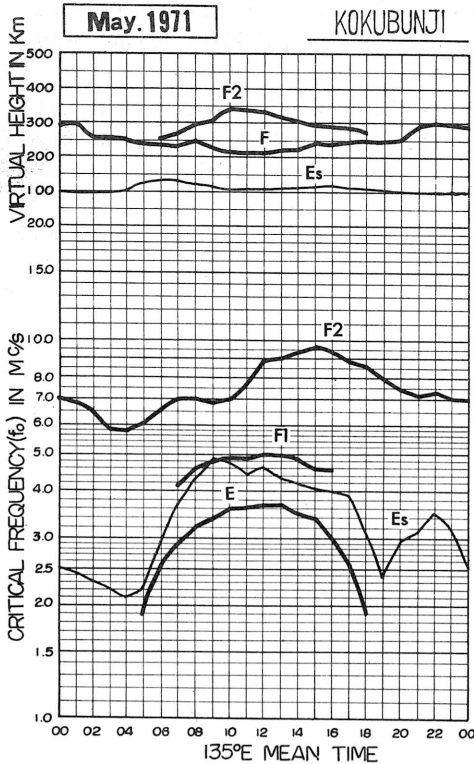
In the column 'Remarks', the event with its corresponding solar X-ray data and solar radio data is shown by 'X' and 'R', respectively.



IONOSPHERIC DATA  
MONTHLY MEDIAN CHARACTERISTICS



IONOSPHERIC DATA  
MONTHLY MEDIAN CHARACTERISTICS



# IONOSPHERIC DATA

MAY. 1971

FOF2 (0.1 MHZ)

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

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	54	55	54	51	46	53	60	55	50	53	56	60	63	67	68	73	69	71	60	60	64	63	61	60		
2	60	59	56	54	51	57	63	69	59	66	76	75	75	86	84	85	74	69	76	69	60	62	58	55		
3	53	49	48	44	36	38	43	44	A	A	52	56	57	62	62	60	61	60	61	63	I S	65	63	64		
4	60	56	54	53	53	48	56	64	6E	71	73	73	72	77	79	74	71	74	73	79	77	74	67	65		
5	64	62	58	58	58	65	73	68	73	69	68	75	88	83	85	93	88	87	85	80	74	73	73	71		
6	66	67	63	57	57	61	68	70	73	80	78	84	83	80	85	94	87	76	79	87	91	86	81	65		
7	60	56	57	57	56	64	64	56	63	A	66	73	73	71	73	67	73	71	81	84	74	73	73	71		
8	64	58	56	48	43	48	54	C	C	53	55	56	60	63	63	64	66	63	63	66	S	72	67	65		
9	63	59	56	56	53	58	64	68	A	67	66	63	71	74	70	80	73	75	73	76	75	U S	73	71	68	
10	66	64	60	60	56	60	65	66	76	78	81	81	76	74	74	80	85	80	76	77	73	73	72	F	68	
11	F	F	F	F	F	65	61	56	63	70	78	87	80	78	73	75	76	79	83	85	93	83	72	74	75	74
12	72	70	67	66	65	69	80	85	82	71	73	R	76	72	75	79	76	80	83	84	80	79	73	I S	72	
13	68	70	66	64	65	73	74	75	78	82	74	74	80	83	85	86	85	80	79	77	76	80	81	76		
14	74	68	68	66	69	69	67	67	73	75	83	83	76	80	83	89	89	86	80	75	74	77	73	73		
15	74	73	70	61	56	62	68	64	61	63	65	74	77	A	85	82	81	77	79	78	74	78	76	78		
16	74	73	70	66	66	75	68	67	69	83	95	90	84	91	93	83	83	A	91	A	S	A	U S	84	F	
17	F	F	F	F	F	69	69	65	69	76	85	77	I R	82	88	100	88	82	74	74	83	86	85	85	81	71
18	77	64	69	66	I A	62	53	50	46	A	R	R	A	R	53	R	A	55	A	54	51	50	F	F	F	
19	F	55	47	45	A	A	53	50	A	50	R	A	R	49	52	53	50	51	54	52	57	57	57	58		
20	52	50	47	37	42	51	53	53	54	57	56	56	56	58	59	59	60	55	I A	57	63	66	63	63	F	60
21	F	F	F	F	F	51	56	63	58	60	67	66	66	71	69	A	66	63	A	76	76	68	60	F		
22	F	F	F	F	F	50	F	73	73	76	66	67	69	70	71	67	71	72	71	72	79	75	73	72	71	
23	70	65	62	60	58	66	70	68	67	65	70	74	75	83	78	70	63	63	67	76	78	84	73	63		
24	57	55	56	54	58	70	70	63	63	63	69	67	64	71	68	72	73	70	I S	72	78	82	78	74	67	
25	66	60	60	58	64	63	64	79	67	61	63	62	65	I A	70	77	69	67	67	73	73	68	71	71	67	
26	64	66	63	53	52	54	59	62	58	63	69	67	A	78	74	68	68	70	73	75	70	69	64	63		
27	61	59	55	54	50	49	50	54	61	A	59	56	59	61	63	67	71	66	66	73	S	73	69	61		
28	60	61	60	60	56	59	66	62	63	65	66	67	69	70	70	67	62	65	70	73	73	78	78	70		
29	63	58	56	56	63	64	65	73	78	77	69	63	63	65	73	71	68	71	76	76	71	75	76	F		
30	F	67	60	57	60	63	72	82	81	74	A	73	73	73	76	78	77	82	82	78	80	81	73	70		
31	69	68	64	F	F	48	48	50	A	62	56	58	A	A	A	51	53	54	52	54	55	61	63	61	57	
00	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	29	28	28	30	30	31	29	26	27	28	27	27	29	30	29	31	29	30	30	28	29	30	27		
MED	64	61	59	57	56	60	64	67	68	66	68	73	73	72	74	73	72	71	73	76	74	73	72	67		
UQ	69	67	64	60	62	65	68	70	76	76	75	75	76	80	83	82	79	77	80	79	76	78	75	71		
LQ	60	57	56	54	50	53	56	62	61	62	64	63	64	67	68	67	66	65	66	69	67	69	64	63		

The Radio Research Laboratories, Japan

MAY. 1971

FOF2 (0.1 MHZ)

IONOSPHERIC DATA

MAY. 1971

FOF1 (0.01 MHZ)

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

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							410	430	470	470	A	500	470	460	A	L								
2							420	L	A	480	490	480	470	480	440									
3					310	360	400	A	A	460	480	470	460	470	440	430								
4							440	460	480	470	490	510	480	470	480									
5							460	460		520	500	490	500	470										
6							480	490	490	500	500	480	490	470		L								
7							A	A	490	480	500	500	490	470	440									
8					400		C	C	470	470	490	500	490	470	460	A								
9					400	440	A	A	470	500	500	500	510	470			A							
10					430	500	480	A	A	500	A	500	490	500		A								
11							A	500	A	500	500	510	510	490	480									
12							480	490	A	B	B	B	510	490										
13							A	490	A	480	540	510	500	510	A	450								
14							470	A	A	A	500	A	540	510	490	460	500							
15					360	410	530	A	A	A	500	A	A	A	A	470								
16							450	A	A	A	A	A	A	A	A		A							
17							460	490	500	A	530	510	520	500	450	430								
18					A	430	400	A	440	430	A	400	470	450	A	430	A							
19					A	A	420	A	A	A	A	460	450	450	430	400								
20						A	460	A	A	A	A	480	470	A	440	450	A							
21						410	430	450	470	490	500	500	470	480	A	A	540							
22						400	440	460	A	460	500	A	480	480	440	A	A							
23							430	A	460	480	470	470	460	450	460	440	A							
24							410	480	450	470	470	490	450	450	450	A	A							
25							420	440	450	480	480	480	A	440	A	420	A							
26					360	400	500	440	470	480	A	A	A	430	450	A	400							
27						A	A	A	A	A	480	480	470	480	440	430	400							
28							440	A	470	480	480	470	470	470	460	430	400							
29							430	460	470	480	490	480	490	480	470	440	A							
30							480	A	490	A	A	A	A	A	A	450	410							
31						390	A	A	470	470	A	A	A	470	440	430	400							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					3	10	20	16	18	19	21	23	24	27	23	16	8							
MED					360	400	435	460	470	480	490	500	480	480	460	440	400							
UQ					360	410	460	480	490	480	500	500	500	495	470	450	455							
LQ					335	400	420	450	460	470	480	480	470	465	440	430	400							

The Radio Research Laboratories, Japan

MAY. 1971

FOF1 (0.01 MHZ)

IONOSPHERIC DATA

MAY. 1971

FOE (0.01 MHZ)

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

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	180	240	290	305	325	340	350	340	R	340	315	285	230	190	S				
2					E	190	240	290	305	325	335	335	R	335	340	325	310	285	240	185	E			
3					E	S	255	295	310	335	335	345	330	320	330	315	290	250	190	E				
4					E	190	250	290	320	320	A	R	330	330	A	A	290	240	155	E				
5					S	190	245	295	320	350		R	A	A	A	R	300	250	S	S				
6					S	190	255	300	320	320	335	335	R	330	325	315	295	260	195	S				
7					S	195	255	295	315	335	A	A	A	A	325	315	295	250	185	S				
8					E	200	245	C	C	A	335	370	370	370	355	330	295	260	200	S				
9					S	190	260	300	315	325	340	355	A	360	350	330	300	250	195	E				
10					E	210	270	305	335	345	350	360	B	380	350	340	305	270	195	S				
11					S	200	270	300	330	340	350	345	340	R	R	330	300	260	200	E				
12					S	200	270	300	330	350	365	B	B	B	B	325	305	270	200	S				
13					S	205	270	300	335	345	350	B	340	A	A	A	305	280	210	S				
14					S	205	280	305	330	345	360	360	340	A	R	330	300	270	210	S				
15					E	210	280	320	335	350	355	355	330	A	A	A	A	A	205	S				
16					S	200	265	R	325	340	350	355	350	335	A	A	300	270	A	S				
17					A	210	280	300	325	355	360	360	345	A	A	335	305	270	200	S				
18					S	195	265	295	310	335	R	365	365	365	350	320	290	250	200	S				
19					S	205	255	295	320	330	340	345	340	330	325	320	295	260	200	S				
20					140	200	255	300	310	330	345	340	350	350	340	320	300	250	195	S				
21					S	200	265	300	315	330	R	R	A	A	340	315	285	A	A	S				
22					S	200	255	295	300	305	320	A	A	A	325	320	295	250	200	S				
23					S	205	260	295	310	320	335	320	320	300	A	320	295	255	200	S				
24					A	205	260	300	305	320	330	325	325	R	A	A	A	A	185	E				
25					A	200	245	290	300	315	315	B	345	335	325	310	295	245	A	S				
26					S	190	255	295	315	320	335	330	330	A	A	A	295	A	200	E				
27					A	200	250	285	300	320	320	320	320	320	300	A	A	250	195	S				
28					S	210	270	300	305	320	325	310	R	A	A	A	295	260	205	S				
29					S	230	275	300	310	325	330	330	310	300	320	320	305	A	200	A				
30					A	205	270	300	320	330	340	345	345	355	345	325	305	280	205	E				
31			E	E	125	200	250	300	315	335	335	335	325	A	A	A	300	260	200	S				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT			1	1	9	30	31	29	30	30	27	23	22	16	17	21	28	26	27	8				
MED			E	E	E	200	260	300	315	330	340	345	340	335	330	320	295	258	200	E				
UQ					E	205	270	300	325	340	350	355	345	358	345	330	300	270	200	E				
LQ					E	195	252	295	310	320	335	332	330	325	325	315	295	250	195	E				

The Radio Research Laboratories, Japan

MAY. 1971

FOE (0.01 MHZ)

### IONOSPHERIC DATA

MAY. 1971

FOES (0.1 MHz)

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

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>16</sub>	E <sub>16</sub>	E <sub>13</sub>	E	E	G	29	34	37	38	G	J <sub>53</sub>	44	G	43	54	G	G	23	24	J <sub>23</sub>	E <sub>16</sub>	E <sub>15</sub>		
2	E <sub>15</sub>	E <sub>16</sub>	E	E	E	G	31	37	45	48	G	G	G	G	28	G	G	G	25	23	18	J <sub>28</sub>	E <sub>16</sub>	E <sub>16</sub>	
3	J <sub>23</sub>	J <sub>24</sub>	22	E	E	G	G	35	50	J <sub>55</sub>	J <sub>54</sub>	J <sub>50</sub>	43	39	40	G	G	33	J <sub>60</sub>	J <sub>30</sub>	20	J <sub>25</sub>	J <sub>50</sub>	E	
4	E <sub>14</sub>	E	E	16	E	G	G	38	37	45	36	G	G	G	J <sub>55</sub>	J <sub>43</sub>	G	38	J <sub>34</sub>	J <sub>28</sub>	J <sub>53</sub>	J <sub>25</sub>	40	J <sub>35</sub>	
5	J <sub>25</sub>	J <sub>30</sub>	J <sub>23</sub>	16	E <sub>14</sub>	G	G	G	G	40	38	40	40	38	G	G	G	25	G	E <sub>20</sub>	E <sub>16</sub>	J <sub>25</sub>	E <sub>15</sub>	30	E <sub>15</sub>
6	E <sub>15</sub>	E	E	E <sub>15</sub>	E <sub>15</sub>	G	G	34	38	G	G	G	G	G	G	G	G	G	G	E <sub>15</sub>	20	19	E <sub>16</sub>	E	
7	J <sub>34</sub>	J <sub>25</sub>	20	E <sub>15</sub>	E <sub>15</sub>	G	G	35	J <sub>55</sub>	J <sub>63</sub>	44	38	44	36	G	G	38	40	33	20	J <sub>30</sub>	J <sub>63</sub>	J <sub>43</sub>	29	
8	E <sub>16</sub>	E <sub>15</sub>	J <sub>24</sub>	J <sub>28</sub>	J <sub>30</sub>	32	37	C	C	39	50	44	G	41	G	44	J <sub>55</sub>	39	31	23	31	J <sub>35</sub>	33	E <sub>15</sub>	
9	J <sub>35</sub>	J <sub>26</sub>	E <sub>16</sub>	E	E <sub>15</sub>	35	34	42	J <sub>85</sub>	J <sub>73</sub>	G	G	39	G	G	40	J <sub>70</sub>	J <sub>76</sub>	33	20	J <sub>25</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	
10	E <sub>16</sub>	E <sub>18</sub>	J <sub>35</sub>	J <sub>32</sub>	18	G	36	31	44	51	51	41	J <sub>55</sub>	G	G	41	J <sub>53</sub>	J <sub>55</sub>	J <sub>51</sub>	J <sub>50</sub>	J <sub>26</sub>	J <sub>30</sub>	28	E <sub>18</sub>	
11	25	J <sub>24</sub>	J <sub>30</sub>	20	E <sub>15</sub>	28	38	36	J <sub>58</sub>	46	J <sub>53</sub>	40	G	G	G	G	37	34	30	J <sub>33</sub>	E	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	
12	E <sub>14</sub>	E <sub>16</sub>	J <sub>24</sub>	E <sub>15</sub>	E <sub>15</sub>	G	G	35	G	45	J <sub>55</sub>	E <sub>58</sub>	E <sub>55</sub>	E <sub>49</sub>	E <sub>40</sub>	G	42	35	J <sub>43</sub>	J <sub>40</sub>	E <sub>16</sub>	J <sub>21</sub>	J <sub>33</sub>	J <sub>53</sub>	
13	E <sub>16</sub>	J <sub>33</sub>	E <sub>15</sub>	E	E <sub>16</sub>	20	32	46	41	J <sub>51</sub>	44	43	47	44	J <sub>43</sub>	53	38	G	35	J <sub>55</sub>	38	J <sub>40</sub>	J <sub>63</sub>	25	
14	24	23	22	E	E <sub>14</sub>	25	38	41	J <sub>53</sub>	51	53	J <sub>53</sub>	51	41	G	G	G	G	G	20	32	E	E <sub>15</sub>	E <sub>15</sub>	
15	E <sub>16</sub>	17	E	E <sub>16</sub>	16	G	32	G	50	J <sub>65</sub>	J <sub>63</sub>	J <sub>58</sub>	J <sub>53</sub>	J <sub>81</sub>	J <sub>60</sub>	J <sub>52</sub>	J <sub>40</sub>	38	J <sub>40</sub>	J <sub>65</sub>	J <sub>26</sub>	J <sub>53</sub>	J <sub>41</sub>	J <sub>63</sub>	
16	J <sub>35</sub>	J <sub>23</sub>	E <sub>15</sub>	E	E <sub>15</sub>	G	G	G	43	J <sub>61</sub>	J <sub>83</sub>	J <sub>63</sub>	J <sub>58</sub>	J <sub>68</sub>	J <sub>73</sub>	J <sub>76</sub>	34	J <sub>93</sub>	J <sub>74</sub>	J <sub>140</sub>	74	J <sub>104</sub>	J <sub>76</sub>	J <sub>74</sub>	
17	J <sub>40</sub>	50	J <sub>60</sub>	J <sub>44</sub>	J <sub>23</sub>	G	37	36	G	46	70	J <sub>75</sub>	44	J <sub>41</sub>	J <sub>43</sub>	G	G	G	26	19	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	
18	J <sub>39</sub>	J <sub>35</sub>	50	J <sub>60</sub>	J <sub>80</sub>	J <sub>43</sub>	35	41	50	54	G	J <sub>103</sub>	G	43	G	J <sub>61</sub>	40	J <sub>65</sub>	29	30	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E	
19	E <sub>15</sub>	E	E <sub>16</sub>	20	40	J <sub>43</sub>	J <sub>48</sub>	43	J <sub>55</sub>	48	45	60	G	44	43	G	34	31	G	22	J <sub>30</sub>	J <sub>62</sub>	J <sub>53</sub>	J <sub>30</sub>	
20	J <sub>33</sub>	E <sub>14</sub>	E	E	G	J <sub>74</sub>	48	50	J <sub>63</sub>	50	J <sub>65</sub>	42	J <sub>56</sub>	J <sub>61</sub>	G	40	J <sub>61</sub>	J <sub>58</sub>	J <sub>28</sub>	20	E <sub>15</sub>	J <sub>25</sub>	J <sub>61</sub>		
21	J <sub>33</sub>	J <sub>23</sub>	J <sub>20</sub>	J <sub>23</sub>	E <sub>15</sub>	G	34	33	41	52	G	32	40	38	J <sub>71</sub>	J <sub>138</sub>	D	J <sub>71</sub>	J <sub>73</sub>	20	J <sub>33</sub>	J <sub>23</sub>	J <sub>40</sub>	J <sub>23</sub>	
22	28	28	J <sub>25</sub>	J <sub>33</sub>	J <sub>42</sub>	30	32	50	J <sub>63</sub>	J <sub>64</sub>	37	40	J <sub>48</sub>	J <sub>42</sub>	G	37	J <sub>55</sub>	J <sub>43</sub>	J <sub>50</sub>	J <sub>61</sub>	J <sub>26</sub>	J <sub>25</sub>	J <sub>28</sub>	19	
23	E <sub>16</sub>	E	E	E	E <sub>15</sub>	G	30	38	J <sub>53</sub>	44	39	42	39	J <sub>43</sub>	34	43	J <sub>85</sub>	J <sub>50</sub>	J <sub>40</sub>	J <sub>38</sub>	E <sub>15</sub>	J <sub>25</sub>	17	J <sub>21</sub>	
24	18	15	15	15	13	G	G	35	36	J <sub>50</sub>	J <sub>46</sub>	39	G	G	34	J <sub>33</sub>	J <sub>51</sub>	J <sub>50</sub>	J <sub>63</sub>	J <sub>35</sub>	J <sub>29</sub>	J <sub>24</sub>	18	16	
25	E <sub>15</sub>	16	E	15	J <sub>23</sub>	G	J <sub>44</sub>	42	38	40	40	E <sub>38</sub>	40	J <sub>70</sub>	G	45	37	J <sub>58</sub>	J <sub>65</sub>	J <sub>40</sub>	J <sub>58</sub>	25	J <sub>28</sub>	J <sub>31</sub>	
26	E <sub>17</sub>	E <sub>15</sub>	J <sub>23</sub>	14	E <sub>15</sub>	G	30	35	J <sub>47</sub>	G	G	45	J <sub>113</sub>	J <sub>74</sub>	J <sub>41</sub>	J <sub>40</sub>	J <sub>50</sub>	30	40	J <sub>35</sub>	J <sub>26</sub>	J <sub>25</sub>	E <sub>16</sub>	J <sub>24</sub>	
27	E <sub>16</sub>	E <sub>14</sub>	J <sub>23</sub>	J <sub>26</sub>	17	26	41	J <sub>60</sub>	J <sub>70</sub>	80	J <sub>75</sub>	43	40	36	36	J <sub>48</sub>	38	37	30	J <sub>30</sub>	J <sub>30</sub>	27	J <sub>30</sub>	J <sub>24</sub>	
28	E <sub>15</sub>	E <sub>15</sub>	E	E	E <sub>14</sub>	G	34	38	44	43	42	38	G	36	36	40	37	33	40	23	J <sub>29</sub>	E <sub>14</sub>	E <sub>15</sub>	J <sub>21</sub>	
29	E <sub>16</sub>	13	J <sub>23</sub>	E	E <sub>16</sub>	J <sub>43</sub>	37	40	J <sub>48</sub>	40	44	40	43	37	G	G	G	J <sub>53</sub>	J <sub>53</sub>	J <sub>43</sub>	E	22	J <sub>32</sub>	J <sub>35</sub>	
30	J <sub>35</sub>	J <sub>24</sub>	E	E	15	27	34	38	J <sub>54</sub>	40	J <sub>74</sub>	J <sub>65</sub>	60	52	J <sub>73</sub>	J <sub>56</sub>	37	J <sub>63</sub>	J <sub>90</sub>	J <sub>143</sub>	E	E	E <sub>14</sub>	J <sub>30</sub>	
31	J <sub>35</sub>	J <sub>30</sub>	J <sub>35</sub>	24	J <sub>33</sub>	J <sub>42</sub>	36	J <sub>63</sub>	J <sub>66</sub>	41	43	J <sub>80</sub>	J <sub>81</sub>	J <sub>63</sub>	38	39	43	33	J <sub>63</sub>	J <sub>34</sub>	J <sub>34</sub>	23	E <sub>17</sub>	E <sub>16</sub>	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	E <sub>17</sub>	16	20	E <sub>15</sub>	E <sub>15</sub>	G	34	38	48	48	44	42	41	40	35	40	38	38	40	J <sub>30</sub>	J <sub>26</sub>	J <sub>24</sub>	25	21	
UQ	J <sub>33</sub>	J <sub>24</sub>	J <sub>24</sub>	22	18	29	37	42	J <sub>54</sub>	J <sub>54</sub>	53	J <sub>58</sub>	49	J <sub>45</sub>	J <sub>43</sub>	46	46	J <sub>54</sub>	J <sub>56</sub>	J <sub>40</sub>	J <sub>30</sub>	J <sub>28</sub>	J <sub>36</sub>	J <sub>30</sub>	
LQ	E <sub>16</sub>	E <sub>15</sub>	E	E	E <sub>13</sub>	G	E <sub>29</sub>	35	38	40	36	38	G	32	G	G	E <sub>25</sub>	30	30	22	19	16	E <sub>16</sub>	E <sub>16</sub>	

The Radio Research Laboratories, Japan

MAY. 1971

FOES (0.1 MHz)



# IONOSPHERIC DATA

MAY. 1971

FBES (0.1 MHZ)

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

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>16</sub>	E <sub>18</sub>	E <sub>13</sub>	E	E	G	G	G	G	G	G	52	42	G	42	54	G	G	G	G	20	E <sub>18</sub>	E	E <sub>15</sub>
2	E <sub>15</sub>	E <sub>18</sub>	E	E	E	G	G	G	45	47	G	G	G	G	28	G	G	G	G	23	17	26	E <sub>16</sub>	E <sub>16</sub>
3	20	20	E	E	E	G	G	G	A	A	43	45	43	G	G	G	G	G	57	26	18	18	46	E
4	E <sub>14</sub>	E	E	E	E	G	G	37	G	G	36	G	G	G	37	38	G	37	30	25	36	20	27	31
5	23	20	21	14	E <sub>14</sub>	G	G	G	G	G	G	40	38	37	G	G	G	G	E <sub>20</sub>	E <sub>16</sub>	22	E <sub>15</sub>	22	E <sub>15</sub>
6	E <sub>15</sub>	E	E	E <sub>15</sub>	E <sub>15</sub>	G	G	G	G	G	G	G	G	G	G	G	G	G	G	E <sub>15</sub>	E	E	E <sub>16</sub>	E
7	30	20	19	E <sub>15</sub>	E <sub>13</sub>	G	G	G	50	A	40	38	40	36	G	G	G	G	G	G	24	27	40	20
8	E <sub>16</sub>	E <sub>15</sub>	24	26	27	30	36	C	C	39	G	G	G	G	G	G	44	G	G	G	A	36	24	E <sub>15</sub>
9	20	22	E <sub>16</sub>	E	E <sub>12</sub>	G	G	G	A	57	G	G	38	G	G	G	40	42	32	G	20	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>
10	E <sub>16</sub>	E <sub>18</sub>	17	21	15	G	G	G	42	49	49	G	52	G	G	G	50	40	42	48	21	27	18	E <sub>18</sub>
11	E	17	16	E	E <sub>15</sub>	G	G	G	55	45	50	G	G	G	G	G	G	G	G	G	E	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>
12	E <sub>14</sub>	E <sub>16</sub>	16	E <sub>15</sub>	E <sub>13</sub>	G	G	G	G	45	53	E <sub>58</sub>	E <sub>55</sub>	E <sub>49</sub>	E <sub>40</sub>	G	40	G	43	33	E <sub>16</sub>	20	22	46
13	E <sub>16</sub>	34	E <sub>15</sub>	E	E <sub>16</sub>	G	G	45	G	47	43	G	45	42	43	47	G	G	G	50	36	37	16	E
14	E	E	E	E	E <sub>14</sub>	G	G	G	52	51	53	49	51	40	G	G	G	G	G	G	26	E	E <sub>15</sub>	E <sub>15</sub>
15	E <sub>16</sub>	E	E	E <sub>16</sub>	G	G	G	G	50	52	53	52	G	A	51	50	40	38	38	57	22	40	37	30
16	27	E	E <sub>15</sub>	E	E <sub>15</sub>	G	G	G	G	53	80	58	58	68	73	58	G	A	57	A	51	A	57	18
17	20	23	47	30	18	G	G	G	G	45	A	43	G	40	40	G	G	G	G	18	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>
18	35	25	48	27	A	42	G	G	A	G	G	A	G	42	G	A	40	A	G	G	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E
19	E <sub>15</sub>	E	E <sub>16</sub>	E	A	A	38	37	A	47	A	A	G	G	G	G	G	G	G	G	29	45	40	23
20	E	E <sub>14</sub>	E	E	G	35	50	G	48	54	48	47	G	G	47	G	G	46	A	21	16	E <sub>15</sub>	20	30
21	17	18	18	15	E <sub>15</sub>	G	G	G	40	43	G	G	38	39	44	A	50	49	A	18	30	18	E	16
22	E	17	E	20	27	G	G	G	G	50	G	38	47	38	G	G	52	42	49	44	25	20	24	16
23	E <sub>16</sub>	E	E	E	E <sub>15</sub>	G	G	G	51	G	G	G	G	43	34	G	G	45	30	37	E <sub>15</sub>	23	E	18
24	16	E	E	E	13	G	G	G	G	G	G	G	G	G	34	32	43	50	38	25	25	21	E	E
25	E <sub>15</sub>	15	E	15	22	G	40	36	G	G	G	E <sub>36</sub>	G	A	G	42	G	58	40	37	30	19	19	24
26	E <sub>17</sub>	E <sub>15</sub>	19	E	E <sub>15</sub>	G	G	G	G	G	G	45	A	55	37	35	49	26	32	33	25	23	E <sub>16</sub>	20
27	E <sub>16</sub>	E <sub>14</sub>	20	20	15	G	40	50	45	A	51	G	G	G	G	37	33	35	G	24	21	E	24	23
28	E <sub>15</sub>	E <sub>15</sub>	E	E	E <sub>14</sub>	G	G	G	44	G	G	G	G	35	36	35	G	G	40	20	20	E <sub>14</sub>	E <sub>15</sub>	19
29	E <sub>16</sub>	E	16	E	E <sub>16</sub>	G	G	G	43	G	G	G	G	G	G	G	G	44	40	40	E	E	20	E
30	E	20	E	E	14	G	G	G	50	G	A	52	50	52	49	48	G	40	50	32	E	E	E <sub>14</sub>	23
31	22	20	29	E	20	34	G	A	53	G	G	A	A	A	37	34	40	G	47	26	31	E	E <sub>17</sub>	E <sub>16</sub>
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E	E <sub>15</sub>	G	G	G	44	45	G	E <sub>38</sub>	G	36	G	G	G	26	32	24	21	18	17	E <sub>16</sub>
UQ	18	20	18	14	16	G	G	G	51	50	50	49	45	42	40	40	40	43	42	35	28	24	24	22
LQ	E <sub>15</sub>	E	E	E	E <sub>15</sub>	G	G	G	G	G	G	G	G	G	G	G	G	G	G	E <sub>15</sub>	16	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>

The Radio Research Laboratories, Japan

MAY. 1971

FBES (0.1 MHZ)

# IONOSPHERIC DATA

MAY. 1971

F-MIN (0.1 MHZ)

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

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>16</sub>	E <sub>18</sub>	E <sub>13</sub>	E	E	11	11	11	15	17	20	20	20	22	20	17	16	12	11	E <sub>15</sub>	E	E <sub>16</sub>	E	E <sub>15</sub>
2	E <sub>15</sub>	E <sub>16</sub>	E	E	E	13	15	20	15	17	20	20	20	20	18	20	17	15	12	E	E	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>
3	E <sub>14</sub>	E	E <sub>15</sub>	E	E	E <sub>16</sub>	17	18	20	20	20	23	20	20	20	20	17	12	12	E	E	E	E	E
4	E <sub>14</sub>	E	E	E	E	12	15	15	15	17	20	21	20	20	17	19	16	15	E	E	E <sub>13</sub>	E <sub>15</sub>	E <sub>17</sub>	E <sub>15</sub>
5	E	E	E	E	E <sub>14</sub>	15	16	17	18	21	27	27	25	24	15	17	15	11	E <sub>20</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
6	E <sub>15</sub>	E	E	E <sub>15</sub>	E <sub>15</sub>	12	17	17	23	25	23	25	25	21	20	21	20	15	11	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>16</sub>	E
7	E	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>13</sub>	11	11	17	20	20	20	23	22	23	20	20	17	12	12	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>
8	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E	13	12	C	C	20	20	24	23	21	22	20	17	11	12	E <sub>12</sub>	E <sub>16</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>15</sub>
9	E <sub>17</sub>	E <sub>15</sub>	E <sub>16</sub>	E	E <sub>12</sub>	12	12	14	17	20	20	19	20	20	19	19	16	12	12	E	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>
10	E <sub>16</sub>	E <sub>18</sub>	E	E	E	12	16	17	20	20	20	21	37	27	24	23	18	16	15	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>16</sub>
11	E	E <sub>15</sub>	E	E <sub>15</sub>	E <sub>15</sub>	13	11	18	17	20	24	21	23	21	25	20	15	12	13	E	E	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>
12	E <sub>14</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	12	17	18	20	22	24	58	55	49	40	20	20	20	17	E <sub>15</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>15</sub>
13	E <sub>16</sub>	E	E <sub>15</sub>	E	E <sub>16</sub>	12	15	15	17	20	22	37	25	25	25	20	20	18	16	E <sub>12</sub>	E <sub>15</sub>	E	E	E <sub>16</sub>
14	E <sub>12</sub>	E <sub>16</sub>	E <sub>13</sub>	E	E <sub>14</sub>	12	15	17	20	26	22	20	20	20	23	21	20	20	17	E <sub>15</sub>	E <sub>16</sub>	E	E <sub>15</sub>	E <sub>15</sub>
15	E <sub>16</sub>	E	E	E <sub>16</sub>	E	13	13	20	21	21	20	27	21	22	27	21	20	17	15	E <sub>12</sub>	E	E	E <sub>16</sub>	E <sub>16</sub>
16	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>	E	E <sub>15</sub>	12	16	18	17	22	21	26	27	27	21	25	20	18	15	E <sub>15</sub>	E <sub>17</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>
17	E <sub>16</sub>	E	E <sub>15</sub>	E	E	12	18	12	20	18	20	21	20	20	20	16	17	13	13	E <sub>12</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>15</sub>
18	E	E <sub>15</sub>	E	E <sub>14</sub>	E <sub>13</sub>	12	14	16	16	20	21	21	21	21	22	20	17	13	16	E <sub>14</sub>	E <sub>16</sub>	E <sub>15</sub>	E <sub>16</sub>	E
19	E <sub>15</sub>	E	E <sub>16</sub>	E	E <sub>15</sub>	15	16	16	17	22	23	20	25	20	17	20	16	17	11	E <sub>12</sub>	E	E	E	E
20	E	E <sub>14</sub>	E	E	E	E	12	11	17	17	20	20	20	20	20	20	20	16	17	E <sub>13</sub>	E	E <sub>15</sub>	E	E
21	E	E	E	E	E <sub>15</sub>	14	16	20	18	20	20	20	23	20	20	16	16	13	E	E <sub>14</sub>	E	E	E <sub>16</sub>	E
22	E <sub>16</sub>	E <sub>13</sub>	E <sub>16</sub>	E <sub>16</sub>	E <sub>13</sub>	13	15	15	17	20	20	26	20	26	20	16	15	13	12	E <sub>12</sub>	E	E	E	E
23	E <sub>16</sub>	E	E	E	E <sub>15</sub>	11	12	11	16	17	18	18	19	18	18	16	16	11	11	E <sub>12</sub>	E <sub>15</sub>	E	E	E
24	E	E	E	E	E	11	11	12	16	16	17	17	17	18	19	17	12	12	11	E	E	E	E	E
25	E <sub>15</sub>	E	E	E	E	E	E	E	17	16	20	36	17	20	16	17	18	15	16	E <sub>12</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
26	E <sub>17</sub>	E <sub>15</sub>	E	E	E <sub>15</sub>	E	11	22	20	21	20	20	20	20	20	20	17	12	12	E	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E
27	E <sub>16</sub>	E <sub>14</sub>	E	E	E	12	12	18	20	20	20	20	20	20	24	20	17	12	12	E <sub>11</sub>	E	E	E	E <sub>15</sub>
28	E <sub>15</sub>	E <sub>15</sub>	E	E	E <sub>14</sub>	12	12	17	18	18	18	23	26	20	18	20	16	12	14	E <sub>12</sub>	E	E <sub>12</sub>	E <sub>15</sub>	E
29	E <sub>16</sub>	E	E	E	E <sub>16</sub>	11	13	16	15	17	20	19	23	20	18	18	17	15	11	E	E	E <sub>13</sub>	E	E
30	E	E	E	E	E	11	E	16	17	19	20	20	21	20	20	18	17	13	11	E	E	E	E <sub>14</sub>	E
31	E <sub>12</sub>	E	E	E	E	11	11	11	13	20	18	20	20	20	20	16	17	12	11	E <sub>11</sub>	E	E <sub>13</sub>	E <sub>17</sub>	E <sub>16</sub>
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E <sub>15</sub>	E <sub>13</sub>	E	E	E <sub>13</sub>	12	13	16	17	20	20	21	21	20	20	20	17	13	12	E <sub>12</sub>	E	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>
UQ	E <sub>16</sub>	E <sub>15</sub>	E <sub>15</sub>	E	E <sub>15</sub>	12	16	18	20	20	21	24	24	22	22	20	18	16	15	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>16</sub>	E <sub>13</sub>
LQ	E <sub>12</sub>	E	E	E	E	11	12	14	16	18	20	20	20	20	18	17	16	12	11	E	E	E	E	E

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MAY. 1971

F-MIN (0.1 MHZ)

# IONOSPHERIC DATA

MAY. 1971

M(3000)F2 (0.01)

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

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	265	275	295	305	305	310	315	305	310	260	290	305	285	290	315	315	325	330	310	295	285	280	280	280
2	275	275	285	270	275	295	300	320	285	290	305	295	285	300	295	310	310	295	315	310	270	275	280	275
3	270	265	285	280	280	260	285	260	A	A	260	285	300	305	305	300	305	300	300	285	270	270	285	280
4	280	285	280	275	300	300	310	300	315	300	320	295	305	290	315	310	310	320	305	290	290	295	275	270
5	280	275	280	285	310	310	330	320	330	320	290	295	305	315	300	310	305	310	320	315	305	285	290	280
6	280	285	290	280	300	305	310	330	315	325	310	310	305	290	305	300	310	305	285	290	290	280	280	285
7	265	260	260	270	295	305	345	315	325	A	300	300	280	270	300	285	300	280	290	310	265	260	260	275
8	265	275	285	270	265	290	295	C	C	260	265	270	295	295	300	295	310	310	310	285	S	280	270	260
9	285	270	270	285	270	290	295	310	A	305	320	285	295	295	285	315	310	310	315	295	280	U.S.	270	270
10	275	275	285	285	295	295	310	305	310	310	295	305	290	320	310	300	310	315	315	295	275	275	280	265
11	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
12	285	275	285	285	290	300	310	310	305	310	280	R	320	300	295	305	300	300	300	310	290	290	275	280
13	270	270	290	290	275	290	285	295	310	305	325	295	295	295	295	295	305	310	310	300	275	265	280	280
14	285	280	270	290	280	320	290	305	290	300	295	300	290	285	275	295	305	305	310	300	285	275	265	250
15	270	290	270	265	255	265	285	305	270	285	265	295	310	A	290	305	295	305	305	310	270	260	275	265
16	270	265	270	280	275	295	325	305	295	300	310	310	290	295	300	305	300	A	295	A	S	A	U.S.	F
17	F	F	F	F	290	290	275	310	305	310	290	270	280	290	295	295	295	255	270	300	270	265	270	270
18	275	280	260	250	A	A	235	230	240	A	R	R	A	R	245	R	A	275	A	280	295	265	F	F
19	265	290	255	260	A	A	270	250	A	255	R	A	R	230	275	285	300	280	295	280	280	265	280	285
20	270	280	305	270	285	320	270	275	265	265	255	250	255	285	300	295	305	310	290	290	285	270	265	F
21	F	F	F	F	285	295	310	315	300	280	285	285	290	310	310	A	305	295	A	300	300	310	280	F
22	F	F	F	F	285	295	315	305	310	325	300	295	315	310	290	310	315	310	310	305	295	280	280	280
23	285	285	295	300	300	290	315	325	315	335	300	310	305	300	325	315	300	295	285	290	290	310	305	285
24	290	275	270	280	295	315	340	335	300	295	305	295	270	310	295	295	300	300	I.S.	310	295	295	295	285
25	290	290	285	280	295	315	295	330	330	310	290	295	300	A	310	305	300	300	305	300	280	300	290	285
26	280	290	300	290	280	295	295	315	310	290	290	285	A	310	325	295	295	285	315	295	295	290	290	285
27	285	290	310	295	280	290	310	280	295	A	305	310	290	295	285	300	310	305	295	290	S	300	315	285
28	285	285	305	310	300	315	335	310	315	315	290	300	295	310	315	305	320	300	305	300	290	295	305	300
29	300	295	295	305	300	300	310	310	310	320	320	320	300	290	290	310	300	300	315	305	280	285	290	F
30	F	300	290	300	295	285	320	290	310	310	A	295	310	295	290	295	300	295	285	295	290	295	270	270
31	275	275	285	300	F	F	285	265	A	295	270	305	A	A	A	255	275	285	290	315	310	290	285	285
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	29	28	28	30	30	31	29	26	27	28	27	27	29	30	29	31	29	30	30	28	29	30	27
MED	278	280	285	282	290	295	310	305	310	305	298	295	295	295	300	300	305	300	305	300	285	285	280	280
UQ	285	285	295	292	300	305	315	315	315	312	308	305	305	305	310	310	310	310	310	310	290	295	290	285
LQ	270	275	270	272	280	290	288	300	295	288	290	290	290	290	290	295	300	295	295	290	272	275	275	270

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MAY. 1971

M(3000)F2 (0.01)



# IONOSPHERIC DATA

MAY. 1971

M(3000)F1 (0.01)

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

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								350	350	365	370	A	330	365	A	A	L							
2								350	A	A	360	365	370	380	340	345								
3						325	345	365	A	A	A	A	A	365	360	365	350							
4								365	350	355	405	380	345	365	360	355								
5									385	385		365	360	355	350	345								
6									355	370	370	360	360	375	345	350	L							
7									A	A	345	355	340	350	350	340	340							
8						A	C	C	355	365	350	340	355	360	360	A								
9								365	365	A	A	380	360	360	365	335	360			A				
10								370	340	A	A	A	360	A	350	345	340	A						
11									A	A	A	A	360	360	365	345	345	345						
12									365	A	A	B	B	B	355	345								
13								A	345	A	A	335	A	350	A	A	355							
14								360	A	A	A	A	A	A	335	335	335	350	290					
15						325	345		A	A	A	A	360	A	A	A	A							
16									375	A	A	A	A	A	A	A	A							
17								370	350	A	A	340	355	335	350	365	350							
18						A	325	350	A	405	375	A	360	355	360	A	A	A						
19						A	A	355	A	A	A	A	360	400	365	380			350					
20						A	360	A	A	A	A	A	360	390	A	385	335	A						
21							365	355	365	A	365	345	350	380	A	A	A	A						
22							370	385	370	A	400	360	A	355	365	370	A	A						
23								395	A	375	365	370	365	A	375	370	350	A						
24								390	355	400	385	380	365	355	375	355			A	A				
25								A	385	400	380	375	355	A	385	A	355	A						
26						335	355	360	385	380	380	A	A	A	395	355	A	345						
27							A	A	A	A	A	375	375	380	345	365	350	365						
28								365	A	380	375	395	385	380	370	350	360	350						
29								370	A	395	375	385	395	355	360	340	370	A						
30								360	A	370	A	A	A	A	A	A	355	A						
31									A	A	370	370	A	A	A	380	355	A	350					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	9	19	13	14	17	19	21	23	24	23	13	6						
MED						325	360	360	365	378	375	360	360	365	360	355	350	350						
UQ						330	365	368	375	395	380	375	365	378	368	365	355	350						
LQ						325	345	355	350	370	365	358	355	355	345	345	350	345						

MAY. 1971

M(3000)F1 (0.01)

## IONOSPHERIC DATA

MAY. 1971

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

135° E Mean Time (G. M. T. + 9h)

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								320	320	475	400	A	385	345	310	300	285								
2								295	385	330	315	325	360	305	310	290									
3					455	390	480		A	A	490	400	370	335	325	310	310								
4								300	295	320	300	350	325	325	300	295									
5									265	270		320	300	290	315	275									
6									300	275	290	300	300	300	300	300	270								
7									290	A	345	325	355	360	320	350	305								
8					325		C	C		475	450	450	370	345	335	325	305								
9					310	315		A	I A	325	305	330	350	320	360	295		270							
10					290	325		300	300	310	300	345	275	325	315	280									
11									300	285	275	295	275	310	315	300	300								
12									290	280	350	325	300	310	320	310									
13								290	305	300	280	350	325	315	315	305	285								
14								300	320	330	310	300	320	345	340	305	300	265							
15					370	285		400	370	400	360	320		A	320	300	310								
16								270	300	A	315	305	320		A	295		A							
17								295	285	295	I A	315	365	325	310	295	275	300							
18					A	550	550		A	R	R	A	R	525	R	A	395	A							
19					A	385	470		A	A	A	A	R	600	425	380		380							
20					A	465			A	A	475	500	475	415	360	350	320	300							
21						325	300	320	400	375	370	365	320	360		A	315	350							
22						265	305	310	290	305	345	310	320	330	310	300	290								
23							250	310	300	335	305	315	315	275	305	300	300								
24						265	315	315	325	335	400	315	335	320	300	315									
25							250	250	300	350	360	335	I A	335	290	300	305	A							
26					335	300	425	285	365	325	345		A	300	280	320	310	315							
27						310	A		330	A	A		350	370	370	350	320	305	275						
28						290	300	305	345	320	325	320	310	300	300	300									
29							280	285	300	300	300	350	355	340	310	300	300								
30						315	265	275		A	305	300	340	330	315	300	300								
31						450	A	360	450	360		A	A	A	485	415	375	350							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT					3	12	21		25	25	25	27	27	29	29	29	24	14							
MED					370	318	300		300	300	325	330	325	320	320	305	300	300							
UQ					412	388	325		320	330	360	355	362	345	340	320	310	315							
LQ					352	295	290		285	295	305	310	312	310	310	300	300	290							

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

The Radio Research Laboratories, Japan

# IONOSPHERIC DATA

MAY, 1971

H'F (KM)

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

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 Date	00	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	250	240	235	245	255	250	235	220	215	A	A	210	A	A	215	240	215	260	265	275	270	275	
2	275	285	275	270	285	245	250	260	A	A	215	215	210	210	245	220	235	240	250	245	260	300	260	275	
3	300	305	285	275	275	250	250	245	A	A	A	A	A	240	225	210	235	245	A	265	275	300	290	270	
4	270	280	275	260	245	210	210	235	245	220	200	210	200	250	220	250	210	250	260	255	A	255	290	305	
5	295	300	290	260	240	230	210	220	220	215	250	200	200	205	215	225	225	230	245	225	250	270	275	265	
6	260	260	260	275	230	225	200	220	225	210	215	200	225	210	205	245	240	245	260	250	250	270	240	225	
7	320	320	310	280	235	250	235	250	A	A	250	225	215	220	230	250	250	250	285	250	275	300	300	270	
8	280	280	280	300	320	300	A	C	C	C	250	250	250	230	240	240	220	245	260	250	260	A	A	300	275
9	280	300	290	275	285	250	240	230	A	A	210	205	205	190	225	230	265	A	250	255	260	265	255	280	
10	280	270	280	260	250	245	240	250	A	A	A	215	A	250	235	260	A	260	260	A	260	300	280	290	
11	300	315	290	245	235	245	250	240	A	A	A	240	210	205	215	235	240	250	255	240	250	275	270	275	
12	260	275	270	260	245	245	245	235	220	A	A	B	B	B	210	220	A	260	260	250	250	255	260	285	
13	280	310	270	270	275	245	245	A	250	A	A	240	250	240	A	A	250	250	260	A	A	340	270	275	
14	270	280	275	260	260	225	245	250	A	A	A	A	A	215	225	215	230	235	250	245	275	275	280	315	
15	295	260	265	275	275	260	240	240	A	A	A	A	220	A	A	A	A	280	260	A	275	310	315	305	
16	305	295	280	260	270	250	225	215	250	A	A	A	A	A	A	A	250	A	A	A	A	A	A	300	
17	280	270	A	270	245	240	235	225	220	240	A	250	205	230	230	215	220	245	265	250	280	270	285	275	
18	A	255	A	350	A	A	280	240	A	200	250	A	250	265	250	A	A	A	280	285	300	315	305	310	
19	300	260	320	305	A	A	A	250	A	A	A	A	240	210	235	210	230	250	240	270	300	A	A	275	
20	270	260	225	300	290	A	A	215	A	A	A	A	250	225	A	210	245	A	A	270	260	275	305	315	
21	280	290	250	220	260	230	220	210	250	215	A	200	250	205	215	A	A	A	A	A	255	260	225	270	285
22	300	275	265	300	315	250	250	200	210	A	200	200	A	225	190	230	A	A	A	A	250	260	280	270	
23	260	250	250	250	245	240	220	245	A	230	200	235	210	220	215	260	230	A	275	280	265	255	225	250	
24	260	295	280	280	260	245	225	225	220	205	225	215	210	200	225	225	A	A	A	260	255	260	235	260	
25	260	275	275	285	250	230	A	A	235	200	200	205	205	A	240	A	250	A	A	250	300	265	265	290	
26	285	260	255	245	250	245	220	245	220	200	200	A	A	A	205	215	A	245	A	260	260	260	250	265	
27	270	260	255	275	250	245	A	A	A	A	A	210	200	205	240	240	230	250	260	260	250	250	250	265	
28	270	260	255	235	230	245	250	240	A	235	225	200	205	210	205	230	225	235	A	250	265	255	245	245	
29	250	260	250	260	260	240	250	240	A	205	240	200	200	205	200	230	235	A	A	A	250	265	270	270	
30	260	250	235	255	250	230	225	225	A	210	A	A	A	A	A	A	235	A	A	270	225	245	275	270	
31	300	285	270	245	260	A	250	A	A	225	230	A	A	A	210	215	A	235	A	270	300	260	250	260	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	31	29	31	29	27	26	26	13	16	18	19	21	24	24	23	22	20	19	25	27	28	29	31	
MED	280	275	270	270	250	245	240	240	225	215	215	215	210	215	225	225	235	248	260	255	260	268	270	275	
UQ	300	292	280	278	275	248	250	245	245	228	240	238	225	235	235	238	245	250	260	265	275	288	285	288	
LQ	270	260	255	258	245	235	225	225	220	205	200	202	205	208	210	215	230	240	250	250	250	258	255	268	

MAY, 1971

H'F (KM)

# IONOSPHERIC DATA

MAY. 1971

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

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

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	G	150	135	125	120	G	115	120	G	150	130	G	G	125	120	115	S	E	S
2	S	S	E	E	E	G	145	135	120	120	G	G	G	100	G	G	G	G	135	115	120	110	S	S
3	100	100	100	E	E	G	G	145	120	120	115	115	115	115	125	G	G	140	115	115	115	110	110	E
4	S	E	E	105	E	G	G	110	140	110	110	G	G	G	105	105	G	115	110	110	110	105	105	100
5	100	100	100	100	S	G	G	G	G	145	140	105	105	110	G	G	105	G	S	S	110	S	105	S
6	S	E	E	S	S	G	G	160	145	G	G	G	G	G	G	G	G	G	G	S	110	110	S	E
7	120	120	140	S	S	G	G	145	120	110	110	110	105	105	G	G	150	125	120	140	125	115	110	110
8	S	S	125	120	120	120	110	C	C	105	120	130	G	150	G	140	125	140	150	125	125	120	105	S
9	100	100	S	E	S	120	125	120	110	110	G	G	105	G	G	150	120	115	115	125	115	S	S	S
10	S	S	110	110	110	G	145	135	125	120	120	120	115	G	G	160	140	125	115	110	110	110	110	S
11	105	100	100	100	S	125	125	145	115	115	110	110	G	G	G	G	140	140	125	120	E	S	S	S
12	S	S	100	S	S	G	G	140	G	120	115	B	B	B	B	G	125	125	115	110	S	110	105	110
13	S	105	S	E	S	105	125	120	120	115	115	115	110	110	105	105	140	G	130	120	115	110	110	105
14	105	100	100	E	S	145	125	125	115	115	110	110	110	110	G	G	G	G	G	125	110	E	S	S
15	S	105	E	S	125	G	140	G	115	115	110	110	110	105	105	105	105	115	115	110	110	110	110	110
16	105	105	S	E	S	G	G	G	125	115	110	110	110	110	105	105	120	115	110	105	105	110	110	110
17	110	110	105	105	100	G	145	145	G	120	115	115	110	100	105	G	G	G	125	125	S	S	S	S
18	115	120	125	125	120	125	125	125	120	120	G	115	G	125	G	115	120	115	140	120	S	S	S	E
19	S	E	S	120	120	120	120	125	115	120	115	115	G	120	125	G	125	125	G	120	110	115	110	105
20	110	S	E	E	G	125	115	125	120	120	115	110	120	120	120	G	120	115	110	115	125	S	105	100
21	100	100	100	105	S	G	125	135	120	120	G	120	105	105	120	110	105	105	105	105	105	110	115	105
22	100	100	120	120	115	120	115	115	110	110	110	105	105	105	G	145	120	120	115	110	115	115	110	105
23	S	E	E	E	S	G	135	125	120	125	120	110	110	105	105	140	120	115	115	110	S	110	105	105
24	105	105	105	100	100	G	G	125	125	120	115	115	G	G	105	105	100	105	110	110	105	105	105	105
25	S	105	E	100	100	G	125	125	120	120	115	B	125	115	G	120	125	115	110	110	110	105	105	105
26	S	S	100	105	S	G	135	125	115	G	G	110	110	105	105	105	110	110	120	115	110	110	S	105
27	S	S	100	100	100	125	120	115	110	110	110	110	110	115	110	105	110	120	115	110	110	110	105	100
28	S	S	E	E	S	G	125	120	120	115	110	115	G	105	105	105	125	125	115	115	110	S	S	105
29	S	100	100	E	S	100	125	120	110	115	115	115	110	110	G	G	G	110	110	110	E	120	110	110
30	105	105	E	E	100	120	125	120	110	115	110	110	110	120	115	115	120	110	110	110	E	E	S	125
31	115	105	130	145	125	115	120	115	110	110	110	105	105	105	105	105	125	125	115	110	110	115	S	S
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	18	17	15	12	13	23	27	27	29	24	25	21	23	17	19	23	24	27	29	24	21	19	18
MED	105	105	100	105	112	120	125	125	120	115	115	110	110	110	105	110	120	115	115	115	110	110	110	105
UQ	110	105	120	120	120	125	135	135	120	120	115	115	110	115	120	135	125	125	122	120	115	115	110	110
LQ	100	100	100	100	100	120	122	120	115	115	110	110	105	105	105	105	115	115	110	110	110	110	105	105

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

# IONOSPHERIC DATA

MAY, 1971

TYPES OF ES

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

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

MAY, 1971

TYPES OF ES



## IONOSPHERIC DATA

MAY. 1971

FOF2 (0.1 MHz)

135° E Mean Time (G. M. T. + 9h)

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	57	56	59	55	44	56	68	63	68	67	69	I <sub>A</sub> <sup>68</sup>	73	76	81	87	86	78	63	62	63	I <sub>R</sub> <sup>62</sup>	60	61																										
2	59	59	57	54	52	58	66	65	69	72	82	82	86	98	99	94	86	81	82	79	59	56	56	56																										
3	57	54	57	43	40	46	43	I <sub>R</sub> <sup>45</sup>	I <sub>A</sub> <sup>49</sup>	54	I <sub>R</sub> <sup>56</sup>	R <sub>59</sub>	I <sub>A</sub> <sup>66</sup>	71	69	I <sub>R</sub> <sup>68</sup>	63	64	67	62	64	65	F	F																										
4	F	F	F <sub>65</sub>	53	51	55	59	69	73	66	73	74	71	76	89	89	80	78	78	75	75	70	68	68																										
5	68	I <sub>C</sub> <sup>66</sup>	63	63	65	64	69	73	72	68	76	78	91	101	99	99	98	97	96	88	78	77	79	76																										
6	73	69	66	58	57	59	71	81	85	91	83	93	96	96	102	102	99	83	80	90	91	75	77	71																										
7	59	59	56	63	68	62	75	R <sub>59</sub>	69	69	80	89	90	92	94	84	86	88	84	89	72	I <sub>R</sub> <sup>74</sup>	73	78																										
8	68	64	63	58	51	52	56	54	55	56	I <sub>R</sub> <sup>60</sup>	61	66	67	67	72	71	69	68	64	67	70	67	68																										
9	66	58	59	57	57	61	68	I <sub>R</sub> <sup>78</sup>	81	77	69	74	81	89	89	89	90	81	79	I <sub>A</sub> <sup>75</sup>	74	74	76	72																										
10	69	71	69	65	59	64	73	75	84	85	87	89	85	91	82	89	95	89	81	71	72	72	72	71																										
11	70	69	68	65	58	58	68	84	88	91	88	80	89	85	88	97	97	94	97	84	72	74	77	76																										
12	74	71	68	69	61	71	88	94	83	73	86	90	88	79	83	88	86	88	89	86	79	77	73	72																										
13	71	68	68	67	63	73	83	83	88	85	72	85	91	94	104	108	109	92	84	75	I <sub>R</sub> <sup>70</sup>	71	80	83																										
14	F	S <sub>84</sub>	F <sub>75</sub>	F <sub>68</sub>	F <sub>63</sub>	72	78	75	77	87	94	92	86	I <sub>A</sub> <sup>92</sup>	97	104	108	99	91	77	I <sub>A</sub> <sup>70</sup>	73	75	70																										
15	74	77	73	58	56	60	85	72	I <sub>A</sub> <sup>68</sup>	I <sub>A</sub> <sup>67</sup>	76	88	93	91	98	102	95	88	88	78	67	69	73	75																										
16	73	72	66	65	64	69	67	69	76	89	91	97	98	98	112	98	88	90	94	77	78	82	82	79																										
17	F	F	F	F <sub>69</sub>	F <sub>61</sub>	66	72	83	91	88	86	93	98	102	105	95	85	78	87	98	83	82	77	78																										
18	74	86	64	67	76	57	55	51	49	R	A <sub>49</sub>	E <sub>49</sub>	R	R	I <sub>A</sub> <sup>56</sup>	54	54	54	56	I <sub>A</sub> <sup>55</sup>	57	53	56	53																										
19	54	66	49	43	43	44	48	I <sub>R</sub> <sup>50</sup>	I <sub>R</sub> <sup>52</sup>	55	53	A	E <sub>52</sub>	E <sub>48</sub>	57	54	56	57	57	54	58	57	57	I <sub>R</sub> <sup>62</sup>																										
20	58	55	I <sub>R</sub> <sup>58</sup>	40	40	53	54	51	54	52	I <sub>R</sub> <sup>54</sup>	58	64	64	69	67	64	60	I <sub>R</sub> <sup>60</sup>	63	69	68	67	67																										
21	65	62	68	48	44	56	69	66	68	63	71	75	69	84	84	79	69	71	75	82	75	69	I <sub>A</sub> <sup>60</sup>	58																										
22	I <sub>R</sub> <sup>58</sup>	57	56	55	51	59	82	78	72	61	68	72	78	77	75	79	80	73	72	75	74	72	I <sub>R</sub> <sup>70</sup>	I <sub>R</sub> <sup>72</sup>																										
23	70	68	F	60	56	64	64	65	68	65	73	85	79	83	84	78	63	63	73	79	84	78	63	63																										
24	63	59	59	61	62	75	Z <sub>71</sub>	66	68	67	69	76	67	76	88	88	81	77	79	89	82	F <sub>76</sub>	76	67																										
25	65	63	63	58	61	68	78	73	68	Z <sub>59</sub>	59	65	78	88	85	75	75	74	78	76	67	69	66	66																										
26	63	64	61	I <sub>R</sub> <sup>57</sup>	58	63	58	60	62	64	67	71	87	87	76	74	78	79	85	86	69	64	62	63																										
27	60	58	F	F	48	54	52	68	77	64	59	I <sub>A</sub> <sup>60</sup>	62	70	73	80	81	71	68	78	76	F <sub>71</sub>	F	F <sub>64</sub>																										
28	F <sub>65</sub>	66	65	57	59	71	61	64	68	75	70	71	71	78	79	78	71	68	75	76	78	F	F	70																										
29	61	F	F <sub>54</sub>	F	F	61	74	83	79	74	68	63	63	71	80	88	85	77	84	78	69	72	74	F																										
30	71	F	66	59	57	64	62	77	84	77	67	I <sub>A</sub> <sup>72</sup>	76	78	82	86	90	88	88	78	83	81	74	76																										
31	67	67	62	63	53	46	51	59	63	63	I <sub>A</sub> <sup>60</sup>	I <sub>R</sub> <sup>56</sup>	A	A	54	57	61	56	I <sub>A</sub> <sup>57</sup>	55	64	I <sub>R</sub> <sup>64</sup>	62	59																										
	00	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	29	30	31	31	31	31	30	30	30	29	29	31	31	31	31	31	31	31	30	28	29																										
MED	66	66	63	58	57	61	68	69	69	68	70	74	79	84	84	87	85	78	79	77	72	72	72	70																										
UQ	70	69	67	65	61	65	74	78	80	77	82	88	89	92	96	94	90	88	86	83	78	75	76	75																										
LQ	60	59	58	55	51	56	58	62	68	63	67	65	69	76	76	76	71	70	70	73	67	68	62	63																										

The Radio Research Laboratories, Japan

MAY. 1971

FOF2 (0.1 MHz)



# IONOSPHERIC DATA

MAY. 1971

FOE (0.01 MHz)

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

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						A	A	290	320	340	350	360	365	370	355	335	300	260	200	S				
2						A	A	290	315	340	350	355	360	375	350	325	295	255	A	S				
3						170	230	290	320	340	350	350	A	A	A	A	290	255	A	S				
4						A	245	290	320	A	A	A	A	A	360	340	300	A	A	E				
5						B	240	285	320	A	A	A	370	375	355	335	310	A	A	S				
6						A	250	295	325	340	A	A	365	370	350	330	305	260	215	S				
7						A	250	290	315	340	355	365	370	365	350	335	300	A	A	E				
8						A	245	285	315	340	350	360	370	375	355	330	290	250	200	S				
9						A	235	290	325	340	355	360	370	380	355	335	305	260	A	E				
10						A	255	305	330	345	355	360	370	375	360	335	295	255	A	S				
11						A	250	300	325	345	355	A	A	A	A	A	A	A	A	S				
12						A	265	300	330	350	360	B	B	B	B	335	305	270	A	E				
13						195	255	300	325	345	355	365	A	A	A	350	320	280	A	S				
14						A	255	295	325	345	360	A	A	A	A	A	A	280	A	S				
15						A	255	310	330	345	A	A	A	A	360	A	A	A	200	E				
16						185	255	300	330	345	A	A	375	365	355	325	300	260	A	S				
17						A	255	300	325	A	A	365	375	380	A	A	A	A	A	S				
18						A	255	295	325	345	355	355	360	A	A	A	A	255	A	S				
19						A	255	295	320	340	355	365	370	360	350	325	295	255	A	S				
20						205	265	300	320	340	355	360	360	365	345	315	295	A	A	S				
21						A	245	285	320	A	A	A	375	370	350	A	A	A	A	E				
22						A	A	290	A	A	A	365	370	370	350	325	290	250	A	S				
23						A	A	305	325	340	350	360	A	A	A	325	300	A	A	S				
24						185	250	295	320	340	A	A	A	365	345	320	285	245	A	E				
25						195	260	A	A	A	A	A	370	360	335	315	290	A	A	S				
26						185	255	295	315	335	350	A	A	A	355	335	300	A	A	S				
27						A	255	295	315	335	A	A	A	365	A	A	A	260	A	S				
28						195	265	300	320	335	345	355	A	A	355	335	A	A	A	S				
29						210	265	305	A	A	A	360	A	A	A	A	A	A	220	S				
30						200	260	300	325	335	350	360	370	370	360	340	310	270	A	S				
31						A	255	300	315	340	A	A	A	A	A	A	310	270	A	S				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						10	27	30	28	24	18	17	17	18	20	21	22	18	5	7				
MED						195	255	295	320	340	355	360	370	370	355	335	300	260	200	E				
UQ						200	255	300	325	345	355	365	370	375	355	335	305	270	215	E				
LQ						185	250	290	320	340	350	360	365	365	350	325	295	255	200	E				

The Radio Research Laboratories, Japan

MAY. 1971

FOE (0.01 MHz)



IONOSPHERIC DATA

MAY. 1971

FOES (0.1 MHZ)

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

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 <sub>14</sub>	E <sub>13</sub>	E	E	E	20	31	J <sub>64</sub>	J <sub>64</sub>	J <sub>48</sub>	J <sub>58</sub>	J <sub>80</sub>	42	42	G	G	G	G	G	J <sub>34</sub>	J <sub>36</sub>	J <sub>28</sub>	E <sub>13</sub>	E <sub>14</sub>
2	E <sub>14</sub>	E <sub>14</sub>	E <sub>13</sub>	E	E	20	29	37	J <sub>48</sub>	43	J <sub>48</sub>	41	38	G	G	G	G	G	23	J <sub>23</sub>	J <sub>18</sub>	J <sub>18</sub>	J <sub>17</sub>	J <sub>20</sub>
9	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E	E <sub>13</sub>	G	30	38	49	45	G	G	J <sub>72</sub>	J <sub>84</sub>	J <sub>53</sub>	J <sub>54</sub>	44	32	J <sub>34</sub>	J <sub>68</sub>	J <sub>29</sub>	J <sub>53</sub>	J <sub>79</sub>	J <sub>34</sub>
4	J <sub>28</sub>	J <sub>48</sub>	J <sub>43</sub>	J <sub>30</sub>	J <sub>15</sub>	20	32	38	38	J <sub>49</sub>	J <sub>63</sub>	J <sub>44</sub>	J <sub>41</sub>	J <sub>41</sub>	G	G	35	37	22	J <sub>54</sub>	J <sub>66</sub>	J <sub>40</sub>	J <sub>29</sub>	J <sub>38</sub>
5	E <sub>14</sub>	C	J <sub>20</sub>	J <sub>20</sub>	E <sub>20</sub>	G	G	G	J <sub>41</sub>	J <sub>46</sub>	J <sub>56</sub>	G	G	G	G	G	36	33	J <sub>58</sub>	J <sub>83</sub>	J <sub>79</sub>	J <sub>20</sub>	J <sub>18</sub>	J <sub>31</sub>
6	J <sub>23</sub>	J <sub>22</sub>	J <sub>17</sub>	E	E	22	28	33	44	40	42	41	G	G	G	G	G	G	G	E <sub>14</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>	E <sub>13</sub>
7	E <sub>13</sub>	E <sub>13</sub>	E	E <sub>13</sub>	E <sub>13</sub>	20	G	35	39	J <sub>57</sub>	J <sub>53</sub>	J <sub>79</sub>	G	G	G	G	33	J <sub>63</sub>	28	J <sub>29</sub>	J <sub>37</sub>	J <sub>20</sub>	J <sub>20</sub>	E <sub>13</sub>
8	E <sub>13</sub>	E <sub>13</sub>	E	E <sub>13</sub>	J <sub>29</sub>	23	26	32	34	38	37	G	G	G	39	41	J <sub>50</sub>	32	J <sub>38</sub>	J <sub>30</sub>	J <sub>36</sub>	J <sub>29</sub>	J <sub>31</sub>	J <sub>35</sub>
9	J <sub>36</sub>	J <sub>28</sub>	J <sub>23</sub>	E <sub>13</sub>	E	J <sub>38</sub>	35	J <sub>63</sub>	J <sub>41</sub>	J <sub>83</sub>	39	G	41	G	G	49	J <sub>60</sub>	J <sub>50</sub>	J <sub>78</sub>	J <sub>74</sub>	J <sub>22</sub>	J <sub>30</sub>	J <sub>24</sub>	E <sub>13</sub>
10	E <sub>13</sub>	E <sub>14</sub>	E	J <sub>16</sub>	20	G	G	G	41	40	47	J <sub>65</sub>	J <sub>53</sub>	41	41	J <sub>60</sub>	J <sub>57</sub>	J <sub>53</sub>	J <sub>37</sub>	E <sub>14</sub>	J <sub>47</sub>	J <sub>40</sub>	J <sub>34</sub>	J <sub>24</sub>
11	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	J <sub>18</sub>	J <sub>23</sub>	23	33	J <sub>50</sub>	J <sub>64</sub>	J <sub>78</sub>	39	42	J <sub>50</sub>	43	43	39	J <sub>56</sub>	J <sub>38</sub>	J <sub>38</sub>	J <sub>44</sub>	J <sub>25</sub>	E <sub>14</sub>	J <sub>17</sub>	E <sub>13</sub>
12	E <sub>13</sub>	E	E <sub>14</sub>	E	22	30	34	42	38	G	E <sub>60</sub>	E <sub>60</sub>	E <sub>60</sub>	E <sub>40</sub>	E <sub>37</sub>	G	37	J <sub>48</sub>	J <sub>36</sub>	J <sub>46</sub>	J <sub>35</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>
13	J <sub>21</sub>	J <sub>32</sub>	J <sub>18</sub>	J <sub>22</sub>	J <sub>18</sub>	G	32	37	45	50	J <sub>46</sub>	47	44	J <sub>77</sub>	44	G	37	38	J <sub>33</sub>	J <sub>78</sub>	J <sub>55</sub>	J <sub>49</sub>	J <sub>36</sub>	J <sub>59</sub>
14	J <sub>59</sub>	J <sub>24</sub>	J <sub>29</sub>	J <sub>29</sub>	J <sub>28</sub>	J <sub>53</sub>	J <sub>56</sub>	J <sub>50</sub>	J <sub>69</sub>	J <sub>57</sub>	J <sub>66</sub>	J <sub>74</sub>	J <sub>93</sub>	J <sub>165</sub>	J <sub>104</sub>	J <sub>89</sub>	36	33	J <sub>43</sub>	E <sub>14</sub>	J <sub>84</sub>	J <sub>44</sub>	J <sub>29</sub>	J <sub>18</sub>
15	J <sub>38</sub>	J <sub>29</sub>	E	J <sub>29</sub>	E	22	35	J <sub>45</sub>	J <sub>83</sub>	J <sub>84</sub>	J <sub>83</sub>	J <sub>68</sub>	J <sub>84</sub>	40	G	J <sub>43</sub>	J <sub>37</sub>	28	23	J <sub>19</sub>	E <sub>13</sub>	J <sub>43</sub>	J <sub>31</sub>	J <sub>69</sub>
16	J <sub>51</sub>	J <sub>35</sub>	J <sub>39</sub>	J <sub>21</sub>	E	G	G	41	37	48	J <sub>83</sub>	J <sub>74</sub>	G	41	G	37	37	G	24	J <sub>30</sub>	J <sub>27</sub>	J <sub>27</sub>	J <sub>38</sub>	J <sub>43</sub>
17	J <sub>84</sub>	J <sub>80</sub>	J <sub>63</sub>	J <sub>31</sub>	J <sub>23</sub>	J <sub>38</sub>	31	J <sub>65</sub>	J <sub>68</sub>	44	41	G	G	G	J <sub>46</sub>	J <sub>46</sub>	J <sub>37</sub>	J <sub>55</sub>	J <sub>62</sub>	J <sub>26</sub>	J <sub>19</sub>	E <sub>13</sub>	J <sub>18</sub>	E <sub>13</sub>
18	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>	J <sub>23</sub>	J <sub>30</sub>	J <sub>44</sub>	J <sub>46</sub>	J <sub>40</sub>	G	J <sub>67</sub>	J <sub>61</sub>	G	41	43	54	J <sub>58</sub>	J <sub>69</sub>	J <sub>47</sub>	27	J <sub>83</sub>	J <sub>58</sub>	J <sub>20</sub>	J <sub>33</sub>	J <sub>19</sub>
19	E <sub>13</sub>	J <sub>46</sub>	J <sub>33</sub>	E <sub>13</sub>	J <sub>18</sub>	30	35	J <sub>43</sub>	43	46	43	53	J <sub>60</sub>	46	36	G	33	G	23	J <sub>23</sub>	E <sub>13</sub>	J <sub>46</sub>	J <sub>63</sub>	J <sub>49</sub>
20	J <sub>55</sub>	J <sub>44</sub>	J <sub>38</sub>	J <sub>16</sub>	E <sub>13</sub>	30	39	41	J <sub>48</sub>	J <sub>80</sub>	43	G	54	45	46	36	37	29	J <sub>43</sub>	E <sub>13</sub>	E <sub>14</sub>	J <sub>37</sub>	J <sub>34</sub>	J <sub>38</sub>
21	J <sub>38</sub>	J <sub>31</sub>	E <sub>13</sub>	J <sub>20</sub>	E <sub>13</sub>	22	31	33	J <sub>47</sub>	J <sub>58</sub>	44	38	G	G	J <sub>51</sub>	J <sub>80</sub>	J <sub>63</sub>	J <sub>48</sub>	J <sub>41</sub>	J <sub>43</sub>	J <sub>35</sub>	J <sub>59</sub>	J <sub>68</sub>	J <sub>45</sub>
22	J <sub>19</sub>	J <sub>50</sub>	J <sub>51</sub>	J <sub>54</sub>	J <sub>33</sub>	J <sub>43</sub>	J <sub>60</sub>	J <sub>54</sub>	38	45	J <sub>47</sub>	G	G	43	G	37	35	J <sub>47</sub>	30	J <sub>44</sub>	J <sub>30</sub>	J <sub>29</sub>	J <sub>40</sub>	J <sub>36</sub>
23	J <sub>36</sub>	J <sub>39</sub>	J <sub>38</sub>	J <sub>28</sub>	J <sub>21</sub>	23	J <sub>29</sub>	36	40	44	47	J <sub>62</sub>	45	J <sub>72</sub>	J <sub>78</sub>	38	J <sub>52</sub>	J <sub>52</sub>	J <sub>55</sub>	J <sub>28</sub>	J <sub>49</sub>	J <sub>36</sub>	J <sub>41</sub>	J <sub>20</sub>
24	J <sub>19</sub>	J <sub>21</sub>	J <sub>18</sub>	J <sub>16</sub>	J <sub>17</sub>	G	27	34	42	J <sub>50</sub>	45	J <sub>49</sub>	39	G	36	36	43	J <sub>67</sub>	J <sub>47</sub>	J <sub>26</sub>	J <sub>89</sub>	J <sub>84</sub>	J <sub>29</sub>	J <sub>18</sub>
25	J <sub>20</sub>	J <sub>20</sub>	J <sub>27</sub>	J <sub>19</sub>	J <sub>14</sub>	G	29	33	J <sub>45</sub>	J <sub>44</sub>	46	43	G	G	G	40	J <sub>58</sub>	J <sub>50</sub>	J <sub>42</sub>	E <sub>14</sub>	J <sub>19</sub>	J <sub>53</sub>	J <sub>60</sub>	J <sub>36</sub>
26	J <sub>35</sub>	J <sub>37</sub>	J <sub>36</sub>	J <sub>33</sub>	J <sub>19</sub>	G	35	41	42	41	G	38	J <sub>40</sub>	42	36	36	38	J <sub>44</sub>	25	23	J <sub>42</sub>	J <sub>26</sub>	J <sub>21</sub>	J <sub>18</sub>
27	J <sub>35</sub>	J <sub>25</sub>	J <sub>45</sub>	J <sub>33</sub>	E <sub>13</sub>	30	36	38	45	J <sub>53</sub>	J <sub>48</sub>	J <sub>68</sub>	J <sub>58</sub>	G	37	39	34	J <sub>42</sub>	J <sub>74</sub>	J <sub>75</sub>	J <sub>79</sub>	J <sub>44</sub>	J <sub>36</sub>	J <sub>18</sub>
28	J <sub>34</sub>	J <sub>28</sub>	J <sub>44</sub>	J <sub>58</sub>	J <sub>45</sub>	23	30	43	J <sub>53</sub>	J <sub>55</sub>	J <sub>79</sub>	40	44	J <sub>54</sub>	G	G	33	J <sub>44</sub>	J <sub>54</sub>	J <sub>46</sub>	J <sub>80</sub>	J <sub>34</sub>	J <sub>81</sub>	J <sub>38</sub>
29	J <sub>47</sub>	J <sub>35</sub>	J <sub>28</sub>	J <sub>33</sub>	J <sub>39</sub>	G	41	39	J <sub>74</sub>	J <sub>59</sub>	41	38	43	J <sub>44</sub>	J <sub>68</sub>	J <sub>43</sub>	J <sub>41</sub>	J <sub>46</sub>	G	E <sub>14</sub>	E <sub>13</sub>	J <sub>20</sub>	J <sub>27</sub>	J <sub>43</sub>
30	J <sub>51</sub>	J <sub>44</sub>	J <sub>39</sub>	E	J <sub>26</sub>	G	29	37	40	J <sub>64</sub>	J <sub>98</sub>	J <sub>88</sub>	45	42	40	37	35	J <sub>40</sub>	27	J <sub>24</sub>	J <sub>38</sub>	J <sub>18</sub>	J <sub>38</sub>	E <sub>13</sub>
31	J <sub>31</sub>	E <sub>13</sub>	E	E	J <sub>30</sub>	J <sub>45</sub>	J <sub>50</sub>	41	36	J <sub>44</sub>	J <sub>83</sub>	J <sub>85</sub>	J <sub>83</sub>	J <sub>74</sub>	J <sub>59</sub>	36	J <sub>53</sub>	J <sub>50</sub>	J <sub>57</sub>	J <sub>31</sub>	J <sub>40</sub>	J <sub>26</sub>	J <sub>33</sub>	J <sub>29</sub>
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J <sub>23</sub>	J <sub>26</sub>	J <sub>20</sub>	J <sub>19</sub>	J <sub>17</sub>	22	31	38	43	J <sub>48</sub>	46	44	42	41	37	37	37	J <sub>42</sub>	J <sub>36</sub>	J <sub>30</sub>	J <sub>36</sub>	J <sub>29</sub>	J <sub>31</sub>	J <sub>24</sub>
UQ	J <sub>37</sub>	J <sub>37</sub>	J <sub>38</sub>	J <sub>29</sub>	J <sub>24</sub>	30	35	J <sub>43</sub>	J <sub>48</sub>	J <sub>58</sub>	J <sub>60</sub>	J <sub>66</sub>	53	44	46	43	J <sub>51</sub>	J <sub>49</sub>	J <sub>45</sub>	J <sub>46</sub>	J <sub>52</sub>	J <sub>44</sub>	J <sub>38</sub>	J <sub>38</sub>
LQ	E <sub>14</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>20</sub>	29	34	40	44	42	38	G	G	G	G	35	32	24	J <sub>23</sub>	J <sub>20</sub>	J <sub>20</sub>	J <sub>20</sub>	16

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MAY. 1971

FOES (0.1 MHZ)

## IONOSPHERIC DATA

MAY. 1971

FBES (0.1 MHz)

135° E Mean Time (G. M. T. + 9h)

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 <sub>14</sub>	E <sub>13</sub>	E	E	E	20	30	46	44	39	45	A	41	41	G	G	G	G	G	29	30	24	E <sub>13</sub>	E <sub>14</sub>			
2	E <sub>14</sub>	E <sub>14</sub>	E <sub>13</sub>	E	E	20	29	35	46	43	40	40	38	G	G	G	G	G	23	22	E	E	E	19			
3	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E	E <sub>13</sub>	G	30	U <sub>R</sub> 38	A	43	G	G	A	43	53	44	44	G	25	23	25	28	25	27			
4	20	25	25	23	E	20	29	38	36	49	62	43	41	41	G	G	33	30	20	53	34	18	25	25			
5	E <sub>14</sub>	C	18	19	18	E <sub>B</sub> 20	G	G	G	38	44	55	G	G	G	G	35	32	57	79	35	17	E	26			
6	22	18	14	E	E	22	28	31	38	38	41	40	G	G	G	G	G	G	E <sub>14</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>	E <sub>13</sub>	E <sub>13</sub>			
7	E <sub>13</sub>	E <sub>13</sub>	E	E <sub>13</sub>	E <sub>13</sub>	19	G	34	38	54	53	53	G	G	G	G	31	60	24	21	20	19	19	E <sub>13</sub>			
8	E <sub>13</sub>	E <sub>13</sub>	E	E <sub>13</sub>	26	22	26	32	34	38	37	G	G	G	38	40	46	31	34	26	30	22	26	30			
9	27	23	20	E <sub>13</sub>	E	21	30	U <sub>R</sub> 63	40	37	39	G	40	G	G	40	50	50	70	A	18	22	24	E <sub>13</sub>			
10	E	E <sub>13</sub>	E <sub>14</sub>	E	E	20	G	G	41	40	47	50	53	41	40	54	57	52	37	E <sub>14</sub>	39	35	30	22			
11	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E	E	23	32	50	62	65	39	41	49	43	39	36	35	34	38	43	23	E <sub>14</sub>	E	E <sub>13</sub>			
12	E <sub>13</sub>	E	E <sub>14</sub>	E	E	22	30	34	40	38	G	E <sub>B</sub> 60	E <sub>B</sub> 60	E <sub>B</sub> 40	E <sub>B</sub> 37	G	35	43	33	35	30	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>			
13	20	28	17	20	15	G	30	35	44	49	44	47	40	50	38	G	35	35	26	60	59	36	26	35			
14	40	19	19	20	20	31	56	49	60	56	64	60	70	A	86	70	35	30	39	E <sub>14</sub>	A	38	20	E			
15	E	21	E	16	E	22	32	45	A	A	43	58	62	40	G	40	35	28	23	17	E <sub>13</sub>	27	23	23			
16	E	23	21	17	E	G	G	39	37	47	70	67	G	41	G	36	U <sub>R</sub> 37	G	23	28	24	25	31	35			
17	34	28	24	E	16	25	31	64	67	44	39	G	G	G	43	40	34	54	31	20	E <sub>B</sub> 19	E <sub>13</sub>	E	E <sub>13</sub>			
18	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>	20	27	35	31	31	G	40	A	G	41	41	54	A	36	43	27	A	35	18	31	E			
19	E <sub>13</sub>	17	21	E <sub>13</sub>	16	25	34	43	43	46	43	A	41	43	G	G	G	G	23	20	E <sub>13</sub>	E	22	45			
20	30	30	E	E	E <sub>13</sub>	28	33	32	43	37	39	G	44	40	37	35	37	29	35	E <sub>13</sub>	E <sub>14</sub>	25	22	21			
21	16	24	E <sub>13</sub>	20	E <sub>13</sub>	22	31	33	38	42	43	37	G	G	45	35	58	30	38	25	25	58	A	28			
22	17	31	39	35	20	36	52	52	36	41	44	G	G	39	G	37	33	45	30	41	25	25	40	24			
23	23	35	30	21	18	23	29	35	38	43	45	60	43	49	39	37	39	45	55	20	19	24	19	E			
24	E	16	E	E	14	G	27	33	41	46	43	40	39	G	35	34	43	60	45	20	60	20	25	E			
25	E	17	20	17	E	G	29	32	45	40	38	39	G	G	G	37	42	34	36	E <sub>14</sub>	E	25	27	27			
26	20	27	31	25	18	G	34	36	40	35	G	38	37	38	32	35	33	29	23	23	37	20	19	E			
27	E	18	30	20	E <sub>13</sub>	30	28	35	43	53	45	A	57	G	37	39	34	34	50	19	25	E	23	E			
28	20	18	22	43	14	23	29	43	42	55	41	38	40	44	34	G	G	33	44	38	33	29	27	30	30		
29	18	23	18	E	20	G	39	36	49	55	40	38	38	43	43	36	36	31	G	E <sub>14</sub>	E <sub>13</sub>	18	20	25			
30	30	31	18	E	22	G	29	35	39	56	40	A	40	41	39	37	34	34	25	23	36	18	26	E <sub>13</sub>			
31	24	E <sub>13</sub>	E	E	26	40	44	36	G	42	A	38	A	A	40	36	40	44	A	25	25	26	30	20			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31			
MED	14	18	17	13	13	22	30	35	41	43	43	40	40	40	37	36	35	34	31	23	25	22	23	20			
UQ	21	25	21	20	18	24	32	43	44	51	45	58	45	43	40	40	40	44	38	34	34	26	26	26			
LQ	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E	E	E <sub>G</sub> 19	28	33	38	40	39	38	G	G	G	G	33	29	23	20	18	18	19	E <sub>13</sub>			

The Radio Research Laboratories, Japan

MAY. 1971

FBES (0.1 MHz)

# IONOSPHERIC DATA

MAY. 1971

F-MIN (0.1 MHZ)

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

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

Mo Day	00	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>14</sub>	E <sub>13</sub>	E	E	E	13	14	15	16	18	19	20	20	18	19	19	15	16	16	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>
2	E <sub>14</sub>	E <sub>14</sub>	E <sub>13</sub>	E	E	14	18	15	18	18	24	21	18	19	19	18	15	13	13	E <sub>13</sub>	E	E <sub>14</sub>	E <sub>14</sub>	E <sub>13</sub>
3	E <sub>13</sub>	E	E <sub>13</sub>	E	E <sub>13</sub>	13	14	19	16	18	20	21	19	24	19	19	16	14	13	E <sub>13</sub>	E <sub>13</sub>	E	E	E
4	E	E	E	E	E	13	18	18	18	20	19	19	19	19	18	18	14	14	13	E	E	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>
5	E <sub>14</sub>	C	E	E	E	20	16	18	19	18	18	28	20	19	19	19	18	15	17	E <sub>13</sub>	E <sub>13</sub>	E	E <sub>14</sub>	E <sub>13</sub>
6	E	E	E	E	E	14	13	20	18	19	25	27	17	19	18	18	15	14	15	E <sub>14</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>	E <sub>13</sub>
7	E <sub>13</sub>	E <sub>13</sub>	E	E <sub>13</sub>	E <sub>13</sub>	13	14	16	15	18	20	17	18	20	19	15	15	15	13	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>
8	E <sub>13</sub>	E <sub>13</sub>	E	E <sub>13</sub>	E <sub>13</sub>	12	14	15	18	18	18	18	19	20	16	18	15	15	14	E <sub>13</sub>	E	E	E	E <sub>13</sub>
9	E <sub>13</sub>	E	E	E <sub>13</sub>	E	14	14	19	18	18	17	20	20	21	19	20	18	14	14	E	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>
10	E	E <sub>13</sub>	E <sub>14</sub>	E	E <sub>13</sub>	13	14	16	16	15	26	20	19	28	18	19	15	15	15	E <sub>14</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>
11	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E	E <sub>13</sub>	14	16	20	18	18	16	21	19	19	18	19	16	14	14	E <sub>13</sub>	E	E <sub>14</sub>	E <sub>13</sub>	E <sub>13</sub>
12	E <sub>13</sub>	E	E <sub>14</sub>	E	E	14	18	19	18	27	24	60	60	40	37	23	18	14	13	E	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>
13	E	E	E	E	E	14	14	18	20	18	22	26	25	25	19	27	16	14	16	E <sub>13</sub>	E	E	E	E
14	E	E	E	E	E	E	17	20	16	20	22	20	20	20	21	19	17	18	15	E <sub>14</sub>	E	E	E	E
15	E	E	E	E	E	13	18	18	18	24	21	21	25	27	20	20	19	15	14	E	E <sub>13</sub>	E	E	E
16	E <sub>13</sub>	E <sub>14</sub>	E	E	E	15	17	18	17	19	19	19	20	20	20	18	19	14	15	E <sub>13</sub>	E <sub>14</sub>	E	E <sub>13</sub>	E
17	E	E <sub>13</sub>	E	E	E	E	17	18	20	18	23	23	19	17	19	17	17	15	13	E <sub>14</sub>	19	E <sub>13</sub>	E <sub>14</sub>	E <sub>13</sub>
18	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>	E	E	E	14	18	15	18	19	25	20	19	20	18	16	13	14	E <sub>13</sub>	E <sub>13</sub>	E	E	E
19	E <sub>13</sub>	E	E	E <sub>13</sub>	E	14	14	18	17	18	21	18	20	20	21	15	15	13	14	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E
20	E <sub>13</sub>	E <sub>13</sub>	E	E	E <sub>13</sub>	13	15	19	17	17	19	18	19	19	19	18	19	17	14	E <sub>13</sub>	E <sub>14</sub>	E <sub>13</sub>	E	E <sub>13</sub>
21	E	E <sub>13</sub>	E <sub>13</sub>	E	E <sub>13</sub>	15	20	19	20	20	18	21	20	19	19	15	16	14	13	E	E <sub>14</sub>	E <sub>13</sub>	E	E
22	E	E	E	E	E	13	14	18	16	18	19	19	19	19	19	18	15	14	14	E <sub>13</sub>	E	E <sub>13</sub>	E	E
23	E	E	E	E	E	13	13	16	19	15	19	18	18	20	18	14	14	15	14	E <sub>13</sub>	E <sub>13</sub>	E	E <sub>14</sub>	E <sub>13</sub>
24	E	E	E <sub>13</sub>	E	E	13	13	15	16	15	17	20	25	22	18	16	17	14	13	E	E <sub>13</sub>	E	E	E <sub>13</sub>
25	E <sub>13</sub>	E	E	E	E	14	13	16	14	18	16	18	20	20	17	17	16	15	13	E <sub>14</sub>	E <sub>13</sub>	E	E	E <sub>13</sub>
26	E	E	E	E	E	12	14	15	18	16	18	22	21	18	19	15	14	14	15	E <sub>13</sub>	E	E <sub>13</sub>	E	E <sub>13</sub>
27	E <sub>13</sub>	E	E	E	E <sub>13</sub>	13	16	18	18	14	19	20	26	19	21	19	15	14	14	E <sub>13</sub>	E	E	E	E <sub>13</sub>
28	E	E	E	E	E	13	14	18	15	21	21	19	21	20	19	16	18	14	14	E <sub>13</sub>	E	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>
29	E	E	E	E	E	14	15	16	14	14	19	20	20	20	18	18	14	13	13	E <sub>14</sub>	E <sub>13</sub>	E	E	E <sub>14</sub>
30	E	E	E	E	E	14	13	15	15	18	25	20	21	21	20	18	15	14	13	E <sub>13</sub>	E <sub>13</sub>	E	E	E <sub>13</sub>
31	E <sub>13</sub>	E <sub>13</sub>	E	E	E	13	14	16	18	19	20	20	23	20	18	18	15	14	14	E <sub>13</sub>	E	E	E <sub>13</sub>	E
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E <sub>13</sub>	E	E	E	E	13	14	18	18	18	19	20	20	20	19	18	16	14	14	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>
UQ	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E	E <sub>13</sub>	14	16	18	18	19	22	21	21	20	20	19	17	15	14	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>
LQ	E	E	E	E	E	13	14	16	16	18	18	19	19	19	18	17	15	14	13	E <sub>13</sub>	E	E	E	E

The Radio Research Laboratories, Japan

MAY. 1971

F-MIN (0.1 MHZ)

### IONOSPHERIC DATA

MAY. 1971

M(3000)F2 (0.01)

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

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	265	280	295	310	295	305	320	300	325	290	310	300	300	295	305	320	325	320	300	290	280	285	280		
2	275	275	285	270	275	310	325	330	310	290	295	285	280	290	305	300	310	300	310	320	290	270	275	275	
3	275	265	280	300	275	310	305	300	I <sub>R</sub> 285	270	I <sub>R</sub> 265	265	I <sub>A</sub> 290	300	315	I <sub>R</sub> 310	310	300	315	290	285	280	F	F	
4	F	F	F	300	285	300	315	310	315	315	325	305	295	280	285	305	305	305	310	310	290	295	285	280	280
5	280	I <sub>C</sub> 280	285	300	320	325	325	320	320	315	305	290	285	300	305	300	310	305	310	310	290	275	285	285	
6	280	290	295	275	300	305	325	320	305	320	290	290	290	290	295	300	315	310	290	295	295	280	I <sub>R</sub> 265	270	280
7	270	265	275	285	320	310	345	335	I <sub>R</sub> 295	295	285	300	280	295	290	305	300	310	300	315	280	I <sub>R</sub> 265	270	280	
8	285	270	280	295	295	295	305	285	260	270	I <sub>R</sub> 290	275	290	305	315	305	310	315	310	285	285	285	280	280	
9	290	275	270	280	285	310	305	I <sub>R</sub> 310	320	315	285	295	280	325	305	310	320	320	305	I <sub>A</sub> 290	285	275	275	280	
10	275	295	295	300	285	310	295	320	300	290	305	305	280	305	295	305	310	315	315	290	275	270	280	275	
11	270	280	290	290	295	305	305	310	320	310	320	290	290	315	295	290	300	310	315	315	280	275	285	275	
12	275	285	290	300	280	310	320	320	325	295	300	310	305	290	295	295	300	310	305	300	280	285	280	280	
13	280	265	290	285	280	300	325	305	310	320	270	285	290	285	290	290	310	310	310	305	I <sub>R</sub> 275	275	275	285	
14	F	S	295	F	285	F	295	310	305	300	285	300	295	285	I <sub>A</sub> 280	280	290	300	310	310	295	I <sub>A</sub> 280	270	270	260
15	270	285	305	260	265	255	330	310	I <sub>A</sub> 315	I <sub>A</sub> 285	265	300	290	285	290	300	295	300	310	295	275	270	265	270	
16	275	280	275	290	285	335	310	315	290	295	305	310	290	285	300	315	310	300	315	285	275	270	275	280	
17	F	F	F	305	F	280	305	310	300	310	305	280	275	280	295	295	300	285	270	285	305	280	270	255	270
18	260	300	265	260	265	260	255	230	240	R	A	G	R	R	260	I <sub>A</sub> 260	265	275	285	I <sub>A</sub> 280	265	270	260	265	
19	270	290	270	265	280	270	260	I <sub>R</sub> 255	I <sub>R</sub> 255	270	240	A	G	G	275	265	280	290	295	295	270	265	270	I <sub>R</sub> 270	
20	280	280	I <sub>R</sub> 300	285	285	310	315	265	275	270	I <sub>R</sub> 250	265	280	285	295	295	315	290	I <sub>R</sub> 300	280	280	275	270	270	
21	265	290	315	310	295	310	320	310	310	300	290	295	280	295	300	305	280	295	295	310	295	300	I <sub>A</sub> 280	270	
22	I <sub>R</sub> 270	280	280	285	290	305	315	310	305	330	280	285	300	285	290	300	320	305	305	295	290	290	I <sub>R</sub> 285	I <sub>R</sub> 290	
23	290	275	F	305	300	325	330	310	330	295	295	310	300	300	300	315	305	290	290	290	310	310	285	280	
24	285	275	275	285	295	340	325	330	320	320	290	305	295	265	285	295	310	300	290	300	290	285	290	285	
25	290	280	275	275	295	320	325	330	330	I <sub>R</sub> 310	285	275	285	305	305	305	300	295	295	300	290	290	290	290	
26	280	290	290	I <sub>R</sub> 285	295	335	300	320	300	285	295	280	295	300	295	290	285	325	300	315	305	290	290	280	
27	280	285	F	F	305	330	280	300	325	325	310	I <sub>A</sub> 300	275	295	280	305	320	305	300	275	290	300	F	F	290
28	285	290	300	300	310	340	335	310	320	320	305	285	290	290	290	300	315	315	305	290	295	F	F	305	
29	295	F	285	F	F	310	300	325	310	315	310	290	270	280	280	300	305	290	310	310	295	285	300	F	
30	295	F	310	305	315	310	295	290	320	320	280	I <sub>A</sub> 285	280	280	280	290	300	295	305	285	300	280	280	280	
31	285	270	280	305	300	285	290	290	280	305	I <sub>A</sub> 280	I <sub>A</sub> 265	A	A	250	280	285	305	I <sub>R</sub> 310	285	285	I <sub>R</sub> 290	280	275	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	27	28	29	30	31	31	31	31	30	30	30	29	29	31	31	31	31	31	31	31	31	30	28	29
MED	280	280	288	285	295	310	310	310	310	302	290	290	285	290	295	300	305	305	305	295	285	280	280	280	
UQ	285	290	295	300	300	318	325	320	320	320	305	300	290	300	300	305	310	310	310	305	292	285	285	280	
LQ	270	275	278	285	280	305	302	300	298	290	280	280	280	285	288	292	300	295	298	290	280	270	272	275	

The Radio Research Laboratories, Japan

MAY. 1971

M(3000)F2 (0.01)

# IONOSPHERIC DATA

MAY. 1971

M(3000)F1 (0.01)

135° E Mean Time (G. M. T. + 9h)

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 DUT	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	355	340	365	350	385	360	345	350	L	L						
2							L	L	A	365	355	375	375	360	365	350	L	L						
3							U	A	I	I	H	I	I	I	A	A	I	A	L					
4							L	L	370	365	360	395	350	345	355	355	355	L	L					
5								L	L	350	345	I	375	350	365	350	L	L	A					
6							L	L	L	L	350	350	360	355	365	350	345	L	L					
7								L		I	I	I	370	360	350	345	350	A	L					
8					L	340	345	345	350	360	350	375	355	360	350	355	L	A						
9							L	A	355	380	380	375	340	355	375	370	A	A	A					
10							L	L	350	L	I	I	I	360	370	A	A	A	A					
11							L	A	A	A	380	380	I	365	345	360	345	L						
12							L	L	U	390	360	370	B	B	345	360	350	350	A	A				
13							L	L	360	A	340	350	370	340	355	365	355	L	L					
14							A	A	A	A	A	A	A	A	A	A	350	L	A					
15						285	U	A	A	A	300	I	I	325	380	345	355	L	L					
16							L	L	H	390	350	A	A	360	350	355	345	380	U	L				
17							L	A	A	370	375	340	340	380	345	375	335	A	L					
18						340	350	360	370	I	380	350	370	345	A	A	320	I	325					
19						350	I	I	I	I	340	370	350	350	350	350	330	I	L					
20						345	350	I	380	385	380	360	385	395	365	365	L	A						
21							L	U	360	355	350	395	390	360	380	375	365	I	A	A				
22						A	A	A	400	390	360	375	375	375	360	380	370	A	L					
23						L	L	L	385	360	I	I	365	I	355	370	L	A	A					
24							L	L	360	I	375	375	370	370	365	350	355	A	A	A				
25							L	L	A	360	380	365	375	365	370	355	I	A	A					
26							L	365	370	370	385	380	400	385	370	365	345	335	L					
27						335	350	I	I	I	I	I	I	370	350	370	365	L	A					
28							L	A	345	I	390	405	385	370	385	370	350	A	A					
29							L	380	A	A	380	345	390	355	340	370	360	360	L					
30							L	U	385	I	360	I	350	380	355	370	340	L	L					
31						A	A	355	370	380	365	390	A	A	375	365	I	I	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					1	7	10	22	24	29	28	28	29	28	27	24	8	1						
MED					285	345	352	360	362	360	360	365	360	360	360	350	345	325						
UQ					352	360	370	378	380	378	375	370	370	370	370	358	352							
LQ					340	350	355	350	355	350	352	350	350	350	350	345	335							

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M(3000)F1 (0.01)



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

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

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								255	290	340	305	320	315	300	320	285	260	245							
2							240	290	290	330	315	320	335	310	300	295	270	260							
3							330	A	I A 430	420	I R 445	430	I A 360	325	300	320	280	265							
4							255	285	285	270	I A 300	320	350	350	310	280	280	265	255						
5								250	240	305	315	305	325	300	290	290	265	280	260						
6							245	260	300	260	305	320	305	300	300	290	265	255	260						
7								235	340	335	340	310	325	305	300	285	295	280	265						
8							290	320	365	460	440	410	400	355	330	320	305	285	280	260					
9							300	I A 290	280	280	290	310	370	310	300	290	270	255	A						
10							265	265	305	285	300	305	345	290	300	305	275	260	235						
11							250	280	285	285	270	275	305	305	310	300	295	260							
12							265	260	250	290	315	290	320	315	330	305	300	280	255						
13							260	265	290	260	440	325	310	335	315	300	275	255	250						
14							270	265	310	320	300	300	340	I A 345	I A 330	310	280	255	250						
15							420	250	265	I A 310	I A 340	400	310	315	330	310	300	285	260	260					
16							250	260	285	295	310	300	295	305	295	280	270	280	250						
17							250	310	285	300	300	350	330	310	305	285	315	335	295						
18							415	530	540	R	A	G	R	R	A	A	440	380	340						
19							460	540	R	450	550	A	G	G	405	450	370	325	280						
20							300	440	415	450	I R 540	450	385	370	340	330	305	260	265						
21							240	270	310	340	340	325	390	330	300	300	I A 295	300	280						
22							285	270	285	300	280	375	345	325	330	320	300	275	270	260					
23							250	250	250	260	320	340	300	315	320	305	285	280	330	315					
24							220	260	290	295	350	300	335	375	330	300	285	310	275						
25							255	255	270	365	400	400	325	300	300	300	310	295	275						
26							255	280	330	340	315	325	320	295	300	320	325	300	265						
27							365	315	270	290	330	I A 375	I A 380	335	340	305	280	275	300						
28							240	260	305	300	325	360	350	330	310	300	290	295	280						
29							290	260	265	280	310	365	405	370	350	315	280	300	265						
30							250	315	255	295	340	I A 360	365	340	335	320	315	285	270						
31							A	A	350	365	340	A	R	A	A	500	400	360	300	I A 295					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT					4	27	30	30	30	29	29	29	29	29	30	30	31	31	26						
MED					288	255	268	290	302	325	320	335	325	310	300	285	280	265							
UQ					355	295	310	310	340	375	360	360	335	330	310	302	300	280							
LQ					268	250	260	280	285	305	305	320	305	300	290	275	260	260							

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

# IONOSPHERIC DATA

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

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

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	295	290	250	230	240	245	240	240	240	230	240	215	215	250	195	200	235	220	235	255	285	290	260	275
2	290	280	265	255	280	240	230	250	250	240	210	210	200	205	205	225	235	230	255	225	245	275	295	300
3	295	305	275	240	295	270	255	240	250	240	200	200	A	A	A	A	245	230	250	250	270	290	295	305
4	290	295	275	240	230	240	230	255	205	A	A	195	230	205	205	210	240	230	245	300	255	255	285	305
5	285	280	285	255	240	215	220	205	200	205	205	195	190	195	205	220	240	230	255	275	270	285	270	275
6	280	260	245	250	245	225	225	210	200	230	210	215	205	200	215	205	230	240	250	255	250	230	250	250
7	255	300	290	265	230	250	220	220	230	230	235	240	220	205	210	240	240	245	255	240	245	290	300	270
8	240	265	260	250	290	270	240	235	225	215	240	200	215	215	240	230	220	250	250	260	295	290	290	300
9	275	295	295	270	265	250	240	230	235	205	200	195	220	225	225	245	A	A	A	265	260	290	290	275
10	290	275	260	240	235	235	235	240	250	240	230	220	215	215	230	A	A	A	A	245	290	320	305	300
11	290	275	260	250	230	230	240	245	A	A	210	210	220	225	240	230	245	250	250	235	245	290	265	270
12	270	270	255	240	255	245	240	240	230	205	195	B	B	230	205	230	230	260	260	250	265	250	255	265
13	290	300	280	265	285	240	245	230	240	230	230	205	210	225	215	235	250	260	250	275	305	305	310	300
14	300	265	255	260	265	250	A	A	A	A	A	A	A	A	A	A	245	235	235	240	A	330	295	300
15	295	270	240	255	330	250	250	A	A	A	230	220	220	230	210	230	240	235	250	235	255	325	325	320
16	285	295	280	265	260	220	230	240	190	A	A	A	195	220	210	230	220	230	245	240	290	295	295	290
17	325	295	260	225	255	250	240	A	A	230	200	190	235	215	240	240	230	245	270	245	250	275	300	275
18	310	245	295	340	305	365	A	250	240	220	215	230	230	250	A	A	A	245	280	285	315	315	315	325
19	320	265	340	250	320	280	245	240	245	250	250	240	220	230	230	220	210	230	230	265	280	280	340	290
20	290	310	250	215	285	255	250	210	225	200	215	210	210	210	215	220	240	230	245	265	265	295	305	300
21	290	295	230	250	260	250	230	205	205	240	205	195	200	210	220	230	230	235	255	250	235	280	295	300
22	305	315	325	305	270	240	A	A	200	225	205	200	180	215	200	225	230	A	A	270	255	265	300	270
23	265	290	280	250	250	225	220	230	210	235	A	A	240	215	210	250	245	260	280	255	240	240	240	270
24	270	295	295	270	260	225	220	215	230	230	215	220	200	200	220	235	A	A	A	255	280	260	250	255
25	265	280	280	290	260	240	235	230	220	220	195	220	220	205	200	240	245	240	250	230	240	280	275	285
26	290	280	280	280	265	240	235	235	240	200	210	210	195	195	215	230	215	240	240	245	265	265	245	265
27	290	290	305	245	220	240	255	240	A	A	A	A	A	215	240	230	230	245	250	250	260	250	270	265
28	295	275	265	260	255	230	235	A	A	A	205	200	215	220	200	215	210	235	245	265	280	270	250	250
29	255	285	250	235	260	235	235	230	A	A	210	205	210	210	220	230	220	230	240	230	255	265	255	280
30	250	285	240	240	245	235	230	255	235	210	230	215	200	200	235	215	230	235	245	240	265	270	285	270
31	285	280	205	240	250	A	A	A	230	A	A	205	A	A	220	240	A	A	A	275	280	280	300	290
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	27	25	24	22	25	26	26	28	28	27	26	26	26	31	30	31	31	31
MED	290	285	265	250	260	240	235	235	230	230	210	210	215	215	215	230	232	235	250	250	265	280	290	280
UQ	295	295	282	265	275	250	240	240	240	235	230	220	220	225	228	235	240	245	255	265	280	290	300	300
LQ	272	275	252	240	245	235	230	230	208	210	205	200	200	205	205	220	230	230	245	240	250	265	262	270

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

# IONOSPHERIC DATA

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

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

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

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



# IONOSPHERIC DATA

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TYPES OF ES

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

Station **AKITA** Lat. **39 43.5 N** Long. **140 08.2 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					H1	H2	H2	H2	H2	H2	F2	F2	H1	H1						F3	F3	F2		
2					H1	H1	H1	H2	H2	H2	F2	F2	F1							F1	F3	F1	F1	F2
3							H1	H1	H2	H2			H2	F1	H2	H2	H2	H2	H2	F2	F2	F2	F2	F3
4	F3	F3	F4	F3	F2	F1	H2	H2	H2	F1	F2	F2	F1	F2			F1	H2	F1	F3	F3	F1	F3	F2
5			F3	F1	F1					F1	F2	F1					F1	F2	F3	F2	F3	F2	F1	F2
6	F2	F2	F1				H1	H1	H1	H1	H1	F1	F1											
7							H1	H1	H2	H1	H2	H2	H2				H1	H2	H2	H2	F1	F2	F2	F2
8					F3	H2	H1	H1	F1	F1	F1				H1	H1	H2	H1	H2	H2	F2	F3	F2	F3
9	F4	F3	F2				F1	F1	F1	H2	F1	F1		F1		H1	H2	H2	H3	F4	F2	F3	F2	F2
10					F1	F1			H2	H1	H2	F1	H2	H1	H1	H2	H2	H2	H2	F3	F4	F3	F3	F2
11				F2	F1	H1	H1	H2	H2	H2	F1	F1	F2	F1	F2	F2	F2	H2	H2	H2	F2		F1	
12					H1	H1	H2	H1	H1	H1							H2	H2	H2	H2	F4			
13	F2	F3	F2	F2	F1		H1	H1	H2	H2	H2	F1	F1	F2	F1		H1	H2	H1	F3	F3	F4	F4	F4
14	F6	F3	F2	F2	F2	F2	H2	H2	H2	H2	H2	F1	F3	F2	F2	F2	H1	H1	H2	F4	F4	F2	F1	F1
15	F2	F1		F1			H1	H2	H2	H2	H2	F1	F2	F1		F2	F2	F2	H1	F1		F4	F3	F4
16	F2	F2	F3	F1			H2	H1	H2	H2	F1	F3		F1		H2	H1	H1	H2	F2	F2	F4	F3	F3
17	F3	F3	F2	F1	F2	F2	H1	H2	H2	H2	H2	F1			F2	F2	H2	H2	H2			F1		
18				F1	F2	H2	H2	H1		F1	H2		H1	H1	H2	H2	H2	H2	H2	F3	F2	F3	F1	F1
19		F2	F3		F1	H3	H2	H2	H2	H2	H2	F1	H2	F2	H1		F1	H2	H2		F2	F4	F4	F4
20	F4	F3	F2	F1			H2	H2	H2	H2	F1	H1	H1	H2	F1	F1	F1	F2	F2		F3	F4	F4	F2
21	F4	F3	F1				H1	H1	H1	F1	H2	F1	F1		H2	F1	H2	F4	F3	F3	F3	F3	F3	F2
22	F1	F3	F4	F2	F2	F3	F3	F2	H2	F1	H2		H1		H1	H1	H2	H2	H2	F3	F3	F3	F2	F2
23	F3	F4	F3	F3	F3	F2	F2	H1	H1	H2	H2	H2	H2	H2	H2	H1	H2	H2	H2	F3	F4	F2	F1	F1
24	F1	F2	F1	F1	F1		H1	H1	H2	H2	H2	F1	F1		F2	F1	H2	H2	H2	F3	F3	F2	F1	F1
25	F1	F3	F3	F1	F1		H2	H1	H3	F1	F1	F1				H1	H2	H2	H2	F1	F3	F3	F3	F3
26	F2	F3	F4	F3	F2		H2	H2	F1	F1		F1	F1	F1	F1	F1	H2	H2	H2	F4	F2	F1	F2	F2
27	F2	F2	F2	F2			H2	H1	H2	H2	H2	H2	F2		F2	F2	H2	H2	H2	F5	F2	F2	F1	F1
28	F2	F2	F3	F2	F2	F1	H1	H1	H3	H2	H2	F1	F1	F2	F1		F1	F4	F3	F3	F3	F3	F3	F3
29	F2	F2	F2	F1	F2		H2	H2	H2	H2	H2	F1	F1	F2	F2	F2	H2	H2			F2	F2	F3	F3
30	F3	F4	F2		F3		H1	H1	H1	H2	H2	F1	H2	H1	H1	H1	H1	H2	H2	F3	F1	F2	F2	F2
31	F2				F3	H3	H3	H2	H1	H2	H2	F1	F2	F2	F1	F1	H3	H3	H3	H2	F2	F3	F3	F3
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

MAY, 1971

TYPES OF ES

# IONOSPHERIC DATA

MAY. 1971

FOF2 (0.1 MHz)

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

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	60	58	61	51	42	52	64	71	77	80	76	74	78	85	91	100	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	74	80	87	96	106	107	102	98	91	90	J <sup>R</sup> <sub>76</sub>	58	51	55	55
3	56	53	54	46	44	47	45	42	51	54	55	64	72	79	J <sup>R</sup> <sub>78</sub>	70	68	70	69	68	66	65	64	61
4	F <sup>60</sup>	F	61	54	51	54	58	67	72	70	71	76	75	83	98	J <sup>B</sup> <sub>105</sub>	96	C	79	J <sup>R</sup> <sub>76</sub>	I <sup>R</sup> <sub>74</sub>	J <sup>R</sup> <sub>75</sub>	71	I <sup>R</sup> <sub>70</sub>
5	J <sup>R</sup> <sub>71</sub>	70	69	66	J <sup>R</sup> <sub>66</sub>	66	66	70	70	66	80	86	92	108	113	110	106	J <sup>R</sup> <sub>103</sub>	I <sup>A</sup> <sub>102</sub>	A	85	I <sup>R</sup> <sub>79</sub>	85	91
6	J <sup>R</sup> <sub>85</sub>	I <sup>C</sup> <sub>77</sub>	72	65	59	61	J <sup>R</sup> <sub>75</sub>	83	83	81	89	96	J <sup>B</sup> <sub>105</sub>	110	111	I <sup>C</sup> <sub>113</sub>	I <sup>C</sup> <sub>112</sub>	95	91	96	90	J <sup>R</sup> <sub>77</sub>	71	J <sup>R</sup> <sub>71</sub>
7	66	62	62	66	65	60	71	62	66	72	88	99	104	106	111	106	96	J <sup>R</sup> <sub>96</sub>	85	88	72	I <sup>R</sup> <sub>74</sub>	J <sup>R</sup> <sub>79</sub>	I <sup>R</sup> <sub>82</sub>
8	J <sup>R</sup> <sub>78</sub>	68	67	62	51	53	58	57	61	65	66	71	74	80	77	79	77	72	70	68	70	69	69	69
9	68	61	58	59	57	61	79	87	84	76	H <sup>72</sup>	83	95	100	100	J <sup>R</sup> <sub>101</sub>	91	I <sup>A</sup> <sub>84</sub>	I <sup>A</sup> <sub>82</sub>	74	I <sup>A</sup> <sub>74</sub>	74	76	U <sup>R</sup> <sub>71</sub>
10	71	71	72	65	57	63	70	82	83	85	89	92	93	J <sup>B</sup> <sub>105</sub>	J <sup>R</sup> <sub>103</sub>	96	97	96	81	70	71	J <sup>R</sup> <sub>73</sub>	73	I <sup>R</sup> <sub>73</sub>
11	75	70	68	66	60	62	J <sup>R</sup> <sub>74</sub>	90	88	83	85	89	99	J <sup>B</sup> <sub>103</sub>	107	106	109	103	101	91	77	J <sup>R</sup> <sub>75</sub>	J <sup>R</sup> <sub>76</sub>	J <sup>R</sup> <sub>81</sub>
12	R	J <sup>R</sup> <sub>78</sub>	I <sup>R</sup> <sub>75</sub>	65	61	J <sup>R</sup> <sub>74</sub>	83	96	78	76	86	96	92	92	90	99	97	95	91	87	81	J <sup>R</sup> <sub>74</sub>	78	I <sup>R</sup> <sub>76</sub>
13	76	J <sup>R</sup> <sub>71</sub>	J <sup>R</sup> <sub>71</sub>	I <sup>R</sup> <sub>69</sub>	67	J <sup>R</sup> <sub>77</sub>	81	90	98	71	76	86	103	108	120	129	124	J <sup>R</sup> <sub>106</sub>	90	76	76	J <sup>R</sup> <sub>76</sub>	J <sup>R</sup> <sub>76</sub>	80
14	J <sup>F</sup> <sub>81</sub>	F	82	A	F <sup>64</sup>	79	81	74	74	86	I <sup>A</sup> <sub>90</sub>	94	94	104	114	118	119	114	100	79	66	71	73	69
15	71	75	67	56	F <sup>53</sup>	56	79	81	62	69	85	99	105	110	111	113	107	102	91	A	71	J <sup>R</sup> <sub>78</sub>	74	F
16	F	J <sup>B</sup> <sub>75</sub>	71	J <sup>R</sup> <sub>66</sub>	65	66	61	J <sup>R</sup> <sub>68</sub>	J <sup>R</sup> <sub>82</sub>	99	90	J <sup>B</sup> <sub>105</sub>	106	110	116	116	98	95	84	75	R	85	85	J <sup>R</sup> <sub>84</sub>
17	J <sup>R</sup> <sub>82</sub>	83	J <sup>R</sup> <sub>74</sub>	65	58	65	80	86	80	84	90	99	J <sup>R</sup> <sub>104</sub>	109	113	J <sup>R</sup> <sub>104</sub>	102	88	95	J <sup>R</sup> <sub>103</sub>	86	J <sup>R</sup> <sub>81</sub>	I <sup>R</sup> <sub>74</sub>	I <sup>R</sup> <sub>81</sub>
18	71	85	65	71	81	61	55	J <sup>R</sup> <sub>54</sub>	53	E <sup>G</sup> <sub>43</sub>	E <sup>G</sup> <sub>46</sub>	56	54	I <sup>A</sup> <sub>56</sub>	I <sup>A</sup> <sub>53</sub>	56	54	56	55	58	59	57	60	J <sup>R</sup> <sub>55</sub>
19	60	J <sup>R</sup> <sub>67</sub>	50	J <sup>R</sup> <sub>50</sub>	46	45	50	51	53	55	61	52	A	56	A	61	65	62	62	61	60	61	61	63
20	62	59	J <sup>R</sup> <sub>59</sub>	50	F	50	J <sup>R</sup> <sub>56</sub>	53	R	R	56	59	A	J <sup>R</sup> <sub>76</sub>	73	J <sup>B</sup> <sub>75</sub>	65	64	65	66	72	J <sup>R</sup> <sub>72</sub>	I <sup>R</sup> <sub>71</sub>	R
21	R	71	J <sup>R</sup> <sub>77</sub>	46	45	54	72	62	65	66	70	J <sup>R</sup> <sub>75</sub>	79	90	96	88	79	80	86	83	76	70	61	61
22	60	58	56	52	49	51	J <sup>R</sup> <sub>75</sub>	A	A	I <sup>A</sup> <sub>60</sub>	67	76	79	84	89	91	91	A	A	70	71	63	74	71
23	69	69	66	58	50	59	66	61	63	72	70	90	86	I <sup>A</sup> <sub>80</sub>	83	79	69	73	80	88	94	58	57	F
24	65	60	F	J <sup>R</sup> <sub>58</sub>	60	68	67	64	63	65	66	76	67	81	97	100	83	86	87	92	81	I <sup>R</sup> <sub>75</sub>	J <sup>R</sup> <sub>78</sub>	I <sup>R</sup> <sub>67</sub>
25	67	67	61	58	61	J <sup>R</sup> <sub>77</sub>	J <sup>R</sup> <sub>72</sub>	71	70	60	59	68	88	95	87	79	A	I <sup>A</sup> <sub>80</sub>	86	86	J <sup>R</sup> <sub>73</sub>	J <sup>R</sup> <sub>70</sub>	68	J <sup>R</sup> <sub>66</sub>
26	70	62	60	57	58	66	59	I <sup>R</sup> <sub>56</sub>	65	66	68	76	88	96	86	86	87	91	96	87	J <sup>R</sup> <sub>79</sub>	56	J <sup>R</sup> <sub>62</sub>	60
27	61	56	60	54	49	51	59	80	74	65	63	62	68	79	I <sup>A</sup> <sub>86</sub>	91	85	78	I <sup>A</sup> <sub>73</sub>	R	J <sup>R</sup> <sub>76</sub>	66	F	F
28	F	78	F <sup>63</sup>	F	J <sup>R</sup> <sub>64</sub>	57	59	60	70	I <sup>A</sup> <sub>68</sub>	67	68	78	84	92	86	80	73	73	80	J <sup>R</sup> <sub>80</sub>	J <sup>R</sup> <sub>73</sub>	F	A
29	A	A	F	F	F	61	76	87	75	65	66	65	67	77	86	97	95	89	87	81	78	76	73	68
30	J <sup>S</sup> <sub>70</sub>	S	F	F <sup>58</sup>	55	56	62	79	87	64	67	72	J <sup>B</sup> <sub>75</sub>	88	90	91	93	93	90	86	86	80	J <sup>R</sup> <sub>78</sub>	78
31	71	64	70	66	66	64	60	62	60	61	60	A	59	58	58	61	64	60	56	I <sup>A</sup> <sub>57</sub>	I <sup>A</sup> <sub>61</sub>	65	60	61
	00	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	27	27	28	30	30	29	28	30	31	30	29	31	30	31	29	28	29	27	29	30	28	25
MED	70	68	66	58	58	61	66	70	71	68	70	76	88	90	94	97	93	88	86	79	74	72	73	70
UQ	71	75	71	66	64	66	75	82	81	76	85	92	96	106	111	106	98	96	91	87	80	J <sup>R</sup> <sub>75</sub>	J <sup>R</sup> <sub>76</sub>	J <sup>R</sup> <sub>78</sub>
LQ	62	61	60	54	50	54	59	61	63	65	66	68	75	80	86	82	79	73	73	70	71	65	63	63

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FOF2 (0.1 MHz)

### IONOSPHERIC DATA

MAY. 1971

FOF1 (0.01 MHZ)

135° E Mean Time (G. M. T. + 9h)

Station **KOKUBUNJI TOKYO** Lat. **35° 42.4' N.** Long. **139° 29.3' E** Sweep 1 MHz to 20 MHz in 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	490	490	480	490	490	500	L	L	C	C	C					
2						C	C	C	C	L	510	500	490	510	500			L	L					
3									450	480	490	A	490	480	L	L	L	L						
4								L	L	500	520	480	510	R	490	L	L	C						
5									430	L	L	500	A	A	A	A	L							
6							L	L	L	L	L	510	500	500	480	C	C	L						
7									L	L	500	L	510	510	L	L	L	L						
8							L	440	450	490	510	510	510	490	500	490	450	L						
9							L	L	L	500	L	560	A	540	A	480	A	A	A					
10								L	U	520	A	A	500	500	500	L	L							
11								L	L	A	A	550	A	A	L	L	A							
12								L	A	A	A	B	B	L	550	L	L							
13							L	L	A	A	A	A	510	540	530	500	460	L						
14								A	A	500		L	L	550	500	510	460	L						
15								A	550	510	A	L	A	490	L	L	L	A						
16									A	460	490	520	L	L	490	490		L						
17								L	A	A	510	510	510	A	A	L	490	L	L					
18									390	390	A	430	460	460	A	A	A	460	A	A				
19									390	400	430	450	460	480	A	A	A	450	440	L	L			
20							L	410	460	460	460	480	A	480	460	L	A	L	L					
21								510	A	460	A	A	500	500	490	A	460	L	L					
22								L	A	A	A	500	480	500	490	A	A	A	A	A				
23								L	L		470	470	490	A	A	470	450	500	420	L				
24						L		L	460	A	A	480	L	490	480	450	A	A	L					
25							L	L	A	A	480	480	480	460	460	A	A	A	A					
26							L	460	460	A	480	480	460	480	L	460	450	L	L					
27								L	L	A	A	A	490	A	A	A	A	L	A					
28									A	A	A	A	A	A	480	R	460	A	A	A				
29							L	A	A	A	490	A	510	500	A	A	A	A	A					
30									310	410	A	A	500	500	550	500	500	470	450	L				
31								A	420	A	A	A	A	A	480	A	440	440	A	A				
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	8	10	13	17	19	17	21	15	13	10	1						
MED							390	415	460	480	490	490	500	500	490	460	455	420						
UQ							390	450	490	500	500	510	510	500	500	490	460							
LQ							350	405	450	460	480	480	490	480	480	450	450							

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FOF1 (0.01 MHZ)

### IONOSPHERIC DATA

MAY, 1971

FOE (0.01 MHZ)

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

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						165	245	280	310	340	360	370	365	370	365	340	C	C	C					
2						C	C	C	C	340	350	345	350	360	355	340	300	250	155					
3						A	225	280	325	350	370	360	370	370	355	335	300	250	170					
4						140	245	285	325	R	A	R	B	B	345	335	A	C	A					
5						B	A	A	A	A	R	R	A	A	A	A	A	A	A					
6						B	260	300	320	330	R	R	B	R	R	I	C	I	C	R	190			
7						B	240	280	A	I	R	I	R	R	R	I	R	I	R	I	A			
8						B	235	280	A	345	370	375	375	380	360	350	300	265	175					
9						A	270	300	I	A	I	A	A	A	A	395	355	310	255	A				
10						170	250	310	330	A	A	A	A	A	R	A	300	A	A					
11						B	250	I	A	325	I	A	A	A	A	A	A	305	A	A				
12						175	I	A	I	R	330	350	365	B	B	B	R	310	265	A				
13						R	250	310	I	A	330	355	I	B	A	B	375	370	350	330	270	200		
14						215	270	310	330	365	375	380	A	A	R	40	315	270	200					
15						200	270	310	A	A	A	A	A	A	A	A	A	A	A					
16						160	250	300	320	350	I	R	R	R	365	I	R	I	R	300	280	A		
17						220	260	290	I	A	A	A	A	A	A	A	A	305	260	A				
18						B	260	290	325	I	A	A	R	A	R	350	I	A	300	I	A	245	A	
19						190	250	290	315	350	360	R	R	370	360	330	I	A	300	270	R	190		
20						180	250	290	320	R	A	B	A	A	A	A	A	A	A					
21						B	240	280	A	A	B	A	R	R	R	A	290	A	A					
22						A	A	A	A	A	A	R	U	R	R	350	340	300	255	A				
23						205	270	A	310	340	345	365	I	R	355	355	345	335	300	255	A			
24						190	260	300	305	325	335	A	A	A	A	A	A	A	A					
25						200	240	I	A	I	A	I	A	350	I	R	345	325	285	255	A			
26						180	235	I	A	I	A	A	A	B	R	340	A	A	A	A	A			
27						200	250	280	A	320	A	A	A	A	A	A	A	A	A	A				
28						B	260	290	A	A	A	345	A	R	A	A	A	A	A					
29						B	250	300	A	A	A	A	A	A	A	A	A	A	A	A	B			
30						190	260	305	325	350	365	370	370	385	375	340	310	255	A					
31						180	250	290	320	335	I	A	350	350	A	A	A	R	260	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						17	28	27	21	21	16	11	9	12	15	17	20	17	7					
MED						190	250	290	320	340	360	360	370	368	350	340	300	255	190					
UQ						200	260	300	325	350	370	370	370	378	362	340	310	265	195					
LQ						175	245	280	315	330	348	352	355	358	348	330	300	255	172					

The Radio Research Laboratories, Japan

MAY, 1971

FOE (0.01 MHZ)

IONOSPHERIC DATA

MAY. 1971

FOES (0.1 MHz)

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

Station KOKUBUNJI TOKYO Lat. 35 42.4 N. Long. 139 29.3 E Sweep 1 MHz to 20 MHz in 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>14</sub>	J <sub>X</sub> <sub>18</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	G	28	40	42	49	47	44	46	40	G	G	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	J <sub>X</sub> <sub>58</sub>	47	40	39	40	44	G	G	G	J <sub>X</sub> <sub>28</sub>	J <sub>X</sub> <sub>18</sub>	J <sub>X</sub> <sub>30</sub>	M <sub>22</sub>	J <sub>X</sub> <sub>30</sub>	J <sub>X</sub> <sub>22</sub>
3	17	19	E <sub>14</sub>	E <sub>14</sub>	E <sub>12</sub>	21	31	36	40	49	50	J <sub>X</sub> <sub>66</sub>	45	41	45	J <sub>X</sub> <sub>42</sub>	J <sub>X</sub> <sub>40</sub>	G	23	J <sub>X</sub> <sub>84</sub>	J <sub>X</sub> <sub>43</sub>	J <sub>X</sub> <sub>60</sub>	J <sub>X</sub> <sub>51</sub>	J <sub>X</sub> <sub>24</sub>
4	J <sub>X</sub> <sub>28</sub>	J <sub>X</sub> <sub>42</sub>	J <sub>X</sub> <sub>37</sub>	22	M <sub>21</sub>	G	32	33	37	41	48	G	E <sub>40</sub>	E <sub>40</sub>	G	G	35	C	J <sub>X</sub> <sub>50</sub>	J <sub>X</sub> <sub>37</sub>	J <sub>X</sub> <sub>24</sub>	21	E <sub>16</sub>	J <sub>X</sub> <sub>41</sub>
5	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>39</sub>	J <sub>X</sub> <sub>39</sub>	J <sub>X</sub> <sub>34</sub>	J <sub>X</sub> <sub>25</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>31</sub>	J <sub>X</sub> <sub>39</sub>	G <sub>35</sub>	G <sub>34</sub>	G <sub>35</sub>	J <sub>X</sub> <sub>51</sub>	J <sub>X</sub> <sub>69</sub>	J <sub>X</sub> <sub>79</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>38</sub>	J <sub>X</sub> <sub>36</sub>	J <sub>X</sub> <sub>85</sub>	84	J <sub>X</sub> <sub>59</sub>	J <sub>X</sub> <sub>41</sub>	J <sub>X</sub> <sub>19</sub>	J <sub>X</sub> <sub>21</sub>
6	J <sub>X</sub> <sub>21</sub>	C	20	E <sub>13</sub>	E <sub>13</sub>	22	29	36	38	G	G	G	E <sub>40</sub>	G <sub>32</sub>	G	C	C	G	22	20	20	20	26	E <sub>15</sub>
7	21	19	E <sub>15</sub>	E <sub>13</sub>	E <sub>13</sub>	20	G <sub>17</sub>	35	40	J <sub>X</sub> <sub>46</sub>	39	G	G	G	G	42	G	35	22	J <sub>X</sub> <sub>19</sub>	J <sub>X</sub> <sub>29</sub>	20	J <sub>X</sub> <sub>25</sub>	J <sub>X</sub> <sub>17</sub>
8	22	E <sub>15</sub>	20	J <sub>X</sub> <sub>20</sub>	21	22	26	J <sub>X</sub> <sub>35</sub>	J <sub>X</sub> <sub>40</sub>	40	G	G	G	43	G	41	29	G	21	E <sub>15</sub>	J <sub>X</sub> <sub>43</sub>	J <sub>X</sub> <sub>64</sub>	J <sub>X</sub> <sub>30</sub>	J <sub>X</sub> <sub>39</sub>
9	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>24</sub>	18	J <sub>X</sub> <sub>18</sub>	E <sub>14</sub>	37	J <sub>X</sub> <sub>30</sub>	J <sub>X</sub> <sub>28</sub>	J <sub>X</sub> <sub>40</sub>	J <sub>X</sub> <sub>44</sub>	40	40	J <sub>X</sub> <sub>55</sub>	J <sub>X</sub> <sub>41</sub>	60	48	J <sub>X</sub> <sub>78</sub>	95	J <sub>X</sub> <sub>81</sub>	J <sub>X</sub> <sub>74</sub>	J <sub>X</sub> <sub>129</sub>	J <sub>X</sub> <sub>41</sub>	J <sub>X</sub> <sub>40</sub>	19
10	M <sub>20</sub>	J <sub>X</sub> <sub>39</sub>	J <sub>X</sub> <sub>28</sub>	J <sub>X</sub> <sub>25</sub>	J <sub>X</sub> <sub>21</sub>	23	29	36	36	J <sub>X</sub> <sub>57</sub>	66	J <sub>X</sub> <sub>57</sub>	46	45	G	46	J <sub>X</sub> <sub>42</sub>	J <sub>X</sub> <sub>57</sub>	J <sub>X</sub> <sub>70</sub>	J <sub>X</sub> <sub>51</sub>	J <sub>X</sub> <sub>23</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>41</sub>	J <sub>X</sub> <sub>41</sub>
11	J <sub>X</sub> <sub>28</sub>	22	20	E <sub>13</sub>	22	29	J <sub>X</sub> <sub>41</sub>	J <sub>X</sub> <sub>42</sub>	41	J <sub>X</sub> <sub>53</sub>	J <sub>X</sub> <sub>54</sub>	46	J <sub>X</sub> <sub>51</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>41</sub>	J <sub>X</sub> <sub>51</sub>	J <sub>X</sub> <sub>64</sub>	J <sub>X</sub> <sub>75</sub>	70	J <sub>X</sub> <sub>61</sub>	J <sub>X</sub> <sub>49</sub>	J <sub>X</sub> <sub>30</sub>	E <sub>16</sub>	J <sub>X</sub> <sub>25</sub>
12	20	E <sub>14</sub>	20	E <sub>14</sub>	20	G	29	G	J <sub>X</sub> <sub>47</sub>	J <sub>X</sub> <sub>50</sub>	50	E <sub>76</sub>	E <sub>60</sub>	E <sub>42</sub>	E <sub>40</sub>	40	36	J <sub>X</sub> <sub>49</sub>	J <sub>X</sub> <sub>31</sub>	J <sub>X</sub> <sub>25</sub>	J <sub>X</sub> <sub>29</sub>	E <sub>15</sub>	J <sub>X</sub> <sub>61</sub>	J <sub>X</sub> <sub>26</sub>
13	E <sub>15</sub>	E <sub>15</sub>	J <sub>X</sub> <sub>36</sub>	J <sub>X</sub> <sub>25</sub>	22	G	G	39	J <sub>X</sub> <sub>44</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>61</sub>	J <sub>X</sub> <sub>111</sub>	E <sub>40</sub>	46	G	G	G	G	23	19	M <sub>21</sub>	E <sub>14</sub>	J <sub>X</sub> <sub>36</sub>	J <sub>X</sub> <sub>52</sub>
14	J <sub>X</sub> <sub>56</sub>	J <sub>X</sub> <sub>53</sub>	J <sub>X</sub> <sub>25</sub>	J <sub>X</sub> <sub>62</sub>	J <sub>X</sub> <sub>40</sub>	G	32	50	48	47	J <sub>X</sub> <sub>91</sub>	45	J <sub>X</sub> <sub>61</sub>	J <sub>X</sub> <sub>51</sub>	G	G	38	32	27	J <sub>X</sub> <sub>65</sub>	J <sub>X</sub> <sub>60</sub>	36	J <sub>X</sub> <sub>75</sub>	J <sub>X</sub> <sub>42</sub>
15	J <sub>X</sub> <sub>25</sub>	J <sub>X</sub> <sub>28</sub>	J <sub>X</sub> <sub>36</sub>	J <sub>X</sub> <sub>30</sub>	J <sub>X</sub> <sub>36</sub>	G	30	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>44</sub>	J <sub>X</sub> <sub>74</sub>	J <sub>X</sub> <sub>54</sub>	49	J <sub>X</sub> <sub>58</sub>	46	J <sub>X</sub> <sub>41</sub>	45	J <sub>X</sub> <sub>39</sub>	J <sub>X</sub> <sub>44</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>80</sub>	22	J <sub>X</sub> <sub>19</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>51</sub>
16	J <sub>X</sub> <sub>84</sub>	J <sub>X</sub> <sub>30</sub>	J <sub>X</sub> <sub>19</sub>	E <sub>13</sub>	J <sub>X</sub> <sub>22</sub>	E <sub>14</sub>	G	37	J <sub>X</sub> <sub>42</sub>	41	G	G	G	46	G	G	41	38	J <sub>X</sub> <sub>34</sub>	21	22	21	22	J <sub>X</sub> <sub>29</sub>
17	18	E <sub>15</sub>	E <sub>14</sub>	19	E <sub>14</sub>	G	32	39	J <sub>X</sub> <sub>52</sub>	J <sub>X</sub> <sub>68</sub>	44	40	49	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>75</sub>	J <sub>X</sub> <sub>40</sub>	G	29	26	21	E <sub>16</sub>	E <sub>15</sub>	J <sub>X</sub> <sub>52</sub>	J <sub>X</sub> <sub>41</sub>
18	J <sub>X</sub> <sub>20</sub>	E <sub>15</sub>	E <sub>15</sub>	22	J <sub>X</sub> <sub>39</sub>	35	30	36	J <sub>X</sub> <sub>48</sub>	47	J <sub>X</sub> <sub>52</sub>	43	50	60	63	J <sub>X</sub> <sub>72</sub>	J <sub>X</sub> <sub>48</sub>	J <sub>X</sub> <sub>39</sub>	24	J <sub>X</sub> <sub>19</sub>	J <sub>X</sub> <sub>30</sub>	J <sub>X</sub> <sub>32</sub>	J <sub>X</sub> <sub>34</sub>	21
19	J <sub>X</sub> <sub>25</sub>	21	J <sub>X</sub> <sub>19</sub>	20	E <sub>15</sub>	25	34	39	41	42	42	43	J <sub>X</sub> <sub>94</sub>	55	J <sub>X</sub> <sub>107</sub>	J <sub>X</sub> <sub>41</sub>	G	G	G	22	20	E <sub>15</sub>	J <sub>X</sub> <sub>31</sub>	J <sub>X</sub> <sub>37</sub>
20	21	J <sub>X</sub> <sub>19</sub>	J <sub>X</sub> <sub>31</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>19</sub>	23	32	35	36	40	40	J <sub>X</sub> <sub>50</sub>	J <sub>X</sub> <sub>94</sub>	44	46	39	J <sub>X</sub> <sub>51</sub>	J <sub>X</sub> <sub>45</sub>	J <sub>X</sub> <sub>25</sub>	22	E <sub>14</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>24</sub>	J <sub>X</sub> <sub>29</sub>
21	J <sub>X</sub> <sub>30</sub>	J <sub>X</sub> <sub>24</sub>	J <sub>X</sub> <sub>24</sub>	J <sub>X</sub> <sub>24</sub>	E <sub>15</sub>	30	60	J <sub>X</sub> <sub>59</sub>	J <sub>X</sub> <sub>49</sub>	J <sub>X</sub> <sub>39</sub>	49	J <sub>X</sub> <sub>58</sub>	35	G	40	J <sub>X</sub> <sub>62</sub>	J <sub>X</sub> <sub>41</sub>	J <sub>X</sub> <sub>39</sub>	J <sub>X</sub> <sub>29</sub>	19	21	J <sub>X</sub> <sub>35</sub>	J <sub>X</sub> <sub>60</sub>	J <sub>X</sub> <sub>29</sub>
22	21	21	E <sub>15</sub>	E <sub>13</sub>	20	22	J <sub>X</sub> <sub>34</sub>	J <sub>X</sub> <sub>101</sub>	730	J <sub>X</sub> <sub>87</sub>	43	G	43	42	53	48	J <sub>X</sub> <sub>58</sub>	J <sub>X</sub> <sub>97</sub>	J <sub>X</sub> <sub>108</sub>	J <sub>X</sub> <sub>60</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>38</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>54</sub>
23	J <sub>X</sub> <sub>50</sub>	21	22	21	J <sub>X</sub> <sub>36</sub>	J <sub>X</sub> <sub>20</sub>	J <sub>X</sub> <sub>27</sub>	37	42	41	42	44	J <sub>X</sub> <sub>58</sub>	J <sub>X</sub> <sub>88</sub>	42	G	37	32	J <sub>X</sub> <sub>30</sub>	43	30	M <sub>43</sub>	J <sub>X</sub> <sub>40</sub>	J <sub>X</sub> <sub>32</sub>
24	25	J <sub>X</sub> <sub>52</sub>	J <sub>X</sub> <sub>28</sub>	J <sub>X</sub> <sub>36</sub>	24	20	32	37	42	J <sub>X</sub> <sub>57</sub>	J <sub>X</sub> <sub>49</sub>	46	J <sub>X</sub> <sub>41</sub>	41	J <sub>X</sub> <sub>39</sub>	J <sub>X</sub> <sub>48</sub>	J <sub>X</sub> <sub>46</sub>	J <sub>X</sub> <sub>55</sub>	J <sub>X</sub> <sub>36</sub>	J <sub>X</sub> <sub>30</sub>	J <sub>X</sub> <sub>74</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>45</sub>	J <sub>X</sub> <sub>64</sub>
25	J <sub>X</sub> <sub>24</sub>	E <sub>15</sub>	26	J <sub>X</sub> <sub>19</sub>	20	G	G	36	J <sub>X</sub> <sub>55</sub>	J <sub>X</sub> <sub>44</sub>	J <sub>X</sub> <sub>48</sub>	42	41	32	G	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>85</sub>	J <sub>X</sub> <sub>85</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>16</sub>	J <sub>X</sub> <sub>23</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>41</sub>	J <sub>X</sub> <sub>35</sub>
26	J <sub>X</sub> <sub>35</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>60</sub>	20	16	31	J <sub>X</sub> <sub>49</sub>	J <sub>X</sub> <sub>48</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>41</sub>	J <sub>X</sub> <sub>44</sub>	E <sub>39</sub>	G	J <sub>X</sub> <sub>42</sub>	J <sub>X</sub> <sub>40</sub>	J <sub>X</sub> <sub>41</sub>	J <sub>X</sub> <sub>34</sub>	J <sub>X</sub> <sub>24</sub>	J <sub>X</sub> <sub>24</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>64</sub>	J <sub>X</sub> <sub>24</sub>	J <sub>X</sub> <sub>31</sub>
27	22	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>25</sub>	J <sub>X</sub> <sub>29</sub>	E <sub>13</sub>	24	30	J <sub>X</sub> <sub>40</sub>	J <sub>X</sub> <sub>44</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>50</sub>	J <sub>X</sub> <sub>56</sub>	J <sub>X</sub> <sub>55</sub>	J <sub>X</sub> <sub>55</sub>	J <sub>X</sub> <sub>91</sub>	J <sub>X</sub> <sub>65</sub>	J <sub>X</sub> <sub>59</sub>	J <sub>X</sub> <sub>39</sub>	J <sub>X</sub> <sub>139</sub>	J <sub>X</sub> <sub>21</sub>	J <sub>X</sub> <sub>36</sub>	J <sub>X</sub> <sub>51</sub>	J <sub>X</sub> <sub>28</sub>	J <sub>X</sub> <sub>44</sub>
28	J <sub>X</sub> <sub>60</sub>	J <sub>X</sub> <sub>74</sub>	21	J <sub>X</sub> <sub>41</sub>	J <sub>X</sub> <sub>40</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>44</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>60</sub>	J <sub>X</sub> <sub>69</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>59</sub>	J <sub>X</sub> <sub>88</sub>	G	48	41	J <sub>X</sub> <sub>62</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>78</sub>	J <sub>X</sub> <sub>22</sub>	J <sub>X</sub> <sub>39</sub>	J <sub>X</sub> <sub>74</sub>	J <sub>X</sub> <sub>44</sub>	J <sub>X</sub> <sub>109</sub>
29	J <sub>X</sub> <sub>84</sub>	J <sub>X</sub> <sub>104</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>32</sub>	J <sub>X</sub> <sub>29</sub>	23	32	J <sub>X</sub> <sub>60</sub>	J <sub>X</sub> <sub>67</sub>	67	J <sub>X</sub> <sub>49</sub>	J <sub>X</sub> <sub>58</sub>	J <sub>X</sub> <sub>41</sub>	J <sub>X</sub> <sub>44</sub>	J <sub>X</sub> <sub>63</sub>	75	J <sub>X</sub> <sub>74</sub>	J <sub>X</sub> <sub>75</sub>	76	J <sub>X</sub> <sub>62</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>28</sub>
30	J <sub>X</sub> <sub>40</sub>	J <sub>X</sub> <sub>63</sub>	J <sub>X</sub> <sub>34</sub>	J <sub>X</sub> <sub>30</sub>	J <sub>X</sub> <sub>36</sub>	18	J <sub>X</sub> <sub>29</sub>	36	56	J <sub>X</sub> <sub>58</sub>	47	43	44	43	44	38	40	J <sub>X</sub> <sub>39</sub>	J <sub>X</sub> <sub>38</sub>	J <sub>X</sub> <sub>49</sub>	J <sub>X</sub> <sub>94</sub>	J <sub>X</sub> <sub>73</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>27</sub>
31	J <sub>X</sub> <sub>41</sub>	J <sub>X</sub> <sub>36</sub>	J <sub>X</sub> <sub>30</sub>	J <sub>X</sub> <sub>41</sub>	J <sub>X</sub> <sub>34</sub>	J <sub>X</sub> <sub>34</sub>	J <sub>X</sub> <sub>52</sub>	J <sub>X</sub> <sub>41</sub>	J <sub>X</sub> <sub>67</sub>	62	J <sub>X</sub> <sub>61</sub>	70	55	J <sub>X</sub> <sub>80</sub>	J <sub>X</sub> <sub>49</sub>	J <sub>X</sub> <sub>36</sub>	G	J <sub>X</sub> <sub>44</sub>	J <sub>X</sub> <sub>44</sub>	66	J <sub>X</sub> <sub>84</sub>	J <sub>X</sub> <sub>51</sub>	J <sub>X</sub> <sub>24</sub>	J <sub>X</sub> <sub>51</sub>
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	30	30	30	30	30	30	31	31	31	31	31	31	30	29	29	30	30	30	30	30	30
MED	J <sub>X</sub> <sub>25</sub>	J <sub>X</sub> <sub>24</sub>	J <sub>X</sub> <sub>23</sub>	J <sub>X</sub> <sub>22</sub>	21	22	30	37	J <sub>X</sub> <sub>43</sub>	J <sub>X</sub> <sub>49</sub>	48	44	46	43	42	41	J <sub>X</sub> <sub>40</sub>	J <sub>X</sub> <sub>39</sub>	J <sub>X</sub> <sub>32</sub>	J <sub>X</sub> <sub>24</sub>	J <sub>X</sub> <sub>30</sub>	J <sub>X</sub> <sub>31</sub>	J <sub>X</sub> <sub>35</sub>	J <sub>X</sub> <sub>32</sub>
UQ	J <sub>X</sub> <sub>40</sub>	J <sub>X</sub> <sub>39</sub>	J <sub>X</sub> <sub>29</sub>	J <sub>X</sub> <sub>30</sub>	J <sub>X</sub> <sub>29</sub>	25	32	J <sub>X</sub> <sub>42</sub>	J <sub>X</sub> <sub>49</sub>	J <sub>X</sub> <sub>58</sub>	J <sub>X</sub> <sub>51</sub>	54	J <sub>X</sub> <sub>55</sub>	52	51	48	J <sub>X</sub> <sub>51</sub>	J <sub>X</sub> <sub>54</sub>	J <sub>X</sub> <sub>70</sub>	J <sub>X</sub> <sub>61</sub>	J <sub>X</sub> <sub>49</sub>	J <sub>X</sub> <sub>51</sub>	J <sub>X</sub> <sub>51</sub>	J <sub>X</sub> <sub>42</sub>
LQ	21	19	19	E <sub>14</sub>	E <sub>15</sub>	G	29	36	40	42	42	40	40	U <sub>38</sub>	G	36	35	32	24	20	22	21	J <sub>X</sub> <sub>25</sub>	J <sub>X</sub> <sub>25</sub>

MAY. 1971

FOES (0.1 MHz)

The Radio Research Laboratories, Japan



# IONOSPHERIC DATA

MAY. 1971

FBES (0.1 MHz)

135° E Mean Time (G. M. T. + 9h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E <sub>14</sub> <sup>B</sup>	E <sub>13</sub> <sup>B</sup>	E <sub>13</sub> <sup>B</sup>	E <sub>13</sub> <sup>B</sup>	E <sub>13</sub> <sup>B</sup>	G	27	40	35	43	41	40	44	39	G	G	C	C	C	C	C	C	C	C	
2	C	C	C	C	C	C	C	C	C	40	41	40	39	40	43	G	G	G	26	17	25	E	E	E	
3	E	E <sub>14</sub> <sup>B</sup>	E <sub>14</sub> <sup>B</sup>	E <sub>12</sub> <sup>B</sup>	E <sub>12</sub> <sup>B</sup>	19	30	35	40	43	40	51	45	40	45	42	34	G	22	20	25	30	51	24	
4	E	38	22	15	E	G	30	33	37	40	41	G	E <sub>40</sub> <sup>B</sup>	E <sub>40</sub> <sup>B</sup>	G	G	34	C	47	31	E	17	E <sub>16</sub> <sup>S</sup>	37	
5	32	20	18	24	E	26	25	31	36	E <sub>35</sub> <sup>R</sup>	E <sub>34</sub> <sup>R</sup>	E <sub>35</sub> <sup>R</sup>	50	52	51	50	35	30	A	A	52	37	E	17	
6	E	C	E	E <sub>13</sub> <sup>B</sup>	E <sub>13</sub> <sup>B</sup>	21	28	33	36	G	G	G	E <sub>40</sub> <sup>B</sup>	E <sub>32</sub> <sup>R</sup>	G	C	C	G	21	E	E	E	24	E <sub>15</sub> <sup>S</sup>	
7	E	E	E <sub>15</sub> <sup>S</sup>	E <sub>13</sub> <sup>B</sup>	E <sub>13</sub> <sup>B</sup>	20	17	33	40	45	38	G	G	G	G	39	G	32	21	18	28	E	18	16	
8	E	E <sub>15</sub> <sup>S</sup>	E	19	E	20	26	31	40	38	G	G	G	42	G	41	E <sub>25</sub> <sup>R</sup>	G	20	E <sub>14</sub> <sup>B</sup>	41	26	29	39	
9	24	17	E	E	E <sub>14</sub> <sup>B</sup>	30	G	G	37	40	40	40	52	40	60	44	51	A	A	59	A	26	15	E	
10	E	35	25	19	17	22	29	35	36	49	62	52	42	41	G	42	41	55	66	50	21	25	25	35	
11	E	16	E	E <sub>13</sub> <sup>B</sup>	E	25	37	38	40	50	52	40	50	52	40	45	60	74	60	61	25	E	E <sub>16</sub> <sup>S</sup>	24	
12	E	E <sub>14</sub> <sup>B</sup>	E	E <sub>14</sub> <sup>B</sup>	E	G	28	G	44	50	49	E <sub>76</sub> <sup>B</sup>	E <sub>60</sub> <sup>B</sup>	E <sub>42</sub> <sup>B</sup>	E <sub>40</sub> <sup>B</sup>	38	35	48	30	17	17	E <sub>15</sub> <sup>S</sup>	16	26	
13	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	25	25	E	G	G	34	43	53	54	59	E <sub>40</sub> <sup>B</sup>	44	G	G	G	G	23	16	E	E <sub>14</sub> <sup>B</sup>	17	51	
14	38	40	18	A	41	G	32	48	47	44	A	44	52	49	G	G	35	32	25	42	26	23	54	25	
15	19	21	28	26	27	G	29	51	44	40	51	45	58	40	40	40	34	39	50	A	E	17	25	40	
16	25	30	E	E <sub>13</sub> <sup>B</sup>	E	E <sub>14</sub> <sup>B</sup>	G	35	40	40	G	G	G	44	G	G	40	31	32	E	E	E	E	25	
17	E	E <sub>15</sub> <sup>S</sup>	E <sub>14</sub> <sup>B</sup>	E	E <sub>14</sub> <sup>B</sup>	G	32	38	51	60	41	41	47	54	75	38	G	28	25	E	E <sub>16</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	25	40	
18	17	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E	35	28	28	34	45	40	40	42	50	A	A	44	43	32	22	17	28	25	22	E	
19	E	E	17	E	E <sub>15</sub> <sup>S</sup>	21	32	37	40	40	41	40	A	A	A	38	G	G	G	16	E	E <sub>15</sub> <sup>S</sup>	E	20	
20	E	16	31	16	16	20	30	33	R <sub>36</sub>	38	40	44	A	40	40	38	50	28	25	16	E <sub>14</sub> <sup>B</sup>	19	16	26	
21	29	17	19	20	E <sub>15</sub> <sup>S</sup>	26	50	35	48	36	48	50	E <sub>35</sub> <sup>R</sup>	G	40	50	33	34	25	16	E	28	30	22	
22	E	16	E <sub>15</sub> <sup>S</sup>	E <sub>13</sub> <sup>B</sup>	E	20	28	A	A	A	40	G	43	42	52	48	51	A	A	52	29	27	41	16	
23	25	E	E	E	28	18	G <sub>25</sub>	G <sub>36</sub>	41	39	42	42	58	A	40	G	37	28	25	43	E	39	29	27	
24	17	25	21	25	16	17	32	36	42	54	48	41	40	39	38	40	41	54	26	25	40	22	22	E	
25	19	E <sub>15</sub> <sup>S</sup>	23	E	E	G	G	34	52	44	40	42	40	32	G	48	76	A	50	16	19	26	27	26	
26	24	27	25	32	E	G <sub>14</sub>	30	44	40	51	40	40	E <sub>39</sub> <sup>B</sup>	G	41	36	31	30	21	20	21	46	21	30	
27	E	E	20	16	E <sub>13</sub> <sup>B</sup>	22	28	36	41	50	48	53	43	51	A	60	55	33	A	20	33	40	22	24	
28	29	20	E	27	23	16	40	49	57	A	52	50	64	G	E <sub>48</sub> <sup>R</sup>	35	61	46	64	22	24	23	37	24	
29	A	19	24	22	19	20	30	59	66	62	40	51	41	43	51	75	45	52	75	55	26	26	21	17	
30	34	39	19	16	25	15	25	35	51	53	45	42	42	43	44	37	40	37	30	40	39	52	54	26	
31	22	26	25	30	33	28	48	33	55	56	48	52	50	43	49	34	G	42	33	A	A	20	19	29	
CNT	30	29	30	30	30	30	30	30	30	31	31	31	31	31	31	30	29	29	30	30	30	30	30	30	30
MED	16	16	18	16	E <sub>14</sub> <sup>B</sup>	20	28	35	41	44	41	42	43	42	40	38	35	32	28	20	24	23	22	24	
UQ	25	25	23	24	19	22	32	38	48	52	48	49	50	46	50	44	45	48	60	50	29	27	29	29	
LQ	E	15	E	E <sub>13</sub> <sup>B</sup>	E	G	25	33	40	40	40	40	40	U <sub>38</sub>	G	34	31	28	23	16	E	15	16	17	

MAY. 1971

FBES (0.1 MHz)



### IONOSPHERIC DATA

MAY. 1971

F-MIN (0.1 MHZ)

135° E Mean Time (G. M. T. + 9h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	13	13	13	13	14	14	14	14	16	26	26	15	26	16	15	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	16	26	26	16	26	17	22	14	14	14	12	14	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>
3	14	14	14	14	12	13	14	15	16	15	26	26	26	26	26	19	16	14	14	12	13	13	14	E <sub>15</sub> <sup>S</sup>
4	E <sub>15</sub> <sup>S</sup>	13	12	12	14	12	14	14	15	25	25	25	40	40	26	16	15	C	14	13	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E <sub>16</sub> <sup>S</sup>	13
5	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	13	13	12	13	14	15	15	23	25	26	26	28	25	23	19	14	13	E <sub>15</sub> <sup>S</sup>	13	13	E <sub>15</sub> <sup>S</sup>	13
6	E <sub>15</sub> <sup>S</sup>	C	E <sub>15</sub> <sup>S</sup>	13	13	14	13	14	15	24	26	29	40	27	23	C	C	15	15	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	14	12	E <sub>15</sub> <sup>S</sup>
7	E <sub>15</sub> <sup>S</sup>	13	E <sub>15</sub> <sup>S</sup>	13	13	14	14	15	15	22	26	25	25	26	15	19	15	15	15	12	13	13	E <sub>15</sub> <sup>S</sup>	12
8	14	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	13	13	15	13	15	15	25	24	25	28	26	26	15	15	14	14	14	13	E <sub>15</sub> <sup>S</sup>	14	E <sub>15</sub> <sup>S</sup>
9	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	14	14	14	14	15	15	16	25	25	25	27	19	24	16	14	14	13	13	14	13	E <sub>15</sub> <sup>S</sup>
10	E <sub>15</sub> <sup>S</sup>	13	13	13	13	14	14	15	26	25	20	25	32	31	26	15	15	15	14	14	13	13	13	E <sub>15</sub> <sup>S</sup>
11	E <sub>15</sub> <sup>S</sup>	13	E <sub>15</sub> <sup>S</sup>	13	E <sub>15</sub> <sup>S</sup>	15	14	15	15	25	28	25	28	29	25	25	15	15	15	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	14	E <sub>16</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>
12	E <sub>15</sub> <sup>S</sup>	14	14	14	13	14	15	20	16	26	25	76	60	42	40	25	25	15	15	13	13	E <sub>15</sub> <sup>S</sup>	13	14
13	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	13	13	12	15	15	14	25	19	37	26	40	26	29	26	16	15	14	13	E <sub>15</sub> <sup>S</sup>	14	12	14
14	12	14	13	14	14	14	14	16	16	25	25	28	26	27	26	28	16	19	13	12	14	13	13	14
15	13	13	13	13	13	13	15	15	16	26	28	28	25	25	25	25	15	15	15	14	13	13	14	13
16	12	13	13	13	13	14	14	15	15	25	25	26	26	26	25	25	15	15	13	13	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>
17	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	14	E <sub>15</sub> <sup>S</sup>	14	14	14	15	14	25	26	25	25	25	25	22	15	15	13	E <sub>15</sub> <sup>S</sup>	E <sub>16</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E <sub>14</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>
18	13	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	13	14	15	15	14	25	19	23	25	26	25	19	15	15	15	13	12	13	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>
19	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	13	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	15	15	15	15	19	23	24	25	25	20	15	15	15	14	14	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	130
20	E <sub>15</sub> <sup>S</sup>	13	E <sub>15</sub> <sup>S</sup>	13	13	14	13	15	15	15	26	38	25	28	28	26	26	15	15	13	14	E <sub>15</sub> <sup>S</sup>	13	14
21	13	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	13	E <sub>15</sub> <sup>S</sup>	15	15	15	25	25	33	26	28	29	26	18	15	15	14	E <sub>15</sub> <sup>S</sup>	13	13	E <sub>15</sub> <sup>S</sup>	13
22	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	13	E <sub>15</sub> <sup>S</sup>	15	15	15	19	26	27	20	25	26	26	16	16	15	13	14	13	13	13	13
23	12	14	13	13	12	13	13	14	15	16	25	25	25	25	25	15	15	14	12	E <sub>15</sub> <sup>S</sup>	13	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	13
24	13	13	12	13	12	14	14	14	15	15	15	25	25	25	25	25	15	14	13	13	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>
25	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	13	13	13	14	14	15	15	25	19	25	26	25	15	15	15	15	14	12	13	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	13
26	E <sub>15</sub> <sup>S</sup>	13	13	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	13	15	15	18	15	15	25	39	19	15	15	15	15	13	12	13	13	E <sub>15</sub> <sup>S</sup>	13
27	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	12	12	13	13	15	15	15	15	15	25	25	25	25	25	15	15	15	14	13	13	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>
28	14	13	13	14	E <sub>15</sub> <sup>S</sup>	12	15	13	14	14	25	15	26	25	25	25	15	15	14	13	12	E <sub>15</sub> <sup>S</sup>	13	12
29	E <sub>15</sub> <sup>S</sup>	13	13	12	13	13	13	15	14	19	15	15	25	25	21	15	15	14	13	14	E <sub>15</sub> <sup>S</sup>	12	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>
30	E <sub>15</sub> <sup>S</sup>	13	13	14	13	13	14	14	15	15	25	26	26	26	21	23	14	14	13	12	13	12	12	14
31	12	13	13	12	12	14	12	14	14	15	14	25	25	25	25	19	15	15	14	13	12	13	13	13
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	30	30	30	30	30	30	31	31	31	31	31	31	30	29	29	30	30	30	30	30	30
MED	E <sub>15</sub> <sup>S</sup>	14	13	13	13	14	14	15	15	22	25	25	26	26	25	20	15	15	14	13	13	14	E <sub>15</sub> <sup>S</sup>	13
UQ	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	14	14	14	15	15	16	25	26	26	28	27	26	25	16	15	15	14	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>	E <sub>15</sub> <sup>S</sup>
LQ	13	13	13	13	13	13	14	14	15	16	22	25	25	25	21	15	15	14	13	13	13	13	13	13

The Radio Research Laboratories, Japan

MAY. 1971

F-MIN (0.1 MHZ)

# IONOSPHERIC DATA

MAY, 1971

M(3000)F2 (0,01)

135° E Mean Time (G. M. T. + 9h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N. Long. 139° 29.3' E Sweep 1 MHz to 20 MHz in 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	315	335	290	325	340	310	310	315	320	300	295	300	295	320	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	295	295	280	280	290	300	305	310	310	320	330	265	275	265	270
3	275	280	290	285	295	325	315	355	275	280	280	305	305	310	320	315	320	315	310	295	295	280	290	295
4	265 <sup>F</sup>	F	285	280	295	330	325	315	320	305	285	290	270	280	285	305 <sup>R</sup>	320	C	290	305 <sup>R</sup>	290	275 <sup>R</sup>	285	285 <sup>R</sup>
5	280 <sup>R</sup>	285	290	305	330 <sup>R</sup>	330	350	330	325	280	300	300	285	295	305	300	305	300	300	A	275	275 <sup>R</sup>	275 <sup>R</sup>	290
6	285 <sup>R</sup>	285 <sup>R</sup>	305	280	285	325	310 <sup>R</sup>	335	300	310	280	280	290	290	300	305 <sup>R</sup>	310 <sup>R</sup>	315	295	295	300	295 <sup>R</sup>	285 <sup>R</sup>	285 <sup>R</sup>
7	275	275	275	290	310	335	355	340	305	310	275	295	290	285	300	285	305	330	320	295	290	275 <sup>R</sup>	265 <sup>R</sup>	275 <sup>R</sup>
8	285 <sup>R</sup>	265	280	290	300	305	295	300	315	280	290	295	280	310	310	320	330	325	325	295	290	275	280	270
9	290	280	275	285	290	295	295	330	335	310	285 <sup>H</sup>	280	290	300	300	315 <sup>R</sup>	320	320	315	290	275 <sup>R</sup>	275	275	280 <sup>R</sup>
10	275	285	300	300	280	315	320	330	315	305	280	285	290	295	310 <sup>R</sup>	310	310	315	320	300	285	275 <sup>R</sup>	280 <sup>R</sup>	275 <sup>R</sup>
11	270	285	280	290	295	320	310 <sup>R</sup>	335	330	305	315	280	300	295 <sup>R</sup>	300	305	305	30	310	310	285	270 <sup>R</sup>	280 <sup>R</sup>	285 <sup>R</sup>
12	R	280 <sup>R</sup>	295 <sup>R</sup>	310	280	305 <sup>R</sup>	325	325	320	290	285	305	285	295	280	305	310	315	320	300	285	285 <sup>R</sup>	280	285 <sup>R</sup>
13	290	285 <sup>R</sup>	285 <sup>R</sup>	280 <sup>R</sup>	285	300 <sup>R</sup>	310	310	345	325	280	285	225	280	260	240	250	290 <sup>R</sup>	255	295	270	280 <sup>R</sup>	275 <sup>R</sup>	285
14	300 <sup>F</sup>	F	315	A	275 <sup>F</sup>	305	335	305	300	300	300	300	270	280	270	295	310	325	330	315	280	270	280	265
15	285	305	320	265	265 <sup>F</sup>	285	330	355	280	290	285	290	295	300	290	295	305	305	310	A	270	260 <sup>R</sup>	260 <sup>R</sup>	F
16	F	290 <sup>R</sup>	295	300 <sup>R</sup>	290	320	335	320 <sup>R</sup>	310 <sup>R</sup>	305	290	285 <sup>R</sup>	280	290	300	315	295	305	305	280	R	265	280	285 <sup>R</sup>
17	295 <sup>R</sup>	300	310 <sup>R</sup>	310	280	295	300	330	300	290	275	285	280 <sup>R</sup>	270	295	290 <sup>R</sup>	295	285	285	295 <sup>R</sup>	295	270 <sup>R</sup>	275 <sup>R</sup>	280 <sup>R</sup>
18	270	295	265	255	285	285	235	240	245	G	G	250	275	A	A	275	260	300	280	280	270	260	255	270 <sup>R</sup>
19	255	285 <sup>R</sup>	295	295 <sup>R</sup>	260	265	240	260	265	255	295	250	A	270	A	295	295	310	310	285	265	265	265	270
20	295	280	300 <sup>R</sup>	325	F	315	320 <sup>R</sup>	325	R	R	255	255	A	290 <sup>R</sup>	300	305 <sup>R</sup>	310	300	310	295	280	290 <sup>R</sup>	275 <sup>R</sup>	R
21	R	285	265 <sup>R</sup>	300	285	325	310	295	310	310	290	280 <sup>R</sup>	290	285	305	300	295	310	305	315	295	290	280	280
22	290	285	300	310	290	305	325 <sup>R</sup>	A	A	A	280	295	290	290	300	310	285	A	A	300	285	285	295	295
23	295	305	315	325	300	330	350	330	335	320	285	310	315	310	300	330	300	295	295	295	335	320	280 <sup>F</sup>	F
24	290	285	F	285 <sup>F</sup>	305	345	365	335	320	300	290	295	255	260	290	320	290	290	300	305	320	R	280 <sup>R</sup>	300 <sup>R</sup>
25	285	285	295	280	295	325 <sup>R</sup>	350 <sup>R</sup>	340	320	335	275	290	295	315	300	290	A	A	295	305	315	300 <sup>R</sup>	295	300 <sup>R</sup>
26	290	325	300	295	310	335	355	315 <sup>R</sup>	305	310	295	275	285	295	285	280	285	295	315	325	320 <sup>R</sup>	295	285 <sup>R</sup>	285
27	285	285 <sup>R</sup>	300	300	310	315	305	325	335	335	315	285	285	290	300 <sup>R</sup>	310	320	315	290 <sup>R</sup>	R	305 <sup>R</sup>	310	F	F
28	F	260	305 <sup>F</sup>	F	320 <sup>R</sup>	350	320	300	300	310 <sup>R</sup>	330	280	285	275	300	295	300	315	290	305	290 <sup>R</sup>	315 <sup>R</sup>	F	A
29	A	A	F	F	F	320	305	315	330 <sup>R</sup>	320 <sup>R</sup>	315	295	270	280	280	300	315	310	310	310	285	270	295	305
30	300 <sup>S</sup>	S	F	300 <sup>F</sup>	310	320	320	315	345	345	300	295	270 <sup>R</sup>	290	290	290	300	300	295	305	290	285	285 <sup>R</sup>	290
31	285	285	300	305	320	280	275	310	285 <sup>R</sup>	285	265	A	275	270	285	280	295	320	285	285 <sup>R</sup>	280 <sup>R</sup>	280	285	285
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	26	27	27	28	30	30	29	28	29	31	30	29	30	29	31	29	27	29	27	29	29	28	25
MED	285	285	295	295	292	320	320	325	312	305	285	288	285	290	300	305	305	310	305	300	285	275	280	285
UQ	290	285	302	305	308	325	335	330	328	310	298	295	290	295	300	310	310	315	315	305	295	290	285	290 <sup>R</sup>
LQ	275	280	285	285	285	305	305	310	300	290	280	280	275	280	290	292	295	300	295	295	280	270	275	275

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M(3000)F2 (0,01)

# IONOSPHERIC DATA

MAY. 1971

M(3000)F1 (0.01)

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

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	350	370	350	390	390	380	H	L	L	C	C	C				
2						C	C	C	C	L	350	390	390	330	A	L	L	L						
3									370	340	390	A	340	380	L	L	L	L						
4								L	L	360	365	395	355	R	400	L	L	C						
5									445	L	L	380	A	A	A	A	L							
6							L	L	L	L	L	355	375	360	355	C	C	L						
7									L	L	360	L	380	370	L	L	L	L						
8							L	340	360	370	340	370	370	390	340	350	360	L						
9							L	L	L	380	L	360	A	320	A	A	A	A	A					
10								L	U	330	A	A	A	380	380	380	L	L						
11								L	L	A	A	380	A	A	L	L	A							
12								L	A	A	A	B	B	L	350	L	L							
13							L	L	A	A	A	A	380	350	380	340	360	L						
14								A	A	380		L	L	340	350	340	360	L						
15								A	370	360	A	L	A	390	L	L	L	A						
16									A	390	390	370	L	L	370	360		L						
17							L	A	A	370	370	370		A	A	L	390	R	L	L				
18						300	350	A	A	370	350	A	A	A	360	A	A							
19						330	330	360	360	370	360	A	A	A	380	340	340	L	L					
20							L	360	330	390	380	350	A	390	360	L	A	L	L					
21							360	A	350	A	A	380	300	350	A	350	L	L						
22							L	A	A	A	390	390	340	340	A	A	A	A	A					A
23							L	L		400	390	390	A	A	360	365	340	340	L					
24						L		L	370	A	A	390	L	340	340	340	A	A	L					
25							L	L	A	A	400	360	360	390	360	A	A	A	A					
26							L	350	350	A	370	390	390	390	L	350	330	L	L					
27								L	L	A	A	A	330	A	A	A	A	L	A					
28								A	A	A	A	A	A	360	R	350	A	A	A					
29							L	A	A	A	360	A	370	360	A	A	A	A	A					
30							390	380	A	A	350	380	350	350	A	360	A	L						
31							A	360	A	A	A	A	A	L	A	360	360	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	8	10	12	17	19	17	21	13	12	9	1						
MED							330	355	360	370	370	380	370	360	360	355	360	340						
UQ							360	360	370	385	390	390	380	380	370	360	360							
LQ							315	345	350	360	360	360	355	340	350	345	340							

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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. + 9h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							300	300	290	260	325	305	320	310	280		C	C	C					
2						C	C	C	C	300	320	340	325	305	280	290	275	260						
3								450	380	790	350	330	305	290	280	280	280							
4							275	280	310	360	305	360	360	320	280	255		C						
5								240	250	310	300	320	310	285	290	270								
6						250	250	250	270	305	300	315	310	290	290	285	270							
7								290	310	350	300	310	310	290	285	290	255							
8						300	340	300	380	375	350	330	310	305	290	275	260							
9						260	250	250	290	300	365	315	315	305	280	270		A	A					
10							250	320	290	340	300	305	305	290	305	280								
11							260	250	290	265	340	300	305	300	300									
12							250	250	290	300	325	300	305	340	295	285								
13						250	265	250	250	355	330	310	320	315	285	275	240							
14							260	270	285	310	310	325	350	320	290	275	260							
15							240	420	345	355	310	330	295	305	300	270	260							
16								290	285	290	325	300	300	305	280		250							
17							250	280	320	340	320	320	345	305	295	300	295	290						
18						505	530	550		G	G	520	520	A	A	450	440	310						
19						490	450	460	490	385	510		A	460	A	350	330	305	280					
20						295	300		R	R	490	490		A	350	335	290	300	280	260				
21							350	300	315	355	340	350	345	300	295	305	290	260						
22							270	A	A	A	380	330	330	320	310	300	270	A	A					
23							235	230		305	325	295	290	315	300	280	330	320	280					
24						230		280	300	310	340	325	340	400	315	285	305	300	270					
25							240	250	305	290	355	360	330	290	290	310		A	A					
26							245	R	310	305	350	360	335	300	350	335	305	290	260					
27								270	255	280	330	370	375	345	310	290	270	280	300					
28							310	A	305	A	290	365	360	345	315	300	300	275	A					
29							250	250	290	300	295	345	410	375	350	320	280	280	320					
30							220	290	260	260	345	320	390	325	320	320	290	280						
31							380	320	375	395	420	430	405	440	400	305	340	290	270					
Hour Day	00	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	14	24	27	28	31	31	29	30	29	31	27	22	11					
MED						230	255	268	290	300	340	330	330	318	305	290	285	280	275					
UQ						300	305	308	318	358	358	350	345	320	302	302	290	288						
LQ						245	250	258	288	308	315	310	305	300	285	275	260	265						

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

# IONOSPHERIC DATA

MAY. 1971

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

135° E Mean Time (G. M. T. + 9h)

Station **KOKUBUNJI TOKYO** Lat. **35° 42.4' N**, Long. **139° 29.3' E** Sweep 1 MHz to 20 MHz in 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	275	240	220	260	240	220	245	225	250	245	220	240	195	205	200	C	C	C	C	C	C	C	C	
2		C	C	C	C	C	C	C	C	225	260	200	210	225	220	205	220	230	250	230	240	290	310	300	
3	300	290	260	250	280	250	250	240	260	220	205	240	220	230	250	240	220	225	250	250	280	300	285	290	
4	305	310	280	245	250	240	220	230	220	240	220	200	200	205	205	250	240	245	285	240	240	260	285	300	
5	320	290	280	260	240	210	210	225	195	200	240	220	A	A	285	270	240	250	260	260	300	290	300	275	
6	275	250	250	250	260	240	230	240	220	210	210	210	205	200	210	210	210	250	260	255	250	240	280	260	
7	265	300	290	260	215	240	230	230	250	290	210	200	205	210	250	250	240	250	250	250	250	290	300	270	
8	240	285	260	260	250	260	240	240	260	205	210	225	240	240	255	250	240	225	245	255	300	340	300	A	
9	275	270	290	260	270	260	235	220	220	200	195	190	250	240	220	A	A	A	A	A	300	300	290	290	
10	290	300	260	240	245	255	240	245	210	230	240	A	240	210	210	240	250	260	290	305	290	300	305	305	
11	295	290	280	240	240	240	250	250	240	230	220	200	230	260	240	280	290	280	260	275	245	300	290	290	
12	290	260	250	235	265	250	240	235	A	A	A	B	B	215	220	240	220	260	255	245	250	240	290	290	
13	290	290	295	285	280	240	240	240	240	240	245	240	205	250	200	255	240	235	240	230	270	285	290	310	
14	290	310	245	270	310	245	240	A	A	250	250	230	210	205	220	230	240	230	240	250	290	310	350	350	
15	305	260	230	300	350	255	250	245	245	210	A	280	A	220	220	250	200	245	260	A	255	310	315	350	
16	300	265	260	250	250	240	240	250	250	205	210	200	200	250	210	260	260	240	250	245	290	300	295	295	
17	260	250	250	240	265	250	240	240	A	A	220	205	260	A	A	250	210	220	260	245	250	260	350	325	
18	300	290	250	340	305	290	260	260	A	A	240	250	A	A	A	A	A	A	270	290	300	360	340	340	
19	330	260	260	290	250	300	270	300	290	250	220	240	A	A	A	240	240	245	250	260	295	300	310	305	
20	275	290	290	240	290	250	250	240	250	220	210	250	A	205	250	260	220	230	250	260	270	275	295	300	
21	300	290	240	235	290	260	240	250	290	220	250	220	200	260	225	250	205	250	250	250	250	250	260	300	300
22	300	290	270	250	265	250	240	A	A	A	185	185	260	255	250	260	A	A	A	A	290	300	300	260	
23	280	250	230	230	290	230	230	225	260	200	230	205	205	215	230	210	240	225	250	260	220	250	300	300	
24	280	300	290	290	245	220	230	220	240	A	A	205	230	220	220	270	A	A	250	250	250	255	250	255	
25	290	280	285	300	260	240	220	220	A	220	200	260	220	200	230	A	A	A	A	250	240	290	300	290	
26	290	240	260	310	250	240	230	240	250	260	210	200	200	205	290	230	240	245	250	215	250	300	300	300	
27	260	300	260	280	240	240	240	250	250	235	255	215	290	A	A	A	A	255	250	250	250	290	310	265	
28	300	295	245	295	260	210	250	A	A	260	260	240	200	230	210	230	A	A	A	245	260	250	300	240	
29	A	250	290	280	250	245	240	250	280	A	210	240	205	240	A	A	A	A	A	250	250	270	275	255	
30	290	290	260	245	260	220	200	225	230	225	230	210	210	240	235	230	230	250	240	250	290	310	320	280	
31	270	290	280	260	250	280	270	250	A	A	A	A	230	240	235	220	240	A	A	A	A	250	290	305	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	30	30	30	30	30	30	27	22	24	27	28	25	26	26	26	22	22	24	26	29	30	30	29	
MED	290	290	260	260	260	242	240	240	248	225	220	215	210	222	222	245	240	245	250	250	255	290	300	295	
UQ	300	290	280	285	280	255	250	250	260	245	242	240	240	240	250	255	240	250	260	260	290	300	310	305	
LQ	275	260	250	240	250	240	230	230	225	210	210	200	205	205	210	230	220	230	250	245	250	260	290	275	

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



# IONOSPHERIC DATA

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

135° E Mean Time (G. M. T. + 9h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N. Long. 139° 29.3' E Sweep 1 MHz to 20 MHz in 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	B	105	B	B	B	G	145	130	125	125	125	120	125	150	G	G	C	C	C	C	C	C	C	C	
2	C	C	C	C	C	C	C	C	C	120	115	120	115	130	120	G	G	G	115	110	105	105	100	100	
3	100	100	B	B	B	150	145	140	140	125	125	120	120	130	125	120	120	G	125	105	105	105	105	100	
4	100	100	100	100	100	G	155	150	135	140	110	G	B	B	G	G	140	C	100	100	100	100	S	100	
5	100	100	100	100	100	100	105	105	105	100	100	100	100	100	105	105	110	105	105	100	100	100	100	100	
6	100	C	100	B	B	150	150	140	140	G	G	G	B	100	G	C	C	G	150	100	100	100	100	S	
7	120	115	S	B	B	140	G	140	130	120	120	G	G	G	G	150	G	120	120	105	100	110	100	100	
8	100	S	100	110	110	120	140	115	110	125	G	G	G	160	G	145	105	G	140	B	115	100	100	100	
9	100	100	100	110	B	125	130	105	115	110	115	110	105	105	140	130	120	115	110	115	110	105	105	100	
10	100	105	105	105	105	145	150	140	155	120	120	130	100	100	G	140	120	110	110	105	105	100	105	100	
11	100	100	100	B	100	140	130	120	140	115	105	110	105	110	110	100	140	130	115	110	105	105	S	100	
12	100	B	110	B	100	G	150	G	130	130	130	B	B	B	B	E	G	140	115	110	110	105	S	105	100
13	S	S	100	100	100	G	G	140	120	110	115	110	B	120	G	G	G	G	130	110	110	B	105	105	
14	105	105	100	100	100	G	140	125	120	110	110	110	105	105	G	G	130	115	120	110	105	100	105	105	
15	105	110	105	105	105	G	130	125	110	110	105	105	105	105	105	105	105	110	110	100	100	100	100	100	
16	105	100	100	B	100	B	G	140	110	120	G	G	G	140	G	G	140	130	110	110	100	100	100	100	
17	100	S	B	100	B	G	150	140	110	110	110	105	130	100	100	100	G	150	120	110	S	S	100	100	
18	100	S	S	100	130	130	150	140	120	135	120	140	140	120	120	110	110	110	140	100	100	105	100	100	
19	100	100	100	100	S	150	140	140	140	140	140	120	110	110	110	110	G	G	G	120	105	S	110	110	
20	110	105	100	100	100	165	130	140	140	130	135	120	110	120	120	140	100	110	105	100	B	105	105	105	
21	100	100	100	100	S	140	120	110	110	110	105	105	105	G	140	110	110	110	105	100	100	100	100	100	
22	100	100	S	B	100	115	110	110	105	105	110	G	150	155	130	130	125	115	110	105	115	115	105	105	
23	105	105	100	100	100	100	100	130	125	125	120	125	120	110	125	G	130	110	105	105	105	110	105	105	
24	105	110	100	100	100	100	130	130	120	110	110	110	110	105	110	110	130	110	110	105	105	105	105	100	
25	100	S	100	100	100	G	G	110	110	110	110	120	130	120	G	130	120	110	110	105	100	100	100	100	
26	100	100	100	100	100	100	140	120	120	110	110	110	B	G	110	120	110	110	105	100	100	100	100	100	
27	100	100	100	100	B	150	140	115	110	110	110	105	105	110	105	105	105	110	105	105	100	100	100	110	
28	105	100	100	100	100	105	130	120	110	110	110	110	105	G	110	110	100	105	105	100	100	100	100	100	
29	100	100	100	100	100	150	140	110	110	110	105	100	105	110	110	105	110	105	105	100	100	100	100	100	
30	110	105	105	100	100	105	105	145	125	120	125	125	125	160	150	145	125	110	105	105	100	100	105	110	
31	110	105	100	115	130	130	120	125	115	110	110	105	105	105	110	110	G	120	110	110	110	105	105	105	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	23	24	22	21	21	26	29	30	30	28	24	23	25	20	23	23	23	29	29	28	26	28	29	
MED	100	100	100	100	100	130	140	130	120	112	110	110	110	110	110	110	120	110	110	105	102	100	100	100	
UQ	105	105	100	100	100	150	145	140	130	125	120	120	122	130	125	132	130	115	120	110	105	105	105	105	
LQ	100	100	100	100	100	105	130	115	110	110	110	105	105	105	110	108	110	110	105	100	100	100	100	100	

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



# IONOSPHERIC DATA

MAY. 1971

TYPES OF ES

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

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

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

MAY. 1971

TYPES OF ES

# IONOSPHERIC DATA

MAY, 1971

HPF2 (KM)

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

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	375	350	300	270	330	290	255	310	305	305	280	330	315	320	330	300	C	C	C	C	C	C	C	C	
2	C	C	C	C	C	C	C	C	C	C	320	340	360	360	350	315	315	305	300	295	285	360	385	400	385
3	390	380	340	320	345	280	300	250	G	G	G	340	330	305	300	300	300	300	300	340	350	360	350	345	
4	400 <sup>F</sup>	F	350	340	330	280	280	300	300	320	400	350	400	390	380	340	300	C	360	310	355	390	380	380	
5	400 <sup>B</sup>	390	370	310	290	290	280	280	300	380	350	340	380	355	340	350	340	340	300	A	400	400	400	370	
6	380 <sup>R</sup>	380 <sup>C</sup>	340	390	380	300	300	270	350	300	390	300	370	350	350	345	320	300	350	350	350	350	350	390	
7	390	400	400	355	300	270	260	280	320	380	400	360	390	380	340	340	340	270	300	350	350	400	400	390	
8	380 <sup>R</sup>	400	380	370	350	340	350	350	320	G	370	350	350	315	310	300	285	290	280	350	350	380	370	380	
9	290	280	275	285	290	295	295	330	335	310	285	H	280	350	340	325	305	280	300	300	305	370	390	380	
10	390	350	320	305	350	300	280	260	325	340	390	380	370	360	330	330	330	300	300	350	380	400	390	400	
11	400	380	390	370	350	300	330	270	290	340	310	390	350	360	350	340	340	340	330	330	350	400	380	355	
12	R	390 <sup>R</sup>	350 <sup>R</sup>	330	390	340	300	300	300	360	380	340	380	350	390	340	330	320	300	340	350	380	390	380	
13	370	380 <sup>R</sup>	380 <sup>R</sup>	390 <sup>R</sup>	380	350	300	305	280	270	375	355	350	370	350	315	300	320	300	315	385	370	380	360	
14	340 <sup>F</sup>	F	300	A	370 <sup>F</sup>	300	270	290	300	320	340	330	380	380	360	340	300	300	290	290	375	400	360	400	
15	380	310	285	390	400 <sup>F</sup>	375	290	250	G	370	380	370	360	350	350	350	340	340	330	A	400	400	450	F	
16	F	360 <sup>R</sup>	360	350 <sup>R</sup>	355	300	290	300	330	340	360	380	390	370	350	320	360	340	320	390	R	400	390	380	
17	400 <sup>R</sup>	350	350 <sup>R</sup>	320	390	350	300	300	350	380	390	390	390	400	360	370	350	380	390	380	350	395	365	390	
18	400	350	405	440	380	380	520	G	G	A	G	G	G	A	A	G	G	350	380	390	390	440	400	350	
19	410	360 <sup>R</sup>	360	360	400	420	G	G	G	G	G	G	A	G	A	360	360	330	330	350	400	400	400	400	
20	360	390	350 <sup>R</sup>	290	F	320	300	300	R	R	G	G	A	355	350	305	330	350	305	360	390	370	400	R	
21	R	380	300 <sup>R</sup>	350	380	300	300	G	330	330	370	390	370	395	340	350	350	310	350	305	350	350	390	390	
22	370	380	350	330	350	350	290	A	A	285	380	350	350	350	340	310	290	A	A	A	360	370	355	330	
23	340	300	300	290	315	280	250	260	270	300	350	310	300	325	320	290	350	345	340	330	280	280	360	F	
24	360	360	F	355	310	250	250	290	300	350	350	370	410	440	380	300	390	355	340	350	300	R	345	350	
25	380	360	360	390	340	290	245	280	305	290	380	370	355	320	340	355	350	355	355	315	315	350	360	350	
26	355	300	340	350	330	275	250	310	340	330	360	400	380	350	380	380	380	350	320	290	300	350	380	380	
27	355	380 <sup>R</sup>	350	350	330	300	340	300	280	300	320	380	390	365	350	330	300	310	360	R	330	310	F	F	
28	F	390	340 <sup>F</sup>	F	300	245	300	350	345	300	290	390	380	390	350	350	335	320	370	310	355	315	F	A	
29	A	A	F	F	F	310	310	290	290	300	300	350	410	385	370	340	305	300	A	300	340	340	330	310	
30	315 <sup>S</sup>	S	F	310 <sup>F</sup>	300	285	295	300	270	260	350	325	400	350	340	350	320	315	320	310	340	360	370	360	
31	355	350	320	310	300	360	375	320	380	A	G	A	G	G	A	390	350	300	355	350	390	385	390		
	00	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	27	27	28	30	29	26	24	25	26	27	27	28	28	30	29	28	28	26	29	29	28	25	
MED	380	370	350	350	348	300	295	300	305	320	360	355	370	355	350	340	330	320	325	335	350	380	380	380	
UQ	390	380	360	365	380	340	300	305	332	340	380	380	390	380	355	350	350	342	352	350	380	400	400	390	
LQ	355	350	320	310	312	285	280	280	295	300	340	340	350	350	335	310	300	300	300	310	350	350	362	355	

The Radio Research Laboratories, Japan

MAY, 1971

HPF2 (KM)

### IONOSPHERIC DATA

MAY, 1971

YPF2 (KM)

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

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	85	95	60	50	75	65	70	90	70	90	80	75	85	85	60	C	C	C	C	C	C	C	C	C	
2	C	C	C	C	C	C	C	C	C	100	85	110	100	90	85	90	85	55	J <sub>80</sub>	60	155	85	90	65	
3	65	70	80	100	55	65	50	55	G	G	G	60	70	55	J <sub>55</sub>	105	55	70	95	110	60	80	70	65	
4	100	F	F	90	105	70	70	75	60	55	100	90	90	90	100	J <sub>90</sub>	100	C	100	90	105	90	100	110	
5	90	100	110	100	100	100	100	100	90	100	110	100	100	105	100	90	100	J <sub>110</sub>	I <sub>100</sub>	A	90	I <sub>90</sub>	90	90	
6	100	100	110	90	110	100	Y <sub>100</sub>	110	100	100	100	90	J <sub>90</sub>	110	100	I <sub>95</sub>	I <sub>95</sub>	90	90	110	110	J <sub>90</sub>	90	90	
7	100	100	90	105	100	110	100	100	100	110	90	110	90	100	100	100	100	110	100	100	100	I <sub>90</sub>	J <sub>90</sub>	I <sub>100</sub>	
8	100	90	110	110	110	100	110	110	90	G	80	60	125	85	70	50	60	80	90	95	90	90	80	70	
9	65	100	100	100	95	100	100	80	100	85	90	H	100	95	85	85	J <sub>80</sub>	80	I <sub>70</sub>	I <sub>90</sub>	95	I <sub>90</sub>	85	90	U <sub>80</sub>
10	70	90	90	110	120	100	90	100	45	110	100	110	110	Y <sub>100</sub>	Y <sub>110</sub>	120	110	100	120	120	110	J <sub>90</sub>	100	I <sub>90</sub>	
11	90	110	100	120	110	110	100	110	100	110	90	90	110	Y <sub>100</sub>	110	120	110	100	110	110	110	90	Y <sub>100</sub>	105	
12	R	J <sub>90</sub>	I <sub>100</sub>	110	100	110	90	90	100	100	100	120	100	110	90	120	110	110	90	100	110	Y <sub>100</sub>	90	I <sub>100</sub>	
13	110	110	110	100	100	90	95	100	125	95	115	100	105	95	95	70	J <sub>95</sub>	105	100	115	Y <sub>100</sub>	J <sub>80</sub>	95	95	
14	J <sub>60</sub>	F	70	A	I <sub>100</sub>	105	85	70	125	125	I <sub>105</sub>	90	95	110	110	80	80	60	70	70	85	100	100	75	
15	80	95	75	120	110	F	85	55	50	G	110	110	110	120	110	110	110	110	110	A	90	J <sub>90</sub>	90	F	
16	F	Y <sub>100</sub>	120	110	105	90	100	90	110	110	120	100	110	100	90	90	110	120	110	120	100	R	90	100	110
17	J <sub>90</sub>	100	J <sub>90</sub>	100	100	110	90	90	90	100	100	100	Y <sub>100</sub>	90	120	J <sub>110</sub>	100	110	100	Y <sub>110</sub>	100	95	I <sub>100</sub>	I <sub>95</sub>	
18	90	100	105	100	110	100	140	G	G	A	G	G	G	A	A	G	G	110	100	100	100	100	100	J <sub>110</sub>	
19	110	J <sub>100</sub>	110	120	100	90	G	G	G	G	G	G	A	G	A	110	110	110	110	100	90	90	100	90	
20	110	100	J <sub>90</sub>	90	F	100	J <sub>120</sub>	90	R	R	G	G	A	R	110	J <sub>115</sub>	110	100	95	110	100	110	I <sub>90</sub>	R	
21	R	110	J <sub>90</sub>	110	100	90	90	G	110	110	120	Y <sub>100</sub>	120	95	110	100	90	100	100	95	110	110	100	100	
22	110	100	100	110	110	110	110	A	A	A	90	105	70	120	80	85	65	A	A	A	100	90	85	80	
23	80	95	95	80	95	75	50	65	80	60	120	85	100	I <sub>105</sub>	100	80	60	100	105	110	50	80	95	F	
24	90	100	F	90	90	55	30	55	75	110	110	90	110	90	100	110	100	95	120	110	90	R	125	I <sub>100</sub>	
25	100	100	100	90	110	J <sub>90</sub>	105	90	95	100	100	110	105	80	100	105	I <sub>110</sub>	I <sub>105</sub>	105	95	J <sub>85</sub>	Y <sub>110</sub>	100	110	
26	105	100	110	110	100	105	100	I <sub>100</sub>	100	110	100	90	110	100	100	100	100	110	100	120	J <sub>90</sub>	110	110	110	
27	105	100	90	100	110	100	90	90	100	80	110	110	90	95	I <sub>105</sub>	110	100	110	I <sub>100</sub>	R	J <sub>100</sub>	100	F	F	
28	F	100	120	F	J <sub>90</sub>	105	120	90	115	I <sub>110</sub>	100	100	100	100	110	110	95	100	120	100	J <sub>95</sub>	105	F	A	
29	A	A	F	F	F	100	100	90	J <sub>90</sub>	I <sub>100</sub>	100	95	85	110	100	80	95	75	A	85	100	80	90	85	
30	J <sub>90</sub>	S	F	F	100	70	75	55	50	65	95	100	J <sub>85</sub>	100	105	100	95	100	100	90	80	90	J <sub>90</sub>	85	
31	105	95	95	90	60	90	120	80	I <sub>80</sub>	A	G	A	G	G	A	100	110	100	95	I <sub>90</sub>	I <sub>100</sub>	100	105	100	
CNT	25	26	27	27	28	30	29	26	24	24	26	27	27	28	28	30	29	28	28	26	29	29	28	25	
MED	90	100	100	100	100	100	100	90	98	100	100	100	100	100	100	100	100	100	100	100	100	90	92	95	
UQ	105	100	110	110	110	105	100	100	100	110	105	110	108	105	110	110	110	110	108	110	105	100	100	100	
LQ	85	95	90	92	95	90	85	70	80	100	90	90	90	90	90	85	90	92	95	95	90	90	90	85	

The Radio Research Laboratories, Japan

MAY, 1971

YPF2 (KM)

IONOSPHERIC DATA

MAY. 1971

FOF2 (0.1 MHz)

135° E Mean Time (G. M. T. + 9h)

Station		YAMAGAWA		Lat. 31 12.1 N.		Long. 130 37.1 E		Sweep 1 MHz to 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	J	77	J	78	S	80	U	67	48	48	63	S	85	S	88	96	82	81	86	95	102	111	111	101	102	Y	00	J	74	69	68	70				
2		71	70	71	S	64	62	58	60	63	78	84	82	91	102	114	S	120	J	124	126	130	U	103	81	J	62	S	58	56	58					
3	J	63	58	55	U	54	44	U	39	47	49	55	59	66	72	84	89	92	89	95	94	86	90	77	J	78	J	69	S	69						
4	J	63	J	60	56	I	55	J	53	49	61	64	68	68	72	76	85	94	111	123	116	88	91	93	S	88	85	83	82							
5		80	79	79	S	78	70	49	59	66	66	72	84	97	106	119	133	135	138	128	U	112	114	U	113	I	112	I	98	I	93					
6		93	S	82	79	72	62	60	75	85	88	73	85	I	100	120	126	128	121	115	118	122	S	116	102	S	86	S	74	S	68					
7		70	66	65	S	68	73	48	64	78	68	74	92	110	117	127	131	120	116	120	S	92	101	94	S	86	92				92					
8	I	92	85	84	76	59	57	67	74	I	74	77	89	102	114	115	111	103	101	89	84	83	76	75	77	72										
9		73	68	62	S	61	S	52	66	81	77	70	77	93	112	S	130	123	112	104	91	S	88	S	79	81	80	J	80							
10		77	I	78	78	68	S	53	51	67	80	79	78	84	96	111	121	S	125	117	111	106	J	99	87	81	J	86	J	88	91					
11	U	93	F	F	89	75	68	76	U	89	86	74	81	90	105	119	129	142	130	121	S	I	114	109	87	79	81	81	83							
12	I	82	S	I	S	I	S	67	S	66	88	90	72	77	81	U	R	100	107	108	S	122	125	105	I	A	106	I	A	101	86	J	83	91	I	98
13	94	U	85	87	J	81	77	73	I	85	U	96	I	86	C	C	C	107	123	142	153	144	133	112	106	91	89	79	U	80						
14	78	F	J	82	F	F	F	70	73	72	77	87	88	93	105	119	131	137	143	S	139	117	82	76	I	76	I	78	I	76						
15	S	S	I	82	59	F	J	54	I	79	65	65	69	89	100	112	121	J	126	131	131	Y	126	113	I	100	84	79	84	89						
16	87	S	88	90	S	82	70	60	58	71	82	98	77	90	108	121	120	122	S	120	S	98	84	84	I	86	S	I	94	I	96					
17	I	92	86	87	I	73	S	60	64	79	80	77	84	93	102	108	114	S	127	134	123	109	106	I	118	I	102	S	84	79	J	87				
18	I	82	82	U	73	62	68	59	54	51	51	51	55	59	62	56	59	58	60	58	61	67	62	S	62	59	62	59								
19	J	62	69	68	44	S	42	41	49	49	53	59	68	63	64	64	66	78	77	81	84	78	67	69	70	J	68									
20	71	J	68	63	51	40	42	64	57	59	I	61	68	84	106	109	S	102	93	81	73	70	J	77	J	78	81	81	S							
21	F	72	79	59	S	53	49	58	66	68	76	J	87	J	101	111	118	124	107	103	108	Y	110	Y	100	77	70	72	J	72						
22	70	71	70	62	J	55	J	56	70	73	J	61	64	68	86	95	108	115	116	I	100	86	I	76	I	68	74	78	76	S						
23	S	S	I	73	S	56	54	64	59	64	68	74	85	90	82	85	92	93	92	92	92	U	92	U	92	U	92	65	S	F						
24	F	64	F	F	F	F	59	56	60	60	67	66	63	72	S	90	106	102	95	101	103	I	A	99	88	J	72	68	S							
25	A	J	69	F	60	64	F	60	60	62	64	69	77	90	U	97	J	96	J	96	U	98	104	106	I	112	J	98	79	J	78	U	71			
26	F	70	F	S	J	63	58	U	61	56	S	59	64	65	75	76	89	101	105	C	C	I	107	I	109	108	U	89	J	58	S	S				
27	S	F	U	68	45	F	F	F	65	90	75	64	62	62	77	92	104	105	96	I	92	I	91	90	75	71	64	F								
28	F	68	F	F	60	I	A	55	66	73	70	68	68	79	93	103	104	102	I	100	107	105	91	80	I	74	I	70								
29	I	58	S	S	S	F	F	58	71	71	65	64	69	87	82	103	I	A	113	119	111	S	102	S	103	I	96	89	I	88	S	88				
30	77	67	68	F	F	F	62	81	72	63	78	72	86	92	100	105	108	U	105	109	U	99	84	U	84	85	S	79								
31	77	69	U	S	71	70	67	59	U	88	J	74	65	I	60	I	A	58	61	I	A	60	64	62	69	68	61	63	66	66	64	60	I	62		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23												
CNT	24	25	26	26	25	27	31	31	31	30	30	30	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	29	25						
MED	77	70	73	63	60	56	64	71	71	70	77	86	100	108	111	112	110	104	102	S	99	S	84	79	78	79										
UQ	84	81	80	73	67	60	72	80	77	77	84	96	108	119	126	123	123	114	S	109	S	104	S	91	S	84	84	S	88							
LQ	70	67	68	59	53	49	58	62	64	64	68	72	86	92	102	102	96	92	87	84	S	76	70	70	70											

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MAY. 1971

FOF2 (0.1 MHz)

### IONOSPHERIC DATA

MAY. 1971

FOF1 (0.01 MHz)

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

Station **YAMAGAWA** Lat. **31 12.1 N.** Long. **130 37.1 E** Sweep 1 MHz to 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	U 580	490	480	500	570	U 480	L	L					
2									L	L	L	500	520	490	U 500	480	L	L						
3									L	470	500	510	510	510	470	L	490	L	L					
4								L	L	480	L	L	520	I 490	510	490	460	L	L					
5									L	L	540	550	530	520	480	500	480	L	L					
6									L	L	540	560	520	510	500	500	480	L	L					
7								310	L	L	540	540	L	L	510	520	A	A	L					
8								L	C	L	530	520	520	520	490	500	L	L	L					
9								L	L	L	L	L	520	520	510	460	L	L	A					
10								L	L	L	A	570	540	530	510	520	U 500	L						
11									A	A	A	570	550	540	550	A	A	A	A					
12								L	U 450	560	U 580	L	560	530	540	490	U 490	A						
13								L	C	C	C	C	550	540	A	510	U 500	L						
14									L	L	A	A	L	A	530	510	L	L	L					
15								L	A	540	560	530	A	520	540	L	460	L	A					
16								310	460	520	L	570	530	520	530	530	480	400	L					
17									A	L	L	A	A	L	540	L	410	L	L					
18								L	390	420	430	440	470	480	480	480	470	460	L	420				
19								L	400	450	I 460	I 480	I 490	500	530	530	490	460	430	L				
20									450	C	530	490	500	480	510	480	L	U 420	L					
21								L	L	530	510	550	I 530	530	500	490	500	A	A					
22								L	L	510	470	L	490	500	490	A	A	A	A					
23									A	A	490	490	470	500	L	490	450	440	A					
24								L	410	A	520	A	500	480	480	470	A	A	L					
25								L	L	A	A	480	490	A	A	A	A	440	A					
26								L	L	A	A	A	500	L	480	C	C	L	A					
27								L	L	A	A	470	A	500	490	480	460	A	A	A				
28									A	A	A	A	A	500	I 480	480	A	A	430	L				
29								L	A	A	A	A	510	A	A	A	A	A	A					
30								L	L	440	490	A	L	A	530	470	470	480	A	L				
31								A	440	A	A	480	A	480	480	460	440	440	380					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								4	9	10	14	19	25	25	26	22	17	7	2					
MED								350	450	485	525	520	510	510	500	490	480	430	400					
UQ								395	450	530	540	555	530	530	530	510	490	440						
LQ								310	440	470	490	490	500	490	480	470	460	425						

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MAY. 1971

FOF1 (0.01 MHz)



# IONOSPHERIC DATA

MAY. 1971

FOE (0.01 MHZ)

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

Station **YAMAGAWA** Lat. **31 12.1 N** Long. **130 37.1 E** Sweep **1** MHz to **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							195	255	300	320	345	355 <sup>A</sup>	360	360	340	325	305	270	205					
2							170 <sup>n</sup>	255	295	320	335	355	360	360	350	340	305	275	220					
3							190	255	290	320	340	345	360	360	360	335	310	280	220					
4							170	250	300	320	335 <sup>H</sup>	360	375	360	360	340	320	280	200					
5							175	260	I <sup>A</sup> <sub>295</sub>	I <sup>A</sup> <sub>320</sub>	I <sup>A</sup> <sub>350</sub>	A	A	R	365	I <sup>A</sup> <sub>340</sub>	315	290	220					
6							170	260	300	330	350	370 <sup>A</sup>	380	380	360	330	310	280	210					
7							180	250	290	330	355	360	370 <sup>U</sup>	370	370	350	315	270	220					
8							190	260	I <sup>C</sup> <sub>300</sub>	330	340	360	380	380	375	340	315	270	230 <sup>H</sup>					
9							185	260	305	330	350	360	375	380	370	350	320	290	220					
10							180	270	310	325	340	345	I <sup>A</sup> <sub>355</sub>	375	370	350	325	295	225					
11							220	280	315	340	365	A	A	A	A	I <sup>A</sup> <sub>360</sub>	330	290	240 <sup>H</sup>					
12							170	270	320	325	360	B	B	400 <sup>U</sup>	380 <sup>R</sup>	355 <sup>R</sup>	330	295	225					
13							200 <sup>C</sup>	270	I <sup>C</sup> <sub>300</sub>	C	C	C	380	380	375	355	325	295	220					
14							200	270	310	350	360	370	360	360	I <sup>A</sup> <sub>360</sub>	350	325 <sup>S</sup>	300	250					
15							190	280	320	340	355	A	A	A	A	A	330	A	A					
16							200	260	310	330	350	360	380	380	370	I <sup>A</sup> <sub>345</sub>	320	290	235					
17							220	260	300	320	I <sup>R</sup> <sub>350</sub>	I <sup>A</sup> <sub>365</sub>	370	365	355	350	310	285 <sup>H</sup>	235					
18							200	260	295	330	350	360	365	370	360	340	320	285	210					
19							170	270	310	330	350	360	360	370	360	340	310	270	A					
20							210	260	300	I <sup>C</sup> <sub>330</sub>	350	365	370	360	365	345	330	300	215					
21							190	250	290	315	I <sup>A</sup> <sub>335</sub>	370	I <sup>A</sup> <sub>370</sub>	370	370	335	320	275	195					
22							R	260	290	A	A	A	A	355	370	340	310	275	210 <sup>A</sup>					
23							A	260 <sup>H</sup>	300	I <sup>C</sup> <sub>320</sub>	330	340	360	I <sup>A</sup> <sub>355</sub>	335	335	320	290	A					
24							200	260 <sup>H</sup>	290	320	335	340	330	330	320	315	325	280	230					
25							190 <sup>H</sup>	260 <sup>H</sup>	280	310 <sup>H</sup>	330 <sup>H</sup>	340	350	I <sup>R</sup> <sub>350</sub>	350	330	310	285	225					
26							190	275	300	320	335	350 <sup>H</sup>	345 <sup>H</sup>	340	A	C	C	270	A					
27							205	250	295	325	A	A	A	A	A	A	320	300	A					
28							210	260	310	325	350	I <sup>A</sup> <sub>355</sub>	360	A	A	A	A	A	A					
29							210 <sup>H</sup>	260	300	330	340	355	365	A	A	A	A	A	A					
30							A	270 <sup>H</sup>	300	330	355	360	370	370	360	350	325	300	A					
31							200	260	300	330	340	I <sup>A</sup> <sub>345</sub>	355	I <sup>A</sup> <sub>350</sub>	350	340	325	I <sup>A</sup> <sub>290</sub>	230					
Hour Day	00	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	31	31	29	28	24	25	25	25	26	28	28	23					
MED							190	260	300	325	350	360	365	365	360	340	320	285	220					
UQ							200	270	308	330	350	360	370	375	370	350	325	292	230					
LQ							180	260	295	320	338	348	360	360	355	335	310	275	212					

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MAY. 1971

FOE (0.01 MHZ)



IONOSPHERIC DATA

MAY. 1971

FOES (0.1 MHZ)

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

Station	YAMAGAWA				Lat	31 12.1 N				Long	130 37.1 E				Sweep	1 MHz to 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>13</sub>	E <sub>13</sub>	E <sub>17</sub>	E <sub>11</sub>	E <sub>13</sub>	G	30	35	48	37	39	G	G <sub>35</sub>	G	40	38	G	G	E <sub>15</sub>	24	22	J <sub>29</sub>	J <sub>26</sub>		
2	22	21	20	E <sub>13</sub>	E <sub>11</sub>	E <sub>14</sub>	28	J <sub>53</sub>	J <sub>54</sub>	J <sub>50</sub>	J <sub>108</sub>	47	42	38	G	G	36	35	J <sub>40</sub>	J <sub>43</sub>	J <sub>36</sub>	J <sub>33</sub>	25	J <sub>25</sub>	
3	20	19	E <sub>12</sub>	E	E <sub>13</sub>	G	29	39	40	42	46	38	G	G	G	20	G	G	E <sub>14</sub>	E <sub>11</sub>	E <sub>14</sub>	E <sub>11</sub>	E <sub>14</sub>		
4	18	J <sub>26</sub>	22	J <sub>51</sub>	J <sub>32</sub>	J <sub>26</sub>	G	31	35	40	42	39	G	J <sub>74</sub>	45	39	G	G	J <sub>35</sub>	J <sub>39</sub>	19	J <sub>34</sub>	J <sub>26</sub>	J <sub>37</sub>	
5	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>12</sub>	E <sub>11</sub>	E <sub>13</sub>	23	32	31	38	J <sub>40</sub>	44	40	G <sub>36</sub>	G <sub>32</sub>	40	37	19	31	J <sub>30</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	
6	E <sub>13</sub>	E <sub>13</sub>	E <sub>17</sub>	E <sub>13</sub>	E <sub>12</sub>	E <sub>12</sub>	27	40	39	38	G	41	50	50	50	25	J <sub>30</sub>	31	34	J <sub>65</sub>	J <sub>70</sub>	J <sub>53</sub>	J <sub>26</sub>	E <sub>15</sub>	
7	E <sub>14</sub>	J <sub>28</sub>	17	E <sub>14</sub>	E	E <sub>12</sub>	G	G	44	29	38	44	27	G	30	41	55	J <sub>59</sub>	J <sub>54</sub>	28	16	16	22	J <sub>44</sub>	24
8	E <sub>15</sub>	E <sub>11</sub>	19	11	12	E <sub>14</sub>	22	31	C	J <sub>68</sub>	J <sub>60</sub>	43	45	G	G	37	34	33	14	19	E <sub>13</sub>	E <sub>15</sub>	J <sub>26</sub>	J <sub>45</sub>	
9	J <sub>53</sub>	J <sub>36</sub>	J <sub>32</sub>	J <sub>23</sub>	J <sub>19</sub>	J <sub>25</sub>	25	41	J <sub>50</sub>	J <sub>83</sub>	J <sub>84</sub>	J <sub>80</sub>	G	46	J <sub>81</sub>	J <sub>63</sub>	J <sub>70</sub>	J <sub>61</sub>	J <sub>64</sub>	J <sub>85</sub>	J <sub>84</sub>	J <sub>33</sub>	21	J <sub>25</sub>	
10	22	J <sub>51</sub>	E <sub>13</sub>	J <sub>22</sub>	E <sub>14</sub>	E <sub>12</sub>	29	30	G	41	J <sub>70</sub>	J <sub>49</sub>	40	G	G	46	40	33	34	J <sub>64</sub>	J <sub>51</sub>	J <sub>22</sub>	J <sub>63</sub>	J <sub>22</sub>	
11	J <sub>20</sub>	J <sub>52</sub>	J <sub>60</sub>	J <sub>41</sub>	J <sub>42</sub>	J <sub>18</sub>	27	J <sub>43</sub>	J <sub>63</sub>	J <sub>80</sub>	J <sub>56</sub>	47	42	J <sub>51</sub>	J <sub>64</sub>	71	J <sub>50</sub>	49	89	90	J <sub>25</sub>	15	19	J <sub>34</sub>	
12	25	22	E <sub>14</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>16</sub>	G	36	43	41	G	E <sub>54</sub>	E <sub>54</sub>	47	44	46	J <sub>48</sub>	J <sub>74</sub>	166	J <sub>102</sub>	57	J <sub>92</sub>	J <sub>72</sub>	J <sub>29</sub>	
13	25	J <sub>29</sub>	22	J <sub>52</sub>	J <sub>43</sub>	E <sub>14</sub>	G	32	C	C	C	C	49	43	50	44	G	G	27	E <sub>15</sub>	J <sub>24</sub>	J <sub>32</sub>	E <sub>15</sub>	J <sub>26</sub>	
14	J <sub>52</sub>	J <sub>56</sub>	J <sub>55</sub>	J <sub>51</sub>	J <sub>33</sub>	J <sub>29</sub>	27	38	44	J <sub>57</sub>	J <sub>164</sub>	J <sub>76</sub>	J <sub>102</sub>	J <sub>134</sub>	41	G	38	34	30	J <sub>27</sub>	J <sub>51</sub>	22	J <sub>26</sub>	J <sub>50</sub>	
15	J <sub>51</sub>	J <sub>51</sub>	J <sub>42</sub>	E <sub>15</sub>	J <sub>20</sub>	E <sub>11</sub>	J <sub>38</sub>	J <sub>63</sub>	59	J <sub>71</sub>	48	73	117	85	J <sub>62</sub>	38	J <sub>93</sub>	J <sub>94</sub>	J <sub>52</sub>	J <sub>44</sub>	J <sub>36</sub>	J <sub>29</sub>	22	J <sub>25</sub>	
16	71	60	J <sub>58</sub>	J <sub>42</sub>	J <sub>29</sub>	J <sub>23</sub>	G	J <sub>27</sub>	G	41	46	45	J <sub>45</sub>	J <sub>41</sub>	46	41	39	33	30	16	J <sub>23</sub>	J <sub>34</sub>	J <sub>23</sub>	E <sub>15</sub>	
17	J <sub>29</sub>	J <sub>19</sub>	J <sub>29</sub>	13	J <sub>64</sub>	J <sub>26</sub>	27	39	J <sub>49</sub>	J <sub>51</sub>	J <sub>53</sub>	J <sub>56</sub>	54	43	30	G	28	32	26	22	18	E <sub>15</sub>	E <sub>14</sub>	J <sub>36</sub>	
18	J <sub>38</sub>	E <sub>13</sub>	J <sub>17</sub>	19	E	E <sub>12</sub>	27	35	J <sub>70</sub>	42	J <sub>50</sub>	43	43	41	G	38	G	32	31	19	18	22	21	E <sub>15</sub>	
19	J <sub>25</sub>	J <sub>32</sub>	J <sub>30</sub>	J <sub>28</sub>	J <sub>28</sub>	E <sub>14</sub>	J <sub>34</sub>	32	40	J <sub>50</sub>	J <sub>55</sub>	J <sub>84</sub>	42	44	43	40	33	38	J <sub>49</sub>	19	E <sub>15</sub>	J <sub>21</sub>	21	J <sub>29</sub>	
20	J <sub>53</sub>	E <sub>12</sub>	21	21	E <sub>13</sub>	16	27	32	35	C	41	40	43	43	38	39	36	42	J <sub>47</sub>	39	E <sub>13</sub>	J <sub>41</sub>	J <sub>57</sub>	J <sub>29</sub>	
21	J <sub>37</sub>	60	J <sub>42</sub>	J <sub>19</sub>	E <sub>12</sub>	15	32	J <sub>51</sub>	J <sub>75</sub>	56	37	G <sub>36</sub>	M <sub>77</sub>	G	G	36	J <sub>50</sub>	J <sub>84</sub>	J <sub>62</sub>	J <sub>37</sub>	J <sub>27</sub>	E <sub>15</sub>	E <sub>15</sub>	J <sub>21</sub>	
22	J <sub>21</sub>	J <sub>23</sub>	18	J <sub>24</sub>	J <sub>20</sub>	18	23	33	37	J <sub>64</sub>	35	J <sub>76</sub>	J <sub>78</sub>	J <sub>61</sub>	50	J <sub>75</sub>	J <sub>101</sub>	J <sub>99</sub>	J <sub>84</sub>	J <sub>64</sub>	J <sub>50</sub>	J <sub>50</sub>	J <sub>90</sub>	J <sub>69</sub>	
23	J <sub>100</sub>	J <sub>73</sub>	J <sub>32</sub>	J <sub>20</sub>	20	16	34	46	55	J <sub>55</sub>	43	44	G	44	44	41	G	37	44	22	J <sub>42</sub>	M <sub>28</sub>	J <sub>47</sub>	32	
24	J <sub>32</sub>	J <sub>31</sub>	J <sub>20</sub>	J <sub>21</sub>	J <sub>30</sub>	J <sub>37</sub>	27	31	41	J <sub>49</sub>	J <sub>51</sub>	J <sub>57</sub>	44	45	J <sub>44</sub>	J <sub>45</sub>	J <sub>68</sub>	D	J <sub>161</sub>	J <sub>136</sub>	J <sub>51</sub>	J <sub>102</sub>	J <sub>61</sub>	J <sub>51</sub>	
25	J <sub>25</sub>	J <sub>25</sub>	J <sub>20</sub>	22	E	25	23	31	J <sub>45</sub>	J <sub>50</sub>	J <sub>52</sub>	47	J <sub>62</sub>	59	74	J <sub>80</sub>	J <sub>57</sub>	42	J <sub>77</sub>	J <sub>30</sub>	J <sub>27</sub>	J <sub>33</sub>	J <sub>36</sub>	J <sub>57</sub>	
26	E <sub>14</sub>	J <sub>25</sub>	J <sub>53</sub>	36	J <sub>27</sub>	J <sub>29</sub>	24	31	37	48	53	52	45	54	40	C	C	34	J <sub>40</sub>	J <sub>37</sub>	J <sub>27</sub>	J <sub>33</sub>	J <sub>94</sub>	J <sub>52</sub>	
27	J <sub>50</sub>	J <sub>61</sub>	J <sub>22</sub>	34	20	20	29	39	J <sub>47</sub>	J <sub>57</sub>	J <sub>58</sub>	J <sub>53</sub>	58	44	41	42	J <sub>79</sub>	J <sub>138</sub>	J <sub>138</sub>	69	J <sub>57</sub>	J <sub>84</sub>	J <sub>42</sub>	J <sub>32</sub>	
28	J <sub>33</sub>	104	J <sub>85</sub>	70	104	J <sub>106</sub>	31	48	J <sub>71</sub>	J <sub>61</sub>	J <sub>63</sub>	J <sub>76</sub>	52	J <sub>61</sub>	J <sub>85</sub>	137	J <sub>109</sub>	J <sub>44</sub>	J <sub>30</sub>	J <sub>32</sub>	J <sub>32</sub>	J <sub>52</sub>	J <sub>42</sub>	70	
29	J <sub>26</sub>	J <sub>61</sub>	J <sub>38</sub>	J <sub>35</sub>	J <sub>43</sub>	J <sub>29</sub>	30	J <sub>45</sub>	J <sub>53</sub>	58	70	J <sub>75</sub>	J <sub>64</sub>	M <sub>88</sub>	J <sub>106</sub>	J <sub>140</sub>	95	J <sub>129</sub>	100	M	49	J <sub>49</sub>	J <sub>43</sub>	J <sub>52</sub>	J <sub>26</sub>
30	J <sub>29</sub>	J <sub>29</sub>	J <sub>27</sub>	J <sub>24</sub>	J <sub>33</sub>	J <sub>49</sub>	J <sub>32</sub>	35	37	44	52	J <sub>54</sub>	J <sub>53</sub>	G	G	40	38	J <sub>88</sub>	J <sub>52</sub>	J <sub>53</sub>	J <sub>61</sub>	J <sub>36</sub>	J <sub>27</sub>	J <sub>19</sub>	
31	J <sub>41</sub>	J <sub>34</sub>	J <sub>30</sub>	J <sub>21</sub>	J <sub>21</sub>	J <sub>36</sub>	J <sub>33</sub>	J <sub>53</sub>	J <sub>53</sub>	J <sub>135</sub>	76	J <sub>70</sub>	J <sub>79</sub>	51	40	40	G	34	49	27	J <sub>31</sub>	24	J <sub>29</sub>	35	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	31	31	29	29	30	30	31	31	31	30	30	31	31	31	31	31	31	31	
MED	J <sub>26</sub>	J <sub>29</sub>	J <sub>22</sub>	21	20	16	27	35	44	J <sub>50</sub>	52	48	45	44	41	40	38	37	40	J <sub>37</sub>	J <sub>27</sub>	J <sub>32</sub>	J <sub>26</sub>	J <sub>29</sub>	
UQ	J <sub>46</sub>	J <sub>52</sub>	J <sub>35</sub>	J <sub>34</sub>	J <sub>31</sub>	J <sub>26</sub>	30	42	J <sub>53</sub>	J <sub>57</sub>	J <sub>60</sub>	J <sub>70</sub>	56	52	50	46	J <sub>59</sub>	J <sub>68</sub>	J <sub>63</sub>	J <sub>58</sub>	J <sub>50</sub>	J <sub>38</sub>	J <sub>46</sub>	J <sub>36</sub>	
LQ	20	20	18	12	E <sub>12</sub>	E <sub>14</sub>	22	31	37	41	41	44	41	37	E <sub>30</sub>	38	30	32	30	20	18	22	21	J <sub>23</sub>	

The Radio Research Laboratories, Japan

MAY. 1971

FOES (0.1 MHZ)

## IONOSPHERIC DATA

MAY. 1971

FBES (0.1 MHz)

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

Station	YAMAGAWA				Lat. 31 12.1 N	Long. 130 37.1 E	Sweep 1 MHz to 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>13</sub>	E <sub>14</sub>	E <sub>11</sub>	E <sub>11</sub>	E	E <sub>13</sub>	G	29	G	41	G	36	G	G	G	38	36	G	G	E <sub>15</sub>	15	E	20	17		
2	E	E	E	E <sub>13</sub>	E <sub>11</sub>	E <sub>14</sub>	22	49	32	36	40	46	40	38	G	G	G	33	39	42	33	25	E	21		
3	E	E	E <sub>12</sub>	E	E	E <sub>13</sub>	G	28	34	36	40	43	G	G	G	G	20	G	G	E <sub>14</sub>	E <sub>11</sub>	E <sub>14</sub>	E <sub>11</sub>	E <sub>14</sub>		
4	E	26	E	E	22	16	G	30	G	37	40	38	G	53	42	37	G	G	31	37	17	20	20	E		
5	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>12</sub>	E <sub>11</sub>	E <sub>13</sub>	G	G	31	36	36	39	39	E <sub>36</sub>	G	32	39	G	19	28	24	E <sub>13</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	
6	E <sub>13</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>13</sub>	E <sub>12</sub>	E <sub>12</sub>	25	36	33	G	G	41	47	42	G	G	25	21	G	G	45	60	E	21	E <sub>15</sub>	
7	E <sub>14</sub>	21	E	E <sub>14</sub>	E	E <sub>12</sub>	G	G	37	28	G	42	G	G	40	49	56	42	G	15	15	15	28	E		
8	E <sub>15</sub>	E <sub>11</sub>	E	E	12	E <sub>14</sub>	G	G	C	38	38	43	43	G	G	G	G	G	14	16	E <sub>13</sub>	E <sub>15</sub>	15	24		
9	32	33	25	E	16	12	G	38	39	46	42	39	G	42	50	44	44	44	44	65	64	25	E	18		
10	17	33	E <sub>13</sub>	16	E <sub>14</sub>	E <sub>12</sub>	28	G	G	40	65	45	38	G	G	44	37	31	34	61	28	18	20	22		
11	16	20	21	23	37	E	26	41	61	53	53	42	39	49	43	54	29	48	86	40	24	15	17	20		
12	16	E	E <sub>14</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>16</sub>	G	34	39	G	G	E <sub>54</sub>	E <sub>54</sub>	E <sub>47</sub>	44	46	44	71	A	A	52	26	38	22		
13	16	16	E	25	41	E <sub>14</sub>	G	G	C	C	C	C	48	42	50	42	G	G	27	E <sub>15</sub>	21	30	E <sub>15</sub>	22		
14	36	48	35	28	20	21	27	34	41	50	61	53	51	60	40	G	37	G	G	25	29	E	19	24		
15	40	24	29	E <sub>15</sub>	14	E <sub>11</sub>	34	35	50	43	42	41	53	49	42	36	38	43	37	41	27	24	20	E		
16	21	40	20	21	23	E	G	23	G	40	44	43	34	33	45	38	37	G	G	16	21	21	15	E <sub>15</sub>		
17	E	E	19	12	35	15	G	32	45	50	48	55	53	42	29	G	28	G	G	20	15	E <sub>15</sub>	E <sub>14</sub>	25		
18	30	E <sub>13</sub>	E	15	E	E <sub>12</sub>	26	32	35	36	40	38	42	40	G	37	G	31	27	16	17	E	E	E <sub>15</sub>		
19	16	27	25	24	22	E <sub>14</sub>	29	29	36	47	51	40	39	40	39	37	G	G	27	16	E <sub>15</sub>	16	20	20		
20	19	E <sub>12</sub>	E	E	E <sub>13</sub>	15	25	30	G	C	G	39	39	41	G	38	G	34	40	27	E <sub>13</sub>	22	28	E		
21	31	42	20	18	E <sub>12</sub>	15	30	38	42	38	37	36	72	G	G	36	35	64	40	22	23	E <sub>15</sub>	E <sub>15</sub>	15		
22	21	13	E	18	16	15	22	30	35	36	35	42	43	52	50	70	74	45	25	E <sub>64</sub>	20	21	19	33		
23	52	20	16	20	11	14	30	40	54	54	40	43	G	43	42	36	G	34	41	21	36	25	33	19		
24	16	24	15	E	14	21	24	30	40	44	48	52	43	42	39	42	53	50	28	A	35	56	22	39		
25	A	20	15	13	E	E	22	30	42	48	49	44	48	59	64	54	57	42	45	30	27	22	29	20		
26	E <sub>14</sub>	22	E	20	21	25	15	G	36	47	52	50	42	39	39	C	C	33	38	28	26	24	20	50		
27	22	32	15	22	13	E	29	35	44	53	40	50	43	39	39	37	65	A	A	38	29	30	35	27		
28	21	E	22	28	35	A	30	44	63	56	54	63	48	53	42	62	A	39	28	32	29	33	30	35		
29	E	22	27	29	27	20	G	37	51	48	61	64	44	69	94	A	85	95	40	39	45	28	52	21		
30	26	15	E	21	E	17	28	34	37	42	50	52	53	G	G	38	37	50	30	52	61	29	26	E		
31	31	30	20	16	16	33	31	50	37	A	A	39	A	43	38	38	G	30	37	25	31	20	22	20		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	31	31	31	31	31	31	29	29	30	30	31	31	30	30	30	31	31	31	31	31	31	31	31	
MED	16	20	14	15	14	E <sub>14</sub>	22	32	37	42	41	42	42	42	39	38	36	33	30	28	26	21	20	20		
UQ	28	26	20	21	22	16	28	36	42	48	51	50	48	48	44	44	44	44	40	41	32	25	27	22		
LQ	E <sub>14</sub>	E <sub>13</sub>	E	E <sub>12</sub>	E <sub>11</sub>	E <sub>12</sub>	G	28	33	36	37	39	38	34	G	36	G	G	20	18	16	15	15	15		

The Radio Research Laboratories, Japan

MAY. 1971

FBES (0.1 MHz)

# IONOSPHERIC DATA

MAY. 1971

F-MIN (0.1 MHZ)

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

Station **YAMAGAWA** Lat. **31 12.1 N** Long. **130 37.1 E** Sweep 1 MHz to 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>13</sub>	E <sub>14</sub>	11	11	E	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	15	16	16	20	19	20	19	16	15	14	14	E <sub>13</sub>	E <sub>13</sub>	E <sub>12</sub>	E <sub>13</sub>	E <sub>13</sub>
2	E <sub>13</sub>	E <sub>13</sub>	E <sub>11</sub>	13	E <sub>11</sub>	E <sub>14</sub>	E <sub>13</sub>	11	15	17	20	19	21	22	21	16	15	14	11	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>13</sub>
3	E <sub>15</sub>	E <sub>15</sub>	E <sub>12</sub>	E	E	E <sub>13</sub>	E <sub>14</sub>	11	14	17	20	21	20	21	21	17	15	15	13	E <sub>14</sub>	11	E <sub>12</sub>	11	E <sub>14</sub>
4	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E	E	11	E <sub>13</sub>	E <sub>14</sub>	15	18	21	20	20	21	20	19	15	14	15	E <sub>13</sub>	E <sub>14</sub>	E <sub>14</sub>	E <sub>14</sub>	E <sub>15</sub>
5	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>12</sub>	E <sub>11</sub>	13	E <sub>15</sub>	E <sub>13</sub>	15	19	21	25	22	22	20	19	16	15	15	E <sub>11</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>
6	E <sub>15</sub>	E <sub>15</sub>	E <sub>12</sub>	13	12	12	E <sub>13</sub>	11	15	15	20	21	21	21	19	15	14	14	11	E <sub>13</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>
7	E <sub>14</sub>	E <sub>12</sub>	E <sub>14</sub>	E <sub>14</sub>	E	12	12	12	15	15	20	21	19	21	19	20	16	12	11	E	E <sub>12</sub>	E <sub>11</sub>	E <sub>12</sub>	E <sub>13</sub>
8	E <sub>15</sub>	E <sub>11</sub>	12	E	E	14	E <sub>12</sub>	14	C	19	19	21	21	24	21	21	15	14	11	12	E <sub>13</sub>	E <sub>15</sub>	E <sub>17</sub>	E <sub>13</sub>
9	E <sub>15</sub>	E <sub>15</sub>	14	E <sub>13</sub>	E	E	E <sub>15</sub>	15	14	16	20	21	22	21	21	20	16	15	12	11	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>	E <sub>15</sub>
10	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>13</sub>	14	12	17	E <sub>14</sub>	15	19	20	22	22	22	22	22	22	15	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>
11	E <sub>15</sub>	E <sub>15</sub>	E <sub>12</sub>	15	13	E <sub>14</sub>	16	15	15	16	16	22	22	21	19	19	15	18	11	11	E <sub>13</sub>	E <sub>11</sub>	E <sub>13</sub>	E <sub>15</sub>
12	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>	E <sub>13</sub>	13	16	E <sub>15</sub>	E <sub>14</sub>	15	20	22	54	54	22	22	20	17	17	12	13	E <sub>11</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>14</sub>
13	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	12	E <sub>15</sub>	14	15	15	C	C	C	C	23	22	24	21	21	20	E <sub>15</sub>	15	E <sub>13</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
14	E <sub>15</sub>	E <sub>14</sub>	E	E	E <sub>11</sub>	E <sub>12</sub>	16	15	16	21	22	23	22	23	23	22	20	22	16	E <sub>13</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>15</sub>
15	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	15	11	11	15	E <sub>15</sub>	17	20	22	22	22	22	22	20	20	14	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>
16	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>15</sub>	E	E <sub>15</sub>	14	E <sub>15</sub>	15	17	20	21	20	22	22	20	15	15	11	E <sub>11</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>	E <sub>15</sub>
17	E <sub>15</sub>	E <sub>15</sub>	E <sub>11</sub>	E	E	E <sub>12</sub>	E <sub>14</sub>	12	15	22	22	22	22	21	22	20	21	14	14	E <sub>13</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>
18	E <sub>15</sub>	E <sub>13</sub>	E <sub>12</sub>	E	E	12	15	14	14	15	21	20	20	20	20	21	16	14	E <sub>14</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>12</sub>	E <sub>15</sub>	E <sub>15</sub>
19	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>	E	E	E <sub>14</sub>	E <sub>15</sub>	15	15	20	20	21	22	21	21	21	15	14	12	E <sub>13</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>12</sub>
20	E <sub>15</sub>	E <sub>12</sub>	13	12	E <sub>13</sub>	E <sub>12</sub>	E <sub>14</sub>	11	15	C	22	22	22	22	22	23	22	15	13	11	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>
21	E <sub>14</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	12	E <sub>12</sub>	14	14	22	21	20	22	23	22	22	22	16	15	11	E <sub>13</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>
22	E <sub>15</sub>	E <sub>12</sub>	E <sub>12</sub>	E	E	E <sub>12</sub>	E <sub>17</sub>	14	15	E <sub>26</sub>	21	22	23	22	23	21	19	15	11	21	E <sub>12</sub>	E <sub>13</sub>	11	E <sub>14</sub>
23	E <sub>15</sub>	E <sub>12</sub>	11	E	E	E	13	15	15	E <sub>36</sub>	22	24	24	21	23	21	17	15	14	13	E <sub>14</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>11</sub>
24	E <sub>15</sub>	11	12	E	E	E <sub>13</sub>	E <sub>13</sub>	14	14	E <sub>24</sub>	19	20	20	22	22	19	19	15	E <sub>12</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>	E <sub>14</sub>	E <sub>14</sub>
25	E <sub>15</sub>	E <sub>12</sub>	E <sub>13</sub>	E <sub>11</sub>	E	E <sub>13</sub>	E <sub>13</sub>	11	15	16	15	22	22	22	17	15	15	14	11	11	E <sub>13</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>13</sub>
26	E <sub>14</sub>	E <sub>14</sub>	E <sub>14</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>13</sub>	11	15	16	E <sub>22</sub>	22	22	22	24	C	C	17	E <sub>14</sub>	11	E <sub>14</sub>	12	E <sub>13</sub>	E <sub>13</sub>
27	E <sub>12</sub>	E <sub>12</sub>	13	E	E	15	E <sub>12</sub>	E <sub>15</sub>	16	19	21	20	20	21	22	20	16	14	E <sub>15</sub>	11	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	E <sub>15</sub>	E <sub>15</sub>	E <sub>12</sub>	15	16	20	20	21	22	22	21	20	19	15	14	11	E <sub>12</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>
29	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E	E <sub>13</sub>	13	14	16	19	22	21	21	22	21	20	19	15	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>13</sub>
30	E <sub>15</sub>	E <sub>13</sub>	E <sub>15</sub>	E <sub>13</sub>	E <sub>14</sub>	E <sub>11</sub>	E <sub>11</sub>	11	15	20	20	24	22	22	22	21	19	15	11	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>15</sub>
31	E <sub>14</sub>	E <sub>13</sub>	E <sub>12</sub>	E	E	E <sub>13</sub>	E <sub>15</sub>	E <sub>15</sub>	15	19	21	21	24	22	22	22	18	14	E <sub>14</sub>	14	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	29	29	30	30	31	31	31	30	30	31	31	31	31	31	31	31
MED	E <sub>15</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>12</sub>	E	E <sub>13</sub>	E <sub>14</sub>	12	15	18	20	21	22	22	22	20	16	15	12	E <sub>13</sub>	E <sub>13</sub>	E <sub>14</sub>	E <sub>14</sub>	E <sub>15</sub>
UQ	E <sub>15</sub>	E <sub>15</sub>	E <sub>14</sub>	E <sub>13</sub>	E <sub>12</sub>	E <sub>14</sub>	15	15	15	20	22	22	22	22	22	21	19	15	14	E <sub>14</sub>	E <sub>14</sub>	E <sub>15</sub>	E <sub>15</sub>	E <sub>15</sub>
LQ	E <sub>13</sub>	E <sub>12</sub>	E <sub>12</sub>	E	E	E <sub>12</sub>	E <sub>13</sub>	12	15	16	20	21	20	21	20	19	15	14	11	11	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>	E <sub>13</sub>

The Radio Research Laboratories, Japan

MAY. 1971

F-MIN (0.1 MHZ)

# IONOSPHERIC DATA

MAY. 1971

M(3000)F2 (0.01)

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

Station **YAMAGAWA** Lat. **31 12.1 N.** Long. **130 37.1 E** Sweep **1 MHz** to **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	270	280	300	U20	290	280	310	350	330	335	335	315	285	290	305	305	315	315	325	U15	U10	290	270	275
2	270	290	310	290	300	315	320	310	330	325	295	280	275	290	295	300	310	325	U30	320	U20	265	265	265
3	280	285	280	U30	305	U20	310	325	285	305	305	310	310	315	315	310	305	315	315	305	295	U20	U20	275
4	U25	U25	300	U20	U25	285	330	345	330	335	290	290	270	275	290	310	320	305	295	295	290	295	275	280
5	275	280	285	310	330	325	360	335	335	310	295	280	280	285	300	300	310	315	U30	305	U20	U25	U20	U25
6	290	280	305	320	275	285	320	330	350	290	265	U20	280	300	305	305	295	295	305	310	300	315	265	270
7	270	260	260	280	330	330	325	335	345	285	260	275	285	290	305	305	300	315	295	290	275	270	260	270
8	U20	280	290	305	285	280	310	315	U25	285	285	290	295	305	305	305	315	325	310	305	285	270	275	280
9	280	270	260	280	285	280	305	335	325	305	285	270	285	305	310	305	325	320	310	300	280	280	275	U25
10	270	U25	300	320	300	295	330	350	330	300	290	275	290	295	310	305	305	305	U30	305	275	U20	U25	295
11	U20	F	F	325	300	300	325	U25	350	325	305	290	280	295	290	305	295	300	U30	310	300	260	265	275
12	U25	285	U25	U20	275	295	340	345	335	305	300	U20	280	285	280	290	315	305	U30	U25	305	U20	270	U20
13	285	U20	285	U30	305	285	U30	U30	350	C	C	C	275	280	300	305	315	295	305	295	325	280	275	U25
14	280	F	U25	F	F	U20	330	320	320	315	285	270	265	275	285	290	300	310	320	315	265	U20	U20	U20
15	S	S	U30	300	F	U25	U30	U30	335	290	280	280	285	290	U20	285	290	U25	U20	U30	270	255	265	265
16	270	260	290	285	305	290	295	325	320	315	325	270	275	290	290	295	305	305	295	285	U20	U20	U20	U20
17	U20	290	310	U30	285	265	320	325	320	300	280	280	275	275	290	300	300	275	270	U30	U30	U25	250	U20
18	U20	280	U25	255	285	320	275	225	235	235	245	260	285	250	275	270	285	275	270	285	275	255	260	255
19	U20	280	335	265	265	255	290	250	285	270	300	300	305	285	290	305	305	310	305	300	270	270	270	U20
20	280	U20	300	300	275	290	360	325	325	U20	270	255	285	310	305	310	305	320	290	U30	U25	285	270	S
21	F	305	335	320	U30	310	325	330	300	295	U20	U25	290	U20	310	290	295	305	U15	U30	315	285	280	U20
22	280	275	320	330	U25	U30	335	370	U30	330	265	275	265	285	295	315	U15	305	U10	U20	275	270	275	S
23	S	S	U20	290	305	305	335	355	315	315	300	305	310	285	270	290	295	295	300	U30	U30	260	S	F
24	F	280	F	F	F	335	370	360	310	320	315	305	240	270	290	295	295	295	310	U20	325	U30	295	S
25	A	U25	F	290	305	F	380	345	360	325	290	275	285	U30	U20	U25	U25	290	295	U15	U25	280	U20	U25
26	F	F	U25	U20	315	U30	375	340	340	290	300	270	270	265	295	C	C	U25	U15	U30	U30	U25	S	S
27	S	F	U30	305	F	F	305	345	350	330	315	275	275	280	300	315	300	U30	U30	320	285	290	270	F
28	F	270	F	F	335	U25	335	325	330	330	300	A	260	270	280	285	U20	280	300	305	320	300	U20	U25
29	U20	S	S	S	F	F	330	350	340	340	315	260	265	300	275	U20	305	290	295	U30	U30	280	U20	295
30	300	300	290	F	F	F	310	335	335	310	310	275	275	285	285	285	300	U25	310	U15	280	U20	290	300
31	280	275	U20	310	300	305	U30	U20	315	A	A	270	U20	280	265	295	310	295	300	290	295	280	285	U20
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	25	26	26	25	27	31	31	31	29	29	29	31	31	31	30	30	31	31	31	31	31	29	25
MED	280	280	295	300	300	295	325	335	330	310	295	275	280	285	290	300	305	305	305	305	295	280	270	275
UQ	285	285	305	320	305	312	335	345	338	325	305	290	285	295	305	305	310	312	310	315	308	280	275	280
LQ	270	275	285	290	285	282	310	325	318	290	280	270	272	280	285	290	295	295	295	295	275	265	265	270

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MAY. 1971

M(3000)F2 (0.01)

### IONOSPHERIC DATA

MAY. 1971

M(3000)F1 (0.01)

135° E Mean Time (G. M. T. + 9h)

Station **YAMAGAWA** Lat. **31 12.1 N** Long. **130 37.1 E** Sweep **1** MHz to **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	U	345	385	415	340	300	350	L	L					
2									L	L	L	A	355	385	U	345	370	L	L					
3									L	H	360	360	370	H	370	365	H	405	L	345	L	L		
4								L	L	370	L	L	365	H	385	335	360	355	L	L				
5									L	L	340	325	360	355	H	375	360	345	L	L				
6									L	L	340	330	A	355	H	360	370	355	L	L				
7							400		L	L	330	350	H	L	L	355	A	A	A	L				
8								L	C	L	340	355	365	355	L	375	360	L	L	L				
9								L	L	L	L	L	365	400	H	A	395	L	L	A				
10								L	L	L	A	345	345	H	365	370	355	U	355	L				
11									A	A	A	350	365	A	340	A	A	A	A					
12								L	U	405	355	U	350	L	B	U	345	345	A	A	A			
13								L	C	C	C	C	A	345	H	A	340	U	350	L				
14									L	L	A	A	L	A	375	H	350	L	L	L				
15								L	A	335	320	340	A	A	A	H	340	L	370	L	A			
16							420	370	365	L	335	325	370	340	340	340	355	400	L					
17									A	L	L	A	A	L	350	L	485	L	L					
18						L	325	340	380	375	365	385	375	375	370	365	L	320						
19						L	345	340	A	A	H	365	380	360	H	340	H	365	350	345	L			
20							375	C	340	H	H	390	380	405	355	H	375	L	U	375	L			
21							L	L	335	335	340	A	365	365	370	350	A	A						
22						L	L	H	355	395	L	385	350	A	A	A	A	A	A					
23								A	A	365	355	400	355	L	350	345	U	335	A					
24							L	395	A	A	A	380	365	355	360	A	A	L						
25							L	L	A	A	355	A	A	A	A	A	A	A	A					
26							L	L	A	A	A	360	L	365	C	C	L	A						
27						L	L	A	A	L	A	360	H	365	355	350	A	A	A					
28							A	A	A	A	A	A	A	380	A	375	A	A	350	L				
29							L	A	A	A	A	355	A	A	A	A	A	A	A					
30						L	L	375	365	A	L	A	345	330	370	345	A	L						
31							A	340	A	A	375	A	365	375	370	385	340	A						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								4	9	9	12	18	19	22	25	20	16	6	1					
MED								372	370	365	340	352	365	365	355	360	352	348	320					
UQ								410	375	370	362	365	380	380	375	370	360	375						
LQ								335	340	355	338	340	358	355	340	350	348	340						

MAY. 1971

M(3000)F1 (0.01)



# IONOSPHERIC DATA

MAY. 1971

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

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

Station **YAMAGAWA** Lat. **31 12.1 N** Long. **130 37.1 E** Sweep **1** MHz to **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	255	250	250	300	290	305	300	285	270	250	250					
2									260	255	320	325	325	300	300	295	285	255						
3									380	330	310	315	300	295	290	295	295	260	250					
4								235	270	275	330	330	350	335	315	280	260	245	260					
5									225	330	325	300	315	325	300	290	270	245	240					
6									225	345	320	340	325	295	285	280	275	280	255					
7								220	240	340	300	350	310	310	285	290	295	245	255					
8								245	C	305	315	305	295	285	285	275	275	250	260					
9								240	245	260	300	350	330	290	290	280	265	250	255					
10								240	250	300	320	340	310	305	280	290	275	255						
11									250	260	265	325	325	300	300	275	260	270	E A 290					
12								225	235	300	310	325	330	305	315	305	275	280						
13								240	C	C	C	C	335	335	305	285	265	250						
14									270	295	320	310	355	340	325	300	275	255	240					
15								240	270	330	330	325	315	300	300	295	275	270	250					
16								230	270	275	255	325	325	300	295	295	275	245	245					
17									245	300	300	330	305	340	310	290	285	290	320					
18						325	555	550	570	510	450	400	505	430	435	375	400	360						
19						350	505	400	430	340	330	340	380	370	325	295	290	280						
20								275	C	400	380	325	295	295	290	265	255	300						
21								250	295	330	300	330	315	320	290	300	305	290	260					
22						235	225	300	280	305	345	350	325	300	275	275	255	240						
23								300	300	330	300	295	340	340	330	310	300	270						
24								225	250	260	305	305	445	370	315	305	300	295	270					
25								260	255	300	340	345	310	300	330	315	320	300	290					
26								250	250	310	315	330	350	340	325	C	C	295	265					
27						270	250	240	275	290	400	350	330	300	280	300	A	A						
28								295	E A 295	270	340	A	375	355	340	300	I A 310	290	275					
29								240	250	280	A	E A 465	360	375	A	A	300	E A 345	275					
30						245	240	250	305	315	325	355	330	330	315	300	300	260						
31								250	300	A	A	420	A	390	440	345	315	300	300					
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							5	22	29	28	28	29	30	31	30	29	30	30	26					
MED							270	240	255	300	315	330	325	325	300	295	280	268	260					
UQ							325	250	295	330	330	345	350	340	325	305	300	292	278					
LQ							245	235	250	275	300	325	310	300	295	285	275	250	250					

The Radio Research Laboratories, Japan

MAY. 1971

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



# IONOSPHERIC DATA

MAY. 1971

H'F (KM)

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

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	280	265	240	200	220	280	245	230	210	E <sub>50</sub>	19H	20H	200	185	280	240	225	215	240	225	215	250	295	305	
2	270	275	250	250	250	215	205	A	205	215	205	E <sub>60</sub>	210	205	195	205	200	240	225	225	275	310	305	330	
3	300	275	280	230	220	295	250	245	225	205	205	20H	200	20H	200	195	20H	220	235	235	245	260	280	290	
4	290	295	260	250	255	250	225	220	205	215	20H	20H	20H	20H	E <sub>50</sub>	225	205	220	I <sub>230</sub>	255	240	250	270	290	
5	290	275	260	230	200	200	205	210	205	20H	17H	200	18H	195	200	240	235	230	225	245	225	250	255	275	
6	250	250	245	210	250	245	245	240	220	205	H <sub>195</sub>	250	I <sub>245</sub>	I <sub>220</sub>	215	20H	230	21H	250	240	265	215	250	275	
7	290	300	295	250	220	205	225	220	230	20H	225	225	21H	20H	245	A	A	A	230	250	240	250	300	265	
8	255	255	250	220	220	260	250	225	I <sub>215</sub>	205	200	225	220	220	220	205	21H	225	225	245	250	275	275	295	
9	300	300	300	255	250	275	245	235	225	I <sub>205</sub>	220	200	270	20H	A	245	A	A	A	A	I <sub>280</sub>	300	285	295	
10	295	300	250	215	250	260	245	230	210	21H	A	E <sub>25</sub>	195	200	195	245	220	220	230	E <sub>280</sub>	300	280	290	290	
11	250	300	260	250	245	240	240	250	A	A	A	200	190	A	E <sub>50</sub>	A	A	A	A	240	240	260	300	295	
12	280	275	250	225	245	250	230	225	215	20H	H <sub>195</sub>	B	B	280	245	A	A	A	A	A	E <sub>250</sub>	E <sub>295</sub>	335	275	
13	260	270	260	250	265	250	250	240	C	C	C	C	E <sub>270</sub>	200	A	E <sub>50</sub>	225	225	240	240	250	280	275	300	
14	300	E <sub>340</sub>	275	260	300	250	225	230	E <sub>50</sub>	A	A	A	A	A	195	250	230	21H	245	210	300	305	310	350	
15	350	290	240	250	305	300	230	220	I <sub>220</sub>	E <sub>240</sub>	23H	205	A	I <sub>215</sub>	20H	195	230	I <sub>225</sub>	I <sub>230</sub>	245	260	310	315	295	
16	300	300	260	250	250	235	225	205	20H	225	H <sub>210</sub>	220	200	200	265	22H	220	210	230	245	300	310	295	275	
17	260	250	240	220	250	290	220	220	A	A	A	A	A	200	195	285	21H	210	235	H <sub>260</sub>	220	245	330	310	
18	280	280	205	330	250	210	270	280	255	225	E <sub>250</sub>	230	230	225	220	210	220	225	245	290	255	305	300	350	
19	325	300	235	E <sub>280</sub>	320	350	E <sub>300</sub>	235	E <sub>245</sub>	A	A	21H	200	20H	20H	20H	205	205	250	245	245	290	300	285	
20	275	270	240	200	295	275	225	210	205	I <sub>200</sub>	C	21H	20H	200	200	20H	21H	21H	210	A	255	265	290	305	295
21	310	285	235	225	245	250	240	A	A	20H	200	18H	A	200	200	205	205	A	A	235	230	245	280	300	
22	300	275	250	220	255	250	220	215	20H	18H	195	210	A	A	A	A	A	A	A	A	290	280	290	305	
23	E <sub>280</sub>	275	230	230	240	240	220	225	A	A	220	E <sub>265</sub>	200	E <sub>250</sub>	E <sub>250</sub>	225	200	250	A	250	235	200	E <sub>360</sub>	320	
24	275	300	280	250	255	225	205	210	E <sub>250</sub>	A	A	A	200	E <sub>245</sub>	E <sub>230</sub>	E <sub>260</sub>	I <sub>225</sub>	A	E <sub>250</sub>	A	235	E <sub>300</sub>	260	340	
25	A	300	260	255	250	215	205	210	E <sub>240</sub>	A	A	A	A	A	A	A	A	A	A	A	245	220	250	295	290
26	300	270	280	245	250	230	210	220	230	A	A	A	220	195	205	C	C	230	A	235	230	250	375	A	
27	300	E <sub>340</sub>	220	245	280	280	A	250	A	A	205	I <sub>195</sub>	E <sub>240</sub>	210	225	230	A	A	A	250	250	250	300	300	
28	315	270	310	235	240	I <sub>220</sub>	245	A	A	A	A	A	I <sub>215</sub>	I <sub>225</sub>	225	A	A	I <sub>225</sub>	225	250	225	245	300	E <sub>500</sub>	
29	250	290	325	290	250	240	230	E <sub>230</sub>	A	A	A	A	225	A	A	A	A	A	A	A	250	250	245	E <sub>295</sub>	255
30	250	250	245	245	245	250	240	240	225	E <sub>225</sub>	A	A	A	20H	19H	220	215	A	230	255	E <sub>225</sub>	290	275	255	
31	295	315	280	250	240	275	245	A	E <sub>260</sub>	A	A	215	A	E <sub>250</sub>	220	220	220	225	I <sub>240</sub>	255	270	250	285	330	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	31	31	31	31	31	30	27	23	18	18	21	22	26	26	23	21	20	20	27	31	31	31	30	
MED	290	278	250	245	250	250	230	225	215	204	204	205	202	200	209	220	220	222	231	245	248	255	295	295	
UQ	300	300	278	250	255	275	245	238	228	218	215	220	222	215	A <sub>232</sub>	238	225	225	241	251	266	291	301	305	
LQ	265	270	240	225	242	232	220	220	208	200	195	200	200	20H	200	205	205	210	230	240	234	250	279	285	

The Radio Research Laboratories, Japan

MAY. 1971

H'F (KM)

IONOSPHERIC DATA

MAY. 1971

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

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

Station	YAMAGAWA				Lat.	31 12.1 N				Long.	303 71 E				Sweep	2 MHz to 02 MHz in 0 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	B	B	E	S	G	145	145	125	150	100	G	100	G	155	150	G	G	S	105	105	100	100
2	100	100	100	B	S	S	140	115	105	115	105	120	115	130	G	G	170	150	120	105	105	100	100	100
3	100	100	S	E	E	S	G	150	125	130	115	110	145	G	G	G	100	G	G	S	B	S	B	S
4	100	100	100	100	100	100	G	150	125	130	120	125	G	110	110	115	G	G	105	105	100	100	100	100
5	S	S	S	S	S	B	165	155	125	100	100	100	100	100	100	150	150	100	140	100	S	S	S	S
6	S	S	S	B	B	B	135	125	110	120	G	170	150	140	140	100	100	160	150	110	100	100	100	S
7	S	100	125	S	E	B	G	G	125	100	145	125	100	100	175	125	115	110	120	110	100	100	100	100
8	S	S	95	115	110	B	140	115	C	115	115	120	120	G	G	160	150	150	100	115	S	S	100	100
9	100	100	100	100	100	110	125	115	115	110	105	110	G	155	130	125	120	120	110	105	105	100	100	100
10	100	100	S	105	B	B	130	145	G	125	105	105	105	G	G	135	130	135	120	105	105	105	105	100
11	100	100	100	100	100	100	125	120	105	110	105	105	100	100	100	130	100	125	120	115	110	110	105	100
12	100	100	S	S	B	B	G	130	125	120	G	B	B	160	150	150	140	110	105	105	105	100	100	100
13	100	100	100	105	105	B	G	150	C	C	C	C	120	120	120	120	G	G	110	B	105	105	S	100
14	100	100	100	100	100	100	140	125	125	110	105	105	105	100	120	G	150	145	130	110	100	100	100	110
15	110	100	100	B	105	B	130	120	110	110	105	110	100	100	100	100	105	100	100	95	95	95	95	105
16	100	100	100	100	100	100	G	105	G	125	110	110	100	100	150	135	130	125	120	120	100	100	100	S
17	100	100	100	100	100	105	145	135	125	120	125	120	110	120	100	G	100	150	145	110	110	S	S	105
18	105	S	100	100	E	B	135	130	130	130	125	130	130	130	G	125	G	120	105	105	105	125	115	S
19	105	100	100	100	100	S	130	140	125	115	110	110	120	115	110	115	120	110	100	100	S	100	100	105
20	105	S	105	105	S	145	135	125	140	C	115	130	110	110	140	115	130	105	105	105	S	100	100	100
21	100	100	100	100	B	125	110	110	105	125	100	100	100	G	G	150	110	105	105	100	100	S	S	100
22	100	100	100	100	100	100	150	130	105	100	105	105	110	145	140	125	115	110	100	110	105	105	105	105
23	100	100	100	100	100	100	140	125	120	110	110	110	G	100	110	120	G	110	105	105	100	100	105	100
24	100	105	100	100	100	100	130	125	115	115	115	105	105	105	105	105	125	115	105	105	100	100	100	100
25	105	100	100	100	E	100	150	125	120	110	110	110	110	130	125	120	115	115	110	105	105	105	100	100
26	S	100	100	100	100	100	125	145	125	110	110	110	105	130	115	C	C	110	100	105	105	105	110	105
27	105	100	100	100	100	145	120	115	110	110	105	105	100	100	100	140	120	110	100	100	100	100	100	100
28	100	100	110	100	100	100	130	125	120	115	105	110	105	100	100	115	95	100	100	100	100	100	110	110
29	100	95	105	100	100	100	125	120	115	120	110	105	105	100	100	100	100	100	100	100	100	100	100	100
30	95	100	110	100	100	100	100	140	135	125	120	115	115	G	G	150	135	120	105	105	105	100	100	100
31	100	100	100	100	100	120	120	120	110	110	105	105	105	105	120	110	G	130	120	110	110	110	105	115
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	25	25	23	19	18	24	30	27	29	28	29	26	26	23	26	25	27	29	28	26	26	26	26
MED	100	100	100	100	100	100	130	125	120	115	110	110	105	108	115	125	120	115	105	105	105	100	100	100
UQ	100	100	100	100	100	110	140	140	125	125	115	120	115	130	135	140	135	128	120	110	105	105	105	105
LQ	100	100	100	100	100	100	125	120	110	110	105	105	100	100	100	115	105	110	100	102	100	100	100	100

The Radio Research Laboratories, Japan

MAY. 1971

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

# IONOSPHERIC DATA

MAY. 1971

TYPES OF ES

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

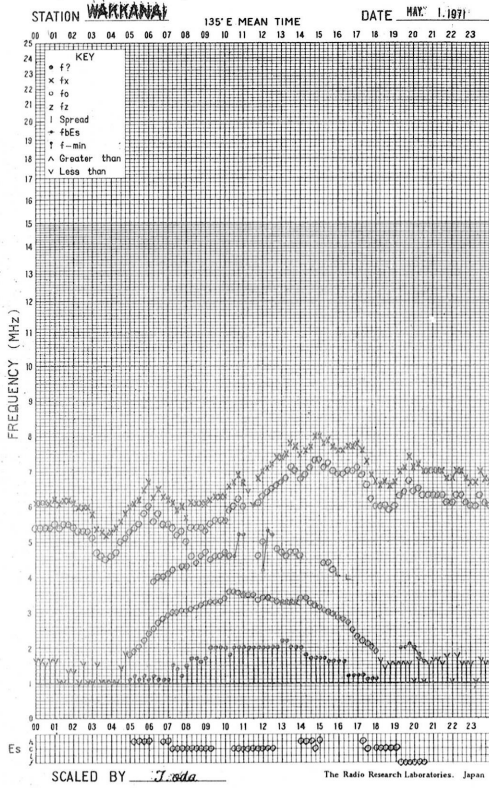
Station **YAMAGAWA** Lat. **31 12.1 N** Long. **130 37.1 E** Sweep **1** MHz to **20** MHz in **20** sec in automatic operation

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

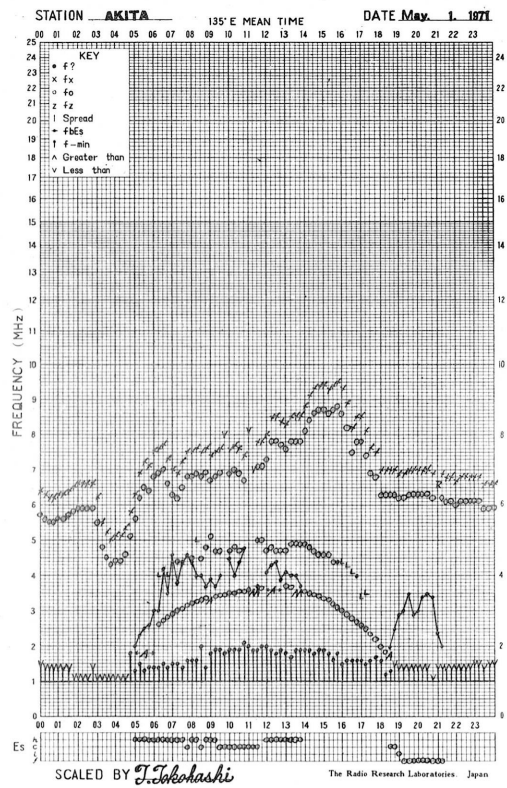
MAY. 1971

TYPES OF ES

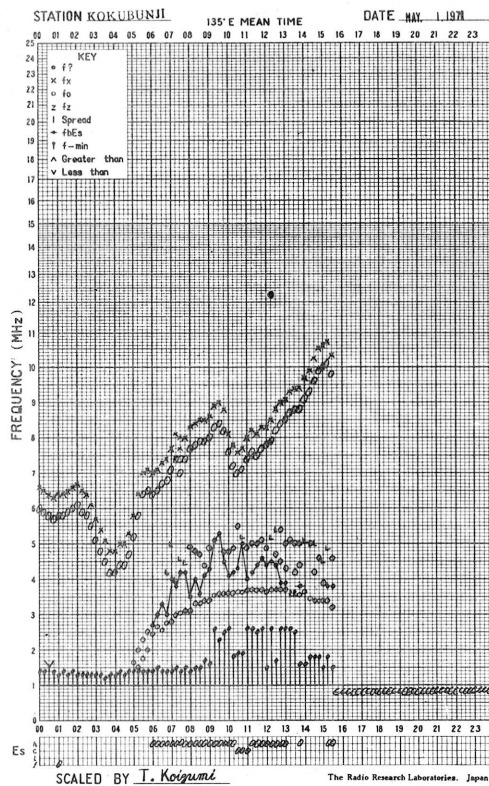
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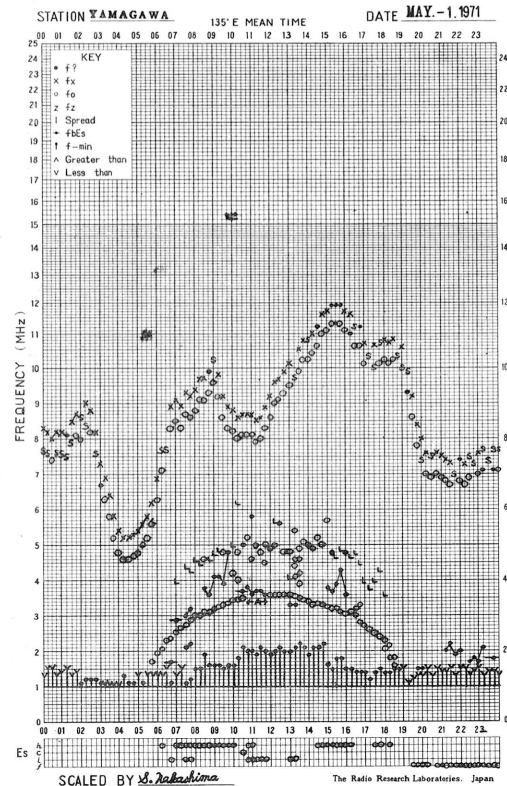
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f-PLOT OF IONOSPHERIC DATA

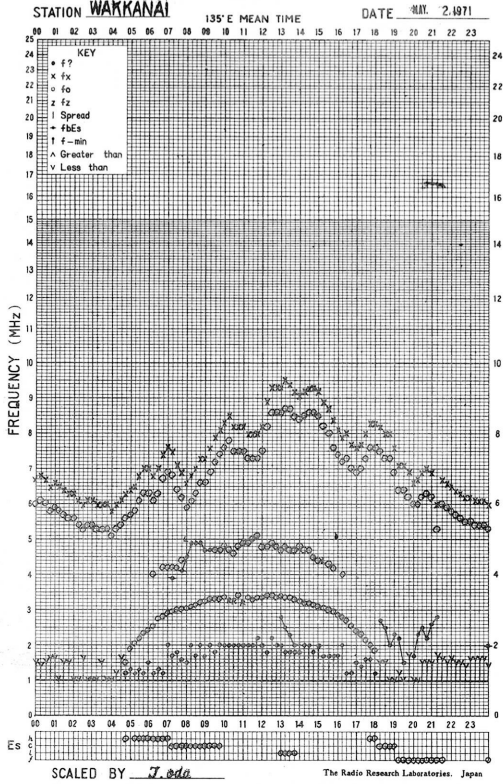


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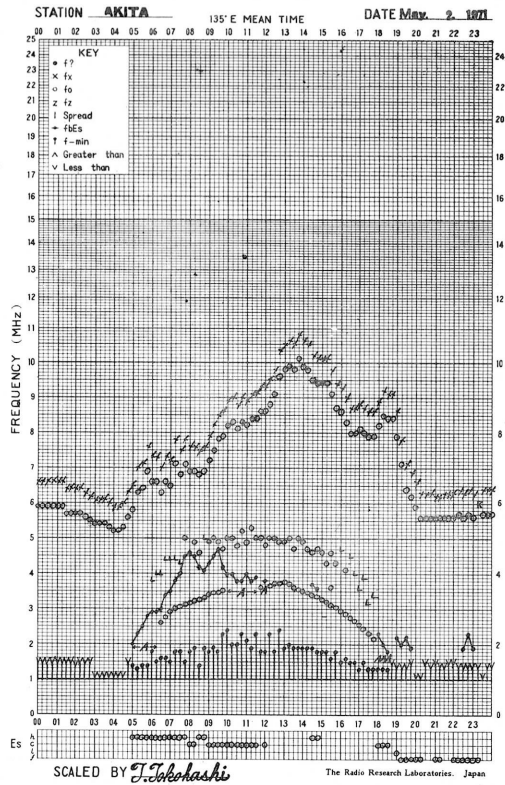




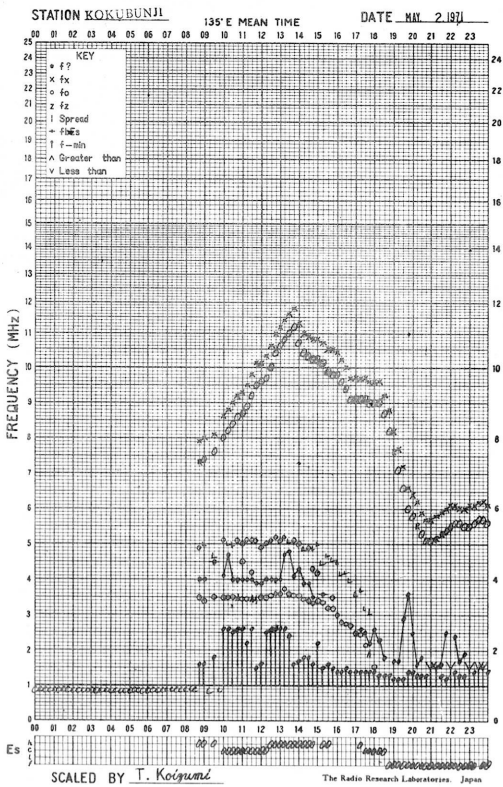
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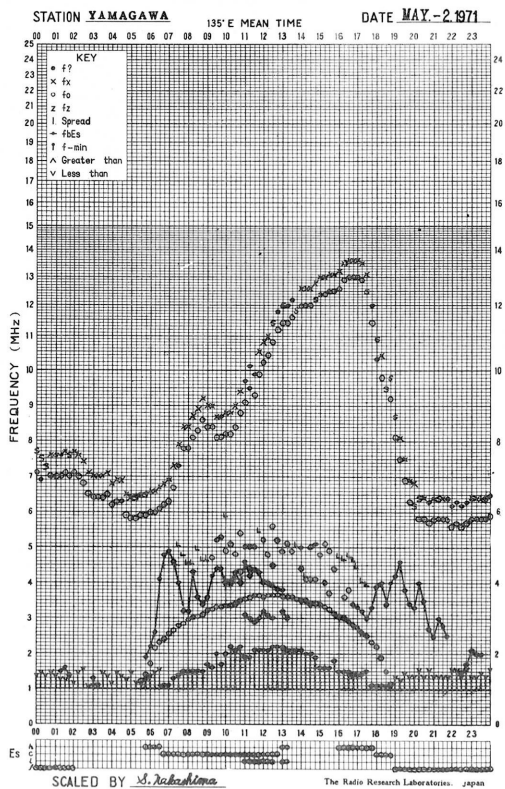
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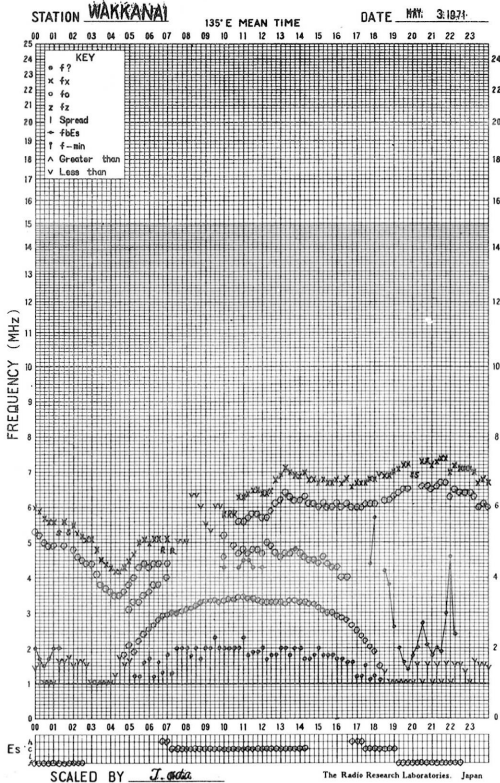
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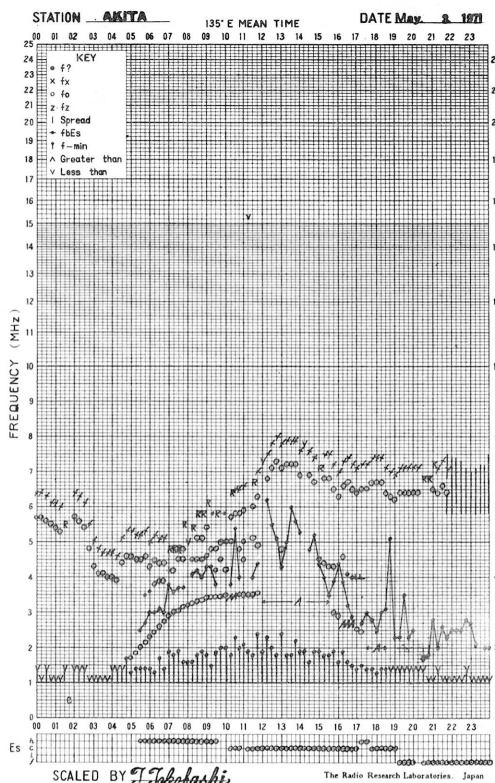
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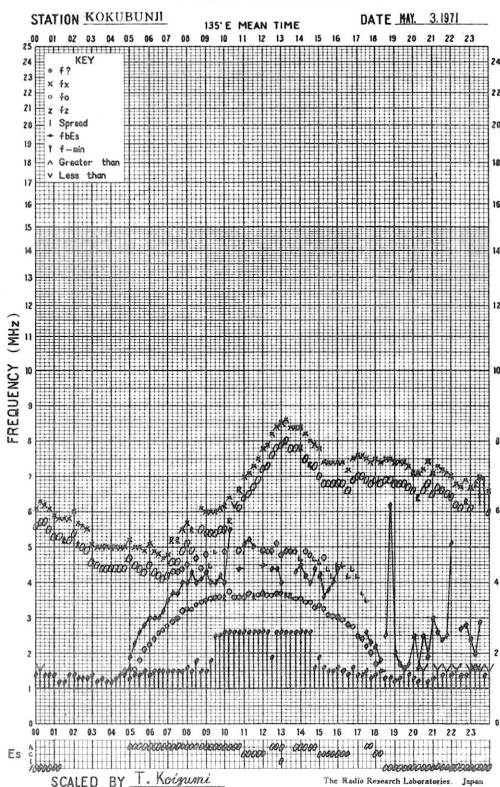
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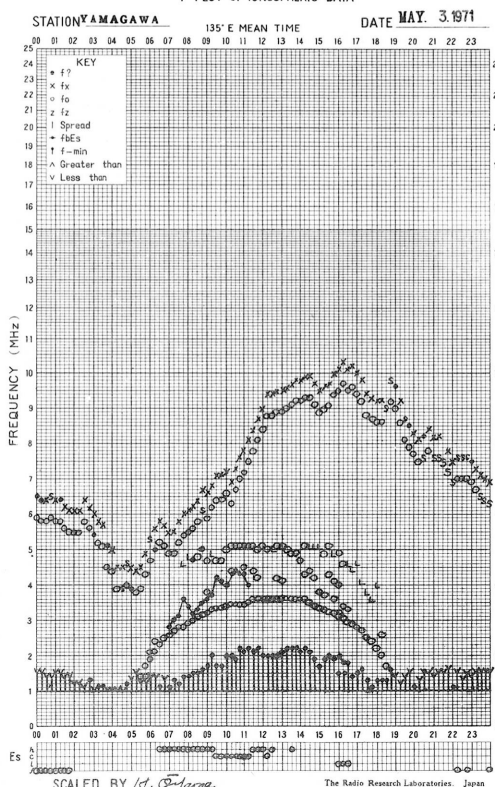
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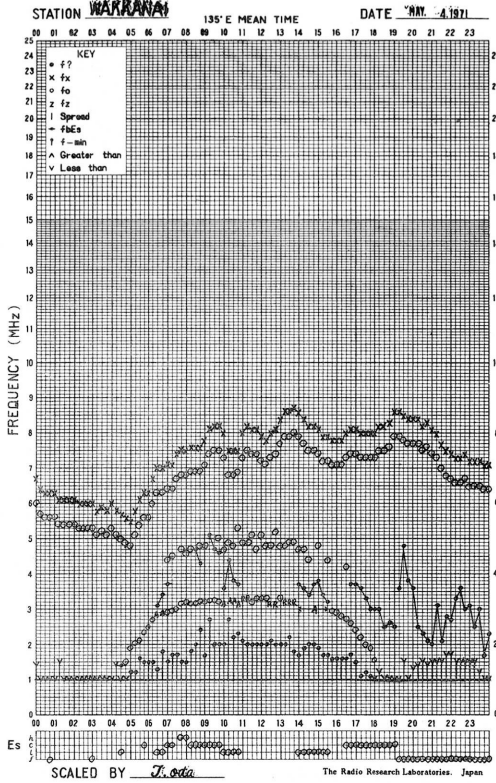


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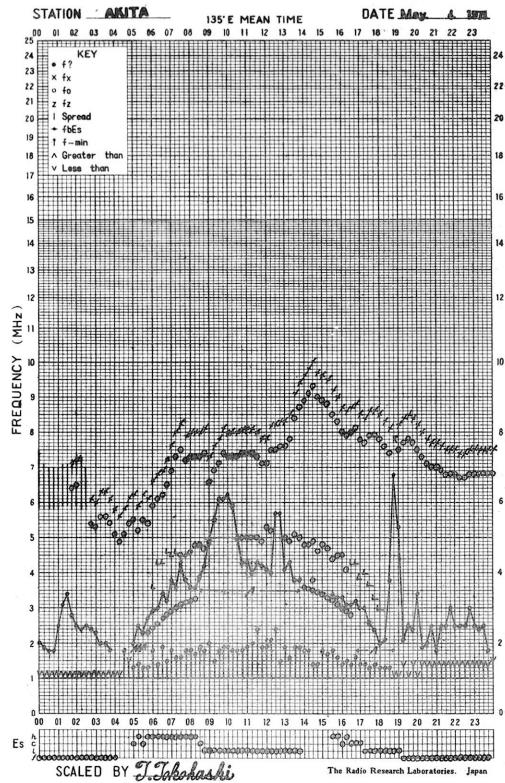




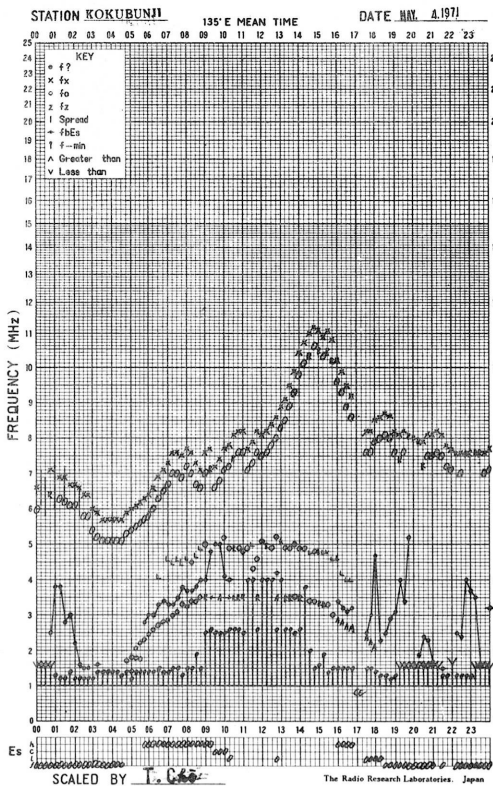
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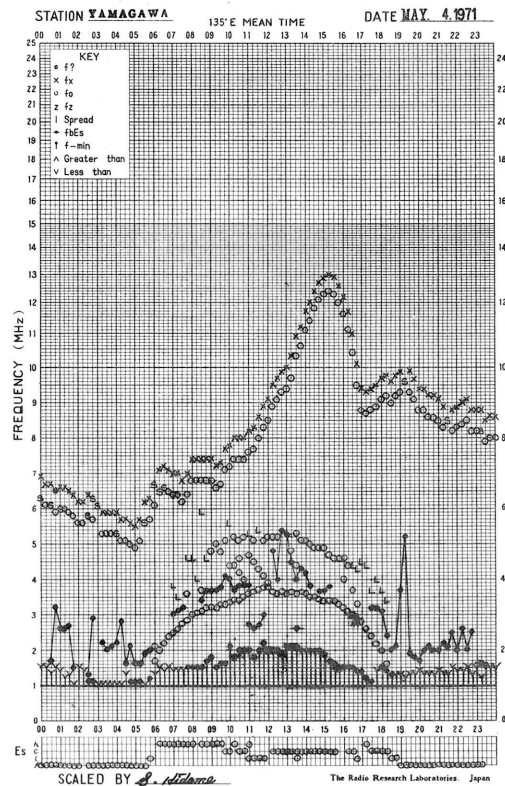
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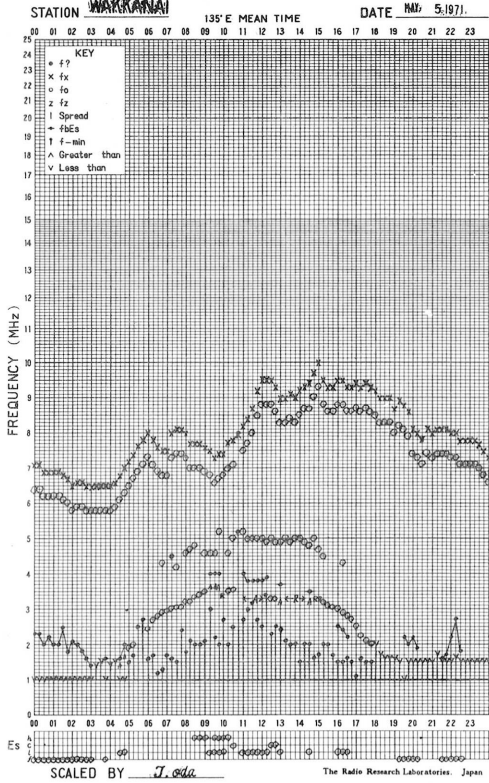
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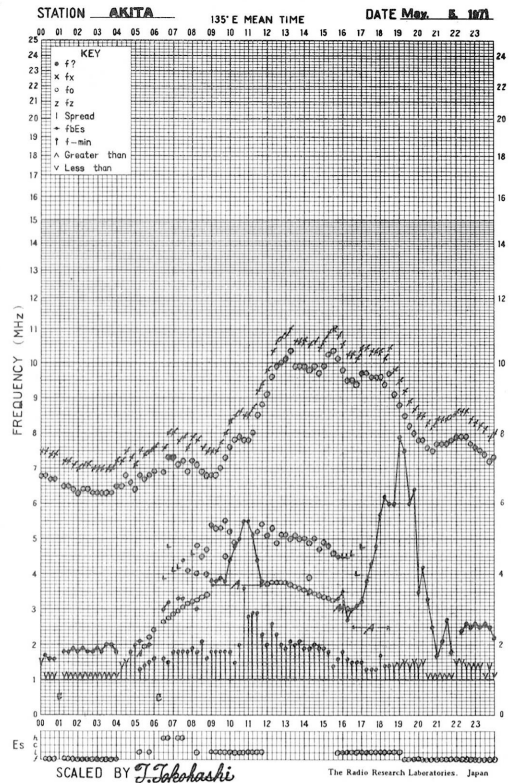
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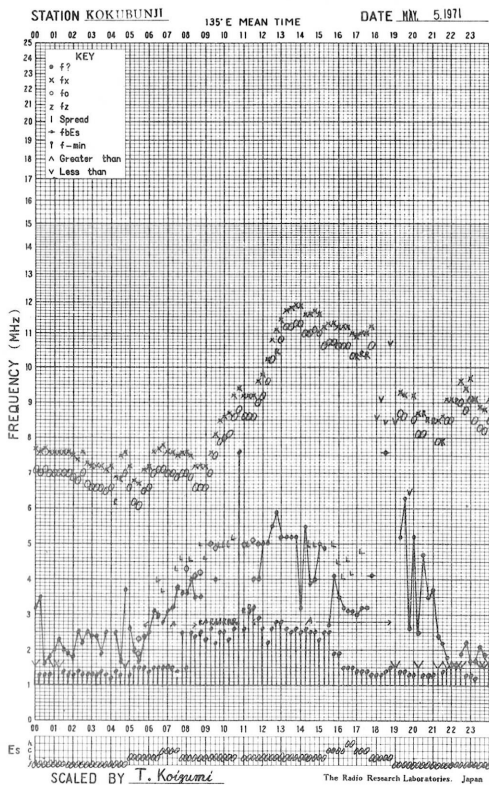
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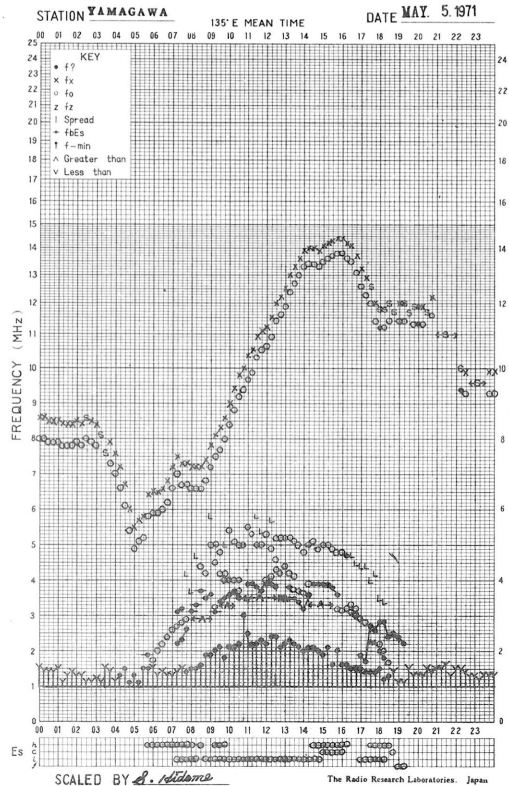
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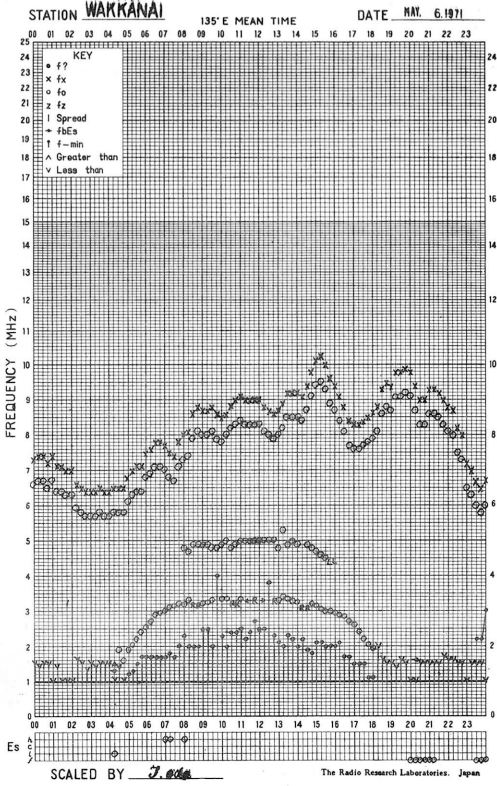
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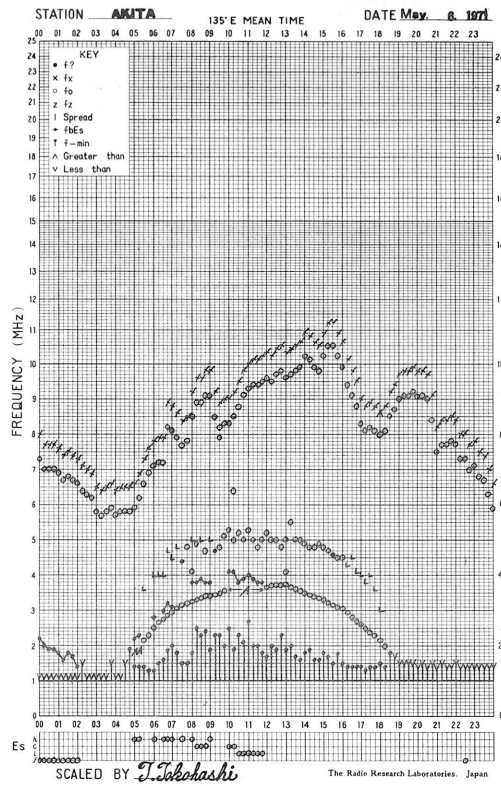
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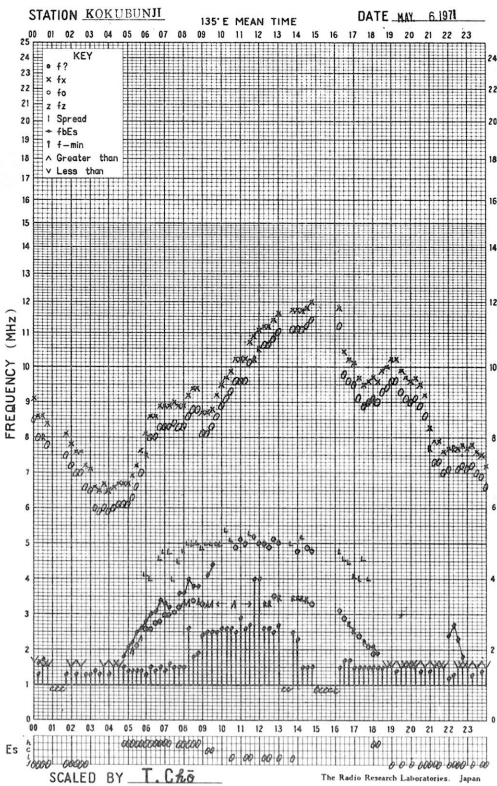
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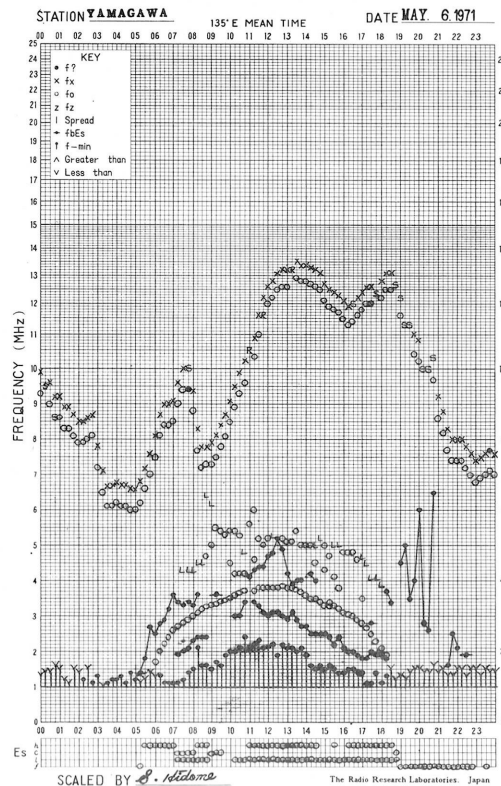
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f-PLOT OF IONOSPHERIC DATA

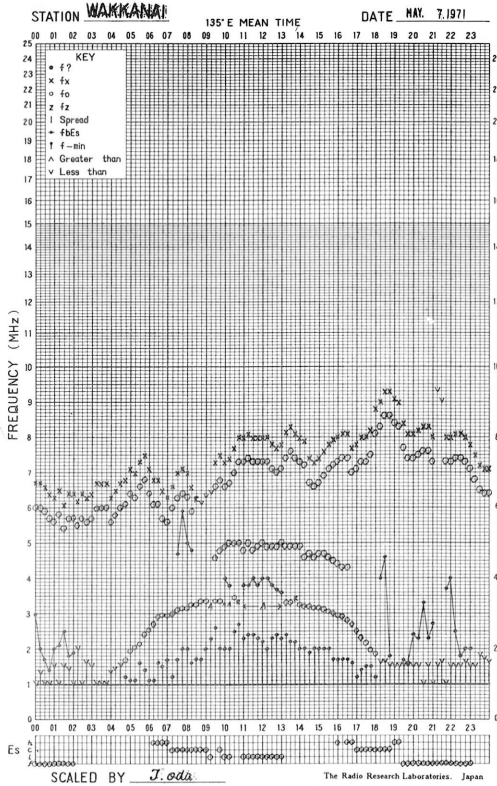


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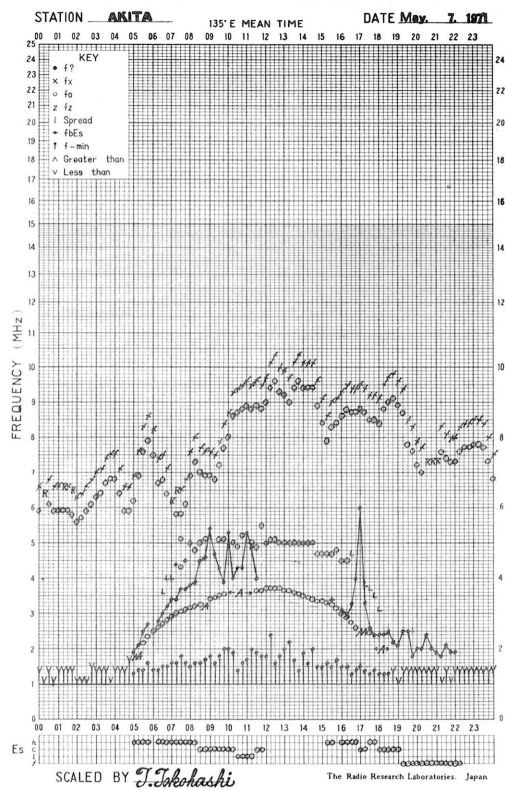




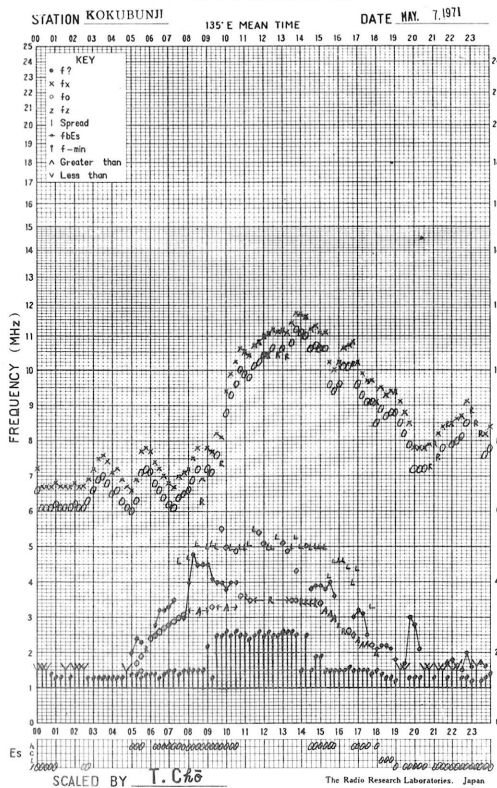
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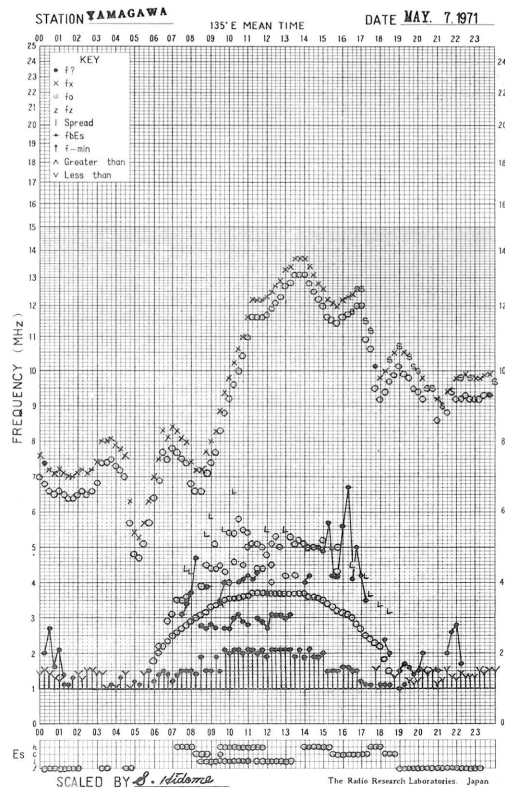
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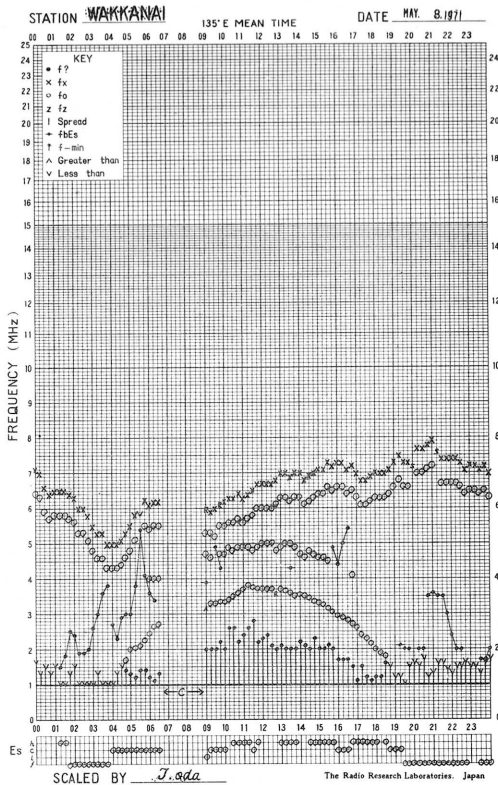
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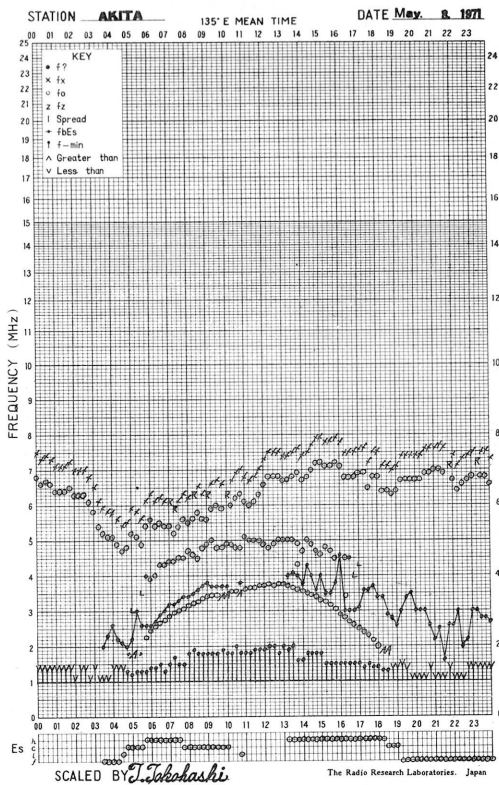
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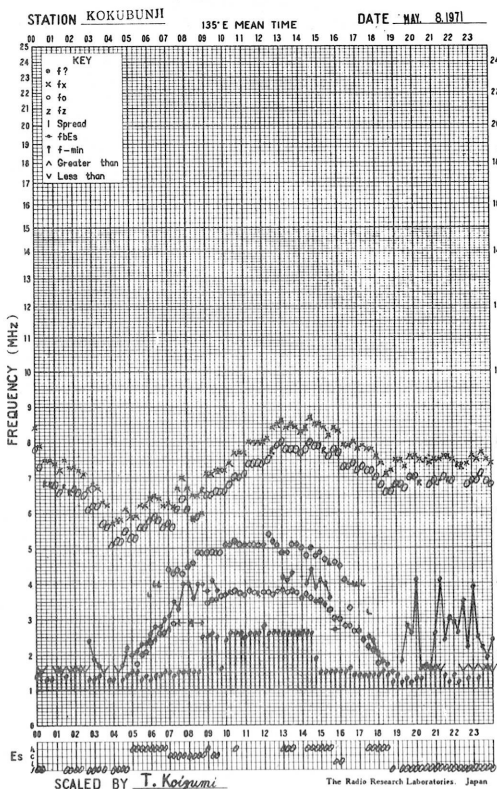
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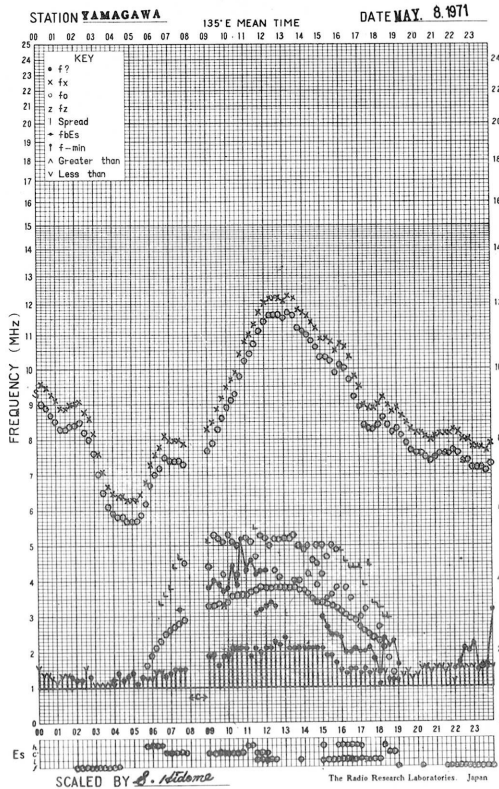
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f-PLOT OF IONOSPHERIC DATA

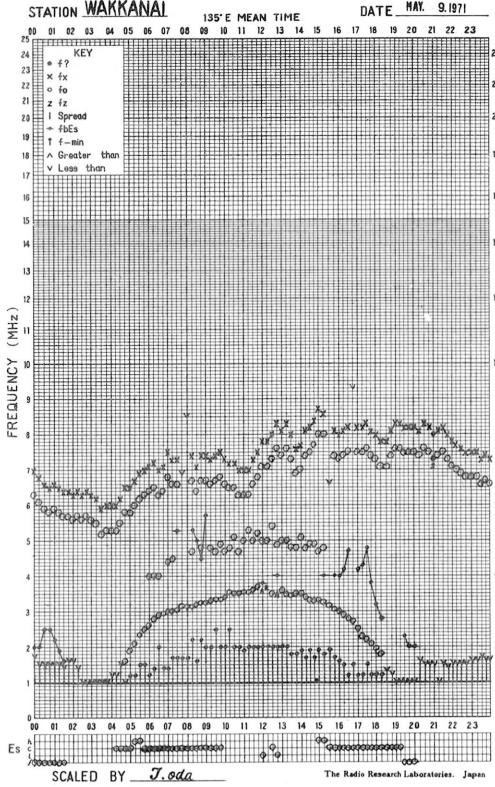


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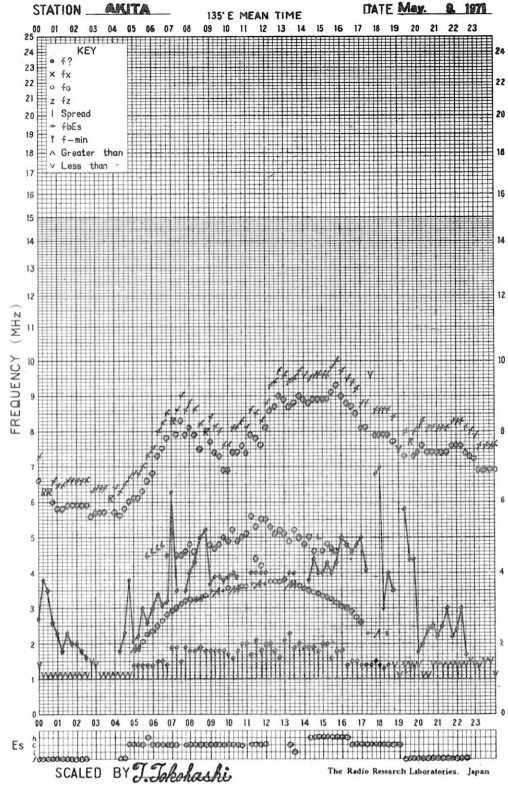




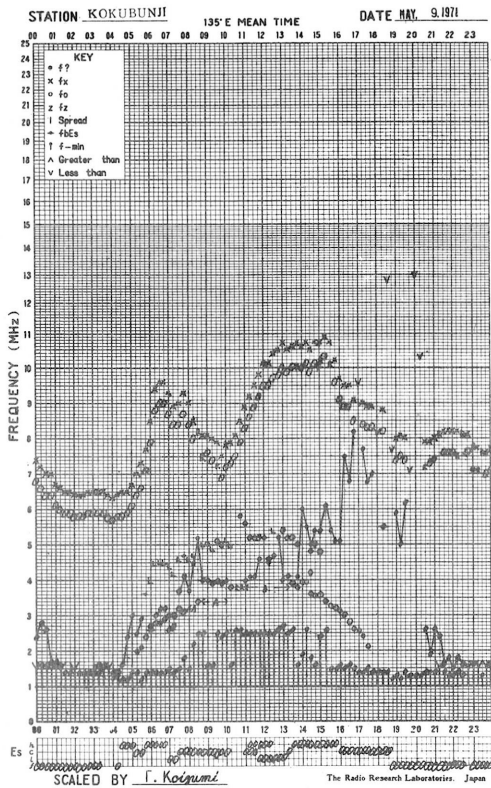
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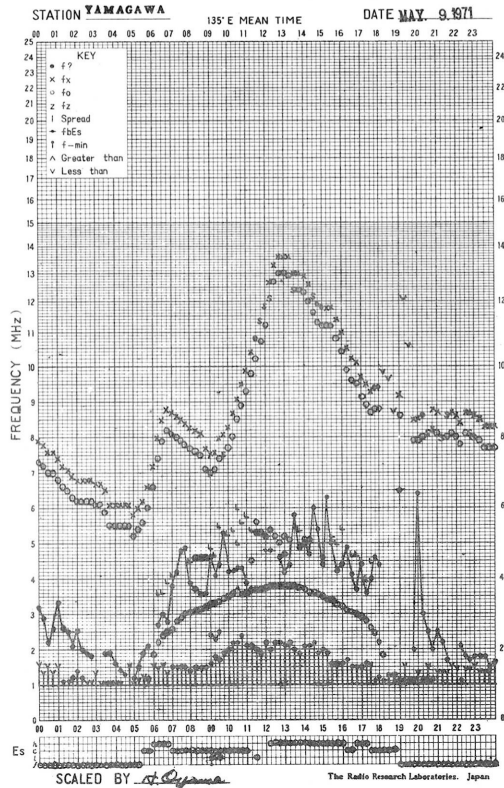
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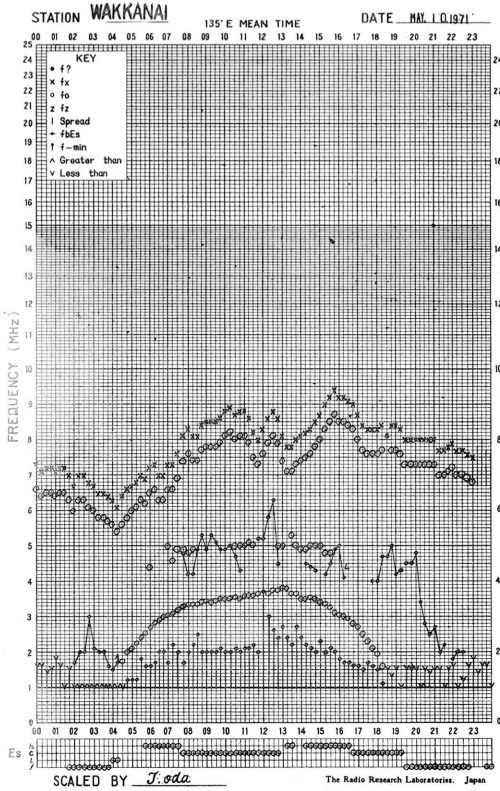
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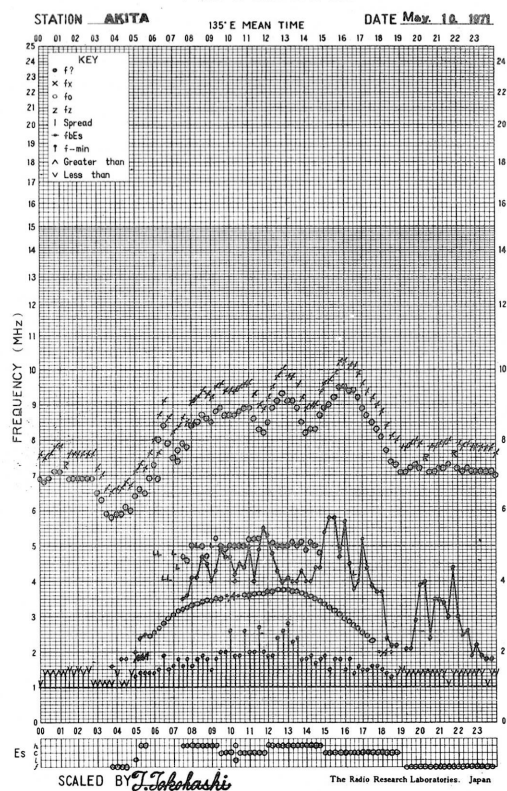
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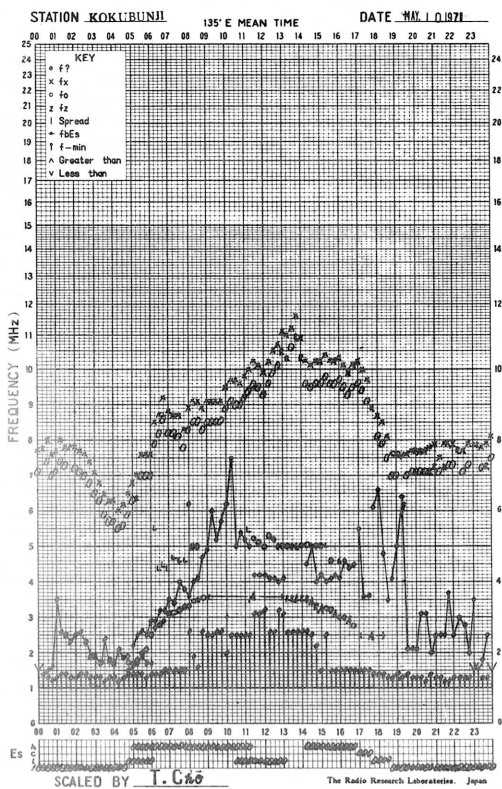
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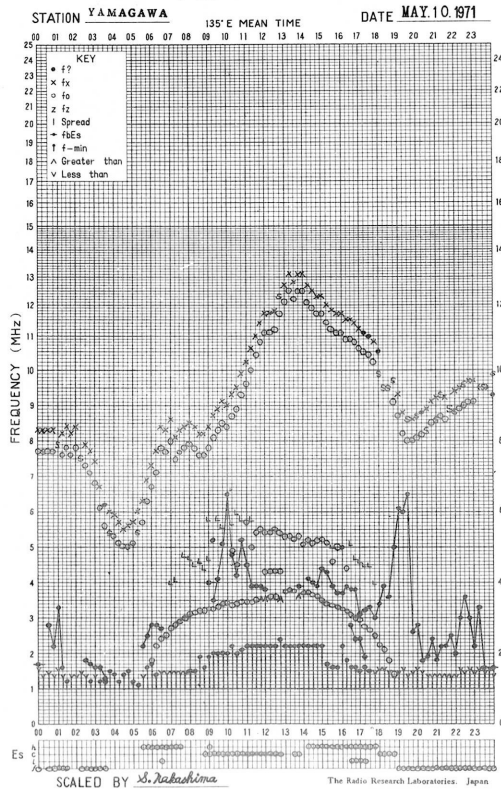
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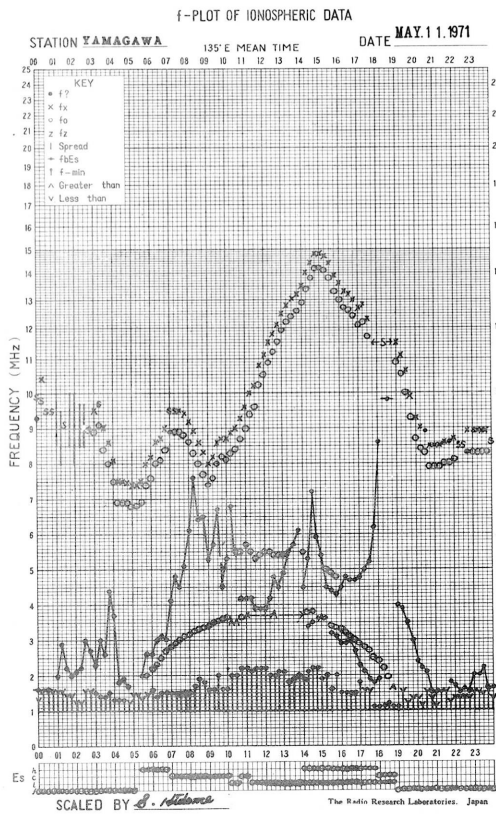
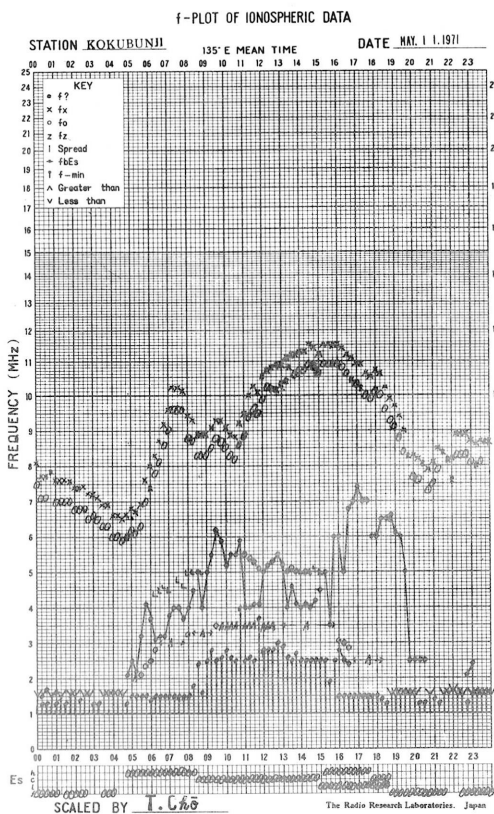
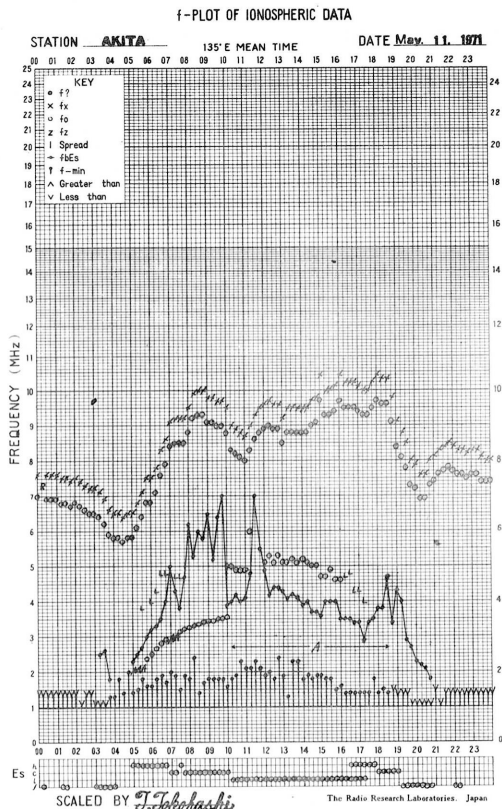
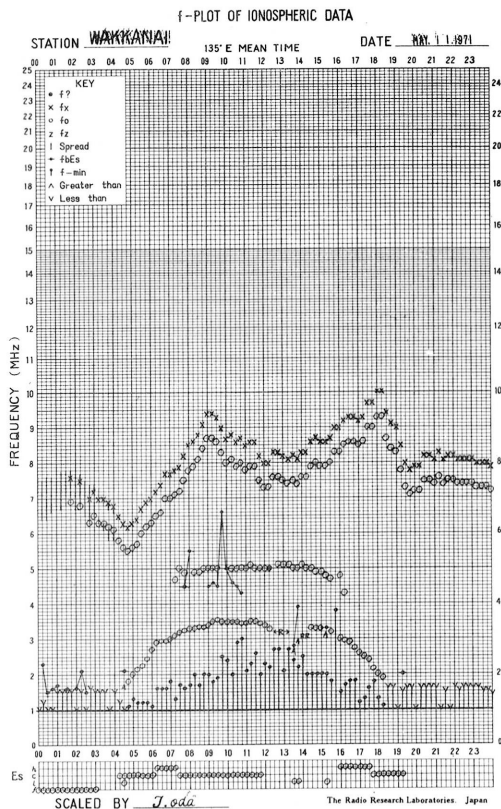


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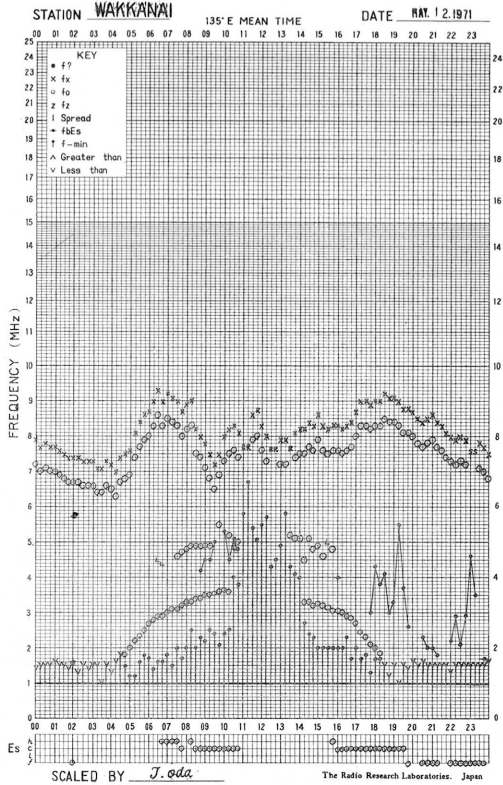
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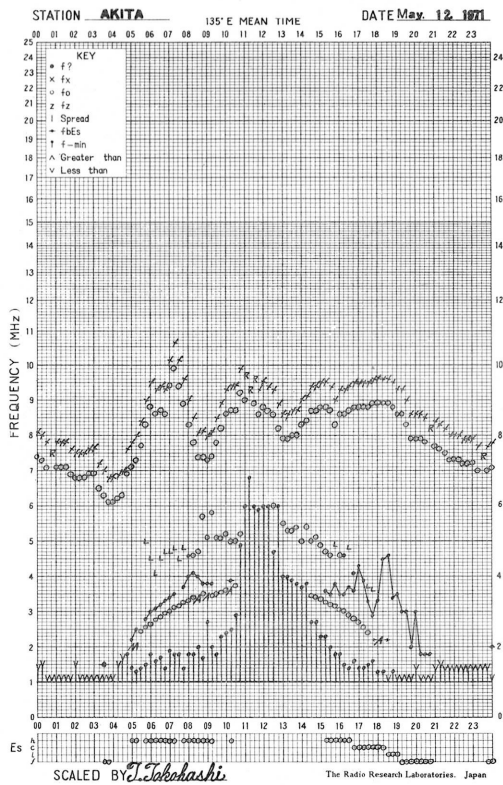




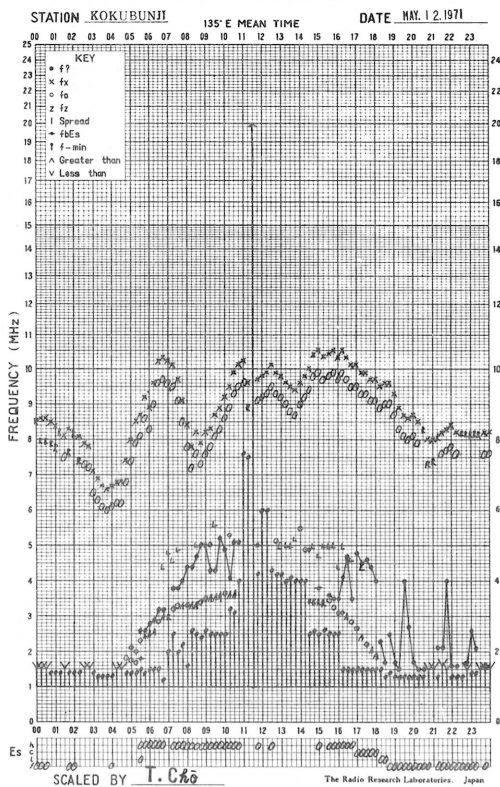
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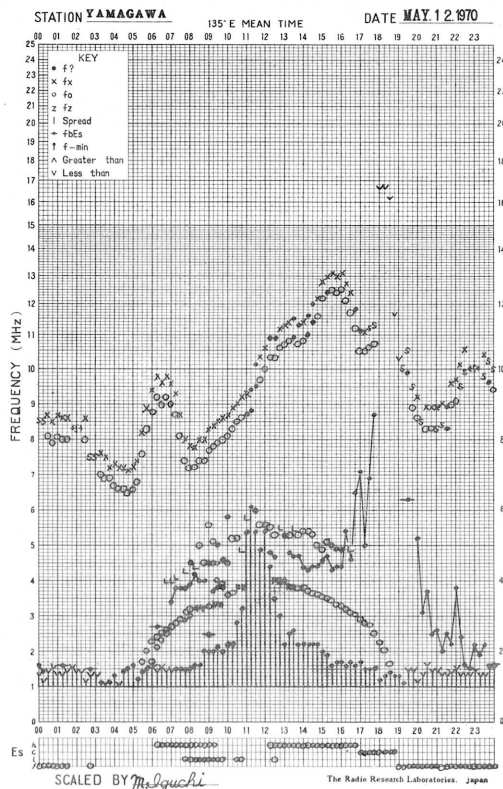
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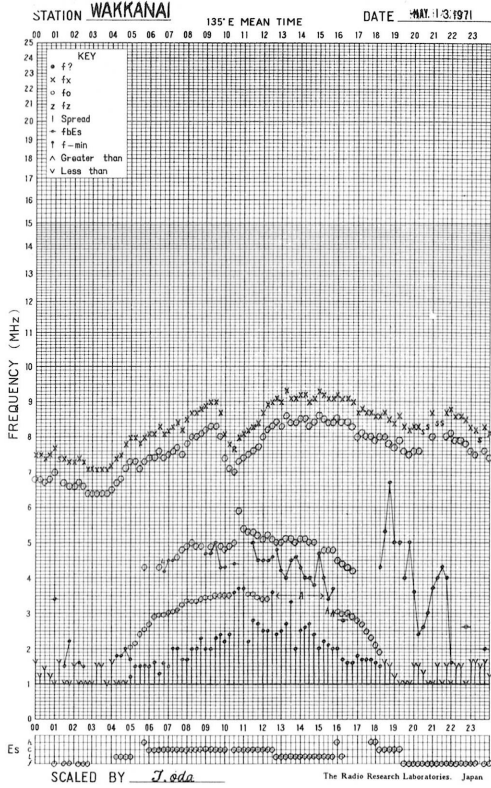
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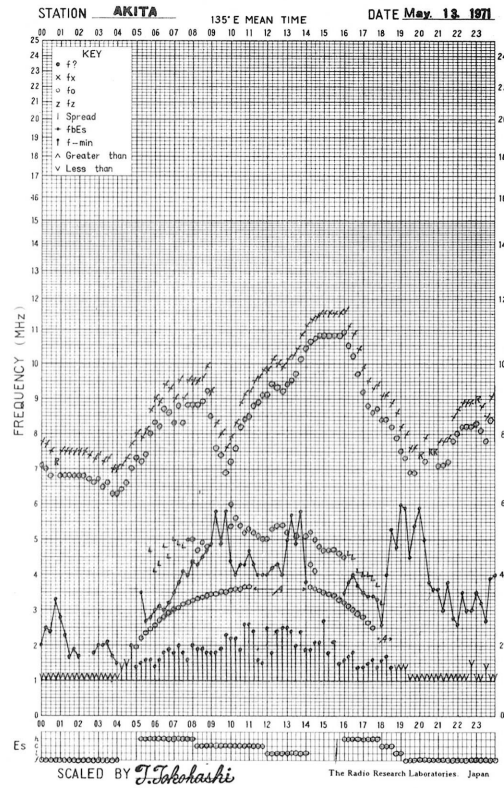
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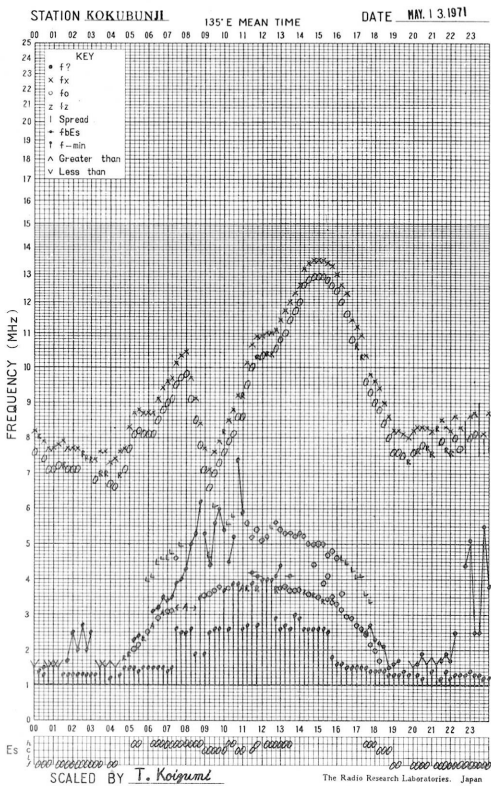
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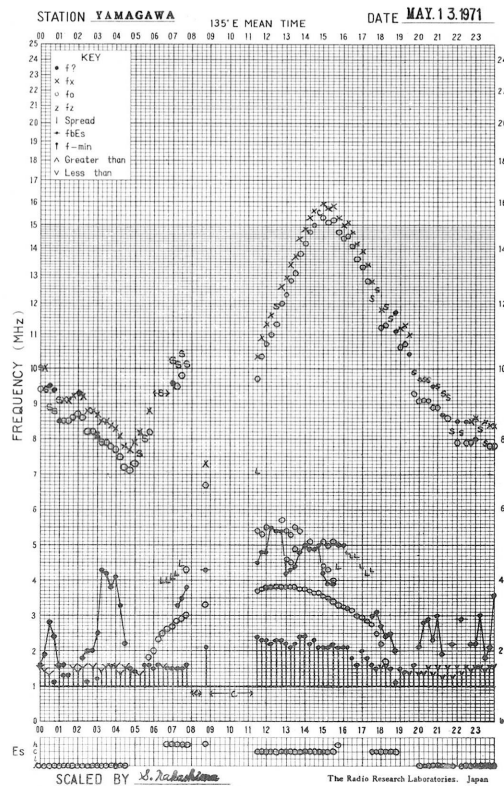
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f-PLOT OF IONOSPHERIC DATA

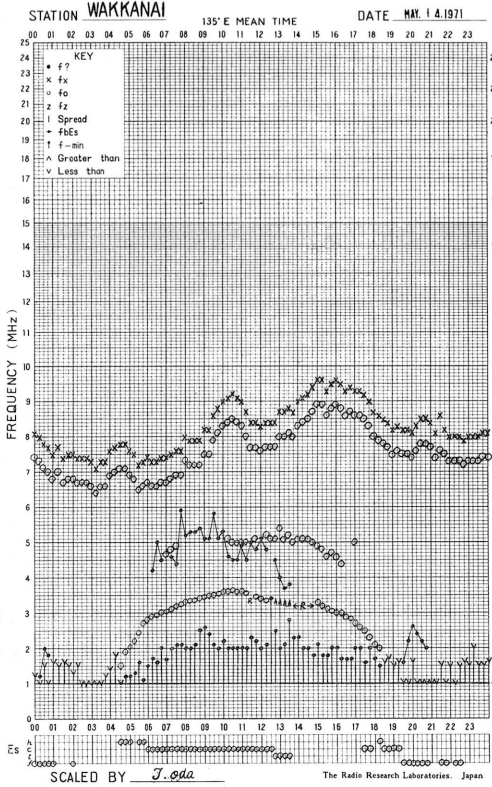


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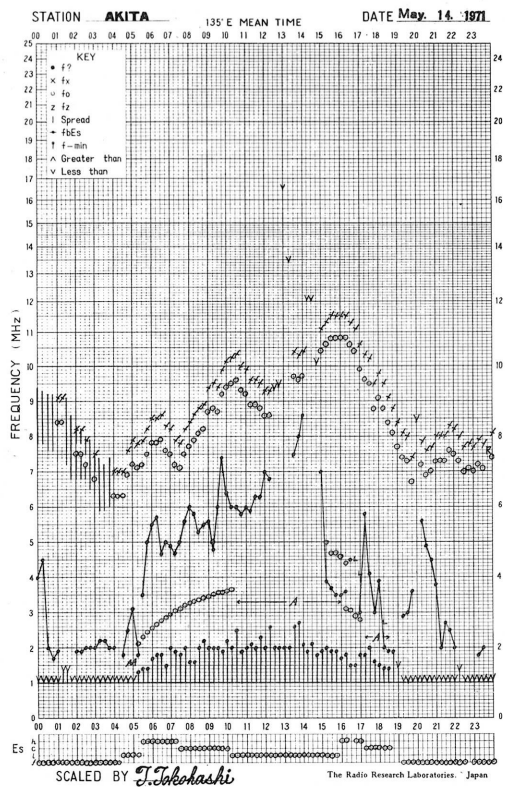




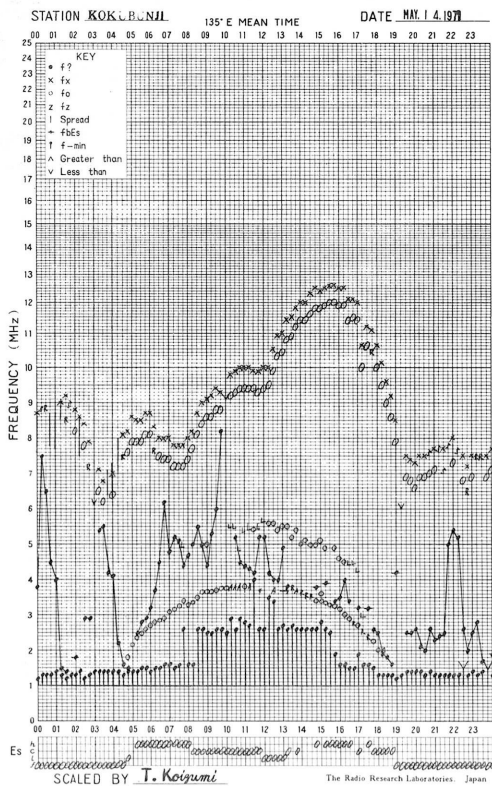
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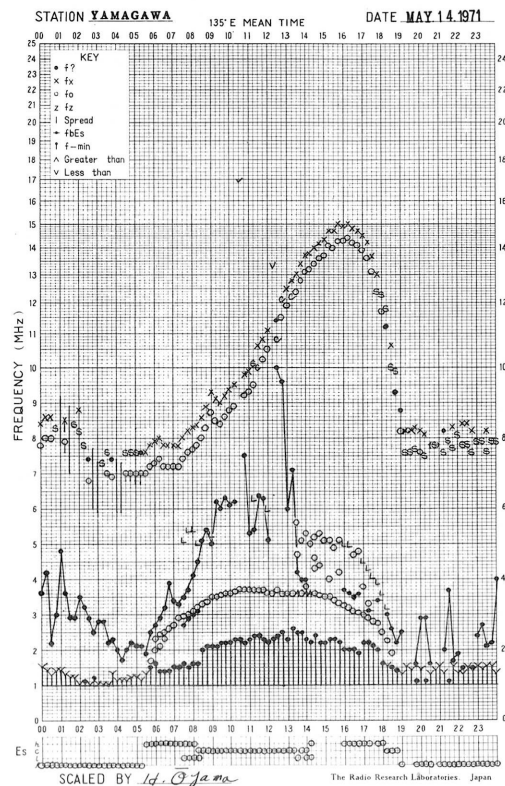
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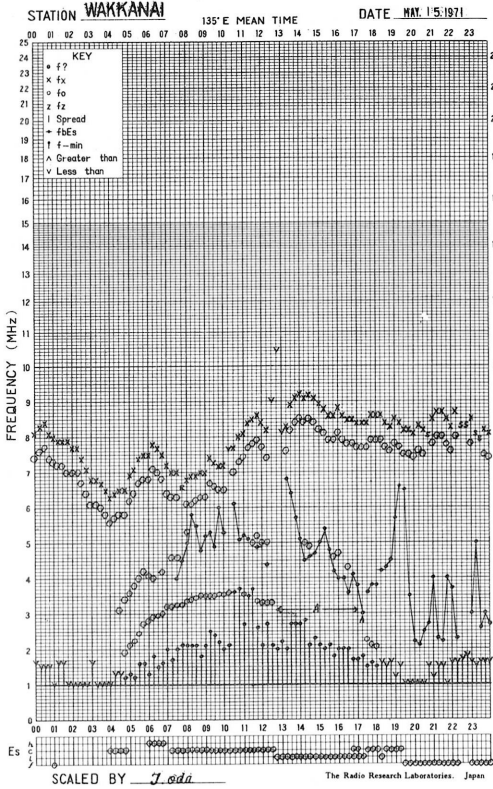
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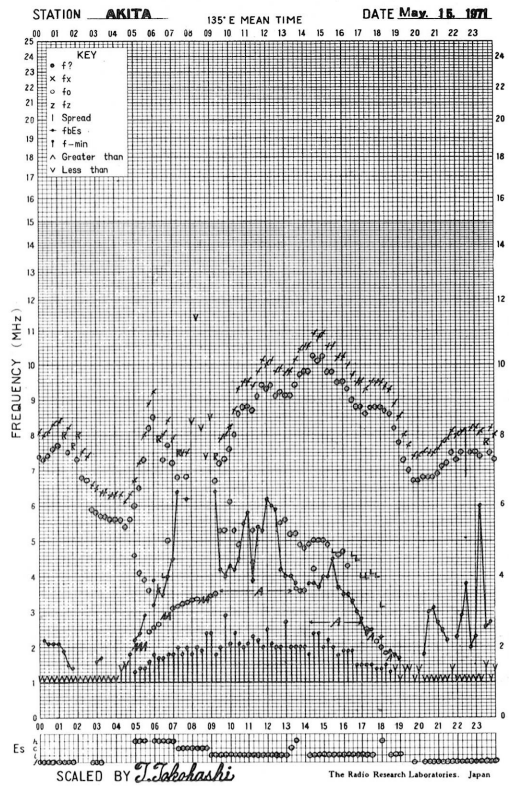
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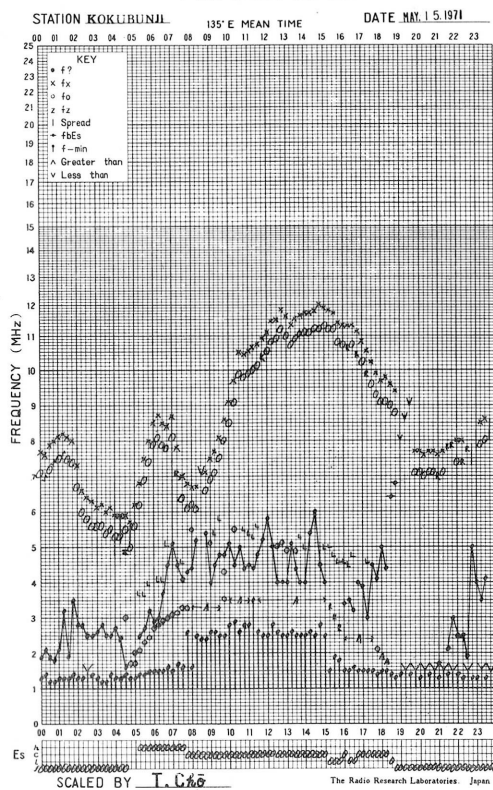
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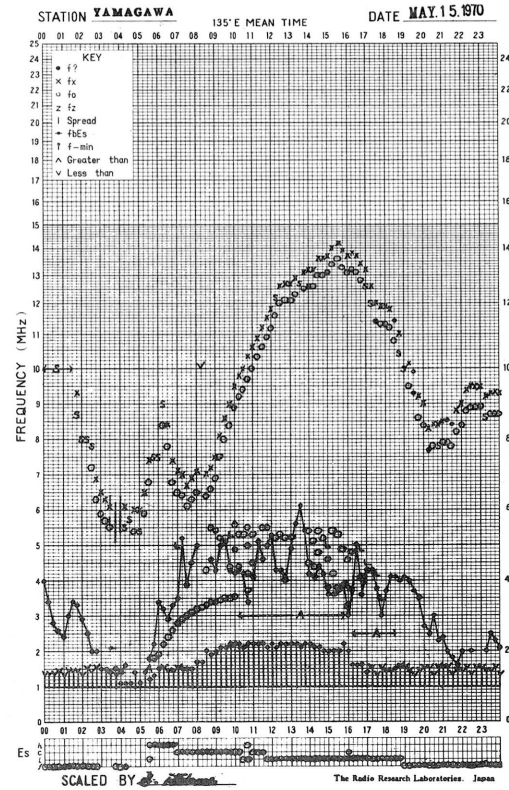
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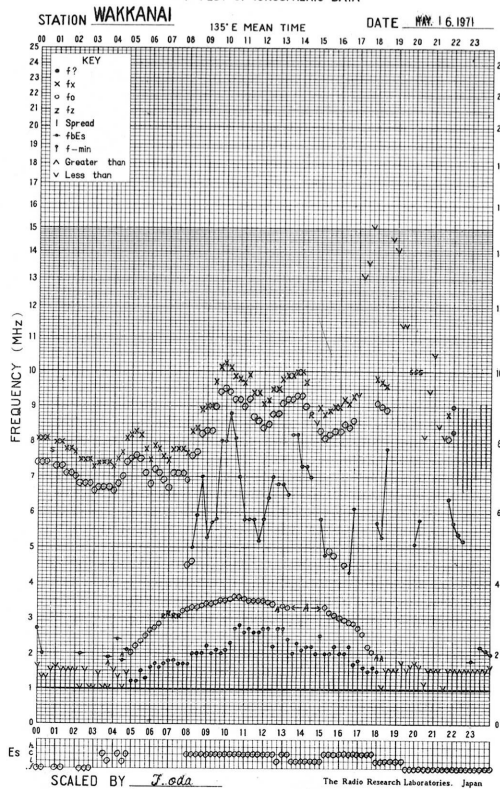
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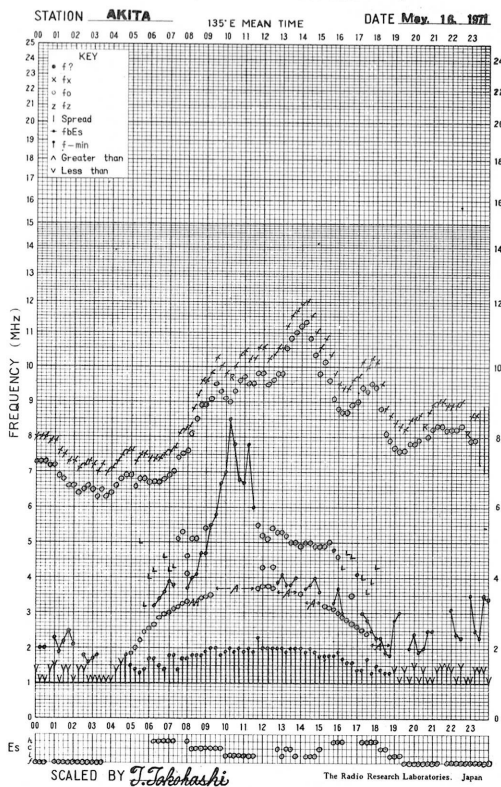
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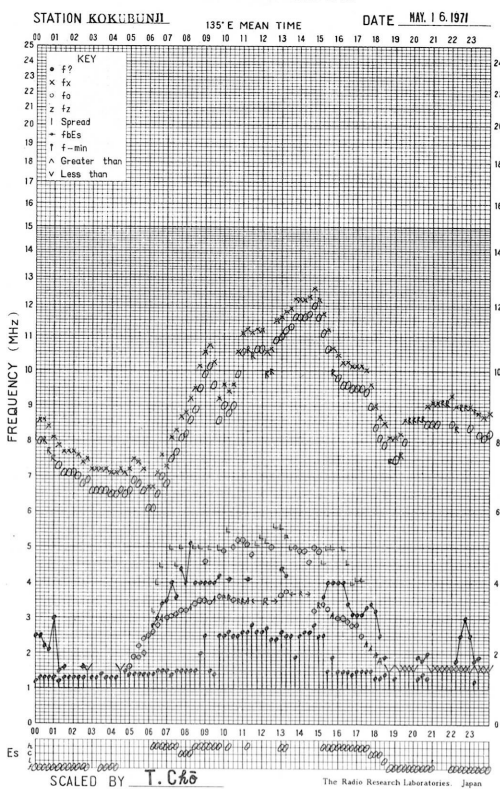
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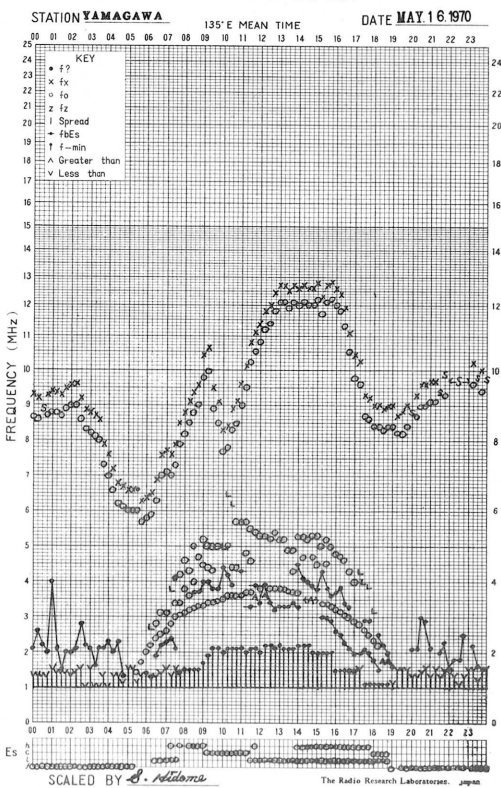
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

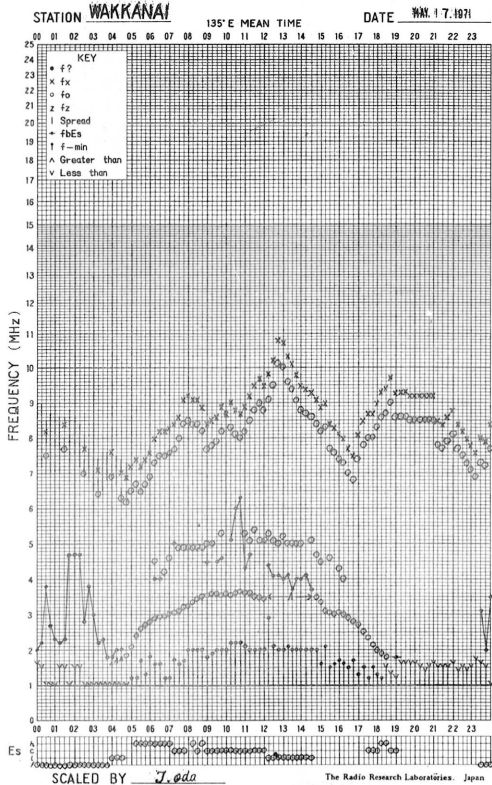


f-PLOT OF IONOSPHERIC DATA

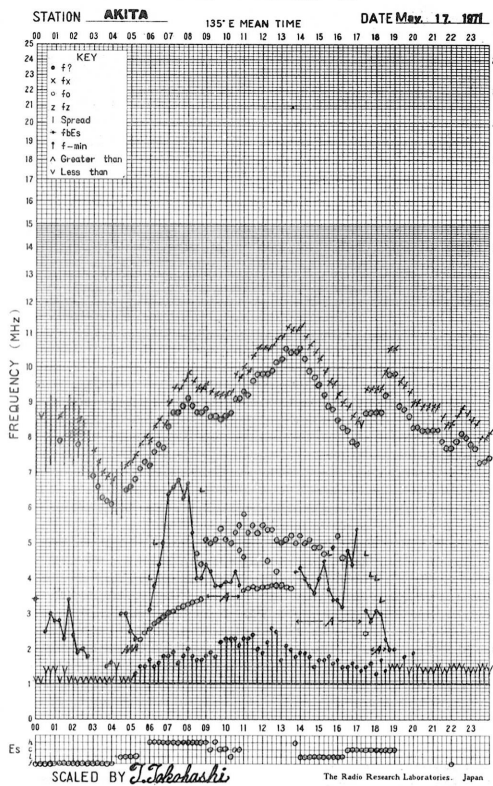




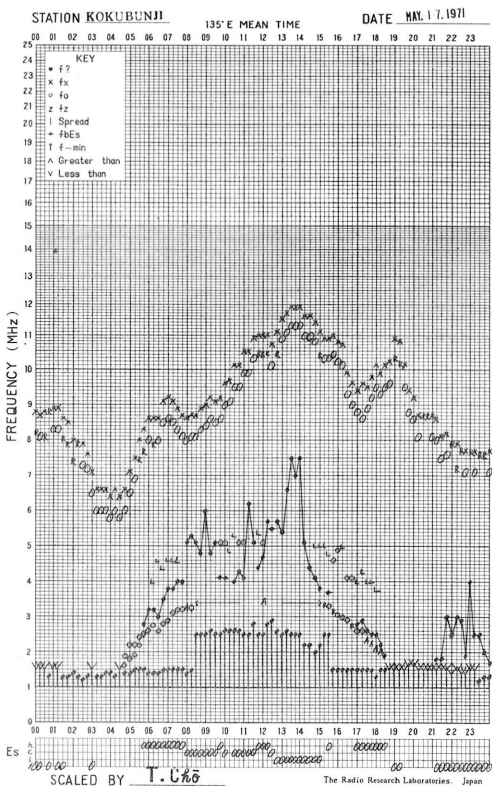
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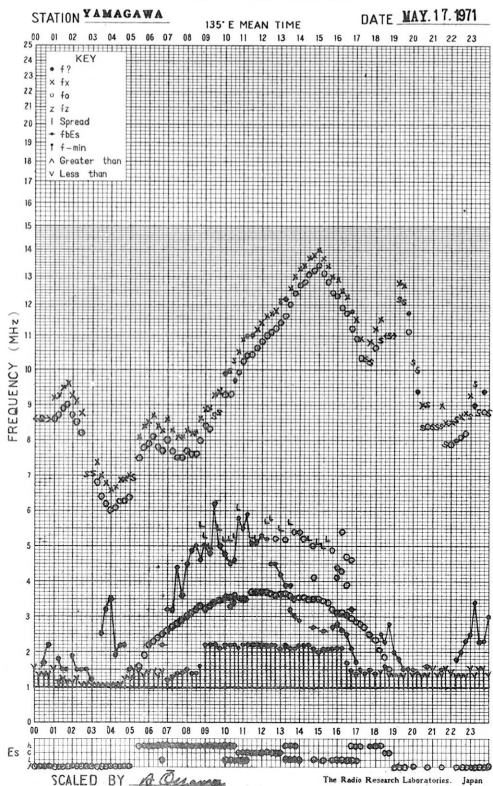
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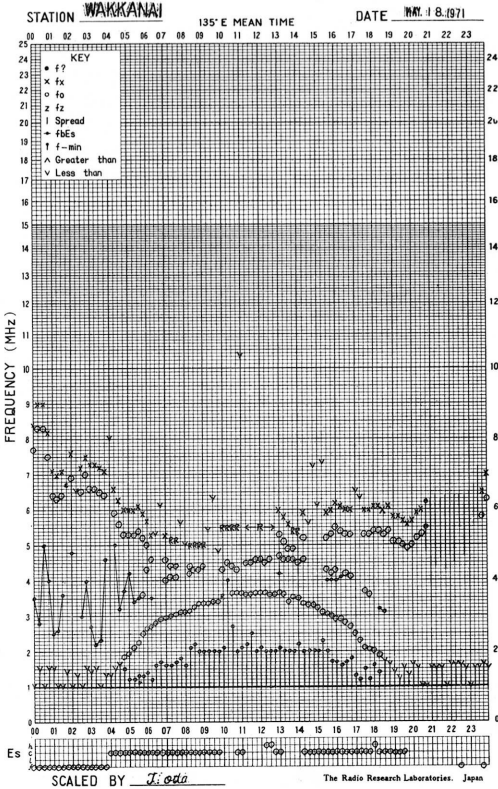
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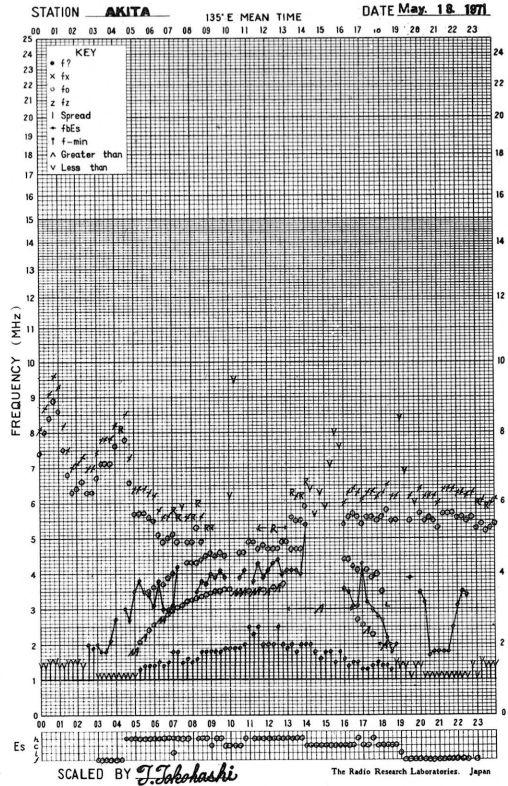
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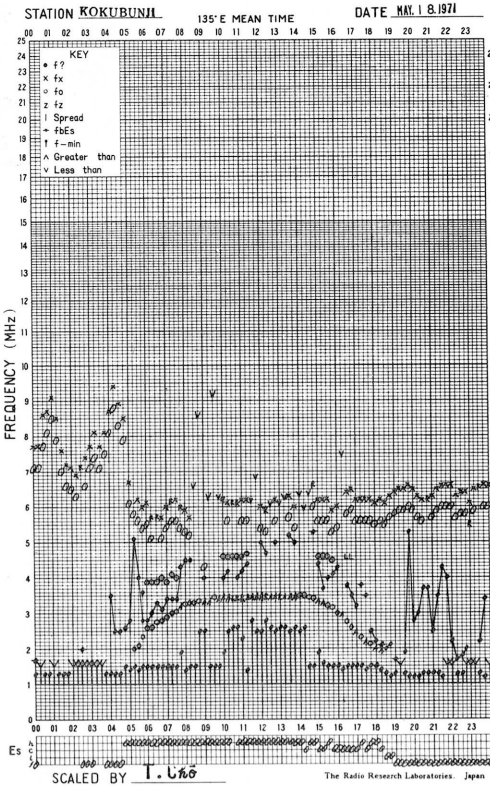
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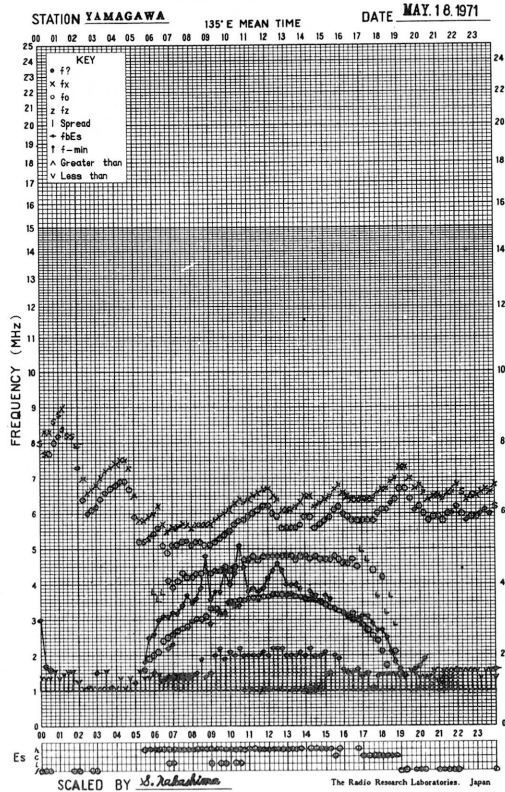
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f-PLOT OF IONOSPHERIC DATA

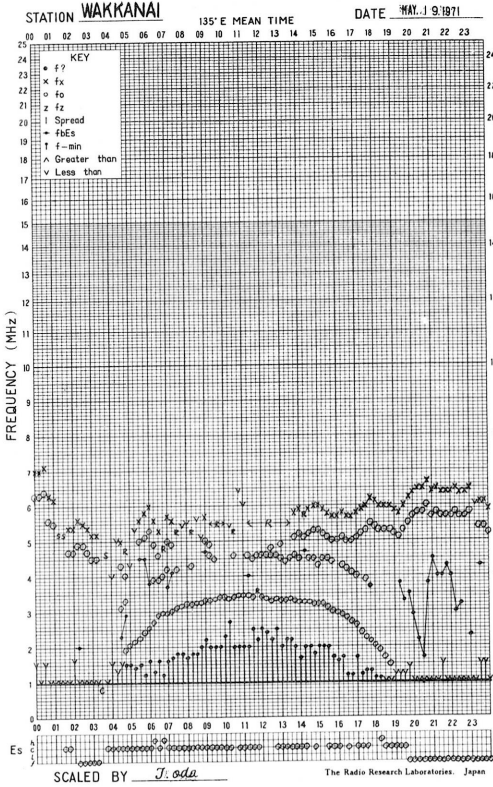


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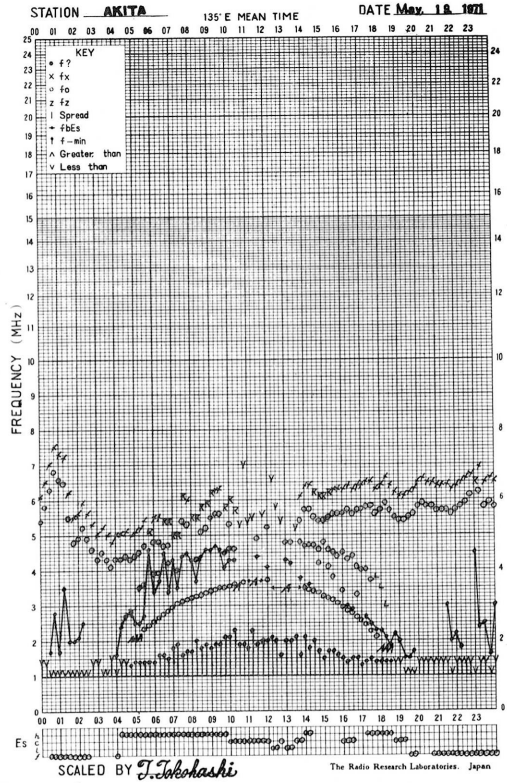




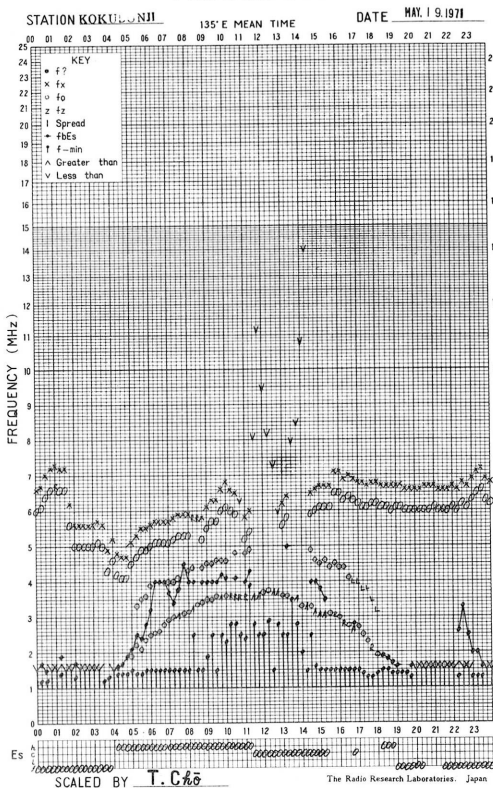
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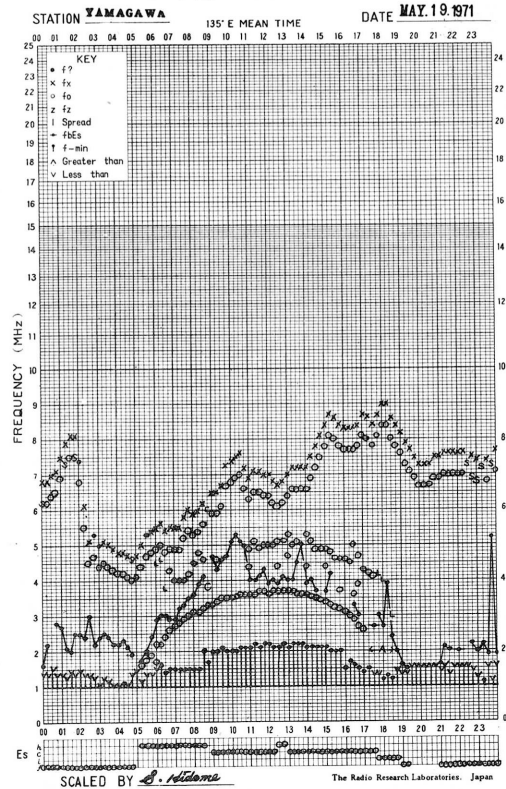
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f-PLOT OF IONOSPHERIC DATA

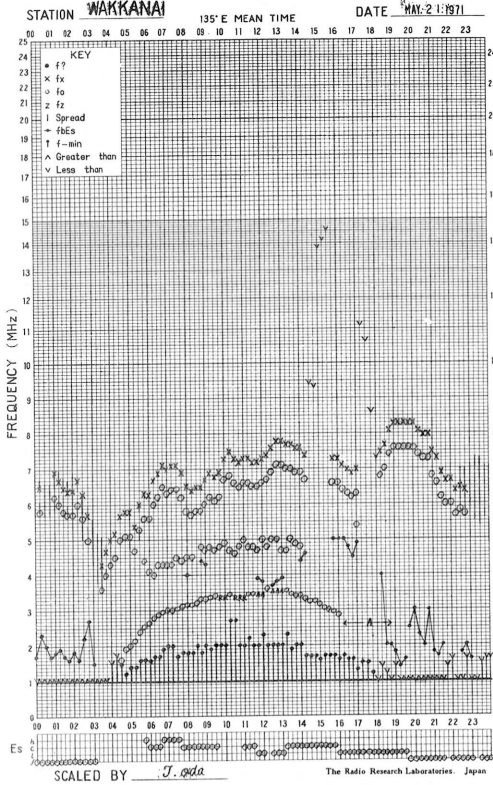


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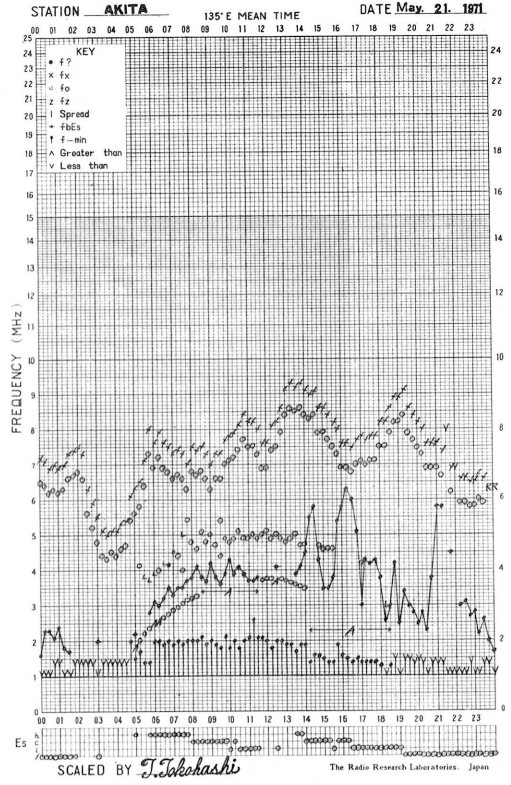




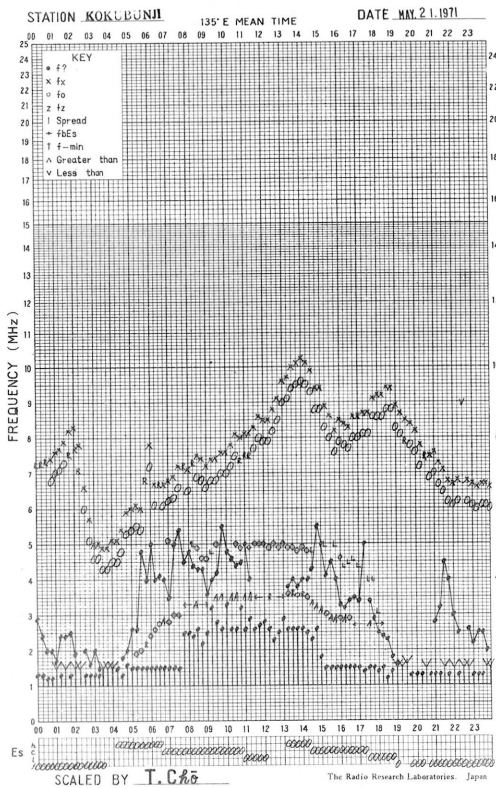
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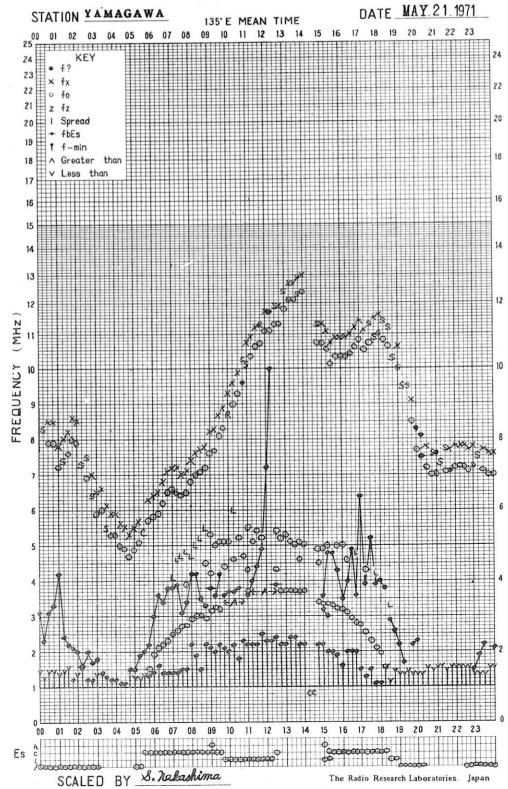
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f-PLOT OF IONOSPHERIC DATA

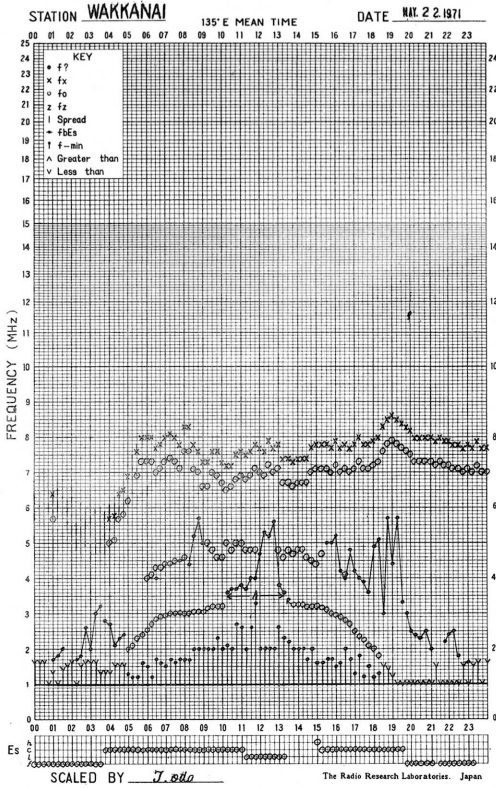


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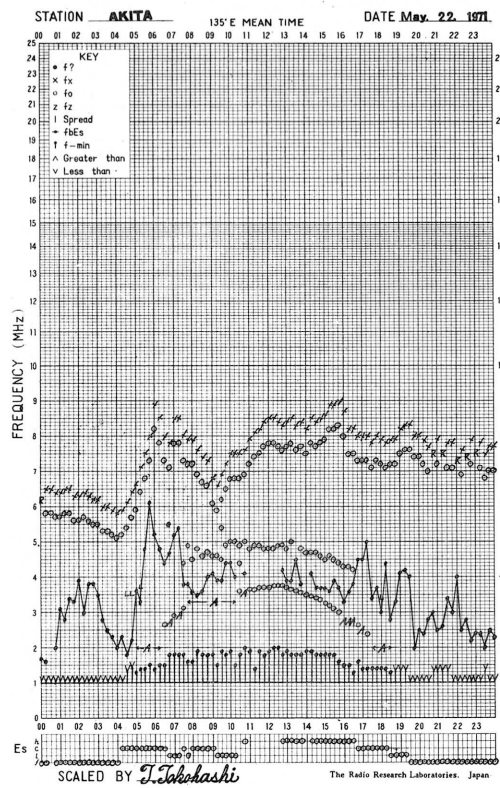




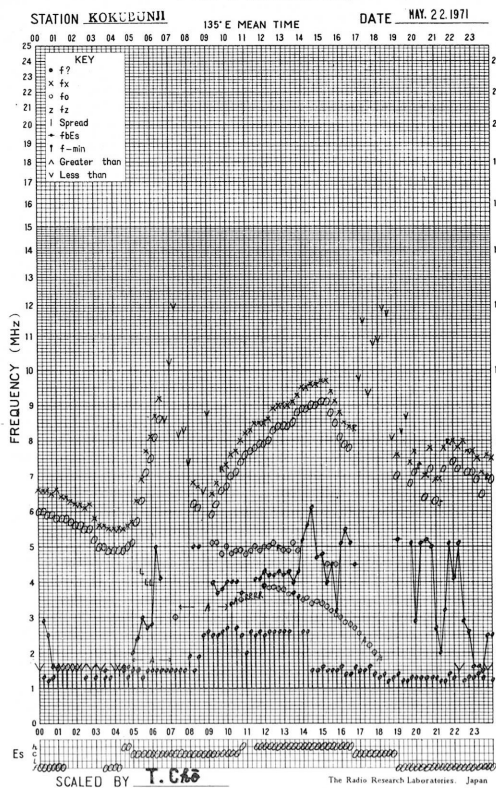
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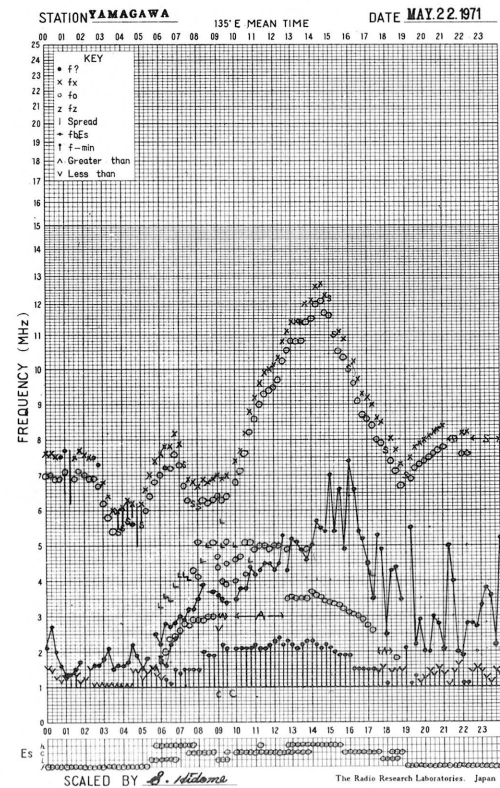
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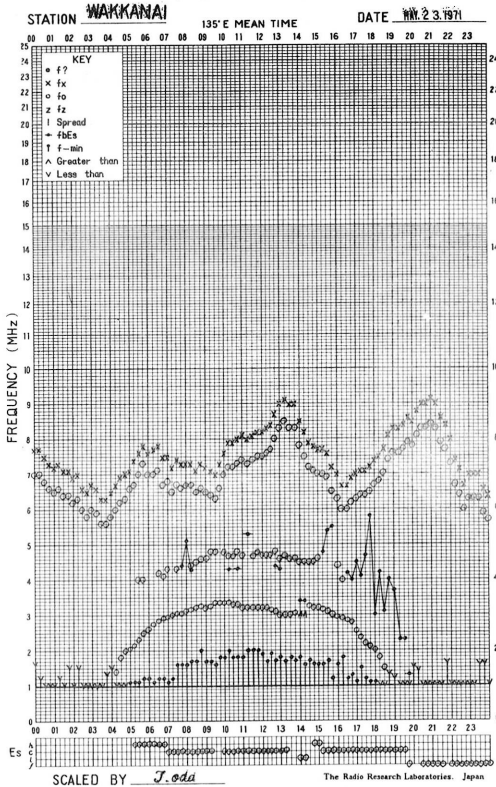
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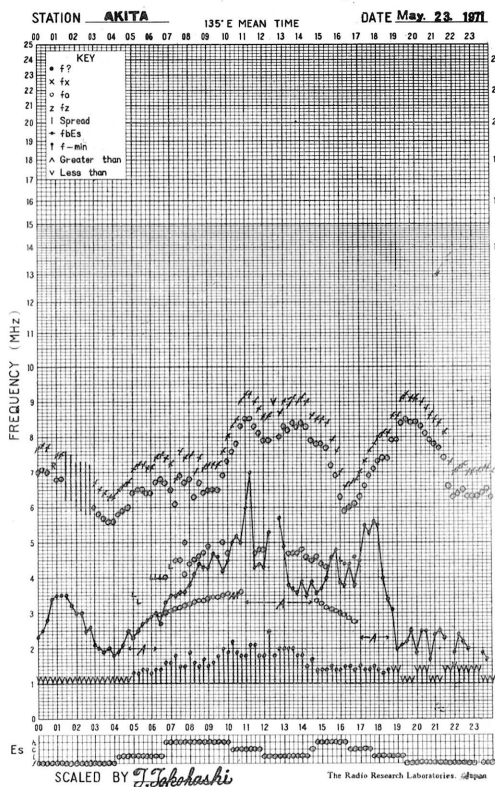
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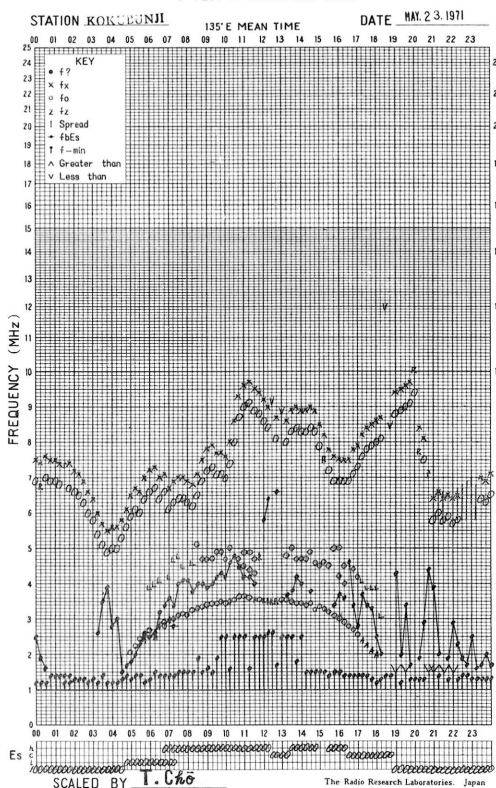
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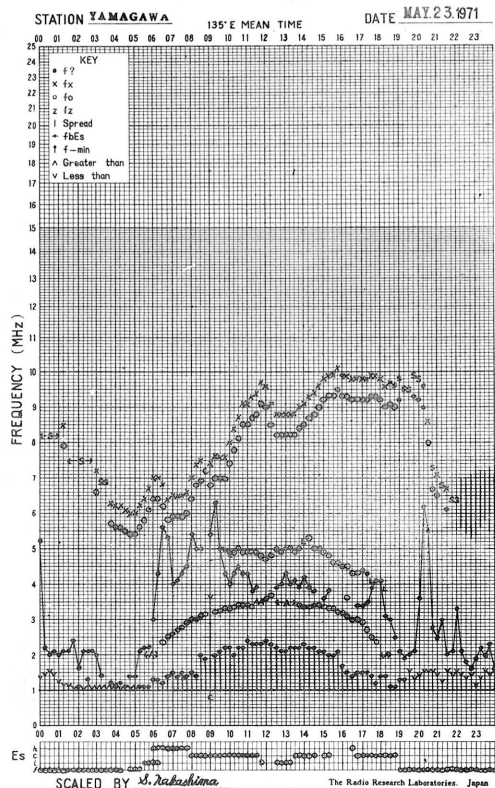
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

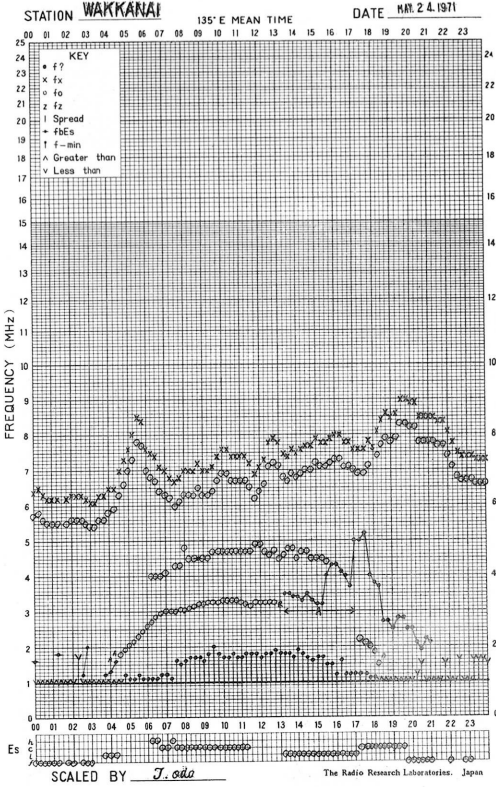


f-PLOT OF IONOSPHERIC DATA

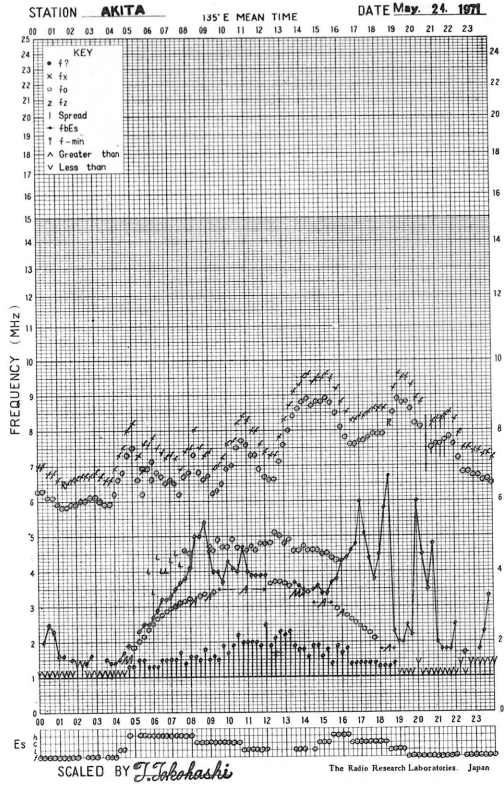




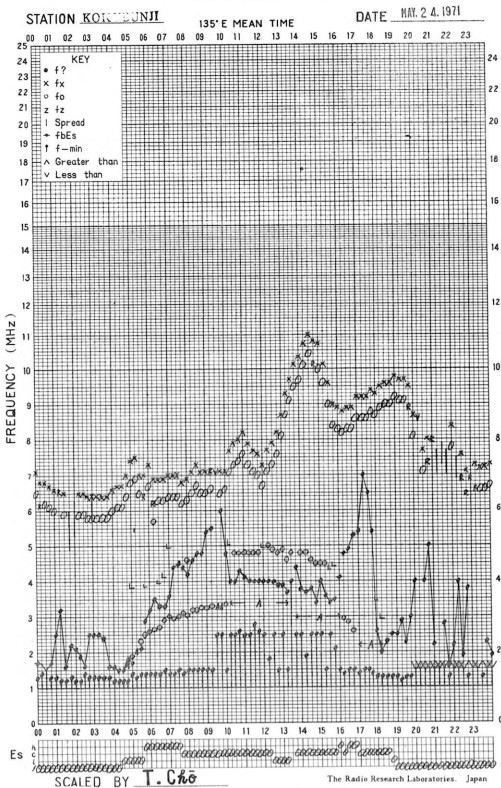
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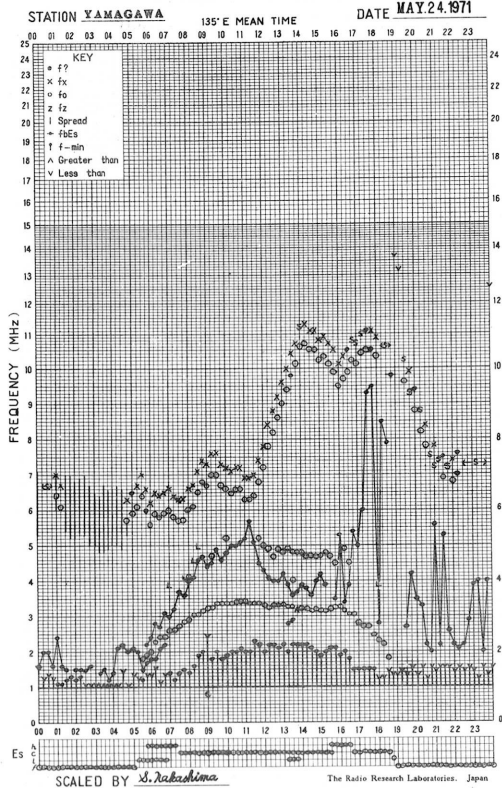
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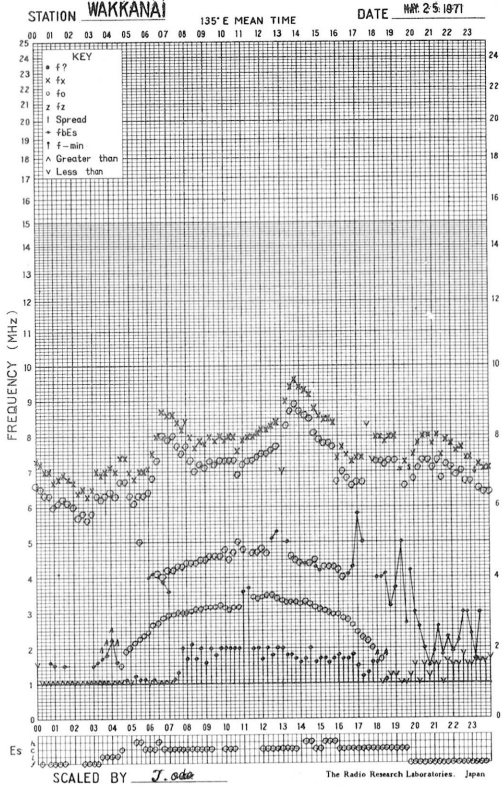
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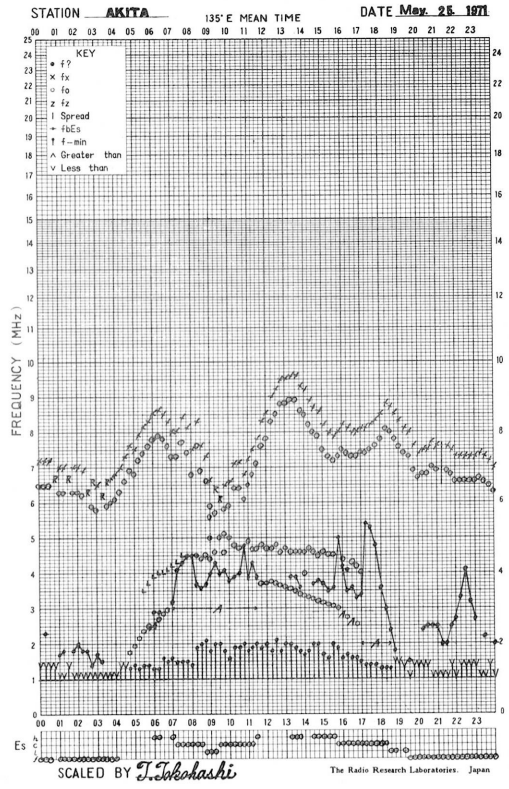
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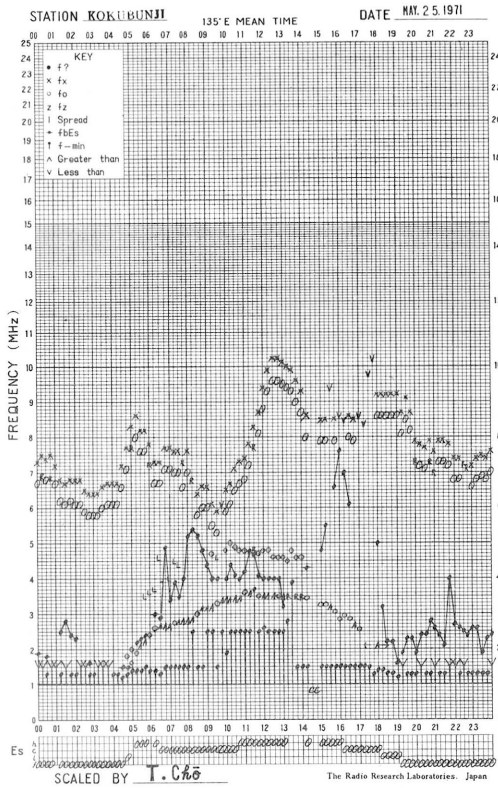
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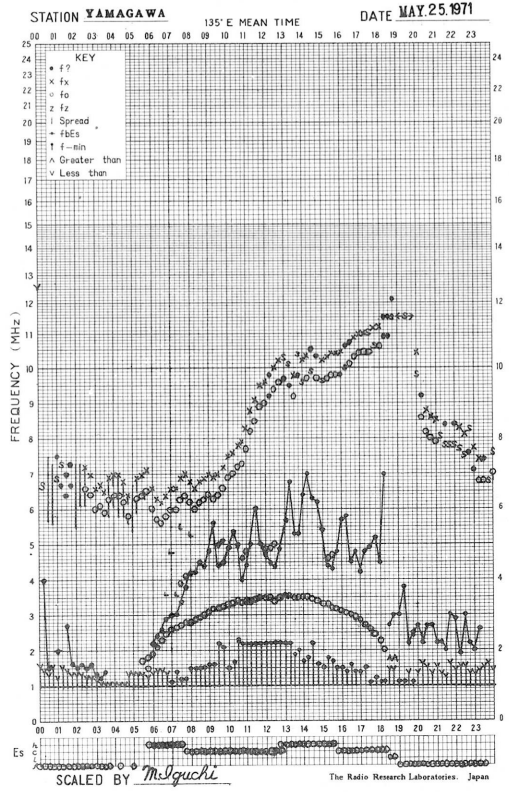
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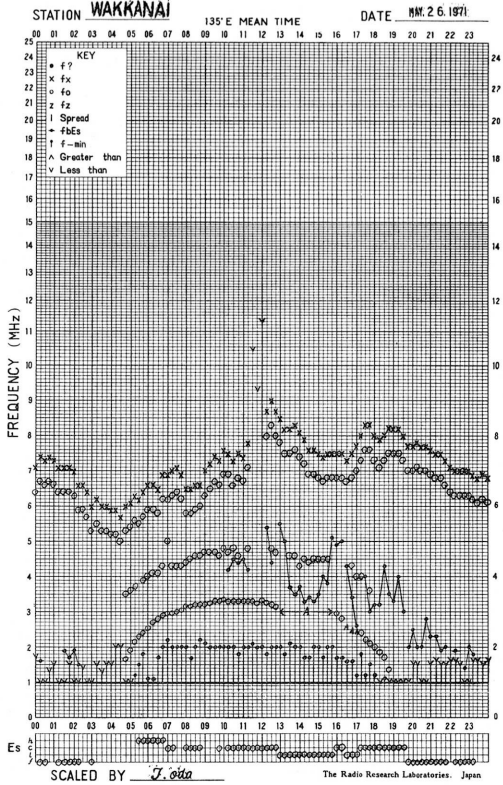
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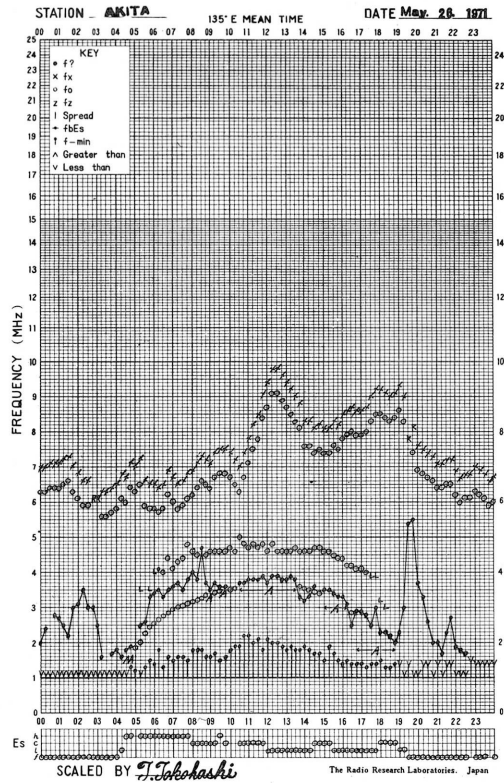
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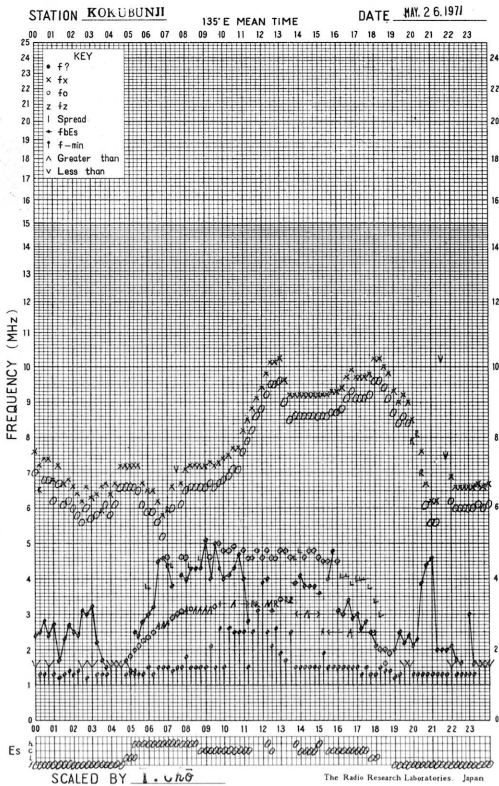
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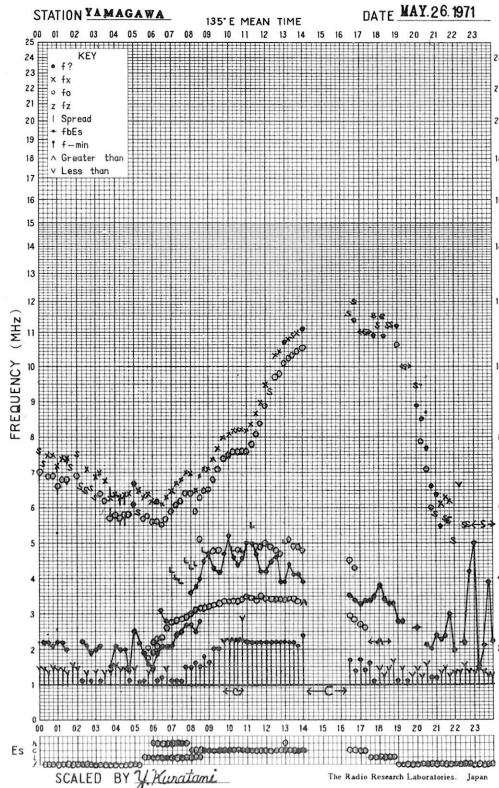
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

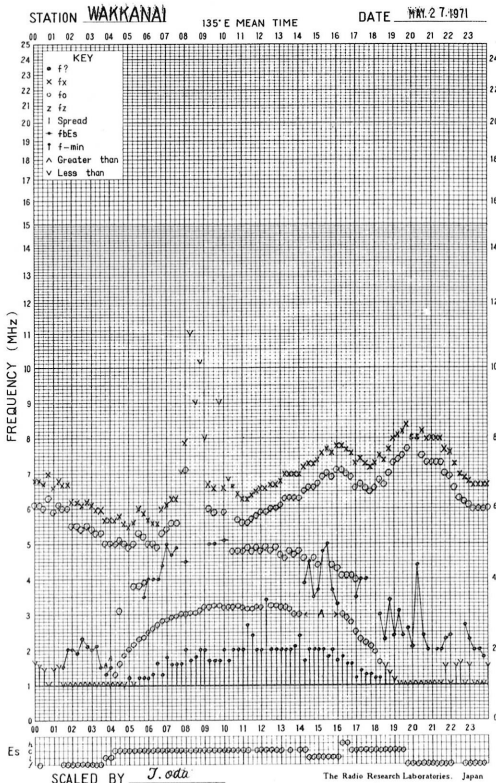


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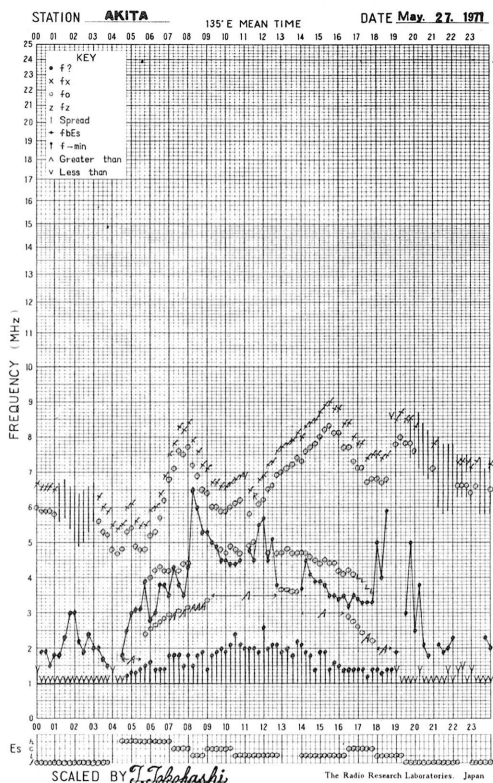




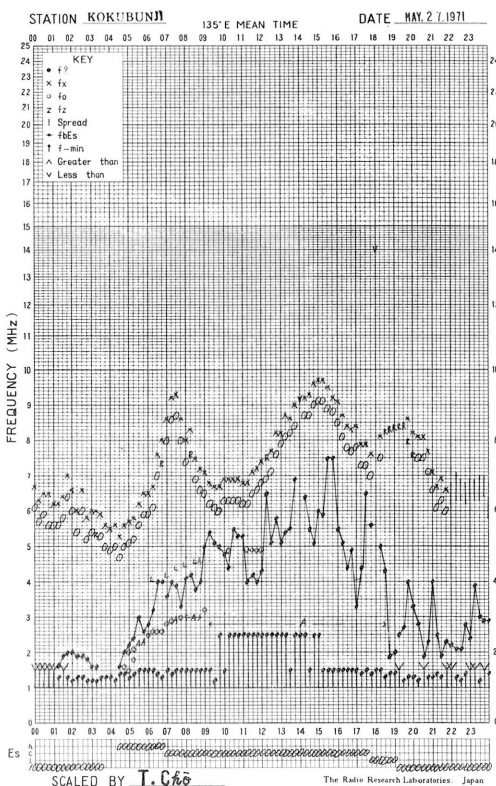
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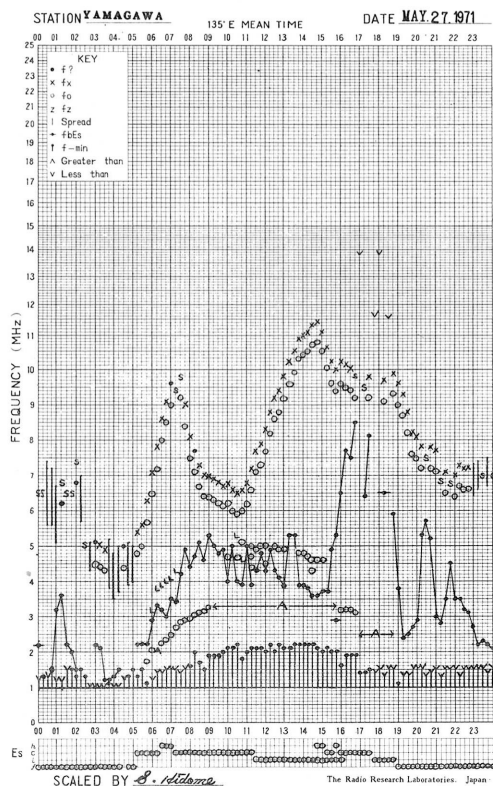
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

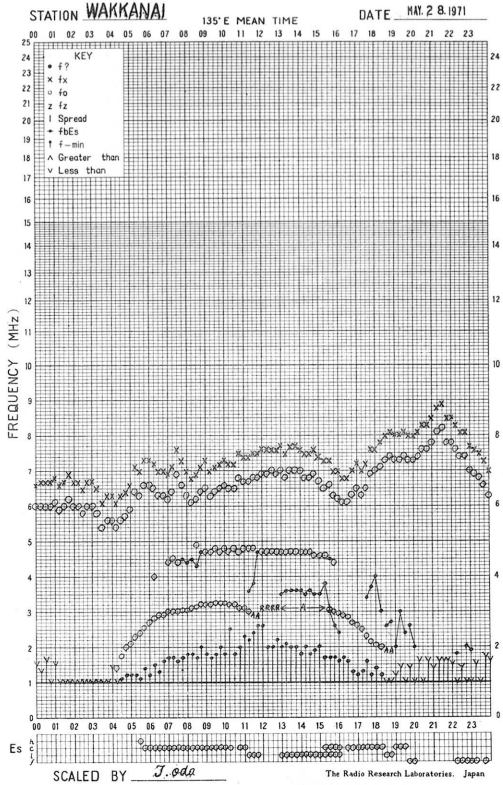


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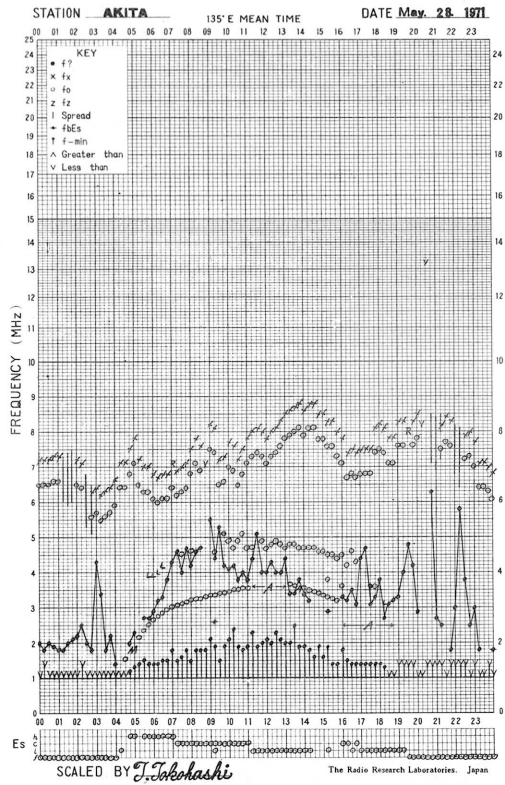




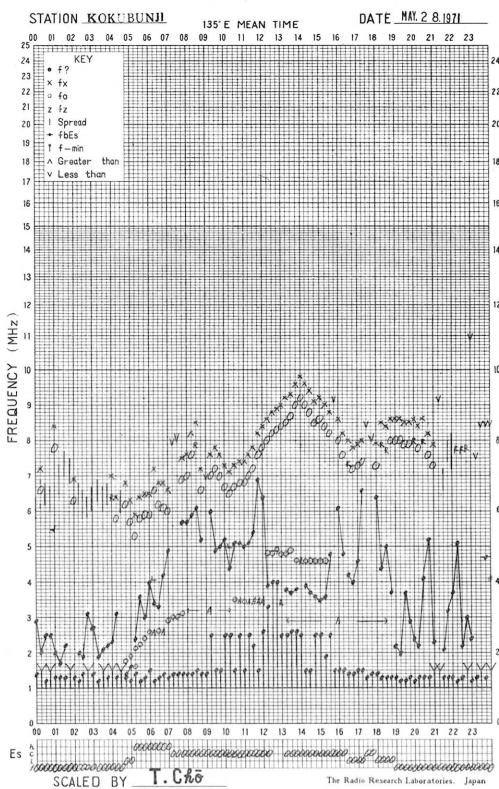
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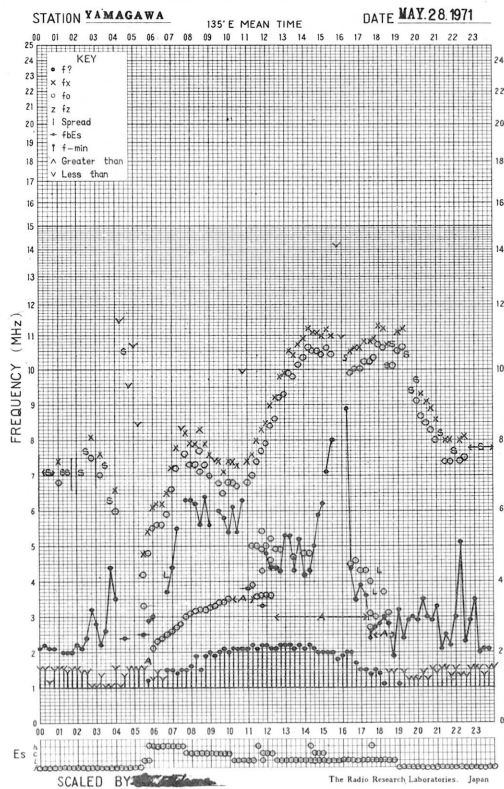
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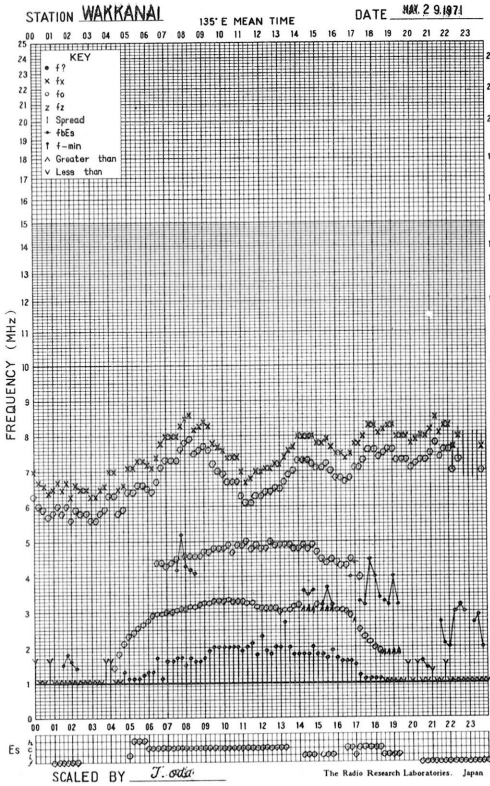
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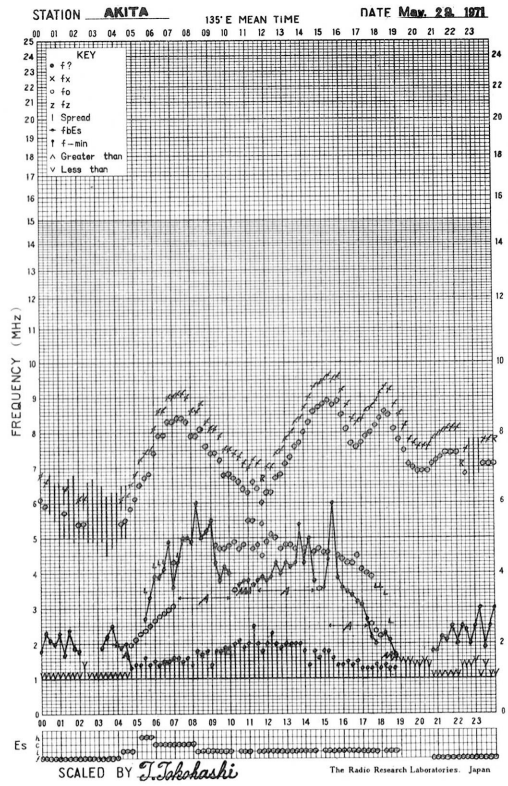
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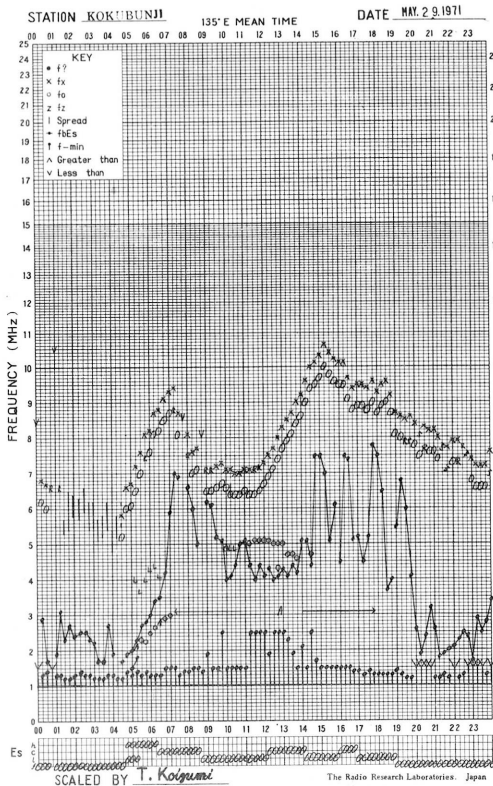
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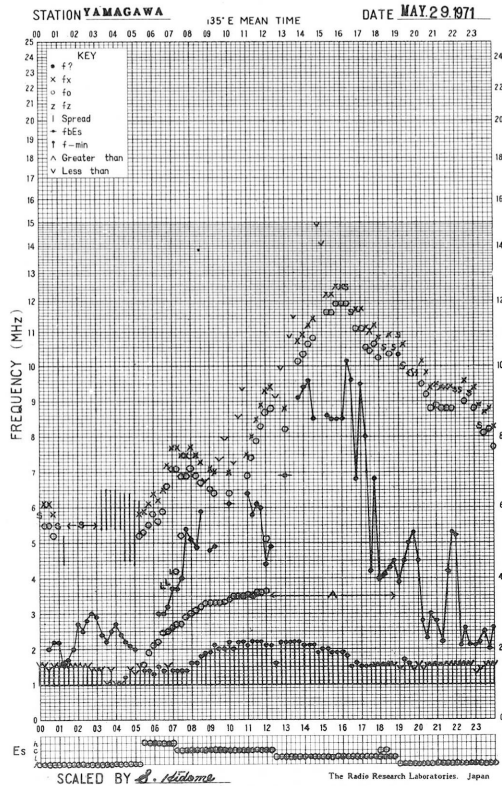
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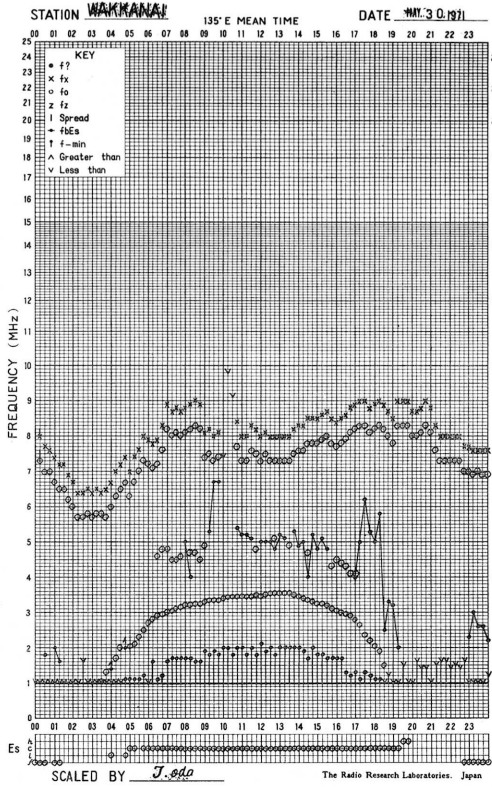
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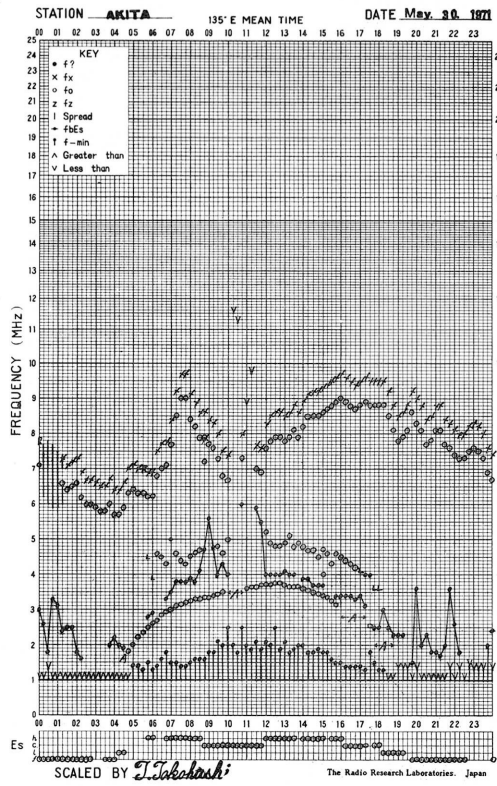
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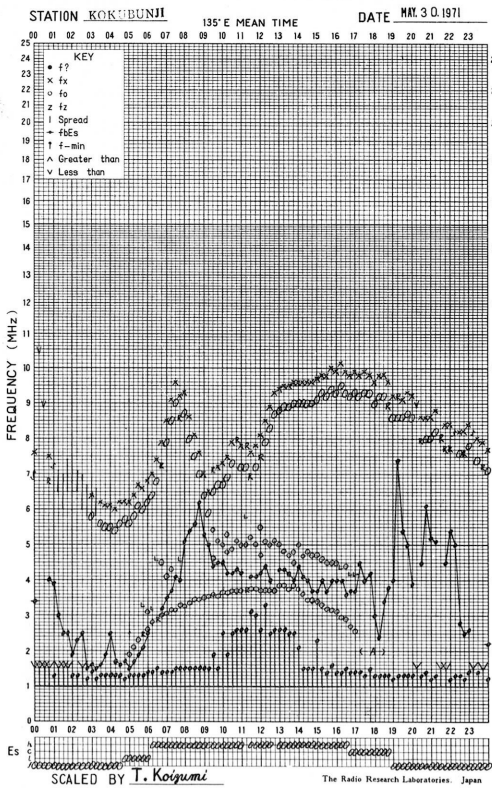
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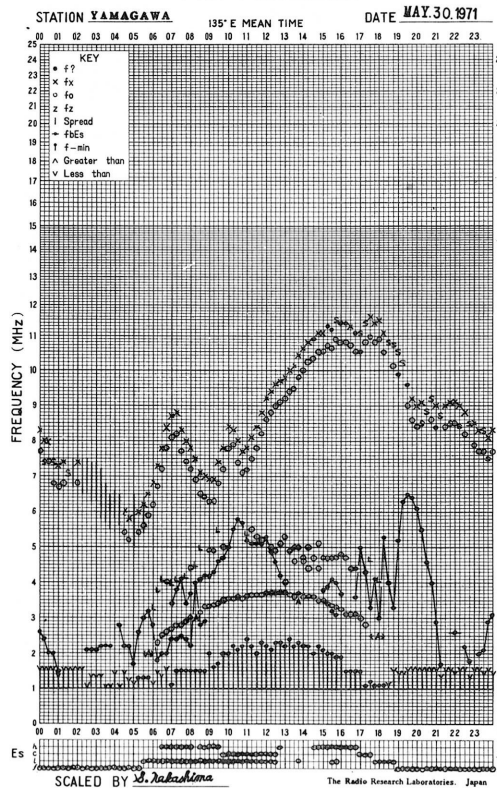
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

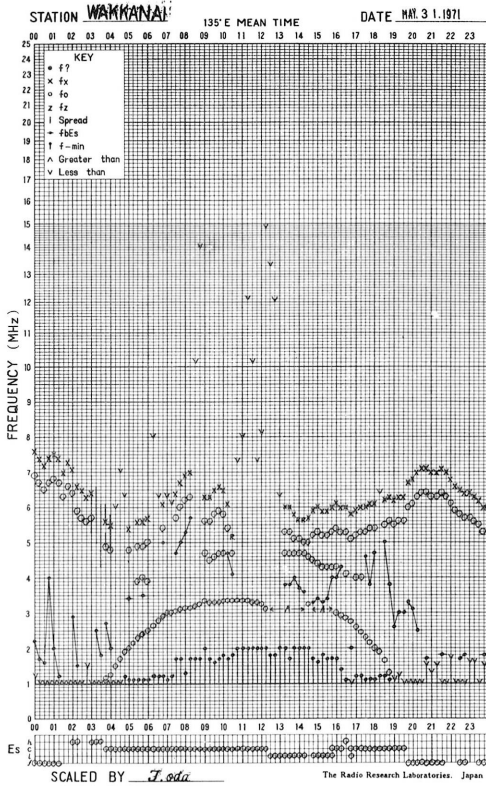


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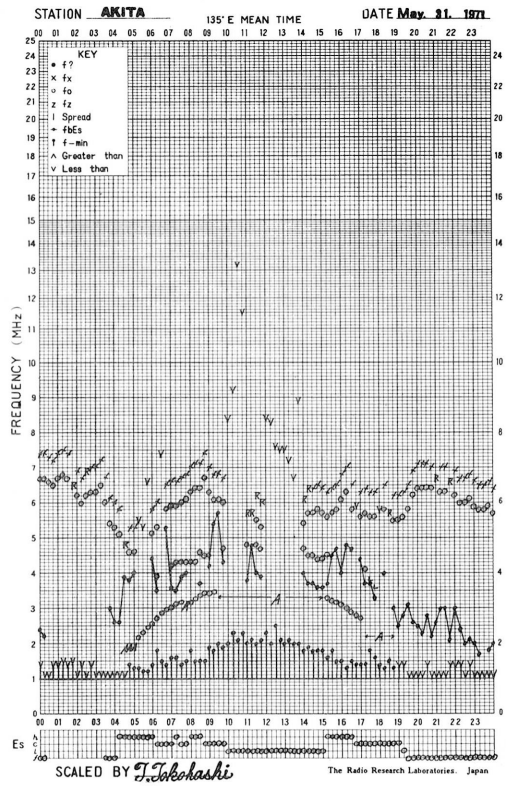




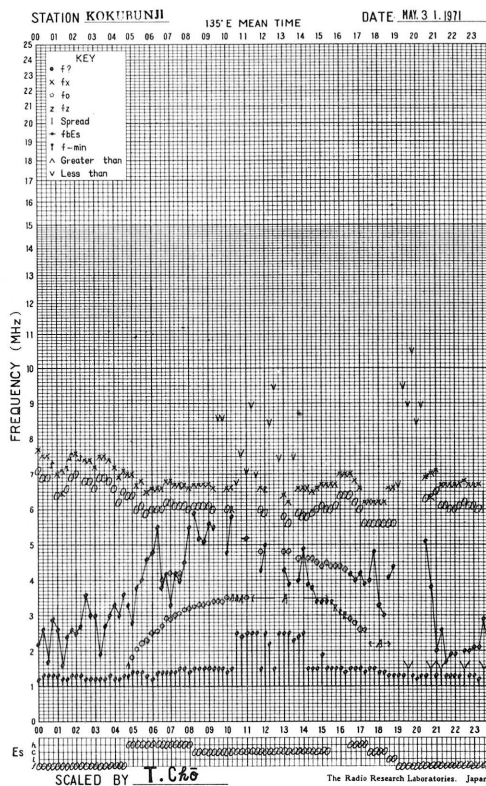
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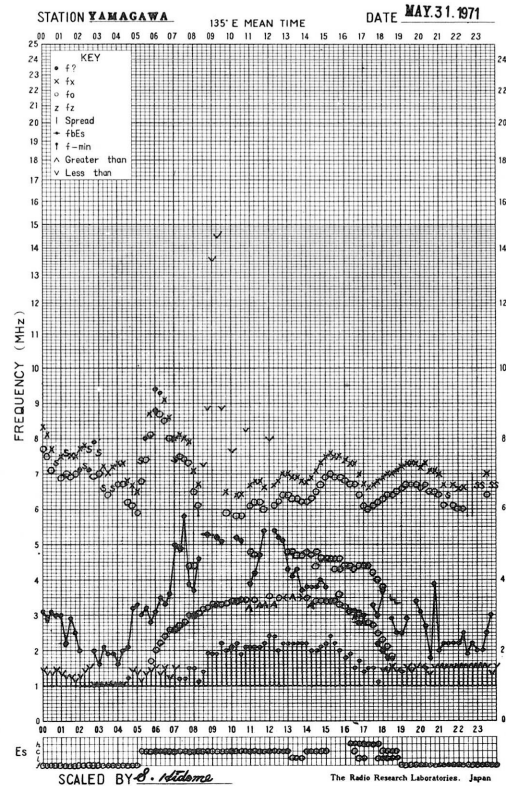
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA





## SOLAR RADIO EMISSION

<u>Flux Density and Variability</u>										
Month: May 1971						Frequency: 200 MHz				
Observing station: Hiraiso										
Flux density $10^{-22} \text{Wm}^{-2} (\text{Hz})^{-1}$						Variability 0 to 3				
UT	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
Date										
1	6	5	6	5	5	0	0	0	0	0
2	5	5	5	5	5	0	0	0	0	0
3	5	5	4	7	5	0	0	0	0	0
4	5	4	5	6	5	0	0	0	0	0
5	5	5	6	7	6	0	0	0	0	0
6	6	6	6	6	6	0	0	0	1	0
7	10	9	12	106	9	1	1	1	1	1
8	107	77	44	31	87	*	1	1	1	1
9	15	23	34	59	26	1	1	1	1	1
10	38	24	21	30	35	1	1	1	1	1
11	20	18	39	47	27	1	1	1	1	1
12	32	27	22	7	31	1	0	1	0	1
13	6	6	6	7	6	0	0	0	0	0
14	6	5	5	5	6	0	*	*	0	*
15	5	5	6	5	5	0	0	0	0	0
16	5	5	5	5	5	0	0	0	0	0
17	5	5	5	5	5	0	0	0	0	0
18	6	5	6	5	6	0	0	0	0	0
19	5	5	5	5	5	0	0	0	0	0
20	6	6	6	6	6	0	0	*	0	0
21	5	6	6	6	6	0	0	0	0	0
22	5	5	6	6	6	0	0	0	0	0
23	5	5	q	5	5	0	0	0	0	0
24	5	5	5	q	5	0	0	0	0	0
25	5	5	6	7	5	0	0	0	0	0
26	8	11	8	13	8	0	1	0	1	0
27	11	12	13	9	12	1	1	1	0	1
28	11	12	16	10	12	1	1	1	1	1
29	9	10	10	8	10	1	1	1	0	1
30	8	8	10	11	9	0	1	0	0	0
31	11	10	12	9	11	1	0	1	1	1

Note No observations during the following periods:

8th	0600-	0700	14th	1930-	2200
11th	1930-	2200	15th	0145-	0315
12th	1930-	2200	17th	0110-	0220
13th	1930-	2200			

q: quiet level, when radiometer is unstable.

\*: interference by atmospherics.

## SOLAR RADIO EMISSION

<u>Flux Density</u>					
Month: May 1971					
Observing station: Hiraiso			Frequency: 500 MHz		
Flux density $10^{-22} \text{ Wm}^{-2} (\text{Hz})^{-1}$					
UT	00-03	03-06	06-09	21-24	Day
Date					
1	23	23	22	22	22
2	22	21	22	21	22
3	22	23	23	21	22
4	23	23	23	21	23
5	23	22	22	26	22
6	26	25	26	28	26
7	28	27	28	29	28
8	31	31	32	31	31
9	27	27	28	29	28
10	28	27	28	28	28
11	27	29	30	29	28
12	29	27	28	28	28
13	28	29	29	-	28
14	26	27	27	26	26
15	26	26	26	24	26
16	24	24	25	25	24
17	24	24	24	24	24
18	23	24	24	24	23
19	25	25	24	25	24
20	24	23	24	23	24
21	23	23	23	23	23
22	23	23	23	22	23
23	22	23	22	21	22
24	21	21	21	19	21
25	20	21	21	20	20
26	21	22	22	22	21
27	21	22	24	23	22
28	25	24	24	24	24
29	26	27	27	26	26
30	24	23	24	21	24
31	22	23	22	22	22

Note No observations during the following periods:

13th 2100- 14th 0010  
 17th 0445- 0525

Distinctive Events  
(single-frequency observations)

Month: May 1971

Observing station: Hiraiso

Normal observing period: 1930 - 0940 (sunrise to sunset)

Date	Frequency	Starting time	Time of maximum	Duration	Type	Flux density $10^{-22} \text{ W m}^{-2} (\text{Hz})^{-1}$		Remarks
	MHz	UT	UT	minutes		peak	mean	
11	100	0131.5	0132.0	2.0	C	60	10	
12	500	0147.0	0151.2	28.0	C	30	6	noise storm
	200	0149.0	0210.0	35	C	40	10	
	100	2200	0240	360		180	40	

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

MAY 1971	FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M																											
MEASURED AT HIRAISSO																												
UT DAY	00H 15M	01H 15M	02H 15M	03H 15M	04H 15M	05H 15M	06H 15M	07H 15M	08H 15M	09H 15M	10H 15M	11H 15M	12H 15M	13H 15M	14H 15M	15H 15M	16H 15M	17H 15M	18H 15M	19H 15M	20H 15M	21H 15M	22H 15M	23H 15M				
1	-9	8	5	4	13	18	7	-21	-8	-11	-21	8	-20	-10	ES	-8	-3	0	-2	-25	0	10	12	11	8			
2	6	9	1	13	17	18	-13	-8	-10	-10	-15	ES	6	-25	-28	-10	-13	-23	-11	-26	-19	-7	-17	-15	-5			
3	-3	-9	-12	-3	-10	-15	-17	-8	-4	-22	-19	ES	2	-15	-8	0	9	9	7	-8	8	11	1	1	1			
4	3	-3	5	13	7	10	ES	ES	ES	ES	ES	ES	3	ES	ES	ES	ES	-7	3	10	12	10	3	6	-2			
5	-3	1	-4	2	13	2	3	4	16	3	-14	ES	-1	-18	-8	10	ES	11	-4	6	-4	-1	2	C	C	C		
6	C	C	C	8	7	21	20	ES	-3	-15	-13	ES	11	-13	4	-8	1	1	ES	0	-22	-15	ES	6	-9	12	ES	11
7	12	8	-9	-8	ES	ES	-14	-14	-15	-19	-16	ES	2	ES	ES	ES	-5	-5	-3	-4	-28	-22	ES	-2	-25	-22	ES	-4
8	-8	0	ES	ES	ES	-14	5	-25	-4	-15	-20	ES	6	ES	ES	3	5	8	2	-23	2	12	1	2	-3			
9	2	-1	-4	2	4	-12	-17	-12	-2	-12	-7	ES	11	-11	6	8	11	3	3	-5	7	1	1	-5	7			
10	0	-4	-4	-1	2	6	3	8	-1	-2	-16	ES	6	-13	16	12	-2	8	11	3	-3	3	-4	-9	-8			
11	-5	-8	-7	-2	-5	3	13	3	2	-3	-12	ES	9	-15	21	7	-5	1	-1	-12	-3	8	3	-8	-7			
12	-4	-11	-28	-19	-3	8	10	-13	-13	-13	-13	ES	11	-9	26	18	17	7	7	0	0	0	2	-8	1			
13	-7	-1	-1	2	6	16	12	-3	-4	-4	ES	14	ES	9	21	21	19	16	8	-19	-4	ES	-4	-2	-11	-6		
14	-9	-2	-5	2	11	14	4	-6	-7	-5	-13	ES	8	2	9	18	13	15	13	-13	-7	5	9	-1	-3			
15	-5	-4	2	1	11	2	-8	-12	-11	-11	-13	ES	0	-8	2	8	12	13	6	2	2	7	2	2	2			
16	2	8	2	10	8	9	11	1	-3	-7	-16	ES	1	19	17	14	16	12	9	2	-1	4	0	4				
17	-3	-1	-4	2	3	3	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		
18	-28	-25	-22	ES	ES	ES	-16	-16	-13	-25	-18	-18	-13	-12	ES	-8	-8	-2	-12	-28	-28	-28	-10	-28	-28			
19	-28	-28	-28	-14	-25	-14	-16	-25	-21	-25	-17	-16	ES	ES	-14	ES	-8	-6	-6	9	-28	-7	9	7	-25	-20		
20	-10	-19	ES	ES	2	1	-13	-6	-3	4	-17	-12	-11	2	ES	-3	-3	-4	17	6	8	-3	0	-4	2			
21	5	3	3	-12	-19	-11	-9	-25	ES	ES	ES	ES	ES	2	2	2	9	12	11	0	4	9	5	1	2			
22	-3	-4	-6	7	9	16	7	13	2	-4	-14	12	-10	26	21	6	11	11	4	7	13	-1	-3	-1				
23	-3	-5	1	-3	2	10	-14	-14	-14	-15	-12	-10	-7	6	10	7	3	9	-3	9	13	3	4	-2				
24	-7	-7	1	7	12	17	12	8	7	16	13	16	3	16	6	11	9	3	5	9	6	6	3	-2				
25	1	-8	-8	-4	2	2	5	13	2	9	6	ES	ES	15	14	9	8	13	3	4	6	-3	-2	-3				
26	2	-2	3	5	8	15	ES	ES	ES	ES	ES	ES	ES	21	-1	2	14	ES	4	7	-7	-3	-16	-16	-2			
27	-8	-11	-16	-8	-4	12	9	12	12	8	-4	ES	ES	18	15	7	13	13	-2	2	8	7	1	2				
28	-1	2	2	-3	12	13	14	13	4	-8	8	ES	-4	11	18	19	16	13	3	2	3	5	3	-4	-2			
29	-7	5	1	-4	11	11	15	15	13	13	6	-1	-3	-3	21	19	2	0	4	1	6	1	-2	0				
30	4	7	0	4	14	17	7	-6	-11	-11	-13	-12	ES	ES	2	-10	-7	-9	-17	-12	ES	ES	ES	ES	-11			
31	1	-7	-15	-13	2	2	4	7	13	11	4	ES	-12	14	8	12	10	2	6	10	6	2	2	-1				
CNT	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	30			
MED	-3	-2	US	-4	4	8	4	US	ES	US	ES	ES	ES	1	ES	4	7	US	7	US	4	-3	1	US	6	1	-2	-2
UD	5	8	ES	10	13	18	14	13	13	11	6	ES	ES	21	21	17	15	13	7	9	12	7	6	4				
LD	-10	-19	-22	-17	-19	-15	-17	-25	-15	-22	-20	-15	-18	-12	ES	-8	-10	-7	ES	-9	-28	-19	-15	-19	-25	-20		



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

MAY 1971 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISSO

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

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

May 1971	Whole Day Index	W W V				L M				W W V H				Warning				Principal magnetic storms		
		00 06 12 18 06 12 18 24	00 06 12 18 06 12 18 24	00 06 12 18 06 12 18 24	00 06 12 18 06 12 18 24	00 06 12 18 06 12 18 24	00 06 12 18 06 12 18 24	00 06 12 18 06 12 18 24	00 06 12 18 06 12 18 24	Start	End	H								
1	4-	(4)(4)(3) 4	3 4 (4)(4)	4 3 2 4	N N N N															
2	3+	(5) 3 (2)(3)	(5) - - (2)	4 4 (2) 3	N N N N															
3	3+	(3)(3) 3 (4)	4 3 (4) 4	4 3 4 4	N N N N															
4	4°	(4)(4) 4 4	4 4 (4) 4	4 3 4 4	N N N N															
5	4°	(3)(4) 4 (4)	4 4 (4) 4	4 4 4 (4)	N N N N															
6*	4-	(4)(4) 4 (4)	4 4 (4) 2	4 4 (3) 4	N N N N	02.0	23.00	103 <sup>Y</sup>												
7*	3°	(3)(3)(3)(3)	3 4 (4)(1)	4 3 3 4	N U U U															
8*	4-	(4)(3) 3 4	4 4 (4)(4)	4 4 4 4	U N N N															
9*	4-	3 (4) 4 (4)	3 - - (4)	4 4 4 4	N N N N															
10	4°	4 4 (4)(4)	3 4 (4) 4	4 4 3 4	N N N N															
[11]	4°	(4) 5 (4) 4	4 4 (4) 4	4 4 4 4	N N N N															
[12]	4°	(4)(4)(5) 4	4 4 (4) 4	3 4 4 4	N N N N															
[13]	4°	4 4 (5) 4	4 4 (4) 4	3 4 4 3	N N N N															
14	4°	4 4 (5) 4	4 4 (4) 3	4 4 3 4	N N N N															
15	4+	4 (4)(5) 4	4 4 (4)(5)	4 4 5 4	N N N N															
16	4+	(4) 4 (5) 4	4 - - (5)	4 4 5 4	N N N N															
17	4-	(4)(3)(3)(3)	4 4 (4) -	4 4 (3) 3	N N U U	06.29	---	04 <sup>Y</sup>												
18*	3°	(3)(3)(2)(3)	3 4 (3) -	3 3 3 3	U U U U	19.24	---	21.00												
19*	3°	(3)(2)(2)(3)	(4) 4 (4) -	3 3 3 4	U U N N															
20	4-	(3) 4 4 (4)	(3)(4) C 3	4 4 4 4	N N N N															
21	4°	(4)(4) 4 4	4 4 (4) -	4 4 4 4	N N N N															
22	4°	(4)(4)(5) 4	(4) 4 (4)(4)	4 4 4 4	N N N N															
23	3+	(4) 3 4 4	(4) - - (2)	4 4 4 5	N N N N															
24	4°	(4)(5)(4) 4	3 3 (4) 5	4 4 4 4	N N N N															
25	4+	(4) 5 (5)(4)	4 4 (4) 4	4 4 4 4	N N N N															
26	4-	(4)(3)(4) 3	5 4 (4) 3	4 4 4 4	N N N N															
27	4°	(4)(4) 5 4	4 4 (4) 4	4 4 4 4	N N N N															
28	4+	(4)(5)(5) 4	4 4 (4) 5	4 4 4 4	N N N N															
29	4+	(4)(5)(5) 4	4 3 (4)(5)	4 4 5 4	N N N N															
30*	4-	(4)(4)(3)(3)	4 - - (4)	4 4 4 3	N N N N	07.36	22.00	58 <sup>Y</sup>												
31*	4°	(4) 5 4 4	4 4 (4) 3	4 4 4 4	N N N N															

GEOALERT

- " = PROTON FLARE
- \* = MAGSTORM
- ° = MAGCALME
- ' = COSMIC EVENT

- [ ] = Regular World Day
- = impossible to evaluate
- ( ) = inaccurate

- C = artificial accident
- = continuing magnetic storm

## SUDDEN IONOSPHERIC DISTURBANCES

(S.I.D.)

HIRAISO

Time in U.T.

May. 1971	SWF					Start- time	Dura- tion	Type	Imp.	Correspondence		
	Drop-out Intensities (db)									Flare	Solar Noise	Mag
	CO	LM	HA	TO	SH							
5		13				03.18	18	S	1	×		
10		8				23.14	22	Slow	1-			
12	×	10	×			01.31	122	G	1-	×	×	

## I N U B O

1971	S P A								Remarks
May	Phase Advance (degrees)					Time (U.T.)			
DATE	GBR	WVVL	NAA	NWC	NPG	Start	End	Maximum	
3				12		0423	0517	0427	
3	<u>40</u>		29			1412	1452	1416	X
4				<u>12</u>	9	2240	2323	2257	
5	40	55	50	<u>80</u>	48	0137	0300	0147	X
5			12	<u>16</u>		0309	0353	0318	X
5		36	37	24	<u>39</u>	2256	0014	2311	
6				<u>16</u>	7	0145	0220	0155	
7			29			0422	0508	0437	
7			<u>21</u>	8		0652	0734	0701	
7	15		<u>19</u>		17	2142	2239	2156	X
8				<u>16</u>	13	0058	0132	0105	
8				8		0257	0333	0304	
8				8		0502	0547	0505	
11		<u>43</u>	21	40	22	0138	0222	0142	X
11				<u>16</u>	3	0343	0417	0345	
12	80	—	64	<u>116</u>	78	0126	0456	0210	X
13				6		0244	0314	0250	
14				8		0222	0250	0230	
14				12		0420	0445	0427	
14	<u>70</u>			56	10	0741	0924	0800	X
18				8		0302	0332	0308	
20	15		10	<u>56</u>	10	0610	0750	0622	X

NOTES(1) : The letter E or D Attached to a time shows that the pertinent time is earlier or more delayed than the given time, respectively.

(2) : The mark \* shows a multi-peak event.

(3) : The mark \*\* shows a time on the day before the pertinent day.



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IONOSPHERIC DATA IN JAPAN FOR MAY 1971

第 23 卷 第 5 号

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1971年9月20日 印 刷 (不許複製非売品)  
1971年9月25日 発 行

編 集 兼  
發 行 人

今 野 清 恒

東京都小金井市貫井北町4丁目2-1

發 行 所

郵 政 省 電 波 研 究 所

184 東京都小金井市貫井北町4丁目2-1

電話 国分寺 (0423) (21) 1 2 1 1 (代)

印 刷 所

有限会社 研 文 社

160 東京都新宿区四谷3丁目6

電話 (353) 8 3 5 8 ・ (351) 0 0 4 6

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