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IONOSPHERIC DATA IN JAPAN

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RADIO RESEARCH LABORATORIES

NUKUI-KITAMACHI, KOGANEI-SHI, TOKYO, JAPAN

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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	}	The ordinary wave critical frequency for the $F2$, $F1$ and E layers, respectively.
f_oF1		
f_oE		
f_oE_s		The ordinary wave top frequency corresponding to highest frequency at which a mainly continuous trace is observed.
f_oE_s		The lowest ordinary wave frequency at which the E_s 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.
$h'F2$		The minimum virtual height, $h'F2$, refers to the highest, most stable stratification observed in the F region and can only be scaled when such stratification is present.
$h'F$		The natural and most significant F region virtual height parameter is that for lowest F region stratification. This will be denoted by $h'F$. Thus $h'F$ is identical with the current $h'F2$ when F region stratification is absent, e.g., at night, and with the current $h'F1$ when $F1$ stratification is present.
$h'E_s$		The lowest virtual height of the trace used to give the f_oE_s .
h_pF2		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 E_s

The eight standard types of E_s 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 E_s trace that does not correspond to any of the eight types.

F An E_s 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 E_s traces observed in the daytime are classified according to their virtual height: H or L.

L A flat E_s trace at or below the normal E layer minimum virtual height in the day or below the night E layer minimum virtual height at night.

C An E_s trace showing a relatively symmetrical cusp at or below f_oE . This is usually continuous with the normal E trace, although when the deviative absorption is large, part or all of the cusp may be missing. (Usually a daytime type.)

H An E_s trace showing a discontinuity in height with the normal E layer trace at or above f_oE . The cusp is not symmetrical, the low frequency end of the E_s trace lying clearly above the high frequency end of the normal E trace. (Usually a daytime type.)

Q An E_s trace which is diffuse and non-blanketing over a wide

frequency range. 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 E_s trace showing an increase in virtual height at the high frequency end similar to group retardation but which is non-blanketing 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 E_s 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 E_s trace which rises steadily with frequency and usually emerges from another type E_s 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 E_s trace such as E_s-L or E_s-F , at frequencies which greatly exceed the E layer critical frequency, whereas at low latitudes it usually rises from E_s-Q , E_s-C or E_s-H at frequencies near the regular E critical frequency. Type S is never used to determine f_oE_s and $h'E_s$. The slant trace is sometimes observed to start at f_oE without echoes clearly identifiable as E_s echoes being seen.

N

The designation 'N' is used to denote an E_s 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 E_s

When the ionogram shows the presence of multiple reflections from E_s 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 Hiraiso 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 Hiraiso 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 ± 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	± 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 atmospheric.
- U: Inaccurate measurement influenced by interferences, atmospheric, 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)	4=normal
2=poor (disturbed)	5=good
3=rather poor (unstable)	

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 15MHz 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 Observatory. 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.

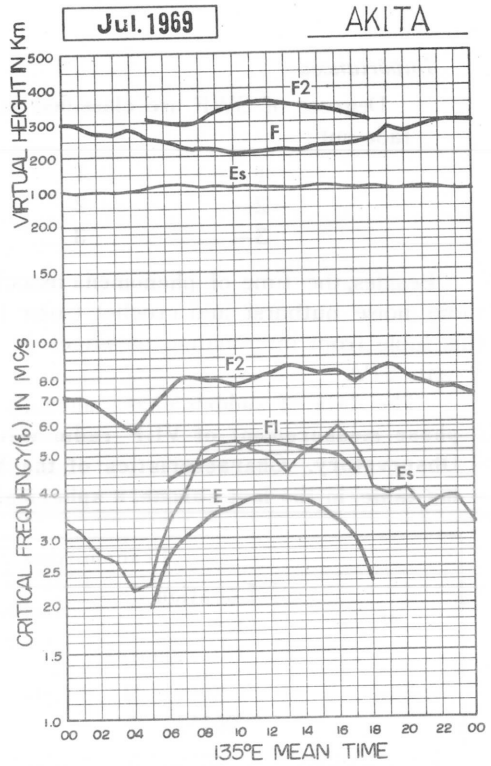
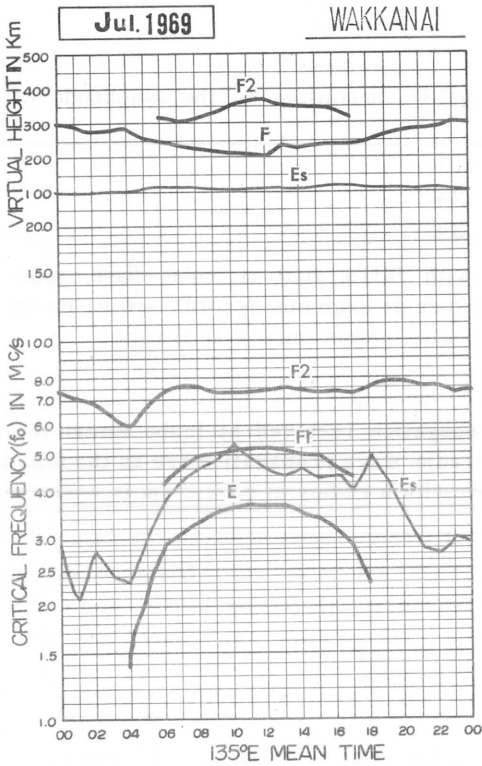
Transmitting Site					Distance (km) to Inubo along the Great Circle
Name	Location (Geographic Coordinate)	Station Call	Frequency (kHz-UTC)	Radiation Power (kW)	
Rugby	52° 22' N 001° 11' W	GBR	16.0	40	9550
Fort Collins	40° 41' N 105° 03' W	WWVL	20.0	1.8	9190
Cutler	44° 39' N 067° 12' W	NAA	17.8	1000	10650
North West Cape	21° 49' S 114° 10' E	NWC	22.3	1000	6990
Lualualei	21° 26' N 158° 10' 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 HA2 HA3	10.2 12.2 13.6	2	6100
Aldra	66° 25' N 013° 09' E	AL0 AL2 AL3	10.2 12.2 13.6	4	7820

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.

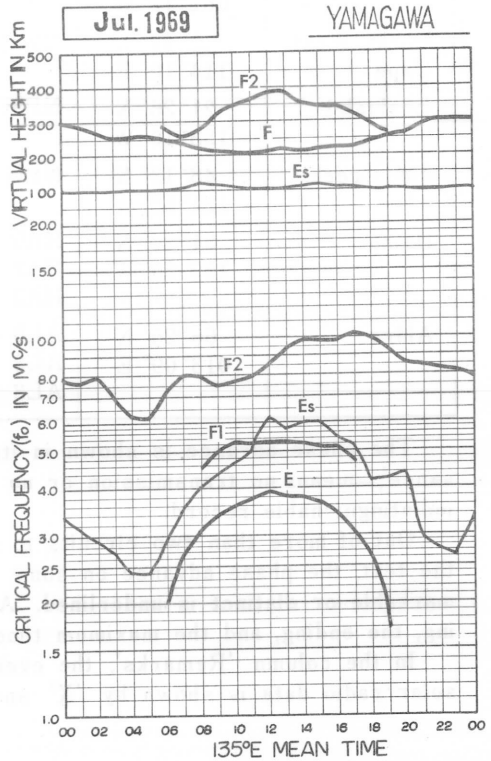
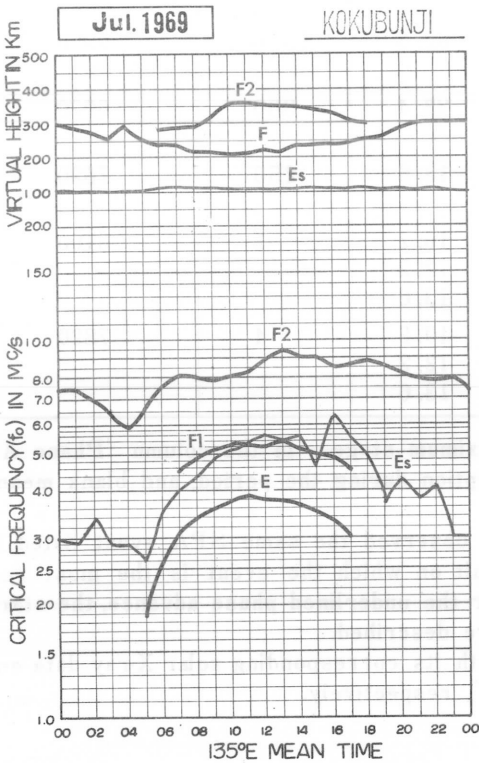
Out of more than two circuits to have observed the same SPA event listed in the text, the phase advance on some circuit on which the event is the most remarkable or distinct is underlined. As for the underlined phase advance, the starting, the ending, and the maximum times are described.

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 LIST OF MEDIAN VALUES

OBSERVED AT: MAKKANAI

Jul, 1969

1 35° E Mean Time (G.M.T. +9h)

Table with columns for parameters (foF2, foF1, foE, fmin, M(3000)F2, M(3000)F1, h'pF2, h'Es) and rows for median values across months 00-23.

IONOSPHERIC DATA LIST OF MEDIAN VALUES

OBSERVED AT: AKITA

Jul, 1969

1 35° E Mean Time (G.M.T. +9h)

Table with columns for parameters (foF2, foF1, foE, fmin, M(3000)F2, M(3000)F1, h'pF2, h'Es) and rows for median values across months 00-23.

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: KOKUBUNJI

Jul, 1969

135° E Mean Time (G.M.T.+9h)

Table with columns for CHAN, HR (00-23) and rows for foF2, foF1, foE, foEs, Fmin, (3000)F2, (3000)F1, h'F2, h'F, h'Es, hpF2, yppF2. Includes values like 07u, 07s, 07o, 065, etc.

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: YAMAGAWA

Jul, 1969

135° E Mean Time (G.M.T.+9h)

Table with columns for CHAN, HR (00-23) and rows for foF2, foF1, foE, foEs, Fmin, (3000)F2, (3000)F1, h'F2, h'F, h'Es, hpF2, yppF2. Includes values like 07s, 077, 079, 069, etc.

IONOSPHERIC DATA

JUL. 1969

FOF2 (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	75	70	69	64	F ₇₅	77	89	102	83	78	70	73	I _A ₇₄	73	73	76	75	A	A	91	83	86	86	79
2	78	73	70	65	68	80	96	94	103	87	78	A	A	73	R ₇₆	H ₆₆	67	71	76	85	86	88	87	86
3	88	75	73	69	73	92	100	103	94	91	78	80	79	78	71	70	72	70	73	79	83	87	87	87
4	78	80	73	69	71	88	104	104	101	84	78	83	81	80	79	73	71	74	75	78	85	80	89	87
5	86	86	76	70	71	83	92	97	92	81	80	78	78	77	78	74	73	78	80	80	83	84	85	84
6	85	83	76	78	I _C ₇₅	78	93	104	103	88	90	89	92	90	87	79	74	78	80	83	85	84	85	84
7	80	77	75	77	78	87	90	91	85	83	74	73	73	75	74	73	74	76	79	83	83	88	88	85
8	83	81	79	73	70	73	70	76	83	76	70	73	82	82	73	74	I _A ₇₄	77	79	83	83	91	86	85
9	78	80	78	74	73	71	75	75	76	69	76	76	80	78	82	77	81	79	77	83	81	81	83	85
10	86	81	81	74	70	75	77	75	76	A	A	A	A	A	84	78	74	73	74	75	84	86	F	85
11	80	75	73	72	67	73	81	83	78	79	86	87	89	87	83	75	77	81	81	79	84	82	80	80
12	81	78	69	70	67	72	75	79	81	73	80	85	82	87	86	85	83	79	78	73	74	76	76	76
13	73	73	67	63	66	75	94	102	95	96	100	97	93	86	86	80	80	82	83	80	82	80	80	S ₇₉
14	76	75	71	63	F ₅₉	59	63	63	63	59	60	W	56	57	57	60	65	65	63	66	F ₇₅	73	F ₇₅	F ₆₇
15	F	F	U ₅₉	F ₅₅	F ₅₄	F ₆₆	71	72	65	A	58	55	53	W	54	54	59	59	60	62	68	F ₆₈	F	F
16	F	F	U ₅₈	F ₅₃	F ₅₀	58	63	77	79	70	70	69	74	70	70	70	70	74	79	87	87	74	77	73
17	72	73	63	58	56	63	67	68	63	I _A ₆₂	A	A	A	68	63	63	65	63	63	67	71	72	68	S ₆₅
18	64	62	58	F ₅₅	56	67	78	71	63	60	64	66	66	69	72	73	73	66	70	77	74	76	73	70
19	F ₆₇	F ₆₆	F ₆₉	F ₆₄	F ₅₀	60	63	64	63	66	65	63	61	65	63	64	61	60	64	67	72	71	69	67
20	62	62	60	57	56	62	66	73	79	78	84	78	67	69	63	66	71	72	73	74	77	74	72	71
21	68	69	66	63	60	63	73	65	66	71	73	65	71	68	67	I _A ₆₆	67	70	71	76	73	70	71	F ₆₇
22	F	F	F ₆₁	F ₅₇	56	63	F ₇₂	72	65	70	63	73	67	66	71	73	71	70	71	78	78	71	U ₇₀	S ₇₀
23	70	68	F ₆₈	60	58	67	71	67	68	70	70	70	76	76	68	67	71	72	74	77	78	73	66	F ₆₅
24	F ₆₆	F ₆₃	F ₆₃	F ₅₈	F ₅₆	F ₆₄	F ₇₃	77	75	63	R ₆₀	61	66	70	68	67	66	70	78	83	75	S	F	F
25	F	F ₆₀	F	F ₅₇	F	F ₅₅	63	71	66	73	62	65	70	75	78	78	81	87	93	83	73	73	68	67
26	65	64	60	50	48	59	R ₇₅	77	72	68	68	69	75	77	78	74	75	78	75	86	81	F ₇₄	F ₇₀	F ₆₈
27	F ₆₀	F ₅₉	F	F ₅₄	F ₄₉	51	C	C	C	C	73	64	79	96	85	81	89	I _R ₈₀	79	83	76	76	65	59
28	F ₅₇	57	54	51	54	67	79	90	76	76	73	65	73	84	78	78	77	73	75	84	C	C	C	C
29	C	66	64	61	54	61	73	77	68	73	71	71	78	73	71	70	74	72	73	78	77	78	77	72
30	68	70	68	64	64	65	66	73	73	80	79	73	72	74	74	70	68	67	68	70	78	79	75	71
31	68	66	63	64	56	58	68	66	69	66	A	64	74	74	A	A	A	72	I _A ₆₇	69	71	74	72	70
	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	29	31	30	31	30	30	30	28	28	27	28	29	30	30	30	30	30	31	30	29	27	28
MED	74	70	69	63	60	67	74	76	76	73	73	73	74	75	74	73	73	72	75	79	78	76	76	72
UQ	80	77	73	70	70	75	89	91	83	80	78	78	80	80	79	77	75	78	79	83	83	84	85	84
LQ	67	64	63	57	56	62	68	71	66	68	66	65	68	70	68	67	68	70	71	74	74	73	70	68

JUL. 1969

FOF2 (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1969

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							430	460	A	A	A	A	I A	520	520	530	490	A	A					
2							430	L	A	A	A	A	A	A	510		500		L					
3							A	490	520	500	520	520	540	530	530	510	500	450						
4							A	500	510		A	A	550	560	530	520	H	H	450					
5							500	500	510	530	530	540	550	530	510		A	A						
6							C	500	500	510	570	550	540	540	530	510	510	490						
7							460	470	500	530	540	560	540	530	I A	520	500	A	A					
8							A	500		A	A	550	520	530	530	500	A	470						
9								500	500	540	530		A	530	530	530	530	480	480					
10							380	470	500		A	A	A	A	A	A	500	500	470					
11							390	450	490	510	A	520	530	550	540	540	500	470	460					
12								500	490	500	I A	520	I A	530	530	510	490							
13							460	480	510	470	560	520	540	510	510	510	480	450						
14							A	A	A		500	510	520	500	500	500	480	A	A					
15							400	420	A	A	A	480	490	500	490	490	460	450	440	390				
16							420	430	A	A	A	A	A	I A	520	490	500	480	440	400				
17							430	450	470		A	A	A	A	500	490	490	460						
18							410	460		500		A	A	510	500	490	480	460	430					
19							400	420	470	480	I A	490	490	510	500	490	A	450						
20								460	520	500	500	510	490	490	490	490	440	A	380					
21							400	400	450	460	500	500	490	A	A	500	A	450	A					
22							430	440	460	510		A	490	510	500	480	470	440	430					
23							400	430	470	490		A	490		A	500	490	470	420					
24							400	430	470	450	470	460	500	500	470	470	430	410						
25							450	440	440	460		A	510	510	500	I A	480	450	420					
26							A	430	470	470	490	500	490	490	500	500	460	410						
27							C	C	C	C	A	A	A		500	490	490	450	A					
28							390	450	450	480	500	510	520	I A	510	510	500	460	400					
29							410	460	480	490	510	500	500	500	500		A	A	410					
30									500	480	490	530	520	500	500	500	460	L						
31							A	A	500		A	A	500	530	510		A	A	A	L				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						4	17	23	23	21	19	21	24	27	29	26	24	18	3					
MED						395	420	460	500	500	510	510	520	510	500	500	460	440	390					
UQ						400	430	490	500	510	525	530	540	530	530	510	485	460	395					
LQ						385	400	445	470	480	490	490	505	500	490	490	450	420	385					

The Radio Research Laboratories, Japan

JUL. 1969

FOF1 (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1969

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					A	225	290	305	320	335	355	370	355	A	A	360	325	300	230	A				
2					A	205	275	315	335	355	375	355	A	A	385	355	320	300	245	S				
3					A	225	290	310	340	350	355	360	350	335	A	A	330	300	250	150				
4					150	230	300	310	330	350	345	350	A	A	A	365	335	300	250	A				
5					A	225	295	310	335	355	380	A	A	A	380	325	305	300	235	150				
6					A	230	I ^C 295	315	340	365	370	380	380	390	350	340	330	300	250	A				
7					140	230	300	315	350	375	400	400	395	385	350	360	330	300	250	A				
8					A	230	295	315	330	330	345	370	380	380	380	370	330	300	225	S				
9					A	A	305	I ^A 315	345	370	390	385	355	380	390	370	330	300	215	E				
10					A	210	285	310	355	385	395	380	370	355	310	A	335	300	235	S				
11					130	225	290	315	335	345	355	360	350	A	A	A	A	A	A	A				
12					140	230	290	320	340	370	380	395	395	385	375	355	315	A	A	A				
13					A	230	290	305	335	350	370	390	385	370	I ^A 370	370	335	300	210	E				
14					I ^A 140	215	290	315	335	360	345	350	360	370	390	355	320	290	230	A				
15					A	A	270	305	320	320	A	A	355	325	A	350	315	290	A	A				
16					A	215	295	310	335	350	360	370	355	340	320	A	A	A	240	A				
17					A	220	280	305	330	350	360	380	335	350	I ^A 340	A	A	A	A	A				
18					A	210	I ^A 270	310	335	360	390	370	365	375	I ^A 345	A	A	A	A	A				
19					A	210	270	A	A	350	360	355	350	350	340	315	I ^A 305	270	A	A				
20					A	215	A	A	A	A	A	365	385	385	370	340	305	260	A	A				
21					A	220	280	305	320	340	355	365	370	355	340	320	300	A	A	A				
22					A	A	275	305	330	345	350	360	370	375	350	335	315	290	215	125				
23					A	A	A	A	320	345	370	380	380	370	330	330	300	275	A	A				
24					A	A	A	A	A	A	A	A	355	345	345	325	290	A	A	A				
25					A	A	A	A	A	320	330	365	I ^A 370	365	330	315	300	270	205	E				
26					A	175	235	260	325	340	350	350	350	345	A	A	320	280	205	A				
27					A	200	C	C	C	C	345	A	A	370	A	A	310	275	A	A				
28					A	185	265	290	310	330	340	350	375	375	350	A	A	A	A	A				
29					E	190	265	300	305	330	340	A	A	A	A	330	300	275	A	E				
30					A	175	270	300	325	340	375	380	390	375	355	340	320	290	230	A				
31					E	205	275	305	330	360	370	375	355	I ^A 355	380	345	315	280	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					7	25	26	25	26	28	28	26	26	25	23	22	26	23	17	7				
MED					140	215	288	310	332	350	360	370	368	370	350	342	318	290	230	E				
UQ					140	225	295	315	335	360	375	380	380	375	378	360	330	300	245	138				
LQ					E 130	205	270	305	325	340	348	360	355	350	340	330	305	278	215	E				

JUL. 1969

FOE (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1969

FOES (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	J ₂₈ ^X	21	J ₃₃ ^X	J ₃₃ ^X	J ₂₃ ^X	30	J ₅₃ ^X	J ₅₃ ^X	J ₇₃ ^X	J ₇₃ ^X	J ₇₃ ^X	J ₆₉ ^X	J ₉₃ ^X	J ₆₃ ^X	J ₆₈ ^X	40	J ₅₈ ^X	J ₉₈ ^X	J ₉₃ ^X	J ₆₃ ^X	J ₅₃ ^X	J ₄₃ ^X	J ₃₃ ^X	E ₁₅	
2	E	16	J ₂₄ ^X	J ₃₃ ^X	J ₂₃ ^X	J ₆₃ ^X	J ₆₀ ^X	G	J ₅₅ ^X	J ₁₁₆ ^X	J ₇₃ ^X	J ₁₈₃ ^X	J ₁₆₃ ^X	J ₆₅ ^X	J ₇₃ ^X	40	G	G	32	26	J ₂₈ ^X	J ₆₃ ^X	J ₆₅ ^X	J ₅₃ ^X	
3	J ₃₅ ^X	J ₃₀ ^X	J ₃₃ ^X	J ₄₃ ^X	J ₃₅ ^X	30	J ₅₄ ^X	39	44	44	42	44	46	40	41	43	G	40	J ₇₃ ^X	J ₃₃ ^X	J ₃₃ ^X	J ₂₅ ^X	J ₄₀ ^X	J ₂₄ ^X	
4	E	17	J ₃₃ ^X	J ₂₆ ^X	G	G	J ₅₀ ^X	J ₆₄ ^X	J ₅₀ ^X	J ₇₄ ^X	J ₅₄ ^X	J ₄₇ ^X	40	J ₄₃ ^X	J ₃₃ ^X	G	G	29	43	J ₄₃ ^X	J ₄₀ ^X	J ₃₃ ^X	J ₃₀ ^X		
5	J ₂₃ ^X	J ₂₀ ^X	J ₃₀ ^X	J ₃₅ ^X	23	G	J ₂₈ ^X	36	42	J ₅₁ ^X	43	J ₅₇ ^X	42	J ₄₆ ^X	44	J ₄₄ ^X	J ₇₄ ^X	60	J ₆₀ ^X	30	J ₃₀ ^X	21	J ₃₅ ^X	J ₅₀ ^X	
6	E ₁₆ ^S	18	J ₂₃ ^X	J ₂₅ ^X	D ₂₃	G	E ₅₀ ^G	40	40	52	43	G	44	G	G	G	G	G	G	28	J ₃₃ ^X	J ₃₃ ^X	J ₂₅ ^X	20	
7	20	E	E	E	G	G	G	40	42	42	G	45	45	45	J ₇₃ ^X	44	J ₅₃ ^X	J ₁₂₁ ^X	J ₅₀ ^X	J ₃₃ ^X	J ₅₃ ^X	J ₅₀ ^X	J ₂₅ ^X	J ₄₃ ^X	
8	J ₆₃ ^X	J ₆₃ ^X	J ₄₈ ^X	J ₂₅ ^X	J ₃₃ ^X	30	43	J ₈₃ ^X	J ₇₀ ^X	J ₁₀₁ ^X	J ₆₅ ^X	43	43	54	J ₈₀ ^X	J ₇₀ ^X	J ₉₅ ^X	J ₅₃ ^X	J ₈₃ ^X	J ₃₆ ^X	J ₅₃ ^X	J ₆₃ ^X	E ₁₆ ^S	J ₃₃ ^X	
9	J ₅₃ ^X	J ₃₅ ^X	J ₄₀ ^X	J ₂₁ ^X	J ₂₆ ^X	J ₃₃ ^X	G	J ₅₁ ^X	G	G	44	J ₁₀₃ ^X	J ₇₀ ^X	J ₅₁ ^X	51	G	42	J ₅₁ ^X	J ₅₅ ^X	J ₄₂ ^X	J ₃₁ ^X	E	J ₃₄ ^X	J ₄₀ ^X	
10	J ₃₀ ^X	J ₃₅ ^X	J ₂₀ ^X	J ₄₄ ^X	23	30	G	41	60	J ₉₃ ^X	J ₉₂ ^X	J ₁₀₃ ^X	J ₁₇₈ ^X	J ₁₁₇ ^X	J ₇₁ ^X	J ₅₀ ^X	41	J ₅₈ ^X	J ₁₀₃ ^X	J ₆₅ ^X	J ₃₃ ^X	J ₂₃ ^X	J ₄₁ ^X	J ₂₅ ^X	
11	J ₂₃ ^X	15	E	E	G	G	41	45	51	J ₆₅ ^X	44	43	J ₅₈ ^X	40	J ₄₃ ^X	J ₅₃ ^X	J ₆₃ ^X	J ₄₃ ^X	J ₄₀ ^X	J ₆₅ ^X	63	J ₂₁ ^X	J ₂₃ ^X	J ₇₃ ^X	
12	J ₅₃ ^X	J ₂₀ ^X	J ₂₅ ^X	E	G	G	G	48	J ₅₃ ^X	J ₆₅ ^X	43	J ₅₄ ^X	44	46	42	39	40	J ₅₀ ^X	J ₂₄ ^X	E ₁₅	J ₂₃ ^X	J ₆₃ ^X	J ₆₃ ^X		
13	J ₂₃ ^X	15	E	J ₂₃ ^X	15	G	G	J ₆₀ ^X	G	44	J ₆₁ ^X	J ₆₃ ^X	43	42	43	G	G	G	J ₆₃ ^X	J ₈₃ ^X	J ₃₅ ^X	J ₄₅ ^X	J ₃₃ ^X	J ₅₈ ^X	
14	J ₅₃ ^X	J ₆₀ ^X	J ₄₃ ^X	E	J ₃₃ ^X	30	J ₅₅ ^X	J ₅₃ ^X	J ₆₈ ^X	43	45	43	43	G	G	42	J ₆₃ ^X	J ₆₃ ^X	J ₄₃ ^X	J ₅₃ ^X	J ₃₃ ^X	J ₃₅ ^X	J ₃₃ ^X	J ₂₆ ^X	
15	18	E	18	E	21	J ₃₈ ^X	J ₆₃ ^X	J ₇₃ ^X	J ₈₁ ^X	J ₁₀₃ ^X	J ₅₄ ^X	40	G	45	J ₄₀ ^X	G	41	35	J ₄₀ ^X	J ₅₀ ^X	J ₅₁ ^X	J ₃₁ ^X	J ₅₁ ^X	J ₄₃ ^X	
16	J ₃₄ ^X	J ₂₃ ^X	J ₃₄ ^X	J ₁₈ ^X	J ₂₃ ^X	J ₁₈ ^X	J ₃₅ ^X	40	J ₆₃ ^X	J ₅₁ ^X	J ₆₃ ^X	J ₇₀ ^X	J ₅₈ ^X	J ₉₁ ^X	55	J ₇₁ ^X	J ₆₅ ^X	34	G	J ₅₃ ^X	J ₇₄ ^X	J ₁₀₅ ^X	J ₅₃ ^X	J ₂₁ ^X	
17	J ₅₅ ^X	J ₃₃ ^X	J ₅₃ ^X	J ₂₅ ^X	J ₃₀ ^X	J ₂₅ ^X	G	34	47	J ₈₈ ^X	J ₉₈ ^X	J ₇₉ ^X	J ₈₃ ^X	40	39	J ₄₃ ^X	J ₄₆ ^X	J ₃₃ ^X	J ₅₃ ^X	J ₅₂ ^X	J ₃₅ ^X	J ₃₃ ^X	J ₆₆ ^X	J ₆₅ ^X	
18	J ₄₀ ^X	J ₂₉ ^X	J ₂₄ ^X	J ₂₄ ^X	J ₂₅ ^X	23	33	J ₃₂ ^X	G	54	J ₆₁ ^X	54	43	43	J ₆₄ ^X	40	J ₄₃ ^X	J ₃₅ ^X	J ₃₀ ^X	J ₂₄ ^X	J ₂₃ ^X	15	20	J ₂₂ ^X	
19	J ₂₂ ^X	E	J ₂₈ ^X	J ₂₀ ^X	19	20	J ₃₅ ^X	J ₅₅ ^X	42	49	J ₅₅ ^X	50	J ₆₃ ^X	45	46	J ₅₅ ^X	J ₆₈ ^X	38	29	28	J ₃₅ ^X	J ₄₃ ^X	J ₂₃ ^X	J ₂₃ ^X	
20	J ₃₀ ^X	J ₂₈ ^X	J ₂₃ ^X	18	J ₂₁ ^X	G	36	J ₄₃ ^X	J ₄₅ ^X	J ₄₃ ^X	40	G	J ₂₉ ^X	J ₂₅ ^X	G	41	J ₄₆ ^X	J ₆₄ ^X	J ₈₀ ^X	J ₆₄ ^X	J ₆₄ ^X	20	26	E	
21	J ₂₃ ^X	J ₂₃ ^X	J ₃₀ ^X	J ₃₃ ^X	J ₂₅ ^X	J ₃₀ ^X	G	35	J ₈₀ ^X	48	J ₇₄ ^X	J ₈₀ ^X	J ₇₃ ^X	J ₈₀ ^X	J ₆₀ ^X	J ₁₀₃ ^X	J ₇₄ ^X	J ₆₃ ^X	40	J ₇₀ ^X	J ₃₅ ^X	J ₃₄ ^X	J ₂₈ ^X	J ₃₈ ^X	
22	J ₄₀ ^X	J ₃₄ ^X	J ₃₁ ^X	J ₂₃ ^X	J ₄₀ ^X	J ₆₁ ^X	G	J ₆₀ ^X	47	46	J ₉₈ ^X	43	G	G	G	G	41	J ₄₅ ^X	J ₃₃ ^X	J ₄₃ ^X	E	E ₁₆ ^S	J ₃₀ ^X		
23	J ₂₁ ^X	21	J ₄₃ ^X	J ₄₃ ^X	J ₃₃ ^X	J ₁₀₅ ^X	J ₅₃ ^X	J ₆₃ ^X	40	47	J ₅₀ ^X	J ₅₀ ^X	J ₆₃ ^X	J ₈₂ ^X	J ₆₂ ^X	50	35	36	J ₃₃ ^X	J ₂₃ ^X	J ₂₃ ^X	E	E ₁₅ ^S	J ₃₃ ^X	
24	J ₃₆ ^X	J ₃₃ ^X	J ₇₀ ^X	J ₇₃ ^X	J ₃₀ ^X	J ₃₈ ^X	J ₅₁ ^X	J ₆₁ ^X	J ₅₅ ^X	J ₄₄ ^X	J ₄₀ ^X	J ₄₀ ^X	G	G	41	J ₆₁ ^X	J ₅₀ ^X	J ₇₈ ^X	J ₇₀ ^X	J ₈₀ ^X	J ₈₅ ^X	J ₃₄ ^X	J ₆₀ ^X		
25	J ₂₃ ^X	J ₂₀ ^X	J ₂₃ ^X	J ₁₃ ^X	20	J ₃₃ ^X	J ₄₃ ^X	J ₃₄ ^X	J ₃₃ ^X	G	J ₃₁ ^X	J ₅₃ ^X	44	J ₅₆ ^X	J ₇₄ ^X	J ₉₈ ^X	40	36	J ₅₃ ^X	21	E	E ₁₅ ^S	J ₂₅ ^X	24	
26	J ₃₀ ^X	E	20	J ₄₃ ^X	J ₂₅ ^X	J ₃₃ ^X	J ₇₃ ^X	J ₃₈ ^X	G	G	43	J ₄₈ ^X	41	41	J ₆₃ ^X	J ₅₃ ^X	47	36	J ₄₂ ^X	J ₅₈ ^X	J ₆₁ ^X	J ₂₆ ^X	24	J ₃₀ ^X	
27	E ₁₅ ^S	J ₂₅ ^X	J ₂₃ ^X	20	15	33	C	C	C	C	J ₇₁ ^X	J ₇₀ ^X	J ₅₈ ^X	J ₆₈ ^X	J ₁₂₁ ^X	90	62	J ₁₁₅ ^X	J ₆₃ ^X	J ₆₃ ^X	E ₁₅ ^S	19	19		
28	J ₃₁ ^X	J ₃₁ ^X	J ₄₃ ^X	J ₂₈ ^X	J ₃₄ ^X	24	G	J ₇₃ ^X	38	40	46	45	47	J ₇₃ ^X	39	J ₃₈ ^X	J ₄₃ ^X	J ₃₅ ^X	J ₃₁ ^X	21	C	C	C	C	
29	C	E	J ₃₃ ^X	18	J ₂₆ ^X	J ₃₃ ^X	J ₄₄ ^X	J ₄₃ ^X	38	45	48	43	J ₄₀ ^X	J ₄₃ ^X	J ₄₅ ^X	J ₇₂ ^X	J ₆₈ ^X	J ₆₅ ^X	J ₇₀ ^X	J ₁₀₅ ^X	E	J ₃₅ ^X	E ₁₅ ^S	J ₂₅ ^X	
30	J ₃₀ ^X	E	J ₂₃ ^X	E	J ₂₃ ^X	22	32	35	G	G	G	G	J ₃₁ ^X	G	J ₂₉ ^X	J ₂₂ ^X	G	G	33	J ₃₃ ^X	20	E ₁₅ ^S	21	J ₃₄ ^X	
31	J ₂₃ ^X	J ₂₃ ^X	J ₂₃ ^X	J ₅₃ ^X	J ₆₃ ^X	36	J ₅₃ ^X	J ₆₅ ^X	J ₅₃ ^X	J ₅₅ ^X	J ₁₅₀ ^X	J ₅₄ ^X	J ₆₁ ^X	J ₆₅ ^X	J ₇₂ ^X	J ₈₁ ^X	J ₉₈ ^X	J ₅₈ ^X	J ₁₀₈ ^X	J ₆₅ ^X	J ₅₁ ^X	J ₂₆ ^X	J ₂₄ ^X	25	
	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	30	30	30	31	31	31	31	31	31	31	31	31	31	31	30	30	30	30
MED	J ₂₉ ^X	J ₂₁ ^X	J ₂₈ ^X	J ₂₄ ^X	J ₂₃ ^X	30	37	J ₄₃ ^X	46	48	J ₅₄ ^X	J ₅₀ ^X	46	44	J ₄₆ ^X	43	J ₄₆ ^X	40	J ₅₀ ^X	J ₄₃ ^X	J ₃₅ ^X	J ₂₈ ^X	J ₂₇ ^X	J ₃₀ ^X	
UQ	J ₃₆ ^X	J ₃₀ ^X	J ₃₄ ^X	J ₃₃ ^X	J ₃₁ ^X	J ₃₃ ^X	J ₅₃ ^X	J ₆₀ ^X	J ₆₀ ^X	J ₅₅ ^X	J ₇₂ ^X	J ₆₆ ^X	J ₆₂ ^X	J ₆₀ ^X	J ₆₄ ^X	J ₅₄ ^X	J ₆₄ ^X	J ₅₉ ^X	J ₇₂ ^X	J ₆₄ ^X	J ₅₃ ^X	J ₄₃ ^X	J ₃₅ ^X	J ₄₃ ^X	
LQ	J ₂₂ ^X	16	J ₂₃ ^X	18	20	E ₁₈ ^G	G	36	38	43	43	43	42	40	40	39	37	35	J ₃₃ ^X	J ₂₉ ^X	J ₃₀ ^X	20	23	J ₂₃ ^X	

JUL. 1969

FOES (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1969

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	19	16	20	18	18	G	40	40	56	70	60	66	A	45	51	G	50	A	A	57	40	25	22	E ₁₅																								
2	E	E	E	18	18	60	G	G	50	76	58	A	A	52	48	G	G	G	G	24	20	28	43	30																								
3	17	19	25	21	32	G	50	G	G	G	G	G	G	G	38	37	G	G	56	25	20	17	40	E																								
4	E	12	23	23	G	G	41	48	45	48	69	53	44	40	40	31	G	G	G	25	40	28	22	22																								
5	20	17	12	20	18	G	G	22	G	G	G	G	45	42	40	G	40	58	52	51	30	17	18	25	19																							
6	E ₁₀	17	19	16	18	G	E ₃₀	G	G	49	G	G	G	G	G	G	G	G	G	20	20	20	16	17																								
7	E	E	E	E	G	G	G	G	G	G	G	G	G	G	55	G	50	52	40	25	20	30	21	30																								
8	40	26	20	20	17	G	G	52	G	54	59	G	G	47	50	G	A	43	65	22	21	16	E ₁₆	30																								
9	20	16	17	13	18	25	G	36	G	G	G	53	47	50	50	G	G	36	47	26	16	E	30	20																								
10	18	25	18	20	20	G	G	G	54	A	A	A	A	A	57	47	G	42	60	47	28	20	21	18																								
11	15	15	E	E	G	G	37	42	49	62	G	G	53	40	43	39	40	32	31	57	28	16	17	38																								
12	18	16	16	E	G	G	G	G	44	G	57	G	57	G	G	G	G	35	26	18	E ₁₄	18	43	20																								
13	17	12	E	16	15	G	G	G	G	G	G	40	G	G	39	G	G	G	60	20	28	40	20	30																								
14	20	20	11	E	19	G	52	45	51	G	G	G	G	G	G	G	47	48	36	22	16	20	27	15																								
15	16	E	12	E	15	30	36	46	47	A	44	42	G	G	38	G	G	G	30	23	20	17	17	40																								
16	30	18	24	16	17	G	20	28	G	48	50	56	63	50	57	G	54	36	30	G	26	47	50	29	16																							
17	24	30	20	15	13	17	G	G	G	A	A	A	A	A	G	38	36	33	30	24	30	24	20	23	57																							
18	30	19	E	11	16	20	28	30	G	G	55	53	G	G	39	36	36	29	24	18	15	13	15	17																								
19	17	E	16	13	14	G	22	33	36	45	54	46	G	G	43	53	40	G	25	22	28	30	15	16																								
20	18	19	E	14	17	G	30	33	40	39	39	G	G	28	24	G	G	41	41	27	42	28	15	E	E																							
21	17	16	16	20	17	16	G	G	G	G	G	G	51	60	49	A	39	47	25	25	30	17	20	28																								
22	25	20	18	19	30	24	G	39	41	G	51	G	G	G	G	G	G	G	30	20	30	E	E ₁₆	22																								
23	18	E	30	26	17	50	28	34	G	43	50	G	58	70	43	G	G	G	34	17	17	E	E ₁₅	E																								
24	17	15	18	40	17	26	32	35	34	36	36	36	G	G	G	G	G	26	68	50	30	53	24	32																								
25	15	16	17	13	12	20	30	30	30	G	29	50	39	G	48	50	G	16	45	17	E	E ₁₅	16	18																								
26	16	E	16	17	22	30	44	G	G	G	G	G	G	G	46	40	44	G	40	50	30	22	E	E																								
27	E ₁₅	17	17	16	15	G	C	C	C	C	58	57	50	32	45	43	40	E ₆₂	50	20	52	E ₁₅	17	17																								
28	20	16	19	17	25	16	G	G	G	G	43	G	G	56	G	35	35	29	24	17	C	C	C	C																								
29	C	E	20	E	24	G	G	G	G	G	G	40	40	40	40	58	61	35	30	67	E	30	E ₁₅	16																								
30	E	E	E	E	15	G	G	G	G	G	G	G	G	G	30	G	27	G	20	G	G	17	20	17	E ₁₅	18	27																					
31	16	18	18	30	22	30	46	56	49	50	A	G	50	42	A	A	A	35	A	30	48	E	15	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	30	31	31	31	31	31	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	30	30	30	30																							
MED	17	16	17	16	17	G	22	29	E ₃₀	E ₃₆	43	36	39	27	40	31	35	30	31	25	22	18	19	18																								
UQ	20	18	20	20	18	22	36	39	47	50	58	53	50	46	48	42	42	40	50	30	30	28	24	30																								
LQ	16	E	E	12	12	15	G	G	G	G	G	G	G	G	G	G	G	G	24	20	17	15	16	16																								

JUL. 1969

FBES (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1969

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

The Radio Research Laboratories, Japan

JUL. 1969

F=MIN (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1969

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	280	270	290	280	265 ^F	275	275	315	305	310	265	275	290 ^{I A}	280	275	290	280	A	A	290	270	265	280	275														
2	285	265	270	270	260	275	290	290	300	295	285	A	A	275	275 ^B	275 ^H	265	260	275	280	280	275	275	280														
3	285	270	270	275	270	285	290	290	275	295	280	280	270	290	270	265	285	285	290	280	275	260	265	275														
4	285	285	290	265	255	255	295	290	295	290	265	280	265	275	290	290	270	300	280	280	270	280	275	275														
5	270	290	295	265	260	275	280	290	295	290	280	285	275	275	275	280	265	295	290	280	270	265	270	270														
6	275	275	280	280	265 ^{I C}	280	280	290	310	285	280	275	270	280	275	280	270	285	280	280	280	270	270	270														
7	265	260	255	260	255	265	280	285	285	290	275	260	270	280	275	275	270	290	290	290	275	275	275	270														
8	270	270	280	265	255	260	270	290	300	290	275	250	280	280	275	275	280 ^{I A}	290	285	275	265	270	280	270														
9	270	265	280	285	275	270	295	280	280	245	275	265	275	265	275	265	275	280	275	275	280	260	265	265														
10	265	270	265	275	260	295	285	280	290	A	A	A	A	A	A	290	280	285	300	285	285	265	275	F 270														
11	280	260	260	260	260	275	275	275	290	270	285	275	280	285	295	280	285	295	295	280	285	280	265	265														
12	260	275	265	285	285	280	270	290	310	275	260	280	255	275	280	270	290	280	285	275	265	260	265	265														
13	265	275	275	270	260	270	275	275	265	255	265	270	280	290	285	280	290	280	300	275	280	275	265	280 ^S														
14	275	265	270	285	285	255	260	255	275	255	270	W	240	240	240	250	275	275	275	275	260 ^F	265	265 ^F	270 ^F														
15	F	F	U ^F	U ^F	F	260 ^F	250 ^F	260	290	270	A	275	245	230	W	245	245	270	285	290	275	280	280 ^F	F F														
16	F	F	U ^F	U ^F	F	280 ^F	280	255	280	310	285	275	260	295	275	285	270	285	285	290	285	300	270	275	275													
17	265	290	300	255	285	265	270	290	285	I A	A	A	A	285	275	285	290	290	290	290	280	290	280	285 ^S														
18	280	275	275	275 ^F	280	275	310	310	285	280	280	285	280	290	290	310	305	290	285	295	280	275	275	260														
19	270 ^F	275 ^F	285 ^F	300 ^F	285 ^F	300	315	295	285	285	280	285	290	280	295	310	300	285	290	285	290	285	250	265														
20	275	275	285	295	295	305	295	300	280	285	310	305	270	315	285	280	310	295	300	295	290	285	280	270														
21	270	280	290	290	280	285	315	325	280	260	310	310	295	295	300	I A	285	290	285	300	290	290	285	270 ^F														
22	F	265 ^F	280 ^F	265 ^F	270	275	280 ^F	295	325	285	265	305	255	275	295	300	305	285	270	285	285	270	U S	270														
23	275	295	280 ^F	275	315	275	295	290	280	315	285	270	295	305	295	295	295	300	305	295	295	290	275	275 ^F														
24	275 ^F	280 ^F	285 ^F	295 ^F	285 ^F	295 ^F	290 ^F	310	310	310	285 ^R	290	275	300	300	285	290	285	295	300	305	S	F	F														
25	F	280 ^F	F	290 ^F	F	290 ^F	295	310	305	315	300	270	275	295	300	290	295	300	290	315	250	280	280	285														
26	280	290	295	285	300	300	300 ^B	320	305	310	295	270	300	290	290	285	295	310	295	300	300	295 ^E	285 ^F	265 ^F														
27	265 ^F	270 ^F	F	275 ^F	270 ^F	275	C	C	C	C	C	300	255	275	275	270	280	295	I R	285	285	290	280	285	270	270												
28	255 ^F	280	275	265	275	285	290	320	315	305	320	280	275	300	300	295	310	295	295	300	C	C	C	C														
29	C	275	285	295	295	300	300	320	325	305	295	280	295	290	285	275	300	295	300	285	280	290	290	280														
30	265	270	270	275	280	290	290	295	290	285	310	285	285	295	300	290	295	285	280	270	280	280	295	270														
31	265	260	270	270	255	275	265	290	290	275	A	275	275	285	A	A	A	305	I A	300	290	265	270	270	270													
CNT	26	29	29	31	30	31	30	30	30	28	28	28	28	30	30	30	30	30	30	31	30	29	27	28														
MED	270	275	280	275	272	275	288	290	290	288	280	275	275	282	285	280	290	288	290	285	280	275	275	270														
UQ	280	280	285	285	285	288	295	310	305	300	295	285	288	290	295	290	295	295	295	290	285	285	280	275														
LQ	265	270	270	265	260	272	275	290	280	278	275	268	270	275	275	275	275	285	285	280	270	270	268	270														

JUL. 1969

M(3000)F2 (0.01)

IONOSPHERIC DATA

JUL. 1969

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							A	A	A	A	A	A	A	350	I A 355	345	A	A						
2							L 370	L	A	A	A	A	A	A	A		340		L					
3							A	350	L 345	365	365	385	350	340	345	355	330	355						
4								A	A	A	A	A	350	335	340	H 360	H 340	365						
5							L 345	360	360	375	350	350	350	345	360	350	A	A						
6							C	340	360	I A 380	345	365	370	355	360	355	335	320						
7							350	360	350	360	355	345	370	360	I A 340	345	A	A						
8								A	360	A	A	365	375	360	I A 370	350	A	A						
9								350	365	350	350	A	A	A	A	340	345	335						
10							325	320	350	A	A	A	A	A	A	A	340	A						
11							335	340	A	A	A	365	375	I A 350	355	350	360	355	350					
12								340	I A 365	380	I A 370	365	I A 355	340	340	340	335							
13							325	355	370	405	345	365	350	370	355	340	335	335						
14							A	A	A	360	355	350	380	345	345	340	A	A						
15							315	A	A	A	A	395	380	390	365	370	355	320	315					
16							355	375	A	A	A	A	A	A	365	I A 345	335	340	325					
17							340	355	355	A	A	A	A	360	380	345	350							
18							355	350	350	A	A	A	355	360	365	350	350	350						
19							350	370	355	A	A	A	355	355	A	A	360							
20								350	340	360	360	360	390	365	365	345	A	A	340					
21							325	335	365	390	360	345	355	A	A	A	A	335	A					
22							335	340	I A 345	355	A	385	375	355	375	360	375	325						
23							375	385	355	A	A	380	A	A	A	365	345	350						
24							360	385	380	395	390	395	360	340	365	355	360	340						
25								370	345	380	370	A	360	360	I A 345	I A 350	355	350						
26							A	395	360	390	390	360	375	355	I A 350	I A 350	I A 350	365						
27							C	C	C	C	A	A	A	340	I A 340	I A 335	I A 345	A						
28							360	375	390	365	380	395	365	I A 350	350	345	355	375						
29							L 365	360	365	370	355	380	365	360	350	A	A	355						
30									340	375	390	375	365	380	370	350	350	L						
31							A	A	A	A	A	395	I A 355	355	A	A	A	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					4	15	21	20	18	17	20	22	25	24	25	23	16	3						
MED					325	350	355	360	365	365	370	362	355	355	350	345	350	325						
UQ					330	360	370	365	380	375	385	375	360	365	355	355	355	332						
LQ					320	338	350	348	360	355	360	355	345	345	345	338	335	320						

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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H*F2 (KM)

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

Station WAKKANAI Lat. 45 23.6 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	280	275	A	420	420	I ³⁶⁵ A	385	400	350	340	A							
2							275	270	285	A	375	A	A	395	350		405		I ³²⁰ B						
3							300	305	325	295	330	370	370	360	395	410	360	325							
4							280	280	290	I ³⁷⁰ A	360	400	400	360	360	385	315								
5							280	295	300	350	360	380	390	380	360	390	325								
6							310	285	275	290	360	350	370	350	360	325	350	340							
7							300	300	300	320	330	335	415	390	400	370	380	320							
8							350	315	310	320	450	360	350	350	370	A	325								
9							350	305	485	385	395	375	390	360	400	345	330								
10						295	340	350	335	A	A	A	A	A	340	350	350	320							
11						325	325	325	320	380	345	370	370	340	345	340	370	315							
12							320	300	345	425	350	420	370	360	345	325									
13							320	300	315	300	365	325	340	350	350	360	315	310							
14						I ³⁸⁰ A	410	405	490	450	W	555	540	540	490	370	350								
15						380	370	330	410	A	410	550	600	W	550	520	415	370	345						
16							375	350	295	370	350	I ³⁹⁰ A	350	390	370	390	350	340	310						
17							380	360	370	A	A	A	A	375	375	360	345								
18							285	325		415	400	380	370	360	350	320	320	300							
19							260	305	350	370	395	395	390	405	370	325	325								
20							320	370	345	320	335	360	325	355	380	320	300	280							
21						330	300	290	370	390	350	320	350	I ³⁴⁵ A	345	I ³⁵⁰ A	335	325							
22							350	345	290	370	440	325	400	410	350	325	315	340							
23							270	310	325	315	365	360	335	I ³²⁰ A	350	350	330	310							
24							310	300	285	295	350	390	400	345	340	345	350	320							
25							325	300	290	315	410	395	350	325	350	310	300								
26							315	245	320	295	345	330	330	325	345	350	320	290							
27						C	C	C	C	350	A	375	345	325	330	305	I ³²⁰ A								
28							285	280	295	290	315	380	400	345	325	335	310	290							
29							375	300	300	325	360	375	325	350	360	350	A	300							
30									320	345	300	360	360	345	325	350	325	315							
31							370	I ³⁵⁰ A	330	350	A	410	380	350	A	A	A	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					4	22	29	29	25	28	27	28	30	30	29	28	26	4							
MED					328	318	310	315	325	355	370	372	355	352	350	342	320	315							
UQ					355	370	345	330	370	390	395	400	390	370	370	365	325	332							
LQ					310	300	290	295	295	338	350	360	345	345	345	320	300	295							

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H*F2 (KM)

IONOSPHERIC DATA

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H^oF (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	265	260	275	270	265	250	A	A	A	A	A	A	A	250	I ^A 235	225	A	A	A	A	300	290	290	290	
2	290	275	250	290	285	I ^A 270	245	250	A	A	A	A	A	A	A	220	230	250	250	270	270	295	I ^A 295	295	
3	265	250	300	300	330	A	260	A	220	245	215	210	210	210	205	215	225	225	250	I ^A 265	290	275	290	I ^A 290	260
4	260	260	265	315	295	250	A	A	A	A	A	A	205	205	215	I ^H 205	I ^H 220	240	245	270	I ^A 280	300	290	300	
5	300	260	250	280	270	260	245	240	220	210	200	240	215	220	205	250	A	A	A	265	265	290	300	300	
6	275	265	260	270	270	245	I ^C 240	250	245	I ^A 210	200	200	205	225	210	215	235	235	245	270	265	270	260	275	
7	300	300	300	300	290	260	245	230	230	225	205	210	200	240	I ^A 250	260	A	A	A	275	275	305	295	I ^A 310	
8	A	310	300	285	265	250	250	A	250	I ^A 235	I ^A 210	210	210	250	I ^A 245	260	A	A	A	270	290	290	260	I ^A 300	
9	300	300	275	260	260	250	250	215	215	210	215	I ^A 225	I ^A 210	A	A	235	250	250	A	I ^A 300	260	275	I ^A 315	300	
10	300	300	290	285	290	260	220	250	A	A	A	A	A	A	A	A	250	A	A	A	305	275	330	300	
11	275	290	310	300	300	260	260	A	A	A	225	205	A	210	240	215	260	250	260	I ^A 280	290	260	290	I ^A 325	
12	300	280	275	275	260	250	240	250	A	210	I ^A 220	225	I ^A 240	250	250	225	250	240	250	260	265	295	I ^A 300	300	
13	295	280	250	275	290	260	250	225	230	200	210	195	225	220	230	250	225	230	I ^A 265	260	270	I ^A 320	300	310	
14	290	280	240	250	250	260	A	A	A	220	235	260	220	240	225	245	A	A	A	295	295	300	300	295	
15	270	260	270	260	310	290	A	A	270	A	275	245	230	220	245	245	240	240	265	300	285	280	280	I ^A 320	
16	315	295	290	270	265	250	230	220	A	A	A	A	A	A	A	I ^A 250	I ^A 250	240	250	240	280	A	A	305	285
17	305	290	260	310	280	260	240	200	250	A	A	A	A	200	210	240	240	240	250	280	280	270	275	A	
18	300	300	260	285	295	250	250	225	230	250	A	A	225	240	210	215	250	235	240	260	260	260	275	290	
19	300	275	260	250	250	260	250	225	240	A	A	A	225	230	A	A	250	265	250	270	275	I ^A 295	275	265	
20	285	295	260	250	265	250	230	205	245	245	215	210	200	250	205	250	A	A	250	I ^A 260	270	260	260	295	
21	295	290	260	270	270	240	240	230	200	240	275	250	A	A	A	A	290	A	250	275	270	260	285	320	
22	335	310	285	270	300	260	250	290	A	235	I ^A 225	200	200	200	220	210	240	235	270	265	290	270	275	305	
23	290	270	275	290	280	A	250	220	220	I ^A 250	A	225	A	A	A	245	240	240	260	260	250	245	270	280	
24	290	275	275	I ^A 295	300	260	250	235	205	215	185	195	210	215	225	250	250	220	A	A	270	A	305	320	
25	285	290	275	265	245	235	245	200	200	215	210	I ^A 240	240	225	I ^A 205	I ^A 240	235	240	I ^A 250	240	245	270	260	300	
26	270	275	245	250	295	290	I ^A 250	235	200	190	205	240	220	235	I ^A 245	I ^A 250	I ^A 250	260	A	A	A	275	245	290	
27	315	315	310	280	310	250	C	C	C	C	A	A	A	235	A	A	I ^A 260	I ^A 275	I ^A 275	255	A	260	250	290	
28	320	300	290	300	300	260	245	225	210	210	240	205	200	I ^A 250	240	215	250	235	250	265	C	C	C	C	
29	C	290	285	240	250	250	260	250	210	225	250	200	225	235	240	A	A	250	270	I ^A 250	250	290	250	260	
30	300	295	275	260	270	240	210	235	210	200	195	200	210	195	185	240	225	230	250	290	275	270	270	300	
31	285	300	290	I ^A 310	325	315	A	A	A	A	A	225	A	245	A	A	A	260	A	275	I ^A 290	285	275	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	29	31	31	31	31	30	24	23	20	20	20	22	21	25	23	25	23	23	21	27	27	28	30	29	
MED	295	290	275	275	280	260	245	230	225	215	212	210	210	230	225	240	240	240	250	270	275	278	282	300	
UQ	300	300	290	292	298	260	250	245	245	235	230	240	225	240	242	250	250	250	265	280	288	292	300	300	
LQ	285	275	260	262	265	250	240	220	210	210	205	200	205	215	210	220	235	235	250	260	265	270	270	290	

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H^oF (KM)

IONOSPHERIC DATA

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H^oE^s (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	105	105	105	100	100	140	115	110	110	105	105	110	110	105	105	145	125	115	110	110	110	110	110	S																						
2	E	100	100	100	105	110	110	G	110	110	110	110	105	110	110	135	G	G	120	115	115	110	110	105																						
3	105	105	100	100	100	125	115	120	120	120	115	110	115	115	110	105	G	125	115	115	110	110	105	105																						
4	E	105	100	100	G	G	125	115	110	110	110	110	110	105	105	105	G	G	100	115	110	110	110	105																						
5	105	105	105	100	100	G	105	135	120	115	110	110	110	110	115	110	110	115	120	120	115	115	110	110																						
6	S	100	100	100	105	G	C	140	145	120	120	G	120	G	G	G	G	G	G	115	100	110	110	110																						
7	100	E	E	E	G	G	G	120	120	120	G	125	120	115	110	125	120	120	115	110	110	110	110	110																						
8	110	110	110	105	105	140	120	115	115	110	110	115	115	115	125	120	115	115	110	110	115	110	S	105																						
9	105	100	100	105	105	110	G	110	G	G	115	110	110	110	120	G	120	115	110	110	105	E	100	100																						
10	105	100	100	115	115	120	G	120	120	110	110	110	110	105	105	105	125	115	110	110	110	105	105	105																						
11	105	105	E	E	G	G	120	115	115	110	110	110	110	105	105	105	105	100	100	110	120	100	110	105																						
12	105	105	105	E	G	G	G	G	120	120	110	125	110	120	120	120	115	110	105	110	S	100	110	110																						
13	110	110	E	105	105	G	G	115	G	115	110	110	115	120	110	G	G	G	110	110	105	110	110	110																						
14	110	110	110	E	100	125	120	120	110	115	110	110	110	G	G	125	115	110	115	110	110	110	110	110																						
15	105	E	100	E	110	115	120	110	110	110	110	105	G	110	105	G	120	115	110	110	110	110	105	105																						
16	105	105	100	105	100	105	110	140	115	115	110	110	110	110	110	110	110	110	G	110	110	110	110	110																						
17	110	105	105	105	105	105	G	140	135	115	110	110	110	115	110	110	110	105	105	100	100	100	100	110																						
18	110	105	110	110	105	105	105	105	G	120	115	115	115	115	110	110	110	110	105	105	105	105	110	110																						
19	110	E	110	105	105	105	105	105	105	120	110	115	110	110	110	110	110	110	110	110	105	105	105	110																						
20	110	110	110	110	110	G	110	110	105	105	105	G	105	105	G	125	115	110	105	105	105	110	105	E																						
21	110	105	105	105	105	105	G	140	120	135	115	115	115	110	110	110	115	110	105	105	100	100	105	100																						
22	105	105	105	105	105	105	G	125	125	120	110	120	G	G	G	G	G	125	120	120	110	E	S	105																						
23	100	105	110	105	110	110	105	105	140	120	120	120	125	115	110	125	120	115	110	110	100	E	S	115																						
24	110	110	110	110	110	110	110	105	110	105	105	100	G	G	G	120	115	110	110	105	105	100	100	100																						
25	100	100	100	100	100	100	105	105	105	G	105	120	100	125	110	120	120	120	115	110	E	S	100	100																						
26	120	E	115	115	110	115	115	110	G	G	120	110	110	110	110	105	120	125	110	110	110	110	105	110																						
27	S	105	110	105	105	120	C	C	C	C	110	110	105	105	120	120	115	115	110	110	105	S	105	100																						
28	110	110	105	105	105	145	G	110	115	115	110	110	140	115	120	105	105	105	105	105	C	C	C	C																						
29	C	E	135	125	120	120	120	115	110	115	110	105	105	100	100	115	115	120	115	110	E	110	S	105																						
30	105	E	100	E	100	140	130	125	G	G	G	G	105	G	105	100	G	G	125	100	100	S	110	110																						
31	115	110	105	105	105	120	115	115	120	115	110	110	110	110	125	120	110	120	110	110	110	115	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	26	25	28	25	27	23	20	28	25	26	29	28	28	26	26	26	24	26	29	31	27	24	26	28																						
MED	105	105	105	105	105	115	115	115	115	115	110	110	110	110	110	112	115	115	110	110	110	110	108	105																						
UQ	110	110	110	105	108	122	120	122	120	120	110	115	115	115	115	120	120	120	115	110	110	110	110	110																						
LQ	105	105	100	100	102	105	108	110	110	110	110	110	110	105	105	105	110	110	105	110	105	105	105	105																						

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H^oE^s (KM)

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IONOSPHERIC DATA

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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	F2	F1	F2	F2	F	H	C3	C2	C2	C3	C2	C2	C2	F2	F2	H	C2	C4	C4	F4	F5	F4	F2	
2		F1	F1	F2	F	C3	C1		C2	C4	C3	C3	F2	F2	C2	H			C1	C3	F2	F4	F4	F4
3	F2	F2	F4	F2	F	C1	C3	C1	C1	C1	C1	C1	C1	C1	F	F		C3	C3	C3	F2	F2	F6	F1
4		F1	F2	F3			C2	C2	C2	C2	C2	C2	F2	F	F	F			F	C3	F5	F3	F3	F4
5	F2	F2	F1	F3	F		F	H	C1	C1	C1	F	F	F	C	C	C3	C3	C2	C3	F2	F1	F4	F2
6		F1	F1	F2	F			H	H	C1	C1		C1							C1	F2	F2	F1	F1
7	F1							C1	C1	C1		C1	C1	C1	C3	C1	C2	C3	C2	C2	F3	F4	F2	F4
8	F3	F3	F2	F2	F	H	C2	C2	C2	C2	C2	C1	C1	C1	C1	C2	C2	C2	C4	C4	F3	F4		F4
9	F2	F2	F2	F1	F	F	F			C1	C2	C2	C2	C1			C1	C2	C4	C3	F2		F4	F4
10	F2	F4	F2	F2	F	C2		C1	C2	C3	C3	C2	C3	C3	C3	F	F	C2	C3	C3	F6	F2	F2	F2
11	F2	F1				C2	C3	C2	C3	C1	C1	C2	F	F	F	F	F	F	F	C3	F3	F1	F2	F3
12	F2	F1	F2					C1	C2	C2	C1	C2	C2	C1	C1	C1	C2	F	F	F	F	F1	F3	F2
13	F2	F1		F2	F			C1		C1	C1	C1	C1	C1	F				C3	C2	F4	F3	F2	F4
14	F2	F2	F1		F	F	C2	C2	C2	C1	C2	C1	C1			C1	C2	C2	C2	F	F1	F2	F5	F1
15	F1		F1		F	F	C2	C3	C2	C3	F	F		C1	F		C2	C3	F	F	F3	F2	F2	F4
16	F4	F2	F3	F2	F	F	F	H	H	C2	C2	C2	C3	C2	C3	C2	F	F		F	F3	F3	F4	F2
17	F3	F4	F2	F2	F	F		H	H	C3	C3	C3	C2	C1	F	F	F	F	F	F	F3	F2	F2	F4
18	F2	F3	F1	F1	F	F	F	F		C1	C2	C2	C1	C1	F	F	F	F	F	F	F1	F1	F1	F2
19	F2		F3	F1	F	F	F	F	F	C1	C2	C1	C1	C2	C2	C3	F	C2	C2	F	F3	F4	F2	F1
20	F6	F2	F1	F1	F	F	F	F	F	F	F	F		F	F		C1	C2	C3	F	F4	F1	F1	
21	F2	F1	F1	F2	F	F		H	C1	H	C1	C2	C2	C2	C2	C3	C2	F	F	F	F3	F1	F3	F4
22	F3	F3	F3	F2	F	F		C3	C1	C2	C2	C1					C2	C4	C2		F4			F3
23	F2	F1	F3	F6	F	F	F	F	H	C1	C2	C1	C2	C3	C1	C1	C1	C2	C2	F	F1			F2
24	F2	F1	F3	F3	F	F	F	F	F	F	F	F				C1	C2	F	F	F	F2	F3	F4	F4
25	F1	F2	F1	F1	F	F	F	F	F		F	C1	F	F	C1	C1	C2	C1	C1	C2			F1	F1
26	F1		F1	F2	F	C2	C2	C2		C1	C1	C1	C1	F	F	F	C1	C4	F	F	F3	F2	F1	F1
27		F2	F2	F2	F	C1				C1	F	F	F	F	C1	C1	C2	C1	F	F	F5		F1	F1
28	F2	F2	F3	F3	F	H	F	C1	C1	C1	C2	C1	H	C2	C1	F	F	F	F	F				
29			F6	F1	F	C1	C1	C2	C2	C2	C2	F	F	F	F	C1	C3	C1	C2	C4		F2		F1
30	F1	F1	F1	F1	F	H	H	H	C1				F	F	F	F			C1	F	F1		F1	F4
31	F1	F2	F3	F3	F	C2	C4	C3	C3	C2	C3	C1	C2	F	C2	C2	C3	C2	F	F	F3	F1	F2	F2
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

JUL. 1969

TYPES OF ES

IONOSPHERIC DATA

JUL. 1969

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		81	78	F	F	F	83	94	104	100	80	I _A 76	78	86	86	86	83	87	82	86	94	84	83	81	79	
2		F	80	82	70	70	74	95	97	98	95	88	89	87	84	81	74	65	73	81	90	89	86	88	86	
3		81	83	80	75	74	81	92	98	87	83	79	88	86	80	76	76	73	76	78	86	83	81	89	88	
4		83	81	68	69	71	82	98	102	I _R 100	86	82	88	89	91	87	80	82	75	75	79	84	I _R 86	86	89	
5		91	87	81	72	67	76	93	I _R 101	93	78	79	85	86	85	87	82	82	86	86	86	76	86	87	83	
6		85	I _R 88	84	74	75	77	87	98	I _A 92	91	89	91	97	99	96	93	90	86	86	88	84	82	F	F	
7		86	83	F	F	F	86	102	95	95	89	83	79	83	I _A 83	83	86	85	86	84	82	86	88	F		
8		90	S ₈₄	I _R 84	F	I _C 75	79	72	81	I _R 84	77	77	I _A 80	87	I _R 86	84	81	84	86	82	85	I _R 84	82	87	83	
9		88	79	F	82	76	80	78	75	78	I _R 80	81	83	84	89	95	93	90	86	85	89	84	I _R 88	88	83	
10		89	93	91	79	81	81	86	87	84	86	87	89	91	I _C 91	94	92	84	79	82	85	87	86	84	86	
11		I _R 80	F	F	F	F	82	91	88	86	88	C	C	C	109	106	94	90	91	87	91	84	81	81	F	
12		F	F	F	78	67	64	82	87	79	72	82	94	100	100	101	95	90	81	83	76	80	74	76	76	
13		75	75	68	61	59	70	91	I _R 96	81	89	98	106	104	89	88	87	86	86	89	89	80	81	83	77	
14		82	83	78	65	56	57	67	73	A	A	59	I _A 60	I _A 60	64	64	63	I _A 66	71	69	66	A	F	F	S ₆₈	
15		68	68	64	54	50	61	74	77	H ₁ 60	I _C 62	61	58	60	55	56	61	59	61	62	68	72	69	68	67	
16		68	68	C	C	C	C	C	C	C	C	C	C	C	88	86	81	83	78	I _C 86	94	94	89	76	I _R 76	78
17		I _R 76	70	60	53	57	56	64	I _C 72	81	83	67	69	I _C 73	73	65	68	68	72	70	70	72	71	I _C 69	64	
18		F	F	56	55	F	56	68	I _C 78	68	66	67	69	69	71	77	79	76	I _C 77	78	77	76	74	73	71	
19		71	71	70	63	56	61	61	59	60	65	70	71	68	66	70	70	68	63	67	76	79	I _R 71	66	68	
20		67	67	64	61	56	53	59	66	76	76	82	78	71	70	71	71	72	I _R 74	75	83	76	73	74	I _R 72	
21		68	65	64	59	55	57	66	I _R 66	66	74	87	78	73	73	I _A 70	79	82	86	89	82	72	71	73	71	
22		66	65	67	61	58	66	77	83	72	80	I _A 72	I _A 75	78	85	I _R 86	84	72	69	69	83	83	75	71	74	
23		69	66	64	58	58	67	73	73	80	73	71	81	87	88	78	81	69	71	79	88	79	71	66	69	
24		70	66	66	56	56	62	73	80	69	62	60	66	75	82	79	69	71	75	83	I _R 88	I _R 80	71	68	67	
25		67	67	63	61	58	52	61	75	81	72	66	70	81	83	84	91	I _A 92	96	96	91	76	71	73	69	
26		68	63	59	56	53	54	76	83	66	63	77	73	81	92	86	78	82	88	91	88	80	R	R	R	
27		R	F	F	S ₅₉	59	59	71	62	63	69	74	74	80	97	92	94	97	I _A 86	86	90	74	74	68	64	
28		61	56	56	56	I _C 56	65	73	83	76	82	69	76	72	85	95	90	83	76	75	87	78	73	74	74	
29		69	69	67	62	56	58	66	79	79	77	73	73	81	81	79	80	80	77	71	73	77	81	71	74	
30		71	71	68	64	63	66	66	78	79	80	75	78	81	76	82	79	73	71	69	76	80	76	72	71	
31		66	65	62	63	58	59	68	80	78	I _R 72	72	68	80	91	91	74	73	72	81	67	73	78	73	71	
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		27	27	24	26	26	30	30	30	29	29	29	29	30	31	31	31	31	31	31	31	30	29	28	27	
MED		71	71	67	62	58	66	74	80	79	78	76	78	81	85	84	81	82	77	82	85	80	76	74	74	
UQ		82	82	79	70	70	79	91	95	86	83	82	85	87	90	90	88	86	86	86	88	84	82	85	81	
LQ		68	66	64	58	56	58	67	75	72	72	70	71	73	78	78	75	72	72	75	76	76	73	71	69	

JUL. 1969

FOF2 (0.1 MHz)

IONOSPHERIC DATA

JUL. 1969

FOF1 (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						L	440	470	A	A	A	I A 540	I A 530	I A 530	510	510	490	L	L						
2						L	420	460	490	510	530	550	550	550	520	540	510	460	H	L					
3						L	L	470	I A 560	I A 520	I A 550	I A 540	530	530	530	520	490	460	L						
4						L	L	490	500	530	560	550	540	540	540	530	490	L	L						
5							U 460	480	470	600	570	530	I A 540	540	I A 540	530	500	460							
6						L	470	I 490	490	520	560	560	570	570	510	490	460	L							
7							420	L	500	I A 560	I A 560	540	540	I A 540	510	I A 520	490	A	A						
8						L	L	480	I A 500	580	530	I A 590	550	I A 530	520	550	500	450	H	L					
9							U 450	460	530	540	570	560	540	560	560	520	500	L	L						
10						A	L	L	490	I A 520	I A 540	I A 560	570	H I C 550	I C 540	H 530	500	A	A						
11						L	L	L	530	560	C	C	C	550	H 540	H 570	500	A	L						
12							L	470	530	600	610	540	A	A	A	520	A	A	A						
13						L	L	480	490	570	560	560	540	530	520	520	I A 490	410	L						
14							490	480	470	A	A	A	I A 540	I A 540	520	510	A	A	A	A					
15						L	A	A	460	I C 480	I A 480	490	500	500	480	470	460	430	A						
16						C	C	C	C	C	C	C	A	A	510	480	A	C	400						
17							520	I C 470	470	480	490	490	I C 510	I A 500	L	470	A	A	L						
18						L	L	I C 430	470	490	500	A	A	520	480	I A 480	460	I C 420	360						
19						L	L	460	470	470	I A 490	A	A	A	A	A	450	460	A						
20							A	A	480	500	490	H 500	500	500	560	H 470	450	A	A						
21							L	480	470	480	I A 520	I A 510	500	I A 500	I A 490	I A 460	410	L							
22						L	400	460	450	490	A	A	A	A	A	I A 470	440	430	A						
23							L	450	470	500	I A 500	510	500	A	A	480	440	390	A						
24							L	450	460	510	470	490	490	490	470	480	H 460	450	A						
25							L	440	480	460	510	500	500	490	510	490	I A 440	420	L						
26							400	420	460	490	500	490	500	490	470	480	I A 460	I A 420	360						
27						L	L	I A 440	I A 480	I A 500	I A 510	530	490	470	500	A	A	A	A						
28							L	L	510	520	510	520	510	510	490	480	450	430	L						
29							L	460	480	500	520	510	510	520	510	480	A	A	A						
30							L	450	550	470	520	520	520	520	490	500	460	450	L						
31							I A 400	460	480	I A 510	500	550	530	500	500	500	510	H 500	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT						1	10	23	28	28	26	26	25	26	26	28	25	18	3						
MED						490	430	460	480	505	515	535	530	520	510	500	490	440	360						
UQ						460	470	500	535	550	550	540	540	540	520	500	460	380							
LQ						400	450	470	490	500	510	500	500	500	500	480	460	420	360						

JUL. 1969

FOF1 (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1969

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						E	A	A	A	A	A	A	A	A	A	A	A	A	300	A	A				
2						E	A	A	A	A	A	A	A	A	A	385	355	315	295	A	S				
3						E	220	280	A	A	355	A	A	A	A	A	A	A	A	A	S				
4						E	A	270	I A 310	A	A	A	A	A	A	A	A	335	295	A	A				
5						E	A	275	A	A	A	A	A	A	A	A	A	A	A	A	S				
6						E	195	I A 265	310	340	355	370	I A 375	I A 385	395	380	I A 360	340	305	235	S				
7						E	205	275	315	A	A	375	A	A	A	390	I A 370	I A 340	300	A	A				
8						C	I A 220	I A 275	315	I A 345	355	A	A	A	A	380	355	335	A	A	A				
9						E	200	270	310	340	360	I A 370	385	390	400	385	365	330	A	A	A				
10						E	A	A	315	I A 340	I A 360	370	A	A	C	390	375	345	305	A	A				
11						E	205	A	A	A	355	C	C	C	A	A	345	325	A	A	S				
12						E	205	I A 270	305	335	I A 360	I A 375	390	A	A	A	A	A	A	A	S				
13						E	215	265	305	I A 330	355	370	390	400	380	370	360	335	I A 290	240	155				
14						E	A	A	305	335	355	370	A	A	A	A	A	A	300	A	S				
15						E	A	A	305	A	C	A	380	380	A	A	A	330	A	A	A				
16						C	C	C	C	C	C	C	C	380	A	A	A	A	C	A	A				
17						E	210	A	A	340	355	360	380	I A 380	A	A	A	A	A	A	A				
18						E	175	250	I C 285	330	A	A	I A 380	A	A	375	A	A	C	A	A				
19						E	210	260	305	I A 330	355	365	375	I A 380	I A 375	360	330	A	A	A	A				
20						E	A	A	A	A	A	A	I A 380	I A 385	I A 390	380	A	A	A	A	A				
21						S	200	260	295	325	350	365	375	385	I A 370	355	325	A	A	230	S				
22						E	200	265	305	330	350	360	370	380	380	A	A	A	A	A	A				
23						E	A	A	A	A	A	A	A	A	A	A	A	295	A	A	A				
24						E	A	A	305	I A 330	350	365	375	390	395	370	335	305	A	A	A				
25						S	180	250	A	A	A	370	375	380	I A 380	375	325	I A 290	I A 260	225	S				
26						S	A	A	A	A	A	I A 365	I A 380	I A 390	395	380	365	A	A	A	A				
27						E	A	A	A	A	A	A	A	395	390	370	340	A	A	A	A				
28						C	200	I A 250	I A 290	325	345	365	375	385	395	375	360	325	290	245	A				
29						E	A	A	A	I A 330	A	A	A	A	380	I A 370	340	310	A	A	S				
30						E	200	260	300	320	350	360	370	380	370	365	355	I A 340	I A 270	230	S				
31						E	A	A	290	330	350	355	A	A	385	380	355	A	A	A	A				
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						25	16	16	18	17	17	17	16	16	15	19	18	16	11	6	1				
MED						E	202	265	305	330	355	365	378	385	385	375	355	330	295	232	155				
UQ						E	210	272	310	340	355	370	380	390	395	380	360	338	300	240					
LQ						E	200	260	300	330	350	365	375	380	380	370	340	312	290	230					

JUL. 1969

FOE (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1969

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	J 45	J 44	J 47	J 30	E	23	32	43	J 54	J 73	J 81	J 91	J 60	J 74	J 81	J 41	34	34	J 36	J 63	J 84	J 53	J 66	J 43
2	J 73	J 33	J 63	J 48	J 40	J 31	J 44	J 63	J 53	J 44	J 43	34	J 46	42	40	42	J 84	G	J 36	J 43	J 63	J 39	J 78	J 44
3	J 43	J 33	J 33	J 29	J 34	J 24	J 35	J 51	J 64	J 80	J 73	J 88	43	41	J 56	J 54	J 64	J 45	33	J 39	J 63	J 44	J 26	J 24
4	J 20	J 20	J 24	J 30	E	28	33	37	J 49	J 54	46	44	40	41	J 54	J 50	35	34	J 29	J 26	J 25	J 35	J 40	J 49
5	J 33	J 44	J 39	J 29	J 38	J 33	G	35	40	J 53	J 58	J 56	J 80	J 51	J 104	J 70	43	J 90	J 94	J 38	J 69	J 48	J 63	J 53
6	J 28	J 33	J 38	J 31	J 20	27	39	J 75	J 130	J 54	J 60	J 54	40	G	41	42	G	37	J 40	J 64	J 48	J 33	J 38	J 20
7	J 20	J 29	J 20	E	J 16	G	G	39	J 64	J 61	J 64	44	J 20	J 89	J 64	J 68	38	J 58	J 97	J 45	J 54	J 50	J 45	J 63
8	J 54	J 34	J 28	J 70	C	23	35	45	J 84	J 141	J 140	J 133	J 64	J 79	G	46	J 84	J 78	J 37	J 35	J 18	J 25	J 18	J 38
9	J 60	J 63	J 33	J 25	E	G	32	G	G	40	46	J 84	J 49	G	46	J 47	J 54	J 64	J 53	J 39	J 25	J 25	J 25	J 32
10	J 23	J 20	J 23	J 20	J 23	J 54	33	38	46	J 70	J 70	J 59	J 59	C	42	G	39	J 51	J 44	J 38	J 84	J 65	J 43	J 29
11	J 54	J 68	J 59	J 25	J 19	28	J 43	J 79	J 58	41	C	C	C	J 43	J 49	42	J 65	J 68	J 35	J 35	J 30	J 34	J 65	J 63
12	J 43	J 74	J 59	J 35	J 24	G	31	38	43	54	44	48	J 23	J 74	61	J 94	J 83	J 104	J 73	J 53	J 26	J 21	J 23	J 53
13	J 43	J 39	J 96	J 21	J 20	G	30	39	J 53	J 54	J 54	G	G	G	43	J 74	J 57	J 59	J 40	G	J 26	J 28	J 28	J 29
14	J 43	J 25	J 25	J 40	J 44	J 50	39	47	J 99	J 97	J 55	J 79	J 66	J 65	J 67	J 73	J 111	J 82	J 59	J 35	J 19	J 74	J 84	J 43
15	J 43	J 26	J 39	J 26	J 28	J 54	J 84	J 53	J 104	C	J 68	J 50	J 49	43	39	39	G	38	J 42	J 40	J 34	J 29	J 25	J 29
16	J 21	J 25	C	C	C	C	C	C	C	C	C	C	J 60	J 57	J 56	J 68	J 81	C	J 40	J 20	J 35	J 37	J 34	J 43
17	J 30	J 73	J 45	J 29	J 27	G	J 38	C	40	43	43	41	C	J 63	J 88	J 133	J 90	J 63	J 75	J 63	J 45	J 38	C	J 43
18	J 51	J 48	J 25	J 23	J 26	G	G	C	G	J 41	J 61	J 67	J 58	J 50	G	J 80	J 55	C	J 33	J 26	J 23	J 20	J 39	J 26
19	J 20	J 29	J 29	J 18	J 18	G	J 31	J 32	36	38	J 51	J 50	J 65	J 70	J 67	J 68	J 88	J 83	J 64	J 37	J 19	J 24	E 14	J 28
20	J 25	J 26	J 25	J 43	J 25	J 29	J 54	J 58	J 39	J 42	39	41	46	J 40	G	J 60	35	J 63	J 64	J 43	J 36	J 29	J 53	J 52
21	J 44	J 31	J 22	J 20	J 19	G	G	34	41	42	42	J 56	J 81	J 64	J 96	J 76	J 68	J 32	G	E 15	J 20	J 23	J 22	J 25
22	J 43	J 43	J 53	J 28	J 20	G	29	40	J 53	J 55	J 84	J 88	J 59	J 60	J 85	J 49	J 73	J 40	J 40	J 63	J 84	J 24	J 43	J 28
23	J 20	J 20	J 20	J 16	J 18	J 38	J 43	J 44	J 56	J 88	J 80	40	J 53	J 59	J 88	40	39	33	J 76	J 53	J 47	J 50	J 30	J 25
24	J 25	J 20	J 25	J 18	J 25	J 58	J 60	J 42	J 63	G	J 42	G	G	G	G	39	J 43	J 43	J 53	J 39	J 62	J 35	J 54	J 48
25	J 40	M 21	J 20	E 14	E 14	G	G	35	J 53	45	J 66	44	44	45	J 60	J 99	J 138	J 38	G	J 31	E 14	E 14	E 14	J 24
26	J 20	J 18	J 26	E	E 14	20	J 42	J 36	J 38	39	38	39	40	G	G	G	J 71	J 46	J 33	J 18	J 33	J 80	J 53	J 49
27	J 28	J 31	J 25	J 30	J 26	21	33	J 64	J 73	J 60	J 76	J 52	J 40	39	J 53	J 67	J 84	J 20	J 95	J 74	J 78	J 53	J 45	J 27
28	J 40	J 26	J 30	J 27	C	G	J 38	J 31	G	G	G	G	G	G	G	J 53	G	G	J 28	J 25	J 24	J 20	J 65	J 53
29	J 18	J 24	J 25	J 40	J 29	J 39	J 33	36	36	42	J 48	43	41	J 48	50	J 80	J 59	J 58	J 67	J 64	J 52	J 80	J 24	J 20
30	J 20	J 20	J 18	E 14	J 18	G	G	G	38	G	G	G	G	J 40	J 33	J 50	J 38	J 32	29	J 34	J 40	E 14	J 19	J 44
31	J 24	J 49	J 26	J 25	J 74	J 51	J 54	34	45	J 79	J 48	J 58	43	G	44	41	J 88	J 133	J 48	J 54	J 88	J 83	J 30	J 26
	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	30	30	28	30	30	28	30	29	29	29	29	30	31	31	31	29	31	31	31	31	30	31
MED	J 33	J 31	J 27	J 26	J 22	23	33	39	J 51	J 53	J 54	J 50	J 49	J 44	J 50	J 53	J 59	J 51	J 40	J 39	J 40	J 35	J 38	J 38
UQ	J 43	J 44	J 39	J 30	J 28	J 33	J 42	J 49	J 63	J 61	J 68	J 59	J 60	J 63	J 66	J 72	J 84	J 68	J 64	J 53	J 66	J 50	J 53	J 48
LQ	J 22	J 24	J 25	J 20	J 18	G	30	35	39	41	43	41	40	39	40	42	38	J 37	J 34	J 32	J 26	J 24	J 25	J 26

The Radio Research Laboratories, Japan

JUL. 1969

FOES (0.1 MHz)

IONOSPHERIC DATA

JUL. 1969

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	26	29	19	16	E	23	31	38	48	65	A	62	60	55	40	41	34	33	35	40	32	53	40	25					
2	40	49	44	24	E	24	36	38	40	38	40	34	42	42	40	G	34	G	28	31	16	E	E	23					
3	E	17	21	25	21	18	32	40	57	60	64	70	41	41	42	42	40	35	31	30	E	28	18	E					
4	E	E	E	E	E	25	32	36	46	44	45	44	40	41	45	40	G	32	26	19	23	E	E	20					
5	E	38	30	19	14	27	G	34	37	49	49	46	56	47	62	42	40	34	30	33	52	22	21	23					
6	E	14	15	18	16	25	31	34	A	40	44	46	40	G	40	40	G	35	38	46	33	20	E	E					
7	E	E	14	E	14	G	G	36	45	60	62	44	42	A	44	56	38	47	80	45	22	E	31	49					
8	E	23	18	20	C	23	33	45	69	52	45	A	46	69	G	45	40	30	24	18	E	18	E	32					
9	44	E	E	19	E	G	32	G	G	40	44	42	42	G	44	44	39	38	25	20	E	E	24	28					
10	E	E	E	15	16	UR	54	30	35	39	60	68	59	48	C	G	G	39	48	40	29	E	34	24	29				
11	UR	53	40	54	15	15	26	40	44	36	40	C	C	C	39	40	40	40	60	30	25	24	25	23	45				
12	18	24	20	15	15	G	30	37	40	45	44	46	85	64	60	40	50	48	45	34	17	18	E	E					
13	19	21	31	15	15	G	G	38	39	44	45	G	G	G	42	41	54	34	G	G	E	E	20	19					
14	23	E	18	16	30	23	34	36	A	A	55	A	A	48	44	60	A	50	44	29	A	28	50	30					
15	30	15	19	16	15	21	46	50	41	C	58	45	43	40	37	37	G	34	41	21	21	21	16	21					
16	E	E	C	C	C	C	C	C	C	C	C	C	60	51	44	40	61	C	31	19	20	26	32	22					
17	23	18	E	17	16	G	30	C	37	43	40	41	C	60	39	38	55	50	26	47	23	22	C	19					
18	17	15	18	20	15	G	G	C	G	38	45	63	58	47	G	49	37	C	23	18	14	17	32	17					
19	E	E	18	E	17	G	21	27	36	37	51	50	58	60	64	55	39	43	42	26	E	20	E _S	19					
20	19	E	18	E	18	23	45	55	34	39	38	39	43	40	G	37	32	60	48	30	26	21	18	50					
21	23	21	E	E	E	G	G	34	40	40	39	56	52	45	A	58	47	29	G	E _S	15	17	17	19	18				
22	18	24	25	19	18	G	G	35	44	39	A	A	53	59	56	48	38	29	40	28	E	E	18	23					
23	E	E	E	E	16	22	30	33	36	40	63	39	48	54	62	37	35	32	54	30	24	22	23	16					
24	E	18	19	E	16	32	31	28	35	G	33	G	G	G	G	36	35	30	45	21	17	21	23	38					
25	29	E	17	E _S	14	E _S	14	G	G	35	36	38	42	43	44	45	48	39	A	31	G	E	E _S	14	E _S	14	E _S	14	E
26	E	E	E	E	E _S	14	19	29	34	36	38	38	39	40	G	G	G	64	E _R	46	32	16	23	47	44	18			
27	E	E	17	17	18	21	27	52	56	60	62	42	34	35	48	59	73	A	46	43	19	24	39	20					
28	25	21	23	E	C	G	28	30	G	G	G	G	G	G	G	34	G	G	20	19	E	E	25	34					
29	E	18	E	E	25	25	26	32	35	38	40	40	41	34	45	45	53	48	59	50	48	42	20	E					
30	E	E	E	E _S	14	E	G	G	G	37	G	G	G	G	32	31	30	35	30	26	17	24	E _S	14	E	27			
31	E	E	18	15	45	38	47	34	40	65	44	41	42	G	43	39	34	34	31	21	45	35	21	E					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	31	31	30	30	28	30	30	28	30	29	29	29	29	30	31	31	31	29	31	31	31	31	30	31					
MED	E	15	18	15	15	21	30	35	39	40	45	44	43	42	42	40	39	34	31	26	20	21	20	20					
UQ	23	21	20	18	18	25	32	38	45	52	58	56	53	54	46	45	52	48	43	32	24	26	25	28					
LQ	E	E	E	E	14	G	G	34	36	38	40	39	40	32	34	37	34	31	26	19	E	14	14	18					

JUL. 1969

FBES (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1969

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

Hour Day	00	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 ₁₃	E	E	E	E	13	13	13	13	14	20	22	23	19	19	18	17	14	14	13	E	E	E ₁₃	E ₁₃
2	E ₁₃	E ₁₂	E	E	E	13	13	13	15	15	16	18	18	19	18	18	14	13	14	E ₁₄	E	E ₁₄	E ₁₄	E ₁₃
3	E ₁₄	E	E ₁₃	E	E	13	14	14	13	15	18	14	19	17	18	15	15	14	12	E ₁₂	E ₁₄	E	E ₁₄	E ₁₄
4	E ₁₄	E	E ₁₄	E ₁₄	E	12	14	14	16	18	23	19	20	23	18	16	15	13	13	13	E ₁₄	E ₁₄	E ₁₄	E ₁₄
5	E ₁₄	E ₁₄	E	E	E	13	13	14	15	17	16	14	21	18	18	16	16	17	14	E ₁₄	E ₁₃	E	E ₁₃	E ₁₃
6	E ₁₄	E	E	E	E	14	15	14	14	18	17	19	18	21	18	16	16	15	13	E ₁₄	E ₁₄	E ₁₃	E ₁₃	E ₁₃
7	E ₁₄	E ₁₃	E	E	E	13	13	14	13	16	19	24	20	19	21	19	14	14	14	12	E ₁₃	E ₁₄	E ₁₃	E ₁₃
8	E ₁₄	E	E	E	C	13	14	15	16	16	14	20	19	19	17	14	14	15	13	E	E ₁₄	E ₁₃	E ₁₄	E ₁₃
9	E ₁₄	E ₁₄	E	E	E	14	13	14	16	15	17	19	22	19	19	18	13	13	12	12	E ₁₃	E ₁₄	E ₁₃	E ₁₄
10	E ₁₄	E ₁₃	E ₁₄	E	E	E	18	13	16	14	16	16	18	C	16	17	18	14	13	13	E ₁₂	E ₁₂	E ₁₃	E ₁₄
11	E ₁₃	E ₁₃	E ₁₄	E	E	14	14	14	18	14	C	C	C	15	18	16	13	14	12	E ₁₃	E ₁₃	E ₁₃	E ₁₄	E ₁₄
12	E ₁₄	E	E	E	E	13	14	14	15	19	18	16	20	18	19	15	14	14	13	E ₁₃	E ₁₄	E ₁₃	E ₁₄	E ₁₄
13	E ₁₄	E ₁₃	E ₁₄	E	E	13	14	15	16	17	23	20	19	21	18	15	14	13	13	12	E ₁₃	E ₁₃	E ₁₄	E ₁₃
14	E ₁₃	E ₁₃	E	E	E	E	14	13	16	16	16	19	18	17	17	17	15	14	13	E ₁₄	E ₁₄	E ₁₂	E ₁₄	E ₁₄
15	E ₁₃	E	E	E	E	E	14	13	15	C	16	15	18	18	18	18	14	13	13	13	E ₁₂	E ₁₃	E ₁₃	E ₁₃
16	E ₁₄	E ₁₄	C	C	C	C	C	C	C	C	C	C	22	18	20	18	18	C	15	12	E ₁₄	E ₁₂	E ₁₂	E ₁₄
17	E ₁₄	E	E ₁₄	E	E	14	14	C	16	20	20	22	C	20	18	18	15	14	13	E ₁₃	E ₁₄	E ₁₂	C	E ₁₃
18	E ₁₃	E ₁₃	13	E	E	E	14	C	15	15	18	20	23	19	19	19	14	C	E	E	E	E ₁₄	E ₁₃	E ₁₃
19	E ₁₄	E ₁₄	E ₁₄	E	E	12	13	14	17	16	16	18	18	18	18	18	16	15	14	13	E ₁₄	E ₁₄	E ₁₄	E ₁₄
20	E ₁₄	E ₁₄	E ₁₄	E	E	E	13	15	15	19	17	17	15	14	16	15	15	14	14	14	E ₁₃	E ₁₄	E ₁₄	E ₁₄
21	E ₁₄	E ₁₄	E ₁₃	E	E ₁₃	13	12	14	15	15	15	14	16	15	14	14	14	E	14	E ₁₅	E ₁₄	E	E ₁₃	E ₁₄
22	E ₁₃	E ₁₃	E ₁₄	E	E	14	14	14	14	14	18	18	19	19	18	16	13	14	13	13	E ₁₄	E ₁₄	E ₁₃	E ₁₄
23	E ₁₄	E ₁₄	E ₁₄	E ₁₃	E	14	15	15	14	14	16	13	14	15	14	15	14	14	14	13	E ₁₄	E ₁₃	E ₁₄	E ₁₄
24	E ₁₄	E	E	E	E	13	14	13	14	17	18	18	19	21	18	18	15	14	13	E	E	E	E ₁₄	E ₁₄
25	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	14	14	13	16	14	14	15	17	15	16	15	14	15	15	E ₁₄	E ₁₂	E ₁₄	E ₁₄	E ₁₄
26	E ₁₄	E ₁₄	E ₁₄	E	E ₁₄	13	15	14	16	18	19	19	20	16	20	17	18	14	14	E	E	E ₁₄	E ₁₄	E ₁₃
27	E ₁₂	E ₁₄	E ₁₃	E ₁₄	E	14	14	15	16	20	18	21	23	17	15	15	14	13	13	14	E ₁₄	E ₁₂	E ₁₄	E ₁₄
28	E ₁₄	E ₁₄	E ₁₂	E	C	13	14	16	16	17	19	21	16	23	17	15	13	14	14	12	E ₁₄	E ₁₄	E ₁₄	E ₁₄
29	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E	13	16	13	15	16	16	23	18	17	16	16	14	14	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄
30	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E	14	14	14	15	15	18	17	15	18	16	15	14	13	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄
31	E ₁₄	E ₁₄	E	E	E	14	15	14	16	15	16	21	19	19	18	14	14	E	E	E	E ₁₄	E ₁₄	E ₁₄	E ₁₄
	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	30	30	28	30	30	28	30	29	29	29	29	30	31	31	31	29	31	31	31	31	30	31
MED	E ₁₄	E ₁₃	E ₁₃	E	E	13	14	14	15	16	17	19	19	18	18	16	14	14	13	E ₁₃	E ₁₄	E ₁₃	E ₁₄	E ₁₄
UQ	E ₁₄	E ₁₄	E ₁₄	E	E	14	14	14	16	17	18	20	20	19	18	18	15	14	14	14	E ₁₄	E ₁₄	E ₁₃	E ₁₄
LQ	E ₁₄	E	E	E	E	13	13	13	15	15	16	16	18	17	16	15	14	13	13	E ₁₂	E ₁₃	E ₁₂	E ₁₃	E ₁₃

The Radio Research Laboratories, Japan

JUL. 1969

F-MIN (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1969

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

JUL. 1969

M(3000)F2 (0.01)

IONOSPHERIC DATA

JUL. 1969

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 Day	00	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	345	345	A	A	A	I ^A 340	I ^A 345	I ^A 340	355	335	325	L	L					
2						L	355	350	350	370	375	345	340	345	360	335	330	325	H	L				
3						L	L	360	I ^A 335	I ^A 365	I ^A 350	I ^A 360	375	360	360	340	350	325	L	L				
4						L	L	345	355	365	350	380	350	350	345	335	330	L	L					
5						U	335	365	385	335	335	380	I ^A 335	365	I ^A 355	320	335	330						
6						L	360	I ^A 365	390	390	355	360	350	335	355	345	345	L	L					
7						340	L	355	I ^A 340	I ^A 360	375	375	I ^A 360	350	I ^A 335	330	A	A						
8						L	L	365	I ^A 365	340	395	I ^A 340	365	I ^A 370	360	330	340	335	H	L				
9						U	355	365	360	355	350	370	355	340	340	365	335	L	L					
10						A	L	L	380	I ^A 365	I ^A 355	I ^A 340	355	I ^C 360	355	340	345	A	A					
11						L	L	L	360	340	C	C	C	350	355	315	335	A	A	L				
12						L	355	340	330	320	360	A	A	A	345	A	A	A						
13						L	L	355	365	335	335	355	H	355	360	380	330	I ^A 330	350	L				
14						300	310	325	A	A	A	I ^A 355	I ^A 360	360	355	A	A	A	A					
15						L	A	A	355	I ^C 360	I ^A 360	365	375	380	375	345	335	335	A					
16						C	C	C	C	C	C	C	A	A	335	365	A	C	325					
17						315	I ^C 335	370	360	370	390	I ^C 360	I ^A 355	L	360	A	A	L						
18						L	L	I ^C 350	350	365	370	A	A	360	390	I ^A 360	350	I ^C 340	335					
19						L	L	370	385	365	I ^A 345	A	A	A	A	A	345	350	A					
20						A	A	355	345	370	H	380	375	380	370	H	360	355	A	A				
21						L	355	385	380	390	I ^A 370	I ^A 320	I ^A 340	I ^A 320	I ^A 340	I ^A 340	340	L						
22						L	350	330	I ^A 345	350	A	A	A	A	A	I ^A 360	365	345	A					
23						L	335	365	360	I ^A 370	375	A	A	A	375	360	360	A						
24						L	350	400	355	390	380	370	345	365	365	H	340	330	A					
25						L	345	340	395	370	385	355	365	340	350	I ^A 350	355	L						
26						355	380	375	390	380	375	380	375	385	365	I ^A 340	I ^A 340	A						
27						L	L	I ^A 370	I ^A 360	I ^A 370	I ^A 340	340	365	385	A	A	A	A	A					
28						L	L	355	360	355	370	375	355	355	355	345	355	L						
29						L	350	360	380	385	375	385	350	355	365	A	A	A	A					
30						L	345	330	385	385	385	385	370	405	335	355	340	L						
31						I ^A 340	340	370	I ^A 360	360	345	360	360	360	360	335	H	315	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	10	23	28	28	26	26	24	26	25	28	25	18	2					
MED						300	342	350	360	360	365	370	362	360	355	348	340	340	330					
UQ						355	362	368	370	380	380	375	365	365	360	350	350							
LQ						335	345	352	348	350	355	355	350	350	335	335	330							

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M(3000)F1 (0.01)

IONOSPHERIC DATA

JUL. 1969

H^oF₂ (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					300	310	275	280	320	A	410	380	370	350	350	330	330	325							
2					340	290	290	300	315	360	365	355	385	345	355	395	370	315							
3					290	290	290	280	320	370	370	350	365	395	370	355	345	305							
4					300	280	315	280	320	350	380	355	355	335	355	345	310	300							
5					315	280	280	350	410	365	380	375	345	380	360	340									
6					290	290	I ₃₀₀	305	330	380	380	345	365	345	350	330	305								
7					280	290	295	325	345	355	395	I ₃₇₅	365	380	350	315	A								
8					275	300	315	I ₃₀₀	A	340	345	I ₄₀₅	360	370	350	370	355	320	290						
9					290	290	350	320	375	360	360	385	355	345	345	310	300								
10					I ₂₉₀	A	305	300	330	340	350	345	375	I ₃₇₀	355	340	340	325	315						
11					350	305	295	350	370	C	C	C	330	330	330	345	330	300							
12					300	290	325	380	410	380	I ₃₆₅	A	365	330	340	325	295	295							
13					320	290	275	285	H	380	365	355	320	340	360	355	320	300	300						
14					395	380	355	A	A	A	A	A	440	440	A	A	350	300							
15					350	365	340	350	H	I ₄₁₅	C	A	490	440	525	540	410	400	350	325					
16					C	C	C	C	C	C	C	C	345	345	385	335	350	I ₃₃₀	290						
17					430	C	310	300	345	350	I ₃₅₅	A	355	355	315	355	I ₃₅₀	310	290						
18					350	330	I ₂₉₅	310	320	355	I ₃₆₅	A	350	410	345	330	340	I ₃₀₀	290						
19					280	255	390	420	395	355	355	345	400	375	340	325	345	330							
20					300	325	315	350	315	325	325	325	365	380	330	335	310	295							
21					235	330	330	305	340	330	340	I ₄₀₀	A	350	330	300	280								
22					325	295	280	280	330	I ₃₂₀	A	I ₃₅₀	365	350	I ₃₂₅	A	310	300	315	330					
23					295	270	315	330	I ₃₄₅	A	350	330	310	330	325	290	315	335							
24					270	300	270	345	300	415	370	325	310	335	330	325	300								
25					305	295	305	295	365	380	345	335	360	320	I ₃₂₅	A	290	275							
26					280	265	265	400	345	355	355	315	330	350	340	320	270								
27					310	270	I ₂₇₀	A	370	335	400	430	350	330	320	325	I ₃₀₀	305							
28					275	285	330	320	305	340	410	355	305	320	300	290	300								
29					265	300	300	310	335	360	360	345	350	325	310	300	290								
30					310	295	320	295	340	345	340	350	330	330	320	330	320								
31					330	330	300	I ₃₂₅	A	300	425	375	330	290	330	350	340	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					14	29	29	28	29	26	28	29	31	31	30	30	31	29							
MED					315	295	290	302	330	345	362	360	355	350	340	340	320	300							
UQ					350	310	300	328	350	360	380	375	372	365	355	350	330	315							
LQ					290	280	280	282	320	330	350	345	342	330	330	325	305	290							

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H^oF₂ (KM)

IONOSPHERIC DATA

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H'F (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	295	310	260	265	290	240	230	230	A	A	A	A	A	A	210	240	230	240	270	265	275	280	295	290
2	320	295	280	290	280	250	245	225	210	210	200	230	240	230	225	210	230	230	265	285	270	265	280	280
3	265	280	260	305	305	265	250	235	220	200	230	220	200	215	230	230	230	250	260	280	280	320	290	265
4	280	255	245	305	295	260	245	230	230	225	240	210	210	240	205	205	230	240	260	280	280	290	280	305
5	295	285	260	280	295	255	240	230	225	230	215	210	220	230	230	245	240	240	270	280	A	320	290	310
6	310	275	270	250	265	245	240	225	225	220	200	200	195	205	230	225	230	250	270	295	290	290	295	270
7	290	290	310	305	305	260	250	230	215	215	230	220	200	235	245	245	250	A	A	280	290	290	320	315
8	290	300	270	290	290	275	250	A	A	A	190	210	230	225	210	260	245	215	235	275	270	290	280	300
9	285	290	290	280	265	255	225	220	225	210	200	195	205	240	240	240	240	255	245	280	260	295	300	300
10	295	285	270	245	275	255	215	245	215	240	230	230	230	200	215	230	245	250	260	275	290	315	305	295
11	260	280	310	295	290	250	250	230	215	230	C	C	C	A	190	220	240	240	240	280	260	280	305	330
12	295	300	315	255	265	245	250	240	225	240	230	230	A	A	A	230	A	A	A	250	290	275	295	280
13	305	260	270	280	305	270	245	235	230	240	235	195	215	230	215	240	240	230	240	265	255	290	290	300
14	315	280	255	235	280	245	255	250	A	A	A	240	240	230	240	A	A	A	A	290	310	340	330	300
15	315	290	245	270	355	265	A	A	A	A	C	A	A	230	210	210	215	235	235	255	305	280	280	310
16	295	270	C	C	C	C	C	C	C	C	C	C	A	A	235	220	A	C	A	270	240	275	315	305
17	280	275	245	280	305	250	240	200	205	240	230	230	225	230	230	225	A	A	245	295	270	280	295	285
18	310	295	290	280	275	245	235	240	230	220	A	A	A	A	205	230	230	235	255	260	250	290	305	295
19	295	280	255	240	250	255	230	225	200	220	A	A	A	A	A	A	A	215	A	280	255	245	270	295
20	295	295	270	245	240	235	A	A	190	240	210	210	230	220	215	230	215	A	A	270	245	285	300	300
21	315	290	280	245	290	240	250	230	210	200	220	220	205	200	A	A	A	235	245	245	250	275	280	280
22	305	305	300	290	295	270	245	250	230	235	A	A	A	A	A	230	235	230	A	280	255	260	295	295
23	280	275	270	260	285	270	265	230	220	215	205	195	A	A	A	205	230	210	A	255	250	250	280	290
24	270	275	265	245	270	310	235	225	220	190	180	200	200	230	240	205	225	230	245	265	240	250	300	310
25	305	280	270	250	230	250	230	250	220	205	210	220	210	220	225	235	235	230	245	240	245	275	280	270
26	275	255	250	250	250	255	240	200	215	200	190	195	200	200	200	250	240	235	245	245	225	A	A	290
27	320	330	320	300	290	240	245	A	A	A	230	220	230	250	A	A	A	A	A	290	235	305	325	300
28	320	295	300	295	280	265	245	225	225	215	230	215	195	220	210	230	240	230	240	250	255	245	335	300
29	295	280	250	245	250	255	240	220	225	195	195	225	200	230	A	A	A	A	A	290	280	300	240	280
30	290	295	270	255	270	250	240	235	230	200	195	190	195	215	205	240	230	240	260	280	285	260	250	275
31	285	300	305	270	290	275	260	240	240	220	210	220	210	225	240	220	240	230	240	245	310	300	270	270
	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	30	30	30	30	28	26	25	25	23	24	23	24	24	26	23	23	21	31	30	30	30	31
MED	295	285	270	270	282	255	245	230	220	220	210	218	210	225	220	230	235	235	245	280	265	282	295	295
UQ	308	295	290	290	295	265	250	240	225	230	230	222	230	230	232	240	240	240	260	280	280	295	305	300
LQ	285	278	260	250	265	245	238	225	215	205	200	200	200	215	210	220	230	230	245	262	250	275	280	280

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H'F (KM)

IONOSPHERIC DATA

JUL. 1969

H^oES (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	105	105	105	110	E	125	125	115	115	115	110	115	115	115	115	115	115	130	120	115	115	115	110	110
2	110	105	100	105	105	115	115	110	110	115	115	120	115	120	140	140	140	G	125	115	115	125	115	110
3	110	105	105	105	105	110	130	125	115	115	110	115	115	115	115	115	110	110	120	115	105	110	100	100
4	100	105	105	105	E	130	140	130	115	115	110	110	115	110	105	105	155	135	105	100	100	100	100	105
5	105	105	100	105	105	105	G	145	120	115	115	115	115	115	115	115	125	115	115	115	120	120	115	110
6	105	105	100	100	105	150	130	135	115	125	120	115	125	G	140	140	G	130	130	115	115	105	110	110
7	110	105	105	E	110	G	G	130	125	115	115	130	115	115	125	120	130	125	115	115	110	110	110	105
8	110	105	110	105	C	145	130	125	115	110	115	115	115	115	G	130	120	115	120	115	115	110	110	110
9	110	105	105	105	E	G	140	G	G	140	125	120	125	G	130	130	120	115	115	110	105	100	100	100
10	100	100	100	100	115	115	120	140	120	115	115	115	115	C	120	G	135	120	115	110	110	110	110	105
11	105	105	105	105	120	140	130	115	130	130	C	C	C	115	110	115	120	115	105	105	105	105	100	110
12	105	105	105	105	105	G	E	G	140	130	125	120	125	115	115	115	115	110	105	105	105	100	100	100
13	110	110	105	105	105	G	145	115	115	115	115	G	G	G	140	125	120	120	140	G	120	115	100	110
14	110	115	110	110	105	105	130	125	120	115	115	115	115	115	115	110	110	120	115	110	105	110	110	110
15	110	110	105	100	105	110	120	125	115	C	115	120	130	115	115	120	G	120	115	105	110	105	105	105
16	110	110	C	C	C	C	C	C	C	C	C	C	C	115	115	115	115	115	C	115	110	115	110	105
17	105	105	105	105	105	G	120	C	145	130	135	135	C	115	110	110	105	105	105	110	105	105	C	110
18	115	115	110	110	110	G	G	C	G	115	125	120	120	115	G	120	115	C	115	110	110	100	105	100
19	100	100	105	100	105	G	105	105	115	140	125	120	115	115	115	115	115	110	110	110	120	105	S	105
20	105	110	110	110	110	110	110	110	110	115	115	120	120	125	G	120	125	115	115	105	100	100	100	100
21	100	105	105	105	105	G	G	145	135	130	140	125	130	120	125	120	115	120	G	S	110	110	105	105
22	105	105	105	105	105	G	145	135	125	120	115	115	115	115	115	115	110	115	115	115	115	110	110	105
23	110	100	100	100	100	115	110	105	105	120	110	120	115	115	115	125	115	120	110	105	105	100	100	100
24	100	100	100	100	105	110	110	105	105	G	110	G	G	G	G	125	125	115	110	110	110	105	105	100
25	100	105	100	S	S	G	G	115	110	125	130	135	130	130	125	120	115	115	G	115	S	S	S	100
26	100	105	100	E	S	130	115	115	115	120	120	120	120	G	G	G	125	115	120	115	105	110	110	110
27	110	110	105	105	100	115	120	115	115	115	110	140	110	110	135	125	120	120	115	110	105	105	105	100
28	105	105	105	110	C	G	110	110	G	G	G	G	G	G	G	115	G	G	105	120	115	115	115	115
29	105	105	105	120	120	125	120	120	130	130	120	115	110	105	130	120	120	115	115	115	110	110	105	105
30	105	110	105	S	100	G	G	G	140	G	G	G	G	105	100	105	100	100	130	120	110	S	115	115
31	110	110	105	105	105	110	120	125	125	120	120	125	120	G	135	140	120	115	115	115	120	120	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	31	31	30	26	23	18	24	26	27	26	27	25	25	23	25	29	28	27	29	29	30	29	28	31
MED	105	105	105	105	105	115	120	122	115	118	115	120	115	115	115	120	120	115	115	110	110	110	105	105
UQ	110	110	105	105	108	130	130	130	125	125	120	125	120	115	130	125	125	120	120	115	115	110	110	110
LQ	105	105	100	105	105	110	115	115	115	115	115	115	115	115	115	115	115	115	110	110	105	105	100	100

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H^oES (KM)

IONOSPHERIC DATA

JUL. 1969

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	F4	F4	F3	F3		N	H	C	N	N	C	N	N	C	C	C	H	H	C	C	F4	F4	F4	F6	
2	F4	F4	F5	F5	F	F	F	N	N	C	C	C	C	C	H	H	H		H	C	F3	F	F3	F3	
3	F3	F3	F3	F3	F	F	H	H	C	C	N	N	N	C	C	C	C	N	C	C	F5	F4	F	F3	
4	F2	F2	F1	F2		H	H	H	C	N	N	N	C	C	N	N	H	H	N	F	F5	F2	F3	F3	
5	F3	F5	F5	F3	F	F		H	N	N	N	C	N	N	N	N	H	N	C	C	F3	F5	F3	F4	
6	F2	F3	F3	F2	F	H	H	H	C	H	C	C	H		H	H		H	H	C	F3	F4	F3	F1	
7	F1	F2	F1		F			H	N	N	N	H	C	N	H	N	N	H	C	C	F5	F4	F4	F4	
8	F3	F4	F3	F3		H	H	H	N	N	N	C	C	N		H	N	C	C	C	F1	F3	F1	F6	
9	F3	F2	F2	F3				H			H	H	C	H		H	N	C	N	N	F2	F2	F4	F3	
10	F2	F1	F2	F1	N	C	C	H	C	N	N	N	N		H		N	N	C	C	F2	F4	F4	F4	
11	F4	F4	F4	F2	C	H	H	C	H	H			N	N	C	C	N	C	C	F4	F	F4	F4	F4	
12	F3	F5	F2	F3	F		H	H	H	H	H	H	N	N	N	N	N	N	N	N	F2	F3	F2	F2	
13	F3	F5	F4	F3	N		H	N	N	N	N				H	H	N	N	C	H	F2	F2	F2	F3	
14	F2	F2	F3	F2	F	F	H	H	H	C	N	N	N	N	C	C	C	C	C	C	F3	F4	F5	F4	
15	F4	F2	F3	F3	N	N	N	H	N		N	N	H	C	C	N		C	C	N	F4	F	F3	F	
16	F2	F2											N	N	N	N	C	C	C	F	F3	F3	F4	F3	
17	F4	F3	F2	F2	N		N		H	H	H	H		C	C	N	N	N	N	F	F2	F3		F2	
18	F2	F3	F5	F2	N					N	H	H	H	N	N	N	C	C	N	C	F2	F2	F4	F2	
19	F1	F2	F2	F1	N		N	N	N	H	H	N	N	N	N	N	N	N	C	C	F1	F2		F3	
20	F3	F2	F2	F2	N	F	F4	F	N	N	C	C	C	H		N	H	N	C	C	F4	F2	F4	F3	
21	F2	F3	F1	F1	F			H	H	H	H	N	N	N	N	N	N	N	N	N	F2	F2	F4	F3	
22	F2	F3	F3	F3	N		H	H	H	N	N	N	N	N	N	N	N	N	C	C	F2	F2	F2	F4	
23	F2	F2	F2	F1	F	C	F	F	F	N	C	F	H	N	N	C	H	N	N	C	F3	F3	F2	F2	
24	F2	F2	F3	F1	F	F	F	F	N		F					H	N	N	C	C	F2	F4	F3	F4	
25	F5	F1	F3					N	N	H	H	H	H	H	N	N	C	C		C				F1	
26	F1	F1	F1			C	N	N	C	C	C	C	C				N	N	N	N	F2	F4	F5	F3	
27	F2	F2	F2	F2	N	N	C	C	C	C	C	N	H	F	F	N	H	C	C	C	F2	F2	F4	F2	
28	F5	F3	F5	F1			N	F								F			F	N	F3	F1	F3	F5	
29	F1	F2	F2	F1	C	H	H	C	H	H	C	N	N	N	F	H	C	N	C	C	F4	F3	F5	F2	
30	F1	F2	F1		F				H					F	F	F			F	N	F4	F1	F3	F3	
31	F2	F2	F3	F1	F	F	C	H	H	H	H	H			H	H	N	N	C	C	F4	F3	F3	F2	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
UQ																									
LQ																									

JUL. 1969

TYPES OF ES

IONOSPHERIC DATA

JUL. 1969

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	R	R	F	F	F	86	J ₉₈ R	103	97	77	65	81	91	98	97	96	93	90	86	95	91	80	81	81
2	J ₇₆ R	81	F	72	69	70	87	95	94	97	95	97	103	95	90	84	72	76	88	95	92	85	88	81
3	84	I ₈₁ R	78	76	74	77	91	101	84	80	82	I ₉₀ A	90	I ₈₄ A	82	81	77	78	85	85	82	82	F	R ₈₇
4	F	F ₇₅	F ₇₄	74	77	80	87	98	94	87	87	93	100	103	91	88	83	77	77	80	84	85	86	91
5	87	I ₉₂ R	84	71	J ₇₁ R	77	91	97	91	78	80	86	89	95	94	91	I ₉₂ A	95	95	86	82	F ₈₄	F ₈₆	F
6	F	F ₈₈	F ₈₄	F ₈₄	J ₈₀ F	79	84	88	88	90	90	92	104	104	103	104	104	102	96	91	83	82	J ₈₅ F	J ₈₆ F
7	F ₈₉	F	J ₈₈ F	F	F ₈₈	F	101	99	90	89	87	86	89	89	89	92	95	96	91	89	88	89	89	88
8	F	R ₉₆	F	F ₈₅	F	83	85	88	80	J ₇₅ R	80	I ₈₀ A	I ₈₆ A	88	90	89	88	91	91	90	84	90	93	90
9	90	87	89	84	80	81	81	78	84	81	84	88	91	99	107	101	90	100	97	91	90	93	95	96
10	91	93	96	90	81	84	95	97	91	93	98	102	102	99	100	96	91	87	91	92	85	89	F	89
11	F ₈₃	J ₈₃ R	J ₇₈ R	74	81	86	94	94	90	91	96	102	110	120	118	110	102	99	98	101	85	87	84	86
12	F	F	F	F ₈₈	F	71	90	90	68	74	84	99	112	I ₁₀₈ A	108	102	97	94	89	89	82	84	79	79
13	77	80	71	60	59	68	97	90	J ₇₅ R	90	100	112	110	96	89	91	90	95	98	85	80	83	84	S ₈₃
14	85	88	79	64	54	56	68	78	79	I ₇₀ A	I ₆₃ A	61	I ₆₅ S	I ₆₇ A	R	67	74	76	78	69	65	70	R	F ₇₀
15	70	70	F ₆₂	57	50	F ₅₈	I ₇₇ A	I ₈₀ A	I ₇₀ A	66	I ₆₆ R	I ₆₂ S	64	I ₅₆ A	60	62	63	65	65	68	71	73	69	66
16	67	65	66	58	53	55	68	82	103	85	87	90	93	95	92	91	89	95	102	102	89	84	81	87
17	79	75	70	V ₅₉	54	55	66	74	81	91	80	77	75	73	81	74	74	75	79	75	72	73	72	72
18	72	70	F ₆₉	68	49	53	66	75	74	76	69	69	72	78	82	84	84	92	90	76	76	78	78	80
19	79	77	69	73	59	64	61	61	66	66	72	78	75	72	I ₇₃ A	78	75	68	73	S ₈₃	79	78	74	74
20	J ₇₃ R	68	64	63	49	I ₄₉ A	56	69	72	84	84	79	77	I ₇₆ A	80	80	J ₇₆ R	76	80	84	76	74	71	70
21	F ₆₅	F	J ₇₄ F	65	58	66	65	76	69	R ₇₃	84	83	I ₇₇ A	68	75	89	98	105	105	84	76	J ₇₆ R	76	76
22	70	68	69	63	65	66	84	85	77	72	84	I ₈₂ A	89	104	100	93	72	I ₆₉ A	70	85	F ₈₄	79	80	I ₈₀ R
23	74	72	69	64	64	66	62	78	R ₇₅	78	75	84	94	98	91	91	74	78	91	91	75	J ₇₄ R	69	74
24	73	72	67	58	52	55	74	70	64	65	66	69	80	94	83	79	J ₇₄ R	81	86	92	J ₈₄ R	80	I ₇₃ R	71
25	68	68	69	66	56	50	61	71	83	64	69	75	82	85	90	94	102	109	111	93	85	82	83	79
26	I ₇₇ R	77	64	60	F	51	76	75	69	Z ₆₂	72	81	93	98	92	88	90	98	101	86	75	H ₅₉	F ₆₃	A
27	F ₆₅	59	F	F ₆₄	F ₆₄	68	64	66	66	74	78	80	83	99	98	104	104	95	95	94	75	74	75	72
28	67	64	62	59	59	64	72	77	89	78	82	76	78	91	107	99	85	81	84	85	76	69	F	F
29	F	J ₇₄ R	F ₇₀	68	56	56	68	81	94	82	72	76	80	95	92	94	85	78	71	I ₇₈ A	I ₈₀ R	J ₇₉ R	J ₇₉ R	70
30	69	70	F ₆₉	65	64	63	70	72	87	78	76	79	88	87	88	89	79	74	76	84	80	74	75	70
31	67	62	61	59	57	56	65	85	78	81	75	79	84	105	103	R	70	81	81	72	F	I ₇₅ R	J ₇₆ R	70
CNT	25	27	26	29	27	30	31	31	31	31	31	31	31	31	30	30	31	31	31	31	30	31	27	28
MED	74	75	70	65	59	66	76	81	81	78	80	82	89	95	91	91	85	87	89	86	82	80	79	80
UQ	83	83	78	74	72	77	88	92	90	86	86	90	94	99	100	96	92	95	96	92	85	84	84	86
LQ	69	69	67	60	55	56	66	75	72	74	72	78	79	84	83	84	74	76	80	84	76	74	74	72

JUL. 1969

FOF2 (0.1 MHz)

IONOSPHERIC DATA

JUL. 1969

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	A	A	A	A	A	A	A	A	A	510	480	L	L					
2							L		510	L	L	530	540	550	500	510	550	460	L					
3							L	L	A	A	A	A	A	A	A	A	A	A	L					
4								450	L	550	550	550	A	550	L	500	A	A	L					
5							L	L	500	A	A	A	A	A	A	A	A	460	L					
6							L	L	520	530	550	570	550	560	560	560	510	480	L					
7							L	L	L	510	610	L	560	570	550	540	500	L						
8							L	L	A	A	A	A	A	A	510	A	500	450						
9							L	L	520	L	A	A	R	550	A	550	500	470	A					
10					L		L	L	520	500	A	A	A	550	550	530	L	A	A	A				
11							L	A	480	A	A	A	550	A	A	540	510	L						
12							L	L	A	550	590	L	A	A	A	A	A	A	A					
13							L	L	630	540	550	560	560	570	540	540	510	L	L					
14							L	L	A	A	A	A	S	A	A	500	A	A	L					
15						L	A	A	A	A	510	S	A	A	A	490	460	L	L					
16							L	L	500	450	500	A	A	A	A	A	490	A						
17						450	L	480	500	A	A	A	500	A	510	500	A	L	L					
18							L	A	460	490	550	A	A	A	530	490	460	450	L					
19							A	500	490	530	530	A	A	A	500	H	A	420	L					
20							L	L	480	490	500	A	A	A	A	490	A	L						
21							490	L	470	530	530	520	A	A	H	510	500	470	450	A				
22							L	L	480	510	A	A	510	540	A	A	A	A	A					
23							L	A	490	A	A	A	A	A	490	A	A	A	A					
24							L	430	L	480	500	500	500	490	500	490	A	430	L					
25							L	L	450	500	520	510	A	A	A	490	480	A	L					
26							L	L	L	510	530	530	520	520	500	500	460	420	L					
27									A	A	A	540	A	530	520	500	A	A	L					
28							L	L	U	490	L	510	510	510	510	500	480	450	L	L				
29							A	440	460	510	490	510	500	490	A	A	A	A	A					
30							L	L	470	520	550	550	550	530	540	500	L	L	L					
31								A	A	490	A	R	520	R	R	L	A	A						
CNT							1	1	5	18	19	16	13	13	14	15	22	15	10					
MED							450	490	450	485	510	530	530	520	545	510	500	490	450					
UQ								480	510	525	550	550	550	550	540	530	505	460						
LQ								440	470	490	510	510	510	520	500	490	465	430						

The Radio Research Laboratories, Japan

JUL. 1969

FOF1 (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1969

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						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
2						A	A	A	A	A	A	A	A	A	B	A	A	A	A					
3						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
4						200	270	320	A	B	A	A	A	A	A	A	A	A	A					
5						A	A	A	A	A	380	390	400	390	380	360	A	300	220					
6						A	I A 265	340	A	A	A	385	I A 395	A	A	A	345	300	A					
7						200	I A 290	A	A	A	I A 380	390	400	400	400	370	340	310	A					
8					A	265	310	350	360	I A 370	385	I A 385	I A 385	I A 375	I A 355	A	A	A						
9						A	255	I R 315	I A 350	I A 370	A	A	I A 395	I A 395	I A 385	A	A	A	A					
10						A	A	315	A	365	A	A	A	A	A	A	A	A	A					
11						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
12						A	260	A	A	A	400	405	A	A	A	A	A	A	A					
13						A	280	I A 310	340	A	A	390	395	B	R	I R 370	A	A	A					
14						A	270	310	335	A	A	A	A	A	A	350	330	A	A					
15						185	I A 250	300	325	A	A	R	I A 380	A	A	A	A	A	A					
16						190	A	A	R	350	A	A	A	A	A	A	A	A	A					
17						195	A	A	350	355	A	A	A	A	A	A	A	A	A					
18						A	A	A	A	A	A	I A 390	A	A	A	A	A	A	A					
19						A	250	310	340	360	390	390	380	380	370	A	A	A	A					
20						A	A	A	A	A	A	A	A	370	370	360	330	A	A					
21						A	I A 240	305	330	350	375	390	I A 380	370	360	350	I A 320	A	A					
22						160	260	300	330	355	370	380	380	A	A	330	A	A	A					
23						165	255	290	340	365	370	380	380	380	360	A	A	A	A					
24						A	260	300	330	A	R	R	I R 375	R 385	I A 360	345	A	A	A					
25						B	R	295	A	A	365	385	385	370	360	340	A	A	B					
26						185	A	A	A	370	A	R	R 380	R 385	I R 375	340	A	A	220					
27						A	A	A	A	A	A	A	A	A	365	365	330	A	A					
28						A	I A 240	A	A	360	365	I A 375	R	R	A	I A 345	I A 325	300	A					
29						B	A	A	A	A	A	A	A	A	380	A	A	A	B					
30						185	A	A	A	A	A	A	A	A	A	A	330	280	240					
31						A	250	I A 315	I A 340	360	370	A	A	A	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					10	16	15	12	12	11	13	14	11	13	12	8	5	3						
MED					188	260	310	340	360	375	390	382	380	370	350	330	300	220						
UQ					200	270	315	345	368	382	390	395	388	380	362	335	300	230						
LQ					185	250	300	330	355	370	385	380	372	360	342	328	300	220						

JUL. 1969

FOE (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1969

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	J ₅₄	J ₆₄	J ₅₁	J ₅₆	E ₁₃	21	J ₅₀	J ₆₇	J ₇₈	J ₆₁	J ₆₈	77	J ₈₀	J ₇₃	J ₁₀₉	47	J ₄₁	J ₃₈	J ₃₀	J ₂₁	J ₄₈	J ₄₀	60	J ₄₂
2	J ₈₄	J ₆₅	J ₅₅	J ₇₁	J ₄₁	J ₃₀	35	J ₅₄	J ₅₁	J ₄₈	46	46	39	40	E ₄₅	J ₇₄	J ₈₆	38	28	J ₂₃	J ₃₈	J ₂₆	J ₇₉	J ₆₄
3	J ₃₅	J ₂₆	J ₃₀	22	J ₃₀	J ₅₀	J ₃₇	136	J ₅₄	J ₅₈	J ₇₁	J ₁₄₈	J ₈₀	J ₁₁₀	J ₁₀₆	J ₇₀	J ₆₅	J ₅₆	J ₃₉	J ₃₇	J ₃₄	J ₁₁₀	J ₅₁	20
4	E ₁₆	J ₂₂	E ₁₂	23	E ₁₃	25	32	39	J ₄₁	E ₄₀	42	53	57	J ₅₁	J ₅₄	46	J ₅₉	J ₅₅	J ₄₁	J ₂₉	J ₂₆	E ₁₈	J ₅₃	J ₂₆
5	J ₄₂	J ₆₄	J ₂₉	J ₃₂	J ₅₂	J ₃₂	J ₅₁	40	J ₄₀	J ₅₄	J ₅₆	J ₈₉	114	J ₇₉	J ₅₉	J ₉₆	J ₁₀₈	43	J ₃₃	57	J ₃₄	J ₅₄	J ₇₆	J ₈₃
6	J ₈₃	J ₄₁	J ₅₃	J ₄₃	J ₃₈	J ₃₁	J ₆₂	42	J ₄₁	47	44	G	46	43	45	44	39	35	J ₃₀	J ₂₄	J ₆₃	J ₆₃	J ₂₈	J ₃₆
7	20	J ₂₂	J ₂₉	J ₂₆	J ₂₃	G	J ₂₈	J ₃₃	40	J ₅₄	51	J ₆₃	J ₆₄	52	47	J ₅₇	43	42	J ₄₃	J ₅₂	J ₃₆	J ₃₉	J ₁₉	J ₉₄
8	J ₆₃	J ₇₄	J ₉₆	J ₃₉	J ₃₄	26	35	J ₄₃	J ₆₇	77	J ₉₆	J ₉₁	J ₁₂₈	J ₉₁	46	J ₈₄	J ₉₅	J ₇₆	J ₃₇	J ₂₉	J ₂₁	J ₂₇	J ₄₂	E ₁₈
9	E ₁₆	J ₂₄	J ₅₄	J ₂₇	E ₁₅	24	32	G	46	55	J ₈₄	J ₁₂₉	48	47	J ₈₄	J ₅₄	J ₉₄	J ₆₆	J ₆₄	J ₅₁	J ₂₉	J ₂₆	J ₃₀	J ₂₆
10	J ₂₅	22	20	E	22	22	J ₃₉	37	J ₄₃	43	J ₆₁	J ₈₀	J ₆₇	J ₅₄	J ₄₂	J ₄₂	J ₅₃	J ₆₄	J ₅₀	J ₂₉	J ₆₃	J ₈₆	J ₅₅	J ₃₄
11	J ₃₂	20	J ₂₉	J ₂₉	J ₂₄	J ₂₄	J ₈₄	J ₇₄	J ₄₂	J ₈₉	J ₈₄	J ₆₃	J ₉₅	J ₁₃₈	J ₉₃	J ₇₄	J ₅₅	J ₅₄	J ₈₀	J ₈₇	J ₅₁	J ₂₉	J ₉₆	J ₅₆
12	J ₅₁	J ₉₀	J ₄₃	J ₄₁	J ₂₉	J ₃₇	35	40	43	J ₄₃	51	J ₅₆	80	J ₁₂₇	J ₁₁₃	J ₁₂₂	J ₁₆₃	J ₈₈	J ₉₂	J ₆₈	J ₄₂	J ₃₄	J ₂₄	24
13	E ₁₂	J ₄₂	J ₃₈	J ₅₂	J ₄₂	J ₂₆	30	J ₄₁	J ₅₆	J ₅₄	J ₅₉	G	G	E ₅₄	G	G	40	J ₃₇	J ₄₂	J ₃₇	J ₂₈	J ₃₀	J ₄₀	J ₂₃
14	J ₂₅	J ₃₉	J ₃₆	J ₂₉	J ₃₃	J ₃₆	J ₄₁	39	J ₅₉	J ₁₁₃	J ₉₆	55	43	J ₁₂₅	J ₇₆	46	J ₁₀₄	J ₆₅	J ₁₈₀	J ₃₈	J ₅₂	J ₁₁₀	J ₈₅	J ₆₁
15	J ₆₄	J ₄₁	J ₂₅	J ₂₅	J ₂₉	J ₃₆	81	89	J ₁₀₉	J ₁₁₉	J ₄₁	G	J ₅₈	76	J ₇₀	42	35	J ₄₁	J ₆₀	J ₅₄	J ₆₉	J ₆₃	J ₅₀	J ₄₁
16	J ₂₅	J ₂₇	J ₂₉	J ₂₉	J ₄₂	J ₂₅	30	36	G	43	J ₅₉	J ₅₄	J ₅₆	J ₅₅	J ₇₈	J ₇₇	J ₄₃	J ₇₉	J ₁₁₀	J ₃₄	23	J ₂₉	21	J ₃₆
17	J ₃₀	J ₂₃	J ₄₁	J ₂₉	J ₂₉	G	28	35	37	J ₆₈	62	J ₅₃	43	J ₅₂	J ₆₀	J ₄₁	J ₇₀	J ₃₆	J ₄₁	J ₂₄	J ₃₃	J ₂₉	J ₄₁	J ₅₄
18	J ₄₁	J ₃₅	J ₅₄	J ₅₁	J ₅₆	J ₅₁	J ₄₁	J ₅₄	J ₄₃	J ₄₂	48	J ₆₀	J ₉₆	J ₅₅	J ₅₆	J ₄₂	J ₆₂	J ₄₃	J ₄₂	J ₃₉	J ₄₃	J ₂₉	24	J ₂₆
19	J ₂₇	23	J ₅₀	J ₃₉	J ₄₁	J ₂₉	30	J ₆₈	36	42	44	45	J ₇₁	J ₆₈	J ₇₁	J ₄₃	J ₆₈	J ₅₅	J ₅₄	43	J ₆₁	J ₆₈	J ₃₃	23
20	J ₂₉	J ₃₂	J ₃₄	J ₃₈	M ₃₈	J ₆₉	J ₄₂	35	J ₆₁	J ₅₅	42	J ₅₆	J ₅₈	81	J ₅₄	J ₄₂	J ₇₂	J ₆₄	J ₅₃	J ₅₃	J ₄₃	J ₂₄	J ₃₁	J ₆₅
21	J ₆₂	J ₆₃	J ₃₇	J ₃₈	J ₂₆	J ₃₄	J ₂₉	34	40	J ₅₆	G	48	113	62	42	41	J ₅₄	36	J ₇₁	J ₃₆	E ₁₂	J ₅₀	M ₃₂	J ₂₇
22	J ₃₀	J ₃₀	J ₃₀	J ₂₈	J ₃₇	G	34	39	39	49	J ₅₃	96	46	43	J ₉₀	J ₅₄	J ₆₄	M ₉₁	M ₅₇	J ₆₄	J ₆₂	J ₁₂₁	J ₅₆	J ₂₉
23	J ₂₄	J ₂₉	22	20	20	G	23	40	J ₉₆	102	J ₅₄	J ₁₁₄	J ₅₆	J ₈₈	J ₁₀₅	J ₁₉₃	J ₉₃	J ₁₂₈	J ₇₀	23	J ₅₃	J ₄₁	J ₂₉	J ₂₉
24	E ₁₂	M ₂₁	J ₃₅	15	18	J ₂₈	J ₂₉	J ₂₉	J ₃₈	J ₄₀	G	G	G	43	43	J ₄₂	J ₈₁	J ₃₈	J ₄₂	J ₅₅	J ₄₃	J ₃₈	J ₅₄	J ₂₉
25	J ₂₅	J ₂₇	21	21	E ₁₅	E ₁₆	G	34	38	42	43	44	J ₅₆	J ₇₄	J ₇₁	48	J ₈₅	J ₁₂₀	J ₅₄	J ₅₆	23	J ₃₃	J ₂₄	21
26	J ₃₁	21	22	21	E ₁₅	G	J ₃₄	J ₃₆	J ₄₁	J ₃₀	J ₃₉	G	G	43	G	36	J ₃₆	J ₅₄	M ₁₉	E ₁₅	M ₃₉	24	J ₄₂	J ₈₉
27	J ₄₄	J ₃₆	J ₃₅	J ₃₉	J ₃₆	J ₃₀	J ₄₁	J ₅₅	J ₇₁	J ₅₄	J ₅₄	47	J ₆₈	38	43	43	J ₅₆	J ₆₃	J ₁₂₁	J ₉₅	M ₆₁	49	J ₄₄	J ₃₀
28	J ₂₉	24	J ₂₅	J ₁₅	J ₅₆	J ₄₃	J ₂₉	35	32	G	G	G	G	G	42	42	G	G	25	22	J ₅₁	J ₂₅	J ₂₉	J ₅₁
29	J ₄₂	J ₂₉	J ₂₆	22	J ₂₉	J ₂₉	J ₅₆	J ₃₉	J ₄₃	J ₄₁	44	J ₅₄	45	43	J ₇₉	J ₅₆	J ₇₀	J ₅₆	J ₅₈	J ₁₂₁	J ₁₀₉	J ₅₄	J ₂₅	22
30	J ₂₂	J ₂₅	J ₂₉	J ₂₅	28	21	J ₄₃	J ₄₁	J ₄₃	J ₄₀	J ₄₅	J ₄₂	45	44	J ₅₂	44	35	32	32	J ₂₉	J ₂₈	24	21	22
31	21	J ₂₄	J ₃₉	E	J ₁₄	20	J ₃₆	J ₅₁	J ₅₀	42	J ₅₉	47	47	44	48	J ₅₅	J ₈₅	J ₁₀₇	J ₈₉	J ₂₅	J ₆₁	J ₈₄	J ₅₅	J ₄₁
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J ₃₀	J ₂₉	J ₃₄	J ₂₉	J ₂₉	J ₂₆	J ₃₅	40	J ₄₃	J ₄₉	J ₅₁	54	56	54	J ₅₆	J ₄₆	J ₆₄	J ₅₅	J ₅₀	J ₃₇	J ₄₃	J ₃₈	J ₄₁	J ₃₀
UQ	J ₄₃	J ₄₁	J ₄₂	J ₃₉	J ₃₈	J ₃₃	J ₄₂	J ₅₂	J ₅₅	J ₅₇	J ₆₀	J ₇₀	J ₇₆	J ₇₈	J ₇₈	J ₆₄	J ₈₅	J ₆₆	J ₆₇	J ₅₄	J ₅₇	J ₅₈	J ₅₄	J ₅₂
LQ	J ₂₄	J ₂₄	J ₂₈	22	21	21	30	36	40	42	44	44	45	44	45	42	J ₄₃	J ₃₈	J ₃₈	J ₂₇	J ₃₁	J ₂₈	J ₂₈	J ₂₉

JUL. 1969

FOES (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1969

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	26	16	16	18	E ₁₃ ^B	20	46	53	75	53	53	70	76	62	71	41	37	26	29	19	46	40	25	26
2	40	E	37	41	28	26	30	52	43	42	44	43	E ₃₉ ^R	40	E ₄₅ ^B	40	34	34	27	22	21	E	19	19
3	25	19	16	E	25	20	35	34	48	54	65	A	66	A	55	56	50	53	32	36	30	25	29	E
4	E ₁₆ ^S	E	E ₁₂ ^B	E	E ₁₃ ^B	21	32	38	40	E ₄₀ ^B	42	51	57	50	53	42	54	51	30	27	20	E ₁₆ ^S	E	E
5	27	26	27	26	35	27	40	33	37	53	56	75	64	58	57	79	A	33	28	42	25	18	41	56
6	42	29	15	28	29	24	30	39	40	40	41	G	45	43	43	40	37	27	30	19	30	25	20	17
7	15	16	19	E	15	G	28	33	40	46	50	46	62	52	45	57	40	37	34	40	34	35	16	28
8	34	72	55	22	18	22	34	39	52	A	55	A	A	70	42	56	40	37	34	26	16	16	26	E ₁₆ ^S
9	E ₁₆ ^S	15	17	17	E ₁₅ ^S	22	30	G	43	51	60	53	E ₄₈ ^R	43	56	45	40	38	40	33	20	E	E	19
10	E	E	E	E	E	20	36	36	41	40	60	75	64	51	40	40	51	64	46	21	19	16	40	20
11	25	E	23	19	17	24	40	66	40	65	74	56	51	56	53	41	39	40	50	76	41	26	25	28
12	25	40	30	18	24	26	31	38	40	42	51	55	80	A	60	89	80	76	75	52	24	17	21	17
13	E ₁₂ ^B	25	E	28	28	22	28	40	51	42	43	G	G	E ₅₄ ^B	G	G	38	32	30	25	18	18	25	16
14	17	26	20	16	20	21	38	37	54	A	A	51	E ₄₃ ^S	A	60	41	60	60	30	20	20	19	41	29
15	61	25	22	20	19	32	A	A	A	56	40	G	53	A	53	38	34	40	34	50	30	29	30	26
16	21	23	20	20	20	18	28	32	G	42	56	54	55	55	54	60	40	53	50	32	16	20	E	25
17	19	15	40	21	15	G	24	30	36	55	59	51	40	52	40	38	65	30	28	17	27	27	28	28
18	19	26	25	18	26	46	32	51	38	42	45	59	52	54	40	39	38	39	27	29	29	25	E	19
19	15	15	16	25	25	22	28	51	35	38	40	44	64	51	A	40	55	35	28	20	16	45	26	20
20	25	15	26	18	20	A	29	32	37	41	40	55	55	A	54	40	59	35	35	19	29	16	18	42
21	19	40	19	20	16	22	28	33	38	40	G	40	A	60	41	40	33	33	44	28	E ₁₂ ^B	28	20	19
22	25	18	15	26	26	G	33	39	38	45	55	A	46	42	75	53	46	A	53	26	38	22	29	E
23	15	20	15	E	15	G	G	33	60	40	52	52	56	76	46	75	55	46	63	17	25	26	17	17
24	E ₁₂ ^B	E	E	12	16	18	21	26	28	38	G	G	G	40	40	36	56	35	25	19	26	16	26	25
25	20	22	E	E	E ₁₅ ^S	E ₁₆ ^S	G	33	G	37	40	43	55	55	54	43	38	53	26	25	E	25	20	E
26	E	E	16	16	E ₁₅ ^S	G	26	32	39	G	39	G	G	43	G	34	33	35	16	E ₁₅ ^S	29	E	34	A
27	28	17	22	25	26	29	32	50	50	52	53	44	55	38	40	42	55	52	26	26	40	40	39	26
28	22	16	19	13	30	26	26	30	32	G	G	G	G	G	41	40	G	G	E ₂₅ ^R	E	18	18	16	26
29	26	16	19	16	16	27	52	30	38	40	40	41	41	43	76	52	56	51	58	A	21	50	15	14
30	16	15	18	16	15	16	27	30	37	40	45	40	41	40	46	38	28	30	25	16	14	E	E	E
31	E	E	16	E	E	18	35	45	48	42	59	E ₄₇ ^R	40	43	E ₄₈ ^R	46	53	52	40	17	28	26	32	30
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	20	16	19	18	18	22	30	36	40	42	50	51	53	52	48	41	40	38	30	25	25	22	25	20
UQ	26	25	22	22	26	26	35	42	48	52	56	56	63	61	56	52	55	52	42	32	30	26	29	27
LQ	16	15	16	12	15	18	28	32	37	40	40	40	40	43	40	40	38	34	28	19	18	16	16	16

JUL. 1969

FBES (0.1 MHz)

IONOSPHERIC DATA

JUL. 1969

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	11	10	11	10	13	16	16	16	18	32	26	28	25	27	23	23	16	17	11	13	10	E ₁₆ S ₁₆	E ₁₆ S ₁₆	E ₁₅ S ₁₅
2	E ₁₆ S ₁₆	E ₁₆ S ₁₆	10	10	10	12	16	15	25	18	27	26	27	26	45	26	22	16	16	12	10	E ₁₆ S ₁₆	E ₁₆ S ₁₆	12
3	10	12	11	E ₁₆ S ₁₆	10	14	16	18	16	18	26	28	26	28	26	26	27	13	10	11	11	10	E ₁₆ S ₁₆	E ₁₆ S ₁₆
4	E ₁₆ S ₁₆	12	12	E ₁₆ S ₁₆	13	17	16	18	25	40	26	30	35	26	27	27	27	15	11	10	10	E ₁₆ S ₁₆	E ₁₆ S ₁₆	E ₁₆ S ₁₆
5	E ₁₅ S ₁₅	E ₁₆ S ₁₆	11	11	12	10	15	16	16	18	26	26	26	26	25	19	20	15	14	E ₁₅ S ₁₅	11	10	11	E ₁₅ S ₁₅
6	11	10	10	10	10	12	14	16	17	22	22	25	26	25	26	26	16	16	10	10	11	11	11	E ₁₅ S ₁₅
7	12	12	11	10	10	13	15	16	16	19	25	25	22	27	27	22	17	16	14	11	12	12	12	12
8	E ₁₆ S ₁₆	13	10	10	10	12	10	12	15	26	25	26	27	26	22	18	16	17	13	11	10	10	12	E ₁₆ S ₁₆
9	E ₁₆ S ₁₆	11	E ₁₆ S ₁₆	10	E ₁₅ S ₁₅	15	12	17	18	25	26	22	26	26	26	25	17	16	16	11	12	11	E ₁₅ S ₁₅	13
10	E ₁₆ S ₁₆	E ₁₅ S ₁₅	E ₁₅ S ₁₅	10	E ₁₅ S ₁₅	15	12	12	16	17	25	27	26	26	26	26	25	16	13	12	10	14	11	E ₁₅ S ₁₅
11	11	E ₁₆ S ₁₆	E ₁₅ S ₁₅	10	12	13	16	16	26	26	25	26	26	26	18	20	15	13	12	10	11	12	14	E ₁₅ S ₁₅
12	12	12	11	10	10	11	16	19	20	25	26	26	28	27	25	16	16	12	10	10	12	12	10	E ₁₅ S ₁₅
13	12	12	11	10	10	12	15	15	15	25	17	19	25	54	27	27	17	16	12	11	13	12	E ₁₅ S ₁₅	E ₁₅ S ₁₅
14	E ₁₅ S ₁₅	11	12	E	E	10	15	17	21	26	20	23	25	30	22	26	11	12	15	10	11	11	E ₁₆ S ₁₆	E ₁₅ S ₁₅
15	13	10	12	11	10	15	13	15	16	16	26	27	27	27	26	18	18	15	12	E ₁₅ S ₁₅	12	E ₁₅ S ₁₅	E ₁₆ S ₁₆	E ₁₅ S ₁₅
16	12	10	11	10	10	15	16	16	17	26	27	26	27	27	26	26	16	16	14	12	11	11	E ₁₆ S ₁₆	12
17	12	12	10	10	10	12	15	15	15	26	26	27	26	26	26	15	16	12	12	12	13	E ₁₆ S ₁₆	12	E ₁₆ S ₁₆
18	12	11	10	10	10	11	12	11	14	16	17	26	27	25	27	16	15	12	12	12	13	E ₁₅ S ₁₅	E ₁₅ S ₁₅	14
19	12	11	12	11	10	12	12	13	15	15	16	26	18	25	18	17	15	15	12	11	10	E ₁₆ S ₁₆	11	10
20	E ₁₆ S ₁₆	12	11	10	10	11	13	12	12	14	17	19	26	15	26	16	17	12	11	11	11	12	12	12
21	11	10	11	11	12	12	11	14	16	16	18	26	26	27	17	16	15	14	13	11	12	E ₁₆ S ₁₆	11	12
22	12	12	10	10	10	14	12	14	14	16	17	26	26	26	26	16	15	13	11	11	10	11	10	13
23	12	10	10	12	14	13	12	12	14	16	16	18	16	16	12	15	13	13	14	E ₁₅ S ₁₅	14	E ₁₅ S ₁₅	12	12
24	12	14	11	10	10	12	12	15	15	14	18	17	27	29	27	16	14	14	11	10	10	12	E ₁₆ S ₁₆	E ₁₅ S ₁₅
25	12	11	E ₁₅ S ₁₅	E ₁₅ S ₁₅	E ₁₅ S ₁₅	16	14	16	13	12	18	16	16	16	16	15	12	12	15	10	E ₁₆ S ₁₆	E ₁₅ S ₁₅	12	12
26	E ₁₆ S ₁₆	E ₁₅ S ₁₅	12	13	E ₁₅ S ₁₅	16	12	15	16	17	18	26	26	26	26	25	18	14	10	E ₁₅ S ₁₅	E ₁₅ S ₁₅	E ₁₅ S ₁₅	13	12
27	13	10	10	10	12	10	11	15	14	15	17	27	16	19	16	15	12	12	11	11	13	10	13	13
28	12	13	13	10	10	12	12	15	16	25	26	26	26	25	26	16	15	16	11	E ₁₆ S ₁₆	12	12	10	11
29	E ₁₅ S ₁₅	11	11	11	12	10	12	11	12	16	16	18	28	16	16	15	12	11	16	12	12	E ₁₆ S ₁₆	12	10
30	12	12	10	10	10	14	14	15	15	16	25	18	23	26	17	19	14	12	13	12	10	14	11	E ₁₅ S ₁₅
31	E ₁₅ S ₁₅	12	11	10	10	13	12	12	15	16	15	26	26	26	25	14	12	16	12	10	12	12	E ₁₆ S ₁₆	E ₁₆ S ₁₆
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	12	12	11	10	10	12	13	15	16	18	25	26	26	26	26	18	16	14	12	11	11	11	12	E ₁₅ S ₁₅
UQ	E ₁₅ S ₁₅	12	12	10	12	14	15	16	17	25	26	26	27	27	26	26	17	16	14	12	12	E ₁₅ S ₁₅	E ₁₆ S ₁₆	E ₁₅ S ₁₅
LQ	12	11	10	10	10	12	12	14	15	16	17	22	25	25	20	16	14	12	11	10	10	11	11	12

The Radio Research Laboratories, Japan

JUL. 1969

F-MIN (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1969

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	R	R	F	F	F	275	J ₂₈₅	290	320	270	295	J ₂₆₅	255	275	270	270	280	280	265	275	295	265	260	260	
2	J ₂₆₅	260	F	260	280	270	275	285	275	275	265	260	285	295	250	285	265	265	285	285	285	270	285	265	
3	275	J ₂₈₀	280	275	270	275	265	300	315	275	270	J ₂₇₀	290	J ₂₇₀	280	270	280	270	285	285	270	255	F	J ₂₈₅	
4	F	300	F	270	275	295	285	275	310	265	265	255	260	280	275	280	295	290	275	290	275	275	255	265	
5	270	J ₂₈₅	285	295	J ₂₇₀	285	295	295	310	300	270	265	255	265	265	265	J ₂₇₅	280	285	290	260	250	J ₂₇₀	F	
6	F	285	J ₂₈₀	J ₂₈₀	J ₂₈₅	290	300	305	305	290	260	250	260	270	265	265	280	280	290	285	280	265	J ₂₆₅	J ₂₈₅	
7	285	F	J ₂₇₀	F	J ₂₇₀	F	290	295	290	270	265	265	265	265	260	260	275	275	285	280	270	265	265	265	
8	F	J ₂₉₀	F	J ₂₉₅	F	280	300	300	295	J ₂₈₀	275	J ₂₈₀	J ₂₇₅	260	270	270	275	280	285	280	275	255	260	290	
9	270	265	280	275	290	295	295	285	285	285	275	260	255	265	270	265	260	280	300	275	260	260	265	270	
10	265	270	290	290	285	280	285	310	275	270	275	270	265	270	270	280	275	275	275	285	270	265	F	280	
11	J ₂₈₀	J ₂₈₀	J ₂₇₅	280	280	265	280	285	260	260	250	265	265	260	280	275	285	285	285	295	270	265	270	260	
12	F	F	F	300	F	280	310	310	310	270	250	260	270	J ₂₇₅	275	285	290	280	255	280	265	260	265	265	
13	285	280	310	265	265	295	300	300	J ₂₅₅	245	245	275	280	290	265	275	265	265	285	280	265	260	260	265	
14	270	285	290	345	275	295	265	270	295	J ₂₈₀	J ₂₇₀	265	J ₂₆₅	J ₂₆₅	R	255	285	280	305	290	265	255	R	J ₂₇₀	
15	255	285	305	280	260	265	J ₂₇₀	J ₂₉₀	J ₂₆₀	275	J ₂₈₀	J ₂₆₀	265	J ₂₇₀	265	275	275	290	290	280	270	265	265	260	
16	275	280	275	295	270	275	270	260	290	280	275	260	260	275	275	275	280	275	295	295	280	285	265	270	
17	270	295	300	J ₂₇₀	280	275	305	295	290	310	315	290	295	280	290	290	310	295	300	295	285	275	280	270	
18	270	275	J ₂₈₀	310	290	J ₃₀₀	305	310	310	315	275	J ₃₀₀	280	290	285	285	280	295	290	290	275	275	270	265	
19	270	285	305	300	295	295	315	J ₂₉₀	290	300	275	305	285	300	J ₂₇₅	275	295	290	290	290	290	290	270	270	275
20	J ₂₉₀	280	295	315	305	J ₃₀₀	305	315	300	305	300	290	275	J ₂₈₀	290	295	J ₂₉₀	290	285	295	290	270	275	270	
21	275	F	J ₂₇₀	305	285	290	285	310	280	J ₂₇₅	295	300	J ₂₉₀	J ₂₇₀	270	270	280	290	305	300	280	J ₂₈₀	285	280	
22	275	280	275	275	280	270	300	285	315	280	310	J ₂₈₀	270	290	285	315	295	J ₂₈₅	280	275	J ₂₈₀	270	280	J ₂₈₀	
23	275	280	275	280	290	300	305	305	A	305	285	280	280	290	285	310	295	280	295	315	280	J ₂₆₅	275	260	
24	300	285	295	305	290	300	325	330	300	295	290	275	280	305	290	295	J ₂₉₀	290	285	295	J ₂₇₅	290	J ₂₈₀	270	
25	285	265	295	300	340	285	280	315	315	345	295	285	295	275	280	275	285	295	305	300	285	285	285	300	
26	J ₂₈₀	305	295	305	F	300	335	335	320	315	280	280	280	285	285	275	280	295	315	305	300	J ₂₉₀	J ₂₇₀	A	
27	J ₂₇₀	255	F	F	J ₂₉₀	315	305	315	290	300	300	275	260	275	275	280	300	290	275	295	280	255	280	265	
28	275	280	275	280	290	310	305	325	305	300	315	285	280	265	305	305	295	300	300	310	305	270	F	F	
29	F	J ₂₉₀	J ₃₁₀	305	305	305	310	300	320	305	295	275	265	285	285	295	305	305	295	J ₂₉₀	J ₂₈₀	J ₂₉₀	J ₂₉₀	285	
30	275	275	J ₂₉₀	290	285	300	300	290	310	285	290	280	295	270	275	285	290	290	290	295	295	275	280	285	
31	275	275	280	290	270	270	265	305	295	310	270	280	275	285	305	R	285	285	310	305	F	J ₂₇₀	J 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	25	27	26	28	27	30	31	31	30	31	31	31	31	31	31	30	30	31	31	31	31	30	31	27	28
MED	275	280	282	290	285	290	300	300	298	285	275	275	275	275	275	275	285	285	290	290	280	270	270	270	
UQ	280	285	295	302	290	300	305	310	310	302	295	280	280	285	285	285	292	290	298	295	285	275	280	280	
LQ	270	275	275	278	272	275	280	290	290	275	270	265	265	270	270	270	278	280	285	282	270	262	265	265	

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M(3000)F2 (0,01)

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M(3000)F1 (0.01)

135° E Mean Time (G. M. T. + 9h)

Station 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	A	A	A	A	A	A	A	A	A	355	340	L	L	L					
2							L		360	L	L	360	360	345	390	355	315	330	L						
3							L	L	A	A	A	A	A	A	A	A	A	A	L						
4								375	L	345	350	345	A	335	L	360	A	A	L						
5							L	L	365	A	A	A	A	A	A	A	A	340	L						
6							L	L	380	395	375	340	365	355	340	325	335	335	L						
7							L	L	L	395	U 315	L	A	A	345	A	340	L							
8							L	L	A	A	A	A	A	A	380	A	345	350							
9							L	L	350	L	A	A	R	350	A	330	345	305	A						
10						L		L	370	380	A	A	A	360	345	340	A	A	A						
11							L	A	375	A	A	A	360	A	A	335	350	L							
12							L	L	A	345	A	A	A	A	A	A	A	A	A						
13							L	L	320	U 325	355	355	340	B	350	325	335	L	L						
14							L	L	A	A	A	A	S	A	A	360	A	A	L						
15						L	A	A	A	A	390	S	A	A	A	335	355	L	L						
16								L	345	385	360	A	A	A	A	A	330	A							
17					305	L	340	345	A	A	A	385	A	360	345	A	L	L							
18						L	A	370	370	335	A	A	A	350	365	350	U 335	L							
19							A	360	360	360	330	A	A	A	340	A	345	L							
20							L	355	365	360	A	A	A	A	365	A	L								
21						335	L	385	345	375	375	A	A	375	340	360	U 335	A							
22						L	L	370	355	A	A	380	355	A	A	A	A	A							
23							L	A	365	A	A	A	A	A	A	A	A	A							
24						L	375	L	395	385	380	385	360	385	350	A	350	L							
25						L	L	385	375	365	375	A	A	A	350	335	A	L							
26						L	L	L	375	360	360	380	355	370	360	350	345	L							
27								A	A	A	335	A	360	345	320	A	A	L							
28						L	L	U 345	L	370	375	385	370	360	360	360	L	L							
29						A	365	370	380	400	375	400	385	A	A	A	A	A							
30						L	L	375	375	370	365	390	365	335	360	L	L	L							
31							A	A	385	A	R	365	R	R	L	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	1	5	18	19	15	13	12	12	14	21	15	10							
MED						305	335	365	370	370	365	360	380	358	355	350	345	338							
UQ								375	375	380	375	375	385	362	375	360	350	345							
LQ								345	355	358	358	345	362	352	345	335	335	335							

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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H^oF₂ (KM)

135° E Mean Time (G. M. T. + 9h)

Station 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	295	280	290	300	345	390	420	325	355	325	330	310	300						
2						260		305	340	325	365	335	345	350	345	400	350	310						
3						300	270	265	340	385	350	370	385	385	360	380	350	320						
4							295	260	360	360	390	375	345	355	340	360	300	310						
5						290	260	275	295	375	E 410	380	370	360	E 400	I 360	310	300						
6						260	270	290	320	330	370	370	345	350	370	325	310	290						
7						275	270	300	305	380	340	380	370	380	375	345	320							
8						270	270	275	A	390	I 375	I 350	400	350	360	350	315							
9						250	300	315	320	375	390	400	375	350	350	335	335	295						
10						290		280	320	325	340	350	360	360	375	335	330	350	300					
11							295	300	310	390	A 400	360	360	350	325	315	330	300						
12							270	285	250	385	410	370	350	I 345	340	370	A 350	A 350	I 315					
13							280	260	450	355	370	345	320	320	355	350	320	315	300					
14							390	345	300	A	I 440	I 460	I 450	I 440	400	480	370	350	300					
15						360	A	I 360	A	410	380	I 510	450	I 435	450	390	400	345	325					
16							360	310	295	350	345	350	350	350	345	340	330							
17						350	295	340	320	295	300	340	330	390	340	335	340	300	295					
18							290	290	300	295	400	330	380	345	345	330	325	300	325					
19							A	375	340	370	345	360	A 335	I 365	320	320	315	295						
20							290	300	305	305	340	375	I 360	340	325	320	300							
21							360	310	305	375	320	310	I 345	I 400	395	350	320	295	260					
22							275	255	290	330	305	I 350	350	315	320	280	300	A	E 350					
23							290	A	305	340	355	345	325	A 320	300	310	340	300						
24							255	260	260	310	360	395	350	300	305	340	340	305	295					
25							300	260	280	300	365	355	350	340	350	350	310	300	260					
26							250	250	290	310	360	360	325	340	310	340	325	295	255					
27								A	320	325	360	355	355	340	325	290	290	300						
28							275	255	270	285	300	345	340	360	310	295	290	290	275					
29							275	290	290	315	310	385	395	340	I 350	315	295	290	E 350					
30							290	250	295	290	340	350	315	370	345	320	300	300	290					
31							290	270	300	390	365	365	360	300	275	300	310							
CNT						4	22	28	28	29	31	31	31	31	31	31	31	30	25					
MED						320	278	282	292	315	360	358	355	350	350	340	330	310	300					
UQ						355	295	298	308	340	380	376	378	370	358	352	348	335	305					
LQ						285	270	260	275	300	328	345	348	340	340	322	315	300	295					

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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	285	260	280	265	250	A	A	A	A	A	A	A	A	A	240	240	220	250	265	285	310	330	300	
2	355	330	285	345	280	260	245	290	250	210	260	200	200	240	230	225	230	240	255	265	255	275	280	260	
3	300	280	255	295	300	250	250	240	I 220	I 225	A	A	A	A	A	A	A	A	280	265	300	315	360	255	
4	260	240	300	295	290	245	240	250	240	210	215	I 215	A	A	A	240	A	A	250	290	300	285	315	300	
5	300	290	265	250	330	260	I 245	240	210	I 230	A	A	A	A	A	A	A	245	255	270	300	300	320	350	
6	350	290	255	270	270	240	245	240	200	205	195	200	200	200	225	220	225	230	250	260	270	280	270	290	
7	290	300	305	290	300	250	240	225	205	205	E 20	260	240	I 240	240	I 220	270	225	270	260	290	300	290	310	
8	340	340	310	280	290	255	250	230	A	A	A	A	A	A	215	I 220	240	250	270	275	260	305	310	285	
9	285	300	275	250	250	240	240	240	245	A	A	A	I 225	200	I 245	250	250	260	A	290	285	300	300	300	
10	300	285	270	250	260	260	250	240	240	205	I 220	A	A	I 210	210	250	A	A	A	280	290	310	380	295	
11	300	290	285	290	285	255	250	I 250	230	A	A	I 245	230	A	A	250	250	A	305	300	315	290	305	320	
12	325	360	295	255	290	285	260	240	I 220	220	I 230	A	A	A	A	A	A	A	I 280	300	270	290	305	290	
13	270	280	230	300	340	270	240	240	260	I 220	220	200	230	I 235	240	250	250	225	I 265	250	275	300	300	300	
14	295	280	230	205	250	250	270	250	A	A	A	A	S	A	A	245	A	A	250	260	300	310	380	310	
15	370	300	240	280	350	A	A	A	A	I 240	210	I 235	A	A	I 230	210	H 230	A	A	340	300	300	310	315	
16	300	290	275	260	310	290	250	230	230	250	A	A	A	A	A	A	250	I 260	290	255	245	255	300	300	
17	285	255	275	305	285	245	205	250	240	A	A	A	210	I 230	205	240	I 240	240	250	250	290	300	300	310	
18	300	310	300	250	295	360	250	I 250	240	225	250	A	A	A	205	205	245	I 250	290	250	295	295	290	300	
19	290	270	245	260	275	245	225	I 240	205	200	200	250	A	I 210	I 210	225	H 220	A	220	255	225	255	300	290	300
20	280	260	270	240	245	I 255	240	210	225	220	210	I 215	I 240	I 230	I 230	240	A	250	270	240	260	275	290	E 340	
21	320	E 350	290	245	290	255	210	225	200	H 220	190	200	A	A	200	225	205	230	I 250	240	260	290	275	280	
22	300	290	290	300	300	250	250	240	205	250	A	A	225	220	A	A	A	A	A	275	300	260	300	260	
23	275	280	270	260	255	255	240	220	I 240	220	I 240	I 215	I 235	A	A	A	I 240	I 245	I 260	245	255	290	285	290	
24	250	260	250	245	260	255	225	205	200	200	190	H 200	225	225	240	230	I 230	I 240	250	250	260	250	290	300	
25	295	305	250	250	240	240	200	240	220	210	200	210	A	A	A	260	240	A	A	240	240	290	285	260	
26	255	245	245	245	250	250	I 225	200	245	205	200	195	195	245	205	205	205	270	250	245	250	210	E 350	I 315	
27	310	360	355	305	290	260	240	260	A	A	I 215	250	I 250	220	240	280	A	A	270	255	290	320	300	305	
28	285	270	280	275	295	255	205	225	200	200	H 220	215	200	215	230	245	240	240	250	245	250	270	340	310	
29	300	270	260	245	245	245	I 240	240	215	210	200	200	200	240	A	A	A	A	A	I 295	280	300	250	290	
30	300	300	285	255	290	250	240	220	215	205	195	190	180	200	260	210	220	235	250	260	245	260	260	250	
31	290	290	290	255	290	270	250	A	I 230	225	A	A	200	A	A	I 230	I 230	I 260	280	250	305	300	300	300	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	30	29	28	26	24	20	18	17	16	18	24	20	20	25	31	31	31	31	31	
MED	300	290	275	260	290	255	240	240	222	215	211	212	225	222	230	235	240	240	255	260	280	295	300	300	
UQ	300	300	290	290	295	260	250	245	240	225	222	235	230	238	240	248	248	250	270	275	298	300	311	309	
LQ	285	275	255	250	260	250	240	225	205	205	200	200	200	210	210	220	230	230	250	250	258	278	290	290	

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H·F (KM)

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H^oES (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	110	105	110	110	B	130	110	110	110	110	110	105	110	110	110	110	110	105	105	105	110	110	110	110
2	110	110	110	110	110	115	110	110	110	110	110	110	110	110	B	130	125	120	130	115	110	110	110	110
3	105	100	105	110	100	110	110	115	115	110	110	110	110	110	110	110	110	120	120	110	110	110	110	100
4	S	100	B	110	B	150	130	120	115	B	110	105	110	105	100	140	140	130	100	100	100	S	110	110
5	110	110	110	105	100	105	105	110	105	115	110	110	110	115	115	110	110	115	115	115	110	115	115	115
6	110	105	105	105	105	115	115	140	110	130	110	G	120	115	140	110	130	105	115	100	115	120	110	105
7	100	105	105	105	105	G	115	110	110	110	110	115	115	130	125	115	115	120	115	110	110	110	110	110
8	110	105	105	105	105	140	130	115	115	110	110	110	110	110	150	120	130	115	110	110	110	110	110	E
9	S	110	110	110	S	140	140	G	140	130	125	115	130	140	120	125	125	110	110	110	105	105	110	100
10	100	100	100	E	115	130	120	140	125	140	110	110	110	110	110	115	145	120	110	110	110	110	110	110
11	100	100	100	100	110	120	110	110	110	110	110	110	110	110	105	105	105	105	100	100	100	100	100	110
12	110	110	110	100	100	100	140	140	150	110	125	115	110	110	110	105	105	105	100	100	100	100	100	100
13	B	110	110	105	100	105	140	115	110	110	105	G	G	B	G	G	115	105	100	100	100	105	110	100
14	105	105	105	100	100	100	125	130	115	110	110	110	110	110	130	140	110	110	110	100	110	110	110	110
15	110	100	100	100	105	140	130	115	110	110	115	G	120	110	110	115	140	110	110	110	110	110	110	105
16	100	100	100	100	105	100	110	130	G	130	115	115	115	115	115	110	110	110	110	105	110	105	105	100
17	100	100	100	100	100	G	140	135	160	115	115	110	125	110	110	110	105	110	105	100	100	100	105	110
18	105	110	110	105	105	100	100	100	100	110	105	110	130	110	110	110	105	105	105	105	105	100	105	100
19	100	105	105	105	105	105	150	125	150	130	130	130	115	115	115	115	110	110	110	105	105	100	100	100
20	100	110	105	105	105	105	105	105	105	105	110	105	110	115	115	125	115	115	110	110	105	100	110	110
21	110	105	105	105	100	105	120	155	140	130	G	130	120	120	130	125	115	110	110	105	B	105	105	105
22	105	105	105	105	105	G	140	125	130	115	110	110	110	110	110	110	110	105	105	110	105	125	105	105
23	100	100	100	100	100	G	105	150	130	130	120	115	125	115	126	110	110	110	110	105	100	100	100	100
24	B	115	110	110	110	105	105	105	105	100	G	G	G	145	140	130	125	110	110	100	100	100	100	100
25	100	100	100	100	S	B	G	170	110	105	140	140	130	130	130	125	120	110	110	110	110	105	105	100
26	100	100	100	100	S	G	100	100	100	105	115	G	G	155	G	105	105	115	105	S	105	105	105	105
27	105	100	100	105	100	105	115	110	110	110	105	110	105	110	140	130	115	110	110	110	100	100	100	100
28	100	100	105	105	105	105	105	105	105	G	G	G	G	G	130	140	G	G	130	105	110	110	110	110
29	110	100	100	100	110	110	110	110	110	110	110	110	110	160	130	140	130	120	110	110	110	110	105	105
30	100	100	100	100	100	100	105	110	110	105	100	100	100	105	100	100	100	150	140	115	110	110	110	110
31	110	105	105	E	100	140	125	125	115	130	120	110	115	120	135	130	130	110	110	110	110	110	110	100
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	31	30	29	26	25	30	30	30	29	28	25	27	29	28	30	30	30	31	30	30	30	31	30
MED	105	105	105	105	105	105	115	115	110	110	110	110	110	110	115	115	115	110	110	108	110	108	110	105
UQ	110	108	110	105	105	130	130	130	125	130	115	115	120	120	130	130	125	115	110	110	110	110	110	110
LQ	100	100	100	100	100	105	105	110	110	110	110	110	110	110	110	110	110	110	105	100	100	100	105	100

JUL. 1969

H^oES (KM)

IONOSPHERIC DATA

JUL. 1969

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	F3	F2	F3	F3		H1	C3	C3	C3	C2	C2	C2	C2	C2	C2	C1	C2	C1	F2	F2	F5	F2	F3		
2	F3	F2	F4	F3	F2	L2	C1	C3	C2	C1	C2	C1	C1	C1		H1	H1	H1	H2	F1	F3	F2	F2	F2	
3	F2	F2	F1	F1	F2	L2	L2	C1	C2	C2	C2	C3	C2	C2	C2		L2	H2	H1	F4	F2	F1	F3	F1	
4		F1		F1		H1	H1	H1	C1		C1	C2	C1	C1	C1	H1	H2	H2	L2	F3	F2		F2	F2	
5	F3	F3	F3	F3	F3	L2	L3	L2	H1	C2	C2	C2	C2	C2	C2	C3	C3	C1	C2	F5	F4	F3	F4	F4	
6	F4	F2	F3	F4	F5	C2	C2	HL22	L1	HC11	C1		C1	C1	HL11	L1	H1	HL31	LL32	F2	FF33	FF22	FF32	F3	
7	F2	F2	F2	F3	F2		C1	C2	C1	C2	C2	C1	C1	C1	H1	H1	C2	C2	C3	F6	F4	F5	F2	F3	
8	F4	F5	F4	F3	F3	H1	H2	C2	C2	C2	C2	C3	C3	C2	H1	H1	H1	C2	C2	F5	F2	F3	F3		
9		F2	F2	F2		H1	H1		H1	H1	H2	C1	C1	H1	H1	H2	H2	L2	L2	F3	F2	F1	F2	F2	
10	F1	F2	F1		F1	H1	H2	H1	H1	H1	C2	C2	C2	C2	L1	C1	H2	H2	C2	F3	F2	F2	F5	F3	
11	F2	F1	F2	F2	F2	H2	L2	C1	C1	C2	C2	C2	C2	C2	L2	L2	L2	L2	L3	F3	F3	F3	F2	FF12	
12	FF13	F2	F2	F2	F2	L2	H1	HL11	HL11	L1	H1	C1	C2	C4	C2	C3	L4	L3	L3	F4	F3	F2	F4	F2	
13		F4	F2	F3	F5	L2	H1	C2	C2	C1	L2						C1	C2	L2	F2	F2	FF11	F2	F2	
14	F2	F3	F1	F2	F3	L2	H2	H2	C3	C2	C2	C1	C1	C2	H2	H1	C2	C2	C2	F2	FF12	FF22	FF21	F3	
15	F5	F3	F3	F3	F3	H2	H3	C3	C3	C2	C1		H1	C2	C2	C1	H1	C2	F3	F3	F3	F3	F3	F2	
16	F3	F3	F2	F3	F3	L1	L1	H1		H2	C2	C1	C2	C1	C2	C2	C2	L2	L3	F2	F2	F3	F1	F3	
17	F3	F2	F4	F3	F2		H1	H1	H1	C2	C2	C1	H1	C1	C2	L1	L2	L3	L3	F2	F3	F3	F2	F2	
18	F3	F3	F3	F3	F3	L4	L3	L3	L2	L2	L2	C2	HL12	C2	C1	C2	L2	L3	L3	F3	F4	F3	F1	F4	
19	F2	F2	F4	F4	F4	L5	H1	H2	H1	H1	H1	H1	C3	C2	C2	C1	C4	C3	C2	F3	F2	F3	F2	F2	
20	F3	F2	F5	F4	F5	L3	L2	L2	L2	L2	L2	L2	C2	C2	C2	H1	C2	C3	C4	F4	F4	F2	F2	F4	
21	F3	F4	F4	F5	F2	L5	CH11	H1	H1	H1		H1	C2	C1	H1	H1	C1	C2	L3	F4		F3	F5	F2	
22	F4	F2	F2	F4	F4		H2	H3	H1	C2	C2	C3	C1	C1	C2	C2	C3	L3	L4	F3	F3	FF13	F4	F2	
23	F3	F4	F2	F1	F2		L3	HL22	H2	H2	H2	C2	H2	C2	C2	C2	C3	C3	L3	F2	F3	F2	F2	F2	
24		F1	F1	F1	F2	L2	L2	L1	L1	L1					H1	H1	H1	H2	C3	L2	F3	F3	F3	F3	
25	F3	F3	F2	F1		H1	HL11	L2	H1	H1		H2	H1	H2	H2	H3	C3	L2	F4	F2	F3	F2	F1	F1	
26	F1	F2	F2	F1		L2	L2	L2	L1	CH11			H1		L1	L2	CL12	L1		F5	F1	F4	F3	F3	
27	F4	F4	F3	F5	F4	L2	C32	C2	C3	C2	L2	L2	L2	L1	H1	H2	C2	C3	C3	F5	F4	F4	F4	F4	
28	F3	F2	F3	F1	F5	L2	L1	L1	L1						H1	H1			HL11	F1	F3	F2	F2	F3	
29	F3	F3	F2	F1	F1	L3	C3	C2	C2	C1	C1	C1	C1	HL11	H2	HL11	H2	H3	L3	F3	F3	F3	F3	F2	
30	F2	F2	F2	F2	F1	L1	L2	L1	C1	L2	L2	L1	L1	L1	L3	L2	L2	HL12	H1	F2	F3	F2	F1	F2	
31	F2	F2	F2		F2	H2	H3	H3	C2	H1	H2	C2	C1	H1	H1	H1	H2	C2	L3	F2	F3	F2	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																									

JUL. 1969

TYPES OF ES

IONOSPHERIC DATA

JUL. 1969

HPF2 (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	R	R	F	F	F	380	JR	350	300	380	350	I20	I20	385	400	385	345	370	365	380	340	400	400	400	
2	J40	395	F	390	350	400	385	350	385	380	400	400	365	360	390	360	410	385	355	345	350	400	375	390	
3	365	I30	365	385	390	375	395	330	310	385	400	I30	370	I35	395	395	385	375	350	365	385	425	F	365	
4	F	315	390	385	385	335	350	350	325	395	405	420	400	390	395	355	360	345	365	360	385	395	430	400	
5	400	I35	340	325	JR	345	340	340	300	310	390	410	405	400	390	I30	I30	350	340	310	400	405	390	F	
6	F	350	JF	355	350	J50	320	305	305	310	350	400	415	400	390	400	405	360	360	350	340	350	380	415	375
7	360	F	J40	F	400	F	340	320	350	360	400	390	400	390	400	400	360	360	350	350	360	390	380	390	
8	F	350	F	340	F	340	310	305	310	A	400	I35	I30	410	400	400	375	350	365	365	385	425	400	375	
9	390	400	360	355	360	300	310	350	350	360	400	410	440	400	400	390	410	360	340	370	400	400	395	400	
10	400	400	365	350	355	365	360	300	390	385	360	385	400	395	400	360	360	395	365	360	395	400	F	385	
11	J30	J30	J30	380	385	380	360	350	370	410	420	400	410	390	360	370	375	360	345	335	400	400	400	410	
12	F	F	F	335	F	375	305	305	300	395	420	400	370	I30	370	370	360	360	420	350	390	390	390	380	
13	350	360	300	390	390	330	310	300	JR	455	430	440	370	355	350	390	355	390	380	355	350	370	400	400	380
14	390	350	310	250	360	310	400	360	310	I30	A	A	S	A	R	G	380	365	335	360	400	435	R	400	
15	400	380	320	390	410	I40	I30	I30	I35	I40	R	S	G	A	G	400	400	360	355	380	380	400	400	400	
16	390	380	365	350	400	400	400	400	365	365	380	400	400	375	375	365	365	375	330	315	360	375	400	395	
17	390	345	325	405	380	400	320	350	350	330	320	350	350	400	350	350	A	335	330	350	360	390	390	395	
18	390	380	380	310	370	I30	310	305	310	300	400	A	380	350	350	350	350	330	325	330	370	360	370	395	
19	380	355	320	320	330	325	280	I35	380	345	375	350	A	335	I30	330	340	350	340	320	340	370	380	380	
20	J30	355	320	300	300	I35	300	300	310	320	320	350	380	I35	350	330	J30	320	330	315	340	380	355	380	
21	380	F	J30	300	360	320	380	310	355	375	330	320	A	A	400	375	355	340	305	310	360	J30	355	360	
22	375	360	375	380	380	380	310	320	300	350	310	I30	380	340	350	300	320	I30	360	360	360	350	370	I35	
23	355	350	370	360	340	305	300	305	A	310	355	360	360	350	350	300	330	355	330	300	350	J30	380	380	
24	320	350	320	310	345	310	290	280	310	320	G	400	375	330	350	350	J30	340	350	335	J30	340	I30	385	
25	380	400	350	330	270	350	350	300	300	300	G	375	355	370	370	380	350	350	300	330	350	365	350	350	
26	J30	315	350	315	F	330	265	270	300	300	360	365	355	360	340	360	360	330	300	300	315	350	J30	A	
27	390	415	F	390	345	300	290	290	355	320	330	365	405	380	370	360	320	340	360	310	350	405	355	390	
28	365	370	370	360	330	300	300	270	300	340	310	365	370	390	350	325	330	310	320	310	330	400	F	F	
29	F	J30	F	335	315	310	300	300	300	330	335	385	400	360	380	350	310	320	A	I35	I30	J30	J30	380	
30	395	390	F	350	360	330	315	350	310	320	350	360	330	390	365	350	320	350	330	320	325	360	350	350	
31	380	385	380	345	390	370	400	305	305	300	400	390	385	360	330	R	350	350	300	310	F	I30	J30	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	25	27	26	29	27	30	31	31	30	30	27	28	27	28	29	29	30	31	30	31	30	31	27	28	
MED	380	360	360	350	360	338	315	310	310	350	380	385	380	378	370	360	360	350	342	340	360	390	380	382	
UQ	390	382	370	380	388	375	360	350	355	380	400	400	400	390	395	385	375	360	355	360	385	400	400	395	
LQ	365	350	325	325	345	315	302	300	300	320	342	362	368	360	350	350	345	340	330	315	350	368	362	378	

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HPF2 (KM)

IONOSPHERIC DATA

JUL. 1969

YPF2 (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	R	R	F	F	F	120	JR	100	90	110	100	I	I	85	90	115	115	130	95	110	100	100	100	100
2	JR	95	F	110	90	100	95	110	105	100	100	100	95	130	90	80	80	105	105	95	110	90	105	110
3	95	I	95	95	90	105	115	80	130	105	100	I	I	95	95	105	75	100	95	105	85	F	95	95
4	F	F	105	105	105	100	100	115	95	135	120	100	90	95	105	110	95	125	120	105	95	110	90	90
5	100	I	100	75	JR	95	90	100	100	90	105	90	155	100	125	I	I	120	120	105	115	I	I	F
6	F	F	J	J	J	90	95	100	90	95	150	135	105	110	110	100	110	110	100	100	100	110	J	J
7	80	F	J	F	F	70	F	85	90	100	135	95	150	100	110	105	105	130	110	100	120	110	110	100
8	F	95	F	F	F	110	90	135	110	A	90	I	I	120	100	100	105	110	95	115	95	115	100	85
9	110	100	100	105	120	100	110	110	110	100	100	100	100	100	100	100	130	90	60	110	130	100	95	100
10	100	90	95	100	105	115	100	100	100	115	100	115	100	105	100	100	130	95	125	120	95	100	F	95
11	105	JR	JR	110	105	110	120	100	90	100	130	100	90	110	100	120	105	100	105	115	100	100	100	90
12	F	F	F	F	F	105	105	95	140	100	130	100	120	I	125	120	85	90	95	125	110	110	110	100
13	95	85	70	110	100	75	90	170	JR	70	130	140	105	95	95	125	115	125	120	95	100	125	105	100
14	105	100	95	60	100	100	90	120	95	I	A	A	A	S	A	R	G	70	125	105	130	100	105	R
15	100	110	120	100	90	F	I	I	I	I	A	A	A	R	S	G	A	G	90	100	90	85	100	100
16	100	80	125	100	110	90	90	90	75	115	110	140	100	85	115	125	125	85	80	125	100	105	100	85
17	100	95	105	105	110	100	90	60	90	70	90	90	90	80	90	80	A	75	110	80	90	70	90	95
18	110	100	120	90	120	I	R	90	95	90	55	50	A	75	100	95	75	105	90	85	130	90	85	85
19	80	90	75	80	75	80	80	I	90	65	55	115	60	A	75	I	90	80	100	95	100	80	110	100
20	JR	135	80	70	90	I	A	100	70	135	80	80	95	115	I	A	75	70	JR	125	115	95	105	90
21	75	F	J	75	90	105	70	80	100	75	85	95	A	A	100	120	95	85	85	95	95	J	85	85
22	85	85	85	80	65	80	145	125	60	110	90	I	I	120	100	140	70	125	I	100	100	90	90	80
23	100	100	85	100	105	105	115	95	A	90	100	115	110	95	105	95	100	115	115	75	120	JR	90	100
24	80	95	85	75	75	95	70	75	140	85	G	80	105	110	100	90	JR	100	90	115	JR	100	I	105
25	70	100	90	110	120	130	90	80	100	140	G	85	85	120	120	110	100	100	100	110	100	115	100	100
26	I	95	100	85	F	80	125	80	100	100	115	100	145	90	130	135	140	105	70	70	85	75	105	A
27	75	90	F	65	80	60	70	65	90	80	70	120	140	105	90	110	95	130	100	95	100	100	95	100
28	90	90	100	85	85	75	75	90	55	90	90	115	110	110	90	115	110	100	120	100	80	90	F	F
29	F	JR	F	105	85	90	150	100	100	100	105	105	100	100	80	100	90	90	A	I	I	JR	JR	110
30	395	390	370	350	360	330	315	350	310	320	350	360	125	110	105	110	100	95	90	95	85	110	100	90
31	80	80	75	70	100	100	150	95	105	100	100	110	105	100	100	R	140	100	90	90	F	I	JR	110
Hour Day	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	27	26	29	27	30	31	31	30	30	27	28	27	28	29	29	30	31	30	31	30	31	27	28
MED	100	95	95	100	100	100	95	95	100	100	100	102	100	100	100	100	105	100	100	100	100	100	95	95
UQ	100	100	105	105	108	105	112	100	110	110	115	115	118	110	110	110	125	110	110	115	110	105	100	100
LQ	80	90	85	75	88	90	90	85	90	90	90	95	100	95	90	90	100	92	90	95	90	90	88	90

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YPF2 (KM)

IONOSPHERIC DATA

JUL. 1969

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	102	99	100	92	90	86	84	97	86	74	73	80	91	102	109	103	98	100	94	107	108	79	75	178
2	F	I	S	S	64	59	67	82	86	91	86	94	104	105	103	96	89	96	104	109	94	89	88	91
3	93	88	86	82	81	77	86	85	77	75	82	I	86	91	98	100	98	102	97	86	J	81	79	84
4	F	I	S	S	76	74	85	90	86	80	86	95	103	104	95	98	95	97	99	J	81	84	J	88
5	S	S	93	76	71	68	76	86	78	H	80	81	86	92	I	99	103	95	96	94	84	84	85	92
6	F	S	S	F	F	F	77	80	84	84	81	I	85	96	104	107	110	112	111	100	94	86	J	92
7	I	94	F	96	89	90	I	91	78	81	82	82	85	92	94	100	104	106	107	I	94	I	J	93
8	J	98	U	J	F	84	88	82	85	69	I	85	I	91	95	95	99	110	108	I	88	93	99	J
9	I	98	U	J	79	72	74	81	79	81	78	85	88	99	107	109	112	I	106	92	I	J	102	I
10	I	100	I	S	S	74	70	U	83	85	79	83	91	92	96	97	103	109	112	115	108	97	85	85
11	F	F	80	72	68	65	78	84	81	78	84	93	100	116	127	138	137	140	122	I	J	I	I	88
12	I	87	I	S	75	77	89	75	68	J	74	I	108	109	106	105	110	106	104	I	J	J	83	I
13	I	84	I	70	J	63	I	80	68	75	91	J	114	93	81	84	90	95	97	I	86	J	C	C
14	C	94	I	73	57	44	59	78	84	73	I	I	77	77	79	77	78	J	J	79	J	71	J	77
15	I	74	75	I	51	50	57	77	80	70	63	I	65	I	I	64	64	70	79	83	76	J	72	72
16	67	66	65	61	53	48	56	75	84	77	77	75	80	94	U	99	99	100	105	110	I	92	87	83
17	79	76	77	70	61	60	66	83	89	78	77	75	70	74	89	J	89	101	98	J	77	77	78	79
18	80	86	I	71	64	63	63	66	81	70	69	I	71	78	I	95	102	106	96	J	87	J	S	U
19	79	76	70	F	58	56	61	69	72	69	79	H	77	I	85	82	84	92	95	90	85	82	77	74
20	S	S	71	69	54	46	55	65	71	75	68	66	75	81	88	94	I	I	J	S	S	S	I	I
21	74	71	J	67	62	64	71	81	70	67	79	68	65	69	78	92	101	112	106	89	84	90	I	84
22	78	72	71	F	67	67	74	73	69	74	71	79	J	88	103	105	89	83	83	86	84	91	92	91
23	84	77	70	66	61	48	U	69	70	68	64	73	85	95	94	89	99	J	90	82	78	81	I	75
24	U	77	73	70	59	54	73	63	60	64	65	72	81	84	98	90	90	102	105	87	88	I	I	79
25	73	F	F	F	54	47	54	79	73	67	68	80	75	81	91	101	111	111	109	J	I	I	94	I
26	I	75	60	59	59	54	60	69	69	68	70	79	92	97	102	103	107	115	J	100	78	I	72	73
27	F	F	F	F	F	F	F	I	71	84	I	I	C	C	C	C	C	106	97	92	76	82	76	73
28	73	70	70	69	61	53	67	87	83	73	74	85	89	98	112	109	105	109	U	93	80	65	70	J
29	J	77	I	J	61	J	63	80	84	71	69	71	85	95	106	97	92	83	J	J	86	78	S	S
30	U	74	U	72	69	65	62	71	84	83	82	73	82	J	102	103	104	108	104	107	80	72	74	76
31	71	U	J	68	58	50	J	79	73	76	76	79	96	117	118	91	87	90	87	92	I	85	82	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	24	25	29	29	28	29	31	31	31	31	31	31	30	30	30	30	30	31	31	31	31	31	28	28
MED	78	77	79	69	62	62	71	80	79	75	77	79	85	94	98	98	98	102	99	92	85	84	83	82
UQ	90	U	S	S	70	70	78	84	84	79	81	85	92	100	105	103	105	110	106	100	91	88	92	88
LQ	74	73	70	66	58	52	61	74	71	70	70	74	77	81	89	90	90	96	94	88	80	78	76	76

The Radio Research Laboratories, Japan

JUL. 1969

FOF2 (0.1 MHz)

IONOSPHERIC DATA

JUL. 1969

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	A	A	U	520	570	540	530	530	500	510	460	450	L			
2							L	L	440	L	510	530	580	560	570	520	L	490	L	L				
3								A	L	530	550	A	A	A	A	L	510	470	L					
4							L	L	540	L	560	540	540	520	L	520	520	490	L	A				
5								L	A	L	530	570	560	A	A	A	A	500	L	A				
6								L	L	A	A	A	550	530	560	530	520	500	L					
7								L	510	500	540	A	590	540	530	540	510	500	L					
8								L	L	U	A	A	A	570	530	550	510	A	A					
9								L	L	530	560	540	570	560	550	530	540	A	L					
10							L	L	440	L	540	580	600	530	540	540	540	490	L					
11								L	A	510	A	L	570	530	540	540	540	480	L	L				
12								L	L	L	U	600	520	A	530	550	530	L	L	L	A			
13							L	L	L	L	L	560	520	540	540	L	510	470	A					
14								L	L	A	A	A	A	530	A	500	A	A	L					
15								L	470	430	490	530	A	A	A	A	500	470	450	420	L			
16								L	430	L	L	500	540	530	A	A	A	500	A	L				
17								L	L	450	500	490	L	530	550	500	510	510	460	L	220			
18								L	450	470	510	A	A	A	A	A	A	A	L					
19								L	L	510	A	500	A	510	490	490	510	450	A					
20								L	L	490	490	L	L	500	510	A	A	A	A	A	L			
21								L	L	420	480	510	530	A	A	480	A	A	L	L				
22							L	L	470	490	510	490	490	490	490	A	A	480	L	A				
23								L	460	540	540	500	490	480	500	A	490	A	A	A				
24								L	450	L	L	500	490	500	500	480	L	440	L	L				
25								L	L	L	L	500	L	A	500	A	A	A	A	A				
26								L	A	460	L	530	500	520	520	520	490	500	440	L	L			
27									A	L	480	C	C	C	C	C	C	C	A	A	A			
28								L	L	U	540	530	500	540	510	510	510	490	470	L				
29								L	A	490	500	540	510	500	A	A	A	A	A	A				
30								L	U	460	480	L	A	A	A	510	490	480	450	410				
31								L	L	490	500	550	520	530	520	520	L	L	A	A	A			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	14	18	21	19	21	22	20	19	18	18	3	1				
MED								450	455	500	530	520	530	530	525	510	510	470	420	220				
UQ								470	530	540	540	560	540	540	530	520	490	435						
LQ								450	490	510	500	520	510	500	495	500	450	415						

JUL. 1969

FOF1 (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1969

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					S	200	270	310	A	A	A	390	A	A	A	A	300	260	A					
2					E	210	280	A	A	A	A	A	A	A	370	340	310 ^H	260	170					
3					B	A	A	A	350	365	A	A	A	A	A	A	320	260	160					
4					E	A	A	A	A	A	A	A	A	A	380	350	320 ^I	A	A					
5					E	A	I A 275	I A 310	A	A	C	C	C	C	400	380	350	315	270	175				
6					B	A	A	A	A	A	A	A	A	370	A	A	A	A	270	170				
7					E	190	A	A	A	I A 380	R 385	390	400 ^R	390 ^R	I A 375	350	320	265	A					
8					E	180	290	320	350	375	I A 385	390	390 ^R	390	370	350	315	265	A					
9					E	A	260	330	350	375	390	400	400	390	375	340	310	250	A					
10					B	A	270	320	350	360	A	A	A	400 ^H	380	360	A	A	A					
11					B	220	290	A	A	A	380	390	400	385	380	350	320	270	165					
12					E	A	A	320	360	390	390	400	400	A	A	A	A	A	A					
13					B	A	A	A	355	A	A	A	A	400	380	A	A	A	A					
14					B	200 ^H	280	320	345	370	390 ^R	390	390	385	375	345	310	230	A					
15					B	A	275	320	I A 340	I A 360	I A 370	380	A	A	A	345	I A 305	260	A					
16					S	200 ^H	265	320	345	360	380	385	385	380	365	A	A	A	A					
17					E	200	270	310	335	350	370	A	A	A	A	A	290	250	A					
18					E	A	270	310	I A 340	I A 360	375	390	370	A	A	A	A	A	A					
19					B	190	260	310	340	355	380	I A 380	I A 375	370	I A 350	I A 325	A	A	A					
20					E	A	A	300	A	A	A	A	R 370	365	355	A	A	A	A					
21					B	170	260	310	335	360	370 ^H	370	370	360	355	330	295	230	A					
22					B	200	265	310	330	350	370	365 ^R	370	365	355	335	290	I A 240	A					
23					B	200 ^H	260 ^F	310	340	355	370	375	370	370	350	315	290	A	S					
24					B	A	260	300	330	360	380	390	380	370	350	325	A	A	A					
25					B	170	260	300	330	360	375 ^H	380	I A 375	380	350	325	A	A	A					
26					B	A	A	310	340	360	370	380	390 ^R	370	355 ^R	335 ^H	290	230	150					
27					B	A	A	A	330	C	C	C	C	C	C	C	295	235	A					
28					E	A	250	300	330	355	370	I A 370	370 ^R	370	365	340	300	260	S					
29					S	S	240	A	A	A	A	A	A	I R 370	365	340	300	250	A					
30					B	A	A	A	A	A	A	A	A	A	355	330	305	230	A					
31					S	170	260	310	330	360	370 ^R	390 ^R	380 ^R	380	360	335	305	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					11	14	21	21	21	20	19	19	19	20	23	21	21	19	6					
MED					E	200	265	310	340	360	375	390	380	380	365	340	305	260	168					
UQ					E	200	275	320	350	368	382	390	390	390	375	350	315	262	170					
LQ					E	180	260	310	330	358	370	380	370	370	355	330	295	238	160					

JUL. 1969

FOE (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1969

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	J ₅₀	J ₃₄	J ₄₉	J ₃₀	J ₂₂	J ₂₉	21	J ₃₄	J ₅₂	J ₅₉	J ₆₄	J ₆₆	J ₅₄	J ₆₄	J ₇₄	45	J ₅₂	J ₃₃	J ₂₉	J ₃₆	J ₂₄	23	E ₁₅	J ₂₉	
2	J ₃₇	J ₈₅	J ₈₀	J ₃₉	J ₅₃	22	42	38	J ₄₈	J ₅₃	J ₄₄	J ₄₄	J ₆₆	J ₅₀	J ₅₉	41	39	36	32	24	15	J ₃₅	J ₆₈	J ₂₆	
3	J ₃₁	J ₂₉	J ₂₆	J ₂₉	J ₂₆	J ₂₅	J ₃₂	J ₄₄	J ₃₇	39	J ₅₉	J ₁₁₃	91	J ₁₁₀	104	J ₆₄	J ₅₀	23	30	19	J ₂₂	J ₂₁	J ₂₆	25	
4	J ₅₂	J ₅₀	J ₃₁	J ₁₁₅	J ₃₄	J ₃₄	J ₃₆	36	J ₄₆	J ₅₈	48	50	J ₁₀₁	J ₅₃	J ₅₅	53	42	39	J ₅₃	J ₅₉	J ₅₆	J ₂₀	J ₂₂	J ₂₇	
5	J ₃₄	J ₂₇	J ₂₉	J ₃₄	J ₂₂	J ₂₁	47	J ₃₅	J ₅₃	J ₄₄	J ₄₆	G	50	57	J ₆₅	J ₇₈	J ₇₁	34	19	51	J ₇₄	J ₃₄	J ₄₀	J ₈₀	
6	J ₆₂	J ₃₁	J ₇₄	J ₃₉	J ₃₇	J ₃₁	28	39	J ₄₇	J ₈₄	J ₅₃	J ₉₆	J ₅₂	49	J ₁₀₁	J ₁₁₄	J ₆₇	J ₅₀	23	20	J ₂₂	E ₁₅	J ₂₆	J ₂₃	
7	22	J ₅₃	E ₁₁	E ₁₁	J ₃₆	J ₂₆	J ₃₀	36	46	44	49	J ₇₇	89	J ₆₀	J ₆₃	47	48	44	41	J ₃₇	J ₃₉	J ₄₉	J ₅₁	J ₃₇	
8	J ₅₁	J ₆₂	J ₈₃	J ₄₆	J ₅₃	J ₃₉	J ₄₉	J ₈₄	J ₆₃	J ₁₀₂	J ₁₀₆	J ₁₄₄	J ₁₂₆	J ₆₇	43	J ₆₆	J ₇₃	J ₅₉	J ₅₇	J ₅₁	J ₄₃	J ₂₉	J ₃₆	J ₆₂	
9	J ₈₅	20	J ₆₄	J ₃₉	J ₂₈	J ₂₉	J ₂₉	33	39	45	42	46	51	J ₇₆	J ₅₄	J ₆₆	J ₅₈	J ₁₀₀	J ₄₃	J ₄₉	J ₆₂	J ₃₆	J ₃₃	J ₂₄	
10	23	22	E ₁₅	E	E ₁₁	E ₁₁	J ₂₆	J ₃₉	J ₄₂	45	J ₅₁	51	J ₅₂	J ₅₇	45	42	39	J ₃₆	J ₃₅	J ₄₂	J ₇₄	J ₅₂	J ₄₃	J ₂₂	
11	70	J ₆₄	J ₃₅	J ₄₈	J ₄₅	J ₄₄	J ₃₄	J ₃₀	J ₅₀	J ₆₀	J ₇₂	J ₅₀	J ₆₅	J ₈₆	J ₆₄	40	J ₆₉	G	33	21	J ₁₇	J ₁₇	J ₂₀	J ₃₄	
12	J ₃₂	J ₄₈	J ₂₉	J ₂₂	J ₂₆	J ₃₄	J ₄₅	J ₅₀	40	53	48	J ₉₆	J ₇₈	J ₈₁	J ₄₉	60	J ₈₉	J ₅₁	J ₄₁	J ₄₇	J ₅₄	22	18	25	
13	E ₁₅	E ₁₃	E ₁₂	E ₁₁	E ₁₅	J ₃₁	J ₃₉	J ₃₄	J ₄₇	J ₄₃	41	J ₄₀	J ₈₄	J ₅₁	M ₅₅	50	J ₈₄	J ₈₈	J ₁₃₄	J ₂₉	J ₃₇	J ₂₉	J ₂₇	J ₁₉	
14	J ₂₈	E ₁₁	E ₁₂	E ₁₇	E ₁₃	E ₁₁	25	37	J ₄₈	J ₁₀₉	J ₉₉	J ₈₇	J ₇₇	J ₅₉	J ₆₁	42	J ₇₈	J ₆₂	J ₄₁	J ₄₁	J ₂₄	J ₂₀	22	J ₆₂	
15	J ₃₈	J ₅₂	J ₅₀	J ₃₉	J ₄₈	J ₃₃	J ₂₆	J ₃₇	J ₅₄	J ₉₅	J ₅₇	J ₁₆₂	J ₁₁₉	J ₁₆₂	J ₈₇	J ₁₃₆	J ₅₀	J ₃₇	26	J ₂₆	J ₄₄	J ₇₃	J ₆₁	J ₂₄	
16	J ₃₆	J ₃₃	J ₄₆	J ₁₆	J ₄₁	J ₂₁	J ₂₄	36	35	43	43	46	J ₆₁	J ₁₀₅	J ₆₅	J ₉₈	J ₁₇₆	J ₆₆	J ₈₄	J ₁₀₂	J ₇₃	J ₃₀	J ₂₂	22	
17	J ₂₆	J ₃₂	J ₃₃	J ₂₇	J ₂₄	J ₂₃	J ₂₈	31	35	36	44	46	47	J ₅₆	J ₉₄	J ₆₉	J ₇₀	J ₅₄	27	J ₂₅	22	J ₂₂	J ₃₀	E ₁₄	
18	J ₄₄	E ₁₄	J ₃₅	J ₃₈	J ₂₉	J ₃₀	J ₂₉	24	J ₃₂	40	J ₄₆	J ₇₃	J ₆₈	J ₈₀	J ₁₅₄	J ₁₀₉	J ₁₀₃	76	J ₃₂	J ₆₅	45	J ₃₈	18	18	
19	E ₁₄	19	E ₁₂	E	E	E ₁₁	27	J ₄₄	35	37	J ₁₁₅	J ₉₂	J ₁₄₉	182	39	J ₄₇	38	J ₉₈	J ₇₆	J ₇₆	J ₅₈	J ₃₀	23	J ₂₄	
20	J ₂₄	J ₆₈	J ₂₉	J ₃₄	J ₁₈	J ₂₉	J ₃₄	29	34	J ₃₈	J ₄₄	J ₆₂	J ₄₃	41	J ₅₇	J ₆₂	J ₁₂₁	J ₁₂₉	J ₄₇	J ₃₄	J ₇₉	J ₂₃	E ₁₅	J ₈₃	
21	J ₂₀	J ₂₈	23	15	E ₁₃	E ₁₁	G	36	37	J ₄₈	J ₄₉	J ₉₈	J ₈₆	J ₁₀₉	J ₈₇	J ₆₂	J ₅₂	J ₆₁	27	19	20	J ₃₀	J ₃₆	J ₃₆	
22	J ₃₆	J ₃₂	J ₃₂	J ₁₉	J ₃₅	20	22	31	J ₄₄	40	41	40	39	39	39	J ₇₄	J ₅₄	J ₃₂	27	J ₆₄	J ₆₄	J ₂₈	J ₃₃	J ₂₈	
23	J ₂₆	J ₂₆	24	J ₂₁	E ₁₄	E ₁₂	G	31	41	46	J ₆₄	G	J ₆₃	45	J ₇₈	J ₆₇	38	J ₆₅	J ₉₆	J ₆₁	J ₆₀	E ₁₅	E ₁₅	E ₁₅	
24	J ₃₉	J ₂₄	J ₂₀	J ₂₅	J ₂₄	24	J ₂₇	G	G	J ₃₃	42	G	G	G	G	38	40	J ₄₅	J ₆₇	J ₅₁	J ₆₂	J ₆₅	J ₆₄	J ₅₀	
25	J ₂₀	J ₅₄	20	22	E ₁₂	E ₁₁	G	29	34	37	43	40	44	J ₅₃	49	J ₅₉	J ₇₆	J ₁₂₂	J ₆₄	J ₅₀	J ₂₉	J ₃₀	J ₂₂	J ₅₄	
26	J ₄₁	J ₄₁	J ₂₂	J ₃₃	J ₃₇	J ₃₇	J ₃₄	50	J ₅₄	J ₄₂	J ₃₆	J ₃₆	J ₃₄	J ₃₆	45	J ₃₃	J ₂₉	34	28	G	22	C	20	J ₂₅	
27	J ₆₄	J ₃₆	J ₄₀	J ₂₇	22	J ₃₀	J ₅₁	J ₇₀	39	J ₇₀	C	C	C	C	C	C	C	C	110	J ₅₈	J ₅₈	J ₅₀	J ₆₂	J ₃₀	J ₂₃
28	J ₃₀	J ₂₆	J ₂₅	J ₂₁	E	J ₂₁	J ₄₄	J ₃₇	33	37	J ₄₀	J ₃₄	J ₃₉	42	42	26	37	33	27	17	E ₁₅	E ₁₅	18	J ₃₁	
29	J ₆₄	J ₂₉	J ₂₄	J ₁₆	E	J ₁₆	J ₂₄	J ₃₄	J ₇₀	J ₈₄	J ₄₄	J ₅₀	J ₄₀	44	J ₅₄	J ₇₀	J ₆₅	78	J ₇₇	J ₁₃₄	J ₆₁	J ₆₂	J ₆₁	J ₂₆	
30	J ₂₄	19	23	23	E ₁₆	J ₂₄	J ₂₉	J ₃₃	J ₄₀	36	62	J ₈₆	J ₁₂₄	J ₆₂	J ₇₃	J ₃₉	36	36	33	J ₃₀	J ₂₄	J ₂₇	J ₃₂	J ₂₉	
31	J ₂₈	24	J ₂₅	J ₃₀	J ₂₄	J ₂₁	25	33	35	36	43	46	45	43	J ₆₃	45	54	J ₉₀	J ₉₈	J ₅₁	J ₈₆	25	J ₃₆	J ₄₄	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	30	30	30	30	30	31	31	31	31	30	31	31
MED	J ₃₄	J ₃₁	J ₂₉	J ₂₇	J ₂₄	J ₂₄	J ₂₉	36	J ₄₁	J ₄₄	J ₄₇	J ₅₀	J ₆₂	J ₅₇	J ₆₀	J ₆₀	J ₅₄	J ₅₁	J ₄₁	J ₄₂	J ₄₄	J ₂₉	J ₂₇	J ₂₆	
UQ	J ₄₇	J ₄₉	J ₃₈	J ₃₈	J ₃₆	J ₃₀	J ₃₅	38	J ₄₈	J ₅₈	J ₅₉	J ₈₇	J ₈₆	J ₈₀	J ₇₄	J ₆₉	J ₇₃	J ₇₇	J ₆₁	J ₅₄	J ₆₂	J ₃₅	J ₃₆	J ₃₆	
LQ	J ₂₅	24	22	J ₁₈	E ₁₄	20	25	32	35	38	43	40	45	45	49	42	40	36	28	J ₂₆	J ₂₃	J ₂₂	21	J ₂₄	

The Radio Research Laboratories, Japan

JUL. 1969

FOES (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1969

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	26	16	24	19	15	22	G	30	47	52	40	50	50	44	49	44	37	28	18	24	19	E	E	S	22				
2	18	19	17	E	14	13	38	G	40	49	41	42	50	44	51	41	G	35	30	23	15	19	20	17					
3	E	15	23	20	13	18	24	43	33	G	49	A	68	69	92	53	40	G	29	G	E	17	19	E					
4	35	21	E	34	20	18	26	35	45	42	46	46	52	49	49	51	38	37	43	58	46	18	17	E					
5	33	20	E	15	13	13	39	33	49	41	46	G	47	57	64	75	70	G	17	G	49	29	16	E	35				
6	54	15	24	15	20	17	21	37	46	76	52	A	52	E	R	42	60	57	33	G	21	13	E	E	S	18	19		
7	E	E	E	B	E	B	E	B	19	16	17	35	45	41	46	62	62	48	62	44	44	40	41	37	38	33	29	27	
8	51	15	53	35	45	22	43	38	42	43	A	83	A	49	G	61	44	53	55	48	29	26	24	26					
9	24	E	16	19	19	19	19	G	37	41	41	45	50	76	49	56	44	100	39	49	51	30	28	19					
10	E	E	E	S	E	E	B	E	B	E	B	22	31	37	39	45	47	51	46	43	40	G	33	31	36	70	25	43	E
11	21	29	16	17	17	25	18	27	42	44	65	44	48	46	57	G	47	G	31	G	E	E	E	E					
12	23	25	19	E	16	25	31	32	36	46	44	45	53	75	41	48	42	35	30	37	33	E	E	E					
13	E	S	E	S	E	B	E	B	E	B	E	B	45	47	42	44	41	35	49	20	16	25	23	E					
14	21	E	B	E	B	E	B	E	B	E	B	G	35	41	57	A	A	74	49	53	42	62	47	32	38	16	E	E	16
15	33	31	44	30	30	26	22	24	27	40	46	A	52	55	A	44	33	31	G	25	22	28	30	20	16				
16	E	S	18	45	15	28	16	G	G	G	G	41	49	53	50	96	82	48	41	65	65	27	20	E					
17	16	24	27	17	19	16	18	G	G	G	40	45	45	46	52	40	41	47	19	18	E	E	E	E	S	14			
18	E	E	S	16	23	21	17	22	G	29	39	40	64	74	A	87	91	64	25	32	37	26	E	E					
19	E	S	E	E	B	E	E	B	E	B	G	29	G	G	50	47	65	A	G	42	34	75	51	41	25	23	E	E	
20	16	43	17	16	E	19	24	29	G	38	44	42	41	41	56	58	A	70	46	22	25	20	E	S	15	E			
21	E	E	E	E	E	B	E	B	G	35	36	40	43	44	48	54	65	40	47	57	G	19	E	25	28	28			
22	28	32	22	E	20	12	G	G	41	38	38	G	E	R	E	R	G	64	50	32	25	61	35	18	30	28			
23	27	18	18	E	E	B	E	B	G	29	39	39	39	G	61	42	47	50	38	53	89	61	17	E	S	E	S	E	S
24	19	E	E	E	E	B	E	B	G	G	G	G	G	G	G	G	G	38	35	26	17	50	26	46	41				
25	E	22	14	E	E	B	E	B	G	G	G	G	42	51	48	47	62	100	40	25	29	18	17	27					
26	27	35	14	24	25	20	24	43	27	30	31	34	G	G	G	45	33	G	29	G	G	E	C	E	E				
27	50	25	32	15	E	15	42	A	34	36	C	C	C	C	C	C	C	76	42	43	31	25	26	17					
28	26	25	18	17	E	16	22	20	G	G	34	G	E	R	42	42	G	36	32	27	17	E	S	E	S	E	17		
29	18	E	15	E	11	S	22	31	46	37	40	42	40	43	52	67	57	73	75	53	53	22	20	17					
30	16	E	E	E	E	B	15	20	28	33	36	47	61	53	47	32	36	32	32	25	18	18	32	24					
31	22	18	18	22	16	16	25	31	33	G	42	44	44	E	B	46	44	42	64	81	38	A	17	19	32				
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	31	31	31	31	31	30	31	31	31	31	30	30	30	30	30	30	31	31	31	31	31	30	31	31					
MED	21	18	16	15	14	16	22	29	36	39	44	44	50	48	49	44	42	37	31	32	28	18	19	17					
UQ	27	24	22	20	20	19	24	35	42	42	47	53	61	54	56	58	57	60	42	46	38	25	25	25					
LQ	16	E	E	E	E	E	E	E	12	E	G	17	20	27	30	40	40	44	43	42	40	37	32	25	20	16	15	E	E

JUL. 1969

FBES (0.1 MHz)

IONOSPHERIC DATA

JUL. 1969

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

The Radio Research Laboratories, Japan

JUL. 1969

F-MIN (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1969

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

Table with 24 columns (00-23) and 32 rows (1-31, CNT, MED, UQ, LQ). Each cell contains numerical data representing ionospheric parameters, often with superscripts (e.g., 275^S).

JUL. 1969

M(3000)F2 (0.01)

IONOSPHERIC DATA

JUL. 1969

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	A	A	U L 365	335	A	355	A	H 345	335	350	315	L				
2							L	L	385	L	L 375	375	325	340	A	345	L	325	L	L				
3								A	L	340	325	A	A	A	A	A	340	340	L					
4							L	L	350	L	355	370	A	A	L	A	345	340	L	A				
5								L	A	L	375	H 365	340	A	A	A	A	320	L	A				
6							L	L	A	A	A	365	A	355	A	A	A	320	L					
7							L	L	375	H 380	355	A	A	360	A	H 305	330	320	L					
8							L	L	U L 335	A	A	A	330	370	I A 330	350	A	A						
9							L	L	350	L	355	350	345	A	A	A	310	A	L					
10							L	L	385	L	355	330	315	H 375	H 350	H 350	H 335	H 325	L					
11							L	A	L	A	L	335	375	I A 370	H 365	330	335	L	L					
12							L	L	L	U L 305	325	A	A	345	A	L	L	L	A					
13							L	L	L	L	L	H 340	385	355	360	L	355	340	A					
14							L	L	A	A	A	A	A	A	A	360	A	A	L					
15							L	330	405	365	320	A	A	A	A	380	H 360	340	325	L				
16							L	L	345	L	L	380	340	A	A	A	A	A	L					
17							L	L	360	H 380	390	L	375	345	I A 370	345	330	I A 335	L	370				
18							L	L	H 355	385	365	A	A	A	A	A	A	A	L					
19							L	L	L	345	A	A	A	A	390	350	H 335	I A 345	A					
20							L	L	355	350	365	L	400	H 375	A	A	A	A	A	L				
21							L	L	L	425	375	360	330	A	A	375	A	A	L	L				
22							L	L	345	345	H 335	325	H 335	H 325	H 375	A	A	325	L	A				
23							L	L	365	345	H 345	400	I A 395	405	H 330	A	345	A	A	A				
24							L	L	375	L	L	360	385	380	360	355	L	345	L	L				
25							L	L	L	L	L	360	L	A	A	A	A	A	A	A				
26							L	A	370	L	360	H 380	H 365	375	335	365	330	340	L	L				
27							A	L	L	355	C	C	C	C	C	C	C	A	A	A				
28							L	L	U L 360	360	395	345	H 370	H 320	315	L 345	L 335	L						
29							L	A	375	380	365	400	H 390	A	A	A	A	A	A					
30							L	U L 375	395	L	A	A	A	H 375	400	350	345	U L 340						
31							L	L	345	360	365	385	375	355	365	L	L	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	14	17	21	18	17	16	15	15	16	18	3	1				
MED							338	368	360	360	360	365	365	360	350	338	338	325	370					
UQ							375	380	375	375	385	375	370	365	348	340	332							
LQ							355	345	355	340	335	350	348	345	330	325	320							

JUL. 1969

M(3000)F1 (0.01)

IONOSPHERIC DATA

JUL. 1969

H¹F² (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								275	255	290	330	495	410	390	335	310	340	310	340	300						
2							325	285	295	335	295	355	350	345	355	310	370	345	300	280						
3								250	275	330	365	A	E ₄₁₀ ^A	405	I ₄₀₀ ^A	355	345	325	300							
4							275	245	305	280	400	395	360	340	345	345	345	330	305	300						
5							280	255	310	355	450	420	405	400	350	350	350	345	295	300						
6							250	280	A	310	A	445	400	390	355	350	330	300								
7							240	285	305	350	E ₃₈₀ ^A	400	390	390	360	355	340	300								
8							250	255	385	I ₃₈₅ ^A	A	I ₃₉₅ ^A	390	355	385	355	330	290								
9							275	265	300	400	355	405	400	370	365	355	E ₃₇₅ ^A	285								
10							270	270	255	320	330	360	380	365	375	360	340	315	295							
11							340	260	315	400	350	400	350	335	320	310	300	280	260							
12							235	275	360	445	I ₄₀₀ ^C	350	345	350	345	350	295	295	285							
13							255	245	365	430	355	345	310	330	360	360	370	325	310							
14							265	300	295	A	A	I ₄₁₀ ^A	390	400	400	400	320	290								
15							290	320	270	360	480	I ₄₆₀ ^A	440	425	I ₄₂₅ ^A	420	400	340	300	265						
16							280	300	290	350	340	390	440	385	350	E ₄₅₀ ^A	375	325	290							
17							285	280	265	305	330	345	405	450	350	345	360	310	260	260						
18							255	255	280	300	445	E ₄₀₀ ^A	A	I ₃₅₅ ^A	A	A	300	255								
19							280	255	355	300	300	350	I ₃₈₀ ^A	335	345	A	360	350	300							
20							265	290	295	320	350	370	380	355	340	A	350	280	245							
21							255	255	280	300	300	520	435	395	355	330	300	255	250							
22							250	250	305	335	375	380	355	320	305	310	315	330	305	E ₃₅₅ ^A						
23							290	300	355	455	380	350	330	320	340	330	305	I ₂₈₀ ^A	E ₂₉₀ ^A							
24							250	275	310	375	350	330	370	320	320	330	300	270	250							
25							285	250	255	320	360	325	415	400	355	340	320	E ₃₅₀ ^A	285	245						
26							255	230	305	280	380	350	370	320	350	325	340	290	260	230						
27							A	320	280	C	I ₃₆₀ ^C	C	C	C	C	C	300	305	250							
28							250	260	280	340	310	320	355	310	305	305	300	255								
29							255	255	270	305	430	360	355	320	320	300	E ₃₅₀ ^A	E ₃₅₀ ^A	290							
30							275	265	255	320	350	405	340	335	335	320	310	290								
31							280	250	305	300	325	375	365	315	305	280	330	320	A	265						
CNT							12	29	31	30	29	27	30	29	30	29	28	31	30	18						
MED							280	255	275	308	350	358	386	380	392	345	345	320	291	262						
UQ							288	275	298	335	380	392	410	400	375	358	358	335	300	288						
LQ							262	250	255	280	320	350	355	345	335	320	330	302	280	250						

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H^oF (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	295	270	285	255	250	250	240	225 ^H	A	A	200	220 ^I	240 ^I	250	A	240 ^I	225	225	230	275	240	225	305	340
2	345	300	270	240	240	260	270	235	240	A	200 ^H	200 ^H	A	230	250 ^H	230	225 ^H	225	245	260	245	290	305	300
3	290	300	300	290	265	260	245	230 ^I	210	205	A	A	A	A	A	A	230	225	250	255	250	300	320	305
4	350	250	255	280	265	260	250	225	250 ^E	245	230	220	A	250 ^I	245 ^I	225	225	245	285 ^I	300 ^A	310	300	295	
5	330	275	240	245	250	265	250	210 ^H	230 ^I	210 ^H	205	200 ^H	250	A	A	A	A	200 ^H	240	A	300	335	295	350
6	350	255	280	270	260	255	245	245	A	A	A	A	230 ^I	220 ^I	200 ^H	A	A	230	245	260	250	275	300	310
7	300	305	285	260	270	255	250	230	240	200 ^H	230	A	A	255 ^A	A	230 ^H	260 ^H	255	300 ^H	270	280	305	330	340
8	350	285	305	250	350	280	245	250	240 ^E	220	A	A	A	280 ^H	210	A	255 ^A	A	A	275	275	340	325	300
9	290	275	275	255	250	250	230	225	240	210	200	240 ^E	260 ^E	A	A	A	300 ^A	A	270 ^E	300	330	310	325	310
10	290	275	255	225	240	255	250	210 ^H	230	200 ^H	240	250 ^I	225 ^I	215	210 ^H	220 ^H	225 ^H	225 ^H	250	260	290 ^I	320	345	300 ^E
11	295	290	300	290	275	300	250	220	220 ^I	225	235	195	A	225	205	220 ^H	230 ^I	230	245	245	245	290	295	300
12	300	300	255	275	295	290	230	240	200	250 ^A	205	220 ^I	215	220 ^I	220 ^H	215	250 ^H	230	240	270 ^I	280	290	300	305
13	295	250	230	250	300	300	250	205 ^H	230	245 ^H	240 ^H	200 ^H	210	250	210	250	225	240	250 ^I	270	255	310	300	290
14	300	245	225	250	225	255	255	250	230 ^H	A	A	A	A	A	A	245	A	A	255	260	260	305	290	290
15	310	325	275	290	320	350	250	240	220	215	290 ^E	A	A	A	A	230	205 ^H	225	250	255	270	305	280	295
16	360 ^E	300	315 ^A	245	300 ^A	325	250	240	215	220 ^H	210	205	A	A	A	A	A	A	255 ^E	285	305	270	300	300
17	265	290	275	275	275	300	225	240	205 ^H	200	205	200 ^I	230	250 ^H	205 ^A	220	250	235 ^A	240	230	245	275	295	305
18	300	250	245	250	265	280	230	225 ^H	175 ^H	215	225	A	A	A	A	A	A	A	250	250	290	290	280	270
19	285	275	250	245	245	295	230	225	225	220 ^H	205	205	215	220	195	250	210 ^H	A	A	260	250	260	270	300
20	275	300	265	245	220	265	255	235	220	220	250 ^E	210	200	200 ^H	A	A	A	A	A	250	250	270	280	290
21	275	300	255	245	275	270	250	250	240	205	250 ^E	250 ^E	260 ^E	A	A	205	A	A	230	250	255	280	265	255
22	290	330	290	290	290	270	240	230	270 ^E	210	205 ^H	200	220 ^H	190	205 ^H	225	220 ^H	210	225 ^H	A	295	265	275	290
23	260	265	255	255	245	265	210	255	235	250	220 ^H	200	210 ^I	200	A	A	225	A	A	255 ^I	270	260	270	300
24	290	255	260	250	260	280	220	205 ^H	195	180 ^H	230 ^H	225	200	200	210	225	225	225 ^A	250	250	280	300	320 ^E	330
25	280	315	275	240	205	280	250	250	205	205 ^H	200 ^H	200	210 ^H	A	A	A	A	A	250 ^I	250 ^I	250	255	280	255
26	220	300	270	290	255	255	245	235 ^A	200	230	210 ^H	195	200 ^H	195	215 ^A	230	240 ^H	225	210 ^H	240	210	250 ^C	270	265
27	350 ^A	350	300 ^E	300	260	210	270	245 ^I	230	230	210 ^C	200 ^C	C	C	C	C	C	A	A	A	295	300	270	300
28	295	300	290	265	250	260	260	240	225	225	215	200	215 ^H	220	215 ^H	210 ^H	220 ^H	225 ^H	235	255 ^H	220	255	320	305
29	305	265	240	225	225	255	250	245	A	205	215	200	200 ^H	230	A	A	A	A	A	A	290 ^A	255	340	255
30	300	290	270	255	250	290	250	230	230	205	280 ^I	200 ^I	200	A	A	200	200 ^H	240	250	255	225	260	320	300
31	300	300	275	260	290	305	255	235	220	215	215	200	200	250 ^E	240 ^E	A	250 ^H	A	A	A	A	285	275	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	31	31	31	31	31	31	31	31	28	27	27	24	20	20	15	18	21	18	24	26	30	31	31	31
MED	295	290	270	255	260	265	250	235	224	215	212	200	212	221	210	225	225	225	246	258	260	290	298	300
UQ	304	300	282	275	275	290	250	242	234	224	227	212	226	240	216	230	238	230	250	270	285	305	320	305
LQ	290	268	255	245	248	255	240	225	212	205	205	200	200	208	205	220	225	225	240	250	250	262	280	290

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H^oF (KM)

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H¹ES (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	105	105	105	105	105	105	140	110	105	105	105	105	105	105	100	145	100	105	100	100	100	100	100	S	105	
2	105	105	105	105	105	105	130	130	110	105	100	105	105	100	100	150	140	130	125	115	105	105	100	100	100	
3	100	100	100	100	100	100	100	100	100	125	110	105	100	100	100	100	100	100	140	120	100	100	105	100	100	
4	105	105	105	100	100	100	100	125	120	125	115	100	100	100	140	135	140	130	95	110	110	95	95	100	100	
5	100	100	100	100	100	100	100	100	100	100	100	G	150	130	120	120	115	150	100	115	110	105	105	105	105	
6	105	105	100	100	100	100	105	140	105	105	100	100	100	110	105	100	100	100	100	100	100	S	100	95	100	
7	95	105	B	B	105	100	105	140	130	130	125	120	115	120	125	130	125	125	115	105	105	100	100	100	100	
8	105	105	105	100	100	100	130	120	130	115	110	110	105	125	150	125	120	115	110	105	105	105	105	105	105	
9	105	100	100	105	105	100	105	140	130	120	130	130	125	115	115	115	115	105	105	105	105	105	100	95	95	
10	100	95	S	E	B	B	125	110	110	115	110	105	105	110	125	125	150	105	105	115	100	100	100	100	100	
11	105	105	105	110	105	105	105	105	105	105	120	110	105	115	115	140	120	G	140	125	100	100	100	105	105	
12	95	105	95	95	95	105	100	100	145	125	125	115	110	105	105	100	100	105	100	95	95	95	100	100	100	
13	S	S	B	B	B	105	100	100	100	100	110	100	100	100	100	120	105	105	100	100	100	95	95	95	95	
14	100	B	B	B	B	B	150	130	130	120	115	115	110	115	115	135	120	120	110	105	105	105	110	105	105	
15	100	100	100	100	100	100	100	100	100	115	120	115	110	105	105	105	105	105	105	105	105	105	105	105	100	100
16	100	105	100	100	100	95	100	135	135	125	125	120	120	105	110	105	105	105	105	100	100	100	100	100	100	100
17	105	100	100	100	100	100	100	165	155	140	120	110	110	100	105	105	105	105	100	100	100	105	100	100	S	100
18	100	S	100	100	100	100	100	100	100	100	100	110	110	105	105	105	100	100	100	105	100	95	100	115	100	
19	S	105	B	E	E	B	145	125	145	135	110	115	105	105	120	110	110	100	100	100	100	100	100	100	120	
20	100	100	100	100	100	100	100	155	150	100	100	100	100	100	140	120	110	105	105	120	105	110	110	S	110	
21	100	100	100	100	B	B	G	145	150	130	120	115	115	115	115	120	115	110	110	110	105	105	100	100	100	
22	100	105	105	105	105	105	155	140	120	120	120	125	125	130	140	120	120	115	105	105	105	105	100	100	100	
23	100	105	100	100	B	B	G	165	140	130	130	G	120	125	120	110	120	110	110	105	105	S	S	S	S	
24	105	115	110	105	105	110	105	G	G	100	165	G	G	G	G	140	125	105	105	100	100	100	100	100	100	
25	100	95	95	100	B	B	G	155	140	145	130	150	130	100	125	125	110	105	105	100	100	100	100	100	100	
26	100	95	95	100	100	100	100	100	100	100	100	100	100	100	160	100	100	125	110	G	100	C	100	100		
27	100	100	100	95	125	125	105	105	140	125	C	C	C	C	C	C	C	110	110	105	110	100	95	120	100	
28	115	95	95	100	E	100	100	100	155	145	105	105	105	140	125	100	130	130	125	160	S	S	110	105	105	
29	105	100	100	100	E	130	120	115	105	105	105	105	105	105	155	130	125	125	120	115	110	105	105	105	105	
30	100	100	95	100	B	105	105	110	105	105	105	105	105	100	100	100	100	130	120	115	110	105	110	105	105	
31	105	100	100	100	100	105	140	140	150	150	130	140	130	130	115	125	130	115	105	105	110	105	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	29	28	26	26	21	25	28	30	30	31	30	27	29	29	29	30	30	30	31	30	30	27	28	29		
MED	100	100	100	100	100	100	105	122	125	120	112	110	105	110	115	120	115	108	105	105	105	100	100	100	100	
UQ	105	105	105	100	105	105	128	140	140	128	125	115	115	125	125	125	125	120	112	110	105	105	105	105	105	
LQ	100	100	100	100	100	100	100	100	105	105	105	105	105	100	105	105	105	105	100	100	100	100	100	100	100	

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H¹ES (KM)

IONOSPHERIC DATA

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TYPES OF ES

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

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

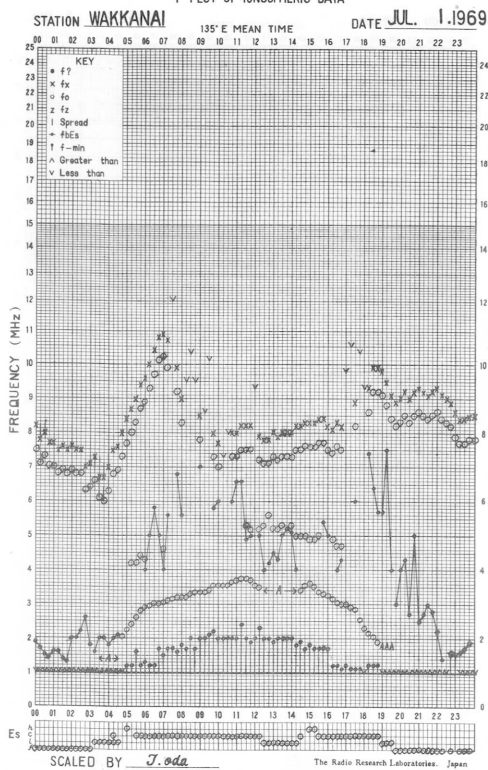
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	FF 41	FF 21	FF 22	FF 21	F 3	L 8	HL 11	C 3	C 3	C 3	C 3	C 2	C 2	L 2	HL 12	L 2	L 2	L 2	L 2	F 3	F 1		FF 32		
2	FF 21	FF 31	F 3	F 2	F 3	L 1	H 6	H 5	C 2	L 3	L 2	L 1	L 2	L 1	L 3	HL 11	H 1	H 1	H 1	C 3	F 1	F 5	F 2	F 3	
3	F 2	F 2	F 2	F 3	F 2	L 3	L 4	L 4	HL 21	H 1	C 2	C 4	C 3	L 4	L 5	L 4	L 2	L 1	HL 21	C 2	F 3	F 4	FF 22	F 1	
4	F 5	F 3	F 2	F 4	F 5	L 3	L 5	HL 33	C 32	HL 21	C 11	L 2	L 2	L 2	HL 13	HL 22	HL 22	HL 23	L 5	C 23	FF 26	F 4	F 2	FF 21	
5	F 7	F 3	F 2	F 2	F 1	L 1	L 7	L 4	L 4	HL 21	L 2		H 1	H 1	H 2	C 2	C 41	HL 11	L 1	C 11	FF 52	F 2	F 2	F 4	
6	F 4	F 3	F 4	F 2	F 3	L 2	L 2	HL 22	C 2	L 2	L 1	L 2	L 1	L 1	L 2	L 3	L 4	L 3	L 2	L 1	F 2		F 4	F 5	
7	F 2	F 2			F 4	L 5	HL 43	HL 34	HL 12	HL 21	HL 11	C 2	C 2	C 2	H 3	HL 11	H 1	H 2	C 2	L 2	F 7	F 3	F 3	F 3	
8	F 3	F 3	F 5	F 6	F 1	L 3	H 4	C 2	H 2	C 2	C 2	C 4	C 2	H 1	H 1	H 2	C 2	C 3	C 3	L 3	F 6	F 4	FF 25	FF 23	
9	FF 23	F 2	F 3	F 3	F 2	L 3	L 4	HL 22	H 2	C 1	H 1	H 1	H 1	C 2	C 1	C 1	C 2	C 3	C 3	L 4	F 6	F 3	F 3	F 2	
10	F 1	F 1						C 1	C 2	C 2	C 2	C 1	C 2	C 1	H 1	H 1	H 1	L 2	L 3	C 33	F 6	F 3	F 3	F 3	
11	FF 13	FF 33	FF 22	FF 21	F 6	L 5	HL 21	L 2	L 3	L 2	C 14	C 1	C 2	C 1	C 3	HL 11	HL 21		HL 21	C 2	F 2	F 1	F 2	FF 22	
12	F 6	FF 22	F 5	F 2	F 2	L 5	L 4	L 2	H 1	H 2	H 1	C 2	C 2	C 2	C 1	L 3	L 2	C 2	L 3	C 2	F 5	F 2	F 1	F 1	
13						L 3	L 3	L 5	L 4	L 2	C 11	L 2	L 2	L 2	HL 11	HL 11	C 2	C 2	L 3	HL 21	F 2	F 2	F 2	F 1	
14	F 3						H 3	H 3	H 1	C 2	C 4	C 3	C 2	C 2	C 5	H 1	C 5	C 5	C 5	L 5	F 3	F 1	F 1	F 2	
15	F 3	F 3	F 4	F 3	F 3	L 3	L 3	HL 31	HL 21	HL 22	HL 22	HL 21	C 2	C 2	C 4	C 2	L 2	L 2	L 2	L 2	F 5	F 4	F 3	F 2	
16	F 2	F 2	F 4	F 1	F 3	L 2	HL 11	H 2	H 2	HL 11	C 1	C 1	C 2	C 2	C 2	C 3	L 4	L 3	L 3	L 4	F 6	F 6	F 3	F 1	
17	F 2	F 3	F 4	F 3	F 2	L 2	L 2	HL 11	HL 11	H 1	H 1	C 1	C 1	L 1	C 2	C 2	C 1	C 2	L 1	HL 11	F 1	FF 11	F 2		
18	F 3		F 6	F 4	F 4	L 3	L 3	L 2	L 3	HL 21	L 2	C 3	C 3	C 3	L 4	L 6	L 7	L 4	C 43	F 5	F 3	F 1	F 1		
19		F 1					H 2	H 2	H 1	H 1	C 2	C 1	C 3	C 2	C 1	C 1	L 4	L 2	L 4	L 4	F 4	F 3	F 2	FF 11	
20	F 2	F 5	F 3	F 3	F 1	L 6	L 4	HL 23	HL 22	L 3	L 2	L 2	L 2	HL 11	H 2	C 2	C 4	L 3	HL 22	HL 42	FF 26	FF 31		F 3	
21	F 2	F 2	F 2	F 1			H 4	H 2	H 1	C 1	C 2	C 2	C 3	C 2	C 2	C 2	C 2	C 2	C 2	L 2	F 1	F 6	F 3	F 2	
22	FF 32	FF 32	FF 21	F 1	F 4	L 1	H 1	H 2	C 2	C 11	C 1	C 11	C 11	HL 11	HL 11	C 2	C 1	C 3	L 2	L 3	F 5	F 2	F 4	F 6	
23	F 2	F 3	F 2	F 1				HL 11	H 3	H 2	H 1		H 2	H 1	C 2	C 2	C 2	C 3	C 4	L 4	F 2				
24	F 3	F 2	F 1	F 4	F 2	L 1	HL 11		H 2	H 1					H 1	H 2	L 5	L 2	L 2	L 2	F 4	F 5	F 4	F 5	
25	F 2	F 2	F 2	F 1			H 2	H 2	H 2	H 1	HL 11	H 2	L 2	L 2	H 1	H 2	C 4	C 3	C 3	L 3	F 2	F 4	F 3	F 5	
26	F 4	F 4	F 2	F 3	F 5	L 3	L 4	L 5	L 2	L 2	L 1	L 1	L 1	L 1	HL 11	L 1	L 1	HL 2	C 1	F 1		F 1	F 1		
27	F 4	F 4	F 4	F 4	F 1	C 3	L 3	L 3	HL 22	H 1							C 6	C 6	C 5		F 4	F 4	F 5	F 5	
28	FF 24	F 3	F 2	F 2		L 2	L 3	HL 22	HL 12	HL 11	HL 11	L 1	L 2	HL 11	HL 11	L 1	HL 11	HL 11	C 12	H 1			F 1	F 2	
29	F 2	F 2	F 3	F 1		H 1	C 3	C 4	C 3	L 1	L 2	L 1	L 1	HL 11	HL 22	H 2	H 4	C 43	C 5	L 2	F 3	F 4	F 3	F 2	
30	F 1	F 1	F 2	F 1		L 2	L 3	C 33	C 3	C 2	C 3	L 3	L 3	L 3	L 2	HL 11	HL 11	HL 21	C 31	C 31	FF 21	FF 11	F 4	F 4	
31	F 4	F 1	F 2	F 4	F 2	L 1	H 3	H 3	H 1	H 1	H 1	H 1	H 1	H 1	C 2	HL 21	HL 22	C 5	C 5	L 7	F 4	F 2	F 3	F 6	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
UQ																									
LQ																									

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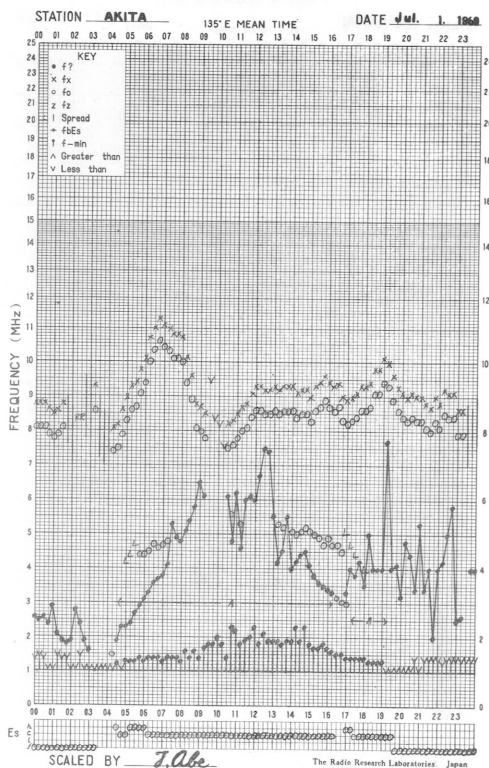
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TYPES OF ES

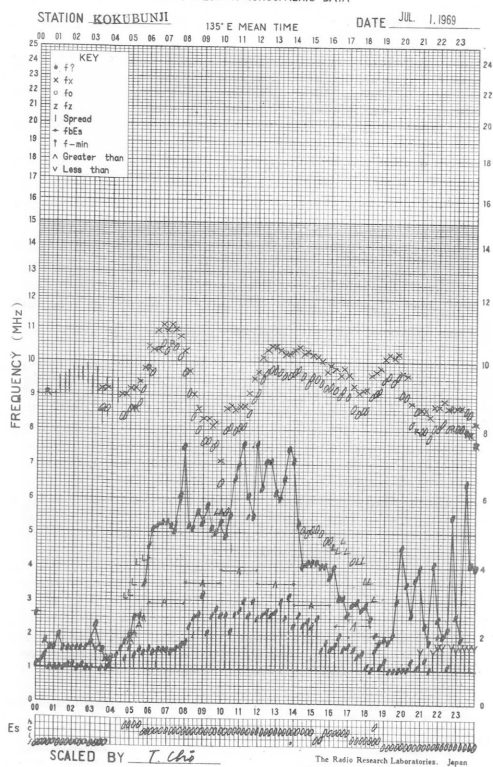
f-PLOT OF IONOSPHERIC DATA



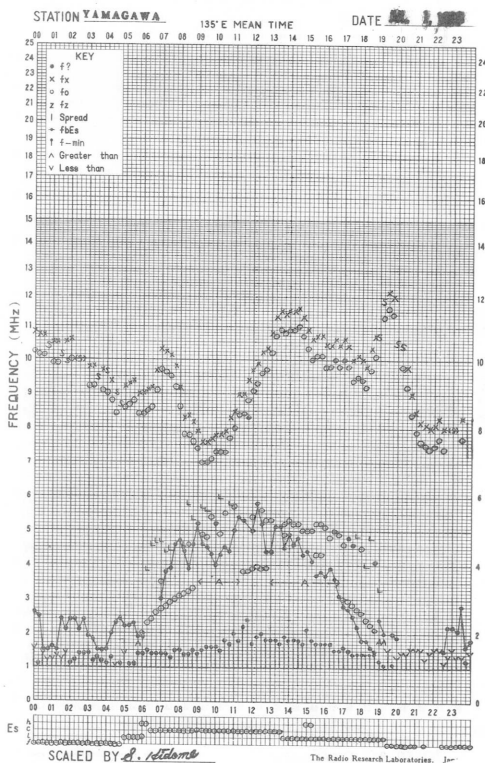
f-PLOT OF IONOSPHERIC DATA



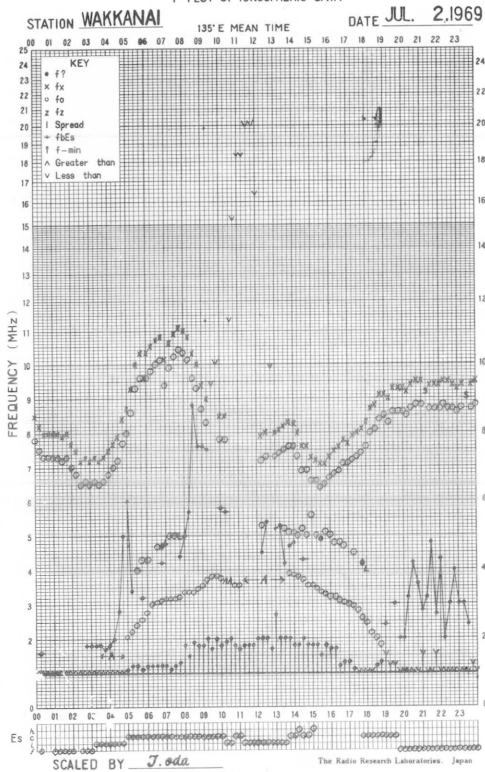
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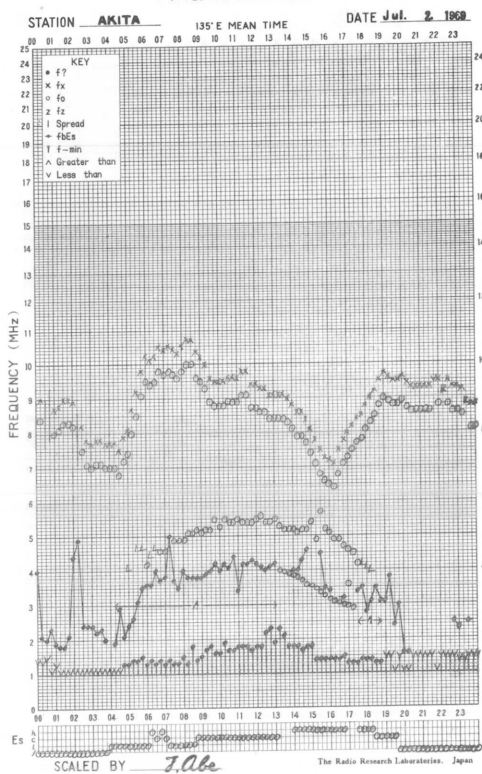
f-PLOT OF IONOSPHERIC DATA



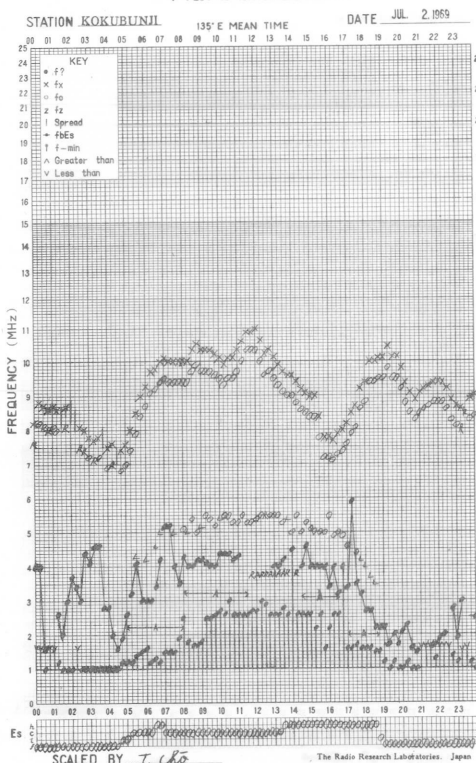
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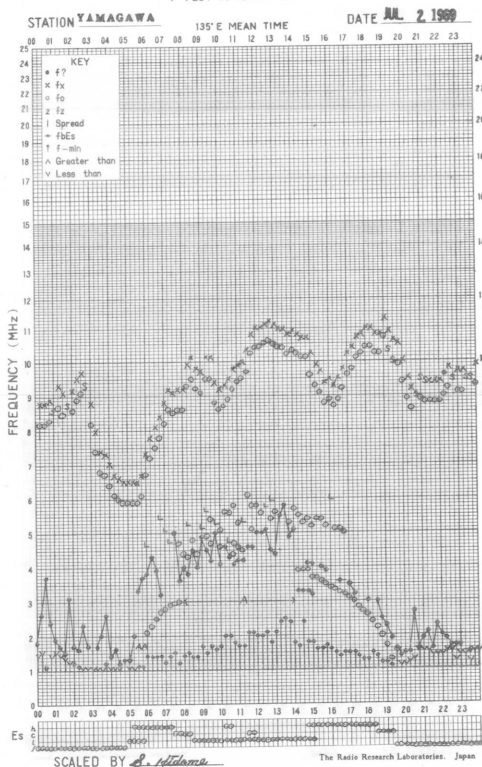
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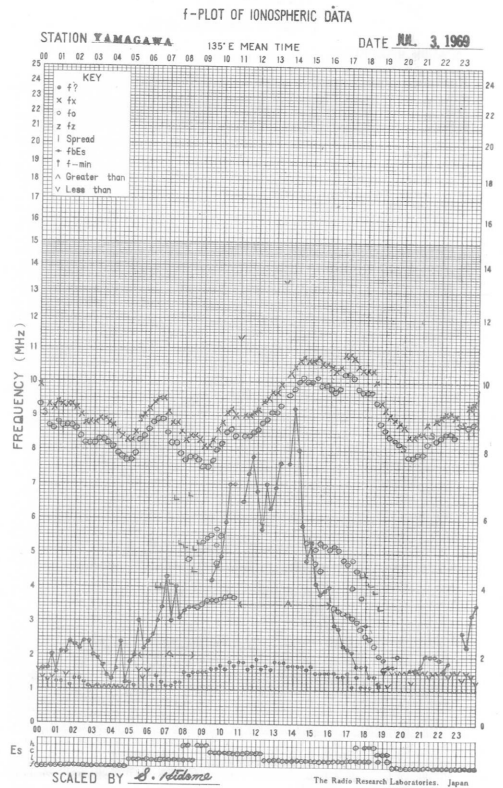
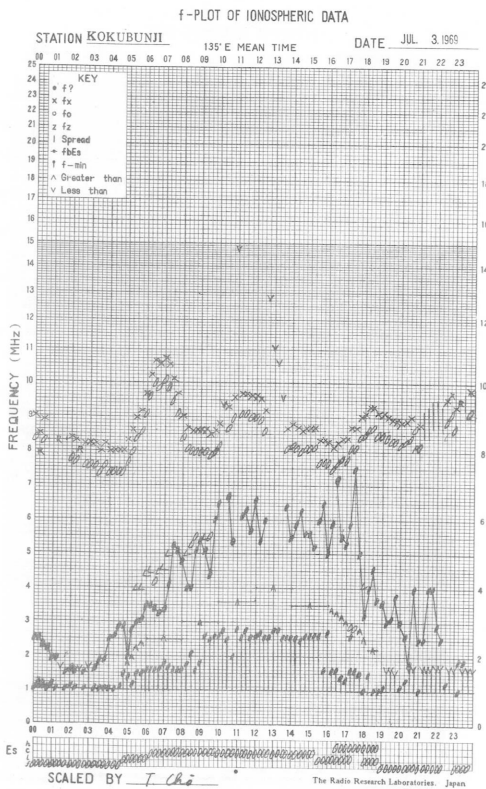
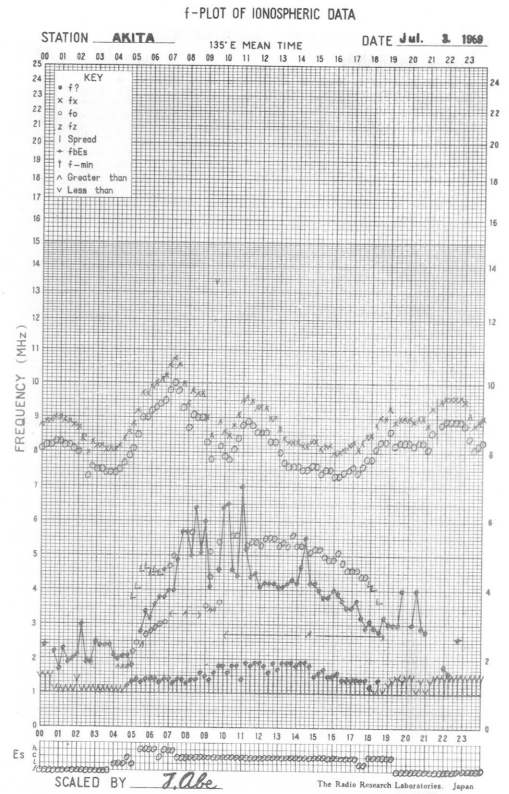
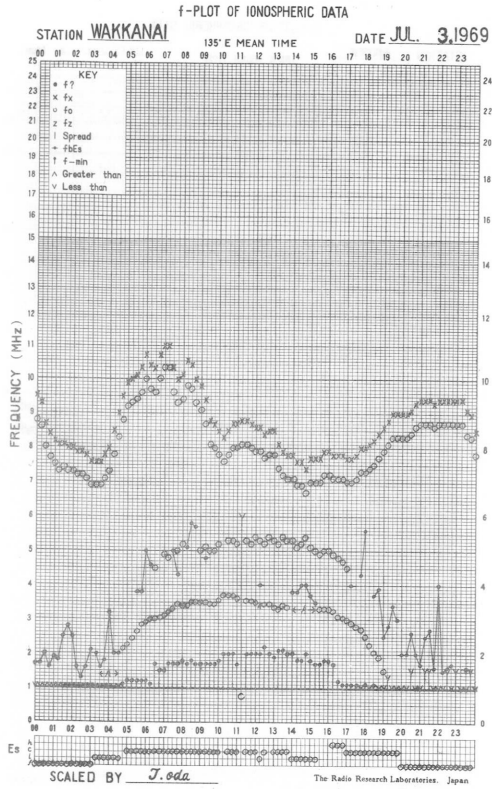


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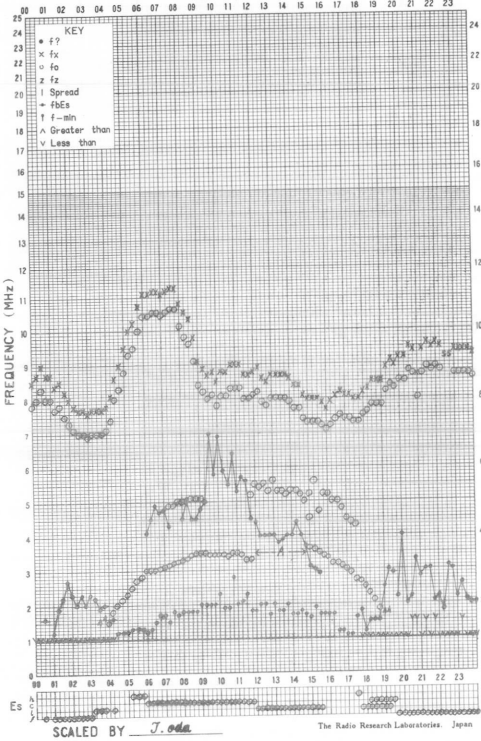
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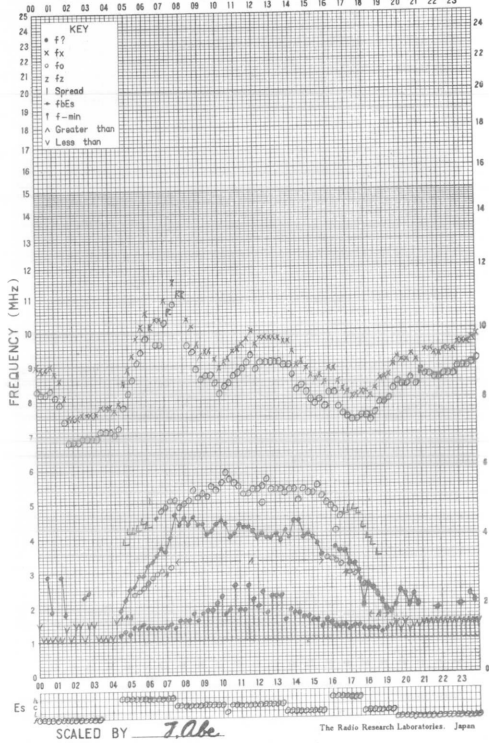
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STATION **WAKKANAI** 135° E MEAN TIME DATE **JUL 4 1969**



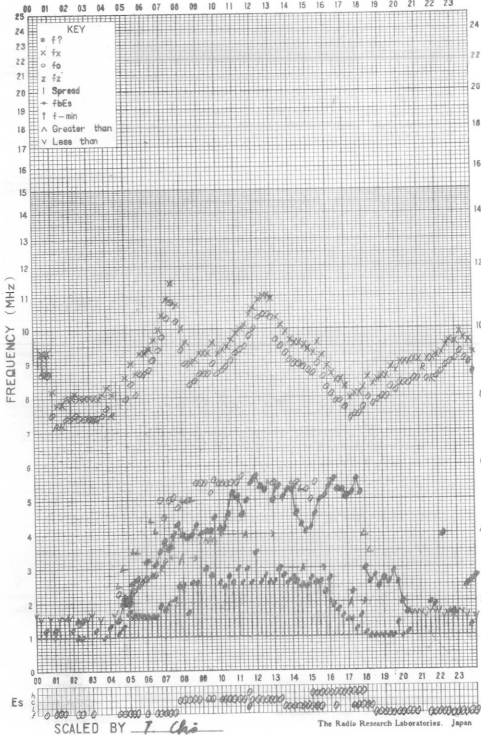
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STATION **AKITA** 135° E MEAN TIME DATE **JUL 4 1969**



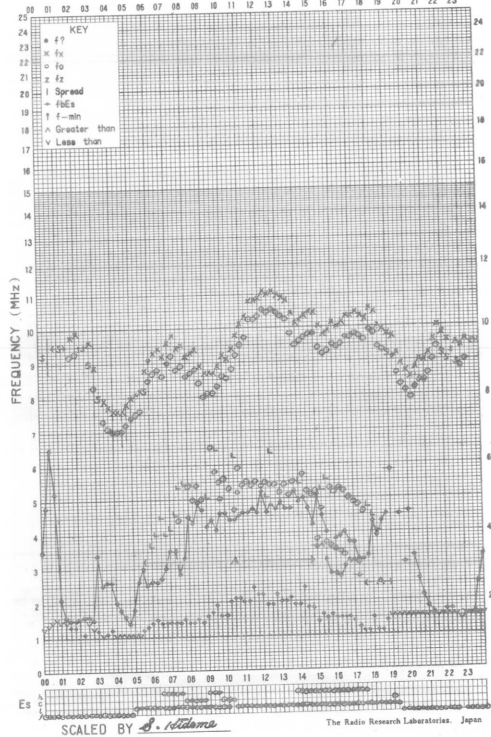
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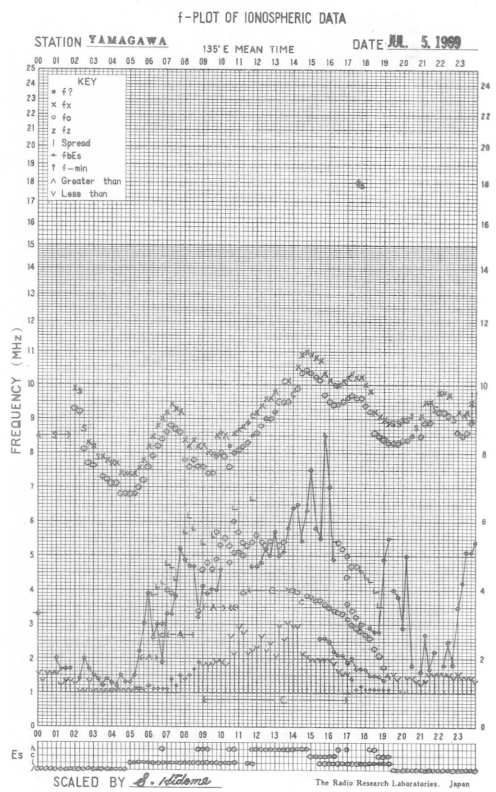
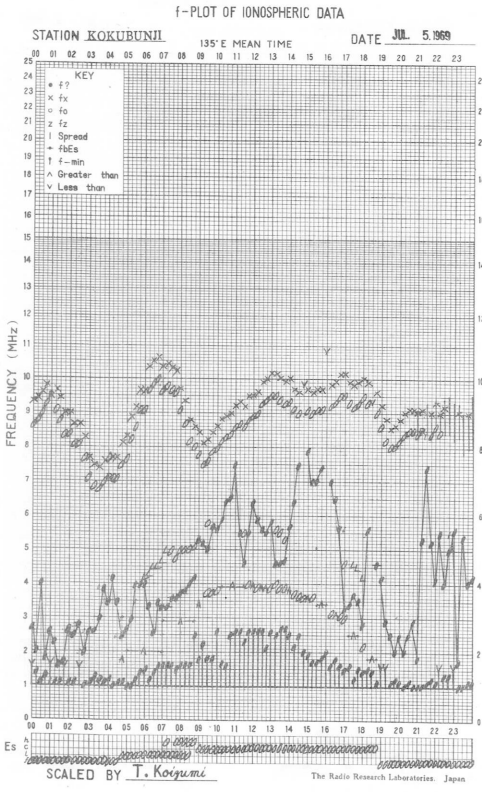
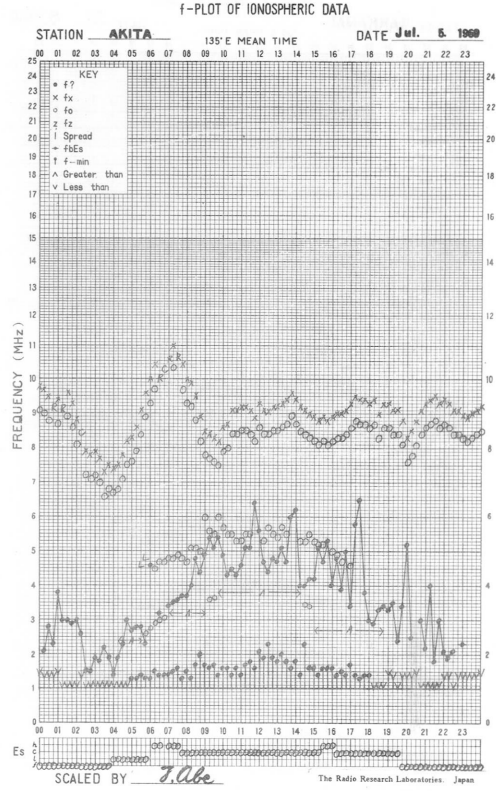
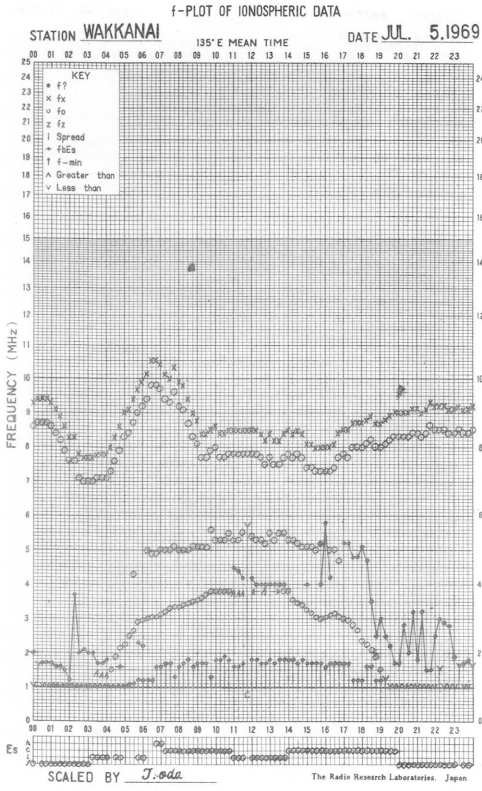
STATION **KOKUBUNJI** 135° E MEAN TIME DATE **JUL 4 1969**



f-PLOT OF IONOSPHERIC DATA

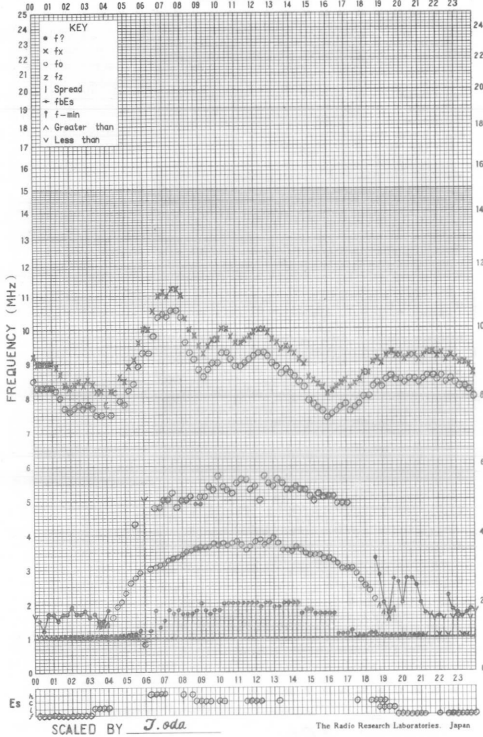
STATION **YAMAGAWA** 135° E MEAN TIME DATE **JUL 4 1969**





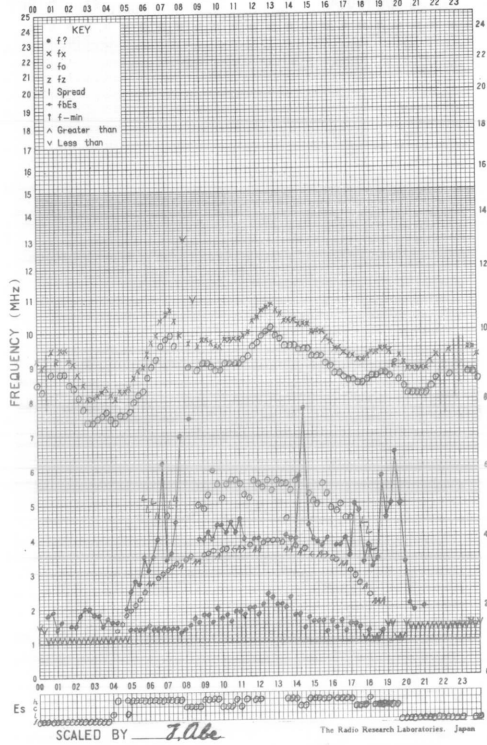
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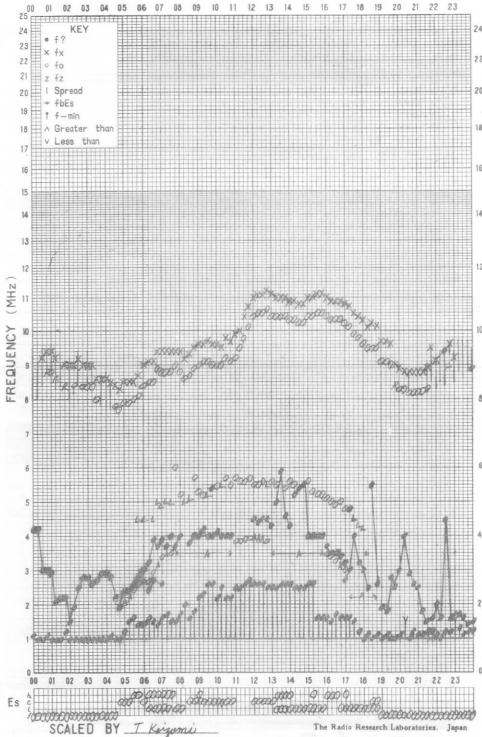
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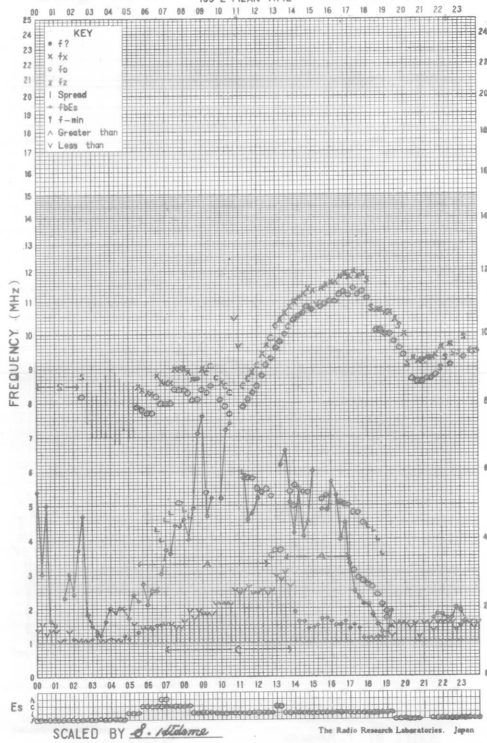
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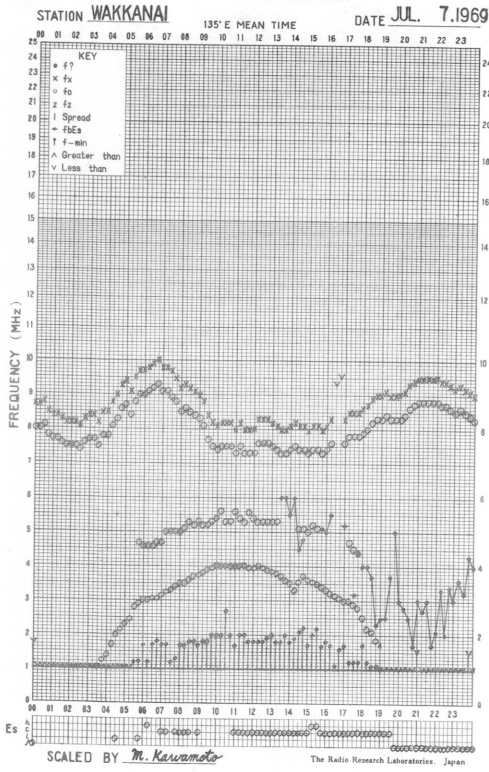


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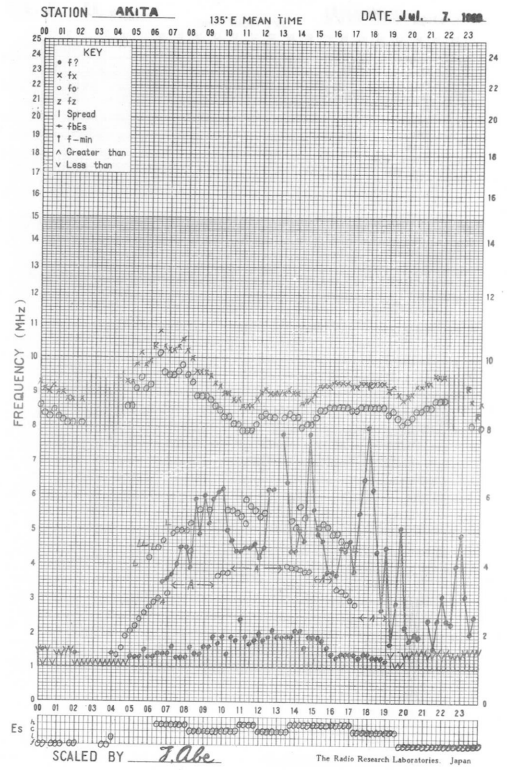
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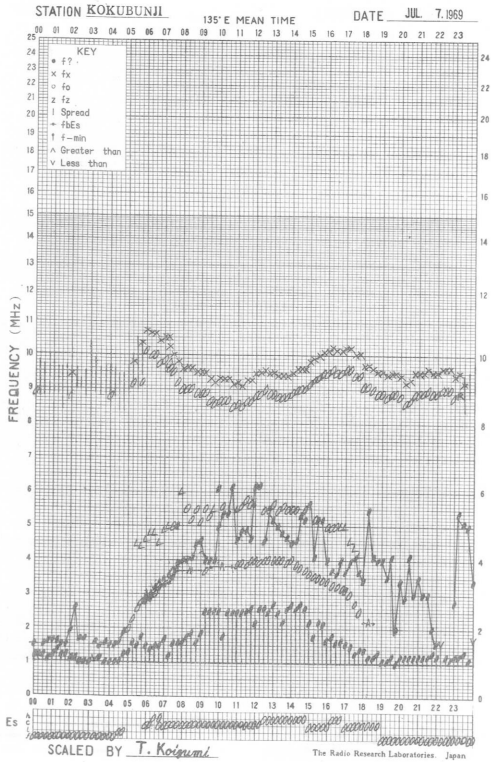
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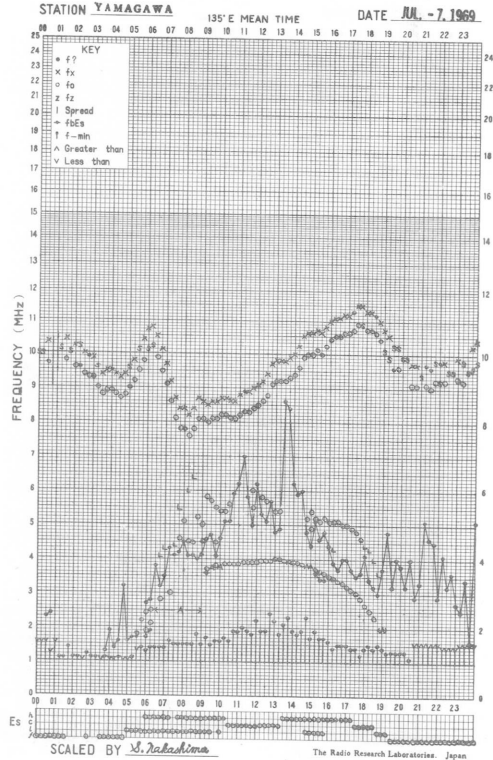
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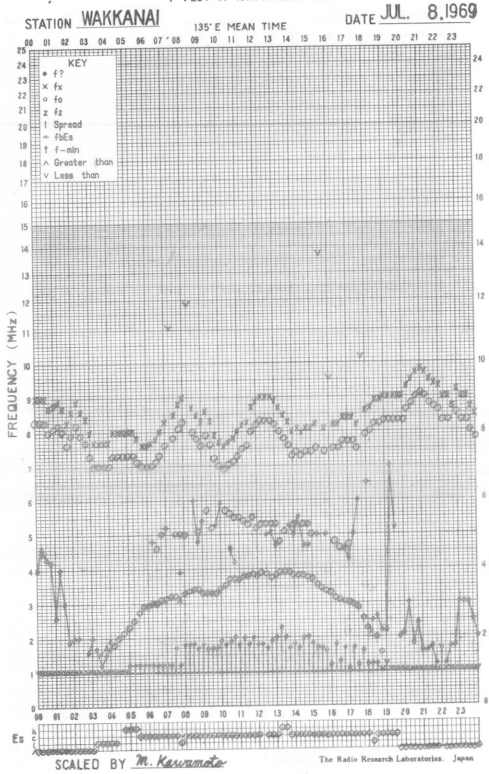
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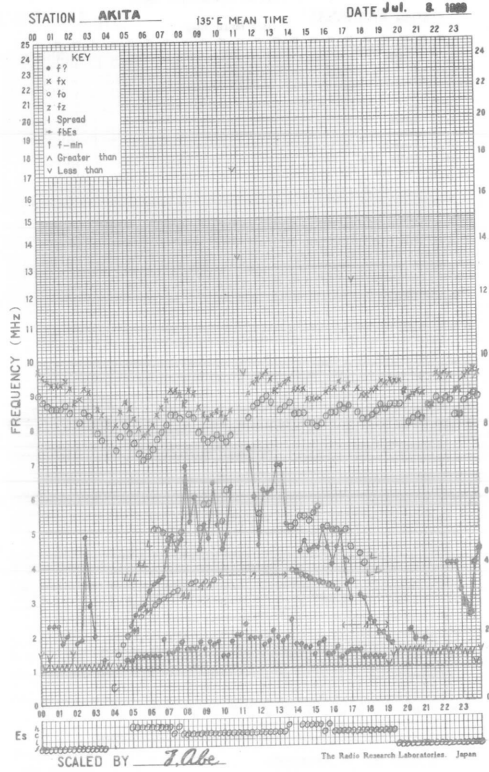
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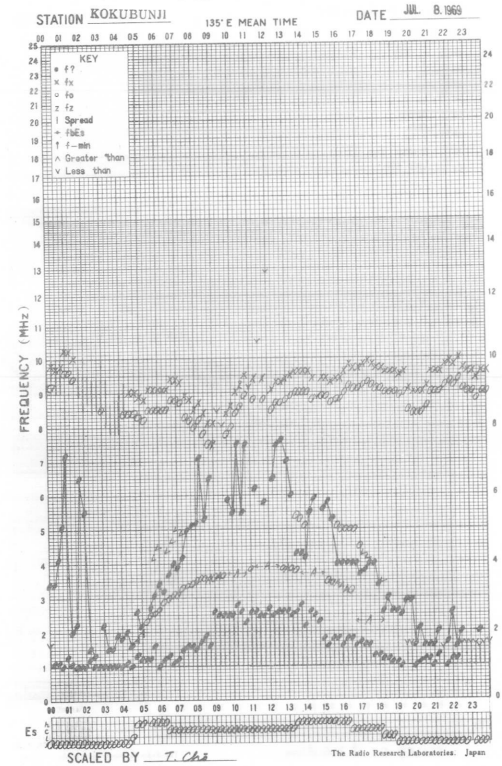
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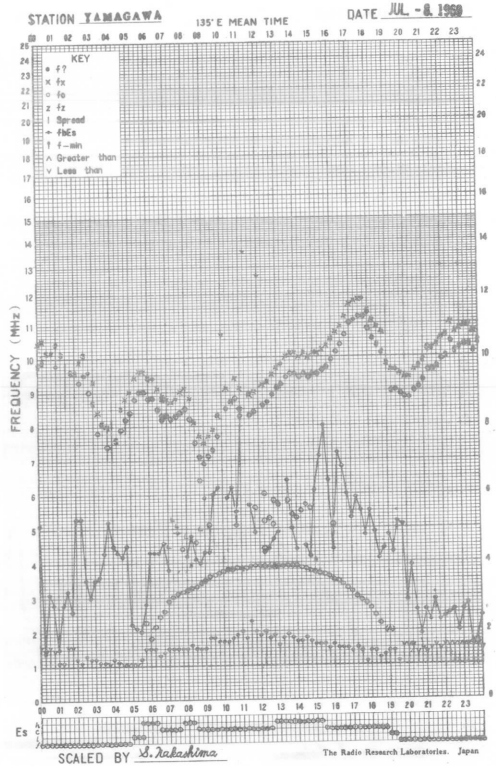
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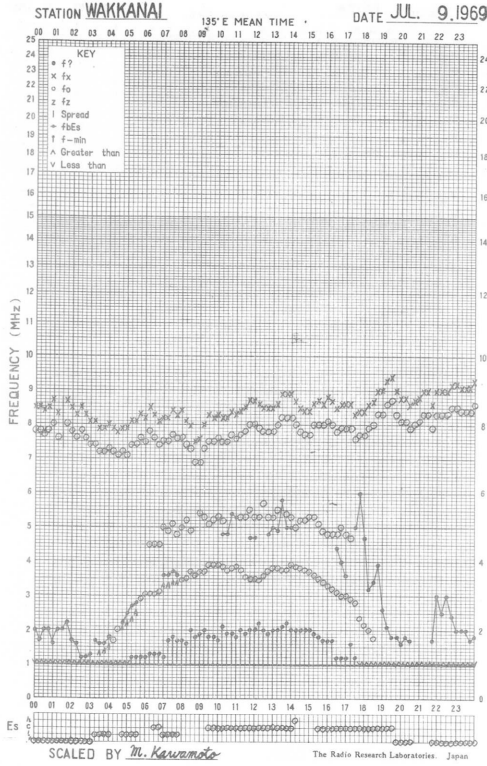
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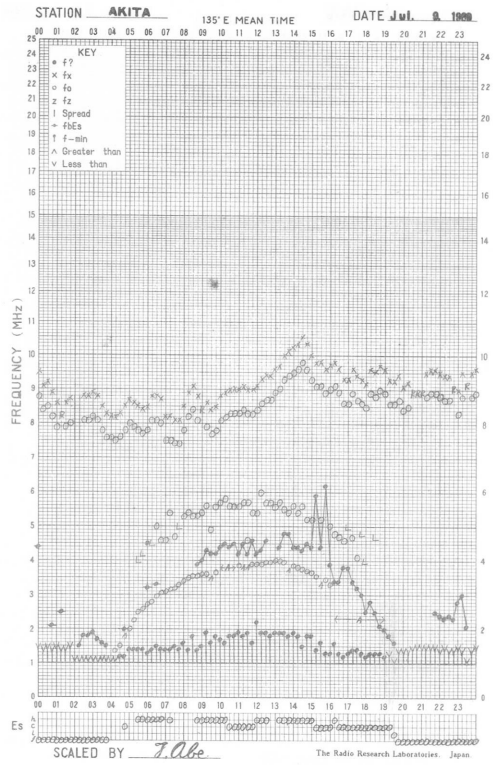
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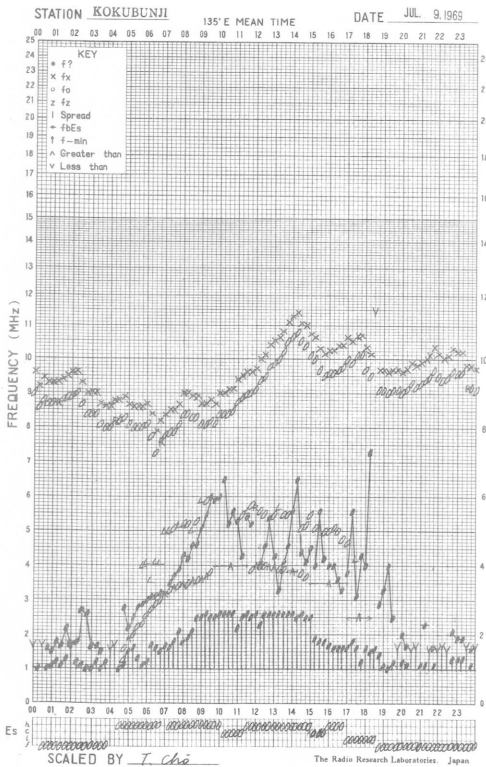
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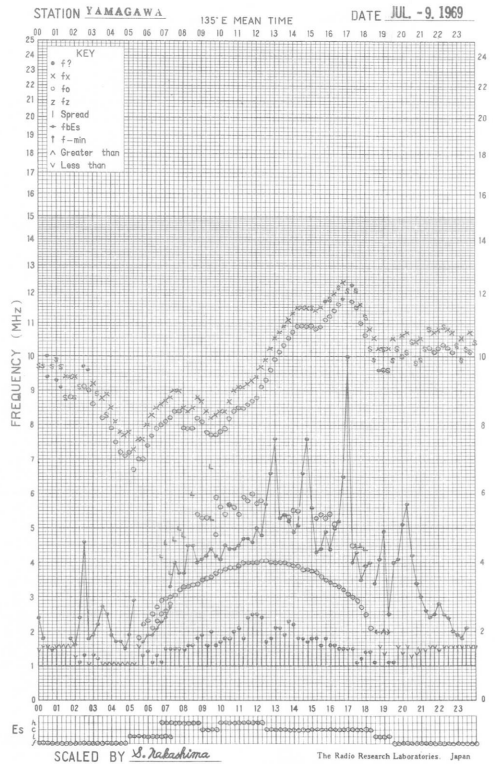
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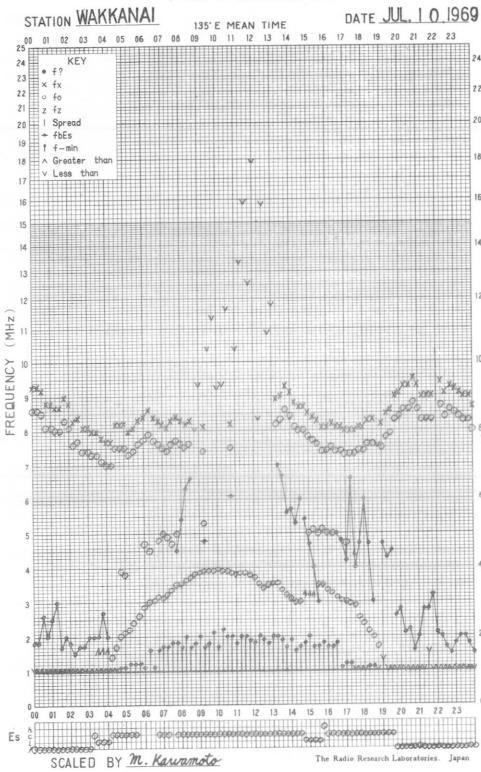
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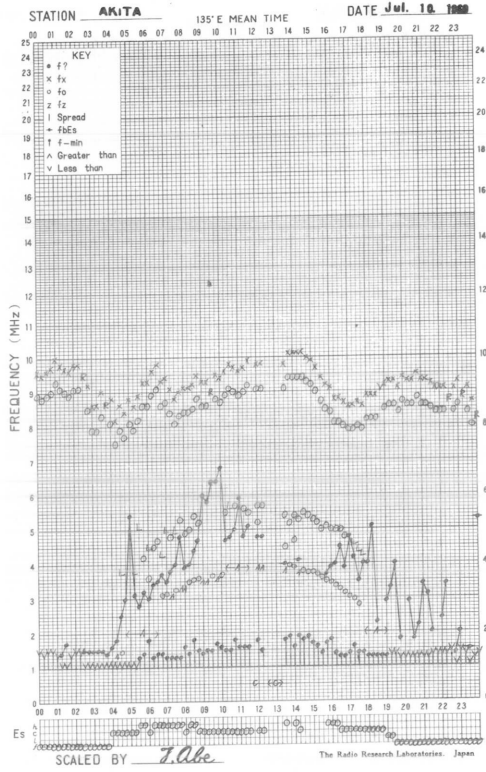
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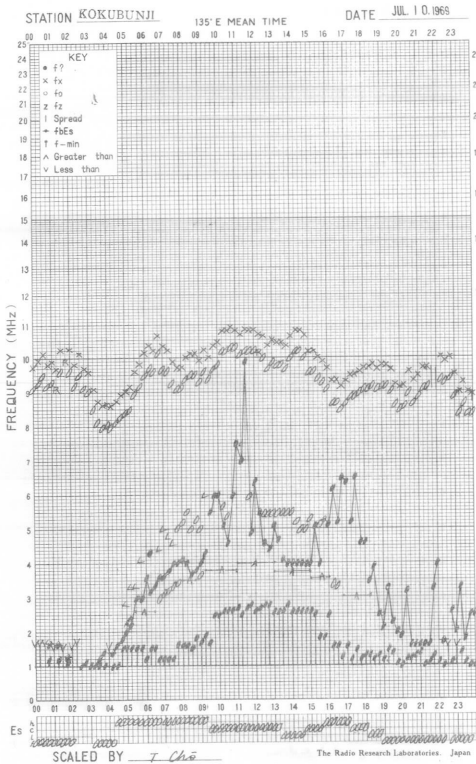
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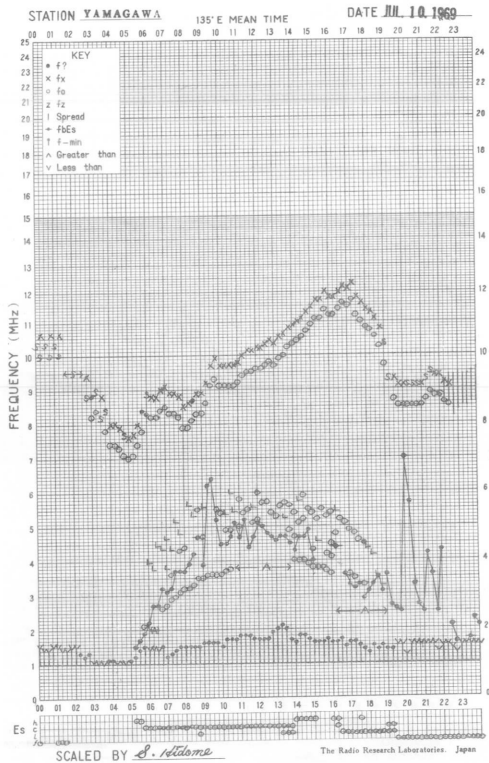
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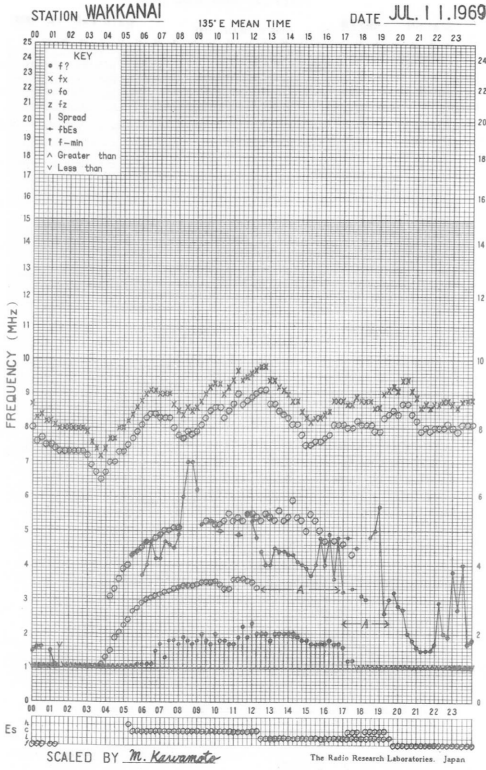
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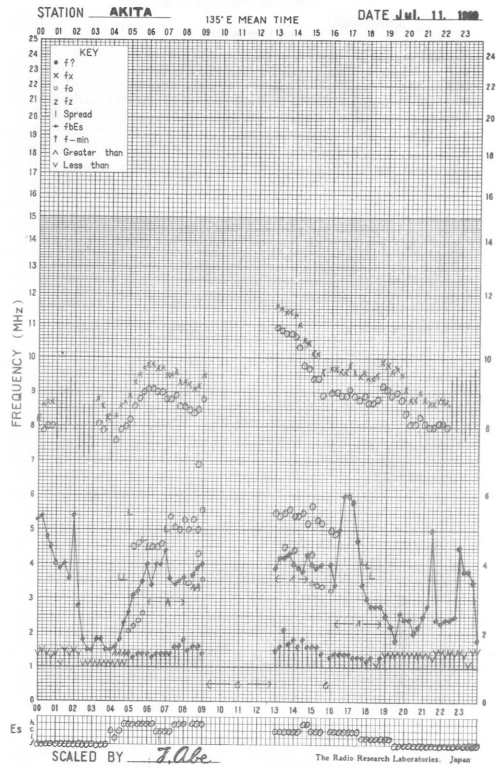
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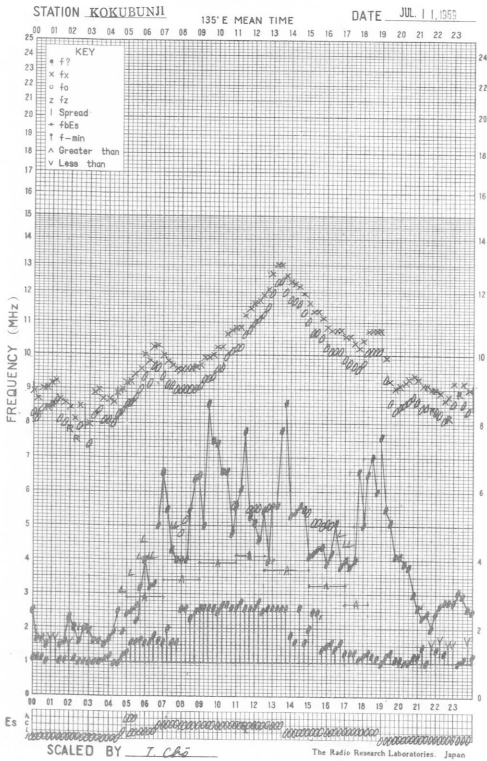
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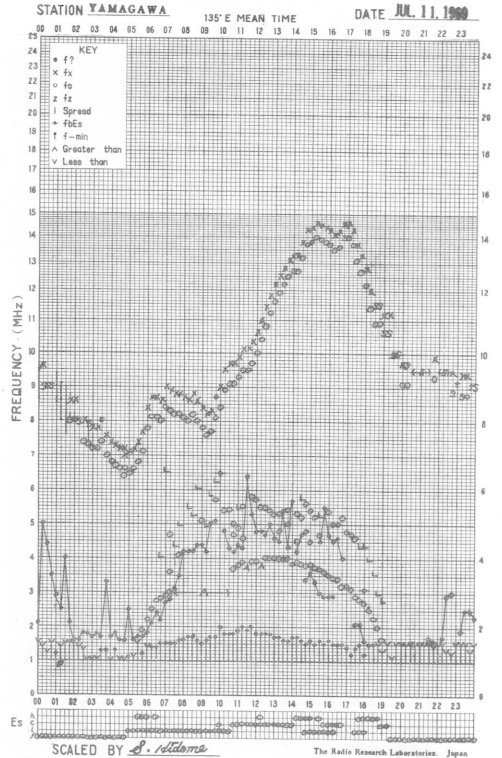
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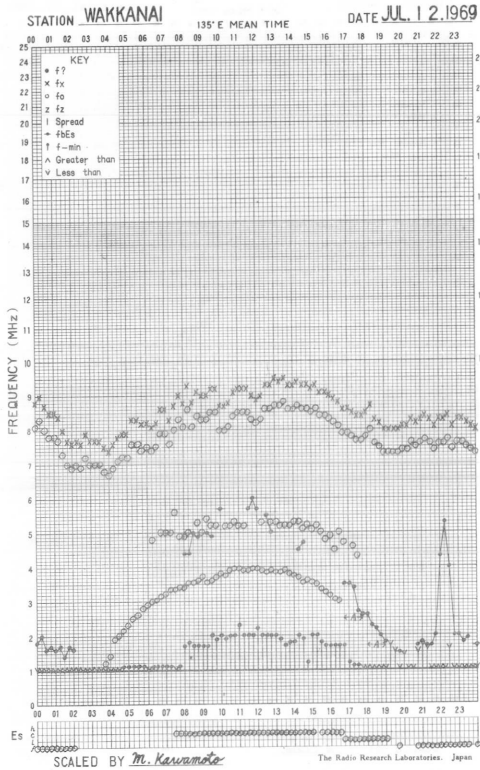
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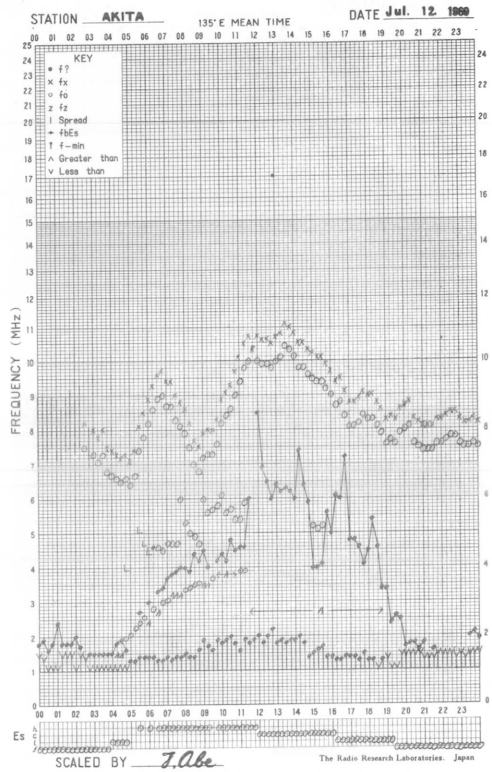
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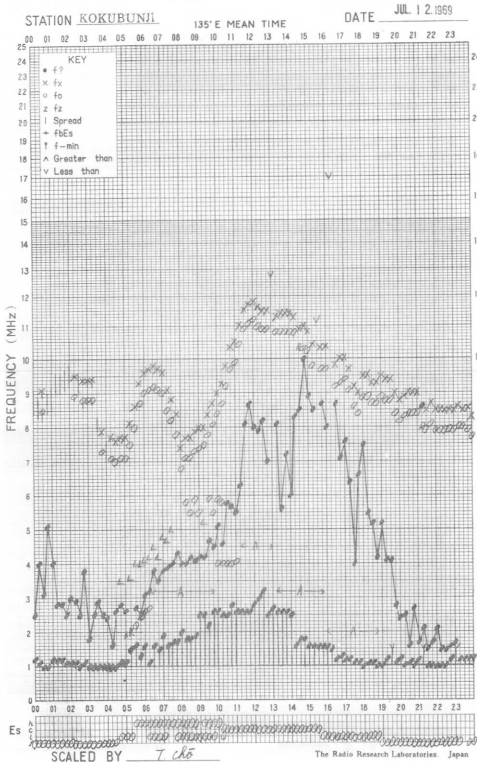
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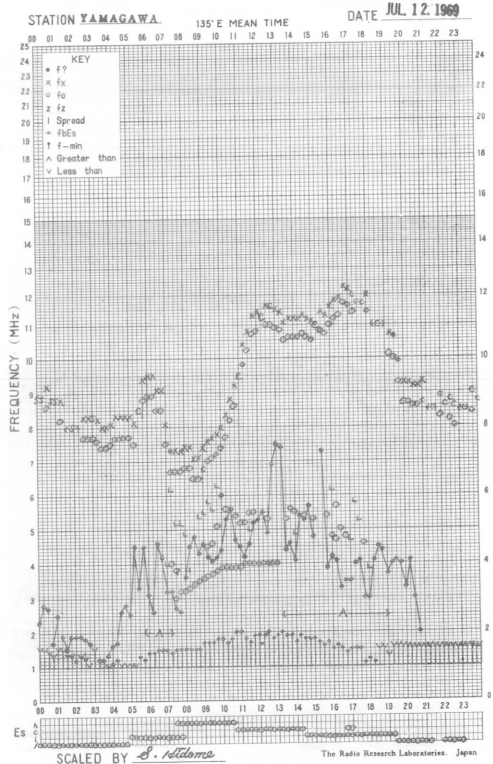
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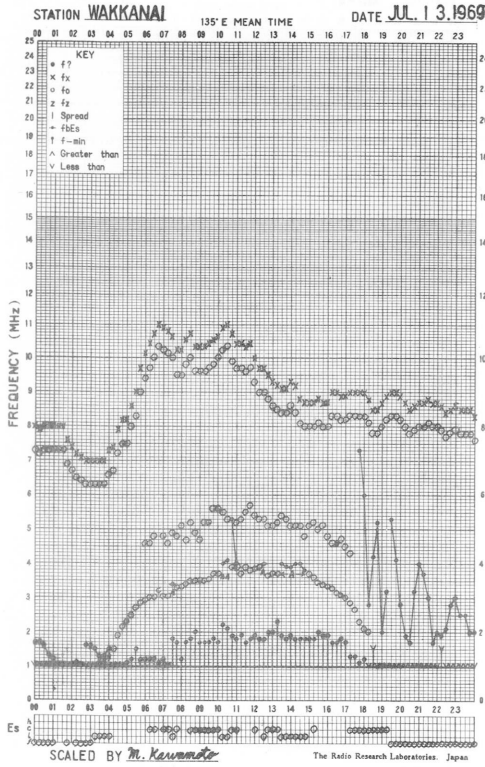
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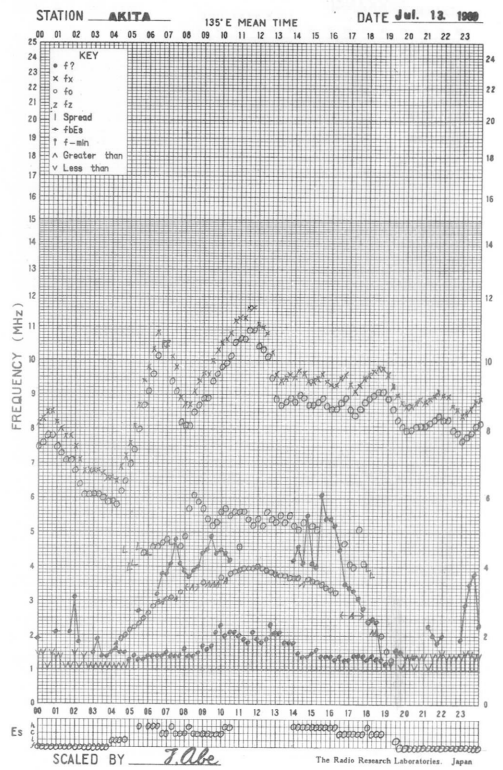
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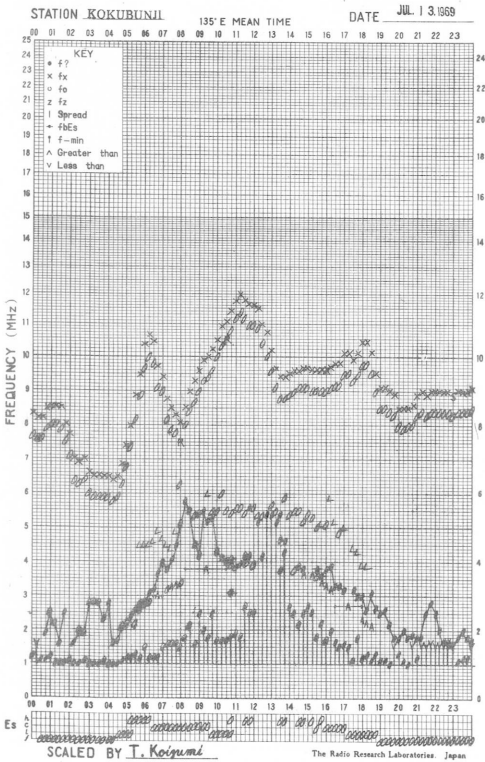
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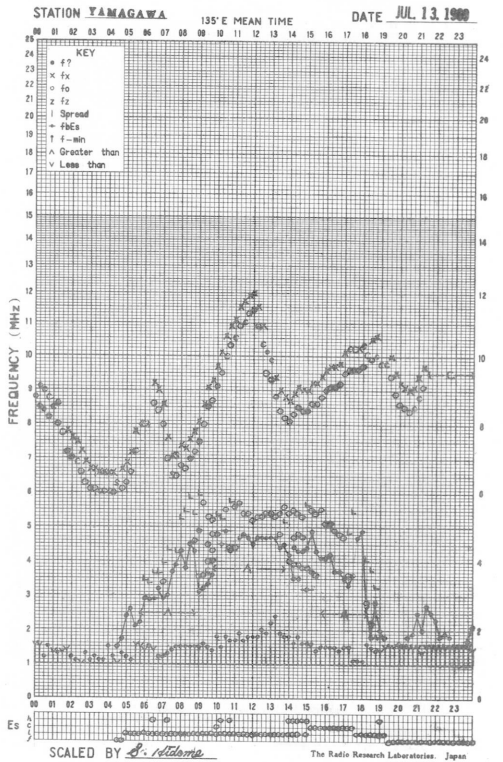
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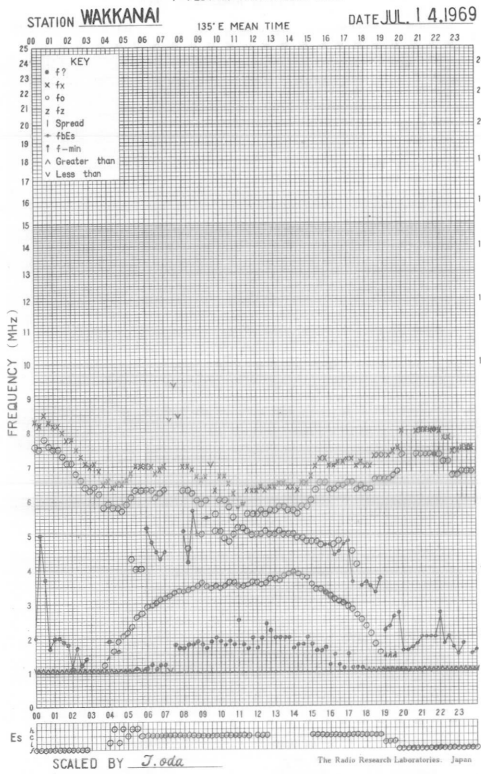
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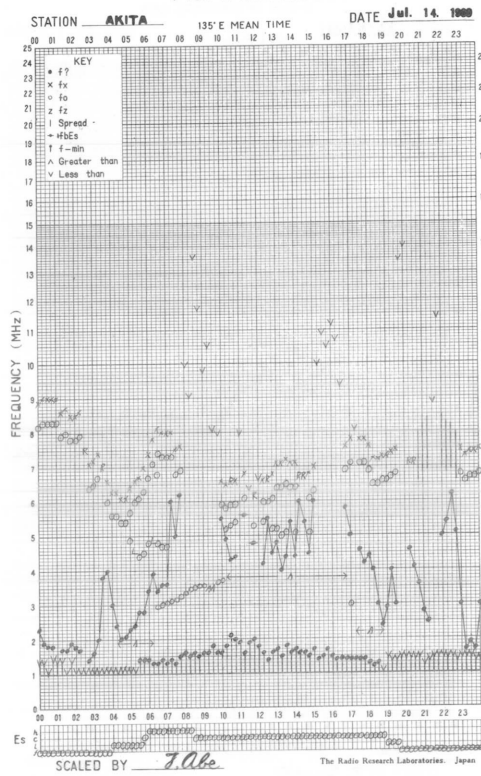
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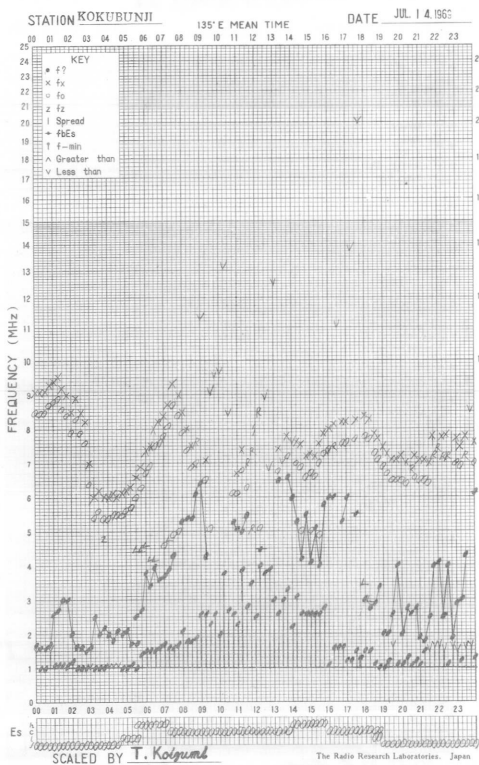
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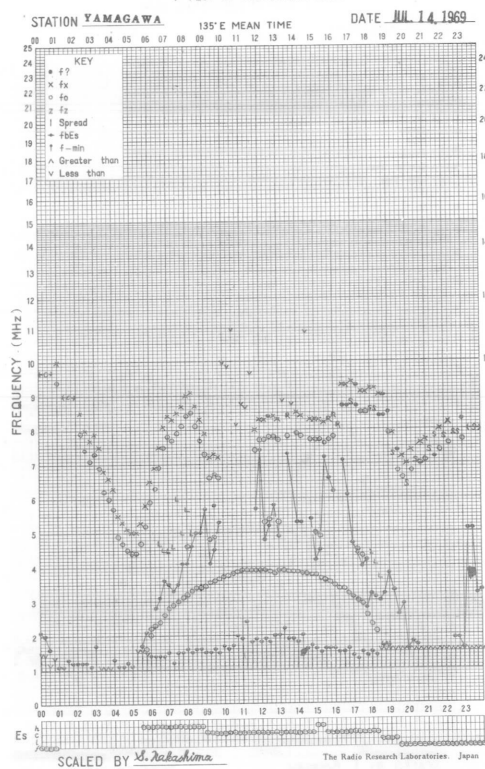
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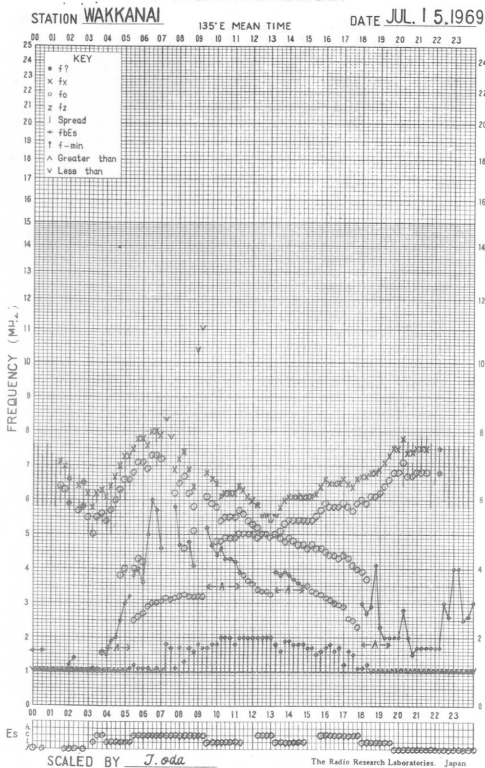
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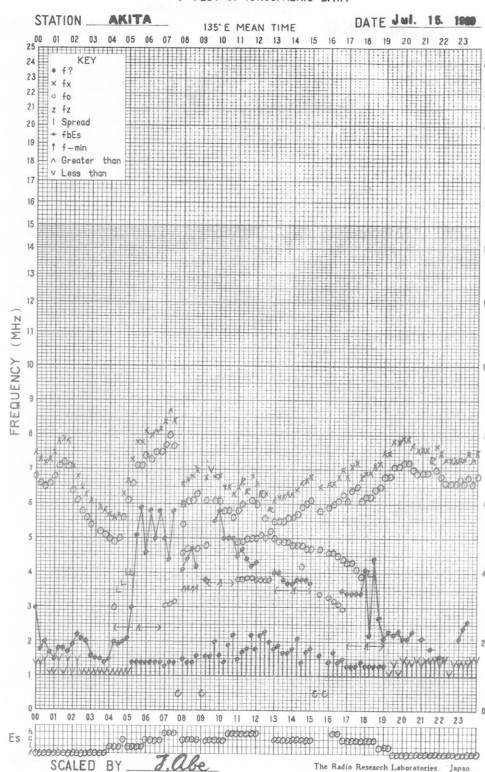
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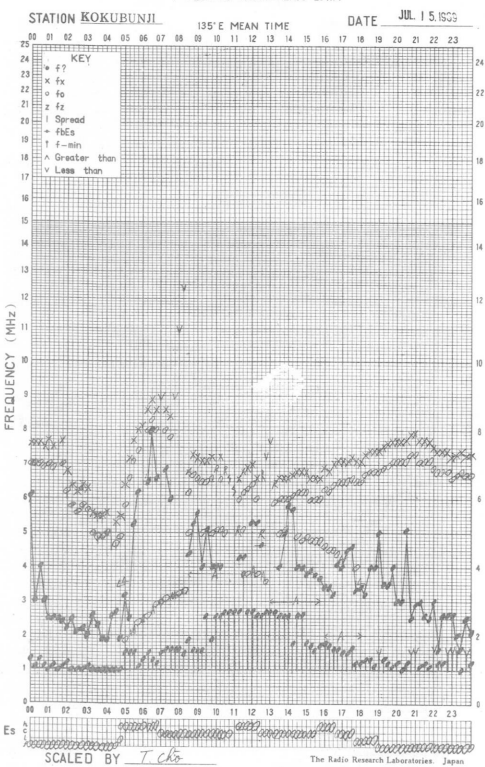
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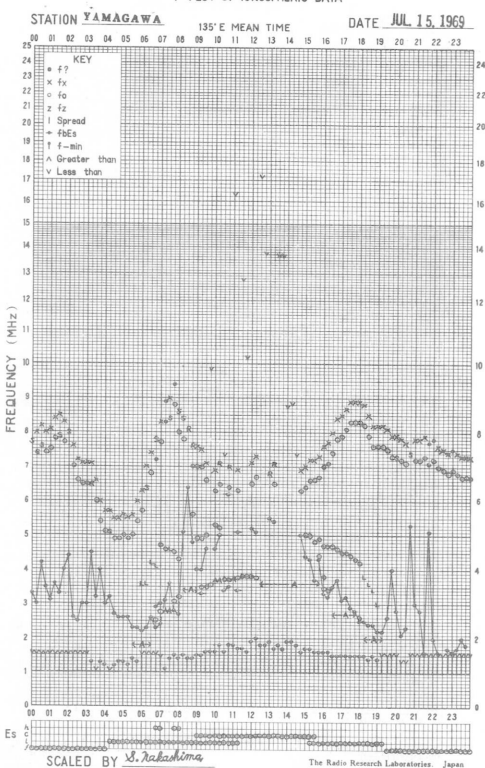
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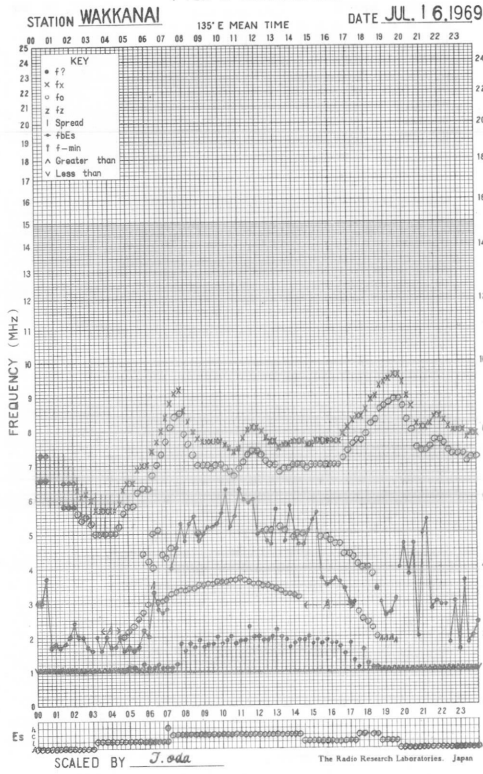
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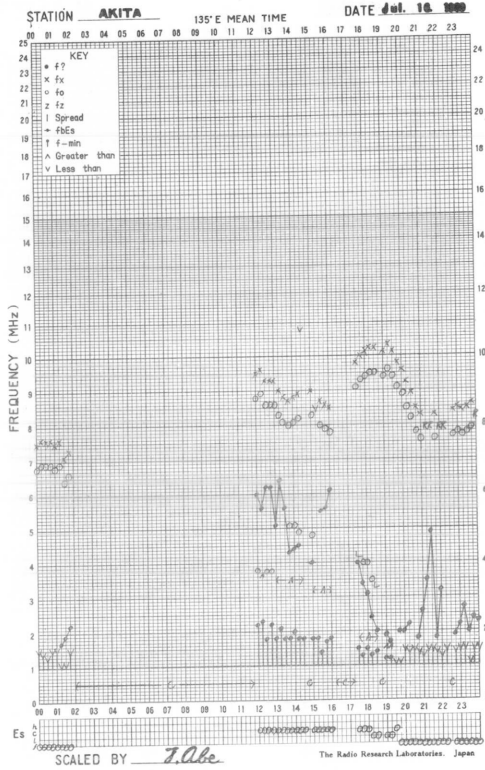
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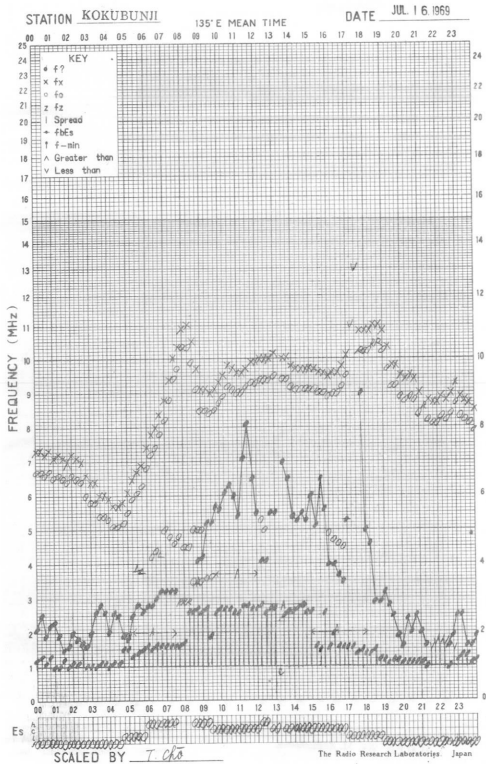
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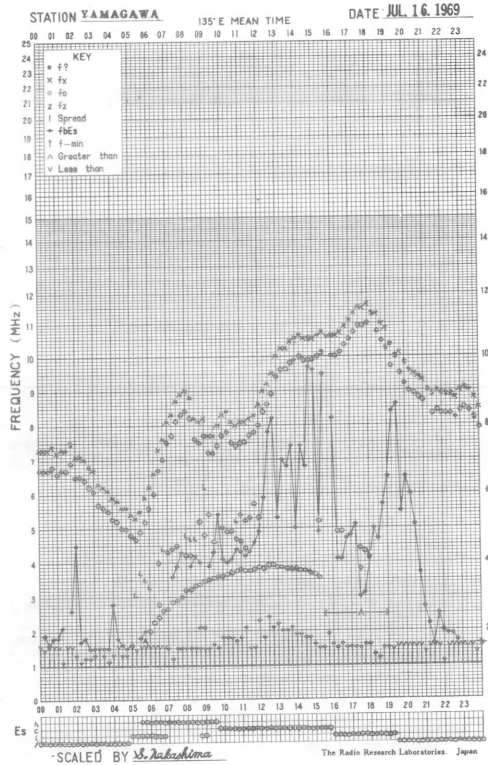
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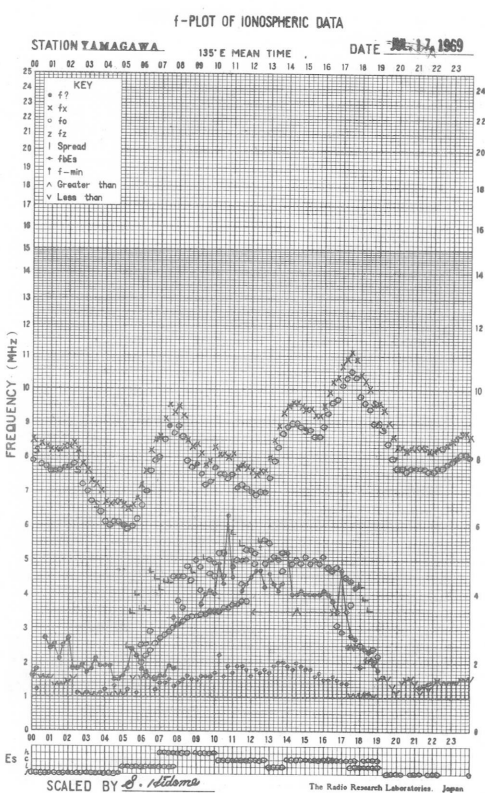
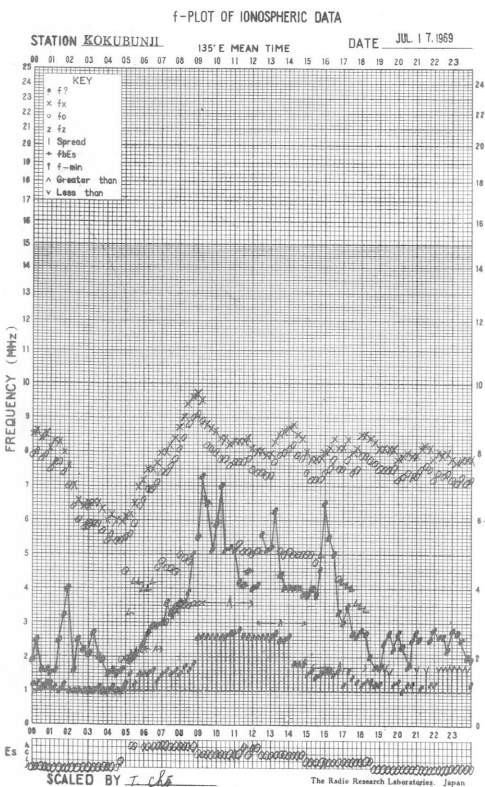
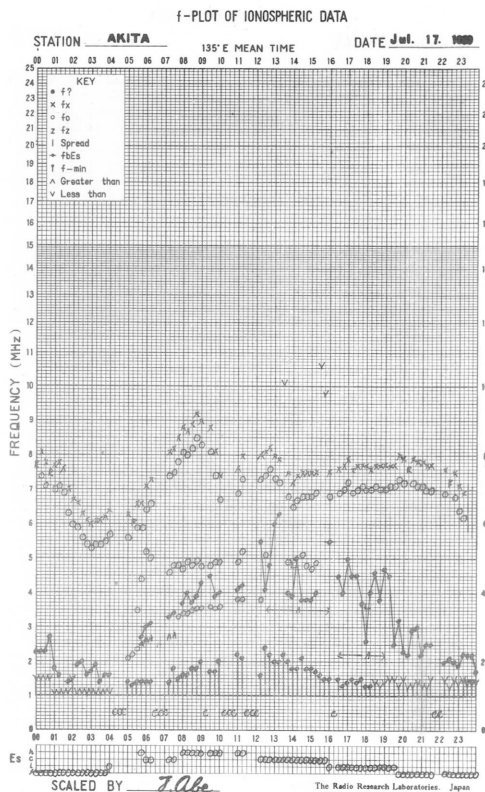
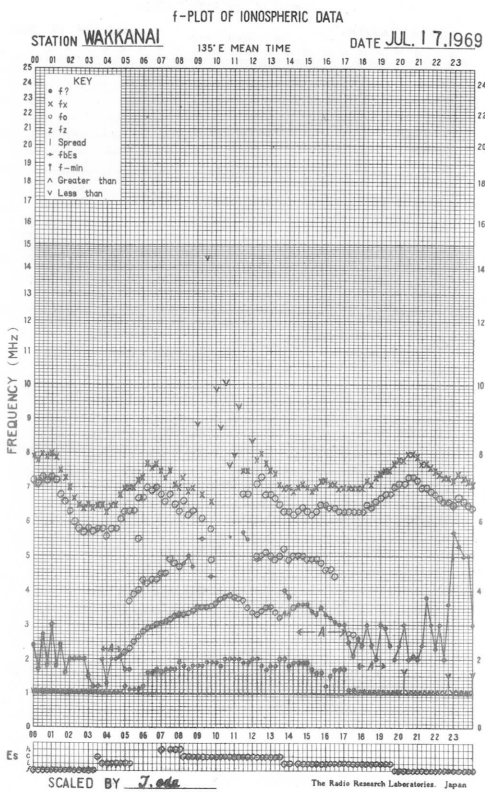


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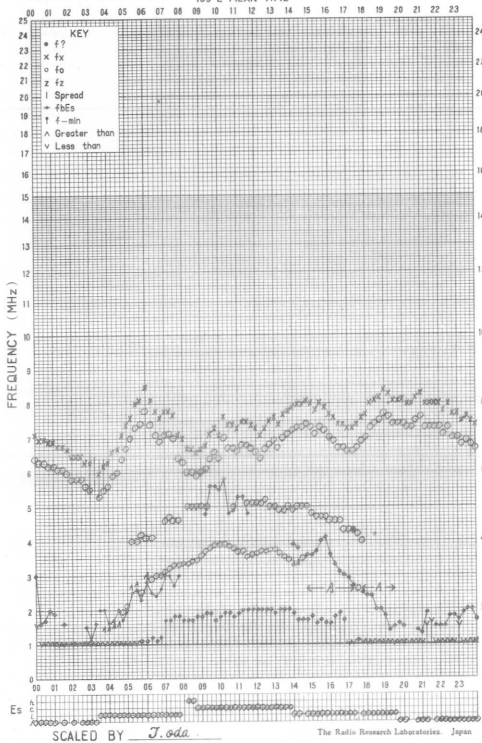
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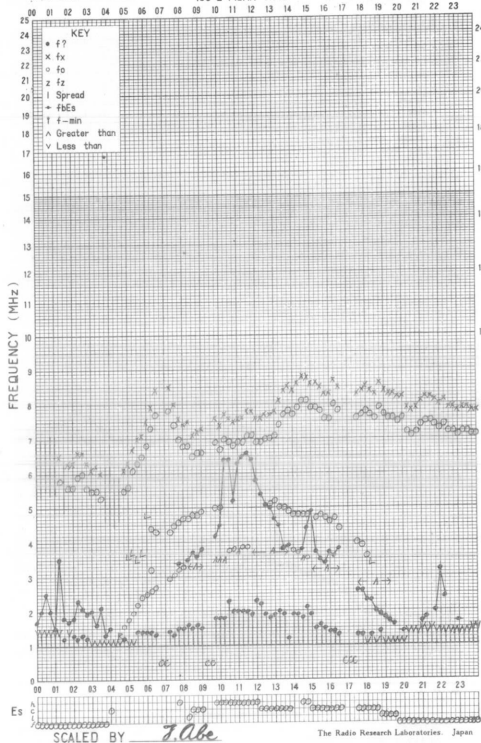
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STATION WAKKANAI 135°E MEAN TIME DATE JUL 18 1969



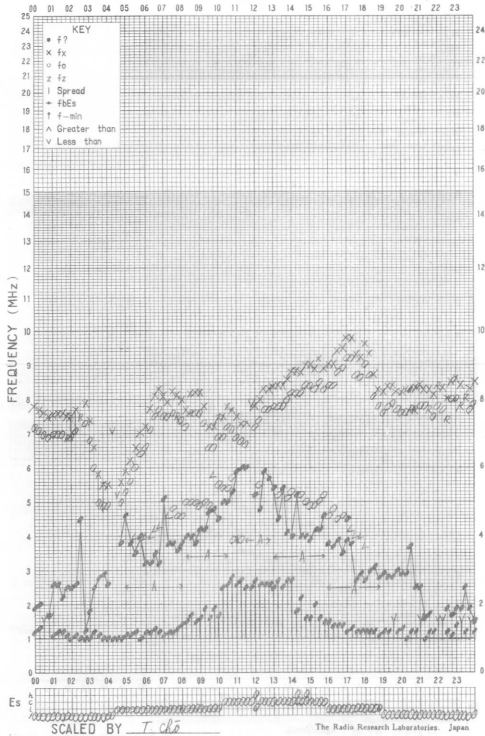
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STATION AKITA 135°E MEAN TIME DATE Jul. 18 1969



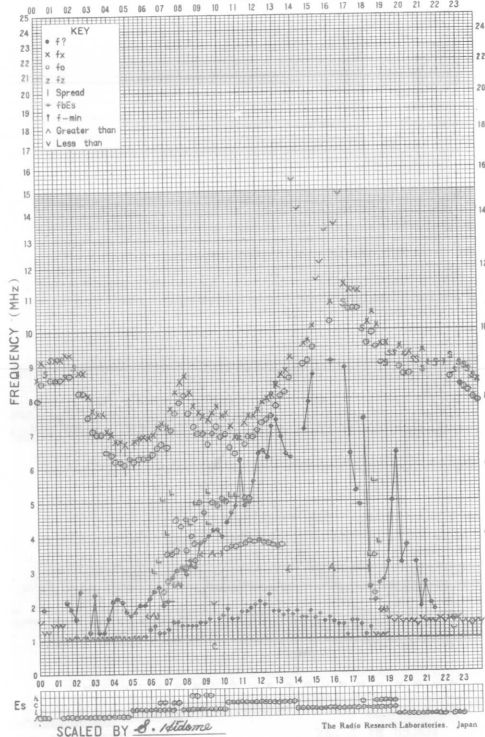
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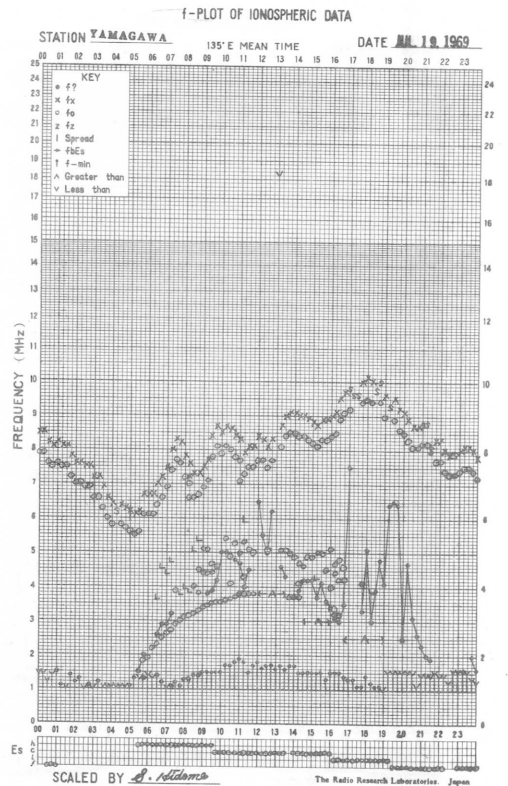
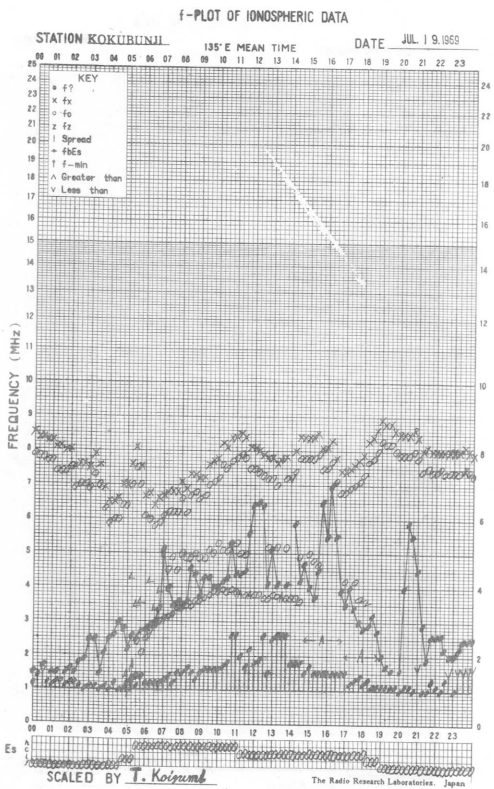
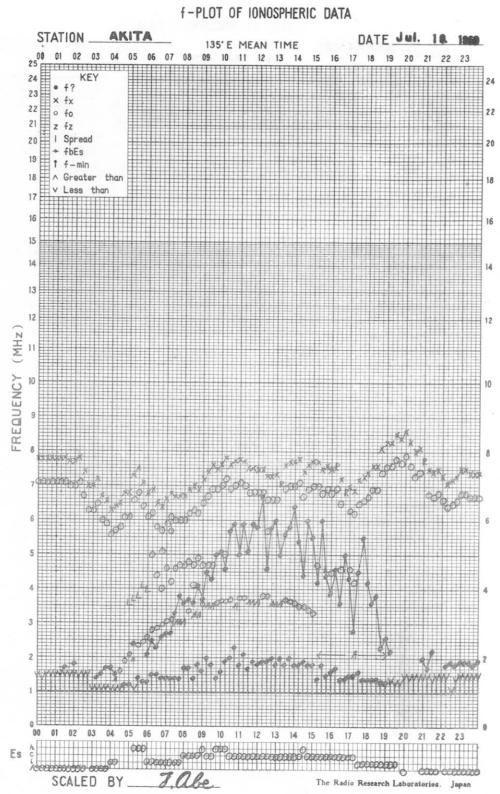
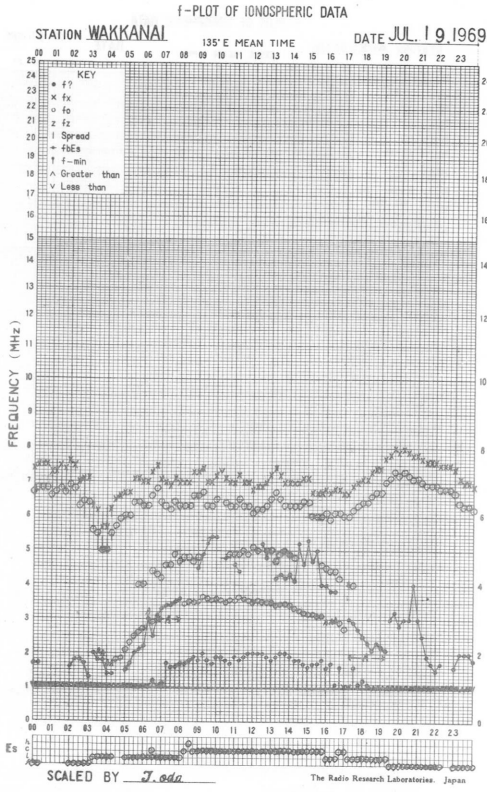
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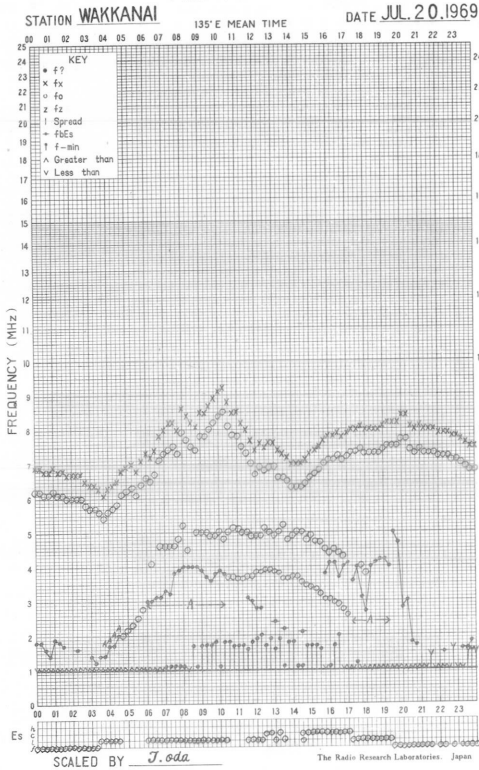
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STATION YAMAGAWA 135°E MEAN TIME DATE JUL 18 1969

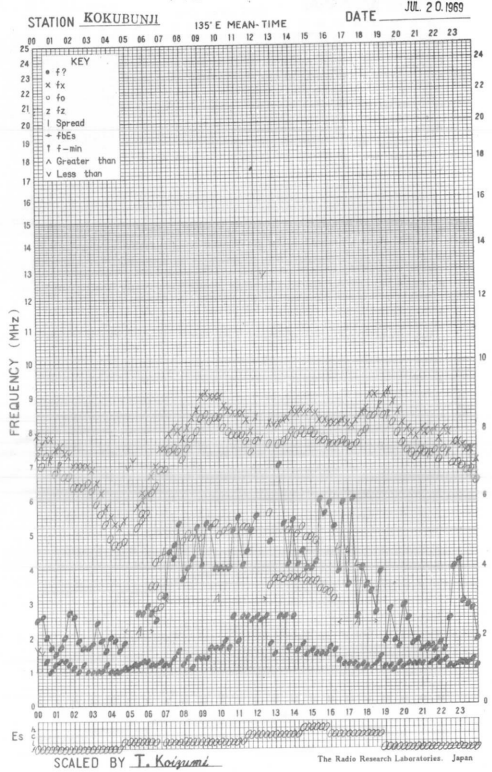




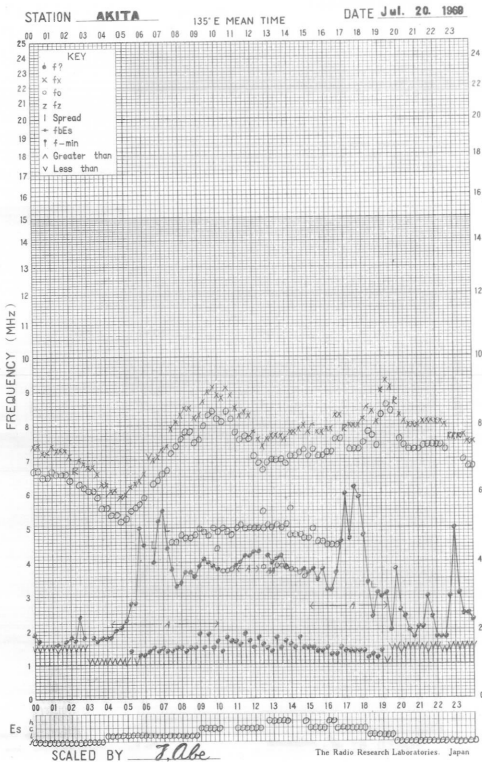
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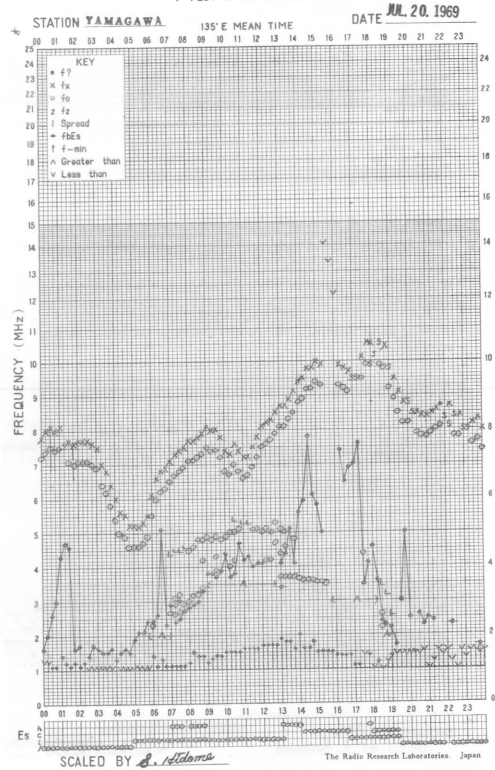
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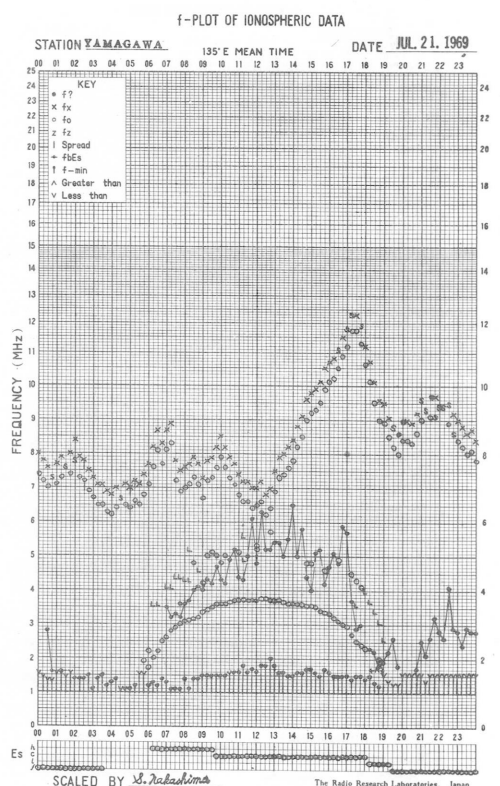
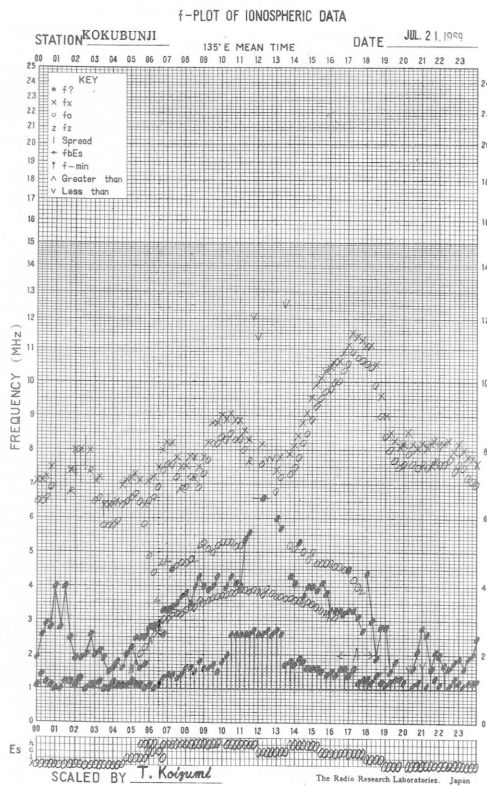
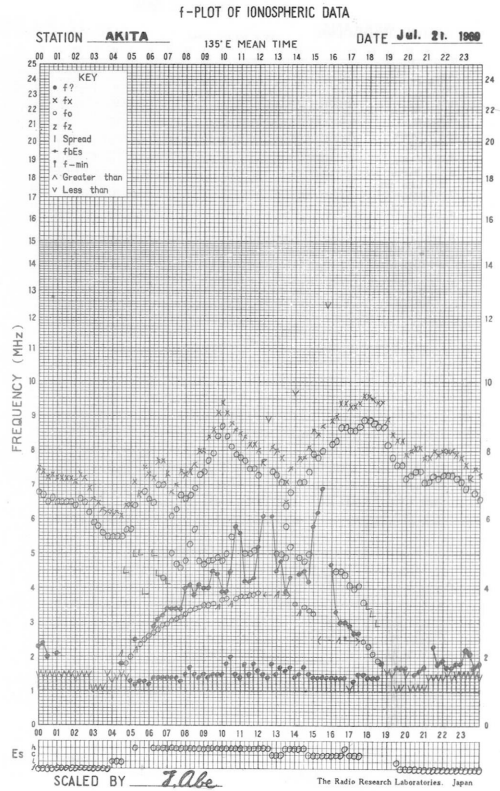
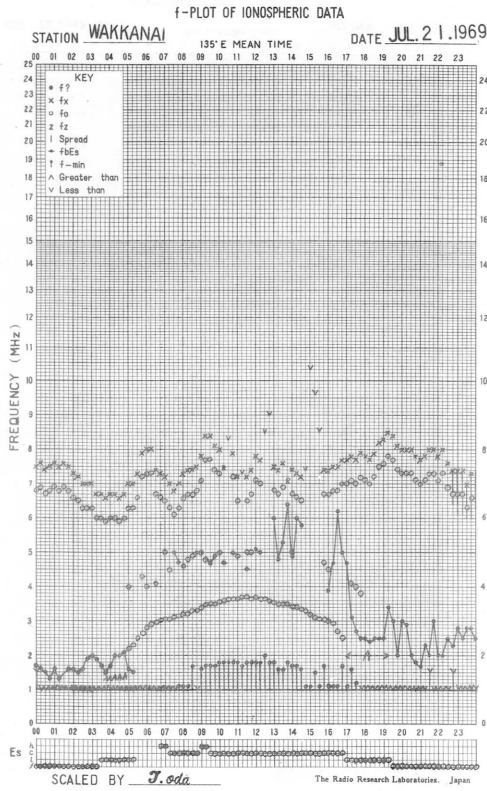


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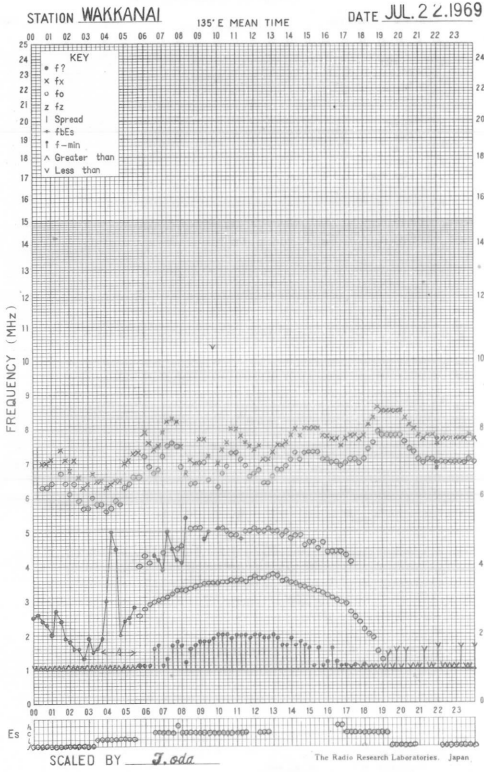


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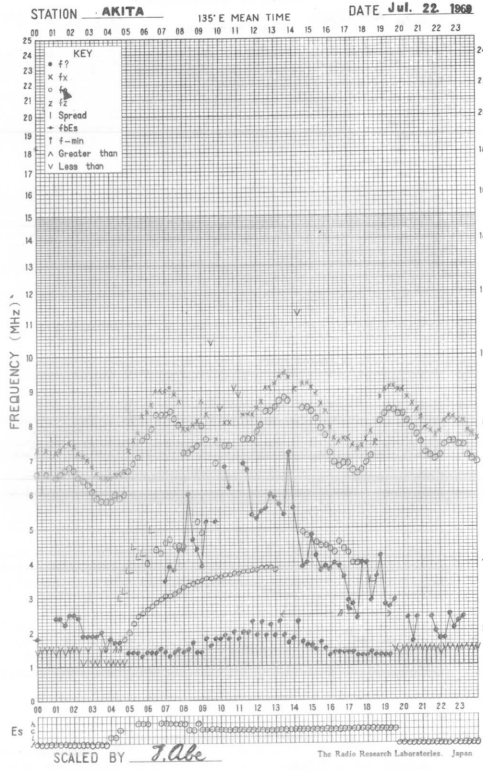




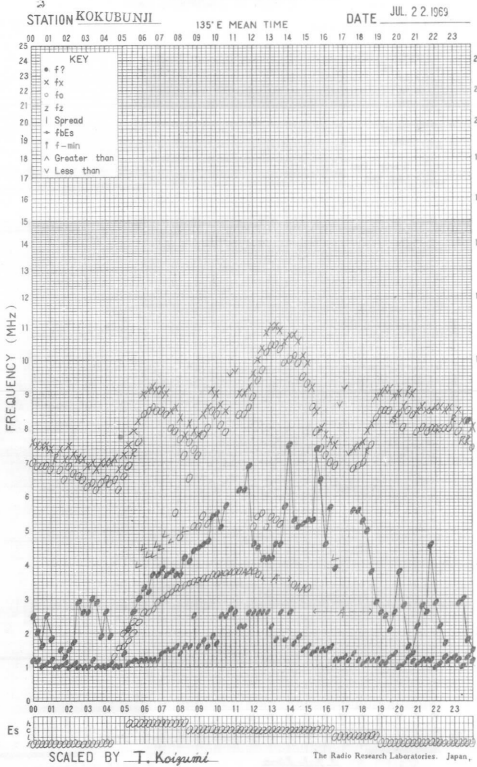
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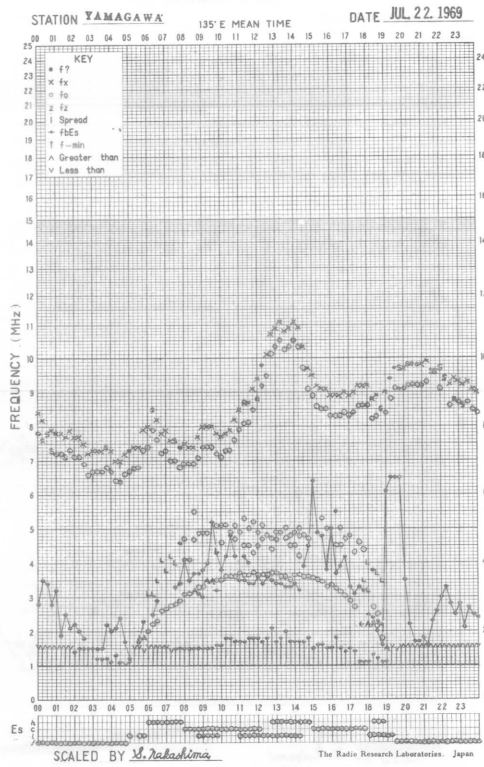
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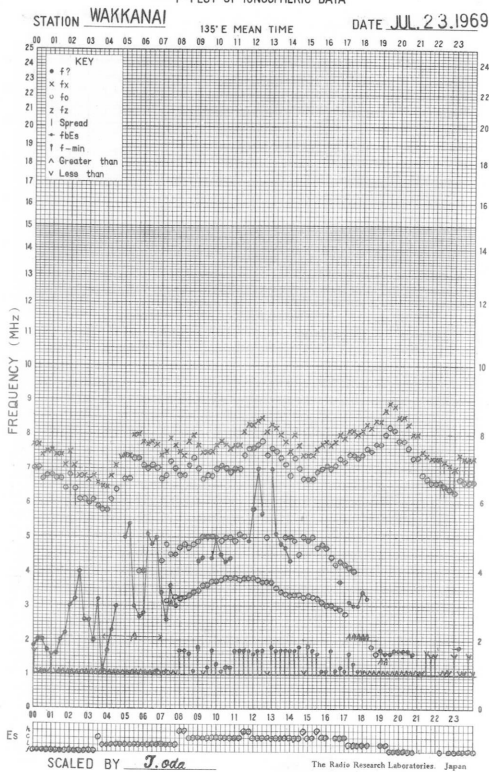
f-PLOT OF IONOSPHERIC DATA



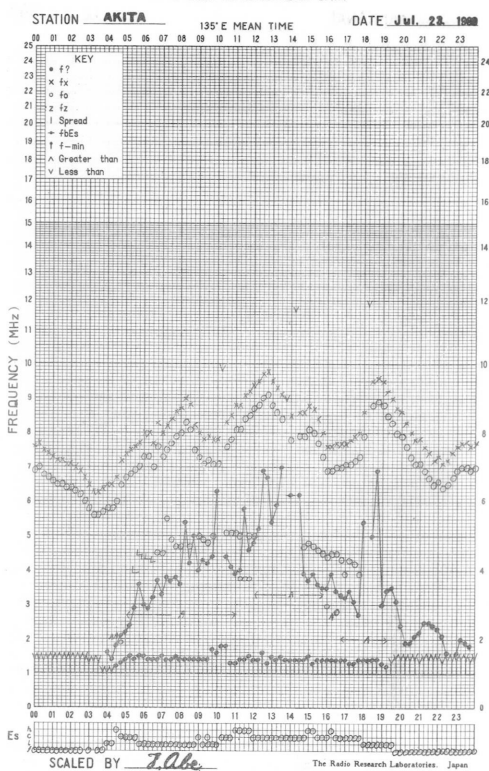
f-PLOT OF IONOSPHERIC DATA



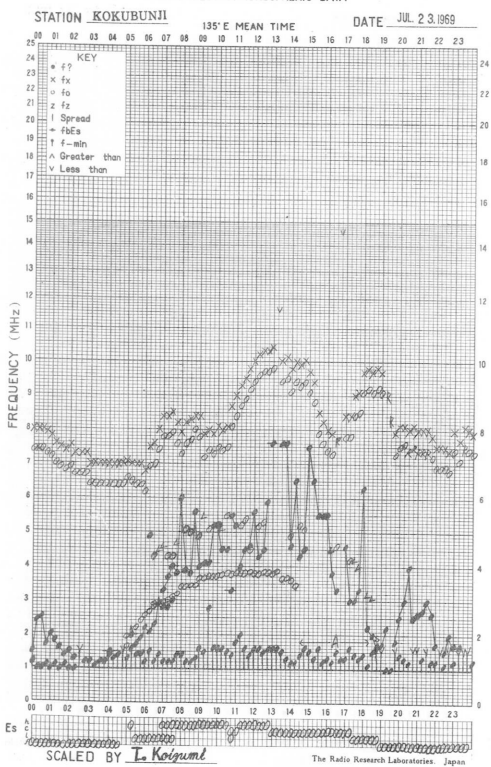
f-PLOT OF IONOSPHERIC DATA



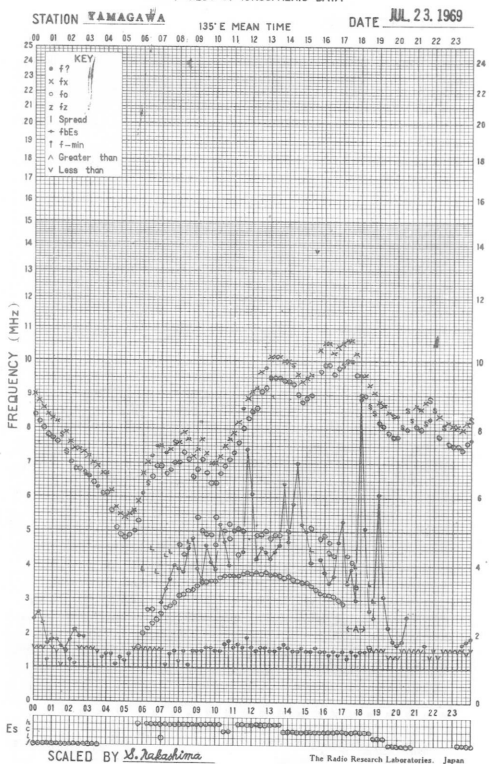
f-PLOT OF IONOSPHERIC DATA



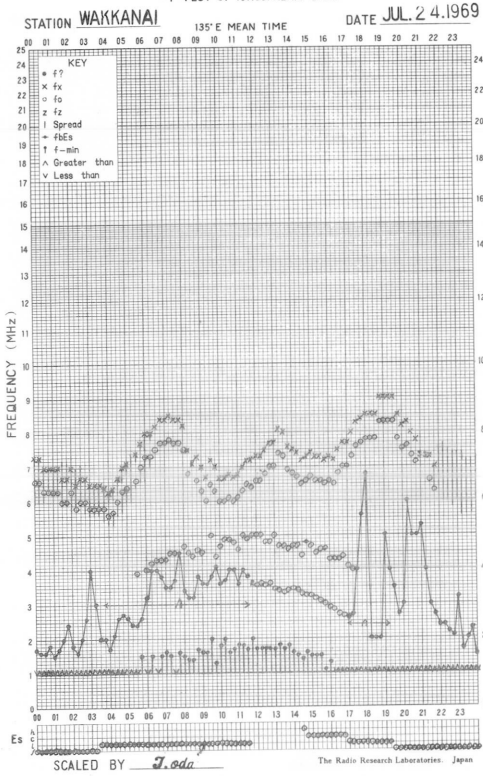
f-PLOT OF IONOSPHERIC DATA



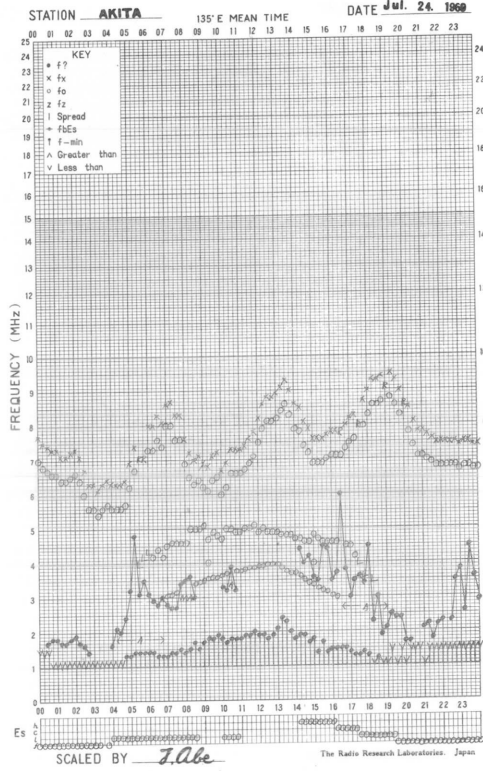
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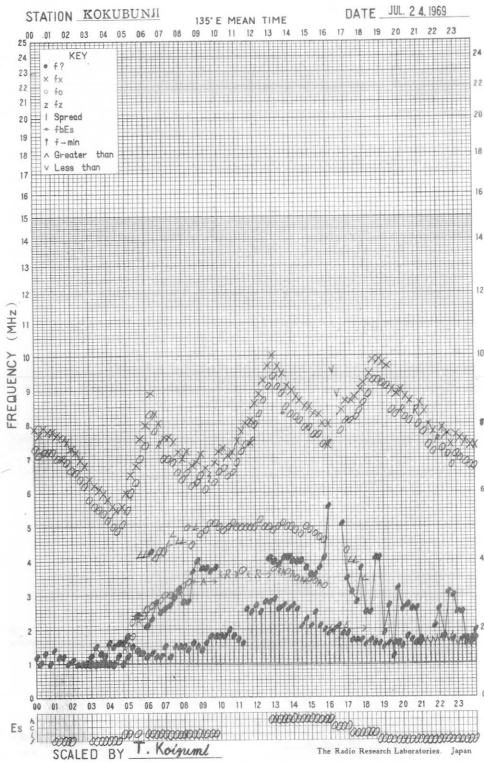
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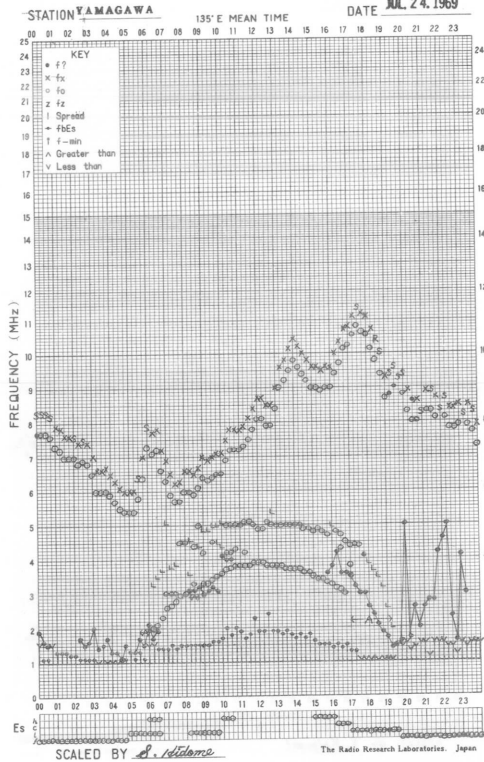
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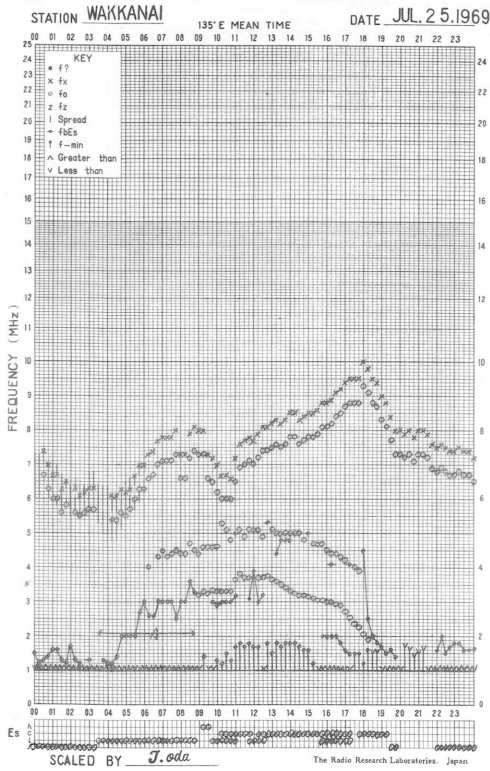
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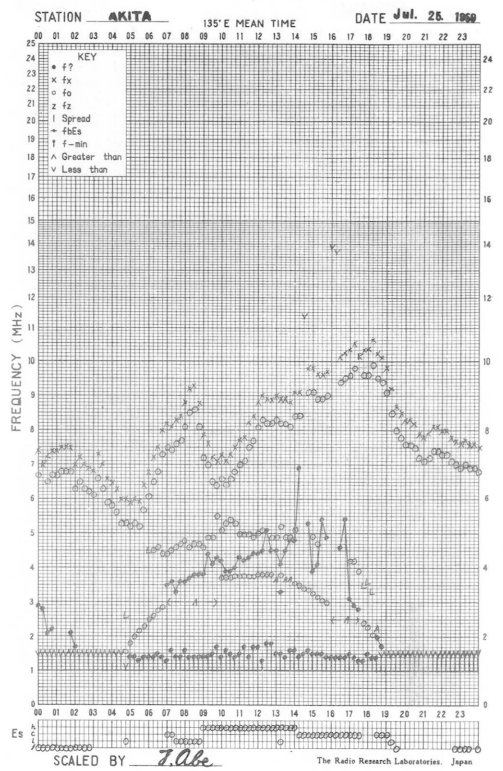
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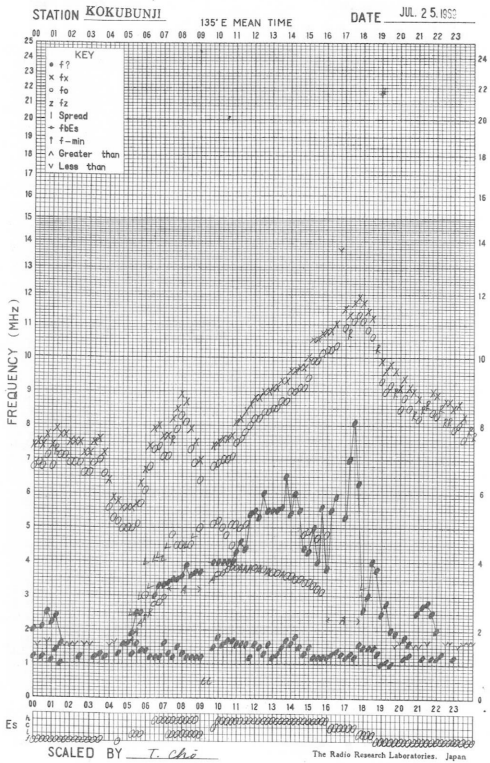
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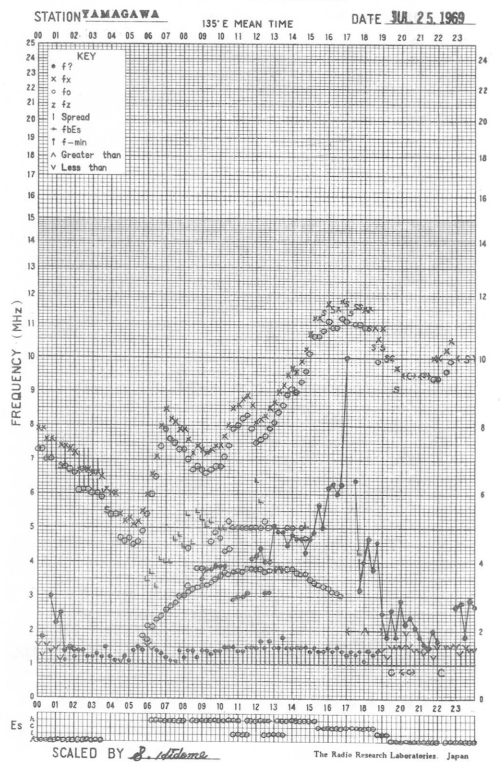
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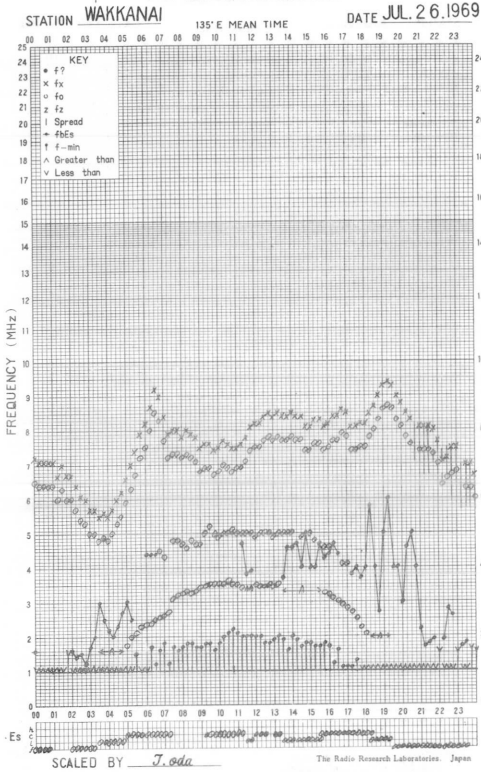
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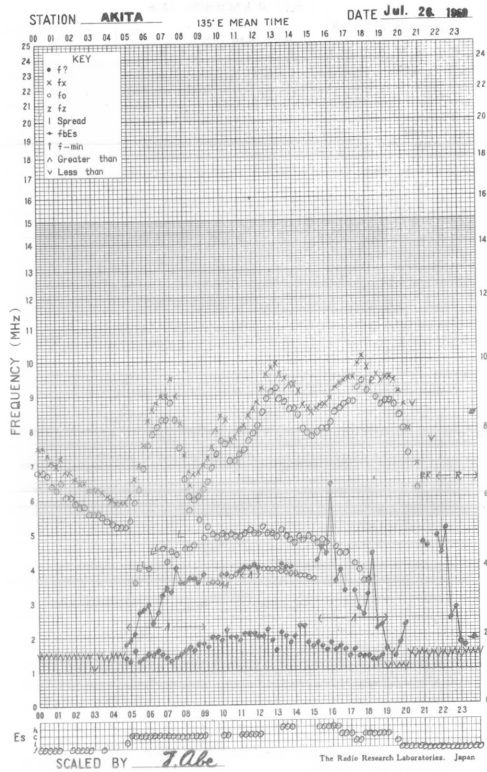
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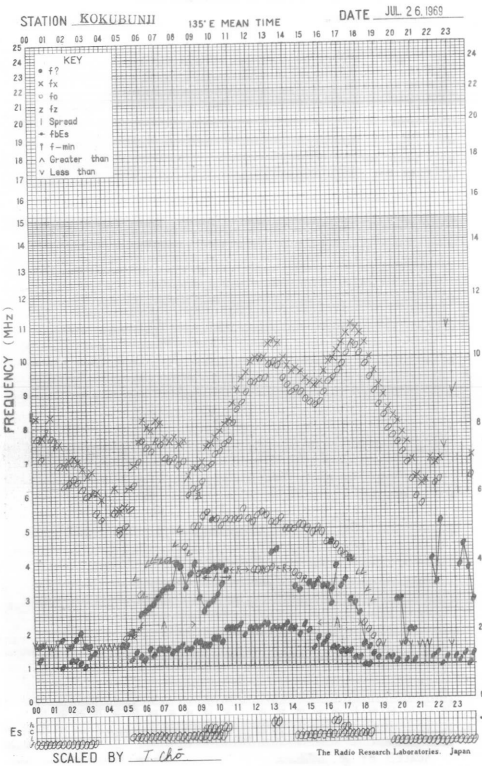
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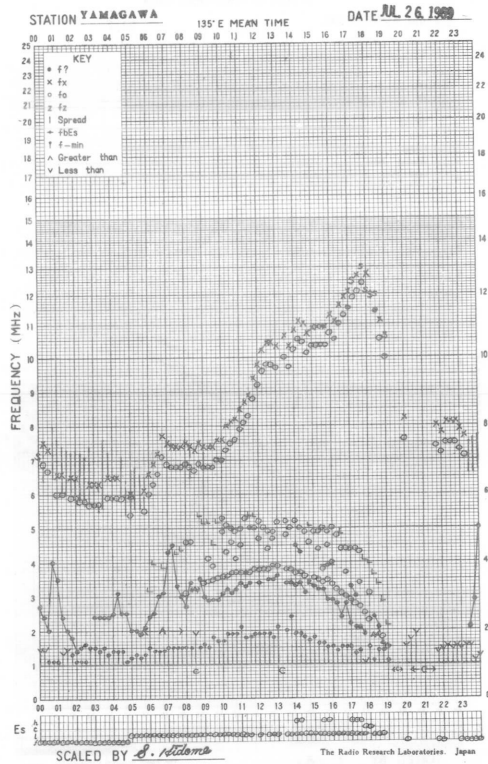
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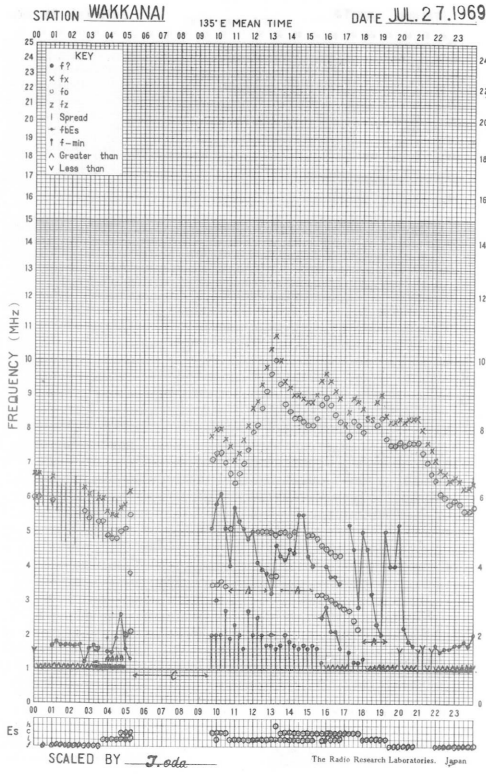
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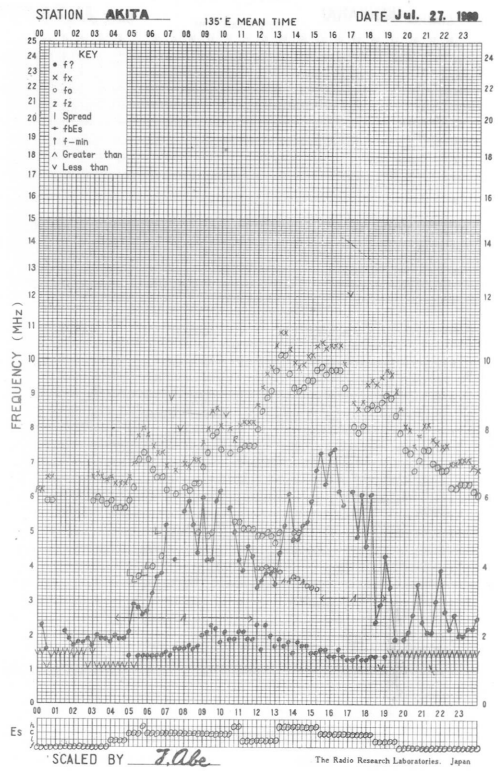
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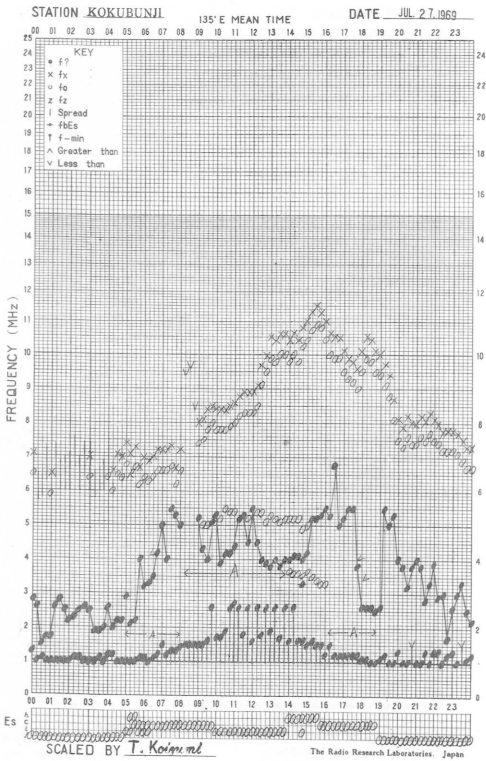
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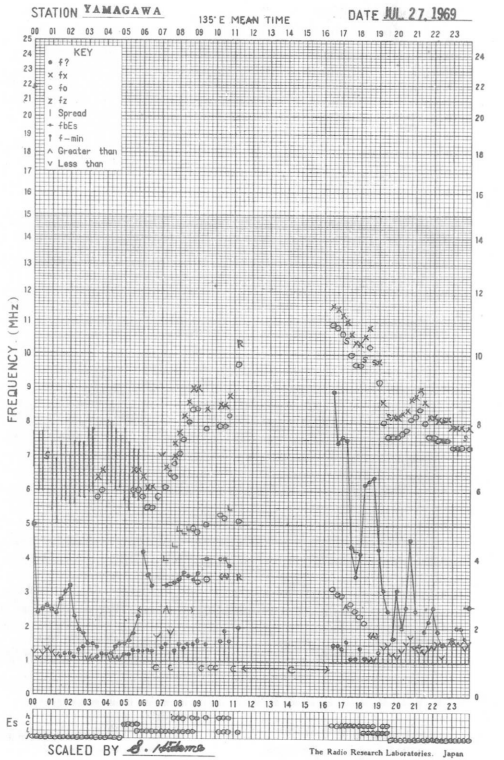
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

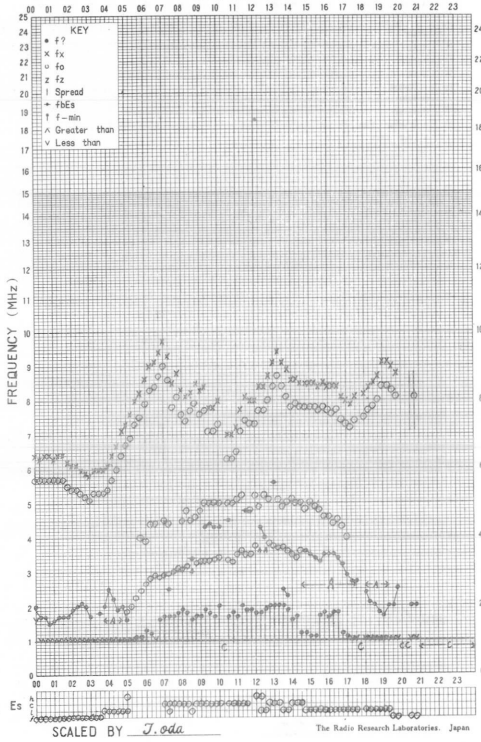


f-PLOT OF IONOSPHERIC DATA



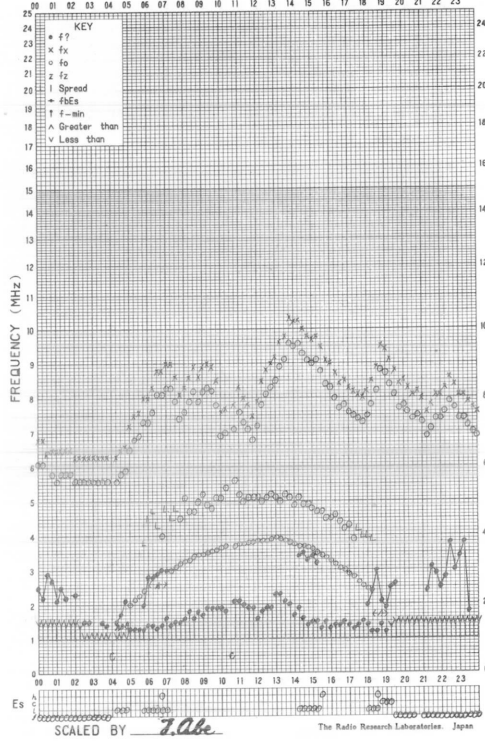
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE JUL 28 1969



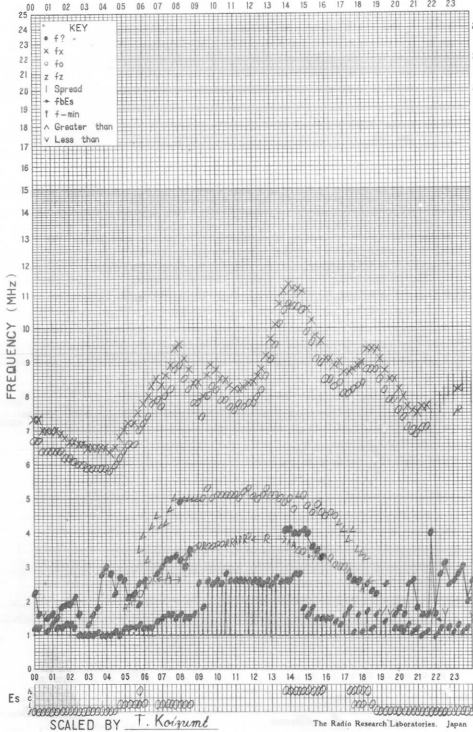
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE JUL 28 1969



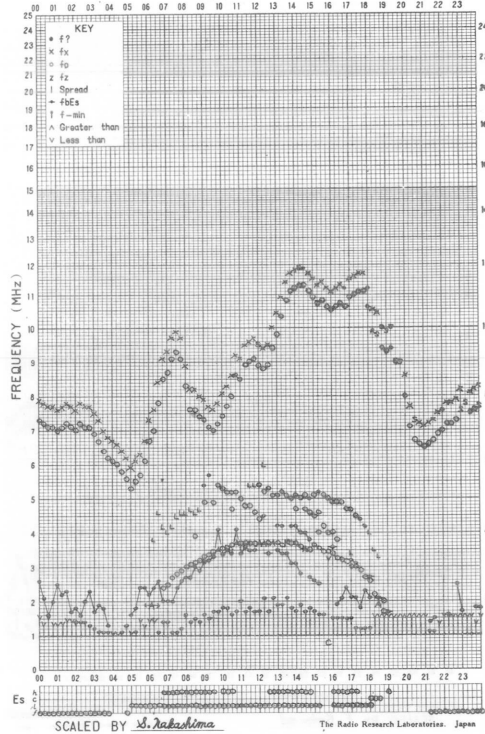
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE JUL 28 1969

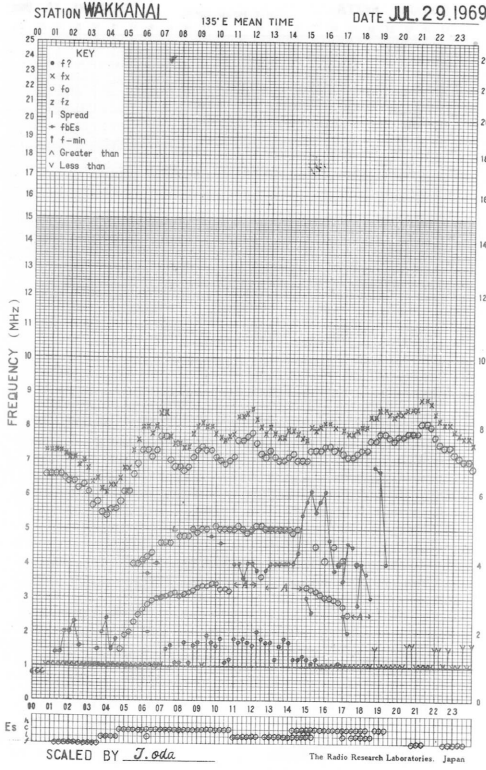


f-PLOT OF IONOSPHERIC DATA

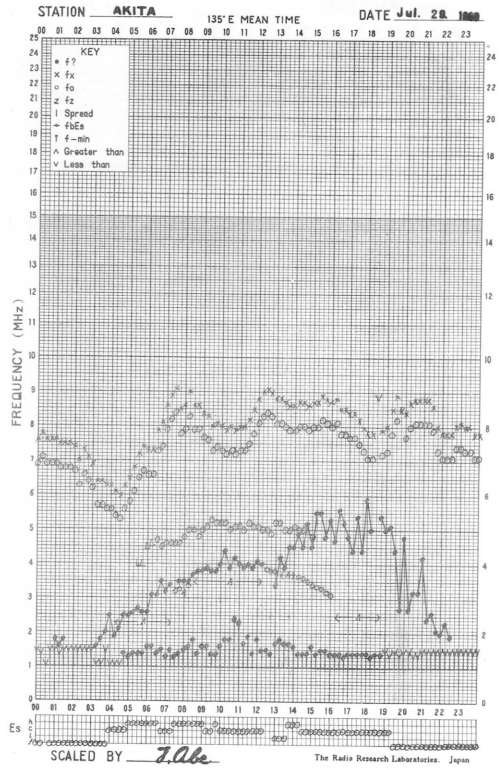
STATION YAMAGAWA 135° E MEAN TIME DATE JUL 28 1969



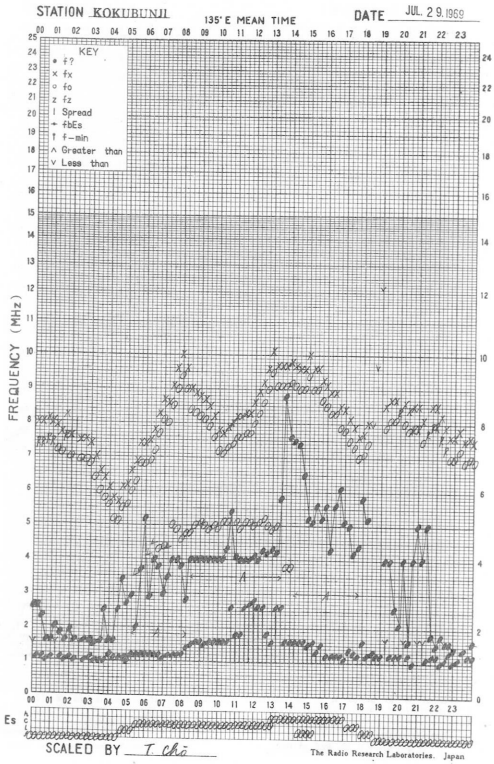
f-PLOT OF IONOSPHERIC DATA



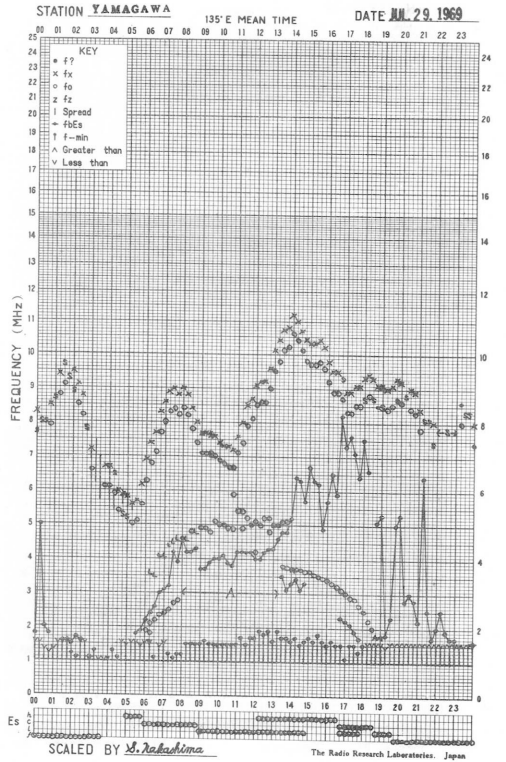
f-PLOT OF IONOSPHERIC DATA



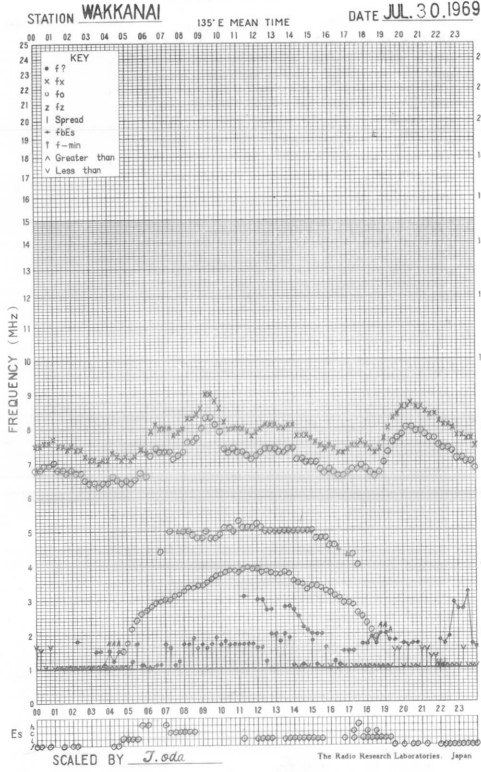
f-PLOT OF IONOSPHERIC DATA



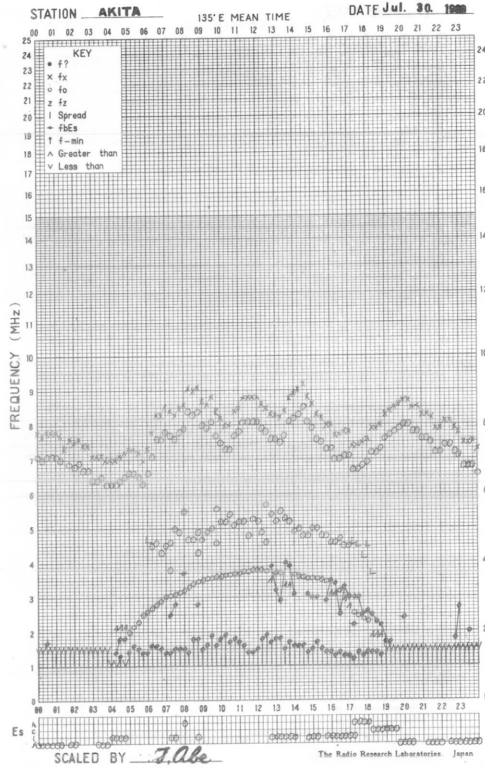
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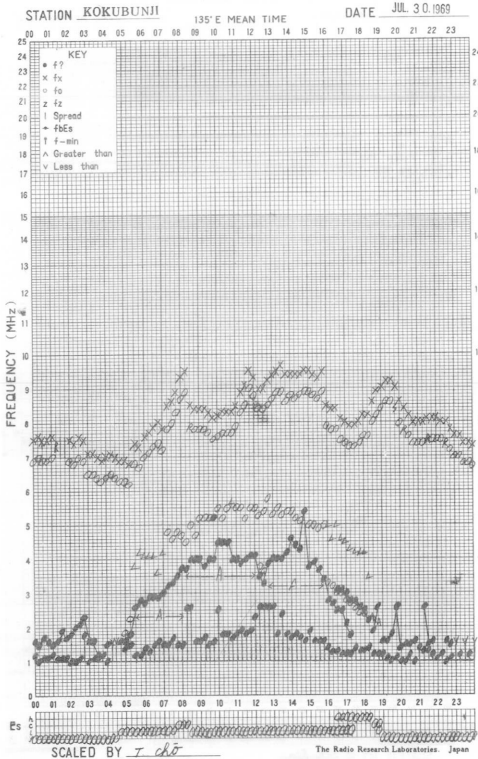
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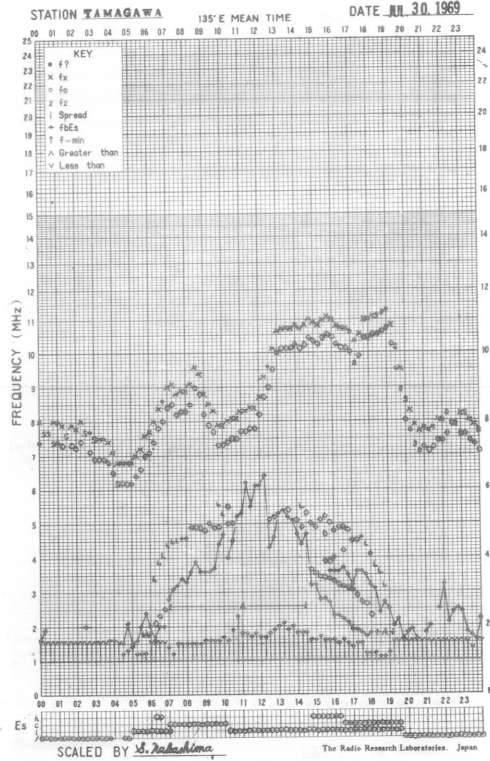
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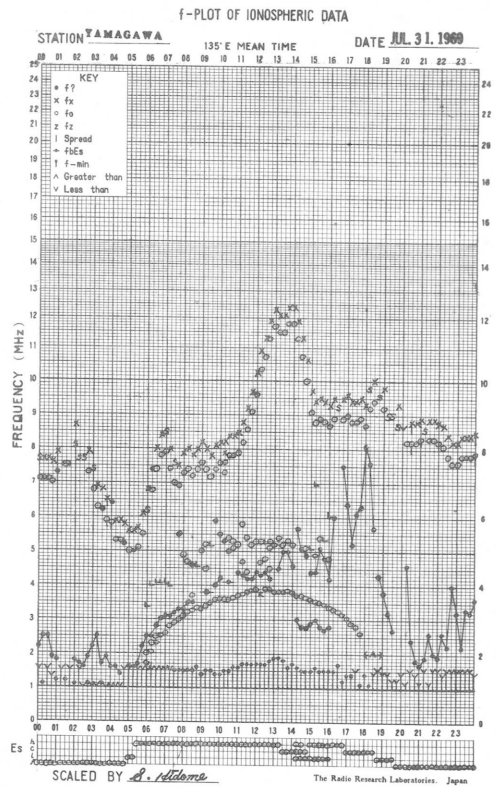
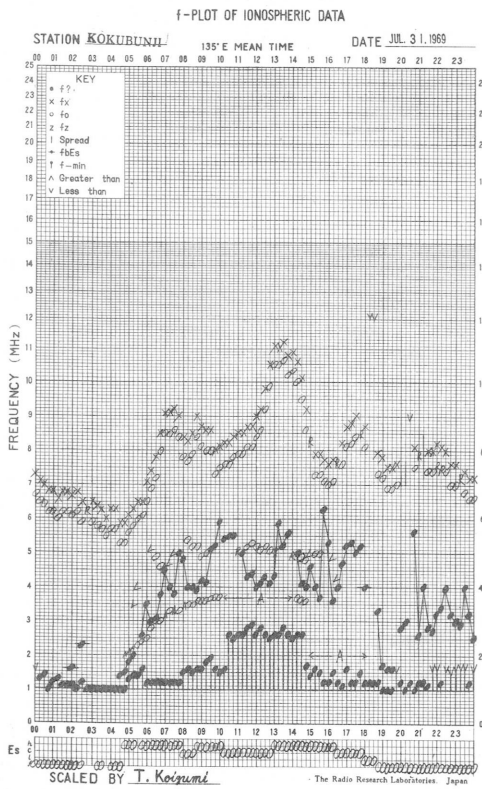
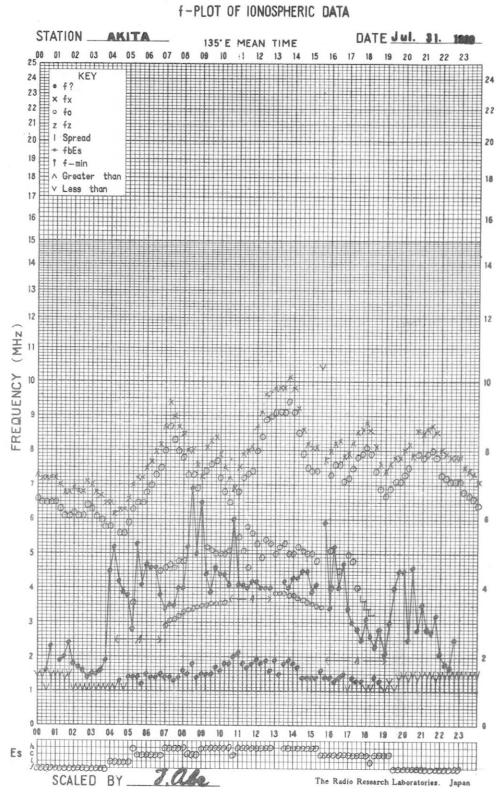
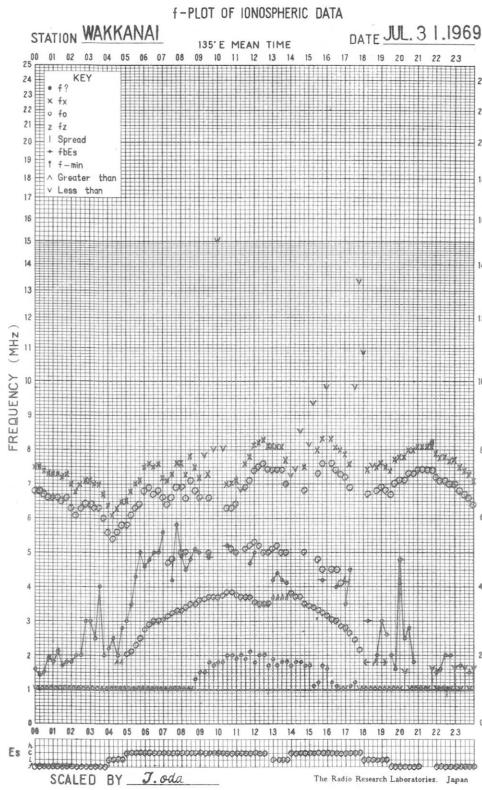


f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA





SOLAR RADIO EMISSION

Flux Density and Variability										
Month: July 1969						Frequency: 200 MHz				
Observing station: Hiraiso										
Flux density $10^{-22} W_m^{-2} (Hz)^{-1}$						Variability 0 to 3				
UT	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
Date										
1	5	6	6	5	6	0	0	0	0	0
2	6	5	6	5	6	0	0	0	0	0
3	6	6	6	5	6	0	0	0	0	0
4	6	6	6	-	6	1	0	0	-	0
5	6	6	7	6	6	0	1	0	0	0
6	5	6	6	6	6	1	0	0	0	0
7	6	7	8	11	7	1	1	1	1	1
8	10	10	10	-	10	1	1	1	-	1
9	7	8	7	-	7	0	1	0	-	0
10	7	6	7	-	7	0	0	0	-	0
11	6	7	7	-	7	0	0	0	-	0
12	7	6	-	-	7	0	0	-	-	0
13	7	6	7	-	7	0	1	0	-	0
14	7	6	7	7	6	1	0	0	1	0
15	7	8	11	-	8	1	1	1	-	1
16	9	6	6	-	7	1	0	0	-	0
17	7	7	7	(7)	7	0	0	1	(1)	0
18	7	8	10	10	8	1	1	1	1	1
19	(10)	13	16	7	12	(1)	1	1	0	1
20	7	7	7	6	7	0	0	0	0	0
21	6	6	7	q	6	0	*	*	0	0
22	7	7	7	7	7	0	0	0	0	0
23	7	7	6	6	7	0	0	0	0	0
24	7	7	7	6	7	0	0	0	0	0
25	7	7	7	6	7	0	0	0	0	0
26	7	6	7	6	7	0	0	0	0	0
27	6	6	6	6	6	0	0	0	0	0
28	6	6	6	6	6	0	0	0	0	0
29	6	6	6	6	6	0	0	0	0	0
30	6	6	6	7	6	0	0	0	0	0
31	7	7	7	18	7	0	0	0	0	0

Note No observations during the following periods:

4th	1930-	2400	13th	1930-	2400
6th	0400-	0500	15th	1930-	2400
8th	1930-	2400	16th	0800-	2400
9th	1930-	2400	17th	0500-	0600
10th	1930-	2400	17th	2200-	2400
11th	1930-	2400	19th	0100-	0330
12th	0600-	2400	19th	0450-	0700

*: interference by atmospherics.

"q" means quiet level, radiometer being unstable.

SOLAR RADIO EMISSION

<u>Flux Density</u>					
Month: July 1969					
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	28	27	26	27	27
2	29	28	27	28	28
3	28	28	27	28	28
4	29	29	27	28	27
5	30	30	30	30	30
6	32	31	30	29	31
7	32	32	30	33	31
8	32	31	31	33	32
9	32	31	31	32	32
10	31	31	29	-	31
11	31	29	28	31	29
12	28	27	27	30	28
13	29	29	28	28	29
14	28	28	29	31	28
15	30	30	29	29	30
16	29	28	28	28	29
17	30	31	29	28	29
18	29	29	27	30	28
19	27	28	27	30	28
20	27	27	25	27	26
21	27	26	26	q	26
22	26	26	25	26	26
23	25	24	23	26	25
24	26	27	26	27	26
25	26	25	25	25	26
26	26	25	24	27	25
27	26	25	25	27	26
28	26	27	25	27	26
29	25	26	25	-	26
30	31	31	31	29	31
31	29	29	28	31	29

Note No observations during the following periods:

1st	2030-	2130	12th	0730-	0830
3rd	0830-	0930	13th	0730-	0830
5th	0400-	0500	13th	2030-	2130
5th	1930-	2200	14th	0630-	0720
6th	1930-	2140	15th	2030-	2130
7th	2030-	2130	16th	0630-	0705
8th	2030-	2130	16th	2030-	2130
9th	2030-	2130	17th	0700-	0800
10th	0330-	0430	17th	2030-	2130
10th	2000-	11th 0010	18th	0130-	0300
11th	0330-	0430	18th	0500-	0630
11th	0730-	0800	29th	2045-	30th 0010

"q" means quiet level, radiometer being unstable.

Distinctive Events
(single-frequency observations)

Month: July 1969

Observing station: Hiraiso

Normal observing period: 1930 - 0950 (sunrise to sunset)

Date	Frequency	Starting time	Time of maximum	Duration	Type	Flux density $10^{-22} \text{ Wm}^{-2} (\text{Hz})^{-1}$		Remarks
	MHz	UT	UT	minutes		peak	mean	
6	200	0802.0	0803.0	1.0	C	430	120	
7	200	0342.5	0342.5	1.0	C	830	160	
	500	0538.0	0538.5	2.0	C	25	15	
	200	0537.0	0538.0	2.5	C	2130	360	
14	200	0811.0	0813.3	6.0	C	270	40	
19	500	2146	2305.5	279	C	40	5	

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

JUL 1969	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	-4	1	-1	0	4	9	10	-5	-3	-1	-1	1	13	22	22	15	9	8	-1	1	S	6	8	2
2	6	2	0	5	10	12	11	14	21	15	16	9	8	24	26	18	16	10	6	6	8	4	4	3
3	-3	-2	2	3	10	13	18	20	17	14	20	18	21	20	25	12	14	5	2	7	5	ES-3	-3	-1
4	-3	-2	0	2	8	15	19	21	21	21	18	14	24	17	21	14	14	9	3	1	1	1	3	1
5	-4	2	2	4	13	10	12	24	21	22	24	20	22	24	19	21	11	14	6	8	6	1	-2	-2
6	-5	2	3	5	8	9	14	16	17	17	15	15	22	22	19	15	12	10	3	2	4	-1	-1	-5
7	-3	-5	-4	4	7	13	11	27	17	12	7	-1	19	26	22	9	8	9	14	4	2	1	-2	-1
8	-9	-11	-3	1	-3	3	5	12	17	16	19	9	22	25	21	15	10	5	8	5	0	-2	1	-1
9	-5	1	3	2	8	8	12	14	8	12	10	1	15	19	22	18	11	14	6	5	-5	-3	11	2
10	-1	6	3	6	8	5	10	17	10	12	2	2	4	22	11	14	9	9	-8	1	6	8	2	1
11	4	4	0	C	7	C	C	16	15	9	2	ES-4	19	26	14	16	11	-45	7	7	3	-1	3	-1
12	-3	-1	-5	-1	6	9	13	14	16	2	-4	-5	0	10	19	16	17	18	3	4	5	8	12	-1
13	1	1	2	5	7	11	13	9	24	25	C	3	8	10	13	15	11	12	4	-1	9	-7	-8	ES-3
14	0	-2	-4	3	7	-4	1	8	4	ES-4	ES-6	ES-7	ES-7	-3	3	9	7	4	0	-4	-3	-6	-1	1
15	5	2	-3	-11	0	-2	15	11	-8	-7	-1	3	-2	16	15	6	8	2	4	-2	-1	9	-1	1
16	2	1	7	4	8	8	17	21	16	4	0	ES-3	ES-1	0	16	16	24	22	2	8	9	16	11	7
17	-1	7	2	6	7	8	12	11	6	ES-3	ES-3	ES-1	-6	16	17	15	8	4	2	5	2	3	-3	0
18	2	-6	-8	4	12	15	22	10	14	-5	ES-9	ES-5	-6	2	11	7	15	13	7	13	10	9	6	-2
19	3	8	4	-3	9	16	14	23	10	15	ES-2	ES-0	-5	17	21	8	11	8	7	4	4	0	0	4
20	5	8	9	12	16	14	16	3	17	16	5	-8	-7	14	6	8	14	12	9	4	-1	2	-3	4
21	7	4	5	6	10	13	13	14	-2	-2	ES-0	ES-6	2	21	19	16	14	14	-2	5	8	3	1	8
22	12	7	5	7	8	16	-3	-7	-6	1	2	US-1	-6	19	21	19	9	4	0	4	0	6	1	12
23	3	-3	-1	5	6	13	7	0	-4	-2	ES-6	8	4	16	8	9	11	9	12	-2	8	5	4	0
24	-1	0	-2	-9	1	4	11	-4	ES-2	ES-9	ES-13	ES-6	ES-5	16	11	9	17	6	6	4	-2	-3	-2	-2
25	7	-6	-3	1	3	11	2	10	11	14	5	ES-5	-2	7	11	10	11	7	-1	-1	7	-3	-5	0
26	1	-1	-4	-4	4	10	11	8	4	9	7	-1	-7	13	12	13	5	4	1	2	0	10	1	6
27	11	4	-9	1	US-1	ES-12	ES-12	ES-8	ES-11	-6	-11	-7	-7	ES-13	ES-8	-3	-6	ES-12	ES-19	ES-20	-19	ES-13	-13	-6
28	ES-16	-8	ES-25	-2	-5	8	6	-4	ES-13	ES-11	ES-5	ES-8	ES-17	12	0	3	1	14	0	6	7	4	0	-6
29	-6	-3	5	0	2	11	11	0	-2	8	16	13	18	21	17	13	7	13	1	1	1	-4	-3	-5
30	C	-7	-3	2	3	12	11	6	-7	18	1	-4	ES-8	20	20	7	4	8	1	3	5	-1	-2	-5
31	6	-6	-9	-3	6	1	9	8	-1	ES-5	ES-2	ES-3	ES-2	1	4	7	6	5	5	2	-9	-3	-6	-2
CNT	30	31	31	30	31	30	30	31	31	31	30	31	31	31	31	31	31	31	31	31	30	31	31	31
MED	0	1	0	2	7	10	11	11	10	9	US-2	US-1	US-2	17	17	13	11	9	3	4	4	1	0	0
UD	7	7	5	6	12	15	18	23	21	21	19	15	22	25	22	18	17	14	9	8	9	9	11	7
LD	-6	-7	-9	-4	-1	-2	1	-5	ES-8	ES-7	ES-9	ES-7	ES-9	0	3	6	4	2	-2	-2	-5	ES-6	-6	ES-5

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

JUL 1969	FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M																							MEASURED AT HIRAISO			
UT DAY	00H 45M	01H 45M	02H 45M	03H 45M	04H 45M	05H 45M	06H 45M	07H 45M	08H 45M	09H 45M	10H 45M	11H 45M	12H 45M	13H 45M	14H 45M	15H 45M	16H 45M	17H 45M	18H 45M	19H 45M	20H 45M	21H 45M	22H 45M	23H 45M			
1	-3	-9	-5	-2	11	9	18	15	19	24	24	24	20	13	11	11	11	12	0	3	3	6	-2	0			
2	1	0	2	9	10	15	18	20	23	26	25	24	17	21	16	ES-5	16	6	-7	7	5	0	-2	-3			
3	ES-5	-5	-1	-1	6	12	16	14	21	23	26	19	15	5	9	2	12	9	10	2	3	0	-1	-7			
4	-7	-4	0	5	15	16	21	23	16	20	27	15	21	14	18	19	22	10	8	5	6	-1	-1	-1			
5	ES-1	-5	2	5	8	14	22	22	19	22	20	21	19	20	24	18	18	11	4	2	4	-5	-7	-2			
6	-1	-1	0	1	3	13	15	18	22	20	19	19	20	18	22	13	15	15	15	9	3	1	0	ES-5			
7	-4	-10	-1	4	7	13	17	11	20	20	22	20	20	23	21	22	21	8	6	13	3	ES-1	-2	-4			
8	-8	-13	-8	-4	-1	4	4	15	20	26	22	20	11	21	21	13	22	20	17	4	1	-6	-11	-2			
9	-6	-2	-3	-3	5	10	12	8	24	23	20	22	22	18	19	21	17	14	4	-7	4	-3	-4	0			
10	1	-4	-1	-2	8	10	4	16	20	26	19	15	17	17	12	17	17	12	4	2	S	-1	2	-1			
11	-2	0	-2	C	C	C	C	18	24	24	15	12	12	14	16	22	13	-2	6	3	1	-1	-5	-4			
12	-5	-6	-3	-1	6	8	8	12	16	13	15	15	13	13	8	ES-15	19	13	-1	4	2	-2	-1	-3			
13	-3	-3	0	0	6	11	16	16	24	C	21	16	18	16	20	15	16	18	10	4	6	1	-8	ES-14			
14	ES-19	-19	-1	-1	2	16	15	20	22	22	17	14	15	19	23	16	10	10	6	1	1	-1	-3	-3			
15	2	-1	0	3	5	12	13	14	14	19	20	17	21	13	17	ES-8	6	11	-6	-3	8	1	-4	-2			
16	0	-2	1	4	9	14	19	26	24	19	21	19	16	21	14	-2	12	-1	-6	11	5	-1	3	2			
17	1	-3	-2	6	6	8	11	21	16	21	22	22	18	14	7	-5	8	14	3	3	2	7	-5	ES-1			
18	-3	-8	-3	8	12	15	14	20	20	22	20	15	19	22	19	17	15	25	6	2	2	0	ES-0	ES-5			
19	2	0	-4	1	11	-2	20	21	23	22	23	27	17	23	23	-4	11	11	7	3	-2	4	6	0			
20	-3	-3	7	9	14	13	22	22	21	20	16	14	13	6	7	14	14	18	-6	-2	2	-5	-3	0			
21	-1	-10	-1	3	7	15	19	21	19	27	19	11	18	18	14	-2	-3	8	5	11	-2	-1	-1	-4			
22	1	2	-1	2	10	15	18	18	23	22	18	22	15	14	19	17	12	8	8	4	5	7	2	-1			
23	-9	-7	-5	-1	6	13	15	15	23	20	14	24	21	5	20	14	9	12	-1	3	2	4	1	-7			
24	-15	-11	-10	-2	4	8	14	18	19	19	19	18	15	16	1	-5	-1	19	-3	2	-2	-9	-13	-8			
25	-10	-11	-8	0	6	9	11	22	12	24	20	17	13	18	ES-1	11	15	11	6	-1	-4	-10	-5	-13			
26	-3	-10	-12	-4	4	7	14	13	19	16	21	19	10	12	ES-8	-7	12	5	1	9	3	1	-9	-6			
27	-7	-9	-1	1	2	1	13	14	17	19	19	12	5	-1	12	2	17	7	-6	1	-5	ES-3	ES-13	-12			
28	-9	-2	7	7	5	14	7	21	19	9	12	13	14	6	ES-11	ES-12	-10	6	-1	2	0	-1	-5	-6			
29	-2	-4	-3	3	8	14	18	22	19	17	17	18	19	17	1	ES-32	-6	12	9	2	-2	-3	-5	-5			
30	C	-7	-3	3	4	12	11	2	16	27	19	16	21	17	20	20	11	13	1	6	-2	-7	-7	-6			
31	-2	-13	-8	-5	6	11	13	18	20	21	16	20	16	17	18	-1	11	18	5	-1	3	-6	-8	-3			
CNT	30	31	31	30	30	30	30	31	31	30	31	31	31	31	31	31	31	31	31	31	30	31	31	31			
MED	US-3	-5	-1	1	6	12	15	18	20	22	20	18	17	17	16	11	12	11	4	3	2	US-1	US-3	US-3			
UD	1	0	2	8	12	15	21	22	24	26	25	24	21	22	23	21	21	19	10	11	6	6	2	ES-0			
LD	ES-10	-13	-8	-4	2	4	7	11	16	16	15	12	11	5	ES-1	ES-12	-3	5	-6	-2	-2	ES-9	ES-11	ES-12			

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Jul. 1969	Whole Day Index	H B		W W V				L M				W W V H				Warning				Principal magnetic storms			
		06	12	18	00	06	12	18	00	06	12	18	00	06	12	18	00	06	12	18	Start	End	ΔH
		12	18	24	06	12	18	24	06	12	18	24	06	12	18	24	06	12	18	24			
1	4o	4	4	4	4	4	4	(4)	5	4	-	4	4	5	4	4	N	N	N	N			
2	4o	4	4	4	(4)	4	4	(3)	4	4	-	5	5	5	4	N	N	N	N				
3	4+	4	4	4	4	5	5	5	4	3	-	C	4	4	4	4	N	N	N	N			
4	4+	4	4	4	(5)	4	5	5	4	4	-	5	5	4	4	(3)	N	N	N	N			
5	5-	4	4	4	5	5	5	5	5	4	-	-	4	5	5	5	N	N	N	N			
6	5-	4	4	4	5	5	5	5	(5)	-	-	-	5	5	5	5	N	N	N	N			
7	4+	4	4	4	4	4	5	5	5	5	-	4	4	4	4	4	N	N	N	N			
8	4+	4	4	4	4	4	5	5	4	4	-	4	4	4	5	4	N	N	N	N			
9	4o	4	4	4	4	4	4	4	4	4	-	4	4	4	4	4	N	N	N	N			
10	4o	4	4	4	5	4	4	4	4	4	-	4	4	4	4	4	N	N	N	N			
11	5-	4	5	5	5	4	5	5	4	4	-	5	4	4	4	4	N	N	N	N			
12	4+	4	4	4	4	4	4	(5)	5	5	-	-	4	4	4	4	N	N	N	N			
13	4o	4	4	(4)	4	4	4	(3)	(4)	-	-	-	4	4	4	4	N	N	N	N			
14	4-	4	4	4	(3)	3	3	(3)	4	4	-	(4)	3	4	4	4	N	N	N	N			
{15}	4o	4	4	5	3	4	4	4	5	4	-	(4)	4	4	3	4	N	N	N	N			
{16}	4o	4	4	4	4	3	4	4	4	4	-	4	4	4	3	4	N	N	N	N			
{17}	4o	4	4	4	4	4	4	4	4	4	-	4	4	4	3	C	N	N	N	N			
18	4-	4	4	4	3	4	4	4	(3)	(3)	-	4	4	4	4	4	N	N	N	N			
19	4o	4	4	4	4	4	4	4	4	4	-	-	4	4	4	4	N	N	N	N			
20	4o	4	4	4	4	4	(4)	4	(4)	-	-	-	4	4	4	4	N	N	N	N			
21	4o	4	5	4	4	4	4	4	(3)	-	-	-	4	4	4	C	N	N	N	N			
22	4-	4	4	4	3	4	4	3	3	C	-	C	4	4	4	4	N	N	N	N			
23	4-	4	4	4	3	4	4	3	C	C	-	C	4	4	4	4	N	N	N	N			
24	4-	4	4	4	3	3	4	4	C	C	-	C	4	4	4	4	N	N	N	N			
25	4o	(4)	(4)	4	4	4	(4)	C	C	C	-	C	4	4	4	4	N	N	N	N			
26	4o	4	4	3	4	4	4	4	C	C	-	C	4	4	4	4	N	N	N	N	11.52	---	150 ^Y
27	3o	3	4	(3)	3	3	3	2	C	C	-	C	4	4	3	3	N	U	U	U	---	16xx	
28	3+	(3)	4	4	(3)	2	4	4	C	C	-	C	4	4	3	3	N	N	N	N			
29	4-	4	C	C	3	4	4	4	C	C	-	C	4	4	3	3	N	N	N	N			
30	4o	4	4	4	5	4	4	4	C	C	-	C	4	4	5	(4)	N	N	N	N			
31	4o	4	4	4	4	4	4	4	C	C	-	C	4	4	4	4	N	N	N	N			

IQSY GEOALERT and ADALERT (Western Pacific Region)

* = MAGSTORM

o = MAGCALME

Δ = COSMIC EVENT

() = Regular World Day

C = artificial accident

- = impossible to evaluate

--- = continuing magnetic storm

() = inaccurate

SUDDEN IONOSPHERIC DISTURBANCES (S.I.D.)

HIRAISO

No Sudden Ionospheric Disturbance was observed during July, 1969.

I N U B O

1969	S P A											Time (U. T.)			Remarks
Apr.	Phase Advance (degrees)										Time (U. T.)				
DATE	GBR	WWVL	NAA	NWC	NFM	HAO	HA2	HA3	AIO	AI2	AI3	Start	End	Maximum	
1					<u>8</u>	—	8		—	—		2 3 5 0	0 0 3 0	0 0 0 3	
2		14	10	—	<u>17</u>	—	13	14	—	—	14	0 1 1 2	0 2 3 0	0 1 2 8	
2		<u>25</u>	10	—	<u>21</u>	—	17	16	—	—	18	0 2 3 6	0 3 3 0	0 2 4 1	
2				16	—	—	—	—	—	—		0 5 1 8	0 5 4 4	0 5 2 4	
2				16	—	—	—	—	—	—		0 5 4 4	0 6 1 5	0 5 5 0	
4				<u>40</u>	28	—	21	18	—	—	25	0 3 4 0	0 4 2 2	0 3 4 7	
5					<u>12</u>	—	7	7	—	—	11	0 3 4 1	0 4 3 0	0 3 4 9	
5				12	—	—	—	—	—	—		0 5 3 7	0 6 1 6	0 5 4 4	
6					<u>17</u>	—	13	11	—	—		2 3 1 1	0 0 3 0	2 3 1 7	
8				<u>16</u>	7	—	4	5	—	—		0 3 2 2	0 4 1 0	0 3 3 0	
9			6	12	14	—	15	11	—	—	<u>18</u>	0 3 4 4	0 4 0 9	0 3 4 9	
10	95	58	77	<u>136</u>	95	—	99	94	—	—	76	0 3 5 9	0 6 3 0	0 4 0 8	
12				12	<u>39</u>	—	29	29	—	—		2 2 2 3	2 3 3 0	2 2 4 4	
14				56	<u>30</u>	—	20	22	—	—		0 4 3 7	0 5 4 5	0 5 0 1	
14				<u>32</u>	—	—	—	7	—	—		0 5 5 9	—	0 6 1 0	
14				12	—	—	—	—	—	—		0 6 5 0	0 7 4 0	0 7 0 4	
14					<u>30</u>	—	24	—	—	—		2 2 0 0	2 3 0 0	2 2 2 0	
15		36	19	<u>48</u>	38	—	33	32	—	—		0 0 0 8	0 1 2 5	0 0 2 7	
15				—	—	—	26	—	—	—		2 3 4 0	—	0 0 0 5	
16				—	—	—	12	—	—	—		0 0 2 9	0 1 3 0	0 0 4 5	
16			<u>13</u>	8	—	—	—	—	—	—		0 7 0 2	0 7 3 3	0 7 0 7	
16					<u>55</u>	—	46	—	—	—		2 0 4 0	2 2 0 0	2 1 0 7	
18					—	—	—	—	—	—		0 4 3 9	0 5 5 4	0 4 5 5	
19	30	<u>36</u>	13	<u>44</u>	—	—	—	—	13	—		2 2 4 6	2 3 3 2	2 2 5 3	
19			19	24	—	40	—	—	18	20	—	0 2 0 4	0 3 1 0	0 2 1 5	
20			6	<u>44</u>	—	50	—	—	—	18	—	—	—	—	
20				12	—	—	—	—	—	—		0 7 0 9	0 7 5 0	0 7 2 0	
21	15		10	<u>36</u>	—	—	—	—	13	—		0 1 4 6	0 2 4 0	0 1 5 8	
21			19	<u>56</u>	—	—	—	—	23	—		0 3 4 6	0 5 4 0	0 3 5 1	
21				<u>16</u>	—	—	—	—	18	—		0 8 3 0	0 9 1 0	0 8 3 5	
21	30			—	—	—	—	—	—	—		0 9 2 0	1 0 3 0	0 9 2 6	
21	50	43	96	—	<u>101</u>	—	—	—	—	—		2 0 0 9	2 1 2 8	2 0 1 7	
22				12	—	—	—	—	—	—		0 0 0 6	0 0 4 0	0 0 1 0	
23	50	43	29	—	<u>65</u>	—	—	—	43	—		0 3 2 4	0 4 4 8	0 3 3 9	
24	80	122	64	<u>128</u>	—	<u>126</u>	—	—	73	—		0 3 1 0	0 4 2 8	0 3 2 5	
26	50	<u>86</u>	70	84	—	94	—	—	50	—		2 3 0 4	0 0 0 7	2 3 0 0	

INUBO

1969	S P A										Remarks
May	Phase Advance (degrees)							Time (U.T.)			
DATE	GBR	WWVL	NAA	NWC	HA3	AL2	AL3	Start	End	Maximum	
2				<u>12</u>	7			0235	0310	0240	
6	50	86	45	<u>100</u>	76	65	72	0237	0450	0255	X
6	30		26	<u>52</u>	18	32	29	0637	0750	0650	X
7		<u>36</u>	13	—	29	11	22	0157	0244	0202	X
12			13	<u>28</u>	18	13		0140	0212	0147	X
12				24				0544	0720	0614	X
13				8	<u>11</u>			2303	2346	2314	X
15		14		16	<u>20</u>			2220	2336	2250	
17				<u>24</u>	14			0425	0520	0433	
17				16				0653	0733	0705	X
17		50	<u>96</u>		76			1922	2040	1930	
17						42		2221	2340	2255	
18				16	11	42	<u>25</u>	0104	0145	0115	X
18	40	25	35	92	79	34	<u>94</u>	0224	0406	0231	X
18	40	29	26	<u>68</u>	18	43	40	0548	0724	0607	X
18				8				0815	0848	0820	X
18		29	26	<u>47</u>				2059	2215	2113	X
19			10	<u>32</u>	—	14	—	0400	0450	0404	
19	40		19	<u>80</u>	—	58	—	0536	0730	0605	
19	10	<u>25</u>	19	24	—	—	—	2320	0001	2323	X
20	30	43	58	<u>80</u>	—	39	—	0035	0133	0043	X
20				24	—	—	—	0308	0337	0312	
20				12	—	—	—	0346	0408	0350	X
21	<u>25</u>		13	—	—	—	—	0152	0230	0203	X
21	20	22	16	<u>52</u>	—	—	—	0528	0653	0540	
22	35	43	26	<u>72</u>	—	27	—	0438	0553	0455	X
23				8	—	—	—	0408	0430	0410	
23				16	—	—	—	0433	0510	0440	
25				8	—	—	—	0456	0527	0500	
25				8	—	—	—	0757	0831	0800	
26				16	—	—	—	0614	0650	0621	X
27	30	58	32	<u>64</u>	—	31	—	0054	0247	0100	X
27			58	—	—	—	—	0138	0400	0142	
29	35	<u>83</u>	51	80	—	48	—	0023	0138	0033	X
29	90	72	77	<u>136</u>	—	83	—	0407	0550	0417	
29		<u>101</u>	70	—	—	—	—	1942	2111	1955	
30		29	13	<u>32</u>	—	—	—	0421	0557	0450	
30	35	40	22	<u>56</u>	—	33	—	0612	0743	0627	
31		<u>151</u>	109	—	—	—	—	2104	0000	2127	X

INUBO

1969	S P A									Remarks
Jun.	Phase Advance (degrees)						Time (U.T.)			
DATE	GBR	WWVL	NAA	NWC	NPG	AL2	Start	End	Maximum	
3		22	13	<u>32</u>	—	12	0127	0231	0137	X
3			10	<u>48</u>	—	22	0423	0600	0444	X
3					—	21	0720	0830	0752	X
4	35	18	22	<u>72</u>	—	44	0629	0750	0643	X
5		29	26	<u>72</u>	—	28	0219	0337	0235	
5			6	<u>24</u>	—		0424	0510	0430	X
5	<u>160</u>		38	—	—	131	0955	1130	1008	X
5		<u>36</u>	20	—	—		2134	2206	2141	
5	25	<u>90</u>	51	48	—	40	2312	0011	2334	
6	35	54	32	<u>56</u>	—		0050	0230	0125	
6	60	<u>94</u>	32	96	—	78	0437	0629	0520	X
6	40		22	40	—	<u>44</u>	0634	0730	0653	X
6	<u>20</u>			12	—	16	0740	0800	0750	
6	<u>80</u>				—	62	0950	1130	1000	
6		65	22	48	—	<u>64</u>	2356	0135	0034	
7	40	<u>94</u>	64	72	—		0020	0140	0029	X
7	20			<u>24</u>	—	18	0426	0524	0435	X
7	<u>70</u>		32	<u>64</u>	—	46	0808	0900	0812	
7	<u>50</u>				—	44	0955	1110	1007	X
8	15	<u>43</u>	13	40	—	13	0152	0250	0200	
8				16	—		0328	0413	0334	X
8	20			<u>32</u>	—	29	0753	0857	0810	X
9				16	—		0053	0120	0057	
9				8	—		0124	0154	0132	
9	15			<u>24</u>	—		0627	0703	0633	X
10				16	—		0007	0040	0015	
10				8	—		0738	0810	0742	X
11				—	—	26	0145	0300	0200	
11				16	—		0522	0557	0527	X
12				16	—		0105	0133	0110	
12				8	—		0300	0344	0310	
14				<u>24</u>	—		0426	0550	0500	
15				<u>72</u>	—	44	0332	0550	0413	X
16		<u>65</u>	26	—	40		2021		2028	
16		<u>86</u>	64	—	67		2047	2351	2106	X
18				—	13		0152	0243	0204	
23		14	<u>19</u>	—	13	16	0253	0338	0300	X
24		<u>22</u>	<u>19</u>	—	13		0041	0145	0052	

I N U B O

1969	S P A									Remarks
Jul.	Phase Advance(degrees)						Time (U. T.)			
DATE	GBR	WWVL	NAA	NWC	NPG	AL2	Start	End	Maximum	
2		29	<u>38</u>	—	20	12	0115	0216	0126	
2	17		<u>32</u>	—	10	18	0348	0418	0355	X
3	<u>29</u>			—		24	1516	1630	1532	X
4		32	<u>35</u>	—	10		0008	0047	0022	X
4		<u>50</u>	29	—	10		0050	0125	0055	
24				23	—		0236	0311	0247	X

IONOSPHERIC DATA IN JAPAN FOR JULY 1969

第 21 卷 第 7 号

1969年11月20日 印 刷
1969年11月25日 發 行 (不許複製非売品)

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

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