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IONOSPHERIC DATA IN JAPAN

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NUKUI-KITAMACHI, KOGANEI-SHI, TOKYO, JAPAN

CONTENTS

SITE OF THE RADIO WAVE OBSERVATORIES AND HIRAISO BRANCH

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

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

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

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

SYMBOLS AND TERMINOLOGY

A. IONOSPHERE

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

Terminology

f_oF2, f_oF1, f_oE — The ordinary wave critical frequency for the $F2$, $F1$ and E layers, respectively.

f_oEs — The ordinary wave top frequency corresponding to highest frequency at which a mainly continuous trace is observed.

f_bEs — The lowest ordinary wave frequency at which the Es layer begins to become transparent. This is usually determined from the minimum frequency at which reflections from layers at greater heights are observed.

f-min — The frequency below which no echoes are observed.

$M(3000)F2$ — The maximum usable frequency factor for a path of 3000 km for transmission by $F2$ layer.

$M(3000)F1$ — The maximum usable frequency factor for a path of 3000 km for transmission by $F1$ layer.

$h'F2$ — 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.

$h'Es$ — The lowest virtual height of the trace used to give the f_oEs.

$hpF2$ — The virtual height of the $F2$ layer measured on the ordinary

wave component at a frequency equal to $0.834 f_0F2$.

ypF2 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 $0.969 f_0F2$).

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 *Es*.

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 extra-ordinary component.
O	Extraordinary component characteristic deduced from the ordinary component. (Used for x- characteristics only.)
T	Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
U	Uncertain or doubtful numerical value.
Z	Measurement deduced from the third magneto-ionic component.

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

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

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

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

d. Description of Standard Types of *Es*

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

F	An *Es* 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 *Es* traces observed in the daytime are classified according to their virtual hight: *H* or *L*.
L	A flat *Es* 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 *Es* 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 *Es* 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 *Es* trace lying clearly above the high frequency end of the normal *E* trace. (Usually a daytime type.)
Q	An *Es* trace which is diffuse and non-blanketing over a wide

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

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

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

S A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace. The rising trace alone is classified as *'S'*; the horizontal trace is classified separately. At high latitudes the slant trace usually starts to rise from a horizontal *Es* trace such as *Es-L*, or *Es-F*, at frequencies which greatly exceed the *E* layer critical frequency, whereas at low latitudes it usually rises from *Es-Q Es-C* or *Es-H* at frequencies near the regular *E* critical frequency. Type *S* is never used to determine f_0Es and $h'Es$. The slant trace is sometimes observed to start at f_0E without echoes clearly identifiable as *Es* echoes being seen.

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

e. Multiple Reflections from *Es*

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

B. SOLAR RADIO EMISSION

Solar radio observations are carried out on 200 and 500 MHz at 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 $10^{-22}\,W \cdot m^{-2} Hz^{-1}$ 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	λ/2 vertical	λ/2 vertical
Distance	9150 km	6270 km

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

Receiver

Antenna	4.5m 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 atmospherics.

U : Inaccurate measurement influenced by interferences, atmospherics, or non-propagational reasons.

E : Less than the following figure.

b. Radio Propagation Quality Figures

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

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

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

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

N = normal
U = unstable
W = disturbed

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

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

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

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

(i) SWF

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

Circuits and Drop-out intensities

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

Start-time and Duration

Types

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

Importances

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

1−	1	1+
2−	2	2+
3−	3	3+

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

(ii) SPA

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

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

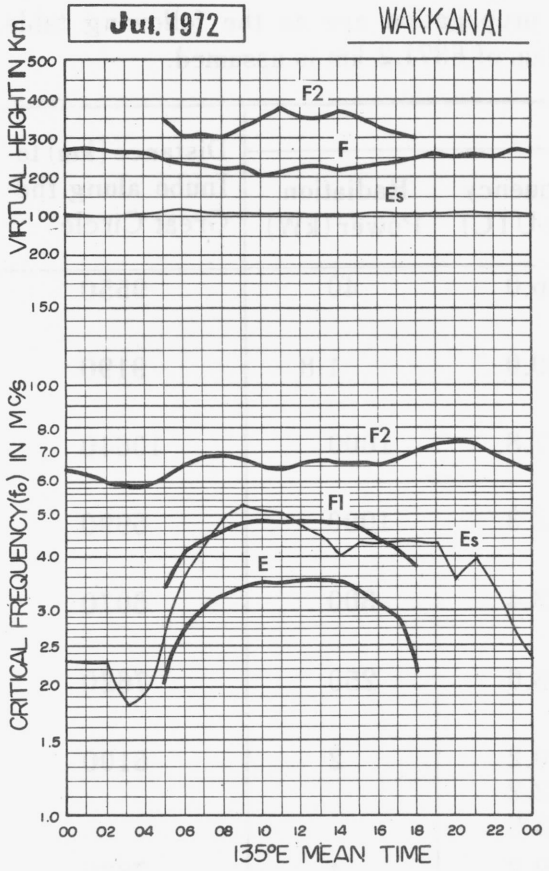
Transmitting Site					Distance (km) to Inubo along the Great Circle
Name	Location (Geographic Coordinate)	Station Call	Frequency (kHz-UTC)	Radiation Power (kW)	
Rugby	52°22′N 001°11′W	GBR	16.0	40	9550
Fort Collins	40°41′N 105°03′W	WWVL	20.0	1.8	9190
Cutler	44°39′N 067°17′W	NAA	17.8	1000	10640
North West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

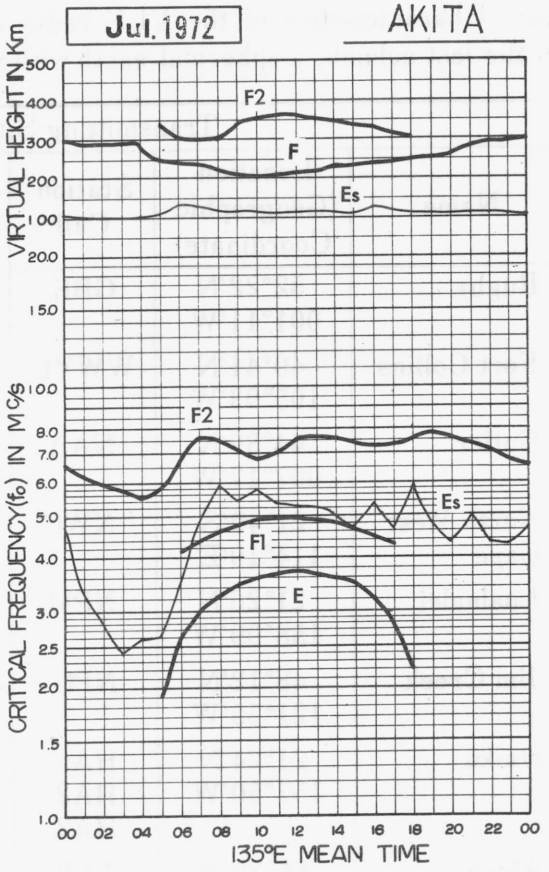
The phase advance is shown in its maximum stage. In the column 'Phase Advance', — means no transmission or no reception during the period, and blank means indistinguishable record.

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.

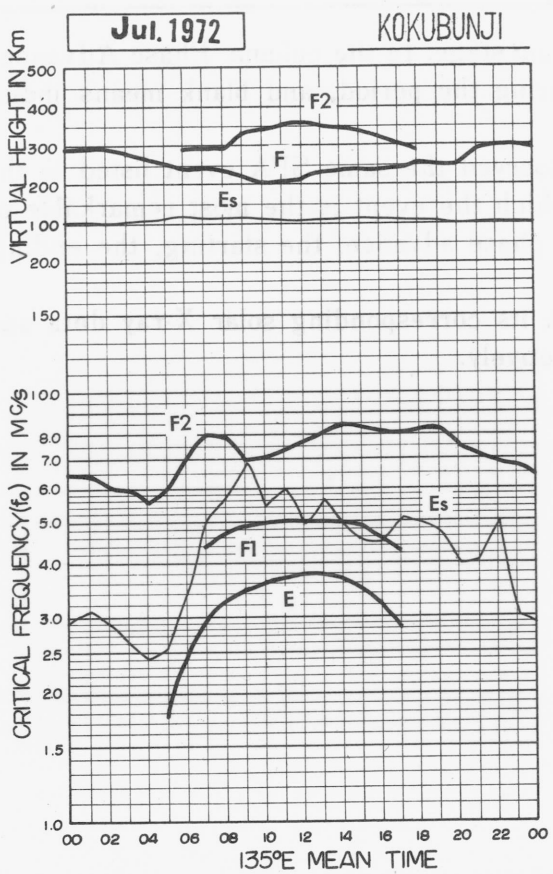
In the column 'Remarks', the event with its corresponding solar X-ray data and solar radio data is shown by 'X' and 'R', respectively.

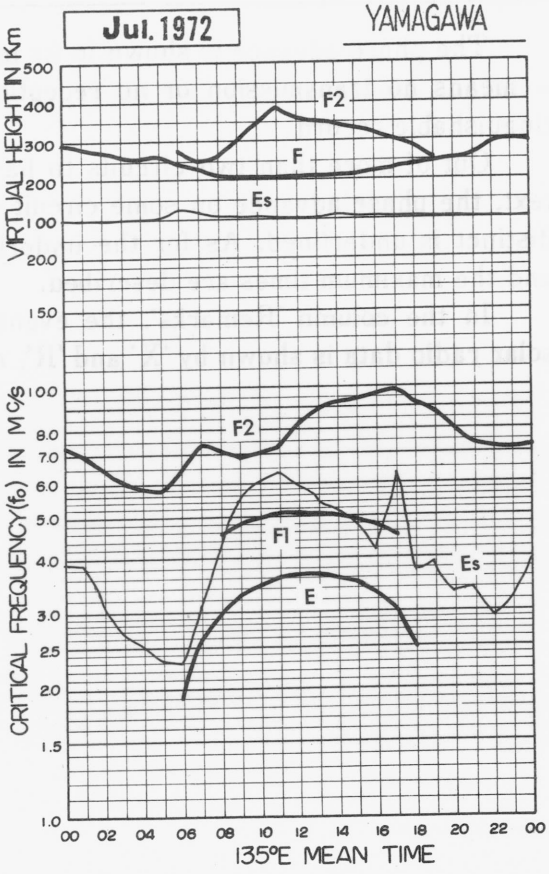
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	70	66	60	59	65	73	75	69	75	75	80	R	75	74	70	69	71	73	73	77	83	S	S	77
2	C	C	C	C	C	C	C	A	78	78	83	A	70	71	73	69	66	66	70	75	83	82	C	C
3	C	C	67	64	C	C	71	80	77	68	67	79	80	68	70	69	65	65	71	75	78	70	70	68
4	C	C	C	63	C	C	C	C	C	66	A	C	73	81	78	82	77	72	73	76	78	74	S	S
5	70	68	66	66	70	70	68	76	76	77	78	78	78	73	67	A	67	A	70	86	81	84	S	74
6	72	73	70	67	66	66	75	88	90	87	79	81	74	H 67	69	71	74	72	75	80	86	88	86	84
7	79	73	73	73	69	81	95	88	86	84	83	A	86	85	86	R	R	A	A	88	95	S 96	S	S 85
8	S 83	S	S	S	F 60	61	63	73	74	75	A	68	A	A	A	76	74	76	A	84	S	S 90	84	S 85
9	S	S 68	F 67	F 60	F 57	A	63	65	62	54	R	A	54	53	53	53	55	56	59	64	67	71	71	64
10	66	63	66	F 57	61	61	58	75	69	68	75	81	80	68	73	A	A	A	A	86	88	90	78	71
11	68	67	66	60	60	65	69	81	85	85	73	73	74	70	66	68	66	70	74	81	84	80	78	73
12	70	68	62	57	59	67	75	81	83	80	65	65	66	69	73	75	73	A	70	81	76	F	F	F
13	65	C	C	C	C	C	C	C	C	67	C	56	57	58	59	58	64	63	A	70	73	73	69	66
14	60	57	53	48	51	58	66	76	78	77	64	64	63	67	68	72	64	61	62	72	78	73	69	66
15	63	65	60	58	55	61	63	65	73	74	65	64	63	65	66	64	64	61	66	68	72	75	S	65
16	59	I S 58	58	54	58	58	I C 54	66	62	62	54	51	R	57	60	62	63	61	63	64	73	71	76	65
17	63	63	60	60	63	74	63	65	63	A	A	A	60	60	58	60	63	60	57	56	65	65	65	65
18	61	62	I C 64	63	66	63	78	75	67	63	58	55	63	65	60	68	61	63	64	74	69	I S 67	S 66	61
19	56	54	S	56	57	53	60	A	56	56	A	A	68	71	67	65	61	68	68	68	74	70	65	67
20	64	63	60	55	53	C	57	63	63	66	64	68	A	69	74	72	68	70	74	75	76	73	67	64
21	65	63	64	59	F 58	58	66	64	R	59	57	56	63	66	60	61	66	66	A	76	65	64	66	63
22	F 63	62	58	54	56	59	55	69	61	59	65	65	66	68	65	67	68	67	65	73	73	66	S	F 64
23	F 65	F	F	F	F 54	60	69	80	93	76	A	63	64	67	63	64	65	71	71	78	I S 80	77	67	64
24	63	58	54	50	51	58	64	59	58	52	60	57	A	58	57	A	56	57	A	A	S	F	F 65	F
25	F	F	F	F	F 48	51	60	66	62	A	57	56	54	56	53	50	51	58	62	68	67	64	59	63
26	60	55	57	50	44	50	60	61	58	55	A	51	R	53	50	47	52	54	60	66	70	68	57	47
27	47	47	43	43	38	46	60	63	64	54	56	57	62	62	58	61	66	72	73	70	69	70	65	63
28	63	57	56	50	48	57	69	81	69	63	57	62	A	A	58	63	65	67	72	75	79	F	F	F
29	F	54	48	F 46	F	56	70	70	61	56	C	52	53	55	55	59	55	59	56	57	63	63	63	62
30	57	55	54	53	50	58	68	69	65	62	66	65	78	70	67	66	68	68	64	66	69	74	F 70	F 71
31	F	63	61	58	58	61	66	68	75	75	68	71	78	83	79	77	75	71	73	69	75	73	69	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	24	24	24	26	26	25	28	27	28	29	22	24	25	29	30	27	29	27	25	30	29	27	22	26
MED	64	63	60	58	58	60	66	69	69	67	65	64	66	67	66	66	65	66	70	74	75	73	68	66
UQ	69	66	66	60	61	65	70	78	78	76	75	70	75	70	70	70	68	70	73	78	80	78	71	71
LQ	60	57	56	53	51	58	60	65	62	59	58	56	63	60	58	61	63	61	63	68	69	69	65	64

JUL. 1972 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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								440L	500L	500	A	500	520	490	500	490	470	410						
2							A	A	A	510	500	A	530	500	490	A	470							
3								470	A	A	A	A	A	510	500	490	450	450	A					
4							C	C	C	490	A	C	500	500	A	A	A	450	400					
5								460	490	500	520	A	A	A	A	A	A	A	400L					
6							440L	470	A	A	500	520	500		500	500	A	A	A					
7							450L	450	510	L	A	A	A	500	A	500	470	A	A					
8						380	490	440	A	A	A	A	A	A	A	480	460	A						
9							A	A	A	A	470	A	480	470	460	470	440	410	A					
10							410	440	A	A	490	A	500	490	500	A	A	A	A					
11							A	460L	460	480	500	A	490	510	500	A	A	A	A					
12							430	460	A	A	A	480	500	A	A	A	A	A	A					
13							C	C	C	470	C	470	A	480	480	470	A	A	A					
14								450	460	A	480	490	500	470	500	480	460	440L	380UL					
15								A	A	A	480	A	A	480	490	470	470	420	L					
16							C	A	A	A	470	470	470	470	450	440	430	430L	370L					
17							R	430	430	A	A	A	A	460	450	450	430	400						
18							440L	430	460	460	A	480	470	470	460	460	430	410						
19							400L	A	440	A	A	A	A	490	470	440	440	400						
20								430	440	470	480	A	A	A	A	A	440	430						
21							390		460	460	470	480	480	490	460	A	440	A	A					
22								430	450	500	490	480	490	480	470	460	A	420						
23							420	440	460	480	A	500	480	470	470	480	A	A						
24						340L	400	A	430	A	450	470	A	A	360	A	420	410						
25						330	A	A	A	A	470	470	470	460	460	440	430	400	370					
26						340	380	A	A	A	A	470	470	470	480L	440	430	400	A					
27						330	370	430	440	470	500	490	500	490	490	470	440	A						
28								440	460	470	A	A	A	A	530	470	A	A	A					
29							A	A	A	480	C	480	480	470	470	460	460	400						
30						350UL	400L	450L	460	490	490	A	480	A	A	490	430	410						
31								480L	A	480	500	500	510	490	490	480	460	420UL						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						6	13	19	16	16	17	16	20	23	24	22	21	18	5					
MED						340	410	440	460	480	490	480	490	480	480	470	440	410	380L					
UQ						350L	440	460	460	495	500	495	500	490	500	480	460	430	400L					
LQ						330	400	435	440	470	470	470	480	470	460	460	430	400	370L					

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JUL. 1972 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1972 | FOE (0.01 MHZ) | 135 E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45 23·6 N · Long. 141 41·1 E Sweep 1 MHz to 20 MHz in 20 sec in automatio operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				E	S	220	290	310	335	350	R	B	375	A	A	A	300	290	230	150	E			
2				C	C	235	275	305	330	340	345	340	335	B	A	A	A	290	235	160	E			
3				E	C	C	275	305	340	350	370	B	A	A	A	A	R	295	240	160				
4				S	C	C	C	C	C	B	B	C	380	365	320	335	A	A	A	A				
5				E	A	A	280	310	335	A	A	355	A	A	350	A	A	A	A	E				
6				E	A	A	290	310	340	365	360	A	A	A	A	A	345	300	235	S				
7				E	A	225	290	315	335	355	360	345	A	A	370	A	A	295	225	S				
8				E	A	A	285	315	345	355	375	375	360	A	A	A	325	290	200	A				
9					A	225	265	300	315	325	330	B	A	A	365	340	310	285	210	S				
10					A	215	260	300	325	350	350	340	330	A	A	A	315	280	215	125				
11				E	S	215	270	300	320	330	320	A	A	A	A	A	A	285	A	A				
12					120	215	280	305	330	345	365	365	375	375	365	345	315	285	220	E				
13					C	C	C	C	C	330	C	350	345	330	A	A	310	280	220	S				
14					A	215	280	305	335	350	365	R	370	350	335	A	315	290	220	140	E			
15					S	200	285	305	330	345	355	370	B	330	A	A	A	A	220	A				
16					S	205	280	300	325	335	340	B	345	R	355	I R 350	A	A	A	A				
17					A	215	275	305	330	345	350	350	340	A	A	R	A	A	215	E				
18					120	200	250	300	325	340	350	350	350	A	A	A	A	A	A	A				
19					A	A	A	A	I A 310	330	335	340	A	A	A	330	A	A	A	S				
20					A	A	280	300	A	340	360	370	370	360	350	315	300	A	215	A				
21					A	200	260	300	320	340	345	365	350	350	350	A	A	A	200	S				
22					S	A	A	300	325	340	345	330	345	A	A	A	A	A	205	E				
23					A	205	275	300	320	335	350	350	335	325	350	335	305	280	205	S				
24					A	205	265	300	315	330	A	350	A	A	370	340	305	285	200	S				
25					E	205	250	295	310	320	320	330	345	345	340	A	300	280	210	E				
26					A	185	240	290	300	A	A	R	A	R	350	335	305	290	205	A				
27					A	215	260	300	315	325	335	330	A	R	350	A	320	280	210	A				
28					E	200	245	300	320	345	355	350	350	345	A	A	310	290	205	A				
29					A	205	260	295	315	330	C	330	A	370	345	325	305	280	210	E				
30					S	205	265	300	325	335	350	A	A	A	A	A	A	290	A	S				
31					A	200	280	305	325	350	360	365	350	A	R	R	320	290	220	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	4	22	27	28	28	28	24	21	18	11	15	10	17	21	24	11	3			
MED				E	E E 120	205	275	300	325	340	350	350	350	350	350	335	310	290	215	E	E			
UQ				E	120	215	280	305	332	350	360	365	370	362	360	340	315	290	220	145	E			
LQ				E	E	200	260	300	318	330	342	340	345	338	348	330	305	280	205	E	E			

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JUL. 1972 | FOE (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E_{16}^{S}	J_{31}^{X}	J_{25}^{X}	23	E_{16}^{S}	G	G	J_{45}^{X}	J_{51}^{X}	J_{53}^{X}	J_{70}^{X}	51	49	J_{45}^{X}	40	J_{41}^{X}	G	34	33	21	20	22	E_{16}^{S}	J_{22}^{X}
2	E_{17}^{S}	C	C	C	C	30	43	J_{75}^{X}	55	45	42	J_{93}^{X}	J_{56}^{X}	47	J_{45}^{X}	J_{54}^{X}	J_{41}^{X}	38	J_{41}^{X}	J_{56}^{X}	J_{113}^{X}	J_{81}^{X}	J_{53}^{X}	J_{53}^{X}
3	J_{23}^{X}	C	15	16	C	C	36	J_{60}^{X}	J_{65}^{X}	J_{61}^{X}	60	J_{63}^{X}	J_{68}^{X}	J_{56}^{X}	J_{54}^{X}	J_{43}^{X}	G	G	38	24	J_{25}^{X}	J_{24}^{X}	E_{15}^{S}	E_{16}^{S}
4	E_{13}^{S}	C	J_{20}^{X}	E_{15}^{S}	C	C	C	C	C	49	J_{72}^{X}	C	43	J_{60}^{X}	J_{73}^{X}	J_{50}^{X}	M 66	J_{43}^{X}	J_{35}^{X}	J_{33}^{X}	J_{80}^{X}	J_{118}^{X}	J_{76}^{X}	27
5	E_{15}^{S}	F_{13}^{S}	E	E	20	27	32	43	39	38	J_{52}^{X}	J_{63}^{X}	J_{68}^{X}	J_{61}^{X}	J_{55}^{X}	J_{76}^{X}	J_{63}^{X}	71	J_{33}^{X}	J_{63}^{X}	J_{64}^{X}	J_{63}^{X}	J_{63}^{X}	J_{62}^{X}
6	E_{15}^{S}	16	J_{33}^{X}	J_{31}^{X}	J_{31}^{X}	J_{30}^{X}	38	J_{60}^{X}	J_{73}^{X}	J_{81}^{X}	J_{61}^{X}	J_{63}^{X}	43	40	40	38	52	J_{76}^{X}	J_{88}^{X}	J_{70}^{X}	J_{61}^{X}	J_{53}^{X}	J_{35}^{X}	E_{16}^{S}
7	E_{15}^{S}	J_{53}^{X}	J_{31}^{X}	J_{33}^{X}	J_{30}^{X}	G	35	43	J_{63}^{X}	J_{55}^{X}	J_{63}^{X}	J_{105}^{X}	53	40	J_{75}^{X}	J_{56}^{X}	J_{65}^{X}	J_{95}^{X}	J_{95}^{X}	J_{153}^{X}	J_{133}^{X}	J_{73}^{X}	J_{73}^{X}	J_{64}^{X}
8	63	J_{63}^{X}	J_{63}^{X}	J_{55}^{X}	55	J_{53}^{X}	J_{51}^{X}	43	J_{58}^{X}	J_{60}^{X}	J_{85}^{X}	67	J_{121}^{X}	J_{150}^{X}	J_{74}^{X}	40	45	J_{66}^{X}	J_{141}^{X}	J_{55}^{X}	J_{73}^{X}	J_{88}^{X}	J_{35}^{X}	J_{53}^{X}
9	J_{28}^{X}	J_{53}^{X}	J_{55}^{X}	J_{26}^{X}	33	J_{75}^{X}	J_{60}^{X}	J_{64}^{X}	J_{50}^{X}	J_{71}^{X}	J_{50}^{X}	J_{58}^{X}	44	40	G	43	43	34	J_{53}^{X}	J_{43}^{X}	J_{38}^{X}	E_{15}^{S}	28	J_{24}^{X}
10	E_{15}^{S}	E_{15}^{S}	J_{53}^{X}	J_{21}^{X}	21	38	32	43	J_{56}^{X}	J_{68}^{X}	J_{63}^{X}	J_{105}^{X}	J_{68}^{X}	J_{64}^{X}	J_{55}^{X}	J_{120}^{X}	J_{162}^{X}	J_{155}^{X}	128	30	J_{25}^{X}	J_{23}^{X}	20	J_{25}^{X}
11	J_{25}^{X}	J_{36}^{X}	J_{30}^{X}	21	24	34	J_{56}^{X}	J_{54}^{X}	J_{73}^{X}	J_{48}^{X}	J_{43}^{X}	J_{51}^{X}	40	40	J_{75}^{X}	100	J_{64}^{X}	J_{66}^{X}	J_{70}^{X}	J_{45}^{X}	J_{33}^{X}	J_{23}^{X}	E_{15}^{S}	E
12	E	J_{23}^{X}	E	E	18	28	J_{43}^{X}	J_{45}^{X}	J_{63}^{X}	J_{58}^{X}	J_{51}^{X}	J_{55}^{X}	G	58	J_{54}^{X}	J_{75}^{X}	J_{82}^{X}	J_{113}^{X}	J_{65}^{X}	J_{40}^{X}	J_{80}^{X}	J_{51}^{X}	J_{63}^{X}	J_{53}^{X}
13	J_{33}^{X}	C	C	C	C	C	C	C	C	48	C	44	55	43	38	48	J_{60}^{X}	J_{65}^{X}	J_{75}^{X}	J_{52}^{X}	J_{33}^{X}	J_{53}^{X}	J_{36}^{X}	J_{30}^{X}
14	E_{18}^{S}	J_{23}^{X}	J_{21}^{X}	18	17	G	G	38	40	54	G	G	43	G	40	35	G	36	32	24	E	J_{20}^{X}	J_{25}^{X}	J_{25}^{X}
15	22	J_{33}^{X}	28	E_{15}^{S}	E_{15}^{S}	26	40	43	M 64	J_{65}^{X}	49	49	53	53	J_{51}^{X}	J_{40}^{X}	J_{33}^{X}	J_{33}^{X}	30	23	J_{25}^{X}	J_{23}^{X}	J_{33}^{X}	23
16	E_{13}^{S}	E_{15}^{S}	23	E	E_{15}^{S}	28	38	48	46	J_{53}^{X}	42	40	G	G	G	G	44	31	J_{35}^{X}	30	J_{73}^{X}	J_{64}^{X}	J_{63}^{X}	J_{65}^{X}
17	J_{63}^{X}	J_{31}^{X}	19	18	18	33	38	41	41	J_{90}^{X}	J_{123}^{X}	J_{68}^{X}	J_{53}^{X}	41	38	G	34	30	G	J_{41}^{X}	J_{23}^{X}	J_{35}^{X}	J_{30}^{X}	J_{25}^{X}
18	E	21	E	E	G	G	32	41	39	43	J_{55}^{X}	40	41	45	40	41	J_{41}^{X}	J_{51}^{X}	J_{56}^{X}	J_{34}^{X}	J_{35}^{X}	J_{91}^{X}	J_{68}^{X}	J_{41}^{X}
19	J_{53}^{X}	J_{28}^{X}	J_{28}^{X}	J_{51}^{X}	22	28	J_{50}^{X}	J_{143}^{X}	J_{65}^{X}	J_{55}^{X}	J_{88}^{X}	J_{113}^{X}	63	J_{43}^{X}	43	G	40	J_{58}^{X}	J_{43}^{X}	E_{18}^{S}	28	J_{30}^{X}	J_{33}^{X}	J_{53}^{X}
20	J_{25}^{X}	20	J_{30}^{X}	J_{34}^{X}	19	31	G 20	G	40	44	44	48	J_{143}^{X}	70	J_{51}^{X}	J_{56}^{X}	40	42	G 21	32	J_{21}^{X}	J_{33}^{X}	J_{24}^{X}	E_{15}^{S}
21	E	E_{15}^{S}	20	E	16	24	G	G	40	44	45	41	47	45	G	J_{54}^{X}	J_{53}^{X}	55	J_{78}^{X}	J_{60}^{X}	J_{45}^{X}	J_{43}^{X}	J_{53}^{X}	J_{22}^{X}
22	30	E	E_{15}^{S}	E	E_{14}^{S}	23	30	G	J_{69}^{X}	G	40	43	G	J_{54}^{X}	39	J_{75}^{X}	J_{60}^{X}	J_{53}^{X}	J_{41}^{X}	23	J_{58}^{X}	J_{51}^{X}	J_{53}^{X}	J_{35}^{X}
23	J_{25}^{X}	24	E	E	20	G	G	35	43	J_{48}^{X}	J_{65}^{X}	J_{60}^{X}	42	G	G	G	J_{58}^{X}	J_{48}^{X}	J_{43}^{X}	29	J_{33}^{X}	J_{43}^{X}	J_{30}^{X}	24
24	J_{31}^{X}	E	J_{23}^{X}	J_{23}^{X}	J_{25}^{X}	G	36	J_{51}^{X}	J_{48}^{X}	J_{54}^{X}	39	G	J_{61}^{X}	J_{59}^{X}	44	J_{73}^{X}	J_{90}^{X}	J_{75}^{X}	J_{95}^{X}	J_{133}^{X}	J_{70}^{X}	J_{35}^{X}	J_{53}^{X}	J_{63}^{X}
25	J_{35}^{X}	J_{63}^{X}	J_{50}^{X}	J_{38}^{X}	19	J_{33}^{X}	38	J_{63}^{X}	J_{58}^{X}	J_{66}^{X}	J_{64}^{X}	J_{55}^{X}	40	40	40	35	37	40	J_{35}^{X}	J_{63}^{X}	J_{35}^{X}	J_{29}^{X}	J_{31}^{X}	26
26	E_{16}^{S}	F	E	E_{15}^{S}	18	23	J_{37}^{X}	J_{52}^{X}	J_{45}^{X}	J_{75}^{X}	J_{62}^{X}	G	40	G	G	62	G	G	J_{53}^{X}	J_{65}^{X}	J_{53}^{X}	J_{19}^{X}	15	E
27	E_{15}^{S}	E_{15}^{S}	E	15	15	G	33	36	38	43	40	41	J_{43}^{X}	G	G	34	G	J_{44}^{X}	J_{50}^{X}	J_{60}^{X}	J_{33}^{X}	27	J_{51}^{X}	27
28	J_{23}^{X}	J_{24}^{X}	J_{23}^{X}	J_{40}^{X}	18	J_{35}^{X}	J_{53}^{X}	40	40	J_{53}^{X}	J_{51}^{X}	J_{68}^{X}	J_{80}^{X}	139	J_{113}^{X}	J_{56}^{X}	J_{65}^{X}	J_{60}^{X}	J_{115}^{X}	J_{97}^{X}	J_{63}^{X}	J_{78}^{X}	J_{75}^{X}	J_{30}^{X}
29	J_{66}^{X}	J_{35}^{X}	J_{33}^{X}	J_{25}^{X}	J_{33}^{X}	30	J_{49}^{X}	M 72	J_{63}^{X}	J_{56}^{X}	C	40	40	G	G	G	36	32	35	J_{50}^{X}	J_{35}^{X}	J_{40}^{X}	J_{33}^{X}	J_{47}^{X}
30	J_{31}^{X}	E	E_{15}^{S}	E	E_{13}^{S}	G	G	39	41	49	48	J_{33}^{X}	J_{54}^{X}	J_{78}^{X}	J_{75}^{X}	J_{45}^{X}	34	G	35	J_{43}^{X}	J_{63}^{X}	J_{64}^{X}	J_{23}^{X}	J_{36}^{X}
31	J_{23}^{X}	J_{22}^{X}	J_{23}^{X}	J_{18}^{X}	J_{20}^{X}	G 17	32	36	47	43	43	41	40	40	G	G	G 30	G	26	J_{33}^{X}	17	24	23	J_{28}^{X}
	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	27	29	29	27	28	29	29	29	31	29	30	31	31	31	31	31	31	31	31	31	31	31	31
MED	23	J_{23}^{X}	J_{23}^{X}	18	19	28	36	43	J_{50}^{X}	J_{53}^{X}	J_{51}^{X}	51	47	45	40	43	43	J_{44}^{X}	J_{43}^{X}	J_{43}^{X}	J_{35}^{X}	J_{40}^{X}	J_{33}^{X}	J_{27}^{X}
UQ	J_{30}^{X}	J_{32}^{X}	J_{30}^{X}	J_{26}^{X}	23	32	J_{43}^{X}	J_{54}^{X}	J_{63}^{X}	J_{60}^{X}	J_{63}^{X}	J_{63}^{X}	J_{58}^{X}	J_{58}^{X}	J_{54}^{X}	J_{56}^{X}	J_{62}^{X}	J_{66}^{X}	J_{72}^{X}	J_{60}^{X}	J_{64}^{X}	J_{64}^{X}	J_{53}^{X}	J_{50}^{X}
LQ	E_{15}^{S}	15	15	E	16	G	32	39	41	46	43	41	40	40	E_{38}^{G}	35	34	34	35	30	J_{26}^{X}	J_{24}^{X}	J_{24}^{X}	24

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JUL. 1972 | FOES (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | FBES (0.1 MHZ) | 135 E Mean Time (G. M. T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 16	25	15	16	E S 16	G	G	G	47	47	54	49	G	44	38	39	G	G 20	30	G	19	18	E S 16	E
2	E S 17	C	C	C	C	G	42	A	52	G	G	A	49	43	42	54	41	G	37	42	23	70	A	A
3	16	C	E	15	C	C	G	G	63	55	54	52	60	46	42	38	G	G	38	G	20	18	E S 15	E S 16
4	E S 13	C	15	E S 15	C	C	C	C	C	46	A	C	G	43	70	50	60	40	31	24	67	62	55	E
5	E S 15	E S 13	E	E	17	27	G	G	G	40	43	56	67	59	54	A	60	A	28	65	48	50	50	16
6	E S 15	E	20	18	22	25	G	G	50	54	G	42	42	40	40	38	48	60	48	20	18	45	20	E S 16
7	E S 15	24	20	26	23	G	G	42	G	45	50	A	50	40	64	47	42	A	A	42	56	51	65	43
8	20	47	40	47	45	26	42	43	54	52	A	65	A	A	A	39	41	64	A	43	67	70	22	19
9	E	18	25	18	27	A	55	54	46	47	43	A	40	40	G	G	G	G	41	41	30	E S 15	E	20
10	E S 15	E S 15	E	E	17	38	G	40	50	53	44	70	47	45	43	A	A	A	A	24	23	20	17	25
11	E	18	E	14	G	G	55	42	43	45	G	50	40	40	44	56	54	57	50	46	30	17	E S 15	E
12	E	15	E	E	G	G	37	44	62	50	48	45	G	53	50	62	65	A	37	36	52	35	50	25
13	E	C	C	C	C	C	C	C	C	G	C	G	53	G	37	40	53	50	A	20	22	30	E	20
14	E S 18	15	13	13	17	G	G	G	G	54	G	G	G	G	G	35	G	G	G	G	E	E	16	20
15	E	28	E	E S 15	E S 15	G	G	43	E R 64	50	46	49	53	45	40	36	33	32	G 17	21	21	20	26	E
16	E S 13	F S 15	E	E	E S 15	G	E C 38	43	43	52	G	G	G	G	G	G	33	30	25	23	43	40	17	40
17	E	26	15	14	16	G	E R 38	G	41	A	A	A	47	40	37	G	34	27	G	22	18	23	17	18
18	E	E	E	E	G	G	G	37	G	G	50	E R 40	G	42	40	40	36	32	30	29	28	54	30	19
19	46	20	23	35	19	26	34	A	35	53	A	A	50	40	38	G	32	32	40	E S 18	18	18	24	20
20	17	E	E	22	16	23	G 20	G	38	44	44	48	A	57	46	46	38	30	G 17	24	17	30	23	E S 15
21	E	E S 15	E	E	14	G	G	G	40	G	43	G	G	G	G	45	38	52	A	60	43	27	41	18
22	E	E	E S 15	E	E S 14	22	29	G	G	G	G	43	G	40	39	40	47	32	36	20	55	30	45	18
23	17	E	E	E	15	G	G	G	42	41	A	G	G	G	G	G	55	45	40	26	30	25	18	17
24	E	E	E	14	22	G	35	43	G	46	37	G	A	55	G	A	G	G	A	A	60	25	E	18
25	E	15	36	28	15	31	38	50	54	A	43	44	G	G	G	34	G	G	34	36	24	E	25	E
26	E S 16	E	E	E S 15	13	G	G	44	44	46	A	G	40	G	G	42	G	G	37	19	41	16	E	E
27	E S 15	E S 15	E	E	13	G	G	G	G	G	G	G	42	G	G	34	G	41	40	52	18	E	31	16
28	E	18	E	16	G	32	G	G	G	G	51	59	A	A	42	40	50	51	50	57	40	33	E	20
29	30	15	18	18	20	G	46	67	50	43	C	G	40	G	G	G	G	G	34	20	20	20	20	40
30	17	E	E S 15	E	E S 13	G	G	G	G	47	47	53	43	55	56	42	32	G	32	36	58	40	E	18
31	17	16	16	12	14	G 15	G	G	46	G	G	G	G	40	G	G	G 30	G	G 20	28	E	E	E	17
	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	27	29	29	27	28	29	29	29	31	29	30	31	31	31	31	31	31	31	31	31	31	31	31
MED	E E 15	15	E	14	15	G	G	37	42	46	44	46	42	40	39	40	36	32	37	26	28	25	20	18
UQ	16	18	16	18	18	26	38	43	50	52	54	59	52	46	44	46	49	52	49	42	46	40	30	20
LQ	E	E	E	E	E G 14	G	G	G	G	E G 40	G	G	G	G	G	34	G	G	30	20	20	18	E E 15	16

JUL. 1972 | FBES (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 16	E S 15	E	E	E S 16	11	E	17	13	20	24	40	21	20	20	19	18	11	12	12	E	E S 15	E S 16	E
2	E S 17	C	C	C	C	15	20	17	20	20	27	20	12	39	23	30	17	15	12	E	E	E S 15	E S 16	E S 15
3	E S 13	C	E	E	C	C	15	15	17	20	25	40	20	32	22	18	17	16	15	E	E	F	E S 15	E S 16
4	E S 13	C	E	E S 15	C	C	C	C	C	37	39	C	20	20	20	20	18	18	11	E	E	F	E S 15	E S 15
5	E S 15	E S 13	E	E	E	13	16	17	18	21	20	26	20	20	20	19	16	16	E	E	E S 15	E	E	E S 15
6	E S 15	E	E	E	E	E	15	16	20	20	20	21	20	20	20	20	20	17	15	E S 14	E	E	E S 13	E S 16
7	E S 15	E	E	E	E	12	15	17	18	28	27	23	30	20	20	20	17	17	12	E S 15	E	F	E	E
8	E	E S 15	E	E	E	15	17	18	19	19	20	20	22	19	23	20	18	17	12	E	E	E S 16	E S 15	E
9	E S 15	E	E	E	E	12	16	17	16	19	20	35	18	20	18	17	12	16	12	E S 13	E	E S 15	E S 15	E
10	E S 15	E S 15	E S 13	E	E	12	18	17	20	19	20	19	20	20	18	20	17	12	12	E	E	F	E	E S 12
11	E S 14	E	E S 15	E	E S 12	12	11	12	17	18	17	20	29	19	19	20	15	12	12	E	E	E S 15	E S 15	E
12	E	E	E	E	E	12	16	18	18	18	20	20	23	21	20	19	18	16	12	E	E	F	E	E
13	E S 15	C	C	C	C	C	C	C	C	19	C	20	20	30	20	18	17	19	11	E S 15	E	E	E S 15	E
14	E S 18	E	E	E	E	14	12	16	17	17	17	19	20	19	18	19	18	13	12	E	E	E S 15	E S 12	E S 15
15	E S 15	F	E S 15	E S 15	E S 15	13	12	17	20	18	23	23	37	20	21	17	17	17	11	E	E	F	E	E S 15
16	E S 13	E S 15	E S 15	E	E S 15	12	18	18	18	20	20	35	20	19	27	20	17	17	16	E	E S 15	E	E	E S 15
17	E S 15	E	E	E	E	13	16	16	18	19	20	20	23	23	23	20	17	16	16	E	E	E S 15	E S 14	E
18	E	E S 15	E	E	E	14	18	16	17	19	17	20	20	20	21	19	17	16	12	E	E S 15	E S 15	E	E S 15
19	E	E	E	E	E	12	17	17	19	18	20	20	20	18	18	19	16	13	E	E S 18	E S 15	E S 14	E S 14	E S 15
20	E	E S 15	E	E	E	E	12	16	16	19	20	19	20	20	19	18	18	17	11	12	E	E	E S 15	E S 15
21	E	E S 15	E S 15	E	E	12	16	16	18	18	20	19	20	18	18	18	17	12	11	E S 12	E	E	E	E
22	E S 15	E	E S 15	E	E S 14	13	17	19	19	19	20	20	19	20	20	18	16	17	12	E	E	F	E S 15	E
23	E	E	E	E	E	12	11	16	17	18	20	18	20	20	18	18	16	15	17	E S 13	E	E S 15	E S 13	E S 16
24	E S 15	E	E	E	E	11	15	17	18	19	20	19	20	20	20	20	16	17	16	E S 13	E	E	E S 15	E
25	E S 15	E	E	E	E	11	12	12	17	20	19	22	20	20	20	17	17	12	11	E	E	E S 15	E S 14	E S 15
26	E S 16	E	E	E S 15	E	12	11	16	18	20	19	20	20	20	20	18	18	17	12	E	E	F	E	E
27	E S 15	E S 15	E	E	E	12	11	12	18	18	19	20	20	23	20	19	17	15	11	E	E	E S 15	E	E S 15
28	E S 15	F	E	E	E	12	12	17	20	19	20	22	23	20	20	20	20	16	13	E	F S 15	E	E S 15	E
29	E	F	E	E	E	11	11	16	20	19	C	23	30	28	20	20	17	16	12	E	E	F	E S 15	E S 15
30	E	E	E S 15	E	E S 13	15	15	20	19	23	26	30	30	20	20	18	17	16	12	E S 12	E S 15	E	E S 15	E
31	E S 15	F	E	E	E	E	12	16	18	20	20	19	26	20	20	20	20	16	15	E	E	E S 17	E S 14	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	27	29	29	27	28	29	29	29	31	29	30	31	31	31	31	31	31	31	31	31	31	31	31
MED	E S 15	E	E	E	E	12	15	17	18	19	20	20	20	20	20	19	17	16	12	E	E	E	E S 14	E S 12
UQ	E S 15	E S 15	E	E	E	13	16	17	19	20	20	23	23	20	20	20	18	17	12	E S 12	E	E S 15	E S 15	E S 15
LQ	E	E	E	E	E	12	12	16	17	18	20	20	20	20	20	18	17	15	11	E	E	E	E	E

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JUL. 1972 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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	275	280	285	280	285	300	315	290	290	285	290	R	295	295	295	300	295	300	290	300	300	S	S	280
2	C	C	C	C	C	C	C	A	315	295	315	A	270	290	300	290	290	280	295	295	285	300	C	C
3	C	C	285	295	C	C	300	295	285	265	270	280	315	305	270	295	285	280	295	290	310	285	270	285
4	C	C	C	290	C	C	C	C	C	290	A	C	275	295	285	295	310	305	300	290	285	275	S	S
5	270	275	275	305	315	310	280	305	290	295	295	295	310	305	280	A	295	A	285	290	295	290	S	285
6	265	280	300	315	315	280	280	290	300	300	280	290	295	H 280	285	280	300	280	280	290	280	285	300	295
7	290	280	275	290	270	275	295	305	285	305	280	A	265	270	280	R	R	A	A	290	285	S 280	S	270
8	S 265	S	S	S	F 265	300	265	295	335	335	A	290	A	A	A	295	295	305	A	285	S	S 290	285	S 285
9	S	S 280	F 285	F 285	F 290	A	265	275	280	250	R	A	250	255	270	265	290	295	280	290	275	260	275	275
10	280	270	280	F 265	290	295	295	310	310	285	280	300	315	280	295	A	A	A	A	290	305	300	295	285
11	270	270	290	290	285	295	300	275	310	310	290	300	300	290	285	295	305	290	310	295	295	300	290	280
12	295	280	280	290	290	285	275	300	300	300	305	290	275	280	295	305	300	A	300	295	295	F	F	F
13	285	C	C	C	C	C	C	C	C	285	C	265	280	300	290	295	295	285	A	305	300	290	285	280
14	285	290	285	290	285	295	280	295	320	300	335	295	275	300	295	315	300	305	285	295	300	285	280	280
15	280	285	290	300	265	290	275	290	300	325	305	295	275	280	280	295	295	290	300	290	290	280	S	290
16	280	I S 280	295	285	305	310	I C 270	290	290	295	285	245	R	265	270	285	290	275	285	280	280	295	305	275
17	265	280	280	285	280	320	285	270	285	A	A	A	275	290	280	285	295	300	305	295	285	275	285	290
18	290	275	I C 280	285	300	285	290	310	280	295	290	255	285	290	285	310	300	295	290	310	305	I S 280	S 290	295
19	285	280	S	295	305	320	300	A	310	285	A	A	280	295	315	310	295	295	300	295	295	285	280	285
20	280	290	300	290	310	C	265	295	305	320	315	295	A	295	310	305	305	290	295	295	295	300	290	280
21	280	265	285	280	F 290	275	305	280	R	320	315	290	290	275	285	295	305	305	A	315	290	275	275	285
22	F 285	285	295	275	295	315	310	320	310	270	295	290	290	310	290	300	325	315	300	315	285	275	S	F 290
23	F 285	F	F	F	F 275	285	265	290	310	310	A	280	290	295	285	290	285	310	295	295	I S 290	285	285	280
24	285	295	300	270	280	290	305	305	275	250	295	275	A	A	300	A	305	295	A	A	S	F	F 285	F
25	F	F	F	F	F 270	265	250	290	275	A	275	285	260	280	270	250	270	285	300	305	285	290	255	265
26	275	275	300	270	280	275	285	295	290	300	A	245	R	275	270	225	275	275	285	290	285	300	300	270
27	275	265	280	270	270	270	300	295	310	320	230	280	275	300	270	285	290	305	310	305	275	285	285	275
28	285	280	285	270	275	290	275	320	330	300	265	280	A	A	255	290	285	290	295	280	285	F	F	F
29	F	275	275	F 285	F	290	285	A	290	295	C	270	245	270	265	290	300	305	295	300	285	275	280	290
30	295	275	275	275	280	295	295	310	290	290	315	280	310	285	285	290	310	310	315	280	290	295	F 285	F 280
31	F	285	285	295	295	295	325	295	315	315	280	285	295	295	290	300	300	310	315	290	295	290	275	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	24	24	24	26	26	25	28	26	28	29	22	24	25	28	30	27	29	27	25	30	29	27	22	26
MED	280	280	285	285	285	290	285	295	300	295	290	285	280	290	285	295	295	295	295	295	290	285	285	280
UQ	285	282	292	290	295	300	300	305	310	310	305	292	295	295	295	300	300	305	300	300	295	292	290	285
LQ	275	275	280	275	275	285	275	290	288	285	280	278	275	280	270	288	290	288	290	290	285	280	280	275

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JUL. 1972 | M(3000)F2 (0.01)

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								380L	A	A	A	A	365	385	360	340	345	365						
2							A	A	A	370	380	A	A	360	350	A	350							
3								360	A	A	A	A	A	370	390	345	365	350	A					
4							C	C	C	A	A	C	365	360	A	A	A	A	350					
5								350	355	365	A	A	A	A	A	A	A	A	325L					
6							365L	350	A	A	380	365	395		360	355	A	A	A					
7							375L	A	350	L	A	A	A	345	A	A	A	A	A					
8						340	A	A	A	A	A	A	A	A	A	350	A	A						
9							A	A	A	A	A	A	360	370	380	355	365	350	A					
10							365	A	A	A	A	A	A	A	A	A	A	A	A					
11							A	A	A	A	380	A	375	355	A	A	A	A	A					
12							350	A	A	A	A	A	360	A	A	A	A	A	A					
13							C	C	C	380	C	380	A	365	365	365	A	A	A					
14								355	360	A	375	365	360	380	350	350	350	330L	340U					
15								A	A	A	A	A	A	A	340	365	340	335	L					
16							C	A	A	A	380	380	360	370	375	370	365	335L	340L					
17							R	370	A	A	A	A	A	370	375	365	350	360						
18							340L	380	380	375	A	R	375	380	360	350	370	355						
19							350L	A	385	A	A	A	A	355	365	380	345	355						
20								350	370	A	A	A	A	A	A	A	365	330						
21							335		A	390	360	370	375	355	370	A	365	A	A					
22								370	375	360	375	A	365	365	360	390	A	355						
23							335	365	A	355	A	370	375	380	355	340	A	A						
24						330L	A	A	385	A	420	380	A	A	350	A	355	345						
25						A	A	A	A	A	A	A	365	370	360	365	330	320	A					
26						330	350	A	A	A	A	340	375	380	375L	A	345	340	A					
27						325	350	370	385	380	370	365	365	360	355	355	350	A						
28								370	370	385	A	A	A	A	320	360	A	A	A					
29							A	A	A	355	C	385	385	385	370	360	350	355						
30						340U	355L	360L	370	A	A	A	380	A	A	345	350	350						
31								355L	A	360	360	375	370	375	365	355	335	355UL						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						5	11	14	11	11	10	11	18	21	22	20	19	17	4					
MED						330	350	362	370	370	378	370	368	370	360	355	350	350	340L					
UQ						340L	360L	370	382	380	380	380	375	380	370	365	365	355	345					
LQ						330	345	355	365	360	370	365	365	360	355	350	345	335	332L					

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JUL. 1972 | M(3000)F1 (0.01)

IONOSPHERIC DATA

JUL. 1972 | 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								275	350	345	345	300	350	340	350	325	340	310						
2							270	A	275	325	300	A	390	360	350	350	320							
3								350	A	A	415	370	320	345	380	325	320	350	300					
4							C	C	C	325	A	C	365	325	A	325	A	315	295					
5								300	300	340	330	330	A	A	395	A	360	A	320					
6							305	320	300	320	315	340	330		350	350	310	A	310					
7							275	255	325	300	340	A	350	335	A	345	300	A	A					
8						300	415	300	275	270	A	A	A	A	A	315	325	A						
9							A	A	365	490	R	A	510	505	450	475	370	350	360					
10							300	320	285	345	365	A	300	360	345	A	A	A	A					
11							505	325	265	360	350	345	340	345	350	355	325	A	300					
12							340	290	300	295	325	370	390	375	350	A	A	A	300					
13							C	C	C	325	C	450	A	370	385	375	345	345	A					
14								305	275	315	295	360	410	345	350	305	315	315	300					
15								350	R	295	320	345	400	380	360	340	340	345	300					
16							C	345	320	345	425	530	R	445	410	370	345	350	300					
17							295	375	350	A	A	A	405	390	410	400	345	300						
18							310	260	380	340	390	520	365	360	390	330	320	325						
19							305	A	280	A	A	A	350	345	320	300	325	315						
20								325	300	300	320	370	A	350	310	300	305	320						
21							310		300	305	335	400	350	360	375	370	320	300	A					
22								300	260	450	345	335	360	315	345	335	300	300						
23							350	295	280	295	A	400	345	360	370	350	365	300						
24						325	300	325	390	505	370	405	A	A	370	A	340	350						
25						380	400	350	A	A	420	395	465	415	420	510	445	360	300					
26						365	350	345	370	370	A	545	R	425	475	650	415	385	305					
27						400	320	300	320	310	600	420	400	340	450	380	340	300						
28								260	270	330	A	A	A	A	500	375	330	325	300					
29							310	A	350	360	C	470	520	450	455	370	360	315						
30						310	300	310	320	345	325	385	310	360	350	345	300	290						
31								330	300	295	350	350	325	320	330	320	315	290						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						6	18	24	26	27	21	22	23	26	28	27	28	23	13					
MED						345	310	315	300	325	345	378	360	360	370	350	328	315	300					
UQ						380	350	338	350	345	370	420	400	380	410	372	345	348	305					
LQ						310	300	298	280	300	325	345	342	345	350	325	318	300	300					

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JUL. 1972 | H'F2 (KM)

IONOSPHERIC DATA

JUL. 1972 | H'F (KM) | 135 E Mean Time (G. M. T. + 9h)

Station WAKKANAI Lat. 45 23·6 N Long. 141 41·1 E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	275	275	260	275	265	250	245	230	A	A	A	A	210	215	210	250	230	225	255	275	250	250	245	275
2	280	C	C	C	C	225	A	A	A	210	200	A	A	230	240	A	A	265	A	A	275	A	A	A
3	260	C	255	245	C	C	265	240	A	A	A	A	A	235	200	215	225	230	A	265	250	245	260	260
4	280	C	290	265	C	C	C	C	C	A	A	C	215	245	A	A	A	A	250	260	A	A	A	265
5	285	285	270	260	255	250	235	240	215	200	A	A	A	A	A	A	A	A	250	A	A	A	A	270
6	275	275	275	250	255	225	225	250	A	A	225	210	200	190H	215	230	A	A	A	270	275	A	250	250
7	250	275	295	275	275	235	250	A	220	A	A	A	A	250	A	A	A	A	A	A	A	A	A	A
8	310	A	A	A	A	255	A	A	A	A	A	A	A	A	A	245	A	A	A	A	A	A	270	285
9	240	270	295	260	290	A	A	A	A	A	A	A	225	215	225	245	245	250	A	A	285A	285	275	275
10	275	290	270	295	255	250	225	A	A	A	A	A	A	A	A	A	A	A	A	275	255	250	240	265
11	280	300	270	250	270	270	A	A	A	A	200	A	225	200	A	A	A	A	A	A	260	245	250	255
12	250	260	250	250	265	250	250	A	A	A	A	A	200	A	A	A	A	A	A	260	A	A	A	275
13	260	C	C	C	C	C	C	C	C	215	C	225	A	225	215	250	A	A	A	265	250	275A	250	250
14	260	265	260	250	270	240	240	240	240	A	205	200	230	225	215	200	220	225	225	270	245	245	250	260
15	260	280	250	245	225	250	265	A	A	A	A	A	A	A	270	220	215	230	245	260	260	295	250	250
16	265	280	265	250	245	250	A	A	A	A	205	210	250	250	215	225	245	245	225	295	A	A	250	A
17	260	280	275	280	275	250	A	265	A	A	A	A	A	245	220	215	250	245	245	265	265	290	270	270
18	260	285	250	270	270	245	245	245	215	240	A	A	225	230	250A	285A	225	250	250	270	250	A	A	260
19	A	300	295	A	245	240	250	A	200	A	A	A	A	225	230	210	210	230	A	260	250	260	295	280
20	275	250	250	275	230	200	205	220	230	A	A	A	A	A	A	A	225	250	240	270	250	265	250	265
21	260	280	260	280	275	250	260	220	A	215	250	215	205	230	215	A	290	A	A	A	A	300	A	275
22	270	250	240	255	295	245	225	200	215	200	185	A	240	215	210	210	A	215	A	245	A	300	A	250
23	275	260	250	245	300	245	240	245	A	250	A	200	200	195	240	240	A	A	A	260	260	260	230	275
24	260	250	245	300	285	250	A	A	225	A	200	225	A	A	290	A	225	240	A	A	A	305	245	300
25	250	250	A	340	300	A	A	A	A	A	A	A	225	245	250	245	275	260	A	A	295	250	315	300
26	295	270	270	250	295	245	245	A	A	A	A	250	240	210	200	A	215	245	A	270	A	240	235	275
27	300	300	270	290	310	250	240	230	210	225	200	225	225	220	235	225	220	A	A	A	250	250	300	275
28	270	280	270	300	310	270	260	245	220	235	A	A	A	A	250	225	A	A	A	A	A	A	245	250
29	300	240	280	290	285	250	A	A	A	250	C	200	210	245	230	250	260	235	270A	260	270	280	290	280A
30	260	275	290	275	295	260	240	225	250	A	A	A	225	A	A	255	240	220	270	A	A	A	260	275
31	260	270	270	265	250	240	235	230	A	250	225	210	200	205	210	225	240	240	250	250	250	250	265	295
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	26	27	27	26	26	20	15	11	11	10	11	18	22	22	20	18	18	12	19	19	20	23	28
MED	268	275	270	265	272	250	242	240	220	225	202	210	225	225	222	228	228	240	250	265	255	260	250	272
UQ	280	280	275	280	295	250	250	245	228	245	225	225	225	245	240	248	245	250	252	270	268	288	270	275
LQ	260	260	252	250	255	240	235	228	215	212	200	205	205	215	215	218	220	230	242	260	250	250	248	260

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JUL. 1972 | H'F (KM)

IONOSPHERIC DATA

JUL. 1972 | H'ES (KM) | 135° E Mean Time (G. M. T. + 9h)

Station WAKKANAI Lat. 45° 23·6' N, Long. 141° 41·1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

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

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JUL. 1972 | H'ES (KM)

IONOSPHERIC DATA

JUL. 1972 | TYPES OF ES | 135 E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45 23·6 N · Long. 141 41·1 E Sweep 1 MHz to 20 MHz in 20 sec in automatio operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		F 3	F 2	L 1				C 1	C 2	C 2	C 2	C 1	C 1	L 1	L 1	L 2		CL 11	C 2	C 1	C 1	F 2		F 1
2						C 1	C 1	C 2	C 1	C 1	C 1	C 2	C 2	L 1	L 1	L 1	L 2	C 2	C 2	C 4	L 5	F 4	F 1	F 5
3	F 2		F 1	L 1			C 1	C 1	C 3	C 2	C 2	C 1	L 2	L 2	L 2	L 2			C 1	C 2	F 2	F 2		
4			F 1							C 1	C 1		C 1	C 1	C 2	C 2	L 2	L 2	L 2	L 3	F 3	F 3	F 3	F 1
5					L 1	L 1	C 1	C 1	C 1	L 1	L 1	C 2	L 2	L 2	L 2	L 3	L 2	L 4	CL 21	C 3	F 3	F 3	F 3	F 2
6		F 1	F 3	L 3	L 2	L 2	C 1	C 1	C 2	C 2	C 1	L 1	L 1	L 1	L 1	L 1	C 1	C 2	C 3	C 2	F 2	F 3	F 3	
7		F 3	F 2	L 3	L 3		C 1	C 2	C 1	C 1	C 2	C 2	L 2	L 1	C 2	CL 11	HL 11	C 3	C 6	C 4	F 4	F 4	F 5	F 4
8	FF 12	F 3	F 3	L 3	CL 21	L 2	C 1	C 1	C 2	C 2	C 2	C 2	C 2	L 2	L 1	L 1	C 1	C 2	C 3	L 3	F 3	F 5	F 3	F 2
9	F 1	F 2	F 3	F 2	CL 22	C 5	C 2	C 3	C 1	C 2	C 1	L 1	L 1	L 1		C 1	C 1	C 1	C 2	C 3	F 3		F 1	F 2
10			F 1	F 1	L 1	C 2	C 1	C 1	C 2	C 2	C 1	C 2	C 1	L 1	L 1	CL 41	C 3	C 3	C 3	C 3	F 3	F 2	F 2	F 2
11	F 1	F 2	F 2	CL 11	C 1	C 2	C 2	C 2	C 2	C 2	C 1	L 1	L 1	L 1	CL 11	CL 21	CL 21	CL 21	CL 32	CL 43	F 3	F 2		
12		F 2			H 1	H 1	C 2	C 2	C 2	C 2	C 1	C 1		C 1	C 1	C 3	C 3	C 3	C 3	L 4	F 4	F 4	F 4	F 3
13	F 1									C 1		C 1	C 1	C 1	L 1	CL 11	C 2	C 2	C 2	C 2	F 3	F 3	F 1	F 4
14		F 2	F 2	F 2	L 1			C 1	C 1	C 1			C 1		C 1	L 1		C 1	C 1	C 1		F 1	F 2	F 3
15	F 1	F 4	F 2			C 1	C 2	C 1	C 1	C 1	C 2	C 1	C 1	C 1	L 1	L 1	L 2	L 2	CL 11	L 2	F 3	F 2	F 4	F 1
16			F 1			H 1	C 1	C 1	C 1	C 2	C 1	C 1					L 1	L 1	L 2	L 2	F 3	F 2	F 2	F 3
17	F 1	F 4	F 2	F 1	L 1	C 2	H 1	H 1	C 1	C 2	C 2	C 2	C 1	L 1	L 1		L 1	L 2		C 2	F 2	F 2	F 2	F 4
18		F 1					C 1	C 1	C 1	C 1	C 2	C 1	C 1	L 1	L 1	L 1	L 2	L 2	L 3	L 3	F 3	F 3	F 3	F 2
19	F 3	F 2	F 2	F 5	L 2	L 2	L 2	L 2	L 1	C 3	C 2	C 2	L 1	L 1	L 1		L 1	L 2	L 4		F 1	F 2	F 2	F 2
20	F 2	F 1	F 2	F 2	L 1	L 1	L 1		L 1	C 1	C 1	C 1	C 1	C 2	C 1	C 1	C 2	L 2	L 1	L 2	F 1	F 4	F 2	
21			F 1		L 1	H 1			C 1	C 1	C 1	C 1	C 1	C 1		L 2	L 2	CL 22	C 4	C 4	F 3	F 3	F 3	F 2
22	F 1					L 1	L 1		C 1		C 1	C 2		L 1	L 2	L 2	L 2	L 2	C 2	C 2	F 3	F 4	F 2	F 2
23	F 2	F 1			L 1			H 1	C 1	C 2	C 2	C 1	C 1				C 1	C 2	C 3	C 2	F 4	F 3	F 2	F 2
24	F 1		F 1	F 2	L 4		C 1	C 2	C 2	C 2	L 1		L 2	L 2	C 1	C 2	C 1	C 2	C 3	C 3	F 5	F 4	F 2	F 2
25	F 2	F 2	F 4	F 3	C 1	C 2	C 2	C 2	C 2	C 3	C 1	C 1	C 1	C 1	C 1	L 1	C 1	C 2	C 2	C 3	F 3	F 2	F 3	F 1
26					L 1	C 1	C 2	C 3	C 2	L 1	L 1		L 1			C 1			C 3	L 2	F 3	F 1	F 1	
27				F 1	L 1		C 2	C 1	C 1	C 1	C 1	C 1	L 1			L 1		C 3	C 3	L 3	F 2	F 1	F 3	F 1
28	F 1	F 2	F 1	F 2	C 1	C 2	C 2	C 1	C 1	C 2	C 2	C 2	C 2	C 2	L 2	L 2	C 1	C 2	C 2	L 3	F 3	F 3	F 2	F 3
29	F 3	F 2	F 2	F 2	L 3	C 1	C 3	C 2	C 2	C 2		C 1	L 1				H 1	H 1	C 2	C 3	F 3	F 3	F 3	F 3
30	F 2							C 1	C 1	C 2	C 1	L 2	L 2	L 2	L 2	L 2	L 2		CL 21	C 4	F 5	F 5	F 1	F 2
31	F 2	F 2	F 2	F 1	L 1	L 1	H 1	H 1	C 1	C 1	C 1	C 1	C 1	L 1			L 1		CL 11	L 3	F 1	F 1	F 1	F 2
	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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JUL. 1972 | TYPES OF ES

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	67	63	62	F 61	62	74	76	79	86	78	87	88	89	91	84	85	81	77	81	91	91	82	80	82
2	74	77	73	69	70	77	89	73	84	I C 84	I A 78	81	85	87	79	75	74	72	77	86	87	80	F 76	F
3	F	F	F 69	F 58	F 54	62	74	83	85	90	93	88	91	91	88	91	84	82	86	91	77	71	71	67
4	67	62	62	63	F	F 65	76	89	H 89	74	I A 68	71	79	89	90	A	A	84	77	83	73	71	F 72	F
5	F 73	F	F	F	64	64	77	H 77	84	I A 79	81	I A 84	I A 85	I A 82	78	I A 75	72	74	84	90	84	75	72	F
6	F	F	F	F 72	F	F 63	72	86	96	H 83	83	82	77	74	77	79	H 68	73	79	78	87	91	88	F 83
7	F	F 77	F 78	F 73	F 70	F 82	88	85	85	88	87	86	92	103	105	102	97	94	I R 95	I A 98	94	82	79	F
8	F 82	F	F 79	F 77	F	60	64	75	I A 71	I A 71	68	74	84	87	92	91	83	84	I A 86	81	F	91	F 89	87
9	F	F 79	F	F	F	F 57	58	I A 62	62	56	56	58	I R 56	60	61	56	61	58	I A 61	65	66	67	F	F
10	F	F 66	F	F	F	56	67	73	74	71	82	79	82	80	75	77	74	A	A	I A 94	F	94	71	68
11	66	F	F 67	64	F 63	67	70	79	92	87	67	74	83	I R 83	79	74	74	I A 78	I A 82	I A 84	89	79	70	67
12	F	F	F	F	F	F	77	96	91	74	70	75	81	91	88	89	87	82	84	92	84	66	F	F
13	68	F 62	63	64	59	65	79	84	87	66	69	73	70	73	73	72	71	74	75	84	82	F 72	F 73	F 73
14	69	62	57	53	50	54	65	70	77	72	68	61	72	72	75	73	72	67	67	78	I R 78	F 72	67	67
15	66	I R 66	F 66	59	57	57	66	75	83	81	73	69	65	68	76	73	69	61	68	77	74	F 68	F	65
16	F 62	F 63	58	54	52	52	56	78	69	65	59	I A 58	61	67	71	68	67	68	69	74	78	75	72	F 65
17	F	F	F	F	F	F	64	67	61	I A 62	63	67	I A 68	72	74	87	87	76	69	66	66	61	F	62
18	61	59	59	F	57	63	F 74	93	77	71	67	68	76	86	73	77	76	71	67	71	72	69	70	F 70
19	F	59	F	56	51	58	63	62	63	59	I A 65	69	72	79	77	73	64	66	75	77	I R 73	72	I R 70	72
20	72	F 63	64	F	53	51	63	73	73	76	66	73	78	78	75	73	72	I A 75	86	92	89	65	61	60
21	61	F 60	F 59	F 56	F 56	58	66	76	66	56	67	68	68	74	71	71	71	77	83	74	63	64	F	70
22	F 63	F	57	57	56	56	67	77	61	54	63	67	70	73	79	81	78	68	68	71	68	66	F 67	F
23	F	65	F 60	F 50	F 50	53	73	92	98	85	I A 71	71	76	77	78	77	I A 76	78	84	84	I R 78	73	69	66
24	68	I R 64	57	51	F 55	58	F 65	69	60	56	58	A	A	68	65	59	61	65	64	67	I R 64	F	F	F
25	F	F	F	F	F	F 55	F	F 80	I R 76	I A 65	57	63	61	60	I A 57	56	60	59	69	75	59	59	56	60
26	59	57	F 53	53	49	52	65	F 72	61	58	51	60	60	R 56	52	51	56	60	65	66	64	F	58	46
27	F 45	F 42	F 43	42	40	42	60	73	H 65	55	R 53	64	69	70	64	65	70	74	74	I R 74	F	F 70	F	64
28	61	60	59	58	51	I A 58	F 77	92	H 78	62	66	I A 66	67	71	71	66	73	76	76	78	V 77	F	F	F
29	F	F	F	F	F	56	F 72	64	64	60	I R 54	I A 55	57	62	65	65	67	63	63	58	63	F 65	63	63
30	58	58	56	55	54	62	78	78	67	70	63	I A 70	78	80	81	79	75	73	67	62	F 70	79	F	F
31	F	F	F	F	F	57	62	68	73	73	73	79	88	91	96	93	91	84	I A 75	78	75	74	72	68
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	20	21	21	21	29	30	31	31	31	31	30	30	31	31	30	30	30	30	31	28	28	22	21
MED	66	62	60	58	55	58	68	77	76	71	67	70	76	77	76	74	72	74	75	78	76	72	71	67
UQ	68	66	F 66	64	59	63	76	84	85	78	73	79	83	86	80	81	78	78	83	85	84	79	73	70
LQ	61	60	57	54	51	56	64	72	66	61	63	66	68	70	71	68	68	67	68	72	67	66	67	64

JUL. 1972 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Hour / Day	00	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	UL 510	490	IA 510	IA 510	530	510	510	500	490	470	L 460	L					
2							L	A	A	C	A	530	530	510	520	480	480	440	A	A				
3							L	A	A	500	A	A	A	540	510	490	UL 500	440	L					
4							UL 420	UL 560	480	540	A	A	A	A	A	A	A	A	A					
5						L	UL 450	440	A	A	520	A	A	A	A	IA 500	IA 510	450	A					
6							L	A	IA 490	H 670	IA 550	IA 520	IA 550	540	530	500	UL 450	A	A					
7						L	L	A	A	A	A	A	550	IA 530	480	500	IA 500	L	A	A				
8							L 450	A	A	A	IA 530	510	IA 530	IA 530	A	A	A	A	A					
9							A	A	A	470	480	480	480	490	470	480	440	430	A					
10						L	410	A	A	H 500	IA 490	500	510	500	500	500	A	A	A					
11							A	IA 470	IA 490	470	IA 530	A	500	A	A	A	A	A	A					
12							L	460	IA 540	A	H 560	A	A	A	IA 480	IA 470	480	UL 430	L					
13						L	A	A	460	520	IA 500	A	500	500	510	480	440	430	I					
14							L	UL 460	470	470	A	510	500	H 500	480	470	460	A	L					
15							UL 480	IA 440	A	A	A	IA 490	490	480	480	H 470	450	L 450	L					
16						UL 400	430	430	A	A	A	A	A	500	470	490	460	420	A					
17							UL 510	L 470	A	A	A	A	A	IA 490	470	460	440	420	L					
18							L	440	460	A	490	IA 510	IA 500	490	470	460	450	L 440	I					
19							L	L	460	H 490	IA 480	H 490	IA 480	480	480	460	440	430	A					
20							L	420	470	480	490	480	R 480	R 470	460	450	L	IA 420	L					
21							310	430	L	460	500	490	510	IA 480	480	470	450	410	L					
22							L	L 420	450	480	470	510	IA 500	IA 490	480	460	IA 440	L	A					
23						L	410	430	IA 450	IA 470	IA 510	510	520	IA 470	IA 470	470	A	A	A					
24							380	IA 420	460	440	A	A	A	480	H 480	IA 460	430	410	I 360					
25						L	A	A	A	A	A	H 480	A	A	A	470	430	IA 400	A					
26						L	380	420	450	440	430	460	460	470	460	L	430	410	I					
27						L	380	IA 420	450	IA 490	490	470	490	490	490	470	A	A	A					
28						A	L	430	L	470	480	IA 500	480	490	470	510	450	IA 420	L					
29								A	A	A	480	500	500	490	470	470	460	410	A					
30							L	A	A	500	490	A	A	A	IA 500	490	460	A	L					
31								IA 460	480	490	510	490	510	510	500	480	460	L	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	12	19	16	20	21	20	22	25	26	27	24	19	1					
MED						UL 400	415	440	465	485	490	500	500	490	480	470	450	430	L 360					
UQ							UL 450	460	485	500	IA 510	510	510	510	500	490	465	440						
LQ							380	425	455	470	480	485	490	480	470	470	440	415						

JUL. 1972 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					A	A	275	315	335	355	IA 360	370	IA 380	385	IA 375	360	330	285	A	A	E			
2					S	215	280	315	340	C	A	A	A	A	A	355	A	A	A	A	E			
3					A	A	270	315	345	355	365	IA 375	380	A	A	355	335	295	255	A	S			
4					A	220	IA 270	315	345	355	365	IA 370	A	A	A	A	A	A	A	A	S			
5					A	A	265	305	A	A	A	A	A	A	A	A	A	A	A	A	S			
6					A	A	A	315	340	A	A	A	A	A	A	A	A	A	A	A	S			
7					A	A	IA 280	320	A	IA 350	A	A	A	A	A	355	330	290	A	A	E			
8					E	A	265	315	335	350	360	370	A	A	A	A	330	290	230	A	E			
9					E	A	IA 270	300	A	A	A	A	A	380	375	355	A	A	A	A	S			
10					E	A	255	300	330	350	IA 360	365	A	A	365	350	320	280	A	A				
11					E	A	285	310	A	A	A	A	A	A	A	A	320	A	A	A				
12					E	A	275	310	335	355	365	375	380	375	365	345	A	A	A	165				
13					E	A	A	A	A	A	A	A	A	A	A	A	A	280	A	A				
14					E	190	255	310	330	350	360	IA 370	A	A	A	A	A	A	A	A				
15					E	A	IA 270	315	335	350	IA 360	IA 365	IA 375	A	A	A	320	285	A	A				
16					E	205	265	305	330	350	360	A	A	A	A	A	A	A	A	A				
17					E	A	265	305	330	350	360	A	A	A	A	A	A	A	A	A				
18					E	200	270	IA 310	325	A	A	A	A	A	A	A	A	A	A	A				
19					E	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
20					E	215	265	290	320	335	350	360	360	360	350	A	A	A	A	S				
21					E	180	250	280	310	350	360	370	380	A	A	345	310	270	A	A				
22					E	200	255	IA 300	IA 320	IA 340	355	360	A	A	A	A	315	270	220	S				
23					E	180	255	305	330	355	365	A	A	A	IA 350	335	305	275	215	S				
24						180	255	300	325	IC 350	IA 355	360	IA 365	365	355	345	315	290	A	S				
25						A	250	285	315	IA 335	360	IA 365	370	365	IA 355	340	305	265	205	S				
26					E	175	230	265	285	A	A	A	365	360	350	330	305	280	A					
27						180	255	280	310	335	350	IA 355	360	A	A	A	320	280	215					
28						B	230	275	320	345	A	A	A	360	IA 350	IA 330	315	290	230					
29						180	255	280	310	350	A	A	IA 375	380	370	355	325	270	A					
30						190	255	295	325	A	A	A	A	A	A	A	330	IA 280	225					
31						170	250	300	330	345	360	370	A	A	A	A	IA 330	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					17	15	28	29	25	21	18	15	11	9	11	14	18	17	8	1	4			
MED					E	190	265	305	330	350	360	370	375	365	355	348	320	280	222	165	F			
UQ					E	202	270	315	335	350	360	370	380	380	368	355	330	290	230		F			
LQ					E	180	255	295	320	345	360	362	365	360	350	340	315	275	215		F			

The Radio Research Laboratories, Japan

JUL. 1972 | FOE (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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	JX 29	JX 28	JX 28	JX 36	JX 41	30	34	JX 49	JX 49	JX 53	JX 67	44	44	G	42	42	G	38	34	JX 33	JX 43	JX 25	ES 14	JX 18
2	JX 36	JX 33	JX 28	JX 24	ES 14	G	33	JX 58	JX 74	C	JX 91	56	JX 49	42	39	G	37	38	JX 52	JX 47	JX 45	JX 43	JX 84	JX 63
3	JX 79	JX 84	JX 88	JX 71	JX 67	JX 45	35	JX 69	JX 74	JX 67	JX 77	JX 108	JX 72	JX 52	JX 60	G	38	32	28	JX 23	JX 75	JX 53	JX 22	ES 14
4	JX 23	JX 19	JX 17	JX 19	JX 19	G	33	40	46	45	JX 67	JX 62	JX 74	JX 62	JX 89	JX 120	JX 127	JX 79	JX 65	JX 65	JX 34	JX 21	JX 65	JX 43
5	JX 59	JX 36	JX 39	JX 28	JX 26	23	30	JX 44	JX 83	JX 98	JX 52	JX 93	JX 98	JX 138	JX 59	JX 108	JX 108	JX 53	JX 74	JX 46	JX 72	JX 40	JX 58	JX 63
6	JX 73	JX 72	JX 28	JX 24	JX 87	JX 51	38	JX 62	JX 69	JX 64	JX 92	JX 64	JX 79	JX 49	39	JX 53	40	JX 88	JX 75	JX 30	JX 42	JX 42	JX 45	JX 74
7	JX 75	JX 59	JX 28	JX 36	JX 32	JX 29	35	JX 59	JX 65	JX 66	JX 84	JX 91	JX 57	JX 71	JX 49	46	JX 55	JX 73	JX 108	JX 119	JX 111	JX 88	JX 59	JX 33
8	JX 28	JX 26	M 20	ES 14	JX 27	JX 31	33	JX 83	JX 103	JX 71	JX 58	JX 45	JX 74	JX 84	JX 64	JX 64	JX 79	JX 84	JX 89	JX 88	JX 73	JX 43	JX 52	JX 53
9	JX 73	JX 78	JX 86	JX 43	JX 30	JX 42	JX 53	JX 108	JX 54	JX 44	43	JX 47	JX 43	G	G	JX 55	42	JX 46	JX 87	JX 69	JX 50	JX 100	JX 50	JX 71
10	JX 75	JX 54	JX 65	JX 43	JX 19	JX 30	G	JX 50	JX 69	JX 73	JX 57	47	44	44	G	43	JX 93	JX 179	D	JX 137	JX 93	JX 119	JX 37	JX 39
11	JX 78	JX 51	JX 49	JX 43	JX 54	JX 36	JX 46	JX 53	JX 88	JX 81	JX 84	JX 53	JX 48	JX 178	JX 89	JX 64	JX 67	JX 91	JX 113	JX 104	JX 97	JX 89	JX 43	JX 25
12	JX 53	JX 33	JX 19	JX 23	JX 18	28	34	45	JX 77	JX 53	48	JX 55	JX 53	JX 65	50	JX 67	JX 82	JX 36	26	G	JX 25	JX 63	JX 40	JX 51
13	JX 38	JX 36	JX 30	JX 24	JX 23	JX 26	JX 50	JX 103	JX 66	JX 80	JX 60	50	JX 54	JX 42	JX 43	JX 42	36	JX 42	JX 36	JX 42	JX 20	JX 76	JX 78	JX 52
14	JX 21	JX 19	JX 33	JX 20	JX 16	JX 20	JX 50	34	39	45	50	45	43	40	JX 65	JX 55	JX 63	JX 97	JX 87	JX 138	JX 111	JX 79	JX 25	JX 20
15	JX 18	JX 25	JX 29	JX 28	JX 26	JX 80	36	43	JX 88	JX 59	JX 52	50	39	38	JX 38	JX 38	JX 33	JX 30	JX 29	JX 41	JX 66	JX 88	JX 27	JX 27
16	JX 44	JX 24	JX 20	JX 18	JX 19	G	29	43	54	JX 67	JX 89	JX 133	JX 60	41	46	JX 89	JX 61	JX 84	JX 69	JX 42	JX 38	JX 18	JX 63	JX 54
17	JX 73	JX 103	JX 44	JX 64	JX 43	22	31	43	JX 66	JX 68	JX 73	JX 129	JX 121	JX 84	JX 79	JX 49	JX 54	JX 39	JX 28	JX 26	JX 26	JX 43	JX 38	JX 36
18	JX 47	JX 28	JX 27	JX 26	JX 26	G	34	JX 56	JX 47	JX 48	46	JX 53	JX 79	JX 89	JX 59	JX 54	JX 41	JX 43	JX 28	JX 38	JX 29	JX 28	JX 43	JX 74
19	JX 63	JX 43	JX 38	JX 21	JX 33	JX 23	JX 29	JX 44	JX 43	JX 44	JX 64	JX 58	JX 64	JX 59	JX 60	JX 36	36	40	JX 46	JX 33	JX 59	JX 23	JX 64	JX 64
20	JX 54	JX 59	JX 53	JX 29	JX 24	JX 27	30	32	38	JX 56	41	G	43	JX 50	JX 53	JX 39	JX 83	JX 110	JX 65	JX 50	JX 20	JX 18	JX 18	JX 18
21	M 21	JX 15	JX 13	M 19	JX 18	22	28	33	JX 41	46	55	JX 53	43	JX 65	JX 91	36	47	JX 43	JX 52	JX 74	JX 27	JX 61	JX 41	JX 53
22	JX 33	JX 21	JX 19	JX 22	JX 24	JX 26	G	JX 41	JX 48	38	JX 44	JX 43	JX 60	JX 88	JX 62	JX 43	JX 65	JX 50	JX 60	JX 73	JX 23	JX 46	JX 52	JX 54
23	JX 60	JX 21	JX 23	ES 14	E	20	33	39	JX 82	JX 89	JX 80	JX 61	JX 73	JX 93	JX 58	47	JX 96	JX 64	JX 45	JX 36	JX 35	JX 50	JX 28	JX 40
24	JX 34	JX 24	JX 26	JX 28	JX 16	G	34	JX 83	JX 60	40	JX 73	JX 70	JX 99	43	G	JX 79	JX 73	JX 43	JX 87	JX 73	JX 105	JX 83	JX 90	JX 48
25	JX 48	JX 83	JX 43	JX 45	JX 50	JX 46	JX 51	JX 73	JX 89	JX 90	JX 50	JX 46	49	JX 59	JX 60	G	JX 64	JX 53	JX 134	JX 88	JX 36	JX 88	JX 40	JX 36
26	JX 25	JX 18	JX 26	JX 23	JX 28	G	32	JX 35	35	JX 41	JX 78	JX 43	G	40	42	JX 71	JX 38	G	25	JX 51	JX 28	JX 31	JX 35	JX 16
27	JX 20	JX 24	JX 26	JX 16	E	G	30	JX 45	40	JX 53	JX 49	JX 48	46	JX 63	JX 42	42	JX 88	JX 78	JX 71	JX 88	JX 83	JX 66	JX 61	JX 40
28	JX 26	JX 25	JX 26	JX 23	JX 29	JX 69	JX 43	JX 56	JX 38	JX 41	JX 39	JX 83	40	43	JX 44	JX 43	47	JX 105	JX 43	JX 39	JX 78	JX 85	JX 60	JX 83
29	JX 73	JX 41	JX 110	JX 78	JX 51	27	JX 51	JX 55	JX 56	JX 74	JX 71	JX 89	46	G	44	49	37	35	JX 57	JX 67	JX 43	JX 41	JX 41	JX 26
30	JX 29	JX 26	JX 20	JX 24	JX 28	JX 29	38	JX 52	JX 64	JX 48	JX 49	JX 83	JX 108	JX 83	JX 96	JX 46	37	45	JX 37	JX 36	JX 53	JX 89	JX 129	JX 76
31	JX 68	JX 54	JX 23	JX 24	JX 33	JX 26	29	47	39	46	44	46	43	40	JX 37	JX 36	JX 36	33	JX 80	JX 39	JX 20	JX 26	JX 28	JX 18
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	JX 47	JX 33	JX 28	JX 24	JX 26	JX 26	34	JX 49	JX 60	JX 54	JX 58	JX 53	JX 53	JX 52	JX 50	JX 46	JX 54	JX 46	JX 60	JX 47	JX 43	JX 50	JX 43	JX 43
UQ	JX 70	JX 54	JX 41	JX 36	JX 33	JX 30	38	JX 58	JX 74	JX 71	JX 75	JX 76	JX 74	JX 77	JX 61	JX 60	JX 76	JX 89	JX 81	JX 74	JX 74	JX 84	JX 60	JX 58
LQ	JX 28	JX 24	JX 23	JX 22	JX 19	20	30	43	JX 44	JX 45	JX 49	JX 46	44	42	42	40	38	38	JX 36	JX 37	JX 28	JX 36	JX 36	JX 26

The Radio Research Laboratories, Japan

JUL. 1972 | FOES (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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	23	22	24	16	20	24	34	41	47	53	54	42	40	G	41	39	G	36	30	25	24	E	E S 14	E
2	27	24	22	18	E S 14	G	33	55	62	C	A	49	40	42	39	G	36	38	47	45	42	33	40	40
3	64	41	40	18	18	28	35	68	62	40	56	56	70	44	41	G	38	32	28	20	40	22	19	E S 14
4	20	17	15	16	17	G	30	40	44	44	A	57	60	60	82	A	A	76	42	50	27	E	40	30
5	32	22	28	23	23	23	29	43	64	A	50	A	A	A	57	A	56	32	65	46	25	26	36	36
6	31	36	E	19	24	38	36	58	65	45	56	56	58	44	39	44	39	61	73	21	22	28	18	32
7	29	25	E	29	30	24	31	49	57	57	74	72	45	68	44	42	54	40	50	A	24	48	35	25
8	22	22	E	E S 14	23	25	30	67	A	A	57	45	67	80	59	64	54	70	A	54	43	39	27	36
9	35	59	54	24	24	37	42	A	54	44	42	44	40	G	G	45	41	42	A	53	50	62	25	30
10	60	E	28	23	15	28	G	50	67	39	57	44	42	43	G	43	68	A	A	A	90	66	20	25
11	E	28	38	34	24	26	43	52	61	45	60	U R 53	46	A	54	U R 64	62	A	A	A	71	62	34	18
12	27	16	E	16	E	24	34	44	76	51	47	54	53	52	50	66	36	31	26	G	19	50	24	35
13	21	26	17	17	15	22	43	65	35	42	54	U R 50	44	40	40	40	35	41	32	38	19	25	41	36
14	18	E	25	16	E	17	19	34	38	44	50	40	40	39	40	40	38	48	23	50	64	24	E	E
15	E	E	E	16	16	22	32	44	56	57	51	50	39	38	38	37	29	24	24	23	38	38	22	24
16	25	19	16	E	15	G	29	39	48	58	55	A	55	40	44	38	38	31	42	29	25	E	18	E
17	42	17	40	28	24	20	30	41	59	A	53	56	A	50	40	37	36	33	24	23	20	F	20	20
18	25	17	18	18	20	G	31	41	45	U R 48	45	53	55	44	42	38	35	43	24	21	24	25	22	20
19	19	18	25	E	16	21	27	38	41	40	A	42	55	37	45	35	36	30	40	25	U R 59	18	46	30
20	22	26	24	18	26	17	29	32	36	42	37	G	40	39	G	35	35	A	23	23	16	E	17	E
21	E	16	13	E	13	G	28	32	35	G	48	45	41	61	43	G	36	32	30	37	18	26	23	23
22	26	E	E	E	15	18	G	35	38	36	37	39	57	62	38	37	63	35	43	41	17	22	45	44
23	40	E	E	E S 14	E	20	29	35	45	58	A	40	40	52	U R 58	44	A	45	39	20	35	20	22	22
24	17	17	15	14	14	G	30	55	40	38	48	A	A	43	G	54	36	33	24	20	F	27	25	17
25	30	33	33	36	24	22	45	66	60	A	U R 50	38	48	52	A	G	40	53	61	19	16	22	15	20
26	17	16	13	15	E	G	29	30	35	35	37	38	G	39	42	37	34	G	23	42	16	27	E	16
27	E	E	16	15	E	G	27	43	36	52	39	45	45	40	38	40	60	47	47	53	24	17	23	16
28	23	16	17	15	17	A	35	33	35	36	37	A	40	42	38	39	40	56	25	22	20	53	16	22
29	42	18	22	22	16	23	40	43	55	54	44	40	46	G	43	41	36	35	43	40	16	18	27	22
30	19	16	16	16	18	16	37	46	59	44	47	A	64	55	70	42	36	45	G	21	F	21	30	34
31	28	E	E	E	22	16	29	47	39	46	44	45	42	40	37	36	35	32	A	30	E	20	25	E
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	25	17	17	16	17	21	30	43	48	45	50	49	46	43	41	40	38	40	40	30	24	25	23	22
UQ	30	24	25	20	23	24	35	54	60	57	56	56	58	54	48	44	54	50	56	48	39	36	32	31
LQ	19	16	E E 13	14	14	E G 16	29	38	38	40	44	42	40	40	38	37	36	32	24	22	18	19	18	16

JUL. 1972 | FBES (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 14	E	E	E	E	14	16	17	18	18	21	24	21	22	22	18	16	15	15	14	E	E S 14	E S 14	E S 14
2	E S 14	E S 14	E S 14	E	E S 14	14	17	18	18	C	19	23	22	22	23	18	16	15	14	14	E	E S 14	E S 14	E S 14
3	E S 14	E	E	E	E	14	15	16	17	16	21	30	21	21	22	16	16	17	14	14	E S 14	E S 14	E S 14	E S 14
4	E S 14	E	E	E	E	15	16	18	16	18	21	22	22	21	22	21	16	15	14	14	E S 14	E S 14	E S 14	E S 14
5	E S 14	E	E	E S 14	E	14	16	14	18	24	27	21	22	28	19	18	16	16	14	14	E S 14	E S 14	E S 14	E S 14
6	E S 14	E	E	E	E	E	14	16	18	21	22	21	21	21	21	21	23	15	14	14	E S 14	F S 14	E S 14	E S 14
7	E S 14	E S 14	E S 14	E S 14	E	E	14	14	16	22	19	21	23	22	22	17	16	15	13	E	F	E S 14	E S 14	E S 14
8	E S 14	E S 14	E S 14	E S 14	E	14	15	17	16	19	20	22	26	22	18	18	18	16	14	14	E	F	E S 13	E S 14
9	E S 14	E S 14	E	E	E	14	15	16	17	18	17	22	21	22	18	18	15	14	14	13	E S 14	E S 13	E S 13	E S 14
10	E	E	E	E	E	14	16	18	17	21	23	22	22	24	23	19	16	14	14	13	E	E S 14	E	E S 14
11	E S 14	F	E	E	E	E	15	14	17	17	21	18	21	21	21	18	15	15	14	14	E S 14	E S 14	E S 14	E S 14
12	E	E	E S 14	E	E	15	16	17	16	17	23	23	20	17	18	16	16	14	16	14	E	E S 13	E S 14	E S 14
13	E S 14	E	E	E	E	E	13	14	14	16	16	18	22	16	21	21	16	14	F	E	E S 14	E S 14	E S 14	E
14	E S 14	E S 14	E	E	E	14	E	15	16	17	15	16	16	19	19	15	16	14	14	14	E S 14	E S 14	E S 14	E S 14
15	E S 14	E S 13	E	E	E	E	15	15	16	17	21	23	31	21	18	16	15	14	14	14	E S 14	E S 14	E S 14	E S 14
16	E S 14	E	E	E	E	15	16	16	15	15	18	21	21	18	22	21	18	15	14	14	E S 14	E S 14	E S 14	E S 14
17	E S 14	E	E	E	E	14	15	15	15	17	19	18	21	23	23	18	15	15	14	13	E S 14	E S 14	E S 14	E S 14
18	E S 14	E	E	E	E	15	15	15	16	16	21	20	18	19	18	18	15	13	14	14	E S 14	E S 14	E S 14	E S 14
19	E	F	E	E	E	E	15	14	16	16	17	16	18	18	17	16	14	14	14	14	E S 14	E S 14	E S 14	E
20	E	E	E	E	E	E	15	16	15	16	20	21	23	22	20	17	17	16	14	F S 14	E S 13	E S 14	E S 14	E S 14
21	E S 14	E S 13	E	E S 13	E	E	15	15	15	14	16	16	18	18	18	18	16	13	15	13	E S 13	E S 14	E S 13	E S 14
22	E S 14	E	E S 14	E	E	14	15	16	17	17	23	20	22	23	19	17	16	15	15	F S 14	E S 13	E S 14	E S 14	E
23	E S 13	E S 14	E S 14	E S 14	E	17	14	16	16	17	23	22	15	25	17	17	14	15	14	E S 14	E S 13	E S 13	E S 14	E S 14
24	E S 14	E S 14	E	E	E	14	15	15	18	E C 37	25	32	25	26	20	22	16	15	14	E S 13	E S 14	E S 14	E S 14	E S 13
25	E S 13	E S 13	E	E	E	E	14	15	17	16	17	22	17	17	23	15	15	15	13	E S 13	E S 13	E S 13	E S 12	E S 14
26	E S 14	E S 13	E	E	E	14	15	15	15	16	17	23	22	24	17	15	17	16	14	E S 14	E S 14	E S 13	E S 14	E S 13
27	E S 14	E	E	E	E	13	13	14	15	17	18	23	16	23	16	18	15	13	14	E S 13	E S 14	E S 14	E S 14	E S 14
28	E S 14	E S 14	E S 13	E	E	21	13	14	16	17	22	20	17	18	20	18	16	15	15	E S 14	E S 14	E S 14	E S 14	E S 13
29	E S 14	E S 14	E S 14	E S 14	E	14	15	13	14	16	16	18	18	19	20	16	14	15	13	F S 14	E	E S 14	E S 13	E S 14
30	E S 14	E	E	E	E	13	15	16	16	18	18	18	22	22	15	18	15	15	14	E	E S 14	E S 14	E S 14	E S 14
31	E S 14	E	E	E	E	E	14	14	15	16	16	22	16	16	18	16	16	16	15	E S 14	E S 14	E S 14	E S 13	E S 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	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E S 14	E	E	E	E	14	15	15	16	17	20	21	21	21	20	18	16	15	14	14	E S 14	E S 14	E S 14	E S 14
UQ	E S 14	E S 14	E E 13	E	E	14	15	16	17	18	22	22	22	22	22	18	16	15	14	14	E S 14	E S 14	E S 14	E S 14
LQ	E S 14	E	E	E	E	E	14	14	15	16	17	19	18	18	18	16	15	14	14	E S 13	E S 13	E S 14	E S 14	E S 14

The Radio Research Laboratories, Japan

JUL. 1972 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	285	280	280	270F	280	310	305	290	305	275	280	275	290	285	285	290	295	285	285	290	295	275	280	275
2	275	285	290	285	285	295	325	295	300	305IC	280IA	265	275	275	290	285	285	300	285	285	295	290	290F	F
3	F	F	320F	295F	285F	320	280	280	275	295	280	270	275	280	275	280	270	280	290	310	285	275	280	280
4	275	275	275	275	F	275F	270	285	295H	290	275IA	255	265	275	280	A	A	300	290	295	280	275	280F	F
5	280F	F	F	F	295	295	290	275H	295	280IA	270	285IA	290IA	280IA	280	285IA	290	280	275	300	290	275	265	F
6	F	F	F	305F	F	305F	270	280	290	270H	270	295	280	280	290	300	340H	280	295	265	275	280	300	300F
7	F	275F	285F	290F	280F	295F	305	280	275	290	275	270	260	270	265	280	270	290	280IB	290IA	300	270	270	F
8	270F	F	265F	270F	F	255	265	295	285IA	285IA	270	280	275	265	285	295	290	290	290IA	290	F	275	280F	295
9	F	275F	F	F	F	280F	245	260IA	280	245	245	265	250IB	265	275	275	285	310	290IA	295	280	260	F	F
10	F	290F	F	F	F	290	305	275	300	280	280	275	270	295	280	290	290	A	A	280IA	F	320	285	280
11	275	F	290F	285	275F	300	265	280	300	330	275	275	285	285IB	280	290	285	285IA	280IA	295IA	295	305	280	285
12	F	F	F	F	F	F	275	305	315	295	265	285	275	285	285	285	285	290	290	295	310	280	F	F
13	290	265F	285	295	300	300	290	275	315	280	280	300	300	290	290	295	295	305	295	295	300	280F	280F	290F
14	285	280	300	290	290	305	315	300	305	305	320	275	285	290	300	290	295	300	295	285	300IB	295F	280	285
15	275	280IB	285F	290	300	285	280	290	300	315	300	295	290	275	295	290	305	285	285	290	295	295F	F	280
16	280F	270F	280	295	300	290	270	310	310	310	A	A	265	280	280	290	290	295	290	280	280	285	290	310F
17	F	F	F	F	F	F	295	295	A	A	285	295	280IA	285	285	275	295	295	305	290	295	270	F	280
18	280	275	285	F	285	290	275F	300	305	295	295	270	280	295	285	290	310	300	295	300	290	280	285	295F
19	F	280	F	300	300	310	320	340	320	295	305IA	285	290	295	305	295	310	300	295	300	285IB	285	280IB	290
20	310	300F	300	F	300	290	310	305	300	300	295	280	305	300	310	295	290	275IA	280	310	315	280	275	270
21	275	275F	280F	275F	290F	320	295	320	255	340	300	305	295	300	295	295	305	300	315	325	280	280	F	290
22	290F	F	300	310	290	305	320	340	335	295	280	290	295	285	275	305	310	295	310	290	295	285	270	F
23	F	295	310F	275F	285F	270	270	305	320	300	320IA	275	285	280	275	290	290IA	285	305	300	290IB	270	280	275
24	285	310IB	280	265	275F	305	275F	325	300	300	290	A	A	300	295	315	305	310	305	310	285IB	F	F	F
25	F	F	F	F	F	355F	F	270F	300IB	285IA	255	310	265	270	265IA	260	290	270IA	285	315	280	280	255	260
26	275	275	270F	290	285	270	285	305F	280	285	295	270	290	260	270	265	270	285	300	295	290	F	290	265
27	260F	260F	270F	265	265	265	295	305	305	290IA	295IB	285	295	305	290	280	300	305	305	300IB	F	275F	F	280
28	275	275	290	250	270	265IA	290F	315	330H	330	295	280IA	285	290	305	290	295	300	295	295	280V	F	F	F
29	F	F	F	F	F	310	290F	305	315	295	270IB	250IA	260	275	290	300	305	315	315	290	280	270F	270	280
30	280	280	280	275	275	295	310	300	290	285	290	280IA	280	280	285	305	305	315	295	290	275F	255	F	F
31	F	F	F	F	F	315	320	320	325	295	290	270	285	275	285	290	295	300	300IA	290	285	280	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	19	20	21	21	21	29	30	31	30	30	30	29	30	31	31	30	30	30	30	31	28	28	22	21
MED	280	278	285	285	285	295	290	300	300	295	280	280	282	280	285	290	295	295	295	295	290	280	280	280
UQ	285	282	290	295	295	305	305	305	315	300	295	285	290	290	290	295	305	300	300	300	295	285	285	290
LQ	275	275F	280	275	280	285	275	280	290	285	275	270	275	275	280	285	290	285	285	290	280	275	275	275

JUL. 1972 | M(3000)F2 (0.01)

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Hour / Day	00	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	UL 335	IA 370	IA 360	IA 380	370	365	375	380	355	350	L 350	L					
2							L	A	A	C	A	355	360	360	345	365	350	345	A	A				
3							L	A	A	380	A	A	A	350	365	370	UL 335	335	L					
4							UL 355	UL 320	IA 360	365	A	A	A	A	A	A	A	A	A					
5						L	UL 335	A	A	A	A	A	A	A	A	A	A	340	A					
6							L	A	A	H 340	IA 355	IA 375	IA 350	360	355	360	UL 380	A	A					
7						L	L	A	A	A	A	A	350	IA 355	IA 360	370	IA 350	L	A	A				
8							L 335	A	A	A	A	370	IA 355	IA 345	A	A	A	A	A					
9							A	A	A	A	395	380	375	370	380	A	A	A	A					
10						L	330	A	A	H 380	IA 380	385	360	380	360	335	A	A	A					
11							A	IA 345	IA 360	A	A	A	IA 370	A	A	A	A	A	A					
12							L	A	A	A	H 345	A	A	A	A	A	335	UL 330	L					
13						L	A	A	395	355	IA 380	A	385	360	355	375	365	A	L					
14							L	UL 345	360	390	A	380	380	H 360	375	365	350	A	L					
15							UL 320	A	A	A	A	IA 385	395	395	385	H 370	365	L 335	L					
16						UL 300	335	350	A	A	A	A	A	370	IA 370	350	345	365	A					
17							UL 355	L 350	A	A	A	A	A	A	370	360	360	370	L					
18							L	IA 360	IA 375	A	375	IA 345	IA 360	370	395	370	355	L 350	L					
19							L	L	405	H 390	IA 385	H 350	IA 375	400	IA 370	370	380	335	A					
20							L	375	340	340	370	380	R 400	R 385	415	400	L	IA 345	L					
21							395	355	L	395	IA 380	IA 380	375	IA 385	375	365	355	350	L					
22							L	L 375	400	415	440	355	IA 375	IA 380	380	380	IA 370	L	A					
23						L	330	355	IA 375	IA 375	IA 355	365	350	IA 385	IA 370	A	A	A	A					
24							340	IA 350	355	405	A	A	A	375	H 360	IA 370	355	345	L 350					
25						L	A	A	A	A	A	H 380	A	A	A	330	A	A	A					
26						L	350	360	400	415	425	395	375	380	370	L	350	335	L					
27						L	355	IA 360	385	IA 385	405	IA 400	IA 370	370	360	360	A	A	A					
28						A	L	365	L	390	415	IA 375	410	355	385	345	IA 350	IA 335	L					
29								A	A	A	375	380	370	365	370	355	345	A	A					
30							L	A	A	365	A	A	A	A	IA 350	345	350	A	L					
31								IA 350	360	IA 365	370	380	375	375	370	355	350	L	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	12	16	14	18	17	20	22	24	25	23	21	15	1					
MED						UL 300	338	352	372	380	380	380	372	370	370	365	350	345	L 350					
UQ							355	360	395	390	395	380	375	380	380	370	360	350						
LQ							332	348	360	365	370	368	360	360	360	355	350	335						

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JUL. 1972 | M(3000)F1 (0.01)

IONOSPHERIC DATA

JUL. 1972 | H'F2 (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 automatio operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							270	315	290	355	345	370	320	335	335	325	315	325	310					
2							245	280	315	I C 305	A	390	360	345	340	345	335	320	315	280				
3							300	I A 340	330	320	335	355	350	340	345	335	330	315	300					
4							285	330	285	360	A	425	390	360	A	A	A	A	295					
5						270	320	300	320	I A 360	370	I A 355	I A 350	I A 350	345	I A 350	350	350	350					
6							300	300	300	400	355	320	380	380	365	330	275	I A 335	I A 310					
7						280	260	285	295	330	I A 340	I A 355	395	355	340	330	310	305	315	A				
8							350	I A 320	I A 340	I A 365	360	390	380	I A 370	345	320	330	340	A					
9							430	A	370	540	545	475	550	450	400	450	380	325	A					
10						300	320	290	I A 310	390	355	350	360	335	340	335	A	A	A					
11							270	340	300	270	A	400	325	I A 350	330	I A 330	350	A	A					
12							315	290	295	320	440	340	380	325	345	315	315	300	295					
13						285	280	350	280	B 360	355	340	345	345	350	340	320	300	285					
14							280	305	300	310	310	355	365	340	335	330	330	340	310					
15							350	330	310	290	325	340	350	405	345	335	315	355	320					
16						350	375	305	290	A	A	A	A	390	360	355	350	310	300					
17							340	325	A	A	385	355	I A 365	355	370	335	300	290	285					
18							285	270	270	350	355	410	375	320	365	330	305	305	290					
19							255	250	305	400	I A 345	375	345	335	305	325	310	330	295					
20							290	295	315	300	355	370	325	310	325	320	330	I A 335	300					
21							260	285	255	270	350	335	370	345	330	335	310	295	265					
22							270	250	260	385	365	390	I A 350	I A 340	355	310	I A 290	295	300					
23						350	350	310	275	295	A	370	350	350	365	320	I A 320	315	285					
24							350	300	355	360	380	I A 360	I A 370	345	350	I A 350	345	310	300					
25						330	385	A	280	I A 340	I A 365	345	440	410	I A 405	450	370	I A 380	I A 320					
26						350	335	305	385	380	395	410	390	445	465	440	410	355	300					
27						380	340	295	295	A	400	395	370	350	370	390	I A 340	295	280					
28						I A 345	300	290	260	300	335	A	370	350	335	385	335	310	300					
29								320	320	I R 335	I R 460	R	480	435	380	350	335	300	275					
30							270	290	A	355	350	I A 380	355	355	365	325	300	290	275					
31								295	305	315	335	360	340	350	330	320	315	290	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						10	29	29	29	28	26	28	30	31	30	30	29	28	26	1				
MED						338	300	300	300	345	355	365	365	350	345	335	330	312	300	280				
UQ						350	340	320	315	362	380	390	380	365	365	350	340	335	310					
LQ						285	270	290	285	308	345	352	350	340	335	325	310	300	285					

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JUL. 1972 | H'F2 (KM)

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Hour / Day	00	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	285	300	295	290	245	240	A	A	A	A	200	210	210	220	230	230	245	260	270	265	250	270	280
2	295	295	270	280	280	245	245	A	A	C	A	A	195	230	225	225	240	A	A	A	265	270	285	340A
3	I A 325	310	250	260	285	250	240	A	A	205	A	A	A	I A 230	210	205	260	I A 250	265	265	260	270	275	265
4	300	285	290	290	285	245	230	240	I A 220	210	A	A	A	A	A	A	A	A	A	285	265	270	280	315
5	310	305	310	285	250	220	205	I A 235	I A 245	A	A	A	A	A	A	A	A	240	I A 255	275	255	260	315	315
6	300	310	250	240	265	290	250	A	A	H 230	A	A	I A 215	230	220	I A 230	A	A	A	270	290	290	245	265
7	295	280	280	285	295	245	230	I A 220	A	A	A	A	A 230	I A 235	I A 230	I A 225	I A 235	I A 240	A	A	255	300	325	340
8	305	315	300	290	250	250	240	A	A	A	A	I A 220	A	A	A	A	A	A	A	295	I A 325	315	300	280
9	280	I A 310	A 330	285	265	295	A	A	A	A	215	I A 215	220	230	230	A	A	A	A	I A 300	I A 310	I A 325	285	350
10	I A 275	275	305	250	230	I A 250	240	A	A	H 200	I A 215	230	I A 215	210	230	A	A	A	A	A	I A 280	255	240	290
11	295	330	310	305	295	250	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A 320	300	265	285
12	310	265	250	270	270	250	A	A	A	A	H 230	A	A	A	A	A	240	240	245	260	240	I A 240	305	320
13	275	310	285	260	235	255	A	A	205	230	I A 200	I A 240	215	240	225	205	240	A	A	260	245	285	I A 320	300
14	255	280	280	265	250	245	240	235	235	I A 225	I A 220	205	200	200H	215	I A 240	230	I A 235	225	290	I A 260	250	255	285
15	290	280	260	260	250	250	260	A	A	A	A	I A 225	200	200	195	205H	240	240	250	255	285	290	300	280
16	300	295	280	245	240	235	255	A	A	A	A	A	A	200	I A 240	230	I A 225	230	A	295	265	255	250	235
17	A	275	I A 315	325	290	230	230	A	A	A	A	A	A	A	240	230	I A 230	230	245	270	250	290	310	295
18	295	295	285	290	285	255	245	A	A	I A 210	A	A	I A 250	I A 230	235	240	230	205	255	250	260	295	285	265
19	285	295	300	255	245	245	215	I A 225	I A 200	H 195	I A 200	A	A	210	I A 230	200	210	230	I A 250	250	I A 265	280	I A 310	290
20	255	260	260	285	245	255	245	215	240	I A 230	230	205	235	235	200	210	220	I A 235	275	255	245	230	235	290
21	290	280	275	275	290	240	230	230	210	200	I A 195	I A 210	215	I A 220	I A 230	215	250	230	I A 250	240	250	300	320	280
22	300	245	245	275	275	245	215	I A 215	200	195	185	225	I A 235	I A 220	230	205	I A 225	245	I A 240	I A 255	230	290	I A 320	I A 335
23	A	250	290	280	290	260	245	240	I A 255	I A 230	I A 240	230	220	I A 220	I A 230	A	A	A	A	250	270	275	280	290
24	280	250	245	305	285	255	260	I A 240	240	215	I A 200	A	A	245	230H	I A 240	240	245	240	260	230	I A 320	320	275
25	I A 290	I A 315	I A 330	I A 320	295	285	A	A	A	A	A	H 215	A	A	A	245	A	A	I A 285	250	255	280	315	320
26	295	275	280	280	270	250	255	250	215	200	200	210	235	225	I A 235	240	250	240	250	I A 270	245	280A	230	295
27	325	330	310	315	290	280	245	I A 235	210	I A 210	200	I A 205	I A 235	245	230	240	A	A	A	A	265	295	300	280
28	300	295	270	300	315	S	S	245	220	210	190	I A 205	200	I A 210	200	255	I A 245	I A 250	250	250	270	I A 300	250	280
29	I A 295	270	270	330	280	260	260	A	A	A	A	210	I A 205	215	I A 230	250	240	I A 250	I A 255	300	255	305	315	275
30	295	300	290	295	305	265	A	A	A	A	A	A	A	A	A	A	235	I A 240	250	245	290	255	300	280
31	290	265	285	245	270	235	240	I A 235	230	I A 225	230	I A 230	215	200	200	230	245	250	I A 280	270	245	280	290	290
	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	14	14	17	15	17	19	23	24	22	21	20	19	26	31	31	31	31
MED	295	285	285	285	280	250	240	235	220	210	200	215	215	220	230	230	240	240	250	262	260	280	290	290
UQ	300	308	300	295	290	255	248	240	240	I A 225	225	I A 225	232	230	230	240	240	245	258	275	270	298	312	308
LQ	285	275	270	262	250	245	230	I A 225	210	200	200	205	208	210	218	210	230	232	248	250	250	265	272	280

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JUL. 1972 | H'F (KM)

IONOSPHERIC DATA

JUL. 1972 | H'ES (KM) | 135° E Mean Time (G. M. T. + 9h)

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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	105	105	100	110	105	140	140	125	125	125	115	115	120	G	115	120	G	130	115	110	110	110	S	105
2	100	100	100	100	S	G	140	125	115	C	115	115	110	115	130	G	135	130	115	115	110	110	110	115
3	110	105	105	105	105	105	125	120	115	125	115	115	115	115	115	G	150	150	125	120	115	115	110	S
4	105	105	100	100	100	G	150	130	125	125	115	115	115	115	115	115	110	110	105	100	105	100	105	110
5	100	100	100	100	100	120	140	125	115	115	115	115	110	110	110	110	110	110	105	105	105	105	105	100
6	100	100	100	100	105	100	130	115	115	115	110	105	105	105	110	110	115	115	115	105	100	100	100	105
7	105	105	100	100	100	100	120	125	120	120	115	115	115	115	110	125	125	125	110	105	105	100	100	100
8	100	100	100	S	115	115	140	125	115	115	115	115	110	105	115	115	125	120	120	115	110	110	110	105
9	100	100	100	100	115	125	125	115	115	115	115	110	110	G	G	125	115	115	105	105	110	110	110	110
10	110	105	105	105	105	110	G	130	125	130	115	115	120	125	G	140	125	120	115	115	120	115	110	105
11	115	105	105	105	100	105	130	115	115	115	110	110	105	115	110	105	125	115	110	110	110	105	105	110
12	110	105	110	110	105	125	125	125	120	125	125	125	125	125	125	120	115	120	125	G	110	110	110	105
13	105	100	110	105	105	105	115	110	115	115	115	115	115	115	110	110	140	125	125	115	105	110	110	110
14	110	105	100	105	105	105	110	140	130	125	125	125	125	125	115	115	115	110	115	110	110	110	105	105
15	110	110	100	100	100	100	140	130	125	120	115	115	115	115	110	110	110	105	110	110	100	100	100	100
16	100	100	100	100	100	G	145	130	130	125	115	110	115	115	115	115	110	115	115	110	110	110	110	110
17	110	110	105	105	100	120	150	130	125	120	115	115	110	110	110	110	110	110	105	100	100	120	100	110
18	105	105	105	105	100	G	130	125	125	120	115	115	115	110	110	110	110	110	105	105	105	100	100	110
19	110	110	100	105	110	110	110	110	110	110	110	110	110	110	105	105	100	110	110	110	110	110	110	100
20	100	105	105	100	100	100	150	150	130	125	135	G	125	120	120	120	110	110	110	110	105	105	100	100
21	105	100	105	110	110	150	155	145	105	130	125	130	130	115	115	140	130	125	120	110	110	105	110	105
22	105	105	100	105	100	110	G	115	110	120	130	115	110	110	115	110	130	130	125	120	120	115	115	110
23	110	110	110	S	E	160	140	140	125	120	120	115	115	115	115	135	130	130	130	130	125	120	115	115
24	110	105	105	100	100	G	140	120	120	120	115	115	110	125	G	130	125	125	115	115	115	110	115	110
25	110	110	105	110	110	115	125	120	120	115	120	120	115	115	110	G	130	130	125	120	120	115	110	110
26	105	105	105	105	135	G	120	120	110	110	110	110	G	150	135	130	130	G	120	115	115	115	110	110
27	120	110	110	110	E	G	135	120	120	110	115	115	115	115	115	120	130	130	125	120	120	115	115	100
28	100	100	105	115	120	120	120	120	115	120	110	110	115	165	110	115	130	130	125	120	115	115	110	105
29	110	105	110	110	105	135	130	125	125	120	115	115	115	G	140	140	140	130	115	110	110	105	105	105
30	105	105	105	105	100	105	125	125	115	115	115	110	110	105	105	105	140	125	125	110	110	110	110	110
31	105	105	105	105	105	105	150	125	125	125	125	115	115	115	115	115	110	145	115	105	110	105	100	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	31	31	31	29	28	24	29	31	31	30	31	30	30	28	28	28	30	30	31	30	31	31	30	30
MED	105	105	105	105	105	110	130	125	120	120	115	115	115	115	115	115	125	122	115	110	110	110	110	105
UQ	110	105	105	105	108	122	140	130	125	125	118	115	115	118	115	125	130	130	125	115	115	115	110	110
LQ	102	100	100	100	100	105	125	120	115	115	115	110	110	110	110	110	110	110	110	105	105	105	105	105

The Radio Research Laboratories, Japan

JUL. 1972 | H'ES (KM)

IONOSPHERIC DATA

JUL. 1972 | 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F5	F2	F3	F1	L5	H1	H3	H3	H2	H2	C2	C2	C1		C1	C1		H2	C2	L3	L3	F1		F1
2	F4	F3	F3	F2			H2	H3	C3		C3	C2	L1	C1	H1		H1	H2	C3	C5	L4	F4	F3	F5
3	F5	F3	F3	F2	L3	L4	H2	H4	C2	H2	C2	C2	C2	C2	C2		H1	HL22	HL22	C2	C3	F2	F3	
4	F3	F2	F1	F2	L2		H1	H2	H2	H1	C2	C2	C2	C2	C2	C3	L4	L2	L3	L3	L3	F2	F3	F2
5	F3	F3	F3	F3	L2	C1	H1	H2	C2	C2	C2	C4	L3	L3	L2	L3	L2	L2	L4	L3	L3	F3	F3	F3
6	F3	F4	F3	F2	L2	L3	H3	C2	C3	C2	L2	L1	L2	L2	L1	L2	C1	C3	C4	L2	L2	F4	F2	F2
7	F3	F2	F2	F3	L4	L2	C1	H2	C3	H2	C2	C2	C1	C2	L2	H2	H2	H2	L3	L4	L3	F4	F3	F3
8	F2	F2	F1		L2	C2	H1	H3	C3	C2	C2	C2	L2	L3	C2	C3	H2	C3	C4	C3	L3	F3	F3	F3
9	F3	F3	F3	F2	C3	H3	H3	C3	C2	C2	C2	L2	L1			H3	C2	C3	L4	L4	L4	F4	F3	F4
10	F3	F3	F2	F2	L1	L2		H2	H3	H1	C2	C1	C1	H2		H1	H3	C5	C4	C4	F6	F3	F2	F2
11	F1	F3	F5	F3	L3	L3	H4	C3	C2	C2	L3	L2	L2	C2	L2	L3	H3	C5	L5	L3	F4	F3	F3	F2
12	F2	F2	F1	F2	L1	H2	H2	H3	C3	H2	H2	H1	H1	H2	H1	H2	C2	C1	H2		F3	F2	F3	F4
13	F3	F3	F2	F2	L2	L2	C3	L3	C1	C1	C2	C2	C2	C1	L2	L2	H1	H2	H3	C3	F1	F3	F3	F5
14	F3	F2	F2	F2	L1	L1	L1	H1	H2	H2	H2	H1	H1	H1	C2	C2	C2	L2	C1	L3	F3	F4	F2	F3
15	F2	F2	F2	F1	L2	L2	H2	H2	H3	C2	C2	C2	C1	C1	L1	L1	L2	L2	L1	L2	F3	F3	F3	F3
16	F3	F2	F1	F1	L1		H1	H2	H2	H2	C2	L3	C2	C1	C2	C2	L2	C2	C3	L2	F3	F1	F3	F2
17	F3	F2	F2	F4	L3	C1	H1	H2	H2	C3	C2	C2	L2	L2	L2	L2	L2	L2	L2	L3	F2	F2	F2	F2
18	F3	F2	F2	F2	L3		H2	H2	H2	C2	C2	C2	C2	L2	L2	L2	L2	L2	L3	L3	F4	F3	F2	F2
19	F2	F2	F3	F1	L2	L2	L3	L2	L2	L2	L3	L2	L2	L1	L2	L1	L2	L1	L3	L2	F4	F3	F4	F3
20	F2	F3	F2	F2	L1	L2	HL22	H1	H1	H1	H1		H1	H2	H1	H1	C2	C3	C2	C4	F2	F1	F2	F1
21	F1	F1	F1	F1	L1	H1	H1	H1	LH21	H1	H2	H2	H1	C2	C2	H1	H1	H2	C3	L3	F2	F3	F2	F3
22	F4	F1	F2	F1	L1	L2		C2	L2	C1	H1	C1	C2	C2	C1	C1	H2	H2	H2	C3	F1	F3	F4	F5
23	F6	F1	F1			H1	H2	H2	H2	H2	H2	C2	C2	C2	C2	H2	H3	H4	H4	H3	F6	F2	F3	F3
24	F2	F2	F2	F1	F2		H1	H3	H2	H2	C2	C2	C3	H1		H2	H3	H2	C2	C3	F2	F3	F3	F3
25	F4	F4	F3	F5	F6	C2	H2	H3	H4	C2	H2	H1	C2	C2	C2		H2	H3	H2	C2	F2	F2	F2	F2
26	F2	F2	F2	F2	H1		C2	H1	C2	C1	C1	C1		H1	H2	H1	H1		C2	F2	F2	F4	F2	F2
27	F1	F2	F3	F2			H2	H3	H1	C2	C2	C2	C2	C2	C2	H2	H2	H3	H5	F3	F2	F2	F3	F2
28	F3	F2	F2	F1	F3	C3	C2	H2	C1	H1	C1	C3	C1	H1	C1	CH11	H2	H3	C2	F2	F2	F3	F2	F2
29	F3	F2	F2	F3	F2	H2	H3	H3	H2	H2	C2	C1	C2		H1	H1	H1	H2	C3	F3	F2	F2	F3	F2
30	F3	F2	F2	F1	F2	L2	H2	H3	C2	C2	C2	L3	L2	L2	L3	L2	H2	H2	H2	F2	F2	F2	F2	F3
31	F2	F2	F1	F2	F3	L1	H1	H2	H2	H2	H2	C2	C2	C1	C1	C1	L2	H1	C3	F4	F2	F3	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. 1972 | TYPES OF ES

IONOSPHERIC DATA

JUL. 1972 | 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	S	S	61	60	S	71	66	78	83	79	85H	94	101R	103R	91	93	88	86	90	98	90	81	86	84
2	79S	J 78S	76	72	70	77S	79H	80	84	84	78	87R	A	A	A	80	79	83	89	93	86S	76S	C	C
3	C	C	C	C	C	C	C	C	C	97	94	J 87R	A	108	98	J 101R	103	100	97	98	81	71	I 70S	70
4	65	64	63S	62	I 63S	67	78	91	A	70	62	R	82	93	98	100	106	95	86	81R	75S	J 76S	J 78S	S
5	S	I 84S	82S	S	F	71S	U 75S	R	87	A	80	A	A	A	87	83	78	87	J 91R	85	S	R	S	S
6	S	S	S	66	56S	59	73	84	89	84	81	I 83S	79	81	85	78R	72	80	84	83	J 89R	90R	87S	84
7	S	S	S	U 80S	S	S	85S	84S	88	A	89R	89	100	110	117	115	121	114	111	109R	R	I 81S	80	I 83S
8	85	86S	85S	80S	73S	65	71	75	64	72	A	A	A	95	98	100R	91	95	85	A	A	J 80S	F 86	S
9	76S	F 77	I 67S	71	59	F 59	A	A	A	A	59	59	60	63	63	61	64	67	68	70	66	64	U 63S	A
10	A	F	F	F	F 50	51	71	80	75	A	A	A	85	89	85	85	80	80	J 81R	J 99R	S	S	S	A
11	S	S	S	F	F	S 60	61	A	95	R	75	A	A	95	94	J 89R	A	A	A	96	S 95	S	A	S
12	S	S	S	S	F	A	S	R	90	73	A	83	90	J 106R	J 103R	J 103R	J 101R	J 103R	96	99	83	76	67S	F 65
13	F 78	69	64	F 66	F 64	58	73	87	80	A	74	74	74	78	C	C	76	79	A	R 86	S	I 72S	S	S
14	S	S 65	S 63	S 55	50	51	65	65	R 77	68	68	65	75	78	77	78	J 75R	76	80	81	S 79	S	S	S
15	S	S	S 65	S	F	59	65	78	83	85	81	71	69	79	85	83	75	65	A	80	F 71	71	U 65S	S 64
16	S 64	U F 65	F 61	59	54	54	64	82	86	63	A	65	I 70R	77	84	81	I 78A	S 80	79	U 82R	80	78S	U 75S	J 70S
17	59	58	F 58	54	F 54	65	66	67	66	69	84	84	A	A	106	114	109	A	91	84	70	61	S 64	F
18	F 60	U F 60	F 59	F 62	58	64	R 66	83	79	A	63	A	85	91	88	87	91	75	S 73	S 75	S 74	S	S	U 70S
19	I 74R	65	64	61	55	59	R 70	63	R	55	65	65	80	80	84	80	68	68	75	J 72S	S 70	S	U 71S	S
20	S	U 70S	S	J 53S	F	51	59	65	J 74R	83	72	79	89	R 82	79	73	80	J 89R	J 103R	110	J 77R	60	59	59
21	60	58	56	54	55	59	60	82	66	65	65	76	74	J 77R	82	75	76	84	A	S	65	I 66R	I 71S	S
22	S	U 61S	I 62S	S 60	F	61	76	R	A	55	66	70	71	80	91	90	80	75	70	A	S 70	S 66	U 60S	S
23	S	S	S	F	F	50	J 73R	R	90	82	R	A	83	A	85	J 91R	84	R	I 91R	86	R	R	R	70
24	R 71	S 70	51	50	S 48	59	61	R	A	61	65	A	J 75R	84	81	72	69	71	67	66	65	I 62R	I 60S	F
25	F	F	S	55	F	J 55S	70	82	85	A	A	A	80	J 68R	65	68	65	R 64	R	77	A	J 59R	S	I 58S
26	J 59S	I 55S	S 52	S 53	S 53	53	70	95	71	54	56	62	68	61	57	58	67	71	72	67	65	60	56	49
27	45	J 44S	F 43	F 40	F 40	44	64	75	60	54	59	70	73	75	70	73	76	S	75	74	67	F	A	U 63F
28	F 60	F 60	55	54	U 50F	55	J 76R	82	70	I 64R	65	I 70A	73	75	80	75R	82	82	81	82	J 78R	S	S	S
29	F	S 65	S	F	F	59	S 71	79	A	A	57	63	I 62A	71	74	74	73	70	60	64	61	64	64	J 64F
30	F 63	F 60	F 60	F 60	F 60	67	75	75	67	61	A	71	77	85	91	99	87	74	69	66	69	F	65	64
31	U 60F	F	J 61F	F	F 54	60	59	69	73	69	75	84	95	100	109	109	103	95	84	83	75	75	74	69
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	16	20	21	22	19	28	28	23	24	22	24	22	25	27	29	30	30	27	26	28	24	21	20	16
MED	64	65	61	60	55	59	70	80	80	69	70	72	77	81	85	83	80	80	82	82	74	71	68S	67
UQ	75	70S	64S	66	60	64	74	82	86	82	80	84	85	94	94	99	91	88	91	94	80	78S	78S	70
LQ	60	60	58F	54	52	54	64	75	70	61	64	65	73	77	80	75	75	72	73	74	68	64	64S	64

JUL. 1972 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Hour / Day	00	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	L 520	L 520	530	550	520	520	490	A	450	L					
2									L 510	A	A	A	A	A	A	A	490	L 450	A					
3							C	C	C	A	A	A	A	A	L 510	L 530	L 450	L 440	L					
4							L	L 450	A	430	A	A	L 510	500	A	A	L 480	L 420	A					
5							L	A	A	A	A	A	A	A	A	500	L 500	L 430						
6							L	L	A	A	A	A	A	A	L 510	L 490	L	L 420	A					
7							L	L 530	A	A	A	L	R 530	L 310	L 500	A	L	L	A					
8							A	L		A	A	A	A	A	540	510	L 500	L 450	A					
9							A	A	A	A	A	490	R 500	520	480	A	A	420	L 370					
10							L	L	A	A	A	A	A	A	500	490	A	450	L					
11							A	A	A	A	A	A	A	A	A	A	A	A	A					
12							L	A	A	A	A	A	A	A	500	A	460	L 440	U L 380					
13							440	L	L 470	A	510	A	L 500	500	C	C	L	A	A					
14							L	L	L 480	L	A	A	500	L 490	L 500	L 480	L 470	L	A					
15							L 400	A	L 460	A	510	H 500	R 510	A	500	470	L 450	U L 450	A					
16							A	A	470	L	A	A	A	A	R 480	490	A	A	A					
17							L	A	510	A	A	A	A	A	A	A	A	A	A					
18							U L 410	A	L 470	A	460	A	A	A	A	A	L 440	L 400	A					
19						L	L	L	L 460	R 490	L 460	A	A	L 490	480	L 450	L 450	L 420	L					
20								L	L 460	A	500	500	500	490	L 490	L 460	L 440	L 420	A					
21							L	L 410	L	L 500	490	L 500	L 500	490	A	L 480	L 450	L	A					
22							A	A	A	500	490	490	A	A	490	A	L	A	A					
23							L 400	L 430	A	L 480	A	A	R 500	A	490	A	A	A	L					
24								A	A	A	L 470	A	A	L 480	A	L 480	L 440	A	L					
25							A	A	A	A	A	A	L 490	L 480	L 500	L 460	L 450	L	A					
26							L	L 420	L 450	H 490	480	490	490	R 500	490	450	420	U 350						
27							L	440	L 460	A	500	500	520	A	510	490	L 470	A	A					
28						L 350	L	A	A	L 490	A	A	520	510	500	A	L 450	A	L					
29						L	L	L	A	A	500	A	A	500	510	480	460	L	L					
30							A	L 450	L	A	A	A	A	520	A	490	470	L 410	L					
31								A	U L 500	510	A	520	510	520	510	500	470	430	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	4	7	12	9	12	9	15	16	21	19	20	17	2					
MED						L 350	L 405	L 440	L 470	490	495	500	500	500	500	490	L 455	L 430	L 375					
UQ							425	L 450	L 490	500	505	500	515	515	510	490	470	L 450						
LQ							L 400	L 425	L 460	490	475	490	500	L 490	490	L 475	L 450	L 420						

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JUL. 1972 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Hour / Day	00	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	260	300	IA 340	360	370	IA 375	A	A	375	355	330	300	A					
2						IA 190	260	IA 300	345	A	A	A	A	A	A	A	A	A	A					
3						C	C	C	C 360	A	B	A	A	A	A	A	A	A	A					
4						160	A	A	A	350	R 365	R 380	380	385	IA 370	350	A	A	A					
5						A	260	300	320	IA 350	R 380	IA 380	A	A	355	360	335	290	A					
6						A	260	A	A	A	A	A	A	A	A	A	R	295	220					
7						185	R 260	A	320	A	A	A	B	R	IR 380	350	R 330	IA 280	A					
8						200	IA 240	310	345	365	385	A	A	A	A	365	325	290	220					
9						B	260	280	IA 320	IA 330	A	A	A	A	A	A	A	A	A					
10						B	250	300	345	350	360	A	A	B	A	R 350	R 320	280	220					
11						160	250	300	IA 310	A	A	A	A	A	A	350	325	260	A					
12						175	260	300	340	360	390	395	390	390	375	345	330	295	R					
13						A	A	A	330	A	A	A	A	A	C	C	A	275	A					
14						160	250	300	325	350	IA 360	A	A	R	A	A	A	A	A					
15						A	250	IR 310	IR 330	350	A	A	A	A	A	A	A	A	A					
16						A	255	295	S 325	365	370	IA 380	IA 375	UA 375	IA 370	A	A	A	A					
17						180	265	300	330	355	375	A	A	A	A	A	A	A	A					
18						195	265	290	335	A	A	IR 360	360	A	A	A	A	A	A					
19						160	A	A	A	A	A	A	A	A	A	350	310	A 270	A					
20						A	IA 240	290	310	245	360	370	IA 370	A	A	A	A	A	A					
21						A	250	290	315	R 340	IR 350	R 350	IR 390	IA 370	350	340	320	IA 270	200					
22						A	A	A	A	A	R	A	A	A	IA 360	350	310	275	A					
23						160	250	IA 300	325	345	350	350	A	A	A	320	315	A	A					
24						175	250	IA 270	305	A	A	A	A	R	IA 360	IA 340	320	A	A					
25						A	A	IA 290	315	IA 350	A	A	A	355	A	R	A	270	A					
26						B	250	A	A	A	R	A	R	R 370	365	340	A	A	A					
27						170	240	270	305	325	355	A	A	395	380	A	A	A	A					
28						A	A	A	A	A	A	A	R	R	B	360	325	290	A					
29						B	225	290	315	340	350	IA 360	IA 380	385	385	360	325	275	A					
30						A	230	285	320	340	A	A	A	A	A	A	330	A	A					
31						A	265	305	330	B	380	370	A	A	A	A	340	290	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						13	24	22	24	19	15	11	7	8	12	16	16	16	4					
MED						175	250	300	325	350	365	370	I 380	380	370	350	325	280	220					
UQ						185	260	300	332	358	378	380	385	388	378	358	330	290	220					
LQ						160	250	290	315	340	358	360	IA 372	370	360	342	320	272	210					

The Radio Research Laboratories, Japan

JUL. 1972 | FOE (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J29	M22	M20	J21	J51	25	J46	J49	J61	48	47	J56	45	41	G	43	48	40	M36	J30	J30	J30	J29	J25
2	J29	J29	M24	J20	M20	21	30	J52	J58	J68	J85	J90	J159	M103	J92	J85	J44	J35	J43	J62	J40	J36	C	C
3	C	C	C	C	C	C	C	C	C	J114	J89	J89	J144	J139	J49	J44	J51	35	J40	J48	J30	J49	J54	J29
4	J25	21	E15 S	M22	M20	21	J41	J50	J94	J46	49	J60	43	J64	J54	J60	45	J41	J144	J100	J58	J50	J54	J21
5	J41	J29	J54	J35	J28	J39	31	J61	J149	87	J64	J110	J115	J154	J54	42	38	32	J41	J41	J31	39	35	J41
6	J54	J41	J29	J34	J25	22	31	J45	J59	J74	J55	J159	J111	J60	J41	44	G	J54	41	22	J51	J22	J39	J24
7	J28	J57	J55	J24	M22	24	32	J49	J75	D	J51	J51	J49	44	43	60	J47	J45	J73	J49	J54	J29	J25	J25
8	J25	J20	M21	M21	E15 S	24	J61	J51	J58	J61	J101	J114	J144	J66	43	45	40	J52	J53	D	J110	J74	J54	J54
9	J38	J40	J70	J29	J49	J41	J67	J107	J122	J104	J60	47	J40	46	J42	J60	J54	J56	J29	J41	J50	J53	J75	J84
10	J79	J54	J60	J30	21	29	34	38	J118	J161	J131	D	J58	J54	J55	G	71	J38	37	J61	J51	J51	J64	J80
11	J81	J54	J74	J35	J25	25	J54	88	J69	80	J64	J107	J184	J62	81	J59	90	J113	J106	J84	J50	J84	J89	J51
12	J41	J42	J51	J23	J24	65	J41	J49	J54	72	J73	66	J60	56	44	J72	36	32	G23	J29	J29	J30	J53	J29
13	J40	J38	J53	J44	J26	J28	J61	J51	J54	J109	40	54	46	J61	C	C	J54	J51	J99	J74	J35	J35	J51	J61
14	J41	J21	J19	M21	J19	23	26	36	41	48	49	J57	42	G	46	45	J46	J85	J76	J54	J84	J54	J41	J50
15	J40	J41	J51	J49	J44	J35	J39	72	J52	J60	46	45	45	60	J43	M44	J44	J41	J142	J99	J40	J40	J74	J74
16	J29	J42	J42	J39	J30	J25	J41	J51	J54	J52	J75	J51	J67	J56	J54	47	J92	J74	J54	J48	J30	J36	J26	J19
17	J27	J23	J54	J36	J34	J28	G	J53	42	J52	J54	J53	J90	J185	J110	J102	J144	J120	J74	J42	J30	J89	J26	J29
18	J24	J32	J29	J25	J24	J30	36	J43	J50	J84	J55	J94	J85	J74	J75	J74	J49	J29	J44	J28	J74	J54	J54	J29
19	J41	J24	M20	M22	M22	G15	J31	J35	40	45	45	J52	J72	J88	J49	36	35	34	J29	E15 S	J36	J25	J41	J54
20	J84	J35	J51	J29	J25	J35	J28	33	37	45	45	J45	45	J41	45	36	36	J78	J46	J24	J29	J29	J25	J24
21	J21	22	E13 B	20	E13 B	J34	28	35	35	G	G32	G30	G	50	J55	41	37	J49	J121	66	J29	J29	J49	J51
22	J29	J29	J19	J28	M23	J25	J51	J109	J119	J54	34	45	46	J69	J111	J74	J84	J89	J74	J131	J55	M22	J25	J55
23	J51	J61	J31	J44	J21	22	35	J52	J52	39	J65	J149	J45	J112	J59	J55	J66	J95	J131	J45	J41	J66	J54	J29
24	J29	J41	J25	J25	J26	G	32	J65	J120	J75	40	85	63	G	J52	J54	37	J88	J54	J25	J24	J29	J25	J21
25	J25	J35	J24	J22	J22	J25	J25	J54	J61	J89	J125	J135	45	46	42	G	42	J59	J54	J109	J99	J75	J26	J24
26	J41	J26	M21	J19	M21	J26	G	J31	32	35	G	J39	G	G	G	36	J40	J30	25	J34	J19	J75	J60	J30
27	J25	J29	M20	M21	21	G	29	34	47	J73	42	42	J49	J61	J55	J70	J43	J74	J50	J52	J53	J30	J84	J40
28	J30	J30	J24	J30	J29	J25	J40	126	J73	J78	J51	J81	30	41	E40 B	53	39	J54	J74	J84	J35	J25	J53	J44
29	J24	J24	M20	J29	J26	J25	J39	J41	80	M70	J53	J60	J74	43	G	39	36	J57	J30	J30	J22	J40	J30	J30
30	J26	J29	J30	J30	J40	23	J54	J40	40	J66	J90	J60	62	J49	J73	J40	37	J30	25	J29	J38	J60	J54	J54
31	J25	J77	J64	J25	J25	J28	G22	45	44	45	J56	46	47	45	J48	J42	G	32	J41	J30	J60	J44	J26	J24
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	31	31	31	31	31	30	30	31	31	31	31	31	31	30	30
MED	J29	J31	J29	J26	J24	25	J34	J50	J56	J68	J54	J60	J49	J56	J49	45	44	J51	J50	J48	J40	J40	J50	J30
UQ	J41	J41	J53	J34	J28	J29	J41	J54	J75	J82	J69	J92	J80	J68	J55	J60	J52	J74	J74	J70	J54	J54	J54	J54
LQ	J25	J24	20	J22	21	23	29	J40	44	48	46	J49	45	44	43	41	37	J35	J38	J30	J30	J30	J26	J25

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JUL. 1972 | FOES (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Hour / Day	00	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	19	44	22	35	46	54	44	45	51	42	41	G	40	47	40	G	25	25	16	24	16
2	20	20	15	E	E	20	30	42	45	61	75	77	A	A	A	58	43	32	43	40	20	25	C	C
3	C	C	C	C	C	C	C	C	C	75	58	53	A	65	45	38	35	G	33	30	25	20	30	20
4	E	E	E S 15	E	16	20	34	40	A	40	49	60	42	50	51	58	42	38	75	31	35	45	40	19
5	23	20	30	25	18	32	31	60	78	A	61	A	A	A	51	31	38	31	41	40	18	25	34	40
6	40	34	25	26	23	20	31	40	52	51	54	A	75	52	40	40	G	30	32	16	34	20	25	16
7	23	23	26	16	E	23	30	35	70	A	51	45	45	42	42	51	34	40	46	40	50	28	20	23
8	22	E	E	E	E S 15	24	50	33	45	56	A	A	A	66	42	40	37	35	51	A	A	54	45	33
9	25	27	55	24	34	28	A	A	A	A	50	44	40	44	40	52	45	40	25	26	28	40	52	A
10	A	54	41	25	15	26	29	37	57	A	A	A	57	50	47	G	E R 71	32	30	60	38	40	45	A
11	35	35	33	21	20	24	45	A	63	E R 80	59	A	A	60	75	51	A	A	A	75	30	41	A	25
12	30	39	40	18	19	A	38	45	50	68	A	64	51	55	42	70	35	G	E R 23	16	20	28	29	24
13	33	25	26	42	17	26	34	30	43	A	40	51	43	40	C	C	43	49	G	65	35	33	18	45
14	30	E	15	E	16	14	26	34	46	46	49	56	40	G	44	40	35	32	65	33	40	40	23	35
15	E	35	35	30	26	25	22	68	40	56	40	41	43	58	43	40	37	32	A	63	40	34	46	50
16	22	30	34	28	29	26	41	50	40	45	A	51	52	55	44	45	A	50	40	44	17	25	16	E
17	22	20	34	18	27	15	G	51	40	48	51	51	A	A	76	100	101	A	63	25	23	27	E	25
18	E	15	20	E	19	16	29	43	43	A	41	A	50	50	50	48	38	28	30	19	40	30	30	24
19	20	19	E	15	15	14	26	34	G	43	41	51	59	40	42	36	32	30	28	E S 15	16	15	22	19
20	45	25	25	24	E	22	27	32	32	44	43	42	41	40	39	32	34	28	41	16	15	25	19	23
21	19	E	E B 13	E	E B 13	22	28	31	34	G	G 32	G 29	G	44	55	40	35	35	A	65	19	21	22	19
22	25	21	15	E	E	20	30	40	A	40	E R 34	40	E R 46	65	42	69	38	65	40	A	36	E	E	30
23	30	30	29	22	E	17	31	37	42	38	59	A	41	A	41	55	60	55	30	30	E R 41	E R 66	30	E
24	24	25	19	17	24	G	29	55	A	57	40	A	61	G	50	39	35	40	22	16	16	28	24	21
25	21	22	22	20	17	25	46	51	59	A	A	A	44	44	40	G	38	40	40	32	A	25	19	E
26	25	20	E	16	E	16	G	26	31	35	G	39	G	G	G	36	35	28	25	23	E	55	43	16
27	E	16	E	E	E	G	26	33	41	51	40	41	47	57	43	42	36	55	45	40	43	16	A	25
28	16	16	17	21	24	22	30	54	51	41	50	A	E R 30	41	E R 40	50	34	52	28	16	19	E	16	25
29	19	E	E	25	25	G 20	35	39	A	A	44	53	A	43	G	39	36	40	23	16	E	35	19	19
30	18	25	25	25	25	21	44	38	40	60	A	51	58	49	57	39	30	29	25	26	16	30	16	25
31	E	40	45	E	14	22	G 22	40	40	45	56	44	44	42	44	42	G	30	33	17	18	35	17	18
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	31	31	31	31	31	30	30	31	31	31	31	31	31	30	30
MED	22	22	24	18	17	22	30	40	46	54	50	53	47	50	43	40	36	35	33	30	25	28	24	24
UQ	30	30	33	25	24	25	35	51	63	D A 80	60	A	68	59	50	51	42	44	46	42	38	36	40	30
LQ	18	16	15	E	E E 13	17	27	34	40	44	41	44	42	42	40	39	35	30	26	18	18	23	19	19

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JUL. 1972 | FBES (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Hour / Day	00	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}^{S}	12	E_{15}^{S}	13	12	13	15	15	18	26	26	26	25	26	19	19	15	14	12	12	12	12	12	12
2	12	12	14	12	14	15	15	15	20	16	25	26	29	26	16	15	15	14	13	12	13	E_{15}^{S}	C	C
3	C	C	C	C	C	C	C	C	C	15	25	39	32	25	21	25	14	13	13	12	12	12	13	12
4	E_{15}^{S}	12	E_{15}^{S}	E_{15}^{S}	14	14	15	14	15	24	25	25	25	25	25	25	15	15	13	13	12	E_{15}^{S}	13	13
5	12	13	E_{15}^{S}	12	13	15	14	15	16	25	28	40	26	31	25	26	18	15	15	13	12	E_{15}^{S}	13	E_{15}^{S}
6	E_{15}^{S}	13	13	14	13	15	15	15	15	15	23	25	26	25	25	19	26	14	15	13	13	E_{15}^{S}	E_{15}^{S}	13
7	E_{15}^{S}	12	13	13	E_{15}^{S}	15	15	15	15	26	26	28	40	25	25	21	15	15	13	13	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
8	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	12	E_{15}^{S}	15	15	15	15	19	24	26	24	26	26	19	15	15	15	12	13	13	E_{15}^{S}	E_{15}^{S}
9	E_{15}^{S}	12	E_{15}^{S}	12	14	14	15	15	15	22	25	26	25	29	16	16	15	15	13	12	14	E_{15}^{S}	12	E_{15}^{S}
10	E_{15}^{S}	12	12	12	12	18	15	15	15	16	27	24	26	38	30	16	15	15	15	12	E_{15}^{S}	12	E_{15}^{S}	E_{15}^{S}
11	E_{15}^{S}	14	E_{15}^{S}	E_{15}^{S}	12	14	15	15	15	15	25	25	26	25	25	15	26	15	15	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	15	13
12	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	13	14	15	14	16	15	16	19	26	26	26	26	15	14	14	13	14	E_{15}^{S}	14	E_{15}^{S}	E_{15}^{S}
13	12	E_{15}^{S}	14	13	13	13	14	14	16	16	25	25	33	26	C	C	15	15	15	13	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	12
14	E_{15}^{S}	E_{15}^{S}	13	13	12	13	13	15	15	15	25	24	25	26	25	23	15	15	15	14	13	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
15	13	13	12	13	13	13	13	16	15	17	25	20	35	28	18	15	14	14	12	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	12
16	14	E_{15}^{S}	13	13	14	13	14	14	15	15	18	29	26	22	25	16	15	14	14	12	E_{15}^{S}	14	E_{15}^{S}	E_{15}^{S}
17	E_{15}^{S}	12	12	12	12	14	15	15	15	15	25	31	25	19	25	15	15	14	14	12	13	14	E_{15}^{S}	14
18	E_{15}^{S}	14	13	E_{15}^{S}	E_{15}^{S}	12	13	14	15	19	15	25	25	25	23	15	15	15	13	12	E_{15}^{S}	E_{15}^{S}	14	14
19	13	12	12	12	12	13	13	15	14	15	23	16	25	16	25	15	15	13	13	E_{15}^{S}	12	12	E_{15}^{S}	12
20	12	13	13	13	13	13	13	13	14	15	25	25	23	25	25	15	15	13	12	12	13	13	13	13
21	13	E_{15}^{S}	13	E_{15}^{S}	13	13	14	15	14	15	20	15	25	25	25	22	15	15	13	13	13	13	E_{15}^{S}	14
22	E_{15}^{S}	E_{12}^{S}	12	E_{15}^{S}	E_{15}^{S}	15	15	15	15	19	23	25	21	25	15	25	15	15	13	13	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
23	E_{15}^{S}	12	13	12	E_{15}^{S}	13	15	15	14	14	25	26	25	15	25	25	14	15	15	12	13	12	E_{15}^{S}	13
24	12	13	12	12	12	14	15	15	15	20	30	28	32	29	25	20	15	14	14	13	E_{15}^{S}	12	13	12
25	E_{15}^{S}	12	13	12	12	13	13	15	15	25	15	25	25	25	26	15	15	13	13	13	12	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
26	E_{15}^{S}	13	13	12	13	13	14	15	15	15	18	15	26	25	19	15	16	14	12	12	13	13	13	15^{S}
27	E_{15}^{S}	12	13	E_{15}^{S}	13	13	14	14	13	15	17	26	25	26	16	15	15	14	12	12	14	14	14	12
28	14	14	14	14	12	12	12	14	14	15	23	25	19	25	40	19	25	15	13	12	12	E_{15}^{S}	13	12
29	12	13	E_{15}^{S}	13	12	13	12	15	15	14	15	15	28	28	26	19	25	14	12	13	13	13	14	13
30	13	14	14	12	14	14	14	14	15	15	26	28	26	22	23	14	17	14	12	E_{15}^{S}	E_{15}^{S}	14	E_{15}^{S}	13
31	14	E_{15}^{S}	13	12	12	12	13	14	14	39	25	16	29	25	23	14	14	14	14	12	13	E_{15}^{S}	12	12
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	31	31	31	31	31	30	30	31	31	31	31	31	31	30	30
MED	E_{15}^{S}	12	13	12	12	13	14	15	15	16	25	25	26	25	25	16	15	14	13	12	12	13	E_{15}^{S}	12
UQ	E_{15}^{S}	14	E_{15}^{S}	14	14	15	15	15	15	20	25	26	27	26	25	21	15	15	14	13	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
LQ	12	12	13	12	12	13	13	14	15	15	22	24	25	25	21	15	15	14	13	12	13	13	13	12

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JUL. 1972 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	295	275	S	325	290	290	315	280	255H	255	280R	270R	285	290	280	285	280	300	305	280	280	285
2	275S	280S	305	290	285	320S	280H	315	285	305	A	A	A	A	A	280	270	275	285	295	300	290	C	C
3	C	C	C	C	C	C	C	C	C	280	285	260R	A	285	280	270R	290	290	300	315	310	280	285S	275
4	275	280	285S	290	280S	300	320	330	A	300	275	265	270	260	270	280	300	305	305	300R	270S	265S	270S	S
5	S	285S	295S	S	F	295S	320S	R	290	A	275	A	A	A	285	280	270	290	305R	285	S	R	S	S
6	S	S	S	310	290S	305	300	285	285	285	275	270S	275A	285	285	300R	380	295	300	265	270R	290R	280S	285
7	S	S	S	275S	S	S	305S	285S	285	A	275R	250	250	275	275	270	255	280	290	285R	R	270S	250	265S
8	270	270S	280S	290S	280S	265	295	310	285	290	A	A	A	275	275	290R	285	305	305	A	A	275S	280F	S
9	280S	270F	290S	285	285	305	A	A	A	A	255	245	260	270	280	275	280	295	300	300	270	260	255S	A
10	A	F	F	F	280F	295	310	300	275	A	A	A	260	280	270	285	R	275	275R	285R	S	S	S	A
11	S	S	S	F	F	300S	330	A	305	R	280	A	A	275	280	280R	A	A	A	315	325S	S	A	S
12	S	S	S	S	F	A	S	R	310	260	A	270	255	285R	285R	290R	295R	295R	305	305	295	290	280S	260F
13	275F	275	275	290F	305F	310	295	300	350	A	295	285	285	285	C	C	300	305	A	305R	S	280S	S	S
14	S	295S	285S	295S	300	315	325	310	310R	330	310	265	270	295	290	295	295R	290	300	295	290S	S	S	S
15	S	S	295S	S	F	275	280	280	280	295	285	280	265	265	280	290	265	290	A	305	300F	280	255S	285S
16	295S	270	295	290	280	290	300	300	340	295	A	305	280R	280	285	290	290A	290S	290	295R	290	275S	290S	290S
17	275	275	285F	280	260F	315	310	320	270	270	295	290	A	A	285	290A	295	A	300	300	300	295	285S	F
18	285F	280F	285F	295	295	310	295R	300	355	A	285	A	270	275	275	275	310	310	305S	295S	285S	S	S	285S
19	290R	280	280	295	295	305	315R	320	R	270	295	275	290	270	285	300	305	295	300	320S	275S	S	285S	S
20	S	300S	S	285S	F	315	325	290	285R	315	290	280	305	305R	290	290	275	275R	285R	320	325R	280	275	260
21	270	310	285	295	290	305	305	240	335	290	280	305	295	290R	295	295	305	310	A	S	265	275R	270S	S
22	S	290S	300S	290S	F	295	330	R	A	255	295	285	280	275	295	305	295	310	315	A	285S	290S	285S	S
23	S	S	S	F	F	260	280R	R	310	305	R	A	280	A	270	285R	285	R	300R	325	R	R	R	275
24	295R	290S	295	270	280S	305	275	R	A	A	310	A	280R	300	310	310	305	325	315	300	275	280R	285S	F
25	F	F	S	275	F	275S	275	280	285	A	A	A	290	295R	280	295	285	280R	R	310	A	255R	S	275S
26	280S	280S	270S	285S	290S	280	300	315	335	285	255	275	310	300	305	285	295	300	310	305	310	305	275	280
27	280	270S	275F	285F	280F	280	300	325	355	A	290	295	290	310	285	305	305	S	305	295	295	F	F	230
28	280F	290F	295	285	270F	265	320R	330	340	R	310	A	290	295	290	285F	305	305	310	300	285R	S	S	S
29	F	290S	S	F	F	290	310S	320	A	A	270	285	265A	290	280	290	310	325	310	305	290	270	270	265F
30	285F	280F	280F	280F	280F	310	335	315	305	335	A	290	275	280	285	295	310	310	320	295	275	F	300	290
31	305F	F	250F	F	295F	335	320	320	330	305	300	285	285	295	285	285	300	315	300	300	280	275	290	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	16	20	21	22	19	28	28	23	24	19	23	21	25	27	29	30	29	27	26	28	24	21	20	16
MED	280	280	285	288	285	302	305	310	308	290	285	280	280	285	285	290	295	295	300	300	290	280	280S	278
UQ	288	290S	295S	290	292	310	320	320	335	305	295	285	290	295	285	295	305	308	305	305	300	290	285S	285
LQ	275	275	280	280	280	285	295	290	285	280	275	265	270	275	280	280	285	290	300	295	275	275	270	265

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JUL. 1972 | M(3000)F2 (0.01)

IONOSPHERIC DATA

JUL. 1972 | 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								A	A	L 370	370	A	370	370	380	350	A	A	L					
2									350	A	A	A	A	A	A	A	340	340	A					
3							C	C	C	A	A	A	A	A	350	320	360	350	L					
4							L	360	A	440	A	A	330	340	A	A	340	360	A					
5							L	A	A	A	A	A	A	A	A	380	330	350						
6							L	L	A	A	A	A	A	A	380	360	L	340	A					
7							L	340	A	A	A	L	R 360	360	380	A	L	L	A					
8							A	L		A	A	A	A	A	330	340	340	330	A					
9							A	A	A	A	A	370	R 380	360	380	A	A	A	330					
10							L	L	A	A	A	A	A	A	330	350	A	340	L					
11							A	A	A	A	A	A	A	A	A	A	A	A	A					
12							L	A	A	A	A	A	A	A	360	A	350	330	U 350					
13							320	L	A	A	400	A	380	360	C	C	L	A	A					
14							L	L	330	L	A	A	380	390	365	340	340	L	A					
15							350	A	350	A	370	400	380	A	380	370	360	340	A					
16							A	A	360	L	A	A	A	A	R 360	A	A	A	A					
17							L	A	330	A	A	A	A	A	A	A	A	A	A					
18							U 350	A	A	A	410	A	A	A	A	A	340	350	A					
19						L	L	L	380	R 400	400	A	A	350	380	360	340	360	L					
20								L	360	A	340	380	360	370	380	380	350	340	A					
21							L	370	L	380	390	380	380	380	A	350	360	L	A					
22							A	A	A	380	410	410	A	A	370	A	L	A	A					
23							330	350	A	400	A	A	R 380	A	330	A	A	A	L					
24								A	A	A	410	A	A	380	A	360	370	A	L					
25							A	A	A	A	A	A	330	350	360	350	340	L	A					
26							L	340	360	370	395	385	350	360	365	350	360	335	U R 360					
27							L	365	390	A	380	410	A	A	350	350	340	A	A					
28						320	L	A	A	370	A	A	370	370	340	A		360	A	L				
29							L	L	A	A	380	A	A	380	350	355	350	L	L					
30							A	360	L	A	A	A	A	A	A	365	350	365	L					
31									360	350	A	365	390	380	350	340	360	350						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	4	7	10	9	12	8	14	15	21	18	19	16	3					
MED						320	340	360	360	380	392	382	375	370	360	350	350	345	U 350					
UQ							350	362	360	400	405	405	380	380	380	360	360	355	U 355					
LQ							325	345	350	370	375	375	360	360	350	350	340	340	340					

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JUL. 1972 | M(3000)F1 (0.01)

IONOSPHERIC DATA

JUL. 1972 | H'F2 (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								305	260	340	330H	360	330	320	325	320	320	310	310					
2									345	290	A	A	A	A	A	360	345	330	300					
3							C	C	C	350A	350	375	A	320	350	340	315	300	290					
4							265	270	A	320	310A	400EA	385	385	340	335	300	280	330A					
5							270	285	390EA	A	400	A	A	A	345	340	350	315						
6							290	320	290	320	330	A	A	350	340	300	350	310	295					
7							260	350	300A	A	340	400	400	350	340	340	320	300	290					
8							320	285		355	A	A	A	360	300	320	330	290	270					
9							A	A	A	A	470	490	475	425	395	400A	375	320	305					
10							280	260	345	A	A	A	400	350	350	340	IA 330	340	310					
11							300	A	290	A	340	A	A	340	350	310	A	A	A					
12							310	290	275	A	A	375A	375	330	310	325	300	300	275					
13							320	260	240	A	360	350	350	350	C	C	330	270	A					
14							260	300	295	290	310	390EA	365	340	350	320	340	305	320A					
15							340	350EA	340	320	305	345	420	390	345	320	310	345	IA 310					
16							275	290	255	350L	A	345	400	370	340	345	A	310	290					
17							230	300	400	400	325	330	A	A	355	IA 320	A	A	290					
18							310	280	250	A	325	A	EA 400	340	350	340	300	285	290					
19						260	250	260	300	460	350	400	340	340	330	300	320	330	290					
20								290	310	300	340	350	305	290	310	340	340	340	300					
21							265	250	290	350	390	300	330	350	320	300	300	290	A					
22							255	245	A	480	350	340	385	390A	300	295	280	315A	270					
23							340	290	275	290	400	A	340	IA 340	360	330	300	300	290					
24								345	A	A	340	A	370	320	300	330	310	290	270					
25							350	330	320	A	A	A	330	340	390	350	340	360	300					
26							320	265	255	405	505	425	320	355	360	395	350	310	280					
27							300	260	260	A	370	355	355	320	370	325	315	300	260					
28						380	270	255	255	280	340	IA 360	360	350	350H	345	310	290	280					
29							260	265	A	A	455	390	IA 440	360	370	340	310	290	250					
30							245	280	260	A	A	355	375	350	340	305	290	275	250					
31								250	290	330	330	340	325	325	305	300	285	270	260					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	24	27	24	18	24	21	24	28	29	30	28	29	27					
MED						320	278	282	290	335	340	358	365	350	345	330	318	300	290					
UQ							315	298	310	355	380	382	400	358	350	340	340	315	300					
LQ							260	260	260	300	330	345	335	335	325	320	300	290	272					

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JUL. 1972 | H'F2 (KM)

IONOSPHERIC DATA

JUL. 1972 | H'F (KM) | 135 E Mean Time (G. M. T. + 9h)

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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	260	250	260	295	E A 360	240	240	A	A	220	225	A	200	220	200	220	A	A	270	255	245	250	290	255
2	290	290	250	255	260	230	H 220	270	A 260	A	A	A	A	A	A	A	I A 250	245	A	A 250	A 250	250	C	C
3	C	C	C	C	C	C	C	C	C	A	A	A	A	A	A 280	H 240	220	240	275	250	230	300	300	270
4	290	270	280	260	280	260	250	A 250	A	240	A	A	250	I A 240	I A 240	I A 240	260	260	A	240	300	340	315	320
5	300	270	290	280	255	260	250	A	A	A	A	A	A	A	I A 210	205	250	240	270	250	250	300	320	340 A
6	305	290	250	240	260	240	250	I A 270	A	A	A	A	A	A	220	220	250	260	I A 260	290	300	290	300	260
7	315	310	270	260	260	250	240	240	A	A	A	220	240	240	230	I A 230	210	I A 230	I A 270	260	260 A	290	300	315
8	330	300	290	260	260	250	I A 250	240	260	A	A	A	A	A	245	240	240	250 A	I A 260	A	A	E A 360	310	270
9	250 A	290	A	255	260 A	270	A	A	A	A	A	245	210	240	225	A	A	A	250	260	320	350 A	I A 370	A
10	A	A	320	250	260	280	240	250	A	A	A	A	A	A	A	240	I A 260	240	290	300 A	290	280	E A 350	A
11	330	350	330	290	290	240	A	A	A	A	A	A	A	A	A	A	A	A	A	300	250	290	I A 310	345
12	300	300	310	270	270	A	I A 270	A	A	A	A	A	A	A	230	A	220	230	240	245	220	260	300 A	320
13	320	290	300	290	245	245	250 A	245	I A 230	I A 220	200	A	240	210	C	C	I S 270	A	A	280 A	250	270	300	350 A
14	305	260	260	240	250	250	240	240	250 A	I A 240	A	A	210	200	250	270 A	240 H	240	I A 250	250	260	300 A	340	300
15	305	300	300	300	300	255	240	I A 240	240	A	220	180 H	210	I A 220	210	245	245	245	I A 250	A	290	290	A	A
16	270	350 A	290	270	300 A	265	A	A	245	I A 250	I A 200	A	A	A	255 A	A	A	A	A	280 A	245	270	255	250
17	290	300	310	280	310	245	230	I A 230	240	A	A	A	A	A	A	A	A	A	A	255	250	280 A	290	300
18	255	290	300	255	280	255	245	A	A	A	200	A	A	A	A	A	250	240	I A 240	250	300 A	300	300	290
19	285	290	275	260	255	250	245	250	210	200	240	A	I A 230	250	220	210	210	240	260	240	250	290	300	300
20	290	240	290	300	265	260	250	240	240	I A 240	250	240	250	220	200 H	200	290 A	230	I A 260	245	240	260	300	330
21	325	290	270	260	270	260	210	220	240	200	200	200	200	230 A	I A 230	240	220	A	A	E A 310	300	300	300	300
22	290	260	245	250	295	260	A	A	A	200	200	200	A	A	250	I A 220	250	A	A	A	300	250	260	330
23	305	300 A	250	300	300	255	240	250	I A 240	200	A	A	200	I A 240	E A 300	A	A	A	260	250	I A 290	A	300	295
24	270	255	290	305	300	250	240	A	A	I A 240	210	A	A	240	A	250 H	240	I A 250	250	250	250	280	290	300
25	315	300	310	300	300	300	A	A	A	A	A	A	E A 290	260	240	240	260	I A 250	I A 260	250	A	320	350	300
26	295	300	250	290	260	260	250	210	200 H	200 H	200	210	240	210	220	220	220	230	245	255	220	I A 270	E A 350	280
27	300	310	300	290	305	255	225	210	220	A	200	180	A	A	245	260	245	A	A	260 A	290	260	A	300
28	275	270	250	300	340	255	245	I A 255	I A 240	210	I A 200	I A 200	210	240	200	I A 250	200 H	I A 250	260	250	250	250	260	240
29	290	250	250	300	300	265	250	250 A	A	A	220	I A 230	I A 200	220	240	230	225	I A 230	230	255	245	310	295	300
30	270	300	300	300	290	245	A	250	220	A	A	A	A	A	A	200	230	210	240	270	280	345	240	255
31	245	A	310	240	245	220	225	A	230	260	A	220	205	195	245	250 A	225	230	A	245	245	300 A	260	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	29	28	29	30	30	29	24	19	16	14	14	11	16	17	23	22	25	21	21	28	29	30	28	27
MED	290	290	290	275	272	255	242	245	240	220	200	210	210	230	230	240	240	240	260	251	250	290	300	300
UQ	305	300	300	300	300	260	250	250	242	I A 240	220	225	240	240	245	245	250	250	260	262	290	300	308	318
LQ	275	270	260	255	260	245	240	240	225	200	200	200	202	220	220	220	220	230	250	250	245	270	290	275

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JUL. 1972 | H'F (KM)

IONOSPHERIC DATA

JUL. 1972 | H'ES (KM) | 135 E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	105	100	100	100	120	130	120	110	110	110	110	110	110	G	110	135	130	100	120	100	105	100	100
2	100	100	100	100	100	145	130	120	115	110	105	105	105	105	105	105	105	105	100	100	100	100	C	C
3	C	C	C	C	C	C	C	C	C	110	105	105	105	105	105	100	100	100	110	110	100	110	100	100
4	100	100	S	100	100	140	105	105	110	110	115	110	140	120	110	110	110	110	100	100	100	100	100	100
5	100	100	100	100	100	100	140	110	105	105	110	105	105	105	110	140	140	150	115	110	100	100	100	100
6	100	100	100	100	100	130	150	110	110	105	105	105	100	100	105	100	G	115	110	110	100	100	100	100
7	100	100	100	100	100	140	140	115	110	105	110	110	115	130	130	115	140	120	105	100	100	100	100	100
8	100	100	100	100	S	175	130	130	110	110	110	105	105	110	115	150	130	130	110	110	110	105	105	100
9	100	100	100	100	120	120	115	110	110	110	110	110	105	105	110	105	105	105	105	100	100	105	105	105
10	100	100	100	100	100	150	135	130	115	110	110	105	110	105	110	G	110	130	110	110	105	110	105	105
11	100	100	100	100	100	140	115	110	110	110	105	105	110	105	110	115	110	110	110	100	100	100	110	115
12	100	105	105	100	120	120	120	110	120	115	125	120	115	125	130	120	130	125	115	110	100	100	105	100
13	105	100	100	100	100	120	110	110	110	110	110	100	110	100	C	C	120	115	110	110	100	100	110	105
14	100	100	100	100	100	100	E G 180	130	130	120	115	110	120	G	110	110	120	120	110	110	105	100	100	105
15	100	100	100	100	100	100	105	120	120	110	110	110	110	110	110	105	100	100	100	100	105	100	100	105
16	100	100	100	100	100	100	130	125	125	125	115	110	110	110	110	110	110	110	110	110	105	105	100	100
17	100	100	100	100	100	100	G	125	125	120	115	110	110	105	105	105	100	100	100	100	100	110	110	105
18	100	100	100	100	100	100	130	125	120	110	110	110	110	110	110	105	110	100	100	100	100	100	100	100
19	100	100	100	100	100	110	105	105	110	110	110	105	100	105	100	130	125	120	110	S	105	110	110	105
20	110	100	105	100	100	100	160	140	130	120	125	120	110	110	120	110	110	110	100	100	100	100	100	100
21	100	100	B	110	B	100	140	125	140	G	100	100	G	125	110	130	140	120	110	110	100	100	100	100
22	100	100	100	100	100	110	105	105	105	105	110	110	130	110	110	130	110	110	110	105	100	100	105	105
23	105	100	100	100	100	140	135	130	110	115	105	105	110	110	110	110	115	110	110	110	110	110	105	100
24	100	100	100	100	100	G	140	110	105	105	110	110	110	G	130	115	140	110	110	110	110	100	100	100
25	100	100	100	100	100	105	110	110	110	110	110	105	110	110	110	G	130	110	105	105	105	100	100	100
26	100	100	100	100	100	100	G	110	105	105	G	100	G	G	G	145	110	110	110	105	105	105	100	100
27	100	100	105	100	120	G	120	115	110	105	110	110	105	130	130	110	110	120	115	105	105	110	105	105
28	100	100	100	100	100	110	105	105	105	105	105	100	100	E G 150	B	140	140	115	110	105	100	100	100	100
29	100	100	100	100	100	140	115	110	110	110	110	110	110	130	G	150	130	120	115	110	105	100	100	100
30	100	100	100	100	100	120	110	110	115	105	105	105	100	100	100	100	100	100	115	120	110	105	105	105
31	110	100	100	100	100	100	105	130	125	125	115	110	105	105	105	105	G	120	105	100	100	100	100	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	30	30	28	30	28	28	28	30	30	30	30	31	29	28	26	28	29	31	31	30	31	31	30	30
MED	100	100	100	100	100	115	122	112	110	110	110	110	110	110	110	110	110	110	110	108	100	100	100	100
UQ	100	100	100	100	100	140	136	125	120	110	110	110	110	112	110	130	130	120	110	110	105	105	105	105
LQ	100	100	100	100	100	100	110	110	110	105	105	105	105	105	105	105	110	110	105	100	100	100	100	100

The Radio Research Laboratories, Japan

JUL. 1972 | H'ES (KM)

IONOSPHERIC DATA

JUL. 1972 | 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	F2	F5	F1	F3	F4	H1	H2	H2	C2	C1	C2	C2	C1	C1		C1	H2	H2	LL32	FF23	F5	F2	F5	F3
2	F4	F4	F1	F1	F1	H1	H2	C2	C2	C2	C2	C2	C2	C3	C2	C2	C2	L3	L4	F3	F4	F5		
3										C2	C2	C2	C2	C3	C2	L2	L2	LH21	CL22	FF21	F3	FF21	F3	F4
4	F2	F1		F1	F1	H1	C3	C2	C3	C2	C1	C2	H1	H1	C2	C2	C2	C2	L3	F3	F5	F3	F5	F3
5	F4	F4	F3	F3	F2	L3	H1	C2	C2	C2	C2	C2	C2	C2	C2	H1	H1	H1	CL12	FF21	F4	F4	F5	F5
6	F3	F4	F4	F3	F3	HL11	H1	C2	C2	C2	C2	C2	C2	L1	L1	L1		C1	C2	F2	F4	F3	F3	F4
7	F3	F3	F3	F3	F2	H1	H1	C2	C2	C2	C1	C1	C1	H1	H1	C1	H1	H1	C3	F5	F4	F3	F2	F4
8	F3	F2	F2	F1		H1	HL11	H1	C2	C2	C3	C3	C3	C2	C1	H1	H1	H2	C2	H5	H4	H5	H4	H5
9	F4	F4	F4	F4	FF31	H3	C3	C3	C2	C2	C2	C1	C1	L1	C1	C2	C2	C3	L2	F4	F5	F5	F4	F4
10	F4	F4	F4	F4	F2	H2	H2	H2	C2	C2	C3	C2	C2	C1	C1		C2	H2	C2	F4	F4	F5	F3	F3
11	F3	F3	F4	F3	F3	H2	C3	C2	C2	C2	C2	C2	C2	C2	C2	C2	C2	C2	C3	F3	F3	F2	FF44	FF34
12	F4	F4	F4	F3	FF21	H4	H1	C2	H2	C2	H2	H2	C1	H2	H1	H2	H1	H1	L2	F4	F3	F3	F4	F3
13	F4	F4	F3	F1	F2	C3	C4	C2	C2	C2	C1	C2	C1	L1			HL12	CL32	CL21	FF31	FF41	F3	FF21	F4
14	F4	F2	F3	F2	F2	L1	H1	HL11	HL11	HL11	C1	C2	H1		C1	C1	HL11	H1	C3	F3	F3	F3	F3	F3
15	F4	F4	F4	F5	F3	L3	LH11	H2	H1	C2	C1	C1	C1	C2	C2	L1	L2	L2	L3	F3	F5	F4	F5	F6
16	F6	F5	F3	F3	F3	L2	H2	H3	H1	H1	C1	C1	C2	C1	C1	C2	C3	C2	C2	F4	F4	F4	F2	F2
17	F3	F4	F3	F3	F3	L2		H3	H1	H1	C1	C2	C2	C3	C2	C3	L3	L3	L3	F4	F3	FF34	FF23	F4
18	F1	F3	F3	F1	F2	L2	HL12	H2	H2	C2	C2	C2	C1	C1	C2	C2	C2	L1	L2	F3	F2	F4	F4	F4
19	F3	F4	F1	F2	F2	L1	L2	L2	CH11	C1	C1	C2	C2	C1	L1	HL11	H1	H1	C2		F3	F3	F3	F5
20	F3	F4	F3	F4	F2	L2	HL11	H1	H1	H1	H1	H1	C1	C1	H1	C1	C2	C2	L4	F2	F3	F3	F3	F2
21	F3	F2		F1		L3	H1	H1	H1		L1	L1		H1	C2	H1	H1	H2	C3	F4	F3	F4	F2	F5
22	F4	F6	F2	F2	F1	L2	C3	C2	C2	C1	C1	C1	HL1	C1	C1	H1	C1	C3	C4	F3	F3	F2	F5	F3
23	F4	F4	F4	F3	F2	H1	H2	H1	C2	C1	C1	C2	C1	C2	C1	C2	C2	C2	C2	F3	F5	F4	F3	F3
24	F3	F4	F4	F2	F2		H2	C2	C2	C2	C1	C2	C1		H1	C1	C1	C2	L2	F1	F1	F4	F3	F3
25	F1	F3	F5	F5	F2	C2	C3	C3	C2	C2	C2	C2	C1	C1	C1		H1	C2	C3	F3	F3	F2	F2	F2
26	F3	F3	F1	F1	F1	L1		C1	C1	L1	G1	L1				H1	C1	C1	C2	F3	F2	F3	F4	F4
27	F2	F3	F1	F2	F2	G1	H1	C3	C2	C2	C2	C1	C2	H2	H1	C2	C2	H3	C4	F4	F6	F3	F3	F4
28	F4	F3	F2	F2	F4	C2	C2	C2	C2	C1	L1	L1	L1	H1		H1	H1	C3	C3	F2	F2	F2	F2	F3
29	F2	F2	F2	F1	F2	HL21	C3	C2	C2	C2	C2	C2	C2	H1		H1	H1	H3	C2	F2	F2	F4	F2	F3
30	F2	F4	F5	F4	F3	CL21	C3	C2	C2	C2	C2	C2	L2	L2	L2	L2	L2	L2	CL22	F2	F2	F3	F3	F3
31	F2	F3	F3	F2	F4	L3	L2	H2	H1	H1	C2	C1	C1	C1	C2	CL21		H1	C3	F4	F3	F4	F6	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. 1972 | TYPES OF ES

IONOSPHERIC DATA

JUL. 1972 | 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	350	365	S	290	350	350	300	350	420H	410	370R	350JR	350	340	360	345	360	310	305	370	370	350
2	375S	370JS	315	330	350	280S	375H	300	350	305	A	A	A	A	A	370	370	360	345	315	310	330	C	C
3	C	C	C	C	C	C	C	C	C	360	340	420JR	A	350	390	390JR	350	350	350	300	300	390	370IS	360
4	350	365	380S	350	350IS	300	295	290	A	350	340	A	400	400	395	390	340	320	340	300R	395S	400JS	400JS	S
5	S	360IS	340S	S	F	340S	300US	R	A	A	405	A	A	A	355	355	390	350	340JR	350	S	R	S	S
6	S	S	S	295	340S	300	340	350	340	340	350	390IA	390IA	360	350	330R	390	350	350	385	390JR	350R	360S	355
7	S	S	S	350US	S	S	310S	360S	360	A	370R	450	440	390	380	390	390	350	340	340JR	R	390IS	360	400IS
8	400	400S	390S	360S	350S	360	350	300	340	355	A	A	A	375	355	350R	355	305	300	A	A	390JS	355F	S
9	350S	370F	345IS	350	320	320	A	A	A	A	A	G	G	G	G	A	375	325	325	310	380	420	440US	A
10	A	F	F	F	350F	330	300	310	375	A	A	A	400	380	390	350	R	360	380JR	350JR	S	S	S	A
11	S	S	S	F	F	300S	320	A	300	R	350	A	A	370	370	350JR	A	A	A	320	290S	S	A	S
12	S	S	S	S	F	A	S	R	300	A	A	385	415	365JR	350JR	350R	335R	330JR	310	300	320	345	365S	400F
13	380F	370	370	320F	315F	300	330	300	255	A	G	355	380	360	C	C	340	300	A	320R	S	370IS	S	S
14	S	350S	340S	340S	300	300	290	300	305R	295	310	A	365	355	355	360	350JR	340	335	320	340S	S	S	S
15	S	S	350S	S	F	350	345	A	390	330	330	350	420	400	350	345	360	350	A	325	320F	350	440US	355S
16	320S	380	310	340	360	350	310	320	260	G	A	350	370IR	370	350	350	350IA	345S	350	330UR	340	355S	320US	340JS
17	365	370	350F	350	400F	290	305	305	G	400	345	350	A	A	370	350IA	A	A	315	305	315	340	365S	F
18	345F	365UF	365	330	345	305	345R	305	250	A	360	A	A	350	390	380	330	300	300S	350S	370S	S	S	350US
19	360IR	360	350	350	350	300	280R	280	R	G	355	400	350	350	355	310	340	355	350	300IS	390S	S	380US	S
20	S	300US	S	350JS	F	300	290	340	350JR	310	355	350	340	300R	350	340	350	380JR	350JR	290	285JR	350	390	400
21	400	355	350	350	340	290	305	260	260	355	390	310	350	355JR	340	340	310	300	A	S	400	390IR	400IS	S
22	S	340US	310IS	340S	F	300	270	R	A	G	360	350	390	395	345	310	340	A	300	A	380S	350S	350S	S
23	S	S	S	F	F	400	350JR	R	300	315	R	A	380	A	400	350JR	350	R	300IR	300	R	R	R	395
24	360R	300S	350	360	350S	300	350	R	A	A	G	A	395JR	340	310	340	340	300	300	340	360	350IR	350IS	F
25	F	F	S	360	F	400JS	390	360	350	A	A	A	340	350JR	390	360	355	390R	R	305	A	400JR	S	390IS
26	350JS	370IS	390S	360S	340S	355	350	300	260	G	G	G	320	G	G	400	350	320	310	305	305	A	370	355
27	380	380JS	355F	355F	390F	360	310	280	260	A	G	355	355	315	375	325	315	S	300	330	330	F	A	330
28	355F	325F	320	355	390UF	400	290JR	280	260	R	G	A	365	350	350	360R	335	310	300	340	350JR	S	S	S
29	F	350S	S	F	F	340	300S	300	A	A	G	A	A	355	370	350	320	300	300	305	340	380	370	390JF
30	350F	375F	370F	360F	350F	300	260	290	300	A	A	360	380	350	355	335	305	300	280	330	370	F	305	325
31	305UF	F	330JF	F	305F	250	280	280	290	330	340	355	350	375	345	340	320	300	305	310	350	370	350	350
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	16	20	21	22	19	28	28	22	22	13	16	16	22	25	27	29	28	26	26	28	24	20	20	16
MED	358	365	350	350	350	300	310	300	300	340	352	355	375	355	355	350	350	335	320	318	340	370	368S	355
UQ	378	370	365	360	350	350	348	320	350	355	365	395	395	375	378	360	358	350	350	335	375	390	385S	392
LQ	350	350S	340	340	340	300	292	290	260	315	340	350	350	350	350	340	335	300	300	305	312	350	352S	350

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JUL. 1972 | HPF2 (KM)

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	90	95	S	100	100	90	90	100	H 120	95	R 90	J R 120	100	100	100	100	95	100	85	90	100	90
2	S 75	J S 80	85	85	95	S 70	H 75	75	100	115	A	A	A	A	A	90	120	110	105	90	90	85	C	C
3	C	C	C	C	C	C	C	C	C	110	120	J R 120	A	110	100	J R 100	110	110	110	90	100	100	I S 90	100
4	110	95	S 110	110	I S 110	100	95	100	A	100	120	A	90	100	95	100	100	100	120	R 100	S 95	J S 100	J S 100	S
5	S	I S 100	S 100	S	F	S 120	U S 90	R	A	A	95	A	A	A	95	105	100	110	J R 100	90	S	K	S	S
6	S	S	S	100	S 100	100	100	90	100	100	110	I A 100	I A 100	100	110	R 110	100	110	90	105	J R 100	R 110	S 100	105
7	S	S	S	U S 90	S	S	S 100	S 100	100	A	R 120	140	110	100	100	100	100	110	100	J R 120	R	I S 100	100	I S 90
8	90	S 90	S 100	S 100	S 110	100	110	100	120	65	A	A	A	95	105	R 95	90	90	85	A	A	J S 80	F 95	S
9	S 110	F 100	I S 100	100	100	85	A	A	A	A	A	G	G	G	G	A	95	75	80	135	115	85	U S 75	A
10	A	F	F	F	F 110	75	75	95	100	A	A	A	90	110	100	110	R	100	J R 110	J R 110	S	S	S	A
11	S	S	S	F	F	S 100	140	A	100	R	110	A	A	110	90	J R 110	A	A	A	90	S 100	S	A	S
12	S	S	S	S	F	A	S	R	90	A	A	110	135	J R 90	J R 100	R 95	R 110	J R 90	85	85	125	100	S 90	F 100
13	F 90	95	95	F 120	F 85	90	90	75	45	A	G	105	110	100	C	C	120	100	A	R 120	S	I S 100	S	S
14	S	110	S 100	S 100	100	100	100	100	R 105	95	90	A	100	105	105	100	J R 110	100	105	120	S 100	S	S	S
15	S	S	S 110	S	F	110	115	A	100	175	115	105	75	105	110	100	85	95	A	70	F 80	100	U S 65	S 90
16	S 85	90	95	105	90	95	100	80	85	G	A	70	I R 80	80	100	95	I A 100	S 105	100	U 90	100	S 90	U S 95	J S 105
17	100	80	F 85	100	F 100	80	90	50	G	70	100	100	A	A	95	I A 95	A	A	85	80	90	65	S 80	F
18	F 100	U F 85	F 80	F 70	100	90	R 55	95	45	A	120	A	A	110	100	110	110	100	S 100	S 100	S 110	S	S	U S 110
19	I R 100	100	110	90	90	100	R 100	100	R	G	105	100	90	100	105	90	110	105	90	J S 100	S 100	S	U S 110	S
20	S	U 90	S	J S 110	F	100	100	100	J R 110	90	105	110	100	R 100	100	120	110	J R 90	J R 90	100	J R 105	110	100	90
21	90	105	100	90	100	100	95	90	100	95	90	110	90	J R 85	100	100	90	100	A	S	90	I R 100	I S 90	S
22	S	U S 120	I S 100	S 100	F	100	80	R	A	G	100	90	100	95	115	130	100	A	100	A	S 110	S 110	U S 110	S
23	S	S	S	F	F	100	J R 110	R	100	95	R	A	110	A	90	J R 90	90	R	I R 100	100	R	R	R	95
24	R 100	S 100	90	100	S 90	90	110	R	A	A	G	A	J R 95	100	90	100	100	100	100	100	100	I R 110	I S 100	F
25	F	F	S	100	F	J S 90	100	100	110	A	A	A	100	J R 110	100	100	105	R 100	R	95	A	J R 90	S	I S 100
26	J S 110	I S 100	S 100	S 100	S 120	105	110	90	90	G	G	G	75	G	G	50	60	85	85	80	55	A	80	100
27	50	J S 90	E 85	F 90	F 100	85	90	70	40	A	G	95	90	65	70	75	80	S	95	75	80	F	A	85
28	F 115	80	85	90	U F 100	90	J R 60	50	90	R	G	A	95	110	110	R 100	105	90	100	100	J R 90	S	S	S
29	F	S 110	S	F	F	100	U S 100	80	A	A	G	A	A	90	100	100	70	55	100	95	100	90	90	J F 110
30	F 90	F 70	F 80	F 90	F 100	60	60	80	95	A	A	85	90	100	90	110	90	95	115	110	80	F	100	120
31	U F 90	F	J F 80	F	F 100	80	80	80	40	70	70	95	100	100	100	100	125	70	110	110	95	100	95	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	16	20	21	22	19	28	28	22	22	13	16	16	22	25	27	29	28	26	26	28	24	20	20	16
MED	95	95	95	100	100	100	100	90	100	95	108	100	95	100	100	100	100	100	100	100	100	100	S 95	100
UQ	105	S 100	S 100	100	100	100	100	100	100	100	120	110	100	110	102	105	110	105	105	108	100	100	100	105
LQ	90	88	85	90	98	88	85	80	90	90	98	95	90	95	95	95	90	90	90	90	90	90	S 90	90

The Radio Research Laboratories, Japan

JUL. 1972 | YPF2 (KM)

IONOSPHERIC DATA

JUL. 1972 | 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	S	S	F	F	F	F	57	73	S 86	88	86	I S 93	100	J R 106	104	102	101	107 S	S	S	S 98	S 85	U S 84	I S 82
2	J S 83	J S 77	I S 82	I S 80	F 64	S 60	65	U C 84	82	76	72	85	U R 94	99	94	91	97	108 S	I C 103	S 98	I S 92	S 81	73	71
3	S 72	S	S	S	A	S	S 63	68	82	93	I A 83	I R 82	I A 94	103	I A 101	100 S	106 S	105 S	I C 103	S 93	S 86	S 73	J S 64	F
4	S	S	S 66	F 58	S 59	F	69	81	72	68	62	I A 71	83	96 R	109 R	112 R	116	113	105 R	93 R	88	I S 79	S 84	77
5	S 79	90	I S 87	F	76	70	68	84	85	79	78	85	91	96	96	93	101 S	101 S	J S 102	S 86	I S 82	86	J S 89	I S 90
6	I S 93	S 93	I S 92	79	S 73	66	S 73	S 81	79	79	78	78	84	91	88	78	88	87	81	88	U S 90	S 91	S	S
7	J S 86	J S 85	J S 84	U S 82	71	69	73	75	78	93	83	88	101 R	109 R	I S 110	J S 114	J S 121	129	S	S	S 93	S	S	S
8	S	S	S	S 92	U S 78	S 77	J S 88	80	65	H 65	78	76	88	95	103	111	U S 109	S 97	83	S 73	I S 75	S 76	I S 79	77
9	I S 78	S 79	S	F	F	S 60	F 62	I A 62	59	A	A	63	68	75	80	H 85	84	81	C 85	83	76	S 71	73	S 75
10	73	S 77	71	66	65	64	75	73	69	I A 78	77	72	R 83	93	92	S 94	91	90	I C 88	U S 92	S 93	J S 82	S 78	R
11	S	I S 64	I S 88	S 92	H 63	I S 50	I A 57	J C 83	S 84	78	82	95	I S 109	I S 115	115	I S 106	95	S 103	C 115	I S 112	S 93	S 76	71	I A 65
12	S 74	I S 79	S	S	F	F	F 63	I S 83	72	72	76	F 82	91	101 S	I S 112	116	I S 117	S 117	I S 116	I S 113	S 100	S 77	U S 68	71
13	68	F	69	Z 74	58	S 53	60	S 76	71	I A 66	I A 66	71	70	80	92	87	80	S 82	91 S	U S 87	U S 77	S 72	68	I S 70
14	I S 72	I S 72	I S 70	62	56	47	55	70	71	69	76	83	83	81	85	I S 86	I A 90	J S 101	I S 96	S 90	S 72	S 70	S	S
15	S	F	F	S	S 52	F	55	75	J S 83	86	I A 77	I A 71	I A 71	80	89	S 94	94	S	S 108	J S 102	U S 78	J S 73	S 72	I S 72
16	S	S	S	F	S	F	62	S 73	S 69	62	62	66	74	85	92	S 95	96	J S 99	J C 103	J S 99	I S 94	I S 89	I S 85	S 71
17	69	68	J S 63	I S 60	J S 64	I S 66	70	64	65	J S 70	84	I A 87	88	S 98	J R 108	J S 120	129	S 130	I C 119	I S 99	S 82	I S 80	S 78	S 75
18	I S 76	S 76	S	68	S 68	F	S 56	72	S 78	H 60	59	69	84	94	92	94	98	94	C 81	82	78	72	74	I S 75
19	73	69	68	66	64	63	66	67	63	63	63	69	81	90	99	90	S 92	84	86	77	S 66	68	71	S 71
20	J S 76	F 68	S 59	S	S	F	52	62	72	69	71	80	90	83	67	73	88	U S 105	U S 121	S	70	63	U S 61	64
21	S 63	60	58	54	53	50	S 61	79	61	69	H 70	72	73	85	90	94	97	90	U S 88	S 61	59	S 61	F 67	F
22	S 65	F	S 56	I S 56	F 56	58	S 81	I A 69	57	54	61	64	A	A	97	95	87	77	83	S 77	S 76	S 72	F	S 71
23	J S 67	S 57	60	S	S	S	S 65	I S 87	I A 79	63	66	74	73	80	89	90	S 99	S 115	120 S	I S 78	S 60	J S 64	S	A
24	S	I S 77	I S 64	S 55	S	S	55	81	F 71	67	I A 62	65	76	85	88	89	90	S 87	I A 91	S 82	71	64	S 61	58
25	S 57	S 58	S 53	S 55	S 55	54	58	65	U S 77	H 66	A	73	84	63	75	88	78	Z 81	I A 80	U S 88	55	53	F	F
26	F	S 52	S 52	F 51	F 53	51	63	S 90	70	59	63	69	89	81	67	70	79	U S 87	80	78	75	58	48	S 46
27	U S 45	I S 48	F 48	F	U S 40	J S 44	65	65	58	58	58	71	73	78	87	84	77	76	80	80	71	67	S 62	S
28	S	S	55	49	42	43	70	71	60	69	62	68	71	76	76	82	91	91	C 91	J S 90	U S 84	S 78	S 74	S 72
29	68	J S 70	S 64	59	58	S 58	69	83	65	68	71	70	68	82	R 87	R 96	S 102	S 98	I S 87	I S 80	S 76	S 65	S 62	S 66
30	F	S 58	S 56	S 52	S 55	F	S 71	58	H 64	58	68	64	70	82	96	R 105	S 102	89	74	71	S 62	F	I S 64	F 63
31	S 62	S 59	S	S	S 55	I S 58	61	70	65	64	69	80	J R 89	101 S	J S 112	S 119	J S 121	I S 113	I C 106	I S 98	S 86	S 81	J S 76	S 75
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	22	22	20	23	20	31	31	31	30	29	31	30	30	31	31	31	30	29	28	31	29	25	22
MED	S 72	S 70	S 64	61	58	58	63	73	71	68	71	72	84	88	92	94	96	S 98	91	S 88	S 78	S 73	S 72	S 71
UQ	S 76	S 77	I S 71	76	64	65	70	81	78	78	78	82	90	98	102	104	S 102	S 106	I 105	S 96	S 89	S 80	S 78	S 75
LQ	S 67	S 59	S 58	55	55	50	59	68	65	63	63	69	73	81	88	88	89	87	83	S 79	72	S 67	S 64	S 62

JUL. 1972 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Hour / Day	00	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	L	A	510	530H	510	510H	490H	470L	L	A				
2								L	450L	510L	L	A	520	510H	530	540L	500H	A	L					
3								L	480L	490	A	A	A	A	A	A	480R	A	A	A				
4								L	L	500L	550L	A	530	A	A	A	A	A	A					
5								L	L	U 560L	R	R	520	500L	A	510L	490L	450L	390	L				
6							L	L	U 470L	L	520	600	I A 520	I A 520	A	L	A	A	L	L				
7								L	L	510L	500L	560	520	520	530	530L	500H	460	L	L				
8									L	L	530H	560L	A	530	530H	510H	480L	460L	L					
9								A	440	A	A	A	A	510	500	500	480	U 470L	U 420L	L				
10							L	L	420	A	500	L	A	A	500H	490	490L	A	A	A				
11							A	A	460	A	A	A	510L	A	A	A	L	450L	L	L				
12							L	L	A	A	500	530	510	500L	A	A	A	A	A					
13							L	L	U 540L	A	A	A	520	510	500	490	A	A	A					
14							L	L	L	520L	500	500	500	A	A	A	A	A	A					
15								L	L	470H	A	A	A	A	A	A	A	A	A					
16								A	A	450L	A	500H	490	A	A	A	450	A	A					
17								L	A	A	A	A	A	I A 490	490H	470	I A 460	450	L					
18							L	L	L	460L	A	500	A	A	A	480	A	440L	L					
19								L	400L	470L	470L	510	480	I A 480	480	U 480L	460	R	L					
20								L	L	480L	480	A	490	500	470	500	460	430	L	L				
21								L	380L	470H	460R	500H	500	470R	500	500H	470	L	L					
22								A	460L	470L	A	A	A	A	480	470	A	I A 430	390L	A				
23							L	A	A	520L	490H	I A 480	A	500R	480H	A	I A 460	430L	380L					
24								L	L	A	A	A	A	I A 500	490	I A 480	470	450	A	A				
25							L	L	A	470L	I A 480	I A 500	490L	520L	I A 500	490	470L	U 450L	A					
26							L	L	L	490L	500	520L	500	500	500	480	480	450L	L					
27							L	L	L	L	L	520L	A	490	A	A	470L	L	L					
28								L	A	490	500L	A	530	A	I A 500	500	A	450	L					
29							L	L	L	L	A	530	I A 510	510	520	480	470H	A	A					
30								L	L	480L	520H	490	500	510H	490H	480H	480	450L	L					
31								L	L	L	A	A	A	A	500	500	480	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									10	18	15	15	19	20	20	21	21	16	4					
MED									455L	485L	500	510	510	505	500	490	480	450L	390L					
UQ									470L	510L	510	530	520	515	505	500	480	455L	405					
LQ									420L	470L	485	500	500	500	490	480	470	445L	385L					

The Radio Research Laboratories, Japan

JUL. 1972 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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 automatio operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						S	220	290	330	340	350	355	A	A	360	350	330	300	260	170				
2						S	190	280	310	340	350	350	IA 355	360	A	A	A	A	A	B				
3						S	H 220	280	320	360	370	370	365	360	360	A	A	A	A	A				
4						S	210	A	A	360	A	375	390	380	370	350	340	310	A	A				
5						S	170	265	300	IA 335	IA 360	385	A	A	A	A	365	IA 305	230	B				
6						S	230	270	A	A	A	A	A	A	A	A	A	A	A	A				
7						E	200	280	320	360	370	IA 375	A	A	A	370	330	300	260	160				
8						S	190	280	320	350	350	A	A	A	360	IA 355	IA 335	IA 300	IA 255	A				
9						B	H 210	270	310	330	A	A	A	A	A	A	A	A	A	A				
10						S	H 190	270	310	335	360	370	370	H 365	IR 360	IR 355	A	A	A	A				
11						S	H 200	260	305	330	A	A	A	A	A	A	A	300	240	S				
12						S	A	A	A	A	A	A	A	380	IA 370	360	330	A	A	A				
13						S	A	255	305	A	A	A	A	A	365	IA 355	335	310	255	A				
14						S	150	270	310	H 330	350	370	370	360	IA 360	350	340	310	250	S				
15						S	190	260	310	335	A	A	A	A	A	A	A	A	A	S				
16						S	170	260	300	A	A	A	A	A	350	340	330	A	A	S				
17						E	170	270	310	330	360	370	360	360	A	A	A	A	A	S				
18						S	H 190	R 260	310	IA 335	350	360	370	370	345	320	IA 310	IA 280	IA 255	A				
19						A	A	250	IA 300	A	IA 345	365	IA 360	365	355	350	325	295	H 245	150				
20						S	A	250	H 300	330	345	360	IA 360	370	355	340	320	IA 290	IA 245	A				
21						S	185	265	300	H 330	IA 350	IA 365	370	370	360	350	330	290	240	S				
22						S	A	A	A	A	A	A	A	A	360	350	330	300	250	S				
23						S	A	260	300	325	A	A	A	IA 370	IA 360	360	330	300	240	S				
24						S	S	250	280	310	305	335	360	375	R 370	IA 345	330	300	A	A				
25						S	A	250	R 300	IA 330	A	A	A	A	365	IC 355	330	295	235	S				
26						E	160	A	A	C	IA 345	360	IA 360	370	365	350	325	295	230	A				
27						S	170	245	H 290	320	340	360	IA 380	385	375	355	340	305	260	150				
28						S	A	260	300	A	A	A	A	A	A	355	340	A	A	S				
29						S	180	260	IA 295	325	350	370	A	A	A	360	330	A	A	S				
30						S	S	250	300	320	340	A	A	380	360	350	330	300	250	B				
31						S	210	H 280	H 300	H 335	R 360	360	370	R 375	375	370	350	A	A	S				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	21	27	26	23	19	18	14	17	21	23	23	19	17	4				
MED						E	190	260	302	330	350	365	368	370	360	350	330	300	250	155				
UQ						E	210	270	310	338	360	370	370	375	365	355	338	302	255	165				
LQ						E	170	258	300	330	345	360	IA 360	365	360	350	330	295	240	150				

The Radio Research Laboratories, Japan

JUL. 1972 | FOE (0.01 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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_{62}^{X}	23	J_{19}^{X}	J_{34}^{X}	J_{24}^{X}	J_{27}^{X}	38	J_{47}^{X}	J_{62}^{X}	J_{65}^{X}	51	92	37	40	$^{G}36$	G	G	35	34	J_{35}^{X}	13	19	J_{33}^{X}	J_{29}^{X}
2	42	J_{27}^{X}	25	20	E_{14}^{S}	E_{15}^{S}	G	G	35	J_{49}^{X}	47	J_{63}^{X}	J_{64}^{X}	40	44	37	38	J_{46}^{X}	J_{30}^{X}	J_{34}^{X}	J_{31}^{X}	J_{25}^{X}	J_{23}^{X}	J_{26}^{X}
3	J_{71}^{X}	J_{62}^{X}	J_{81}^{X}	J_{95}^{X}	J_{62}^{X}	J_{27}^{X}	26	32	J_{50}^{X}	J_{95}^{X}	145	J_{100}^{X}	142	J_{99}^{X}	J_{102}^{X}	J_{75}^{X}	J_{42}^{X}	J_{84}^{X}	77	J_{82}^{X}	J_{92}^{X}	J_{70}^{X}	57	39
4	J_{64}^{X}	47	J_{25}^{X}	J_{25}^{X}	32	J_{31}^{X}	G	31	35	G	J_{118}^{X}	J_{104}^{X}	J_{58}^{X}	J_{80}^{X}	J_{63}^{X}	J_{109}^{X}	J_{82}^{X}	80	J_{54}^{X}	J_{74}^{X}	J_{59}^{X}	J_{39}^{X}	J_{33}^{X}	J_{27}^{X}
5	J_{27}^{X}	J_{50}^{X}	J_{31}^{X}	26	26	23	24	36	J_{35}^{X}	J_{77}^{X}	75	51	J_{64}^{X}	J_{47}^{X}	J_{70}^{X}	42	G	37	J_{37}^{X}	43	J_{31}^{X}	28	32	32
6	31	33	33	41	31	20	$^{G}19$	30	37	J_{45}^{X}	53	J_{49}^{X}	J_{65}^{X}	J_{75}^{X}	J_{95}^{X}	J_{95}^{X}	J_{80}^{X}	J_{64}^{X}	J_{33}^{X}	J_{30}^{X}	J_{19}^{X}	19	E_{14}^{S}	20
7	E_{14}^{S}	17	E_{13}^{S}	E_{14}^{S}	E	E	23	31	35	J_{58}^{X}	54	J_{48}^{X}	J_{49}^{X}	43	38	$^{G}35$	$^{G}31$	G	28	23	20	J_{69}^{X}	E_{15}^{S}	J_{19}^{X}
8	J_{26}^{X}	J_{31}^{X}	24	E_{15}^{S}	E_{13}^{S}	E_{15}^{S}	25	31	35	43	41	42	J_{54}^{X}	52	40	43	J_{41}^{X}	35	32	J_{62}^{X}	J_{58}^{X}	J_{34}^{X}	24	J_{51}^{X}
9	58	J_{58}^{X}	J_{38}^{X}	J_{38}^{X}	J_{34}^{X}	24	31	J_{76}^{X}	J_{64}^{X}	J_{79}^{X}	D	J_{71}^{X}	J_{87}^{X}	50	J_{58}^{X}	J_{42}^{X}	J_{38}^{X}	J_{35}^{X}	29	J_{29}^{X}	J_{25}^{X}	24	E_{15}^{S}	E_{14}^{S}
10	J_{20}^{X}	J_{29}^{X}	J_{26}^{X}	17	E_{11}^{B}	17	32	31	37	94	J_{56}^{X}	J_{72}^{X}	58	J_{90}^{X}	47	40	J_{69}^{X}	J_{70}^{X}	J_{83}^{X}	42	55	J_{55}^{X}	J_{78}^{X}	J_{100}^{X}
11	J_{73}^{X}	J_{73}^{X}	J_{34}^{X}	45	J_{32}^{X}	J_{74}^{X}	J_{77}^{X}	J_{81}^{X}	J_{74}^{X}	J_{104}^{X}	J_{184}^{X}	J_{89}^{X}	J_{51}^{X}	J_{104}^{X}	J_{110}^{X}	J_{51}^{X}	38	36	35	18	J_{22}^{X}	25	J_{74}^{X}	J_{92}^{X}
12	J_{82}^{X}	J_{63}^{X}	J_{41}^{X}	J_{27}^{X}	J_{20}^{X}	20	26	31	J_{84}^{X}	49	43	48	44	41	J_{66}^{X}	J_{85}^{X}	J_{110}^{X}	J_{70}^{X}	J_{103}^{X}	J_{60}^{X}	J_{74}^{X}	J_{33}^{X}	J_{28}^{X}	J_{31}^{X}
13	J_{40}^{X}	J_{37}^{X}	45	J_{36}^{X}	J_{27}^{X}	J_{25}^{X}	23	37	J_{63}^{X}	J_{95}^{X}	J_{145}^{X}	J_{90}^{X}	49	42	41	J_{65}^{X}	J_{54}^{X}	J_{78}^{X}	J_{76}^{X}	J_{88}^{X}	J_{79}^{X}	J_{87}^{X}	J_{51}^{X}	J_{52}^{X}
14	J_{64}^{X}	J_{114}^{X}	J_{30}^{X}	22	J_{20}^{X}	16	21	30	38	42	47	52	J_{52}^{X}	J_{52}^{X}	J_{96}^{X}	$^{M}180$	$^{M}110$	170	J_{74}^{X}	J_{88}^{X}	J_{36}^{X}	J_{28}^{X}	J_{36}^{X}	J_{31}^{X}
15	J_{64}^{X}	J_{44}^{X}	J_{52}^{X}	J_{64}^{X}	J_{32}^{X}	J_{25}^{X}	27	37	J_{47}^{X}	J_{84}^{X}	133	102	84	J_{58}^{X}	60	J_{100}^{X}	J_{54}^{X}	$^{M}99$	J_{102}^{X}	J_{39}^{X}	J_{53}^{X}	J_{34}^{X}	J_{28}^{X}	J_{25}^{X}
16	J_{21}^{X}	$^{M}90$	J_{48}^{X}	J_{50}^{X}	J_{33}^{X}	J_{31}^{X}	J_{37}^{X}	38	189	J_{133}^{X}	J_{83}^{X}	44	44	J_{53}^{X}	$^{M}67$	$^{M}110$	J_{71}^{X}	J_{71}^{X}	J_{95}^{X}	J_{100}^{X}	J_{56}^{X}	J_{25}^{X}	24	J_{33}^{X}
17	J_{31}^{X}	J_{33}^{X}	J_{34}^{X}	J_{51}^{X}	J_{34}^{X}	E	G	33	71	J_{72}^{X}	J_{73}^{X}	J_{135}^{X}	J_{69}^{X}	J_{58}^{X}	41	J_{48}^{X}	J_{82}^{X}	J_{44}^{X}	J_{36}^{X}	J_{74}^{X}	J_{33}^{X}	J_{32}^{X}	J_{23}^{X}	J_{23}^{X}
18	J_{21}^{X}	J_{62}^{X}	44	J_{38}^{X}	18	E_{13}^{S}	22	28	J_{40}^{X}	40	J_{52}^{X}	J_{84}^{X}	J_{80}^{X}	J_{70}^{X}	J_{74}^{X}	J_{49}^{X}	J_{72}^{X}	J_{39}^{X}	J_{30}^{X}	J_{33}^{X}	J_{30}^{X}	E_{15}^{S}	J_{26}^{X}	J_{39}^{X}
19	J_{32}^{X}	J_{39}^{X}	J_{34}^{X}	J_{22}^{X}	E_{14}^{S}	27	23	G	J_{35}^{X}	J_{33}^{X}	38	40	41	J_{82}^{X}	40	39	36	J_{47}^{X}	31	J_{31}^{X}	J_{31}^{X}	J_{36}^{X}	J_{33}^{X}	J_{25}^{X}
20	J_{40}^{X}	J_{61}^{X}	J_{29}^{X}	J_{35}^{X}	25	35	J_{30}^{X}	28	36	45	49	J_{80}^{X}	76	J_{55}^{X}	50	47	35	31	J_{30}^{X}	J_{21}^{X}	J_{23}^{X}	J_{29}^{X}	20	21
21	22	J_{21}^{X}	21	22	E_{13}^{S}	20	21	28	36	$^{G}25$	38	38	G	J_{52}^{X}	44	39	38	39	J_{37}^{X}	27	J_{20}^{X}	J_{37}^{X}	J_{37}^{X}	J_{39}^{X}
22	J_{53}^{X}	J_{34}^{X}	26	J_{40}^{X}	J_{41}^{X}	J_{28}^{X}	J_{93}^{X}	170	92	J_{49}^{X}	J_{99}^{X}	$^{M}76$	D	147	43	45	51	J_{73}^{X}	35	J_{50}^{X}	J_{89}^{X}	J_{63}^{X}	J_{54}^{X}	J_{34}^{X}
23	J_{33}^{X}	J_{23}^{X}	J_{26}^{X}	J_{24}^{X}	J_{51}^{X}	J_{51}^{X}	J_{33}^{X}	J_{48}^{X}	J_{84}^{X}	J_{56}^{X}	J_{58}^{X}	J_{72}^{X}	J_{61}^{X}	47	40	J_{50}^{X}	J_{59}^{X}	J_{89}^{X}	J_{39}^{X}	J_{74}^{X}	J_{68}^{X}	J_{49}^{X}	J_{62}^{X}	J_{84}^{X}
24	J_{55}^{X}	J_{50}^{X}	J_{33}^{X}	J_{25}^{X}	E	E_{12}^{S}	23	J_{44}^{X}	37	84	J_{107}^{X}	70	52	55	38	J_{58}^{X}	J_{51}^{X}	127	J_{162}^{X}	84	47	38	45	J_{19}^{X}
25	E_{14}^{S}	E_{14}^{S}	E_{13}^{S}	E_{14}^{B}	18	23	J_{28}^{X}	J_{39}^{X}	J_{66}^{X}	J_{69}^{X}	J_{77}^{X}	J_{59}^{X}	J_{70}^{X}	J_{74}^{X}	68	E_{48}^{C}	38	J_{145}^{X}	J_{117}^{X}	42	26	J_{86}^{X}	J_{60}^{X}	J_{70}^{X}
26	39	38	27	23	28	26	G	J_{31}^{X}	J_{64}^{X}	E_{40}^{C}	36	38	37	G	38	39	34	33	29	J_{31}^{X}	19	J_{24}^{X}	J_{27}^{X}	J_{40}^{X}
27	J_{29}^{X}	J_{41}^{X}	J_{35}^{X}	J_{32}^{X}	19	J_{25}^{X}	J_{21}^{X}	32	31	J_{27}^{G}	J_{61}^{X}	J_{73}^{X}	J_{65}^{X}	49	J_{61}^{X}	J_{61}^{X}	G	J_{54}^{X}	J_{42}^{X}	J_{37}^{X}	J_{31}^{X}	23	20	J_{61}^{X}
28	J_{64}^{X}	J_{62}^{X}	27	J_{23}^{X}	J_{26}^{X}	J_{23}^{X}	J_{36}^{X}	J_{39}^{X}	J_{50}^{X}	J_{84}^{X}	170	63	55	54	102	56	$^{M}188$	J_{87}^{X}	J_{49}^{X}	J_{39}^{X}	J_{33}^{X}	J_{52}^{X}	J_{24}^{X}	J_{20}^{X}
29	J_{24}^{X}	E_{14}^{S}	J_{23}^{X}	J_{20}^{X}	E_{11}^{B}	E_{15}^{S}	22	J_{42}^{X}	J_{50}^{X}	J_{69}^{X}	84	J_{57}^{X}	64	39	65	G	G	90	J_{86}^{X}	71	J_{62}^{X}	45	J_{39}^{X}	J_{61}^{X}
30	J_{34}^{X}	J_{34}^{X}	J_{26}^{X}	J_{26}^{X}	E_{14}^{S}	E_{14}^{S}	20	28	43	37	40	39	45	$^{G}34$	J_{36}^{G}	J_{33}^{G}	J_{31}^{G}	32	29	E_{18}^{B}	J_{33}^{X}	J_{52}^{X}	J_{59}^{X}	J_{82}^{X}
31	J_{40}^{X}	J_{54}^{X}	33	J_{38}^{X}	J_{33}^{X}	J_{56}^{X}	G	34	44	46	72	J_{61}^{X}	J_{60}^{X}	54	J_{51}^{X}	J_{46}^{X}	37	J_{73}^{X}	J_{35}^{X}	30	J_{51}^{X}	J_{29}^{X}	J_{29}^{X}	J_{18}^{X}
	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_{39}^{X}	J_{39}^{X}	J_{30}^{X}	J_{26}^{X}	25	23	23	32	44	J_{56}^{X}	61	J_{63}^{X}	58	53	51	48	41	J_{64}^{X}	J_{37}^{X}	J_{39}^{X}	J_{33}^{X}	J_{34}^{X}	J_{29}^{X}	J_{32}^{X}
UQ	J_{60}^{X}	J_{60}^{X}	J_{34}^{X}	J_{38}^{X}	J_{32}^{X}	J_{27}^{X}	30	39	J_{64}^{X}	J_{82}^{X}	J_{103}^{X}	J_{82}^{X}	J_{67}^{X}	J_{72}^{X}	J_{68}^{X}	J_{63}^{X}	J_{70}^{X}	J_{82}^{X}	J_{76}^{X}	J_{72}^{X}	J_{57}^{X}	J_{50}^{X}	J_{45}^{X}	J_{52}^{X}
LQ	J_{26}^{X}	J_{30}^{X}	26	22	14	16	21	30	36	42	48	48	49	45	40	40	36	36	32	J_{30}^{X}	J_{26}^{X}	J_{25}^{X}	24	J_{24}^{X}

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JUL. 1972 | FOES (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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	58	E	13	22	15	16	36	47	55	55	50	E S 92	E R 37	E R 40	G 35	G	G	34	34	31	E S 13	E	21	E
2	30	24	E	18	E S 14	E S 15	G	G	G	44	43	54	48	E R 40	E R 44	37	35	45	30	33	23	17	21	22
3	E	53	47	32	A	20	26	32	41	48	A	63	A	70	A	65	42	74	73	65	49	24	26	31
4	53	35	E	16	22	25	G	30	33	G	53	A	50	61	57	55	70	77	47	54	53	E S 39	46	19
5	20	25	25	17	14	S	G	35	33	49	49	51	46	43	60	42	G	34	37	22	20	20	25	21
6	18	22	21	16	20	E	G 18	30	35	41	46	47	65	57	59	53	57	52	29	26	E	E	E S 14	E
7	E S 14	E	E S 13	E S 14	E	E	G	G	34	41	45	44	48	E R 43	E R 38	G 35	G 31	G	E R 28	23	E	E	E S 15	E
8	20	22	E	E S 15	E S 13	E S 15	G	G	G	43	39	E R 42	50	51	E R 40	E R 43	35	31	32	39	E S 58	21	15	30
9	15	31	30	33	15	14	30	A	43	A	A	54	53	43	45	42	38	30	27	21	15	E	E S 15	E S 14
10	16	17	15	E	E B 11	S	G	30	36	A	48	54	50	54	41	40	38	48	49	37	50	52	52	78
11	50	53	24	22	E	18	A	49	39	52	60	54	49	80	76	51	35	35	30	E R 18	20	15	48	A
12	50	50	40	24	16	E	24	31	57	49	43	47	43	E R 41	66	63	E S 110	68	75	50	62	29	23	23
13	31	32	39	29	24	23	21	36	37	A	A	50	44	41	G	48	50	50	72	76	64	52	29	21
14	50	50	15	13	15	15	E R 21	29	G	42	46	49	48	50	52	49	A	45	E S 74	65	29	E	21	E
15	50	30	43	33	25	19	25	35	43	38	A	A	A	50	50	64	47	53	93	35	34	26	25	22
16	16	52	27	24	15	15	26	38	58	40	56	39	E R 44	51	58	48	41	63	75	54	30	21	E	16
17	E	19	21	25	29	E	G	G	63	64	69	A	62	55	40	36	E R 82	44	35	68	29	27	16	23
18	E	21	15	20	E	E S 13	G	E R 28	35	36	52	43	67	53	62	43	47	34	26	28	27	E S 15	20	E S 39
19	23	27	25	17	E S 14	15	23	G	32	33	37	39	40	67	E R 40	39	G	39	30	24	20	28	16	E
20	26	29	20	25	E	20	18	G	34	42	46	49	43	47	44	40	34	30	27	16	E	18	E	E
21	E	16	E	E	E S 13	S	G	28	33	G 25	E R 38	E R 38	G	40	40	38	36	38	32	22	15	32	16	25
22	16	24	E	25	20	21	50	A	34	40	47	60	A	A	E R 43	44	46	52	28	43	E	21	40	E
23	E	E	15	18	13	30	20	40	A	47	38	51	56	46	37	48	59	34	36	60	23	30	46	A
24	46	50	E	14	E	E S 12	21	36	33	49	A	49	50	54	G	54	45	39	A	31	30	35	16	E
25	E S 14	E S 14	E S 13	E B 14	15	G	24	33	44	46	A	54	43	42	54	E C 48	G	36	A	33	17	E	50	21
26	29	29	E	14	17	13	G	27	36	E C 40	36	38	37	G	38	38	G	32	27	30	E	E	15	22
27	25	29	25	22	E	S	G	31	G	G 27	48	44	50	48	52	52	G	43	39	E S 37	26	E	E	E
28	19	24	15	16	22	17	23	36	44	44	44	47	44	50	68	44	50	31	30	24	21	25	E	E
29	16	E S 14	15	E	E B 11	E S 15	21	34	32	47	63	52	54	38	49	G	G	56	E S 86	47	28	27	22	20
30	21	30	20	16	E S 14	E S 14	19	G	33	35	38	39	41	G 33	G 34	G 30	G 27	G	29	E B 18	28	40	27	25
31	E	14	23	14	19	24	G	33	42	44	63	58	59	E R 54	49	44	G	53	32	18	15	E	16	E
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	27	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	20	25	15	17	15	15	20	31	35	44	48	50	49	49	45	44	36	39	33	32	23	21	21	20
UQ	30	32	25	24	20	20	24	36	43	49	63	54	55	54	58	50	47	52	U 60	48	30	28	26	24
LQ	14	18	13	14	E E 12	E E 13	G	28	33	40	44	44	44	41	U 37	38	E G 27	34	30	24	15	E	15	E

The Radio Research Laboratories, Japan

JUL. 1972 | FBES (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | 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 S 15	E S 14	E	E S 14	E S 13	E S 12	E S 15	14	12	20	16	23	25	23	25	18	17	15	13	E S 13	E	E S 15	E S 14	E S 15
2	E S 13	E S 14	E S 14	E	E S 14	E S 15	14	15	15	23	23	23	23	26	23	19	17	15	15	14	E S 13	E S 15	E S 13	E S 14
3	E S 15	E S 14	E S 15	E	E	E S 13	14	15	15	19	22	26	24	24	23	24	17	14	14	14	E S 15	E S 14	E S 14	E S 15
4	E S 15	E S 14	E S 15	E S 13	E S 13	E S 13	E S 14	18	19	17	20	24	28	25	22	24	15	15	15	E S 15	E S 14	E S 14	E S 14	E S 13
5	E S 14	E S 14	E S 14	E	E	E S 14	E S 15	15	16	19	24	24	24	28	25	19	20	19	11	14	11	E S 13	E S 14	E S 14
6	E S 15	E S 14	E S 13	E	E	E S 14	15	14	14	18	18	21	28	23	22	17	25	15	14	14	E S 15	E S 15	E S 14	E S 15
7	E S 14	E S 14	E S 13	E S 14	E	E	E S 14	14	15	19	21	24	24	28	24	20	19	15	13	E S 14	E S 15	E S 14	E S 15	E S 14
8	E S 14	E S 15	E S 14	E S 15	E S 13	E S 15	E S 14	14	15	18	22	23	24	24	22	20	16	15	13	E S 13	E S 14	E S 13	E S 13	E S 15
9	E	E S 14	E	E S 14	E	11	E S 13	14	15	19	19	22	24	24	20	20	20	14	15	11	E	E S 15	E S 15	E S 14
10	E S 15	E S 13	E S 14	11	11	E S 15	E S 14	13	15	19	19	22	25	24	19	23	19	14	15	E S 15	E S 14	E S 14	E S 14	E S 15
11	E S 15	E S 15	E S 14	E S 13	E S 14	E	E S 14	16	17	15	20	22	24	25	20	22	17	15	14	14	E S 14	E S 13	E S 15	E S 13
12	E S 14	E S 13	E S 13	E S 14	E S 13	E S 15	16	15	15	15	18	22	21	23	20	17	17	15	15	14	E S 14	E S 14	E S 13	E S 14
13	E S 14	E S 14	E	E S 13	E S 13	E S 13	15	15	15	16	16	21	18	24	17	17	16	11	13	E S 14	E S 15	E S 14	E S 15	E S 14
14	E S 13	E S 13	E S 13	E	E S 14	E S 14	E S 14	15	15	15	17	23	15	19	15	15	15	15	E S 14	E S 15	E S 15	E S 15	E S 13	E S 15
15	E S 14	E S 13	E S 13	E S 13	E	E S 13	E S 14	13	15	15	15	18	28	20	20	17	15	15	13	E S 15	E S 13	E S 14	E S 14	E S 14
16	E S 13	E S 15	E S 13	E	E	E S 14	13	13	14	15	20	20	24	19	23	15	14	14	14	E S 14	E S 14	E S 14	E S 14	E S 14
17	E S 15	E S 14	E S 13	12	12	E	14	15	15	E C 20	19	24	25	24	20	16	15	14	14	E S 14	E S 14	E S 13	E S 14	E S 13
18	E S 14	E S 14	E S 13	E S 13	E S 13	E S 13	E S 13	14	15	15	24	22	24	24	24	21	17	14	14	13	E S 14	E S 15	E S 13	E S 14
19	E S 14	E S 13	E	E	E S 14	E	13	15	14	16	16	22	15	21	17	16	15	14	15	E S 13	E S 13	E S 14	E S 13	E S 14
20	E S 13	E S 13	E S 14	E S 13	E S 13	E S 13	E S 13	12	14	15	16	17	21	21	18	15	18	15	E C 20	11	E S 14	E S 15	E S 15	E S 14
21	E S 14	E S 15	E S 15	E S 13	E S 13	E S 14	E S 15	14	14	15	18	20	19	24	20	17	15	14	14	E S 15	E S 13	E S 14	E S 14	E S 14
22	E S 14	E S 14	E S 13	E S 14	E	E S 14	E S 13	13	14	14	20	20	19	20	23	17	14	14	16	E S 13	E S 15	E S 14	E S 14	E S 15
23	E S 15	E S 15	E S 14	E	E	E S 13	E S 14	14	13	15	15	17	18	23	22	20	17	14	11	E S 14	E S 14	E S 15	E S 14	E S 14
24	E S 15	E S 13	E S 15	E	E	E S 12	E S 15	13	15	14	15	15	17	20	21	19	14	14	14	E S 13	E S 14	E S 14	E S 14	E S 15
25	E S 14	E S 14	E S 13	14	E	E S 13	14	13	13	15	15	15	20	20	16	E C 48	15	11	11	E S 13	E S 14	E S 14	E S 14	E S 14
26	E S 13	E S 14	E S 14	E	E	E	E S 13	14	14	E C 40	22	24	19	20	17	17	15	14	13	14	E S 13	E S 14	E S 12	E S 14
27	E S 15	E S 13	E S 13	14	E S 14	E S 14	13	12	12	14	16	19	23	19	17	16	13	14	14	E S 13	E S 13	E S 13	E S 13	E S 15
28	E S 14	E S 13	E S 12	E	E S 12	E S 12	E S 13	13	15	15	14	16	22	15	14	20	15	14	14	E S 14	E S 14	E S 14	E S 15	E S 14
29	E S 13	E S 14	E S 13	E S 14	11	E S 15	E S 14	11	11	15	18	19	18	19	20	19	15	14	13	E S 13	E S 14	E S 14	E S 13	E S 15
30	E S 13	E S 13	E S 13	E S 13	E S 14	E S 14	E S 15	13	14	16	16	20	19	26	22	19	15	13	16	18	E S 14	E S 14	E S 15	E S 15
31	E S 15	E S 13	E	E	E	E S 14	E S 13	14	14	16	16	21	18	21	20	16	15	14	E C 16	E S 13	E S 13	E S 14	E S 14	E S 15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E S 14	E S 14	E S 13	E S 13	E S 12	E S 13	E S 14	14	15	16	18	22	23	23	20	18	15	14	14	E S 14	E S 14	E S 14	E S 14	E S 14
UQ	E S 15	E S 14	E S 14	E S 14	E S 14	E S 13	E S 14	E S 14	15	15	18	20	23	24	24	22	20	17	15	14	14	E S 14	E S 14	E S 14	E S 15
LQ	E S 14	E S 13	E S 13	E	E	E S 12	E S 13	13	14	15	16	20	19	20	18	17	15	14	13	E S 13	E S 13	E S 14	E S 13	E S 14

The Radio Research Laboratories, Japan

JUL. 1972 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

JUL. 1972 | M(3000)F2 (0.01) | 135° E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	F	F	F	F	280	300	280S	280	265	I 250S	260	J 275R	265	260	265	265S	S	S	295S	285S	U 270D	I 275S
2	J 255S	J 275S	I 285S	I 310S	285F	285S	300	U 310C	300	305	245	255	U 265R	275	270	260	265	275S	I 290C	300D	I 300S	305S	265	270D
3	285S	S	S	S	A	S	310S	290	285	310	A	I 235R	I 250A	265	I 280A	265S	280S	I 285S	I 295C	300S	315S	280D	J 280D	F
4	S	S	280S	295F	285S	F	295	320	335	315	260	I 245R	245	255R	270R	280R	295	290	290R	285R	270	I 270D	270D	270
5	260S	260	I 285S	F	285	295	295	290	295	280	255	265	265	275	275	270	285S	290S	J 310D	295S	I 270D	265	J 260D	I 270D
6	I 280S	300S	I 305S	305	300S	300	310D	295S	310	285	285	250	275	285	300	255	280	290	285	275	U 285S	285S	S	S
7	J 285S	J 275S	J 290D	U 310	295	290	290	305	275	295	235	240	250R	I 260R	I 265S	J 270S	J 275S	295	S	S	270D	S	S	S
8	S	S	S	305S	U 260S	260S	J 300S	325	330	305H	290	275	275	265	265	280	U 295S	300S	305	275S	I 260S	250S	I 270D	250
9	I 260S	255S	S	F	F	285S	290F	I 265A	260	A	A	245	270	265	280	265H	260	280	295C	290	265	260D	260	270D
10	275	295S	295	290	275	280	305	320	310	A	290	250	245R	285	270	280S	295	290	I 285C	U 270D	295S	J 340D	270D	R
11	S	I 270D	I 285S	310S	285H	I 290S	I 295A	J 300C	310S	300	245	255	I 270D	I 285S	290	I 285S	275	280D	I 290C	I 310D	320D	290D	280	I 275A
12	265S	I 275S	S	S	F	F	320F	I 330S	305	330	270	260F	260	275S	I 280D	285	I 290D	295S	I 300S	I 305S	320S	315S	U 270D	270
13	265	F	290	300Z	310	305S	315	345S	350	I 330A	I 290A	295	275	285	300	300	295	300D	310S	U 310D	U 285S	290D	275	I 280D
14	I 295S	I 315S	I 320S	315	315	290	305	315	305	290	290	280	290	270	275	I 270D	I 280A	J 280D	I 300S	310D	280D	255S	S	S
15	S	F	F	S	300S	F	300	320	J 305S	305	I 290A	I 270A	I 260A	265	260	265S	270	S	300D	I 315S	U 285S	J 275S	270D	I 265S
16	S	S	S	F	S	F	340	335S	345S	335	A	280	265	275	270	270D	275	I 285S	J 290C	J 295S	I 285S	I 280D	I 280D	285S
17	265	280	J 285S	I 265S	J 270S	I 285S	315	320	A	J 285S	280	I 265A	255	265S	J 270R	J 275S	300	300D	I 290C	I 310D	290D	I 290D	270D	260D
18	I 280S	290D	S	300	290D	F	305S	315	360D	315H	280	275	270	285	285	285	295	300	310C	290	300	280	275	I 290D
19	295	305	295	300	300	305	325	345	335	320	320	280	285	290	300	280	305S	300	315	325	280D	260	275	290D
20	J 300S	320F	315S	S	S	F	335	320	330	305	295	285	315	305	290	265	275	U 285S	U 305S	S	285	285	U 290D	275
21	285S	295	295	285	315	310	330D	350	325	315	305H	305	275	285	285	285	300	315	U 325S	315S	255	265S	255S	F
22	300S	F	285S	I 270D	285F	300	340S	I 350A	340	350	280	A	A	A	290	295	300	285	300	295S	275S	280D	F	280D
23	J 285S	280D	295	S	S	S	310S	I 335S	I 320A	310	295	285	265	270	270	260	285S	305S	310D	I 345S	255S	J 265S	S	A
24	S	I 335S	I 305S	280D	S	S	295	320	325F	345	I 310A	275	290	295	295	305	295	300D	I 310A	325S	300	280	280D	260
25	265S	275S	260D	265S	295S	295	315	320	U 305S	335H	A	280	315	255	285	300	300	275Z	I 315A	U 320D	310	265	F	F
26	F	275S	285S	270F	300F	290	300	355S	360	315	265	265	305	310	295	285	300	U 295S	300	310	310	300	280	265S
27	U 260S	I 270D	295F	F	U 275S	J 305S	330	315	340	315	250	295	285	300	300	305	300	305	300	305	300	285	275S	S
28	S	S	290	285	265	290	350	360	340	310	330	295	280	290	290	285	295	295	295C	J 290D	U 295S	280D	270D	275S
29	275	J 285S	300S	270	275	295S	320	335	305	310	305	295	260	275	270R	270D	290D	295S	I 285S	I 300D	270D	285S	250D	280D
30	F	275S	275S	270D	275S	F	355S	330	305H	320	295	305	275	260	270	280R	295S	315	305	300	290D	F	I 280D	285F
31	290D	290D	S	S	290D	I 315S	330	345	330	310	295	280	J 265R	265S	J 280D	285S	J 290D	I 290D	I 285C	I 285S	300D	280D	J 275S	275S
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	22	22	20	23	20	31	31	30	29	27	30	30	30	31	31	31	30	29	28	31	29	25	22
MED	285D	280D	290D	292	285	292	310	320	315	310	290	275	270	275	280	280	290	292S	300	300D	285S	280D	270D	275S
UQ	285S	295S	295S	305	300	302	328	335	335	320	295	285	280	285	290	285	295	300D	310D	310D	300D	285S	280D	280D
LQ	265S	275S	285S	270	275	288	300	312	305	305	265	255	260	265	270	268	278	285S	290C	290D	272S	265S	270D	270D

JUL. 1972 | M(3000)F2 (0.01)

IONOSPHERIC DATA

JUL. 1972 | 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								A	A	A	L	A	375	360 H	375	355 H	345 H	330 L	L	A				
2								L	375 L	A	L	A	A	365 H	360	335 L	340 H	A	L					
3								L	345 L	A	A	A	A	A	A	A	355 R	355 R	355 R	355 R				
4								L	L	340 L	A	A	A	A	A	A	A	A	A					
5								L	L	330 U L	R	R	385	410 L	A	355 L	345 L	350 L	A	L				
6							L	L	355 U L	L	365	310	A	A	A	L	A	A	L	L				
7								L	L	350 L	360 L	345	A	355	345	340 L	340 H	350	L	L				
8									L	L	340 H	340	A	A	350 H	335 H	360 L	350 L	L					
9								A	A	A	A	A	A	365	360	360	355	335 U L	315 U L	L				
10							L	L	385	A	370	L	A	A	370 H	375	330 L	A	A	A				
11							A	A	370	A	A	A	A	A	A	A	L	345 L	L	L				
12							L	L	A	A	360	340	385	380 L	A	A	A	A	A					
13							L	L	315 U L	A	A	A	350	365	360	A	A	A	A					
14							L	L	L	335 L	380	A	A	A	A	A	A	A	A					
15								L	L	370 H	A	A	A	A	A	A	A	A	A					
16								A	A	385 L	A	390 H	365	A	A	A	375	A	A					
17								L	A	A	A	A	A	I A 385	400 H	370	A	A	L					
18							L	L	L	405 L	A	350	A	A	A	375	A	340 L	L					
19								L	405 L	370 L	385 L	370 L	400	I A 390	355	365 U L	370	R	L					
20								L	L	355 L	A	A	380	A	420	370	375	340	L	L				
21								L	425 L	380 H	395 R	385 H	380	425 R	390	345 H	360	L	L					
22								A	375 L	385 L	A	A	A	A	A	A	A	I A 350	345 L	A				
23							L	A	A	A	390 H	I A 380	A	380 R	395 H	A	A	350 L	A					
24								L	L	A	A	A	A	I A 385	375	I A 370	A	345	A	A				
25							L	L	A	A	I A 400	I A 390	370 L	345 L	I A 355	I C 370	330 L	U L 335	A					
26							L	L	L	365 L	370	355 L	375	360	365	375	340	335 L	L					
27							L	L	L	L	L	345 L	A	A	A	A	360 L	L	L					
28								L	A	365	365 L	A	360	A	A	360	A	355	L					
29							L	L	L	L	A	A	I A 380	375	A	375	375 H	A	A					
30								L	L	360 L	350 H	395	400	395 H	380 H	370 H	355	345 L	L					
31								L	L	L	A	A	A	A	340	345	355	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									9	14	13	13	13	16	17	19	18	16	3	1				
MED									375 L	365 L	370	355	380	378	365	365	355	345 L	345 L	355 R				
UQ									385 L	380 L	385	385	385	388	380	370	360	350	350					
LQ									355 L	350 L	360	345	370	362	355	350	340	338 L	330 L					

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JUL. 1972 | M(3000)F1 (0.01)

IONOSPHERIC DATA

JUL. 1972 | H'F2 (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 automatio operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								295	300	305	350	I A 380	340	335	350	350	345	330	290	255				
2								255	265	295	440	400	345	340	355	365	345	325	280					
3								265	310	275	A	E A 500	A	350	A	350	325	320	310	280				
4								250	265	290	445	A	410	380	340	310	300	290	285					
5								290	275	345	410	395	355	340	345	350	330	300	270	250				
6							280	250	270	300	350	420	355	340	310	400	350	300	320	295				
7								245	340	290	H 290	455	395	355	345	360	330	290	270	260				
8									250	280	335	385	360	350	345	320	290	280	260					
9								A	450	A	A	475	415	390	350	330	330	320	295	270				
10							250	250	310	A	315	510	410	340	350	335	315	310	300	290				
11							A	280	275	290	E A 350	395	350	330	310	305	325	340	290	255				
12							280	245	I A 245	300	350	405	395	350	380	320	A	300	290					
13							265	250	255	A	A	345	390	355	320	310	320	300	300					
14							270	275	300	330	340	345	325	360	355	350	I A 335	300	A					
15								295	290	290	A	A	A	375	375	E A 350	330	305	E A 320					
16								245	250	270	A	350	390	355	350	340	325	310	310					
17								265	A	E A 360	E A 350	A	410	375	350	330	310	275	260					
18							280	300	250	H 260	A	400	E A 380	335	325	340	300	275	280					
19								245	255	300	310	395	345	E A 330	305	325	290	295	270					
20								255	265	320	345	335	290	280	335	400	350	320	270	240				
21								230	230	305	300	330	355	325	325	315	290	265	245					
22								I A 235	260	270	325	A	A	A	305	295	285	300	290	255				
23							275	245	I A 230	325	350	360	E A 350	375	345	370	325	275	245					
24								255	240	260	A	400	350	330	320	300	300	310	A	240				
25							295	275	250	270	A	385	290	480	380	310	315	320	I A 295					
26							300	240	250	300	430	425	320	295	345	365	330	300	285					
27							255	235	250	310	500	340	350	320	315	305	310	300	285					
28								240	260	300	295	345	395	340	370	340	310	295	285					
29							250	240	320	300	315	350	425	375	365	350	300	290	I A 270					
30								230	290	300	355	325	390	395	355	325	290	275	280					
31								245	250	L	E A 370	350	360	375	350	325	305	300	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							11	29	30	27	23	27	28	30	30	31	30	31	29	11				
MED							275	250	262	300	345	385	356	350	345	332	318	300	285	255				
UQ							280	265	290	304	357	401	395	375	355	350	330	310	292	275				
LQ							260	245	250	285	316	348	346	335	325	318	300	290	270	252				

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JUL. 1972 | H'F2 (KM)

IONOSPHERIC DATA

JUL. 1972 | H'F (KM) | 135° E Mean Time (G. M. T. + 9h)

Station YAMAGAWA Lat. 31° 12.1' N. Long. 130° 37.1' E Sweep 1 MHz to 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	285	270	300	250	250	E 290 A	A	A	A	A	A	205	205 H	215	205 H	205 H	240 H	I 240 A	I 240 A	240	245	270	255
2	315	305	255	240	250	250	235	225	210	A	210 H	A	A	A	E 250 B	210	215 H	A	235	250	240	235	235	300
3	275	300	290	240	I 290 A	305	250	240	A	A	A	A	A	A	A	A	270	A	A	A	260	270	270	E 350 A
4	A	E 310 A	280	265	275	290	250	225	200 H	205	A	A	A	A	A	A	A	A	A	E 260 A	300	I 295 S	295	290
5	325	305	270	280	295	235	235	250	205	I 215 A	I 235 A	A	E 220 A	200	A	E 245 A	220	220 H	I 240 A	250	270	295	300	295
6	275	250	240	230	250	250	245	225	210	220 H	E 240 A	E 255 A	A	A	A	A	A	A	220	280	260	250	255	275
7	285	270	255	240	235	250	235	225	205 H	225	E 250 A	210	A	A	220	225 H	240 H	225	245	255	230	270	295	310
8	300	295	260	230	245	290	240	230	215	225	210 H	225 H	A	A	E 250 A	I 225 A	235 H	230 H	245	E 285 A	A	305	275	E 340 A
9	290	325	310	255	220	270	240	A	A	A	A	A	A	210	A	220	210	225 H	235	245	240	280	300	275
10	275	265	250	230	275	270	235	235	200	A	E 275 A	A	I 210 A	I 215 A	200 H	245	235	A	A	A	260	305	E 360 A	A
11	E 330 A	310	275	250	205 H	250	I 255 A	I 250 A	250	A	A	A	A	A	A	A	225 H	230	250	250	220	240	E 325 A	A
12	I 350 A	310	300	245	220	275	250	235	A	A	240	A	200	E 230 B	A	A	A	A	A	250	E 260 A	240	295	310
13	340	335	290	275	215	255	240	E 250 A	200	A	A	A	E 250 A	210	225	A	A	A	A	E 320 A	E 350 A	E 305 A	E 295 A	300
14	E 360 A	E 315 A	250	230	250	260	240	235	220	E 250 A	E 260 A	A	A	A	A	A	A	A	A	A	245	300	325	300
15	E 350 A	265	E 280 A	270	275	295	240	250	I 230 A	205 H	A	A	A	A	A	A	A	A	A	245	250	270	290	285
16	290	A	240	230	300	275	225	I 240 A	A	220	A	200 H	250	A	A	A	E 230 A	A	A	260	260	250	245	250
17	300	290	275	295	305	275	230	240	A	A	A	A	A	A	180 H	205	A	A	A	E 280 A	255	275	300	295
18	280	280	300	280	250	275	245	250	205 H	200	A	E 250 A	A	A	A	E 250 A	I 230 A	240	215	260	250	255	290	I 285 A
19	270	280	290	260	250	255	240	220	195	190 H	200	200	195	I 220 A	260	230	210	E 270 A	240	245	245	E 335 A	295	265
20	260	245	245	340	240	260	240	240	230	E 250 A	A	A	E 230 A	I 220 A	215	200	200	205	235	250	215	250	300	295
21	290	275	265	285	275	250	250	225	200	195 H	200	210 H	215	190	195	225 H	215	I 220 A	I 240 A	225	250	330	310	290
22	245	275	265	E 310 A	295	265	245	I 230 A	210	220	A	A	A	A	I 205 A	I 215 A	I 210 A	A	240	I 245 A	240	260	E 330 A	255
23	255	270	260	240	305	320	250	I 240 A	I 235 A	A	195 H	A	A	E 250 A	180 H	A	A	225	I 230 A	240	290	E 330 A	A	A
24	300	250	220	255	255	275	245 H	I 235 A	215	A	A	A	A	A	215	A	A	E 270 A	A	A	250	275	270	305
25	310	290	315	300	285	270	250	A	A	A	I 185 A	A	E 250 A	245	I 230 A	I 200 C	230	E 245 A	A	250	235	315	A	340
26	300	315	265	295	265	285	260	225	E 220 A	220	200	205	205	215	220	220	220	215 H	230	255	235	225	265	340
27	E 370 A	E 350 A	295	E 400 A	315	260	240	215	200 H	190 H	E 260 A	E 270 A	A	A	A	A	225	I 250 A	I 250 A	250	245	250	290	310
28	285	265	250	270	350	300	250	I 220 A	I 205 A	E 250 A	E 250 A	A	240	A	A	E 255 A	A	225	245	250	250	255	270	255
29	295	275	240	290	280	260	245	235	210 H	A	A	A	I 205 A	195	A	205	210 H	A	A	255	285	280	280	285
30	300	310	285	320	290	255	225	205	215 H	210	205 H	195	185	195 H	235 H	195 H	195	210 H	245	250	245	A	330	295
31	255	270	280	275	250	250	220	225	I 220 A	250	A	A	A	A	A	E 275 A	220	A	E 250 A	250	245	250	260	295
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	31	31	31	31	31	28	24	18	16	10	14	14	16	19	21	17	19	27	30	30	29	28
MED	290	283	268	265	255	265	240	234	210	214	U 210	205	207	210	216	212	220	225	240	250	248	264	288	294
UQ	308	308	288	287	288	275	250	240	220	222	E 250 A	E 250 A	E 240 A	218 A	227	230	230	235	245	254	260	290	298	304
LQ	275	270	252	240	250	252	238	225	202	205	200	200	205	200	202	205	210	220	235	248	240	250	270	280

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JUL. 1972 | H'F (KM)

IONOSPHERIC DATA

JUL. 1972 | H'ES (KM) | 135° E Mean Time (G. M. T. + 9h)

Station YAMAGAWA Lat. 31° 12.1' N. Long. 303° 71.E 1' Sweep 2 MHz to 02 MHz in 0 sec in automatio operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	105	105	100	105	105	100	125	115	115	110	110	105	105	105	105	G	G	155	130	115	110	110	100	100
2	95	95	95	95	S	S	G	G	115	105	105	105	105	125	110	150	105	100	100	100	95	95	95	95
3	105	105	105	105	105	105	150	140	120	110	105	100	100	100	105	105	100	100	100	100	110	110	105	100
4	100	100	100	100	100	100	G	100	100	G	115	105	110	105	105	105	105	105	105	100	100	100	100	100
5	100	105	105	100	100	100	115	110	105	110	110	110	105	105	105	110	G	105	115	110	110	100	100	100
6	100	100	95	95	95	95	110	140	105	105	105	105	105	105	100	100	100	100	100	100	100	100	S	100
7	S	100	S	S	E	E	150	140	130	115	115	110	105	105	105	105	105	G	140	125	115	110	S	100
8	100	95	95	S	S	S	150	150	145	120	120	110	105	105	110	140	100	140	130	120	100	100	100	105
9	110	100	105	95	115	130	135	120	110	110	105	100	100	100	100	100	100	100	100	100	100	100	S	S
10	100	95	95	100	B	130	135	145	130	110	120	110	110	110	130	140	100	100	100	100	95	110	125	105
11	105	95	110	100	120	120	120	115	110	105	105	100	105	105	105	105	130	120	110	100	100	100	105	105
12	100	100	100	100	100	100	120	110	110	175	150	125	140	140	115	110	110	110	100	100	95	95	95	100
13	100	100	95	95	100	110	115	110	110	105	105	105	105	105	150	100	125	120	115	115	110	110	110	105
14	105	100	105	100	100	100	125	145	130	120	115	115	110	110	110	115	120	115	105	105	105	105	100	100
15	100	100	100	95	95	100	140	125	120	115	105	100	100	100	100	115	100	105	105	105	100	95	95	95
16	95	105	100	100	100	105	125	125	110	110	105	105	105	115	110	110	110	105	105	100	100	100	95	100
17	100	100	100	95	95	E	G	140	110	110	110	105	100	100	100	100	100	100	100	95	95	95	105	100
18	110	100	100	95	95	S	150	155	110	110	110	105	105	105	105	105	105	100	100	100	100	S	100	100
19	100	100	100	100	S	100	145	G	100	105	155	140	120	110	115	115	135	115	130	110	110	105	110	105
20	105	105	105	105	105	100	105	150	125	120	115	105	110	110	110	115	115	105	105	100	100	100	100	100
21	100	100	100	100	S	100	100	135	120	100	150	100	G	125	140	145	135	120	120	125	125	110	110	105
22	105	105	100	100	100	100	100	100	100	100	110	105	100	100	135	125	120	115	120	110	110	105	105	100
23	100	100	100	100	100	100	100	115	110	110	105	105	105	105	105	140	125	125	115	110	105	120	105	100
24	100	100	100	105	E	S	125	110	110	105	105	105	115	120	140	120	120	110	105	105	100	100	100	100
25	S	S	S	B	105	105	115	110	110	110	105	105	105	115	125	C	140	110	110	110	110	110	110	105
26	100	105	105	105	105	110	G	105	100	C	150	155	115	G	150	130	150	125	115	105	100	105	100	105
27	100	105	100	100	105	100	100	110	120	100	105	115	110	140	125	120	G	115	115	110	105	105	105	105
28	105	105	100	100	100	100	100	120	105	100	100	100	95	145	120	120	110	110	110	105	100	100	100	100
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30	95	95	95	95	S	S	125	145	115	115	110	150	100	100	100	100	100	140	120	B	105	105	105	105
31	100	100	100	100	100	100	G	125	120	120	115	110	110	115	125	125	145	105	105	110	100	100	100	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	29	29	29	28	22	23	26	29	31	29	31	31	30	30	31	28	27	30	31	30	31	30	28	30
MED	100	100	100	100	100	100	125	120	110	110	110	105	105	105	110	115	110	110	110	105	100	100	100	100
UQ	105	105	100	100	105	105	135	140	120	115	115	110	110	115	125	125	125	120	115	110	110	110	105	105
LQ	100	100	100	95	100	100	110	110	110	105	105	105	105	105	105	105	100	100	102	100	100	100	100	100

The Radio Research Laboratories, Japan

JUL. 1972 | H'ES (KM)

IONOSPHERIC DATA

JUL. 1972 | TYPES OF ES | 135° E Mean Time (G. M. T. + 9h)

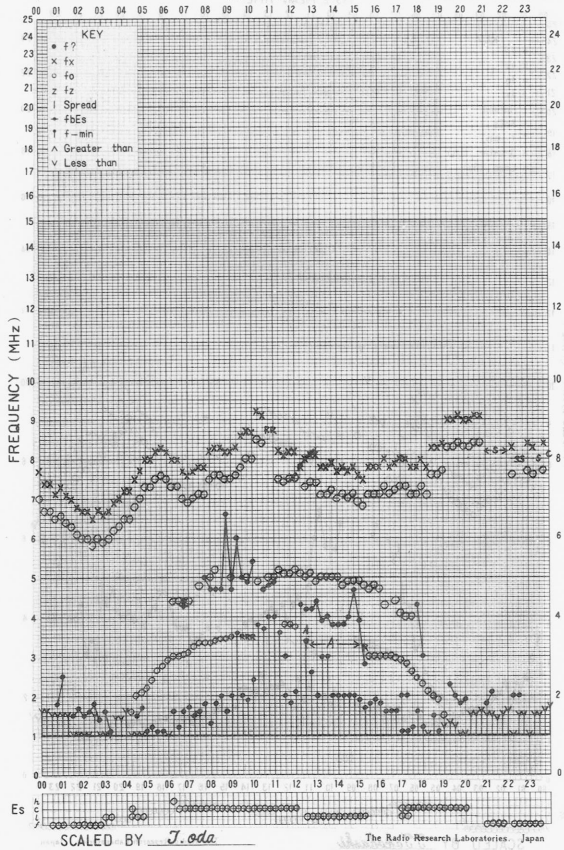
Station YAMAGAWA Lat. 31° 12.1' N. Long. 130° 37.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

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	F 7	F 2	F 2	F 2	F 2	L 2	C 3	C 2	C 4	C 3	C 2	C 3	C 1	C 1	L 1			H 1	H 2	C 3	F 1	F 1	F 4	F 2
2	F 4	F 3	F 1	F 1					C 2	C 1	C 2	C 2	C 1	H 1	C 1	HC 11	L 1	L 4	L 2	L 4	F 4	F 2	F 3	F 3
3	FF 22	F 6	F 5	F 4	F 5	L 4	H 2	H 1	H 2	C 2	C 4	C 2	C 3	C 3	CL 41	CL 21	CL 11	L 5	L 4	L 3	FF 25	FF 23	FF 32	F 3
4	F 4	F 3	F 2	F 2	F 2	L 4		L 2	C 1		HC 21	C 3	C 1	C 2	C 2	C 2	C 3	CL 31	CL 22	L 3	F 4	F 3	F 4	F 4
5	F 3	F 3	F 3	F 2	F 2	L 1	C 1	C 2	C 2	C 2	C 2	C 1	L 1	L 1	C 2	C 1		C 2	C 3	L 2	F 4	F 3	F 3	F 3
6	F 4	F 3	F 3	F 3	F 2	L 1	L 1	H 1	C 2	C 2	C 1	C 1	C 3	C 2	L 2	L 2	L 2	L 3	L 2	L 2	F 1	F 1		F 1
7		F 1					H 1	HL 11	HL 11	C 1	C 2	C 1	C 1	C 1	C 1	L 1	L 1		HL 11	C 3	F 1	F 1		F 3
8	F 3	F 4	F 2				H 1	H 1	HL 11	H 1	H 1	C 1	C 1	C 2	C 1	HL 11	L 2	HL 12	HL 11	HL 32	FF 23	F 4	F 2	F 3
9	F 3	F 5	FF 64	F 5	FF 12	H 1	H 2	H 5	C 2	C 3	C 4	C 2	C 2	L 2	L 1	L 2	L 2	L 2	L 2	L 2	F 3	F 2		
10	F 2	F 3	F 2	F 1		H 1	H 1	H 1	H 2	C 4	H 1	C 2	C 1	C 2	H 1	HL 11	L 2	L 2	L 2	L 4	F 5	FF 16	FF 16	F 3
11	F 4	F 3	FF 13	F 3	F 1	L 3	C 4	C 3	C 2	C 2	C 2	C 2	C 1	C 3	C 3	C 1	HC 12	CL 22	C 1	L 1	F 2	F 1	F 3	F 2
12	F 4	F 3	F 2	F 3	F 1	L 1	C 1	C 1	C 2	HC 11	HC 11	HC 11	HC 11	H 1	HC 31	C 3	C 4	CL 52	L 3	L 4	F 4	F 3	F 3	F 2
13	F 2	F 5	F 5	F 3	F 2	LL 11	CL 12	CL 21	C 2	C 4	C 4	C 2	C 1	C 2	HL 11	LH 21	HL 22	CL 32	CL 51	CL 41	FF 52	FF 31	F 2	F 2
14	F 6	F 4	F 4	F 2	F 1	L 2	H 1	H 1	H 1	H 1	CL 11	C 2	C 1	C 1	C 2	C 3	C 3	C 3	C 3	C 4	F 4	F 2	F 3	F 2
15	F 4	F 5	F 5	F 3	F 4	L 1	H 2	H 2	C 2	C 2	C 4	C 4	C 2	C 2	C 3	CC 22	C 2	C 2	C 4	L 6	F 4	F 6	F 4	F 5
16	F 2	FF 33	F 5	F 3	F 2	L 1	H 2	H 2	C 4	C 2	C 3	C 1	C 1	C 2	C 2	C 1	C 2	C 3	C 5	L 6	F 3	F 3	F 1	FF 21
17	F 2	F 3	F 4	F 2	F 3			H 1	C 3	C 3	C 2	C 3	C 3	C 2	C 2	L 1	L 5	L 4	L 3	L 5	F 5	F 4	FF 12	F 2
18	FF 11	F 3	F 2	F 2	F 1		H 1	HL 11	C 2	C 1	C 1	C 1	C 2	C 2	C 2	C 2	C 2	C 3	C 1	L 2	F 3		F 2	F 3
19	F 2	F 3	F 3	F 2		L 2	HL 21		L 3	L 2	HL 11	H 1	C 1	C 2	C 1	C 1	H 1	C 2	H 2	C 2	F 4	F 3	F 3	F 3
20	F 3	F 3	F 3	F 3	F 1	L 3	L 1	HL 11	CL 22	CL 21	C 2	C 2	C 1	C 1	C 1	C 2	C 1	L 2	L 2	L 2	F 3	F 2	F 1	F 1
21	F 1	F 1	F 1	F 1		L 1	L 1	H 1	C 2	L 1	HL 22	L 1		H 1	H 1	H 1	HL 11	HL 12	CL 21	C 3	F 2	F 4	F 2	F 5
22	F 4	F 4	F 2	F 4	F 3	L 3	L 3	L 2	L 3	L 3	CL 11	C 3	C 2	C 4	H 1	H 1	H 2	C 2	C 2	C 4	F 2	F 2	F 6	F 3
23	F 1	F 2	F 2	F 2	F 3	L 4	L 1	C 2	C 4	C 2	C 1	C 1	C 2	C 1	C 1	H 1	H 1	H 3	C 3	C 4	F 2	FF 32	F 5	F 6
24	F 4	F 2	F 2	F 3			H 2	C 2	C 2	C 3	C 3	C 2	C 2	H 2	H 1	HH 41	C 2	C 3	L 4	L 4	F 4	F 4	F 2	F 1
25					F 1	L 1	L 2	C 3	C 3	C 3	C 2	C 2	C 2	CH 11	H 3		H 1	C 2	C 4	L 5	F 2	F 2	F 7	F 4
26	F 7	F 5	F 2	F 2	F 4	L 2		C 2	C 3		HL 11	HL 11	CL 11		H 1	H 1	H 1	H 2	C 1	L 3	F 1	F 2	F 2	F 3
27	F 5	F 7	F 4	F 3	F 1	L 1	LH 11	CL 21	CL 12	L 1	C 2	C 2	C 1	H 1	H 1	H 2		C 2	C 3	C 4	F 5	F 1	F 1	F 2
28	F 3	F 3	F 2	F 2	F 4	L 2	L 2	C 3	C 2	C 2	L 2	LH 21	LH 11	HL 12	CL 31	H 2	C 2	C 2	C 1	C 3	F 3	F 2	F 2	F 1
29	F 2		F 1	F 2			H 2	C 4	C 2	C 3	C 3	C 2	C 2	L 1	L 2			LC 42	CL 23	L 4	F 3	FF 14	F 5	FF 22
30	F 3	F 3	F 2	F 2			H 1	H 1	C 2	C 1	C 1	HL 12	L 2	L 1	L 2	L 1	L 2	HL 12	H 1		F 4	F 4	F 3	FF 13
31	F 2	F 3	F 4	F 2	F 2	L 4		HL 21	C 3	H 2	HL 21	CL 21	CL 21	C 1	H 1	H 1	H 1	C 3	C 3	LH 11	F 3	F 3	F 2	F 2
	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. 1972 | TYPES OF ES

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE JUL. 1, 1972

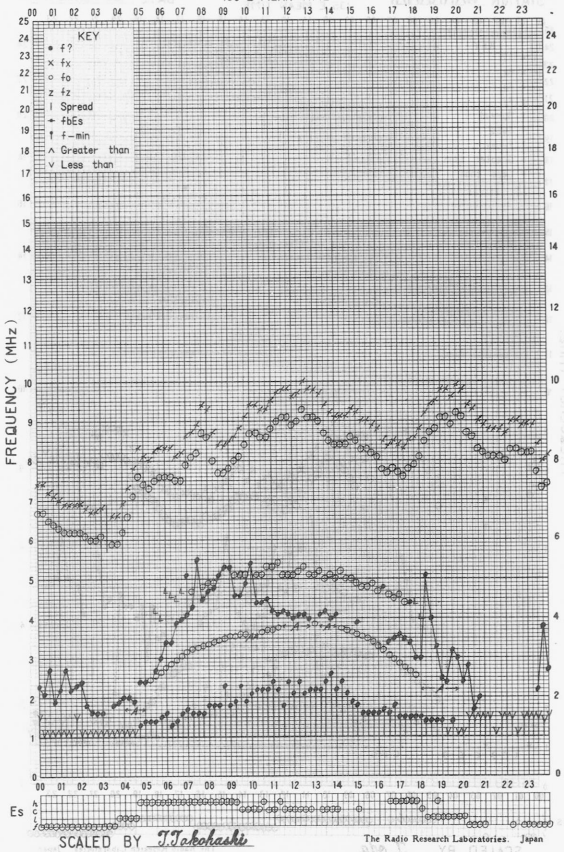


SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Jul. 1. 1972



SCALED BY T. Takahashi

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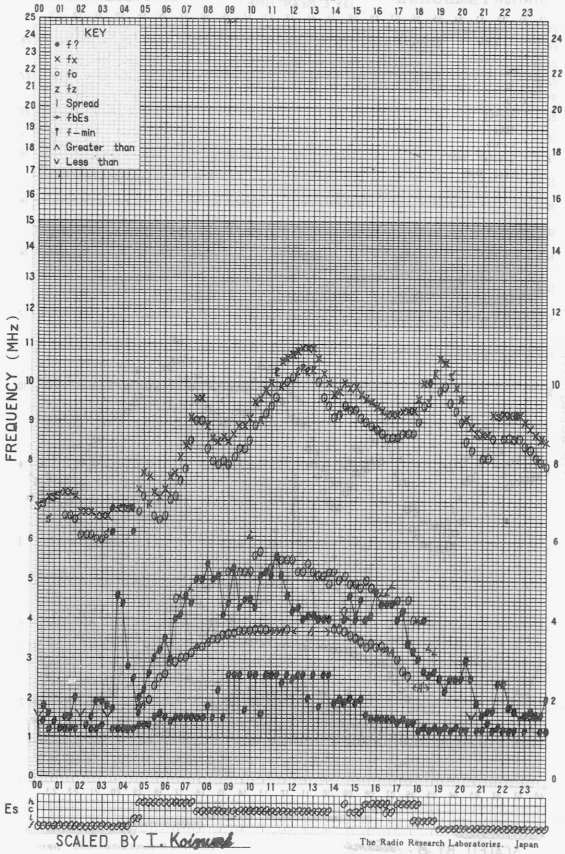
STATION KOKUBUNJI 135°E MEAN TIME DATE JUL. 1, 1972



SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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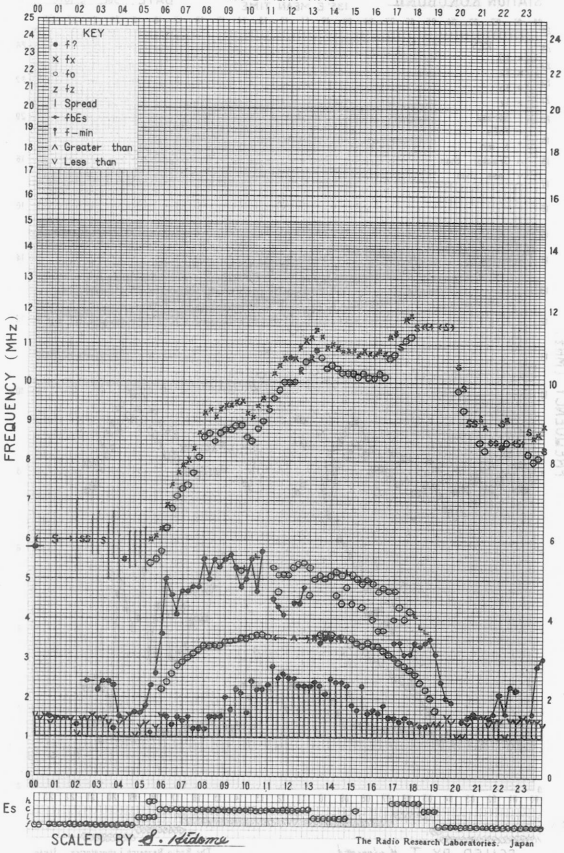

SCALED BY S. Nitadori

The Radio Research Laboratories. Japan

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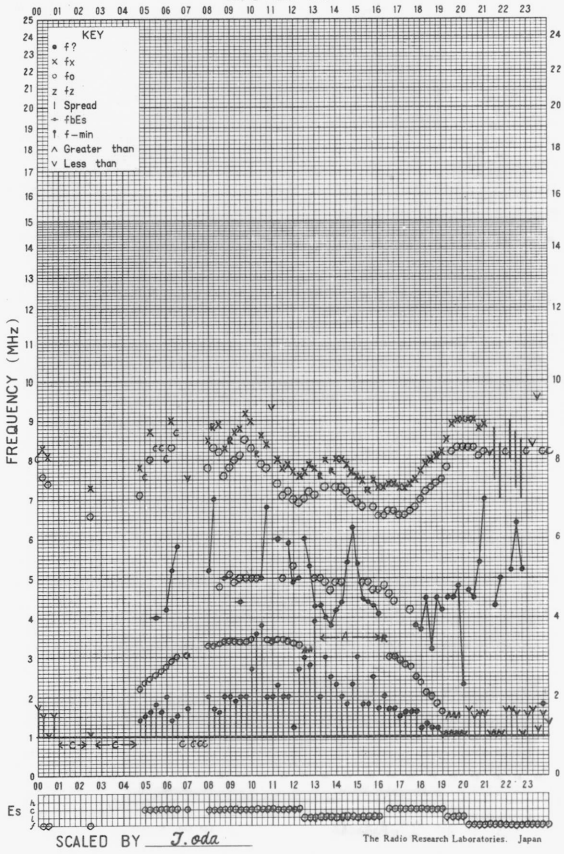

SCALED BY T. Oda

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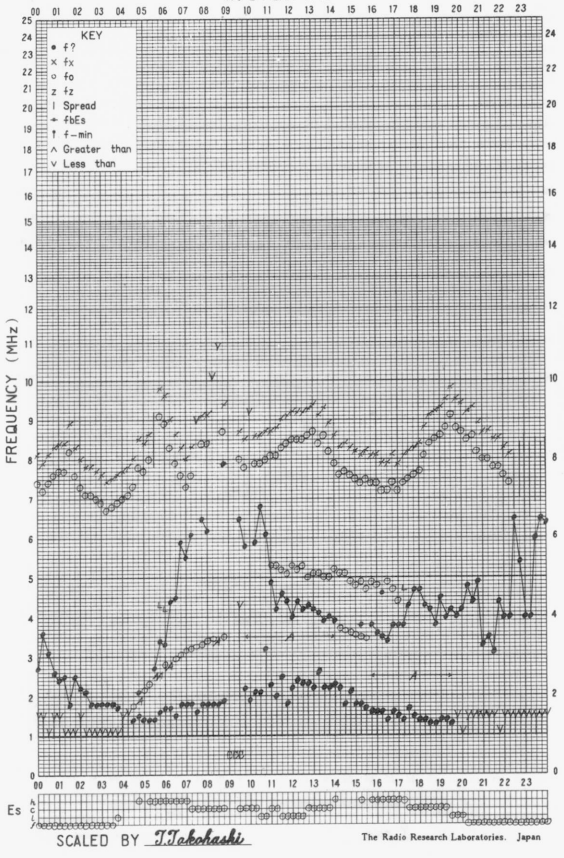

SCALED BY T. Takahashi

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f-PLOT OF IONOSPHERIC DATA

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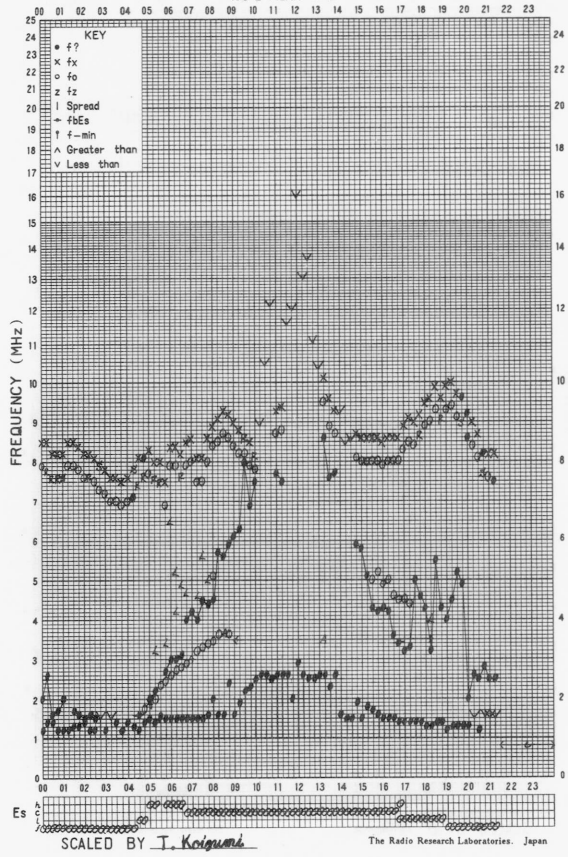

SCALED BY T. Koizumi

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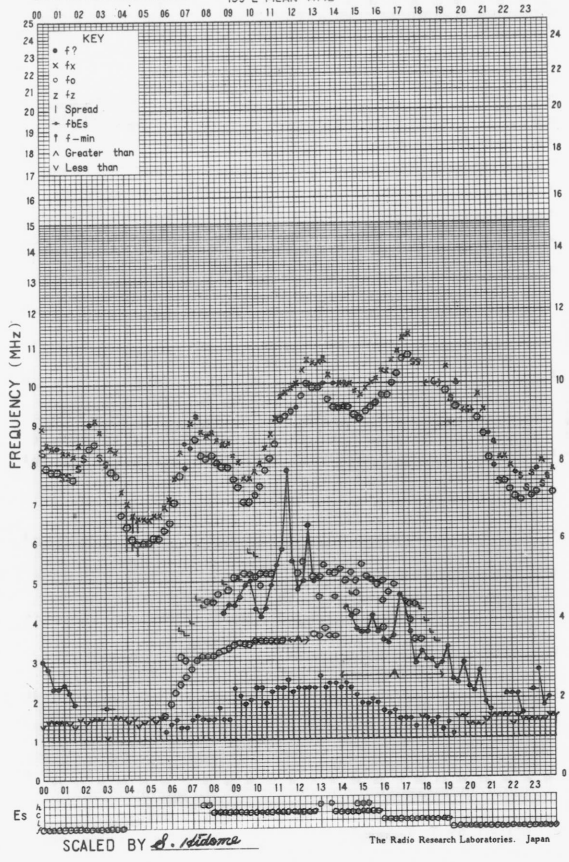

SCALED BY S. Ishidome

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f-PLOT OF IONOSPHERIC DATA

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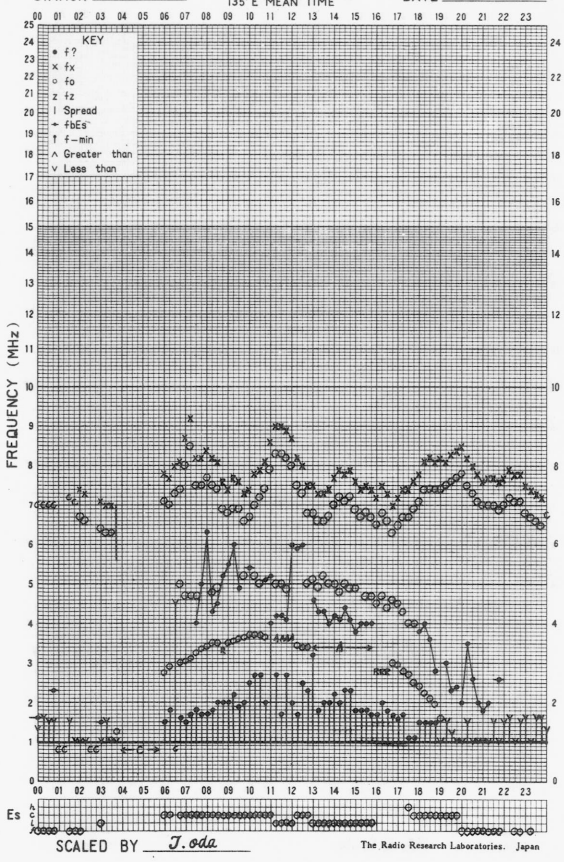

SCALED BY T. Oda

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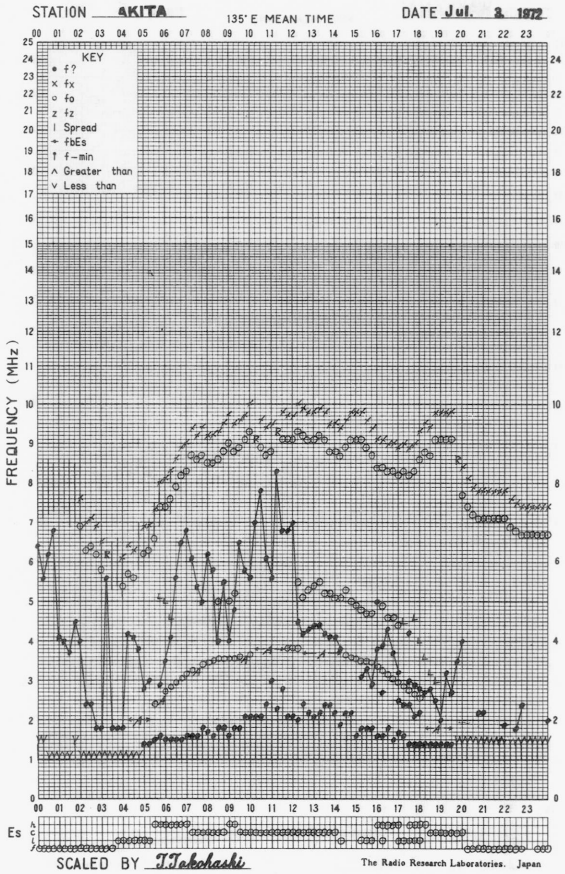

SCALED BY T. Takahashi

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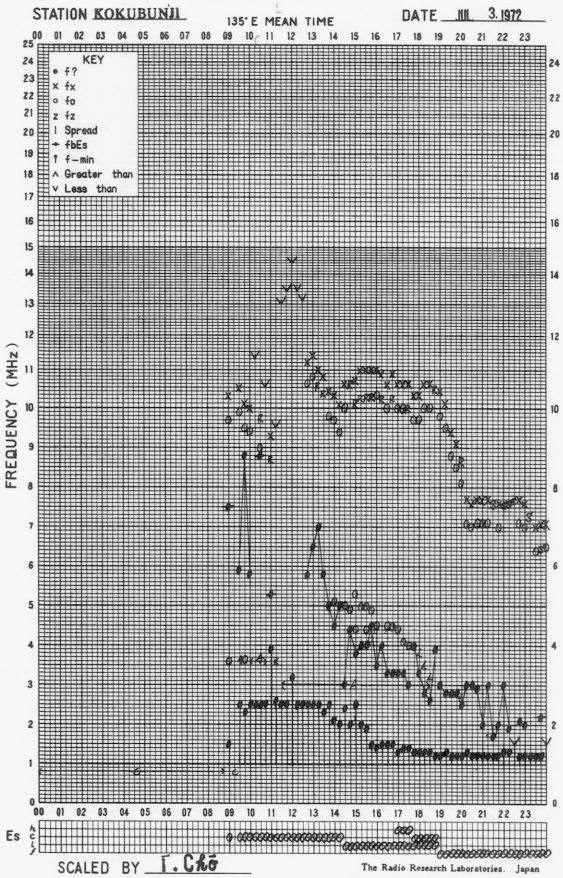

SCALED BY T. Cho

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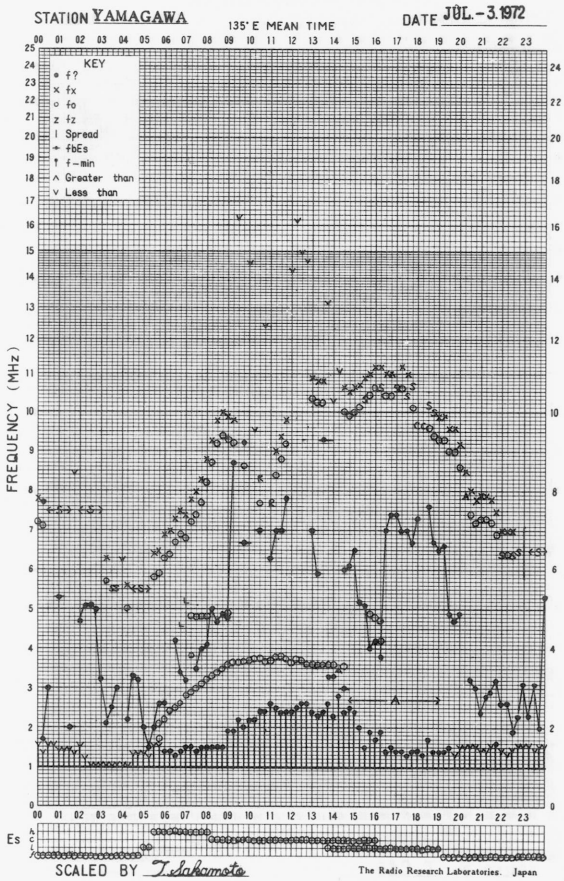
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE JUL. - 3.1972



SCALED BY T. Sakamoto

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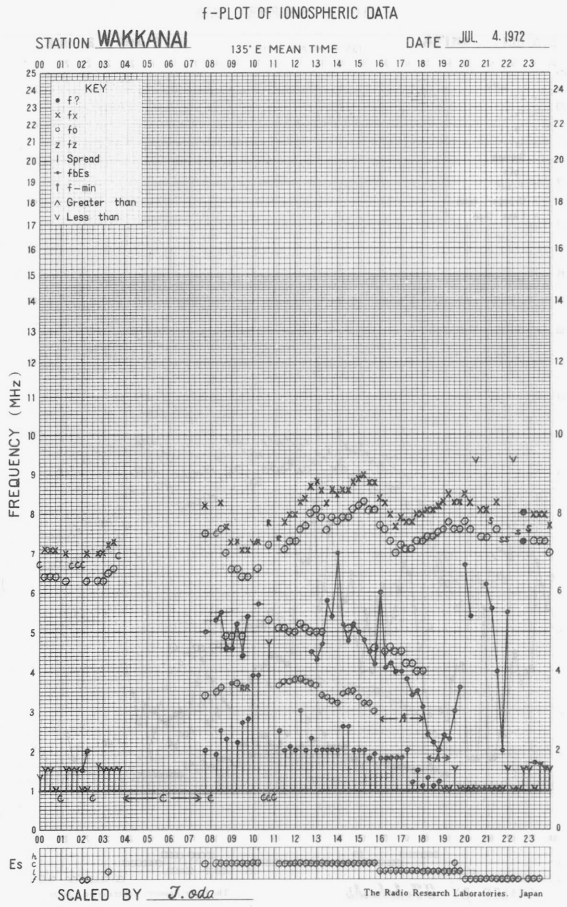
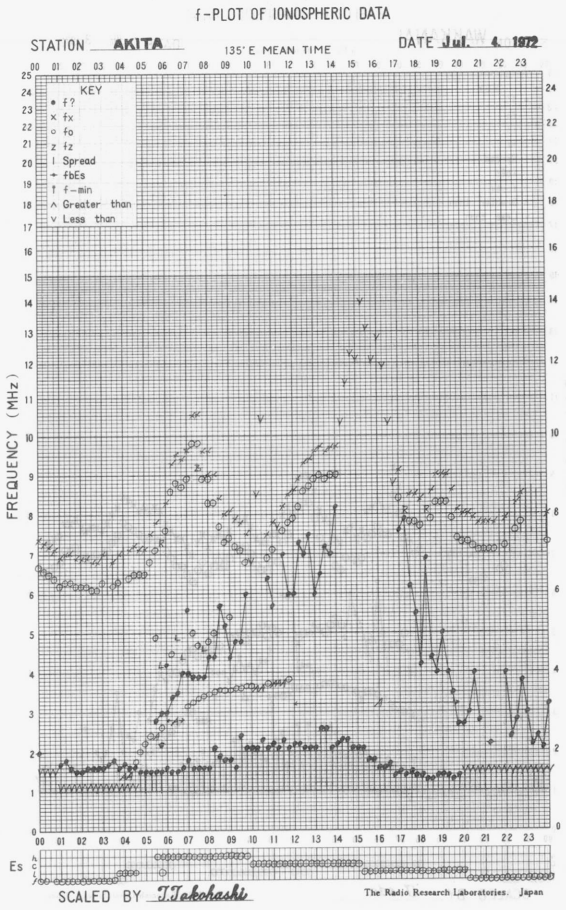
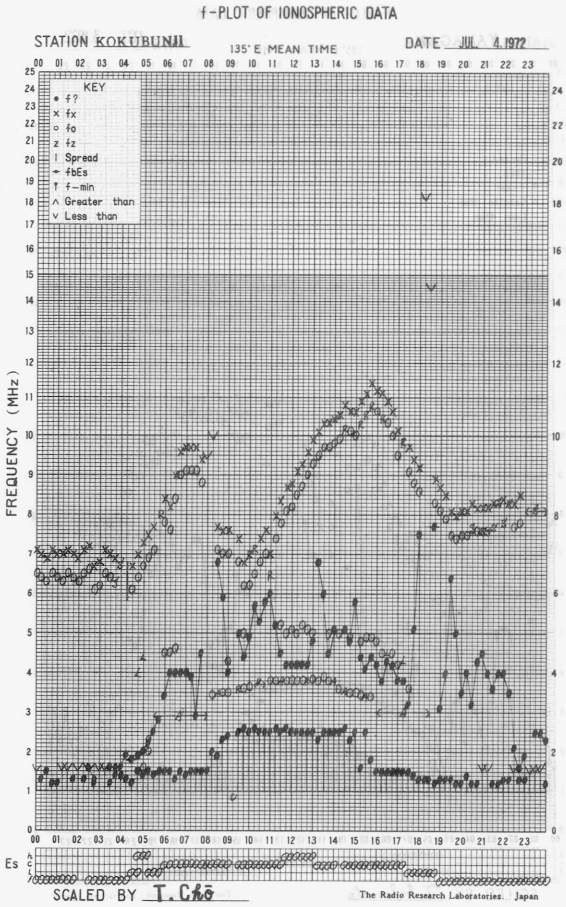
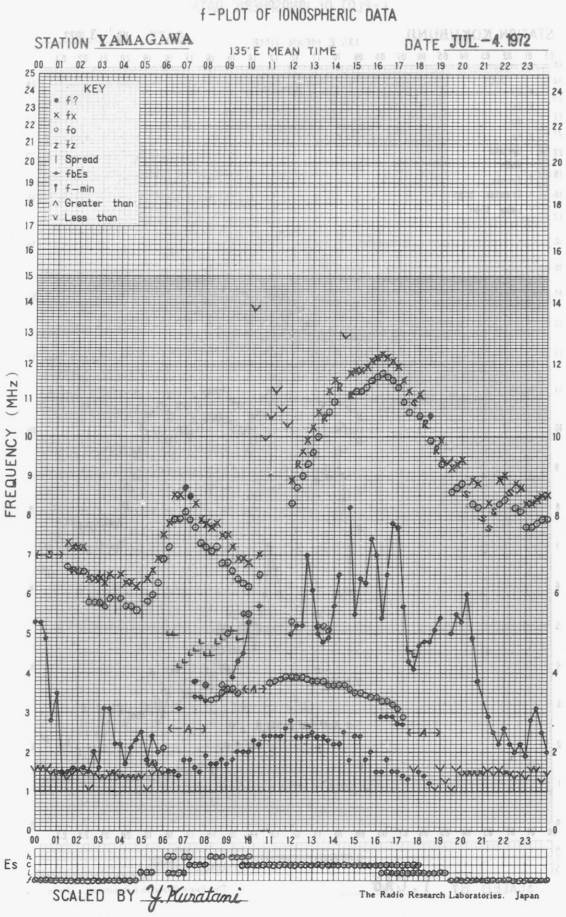

f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE JUL. 4. 1972
KEY
• f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY J. oda
The Radio Research Laboratories. Japan

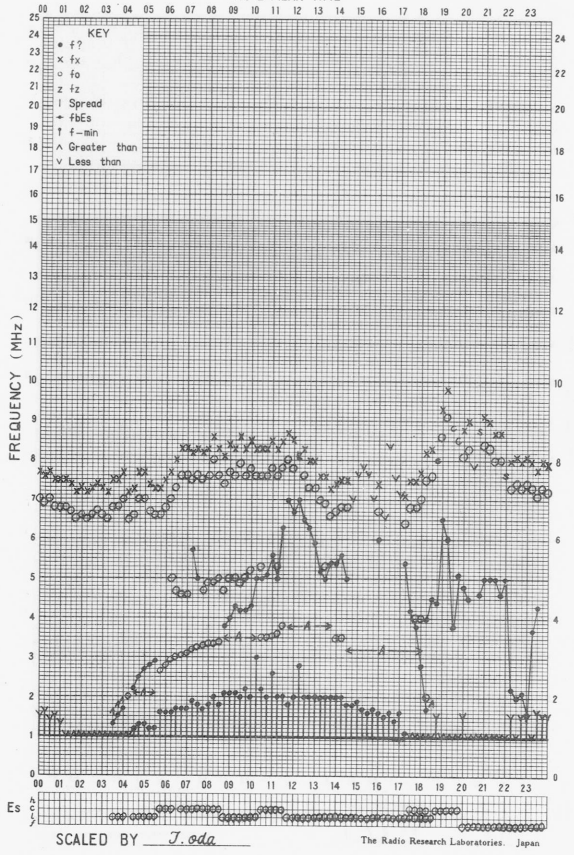

f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135° E MEAN TIME
DATE Jul. 4. 1972
KEY
• f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135° E MEAN TIME
DATE JUL. 4. 1972
KEY
• f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Cho
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135° E MEAN TIME
DATE JUL.-4. 1972
KEY
• f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY Y. Kuratani
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE JUL. 5. 1972



SCALED BY T. Oda

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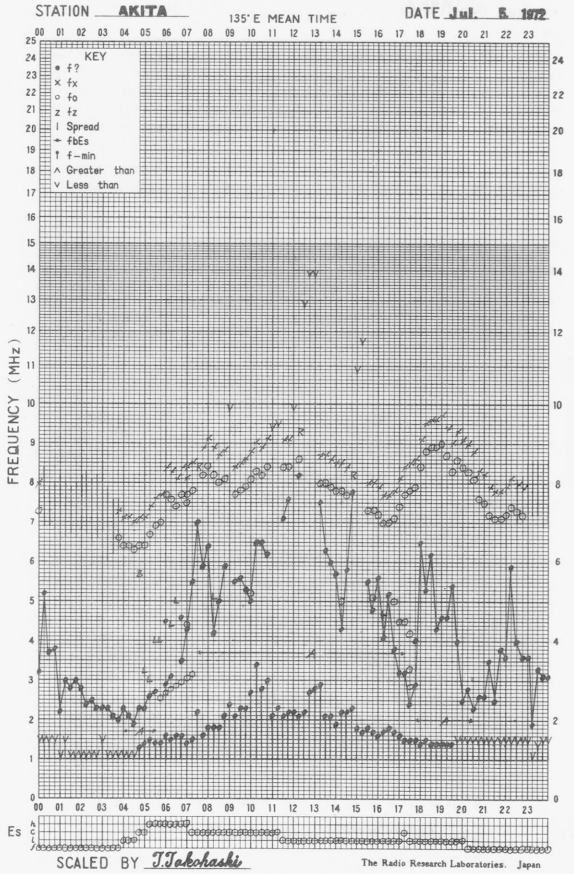
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Jul. 5. 1972



SCALED BY T. Takahashi

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f-PLOT OF IONOSPHERIC DATA

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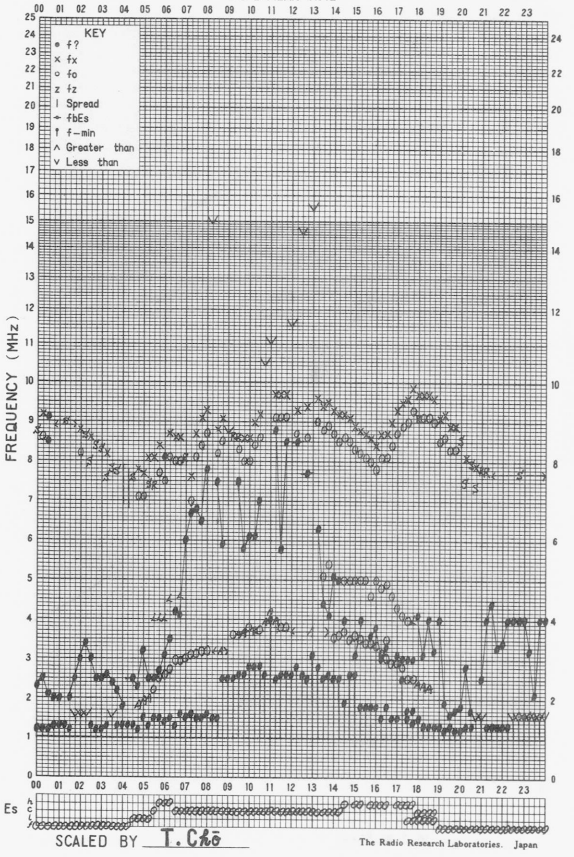

SCALED BY T. Cho

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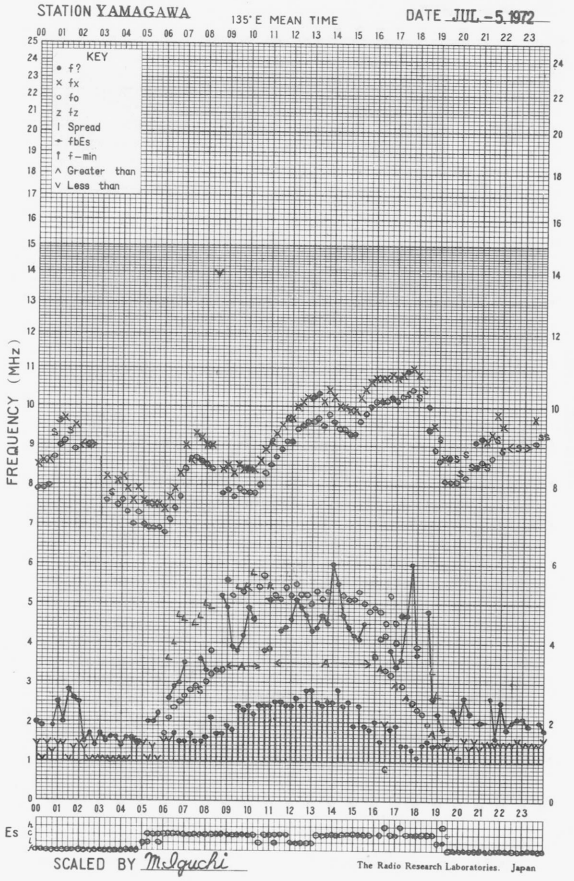

SCALED BY M. Iguchi

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f-PLOT OF IONOSPHERIC DATA

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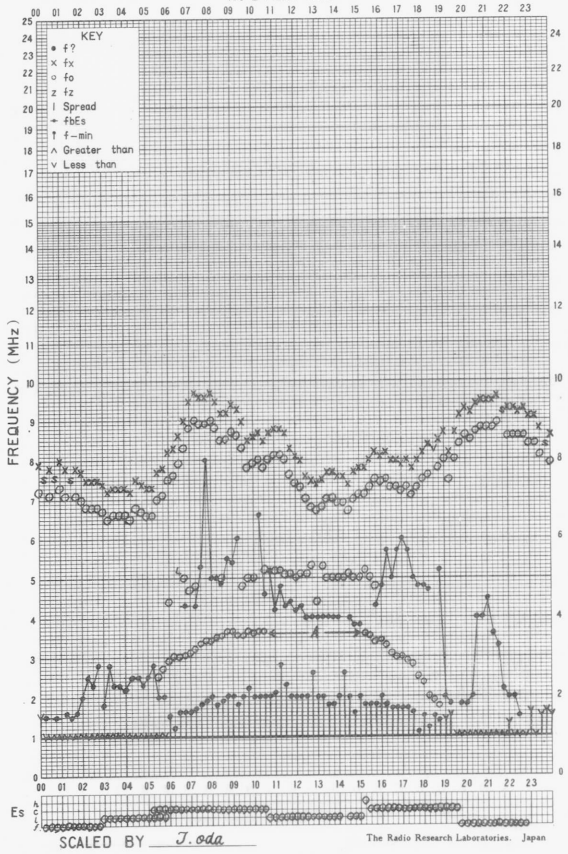

SCALED BY J. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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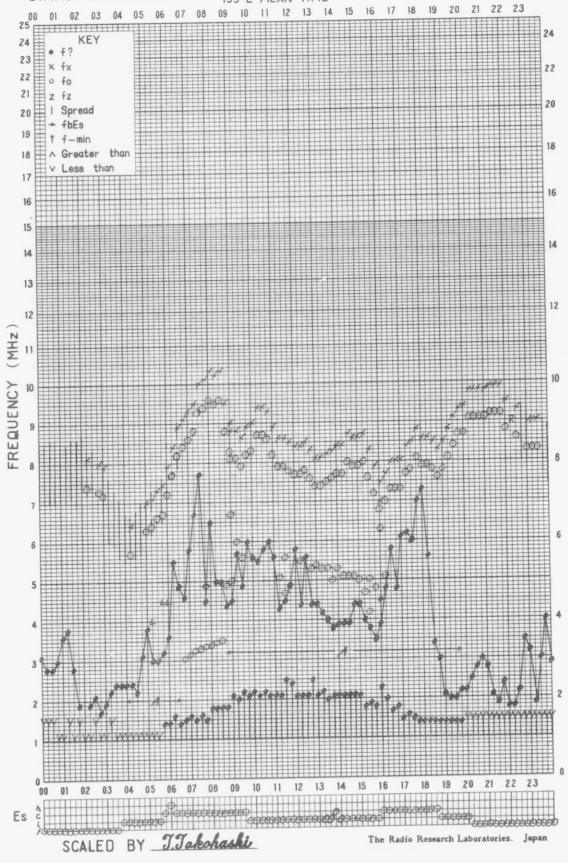

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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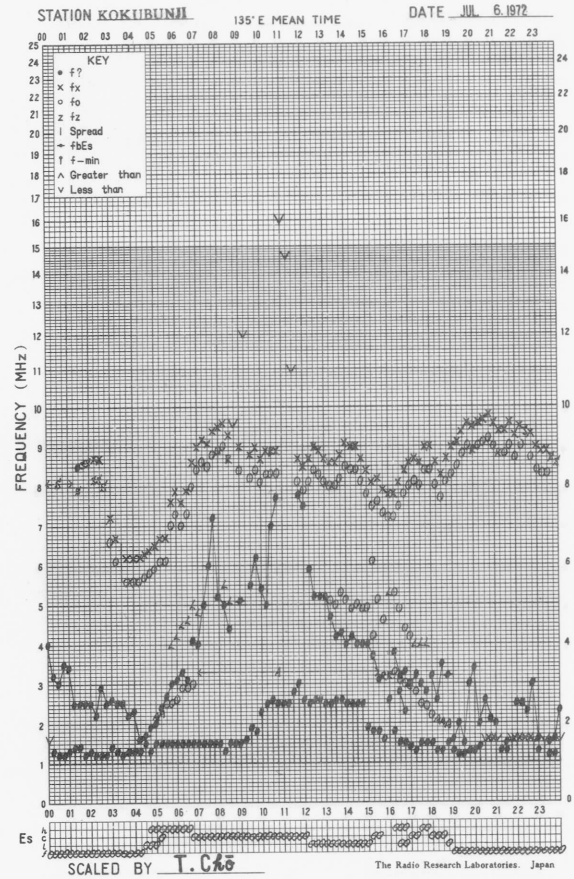

SCALED BY T. Chō

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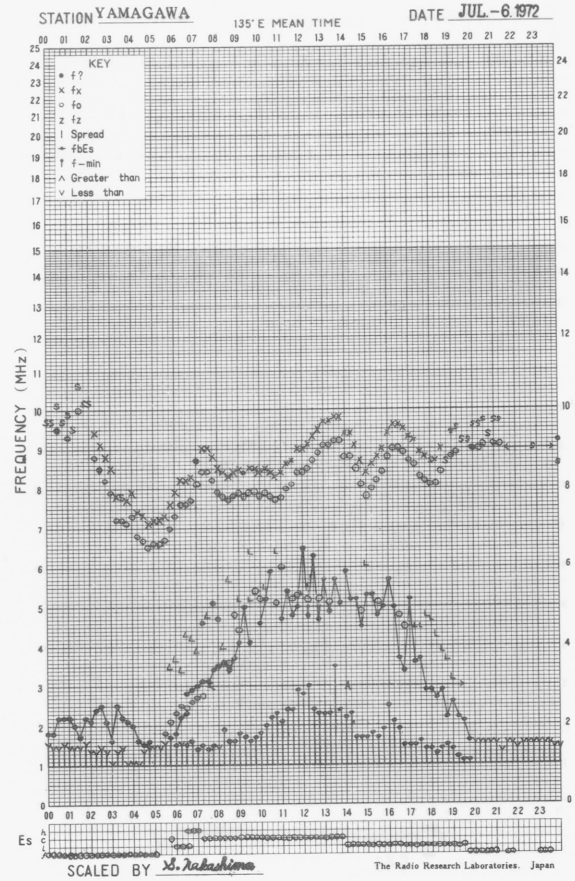
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE JUL.-6.1972



SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

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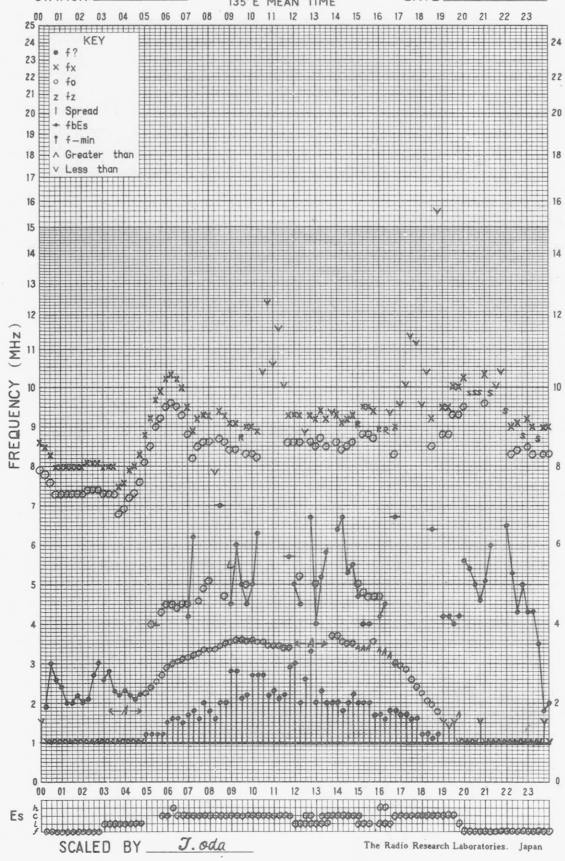
STATION WAKKANAI 135°E MEAN TIME DATE JUL. 7.1972



SCALED BY T. oda

The Radio Research Laboratories. Japan

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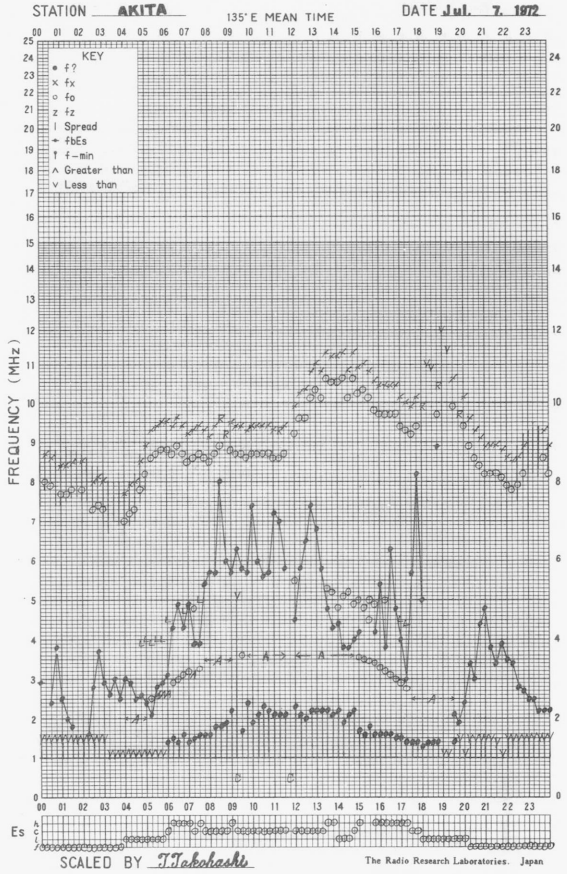

SCALED BY T.Takahashi

The Radio Research Laboratories. Japan

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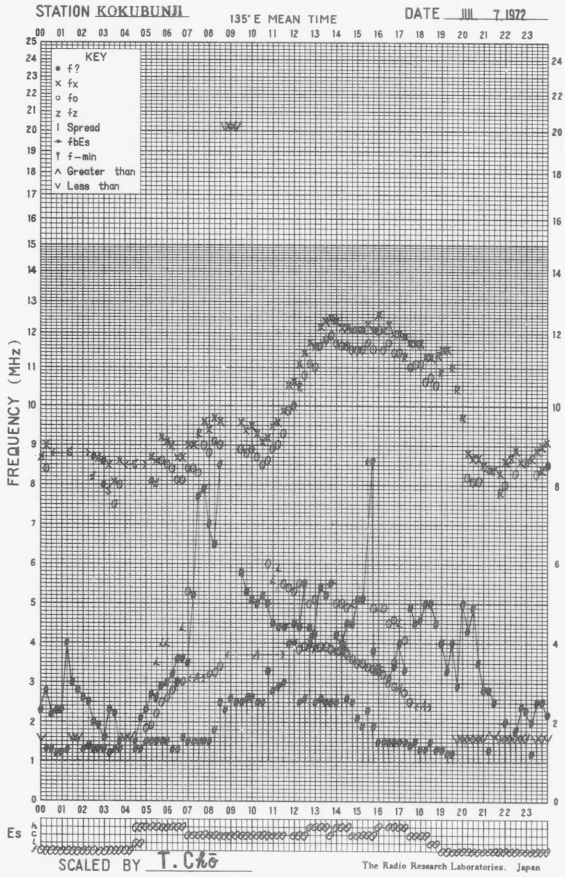

SCALED BY T. Cho

The Radio Research Laboratories. Japan

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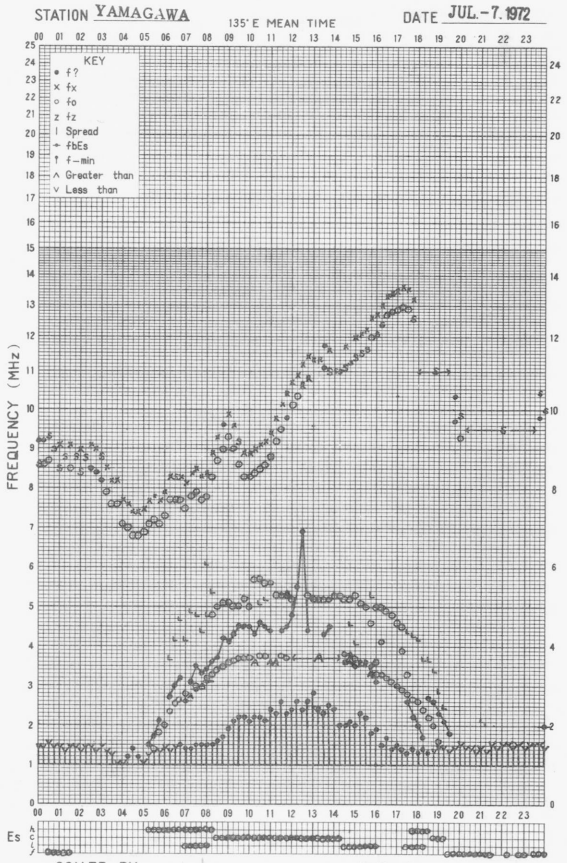

SCALED BY

The Radio Research Laboratories. Japan

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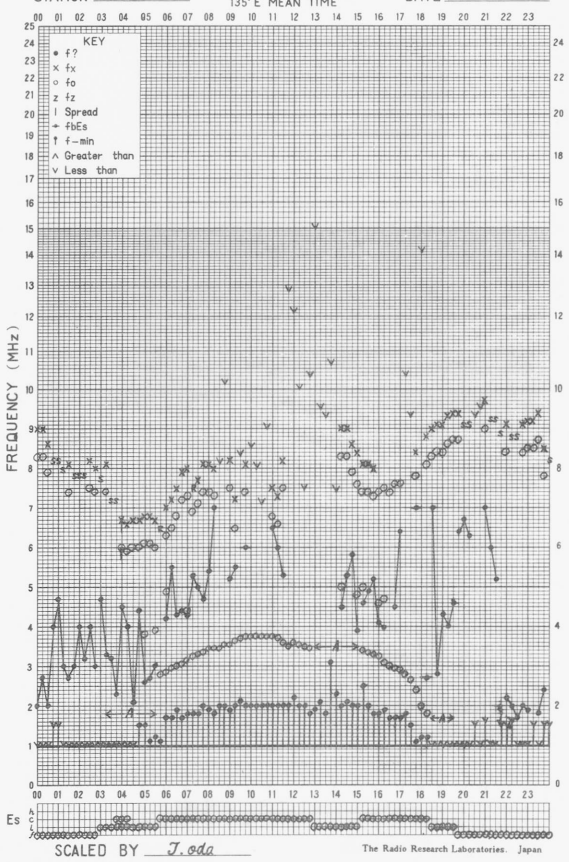

SCALED BY T. oda

The Radio Research Laboratories. Japan

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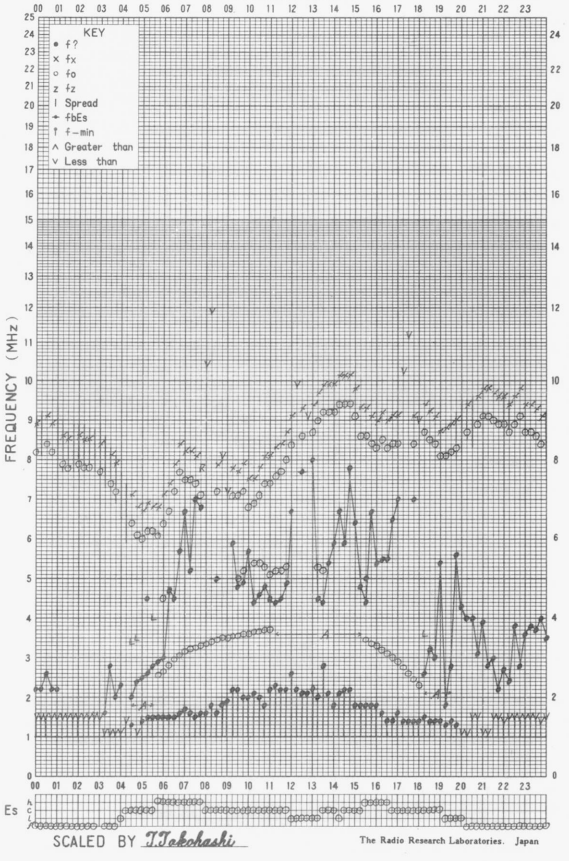

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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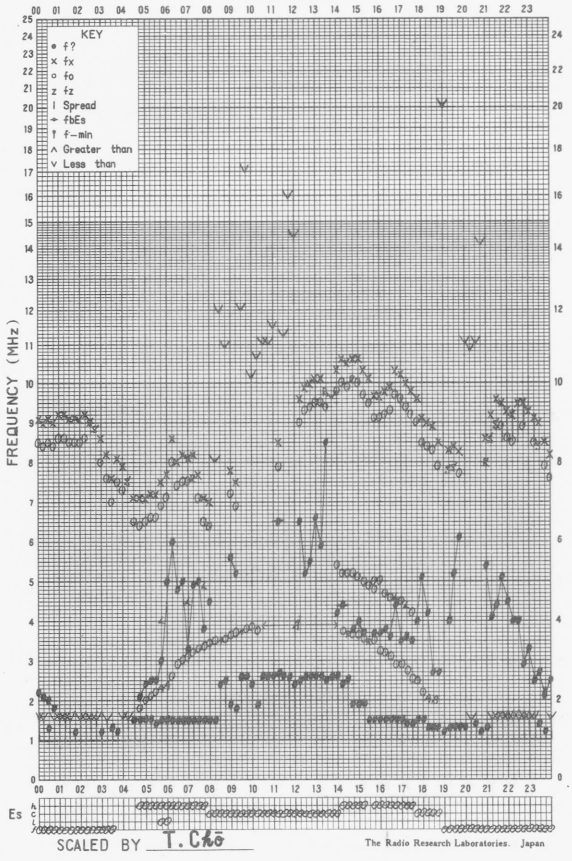

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The Radio Research Laboratories. Japan

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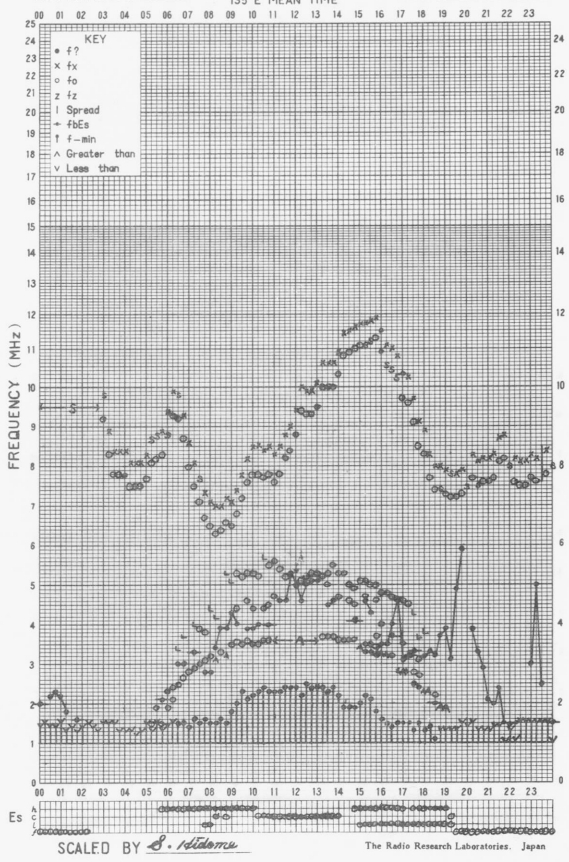

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The Radio Research Laboratories. Japan

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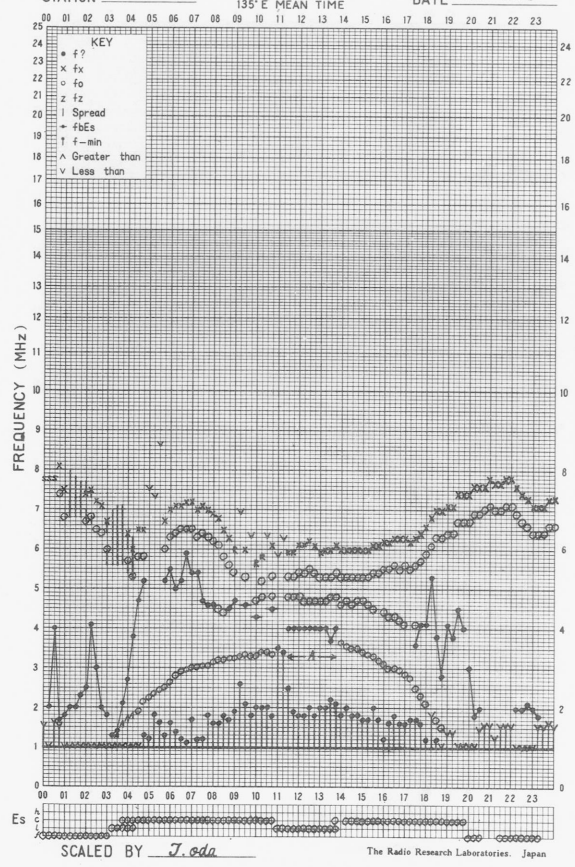

SCALED BY J. Oda

The Radio Research Laboratories. Japan

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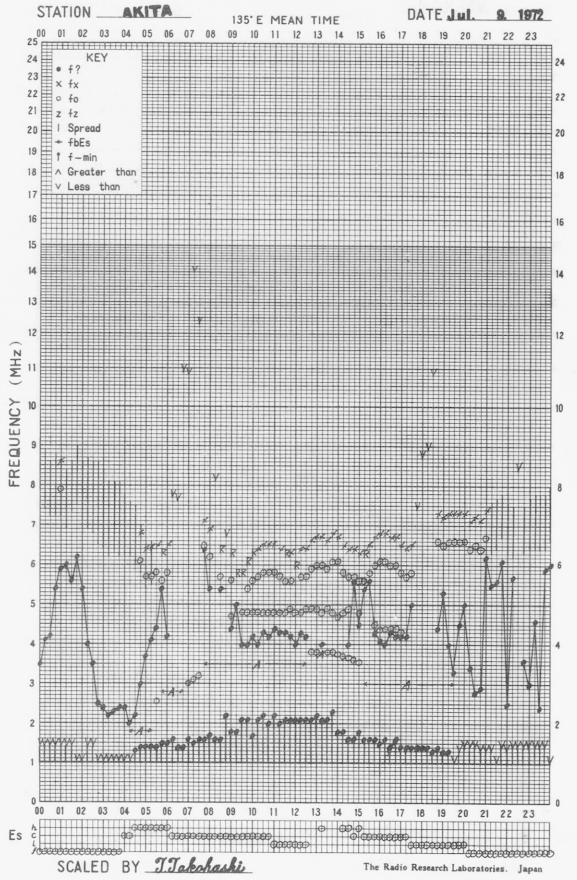

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The Radio Research Laboratories. Japan

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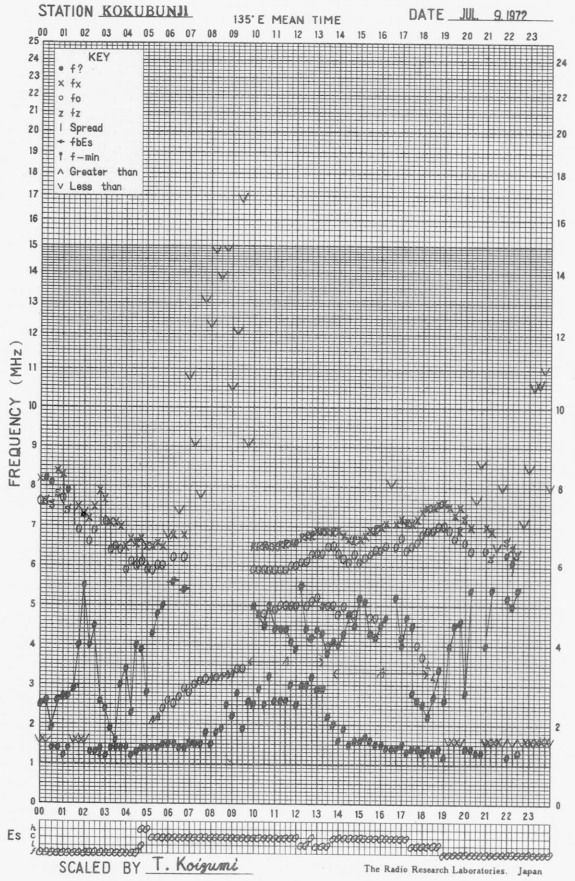

SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

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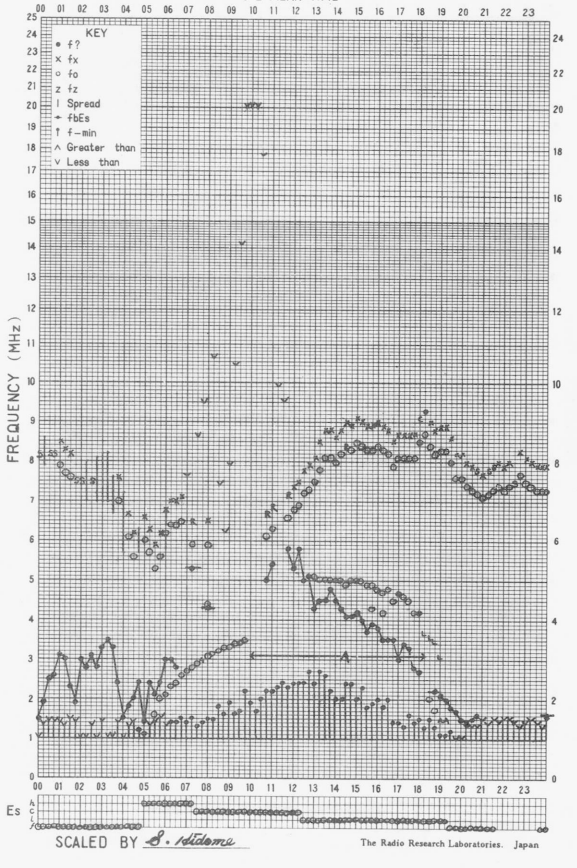

SCALED BY S. Ishidomi

The Radio Research Laboratories. Japan

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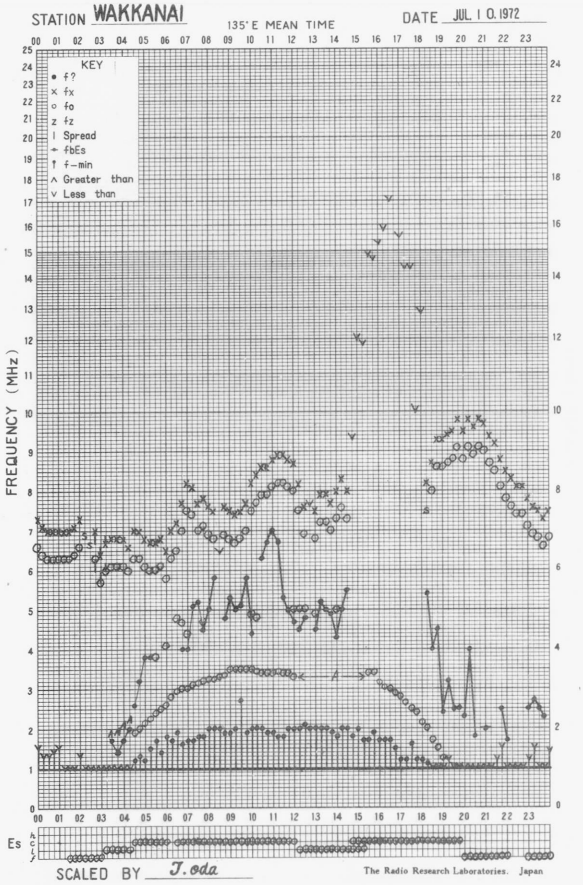

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The Radio Research Laboratories. Japan

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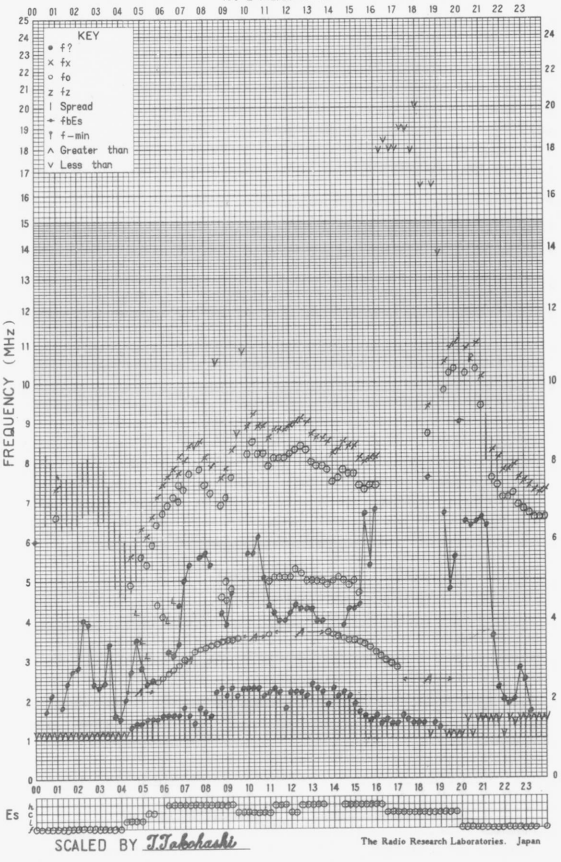

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The Radio Research Laboratories. Japan

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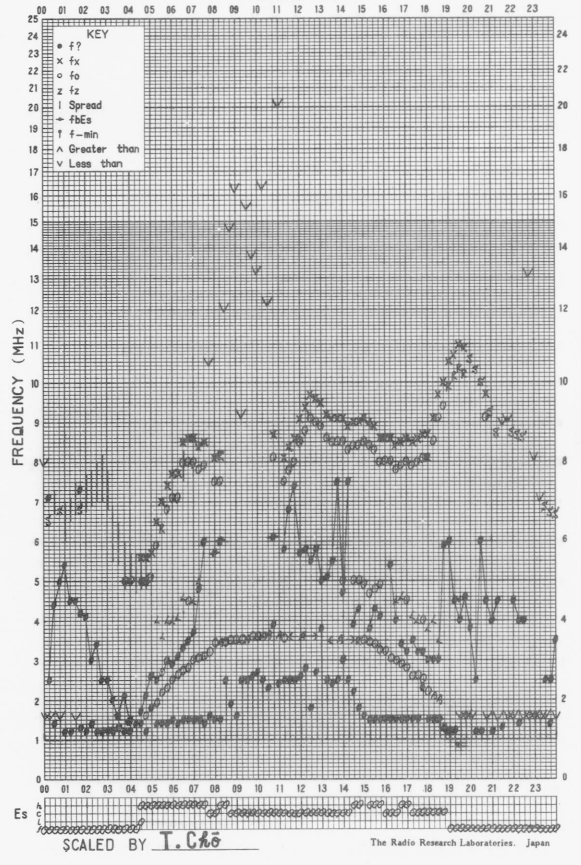

SCALED BY T. Chō

The Radio Research Laboratories. Japan

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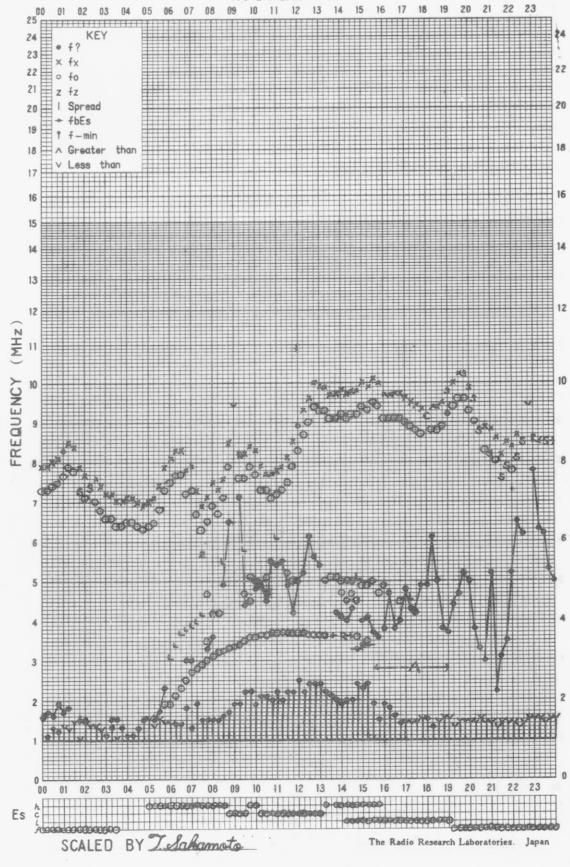
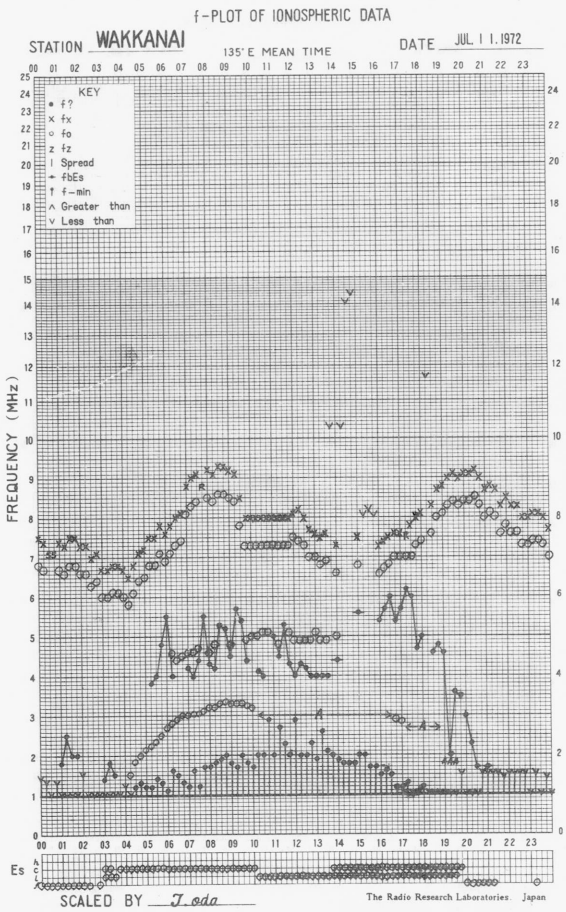


SCALED BY T. Sakamoto

The Radio Research Laboratories. Japan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STATION WAKKANAI
135°E MEAN TIME
DATE JUL. 11. 1972
KEY
f?
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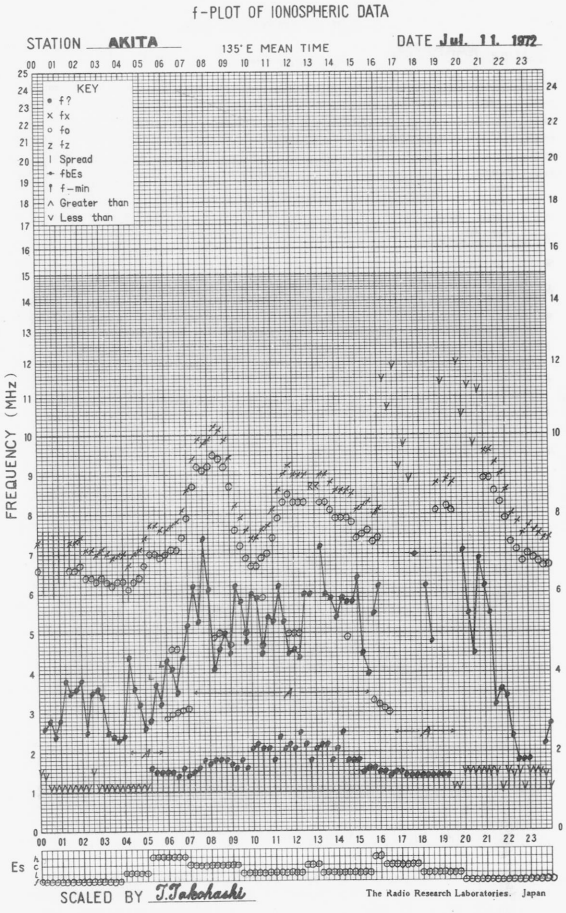
Spread
fbEs
f-min
Greater than
Less than
FREQUENCY (MHz)
Es
SCALED BY T. oda
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE Jul. 11. 1972
KEY
f?
fx
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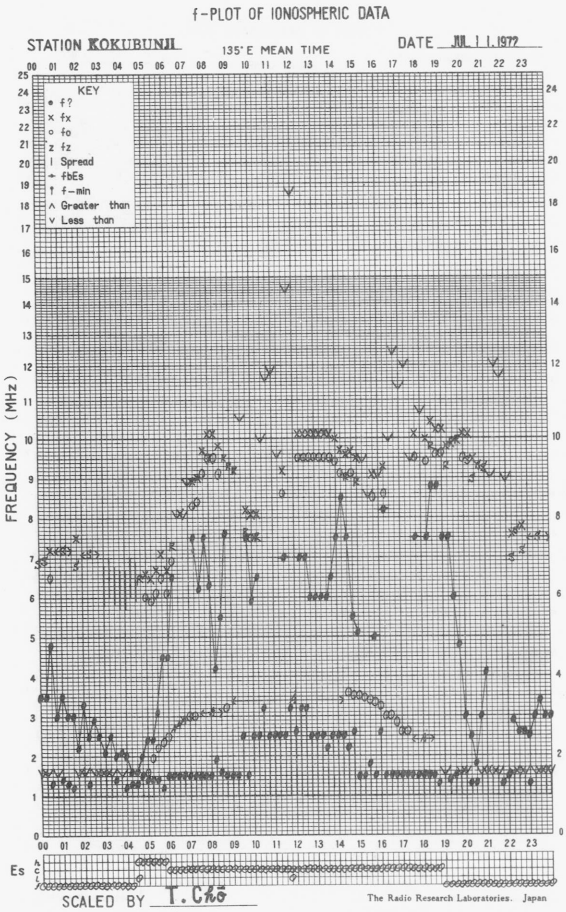
Spread
fbEs
f-min
Greater than
Less than
FREQUENCY (MHz)
Es
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan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DATE JUL. 11. 1972
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FREQUENCY (MHz)
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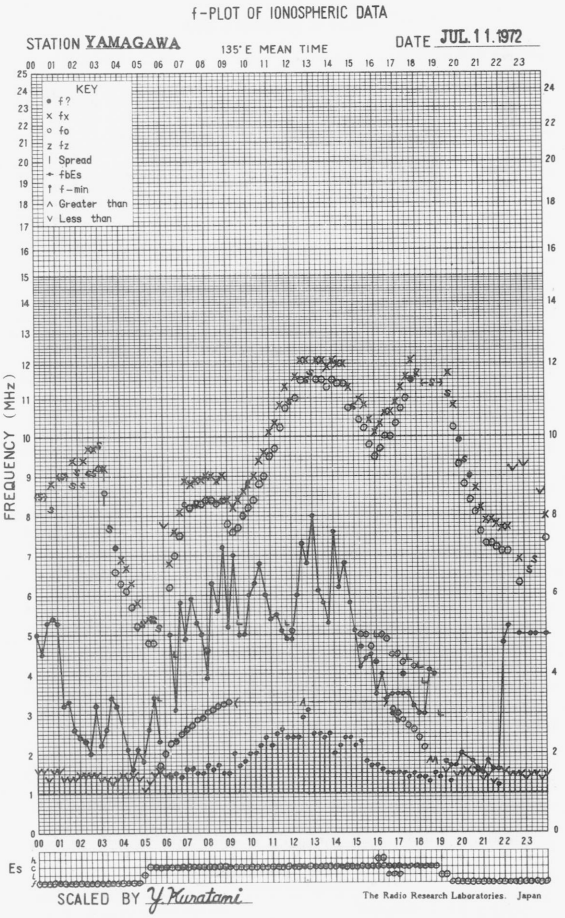
SCALED BY T. Cho
The Radio Research Laboratories. Japan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DATE JUL. 11. 1972
KEY
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Spread
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f-min
Greater than
Less than
FREQUENCY (MHz)
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The Radio Research Laboratories. Japan

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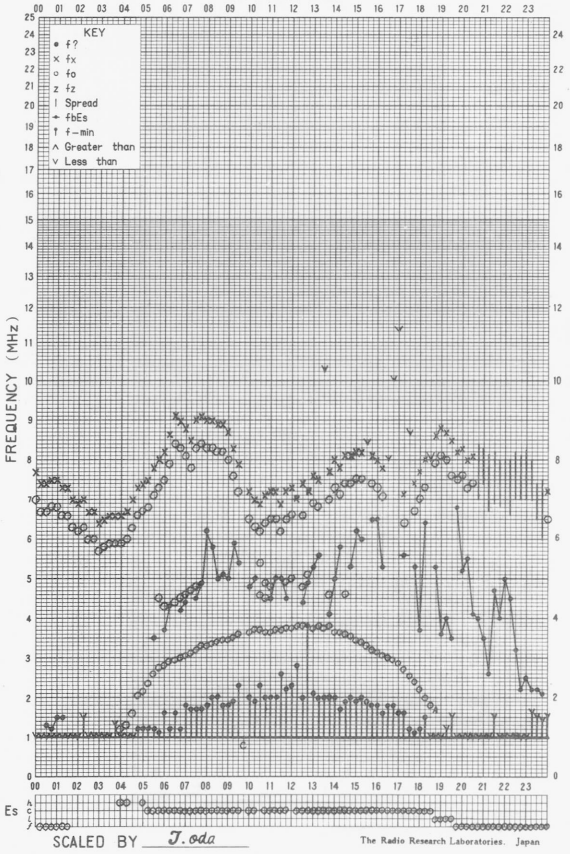

SCALED BY J. oda

The Radio Research Laboratories. Japan

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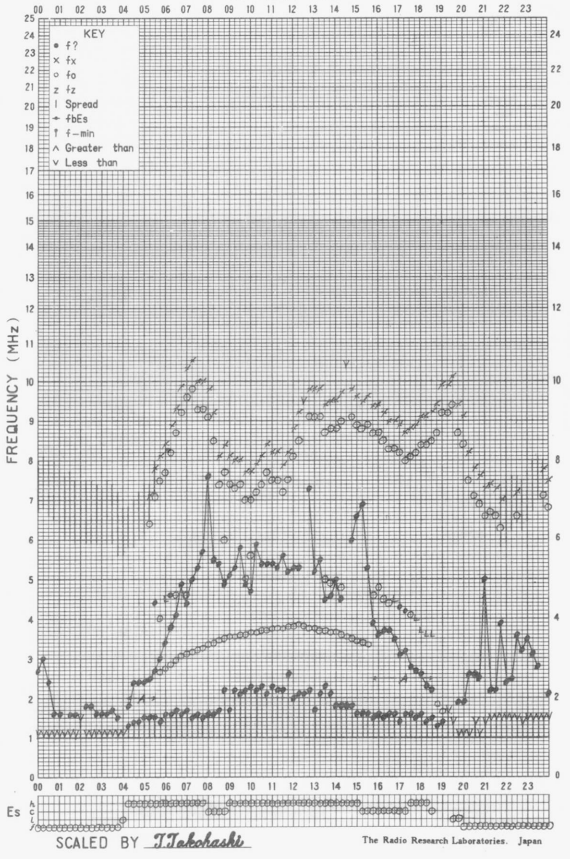

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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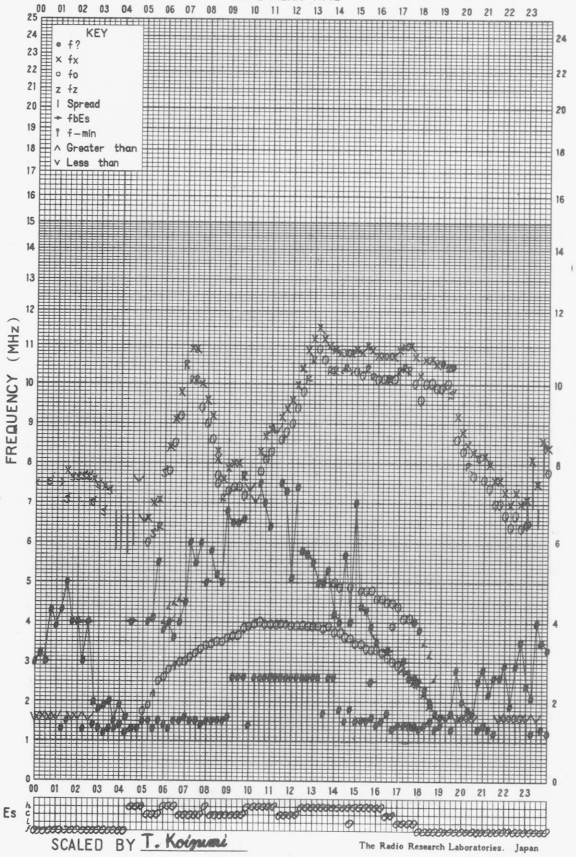

SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

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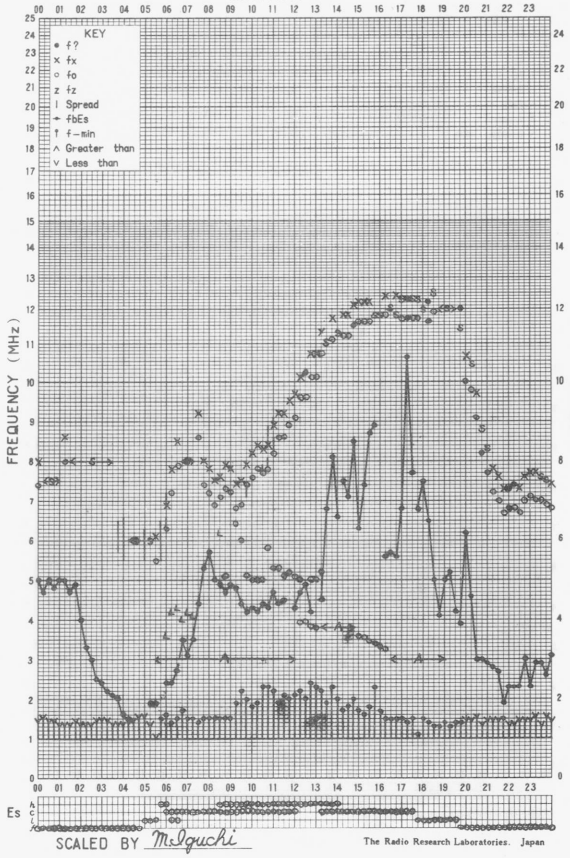

SCALED BY M. Iguchi

The Radio Research Laboratories. Japan

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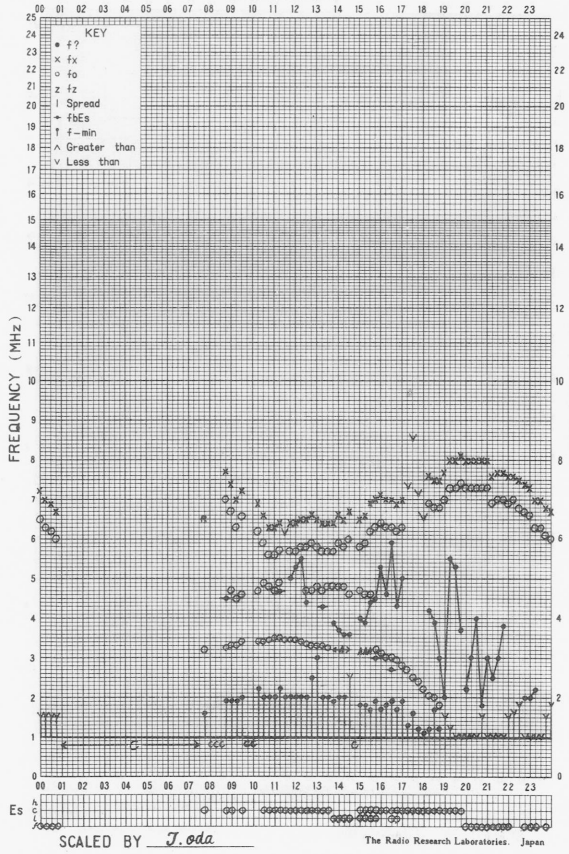

SCALED BY T. oda

The Radio Research Laboratories. Japan

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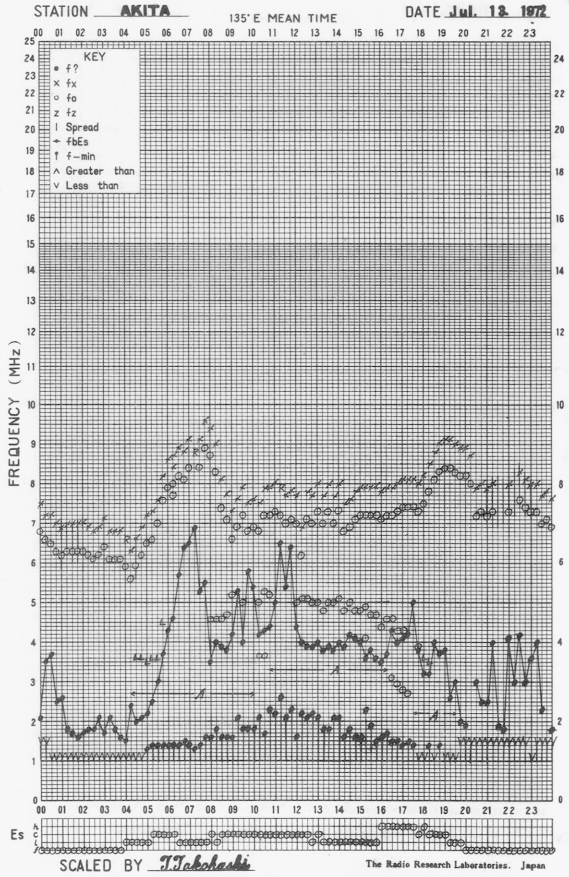

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The Radio Research Laboratories. Japan

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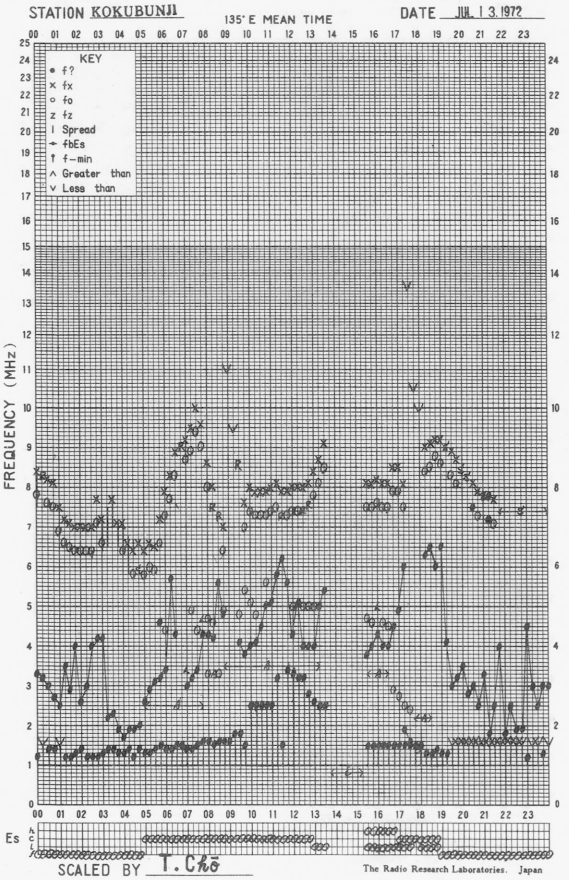

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The Radio Research Laboratories. Japan

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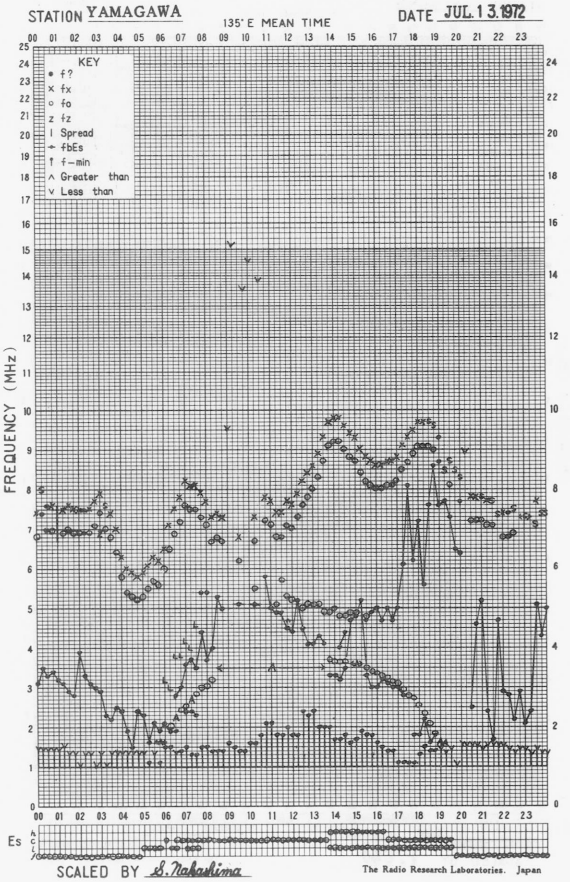

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The Radio Research Laboratories. Japan

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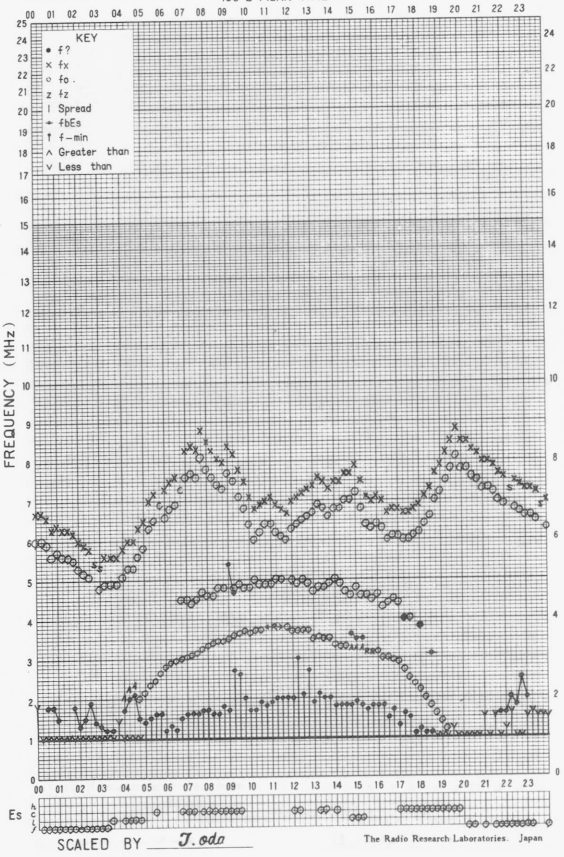

SCALED BY J. odo

The Radio Research Laboratories. Japan

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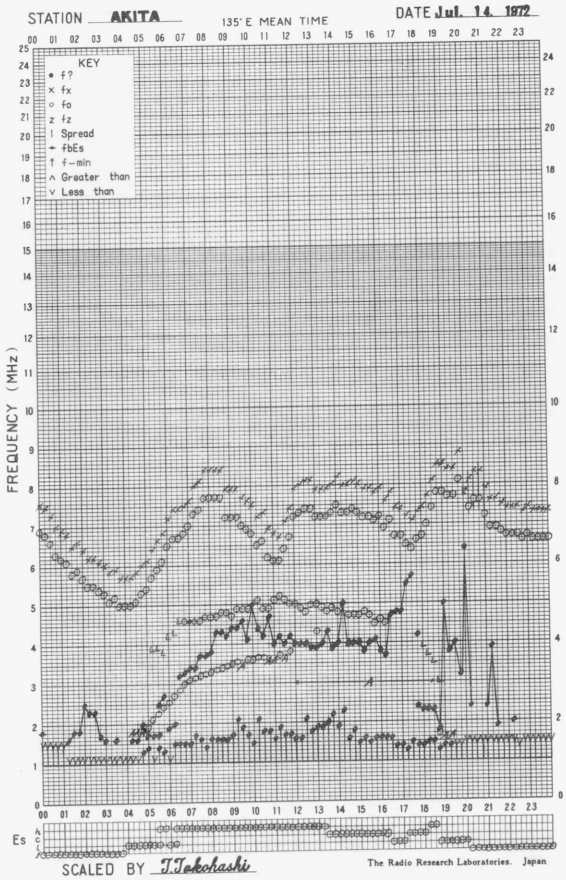

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The Radio Research Laboratories. Japan

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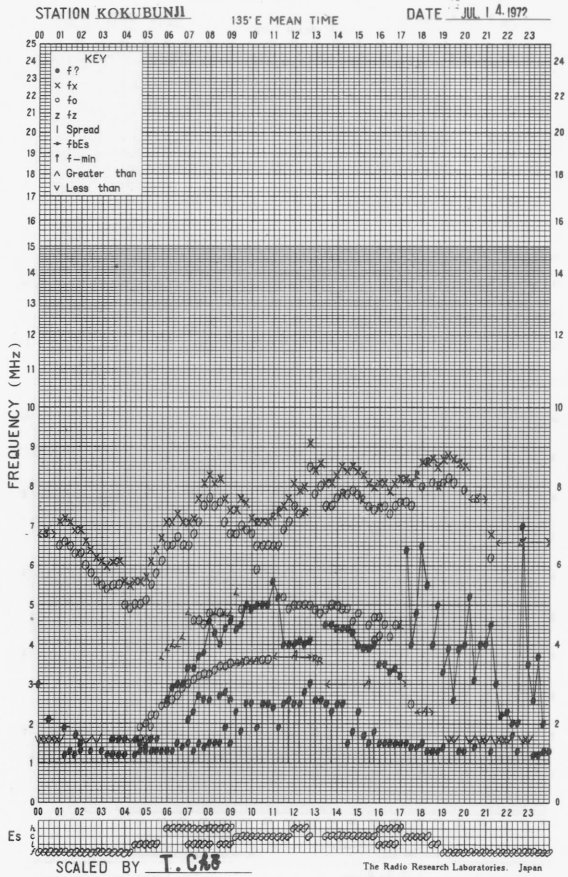

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The Radio Research Laboratories. Japan

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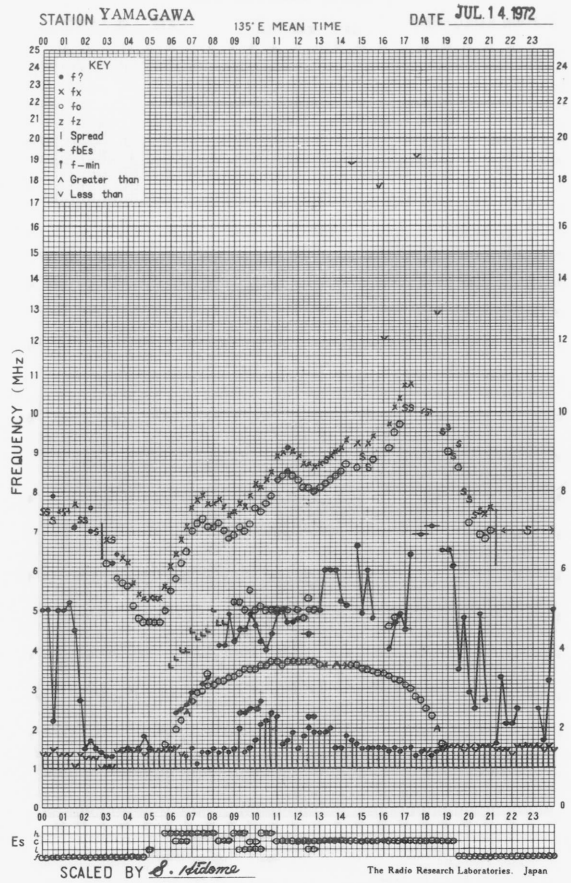

SCALED BY S. Hidema

The Radio Research Laboratories. Japan

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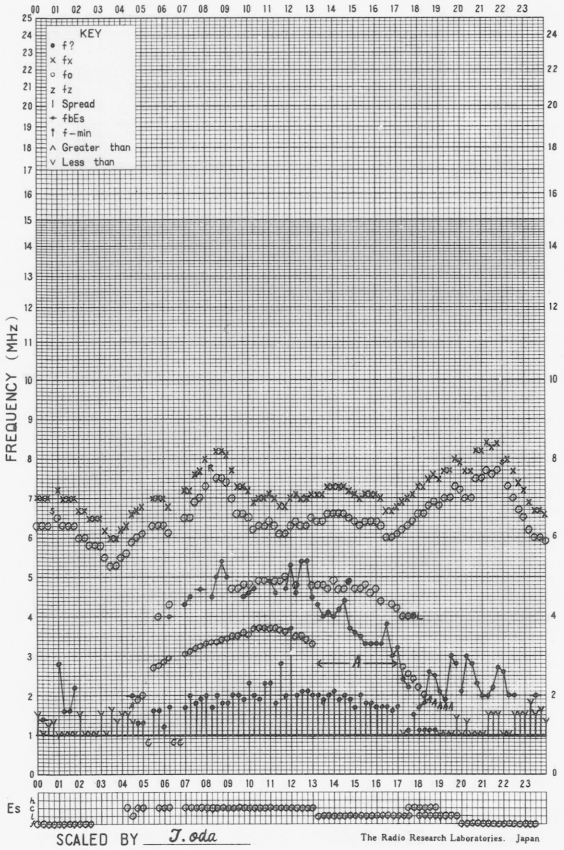

SCALED BY T. oda

The Radio Research Laboratories. Japan

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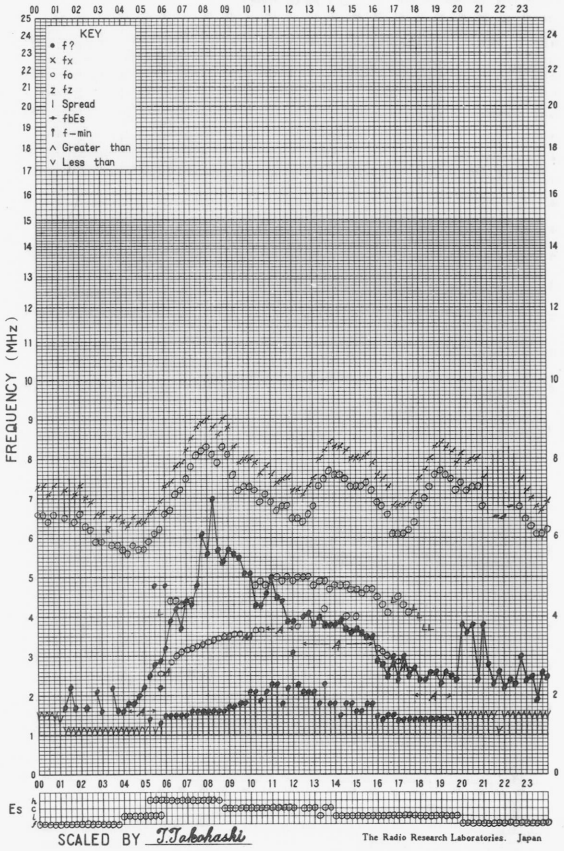

SCALED BY T.Takahashi

The Radio Research Laboratories. Japan

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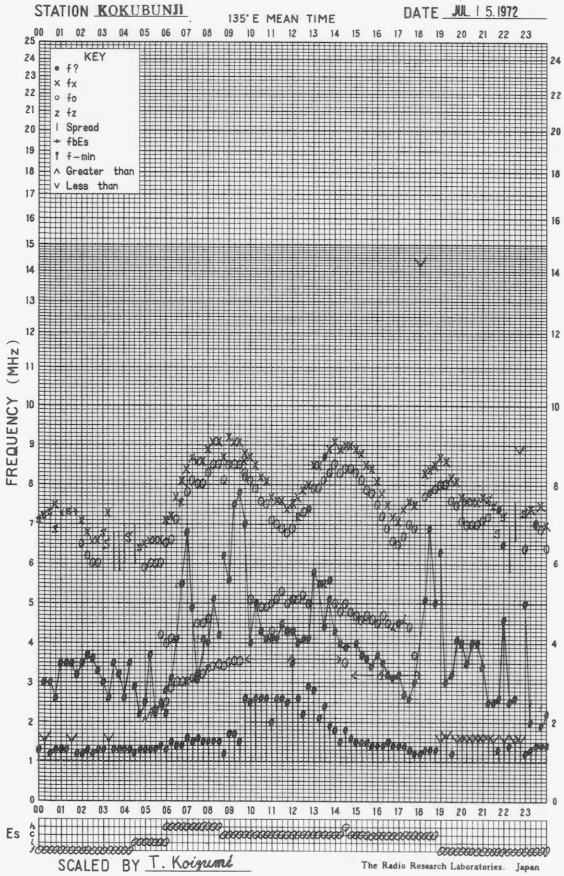

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The Radio Research Laboratories. Japan

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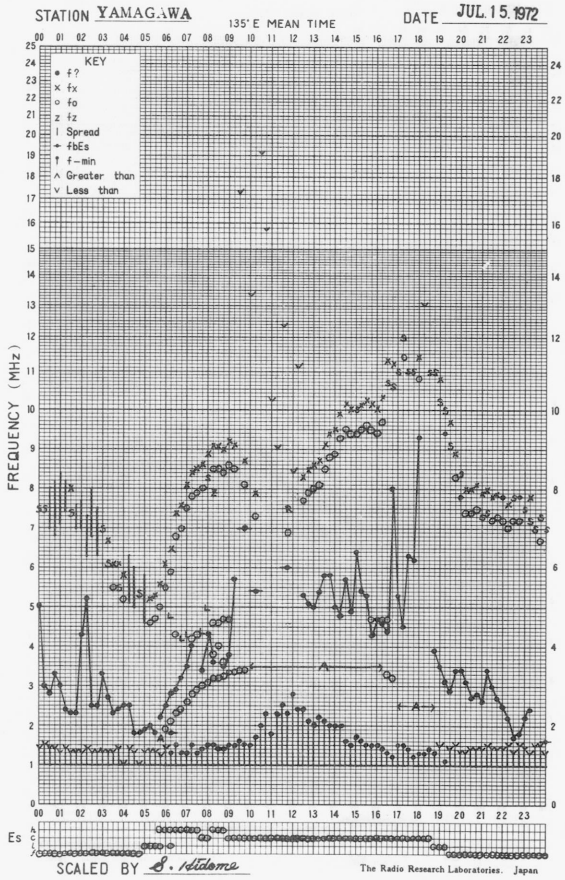

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The Radio Research Laboratories. Japan

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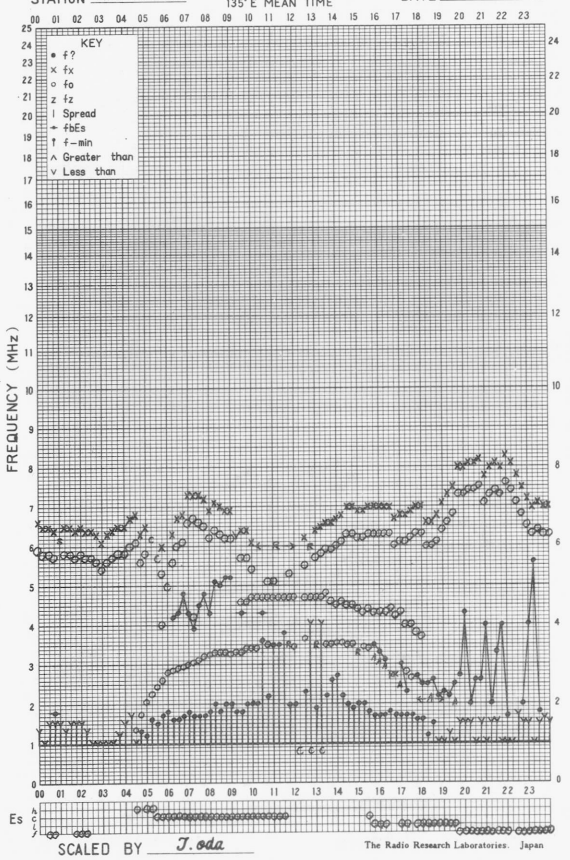

SCALED BY J. oda

The Radio Research Laboratories. Japan

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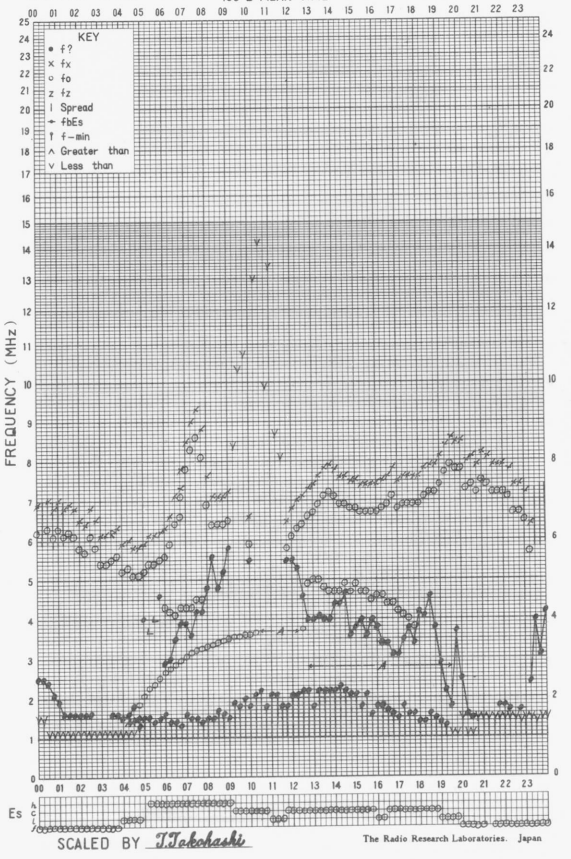

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The Radio Research Laboratories. Japan

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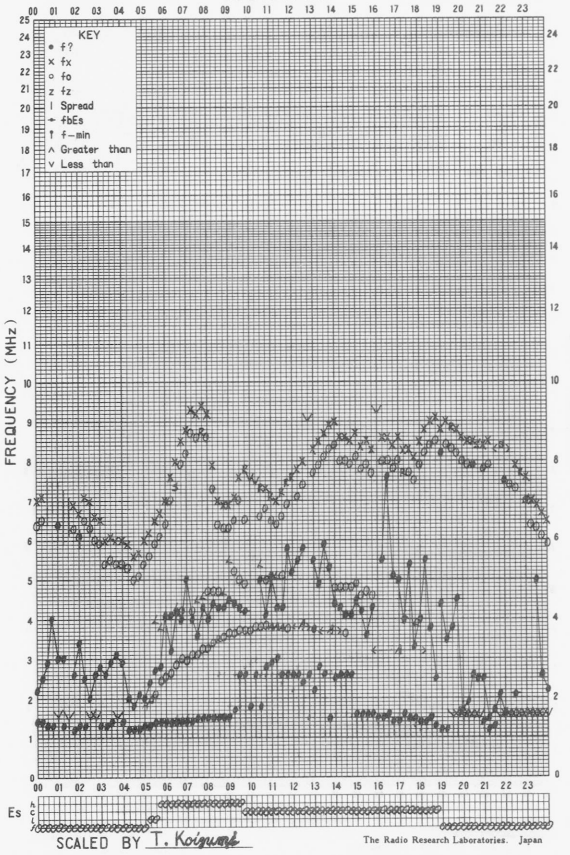

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The Radio Research Laboratories. Japan

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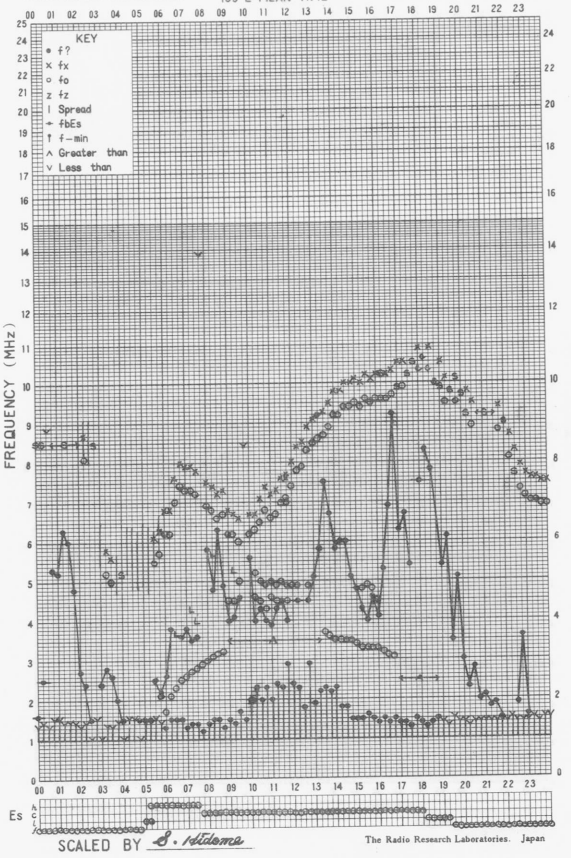

SCALED BY S. Ishidoma

The Radio Research Laboratories. Japan

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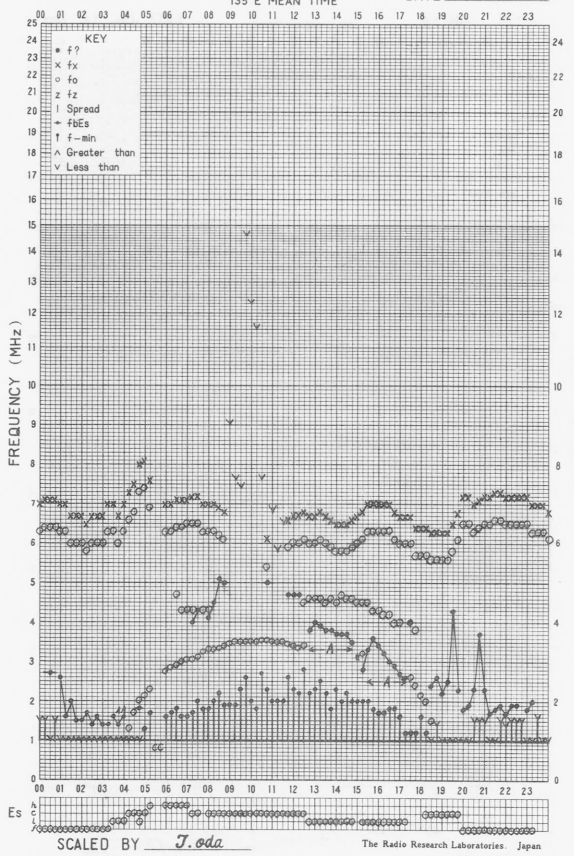

SCALED BY J. Oda

The Radio Research Laboratories. Japan

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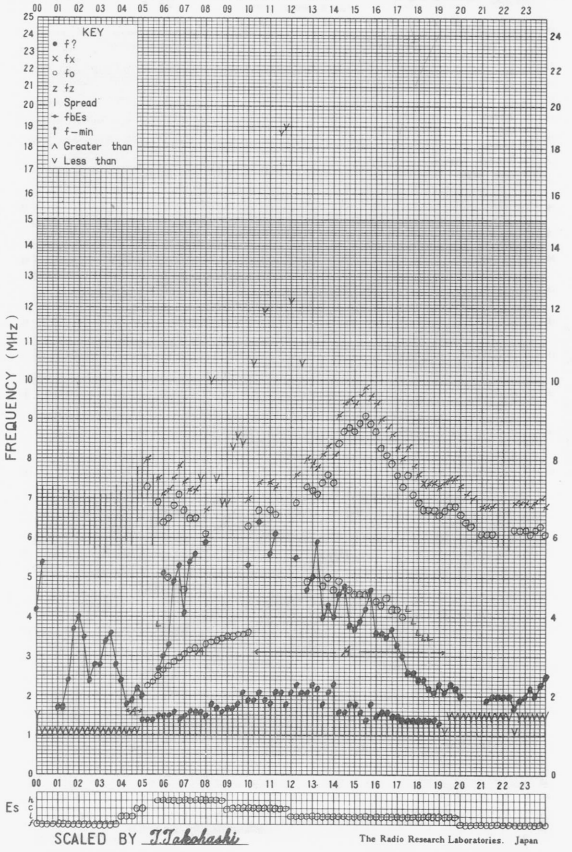

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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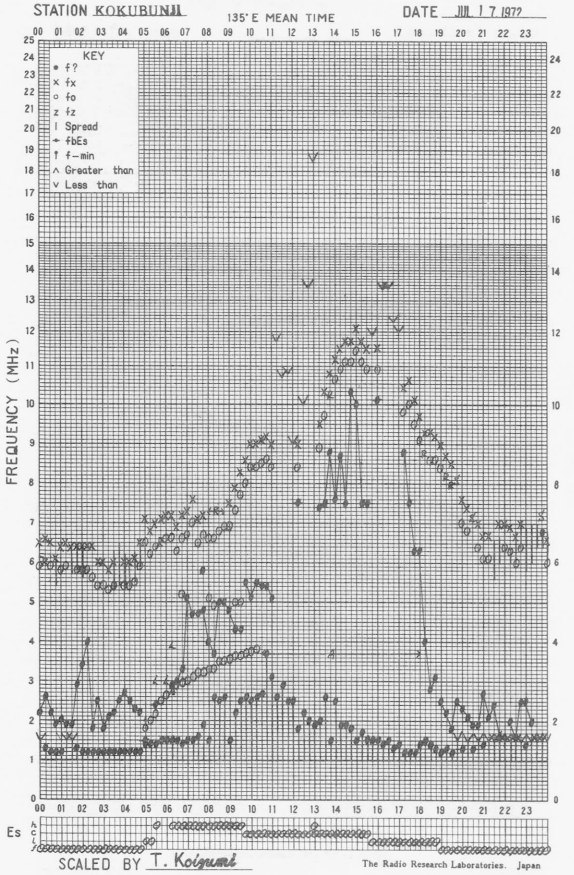
STATION KOKUBUNJI 135°E MEAN TIME DATE JUL. 17. 1972

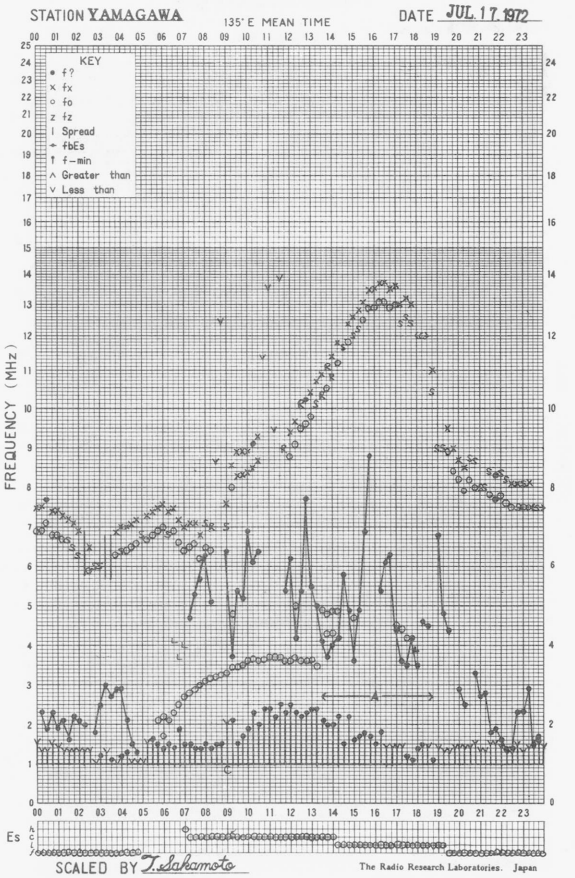


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE JUL. 17. 1972

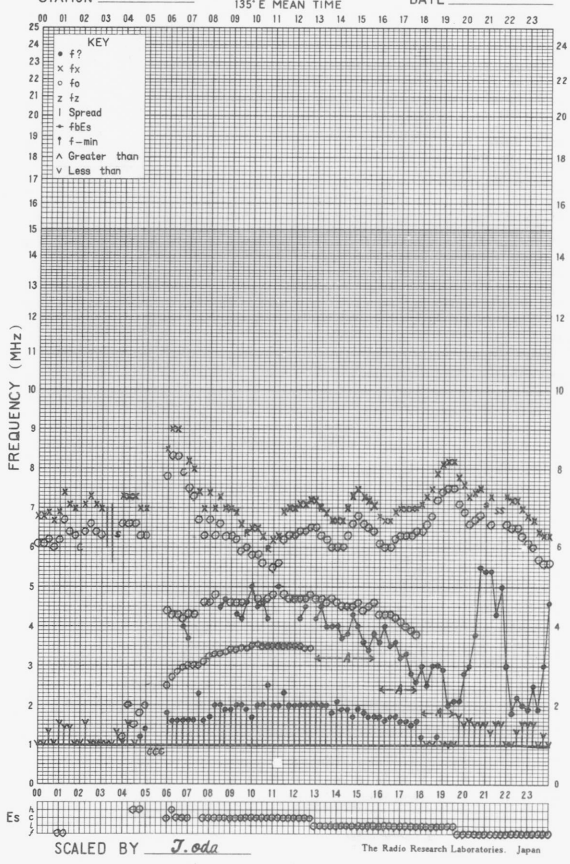


SCALED BY T. Sakamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE JUL. 18. 1972

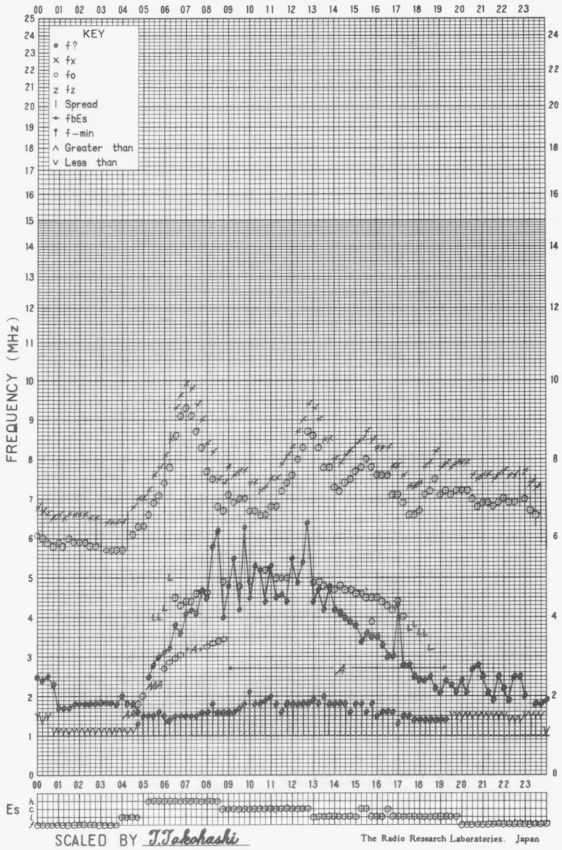


SCALED BY T. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Jul. 18. 1972



SCALED BY T. Tokohashi

The Radio Research Laboratories. Japan

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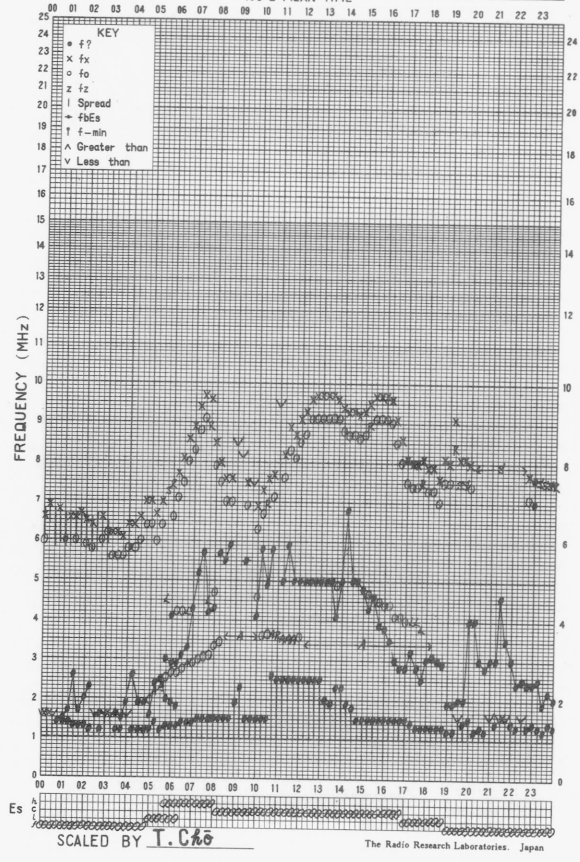

SCALED BY T. Chō

The Radio Research Laboratories. Japan

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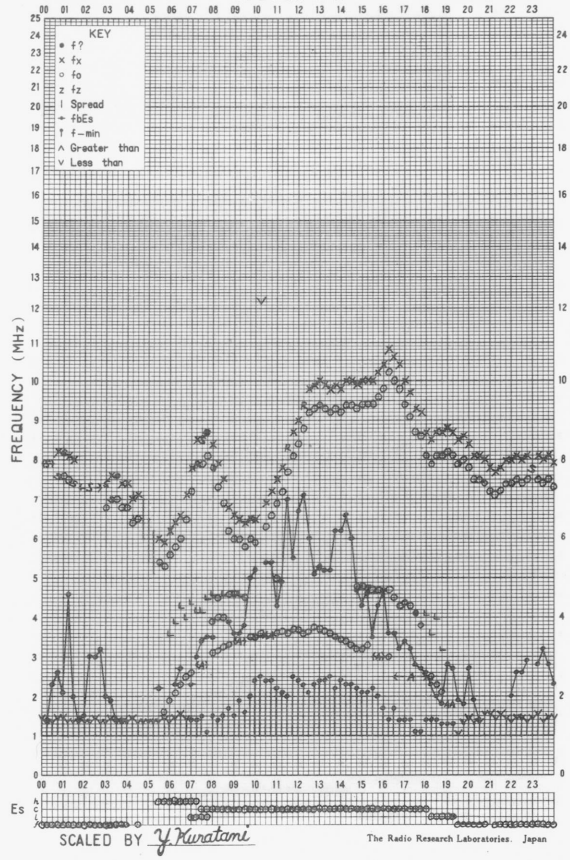

SCALED BY Y. Kuratani

The Radio Research Laboratories. Japan

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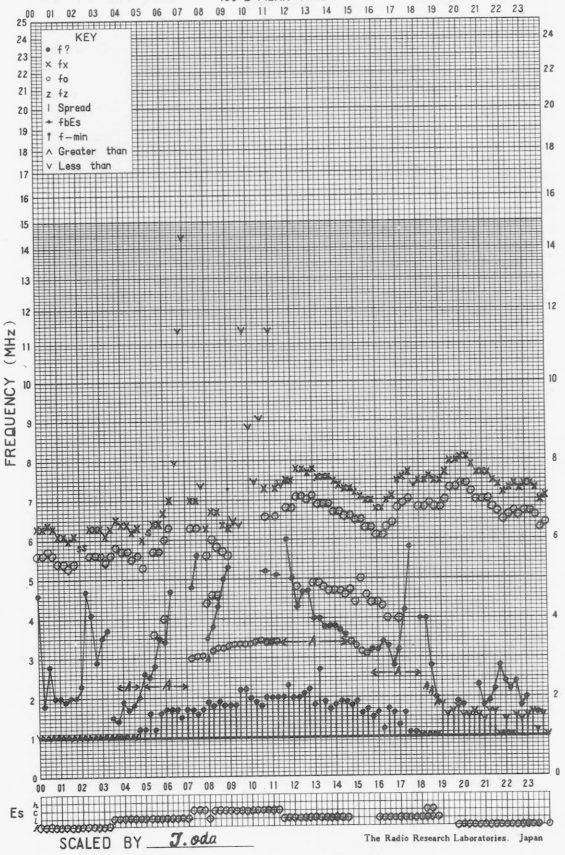
STATION WAKKANAI 135°E MEAN TIME DATE JUL. 19. 1972



SCALED BY J. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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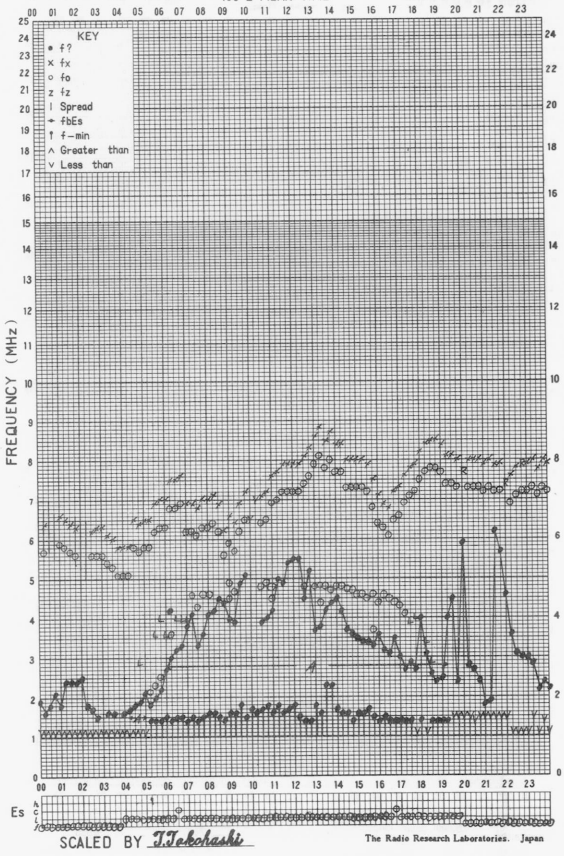

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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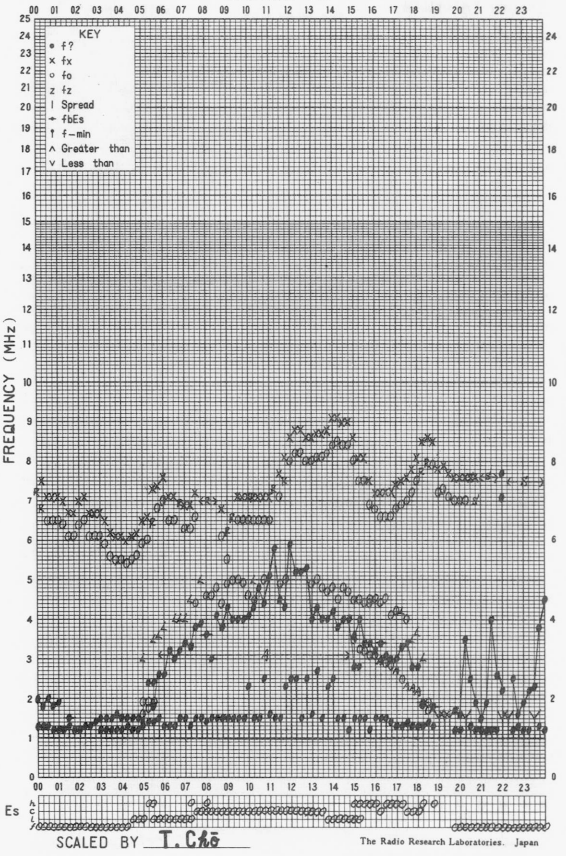

SCALED BY T. Chō

The Radio Research Laboratories. Japan

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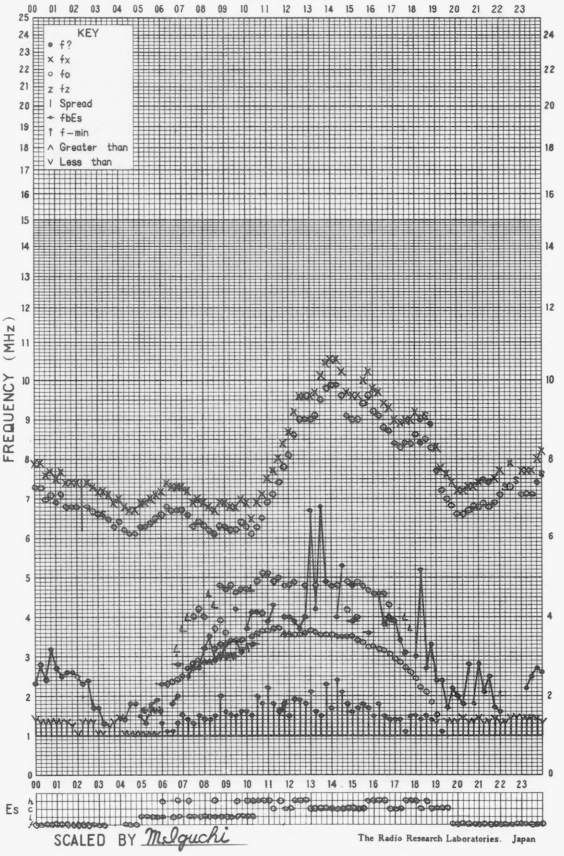

SCALED BY M. Iguchi

The Radio Research Laboratories. Japan

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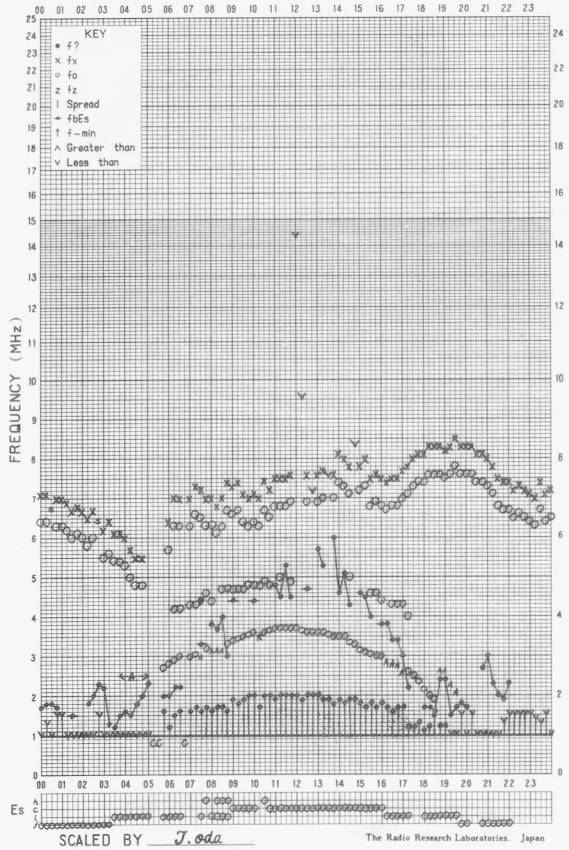
STATION WAKKANAI 135°E MEAN TIME DATE JUL. 20. 1972



SCALED BY T. oda

The Radio Research Laboratories. Japan

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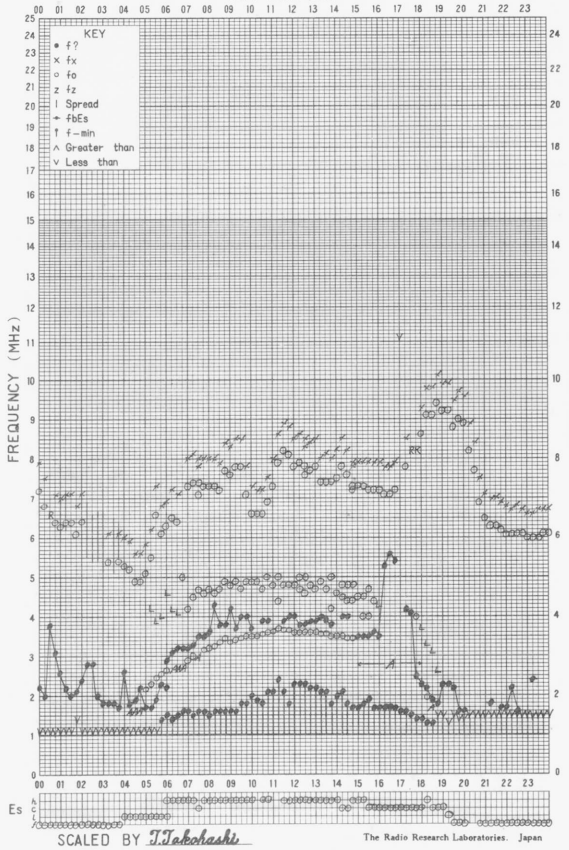

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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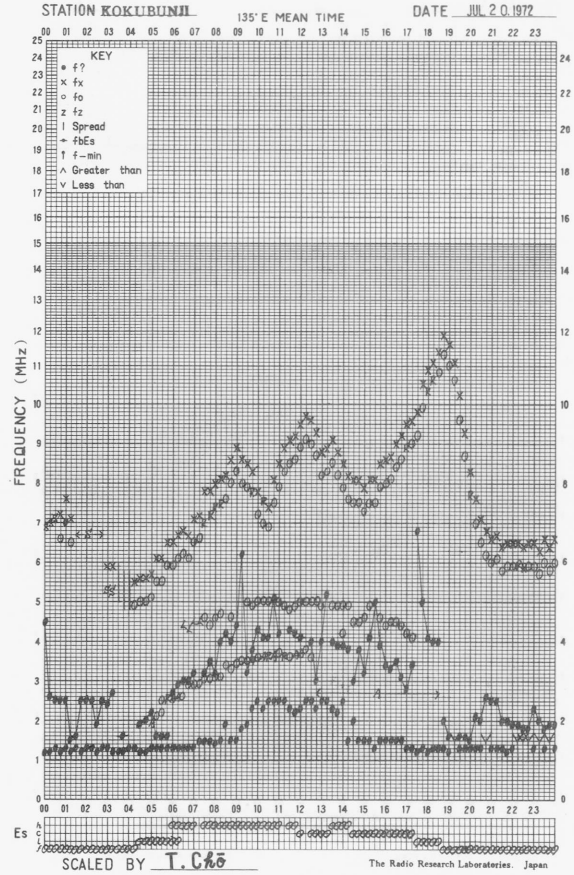

SCALED BY T. Chō

The Radio Research Laboratories. Japan

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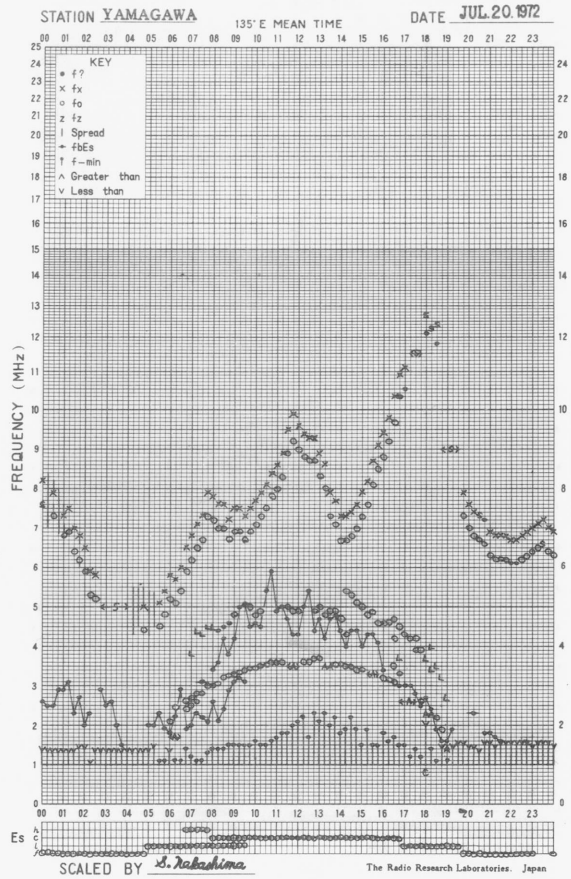

SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

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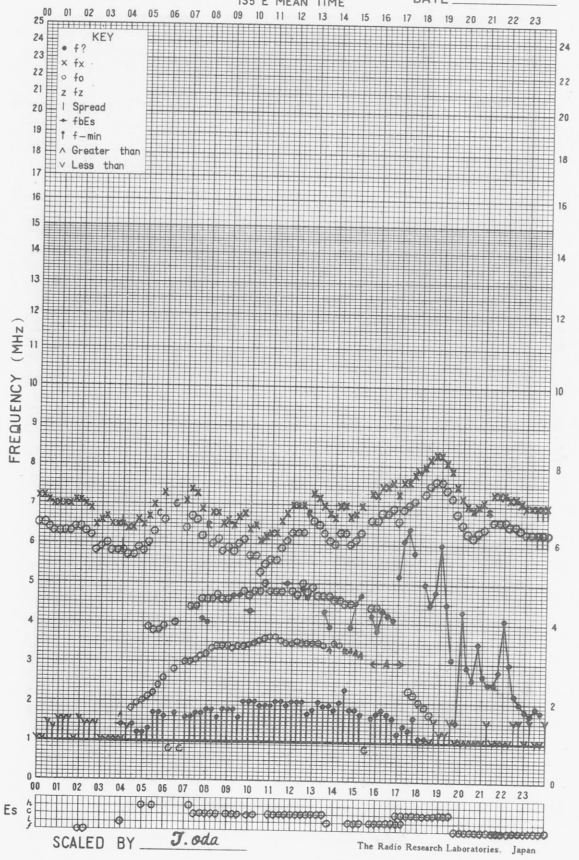

SCALED BY J. oda

The Radio Research Laboratories. Japan

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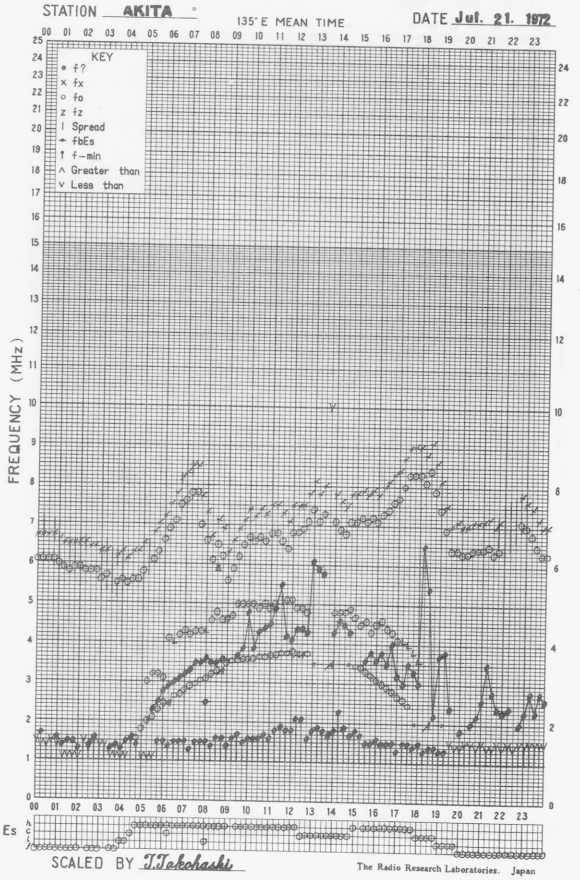

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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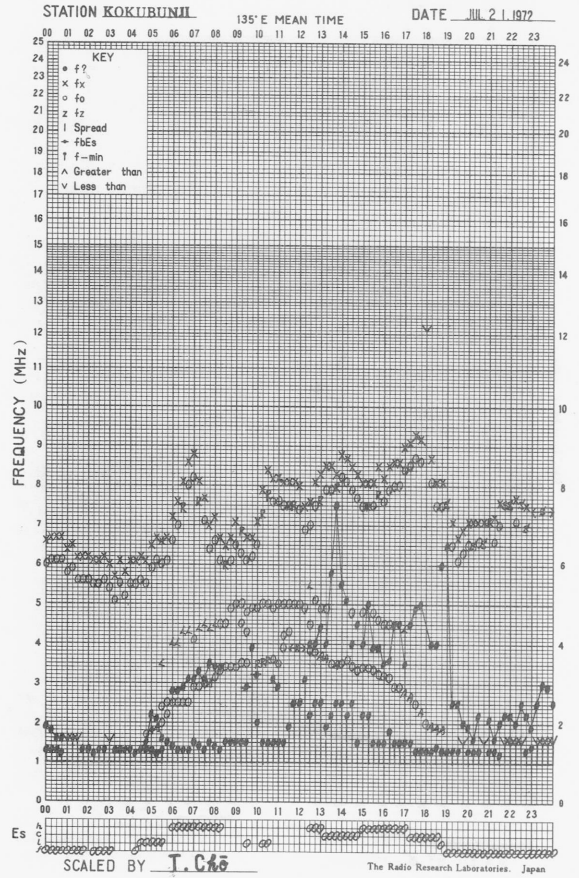

SCALED BY T. Chō

The Radio Research Laboratories. Japan

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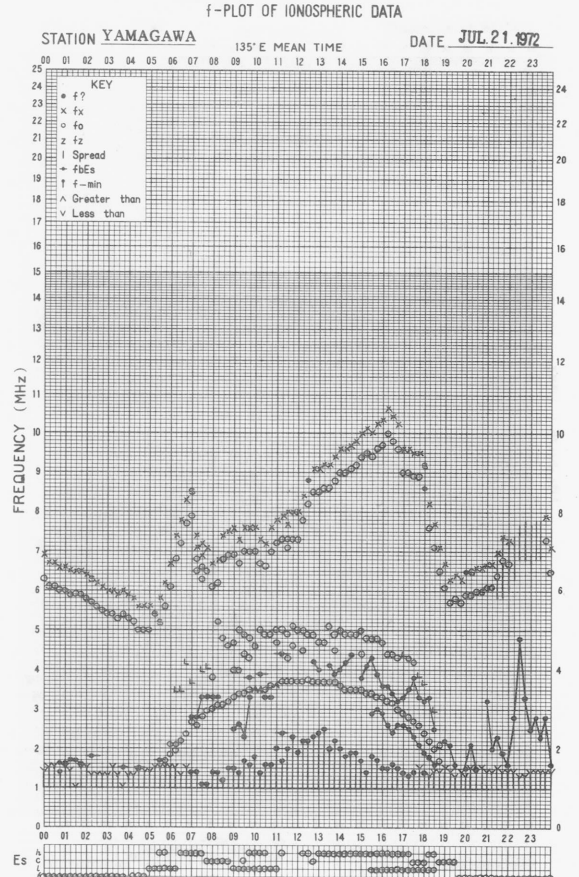

SCALED BY S. Hidema

The Radio Research Laboratories. Japan

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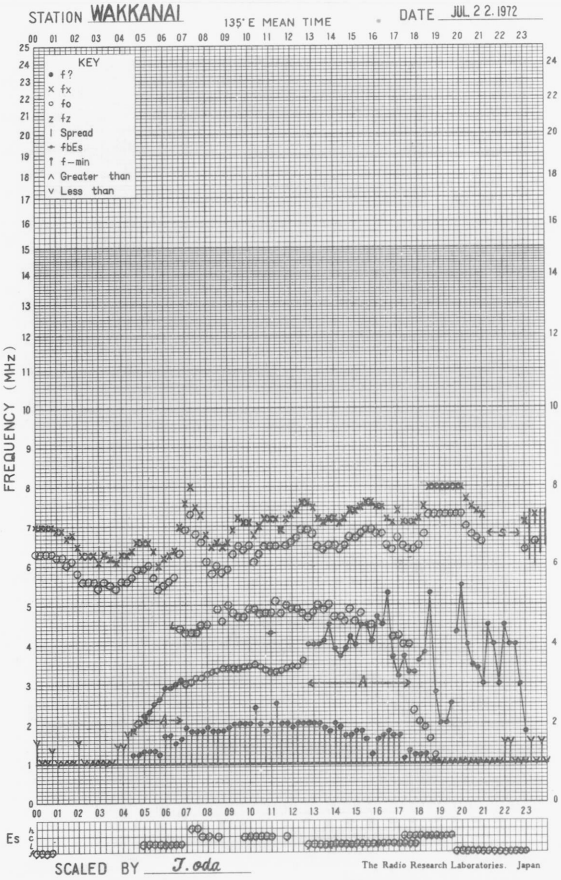

SCALED BY T. oda

The Radio Research Laboratories. Japan

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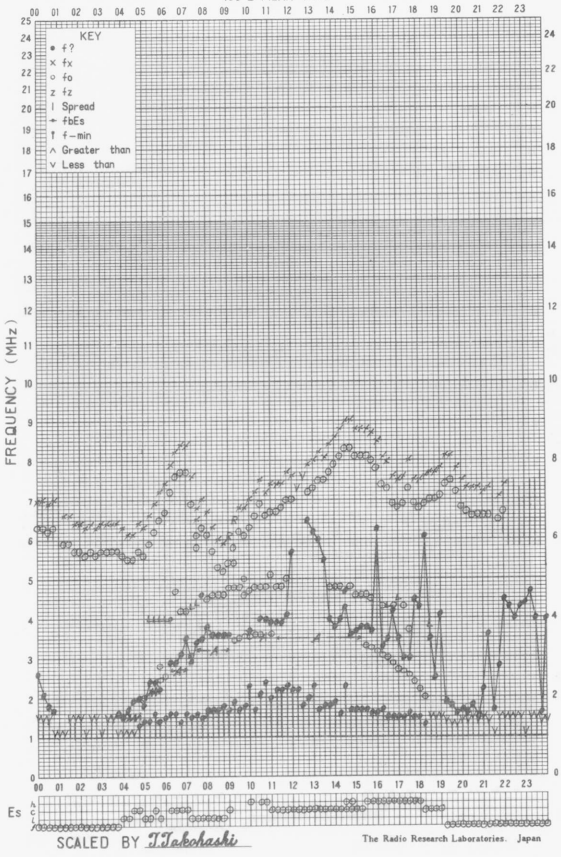

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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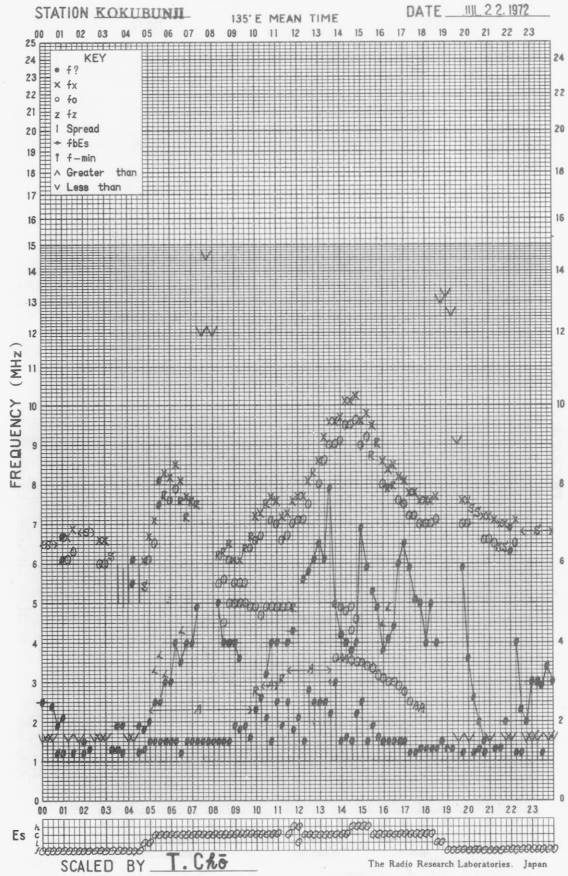

SCALED BY T. Chō

The Radio Research Laboratories. Japan

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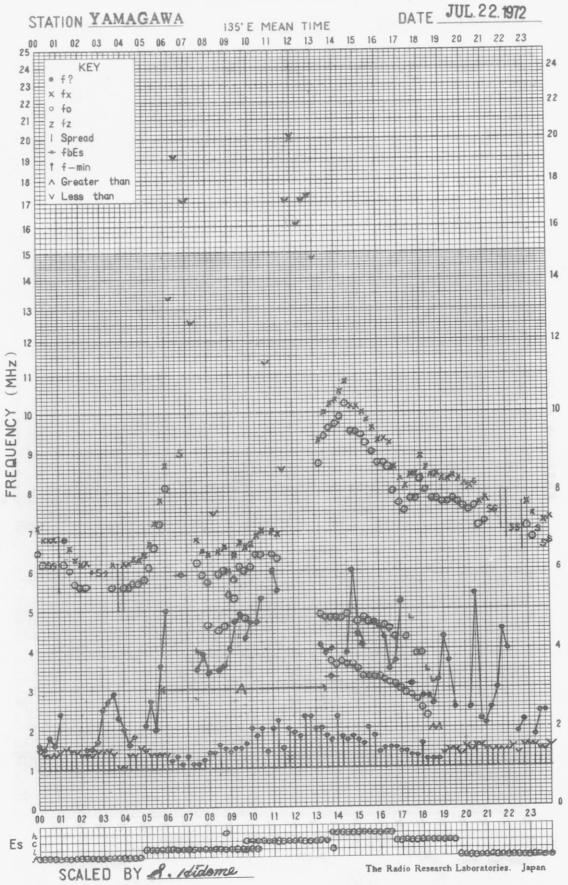

SCALED BY A. Ishioma

The Radio Research Laboratories. Japan

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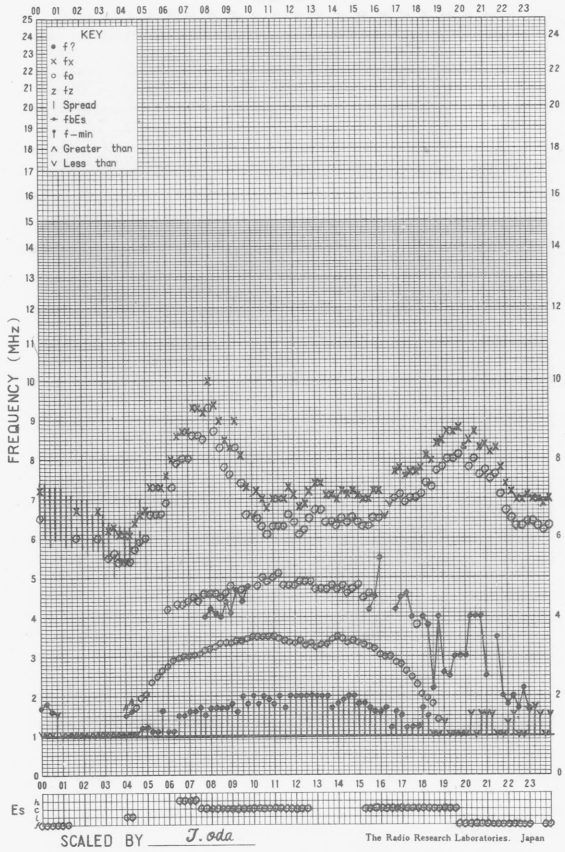

SCALED BY T. Oda

The Radio Research Laboratories. Japan

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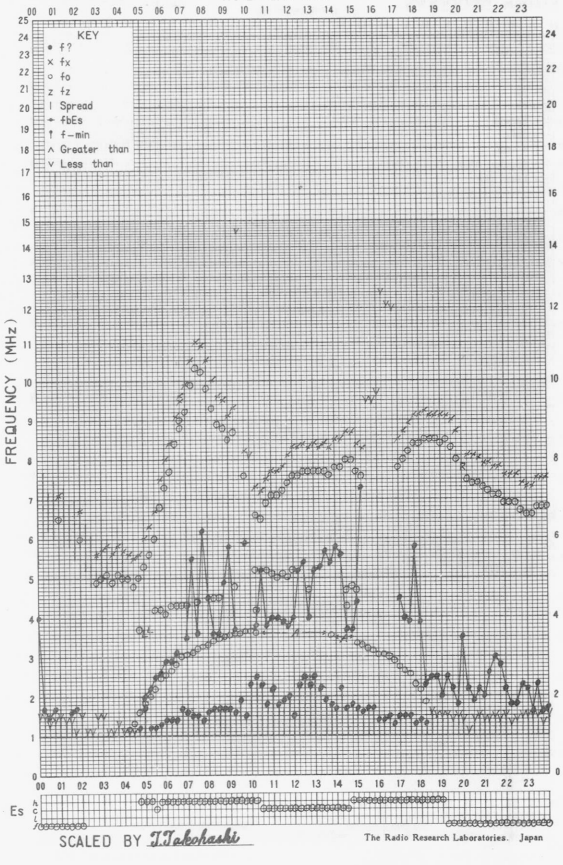

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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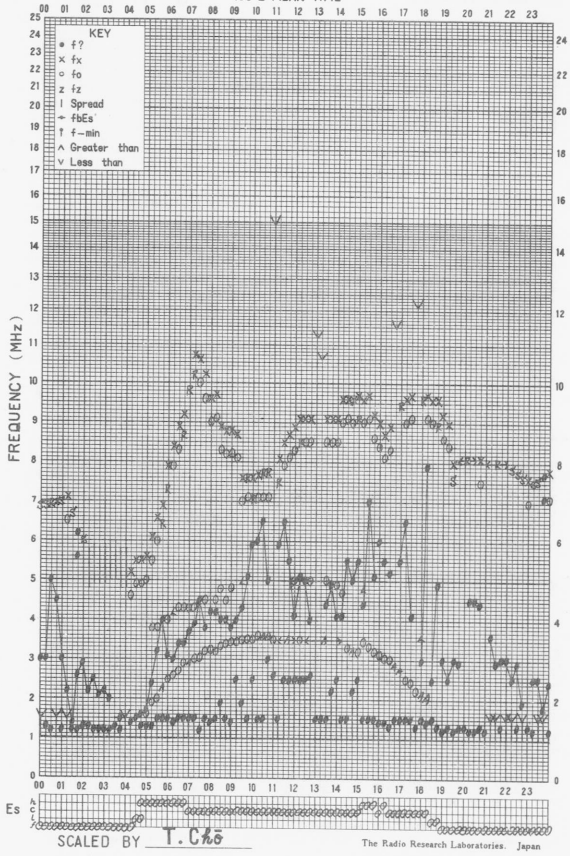

SCALED BY T. Cho

The Radio Research Laboratories. Japan

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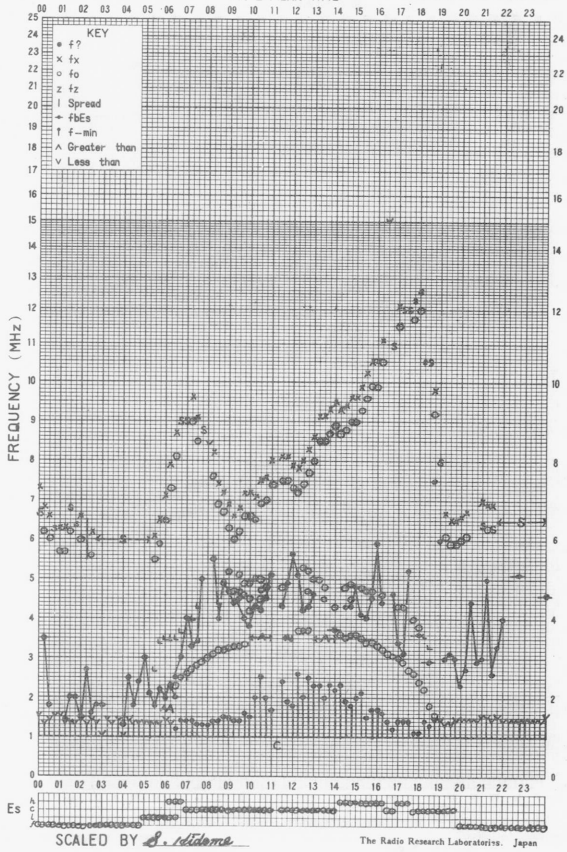
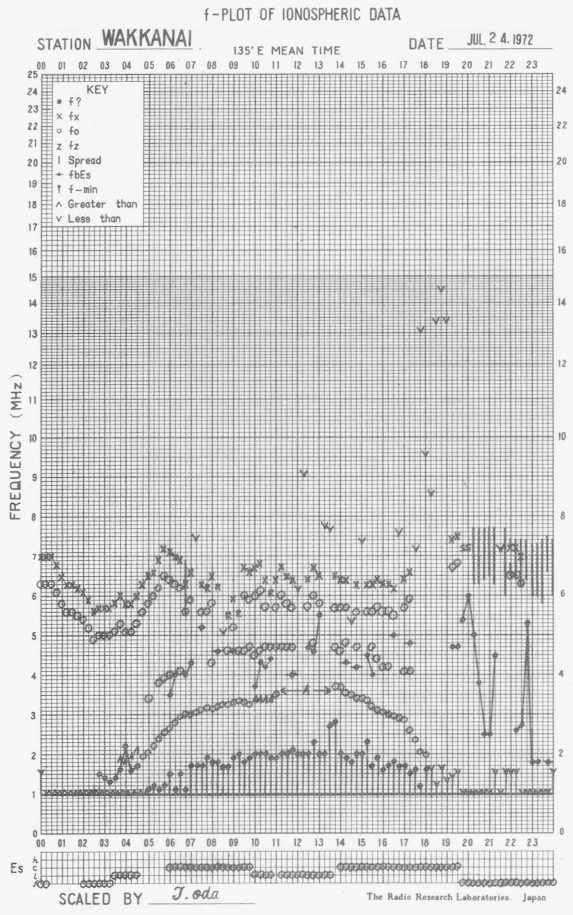


SCALED BY S. Iidome

The Radio Research Laboratoriss. Japan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135°E MEAN TIME
DATE JUL. 24. 1972
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FREQUENCY (MHz)
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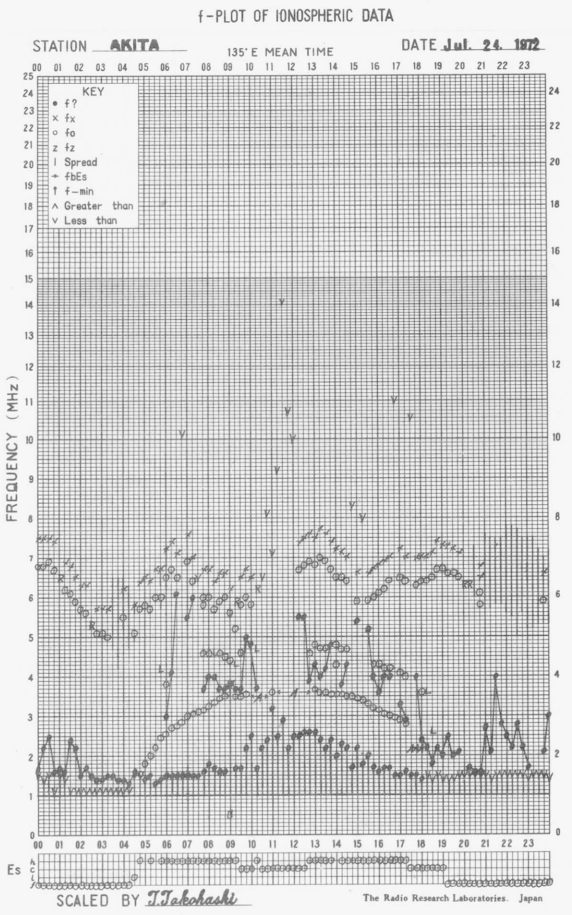
SCALED BY T. Oda
The Radio Research Laboratories. Japan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DATE Jul. 24. 1972
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∨ Less than
FREQUENCY (MHz)
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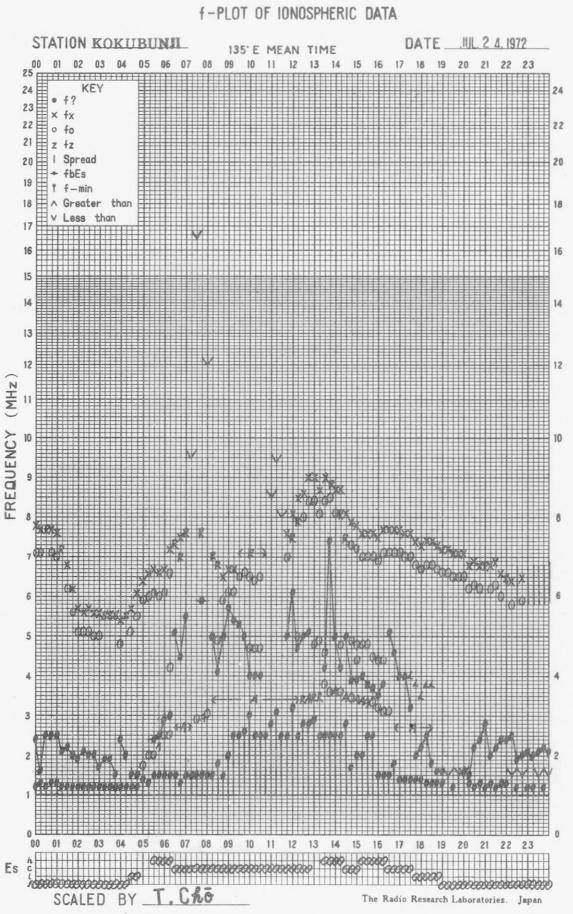
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan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DATE JUL. 24. 1972
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FREQUENCY (MHz)
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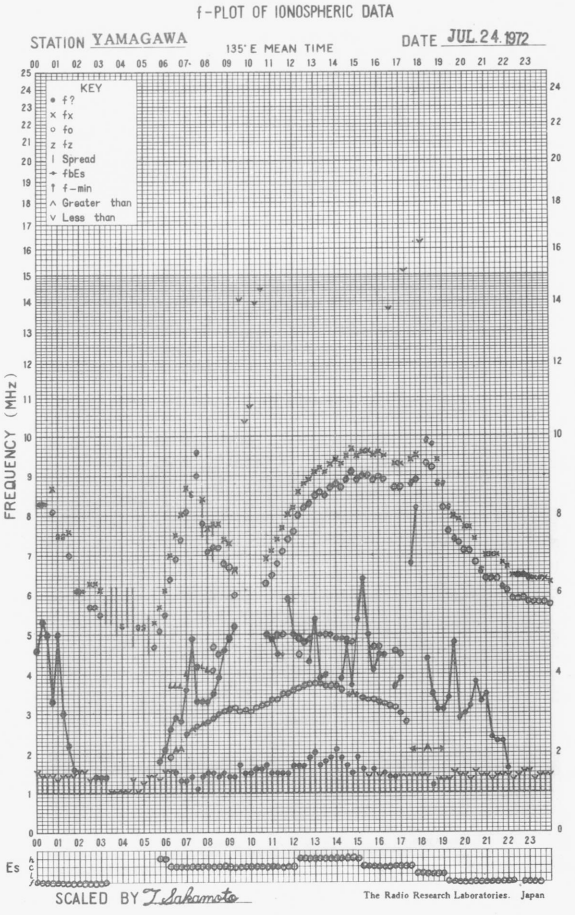
SCALED BY T. Chō
The Radio Research Laboratories. Japan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∧ Greater than
∨ Less than
FREQUENCY (MHz)
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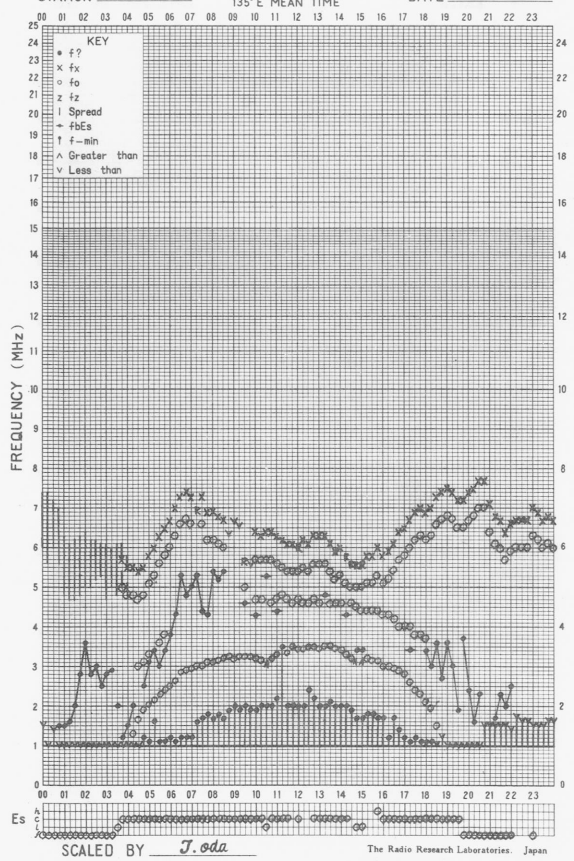
SCALED BY T. Takamoto
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE JUL. 25. 1972



SCALED BY T. Oda

The Radio Research Laboratories. Japan

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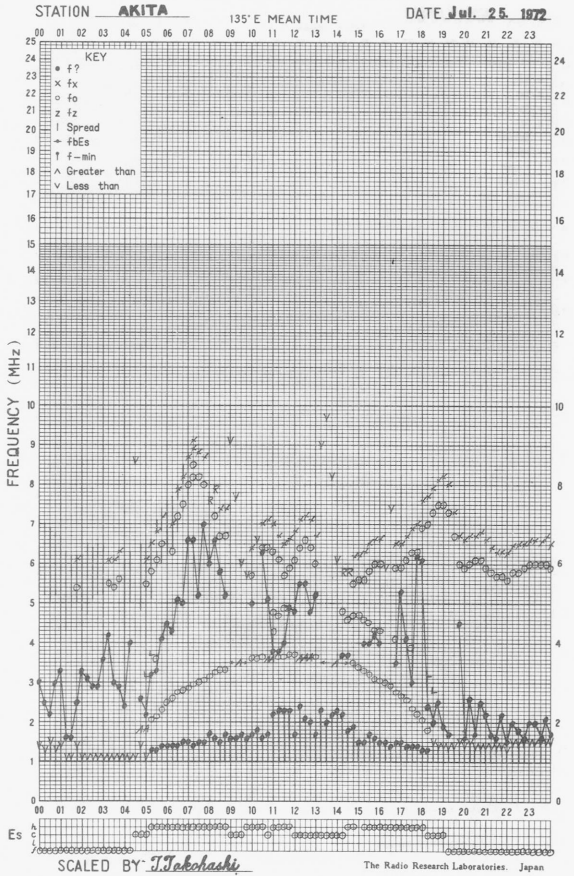

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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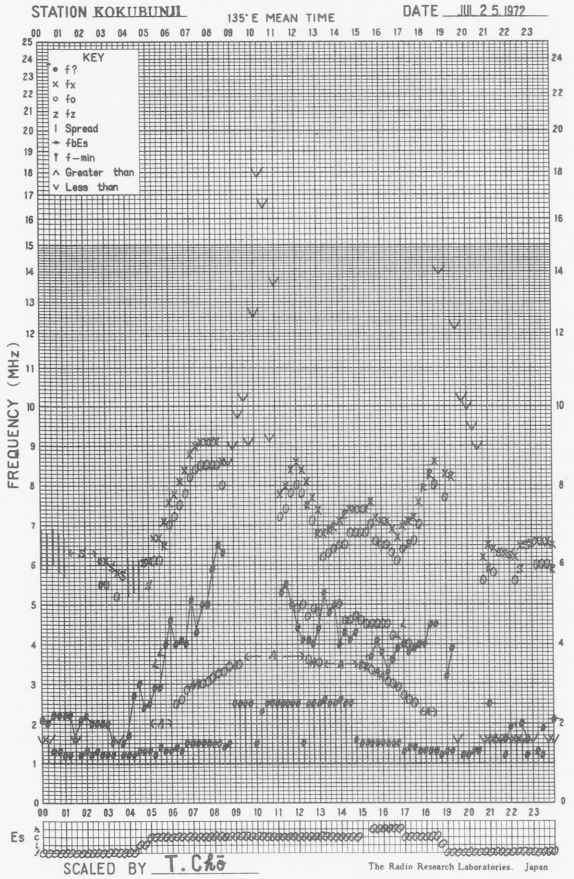

SCALED BY T. Chō

The Radio Research Laboratories. Japan

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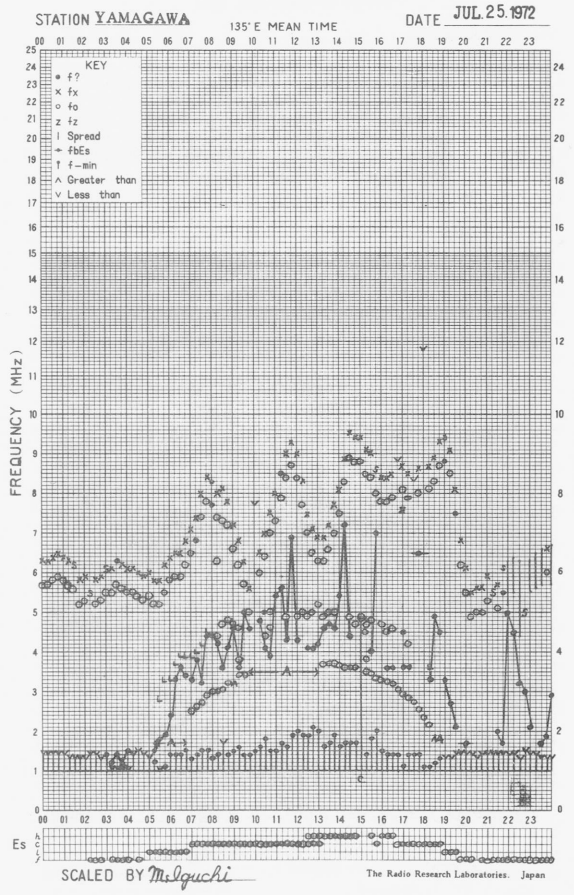

SCALED BY M. Iguchi

The Radio Research Laboratories. Japan

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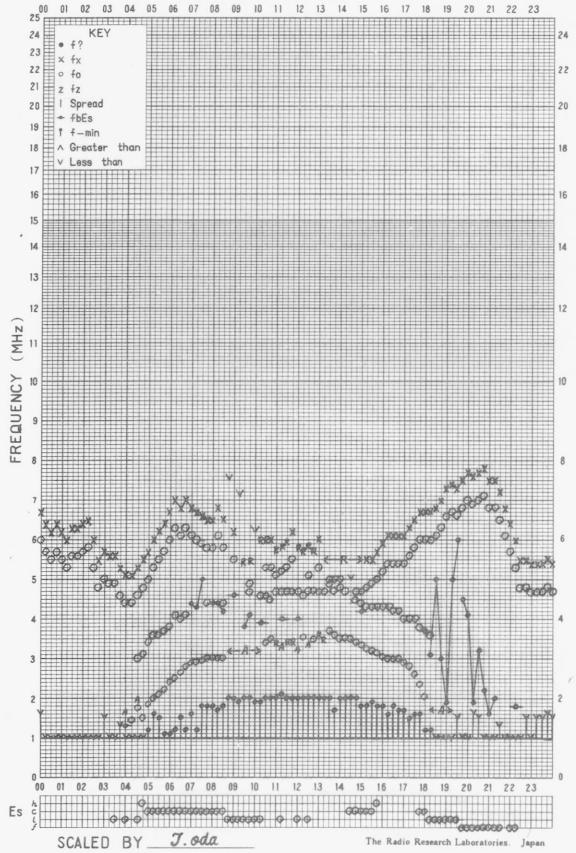

SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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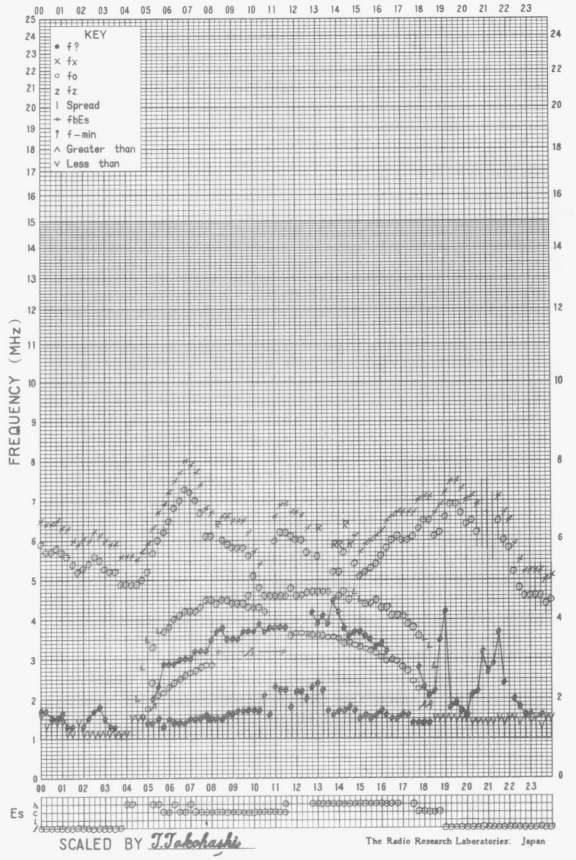

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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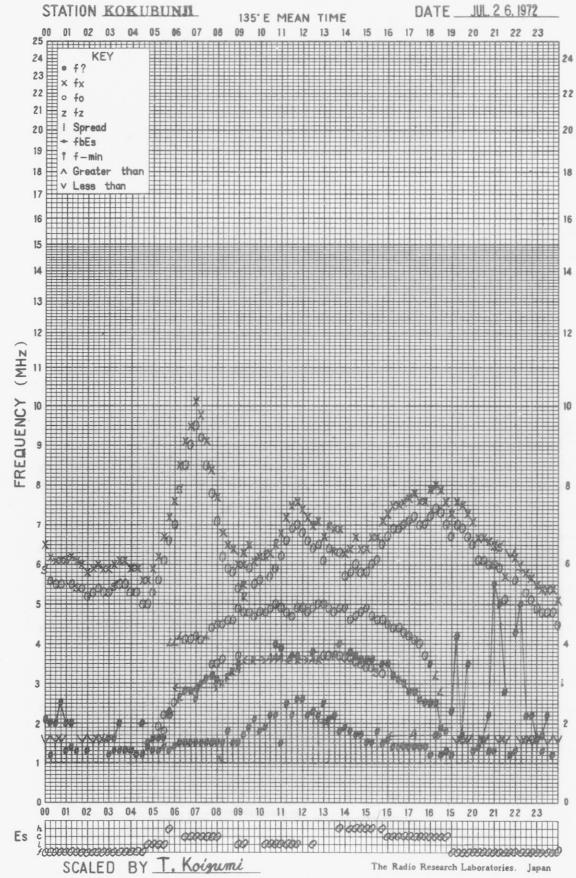

SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

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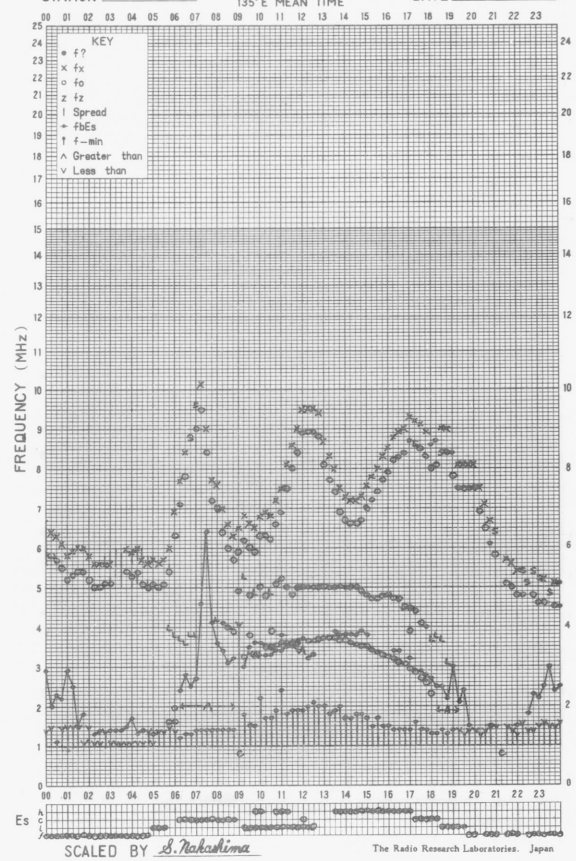

SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

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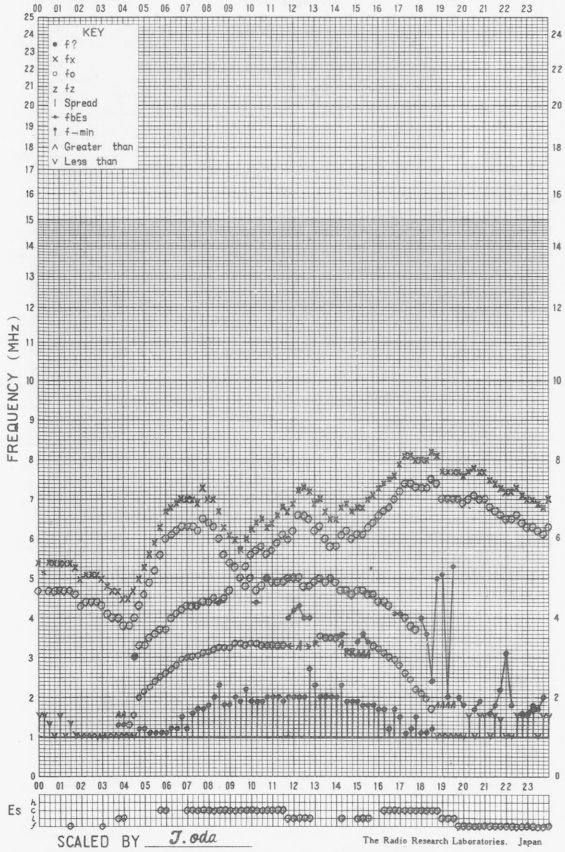

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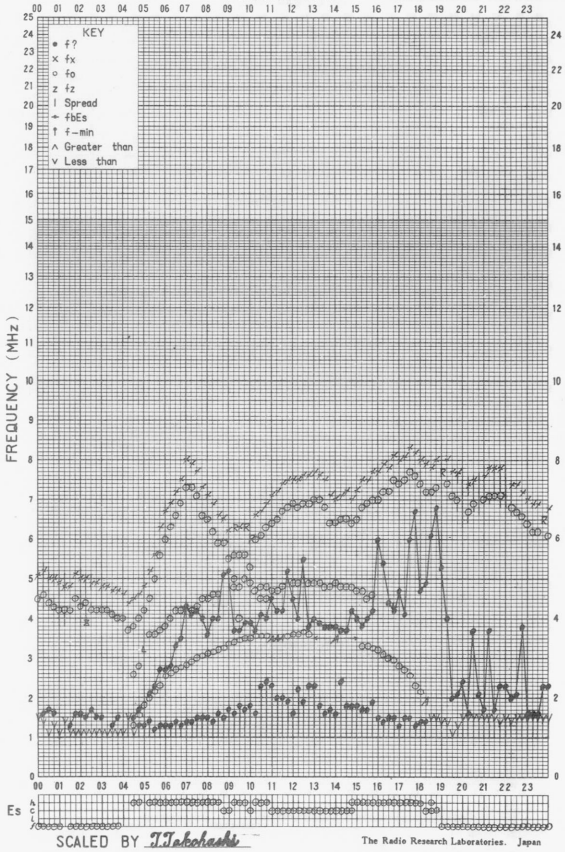

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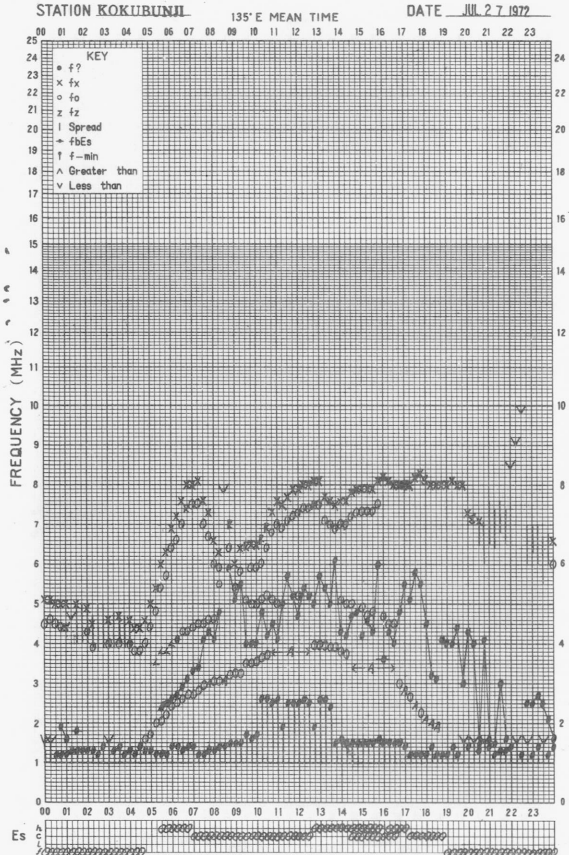

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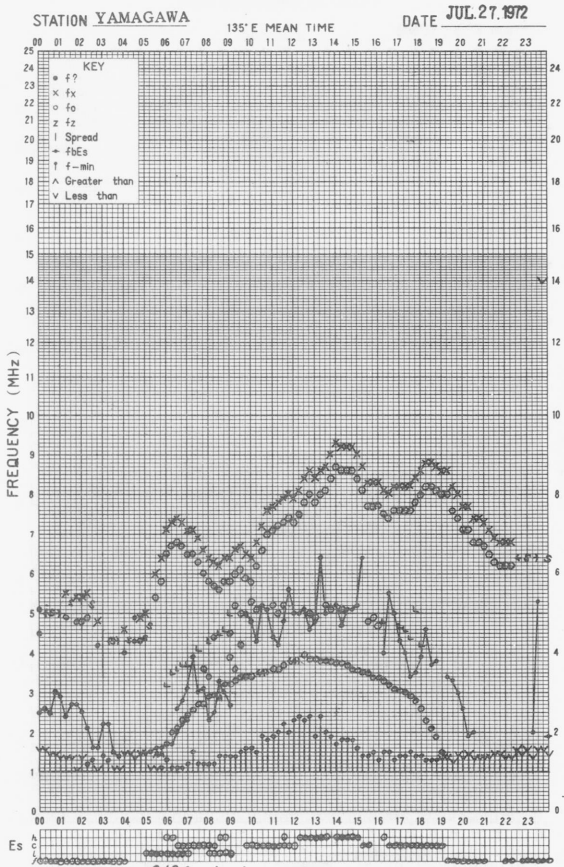

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE JUL. 28. 1972

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FREQUENCY (MHz)

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SCALED BY J. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Jul. 28. 1972

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v Less than

FREQUENCY (MHz)

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SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE JUL. 28. 1972

KEY
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↑ f-min
^ Greater than
v Less than

FREQUENCY (MHz)

Es

SCALED BY T. C&S

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE JUL. 28. 1972

KEY
• f?
× fx
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
^ Greater than
v Less than

FREQUENCY (MHz)

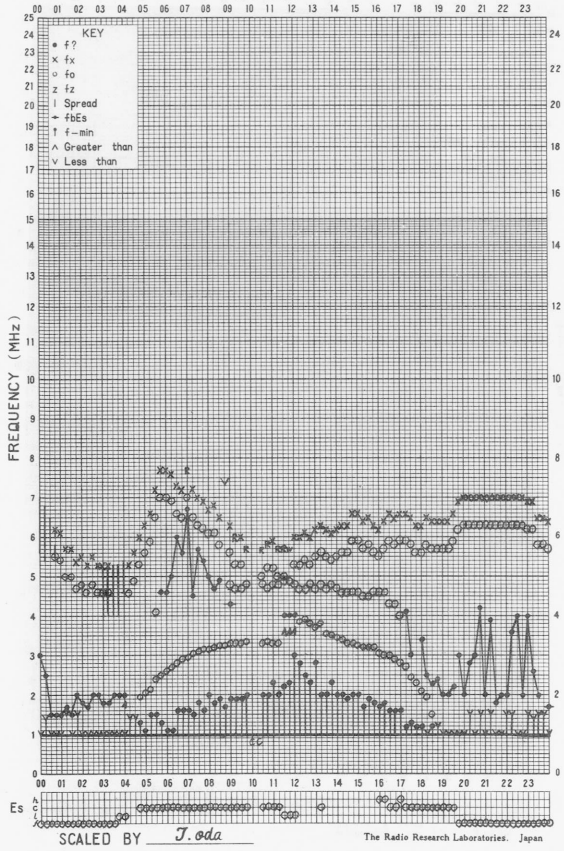
Es

SCALED BY S. Ishidome

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE JUL 2 9. 1972

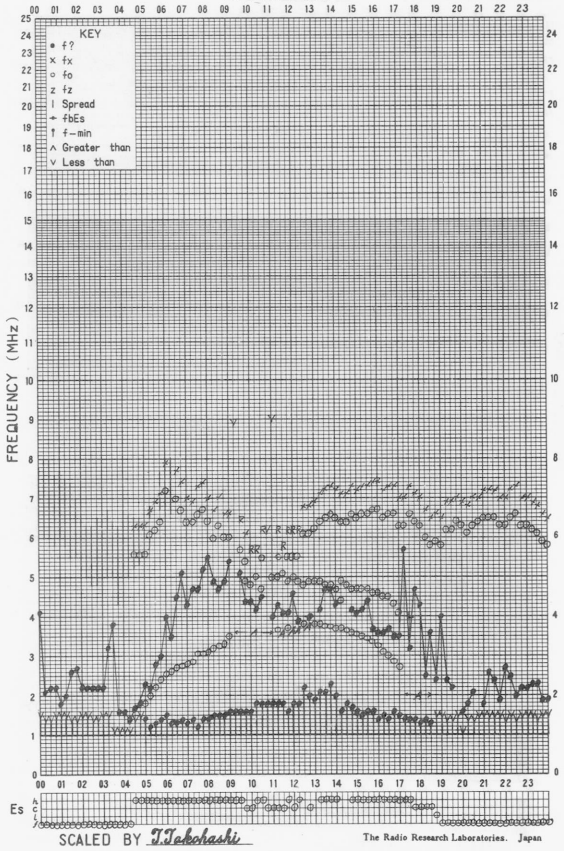


SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Jul. 29. 1972

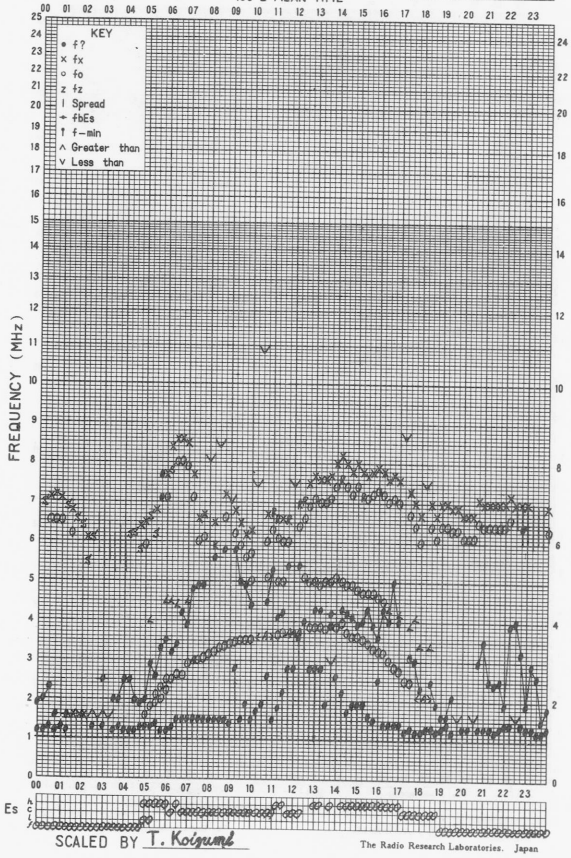


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE JUL 2 9. 1972

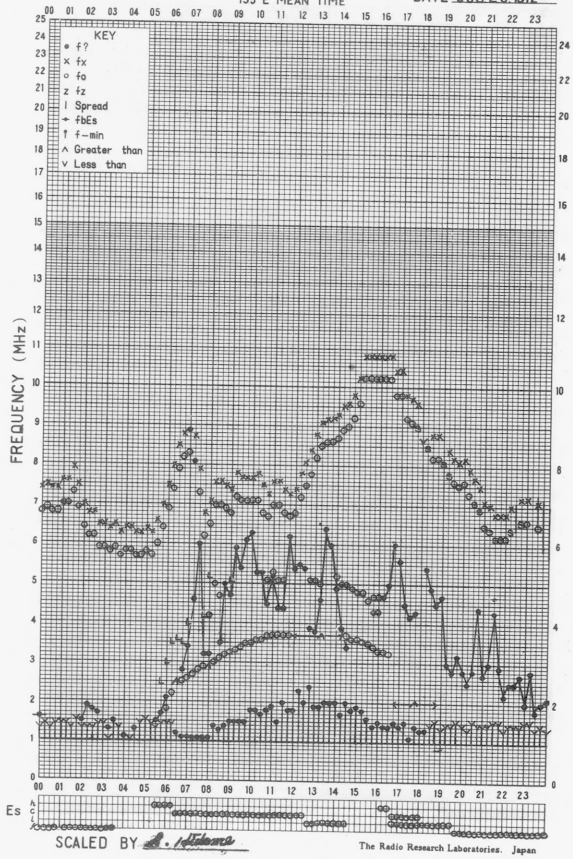


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE JUL 29 1972

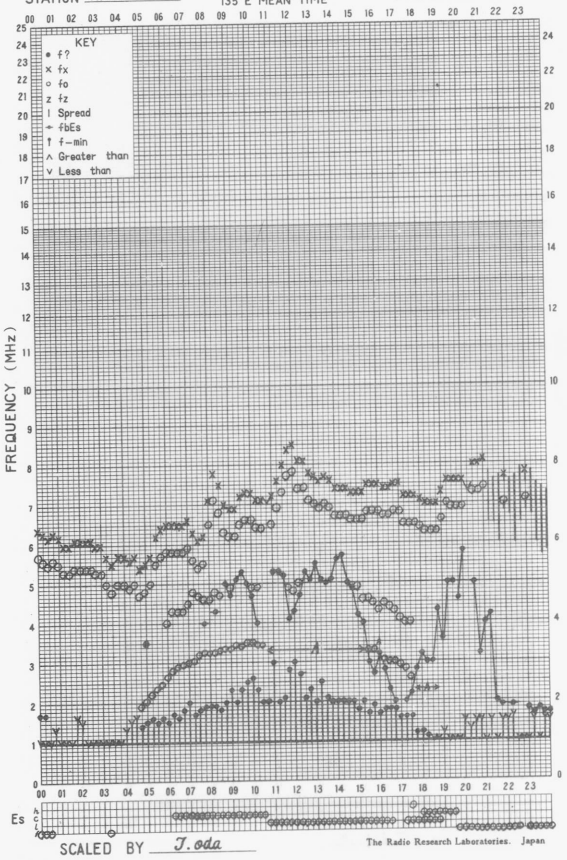


SCALED BY A. Ishikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE JUL. 30. 1972

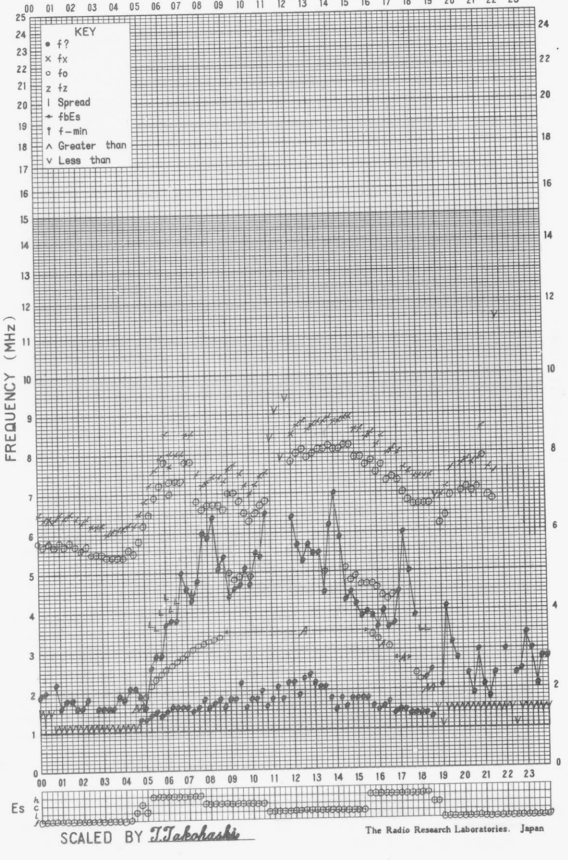


SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Jul. 30. 1972

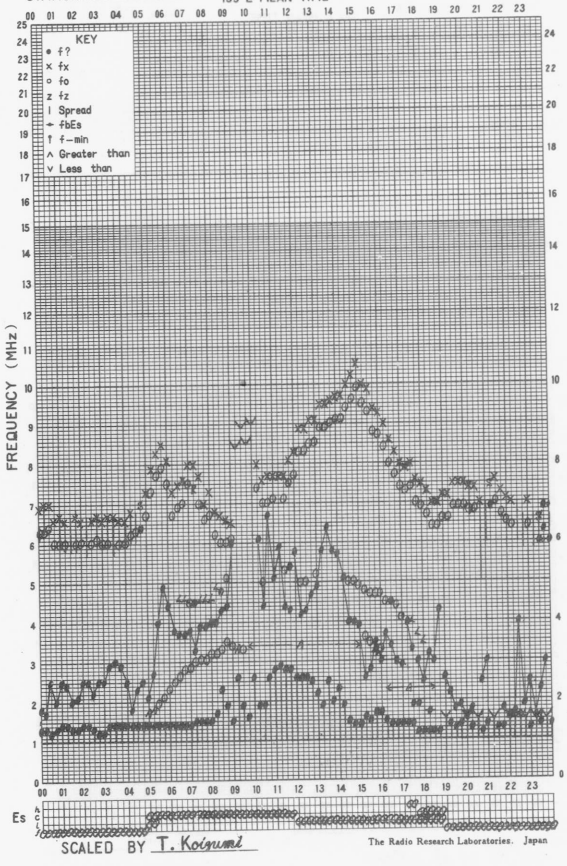


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE JUL. 30. 1972

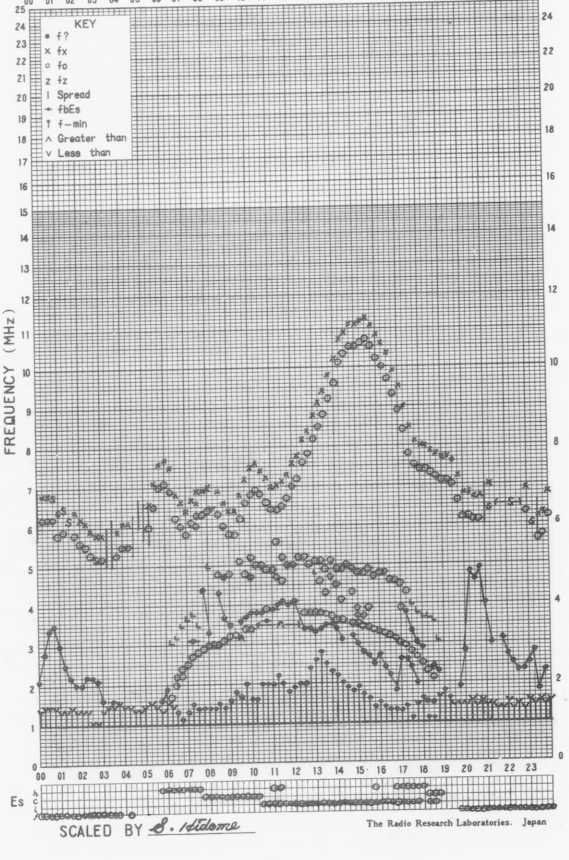


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE JUL. 30. 1972

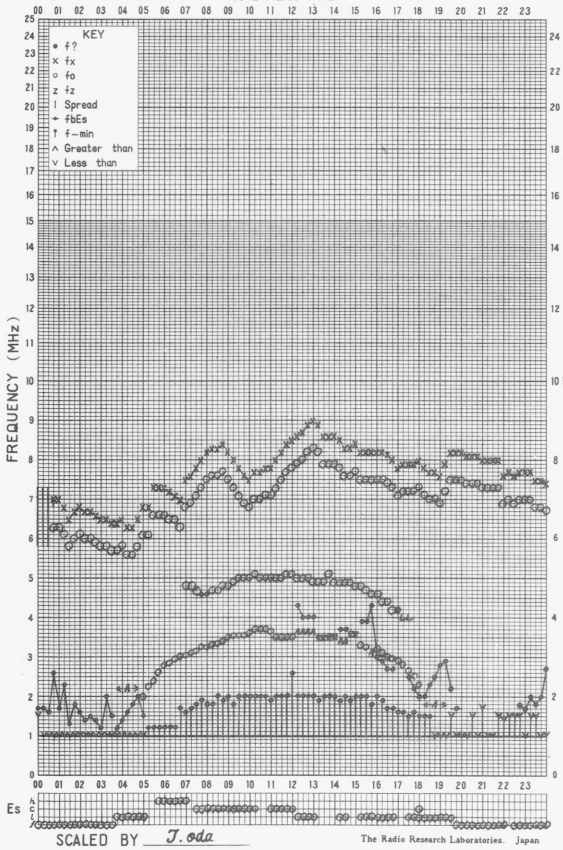


SCALED BY S. Kidoma

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE JUL. 31. 1972

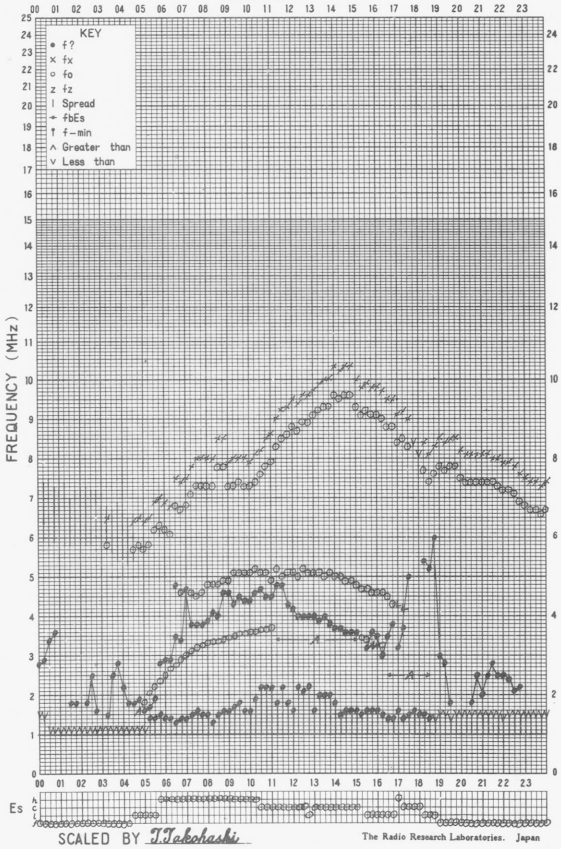


SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Jul. 31. 1972

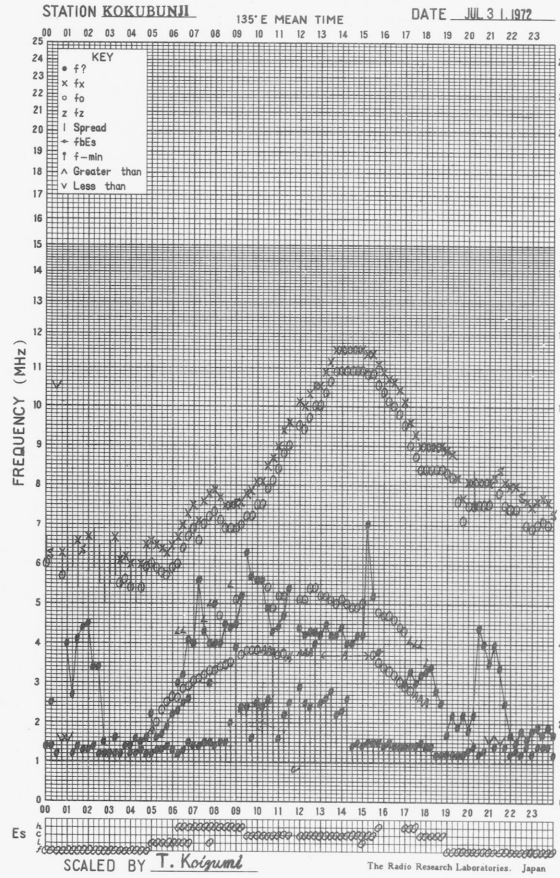


SCALED BY T.Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE JUL. 31. 1972

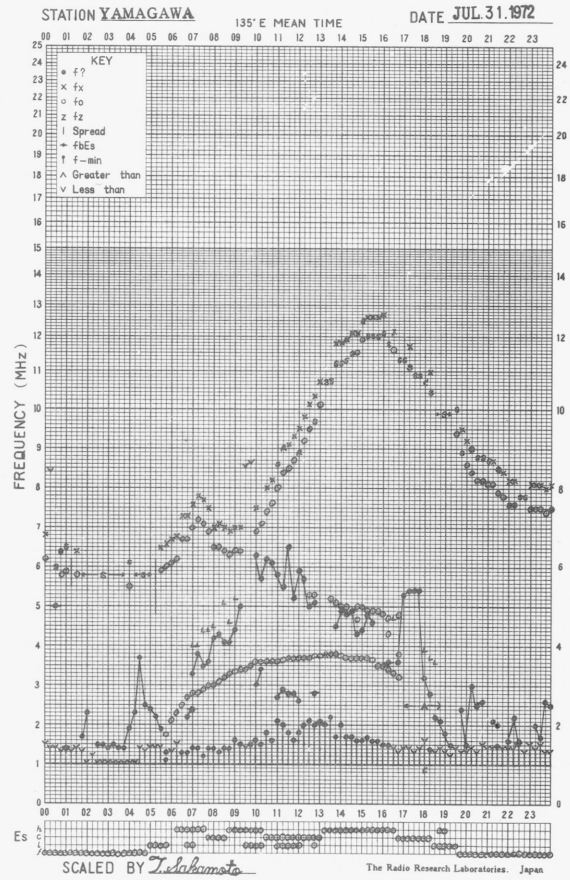


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE JUL. 31. 1972



SCALED BY T.Sakamoto

The Radio Research Laboratories. Japan

SOLAR RADIO EMISSION

Flux Density and Variability

Month: July 1972
Observing station: Hiraiso Frequency: 200 MHz

	Flux density 10^{-22} Wm^{-2} Hz^{-1}					Variability 0 to 3				
UT	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
Date										
1	6	6	6	6	6	0	0	0	0	0
2	7	7	6	6	6	0	0	0	0	0
3	7	8	7	7	7	0	0	0	0	0
4	6	6	8	q	7	0	0	0	0	0
5	6	6	5	6	6	0	0	0	0	0
6	5	5	5	5	5	0	0	0	0	0
7	5	5	6	5	5	0	0	0	0	0
8	5	6	6	6	6	0	0	0	0	0
9	6	6	6	5	6	0	0	0	0	0
10	5	5	5	q	5	0	0	0	0	0
11	5	6	6	5	6	0	0	0	0	0
12	5	5	q	5	5	0	0	0	0	0
13	5	6	6	5	6	0	0	0	0	0
14	6	6	6	5	6	0	0	0	0	0
15	6	5	(5)	-	5	0	0	(0)	-	0
16	5	6	6	5	6	0	0	0	0	0
17	5	5	5	5	5	0	0	0	0	0
18	6	5	5	5	6	0	0	0	0	0
19	5	6	6	5	5	0	0	0	0	0
20	6	6	6	5	6	0	0	0	0	0
21	6	6	6	6	6	0	0	0	0	0
22	6	5	5	5	6	0	0	0	0	0
23	5	5	5	5	5	0	0	0	0	0
24	5	5	5	5	5	0	0	0	0	0
25	5	6	6	7	5	0	0	0	0	0
26	5	-	-	-	(7)	0	-	-	-	(0)
27	-	-	-	6	-	-	-	-	0	-
28	7	6	6	6	6	0	0	0	0	0
29	6	6	5	5	6	0	0	0	0	0
30	5	6	q	5	5	0	0	0	1	0
31	5	6	6	6	6	0	0	0	0	0

Note No observations during the following periods:

15th 0650- 16th 0100
19th 2300- 2400
26th 0200- 27th 0950

q: quiet level, when radiometer is unstable.

SOLAR RADIO EMISSION

Flux Density

Month: July 1972
Observing station: Hiraiso Frequency: 500 MHz

Flux density 10^{-22} Wm^{-2} Hz^{-1}

UT	00-03	03-06	06-09	21-24	Day
Date					
1	30	31	29	28	29
2	30	29	30	q	29
3	q	30	27	27	28
4	28	28	27	29	28
5	29	30	28	29	29
6	30	29	28	29	29
7	30	28	27	27	28
8	q	q	q	q	27
9	q	q	q	q	q
10	q	30	29	29	30
11	29	30	30	30	30
12	29	29	27	26	29
13	29	29	27	28	28
14	29	27	27	28	28
15	28	28	(28)	-	28
16	26	28	27	27	27
17	27	27	27	27	27
18	26	27	25	25	26
19	25	25	26	25	25
20	25	25	26	26	25
21	25	23	24	26	24
22	26	25	24	26	25
23	26	25	24	26	25
24	26	25	24	26	25
25	27	26	25	27	26
26	26	26	25	25	26
27	25	24	25	27	25
28	27	27	28	28	27
29	28	29	28	28	28
30	28	27	27	26	28
31	26	26	28	27	26

Note No observations during the following periods:

15th 0700- 16th 0100

q: quiet level, when radiometer is unstable.

Distinctive Events

(single-frequency observations)

Month: July 1972
Observing station: Hiraiso
Normal observing period: 1930 - 0950 (sunrise to sunset)

Date	Frequency	Starting time	Time of maximum	Duration	Type	Flux density 10^{-22} Wm^{-2}Hz^{-1}		Remarks
	MHz	UT	UT	minutes		peak	mean	
15	200	0409.5	0410.0	2.5	C	60	10	
	100	0409.5	0410.3	2.5	C	80	40	P: l
18	100	0235	0248	28	RF	10	5	P: O
19	100	0343	0348	17	RF	15	7	P: l
22	100	0340.0	0341.2	11.0	C	140	25	P: l
		0552.4	0552.9	1.2	C	130	40	P: l
25	100	0012.8	0013.2	1.3	C	>1000	>100	P: L
26	100	0014.0	0014.2	0.8	C	>1000	>500	P: L
		0015.4	0015.8	1.0	C	500	200	P: L
		0642.2	0642.5	0.5	C	180	100	P: R
27	100	0632.5	0634.1	3.5	C	115	40	P: r
28	100	0122.0	0122.5	5.0	C	140	40	P: r
	200	0124.0	0125.5	3.0	C	270	40	
30	100	0715.0	0717.3	3.0	C	200	80	P: l
		0719.5	0719.7	1.0	C	140	50	P: l
	200	2155.0	2155.0	0.5	C	140	-	

P: means polarization degree.

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

JUL 1972 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

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

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

JUL 1972 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	-1	8	3	8	8	17	20	23	20	21	17	19	15	17	18	14	19	16	ES 2	15	5	7	-1	-5
2	-3	0	3	5	11	16	20	17	20	28	22	21	20	15	17	19	21	15	6	12	10	8	3	-2
3	-3	-9	-2	-1	5	8	14	17	22	21	18	22	22	21	18	11	17	16	19	11	16	3	5	-6
4	-5	5	2	ES 11	ES 14	14	15	20	22	24	22	21	21	22	22	19	17	18	13	10	9	10	2	1
5	-4	-3	-4	10	8	12	17	19	22	22	21	18	23	24	17	10	20	18	14	14	7	1	1	-2
6	-1	-3	-2	3	7	13	18	0	21	22	22	19	22	23	9	11	14	19	15	14	9	2	9	7
7	5	3	-2	8	13	17	20	20	23	21	21	23	20	27	22	23	23	20	21	15	9	12	5	-3
8	-8	2	7	4	12	19	18	21	19	20	18	22	18	13	16	-2	0	7	2	-6	-3	2	-2	-10
9	ES -23	-5	-8	4	9	8	16	17	20	24	17	14	17	13	17	13	21	16	14	15	12	6	0	-3
10	-3	0	2	1	13	17	19	21	25	22	25	20	19	17	13	16	18	17	-1	16	13	4	0	7
11	3	4	1	6	12	14	22	22	25	22	22	20	19	19	15	10	5	17	8	14	9	11	8	0
12	-2	-3	3	7	14	17	20	22	22	22	22	21	14	14	14	4	2	13	8	8	14	9	7	-4
13	-2	-2	2	3	12	17	16	20	22	20	14	22	14	16	ES 6	-6	1	7	1	2	-2	2	-4	-4
14	-7	-3	-3	7	15	12	16	16	25	13	21	13	7	11	ES 14	3	13	8	10	14	6	10	-2	-4
15	8	2	3	5	12	17	20	17	22	19	22	18	18	17	17	11	1	15	8	8	7	4	8	-1
16	1	-2	-2	-1	11	17	16	21	20	23	22	22	24	20	6	-1	1	-2	-9	12	11	10	-3	-11
17	-13	-9	2	6	10	15	19	21	19	23	20	10	15	20	18	13	12	6	2	12	13	10	2	-1
18	-4	7	3	8	12	16	19	17	26	11	19	7	5	8	ES 6	ES -13	2	16	-3	6	8	6	1	5
19	-4	-2	1	7	11	15	17	18	21	22	20	25	19	23	25	-15	-15	13	ES 12	13	6	2	2	0
20	0	1	1	1	9	6	10	18	24	24	19	20	18	11	11	10	17	10	-2	15	4	10	-5	-5
21	0	5	10	10	12	18	18	22	23	23	19	25	20	17	12	7	4	0	14	9	9	-1	-2	-13
22	-1	-1	0	8	10	16	18	22	23	20	21	21	13	16	19	4	0	9	-3	14	11	13	8	7
23	0	1	4	7	14	14	20	21	25	24	21	19	20	21	17	14	9	16	6	7	5	5	0	-4
24	0	-1	3	5	13	13	14	18	19	14	18	13	17	15	ES 18	-7	10	5	4	9	13	7	9	0
25	1	0	2	ES 6	10	10	17	15	22	23	24	14	10	6	5	9	-1	5	6	3	-2	8	4	1
26	-9	-1	1	4	1	1	-2	11	15	14	16	14	ES -1	ES -13	ES -20	ES -26	ES -26	ES -26	ES -26	-3	1	-1	0	-6
27	-4	-4	-1	5	4	10	15	19	19	14	18	20	14	7	3	9	-1	11	-8	8	8	7	4	-1
28	6	3	8	7	15	15	20	27	25	26	17	16	17	18	11	17	-7	8	15	15	8	1	-3	-7
29	1	-1	-3	3	7	11	17	21	14	15	11	8	13	9	13	5	5	5	-5	0	5	5	-1	-4
30	-3	-1	4	7	9	15	17	14	28	23	5	23	9	3	ES 10	6	10	7	9	6	7	13	13	9
31	8	7	9	17	19	23	27	21	29	25	26	29	22	26	11	23	9	8	18	14	10	-2	6	-2
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	-2	-1	2	US 6	US 11	15	18	20	22	22	20	20	18	17	US 14	10	9	11	US 6	12	8	6	2	-2
UD	6	7	8	ES 10	15	18	20	22	26	25	24	25	22	24	22	19	21	18	18	15	13	12	9	7
LD	-9	-5	-3	ES 1	ES 5	8	14	14	19	14	14	10	7	6	ES 5	ES -13	-7	0	ES -8	0	-2	-1	-3	-10

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Jul. 1972	Whole Day Index		W W V 00 06 12 18 / 06 12 18 24	L M 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Warning 00 06 12 18 / 06 12 18 24	Principal magnetic storms Start	End	ΔH
1	4-		4 (4) 4 (4)	2 4 (4) -	4 4 4 4	N N N N			
2	4+		(4)(5) 4 (5)	(4) - - -	4 4 4 4	N N N N			
3	4+		4 (5) 4 (5)	4 4 (4) 4	3 4 4 4	N N N N			
4	4°		(4)(5) 4 (4)	4 3 (3)(4)	4 4 5 4	N N N N			
5	4°		4 (4) 4 4	3 4 (4)(4)	4 4 5 4	N N N N			
6	4°		(4)(5) 4 (4)	3 4 (4) 4	4 4 4 5	N N N N			
7	4°		(4)(4) 5 4	3 4 (4)(4)	4 4 5 4	N N N N			
8	3+		3 (3) 3 3	4 4 (4)(4)	4 4 4 3	N N N N			
9	4-		3 (4) 4 4	(4) - - -	3 4 4 4	N N N N			
10	4+		4 (5) 4 4	5 - - (4)	4 4 4 4	N N N N			
[11]	4°		4 (4) 4 (5)	3 4 (3) 4	4 4 4 4	N N N N			
[12]	4+		4 (4)(4) 5	5 4 (4)(4)	4 4 4 4	N N N N			
[13]	4-		4 (4)(3) 4	3 4 (4) 4	4 4 3 3	N N N N			
14	4+		4 (4) 5 4	5 (4) - (4)	4 4 4 4	N N N N			
15	4°		4 (4) 4 4	3 4 (4) -	4 4 4 4	N N N N			
16	4°		4 (4) 4 3	(5) - - -	4 4 3 3	N N N N			
17	4-		4 (3)(3) 4	4 4 (4) 4	4 4 4 4	N N N N			
18	4°		4 (4) 4 4	5 4 (4) 4	4 4 3 4	N N N N			
19	4°		4 (3) 4 4	5 4 (4) 5	4 4 4 4	N N N N			
20	4°		(4)(4) 4 4	4 4 (4) 4	4 4 4 4	N N N N			
21	4°		4 (4) 4 4	4 4 (4) 4	4 4 4 4	N N N N			
22	4°		4 (4) 4 (5)	4 (3)(4) -	4 4 3 4	N N N N			
23	4-		4 (4)(3) 3	(5) - - -	4 4 4 4	N N N N			
24	4°		4 (4) 4 3	4 4 (4)(4)	4 4 4 4	N N N N	10.0	---	87γ
25	3°		(3)(3)(2)(2)	3 4 (4) 4	4 4 3 4	N N N N	---	---	
26	3°		3 (2)(2)(3)	4 3 (4)(4)	3 3 (1) 3	N N N N	---	---	
27	3+		3 (2)(3) 4	4 4 (4) 4	4 4 3 4	N U U U	---	24.0	
28	4-		4 (4) 3 4	4 4 (3)(4)	4 4 4 4	U U U U			
29	4-		4 (3) 4 4	3 4 (4)(4)	4 3 3 4	N N N N			
30	4°		4 (4) 4 4	4 - - (4)	4 4 4 4	N N N N			
31	4°		4 (3) 4 (4)	5 (4) - 4	5 5 4 4	N N N N			

GEOALERT

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

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

C = artificial accident
--- = continuing magnetic storm

SUDDEN IONOSPHERIC DISTURBANCES

(S.I.D.)

HIRAISO

Time in U.T.

Jul. 1972	S W F						Correspondence		
	Drop-out Intensities (db) CO LM HA TO SH	Start-time	Dura-tion	Type	Imp.	Flare	Solar Noise	Mag.
3	8	01.32	35	G	1-			

I N U B O

1972	S P A									Remarks
Jul.	Phase Advance (degrees)						Time (U.T.)			
DATE	NAA	NWC	NPG	HA3	AL3		Start	End	Maximum	
1		8					0315	0336	0320	
3	6	—	11	22			0150	0233	0200	X
3	10	8	7				2330	2355	2337	
4	9	8	7	13			0021	0101	0031	
4	10	24	7	12			0527	0614	0532	X
4		8					0723	0754	0726	
4			9	6			2210	2245	2217	
5	—	16	12	13			0058	0140	0104	X
6		16*	7*				0103	0145	0124	X
6		20	7	9			0203	0256	0220	X
6		64	11				0647	0830	0700	
6		12	7	9			2353	0018	2358	
8		12	5	9			0028	0100	0037	X
8		16	5	9			0248	0340	0253	X
8		18	3	9			0434	0520	0441	X
8		12					0733	0823	0735	
10		8					0353	0430	0357	
10		12					0832	0923	0840	X
14		28	16	23			0002	0107	0010	
14	36		45	58			1956	2145	2024	X
15	17	48	20	33	21		0254	0409	0258	X
21			14	20			2056	2157	2114	X
23			3	4			2152	2209	2156	
28		8	3				0123	0143	0129	
28		12					0615	0650	0620	
28			4	9			2144	2221	2149	
31		—	—	12			0121	0153	0131	
31		16	3				0428	0456	0432	
31			5	—	—		2303	2327	2309	

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

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

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

IONOSPHERIC DATA IN JAPAN FOR JULY 1972

第 24 巻 第 7 号

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編集兼
発行人 今野清恒
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発行所 郵政省電波研究所
〒184 東京都小金井市貫井北町4丁目2－1
☎ (0423)(21)1211(代)

印刷所 株式会社 真成社
〒162 東京都新宿区筑土八幡町8
☎ (260)5279