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IONOSPHERIC DATA IN JAPAN

FOR DECEMBER 1958

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Prepared by

THE RADIO RESEARCH LABORATORIES

KOKUBUNJI, TOKYO, JAPAN

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THE RADIO RESEARCH LABORATORIES

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CONTENTS

SITES OF THE RADIO WAVE OBSERVATORIES

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

	Latitude	Longitude	Site
Wakkanai	45°23.6′N.	141°41.1′E.	Wakkanai-shi, Hokkaido
Akita	39°43.5′N.	140°03.2′E.	Tegata Nishishin-machi, Akita-shi, Akita-ken
Kokubunji	35°42.4′N.	139°29.3′E.	Koganei-machi, Kitatama-gun, Tokyo-to
Yamagawa	31°12.5′N.	130°37.7′E.	Yamagawa-machi, Ibusuki-gun, Kagoshima-ken

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

	Latitude	Longitude	Site
Hiraiso	36°22.0′N.	140°37.5′E.	Hiraiso-machi, Nakaminato-shi, Ibaragi-ken

SYMBOLS AND TERMINOLOGY

A. IONOSPHERE

All symbols and terminology in the table of ionospheric data are used in accordance with the First Report of the Special Committee on World-Wide Ionospheric Soundings (URSI/AGI), Brussels, September 2, 1956, and the Second Report of the Committee, May, 1957, supplementary to the First Report.

Terminology

f_0F2, f_0F1, f_0E — The ordinary-wave critical frequency for the $F2$, $F1$ and E layers respectively.

f_0E_s — The ordinary wave top frequency corresponding to highest frequency at which a mainly continuous trace is observed.

f_bE_s — The ordinary wave frequency at which the highest blanketing E_s layer becomes effectively transparent. This is usually determined from the minimum frequency at which reflections from layers at greater heights are observed.

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

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

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

$h'F2$ — The minimum virtual height, $h'F2$, refers to the highest, most stable stratification observed in the F region and can only be scaled when such stratification is present.

$h'F$ — The natural and most significant F region virtual height parameter is that for lowest F region stratification. This will be denoted by $h'F$. Thus $h'F$ is identical with the current $h'F2$ when F region stratification is absent, e. g., at night, and with the current $h'F1$ when $F1$ stratification is present.

$h'E_s$ The lowest virtual height of the trace used to give the f_0E_s.

$hpF2$ The virtual height of the $F2$ layer measured on the ordinary-wave branch 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 Symbols

Used following the numerical value on monthly tabulation sheets.

A Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example E_s.

B Measurement influenced by, or impossible because of, absorption in the vicinity of f-min.

C Measurement influenced by, or impossible because of, any non-ionospheric reason.

D Measurement influenced by, or impossible because of, the upper limit of the nomal 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 is too small compared with that of a lower thick layer.

H Measurement influenced by, or impossible because of, the presence of a stratification.

L Measurement influenced by or impossible because the trace has no sufficiently definite cusp between layers.

M Measurement questionable because the ordinary and extraordinary components are not distinguishable.

N Conditions are such that the measurement cannot readily be interpreted, for example, in the presence of oblique echoes.

O Measurement refers to the ordinary component.

R Measurement influenced by, or impossible because of, absorption in the vicinity of a critical frequency.

S Measurement influenced by, or impossible because of, interference or atmospherics.

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 Symbols

Used as a preceeding symbol on monthly tabulation sheets.

D *greater than.....*

E *less than.....*

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

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 magnetoionic component.

c. Description of Standard Types of E_s

The nine standard types of E_s are identified by small (lower case) letters: *l*, *c*, *h*, *q*, *r*, *a*, *s*, *f*, *n*. These letters are suggestive of the names low, cusp, high, equatorial, retardation, auroral, slant, flat and unclassified, respectively; it is strongly emphasized that these names are suggestive, not restrictive. The standard types are:

l A flat E_s trace at or below the normal E layer minimum virtual height. Use in daytime only.

c An E_s trace showing a relatively symmetrical cusp at or below f_0E. This is usually continuous with the normal E trace though, when the deviative absorption is large, part or all of the cusp may be missing. Use in daytime only.

h An E_s trace showing a discontinuity *in height* with the normal E layer trace at or above f_0E. The cusp is not symmetrical, the low frequency end of the E_s trace lying clearly above the high frequency end of the normal E trace. Use in daytime only.

q An E_s trace which is diffuse and non-blanketing over a wide frequency range. The spread is most pronounced at the upper edge of the trace. (This type is common in daytime in the vicinity of the magnetic equator.)

r An E_s trace which is non-blanketing over part or all of its frequency range showing an increase in virtual height at the high frequency end similar to group retardation. This is distinguished at present from true group retardation (a blanketing thich layer included in the E layer tables: f_0E, $h'E$) by the lack of group retardation in the F traces at corresponding frequencies.

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

s A diffuse E_s trace which rises steadily with frequency. This usually emerges from another E_s trace which should be classified separately. At high latitudes the slant trace usually starts to rise from a horizontal E_s trace, *l*, *h* or *f*, and frequencies which greatly exceed the E layer critical frequency (e.g. about 6 Mc/s) whereas at low latitudes it usually rises from equatorial type E_s, *q*, at frequencies near the E region critical frequency.

f An E_s trace which shows no appreciable increase of height with

frequency. The trace is usually relatively solid at most latitudes. This classification may only be used at night; apparently flat E_s traces observed in the daytime are classified according to their virtual height: *h* or *l*.

n An *E* trace which cannot be classified into one of the standard types. This must not be used for intermediate cases between any two classes. A choice should always be made whenever possible, even if it is doubtful.

d. Multiple Reflections from E_s

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

B. SOLAR RADIO EMISSION

Solar radio emission is received on 200 Mc at Hiraiso Radio Wave Observatory using a 6×4 dipole broadside array and an ordinary superheterodyne receiver. The type of observation is of intensity recording of both steady flux and outstanding occurrences.

a. Daily Data

Steady flux The mean value of recorded base level. Outstanding occurrences are to be omitted except the phenomena with duration of hours or more.

Variability Variability is expressed in four grades as follows:

0=no burst
1=a few bursts
2=many bursts
3=exceptionally many bursts

Number of bursts is determined relatively in comparison with the base level. If the number of bursts be fixed, the variability is greater, when bursts are widely distributed, than in the case of being concentrated in a short period.

b. Outstanding occurrences

Starting time When the start is not obvious, 20% rise time of smoothed flux is adopted and *x* is suffixed. (e.g. 0234*x*)

Maximum time When the instantaneous maximum can not be taken, the smoothed maximum is used and *x* is suffixed. (e.g. 0539*x*)

Time of end When the phenomena have ended obscurely the time of 20% of maximum smoothed flux is written.

Type Outstanding emissions are classified as follows: On another point of view, the classification in the URSI Interchange code is to be added.

S : simple rise and fall of intensity
C : complex variation of intensity
A : appears to be part of general activity
D : distinct from (i.e. apparently superposed upon) the general

activity

M : multiple peaks separated by relatively long period of quietness

F : multiple peaks separated by relatively short period of quietness

E : sudden commencement or rise of activity

Combined letters express one phenomenon (e.g. SD, ECD); letters joined by + express some phenomena occurring in parallel; the preceding term is more important (e.g. SD+F, SA+C).

Maximum intensity

Instantaneous : The highest value above the base level.

Smoothed : By multiplying the duration, the approximate total power of the phenomenon con be estimated.

C. RADIO PROPAGATION CONDITIONS

a. Radio Propagation Quality Figures

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

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

The tabulated circuits contain WWV (frequencies 10, 15, 20 Mc broadcast from Washington, D.C.), San Francisco (commercial circuit) and WWVH (frequencies 10, 15 Mc broadcast from Hawaii), which are received at Hiraiso Radio Wave Observatory near Tokyo.

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

N=normal
U=unstable
W=disturbed

The letter W expresses disturbed condition expected to be during the following 12 hours after issue. The letter U and N means also unstable or normal conditions, respectively.

Whole day radio quality indices are the weighted averages of the 6-hourly indices of WWV and S.F., with half weight given to quality grade 2 (normal). This procedure is taken to avoid the concentration of the whole day indices to grade 2.

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

b. Sudden Ionospheric Disturbances (S. I. D.)

The data of short wave fade-out (SWF) are preparated from the field intensity records on following circuits received at Hiraiso. Characteristics of the phenomenon are classified as follows.

Circuits and Drop-out intensity

W S .....WWV 20 Mc, 15 Mc and 10 Mc (Washington)
S F .....WNA-27: 7.6550 Mc, WND-20: 10.4925 Mc, WNC-93: 13.7525 Mc, WMJ-30A2: 20.8173 Mc (San Francisco)
H A.....WWVH 15 Mc and 10 Mc (Hawaii)
T O.....JJY 15 Mc and 10 Mc (Tokyo)
M N.....DZM-28: 14.5850 Mc (Manila)
L N.....GIJ-34: 14.6702 Mc (London)

Start-time and Duration, Types and Importances are described from the data of a circuit whose Drop-out Intensity is underlined. Drop-out Intensities of 10 Mc, 15 Mc and 20 Mc for WWV, WWVH and JJY are marked; 10 Mc ('), 15 Mc (none) and 20 Mc (").

Start-times and Durations

Types

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

Importances

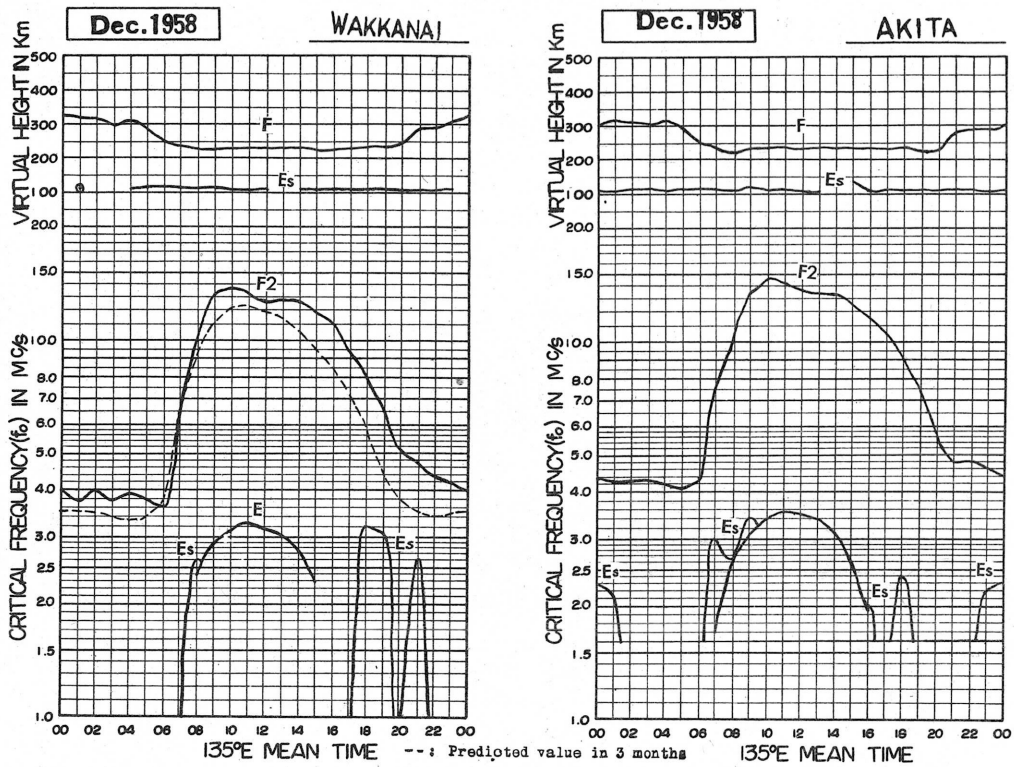
Degrees of SWF are classified into 9 grades according to the amplitude of fade-out;

1−	1	1+
2−	2	2+
3−	3	3+

The data of sudden enhancement of atmospheric (SEA) observed on 28 kc are tabulated on each *Start-time, Duration and Importance.*

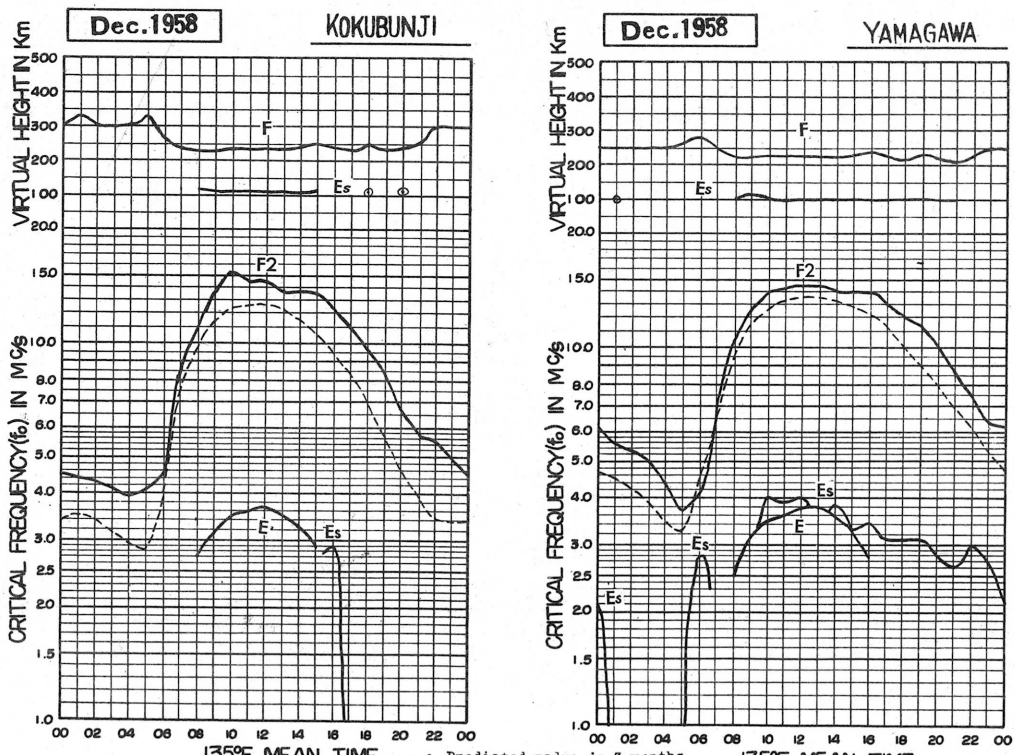
Besides, the time associated phenomena of SID's, that is, solar flare, solar radio noise outburst and crochet (solar flare effect in magnetic record) are given in this table from interchange messages or measurements at Hiraiso.

IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS



--: Predicted value in 3 months advance by R.R.L.

IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS



--: Predicted value in 3 months advance by R.R.L.

IONOSPHERIC DATA

Wakkanai

Lat. 45° 23.6' N
Long. 141° 41.1' E

Dec. 1958 | foF2 | 135° E Mean Time (G.M.T.+ 9h.)

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	3.8	3.8	3.8	3.8	3.8	3.8	4.0	8.3	10.8	J13.5R	I14.4R	I14.0R	J13.5R	13.0H	12.8	12.1	11.2	9.7	I8.3S	U7.0S	5.2	4.8	4.7	4.4
2	4.3	4.3	4.3	4.2	4.1	4.2	4.6	8.3	11.8	13.4	14.6	U14.3R	13.3H	J13.4RH	U13.4RH	12.6	11.3	10.8	8.3	6.5	4.8	4.7	4.4	4.3
3	4.0	4.0	4.1	4.3	4.0	3.8	I4.0A	J8.3S	13.5	R	R	R	R	R	R	U14.3R	13.3	10.9	9.3	U7.3S	6.3	6.3	5.7	4.9
4	4.6	4.6	4.5	4.4	4.3	4.6	3.5	U7.8S	C	R	R	R	R	U14.6RH	U14.0R	13.5	12.2	10.5	9.2	6.1	5.8	5.6	6.4	4.7
5	4.0	3.8	4.0	3.5	3.0	2.9	3.3	I6.3S	8.3	8.8	10.3H	10.3H	11.0H	11.7	11.5H	11.1	J10.8S	7.8	U7.0S	U7.1S	U6.2S	F	F	F
6	F	F	I5.9S	5.3	I4.7F	4.8	5.3	9.7	U13.3R	R	R	R	R	R	14.3	13.5	12.3	10.7	U7.6S	6.8	5.4	5.1	5.0	4.6
7	I4.6F	4.3	4.3	4.5	4.3	4.3	3.9	U7.3S	C	C	C	C	C	C	C	C	C	9.3	8.3	U8.0S	5.1	4.4	4.4	4.4
8	4.0F	F	F	F	F	F	4.1	I8.0S	12.3	I13.3R	14.4	14.5	13.4	13.0	12.9	12.3	11.5	9.3	I7.5S	U6.6S	4.8	4.5	U4.5S	4.5
9	4.7	4.3F	4.0	4.0	4.5	4.6	3.3	6.6	12.8	R	R	R	I14.2R	14.0H	U13.0R	13.0	11.6	9.7	U7.8S	I7.6S	6.3	5.3	4.5	4.1
10	4.3	4.4	4.3	3.8	3.8	4.3	4.0	8.0	R	R	R	R	R	RH	R	11.7	11.3	8.8	U7.5S	6.0	3.8	3.6	3.5	3.6
11	3.8	3.7	3.8	3.7	3.8	4.0	4.1	7.8	11.6	I14.3R	U14.3R	I13.8R	12.7H	13.0	12.8	11.6	10.8	8.8	6.4	5.7	4.1	U4.5S	4.0	4.0
12	4.0	3.8	3.8	4.0	4.0	3.8	3.3	6.3	10.0	13.2	I14.2R	13.5	12.2H	12.6	11.8	11.2	10.0	U8.0S	6.1	4.8	3.6	3.6F	3.6	3.7
13	3.6	3.6	3.7	3.8	3.6	3.6	I3.2S	6.2	10.2	13.2	J13.8R	12.8	12.3H	12.3H	11.5	11.8	11.1	8.5	6.8	6.0	5.2	5.0	4.5	3.8
14	3.4	3.5F	3.6	3.7F	3.2F	3.3	3.5F	5.8H	11.5	13.3	I14.6R	U14.0R	13.8	U13.3RH	13.3	12.3	11.0	9.7	8.3	6.2	5.1	4.9	4.6	4.2
15	3.6	3.6F	3.4	3.4	4.0	C	C	C	C	13.6	R	R	R	R	14.1	U13.8R	12.3	J10.3S	U8.5S	7.4	5.0	4.5	4.5	4.5
16	4.2	4.1	4.0	4.3	4.3	4.3	3.6	6.3	9.5	13.8	I14.4R	14.5	I13.8R	12.8	12.3	11.8H	12.4	U10.5S	9.3	6.0	5.0	5.2	4.7	4.6
17	I4.8F	4.8F	I4.4F	4.2F	I4.1F	4.0	4.1	6.8	J11.3R	13.1	13.0	J13.1R	12.8	13.3	12.3	10.5	11.2	9.3	I7.8S	5.4	4.0	4.0	3.8	3.8
18	4.1	3.8	3.4	3.1F	3.0F	2.2F	2.8	U6.5S	9.5	12.5H	13.2H	13.0	I13.4R	I13.8R	I13.7RH	12.3	10.3	J10.3S	J8.2S	6.7	5.3	5.3	5.3	5.3
19	4.9	5.0	4.9	4.9	4.7	4.7	4.1	6.4	9.8	11.2	13.0H	12.9	11.8H	12.8	12.3	11.7	U10.5SH	U7.8S	U7.5S	7.0	5.5	5.2	5.2	4.4
20	4.8	4.3	4.5	4.5	4.5	4.6	4.4	6.6	10.0	11.5	J13.3R	13.3H	12.5H	11.9	12.5	11.8	9.3	7.5	I7.1S	6.5	3.8	3.6	3.6	3.7
21	3.8	4.0	3.8	3.8	3.7	3.6	3.9	6.3	10.1	12.0	13.3	U13.3R	11.7H	11.8H	11.7	10.2	U10.3S	7.3	7.0	5.9	3.7	3.1	3.4	3.5
22	3.4	3.5	3.4	3.5	3.6	3.5	3.7	6.3	9.5	11.8H	I12.6R	I13.3R	12.5	12.5	12.5	11.2	9.5	8.8	I7.0C	5.2	3.6	3.3	3.1	3.3
23	3.4	3.3	3.3	3.5	3.8	3.0	2.5	5.3	9.3	13.1	I13.6R	13.0	12.3	12.8	12.8	11.7	10.8	8.8	U7.2S	5.4	3.7	3.9	3.8	3.9
24	3.8	3.8	4.0	3.7	3.6	3.6	3.7	6.4	J10.7R	J13.3R	J13.8R	12.3H	12.6	12.8	12.2	11.7	10.6	9.0	I8.3S	6.0	3.9	I3.2A	3.3	3.3
25	3.4	3.4	3.3	3.3	3.4	3.4	3.2	5.5	8.5	11.1	13.4	11.8	12.3H	11.5	11.1	11.0	8.3	9.0	6.6	5.1	3.7	3.3	3.3	3.2
26	3.3	3.6	3.8	3.6	4.0	4.4	3.4	5.8	8.7	12.9	12.6	11.9	11.8	10.3	11.7H	10.3	9.3	U8.3S	U8.0S	5.3	3.9	4.2	4.1	3.6
27	3.4	3.7	4.0	3.3	3.0	3.0	3.2	6.3H	10.0	12.2	14.4	14.0	12.3	12.8H	12.7H	11.8	10.9	9.8	9.5	U7.5S	4.6	4.8	4.2	4.3
28	4.6	4.5	4.6	4.3	4.4	4.2	4.0	6.4	10.3	13.0	J14.3R	13.7	14.0H	13.0H	12.5	12.1	10.9	9.5	8.1	6.5	5.3	4.7	4.4	4.1
29	3.7	3.4	3.4	3.7	4.1	3.9	3.1	6.2	10.3	13.0	14.0	14.3	U13.7R	U13.3R	I14.0R	12.3	11.7	11.2	9.0	6.8	5.2	4.9	4.4	4.3
30	4.3	4.1	3.8F	3.8	3.6	3.0	I3.2A	5.8	J11.3R	R	R	R	R	RH	R	14.0	J13.8R	12.8	I10.8S	7.5	6.8	6.8	5.3	4.5
31	4.6	4.5	4.0	3.8	3.3	3.3F	2.9F	6.2	12.3	R	R	R	R	R	R	12.1	12.1	11.0	8.3	6.8	5.2	4.9	4.6	3.7
No.	30	29	30	30	30	29	30	30	27	23	22	22	23	24	26	30	30	31	31	31	31	30	30	30
Median	4.0	3.8	4.0	3.8	3.9	3.8	3.6	6.4	10.3	13.1	13.8	13.3	12.6	12.8	12.6	11.8	11.0	9.3	8.0	6.5	5.0	4.7	4.4	4.2
U.Q	4.6	4.3	4.3	4.3	4.3	4.3	4.0	7.8	11.6	13.3	14.4	14.0	13.5	13.3	13.3	12.3	11.9	10.5	8.3	7.0	5.3	5.1	4.7	4.5
L.Q	3.6	3.6	3.7	3.6	3.6	3.4	3.2	6.2	9.5	12.0	13.2	12.9	12.3	12.4	12.2	11.6	10.3	8.8	7.1	5.9	3.9	3.9	3.8	3.7
Q.R	1.0	0.7	0.6	0.7	0.7	0.9	0.8	1.6	2.1	1.3	1.2	1.1	1.2	0.9	1.1	0.7	1.6	1.7	1.2	1.1	1.4	1.2	0.9	0.8

foF2

Sweep 1.0 Mc to 20.7 Mc in 1 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

W 1

IONOSPHERIC DATA

Dec. 1958 | foF1 | 135° E Mean Time (G.M.T.+ 9h.) | Wakkanai | Lat. 45° 23.6' N | Long. 141° 41.1' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4									C															
5																								
6																								
7									C	C	C	C	C	C	C	C	C							
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15						C	C	C	C															
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																			C					
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
No.																								
Median																								

foF1

Sweep 1.0 Mc to 20.7 Mc in 1 min sec in automatic operation.

The Radio Research Laboratories, Japan.

W 2

IONOSPHERIC DATA

Dec. 1958 | foE | 135° E Mean Time (G.M.T. + 9h.)

Wakkanai

Lat. 45° 23.6' N
Long. 141° 41.1' E

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	2.55	2.95	3.20	3.30	3.25	3.20	2.75	2.30								
2									2.55^{H}	2.95	3.15	3.40	3.40^{H}	3.30	2.90	2.35								
3									I 2.55^{A}	2.80	3.10	3.35	3.20	3.05	2.90	2.35^{H}								
4								1.90	I 2.60^{C}	2.95	3.20	3.35	3.45	3.05	2.75	I 2.40^{A}								
5									A	2.90	3.10	3.10	3.10	3.00	I 2.65^{A}	2.25								
6									2.60	I 2.95^{A}	I 3.25^{A}	3.30	3.20	3.00	2.60	2.35								
7									C	C	C	C	C	C	C	C								
8									2.40	2.90	3.05	3.25	3.20	3.05	2.80^{H}	2.60^{H}								
9								1.90	2.50	2.95	3.15	3.20	3.20	3.05	2.85	I 2.25^{C}								
10									2.35	2.90	3.10	3.35	3.35	3.10	2.80	2.10								
11									2.45	3.05	3.10	3.35	3.40	3.35	2.90	A								
12									I 2.45^{A}	3.00	3.10	3.40	3.40^{H}	I 3.15^{A}	2.90	2.35								
13									2.40	2.90	3.15	3.30	3.20	3.00	2.65	2.25								
14								S	2.45^{H}	2.90^{H}	A	A	A	3.05	2.90	S								
15								C	C	2.85	3.10	3.25	3.25	3.05	2.75	R								
16									2.00	2.80	3.00	3.25	3.40	3.10	2.75	2.30								
17									2.35	2.90	3.15	3.45	3.25	3.05	2.70	2.30								
18									I 2.35^{A}	2.90	3.00	3.10	3.10	2.90	2.80^{H}	2.25								
19									2.30	2.75	2.90	3.30	3.25	3.00	2.70	I 2.30^{A}								
20									2.35^{H}	2.90	3.00	3.25	3.20	3.00	2.65	A								
21									2.25^{H}	2.75	3.20	3.15	I 3.20^{A}	I 3.00^{A}	2.70	2.30								
22									2.30	I 2.70^{A}	I 3.00^{A}	3.20	3.15	3.05	I 2.70^{A}	2.30								
23									2.35	I 2.70^{A}	3.00	3.10	3.10	3.05	2.70	2.45								
24									I 2.50^{A}	I 2.70^{A}	I 2.90^{A}	3.10	3.10	3.00	2.70	I 2.40^{S}								
25									A	2.75	3.05	3.20	3.20	3.00	2.60	S								
26									S	2.90	3.05	3.20	3.20	3.05	2.75	2.30								
27									2.45	2.70	A	A	S	S	S	S								
28									R	A	3.00	3.05	3.20	3.10	2.75	S								
29									I 2.20^{S}	2.60	I 2.90^{A}	3.20	3.25	3.10	2.75	2.35								
30									A	2.70	3.05	3.20	3.25^{H}	3.10	I 2.80^{S}	S								
31									A	A	3.10	3.20	3.40	3.20	2.90	2.35	S							
No.								2	23	28	28	28	28	29	29	22								
Median								1.90	2.40	2.90	3.10	3.25	3.20	3.05	2.75	2.30								

foE

Sweep 1.0 Mc to 20.7 Mc in 1 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

W 3

IONOSPHERIC DATA

Dec. 1958 | foEs | 135° E Mean Time (G.M.T. + 9h.) | Wakkanai | Lat. 45° 23.6' N | Long. 141° 41.1' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	3.5M	3.5M	3.1M	E	E	E	E	3.0M	2.3G	G	G	3.5	3.5	3.5	3.5	2.9	E	5.7M	3.5M	6.0M	3.5M	E	3.5M	E
2	E	E	2.5M	E	E	E	E	E	G	G	G	G	G	5.5M	G	G	E	E	3.0M	3.5M	4.0M	2.5M	2.8M	2.7M
3	E	E	E	E	E	2.5M	7.0M	3.5M	3.5M	6.0M	G	G	G	G	G	G	E	E	5.5M	3.5M	E	3.2M	3.1M	E
4	E	E	E	E	E	E	E	G	C	G	G	G	G	G	2.3G	2.7M	E	E	E	E	E	3.0	3.5M	E
5	E	2.4M	2.4M	1.2	1.2	2.4M	2.7M	3.5M	5.5M	3.5	3.5	6.0M	G	G	3.5M	G	3.5M	E	E	E	E	E	E	E
6	3.5M	3.4M	2.5M	E	E	3.6M	7.0M	E	4.0	6.5M	4.8M	6.4M	5.3M	9.5M	5.3M	5.0M	5.2M	3.5M	3.5M	5.0	3.2M	2.5M	E	E
7	E	2.7M	3.1M	3.1M	2.4M	E	E	E	C	C	C	C	C	C	C	C	C	E	E	E	E	E	E	E
8	E	3.5M	E	E	E	E	E	E	2.7	G	G	G	G	G	G	G	E	E	E	E	E	E	E	E
9	E	E	E	E	E	E	E	G	3.5M	G	G	G	G	3.4	G	C	E	E	2.3M	3.1M	3.0M	3.3M	E	3.1M
10	E	E	E	2.4M	3.1M	2.2M	E	3.5M	G	G	G	3.5	3.5	3.5	3.5	3.5	E	3.0	7.5M	5.2M	3.1M	3.5M	E	E
11	E	E	E	E	E	E	E	E	G	G	3.5	G	G	G	3.5	2.4M	E	6.0M	3.3M	E	E	E	3.0M	3.0M
12	E	3.5M	E	3.0M	3.0M	E	3.5M	E	5.6M	G	G	G	G	4.5M	G	G	E	E	6.0M	4.2M	E	2.8M	E	E
13	E	E	E	E	E	E	4.5M	E	G	G	3.5	G	G	G	G	G	2.6M	4.5M	4.2M	4.9M	4.1M	E	E	3.5M
14	E	3.2M	2.5M	E	E	3.5M	3.5M	3.0M	G	3.5	5.8M	5.8M	5.2M	5.3M	3.5	S	E	4.0M	4.2M	3.5M	E	4.5M	E	3.1
15	3.0M	E	E	E	4.8M	C	C	C	C	3.0	G	G	G	G	2.3G	G	E	E	4.9M	3.3M	3.5M	3.1M	3.1M	E
16	E	3.5M	3.3M	E	E	E	3.5M	3.5M	3.4M	G	G	G	G	G	G	G	E	E	E	5.0M	3.0M	E	E	3.3M
17	E	3.2M	E	E	E	E	E	E	2.5	G	G	3.5	G	G	G	3.0M	2.7M	E	E	E	3.5M	3.5M	4.5M	E
18	3.3M	E	3.0M	E	4.4M	E	E	2.5M	3.5M	6.0M	4.4M	G	G	G	G	G	E	E	E	E	E	E	E	E
19	E	E	E	E	E	E	E	E	G	G	3.5	G	G	G	G	2.6M	3.5M	3.2M	2.7M	E	E	E	E	E
20	E	E	E	E	E	E	E	E	G	G	G	G	G	G	3.1	3.5M	E	4.2M	3.3M	E	2.3M	3.5M	3.2M	E
21	3.5	3.5M	E	E	2.4M	3.5M	E	E	G	G	G	G	3.5M	5.6M	3.5	G	E	E	3.1M	3.2M	E	E	E	E
22	E	2.7M	E	E	E	2.8M	3.1M	3.1M	3.0	3.0M	5.3M	5.7M	G	3.5	3.5M	G	E	3.3M	C	3.5M	E	2.6M	7.0M	2.5M
23	E	3.0M	E	4.7M	3.5M	E	3.0M	3.0M	G	3.5M	G	G	G	G	G	G	3.5M	4.0M	4.5M	4.5M	4.0M	3.1M	3.5M	E
24	E	E	E	E	E	E	2.9M	4.3M	3.4M	3.5M	3.5M	G	G	G	G	S	3.5M	6.0M	4.5M	5.3M	4.5M	7.0M	E	3.0M
25	E	3.5M	E	E	E	E	3.2M	2.5M	3.5	3.0	G	G	G	G	4.7M	2.4	3.0M	E	E	E	E	3.1M	3.2M	E
26	E	E	E	E	E	E	E	E	S	G	3.4	G	G	G	G	G	2.1M	2.7M	E	E	E	E	E	E
27	3.0M	E	E	3.0M	1.3	E	E	E	G	G	5.3M	4.0M	S	S	S	S	3.1M	E	E	3.0M	3.5M	E	E	E
28	E	E	E	E	E	E	E	E	G	3.2M	G	3.5	3.5	G	G	S	E	E	3.5M	2.9M	E	3.0M	E	2.8M
29	E	E	E	E	E	3.0M	E	E	S	2.9	4.1M	G	G	G	G	2.9	5.0M	5.2M	3.5M	E	E	E	2.5M	E
30	E	E	E	E	E	2.3M	5.7M	3.0M	2.6M	G	G	G	G	G	3.5	5.5M	3.5M	4.5M	5.7M	5.0M	3.4M	6.0M	E	E
31	3.5M	3.3M	E	E	3.5M	E	E	E	2.8M	6.2M	3.0G	G	G	G	G	3.5	S	E	E	E	4.5M	3.2M	3.5M	E
No.	31	31	31	31	31	30	30	30	26	30	30	30	29	29	29	25	29	31	30	31	31	31	31	31
Median	E	E	E	E	E	E	E	E	2.6	G	G	G	G	G	G	G	E	E	3.2	3.1	E	2.6	E	E
U.Q	E	3.3	2.4	E	2.4	2.3	3.2	3.0	3.5	3.5	3.5	3.5	G	3.5	3.5	3.0	3.3	4.0	4.2	4.5	3.5	3.2	3.2	2.7
L.Q	E	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	E	E	E	E	E	E	E	E
Q.R																								

foEs

Sweep 1.0 Mc to 20.7 Mc in 1 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

W 4

IONOSPHERIC DATA

Wakkanai

Lat. 45° 23.6' N
Long. 141° 41.1' E

Dec. 1958

fbEs

135° E Mean Time (G.M.T.+ 9h.)

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					2.0	2.0			2.3	2.5	2.4	2.5	G		2.4	E	E	E		E	
														G					E	E	E	E	E	E
2			E																E	2.1		E	E	
3						E	A	E	2.5	G					2.0	2.5						E	E	
									C															
4															2.9		E							
5		E	E	E	E	E	E	E	2.4	2.5	2.8	G												
6	E	E	E			2.6	3.0		2.5	6.0	3.8	2.7	2.4	2.1	2.3	4.0	4.6	2.7	3.4	E	E	E		
									C	C	C	C	C	C	C	C	C							
7		E	E	E	E				G															
8		E																	E	24	E	E		E
									2.2					2.7		C								
9																		E	3.0	2.5	E	E		
10				E	E	E		2.0				2.6	2.5	2.5	2.5	G							E	E
11											G				G	2.4		3.0	2.1			E		
																			4.0	E				
12		E		E	E		E		4.5					3.2			E	3.1	2.7	2.6	2.4			E
13							E				2.4											E		E
14		E	E			2.1	E	G		2.4	3.4	3.2	3.2	G	G	S		2.2	2.5	E				
15	E				E	C	C	C	C	2.4					2.2				E	2.4	E	E	E	
16		E	E				E	E	G											2.3	E			E
									2.0			2.4				1.9	2.1				E	E	E	
17		E																						
18	E		E		E			E	2.4	2.6	2.2					2.4	E	E	E					
19											2.2										E	E	E	
20															2.4	2.5		2.2	E					
21	E	E			E	E							3.2	3.7	2.4				E	E				
22		E				E	E	2.2	2.1	3.0	3.0	2.5		G	3.0			E	C	E		E	E	E
23		E		E	E		E	E		3.0							E	E	E	E	E	E	E	
24							E	2.4	2.6	2.8	3.0					S	E	3.0	E	E	E	A		E
25		E					E	E	2.5	G					3.9	G	E					E	E	
26									S		G						E	E						
27	E			E	E						3.1	3.7	S	S	S	S	2.4			E	E			
28										3.0		G	2.7			S			E	E		E		E
29						E			S	G	3.1					G	4.0	E	E				E	
30						E	A	E	2.5						G	G	E	E	3.5	E	E	3.0		
31	E	E			E				2.5	5.5	2.7					G	S				2.4	E	E	
No.	7	14	8	6	10	9	12	12	15	13	13	9	6	9	13	12	12	14	19	18	15	18	13	9
Median	E	E	E	E	E	E	E	E	2.4	2.6	2.8	2.5	2.6	2.4	2.4	G	E	E	E	E	E	E	E	E

fbEs

Sweep 1.0 Mc to 20.7 Mc in 1 min sec in automatic operation.

The Radio Research Laboratories, Japan.

W 5

IONOSPHERIC DATA

Dec. 1958 | f-min | 135° E Mean Time (G.M.T.+ 9h.) | Wakkanai | Lat. 45° 23.6' N | Long. 141° 41.1' E

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	E1.70 S	E1.20 S	E1.40 S	E1.40 S	E	E1.55 S	E1.60 S	E1.60 S	E1.70 S	E1.70 S	E2.00 S	E1.90 S	E2.00 S	E2.00 S	E1.80 S	E1.70 S	E1.75 S	E1.60 S	E1.60 S	E1.60 S	E1.80 S	E1.60 S	E1.60 S	E1.60 S
2	E1.60 S	E1.40 S	E	E	E	E1.60 S	E1.60 S	E1.80 S	E1.70 S	E1.70 S	E1.80 S	E2.00 S	E2.00 S	E2.05 S	E2.00 S	E1.70 S	E1.70 S	E1.75 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
3	E1.70 S	E1.25 S	E1.10 S	E	E	E1.50 S	E1.60 S	E1.60 S	E1.75 S	E1.80 S	E2.00 S	E1.90 S	E2.00 S	E1.90 S	E1.80 S	E1.75 S	E1.70 S	E1.60 S	E1.70 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
4	E1.75 S	E1.40 S	E1.10 S	E1.10 S	E1.10 S	E1.55 S	E1.60 S	E1.65 S	C	E1.80 S	E2.00 S	E2.00 S	E2.00 S	E2.05 S	E1.80 S	E1.85 S	E1.90 S	E1.70 S	E1.60 S	E1.60 S	E1.90 S	E1.60 S	E1.60 S	E1.60 S
5	E1.60 S	E1.25 S	E1.10 S	E	E	E1.25 S	E1.60 S	E1.60 S	E1.70 S	E1.75 S	E1.75 S	E1.80 S	E2.00 S	E1.90 S	E1.85 S	E1.70 S	E1.70 S	E1.60 S	E1.60 S	E1.60 S	E1.65 S	E1.60 S	E1.60 S	E1.60 S
6	E1.60 S	E1.30 S	E	E	E	E1.50 S	E1.60 S	E2.00 S	E1.70 S	E1.65 S	E1.70 S	E1.70 S	E1.70 S	E1.70 S	E1.75 S	E1.80 S	E1.70 S	E1.65 S	E1.90 S	E1.60 S	E1.90 S	E1.70 S	E1.60 S	E1.60 S
7	E1.60 S	E1.20 S	E	E	E	E1.60 S	E1.60 S	E1.70 S	C	C	C	C	C	C	C	C	C	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
8	E1.60 S	E1.30 S	E	E	E	E1.50 S	E1.60 S	E1.60 S	E1.85 S	E2.00 S	E2.00 S	E2.00 S	E2.00 S	E2.00 S	E1.75 S	E1.80 S	E1.60 S	E1.65 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
9	E1.60 S	E1.25 S	E	E	E1.20 S	E1.55 S	E1.60 S	E1.60 S	E1.60 S	E1.80 S	E1.80 S	E1.90 S	E1.85 S	E1.85 S	E1.80 S	E3.50 C	E1.70 S	E1.60 S	E1.70 S	E1.60 S	E1.75 S	E1.60 S	E1.60 S	E1.70 S
10	E1.60 S	E1.25 S	E	E	E	E1.40 S	E1.60 S	E1.60 S	E1.70 S	E2.00 S	E2.00 S	E1.70 S	E1.85 S	E1.65 S	E1.70 S	E1.65 S	E1.90 S	E1.60 S	E1.60 S	E1.60 S	E1.80 S	E1.70 S	E1.60 S	E1.60 S
11	E1.60 S	E1.55 S	E1.25 S	E	E	E1.40 S	E1.60 S	E1.80 S	E1.80 S	E2.00 S	E2.40 S	E2.40 S	E2.40 S	E2.40 S	E2.40 S	E1.80 S	E1.70 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
12	E1.60 S	E1.40 S	E	E	E	E1.60 S	E1.55 S	E1.80 S	E1.75 S	E2.00 S	E2.00 S	E2.00 S	E2.00 S	E2.00 S	E2.00 S	E2.00 S	E1.90 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
13	E1.60 S	E1.20 S	E	E	E	E1.50 S	E1.60 S	E1.70 S	E1.60 S	E1.70 S	E2.00 S	E1.90 S	E2.00 S	E2.00 S	E2.00 S	E1.70 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
14	E1.60 S	E1.10 S	E	E	E	E1.50 S	E1.60 S	E1.60 S	E1.70 S	E1.80 S	E2.00 S	E2.00 S	E2.40 S	E2.10 S	E2.10 S	E2.40 S	E2.00 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
15	E1.60 S	E1.25 S	E1.20 S	E	E	C	C	C	C	E2.00 S	E2.10 S	E2.50 S	E2.40 S	E2.45 S	E2.00 S	E1.65 S	E1.70 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
16	E1.60 S	E1.40 S	E1.40 S	E	E1.20 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E2.00 S	E2.40 S	E2.40 S	E2.40 S	E2.10 S	E2.00 S	E1.70 S	E1.70 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.70 S	E1.60 S
17	E1.65 S	E1.30 S	E1.30 S	E	E	E1.40 S	E1.60 S	E1.65 S	E1.75 S	E1.80 S	E2.00 S	E2.00 S	E2.00 S	E2.00 S	E1.75 S	E1.70 S	E1.60 S	E1.70 S	E1.75 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
18	E1.60 S	E1.30 S	E1.10 S	E	E	E1.55 S	E1.60 S	E2.00 S	E1.60 S	E1.60 S	E2.00 S	E2.10 S	E2.40 S	E1.80 S	E2.05 S	E1.70 S	E1.70 S	E1.60 S	E1.65 S	E1.60 S	E1.60 S	E1.60 S	E1.65 S	E1.70 S
19	E1.60 S	E1.50 S	E	E	E	E1.40 S	E1.60 S	E1.70 S	E2.00 S	E2.40 S	E1.70 S	E2.00 S	E2.00 S	E2.20 S	E2.00 S	E1.75 S	E1.60 S	E1.60 S	E1.60 S	E1.70 S	E1.60 S	E1.60 S	E1.65 S	E1.60 S
20	E1.60 S	E1.25 S	E	E	E	E1.60 S	E1.60 S	E1.70 S	E1.75 S	E2.00 S	E2.00 S	E2.00 S	E2.00 S	E2.00 S	E1.90 S	E1.80 S	E1.70 S	E1.60 S	E1.60 S	E1.60 S	E1.70 S	E1.60 S	E1.60 S	E1.75 S
21	E1.60 S	E1.25 S	E1.25 S	E	E	E1.40 S	E1.60 S	E1.70 S	E1.70 S	E2.00 S	E2.50 S	E2.40 S	E2.00 S	E2.00 S	E2.40 S	E2.00 S	E1.90 S	E1.60 S	E1.70 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
22	E1.60 S	E1.25 S	E1.25 S	E	E1.25 S	E1.50 S	E1.60 S	E1.60 S	E1.70 S	E2.00 S	E2.00 S	E2.00 S	E2.40 S	E2.45 S	E2.50 S	E2.00 S	E2.00 S	E1.60 S	C	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
23	E1.65 S	E1.30 S	E	E	E	E1.40 S	E1.60 S	E1.60 S	E2.00 S	E2.00 S	E2.50 S	E2.40 S	E2.40 S	E2.40 S	E2.10 S	E2.10 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
24	E1.60 S	E1.20 S	E	E	E	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E2.00 S	E2.00 S	E2.00 S	E2.40 S	E2.40 S	E2.40 S	E2.40 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.80 S
25	E1.70 S	E1.30 S	E1.10 S	E	E	E1.60 S	E1.75 S	E1.60 S	E1.70 S	E2.30 S	E2.40 S	E2.50 S	E2.40 S	E3.00 S	E2.45 S	E2.00 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
26	E1.60 S	E1.50 S	E1.25 S	E	E	E1.50 S	E1.60 S	E1.60 S	E2.60 S	E2.10 S	E2.45 S	E2.20 S	E2.40 S	E2.10 S	E2.50 S	E2.10 S	E1.70 S	E1.60 S	E1.60 S	E1.65 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S
27	E1.60 S	E1.40 S	E	E	E	E1.60 S	E1.80 S	E1.60 S	E2.10 S	E2.10 S	E2.00 S	E2.40 S	E2.50 S	E3.50 S	E3.00 S	E2.60 S	E1.70 S	E1.70 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.80 S
28	E1.60 S	E1.60 S	E1.25 S	E	E	E1.60 S	E1.60 S	E1.60 S	E1.75 S	E2.00 S	E2.40 S	E2.50 S	E2.40 S	E2.10 S	E2.10 S	E2.40 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.70 S	E1.60 S	E1.60 S
29	E1.60 S	E1.60 S	E1.25 S	E	E	E1.55 S	E1.70 S	E1.75 S	E2.40 S	E2.00 S	E2.05 S	E2.40 S	E2.40 S	E2.00 S	E2.00 S	E2.00 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.70 S
30	E1.80 S	E1.30 S	E	E	E	E1.40 S	E1.60 S	E1.50 S	E2.05 S	E2.45 S	E2.45 S	E2.50 S	E2.40 S	E2.40 S	E2.85 S	E2.10 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.60 S	E1.70 S
31	E1.60 S	E1.20 S	E	E	E1.15 S	E1.55 S	E1.55 S	E1.70 S	E2.00 S	E2.50 S	E2.50 S	E2.50 S	E2.50 S	E2.45 S	E2.05 S	E1.85 S	E2.00 S	E1.70 S	E1.60 S	E1.60	E1.60 S	E1.60 S	E1.60 S	E1.55 S
No.	31	31	16	29	26	30	30	30	28	30	30	30	30	30	30	30	30	31	30	31	31	31	31	31
Median	E1.60	E1.30	E	E	E	E1.55	E1.60	E1.60	E1.70	E2.00	E2.00	E2.00	E2.20	E2.00	E2.00	E1.80	E1.70	E1.60	E1.60	E1.60	E1.60	E1.60	E1.60	E1.60

f-min

Sweep 1.0 Mc to 20.7 Mc in 1 min ~~sec~~ in automatic operation.

The Radio Research Laboratories, Japan.

W 6

IONOSPHERIC DATA

Dec. 1958 | (M3000)F2 | 135° E Mean Time (G.M.T.+ 9h.) | **Wakkanai** | Lat. 45° 23.6' N, Long. 141° 41.1' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.70	2.70	2.70	2.70	2.70	2.95	3.30	3.15	3.05	$^{J}3.10^{R}$	$^{I}3.00^{R}$	$^{I}2.95^{R}$	$^{J}2.95^{R}$	2.90^{H}	2.90	2.85	2.85	2.80	$^{I}2.70^{S}$	$^{U}3.00^{S}$	2.90	2.55	2.70	2.55
2	2.50	2.45	2.55	2.55	2.55	2.60	2.75	3.25	3.05	3.10	3.00	$^{U}3.05^{R}$	2.85^{H}	$^{J}2.85^{RH}$	$^{U}2.90^{RH}$	2.95	2.85	2.80	3.00	2.85	2.75	2.45	2.30	2.55
3	2.40	2.30	2.30	2.40	2.30	2.70	$^{I}2.65^{A}$	$^{J}2.90^{S}$	2.95	R	R	R	R	R	R	$^{U}2.90^{R}$	2.95	2.70	3.00	$^{U}2.75^{S}$	2.75	2.80	2.90	2.65
4	2.60	2.45	2.50	2.45	2.55	2.80	3.00	$^{U}3.05^{S}$	C	R	R	R	R	$^{U}2.90^{RH}$	$^{U}2.90^{R}$	2.95	2.80	2.75	3.05	2.90	2.65	2.40	2.75	2.30
5	2.20	2.30	2.25	2.35	2.35	2.15	2.30	$^{I}2.95^{S}$	2.80	2.75	2.60^{H}	2.65^{H}	2.55^{H}	2.75	2.80^{H}	2.90	$^{U}2.70^{S}$	2.70	$^{U}2.70^{S}$	$^{U}2.80^{S}$	$^{U}2.75^{S}$	F	F	F
6	F	F	$^{I}2.60^{S}$	2.75	$^{I}2.60^{F}$	2.70	3.00	2.90	$^{U}3.10^{R}$	R	R	R	R	R	3.00	2.95	2.85	3.00	$^{U}3.00^{S}$	2.95	2.75	2.60	2.60	2.45
7	$^{I}2.35^{F}$	2.35	2.40	2.50	2.40	2.70	3.10	$^{U}3.00^{S}$	C	C	C	C	C	C	C	C	C	2.80	2.95	$^{U}3.05^{S}$	2.90	2.70	2.65	2.70
8	2.50^{F}	F	F	F	F	F	2.95	$^{I}3.05^{S}$	3.25	$^{I}3.15^{R}$	3.05	3.05	3.00	3.00	3.00	3.10	2.80	2.70	$^{I}2.70^{S}$	$^{U}2.95^{S}$	2.85	2.65	$^{U}2.65^{S}$	2.60
9	2.55	2.40^{F}	2.40	2.45	2.55	3.00	2.75	2.70	3.15	R	R	R	$^{I}2.95^{R}$	2.85^{H}	$^{U}2.95^{R}$	3.05	2.80	2.85	$^{U}2.70^{S}$	$^{I}2.85^{S}$	2.90	2.80	2.70	2.50
10	2.50	2.60	2.80	2.90	2.55	2.60	2.80	3.00	R	R	R	R	R	RH	R	2.85	3.00	2.95	$^{U}2.90^{S}$	3.15	3.00	2.85	2.65	2.70
11	2.65	2.70	2.70	2.65	2.75	2.80	3.05	3.15	3.30	$^{I}3.10^{R}$	$^{U}3.05^{R}$	$^{I}3.00^{R}$	2.95^{H}	2.95	3.00	2.90	2.85	2.85	2.80	3.05	2.75	$^{U}2.75^{S}$	2.70	2.80
12	2.75	2.70	2.55	2.60	2.80	3.00	2.90	2.45	3.05	3.05	$^{I}3.10^{R}$	3.10	2.95^{H}	3.00	2.85	2.95	2.90	$^{U}3.00^{S}$	3.05	3.00	2.75	2.85^{F}	2.70	2.70
13	2.70	2.70	2.70	2.70	2.75	2.75	$^{I}2.95^{S}$	3.05	2.95	3.05	$^{J}3.05^{R}$	3.05	2.80^{H}	2.80^{H}	2.80	2.75	2.90	2.85	2.65	2.95	2.65	2.70	2.70	2.45
14	2.30	2.40^{F}	2.40	2.50^{F}	2.35^{F}	2.35	3.30^{F}	2.60^{H}	2.95	2.95	$^{I}3.00^{R}$	$^{U}2.90^{R}$	2.85	$^{U}2.90^{RH}$	2.90	2.85	2.75	2.85	3.00	2.90	2.85	2.70	2.75	2.60
15	2.55	2.50^{F}	2.35	2.45	2.35	C	C	C	C	2.95	R	R	R	R	2.85	$^{U}2.95^{R}$	2.95	$^{J}2.90^{S}$	$^{U}2.85^{S}$	3.05	2.85	2.60	2.60	2.70
16	2.60	2.55	2.50	2.50	2.60	2.95	3.35	3.05	2.85	3.05	$^{I}3.00^{R}$	2.95	$^{I}2.95^{R}$	3.05	2.95	2.80^{H}	2.90	$^{U}2.85^{S}$	2.95	2.90	2.70	2.55	2.50	2.45
17	2.40	2.45^{F}	2.55^{F}	2.45^{F}	$^{I}2.50^{F}$	2.70	3.00	3.10	$^{I}3.25^{R}$	3.25	3.15	$^{J}3.05^{R}$	3.00	3.05	3.10	2.85	2.90	2.80	$^{I}3.00^{S}$	3.05	2.65	2.55	2.50	2.55
18	2.70	2.90	2.80	2.30^{F}	2.40^{F}	2.55^{F}	2.40	$^{U}2.80^{S}$	2.80	3.20^{H}	3.05^{H}	2.95	$^{I}2.90^{R}$	$^{I}2.85^{R}$	$^{I}2.85^{RH}$	2.90	2.75	$^{J}2.80^{S}$	$^{J}2.90^{S}$	2.95	2.75	2.65	2.70	2.70
19	2.60	2.50	2.60	2.55	2.55	2.75	2.85	3.05	3.30	3.05	3.05^{H}	3.05	2.90^{H}	3.05	2.90	2.80	$^{U}2.85^{SH}$	$^{U}2.95^{S}$	$^{U}2.85^{S}$	3.00	2.95	2.70	2.70	2.65
20	2.55	2.40	2.40	2.50	2.55	2.60	2.90	3.05	3.20	3.15	$^{J}3.10^{S}$	3.10^{H}	3.10^{H}	3.00	3.10	3.15	2.95	2.95	$^{I}2.90^{S}$	3.20	3.15	2.70	2.70	2.65
21	2.65	2.50	2.65	2.70	2.65	2.70	2.95	3.05	3.10	3.10	3.15	$^{U}3.10^{R}$	3.00^{H}	2.80^{H}	3.00	2.95	$^{U}3.10^{S}$	2.80	2.80	3.30	3.25	2.65	2.70	2.70
22	2.50	2.55	2.65	2.55	2.70	2.65	3.20	3.10	3.15	3.05^{H}	$^{I}3.05^{R}$	$^{I}3.05^{R}$	3.10	3.05	3.10	3.05	3.00	3.10	$^{I}3.05^{C}$	3.20	3.05	2.85	2.65	2.70
23	2.65	2.65	2.50	2.75	3.15	2.85	2.80	3.05	3.10	3.10	$^{I}2.95^{R}$	3.15	3.10	3.05	3.10	3.00	3.00	3.05	$^{U}2.95^{S}$	3.20	2.80	2.65	2.65	2.55
24	2.55	2.55	2.65	2.60	2.60	2.65	2.75	3.00	$^{J}3.10^{R}$	$^{J}3.10^{R}$	$^{J}3.10^{R}$	3.20^{H}	3.05	3.05	2.85	3.00	3.00	2.90	$^{I}3.00^{S}$	3.15	3.35	$^{I}2.60^{A}$	2.70	2.60
25	2.60	2.65	2.85	2.80	2.85	2.90	3.05	3.15	3.20	3.10	3.25	3.15	3.15	3.05	2.95	3.10	3.05	3.00	3.05	3.00	3.25	2.80	2.85	2.50
26	2.55	2.70	2.70	2.90	2.80	3.00	3.30	2.95	3.15	3.20	3.15	3.00	3.05	2.80	2.95^{H}	2.95	2.95	$^{U}2.80^{S}$	$^{U}3.05^{S}$	3.00	2.70	2.65	2.80	2.60
27	2.45	2.55	2.80	2.80	2.45	2.65	2.75	3.10^{H}	3.10	3.05	3.05	3.05	3.00	2.90^{H}	3.00^{H}	2.90	2.95	2.80	3.00	$^{U}3.05^{S}$	2.65	2.70	2.75	2.55
28	2.60	2.55	2.65	2.40	2.70	2.85	3.05	2.95	3.00	3.10	$^{J}3.15^{R}$	3.05	2.95^{H}	2.95^{H}	3.05	2.85	2.75	2.90	3.05	3.00	2.90	2.80	2.75	2.75
29	2.65	2.50	2.45	2.65	2.85	3.10	3.20	2.95	3.30	3.10	3.15	3.05	$^{U}2.95^{R}$	$^{U}2.95^{R}$	$^{I}3.00^{R}$	2.85	2.85	2.85	3.00	3.00	3.00	2.95	2.70	2.70
30	2.60	2.55	2.55^{F}	2.65	3.00	2.90	$^{I}2.65^{A}$	3.00	$^{J}3.05^{R}$	R	R	R	R	RH	R	3.00	$^{U}2.95^{R}$	3.05	$^{I}3.05^{S}$	3.05	2.95	3.10	2.95	2.50
31	2.60	2.55	2.65	2.65	2.70	2.70^{F}	2.80^{F}	2.90	3.25	R	R	R	R	R	R	3.00	2.90	2.90	3.05	3.00	2.80	2.85	3.05	2.75
No.	30	29	30	30	30	29	30	30	27	23	22	22	23	24	26	30	30	31	31	31	31	30	30	30
Median	2.60	2.55	2.60	2.60	2.60	2.70	2.95	3.00	3.10	3.10	3.05	3.05	2.95	2.95	2.95	2.95	2.90	2.85	3.00	3.00	2.85	2.70	2.70	2.60

(M3000)F2 Sweep 1.0 Mc to 20.7 Mc in 1 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

W 7

15

IONOSPHERIC DATA

Dec. 1958 | (M3000)F1 | 135° E Mean Time (G.M.T.+ 9h.) | Wakkanai | Lat. 45° 23.6' N, Long. 141° 41.1' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4									C															
5																								
6																								
7									C	C	C	C	C	C	C	C	C							
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15						C	C	C	C															
16																								
17																								
18																								
19																								
20																								
21																								
22																			C					
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
No.																								
Median																								

(M3000)F1 Sweep 1.0 Mc to 20.7 Mc in 1 min sec in automatic operation.

The Radio Research Laboratories, Japan.

W 8

IONOSPHERIC DATA

Dec.1958 | h'F2 | 135° E Mean Time (G.M.T.+ 9h.) | Wakkanai | Lat. 45° 23.6' N, Long. 141° 41.1' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4									C															
5																								
6																								
7									C	C	C	C	C	C	C	C	C							
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15						C	C	C	C															
16																								
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22																			C					
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
No.																								
Median																								

h'F2

Sweep 1.0 Mc to 20.7 Mc in 1 min sec in automatic operation.

The Radio Research Laboratories, Japan.

W 9

IONOSPHERIC DATA

Dec. 1958 | h'F | 135° E Mean Time (G.M.T.+ 9h.) | Wakkanai | Lat. 45° 23.6' N | Long. 141° 41.1' E

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	330	330	315	300	305	260	240	245	225	225	230	230	230	215^{H}	235	225	220	240	220	245	250	290	300	290
2	330	335	325	300	310	290	240	235	220	220	235	240	230^{H}	220^{H}	230^{H}	245	240	245	220	250	265	335	375	425
3	350	370	360	295	350	290	I 285^{A}	265	240	230	235	225	230	230	235	225	230	220	240	230	250	260	260	275
4	290	300	300	315	310	250	240	240	I 220^{C}	230	225	230	220	225^{H}	225	220	230	230	235	245	300	345	280	325
5	450	450	405	425	470	530	420	300	280	260	265^{H}	250^{H}	255^{H}	250	250^{H}	240	230	220	260	250	250	285	265	260
6	285	290	260	250	270	320	285	230	235	I 230^{A}	230	230	220	I 240^{A}	225	240	250^{A}	250	250	230	270	300	280	290
7	330	350	350	320	315	285	230	240	C	C	C	C	C	C	C	C	C	215	245	235	230	270	305	275
8	310	300	320	290	320	265	240	245	225	225	230	230	225	230	230	225	225	210	220	240	250	295	300	290
9	305	320	350	345	305	255	250	280	245	230	235	240	235	220^{H}	220	E 245^{C}	220	225	250	250	245	250	270	305
10	350	305	260	260	260	270	290	255	240	220	230	235	230	230^{H}	240	215	245	240	250	250	250	320	350	345
11	320	305	310	300	305	280	245	245	240	240	230	230	220^{H}	235	240	225	240	230^{A}	245	250	260	295	290	300
12	300	320	335	330	295	235	260	235	240	240	240	235	225^{H}	235	230	250	220	225	270^{A}	250	290	290	320	310
13	310	305	315	300	300	290	275	240	225	245	230	230	230^{H}	240^{H}	235	240	225	250	280	270	290	285	260	325
14	480	460	420	325	335	450	240	250^{H}	255	245	250	230	230	240^{H}	245	230	225	235	250	245	250	290	275	285
15	325	375	400	390	380	C	C	C	C	225	240	225	230	240	225	240	210	215	250	245	250	300	305	275
16	300	320	340	310	305	240	240	240	215	240	235	220	230	230	240	220^{H}	245	220	230	240	290	305	310	325
17	350	290	270	305	310	300	245	230	240	235	230	230	225	240	230	215	245	215	225	220	290	310	350	320
18	310	280	270	390	390	445	420	235	245	240^{H}	240^{H}	230	245	230	225^{H}	220	240	250	225	230	260	295	295	290
19	280	300	295	265	260	250	240	240	225	210	240^{H}	230	220^{H}	245	245	220	200^{H}	220	250	245	230	275	285	270
20	310	305	305	300	300	300	250	240	220	220	225	230^{H}	225^{H}	230	240	220	205	230	250	235	230	310	350	320
21	350	320	315	310	310	330	275	230	235	220	225	225	225^{H}	230^{H}	235	220	240	200	240	225	225	325	330	325
22	370	350	350	330	310	300	240	240	220	230^{H}	240	240	215	230	245	220	225	240	I 220^{C}	220	250	320	320	330
23	340	390	360	300	240	225	350	220	215	230	225	225	225	250	235	240	235	225	240	220	275	315	320	350
24	345	310	290	300	315	305	275	250	225	245	225	220^{H}	225	235	225	225	220	250	225	220	215	335^{A}	340	320
25	350	320	290	275	285	250	250	230	210	225	235	225	230^{H}	235	240	230	210	250	220	240	230	305	300	340
26	390	350	290	270	285	250	215	210	215	240	225	225	235	230	245^{H}	220	220	230	225	215	280	300	295	300
27	425	360	270	240	360	325	315	215^{H}	240	230	230	225	230	225^{H}	240^{H}	240	235	220	235	210	250	290	265	320
28	305	300	285	315	290	250	250	235	225	225	240	225	240^{H}	225^{H}	240	225	225	220	230	225	240	250	250	290
29	320	405	400	330	285	235	235	240	210	220	215	220	215	240	245	210	245^{A}	230	215	225	240	260	270	305
30	310	320	340	325	270	210	I 285^{A}	250	220	225	220	215	220	225^{H}	225	220	230	230	235^{A}	210	260	260	240	275
31	290	300	275	300	320	310	260	220	225	230^{A}	235	220	225	225	240	225	230	215	210	220	270	265	265	250
No.	31	31	31	31	31	30	30	30	29	30	30	30	30	30	30	29	30	31	31	31	31	31	31	31
Median	325	320	315	300	305	290	250	240	225	230	230	230	230	230	235	225	230	230	235	235	250	295	295	305

h'F | Sweep 1.0 Mc to 20.7 Mc in 1 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec.1958 | h'Es | 135° E Mean Time (G.M.T.+ 9h.) | Wakkanai | Lat. 45° 23.6' N | Long. 141° 41.1' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	105	100	100	E	E	E	E	110	105	G	G	105	100	105	100	130	E	110	110	110	110	E	100	E
2	E	E	100	E	E	E	E	E	G	G	G	G	G	100	G	G	E	E	110	110	110	105	105	105
3	E	E	E	E	E	120	110	110	110	105	G	G	G	G	G	G	E	E	110	105	E	105	100	E
4	E	E	E	E	E	E	E	G	C	G	G	G	G	G	100	120	E	E	E	E	E	105	105	E
5	E	105	155	130	125	120	125	120	110	115	110	100	G	G	115	G	130	E	E	E	E	E	E	E
6	105	100	100	E	E	125	120	E	110	105	105	130	120	120	150	125	100	100	165	150	110	105	E	E
7	E	105	100	100	100	E	E	E	C	C	C	C	C	C	C	C	C	E	E	E	E	E	E	E
8	E	105	E	E	E	E	E	E	135	G	G	G	G	G	G	G	E	E	E	E	E	E	E	E
9	E	E	E	E	E	E	E	G	120	G	G	G	G	110	G	C	E	E	105	100	100	125	E	135
10	E	E	E	115	110	115	E	105	G	G	G	100	100	135	130	100	E	105	105	105	100	100	E	E
11	E	E	E	E	E	E	E	E	G	G	140	G	G	G	120	120	E	110	105	E	E	E	100	100
12	E	105	E	115	110	E	110	E	110	G	G	G	G	110	G	G	E	E	110	115	E	110	E	E
13	E	E	E	E	E	E	110	E	G	G	100	G	G	G	G	G	100	110	105	105	100	E	E	110
14	E	110	110	E	E	110	110	115	G	105	105	130	130	125	125	S	E	115	110	110	E	110	E	100
15	100	E	E	E	110	C	C	C	C	110	G	G	G	G	105	G	E	E	105	105	105	105	105	E
16	E	100	100	E	E	E	110	105	105	G	G	G	G	G	G	G	E	E	E	110	110	E	E	105
17	E	105	E	E	E	E	E	E	110	G	G	105	G	G	G	105	120	E	E	E	110	105	105	E
18	100	E	105	E	100	E	E	115	105	105	105	G	G	G	G	G	E	E	E	E	E	E	E	E
19	E	E	E	E	E	E	E	E	G	G	130	G	G	G	G	105	100	100	100	E	E	E	E	E
20	E	E	E	E	E	E	E	E	G	G	G	G	G	G	105	105	E	100	105	E	105	105	105	E
21	105	105	E	E	110	110	E	E	G	G	G	G	100	100	100	G	E	E	115	105	E	E	E	E
22	E	100	E	E	E	115	115	110	110	110	105	100	G	125	115	G	E	110	C	110	E	110	105	110
23	E	100	E	105	105	E	115	115	G	105	G	G	G	G	G	G	110	105	110	105	105	105	105	E
24	E	E	E	E	E	E	110	110	105	105	105	G	G	G	G	S	110	105	110	110	110	105	E	110
25	E	110	E	E	E	E	110	105	105	195	G	G	G	G	115	115	110	E	E	E	E	100	100	E
26	E	E	E	E	E	E	E	E	S	G	165	G	G	G	G	G	115	110	E	E	E	E	E	E
27	105	E	E	110	105	E	E	E	G	G	105	105	S	S	S	S	100	E	E	110	100	E	E	E
28	E	E	E	E	E	E	E	E	G	110	G	125	105	G	G	S	E	E	115	100	E	105	E	110
29	E	E	E	E	E	110	E	E	S	135	105	G	G	G	G	120	105	110	105	E	E	E	100	E
30	E	E	E	E	E	120	105	110	105	G	G	G	G	G	125	115	115	110	110	110	110	105	E	E
31	110	110	E	E	110	E	E	E	105	105	105	G	G	G	G	100	S	E	E	E	105	105	100	E
No.	7	14	8	6	10	9	12	12	15	13	13	9	6	9	13	12	12	14	19	18	15	18	13	9
Median	105	105	100	110	110	115	110	110	110	105	105	105	100	110	115	115	110	110	110	110	105	105	105	110

h'Es

Sweep 1.0 Mc to 20.7 Mc in 1 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

W 11

IONOSPHERIC DATA

Dec. 1958

Types of Es

135° E Mean Time (G.M.T.+ 9h.)

Wakkanai

Lat. 45° 23.6' N
Long. 141° 41.1' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f	f	f					l	l			l	l	l	l,h	C		f2	f	f2	f		f	
2			f											l					f	f	f	f	f	f
3						f	f3	f2	l	l									f	f2		f	f	
4															l	l						f	f	
5		f	f	f	f	f	f	f	l	l	l	l			l		f							
6	f2	f	f			f2	f5		l,C	l3	l2	C,l	C,l	C,l	h,l	C	f,f,f	f2	f,f	f2	f	f		
7		f	f	f	f																			
8		f							C															
9									l					l					f	f2	f	f2		f
10				f	f	f		f2				l	l	h,l	C,l	l,C		f	f2	f2	f	f		
11											h				C	l		f3	f2				f	f
12		f		f2	f2		f		l2										f3	f		f		
13							f2				l			l					f5	f2	f5	f2			f
14		f	f			f5	f2	l,C		l	l	C,l	C,l	C	C			f2	f2	f2		f		f
15	f				f3					l					l				f2	f	f	f	f	
16		f	f				f	f	l,h											f2	f			f
17		f							l			l				l	f				f	f	f	
18	f2		f		f			f	l	l	l					l								
19											C,h					l	f	f	f					
20															l	l		f2	f		f	f	f	
21	f	f			f	f2							l	l	l				f	f				
22		f				f	f	f2	l	l	l	l		C	l			f		f		f	f2	f
23		f2		f	f		f	f		l							f	f	f2	f2	f2	f2	f	
24							f	f2	l	l	l						f	f2	f	f	f	f2		f
25		f					f	f	l	h					C	C	f					f	f2	
26											h						f	f						
27	f			f	f						l	l					f			f	f			
28										l		C	l						f	f		f		f
29						f				h	l					C	f3	f	f				f	
30						f	f3	f	l						C	C	f	f	f3	f	f2	f4		
31	f	f			f				l	l	l					l					f2	f2	f	
No.																								
Median																								

Types of Es

Sweep 1.0 Mc to 20.7 Mc in 1 ~~sec~~ min in automatic operation.

The Radio Research Laboratories, Japan.

W 12

IONOSPHERIC DATA

Akita

Lat. 39° 43.5' N
Long. 140° 08.2' E

Dec. 1953

foF2

135° E Mean Time (G.M.T.+ 9h.)

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	4.0	3.9	4.0	4.1	3.9	3.8	4.5	9.0	11.9	13.5	14.5	14.5	14.1 H	13.9 H	13.0 H	13.1 H	11.9	10.3	9.4	7.1	5.7	5.0	5.0	4.6
2	4.4	4.5	4.5	4.3	4.4	4.6	5.6	8.9	10.8	14.3	14.7	14.9	13.8	14.1	13.9 H	13.5	11.9	10.6 S	10.1	7.2	5.4	5.1 S	4.7 S	4.7
3	4.8	4.6	4.9	5.1	5.0	5.1	4.7	9.2	14.2	16.5	17.9 H	17.0 H	16.1 H	15.5 H	15.2 H	15.3	14.2	12.0	10.1	9.1	7.3	6.6	6.4	5.1
4	4.8	4.8	4.9	4.8	4.9	5.1	4.6	8.5	11.9	14.8	16.5	15.4 H	15.1 H	14.5	13.9	13.5	12.3	11.6	10.2 S	8.5	6.9	6.4	7.0	5.3
5	5.1	5.2	5.3	4.8	4.5 H	4.5	4.4	8.2 S	12.7 I	15.4 K	15.3 H	15.3	15.3 H	15.0	13.9	13.2	12.7	10.8	7.5	7.6	6.3	5.2	5.5	5.3
6	4.9	4.9	5.6 F	5.2 F	4.6 F	5.0 F	5.4 Z	10.9 Z	14.6 V	15.9	16.6	17.3	16.2	15.0	14.9	14.3	12.8	12.1	10.8 S	8.3 S	6.4 S	5.4	5.6 S	4.7 S
7	4.2 F	4.2 F	4.3	4.4	4.5	4.6	4.8	8.6	10.9	14.5	15.5	13.9	12.8	12.8	12.2	12.1	11.5	10.4	8.9	7.8	5.6 S	4.4 S	4.6 S	4.6
8	4.3	4.4	4.5	4.4	4.1	4.3	4.8 S	9.4 H	12.7	13.3	14.6	14.4	14.7 H	13.5 H	13.4 H	13.4	12.5	10.3	8.6	7.8	6.4	5.2	5.3	4.8
9	5.1	4.5 F	4.3	4.4	4.5 F	4.9	4.7	7.3	12.9	15.1	15.2	15.3	14.4 H	14.2	13.3 H	12.8	11.6	10.8	9.5	8.0	6.8	5.5	4.9	4.6
10	4.5	4.9	5.0	4.0	3.7	3.6	4.0	8.6	12.1	14.1	14.7	14.1 H	14.4 H	14.0 H	13.7	12.9	11.0	9.2	8.8	6.9	5.0	3.9 S	4.1	3.9
11	4.0	4.1	4.3	I 4.0 S	4.0	4.0	4.5 S	8.3	11.9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	12.4	14.9	13.8	12.1 H	12.0 H	11.9 H	11.2	10.6	8.6	7.3	6.1	4.8 S	4.1 F	4.3 F	4.2
13	3.8	3.8	3.9	3.9	3.9	3.7 F	I 4.6 A	7.8	9.8	12.9	13.9	12.9	12.3 H	12.6	12.6	11.9	11.1	9.4	7.4	7.3	6.1	5.2	5.0	4.1
14	3.6	3.5	3.7	4.0	3.4	3.6	4.3	6.7	10.8 H	14.7	15.1	14.5 H	14.0	13.2 H	13.0	12.5	11.2	9.7	9.0	7.5	5.5	4.9	4.7	4.0
15	4.0	3.9	3.7	3.9	4.0	J 3.9 S	4.1	8.0	12.6 U	14.9 K	16.0	15.7	15.9	15.6	15.1	14.5	13.8	11.3	9.9 S	8.6	6.6	5.0	4.9	4.6
16	4.5	4.4	4.2	4.3	4.3	4.7 S	4.1	7.1	10.9	13.2 H	15.4	14.5	13.7	12.9	12.5	12.2	12.0	12.0	9.6 S	7.2	5.1 S	5.1	5.4	4.8
17	5.0	5.4	4.6	4.3	4.4	4.6	5.4 S	7.9	10.1 S	12.0	13.6 H	13.4	13.8 H	12.8	13.5	12.5	11.0	11.0	9.7	8.1	5.2	4.8	4.6	4.1
18	3.8	4.0	3.6	3.1	3.1	2.6	2.8	7.9	9.6 Y	13.4	13.6	13.3	13.5 H	14.2	13.2	12.2	11.1	11.0	9.4 S	7.6	5.5	5.1	5.4	5.4
19	5.1 S	5.0 S	5.0 F	4.9	4.5	4.6	4.3	7.1 S	9.3	11.8	12.6	12.9 H Y	12.8	13.1	12.4	12.1 H	11.5 S	8.6	7.7	7.6	6.0	4.7	4.8	4.7
20	4.6 F	4.5	4.5	4.4	4.3	4.5	4.9	8.0	10.1	12.1	13.7	13.7	13.3	12.4	12.1	12.5	10.1	8.3	7.6 S	6.8	4.9 H	3.6 S	3.7	3.8
21	3.6	4.0	3.9	3.7	3.7	3.9	4.1	7.3 S	10.5 S	12.4	14.3	13.7	13.0	12.0	11.9	12.1	10.4	9.0	6.7	6.7	4.3	3.5	3.6	3.7
22	3.6	3.8	3.7	3.8	3.9	3.8	4.0	6.3	10.3	12.4	14.2 H	13.7	13.4 H	12.4	11.8	12.6	10.6	9.3	8.4	5.6	3.2	3.1	3.2	3.4
23	3.5	3.5	3.5	3.6	3.9	3.4	2.7	6.8	9.5	12.5	14.6	13.3	12.3	12.2	13.3	12.3	11.0	10.1	8.0	6.5 S	4.3	4.6	4.6	4.4
24	4.3	4.4	4.4	4.5	4.1	4.1	4.3	7.0	10.1	13.6	15.1	14.0	12.3 H	12.9	13.2	12.1	11.1 S	10.2 S	8.7	7.0	3.8 S	3.6	3.7	3.7
25	3.8	3.8	3.9 F	3.6	3.7	3.5 S	3.4	6.8	9.8	10.6	13.3	12.3	11.5	12.0	11.5	10.8	10.0 H	8.3	8.1	6.8	4.9	3.5	3.7	3.1
26	3.1	3.3	3.4	3.5	3.5	3.6	3.6	6.4	9.4	11.7	13.7	13.5	12.6 H	11.9 H	11.1	12.0	10.2	8.6	8.1 I	7.4 S	4.5 H	4.3	4.4	4.3
27	3.9	4.0	4.8	3.4	3.2	2.9	3.3	6.5	9.3	12.8	14.1	13.6	12.6 H	12.0 H	12.5	11.6	11.1	10.2	9.1	7.4	5.0	5.3	5.3	4.5
28	5.0	4.2	4.3	4.2	4.3 F	4.9 F	4.5	7.0	10.5	13.3	14.2	14.1	13.2 H	13.4	12.4 H	12.1	11.3	10.4	8.7 S	7.0	5.1	4.7 S	4.8 S	4.5
29	4.4 F	I 4.1 F	3.8 F	4.3 F	4.8 F	4.5	3.4	6.3	11.5	14.2	15.3	14.3	14.1	13.8	14.1 H	13.8	11.9	12.2	11.1 S	7.9	5.9 F	4.8	4.6	4.8
30	4.6	4.4	4.2	4.3	4.4	4.1	2.6 H	6.9 H	10.8	15.0	17.0	15.7	15.0 H	14.6 H	14.8	14.2	13.6	13.3	11.6	9.1	7.4	6.9	5.5	5.0
31	5.2	5.2	4.6	4.4	4.2	4.0	3.6	7.0	11.9	14.3	15.0	14.5	13.9	14.3 H	14.2	14.1	12.7	12.7	10.2 S	7.8	5.7	5.5	4.7	4.5
No.	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Median	4.4	4.3	4.3	4.3	4.2	4.1	4.3	7.6	10.8	13.4	14.7	14.1	13.8	13.3	13.2	12.5	11.4	10.4	9.0	7.4	5.5	4.8	4.8	4.6
U.Q	4.8	4.6	4.6	4.4	4.5	4.6	4.7	8.5	11.9	14.7	15.3	14.9	14.4	14.2	13.9	13.5	12.3	11.3	9.9	7.9	6.3	5.2	5.3	4.8
L.Q	3.8	3.9	3.9	3.9	3.9	3.7	3.6	6.9	9.8	12.4	14.1	13.6	12.8	12.4	12.4	12.1	11.0	9.3	8.1	7.0	4.9	4.3	4.4	4.1
Q.R	1.0	0.7	0.7	0.5	0.6	0.9	1.1	1.6	2.1	2.3	1.2	1.3	1.6	1.8	1.5	1.4	1.3	2.0	1.8	0.9	1.4	0.9	0.9	0.7

The Radio Research Laboratories, Japan.

foF2

Sweep 1.60 Mc to 20.0 Mc in 20 sec in automatic operation.

A 1

IONOSPHERIC DATA

Dec. 1953 | foF1 | 135° E Mean Time (G.M.T. + 9h.) | Akita | Lat. 39° 43.5' N | Long. 140° 08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3								A									L							
4																								
5																								
6											L	L												
7																								
8																								
9																L								
10																								
11										C	C	C	C	C	C	C	C							
12								C	C															
13														L										
14																								
15											L													
16																								
17															L	L	L							
18										L														
19														L										
20																								
21															L									
22																								
23																								
24																								
25											L			L										
26																								
27																								
28																								
29																								
30																								
31																								
No.																								
Median																								

foF1

Sweep 1.60 Mc to 20.0 Mc in 20 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

A 2

IONOSPHERIC DATA

Dec. 1958 | foE | 135° E Mean Time (G.M.T.+ 9h.)

Akita

Lat. 39° 43.5' N
Long. 140° 08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								2.10	2.75	3.10 H	3.40	3.50	3.55	3.50	3.25	2.55	1.80							
2								A	2.60	3.20	3.45	3.60	3.60	3.50	3.25	2.65	A							
3								A	A	I 3.10 A	3.45	3.50	3.55	3.30	3.05	2.60	B							
4								2.05	2.75	3.20	3.50	3.55	3.45	3.25	3.15	2.70	R							
5								A	2.40	A	A	3.50	3.50	3.40	3.00	2.50	R							
6								A	2.75	3.10	3.50	3.55	3.60	3.35	3.05	2.65	A							
7								A	I 2.55 R	2.90	3.40	3.60	3.55	3.25	2.95	2.75	I 2.05 A							
8								B	2.60	3.05	3.45	3.50	3.50	3.30	2.90	2.40	B							
9								E	2.60	3.05	3.45	3.55	3.55	3.45	3.00	2.45	E							
10								1.70	2.55	3.10	3.45	3.60	3.50	3.50	3.20	2.75	A							
11								1.95	2.80 H	C	C	C	C	C	C	C	C							
12								C	C	3.10	3.50	3.70	3.75	3.55	3.10	I 2.70 C	R							
13								A	A	3.25	3.50	3.55	3.55	3.45	3.00	2.25	A							
14								A	A	A	A	3.50	3.50	3.30	3.10	2.55	B							
15								A	A	A	3.45	3.55	3.60	3.45	R	B	B							
16								A	2.60 H	3.10	I 3.40 A	3.55	3.60	3.45	3.10	2.70	A							
17								A	2.40	3.05	3.45 H	3.55	3.55	3.45	3.00	2.45	1.90							
18								A	2.55	2.95	3.40	3.50	3.50	I 3.40 A	3.10	I 2.55 R	B							
19								B	2.50	3.00	3.30 H	3.40 H	3.45	3.35	3.05	2.60	B							
20								B	2.55	2.95	3.40	3.55	3.50	I 3.40 A	3.15	I 2.60 A	A							
21								B	I 2.60 A	3.20	3.50	3.55	3.50	3.35	3.15	2.50	B							
22								A	A	I 3.00 A	3.30	3.40	3.50	3.40	I 3.00 R	R	B							
23									A	3.05	3.45	3.55	3.50	3.45	3.05	I 2.70 B	R							
24								A	A	3.05	3.35	3.40	3.40	I 3.20 R	2.95	2.75	B							
25								A	A	3.00	3.40	3.50	3.55	3.40	3.00	2.45	A							
26								E	I 2.40 R	I 3.00 A	3.40	3.50	3.55	3.45	3.05	2.75	2.00							
27								B	I 2.30 R	3.00	3.15	3.30	3.50	3.20	B	B	B							
28								E	R	A	3.35	3.55	3.50	3.45	3.20	2.70	B							
29								A	2.30	2.95	3.35	3.50	3.55	3.50	3.30	I 2.65 B	2.05							
30									A	3.00	3.20	3.45	3.50	3.45	3.25	2.75	A							
31									2.45	3.05	I 3.40 A	3.60	I 3.60 A	3.55	3.35	S	B							
No.								7	20	26	28	30	30	30	28	26	6							
Median								1.70	2.55	3.05	3.40	3.55	3.50	3.40	3.10	2.60	1.95							

foE

Sweep 1.60 Mc to 20.0 Mc in 20 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

A 3

23

IONOSPHERIC DATA

Dec. 1958 | foEs | 135° E Mean Time (G.M.T.+ 9h.) | Akita | Lat. 39° 43.5' N | Long. 140° 08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.4M	E	2.4M	2.1M	2.1M	E	E	G	G	G	4.0	3.7	4.0	5.6M	3.7M	3.4	G	3.6M	3.5M	E	5.5M	4.9M	5.0M	3.1M
2	3.0M	2.4M	E	2.0M	E	2.2M	E	2.6M	3.0M	3.8M	G	G	3.7	3.7	3.8	2.8	2.8M	E	2.8M	3.5M	E	3.7M	3.6Y	2.3M
3	3.7M	2.2M	E	E	E	E	2.4M	6.5M	4.9M	4.5M	G	G	G	G	G	G	B	E	E	3.3M	E	2.1M	3.8M	E
4	E	E	E	E	E	E	2.3M	G	G	G	G	4.3M	G	G	G	G	G	E	E	E	E	E	E	2.7M
5	2.1M	2.7M	2.2M	2.5M	2.1M	E	E	3.5M	3.9M	6.0M	4.4M	4.5M	G	G	G	G	G	E	E	3.0M	6.7M	4.1M	2.3M	2.3M
6	E	E	E	E	E	E	3.5YM	2.8M	3.5M	3.9M	4.0	4.4M	4.4M	3.9M	G	2.3q	3.6M	8.9M	9.0M	E	E	5.6M	2.9M	2.2M
7	3.0M	2.6M	E	2.0M	E	2.1M	E	3.9M	G	3.3	3.6	3.9	4.0M	3.6M	G	2.5q	5.6M	E	E	E	E	E	E	E
8	2.3M	E	E	E	E	E	E	B	G	3.7	G	G	4.4M	G	G	G	B	2.5M	2.0M	E	E	E	E	E
9	E	E	E	E	4.0YM	E	E	G	G	G	G	G	G	G	G	G	2.1M	4.5M	E	E	E	E	E	E
10	E	E	2.5M	6.5M	E	2.2M	E	G	G	3.5	3.5M	G	G	G	3.4	3.5	2.4M	2.4M	3.6M	2.2M	E	E	E	E
11	E	E	E	S	2.1M	E	E	G	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	G	5.1M	G	G	G	G	C	G	3.1M	2.7M	9.4M	5.0M	3.1M	E	E
13	E	2.1M	E	E	2.2M	3.9M	10.5M	6.7M	9.0M	4.0M	G	G	G	G	G	G	2.4M	E	2.1M	E	E	E	E	E
14	S	S	E	E	E	E	E	6.7M	4.6M	6.8M	5.3M	G	4.1	3.9	3.6	G	B	E	4.3YM	E	8.5YM	6.7M	5.0M	6.6M
15	4.5M	5.6M	4.0M	2.5M	2.5M	E	S	4.7M	4.6M	3.9Y	3.2q	G	G	G	G	B	B	E	3.0M	E	E	E	3.6M	3.6M
16	3.1M	2.1M	E	E	E	2.0M	2.4M	3.6M	5.0M	G	5.7M	G	G	G	G	G	3.5M	E	E	E	E	E	3.6M	3.0M
17	3.0M	2.3M	2.1M	2.2M	E	E	E	2.3M	2.5	G	G	G	G	G	G	2.4q	2.0M	2.6M	2.3M	E	E	E	E	E
18	2.3M	2.6M	2.2M	2.1M	E	E	2.4M	3.1M	2.8M	G	G	G	4.7M	3.9MY	2.9q	G	G	E	E	E	E	E	E	E
19	E	E	E	E	E	E	E	2.4M	G	G	G	G	G	G	G	G	G	E	2.3M	2.1M	E	2.1M	E	E
20	E	E	E	E	E	E	E	B	G	3.0	G	G	2.9q	5.0M	G	4.5M	3.6M	5.0M	3.1M	4.2M	4.2M	4.1M	E	3.1M
21	3.0M	2.1M	E	E	E	2.5M	E	E	4.8M	3.3M	G	2.9q	G	2.6q	G	G	B	E	E	E	E	E	2.7M	3.7M
22	3.5M	2.5M	E	E	2.1M	2.3M	2.5M	3.1M	5.2M	3.5M	G	G	G	G	G	G	B	3.1M	3.0M	E	2.5M	3.5M	2.5M	2.5M
23	E	E	E	E	2.1M	E	E	4.5M	4.5M	3.5M	G	G	G	G	G	B	G	E	3.5M	2.3M	3.5Y	2.4M	E	E
24	3.0M	E	E	2.5M	2.3M	E	E	3.6M	3.9M	4.0M	3.1q	G	G	3.2q	3.0M	3.0	B	2.2M	3.6M	4.5M	7.1M	4.3M	4.5M	3.9M
25	3.0M	2.4M	2.2M	2.0M	E	2.0M	2.3M	2.8M	3.4M	G	G	4.4M	G	G	3.6	3.0	2.0M	E	3.0M	4.8M	8.5YM	E	E	E
26	2.2M	2.5M	E	E	E	E	2.3M	2.5M	G	4.7M	4.3M	G	3.7M	G	G	2.9	2.2	E	2.5M	3.1M	2.2M	E	E	2.2M
27	2.2M	E	2.2M	E	E	E	E	3.0M	G	G	G	G	G	G	B	3.2	2.5M	E	E	E	E	E	4.0M	E
28	E	3.5M	E	E	E	E	E	E	G	4.0	7.5M	G	G	G	G	G	B	1.8M	3.8M	3.0M	E	E	E	E
29	E	E	2.5M	3.1M	2.1M	2.4M	E	10.1M	G	4.0	3.7	3.9	G	G	G	B	G	3.0M	4.9M	3.4M	4.0M	3.6M	2.4M	2.4M
30	2.4M	2.1M	E	E	E	2.1M	E	5.8M	6.5M	G	G	G	G	G	G	3.0	2.4M	E	E	E	E	9.5M	4.0M	3.0M
31	3.1M	E	2.2M	E	E	E	E	3.5M	G	G	4.5M	4.4M	5.6M	G	3.0q	S	G	E	E	2.5M	2.4M	2.1M	2.5M	3.0M
No.	29	29	30	29	30	30	29	28	30	30	30	30	30	30	29	25	22	30	30	30	30	30	30	30
Median	2.3M	2.1M	E	E	E	E	E	3.0M	2.6M	3.4	G	G	G	G	G	G	2.0M	E	2.4M	E	E	E	E	2.2M
U.Q	3.0	2.4	2.2	2.1	2.1	2.1	2.3	4.2	4.6	4.0	4.0	3.7	3.7	G	G	3.0	2.5	2.6	3.5	3.1	4.0	3.7	3.6	3.0
L.Q	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	E	E	E	E	E	E	E
Q.R																								

foEs

Sweep 1.60 Mc to 20.0 Mc in 20 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

A 4

IONOSPHERIC DATA

Dec. 1958 | foEs | 135° E Mean Time (G.M.T.+ 9h.) | Akita | Lat. 39° 43.5' N | Long. 140° 08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E		E	E	E						G	G	G	3.9	2.8	G		2.1	1.7		2.5	1.7	1.8	E
2	1.7	E		E		1.7		1.9	1.9	2.3			3.7	3.7	3.7	2.8	2.3		E	1.9		E	1.9	E
3	1.8	E					1.8	5.4	3.0	3.2							B			E		E	2.0	
4							E					3.4												E
5	E	E	E	E	E			2.3	2.9	3.4	3.4	3.0								E	3.5	2.5	E	E
6							E	2.0	2.4	2.7	3.8	2.1	2.6	2.1		G	2.4	2.7	2.0			2.2	E	E
7	E	E		E		E		G		G	3.6	3.9	2.7	2.5		1.9	2.4							
8	E							B		G			3.0				B	E	E					
9					E												2.0	2.5						
10			E	E		E				G	2.6				3.4	G	2.4	E	E	E				
11				S	E					C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C		2.8					C		1.7	E	1.8	1.9	E		
13		E			E	2.5	A	2.0	3.3	2.2							2.0		E					
14	S	S						2.3	3.4	3.7	3.9		G	G	G		B		2.0		3.5	3.8	2.8	3.0
15	2.8	2.5	3.0	E	E		S	2.6	2.7	3.3	2.9					B	B		E				E	E
16	E	E				E	E	1.9	2.3		4.0						G						E	E
17	E	E	E	E				G	G							1.9	E	E	E					
18	E	E	E	E			E	2.0	1.9				G	2.5	2.4				E	E		E		
19								G											E	E				
20								B		G			2.8	3.5		2.9	G	2.0	E	E	2.9	2.5		E
21	E	E				E			2.7	2.1		2.3		2.3			B						E	E
22	E	E			E	E	E	G	2.9	3.2							B	E	E		E	E 2.1 S	E	E
23					E			1.7	3.0	2.3						B			2.0	E	E	E		
24	E			E	E			G	G	2.5	2.6			2.8	2.7	2.9	B	E	E	E	2.5	1.9	3.0	E
25	E	E	E	E		E	E	G	2.7			2.7			3.5	3.0	2.0		E	2.4	3.5			
26	E	E					E	2.0		4.4	G		2.8			2.9	G		E	E	E			E
27	E		E					G							B	3.0	2.3					3.0	
28		2.3								3.2	2.7						B	1.7	1.9	E				
29			E	E	E	E		2.3		3.5	3.6	3.9				B		E	E	1.9	E	E	E	E
30	E	E				E		4.2	2.9							G	2.0					E	2.0	1.8
31	E		E					E			3.5	2.6	4.9		2.7	S				E	E	E	E	1.9
No.	18	15	10	11	10	10	9	21	16	18	14	9	10	9	8	12	13	12	19	14	12	14	15	16
Median	E	E	E	E	E	E	E	1.9	2.7	2.6	3.2	2.7	2.8	2.5	2.8	2.4	2.0	E	E	E	2.2	E	E	E

foEs

Sweep 1.60 Mc to 2.00 Mc in 2.0 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

A 5

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IONOSPHERIC DATA

Dec. 1958 | f-min | 135° E Mean Time (G.M.T. + 9h.)

Akita

Lat. 39° 43.5' N
Long. 140° 08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	E	E	1.75	1.75	2.00	1.90	E 3.00 S	2.40	2.55	1.70	1.90	E	E	E	E	E	E	E	E
2	E	E	E	E	E	E	E	E	E	1.70	2.10	2.75	2.00	2.00	2.00	1.95	1.70	1.70	E	E	E	E	E	E
3	E	E	E	E	E	E	1.70	E	1.75	1.90	1.70	1.75	1.75	2.00	1.75	1.70	2.00	E	E	E	E	E	E	E
4	E	E	E	E	E	E	E	E	E	1.90	1.95	1.80	1.80	1.90	1.95	1.90	1.80	E	E	1.70	E	E	E	E
5	E	E	E	E	E	E	E	E	1.80	1.80	1.80	1.70	2.00	1.70	1.70	1.70	1.70	E	E	E	E	E	E	E
6	E	E	E	E	E	E	1.70	E	E	1.80	1.90	1.80	1.70	1.70	1.75	1.75	1.70	E	E	E	E	E	E	E
7	E	E	E	E	E	E	E	E	1.70	1.70	1.75	1.90	1.70	1.75	1.75	1.75	2.00	1.80	E	1.90	E	E	E	E
8	E	E	E	E	E	E	E	2.00	1.75	1.70	1.75	1.70	1.70	1.80	1.70	E	2.00	E	E	E	E	E	E	E
9	E	E	E	E	E	E	E	E	1.70	1.70	1.70	1.75	1.70	1.75	1.95	E	E	E	E	E	E	E	E	E
10	E	E	E	E	E	E	E	E	1.70	1.85	2.00	2.00	1.85	1.90	1.75	1.70	1.70	E	E	E	E	E	E	E
11	E	E	E	S	E	E	E	E	1.80	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	2.00	1.90	2.15	2.80	1.95	1.95	E 3.40 C	1.90	E	E	E	E	E	E	E
13	E	E	E	E	E	E	E	1.75	1.70	2.10	1.90	2.05	2.00	1.95	1.70	E	E	E	E	E	E	E	E 2.00 S	E
14	E 2.50 S	E 3.00 S	2.00	E	2.00	E	1.80	E	2.05	2.30	2.90	2.55	2.60	2.50	2.70	2.10	2.00	E	E	E	E	E	E	E
15	E	E	E	E	E	E	E 3.50 S	E	2.00	2.70	2.75	2.80	2.40	2.75	2.50	2.80	2.10	E	E	E	E	E	E	E
16	E	E	E	E	E	E	E	E	1.70	1.85	1.90	2.50	2.05	1.85	1.95	1.90	1.75	E	E	E	E	E	E	E
17	E	E	E	E	E	E	E	E	E	1.80	1.75	1.85	1.85	1.95	1.75	1.65	E	E	E	E	E	E	E	E
18	E	E	E	E	E	E	E	E	1.65	1.80	1.75	1.85	1.75	1.80	1.70	1.70	1.85	1.70	E	E	E	E	E	E
19	E	E	E	E	E	E	E	1.80	1.70	1.80	1.90	2.00	2.25	2.50	1.95	1.80	1.75	E	E	E	E	E	E	E
20	E	E	E	E	E	E	E	1.85	1.75	1.90	1.80	1.95	1.95	1.95	1.95	1.95	1.75	E	E	E	E	E	E	E
21	E	E	E	E	E	E	E	1.80	1.75	1.85	1.80	1.90	2.00	1.90	1.80	1.95	1.95	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	E	1.75	2.70	2.90	2.50	2.60	2.55	2.70	2.00	2.10	E	E	E	E	E 2.10 S	E	E
23	E	E	E	E	E	E	E	E	1.70	1.90	2.00	1.95	1.95	1.95	1.95	2.90	1.80	E	E	E	E	E	E	E
24	E	E	E	E	E	E	E	E	1.70	1.70	2.00	1.70	1.85	1.90	1.90	1.80	2.05	E	E	E	E	E	E	E
25	E	E	E	E	E	E	E	E	1.70	2.40	2.60	1.80	2.60	2.00	1.90	1.75	E	E	E	E	E	E	E	E
26	E	E	E	E	E	E	E	E	E	1.75	1.95	2.70	1.95	1.95	1.90	1.95	1.70	E	E	E	E	E	E	E
27	E	E	E	E	E	E	E	1.90	1.80	2.50	2.30	1.90	2.75	2.60	3.10	2.70	1.95	E	E	E	E	E	E	E
28	E	E	E	E	E	E	E	E	2.00	2.70	2.00	1.95	2.80	2.10	2.75	1.95	2.05	E	E	E	E	E	E	E
29	E	E	E	E	E	E	E	1.70	1.90	1.90	2.00	2.00	3.00	2.10	1.95	2.80	1.70	E	E	E	E	E	E	E
30	E	E	E	E	E	E	E	E	1.80	1.95	1.95	2.15	2.50	2.15	2.05	1.90	1.70	E	E	E	E	E	E	E
31	E	E	E	E	E	E	E	E	1.90	1.95	1.95	1.90	2.10	2.00	1.90	E 2.65 S	1.90	E	E	E	E	E	E	E
No.	29	29	30	29	30	30	29	30	30	30	30	29	30	30	30	28	30	30	30	30	30	29	30	29
Median	E	E	E	E	E	E	E	E	1.70	1.90	1.90	1.95	2.00	1.95	1.90	1.90	1.80	E	E	E	E	E	E	E

f-min

Sweep 4.60 Mc to 20.0 Mc in 2.0 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec. 1958 | (M3000)F2 | 135° E Mean Time (G.M.T.+ 9h.) | Akita | Lat. 39° 43.5' N | Long. 140° 08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.50	2.55	2.60	2.65	2.60	2.70	2.95	3.25	3.25	3.10	3.00	2.90	2.85H	2.80H	2.80H	2.90H	2.95	2.90	3.10	3.05	2.95	2.90	2.80	3.00
2	2.55	2.50	2.70	2.55	2.50	2.75	3.20	3.15	3.20	3.10	3.00	2.95	2.85	2.85	2.80H	2.85	2.85	2.80S	3.05	2.95	2.70	2.60S	2.35S	2.25
3	2.50	2.25	2.25	2.55	2.45	2.55	2.55	2.90	2.95	2.95	2.90H	2.80H	2.75H	2.75H	2.70H	2.80	2.85	2.85	2.90	3.05	2.90	2.85	3.10	2.75
4	2.60	2.60	2.60	2.50	2.50	2.85	3.30	3.30	3.05	3.10	3.05	2.85H	2.90H	2.90	2.90	2.85	2.80	2.95	3.10S	2.95	2.60	2.50	2.70	2.45
5	2.10	2.10	2.25	2.30	2.00H	2.00	2.20	2.70S	3.00	I 3.00R	2.80H	2.90	2.90H	2.90	2.90	2.85	2.90	2.95	2.85	2.90	3.20	2.55	2.70	2.70
6	2.70	2.70	2.75F	2.80F	2.70F	2.60F	2.75Z F	2.95Z F	3.00V	3.05	3.00	3.00	2.90	2.80	2.90	2.95	2.95	2.90	3.05S	3.00S	3.05S	2.65	2.75S	2.85S
7	2.55F	2.40F	2.35	2.40	2.40	2.70	3.10	3.05	3.20	3.10	3.05	2.95	2.90	2.90	2.80	2.85	2.85	2.90	2.95	3.15	3.05S	2.55S	2.75S	2.70
8	2.60	2.65	2.65	2.60	2.50	2.60	3.10S	3.00H	3.30	3.10	3.05	2.90	2.90H	2.80H	2.80H	2.90	2.95	3.00	3.05	3.05	3.10	2.65	2.70	2.75
9	2.75	2.60F	2.40	2.30	2.60F	3.00	3.20	3.00	3.10	3.10	3.00	2.95	2.80H	2.80	2.90H	2.90	2.90	2.95	3.00	2.90	3.05	2.80	2.80	2.70
10	2.50	2.70	2.85	2.90	2.70	2.80	2.75	3.00	3.25	3.05	2.95	2.80H	2.90H	2.85H	2.85	2.95	2.85	2.85	3.05	3.10	3.00	2.55S	2.75	2.55
11	2.50	2.60	2.85	I 2.70S	2.55	2.75	2.90S	3.10	3.30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	3.00	3.00	2.95	2.80H	2.85H	2.85H	2.80	2.90	2.90	3.05	2.95	3.10S	2.60F	2.60S	2.65
13	2.70	2.60	2.55	2.65	2.65	2.70F	I 2.80A	3.20	3.15	3.00	3.00	2.90	2.80H	2.75	2.80	2.80	2.80	2.85	2.70	2.95	3.00	2.60	2.70	2.60
14	2.00	2.10	2.40	2.40	2.20	2.15	2.60	2.95	2.80H	3.00	2.90	2.75H	2.80	2.75H	2.75	2.90	2.90	3.00	3.00	3.25	3.15	2.80	2.80	2.75
15	2.50	2.50	2.25	2.15	2.35	J 2.55S	2.50	3.10	3.05	U 2.90R	3.00	2.90	2.90	2.90	2.85	2.85	2.90	2.85	2.95S	3.05	3.20	2.80	2.75	2.60
16	2.70	2.50	2.55	2.60	2.55	2.90S	3.15	3.10	3.15	3.10H	3.10	2.95	2.90	2.80	2.80	2.90	2.85	2.90	3.10S	3.05	2.55S	2.60	2.60	2.55
17	2.45	2.80	2.90	2.45	2.50	2.65	3.10S	3.30	3.15S	2.95	2.95H	2.95	2.90H	2.75	2.85	2.95	2.85	3.00	3.05	3.20	3.05	2.60	2.80	2.90
18	2.65	2.55	2.80	2.75	2.75	2.30	2.15	2.95	3.00V	3.15	2.80	2.85	2.65H	2.75	2.85	2.85	2.90	2.85	3.00S	2.90	2.75	2.50	2.60	2.75
19	2.80S	2.60S	2.60F	2.55	2.45	2.65	3.10	3.25S	3.25	3.05	3.10	2.95H	3.05	2.90	2.90	2.85H	2.95S	2.90	2.80	2.90	3.15	2.60	2.70	2.95
20	2.60F	2.55	2.45	2.55	2.55	2.65	2.85	3.10	3.25	3.10	3.05	3.05	3.00	3.00	2.95	3.05	3.10	3.00	3.00S	3.10	2.10H	2.30S	2.65	2.65
21	2.55	2.60	2.65	2.45	2.45	2.50	2.85	3.15S	3.25S	3.20	3.20	3.05	3.00	3.05	2.95	3.05	3.10	3.15	3.00	3.30	3.00	2.60	2.50	2.55
22	2.60	2.40	2.40	2.50	2.60	2.60	2.90	3.05	3.30	3.05	3.00H	3.00	2.90H	3.00	2.90	3.10	3.00	3.00	3.25	3.10	3.10	2.60	2.80	2.50
23	2.60	2.40	2.30	2.65	2.90	3.10	2.90	3.10	3.25	3.10	3.00	3.10	2.90	2.80	2.90	3.00	3.00	3.05	3.10	3.25S	2.65	2.65	2.80	2.50
24	2.45	2.50	2.55	2.85	2.55	2.65	3.00	3.10	3.05	3.00	3.10	3.05	2.85H	2.85	2.90	2.85	3.15S	3.00S	3.00	3.45	2.90S	2.60	2.75	2.50
25	2.50	2.65	2.80F	2.85	2.80	2.60S	3.20	3.20	3.15	3.15	3.10	3.15	2.95	3.00	3.00	2.95	3.00H	3.00	3.20	3.25	3.10	2.70	2.80	2.80
26	2.45	2.40	2.45	2.65	2.90	2.55	3.50	3.10	3.30	3.10	3.05	3.05	2.95H	2.90H	2.80	2.90	3.00	2.90	3.00	I 3.20S	2.70H	2.55	2.60	2.60
27	2.30	2.40	2.95	3.10	2.30	2.40	2.80	3.20	3.10	3.15	3.00	2.95	2.90H	2.80H	2.75	2.90	2.85	2.90	3.10	3.10	2.80	2.65	2.80	2.65
28	2.60	2.75	2.60	2.45	2.55F	2.75F	3.20	3.30	3.20	3.10	2.95	3.00	2.75H	2.85	2.80H	2.85	2.90	3.00	3.05S	3.20	2.90	2.75S	2.70S	2.80
29	2.65F	2.20F	2.15F	2.55F	2.40F	3.10	3.25	2.90	3.20	3.15	3.15	2.90	2.85	2.80	2.80H	2.90	2.80	2.95	3.10S	3.15	2.95F	2.80	2.70	2.75
30	2.80	2.60	2.50	2.50	2.85	3.10	2.70H	2.90H	3.05	3.15	3.10	3.05	2.95H	2.90H	2.55	2.90	2.95	2.95	3.15	3.20	3.05	3.15	3.10	2.65
31	2.70	2.55	2.50	2.65	2.50	2.65	3.00	3.20	3.30	3.15	3.10	3.00	2.80	2.80H	2.75	2.80	2.85	3.00	2.95S	3.10	2.85	2.80	2.70	2.85
No.	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Median	2.60	2.55	2.60	2.55	2.55	2.65	2.90	3.10	3.20	3.10	3.00	2.95	2.90	2.80	2.85	2.90	2.90	2.90	3.05	3.10	3.00	2.60	2.70	2.70

(M3000)F2 Sweep 1.60 Mc to 20.0 Mc in 20 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

A 7

27

IONOSPHERIC DATA

Dec. 1958 | (M3000)F1 | 135° E Mean Time (G.M.T.+ 9h.) | Akita | Lat. 39° 43.5' N | Long. 140° 08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3								A									L							
4																								
5																								
6											L	L												
7																								
8																								
9																L								
10																								
11										C	C	C	C	C	C	C	C							
12								C	C															
13														L										
14																								
15											L													
16																								
17															L	L	L							
18										L														
19														L										
20																								
21															L									
22																								
23																								
24																								
25											L			L										
26																								
27																								
28																								
29																								
30																								
31																								
No.																								
Median																								

(M3000)F1 Sweep 1.60 Mc to 20.0 Mc in 20 sec in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec.1958 | h'F2 | 135° E Mean Time (G.M.T.+ 9h.) | Akita | Lat. 39° 43.5' N | Long. 140° 08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3								A									250L							
4																								
5																								
6											L	230												
7																								
8																								
9																L								
10																								
11										C	C	C	C	C	C	C	C							
12								C	C															
13														L										
14																								
15											255													
16																								
17															255	L	L							
18										250														
19														L										
20																								
21															L									
22																								
23																								
24																								
25											250L			L										
26																								
27																								
28																								
29																								
30																								
31									1															
No.										1	2	1			1		1							
Median										250	250	230			255		250							

h'F2 | Sweep 160 Mc to 200 Mc in 20 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

A 9

IONOSPHERIC DATA

Dec. 1958 | h'F | 135° E Mean Time (G.M.T.+ 9h.) | Akita | Lat. 39° 43.5' N | Long. 140° 08.2' E

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	310	315	300	300	295	250	240	225	245	240	240	245H	245H	245H	240H	235	245	245	210	250A	250A	295	290
2	300	320	295	305	310	310	250	220	210	240	235	210	235	240	230H	230	220	230	240	215	245	310	370	380
3	305	370	370	325	310	300	255	I 260A	245	240	245H	240H	245H	240H	245H	245	245	235	235	245	225	255	255	245
4	255	E 295E	300	E 315E	310	285	205	245	210	225	225	220H	226H	240	230	230	240	255	230	255	270	290	260	270
5	360	440	400	360	355H	440	395	270	260	240	245H	245	245H	240	245	220	245	235	245	255	255	I 290A	295	260
6	250	265	260	250	260	295	250	245	240	225	230	220	220	220	225	225	230	245	235	220	240	295	275	240
7	320	350	340	350	345	295	220	240	225	240	240	220	225	240	245	240	240	230	245	240	220	260	290	260
8	255	300	290	280	330	300	240	240	230	215	245	240	245H	225H	230H	245	245	200	235	245	245	260	295	260
9	260	E 260E	355	355	300	295	250	250	245	245	235	240	245H	245	230H	245	245	255	255	240	240	275	295	295
10	295	295	270	250	E 300E	295	295	255	235	235	235	220H	235H	240H	245	240	220	235	240	220	210	290	295	300
11	335	305	295	I 295S	300	295	250	240	230	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	235	245	245	230H	230H	240H	235	235	210	245	230	240	330	280	290
13	270	320	330	305	295	A	A	240	240	245	245	245	245H	245	250	245	245	225	240	255	245	290	280	E 300S
14	S	S	400	360	340	E 400E	260	245	245H	250	245	240H	245	230H	245	245	240	245	250	245	245A	I 280A	I 280A	A
15	A	A	A	415	360	320	I 280S	245	220	225	250	230	235	240	240	240	225	205	230	230	220	255	290	290
16	290	310	320	305	305	270	220	220	230	205H	245	220	230	225	240	240	245	245	220	220	260	295	305	270
17	305	280	250	295	310	305	240	220	215	220	230H	245	245H	245	245	220	225	245	245	220	225	255	290	250
18	295	300	285	E 340E	400	E 440E	E 445E	210	235	245	235	240	240H	240	240	240	245	270	235	210	235	260	300	270
19	250	300	290	270	290	300	240	240	220	225	230	240H	245	225	240	225H	225	225	250	245	220	255	290	285
20	305	300	305	310	300	310	255	230	215	220	240	240	240	230	240	240	210	225	240	235	I 245M	I 310A	320	305
21	330	320	290	320	365	320	270	250	220	240	240	225	235	225	225	250	225	230	240	235	205	230	320	305
22	300	355	355	350	300	330	215	225	225	245	225H	240	235H	245	245	250	225	240	225	205	245	I 305S	300	295
23	345	355	350	315	270	250	E 270E	240	215	230	240	240	235	240	245	240	240	230	225	220	245	240	265	310
24	310	330	305	280	300	315	235	240	220	245	240	225	210H	245	245	230	230	235	235	220	I 250A	310	I 320A	340
25	340	325	290	280	295	290	230	245	220	230	245	240	240	245	245	245	220H	220	240	240	I 220A	255	290	270
26	340	360	350	300	270	290	235	240	225	240	240	230	225H	230H	240	245	225	210	240	210	210H	300	290	290
27	360	360	265	235	350	360	260	225	225	250	245	245	245H	240H	250	245	245	240	245	215	220	305	295	295
28	290	285	300	330	325	295	235	240	235	240	240	235	225H	240	235H	245	250	235	230	230	240	265	260	255
29	290	405F	405F	340	270	245	210	220	225	225	240	220	235	230	240H	240	225	245	220	210	230	255	290	280
30	290	310	310	320	290	255	270H	I 225M	230	245	245	220	220H	235H	245	240	245	245	225	205	245	245	245	300
31	300	270	255	280	325	310	220	235	215	225	220	220	225	225H	240	230	240	240	210	220	215	255	240	270
No.	28	28	29	28	30	27	27	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28
Median	300	310	305	305	310	295	250	240	225	240	240	240	235	240	240	240	240	235	240	225	240	280	290	290

h'F

Sweep 1.60 Mc to 20.0 Mc in 20 sec in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Akita

Lat. 39° 43.5' N
Long. 140° 08.2' E

Dec. 1958

h'Es

135° E Mean Time (G.M.T.+ 9h.)

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	E	105	105	105	E	E	G	G	G	145	140	145	125	100	125	G	110	105	E	105	100	100	100
2	100	100	E	115	E	100	E	110	110	120	G	G	175	160	135	150	100	E	140	140	E	125	120	125
3	120	120	E	E	E	E	130	120	120	110	G	G	G	G	G	G	B	E	E	105	E	145	105	E
4	E	E	E	E	E	E	115	G	G	G	G	110	G	G	G	G	G	E	E	E	E	E	E	105
5	105	105	105	105	105	E	E	105	120	110	110	110	G	G	G	G	G	E	E	110	105	105	110	105
6	E	E	E	E	E	E	145	110	105	110	125	105	105	105	G	105	100	110	110	E	E	110	110	115
7	110	110	E	110	E	110	E	100	G	125	140	130	105	105	G	100	105	E	E	E	E	E	E	E
8	120	E	E	E	E	E	E	B	G	125	G	G	110	G	G	G	B	100	100	E	E	E	E	E
9	E	E	E	E	100	E	E	G	G	G	G	G	G	G	G	G	170	105	E	E	E	E	E	E
10	E	E	110	110	E	105	E	G	G	135	105	G	G	G	160	140	100	100	100	100	E	E	E	E
11	E	E	E	S	110	E	E	G	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	G	105	G	G	G	G	C	G	115	110	110	105	110	E	E
13	E	120	E	E	100	115	110	105	105	110	G	G	G	G	G	G	105	E	105	E	E	E	E	E
14	S	S	E	E	E	E	E	110	110	110	110	G	145	140	145	G	B	E	110	E	105	105	110	100
15	105	105	110	110	110	E	S	115	115	120	115	G	G	G	G	B	B	E	120	E	E	E	100	100
16	100	100	E	E	E	120	120	110	105	G	105	G	G	G	G	G	120	E	E	E	E	E	105	105
17	105	110	110	120	E	E	E	110	160	G	G	G	G	G	G	105	105	105	105	E	E	E	E	E
18	105	100	100	100	E	E	110	105	105	G	G	G	125	100	100	G	G	E	E	E	E	E	E	E
19	E	E	E	E	E	E	E	120	G	G	G	G	G	G	G	G	G	E	110	105	E	120	E	E
20	E	E	E	E	E	E	E	B	G	150	G	G	115	105	G	105	110	110	110	110	105	105	E	100
21	105	110	E	E	E	115	E	E	115	120	G	105	G	105	G	G	B	E	E	E	E	E	105	100
22	100	100	E	E	105	130	125	120	110	115	G	G	G	G	G	G	G	110	110	E	105	105	100	100
23	E	E	E	E	100	E	E	115	110	115	G	G	G	G	G	B	G	E	105	110	105	105	E	E
24	105	E	E	105	105	E	E	110	110	110	110	G	G	110	110	145	B	110	120	120	110	110	105	105
25	120	110	105	100	E	110	110	105	100	G	G	105	G	G	145	145	110	E	115	110	105	E	E	E
26	105	105	E	E	E	E	110	110	G	105	150	G	105	G	G	160	180	E	120	110	110	E	E	110
27	100	E	115	E	E	E	E	105	G	G	G	G	G	G	B	145	130	E	E	E	E	E	105	E
28	E	100	E	E	E	E	E	E	G	150	120	G	G	G	G	G	B	110	105	105	E	E	E	E
29	E	E	120	120	120	105	E	115	G	150	150	140	G	G	G	B	G	110	110	105	100	100	105	105
30	105	105	E	E	E	110	E	110	105	G	G	G	G	G	G	145	105	E	E	E	E	110	105	105
31	100	E	105	E	E	E	E	115	G	G	110	110	105	G	105	S	G	E	E	110	110	105	105	100
No.	18	15	10	11	10	10	9	21	16	18	14	9	10	9	8	12	13	12	19	14	12	15	15	15
Median	105	105	110	110	105	110	115	110	110	120	110	110	110	105	120	140	105	110	110	110	105	105	105	105

h'Es

Sweep 1.60 Mc to 20.0 Mc in 20 sec in automatic operation.

The Radio Research Laboratories, Japan.

A 11

IONOSPHERIC DATA

Dec. 1958

Types of Es

135° E Mean Time (G.M.T.+ 9h.)

Akita

Lat. 39° 43.5' N
Long. 140° 08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f		f	f	f						h	h	h	c	l	c		f2	f2		f2	f	f	f
2	f	f		f		f		l	l	lh			h	h	h	h	l		f	f2		f	f	f
3	f2	f					f	l3	l2	l2										f2		f	f2	
4							f					l2												f
5	f	f	f	f	f			lh	c	l2	l	l								f	f3	f2	f	f
6							f	l	l2	lh	hl	lh	l	l		l	l	f2	f3			f2	f	f
7	f3	f		f		f		l		h2	h	h2	l	l		l	l							
8	l									c			l					f	f					
9					f												h	f						
10			f	f2		f2				h	l				hl	hl	l	f	f	f				
11					f																			
12											l							f	f2	f2	f2	f2		
13		f			f	f4	f4	l2	l2	l							l		f		f2	f2	f2	f2
14								l2	l2	l2	l2		h	h	h				f		f2	f2	f	f
15	f	f2	f2	f2	f			l	l	l	l								f				f	f
16	f	f				f	f	l	l2		l						l						f2	f
17	f	f	f	f				l	h							l	l	f	f					
18	f	f	f	f			f	l2	l				h	l	l									
19								C											f	f		f		
20										h			l	l		l2	l2	f3	f2	f3	f2	f2		f
21	f	f				f			l2	l		l		l									f	f2
22	f2	f			f	f2	f	l	l2	l								f	f		f	f	f	f
23					f			f	l2	l									f3	f	f	f		
24	f2			f	f			l2	l2	l	l			l	l	h		f	f	f	f2	f3	f2	f2
25	f	f	f	f		f	f2	l2	l2			l			h	hl	l		f	f2	f2			
26	f	f					f	l		l2	hl		l			h	h		f	f				f
27	f		f					l								h	C						f2	
28		f2								hl	l							f	f3	f				
29			f	f	f	f		l		h	h	h						f	f	f	f	f	f	f
30	f	f				f		f2	l3							h	l					f2	f2	f
31	f		f					f			l	l	l2		l					f	f	f	f	f2
No.																								
Median																								

Types of Es

Sweep 1.60 Mc to 20.0 Mc in 20 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

A 12

IONOSPHERIC DATA

Dec. 1958 | foF2 | 135° E Mean Time (G.M.T.+ 9h.)

Kokubunji Tokyo Lat. 35° 42.4' N Long. 139° 29.3' E

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	4.5	4.4	4.5	4.3	3.8	4.0	4.9	9.9	13.0	14.1	14.5	14.4	14.5	14.3	13.8	13.6	12.8	11.0	9.6	8.6	7.3	6.8	5.9	5.2
2	4.5	4.6	4.7	4.4	4.1	4.5	6.4	9.4	12.0	13.9	15.2	14.6	14.7	14.5	14.3	14.0	13.0	11.3	10.7	8.4	7.1	6.0	5.4	5.4
3	5.4	5.0	5.2	5.6	5.9	6.0	5.9	9.7	15.2	16.5	17.3	16.7	16.0	15.3	15.6	15.3	14.3	12.4	10.7	10.3	8.3	6.7	6.6	5.6
4	4.8	4.9	4.9	4.6	5.0	5.0	5.0	8.7	12.8	15.3	15.4	15.3	15.0	15.1	14.0	13.6	12.6	11.3	11.2	9.8	7.2	7.3	7.1	5.3
5	5.0	5.1	5.5	5.3	5.4	5.2	5.3	9.3	15.6	17.8	17.4	17.1	16.8	16.7	15.2	14.1	13.4	12.3	9.1	S	S	6.0	6.1	6.2
6	5.7	4.9	4.4	3.9	3.9	5.3	6.6	11.5	14.6	15.9	17.4	17.1	16.8	16.3	15.4	14.8	13.8	13.0	12.2	9.0	8.2	6.9	7.0	6.4
7	4.4	4.3	4.3	4.4	4.5	4.8	5.5	9.1	11.5	14.1	15.4	14.2	12.9	13.2	12.6	13.0	11.6	11.3	9.4	7.9	6.4	5.1	5.2	5.1
8	4.3	4.4	4.5	4.0	4.1	4.1	5.3	10.3	12.0	13.8	15.2	15.2	14.9	14.4	14.7	14.4	13.3	12.2	9.5	9.6	8.1	6.3	5.9	5.2
9	5.3	4.3	4.2	4.3	4.5	4.8	5.4	8.7	12.4	14.2	14.9	14.8	13.9	14.5	13.9	12.8	12.3	11.1	9.9	8.9	6.9	5.3	5.1	5.0
10	4.6	5.2	4.3	3.8	3.7	3.8	4.4	9.1	11.9	13.7	15.2	15.0	14.5	14.0	14.0	14.3	11.6	10.4	9.3	8.2	6.4	4.5	4.3	4.3
11	3.5	3.6	4.0	3.8	3.6	3.8	4.5	9.5	11.3	13.6	15.7	14.6	14.4	14.3	14.2	13.8	11.0	10.5	9.4	6.8	5.9	5.3	5.5	4.5
12	4.1	3.8	3.8	3.6	3.6	3.8	4.4	8.8	9.7	12.5	14.7	14.6	13.1	12.6	13.0	12.2	11.2	9.6	8.4	7.6	6.4	4.7	4.6	4.5
13	4.1	3.7	3.8	3.8	3.7	3.5	3.9	8.2	10.4	12.9	13.9	13.3	12.7	12.4	13.2	12.4	11.1	10.3	9.0	8.6	7.4	5.9	5.7	4.9
14	3.9	3.8	4.1	4.1	3.6	4.7	5.0	8.3	10.9	14.2	15.3	14.8	14.1	13.1	12.9	12.8	11.8	10.3	9.1	8.3	6.3	5.8	5.5	4.4
15	4.3	4.0	4.0	3.8	4.1	4.0	4.4	8.9	13.3	15.4	15.8	16.2	16.5	S	S	15.1	14.4	12.9	11.3	9.9	8.2	6.6	5.4	4.9
16	4.7	4.3	4.4	4.3	4.1	5.0	5.5	8.2	10.9	S	S	S	14.5	13.6	13.4	13.6	12.4	12.5	11.3	8.3	6.3	5.8	6.3	5.7
17	5.2	5.7	4.9	4.1	3.8	4.2	5.5	8.8	10.1	12.4	14.7	14.0	14.6	13.3	14.5	13.9	12.5	12.2	11.6	9.8	6.6	5.7	5.3	4.9
18	3.8	3.8	3.6	3.0	3.0	2.8	3.1	7.6	9.9	13.4	15.0	14.1	13.4	13.8	13.0	12.0	11.7	10.9	10.7	8.4	6.1	5.5	5.6	5.4
19	5.3	4.6	4.6	4.4	4.1	4.1	5.0	7.6	10.0	10.9	12.6	12.8	14.0	12.4	13.3	13.3	11.7	S	S	8.3	7.0	5.4	4.4	4.7
20	4.3	4.5	4.1	4.2	4.1	4.3	4.8	8.5	11.0	12.9	14.6	14.1	14.7	13.6	12.5	12.6	12.1	9.3	8.2	7.3	5.3	3.4	3.8	4.0
21	3.8	3.9	4.0	3.5	3.6	3.8	4.2	8.0	11.4	13.0	15.1	15.0	13.6	13.3	12.9	12.9	12.0	9.5	7.0	6.9	5.7	4.6	4.0	3.8
22	3.9	3.8	3.6	3.6	3.5	3.6	4.4	7.0	10.6	11.6	14.9	14.7	14.4	13.3	13.0	13.3	12.7	10.0	9.9	7.0	4.7	4.7	4.1	4.0
23	3.8	3.6	3.4	3.5	3.5	3.4	3.2	7.3	10.1	11.5	14.4	13.5	13.6	13.4	13.5	13.3	11.9	10.3	9.7	7.2	5.8	6.1	5.8	5.0
24	4.9	4.7	4.8	5.3	3.9	4.1	4.3	7.7	10.3	12.8	15.6	14.9	13.6	13.5	14.1	13.7	12.3	10.8	9.7	8.3	5.6	4.5	4.5	4.5
25	4.3	4.1	4.0	4.4	3.7	3.6	3.6	7.2	10.7	11.2	12.2	13.3	12.1	12.3	12.0	11.4	10.5	9.7	8.9	8.2	6.9	4.5	4.6	4.3
26	3.6	3.5	3.6	3.8	3.7	3.3	3.5	7.0	10.1	11.8	14.4	13.9	13.6	13.2	12.0	11.7	11.7	9.8	8.6	8.4	6.4	4.9	5.0	5.2
27	4.6	4.6	5.6	4.0	3.0	2.8	3.8	7.4	9.8	13.0	14.6	13.9	12.5	12.8	12.3	12.6	12.0	10.5	8.6	7.3	6.7	5.7	6.2	5.1
28	5.2	4.6	3.9	3.8	3.8	4.3	4.9	8.0	10.7	12.8	14.6	13.7	13.8	14.4	13.7	13.0	12.4	12.0	9.3	7.7	6.3	4.9	5.0	4.8
29	4.4	4.1	4.0	4.5	4.8	4.9	3.4	6.9	11.3	14.7	15.4	14.5	14.8	14.4	13.8	14.2	12.4	12.7	12.4	9.5	6.9	6.4	6.2	6.1
30	5.4	4.6	4.6	4.4	4.6	4.5	3.0	7.1	10.0	14.0	15.8	16.1	14.4	13.8	14.4	14.4	13.2	12.9	12.3	10.0	7.7	7.3	6.2	5.2
31	5.5	5.4	4.6	4.3	4.2	4.2	4.5	7.6	10.5	13.7	15.2	13.8	13.8	14.3	14.6	15.0	14.1	13.7	12.7	10.0	7.7	7.2	6.4	5.9
No.	31	31	31	31	31	31	31	31	31	30	30	30	31	30	30	31	31	30	30	30	30	31	31	31
Median	4.5	4.4	4.3	4.1	3.9	4.1	4.5	8.3	10.9	13.6	15.2	14.6	14.4	13.7	13.8	13.6	12.3	11.0	9.6	8.4	6.6	5.7	5.5	5.0
U. Q.	5.2	4.7	4.6	4.4	4.2	4.8	5.3	9.1	12.0	14.2	15.4	15.0	14.7	14.4	14.3	14.2	13.0	12.3	11.2	9.5	7.3	6.4	6.2	5.4
L. Q.	4.1	3.8	4.0	3.8	3.6	3.8	3.9	7.6	10.1	12.8	14.6	13.9	13.6	13.2	13.0	12.8	11.7	10.3	9.1	7.7	6.3	4.9	4.6	4.5
Q. R.	1.1	0.9	0.6	0.6	0.6	1.0	1.4	1.5	1.9	1.4	0.8	1.1	1.1	1.2	1.3	1.4	1.3	2.0	2.1	1.8	1.0	1.5	1.6	0.9

The Radio Research Laboratories, Japan.

foF2

Sweep 1.0 Mc to 20.0 Mc in 20 ~~min~~ sec in automatic operation.

K 1

IONOSPHERIC DATA

Dec. 1958 | foF1 | 135° E Mean Time (G.M.T.+ 9h.) | Kokubunji Tokyo | Lat. 35° 42.4' N | Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
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11														L										
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28																								
29																								
30																								
31																								
No.																								
Median																								

foF1

Sweep 1.0 Mc to 20.0 Mc in 20 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

K 2

IONOSPHERIC DATA

Dec. 1958 | foE | 135° E Mean Time (G.M.T.+ 9h.) | Kokubunji Tokyo | Lat. 35° 42.4' N | Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								B	3.00^{R}	3.30	3.50^{R}	3.60^{R}	3.70	3.60^{R}	^{I}3.30^{A}	^{I}2.95^{A}	A							
2								B	3.00	3.20	3.60	3.70	3.70^{R}	3.65	3.30	2.80	B							
3								B	2.50	A	A	3.60^{R}	3.65	3.55	3.35	^{I}2.85^{R}	2.35							
4								B	2.90	3.00^{R}	3.60^{R}	3.60^{R}	3.60^{R}	3.50^{R}	^{I}3.15^{R}	2.75^{S}	S							
5								B	2.80	A	A	A	A	^{I}3.60^{A}	^{I}3.30^{RS}	2.80^{S}	S							
6								B	2.60	^{I}3.15^{R}	^{I}3.55^{A}	3.65	3.65^{R}	3.65^{A}	3.35	2.95^{H}	2.30^{H}							
7								B	2.75	^{I}3.00^{A}	3.45^{R}	^{I}3.55^{A}	3.60	3.50	^{I}3.30^{R}	2.70	2.60							
8								B	2.90^{H}	A	A	^{I}3.65^{A}	^{I}3.70^{R}	^{I}3.50^{R}	3.15	2.90	B							
9								B	2.90	^{I}3.25^{R}	3.45	3.60	3.60	3.50	^{I}3.20^{R}	^{I}2.70^{R}	B							
10								B	2.70	3.15^{R}	3.55^{R}	^{U}3.55^{S}	^{I}3.45^{R}	^{I}3.40^{A}	3.20^{R}	2.75	B							
11								B	2.70	3.15	3.60^{R}	3.65	3.65	3.50	3.40	^{U}3.05^{S}	B							
12								B	2.75	3.25	3.50	^{I}3.85^{R}	^{I}3.85^{B}	3.60	3.40	2.80	B							
13								B	2.60	3.35^{R}	^{I}3.60^{R}	^{I}3.70^{B}	^{I}3.70^{A}	3.60^{R}	^{I}3.30^{R}	2.85^{R}	A							
14								B	A	A	R	3.50^{S}	^{I}3.55^{A}	3.60^{S}	B	^{I}2.95^{A}	S							
15								B	A	3.20	R	B	B	B	3.40^{R}	^{I}2.95^{R}	RS							
16								B	2.60	^{I}3.15^{R}	R	R	A	^{I}3.60^{B}	^{I}3.40^{R}	^{I}3.05^{S}	S							
17								B	R	R	3.50	B	^{I}3.65^{RS}	3.55^{R}	^{I}3.30^{R}	^{I}2.95^{S}	B							
18								B	B	3.20^{R}	3.40	B	R	B	R	2.70^{R}	B							
19								S	B	B	B	B	3.40^{R}	^{I}3.40^{R}	^{I}3.30^{B}	^{I}2.95^{R}	S							
20								S	B	A	R	A	^{I}3.60^{R}	3.55	3.35^{R}	S	A							
21								B	2.50	^{I}3.15^{B}	^{I}3.50^{B}	3.65	3.65	3.50^{R}	3.30	B	B							
22								B	2.70	^{I}3.25^{A}	A	A	^{I}3.70^{R}	R	A	R	B							
23								B	A	A	A	^{I}3.60^{R}	B	3.65	3.40^{R}	B	B							
24								B	R	A	A	^{I}3.60^{A}	3.65	3.45	^{I}3.15^{R}	^{I}2.90^{B}	B							
25								B	R	3.15^{R}	^{I}3.45^{R}	B	^{I}3.60^{A}	3.55	^{I}3.25^{R}	^{I}2.85^{S}	B							
26								B	2.60	3.20^{R}	3.55^{S}	^{U}3.65^{R}	^{I}3.60^{R}	B	3.40	^{U}3.05^{S}	B							
27								B	2.60	3.15	3.40^{R}	3.50^{S}	^{I}3.55^{B}	^{I}3.40^{S}	^{I}3.30^{S}	2.70^{S}	S							
28								B	B	B	B	B	B	B	B	B	S							
29								B	B	3.05	3.50^{S}	^{U}3.70^{S}	3.75	B	3.40	^{I}3.10^{A}	B							
30								B	2.80	^{I}3.10^{RS}	^{I}3.35^{R}	^{I}3.50^{R}	3.65^{R}	^{I}3.60^{RS}	3.50^{S}	3.00^{R}	S							
31								B	2.70	^{U}3.30^{R}	3.55	3.75	3.80	^{I}3.70^{A}	3.55	3.10	B							
No.									20	21	19	21	25	25	27	26	3							
Median									2.70	3.15	3.50	3.60	3.65	3.55	3.30	2.90	2.35							

foE

Sweep 1.0 Mc to 20.0 Mc in 20 min/sec in automatic operation.

IONOSPHERIC DATA

Dec. 1958 | foEs | 135° E Mean Time (G.M.T. + 9h.) | Kokubunji Tokyo | Lat. 35° 42.4' N | Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	E	E	G	G	G	3.7	G	4.0	G	5.0M	3.3M	3.1M	3.2M	2.9M	3.1M	E	3.1M	3.0M	E
2	E	E	E	E	E	E	E	B	G	3.4	G	G	3.9	4.1	4.2M	3.6	2.9M	2.8M	E	2.5M	2.5M	2.7M	2.6M	E
3	E	4.3M	2.8M	E	E	E	E	B	2.7	4.4M	4.2M	G	G	G	G	G	2.9M	3.1M	E	E	E	E	E	E
4	3.4M	E	E	E	E	E	E	B	G	3.3	G	G	G	G	G	G	S	E	E	E	E	E	E	E
5	E	E	E	E	E	E	E	B	3.3	4.8M	6.8M	3.9M	4.1M	3.9M	G	G	S	S	5.7M	E	E	E	4.9M	3.4M
6	E	E	E	E	E	E	E	B	2.9	G	4.0	G	G	3.9M	2.6G	G	G	E	E	E	3.1M	3.2S	2.8M	4.3M
7	2.8M	3.0M	E	2.3M	E	E	E	B	G	3.5	G	3.7	G	G	2.7G	G	G	E	E	E	3.9M	E	4.1M	E
8	E	E	E	E	E	E	E	B	G	3.6	3.7	3.8	3.4G	3.3G	G	G	B	E	E	4.2S	E	E	E	E
9	E	E	E	E	E	E	E	B	G	G	G	G	G	G	2.9G	2.6G	B	E	3.4S	2.2M	E	S	E	E
10	E	E	E	2.6S	E	3.7M	2.7M	B	G	G	G	G	G	4.0M	G	G	B	E	E	E	E	E	E	E
11	E	E	E	E	E	E	E	B	G	G	G	G	G	G	G	G	B	E	E	E	E	E	E	E
12	E	E	E	E	E	E	E	B	G	G	G	G	B	G	G	G	B	E	E	E	3.4M	4.3M	3.6M	3.4
13	E	E	E	E	E	E	E	B	G	G	3.3G	B	4.3M	G	G	G	2.9M	E	E	E	E	E	E	E
14	E	E	E	E	E	E	E	B	3.8M	6.6M	G	G	4.3M	G	B	4.0M	S	E	E	E	E	E	5.8MS	4.6M
15	E	2.9M	2.9M	3.3M	3.3M	E	E	B	4.3M	G	G	B	B	B	G	G	G	E	E	E	E	E	E	E
16	E	E	E	E	E	E	E	B	G	2.7G	3.5G	4.0M	4.4M	B	G	G	S	S	E	E	E	E	E	E
17	E	E	E	E	E	E	E	B	G	G	G	B	G	G	G	G	B	E	E	E	E	E	E	E
18	E	E	E	E	E	E	E	B	B	G	G	B	G	B	G	G	B	E	E	E	E	E	E	E
19	E	E	E	E	E	E	E	S	B	B	B	B	G	G	B	G	S	S	1.9MS	E	E	E	E	E
20	E	E	E	E	E	E	E	S	B	3.3	G	3.8	3.4G	G	G	S	3.5M	4.0M	4.5S	3.0S	1.7S	S	E	E
21	E	E	E	E	E	E	2.7M	B	2.7	B	B	G	G	G	G	B	B	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	B	2.5G	3.5	4.8M	3.7	3.7G	G	4.1M	2.9G	B	E	5.0M	4.0M	2.8M	E	E	E
23	4.1M	E	E	E	E	E	E	B	2.9	4.2M	4.4M	3.1G	B	G	G	B	B	4.2M	E	E	E	E	E	E
24	E	E	E	E	E	E	E	B	2.7	4.5M	4.8M	3.7	G	3.0G	G	B	B	E	E	E	3.4M	2.9M	E	E
25	6.8M	5.7S	E	E	E	E	E	B	G	G	G	B	5.0S	G	3.2G	2.7G	B	E	3.0S	E	4.2M	6.8M	E	E
26	S	E	E	E	E	E	E	B	G	3.6	3.8	3.9	2.8G	B	G	G	B	S	E	S	2.5M	E	E	E
27	E	E	E	E	E	E	E	B	G	G	G	G	B	S	S	3.3	S	3.2M	E	E	C	E	E	E
28	E	3.1M	E	E	E	E	E	B	B	B	B	B	B	B	B	B	S	S	E	E	E	E	E	E
29	E	E	E	E	E	3.2M	E	B	G	3.5	3.8	4.0	4.4	B	4.4	4.4M	B	E	2.4M	E	E	3.5M	4.0M	4.3M
30	4.2M	2.9M	2.6S	3.3M	E	E	E	B	G	G	3.0G	G	G	G	G	G	S	3.0M	3.2M	3.0M	E	E	E	E
31	E	2.9M	2.9M	E	E	E	E	B	G	3.0G	3.0G	4.2M	G	4.2M	G	G	B	E	E	E	E	E	E	E
No.	30	31	31	31	31	31	31	1	27	28	28	24	26	24	27	26	8	26	31	30	30	29	31	31
Median	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	2.9M	E	E	E	E	E	E	E
U.Q.	E	E	E	E	E	E	E	G	2.7	3.6	3.8	3.8	4.0	G	G	G	3.0	2.8	2.4	E	2.5	E	2.6	E
L.Q.	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	E	E	E	E	E	E	E
Q.R.																								

foEs

Sweep 1.0 Mc to 20.0 Mc in 20 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

K 4

IONOSPHERIC DATA

Dec. 1958 | f_bE_s | 135° E Mean Time (G.M.T.+ 9h.) | Kokubunji Tokyo | Lat. 35° 42.4' N | Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											3.7		4.0		5.0^{S}	3.1	2.6	E	2.1	E		E	E	
2								B		^{D}3.4^{B}			3.9	4.1	4.2	3.1	2.3	E		E	E	2.2	2.1	
3		2.3	E					B	^{D}2.7^{B}	3.9	3.7						G	E						
4	2.6							B		3.3							S							
5								B	3.3	4.0	5.1	3.9	3.7	3.6			S	S	5.1				3.2	2.3
6								B	2.9		3.7			3.0	2.5						E	2.3	E	2.9
7	E	2.2		1.8				B		3.3		3.6			^{P}2.7^{B}						^{U}2.6^{A}		2.2	
8								B		3.5	3.7	3.8	^{D}3.4^{B}	^{D}3.3^{B}			B			2.9				
9								B							^{U}2.8^{A}	^{D}2.6^{B}	B		2.0	E		S		
10				S		2.4	2.2	B						3.7			B							
11								B									B							
12								B					B				B				E	2.2	2.6	2.6
13								B			3.1	B	3.9				2.4							
14								B	3.2	4.8			3.8		B	3.3	S						3.8	E
15		E	2.3	2.2	2.0			B	3.3			B	B	B										
16								B		B	^{D}3.5^{B}	3.8	^{D}4.4^{B}	B			S	S						
17								B				B					B							
18								B	B			B		B			B							
19								S	B	B	B	B			B		S	S	S					
20								S	B	3.3		3.8	^{P}3.4^{B}			S	2.7	3.9	^{U}3.6^{S}	^{D}3.0^{S}	^{D}1.7^{S}	S		
21							2.3	B	^{D}2.7^{B}	B	B					B	B							
22								B	2.5	3.3	3.8	3.7	^{D}3.7^{B}		3.5	^{D}2.9^{B}	B		2.6	2.2	2.0			
23	2.4							B	2.7	3.7	3.8	^{P}3.1^{B}	B			B	B	3.5						
24								B	G	3.7	4.1	3.7		3.0		B	B				E	2.3		
25	A	A						B				B	3.8		^{P}3.2^{B}	^{D}2.7^{S}	B		2.4		2.6	2.2		
26	S							B		3.5	3.6	3.9	^{P}2.8^{B}	B			B	S		S	E			
27								B					B	S	S	^{D}3.3^{S}	S	2.4			C			
28		2.4						B	B	B	B	B	B	B	B	B	S	S						
29						2.3		B		3.5	3.7	4.0	4.3	B	4.3	3.7	B		E			2.5	2.6	3.5
30	3.0	2.9	^{D}2.6^{S}	2.0				B			B						S	2.6	2.6	2.2				
31		2.6	2.1					B		3.0	3.0	3.4		3.8			B							
No.	5	7	4	3	1	2	2		9	13	12	10	8	6	6	5	5	7	8	7	9	7	8	5
Median	2.6	2.4	2.2	2.0	2.0	2.4	2.2		^{D}2.7	3.5	3.7	3.8	3.9	3.6	3.8	3.3	2.4	2.4	2.5	2.2	E	2.2	2.4	2.6

f_bE_s

Sweep 1.0 Mc to 20.0 Mc in 20 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

K 5

IONOSPHERIC DATA

Dec. 1958 | f-min | 135° E Mean Time (G.M.T.+ 9h.)

Kokubunji Tokyo Lat. 35° 42.4' N Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.00	1.60	1.30	1.25	1.20	1.90	1.40	2.00	2.00	2.10	2.30	2.20	3.20	2.30	2.25	2.00	1.80	1.50	1.40	2.00	2.00	1.50	1.70	2.00
2	2.10	1.40	2.00	1.90	1.90	2.00	2.10	2.20	2.00	2.10	2.35	2.40	2.50	2.60	2.40	2.30	1.80	2.00	1.90	2.00	1.60	1.60	1.90	2.30
3	2.00	2.00	1.60	1.00	1.10	1.90	2.00	2.30	2.10	2.10	2.20	2.30	2.20	2.20	2.20	2.10	1.70	1.90	2.10	2.20	2.20	2.20	2.30	1.60
4	2.20	2.10	2.00	1.20	2.00	2.20	1.40	2.40	2.20	2.40	2.50	2.40	3.10	2.40	2.40	2.40	2.60	2.50	2.20	2.00	2.00	2.10	2.10	2.30
5	2.00	2.10	1.40	1.60	1.50	2.00	2.25	2.30	2.15	2.40	2.30	2.50	2.50	2.10	2.20	2.20	2.40	2.10	2.10	2.20	2.20	2.00	1.90	2.00
6	2.40	2.10	2.00	1.80	1.10	2.10	2.00	2.60	2.10	2.30	2.40	2.40	2.55	2.30	2.00	2.15	1.90	2.00	2.00	1.80	1.80	1.50	2.20	1.60
7	1.70	1.30	1.30	1.20	1.80	1.90	1.70	2.30	2.20	2.35	2.30	2.30	3.10	2.40	2.20	2.30	2.20	1.90	1.50	1.80	1.40	1.90	1.90	1.50
8	1.80	1.80	1.10	1.10	1.90	2.00	1.70	2.30	2.40	2.30	2.40	2.40	2.50	2.30	2.30	2.25	2.40	2.10	2.00	2.00	1.90	2.10	2.00	1.90
9	2.00	1.80	1.20	1.30	1.20	1.20	2.00	2.20	2.20	2.30	2.35	2.40	2.40	2.30	2.40	2.30	2.30	1.80	1.90	1.90	2.00	E 2.30 S	2.05	1.95
10	1.80	1.90	1.90	1.40	1.30	1.90	1.90	2.20	2.30	1.50	2.40	2.40	2.40	2.30	2.40	2.10	2.40	2.00	2.00	1.95	1.90	1.90	1.40	1.85
11	1.70	1.30	1.30	1.10	1.10	1.95	1.90	2.25	2.30	2.30	3.10	2.40	2.40	2.90	2.30	2.30	2.40	2.00	2.20	1.90	1.50	1.80	2.00	1.95
12	1.95	2.20	2.00	1.10	2.00	1.90	1.70	2.20	2.20	2.40	2.50	3.15	3.90	2.50	2.40	2.20	3.00	1.80	1.95	1.95	1.90	1.40	1.95	1.60
13	1.90	1.90	1.90	1.80	1.50	2.00	2.00	2.40	2.30	2.30	2.30	3.70	2.40	2.30	2.40	2.30	2.00	2.20	2.10	2.10	2.10	2.30	2.20	2.10
14	2.20	2.15	1.10	1.90	1.20	2.00	2.20	2.35	2.20	2.30	2.40	2.70	2.45	2.50	3.80	2.30	2.40	2.00	2.00	2.20	2.00	2.20	2.20	2.10
15	1.50	2.20	1.50	1.50	1.30	2.00	2.00	2.20	2.40	2.40	2.50	3.80	4.10	3.80	3.10	2.30	1.40	2.30	2.60	2.30	2.20	2.20	2.20	2.40
16	2.30	2.60	2.60	2.20	2.40	2.20	2.20	2.60	2.35	2.30	2.40	3.20	2.60	4.00	3.10	2.40	3.30	2.30	2.00	2.10	2.10	1.60	2.30	2.20
17	2.00	1.90	2.30	2.20	2.00	2.40	2.00	2.30	2.30	2.60	2.50	4.30	2.50	2.50	2.50	2.40	2.90	2.60	2.40	2.30	2.20	2.50	2.50	1.50
18	2.50	1.90	2.00	1.20	1.90	2.20	2.30	2.20	3.10	2.50	2.50	3.70	3.10	3.70	2.50	2.30	3.10	2.40	2.30	2.30	2.00	2.00	2.00	2.10
19	2.20	2.00	2.10	1.20	1.40	2.00	2.20	2.20	3.00	3.20	3.60	3.80	3.00	2.40	3.40	2.30	2.70	E 3.20 S	1.30	2.20	2.10	2.10	2.00	2.20
20	2.20	2.40	2.00	1.00	1.10	2.10	1.80	2.50	3.00	2.40	3.10	3.10	3.10	2.80	2.60	E 3.20 S	2.20	2.50	1.90	1.90	1.40	E 2.00 S	1.90	2.00
21	1.90	1.30	1.50	1.50	1.20	1.70	1.60	2.20	2.30	3.20	3.80	2.50	2.80	2.55	2.50	3.10	3.00	2.10	1.90	1.90	1.95	1.70	1.80	1.65
22	1.80	1.80	1.40	1.10	1.60	1.50	1.80	2.10	2.30	2.40	2.45	3.20	2.95	3.15	3.00	2.40	2.65	2.00	2.00	1.50	1.90	1.70	1.70	1.70
23	1.80	1.90	1.80	1.95	1.80	1.95	1.90	2.30	2.20	2.50	2.50	2.55	3.70	2.70	2.60	3.45	2.70	1.80	1.95	1.40	1.85	1.90	1.95	1.80
24	1.90	1.95	1.95	1.80	1.60	1.70	2.00	2.20	2.40	2.30	2.70	2.40	2.90	2.40	2.30	2.70	2.50	1.90	1.95	2.10	1.90	1.50	2.05	1.95
25	1.80	1.95	1.80	1.10	1.10	1.90	2.00	2.10	2.40	2.55	2.60	3.80	2.40	2.40	2.30	2.30	2.30	1.90	1.95	1.70	1.95	1.80	1.70	1.95
26	I 1.65 S	2.05	2.00	1.10	2.00	1.50	1.80	2.10	2.30	2.50	3.20	2.30	2.40	3.75	2.60	2.40	2.90	E 2.40 S	2.00	E 5.00 S	1.90	1.80	2.00	1.70
27	1.95	1.60	1.10	1.20	1.10	1.90	2.10	2.20	2.20	2.30	2.65	2.50	3.80	3.70	3.60	2.10	2.70	1.20	2.00	1.90	I 2.15 C	2.20	2.10	2.00
28	2.20	2.00	2.50	1.90	2.20	1.80	2.20	2.50	3.10	3.50	3.70	3.90	3.70	4.60	3.60	3.40	3.30 S	2.00	2.20	2.30	1.90	2.00	2.30	2.20
29	2.20	2.00 S	2.10	1.10	E 3.30 S	1.70	1.90	2.30	2.70	2.55	2.45	3.10	2.90	3.60	2.50	2.50	2.50	2.00	1.60	1.70	1.85	1.70	1.95	1.40
30	2.00	1.70	2.00	1.10	1.50	1.95	1.80	2.20	2.40	2.30	2.35	2.60	2.60	2.50	2.40	2.30	2.60	2.00	1.80	2.00	1.80	3.40	2.30	1.50
31	2.60	2.00	1.90	2.10	2.00	1.80	1.80	2.70	2.20	2.40	2.40	2.40	2.90	2.60	2.50	2.40	2.50	2.00	1.90	1.80	1.55	1.80	1.60	1.90
No.	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	30	31	29	31	30	31	29	31	31
Median	2.00	1.95	1.90	1.25	1.50	1.95	2.00	2.25	2.30	2.40	2.45	2.50	2.80	2.50	2.40	2.30	2.50	2.00	2.00	2.00	1.90	1.90	2.00	1.95

f-min

Sweep 1.0 Mc to 20.0 Mc in 20 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

K 6

IONOSPHERIC DATA

Dec. 1958 | (M3000)F2 | 135° E Mean Time (G.M.T.+ 9h.)

Kokubunji Tokyo | Lat. 35° 42.4' N | Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.60 S	2.70 S	2.65 S	2.80	2.75	2.80 S	2.85 S	U 3.05 R	3.15	3.10 R	I 2.90 S	J 2.85 R	2.70	U 2.75 R	2.70	2.80	2.80 R	2.85	U 2.90 R	I 3.05 S	2.70 R	I 2.80 S	I 2.70 S	2.70 S
2	2.65	2.60 S	2.60 S	2.65 S	2.45	2.60	I 2.95 S	3.20 S	U 3.10 R	2.95 R	U 2.90 RS	2.75 R	2.70 R	2.70	U 2.70 R	U 2.80 R	2.85 R	J 2.80 R	J 2.85 S	I 2.70 S	I 2.70 S	I 2.60 S	2.40 S	2.40
3	2.60 S	2.20	I 2.30 S	I 2.45 S	I 2.50 C	I 2.60 S	2.70 S	2.85 R	U 2.90 R	S	2.85 R	J 2.70 R	I 2.70 S	U 2.70 S	I 2.65 S	2.75 S	U 2.75 R	2.80	2.80 S	I 2.90 S	2.85 R	U 2.80 S	J 2.75 R	2.90
4	2.65 S	2.65	2.70 S	2.50	2.45	2.75 S	U 3.15 S	I 3.10 S	3.15	2.95 S	I 3.00 S	2.90 S	U 2.75 S	2.80 S	2.75 R	2.70 R	2.75 R	2.80	2.90 R	I 2.95 S	U 2.80 S	I 2.60 S	2.80 S	J 2.50 S
5	J 2.40 S	I 2.25 S	I 2.30 S	2.25 S	I 2.15 S	I 2.10 S	2.25 S	2.80 R	U 2.70 RS	I 2.95 R	I 2.85 S	J 2.80 R	I 2.80 S	J 2.80 S	I 2.75 S	2.70 S	2.80	2.80	U 2.75 S	S	S	2.60 S	2.60 S	J 2.70 S
6	I 2.95 S	2.75 S	2.75 S	2.80	2.35 R	I 2.65 S	J 3.00 S	J 3.20 R	I 3.20 R	J 3.00 S	3.00	I 2.75 R	J 2.80 R	J 2.80 S	U 2.80 S	2.75 S	2.85	2.85	U 2.95 S	J 3.10 S	I 2.95 S	I 2.75 S	2.75	2.65
7	2.50	2.45	2.30	2.40	2.40	2.55	3.10 S	3.30 S	3.05	2.90	2.95	2.95 R	2.70 H	2.65	2.70	2.85	2.85	2.90	3.00	I 2.95 S	3.00	2.55	I 2.70 S	2.75
8	2.90	2.55	2.85	2.75	2.30	2.45	2.85 S	3.20 S	3.25	3.15	2.85 S	2.85 S	2.75 S	2.70	2.80 S	2.80	2.80	2.95	2.95	U 2.95 S	I 3.05 S	2.60	I 2.75 S	2.85
9	I 2.75 S	2.60	2.40	2.40	2.60	2.70 S	I 2.80 S	3.00	3.05	J 2.90 R	I 2.90 S	J 2.90 R	2.75	2.75	2.75	2.75	2.75	J 2.80 S	2.85 S	3.00 S	2.90	U 2.60 S	2.65 S	I 2.60 S
10	U 2.60 S	I 2.80 S	3.25	S	2.70	2.65	U 2.75 S	3.20	J 3.05 R	3.00	U 2.90 S	I 2.85 S	U 2.85 S	2.70	2.70 R	J 2.85 S	2.85	J 2.80 S	2.90	I 3.10 S	3.05	2.70	2.55	2.80
11	2.55	2.50	2.70	2.90	2.85	2.55	2.70	3.15	3.20	3.00	3.00 S	2.90	2.80 R	2.80	2.75 R	2.90	J 2.90 S	2.75 S	3.10	2.80	2.90	2.55 S	2.70 S	2.65
12	2.75	2.60	2.55	2.50	2.55	2.65	2.95	3.10	3.20 S	2.90	2.95 S	2.90 S	2.75	2.70	2.70	2.80	2.85	2.80	I 2.95 S	J 3.10 S	3.00 S	2.45	2.70	2.60
13	2.70	2.55	2.40	2.80	2.70	2.60	2.95	J 3.05 S	J 3.10 S	2.95	2.95 R	2.85	2.70	2.60 R	2.70	2.70 R	2.80	J 2.75 S	U 2.85 S	U 2.65 S	I 2.85 S	2.50 S	2.60 S	2.60 S
14	2.10	2.10	2.35	2.45	2.25 S	J 2.10 S	2.65 S	J 2.95 S	2.75 R	2.90	U 2.90 S	2.70 R	2.60	2.65	2.65	2.75	2.90	I 2.80 S	U 2.85 S	I 3.00 S	2.55 S	2.75 S	I 2.80 S	2.75 S
15	2.60 S	J 2.35 R	2.25	2.25	2.35	2.45	2.50 S	3.05 R	3.00 R	U 3.05 S	I 2.90 S	I 2.80 S	I 2.70 S	S	S	I 2.75 S	2.80	2.85	J 2.75 R	I 2.95 S	I 3.00 S	I 2.75 S	I 2.70 S	2.65
16	U 2.60 S	2.60	2.45 S	2.55	2.45	I 2.70 S	U 3.20 S	I 2.95 S	3.10	S	S	S	J 2.85 S	2.70	2.75	2.80 S	2.70 S	2.80 S	J 3.10 S	I 2.95 S	I 2.55 S	I 2.50 S	J 2.60 S	2.65 S
17	2.35 S	2.75 S	2.80	2.70	2.35	2.50	I 3.05 S	3.50	U 3.15 S	3.05 R	J 3.00 R	2.85 R	2.80 S	2.65	I 2.70 S	2.85 S	2.85 S	2.90	3.00 S	I 3.15 S	J 2.95	2.55 S	2.65	2.70 S
18	2.75 S	2.65	2.80	2.65 S	2.25 S	2.20	2.15	3.05 S	2.90 S	2.80 R	2.95 S	2.85 R	2.75	2.70	2.65	2.65 S	2.75 S	2.65 S	J 2.95 S	I 2.90 S	2.60 S	I 2.55 S	I 2.60 S	I 2.65 S
19	U 2.60 S	2.50 S	2.55 S	2.75	2.65	2.50 S	I 2.95 S	I 3.15 S	U 3.20 R	3.05	3.00	2.95	2.85 H	2.65	2.70	2.80	2.90	S	S	2.80 S	2.90	I 2.90 S	2.60 S	I 2.65 S
20	2.55 S	U 2.50 S	2.55	2.60 S	2.45	2.55 S	2.75 S	I 3.25 S	3.10 S	3.00	J 3.10 R	2.90	2.95 S	2.95	2.80	2.85	3.00	3.00	I 2.90 S	U 2.95 S	I 3.00 S	2.60 S	2.50	2.50
21	2.60	2.50	2.90	2.50	2.40	2.50	2.75	I 3.00 S	3.05	2.95 R	3.00 R	2.95	2.85	2.80	2.70	2.85	3.00	3.00	2.90	3.00	3.00	2.90	2.60	2.55
22	2.55	2.35	2.50	2.50	2.45	2.50	2.95	3.05	3.10 S	J 3.10 R	3.20	J 2.95 R	J 2.90 R	2.85	2.80	2.85	3.00	2.80	3.05 S	3.30	2.70	2.95	J 2.50 S	2.65
23	J 2.55 S	2.50 S	2.45	2.60	J 3.00 R	2.70	2.85	3.05	I 3.20 S	3.05	3.00	2.80	2.85	2.75	2.75	2.90	2.95	2.70	3.10 S	2.90	2.65	2.50 S	2.70	2.60
24	U 2.45 S	2.35 S	U 2.55 S	2.85 S	2.70	2.50	2.80	U 3.05 S	3.10	I 2.90 S	2.95	2.90	2.85	2.70 H	2.75	2.80	2.90	2.85	3.00	I 3.15 S	U 2.80 S	2.70	2.55 S	2.60
25	I 2.65 A	I 2.55 A	2.75	2.95	2.75	2.50 R	2.90	I 3.10 S	3.35	J 3.20 R	2.95	2.95	2.75	2.75	2.75	2.90	2.95 S	3.00	2.90	I 3.15 S	2.90	2.90 S	2.65 S	2.75 S
26	I 2.60 S	2.45 S	2.40	J 2.50 S	2.75 S	2.75	2.90	3.15	3.25 R	3.05	2.90	2.90	2.80	2.75 H	2.70	2.75	2.90	U 2.95 S	J 2.80 S	3.20	2.95 S	2.55 S	I 2.60 S	I 2.65 S
27	2.35	2.40	I 2.80 S	2.85	2.35	2.40	2.90	I 3.05 S	3.25	3.05	3.05 S	2.85	2.70	2.70	2.65	2.80	2.85	2.85 S	2.85	2.85 S	I 2.60 C	2.45	2.75 S	2.65 S
28	2.70 S	2.95 S	2.60 S	2.40	2.45	2.80 S	3.10 S	3.00	3.15	3.05	2.95 S	2.85	2.75	2.80 S	2.70	2.65	2.75	2.90	2.90 S	I 2.90 S	2.70 S	2.65 S	2.75 S	2.90 S
29	2.75 S	2.55 S	2.20	2.55 S	2.90 S	I 3.10 S	3.35 S	3.05	3.05	3.05	I 3.00 S	2.75	2.75 R	2.70	2.70	2.75	2.75	2.75	3.00 S	3.15 S	2.90	2.65 S	J 2.60 S	2.75
30	2.80 S	2.65	2.60	2.60	2.80	2.90	3.00	2.95	3.20	3.00 S	I 2.95 S	J 2.95 S	2.80 S	2.70	2.80 S	2.80 S	2.80	2.90	U 2.95 S	3.05 S	U 2.90 S	U 3.10 S	2.75 S	I 2.65 S
31	U 2.65 S	I 2.85 S	3.00 S	2.55 S	2.55	2.45 S	3.05 S	I 3.30 S	J 3.15 S	3.00	U 3.10 S	2.85	2.80 R	2.60	2.70	I 2.80 S	2.75 S	2.80	J 2.85 S	3.00 S	J 2.85 S	2.80	2.80	2.90 S
No.	31	31	31	30	31	31	31	31	31	29	30	30	31	30	30	31	31	30	30	30	30	31	31	31
Median	2.60	2.55	2.55	2.60	2.45	2.55	2.90	3.05	3.10	3.00	2.95	2.85	2.75	2.70	2.70	2.80	2.85	2.80	2.90	U 3.00	2.90	2.60	2.65	2.65

(M3000)F2 Sweep 1.0 Mc to 20.0 Mc in 20 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

K 7

IONOSPHERIC DATA

Dec. 1958

(M3000)F1

135° E Mean Time (G.M.T. + 9h.)

Kokubunji Tokyo

Lat. 35° 42.4' N
Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4																								
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27																								
28																								
29																								
30																								
31																								
No.																								
Median																								

(M3000)F1

Sweep 1.0 Mc to 20.0 Mc in 20 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec. 1958 | h'F2 | 135° E Mean Time (G.M.T.+ 9h.) | Kokubunji Tokyo | Lat. 35° 42.4' N | Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4																								
5																								
6																								
7																								
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26																								
27																								
28																								
29																								
30																								
31																								
No.														1										
Median														310										

h'F2

Sweep 1.0 Mc to 20.0 Mc in 20 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

K 9

IONOSPHERIC DATA

Dec. 1958 | h'F | 135° E Mean Time (G.M.T.+ 9h.) | Kokubunji Tokyo | Lat. 35° 42.4' N | Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	300	300	300	285	285	300	260	250	240	240	225	225	240	250	245^{S}	250	235	220	250	220	245	250	270	280
2	300	310	300	300	305	350	250	225	225	240	240	230	240	240	245	250	230	230	250	225	250	300	350	355
3	300	375	360	305	305	305	250	255	250	250	230	230	240	235	240	250	235	225	250	250	230	255	265	260
4	310	305	300	300	315	300	205	210	230	240	220	220	215	240	240	240	230	250	250	260	255	275	255	300
5	390	460	400	355	350	455	430	265	250	240	235^{S}	245	230	230	220	240	250	230	E 300$^{A}_{S}$	250	250	250	305	300
6	355	275	290	255	275	305	255	250	220	230	230	225	230	230	230	245	240	245	240	205	245	260	275	255
7	300	320	300	350	355	330	245	225	210	210	240	225	230^{H}	210	240	250	250	250	205	245	250^{A}	245	295	255
8	260	305	255	255	E 345^{B}	350	260	245	225	235	230	230	240	230	240	250	210	230	230	255	230	255	300	260
9	260	260	355	350	275	305	280	250	240	230	245	235	240	250	240	245	250	210	265	245	250	E 300^{S}	295	310
10	300	300	245	E 350^{S}	295	320^{A}	300	250	235	235	245	235	250	250	230	250	210	250	250	210	230	240	305	260
11	305	350	290	260	255	325	295	250	210	230	245	245	230	230	235	240	210	230	245	230	210	300	275	260
12	300	345	300	310	325	330	250	250	210	230	250	245	235	240	250	245	250	225	235	230	245	305	305	305
13	300	345	350	325	295	330	270	245	215	225	250	240	245	235	250	250	240	250	240	260	250	250	300	300
14	490	505	355	355	290	460	305	250	240	250	255	240	240	250	250	250	250	230	250	250	230	270	E 320^{A}	285
15	300	400	425	430	365	355	310	250	240	230	220	245	240	240	245	250	240	225	250	230	245	240	295	305
16	310	350	385	330	360	305	230	230	230	250	210	210	230	230	240	250	225	250	230	225	250	260	305	260
17	320	290	300	300	370	365	255	225	210	240	235	235	235	240	245	240	230	250	250	230	215	300	300	270
18	300	330	300	265	450	500	505	210	240	255	245	245	235	235	245	240	240	255	250	240	240	270	305	300
19	275	300	305	270	255	290	255	250	230	215	230^{S}	230	225^{H}	245	250	240	230	240	250	255	250	250	305	305
20	330	335	315	290	295	350	300	250	230	230	250	230	245	240	235	245	230	250^{A}	255	255^{S}	235	E 345^{S}	350	345
21	350	350	295	280	350	350	305	255	235	210	245	230	245	230	230	250	245	210	210	250	245	250	305	345
22	340	375	345	320	310	350	270	230	230	225	250	245	245	230	245	245	240	205	225	210	255	260	310	300
23	355	350	360	310	250	305	260	235	225	230	250	235	245	245	245	250	230	240	225	210	250	260	260	300
24	300	350	310	275	270	350	250	250	240	230	250	245	245	210^{H}	250	250	240	230	230	225	245	300	310	300
25	I 310^{A}	I 305^{A}	300	260	250	305	275	245	245	230	230	255	245	245	245	245	245	235	255	235	245	250	295	295
26	I 305^{S}	360	360	300	295	310	255	225	235	235	245	245	245	230^{H}	250	240	245	230	250	E 295^{S}	225	250	310	305
27	355	350	255	225	300	410	260	245	235	250	250	240	235	240	250	250	250	230	250	220	I 250^{C}	275	285	255
28	280	270	350	350	355	305	245	250	225	240	240	245	240	250	250	240	250	250	230	240	245	260	300	275
29	300	325^{S}	450	330	260^{S}	260	205	220	230	230	240	230	245	240	240	255	235	260	245	225	210	255	300	310^{A}
30	300	350	E 355^{S}	305	295	275	250	230	210	230	240	240	230	225	250	250	240	250	250	230	225	250	250	260
31	310	300	255	325	300	360	210	235	200	230	245	225	230	225	245	250	240	245	240	245	210	250	255	255
No.	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	29	30	31
Median	300	335	300	300	300	330	260	245	230	230	240	235	240	240	245	250	240	235	250	230	245	255	300	300

h'F

Sweep 1.0 Mc to 20.0 Mc in 20 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

K 10

IONOSPHERIC DATA

Dec. 1958 | h'Es | 135° E Mean Time (G.M.T.+ 9h.) | Kokubunji Tokyo | Lat. 35° 42.4' N | Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	E	E	G	G	G	150	G	140	G	115	120	120	110	110	105	E	105	100	E
2	E	E	E	E	E	E	E	B	G	135	G	G	160	150	130	120	105	105	E	140	130	100	100	E
3	E	105	115	E	E	E	E	B	120	105	105	G	G	G	G	G	105	105	E	E	E	E	E	E
4	105	E	E	E	E	E	E	B	G	115	G	G	G	G	G	G	S	E	E	E	E	E	E	E
5	E	E	E	E	E	E	E	B	125	110	110	110	110	110	G	G	S	S	110	E	E	E	105	100
6	E	E	E	E	E	E	E	B	140	G	130	G	G	100	100	G	G	E	E	E	110	105	105	105
7	105	105	E	105	E	E	E	B	G	120	G	115	G	G	100	G	G	E	E	E	115	E	110	E
8	E	E	E	E	E	E	E	B	G	110	110	110	110	110	G	G	B	E	E	105	E	E	E	E
9	E	E	E	E	E	E	E	B	G	G	G	G	G	G	110	110	B	E	105	100	E	S	E	E
10	E	E	E	105	E	05	105	B	G	G	G	G	G	110	G	G	B	E	E	E	E	E	E	E
11	E	E	E	E	E	E	E	B	G	G	G	G	G	G	G	G	B	E	E	E	E	E	E	E
12	E	E	E	E	E	E	E	B	G	G	G	G	B	G	G	G	B	E	E	E	110	105	105	100
13	E	E	E	E	E	E	E	B	G	G	105	B	100	G	G	G	105	E	E	E	E	E	E	E
14	E	E	E	E	E	E	E	B	110	105	G	G	110	G	B	105	S	E	E	E	E	E	105	105
15	E	110	105	105	105	E	E	B	115	G	G	B	B	B	G	G	G	E	E	E	E	E	E	E
16	E	E	E	E	E	E	E	B	G	105	100	100	100	B	G	G	S	S	E	E	E	E	E	E
17	E	E	E	E	E	E	E	B	G	G	G	B	G	G	G	G	B	E	E	E	E	E	E	E
18	E	E	E	E	E	E	E	B	B	G	G	B	G	B	G	G	B	E	E	E	E	E	E	E
19	E	E	E	E	E	E	E	S	B	B	B	B	G	G	B	G	S	S	105	E	E	E	E	E
20	E	E	E	E	E	E	E	S	B	115	G	110	110	G	G	S	105	110	105	105	105	S	E	E
21	E	E	E	E	E	E	105	B	130	B	B	G	G	G	G	B	B	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	B	120	105	105	120	105	G	110	110	B	E	110	105	105	E	E	E
23	105	E	E	E	E	E	E	B	110	110	110	110	B	G	G	B	B	105	E	E	E	E	E	E
24	E	E	E	E	E	E	E	B	110	105	105	105	G	105	G	B	B	E	E	E	105	105	E	E
25	105	105	E	E	E	E	E	B	G	G	G	B	105	G	115	105	B	E	115	E	105	105	E	E
26	S	E	E	E	E	E	E	B	G	170	160	170	105	B	G	G	B	S	E	S	110	E	E	E
27	E	E	E	E	E	E	E	B	G	G	G	G	B	S	S	140	S	115	E	E	C	E	E	E
28	E	100	E	E	E	E	E	B	B	B	B	B	B	B	B	B	S	S	E	E	E	E	E	E
29	E	E	E	E	E	105	E	B	G	E 180 B	155	150	150	B	130	120	B	E	105	E	E	105	100	100
30	100	105	105	105	E	E	E	B	G	G	105	G	G	G	G	G	S	100	105	105	E	E	E	E
31	E	100	100	E	E	E	E	B	G	110	105	100	G	100	G	G	B	E	E	E	E	E	E	E
No.	5	7	4	4	1	2	2		9	14	14	11	12	7	8	8	5	7	9	7	9	7	8	5
Median	105	105	105	105	105	105	105		120	110	110	110	110	110	110	115	105	105	105	105	110	105	105	100

h'Es

Sweep 1.0 Mc to 20.0 Mc in 20 min sec in automatic operation.

The Radio Research Laboratories, Japan.

K 11

IONOSPHERIC DATA

Dec. 1958

Types of Es

135° E Mean Time (G.M.T.+ 9h.)

Kokubunji Tokyo

Lat. 35° 42.4' N
Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											h		h		l	l	l	f	f	f		f	f	
2										h			h	h	h	C	l	f		f	f	f	f	
3		f_3	f						C	l	l						l	f						
4	f									C														
5									C	l	l	l	l	l					f_2				f_2	f_2
6									h		h			l	l						f	f	f	f_2
7	f	f_2		f_2						l		l			l						f^5		f_2	
8										l	l	l	l	l						f				
9															l	l			f	f				
10				f		f_2	f							l										
11																								
12																					f	f	f_2	f
13											l		l				l							
14									l_2	l			l			l							f	f
15		f	f	f_2	f				l															
16										l	l	l	l											
17																								
18																								
19																			f					
20										l		l	l				l_2	f	f_2	f	f			
21							f		C															
22									l	l	l	l	l		l	l			f	f	f			
23	f								l	l	l	l						f_2						
24									l	l	l	l		l							f	f		
25	f_3	f_4											l		l	l			f		f	f		
26										h	h	hl	l								f			
27																h		f			f			
28		f																						
29						f				h	h	h	h		C	l			f			f	f_2	f_2
30	f_2	f	f	f							l							f	f	f				
31		f	f							l	l	l		l										
No.																								
Median																								

Types of Es

Sweep 1.0 Mc to 20.0 Mc in 20 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

K 12

IONOSPHERIC DATA

Kokubunji Tokyo

Lat. 35° 42.1' N
Long. 139° 29.3' E

Dec. 1958

hpF2

135° E Mean Time (G.M.T.+ 9h.)

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	400	355	390	350	355	355	350	300	300	305	340	370	390	400	375	370	350	350	345	315	355	340	360	355
2	400	415	400	400	420	405	325	265	300	335	350	390	400	400	390	365	350	380	345	360	380	410	450	455
3	400	520	500	450	435	400	365	350	345	S	350	390	395	400	405	375	370	355	350	320	340	355	355	335
4	400	400	370	430	440	370	290	300	300	320	315	350	360	360	375	390	370	355	325	320	350	400	350	425
5	495	525	505	500	575	595	525	350	355	320	355	350	355	360	370	365	350	355	350	S	S	395	400	375
6	325	360	360	350	470	395	325	300	295	320	305	345	355	355	370	350	345	350	320	300	330	350	355	355
7	435	420	495	450	455	400	300	255	305	345	330	335	380	395	370	350	350	330	310	325	300	400	360	350
8	310	400	345	355	465	430	330	290	280	300	350	350	355	375	375	360	355	330	345	325	305	400	370	350
9	355	380	455	455	400	390	355	330	300	345	340	350	375	380	390	360	355	355	360	320	335	400	380	400
10	395	355	275	S	380	395	355	300	305	305	345	355	355	360	395	355	345	355	350	295	300	395	430	345
11	400	425	385	335	330	400	380	295	290	305	330	325	355	360	370	345	340	355	305	345	330	400	355	380
12	350	400	405	405	400	395	305	300	280	350	340	345	355	395	360	355	350	350	330	305	305	410	390	400
13	360	400	430	400	350	390	320	300	285	330	330	355	375	400	390	375	360	355	345	350	335	420	400	400
14	560	585	480	450	470	590	390	320	360	355	340	390	405	400	400	375	350	350	340	310	400	375	350	355
15	405	475	500	515	480	450	425	315	305	325	350	370	385	S	S	365	355	350	350	320	320	360	370	400
16	390	405	450	400	440	375	265	305	305	S	S	S	355	375	365	360	365	350	305	330	410	430	400	360
17	440	360	355	370	465	425	320	250	295	300	335	355	355	385	385	350	350	340	325	300	325	390	380	370
18	350	400	350	365	510	530	550	310	345	390	330	355	360	400	400	390	370	400	320	335	395	405	405	380
19	395	410	405	350	375	420	325	300	290	315	325	325	355	390	355	355	350	S	S	345	330	330	410	395
20	405	415	400	400	420	415	355	280	300	310	310	350	345	325	350	345	325	315	330	310	305	400	425	400
21	400	440	345	410	450	420	360	310	305	305	310	345	345	355	370	350	315	310	310	320	305	340	400	405
22	405	455	430	410	420	420	310	300	300	290	300	350	340	355	355	355	305	355	305	290	360	325	400	395
23	405	405	440	390	290	355	305	305	295	305	320	355	350	360	360	330	320	360	300	325	385	405	355	400
24	420	455	400	340	395	415	340	310	305	345	345	350	350	395	380	355	330	350	310	300	340	355	425	400
25	395	395	355	330	345	400	325	310	290	280	320	325	355	360	350	340	320	320	330	295	305	310	390	355
26	390	440	445	425	345	360	310	280	290	300	340	355	350	375	360	355	340	310	340	300	305	400	400	395
27	455	450	330	320	445	455	310	300	280	330	340	350	375	390	395	360	350	345	350	345	365	450	360	355
28	355	325	400	450	445	360	285	300	290	310	325	350	375	370	390	380	355	340	325	325	360	380	360	340
29	370	390	530	440	325	300	250	300	325	320	315	360	375	380	390	360	355	355	310	290	310	390	400	360
30	350	395	400	390	360	330	290	310	290	325	310	330	365	395	370	355	350	320	325	300	340	300	350	385
31	400	350	315	400	410	450	300	265	300	315	310	345	355	400	390	370	360	355	330	305	330	345	350	320
No.	31	31	31	30	31	31	31	31	31	29	30	30	31	30	30	31	31	30	30	30	30	31	31	31
Median	400	405	400	400	420	400	325	300	300	320	330	350	355	380	375	360	350	350	330	320	330	395	380	380

hpF2

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec. 1958 | ypF2 | 135° E Mean Time (G.M.T.+ 9h.) | Kokubunji Tokyo | Lat. 35° 42.4' N | Long. 139° 29.3' E

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	130	125	135	100	135	135	125	105	75	105	150	80	115	100	125	100	110	105	110	110	155	175	160	125
2	145	130	150	140	160	130	100	135	120	115	100	110	110	85	100	125	115	80	120	155	155	145	140	120
3	130	130	120	110	145	130	160	115	105	S	105	85	110	85	120	95	135	120	130	155	160	125	120	115
4	130	115	130	145	120	110	115	120	80	120	90	105	120	90	105	105	130	115	115	120	100	160	150	135
5	95	110	125	140	170	150	125	130	145	130	95	150	110	95	100	135	125	105	125	S	S	180	110	125
6	110	130	130	140	155	130	105	75	70	85	100	110	100	100	80	105	110	80	90	100	90	135	140	150
7	110	135	155	150	145	115	95	90	95	60	75	75	120	100	130	95	100	100	90	105	100	120	115	105
8	135	150	105	145	140	130	115	60	75	90	80	100	120	120	80	100	95	75	60	80	100	115	100	100
9	130	125	140	140	110	100	95	85	105	60	110	95	80	80	80	135	100	90	85	125	110	95	115	100
10	100	80	90	S	120	105	100	55	100	95	60	90	100	135	95	90	110	100	95	100	105	110	120	150
11	140	80	120	110	95	145	120	80	65	95	70	100	90	95	80	85	75	100	90	105	110	90	115	110
12	145	145	150	140	105	105	140	95	110	80	65	90	100	95	135	120	100	105	100	90	100	145	65	100
13	140	110	165	150	145	115	130	95	55	110	125	100	75	140	110	130	130	145	155	115	150	160	160	135
14	170	120	110	125	230	150	120	140	180	95	95	100	115	105	125	105	150	110	130	135	200	130	170	185
15	135	125	150	145	160	125	150	135	125	75	90	90	85	S	S	110	115	120	100	105	125	170	150	115
16	115	125	150	150	130	125	160	170	85	S	S	S	95	125	110	100	135	120	115	145	195	165	125	90
17	150	150	135	140	210	150	100	80	105	120	75	120	95	125	125	115	100	100	95	105	125	135	130	130
18	150	150	120	135	110	170	175	130	125	85	105	110	115	110	110	135	155	145	135	155	185	170	160	140
19	205	140	135	105	205	140	140	115	60	100	95	115	85	115	140	95	95	S	S	155	110	155	130	115
20	155	135	130	105	170	135	145	100	115	90	85	70	70	80	95	105	80	85	110	125	100	145	125	150
21	120	105	100	145	105	135	135	90	95	100	95	65	110	100	130	105	115	95	135	85	95	105	155	145
22	150	140	115	100	130	85	90	135	85	90	80	75	60	95	100	90	115	100	95	65	135	120	145	115
23	105	100	110	115	110	135	100	100	65	95	80	100	105	95	90	100	90	135	95	165	110	150	150	105
24	175	145	145	105	105	140	150	105	90	100	60	95	100	95	95	105	110	100	95	80	125	95	120	100
25	115	135	135	115	150	155	100	100	60	80	85	120	140	110	105	80	125	95	90	100	140	135	110	140
26	130	110	140	125	110	100	135	165	60	100	65	90	110	80	125	125	95	95	120	95	145	105	100	100
27	145	105	110	120	140	105	135	100	80	70	80	100	115	110	105	105	105	105	115	130	135	160	180	180
28	145	105	105	190	120	115	120	105	100	90	100	110	125	105	115	135	105	115	125	145	200	125	115	135
29	140	185	170	105	140	100	110	210	75	80	85	95	100	80	110	90	105	100	90	80	100	160	150	140
30	100	105	150	130	140	80	110	100	100	75	70	80	85	80	85	95	95	110	125	140	110	100	140	130
31	175	125	110	170	150	125	150	100	90	90	80	110	100	105	95	90	100	95	120	95	120	150	150	85
No.	31	31	31	30	31	31	31	31	31	29	30	30	31	30	30	31	31	30	30	30	30	31	31	31
Median	135	125	130	140	140	130	120	100	90	90	85	100	100	100	105	105	110	100	110	110	120	135	130	125

Sweep 1.0 Mc to 20.0 Mc in 20 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec. 1958 | foF2 | 135° E Mean Time (G.M.T. + 9h.) | Yamagawa | Lat. 31° 12.5' N | Long. 130° 37.7' E

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	6.9	6.4	6.1	5.0	4.4^{S}	4.0^{S}	3.7	^{J}7.9^{S}	12.4	14.1	13.8	14.0	15.4^{S}	14.6	^{U}15.1^{SH}	15.0	14.5	13.2	12.0	11.4	^{J}10.8^{S}	9.3	^{J}8.2^{S}	7.4^{S}
2	6.2	5.7	5.4	5.1	4.4	3.8	4.5	^{U}7.8^{S}	11.6	13.6	14.0	14.0	14.1	14.0^{H}	13.8^{H}	14.0	13.5	12.4	11.5	11.5	^{J}10.4^{S}	^{J}8.1^{S}	7.7^{S}	7.6^{S}
3	7.2	6.8	7.0	7.1	7.4^{S}	7.4^{S}	7.4^{S}	^{J}8.2^{S}	12.9	^{I}15.5^{S}	^{I}15.5^{SH}	^{U}15.4^{SH}	15.4^{SH}	15.5^{SH}	15.8^{H}	^{I}15.4^{SH}	14.6	13.9^{S}	13.0	11.4^{S}	10.5	8.8	7.4^{S}	7.2^{S}
4	^{U}6.4^{S}	5.8	5.9	5.0	5.2	4.3	4.5	7.2	11.1	14.4	^{J}14.5^{S}	14.8	14.0	C	C	13.6	13.5	13.0	12.5^{S}	11.4	9.6	9.1^{S}	7.3^{S}	5.8
5	5.5^{S}	5.1	5.5	5.5	5.3	4.8	5.3	8.5	^{U}14.0^{R}	S	S^{H}	S	S^{H}	S^{H}	15.0^{SH}	14.6	14.5	14.1	12.4	11.0	10.4	9.1^{S}	^{J}8.6^{S}	7.1
6	6.8	5.5	4.7	3.9^{S}	3.6	3.7	4.8	^{U}7.6^{S}	11.5	14.4	S^{H}	S	S	S^{H}	14.7^{S}	14.8^{H}	14.0	13.6	14.0	14.1^{S}	13.4^{S}	12.0^{S}	^{J}10.8^{S}	^{U}10.0^{S}
7	8.1^{S}	6.7	6.5	5.8^{H}	5.7	5.7	7.1	8.6	^{U}11.7^{S}	13.4	^{I}14.6^{SH}	15.1^{SH}	13.5	13.5^{H}	14.0^{H}	14.0^{H}	13.7	12.6	11.5	10.3	9.7	^{J}8.9^{S}	^{J}7.9^{S}	7.1^{S}
8	6.4^{S}	6.0	5.3	5.0	4.5	3.6	4.1	8.0^{S}	12.2	12.9	13.7	^{J}14.0^{SH}	^{U}14.0^{S}	14.6	14.6^{H}	14.8^{SH}	14.0	13.0	12.1	11.4	10.6	^{J}8.6^{S}	7.8^{S}	7.0
9	5.9	4.8	4.3	4.7	4.8	3.6	3.7	6.4	12.0	14.1	13.3^{H}	14.7^{H}	^{J}14.4^{S}	14.9	13.9	13.5^{H}	13.0	12.4	11.4^{S}	10.6	8.7	7.2^{S}	6.8	6.3
10	6.1^{S}	^{U}6.3^{S}	4.8	3.6	3.6	3.7	4.4	7.2	11.1	12.9	14.7	^{I}15.4^{SH}	15.0	^{I}14.6^{SH}	^{J}14.8^{SH}	^{U}15.0^{S}	14.0	12.8	11.5	10.2	^{I}9.4^{S}	^{J}8.3^{S}	6.8	^{I}6.5^{C}
11	6.2^{S}	5.1^{S}	4.8^{S}	4.3	4.5	3.2	3.3	6.8	11.3	12.5	13.5	^{U}15.4^{S}	15.7^{S}	^{J}15.2^{SH}	^{U}15.2^{SH}	^{I}15.2^{S}	14.9^{S}	13.6	12.4^{S}	11.6^{S}	^{U}10.9^{S}	8.9	^{J}8.5^{S}	7.1
12	6.1^{S}	^{U}5.5^{S}	5.9	5.7	5.3	4.0	3.9	7.4	10.0^{S}	^{I}11.6^{C}	14.4^{H}	14.7	13.5	13.1^{H}	13.9^{H}	13.6^{H}	12.9	11.9	10.6	^{U}9.9^{S}	^{J}10.2^{S}	7.5^{S}	6.5	6.4^{S}
13	5.8	5.1^{S}	5.1^{S}	4.5	4.0	2.9	3.2	6.5	10.4	12.4	13.2	13.2	13.3	12.8^{H}	13.5^{H}	12.5	11.6	11.0	10.1	10.0	9.3	^{J}8.3^{S}	6.4^{S}	6.3^{S}
14	5.6	5.5	6.1^{S}	6.0	5.4	5.9	^{J}8.0^{S}	10.0	10.6	13.5	15.1	15.1	14.5^{H}	14.2	13.8^{H}	13.9^{H}	13.4	12.0	10.3	8.9	9.7	^{U}8.2^{S}	6.6	5.9
15	5.9	5.0	4.3	F	4.7	4.5	5.6^{S}	7.0	12.1	13.9	^{I}14.8^{S}	S^{H}	S	S^{H}	S^{H}	S^{H}	S	14.8	13.5	12.2	11.2	9.7^{S}	^{U}7.9^{S}	6.5
16	6.3^{S}	5.5	5.3	5.5	5.5	4.8	5.9	6.5^{S}	10.6	12.8	14.5	14.2	14.4	14.4^{H}	14.7^{H}	^{I}14.8^{SH}	14.0	13.2	^{I}13.1^{S}	11.6	10.4	8.6	^{U}8.0^{S}	^{U}7.4^{S}
17	6.7	7.0	5.8	5.0	4.2	3.7	4.5	^{J}8.0^{S}	10.0	12.0	13.5^{H}	14.1	15.0^{H}	^{U}15.0^{SH}	S^{H}	S^{H}	^{J}14.9^{S}	14.0^{S}	13.5	13.5	^{J}11.0^{S}	^{J}8.3^{S}	6.9	6.2^{S}
18	5.2	4.6	3.8	3.8	3.0	2.7	2.8	5.2	7.0	12.5	S	13.8	13.6^{H}	12.9^{H}	12.9^{H}	12.7^{H}	12.6^{H}	12.4	11.6	^{U}9.4^{S}	^{U}7.9^{S}	7.5	7.0^{S}	5.5
19	5.9	5.2	4.2	4.3	4.4	3.3	4.1^{S}	^{U}7.1^{S}	10.8	12.1	11.6	13.0	13.2^{H}	14.2^{H}	14.0	13.8^{SH}	12.5	13.4	12.2^{S}	10.4^{S}	9.0^{S}	^{J}8.3^{S}	6.3^{S}	5.9^{H}
20	5.0	4.9^{S}	4.5	4.2^{S}	4.1	3.4	3.8	6.8	10.5	13.0	14.0	14.5	15.3^{H}	^{I}14.6^{S}	13.9^{H}	13.6^{H}	14.3^{S}	12.9	11.3	8.5	8.7	7.6	5.9^{H}	5.7
21	5.8	5.0	5.0	4.1	3.6	3.5	3.9	6.2	11.0	14.4	14.7	14.9^{H}	14.0	14.6^{H}	14.0^{SH}	14.0^{H}	14.1	12.8	9.6^{H}	8.7	9.1	^{J}8.6^{S}	6.2^{S}	5.1
22	5.1^{S}	4.9	4.6	4.5	4.0	3.8	4.0	6.7	10.4	12.4	13.9	13.8	14.1	14.3^{H}	13.6^{H}	14.0^{H}	14.0	13.5	11.4	10.4	^{U}8.4^{S}	^{J}7.9^{S}	6.1	5.7
23	5.5	5.3	4.7	4.7	4.2	2.7	2.8	5.9	10.6	10.4	12.0	14.0^{S}	14.5	14.7	13.9	14.8^{H}	14.0	13.4	12.5	11.4^{S}	^{U}9.9^{S}	^{U}9.7^{S}	^{J}8.3^{S}	6.4^{S}
24	6.4^{S}	5.3^{S}	5.4	5.6	4.8^{S}	3.7	4.4	6.7	9.9	11.9^{S}	14.5^{H}	^{U}15.5^{SH}	14.5	13.6	14.8^{H}	^{U}15.0^{S}	14.2^{S}	13.0	12.4	12.0	11.5^{S}	^{U}9.3^{S}	^{I}8.3^{S}	7.0^{S}
25	^{U}7.4^{S}	6.9	6.6	6.4	4.7	3.0	3.2	5.9	10.5	11.1	12.5	14.1^{H}	^{U}14.3^{S}	14.5^{H}	13.6	13.3^{H}	12.9	12.8	11.3^{S}	^{U}11.6^{S}	11.4^{S}	9.9	^{U}6.4^{S}	5.4^{H}
26	^{U}5.5^{S}	^{U}4.9^{S}	^{U}4.6^{S}	4.1	4.1	3.2	3.4	6.4	9.7^{S}	11.3	13.1	^{I}14.0^{C}	14.5	^{U}14.8^{SH}	14.3^{S}	13.4	13.3	12.4	10.5^{S}	9.1	8.9	^{U}8.0^{S}	6.1	6.4
27	6.3	6.0	6.8	5.0^{S}	3.2	3.2	4.2	6.4^{S}	9.9	11.7	14.4	13.5	13.0	13.3^{H}	13.2^{H}	13.2^{H}	12.8	12.2	^{U}10.0^{S}	8.6	^{J}8.5^{S}	^{J}8.7^{S}	^{J}8.1^{S}	7.1
28	6.6	6.3	4.4	3.7^{S}	3.6	3.8	4.3	5.9	10.2	12.1	13.7	13.0	14.1	14.2^{H}	14.6^{H}	14.6^{H}	14.0^{S}	13.5	12.6	10.4	^{I}9.0^{S}	^{U}7.9^{S}	6.8	6.2
29	5.5	5.0	4.7^{S}	5.3^{S}	6.0	4.4	3.6	5.5	10.0^{S}	13.5	14.6	14.5	15.0^{H}	15.0	14.5^{H}	14.7^{H}	14.6	14.0	13.5	12.5	^{U}11.6^{S}	11.0^{S}	^{U}9.5^{S}	^{J}8.5^{S}
30	^{I}8.3^{C}	^{U}7.4^{S}	7.0	6.4	5.3^{H}	4.2	4.0	6.0	9.9	10.4	14.5	^{I}15.5^{S}	14.4^{H}	13.5^{H}	13.9^{H}	14.4	^{I}13.7^{S}	12.8	12.5	12.1	10.4	^{U}9.7^{S}	6.9	6.4^{S}
31	6.5^{S}	6.1^{S}	5.7	3.8	3.3	3.4	4.1	6.1	^{U}9.6^{S}	11.5	14.0	14.0	14.0	^{J}15.2^{SH}	S^{H}	S^{H}	S	S	S	S	S	13.6	^{J}11.5^{S}	10.1^{S}
No.	31	31	31	30	31	31	31	31	31	30	28	28	28	27	27	28	29	30	30	30	30	31	31	31
Median	6.2	5.5	5.3	5.0	4.4	3.7	4.1	6.8	10.6	12.6	14.0	14.2	14.4	14.5	14.0	14.0	14.0	13.0	12.0	11.2	10.0	8.6	7.3	6.4
U.Q	6.6	6.3	5.9	5.5	5.3	4.3	4.5	7.8	11.6	13.6	14.6	15.0	14.8	14.8	14.7	14.8	14.2	13.5	12.5	11.6	10.8	9.3	8.2	7.1
L.Q	5.6	5.0	4.6	4.2	4.0	3.3	3.7	6.2	10.0	11.9	13.5	14.0	14.0	13.6	13.8	13.6	13.2	12.4	11.3	10.0	9.0	8.1	6.5	5.9
Q.R	1.0	1.3	1.3	1.3	1.3	1.0	0.8	1.6	1.6	1.7	1.1	1.0	0.8	1.2	0.9	1.2	1.0	1.1	1.2	1.6	1.8	1.2	1.7	1.2

foF2

Sweep 1.0 Mc to 20.0 Mc in 1 ~~sec~~ min in automatic operation.

The Radio Research Laboratories, Japan.

Y 1

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IONOSPHERIC DATA

Dec. 1958 | f_oF1 | 135° E Mean Time (G.M.T. + 9h.) | Yamagawa | Lat. 31° 12.5' N, Long. 130° 37.7' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4														C	C									
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12										C														
13																								
14																								
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24																								
25																								
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27																								
28																								
29																								
30																								
31																								
No.																								
Median																								

f_oF1

Sweep 1.0 Mc to 20.0 Mc in 1 min ~~sec~~ in automatic operation.

IONOSPHERIC DATA

Dec. 1958 | foE | 135° E Mean Time (G.M.T.+ 9h.) | Yamagawa | Lat. 31° 12.5' N | Long. 130° 37.7' E

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	2.70	3.25^{H}	3.50	3.60	3.70	3.70	3.65	3.45	A	S						
2								S	2.55	3.20	3.55^{S}	3.65	3.80	3.90	I3.65^{A}	I3.25^{A}	2.70	S						
3								S	2.55	3.05	A	A	A	A	3.70	3.20	A	A						
4								S	2.60	3.15	3.50	3.70	3.70	C	C	I3.25^{A}	I2.60^{A}	S						
5								S	2.50	3.10	3.45	A	A	A	A	A	A	S						
6								S	2.60	3.20	3.60	I3.70^{A}	3.80	3.80	3.60	3.00	2.70	S						
7								S	2.55	3.05	3.40	3.60	I3.70^{A}	3.85^{H}	3.60	3.25	2.75	A						
8								S	2.30	3.00	3.50	I3.60^{A}	3.75	3.60	3.60^{H}	3.20	2.70	S						
9								S	2.60	3.20	3.50	3.60	3.75	3.80	3.55	3.25	2.60	A						
10								S	2.50^{H}	3.10	3.60	3.60	3.75	I3.55^{S}	3.50	3.20	2.70	1.85						
11								S	2.60	3.25	3.50	I3.60^{A}	3.70	3.80	I3.65^{A}	3.40	2.75	S						
12								S	2.65^{H}	I3.10^{C}	3.55	3.80	3.90	3.80	3.50	I3.20^{A}	I2.75^{B}	A						
13								S	2.50^{H}	3.20	3.70	3.80	3.80	3.70	3.60	3.20	2.55	S						
14								S	2.35^{H}	3.05	A	A	A	A	3.75	3.30	2.80	1.80						
15								S	A	3.05	I3.40^{A}	A	A	3.80	3.70	3.40	2.70	A						
16								S	2.50	3.15	3.50	3.70	3.80	3.80	3.75	3.40	I2.60^{A}	S						
17								S	2.55	3.20	3.50	3.70	3.80	3.70	3.50	3.15	2.70	A						
18								S	2.50	3.05	3.45^{H}	I3.60^{A}	3.65	3.70	3.50	3.15	2.50	S						
19								S	2.45^{H}	3.05^{H}	3.25^{H}	3.50	3.60	3.60	3.45	3.15	2.65	S						
20								S	2.35	3.10	3.40	3.50	I3.50^{A}	3.60	3.60	I3.25^{A}	2.70	S						
21								S	2.30^{H}	3.00	3.40	3.60	3.70	3.75	3.65	3.40	2.80	S						
22								S	2.35	3.05	I3.30^{A}	3.55	3.70	3.70	3.70	3.40	I2.80^{A}	1.65						
23								S	2.30	A	A	A	3.85	3.85	3.70	A	A	A						
24								S	2.05	2.80	I3.40^{A}	3.60	3.75	3.65	3.45	3.30	2.75	1.90						
25								S	2.20	3.00	3.30	3.55	3.70	3.70	3.55	3.25	I2.75^{A}	1.90						
26								S	2.30	3.05	3.40	3.60	3.75	3.80	3.60	3.25	2.85^{H}	S						
27								S	2.35^{H}	3.10	3.40	3.65	3.90	3.80	3.60	3.25^{H}	2.75	A						
28								S	2.50	3.00	3.30	A	A	A	3.45	3.35	2.80	1.90						
29								S	2.30	3.10^{H}	3.50	3.70	3.65	I3.80^{A}	3.70	3.35	2.85	A						
30								S	2.50^{H}	3.05	3.45	3.65	I3.65^{A}	A	A	A	2.85	A						
31								S	2.30	I3.05^{A}	I3.50^{A}	3.80	3.90	3.80	3.70	3.50	2.90	2.00						
No.									30	30	28	25	26	25	28	28	27	7						
Median									2.50	3.10	3.50	3.60	3.75	3.80	3.60	3.25	2.75	1.90						

foE

Sweep 1.0 Mc to 20.0 Mc in 1 min ~~sec~~ in automatic operation.

The Radio Research Laboratories, Japan.

Y 3

IONOSPHERIC DATA

Yamagawa

Lat. 31° 12.5' N
Long. 130° 37.7' E

Dec. 1958

foEs

135° E Mean Time (G.M.T.+ 9h.)

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	E	E	E	E	E	3.0^{M}	G	3.7^{M}	G	4.0	4.8	4.3	4.1	4.0	4.0	3.6^{M}	G	2.3^{M}	S	S	S	S	S
2	S	E	E	E	E	E	S	G	3.2	3.5^{M}	5.9^{M}	6.5^{M}	4.3^{M}	3.7^{G}	5.0^{M}	5.4^{M}	4.8	G	3.1^{M}	2.1^{M}	3.7^{M}	3.2^{M}	3.6^{M}	2.7^{M}
3	S	E	E	3.2^{M}	2.1^{M}	E	S	2.7^{M}	2.7^{M}	3.4	5.7^{M}	7.5^{M}	5.6^{M}	4.0	G	G	3.6^{M}	3.1^{M}	3.2^{M}	3.4^{M}	2.8^{M}	1.9^{M}	S	S
4	S	2.9^{M}	E	E	E	E	S	G	G	G	G	G	G	C	C	3.9^{M}	3.7^{M}	G	S	S	S	S	S	S
5	S	S	E	E	1.2	E	S	G	3.4^{M}	4.0	5.4	7.1^{M}	8.0^{M}	5.9^{M}	8.2^{M}	5.8^{M}	4.3^{M}	3.7^{M}	3.6^{M}	3.0^{M}	3.1^{M}	S	3.0^{M}	2.7^{M}
6	S	E	5.7^{M}	3.7^{M}	4.0^{M}	4.3^{M}	3.0^{M}	G	3.2	G	G	5.0^{M}	G	G	G	G	3.1^{M}	G	2.6^{M}	S	S	S	S	S
7	2.2^{M}	3.2^{M}	2.8^{M}	2.1^{M}	E	E	2.9^{M}	2.9^{M}	G	4.7	5.9^{M}	4.7	6.1^{M}	4.5	3.8^{M}	4.1	3.6^{M}	3.7^{M}	3.6^{M}	5.9^{M}	5.9^{M}	3.2^{M}	3.2^{M}	4.3^{M}
8	3.2^{M}	3.0^{M}	3.2^{M}	E	E	E	2.9^{M}	2.9^{M}	G	G	5.9^{M}	3.9^{M}	G	G	G	G	3.5^{M}	G	S	S	S	S	S	S
9	S	E	E	E	E	E	S	G	G	4.8^{M}	G	G	G	G	G	4.0^{M}	3.2^{M}	3.1^{M}	S	S	S	S	E	S
10	S	S	E	E	E	E	S	3.0^{M}	S	G	G	3.9	G	G	5.7^{M}	G	3.1^{M}	3.1^{M}	2.8^{M}	S	S	3.0^{M}	S	C
11	S	E	4.4^{M}	E	E	E	S	G	3.1^{M}	G	3.7	4.0	4.0	G	4.4^{M}	G	G	G	3.3^{M}	3.0^{M}	2.3^{M}	S	S	2.1^{M}
12	S	E	E	E	E	E	S	G	3.3^{M}	C	5.6^{M}	G	G	G	G	5.3^{M}	B	3.6^{M}	E	S	S	S	S	S
13	S	3.2^{M}	E	E	E	E	S	G	3.2^{M}	3.6	G	G	4.0^{M}	4.7^{M}	3.8^{M}	3.3^{M}	5.0^{M}	3.2^{M}	3.0^{M}	3.1^{M}	S	S	S	S
14	S	E	E	E	3.3^{M}	E	2.8^{M}	G	G	G	3.9	5.9^{M}	5.9^{M}	6.4^{M}	G	5.9^{M}	G	3.1^{M}	E	E	E	E	S	E
15	E	E	E	2.9^{M}	E	E	S	S	8.8^{M}	4.8^{M}	4.0^{M}	4.5^{M}	5.9^{M}	G	G	G	G	4.3^{M}	2.5^{M}	E	E	S	S	S
16	S	E	E	E	E	E	E	G	3.1^{M}	G	5.9^{M}	G	G	G	G	3.7^{M}	5.0^{M}	3.1^{M}	3.1^{M}	2.9^{M}	S	S	S	S
17	S	E	E	E	E	2.7^{M}	S	2.9^{M}	3.2^{M}	G	4.4^{M}	G	5.7^{M}	G	G	G	5.8^{M}	3.2^{M}	3.4^{M}	3.6^{M}	2.7^{M}	2.3^{M}	2.1^{M}	S
18	S	E	E	E	3.3^{M}	E	E	2.8^{M}	G	G	5.9^{M}	3.8	G	G	G	G	3.1^{M}	3.1^{M}	3.1^{M}	S	S	S	S	S
19	S	E	E	E	E	E	5.7^{M}	G	G	G	G	3.7^{M}	G	3.4^{G}	2.5^{G}	3.1^{G}	3.6^{M}	3.2^{M}	2.9^{M}	S	E	S	S	3.9^{M}
20	E	E	E	E	E	E	S	G	G	G	4.0	4.3	7.5^{M}	7.5^{M}	7.0^{M}	4.6^{M}	G	3.1^{M}	S	S	S	S	S	S
21	S	3.1^{M}	3.1^{M}	3.2^{M}	2.7^{M}	E	S	G	3.0^{M}	G	5.5^{M}	5.9^{M}	G	G	G	G	G	3.2^{M}	3.0^{M}	2.3^{M}	S	S	S	S
22	S	S	E	E	E	E	S	G	G	G	3.9^{M}	G	3.6^{G}	G	G	G	5.8^{M}	G	E	E	3.5^{M}	S	S	S
23	S	E	E	E	3.1^{M}	E	S	G	G	3.7^{M}	4.4	7.3^{M}	5.5^{M}	G	6.3^{M}	3.7^{M}	3.3^{M}	3.8^{M}	S	2.7^{M}	2.8^{M}	S	S	S
24	S	4.3^{M}	E	E	E	E	S	G	G	3.6^{M}	4.6^{M}	3.7^{M}	5.7^{M}	G	5.9^{M}	G	G	G	E	E	E	E	S	S
25	S	5.8^{M}	3.3^{M}	E	E	E	E	G	G	G	G	G	G	3.4^{G}	4.0	3.7	3.9^{M}	2.3	3.0^{M}	3.2^{M}	S	S	S	S
26	S	E	E	E	E	2.2^{M}	3.1^{M}	G	G	G	G	G	G	3.1^{G}	3.3^{G}	3.3^{M}	3.6^{M}	G	3.1^{M}	3.1^{M}	2.9^{M}	2.8^{M}	3.0^{M}	3.2^{M}
27	S	E	E	3.3^{M}	2.2^{M}	E	S	1.4	G	3.7	6.2^{M}	5.9^{M}	G	5.1	4.1	4.3	3.4	2.2	3.9^{M}	3.2^{M}	2.2^{M}	S	3.2^{M}	3.1^{M}
28	2.8^{M}	E	E	E	E	E	E	S	G	3.5	3.8	3.9	5.4^{M}	3.8	5.4^{M}	G	3.1	3.1^{M}	3.2^{M}	5.6^{M}	3.9^{M}	E	E	E
29	E	2.3^{M}	E	E	E	E	S	G	G	G	3.8	5.5	5.8^{M}	5.5^{M}	3.8^{M}	G	G	3.7^{M}	4.3^{M}	4.7^{M}	3.0^{M}	3.0^{M}	S	S
30	C	E	E	E	E	E	E	G	G	3.3	3.7	5.7^{M}	6.8^{M}	5.9^{M}	7.5^{M}	5.9^{M}	5.9^{M}	3.6^{M}	3.6^{M}	3.3^{M}	2.9^{M}	2.1^{M}	1.9^{M}	2.1^{M}
31	2.1^{M}	3.3^{M}	E	E	E	E	S	G	G	3.3	3.8	G	5.9^{M}	G	3.8^{M}	5.7^{M}	G	G	3.4^{M}	3.6^{M}	3.1^{M}	3.1^{M}	3.1^{M}	S
No.	7	28	31	31	31	31	12	29	30	30	31	31	31	30	30	31	30	31	26	21	18	12	10	10
Median	2.1^{M}	E	E	E	E	E	2.8^{M}	G	G	G	4.0	3.9	4.0	G	3.8	3.3	3.4^{M}	3.1^{M}	3.1^{M}	3.1^{M}	2.8^{M}	2.6^{M}	3.0^{M}	2.7^{M}
U.Q	2.8	3.0	E	E	1.2	E	3.0	G	3.2	3.6	5.6	5.7	5.8	4.5	5.0	4.3	3.9	3.2	3.4	3.5	3.1	3.0	3.2	3.2
L.Q	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	2.6	2.2	2.2	E	1.9	2.1
Q.R																			0.8	1.3	0.9		1.3	1.1

foEs

Sweep 1.0 Mc to 20.0 Mc in 1 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec. 1958 | f_bE_s | 135° E Mean Time (G.M.T.+ 9h.) | Yamagawa | Lat. 31° 12.5' N | Long. 130° 37.7' E

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						E		G		G	4.6	4.1	G	G	3.6	G		E	S	S	S	S	S
2	S						S		2.9	2.8	G	G	3.5	2.8	G	G	u3.3A		2.3	E	u3.1A	2.5	2.2	S
3	S			1.7	E		S	G	G	G	G	5.5	4.2	G			G	2.5	1.9	1.8	E	E	S	S
4	S	2.1					S							C	C	G	G		S	S	S	S	S	
5	S	S			1.2				G	3.6	4.1	4.4	G	4.3	4.1	3.5	G	G	2.5	1.8	E	S	S	1.8
6	S		2.3	2.3	1.8	1.7	1.7		G			G					2.5		E	S	S	S	S	S
7	E	E	E	E			1.9	G		G	3.9	4.1	G	G	3.1	3.9	2.3	2.6	2.2	2.5	4.5	2.5	2.5	2.7
8	1.6	E	1.8				E	G			G	G					2.6		S	S	S	S	S	S
9	S						S			G						3.1	2.5	G	S	S	S	S		S
10	S	S					S	G				G			G		G	G	E	S	S	E	S	C
11	S		E				S		G		G	G	G		G				E	2.0	E	S	S	E
12	S						S		G	C	G					3.4	B	2.5		S	S	S	S	S
13	S	E							G	3.4			3.2	3.4	G	2.6	2.5	S	S	E	S	S	S	S
14	S				E		E				3.6	4.2	4.3	4.2		G		G					S	
15				1.2			S	G	4.1	3.4	G	G	4.1					2.5	1.7			S	S	S
16	S								G		G					2.5	G	1.7	S	E	S	S	S	S
17	S					E		G	G		3.1		G				G	G	E	2.5	E	E	E	S
18	S				1.9			G			G	G					G	G	S	S	S	S	S	S
19	S						E					3.0		2.6	2.3	2.0	1.8	G	E	S		S	S	1.9
20											G	4.1	4.3	3.4	2.0	3.8		S	S	S	S	S	S	S
21	S	E	1.8	1.7	1.8		S		G		G							1.7	1.6	E	S	S	S	S
22	S	S					S				G		3.5				G				E	S	S	S
23	S				E		S			G	G	4.1	G			G	G	G	S	1.7	E	S	S	S
24	S	E					S			2.6	G	3.1	G		G								S	S
25	S	2.2	1.5											2.6	G	3.7	3.1	G	2.0	2.5	S	S	S	S
26	S					1.2	1.6							2.5	2.1	2.5	2.0		E	2.2	1.7	2.1	S	E
27	S			E	E		S	G		G	G	G		4.5	G	4.0	3.1	G	u2.2A	2.1	E	S	S	1.7
28	S							S		G	3.6	G	4.3	G	3.0		G	1.8	1.6	4.3	2.6			
29		1.7					S				G	4.1	G	G	3.1			G	2.2	3.3	2.0	E	S	S
30	C									G	G	3.1	4.5	G	G	G	2.5	G	1.7	1.7	1.8	E	E	S
31	E	S					S			G	G		G		G	G			1.8	2.4	1.9	S	E	S
No.	3	8	6	6	8	3	7	8	12	13	23	20	18	15	18	18	22	19	19	17	14	8	5	6
Median	E	E	1.6	1.4	E	1.2	E	G	G	G	G	3.0	3.4	2.6	G	2.6	G	G	1.7	2.0	E	E	E	1.8

f_bE_s | Sweep 1.0 Mc to 20.0 Mc in 1 min sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 5

IONOSPHERIC DATA

Dec. 1958 | f-min | 135° E Mean Time (G.M.T. + 9h.) | Yamagawa | Lat. 31° 12.5' N | Long. 130° 37.7' E

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	E1.70S	1.20	1.00	E	E	1.00	1.10	1.80	1.65	1.65	1.70	1.90	1.60	1.85	1.60	1.60	E1.60S	E1.70S	E1.60S	E1.60S	E1.60S	E1.60S	E1.65S	E1.75S
2	E1.70S	1.25	1.10	E	1.00	1.25	E1.60S	1.60	1.55	1.50	1.90	2.20	1.90	1.70	1.60	1.20	1.15	E1.70S	E1.70S	E1.65S	E1.60S	E1.65S	E1.60S	E1.70S
3	E1.70S	1.20	1.10	E	E	1.00	E1.70S	E1.70S	1.60	1.70	1.50	1.90	1.55	1.60	1.85	1.60	E1.60S	1.25	E1.80S	E1.70S	E1.60S	E1.70S	E1.70S	E1.70S
4	E1.70S	E	1.10	E	E	1.00	E1.70S	1.80	1.70	1.70	1.70	1.70	1.85	C	C	1.20	1.80	1.75	E1.65S	E1.70S	E1.70S	E1.70S	E1.60S	1.25
5	E1.70S	E1.70S	1.10	E	E	1.30	E1.60S	1.70	1.60	1.60	1.70	1.95	1.90	2.20	1.70	1.75	E1.60S	E1.60S	1.25	E1.60S	E1.70S	E1.65S	E1.65S	E1.70S
6	E1.80S	1.20	1.10	E	E	E	1.10	1.75	1.60	1.55	1.60	1.60	2.20	1.90	1.60	1.60	E1.70S	1.95	E1.70S	E1.70S	E1.65S	E1.60S	E1.65S	E1.70S
7	E1.60S	1.20	E	E	E	E	1.10	E1.70S	1.60	1.60	1.60	2.00	2.35	1.75	1.50	1.50	1.30	1.15	E1.70S	E1.70S	E1.70S	E1.70S	E1.50S	E1.70S
8	1.25	1.25	E	E	E	1.25	E1.60S	1.60	1.70	1.65	1.90	2.25	2.00	1.90	2.20	2.00	E1.70S	E1.70S	E1.90S	E1.70S	E1.60S	E1.70S	E1.70S	E1.70S
9	E1.70S	1.20	E	E	E	1.10	E1.60S	1.60	1.70	1.60	1.60	1.70	1.70	1.75	1.90	1.60	E1.55S	E1.50S	E1.60S	E1.70S	E1.70S	E1.70S	1.20	E1.70S
10	E1.60S	E1.60S	1.10	E	E	E	E1.70S	1.65	1.70	1.20	2.00	1.85	1.85	1.60	1.50	1.65	E1.75S	E1.70S	E1.70S	E1.70S	E1.70S	E1.60S	E2.00C	C
11	E1.70S	1.20	E	E	E	E	E1.70S	1.70	1.70	1.70	2.20	1.70	1.75	1.80	1.95	1.60	1.50	1.75	E1.65S	E1.70S	E1.60S	E1.70S	E1.70S	E1.70S
12	E1.70S	1.20	1.20	1.20	E	1.20	E1.60S	1.60	1.70	I1.90C	1.90	2.20	2.20	2.20	1.95	1.60	3.10	E1.50S	1.25	E1.70S	E1.70S	E1.70S	E1.65S	E1.60S
13	E1.60S	1.25	1.20	1.15	E	1.10	E1.70S	1.70	1.70	1.60	1.65	1.65	2.20	2.20	2.00	1.60	1.15	E1.70S	1.20	E1.70S	E1.70S	E1.70S	E1.65S	E1.75S
14	E1.60S	1.35	1.15	E	E	1.20	1.10	1.15	1.60	1.50	1.60	1.80	1.95	2.25	2.40	1.65	1.60	1.75	E1.65S	E1.65S	E1.60S	1.25	E1.70S	1.20
15	E1.60S	1.20	1.15	E	E	1.20	E1.75S	1.70	1.60	1.60	1.75	1.95	2.20	1.90	1.90	1.90	1.70	E1.60S	1.20	1.25	1.25	E1.80S	E1.60S	E1.60S
16	E1.70S	1.20	1.10	1.30	E	1.20	1.10	1.60	1.60	1.60	1.50	2.20	2.20	2.20	2.05	1.70	E1.70S	1.20	E1.70S	E1.60S	E1.60S	E1.60S	E1.70S	E1.70S
17	E1.70S	1.20	E	E	1.10	1.25	E1.70S	1.65	1.70	1.70	1.65	2.30	2.20	1.90	1.85	1.70	1.75	1.20	1.25	E1.60S	E1.70S	E1.70S	E1.70S	E1.70S
18	E1.80S	1.20	1.20	1.20	E	1.20	1.30	1.60	1.60	1.60	1.90	2.00	1.70	1.70	1.50	1.90	1.55	E1.70S	E1.70S	E1.60S	E1.60S	E1.60S	E1.60S	E1.70S
19	E1.60S	1.25	1.10	1.10	E	1.15	1.15	1.60	1.60	1.50	1.70	1.65	1.80	1.50	1.60	1.20	1.20	E1.70S	E1.70S	E1.70S	1.20	E1.70S	E1.95S	E1.60S
20	1.20	1.20	E	E	E	E	E1.75S	1.60	1.70	1.50	1.50	1.80	1.70	1.70	1.60	1.65	1.70	E1.60S	E1.60S	E1.60S	E1.70S	E1.60S	E1.70S	E1.70S
21	E1.60S	E1.70S	1.20	1.20	1.20	1.60	E1.60S	E1.60S	1.70	1.70	2.20	1.95	1.85	1.90	1.90	1.70	1.60	E1.60S	1.15	E1.70S	E1.70S	E1.60S	E1.70S	E1.70S
22	E1.70S	E1.60S	1.20	1.20	1.15	1.15	E1.70S	1.60	1.60	1.50	1.70	1.75	2.20	1.90	2.20	2.20	1.75	E1.55S	E1.60S	1.20	E1.60S	E1.60S	E1.70S	E1.70S
23	E1.60S	1.20	1.10	1.15	E	1.20	E1.70S	1.50	1.60	1.70	1.65	1.90	1.95	2.20	2.20	2.80	2.20	E1.50S	E1.60S	1.20	E1.65S	E1.70S	E1.70S	E1.70S
24	E1.70S	1.20	1.15	1.20	E	1.80	E1.60S	1.60	1.55	1.60	1.85	1.90	1.85	1.85	1.60	1.60	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.70S
25	E1.60S	1.20	1.15	E	E	1.20	1.20	1.50	1.65	1.50	1.50	1.65	1.85	1.65	1.65	1.50	1.70	1.15	E1.60S	E1.60S	E1.60S	E1.60S	E1.65S	E1.70S
26	E1.65S	1.30	1.25	E	E	1.10	1.15	1.60	1.60	1.50	1.60	1.50	1.70	1.65	1.60	1.25	1.30	E1.70S	E1.70S	E1.70S	1.20	1.20	E1.70S	E1.60S
27	E1.70S	1.20	1.20	1.15	1.20	1.20	E1.70S	1.10	1.70	1.20	1.50	1.50	1.60	1.95	1.95	1.85	E1.60S	E1.70S	E1.60S	E1.65S	E1.60S	E1.70S	E1.60S	E1.60S
28	E1.70S	1.25	1.20	E	E	E	1.15	E1.70S	1.70	1.20	1.20	1.70	1.80	2.05	2.25	1.80	1.60	E1.55S	1.10	1.10	1.10	E1.60S	E1.60S	E1.70S
29	E1.70S	E	1.25	E	E	E	E1.65S	E1.75S	1.70	1.60	1.65	1.65	1.70	1.90	1.90	1.70	1.70	E1.50S	1.20	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
30	C	1.20	1.10	E	E	1.15	1.20	E1.60S	1.60	1.50	1.60	1.55	1.50	1.50	1.50	1.50	1.50	1.20	1.15	E1.60S	1.20	E1.65S	E1.60S	E1.70S
31	E1.60S	E1.70S	1.10	1.15	E	1.20	E1.60S	E1.60S	1.60	1.60	1.70	1.70	1.85	1.80	1.90	1.70	1.85	E1.70S	1.20	E1.70S	1.20	E1.65S	E1.60S	E1.70S
No.	30	26	31	31	31	31	31	27	31	31	31	31	31	30	30	31	27	31	31	31	31	31	31	30
Median	E1.70	1.20	1.10	E	E	1.15	E1.60	1.60	1.60	1.60	1.65	1.80	1.85	1.90	1.90	1.65	1.60	E1.60	E1.60	E1.65	E1.60	E1.65	E1.65	E1.70

f-min

Sweep 1.0 Mc to 20.0 Mc in 1 min sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 6

IONOSPHERIC DATA

Dec. 1958

(M3000)F2

135° E Mean Time (G.M.T.+ 9h.)

Yamagawa

Lat. 31° 12.5' N
Long. 130° 37.7' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.80	2.90	2.85	2.95	2.95	2.80	2.90	3.00	3.25	3.25	3.05	2.90	2.70	2.80	2.70	2.75	2.90	2.95	2.85	2.95	2.80	3.05	2.90	2.80
2	2.85	2.65	2.90	2.80	2.95	2.55	2.75	3.10	3.30	3.25	3.15	2.85	2.85	2.80	2.75	2.80	2.90	2.85	2.85	2.95	3.00	2.85	2.50	2.55
3	2.70	2.50	2.55	2.55	2.70	2.70	2.95	2.80	2.95	3.10	2.95	2.75	2.65	2.70	2.80	2.80	2.75	2.80	2.95	2.90	3.00	2.95	2.75	2.90
4	2.95	2.85	3.05	2.90	2.95	3.05	2.95	3.25	3.35	3.35	3.15	2.95	2.85	C	C	2.80	2.80	2.85	2.80	2.90	2.95	2.75	2.65	2.65
5	2.35	2.20	2.35	2.45	2.35	2.15	2.35	2.60	2.75	S	S	S	S	S	2.75	2.80	2.80	2.90	2.85	2.85	3.00	2.90	2.85	2.85
6	2.95	2.95	2.95	3.05	2.90	2.55	3.10	3.35	3.30	3.20	S	S	S	S	2.80	2.80	2.85	2.80	2.95	3.20	3.00	2.90	2.80	2.90
7	2.90	2.75	2.75	2.60	2.80	2.60	3.25	3.30	3.30	3.15	3.10	3.05	2.95	2.80	2.80	2.75	2.85	2.95	2.95	2.90	3.00	2.60	2.90	2.95
8	2.85	2.95	2.85	3.10	3.15	2.65	2.80	3.10	3.50	3.15	3.25	3.05	2.90	2.80	2.85	2.85	2.90	2.95	2.90	3.15	3.10	2.95	2.70	2.90
9	3.05	2.80	2.40	2.45	3.25	3.05	2.50	2.80	3.10	3.35	2.95	2.85	2.85	2.75	2.75	2.75	2.75	2.85	2.80	2.75	2.90	2.80	2.80	2.75
10	2.80	3.10	3.35	2.60	2.85	2.60	2.95	2.95	3.35	3.00	3.05	3.00	2.90	2.80	2.70	2.85	2.85	2.95	2.95	3.05	3.10	2.95	2.65	2.80
11	3.10	2.80	2.80	2.90	3.20	2.90	2.70	3.00	3.40	3.20	2.95	2.90	2.90	2.95	2.85	2.95	2.95	3.05	3.00	2.85	2.85	2.80	2.85	2.95
12	2.85	2.70	2.70	3.00	3.00	3.00	2.85	3.10	3.15	3.05	3.00	3.05	2.90	2.75	2.80	2.85	2.80	2.85	3.00	3.05	3.05	2.95	2.70	2.85
13	2.75	2.80	2.75	3.00	3.10	2.65	2.80	3.05	3.35	3.25	3.25	3.00	2.80	2.70	2.75	2.75	2.80	2.80	2.85	3.00	2.95	2.90	2.55	2.60
14	2.15	2.20	2.45	2.50	2.40	2.25	2.65	3.10	3.05	2.90	2.85	2.85	2.70	2.75	2.70	2.75	2.90	2.90	3.00	2.80	3.10	2.95	2.80	2.90
15	2.65	2.40	2.30	F	2.40	2.50	2.50	2.90	3.25	3.00	3.10	S	S	S	S	S	S	2.85	2.95	2.95	2.95	3.00	2.65	2.75
16	2.75	2.60	2.50	2.65	2.70	2.70	3.05	3.25	3.25	3.20	3.25	2.95	2.85	2.85	2.80	2.80	2.95	2.85	3.00	2.95	2.95	2.80	2.60	2.75
17	2.60	2.85	2.85	2.85	2.95	2.55	2.95	3.25	3.45	3.30	3.05	3.00	2.90	2.80	S	S	2.95	2.90	3.00	3.10	2.85	2.75	2.85	2.70
18	2.80	2.60	2.65	2.90	2.35	2.05	2.40	3.05	2.85	2.75	S	3.00	2.90	2.70	2.75	2.70	2.80	2.95	2.95	2.95	2.90	2.85	2.85	2.70
19	2.90	2.90	2.60	2.65	2.95	2.60	2.70	2.95	3.40	3.30	3.05	3.05	2.85	2.95	2.80	2.90	2.80	3.00	2.95	2.90	2.90	2.95	2.70	2.70
20	2.50	2.65	2.70	2.70	3.00	2.60	2.80	2.95	3.25	3.25	3.35	3.05	3.15	2.90	2.85	2.85	2.90	3.05	3.10	2.85	3.00	3.10	2.55	2.65
21	2.75	2.55	2.95	3.05	2.65	2.60	2.80	3.05	3.25	3.35	3.20	3.00	2.90	2.95	2.85	2.85	3.00	3.15	3.10	2.90	3.05	3.05	2.90	2.60
22	2.80	2.65	2.65	2.70	2.85	2.65	2.75	3.15	3.30	3.40	3.20	3.05	3.00	2.95	2.85	2.90	3.00	3.05	3.00	3.10	3.00	3.05	2.95	2.65
23	2.80	2.65	2.65	3.00	3.35	2.45	2.60	2.90	3.50	3.35	3.00	2.90	2.95	3.00	2.80	2.90	2.85	3.00	3.00	2.80	2.85	2.80	3.00	2.55
24	2.65	2.55	2.65	3.05	2.95	2.55	2.85	3.00	3.25	3.10	3.00	3.00	2.95	2.80	2.75	2.80	2.90	2.95	2.90	3.00	3.00	2.95	2.70	2.60
25	2.70	2.60	2.80	3.20	3.25	2.65	2.95	2.90	3.40	3.50	3.20	3.00	2.90	2.90	2.90	2.85	2.85	3.05	2.95	3.20	3.15	3.10	2.60	2.60
26	2.70	2.60	2.60	2.85	3.25	2.60	2.65	3.05	3.50	3.20	3.05	3.00	2.90	2.85	2.80	2.75	2.95	3.00	3.05	2.95	3.00	2.95	2.60	2.55
27	2.65	2.50	3.10	3.00	2.85	2.50	2.80	2.95	3.40	3.15	3.05	2.95	2.85	2.80	2.80	2.80	2.80	2.95	3.00	2.95	2.75	2.75	2.65	2.80
28	2.90	3.15	2.90	2.70	2.65	2.75	3.10	2.80	3.45	3.20	3.15	2.90	2.90	2.80	2.80	2.80	2.85	2.90	2.95	3.00	3.10	2.85	2.80	2.95
29	2.75	2.80	2.35	2.65	3.50	2.85	3.15	2.75	3.20	3.20	3.10	3.00	2.85	2.75	2.70	2.70	2.80	2.90	2.95	3.05	3.00	2.90	2.85	2.65
30	2.80	2.85	2.95	3.05	3.15	2.90	2.85	3.00	3.55	2.95	2.95	2.95	2.85	2.75	2.75	2.85	2.90	2.90	2.95	3.10	3.05	3.10	3.20	2.70
31	2.70	2.85	3.15	2.95	2.55	2.45	2.90	3.10	3.45	3.10	3.10	2.85	2.85	2.75	S	S	S	S	S	S	S	3.10	2.95	2.70
No.	31	31	31	30	31	31	31	31	31	30	28	28	28	27	27	28	29	30	30	30	30	31	31	31
Median	2.80	2.70	2.75	2.90	2.95	2.60	2.80	3.00	3.30	3.20	3.10	3.00	2.90	2.80	2.80	2.80	2.85	2.90	2.95	2.95	3.00	2.95	2.80	2.70

The Radio Research Laboratories, Japan.

(M3000)F2

Sweep 1.0 Mc to 20.0 Mc in 1 min/sec in automatic operation.

Y 7

IONOSPHERIC DATA

Dec. 1958 | (M3000)F1 | 135° E Mean Time (G.M.T.+ 9h.) | Yamagawa | Lat. 31° 12.5' N, Long. 130° 37.7' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4														C	C									
5																								
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30																								
31																								
No.																								
Median																								

(M3000)F1 Sweep 1.0 Mc to 20.0 Mc in 1 min ~~sec~~ in automatic operation.

The Radio Research Laboratories, Japan.

Y 8

IONOSPHERIC DATA

Dec. 1958 | h'F2 | 135° E Mean Time (G.M.T.+ 9h.) | Yamagawa | Lat. 31° 12.5' N | Long. 130° 37.7' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3														C	C									
4																								
5																								
6																								
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26																								
27																								
28																								
29																								
30																								
31																								
No.																								
Median																								

h'F2 | Sweep 1.0 Mc to 20.0 Mc in 1 min (sec) in automatic operation.

The Radio Research Laboratories, Japan.

Y 9

IONOSPHERIC DATA

Dec. 1958 | h'F | 135° E Mean Time (G.M.T. + 9h.) | Yamagawa | Lat. 31° 12.5' N, Long. 130° 37.7' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	250	240	240	230	250	255	250	250	230	225	220	220	220	225	230H	230	225	220	205	230	205	225	225	245
2	250	255	250	250	245	275	290	245	225	220	215	220	230	225H	240H	235	240	205	245	245	245	250	290	285
3	250	275	300	295	275	275	225	230	250	240	230H	240H	230H	225H	225H	220H	235	240	230	225	240	205	245	250
4	240	250	250	230	250	230	250	240	225	225	210	210	230	C	C	220	240	230	240	250	230	230	225	250
5	360	400	370	300	300	445	430	290	250	240	220H	240	220H	225H	205H	230	240	235	210	240	240	225	230	240
6	250	220	250	270	260	350	250	235	210	220	200H	225	215	205H	220	200H	210	225	235	230	200	200	240	210
7	230	250	250	205H	250	255	250	225	210	225	205H	205H	225	210H	200H	240H	245	230	225	240	250	225	250	250
8	250	250	245	245	250	270	300	250	225	210	225	200H	225	220	225H	230H	230	210	245	235	230	220	240	240
9	235	250	310	300	220	235	305	300	245	225	210H	230H	230	240	225	220H	225	230	220	245	220	205	240	275
10	255	235	210	245	260	250	255	255	225	225	225	205H	240	220H	225H	245	225	225	235	240	215	200	225	I265C
11	235	240	255	250	250	200	300	270	225	215	225	225	230	225H	225H	240	240	225	200	225	205	245	230	225
12	235	250	255	250	250	205	270	250	210	I215C	230H	240	225	215H	210H	225H	240	230	220	210	225	200	270	250
13	245	250	250	250	225	250	300	250	240	230	240	225	220	220H	245H	245	240	240	220	250	225	205	205	300
14	390	400	300	275	230	350	285	230	240	235	235	235	240H	230	230H	230H	240	220	205	210	245	220	250	240
15	255	295	355	345	280	300	300	270	230	210	230	225H	225	220H	225H	230H	225	225	200	200	215	200	220	250
16	250	245	285	255	245	270H	250	220	230	220	210	200	210	220H	230H	230H	240	230	240	200	220	205	240	255
17	250	235	225	250	250	290	290	250	205	225	200H	225	220H	210H	230H	230H	230	205	220	240	200	210	205	245
18	250	255	260	255	400	500	300	195	225	250	240	230	225H	230H	225H	230H	230H	230	225	225	210	240	235	250
19	250	225	230	300	250	225	275	255	230	225	220	225	220H	230H	240	225H	225	240	220	225	200	230	230	250H
20	290	260	250	250	255	250	300	250	230	230	230	225	230H	230	220H	225H	225	220	200	205	240	200	245H	290
21	255	245	260	250	315	325	300	200	245	235	225	210H	220	225H	225H	225H	250	205	190H	220	225	200	235	255
22	285	290	290	280	260	295	300	250	220	225	225	220	225	205H	225H	225H	245	220	200	200	200	245	205	290
23	260	255	295	250	200	250	350	270	225	220	225	235	225	240	225	245H	240	220	200	200	210	240	225	245
24	255	280	280	250	250	330	290	240	210	230	225H	210H	230	225	205H	245	240	205	220	200	205	200	205	260
25	260	290	250	230	215	210	250	260	230	220	225	225H	235	225H	245	230H	225	225	205	240	220	200	200	270H
26	265	250	250	260	245	245	300	250	205	220	225	200	220	225H	225	230	240	225	200	230	225	220	250	300
27	300	300	220	220	250	355	265	230	230	235	230	220	225	230H	230H	240H	240	240	200A	225	210	250	225	270
28	240	245	245	255	295	275	240	245	235	230	230	220	240	220H	240H	220H	235	240	205	250	240	205	240	250
29	250	270	340	290	205	225	230	250	225	220	225	225	220H	235	230H	230H	250	235	230	230	205	200	235	240
30	I250C	250	240	220	210H	205	255	245	210	205	220	230	230H	220H	225H	245	240	240	235	230	210	205	200	255
31	260	245	240	240	290	350	285	205	200	220	230	220	220	225H	225H	240H	245	215	245	230	200	200	225	220
No.	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31
Median	250	250	250	250	250	270	285	250	225	225	225	225	225	225	225	230	240	225	220	230	220	205	230	250

h'F

Sweep 1.0 Mc to 20.0 Mc in 1 min sec in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec. 1958 | h'Es | 135° E Mean Time (G.M.T.+ 9h.) | Yamagawa | Lat. 31° 12.5' N, Long. 130° 37.7' E

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	E	E	E	E	E	100	G	100	G	130	110	120	140	130	130	110	G	105	S	S	S	S	S
2	S	E	E	E	E	E	S	G	125	100	105	110	100	100	100	100	135	G	110	125	105	110	105	115
3	S	E	E	100	100	E	S	100	100	125	100	100	100	100	G	G	100	100	100	100	100	100	S	S
4	S	100	E	E	E	E	S	G	G	G	G	G	G	C	C	105	100	G	S	S	S	S	S	S
5	S	S	E	E	135	E	S	G	120	130	105	100	100	100	100	100	100	100	100	100	100	S	100	100
6	S	E	100	100	100	100	100	G	125	G	G	100	G	G	G	G	100	G	100	S	S	S	S	S
7	100	100	105	100	E	E	100	105	G	120	105	105	100	130	100	155	100	100	100	105	105	105	100	100
8	100	100	100	E	E	E	100	100	G	G	100	100	G	G	G	G	100	G	S	S	S	S	S	S
9	S	E	E	E	E	E	S	G	G	100	G	G	G	G	G	100	105	100	S	S	S	S	S	S
10	S	S	E	E	E	E	S	100	G	G	G	120	G	G	115	G	100	100	100	S	S	100	S	C
11	S	E	105	E	E	E	S	G	100	G	125	100	120	G	100	G	G	G	100	100	100	S	S	100
12	S	E	E	E	E	E	S	G	100	C	100	G	G	G	G	100	B	100	E	S	S	S	S	S
13	S	100	E	E	E	E	S	G	100	120	G	G	100	100	100	100	100	100	100	100	S	S	S	S
14	S	E	E	E	100	E	105	G	G	G	100	100	100	100	G	105	G	100	E	E	E	E	S	E
15	E	E	E	100	E	E	S	S	100	105	100	105	100	G	G	G	G	100	100	E	S	S	S	S
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21	S	105	100	100	100	E	S	G	100	G	135	100	G	G	G	G	G	100	100	100	S	S	S	S
22	S	S	E	E	E	E	S	G	G	G	100	G	100	G	G	G	105	G	E	E	105	S	S	S
23	S	E	E	E	100	E	S	G	G	105	100	100	130	G	100	100	100	100	S	100	100	S	S	S
24	S	100	E	E	E	E	S	G	G	100	100	100	130	G	110	G	G	G	E	E	E	E	S	S
25	S	100	100	E	E	E	E	G	G	G	G	G	G	100	150	110	100	120	105	105	S	S	S	S
26	S	E	E	E	E	100	100	G	G	G	G	G	G	100	100	100	100	G	100	100	100	100	100	100
27	S	E	E	100	100	E	S	145	G	135	105	100	G	125	125	120	115	105	100	100	100	S	100	100
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30	C	E	E	E	E	E	E	G	G	150	150	100	100	100	100	100	100	100	100	100	100	100	100	100
31	100	100	E	E	E	E	S	G	G	100	100	G	100	G	100	100	G	G	100	100	100	100	100	S
No.	4	9	6	6	8	3	7	7	12	13	23	21	18	15	18	18	22	21	22	17	14	9	8	8
Median	100	100	100	100	100	100	100	100	100	110	100	100	100	100	100	100	100	100	100	100	100	100	100	100

h'Es

Sweep 1.0 Mc to 20.0 Mc in 1 min sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 11

IONOSPHERIC DATA

Dec. 1958 | Types of Es | 135° E Mean Time (G.M.T. + 9h.) | Yamagawa | Lat. 31° 12.5' N | Long. 130° 37.7' E

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		l		h	c2	h	h	h	h2	l3		f					
2									h3	l3h	lh	h	l2	l2	l3	l4	h4		f3	f	f3	f2	f4	f
3				f4	f2			l2	l	h2	l	l5	l3	l2			l3	l4	f	f2	f	f		
4		f2														l2	l3							
5					f2				c	h2l	c2	l2	l2	l2	l4	l3	l2	l2	f3	f2	f		f	f
6			f2	f3	f4	f2	f		h			l					l		f2					
7	f	f2	f	f			f2	l		h	h	c	l2	h	l2	h	l2h2	lc2	f2f	f2	f5	f2	f3	f3
8	f2	ff	f2				f	l			l	l2					l2							
9										lh						l3	l2	l						
10								l				h			ch		l	l	f			f		
11			f						l		h	l	c		l2				f	f	f			f
12									l		l					l3		l3						
13		f							l	h2			l2	l3	l3	l2	l	l	f	f				
14					f		f				l2	l2	l2	l2		l		l						
15				f					l3	c2l	l	l	l2					l3	f					
16									l		l					l2	l3	l	f	f				
17								l	l		l2		l				l	l3	ff	f2	f	f	f	
18					f2			l			l	l					l	l.	f					
19							f					l		l2	l2	l2	l	l4	f					f2
20											c	c2	l2	l2	l	l4		l2						
21		f	f	f	f				l		h	l2						l2	f	f				
22											l2		l2				l2				f			
23					f					l	l2	l2	hl2		l	l	l2	l3		f	f			
24		f								l4	l2	l2	h		c									
25		f2	f2											l2	hl2	c2l2	l4	c2	f3	f5				
26						f	f							l	l	l	l		f	f3	f	f2	f2	f
27				f	f			h		h2	lh	l		h2	h	c2l	c3	l	f3	f2	f		f2	f2
28	f									c3	c2	l	l2	l2	l2		h2	lh2	f	f4	f3			
29		f									h	h	l	l2	l2			l2	f2	f4	f2	f		
30										h2	h	l2c	l2	l2	l2	l2	l3	l2	f	f	f	f	f	f
31	f	f								l2	l2		l		l	l			f	f2	f	f	f	
No.																								
Median																								

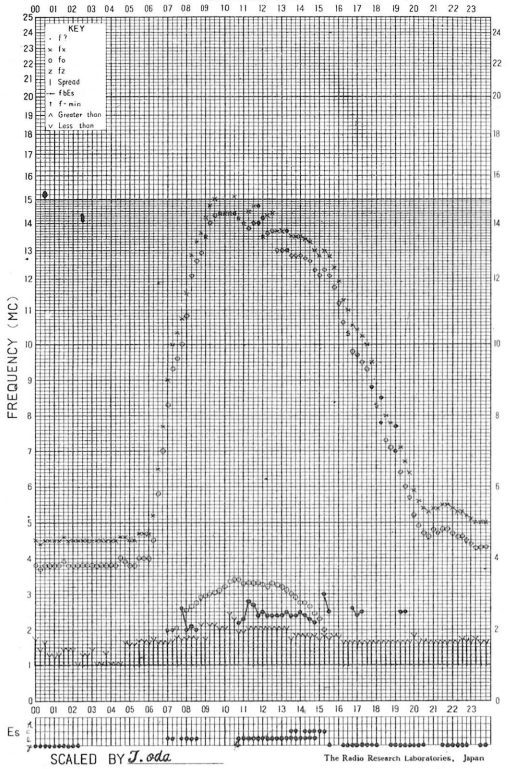
Types of Es

Sweep 10 Mc to 200 Mc in 1 ~~sec~~ min in automatic operation.

The Radio Research Laboratories, Japan.

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE Dec. 1 1958

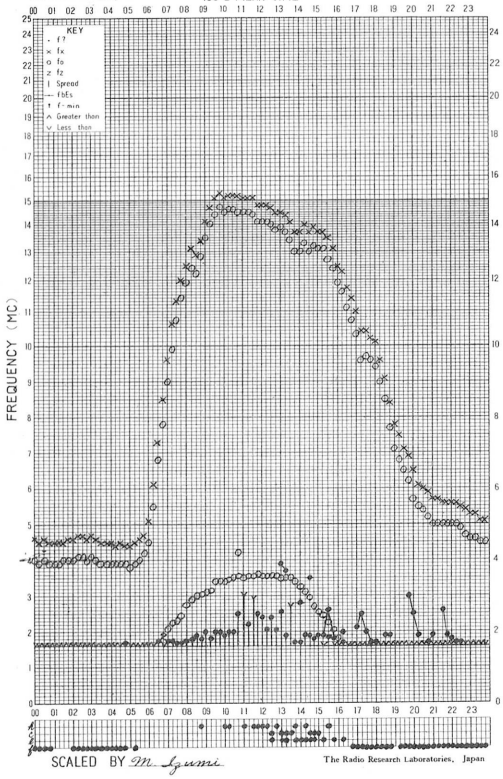


SCALED BY J. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE DEC 1 1958



SCALED BY M. Izumi

The Radio Research Laboratories, Japan

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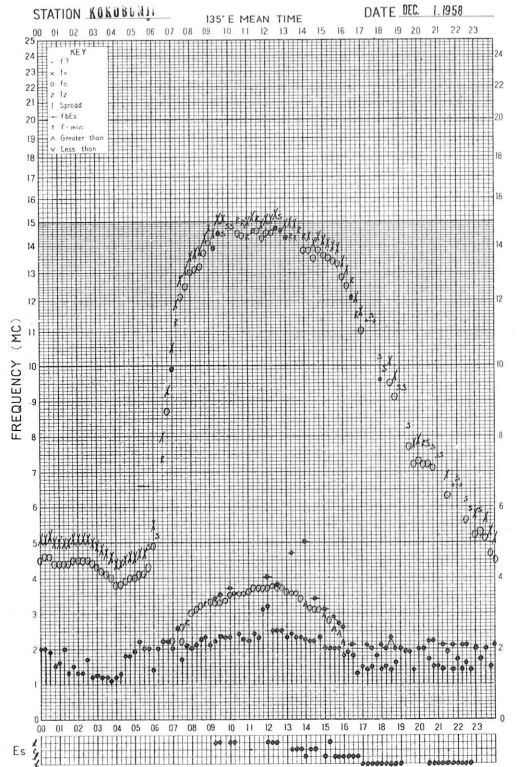

SCALED BY S. Komura

The Radio Research Laboratories, Japan

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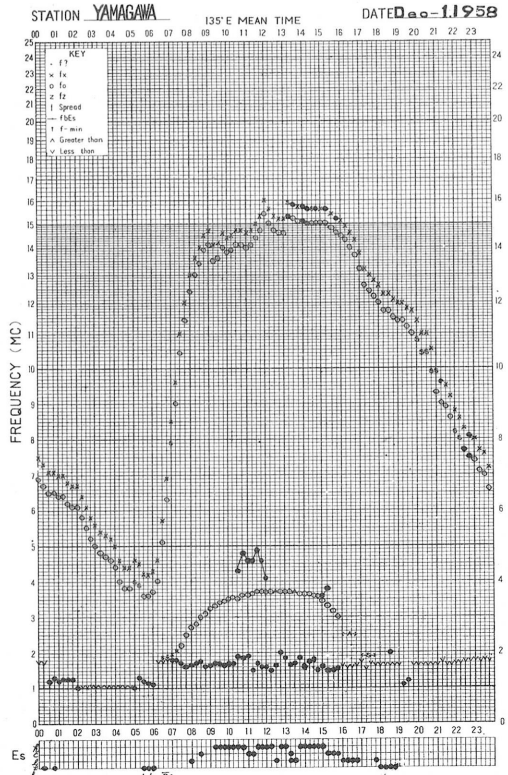

SCALED BY H. Oyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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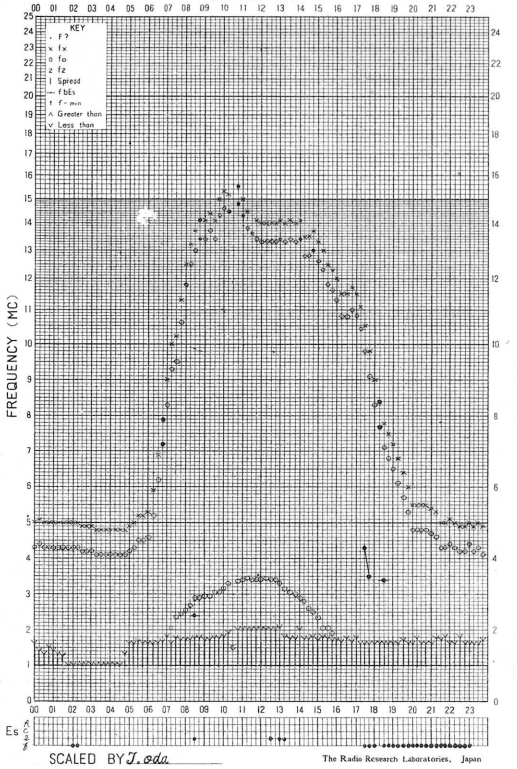

SCALED BY I. Oda The Radio Research Laboratories, Japan

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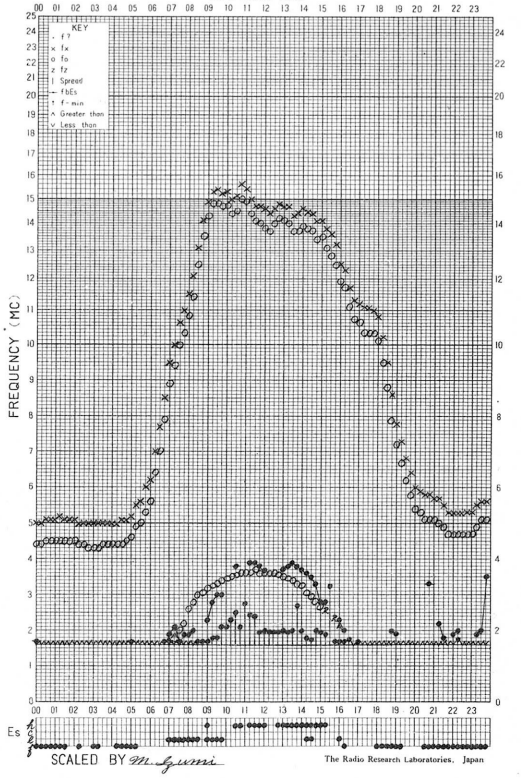

SCALED BY M. Izumi The Radio Research Laboratories, Japan

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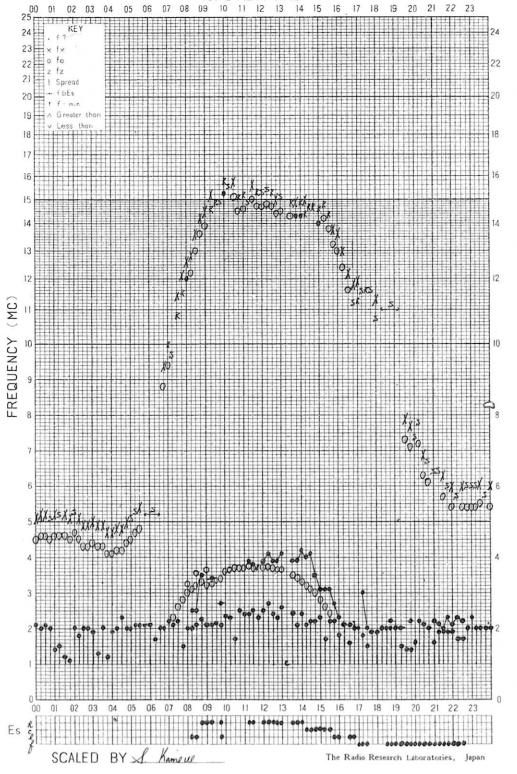

SCALED BY S. Konishi The Radio Research Laboratories, Japan

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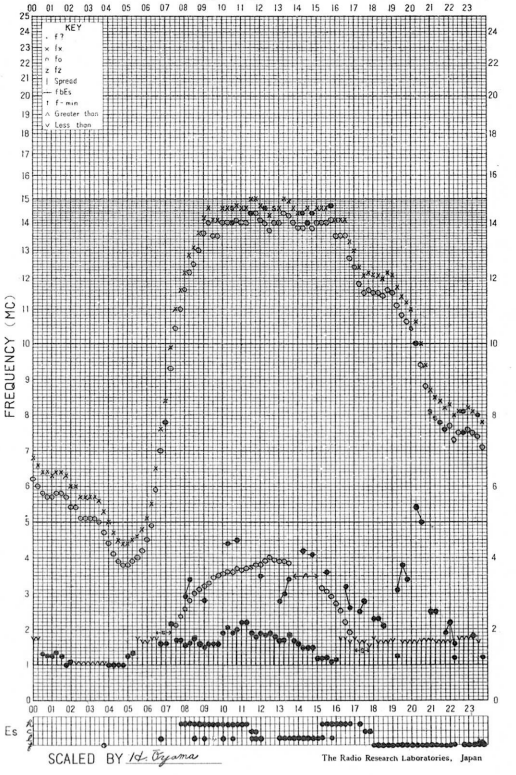

SCALED BY H. Ozaima The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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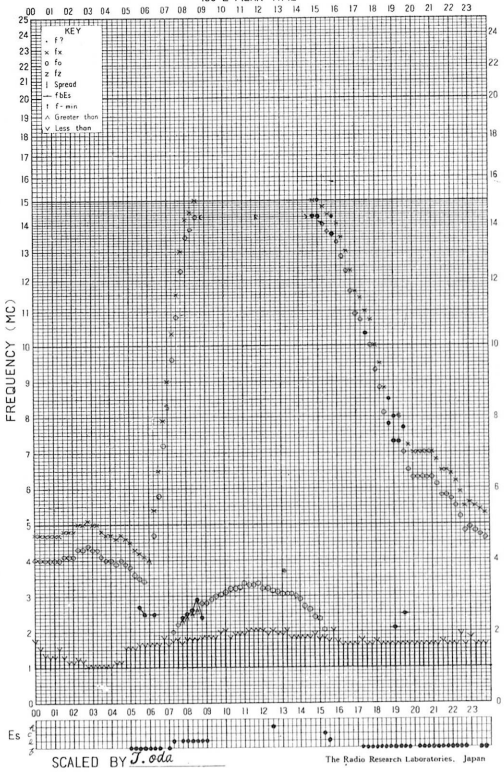

SCALED BY T. Oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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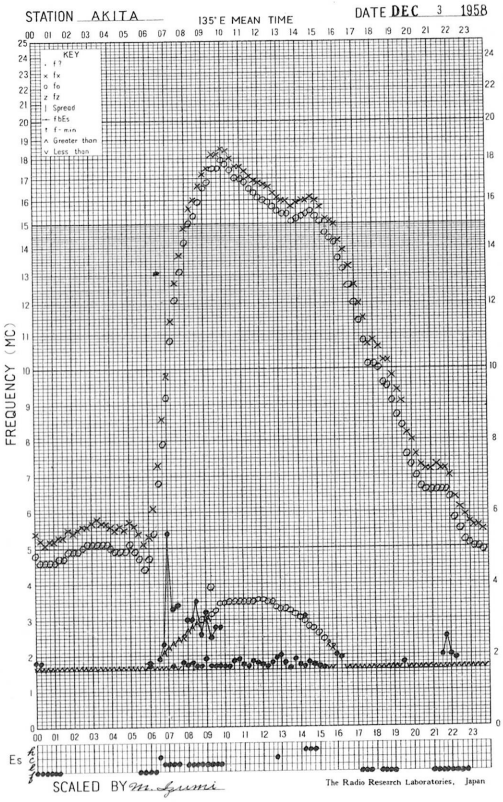
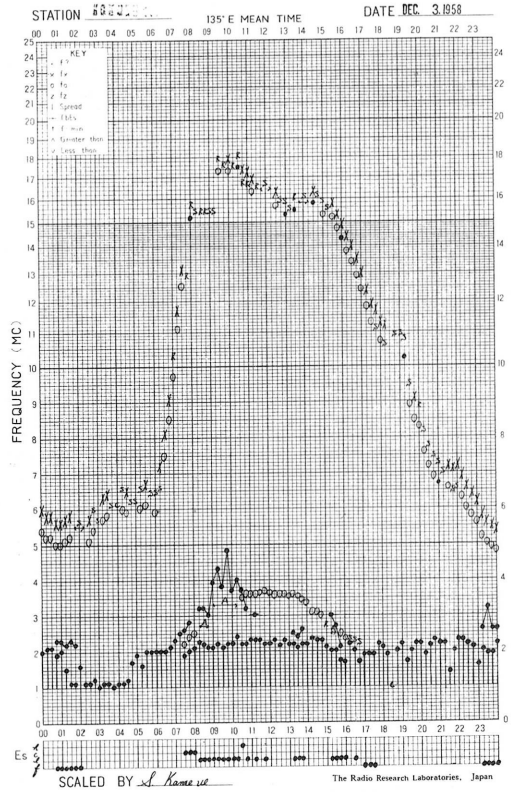


SCALED BY M. Izumi

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION [illegible] 135° E MEAN TIME DATE DEC 3 1958



SCALED BY S. Kameue

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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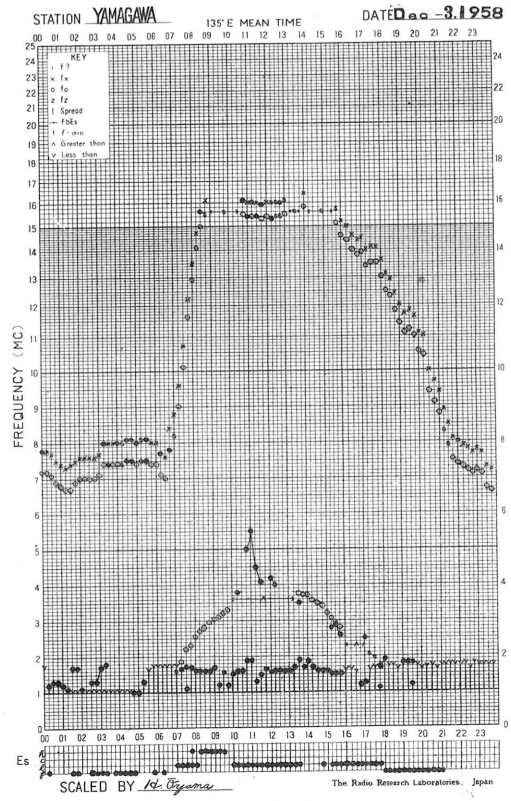

SCALED BY H. Fujiwara

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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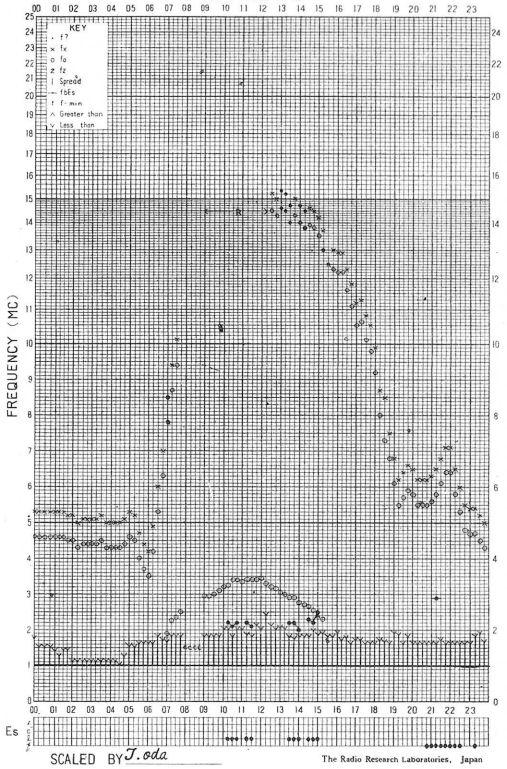

SCALED BY J. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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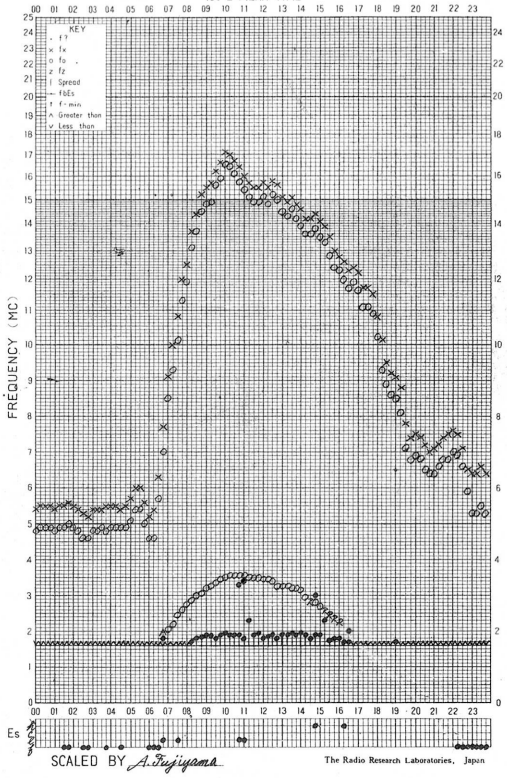
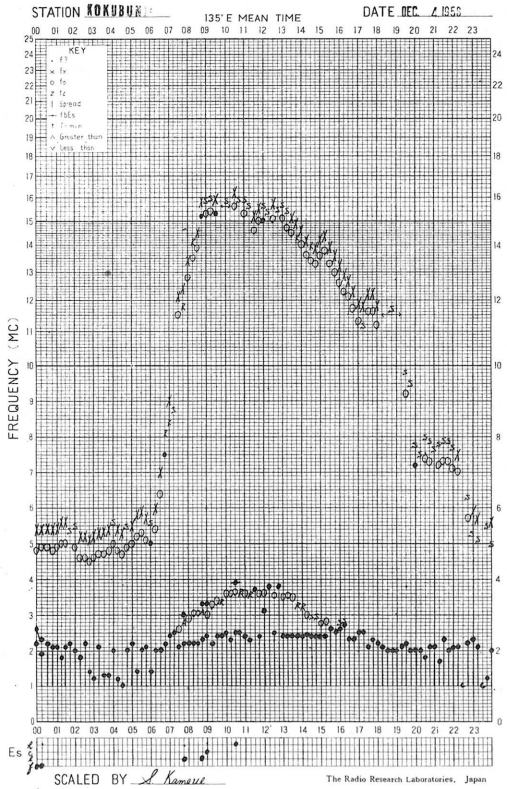


SCALED BY A. Fujiyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUN 135° E MEAN TIME DATE DEC 4 1958

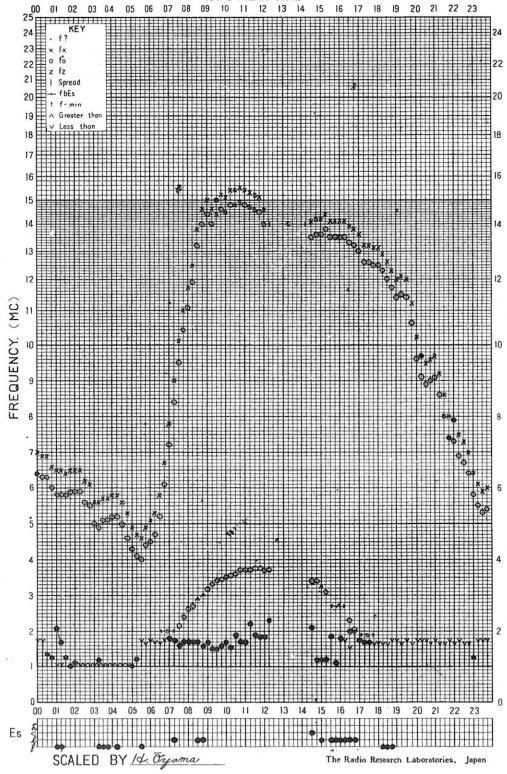


SCALED BY S. Kameue

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE Dec-4 1958

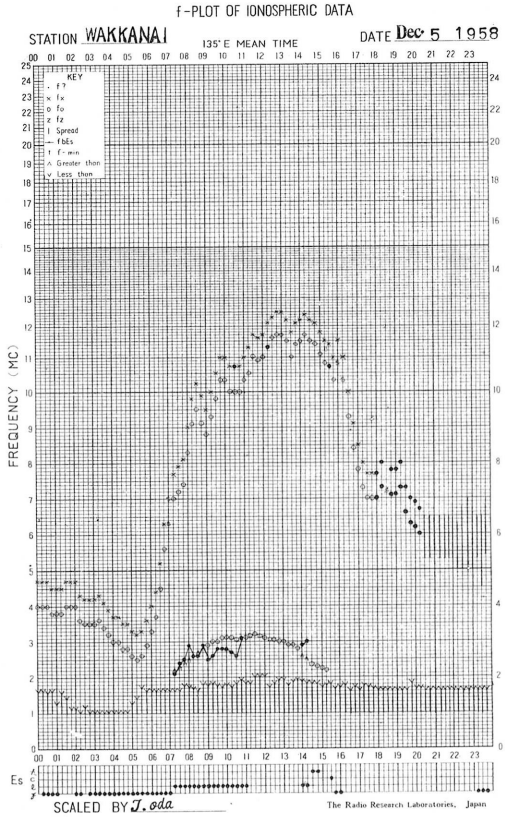


SCALED BY H. Ozaima

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE Dec 5 1958



SCALED BY I. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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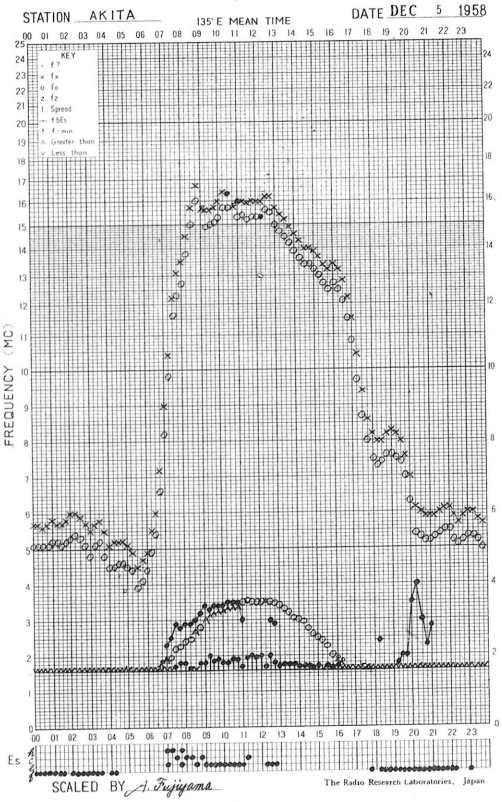

SCALED BY A. Fujiyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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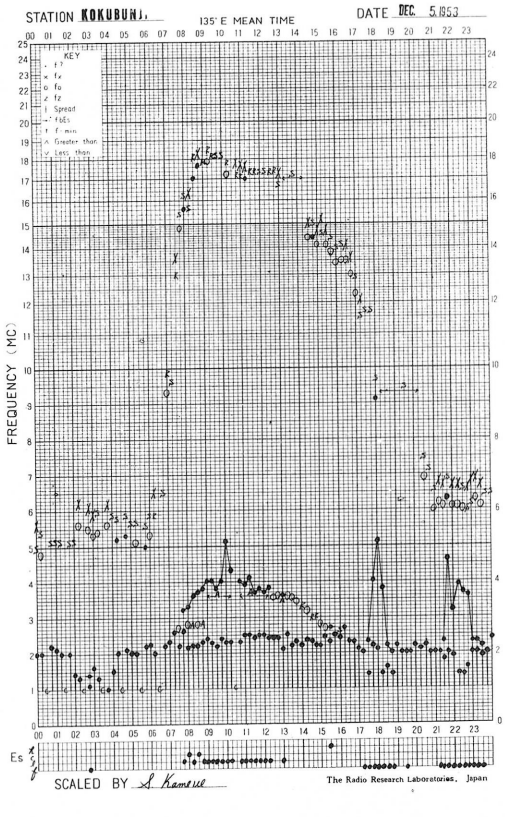

SCALED BY S. Kameue

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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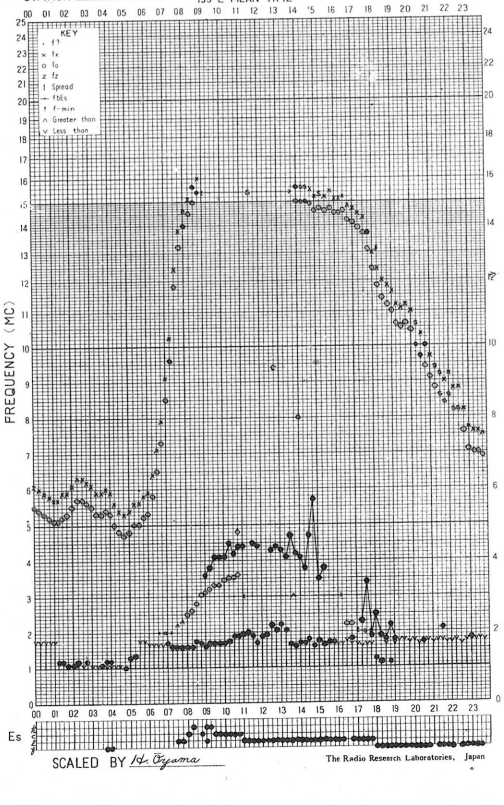

SCALED BY H. Tajima

The Radio Research Laboratories, Japan

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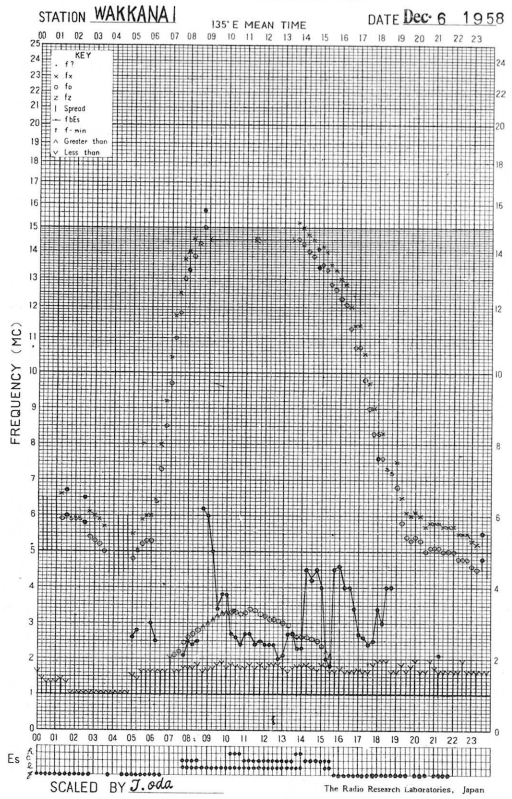
STATION WAKKANAI 135°E MEAN TIME DATE Dec. 6 1958



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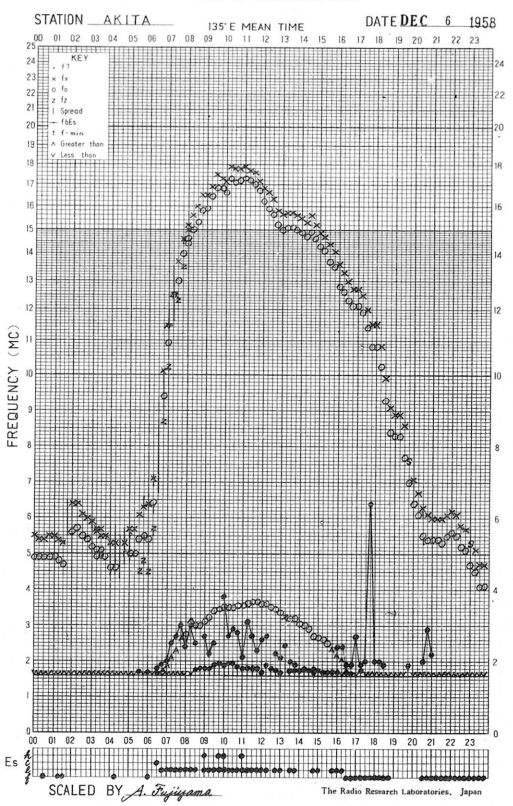

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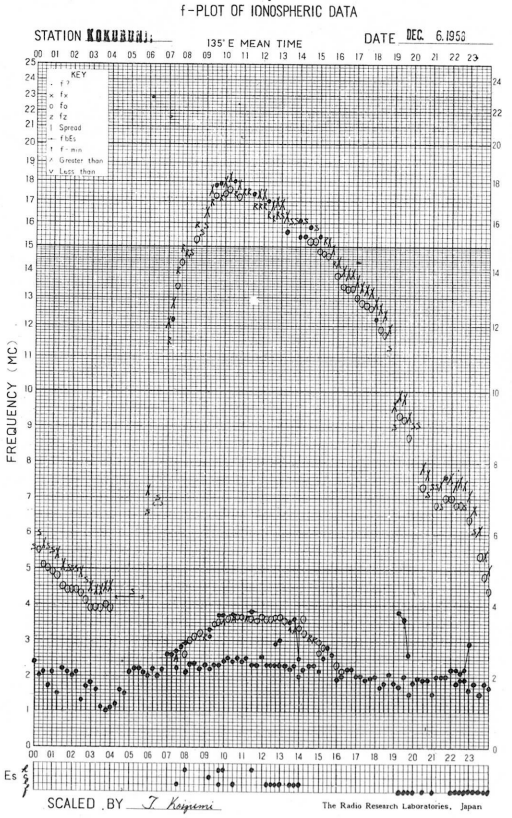

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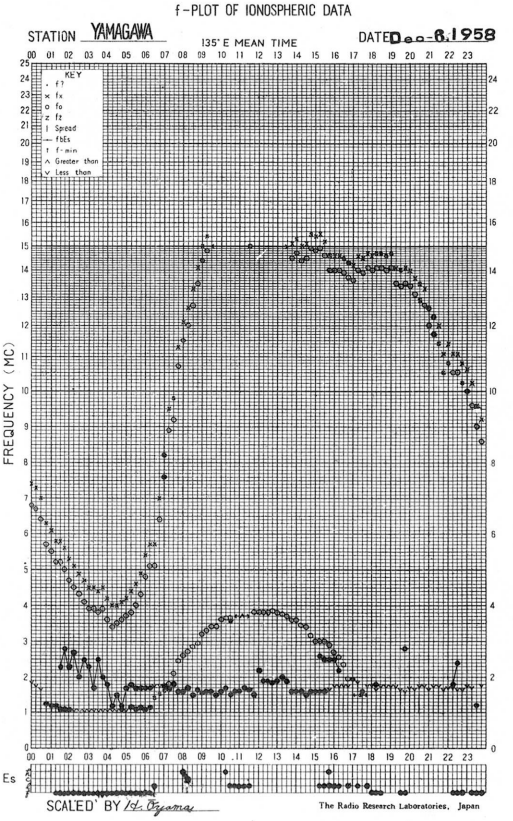

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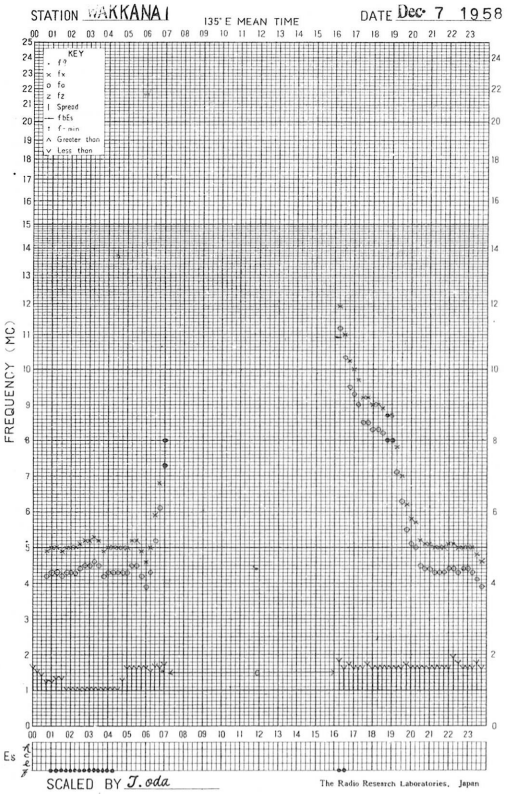

SCALED BY T. oda

The Radio Research Laboratories, Japan

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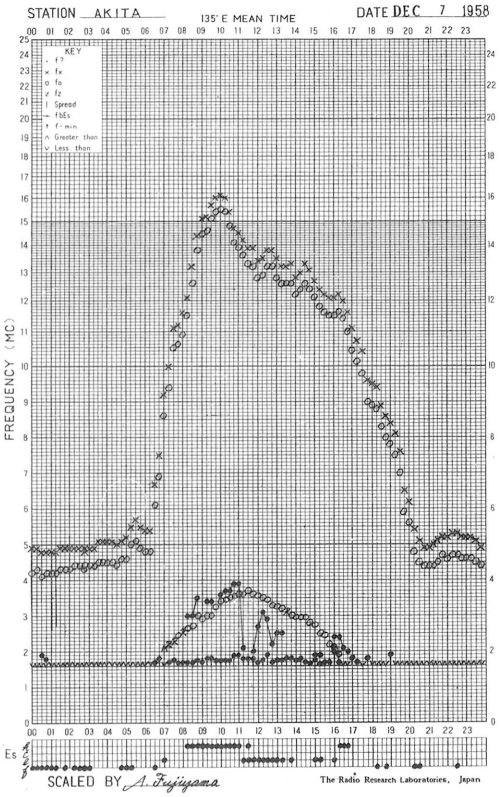

SCALED BY A. Fujiyama

The Radio Research Laboratories, Japan

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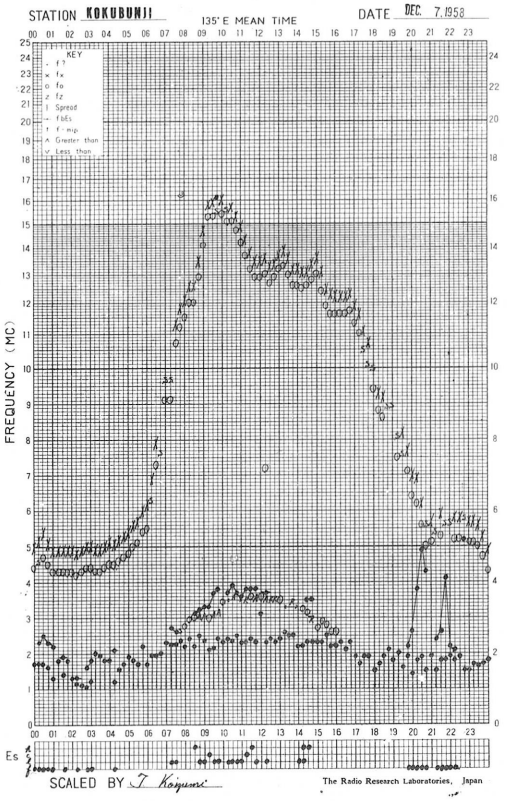

SCALED BY I. Kayusui

The Radio Research Laboratories, Japan

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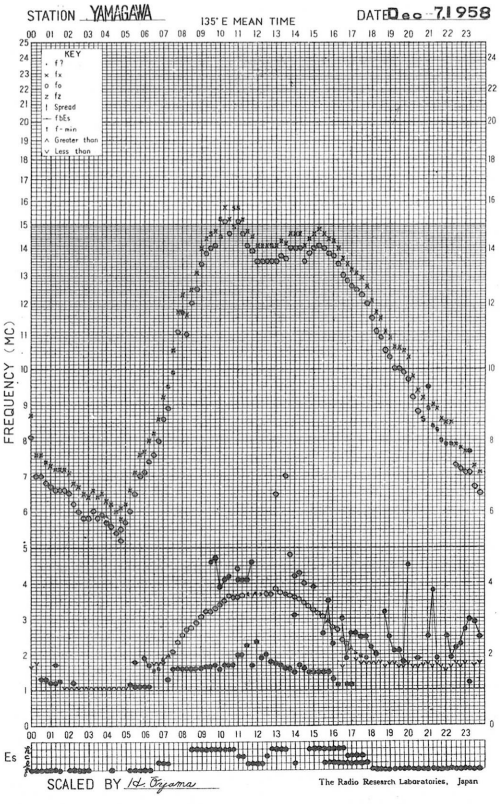

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The Radio Research Laboratories, Japan

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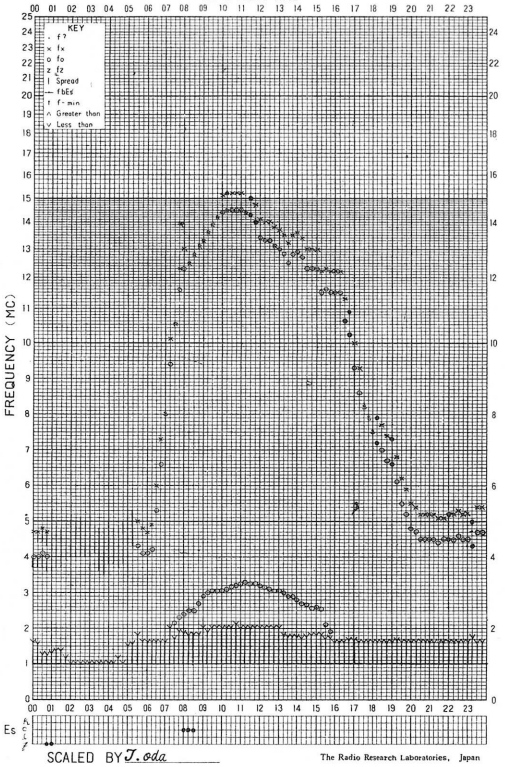

SCALED BY J. oda

The Radio Research Laboratories, Japan

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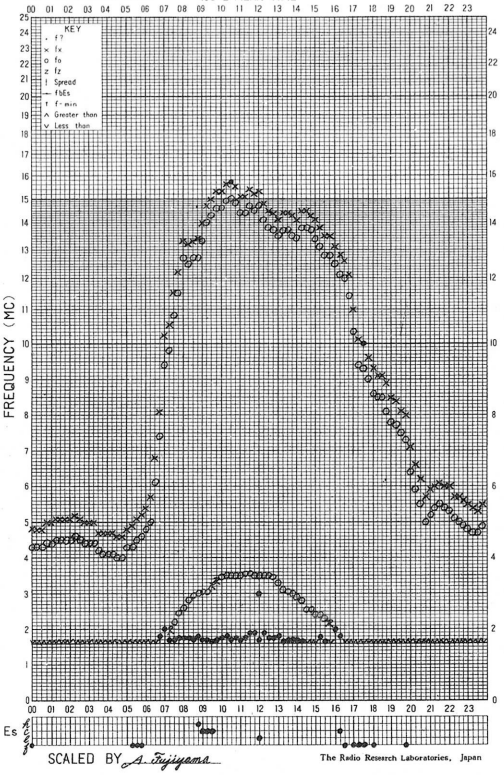

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The Radio Research Laboratories, Japan

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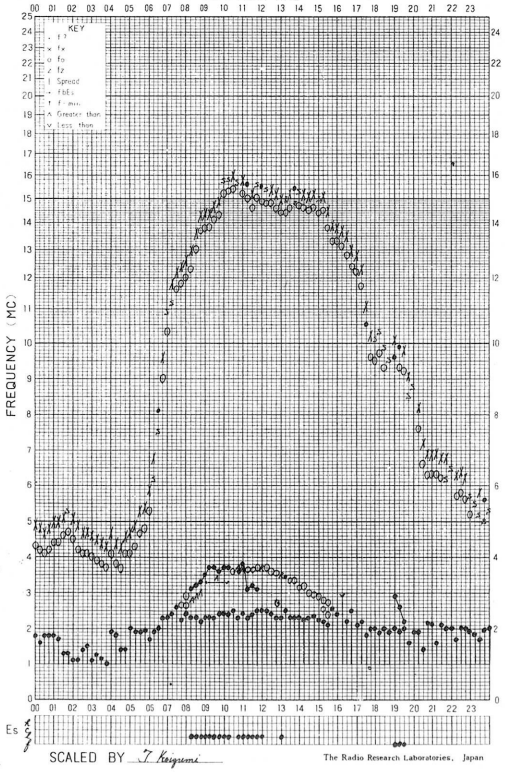

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The Radio Research Laboratories, Japan

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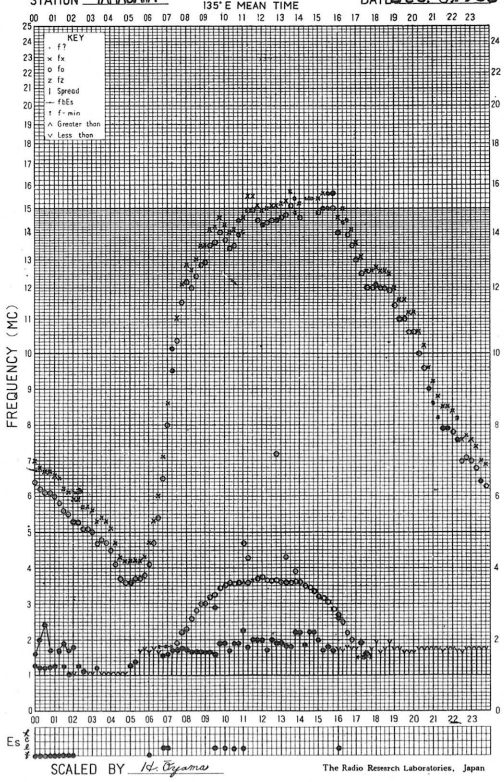
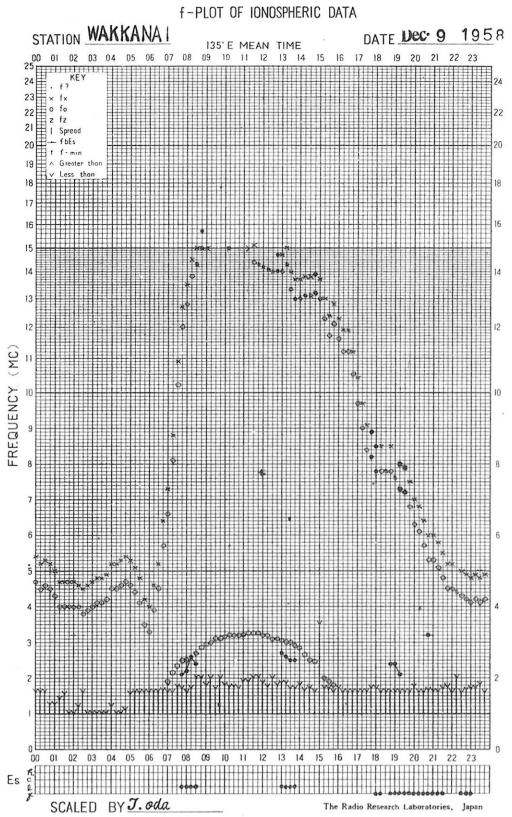


SCALED BY H. Ozawa

The Radio Research Laboratories, Japan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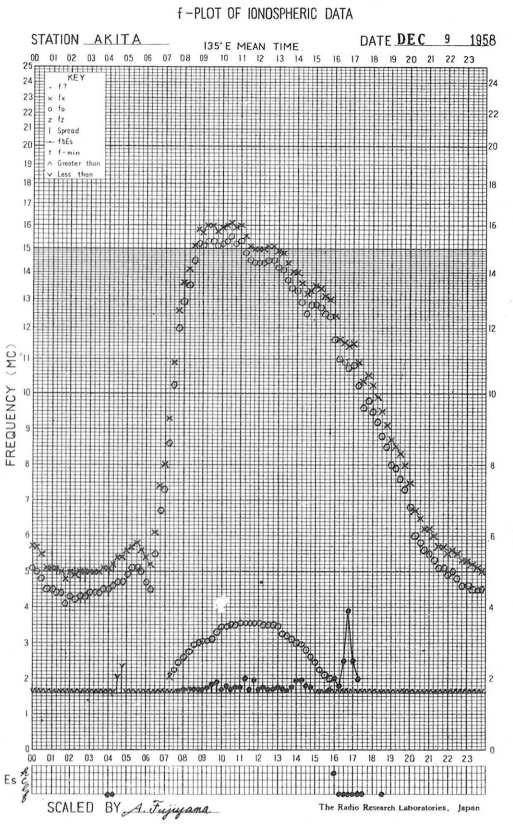
SCALED BY J. oda
The Radio Research Laboratories, Japan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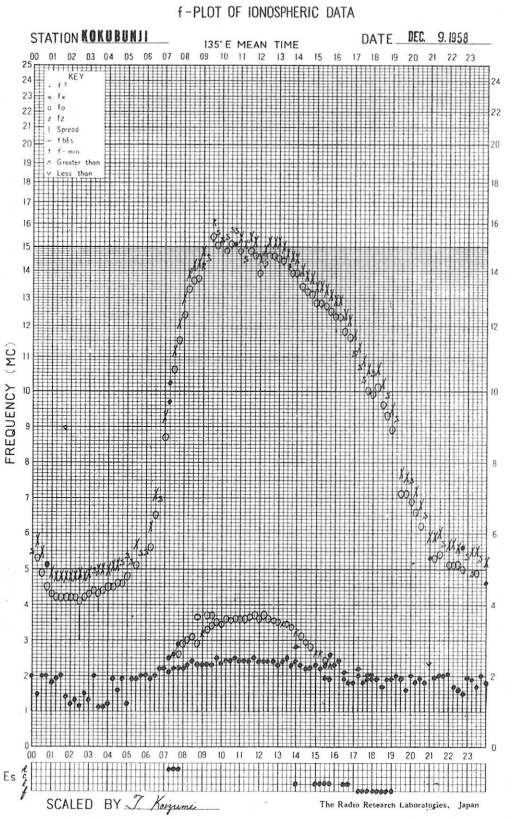
The Radio Research Laboratories, Japan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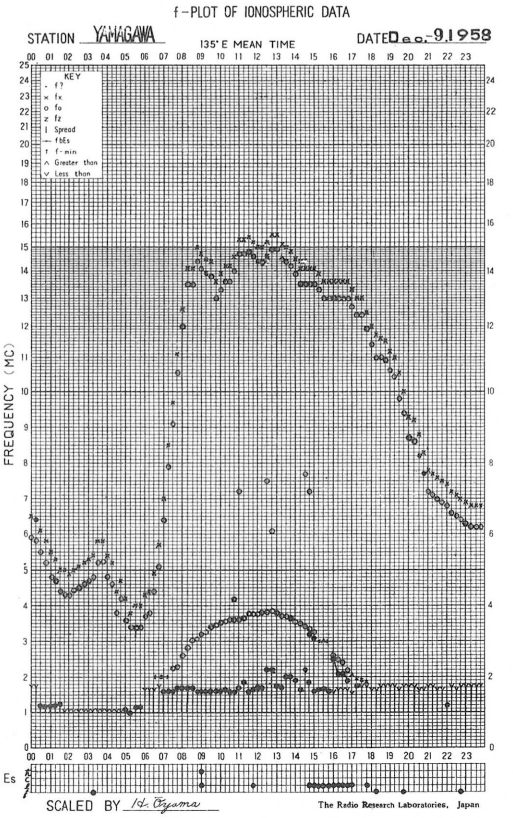
The Radio Research Laboratories, Japan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The Radio Research Laboratories, Japan

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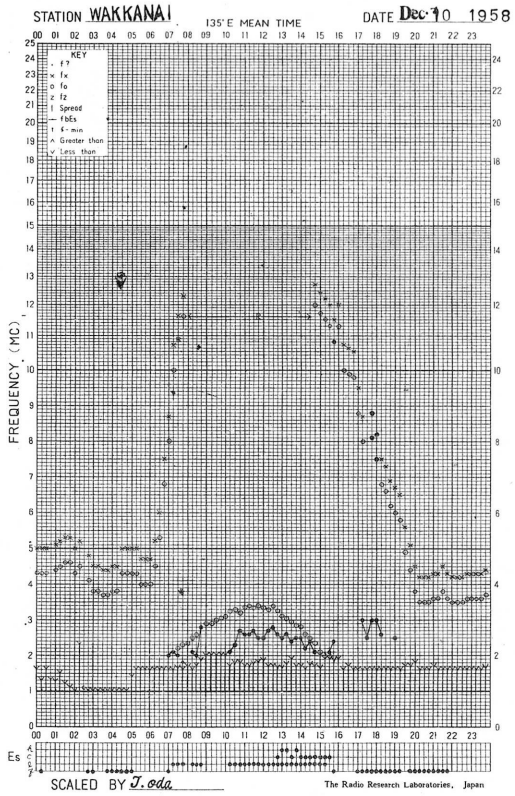

SCALED BY T. Oda

The Radio Research Laboratories, Japan

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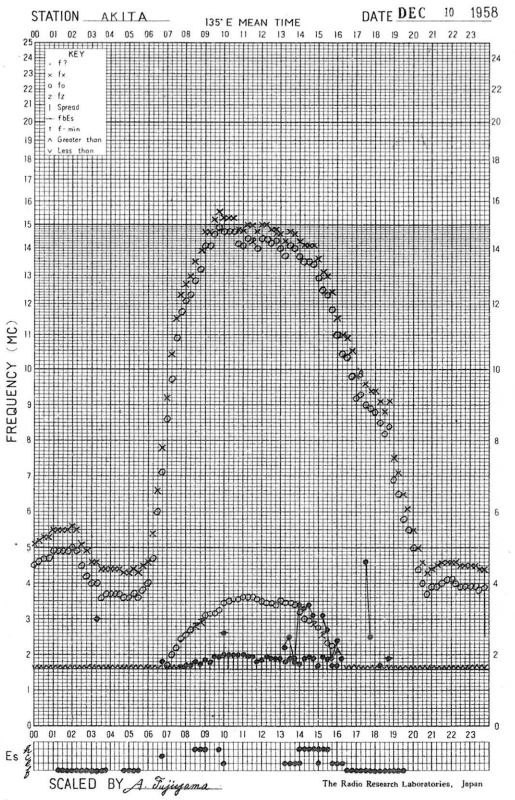

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The Radio Research Laboratories, Japan

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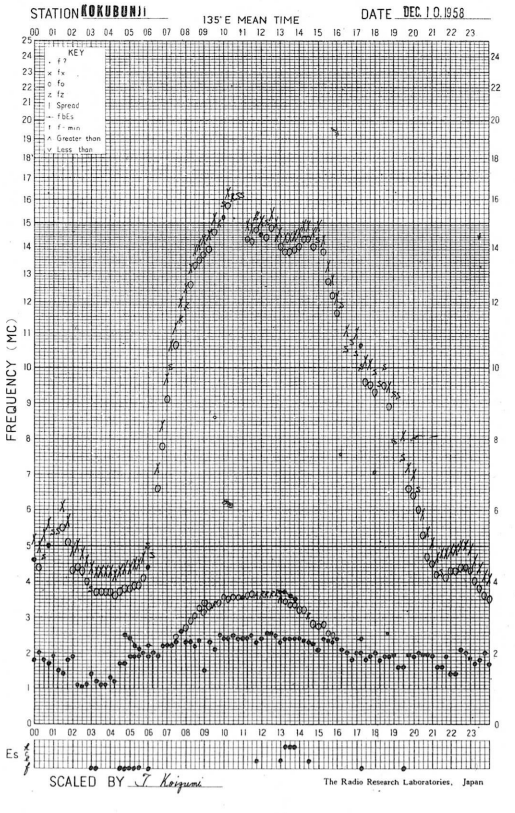

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The Radio Research Laboratories, Japan

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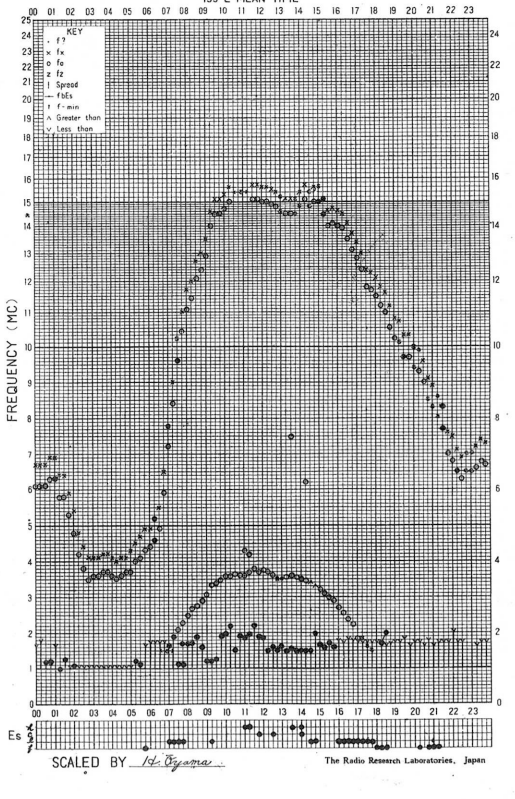

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The Radio Research Laboratories, Japan

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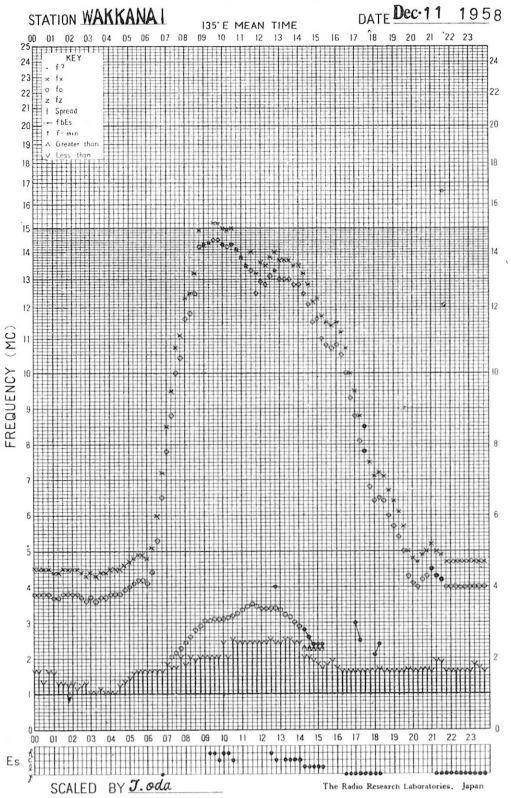

SCALED BY J. Oda

The Radio Research Laboratories, Japan

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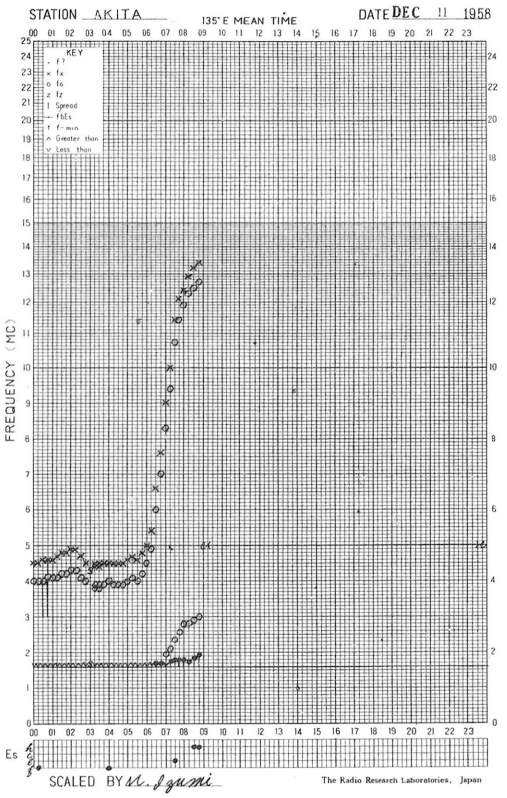

SCALED BY M. Izumi

The Radio Research Laboratories, Japan

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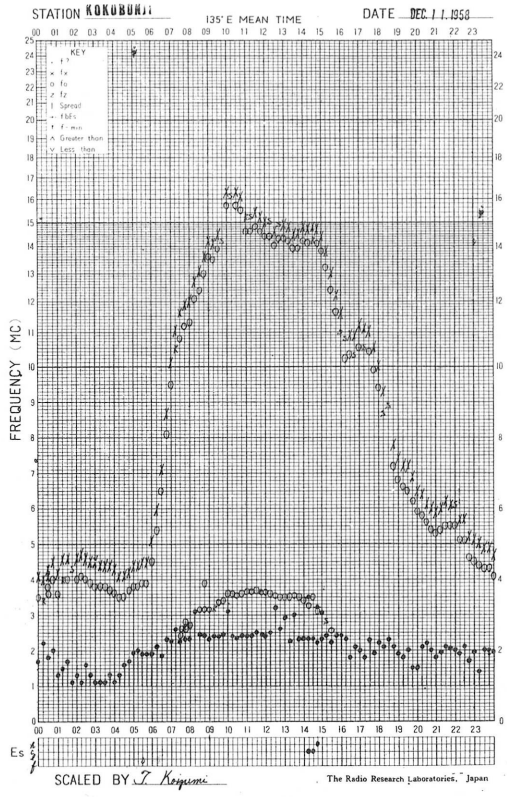

SCALED BY T. Konishi

The Radio Research Laboratories, Japan

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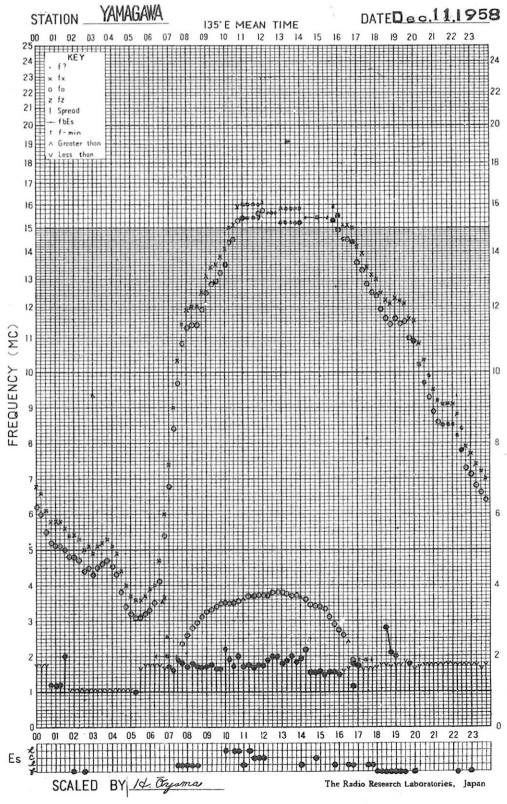

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The Radio Research Laboratories, Japan

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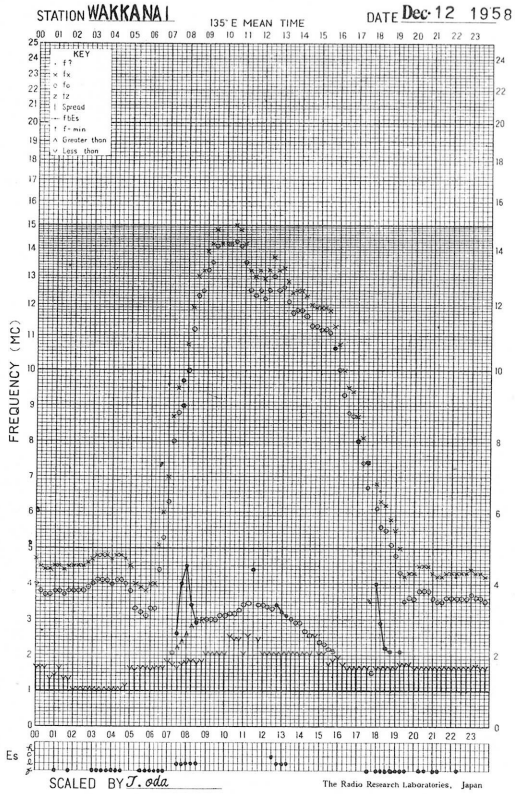

SCALED BY T. Oda

The Radio Research Laboratories, Japan

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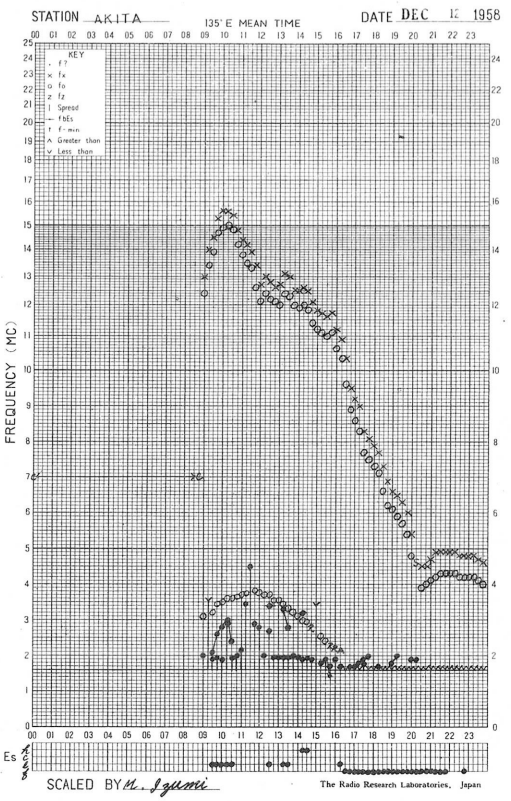

SCALED BY H. Izumi

The Radio Research Laboratories, Japan

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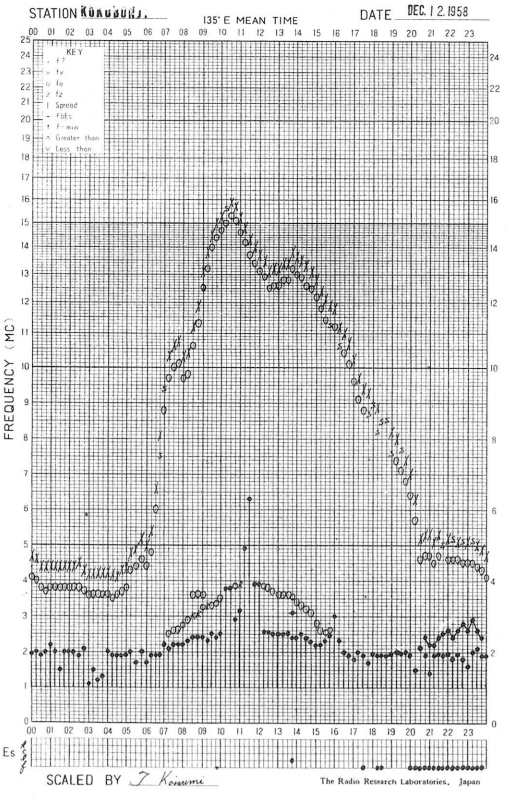

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The Radio Research Laboratories, Japan

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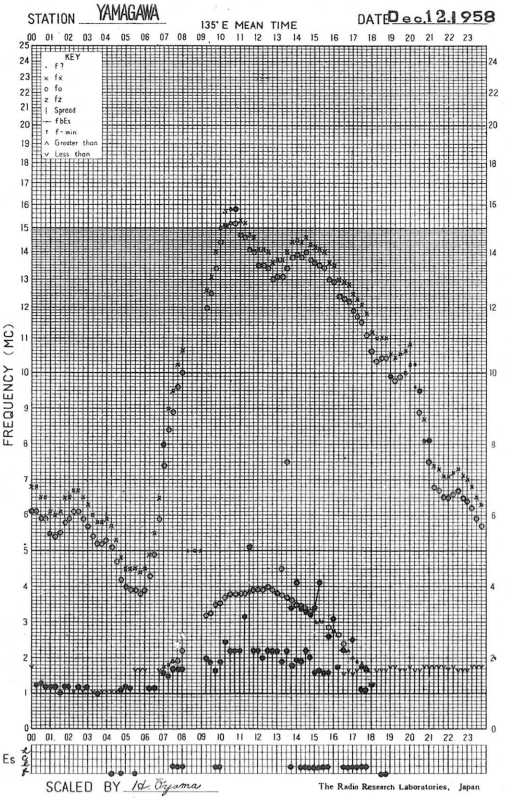

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The Radio Research Laboratories, Japan

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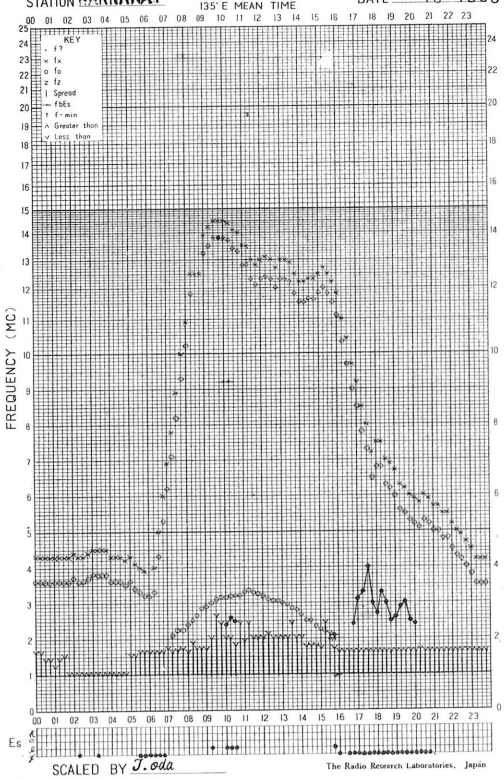

SCALED BY T. Oda

The Radio Research Laboratories, Japan

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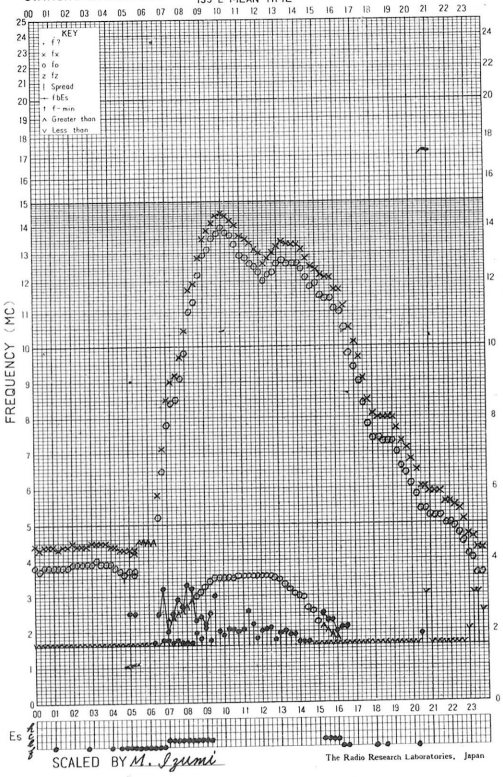

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The Radio Research Laboratories, Japan

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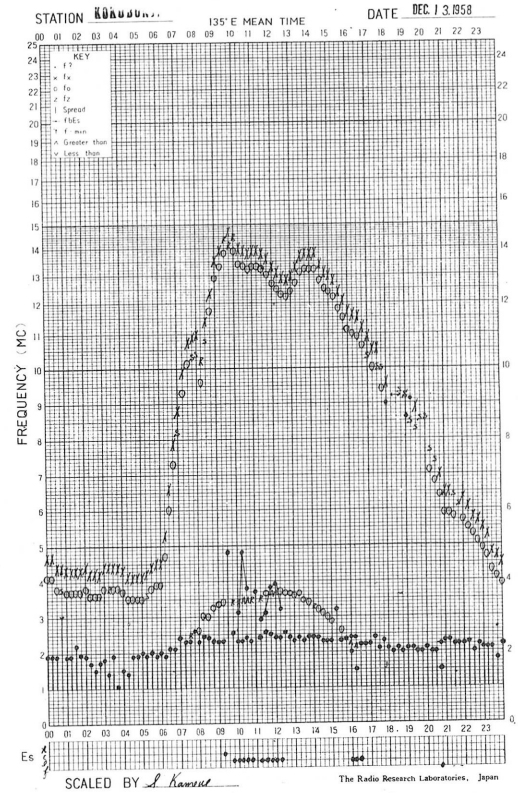

SCALED BY S. Kamei

The Radio Research Laboratories, Japan

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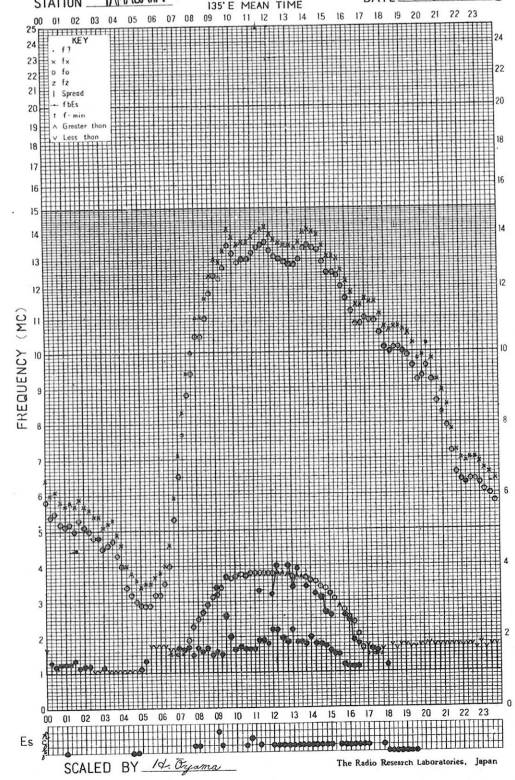

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The Radio Research Laboratories, Japan

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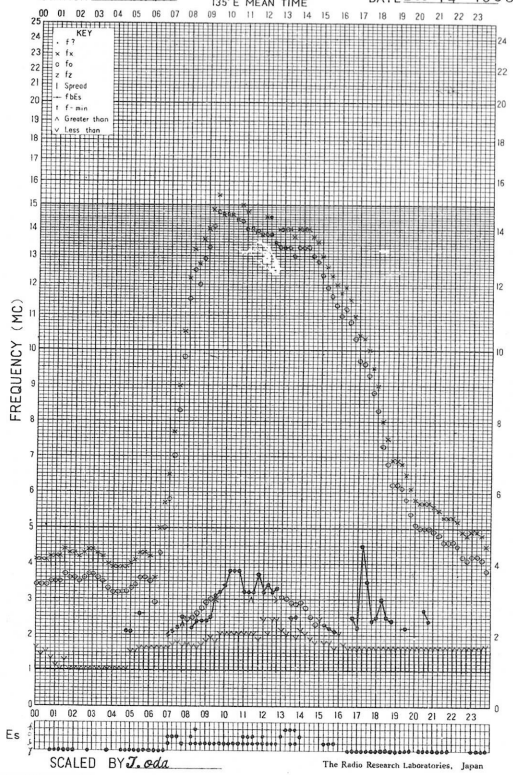

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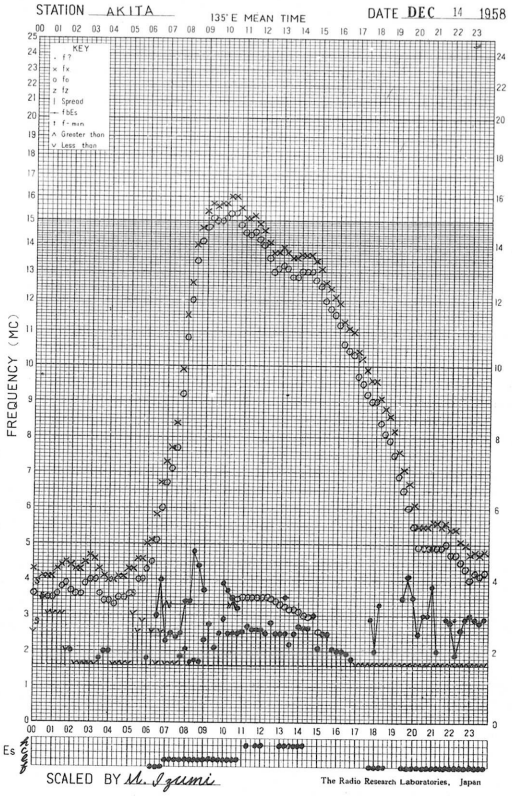

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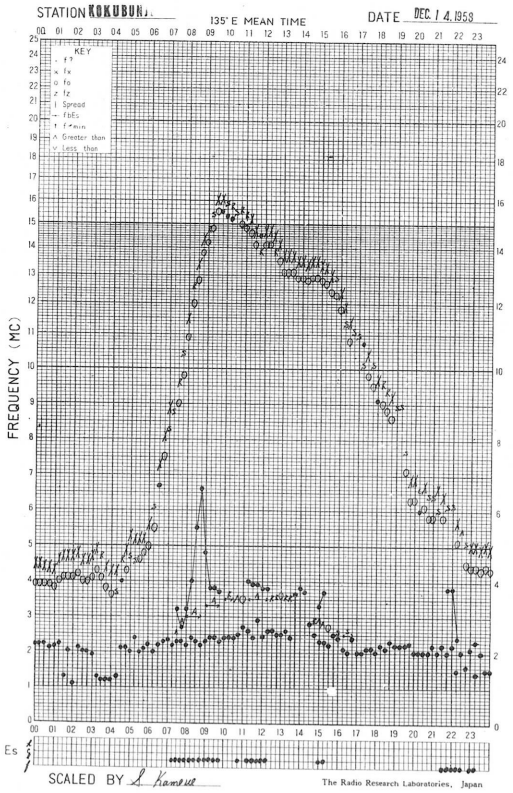

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The Radio Research Laboratories, Japan

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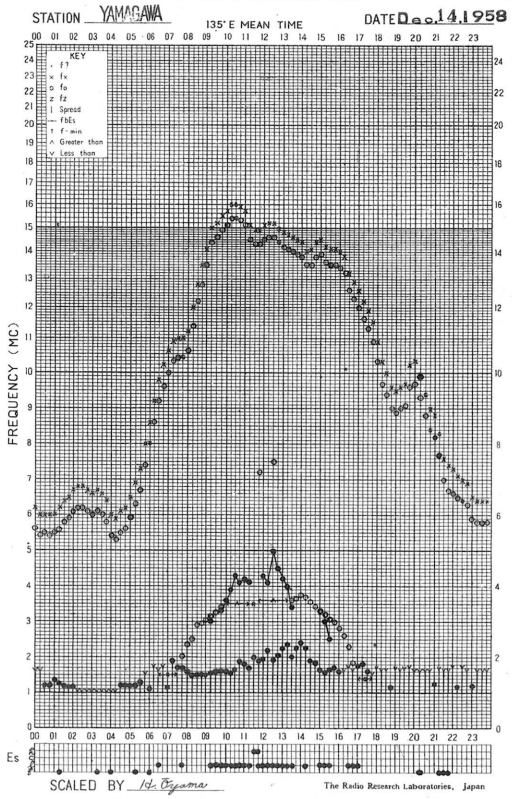

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The Radio Research Laboratories, Japan

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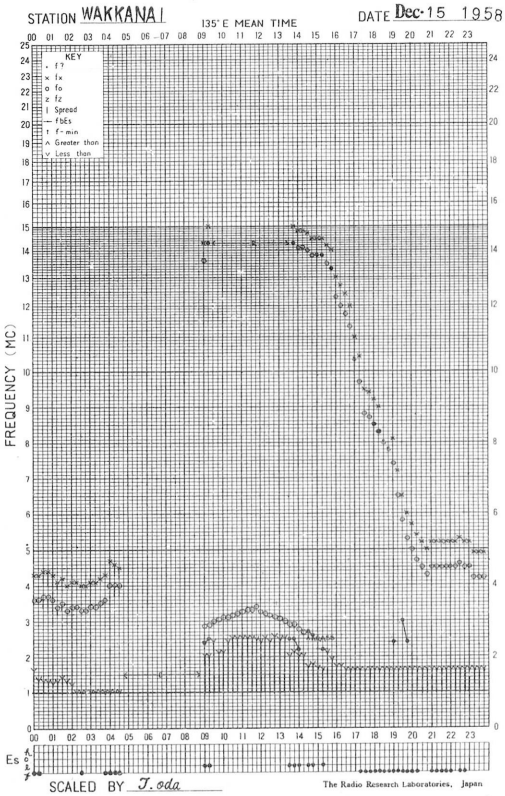

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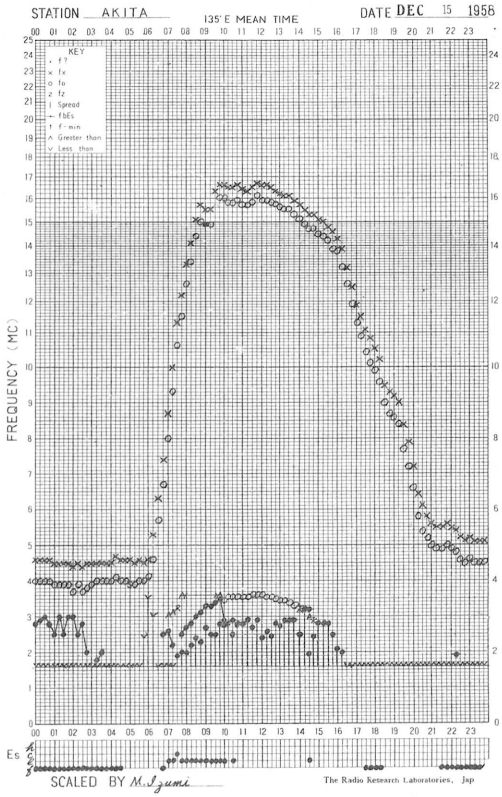

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The Radio Research Laboratories, Jap

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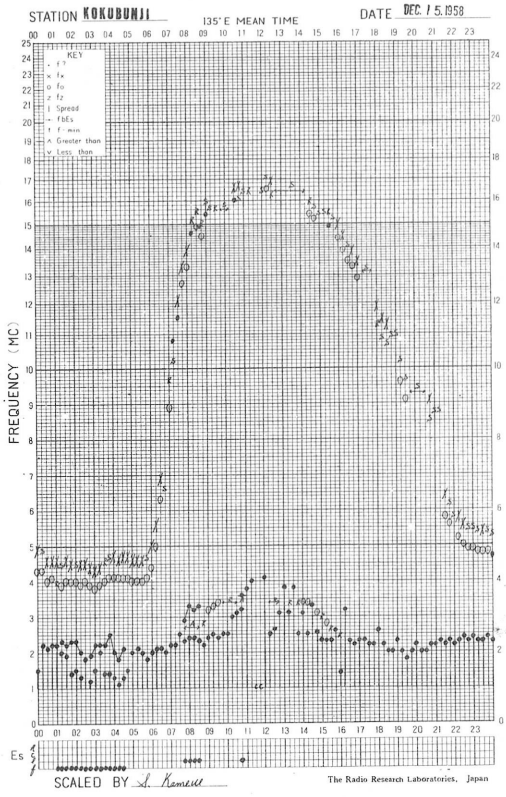

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The Radio Research Laboratories, Japan

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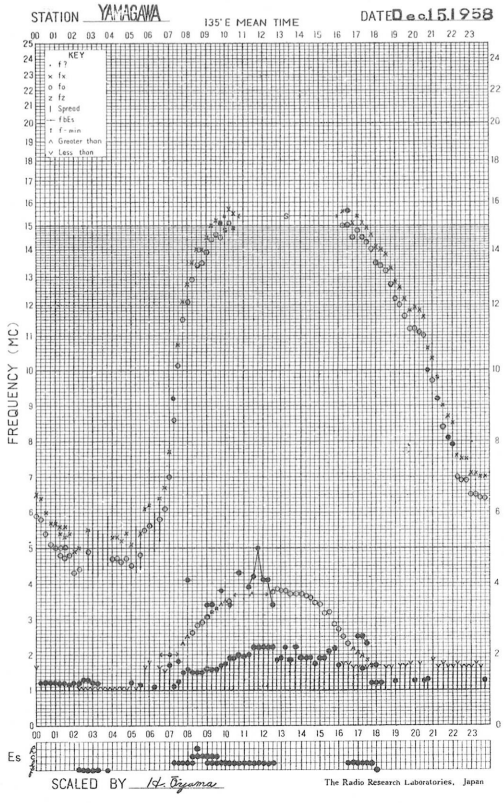

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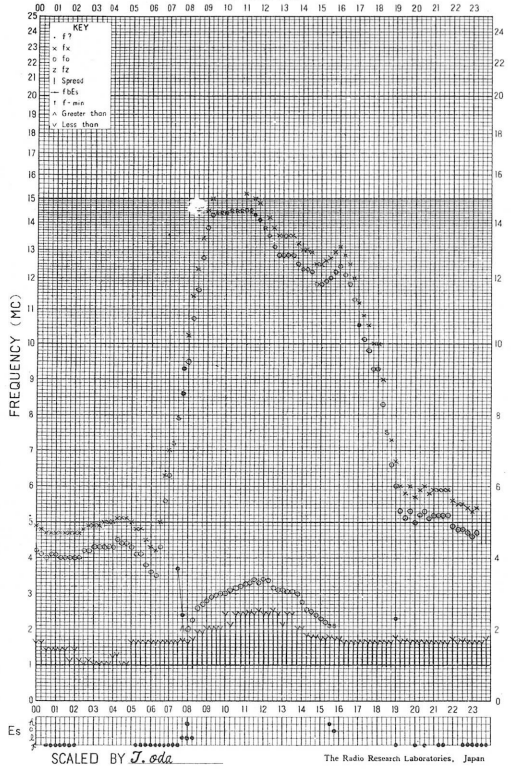

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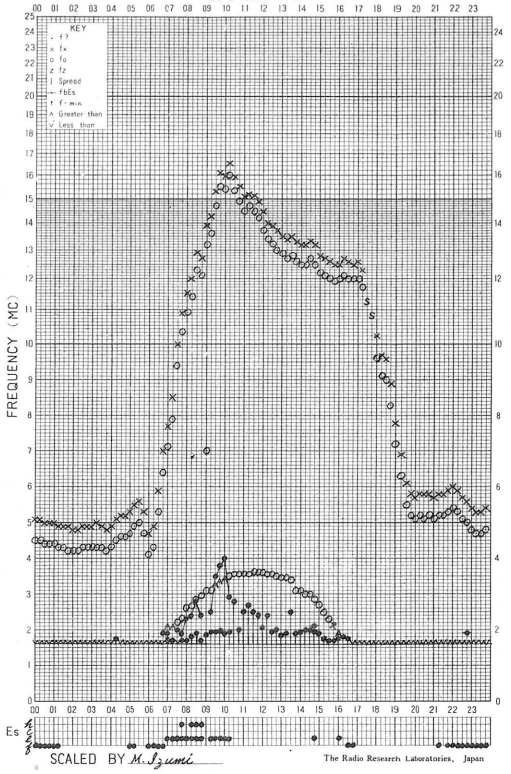

SCALED BY M. Izumi

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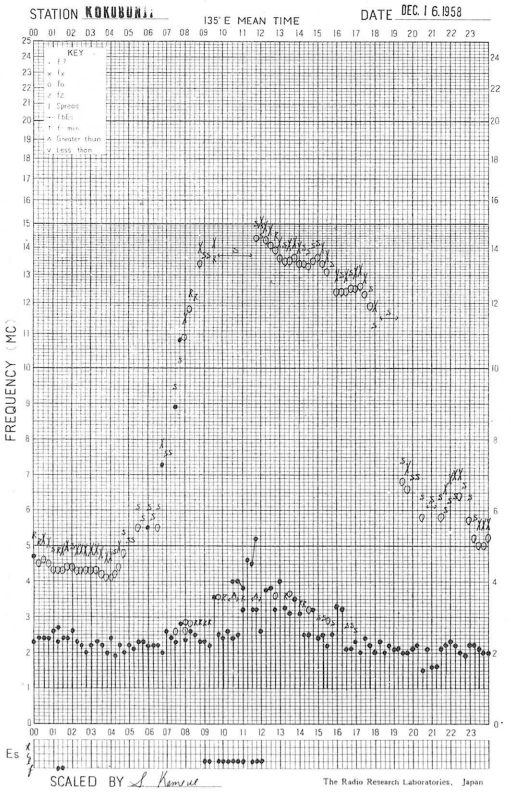

SCALED BY S. Konishi

The Radio Research Laboratories, Japan

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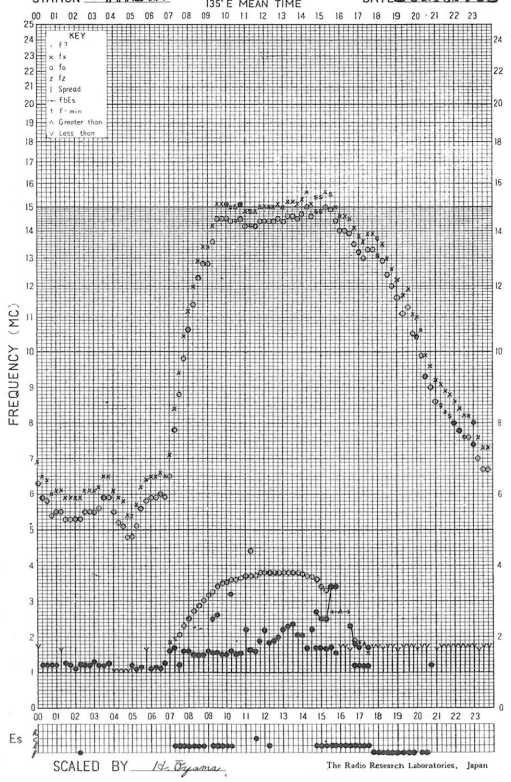
STATION YAMAGAWA 135° E MEAN TIME DATE Dec. 16 1958



SCALED BY H. Ogawa

The Radio Research Laboratories, Japan

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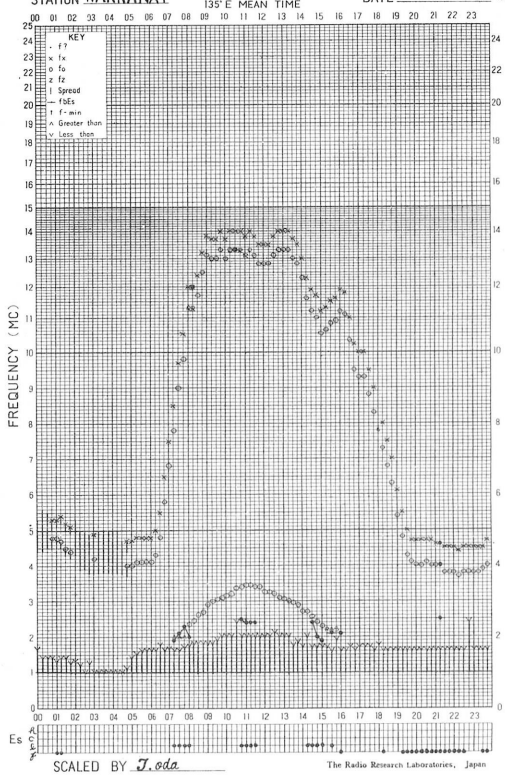

SCALED BY T. Oda

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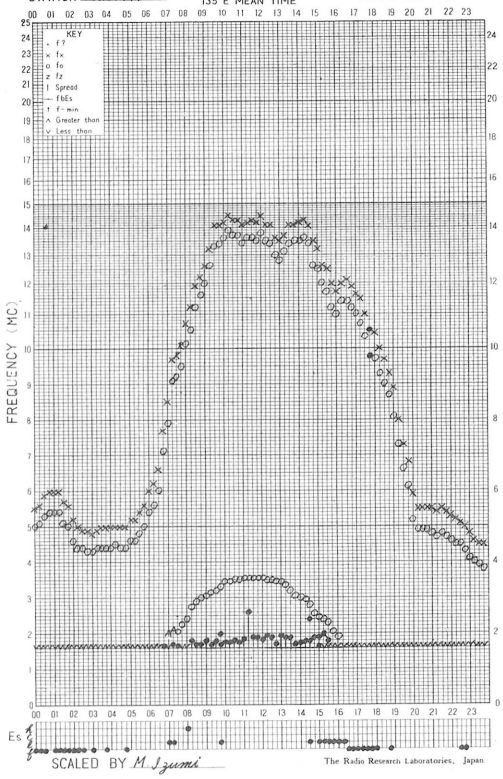

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The Radio Research Laboratories, Japan

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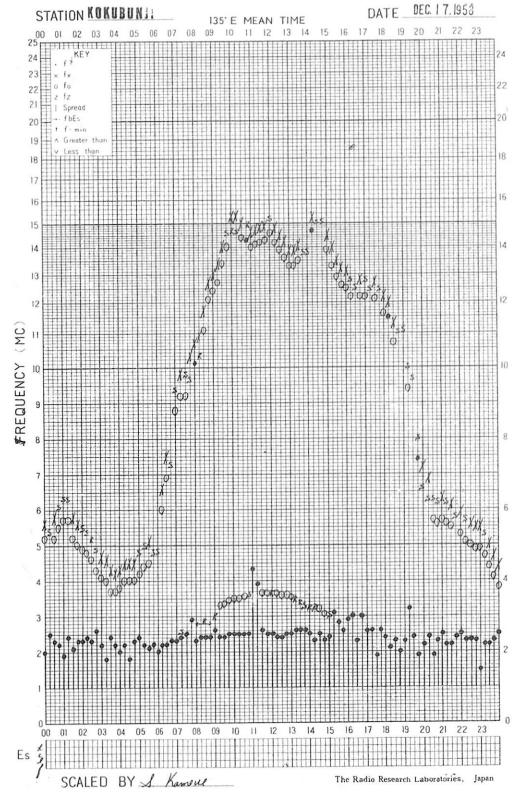

SCALED BY A. Kawai

The Radio Research Laboratories, Japan

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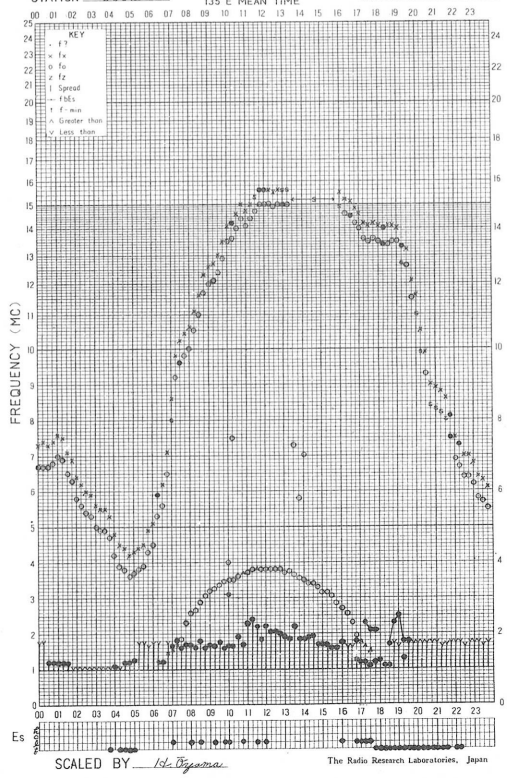

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The Radio Research Laboratories, Japan

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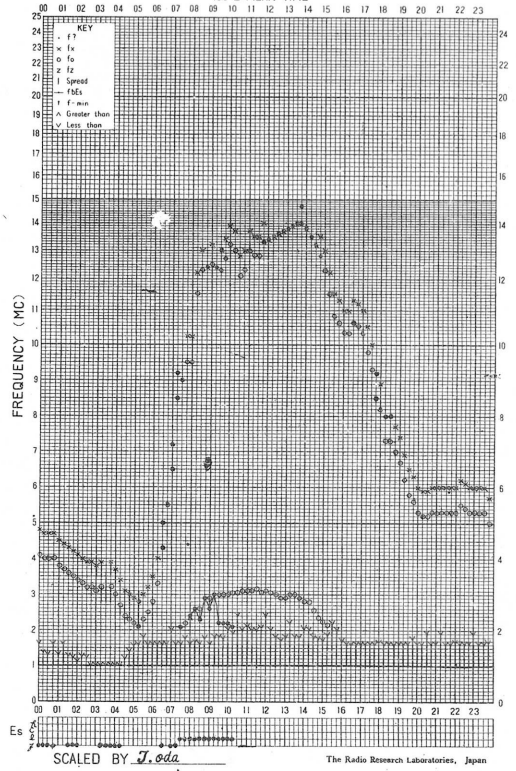

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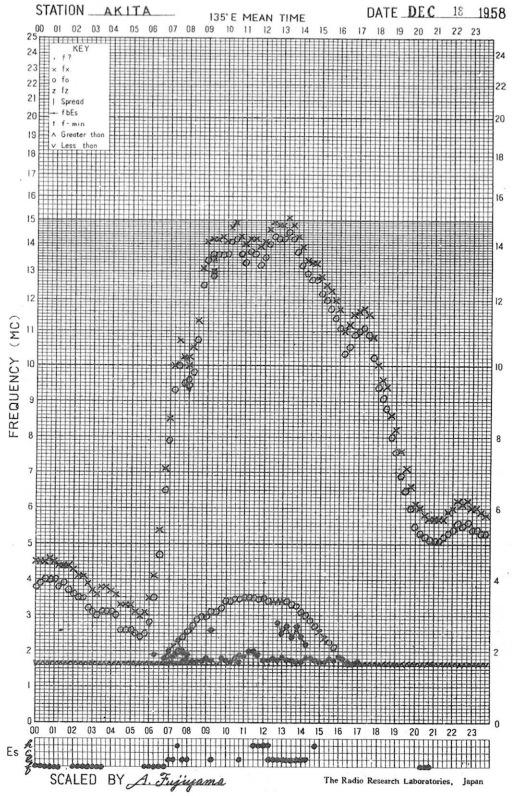

SCALED BY A. Fujiyama The Radio Research Laboratories, Japan

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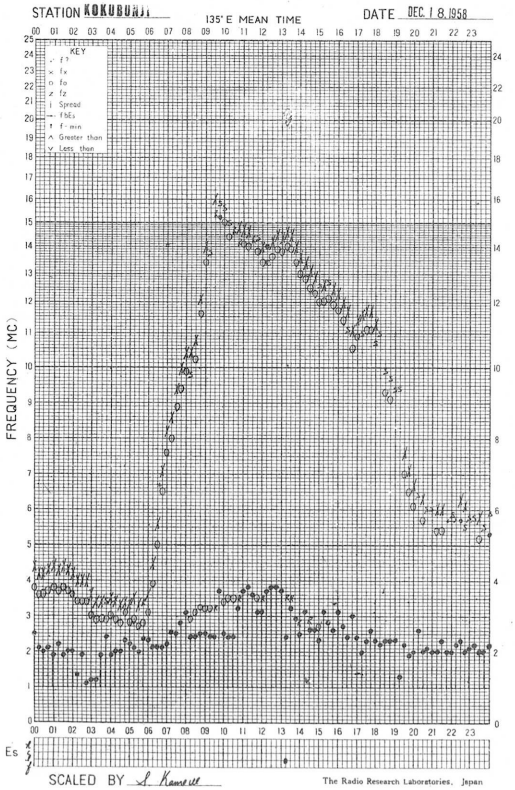

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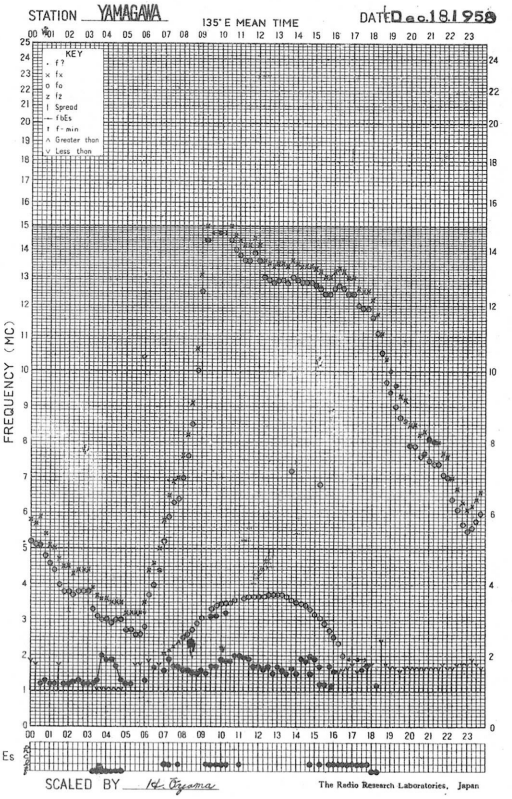

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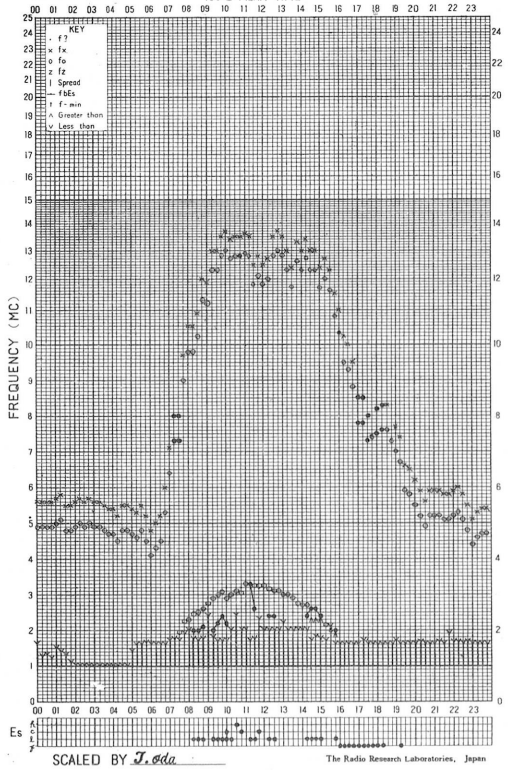

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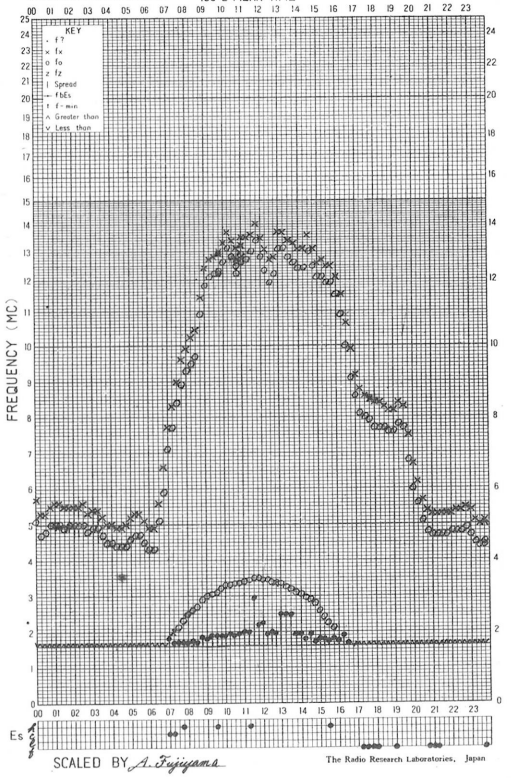

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The Radio Research Laboratories, Japan

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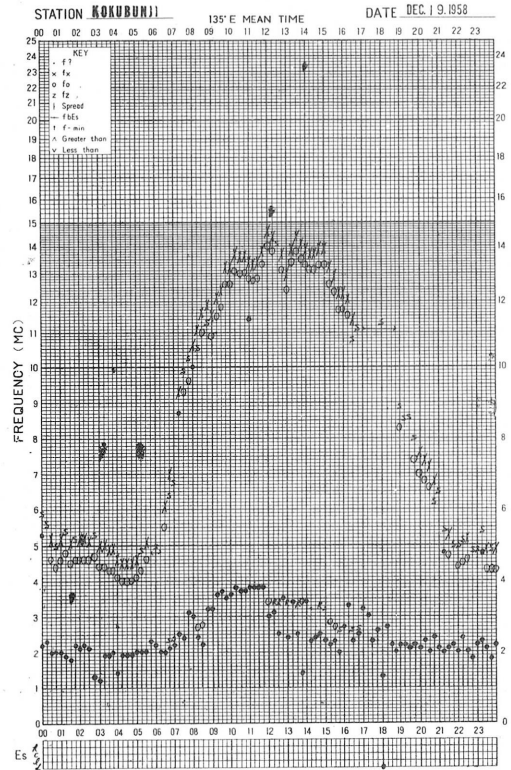

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The Radio Research Laboratories, Japan

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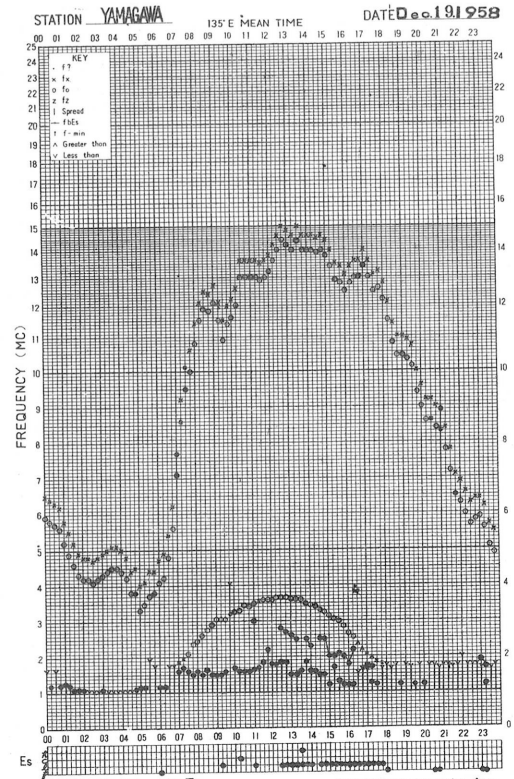

SCALED BY Ichi Ozawa

The Radio Research Laboratories, Japan

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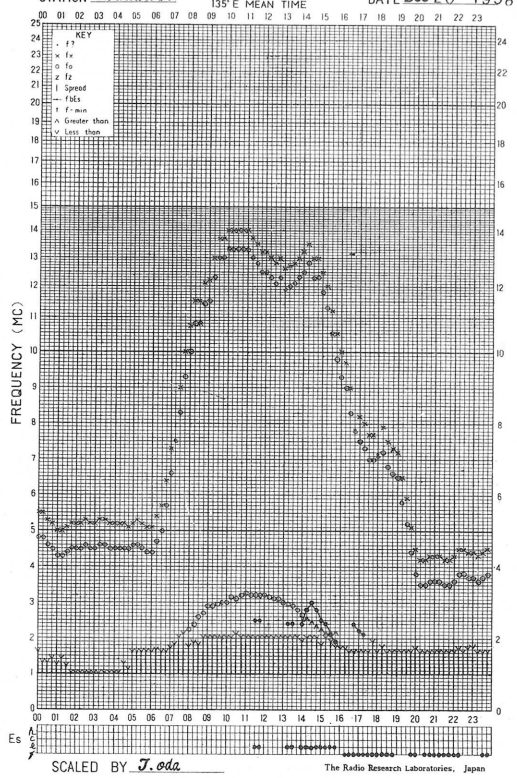

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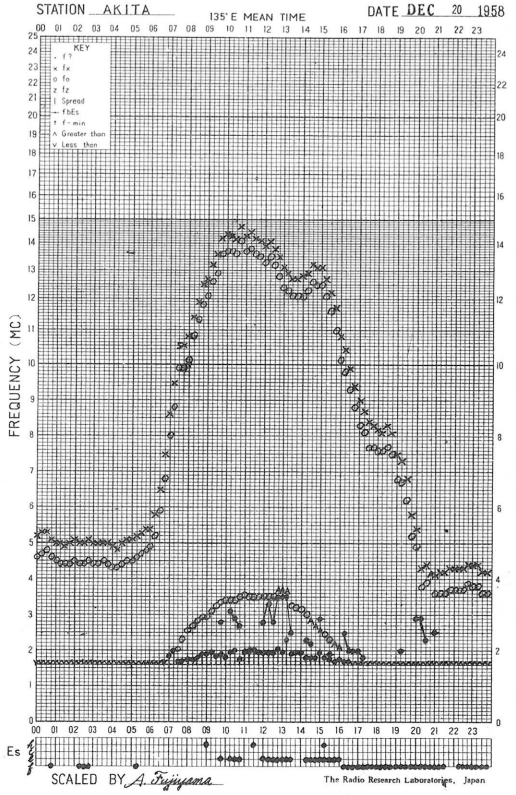

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The Radio Research Laboratories, Japan

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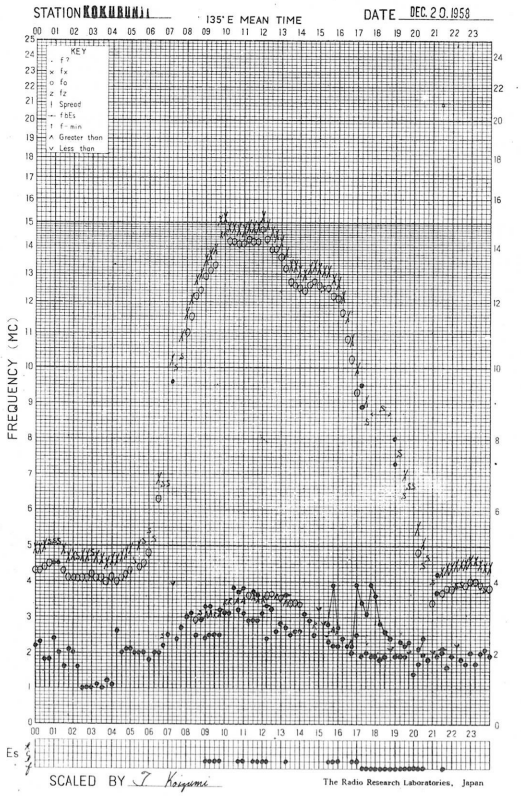

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The Radio Research Laboratories, Japan

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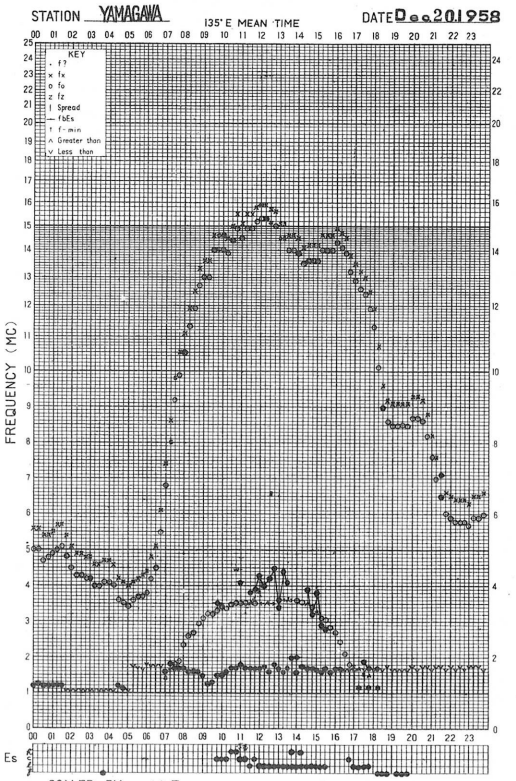

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The Radio Research Laboratories, Japan

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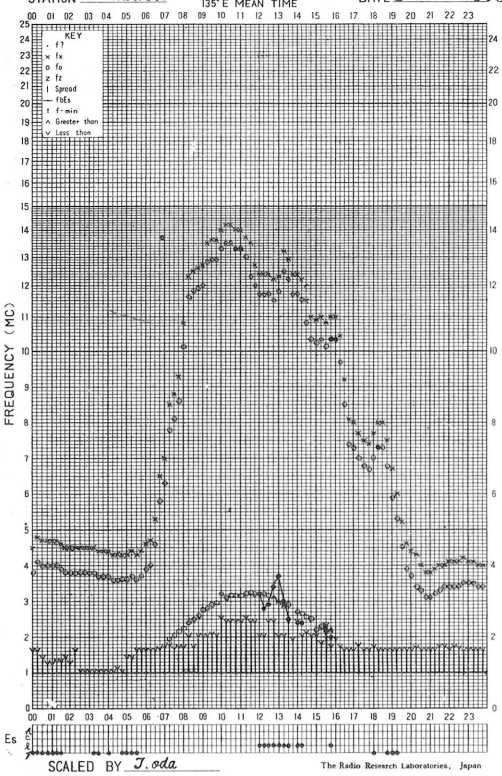

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The Radio Research Laboratories, Japan

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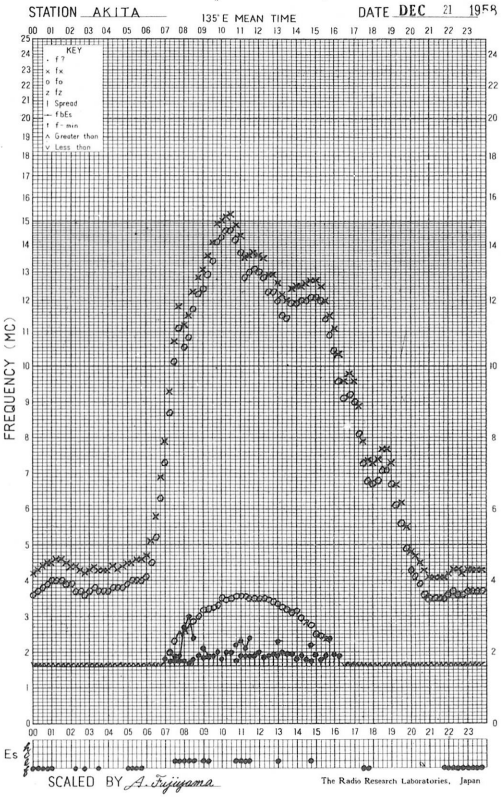

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The Radio Research Laboratories, Japan

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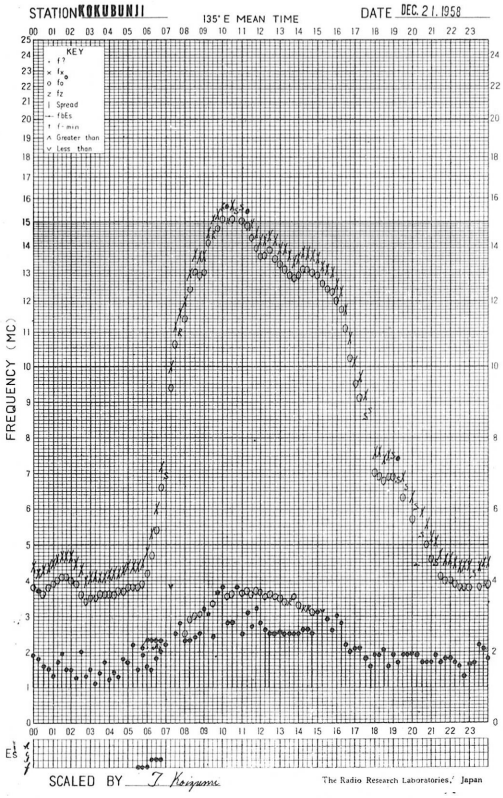

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The Radio Research Laboratories, Japan

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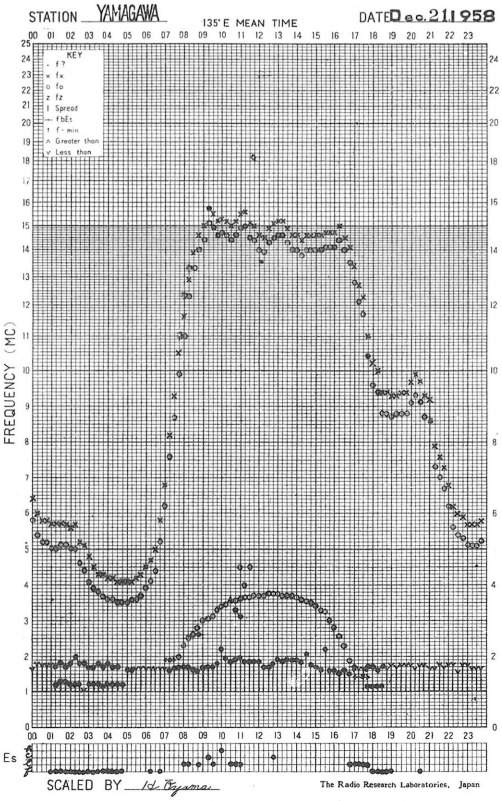

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The Radio Research Laboratories, Japan

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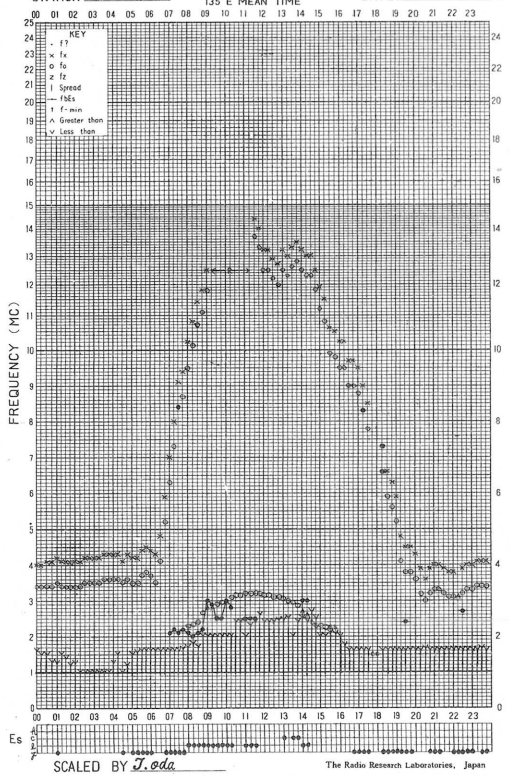

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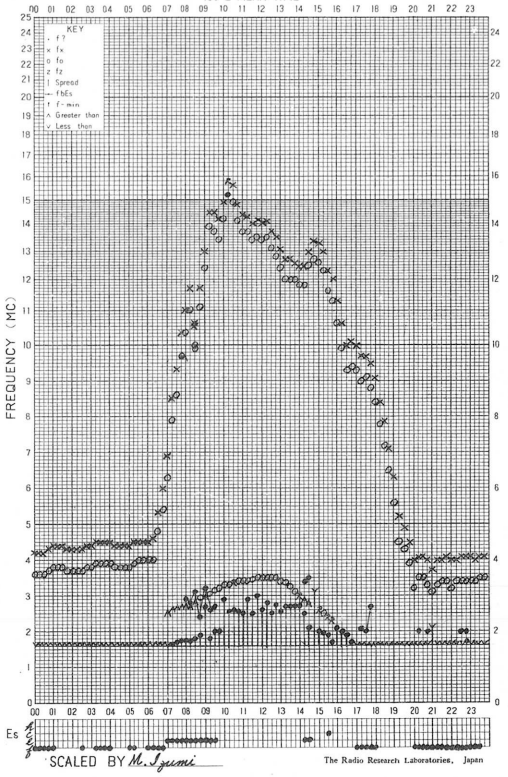

SCALED BY M. Izumi The Radio Research Laboratories, Japan

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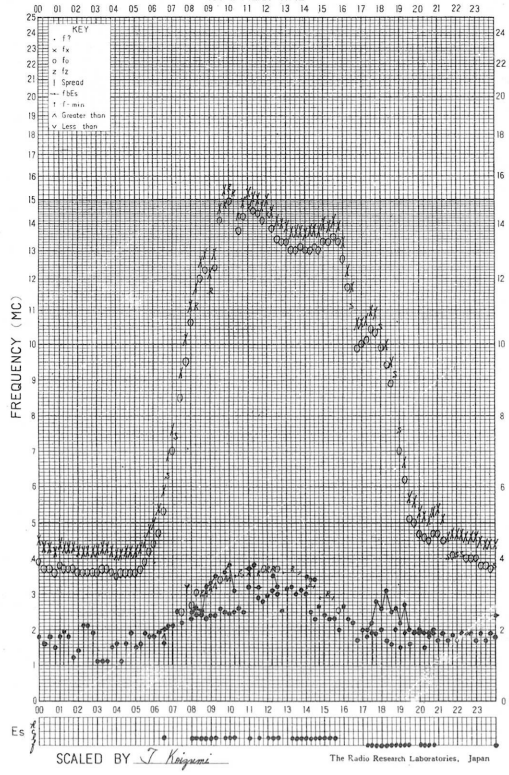

SCALED BY T. Keigumi The Radio Research Laboratories, Japan

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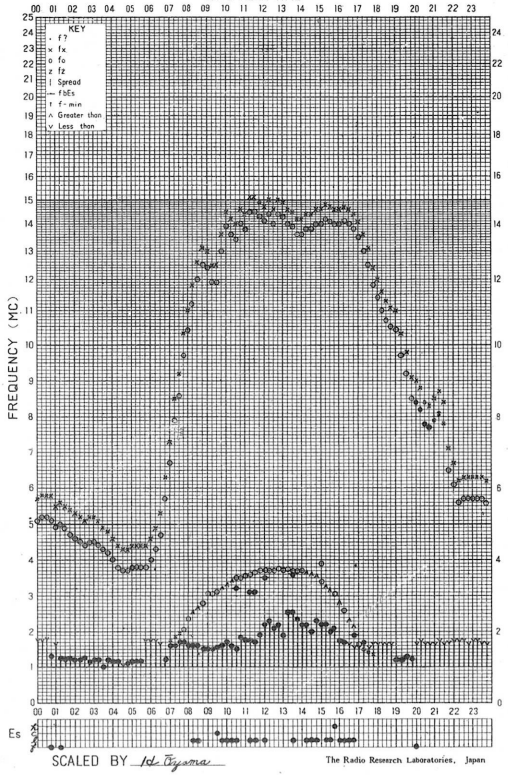

SCALED BY Ichi Fujisawa The Radio Research Laboratories, Japan

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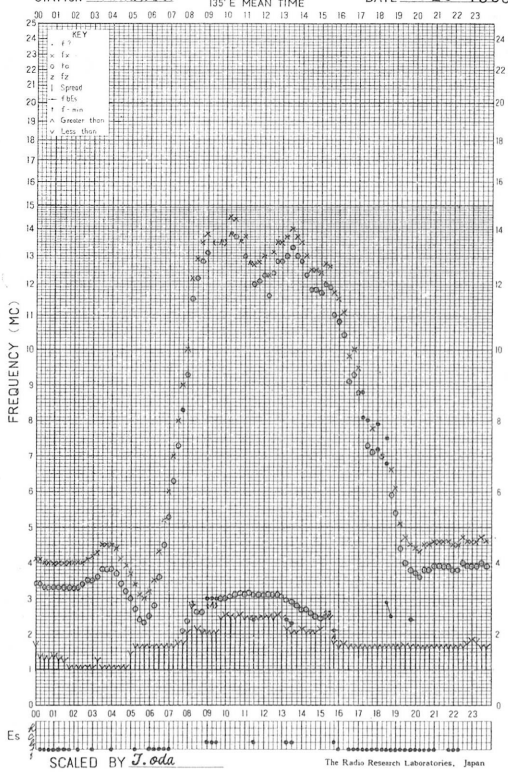

SCALED BY T. Oda

The Radio Research Laboratories, Japan

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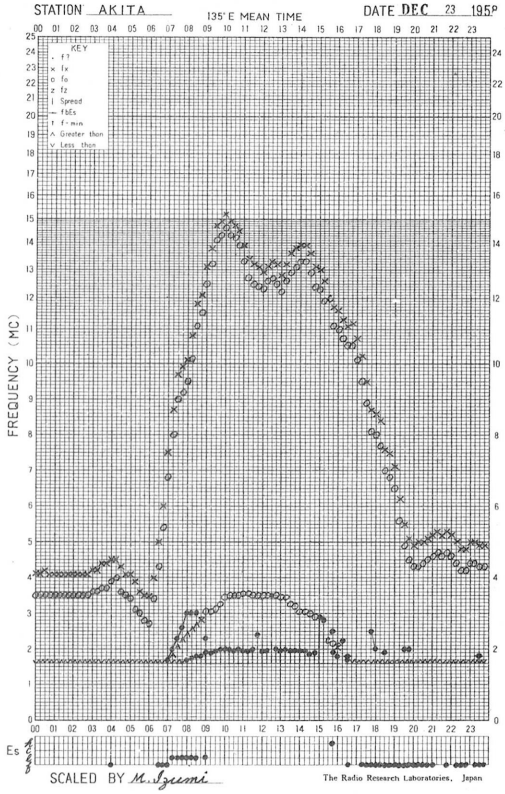

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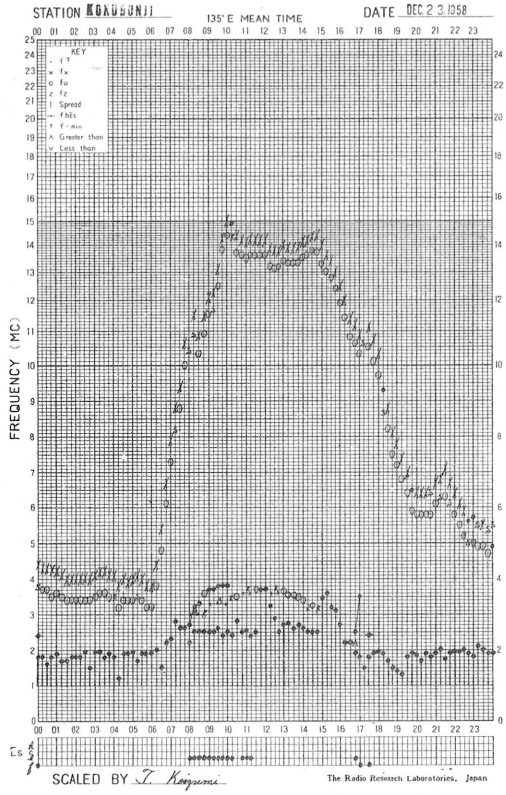

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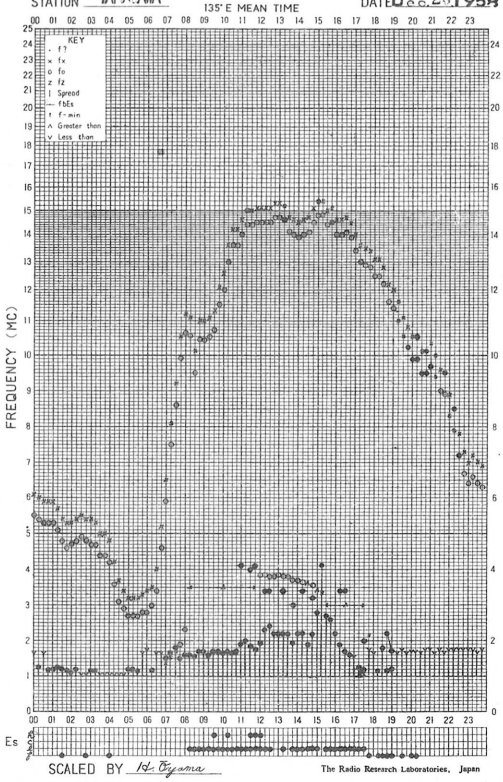

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The Radio Research Laboratories, Japan

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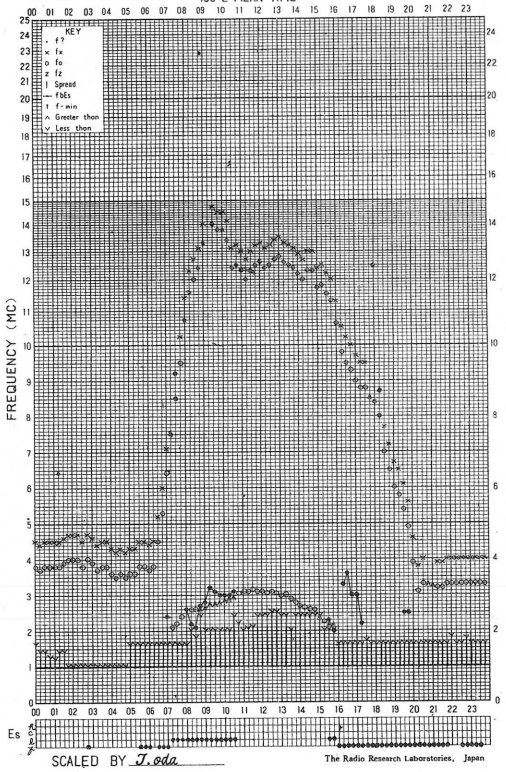

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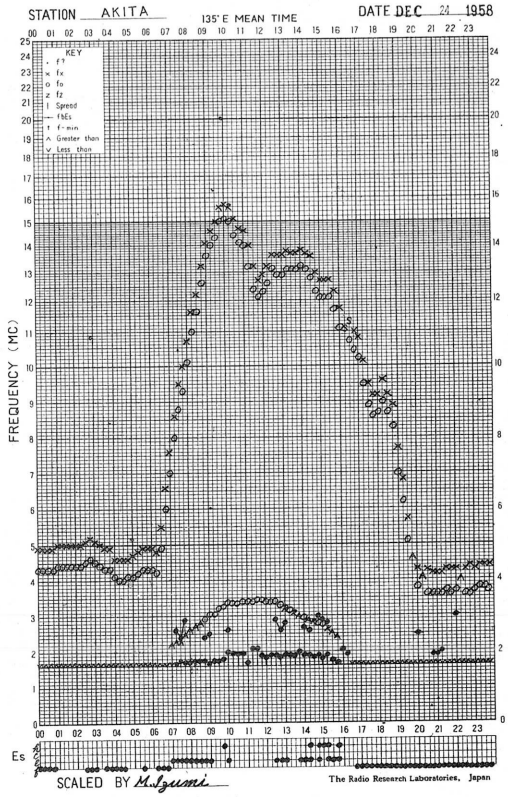

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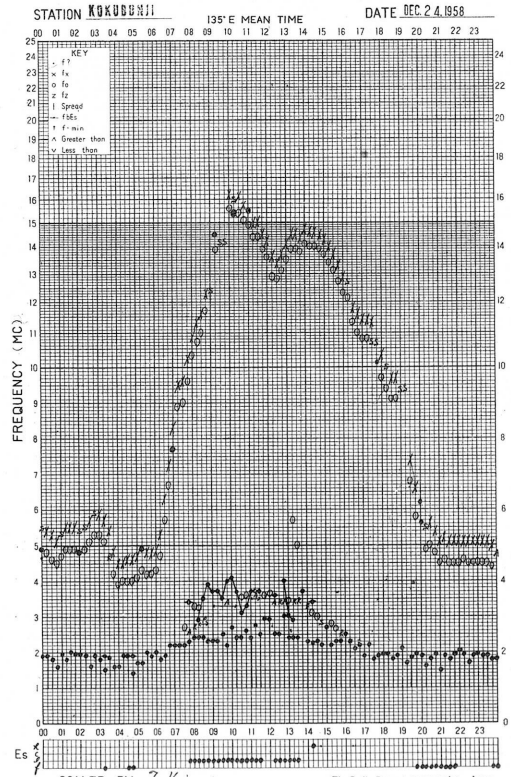

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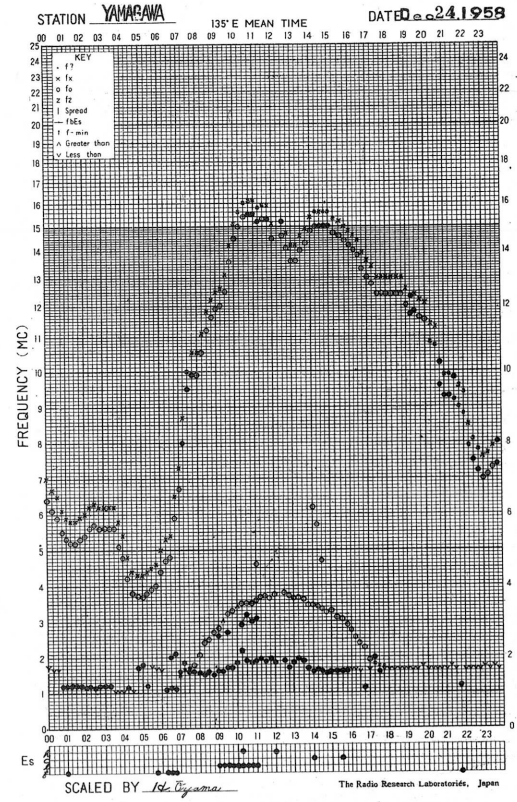

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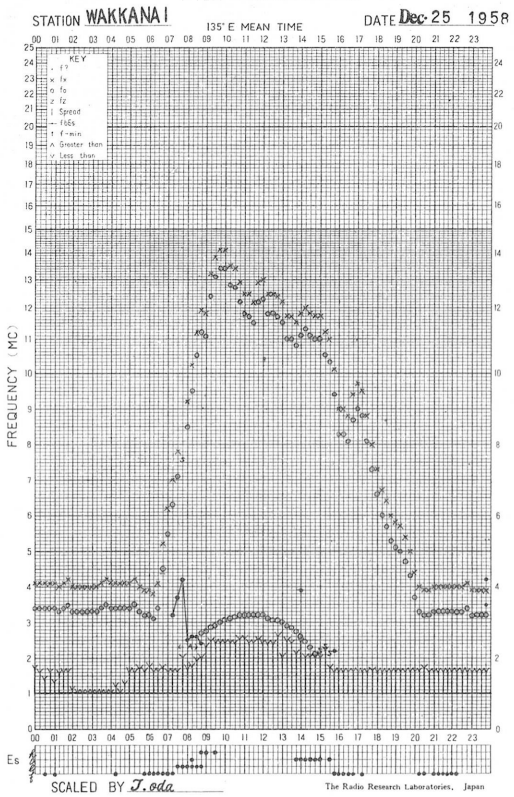

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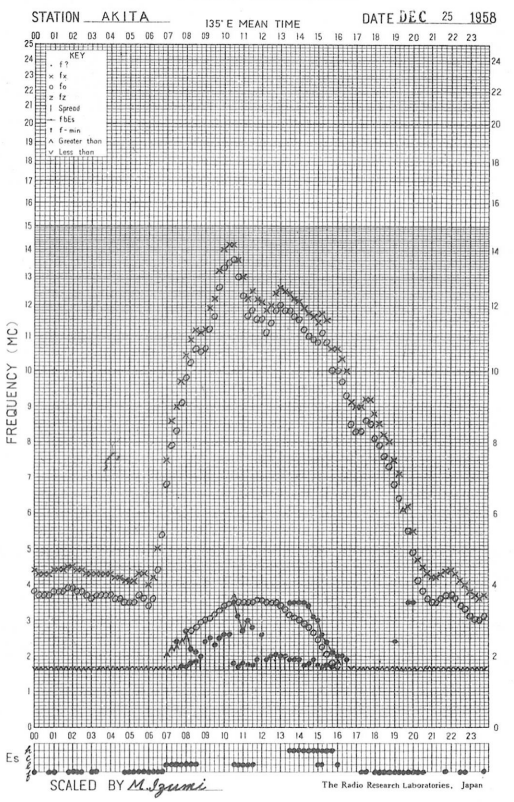

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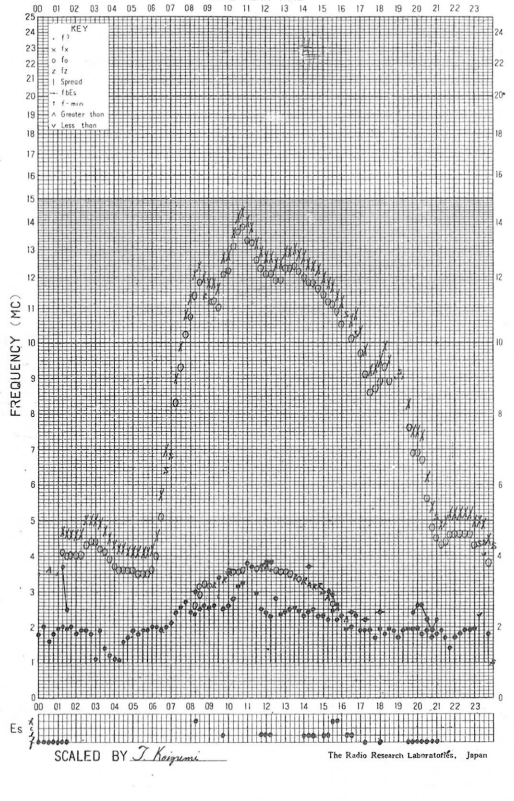

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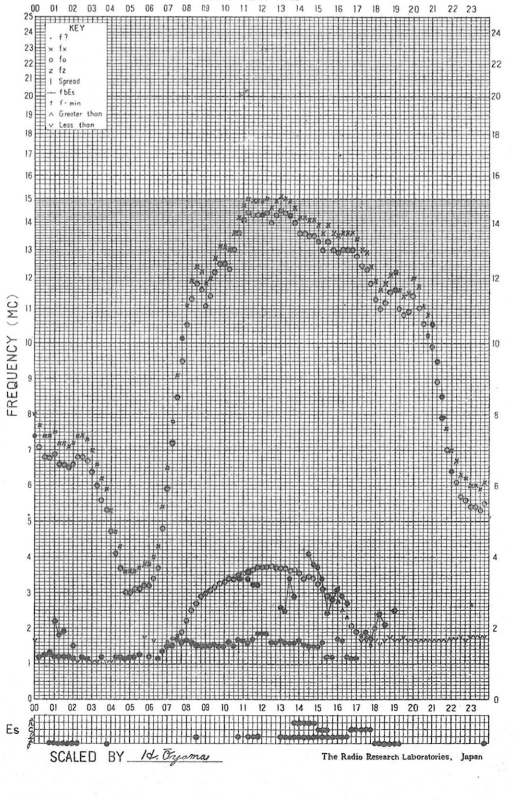

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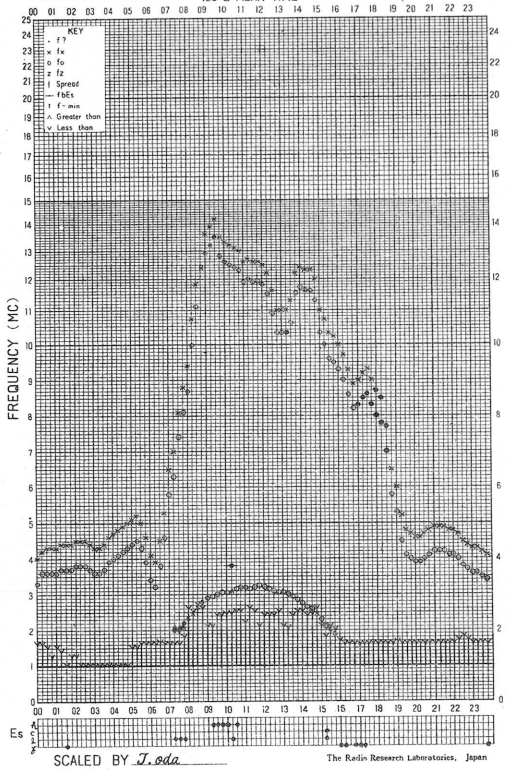

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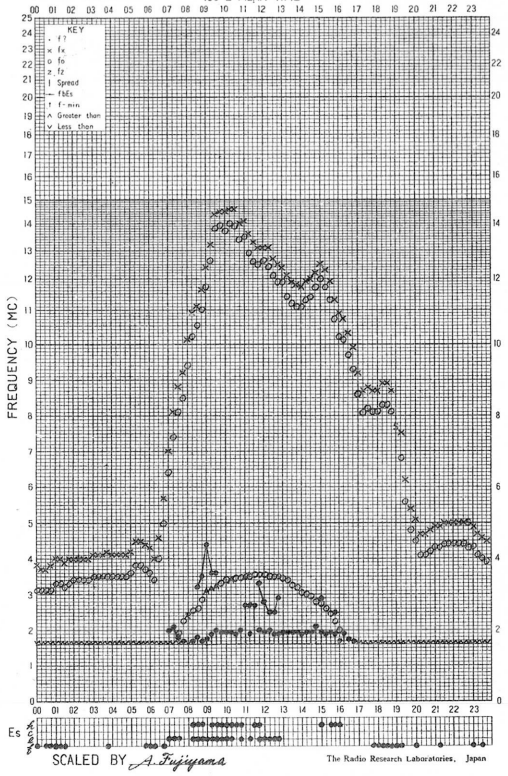

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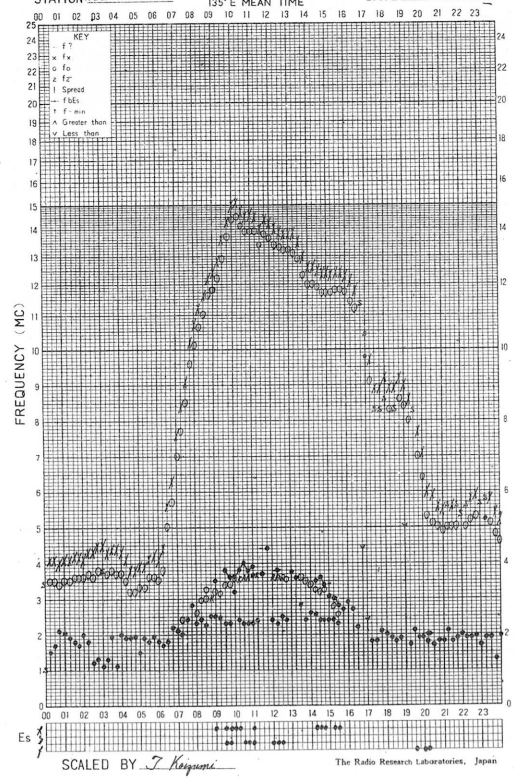

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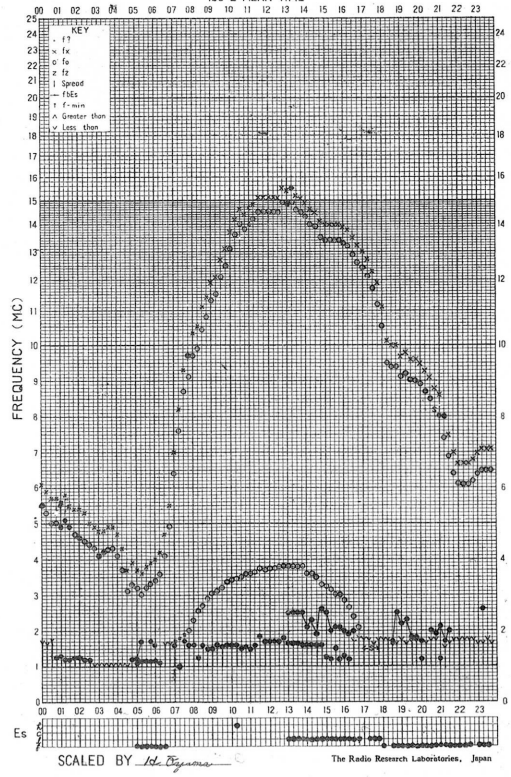

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The Radio Research Laboratories, Japan

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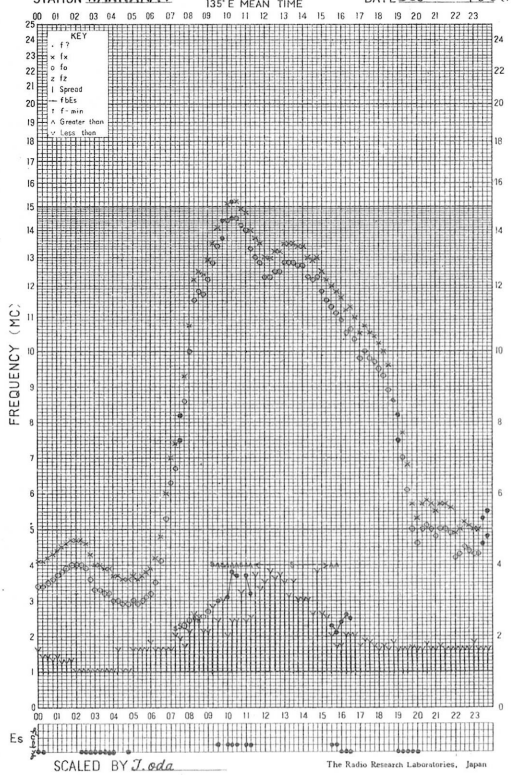

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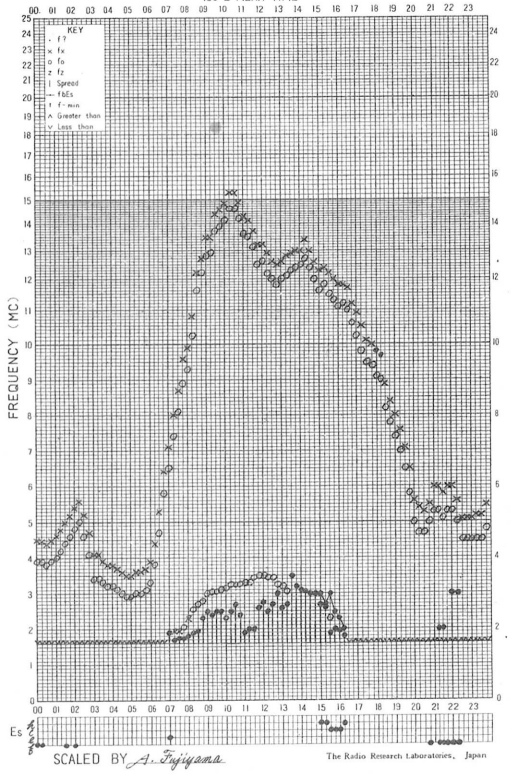

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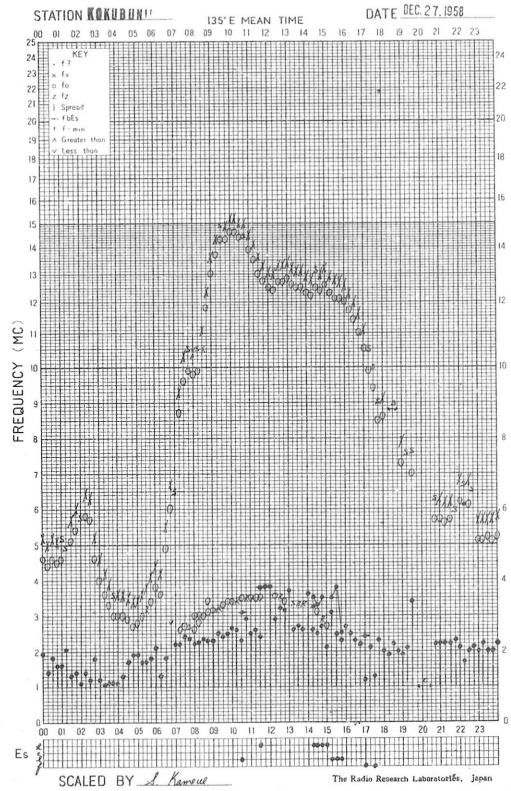
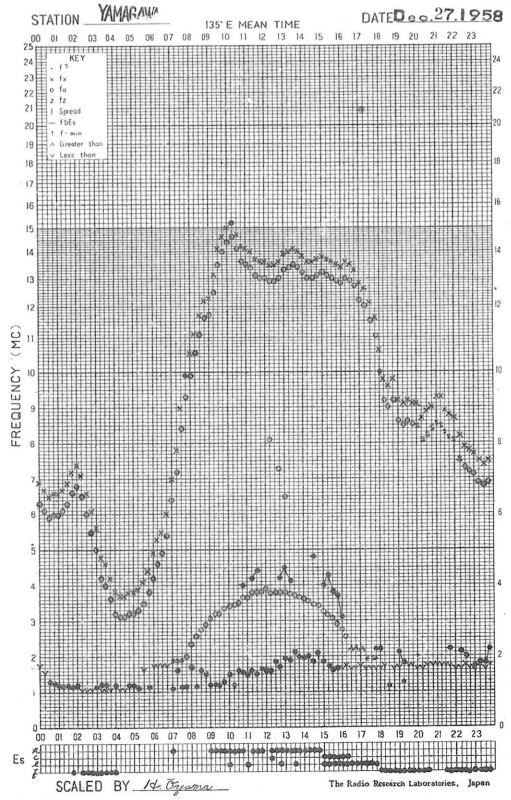


SCALED BY I. Kawai The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

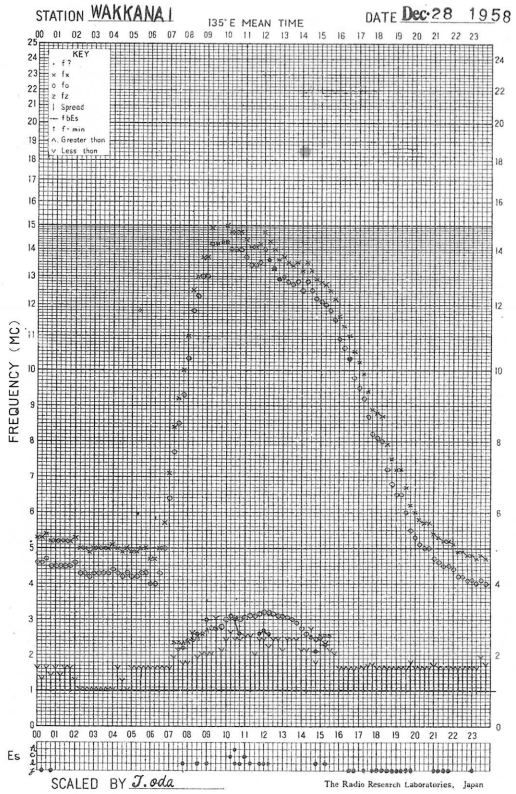
STATION YAMAGAWA 135° E MEAN TIME DATE Dec. 27. 1958



SCALED BY K. Egawa The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE Dec 28 1958

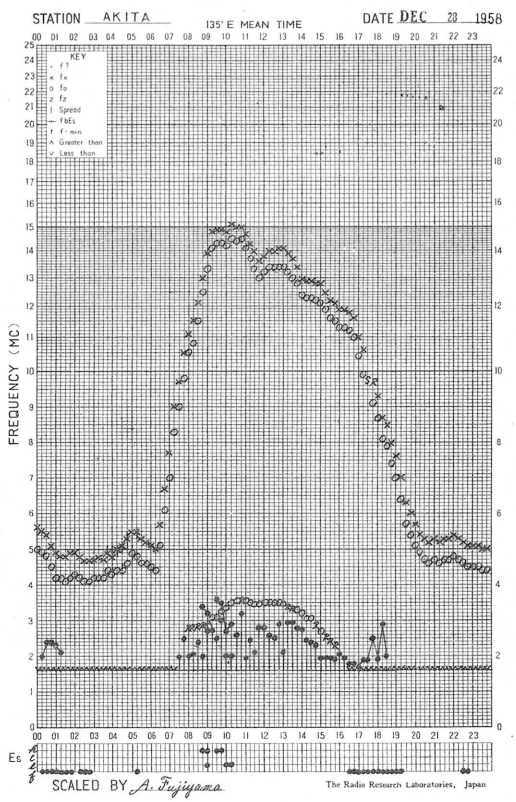


SCALED BY I. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE DEC 28 1958

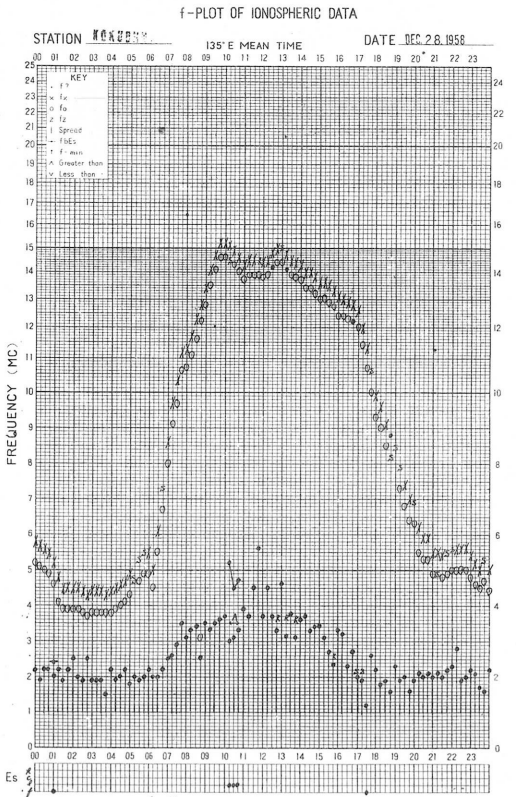


SCALED BY A. Fujiyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE DEC 28 1958

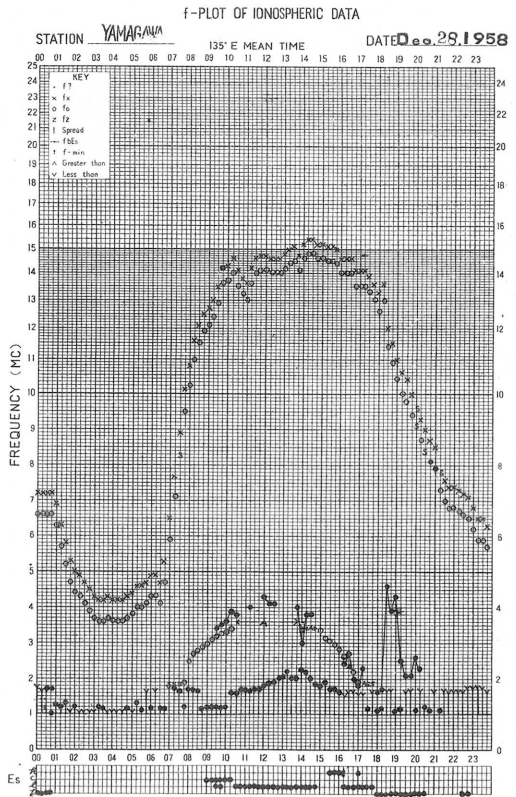


SCALED BY S. Kuroiwa

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE Dec. 28 1958

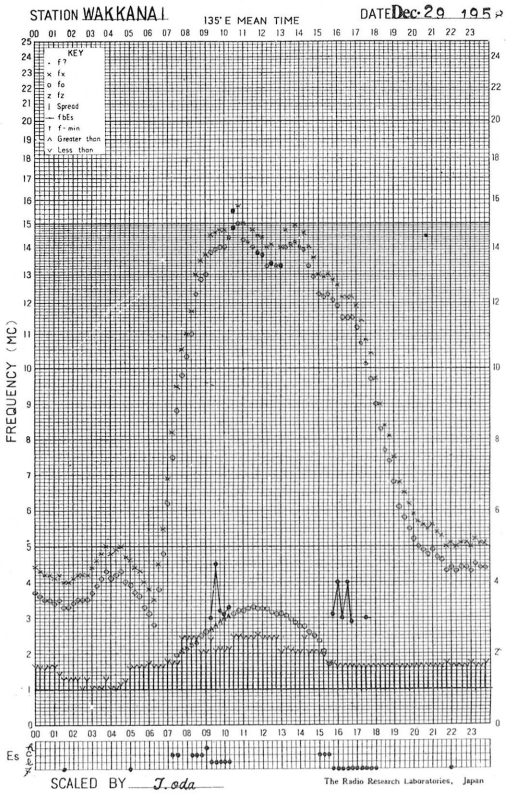


SCALED BY H. Ogawa

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE Dec. 29 1958

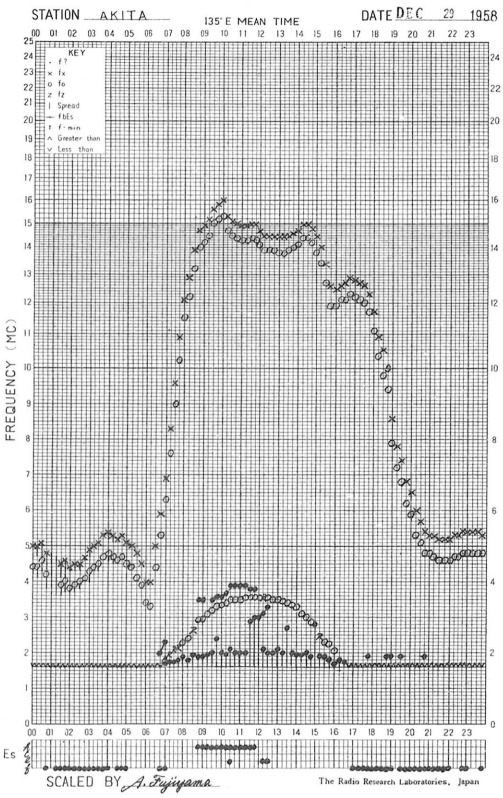


SCALED BY T. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE DEC 29 1958

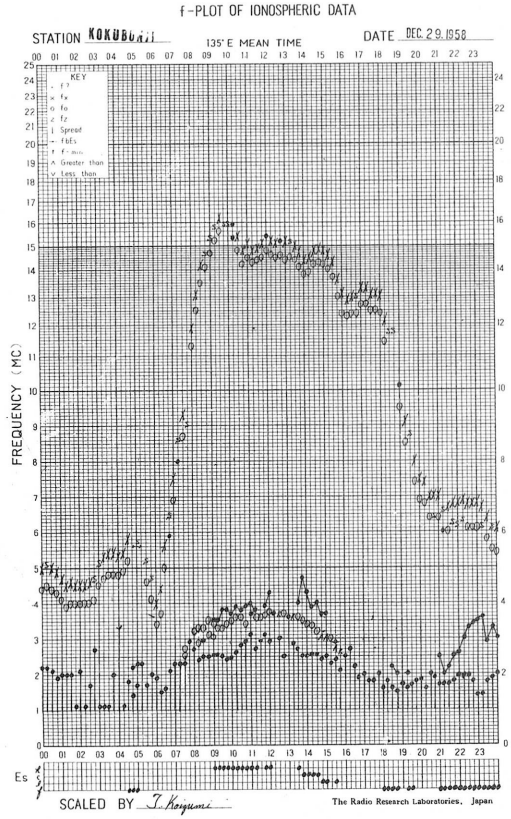


SCALED BY A. Fujiyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE DEC 29 1958

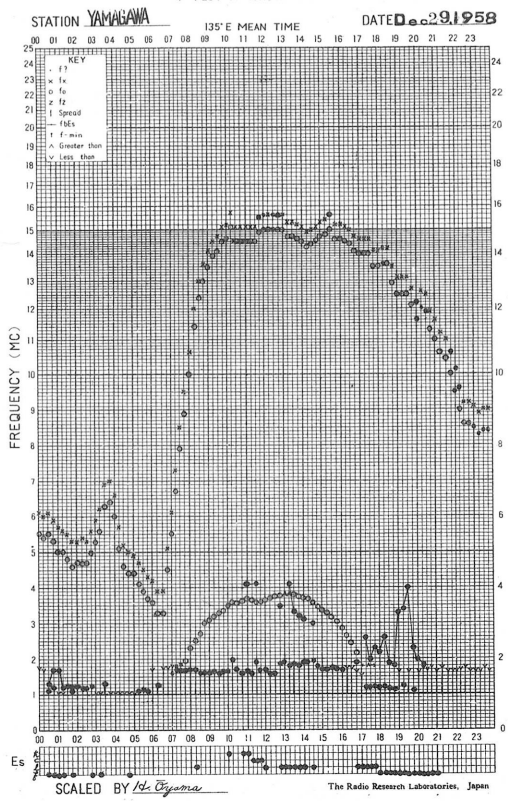


SCALED BY T. Koyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE Dec 29 1958

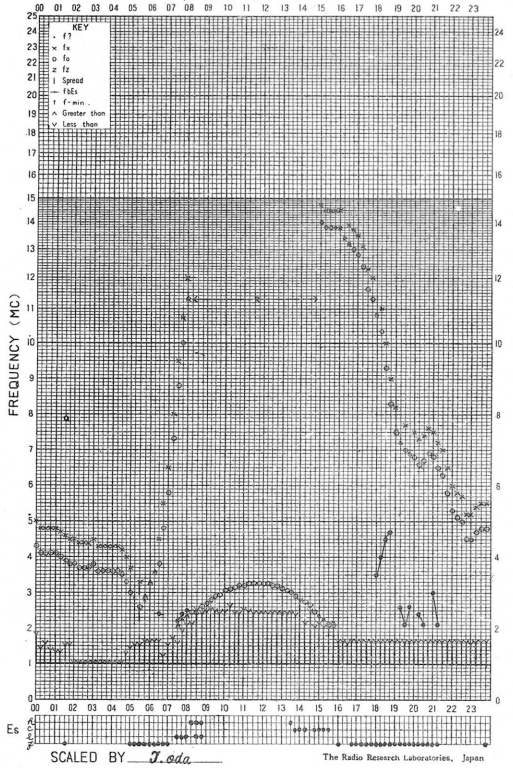


SCALED BY H. Fujiyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE Dec. 30 1958



SCALED BY T. Oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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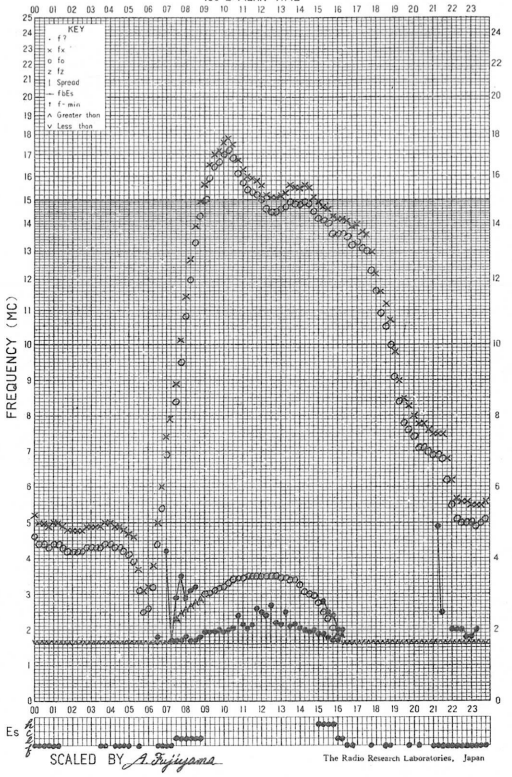
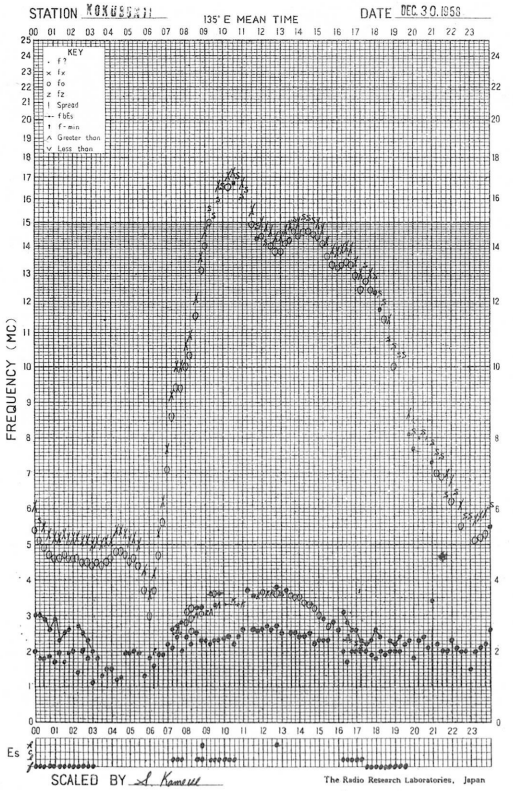


SCALED BY A. Fujiyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE DEC 30 1958

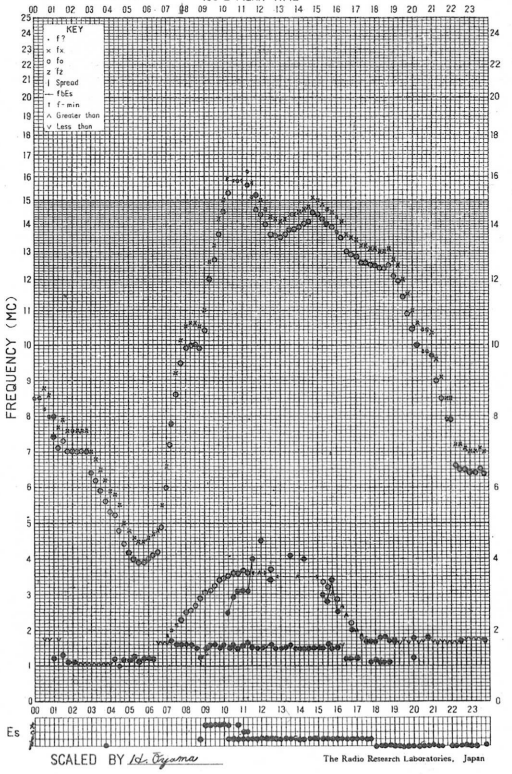


SCALED BY S. Konishi

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE Dec. 30 1958

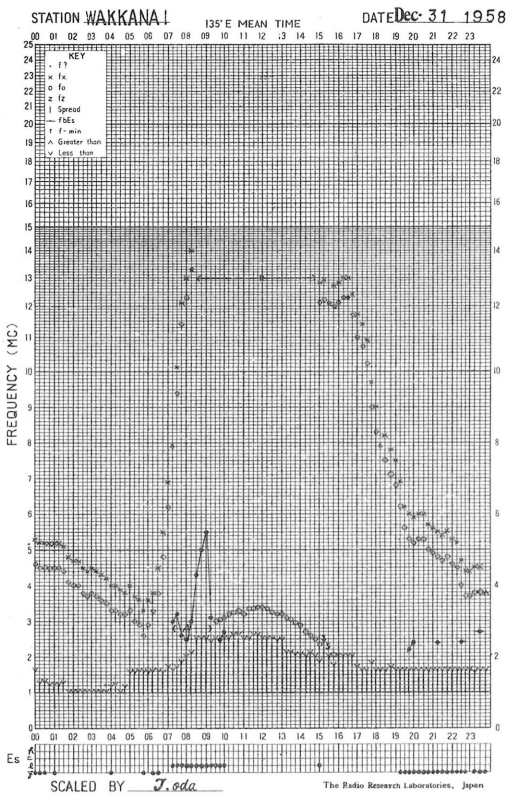


SCALED BY M. Oyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE Dec. 31 1958



SCALED BY T. Oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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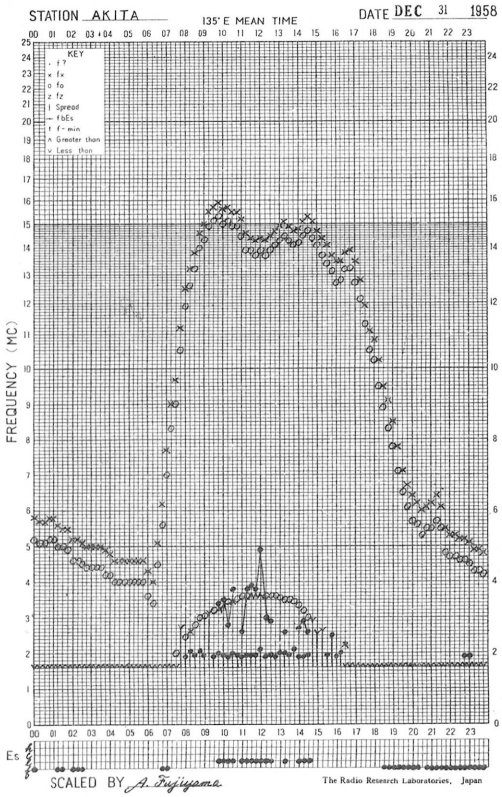
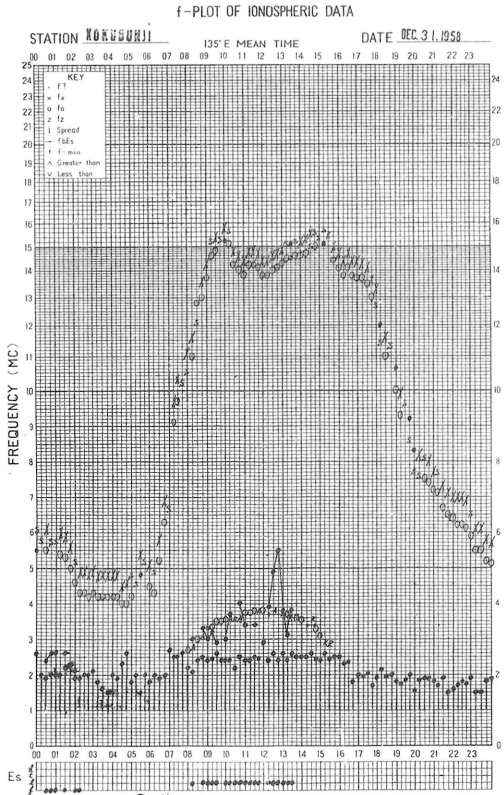


SCALED BY A. Fujiyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE DEC. 31, 1958

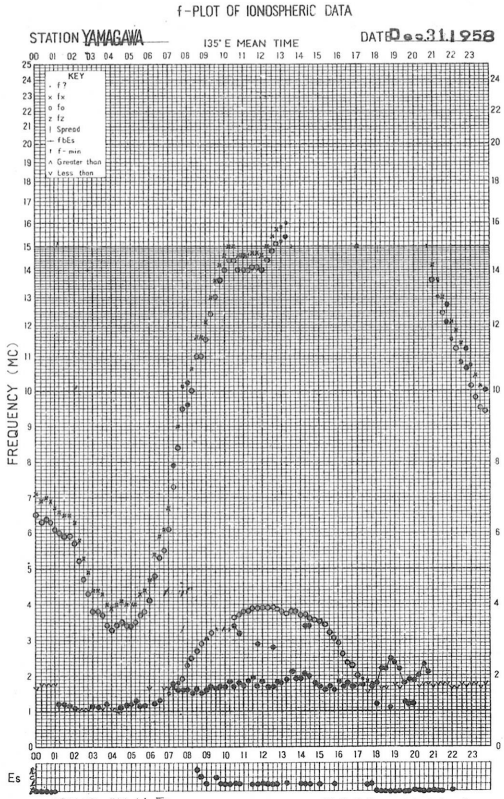


SCALED BY T. Kenjumi

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE Dec. 31 1958



SCALED BY H. Ozawa

The Radio Research Laboratories, Japan

SOLAR RADIO EMISSION 200 Mc/s

Flux in 10^{-22} w.m.$^{-2}$ (c/s)$^{-1}$, 2 polarizations

HIRAISO Time in U.T.

Dec. 1958	Steady Flux					Variability				
	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
1	67	46	(100)	-	71	1	2	2	-	2
2	58	54	(44)	-	52	(2)	2	1	-	2
3	64	69	(60)	-	64	2	2	2	-	2
4	52	57	(60)	-	56	2	2	1	-	2
5	91	129	(142)	-	121	2	2	2	-	2
6	106	95	(124)	-	108	2	2	2	-	2
7	(56)	62	(58)	-	59	2	2	2	-	2
8	45	40	(22)	-	36	2	2	1	-	2
9	121	102	(101)	(45)	108	2	2	2	-	2
10	33	34	(31)	-	36	2	1	1	-	1
11	44	43	(36)	-	41	1	2	2	1	2
12	53	45	(44)	-	47	2	2	2	1	2
13	43	33	(34)	-	37	1	1	1	1	1
14	42	42	(41)	-	42	2	2	2	-	2
15	42	50	(42)	-	45	1	1	1	-	1
16	33	30	(28)	-	30	1	1	1	-	1
17	32	28	(22)	-	27	1	1	1	-	1
18	25	28	(28)	-	27	1	1	1	-	1
19	35	30	(26)	24	30	1	1	1	1	1
20	32	31	(25)	-	28	1	1	1	1	1
21	28	28	(32)	-	29	1	1	1	1	1
22	32	31	(36)	-	33	1	1	1	1	1
23	29	-	-	-	29	1	⁎	1	-	(1)
24	25	(33)	(25)	-	28	1	1	1	1	1
25	26	23	(28)	-	26	1	1	1	(1)	1
26	18	16	(20)	-	18	1	1	1	0	1
27	21	23	(28)	-	24	1	1	2	-	1
28	(29)	24	-	-	25	(1)	(1)	(1)	1	(1)
29	35	28	(24)	-	29	2	1	1	-	1
30	18	(20)	(20)	10	19	1	1	1	1	1
31	19	16	(19)	13	16	1	1	1	1	1

⁎ : Strong signal masked a large outburst

Outstanding Occurrences

Dec. 1958	Start-time	Dura-tion	Type	Max. Inst.	Int. Smd.	Max. Time	Remarks
1	0626.8	0.3	CD/4	720	460	-	
	0636.6	0.9	F/3	1280	280	0637.1	
5	0016.8	0.4	CD/4	950	520	-	
	0439.9	1.8	ECD/8	1400	640	0440.3	
8	0226.6	0.2	ECD/4	740	360	-	
10	0035.7	2.3	CD/8	1600	560	0035.9	
	0219.8	5.4	CD/8	3200	940	0220.5	
11	0053.6	6.5	CD/8	3400	820	0055.7	
	0322.3	0.3	CD/4	1760	1010	-	
	0407.0	0.5	ECD/4	960	320	-	
	0419.8	1.5	ECD/4	710	250	0419.8	
12	0107.2	6.4	CD/8	2880	320	0108.6	
	0144.1	1.0	ECD/4	1640	540	-	
	0154.5	0.3	CD/4	870	170	-	
	0209.0	12	F/3	1950	800	0210.9	
	0225.0	4	CD/8	2500	1450	0226.3	
	0255.5	0.5	CD/4	990	100	-	
	0305.4	0.2	ECD/4	1340	630	-	
	0328.6	3.8	F/3	3500	1200	0331.5	
	0457.8	0.3	CD/4	1860	920	-	
	0518.5	1.0	F/3	1710	530	0518.6	
	0536.6	7.3	F/3	2210	720	0543.7	
	0643.0	1	CD/4	940	140	-	
	0653.1	0.4	ECD/4	1200	230	-	
	2157.0	1.0	CD/8	3100	1600	-	
	2216.5	0.4	ECD/4	900	530	-	
13	0005.5	2.5	F/3	770	110	0007.0	
	0048.5	0.4	CD/4	610	180	-	
	0212.7	0.2	ECD/4	720	230	-	
	0626.3	0.5	ECD/4	650	100	-	
	0656.4	3.5	F/3	1560	410	0656.6	
	2214.7	0.5	CD/4	1820	570	-	
14	0158.9	0.2	ESD/4	2100	1150	-	
	0310.5	1.0	CD/4	2540	260	0311.0	
	0523.7	1.7	F/3	650	350	0524.8	
16	0228.8	0.3	CD/4	620	430	-	
18	0136.7	0.9	CD/4	370	170	-	
19	2319.0	7	CD/8	1080	300	2320.0	
22	0232.8	0.5	CD/4	610	180	-	
	0618.1	0.7	CD/4	580	490	-	
28	2343.2	0.5	CD/4	790	180	-	
29	0111.3	0.8	CD/4	630	120	-	
	0143.8	0.7	CD/4	1000	680	-	

The phenomena observed in the period, December 12, 0100 ~ 0700, are likely to belong to the same family.

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Dec. 1958	Whole Day Index	W W V 00 06 12 18 06 12 18 24	S. F. 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	2+	2 2 (2) 2	2 3 (3) 2	(2) 2 (2 2)	N N N N			
2	2-	2 2 (3) 2	1 1 (2) 1	(2) 2 1 (1)	N N N N	0400	---	110 γ
3	2-	4 2 (1) 2	1 2 (1) 2	1 2 (2 2)	N N N N	---	0600	
4	3-	3 2 (1 4)	1 3 3 3	(2) 2 1 (2)	N U U U	0034	---	180 γ
5	2o	(5) 4 (1) 1	3 1 1 (1)	1 (3 2 2)	U U U U	---	2400	
6	2o	2 2 (2) 2	2 2 2 2	(1) 2 1 (3)	N N N N			
7	2o	2 2 (3) 2	2 - 1 2	(3) 3 (3 2)	N N N N			
8	3-	3 3 (3 3)	1 (3 3) 1	(2 3 2 2)	N N N N			
9	2-	(2) 1 1 2	1 3 1 2	(2) 2 (3 3)	N N N N			
[10]	2o	2 2 (3) 2	2 (2 2) 1	1 2 2 (2)	N N N N			
[11]	1o	1 1 (2) 1	2 1 1 (1)	1 2 (2 2)	N N N N			
12	2+	1 2 (2) 2	3 (2 3) 2	(2) 2 (2 2)	N N N N			
[13]*	2+	3 1 (2) 2	(3) 2 3 2	2 2 (2 2)	N N N N	0002	---	120 γ
14*	3-	4 3 (2 3)	1 (2 3) 3	(2 3 2 3)	N N N N	---	---	
15	2-	2 3 (1 3)	1 (1) 1 1	(3) 2 1 (2)	N N N N	---	0100	
16	3o	4 2 (2 3)	3 (3 3) C	(2) 3 1 (2)	N N N N			
[17]	2-	1 1 (2 2)	2 - (3) 2	2 1 (2 3)	N N N N	1817	---	160 γ
18	1+	3 2 1 (1)	1 1 1 2	(2 2 2 1)	N N N N	---	1600	
19	1+	2 1 (2 2)	1 1 1 1	1 1 (2 2)	N N N N			
20	2-	3 2 (2 2)	1 1 1 1	2 2 (2 2)	N N N N			
21	2+	2 2 (2 2)	1 3 3 2	(2) 2 2 (2)	N N N N			
22	2o	2 3 (2 2)	2 1 2 2	(2) 3 3 (2)	N N N N			
23	3-	3 2 (2) C	2 3 (3) C	(2) 2 (2) C	N N N N			
24	2+	(2) 2 (2 2)	(2) 3 3 -	2 2 2 (2)	N N N N			
25	3-	3 2 (2 2)	3 (4 3 2)	1 2 3 (2)	N N N N	2329	---	40 γ
26	2+	2 2 (2 2)	2 (3) - 2	(1) 2 1 (2)	N N N N	---	0400	
27	2o	2 2 (2 2)	2 (2) - 2	(1) 2 (2 2)	N N N N			
28	2-	(2) 2 (2 2)	1 (2) - -	(3) 2 3 (2)	N N N N			
29	2-	1 1 (2) 2	3 2 - 2	(2) 2 (2 2)	N N N N			
30	2-	(2 2 1 2)	(1) 3 2 2	(2) 2 2 (2)	N N N N			
31	1+	(2) 1 (1) 2	1 - - 2	(3) 2 (3 2)	N N N N			

* = day of Special World Interval [ ] = Regular World Day

( ) = inaccurate --- = continuing magnetic storm

SUDDEN IONOSPHERIC DISTURBANCES

(S.I.D.)

HIRAISO

Time in U.T.

Dec. 1958	SWF										SEA			Correspondence		
	Drop-out Intensities (db)						Start-time	Dura-tion	Type	Imp.	Start-time	Dura-tion	Imp.	Flare	Solar noise	Mag.
	WS	SF	HA	TO	MN	LN										
1											23.28	45	1	x		
12	15" 30	39		25'	-	-	01.06	17	S	3-	01.06	31	1		x	
	9" 17	21		14'	-	-	02.13	30	G	2-	02.13	37	2	x	x	
13	9" 12	20		-	20		00.21	20	S	2+	00.22	32	1	x		x
15											06.27	38	1	x		
16											04.02	68	2			
18											04.35	33	1			

NOTE (1) Suffixes of Drop-out Intensities for WS, HA and TO

' : 10 Mc, no suffix : 15 Mc, " : 20 Mc.

(2) - : unreadable, ( ) : uncertain

IONOSPHERIC DATA IN JAPAN FOR DECEMBER 1958
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