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IONOSPHERIC DATA IN JAPAN

FOR DECEMBER 1959

Vol. 11 No. 12

(Including Provisional Data at Showa Base)

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Prepared by

THE RADIO RESEARCH LABORATORIES

MINISTRY OF POSTS AND TELECOMMUNICATIONS

KOKUBUNJI, TOKYO, JAPAN

F－132

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THE RADIO RESEARCH LABORATORIES

KOKUBUNJI, TOKYO, JAPAN

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 At 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 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.

Varialility 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. 0234x)

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

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

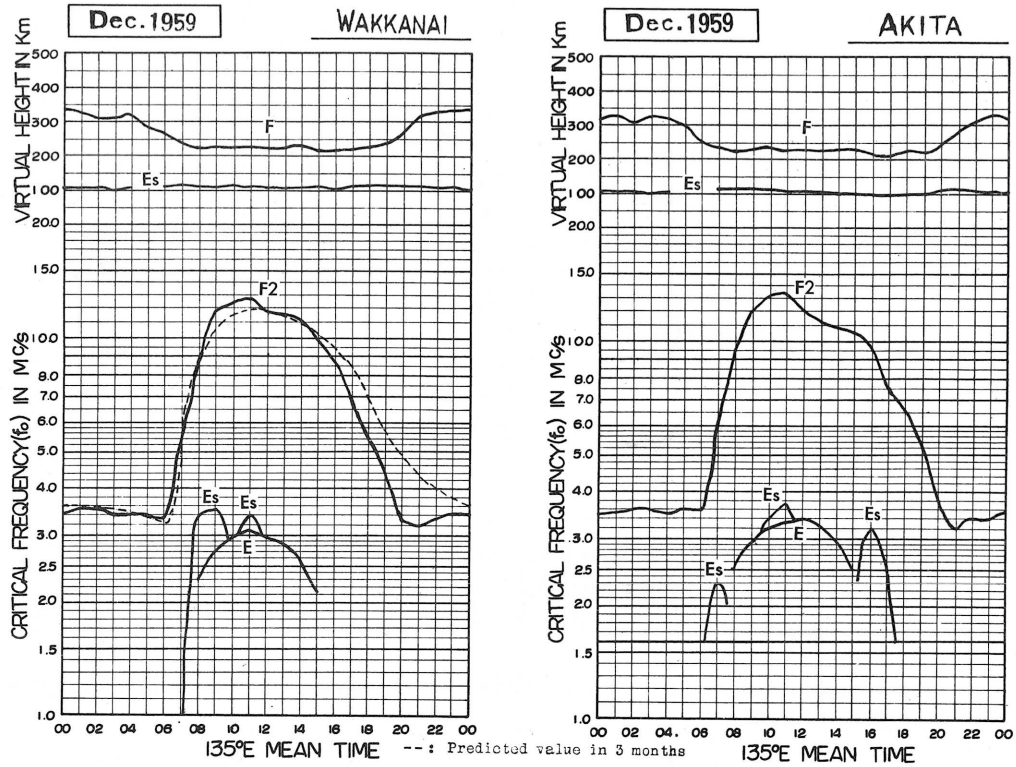
Degrees of SWF are classified into 9 grades according to the amplitude of fade-out;

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.*

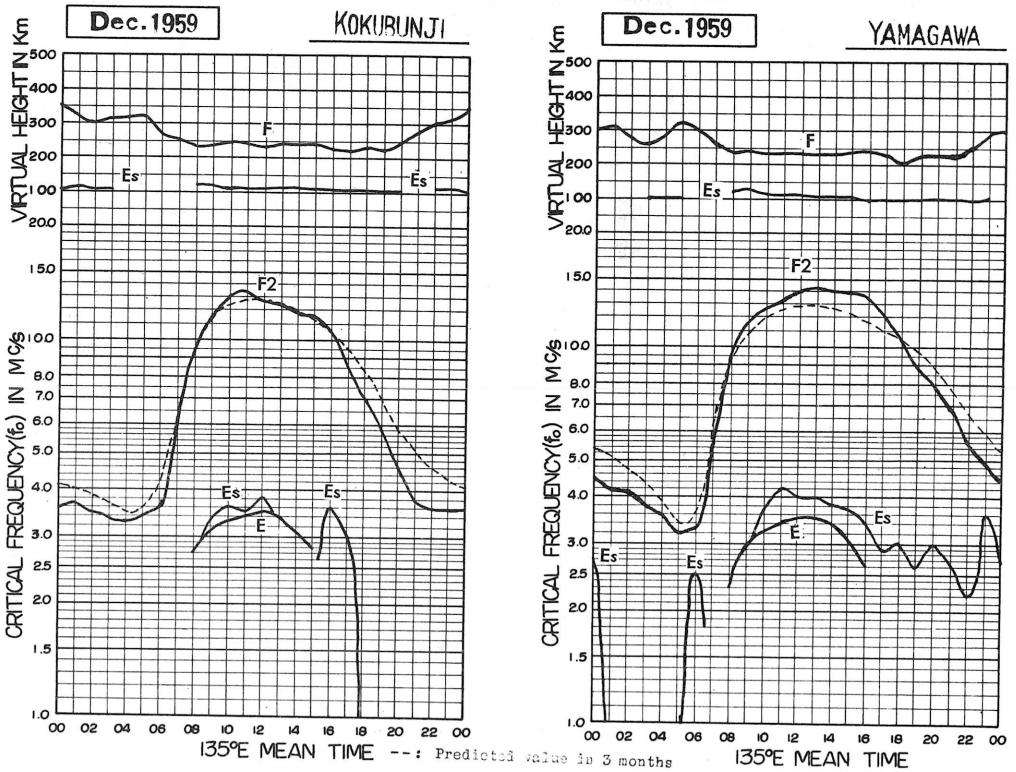
Besides, the time associated phenomena of SID's, that is, solar flare, solar radio noise outburst and crochet (solar flare effect in magnetic record) are given in this table from interchange messages or measurements at Hiraiso.

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

Dec. 1959 | foF2 | 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	4.2	4.3	3.8	3.6	3.6	3.5	3.5	6.7	8.9	12.0	14.6	14.8	14.0	11.5	11.0	11.7	9.8	8.3	5.8	I 4.8 A	3.8	3.0	3.1	3.1
2	3.3	3.2	3.3	3.0	3.0	2.9	3.5	7.3	11.8	13.6	U 14.3 R	14.0	13.5	12.8	11.6	10.8	9.8	8.3	6.8	4.8	I 3.8 A	3.6	3.5	3.7
3	3.8	3.6	3.6	3.4	3.5	3.3	3.3	6.2	10.8	13.5	14.5	14.1	14.0	13.3	12.1	12.2	10.8	9.1	7.3	5.3	4.9	5.2	5.3	4.8
4	4.7	4.6	4.6	4.3	4.5	I 4.8 AS	I 5.2 A	7.6	11.1	R	R	R	13.8	12.8	12.3	12.5	11.4	7.9	5.1	4.3	4.1	3.9	4.0	3.5
5	3.6	3.6	3.5	3.4	3.5	3.8	3.3	6.5	9.5	13.0	13.3	13.0	C	C	C	10.8	9.8	7.7	4.9	I 4.2 C	4.2	3.4	3.4	3.3
6	3.2	2.8	2.6	2.6	3.0 F	2.7 F	2.6	5.3	I 8.6 R	11.5	13.6	U 13.7 R	12.3	12.6	12.0	11.4	10.6	7.9	5.8	4.8	4.1	3.8	4.0	4.0
7	3.9	4.0	3.9	3.7	3.5	3.5	3.3	6.7	9.3	11.8	13.3	13.5	I 13.4 R	12.3	12.3	11.1	8.8	6.8	4.5	4.3	4.3	3.5	3.3	3.2
8	3.2	3.2	3.2	3.3	3.2	3.0	2.7	6.1	8.8	11.8	12.7	12.0	11.1	11.9	10.4	11.4	10.0	6.0	5.8	4.7	3.8	3.4	3.6	3.6
9	3.6	3.5	3.6	3.5	3.5	3.8	4.1	5.8	8.9	10.6	12.0	12.3	12.6	11.3	11.3	10.3	8.5	6.6	5.6	5.8	4.3	3.0	3.5	3.6
10	3.5	3.8	3.8	3.7	3.6	4.0	3.1	5.8	8.5	10.9	13.3	12.8	11.5	9.6	U 11.2 R	U 9.5 S	9.0	7.8	5.3	3.4	3.2	3.4	3.8	3.7
11	3.8	3.8	3.9	3.8	3.8	4.0	3.4	5.8	7.8	11.7	12.3	11.1	10.8	10.3	10.8	9.0	7.5	6.1	6.2	4.9	2.6	J 2.8 A	3.1	3.3
12	3.3	3.5	3.5	3.5	3.8	3.4	2.8	5.6	7.8	10.5	11.2	11.5	12.0	10.3	11.3	9.5	8.8	6.8	4.9	4.4	2.7	2.9	3.2	3.2
13	3.4	3.5	3.8	3.8	3.6	3.0	2.1	C	C	C	C	C	10.3	C	C	C	9.0	7.3	6.0	5.3	3.5	3.8	4.1	4.3
14	4.4	4.5	4.3	4.3	4.3	4.8	3.7	5.5	U 8.8 R	11.5	12.5	13.0	12.4	12.5	11.8	11.8	10.5	8.5	7.0	5.3	4.9	5.0 F	5.3	4.3
15	3.9	3.9	4.0	4.3	4.0	3.3	3.5	7.4	11.3	R	R	R	12.2	12.6	12.1	11.1	8.3	7.5	5.3	4.4	3.0	3.0	3.0	3.3
16	3.3	3.5	3.5	3.3	3.3	3.4	3.2	5.5	9.3	12.3	R	R	R	12.0	12.3	10.8	8.2	6.1	4.5	4.3	4.3	2.9	3.1	3.2
17	3.3	3.3	3.2	3.0	3.2	3.1	3.3	5.1	8.6	10.3	13.5	I 14.0 R	11.6	10.3	11.4	10.3	8.3	6.2	4.1	4.3	3.8	3.2	3.2	3.0
18	3.3 F	3.6 F	3.3	3.3	3.3	3.2	2.9	5.0	9.3	10.2	11.1	12.3	11.1	9.6	10.9	9.3	7.3	6.5	5.2	3.7	3.0	2.9	3.1	3.0
19	3.0	3.1	3.2	3.2	3.2	3.1	3.0	5.3	9.5	11.5	10.8	10.6	9.8	10.1	10.8	10.9	8.0	6.0	5.9	3.6	3.0	3.1	3.3	3.4
20	3.4	3.5	3.6	3.8	3.4	3.4	3.8	7.2	12.3	11.8	13.0	12.8	11.5	11.7	10.8	9.3	7.6	6.4	5.8	4.3	2.8	2.6	2.8	I 2.8 A
21	3.0	I 3.0 A	2.8	2.8	3.0	3.1	3.1	5.3	I 8.7 R	12.3	11.0	11.7	11.1	10.5	10.0	9.5	U 8.0 S	5.6	5.3	3.8	3.0	2.8	3.0	3.2
22	3.2	3.2	3.4	3.3	3.0	3.0	3.2	5.0	7.8	10.0	11.8	I 9.8 R	9.3	9.2	9.3	8.3	6.7	5.8	5.3	3.1	2.8	2.7	2.9	3.0
23	3.0	3.0	3.2	3.3	3.4	3.4	3.7	5.3	7.8	8.8	11.7	10.8	10.6	9.5	8.8	8.2	7.7	7.3	8.3	4.7	2.8	2.8	3.0	3.0
24	3.2	3.4	3.5	I 3.4 S	3.7	3.5	C	C	C	C	C	14.5 H	12.8	10.5	9.4	9.3	8.3	7.3	6.7	5.1	4.6	4.6	3.9	4.0
25	3.8	3.7	3.5	3.8	4.0	3.7	3.1	5.7	9.2	12.8	11.8	12.6	10.3	9.8	9.5	8.2	7.8	6.3	5.0	3.8	3.1	3.2	3.5	3.5
26	3.5	3.4	3.4	3.3	3.4	3.9	3.8	4.9	U 7.8 S	11.9	10.8	10.8	11.0	11.3	9.3	8.8	7.5	6.7	5.4	3.8	2.8	2.9	3.2	3.4
27	3.4	3.5	3.4	3.6	3.4	3.5	4.2	4.7	9.0	12.3	13.3	12.8	13.0	12.3	11.1	9.4	8.7	7.8	6.0	4.5	3.0	3.3	3.3	3.4
28	3.5	3.2 H	3.2	3.8 F	F	F	S	6.0	10.3	12.8	13.0	13.4	13.7	13.0	9.7	9.8	8.8	7.5	6.8	4.5	3.5	3.3	3.2	3.3
29	3.4	3.0	3.3	3.3	3.3	3.3	3.1	5.6	9.3	R	RH	RH	12.6	12.5	11.3	10.2	8.8	6.6	5.1	3.2	3.2	3.5	3.4	3.4
30	3.5	3.3	3.0	3.0	3.0	3.1	2.7	5.3	9.3	12.0	12.5	12.8	11.5	11.5	11.3	9.8	9.3	6.7	5.3	4.1	2.3	2.4	2.5	2.7
31	2.8	2.9	2.8	2.8	3.0	3.0	3.0	5.1	8.5	10.8	11.5	10.8	10.4	11.0	10.2	8.5	8.2	6.1	5.2	4.4	3.3	3.3	3.4	3.5
No.	31	31	31	31	30	30	29	29	29	26	25	26	29	29	29	30	31	31	31	31	31	31	31	31
Median	3.4	3.5	3.5	3.4	3.4	3.4	3.3	5.6	9.0	11.8	12.5	12.8	11.6	11.5	11.1	10.0	8.7	6.8	5.4	4.4	3.3	3.2	3.3	3.4
U.Q	3.8	3.7	3.8	3.8	3.6	3.7	3.6	6.4	9.5	12.3	13.3	13.5	12.9	12.5	11.7	11.1	9.8	7.8	6.0	4.8	4.1	3.5	3.6	3.6
L.Q	3.2	3.2	3.2	3.3	3.2	3.1	3.0	5.3	8.6	10.8	11.6	11.5	10.9	10.3	10.1	9.3	8.0	6.2	5.1	3.8	3.0	2.9	3.1	3.2
Q.R	0.6	0.5	0.6	0.5	0.4	0.6	0.6	1.1	0.9	1.5	1.7	2.0	2.0	2.2	1.6	1.8	1.8	1.6	0.9	1.0	1.1	0.6	0.5	0.4

foF2

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

The Radio Research Laboratories, Japan.

W

IONOSPHERIC DATA

Dec. 1959 | 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																								
5													C	C	C									
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13								C	C	C	C	C		C	C	C								
14																								
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																								
24							C	C	C	C	C													
25																								
26																								
27																								
28																								
29																								
30																								
31													L											
No.																								
Median																								

foF1

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

The Radio Research Laboratories, Japan.

W 2

IONOSPHERIC DATA

Dec. 1959 | 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	A	A	3.25	$I_{3.20}^{A}$	3.15	3.00	2.75	A								
2								A	A	A	3.10	$I_{3.15}^{A}$	3.25	3.05	2.75	2.35								
3								S	S	$I_{2.75}^{A}$	3.05	3.15	3.20	$I_{3.00}^{A}$	2.80	S								
4									A	A	3.10	3.15	3.15	3.00	2.60	2.15								
5								S	2.35	2.85	3.10	3.10	C	C	C	S								
6									A	A	A	A	3.00	$I_{2.80}^{A}$	2.65	2.20								
7									2.35	$I_{2.70}^{A}$	$I_{3.00}^{A}$	$I_{3.15}^{S}$	$I_{3.00}^{A}$	$I_{2.80}^{A}$	2.65	2.15								
8									$I_{2.30}^{A}$	$I_{2.70}^{A}$	3.05	3.15	3.20	3.00	2.60	S								
9									S	$I_{2.75}^{A}$	2.75	3.10	3.00	$I_{2.65}^{A}$	2.10	A								
10									S	S	S	S	S	S	S	S								
11									S	S	S	S	S	S	S	S								
12									$I_{2.35}^{A}$	2.75	2.80	3.10	A	A	A	S								
13								C	C	C	C	C	2.90	C	C	C								
14									A	A	A	3.00	3.00	2.85	A	S								
15									A	2.70	2.90	3.05	3.00	2.90	2.60	2.00								
16									A	A	2.90	2.90	2.90	2.90	2.60	S								
17									2.20	$I_{2.60}^{A}$	2.90	$I_{2.95}^{A}$	3.00	$I_{2.75}^{A}$	A	A								
18									A	A	$I_{2.80}^{A}$	2.95	A	S	S	S								
19									A	S	S	S	S	S	S	S								
20									A	A	A	A	3.05	A	A	A								
21									A	A	3.10	3.30	3.20	3.00	2.70	2.10								
22									2.20	2.70	3.00	3.10	3.10	3.00	2.70	2.10								
23									A	S	S	A	3.05	2.90	S	S								
24								C	C	C	C	A	A	S	S	S								
25									A	S	R	A	3.00	2.90	2.65	2.20								
26									2.25	$I_{2.65}^{A}$	3.00	$I_{3.10}^{A}$	$I_{3.15}^{A}$	3.00	2.60	2.05								
27									S	A	2.85	2.90	3.00	2.90	S	A								
28									2.20	2.60	2.90	3.00	3.00	2.90	2.60	2.30								
29								1.85	2.35	$I_{2.60}^{A}$	2.95	3.00	3.00	2.85	2.60	S								
30									S	$I_{2.65}^{S}$	2.90	3.05	3.05	2.90	2.60	S								
31								A	A	2.65	2.95	3.05	3.00	2.75	S	S	S							
No.								1	9	14	21	22	24	22	17	10								
Median								1.85	2.30	U 2.70	2.95	3.10	3.00	2.90	2.60	2.15								

foE

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

The Radio Research Laboratories, Japan.

W 3

11

IONOSPHERIC DATA

Dec. 1959 | 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	E	E	3.2M	E	E	3.0M	3.2M	3.8M	4.0	6.0M	G	6.5M	3.5M	G	4.4	4.5M	6.0M	6.0M	5.8M	6.0M	6.0M	3.1M	4.5M	E
2	E	E	E	E	2.4	E	E	4.9M	6.0M	8.0M	G	4.0	3.5	G	G	G	3.5M	3.5M	5.8M	4.5M	5.6M	3.5M	E	E
3	E	E	E	2.3M	2.5M	3.5M	E	S	S	3.5M	G	2.5G	G	5.0M	G	S	E	E	3.5M	E	E	E	3.5M	3.5M
4	E	E	E	E	4.2M	5.3M	9.5M	3.1M	4.2M	4.2M	G	3.5	G	G	G	G	E	E	E	E	E	E	E	E
5	E	3.1M	3.5M	3.1M	3.4M	E	E	S	G	3.8	4.2	3.5	C	C	C	S	E	E	E	C	E	E	E	E
6	E	E	E	E	E	E	3.1M	3.5M	3.5	5.8M	5.8M	4.5M	G	3.5M	G	G	E	4.9M	6.0M	3.5M	3.4M	3.5M	3.4M	E
7	3.5M	3.0M	3.4M	E	E	E	E	E	2.9	4.0M	4.4M	S	5.0M	4.0M	G	G	E	E	E	E	E	E	2.6M	E
8	E	2.6M	E	E	E	E	E	E	2.6M	3.5M	G	G	3.0G	3.5	3.5M	S	3.1M	E	E	E	E	E	E	E
9	E	E	E	E	E	E	E	E	S	3.2M	G	4.0	G	3.1M	2.7	4.0M	3.0M	E	E	E	3.5M	E	E	E
10	E	E	E	E	E	E	E	E	S	S	S	S	S	S	S	S	S	E	E	E	E	E	E	E
11	E	E	E	E	E	E	E	3.5M	S	S	S	S	S	S	S	S	S	E	E	E	E	3.5M	E	E
12	3.5M	2.7M	2.6M	2.5M	2.5M	E	E	E	2.6	G	G	4.0	5.6M	5.6M	3.5M	S	3.5M	E	E	E	3.5M	3.3M	3.0M	3.5M
13	3.5M	E	3.4M	3.0M	E	E	E	C	C	C	C	C	G	C	C	C	3.5M	E	3.5M	E	E	E	E	3.0M
14	4.5M	2.6M	3.5M	2.5M	E	E	3.3M	E	4.0M	5.3M	3.5M	G	G	G	5.0M	S	E	E	E	E	E	E	S	E
15	E	E	E	E	E	E	E	2.9M	2.9M	3.5	2.7G	3.5	G	G	G	2.3	3.5M	E	E	E	3.5M	5.7M	3.4M	E
16	E	E	3.2M	E	E	E	7.0M	3.5M	4.2M	2.8M	G	G	G	4.3M	G	S	E	3.4M	E	E	E	E	E	E
17	E	3.9M	4.2M	2.5M	2.4M	E	E	3.5M	G	3.2M	3.4	5.5M	2.6G	4.0M	3.2M	3.5M	3.5M	E	2.8M	E	E	E	E	E
18	E	3.5M	3.5M	2.5M	E	E	E	3.2M	3.4M	5.3M	5.0	G	5.2M	S	S	S	E	E	E	E	4.5M	3.4M	E	3.0M
19	3.4M	3.0M	3.5M	3.1M	3.2M	E	E	E	3.4M	S	S	S	S	S	S	S	E	E	E	E	E	E	5.0M	3.5M
20	3.5M	4.5M	5.0M	4.0M	2.5M	E	E	5.0M	4.8M	4.5M	3.5M	3.1	G	3.3M	4.1M	3.4M	3.5M	E	4.3M	4.3M	E	E	4.3M	5.0M
21	3.5M	4.2M	2.6M	E	E	E	3.5M	5.1M	5.8M	5.0M	G	G	G	G	G	G	E	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	E	E	E	E	E	E	E	3.2M
23	E	2.4M	3.5M	2.5M	2.4M	E	E	E	3.5M	S	S	3.8M	G	G	S	S	3.5M	3.5M	E	E	E	E	E	E
24	E	E	E	3.2M	E	E	C	C	C	C	C	3.3M	5.0M	S	S	S	E	E	E	E	E	5.0M	E	E
25	E	E	E	E	E	E	E	E	5.0M	S	G	7.3M	G	G	G	G	E	2.1M	E	E	E	3.1M	E	E
26	3.5M	3.5M	3.2M	2.5M	E	E	E	E	G	3.5M	5.0M	5.2M	5.5M	G	G	G	3.8M	3.4M	E	E	E	E	3.3M	E
27	E	3.5M	E	E	E	E	E	3.3M	4.1M	5.5M	3.5	G	G	G	S	3.5M	2.5M	E	E	E	E	E	E	E
28	E	E	E	2.4M	E	E	E	E	G	G	G	G	G	G	G	G	5.0M	3.2M	E	E	E	E	E	E
29	E	E	E	E	E	E	E	G	G	3.5M	G	3.5	G	G	G	S	S	E	E	3.0M	E	E	E	E
30	E	3.0M	2.4M	2.4M	3.2M	E	E	E	S	S	G	G	G	G	G	S	E	E	E	E	E	E	E	E
31	E	E	E	E	E	E	E	4.2M	3.5M	G	G	G	G	G	S	S	S	3.5M	E	3.2M	E	4.2M	6.0	E
No.	31	31	31	31	31	31	30	27	24	23	25	26	27	24	21	15	27	31	31	30	31	31	30	31
Median	E	E	E	E	E	E	E	E	3.4M	3.5M	G	3.4	G	G	G	G	E	E	E	E	E	E	E	E
UQ	3.4	3.0	3.4	2.5	2.4	E	E	3.5	4.2	5.3	3.5	4.0	3.5	3.5	3.4	3.5	3.5	3.2	E	E	E	3.3	3.3	E
LQ	E	E	E	E	E	E	E	E	G	3.2	G	G	G	G	G	G	E	E	E	E	E	E	E	E
QR										2.1														

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

Dec. 1959 | fbEs | 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			E			E	2.5	2.5	3.0	3.0		3.4	G		2.7	2.6	5.0	4.5	4.1	A	2.4	E	2.7	
2					E			2.9	3.0	4.0		3.2	2.4				E	E	2.6	E	A	E		
3				E	E	E		S	S	2.9		2.3		3.3		S			E				2.4	E
4					E	A	A	E	2.4	2.8		2.4												
5		E	E	E	E			S		2.2	2.6	2.2	C	C	C	S				C				
6							E	2.6	2.5	3.5	3.1	3.1		3.0				E	2.9	2.4	2.4	E	E	
7	E	E	E						G	2.8	3.1	S	3.1	3.1									E	
8		E							2.5	2.8			2.5	2.5	2.4	S	2.1							
9									S	2.8		2.4		2.9	G	2.4	E				E			
10									S	S	S	S	S	S	S	S	S							
11								E	S	S	S	S	S	S	S	S	S					3.0		
12	E	E	E	E	E				2.5			2.4	3.0	3.6	2.7	S	2.1				2.4	E	E	2.6
13	2.4		E	E				C	C	C	C	C		C	C	C	E		E					E
14	E	E	E	E			E		2.8	2.7	3.0				3.0	S							S	
15								E	2.4	2.4	2.6	2.4				G	E				E	E	E	
16			E				E	E	2.2	2.7				G		S		2.9						
17		E	E	E	E			E		2.6	2.4	3.5	2.5	2.7	2.6	2.6	E		E					
18		E	E	E				E	2.4	3.0	3.1		3.0	S	S	S					E	E		2.4
19	E	E	E	E	E				2.5	S	S	S	S	S	S	S							E	E
20	2.4	2.5	2.6	3.0	E			E	2.4	2.8	3.0	3.1		3.0	3.0	2.4	2.1		E	2.5			2.4	A
21	E	A	E				2.4	2.9	4.0	2.9														
22																								E
23		E	E	E	E				2.4	S	S	3.0			S	S	E	E						
24				E			C	C	C	C	C	3.0	3.3	S	S	S						2.8		
25									2.4	S		3.0						E				E		
26	E	E	E	E						2.7	G	3.2	3.2				E	2.5					E	
27		E						2.5	G	3.5	G				S	2.5	E							
28				E													E	E						
29										2.7		2.4				S	S			E				
30		E	E	E	E				S	S						S								
31								4.0	2.5						S	S	S	2.5		E		E	E	
No.	8	14	15	14	10	3	6	13	18	19	10	16	9	9	7	6	13	9	7	6	7	10	10	7
Median	E	E	E	E	E	E	E	E	2.4	2.8	2.8	3.0	3.0	3.0	2.7	2.4	E	E	E	E	2.4	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. 1959 | 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	E1.70S	E1.60S	E	E	E	E1.60S	E1.60S	1.60	1.70	1.70	2.00	2.00	1.80	1.70	1.70	1.75	E1.65S	E1.50S	E1.60S	E1.60S	E1.60S	E1.80S	E1.60S	E1.60S
2	E1.60S	E1.60S	E2.10S	E	E	E1.60S	E1.60S	1.60	1.70	1.70	1.80	1.75	1.70	1.90	E2.40S	1.70	E1.70S	E1.60S	E1.70S	E1.60S	E1.60S	E1.65S	E1.65S	E1.80S
3	E1.60S	E1.60S	E1.60S	E	E	E1.60S	E1.60S	E1.80S	E2.60S	1.80	1.85	1.70	1.90	1.80	2.00	E2.40S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
4	E1.60S	E1.60S	E1.60S	E1.60S	E	E1.60S	E1.60S	1.60	1.60	1.70	1.80	1.70	1.70	E2.40S	1.70	1.70	E1.60S	E1.60S	E1.60S	E1.65S	E1.60S	E1.60S	E1.60S	E1.60S
5	E1.60S	E	E	E	E	E1.60S	E1.60S	E1.80S	1.65	1.70	1.70	1.70	C	C	C	E2.20S	E1.60S	E1.60S	E1.60S	C	E1.60S	E1.60S	E1.60S	E1.60S
6	E1.70S	E1.35S	E	E	E	E1.60S	E1.60S	E1.60S	1.60	1.65	1.70	1.80	1.90	1.75	1.70	1.80	E1.80S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
7	E1.60S	E1.50S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	1.70	1.70	1.70	E3.30S	1.80	1.70	1.80	1.70	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.65S	E1.60S	E1.65S
8	E1.60S	E1.40S	E1.40S	E	E	E1.60S	E1.60S	E1.60S	1.70	1.75	1.60	1.80	1.60	1.70	1.70	E2.40S	E1.60S	E1.70S	E1.60S	E1.70S	E1.80S	E1.60S	E1.60S	E1.60S
9	E1.60S	E1.60S	E	E	E	E1.60S	E1.60S	E1.60S	E2.40S	2.00	E2.40S	1.85	E2.40S	E2.20S	E2.00S	1.70	E1.60S	E1.70S	E1.80S	E1.70S	E1.60S	E1.60S	E1.60S	E1.60S
10	E1.70S	E1.60S	E	E	E1.30S	E1.60S	E1.60S	E1.60S	E2.50S	E3.00S	E3.10S	E3.00S	E3.10S	E3.00S	E3.00S	E2.60S	E2.00S	E1.80S	E1.60S	E1.60S	E1.70S	E1.90S	E1.60S	E1.60S
11	E1.60S	E1.25S	E	E	E	E1.60S	E1.60S	E1.60S	E3.00S	E3.00S	E3.50S	E3.40S	E3.10S	E3.00S	E2.70S	E2.50S	E2.50S	E1.60S	E1.70S	E1.60S	E1.60S	E1.60S	E1.60S	E1.70S
12	E1.60S	E1.60S	E	E	E	E1.60S	E1.60S	E1.60S	1.60	1.80	2.00	1.90	1.70	1.80	1.85	E2.40S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
13	E1.60S	E1.60S	E	E	E	E1.60S	E1.60S	C	C	C	C	C	2.20	C	C	C	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
14	E1.60S	E	E	E	E	E1.60S	E1.60S	E1.70S	1.60	1.60	1.70	2.00	1.95	2.00	1.70	E2.30S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E2.40S	E1.60S
15	E1.60S	E1.30S	E	E	E	E1.50S	E1.60S	E1.60S	1.60	1.60	1.75	1.70	1.90	2.00	1.90	1.60	E1.60S	E1.60S	E1.60S	E1.70S	E1.60S	E1.60S	E1.60S	E1.60S
16	E1.60S	E1.20S	E	E	E	E1.60S	E1.60S	E1.60S	1.65	1.80	2.10	2.20	2.40	E2.40S	2.00	E2.30S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
17	E1.60S	E1.20S	E	E	E	E1.60S	E1.65S	E1.60S	1.60	1.70	1.65	1.90	1.85	1.90	1.70	1.60	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
18	E1.60S	E1.10S	E	E	E	E1.60S	E1.60S	E1.60S	1.60	1.90	E2.50S	E2.40S	1.90	E3.00S	E2.70S	E2.40S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
19	E1.60S	E1.20S	E	E	E	E1.60S	E1.60S	E1.60S	2.00	E3.00S	E3.00S	E3.60S	E3.30S	E3.10S	E3.00S	E2.40S	E1.70S	E1.70S	E1.60S	E1.80S	E1.60S	E1.60S	E1.60S	E1.60S
20	E1.60S	E1.10S	E	E	E	E1.60S	E1.60S	E1.60S	1.60	2.10	E2.40S	E2.40S	E2.50S	E2.50S	1.90	1.90	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
21	E1.60S	E1.10S	E	E	E	E1.60S	E1.60S	E1.60S	1.60	2.00	E2.40S	E2.40S	E2.50S	1.90	1.80	1.70	E1.80S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.70S
22	E1.60S	E1.40S	E	E	E	E1.60S	E1.60S	E1.60S	1.80	1.70	1.90	E2.40S	E2.40S	E2.40S	1.90	1.70	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
23	E1.60S	E1.20S	E	E	E	E1.40S	E1.60S	E1.60S	1.80	E2.70S	E3.00S	E2.50S	E2.50S	E2.60S	E2.80S	E2.40S	E1.60S	E1.60S	E1.60S	E1.50S	E1.60S	E1.90S	E2.00S	E1.60S
24	E1.60S	E1.40S	E	E1.60S	E	E1.60S	C	C	C	C	C	E2.40S	E2.40S	E3.00S	E2.70S	E2.40S	E1.65S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.90S	E1.60S
25	E1.60S	E1.40S	E1.20S	E	E	E1.60S	E1.60S	E1.80S	1.60	E2.70S	1.90	2.00	2.10	1.95	2.00	1.80	E1.70S	E1.60S	E1.65S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
26	E1.60S	E1.30S	E1.30S	E	E	E1.60S	E1.65S	E1.60S	1.70	1.75	1.90	1.80	1.90	1.90	1.90	1.70	E1.70S	E1.60S	E1.90S	E1.60S	E1.60S	E1.65S	E1.60S	E1.60S
27	E1.60S	E1.20S	E1.30S	E	E	E1.60S	E1.65S	E1.60S	E2.40S	1.90	2.00	1.90	E2.40S	1.90	E2.70S	1.90	E1.70S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
28	E1.60S	E1.20S	E	E	E	E1.60S	E1.60S	E1.80S	1.90	2.00	2.00	E2.40S	E2.50S	2.00	1.85	1.75	E1.70S	E1.70S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.70S
29	E1.60S	E1.20S	E	E	E	E1.60S	E1.60S	1.60	1.70	1.75	1.90	1.90	2.00	E2.40S	E2.50S	E2.50S	E1.90S	E1.70S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
30	E1.80S	E1.15S	E	E	E	E1.60S	E1.60S	E1.60S	E2.40S	E2.90S	2.00	E2.50S	E2.40S	E2.40S	2.00	E2.40S	E1.80S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
31	E1.70S	E1.30S	E1.20S	E	E	E1.60S	E1.60S	E1.60S	1.60	2.10	1.90	2.00	E2.40S	E2.50S	E3.00S	E2.50S	E2.00S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S	E1.60S
No.	31	31	22	28	29	31	30	29	23	23	21	18	17	15	18	30	31	31	31	30	31	31	31	31
Median	E1.60	E1.30	E	E	E	E1.60	E1.60	E1.60	1.65	1.75	1.90	1.90	1.90	1.90	1.85	E2.05	E1.60	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.

IONOSPHERIC DATA

Wakkanai

Lat. 45° 23.6' N
Long. 141° 41.1' E

Dec. 1959 | (M3000)F2 | 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	2.30	2.30	2.45	2.50	2.45	2.55	2.70	3.15	3.05	3.00	3.15	3.15	3.15	3.15	3.00	3.05	3.05	3.10	3.10	I 2.85 A	3.00	2.45	2.45	2.45
2	2.65	2.60	2.80	2.60	2.55	2.70	2.70	3.05	3.30	3.10	V 3.20 R	3.05	3.10	3.15	2.95	2.95	2.95	3.00	3.15	3.05	I 2.75 A	2.65	2.40	2.50
3	2.45	2.60	2.55	2.50	2.50	2.65	2.75	2.90	3.10	3.10	3.15	3.05	3.05	3.10	3.00	3.05	2.90	2.95	3.00	2.85	2.45	2.55	2.50	2.40
4	2.40	2.50	2.65	240	2.65	I 2.60 AS	I 2.75 A	2.90	3.35	R	R	R	3.10	3.10	3.15	3.10	3.20	3.05	2.95	2.95	2.90	2.80	2.80	2.75
5	2.70	2.70	2.70	2.60	2.65	2.80	3.35	3.25	3.20	3.30	3.15	3.25	C	C	C	3.05	3.15	3.00	3.00	I 2.80 C	3.00	2.65	2.45	2.50
6	2.35	2.35	2.40	2.50	2.35 F	2.50 F	2.50	2.85	I 2.95 R	3.00	3.15	V 3.05 R	2.90	3.05	3.00	3.00	3.00	3.00	3.10	2.75	2.95	2.65	2.70	2.55
7	2.60	2.60	2.70	2.75	2.75	2.85	2.95	3.05	3.05	3.20	3.20	3.15	I 3.20 R	3.15	3.15	3.10	3.25	3.00	3.00	3.00	3.00	2.90	2.85	2.80
8	2.70	2.50	2.55	2.80	2.85	3.10	2.65	3.20	3.20	3.20	3.30	3.30	3.00	3.25	3.05	3.15	3.20	3.15	3.00	3.05	2.90	3.10	2.75	2.75
9	2.85	2.80	2.75	2.55	2.65	2.80	3.40	3.10	3.35	2.95	3.25	3.25	3.20	2.85	3.10	3.15	3.20	3.05	2.95	3.10	3.05	2.95	2.65	2.70
10	2.60	2.70	2.70	2.70	2.60	3.00	2.90	3.20	3.20	3.05	3.10	3.10	3.10	2.95	V 3.10 R	V 3.05 S	3.15	2.95	3.25	3.05	2.65	2.75	2.55	2.70
11	2.65	2.80	2.65	2.50	2.90	3.05	2.75	3.25	3.25	3.25	3.30	3.25	3.15	3.10	3.10	3.30	3.15	3.20	3.15	3.20	3.10	2.65	2.50	2.65
12	2.70	2.70	2.65	2.80	3.10	3.00	2.90	3.10	3.45	3.15	3.10	3.05	3.25	3.20	3.20	3.05	3.20	3.05	3.05	3.25	2.75	2.75	2.55	2.55
13	2.60	2.75	2.75	3.00	3.05	3.35	3.00	C	C	C	C	C	2.95	C	C	C	3.20	3.10	2.70	3.40	2.90	2.95	2.75	2.80
14	2.70	2.60	2.60	2.65	2.60	3.00	2.95	3.00	V 2.50 R	3.15	3.20	3.20	3.15	3.15	3.10	3.15	3.15	3.00	3.10	2.90	2.45	2.65 F	2.75	2.90
15	2.55	2.50	2.45	2.65	2.95	2.70	2.75	3.00	3.10	R	R	R	3.25	3.20	3.25	3.10	3.25	3.10	3.20	3.20	3.10	2.75	2.55	2.50
16	2.65	2.70	2.65	2.65	2.50	2.75	2.65	3.00	3.15	3.15	R	R	R	3.20	3.15	3.10	3.30	3.10	3.15	3.00	3.25	2.85	2.65	2.60
17	2.55	2.50	2.45	2.55	2.55	2.75	3.00	2.95	3.35	3.30	3.20	I 3.20 R	3.30	3.10	3.20	3.35	3.20	3.40	3.05	3.00	3.10	3.05	2.75	2.75
18	2.75 F	2.70 F	2.80	2.55	2.70	2.90	3.35	3.00	3.35	3.35	3.25	3.20	3.30	3.20	3.20	3.25	3.15	3.30	3.00	3.30	2.95	2.75	2.65	2.70
19	2.65	2.60	2.60	2.85	2.90	2.95	3.00	2.85	3.20	3.40	3.35	3.30	3.10	3.20	3.05	3.25	2.60	3.10	3.40	3.15	2.45	2.60	2.60	2.55
20	2.65	2.60	2.80	3.10	2.75	2.65	3.10	3.00	3.20	3.20	3.25	3.20	3.15	3.25	3.25	3.25	3.10	3.30	3.10	3.20	3.05	2.70	2.70	I 2.80 A
21	2.85	I 2.75 A	2.80	2.60	2.55	2.80	2.95	3.15	3.25	3.35	3.25	3.25	3.35	3.25	3.05	3.35	V 3.25 S	3.10	3.00	3.15	2.95	2.85	2.65	2.70
22	2.75	2.70	2.95	2.90	2.80	2.85	3.10	3.00	3.20	3.20	3.40	I 3.30 R	3.35	3.15	3.10	3.30	3.20	3.20	3.20	3.30	2.95	2.95	2.65	2.75
23	2.70	2.70	2.70	2.65	2.75	2.80	3.00	3.00	3.20	3.20	3.30	3.25	3.25	3.15	3.20	3.05	3.00	2.85	3.00	3.40	2.95	2.60	2.65	2.55
24	2.65	2.60	2.65	I 2.65 S	2.55	2.80	C	C	C	C	C	3.15	3.10	3.15	3.00	3.10	3.15	3.00	3.15	2.85	2.70	2.80	2.80	2.75
25	2.70	2.70	2.75	2.60	2.80	3.25	2.90	3.00	3.15	3.30	3.20	3.20	3.30	3.25	3.20	3.05	3.00	3.10	2.80	3.30	2.60	2.60	2.70	2.80
26	2.80	2.65	2.75	2.65	2.65	2.90	3.15	3.10	V 3.10 S	3.25	3.35	3.15	3.20	3.25	3.10	3.30	3.15	3.10	3.15	3.30	2.90	2.60	2.50	2.65
27	2.70	2.75	2.70	2.70	2.65	2.80	2.95	2.80	3.20	3.15	3.30	3.10	3.25	3.15	3.10	2.90	3.00	3.15	3.35	3.00	2.60	2.60	2.60	2.50
28	2.90	2.60 H	2.45	2.45 F	F	F	S	2.85	3.10	3.35	3.15	3.15	3.05	3.15	3.20	3.10	3.00	3.00	3.10	3.00	2.95	2.70	2.70	2.40
29	2.50	2.45	2.50	2.50	2.55	2.60	2.60	2.85	3.00	R	RH	RH	3.15	3.10	3.20	3.15	3.15	3.05	3.15	3.25	2.50	2.70	2.65	2.60
30	2.75	2.65	2.75	2.65	2.75	3.05	2.85	3.05	3.20	3.35	3.20	3.20	3.05	3.15	3.20	3.25	3.10	3.00	3.20	3.15	3.15	2.70	2.70	2.50
31	2.55	2.60	2.75	2.60	2.70	2.65	2.95	2.95	3.30	3.35	3.30	3.25	3.25	3.10	3.35	3.25	3.10	3.15	3.10	3.25	2.95	2.75	2.70	2.50
No.	31	31	31	31	30	30	29	29	29	26	25	26	29	29	29	30	31	31	31	31	31	31	31	31
Median	2.65	2.60	2.70	2.65	2.65	2.80	2.95	3.00	3.20	3.20	3.20	3.20	3.15	3.15	3.10	3.10	3.15	3.10	3.10	3.10	2.95	2.70	2.65	2.65

The Radio Research Laboratories, Japan.

(M3000)F2

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

W 7

IONOSPHERIC DATA

Dec. 1959 | (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																								
5													C	C	C									
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13								C	C	C	C	C		C	C	C								
14																								
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																								
24							C	C	C	C	C													
25																								
26																								
27																								
28																								
29																								
30																								
31													L											
No.																								
Median																								

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

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec. 1959 | 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																								
5													C	C	C									
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13								C	C	C	C	C		C	C	C								
14																								
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19																								
20																								
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22																								
23																								
24							C	C	C	C	C													
25																								
26																								
27																								
28																								
29																								
30																								
31													L											
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

17

IONOSPHERIC DATA

Dec. 1959 | 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	410	370	370	360	370	365	365	245	240	235	240	235	220	220	230	230	I240A	250A	270A	I255A	250	350	I410A	400
2	350	300	300	310	340	335	285	240	235	230	230	230	220	225	225	220	235	230	240	250	I305A	350	400	385
3	390	315	360	355	325	320	310	255	240	240	235	230	230	230	220	220	220	225	240	240	305	300	335	340
4	350	320	285	250	330	I335A	I300A	260	240	240	220	220	235	220	230	225	215	205	220	260	265	270	275	290
5	310	300	305	365	340	300	220	230	220	225	220	220	C	C	C	220	220	210	220	I270C	260	305	360	395
6	410	450	445	430	410	395	500	350	220	250	250	220	230	240	225	225	220	215	250	260	275	350	310	320
7	350	345	320	310	310	270	270	230	205	230	230	230	240	220	220	210	210	220	270	260	250	260	280	310
8	300	360	335	270	245	230	295	240	215	230	225	225	220	240	225	240	210	225	245	240	275	290	295	300
9	290	290	280	325	350	270	220	225	220	230	230	235	235	230	240	240	215	225	240	250	230	260	340	315
10	360	335	295	275	340	260	260	240	225	225	240	225	220	220	240	215	220	220	220	230	320	340	350	320
11	320	300	300	315	275	260	225	230	220	240	230	225	225	235	240	220	205	220	240	220	250	I330A	360	360
12	330	315	335	305	260	250	270	240	220	235	235	230	230	230	240	220	220	225	230	225	I300A	335	360	I355A
13	I360A	350	310	265	260	210	310	C	C	C	C	C	225	C	C	C	220	215	225	225	235	260	300	295
14	300	300	325	300	270	240	225	240	230	225	235	225	225	235	240	230	220	215	235	245	325	270	290	240
15	355	350	350	290	250	270	335	240	240	240	240	230	215	235	235	225	215	225	225	245	250	325	350	360
16	350	330	305	310	335	300	260	260	220	235	230	225	225	220	225	215	205	230	225	250	235	270	330	325
17	345	385	405	360	340	290	250	260	210	220	240	230	210	220	225	220	210	210	250	245	265	250	290	270
18	335	340	340	335	315	285	225	220	225	220	215	240	225	220	240	220	215	220	245	235	270	320	315	I340A
19	360	350	330	285	270	270	260	225	235	220	220	225	225	245	245	225	215	225	240	250	300	380	350	360
20	370A	405A	360A	I310A	290	340	310	250	240	215	230	230	225	225	220	220	220	220	250	240	265	350	I345A	330A
21	315	I335A	310	310	330	290	245	250	225	225	225	240	230	230	220	225	225	225	220	235	260	300	330	340
22	320	300	270	250	260	290	260	230	215	230	240	225	225	230	235	225	220	235	225	235	260	285	340	310
23	315	310	300	315	320	280	250	210	220	230	240	220	215	225	230	220	230	260	225	210	260	350	360	370
24	320	340	320	320	360	210	C	C	C	C	C	220H	220	225	225	240	230	240	235	225	280	300	270	315
25	300	300	310	310	280	240	295	240	230	245	230	230	225	225	235	220	220	220	230	225	315	395	320	300
26	300	325	310	285	310	270	240	205	210	240	225	220	235	240	220	220	225	245	230	220	290	350	370	335
27	340	305	300	300	320	285	250	260	235	245	240	220	230	230	220	220	220	220	230	235	335	370	320	370
28	295	260H	320	350	345	310	285	290	230	215	235	220	225	220	200	240	240	220	230	210	265	335	325	390
29	360	325	320	365	350	355	325	250	225	245	225H	215H	215	220	215	215	205	210	235	210	280	310	350	320
30	300	275	270	310	275	260	310	245	220	235	220	225	215	220	230	220	220	220	230	230	260	400	400	400
31	385	345	305	295	300	275	265	I250A	220	220	225	225	215	240	240	235	220	240	230	235	250	315	330	360
No.	31	31	31	31	31	31	30	29	29	29	29	30	30	29	29	30	31	31	31	31	31	31	31	31
Median	340	325	310	310	320	280	270	240	225	230	230	225	225	225	230	220	220	220	230	235	265	320	335	335

h'F

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

The Radio Research Laboratories, Japan.

W 10

IONOSPHERIC DATA

Dec. 1959 | 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	E	E	105	E	E	115	110	110	110	105	G	105	140	G	110	120	115	110	110	110	105	110	105	E
2	E	E	E	E	100	E	E	110	105	105	G	105	105	G	G	G	100	100	110	110	110	110	E	E
3	E	E	E	115	115	115	E	S	S	115	G	100	G	100	G	S	E	E	110	E	E	E	110	105
4	E	E	E	E	115	115	110	115	115	110	G	100	G	G	G	G	E	E	E	E	E	E	E	E
5	E	105	100	100	100	E	E	S	G	105	105	105	C	C	C	S	E	E	E	C	E	E	E	E
6	E	E	E	E	E	E	115	120	115	110	110	110	G	115	G	G	E	110	110	105	110	105	110	E
7	105	105	105	E	E	E	E	E	140	105	105	S	105	100	G	G	E	E	E	E	E	E	105	E
8	E	100	E	E	E	E	E	E	120	120	G	G	105	100	100	S	100	E	E	E	E	E	E	E
9	E	E	E	E	E	E	E	E	S	125	G	105	G	120	115	100	100	E	E	E	105	E	E	E
10	E	E	E	E	E	E	E	E	S	S	S	S	S	S	S	S	S	E	E	E	E	E	E	E
11	E	E	E	E	E	E	E	115	S	S	S	S	S	S	S	S	S	E	E	E	E	105	E	E
12	105	100	100	105	105	E	E	E	115	G	G	105	100	100	100	S	100	E	E	E	110	110	110	100
13	100	E	105	100	E	E	E	C	C	C	C	C	G	C	C	C	100	E	110	E	E	E	E	105
14	105	100	105	105	E	E	115	E	110	105	110	G	G	G	105	S	E	E	E	E	E	E	E	E
15	E	E	E	E	E	E	E	115	115	110	110	105	G	G	G	130	110	E	E	E	110	110	110	E
16	E	E	105	E	E	E	115	110	110	110	G	G	G	105	G	S	E	105	E	E	E	E	E	E
17	E	110	110	110	115	E	E	120	G	110	110	105	110	110	110	105	105	E	115	E	E	E	E	E
18	E	105	105	100	E	E	E	120	110	110	105	G	105	S	S	S	E	E	E	E	120	110	E	110
19	105	105	100	100	100	E	E	E	110	S	S	S	S	S	S	S	E	E	E	E	E	E	110	110
20	105	105	100	100	105	E	E	115	110	110	115	120	G	110	110	105	105	E	105	100	E	E	110	105
21	110	100	100	E	E	E	110	105	105	110	G	G	G	G	G	G	E	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	E	E	E	E	E	E	E	110
23	E	105	100	100	100	E	E	E	110	S	S	105	G	G	S	S	100	100	E	E	E	E	E	E
24	E	E	E	105	E	E	C	C	C	C	C	110	110	S	S	S	E	E	E	E	E	115	E	E
25	E	E	E	E	E	E	E	E	115	S	G	110	G	G	G	G	E	115	E	E	E	115	E	E
26	105	105	105	110	E	E	E	E	G	115	120	105	110	G	G	G	110	100	E	E	E	E	110	E
27	E	110	E	E	E	E	E	145	145	110	120	G	G	G	S	110	105	E	E	E	E	E	E	E
28	E	E	E	120	E	E	E	E	G	G	G	G	G	G	G	G	120	115	E	E	E	E	E	E
29	E	E	E	E	E	E	E	G	G	110	G	100	G	G	G	S	S	E	E	110	E	E	E	E
30	E	105	100	100	105	E	E	E	S	S	G	G	G	G	G	S	E	E	E	E	E	E	E	E
31	E	E	E	E	E	E	E	110	115	G	G	G	G	G	S	S	S	115	E	110	E	105	105	E
No.	8	14	15	14	10	3	6	13	18	19	10	16	9	9	7	6	13	9	7	6	7	10	10	7
Median	105	105	105	100	105	115	110	115	110	110	110	105	105	105	110	110	105	110	110	110	110	110	110	105

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. 1959 | 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	l2	l		l2	k		l	l	f6	f2	f2	f5	f	f	f3	
2					f			l	l2	l2		l	l				f	f	f	f	f	f		
3				f	f2	f				l		l		l					f				f2	f
4					f	f4	f4	f	l	l		l												
5		f	f	f3	f2					l	l	l												
6							f	f	l	l	l	l		l				f	f2	f2	f2	f2	f	
7	f	f	f						k	l	l		l	l								f		
8		f							l				l	l	l		l							
9										l		l		l	c	l	l				f			
10																								
11								f														f2		
12	f	f	f2	f	f				l			l	l	l2	l		f				f2	f	f	f
13	f		f	f													f		f					f
14	f2	f	f4	f			f		l2	l	l				l									
15								f	l	l	l	l				k	f				f	f	f	
16			f				f	f2	l	l				l				f2						
17		f3	f4	f	f			f		l	l	l	l	l	l	l	f		f					
18		f2	f	f				f	l	l	l		l								f	f		f
19	f	f	f	f	f				l														f	f
20	f	f3	f3	f4	f			f	l	l	l	l		l	l	l	f		f	f			f2	f
21	f	f4	f				f	f	l	l														
22																								f
23		f	f	f	f				l			l					f	f						
24				f								l	l									f		
25									l			l						f				f		
26	f	f	f	f						l	c	l	l				f	f					f	
27		f						f	c	l	c					l	f							
28				f													f	f						
29										l		l								f				
30		f	f	f	f																			
31								f2	l									f		f		f2	f	
No.																								
Median																								

Types of Es

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

The Radio Research Laboratories, Japan.

W 12

IONOSPHERIC DATA

Dec. 1959 | foF2 | 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	4.2	4.4	4.2	4.0^{F}	3.9	3.9^{Z}	4.0	8.3	11.6	14.5^{H}	14.7	15.2^{R}	14.9	12.5	10.9	11.5	11.2	8.6	6.7	5.3	4.8	3.4	3.3	3.4
2	I 3.5^{A}	3.5	3.6^{F}	3.2	3.4	3.2^{F}	3.9	8.3	10.8	13.5	15.1^{H}	15.0	13.3	C	C	C	10.5	9.7	7.6	5.6	4.1	3.9	4.2	4.1
3	4.1	4.5	4.5	4.2	4.3	3.9	3.6	7.3	11.5	13.3	14.7	14.8	14.0	13.4	12.2	11.6	11.1	9.4^{S}	8.3^{S}	7.1	5.1	5.2^{S}	5.5	5.5
4	5.1	5.3	5.4	5.1	5.1	5.4	6.0	9.3^{S}	13.1	15.3	16.3	14.7	13.6	13.5	12.8	12.2	11.5	8.9	5.6	4.8^{S}	5.3^{S}	4.9^{S}	4.0^{S} I	3.8^{C}
5	4.0	4.0^{S}	3.9^{S}	3.6^{S}	4.0^{S}	3.7^{S}	4.2^{S}	7.1	10.4	12.6	12.6	13.3	12.0	12.4	12.4	11.7	10.1	8.5	7.0	4.7	4.8^{S}	3.9	3.7	3.6^{S}
6	3.7^{S}	3.3	3.4^{S}	3.1	3.3	3.4	3.1	5.8	11.4	13.1	14.8	14.9	C	C	C	C	C	C	C	C	C	C	C	A^{V}
7	C	C	C	I 4.1^{S}	I 4.1^{C} I	4.1^{C}	C	C	C	C	13.3	13.8	14.0	13.4	12.8	11.5	10.0	6.7^{H}	6.7	5.2	5.1^{S}	4.0^{S} I	3.1^{A}	3.4^{V}
8	3.4^{S}	3.4	3.5	3.4	3.4^{S}	3.1^{S}	3.1	7.6^{S}	10.0	11.3	13.3	12.9	11.7	11.4	12.3	10.8	10.9^{S}	7.5^{S}	5.2	5.5	3.9^{S}	3.6^{S}	3.9^{S}	3.8
9	4.0^{S}	4.0	3.9	3.6^{S}	3.7	3.9^{S}	3.9^{S}	6.8	9.4^{S}	10.6	13.7^{H}	13.1	12.0	11.3	12.0	10.7	9.3	8.0	6.3	5.5	5.5	3.0	3.5	3.5
10	3.4	3.6	3.8	3.8	3.5	3.9	3.6	6.6	9.7	10.1	13.0	13.3	11.7^{H}	11.0	10.4^{H}	10.7	10.0^{S}	8.1^{S}	6.6	3.8^{H}	3.1	3.4^{S}	3.8^{S}	3.9
11	4.0^{S}	4.4^{S}	4.2	4.0	4.1	4.2^{S}	3.6	6.7	8.4	C	C	12.7	11.2	11.0	10.6	10.5	8.9	6.3	6.6	5.7	3.1	2.6	2.8	3.1
12	3.4	3.5	3.6	3.6	3.7	3.3	3.4	6.1	8.2	9.0	12.1	13.1	12.4	12.4	10.1	10.7	8.9	7.5	6.4	4.7	2.9^{H}	3.1^{S}	3.2^{S}	3.4
13	3.5^{S}	3.6^{F}	4.1^{F}	4.6	3.5	2.9	3.1^{S}	5.1	7.6^{S}	10.1	13.0	10.5^{H}	9.8	10.2	11.0	11.6	10.1	7.3	6.7	5.3^{H}	4.2	3.7^{S}	3.9	4.0
14	3.9^{S}	4.0^{S}	4.0^{S}	4.0	4.0	4.1	3.3	5.9	8.0	11.6	13.1	13.0	11.7	11.5	11.5	11.8	10.9	8.8	7.0	5.3	4.8	5.6	5.0	4.8
15	4.0	4.1	4.1	4.5	4.1	3.6	3.4	7.8	10.4	13.1	15.7^{U}	15.0^{R}	13.8	11.4	12.0	11.7	9.8^{S}	7.2	7.7^{S}	4.2^{S}	3.4^{S}	2.9	3.2^{S} I	3.4^{A}
16	3.6	3.8^{S}	3.7	3.6	3.5	3.8^{S}	4.3	6.1	9.7	12.1	14.9	13.8	13.0	12.2	11.8	11.6	9.6^{S}	6.8	5.4	4.3^{S}	4.0	3.1$^{S}_{H}$	3.1	I 3.2^{S}
17	3.4	3.4	3.2	3.3	3.4	3.4	4.0^{S}	7.0	9.6	11.6	12.8	13.2	12.6	10.3	10.6	11.2	9.4	6.8	4.5	4.1^{S}	4.0^{S}	3.7^{S}	3.0^{S}	3.0^{S}
18	2.9^{S}	3.4^{S}	3.5	3.5^{S}	3.5^{S}	3.4^{S}	3.6^{S}	6.1	8.2	10.6	12.2	11.8	12.0	10.5	I 10.6^{C}	10.8	8.5	7.1	5.0	4.6	3.6	2.9	3.0	3.0
19	3.1	3.2	3.4	3.4	3.4	3.3	3.6	6.4	7.9	12.1	12.0	10.6	10.2	9.8	10.5	10.7	9.5	6.1	5.8	5.1	3.1	3.3	3.5	3.4
20	3.5	3.5	3.6	3.7	3.6	3.6	3.8	8.0	11.9	14.0	13.1	13.6	13.0	11.2	10.9	10.5	9.3^{S}	7.4	6.6	5.0	I 3.6^{S} I	3.2^{S}	3.3	3.5^{S}
21	3.4	3.4	3.4	3.1	3.1	3.4^{S}	3.3	5.7	8.6	10.4	11.9	11.8	11.5	10.3	10.0	9.7	8.9	6.4	6.2	5.2	4.3	3.1	2.9	3.1
22	3.1	3.4	3.8	3.1	3.0	2.9	3.3	5.7	8.2	10.0	12.1	11.5	10.1	9.4	9.5	9.1	8.1	5.7	5.7	4.2	2.9	2.9^{S}	2.7^{S}	2.9
23	3.0	3.0	3.0	2.9	3.2^{S}	3.1^{S}	3.5^{S}	6.2	8.1	9.6	11.9	12.0	10.4	9.7	9.3	9.3	8.5	7.9	7.8	6.5	2.9	2.6	2.9	2.9
24	3.3	3.0	3.3	3.6	3.4	3.6	2.8	5.7	9.7	11.2	12.0	14.3	13.1	11.0	9.6	9.5	9.0	8.0	7.4	5.3	4.5	4.5	4.5	3.5
25	3.9	3.9	3.6	3.6	3.9	4.0	3.7	5.7	9.5	12.1	13.1	11.7	11.2	10.6	9.8	9.3	8.2	7.4	5.6	4.5	3.4	3.2	3.6^{S}	3.5^{S}
26	3.5^{S}	3.0	3.1	3.1	3.3	3.7^{S}	3.9^{S}	5.3	7.1	10.3	12.6	11.1	10.1	10.5^{H}	10.9	9.8	8.0	7.5	7.9	4.6	2.9	I 2.8^{A}	3.0	3.4
27	3.3	3.4	3.4	3.5	3.6	3.6	3.7	5.5	9.3	12.7	14.8	14.2	13.6	12.3	11.2	9.8	10.1	9.5	6.8	4.7	3.2^{S}	3.2	3.5	3.4
28	4.3^{S}	3.0	2.9	3.1	3.1^{S}	3.4^{S}	3.9	6.2	13.0	^{U}16.4^{R}	14.6	13.9	12.5	13.1	11.2	9.3	9.2	8.7	8.4^{S}	6.7	I 3.2^{S}	3.1^{S}	3.4	3.4^{S}
29	3.6^{S}	3.7^{S}	3.3^{S}	2.9^{H}	3.4	3.3^{S}	3.7	6.8	10.8^{Z}	13.5	14.6	14.0	12.8	12.1	11.8	11.1	10.0	6.7	5.6	5.2	I 3.4^{S}	3.4	3.6	3.8
30	3.9	3.8	3.1	3.1	3.0	3.0	2.8	6.1	10.0	12.5	13.8	13.4	12.1	12.0	12.0	11.2	9.5	7.7^{S}	6.4	4.4	3.1	2.6^{S}	2.7	3.1^{S}
31	3.1^{S}	3.1	3.1	3.1	3.4	3.3	3.2	5.4	8.8	11.8	12.1	11.6	11.4	11.0	10.5	9.6	8.0	7.2	5.4	5.8	4.0	3.3	3.0	3.1
No.	30	30	30	31	31	31	30	30	30	29	30	31	30	29	29	29	30	30	30	30	30	30	30	30
Median	3.5	3.5	3.6	3.6	3.5	3.6	3.6	6.2	9.7	12.1	13.1	13.3	12.0	11.3	10.9	10.7	9.5	7.5	6.6	5.2	3.8	3.2	3.4	3.4
U.Q	4.0	4.0	3.9	4.0	3.9	3.9	3.9	7.1	10.8	13.2	14.7	14.2	13.1	12.4	12.0	11.6	10.1	8.5	7.0	5.5	4.5	3.7	3.8	3.8
L.Q	3.4	3.4	3.3	3.1	3.4	3.3	3.3	5.7	8.2	10.5	12.2	11.8	11.4	10.5	10.4	9.8	8.9	6.8	5.6	4.6	3.1	3.0	3.0	3.1
Q.R	0.6	0.6	0.6	0.9	0.5	0.6	0.6	1.4	2.6	2.7	2.5	2.4	1.7	1.9	1.6	1.8	1.2	1.7	1.4	0.9	1.4	0.7	0.8	0.7

foF2

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

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec. 1959 | 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														C	C	C								
3													L											
4															L									
5																								
6											L		C	C	C	C	C							
7										C			L											
8																								
9												L												
10												L			L									
11										C	C													
12													L											
13																								
14												L												
15															L									
16										L														
17											L		L		L									
18															C									
19													L											
20																								
21																								
22										L			L											
23																								
24													L											
25													L											
26																								
27											L													
28																								
29																								
30																								
31													L											
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

22

IONOSPHERIC DATA

Lat. 39° 43.5' N
Long. 140° 08.2' E

Akita

Dec. 1959 | foE | 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								A	2.70	3.05	I 3.30 R	3.50	3.45	3.25	3.05	2.55	B							
2								B	2.55	I 3.05 R	3.25	B	A	C	C	C	B							
3								B	2.55	2.95	3.40	3.40	I 3.45 R	3.30	A	A	A							
4								B	2.60	I 3.00 A	3.20	I 3.30 A	3.30	3.40	3.05	B	B							
5								B	2.70	I 3.00 A	3.30	3.45	I 3.40 A	3.30	I 2.90 A	A	B							
6								A	2.40	I 2.75 A	A	A	C	C	C	C	C							
7								C	C	C	A	A	A	A	A	A	A							
8								B	2.45	3.20	I 3.10 R	3.50	3.50	3.35	A	A	A							
9								B	2.55	3.00	3.05	3.30	3.40	I 3.25 R	3.00	A	A							
10								B	2.50	3.00	I 3.20 B	I 3.25 B	I 3.30 B	R	R	B	B							
11								B	B	C	C	B	3.40	3.10	3.00	2.60	B							
12								B	2.60	2.90	3.20	3.45	I 3.40 R	3.30	2.95	2.60	B							
13								1.90	2.30	3.00	I 3.15 R	3.40	I 3.40 A	3.30	2.85	R	B							
14								B	A	2.90	3.10	3.25	I 3.25 A	3.20	2.85	2.20	B							
15								B	R	A	A	A	3.35	3.05	R	R	B							
16									A	A	I 3.10 R	I 3.25 R	I 3.40 A	3.25	2.90	2.45	A							
17								B	A	I 2.65 A	3.10	I 3.10 A	3.20	3.05	2.80	R	B							
18								A	A	R	B	S	R	3.05	I 2.75 C	B	B							
19								B	I 2.40 R	2.95	3.10	I 3.20 R	I 3.25 B	I 3.10 A	2.95	2.40	B							
20								A	A	A	A	A	A	A	A	A	A							
21								A	A	2.95	I 3.10 A	3.40	3.50	I 3.40 R	3.00	2.55	E							
22								B	2.45	2.95	3.20	3.30	3.35	3.25	3.05	2.55	E							
23									2.40	A	A	A	I 3.20 A	3.10	2.90	2.45	E							
24									A	A	A	A	A	A	A	A	B							
25								B	2.45	A	R	3.30	3.35	I 3.30 R	R	A	A							
26									2.30	R	A	A	3.40	3.20	2.95	2.40	A							
27									2.55	R	A	A	3.45	3.30	2.90	A	A							
28								B	R	2.80	3.15	I 3.25 A	3.30	3.25	3.00	I 2.60 R	2.15							
29									2.40	I 2.85 A	3.15	3.30	I 3.40 R	3.20	I 3.00 B	B	B							
30								B	I 2.35 R	2.90	3.30	I 3.30 R	I 3.30 R	3.20	2.95	R	B							
31								B	R	B	3.20	I 3.25 R	3.25	3.10	3.00	I 2.40 B	B							
No.								1	19	19	20	20	25	25	21	12	1							
Median								1.90	2.45	2.95	3.20	3.30	3.40	3.25	2.95	2.50	2.15							

foE

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

IONOSPHERIC DATA

Dec. 1959 | 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	E	E	4.4M	4.2M	3.0M	G	5.5M	4.3M	4.0M	G	G	2.8	B	3.0M	6.7M	3.5M	E	3.1M	E	6.5M
2	5.9M	3.4M	3.1M	3.1M	E	2.4M	E	B	G	G	G	B	5.6M	C	C	C	B	2.9M	E	E	3.1M	E	2.7M	E
3	E	2.9M	E	3.0M	6.5M	2.7M	E	B	G	G	G	G	G	G	5.3M	3.1M	3.2M	2.3M	E	E	E	E	E	4.0M
4	3.2M	3.9M	3.1M	E	2.1M	2.1M	E	B	G	5.9M	G	4.5M	G	G	G	B	B	E	E	E	E	E	E	C
5	E	E	E	E	E	E	E	B	G	4.5M	G	G	5.8M	3.7M	4.1M	2.9M	3.1M	E	E	E	E	E	E	E
6	E	E	E	E	E	E	E	4.0M	7.9M	6.6M	8.5M	9.4M	C	C	C	C	C	C	C	C	C	C	C	6.8M
7	C	C	C	S	C	C	C	C	C	C	9.0M	4.5M	8.4M	6.8M	6.6M	5.4M	6.5M	6.6M	3.6M	4.5M	3.2M	1.9M	6.7M	3.0M
8	2.6M	3.0M	E	E	E	E	E	B	2.7	G	G	G	G	3.0G	6.0M	6.1M	4.2M	4.8M	3.2M	E	E	E	E	E
9	E	3.1M	2.6M	E	E	E	E	B	G	G	3.6	G	G	G	3.3M	3.5M	3.8M	3.4M	E	E	E	E	E	E
10	E	E	E	E	E	E	E	B	G	3.4	B	B	B	G	G	B	B	E	E	E	E	E	E	E
11	E	E	E	E	E	E	E	B	G	C	C	B	G	G	G	G	B	E	E	E	E	E	E	E
12	E	2.5M	2.2M	2.2M	2.3M	E	E	B	G	G	3.4	3.7	G	3.6	G	G	B	E	E	E	E	E	E	E
13	3.2M	2.6M	E	E	2.3	E	E	2.3	2.6	G	G	G	4.4M	G	G	G	B	E	E	E	E	2.6M	2.4M	2.2M
14	E	E	2.6M	E	E	E	2.5M	B	3.1M	G	G	G	4.5M	G	G	G	B	E	E	E	E	E	E	E
15	E	E	E	E	E	E	E	B	3.1M	6.1M	4.5M	6.6M	5.2M	4.6M	G	G	B	3.0M	E	2.1M	5.0M	3.2M	E	5.7M
16	3.1M	2.5M	2.2M	2.3M	E	E	E	E	5.2M	4.1M	G	G	3.3M	G	G	G	3.2M	4.4M	2.3M	E	E	E	E	2.5M
17	E	E	E	E	E	E	E	B	3.6M	3.7M	3.8M	4.0M	G	G	3.5M	G	B	2.5M	E	2.3M	4.0M	E	2.1M	E
18	E	E	2.1M	E	E	E	2.3M	2.9M	4.7M	G	B	S	G	G	C	B	B	E	E	E	E	E	E	E
19	E	E	3.1M	2.4M	E	E	E	B	G	G	G	G	B	4.2M	G	2.7	B	2.3M	2.4M	E	E	E	E	E
20	2.4M	E	2.7M	3.6M	3.0M	6.5M	3.0M	3.5M	2.6M	6.0M	4.1M	5.8M	4.3M	3.4M	3.0M	3.9M	4.7M	4.5M	3.1M	3.4M	3.1M	3.1M	3.0M	E
21	E	E	E	E	E	E	E	5.7M	6.7M	3.3M	7.9M	G	G	G	G	G	G	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	B	2.5M	G	G	G	G	G	G	G	2.0M	2.5M	E	E	E	E	E	E
23	E	E	E	E	2.5M	1.9M	E	E	G	3.6M	4.4M	4.0M	4.5M	G	2.7G	G	G	E	E	E	E	E	E	E
24	E	E	E	E	E	E	E	E	3.1M	5.6M	6.8M	6.1M	3.7M	5.1M	5.1M	5.1M	B	E	E	E	E	6.6M	3.1M	5.0M
25	E	3.0M	E	E	E	E	E	B	G	3.2	G	G	G	G	G	4.3M	3.7M	3.1M	3.2M	E	2.1M	5.7M	3.1M	3.2M
26	3.0M	3.6M	3.3M	3.2M	E	E	E	E	G	G	4.3M	4.8M	G	G	G	G	2.4M	2.5M	E	3.0M	E	8.4M	3.6M	3.1M
27	2.5M	3.1M	2.5M	E	E	E	E	E	G	G	6.2M	10.7M	G	2.8G	3.1M	4.5M	5.1M	3.3M	5.8M	3.5M	3.2M	E	2.7M	3.5M
28	2.4M	E	E	E	E	E	E	B	G	G	G	5.3M	3.0G	4.5M	2.8G	G	G	E	4.5M	E	S	E	E	E
29	E	E	E	E	E	E	E	E	G	4.0M	G	G	G	G	B	B	B	E	E	E	S	E	E	E
30	E	E	E	E	E	E	E	B	G	G	G	G	G	G	G	G	2.6M	E	E	E	2.4M	E	E	E
31	E	E	E	E	E	E	E	B	G	3.5	3.5	4.0	G	G	G	B	B	E	3.0M	E	E	E	E	E
No.	30	30	30	30	30	30	30	12	30	29	28	27	28	29	27	24	15	30	30	30	28	30	30	30
Median	E	E	E	E	E	E	E	2.3	G	G	3.4	3.7	G	G	G	G	3.2M	2.3M	E	E	E	E	E	E
U.Q	2.4	2.9	2.6	E	E	E	E	3.8	3.1	4.0	4.4	4.8	4.4	3.5	3.3	3.7	4.2	3.0	3.0	E	2.2	1.9	2.4	3.1
L.Q	E	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	2.0	E	E	E	E	E	E	E
Q.R																	2.2							

foEs

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

The Radio Research Laboratories, Japan.

A 4

IONOSPHERIC DATA

Akita

Lat. 39° 43.5' N
Long. 140° 08.2' E

Dec. 1959

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							3.0	2.7	2.2		2.9	2.5	3.5			2.8	B	E	4.0	2.8		E		E
2	A	2.3	E	E		E		B				B	5.0	C	C	C	B	2.0			E		E	
3		E		E	3.0	E		B							3.4	G	2.7	E						E
4	E	E	E		E	E		B		3.1		3.6				B	B							C
5								B		3.2			4.7	2.6	3.0	2.7	G							
6								2.4	6.0	2.9	4.0	4.1	C	C	C	C	C	C	C	C	C	C	C	A
7	C	C	C	S	C	C	C	C	C	C	4.5	3.4	4.0	4.5	4.4	4.1	3.0	4.0	E	E	E	E	A	E
8	E	E						B	G					2.6	3.9	3.0	2.7	E	E					
9		E	E					B			3.5				2.5	2.8	2.4	2.4						
10								B		3.4	B	B	B			B	B							
11								B	B	C	C	B					B							
12		E	E	E	E			B			3.4	G		3.5			B					E	E	E
13	E	E			E			G	G				3.5				B							
14			E				E	B	G				3.5				B							
15								B	2.6	3.4	3.5	3.6	3.5	3.5			B	E		E	E	E		A
16	E	E	E	E					3.5	G			3.3				G	1.9	E					2.5
17								B	G	3.2	2.9	G			2.7		B	E		E	E		E	
18			E				E	G	2.9		B	S			C	B	B							
19			E	E				B					B	3.6		2.7	B	E	E					
20	E		E	E	E	E	E	1.9	2.5	3.6	3.5	4.3	4.0	3.4	U 3.0 B	G	G	E	E	E	E	E	E	
21								2.1	2.9	2.5	4.0													
22								B	1.9								E	E						
23					E	E				3.1	3.2	3.5	3.6		2.3							E	E	2.5
24									2.5	3.6	4.2	3.9	3.5	4.4	4.5	3.8	B				E	2.6	E	E
25		E						B	2.5							3.3	2.6	2.2	E			A	E	E
26	E	E	E	E							3.5	3.5					1.9	E		E			E	E
27	E	E	E								3.5	4.0		2.6	2.5	G	2.2	2.0	1.9	E	2.5		E	E
28	E							B				4.5	2.4	2.4	2.4				E		S			
29										3.0					B	B	B				S			
30								B									G				E			
31								B		3.5	3.5	4.0				B	B		E					
No.	9	11	11	7	6	5	4	6	14	13	14	14	12	10	11	11	12	15	10	7	8	8	9	11
Median	E	E	E	E	E	E	E	2.0	2.5	3.2	3.5	3.6	3.5	3.4	3.0	2.8	2.0	E	E	E	E	E	E	E

fbEs

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

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec. 1959 | 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	E	1.75	2.80	2.40	2.00	2.00	2.05	1.80	2.00	2.00	E	E	E	E	E	E	E
2	E	E	E	E	E	E	E	2.00	1.85	1.90	2.05	3.55	2.50	C	C	C	2.20	E	E	E	E	E	E	E
3	E	E	E	E	E	E	E	2.00	1.80	2.95	2.85	2.40	2.90	2.50	1.90	1.75	1.80	E	E	E	E	E	E	E
4	E	E	E	E	E	E	E	1.90	1.90	1.90	2.45	2.00	2.05	2.05	2.30	2.90	2.40	E	E	E	E	E	E	E
5	E	E	E	E	E	E	E	1.90	1.90	1.75	1.95	1.90	2.45	2.00	1.95	1.95	1.90	E	E	E	E	E	E	E
6	E	E	E	E	E	E	E	1.70	1.80	1.80	1.85	2.00	C	C	C	C	C	C	C	C	C	C	C	E
7	C	C	C	S	C	C	C	C	C	C	1.90	2.10	2.10	1.90	1.95	1.70	E	E	E	E	E	E	E	E
8	E	E	E	E	E	E	E	1.90	1.80	2.20	2.00	2.50	2.00	1.90	1.90	E	E	E	E	E	E	E	E	E
9	E	E	E	E	E	E	E	1.80	1.90	2.00	2.05	1.85	2.10	1.75	1.90	1.70	E	E	E	E	E	E	E	E
10	E	E	E	E	E	E	E	1.80	1.90	2.30	3.50	3.50	3.40	2.10	2.00	2.70	1.90	E	E	E	E	E	E	E
11	E	E	E	E	E	E	E	1.90	2.90	C	C	3.70	2.60	2.00	2.20	2.00	1.80	E	E	E	E	E	E	E
12	E	E	E	E	E	E	E	1.75	1.70	1.90	2.00	1.80	2.00	2.00	1.80	2.00	1.95	E	E	E	E	E	E	E
13	E	E	E	E	E	E	E	E	1.80	1.90	1.90	2.00	1.90	1.90	1.90	1.80	1.80	E	E	E	E	E	E	E
14	E	E	E	E	E	E	E	1.90	1.90	1.70	2.05	2.10	2.00	2.05	2.00	1.90	1.90	E	E	E	E	E	E	E
15	E	E	E	E	E	E	E	1.75	1.70	2.00	2.00	2.00	2.75	2.00	1.80	1.90	1.90	E	E	E	E	E	E	E
16	E	E	E	E	E	E	E	E	1.90	2.00	2.00	2.40	1.80	2.00	1.80	1.75	E	E	E	E	E	E	E	E
17	E	E	E	E	E	E	E	1.70	1.90	1.80	1.80	1.90	2.00	1.70	1.90	1.70	1.90	E	E	E	E	E	E	E
18	E	E	E	E	E	E	E	E	1.75	2.05	3.55	3.50	2.70	2.00	I 2.05 C	2.60	2.00	E	E	E	E	E	E	E
19	E	E	E	E	E	E	E	1.80	1.95	2.00	2.00	2.40	3.50	2.50	2.45	2.05	2.00	E	E	E	E	E	E	E
20	E	E	E	E	E	E	E	E	2.00	2.75	2.90	2.80	3.50	2.95	2.40	1.75	E	E	E	E	E	E	E	E
21	E	E	E	E	E	E	E	1.75	1.75	1.70	2.50	2.80	2.10	2.15	1.80	1.65	E	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	1.75	1.70	E	1.80	1.80	1.80	1.75	1.70	1.70	E	E	E	E	E	E	E	E
23	E	E	E	E	E	E	E	E	1.75	2.00	1.80	2.05	2.00	2.00	1.90	1.70	1.80	E	E	E	E	E	E	E
24	E	E	E	E	E	E	E	E	1.75	1.70	2.00	2.00	2.50	2.70	2.50	1.80	2.00	E	E	E	E	E	E	E
25	E	E	E	E	E	E	E	1.70	1.70	2.10	2.00	2.45	2.10	2.80	2.00	1.70	1.70	E	E	E	E	E	E	E
26	E	E	E	E	E	E	E	E	1.75	2.00	2.00	2.00	2.00	2.05	2.00	1.90	E	E	E	E	E	E	E	E
27	E	E	E	E	E	E	E	E	1.80	2.00	2.00	2.20	2.10	2.10	1.90	1.70	1.70	E	E	E	E	E	E	E
28	E	E	E	E	E	E	E	1.80	1.80	2.00	2.00	1.80	1.90	1.80	1.90	1.80	1.80	E	E	E	E	E	E	E
29	E	E	E	E	E	E	E	E	1.80	1.75	2.00	2.00	2.00	1.90	2.05	2.70	2.05	E	E	E	E	E	E	E
30	E	E	E	E	E	E	E	1.80	1.80	2.10	2.80	2.50	2.70	2.10	1.80	2.05	2.00	E	E	E	E	E	E	E
31	E	E	E	E	E	E	E	E	2.00	3.00	2.00	2.55	2.30	2.20	2.05	2.70	1.90	E	E	E	E	E	E	E
No.	30	30	30	30	30	30	30	30	30	29	30	31	30	29	29	29	30	30	30	30	30	30	30	31
Median	E	E	E	E	E	E	E	1.75	1.80	2.00	2.00	2.10	2.10	2.00	1.90	1.80	1.85	E	E	E	E	E	E	E

f-min

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

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec. 1959 | (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	2.40	2.45	2.35	2.30F	2.35	2.35Z	2.50	3.20	3.25	3.15H	3.15	3.15R	3.10	3.15	3.00	3.00	3.20	3.05	3.25	3.05	3.05	3.00	2.40	2.40
2	I2.40A	2.70	2.70F	2.60	2.50	2.50F	2.80	3.30	3.35	3.15	3.20H	3.20	3.05	C	C	C	3.10	3.10	3.25	3.40	2.90	2.50	2.65	2.45
3	2.45	2.60	2.50	2.40	2.60	2.60	2.60	3.15	3.20	3.25	3.10	3.15	3.05	3.00	3.05	3.00	3.05	3.00S	3.10S	3.10	2.80	2.55S	2.55	2.55
4	2.40	2.55	2.65	2.60	2.65	2.60	2.80	3.10S	3.25	3.20	3.20	3.15	3.00	3.05	3.10	3.20	3.15	3.25	3.05	2.90S	3.00S	3.25S	2.80SI	2.70C
5	2.60	2.80S	2.80S	2.70S	2.65S	2.70S	3.10S	3.45	3.25	3.20	3.20	3.20	3.10	3.15	3.15	3.25	3.20	3.20	3.30	3.00	3.10S	2.90	2.60	2.30S
6	2.35S	2.10	2.10S	2.15	2.10	2.30	3.20	2.60	2.90	3.05	2.85	2.95	C	C	C	C	C	C	C	C	C	C	C	A
7	C	C	C	I2.60S	I2.60C	I2.70C	C	C	C	C	3.00	3.10	3.10	3.10	3.10	3.15	3.15	2.80H	3.20	3.00	3.15S	3.30SI	2.90A	2.65
8	2.65S	2.45	2.60	2.80	3.00S	2.90S	2.90	3.30S	3.40	3.20	3.15	3.25	3.25	3.05	3.25	3.10	3.15S	3.30S	2.85	3.25	3.15S	2.70S	2.60S	2.70
9	2.80S	2.80	2.80	2.55S	2.40	2.75S	2.95S	3.25	3.30S	3.30	3.30H	3.25	3.30	3.15	3.20	3.25	3.20	3.10	3.15	3.10	3.50	3.20	2.40	2.70
10	2.40	2.65	2.65	2.60	2.55	2.65	3.00	3.30	3.30	3.15	3.25	3.15	3.10H	3.20	3.00H	3.20	3.20S	3.10S	3.50	2.75H	2.70	2.60S	2.65S	2.55
11	2.55S	2.70S	2.85	2.60	2.75	2.85S	2.80	3.20	3.45	C	C	3.30	3.20	3.20	3.10	3.20	3.35	2.90	3.30	3.45	3.10	2.55	2.55	2.60
12	2.60	2.70	2.80	2.75	3.20	2.75	3.00	3.25	3.50	3.10	3.15	3.20	3.15	3.20	2.95	3.20	3.25	3.20	3.30	3.05	2.75H	2.40S	2.60S	2.50
13	2.55S	2.50F	2.70F	3.20	3.50	2.50	3.05S	3.35	3.20S	3.10	3.25	3.20H	3.15	3.05	3.10	3.20	3.20	3.15	3.25	2.85H	2.85	2.75S	2.70	2.80
14	2.65S	2.60S	2.60S	2.70	2.50	2.90	3.10	3.05	3.30	3.20	3.20	3.20	3.15	2.95	3.10	3.15	3.15	3.30	3.20	2.85	2.65	3.00	2.75	2.95
15	2.45	2.55	2.45	2.75	3.00	2.80	2.50	3.20	3.05	3.20	3.20	L3.20R	3.20	3.00	3.10	3.25	3.25S	3.20	3.35S	3.25S	3.00S	2.50	2.55SI	2.55A
16	2.65	2.40S	2.70	2.70	2.60	2.60S	3.20	3.30	3.25	3.15	3.35	3.20	3.20	3.20	3.15	3.35	3.25S	3.50	3.25	3.25S	3.25	2.65SH	2.55	I2.70S
17	2.65	2.45	2.45	2.40	2.50	2.65	2.90S	3.30	3.35	3.40	3.30	3.30	3.30	3.20	3.10	3.30	3.30	3.35	3.20	3.15S	3.00S	3.00S	2.75S	2.75S
18	2.60S	2.60S	2.60	2.60S	2.65S	2.65S	3.20S	3.45	3.40	3.40	3.40	3.30	3.30	3.20	J3.15C	3.35	3.35	3.40	3.15	3.40	3.10	2.65	2.85	2.45
19	2.60	2.60	2.80	3.00	3.00	2.80	3.10	3.35	3.30	3.35	3.35	3.25	3.35	3.20	3.15	3.20	3.45	3.05	3.10	3.50	3.10	2.30	2.60	2.65
20	2.60	2.60	2.65	2.90	2.80	2.60	2.70	3.10	3.30	3.30	3.20	3.15	3.20	3.20	3.20	3.15	3.30S	3.25	3.40	3.00	I3.10SI	I2.65S	2.60	2.75S
21	2.70	2.70	2.90	2.55	2.65	2.75S	3.15	3.25	3.35	3.30	3.35	3.30	3.30	3.30	3.25	3.25	3.30	3.10	3.25	3.15	3.15	3.00	2.50	2.45
22	2.55	2.70	3.05	3.20	2.65	2.75	3.10	3.35	3.50	3.30	3.25	3.30	3.30	3.20	3.20	3.20	3.30	3.10	3.50	3.35	2.80	2.70S	2.65S	2.50
23	2.65	2.65	2.75	2.45	2.45S	2.65S	2.95S	3.25	3.45	3.40	3.30	3.30	3.25	3.20	3.20	3.20	3.30	3.10	3.25	3.40	3.05	2.45	2.35	2.50
24	2.60	2.55	2.70	2.55	2.35	2.80	2.80	3.20	3.25	3.20	3.25	3.10	3.15	3.10	3.10	3.10	3.20	3.10	3.25	3.00	2.85	2.80	3.10	2.70
25	2.70	2.70	2.60	2.60	2.75	3.00	3.00	3.00	3.40	3.20	3.30	3.30	3.15	3.20	3.15	3.20	3.15	3.25	3.60	3.00	2.75	2.50	2.70S	2.80S
26	2.90S	2.65	2.55	2.65	2.60	2.75S	3.10S	3.40	3.30	3.20	3.35	3.50	3.05	3.05H	3.20	3.25	3.35	3.10	3.35	3.30	2.65	I2.50A	2.35	2.45
27	2.55	2.75	2.55	2.50	2.55	2.65	3.00	3.20	3.10	3.15	3.15	3.10	3.00	3.10	3.05	3.10	3.05	3.20	3.30	3.30	3.05S	2.45	2.60	2.40
28	2.70S	3.15	2.60	2.35	2.40S	2.45S	2.65	2.80	3.30	L3.25R	3.25	3.10	3.10	3.05	3.15	3.15	3.25	3.05	3.20S	3.60	I2.70S	2.40S	2.50	2.45S
29	2.50S	2.65S	2.40S	2.20H	2.50	2.40S	2.55	3.10	3.15Z	3.25	3.20	3.15	3.10	3.05	3.05	3.15	3.30	3.15	3.35	3.50	I3.10S	2.65	2.80	2.70
30	2.65	2.90	2.95	2.70	2.85	2.75	2.80	3.15	3.35	3.25	3.15	3.15	3.05	3.10	3.05	3.15	3.15	3.20S	3.30	3.40	3.30	2.40S	2.50	2.30S
31	2.40S	2.50	2.60	2.55	2.65	2.70	3.00	3.15	3.30	3.35	3.30	3.35	3.20	3.10	3.05	3.20	3.15	3.15	3.15	3.35	3.10	3.20	2.55	2.50
No.	30	30	30	31	31	31	30	30	30	29	30	31	30	29	29	29	30	30	30	30	30	30	30	30
Median	2.60	2.60	2.65	2.60	2.60	2.70	3.00	3.20	3.30	3.20	3.20	3.20	3.15	3.15	3.10	3.20	3.20	3.15	3.25	3.20	3.05	2.65	2.60	2.55

(M3000)F2 Sweep 1.60 Mc to 2.00 Mc in 20 sec in automatic operation.

The Radio Research Laboratories, Japan.

A 7

27

IONOSPHERIC DATA

Dec. 1959 | (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														C	C	C								
3													L											
4															L									
5																								
6											L		C	C	C	C	C							
7										C			L											
8																								
9												L												
10												L			L									
11										C	C													
12													L											
13																								
14												L												
15															L									
16										L														
17											L		L		L									
18															C									
19													L											
20																								
21																								
22										L			L											
23																								
24													L											
25													L											
26																								
27											L													
28																								
29																								
30																								
31													L											
No.																								
Median																								

(M3000)F1 Sweep 160 Mc to 200 Mc in 20 sec in automatic operation.

The Radio Research Laboratories, Japan.

A 8

IONOSPHERIC DATA

Akita

Lat. 39° 43.5' N
Long. 140° 08.2' E

Dec. 1959

h'F2

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																								
2														C	C	C								
3													L											
4															L									
5																								
6											L		C	C	C	C	C							
7										C			L											
8																								
9												245												
10												L			L H									
11										C	C													
12													L											
13																								
14												225												
15															L									
16										L														
17											L		225		L									
18															C									
19													245											
20																								
21																								
22										L			L											
23																								
24													240											
25													L											
26																								
27											250													
28																								
29																								
30																								
31													250											
No.											1	2	4											
Median											250	235	240											

h'F2

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

The Radio Research Laboratories, Japan.

A 9

IONOSPHERIC DATA

Dec. 1959 | 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	380	380	360	360	390	355	I320A	235	245	240H	230	240	245	230	230	245	230	210	I240A	250A	245	240	340	350
2	I340A	I320A	300F	300	340	320	270	245	220	230	235H	245	220	C	C	C	245	230	205	225	255	300	300	340
3	360	340	340	355	I320A	310	250	245	245	230	235	230	230	230	225	225	230	210	230	240	260	300	320	300
4	295	330	305	300	305	305	290	270	235	240	225	230	230	230	230	225	220	200	205	250	260	230	265	C
5	300	280	290	330	310	305	240	220	230	225	210	220	220A	240	230	220	210	205	230	245	250	240	320	390
6	410	450	440	450	440	400	215	250	I240A	225	225	245	C	C	C	C	C	C	C	C	C	C	C	A
7	C	C	C	S	I325C	I275C	C	C	C	C	210	230	220	225	230	225	240	I225A	230	255	245	220	I280A	290
8	305	360	320	290	250	250	270	240	225	225	225	230	220	230	245	230	220	205	240	240	225	280	320	270
9	290	275	270	330	315	280	245	225	230	240	245H	225	235	240	245	230	245	240	245	240	240	230	350	330
10	340	340	320	305	340	305	255	245	245	230	240	220	225H	230	220	240	230	210	220	240H	255	300	330	330
11	340	310	290	320	295	260	245	240	225	C	C	245	245	245	245	245	215	205	230	210	240	300	330	350
12	310	310	305	305	255	240	260	240	210	220	230	240	240	245	225	230	220	220	220	215	220H	350	305	345
13	350	375	300	250	225	340	250	220	220	230	245	225H	240	245	240	240	220	210	220	210H	230	280	290	270
14	310	295	290	295	300	270	210	230	220	245	245	220	245	235	245	245	220	220	245	245	250	250	300	255
15	350	350	350	295	255	300	345	245	235	230	245	230	225	220	225	230	220	210	230	210	230	E300E	320	I340A
16	340	340	305	325	345	325	230	225	225A	230	240	220	230	225	230	230	225	205	230	220	230	245H	300	I310A
17	320	350	370	375	360	320	260	220	220	220	210	230	225	220	225	225	220	205	210	245	245	230	245	265
18	325	345	320	300	305	300	245	225	220	230	245	240	245	230	I240C	245	205	240	220	210	245	250	270	340
19	345	340	300	270	290	295	255	240	205	245	240	240	220	245	245	245	220	205	245	225	245	340	340	305
20	345	335	315	290	295	325	310	250	240	240	230	240	235	225	225	230	220	220	230	220	240	260	325	295
21	305	300	280	335	370	290	230	230	225	235	245	240	245	240	240	245	225	250	240	210	245	245	300	300
22	340	310	260	250	280	300	245	245	220	230	240	230	220	230	240	230	215	210	240	210	280	270	280	310
23	305	310	300	340	350	305	250	240	220	245	245	240	240	230	245	245	240	245	215	210	220	E330E	340	340
24	305	340	300	345	395	290	205	245	245	240	255	245	225	240	245	245	235	240	245	210	255	295	250	I280A
25	300	310	305	325	300	260	250	210	245	240	240	235	225	230	235	235	220	240	210	250	260	I315A	290	280
26	280	300	355	325	340	290	250	205	210	235	245	240	220	205H	245	240	240	245	240	205	240	I310A	340	350
27	320	295	325	345	330	345	255	245	245	240	240	230	230	230	230	220	240	230	235	230	I290A	380	310	380
28	305	230	300	370	360	345	295	270	245	240	230	245	220	230	220	220	240	235	225	210	I280S	360	350	360
29	350	300	340	400H	360	385	310	250	240	240	240	225	240	210	235	240	220	200	215	220	I230S	290	300	300
30	300	260	280	300	295	260	250	245	240	230	225	225	220	225	230	225	210	210	225	210	240	380	360	340
31	360	350	340	345	310	290	260	245	230	245	240	230	230	225	245	225	225	210	245	245	245	245	290	340
No.	30	30	30	30	31	31	30	30	30	29	30	31	30	29	29	29	30	30	30	30	30	28	30	29
Median	320	325	305	325	320	300	250	240	230	235	240	230	230	230	235	230	220	210	230	220	245	280	310	330

h'F

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

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Akita

Lat. 39° 43.5' N
Long. 140° 08.2' E

Dec. 1959 | 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	E	E	E	E	E	E	105	105	105	G	105	105	105	G	G	140	B	105	110	110	E	105	E	105
2	105	110	105	100	E	100	E	B	G	G	G	B	100	C	C	C	B	110	E	E	110	E	105	E
3	E	110	E	115	115	115	E	B	G	G	G	G	G	G	100	100	100	100	E	E	E	E	E	105
4	105	105	105	E	105	105	E	B	G	110	G	105	G	G	G	B	B	E	E	E	E	E	E	C
5	E	E	E	E	E	E	E	B	G	105	G	G	100	100	100	100	100	E	E	E	E	E	E	E
6	E	E	E	E	E	E	E	120	110	110	105	105	C	C	C	C	C	C	C	C	C	C	C	105
7	C	C	C	S	C	C	C	C	C	C	105	105	100	100	100	100	100	100	105	100	100	110	105	105
8	105	100	E	E	E	E	E	B	160	G	G	G	G	100	100	100	100	100	100	E	E	E	E	E
9	E	100	100	E	E	E	E	B	G	G	115	G	G	G	100	100	100	100	E	E	E	E	E	E
10	E	E	E	E	E	E	E	B	G	160	B	B	B	G	G	B	B	E	E	E	E	E	E	E
11	E	E	E	E	E	E	E	B	G	C	C	B	G	G	G	G	B	E	E	E	E	E	E	E
12	E	100	100	105	105	E	E	B	G	G	160	130	G	125	G	G	B	E	E	E	E	110	100	100
13	100	100	E	E	120	E	E	155	160	G	G	G	105	G	G	G	B	E	E	E	E	E	E	E
14	E	E	120	E	E	E	120	B	120	G	G	G	105	G	G	G	B	E	E	E	E	E	E	E
15	E	E	E	E	E	E	E	B	145	115	120	115	120	115	G	G	B	110	E	120	110	110	E	105
16	100	100	100	100	E	E	E	E	110	110	G	G	105	G	G	G	105	100	105	E	E	E	E	105
17	E	E	E	E	E	E	E	B	120	110	115	105	G	G	105	G	B	110	E	100	115	E	105	E
18	E	E	100	E	E	E	110	120	110	G	B	S	G	G	C	B	B	E	E	E	E	E	E	E
19	E	E	100	100	E	E	E	B	G	G	G	G	B	105	G	145	B	100	100	E	E	E	E	E
20	100	E	105	100	100	105	100	105	115	120	115	105	105	105	105	105	105	105	100	100	100	100	100	E
21	E	E	E	E	E	E	E	105	105	105	100	G	G	G	G	G	G	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	B	105	G	G	G	G	G	G	G	105	110	E	E	E	E	E	E
23	E	E	E	E	100	120	E	E	G	110	110	110	105	G	105	G	G	E	E	E	E	E	E	E
24	E	E	E	E	E	E	E	E	110	110	105	110	110	105	105	100	B	E	E	E	E	110	110	105
25	E	105	E	E	E	E	E	B	G	160	G	G	G	G	G	110	120	105	105	E	110	120	120	110
26	105	105	105	105	E	E	E	E	G	G	110	105	G	G	G	G	105	100	E	105	E	110	105	110
27	105	110	110	E	E	E	E	E	G	G	110	105	G	110	105	100	100	100	100	100	100	E	115	120
28	120	E	E	E	E	E	E	B	G	G	G	100	100	100	100	G	G	E	120	E	S	E	E	E
29	E	E	E	E	E	E	E	E	G	110	G	G	G	G	B	B	B	E	E	E	S	E	E	E
30	E	E	E	E	E	E	E	B	G	G	G	G	G	G	G	G	100	E	E	E	120	E	E	E
31	E	E	E	E	E	E	E	B	G	155	155	145	G	G	G	B	B	E	100	E	E	E	E	E
No.	9	11	11	7	6	5	4	6	13	14	14	14	12	10	11	11	12	14	10	7	8	8	9	11
Median	105	105	105	100	105	105	110	110	110	110	110	105	105	105	100	100	100	100	100	100	110	110	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

3-31

IONOSPHERIC DATA

Dec. 1959

Types of Es

135° E Mean Time (G.M.T.+ 9h.)

Akita

Lat. 39° 43.5' N
Long. 140° 08.2' E

32

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							f3	l2	l		l	l	l			h		f	f2	f2		f2		f2
2	f4	f3	f	f2		f							l					f			f		f	
3		f		f2	f3	f									l	l	l	f						f2
4	f	f	f		f	f				l		l												
5										l			l2	l	l2	l	C							
6								l2	C3	l	l2	l2												f3
7											l2	l2	l2	l3	l2	l2	l3	f3	f2	f2	f3	f	f2	f
8	f	f							h					l	l2	l2	l	f2	f					
9		f	f								C2				l	l2	l2	f2						
10										h														
11																								
12		f	f	f	f						h	h		h								f	f	f
13	f	f			f			h	h				l											
14			f				f		l				l2											
15									h	l	l	l	C	C				f		f	f	f2		f3
16	f2	f	f	f					l3	l			l				l	f	f					f
17									l2	l	l	l			l			f		f	f		f	
18			f				f	l	l															
19			f	f										l		h		f	f					
20	f		f	f	f	f	f	l	l	l	l	l	l	l	l	l	l	f	f2	f2	f	f	f	
21								l	l2	l	l													
22									l								l	f						
23					f	f				l	l	l	l2		l									
24									l	l	l2	l2	l	l	l2	l						f2	f	f2
25		f								hl						l	hl	f	f		f	f3	f	f2
26	f2	f2	f3	f2							l	l					l	f		f		f3	f	f
27	f	f	f								l	l2		l	l	l	l	f2	f2	f2	f2		f	f
28	f											l3	l	l	l				f					
29										l														
30																	l				f			
31										h	h	h							f					
No.																								
Median																								

Types of Es

Sweep 160 Mc to 200 Mc in 20 sec in automatic operation.

The Radio Research Laboratories, Japan.

A 12

IONOSPHERIC DATA

Kokubunji Tokyo

Lat. 35° 42.4' N
Long. 139° 29.3' E

Dec. 1959 | 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	4.3	4.3	4.3^{S}	4.3	4.3^{S}	I4.6^{S}	5.0^{S}	I9.3^{S}	12.6^{S}	I14.8^{S}	I15.6^{S}	I14.8^{S}	14.4	13.1	10.9	11.7	11.6	8.7	7.0	5.8^{S}	5.9	J5.2^{S}	3.8	4.0
2	4.2^{S}	U4.2^{S}	3.5	3.3	3.3	3.5	4.3^{S}	I9.0^{S}	11.6	13.3	14.6	J15.1^{S}	13.8	13.0	12.9	11.0	11.5	I10.3^{S}	9.1	5.7	4.9	5.0^{S}	5.1	4.6
3	4.5^{S}	4.7	4.5^{S}	4.5	4.7	J4.3^{S}	4.1	8.1^{S}	J10.8^{S}	S	S	S	J13.8^{S}	13.5	12.5	11.5	11.1	9.6	I9.0^{S}	U7.6^{S}	5.3	5.5	5.4	5.7
4	4.8^{S}	5.0	5.2	5.2	C	C	C	C	C	S	J15.5^{S}	J14.3^{S}	13.5	I13.8^{S}	13.3	12.7	U11.2^{S}	9.3	6.8	5.8^{S}	6.4	6.1^{S}	U3.7^{S}	3.6^{S}
5	3.5^{S}	3.7	3.4	3.4	3.4	3.4	4.2	U7.5^{S}	10.2	12.9^{S}	13.1	11.6^{S}	12.6	13.2	13.1	12.7	U11.2^{S}	8.7	U8.4^{S}	5.7	5.8	5.5	U4.6^{S}	4.1^{S}
6	4.2^{S}	4.0	3.9	3.7	3.7	3.7^{S}	3.8	6.8	11.3	I14.2^{S}	I15.4^{S}	U16.3^{S}	S	S	S	13.5	11.1	I9.5^{S}	J7.4^{S}	5.3	4.8	I4.5^{AS}	4.0^{S}	4.3^{S}
7	U4.3^{S}	4.4^{S}	I4.2^{AS}	U3.8^{S}	4.0^{S}	3.8^{S}	U4.0^{S}	J7.9^{S}	J10.3^{S}	13.1	I13.4^{S}	I13.8^{S}	I14.0^{S}	I14.4^{S}	I13.7^{S}	12.0	10.7^{R}	9.8^{S}	7.2^{S}	6.6	6.0	I4.8^{S}	2.9	3.1
8	3.3	3.2	3.2	3.3	3.1	2.9	3.3^{S}	7.9^{S}	U10.4^{S}	11.9	12.8	13.8	12.8	12.5	12.1	11.3	11.4	9.5^{S}	5.2	5.6	5.2	3.6^{S}	I3.7^{S}	3.8
9	3.8	3.9	3.5^{S}	3.2	3.1	3.3	3.5^{S}	U7.4^{S}	9.3^{S}	11.4	13.1	13.2	13.1	12.8	12.5	12.2	J10.3^{S}	9.3	7.3^{S}	5.8	5.8	4.2^{S}	3.4	3.5
10	3.5	3.4	J3.5^{S}	3.7	3.3	3.4	4.1	7.8^{S}	8.5	11.4	13.2	13.2	11.9	11.4	10.8	11.0	U10.3^{R}	8.9^{S}	I6.7^{S}	4.3	U3.5^{S}	3.4^{S}	U3.6^{S}	3.8^{S}
11	3.9^{S}	U4.1^{S}	4.4^{S}	4.0^{S}	4.0	3.8^{S}	U3.9^{S}	I7.4^{S}	U9.5^{S}	10.4	U13.6^{S}	U14.0^{S}	12.7^{S}	11.9^{S}	11.7	12.0	I11.0^{S}	I8.0^{S}	I6.2^{S}	6.0^{S}	I4.2^{S}	2.9	I2.9^{S}	J2.9^{S}
12	3.1^{S}	U3.2^{S}	3.3	3.2^{S}	3.5	2.9	3.2	U6.8^{S}	I8.4^{S}	U9.2^{S}	I12.3^{S}	13.4^{S}	12.8^{S}	U13.4^{S}	J11.2^{S}	J11.2^{S}	U10.9^{S}	U8.1^{S}	I7.2^{S}	I5.2^{S}	I3.7^{S}	I3.2^{S}	3.2^{S}	U3.2^{S}
13	3.0^{S}	U3.5^{S}	I4.0^{S}	I3.9^{S}	U2.7^{S}	2.3	3.0	S	S	I9.9^{S}	13.2	I11.1^{S}	U9.3^{S}	I10.8^{S}	U11.2^{S}	11.5	I10.3^{S}	I7.5^{S}	I6.8^{S}	5.6	J4.8^{S}	3.9	4.1^{S}	I3.7^{S}
14	U3.6^{S}	I3.8^{S}	3.9	3.6^{S}	3.6	I3.6^{S}	I3.5^{S}	J6.5^{S}	U8.3^{S}	11.5^{S}	I13.5^{S}	U13.5^{S}	11.4^{S}	11.7	11.7^{S}	I12.2^{S}	11.8	J8.5^{S}	6.6^{S}	5.4	I5.3^{S}	5.5	I4.2^{S}	4.5
15	4.0	4.1	4.1^{S}	4.4^{S}	4.0^{S}	3.6^{S}	3.5	I8.5^{S}	I10.6^{S}	P14.5^{S}	C	C	C	12.6	11.5	12.2	11.2	8.0^{S}	J7.6^{S}	3.9	3.3^{S}	2.9	3.3^{S}	J3.6^{S}
16	3.9	4.0	J4.0^{S}	3.6	3.5	3.8	5.3	U6.6^{S}	8.6	11.5	S	S	I13.3^{S}	13.0	12.6	11.7	J11.2^{S}	J8.3^{S}	5.7	4.8	4.1	J3.5^{S}	3.1	3.3
17	J3.4^{R}	3.2	3.2	3.2	3.3	3.5^{S}	I4.3^{S}	I7.8^{S}	I10.8^{S}	12.0^{S}	12.2	12.8	I13.3^{C}	11.8	I10.8^{C}	I11.4^{C}	I10.2^{S}	I7.6^{S}	I5.6^{S}	U4.3^{S}	U4.2^{S}	3.8	I2.7^{A}	2.8
18	2.8	3.1	3.3	3.5	3.2	3.2	3.9^{R}	J6.4^{S}	8.2	10.9	12.1	12.3	12.1	12.1	11.4	11.7	11.3	7.1	I6.5^{S}	5.6	4.6	4.4	3.5	3.3
19	3.2	3.3	3.5	3.5	3.0	3.1	3.3	U6.7^{S}	9.1	I10.8^{S}	13.1	11.7	11.4	10.7	11.1	10.9	I10.2^{S}	I7.3^{S}	5.8^{S}	U5.6^{S}	I4.1^{S}	3.2	3.6	3.6^{S}
20	I3.5^{S}	3.5	3.5	3.7	3.6	3.7^{S}	4.0^{S}	8.4^{S}	I12.0^{S}	U14.2^{S}	14.1^{S}	J14.1^{S}	13.4	12.2	11.6	11.5	I10.7^{S}	8.5	6.9	5.7	4.3^{S}	3.6^{S}	3.8	3.9
21	3.6	3.5	3.6	3.0	3.0	3.2	3.3^{S}	6.2^{S}	8.5	U10.1^{S}	12.3	U12.2^{S}	12.1	11.2	I10.4^{S}	I10.0^{S}	I9.5^{S}	U8.0^{S}	I6.2^{S}	J6.4^{S}	4.7^{S}	I3.6^{S}	3.0^{S}	3.3^{V}
22	3.1	J3.4^{S}	3.5	2.7	2.5	2.6	3.0	I6.5^{S}	8.5^{S}	I10.3^{S}	11.7	12.6	11.2	10.3	J10.3^{S}	10.2	I9.4^{S}	I7.4^{S}	6.3	I6.1^{S}	I4.0^{S}	I3.8^{S}	J3.5^{S}	I3.2^{S}
23	3.1^{S}	3.0	3.0	2.7	2.7	2.8	3.1	6.3^{S}	I8.4^{S}	10.8^{S}	12.6	12.7	11.6	10.9^{S}	11.3	10.5^{S}	J10.0^{S}	8.7	I8.5^{S}	5.9	4.3^{S}	I3.2^{S}	3.2	3.2^{S}
24	3.4	3.2	3.2	3.0	3.0^{S}	3.4^{S}	2.7	6.0	U9.4^{S}	12.5	12.7	J13.4^{S}	13.5	11.6	10.6^{S}	10.2	U10.2^{S}	9.0	I7.6^{S}	6.8	4.9^{S}	4.8	5.5^{S}	3.9
25	J3.7^{S}	4.0	J4.2^{S}	3.9	3.9	U4.6^{S}	5.0^{S}	6.9	9.1	11.0	13.1	11.9	11.4	11.7	I11.6^{C}	10.9	9.3^{S}	8.1	C	C	I4.8^{C}	3.9	3.9	J4.2^{S}
26	I3.6^{C}	3.5	3.1	3.2	3.1	I3.3^{C}	3.6^{S}	C	C	C	11.7	J12.4^{S}	10.4	J10.2^{S}	U12.1^{S}	11.7	I9.0^{S}	I8.0^{S}	J8.4^{S}	7.1^{S}	J4.1^{S}	3.2	3.2	U3.4^{S}
27	3.7^{S}	3.7	2.9	I3.1^{S}	3.3^{S}	3.1	3.3	6.3^{S}	9.1^{S}	13.6	S	S	U13.9^{S}	I13.3^{S}	13.2	11.8^{S}	I10.6^{S}	10.7	J8.1^{S}	5.3	4.2	I4.2^{S}	U4.5^{S}	4.4
28	4.0	4.0	3.3	2.9	3.0	3.0	3.3	6.7^{S}	U12.4^{S}	P15.0^{S}	I14.8^{S}	14.2	14.2	U13.9^{S}	13.9	J11.6^{S}	I10.4^{S}	9.8^{S}	10.1	J8.4^{S}	3.3	3.3^{S}	3.5	3.5^{S}
29	3.8	4.0	3.1	3.1	3.3	3.0	3.3	U7.5^{S}	11.4	S	S	U13.6^{S}	13.5	12.8	12.5	11.8	I10.4^{S}	8.4^{S}	6.2	6.3	U4.2^{S}	3.5	4.1^{S}	4.0^{S}
30	U4.1^{S}	U4.4^{S}	3.6^{S}	2.6	2.7	2.7	2.7	I6.4^{S}	10.5	13.4	I15.0^{S}	14.1^{S}	13.6	13.5	13.1^{S}	12.8	11.4^{S}	8.8	7.0	6.1	4.0	3.2^{S}	I3.4^{S}	3.6^{S}
31	3.4	3.6^{S}	3.2	3.2	U3.3^{S}	3.5	3.9^{S}	6.2^{S}	9.2	11.7	J13.0^{S}	12.3	11.9	11.8	11.9	J10.4^{S}	9.0	I7.4^{S}	6.4	U6.3^{S}	U4.6^{S}	U4.0^{S}	3.4	3.1
No.	31	31	31	31	30	30	30	28	28	27	26	27	29	30	30	31	31	31	30	30	31	31	31	31
Median	3.6	3.7	3.5	3.4	3.3	3.4	3.6	6.8	9.4	11.7	13.1	13.4	12.8	12.4	11.7	11.6	U10.7	8.5	7.0	5.8	4.6	3.8	3.6	3.6
u. q.	4.0	4.1	4.0	3.8	3.6	3.7	4.1	7.8	10.8	13.4	14.1	14.1	13.6	13.2	12.6	12.0	11.2	9.3	7.6	6.3	5.2	4.8	4.1	4.0
l. q.	3.4	3.4	3.2	3.1	3.0	3.0	3.3	6.4	8.6	10.8	12.6	12.3	11.8	11.6	11.2	11.0	10.2	8.0	6.3	5.4	4.1	3.3	3.2	3.3
q. R	0.6	0.7	0.8	0.7	0.6	0.7	0.8	1.4	2.2	2.6	1.5	1.8	1.8	1.6	1.4	1.0	1.0	1.3	1.3	0.9	1.1	1.5	0.9	0.7

foF2

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

The Radio Research Laboratories, Japan.

K 1

IONOSPHERIC DATA

Dec. 1959 | 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																								
4								C	C															
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15											C	C	C											
16																								
17													C		C	C								
18																								
19																								
20																								
21																								
22																								
23																								
24																								
25																								
26								C	C	C														
27																								
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. 1959 | 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	2.60	3.30	3.45^{S}	I3.35^{A}	3.60	3.50^{S}	3.30	2.80^{S}	S							
2								B	2.75^{R}	I3.15^{R}	I3.35^{B}	I3.50^{S}	3.50	I3.55^{B}	I3.40^{R}	3.05^{R}	S							
3								A	A	A S	R S	I3.50^{S}	3.60^{R}	3.55^{R}	3.20	3.00	I2.20^{S}							
4								C	C	I3.20^{S}	I3.40^{A}	3.50	3.55	U3.50^{R}	3.05	R	A							
5								S	2.75^{S}	I3.15^{A}	U3.30^{S}	I3.30^{A}	A S	A S	S	U2.80^{S}	S							
6								A	U2.50^{A}	U3.10^{S}	S	A	A	I3.20^{A}	I2.70^{A}	A S	A S							
7								B	2.70	U3.30^{R}	3.50^{S}	I3.45^{A}	I3.50^{A}	A	A S	A	A							
8								S	2.70	3.10^{S}	U3.30^{R}	3.50^{S}	I3.50^{B}	3.40	3.25^{S}	2.90	A							
9								B	2.70	U3.20^{A}	I3.25^{A}	U3.30^{A}	I3.45^{S}	I3.40^{S}	U2.90^{A}	2.70	S							
10								2.30^{S}	I2.50^{U}	U3.25^{S}	I3.35^{S}	I3.40^{B}	3.50^{S}	3.40^{S}	S	B	A S							
11								S	2.80^{S}	3.25	I3.30^{S}	I3.50^{S}	3.50^{S}	3.30^{S}	I3.05^{R}	2.70^{S}	S							
12								S	2.80^{S}	U2.90^{S}	I3.20^{S}	I3.40^{S}	I3.50^{S}	I3.30^{S}	I3.10^{S}	2.80	S							
13								S	2.60	U3.00^{S}	I3.05^{S}	I3.40^{S}	I3.40^{S}	I3.30^{S}	U2.90^{S}	2.50	S							
14								S	U2.70^{S}	I3.00^{S}	I3.40^{S}	3.30	U3.40^{S}	3.30	3.00^{S}	2.60	S							
15								B	2.50	I3.00^{A}	C	C	C	A	3.10^{S}	2.85	U2.10^{R}							
16								B	A	A	U3.30^{R}	3.35	I3.30^{A}	3.30	3.20^{R}	2.65	S							
17								B	A	A S	3.30^{R}	A	C	3.25^{R}	I2.95^{C}	I2.60^{C}	S							
18								B	2.60	2.80	3.40	3.30	3.35	I3.20^{R}	3.00	2.50^{R}	S							
19								S	2.35	I3.10^{S}	3.35^{R}	3.40	3.40^{R}	3.40^{R}	3.00	2.75	A							
20								A	A	A	A	A	A	A	A	A	A							
21								S	2.55	3.00	I3.40^{S}	I3.55^{S}	I3.60^{R}	3.50	U3.25^{S}	I2.80^{R}	S							
22								1.95^{S}	2.40	I3.00^{A}	I3.25^{A}	3.40^{R}	I3.45^{S}	U3.40^{S}	U3.45^{S}	U2.85^{S}	S							
23								B	2.50	I3.05^{S}	I3.30^{A}	3.50^{S}	I3.50^{S}	I3.20^{S}	2.85^{S}	I2.70^{A}	S							
24								B	A	3.20^{S}	A	S	A	A S	S	2.90	S							
25								S	2.70	I3.25^{S}	I3.50^{S}	I3.50^{S}	U3.50^{S}	I3.30^{A}	I2.95^{C}	2.80	S							
26								C	C	C	U3.40^{S}	U3.40^{S}	3.50^{S}	3.35	3.15^{S}	2.75	S							
27								B	2.70	U3.00^{S}	A	A	A	A S	A S	A	A S							
28								B	2.70^{R}	A	3.25	3.40	A	A	3.05	2.70	A							
29								S	I2.40^{A}	I2.95^{A}	3.30^{S}	U3.50^{S}	3.55^{S}	3.50^{S}	3.30^{S}	2.90^{S}	S							
30								B	I2.60^{B}	2.95	I3.30^{A}	I3.40^{S}	U3.50^{S}	3.40	3.10	2.90	S							
31								S	2.80^{S}	2.90	I3.30^{S}	3.40	3.50^{R}	I3.45^{S}	I3.20^{S}	2.90	B							
No.								7	24	25	25	25	23	24	25	25	2							
Median								U2.10	2.70	U3.10	U3.30	U3.40	U3.50	3.40	3.10	2.80	2.15							

The Radio Research Laboratories, Japan.

foE

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

K 3

IONOSPHERIC DATA

Dec. 1959 | 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	2.9^{M}	E	E	E	E	E	2.7^{M}	B	2.6^{q}	G	S	3.5	G	S	3.8	3.4	3.7^{MS}	3.0^{M}	E	3.0^{M}	3.4^{M}	E	2.1^{M}	E
2	2.8^{M}	E	2.2^{M}	4.1^{M}	E	E	E	B	G	G	B	S	G	B	G	G	S	S	2.8^{M}	3.6^{M}	3.0^{M}	3.6^{M}	2.8^{M}	E
3	E	E	E	E	E	E	3.9^{M}	6.7^{M}	3.1	4.5^{MS}	3.0^{q}	S	G	G	G	G	S	E	E	E	E	E	E	E
4	2.9^{M}	3.4^{M}	E	E	C	C	C	C	C	S	8.2^{M}	G	G	3.3^{q}	3.2	G	3.6^{M}	3.0^{M}	E	4.5^{M}	2.9^{M}	E	4.4^{M}	E
5	E	E	E	E	E	E	E	S	G	3.8	5.8^{M}	4.3^{M}	4.5^{MS}	4.0^{MS}	3.5^{M}	2.7^{q}	S	3.1^{M}	2.2	E	2.5^{M}	4.4^{M}	E	E
6	E	E	E	E	E	E	S	3.5^{MS}	4.4^{M}	4.6^{M}	5.8^{MS}	7.3^{M}	4.5^{M}	4.0^{M}	3.9^{M}	3.9^{MS}	8.6	5.8^{M}	4.4^{M}	3.5^{M}	4.8^{M}	5.7^{M}	4.0^{M}	2.7^{M}
7	3.2^{M}	3.5^{M}	6.1^{M}	3.0^{M}	3.2^{M}	2.8^{M}	2.8^{M}	B	G	G	S	3.8	3.9	3.9	3.7^{MS}	4.5^{M}	4.3^{M}	5.9^{M}	3.8^{M}	S	E	E	E	3.7^{M}
8	3.6^{M}	4.4^{M}	2.8^{M}	2.6^{M}	E	E	E	S	G	3.3	G	2.6^{q}	3.8	G	S	G	3.0^{M}	3.0^{M}	E	E	2.7^{M}	E	E	3.0^{M}
9	E	E	E	E	E	E	E	B	G	3.7	4.0^{M}	3.8^{S}	3.9^{S}	S	3.3	G	S	3.0^{M}	E	E	E	E	E	E
10	E	E	E	E	E	E	E	G	G	G	S	B	G	G	S	B	3.3^{MS}	3.8^{M}	E	E	E	E	E	E
11	E	E	E	E	E	E	E	S	S	G	S	S	S	S	S	S	S	S	E	E	S	E	S	S
12	E	E	E	E	2.5^{MS}	E	E	S	S	S	S	S	S	S	S	S	S	S	S	E	S	S	E	S
13	S	S	S	E	2.0	E	E	S	G	S	S	S	S	S	G	G	S	S	S	E	S	E	E	E
14	E	S	E	E	E	E	E	S	3.6^{M}	S	S	G	S	G	S	G	S	E	E	E	E	2.4	E	
15	E	E	E	E	E	E	E	B	G	3.3^{M}	C	C	C	3.9^{M}	G	G	G	3.1^{S}	E	E	E	3.0^{M}	E	4.1^{M}
16	E	E	E	E	E	E	E	B	2.8	4.2^{MS}	3.1^{q}	G	4.6	G	G	G	S	3.1^{M}	E	2.2^{M}	2.2	E	E	E
17	E	E	E	1.8^{M}	E	E	E	B	3.6^{M}	5.8^{MS}	G	3.5	C	3.2^{q}	C	C	S	3.6	4.4^{M}	4.4^{M}	3.1^{M}	E	4.6^{M}	E
18	E	E	E	E	E	E	E	B	G	G	3.8^{M}	G	G	G	G	G	S	S	3.0^{M}	E	E	E	E	E
19	E	E	E	E	E	E	E	S	2.7	S	G	G	G	G	G	G	^{D}2.7^{S}	3.8^{M}	3.0^{M}	E	E	E	E	E
20	E	E	E	2.2^{M}	E	E	E	2.7	2.6	3.4^{M}	4.4^{S}	4.4^{S}	9.5^{M}	4.2^{M}	3.7^{S}	6.1^{M}	3.7^{M}	^{U}3.0^{S}	E	2.3^{M}	S	S	E	E
21	E	E	E	E	E	E	E	S	3.0	3.3	S	S	2.4^{q}	G	G	S	S	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	S	S	3.2	3.5	G	S	G	G	G	S	E	E	S	E	E	E	E
23	E	E	E	E	E	E	E	B	G	4.0	3.6	G	3.9	3.7^{M}	G	4.0^{M}	S	S	E	E	E	S	E	E
24	E	E	E	E	E	E	E	B	2.8	G	4.5^{MS}	S	4.0	4.3^{MS}	4.4^{M}	G	S	S	E	E	E	E	3.0^{MS}	2.7^{MS}
25	3.5	E	S	E	E	E	E	S	G	S	S	S	S	6.8	C	G	S	S	C	C	C	S	3.5^{M}	3.6^{M}
26	^{D}4.0^{C}	E	3.2	2.4^{M}	C	C	E	C	C	C	G	3.5^{M}	G	G	G	S	S	3.4^{M}	E	E	E	E	E	6.1^{M}
27	4.2^{M}	3.6^{M}	E	E	E	E	E	B	G	3.9	3.9^{M}	4.0^{M}	3.9	4.0	3.9^{MS}	4.4^{M}	5.7^{M}	4.1^{M}	3.4^{M}	E	E	E	E	E
28	E	2.4	E	E	E	E	E	B	G	3.1	G	G	3.9	4.6^{S}	2.8^{q}	G	2.6	2.9^{S}	4.5^{M}	5.5^{M}	E	E	E	E
29	E	E	E	E	E	E	E	S	2.7	3.4	S	S	G	G	G	G	S	E	E	E	E	E	E	E
30	E	E	E	E	E	E	E	B	B	G	3.4	S	3.7	G	G	G	S	S	E	E	E	S	3.0^{M}	2.8^{M}
31	2.1^{S}	2.5^{M}	2.8^{M}	E	E	E	E	S	G	G	S	4.0	3.9	4.2	S	G	B	3.1^{M}	3.0	E	2.6^{M}	E	E	E
No.	30	29	29	31	29	29	29	4	25	24	18	19	23	25	23	25	10	22	28	28	26	26	30	29
Median	E	E	E	E	E	E	E	3.1^{M}	G	3.3	3.6	3.5	3.8	G	G	G	3.6^{M}	3.0^{M}	E	E	E	E	E	E
U. Q.	2.8	E	E	E	E	E	E	5.1	2.8	3.8	4.4	4.0	3.9	4.0	3.7	G	4.3	3.6	3.0	2.2	2.6	E	2.4	2.7
L. Q.	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	3.0	2.9	E	E	E	E	E	E
Q. R.																	1.3	0.7						

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. 1959 | 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	E						2.0	B	2.1		S	3.5^{S}		S	S	D3.4^{S}	3.3	2.0		2.1	2.7		E	
2	E		E	2.2				B			B	S		B			S	S	1.9	2.3	1.9	2.3	2.1	
3							2.6	4.2	3.0	D4.5^{S}	2.9	S		E2.7^{A}	D3.2^{S}		S							
4	2.2	2.0			C	C	C	C	C	S	4.1						2.7	2.2		2.7	E		2.2	
5								S		S	5.1^{S}	D4.3^{S}	D4.5^{S}	S	3.4	2.1	S	2.4	2.0		E	3.2		
6							S	3.0	D4.4^{S}	4.5^{S}	5.1	5.4	4.1	3.6	D3.9^{S}	3.1	5.4^{S}	5.0	2.3	2.7	E3.8^{A}	A S	2.5	1.9
7	2.0	2.4	3.7	1.9	2.2	1.5	2.0	B			S	3.5	D3.9^{S}	S	S	3.6	3.8	3.0	2.6	S				E
8	2.0	2.7	1.9	2.0				S		G		2.6	3.7^{S}		S		2.6	2.5			2.0			2.1
9								B		3.3	4.0	U3.6^{S}	3.6	S	3.2		S	2.6						
10											S	B			S	B	2.6^{S}	2.3						
11								S	S		S	S	S	S	S	S	S	S			S		S	S
12					E			S	S	S	S	S	S	S	S	S	S	S	S		S	S		S
13	S	S	S		E			S		S	S	S	S	S			S	S	S		S		E	
14		S						S	G	S	S		S		S		S					Z.2		2.5
15								B		3.2	C	C	C	U3.6^{S}				E						
16								B	2.8	4.1^{S}	D3.1^{B}		3.5				S	1.9		E	E			
17				E				B	3.0	5.2		3.5	C	2.8	C	C	S	S	3.8	E3.5^{A}	3.1		A	
18								B			3.0						S	S	2.3					
19								S	2.6	S							D2.7^{S}	2.2	E					
20				E				2.4	D2.6^{B}	2.9	4.3	U4.3^{S}	4.5	3.9	U3.2^{S}	4.2	U2.2^{S}	2.1		E	S	S		
21								S	3.0	3.3	S	S	D2.4^{S}			S	S							
22								S	S	3.2	3.5		S				S			S				
23								B		3.8	3.4		S	3.5		2.9	S	S				S		
24								B	D2.8^{S}		3.6	S	S	D4.3^{S}	D4.4^{S}		S	S					E	E
25	2.2		S					S		S	S	S	S	5.0	C		S	S	C	C	C	S	E	1.9
26	C		2.0	E	C	C		C	C	C		2.3				S	S	2.2						2.4
27	2.5	2.3						B		3.3^{S}	3.9^{S}	3.6	3.9	D4.0^{S}	3.5	D4.4^{S}	3.8	2.1	2.5					
28		E						B		U3.1^{S}			D3.9^{S}	4.0	2.3		2.6	2.6	2.2	2.5				
29								S	2.7	3.3	S	S					S							
30								B	B		3.4	S	3.7				S	S				S	S	2.4
31	1.9	1.7	1.6					S			S	4.0	3.9^{S}	D4.2^{S}	S		B	2.5	1.9		1.8			
No.	8	6	5	6	3	1	3	3	10	14	12	11	11	11	7	7	10	16	10	7	8	4	8	8
Median	2.0	2.2	1.9	E	E	1.5	2.0	3.0	D2.8	3.3	3.8	3.6	3.9	3.9	3.4	D3.4	D2.7	2.2	2.2	2.3	1.8	2.8	E	2.0

f_bE_s

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

The Radio Research Laboratories, Japan.

K 5

IONOSPHERIC DATA

Dec. 1959 | 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	1.60	1.90	1.70	1.70	1.60	1.80	1.60	2.50	1.60	2.10	2.70	2.40	2.60	2.55	2.10	1.70	E2.50 S	E1.70 S	1.60	1.60	1.50	1.80	1.50	1.90
2	1.80	1.40	1.40	1.10	1.70	1.60	1.30	2.20	E1.70 S	2.20	3.50	E3.90 S	2.50	3.00	2.20	2.20	E2.50 S	1.70	1.10	1.80	1.40	1.40	1.60	1.40
3	1.90	1.70	1.70	1.10	1.70	1.40	1.80	1.60	1.80	1.30 S	2.00	E2.70 S	2.40	2.55	E2.40 S	2.20	E2.60	1.30 S	1.90	2.00	1.50	1.60	2.00	1.80
4	E1.90 S	1.50 S	1.70	1.70	C	C	C	C	C	E1.40 S	2.60	2.10	2.00	2.00	2.00	2.30	1.80	1.70	1.80	1.00	1.70	2.00	1.50	2.00
5	1.90	1.40	1.10	1.70	1.50	1.80	1.60	E2.00 S	E1.40 S	1.90	2.10	2.20	1.80	E1.70 S	1.70	1.70	E2.30 S	1.50	1.50	1.80	1.70	1.30	1.90	1.90
6	1.60	1.40	1.30	1.30	1.50	1.60	E1.70 SE	1.60 S	E1.90 S	E1.80 S	2.00	2.40	E1.70 S	2.30	E1.60 S	1.40	E1.50 S	1.60	1.20	1.60	E1.80 SE	E1.20 S	1.30	E1.10 S
7	E1.70 S	1.30	1.30	1.25	1.70	1.70	1.10	2.10	E2.00 S	2.00	2.00	2.20	2.10	2.10	E1.50 S	1.80	E2.00 S	E1.60 S	1.20	E2.00 S	2.00	1.40	1.80	1.90
8	1.40	1.20	1.10	1.15	1.70	1.30	1.30 S	E2.30 S	1.90	1.40	2.00	1.50	E2.00 S	2.20	1.90	E1.70 S	1.40	1.40	2.00	1.90	1.60	2.20	2.00	1.30
9	1.60	1.25	1.70	1.90	1.30	1.60	1.80	2.30	2.10	2.25	2.20	2.10	E2.60 SE	E2.30 S	2.20	2.20	E2.50 S	1.40	1.70	2.00	1.95	1.95	1.90	1.70
10	1.70	1.90	1.65	1.65	1.20	1.60	1.90	2.00	2.00	E2.20 S	2.20	3.60	2.20	E2.30 S	E3.10 S	3.10	E2.00 S	E1.30 S	2.00	2.20	2.00	1.60	1.40	1.70
11	2.00	1.90	1.20	1.70	2.30	1.70	1.70	E2.20 S	E1.20 S	E1.60 S	E3.60 S	E4.90 S	E2.50 S	2.20	E2.70 S	2.20	E3.10 S	E2.60 S	1.50	1.90	E2.00 S	E1.80 S	E2.10 S	E2.00 S
12	1.50	1.30	1.90	1.80	1.60	2.00	1.40 S	E2.00 S	E1.90 S	E1.40 S	E1.70 S	E2.10 S	E3.50 S	E1.60 S	E1.70 S	E1.80 S	E2.40 S	E1.80 S	E2.00 S	1.50	E1.90 S	E2.20 S	1.60	E1.90 S
13	E1.60 S	E1.50 S	E1.80 S	1.40	1.60 S	1.20	1.40	E2.20 S	E1.40 S	E1.90 S	1.80	2.10	2.50	2.20	E2.00 S	1.80	E2.40 S	E1.50 S	E1.80 S	1.50	E1.40 S	1.60	1.60	1.50
14	1.40	E1.80 S	1.30	1.50	1.20	1.40	1.40	E2.20 S	2.10	E1.60 S	E2.00 S	1.90	E1.40 S	1.00	E2.10 S	E1.70 S	E2.00 S	1.90	1.80	2.00	2.10	1.70	1.40	1.60
15	1.90	1.60	1.30	1.40	1.40	1.50	1.70	2.00	1.90	2.05	C	C	C	2.55	2.20	2.10	1.80	1.60	1.30	1.30	1.70	1.50	2.00	1.70
16	1.20	2.00	1.60	1.30	1.40	1.50	1.30	2.00	1.90	1.90	2.20	2.10	2.30	2.30	2.00	1.60	E2.90 S	1.10	1.60	1.40	1.50 S	1.80	1.40	1.30
17	1.80	1.80	1.50	1.35	1.40	1.90	2.00	2.20	E1.60 S	1.40 S	2.00	2.40	C	2.00	C	C	E2.10 S	1.80	1.80	1.80	1.20	2.20	2.00	2.10
18	1.80	1.80	1.50	2.00	1.20	1.50	1.30	2.20	2.00	2.30	2.20	2.10	2.10	2.10	2.10	2.10	E2.50 SE	1.95 S	1.90	1.50	1.50	1.90	1.50	1.50
19	1.90	1.50	1.60	1.60	1.60	1.70	1.60	E2.20 S	1.70	1.50	2.15	2.30	2.30	2.20	1.90	1.80	1.90	1.70	2.00	1.50	2.20	2.00	1.80	1.90
20	2.10	1.80	1.60	1.30	1.70	2.00	1.50 S	1.10	2.00	2.00	2.80	2.20	2.40	2.50	2.20	2.20	1.90	E1.70 S	1.70	1.70	E2.00 SE	E1.90 S	1.70	1.90
21	1.60	1.40	1.60	1.40	1.35	1.60	1.70	E2.10 S	2.20	1.30 S	E3.60 S	2.30	2.20	2.40	2.20	2.10	E2.20 S	1.80	1.50	1.70 S	1.90	2.00	2.00	1.70
22	1.50	1.50	1.80	1.60	1.60	1.50	1.20 S	E1.90 S	E1.50 S	1.60	2.30	2.00	E4.50 S	2.40	2.10	E2.40 S	E2.60 S	1.70	2.00	E4.00 S	1.90	1.90	2.00	1.50 S
23	2.10	1.70	1.80	1.70	1.60	1.60	1.40 S	2.10	1.30	E2.00 S	2.10	2.00	E2.40 S	2.10	2.10	1.30 S	E4.30 S	E1.90 S	1.90	1.60	1.70 S	S	1.80 S	1.50
24	1.90 S	1.30	1.70	1.70	1.90	1.30	1.90	1.90	E2.10 S	2.00	1.90	E5.00 S	2.50	E2.80 S	2.00	2.20	E2.40 SE	E2.50 S	1.80	1.80	1.80	1.90	E1.90 SE	E1.80 S
25	E1.40 S	2.30	E2.00 S	2.00	1.50	1.30	1.90	E2.20 S	2.20	E2.10 S	2.20 S	2.30	2.30	E2.80 S	C	2.00	E3.30 S	E2.50 S	C	C	C	E2.70 S	1.30	1.20
26	1.80	1.70	1.30	1.25	E1.40 S	C	1.30 S	C	C	C	2.30	1.90	2.30	1.80	1.80 S	1.70 S	E2.40 S	1.50	1.70	1.30	1.90	1.20 S	2.10	1.50
27	1.70	1.70	2.00	1.40	1.50	1.30	1.80	1.90	1.75	1.90	1.90	2.30	2.40	2.10 S	1.30 S	1.80	E2.00 S	1.90	1.40	1.60	1.70	1.80	1.80	1.70
28	2.10	1.70	1.20	1.50	1.40	1.80	1.50	2.00	1.80	1.90	2.20	2.20	2.20	1.95	2.10	2.15	1.90	1.60	1.90	E2.10 S	1.70	1.50	1.65	1.70
29	1.50	1.80	1.45	1.40	1.80	1.60	1.55 S	E2.20 S	1.80	1.60	2.10	1.60	2.10	E1.50 S	2.00	2.10	E2.90 S	1.65	1.10	1.50	1.40	1.30	1.80	1.10
30	1.30	1.40	1.40	1.15	1.10	1.50	1.60 S	2.10	2.75	2.10	2.20	E3.00 S	2.30	2.10	2.30	1.90	E2.70 S	E2.10 S	1.70	1.40	1.75	E2.20 S	1.90	1.45
31	1.50	2.25	1.40	2.25	1.50	1.30	1.40	E2.00 S	2.20	1.80 S	2.20	1.80	2.20	2.30	2.30	2.15	2.60	2.20 S	1.20	1.80	1.30	1.90	2.00	1.20
No.	30	30	29	31	30	29	29	21	27	27	28	25	24	27	25	29	31	27	28	27	26	26	29	28
Median	E1.70	1.55	1.45	1.40	1.50	1.60	1.55	2.00	E1.90	E1.90	2.20	2.10	2.25	2.20	2.00	2.00	E2.40	E1.60	1.70	1.60	1.70	1.80	1.80	1.65

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. 1959 | (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	2.45	2.40	2.40	2.35	2.35	2.35	2.50	3.00	3.15	3.10	3.10	3.00	3.00	2.90	2.95	3.05	3.15	3.15	3.00	2.95	2.95	3.25	2.40	2.50
2	2.50	2.70	2.90	2.70	2.50	2.65	2.85	3.30	3.20	3.10	3.00	3.10	2.95	2.90	2.95	2.85	2.95	3.05	3.20	3.00	2.65	2.60	2.65	2.50
3	2.55	2.45	2.50	2.40	2.50	2.60	2.70	3.10	3.05	S	S	S	3.00	2.95	3.05	2.95	3.05	3.00	3.10	3.15	2.75	2.55	2.55	2.65
4	2.55	2.50	2.50	2.55	C	C	C	C	C	S	3.10	3.00	2.95	3.00	3.10	3.05	3.10	3.10	3.10	2.85	2.85	3.30	2.70	2.60
5	2.60	2.90	2.70	2.70	2.70	2.60	3.05	3.30	3.15	3.35	3.30	3.30	3.10	3.00	3.00	3.05	3.15	3.10	3.30	2.90	2.90	2.85	2.50	2.25
6	2.30	2.25	2.20	2.15	2.20	2.25	3.15	2.80	3.00	3.00	3.00	2.95	S	S	S	3.05	3.10	3.00	3.20	3.10	2.85	2.85	2.55	2.55
7	2.70	2.75	3.00	2.60	2.65	2.70	2.85	3.30	3.20	3.20	3.15	3.00	3.00	3.00	3.00	3.00	3.05	3.15	3.05	3.05	3.15	3.25	2.60	2.70
8	2.50	2.50	2.60	2.60	2.90	2.70	2.75	3.25	3.15	3.30	3.15	3.10	3.05	3.05	3.00	3.10	3.10	3.25	3.05	3.05	3.25	2.80	2.70	2.80
9	2.80	2.80	2.90	2.55	2.45	2.65	2.85	3.25	3.15	3.15	3.05	3.10	3.05	2.80	2.90	3.05	2.90	3.00	3.15	2.95	3.05	2.85	2.40	2.55
10	2.35	2.45	2.50	2.70	2.60	2.50	2.90	3.20	2.95	3.25	3.10	3.25	2.95	2.90	2.95	3.00	2.95	3.10	3.00	3.20	2.75	2.65	2.60	2.60
11	2.55	2.65	2.90	2.70	2.75	2.65	2.85	3.00	3.25	3.10	3.20	3.15	3.15	3.05	3.05	3.15	3.15	3.00	3.00	3.20	3.05	2.70	2.70	2.70
12	2.60	2.70	2.80	2.70	2.90	2.55	2.70	3.30	3.20	3.25	3.05	3.00	2.95	3.05	3.05	3.10	3.20	3.10	3.20	3.20	2.90	2.40	2.80	2.55
13	2.50	2.45	2.85	3.15	3.35	2.50	2.75	S	S	2.90	3.05	3.15	3.00	2.95	2.95	3.00	3.10	3.00	3.10	3.00	2.95	2.70	2.65	2.70
14	2.55	2.70	2.70	2.75	2.70	2.70	2.90	2.95	3.25	3.10	3.10	3.05	3.05	3.00	2.95	3.00	3.20	3.05	3.00	2.80	2.85	2.95	2.70	2.85
15	2.45	2.65	2.50	2.75	2.85	2.55	2.50	3.10	3.00	S	C	C	C	2.95	2.90	2.95	3.15	3.00	3.15	3.30	3.00	2.60	2.40	2.45
16	2.55	2.65	2.70	2.55	2.40	2.60	3.20	3.20	3.25	3.15	S	S	3.05	3.05	3.00	3.15	3.20	3.15	3.15	3.15	3.00	2.95	2.70	2.60
17	2.60	2.65	2.55	2.50	2.50	2.65	2.75	3.20	3.25	3.25	3.20	3.05	3.10	3.15	3.10	3.15	3.30	3.30	3.30	3.00	3.05	3.10	2.65	2.70
18	2.55	2.65	2.70	2.85	2.80	2.65	3.05	3.45	3.40	3.20	3.05	3.05	3.05	3.05	3.00	3.10	3.25	3.10	3.20	3.05	3.00	3.10	2.70	2.60
19	2.50	2.50	2.65	3.10	2.65	2.60	2.75	3.15	3.40	3.00	3.30	3.15	3.20	3.10	3.05	3.05	3.20	3.15	2.95	3.40	3.10	2.35	2.55	2.75
20	2.65	2.65	2.55	2.75	2.75	2.60	2.60	3.10	3.15	3.05	3.15	3.05	3.10	3.05	3.00	3.15	3.15	3.20	3.20	3.35	3.00	2.55	2.45	2.75
21	2.70	2.75	2.80	2.80	2.45	2.65	3.05	3.35	3.30	3.25	3.25	3.25	3.15	3.20	S	S	S	3.25	3.10	3.30	3.10	3.00	2.70	2.40
22	2.60	2.65	2.95	3.25	2.65	2.85	2.90	3.35	3.55	3.30	3.20	3.15	3.20	3.00	3.00	3.15	3.30	3.20	3.15	3.20	3.00	2.80	2.85	2.65
23	2.65	2.75	2.75	2.65	2.55	2.45	2.85	3.30	3.30	3.25	3.15	3.20	3.10	3.05	3.00	2.95	3.00	2.95	3.20	3.10	3.20	2.70	2.50	2.55
24	2.45	2.75	2.80	2.45	2.35	2.45	3.10	3.00	3.15	3.20	3.00	3.05	3.00	3.00	3.00	2.95	3.10	3.15	3.05	3.05	2.75	2.75	2.95	2.80
25	2.60	2.60	2.85	2.55	2.65	2.80	3.05	3.15	3.10	3.20	3.20	3.05	3.00	3.00	3.00	3.10	3.15	3.20	C	C	2.90	2.55	2.55	2.90
26	2.80	2.80	2.65	2.55	2.60	2.70	3.00	C	C	C	3.10	3.25	3.15	3.05	3.00	3.20	3.10	3.10	3.10	3.25	2.75	2.50	2.55	2.40
27	2.70	2.75	2.80	2.65	2.50	2.50	2.65	3.00	3.00	3.10	S	S	3.00	2.85	2.95	2.95	3.00	3.00	3.35	2.85	2.90	2.40	2.60	2.70
28	2.50	2.75	2.90	2.40	2.45	2.60	2.50	2.95	3.15	3.25	3.20	3.10	2.95	3.00	3.00	2.95	3.05	2.95	3.15	2.90	3.20	2.40	2.50	2.50
29	2.45	2.75	2.35	2.25	2.40	2.35	2.50	3.05	3.25	S	S	3.00	2.95	2.95	3.00	3.00	3.10	3.05	3.05	3.25	3.35	2.60	2.70	2.70
30	2.70	2.75	3.05	2.90	2.90	2.80	2.90	2.95	3.20	3.20	3.10	3.00	2.90	2.95	2.85	2.95	3.10	3.05	3.00	3.30	2.75	2.50	2.40	2.45
31	2.45	2.55	2.50	2.55	2.45	2.75	2.90	3.05	3.15	3.15	3.25	3.00	3.05	2.95	2.90	3.10	3.05	3.00	3.20	3.05	3.30	2.85	2.55	2.55
No.	31	31	31	31	30	30	30	28	28	26	26	27	29	30	29	30	30	31	30	30	31	31	31	31
Median	2.55	2.65	2.70	2.65	2.60	2.60	2.85	3.15	3.20	3.20	3.10	3.05	3.05	3.00	3.00	3.05	3.10	3.10	3.10	3.10	3.00	2.70	2.60	2.60

(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. 1959 | (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								C	C															
5																								
6																								
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9																								
10																								
11																								
12																								
13																								
14																								
15											C	C	C											
16																								
17													C		C	C								
18																								
19																								
20																								
21																								
22																								
23																								
24																								
25																								
26								C	C	C														
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.

K 8

IONOSPHERIC DATA

Dec. 1959 | 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								C	C															
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15											C	C	C											
16																								
17													C		C	C								
18																								
19																								
20																								
21																								
22																								
23																								
24																								
25																								
26								C	C	C														
27																								
28																								
29																								
30																								
31																								
No.																								
Median																								

h'F2

Sweep 1.0 Mc to 22.0 Mc in 20 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

K 9

IONOSPHERIC DATA

Dec. 1959 | 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	355	390	355	355	375	350	320	250	250^{s}	240	250^{s}	225^{s}	225	225^{s}	250^{s}	240	220	215	220	250	270	275	305	355
2	305	305	250	350	320	320	285	240	240	230	240	245	245	245	240	220	250	230	210	250	255	300	300	300
3	315	340	330	330	300	300	305	250	220	245^{s}	250^{s}	250^{s}	230	250^{s}	245	215	220	210	250	240	220	305	305	300
4	255	325	325	305	C	C	C	C	C	240^{s}	210	220	225	235	245	240	205	205	225	220	260	230	250	320
5	315	265	245	300	305	315	255	225	220	240	225	220^{s}	250^{s}	255^{s}	245^{s}	240	220	225	230	250	255	255^{A}	285	400
6	410	350	420	435	420	405	260^{s}	250	270	250	245	E270^{A}	250^{s}	250	250^{s}	240	220^{s}	260^{A}	220	250	E320^{A}	As	E410^{A}	365
7	315	300	E355^{A}	300	325	260	260	225	230^{s}	225	245	240	250	250	245^{s}	230	240	250	255	250	235	215	300	325
8	355^{A}	E455^{A}	350	310	255	305	265	250^{s}	230	240	235	245	240	240	250^{s}	240	250	215	215	250	245	320	340	300
9	300	265	255	350	375	310	250	250	225	245	240	250	245	E250^{s}	240	240	230	250	220	230	225	255	360	350
10	350	350	340	300	300	340	270	250	230	240	230	250	245	250	240	250	225	220	220	250	290	300	305	345
11	350	330	270	305	300	255	270	250	230^{s}	245	235^{s}	250^{s}	240^{s}	240^{s}	245^{s}	245^{s}	225^{s}	220	255	220	255^{s}	280	E355^{s}	405
12	350	300	320	320	260	315	300	230	240	240	230	255^{s}	220	250^{s}	240^{s}	250	230^{s}	210^{s}	230^{s}	205	245^{s}	E400^{s}	305	350
13	E400^{s}	355^{s}	300	230	220	350	265	220	240	E250^{s}	255	240	240	255	245	250	240	210	220	250	250	250	295	300
14	300	305	260	300	305	300	250	250	240	225^{s}	255^{s}	240	240^{s}	250	240	250	235^{s}	205	245	255	255	255	280	300
15	360	345	350	305	255	300	355	250	225	250	C	C	C	245	245	245	230	210	245	200	255	360^{A}	450	405
16	340	350	300	300	350	350	245	225	230	250	250	230	250	235	240	235	225	210	220	210	250	260	305	310
17	350	350	355	365	350	350	300	245	245	220	245	225	I230^{C}	240	I240^{C}	I250^{C}	230	E255^{s}	250^{A}	310^{A}	E305^{A}	250	I370^{A}	350
18	360	360	315	300	255	320	250	220	210	230	245	250	240	245	240	245	240	210	210	255	230	250	280	310
19	390	350	310	255	295	310	300	240	250	255^{s}	250	240	245	235	250	245	240^{s}	215	255	220	250	390	350	315
20	350	345	315	290	300	350	315	255	250	250	250	250	250	240	245	250	220	220	230	210	245	320	350	300
21	305	300	295	280	355	345	260	230	230	225	255	250^{s}	255^{s}	245	240	250	230^{s}	225	220	225	220	250	350	385
22	350	320	285	250	305	310	300	250^{s}	230	240	245	240	245^{s}	245^{s}	250	250	240^{s}	205	245	255^{s}	245	265	275	315
23	350	305	300	310	400	395	295	235	240	255	245	245	250^{s}	235	255^{s}	250	255^{s}	240^{s}	225	215	215	I300^{s}	350	350
24	355	290	300	400	420	375	250	240	250	255	250	260^{s}	250^{s}	250^{s}	250^{s}	245	250	245^{s}	245	230	240	300^{s}	265	250
25	350	355	300	315	300	275	250	230	235	245^{s}	250	250^{s}	230^{s}	260	I250^{C}	250	225	250	C	C	I275^{C}	300^{s}	315	270
26	I300^{C}	300	320	315	320	I325^{C}	255	C	C	C	250	245^{s}	240	225	250	250	215^{s}	255	250	205	250	305	375	410
27	350	300	305	355	350	355	310	240	240	250	255^{s}	250	240	235^{s}	250	250^{s}	255	225	215	210	250	350	305	285
28	355	290	250	380	385	370	325	255	250	245	240	245	245	250	245	240	230	245	250	230	225	360	350	360
29	345	300	300	350	400	410	310	255	250	250	250	240	225^{s}	240^{s}	225	240	220	210	215	220	210	265	305	305
30	305	250	240	265	260	300	315	250	240	240	250	240	230	230	245	240	230	230	245	225	250	E360^{s}	I355^{s}	E390^{A}
31	380	345	345	320	350	300	250	250	230	240^{s}	250^{s}	240	250	255^{s}	250	235	230	250	250	250	220	255	300	315
No.	30	30	30	31	30	30	30	29	29	29	30	29	30	30	31	31	31	30	30	30	29	28	29	30
Median	350	320	300	310	310	320	270	250	240	240	250	245	240	245	245	245	230	220	230	230	250	275	305	320

h'F | Sweep 1.0 Mc to 20.0 Mc in 20 min sec in automatic operation.

The Radio Research Laboratories, Japan.

K 10

42

IONOSPHERIC DATA

Dec. 1959 | 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	105	E	E	E	E	E	105	B	105	G	S	115	G	S	145	140	105	105	E	105	105	E	105	E
2	105	E	105	100	E	E	E	B	G	G	B	S	G	B	G	G	S	S	105	100	105	100	105	E
3	E	E	E	E	E	E	105	105	105	100	100	S	G	G	G	G	S	E	E	E	E	E	E	E
4	105	105	E	E	C	C	C	C	C	S	105	G	G	105	150	G	100	100	E	110	105	E	105	E
5	E	E	E	E	E	E	E	S	G	110	105	105	105	105	105	105	S	100	100	E	120	105	E	E
6	E	E	E	E	E	E	S	120	120	120	110	110	115	110	105	110	105	110	110	115	105	105	105	110
7	115	105	105	105	105	105	105	B	G	G	S	110	105	105	105	105	105	105	105	S	E	E	E	105
8	105	105	105	105	E	E	E	S	G	135	G	105	120	G	S	G	105	110	E	E	105	E	E	110
9	E	E	E	E	E	E	E	B	G	145	130	120	115	S	120	G	S	100	E	E	E	E	E	E
10	E	E	E	E	E	E	E	G	G	G	S	B	G	G	S	B	105	100	E	E	E	E	E	E
11	E	E	E	E	E	E	E	S	S	G	S	S	S	S	S	S	S	S	E	E	S	E	S	S
12	E	E	E	E	105	E	E	S	S	S	S	S	S	S	S	S	S	S	S	E	S	S	E	S
13	S	S	S	E	105	E	E	S	G	S	S	S	S	S	G	G	S	S	S	E	S	E	E	E
14	E	S	E	E	E	E	E	S	130	S	S	G	S	G	S	G	S	E	E	E	E	E	120	E
15	E	E	E	E	E	E	E	B	G	115	C	C	C	110	G	G	G	105	E	E	E	110	E	105
16	E	E	E	E	E	E	E	B	120	110	110	G	105	G	G	G	S	105	E	105	105	E	E	E
17	E	E	E	110	E	E	E	B	115	110	G	110	C	110	C	C	S	105	105	105	105	E	115	E
18	E	E	E	E	E	E	E	B	G	G	105	G	G	G	G	G	S	S	100	E	E	E	E	E
19	E	E	E	E	E	E	E	S	130	S	G	G	G	G	G	G	105	105	115	E	E	E	E	E
20	E	E	E	105	E	E	E	105	120	115	110	110	110	110	110	110	110	105	E	105	S	S	E	E
21	E	E	E	E	E	E	E	S	170	150	S	S	100	G	G	S	S	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	S	S	120	120	G	S	G	G	G	S	E	E	S	E	E	E	E
23	E	E	E	E	E	E	E	B	G	120	120	G	120	120	G	105	S	S	E	E	E	S	E	E
24	E	E	E	E	E	E	E	B	120	G	115	S	110	105	110	G	S	S	E	E	E	E	120	120
25	105	E	S	E	E	E	E	S	G	S	S	S	S	115	C	G	S	S	C	C	C	S	110	110
26	110	E	105	110	C	C	E	C	C	C	G	110	G	G	G	S	S	110	E	E	E	E	E	110
27	110	110	E	E	E	E	E	B	G	125	120	110	110	110	105	105	105	105	100	E	E	E	E	E
28	E	120	E	E	E	E	E	B	G	130	G	G	105	105	105	G	105	105	120	115	E	E	E	E
29	E	E	E	E	E	E	E	S	130	120	S	S	G	G	G	G	S	E	E	E	E	E	E	E
30	E	E	E	E	E	E	E	B	B	G	120	S	145	G	G	G	S	S	E	E	E	S	110	115
31	110	110	110	E	E	E	E	S	G	G	S	150	160	140	S	G	B	125	120	E	110	E	E	E
No.	9	6	5	6	3	1	3	3	11	15	13	11	14	13	10	7	10	17	10	8	9	4	9	8
Median	105	110	105	105	105	105	105	105	120	120	110	110	110	110	110	105	105	105	105	105	105	105	110	110

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. 1959

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	fz						f		l			l			h	h	l	f		f	fz		f	
2	f		f	fz															f	fz	f	fz	f	
3							f3	lz	l	lz	l													
4	f	f									l			l	h		l	f		f	f		f	
5										l	l	l	l	l	l	l		f	f		f	f		
6								l	C	C	C	l	l	l	l	l	l	fz	f	f	f3	fz	f	f
7	f	fz	f3	f	fz	f	f					l	l	l	l	l	l	f	f					f
8	f	f3	f	f						h		l	Cl				l	f			f			f
9										h	h	C	l		C		l	f			f			
10																	l	f						
11																								
12					f																			
13					f																			
14									h														f	
15										l				l				f				f		f
16									l	lz	l		l					f		f	f			
17				f					l	l		l		l				f	f	f3	fz		t	
18											l								f					
19									C								l	f	f					
20				f				l	l	l	l	l	l	l	l	lz	l	f		f				
21									h	hl			l											
22										l	l													
23										l	l		l	l		l								
24									l		l		l	l	l								f	f
25	f													l									f	f
26	f		fz	f								l						f						f
27	f	fz								C	l	l	l	l	l	l	l	fz	f					
28		f								h			l	l	l		l	f	f	f				
29									h	l														
30											l		h										f	
31	f	fz	fz									h	h	h				f	f		f			fz
No.																								
Median																								

Types of Es

Sweep 1.0 Mc to 20.0 Mc in 2 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Kokubunji Tokyo

Lat. 35° 42.4' N
Long. 139° 29.3' E

Dec. 1959

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	450	460	465^{s}	460	475^{s}	I465^{s}	415^{s}	I375^{s}	300^{s}	I300^{s}	I310^{s}	I330^{s}	330	335	320	305	300	300	300	325^{s}	340	J275^{s}	460	430
2	415^{s}	u390^{s}	315	370	475	395	350^{s}	I275^{s}	300	310	310	J305^{s}	315	340	325	345	310	I300^{s}	280	300	355	400^{s}	380	405
3	405^{s}	475	440^{s}	445	405	J400^{s}	350	295	J300^{s}	S	S	S	J320^{s}	325	315	325	325	310	I310^{s}	u300^{s}	350	425	430	400
4	400^{s}	420	440	405	C	C	C	C	C	S	J305^{s}	J320^{s}	340	I320^{s}	305	305	u300^{s}	285	295	300^{s}	340	260^{s}	u350^{s}	385^{s}
5	375^{s}	330	355	370	375	400	305	u270^{s}	300	265^{s}	280	300^{s}	305	330	325	300	u300^{s}	305	u290^{s}	335	340	340	u420^{s}	500^{s}
6	510^{s}	500	540	545	525	505^{s}	300	350	325	I320^{s}	I330^{s}	u355^{s}	S	S	S	310	300	I300^{s}	J290^{s}	300	350	I340^{s}	470^{s}	445^{s}
7	u400^{s}	360^{s}	I315^{As}	u400^{s}	400^{s}	375^{s}	u355^{s}	J260^{s}	J280^{s}	305	I305^{s}	I310^{s}	I330^{s}	I335^{s}	325^{s}	300	305^{R}	300^{s}	310^{s}	300	295	I270^{s}	380	360
8	405	I430^{M}	400	385	320	395	355^{s}	285^{s}	u290^{s}	285	305	310	310	305	320	300	305	290^{s}	300	310	290	375^{s}	I390^{s}	350
9	360	345	310^{s}	410	440	395	330^{s}	u290^{s}	290^{s}	290	305	300	305	355	325	305	J305^{s}	305	285^{s}	300	350	320^{s}	445	400
10	450	405	J400^{s}	350	395	420	320	295^{s}	305	270	310	300	330	335	320	320	u315^{R}	300^{s}	I300^{s}	290	u350^{s}	390^{s}	u400^{s}	425^{s}
11	420^{s}	u400^{s}	330^{s}	390^{s}	370	355^{s}	u335^{s}	I310^{s}	u270^{s}	300^{s}	u300^{s}	u300^{s}	300^{s}	315^{s}	300	300	I300^{s}	I305^{s}	I300^{s}	275^{s}	I285^{s}	360	I420^{s}	J455^{s}
12	405^{s}	u375^{s}	355	365^{s}	305	400	360	u265^{s}	I270^{s}	u270^{s}	I300^{s}	305^{s}	310^{s}	u305^{s}	J300^{s}	J300^{s}	u280^{s}	u300^{s}	I280^{s}	I280^{s}	I300^{s}	I440^{s}	350^{s}	u400^{s}
13	425^{s}	u450^{s}	I345^{s}	I280^{s}	u250^{s}	420	330	S	S	I310^{s}	310	I300^{s}	u310^{s}	I325^{s}	u310^{s}	305^{s}	I300^{s}	I300^{s}	I300^{s}	300	J300^{s}	340	365^{s}	I365^{s}
14	u400^{s}	I380^{s}	350	350^{s}	375^{s}	I375^{s}	I300^{s}	J300^{s}	u300^{s}	310^{s}	I305^{s}	u320^{s}	320^{s}	330	320^{s}	I310^{s}	300	J315^{s}	305^{s}	345	I330^{s}	330	I370^{s}	350
15	450	400	440^{s}	380^{s}	350^{s}	405^{s}	440	I300^{s}	I310^{s}	S	C	C	C	305	325	310	300	305^{s}	J300^{s}	250	300^{s}	400	455^{s}	J445^{s}
16	405	395	J385^{s}	400	430	410	280	u255^{s}	270	305	S	S	310^{c}	320	315	300	J300^{s}	J300^{s}	275	290	310	J300^{s}	390	400
17	J400^{R}	400	430	430	345	400^{s}	I365^{s}	I300^{s}	I300^{s}	290^{s}	290	315	I310^{c}	300	I310^{c}	I300^{c}	I290^{s}	I280^{s}	I270^{s}	u320^{s}	u305^{s}	300	I475^{A}	380
18	430	405	395	350	340	400	300^{R}	J250^{s}	255	300	305	300	305	305	305	305	275	280	I275^{s}	315	300	295	350	400
19	415	400	390	300	355	355	350	u295^{s}	255	I330^{s}	300	300	300	305	310	310	I290^{s}	I300^{s}	320^{s}	u270^{s}	I280^{s}	475	425	390^{s}
20	I400^{s}	400	405	375	370	415^{s}	405^{s}	305^{s}	I300^{s}	u310^{s}	300^{s}	J310^{s}	305	310	310	310	I300^{s}	295	290	260	295^{s}	400^{s}	410	360
21	365	365	350	350	450	390	310^{s}	260^{s}	280	u300^{s}	300	u300^{s}	300	300	S	S	S	u275^{s}	I300^{s}	J280^{s}	300^{s}	I305^{s}	375^{s}	450^{v}
22	420	J390^{s}	325	280	385	355	340	I260^{s}	255^{s}	I290^{s}	300	300	300	310	J305^{s}	305	I290^{s}	I290^{s}	300	I290^{s}	I325^{s}	I360^{s}	J345^{s}	385^{s}
23	380^{s}	355	355	380	445	440	350	270^{s}	I270^{s}	300^{s}	305	300	305	325^{s}	325	310^{s}	J315^{s}	325	I290^{s}	300	280^{s}	I370^{s}	415	430^{s}
24	415	355	350	450	490^{s}	425^{s}	290	315	u300^{s}	300	305	J330^{s}	325	315	330^{s}	325	u310^{s}	300	I305^{s}	300	365^{s}	375	305^{s}	345
25	J420^{s}	400	J355^{s}	405	400	u375^{s}	305^{s}	300	300	300	305	325	310	340	I320^{c}	305	300^{s}	300	C	C	I330^{c}	350	400	J340^{s}
26	I355^{c}	360	390	405	410	I380^{c}	305^{c}	C	C	C	300	J280^{s}	300	J305^{s}	u325^{s}	290	I305^{s}	I310^{s}	J300^{s}	285^{s}	J355^{s}	420	420	u455^{s}
27	400^{s}	355	340	I415^{s}	425^{s}	440	380	305^{s}	305^{s}	310	S	S	u335^{s}	I350^{s}	325	330^{s}	I310^{s}	305	J270^{s}	355	325	I450^{s}	u395^{s}	395
28	425	360	340	460	455	425	410	325^{s}	u300^{s}	I305^{s}	I305^{s}	305	310	u345^{s}	325	J325^{s}	I310^{s}	315^{s}	300	J310^{s}	260	455^{s}	445	445^{s}
29	430	360	425	455	470	490	400	u315^{s}	300	S	S	u315^{s}	325	325	325	305	I300^{s}	290^{s}	305	275	u260^{s}	400	390^{s}	400^{s}
30	u400^{s}	u350^{s}	300^{s}	325	325	355	350	I330^{s}	300	300	I305^{s}	310^{s}	335	335	340^{s}	320	305^{s}	305	305	260	350	405^{s}	I430^{s}	440^{s}
31	440	400^{s}	400	395	u405^{s}	360	300^{s}	300^{s}	295	300	J295^{s}	315	310	325	340	J300^{s}	305	I300^{s}	300	u305^{s}	u260^{s}	u345^{s}	400	415
No.	31	31	31	31	30	30	30	28	28	26	26	27	29	30	29	30	30	31	30	30	31	31	31	31
Median	405	395	355	390	400	400	345	300	300	300	305	305	310	325	320	305	u300	300	300	300	310	360	400	400

hpF2

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

The Radio Research Laboratories, Japan.

K 13

IONOSPHERIC DATA

Dec. 1959 | 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	90	130	115	130	175	130	135	110	85	80	80	90	70	100	105	95	80	85	130	100	100	115	130	110
2	100	85	105	100	110	95	80	90	60	80	85	90	90	90	100	95	95	75	70	100	145	100	115	100
3	140	125	105	105	100	100	105	90	90	S	S	S	90	105	85	110	80	90	90	90	140	115	105	110
4	140	130	110	135	C	C	C	C	C	S	85	80	80	80	95	85	80	110	90	100	120	90	140	115
5	100	90	100	95	85	90	85	105	75	80	70	100	85	70	75	90	85	120	80	100	125	135	140	150
6	100	175	120	155	155	145	90	170	95	85	70	80	S	S	S	90	95	100	100	115	100	130	155	80
7	95	110	80	90	100	95	85	115	95	80	80	90	70	70	80	105	90	70	90	90	105	95	170	115
8	135	120	140	190	120	135	140	100	110	105	85	65	90	95	95	90	80	85	150	90	120	105	100	110
9	90	125	100	120	110	105	110	70	100	65	85	70	95	80	75	80	95	75	100	100	145	130	105	100
10	110	140	105	105	105	85	80	55	50	115	60	55	90	90	100	80	85	105	120	85	120	110	90	100
11	100	90	95	85	110	105	110	90	70	95	90	50	100	85	100	80	90	120	110	85	120	130	130	110
12	115	95	95	90	95	150	130	110	90	80	75	95	90	85	100	80	100	120	115	100	100	190	80	110
13	75	100	110	80	70	100	95	S	S	115	75	50	85	95	100	80	80	85	100	95	90	155	140	120
14	135	110	145	125	120	115	125	100	50	70	80	100	95	90	120	80	80	115	100	100	110	70	90	70
15	100	100	90	70	100	130	100	100	100	S	C	C	C	100	115	90	55	95	95	100	100	100	95	100
16	100	100	90	105	120	90	75	90	80	65	S	S	90	85	85	85	65	100	100	80	90	120	85	100
17	75	90	90	110	95	90	100	75	50	60	75	75	80	90	80	60	60	80	90	100	75	105	110	120
18	110	85	95	80	145	110	100	90	95	55	85	55	90	85	90	85	65	115	90	65	100	55	115	100
19	95	100	105	100	145	100	100	90	50	70	50	90	60	95	90	95	70	80	85	75	120	125	120	95
20	100	90	110	110	100	110	95	90	80	85	60	85	80	85	95	75	90	100	75	85	100	100	130	135
21	130	110	105	100	100	110	95	90	60	70	50	55	60	65	S	S	S	80	90	70	85	110	100	130
22	105	100	95	95	95	75	115	85	95	60	55	70	70	90	90	80	80	90	90	100	115	105	95	115
23	125	100	100	105	65	115	100	80	100	75	75	80	95	140	80	95	120	105	80	90	110	175	145	115
24	125	145	140	100	110	135	80	140	85	65	95	55	75	100	70	95	90	80	90	115	155	110	100	105
25	120	125	95	105	95	110	85	100	100	90	75	75	120	60	100	80	85	70	C	C	120	120	170	85
26	115	115	110	135	120	120	115	C	C	C	90	85	65	90	80	75	85	80	95	115	95	120	110	130
27	105	145	155	110	105	105	120	105	100	80	S	S	70	120	90	90	105	100	90	135	110	155	115	105
28	125	100	110	140	100	125	115	125	80	50	45	90	95	55	80	120	90	90	90	95	135	145	105	105
29	120	100	125	145	95	110	105	90	55	S	S	135	95	100	75	105	90	100	100	80	115	120	90	75
30	75	120	100	110	125	140	85	120	75	55	90	95	90	65	110	85	85	90	100	85	135	140	150	110
31	110	100	110	110	145	135	100	95	60	75	70	85	90	105	115	100	110	105	75	100	110	95	190	135
No.	31	31	31	31	30	30	30	28	28	26	26	27	29	30	29	30	30	31	30	30	31	31	31	31
Median	105	100	105	105	105	110	100	90	80	80	75	85	90	90	90	90	85	90	90	100	115	115	115	110

ypF2 Sweep 1.0 Mc to 20.0 Mc in 20 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

K 14

IONOSPHERIC DATA

Dec. 1959 | 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	5.6	5.2	5.3	4.7	4.5	5.2	5.7	9.5	14.2	14.3	S	S	15.1	15.3	13.5	13.3	13.0	12.0	9.4	9.4	9.0	8.2	5.5	5.4
2	5.5	5.6	5.5	5.1	C	C	C	C	C	C	14.6	C	C	C	C	13.8	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	5.6 C	8.5	11.7	13.3	13.7 C	14.1	C	C	C	C	C	11.7	11.2	9.5	7.8	7.8	8.1	7.3
4	6.3	5.6	5.0	5.0	4.6	4.3	5.0	7.7	14.0	15.2	15.2	13.9	14.5 H	15.8	15.0	14.3	12.2	11.3	10.2	9.1	8.9	S	7.4	4.5
5	4.3	4.1	3.7	3.5	3.2	2.9	3.3	5.9	10.0	13.4	12.7	11.3	12.6	14.4	15.1	15.0	13.8	13.0	11.4	S	S	8.9	7.2	5.5
6	5.2	5.6	4.4	4.3	4.5	4.8	5.5	6.2	10.4	S	S	S	S	S	16.0	15.7 H	14.9	12.6	10.6	8.6	7.8	7.0	6.3	5.4
7	4.9	5.2	5.7	4.6	4.0	3.7	3.7	6.6	11.6	13.3 C	13.4	14.4	15.1	16.1 H	14.9	14.2	13.0 C	11.9	11.0	8.8	8.3	8.4	5.9	4.9
8	4.1	4.1	3.9	3.6	3.6	2.6	2.6	5.5	10.7	11.8	13.1	12.8	13.7	14.1	13.8	13.6 H	13.7	12.6	8.8	8.0	8.0	5.9	5.1	5.3
9	4.1	3.8	3.8 C	3.3 C	3.2 C	2.9	3.1	5.6	10.1	13.0	12.3	13.5	13.0	14.1	14.0	14.6	14.0	12.3	10.3	8.5	8.8	8.8	5.9	5.3
10	5.1	5.0	4.6	4.3	3.9	3.2	3.7 C	5.4	9.2	11.5	12.8	13.2	12.8	12.6 H	12.1	12.6	12.1	11.3	8.4	5.6	5.1 H	5.4	4.7	4.3
11	3.9	3.7	3.7	3.6	3.9	3.2	3.4	5.5	9.2	12.3	12.5	14.0 C	14.3 C	14.6	C	C	C	C	C	7.9	7.9	S	5.4 C	4.9
12	4.2	4.1	4.5	4.0	4.5	3.2	2.3	4.8	8.9	10.4 C	11.4	13.2	14.3	14.7	14.3	14.6	14.2	12.4	S	7.0	6.9	5.6	5.0	4.1
13	3.8	3.8	4.5	4.9	2.4	2.4	2.5	5.2	8.3	9.9 C	10.6	12.7	11.1	12.6 H	13.4	13.0	12.1	11.2	8.5	7.3	7.4	6.2	5.4	3.9
14	3.7	3.8	3.8	3.7	3.8	3.2	3.2	4.9	8.3	9.8	13.6	13.7	11.5	12.1	13.5	13.2	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	4.1
16	C	C	C	C	C	C	C	C	C	C	13.2	14.6	14.9 H	14.8	14.2	14.0	13.3	12.5	10.1	6.4	5.9	5.7	4.7	4.0
17	4.3	3.8	3.6	3.7	3.5	3.7	4.1	6.4	10.7	11.5	12.7	13.2 H	14.6	14.5	12.6	11.9	12.0	11.1	7.9	5.5	5.5	5.4	4.5 C	3.1 C
18	2.8 C	3.1 C	3.4	3.8 C	3.2	2.8	3.4	5.3	8.3	9.8	10.4	11.9	13.1	13.8	13.6	14.3	15.1	14.0	12.8	9.7	8.8	8.1	5.6	4.4
19	3.9	3.8	3.8	4.3	3.7 H	2.6	2.7	5.0	8.5	10.1	11.2	12.0	13.5	13.6	13.0 H	12.2	12.7	11.9	8.4	8.3	7.1	6.4	5.2	4.9
20	4.8	4.6	4.5	3.8	3.3	3.3	3.1	5.0	9.8	13.1	15.6	15.7	15.1	13.9	14.0	13.7	14.1	13.5	10.8	9.2	7.2 C	6.9	5.6	5.2 C
21	4.6 C	4.0	3.9	3.9	3.1	3.2	3.3	5.1	9.1	10.3	12.8	14.2	14.8	14.8	S	S	S	S	S	S	S	7.1	5.4	4.3
22	4.0	3.9	3.5	3.5	3.0	2.3	2.5	4.5	8.8	10.7	11.7	12.8	13.6	13.4	13.3	14.1	13.6 C	S	S	9.2	S	6.4	4.5	3.9
23	3.5	3.6	3.4	3.0	2.7	2.9	2.9	4.7	7.9	10.1	12.7	12.8	11.8	12.3	14.0	14.3	13.7	12.5	11.6	9.5	7.7	6.9	5.4	4.2
24	4.2	4.5	3.8	2.8	2.9	3.6	5.5	S	9.1	12.2	14.0	13.4	14.3	13.2	13.2 H	13.8	14.0	13.8 R	12.7	12.9	S	S	8.7	6.9
25	5.4	5.3	5.7	5.1	3.7	3.9	4.4	5.8	9.3	11.7	11.8	13.5	13.5	14.2 H	14.4	14.0	14.1	12.0	S	8.9	8.7	7.9	6.2	6.3
26	4.4	3.9	3.9	3.8	3.7	3.0	2.8	6.0	8.9	9.3	11.6	12.6	11.6	12.6 H	14.2	12.9	11.7	9.8	9.3	9.3	7.6	5.6	5.5	5.1
27	5.0	5.0	4.1	3.5	3.6	3.5	4.1	6.5	9.6	13.6	S	S	R	S	S H	S	S	13.6	11.7	9.5	9.0	6.8	5.8	5.9
28	5.1	5.4	6.3	3.5	2.8	2.9	2.8	5.0	10.9	13.5	15.2	S	S	S H	14.8	14.6	12.8	11.7	11.2	9.2	5.9 H	5.1	5.3	5.2
29	4.9	5.5	4.3	3.3	3.3	3.2	3.5	5.8	10.2	13.7	14.8	S	14.7 C	13.8	13.0	13.3	12.9	10.6	8.9	7.7	6.2	4.8	4.0	4.6
30	4.6	4.3	4.6	3.8	3.1	2.7	2.9	4.7	9.8	12.5	14.0 C	15.2 C	15.8	R	R	R	C	R	R	C	C	C	C	C
31	5.5	C	C	C	C	C	C	C	C	11.1	12.7 C	12.9	C	C	C	C	C	C	C	C	C	C	C	C
No.	28	27	27	27	26	26	27	26	27	27	27	24	24	23	23	24	22	23	21	24	22	23	26	27
Median	4.5	4.1	4.1	3.8	3.6	3.2	3.3	5.5	9.6	11.8	12.8	13.3	14.0	14.1	14.0	13.9	13.4	12.0	10.3	8.8	7.8	6.8	5.4	4.9
U.Q	5.1	5.2	4.6	4.3	3.9	3.6	4.1	6.2	10.7	13.3	14.0	14.0	14.8	14.7	14.4	14.3	14.0	12.6	11.3	9.4	8.7	7.9	5.9	5.4
L.Q	4.0	3.8	3.8	3.5	3.1	2.9	2.8	5.0	8.9	10.3	11.8	12.8	12.9	13.2	13.3	13.2	12.7	11.3	8.8	7.8	6.9	5.6	5.1	4.2
Q.R	1.1	1.4	0.8	0.8	0.8	0.7	1.3	1.2	1.8	3.0	2.2	1.2	1.9	1.5	1.1	1.1	1.3	1.3	2.5	1.6	1.8	2.3	0.8	1.2

foF2

Sweep 1.0 Mc to 20.3 Mc in 30 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 1

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IONOSPHERIC DATA

Dec. 1959 | foF1 | 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								C	C	C		C	C	C	C		C	C						
3											C	C	C	C	C	C	C							
4																								
5																								
6																								
7										C							C							
8													C											
9																								
10																								
11												C	C		C	C	C	C						
12										C														
13										C														
14																	C	C						
15								C	C	C	C	C	C	C	C	C	C	C						
16								C	C	C														
17																								
18																								
19																								
20																								
21																								
22																	C							
23																								
24																								
25														C										
26																								
27																								
28																								
29											C	C	C	C	C									
30											C	C	C	C	C	C	C	C						
31								C	C		C		C	C	C	C	C	C						
No.																								
Median																								

foF1

Sweep 1.0 Mc to 20.3 Mc in 30 sec in automatic operation.

IONOSPHERIC DATA

Dec. 1959 | 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								1.80	2.70	3.20	3.50	3.60	3.70	3.70	3.60	A	A	S						
2								C	C	C	3.40	C	C	C	C	3.30	C	C						
3								B	2.50	I3.20C	I3.50C	C	C	C	C	C	C	S						
4								S	2.60H	3.10	3.40	I3.70A	A	A	A	A	A	B						
5								S	2.60	3.10H	3.35H	3.40	3.65	3.60	3.35	3.10	2.50	A						
6								S	2.40	3.00	I3.25A	3.30	3.40	A	A	A	A	A						
7								S	2.50	I3.05C	3.40	A	A	I3.45A	A	A	C	A						
8								S	2.60	3.10	3.40	I3.60C	C	A	A	A	2.60	A						
9								S	2.50	3.20	3.30	3.40	3.40	3.20	I3.20A	3.00	A	A						
10								S	2.40	3.00	3.20	3.40	3.55	3.45	3.40	3.20	I2.70A	A						
11								S	2.40H	3.00	I3.25C	I3.50C	I3.50C	3.50	C	C	C	C						
12								S	2.50	I3.00C	3.30	3.50	3.50	I3.40A	I3.35A	3.10	2.60	S						
13								S	2.15	I2.75C	3.20	3.40	I3.40A	I3.40A	3.35	3.10	2.50	A						
14								S	2.20	2.90	3.20H	3.10	A	A	A	A	C	C						
15								C	C	C	C	C	C	C	C	C	C	C						
16								C	C	C	3.05	I3.40A	A	A	A	3.00	2.60	A						
17								S	2.30	2.80	3.10	3.15	I3.30R	3.40	A	A	A	A						
18								S	A	2.80	3.20	3.40	3.50	3.40	3.30	3.10	2.60	A						
19								B	2.20	2.75	I3.10A	3.40	3.55	3.60H	3.40	I3.10A	A	A						
20								S	2.30	3.00	3.10	I3.40A	I3.60A	I3.50A	I3.35A	I3.10A	A	A						
21								S	2.30	3.00	A	A	I3.80A	I3.80A	3.60	3.20	2.70	A						
22								S	2.15	2.90	3.20	I3.50A	3.65	I3.55A	3.50	3.30	I2.75C	S						
23								S	A	I2.90R	3.10	I3.45A	3.55A	3.50	3.40	3.15	2.70H	S						
24								S	2.15	2.80	A	A	A	A	A	3.10	2.65	B						
25								A	2.10	2.90H	3.30	A	3.60	I3.55C	A	A	A	A						
26								S	2.20	2.80	3.20	3.25	A	A	A	A	A	S						
27								B	2.20	2.80	A	A	3.50	I3.50A	3.35	3.20	2.70	A						
28								S	A	I2.90R	A	A	3.50	3.40	3.40	3.20	2.85	S						
29								S	1.80	2.85	C	C	C	C	I3.50C	I3.10C	2.60	2.20						
30								S	2.05	2.90	C	C	C	C	C	C	C	C						
31								C	C	3.00	I3.25C	3.45	C	C	C	C	C	C						
No.								1	24	28	24	20	18	18	15	17	14	1						
Median								1.80	2.30	2.95	3.25	3.40	3.50	3.50	3.40	3.10	2.60	2.20						

foE

Sweep 1.0 Mc to 20.3 Mc in 30 sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 3

IONOSPHERIC DATA

Dec. 1959 | foEs | 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	2.2M	S	E	E	E	E	S	G	G	G	3.6	4.3	5.2	4.1	5.7M	4.5M	3.1	G	3.1M	E	C	S	2.1M	2.1M
2	3.8M	3.0M	3.7M	3.0M	C	C	C	C	C	C	3.7	C	C	C	C	G	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	G	2.4G	C	C	C	C	C	C	C	C	2.6M	E	E	3.6M	2.6M	E	S
4	S	S	E	E	2.7M	E	S	G	G	G	G	6.0M	3.7M	4.7M	6.0M	4.5M	2.7	G	2.0	3.6M	3.9M	S	2.9M	S
5	S	E	E	3.1M	3.0M	E	S	G	2.9	G	3.8	4.1	G	G	3.8M	3.7M	3.3M	2.9M	3.0M	S	S	2.2M	2.3M	S
6	S	S	E	E	C	E	S	G	2.6	3.7	4.0	4.1	4.8	6.0M	6.9M	4.4M	4.1M	3.9M	5.4M	3.6M	S	3.1M	3.0M	3.0M
7	S	E	E	3.0M	3.0M	2.8M	S	2.8M	G	C	3.8	4.5M	6.2M	5.7M	6.0M	7.1M	C	2.8M	2.8M	2.1M	S	S	S	S
8	S	S	E	3.5M	2.1M	E	S	G	G	G	3.9	C	C	4.0	4.3	4.2M	G	3.3M	3.0M	3.0M	2.8M	S	S	S
9	S	C	C	C	C	E	S	G	G	3.3	3.6	4.1	4.1	4.0	3.8	3.3	4.5M	3.6M	3.0M	2.4M	2.5M	S	S	S
10	S	S	E	E	E	E	C	G	G	G	3.5	4.0	G	3.7	3.5M	G	3.6M	3.6M	3.7M	3.0M	S	S	S	S
11	S	E	E	E	E	E	S	G	G	3.1	C	C	C	3.5G	C	C	C	C	C	S	S	S	C	S
12	S	S	E	E	E	E	S	G	G	C	G	4.7	6.1M	3.9	3.9	2.9G	3.0	G	2.4M	2.3M	S	S	S	S
13	S	S	2.8M	E	E	E	S	2.9M	3.0M	C	G	4.0	4.1	5.8M	G	G	G	3.4M	3.7M	3.1M	3.0M	2.4M	E	S
14	E	S	E	E	E	E	2.5M	G	G	G	G	3.6	3.6	3.6	3.3	3.5	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E
16	C	C	C	C	C	C	C	C	C	C	4.0	5.9M	4.0	5.9M	3.8	G	3.7M	4.0M	3.4M	5.4M	2.9M	S	E	4.1M
17	S	E	E	E	E	E	S	2.6M	G	3.0	3.7	3.5	3.3	3.2G	5.9M	4.5M	4.3M	3.8M	6.6M	6.0M	3.8M	2.8M	C	C
18	C	C	E	C	E	E	E	S	2.5	3.1	6.0M	3.3G	G	G	3.9M	4.1M	3.7M	3.7M	3.4M	S	2.1M	2.2M	2.2M	S
19	S	S	E	E	E	E	S	G	G	3.1	3.4	3.9M	3.8M	G	G	3.8	4.3M	3.0M	2.8M	E	S	S	S	S
20	S	S	E	E	E	E	S	G	G	3.2	4.5	6.2M	5.6M	3.8	3.6	9.2M	6.0M	5.2M	3.0M	2.2M	S	S	S	C
21	C	S	3.0M	E	E	E	S	S	G	G	3.9	5.1M	5.3M	4.1	G	G	G	2.9M	E	S	S	S	S	S
22	S	S	E	E	2.7M	E	S	S	2.3	G	3.6	4.0	G	4.0	4.8	G	C	G	2.9M	2.6M	S	S	S	S
23	E	E	E	E	E	E	S	S	3.0M	3.4	3.8	6.1M	3.6	G	G	G	G	G	E	S	E	S	S	S
24	S	E	E	E	E	E	S	G	G	G	3.7	4.5	5.9M	5.8M	3.6	G	G	G	2.9M	S	S	S	S	S
25	S	E	1.5	2.9M	3.1M	3.0M	3.2M	3.3M	3.0M	G	4.0M	5.6M	4.5M	C	6.0M	6.8M	4.4M	3.1M	3.5M	2.3	S	2.8M	3.1M	4.2M
26	3.2M	2.8M	E	E	1.5	1.4	S	S	G	G	4.0	5.6M	5.2M	6.1M	8.3M	7.0M	5.0M	2.6	3.7M	3.9M	3.2M	2.6M	S	4.9M
27	4.4M	4.2M	3.9M	4.0M	2.8M	3.1M	2.7M	G	G	3.6	3.5	4.0M	4.0M	4.5M	G	4.0M	6.0M	3.6M	S	S	S	3.2M	S	S
28	S	S	E	E	1.2	2.9M	S	S	2.4	G	4.5M	3.6	3.9M	G	G	3.0G	G	2.1	3.0M	3.7M	S	S	S	S
29	S	C	E	E	E	E	S	S	2.9M	3.9	C	C	C	C	C	C	G	G	3.0M	2.1M	S	S	3.7M	S
30	S	E	E	E	E	2.7M	E	G	G	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	G	C	4.3	C	C	C	C	C	C	C	C	C	C	C	C
No.	6	11	26	25	24	26	5	20	27	24	25	24	23	24	24	25	22	25	24	19	10	9	10	6
Median	2.7M	E	E	E	E	E	2.5M	G	G	G	3.7	4.2	4.0	4.0	3.8	3.7	3.4M	2.9M	3.0M	2.6M	3.0M	2.6M	2.2M	3.6M
U.Q	3.8	2.8	E	E	2.4	E	3.0	G	2.5	3.2	4.0	5.4	5.2	5.2	5.8	4.5	4.3	3.6	3.4	3.6	3.6	3.0	3.0	4.2
L.Q	E	E	E	E	E	E	E	G	G	G	3.5	4.0	3.6	3.4	G	G	G	G	2.8	2.1	2.5	2.3	E	2.1
Q.R											0.5	1.4	1.6	1.8					0.6	1.5	1.1	0.7		2.1

foEs | Sweep 1.0 Mc to 20.3 Mc in 30 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec. 1959 | 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	E	S					S				G	4.1	5.0	4.1	4.6	G	G		E		C	S	E	E
2	2.6	E	1.8	1.7	C	C	C	C	C	C	G	C	C	C	C		C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C		2.3	C	C	C	C	C	C	C	C	G			2.5	E		S
4	S	S			E		S					5.0	G	G	4.2	3.4	G		1.9	2.7	3.2	S	E	S
5	S			1.7	E		S		G		G	G			2.8	2.8	2.2	G	1.9	S	S	E	E	S
6	S	S			C		S		G	3.5	G	G	4.8	5.0	5.0	4.0	2.9	3.2	3.3	E	S	2.2	E	2.0
7	S			1.8	1.9	E	S	G		C	G	G	G	G	G	4.1	C	G	E	E	S	S	S	S
8	S	S		1.8	1.6		S				G	C	C	G	3.5	3.4		G	2.0	1.8	1.9	S	S	S
9	S	C	C	C	C		S			G	G	3.9	4.0	3.9	3.4	G	G	G	2.0	S	S	S	S	S
10	S	S					C				G	G		G	2.5		G	G	2.1	2.2	S	S	S	S
11	S						S			G	C	C	C	3.4	C	C	C	C	C	S	S	S	C	S
12	S	S					S			C		4.6	4.1	G	G	2.8	G		E	E	S	S	S	S
13	S	S	E				S	G	G	C		3.9	3.7	4.5				G	$^{U}2.5^{A}$	2.2	2.0	1.7		S
14		S					1.8					G	G	G	G	3.4	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
16	C	C	C	C	C	C	C	C	C	C	3.9	3.6	G	G	3.6		2.3	G	E	3.3	E	S		2.5
17	S						S	G		G	3.6	G	G	3.2	5.1	3.6	3.4	2.9	2.6	3.2	S	2.4	C	C
18	C	C		C				S	G		2.4	3.2			G	2.6	2.3	G	$^{E}3.3^{A}$	S	E	E	E	S
19	S	S					S			G	G	3.3	3.2			G	G	G	1.6		S	S	S	S
20	S	S					S			2.6	4.4	4.4	G	G	G	4.9	4.0	2.9	E	E	S	S	S	C
21	C	S	1.5				S	S			G	4.2	3.9	4.0				G		S	S	S	S	S
22	S	S			1.7		S	S	G		G	3.9		G	3.3		C		S	1.7	S	S	S	S
23							S	S	G	G	G	G	G							S		S	S	S
24	S						S				G	4.1	G	4.5	G				E	S	S	S	S	S
25	S		$^{D}1.5^{S}$	1.8	2.1	2.2	2.4	2.2	1.9		3.2	G	3.2	C	3.9	4.1	3.2	G	2.5	2.3	S	1.8	2.3	S
26	2.0	S			$^{D}1.5^{S}$	1.3	S	S			3.9	4.1	G	4.4	4.4	4.8	3.4	G	2.4	3.1	2.3	E	S	2.2
27	1.9	2.3	2.1	2.0	1.6	1.6	E			2.5	G	G	3.3	G		2.2	2.5	G	S	S	S	$^{D}3.2^{S}$	S	S
28	S	S			1.1	1.6	S	S	2.1		G	G	3.3			2.2		G	E	1.9	S	S	S	S
29	S	C					S	S	G	G	C	C	C	C	C	C			2.0	E	S	S	1.8	S
30	S					1.7					C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C		C	4.1	C	C	C	C	C	C	C	C	C	C	C	C
No.	4	2	5	6	8	6	3	4	10	9	21	24	19	19	18	17	15	18	19	15	7	8	7	4
Median	2.0	E	$^{D}1.5$	1.8	1.6	1.6	1.8	G	G	G	G	3.4	3.2	G	3.4	3.4	2.3	G	1.9	1.9	2.0	1.7	E	2.1

f_bE_s

Sweep 1.0 Mc to 20.3 Mc in 30 sec in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec. 1959 | 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	E 1.60 s	E 1.80 s	1.10	1.40	1.80	1.70	E 1.80 s	1.70	1.70	1.80	2.00	2.00	E 2.20 c	2.20	2.00	1.80	1.80	E 1.70 s	1.60	1.60	E 1.50 c	E 1.70 s	1.60	1.70
2	1.70	E 1.70 s	1.60	E	C	C	C	C	C	C	1.95	C	C	C	C	1.80	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	1.80	1.70	E 3.90 c	I 1.80 c	E 2.60 c	C	C	C	C	C	E 1.80 s	1.80	1.70	E 1.60 s	1.40	1.30	E 1.80 s
4	E 1.50 s	E 1.50 s	1.30	1.00	1.10	1.00	E 1.70 s	1.70	1.60	1.80	2.30	2.00	2.05	2.55	1.85	1.80	1.70	1.90	E 1.65 s	E 1.60 s	E 1.70 s	E 1.70 s	E 1.60 s	E 1.70 s
5	E 1.80 s	1.70	1.25	1.00	1.80	1.50	1.60	1.70	1.80	1.70	1.80	1.80	2.00	1.90	1.80	1.90	1.15	E 1.70 s	E 1.80 s	E 1.70 s	E 1.80 s	E 1.90 s	E 1.90 s	E 1.80 s
6	E 1.80 s	E 1.80 s	1.85	1.20	E 1.70 c	1.40	E 1.70 s	1.70	1.65	1.85	1.80	1.90	1.90	1.85	1.90	1.80	1.90	1.80	1.70	E 1.70 s	E 1.80 s	E 1.70 s	E 1.80 s	E 1.70 s
7	E 1.80 s	1.90	1.70	E	1.00	1.60	E 1.60 s	1.60	1.80	I 1.70 c	1.80	2.00	1.70	1.90	1.90	1.70	I 1.55 c	E 1.60 s	E 1.70 s	E 1.50 s	E 1.60 s	E 1.50 s	E 1.50 s	E 1.70 s
8	E 1.60 s	E 1.70 s	1.10	E	E	1.70	E 1.60 s	1.60	1.70	1.80	E 2.00 c	1.70	I 1.90 c	2.20	1.80	1.80	1.80	E 1.70 s	E 1.70 s	E 1.70 s	E 1.70 s	E 1.70 s	E 1.55 s	E 1.70 s
9	E 1.60 s	E 1.80 c	C	C	C	1.50	1.60	1.70	1.70	1.80	1.70	1.85	1.85	1.90	2.00	1.60	1.70	E 1.70 s	E 1.60 s	E 1.60 s	E 1.65 s	E 1.60 s	E 1.80 s	E 1.70 s
10	E 1.70 s	E 1.80 s	1.10	1.30	1.40	E 1.60 s	E 1.50 c	1.70	2.00	1.90	1.85	1.90	2.00	1.90	1.70	1.60	1.80	1.40	E 1.70 s	E 1.70 s	E 1.80 s	E 1.70 s	E 1.80 s	E 1.70 s
11	E 1.70 s	1.60	1.70	1.30	E	1.50	E 1.70 s	1.70	1.80	2.10	E 4.40 c	I 1.90 c	I 1.90 c	1.90	C	C	C	C	C	E 1.65 s	E 1.70 s	E 1.60 s	C	E 1.80 s
12	E 1.80 s	E 1.80 s	1.10	1.10	E	E	E 1.70 s	1.70	1.60	I 1.95 c	1.90	1.70	1.90	2.15	1.90	1.70	1.70	1.70	E 1.60 s	E 1.60 s	E 1.70 s	E 1.65 s	E 1.60 s	E 1.60 s
13	E 1.70 s	E 1.80 s	E	E	1.00	1.30	E 1.60 s	1.50	1.60	I 1.65 c	1.65	1.80	1.80	1.85	1.90	1.70	1.60	1.50	1.35	1.45	E 1.60 s	E 1.60 s	2.10	E 1.85 s
14	1.40	E 1.80 s	E	1.75	1.10	1.50	1.50	1.70	1.50	1.80	1.70	1.80	1.90	1.80	1.90	1.70	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	1.70
16	C	C	C	C	C	C	C	C	C	C	2.20	2.20	2.00	2.20	1.80	1.75	1.60	1.45	E 1.60 s	E 1.60 s	E 1.70 s	E 1.60 s	1.80	1.45
17	E 1.70 s	1.70	1.25	1.70	1.10	1.30	E 1.70 s	1.70	1.60	1.80	1.70	1.90	2.15	2.00	1.90	1.80	1.90	E 1.80 s	1.60	1.70	E 1.60 s	E 1.80 s	C	C
18	C	I 1.85 c	1.70	C	1.50	1.20	1.80	E 1.70 s	1.60	1.90	1.80	1.80	2.00	2.00	1.70	1.70	1.80	1.20	E 1.60 s	E 1.70 s	E 1.75 s	E 1.80 s	E 1.60 s	E 1.70 s
19	E 1.70 s	E 1.80 s	1.40	1.10	1.25	1.10	E 1.60 s	1.75	1.65	1.65	1.80	1.80	1.90	2.30	2.00	1.80	1.70	E 1.60 s	1.25	1.30	E 1.70 s	E 1.80 s	E 1.90 s	E 1.70 s
20	E 1.70 s	E 1.70 s	1.65	1.15	1.10	1.60	E 1.70 s	1.60	1.70	1.60	1.70	1.90	2.20	1.90	1.90	1.90	1.80	1.70	1.20	1.60	E 1.80 s	E 1.80 s	E 1.90 s	C
21	C	E 1.70 s	1.30	1.30	1.70	1.50	E 1.70 s	E 1.60 s	1.60	1.65	2.20	2.40	2.20	2.20	1.90	2.00	1.90	E 1.90 s	1.70	E 1.70 s	E 1.70 s	E 1.60 s	E 1.95 s	E 1.60 s
22	E 1.60 s	E 1.75 s	1.35	1.70	1.10	1.20	E 1.70 s	E 1.75 s	1.70	1.70	1.80	1.90	1.80	2.00	1.90	1.90	I 1.95 c	1.70	E 1.75 s	1.30	E 1.60 s	E 1.70 s	E 1.90 s	E 1.60 s
23	1.70	1.70	1.60	1.00	1.10	1.70	E 1.70 s	E 1.65 s	1.80	1.50	1.65	1.80	2.10	1.70	1.80	1.80	1.50	E 1.60 s	1.60	E 1.60 s	1.30	E 1.70 s	E 1.90 s	E 1.60 s
24	E 1.80 s	1.60	1.60	1.10	1.20	1.90	E 1.60 s	1.40	1.65	1.50	1.80	1.80	1.90	3.00	2.00	1.85	1.80	1.70	E 1.70 s	E 1.70 s	E 1.70 s	E 1.70 s	E 1.80 s	E 1.70 s
25	E 1.70 s	1.70	1.10	1.30	E	E	1.25	1.30	1.40	1.70	1.70	2.00	1.85	I 1.95 c	2.20	1.60	1.60	E 1.70 s	1.70	E 1.60 s	E 1.70 s	1.70	E 1.60 s	E 1.70 s
26	E 1.60 s	E 1.70 s	1.70	1.70	1.20	1.10	E 1.60 s	E 1.60 s	1.70	1.60	1.75	1.80	1.90	1.80	1.75	1.60	1.75	E 1.70 s	E 1.75 s	E 1.85 s	E 1.70 s	E 1.80 s	E 1.80 s	E 1.70 s
27	E 1.70 s	E 1.70 s	1.30	1.00	1.20	1.10	E 1.70 s	1.40	1.70	1.80	1.80	1.90	1.90	1.80	1.85	1.80	1.60	E 1.60 s	E 1.60 s	E 1.60 s	E 1.70 s	E 1.70 s	E 1.70 s	E 1.50 s
28	E 1.65 s	E 1.70 s	1.10	1.30	1.00	1.30	E 1.60 s	E 1.60 s	1.70	1.60	1.80	1.60	1.70	1.60	1.75	1.80	1.80	E 1.70 s	E 1.80 s	E 1.70 s	E 1.70 s	E 1.70 s	E 1.70 s	E 1.70 s
29	E 1.70 s	E 2.20 c	1.10	1.30	1.10	1.35	E 1.60 s	E 1.75 s	1.70	1.50	E 3.60 c	E 8.15 c	C	E 4.80 c	E 7.30 c	E 4.20 c	1.80	1.80	E 1.70 s	E 1.70 s	E 1.70 s	E 1.70 s	E 1.60 s	E 1.60 s
30	E 1.70 s	1.80	1.20	E	1.00	1.10	1.70	1.60	1.65	1.60	C	C	E 9.90 c	E 1.240 c	E 8.80 c	E 1.250 c	C	E 5.40 c	E 10.30 c	C	C	C	C	C
31	E 5.10 c	C	C	C	C	C	C	C	C	1.80	I 1.80 c	1.70	C	C	C	C	C	C	C	C	C	C	C	C
No.	26	27	26	25	24	25	26	25	27	27	26	26	24	25	24	25	24	26	26	26	26	26	24	25
Median	E 1.70	E 1.70	1.30	1.15	1.10	1.35	E 1.65	1.70	1.70	1.70	1.80	1.90	1.90	1.90	1.90	1.80	1.75	E 1.70	E 1.70	E 1.60	E 1.70	E 1.70	E 1.75	E 1.70

f-min

Sweep 1.0 Mc to 20.3 Mc in 30 sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 6

IONOSPHERIC DATA

Dec. 1959 | (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	2.50	2.40	2.50	U2.45	2.45	2.50	2.45	I2.85	3.30	3.00	S	S	2.85	2.95	2.90	2.95	2.90	U3.00	2.95	2.85	2.90	U3.05	3.10	2.40
2	2.55	2.60	2.85	2.95	C	C	C	C	C	C	3.15	C	C	C	C	2.75	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	I2.45	J2.95	3.25	3.15	I3.10	2.95	C	C	C	C	C	3.00	3.05	U3.15	2.80	U2.45	I2.70	2.60
4	2.70	2.50	2.60	2.50	2.60	2.55	2.60	2.85	3.20	I3.30	3.10	U3.08	2.90	2.90	I2.95	3.00	3.05	2.95	J2.95	2.95	2.90	S	U2.75	2.65
5	I2.80	2.90	3.00	2.80	2.65	2.55	2.85	2.90	J3.10	3.30	3.35	3.10	2.95	2.85	3.00	3.00	3.00	3.05	U2.95	S	S	3.05	I2.85	2.25
6	2.35	2.55	2.20	2.20	2.30	2.30	2.55	2.75	I2.80	S	S	S	S	S	I2.80	U2.90	2.95	3.00	2.95	3.05	U2.80	U2.75	2.70	2.50
7	2.50	2.60	3.20	2.85	2.80	2.80	2.70	2.95	I3.35	I3.20	3.15	3.05	3.05	U3.05	2.95	2.90	I3.00	2.95	3.20	3.20	J3.05	3.45	2.70	2.65
8	2.70	2.85	2.55	2.70	3.05	2.70	2.70	2.85	3.35	3.20	3.20	3.05	I2.95	2.90	2.95	2.95	3.05	3.15	2.95	J2.90	J3.00	3.20	2.80	2.65
9	2.95	2.90	I3.00	I2.80	I2.80	2.50	2.80	2.75	J3.05	3.30	3.15	3.10	3.00	2.90	2.85	2.95	2.85	I3.00	J3.00	U2.95	2.75	3.05	2.80	2.50
10	2.55	2.65	2.65	2.85	3.00	2.50	2.80	3.00	3.25	U3.15	3.15	3.10	2.95	I2.90	U2.70	2.90	3.05	3.00	J3.20	3.05	2.60	2.85	U2.65	2.55
11	2.75	2.75	2.75	2.65	2.75	2.70	2.65	2.75	3.20	3.15	3.00	I3.05	I2.95	2.95	C	C	C	C	C	J2.80	I3.05	S	I2.80	U2.35
12	2.45	2.60	U2.65	2.65	3.00	3.40	2.60	2.85	U3.20	I3.10	3.20	3.00	3.00	2.90	U2.85	I2.90	U2.90	3.10	S	2.90	U2.85	2.70	2.70	2.50
13	2.45	2.60	2.95	J3.50	2.65	2.30	2.65	3.10	3.30	I3.10	2.95	3.25	2.90	3.00	2.95	3.05	3.00	3.05	2.90	U2.90	3.10	2.90	U2.65	2.45
14	2.70	2.80	2.90	3.00	2.65	2.60	2.85	3.00	J3.20	J3.00	3.10	3.30	3.05	2.80	2.90	3.05	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	2.45
16	C	C	C	C	C	C	C	C	C	C	3.05	3.15	3.05	2.95	U2.95	U3.00	3.15	3.20	3.50	2.95	2.80	2.90	2.65	2.65
17	U2.55	2.65	2.60	2.55	2.55	2.65	2.70	2.90	3.20	3.15	3.15	3.05	2.95	3.05	2.90	3.00	3.15	3.30	3.25	3.10	3.05	2.95	I2.80	I2.70
18	I2.50	I2.60	2.80	I3.00	3.25	3.30	2.65	3.05	J3.45	I3.25	3.10	3.15	3.10	3.05	2.95	U2.95	I2.90	I3.25	I3.25	U2.85	3.15	J2.90	U3.00	2.60
19	2.40	2.45	2.65	3.10	3.05	2.45	2.80	2.90	3.35	J3.25	3.15	3.15	2.90	3.00	2.90	3.05	3.10	3.10	J3.00	3.15	3.00	U2.65	2.40	2.50
20	2.40	2.50	2.65	2.80	2.80	2.60	2.65	2.60	I3.00	3.15	J3.15	U3.10	3.05	2.95	U2.85	2.90	3.00	U3.20	3.05	I3.20	I2.80	U2.85	U2.55	I2.50
21	I2.40	2.35	2.70	2.65	2.45	2.50	2.75	2.95	3.30	3.10	3.05	3.15	2.95	U2.90	S	S	S	S	S	S	S	U2.80	U2.40	2.35
22	2.40	2.45	2.90	3.15	3.05	2.65	2.80	2.80	U3.30	3.30	3.15	3.05	3.10	3.05	U2.75	U2.90	I3.00	S	S	U2.95	S	I3.05	2.90	2.70
23	2.70	2.50	2.80	3.05	2.65	2.55	2.70	3.15	J3.25	J3.10	3.10	2.95	3.05	U2.80	2.85	U2.95	2.90	U2.90	3.00	U3.10	I2.85	I2.95	J2.90	2.50
24	U2.40	U2.65	3.05	2.55	2.40	2.35	2.90	S	3.25	3.10	3.10	2.90	2.90	2.90	2.75	U2.75	I2.90	I3.00	2.90	I2.95	S	S	J2.75	2.90
25	U2.30	U2.35	2.80	2.45	2.60	2.80	2.80	U3.00	3.25	U3.25	3.05	3.05	2.95	I2.90	2.90	I2.95	3.05	U3.10	S	2.85	U2.85	J2.90	2.75	3.05
26	2.85	2.60	2.85	2.90	3.30	2.45	2.60	U2.85	3.60	3.35	3.20	3.25	2.95	3.05	3.15	2.95	3.10	I3.00	2.95	I3.20	I3.05	2.70	2.60	2.65
27	2.80	3.20	2.90	2.55	2.60	2.45	2.55	I2.85	I2.90	2.95	S	S	R	S	SH	S	S	U3.00	I3.00	U2.75	I2.80	2.70	2.60	2.65
28	2.55	2.70	3.35	2.60	2.50	2.50	2.50	2.65	3.40	3.05	I3.05	S	S	SH	2.85	2.95	3.00	U2.85	3.10	3.55	2.60	2.30	U2.50	2.60
29	2.65	2.85	3.10	2.35	2.50	2.35	U2.55	2.80	J3.25	3.15	I3.10	S	I2.95	2.95	2.90	3.00	3.05	3.15	3.25	J3.30	U3.40	U3.10	2.70	U2.60
30	I2.80	2.80	U2.90	3.25	3.05	2.70	2.75	2.95	3.30	3.30	I3.20	I3.05	2.90	R	R	R	C	R	R	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	3.25	I3.20	2.95	C	C	C	C	C	C	C	C	C	C	C	C
No.	27	27	27	27	26	26	27	26	27	27	27	24	24	23	23	24	22	23	21	24	22	23	26	27
Median	2.55	2.60	2.80	2.80	2.65	2.50	2.70	2.90	3.25	3.15	3.15	3.05	2.95	2.95	2.90	2.95	3.00	3.00	3.00	2.95	2.90	2.90	2.70	2.60

(M3000)F2 Sweep 1.0 Mc to 20.3 Mc in 30 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 7

IONOSPHERIC DATA

Dec. 1959 | (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								C	C	C		C	C	C	C		C	C						
3											C	C	C	C	C	C	C							
4																								
5																								
6																								
7										C							C							
8													C											
9																								
10																								
11												C	C		C	C	C	C						
12										C														
13										C														
14																	C	C						
15								C	C	C	C	C	C	C	C	C	C	C						
16								C	C	C														
17																								
18																								
19																								
20																								
21																								
22																	C							
23																								
24																								
25														C										
26																								
27																								
28																								
29											C	C	C	C	C									
30											C	C	C	C	C	C	C	C						
31								C	C		C		C	C	C	C	C	C						
No.																								
Median																								

(M3000)F1 Sweep 1.0 Mc to 20.3 Mc in 30 sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 8

IONOSPHERIC DATA

Yamagawa

Lat. 31° 12.5' N
Long. 130° 37.7' E

Dec. 1959

h'F2

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												C	C	C	C		C	C						
2								C	C	C		C	C	C	C		C							
3											C	E250 C	C	C	C	C	C							
4																								
5																								
6																								
7										C							C							
8													C											
9																								
10																								
11												C	C		C	C	C	C						
12										C														
13										C														
14																	C	C						
15								C	C	C	C	C	C	C	C	C	C	C						
16								C	C	C														
17																								
18																								
19																								
20																								
21																	C							
22																								
23																								
24																								
25														C										
26																								
27																								
28											E250 C	E275 C	C	E250 C	E290 C									
29											C	C	E300 C	E305 C	E300 C	E300 C	C							
30											C		C	C	C	C	C	C						
31								C	C															
No.											1	2	1	2	2	1								
Median											E250	E260	E300	E280	E295	E300								

h'F2

Sweep 1.0 Mc to 20.3 Mc in 30 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 9

IONOSPHERIC DATA

Dec. 1959 | 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	350	350	300	325	375	340	345	295	250	240	245	250	245	240	245	245	240	225	215	250	230	225	240	325
2	340	275	260	250	C	C	C	C	C	C	240	C	C	C	C	240	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	275	230	250	I 240 C	C	C	C	C	C	C	240	230	230	250	275	250	250
4	250	270	300	250	300	300	300	300	250	250	240	235	240 H	245	250	245	230	235	220	240	250	230	205	255
5	285	250	250	270	290	300	300	240	245	250	240	230	230	230	250	250	230	210	200	215	250	220	250	320
6	375	295	450	410	400	370	300	235	245	250	250	230	245	250	250	235 H	245	225	240	220	230	225	250	300
7	305	310	250	230	255	250	300	280	240	I 235 C	225	225	235	225 H	245	250	I 245 C	240	220	225	235	220	200	275
8	290	320	300	300	250	290	310	275	250	240	240	230	I 240 C	235	235	240 H	250	225	200	245	240	225	250	250
9	250	E 280 S	C	I 265 C	I 300 C	345	275	275	250	245	235	240	245	240	240	225	240	235	210	225	250	225	225	250
10	300	275	255	250	250	310	260	250	245	240	240	235	225	235 H	235	235	245	230	200	240	250 H	255	250	290
11	290	280	300	300	290	250	300	290	235	250	230	I 240 C	I 245 C	240	C	C	C	C	C	240	220	225	I 250 C	290
12	320	320	250	290	250	200	E 350 S	285	240	I 240 C	235	250	245	235	240	245	230	240	205	220	245	225	265	295
13	350	340	275	220	250	390	345 S	250	250	I 240 C	240	245	240	250 H	240	250	240	235	200 A	245	245	240	255	290
14	305	300	275	265	280	300	295	250	240	240	245	250	245	230	230	250	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	340
16	C	C	C	C	C	C	C	C	C	C	235	235	220 H	245	235	230	245	240	205	260	260	230	250	330
17	300	305	320	305	305	300	300	275	230	240	245	200 H	240	230	250	230	240	225	240	245	230	250 C	C	I 310 C
18	I 375 C	I 335 C	305	I 270 C	245	300	300	245	225	240	240	240	240	230	225	230	250	210	200 A	200	220	235	225	300
19	350	345	300	250	225 H	270	305	250	240	230	230	235	235	245	230 H	240	245	225	205	230	215	220	280	300
20	310	305	285	240	275	350	340	295	240	245	250	250	230	225	230	250	250	230	200	210	200	205	250	I 290 C
21	I 295 C	325	300	255	340	350	300	240	240	245	245	245	250	245	240	245	250	225	200	230	210	220	250	300
22	315	330	295	250	250	275	340	270	240	245	240	245	235	240	235	245	I 240 C	210	200	220	235	230	240	270
23	300	340	300	255	300	370	320	250	230	245	240	235	205	210	240	240	245	240	210	205	225	235	250	305
24	350	300	250	305	390	420	260	245	240	250	235	240	240	240	230 H	240	270	245	220	230	210	245	250	230
25	260	310	275	250	300	325	290	250	230	245	240	225	210 H	I 235 C	250	250	250	225	230	240	245	250	250	245
26	250	310	300	290	250	300	350	255	215	235	240	240	210	235 H	250	250	240	240	250	245	210	240	290	330
27	300	290	265	350	340	370	330	245	240	245	245	245	230	230	220 H	240	225	230	200	225	205	280	255	270
28	295	300	245	250	350	400	395	300	230	240	245	225	225	205 H	220 H	240	235	240	240	210	200 H	290	305	295
29	310	260	250	290	350	410	345	265	245	245	C	C	C	C	C	E 250 C	235	210	215	225	200	235	275	310
30	300	250	250	245	250	350	310	275	240	245	C	C	C	C	C	C	C	235	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	240	I 245 C	245	C	C	C	C	C	C	C	C	C	C	C	C
No.	27	27	26	27	26	26	25	27	27	28	28	26	25	25	24	25	24	26	25	26	26	26	25	27
Median	300	305	280	265	290	320	300	265	240	245	240	240	240	235	240	240	240	230	210	230	230	230	250	295

h'F

Sweep 1.0 Mc to 20.3 Mc in 30 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec. 1959 | 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	120	S	E	E	E	E	S	Gr	Gr	Gr	190	145	125	135	125	110	110	Gr	110	E	C	S	110	125
2	100	105	100	100	C	C	C	C	C	C	130	C	C	C	C	Gr	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	Gr	125	C	C	C	C	C	C	C	C	100	E	E	100	110	E	S
4	S	S	E	E	100	E	S	Gr	Gr	Gr	Gr	105	105	105	105	105	105	Gr	100	100	100	S	105	S
5	S	E	E	105	105	E	S	Gr	105	Gr	130	125	Gr	Gr	100	100	100	100	100	S	S	115	100	S
6	S	S	E	E	C	E	S	Gr	130	125	110	120	120	105	105	105	105	110	105	105	S	105	100	100
7	S	E	E	100	100	100	S	105	Gr	C	150	110	100	105	100	100	C	100	100	100	S	S	S	S
8	S	S	E	100	100	E	S	Gr	Gr	Gr	125	C	C	115	115	110	Gr	110	105	105	110	S	S	S
9	S	C	C	C	C	E	S	Gr	Gr	150	140	130	120	120	120	120	100	100	100	100	100	S	S	S
10	S	S	E	E	E	E	C	Gr	Gr	Gr	175	150	Gr	150	100	Gr	100	100	100	100	S	S	S	S
11	S	E	E	E	E	E	S	Gr	Gr	130	C	C	C	105	C	C	C	C	C	S	S	S	C	S
12	S	S	E	E	E	E	S	Gr	Gr	C	Gr	115	115	110	110	110	110	Gr	105	100	S	S	S	S
13	S	S	100	E	E	E	S	120	100	C	Gr	125	110	110	Gr	Gr	Gr	100	100	100	100	100	E	S
14	E	S	E	E	E	E	100	Gr	Gr	Gr	Gr	125	120	110	110	110	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E
16	C	C	C	C	C	C	C	C	C	C	110	110	105	105	105	Gr	105	105	105	100	105	S	E	100
17	S	E	E	E	E	E	S	105	Gr	140	125	125	105	105	105	105	105	110	105	100	100	100	C	C
18	C	C	E	C	E	E	E	S	125	120	100	105	Gr	Gr	100	100	100	100	100	S	100	100	100	S
19	S	S	E	E	E	E	S	Gr	Gr	135	110	105	110	Gr	Gr	105	100	105	110	E	S	S	S	S
20	S	S	E	E	E	E	S	Gr	Gr	110	115	110	115	110	105	100	100	100	100	100	S	S	S	C
21	C	S	110	E	E	E	S	S	Gr	Gr	115	110	110	105	Gr	Gr	Gr	100	E	S	S	S	S	S
22	S	S	E	E	100	E	S	S	130	Gr	120	105	Gr	110	110	Gr	C	Gr	100	100	S	S	S	S
23	E	E	E	E	E	E	S	S	120	155	115	105	105	Gr	Gr	Gr	Gr	Gr	E	S	E	S	S	S
24	S	E	E	E	E	E	S	Gr	Gr	Gr	105	105	110	105	105	Gr	Gr	Gr	100	S	S	S	S	S
25	S	E	100	100	100	100	100	100	100	Gr	105	105	105	C	100	100	100	100	100	145	S	100	100	110
26	105	105	E	E	100	100	S	S	Gr	Gr	125	110	105	105	100	100	100	130	100	100	100	100	S	105
27	105	105	105	105	105	105	100	Gr	Gr	105	105	105	105	100	Gr	100	110	100	S	S	S	110	S	S
28	S	S	E	E	110	105	S	S	120	Gr	105	105	100	Gr	Gr	100	Gr	135	120	105	S	S	S	S
29	S	C	E	E	E	E	S	S	100	130	C	C	C	C	C	C	Gr	Gr	100	100	S	S	110	S
30	S	E	E	E	E	105	E	Gr	Gr	Gr	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	Gr	C	150	C	C	C	C	C	C	C	C	C	C	C.	C
No.	4	3	5	6	9	6	3	4	10	10	21	24	19	19	18	17	15	18	21	16	9	9	7	5
Median	105	105	100	100	100	100	100	105	120	130	115	110	110	105	105	105	100	100	100	100	100	100	100	105

h'Es

Sweep 1.0 Mc to 20.3 Mc in 30 sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 11

IONOSPHERIC DATA

Dec. 1959 | 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										h	h	h	h	h	l2	l2		f				f	f
2	f4	f	f	f2							l													
3									l									l			f3	f		
4					f							l2	l	l	l3	l3	l4		f	f2	f3		f	
5				f2	f				l h		h2	h			l2h	l2C	l3C	l2	f			f	f	
6									h2	h2	l2	h	C2	l3	l2	l2	l3	l2	f3	f		f2	f2	f2
7				f	f2	f		l			h	l2	l2	l2	l2	l2		l	f	f				
8				f2	f2						h			l	l	l2		l3	f2	f2	f			
9										h	h	h	h	C	l	C l2	l3	l2	f	f	f			
10											h	h		h	l2		l2	l2	f3	f4				
11										h				l										
12												h	C	l	l2	l2	h		f	f				
13			f					l	l			h2	l	l2				l2	f2	f2	f2	f		
14							f2					h	l	l	l	l2								
15																								
16											C2	l2	l	l2	l2		l2	l3	f	f3	f			f4
17								l		h2	C2	C	l	l	l4	l3	l3	l2	f2	f3	f2	f		
18									l2	h2	l	l			l2	l	l	l2	f3		f	f	f	
19										h2	l	l	l			l3	l2	l	f					
20										l	C3	l3	l	l2	l2	l3	l3	l3	f	f				
21			f								l	l2	l2	l2				l						
22					f				h		h2	l2		l2	l2				f	f				
23									l	h2	h2	l	l											
24											l	l	l	l	l2				f					
25			f	f2	f2	f3	f4	l3	l2		l2	l	l	l	l3	l2	l3	l2	f3	f2		f	f3	f2
26	f2	f2			f	f					h2	C2	l	l2	l2	l3	l4	h3	f3	f4	f2	f		f2
27	f2	f3	f2	f3	f2	f2	f			l3h	l2	l2	l2	l2		l3	l	l2				f2		
28					f	f			l		l2	l	l2			l		h2	f	f				
29									l h2	h									f2	f			f2	
30						f																		
31												h												
No.																								
Median																								

Types of Es | Sweep 1.0 Mc to 20.3 Mc in 30 sec in automatic operation.

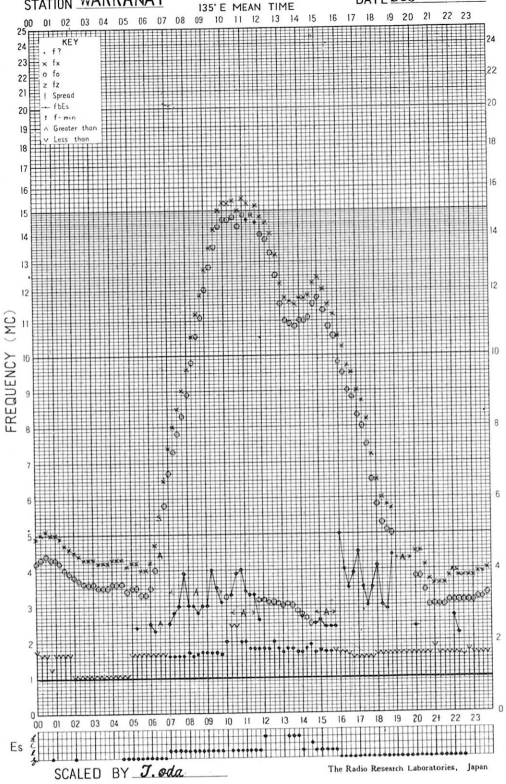
The Radio Research Laboratories, Japan.

Y 12

58

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE Dec. 1 1959

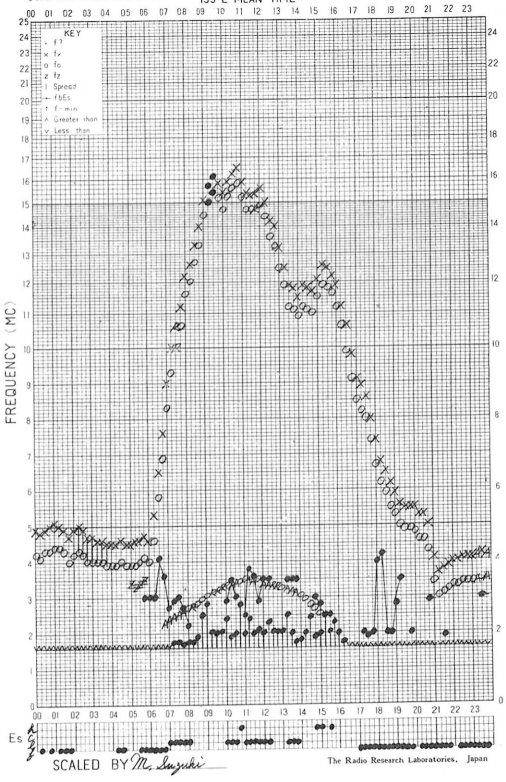


SCALED BY T. Oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Dec. 1 1959



SCALED BY M. Suzuki

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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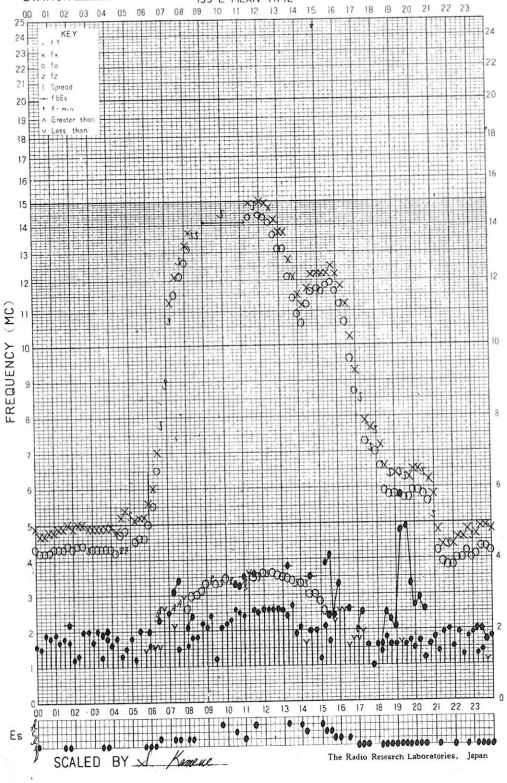
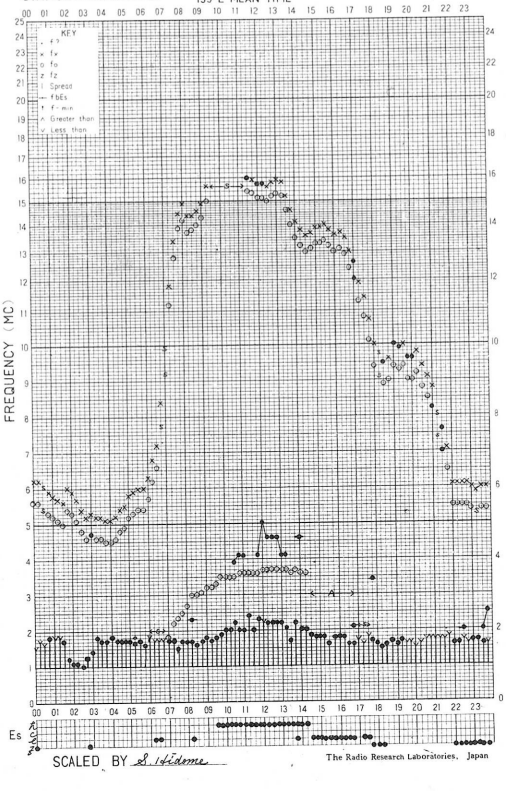


SCALED BY [illegible]

The Radio Research Laboratories, Japan

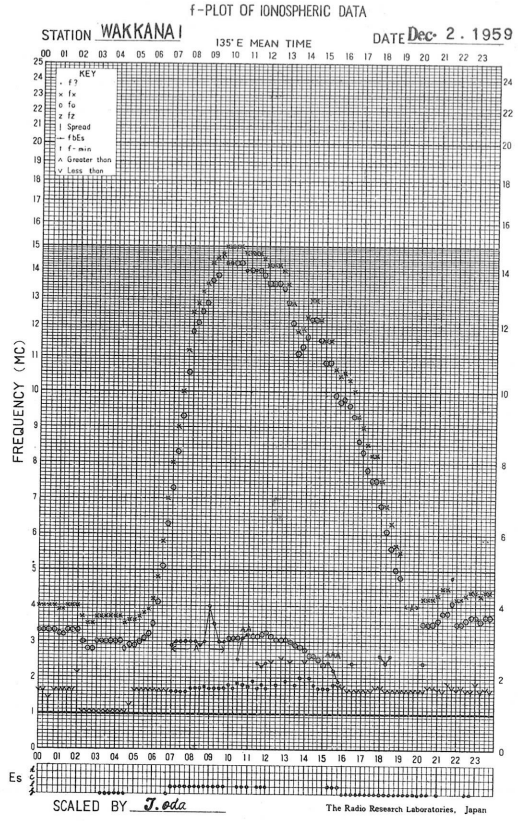
f-PLOT OF IONOSPHERIC DATA

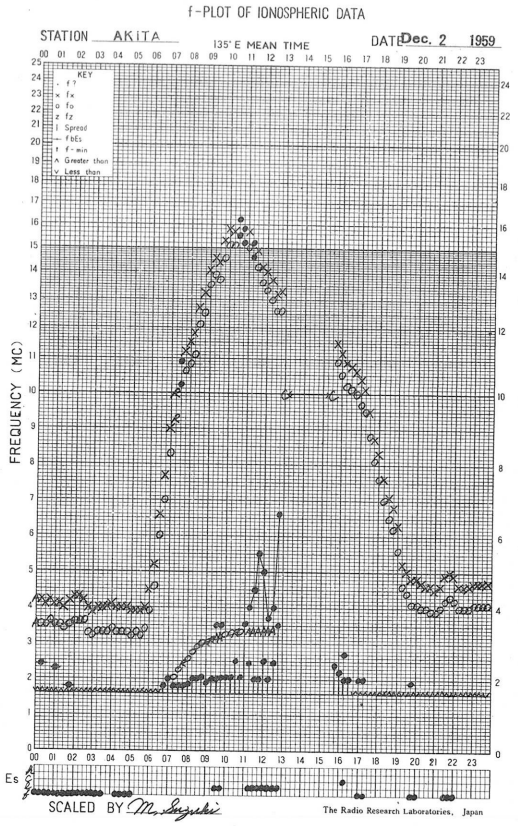
STATION YAMAGAWA 135° E MEAN TIME DATE Dec. 1 1959



SCALED BY S. Ishidome

The Radio Research Laboratories, Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE Dec. 2. 1959
KEY
. f?
× fx
o fo
z fz
I Spread
— fbEs
t f-min
^ Greater than
v Less than
FREQUENCY (MC)
Es
SCALED BY J. oda
The Radio Research Laboratories, Japan


f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135° E MEAN TIME
DATE Dec. 2 1959
KEY
. f?
× fx
o fo
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I Spread
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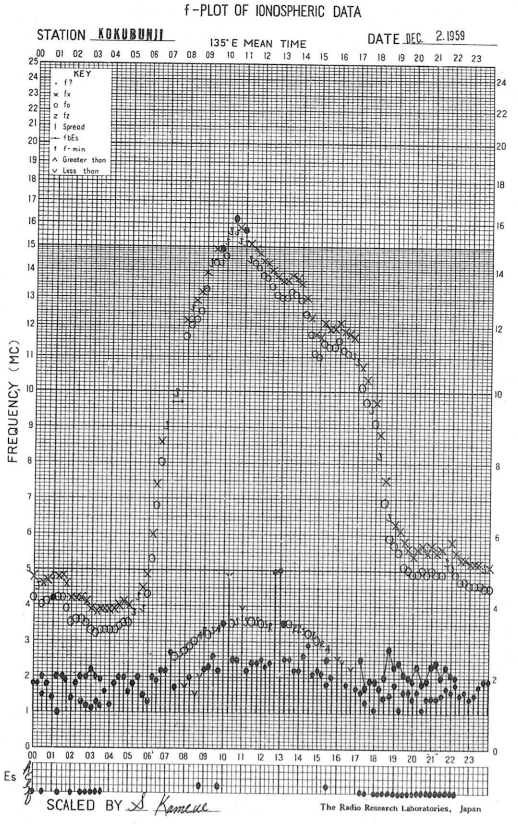
t f-min
^ Greater than
v Less than
FREQUENCY (MC)
Es
SCALED BY M. Suzuki
The Radio Research Laboratories, Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135° E MEAN TIME
DATE DEC. 2.1959
KEY
. f?
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I Spread
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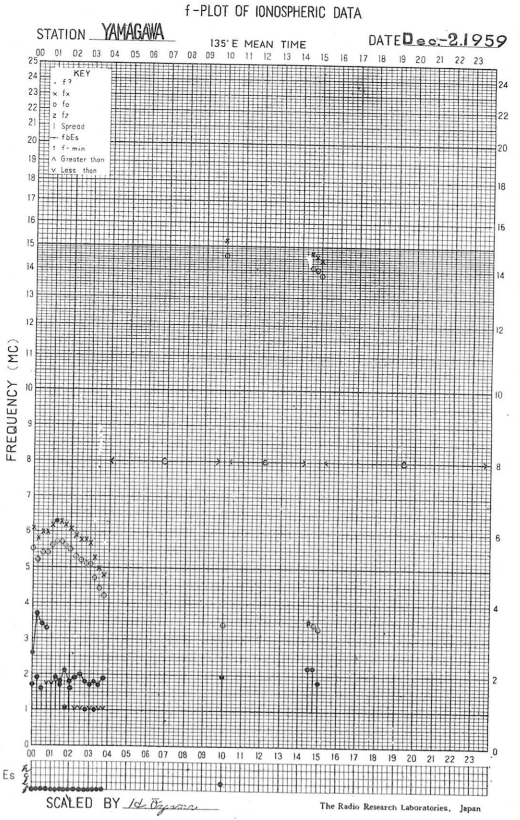
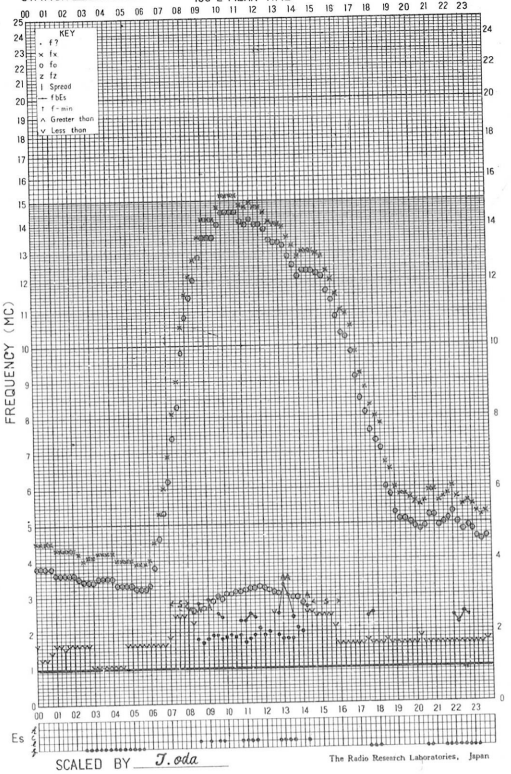
FREQUENCY (MC)
Es
SCALED BY S. Kameue
The Radio Research Laboratories, Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135° E MEAN TIME
DATE Dec.-2.1959
KEY
. f?
× fx
o fo
z fz
I Spread
— fbEs
t f-min
^ Greater than
v Less than
FREQUENCY (MC)
Es
SCALED BY Ichi Tagawa
The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE Dec. 3. 1959



SCALED BY J. Oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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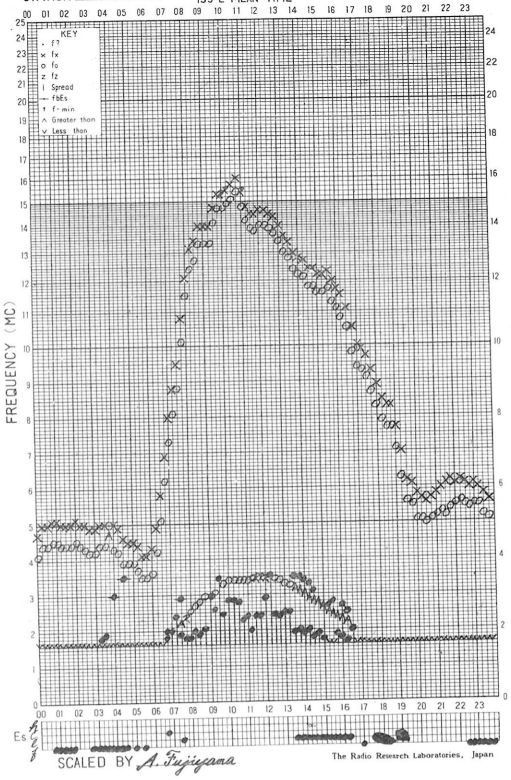

SCALED BY A. Fujiyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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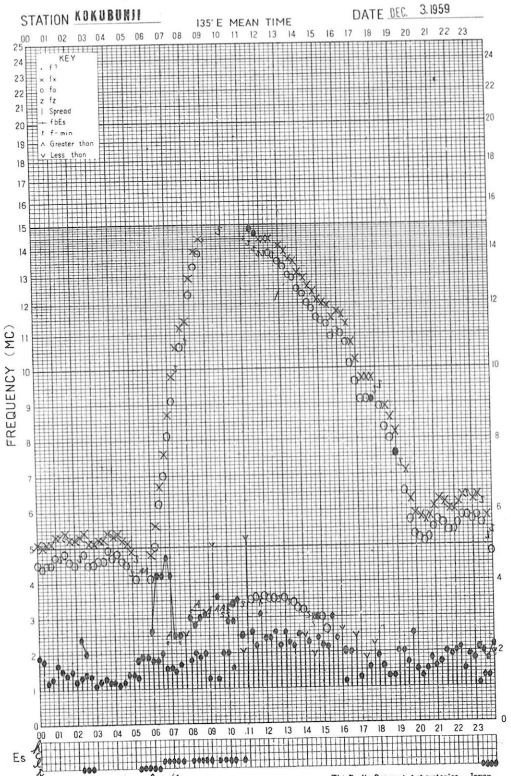

SCALED BY S. Komine

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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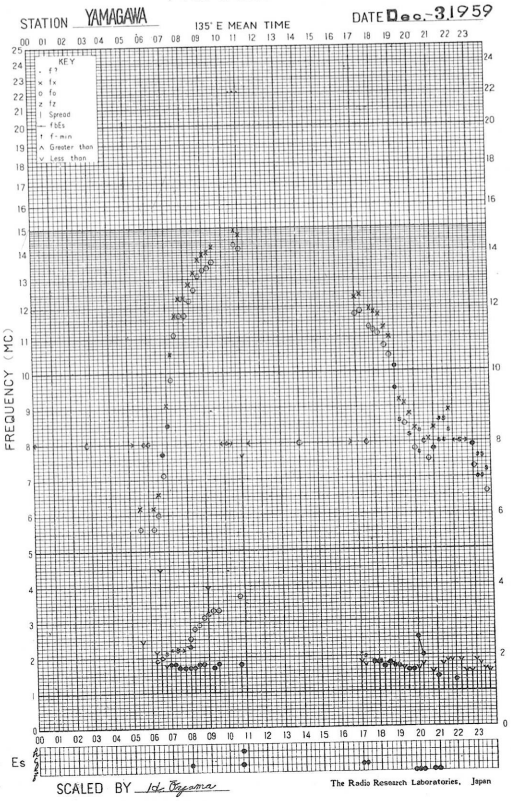
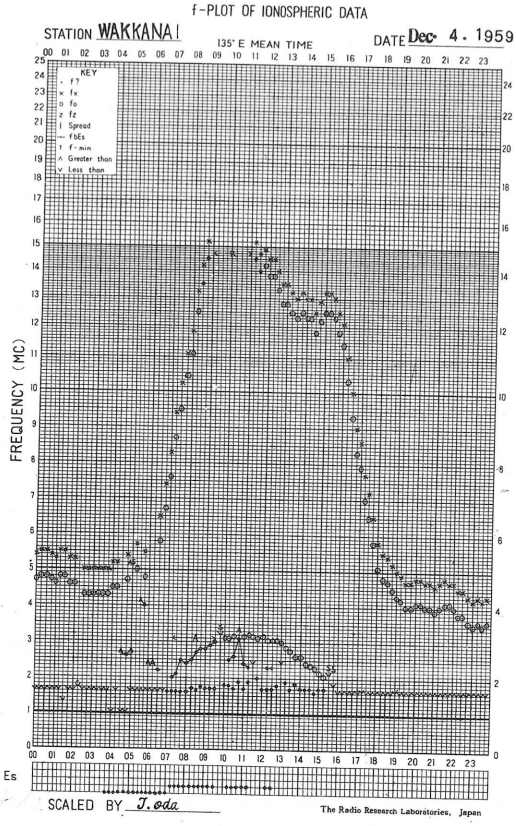


SCALED BY Ids. Tagama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE Dec. 4. 1959

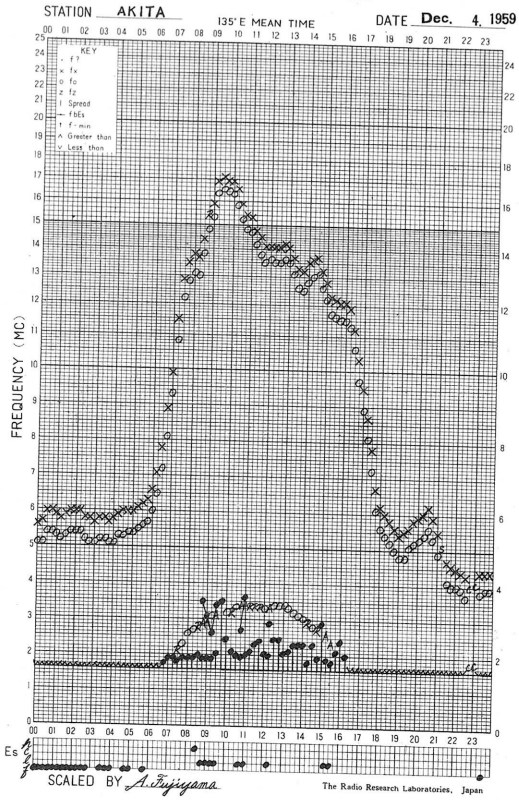


SCALED BY T. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Dec. 4, 1959

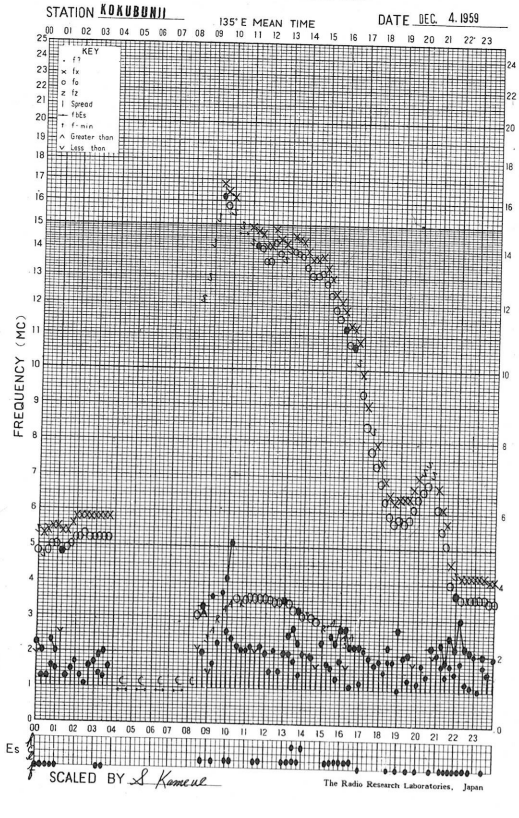


SCALED BY A. Fujiyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE DEC. 4. 1959

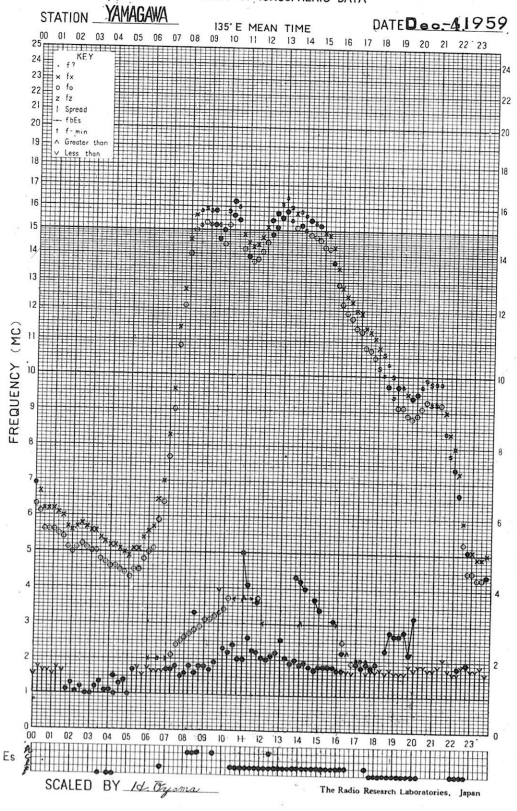


SCALED BY S. Kameue

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE Dec. 4 1959



SCALED BY M. Ogawa

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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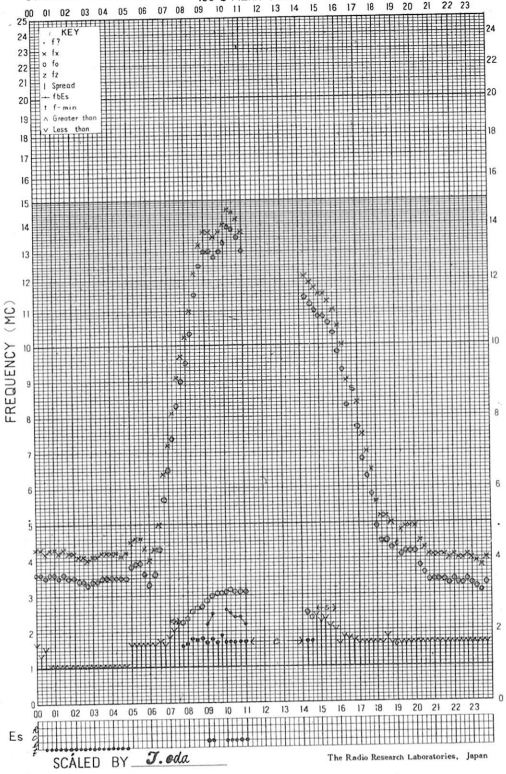

SCALED BY T. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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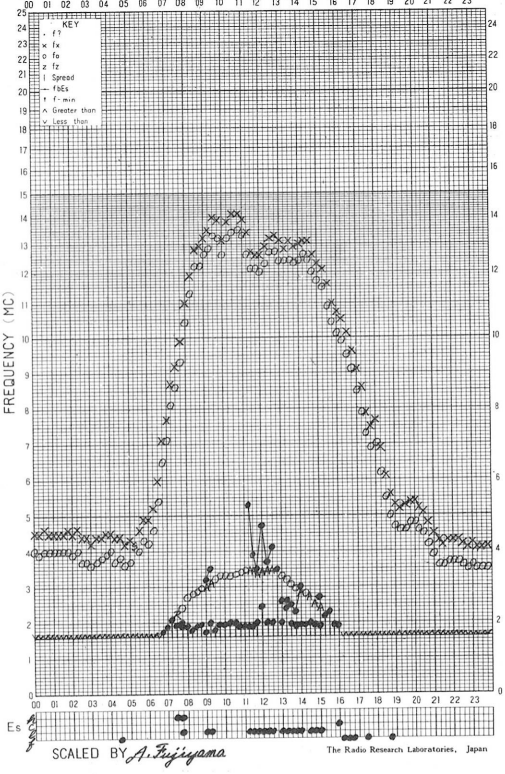

SCALED BY A. Fujiyama

The Radio Research Laboratories, Japan

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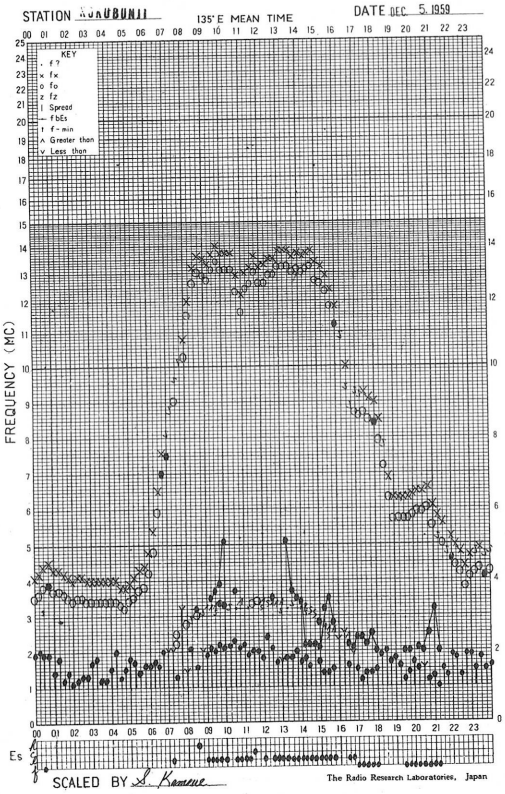

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The Radio Research Laboratories, Japan

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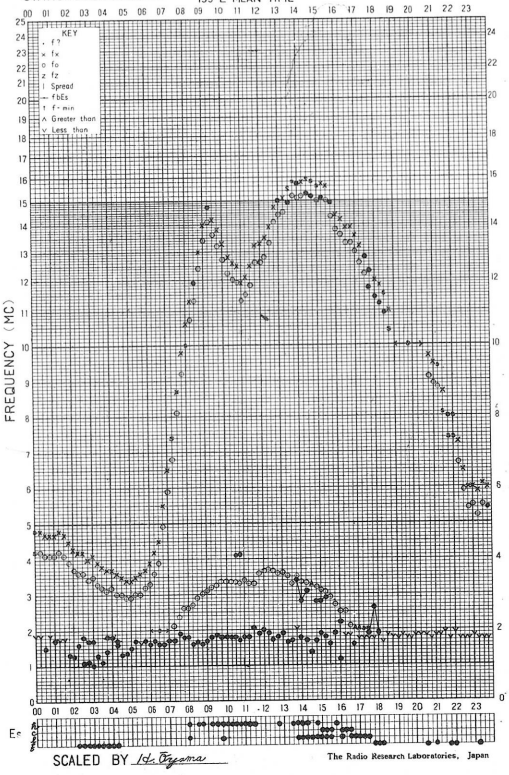

SCALED BY H. Ozyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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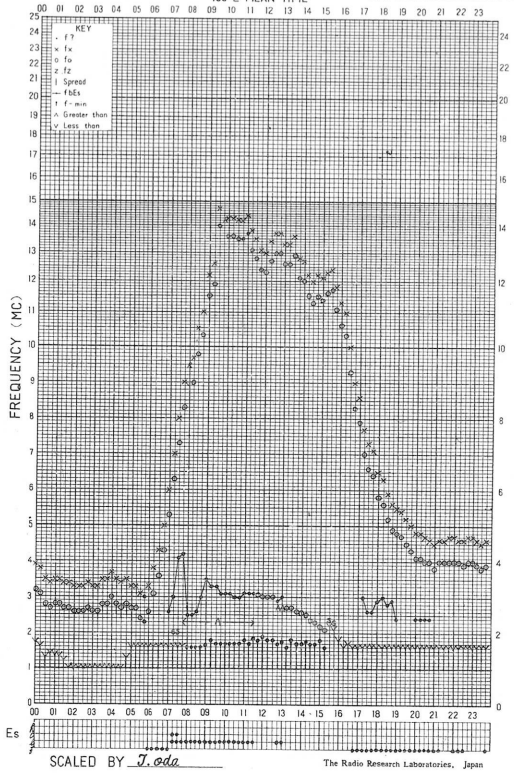

SCALED BY J. Oda

The Radio Research Laboratories, Japan

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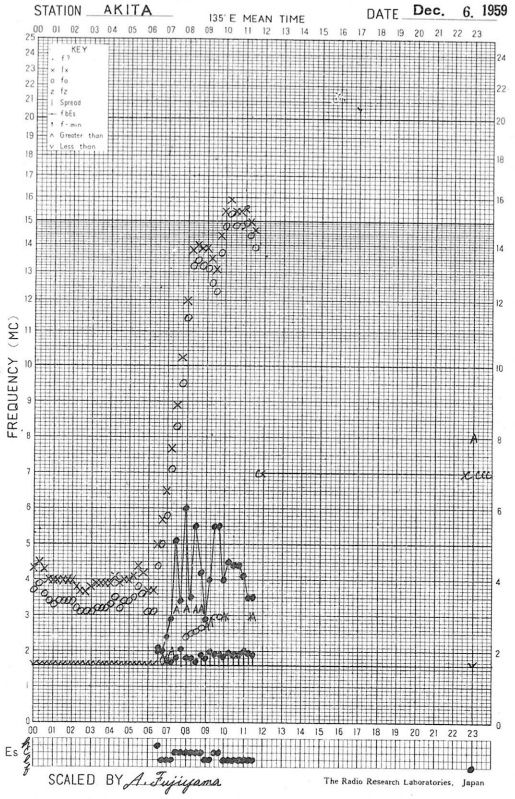

SCALED BY A. Fujiyama

The Radio Research Laboratories, Japan

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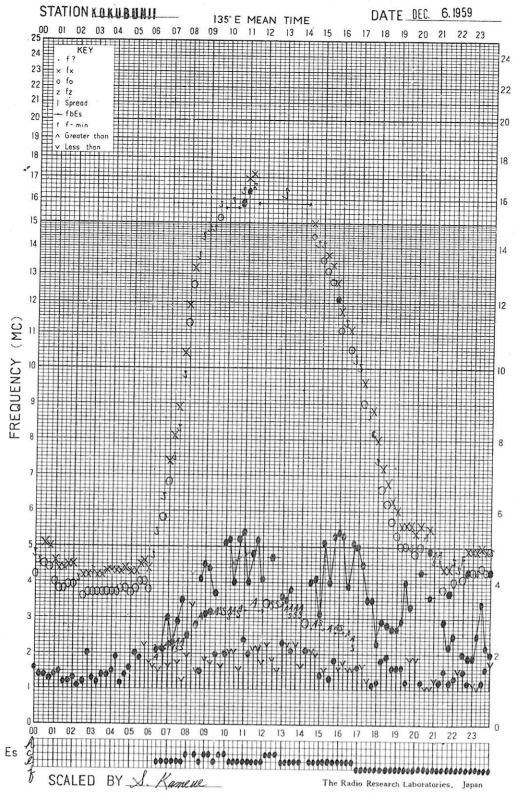

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The Radio Research Laboratories, Japan

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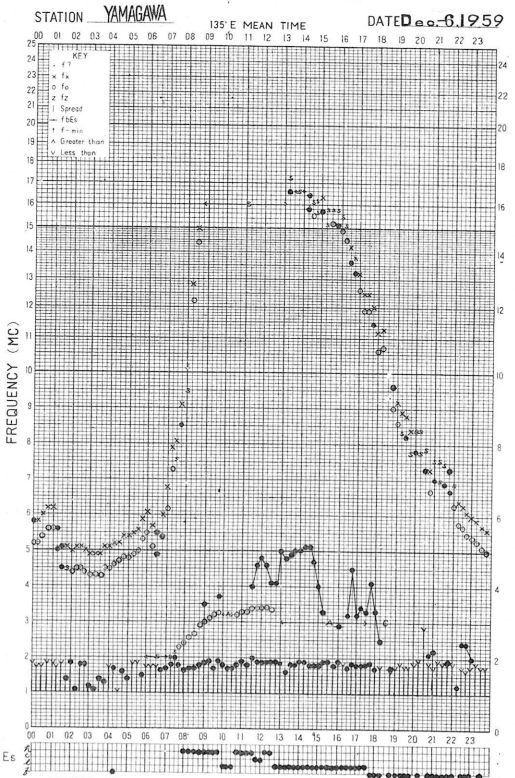

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The Radio Research Laboratories, Japan

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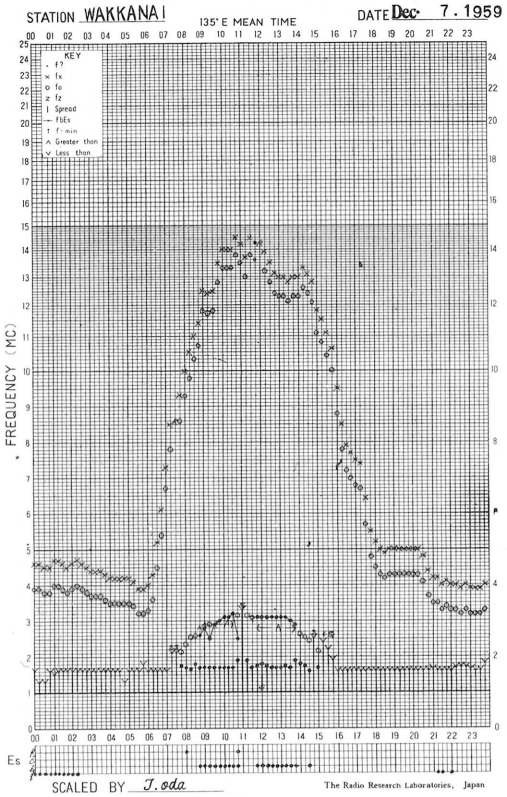

SCALED BY T. Oda The Radio Research Laboratories, Japan

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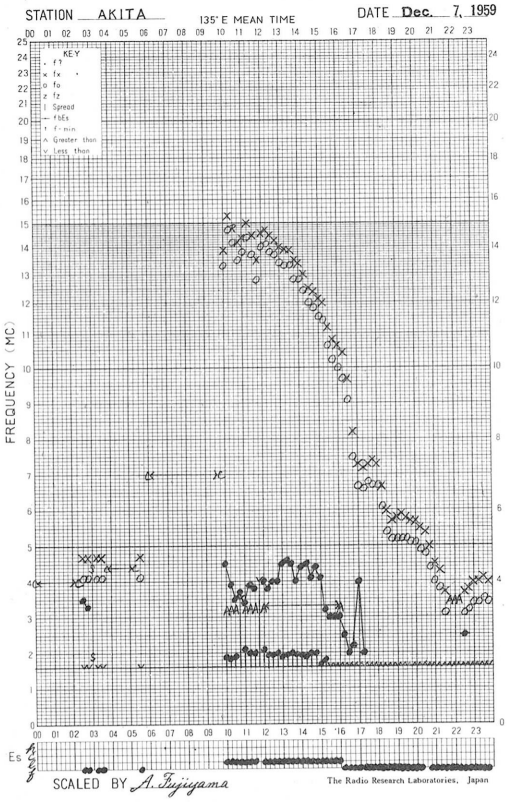

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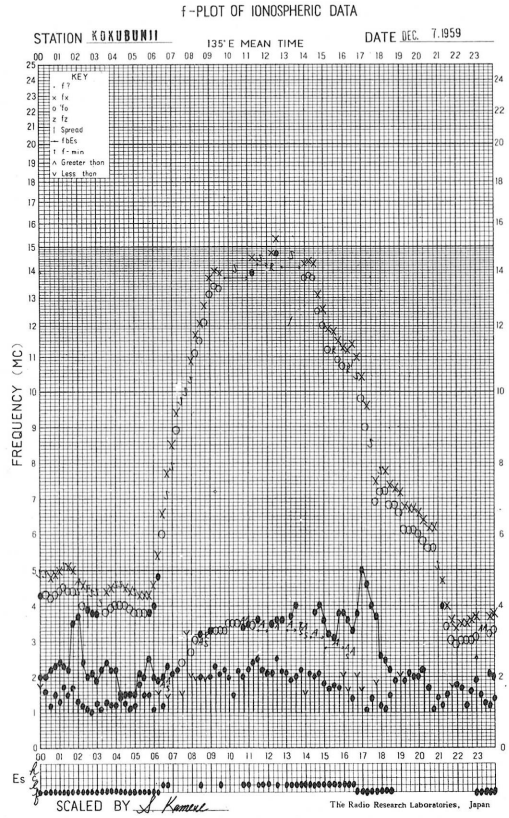

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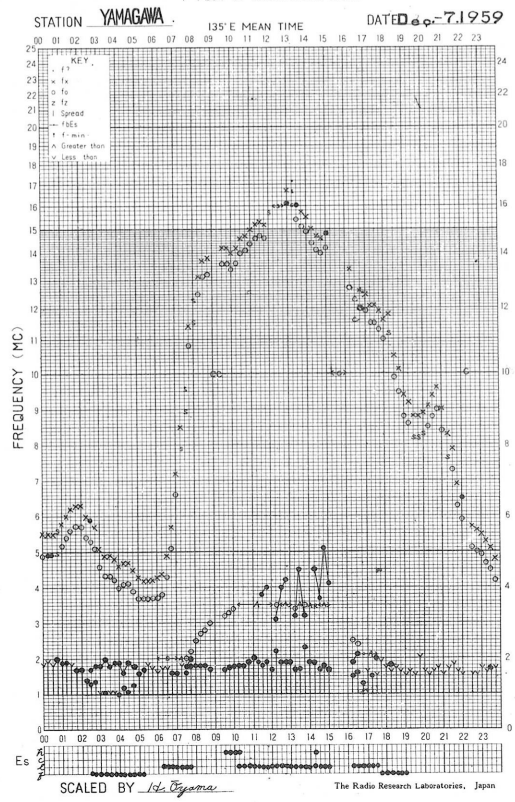

SCALED BY H. Toyama The Radio Research Laboratories, Japan

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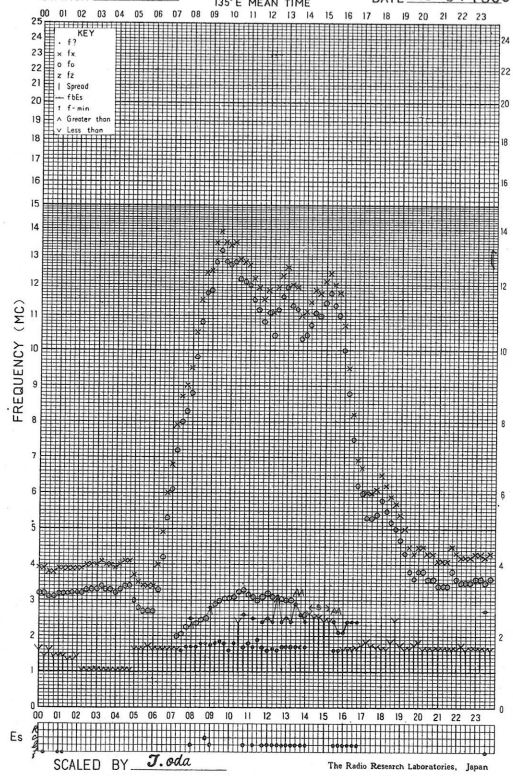

SCALED BY J. Oda The Radio Research Laboratories, Japan

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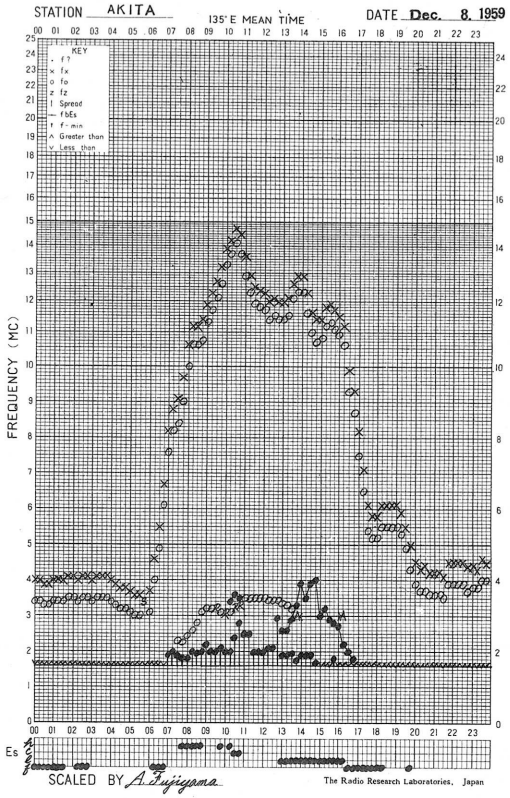

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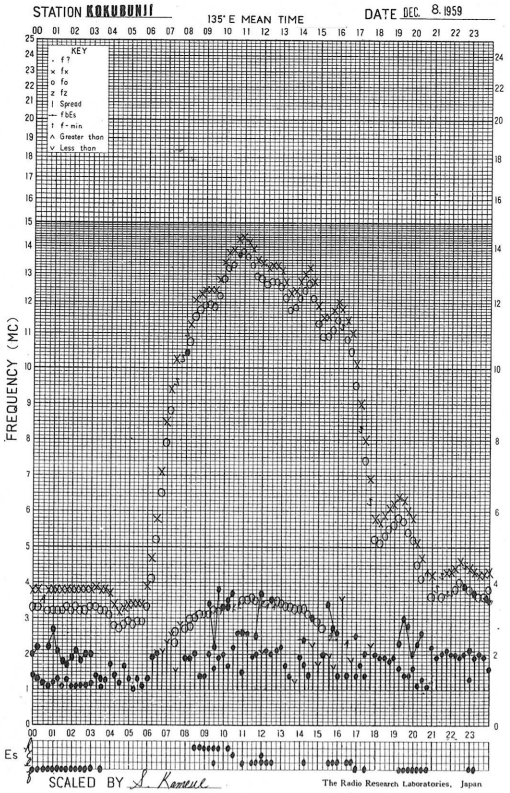

SCALED BY S. Kameui The Radio Research Laboratories, Japan

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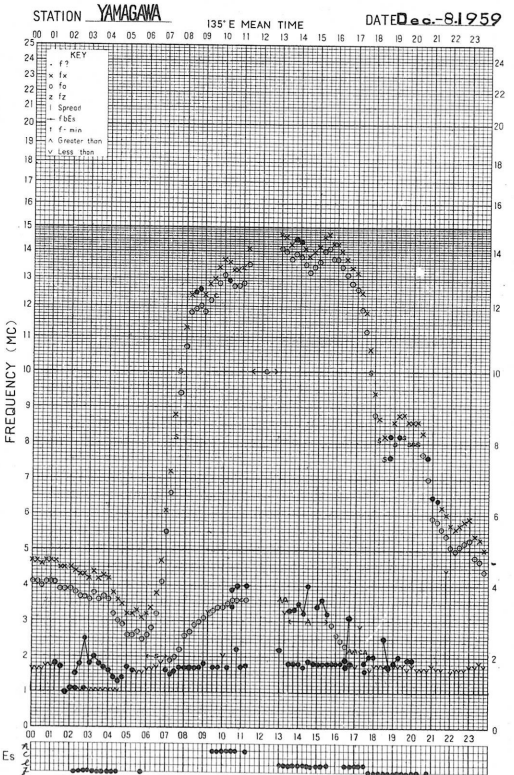

SCALED BY H. Ozama The Radio Research Laboratories, Japan

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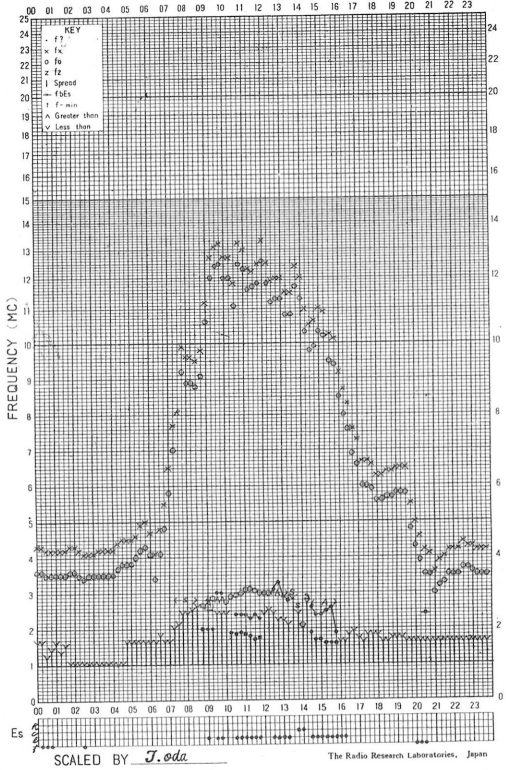

SCALED BY T. oda

The Radio Research Laboratories, Japan

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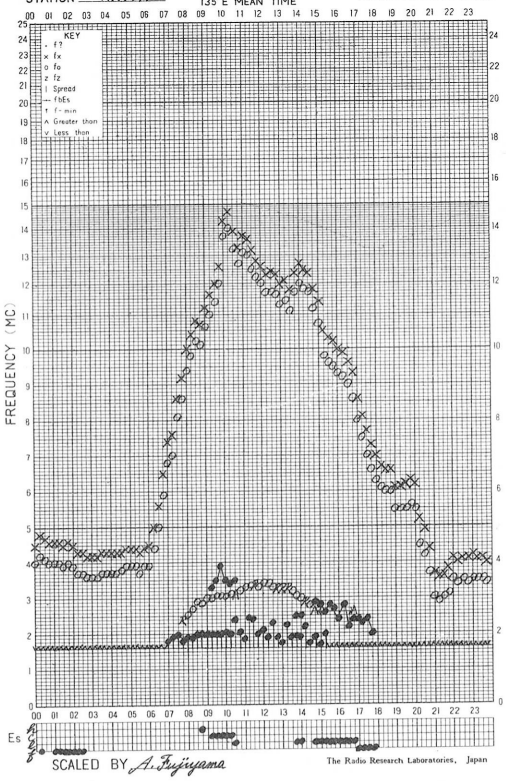

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The Radio Research Laboratories, Japan

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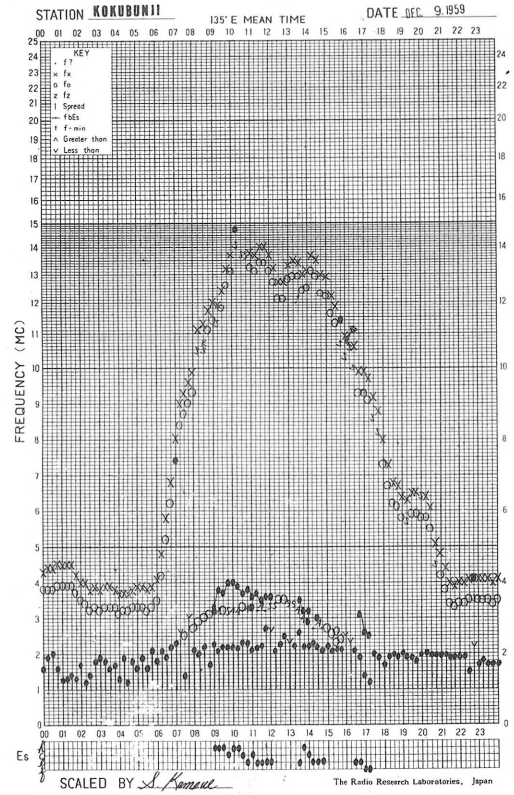

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The Radio Research Laboratories, Japan

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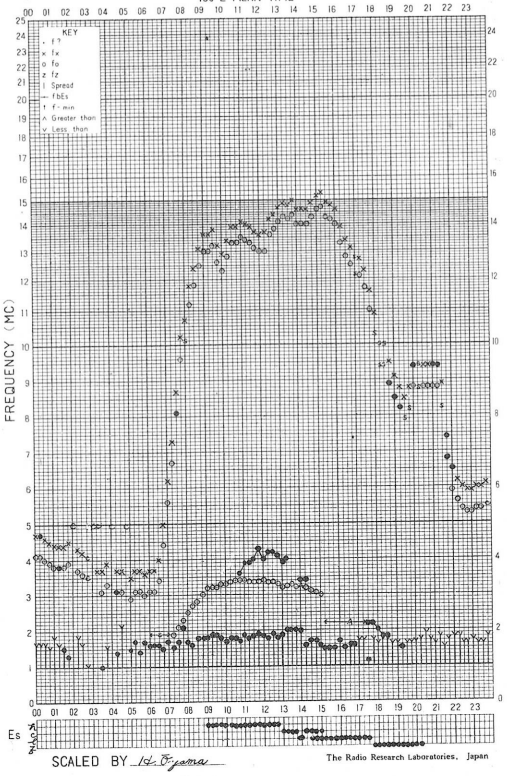

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The Radio Research Laboratories, Japan

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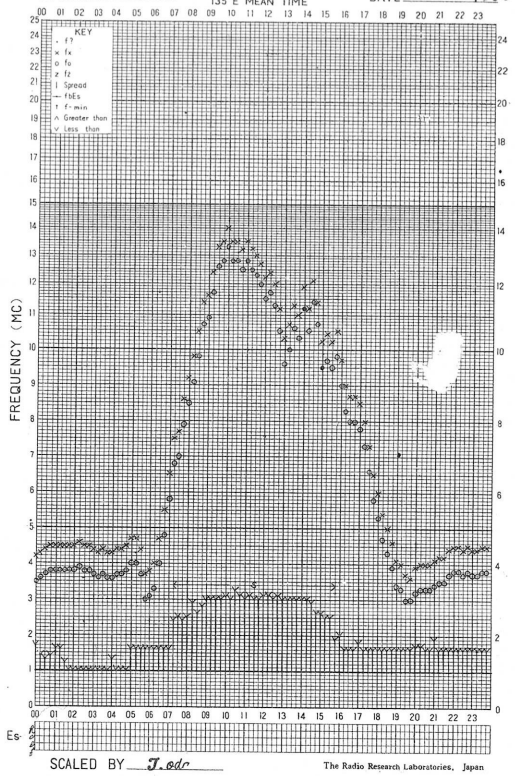

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The Radio Research Laboratories, Japan

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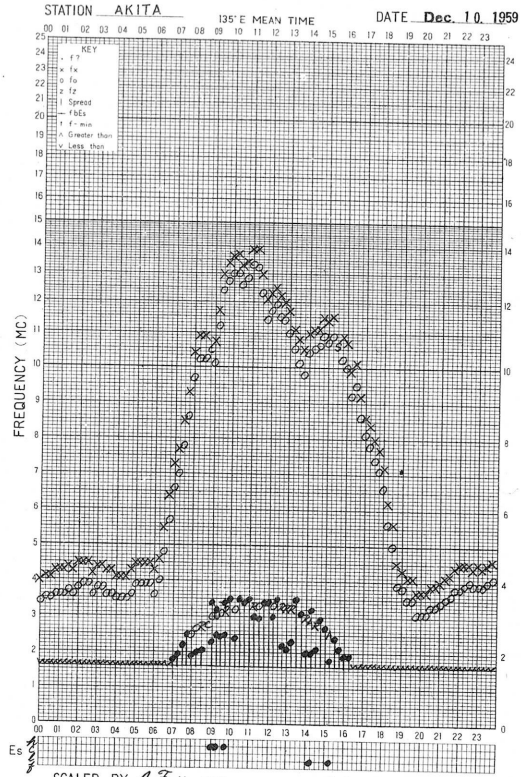

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The Radio Research Laboratories, Japan

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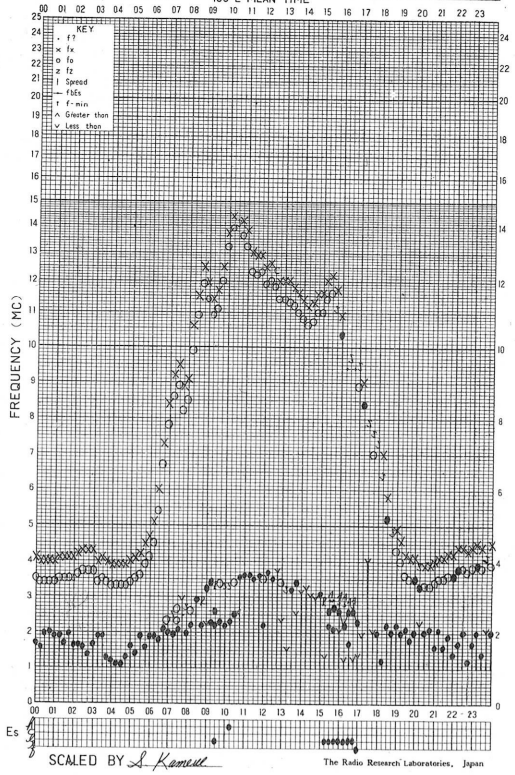

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The Radio Research Laboratories, Japan

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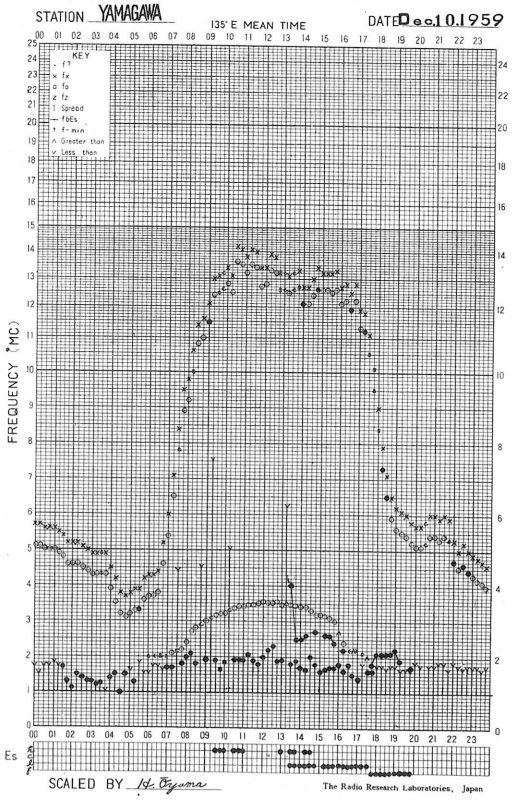

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The Radio Research Laboratories, Japan

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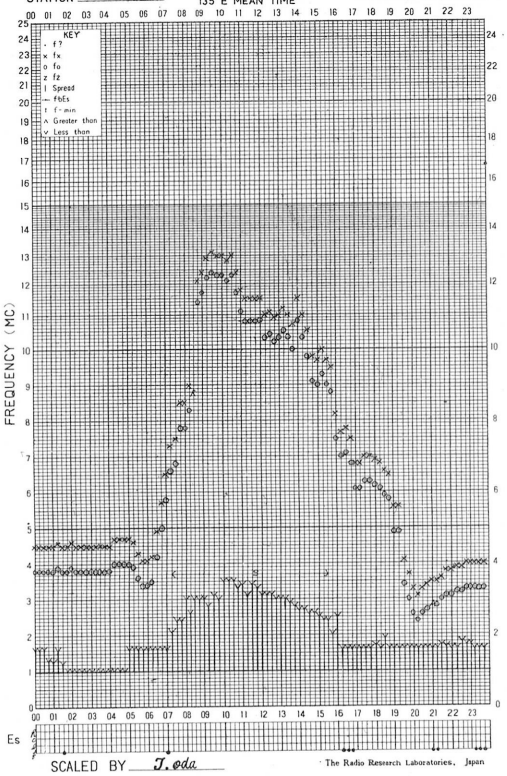

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The Radio Research Laboratories, Japan

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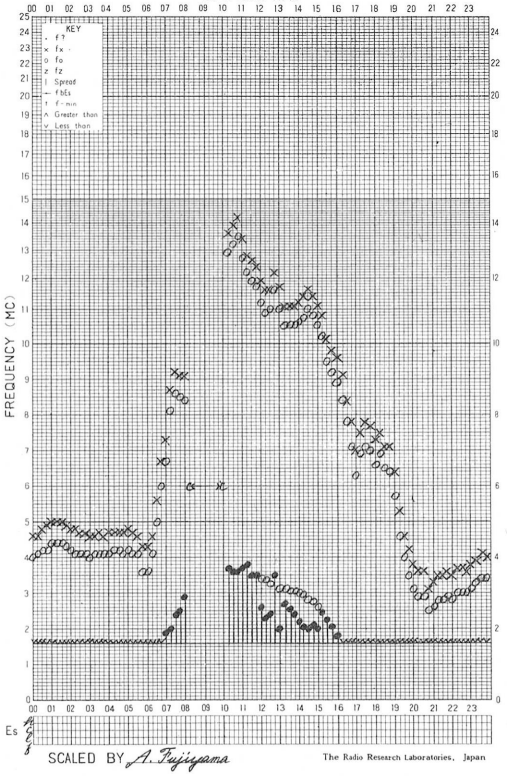

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The Radio Research Laboratories, Japan

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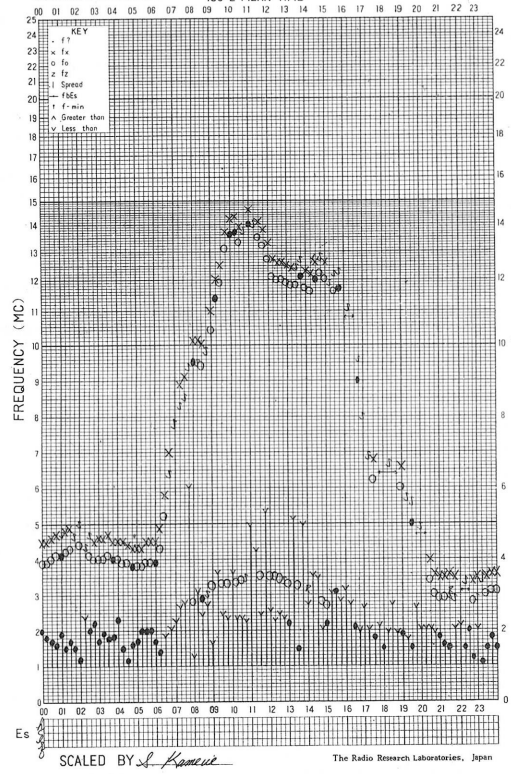

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The Radio Research Laboratories, Japan

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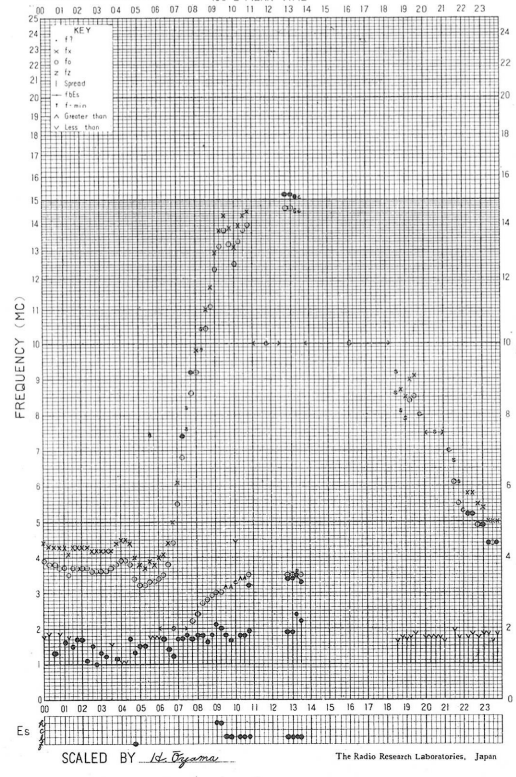
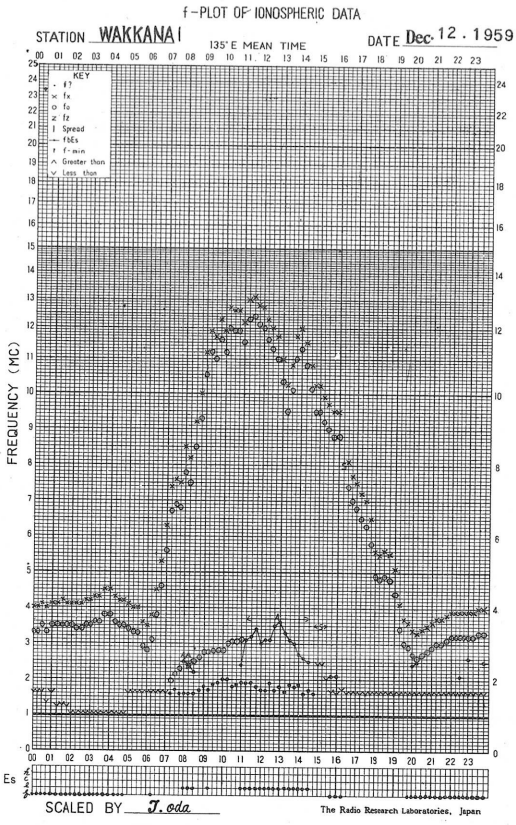


SCALED BY H. Tajima

The Radio Research Laboratories, Japan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FREQUENCY (MC)
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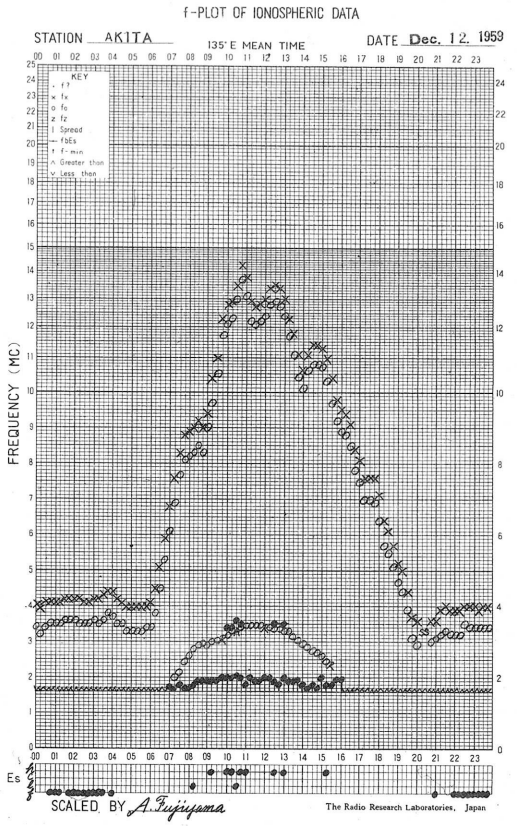
SCALED BY T. oda
The Radio Research Laboratories, Japan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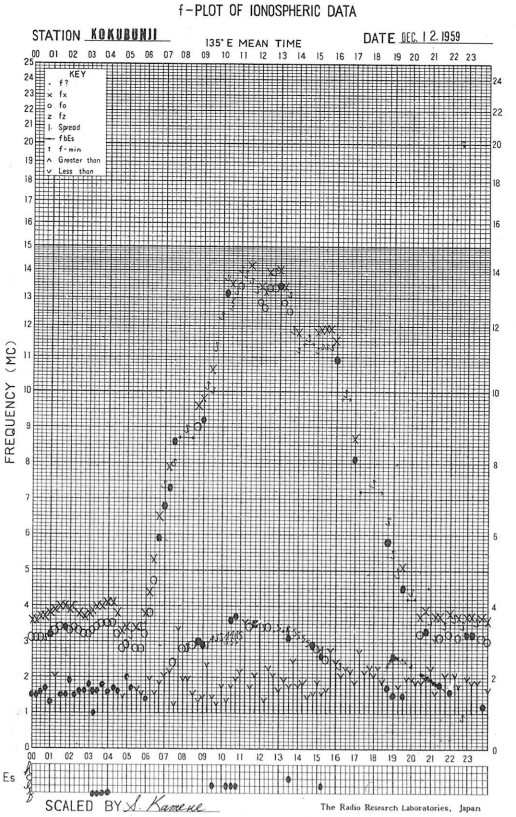
The Radio Research Laboratories, Japan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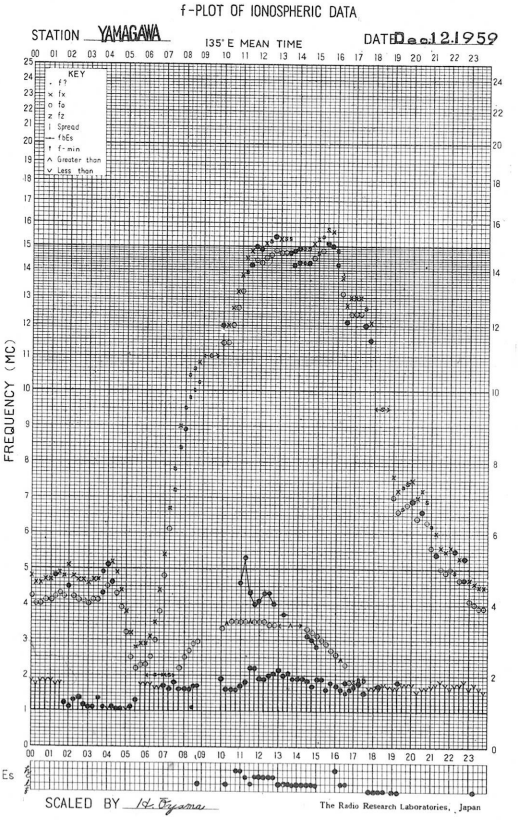
The Radio Research Laboratories, Japan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The Radio Research Laboratories, Japan

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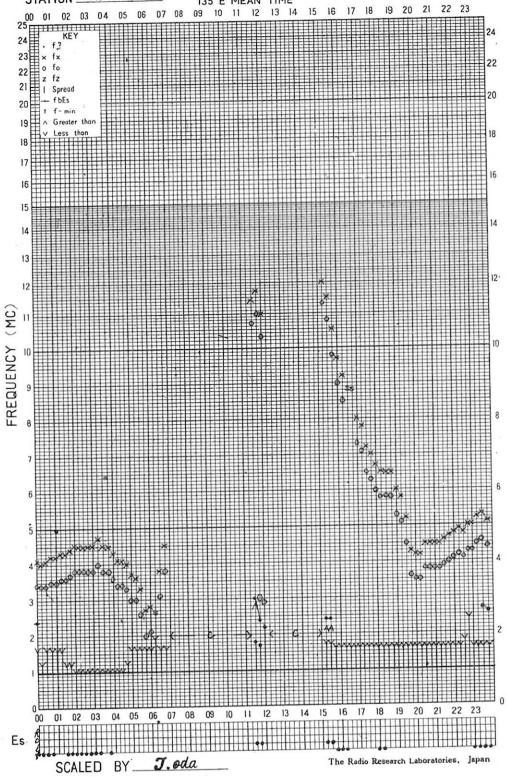

SCALED BY T. oda

The Radio Research Laboratories, Japan

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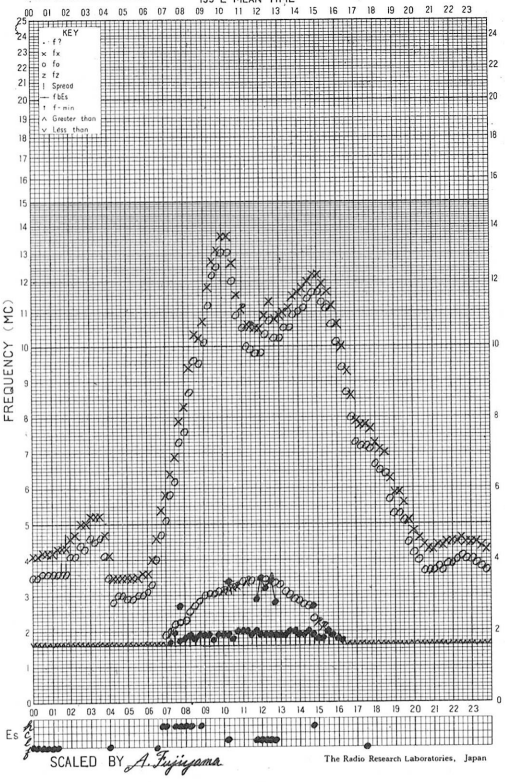

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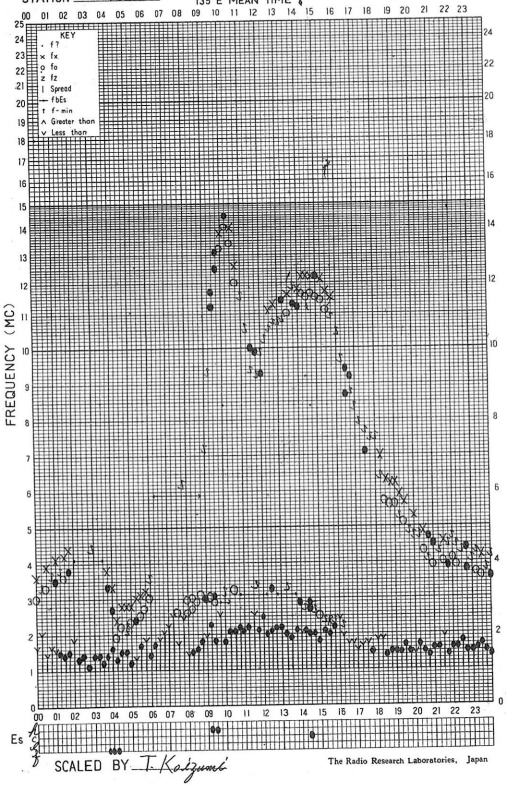

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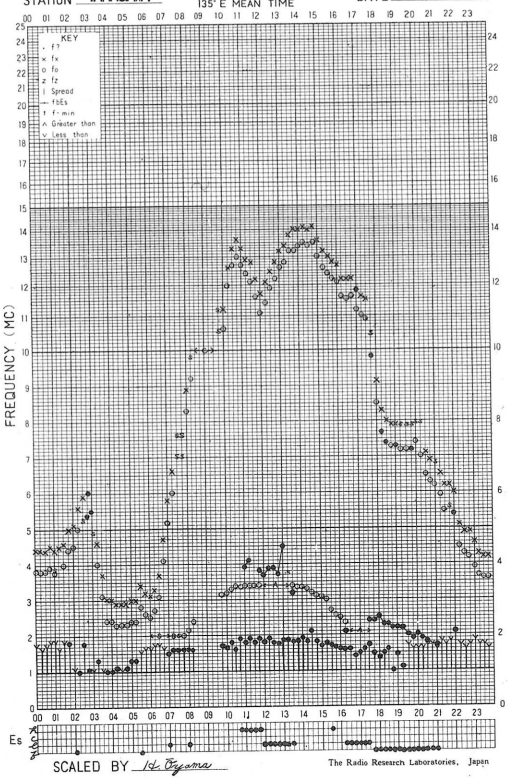

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The Radio Research Laboratories, Japan

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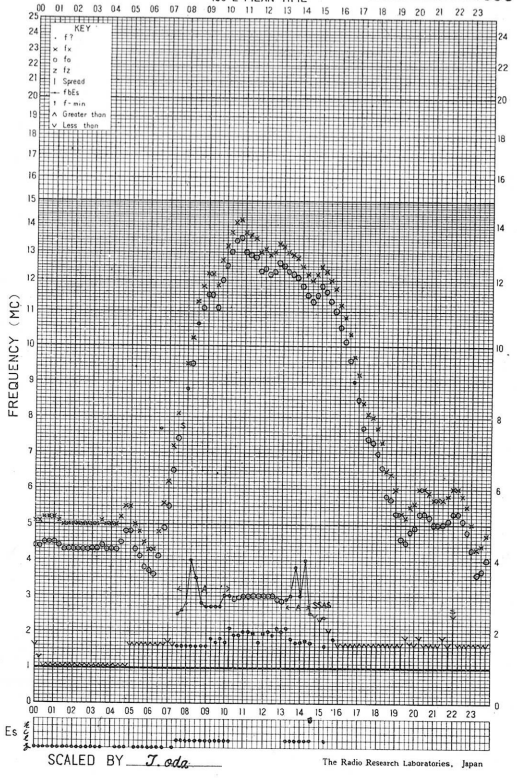

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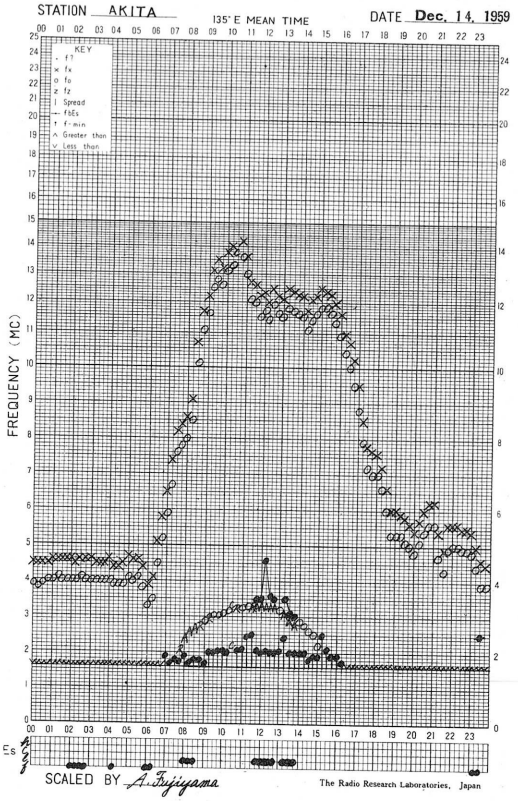

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The Radio Research Laboratories, Japan

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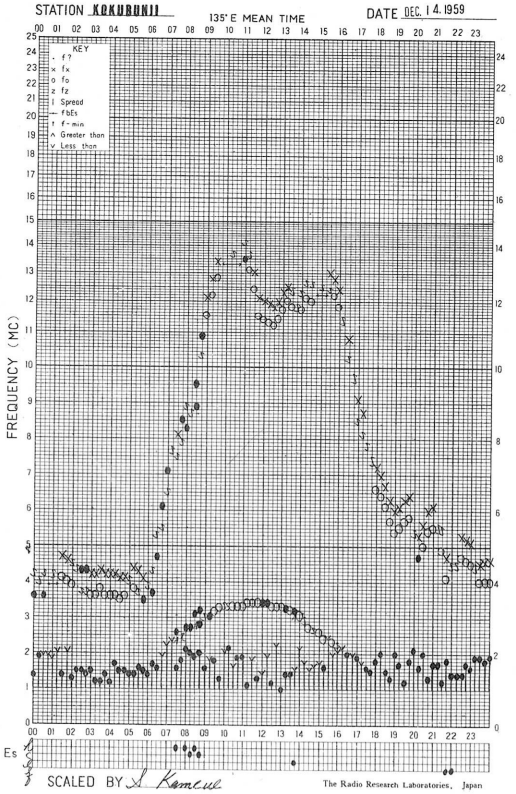

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The Radio Research Laboratories, Japan

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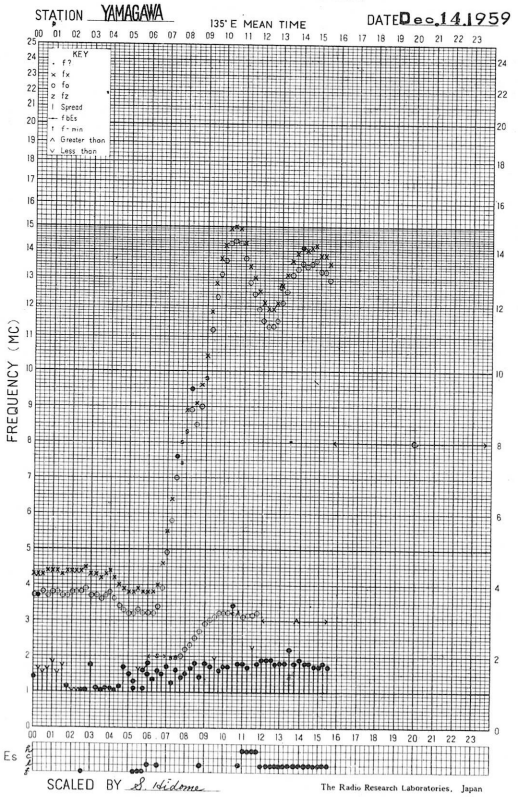

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The Radio Research Laboratories, Japan

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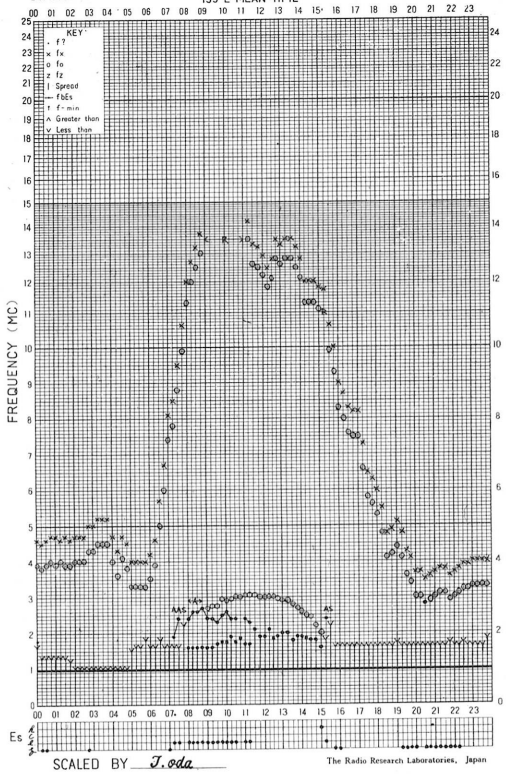

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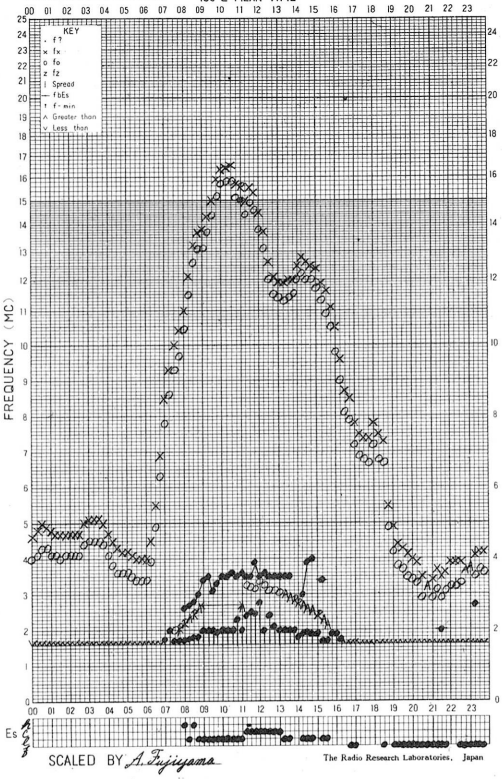

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The Radio Research Laboratories, Japan

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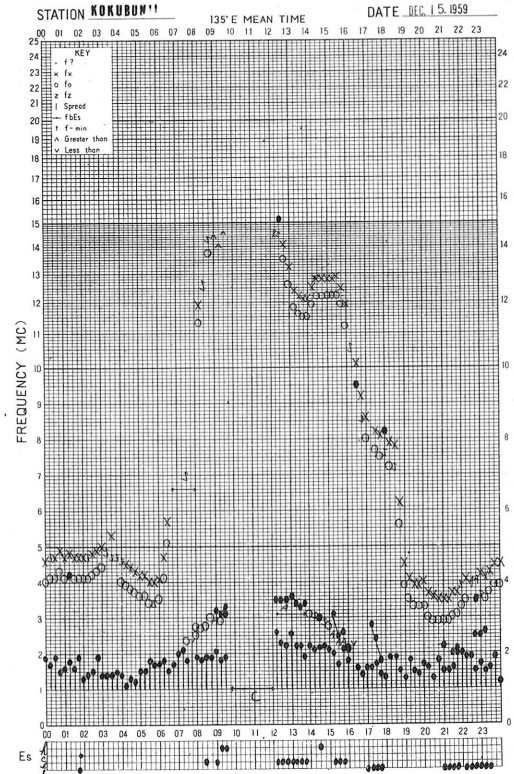

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The Radio Research Laboratories, Japan

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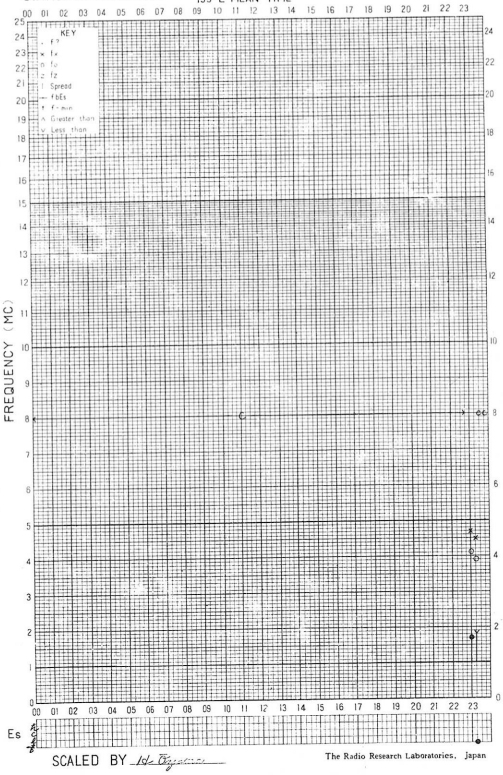

SCALED BY Ida Higashi

The Radio Research Laboratories, Japan

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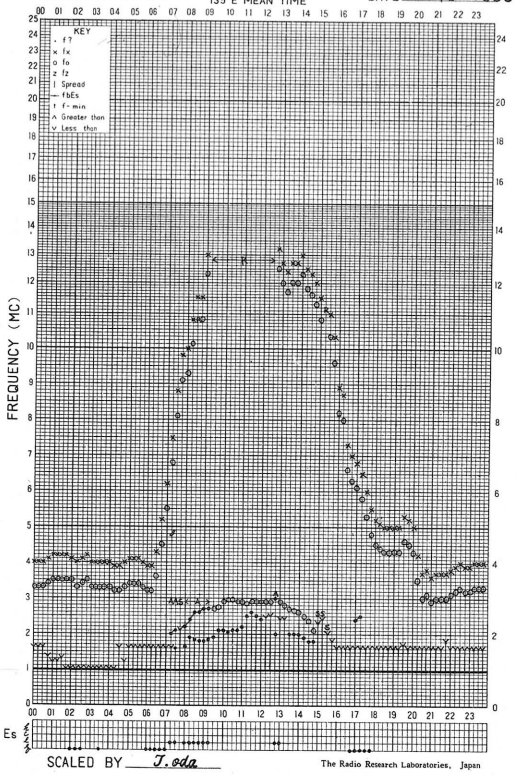

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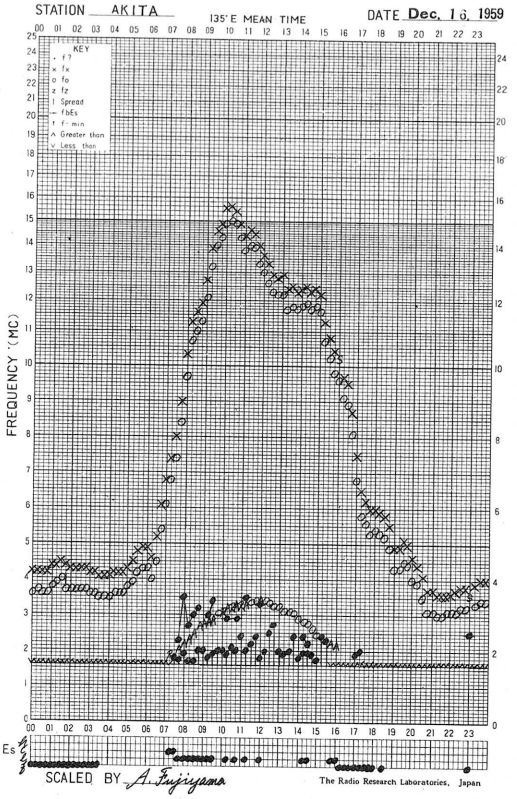

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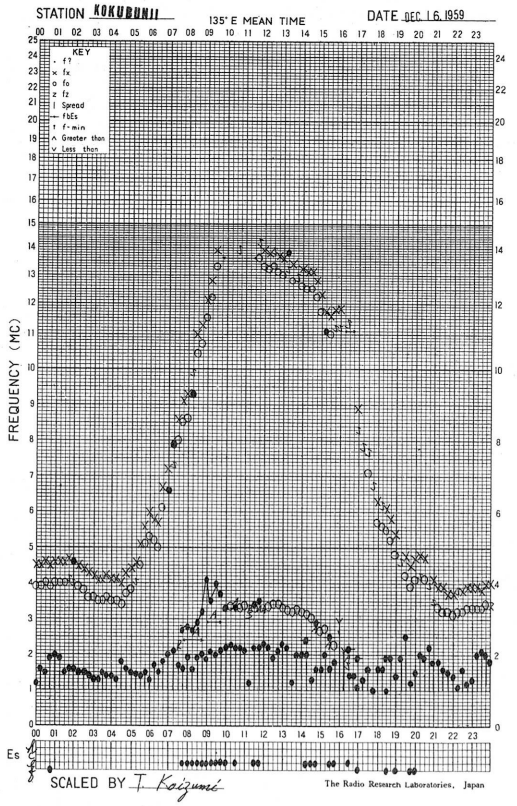

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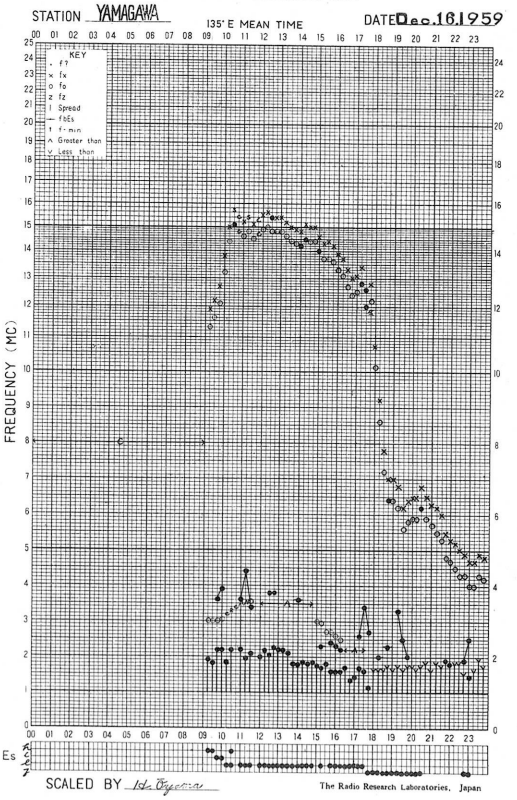

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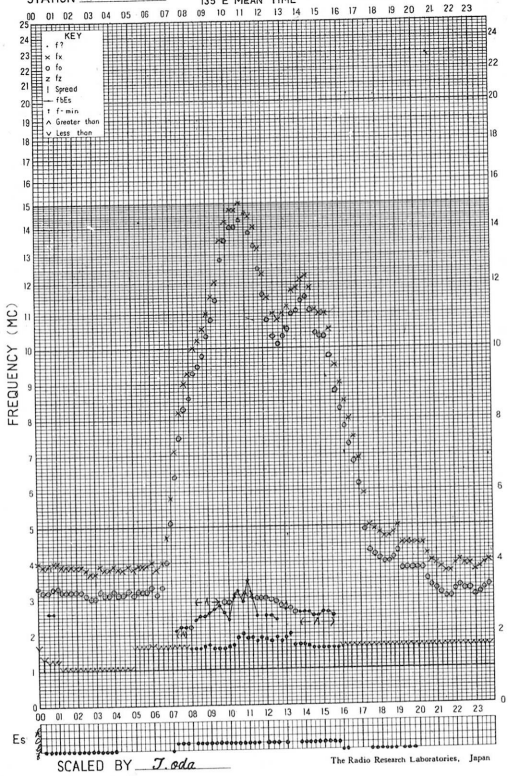

SCALED BY T. Oda

The Radio Research Laboratories, Japan

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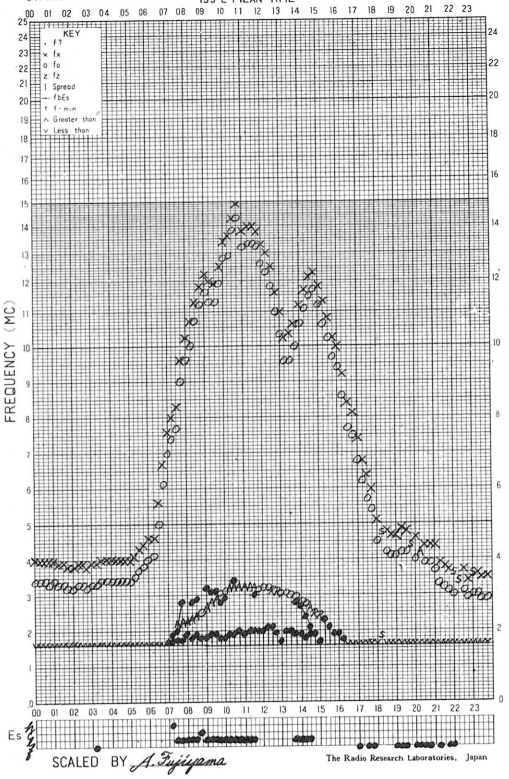

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The Radio Research Laboratories, Japan

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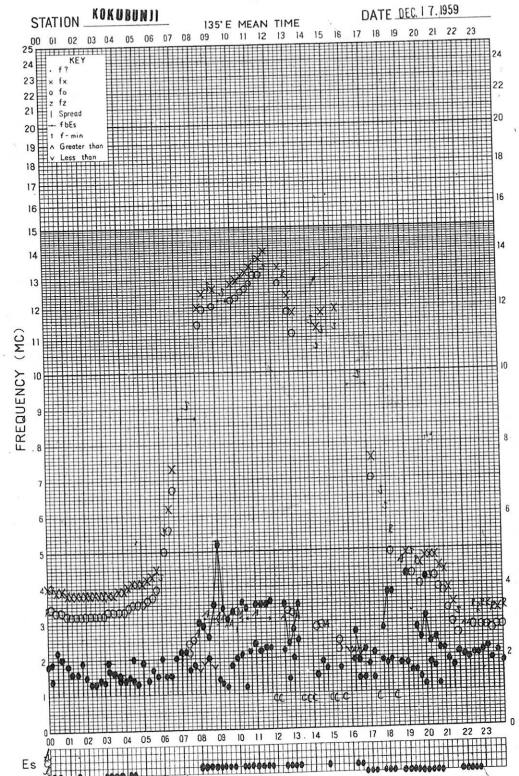

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The Radio Research Laboratories, Japan

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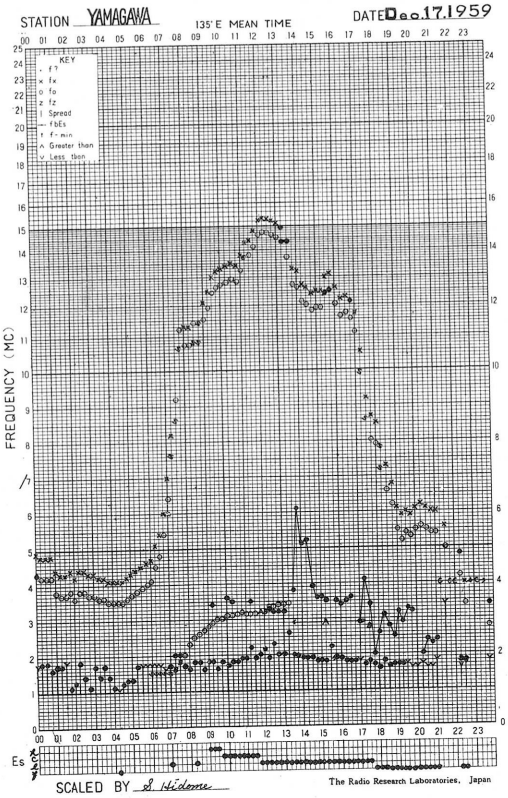

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The Radio Research Laboratories, Japan

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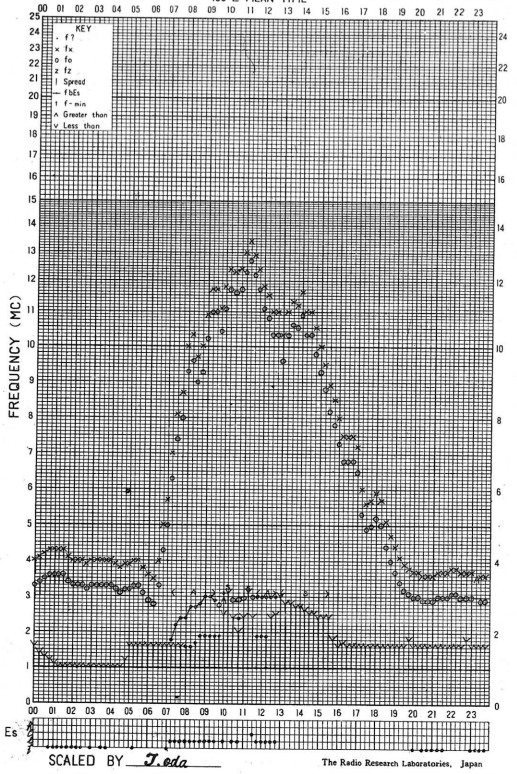

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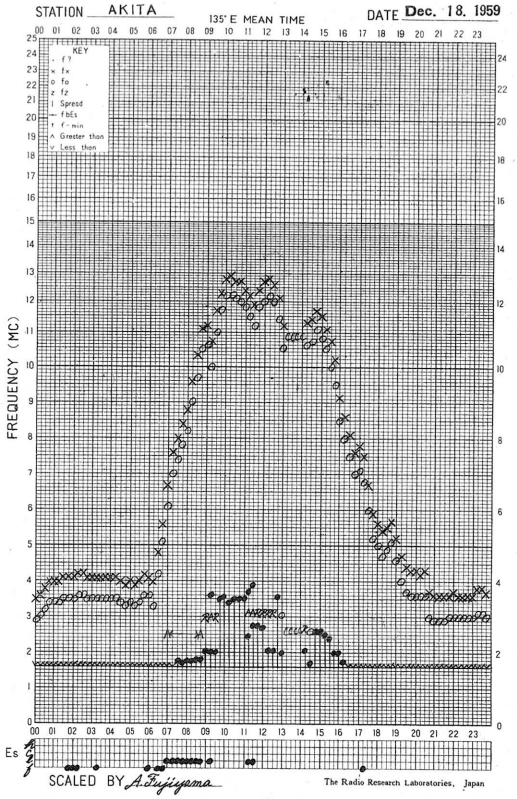

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The Radio Research Laboratories, Japan

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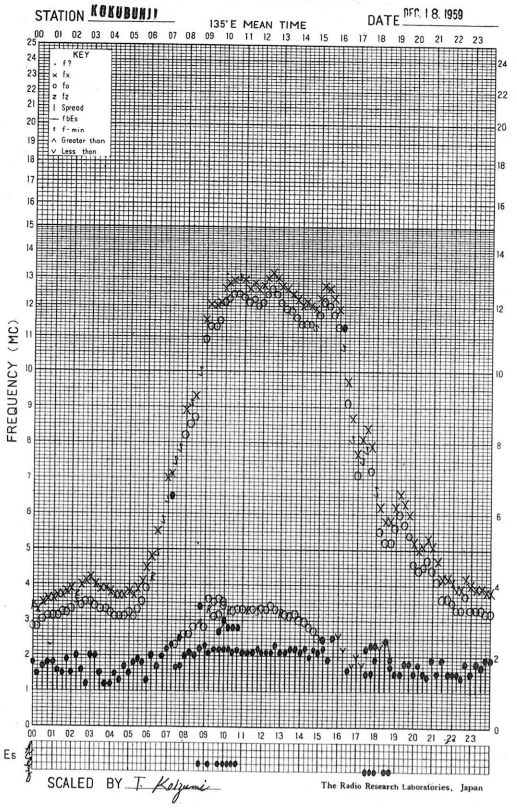

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The Radio Research Laboratories, Japan

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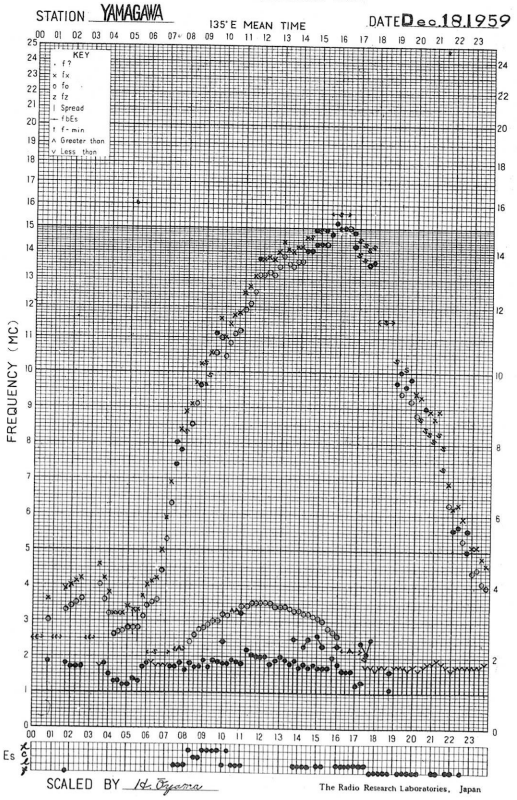

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The Radio Research Laboratories, Japan

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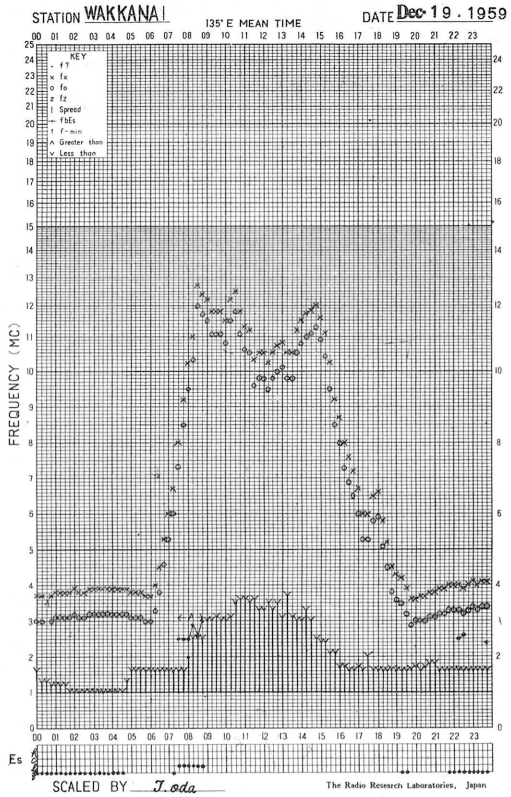

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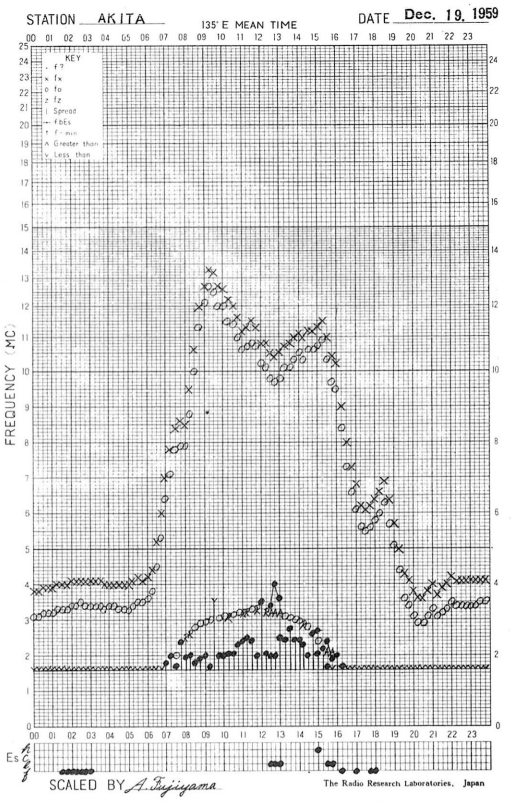

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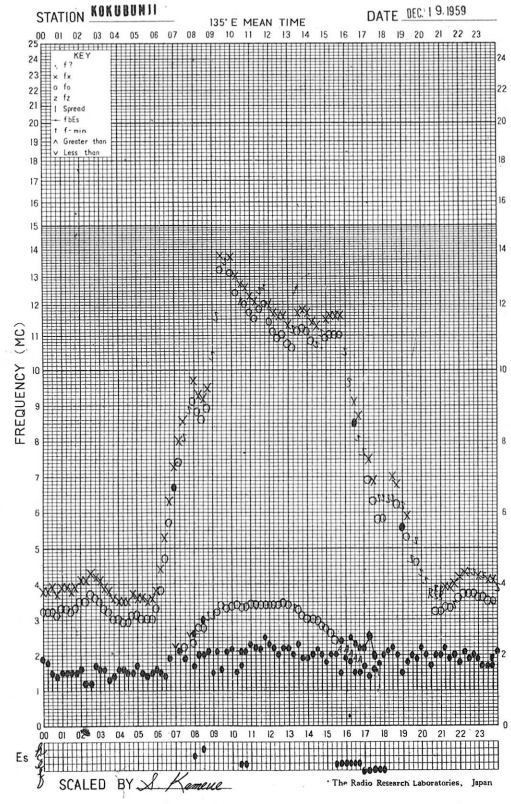

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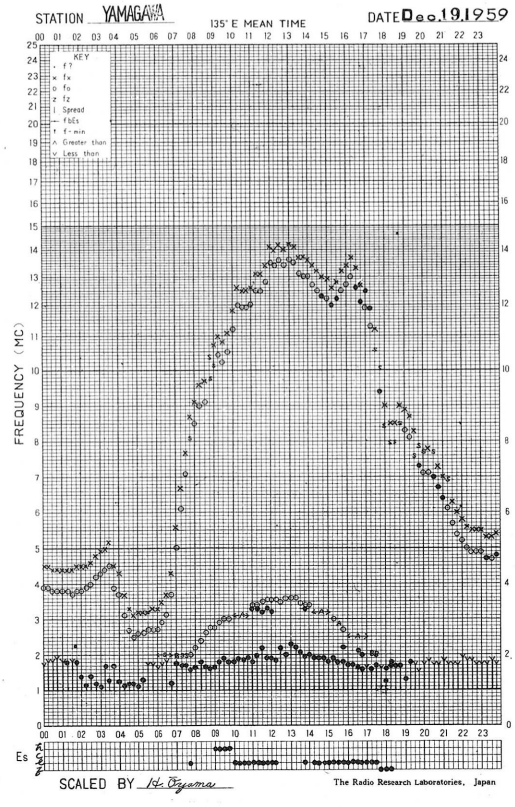

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The Radio Research Laboratories, Japan

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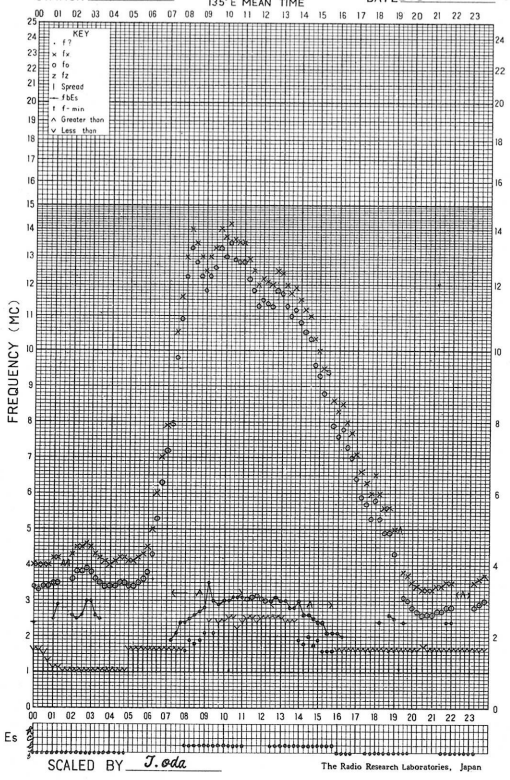

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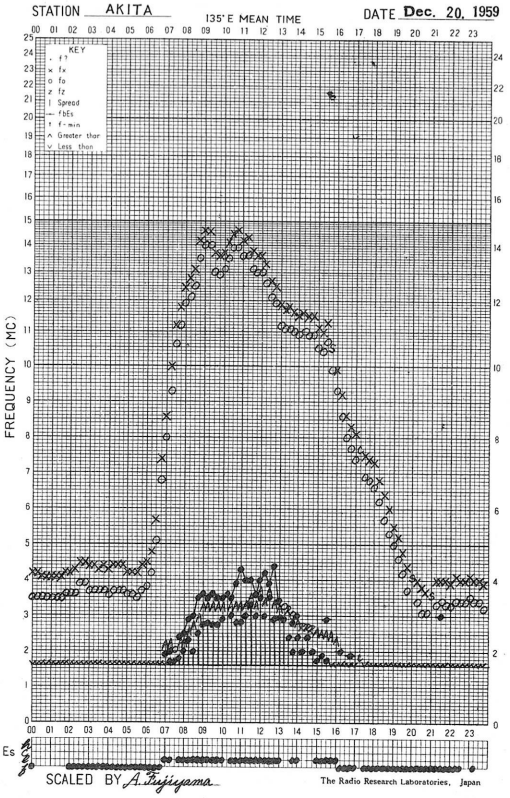

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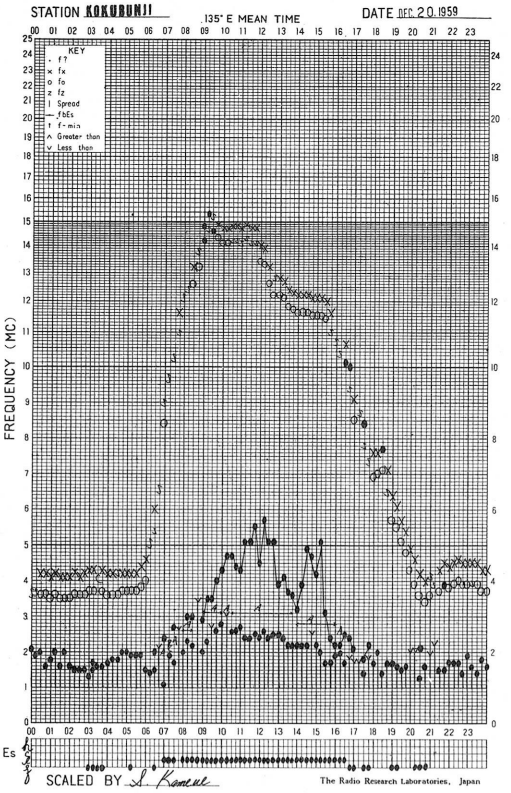

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The Radio Research Laboratories, Japan

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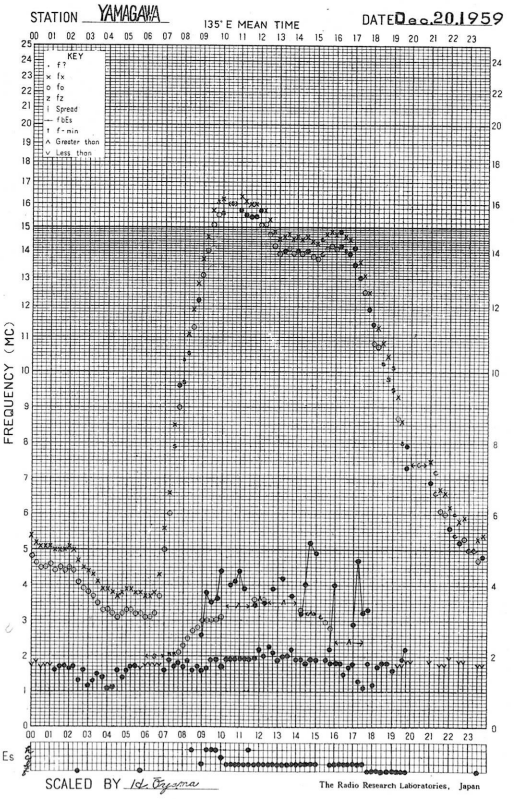

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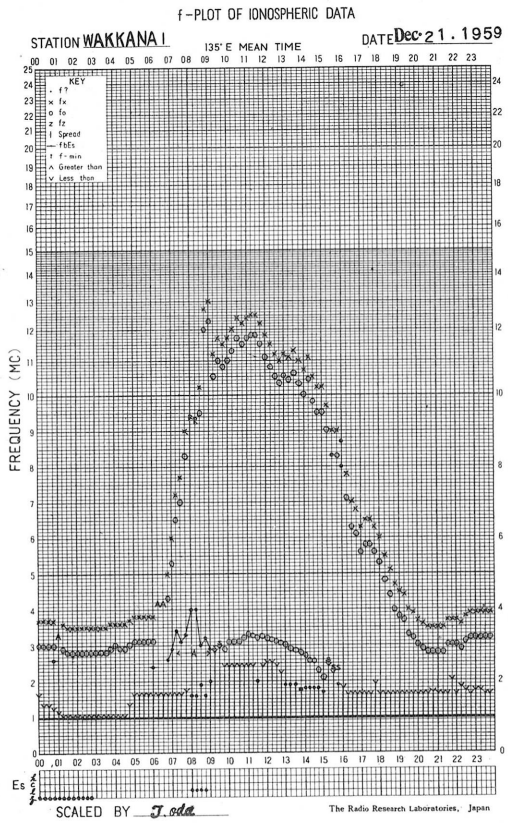
The Radio Research Laboratories, Japan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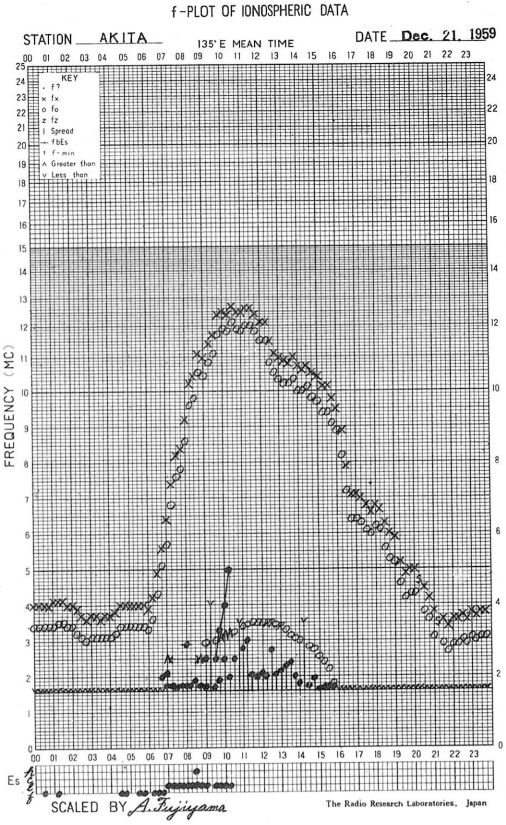
The Radio Research Laboratories, Japan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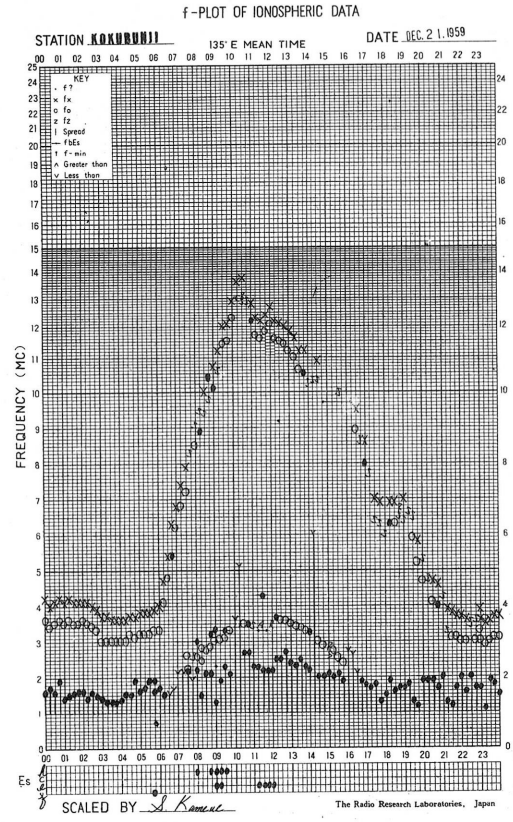
The Radio Research Laboratories, Japan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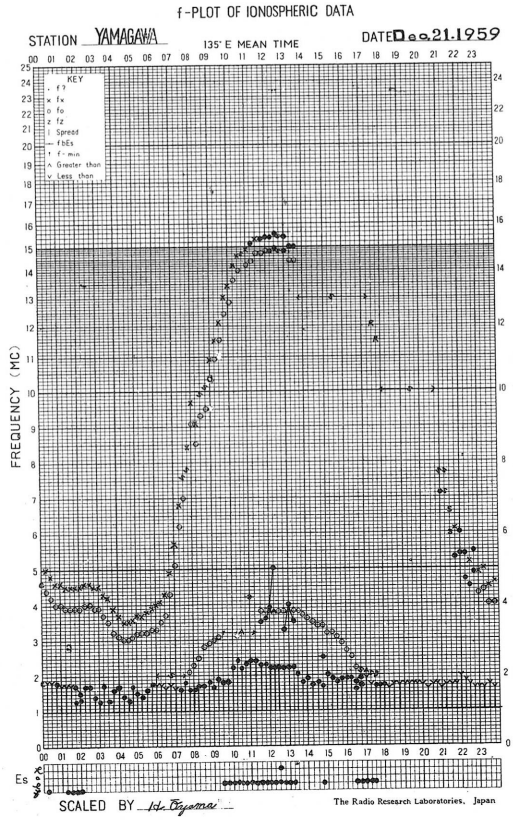
The Radio Research Laboratories, Japan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The Radio Research Laboratories, Japan

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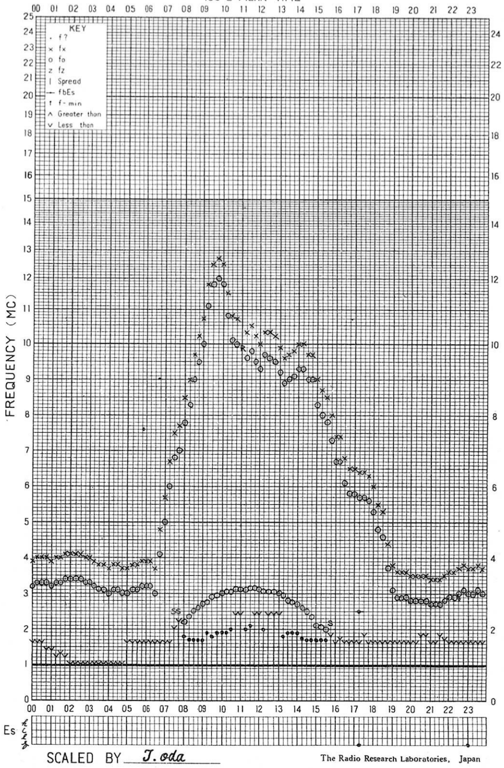

SCALED BY J. oda The Radio Research Laboratories, Japan

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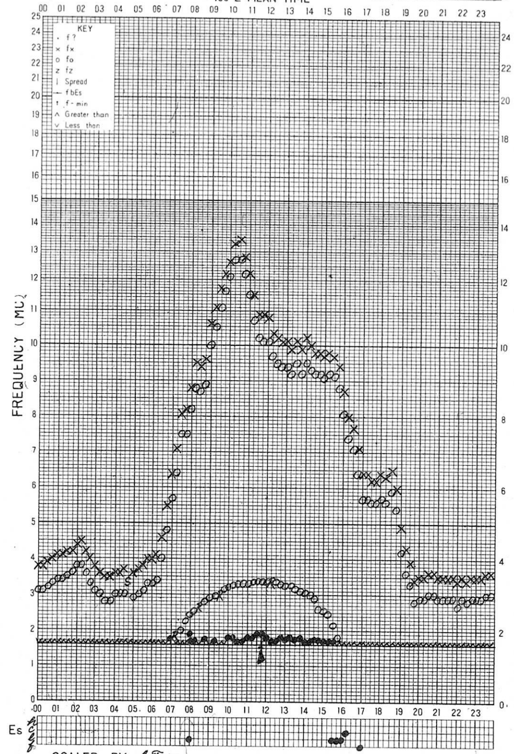

SCALED BY A. Fujiyama The Radio Research Laboratories, Japan

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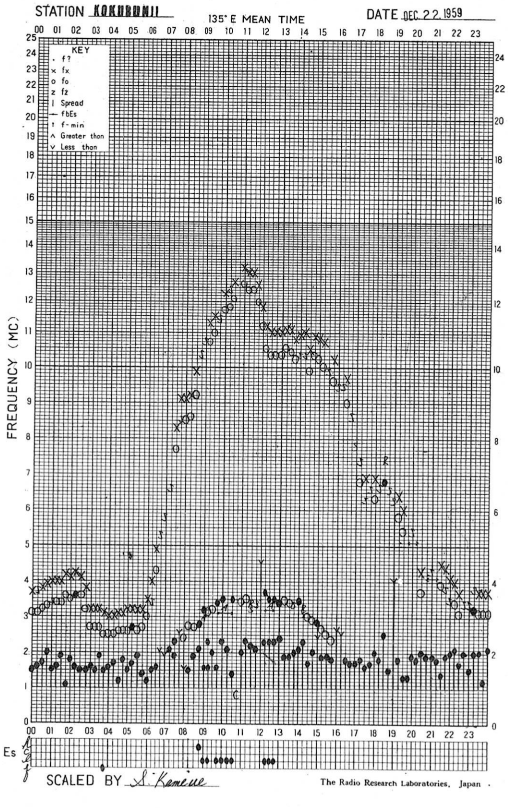

SCALED BY S. Kameue The Radio Research Laboratories, Japan

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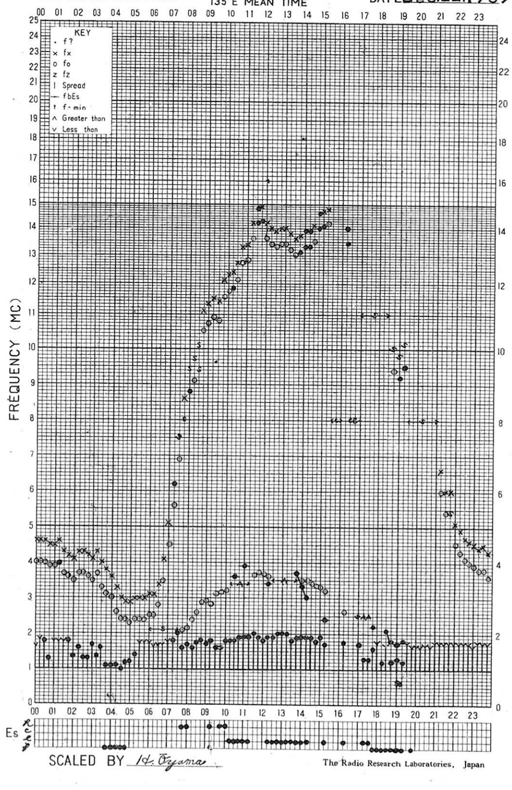

SCALED BY H. Oyama The Radio Research Laboratories, Japan

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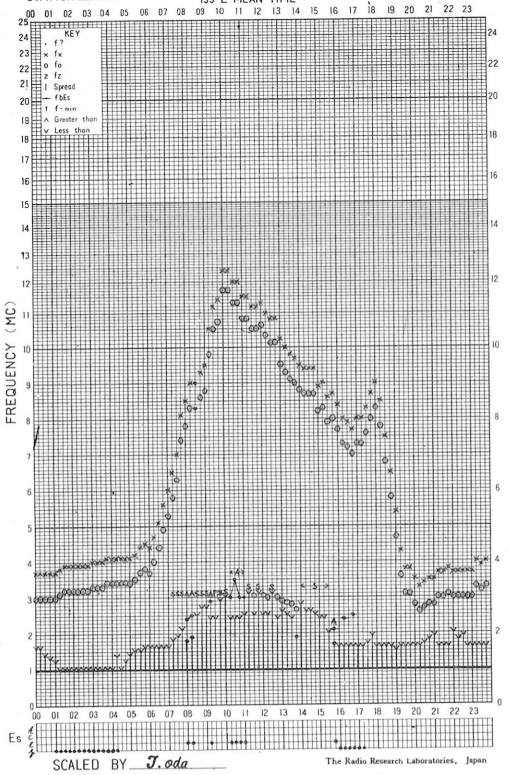

SCALED BY T. oda

The Radio Research Laboratories, Japan

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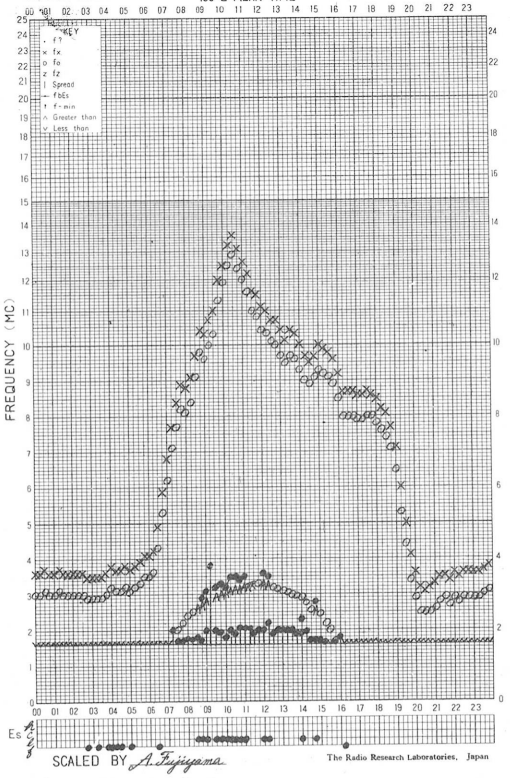

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The Radio Research Laboratories, Japan

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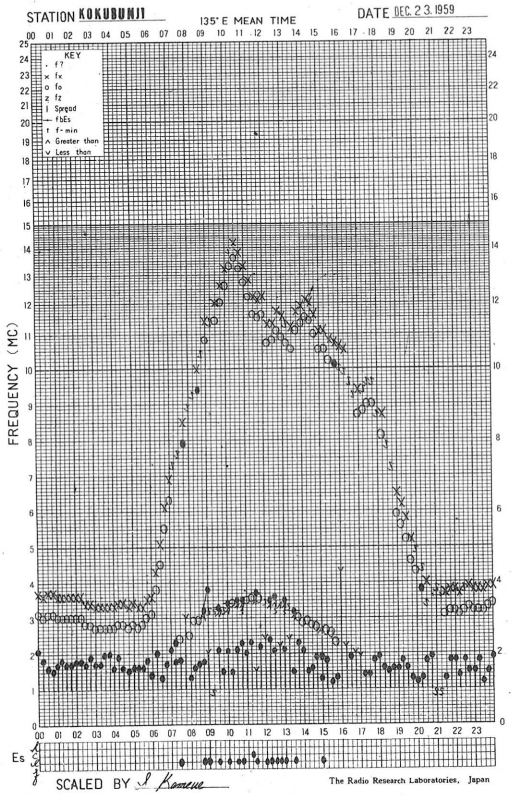

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The Radio Research Laboratories, Japan

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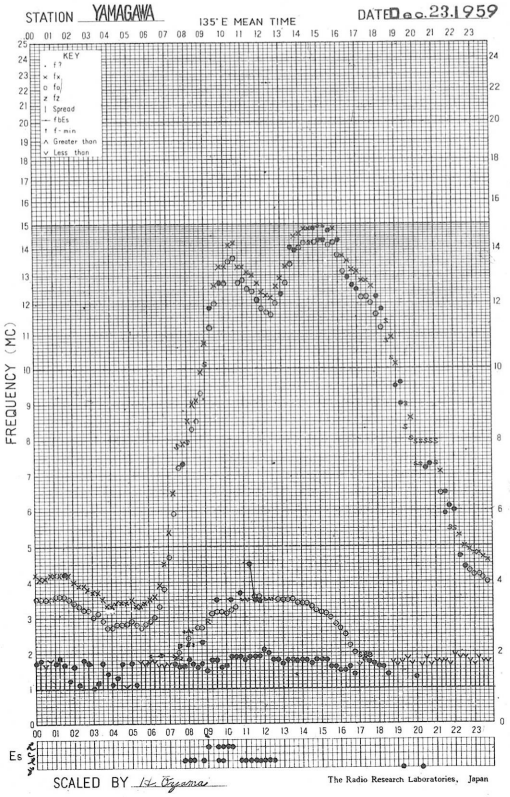

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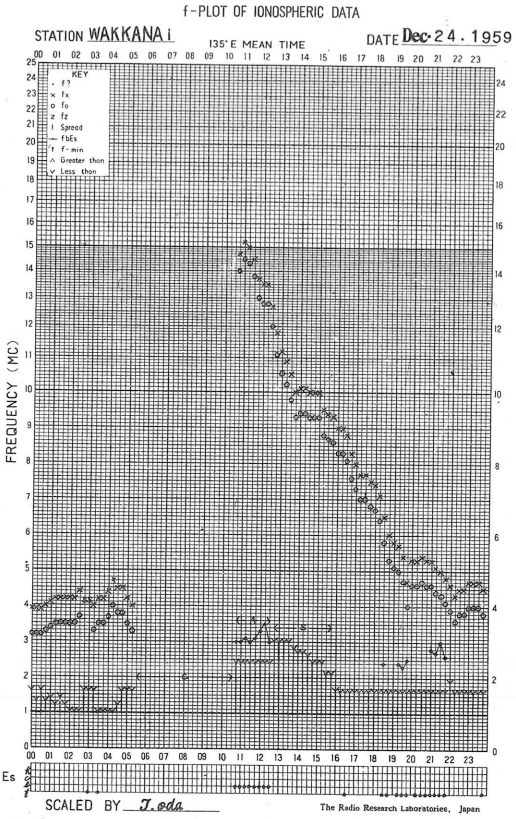
The Radio Research Laboratories, Japan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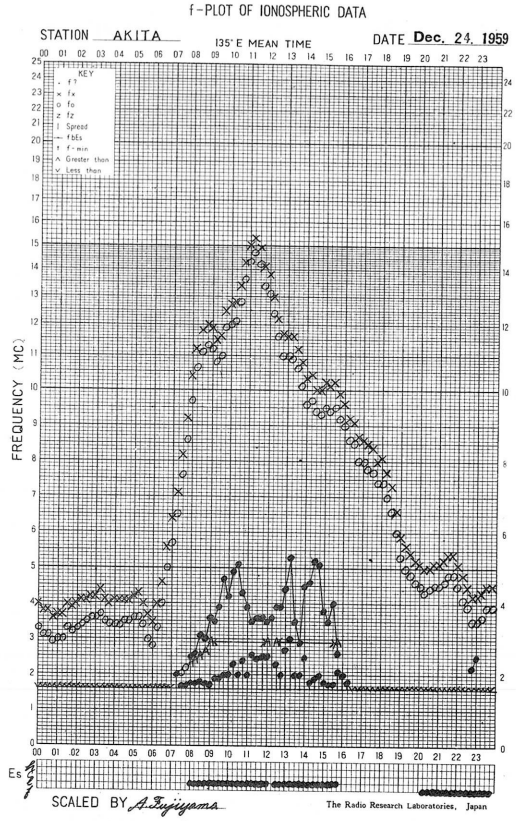
SCALED BY T. Oda
The Radio Research Laboratories, Japan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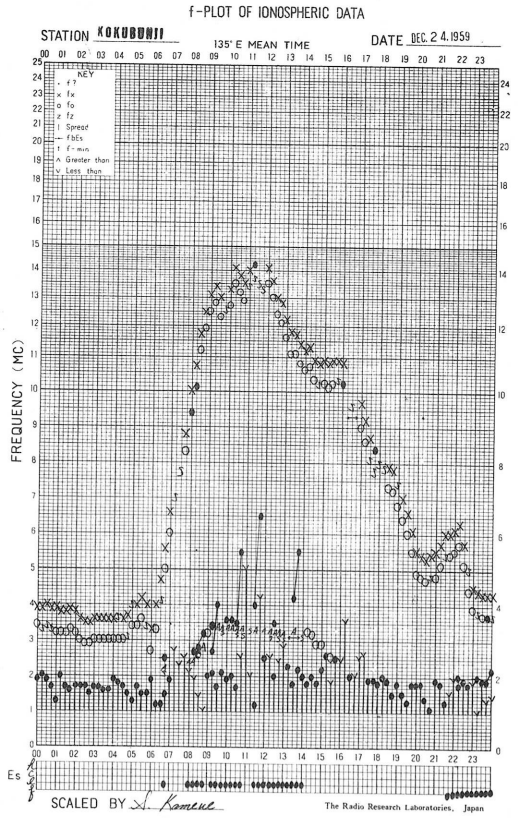
The Radio Research Laboratories, Japan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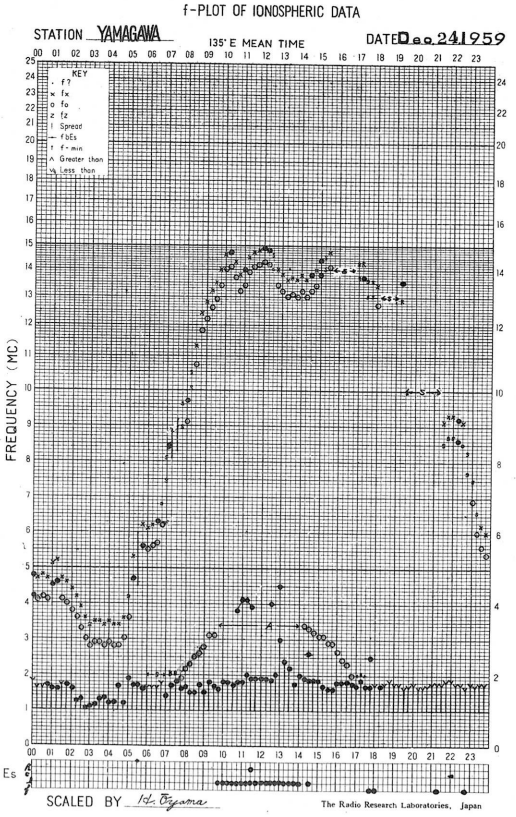
The Radio Research Laboratories, Japan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The Radio Research Laboratories, Japan

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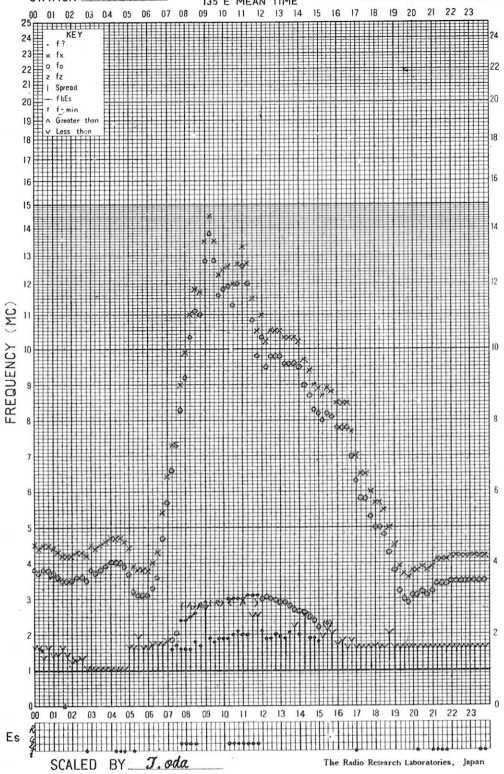

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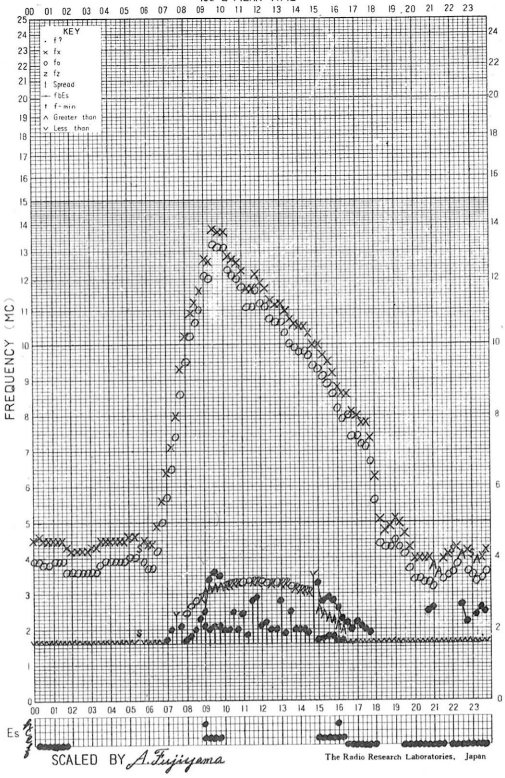

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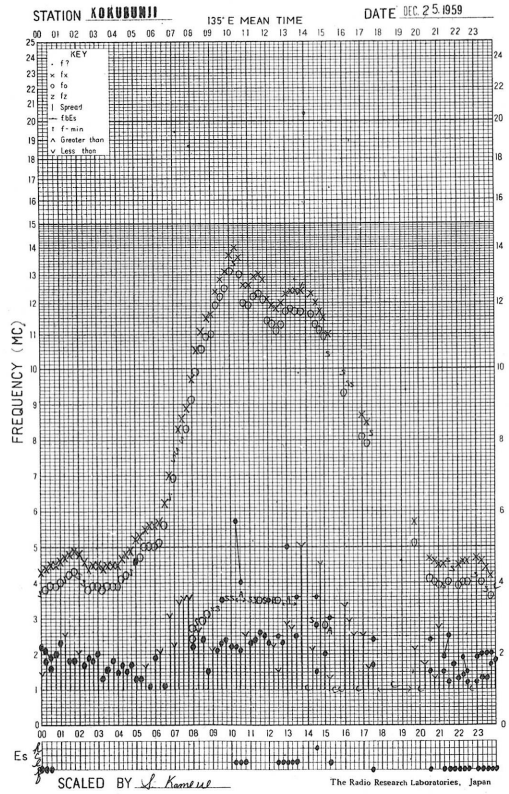

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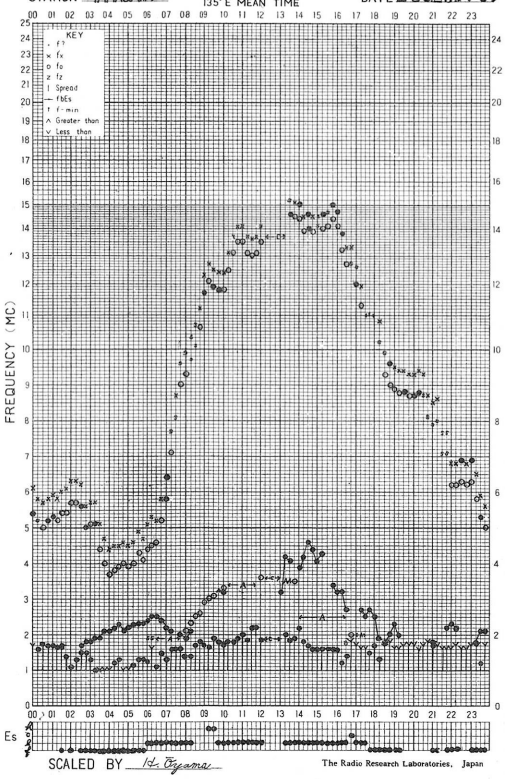

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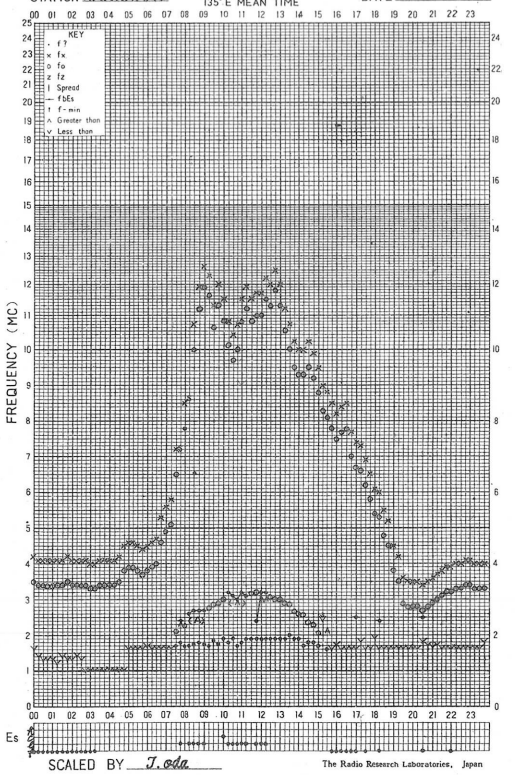

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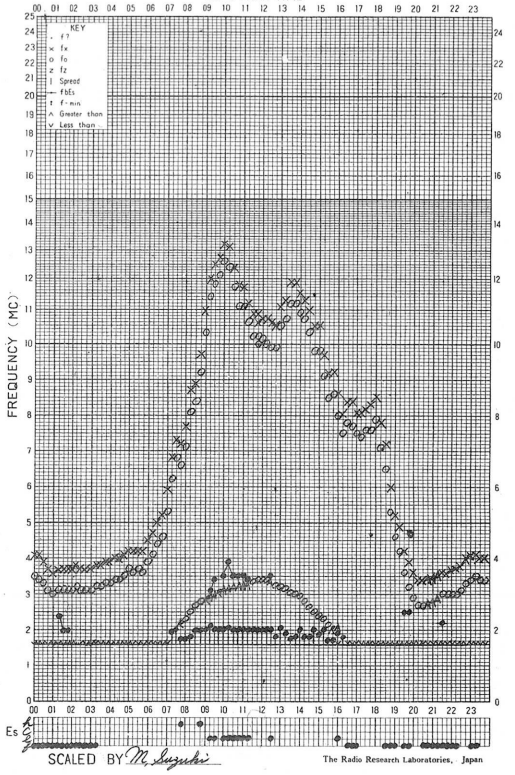

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The Radio Research Laboratories, Japan

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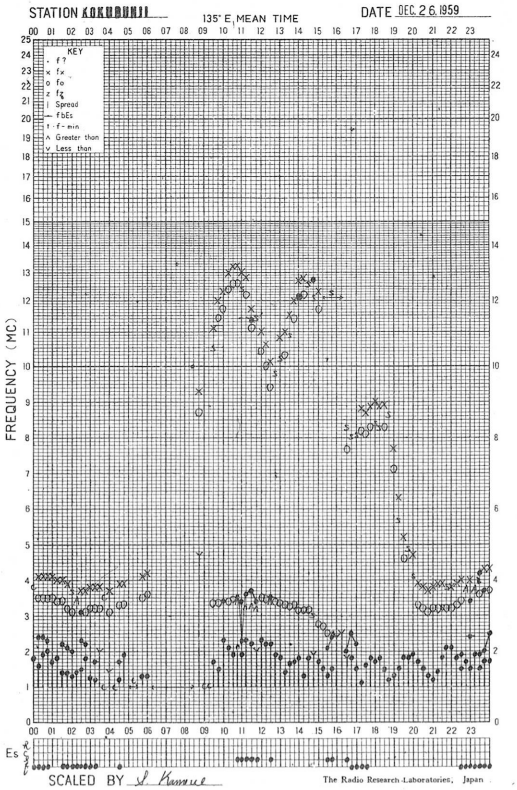

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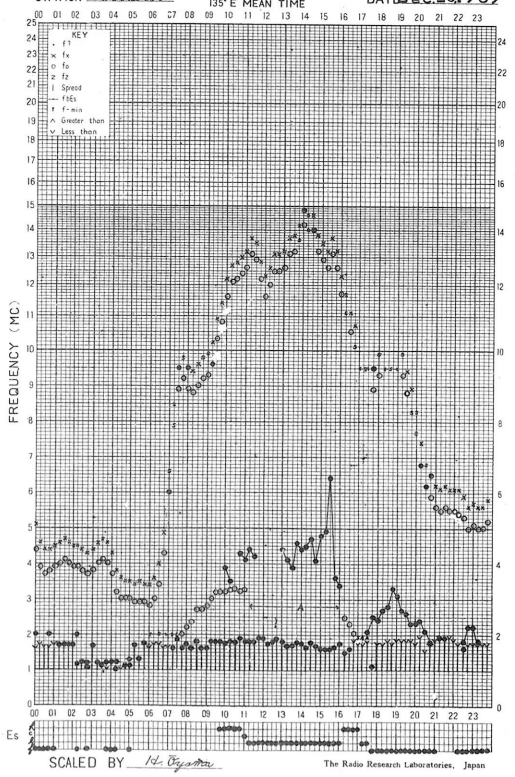

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The Radio Research Laboratories, Japan

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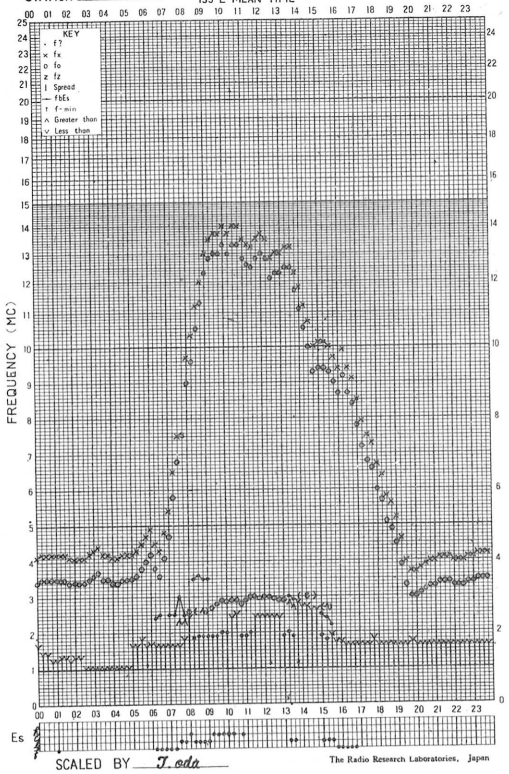
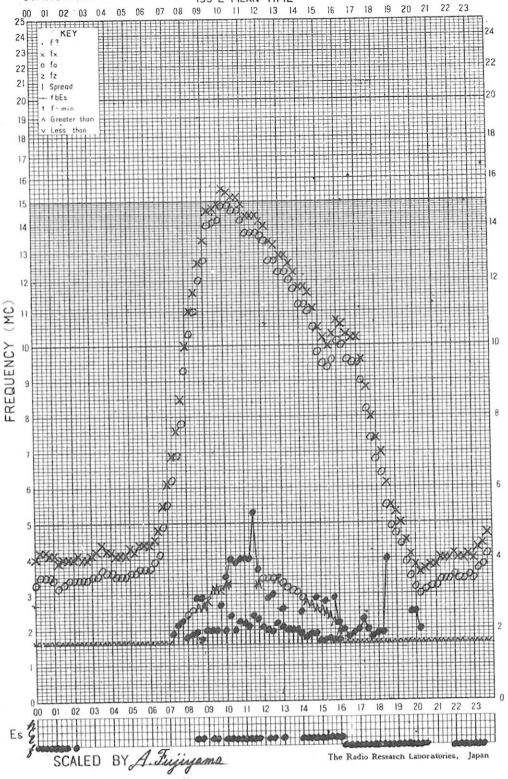


SCALED BY T. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Dec. 27. 1959

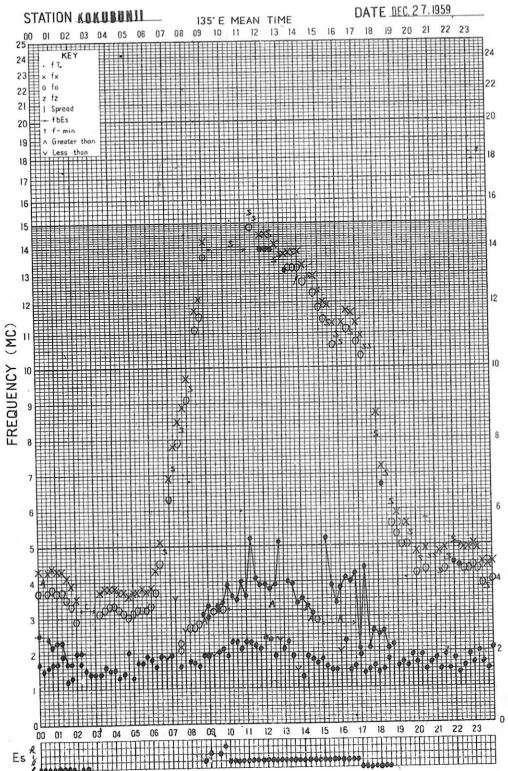


SCALED BY A. Fujiyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE DEC 27 1959

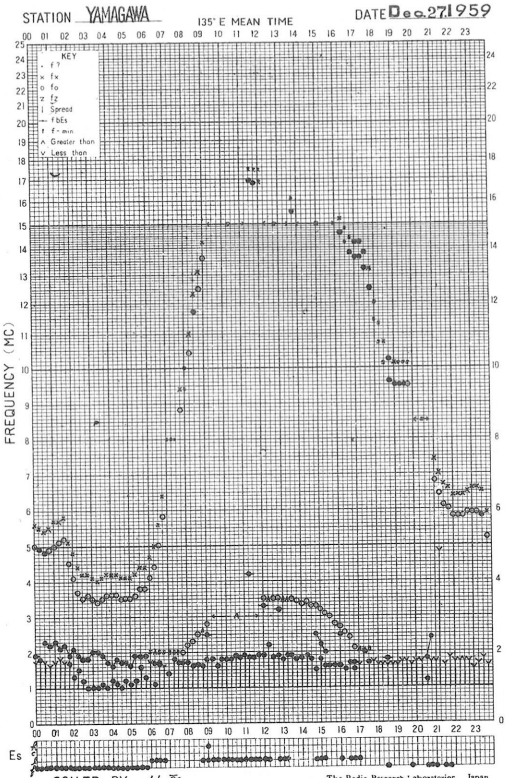


SCALED BY S. Kameue

The Radio Research Laboratories, Japan

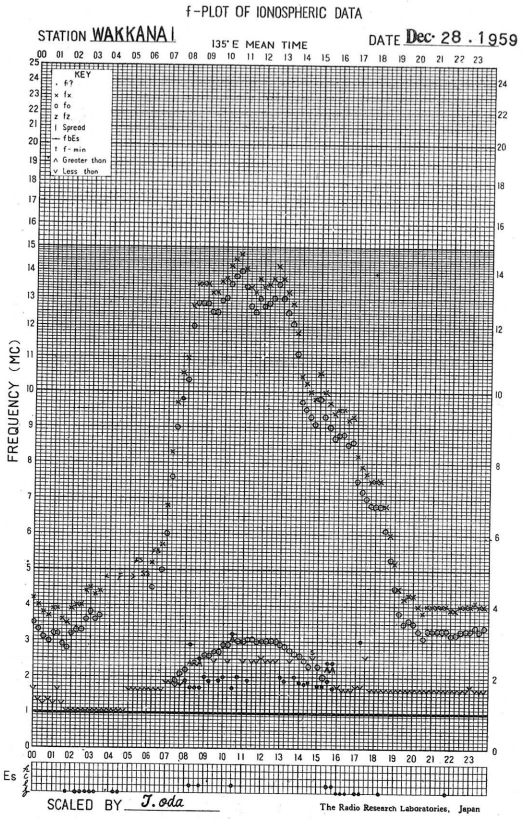
f-PLOT OF IONOSPHERIC DATA

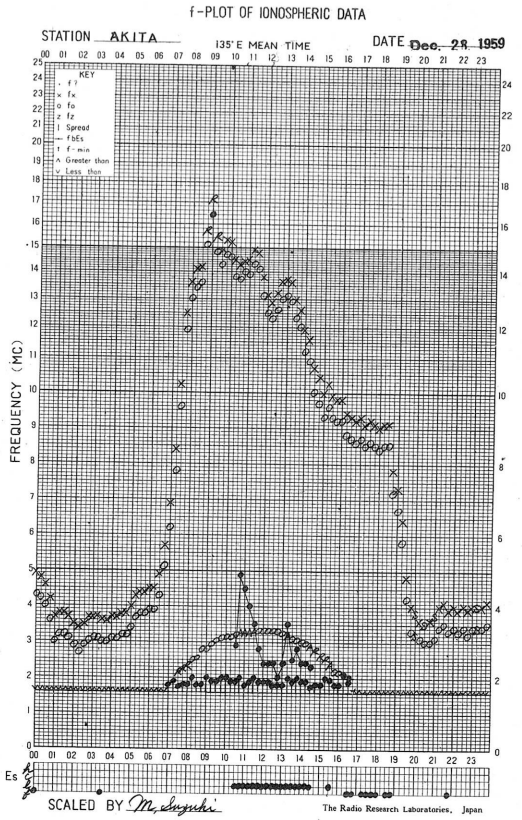
STATION YAMAGAWA 135° E MEAN TIME DATE Dec. 27 1959

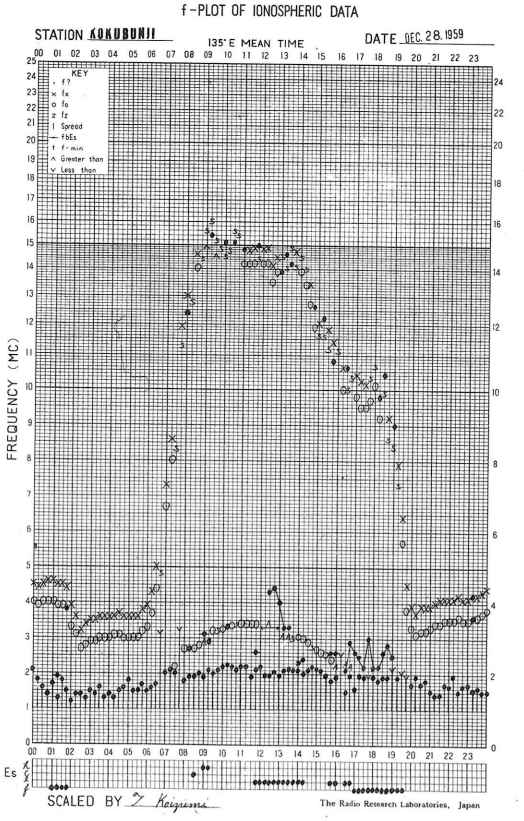


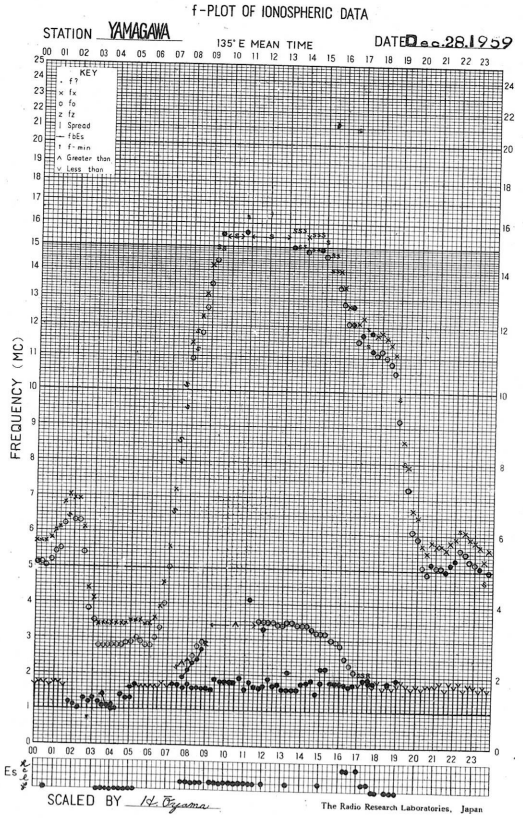
SCALED BY H. Fujiyama

The Radio Research Laboratories, Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135°E MEAN TIME
DATE Dec. 28. 1959
KEY
. f?
× fx
o fo
z fz
| Spread
— fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MC)
Es
SCALED BY T. oda
The Radio Research Laboratories, Japan

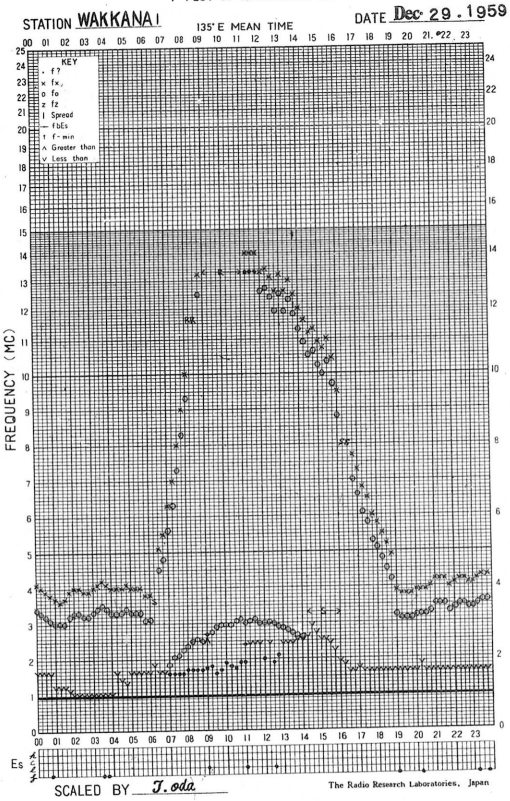

f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135°E MEAN TIME
DATE Dec. 28. 1959
KEY
. f?
× fx
o fo
z fz
| Spread
— fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MC)
Es
SCALED BY M. Suzuki
The Radio Research Laboratories, Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135°E MEAN TIME
DATE DEC. 28. 1959
KEY
. f?
× fx
o fo
z fz
| Spread
— fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MC)
Es
SCALED BY Y. Koyama
The Radio Research Laboratories, Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135°E MEAN TIME
DATE Dec. 28. 1959
KEY
. f?
× fx
o fo
z fz
| Spread
— fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MC)
Es
SCALED BY H. Ozaki
The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE Dec 29. 1959

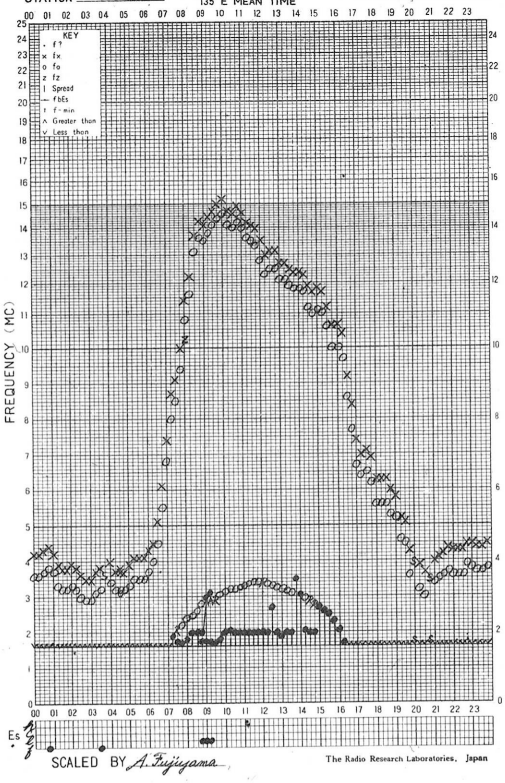


SCALED BY T. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Dec. 29. 1959

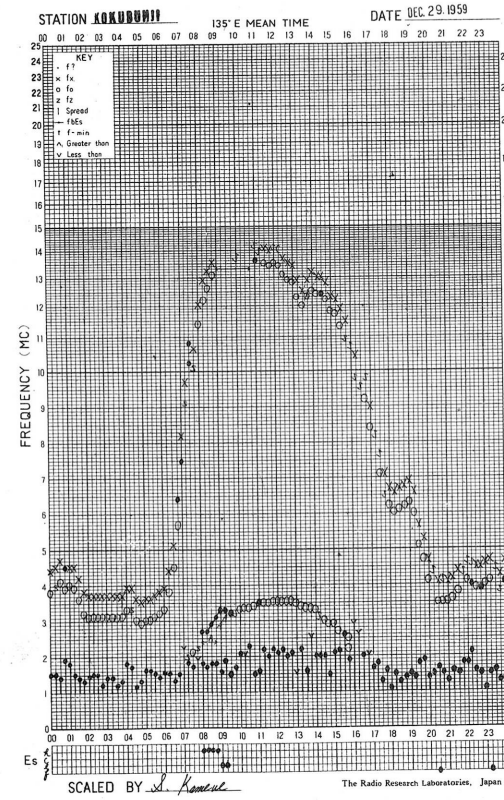


SCALED BY A. Fujiyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE DEC. 29. 1959

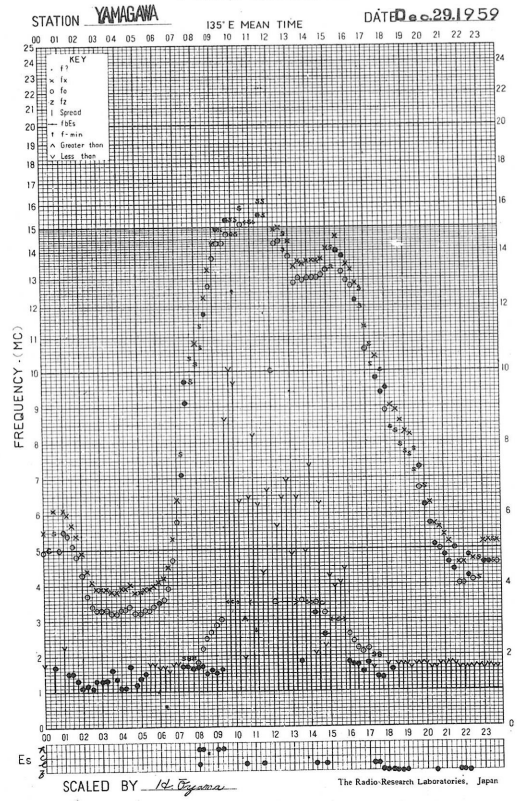


SCALED BY S. Komeiri

The Radio Research Laboratories, Japan

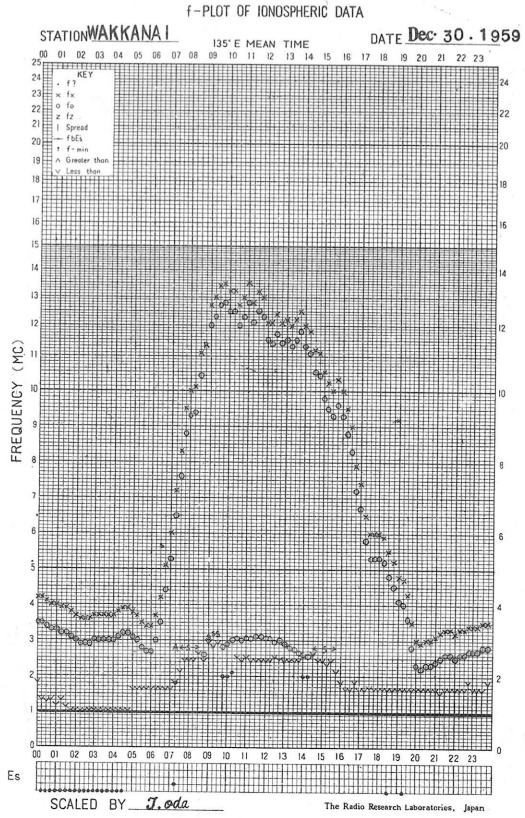
f-PLOT OF IONOSPHERIC DATA

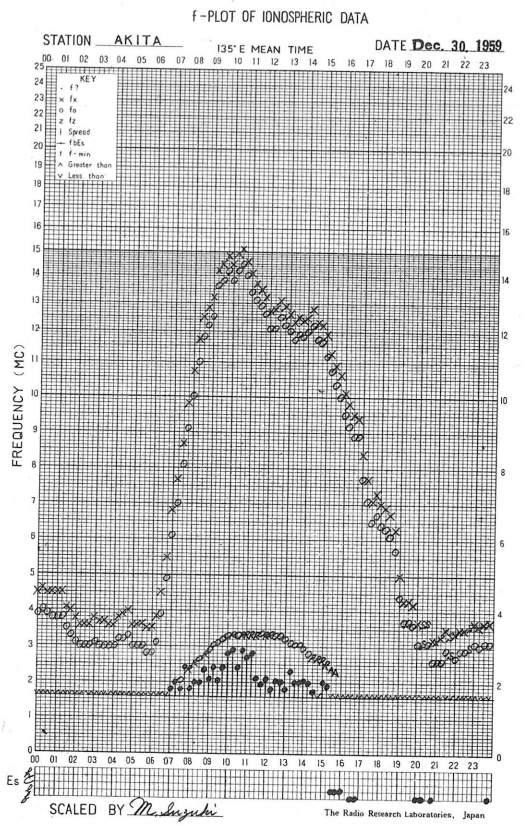
STATION YAMAGAWA 135° E MEAN TIME DATE Dec. 29. 1959

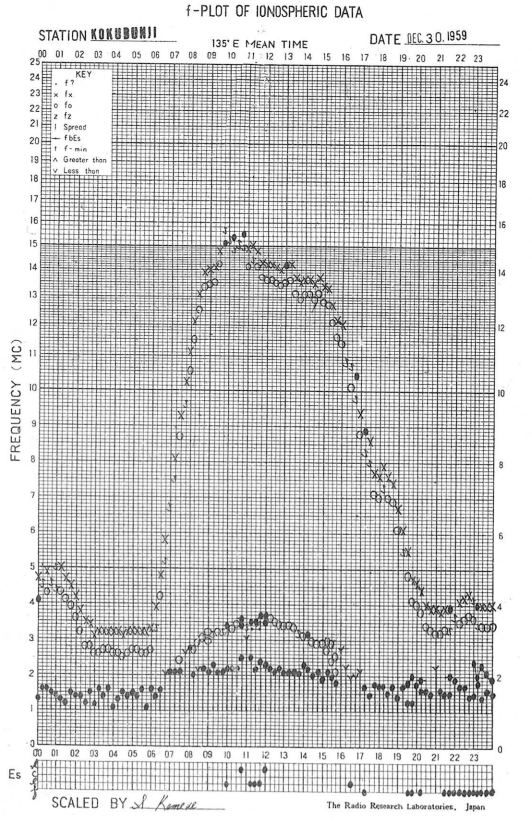


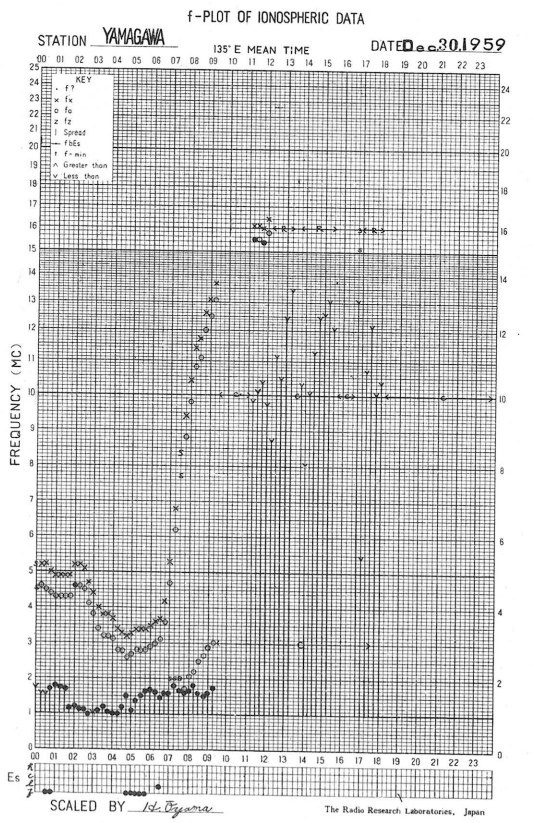
SCALED BY H. Ozawa

The Radio Research Laboratories, Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE Dec. 30. 1959
KEY
FREQUENCY (MC)
Es
SCALED BY T. Oda
The Radio Research Laboratories, Japan

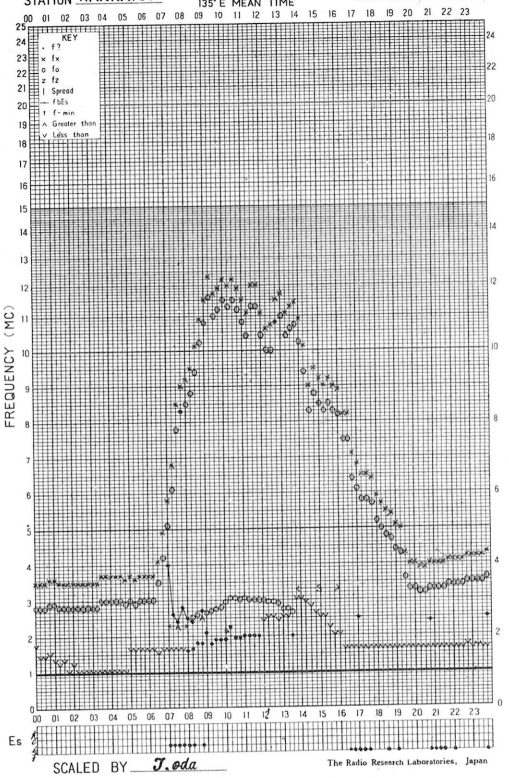

f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135° E MEAN TIME
DATE Dec. 30, 1959
KEY
FREQUENCY (MC)
Es
SCALED BY M. Suzuki
The Radio Research Laboratories, Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135° E MEAN TIME
DATE DEC. 30. 1959
KEY
FREQUENCY (MC)
Es
SCALED BY S. Komeda
The Radio Research Laboratories, Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135° E MEAN TIME
DATE Dec. 30. 1959
KEY
FREQUENCY (MC)
Es
SCALED BY H. Ozawa
The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE Dec. 31. 1959

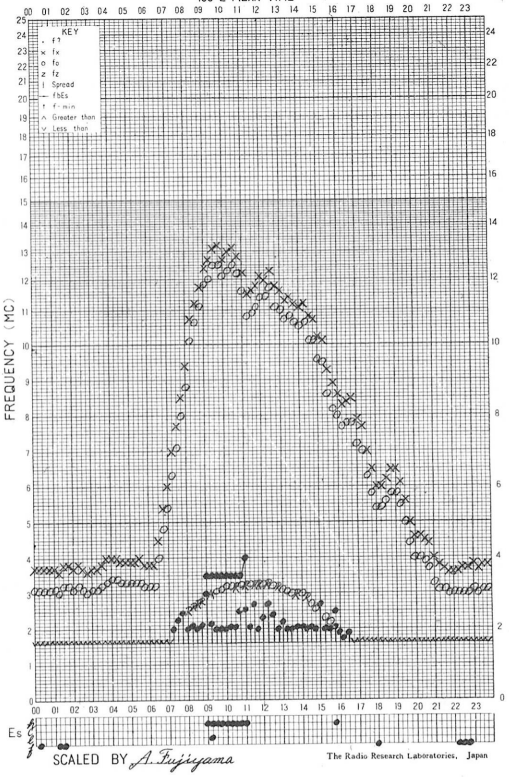


SCALED BY T. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Dec. 31. 1959

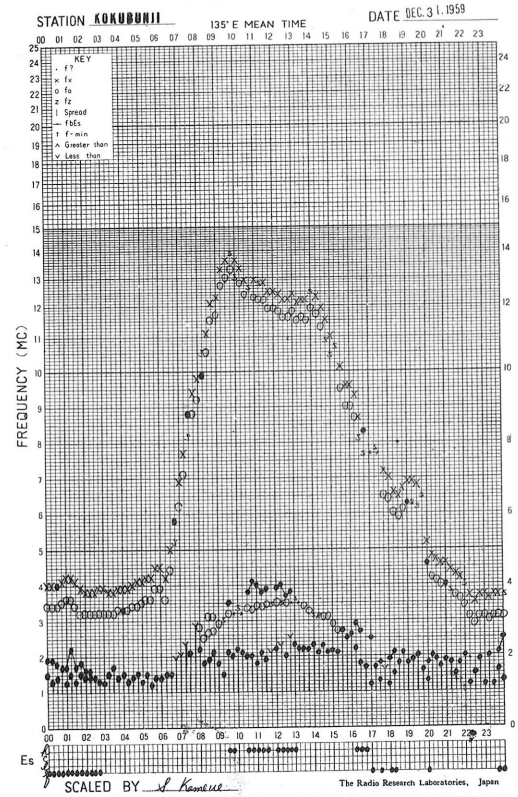


SCALED BY A. Fujiyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE DEC. 31. 1959

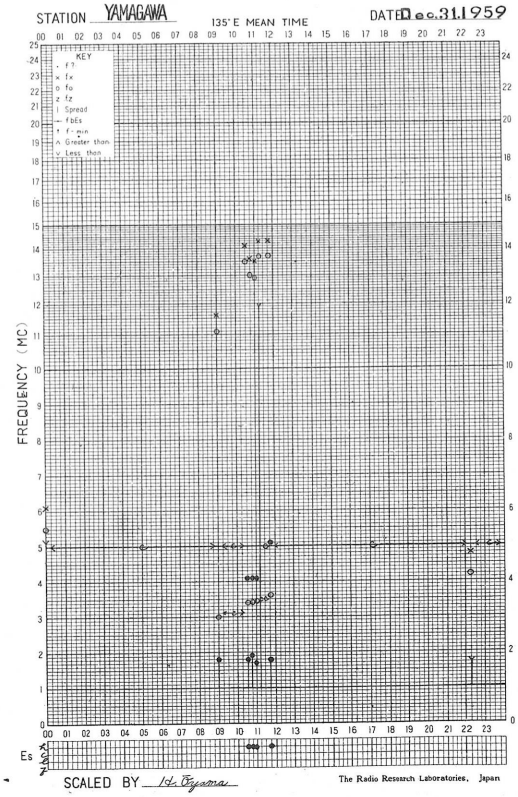


SCALED BY S. Komine

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE Dec. 31. 1959



SCALED BY Ichi Fujisawa

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. 1959	Steady Flux					Variability				
	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
1	10	11	(8)	-	11	1	1	1	-	1
2	19	20	(22)	(29)	19	1	1	1	2	1
3	32	26	(24)	-	28	1	1	1	-	1
4	12	12	(10)	(10)	12	1	1	1	1	1
5	10	11	(8)	-	10	1	1	1	-	1
6	7	9	(6)	-	8	1	1	1	-	1
7	11	12	(12)	-	12	1	1	1	-	1
8	7	7	-	-	7	1	1	1	-	1
9	(9)	8	(8)	-	8	-	1	1	-	1
10	8	9	(9)	-	9	1	1	1	-	1
11	10	10	(8)	-	10	0	1	1	-	1
12	9	10	(11)	-	10	0	0	0	-	0
13	8	7	(5)	-	7	0	0	0	-	0
14	9	7	(8)	-	8	0	0	0	-	0
15	7	8	(6)	-	7	0	0	0	-	0
16	7	6	(6)	-	6	1	0	0	-	0
17	9	6	(6)	-	7	0	0	0	-	0
18	7	7	(8)	-	7	1	0	1	-	1
19	10	8	9	-	9	0	0	0	-	0
20	12	10	(9)	-	11	1	0	0	-	0
21	11	10	(9)	-	10	1	1	1	-	1
22	16	40	(29)	-	28	2	2	2	-	2
23	13	11	(20)	(12)	13	0	1	1	-	1
24	10	10	-	-	10	1	1	1	-	1
25	15	18	(15)	-	16	1	1	1	-	1
26	11	(9)	(8)	-	10	0	0	0	-	0
27	8	7	8	-	8	0	0	0	-	0
28	11	10	(11)	-	10	1	1	1	-	1
29	15	13	(27)	-	16	1	2	1	-	1
30	11	9	7	-	10	0	0	0	-	0
31	10	10	(12)	-	11	-	1	1	-	1

Outstanding Occurrences

Dec. 1959	Start-time	Dura-tion	Type	Max. Inst.	Int. Smd.	Max. Time	Remarks
4	21	~ 600					series of bursts
5	0630.3	1.2	CD/4	>1400	>500	-	off scale
5	2200.6	1.4	CD/4	430	70	2200.7	
5	2319.6	2.2	CD/4	>1200	200	-	off scale
8	0122.4	2.4	CD/4	450	180	0122.8	
10	0515.1	3.6	CD/4	980	60	0516.0	
10	0520.1	0.8	SD/4	490	250	0520.3	
11	0412.1	1.7	CD/8	>1400	>1000	-	off scale
18	0635.8	1.2	CD/4	>1100	270	-	off scale
20	0013.8	1.2	CD/4	380	100	0013.9	
29	0153.4	0.7	CD/4	710	170	-	

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Dec. 1959	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	3-	2 - - 2	3 2 3 2	2 2 1 2	N N N N	---	---	
2	2+	3 - - 3	3 2 2 1	2 2 (2) 1	N N U U	---	---	
3	2o	3 - - 1	2 1 2 3	1 1 1 1	U U U U	---	---	
4	3o	2 - - 2	3 4 4 (2)	2 3 2 2	U U U U	---	2000	94γ
5	2+	1 - - 3	1 2 3 3	2 2 3 2	N U U U	0659	---	
6	3o	3 - - 1	3 4 4 2	2 3 1 1	U U U U	---	2200	156γ
7	1+	1 - - 1	2 2 2 (2)	2 3 1 1	U U U N			
8	2+	1 - - 2	2 3 (3) 2	2 3 2 2	N N N N			
9	1+	1 - - 2	1 1 2 (2)	2 2 1 2	N N N N			
10	1o	1 - - 2	1 1 1 1	2 2 1 2	N N N N			
11	1+	1 - - 2	2 (1 1 1)	2 2 2 2	N N N N			
12	1+	2 - - 3	1 1 1 1	2 2 1 2	N N N N			
13	1o	2 - - 1	1 1 1 1	2 1 1 2	N N N N			
[14]	1+	1 - - 1	1 1 2 2	1 1 1 1	N N N N			
[15]	2-	2 - - 2	3 1 1 (1)	2 1 1 2	N N N N			
[16]	2o	3 - - 2	2 1 2 2	1 1 2 2	N N N N			
[17]	2-	2 - - 2	1 (2 2 2)	2 3 3 2	N N N N			
18	1+	3 - - 1	2 1 1 1	2 3 2 2	N N N N			
19	2-	3 - - 2	2 2 1 1	1 2 1 1	N N N N			
20	1+	2 - - 1	2 2 1 2	2 (2 2) 3	N N N N			
21	1+	1 - - 2	2 1 1 (2)	1 1 1 1	N N N N			
22	1+	1 - - 2	1 (2 2 2)	1 1 2 2	N N N N			
23	1+	1 - - 2	1 2 2 (2)	2 2 1 2	N N N N			
24	1o	2 - - 1	(1) 1 1 1	2 1 1 1	N N N N			
25	2+	1 - - 2	2 3 3 2	(2 2 1) 2	N N N N			
26	2-	2 - - 2	2 (1) 2 2	1 2 2 2	N N N N			
27	3-	3 - - 3	1 3 3 2	(2) 1 2 1	N N N N			
28	2o	3 - - 2	1 (2) 3 1	1 2 1 2	N N N N			
29	1+	2 - - 2	2 1 1 2	1 2 2 2	N N N N			
30	2-	2 - - 2	1 2 2 2	2 2 2 2	N N N N			
31	1+	2 - - 2	2 1 1 2	2 2 2 2	N N N N			

ж = day of Special World Interval

[ ] = Regular World Day

( ) = inaccurate

--- = continuing magnetic storm

SUDDEN IONOSPHERIC DISTURBANCES

(S.I.D.)

HIRAISO

Time in U.T.

Dec. 1959	S W F									S E A			Correspondence		
	Drop-out Intensities (db)					Start-time	Dura-tion	Type	Imp.	Start-time	Dura-tion	Imp.	Flare	Solar Noise	Mag.
	WS	SF	HA	TO	LN										
6					-					06.30	65	2			
7										04.36	93	3		x	
17	15"	-	12		-	03.58	37	Slow	2-	04.02	65	3			

PROVISIONAL IONOSPHERIC DATA

Aug. 1959 | foF2 | 45° E Mean Time (G.M.T.+3h.) | Showa Base | Lat. 69° 00.4′ S | Long. 39° 35.4′ 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	3.1^{F}	A	B	B	A	4.7	F	5.3	B	5.8	B	7.2	8.4	8.2	C	C	8.9	^{U}7.9^{F}	3.0	R	A	A	A
2	A	F	F	3.8^{F}	A	A	5.5	F	A	B	B	5.8	^{U}6.3^{R}	7.7	8.5	8.2	9.3	^{U}8.5^{R}	6.1	3.4	3.0	R	A	3.6
3	A	A	A	3.5	4.8	4.1^{F}	^{U}5.4^{R}	A	5.6	F	B	B	8.0	10.0	9.9	10.1	10.0	^{U}9.0^{F}	9.6	F	3.9	2.5	2.9	A
4	3.5	3.8	2.5	A	3.6	3.5^{F}	A	A	4.3	4.6^{F}	5.7	B	8.2	9.4	8.4^{F}	10.0	10.1	C	F	B	3.6	2.8	A	A
5	A	B	A	A	A	3.1	3.4	2.9	3.2	4.3	6.0	8.6	9.7	10.5	10.8	10.1	8.9	7.8	8.3	6.2	2.2	A	2.5	A
6	R	R	A	A	A	A	A	B	A	4.8	R	7.3	8.2	B	10.9	10.0	^{J}10.0^{R}	R	10.7	6.3	2.5	F	R	A
7	A	A	A	B	A	B	^{U}4.6^{F}	F	A	C	5.7	6.2	7.0	8.0	8.0	8.4	9.3	9.2	^{U}8.2^{F}	^{U}4.4^{F}	A	A	A	A
8	A	A	A	4.3	^{U}5.7^{F}	F	A	4.3^{F}	4.7^{F}	5.5	B	8.0	^{U}9.2^{R}	9.1	9.9	10.2	^{D}9.7^{R}	10.6	^{U}9.9^{F}	^{D}6.5^{R}	B	B	2.2	A
9	A	A	A	R	5.6^{F}	B	5.3	5.6^{F}	4.7^{F}	5.5	^{J}6.4^{R}	6.5	B	9.9	10.2	R	^{U}9.8^{R}	10.4^{F}	8.6	R	A	5.5^{F}	A	R
10	A	^{U}4.0^{R}	A	A	R	3.0^{F}	R	A	4.6	A	6.1	7.2	7.7	8.6	10.1	9.8	9.7	8.8	8.4	6.0	3.2	F	A	A
11	5.1	3.6	^{U}4.0^{F}	A	A	A	4.9	A	A	B	B	9.4	11.3	11.2	10.4	10.7	10.5	9.2	^{J}8.5^{R}	3.7^{F}	^{U}3.0^{F}	B	B	B
12	R	4.2	4.3	A	R	A	4.4^{F}	4.6^{F}	5.0^{F}	6.0	6.9	7.8	9.1	9.9	10.9	^{D}9.5^{S}	^{D}10.8^{R}	8.0	7.8	5.2	2.6	2.1	1.8	1.8
13	^{U}4.3^{R}	4.1	A	B	A	3.8	3.9	4.0	3.8	5.4	6.5	7.8	8.7	9.4	^{D}9.7^{R}	10.4	9.7	7.7	8.0	6.5	3.0	2.3	1.6	5.0
14	F	F	5.3	4.0	^{U}3.6^{R}	4.7	4.6	A	5.4	5.8	6.8	8.7	10.0	9.4	10.3	10.8	9.9	8.1	8.3	5.5	^{U}3.7^{F}	B	2.0	R
15	F	4.2	3.7	F	F	^{U}4.5^{F}	A	A	4.3^{F}	5.8	6.8	7.9	^{J}8.0^{R}	9.0	9.5	10.5	10.1	9.4	7.4	F	3.5^{F}	A	5.4	4.4^{F}
16	F	B	A	F	^{U}4.7^{F}	^{U}3.8^{F}	5.1	5.0	4.7	4.9	B	B	B	B	3.1	5.4	^{U}5.7^{F}	B	F	^{U}4.1^{F}	A	A	A	A
17	A	^{U}4.0^{R}	B	A	A	B	A	B	B	B	B	B	3.5	3.4	B	^{U}4.5^{F}	3.9	2.8	B	A	F	A	A	A
18	A	B	A	R	R	R	R	B	B	B	B	B	B	B	^{D}5.0^{R}	5.0	5.5	6.4	^{D}7.4^{R}	5.7	A	A	A	A
19	A	A	B	B	A	B	A	B	B	B	B	B	B	B	B	5.9	R	6.2	5.2	^{U}3.6^{F}	^{U}2.9^{R}	B	A	B
20	B	B	B	B	A	B	B	B	B	B	B	B	B	4.8	6.0	5.8	6.2	7.3	5.0	3.7	2.4	B	A	A
21	R	A	^{U}3.4^{F}	B	A	A	B	B	A	B	B	B	B	B	^{D}5.6^{R}	6.0^{F}	7.3	7.5	6.0	3.8	A	A	A	A
22	B	R	A	A	4.2	B	^{U}4.3^{F}	R	B	B	B	B	6.1	6.6	^{U}7.2^{R}	^{D}7.2^{R}	6.9	7.6	7.5	5.9	R	A	A	4.1
23	A	A	A	F	B	B	A	^{U}4.1^{F}	B	B	B	B	B	^{U}8.2^{R}	9.7	9.8	^{D}10.8^{R}	^{D}10.7^{R}	F	^{U}4.4^{F}	A	A	^{U}4.5^{R}	R
24	A	A	^{U}3.5^{F}	B	B	3.7^{F}	B	4.2	R	B	B	5.4	B	B	^{U}9.0^{R}	9.0	9.0	9.9	9.5	7.7	B	B	R	A
25	A	A	A	A	F	B	4.3	4.4	3.9	^{D}5.6^{R}	6.8	^{D}6.6^{R}	9.0	10.2	^{U}10.5^{R}	^{J}12.0^{R}	^{J}11.8^{R}	10.7	10.2	3.2	R	R	R	A
26	R	A	A	B	5.4	5.6	5.6^{F}	4.7^{F}	^{U}5.8^{F}	C	8.9	B	^{U}10.5^{R}	11.0	^{J}12.0^{R}	^{J}12.2^{R}	^{J}11.7^{R}	10.9	10.4	8.9	5.4	3.8	2.5	R
27	R	R	R	5.5	B	B	5.5^{F}	6.1^{F}	6.9^{F}	6.7	7.8	9.3	10.7	11.7	12.1	11.5	^{U}11.4^{R}	^{D}8.5^{R}	10.4	8.7	5.2	3.0	2.2	2.0
28	1.8	1.8	2.0	F	3.5	2.9^{F}	3.3^{F}	^{U}3.8^{F}	5.5^{F}	7.4	9.3	^{J}11.4^{R}	^{D}12.1^{R}	11.7	12.5	^{J}12.1^{S}	^{U}11.0^{R}	10.1	^{U}9.6^{R}	^{U}7.9^{R}	F	4.3	2.8	2.2
29	1.9	1.9	A	B	5.4^{F}	F	F	F	F	6.2^{F}	7.2^{F}	8.3	9.8	^{U}11.0^{R}	^{J}11.9^{R}	^{J}11.6^{R}	11.8	^{J}11.8^{S}	^{J}11.8^{S}	^{D}9.7^{R}	F	F	2.5	2.7
30	A	F	4.9	4.7	3.5	3.6^{F}	4.4^{F}	4.5^{F}	4.8	B	7.8	8.1	9.4	10.0	10.8	^{J}12.0^{S}	13.4	^{U}13.3^{R}	9.3	5.7	R	3.1	3.2	A
31	A	A	A	A	R	3.7	4.1	5.2^{F}	6.2^{F}	7.9^{F}	9.2^{F}	10.0	11.0	^{J}11.7^{R}	^{J}11.9^{R}	^{D}11.5^{R}	13.5	^{D}12.1^{R}	^{D}12.0^{R}	8.6	6.2	^{U}3.7^{R}	R	A
No.	5	10	9	6	11	13	18	14	18	15	17	18	23	25	26	27	28	27	26	26	16	10	13	8
Median	3.5	3.9	3.7	4.2	4.7	3.7	4.6	4.4	4.8	^{D}5.6	6.8	8.0	9.0	9.4	10.2	10.1	10.0	9.0	8.4	5.7	3.1	3.0	2.5	3.2
U.Q.	4.7	4.1	4.6	4.7	5.4	4.3	5.3	5.0	5.5	6.2	7.8	8.7	10.0	10.8	10.9	11.5	^{D}10.8	10.6	9.9	6.5	3.8	3.8	3.0	4.2
L.Q.	1.8	3.1	3.0	3.8	3.6	3.3	4.3	4.1	4.3	4.9	6.0	7.2	7.7	8.3	8.5	8.2	9.0	7.8	7.8	3.8	2.8	2.5	2.0	2.1
Q.R.	2.9	1.0	1.6	0.9	1.8	1.0	1.0	0.9	1.2	1.3	1.8	1.5	2.3	2.5	2.4	3.3		2.8	2.1	2.7	1.0	1.3	1.0	2.1

Observed by N. Wakai

foF2

Sweep 1.5 Mc to 20.0 Mc in 30 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

PROVISIONAL IONOSPHERIC DATA

Sep. 1959 | foF2 | 45° E Mean Time (G.M.T.+3h.) | Showa Base | Lat. 69° 00.4′ S, Long. 39° 35.4′ 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	A	F	5.4^{F}	5.6^{F}	B	5.6^{F}	4.6^{F}	B	A	5.8	6.4	B	B	9.7	^{D}10.2^{R}	12.5	11.3	^{U}10.0^{F}	5.5	A	R	F	F
2	A	A	F	F	3.2	A	B	A	B	A	B	5.2	B	B	^{U}11.5^{F}	^{U}9.9^{F}	F	7.8^{F}	7.3	5.4	3.7	A	F	A
3	F	3.4^{F}	4.4^{F}	4.9^{F}	R	A	4.3^{F}	5.3	5.3	5.8	^{D}6.2^{R}	7.0	6.9	^{U}7.2^{R}	8.6	9.6	10.4	10.6	9.4	4.1^{F}	4.8	F	F	A
4	F	F	A	F	^{U}4.6^{F}	^{U}5.5^{F}	A	A	F	^{U}4.4^{F}	B	B	F	B	B	6.2^{F}	7.0	5.8	4.1	F	F	A	3.1^{F}	3.5
5	A	R	A	R	4.5	A	R	A	B	5.5	5.7	5.6	R	B	7.6	8.4	10.5	10.0	10.2	8.3	3.0	A	4.6	A
6	3.6	B	B	A	6.9	^{U}7.0^{F}	4.5^{F}	4.7^{F}	5.4^{F}	6.7	7.0	B	8.4	9.0	10.4	11.0	11.2	10.9	^{D}10.4^{R}	^{D}9.8^{R}	5.4	3.1^{F}	2.8^{F}	2.4
7	2.0	2.9	F	F	3.8^{F}	^{U}4.9^{F}	5.1^{F}	5.4^{F}	6.4	8.1	8.9	9.2	10.0	10.3	10.6	11.2	10.8	10.8	10.0	8.9	4.1	3.4	2.6	6.0
8	3.4	2.7	A	F	^{U}5.4^{R}	5.4^{F}	5.7^{F}	5.6	5.6	7.3^{F}	7.8	8.6	10.4	10.3	^{J}11.5^{R}	^{J}12.0^{R}	^{J}12.0^{S}	^{J}11.8^{S}	^{J}12.0^{S}	11.3	F	3.5	2.8	2.8
9	A	F	R	A	5.5	4.9^{F}	5.2^{F}	^{U}4.9^{R}	6.5	6.9	7.3	8.7	10.0	9.9	10.4	10.6	^{U}10.5^{R}	^{U}9.9^{S}	10.0	8.9	6.8	3.8	2.8^{F}	2.4
10	R	R	F	A	5.0	5.1	F	5.5^{F}	5.8^{F}	5.5^{F}	6.7	8.2	9.3	9.9	10.2	10.4	10.5	10.2	9.3	9.0	6.3	4.3	2.7	2.4
11	4.2	5.5	A	^{U}5.6^{R}	5.4^{F}	4.2^{F}	^{U}4.6^{F}	B	R	R	5.5	6.0	7.0	8.5	8.6	9.4	10.6	^{U}10.5^{R}	^{U}10.6^{R}	^{U}6.9^{R}	4.0	2.5	A	5.5
12	F	^{U}8.8^{F}	A	A	A	4.6^{F}	4.4	A	^{U}5.2^{R}	5.8	6.1	7.2	7.4	8.2	8.4	9.5	9.8	C	C	C	B	B	A	3.6
13	A	A	^{U}4.3^{R}	3.5	B	A	4.5	4.8^{F}	6.1	7.1	8.3	9.1	9.5	10.3	10.2	^{U}10.8^{R}	11.2	10.3	9.4	8.2	6.3	4.4^{F}	2.9^{F}	A
14	R	A	B	5.2^{F}	4.7	4.2^{F}	B	A	B	A	B	B	B	5.7	6.2	^{J}7.4^{R}	^{U}7.4^{R}	^{U}8.9^{R}	7.4	5.7	2.9	^{U}4.6^{R}	A	A
15	R	A	A	F	3.8^{F}	A	4.3	4.3	5.4	6.3	6.2	B	B	R	10.4	^{D}9.8^{R}	11.3	10.7	10.0	9.2	A	3.5	A	A
16	F	B	B	3.5	B	B	B	B	A	B	B	5.5	5.4	5.5	6.1	6.1	6.3	^{U}7.0^{R}	6.9	5.6	3.6	A	4.1	A
17	A	A	A	3.8^{F}	5.0	4.3	A	5.3	6.0	^{U}6.4^{R}	8.1	8.2	9.9	10.0	^{U}10.4^{R}	10.8	^{D}9.7^{R}	^{U}10.3^{R}	9.1	7.5	3.2	A	A	F
18	A	A	F	F	3.9^{F}	A	A	A	5.0	5.4	5.7	5.8	7.1	^{J}8.7^{R}	B	10.0	10.2	^{J}9.8^{R}	9.3	^{U}7.1^{R}	3.0^{F}	A	A	3.4^{F}
19	A	A	B	B	B	^{U}4.3^{R}	B	B	B	B	B	4.1	B	B	6.1	6.0	6.1	6.4	5.6	4.8	3.9	3.8	3.0	A
20	3.8	4.0^{F}	F	3.3^{F}	^{J}3.8^{F}	A	B	A	A	B	B	B	4.4	F	6.3	B	5.4	B	3.2	3.4	A	A	F	B
21	A	4.2^{F}	A	A	A	2.6	B	B	A	B	B	B	B	B	^{D}5.0^{R}	R	^{D}5.8^{R}	4.9	A	A	^{U}4.6^{F}	^{D}5.1^{R}	A	^{U}4.2^{F}
22	A	B	A	3.0	A	B	B	A	B	4.5	B	B	B	B	B	^{D}5.7^{R}	B	^{J}6.3^{S}	4.8	3.4	2.8	4.1	A	A
23	A	A	A	A	A	4.4	5.5	5.9	6.3	6.9	7.3	B	B	^{D}6.8^{R}	^{J}8.7^{R}	10.0	10.4	^{U}10.4^{R}	^{U}9.9^{R}	A	R	A	3.2^{F}	F
24	3.8^{F}	4.4	F	6.2	5.3^{F}	4.7^{F}	3.9	B	^{U}5.8^{R}	B	B	6.2	6.2	R	7.4	7.4	7.7	^{U}6.5^{F}	6.6	4.9	3.5^{F}	R	A	3.1^{F}
25	F	5.0^{F}	4.4	4.8	4.1	3.8	5.0	B	B	4.8	B	5.5	5.8	8.4	9.8	10.0	^{U}9.2^{F}	6.9	4.6	^{U}4.6^{F}	A	A	A	A
26	R	C	C	C	5.0	B	A	B	A	5.8	6.0	B	B	A	7.4	8.0	9.3	B	B	7.2	4.4	R	A	B
27	A	4.6^{F}	A	B	4.6	^{U}5.6^{R}	4.8	A	6.0	A	B	B	6.0	7.0	^{U}8.1^{R}	^{U}10.1^{R}	^{J}10.0^{R}	8.6	5.5	3.7	^{U}4.4^{F}	R	A	A
28	A	A	A	5.1	4.4^{F}	B	B	5.8	5.9	6.5	5.6^{F}	6.1	6.7	9.3	9.3	9.3	9.9	10.5	9.4	8.5	6.6	R	F	A
29	A	B	4.0	5.0	5.4	5.0^{F}	4.9	6.1	7.0	7.8	7.8	8.1	8.7	8.6	8.8	9.0	9.3	8.9	9.3	8.7	8.4	5.4	5.4	5.1
30	3.4	^{D}5.4^{R}	5.5^{F}	F	^{U}5.6^{F}	^{U}5.4^{F}	5.9	6.9	8.6	8.9	10.2	10.4	10.8	11.6	^{J}11.9^{S}	12.0	^{J}11.9^{S}	7.8	5.4^{F}	4.7	^{U}4.6^{R}	4.0	A	A
31																								
No.	7	11	5	13	22	18	16	14	17	20	18	20	19	18	26	26	26	27	27	26	22	14	12	12
Median	3.6	4.4	4.4	4.9	4.8	4.8	4.8	5.4	5.9	6.4	6.8	6.7	7.4	8.8	9.0	10.0	10.3	9.9	9.3	7.0	4.2	3.9	3.0	3.4
U.Q.	3.8	5.0	5.0	5.3	5.4	5.4	5.4	5.8	6.4	7.0	7.8	8.4	9.9	10.0	10.4	10.6	10.8	10.5	10.0	8.7	5.4	4.4	3.6	4.6
L.Q.	3.4	3.4	4.2	3.5	4.1	4.3	4.4	4.8	5.4	5.5	5.8	5.7	6.2	8.2	7.6	8.4	9.2	7.0	5.6	4.8	3.5	3.5	2.8	2.6
Q.R.	0.4	1.6	0.8	1.8	1.3	1.1	1.0	1.0	1.0	1.5	2.0	2.7	3.7	1.8	2.8	2.2	1.6	3.5	4.4	3.9	1.9	0.9	0.8	2.0

Observed by N. Wakai

foF2

Sweep 1.5 Mc to 20.0 Mc in 30 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

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