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IONOSPHERIC DATA IN JAPAN

FOR DECEMBER 1960

Vol. 12 No. 12

(Including Provisional Data at Showa Base)

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THE RADIO RESEARCH LABORATORIES

MINISTRY OF POSTS AND TELECOMMUNICATIONS

KOKUBUNJI, TOKYO, JAPAN

IONOSPHERIC DATA IN JAPAN

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

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

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

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

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

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

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

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

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

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

d. Multiple Reflections from E_s

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

B. SOLAR RADIO EMISSION

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

a. Daily Data

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

Variability Variability is expressed in four grades as follows:

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

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

b. Outstanding occurrences

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

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

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

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

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

activity

M : multiple peaks separated by relatively long period of quietness

F : multiple peaks separated by relatively short period of quietness

E : sudden commencement or rise of activity

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

Maximum intensity

Instantaneous: The highest value above the base level.

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

C. RADIO PROPAGATION CONDITIONS

a. Radio Propagation Quality Figures

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

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

The tabulated circuits contain London (Commercial circuit), 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 London, 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 .....WMA-25: 5.0775 Mc, WMA-47: 7.485 Mc, WMF-27A2: 7.712 3 Mc WMH-30A2: 10.3873 Mc, WMH-53A2: 13.7773 Mc and 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)
L N.....GIJ-27: 7.6975 Mc, GIJ-30: 10.9075 Mc, GBJ 34: 14.798 Mc and GIJ-38: 18.4375 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

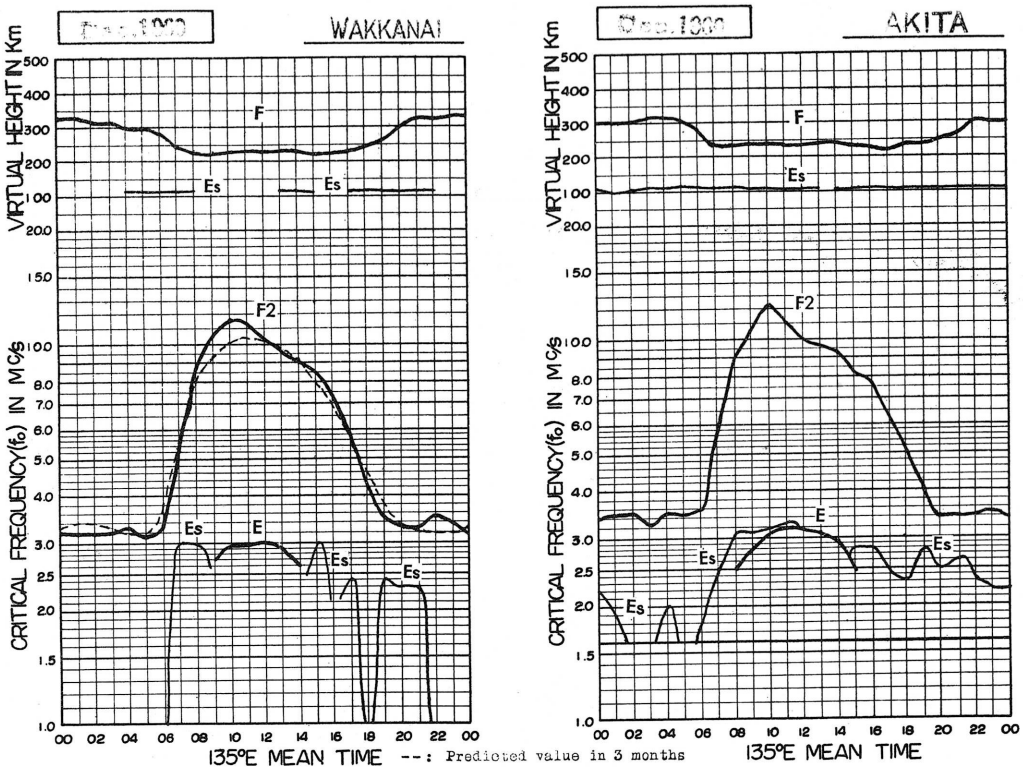
Degrees of SWF are classified into 9 grades according to the amplitude of fade-out;

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.*

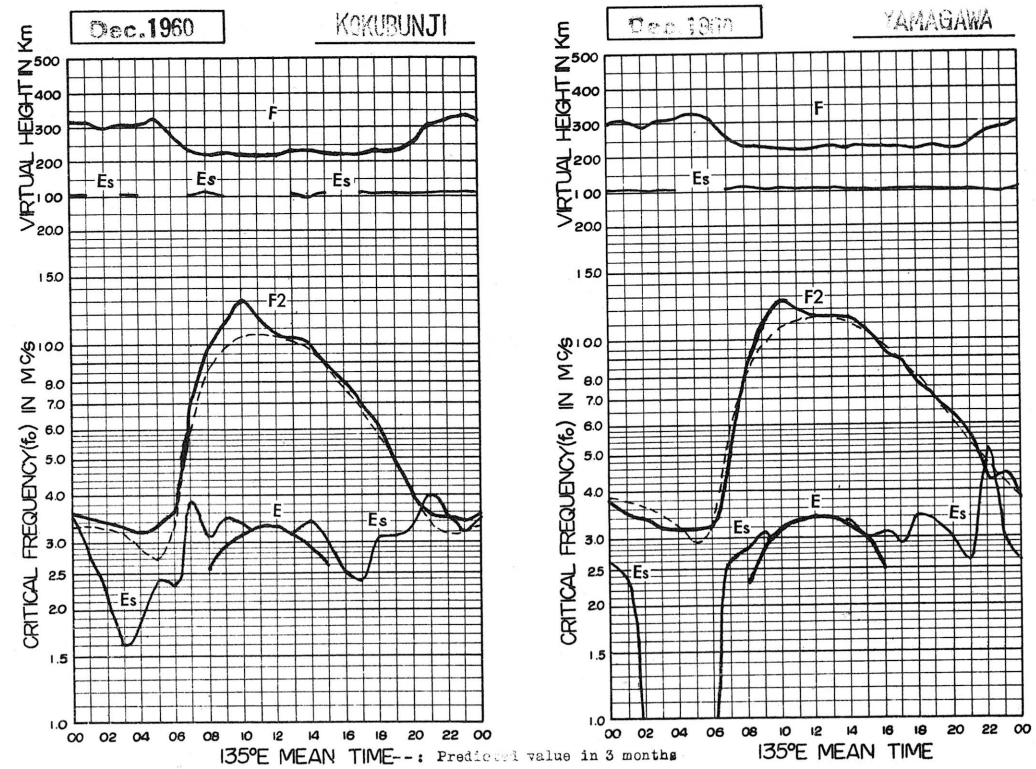
Besides, the time associated phenomena of SID's, that is, solar flare, solar radio noise outburst and crochet (solar flare effect in magnetic record) are given in this table from interchange messages or measurements at Hiraiso.

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. 1960 | 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	3.5	3.2	3.3	3.3	3.4	3.8	2.7	5.6	I 7.8 R	12.4	10.5	9.9	10.2	10.6	9.3	11.1	11.8	6.1	3.3	3.6	4.2	4.2	4.3	4.4
2	4.0	3.8	C	C	C	C	C	C	C	10.0	14.0	13.9	13.2	12.4	10.4	8.7	U 9.5 S	6.1	6.0	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	13.1	13.9	14.2	12.1	10.5	10.3	9.7	9.0	6.1	5.0	3.3	2.9	2.9	2.8	3.0
4	3.2	3.2	3.2	3.1	3.1	3.0	3.3	6.6	9.3	11.1	11.7	11.3	11.3	9.9	9.1	9.1	7.3	5.7	4.2	I 3.2 A	2.5	2.5	2.7	2.9
5	3.2	3.0	3.1	3.0	3.0	3.1	3.3 H	6.2	8.6	10.9	U 10.6 R	11.3	10.3	9.5	9.6	8.8 H	8.2	6.2	4.6	3.0	J 2.3 S	2.4	2.7	2.8
6	2.8	2.8	2.8	2.8	2.8	2.9	3.5	6.8	10.3	10.7	12.0	12.3	11.3	10.0	10.2	8.5	7.7	6.5	5.0	3.2	2.4	2.7	2.9	3.0
7	3.1	3.3	3.2	3.2	3.0	2.9	3.3	6.6	12.6	12.3	13.4	12.8	12.6	13.2	11.9	10.8	9.0	6.2	4.9	4.5	3.6	3.3	3.5	3.4
8	3.5	3.6	3.7	3.7	4.1	3.8	3.8	6.0	11.3	V 14.3 R	13.5	13.1	12.5	12.3	12.9	10.8	10.7	8.0	6.1	5.2	4.3	4.4	4.9	5.0
9	4.7	4.5	4.7	4.9 F	4.9 F	5.0 F	4.9 F	6.9	9.7	12.8	13.2	12.4	11.3	11.5	11.3	9.8	9.3	7.2	4.7	I 3.6 A	I 3.4 A	3.8	3.7	4.0 F
10	I 3.6 F	3.9 F	3.6	3.5	3.8	3.6	3.6	6.2	9.0	11.5	12.5	13.0 H	11.8	12.3	10.9	11.6	9.0	6.5	3.9	4.3	3.9	3.5	3.7	3.9
11	3.8	4.2	4.3	4.4 F	4.3 F	4.5	4.5	6.1	10.3	11.0	10.2	11.2	10.4	10.3	10.3	9.3	7.0	6.7	5.2	4.1	3.5 F	3.5 F	3.6 F	3.7
12	3.7	3.6	3.3	3.3	3.6	3.6	3.3	5.5	11.3	10.1	12.3	11.8	10.7	9.5	11.5	10.5	7.8	6.8	5.2	4.8	I 3.9 C	3.3	I 3.6 A	3.5
13	3.6	3.7	3.6	3.7	3.6	3.3	3.4	6.0	9.3	11.4	13.3	13.4	13.3	12.3	11.7	11.4	8.1	7.1	5.6	4.0	3.2	2.9	3.4	3.6
14	3.6	3.8	3.8	4.0	4.0	3.7	3.6	5.8	9.1	10.7	11.7	11.0	10.0	9.6 H	9.7	9.4	8.0	6.3	4.0	3.5	3.3	3.3	3.5	3.4
15	3.6	3.6	3.5	3.4	3.7	3.4	3.3	5.7	8.5	9.7	12.1	10.8	10.9	10.7	10.8	11.0	6.2	7.1	5.8	I 3.5 A	I 2.9 A	3.0	3.0	3.4
16	2.6	3.0	I 2.8 A	I 2.9 A	3.0	I 2.5 A	2.3	4.0	6.2	6.3 H	5.8	6.1	5.5 F	5.3	5.5	5.0	5.0	3.8	3.3	3.1	4.1	3.3	I 2.9 A	2.7
17	I 2.4 S	2.3	I 2.1 A	2.1	2.2	I 2.9 F	I 3.2 F	5.5	7.3	10.6	12.3	10.3	9.6	N	8.2	6.3	8.1	5.5	4.3	3.3	I 3.3 A	I 3.1 A	2.6	2.4
18	I 2.7 A	3.0	3.1	I 3.2 F	3.3 F	3.0	2.7	4.3	7.7	10.1	10.9	9.8	9.3	9.7	7.5	7.5	7.2	5.2	4.5	4.3	2.9	3.0	3.1	2.8
19	A	A	A	A	A	A	A	4.4	6.5 H	9.8	11.7	11.7	9.6	9.3	8.0	7.3	7.3	I 4.6 A	4.3	3.0	3.3	4.0	3.6 F	3.6
20	3.6 F	3.6	3.3	3.4	3.6	3.7	3.8	4.5	7.3	10.1	10.2	11.4	9.5	8.3	8.0	7.9	7.3	5.0	3.1	2.6	3.3	3.6	3.7	3.3 F
21	3.5 F	3.1 F	2.7 F	3.0	3.2 F	3.2	3.3	4.3	8.3	9.5	11.1	11.1	11.6	10.0	8.9	8.3	6.3	5.0	4.6	3.0	I 3.1 A	3.3	FS	F
22	FS	F	F	F	FS	F	A	4.5	9.3	11.6	12.7	11.3	8.5	8.3	8.3	7.5	5.5	5.0	3.3	2.9	2.6	3.3	3.2	3.1
23	3.0	3.0	3.0	3.0	3.1	3.0 F	2.9	4.7	9.2	8.6	10.6	11.0	9.1	7.8 H	7.5	7.8	6.9	4.4	4.1	3.0	3.6	4.1	4.0	I 3.5 F
24	I 3.0 F	I 2.8 F	3.0	I 2.8 F	2.7	3.0	I 3.4 A	4.8	9.1	11.1	9.7	9.5	9.7	7.3	7.6	8.2	5.6	4.6	3.8	I 3.4 A	3.6	3.6 F	4.1	3.0 F
25	3.0 F	3.0 F	3.0 F	3.0 F	3.0 F	3.0	U 3.1 S	5.0	7.7	9.7	13.0	12.2	9.2	8.2	I 7.7 C	7.9	I 6.7 A	I 5.3 A	4.3	I 2.6 A	I 2.4 A	3.5 F	I 3.5 F	3.4 F
26	3.3 F	3.3 F	3.3	3.2	3.3	3.0	2.3	4.3	6.5	11.0	10.7	10.2	8.6	9.4	8.2	6.7	5.3	5.0	4.6	4.4	3.0	3.3	3.4	3.0
27	2.8	2.7	3.0	3.1	3.5	3.3	2.4	4.3	8.6	10.9	10.6	8.6	8.2	9.3	8.2	7.0	6.2	5.3	4.4	3.7	4.1	4.8	3.7	3.5
28	3.1	2.8	2.8	2.7	2.8	2.7	A	A	A	8.3	10.3	11.2	9.3	9.0	7.8	7.3	5.8	4.3	4.1	3.7	3.3	3.4	3.6	3.6
29	2.8	2.6	2.8	3.2	3.5	2.8	I 2.6 A	4.8	7.1	8.5	11.3	10.4	8.4	8.5	8.4	6.6	6.3	4.5	4.1	3.0	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	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	C	C	C	C	C	C	C	C	C	C	C	C	C	C
No.	26	26	25	25	25	25	24	26	26	29	29	29	29	28	29	29	29	29	29	28	27	27	26	26
Median	3.2	3.2	3.2	3.2	3.3	3.1	3.3	5.5	8.8	10.7	11.7	11.3	10.2	9.6	9.1	8.5	7.3	5.7	4.4	3.5	3.3	3.3	3.5	3.4
UQ	3.6	3.6	3.6	3.4	3.6	3.6	3.6	6.1	9.3	11.4	12.8	12.4	11.4	10.6	10.6	10.2	8.6	6.5	5.0	4.0	3.6	3.6	3.7	3.6
LQ	3.0	3.0	3.0	3.0	3.0	3.0	2.8	4.5	7.7	9.8	10.6	10.4	9.2	8.8	8.0	7.4	6.2	5.0	4.0	3.0	2.9	3.0	3.0	3.0
Q.R.	0.6	0.6	0.6	0.4	0.6	0.6	0.8	1.6	1.6	1.6	2.2	2.0	2.2	1.8	2.6	2.8	2.4	1.5	1.0	1.0	0.7	0.6	0.7	0.6

foF2

Sweep 1.0 Mc to 17.0 Mc in 1 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

W 1

IONOSPHERIC DATA

Dec.1960 | foF1 | 135° E Mean Time (G.M.T. + 9h.) | Wakkanai | Lat. 45° 23.6' N | Long. 141° 41.1' E

10

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

foF1

Sweep 1.0 Mc to 17.0 Mc in 1 ~~sec~~ min in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec.1960 | 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								S	S	2.75	I 2.95 S	2.85	2.85	2.90	2.80	S	S							
2								C	C	A	2.85	3.00	3.00	2.80	S	S	S							
3								C	C	2.80	2.85	3.00	3.00	2.90	2.65	S	S							
4								S	S	2.80	3.00	3.10	3.00	2.90	2.50	S	S							
5								S	S	I 2.75 S	2.85	I 2.80 A	3.00	3.00	2.60	S	S							
6								S	S	2.60	3.00	3.00	3.00	2.90	2.60	S								
7								S	A	A	A	A	A	A	A	A	S							
8								S	A	B	B	3.00	B	B	B	A								
9								S	S	2.60	B	B	B	B	B	B	S							
10								S	S	B	B	B	B	B	B	S	S							
11								S	S	B	B	B	B	B	B	B								
12								S	B	B	B	B	B	B	B	B	S							
13								S	A	A	A	2.80	I 3.00 S	S	S	S								
14									S	S	S	S	S	S	S	S	S							
15								S	S	S	S	S	A	S	S	S								
16									S	S	B	B	B	B	B	A								
17								A	A	A	A	S	S	A	A	S	S							
18									A	2.60	2.80	2.90	2.85	A	S	S								
19									S	B	B	S	2.85	2.70	S	S								
20									A	S	S	S	S	S	S	S								
21									S	S	S	S	S	S	S	A	S							
22									A	S	S	S	S	S	S	S	S							
23									S	S	S	S	S	S	S	S								
24									A	S	S	S	S	S	S	S								
25									S	S	S	S	S	S	C	S	C	C						
26									A	S	S	S	S	S	S	S								
27									S	A	A	S	S	2.90	2.60	S								
28									A	A	A	2.85	2.95	2.80	2.40	S								
29									A	2.30	2.65	2.90	2.80	2.70	2.45	A	S							
30									C	C	C	C	C	C	C	C	C							
31									C	C	C	C	C	C	C	C	C							
No.										8	8	11	11	10	8									
Median										2.70	2.95	2.85	3.00	2.80	2.60									

foE

Sweep 1.0 Mc to 17.0 Mc in 1 ~~sec~~ min in automatic operation.

The Radio Research Laboratories, Japan.

W 3

11

IONOSPHERIC DATA

Dec.1960 | 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	E	E	E	E	E	S	S	G	S	G	G	G	G	S	S	E	E	E	E	E	E	E
2	E	E	C	C	C	C	C	C	C	6.0	G	G	G	G	S	S	S	3.0	2.4	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	G	G	G	G	G	G	S	S	J2.5	5.0	E	E	E	S	2.3
4	2.2	E	E	E	E	E	E	J2.5	S	G	G	J6.3	J6.2	J6.3	G	3.2	S	J3.3	E	7.7	E	E	E	E
5	E	E	E	E	E	E	E	S	S	S	G	3.0	G	G	G	S	S	E	E	E	S	E	E	E
6	E	E	E	E	E	E	E	S	S	G	G	G	G	G	G	S	S	J3.3	J4.0	3.6	E	E	E	E
7	E	E	E	E	E	E	E	J4.3	J12.1	J13.5	J8.3	3.5	J5.1	J5.5	3.5	J3.8	S	E	32M	E	E	J3.0	E	E
8	E	E	E	E	1.6	J2.9	J2.9	S	2.8	B	4.0	J5.3	B	B	B	3.0	3.0	E	E	E	2.8	J4.3	E	E
9	E	E	E	E	E	E	E	S	S	3.2	B	4.0	B	B	B	B	S	2.8	E	4.3M	J5.2	J2.3	E	E
10	E	E	E	E	E	E	E	S	S	B	B	B	B	B	B	S	S	E	E	J3.3	J2.7	E	J3.0	J2.9
11	E	E	E	1.6	E	E	E	S	S	B	B	B	B	B	B	B	E	E	E	E	E	E	E	E
12	E	E	E	E	E	E	E	S	B	B	B	B	B	B	B	B	G	E	E	E	C	3.0	J5.3	E
13	J2.5	E	C	E	E	E	E	2.2	J5.3	2.9	4.0	G	S	S	S	S	E	E	E	E	J3.3	E	E	E
14	E	E	E	E	E	E	E	E	S	S	S	8.3	S	S	S	S	G	2.8	E	E	E	2.3	E	E
15	E	3.0	E	E	E	E	E	G	S	S	S	S	4.0	S	S	S	E	J8.3	6.0	3.9	4.0	3.6	E	E
16	E	E	3.0	J6.5	3.0	J2.9	3.0	E	G	G	B	B	B	G	B	2.7	E	E	4.0	J4.3	J3.3	J3.1	3.0	E
17	S	E	4.0	1.5	E	E	J6.3	J10.3	J12.3	11.6	J8.2	G	G	3.1	3.0	S	S	J2.3	J5.1	J3.3	J5.3	J10.3	E	J3.0
18	J3.3	E	E	E	E	E	J5.0	J6.3	3.0	G	G	G	2.6G	2.7	G	G	J3.5	J9.0	J7.2	J4.6	J3.3	J3.3	E	E
19	J4.5	J6.3	J4.6	J4.6	J4.3	J4.9	3.6	J6.3	G	B	B	S	G	G	S	S	2.6	J7.3	J6.2	J3.3	J2.3	J2.3	J2.5	E
20	E	E	J2.3	2.4	J3.0	J3.3	J3.1	J3.3	J4.3	S	S	S	S	S	S	S	J5.0	J3.5	E	E	J3.3	E	E	E
21	E	E	E	E	1.5	2.4	J2.6	J2.5	S	S	S	S	S	S	S	J3.0	2.6	J2.2	E	J2.8	J3.3	2.8	J3.0	E
22	E	E	E	J5.5	J5.3	J4.0	J4.3	J3.0	3.0	S	S	S	S	S	S	S	J2.5	J3.3	J2.5	J2.3	E	E	E	J2.5
23	J2.5	E	E	E	E	J2.5	E	E	S	S	S	S	S	S	S	S	E	J4.2	J3.8	E	E	E	J2.5	E
24	E	E	J2.8	J3.3	J4.4	J5.1	J4.3	J10.3	2.7	S	S	S	S	S	S	S	J4.1	J5.3	J3.7	J6.1	J5.3	J5.3	J4.0	E
25	E	1.6	2.0	E	4.3	J4.3	J5.1	J3.0	S	S	S	S	S	S	C	S	C	C	J6.3	J5.2	J6.3	J3.3	J2.3	J3.3
26	E	E	E	E	E	E	2.3	E	J2.3	S	S	S	S	S	S	S	E	E	J2.6	E	E	E	E	J5.3
27	J3.0	J2.3	2.0	E	E	J2.3	E	E	S	J3.6	3.0	S	S	G	G	S	E	E	E	J2.5	E	E	E	E
28	E	E	E	E	E	E	3.1	J6.0	J1.3	J3.3	2.8	G	G	G	G	S	E	2.4	F	E	E	J2.3	J2.3	E
29	E	E	E	E	1.4	2.3	J4.9	J6.5	J2.5	G	G	G	G	G	G	2.7	S	E	E	J3.3	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	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	C	C	C	C	C	C	C	C	C	C	C	C	C	C
No.	27	28	26	27	27	27	27	19	13	14	13	15	13	14	11	7	17	28	29	28	25	27	26	27
Median	E	E	E	E	E	E	E	3.0	3.0	G	G	G	G	G	G	3.0	G	2.4	E	2.4	2.3	2.3	E	E
U.Q	E	E	2.0	1.5	1.6	2.9	3.6	6.3	8.3	3.6	4.0	4.0	3.3	2.7	G	3.2	2.8	3.3	3.9	3.8	3.3	3.1	2.5	E
L.Q	E	E	E	E	E	E	E	G	2.4	G	G	G	G	G	G	2.7	E	E	E	E	E	E	E	E
Q.R									5.9							0.5								

foEs

Sweep 1.0 Mc to 17.0 Mc in 1 min/sec in automatic operation.

IONOSPHERIC DATA

Dec.1960 | 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								S	S		S					S	S							
2			C	C	C	C	C	C	C	3.0					S	S	S	E	E	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C							S	S	E	E				S	E
4	E							G	S			6.0	5.8	5.5		G	S	E		A				
5								S	S	S		3.0				S	S				S			
6								S	S							S	S	E	E	E		E		
7								2.5	4.2	10.7	6.0	3.0	4.0	4.2	3.2	3.0	S		E			E		
8					E	E	E	S	2.8	B	4.0	4.7	B	B	B	3.0	E				E	E	·	
9								S	S	G	B	G	B	B	B	B	S	2.7		A	A	E		
10								S	S	B	B	B	B	B	B	S	S			E	2.4		2.4	2.8
11				E				S	S	B	B	B	B	B	B	B								
12								S	B	B	B	B	B	B	B	B					C	E	A	
13	E		C					G	2.4	2.8	3.0		S	S	S	S					E			
14									S	S	S	4.0	S	S	S	S		E				E		
15		E							S	S	S	S	P 4.0 S	S	S	S		4.0	3.0	A	A	E		
16			A	A	E	A	E				B	B	B		B	2.7			E	E	2.7	E	A	
17	S		A	E			E	3.0	3.8	7.3	5.6			3.2	2.8	S	S	E	2.8	2.8	A	A		2.1
18	A						E	E	2.2				G	P 2.7 S			E	E	3.0	3.0	E	E		
19	A	A	A	A	A	A	A	E		B	B	S			S	S	E	A	E	E	E	E	E	
20			E	E	E	E	E	2.7	3.0	S	S	S	S	S	S	S	E	E			E			
21					E	E	E	E	S	S	S	S	S	S	S	2.8	G	E		E	A	2.2	2.2	
22				E	E	E	A	2.6	2.3	S	S	S	S	S	S	S	G	3.1	2.2	E				E
23	E					E			S	S	S	S	S	S	S	S		2.5	E				E	
24			E	E	E	E	A	2.5	2.0	S	S	S	S	S	S	S	4.0	E	3.0	A	E	E	2.2	
25		E	E		2.2	E	E	E	S	S	S	S	S	S	C	S	C	C	2.3	A	A	E	E	
26							E		2.2	S	S	S	S	S	S	S			E					E
27	E	E	E			E			S	3.0	2.9	S	S			S				E				
28							A	A	A	2.7	2.7					S		E				E	E	
29					E	E	A	E	2.1							2.2	S			E	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	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	C	C	C	C	C	C	C	C	C	C	C	C	C	C
No.	6	4	7	7	9	11	13	13	11	7	6	6	4	3	2	6	7	16	14	15	13	14	9	6
Median	E	E	E	E	E	E	E	G	2.4	3.0	3.5	3.5	4.0	4.2	3.0	2.8	E	E	E	E	2.4	E	2.2	E

foEs

Sweep 1.0 Mc to 17.0 Mc in 1 min/~~sec~~ in automatic operation.

The Radio Research Laboratories, Japan.

W 5

IONOSPHERIC DATA

Wakkanai

Lat. 45° 23.6' N
Long. 141° 41.1' E

Dec.1960 | f-min | 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	E1.80S	E1.40S	E1.20S	E	E	E1.60S	E1.80S	E1.70S	E2.50S	2.00	E3.20S	2.00	2.00	2.00	2.00	E2.60S	E1.90S	E1.60S	E2.00S	E2.00S	E2.00S	E1.90S	E1.90S	E2.00S
2	E2.00S	E2.00S	C	C	C	C	C	C	C	2.00	2.00	2.00	2.00	2.10	E2.80S	E2.50S	E1.90S	E2.00S	E1.80S	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	1.95	2.00	2.00	2.00	2.10	1.95	E2.30S	E1.90S	E1.80S	E1.70S	E1.80S	E1.80S	E2.00S	E2.00S	E1.90S
4	E2.00S	E	E1.30S	E	E	E	E1.60S	E1.80S	E2.30S	2.00	2.00	2.00	2.00	2.00	1.90	E2.00S	E2.00S	E1.60S	E1.60S	E2.00S	E2.00S	E1.90S	E1.90S	E1.80S
5	E1.90S	E1.20S	E1.90S	E	E	E	E2.00S	E1.90S	E2.70S	E2.90S	2.10	2.10	2.10	2.10	2.00	E2.30S	E1.90S	E1.90S	E1.90S	E2.00S	E2.10S	E1.80S	E2.00S	E1.90S
6	E2.00S	E2.00S	E	E	E2.00S	E1.40S	E1.90S	E2.00S	E2.30S	2.00	2.00	2.00	2.10	2.05	2.00	E2.10S	E1.80S	E1.80S	E1.60S	E1.90S	E1.90S	E1.90S	E1.90S	E2.00S
7	E2.00S	E	E1.70S	E	E	E1.20S	E1.70S	E1.90S	2.00	2.20	2.10	2.10	2.05	2.10	2.05	2.00	E1.90S	E1.70S	E1.90S	E1.80S	E2.00S	E2.00S	E1.90S	E2.00S
8	E1.80S	E1.40S	E1.70S	E	E	E	E2.00S	E2.10S	2.00	3.00	3.00	2.30	3.20	3.10	3.00	2.00	E1.90S	E1.90S	E2.00S	E1.80S	E1.90S	E1.90S	E1.70S	E1.80S
9	E1.90S	E2.00S	E	E	E	E1.40S	E1.90S	E1.90S	E2.40S	2.40	4.00	3.00	4.20	3.10	3.00	2.20	E2.00S	E1.90S	E1.90S	E1.80S	E1.90S	E1.90S	E2.00S	E1.80S
10	E1.90S	E1.40S	E	E	E	E1.40S	E1.90S	E1.90S	E2.20S	3.00	3.00	4.00	3.10	3.20	2.70	E2.10S	E2.00S	E1.90S	E1.90S	E2.00S	E2.00S	E2.00S	E1.90S	E2.00S
11	E2.00S	E1.70S	E1.20S	E	E1.50S	E1.50S	E1.60S	E1.90S	E2.50S	3.00	4.00	3.20	4.00	4.20	4.15	2.40	E1.90S	E2.00S	E2.00S	E1.90S	E1.80S	E1.80S	E1.90S	E1.90S
12	E2.00S	E1.80S	E	E	E1.20S	E1.40S	E1.90S	E2.00S	2.80	3.00	4.00	4.20	4.20	4.00	3.00	2.80	E2.00S	E1.90S	E1.85S	E2.00S	C	E1.80S	E1.70S	E1.80S
13	E1.80S	E1.70S	C	E	E	E1.90S	E1.90S	E1.80S	2.00	2.00	2.00	2.30	E3.00S	E3.00S	E2.60S	E2.10S	E1.90S	E1.85S	E1.90S	E2.00S	E1.90S	E2.00S	E2.00S	E2.20S
14	E1.90S	E1.90S	E2.00S	E1.90S	E	E	E2.00S	E1.80S	E2.70S	E3.10S	E3.10S	E3.20S	E3.20S	E3.30S	E3.10S	E3.00S	E1.90S	E2.00S	E2.15S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
15	E2.00S	E1.80S	E2.00S	E2.00S	E	E1.60S	E1.70S	E1.90S	E2.70S	E3.00S	E4.20S	E4.00S	E2.60S	E4.20S	E2.70S	E2.10S	E2.00S	E2.00S	E2.00S	E2.00S	E1.90S	E1.90S	E2.00S	E2.00S
16	E2.00S	E2.00S	E	E	E	E	E2.00S	E2.00S	E2.70S	E3.00S	4.50	4.00	4.60	3.10	3.00	2.00	E2.00S	E2.00S	E2.00S	E1.90S	E2.00S	E2.00S	E2.00S	E2.00S
17	S	E2.00S	E	E	E	E	E1.60S	E1.90S	2.00	2.00	2.00	E3.20S	E2.90S	2.00	2.00	E2.30S	E2.00S	E1.60S	E2.00S	E1.90S	E2.00S	E2.00S	E2.00S	E2.00S
18	E2.00S	E1.70S	E1.60S	E	E	E1.60S	E1.90S	E1.90S	2.00	2.00	2.00	2.10	2.05	2.05	E2.40S	E2.20S	E1.80S	E1.80S	E1.90S	E1.90S	E1.90S	E2.00S	E1.80S	E2.00S
19	E2.00S	E	E	E	E	E1.70S	E1.80S	E1.60S	E2.15S	3.00	3.00	E3.00S	2.40	2.20	E2.70S	E2.30S	E1.80S	E1.80S	E2.00S	E1.85S	E1.90S	E1.90S	E2.00S	E2.00S
20	E2.00S	E1.70S	E	E	E	E1.30S	E1.50S	E1.50S	E2.00S	E2.90S	E3.00S	E3.00S	E3.00S	E3.00S	E3.00S	E2.30S	E1.90S	E1.90S	E1.80S	E2.00S	E1.90S	E2.10S	E2.00S	E1.90S
21	E2.00S	E	E	E	E	E1.20S	E1.80S	E1.90S	E1.90S	E2.70S	E2.60S	E3.10S	E4.00S	E3.00S	E3.00S	E2.00S	E2.00S	E1.70S	E1.90S	E1.80S	E1.80S	E2.00S	E2.00S	E2.00S
22	E2.00S	E1.20S	E1.80S	E	E	E	E1.50S	E1.60S	E2.00S	E2.40S	E3.00S	E3.00S	E3.00S	E3.00S	E2.80S	E2.20S	E1.90S	E1.80S	E1.90S	E1.90S	E1.90S	E2.00S	E2.00S	E2.00S
23	E2.00S	E1.70S	E1.50S	E1.80S	E	E	E1.80S	E1.80S	E2.00S	E2.40S	E2.80S	E3.00S	E3.15S	E3.20S	E3.00S	E2.20S	E1.90S	E2.00S	E2.00S	E1.90S	E2.00S	E2.00S	E2.00S	E1.80S
24	E2.00S	E1.80S	E	E	E	E1.25S	E1.50S	E1.50S	E1.90S	E2.80S	E3.00S	E3.80S	E3.00S	E3.00S	E3.00S	E2.70S	E1.90S	E1.80S	E1.70S	E1.80S	E1.90S	E1.90S	E1.80S	E1.80S
25	E1.80S	E	E	E1.60S	E	E	E1.50S	E1.80S	E2.00S	E2.40S	E2.80S	E3.00S	E3.00S	E2.90S	C	E2.35S	C	C	E2.00S	E2.00S	E1.80S	E2.00S	E2.00S	E2.00S
26	E1.90S	E1.60S	E1.60S	E2.00S	E	E1.40S	E1.90S	E1.90S	2.00	E2.70S	E3.00S	E3.10S	E3.00S	E3.00S	E2.60S	E2.30S	E2.00S	E1.90S	E2.00S	E1.95S	E1.80S	E1.90S	E2.00S	E2.00S
27	E2.00S	E	E	E1.30S	E1.60S	E	E1.80S	E1.80S	E2.00S	2.00	2.00	E3.00S	E3.00S	2.30	2.10	E2.30S	E1.90S	E1.90S	E2.00S	E2.00S	E1.90S	E1.95S	E1.60S	E1.80S
28	E1.80S	E	E	E	E	E1.60S	E1.60S	E1.60S	1.60	2.00	2.00	2.00	2.15	2.10	2.00	E2.10S	E2.00S	E1.70S	E1.90S	E1.70S	E2.00S	E1.90S	E2.00S	E1.90S
29	E1.80S	E1.90S	E	E	E	E	E	E1.80S	1.70	2.00	2.10	2.00	2.00	2.10	2.00	E2.00S	E2.00S	E2.00S	E2.00S	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	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	C	C	C	C	C	C	C	C	C	C	C	C	C	C
No.	27	28	14	21	23	27	27	27	27	18	20	17	17	19	16	29	28	28	29	27	26	27	27	27
Median	E2.00	E1.70	E	E	E	E1.25	E1.80	E1.90	E2.00	2.00	2.10	2.10	2.10	2.10	2.00	E2.20	E1.90	E1.90	E1.90	E1.90	E1.90	E1.95	E2.00	E2.00

f-min

Sweep 1.0 Mc to 17.0 Mc in 1 ~~sec~~ min in automatic operation.

IONOSPHERIC DATA

Dec.1960 | (M3000)F2 | 135° E Mean Time (G.M.T.+ 9h.) | Wakkanai | Lat. 45° 23.6' N | Long. 141° 41.1' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.95	2.95	2.75	2.90	2.85	3.35	2.95	3.20	I3.20R	3.40	3.30	3.25	3.15	3.30	3.00	3.00	3.30	3.30	2.90	2.90	2.60	2.55F	2.55	2.75
2	2.75	2.95	C	C	C	C	C	C	C	2.90	3.15	3.20	3.10	3.25	3.25	3.20	U3.35LS	3.10	3.30	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	3.35	3.20	3.30	3.30	3.25	3.10	3.30	3.20	3.30	3.20	3.35	3.10	2.85	2.70	2.85
4	2.80	2.75	2.75	2.75	2.75	2.70	3.05L	3.35	3.45	3.35	3.30	3.25	3.35	3.30	3.40	3.40	3.30	3.05	3.20	I3.30A	3.00	2.80	2.70	2.65
5	2.65	2.70	2.75	2.75	2.85	2.80	2.75H	3.05	3.30	3.15	U3.20R	3.45	3.25	3.25	3.15	3.15H	2.75	3.25	3.30	3.35	I3.45S	2.75	2.50	2.70
6	2.70	2.80	2.85	2.85	2.65	2.75	2.85	3.25	3.40	3.15	3.05	3.15	3.25	3.20	3.10	3.20	3.10	3.20	3.25	3.20	3.20	2.60	2.50	2.50
7	2.60	2.60	2.60	2.70	2.45	2.60	3.00	2.85	3.35	3.15	3.15	3.05	3.15	3.10	3.15	3.25	3.15	3.05	3.35	3.35	3.15	2.75	2.70	2.65
8	2.65	2.60	2.75	2.70	2.85	3.05	2.95	2.90	3.10	U3.35LR	3.25	3.15	3.20	3.10	3.10	3.05	3.15	3.00	3.05	3.00	3.00	2.75	2.80	2.95
9	2.85	2.65	2.70	2.70F	2.60F	2.70F	3.05LF	3.20	3.30	3.30	3.25	3.25	3.20	3.20	3.20	3.20	3.15	3.25	3.25	I3.15LA	I2.85A	2.50	2.60	2.65F
10	I2.95F	2.55	2.55	2.55	2.85	2.60	3.10	3.25	3.05	3.40	3.15	3.25	3.15	3.15	3.15	3.30	3.15	3.25	3.10	3.00	3.10	2.80	2.70	2.85
11	2.80	2.75	2.65	2.60F	2.65F	2.90	3.20	3.10	3.45	3.20	3.30	3.40	3.25	3.30	3.25	3.35	3.20	3.40	3.15	3.15	3.25F	2.75F	2.65F	2.60
12	2.70	2.60	2.80	2.95	2.85	2.90	3.05L	3.05L	3.45	3.20	3.30	3.40	3.35	3.25	3.15	3.25	3.20	3.25	3.10	3.25	I3.20C	2.65	I2.70A	2.80
13	2.65	2.70	I2.60C	2.70	2.60	2.65	2.95	3.25	3.05	3.25	3.25	3.10	3.10	3.10	3.15	3.35	3.10	3.20	3.25	3.05	2.90	2.60	2.75	2.90
14	2.85	2.85	2.80	2.70	2.95	3.05L	3.20	3.30	3.50	3.35	3.40	3.20	3.30	3.15H	3.20	3.40	3.05	3.35	3.25	3.15	3.05	2.90	2.85	2.85
15	2.60	2.70	2.60	2.70	2.75	2.80	2.90	3.20	3.60	3.30	3.30	3.20	3.30	3.10	3.15	3.45	3.30	3.15	3.30	I3.20A	I2.60A	2.60	2.65	2.95
16	2.55	2.60	I2.50A	I2.55A	2.55	I2.50A	2.50	2.60	2.95	2.90H	2.75	3.05	2.80F	3.00	3.20	3.25	3.20	2.95	2.70	2.70	2.90	2.80	I2.70A	2.75
17	I2.90S	3.15	I2.80A	2.40	2.75	I2.90F	I3.10F	3.25	3.15	3.25	3.35	3.45	3.25	N	3.60	3.25	3.25	3.25	3.40	3.40	I3.05LA	I3.10A	3.30	2.95
18	I2.90A	2.75	2.85	I2.90F	3.10F	3.00	3.05L	3.25	3.40	3.40	3.45	3.65	3.30	3.40	3.40	3.20	3.35	3.30	3.00	3.05	3.10	2.70	2.85	2.80
19	A	A	A	A	A	A	A	3.40	3.10H	3.25	3.40	3.15	3.35	3.45	3.45	3.40	3.40	I3.25A	3.35	3.35	2.95	3.00	2.85F	2.80
20	3.00F	3.05	2.85	2.75	2.70	2.95	3.40	3.35	3.30	3.40	3.55	3.50	3.45	3.45	2.80	3.45	3.45	3.60	3.00	3.10	2.75	2.85	3.30	2.90F
21	3.15F	2.95F	2.85F	2.85	2.70F	2.80	2.80	3.00	3.60	3.40	3.35	3.40	3.40	3.35	3.45	3.35	3.35	3.20	3.50	3.50	I3.30A	3.05	FS	F
22	FS	F	F	F	FS	F	A	3.10	3.15	3.45	3.50	3.55	3.40	3.40	3.40	3.45	3.20	3.20	3.40	3.10	2.90	3.05	3.05	2.85
23	3.00	2.85	2.85	2.85	2.75	2.85F	2.95	3.25	3.55	3.35	3.40	3.55	3.55	3.45H	3.35	3.15	3.40	3.40	3.65	2.85	3.05	3.15	2.90	I3.05F
24	I2.95F	I2.75F	2.85	I2.90F	2.95	2.75	I2.90A	3.15	3.40	3.60	3.55	3.45	3.55	3.60	3.30	3.50	3.35	3.50	3.40	I3.00A	3.05	2.90F	3.25	3.15F
25	2.75F	2.75F	2.75F	2.85F	2.75	2.85	U2.95S	3.10	3.50	3.35	3.40	3.40	3.60	3.50	I3.45C	3.50	I3.40A	I3.30A	3.25	I3.40A	I3.10A	2.85F	I2.85F	2.80F
26	3.05F	2.75F	2.75	3.05	3.10	3.05	3.05	3.35	3.10	3.35	3.25	3.55	3.30	3.30	3.40	3.45	3.10	3.20	3.25	3.50	3.00	3.05	3.40	2.85
27	2.95	2.95	2.75	3.00	3.20	3.35	3.05	3.15	3.35	3.30	3.40	3.35	3.30	3.45	3.35	3.45	3.10	3.20	3.00	2.95	2.75	3.15	2.60	2.50
28	2.70	2.70	2.70	2.45	2.55	2.65	A	A	A	3.25	3.15	3.40	3.45	3.55	3.40	3.50	3.45	3.35	3.20	3.30	2.90	2.90	3.05	3.20
29	2.80	2.75	2.70	2.70	3.15	3.40	I2.95A	3.35	3.40	3.35	3.35	3.50	3.40	3.35	3.55	3.55	3.35	3.35	3.30	3.15	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	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	C	C	C	C	C	C	C	C	C	C	C	C	C	C
No.	26	26	25	25	25	25	24	26	26	29	29	29	29	29	29	29	29	29	29	28	27	27	26	26
Median	2.80	2.75	2.75	2.75	2.75	2.85	3.00	3.20	3.35	3.35	3.30	3.35	3.30	3.30	3.25	3.35	3.20	3.25	3.25	3.15	3.05	2.80	2.70	2.80

(M3000)F2 Sweep 1.0 Mc to 17.0 Mc in 1 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

W 7

IONOSPHERIC DATA

Dec.1960 | (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
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3									C															
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23																								
24																								
25															C	C								
26																								
27																								
28																								
29																								
30									C	C	C	C	C	C	C	C								
31									C	C	C	C	C	C	C	C								
No.																								
Median																								

(M3000)F1 Sweep 4.0 Mc to 17.0 Mc in 1 min/sec in automatic operation.

IONOSPHERIC DATA

Dec.1960 | 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									C															
3									C															
4																								
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23																								
24																								
25																								
26															C	C								
27																								
28																								
29																								
30									C	C	C	C	C	C	C	C								
31									C	C	C	C	C	C	C	C								
No.																								
Median																								

h'F2

Sweep 1.0 Mc to 17.0 Mc in 1 min (sec) in automatic operation.

The Radio Research Laboratories, Japan.

W 9

17

IONOSPHERIC DATA

Wakkanai

Lat. 45° 23.6' N
Long. 141° 41.1' E

18

Dec. 1960

h'F

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	300	255	285	290	300	240	280	245	245	245	230	240	235	245	250	245	230	200	265	280	350	360	350	330
2	320	285	C	C	C	C	C	C	C	220H	245	230	245	240	225	220	230	230	240	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	235	230	235	220	230	225	225	230	210	235	245	250	330	E340S	350
4	335	300	315	320	335	300	270	240	240	235	235	A	A	A	220	225	220	220	235	I260A	300	365	390	385
5	370	350	325	300	310	300	250H	215	230	235	230	200H	225	230	230	225H	230	245	250	250	E270S	415	390	375
6	360	370	315	300	390	340	290	250	230	230	245	235	230	235	235	215	220	235	240	260	300	400	425	440
7	420	335	325	310	370	350	270	270	250	I225A	I230A	230	240	250	230	230	225	235	235	240	265	335	330	370
8	350	320	320	300	290	270	275	260	250	235	230	240	225	240	240	235	215	235	220	245	270	310	300	280
9	275	300	300	300	305	290	250	225	240	230	230	225	215	240	225	225	225	225	230	I275A	I320A	350	340	335
10	310	325	310	345	285	310	260	230	220	220	220	240H	235	235	220	230	215	215	250	275	280	320	350	340
11	325	315	300	320	320	270	235	220	240	230	220	230	230	235	235	220	210	235	245	250	260	330	350	360
12	350	350	300	260	290	260	280	260	240	210	240	240	235	225	250	225	220	235	230	250	I250C	340	I340A	300
13	350	330	I340C	325	320	350	300	220	230	230	240	230	225	225	230	235	220	230	230	245	300	370	350	320
14	300	300	300	320	280	260	265	225	235	220	235	220	225	210H	230	225	210	220	260	260	300	320	315	310
15	350	360	350	330	300	300	280	240	215	235	245	220	230	250	230	240	210	270	250	I285A	I390A	390	400	290
16	420	395	I415A	I420A	420	I430A	I430A	340	300	280H	370	340	360	290	280	265	260	265	315	360	300	300	I385A	400
17	I400S	335	I335A	375	320	310	225	250	260	I245A	I235A	220	225	230	220	215	235	225	250	285	I330A	I345A	260	400
18	I385A	360	320	250	260	260	285	250	220	225	225	215	230	240	220	250	220	225	300	300	280	385	310	360
19	A	A	A	A	A	A	A	250	220	245	230	230	230	230	230	220	220	I270A	250	250	310	275	320	320
20	305	275	290	340	300	305	275	240	225	240	230	235	235	235	230	225	225	225	260	300	360	320	250	315
21	260	250	260	320	360	315	320	270	220	225	225	230	240	230	220	220	215	250	230	245	I275A	300	270	250
22	310	350	360	350	275	290	I300A	290	250	225	230	220	225	225	230	225	235	250	250	270	320	300	285	350
23	315	335	320	335	300	320	290	260	230	230	220	225	230	220	225	235	215	260	220	260	290	280	305	320
24	375	360	370	340	300	370	I335A	280	240	225	215	230	230	220	230	225	I240A	235	260	I315A	300	325	250	270
25	325	350	350	320	400	330	310	225	230	240	240	220	220	230	I230C	225	I225C	I230C	250	I265A	I285A	335	300	310
26	290	340	310	300	240	250	300	235	220	235	230	230	240	245	230	225	250	225	265	230	285	275	255	310
27	325	350	325	290	260	235	340	260	240	240	230	230	235	240	235	220	230	235	270	260	330	270	350	370
28	370	365	335	400	375	370	A	A	A	250	230	235	235	230	235	220	220	225	250	250	300	305	305E	260
29	340	370	340	325	240	250	I335A	260	230	230	235	230	225	235	230	215	230	235	250	285	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	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	C	C	C	C	C	C	C	C	C	C	C	C	C	C
No.	27	27	26	26	26	26	25	26	26	29	29	28	28	28	29	29	29	29	29	28	27	27	26	27
Median	335	335	320	320	300	300	280	250	230	230	230	230	230	235	230	225	225	235	250	260	300	325	325	330

h'F

Sweep 1.0 Mc to 17.0 Mc in 1 ~~sec~~ min in automatic operation.

The Radio Research Laboratories, Japan.

W 10

IONOSPHERIC DATA

Dec. 1960 | 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	E	E	E	E	E	S	S	G	S	G	G	G	G	S	S	E	E	E	E	E	E	E
2	E	E	C	C	C	C	C	C	C	110	G	G	G	G	S	S	S	110	120	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	G	G	G	G	G	G	S	S	120	120	E	E	E	S	110
4	110	E	E	E	E	E	E	120	S	G	G	145	140	130	G	160	S	120	E	120	E	E	E	E
5	E	E	E	E	E	E	E	S	S	S	G	110	G	G	G	S	S	E	E	E	E	E	E	E
6	E	E	E	E	E	E	E	S	S	G	G	G	G	G	G	S	S	115	115	110	E	E	E	E
7	E	E	E	E	E	E	E	115	110	110	110	110	110	105	105	105	S	E	115	E	E	110	E	E
8	E	E	E	E	120	115	115	S	110	B	145	125	B	B	B	110	110	E	E	E	115	110	E	E
9	E	E	E	E	E	E	E	S	S	150	B	135	B	B	B	B	S	105	E	125	115	110	E	E
10	E	E	E	E	E	E	E	S	S	B	B	B	B	B	B	S	S	E	E	135	110	E	110	105
11	E	E	E	110	E	E	E	S	S	B	B	B	B	B	B	B	E	E	E	E	E	E	E	E
12	E	E	E	E	E	E	E	S	B	B	B	B	B	B	B	B	G	E	E	E	C	110	110	E
13	110	E	C	E	E	E	E	130	115	115	110	G	S	S	S	S	E	E	E	E	110	E	E	E
14	E	E	E	E	E	E	E	E	S	S	S	110	S	S	S	S	G	105	E	E	E	110	E	E
15	E	110	E	E	E	E	E	G	S	S	S	S	110	S	S	S	E	115	115	110	110	110	E	E
16	E	E	125	120	120	120	115	E	G	G	B	B	B	G	B	105	E	E	115	115	110	110	120	E
17	S	E	115	110	E	E	115	110	110	110	105	G	G	105	105	S	S	130	110	110	110	115	E	115
18	110	E	E	E	E	E	125	110	110	G	G	G	110	110	G	G	120	110	110	110	115	115	E	E
19	150	140	135	125	110	110	110	110	G	B	B	S	G	G	S	S	115	110	110	110	110	110	110	E
20	E	E	135	120	110	110	110	110	110	S	S	S	S	S	S	S	110	110	E	E	105	E	E	E
21	E	E	E	E	110	110	110	105	S	S	S	S	S	S	S	115	125	115	E	110	105	110	105	E
22	E	E	E	120	120	115	115	110	110	S	S	S	S	S	S	S	120	115	115	110	E	E	E	105
23	105	E	E	E	E	115	E	E	S	S	S	S	S	S	S	S	E	115	110	E	E	E	110	E
24	E	E	120	115	115	115	120	110	110	S	S	S	S	S	S	S	115	115	115	110	110	110	105	E
25	E	105	105	E	115	115	110	110	S	S	S	S	S	S	C	S	C	C	115	110	110	110	130	115
26	E	E	E	E	E	E	125	E	110	S	S	S	S	S	S	S	E	E	115	E	E	E	E	115
27	105	105	105	E	E	105	E	E	S	115	115	S	S	G	G	S	E	E	E	115	E	E	E	E
28	E	E	E	E	E	E	115	105	110	110	105	G	G	G	G	S	E	110	E	E	E	110	105	E
29	E	E	E	E	125	120	115	115	115	G	G	G	G	G	G	105	S	E	E	110	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	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	C	C	C	C	C	C	C	C	C	C	C	C	C	C
No.	6	4	7	7	9	11	13	13	11	7	6	6	7	16	14	15	7	16	14	15	13	14	9	6
Median	110	110	120	120	115	115	115	110	110	110	110	120	115	115	115	110	115	115	115	110	110	110	110	110

h'Es | Sweep 1.0 Mc to 17.0 Mc in 1 min ~~sec~~ in automatic operation.

The Radio Research Laboratories, Japan.

W 11

IONOSPHERIC DATA

Wakkanai

Lat. 45° 23.6' N
Long. 141° 41.1' E

Dec. 1960

Types of 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																								
2										l								f	f					
3																		f	f					f
4	f							C				h	h	C2		h l		f		f4				
5												l												
6																		f	f2	f2				
7								C	l2	l3	l2	l	l	l	l	l2			f			f		
8					f	f2	f		l		C	C				l	f				f2	f2		
9										h		C						f		f4	f3	f		
10																				f	f		f2	f3
11				f																		f	f2	
12																					f			
13	f							C	l	l	l											f		
14												l						f				f		
15		f2											l					f2	f2	f	f3	f2		
16			f4	f3	f	f3	f									l			f2	f2	f	f	f	
17			f2	f			f2	l	l2	l2	l			l	l			f	f	f2	f2	f2		
18	f						f	f	l				l	l			f	f	f2	f2	f2	f		
19	f4	f4	f4	f4	f4	f2	f2	f									f	f3	f	f	f	f	f	
20			f	f	f2	f	f	f2	l								f2	f			f			
21					f	f	f2	f								l	C	f		f2	f2	f	f	
22				f2	f2	f2	f4	f2	l								C	f2	f2	f				f
23	f					f2												f2	f				f	
24			f2	f3	f2	f3	f2	f2	l								f2	f	f2	f2	f2	f2	f2	
25		f	f		f3	f3	f2	f											f	f	f2	f	f	f
26							f		l										f					f
27	f	f	f			f				l2	l									f				
28							f2	f3	l4	l2	l							f				f	f	
29					f	f	f2	f2	l							l				f2				
30																								
31																								
No.																								
Median																								

Types of Es

Sweep 1.0 Mc to 17.0 Mc in 1 min sec in automatic operation.

The Radio Research Laboratories, Japan.

W 12

IONOSPHERIC DATA

Dec.1960 | 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	3.6	3.7	3.4	3.3	3.4	3.6	I4.4C	6.0	I8.7C	10.4	12.9	9.9	11.0H	11.1	9.3	U11.0R	11.5RI	8.0C	4.4	4.4	4.6	4.5	I4.6C	4.6
2	4.9	4.5	3.8	4.0	4.5	4.0	4.9	7.3	11.2	10.4	14.6	16.0R	13.5	12.8	11.0	10.0	9.2	8.3	6.6	5.5	3.1	3.1	3.3	3.3
3	3.3	3.7	3.8	3.5	3.5	3.5	3.8	7.0	11.1	13.4	14.9	13.8	13.6	J12.3R	11.9	11.0	9.8	8.0	5.3	4.0	3.2	2.7	3.0	I3.2R
4	3.5	3.5	3.5	3.2	3.5	3.3	3.7	7.5	9.5	10.5	12.0	12.3	10.8	10.3	I9.8R	9.1	8.5	5.7	5.1	4.0	3.3H	3.0	3.1	3.3
5	3.4	3.8	3.9	3.3	3.4	3.3	3.7	6.8	8.4R	11.5	12.4	11.0	U11.5R	11.7	10.1	9.4H	7.9H	6.9	5.5	4.5	2.5	2.6	3.0	3.1
6	3.5	3.5	3.4	3.3	3.3	3.5	4.0	7.3	10.0	12.1	12.1	13.0	12.2H	10.7	10.4H	11.0	8.5	6.0	5.5	4.1	A	A	3.0	3.2
7	3.4	3.6	3.9	3.4	3.5	3.4	3.5	7.6	11.9	J13.2S	13.3	14.0	13.6	13.2	12.8	11.0	9.5	6.9	5.6	5.0	3.8	I3.6A	3.8	3.6
8	3.8	3.9	3.8	3.8	4.0	4.2	4.1	6.8	10.8	14.7	I14.1R	13.1	12.4	12.1	12.6	11.1	10.6	8.4	7.0	5.1	4.5	I4.3A	4.6	4.8
9	4.5	4.4	4.4	4.4	4.2	4.0	4.5	7.4R	11.2	11.6	14.6	13.2	12.7H	11.8	12.1	10.8	9.3	8.7	6.2	4.0	3.3	3.5	3.8	3.9
10	3.5	3.5	3.5	3.4	3.6	3.5	3.8	7.9	9.6	12.6	12.8H	12.6	11.7	12.0H	12.1	10.2	8.9	7.0H	5.8	4.0	4.0	3.6	3.5	4.0
11	3.9	3.8	3.9	3.9	3.7	3.7	4.1	7.1	8.9	U11.0R	12.0	11.2	11.6	10.6	10.3	10.0	8.5	5.6	5.8	5.3	4.4	2.9	3.1	I3.5F
12	3.6F	3.8F	3.6	3.5	3.6	3.5	3.5	6.0	10.1	11.9	12.0	11.2	10.8	9.5	9.8	12.1	9.0	6.3	6.1	5.5	4.9	3.0	3.4	3.5
13	3.5	3.6	3.5	3.5	3.6	3.5	3.6	I7.5R	9.7R	13.0	13.6	14.0	12.2	11.7	12.0	11.3	10.3	7.4	6.1	4.3	3.6	3.0	3.3	3.5
14	3.5	3.5	3.5	3.4	3.6	3.6	4.0	6.5	8.4	10.7	12.0	12.6	10.9	9.5	9.2	10.5	8.2	6.4Z	5.1	4.0	3.5	3.0	3.3	3.4
15	I3.4A	3.5	3.5	3.5	3.5	3.5	3.5	6.8	9.6	9.0	11.6	12.2	9.2	10.6	11.4	10.7	7.2R	6.4	6.9	4.5	I3.5A	3.6	3.9	3.9
16	3.3	2.9	2.9	3.1	3.2	3.0	2.9	4.9	6.5	I7.0RH	7.0	6.5	6.2	6.7	7.1	6.5	5.7FI	5.0F	3.6	I3.8F	F	F	F	F
17	F	F	3.0F	F	F	3.5F	4.0F	6.5	8.5	10.3	13.9	11.0	I9.8RH	10.0	8.6	7.5	6.9	7.8	6.0	3.9	3.1	3.4	3.1	I2.8A
18	2.7	I3.0A	3.3	3.1	3.5	3.0V	2.8	5.6	8.2	11.0	12.2	9.9	8.8	9.1	9.3	7.1	7.6	6.7	5.0	4.5	A	A	A	3.3
19	2.9	2.8	2.5	2.5	2.5	I2.5A	2.5	J5.6R	I9.0R	8.7RI	11.2R	10.5	9.0	9.3	7.9	7.5	7.1	6.6	4.1	4.3	3.1	3.5	3.0	3.5
20	3.4	3.5	3.3	3.5	3.5	3.6	4.0	5.4	8.1	9.6	12.0	9.2	9.1	9.1	8.0	6.8	I7.0A	6.0	I3.7AI	2.2A	3.1	3.5F	3.8	3.5F
21	3.0	2.8	2.9	3.0F	3.0F	I3.0F	3.0	I5.7R	9.0	9.8	13.2	9.6	10.2	10.7	9.5	8.2	6.9	5.9	4.4	3.6	2.5	I3.5FI	3.7F	3.6
22	F	F	F	F	F	A	3.1	5.0	10.4	14.8R	13.3	8.1	8.4	8.5	8.0	7.5	6.1	I5.2A	4.7	I3.1A	I3.1A	3.1	3.1	3.4
23	3.2	I2.8AS	2.9	3.0	3.0	I3.0A	2.9	5.0	10.8	11.5R	12.3	9.0	9.4	8.0	7.1	7.3	8.0	5.3	I3.8A	I3.3A	3.5	3.5F	3.5F	I3.2F
24	2.9F	2.9F	2.9F	I2.9A	I2.9A	2.8F	A	A	10.7R	13.1	11.0	8.7	8.2	8.7	6.8	7.6	7.3	5.5	A	A	A	A	A	A
25	A	A	A	C	C	C	C	C	C	C	13.1	13.0	9.6	9.1R	7.9	7.5	7.5	6.0	5.2	4.0	A	A	A	F
26	3.5	3.5F	3.5	3.3	3.3	2.9	2.4	I4.6A	I6.5R	8.2	11.1	C	C	8.4	I8.6C	6.7	6.3	6.4	5.0	4.0	I3.2A	3.1	F	F
27	F	3.3F	3.2	3.3	3.4	3.0	2.8	5.0	7.9	I10.4R	10.5	9.3	8.3	8.5	9.0	7.5	5.6	5.4	4.5	5.0	I4.2R	5.1	3.8	4.0
28	3.8	3.6	3.6	3.4	3.3	I3.5BF	2.8	I5.4R	8.8R	I10.2R	11.5	I10.4R	9.8	9.6R	8.1	7.3	6.9	5.5	4.0	I4.2R	3.8R	3.5	I3.8F	I4.0R
29	2.4	2.5	2.9	3.0	3.5	2.7	2.4	5.1R	8.6	10.7	10.7	10.9	8.7	8.0	8.5	7.7	5.9	5.6	4.3	4.0	A	A	I3.0A	I3.0A
30	3.0	3.1	3.0	I3.0A	2.9	I2.8A	I3.9A	5.4	6.4	11.1	14.1	10.6	9.4	8.9	7.7	7.2	7.1	4.9	4.1	A	A	A	A	A
31	A	A	3.3F	3.1	2.9	2.8F	2.9	5.8	9.2	I10.0R	12.0	10.7	9.4	9.1	9.3	7.9	7.1	6.0	7.2	I3.8C	2.6	3.4	3.5	3.0
No.	26	27	29	28	28	29	29	29	30	30	31	30	30	31	31	31	31	31	30	29	24	24	25	26
Median	3.4	3.5	3.5	3.3	3.5	3.5	3.6	6.0	9.1	10.8	12.2	11.0	10.0	9.6	9.3	8.2	7.6	6.3	5.2	4.0	3.4	3.4	3.4	3.5
U. Q	3.6	3.7	3.7	3.5	3.6	3.6	4.0	7.2	10.4	12.1	13.3	13.0	11.7	11.7	11.0	10.8	9.0	7.0	6.0	4.5	3.9	3.6	3.8	3.9
L. Q	3.2	3.0	3.0	3.1	3.2	3.0	2.9	5.4	8.4	10.2	11.6	9.9	9.1	8.9	8.0	7.5	6.9	5.6	4.4	4.0	3.1	3.0	3.1	3.2
Q. R	0.4	0.7	0.7	0.4	0.4	0.6	1.1	1.8	2.0	1.9	1.7	3.1	2.6	2.8	3.0	3.3	2.1	1.4	1.6	0.5	0.8	0.6	0.7	0.7

foF2 | Sweep 1.60 Mc to 2.00 Mc in 20 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

A 1

21

IONOSPHERIC DATA

Dec.1960 | 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												L	L											
2										L	L													
3										L														
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16										L	4.2	4.2	4.5	4.1	L									
17											L	L												
18																								
19																								
20											L		L											
21																								
22																								
23												L												
24																								
25										C														
26												C	C		C									
27													L											
28																								
29																								
30																								
31																								
No.											1	1	1	1										
Median											4.2	4.2	4.5	4.1										

foF1

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

The Radio Research Laboratories, Japan.

A 2

IONOSPHERIC DATA

Dec.1960 | foE | 135° E Mean Time (G.M.T.+ 9h.) | Akita | Lat. 39° 43.5' N | Long. 140° 08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								2.00	[2.40C	2.80	3.05	3.20	3.20	3.10	2.90	2.50	A							
2								A	2.50	A	A	A	A	A,	2.90	[2.60A	B							
3								A	A	3.00	3.10	3.25	3.30	3.10	2.75	2.45	A							
4								R	2.45	[3.00R	[3.20R	3.40	3.35	[3.10A	[2.80A	[2.50R	R							
5								R	2.50	[2.85A	3.10	3.20	3.20	3.10	3.00	2.50	B							
6								A	2.50	3.00	3.15	3.20	3.20	A	A	A	B							
7								A	A	S	A	A	3.30	3.10	2.85	2.35	A							
8								A	A	[2.85R	3.15	3.30	[3.30B	R	C	A	A							
9								B	2.50	[2.90A	3.20	B	B	R	R	2.55	A							
10								A	A	R	B	B	B	A	B	B	B							
11								B	B	R	A	A	B	B	B	B	A							
12								B	B	B	B	B	B	B	B	A	A							
13								A	R	A	A	A	A	B	B	R	B							
14								B	B	B	B	B	B	B	B	B	B							
15								B	R	A	B	B	B	B	B	B	A							
16								A	B	B	B	B	B	B	B	B	B							
17								A	R	R	B	R	B	B	B	[2.40R	B							
18								A	A	A	A	R	R	R	A	A	A							
19									A	A	R	R	B	R	[2.65R	B	B							
20									A	A	B	R	R	R	R	R	A							
21								A	A	B	B	B	B	B	A	R	A							
22								A	B	B	B	B	B	B	B	B	A							
23								A	B	B	B	B	B	B	R	R	A							
24								A	A	A	A	A	B	B	B	B	A							
25								C	C	C	A	B	B	R	A	B	A							
26								A	A	B	R	C	C	A	C	A	A							
27									2.20	2.75	[3.00R	3.20	3.20	[3.10B	[2.95S	R	B							
28								B	R	2.60	2.95	A	A	A	A	A	A							
29								A	A	A	A	A	3.05	3.00	2.85	R	S							
30								A	A	A	A	A	A	R	R	A	A							
31									A	R	B	B	B	R	A	A	A							
No.								1	7	9	9	7	9	7	9	8								
Median								2.00	2.50	2.85	3.10	3.20	3.20	3.10	2.85	2.50								

foE

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

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec.1960 | foEs | 135° E Mean Time (G.M.T.+ 9h.) | Akita | Lat. 39° 43.5' N | Long. 140° 08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.1	E	E	E	E	E	C	∫2.3	C	G	G	3.5	G	G	G	∫3.5 Y	∫2.9	C	∫2.9	2.2	E	E	C	2.1
2	E	E	E	E	2.1	E	∫3.8	∫2.9	∫3.1	3.1	∫3.8	∫6.2	∫8.3	∫7.0	G	∫2.8	G	E	E	2.2	∫2.5	∫3.3	∫2.5	∫1.8
3	2.3	2.2	∫2.4	∫2.7	∫3.4	∫6.3	∫1.8	∫3.3	∫5.1	∫4.2	2.9 q	G	G	G	G	2.2 q	2.5	∫2.8	E	∫3.8	∫2.9	E	E	E
4	E	E	∫1.8	E	E	E	E	G	G	G	G	G	G	3.7	∫3.1	3.5	G	E	2.2	∫4.9	∫3.8	∫2.4	2.2	∫2.4
5	E	E	E	E	∫2.4	E	E	2.3	G	∫5.3	3.7	G	G	2.6 q	G	3.0	2.1	∫2.9	∫4.3	∫2.8	2.1	2.2	2.0	E
6	E	∫1.8	2.2	E	E	E	∫1.8	∫3.2	G	G	G	G	2.9 q	∫6.1	∫4.0	∫2.8	G	∫2.9	∫4.3	∫5.0	∫5.9	∫5.0	2.1	∫1.8
7	2.2	E	2.2	2.1	E	E	E	∫2.9	∫5.2	S	∫7.0	3.5	3.1 q	G	2.5 q	2.5	2.1	∫2.4	∫2.4	∫2.9	∫8.5	∫5.0	∫3.8	∫4.1
8	∫2.3	E	E	∫3.0	∫2.9	∫2.5	E	∫2.3	∫3.8	G	G	4.1	3.8	∫4.9	C	∫5.6	2.3	∫2.4	∫2.8	∫4.9	∫5.1	∫8.0 Y	∫2.8	∫2.8
9	∫2.8	E	E	E	∫1.8	E	∫2.4	G	G	3.0	G	B	B	G	G	G	∫3.8	2.2	∫1.8	E	E	∫2.9	∫2.5	∫3.4
10	∫2.3	∫2.3	E	E	E	E	2.1	∫4.9	∫4.3	G	B	B	B	∫3.8	B	B	G	2.1	E	E	E	∫3.7	∫2.3 Y	∫2.4 Y
11	∫2.4	∫2.8	2.0	E	E	E	E	G	B	G	3.4	4.0	B	B	B	B	∫3.6	∫2.2	∫2.4	∫2.3	E	E	E	E
12	∫2.4	∫2.2	E	E	E	E	E	G	B	B	B	B	B	B	B	3.1	∫3.6	∫2.9	∫2.5	E	E	E	E	E
13	E	∫3.0	∫2.5	∫2.5	E	E	E	∫2.9	∫3.5	3.6	∫12.3	4.0	3.5	B	B	G	B	E	E	E	E	E	∫2.8	∫2.2
14	∫2.4	∫2.4	∫2.4 Y	∫1.8	E	E	E	G	B	B	B	B	B	B	B	B	B	∫2.3	2.2	E	E	E	E	E
15	∫3.6	∫2.4	E	∫2.4	∫2.3	2.2	E	G	G	4.2	B	B	B	B	B	B	2.6	2.3	E	∫3.3	∫3.3	∫2.8	∫1.8	E
16	E	E	E	E	∫2.5	∫1.8	∫3.0	∫2.9	G	B	B	B	B	B	B	B	B	E	E	E	E	E	E	E
17	E	E	E	E	2.2	2.1	E	∫2.0	G	G	B	G	B	B	B	G	2.6	∫2.4	∫2.3	∫2.3	∫1.8	∫1.8	∫3.1	∫2.9
18	∫2.3	∫3.2	∫2.0	E	∫2.5	∫4.0	2.2	∫5.9 Y	∫3.5	∫5.0	∫5.3	G	G	G	∫3.3	∫2.9	∫3.3	∫3.0	∫3.1	∫3.8	∫5.0	∫6.0	∫5.0 Y	∫3.7
19	E	∫2.9	E	2.0	2.3	∫2.7	∫1.8	∫2.5	2.7	∫8.5	G	G	B	G	G	B	B	E	E	2.0	E	E	∫2.3	E
20	E	∫1.9	2.2	∫3.0	∫2.3	2.2	E	2.0	∫5.2	∫7.8	B	G	G	G	G	G	∫10.0	∫9.8 Y	∫6.4	∫4.1	2.3	∫2.8	E	E
21	E	E	E	∫1.8	∫2.3	∫3.8	∫2.9	∫4.8	3.0	B	B	B	B	B	3.0	G	∫6.0	∫5.9	∫3.2	∫2.4	∫2.4	∫3.0	∫2.9	∫2.8
22	∫1.9	E	E	∫2.7	∫4.1	∫5.3	∫2.9	2.5	B	B	B	B	B	B	B	B	3.7	∫7.3	∫3.8	∫3.2	∫4.9	2.3	∫2.1	∫3.3
23	∫2.9	∫1.9	∫2.0	E	∫1.9	∫3.6	∫2.1	∫2.8	3.4	B	B	B	B	B	G	G	∫5.0	∫5.0	∫5.0	∫5.1	∫2.3	∫3.0	∫2.3	E
24	E	∫2.4	∫2.4	∫6.5	∫4.1	∫5.3	∫6.0	∫8.9	∫10.5	∫5.3	∫6.6	∫6.8	∫6.5	4.1	B	B	∫2.9	∫5.3	∫6.0	∫6.0	∫5.1	∫4.0	∫5.2	∫3.4
25	∫3.6	∫3.7	∫3.2	C	C	C	C	C	C	C	3.7	B	B	G	4.1	B	2.5	∫2.9	E	∫8.3 Y	6.1	∫8.0	∫3.0	∫3.0
26	2.2	∫1.8	E	2.2	E	E	E	∫5.0	∫2.9	B	G	C	C	3.5	C	2.7	∫2.5	∫2.8	∫2.4	∫2.9	∫5.3	∫2.6	∫2.5	∫2.3
27	∫3.0	∫2.3	∫2.4	E	E	E	E	E	2.7	G	G	3.3	3.5	B	S	G	B	E	2.3	∫2.3	∫2.8	∫2.0	∫1.8	E
28	E	E	E	E	E	E	E	B	2.5	3.1	3.1	∫8.8	∫8.3	∫7.3	∫4.0	∫3.4	∫2.8	E	E	E	E	∫2.4	∫2.8	∫2.8
29	∫2.3	E	E	E	E	E	∫2.1	∫3.8	∫4.1	∫5.8	∫3.3	3.5	2.8 q	G	G	G	∫3.2	∫8.3	E	∫4.0	∫6.2	∫4.0	∫5.0	∫4.0
30	∫2.8	∫2.4	∫2.8	∫2.8	∫2.3	∫3.7	∫3.1	∫4.5	∫4.4	∫8.5	∫7.8	∫3.3	3.5	G	G	∫3.4	3.1	∫5.0	3.2	∫3.8	∫5.9	∫5.9	∫5.3	∫5.0
31	∫4.2	∫3.4	∫2.3	∫2.0	∫2.8	E	∫2.0	E	∫4.2	G	B	B	B	G	3.1	∫3.4	∫3.5	2.3	E	C	E	∫1.8	∫2.3 Y	E
No.	31	31	31	30	30	30	29	29	25	22	20	19	16	20	18	22	26	30	31	30	31	31	30	31
Median	2.2	1.9	E	E	2.0	E	1.8	2.5	3.1	3.1	3.2	3.3	G	G	G	2.8	2.8	2.4	2.3	2.8	2.5	2.6	2.3	2.2
U.Q	2.4	2.4	2.3	2.4	2.4	2.7	2.3	3.8	4.2	5.3	3.8	4.0	3.6	4.0	3.1	3.6	3.6	3.0	3.2	4.0	5.1	4.0	2.9	3.0
L.Q	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	2.3	2.1	E	2.0	E	E	1.8	E
Q.R																	1.3	0.9		2.0			1.1	

foEs

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

IONOSPHERIC DATA

Dec. 1960 | f_bE_s | 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						C	1.7	C			3.4				1.8	1.7	C	E	E			C	E
2					E		2.0	2.0	2.3	3.1	3.3	3.9	4.9	5.5		2.6				E	1.8	2.1	E	E
3	E	E	2.0	1.8	2.8	E	E	1.9	2.9	2.4	2.9					2.0[G]	2.1	2.3		E	E			
4			E											3.4	3.1	2.8			E	3.0	2.4	2.1	E	E
5					E			2.0		3.7	3.5			2.0[G]		2.9	2.0	2.4	4.2	E	E	1.9	E	
6		E	E				1.7	2.5					2.8[G]	6.0	3.8	2.8		2.6	4.0	1.8	A	A	E	E
7	E		E	E				2.5	3.8	S	4.0	3.5	3.1[G]		2.1[G]	2.0	2.0	1.7	E	2.0	E	A	E	2.5
8	E			E	E	E		2.0	2.8			3.8	3.7	3.5	C	4.8	2.0	E	1.8	2.0	3.3	A	E	E
9	E				E		E			3.0		B	B				2.0	E	E			E	E	E
10	E	E					E	3.4	3.0		B	B	B	3.5	B	B		E				2.0	E	2.5
11	2.0	E	E						B		3.4	[U]4.0[B]	B	B	B	B	2.6	E	E	E				
12	E	1.7							B	B	B	B	B	B	B	3.0	2.5	2.0	1.8					
13		E	E	1.8				2.0	3.2	3.0	7.5	3.4	3.3	B	B		B						E	E
14	E	E	E	E					B	B	B	B	B	B	B	B	B	2.0	2.0					
15	A	E		1.8	1.8	E				3.6	B	B	B	B	B	B	2.4	E		2.2	A	1.9	E	
16					2.0	E	2.4	2.0	B	B	B	B	B	B	B	B	B							
17					E	E		1.7			B		B	B	B		2.5	E	1.7	1.8	E	E	1.7	A
18	2.0	A	E		E	E	E	3.5	2.9	3.2	3.5				3.1	2.9	3.0	2.4	2.9	2.7	A	A	A	2.5
19		2.3		E	E	A	E	E	2.6	5.5			B			B	B			E			2.0	
20		2.1	E	E	2.0	E		1.7	2.6	3.9	B						A	3.0	A	A	E	E		
21				E	E	1.9	2.1	4.6	2.7	B	B	B	B	B	2.9		2.5	2.6	E	1.7	E	E	E	2.6
22	E			E	1.8	A	2.5	2.0	B	B	B	B	B	B	B	B	3.0	A	3.4	A	A	E	E	2.5
23	E	A[S]	E		E	A	2.0	2.3	2.7	B	B	B	B	B			2.1	3.0	A	A	2.0	E	E	
24		E	E	A	A	1.8	A	A	7.0	3.6	5.4	5.0	5.5	3.5	B	B	2.9	3.5	A	A	A	A	A	A
25	A	A	E	C	C	C	C	C	C	C	3.5	B	B		3.4	B	2.3	2.9		1.8	A	A	A	E
26	2.0	E		E				A	2.5	B		C	C	3.0	C	2.5	2.0	E	E	E	A	2.0	E	E
27	E	E	E						2.5			2.4	2.4	B	S		B		E	1.7	2.5	E	E	
28								B	2.5	G	2.0	5.9	4.5	4.5	3.0	2.6	2.5					E	2.2	2.5
29	E						E	2.5	2.5	3.3	3.1	3.1	2.6[G]				[E]2.5[S]	1.7		3.0	A	A	A	A
30	E	2.0	E	A	2.0	A	A	2.9	2.5	3.7	4.7	3.3	[U]3.5[B]			3.2	2.7	2.3	2.3	A	A	A	A	A
31	A	A	E	E	2.0		E		2.7		B	B	B		[U]3.1[B]	3.4	2.1	E		C		2.0	E	
No.	19	18	15	14	17	13	15	21	18	13	12	11	10	9	8	14	21	23	20	23	20	23	24	19
Median	E	E	E	E	E	E	1.7	2.0	2.7	3.3	3.5	3.5	3.4	3.5	3.1	2.8	2.4	2.0	1.8	1.8	2.9	2.0	E	2.5

f_bE_s

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

IONOSPHERIC DATA

Dec.1960 | 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	C	1.65	1.65C	1.75	1.85	1.90	1.75	1.80	1.75	1.65	E	C	E	E	E	E	C	E
2	E	E	E	E	E	E	E	E	1.65	1.70	1.75	1.85	1.80	1.80	1.80	1.70	1.75	E	E	E	E	E	E	E
3	E	E	E	E	E	E	E	1.65	1.70	1.70	1.75	1.80	1.80	1.90	2.00	1.65	1.70	E	E	E	E	E	E	E
4	E	E	E	E	E	E	E	1.65	1.70	1.65	1.75	1.85	2.00	1.75	1.80	1.80	1.70	E	E	E	E	E	E	E
5	E	E	E	E	E	E	E	1.65	1.70	1.70	1.80	1.80	1.80	1.80	1.85	1.65	1.70	E	E	E	E	E	E	E
6	E	E	E	E	E	E	E	E	1.75	1.80	1.90	1.80	2.05	1.85	1.75	1.70	1.80	E	E	E	E	E	E	E
7	E	E	E	E	E	E	E	1.65	1.80	3.80	2.50	2.05	1.90	1.80	1.70	1.70	1.65	E	E	E	E	E	E	E
8	E	E	E	E	E	E	E	1.65	1.85	1.90	2.50	1.85	3.30	2.00	E4.00C	1.80	1.65	E	E	E	E	E	E	E
9	E	E	E	E	E	E	E	1.75	1.95	2.10	2.70	3.45	3.40	2.05	2.30	1.80	1.70	E	E	E	E	E	E	E
10	E	E	E	E	E	E	E	1.65	1.90	2.00	3.40	3.50	3.50	2.50	3.00	2.80	1.90	E	E	E	E	E	E	E
11	E	E	E	E	E	E	E	1.80	2.75	2.05	2.50	2.75	3.45	3.50	3.50	2.55	2.20	E	E	E	E	E	E	E
12	E	E	E	E	E	E	E	1.80	2.90	3.70	4.00	3.70	4.05	3.55	3.40	2.00	1.75	E	E	E	E	E	E	E
13	E	E	E	E	E	E	E	E	1.85	1.90	2.00	2.00	2.30	3.30	2.95	1.80	1.85	E	E	E	E	E	E	E
14	E	E	E	E	E	E	E	1.80	3.10	3.70	4.20	4.00	4.00	3.90	3.50	3.00	2.05	E	E	E	E	E	E	E
15	E	E	E	E	E	E	E	1.90	2.05	2.95	3.55	3.80	3.60	3.50	3.50	3.05	1.70	E	E	E	E	E	E	E
16	E	E	E	E	E	E	E	E	2.80	3.20	3.25	3.30	3.20	3.50	3.50	2.80	1.90	E	E	E	E	E	E	E
17	E	E	E	E	E	E	E	E	1.75	2.00	3.20	3.00	3.40	3.40	2.90	1.95	1.75	E	E	E	E	E	E	E
18	E	E	E	E	E	E	E	E	1.75	1.85	2.45	2.50	2.00	2.00	2.00	1.70	1.70	E	E	E	E	E	E	E
19	E	E	E	E	E	E	E	E	1.80	1.85	2.00	1.80	3.90	2.05	2.05	2.50	1.95	E	E	E	E	E	E	E
20	E	E	E	E	E	E	E	E	1.70	2.00	3.30	2.50	2.05	2.00	2.50	1.75	1.70	E	E	E	E	E	E	E
21	E	E	E	E	E	E	E	E	1.80	2.95	3.20	3.20	3.20	3.10	2.00	2.00	1.75	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	E	2.40	3.00	3.50	3.10	3.50	3.50	3.00	2.90	1.70	E	E	E	E	E	E	E
23	E	E	E	E	E	E	E	E	2.20	2.85	3.05	3.50	3.90	3.50	2.00	2.00	1.70	E	E	E	E	E	E	E
24	E	E	E	E	E	E	E	E	1.70	2.20	2.70	3.05	4.00	3.40	3.05	3.00	1.90	1.70	E	E	E	E	E	E
25	E	E	E	C	C	C	C	C	C	C	2.50	3.50	3.55	2.55	2.80	2.80	1.70	1.70	E	E	E	E	E	E
26	E	E	E	E	E	E	E	E	1.75	3.00	2.05	C	C	2.05	C	1.80	1.65	E	E	E	E	E	E	E
27	E	E	E	E	E	E	E	E	1.65	2.05	2.00	1.90	2.00	3.50	E3.40S	2.00	1.90	E	E	E	E	E	E	E
28	E	E	E	E	E	E	E	1.80	1.65	1.75	1.65	1.65	E	E	1.70	E	1.70	E	1.80	E	E	E	E	E
29	E	E	E	E	E	E	E	E	E	E	1.90	2.00	1.90	1.90	2.00	2.00	E2.50S	E	E	E	E	E	E	E
30	E	E	E	E	E	E	E	E	1.75	2.00	2.05	2.50	2.10	3.00	2.50	2.00	1.80	E	E	E	E	E	E	E
31	E	E	E	E	E	E	E	E	1.80	1.90	3.50	3.50	3.80	2.50	2.50	2.00	1.90	E	E	E	E	E	E	E
No.	31	31	31	30	30	30	29	30	30	30	31	30	30	31	28	31	30	30	31	31	31	31	30	31
Median	E	E	E	E	E	E	E	E	1.80	2.00	2.50	2.50	3.20	2.50	2.40	2.00	1.80	E	E	E	E	E	E	E

f-min

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

IONOSPHERIC DATA

Dec. 1960 | (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	295	320	270	270	270	320	I 320 C	320	I 340 C	300	340	320	300 H	300	310	U 310 R	310 R	I 270 C	285	255	265	260	I 265 C	280
2	290	270	240	250	270	250	275	295	320	315	300	315 R	310	320	335	325	330	330	340	350	360	270	265	240
3	245	265	280	295	280	285	285	330	340	315	325	320	325	J 310 R	300	325	325	320	335	315	315	260	270	I 260 R
4	270	275	285	260	260	275	300	340	345	320	320	335	335	340	I 320 R	340	340	310	340	310	290 H	255	270	240
5	240	250	290	255	290	270	295	340	345 R	330	340	335	U 330 R H	330	325	310 H	310 H	340	340	340	295	260	240	235
6	250	260	275	260	250	260	280	340	330	300	315	315	315 H	320	300 H	325	300	295	330	325	A	A	235	220
7	225	240	310	245	245	275	270	330	320	J 320 S	315	315	310	305	310	330	330	325	325	335	325	I 260 A	265	265
8	265	260	265	265	275	290	310	320	310	330	I 320 R	295	310	310	310	315	315	305	320	300	295	I 290 A	285	285
9	300	270	265	250	250	270	290	336 R	350	310	315	320	315 H	305	325	295	320	330	325	330	275	245	265	280
10	275	260	260	235	265	255	290	340	325	335	330 H	315	315	315 H	320	325	345	315 H	320	300	310	290	260	260
11	270	265	260	255	265	280	305	350	335	U 335 R	350	340	335	330	325	335	335	285	310	325	340	270	255	I 255 F
12	255 F	250 F	260	280	310	300	315	315	330	330	335	330	330	315	300	320	325	300	330	320	320	255	260	265
13	255	270	260	255	270	255	280	I 330 R	330 R	310	310	315	320	300	315	310	320	330	340	340	320	270	260	285
14	285	285	300	265	280	295	315	350	340	350	330	350	350	325	350	340	325	325 L	345	315	330	300	275	270
15	I 260 A	260	260	260	260	265	310	320	360	335	325	330	330	320	315	335	320 R	300	325	335	I 275 A	265	255	275
16	280	260	245	230	270	230	240	280	320	I 295 R H	305	310	295	315	315	335	315 F	I 295 F	285	I 280 F	F	F	F	F
17	F	F	245 F	F	F	270 F	330 F	335	330	300	330	340	I 340 R H	340	350	345	305	320	350	335	310	310	330	I 300 A
18	265	I 260 A	280	295	300	335 V	280	325	330	340	345	345	340	330	345	340	330	330	315	325	A	A	A	285
19	250	270	250	245	250	I 270 A	280	J 330 R	I 350 R	355 R	I 340 R	345	340	335	355	350	340	350	315	325	290	310	280	290
20	290	280	275	270	280	280	310	340	325	335	350	350	345	345	355	335	I 330 A	335	I 315 A	I 285 A	260	260 F	290	305 F
21	315	255	260	265 F	265 F	I 260 R	270	I 320 R	335	320	350	340	320	340	340	350	335	310	310	335	295	I 280 F	I 290 F	310
22	F	F	F	F	F	A	300	290	315	350 R	360	345	340	335	340	335	345	I 330 A	340	I 350 A	I 320 A	295	295	300
23	330	I 280 S	250	260	275	I 275 A	290	305	360	345 R	355	340	340	355	355	340	350	355	I 330 A	I 290 A	290	295 F	315 F	I 280 F
24	280 F	270 F	265 F	I 255 A	I 260 A	280 F	A	A	350 R	350	360	380	340	365	340	335	360	330	A	A	A	A	A	A
25	A	A	A	C	C	C	C	C	C	C	340	350	345	350 R	345	335	340	345	350	330	A	A	A	F
26	285	275 F	290	300	310	310	290	I 315 A	I 340 R	345	360	C	C	320	I 345 C	355	350	325	320	350	I 320 A	295	F	F
27	F	285 F	300	305	295	335	300	325	325	I 335 R	330	350	350	310	345	340	340	325	300	315	I 290 R	335	255	260
28	265	280	250	225	250	I 250 R F	255	I 320 R	310 R	I 340 R	340	I 330 R	350	335 R	335	330	340	330	325	I 325 R	290 R	280	I 285 F	I 320 R
29	320	260	260	265	315	285	290	310 R	350	335	340	345	340	355	330	355	340	315	315	330	A	A	I 305 A	I 305 A
30	270	285	275	I 250 A	280	I 290 A	I 320 A	335	330	320	340	330	320	325	340	340	335	325	335	A	A	A	A	A
31	A	A	280 F	300	310	260 F	265	330	335	I 335 R	335	340	330	325	335	340	340	315	360	I 330 C	255	295	300	265
No.	26	27	29	28	28	29	29	29	30	30	31	30	30	31	31	31	31	31	30	29	24	24	25	26
Median	270	270	265	260	270	275	290	330	330	330	335	335	330	325	335	335	330	325	325	325	295	275	270	280

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

The Radio Research Laboratories, Japan.

A 7

27

IONOSPHERIC DATA

Dec.1960 | (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												L	L											
2										L	L													
3										L														
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16										L	340	340	340	360	L									
17											L	L												
18																								
19																								
20											L		L											
21																								
22																								
23												L												
24																								
25										C														
26												C	C		C									
27													L											
28																								
29																								
30																								
31																								
No.											1	1	1	1										
Median											340	340	340	360										

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

The Radio Research Laboratories, Japan.

A 8

IONOSPHERIC DATA

Dec.1960 | h'F2 | 135° E Mean Time (G.M.T.+ 9h.) | Akita | Lat. 39° 43.5' N | Long. 140° 08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1												225	260^{L}											
2										255^{L}	255													
3										245														
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16										345^{H}	330	300	350	295	290									
17											250	210												
18																								
19																								
20											250		250											
21																								
22																								
23												225												
24																								
25										C														
26												C	C		C									
27													250											
28																								
29																								
30																								
31																								
No.										3	4	4	4	1	1									
Median										255	250	225	255	295	290									

h'F2 | Sweep 1.60 Mc to 20 Mc in 20 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

A 9

29

IONOSPHERIC DATA

Dec. 1960 | h'F | 135° E Mean Time (G.M.T. + 9h.)

Akita

Lat. 39° 43.5' N
Long. 140° 08.2' E

30

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	295	250	290	280	295	250	I 250 C	240	I 240 C	245	240	225	220	245	245	250	240	I 230 C	240	315	345	335	I 325 C	305
2	260	315	300	340	330	340	290 A	260	245	240	245	245	245	245	245	225 H	235	220	215	235	205	I 255 A	340	355
3	350	340	300	270 A	I 300 A	290	290	250	245	230	245	220	230	220 H	220 H	240	240	220	205	230	235	E 290 E	290	340
4	300	295	290	305	335	300	260	245	225	240	245	240	240	240	220	245	220	205	245	A	A	A	320	340
5	355	340	290	250	300	290	290	245	210	245	245	245	245 H	245 H	245	220	205 H	210	I 230 A	220	335	I 330 A	340	350
6	350	315	290	300	340	330	290	240	240	245	245	245	210 H	240	230 H	245	205	I 220 A	250 A	225	A	A	390	390
7	390	360	270	340	365	355	310	245	245	245	245	245	230 H	225 H	240	235	245	210	245	240	240	I 310 A	290	I 320 A
8	325	300	300	305	300	280	245	245	245	245	230	240	245	245	245	240	235	210	240	255	A	A	290	255
9	250	290	300	305	330	320	255	240	240	210	245	245	220 H	245	245	205	240	215	210	240	290	330	310	295
10	285	340	305	380	305	340	270	245	225	245	215 H	220	230	240 H	245	220	230	200 H	235	245	250	I 260 A	300	I 310 A
11	290 A	300	325	345	325	305	245	235	225	230	240	245	240	245	245	245	235	220	245	245	230	E 290 E	320	330
12	340	340	325	305	265	255	245	245	245	240	245	240	245	240	240	245	210	215	245	245	230	240	335	300
13	340	340	350	355 A	300	355	290	245	230	245	I 245 A	245	230	230	245	245	230	210	210	205	245	260	330	290
14	290	300	250	295	300	290	250	240	205	240	240	245	245	220	230	220	205	200	220	245	245	245	295	290
15	I 315 A	340	305	300	310	305	255	245	210	230	245	245	220	245	245	240	205	250	245	220	I 255 A	290 A	345	295
16	290	300	340	370	I 385 A	390	I 380 A	330	290	255	255	255	245	255	255	245	245	245	280	255	285	255	390	305
17	240	240	295	350	315	295	245	240	220	245	245	210	210	240	235	210	240	245	240	240	255	245	245	A
18	A	A	300	255	250	245	280	245 A	230	245	245	225	230	245	240 H	215	245	260	260	250 A	A	A	A	A
19	300	I 280 A	E 360 E	400	360	I 320 A	295	245	235	245	245	240 H	245	235 H	240	240	240	210	250	245	240	255	290 A	290
20	250	I 290 A	280	340	330 A	300	250	210	220	245	245	225	225	245	245	210	I 225 A	245	I 235 A	I 230 A	330	330	255	260
21	245	E 280 E	305	345	350	I 330 A	I 305 A	I 260 A	230	235	240	210	240	245	240	235	235	235 A	210	230	E 240 E	300	290	I 215 A
22	280	380	360	300 F	340	I 300 A	I 290 A	280	250	240	220	205	245	245	245	240	240	A	A	A	A	270	290	I 255 A
23	245	I 285 A S	340	320	310	I 330 A	I 280 A	260	245	245	240	205	245	245	235	235	245	210	A	A	I 280 A	270	250	295
24	330	330	340	I 335 A	I 325 A	I 340 A	A	A	250 A	245	230	220	255 A	245	230	245	230	240 A	A	A	A	A	A	A
25	A	A	260	C	C	C	C	C	C	C	245	245	235	245	230	230	230	240	210	240	A	A	A	250
26	I 305 A	340	290	280	245	245	245	I 240 A	235	245	245	C	C	235	C	235	245	245	240	205	A	A	250	260
27	290	290	260	260	280	245	255	245	245	245	245	245	230	240	245	240	230	230	260	245	I 270 A	245	330	345
28	345	290	335	400	360	350	330	230	245	240	245	235	245	245	240	230	240	240	235	240	255	295	I 300 A	I 240 A
29	230	E 340 E	305	340	230	245	E 290 E	245	230	245	245	240	240	235	245	230	210	245	235	A	A	A	A	A
30	300	I 300 A	I 310 A	I 320 A	I 305 A	A	A	245	240	245	245	230	235	245	245	240	240	245	235 A	A	A	A	A	A
31	A	A	305	285	I 300 A	310	295	240	245	240	245	240	245	245	245	240	240	220	235	I 210 C	E 290 E	I 280 A	250	320
No.	28	27	30	30	30	29	27	29	30	30	31	30	30	31	30	31	31	30	28	25	20	20	26	26
Median	300	300	300	310	310	305	280	245	240	245	245	240	240	245	245	240	235	220	240	240	250	270	300	300

h'F

Sweep 1.60 Mc to 20 Mc in 30 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

A10

IONOSPHERIC DATA

Dec.1960 | K'Es | 135° E Mean Time (G.M.T.+ 9h.) | Akita | Lat. 39° 43.5' N | Long. 140° 08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	E	E	E	E	E	C	100	C	G	G	150	G	G	G	100	100	C	105	105	E	E	C	105
2	E	E	E	E	105	E	110	110	105	110	105	105	105	105	G	105	G	E	E	115	105	110	110	110
3	110	105	105	120	115	115	120	110	110	110	110	G	G	G	G	100	100	130	E	115	110	E	E	E
4	E	E	105	E	E	E	E	G	G	G	G	G	G	130	110	150	G	E	125	110	110	110	105	105
5	E	E	E	E	110	E	E	105	G	105	175	G	G	105	G	155	150	100	105	100	100	100	100	E
6	E	105	105	E	E	E	105	110	G	G	G	G	105	105	105	105	G	120	145	110	105	105	105	105
7	105	E	105	100	E	E	E	115	115	S	110	115	110	G	105	105	105	105	100	110	110	105	100	100
8	100	E	E	115	105	115	E	120	115	G	G	130	120	115	C	110	110	105	105	115	105	105	105	105
9	105	E	E	E	105	E	100	G	G	120	G	B	B	G	G	G	100	100	105	E	E	105	110	105
10	105	100	E	E	E	E	105	120	110	G	B	B	B	105	B	B	G	105	E	E	E	105	105	100
11	100	100	100	E	E	E	E	G	B	G	105	105	B	B	B	B	100	100	100	100	E	E	E	E
12	105	100	E	E	E	E	E	G	B	B	B	B	B	B	B	105	105	105	105	E	E	E	E	E
13	E	105	105	105	E	E	E	115	130	115	105	105	105	B	B	G	B	E	E	E	E	E	105	105
14	105	105	100	100	E	E	E	G	B	B	B	B	B	B	B	B	B	105	100	E	E	E	E	E
15	105	105	E	100	105	105	E	G	G	110	B	B	B	B	B	B	105	105	E	105	105	105	105	E
16	E	E	E	E	125	125	110	115	G	B	B	B	B	B	B	B	B	E	E	E	E	E	E	E
17	E	E	E	E	105	105	E	110	G	G	B	G	B	B	B	G	155	105	105	100	100	100	100	105
18	105	105	105	E	110	115	100	105	105	105	105	G	G	G	105	105	105	105	105	105	110	110	110	110
19	E	145	E	145	140	125	125	110	110	105	G	G	B	G	G	B	B	E	E	105	E	E	100	E
20	E	105	105	125	105	105	E	145	105	105	B	G	G	G	G	G	105	105	100	100	100	105	E	E
21	E	E	E	115	115	110	105	105	105	B	B	B	B	B	105	G	110	105	105	105	105	105	100	100
22	100	E	E	120	115	115	115	105	B	B	B	B	B	B	B	B	110	110	110	110	105	105	100	100
23	105	100	100	E	125	115	110	105	145	B	B	B	B	B	G	G	110	110	110	105	105	105	100	E
24	E	100	105	115	110	110	105	105	105	105	105	105	100	105	B	B	130	110	110	105	105	105	105	100
25	100	100	100	C	C	C	C	C	C	C	105	B	B	G	100	B	100	100	E	110	105	100	100	100
26	100	100	E	100	E	E	E	105	105	B	G	C	C	105	C	105	100	100	100	105	105	105	105	105
27	105	100	100	E	E	E	E	E	155	G	G	105	100	B	S	G	B	E	110	110	105	105	100	E
28	E	E	E	E	E	E	E	B	140	130	105	100	100	100	100	100	100	E	E	E	E	105	105	100
29	100	E	E	E	E	E	110	110	105	105	105	105	105	G	G	G	135	110	E	110	105	105	100	100
30	100	100	100	100	105	105	110	105	105	105	100	100	100	G	G	105	100	105	100	105	100	100	105	105
31	100	100	100	100	100	E	115	E	105	G	B	B	B	G	105	105	105	100	E	C	E	100	100	E
No.	19	18	15	14	17	13	15	21	18	13	12	11	10	9	8	14	22	23	20	23	20	23	24	19
Median	105	100	105	110	110	115	110	110	110	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105

K'Es

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

The Radio Research Laboratories, Japan.

A 11

IONOSPHERIC DATA

Lat. 39° 43.5' N
Long. 140° 08.2' E

Akita

Dec. 1960

Types of 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	f							l				h				l	l		f	f				f
2					f		fz	l	lh	lz	l	l	lz	lz		l				f	fz	fz	f	f
3	f	f	fz	fz	f3	fz	f	l	lz	l	lz					l	l	fz		f	f			
4			f											hl	l	hl			f	f	fz	fz	f	f
5					fz			C		lz	h			l		hlz	h	fz	fz	f	f	f	f	
6		f	f				f	lz					l	l3	lzh	l		fz	fz	f	f3	fz	f	f
7	f		f	f				l	l3		lz	l	l		l	l	l	f	f	f	fz	fz	fz	fz
8	f			f	f	fz		C	l			h	C	C		lz	lz	f	fz	f	fz	fz	f	f
9	f				f		f			l							l	f	f			f	f	f
10	f	f					f	lz	l					l				f				fz	f	f
11	f	f	f								l	l					l	f	f	f				
12	f	f														l	l	f	f					
13		f	f	f				l	h	l	lz	l	l										f	f
14	f	f	f	f														f	f					
15	fz	f		f	f	f				l							l	f		f3	f3	fz	f	
16					fz	f	f3	lz									fz	f	f	f	f	f	f	f
17					f	f		l																
18	f	fz	f		f	fz	f	l3	l	l	l				l	l	lz	f3	fz	fz	fz	f3	f	fz
19		fz		f	f	fz	fz	f	lz	lz										f			f	
20		f	f	f	f3	f		h	l	lz							lz	fz	fz	fz	f	f		
21				fz	fz	f3	f4	l4	l						l		lz	fz	f	fz	f	f	fz	f
22	f			fz	fz	f3	f3	l3									l	f3	fz	fz	fz	f	f	f
23	f	f	f		f	f3	fz	lz	h								l	f	f	f	f	f	f	
24		f	f	f4	f3	fz	f4	lz	l4	lz	lz	l	l	l			h	fz	fz	f	f	f	fz	f
25	fz	f	fz								l				l		l	f		f	fz	f	f	f
26	f	f		f				l	l					l		lc	l	fz	f	f	f	f	f	fz
27	fz	f	f						h			l	l						f	f	fz	f	f	
28									hz	hl	l	lz	lz	l	lz	l	l					f	f	f
29	f						f	lz	l	lz	lz	l	l				h	f		f4	fz	fz	fz	fz
30	f	f	fz	fz	f	f4	fz	l3	l	l	l	l	l			l	l	fz	fz	fz	f3	fz	f4	f4
31	fz	fz	f	f	fz		f		l						l	l	l	f				f	f	
No.																								
Median																								

The Radio Research Laboratories, Japan.

Types of Es

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

A 12

IONOSPHERIC DATA

Dec.1960 | foF2 | 135° E Mean Time (G.M.T. + 9h.) | Kokubunji Tokyo | Lat. 35° 42.4' N | Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	3.7	3.9	3.7	3.3	3.1	3.3	3.5	u 6.7s	9.1	8.9	13.0	11.8	10.6	11.7	J10.3s	11.0	11.6	7.4	5.0	4.4	4.5	u 4.6s	4.8	J4.4s
2	u 5.4s	4.0	3.7	4.0	4.4	4.0	4.6	7.6s	12.5	11.9	14.0	15.9	13.9	12.1	11.4	11.8	9.6	u 10.1s	J 8.0s	4.7s	3.7	3.6	3.5	3.4
3	3.6	3.9	4.1s	3.5	3.3	3.1s	3.7	7.3s	11.5	u14.1s	u14.7R	13.9R	13.9s	J15.0s	u14.1s	13.8R	11.8	u 9.7s	6.8	4.7	4.3	3.7	3.4	3.7
4	3.5	3.5	u 3.6s	2.9	3.1	3.0	3.5	u 8.1s	9.6	10.8	12.4	13.0	11.7	10.7	10.9	9.3	8.9	6.5	5.0	3.6	3.3	J 3.3s	3.7	3.7
5	3.3	3.6	3.6	3.4	3.3	3.7	3.7	u 8.1s	9.9	10.1	12.7	12.6	11.5	11.6	12.1	J10.5s	9.0	8.0s	6.4	5.1	3.1	3.1	3.4	3.3
6	3.4	3.5	3.4	3.3	3.7	3.7	4.0	J 8.4s	J10.1R	12.0	13.1	J12.3R	12.7	12.3	11.6	11.1	I 9.6s	6.6	6.7	I 5.3A	3.9	I 3.7A	3.3	3.6
7	3.6	4.0	4.5	3.9	4.0z	3.7s	3.7	I 7.6s	11.3	u14.8s	14.4	13.6	u13.4CI	13.0C	13.0	11.9	10.7	7.7	6.1	5.7	u 4.7s	3.4	3.6	3.7
8	3.8	3.8	3.7	3.6	3.6	4.0	4.1	7.4s	10.3	14.5	14.6s	13.6	13.6	13.3	13.0	12.9	11.6	9.3s	7.4	6.0	5.7	4.4	I 4.7A	4.4
9	I 4.7A	3.6	3.6	3.5	3.4	3.5	u 4.3s	J 9.5s	J10.3s	11.7	14.7	J14.5R	14.1	12.7	13.1	12.9	10.5	J10.6s	8.3	5.5	J 4.1s	3.3	3.9	3.6
10	3.3	3.0	3.4	3.0	3.7	3.1	3.9	u 8.4s	11.6	11.7s	13.0	12.6	12.0	12.1	12.6	u12.1s	8.9	u 7.9s	6.6	u 4.8s	4.7	3.9	3.5	3.4
11	3.3	3.7	3.1	3.1	3.0	3.7	3.6	7.7	9.4	12.1	12.0	11.5	J11.1su	u10.9R	10.5	10.8	u 9.7s	6.1	5.6	6.1	C	C	C	3.1
12	3.1	3.7	3.3	3.4	3.4	3.4	3.4s	6.6s	8.3	I12.1C	13.4	I10.8R	10.7s	10.5	9.8s	11.1	11.0	6.9	6.1R	6.5	5.7	3.1	3.0	3.4
13	3.3	3.4	3.7	3.1	3.3	3.4s	3.5s	I 7.7su	10.4s	13.7	13.7	13.6	12.5	12.4	12.3	12.7	12.0	8.6	6.3	5.7	3.7	3.8s	3.4	3.5s
14	u 3.7s	3.7	3.7s	2.9	3.1	3.4s	3.9	u 7.1s	10.6s	9.8	u11.7R	11.9	11.1	10.8	10.8	u10.3R	u 8.0su	7.9s	6.2	4.7	4.6	3.1	u 3.0s	3.7s
15	3.7	3.3	3.3	3.4	3.1	3.7	3.6su	u 7.6s	u10.0s	J10.4s	11.0	11.5	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	5.7s	C	C	S	C	C
17	I 4.6s	I 3.6s	I 3.0s	I 3.7s	I 3.3s	I 4.0s	I 5.7s	7.0su	u 9.9s	I10.5C	13.9	I11.4C	9.6s	8.8s	I 9.6s	I 7.7su	u 6.4s	S	S	I 5.3s	I 3.6s	S	S	S
18	S	S	S	I 7.7s	I 7.7s	S	S	S	u 7.7s	I11.2C	u11.6	u 9.8s	9.0s	J 8.7su	u10.4s	u 7.8s	u 6.7s	I 7.7s	I 6.6	u 6.0s	u 5.3s	S	S	S
19	S	S	S	S	S	S	S	S	I10.7s	C	C	I10.7C	u 9.0s	J 8.9s	I 9.5C	7.7s	u 6.7s	S	S	C	I 4.7C	I 3.8s	I 3.6s	I 4.0s
20	I 3.8s	I 3.4s	I 3.1s	3.1	3.4s	I 3.7s	I 4.6s	6.4s	u 7.6s	10.8	12.7	I10.0s	8.8s	8.8s	u 8.8s	7.3s	I 6.3s	I 6.0s	S	S	S	S	S	I 5.0s
21	S	S	S	S	S	S	S	S	I 8.7su	13.6R	J14.3R	u 8.9s	9.7R	11.0	9.1	J 7.7s	I 7.4su	5.5s	A	A	A	S	S	S
22	S	S	S	S	S	A	S	S	10.9R	C	C	C	C	C	C	7.3s	7.0	I 6.7s	A	A	S	A	S	AS
23	S	S	S	S	J 7.8A	I 3.8A	I 4.8A	u 5.5s	9.6	13.6	13.0	9.1	u 8.3s	8.5	u 7.7s	7.4	I 7.8s	6.9	A	A	I 3.6A	I 3.7s	S	S
24	S	I 2.8C	I 2.8s	A	A	A	A	5.9	11.0	13.7	J13.4R	u 7.5s	7.5	8.9	7.4	6.6	8.0	5.8	A	A	A	A	A	A
25	A	A	C	u 3.0s	2.9	3.0	3.1	I 5.8A	9.0	11.6	13.4R	11.7	10.3R	9.4	8.1R	7.1	7.9s	7.4	5.7	4.7	I 2.9A	J 3.1A	3.0	3.4
26	u 3.1s	3.4	3.4	3.6	u 2.9R	3.3s	3.1s	4.6s	7.8R	u 7.6s	8.9	8.8	9.6	8.6R	8.5	7.3s	I 6.6CI	6.5s	5.7	J 4.4s	3.0	C	C	C
27	C	C	C	C	C	C	C	C	C	u10.7s	11.7	8.9	8.6	8.0	9.8s	7.7	I 6.4s	4.9	4.5	I 4.8A	4.1	4.9	I 4.0A	4.0
28	4.7	4.4	3.9	3.6	4.1	u 4.0s	3.5	I 6.6s	u 7.8s	11.5	11.9	J10.4s	J10.8su	u 9.6s	8.0	7.7	6.8	u 6.0s	5.3	J 4.1s	3.9	3.5	3.8s	5.1
29	A	A	u 2.5s	2.3	J 3.0s	I 2.7su	2.7s	I 5.7s	J 8.8R	12.6	12.9	9.6	9.5	J 9.0s	7.6s	8.6	I 6.8s	I 5.0A	5.7	A	A	A	A	A
30	A	A	A	S	2.5su	3.0su	3.0s	u 5.4s	8.3	I11.0CU	u14.2s	12.5	11.0	J 9.6s	8.4su	7.7su	u 8.0su	6.9s	I 3.9s	S	S	S	A	A
31	A	I 3.3s	I 3.2s	I 3.2s	I 3.0s	I 2.6s	I 3.3s	I 6.2s	8.0	u11.8s	12.0	10.9	u10.3s	8.1	9.1s	8.9	7.4	7.0	J 4.8su	4.8s	3.2su	3.5s	4.2su	3.1s
No.	19	21	22	23	25	24	24	25	29	28	28	29	28	28	28	29	29	27	23	21	22	19	18	20
Median	3.6	3.5	3.4	3.3	3.2	3.3	3.6	u 7.1	9.9	11.6	13.0	11.5	10.8	10.4	10.0	8.9	8.0	6.9	6.1	4.8	4.0	3.5	3.5	3.4
U.Q.	3.8	3.8	3.6	3.5	3.4	3.7	4.0	7.7	10.5	12.9	14.0	12.8	12.1	12.1	11.8	11.4	10.0	7.9	6.6	5.6	4.6	3.8	3.9	4.0
L.Q.	3.3	3.3	3.2	3.0	3.0	3.1	3.4	6.0	8.5	10.8	12.0	9.9	9.4	8.8	8.6	7.4	6.8	6.1	5.2	4.6	3.6	3.2	3.3	3.2
Q.R.	0.5	0.5	0.4	0.5	0.4	0.6	0.6	1.7	2.0	2.1	2.0	2.9	2.7	3.3	3.2	4.0	3.2	1.8	1.4	1.0	1.0	0.6	0.6	0.8

Note: Parameters reduced to lower frequency range on and after 11th are affected by defects of the ionosonde.

foF2

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

The Radio Research Laboratories, Japan.

K 1

IONOSPHERIC DATA

Kokubunji Tokyo

Lat. 35° 42.4' N
Long. 139° 29.3' E

Dec.1960

foF1

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

The Radio Research Laboratories, Japan.

Note: Parameters reduced to lower frequency range on and after 11th are affected by defectes of the ionosonde.

foF1

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

K 2

IONOSPHERIC DATA

Dec.1960 | 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								I2.15S	2.50	2.95	3.10	3.25	3.35	3.15	I2.90A	2.40	B							
2								A	2.70	I2.80A	3.25	3.30	I3.40A	I3.20S	2.85	2.45	I2.20S							
3								A	I2.70A	I2.90A	I3.20A	3.30	3.35	I3.15A	2.90	2.50	B							
4								I2.00S	2.50	3.15	3.20	3.40	3.40	I3.20A	I2.90A	2.70	2.00S							
5								I2.00S	2.55	2.95	3.20	3.30	3.25	3.15	3.05	2.65	B							
6								A	2.55	3.05	3.20	3.35	A	A	A	2.70	1.90							
7								S	A	A	A	3.40	3.35	I3.20C	3.10	I2.60A	R							
8								A	A	A	A	3.40	I3.30A	A	A	A	"2.05S							
9								S	A	3.00	3.15	3.30	3.30	3.15	I2.90A	S	A							
10								B	I2.60A	I2.90A	I3.15A	3.20	3.40	A	A	S	S							
11								B	C	C	C	C	C	C	C	C	S							
12								S	C	C	C	C	C	C	S	A	S							
13								S	2.40	A	A	3.15S	3.25	A	2.75	S	S							
14								S	S	B	S	S	B	S	S	S	S							
15								S	S	B	S	S	C	C	C	C	C							
16								C	C	C	C	C	C	C	C	C	C							
17								S	S	C	S	C	S	S	S	S	S							
18								S	S	C	S	S	S	S	B	B	A							
19								S	S	C	C	C	S	S	S	S	S							
20								S	S	S	S	C	S	B	B	S	S							
21								S	S	C	C	C	S	S	S	S	S							
22								S	S	C	C	C	C	C	C	S	A							
23								S	S	S	C	S	S	S	S	S	S							
24								S	A	S	S	S	S	S	S	S	S							
25								A	A	B	A	B	B	B	B	B	B							
26								S	S	B	S	S	S	S	S	S	C							
27								C	C	S	S	3.25	R	"3.15S	S	S	S							
28								S	S	2.70	R	A	A	A	A	A	S							
29								S	A	A	A	A	S	S	S	S	S							
30								S	A	C	A	S	S	S	S	S	S							
31								S	S	S	A	S	S	S	S	S	S							
No.								3	8	9	8	12	10	8	8	7	4							
Median								"2.00	2.55	2.95	3.20	3.30	3.35	"3.15	2.90	2.60	"2.00							

Note: Parameters reduced to lower frequency range on and after 11th are affected by defectes of the ionosonde.

foE

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

The Radio Research Laboratories, Japan.

K 3

IONOSPHERIC DATA

Kokubunji Tokyo

Lat. 35° 42.4' N
Long. 139° 29.3' E

Dec.1960

foEs

135° E Mean Time (G.M.T.+ 9h.)

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	S	E	E	S	S	S	2.4G	3.2	2.4G	3.4	G	G	3.0	2.7	B	J2.4	J3.5	2.4M	E	S	S	2.2M
2	S	S	S	E	E	S	S	J2.8	3.5	3.5	3.9	4.0	J3.3	3.0G	G	2.5	S	2.1	S	S	S	J2.4	S	3.0
3	3.8	S	E	J2.6	J3.4	J2.4	J2.9	J3.4	J3.0	J4.0	4.0	2.9G	2.5G	3.1	G	2.3G	B	E	2.4	E	S	S	S	S
4	S	S	2.0M	2.4	2.2M	S	2.0S	S	G	G	J3.3	G	G	3.2	3.7	G	2.4	S	E	S	S	J7.9	S	E
5	S	1.5	E	E	3.3	2.1	2.2	S	J2.7	G	2.9G	3.9	G	G	3.4	3.0	B	S	2.6M	J2.5	2.3	2.5M	S	J2.0
6	2.2M	S	E	E	E	S	2.3	2.4	G	3.3	G	2.9G	4.7S	4.0	J5.6	3.0	2.5	2.3	J3.0	J8.0	5.9	J11.0	J4.4	J2.5
7	J2.1	J2.4	J2.5	J1.7	1.9	S	E	S	J3.6	J5.5	4.0	G	G	C	G	2.9	1.8G	1.8	S	E	J2.8	J4.2	J3.3	2.5
8	J2.4	J2.4	J2.4	J3.4	J2.1S	S	S	J4.8S	J10.4	J4.0	J3.2	G	3.5	3.7	J3.6	3.0	2.3S	J2.2	J3.3	2.4	J2.4S	3.3	J10.6	J8.6
9	J5.0	J3.8	J4.2S	1.3	E	J2.5	S	S	2.8	G	G	G	G	G	J3.6	2.7	J5.9	J8.0	J3.2	S	E	S	E	S
10	S	E	S	2.8	E	S	S	S	2.9	3.5	3.5	G	G	3.4	3.4	S	S	S	E	J2.8	S	S	E	S
11	S	E	S	S	E	E	E	B	C	C	C	C	C	C	C	C	S	S	S	S	C	C	C	S
12	S	S	E	E	E	S	S	S	C	C	C	C	C	C	2.6	3.0	S	2.3	S	2.8	J2.4	S	S	S
13	S	S	S	S	E	S	S	S	G	3.1	3.2	G	G	J4.0	G	S	S	S	S	E	S	E	E	J3.4
14	J2.6	J2.5	J2.5	1.6	J3.4	S	S	S	S	B	S	S	B	S	S	S	S	S	J2.2	J2.5	2.4	S	J2.1	E
15	E	S	S	E	E	E	S	S	S	B	S	S	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	S	C	C	S	C	C
17	S	S	S	S	S	S	S	S	S	C	S	C	S	S	S	S	S	S	S	S	S	S	S	S
18	S	S	S	S	S	S	S	S	S	C	S	S	S	S	3.3	J3.6	J4.2	S	J3.0S	J2.6	3.3	J3.8	J3.2	J4.1
19	J4.3	S	S	S	2.4	S	S	S	S	C	C	C	S	S	S	S	S	S	S	C	C	S	S	S
20	S	S	S	S	J2.9	S	S	S	3.2	4.0	3.0	C	S	4.7	3.4	S	S	S	J4.5	J4.8	J4.6	J3.3	S	S
21	S	S	S	S	S	S	J4.3	S	S	C	C	C	S	S	S	S	S	S	J4.5S	J5.1S	J4.5S	S	S	S
22	S	S	P3.3S	P4.0S	S	J3.8	S	S	S	C	C	C	C	C	C	S	J3.8	J4.5S	J8.4Y	J6.3	J3.1	J4.6	J3.7	J4.0
23	S	S	S	S	J2.7	J4.8	J6.1	J4.3	S	S	C	S	S	S	S	S	S	J8.1	J6.7	5.0S	J8.3	P4.2S	P3.1S	S
24	S	C	S	J4.4	J7.3	J5.4	4.4S	J3.0	J5.4	S	J6.0	S	S	S	S	S	S	J5.1	J8.6	J9.1S	J9.0	J5.0	J5.0	J7.1
25	J5.1	J4.0	C	J2.8Y	S	S	S	J9.0	6.9Y	6.0	J7.3Y	4.2	B	B	B	B	B	S	J2.7Y	J4.3	4.9	3.5	S	J3.3
26	S	S	E	E	S	S	S	S	S	B	S	S	S	S	S	S	C	J3.2	J2.9	S	S	C	C	C
27	C	C	C	C	C	C	C	C	C	S	S	G	G	G	G	S	S	S	2.8Y	J9.3	J8.2	J4.4	J4.3	J3.0
28	J2.8	3.1M	S	S	S	S	S	S	S	3.0	G	3.6	J4.1S	4.0	J4.0S	J3.4	S	S	3.2M	3.1Y	J4.0Y	S	J2.8Y	S
29	3.6M	3.0Y	S	S	E	S	S	J3.9S	J3.6	J4.0	3.9	4.6	S	S	S	S	S	J9.0	4.8	J8.9	J5.0	4.7M	J4.3	J5.0
30	J8.9	J5.6	J4.0	3.3M	2.3M	S	S	J4.0	4.8M	C	J4.1	S	S	S	S	S	S	S	S	J3.2	3.1	J3.0	J4.2	J3.6
31	J3.9	J3.4	S	S	S	S	S	S	S	S	J3.8	S	S	S	S	S	S	S	S	S	S	S	S	S
No.	13	12	12	18	21	8	9	9	16	15	18	15	13	13	16	12	7	13	20	21	19	16	14	16
Median	3.5	2.8	2.2	1.6	1.9	2.4	2.3	3.9	3.1	3.5	3.4	G	G	3.2	3.4	3.0	2.5	2.4	3.1	3.1	3.3	4.0	3.5	3.2
U.R.	4.6	3.6	D2.9	2.8	2.8	4.3	4.4	4.6	4.2	4.0	4.0	3.9	3.4	4.0	3.6	3.0	4.2	6.6	4.5	5.7	5.0	4.6	4.3	4.0
L.R.	2.5	2.0	E	E	E	E	E	2.9	G	3.0	G	G	G	G	G	2.6	2.3	2.2	2.6	2.4	2.4	3.2	2.1	2.4
Q.R.	2.1	1.6						1.7		1.0						0.4	1.9	4.4	1.9	3.3	2.6	1.4	2.2	1.6

The Radio Research Laboratories, Japan.

Note: Parameters reduced to lower frequency range on and after 11th are affected by defectes of the ionosonde.

foEs

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

K 4

IONOSPHERIC DATA

Dec. 1960 | 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	S	S	S			S	S	S	2.1[q]	3.2	2.3[q]	3.4			3.0	2.2[q]	B	1.9	3.1	E		S	S	2.0
2	S	S	S			S	S	2.5	2.2[q]	3.4	3.8	4.0	3.1	[E]3.0[S]		2.3[q]	S	2.0	S	S	S	E	S	1.9
3	2.6	S		2.4	1.7	2.2	2.5	2.9	2.6	3.9	3.5	2.5[q]	2.5[q]	3.1		2.1[q]	B		2.0		S	S	S	S
4	S	S	1.8	1.8	1.5	S	2.0	S			2.3[q]			3.2	3.7		2.4	S		S	S	2.3	S	
5	S	E			1.4	1.7	E	S	2.0[q]		2.3[q]	3.7			3.4	3.0	B	S	2.3	1.7	1.5	2.1	S	2.0
6	S	S				S	1.9	2.1		3.2		2.9[q]	[u]4.0[S]	3.5	4.3	2.3[q]	2.4	2.3	2.0	A	3.1	A	2.6	1.9
7	E	2.2	1.9	1.4	1.2	S		S	2.5	5.5	3.6			C		2.8	[E]1.8[S]	1.5	S		2.7	2.2	2.8	1.9
8	1.9	1.7	2.0	2.2	1.4	S	S	4.7	[u]9.3[A]	[u]4.0[S]	3.2		3.2	3.4	3.3	2.9	2.3	2.0[S]	2.5	2.2	2.1	2.4	A	2.1
9	A	2.6	2.3	1.1		E	S	S	2.6						3.1	[u]2.3[S]	3.7	3.9	2.2	S		S		S
10	S		S	1.3		S	S	S	2.9	3.2	3.3			3.2	3.1	S	S	S		E	S	S		S
11	S		S	S				B	C	C	C	C	C	C	C	C	S	S	S	S	C	C	C	S
12	S	S				S	S	S	C	C	C	C	C	C	[E]2.6[S]	2.9	S	2.1	S	2.8	2.3	S	S	S
13	S	S	S	S		S	S	S		3.1	3.2			3.7		S	S	S	S		S			2.4
14	2.1	2.0	2.2	1.3	E	S	S	S	S	B	S	S	B	S	S	S	S	S	2.1	2.0	2.2	S	2.1	
15		S	S				S	S	S	B	S	S	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	S	C	C	S	C	C
17	S	S	S	S	S	S	S	S	S	C	S	C	S	S	S	S	S	S	S	S	S	S	S	S
18	S	S	S	S	S	S	S	S	S	C	S	S	S	S	3.3	[E]3.6[S]	4.2	S	[E]3.0[S]	2.4	2.9	S	S	S
19	S	S	S	S	S	S	S	S	S	C	C	C	S	S	S	S	S	S	S	C	C	S	S	S
20	S	S	S	S	2.2	S	S	S	3.0	4.0	[E]3.0[S]	C	S	4.6	[E]3.4[S]	S	S	S	S	S	S	S	S	S
21	S	S	S	S	S	S	S	S	S	C	C	C	S	S	S	S	S	S	A	A	A	S	S	S
22	S	S	S	S	S	A	S	S	S	C	C	C	C	C	C	S	[E]3.8[S]	4.0	A	A	S	A	S	AS
23	S	S	S	S	2.7	A	A	3.8	S	S	C	S	S	S	S	S	S	3.1	A	A	A	S	S	S
24	S	C	S	A	A	A	A	2.7	5.4	S	5.9	S	S	S	S	S	S	4.3	A	A	A	A	A	A
25	A	A	C	2.4	S	S	S	A	[u]6.9[R]	5.9	4.9	[E]4.2[R]	B	B	B	B	B	S	2.6	3.0	A	3.1	S	2.7
26	S	S			S	S	S	S	S	B	S	S	S	S	S	S	C	S	2.6	S	S	C	C	C
27	C	C	C	C	C	C	C	C	C	S	S					S	S	S	2.6	A	2.5	3.3	A	2.5
28	2.5	2.9	S	S	S	S	S	S	S	2.9		3.5	[E]4.1[S]	3.9[S][u]	2.8[S]	3.2	S	S	2.8	2.8	E	S	2.7	S
29	A	A	S	S		S	S	S	2.7	3.7	[u]3.9[S]	4.3	S	S	S	S	S	A	3.6	A	A	A	A	A
30	A	A	A	S	E	S	S	3.1	[u]4.8[S]	C	4.0	S	S	S	S	S	S	S	S	3.2	S	S	A	A
31	A	S	S	S	S	S	S	S	S	S	[E]3.8[S]	S	S	S	S	S	S	S	S	S	S	S	S	S
No.	10	9	6	9	10	6	6	8	13	12	14	7	4	9	10	10	6	11	16	17	14	11	9	13
Median	A	2.6	2.1	1.8	1.4	A	2.2	3.0	2.7	3.6	3.4	3.5	3.2	3.4	3.2	2.6	2.4	2.3	2.6	3.0	2.8	3.1	A	2.4

Note: Parameters reduced to lower frequency range on and after 11th are affected by defectes of the ionosonde.

foEs

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

The Radio Research Laboratories, Japan.

K 5

IONOSPHERIC DATA

Dec. 1960 | 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	E1.80 S E1.55 S E1.55 S 1.10	1.10	E1.50 S E1.70 S E2.40 S	1.90	2.00	1.90	1.90	2.10	1.90	1.90	1.80	1.90	E1.70 S E1.60 S E1.80 S	1.30	E1.90 S E1.90 S E1.65 S
2	E1.70 S E1.70 S E1.70 S 1.00	1.10	E1.60 S E1.95 S E1.90 S	1.80	2.10	2.10	2.20	2.10	2.05	1.80	E2.40 S E1.90 S E1.80 S E1.70 S	E1.80 S E1.50 S E1.80 S E1.70 S
3	E1.50 S E1.70 S 1.30 1.00	1.00	E1.70 S 1.20 E1.90 S	1.70	1.80	2.10	2.10	2.10	1.90	1.80	2.20	1.30	E1.70 S 1.30	E1.80 S E1.90 S E1.70 S E1.70 S
4	E1.80 S E1.70 S 1.20 1.05	1.05	E1.80 S E1.50 S E1.80 S	1.80	2.20	2.10	1.90	2.20	1.90	2.20	1.85	E1.60 S E1.70 S 1.40 E1.80 S	E1.50 S 1.20 E1.70 S 1.30
5	E1.70 S 1.20 1.20 1.05	E	1.10	E1.70 S E2.05 S	1.40	1.90	1.95	1.90	1.90	1.95	1.90	1.60	1.80	E1.70 S E1.60 S E1.60 S	E1.40 S E1.80 S E1.50 S E1.50 S
6	E1.80 S E1.80 S 1.20 1.00	1.10	E1.75 S E1.80 S E1.70 S	1.80	2.00	2.00	1.90	2.30	1.90	2.00	1.70	E1.65 S E1.80 S E1.70 S E1.50 S	E1.60 S E1.60 S 1.40 E1.50 S
7	1.45	1.25	1.30	E	1.00	E1.70 S 1.30 E2.20 S	1.90	2.10	1.95	2.20	2.10 I 2.10 C	2.20	1.80	1.60	1.40	E1.40 S E1.60 S E1.50 S E1.70 S
8	E1.45 S E1.50 S E1.80 S 1.10	1.10	E1.40 S E1.30 S E1.70 S	1.80	2.20	2.00	2.20	2.25	2.20	1.90	2.00	E1.80 S E1.40 S E1.70 S E1.85 S	E1.80 S E1.50 S E1.60 S E1.80 S
9	E1.70 S E1.90 S E1.45 S 1.00	E	1.20	E1.50 S E2.10 S	1.80	2.15	2.15	2.10	2.20	2.00	E2.00 S	1.90	1.50	1.40 E1.80 S	1.20 E1.90 S 1.50 E1.60 S
10	E1.80 S 1.20 E1.70 S 1.05	1.20	E1.40 S E1.80 S 1.95	1.90	2.20	2.35	2.20	2.35	2.20	2.30	E2.70 S E2.45 S	1.80	E1.30 S E1.80 S	E1.90 S E1.90 S 1.60 E2.10 S
11	E2.30 S 1.60 E1.85 S E2.05 S	1.40	1.70	1.70	2.55	E2.95 C E3.50 C E3.45 C E4.65 C	E8.05 C E3.85 C E4.45 C E7.50 C	E2.50 S E2.10 S E1.90 S E2.00 S	C	C	C	E2.00 S
12	E1.80 S E1.90 S 1.50 1.55	1.50	E1.80 S E1.85 S E2.15 S	E3.50 C	C	E5.10 C E5.05 C	E6.45 C E4.90 C	2.40	2.15	E2.20 S	1.85	E2.15 S	1.60	1.65	E2.20 S E1.75 S E2.15 S
13	E1.85 S E1.80 S E1.90 S E1.60 S	1.30	E1.95 S E2.20 S E2.90 S	2.15	2.15	2.05	2.15	2.35	2.15	2.30	E2.80 S	E2.70 S E2.70 S E1.90 S	1.65	E1.85 S	1.50	1.60	1.60
14	1.50	1.55	E1.75 S 1.15	1.45	E1.90 S E1.80 S E2.50 S	E4.05 S	3.65	E3.40 S E5.40 S	5.65	E5.60 S E5.25 S E3.85 S	E3.20 S E2.80 S E1.70 S E1.80 S	E1.80 S E2.20 S E2.05 S	1.50
15	1.60	E1.80 S E1.75 S 1.40	1.20	1.35	E1.70 S E3.65 S	E3.25 S	3.15	E5.30 S E5.40 S	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	E4.25 S	C	C	S	C	C
17	S	S	S	S	S	S	S	E3.90 S	E2.90 S	C	E4.10 S	C	E3.85 S	E4.20 S	S	S	E3.20 S	S	S	S	S	S	S	S
18	S	S	S	S	S	S	S	S	E3.45 S	C	E4.15 S	E3.55 S	E3.30 S	E4.30 S	2.80	2.60	2.20	E4.80 S	E2.40 S	E2.15 S	E2.70 S	E2.80 S	E2.15 S	E2.40 S
19	E2.60 S	S	S	S	E2.05 S	S	S	E3.05 S	5.20	C	C	C	E4.10 S	E4.95 S	E4.10 S	E3.50 S	3.30	S	S	C	C	S	S	S
20	S	S	S	E1.90 S	E1.85 S	S	S	E3.40 S	E2.80 S	E3.55 S	E2.75 S	5.15	E4.20 S	3.05	2.90	E3.85 S	S	S	E2.85 S	2.25	E2.55 S	E2.50 S	C	S
21	S	S	S	S	S	S	E2.95 S	S	E4.10 S	E4.70 C	E8.60 C	E4.30 C	E5.40 S	E3.90 S	E4.20 S	E3.50 S	E3.50 S	E2.00 S	E2.30 S	E2.10 S	E2.10 S	S	S	S
22	S	S	E2.50 S	E2.30 S	S	E2.20 S	S	E2.20 S	E4.00 S	C	C	C	C	C	C	E4.70 S	2.40	E2.80 S	E2.85 S	2.00	E2.55 S	2.15	E2.65 S	E2.90 S
23	S	S	S	S	1.55	E2.50 S	E2.20 S	E2.85 S	E3.35 S	E4.40 S	E5.30 S	E4.60 S	E5.40 S	E4.50 S	E4.60 S	E2.95 S	E3.90 S	E2.30 S	E2.40 S	E2.40 S	E2.20 S	E3.00 S	E2.20 S	S
24	S	C	S	E1.90 S	E1.70 S	E2.05 S	E2.10 S	E2.40 S	E2.60 S	E4.60 S	E4.50 S	E4.80 S	E4.50 S	E4.60 S	E4.40 S	E3.90 S	E3.70 S	E2.10 S	E2.15 S	E1.90 S	E2.25 S	E1.90 S	E2.10 S	E2.20 S
25	E1.90 S E2.50 S	C	E2.00 S	E1.80 S	E1.90 S	E2.30 S	E2.45 S	E2.40	3.60	3.15	3.65	4.50	4.40	3.85	3.15	2.90	E2.55 S	E1.90 S	E1.90 S	E1.80 S	E1.90 S	E1.80 S	E1.90 S
26	E2.10 S E2.50 S	1.60	1.60	E1.70 S E2.60 S	E2.65 S E2.45 S	E2.60 S	3.10	E3.20 S E3.65 S	E5.25 S	E6.30 S	E3.15 S	E2.90 S	C	E2.65 S	E1.90 S E1.90 S	E2.65 S	C	C	C
27	C	C	C	C	C	C	C	C	C	E3.15 S E3.50 S	2.60	2.75	2.50	E2.50 S E2.60 S	E2.30 S	E2.80 S E1.95 S	E1.70 S	E2.00 S	E2.00 S	E1.80 S	E1.80 S
28	E2.00 S E2.80 S E2.80 S E1.90 S	E1.70 S E2.70 S E2.80 S E2.50 S	E2.70 S E2.40 S	E2.80 S	2.65	E2.30 S	2.20	2.35	2.35	E2.80 S E2.70 S E2.45 S E2.10 S	E2.10 S E2.15 S	E2.00 S E2.20 S
29	E2.00 S E1.90 S E1.55 S E1.55 S	1.60	S	E2.00 S E2.75 S	E2.45 S E2.50 S	2.40	E2.50 S	E4.30 S E6.40 S	E3.10 S	E3.05 S	E2.80 S E2.80 S E2.65 S E2.60 S	E2.70 S	2.05	E2.20 S E2.65 S
30	E1.80 S E2.70 S E2.60 S E2.80 S	E1.90 S E2.50 S E2.60 S E2.90 S	E2.55 S	C	2.60	E6.35 S	E6.20 S	E6.45 S E5.35 S	E4.35 S	E2.90 S E2.80 S	S	E2.70 S	E2.60 S E2.60 S E2.60 S	E2.55 S
31	E2.80 S E3.10 S	S	S	S	S	E3.80 S	E3.15 S	E6.55 S	2.65	E7.50 S	E7.75 S	E6.35 S E6.05 S E4.20 S	E3.65 S	E5.65 S E7.70 S	2.20	E2.80 S E2.70 S E2.70 S E2.65 S
No.	22	21	20	14	17	22	23	27	29	15	15	14	28	15	16	28	27	26	27	27	26	25	24	23
Median	E1.80	E1.80	E1.65	1.05	1.20	E1.80	E1.80	E2.45	E2.60	2.20	2.10	2.20	E3.60	2.10	2.20	E2.75	E2.45	E2.10	E1.90	E1.85	E1.90	E1.90	E1.80	E1.80

Note: Parameters reduced to lower frequency range on and after 11th are affected by defectes of the ionosonde.

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. 1960 | (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	2.85	2.95	2.80	2.90	2.85	2.75	2.80	u3.45s	3.20	3.10	3.15	3.30	3.05	3.00	J3.00s	2.90	3.10	3.10	3.00	2.65	2.50	u2.60s	2.60	J2.75s
2	u2.80s	2.80	2.70	2.55	2.60	2.75	2.80	3.00s	3.20	3.35	3.15	3.10	3.15	3.05	3.05	3.15	3.15	u3.25s	I3.45s	3.30s	2.75	2.80	2.70	2.60
3	2.50	2.55	2.90s	2.85	2.70	2.60s	2.70	3.15s	3.20	u3.25s	u3.30R	3.25R	3.15s	J3.15s	u3.00s	3.05R	3.15	u3.20s	3.25	3.15	3.00	2.85	2.80	2.75
4	2.70	2.80	u2.85s	2.50	2.55	2.70	2.85	u3.35s	3.45	3.35	3.25	3.25	3.10	3.15	3.10	3.30	3.25	3.20	3.20	2.85	2.80	J2.75s	2.65	2.50
5	2.40	2.65	2.75	2.70	2.50	2.65	2.70	u3.10s	3.40	3.00	3.15	3.15	3.15	3.10	3.05	J3.25s	3.25	3.10s	3.15	3.35	3.20	2.60	2.50	2.65
6	2.50	2.55	2.70	2.70	2.50	2.55	2.85	J3.30sJ	3.15R	3.25	3.20	J3.10R	3.05	3.10	3.10	3.15	I3.40s	3.20	3.05	I3.10A	2.80	I2.65A	2.40	2.20
7	2.35	2.50	2.85	2.45	2.50Z	2.40s	2.70	I3.25s	3.35	u3.20s	3.15	3.10	u3.05C	I3.15C	3.10	3.10	3.30	3.25	3.15	3.10	u3.15s	2.70	2.65	2.55
8	2.60	2.75	2.80	2.55	2.65	2.75	2.95	3.25s	3.10	3.25	3.30s	3.10	3.00	2.85	2.90	3.10	3.10	3.10s	3.05	2.85	2.85	2.75	I2.80A	2.95
9	I2.80A	2.75	2.60	2.60	2.60	2.55	u2.80s	J3.40sJ	3.20s	3.35	3.15	J3.05R	3.15	3.00	3.05	3.10	3.05	J3.00s	3.35	3.05	J2.75s	2.50	2.70	2.80
10	2.75	2.35	2.65	2.40	2.50	2.55	2.85	u3.10s	3.55	3.15s	3.15	3.15	3.10	2.90	3.00	u3.20s	3.30	u3.05s	3.35	u3.25s	3.05	2.85	2.60	2.65
11	2.95	2.75	2.65	2.70	2.75	2.75	2.90	3.25	3.50	3.40	3.25	3.20	J3.25s	u3.10R	3.15	3.15	u3.10s	3.10	3.20	3.15	C	C	C	2.50
12	2.60	2.90	2.75	2.70	2.75	2.70	2.90s	3.30s	3.25	I3.30C	3.35	I3.20R	3.15s	3.00	2.95s	2.95	3.20	3.20	2.80R	3.20	3.40	2.85	2.60	2.70
13	2.75	2.65	2.65	2.55	2.75	2.40s	2.65sI	3.10su	2.95s	3.15	3.10	2.95	3.05	2.95	3.00	3.00	3.10	3.10	3.15	3.20	2.70	2.95s	2.70	2.60s
14	u2.60s	2.70	2.90s	3.05	2.60	2.75s	3.15u	3.10s	3.30s	3.15	u3.30R	3.10	3.15	3.05	3.10	u3.00R	u3.40s	u3.20s	3.20	3.40	3.25	2.60	u2.65s	2.80s
15	2.70	2.65	2.75	2.75	2.75	2.65	2.80su	3.30su	u3.15sJ	3.40s	3.25	3.20	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	3.05s	C	C	S	C	C
17	I3.10s	I3.20s	I2.80s	I2.60s	I2.80s	I2.85s	I3.00s	I3.40s	u3.75s	C	S	C	3.45s	3.10s	I3.25s	I3.35s	u3.20s	S	S	I3.30s	I3.30s	S	S	S
18	S	S	S	I3.10s	I3.00s	S	S	S	u3.15s	I3.30C	I3.55C	u3.60s	3.15s	J3.30su	u3.40su	3.60u	u3.10s	I3.30s	I3.20su	3.35su	3.20s	S	S	S
19	S	S	S	S	S	S	S	S	I3.45s	C	C	I3.50C	u3.50sJ	3.50s	I3.45C	3.25s	u3.35s	S	S	C	I3.35C	I2.90s	I2.75sI	3.00s
20	I3.05s	I2.90s	I2.85s	2.95	2.55s	I2.70s	I2.90s	3.15s	u3.50s	3.45	3.50	I3.60s	3.50s	3.40su	3.75s	3.45s	I3.50s	I3.35s	S	S	S	S	S	S
21	S	S	S	S	S	S	S	S	I3.40su	u3.30R	J3.45Ru	3.50s	3.15R	3.25	3.30	J3.40s	I3.45su	3.35s	A	A	A	S	S	S
22	S	S	S	S	S	A	S	S	3.20R	C	C	C	C	C	C	3.40s	3.30	I3.15s	A	A	S	A	S	AS
23	S	S	S	S	A	A	A	u3.25s	3.20	3.45	3.55	3.50	u3.35s	3.30	u3.40s	3.30	I3.40s	3.60	A	A	I3.30A	I3.20s	S	S
24	S	I2.80C	I2.75s	A	A	A	A	3.05	3.35	3.60	J3.50R	u3.50s	3.45	3.45	3.50	3.20	3.40	3.35	A	A	A	A	A	A
25	A	A	C	u2.60s	2.55	2.65	2.90	I3.20A	3.30	3.35	3.45R	3.30	3.30R	3.30	3.45R	3.40	3.30s	3.40	3.30	3.60	I3.10A	I3.00A	2.65	2.85
26	u2.60s	2.65	2.75	3.05	u3.10R	2.85s	3.15s	3.30s	3.60R	u3.40s	3.15	3.30	3.25	3.25R	3.30	3.30s	I3.30C	I3.15s	3.60	J3.20s	2.95	C	C	C
27	C	C	C	C	C	C	C	C	C	u3.25s	3.20	3.35	3.50	3.25	3.15s	3.40	I3.40s	2.95	2.90	I3.10A	2.70	3.10	A	2.60
28	2.60	2.95	2.50	2.45	2.45	u2.45s	2.60	I3.10su	3.30s	3.30	3.30	J3.40s	J3.25su	u3.15s	3.40	3.35	3.15	u3.35s	3.25	J3.15s	3.10	2.65	2.90s	3.15
29	A	A	u2.55s	2.85	J3.00sI	2.80su	2.60s	I3.00s	J3.25R	3.25	3.55	3.15	3.40	J3.25s	3.30s	3.35	I3.30s	I3.20A	3.15	A	A	A	A	A
30	A	A	A	S	2.80su	2.85su	2.70su	3.15s	3.40	I3.00su	3.25s	3.15	3.15	I3.10s	3.35su	3.15su	u3.30su	3.40s	I3.10s	S	S	S	A	A
31	A	I2.70s	I2.65s	I2.70s	I2.45s	I2.55s	I2.75sI	3.00s	3.30	3.15s	3.15	3.20	u3.20s	3.20	3.20s	3.35	3.25	3.20	J3.15su	3.35s	2.70su	2.60s	2.80su	2.70s
No.	19	21	22	23	24	23	23	25	29	27	27	28	28	28	28	29	29	27	23	21	22	19	17	19
Median	2.70	2.75	2.75	2.70	2.60	2.70	2.80	u3.20	3.30	3.30	3.25	3.20	3.15	3.15	3.15	3.25	3.30	3.20	3.15	3.20	3.00	2.75	2.65	2.70

Note: Parameters reduced to lower frequency range on and after 11th are affected by defects of the ionosonde.

(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.1960 | (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											L		L	L										
2											L													
3														L										
4																								
5																								
6																								
7										A														
8									A				L											
9																								
10																								
11									C				C											
12																								
13											S													
14																								
15													C	C	C	C	C							
16								C	C	C	C	C	C	C	C	C	C							
17										C		C												
18										C														
19										C	C	C												
20																								
21																								
22										C	C	C	C	C	C									
23																								
24																								
25																								
26										L		L	S	S			C							
27								C	C		L													
28																								
29																								
30										C														
31																								
No.																								
Median																								

The Radio Research Laboratories, Japan.

Note: Parameters reduced to lower frequency range on and after 11th are affected by defects of the ionosonde.

(M3000)F1

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

IONOSPHERIC DATA

Dec.1960 | 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											250		255	255										
2											250													
3														250										
4																								
5																								
6																								
7										250A														
8									E325A				245											
9																								
10																								
11									C				E260C											
12																								
13											250													
14																								
15													C	C	C	C	C							
16								C	C	C	C	C	C	C	C	C	C							
17										C		C												
18										C														
19										C	C	C												
20																								
21																								
22										C	C	C	C	C	C									
23																								
24																								
25																								
26										Z40		Z40	E255S	E260S			C							
27								C	C															
28											Z55													
29																								
30										C														
31																								
No.									1	2	4	1	3	2										
Median									E325	Z45	Z50	Z40	E255	Z50										

Note: Parameters reduced to lower frequency range on and after 11th are affected by defects of the ionosonde.

h'F2

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

The Radio Research Laboratories, Japan.

K 9

41

IONOSPHERIC DATA

Dec. 1960 | h'F | 135° E Mean Time (G.M.T. + 9h.) | Kokubunji Tokyo | Lat. 35° 42.4' N | Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	300	z55	z90	z50	z50	300	z50	z30	z30	z40	z30	z30	z20	z05	z40	z45	z20	z05	z70^{A}	325	355	345	310	340^{A}
2	z80	z45	300	350	345	z50	310	z40	z50	z40	z15	z25	z30	z30	z30	z20	z25	z40	z05	z05	z50	z55	310	310
3	E405^{A}	350	z50	310^{A}	300^{A}	355^{A}	320^{A}	z45^{A}	z50	z30	z25	z25	z05	z10	z20	z25	z05	z05	z05	z30	z50	z55	305	310
4	310	300	z85	320	350	345	z95	z45	z25	z40	z30	z30	z20	z05	z45	z35	z20	z05	z10	z40	z45	310	305	350
5	355	350	300	z60	z95	320	305	z30	z10	z25	z40	z40	z30	z10	z45	z30	z15	z30	z05	z25	z20	350^{A}	345	350^{A}
6	350	345	z90	z95	305	360	z95	z25	z45	z45	z05	z10	E250^{S}	z40	z45^{A}	z40	z05	z10	z55	A	E340^{A}	A	E440^{A}	405
7	395	400	300	305	355	400	z80	z10	z40	I235^{A}	z40	z35	z25	I235^{C}	z30	z30	z20	z05	z30	z35	z50^{A}	320^{A}	E400^{A}	350
8	350	z80	305	350^{A}	300	z95	z45	E250^{A}	I240^{A}	z30^{S}	z05	z30	z05	z40	z40	z45	z35	z30	z50	z45	z50	310^{A}	I270^{A}	z80
9	I300^{A}	320	350^{A}	300	300	325	z80	z35	z25	z20	z40	z05	z40	z25	z40	z40	z40^{A}	250^{A}	z10	z30	z40	345	300	z55
10	z80	350	300	350	305	350	z90	z40	z50	z05	z20	z25	z25	z10	z45	z30	z15	z30	z10	z10	z50	z70	z80	345
11	315	300	350	355	310	320	z70	z25	z30	z45	z25	E230^{C}	C	E230^{C}	E240^{C}	z35	z20	z05	z40	z40	C	C	C	355
12	355	355	330	325	305	300	z65	z30	z30	C	E245^{C}	E230^{C}	E255^{C}	E245^{C}	z30	z35	z10	z10	z50	z50	z20	305	350	340
13	330	345	345	375	305	375	345	z35	z20	z30	z10	z30	z25	z30	z30	z50	z45	z05	z25	z30	z50	z55	300	350^{A}
14	325	300	z75	z85	345	325	z45	z30	z30	z25	z25	E255^{S}	z45	z50	z50	z35	z00	z25	z55	z45	z50	350	340	300
15	320	335	325	300	z70	345	z95	z45	z30	z15	z50	z50	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	E320^{S}	C	C	S	C	S
17	I245^{S}	I230^{S}	I315^{S}	I350^{S}	I305^{S}	I280^{S}	I240^{S}	z15	z15	I215^{C}	z05	I220^{C}	z25	z20	I250^{S}	I220^{S}	z40	I240^{S}	I220^{S}	I230^{S}	I250^{S}	S	S	S
18	S	S	S	I290^{S}	I300^{S}	S	S	S	z75	I260^{C}	z25	z25	z25	z50	z50	z25	E255^{A}	E235^{S}	z40	z30	z30	S	S	S
19	S	S	S	S	S	S	S	z50	z30	C	C	C	z30	z35	z30	z25	z05	I220^{S}	S	C	C	S	S	S
20	I265^{S}	I290^{S}	I315^{S}	300	385	I325^{S}	I285^{S}	z35	z25	z45	z35	z10	z25	z35	z15	z25	I210^{S}	I230^{S}	S	S	S	S	S	I220^{S}
21	S	S	S	S	S	S	S	I230^{S}	I240^{S}	E250^{C}	z10	z15	E245^{S}	E250^{S}	z30	z25	z25	z20	A	A	A	S	S	S
22	S	S	S	S	S	A	S	z60	E255^{S}	C	C	C	C	C	C	z30	z30	S	A	A	S	A	S	AS
23	S	S	S	S	A	A	A	z70	z45	z30	z30	z30	E250^{S}	E245^{S}	E230^{S}	z30	E250^{S}	z25	A	A	A	S	S	S
24	S	C	S	A	A	A	A	E250^{S}	z50	z30	z25	z25	z25	E255^{S}	z25	E245^{S}	z45	E250^{A}	A	A	A	A	A	A
25	A	A	C	E400^{A}	355	350	310	I275^{A}	E275^{A}	E255^{A}	z45	z25	z45	z55	z45	z30	z45	z10	z50	z30^{A}	A	E260^{A}	325	E310^{A}
26	E355^{S}	E395^{S}	300	z50	z50	E335^{S}	310	z45	z45	z25	z20	z10	I235^{S}	I245^{S}	z25	z30	I240^{C}	z45	z10	z40	E360^{S}	C	C	C
27	C	C	C	C	C	C	C	C	C	z40	z45	z30	E250^{S}	z40	z40	z35	z30	E255^{S}	z80	A	300^{A}	z60	A	370^{A}
28	360^{A}	300	E410^{S}	410	385	E405^{S}	E395^{S}	z55	z30	z50	z30	z20	E255^{S}	z45	z40^{S}	z40	z35	z30	z30	z60	z50	305	320^{A}	z55
29	A	A	E355^{S}	E370^{S}	z55	S	E360^{S}	I250^{S}	z50	z40	z35	z40	E250^{S}	E255^{S}	z40	z45	z10	I240^{A}	z80^{A}	A	A	A	A	A
30	A	A	A	S	E325^{S}	E355^{S}	E380^{S}	z55	E245^{S}	I250^{C}	z45	z50	z60	z55	z55	z50	z35	z10	I250^{S}	z55	S	S	A	A
31	A	I370^{S}	I270^{S}	I290^{S}	I290^{S}	I375^{S}	350^{A}	z30	z30	z50	z55	z30	E260^{S}	z55	z50	z45	z40	E285^{S}	z55	z30	E400^{S}	E420^{S}	300	E400^{S}
No.	17	19	19	21	23	19	20	26	26	25	27	25	19	23	28	28	27	24	23	20	16	15	14	18
Median	320	320	300	305	305	325	290	240	230	235	230	225	225	235	240	230	225	220	240	230	250	305	310	340

Note: Parameters reduced to lower frequency range on and after 11th are affected by defects of the ionosonde.

h'F

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

The Radio Research Laboratories, Japan.

K 10

IONOSPHERIC DATA

Dec.1960 | 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	S	S	S	E	E	S	S	S	105	E 200 f	105	E 190 f	G	G	100	105	B	100	105	105	E	S	S	105
2	S	S	S	E	E	S	S	105	110	140	130	140	110	110	G	105	S	105	S	S	S	110	S	105
3	105	S	E	110	105	110	105	105	105	100	100	105	100	110	G	110	B	E	110	E	S	S	S	S
4	S	S	105	100	100	S	110	S	G	G	110	G	G	110	200	G	155	S	E	S	S	110	S	E
5	S	115	E	E	110	110	110	S	105	G	100	E 190 f	G	G	E 195 f	155	B	S	100	100	105	100	S	140
6	140	S	E	E	E	S	110	105	G	E 195 B	G	105	100	100	100	105	155	115	110	105	105	105	105	105
7	105	105	105	105	105	S	E	S	115	110	105	G	G	C	G	105	110	115	S	E	105	105	100	105
8	105	105	105	100	105	S	S	105	105	105	105	G	110	110	105	105	145	105	100	100	105	110	105	105
9	100	105	100	105	E	100	S	S	110	G	G	G	G	G	100	105	100	100	100	S	E	S	E	S
10	S	E	S	100	E	S	S	S	110	105	110	G	G	105	105	S	S	S	E	110	S	S	E	S
11	S	E	S	S	E	E	E	B	C	C	C	C	C	C	C	C	S	S	S	S	C	C	C	S
12	S	S	E	E	E	S	S	S	C	C	C	C	C	C	105	100	S	105	S	105	100	S	S	S
13	S	S	S	S	E	S	S	S	G	115	110	G	G	100	G	S	S	S	S	E	S	E	E	105
14	105	105	105	100	100	S	S	S	S	B	S	S	B	S	S	S	S	S	105	100	100	S	100	E
15	E	S	S	E	E	E	S	S	S	B	S	S	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	S	C	C	S	C	C
17	S	S	S	S	S	S	S	S	S	C	S	C	S	S	S	S	S	S	S	S	S	S	S	S
18	S	S	S	S	S	S	S	S	S	C	S	S	S	S	105	105	105	S	105	120	105	115	120	110
19	110	S	S	S	125	S	S	S	S	C	C	C	S	S	S	S	S	S	S	C	C	S	S	S
20	S	S	S	S	120	S	S	S	115	135	105	C	S	105	100	S	S	S	105	105	105	105	S	S
21	S	S	S	S	S	S	115	S	S	C	C	C	S	S	S	S	S	S	105	105	100	S	S	S
22	S	S	110	105	S	110	S	S	S	C	C	C	C	C	C	S	120	115	110	110	105	105	105	100
23	S	S	S	S	125	115	110	105	S	S	C	S	S	S	S	S	S	110	110	105	105	105	105	S
24	S	C	S	120	115	115	110	105	105	S	100	S	S	S	S	S	S	115	115	110	110	105	105	105
25	105	105	C	105	S	S	S	110	105	105	105	105	B	B	B	B	B	S	110	105	105	100	S	100
26	S	S	E	E	S	S	S	S	S	B	S	S	S	S	S	S	C	105	105	S	S	C	C	C
27	C	C	C	C	C	C	C	C	C	S	S	G	G	G	G	S	S	S	110	105	105	105	105	105
28	105	105	S	S	S	S	S	S	S	120	G	115	110	100	100	100	S	S	110	105	105	S	105	S
29	105	105	S	S	E	S	S	105	105	105	105	100	S	S	S	S	S	110	105	105	100	105	105	105
30	105	105	105	105	105	S	S	110	105	C	100	S	S	S	S	S	S	S	S	105	S	S	105	105
31	105	105	S	S	S	S	S	S	S	S	110	S	S	S	S	S	S	S	S	S	S	S	S	S
No.	12	10	7	11	11	6	7	9	13	10	15	6	5	9	10	11	7	12	18	18	16	14	12	14
Median	105	105	105	105	105	110	110	105	105	110	105	105	110	105	100	105	120	110	105	105	105	105	105	105

Note: Parameters reduced to lower frequency range on and after 11th are affected by defects of the ionosonde.

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

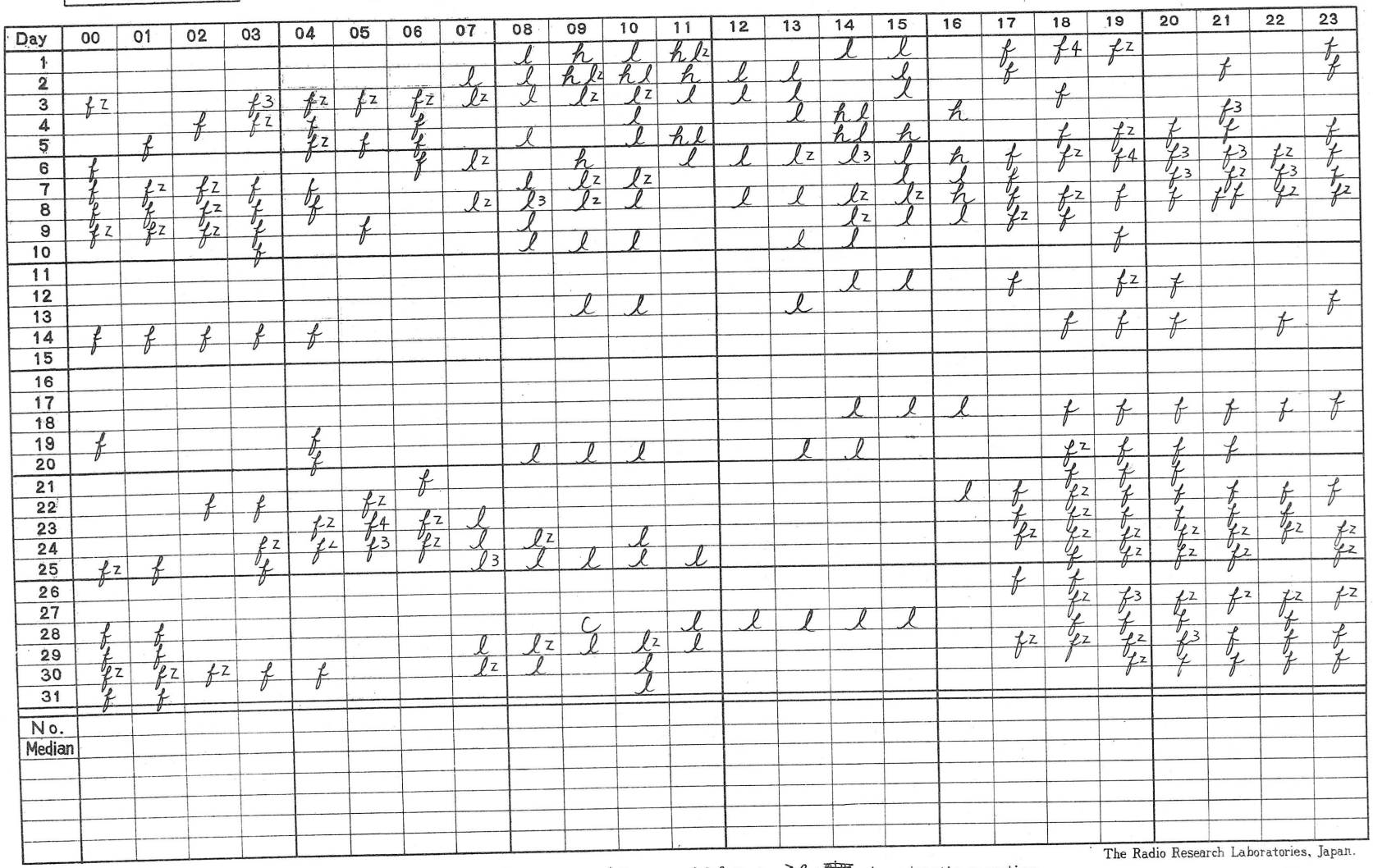
Dec. 1960

Types of Es

135° E Mean Time (G.M.T. + 9h.)

Kokubunji Tokyo

Lat. 35° 42.4' N
Long. 139° 29.3' E



Note: Parameters reduced to lower frequency range on and after 11th are affected by defects of the ionosonde.

Types of Es

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

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Dec.1960 | hpF2 | 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	350	310	345	305	325	350	310	u z55s	300	300	300	z85	305	310	J305s	330	300	300	305	395	445	u400s	395	J400s
2	u345s	330	380	410	405	355	375	305s	310	z90	315	305	305	305	300	300	300	u290s	I250s	z50s	350	320	375	395
3	440	400	310s	335	380	385s	350	z90s	300	u295s	u275R	300R	305s	J310s	u310s	300R	z95	u300s	z60	300	300	300	355	375
4	350	345	u310s	395	400	375	310	u280s	z55	z80	z95	z95	300	300	300	z60	z80	z70	z85	305	315	J350s	375	400
5	410	395	360	350	335	375	360	u275s	z55	305	300	300	300	320	300	J300s	z90	300s	z55	z80	z55	365	405	390
6	405	390	355	385	425	400	350	J280s	J300R	300	300	J330R	300	305	300	300	I250s	z80	300	I300A	350	I365A	410	480
7	455	450	350	415	455R	455s	345	I270s	z95	u300s	300	305	u305CI300C		300	300	z85	z95	z95	300	u285s	350	400	400
8	400	345	345	400	375	355	305	z80s	A	300	z95s	320	305	350	320	305	300	300s	305	320	310	360	I340A	320
9	I330A	350	380	380	400	405	u345s	J255s	J295s	z55	300	J315R	300	325	300	305	305	J305s	z50	300	J310s	405	360	320
10	350	440	355	440	405	400	325	u295s	z50	z95s	z90	z80	300	340	305	u275s	z60	u280s	z60	u250s	310	350	390	400
11	330	360	405	400	380	380	325	z80	z50	z60	z80	z95	J270su300R		300	z95	u260s	z90	300	z80	C	C	C	425
12	405	400	385	380	370	360	330s	z85s	z85	I290C	z55	I275R	300s	300	315s	315	z75	z90	330R	z80	z55	350	415	385
13	370	400	400	445	395	445s	395sI300s		u305s	z80	300	305	305	325	310	310	z95	300	z80	z85	350	300s	365	395s
14	u385s	355	320s	385	400	395s	z55	u295s	z55s	z60	u280R	300	z95	305	z85	u305R	u240su255s		z80	z55	z60	405	u370s	355s
15	360	390	380	360	380	395	345	su255s	u265s	J250s	z90	z85	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	320s	C	C	S	C	C
17	I300sI295sI370sI420s				I365sI330sI310sI270s				u220s	C	S	C	z50s	z80sI290sI260su			z55s	S	S	I260sI280s		S	S	S
18	S	S	S	I325sI340s		S	S	S	u300sI285CI240Cu245s				z95sJz80su255su240s				u300sI260sI280su255s				u295s	S	S	S
19	S	S	S	S	S	S	S	S	I250s	C	C	I250C	u255sJz55sI260C			z70su260s	S	S	C	I270CI355sI375sI325s				
20	I300sI310sI325s			335	425sI380sI325s			250su235s	z75	z45	I240C	z45s	z60su230s			z50sI245sI270s	S	S	S	S	S	S	S	
21	S	S	S	S	S	S	S	S	I260su280RJ240Ru250s				z95R	z95	z75	J270sI290su305s	A	A	A	S	S	S		
22	S	S	S	S	S	A	S	S	300R	C	C	C	C	C	C	z50s	z70	I280s	A	A	S	A	S	AS
23	S	S	S	S	A	A	A	u280s	300	z50	z50	z50	u280s	z70	u265s	z75	I260s	z45	A	A	I280AI295s		S	S
24	S	I360CI390s		A	A	A	A	300	z70	z50	J245Ru245s		z50	z75	z40	z85	z65	z55	A	A	A	A	A	A
25	A	A	C	S	395	390	330	I275A	z90	z95	z55R	z55	z85R	z90	z65R	z55	z80s	z55	z60	z45	I280AI300A		355	320
26	u395s	405	355	300	u280R	345s	S	z55s	z50Ru250s		z85	z80	300	z95R	300	z90s	I270CI290s		z45	J255s	S	C	C	C
27	C	C	C	C	C	C	C	C	C	u280s	z95	z80	z65	z85	300s	z55	I250s	315	315	I310A	355	300	A	400
28	395	315	455	460	450	u450s	395	I280s	u270s	z90	300	J260s	J300su300s		255	z55	z90	u255s	z55	J300s	300	360	350s	300
29	A	A	u400s	400	J305sI320su395sI300s				J290R	300	z55	z95	z70	J290s	z85s	z80	I255sI290A	300	A	A	A	A	A	A
30	A	A	A	S	350sI350s		S	u300s	z55	I280Cu270s		z70	300	I280s	300su300su		z65su255sI300s		S	S	S	A	A	
31	A	I395sI370sI350s			I450sI415sI365sI310s				z55	u280s	z80	z80	u275s	z70	z80s	z60	330	z85	J305su255s		S	u405s	355s	S
No.	19	21	22	22	24	23	21	25	28	27	27	28	28	28	28	29	29	27	23	21	20	19	17	13
Median	370	360	365	385	390	380	345	280	270	280	285	280	300	300	300	285	270	290	285	280	300	350	375	375

Note: Parameters reduced to lower frequency range on and after 11th are affected by defects of the ionosonde. 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. 1960 | 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	55	90	100	85	75	95	90	u 50s	50	80	65	40	85	85	J 90s	95	80	90	90	100	75	u 95s	100	J 105s
2	u 65s	115	115	90	90	135	70	90s	45	60	75	90	70	90	90	55	65	u 60s	I 70s	85s	95	80	75	100
3	70	100	85s	70	75	70s	95	60s	55	u 60s	u 70R	50R	55s	J 75s	u 85s	90R	90	u 45s	75	90	95	100	90	80
4	95	65	u 85s	100	95	80	90	u 70s	60	65	50	55	55	55	95	65	70	85	70	95	105	J 100s	120	100
5	100	95	85	100	90	75	85	u 80s	55	80	55	55	80	65	105	J 50s	55	65s	90	55	95	125	95	100
6	90	65	90	65	120	100	95	J 55s	J 55R	65	55	J 55R	95	85	95	55	I 80s	70	80	I 80A	145	I 80A	95	120
7	95	70	85	90	95E	95s	95	I 80s	40	u 55s	55	65	u 85C	I 85C	95	90	60	60	60	90	u 65s	100	90	95
8	80	65	60	95	80	95	90	55s	A	55	50s	60	95	95	125	85	90	55s	90	125	90	130	I 80A	80
9	I 95A	95	75	115	95	95	u 60s	J 80s	J 60s	70	60	J 80R	80	85	95	85	90	J 85s	60	105	J 140s	120	95	85
10	145	110	140	105	100	100	80	u 100s	45	80s	80	90	70	85	105	u 105s	110	u 120s	90	u 100s	90	95	85	75
11	70	115	75	70	75	80	105	90	55	85	70	55	J 100s	u 70R	90	80	u 135s	110	50	105	C	C	C	110
12	95	95	65	70	80	95	70s	105s	75	I 55C	90	I 105R	100s	95	100s	85	75	90	100R	100	70	105	115	65
13	80	70	70	80	55	70s	60s	I 100s	u 140s	100	95	115	95	85	90	110	100	100	100	105	100	75s	110	100s
14	u 105s	95	105s	65	100	75s	95	u 125s	120s	110	u 60R	80	55	90	115	u 125R	u 110s	u 140s	115	80	90	115	u 105s	95s
15	85	75	95	90	70	60	95s	u 95s	u 120s	J 100s	60	70	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	80s	C	C	S	C	C
17	I 110s	I 100s	I 130s	I 85s	I 105s	I 110s	I 100s	I 95s	u 110s	C	S	C	105s	90s	I 110s	I 120s	u 140s	S	S	I 100s	I 90s	S	S	S
18	S	S	S	I 60s	I 70s	S	S	S	u 75s	I 50C	I 75C	u 100s	75s	J 70s	u 80s	u 90s	u 100s	I 105s	I 90s	u 120s	u 105s	S	S	S
19	S	S	S	S	S	S	S	S	I 100s	C	C	I 70C	u 95s	J 70s	I 85C	105s	u 115s	S	S	C	I 105C	I 90s	I 90s	I 105s
20	I 120s	I 135s	I 120s	90	80s	I 110s	I 100s	120s	u 115s	45	55	I 60s	65s	75s	u 75s	50s	I 95s	I 80s	S	S	S	S	S	S
21	S	S	S	S	S	S	S	S	I 80s	u 65R	J 75R	u 90s	100R	55	65	J 45s	I 45s	u 45s	A	A	A	S	S	S
22	S	S	S	S	S	A	S	S	55R	C	C	C	C	C	C	80s	125	I 110s	A	A	S	A	S	AS
23	S	S	S	S	A	A	A	u 85s	75	50	60	90	u 75s	75	u 60s	75	I 70s	60	A	A	I 70A	I 60s	S	S
24	S	I 90C	I 85s	A	A	A	A	95	55	40	J 35R	u 55s	60	45	65	70	50	50	A	A	A	A	A	A
25	A	A	C	S	105	105	85	I 90A	55	50	70R	70	45R	45	60R	90	75s	95	85	45	I 120A	I 100A	100	125
26	u 100s	90	95	75	u 70R	55s	S	90s	65R	u 85s	105	65	45	55R	45	65s	I 100C	I 105s	45	J 100s	S	C	C	C
27	C	C	C	C	C	C	C	C	C	u 75s	50	50	60	80	55s	80	I 70s	90	85	I 85A	95	80	A	95
28	100	90	90	90	75	u 100s	105	I 90s	u 125s	55	45	J 85s	J 45s	u 80s	85	90	65	u 90s	95	J 50s	90	90	50s	50
29	A	A	u 100s	90	J 95s	I 70s	u 100s	I 70s	J 60R	45	50	60	65	J 55s	50s	65	I 100s	I 50A	55	A	A	A	A	A
30	A	A	A	S	95s	I 80s	S	u 95s	50	I 70C	u 80s	80	95	I 90s	100s	u 105s	u 105s	u 135s	I 100s	S	S	S	A	A
31	A	I 70s	I 70s	I 100s	I 100s	I 110s	I 110s	I 110s	115	u 100s	75	70	u 75s	105	75s	115	50	100	J 95s	u 95s	S	u 95s	95s	S
No.	19	21	22	22	24	23	21	25	28	27	27	28	28	28	28	29	29	27	23	21	20	19	17	18
Median	95	90	90	90	90	95	95	90	60	65	60	70	75	80	90	85	90	90	85	100	95	95	95	100

Note: Parameters reduced to lower frequency range on and after 11th are affected by defects of the ionosonde.

ypF2

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

The Radio Research Laboratories, Japan.

K 14

IONOSPHERIC DATA

Dec.1960 | 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	4.6	3.9	3.1	3.3	3.2	2.4	2.8	5.2	9.1	9.6	11.5	13.0	11.7	13.5	12.9	13.0	13.1	10.0	8.6	6.9	6.2	6.7	6.2	5.7
2	6.0	6.4	3.8	3.8	4.0	4.3	4.6	7.1	12.5	11.4	13.3	C	C	C	C	C	C	C	C	5.9	5.7	5.9	4.9	4.2
3	3.8	4.0	4.2	4.0	3.9	3.6	3.3	5.7	10.1	13.8	15.0	14.3	14.7	S	S	S	S	S	S	9.0	7.6	6.9	5.5	4.8
4	3.7	3.8	3.9	3.4	3.3	3.1	3.1	6.0	8.6	11.4	11.0	11.5	12.2	11.6	11.2	11.2	10.3	10.4	6.9	5.6	6.0	6.0	3.9	3.5
5	3.3	3.5	3.7	3.6	3.5	3.3	3.4	5.8	9.7	11.8	12.2	13.2	13.6	13.8	14.1	13.1	11.7	11.2	9.0	7.7	6.1	5.1	4.3	4.5
6	4.2	4.1	3.3	3.1	3.1	3.1	3.3	6.4	9.5	12.4	14.2	13.2	13.7	14.1	13.5	13.0	12.6	9.4	6.7	7.3	6.8	5.8	4.5	A
7	A	5.6	5.7	5.1	4.9	5.1	6.2	8.9	9.3	13.7	13.9	14.7	14.3	13.9	14.2	13.0	12.5	11.1	7.3	6.8	6.9	6.1	4.9	4.6
8	4.4	4.3	4.0	3.4	3.5	3.5	3.7	6.5	9.8	14.6	14.3	13.4	14.7	S	S	14.5	14.2	14.3	11.7	9.4	8.7	6.4	5.8	5.1
9	4.6	3.9	3.3	3.4	3.3	3.3	3.7	6.8	10.5	11.1	14.3	14.4	14.4	14.4	14.0	14.0	13.2	12.7	12.3	S	7.0	6.2	5.2	4.9
10	4.4	3.1	3.3	3.1	3.4	3.4	3.4	6.7	11.4	11.2	12.4	13.8	14.6	13.6	14.7	14.1	12.2	11.2	9.7	8.8	6.7	6.3	5.6	4.6
11	4.8	4.5	3.6	3.6	3.6	3.2	3.4	5.9	10.6	11.6	11.3	10.6	11.2	11.0	11.6	12.5	12.5	11.4	8.1	7.8	7.5	6.0	3.5	3.2
12	3.3	3.4	3.4	3.4	3.5	3.6	4.0	5.6	8.7	11.5	12.3	10.4	11.6	11.8	12.6	12.4	14.4	12.8	10.5	S	8.7	5.8	5.2	3.7
13	3.8	3.4	3.4	3.2	3.4	3.3	3.3	5.1	9.2	11.4	13.1	14.2	14.5	13.5	13.1	13.3	14.1	12.7	9.8	7.9	6.1	5.8	5.9	3.8
14	3.7	4.4	3.8	3.2	3.2	3.3	3.5	5.7	8.6	11.2	12.3	11.7	12.4	11.6	11.9	12.7	12.0	8.9	7.6	8.1	7.4	5.4	4.4	5.1
15	4.5	4.2	4.2	3.8	3.6	3.2	3.2	4.8	9.7	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	C	C	12.8	11.5	11.6	9.5	7.5	7.1	6.3	6.3	6.5	C	C	C
17	C	C	C	C	C	C	C	C	C	C	12.9	14.3	11.0	9.1	11.5	10.4	8.4	7.4	7.6	8.1	5.8	4.3	2.3	2.4
18	2.7	3.0	3.4	3.8	2.7	2.4	3.1	4.6	8.4	9.4	9.6	10.7	9.1	9.3	10.4	11.0	7.7	7.4	8.5	9.3	7.0	5.4	4.4	5.1
19	4.4	3.0	2.6	2.3	3.0	3.8	5.0	6.5	S	8.8	8.9	9.4	10.8	C	C	C	7.4	6.3	8.3	8.5	4.8	3.3	4.1	4.6
20	3.9	2.7	2.8	2.6	2.7	2.8	2.7	4.6	8.2	8.8	12.9	11.3	8.1	8.3	9.7	8.7	7.3	6.6	7.0	6.5	4.0	3.6	4.1	5.1
21	2.7	2.3	2.1	2.0	2.0	2.1	2.1	4.3	7.7	10.8	12.8	10.0	10.1	11.6	12.3	10.3	7.7	8.3	8.4	A	A	A	Fs	4.8
22	3.2	2.1	2.4	2.6	2.7	2.5	2.9	4.3	8.4	14.3	13.3	9.1	8.7	10.6	11.5	9.8	7.8	8.6	S	A	A	A	A	4.1
23	2.7	2.4	A	A	2.5	2.7	2.8	4.6	7.3	11.2	13.1	12.5	10.6	9.7	10.6	10.0	8.3	8.0	5.9	A	A	A	3.5	4.0
24	3.5	2.4	2.2	2.4	2.5	2.6	2.8	3.9	7.6	10.9	13.5	7.8	8.2	7.9	9.1	8.0	7.8	8.3	6.4	4.4	2.9	2.5	2.7	3.1
25	2.4	F	F	2.4	F	F	F	4.0	7.3	11.1	12.4	12.4	9.9	10.0	9.7	9.1	7.8	8.7	7.6	5.7	4.0	3.6	3.0	3.1
26	C	C	C	C	C	C	C	C	C	C	C	C	C	11.0	C	C	C	C	C	C	C	2.6	3.1	3.3
27	3.2	4.0	5.6	2.0	2.2	2.3	2.3	3.9	6.6	8.3	11.6	11.1	10.7	8.4	9.4	9.3	7.9	6.4	5.7	6.2	5.4	4.4	4.4	C
28	C	C	C	C	C	C	C	C	9.3	10.6	12.0	12.0	11.2	10.4	9.5	8.3	7.5	8.3	6.5	5.4	5.5	4.3	4.3	4.7
29	4.6	2.3	2.4	2.2	2.2	2.2	2.1	3.3	8.5	12.6	14.9	11.7	10.3	10.8	9.9	9.1	9.3	7.2	6.8	7.3	7.8	6.0	3.1	A
30	A	A	2.8	2.6	2.8	3.1	2.7	3.8	7.1	9.3	13.3	12.5	12.3	12.3	10.6	10.4	8.7	9.2	5.5	5.7	5.4	4.9	3.4	3.1
31	3.1	2.9	3.2	3.0	2.8	2.9	2.6	4.8	6.5	10.2	12.8	12.0	11.6	12.2	11.6	10.7	9.5	10.5	7.7	5.3	7.2	5.5	5.2	4.5
No.	25	25	25	26	26	26	26	27	27	27	28	27	28	26	25	26	27	27	26	24	26	26	27	26
Median	3.8	3.5	3.4	3.2	3.2	3.2	3.2	5.2	8.7	11.2	12.8	12.0	11.6	11.6	11.6	10.8	9.3	8.9	7.6	7.1	6.4	5.6	4.3	4.4
U.Q	4.4	4.2	3.8	3.6	3.5	3.4	3.5	6.4	9.7	11.8	13.4	13.4	13.6	13.5	13.0	13.0	12.5	11.2	8.6	8.1	7.2	6.0	5.2	4.8
L.Q	3.2	2.8	2.8	2.6	2.7	2.6	2.8	4.3	7.7	10.2	12.1	10.7	10.4	10.0	10.2	9.5	7.8	7.4	6.7	5.8	5.5	4.3	3.5	3.5
Q.R	1.2	1.4	1.0	1.0	0.8	0.8	0.7	2.1	2.0	1.6	1.3	2.7	3.2	3.5	2.8	3.5	4.7	3.8	1.9	2.3	1.7	1.7	1.7	1.3

foF2

Sweep 1.0 Mc to 20.0 Mc in 30 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 1

47

IONOSPHERIC DATA

Yamagawa

Lat. 31° 12.5' N
Long. 130° 37.7' E

Dec.1960

foF1

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

foF1

Sweep 1.0 Mc to 20.0 Mc in 30 ~~min~~ sec in automatic operation.

IONOSPHERIC DATA

Dec.1950 | foE | 135° E Mean Time (G.M.T. + 9h.) | Yamagawa | Lat. 31° 12.5' N, Long. 130° 37.7' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								S	2.40	I 2.70 A	3.20	3.30	A	A	3.30	3.00	2.40	S						
2								A	2.40	3.00	3.20	C	C	C	C	C	C	C						
3								S	2.40	3.00	I 3.35 B	3.40	3.45	3.40 R	3.30	3.00	2.40	S						
4								S	I 2.40 A	3.00	3.30	3.45	3.50	3.40	I 3.20 R	3.10	2.70	S						
5								B	2.30	2.90	3.25	3.40	3.50	3.50	3.35	I 3.00 A	2.60	A						
6								S	2.50	3.00	3.25	3.30	3.40 R	3.50	3.40	3.30	2.50	S						
7								A	A	2.90	3.20	A	A	A	A	A	A	A						
8								S	2.20	2.75	A	A	A	A	A	A	A	A						
9								B	I 2.25 A	3.00	3.25	3.30	3.40	3.45	3.35	3.05	2.50	A						
10								S	2.30	A	A	A	3.40	A	A	A	A	A						
11								B	B	2.90	R	B	B	A	I 3.35 B	3.10	2.50 R	S						
12								B	2.40	2.80	3.15	3.50	3.40	I 3.40 R	3.35	3.10	2.50	A						
13								B	A	A	C	3.30	3.30	3.30	3.20	I 2.90 A	2.55	A						
14								S	A	I 2.80 A	I 3.10 A	3.40	3.30	3.40	3.25	3.00	2.50	S						
15								B	B	C	C	C	C	C	C	C	C	C						
16								C	C	C	C	C	B	R	A	C	A	A						
17								C	C	C	3.00	I 3.20 C	I 3.20 R	3.10	I 3.05 R	2.90	2.40	S						
18								S	2.05	2.75	3.10	3.25	3.30	3.30	3.15	A	A	A						
19								S	A	A	A	A	A	C	C	C	A	A						
20								S	2.00	2.80	A	A	A	A	A	A	A	A						
21								S	A	A	3.00	I 3.20 R	3.30	I 3.25 R	3.10	2.85	2.40	S						
22								S	A	A	B	B	B	B	R	I 2.85 A	I 2.35 C	S						
23								S	A	A	A	A	A	A	A	A	A	A						
24								S	A	A	B	B	B	B	B	B	B	B						
25								S	I 2.20 A	I 2.65 A	R	B	B	B	A	A	2.50	S						
26								C	C	C	C	C	C	R	C	C	C	C						
27								S	2.15	2.80	3.15	3.30	3.30	3.30	I 3.20 A	I 2.90 C	A	A						
28								C	2.20	2.75	3.00	3.10	3.15	3.20	I 3.20 A	I 3.00 A	2.60	S						
29								S	A	A	A	A	A	I 3.30 A	3.15	3.10	I 2.66 A	S						
30								S	A	A	A	A	A	A	A	A	A	A						
31								S	2.20	2.80	3.20 R	3.40 H	3.50	3.50	A	A	A	A						
No.									16	18	16	15	15	15	16	16	16							
Median									2.30	2.85	3.20	3.30	3.40	3.40	3.20	3.00	2.50							

foE

Sweep 1.0 Mc to 20.0 Mc in 30 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 3

IONOSPHERIC DATA

Yamagawa

Lat. 31° 12.5' N
Long. 130° 37.7' E

Dec.1960

foEs

135° E Mean Time (G.M.T. + 9h.)

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	E	E	E	E	S	S	4	3.5	2.9[q]	3.8	3.7	4.2[m]	3.6	4	3.2	↘4.2	2.4	S	↘2.4	S	S	S
2	S	S	E	E	E	E	S	↘2.4	2.5	↘5.4	4.4	C	C	C	C	C	C	C	C	↘2.6	2.5	↘2.1	S	S
3	S	S	E	↘2.8	↘3.3	5.4[m]	↘5.2	3.0	5.1[m]	4	4.4	2.9[q]	4	4	3.0[q]	4	2.1[q]	2.2	S	S	S	S	S	S
4	S	E	E	↘2.7	E	E	S	S	2.7	3.1	3.1[q]	3.4[q]	4	3.3[q]	3.1[q]	3.0[q]	3.4	2.3	↘2.3	↘3.2	↘2.6	↘2.1	S	S
5	S	↘2.1	E	E	E	E	S	B	3.0	4	4	4	2.3[q]	2.8[q]	2.9[q]	↘3.8	2.2[q]	↘2.8	↘3.1	S	S	S	S	S
6	S	E	E	E	E	E	S	S	3.1	3.0[q]	4	4	4.1	2.7[q]	4	4	3.1	4	S	2.5	2.6[m]	2.3[m]	S	9.2[m]
7	6.0[m]	6.0[m]	4.5	4.4[m]	↘2.9	E	S	3.2	3.4	↘5.0	↘6.7	↘8.4	12.4[m]	6.2	6.0	↘4.8	↘5.1	↘4.9	↘5.0	6.9[m]	9.1[m]	↘5.4	6.0[m]	4.6[m]
8	↘2.4	↘2.3	↘2.4	2.2	E	E	S	2.2	4	2.8	3.6	3.7	3.7	5.5	3.7	↘5.5	↘5.4	5.7	3.4[m]	2.7	2.5	3.6	2.4	S
9	2.8	4.0	↘2.2	↘3.1	2.2	3.2	↘3.6	3.4	2.4	2.7[q]	4	4	4	2.7[q]	4	4	3.1	2.3	3.7[m]	2.2	2.2	2.3	S	2.5
10	2.6	E	E	3.8	E	E	E	2.9	2.1[q]	4.4[m]	3.8	↘5.4	2.9[q]	7.2	6.2	3.2	5.3	↘3.8	2.2	3.9	S	S	S	↘2.1
11	E	E	E	E	E	E	E	B	B	4	4	B	B	4.3	B	4	4	S	↘2.5	E	S	S	S	S
12	S	S	↘2.3	2.4	E	E	E	B	4	4	4	4	4	3.1[q]	4	4	2.8	3.3	4.5	↘3.8	↘2.3	↘2.3	S	S
13	S	S	E	E	E	E	S	B	2.3	3.1	C	4	2.5[q]	2.1[q]	2.2[q]	↘3.9	2.2[q]	2.1	S	S	S	S	S	2.0
14	↘2.1	2.6	↘3.2	E	E	E	S	S	2.3	4.7[m]	3.7	3.1[q]	2.9[q]	4	4	4	4	S	2.1	2.8	2.8	E	C	S
15	2.2	2.7[m]	E	E	E	E	E	B	B	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	C	C	B	4	5.3	C	2.9	2.3	2.3	E	S	C	C	C
17	C	C	C	C	C	C	C	C	C	C	4	C	3.1[q]	3.0[q]	3.0[q]	4	4	S	S	S	E	S	2.3	S
18	↘2.3	5.2	4.4	E	↘3.3	3.0	2.1	2.4	4	4	4	2.8[q]	2.7[q]	3.0[q]	3.3	3.1	↘3.5	↘2.8	↘3.3	2.1	2.5	↘2.4	S	S
19	↘2.5	↘2.2	2.1	2.6	E	E	↘3.1	2.2	3.8[m]	3.1	3.5	12.4[m]	↘8.4	C	C	C	↘4.1	3.2	↘3.9	↘3.9	3.7	↘2.1	S	S
20	S	S	E	E	E	E	S	S	2.7	3.2	4.5	11.1	↘5.5	5.3	4.4	3.9	3.3	↘3.1	2.4	S	S	↘5.3	5.8[m]	3.1
21	2.7[m]	S	B	E	1.1	E	S	2.7	3.0	4.5	3.0[q]	3.0[q]	3.1[q]	3.0[q]	2.7[q]	4	4	S	↘4.3	6.8[m]	6.8[m]	4.1	3.0	3.0
22	4.4	↘2.7	2.5	E	E	E	3.7	5.8	↘8.6	3.3	B	B	B	B	4	2.9	C	↘6.0	11.5[m]	9.0[m]	9.1[m]	5.2	↘5.1	2.4
23	↘2.9	↘2.2	2.3	2.2	E	E	E	9.0[m]	↘5.4	3.0	3.7	3.8	6.0[m]	↘5.6	4.1	3.0	2.7	5.7[m]	4.3[m]	9.1	↘5.3	4.1[m]	E	E
24	E	2.3	E	E	E	E	E	2.2	3.0	5.5	B	B	B	B	B	B	B	2.8	S	↘3.3	5.8	3.8	6.0[m]	↘5.4
25	9.0[m]	↘2.9	↘2.6	3.1	↘2.2	↘2.3	S	2.3	4.0[m]	4.1	4	B	B	6.3	3.3	3.1	4	2.5	3.9[m]	S	3.1	↘2.5	S	S
26	C	C	C	C	C	C	C	C	C	C	C	C	C	4	C	C	C	C	C	C	C	C	S	↘2.3
27	2.9	S	E	E	E	S	E	S	4	4	4	4	2.9[q]	2.9[q]	↘3.9	C	3.6	2.4	↘3.1	↘2.3	S	2.4	S	C
28	C	C	C	C	C	C	C	C	3.0	3.7	4.5	6.0	↘5.5	3.9	4.8	4.5	3.1	4	S	↘3.5	5.3	4.3[m]	5.8[m]	↘3.0
29	4.5	3.1	3.0	2.3	2.4	S	2.2	S	3.1	6.0	6.0	6.0[m]	4.3	4.4	4	4	2.7	3.0	6.0	9.1[m]	5.7	4.5	↘5.4	↘6.2
30	5.8	5.4	↘3.4	↘2.6	↘2.3	↘2.5	↘2.6	↘2.3	↘3.7	4.8	3.1	3.8	↘4.9	4.9	7.7[m]	↘8.4	6.1	3.1	3.7	↘3.4	3.0	↘2.6	2.4	S
31	↘2.3	↘2.3	↘5.2	↘3.6	↘2.5	↘2.3	S	S	4	4	3.0[q]	3.1[q]	3.1[q]	3.8	3.7	↘4.4	4.9	4.1	3.0	S	S	S	S	S
No.	18	19	26	27	27	25	14	14	26	27	25	22	23	26	25	24	26	24	22	21	20	20	11	13
Median	2.6	2.3	E	E	E	E	E	2.6	2.8	3.1	4	4	4	4	3.3	3.0	3.1	2.9	3.4	3.3	2.9	2.6	5.1	3.0
U.Q	4.4	3.1	2.6	2.7	2.2	E	3.1	3.2	3.4	4.5	4.1	5.4	4.9	4.9	4.2	3.9	3.6	4.0	4.3	5.4	5.5	4.2	5.8	5.0
L.Q	2.3	2.1	E	E	E	E	E	2.3	4	4	4	4	4	4	4	4	1.4	2.3	2.4	2.4	2.5	2.3	2.4	2.2
Q.R	2.1	1.0						0.9										1.7	1.9	3.0	3.0	1.9	3.4	2.8

foEs

Sweep 1.0 Mc to 20.0 Mc in 30 min/sec in automatic operation.

IONOSPHERIC DATA

Dec. 1960 | 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	S	S					S	S		3.3	2.8[q]	3.8	4	3.7	3.5		4	E4.2[s]	E	S	2.3	S	S	S
2	S	S					S	1.9	2.3	2.7	3.7	C	C	C	C	C	C	C	C	2.2	E	1.9	S	S
3	S	S		E	1.8	2.2	2.7	4	2.1		3.4	2.4[A]			2.5[A]		2.0[q]	1.9	S	S	S	S	S	S
4	S			2.0			S	S	4	2.7	3.1[A]	3.3[q]		3.3[q]	E3.1[R]	2.7[q]	4	4	1.7	2.3	2.5	1.8	S	S
5	S	2.0					S	B	2.0				E2.3[B]	2.6[q]	2.6[A]	3.3	2.0[A]	4	2.0	S	S	S	S	S
6	S						S	S	2.2	2.5[A]			4.1	2.6[q]			4		S	1.9	2.0	1.8	S	A
7	A	2.6	2.1	2.4	2.2		S	2.3	2.9	4.6	5.1	5.2	5.4	4.5	4.7	3.2	4.1	4.4	4.4	A	A	4.6	2.5	2.3
8	2.2	2.1	2.0	E	E	E	S	4		2.7	4	4	4	4.2	4	3.7	4.0	3.9	2.0	2.0	E	2.7	2.0	S
9	E	2.6	1.9	2.5	2.0	E	3.3	2.3	2.3	2.7[A]				2.5[A]			2.1	4	1.9	E	1.9	1.9	S	E
10	E			2.5				4	2.1[q]	3.9	3.6	4	2.6[q]	6.0	4.2	4	4	2.6	1.8	2.1	S	S	S	2.0
11								B	B			B	B	4.2	B			S	2.0		S	S	S	S
12	S	S	E	E				B						E3.1[R]			4	4	2.2	3.0	2.0	1.9	S	S
13	S	S					S	B	4	4	C		2.4[q]	E2.1[B]	2.2[q]	4	2.1[A]	4	S	S	S	S	S	1.8
14	1.9	E	2.0				S	S	2.1	4	4	3.1[A]	E2.9[B]					S	1.7	2.0	2.2		C	S
15	E	2.1						B	B	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	C	C	B		4.6	C	4	4	2.2		S	C	C	C
17	C	C	C	C	C	C	C	C	C	C		C	E3.1[R]	2.7[A]	E3.0[R]			S	S	S		S	S	S
18	2.0	2.1	A		2.0	2.1	1.9	4				2.5[q]	2.5[q]	2.8[q]	4	4	4	4	2.4	E	2.2	1.8	S	S
19	2.1	2.1	1.8	1.8			2.6	4	3.1	3.1	3.3	4.8	8.2	C	C	C	4	4	E3.7[S]	E3.9[S]	3.4	E	S	S
20	S	S					S	S	4	4	3.3	8.4	5.2	3.8	3.4	3.4	4	2.8	E	S	S	2.2	A	2.7
21	E	S	B		1.1		S	1.7	4	4	2.6[A]	2.7[A]	3.0[q]	2.7[q]	2.7[A]			S	A	A	A	A	2.6	2.5
22	A	E	E				2.5	A	4	3.1	B	B	B	B		4	C	5.1	5.4	A	A	A	A	E
23	A	2.2	A	A				A	4.7	E3.0[B]	E3.7[B]	E3.8[B]	4.9	4.8	4.1	E3.0[B]	4	4.0	2.0	A	A	A		
24		E						4	4	3.4	B	B	B	B	B	B	B	2.4	S	2.9	2.2	1.9	2.1	A
25	1.9	2.0	1.7	1.7	1.8	E	S	4	2.8	3.3		B	B	5.1	E3.3[B]	4		1.9	2.0	S	2.0	2.1	S	S
26	C	C	C	C	C	C	C	C	C	C	C	C	C		C	C	C	C	C	C	C	C	S	E
27	1.9	S				S		S					2.9[q]	2.7[q]	4	C	3.2	4	2.9	2.1	S	E	S	C
28	C	C	C	C	C	C	C	C	2.9	3.6	4.1	5.3	4.5	3.7	4.6	4.5	2.4		S	3.5	3.8	2.1	2.6	2.1
29	2.7	1.9	2.0	1.5	1.8	S	1.9	S	2.8	5.2	4.0	3.8	4	4			4	2.6	3.9	2.7	3.3	3.5	2.7	A
30	A	A	2.3	1.9	1.8	2.0	1.9	1.9	3.2	3.4	4	4	4.5	4.7	5.3	4.8	3.2	2.5	3.3	2.8	2.2	2.4	2.3	S
31	E	2.2	A	2.7	1.9	E	S	S			2.8[q]	3.1[q]	E3.1[B]	3.3	4	3.6	3.3	2.7	E	S	S	S	S	S
No.	16	15	13	13	10	7	7	14	20	20	15	15	15	22	17	14	21	21	21	18	19	19	9	12
Median	2.0	2.1	2.0	1.9	1.8	E	2.5	4	2.2	E3.0	3.3	4	4	E3.2	E3.0	E3.1	4	1.9	2.0	2.5	2.2	2.1	2.6	2.2

foEs

Sweep 1.0 Mc to 20.0 Mc in 30 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 5

IONOSPHERIC DATA

Yamagawa

Lat. 31° 12.5' N
Long. 130° 37.7' E

Dec. 1960

f-min

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 1.70 S	E 1.80 S	E	1.40	1.30	1.70	E 1.80 S	1.80	1.85	1.70	2.00	1.90	2.00	1.90	1.85	1.80	1.70	E 1.60 S	E 1.70 S	E 1.80 S	E 1.70 S	E 2.00 S	E 1.80 S	E 1.70 S
2	E 1.80 S	E 1.90 S	1.30	1.30	1.80	1.80	E 1.80 S	1.70	1.70	1.80	1.90	C	C	C	C	C	C	C	C	1.60	E 1.80 S	E 1.70 S	E 1.80 S	E 1.80 S
3	E 1.85 S	E 1.80 S	1.35	1.30	1.20	1.70	1.80	1.70	E 1.70 S	1.70	1.80	1.80	2.05	2.00	1.70	1.90	1.65	E 1.70 S	E 1.70 S	E 1.70 S	E 1.70 S	E 1.80 S	E 1.70 S	E 1.70 S
4	E 1.65 S	1.70	1.80	1.20	1.60	1.70	E 1.90 S	1.80	E 1.70 S	1.80	2.00	2.20	2.20	2.05	1.85	1.85	1.80	E 1.70 S	E 1.60 S	1.70	1.80	E 1.70 S	E 2.00 S	E 1.80 S
5	E 1.80 S	E 1.80 S	1.30	1.80	1.20	1.30	E 1.70 S	1.80	1.70	1.90	1.90	2.05	2.05	2.00	1.90	1.70	1.60	1.20	E 1.60 S	E 1.80 S	E 1.90 S	E 1.80 S	E 1.80 S	E 1.90 S
6	E 1.90 S	1.70	1.40	1.80	1.30	1.85	E 1.80 S	1.80	1.70	1.85	2.00	2.00	1.85	1.80	1.80	1.70	1.80	E 1.70 S	E 1.85 S	E 1.80 S	E 1.70 S	E 1.70 S	E 2.10 S	E 1.70 S
7	E 1.70 S	E 1.70 S	1.30	1.00	1.25	1.80	E 1.80 S	E 1.65 S	1.80	1.80	1.90	2.10	2.10	2.20	2.00	1.80	1.70	E 1.70 S	E 1.70 S	E 1.75 S	E 1.60 S	E 1.70 S	E 1.90 S	E 1.80 S
8	E 1.90 S	E 1.90 S	1.70	1.80	1.40	1.40	E 1.80 S	1.70	1.80	1.80	1.90	2.05	2.50	2.25	1.85	1.80	1.60	1.20	E 1.60 S	E 1.90 S	E 1.70 S	E 1.80 S	E 1.80 S	E 1.90 S
9	E 1.80 S	1.70	1.20	1.20	1.30	1.70	1.85	1.70	1.60	1.90	1.90	1.80	1.80	1.80	1.80	1.85	1.60	E 1.70 S	E 1.70 S	E 1.70 S	E 1.70 S	E 1.80 S	E 1.85 S	E 1.80 S
10	2.00	2.10	1.80	1.70	1.90	1.80	1.70	1.70	1.80	1.70	1.90	2.20	2.20	2.25	2.10	2.00	1.80	E 1.80 S	1.30	1.80	E 1.70 S	E 1.90 S	E 1.90 S	E 1.80 S
11	2.20	1.70	1.70	1.90	1.80	1.75	1.80	1.60	2.50	2.60	2.50	4.20	4.05	3.30	4.20	2.60	2.25	2.00	E 1.70 S	1.70	E 1.70 S	E 1.80 S	E 1.80 S	E 1.70 S
12	E 1.80 S	E 1.85 S	1.80	1.60	1.35	1.80	1.70	1.80	1.90	2.05	2.40	2.60	2.40	2.55	2.20	2.00	1.80	1.35	E 1.65 S	E 1.70 S	E 1.80 S	E 1.80 S	E 1.80 S	E 1.80 S
13	E 1.90 S	E 2.00 S	1.80	1.80	1.30	1.70	E 1.80 S	1.60	1.80	1.80	I 1.85 C	1.90	1.90	1.80	1.80	1.70	1.70	E 1.80 S	E 1.90 S	E 1.90 S	E 1.80 S	E 1.90 S	E 1.70 S	E 1.70 S
14	E 1.80 S	E 1.80 S	1.70	1.40	1.35	1.10	E 1.80 S	E 1.70 S	1.70	1.80	1.80	2.00	2.20	2.40	2.30	2.20	1.90	E 1.80 S	1.20	E 1.70 S	E 1.70 S	1.70	C	E 1.70 S
15	E 1.70 S	1.90	1.90	1.90	1.80	1.80	2.10	1.50	2.35	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	C	C	4.60	3.10	2.70	I 2.60 C	2.20	1.80	E 1.70 S	1.85	E 1.80 S	C	C	C
17	C	C	C	C	C	C	C	C	C	C	2.10	I 2.30 C	2.20	2.20	2.20	1.85	1.70	2.00	E 1.80 S	E 1.75 S	1.90	E 1.70 S	E 2.20 S	E 1.90 S
18	E 1.70 S	E 1.80 S	1.25	1.70	1.70	1.60	E 1.80 S	E 1.80 S	1.80	1.70	1.80	2.00	2.20	1.90	1.85	1.75	1.60	E 1.70 S	E 1.60 S	E 1.70 S	E 1.70 S	E 1.70 S	E 1.90 S	E 1.70 S
19	E 1.80 S	E 1.90 S	1.20	1.20	1.40	1.80	E 1.70 S	1.60	E 1.70 S	1.80	1.90	1.90	2.10	C	C	C	E 1.60 S	E 1.80 S	E 1.60 S	E 1.70 S	E 1.80 S	E 1.80 S	E 1.80 S	E 1.90 S
20	E 1.60 S	E 1.80 S	1.70	1.70	1.40	1.80	E 1.60 S	E 1.70 S	1.70	1.80	2.10	2.20	2.20	2.20	1.90	1.75	1.70	1.30	E 1.70 S	E 1.70 S	E 1.80 S	E 1.70 S	E 1.90 S	E 1.80 S
21	E 2.00 S	E 1.90 S	2.25	1.30	E	1.80	E 1.80 S	E 1.60 S	E 1.70 S	1.70	1.85	2.20	2.20	2.00	2.00	2.05	1.80	1.95	E 1.60 S	E 1.70 S	E 1.70 S	E 1.70 S	E 1.90 S	E 1.75 S
22	E 1.80 S	1.70	1.70	1.80	1.40	1.70	E 1.70 S	E 1.70 S	1.70	2.00	3.60	3.60	4.10	3.80	2.50	1.90	I 1.95 C E	1.70 S	E 1.60 S	E 1.70 S	E 1.80 S	E 1.80 S	E 1.70 S	E 1.90 S
23	E 1.70 S	1.80	2.05	1.90	2.00	1.85	1.70	1.80	1.70	2.20	2.30	2.75	2.70	2.80	2.65	2.25	2.00	1.70	E 1.70 S	E 1.75 S	E 1.70 S	E 1.70 S	2.20	1.95
24	1.90	1.80	1.40	1.45	1.90	1.80	1.80	1.75	1.80	2.40	3.60	4.70	4.30	4.40	4.30	3.55	2.80	1.90	E 1.80 S	1.70	E 1.65 S	E 1.80 S	E 1.80 S	E 1.70 S
25	E 1.70 S	E 1.70 S	1.30	E	1.30	E 1.70 S	E 1.70 S	E 1.70 S	1.80	1.90	2.60	U 4.10 C	U 4.05 C	3.45	2.60	2.65	1.90	E 1.80 S	E 1.70 S	E 1.90 S	E 1.70 S	E 1.90 S	E 1.80 C	E 1.90 C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	2.75	C	C	C	C	C	C	C	E 1.70 S	E 1.90 S	E 1.90 S
27	E 1.70 S	E 2.00 S	1.60	E	1.10	E 1.70 S	1.35	E 1.70 S	1.70	1.90	1.90	2.00	2.20	2.00	1.90	I 1.85 C	1.85	E 1.75 S	E 1.70 S	E 1.70 S	E 1.80 S	E 1.80 S	E 2.00 S	C
28	C	C	C	C	C	C	C	C	E 1.70 S	1.50	1.75	1.75	1.90	1.90	1.90	1.85	1.75	E 1.90 S	E 1.70 S	E 1.70 S	E 1.70 S	E 1.80 S	E 1.90 S	E 1.80 S
29	E 1.80 S	E 1.60 S	1.70	1.00	1.00	E 1.80 S	E 1.80 S	E 1.80 S	E 1.75 S	1.85	1.80	1.80	1.90	1.85	1.90	2.05	2.20	E 2.00 S	E 1.70 S	E 1.80 S	E 1.60 S	E 1.70 S	E 1.90 S	E 1.90 S
30	E 1.90 S	E 1.80 S	E	E	E	E	E 1.75 S	E 1.65 S	1.70	1.90	2.00	2.05	2.25	2.70	2.50	2.20	1.90	1.85	E 1.70 S	E 1.70 S	E 1.80 S	E 1.80 S	E 1.70 S	E 2.05 S
31	E 1.85 S	E 1.90 S	1.80	1.35	1.00	E 1.80 S	E 1.85 S	E 1.80 S	1.90	1.80	1.90	2.10	2.10	2.05	2.00	1.90	E 1.70 S	E 1.85 S	E 2.10 S	E 1.90 S	E 2.10 S	E 1.75 S	E 1.80 S	E 1.70 S
No.	27	27	27	27	27	25	27	24	27	27	28	27	28	28	27	27	28	28	28	29	29	29	28	28
Median	E 1.80 S	E 1.80 S	1.70	1.40	1.35	1.70	E 1.80 S	E 1.70 S	1.70	1.80	1.90	2.05	2.20	2.20	2.00	1.90	1.80	E 1.80 S	E 1.70 S	E 1.70 S	E 1.70 S	E 1.80 S	E 1.90 C	E 1.80

f-min

Sweep 1.0 Mc to 20.0 Mc in 30 min/sec in automatic operation.

IONOSPHERIC DATA

Dec.1960 | (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	2.85	3.10	2.95	3.10	3.55	2.50	2.70	3.20	3.55	3.20	3.00H	3.45	3.05H	3.05H	3.00H	2.95	3.05	I3.10	2.75	2.70	2.40	I2.75	2.95	2.65
2	2.75	3.15	2.70	2.45	2.50	2.65	2.40	2.85	3.40	L3.25	3.05	C	C	C	C	C	C	C	C	3.40	2.90	3.05	2.85	2.95
3	2.55	2.60	2.90	2.85	3.05	2.95	2.85	3.05	I3.25	3.40	3.20H	3.15H	U3.10H	SH	SH	S	S	S	S	I3.05	2.95	3.25	2.40	L2.60
4	2.60	2.65	2.75	2.80	2.75	2.90	2.75	3.25	3.35	3.40	3.35	3.00	3.15	3.15H	3.05H	3.15	3.25	L3.35	3.40	2.80	3.00	3.15	2.80	2.55
5	2.60	2.60	2.65	2.75	2.95	2.50	2.65	3.00	L3.40	3.30	3.15	3.05H	L3.05	3.00	3.10H	3.15	3.10	L3.25	3.15	3.15	3.05	2.60	2.70	L2.65
6	2.60	2.90	2.85	2.65	2.60	2.40	2.65	3.15	I3.20	3.10	L3.30H	3.05	3.00	3.00	3.00H	3.00	3.30	3.20	L3.05	L3.15	I3.15	3.10	2.35	A
7	A	2.45	2.65	2.65	2.40	2.35	2.65	3.35	3.05	3.30	3.10	3.05	3.00	3.05	L3.05H	3.10	3.20	3.35	3.05	I3.10	I3.25	2.70	2.65	2.70
8	2.75	2.80	2.90	2.50	2.70	2.70	2.85	L3.25	3.25	L3.25	3.25H	3.05	2.90H	S	SH	2.85	2.95	I3.05	2.95	3.00	I2.80	L3.10	3.10	L2.55
9	L3.00	2.85	2.90	2.70	2.65	2.35	2.80	I3.15	3.45	3.25	3.30H	3.05H	3.00	L3.00	L2.90SH	I3.05	3.05	L2.95	L3.10	S	I3.10	2.65	2.90	2.90
10	2.75	2.70	2.75	2.70	2.50	2.80	2.65	L3.00	3.45	3.15	3.10	3.05H	I3.05H	2.95	3.00H	3.20	3.05H	2.90H	L3.10	3.20	2.90	3.15	2.85	2.55
11	I2.90	3.00	2.70	2.75	2.90	2.60	2.75	3.05	3.40	3.45	3.35	3.45	3.15	3.00	3.00	3.10	3.15	3.25	L3.20	L3.05	3.15	2.80	2.90	2.55
12	2.65	2.55	2.50	2.80F	3.15F	2.65	2.85	3.25	3.25	3.30	3.50	3.30	3.20H	3.00	3.00	2.90	3.10	3.20	L3.10	S	3.25	3.10	L2.20	2.55
13	2.90	2.80	2.65	2.50	2.45	2.75	2.50	2.80	3.25	3.20	I3.15	L3.10	3.05	3.05	2.95	3.00	L3.10	L3.10	I3.20	3.15	3.30	2.80	3.15	2.70H
14	L2.85	L3.00	3.20	2.90	2.70	2.60	2.85	3.25	3.30	3.20	3.50	3.10	3.30H	3.10	3.15H	3.25	3.40	3.10	3.10	L3.25	I3.40	2.80	I3.00C	2.85
15	2.80	2.95	2.95	2.95	2.95	2.55	L2.80	3.05	L3.40	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	C	C	3.35	3.05H	L3.10C	I3.30C	3.50H	3.15	3.05	3.05	3.25	C	C	C
17	C	C	C	C	C	C	C	C	C	C	3.20H	I3.20C	3.30H	3.10	3.25H	3.30	3.35	I3.20	3.10	3.50	3.35	3.35	3.20	2.65
18	2.65F	2.75	I2.95A	3.30	3.10	2.85	2.90F	3.10	3.60	L3.55	L3.45	3.45	3.35	3.15	3.15H	3.35H	I3.45	L3.10	3.20	L3.35	I3.60	3.00	L2.35	2.90
19	3.05	2.75	3.00	2.35	2.45	2.50	2.50	3.00	S	3.80	3.40	3.20	3.45	C	C	C	3.30	3.20	3.20	L3.45	3.15	2.85	2.75	3.15
20	3.15	2.70	2.70	2.75	2.65	2.70	2.80	3.10	L3.70	3.10	3.45	3.55	3.35	3.20H	3.30H	3.30	3.35	3.35	3.30	L3.75	2.90	L2.80S	I2.90A	3.60
21	2.70	2.70	L2.60B	2.50F	2.50F	2.60	2.70	L3.05	3.45	3.45	3.45H	3.45	3.00	3.10	3.05	3.30	L3.20	3.30	3.45	A	A	A	Fs	3.75
22	I3.20A	2.75	2.65	2.60	2.40	2.80F	2.85	I3.00A	3.05	3.40	3.60	3.50F	3.05	3.10H	3.15	L3.15	I3.20C	3.30	S	A	A	A	A	3.15
23	I3.30A	3.15	A	A	2.55	2.75	3.00	I3.10A	L3.35	3.35	3.45	3.40	3.30	3.00	3.15	L3.40	3.30	3.40	3.40	A	A	A	2.70	2.95
24	3.45	2.90	3.00	2.55	2.65	2.60F	2.70	3.15	I3.30	3.40	3.55	L3.25	3.30	3.15R	3.35R	L3.40R	3.15	3.35	L3.45	3.40	3.60	3.05	2.35F	I2.90A
25	2.95	F	F	3.06F	F	F	F	3.20	I3.40	3.30	3.40H	L3.55H	L3.35C	3.40	3.20	3.35	3.25H	3.30	L3.45	3.55	L3.30	3.50	L2.95C	3.20
26	C	C	C	C	C	C	C	C	C	C	C	C	C	3.25	C	C	C	C	C	C	C	C	2.75	2.85
27	2.80	3.20	L3.55	2.65	2.45	2.60	3.10	3.20	3.70	3.20	3.40H	3.35F	3.10	3.05	L3.10SH	L3.30C	3.45	3.30	3.10	3.15	3.30	I2.80	L2.80	C
28	C	C	C	C	C	C	C	C	3.40	3.25	3.25	3.35	3.05H	3.15	3.25	3.25	3.10	L3.40	I3.40	3.30	3.40	3.10	2.90	L3.00
29	I3.50	2.85	2.65	2.45	2.65F	2.75	2.65	2.80	3.20	3.35	L3.40	3.30H	3.20H	3.20H	3.20	3.20	3.35	3.35	3.15	3.20	L3.25	3.40	2.80	A
30	A	A	2.85	2.45	2.45	2.75	3.05	2.95	L3.25	3.10	3.35H	3.35	3.25	3.25H	3.15	3.35	3.25	3.30	3.65	3.15	2.95	L2.85	2.95	2.75
31	3.10	2.50	I2.90A	2.95	2.85	2.40	2.90F	3.35	3.30	L3.30	3.30	3.35H	3.15H	3.15H	3.05	3.20	3.20	3.35	3.50	2.75	3.25	2.55	L3.00	3.00
No.	25	25	25	26	26	26	26	27	27	27	28	27	28	26	25	26	27	27	26	24	26	25	27	26
Median	2.85	2.80	2.85	2.70	2.65	2.60	2.80	3.10	3.35	3.30	3.35	3.30	3.15	3.10	3.10	3.20	3.20	3.25	3.20	3.15	3.20	3.00	2.85	2.85

(M3000)F2 Sweep 1.0 Mc to 20.0 Mc in 30 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 7

IONOSPHERIC DATA

Yamagawa

Lat. 31° 12.5' N
Long. 130° 37.7' E

Dec. 1960

(M3000)F1

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

The Radio Research Laboratories, Japan.

(M3000)F1

Sweep 1.0 Mc to 20.0 Mc in 30 ~~min~~ sec in automatic operation.

Y 8

IONOSPHERIC DATA

Dec.1960 | h'F2 | 135° E Mean Time (G.M.T. + 9h.) | Yamagawa | Lat. 31° 12.5' N, Long. 130° 37.7' E

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

h'F2

Sweep 1.0 Mc to 20.0 Mc in 30 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

IONOSPHERIC DATA

Yamagawa

Lat. 31° 12.5' N
Long. 130° 37.7' E

Dec.1960

h'F

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	255	260	260	255	225	405	320	250	220	230	230H	230	220H	215H	225H	240	250	250	230	240	350	290	245	290
2	300	245	265	270	350	300	355	290	250	240	240	C	C	C	C	C	C	C	C	210	250	255	250	285
3	360	340	250	270	290	275	E350A	255	240	240	225H	220H	220H	200H	210H	230	225	225	200	200	225	235	250	270
4	300	305	300	300	305	280	300	250	230	245	235	230	220	210H	210H	200H	240	230	205	235	255	240	250	335
5	355	345	300	300	265	265	340	285	240	240	235	230H	205H	240	250	250	230	225	210	220	205	255	275	310
6	300	275	270	335	310	390	335	260	240	245	225H	240	245	235	220H	240	235	205	225	250	225	240	325	A
7	A	350	300	300	310	400	325	240	240	255	245	265	255	250	250	240	240	225	240	I290A	I265A	E350A	310	325
8	315	290	250	350	300	275	300	255	250	240	225H	220	220H	240	250H	245	250	230	200	250	240	250	245	290
9	250	300	290	355	320	400	E400A	255	235	230	220H	220H	240	225	230H	225H	240	230	225	205	235	250	280	275
10	250	310	320	E375A	350	300	325	280	240	235	225	240	230H	250	245H	240	225H	225	205	225	210	235	250	310
11	300	260	305	310	290	310	300	270	240	230	235	230	240	240	240	245	240	225	220	250	220	205	250	350
12	330	345	360	350	275	300	295	255	235	240	230	230	225H	225	230	230	255	220	220	240	225	225	250	340
13	300	310	325	390	305	310	360	285	230	235	I225C	215	235	230	245	240	250	220	225	240	225	250	240	260C
14	300	270	260	260	300	320	295	250	220	230	230	225	220H	240	210H	250	240	210	230	240	210	210	I260C	300
15	300	295	280	290	270	355	340	280	240	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	C	C	250	245H	255	I230C	220H	240	230	255	225	C	C	C
17	C	C	C	C	C	C	C	C	C	C	205H	I230C	225H	230	230H	245	220	225	240	230	220	210	S	E350S
18	395	375	I315A	245	255	A	280	250	230	230	225	230	230	235	225H	230H	220	250	250	240	210	220	300	255
19	255	300	280	E475B	370	350	340	280	230	230	240	260	260	C	C	C	230	225	270	235	250	260	310	260
20	215	325	310	310	325	350	310	255	230	230	250	245	225	225H	230H	240	230	230	240	205	235	300	I340A	240
21	E350S	E350S	B	375	355	450	S	280	235	240	230H	230	215	230	235	240	230	240	225A	A	A	A	280	220
22	I290A	375	375	365	360	330	I315A	I300A	255	250	230	210H	235	240H	240	230	I240C	250	260	A	A	A	A	230
23	A	E300A	A	A	E400B	330	280	A	255	245	250	250	240	250	250	250	240	240	205	A	A	A	340	280
24	225	350	270	360	380	350	325	270	240	235	225H	225	240	255	250	250	240	240	220	240	240	E280A	450	I320A
25	475	335	255	250	400	400	260	250	245	245	235H	240H	240	260	255	240	235H	240	210	220	205	225	255	235
26	C	C	C	C	C	C	C	C	C	C	C	C	C	240	C	C	C	C	C	C	C	C	300	310
27	345	275	215	225	400	E400S	305	230	230	240	230H	205H	230	230	200H	I235C	245	230	245	250	225	270	275	C
28	C	C	C	C	C	C	C	C	250	250	260	255	245H	240	255	250	245	245	220	250	255	245	305	280
29	255	A	E395A	400	400	E320S	E420S	305	255	250	250	220H	220H	205H	225	240	230H	230	255	250	240	250	380	A
30	A	A	350	440	380	320	285	285	240	240	220H	230	255	250H	250	250	245	240	205	270	240	250	300	315
31	250	400	I345A	E360A	300	410	335	240	230	250	240	230H	225H	230H	220	240	250	245	205	290	240	240	255	265
No.	23	24	24	23	26	25	23	26	28	27	28	27	28	28	27	27	28	28	28	26	26	23	27	25
Median	300	310	295	310	310	330	315	260	240	240	230	230	230	240	235	240	240	230	225	240	230	245	275	285

h'F

Sweep 1.0 Mc to 20.0 Mc in 30 min/sec in automatic operation.

The Radio Research Laboratories, Japan.

Y 10

IONOSPHERIC DATA

Dec.1960 | k'Es | 135° E Mean Time (G.M.T. + 9h.) | Yamagawa | Lat. 31° 12.5' N, Long. 130° 37.7' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	E	E	E	E	S	S	4	110	110	155	110	105	155	4	130	110	100	S	110	S	S	S
2	S	S	E	E	E	E	S	115	115	110	140	C	C	C	C	C.	C	C	C	105	110	155	S	S
3	S	S	E	110	110	110	120	115	105	4	105	105	4	4	105	4	105	105	S	S	S	S	S	S
4	S	E	E	125	E	E	S	S	115	115	110	110	4	110	110	110	155	145	125	110	105	105	S	S
5	S	120	E	E	E	E	S	B	110	4	4	4	105	105	105	105	105	105	100	S	S	S	S	S
6	S	E	E	E	E	E	S	S	115	110	4	4	160	105	4	4	175	4	S	105	105	105	S	110
7	110	110	110	110	105	E	S	125	120	120	115	110	110	110	110	105	110	110	110	105	105	100	100	100
8	100	105	110	105	E	E	S	105	4	110	110	110	110	110	110	105	105	105	100	100	120	110	110	S
9	110	105	105	105	105	110	110	110	105	120	4	4	4	100	4	4	105	105	100	100	100	100	S	100
10	105	E	E	105	E	E	E	110	125	115	110	105	105	110	105	110	105	105	105	105	S	S	S	100
11	E	E	E	E	E	E	E	B	B	4	4	B	B	120	B	4	4	S	105	E	S	S	S	S
12	S	S	105	105	E	E	E	B	4	4	4	4	4	120	4	4	105	110	100	105	105	100	S	S
13	S	S	E	E	E	E	S	B	130	115	C	4	105	105	100	100	100	105	S	S	S	S	S	105
14	105	105	105	E	E	E	S	S	125	120	115	110	110	4	4	4	4	S	105	110	105	E	C	S
15	105	100	E	E	E	E	E	B	B	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	C	C	B	4	110	C	110	105	125	E	S	C	C	C
17	C	C	C	C	C	C	C	C	C	C	4	C	110	110	105	4	4	S	S	S	E	S	130	S
18	110	110	105	E	110	105	105	110	4	4	4	105	105	105	150	105	105	105	100	110	110	105	S	S
19	105	110	110	110	E	E	120	125	115	115	120	110	110	C	C	C	105	105	110	110	105	105	S	S
20	S	S	E	E	E	E	S	S	145	145	110	110	110	110	110	110	110	105	110	S	S	100	100	100
21	100	S	B	E	125	E	S	120	120	105	105	110	110	105	105	4	4	S	105	105	105	105	100	110
22	105	110	110	E	E	E	110	105	105	110	B	B	B	B	4	110	C	120	110	110	105	100	100	100
23	100	100	105	100	E	E	E	110	105	105	105	105	100	100	105	105	110	115	105	105	100	100	E	E
24	E	105	E	E	E	E	E	105	105	110	B	B	B	B	B	B	B	130	S	110	110	105	105	105
25	105	105	105	105	105	105	S	110	120	115	4	B	B	105	105	110	4	125	120	S	110	110	S	S
26	C	C	C	C	C	C	C	C	C	C	C	C	C	4	C	C	C	C	C	C	C	C	S	100
27	105	S	E	E	E	S	E	S	4	4	4	4	110	110	105	C	105	110	110	105	S	110	S	C
28	C	C	C	C	C	C	C	C	130	120	125	120	120	125	120	120	115	4	S	110	110	110	105	105
29	105	105	105	105	105	S	105	S	120	110	110	110	105	100	4	4	125	105	100	100	105	100	105	105
30	105	105	105	105	105	105	105	110	105	110	110	105	105	105	105	105	105	105	105	100	100	100	100	S
31	100	100	100	100	100	100	S	S	4	4	110	110	105	105	105	105	105	100	110	S	S	S	S	S
No.	16	15	13	13	9	6	7	14	20	20	16	16	19	22	19	14	21	22	22	19	19	19	10	12
Median	105	105	105	105	105	105	110	110	115	110	110	110	110	105	105	105	105	105	105	105	105	105	100	100

k'Es

Sweep 10 Mc to 200 Mc in 30 ~~min~~ sec in automatic operation.

The Radio Research Laboratories, Japan.

Y11

IONOSPHERIC DATA

Yamagawa

Lat. 31° 12.5' N
Long. 130° 37.7' E

Dec.1960

Types of 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										l3	l2	h	l2	l2	h l2		h l	l2	f		f4			
2								l	l2	l2 h	h l									f3	f	f		
3				f	f2	f3	f2	l2	l		l2	l			l2		l	l						
4				f2					l2	l	l	l		l	l	l	h2	h	f	f2	f4	f2		
5		f							l3				l	l	l	l2	l	l4	f3					
6									l	l2			h	l			h2			f2	f2	f		f2
7	f3	f3	f2	f2	f2			l2	l2	C2	C2	l3	l3	l2	l2	l	l2	l5	f8	f3	f3	f3	f2	f2
8	f	f	f3	f				l		l	l	l	l	l	l	l2	l3	l3	f3	f3	f	f	f	
9	f	f2	f2	f3	f	f3	f7	l5	l3	l				l			l	l3	f2	f	f	f		f
10	f			f2				l	l	l2	l2	l2	l	l3	l2	l2	l2	l2	f	f				f
11														l					f					
12			f	f										l			l	l2	f3	f3	f2	f		
13									l	l2			l	l	l	l3	l	l						f
14	f	f	f						l	l	l	l	l						f	f	f			
15	f	f																						
16															l		l	l	f2					
17													l	l	l								f	
18	f	f2	f3		f2	f2	f	l				l	l	l	h l	l3	l3	l3	f3	f2	f2	f		
19	f	f	f2	f2			f4	l	l3	l2	l	l3	l4				l2	l	f6	f4	f	f		
20									h2	h l	l2	l3	l4	l2	l2	l2	l	l4	f			f2	f2	f
21	f				f			l	l2	l	l	l	l	l	l				f3	f2	f3	f2	f	f
22	f3	f2	f				f5	l4	l2	l2						l		h3	f4	f3	f2	f3	f2	f
23	f4	f2	f	f				l3	l3	l	l	l	l	l	l	l	l	l3	f	f2	f2	f2		
24		f						l	l	l								h		f2	f2	f2	f3	f3
25	f3	f2	f2	f	f	f		l	l3	l				l	l	l		l	f		f	f3		
26																								f
27	f2												l	l	l2		l2	l2	f4 f3	f2		f		
28									C6	h3	h2	h3	h2	h	l2	h4 l2	l3			f4	f5	f2	f2	f2
29	f3	f2	f2	f	f		f		l3	l3	l2	l2	l2	l			l	l2	f2 f2	f2	f3	f2	f2	f3
30	f3	f2	f4	f3	f2	f3	f2	l2	l4	l3	l	l	l	l	l3	l2	l	l2	f3	f4	f2	f2	f	
31	f	f	f3	f3	f2	f3					l	l	l	l	l2	l2	l2	l	f					
No.																								
Median																								

The Radio Research Laboratories, Japan.

Types of Es

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation.

Y 12

SOLAR RADIO EMISSION 200 Mc/s

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

HIRAISO

Time in U.T.

Dec. 1960	Steady Flux					Variability				
	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
1	8	7	8	(9)	8	0	0	0	(1)	0
2	23	24	-	-	21	1	1	-	-	1
3	9	9	9	-	9	0	0	0	-	0
4	9	8	9	-	8	1	1	0	-	1
5	(21)	19	(11)	-	19	(2)	1	0	-	1
6	9	8	(8)	-	9	0	0	(0)	-	0
7	7	6	-	-	7	0	1	-	-	1
8	7	8	(8)	-	7	0	0	(1)	-	0
9	7	7	9	-	8	0	0	0	-	0
10	8	8	(8)	-	8	0	0	(0)	-	0
11	8	8	(8)	-	8	0	0	(0)	-	0
12	9	9	9	-	9	0	0	0	-	0
13	8	8	8	-	8	0	0	0	-	0
14	7	8	8	-	8	0	0	0	-	0
15	8	7	8	-	8	0	0	0	-	0
16	6	6	(6)	-	6	0	0	(0)	-	0
17	7	8	(9)	-	7	0	0	(0)	-	0
18	9	8	5	-	8	0	0	0	-	0
19	10	10	(7)	-	10	0	0	(0)	-	0
20	9	8	(8)	-	8	0	0	(0)	-	0
21	9	8	7	-	8	0	0	0	-	0
22	8	7	(7)	-	8	1	0	(0)	-	0
23	(13)	9	7	-	9	(0)	0	0	-	0
24	8	9	9	-	9	0	0	0	-	0
25	8	8	7	-	7	0	0	0	-	0
26	6	7	7	-	7	0	0	0	-	0
27	8	7	7	(9)	7	0	0	0	(0)	0
28	8	8	8	-	8	0	0	0	-	0
29	7	8	9	-	8	0	0	0	-	0
30	8	7	(7)	-	7	0	0	(0)	-	0
31	6	9	9	-	8	0	0	0	-	0

Outstanding Occurrences

Dec. 1960	Start-time	Dura-tion	Type	Max. Int.		Max. Time	Remarks
				Inst.	Smd.		
3	2349.2	1.2	CD/4	1150	200	2350.2	
7	0316.0	3	CD/4	660	40	0316.7	
19	0230.4	2.4	CD/4	770	260	0232.0	

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Dec. 1960	Whole Day Index	L. N. 06 12 / 12 18 / 18 24	W W V 00 06 / 06 12 / 12 18 / 18 24	S. F. 00 06 / 06 12 / 12 18 / 18 24	W W V H 00 06 / 06 12 / 12 18 / 18 24	Warning 00 06 / 06 12 / 12 18 / 18 24	Principal magnetic storms start	end	ΔH
1	2o	2 1 -	1 Z Z 1	1 3 3 3	2 1 1 3	U U U U			
2	2+	1 2 2	2 Z Z 1	3 3 2 2	1 1 1 1	U U N N			
3	2+	1 C C	1 Z Z 2	3 3 2 3	1 2 3 2	N N N N			
4	2o	3 C C	1 Z Z 1	2 (2 2 2)	1 2 2 3	N N N N			
5	1o	1 C C	1 Z Z 1	2 1 1 1	2 2 1 3	N N N N			
6	1+	1 2 3	1 Z Z 1	1 1 1 2	1 1 1 1	N N N N			
7	1+	1 1 1	3 Z Z 1	1 1 1 1	1 1 1 1	N N N N			
8	1+	1 1 2	(2) Z Z 2	1 - C C	2 1 2 2	N N N N			
9	2-	2 1 3	1 Z Z 2	1 (1) 2 2	1 1 1 1	N N N N			
10	1+	1 1 2	1 - 1 1	2 1 (2) 2	1 1 1 1	N N N N			
11	2-	1 1 1	1 Z Z 2	2 3 2 2	1 1 3 2	N N N N			
12	1+	1 1 2	1 Z Z 1	1 1 1 2	2 1 3 2	N N N N			
[13]	1+	2 1 2	2 Z Z 2	1 1 1 1	2 1 2 1	N N N N			
[14]	2-	C C C	3 Z Z 1	2 (2) 1 2	3 2 3 2	N N N N			
[15]	3-	C C C	2 Z Z 3	2 2 2 4	3 2 2 2	N N N N	0200	---	
16	3-	C C C	5 Z Z 1	4 1 2 2	2 1 2 1	U U U U	---	2300	120γ
17	3-	C C C	1 Z Z 4	3 2 3 2	1 2 2 1	N N N N	2330	---	
18	3-	C C C	2 Z Z 3	2 2 3 2	1 1 3 1	N N U U	---	---	
19	2-	C C C	3 Z Z 3	1 1 1 1	1 2 3 2	U U U U	---	2000	95γ
20	1+	C C C	2 Z Z 3	1 1 1 1	1 1 1 1	U N N N			
21	2+	C C C	3 Z Z 3	3 2 2 1	1 1 3 2	N N N N			
22	2+	C C C	2 Z Z 2	2 3 2 2	2 1 2 1	N U U U			
23	2o	C C C	3 Z Z 3	2 1 2 1	2 1 1 1	U U U N			
24	2-	C C C	2 Z Z 1	3 2 1 2	3 3 2 2	N N N N			
25	1+	C C C	1 Z Z 1	2 (2) 1 (1)	3 2 1 1	N N N N			
26	1+	(2) C C	2 Z Z 1	1 1 1 2	1 1 1 3	N N N N			
27	2o	(2) C C	1 Z Z 3	2 1 2 2	1 1 2 (2)	N N N N	0510	---	
28	3+	3 C C	4 Z Z 3	2 2 3 3	1 1 2 2	N N N N	---	2100	101γ
29	2-	2 C C	3 Z Z 2	1 1 1 1	1 1 2 1	N N N N			
30	3o	3 C C	2 Z Z 2	2 3 3 2	2 1 1 2	N N N N			
31	2+	2 (1 1)	2 Z Z 2	3 2 2 (2)	2 2 2 1	N N N N			

SUDDEN IONOSPHERIC DISTURBANCES

(S.I.D.)

HIRAISO

Time in U.T.

Dec. 1960	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										
	None														

IONOSPHERIC DATA IN JAPAN FOR DECEMBER 1960
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