F—173

IONOSPHERIC DATA IN JAPAN

FOR MAY 1963

Vol. 15 No. 5

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Prepared by

THE RADIO RESEARCH LABORATORIES
MINISTRY OF POSTS AND TELECOMMUNICATIONS
KOKUBUNJI, TOKYO, 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°08.2'E.	Tegata Nishishin-machi, Akita-shi, Akita-ken
Kokubunji	35°42.4'N.	139°29.3'E.	Koganei-shi, 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.	Isozaki-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_oF2, f_oF1, f_oE — The ordinary-wave critical frequency for the $F2$, $F1$ and E layers respectively.

f_oE_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 normal frequency range. Used in a qualifying sense, see below.

E — Measurement influenced by, or impossible because of, the lower limit of the normal frequency range. Used in a qualifying sense, see below.

F — Measurement influenced by, or impossible because of, the presence of spread echoes.

G — Measurement influenced or impossible because the ionization density 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 by, 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 magneto-ionic component.

c. **Description of Standard Types of E_s**

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

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

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

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

q As 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 thick 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 can 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=very poor (very disturbed)
2=poor (disturbed)
3=rather poor (unstable)
4=normal
5=good

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 averages of the 6-hourly indices of London, WWV and S. F.

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 prepared 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……Various commercial circuits (San Francisco)
H A……WWVH 15 Mc and 10 Mc (Hawaii)
T O……JJY 15 Mc and 10 Mc (Tokyo)
S H……BPV 15 Mc and 10 Mc (Shanghai)
L N……Various commercial circuits (London)

Start-time and Duration, Types and Importances are described from the data of a circuit whose Drop-out Intensity is underlined. Drou-out Intensities of 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

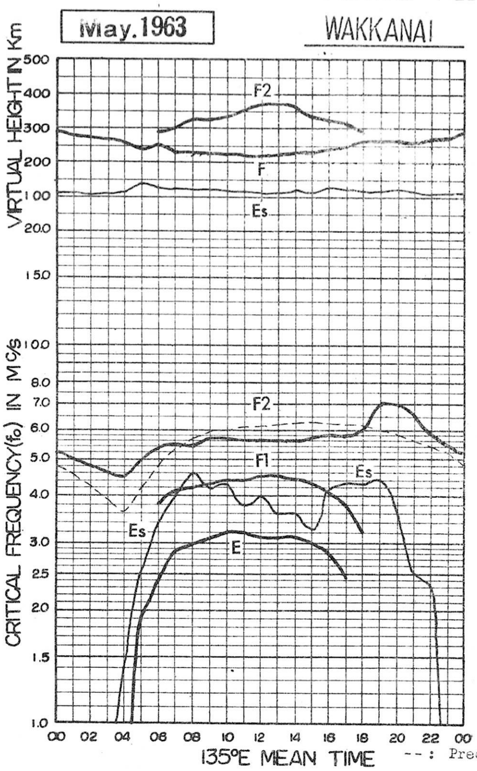
Importances

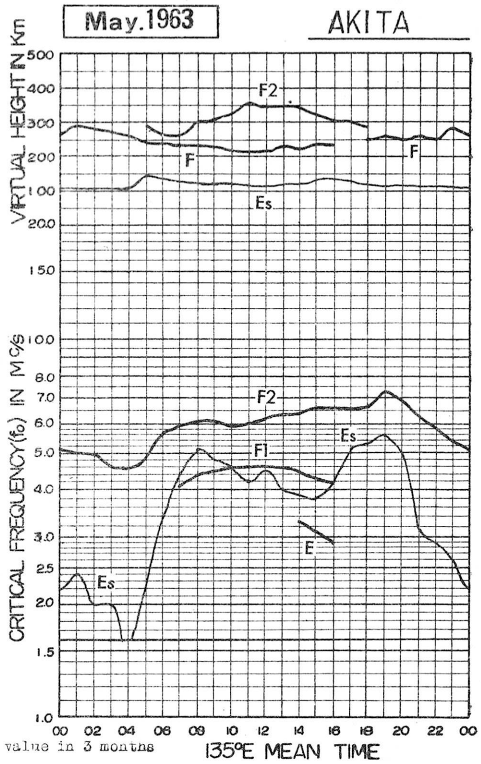
Degrees of SWF are classified into 9 grades according to the amplitude of fade-out;

1−	1	1+
2−	2	2+
3−	3	3+

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.

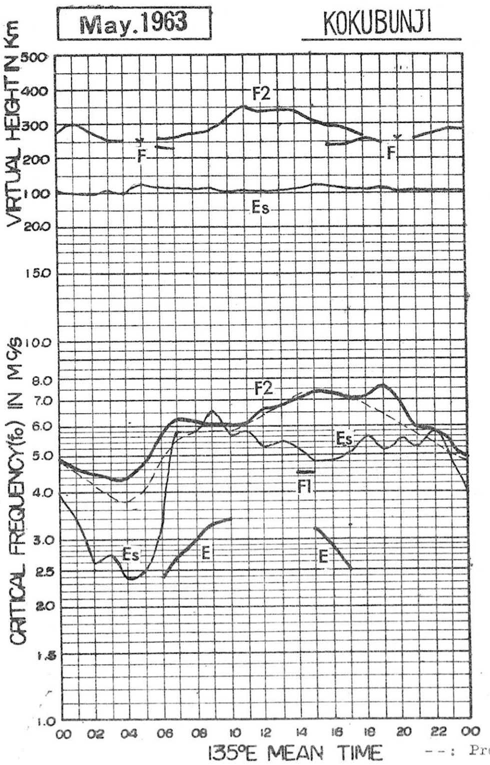
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS

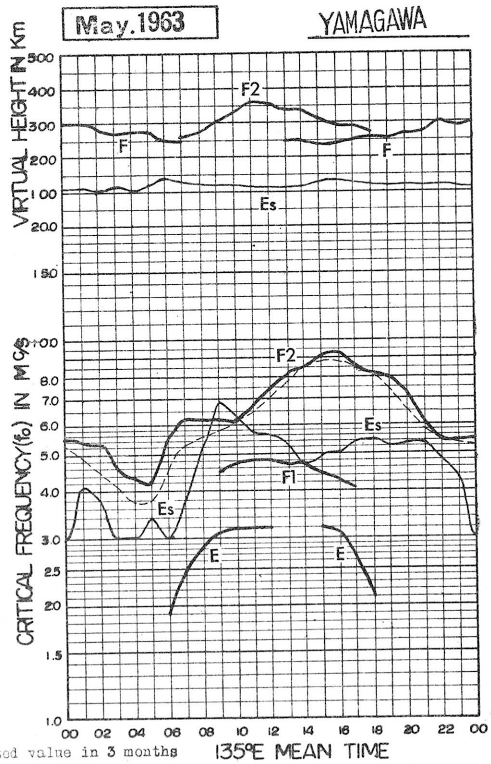




-- : Predicted value in 3 months advance by R.R.L.

IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





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

IONOSPHERIC DATA

May.1963 | 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	5.2	5.1	4.6	3.7	U3.6S	5.0	U4.0R	5.3	6.1	5.3	5.5	4.9	5.8	5.6	7.8	I7.0B	6.9	5.6	5.7	6.3	U6.3S	5.5	5.8	5.4
2	I4.7SF	4.8	4.6	U4.3SF	I4.1SF	4.0	3.9	4.3	R	R	R	R	R	R	4.6	4.9	4.7	5.0	5.3	5.5	U4.7S	4.6	4.4	4.3
3	4.2	4.3	3.9	3.6	3.6	4.6	5.1	5.0	5.4	5.3	I5.1A	5.2	5.5	5.5	I5.7A	5.4	5.2	5.4	6.3	7.0	5.9	4.6	3.8	3.6
4	3.6	3.6	3.7	3.8	3.8	4.4	4.3	4.6	4.9	5.0	5.3	5.1	5.7	5.5	5.3	5.6	5.8	I6.0A	7.2	7.2	U7.2S	5.1	4.7	I4.7A
5	I4.5A	I4.0SF	3.6	3.3	3.2	4.1	4.0	4.3	5.0	5.2	I5.0C	4.8	I5.1A	5.3	5.1	5.4	5.6	5.8	5.8	J6.2S	5.3	5.2	4.8	I4.4S
6	I4.3A	4.3	4.2	3.6	3.9	I4.4A	I5.0A	I5.1A	I5.3A	5.3	A	A	A	5.3	5.8	5.7	I5.7A	I5.7A	5.7	6.2	U6.5SF	5.8	4.7	4.3
7	U4.3S	U4.3S	3.7	I4.1SF	U4.6S	5.1	5.4H	5.4	5.4	6.4	6.1	6.2	5.9	6.3	5.8	5.7	5.8	5.8	5.8	7.0	U7.4S	6.4	5.7	5.1
8	4.7	4.6	4.8	4.1	4.2	5.2H	5.8	5.8	5.7	5.8	5.2	5.4	5.7	6.4	6.0	5.8	5.8	5.7	6.0	7.0	7.0	7.1	5.6	4.9
9	4.3	4.4	4.3	4.3	4.6	5.0	5.4H	5.7	7.0	7.2	6.2	5.7	5.6	6.1	6.1	6.3	6.3	6.5	6.9	7.5	8.0	8.0	5.9	5.6
10	5.4	5.2	4.8	4.7	4.5	4.7	4.6	5.0	5.1	5.0	5.2	5.2	5.4	5.4	5.3	5.8	5.6	I5.5S	5.9	6.3	6.8	U6.6S	5.8	5.0
11	4.3	4.3	4.3	4.4	4.5	4.7	5.1	5.5	5.1	5.3	I5.4A	6.0	5.8	6.0	6.3	6.3	6.7	6.6	6.3	6.0	U6.6S	6.6	6.6	5.8
12	5.4	5.4	5.0	4.7	4.3	4.6H	5.3	A	A	A	5.7	5.6	5.5	5.9	6.0	6.6	6.0	5.6	I6.0A	7.2	7.2	7.0	7.0	5.9
13	5.1	4.6	4.6	4.6	4.4	5.4H	5.6	5.9	5.3	5.6	5.8	6.2	6.1	6.2	7.2	6.5	7.5	7.3	6.7	I7.4S	7.3	7.5	6.6	6.4
14	5.4	5.4	5.0	4.5	4.6	4.9	5.1	5.3	5.3	5.0	5.0	4.9	5.0	5.4	5.2	5.1	5.3	5.3	6.3	U7.3S	6.9	6.4	6.3	5.8
15	5.8	5.5	5.5	5.0	5.0	4.2H	4.7	4.8	5.3	5.7	5.6	5.6	5.5	5.2	5.5	5.8	5.8	5.9	6.5	6.8	6.5	5.4	5.3	5.0
16	4.9	4.6	4.6	4.4	4.5	4.6	5.5	5.7	5.4	5.7	6.4	5.8	5.8	5.8	6.1	6.7	6.1	5.5H	6.4	7.3	7.3	6.9	6.6	6.5
17	6.0	5.6	5.0	4.6	4.6	5.6	6.9	6.7	5.7	6.0	6.0	6.0	6.0	6.1	5.9	6.2	I6.4C	6.2	6.9	7.4	6.6	6.6	6.5	6.3
18	5.9	5.6	5.3	5.2	5.1	5.8	6.3	A	A	A	6.0	6.2	6.3	5.8	I5.8A	5.7	A	A	A	A	7.1	6.3	6.0	5.7
19	5.2	5.0	5.0	U5.1S	5.0	5.0	5.8	6.6	6.0	6.2	6.1	5.5	5.3	5.2	I5.6A	5.8	I5.6A	I5.8A	6.0	7.5	7.8	7.0	5.8	5.0
20	5.0	5.0	4.7	4.8	U4.6SF	5.3H	6.0	6.3	6.3	5.8	5.8	5.7	I6.2A	6.2	5.4	5.7	5.7	6.0	I6.2A	6.1	6.1	5.9	5.7	5.4
21	5.3	5.0	5.0	5.0	5.0	5.3	5.3	5.1	5.1	5.3	5.4	5.7	5.5	5.6	5.8	5.7	5.9	5.7	5.9	6.8	7.3	7.0	6.2	5.4
22	5.2	5.1	5.0	U4.7SF	U4.5SF	5.3	6.5	6.7	6.0	I5.7A	5.2	I5.9A	I5.4A	5.5	5.3	5.6	5.7	6.3	7.3	8.3	7.7	U6.5S	6.3	5.9
23	5.9	5.7	5.5	5.3	5.2	5.6	6.0	6.6	7.3	7.0	6.3	5.7	5.6	5.5	5.5	5.7	6.0	6.0	7.1	8.0	7.5	7.1	6.5	6.3
24	5.8	5.2	5.3	5.2	5.4	5.8H	6.6	7.5	7.5	6.3	5.8	5.8	6.1	5.3	I5.4A	5.6	5.6	5.9	I7.0A	I8.4A	9.3	I8.0A	I5.8A	U4.0SF
25	4.0	SF	SF	SF	U4.3S	4.8	5.0	5.7	6.9	6.2	6.1	5.6	5.7	6.0	U6.1R	6.2	5.8	5.8	6.0	6.9	U7.7S	7.8	6.3	5.5
26	5.4	5.1	5.0	I5.0SF	U5.2SF	5.8	I4.6A	I5.2A	I5.5A	I6.0A	5.7	6.1	5.5V	5.8	5.7	5.7	6.1	I5.8A	I5.9A	7.2	7.7	I7.3SF	U6.3S	5.2
27	U4.8SA	SF	FS	FS	FS	U5.9SF	5.9	6.1	5.6	6.0	5.5	5.3	5.4	4.9	5.1	5.3	5.7	5.8	6.0	7.0	7.0	U6.7S	5.8	5.7
28	5.3	5.0	4.9	5.2	5.1	5.5	6.3	6.0	5.8	6.6	6.3	5.4	5.4	5.6	5.4	I5.9A	6.8	U6.1S	7.0	7.3	U7.3S	U7.0S	6.4	6.7
29	5.8	4.6	U4.4S	I4.3SF	U4.3SF	A	A	A	I5.3A	A	A	A	A	A	A	5.2	5.3	A	A	A	A	A	I5.0A	I4.8A
30	A	A	A	A	A	A	A	A	A	A	A	A	A	A	5.0	5.5	I5.2A	I5.7A	I5.6A	5.3	6.3	6.3	5.9	5.5
31	4.0	4.1	4.1	4.3	4.2	4.5	5.3	5.3	I4.8A	I4.9A	5.0	I5.1A	I5.0A	4.7	4.9	5.0	5.1	5.0	5.3	6.5	6.6	6.3	5.7	5.1
No.	30	28	28	28	29	29	29	27	27	26	27	27	27	28	30	31	30	29	29	29	30	30	31	31
Median	5.2	5.0	4.8	4.6	4.5	5.0	5.3	5.5	5.4	5.7	5.7	5.6	5.6	5.6	5.6	5.7	5.8	5.8	6.0	7.0	7.0	6.6	5.8	5.4
U.Q.	5.4	5.2	5.0	5.0	5.0	5.4	6.0	6.1	6.0	6.2	6.1	5.9	5.8	6.0	6.0	6.2	6.1	6.0	6.8	7.4	7.4	7.0	6.3	5.8
L.Q.	4.3	4.4	4.3	4.2	4.2	4.6	4.8	5.1	5.3	5.3	5.2	5.2	5.4	5.4	5.3	5.5	5.6	5.6	5.8	6.3	6.5	5.9	5.7	4.9
Q.R.	1.1	0.8	0.7	0.8	0.8	0.8	1.2	1.0	0.7	0.9	0.9	0.7	0.4	0.6	0.7	0.7	0.5	0.4	1.0	1.1	0.9	1.1	0.6	0.9

The Radio Research Laboratories, Japan

foF2 | Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

W 1

IONOSPHERIC DATA

May.1963 | foF1 | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45°23.6′ N Long. 141°41.1′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							3.3	3.8	I4.0A	4.2	I4.3A	4.4	4.6	4.3	4.3	B	A							
2							U3.4L	I3.8A	4.0	4.0	4.0	4.2	4.1	4.1	4.2	4.0	3.9	I3.5A						
3							3.6L	3.9	4.3	4.3	I4.4A	4.3	4.3	4.3	I4.3A	I4.3A	4.0	3.5	U3.0L					
4								3.9	4.1	4.3	4.4	4.3	4.4	4.4	4.3	4.1	I4.0A	I3.7A	U3.0L					
5							3.6	3.9	4.1	4.2	I4.4C	U4.4L	A	A	A	4.2	4.1	A						
6							A	A	A	A	A	A	A	4.5	4.4	4.4	A	A						
7								4.1	4.3	4.4	4.6	4.5	4.7	4.6	4.5	4.3	4.1	A						
8							U3.8L	4.0	4.2	4.4	4.6	4.6	4.6	4.4	4.4	4.3	4.1	A						
9								U4.1L	4.3	4.4	4.5	4.6	4.7	4.6	4.5	4.4	4.1	3.9						
10						U3.1L	U3.7L	4.0	4.2	4.3	I4.4R	4.4	4.5	4.5	4.5	4.3H	A	A						
11							3.8L	4.0	4.3	4.4	I4.5A	4.5	4.6	4.6	4.4	4.3	4.0	3.7						
12							A	A	A	A	A	4.6	4.6	I4.5A	4.5	4.4	4.1	4.0L						
13							4.0	I4.1A	4.3	4.6	4.6	4.6	4.8	4.6	4.5	I4.1A	I3.8A	U3.7L						
14							4.1	4.1	I4.2A	4.3	U4.4R	4.4	I4.5R	4.4	4.4	4.3	4.1	3.9	I3.2A					
15							3.8	4.3	4.3	4.3	4.4	4.4	4.5	4.5	4.4	4.3	4.1	4.0	A					
16							U3.6L	4.1	4.3	4.4	4.4	4.6	4.6	4.6	4.6	4.3	4.2							
17							4.0	4.1	I4.3A	4.4	4.5	4.6	4.6	I4.6A	4.5	4.3	I4.1C	4.1						
18							U3.8L	A	A	A	4.5	4.6	4.6	I4.5A	I4.4A	4.3	A	A	A					
19							4.1	I4.2A	I4.2A	I4.3A	4.4	I4.6A	4.5	4.5	I4.4A	R	A	A	A					
20							3.9	I4.1A	4.2	4.4	A	A	A	4.5	I4.3A	4.3	A	A	A					
21							3.8	4.1	I4.2A	I4.3A	I4.4A	I4.4A	4.4	4.4	4.3	4.3	4.2	3.8	A					
22						3.4	3.9	4.1	I4.2A	I4.2A	4.4	I4.4A	I4.4A	4.4	4.4	4.3	4.1	3.8	A					
23							I4.2A	4.1	4.2	4.4	4.4	4.4	4.4	4.4	4.3	4.2	A	A	A					
24							A	A	A	A	4.5	I4.5A	I4.5A	I4.5A	I4.4A	4.3	A	A	A					
25							4.1	A	A	A	4.5	I4.6A	4.6	4.4	4.4	4.3	4.1	3.8	I3.4A					
26								A	A	A	A	4.4	4.4	I4.4A	4.3	I4.2A	4.1	A	A	A				
27							I3.9A	4.0	4.2	4.4	I4.3R	4.3	4.3	4.4	4.3	I4.2A	I4.0A	3.8	3.3					
28							A	I4.1A	I4.3A	4.3	4.4	4.5	4.6	4.4	4.3	A	A	A	A					
29						A	A	A	A	A	A	A	A	A	A	4.2	I4.0A	A	A					
30							A	A	A	A	A	A	A	A	4.3	4.1	A	A	A					
31						3.3	3.7	A	A	A	A	A	A	4.5	4.3	4.2	4.0	3.9	3.4					
No.						3	21	22	22	22	24	26	25	28	29	28	21	15	6					
Median						3.3	3.8	4.1	4.2	4.3	4.4	4.4	4.5	4.5	4.4	4.3	4.1	3.8	U3.2					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foF1 Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

W 2

IONOSPHERIC DATA

May.1963

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						I1.60S	2.30	2.70	2.95	3.10	3.15	3.25	3.25	3.25	3.10	I2.95B	2.95	2.35	S					
2						I1.50S	I2.00S	2.60	2.85	3.00	3.05	3.00	3.15	I3.10A	3.10	2.90	2.60	2.20	S	S				
3						I1.65S	2.25	2.65	2.95	3.10	3.10	3.10	3.00	I3.15R	3.20	3.00	2.75	2.25	S	S				
4						I1.65S	2.25	2.65	2.85	3.00	3.15	I3.00A	I3.10B	3.20	3.15	3.00	2.70	2.25	S	S				
5						I1.60S	2.35	2.70	2.95	3.00	I3.10C	A	A	A	A	3.05	2.80	2.30	S	S				
6						I1.70S	2.20	2.70	2.90	3.10	3.15	3.20	3.15	3.00	3.15	2.95	2.85	2.35	S	S				
7						S	2.35	2.90	3.00	3.15	3.25	3.20	3.05	3.00	3.10	2.95	2.85	2.45	S	S				
8						S	2.40	2.90	3.00	3.10	3.25	3.25	3.10	3.00	3.10	3.00	2.80	2.50	S	S				
9					E	1.95	2.45	2.80	3.00	3.10	3.10	3.05	2.95	3.10	3.00	3.00	2.85	2.50	S	S				
10					A	I1.70S	2.50	2.85	3.00	3.10	3.20	3.25	3.35	3.15	3.25	3.00	2.80	2.35	S	S				
11					1.15	2.00	2.50	2.80	3.00	3.15	3.25	3.25	3.05	I3.00A	I3.00A	3.00	2.90	2.50	S	S				
12					S	1.90	2.45	2.85	3.05	3.15	3.25	3.15	3.15	I3.00A	3.00	I2.90A	I2.75A	2.50	S	S				
13					E	2.00	2.35	2.85	3.00	3.05	U3.20R	3.15	I3.00R	3.00	2.95	2.65	A	A	S					
14					S	2.00	2.50	2.80	3.00	3.05	I3.15B	I3.20B	I3.20R	3.15	3.15	3.00	2.85	2.45	S	S				
15					S	I1.85S	2.45	2.85	3.00	I3.10B	3.10	I3.05B	I2.90A	I3.05R	3.20	3.00	2.80	A	A					
16					S	2.00	2.50	2.90	3.05	3.20	3.25	3.00	3.25	I3.20B	3.15	3.00	U2.80R	2.60	S	S				
17					A	I2.05A	2.45	2.90	3.10	3.20	3.35	3.30	3.25	3.20	A	A	C	C	S	S				
18					1.10	1.85	I2.45B	2.85	3.00	3.15	3.20	3.20	3.10	3.00	I2.95A	I2.95A	2.85	2.35	S	S				
19					A	I1.95S	2.50	2.75	2.90	3.00	3.00	I3.05B	3.00	3.25	3.00	2.90	2.90	2.50	S					
20					E	1.95	2.55	2.90	3.05	3.20	3.20	3.20	3.10	I2.95A	3.20	3.00	2.85	2.45	S	S				
21					A	1.85	2.50	2.65	3.00	3.15	3.20	3.15	3.00	3.00	2.95	3.00	2.50	2.50	S	S				
22					A	2.00	2.50	2.85	3.00	3.10	3.20	3.20	3.00	A	A	A	A	2.45	S	S				
23					E	1.95	I2.40B	2.80	3.00	3.15	3.35	3.25	3.20	3.10	3.00	3.05	2.85	2.40	S	S				
24					1.30	2.15	2.60	2.95	3.05	3.15	I3.20B	3.20	3.00	I3.20B	I3.10A	3.00	2.90	2.50	S	S				
25					1.15	2.05	2.55	2.90	3.00	3.15	3.25	3.20	3.15	3.05	3.00	A	A	A	S	S				
26					A	2.15	2.60	2.80	3.00	3.10	3.15	3.10	3.00	I3.05A	3.20	3.00	2.90	2.40	S	S				
27					E	2.10	2.70	2.90	3.10	3.25	3.20	3.15	3.35	3.20	3.15	3.10	2.80	2.45	S	S				
28					E	2.15	2.60	2.85	3.00	3.10	3.10	3.15	3.20	3.25	3.30	3.10	2.85	2.50	S	S				
29					A	2.00	2.45	2.80	2.95	3.05	3.10	3.15	3.05	3.00	A	A	A	2.50	S	S				
30					A	2.05	2.40	2.80	3.00	3.00	3.05	3.15	3.10	A	A	R	2.80	2.40	S	S				
31					1.20	2.00	2.55	2.90	3.00	3.10	3.25	3.25	3.20	3.25	3.10	3.00	2.80	2.50	2.05	S				
No.					11	29	31	31	31	31	31	30	30	28	26	26	26	27	1					
Median					E	1.95	2.45	2.85	3.00	3.10	3.20	3.20	3.10	3.10	3.10	3.00	2.80	2.45	2.05					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foE

Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

W 3

IONOSPHERIC DATA

May.1963

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	J3.0	E	E	E	2.0	2.9	3.1	J4.3	4.4	J7.0	G	3.8	3.8	4.2	B	4.4	G	S	E	J2.5	2.5	E	E
2	E	E	E	E	E	S	3.4	3.8	J5.0	3.7	4.0	3.4	G	3.3	G	G	3.6	3.9	3.0	S	E	E	E	E
3	E	E	E	E	E	S	2.8	3.5	3.6	3.5	J7.3	3.7	3.4	G	J5.8	5.0	4.0	3.4	3.2	2.3	2.4	E	E	E
4	E	E	E	1.4	E	S	2.6	3.2	3.6	3.4	G	3.6	B	G	4.0	G	J5.6	J7.3	2.5	S	E	E	E	J7.3
5	J5.3	E	J2.3	E	E	S	3.2	3.8	3.8	3.5	C	J4.3	5.7M	5.0	5.3	4.0	4.3	J5.4	J4.5	6.0M	4.3M	J4.0	J3.3	J4.3
6	J4.3	J8.3	J6.0	J6.3	J2.3	J4.3	J5.3	5.8	J6.2	5.1	J6.5	J6.3	J5.5	J6.0	G	J5.0	J6.0	J11.6	J4.3	J5.0	J4.4	J5.0	J2.5	2.3
7	J2.3	2.3	2.4	1.4	2.2	S	G	G	3.4	G	4.0	3.7	4.5	3.8	G	G	4.0	J4.3	J4.4	3.6	J3.1	J3.0	E	E
8	E	E	E	J2.0	J2.1	J2.3	3.3	3.6	3.8	3.8	G	G	J4.3	G	3.6	G	3.6	J4.9	J5.0	J4.8	2.3	E	E	E
9	E	E	J2.5	E	G	G	2.0	3.3	4.0	3.8	3.8	G	G	G	G	G	G	2.9	3.0	S	E	E	E	E
10	E	2.4	E	E	1.6	2.3	2.9	3.3	3.9	3.7	3.8	G	G	G	3.7	G	4.2	J5.0	3.3	S	2.5	J2.3	2.5	2.3
11	E	E	E	E	G	G	2.8	4.3	J4.5	J4.3	6.3	3.9	4.1	3.5	3.4	G	G	G	2.5	3.1	E	E	J2.3	E
12	E	E	J2.4	2.0	S	2.5	J4.3	J5.3	J6.5	J6.2	J5.3	3.8	4.0	J4.8	3.6	3.6	J4.3	3.2	J9.0	J4.3	J2.3	J4.1	E	J2.8
13	E	E	E	E	E	2.5	3.5	4.2	3.8	3.9	3.6	3.5	G	G	3.5	J8.1	J7.6	J3.5	4.0	J4.9	J5.3	E	J3.9	E
14	E	E	E	E	S	G	2.8	3.9	J4.6	4.1	B	3.6	3.9	G	G	G	G	3.5	J4.2	S	2.4	E	E	E
15	E	2.4	2.5	E	S	S	3.3	3.8	J4.3	B	3.5	B	3.8	G	G	G	G	4.3	J4.3	E	E	E	4.0M	J4.0
16	E	J2.4	2.0	E	S	G	G	G	3.6	3.7	G	3.5	G	B	G	G	G	3.0	3.0	S	2.3	J3.5	E	E
17	2.4	E	E	E	1.9	2.6	3.3	3.8	4.7	3.8	4.0	J4.8	J5.2	J5.1	J4.3	3.3	C	3.8	5.0M	J4.6	J3.2	2.4	E	E
18	E	E	E	E	G	G	3.5	J6.5	J11.3	J8.6	J5.0	4.0	J4.3	J6.0	J11.3	J13.3	J9.0	J7.3	J9.4	J8.8	J3.3	2.3	E	E
19	E	E	J4.6	J3.1	J2.6	2.5	4.0	J4.3	J5.1	J6.6	J5.4	5.0	3.6	G	J9.6	3.8	J5.8	J9.0	J9.6	J3.8	J2.8	2.4	E	J2.5
20	E	2.0	1.8	J3.6	E	G	3.5	4.0	3.8	J4.3	4.9	4.6	J8.1	4.2	4.3	G	J4.4	J4.8	J7.3	J5.3	2.4	J4.8	J3.0	J2.3
21	E	E	J2.3	J2.0	1.5	2.3	3.2	4.1	4.3	4.4	4.3	4.3	J4.3	3.6	3.5	4.3	3.3	2.8	J4.5	J4.1	2.6	J2.3	J2.3	2.5
22	J4.0	J3.3	J2.3	J2.0	1.5	1.9G	3.0	4.0	J5.6	J8.1	J6.2	J6.3	J7.3	3.8	3.3	3.3	3.0	3.1	J3.8	J4.3	J4.3	J4.3	2.6	E
23	E	E	E	E	1.4	2.7	J5.2	J7.0	J6.0	4.2	G	G	4.0	3.5	3.4	3.6	5.0	J4.3	J4.3	J4.4	J5.0	J2.3	E	E
24	E	E	E	1.5	G	G	J4.3	J5.1	J6.0	J5.3	4.1	J5.0	J6.1	J5.1	J6.4	G	4.1	J5.4	J14.5	J10.6	J7.3	J9.0	J8.5	E
25	E	E	E	E	G	2.8	3.4	5.1	J5.6	J6.3	4.3	4.4	4.0	4.1	J4.3	J4.3	J3.3	2.9	3.3	J4.9	E	2.5	J3.3	E
26	E	E	E	E	J3.3	3.0	J5.0	J5.3	J10.0	J9.6	J11.3	3.8	J4.3	J5.1	4.8	J5.3	J5.0	J17.3Y	J17.3Y	J6.1	J5.1	J7.8	J4.3	J5.0
27	J3.3	J4.0	J3.5	J6.3	J4.0	3.3	J4.3	3.7	3.8	3.7	3.6	3.6	G	G	G	5.2	4.2	3.1	3.1	3.4	E	J4.1	2.4	E
28	J3.3	E	2.0	J2.3	2.8	4.0	J4.5	4.3	J5.2	4.0	J4.3	3.6	G	G	4.1	J7.1	J5.6	J7.6	J6.0	J4.3	J7.6	J4.3	J3.5	J6.3
29	J7.3	J4.3	J3.3	J8.5	J6.2	J9.3Y	J9.6	J9.3	J6.8	J14.0	J10.5	J11.0	J11.3	J6.1	J5.1	J5.1	5.0M	J7.8	J7.4	J7.1	J10.0	J7.3	J9.3	J6.3
30	J5.3	J9.0	J8.3	J7.4	5.0	J5.8	J7.5	J9.0	J7.3	J5.4	5.1	5.0	5.4	J6.4	4.5	G	J6.3	J9.6	6.0	J6.0	J5.2	J3.3	2.5	E
31	J3.1	E	E	2.2	G	2.6	3.5	J4.3	6.0	J7.0	4.9	J7.0	J5.0	3.7	G	G	3.8	2.8	2.6	J3.6	J3.6	2.7	J3.8	J3.3
No.	31	31	31	31	27	25	31	31	31	30	29	30	30	30	31	30	30	31	30	25	31	31	31	31
Median	E	E	E	E	1.4	2.5	3.4	4.0	4.6	4.2	4.3	3.8	4.0	3.6	3.6	3.3	4.2	4.3	4.3	4.4	3.6	2.5	2.3	E
U.Q.	3.1	2.4	2.4	2.2	2.3	2.9	4.3	5.1	6.0	6.2	5.8	4.8	5.0	5.0	4.6	5.0	5.0	7.3	6.0	5.6	4.4	4.1	3.3	2.8
L.Q.	E	E	E	E	E	G	2.9	3.6	3.8	3.7	3.7	3.5	3.4	G	G	G	3.3	3.1	3.2	3.6	3.3	E	E	E
Q.R.							1.4	1.5	2.2	2.5	2.1	1.3	1.6				1.7	4.2	2.8	2.0	1.1			

The Radio Research Laboratories, Japan

foEs

Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

W 4

IONOSPHERIC DATA

May.1963 | **fbEs** | 135° E. Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45°23.6′ N, Long. 141°41.1′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		2.6				G	G	G	4.2	G	4.4		G	G	G	B	4.3		S		E	E		
2						S	3.0	A	3.1	G	G	G		3.3			G	3.7	2.8	S				
3						S	G	3.4	G	G	A	G	G		A	2.8	3.8	3.3	G	G	E			
4				E		S	G	G	G	G		3.3	B		G		5.6	A	G	S				A
5	A		E			S	G	3.5	G	G	C	3.7	A	4.5	4.5	2.8	3.9	5.0	4.7	6.0	4.0	2.8	2.8	A
6	A	4.7	3.5	E	E	A	A	A	A	4.9	A	A	A	G		3.5	A	A	4.0	4.9	2.6	4.0	2.5	E
7	E	E	E	E	E	S			G		G	G	4.5	G			3.8	4.0	4.4	2.8	2.8	2.8		
8				E	E	G	G	G	G	G			G		G		G	4.6	5.0	4.5	E			
9			E				G	G	4.0	G	G							G	G	S				
10		E			1.2	G	G	G	G	G	E3.8R				G		4.1	A	3.0	S	2.3	E	E	E
11							G	G	G	G	A	G	G	3.5	3.4				G	2.7			E	
12			2.3	E	S	G	4.1	A	A	A	5.3	G	G	4.6	G	3.4	3.3	G	A	4.0	2.3	2.7		2.5
13						G	G	4.1	G	G	G	G			E3.5R	5.2	5.5	3.3	E4.0S	4.5	4.6		3.0	
14					S		G	3.8	A	G	B	E3.6R	E3.9R					G	4.0	S	E			
15		E	E		S	S	G	3.7	G	B	G	B	3.8					3.3	3.9				3.8	E
16		E	E		S				G	G		G		B				G	3.0	S	E	E		
17	E				1.6	2.4	G	G	4.3	G	G	G	G	4.7	3.6	3.2	C	G	4.8	4.2	2.7	E		
18							G	A	A	A	G	G	G	5.0	A	3.5	A	A	A	A	3.3	E		
19			E	E	1.6	G	4.0	4.2	5.0	5.7	4.0	4.7	G		A	E3.8R	A	A	4.5	3.8	E	E		E
20		E	E	3.0			3.2	4.0	G	G	4.6	4.6	A	3.9	4.3		4.4	4.5	A	4.7	E	E	E	E
21			E	E	E1.5R	G	G	G	4.1	4.5	4.3	4.3	G	G	G	G	G	G	4.0	3.6	E	E	E	E
22	3.0	E	E	E	1.3	1.8	G	G	5.0	A	4.0	A	A	3.6	3.3	3.2	3.0	G	3.5	3.5	3.8	4.0	E	
23					G	G	4.7	4.0	G	G			G	G	G	G	4.7	4.0	4.2	4.3	4.2	E		
24				E			4.0	4.6	4.8	5.1	4.0	4.8	4.7	5.0	A		4.1	4.9	A	A	6.3	A	A	
25						G	G	4.7	5.5	4.6	G	4.4	G	E4.1R	G	3.7	3.1	2.6	3.2	4.2		E	E	
26					2.1	G	A	A	A	A	4.4	G	G	4.4	3.9	4.7	G	A	A	4.2	4.0	5.1	3.1	4.0
27	E	E	E	E	G	G	4.0	G	G	G	E3.6R	G				4.7	4.2	G	3.0	2.6		E	E	
28	E		E	E	G	4.0	4.0	4.1	4.6	G	4.3	G			4.1	A	5.6	5.2	4.0	4.0	6.6	2.5	2.6	2.5
29	4.0	3.0	2.2	E	2.0	A	A	A	A	A	A	A	A	A	A	3.5	4.6	A	A	A	A	A	A	A
30	A	A	A	A	A	A	A	A	A	A	A	A	A	A	3.8		A	A	A	4.3	4.7	2.7	2.5	
31	2.3			E		G	G	4.1	A	A	4.6	A	A	G			G	G	G	3.2	3.3	E	3.2	2.9
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

fbEs Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

W 5

IONOSPHERIC DATA

May.1963

f-min

135° E Mean Time (G.M.T. +9h)

Wakkanai

Lat. 45°23.6′N
Long. 141°41.1′E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E1.90S	E1.50S	E2.00S	E	E	E1.70S	2.00	2.00	2.00	2.20	2.05	2.00	2.20	2.10	2.00	I3.70B	2.00	2.00	E2.00S	E2.00S	E1.90S	E2.00S	E2.00S	E2.00S
2	E2.00S	E1.50S	E	E	E	E1.95S	E2.15S	2.00	2.00	2.00	2.00	2.10	2.15	2.00	2.40	2.00	2.00	E2.00S	E1.90S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
3	E2.00S	E1.60S	E	E	E	E2.00S	2.00	2.00	2.15	2.10	2.15	2.20	2.15	2.00	2.00	2.00	2.00	2.00	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
4	E2.00S	E2.00S	E2.00S	E	E	E2.00S	2.00	2.00	2.00	2.00	2.00	2.00	3.40	2.10	2.15	2.00	2.00	2.00	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
5	E2.00S	E2.00S	E	E	E	E2.00S	2.00	2.00	2.00	2.15	I2.45C	3.00	2.30	2.15	2.00	2.00	2.00	1.95	E2.00S	E1.90S	E2.00S	E2.00S	E2.00S	E1.90S
6	E2.00S	E1.60S	E1.70S	E	E	E1.90S	2.00	2.00	2.15	2.00	2.00	2.15	2.00	2.50	2.50	2.00	2.00	2.00	E1.95S	E2.00S	E2.00S	E1.90S	E1.90S	E2.00S
7	E2.00S	E1.70S	E1.80S	E	E	E2.00S	1.85	2.00	2.00	2.00	2.30	2.60	2.00	2.50	2.00	2.00	2.20	2.00	E1.80S	E2.00S	E1.80S	E1.90S	E2.00S	E1.85S
8	E1.90S	E	E1.50S	E	E	E1.90S	1.90	2.00	2.00	2.00	2.40	2.10	2.20	2.10	2.15	2.30	2.00	1.80	E1.80S	E1.80S	E1.80S	E1.80S	E1.85S	E2.00S
9	E2.00S	E2.00S	E	E	E	1.10	1.80	1.95	2.00	2.00	2.25	2.00	2.15	2.15	2.30	2.20	2.15	2.00	E2.00S	E1.90S	E2.00S	E2.00S	E2.00S	E2.00S
10	E1.90S	E1.70S	E1.60S	E	E	E2.00S	1.85	1.90	2.50	2.20	2.50	2.60	2.50	2.50	2.50	2.00	2.00	2.00	E2.00S	E2.15S	E2.00S	E1.80S	E2.00S	E1.90S
11	E2.00S	E1.60S	E	E	E	1.50	2.00	2.00	2.00	2.15	2.35	2.80	2.50	2.50	2.50	2.15	2.20	1.90	E2.00S	E1.85S	E2.10S	E2.00S	E1.85S	E2.00S
12	E1.85S	E1.50S	E1.50S	E	E1.50S	1.60	1.80	2.30	2.15	2.40	2.50	2.10	2.50	2.40	2.20	2.50	2.00	1.90	E2.00S	E1.80S	E1.85S	E1.80S	E2.00S	E1.90S
13	E2.00S	E	E2.00S	E	E	E1.60S	E2.20S	2.30	2.20	2.50	2.40	2.50	2.40	2.50	2.50	2.20	2.25	2.00	E2.00S	E2.00S	E1.75S	E2.35S	E1.60S	E2.00S
14	E2.30S	E2.00S	E2.30S	E1.70S	E1.30S	E1.60S	2.35	2.45	2.25	2.50	3.50	3.30	3.20	2.50	2.60	2.10	2.15	1.90	E1.90S	E2.00S	E2.00S	E1.80S	E2.00S	E2.00S
15	E2.00S	E1.50S	E1.80S	E	E1.30S	E2.25S	2.00	2.00	2.30	3.40	2.25	3.50	2.85	2.50	2.30	2.20	2.20	2.10	1.90	E2.10S	E2.40S	E2.15S	E1.70S	E2.00S
16	E1.80S	E1.20S	E1.50S	E	E1.30S	E1.50S	2.00	2.15	2.00	2.05	2.50	2.50	2.50	3.70	2.50	2.10	2.40	2.00	E2.15S	E2.20S	E2.00S	E2.00S	E2.00S	E2.00S
17	E2.00S	E1.70S	E	E	E	E	2.00	2.10	2.15	2.10	2.20	2.40	2.15	2.50	2.25	2.20	I2.30C	E2.60C	E1.80S	E1.90S	E2.00S	E2.00S	E2.00S	E2.00S
18	E2.00S	E	E1.80S	E	E	1.15	2.50	2.00	2.00	2.10	2.10	2.15	2.15	2.20	2.10	2.15	2.20	1.85	E2.00S	E2.00S	E1.80S	E2.00S	E2.00S	E2.00S
19	E2.00S	E2.00S	E	E	E	E2.00S	1.95	2.15	2.15	2.20	2.70	3.05	2.50	2.20	2.20	2.30	2.10	2.10	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
20	E2.00S	E	E	E	E	E1.60S	2.15	2.20	2.15	2.15	2.50	2.50	2.50	3.00	2.20	2.15	2.00	2.00	E1.90S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
21	E2.00S	E1.95S	E	E	E	E1.20S	2.00	2.00	2.20	2.00	2.20	2.60	2.40	2.50	2.40	2.00	2.00	2.00	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E1.95S
22	E2.00S	E1.50S	E	E	E	E	1.85	2.00	2.00	2.00	2.20	2.05	2.15	2.15	2.50	2.00	2.00	1.90	E1.90S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
23	E2.00S	E1.90S	E	E	E	1.70	2.50	2.00	2.10	2.10	2.20	2.50	2.20	2.10	2.30	2.15	2.15	2.00	E2.00S	E2.00S	E2.00S	E2.00S	E2.10S	E2.00S
24	E2.00S	E1.80S	E	E	E	E	2.00	2.00	2.15	2.60	3.25	2.60	2.20	3.20	2.70	2.40	2.50	2.00	E2.00S	E1.90S	E2.00S	E1.80S	E2.00S	E1.90S
25	E1.90S	E	E	E	E	1.15	1.70	2.00	2.00	2.45	2.05	2.30	2.20	2.80	2.70	2.40	2.00	2.00	E2.00S	E2.00S	E1.90S	E2.00S	E2.00S	E2.00S
26	E2.00S	E2.00S	E	E	E	1.20	1.80	2.15	2.00	2.15	2.00	2.50	2.50	2.50	2.30	2.00	2.00	1.90	E2.00S	E1.90S	E1.90S	E2.00S	E1.90S	E2.00S
27	E1.85S	E1.20S	E	E	E	1.20	1.85	2.15	2.85	2.50	2.50	2.50	2.15	2.30	2.00	2.00	2.35	1.90	E2.00S	E2.00S	E2.10S	E1.80S	E1.80S	E2.00S
28	E1.90S	E1.50S	E	E	E	1.85	1.90	2.00	2.15	2.10	2.15	2.70	2.70	2.60	2.10	2.00	2.00	2.00	E1.95S	E2.00S	E1.50S	E1.90S	E1.80S	E1.80S
29	E1.90S	E	E	E	E	1.25	1.95	2.00	2.00	2.05	2.10	2.60	2.00	2.20	2.60	2.00	2.00	2.00	E2.00S	E2.00S	E2.00S	E1.80S	E1.80S	E2.00S
30	E2.00S	E	E	E	E	1.15	1.70	2.00	2.15	2.10	2.40	2.50	2.15	2.20	2.60	2.00	2.10	2.00	E2.00S	E1.90S	E2.00S	E2.00S	E2.00S	E2.00S
31	E1.90S	E	E	E	E	1.30	1.85	2.00	2.50	2.50	2.00	2.50	2.00	2.20	2.00	2.00	2.00	1.60	1.70	E1.80S	E1.50S	E2.00S	E2.70S	E1.70S
No.	31	31	19	30	27	31	29	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31
Median	E2.00	E1.50	E	E	E	E1.60	2.00	2.00	2.15	2.10	2.25	2.50	2.20	2.40	2.30	2.10	2.00	2.00	E2.00	E2.00	E2.00	E2.00	E2.00	E2.00
U.Q.																								
L.Q.																								
Q.R.																								

f-min

Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

The Radio Research Laboratories, Japan

W 6

IONOSPHERIC DATA

May.1963

M(3000)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	3.05	2.90	2.85	2.90	U2.80S	3.30	I2.80R	2.65	2.95	2.95	3.40	2.65	2.70	2.65	3.10	I3.15B	3.35	3.20	3.05	2.85	U2.95S	2.90	2.95	3.00
2	I2.90SF	2.90	2.70	U2.80SF	I2.85F	3.00	3.05	2.85	R	R	R	R	R	R	2.65	3.05	3.00	3.00	3.20	3.20	U2.95S	2.90	2.95	3.00
3	2.85	3.00	2.85	3.15	3.00	3.05	3.25	3.05	3.05	3.35	I3.05A	2.75	2.95	2.90	I3.05A	3.20	3.00	3.05	3.15	3.15	3.10	3.05	3.00	2.85
4	3.00	2.80	3.05	3.05	3.30	3.40	3.50	3.05	3.00	2.90	2.95	2.90	3.05	3.10	2.90	3.10	I3.00A	I3.00A	2.90	3.00	U3.05S	2.80	2.85	I2.85A
5	I2.85A	I2.95SF	2.90	2.90	2.80	2.95	2.25	2.60	2.85	3.10	I3.05C	2.60	I2.80A	3.00	3.05	3.05	3.05	3.20	3.10	J3.05S	3.10	2.95	3.00	I2.85S
6	I2.80A	2.90	2.95	2.90	3.10	I3.20A	I3.10A	I3.10A	I3.00A	3.15	A	A	A	3.00	3.10	3.10	I3.05A	I3.10A	3.10	2.90	U2.85SF	3.10	3.00	3.50
7	U2.80S	U2.75S	2.95	I2.90SF	U3.25S	3.45	3.35H	3.30	3.10	3.15	3.10	3.25	3.00	3.15	3.10	3.20	3.15	3.15	2.95	2.95	U3.05S	3.10	3.00	3.00
8	2.85	2.95	3.00	2.95	2.90	3.10H	3.25	3.25	3.15	3.15	2.70	2.80	2.85	3.15	3.10	3.10	3.10	3.10	2.90	2.90	2.90	3.15	3.15	2.90
9	2.80	2.75	2.80	2.75	3.25	3.35	3.30H	3.05	3.30	3.35	3.40	3.15	2.85	3.10	3.05	3.00	3.10	3.00	2.90	2.95	3.00	3.15	3.00	2.85
10	2.85	2.90	2.75	2.75	2.95	3.25	3.05	3.10	3.05	2.85	2.90	2.90	2.95	3.05	2.85	3.00	3.05	I3.10S	2.95	2.85	2.95	U3.05S	3.10	3.00
11	2.80	2.75	2.75	2.95	3.15	3.20	3.20	3.30	3.20	2.85	I2.80A	3.05	2.90	2.85	3.00	3.00	3.15	3.35	3.15	2.90	U2.75S	2.80	2.90	2.95
12	2.85	2.95	2.80	3.00	2.90	2.85H	3.25	A	A	A	3.00	3.05	2.90	3.00	2.95	3.10	3.15	3.05	I2.95A	2.95	2.90	2.90	2.90	3.00
13	2.95	2.65	2.80	2.90	2.95	3.25H	3.20	3.40	3.20	2.95	3.15	3.00	2.95	2.90	2.95	2.85	2.45	3.05	3.00	I3.00S	2.90	3.10	2.90	3.05
14	3.00	3.05	3.10	3.00	3.15	3.15	3.15	3.10	3.20	2.80	2.75	2.25	2.40	2.95	2.60	2.95	2.90	2.85	2.90	U3.00S	2.90	2.95	2.85	2.95
15	2.95	3.00	3.00	3.05	3.30	3.15H	3.00	2.70	3.20	3.15	3.05	3.05	3.15	2.90	2.90	3.10	3.10	3.05	3.10	3.05	3.15	2.95	2.90	3.00
16	3.05	2.85	3.15	3.05	3.35	3.50	3.20	3.25	3.20	3.05	3.15	3.10	3.05	3.05	3.00	3.30	3.30	2.95H	3.15	2.90	3.00	2.95	3.00	2.95
17	3.00	3.10	3.05	3.00	3.10	3.10	3.35	3.45	3.35	3.05	3.15	3.10	3.00	3.10	3.20	3.05	I3.15C	3.10	3.20	3.10	2.95	2.90	3.00	3.00
18	3.00	2.90	2.90	2.95	3.00	2.95	3.40	A	A	A	3.05	3.15	3.05	3.00	I3.00A	3.05	A	A	A	A	3.10	3.00	3.00	3.00
19	2.95	2.90	2.95	U3.25S	3.20	3.00	3.05	3.20	2.90	3.25	3.10	3.10	3.00	2.75	I3.05A	3.15	I3.10A	I3.00A	2.85	3.00	3.20	3.10	3.15	2.90
20	2.95	2.95	2.85	2.95	U2.95F	2.90H	3.35	3.15	3.35	3.30	3.15	3.00	I3.05A	3.30	2.95	3.10	3.10	3.05	I3.05A	3.05	2.95	2.75	3.00	2.95
21	2.90	2.90	3.00	3.15	3.10	3.20	3.10	3.35	3.35	3.10	3.00	3.10	3.05	3.00	3.20	3.05	3.05	3.15	3.10	3.00	3.05	3.00	2.90	3.15
22	3.00	3.00	3.00	U3.00SF	U2.90SF	3.00	3.15	3.30	3.35	I3.35A	3.25	I3.05A	I3.05A	3.10	2.95	3.05	3.00	3.00	2.90	3.10	3.10	U3.10S	2.90	3.00
23	3.05	3.00	3.10	3.10	3.10	3.00	3.15	3.10	3.30	3.30	3.40	3.35	3.10	2.95	3.05	3.15	3.10	3.10	3.00	3.15	3.05	3.00	3.05	3.15
24	3.10	3.05	3.00	3.05	3.10	2.90H	3.10	3.15	3.35	3.35	3.00	3.15	3.30	3.00	I2.95A	3.15	3.05	3.00	I2.85A	I3.05A	3.25	I3.15A	I3.20A	U2.80SF
25	2.90	SF	SF	SF	U3.25S	3.15	3.05	3.10	3.35	3.25	3.00	3.10	3.00	2.95	U3.00R	3.05	3.10	3.10	3.00	2.85	U2.90S	3.10	3.05	2.95
26	2.95	2.90	3.00	I3.00SF	U3.10SF	3.55	I3.40A	I3.05A	I3.10A	I3.25A	3.05	3.10	3.25V	2.95	3.00	3.05	3.00	I3.15A	I2.95A	2.85	3.00	I3.10SF	U2.95S	3.05
27	U2.80SF	SF	FS	FS	FS	U3.15SF	3.05	3.30	3.45	3.15	3.20	3.00	3.20	2.55	3.00	2.95	3.00	3.05	3.00	2.95	2.95	U3.05S	3.00	3.05
28	3.00	3.10	2.90	3.10	3.05	3.05	3.15	3.35	3.00	3.05	3.35	3.10	2.85	3.10	2.85	I2.95A	3.05	U3.10S	2.95	3.05	U2.90S	U3.00S	2.85	2.80
29	3.10	2.85	U2.95S	I3.00SF	U3.30F	A	A	A	I2.80A	A	A	A	A	A	A	2.70	3.00	A	A	A	A	A	I2.85A	I2.75A
30	A	A	A	A	A	A	A	A	A	A	A	A	A	A	2.65	3.10	I2.95A	I3.10A	I3.20A	3.00	2.90	2.95	2.95	3.20
31	2.95	2.90	2.90	2.85	2.90	2.85	3.10	3.15	I3.00A	I2.90A	2.75	I2.95A	I2.85A	2.15	2.85	3.05	3.00	2.80	2.85	3.05	2.90	3.00	3.00	2.80
No.	30	28	28	28	29	29	29	27	27	26	27	27	27	28	30	31	30	29	29	29	30	30	31	31
Median	2.95	2.90	2.95	3.00	3.10	3.15	3.15	3.15	3.20	3.15	3.05	3.05	3.00	3.00	3.00	3.05	3.05	3.05	3.00	3.00	2.95	3.00	3.00	3.00
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

M(3000)F2

Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

W 7

IONOSPHERIC DATA

May.1963

M(3000)F1

135° E Mean Time (G.M.T. +9h)

Wakkanai

Lat. 45°23.6′N
Long. 141°41.1′E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							3.60	3.50	I3.65A	3.70	I3.80A	3.85	3.65	3.45	3.55	B	A							
2							U3.45L	I3.50A	3.55	3.80	3.90	3.80	3.90	3.85	3.60	3.50	3.55	A						
3							3.60L	I3.65A	3.70	3.70	I3.65A	3.65	3.90	3.70	I3.65A	I3.55A	I3.50A	I3.35A	U3.65L					
4								3.80	3.65	3.65	3.65	3.95	3.85	3.65	3.70	3.65	I3.55A	I3.40A	U3.65L					
5							3.35	I3.60A	3.65	3.85	I3.60C	U3.70L	A	A	A	A	A	A						
6							A	A	A	A	A	A	A	3.55	3.65	3.65	A	A						
7								3.65	3.70	3.75	3.85	3.80	I3.80A	3.70	3.60	3.60	I3.60A	A						
8							U3.70L	3.80	3.70	3.65	3.90	3.70	3.55	3.85	3.65	3.70	3.60	A						
9								U3.65L	3.55	3.80	3.80	3.90	3.80	3.70	3.60	3.55	3.60	3.50						
10						U3.65L	U3.55L	3.70	3.75	3.80	I3.85R	4.10	3.80	3.80	3.55	3.50H	A	A						
11							3.75L	3.80	3.55	3.60	I3.70A	3.80	3.70	3.50	3.50	3.50	3.70	3.80						
12							A	A	A	A	A	3.70	3.70	I3.70A	3.40	3.60	3.65	3.50L						
13							3.50	I3.85A	3.80	3.60	3.75	3.75	3.45	3.50	3.55	A	A	A						
14							3.65	I3.65A	I3.70A	3.70	U3.85R	3.85	I3.70R	3.85	3.65	3.55	3.60	3.40	I3.55A					
15							3.40	3.35	3.65	3.70	3.85	4.05	3.60	3.80	3.75	3.55	3.65	3.50	A					
16							U3.90L	3.75	3.75	3.85	3.65	3.90	3.70	3.60	3.65	3.70	3.75							
17							3.75	3.75	I3.70A	3.70	3.80	3.70	3.85	I3.70A	3.55	3.70	I3.70C	3.75						
18							U3.95L	A	A	A	A	3.55	3.85	I3.80A	I3.75A	3.70	A	A	A					
19							A	A	A	A	A	A	3.65	3.55	I3.70A	R	A	A	A					
20							3.65	I3.75A	3.80	3.70	A	A	A	3.75	I3.90A	3.65	A	A	A					
21							3.60	3.75	I3.65A	I3.80A	I3.90A	I3.85A	3.90	3.85	3.70	3.70	3.50	3.70	A					
22						3.30	3.60	3.75	I3.85A	I3.95A	3.90	I4.00A	I3.90A	3.85	3.50	3.60	3.70	3.40	A					
23							I3.55A	I3.70A	3.75	3.80	4.10	4.00	4.30	3.90	3.95	3.60	A	A	A					
24							A	A	A	A	3.95	A	A	A	A	3.65	A	A	A					
25							3.55	A	A	A	3.85	I3.75A	3.75	I3.65R	3.70	3.70	3.65	3.55	I3.60A					
26								A	A	A	A	3.90	3.70	I3.70A	I3.60A	I3.60A	3.45	A	A	A				
27							I3.80A	3.85	3.80	4.05	I4.00R	3.95	3.95	3.80	3.70	I3.50A	I3.45A	3.45	A					
28								I3.80A	I3.80A	3.95	I3.80A	3.85	3.70	3.80	A	A	A	A	A					
29						A	A	A	A	A	A	A	A	A	A	3.55	A	A	A					
30							A	A	A	A	A	A	A	A	3.65	3.80	A	A	A					
31						3.40	3.50	A	A	A	A	A	A	3.75	3.95	3.65	3.75	3.40	3.30					
No.						3	20	21	21	21	22	24	24	27	27	26	18	13	5					
Median						3.40	3.60	3.75	3.70	3.75	3.85	3.85	3.80	3.70	3.65	3.60	3.60	3.50	U3.60					
U.Q.																								
L.Q.																								
Q.R.																								

M(3000)F1

Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

The Radio Research Laboratories, Japan

W 8

IONOSPHERIC DATA

May.1963

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							R	430	330	355	290	450	420	450	295	I295B	270							
2							350	A	R	R	R	R	R	R	470	370	390	325						
3							280	330	355	295	I380A	435	370	365	I340A	315	345	315	290					
4								370	375	400	370	405	340	350	385	330	I325A	I320A	275					
5							600	475	390	350	I380C	U465L	I440A	385	350	360	320	A						
6							A	A	A	345	A	A	A	375	340	330	A	A						
7								300	335	310	330	305	360	320	320	315	310	295						
8							270	280	310	305	445	415	400	325	320	320	305	320						
9								295	285	270	275	320	350t	330	330	320	300	310						
10						280	320	350	350	425	390	395	410	370	420	350	340	A						
11							295	295	330	400	I410A	350	400	380	325	325	295	270						
12							300	A	A	A	I320A	370	385	365	365	320	300	310						
13							310	270	310	375	320	345	360	380	330	360	I305A	280						
14							280	345	340	435	460	615	550	380	450	385	380	375	305					
15							380	450	350	340	360	360	350	410	400	335	325	310	290					
16							270	300	320	350	320	330	350	350	350	290	270							
17							265	260	295	340	320	345	370	340	320	320	I300C	295						
18							240	A	A	A	350	330	350	370	I360A	355	A	A	A					
19							330	285	295	325	320	350	385	460	I360A	325	I345A	I335A	325					
20							265	290	290	300	325	385	I345A	300	390	340	325	310	A					
21							320	300	305	350	370	340	370	380	315	345	310	305	280					
22						335	285	280	I275A	I290A	325	I370A	I365A	360	385	345	340	310	290					
23							290	295	270	280	290	305	345	370	370	325	310	305	280					
24							290	280	265	285	350	335	310	I360A	I385A	330	345	I325A	I315A					
25							340	315	290	295	300	325	370	360	345	320	305	310	280					
26								I350A	I330A	I310A	350	340	310	365	355	340	320	I305A	I330A	300				
27							275	255	275	320	340	390	340	490	380	I370A	350	310	300					
28							280	275	335	320	275	355	415	350	400	I350A	320	I300A	285					
29						A	A	A	I405A	A	A	A	A	A	A	445	370	A	A					
30							A	A	A	A	A	A	A	A	460	350	I340A	I310A	I280A					
31						385	320	330	I380A	I405A	445	I400A	I420A	700	440	375	360	390	335					
No.						3	23	25	26	26	27	27	27	28	30	31	29	24	15	1				
Median						335	290	300	330	330	340	355	370	370	360	335	320	310	290	300				
U.Q.																								
L.Q.																								
Q.R.																								

h'F2

Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

IONOSPHERIC DATA

May.1963 | h'F | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45°23.6' N, Long. 141°41.1' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	285	285	280	300	300	255	250	255	I245A	250	I225A	205	235	250	258	I250B	I255A	250	265	270	260	260	275	255
2	275	275	300	290	280	260	275	I260A	245	235	225	230	240	225	245	250	255	I255A	I260A	245	280	280	285	285
3	300	260	280	275	275	250	240	I245A	225	245	I225A	230	220	230	I245A	I250A	I255A	I255A	250	245	230	250	285	320
4	315	325	295	275	230	240	240	230	235	220	230	220	210	210	230	230	I235A	I250A	265	250	245	280	270	I305A
5	I310A	295	295	280	275	250	255	250	250	220	I225C	220	A	A	A	A	A	A	A	A	I260A	300A	295A	I295A
6	I300A	I305A	I320A	295	275	A	A	A	A	A	A	A	A	230	240	235	A	A	A	A	275A	I245A	275	285
7	300	315	320	280	250	240	225H	235	225	210	225	230	I220A	210	235	235	I250A	A	A	A	I250A	U255A	240	260
8	285	275	265	240	265	255H	255	240	240	225	210	210	225	210	210	230	250	A	A	A	260	245	240	275
9	290	300	290	290	250	240	230H	230	I245A	230	235	220	210	210	210	260	240	250	285	265	255	250	250	275
10	290	280	300	275	295	260	245	230	245	230	I230A	190	225	215	250	250H	A	A	A	275	260	260	250	260
11	305	310	300	275	260	245	240	240	240	250	I235A	225	220	220	220	235	240	250	260	270A	295	295	265	260
12	300	275	290	270	280	250H	A	A	A	A	A	230	225	I215A	235	230	250	260	I265A	I265A	260A	280A	265	260A
13	290	300	310	270	295	250H	250	I245A	225	215	200	195	200	235	E340R	A	A	A	A	A	A	245	270	265
14	280	270	260	275	255	250	240	I245A	I235A	235	220	I220A	I220A	205	245	245	240	250	I270A	260	265	260	270	300
15	295	265	265	230	245	230H	260	E270A	250	215	220	195	240	215	210	235	235	285	I270A	245	250	260	I280A	300
16	260	300	270	260	245	240	220	240	215	225	215	230	225	230	230	225	235	250H	I280A	260	260	260	260	270
17	270	250	245	255	260	260	250	250	I230A	215	220	230	225	I230A	230	225	I225C	250	A	A	A	275	265	265
18	265	280	290	265	270	250	250	A	A	A	A	230	220	I225A	I225A	230	A	A	A	A	A	250	260	265
19	295	300	310	245	250	240	A	A	A	A	A	A	200	260	I215A	A	A	A	A	A	245	240	245	285
20	300	280	280	I285A	250	240	255A	I240A	235	235	A	A	A	225	I205A	240	A	A	A	A	260	270	280	275
21	280	290	285	250	240	240	250	240	I240A	I240A	I235A	I230A	225	210	230	225	245	235	I245A	I255A	255	250	250	260
22	I285A	290	265	255	260	250	240	240	I220A	I230A	230	I220A	I210A	200	225	240	225	250	A	A	A	A	260	275
23	265	255	250	240	245	245	I245A	I250A	215	230	220	200	200	210	195	250	A	A	A	A	A	250	255	250
24	250	260	260	255	270	235H	A	A	A	A	225	A	A	A	A	235	A	A	A	A	A	A	A	240
25	285	285	280	270	245	245	235	A	A	A	225	I230A	225	I240A	225	230	260	235	I255A	I270A	270	245	230	270
26	285	285	280	265	260	230	I250A	A	A	A	A	215	230	I225A	I235A	I235A	250	A	A	A	A	A	260A	I280A
27	300	320	300	360	285	245	I250A	240	235	210	I215A	220	230	215	220	I255A	I250A	255	I255A	270A	250	250	255	265
28	280	250	275	260	270	I260A	I250A	I230A	235A	230	I230A	220	220	220	A	A	A	A	A	A	A	250A	295A	275A
29	I275A	I275A	275	250	255	A	A	A	A	A	A	A	A	A	A	250	A	A	A	A	A	A	A	A
30	A	A	A	A	A	A	A	A	A	A	A	A	A	A	230	230	A	A	A	A	A	I260A	265	245
31	305	270	270	270	275	245	260	A	A	A	A	A	A	220	205	250	235	240	260	I260A	I255A	250	I285A	I310A
No.	30	30	30	30	30	28	25	20	21	21	22	24	24	27	26	27	19	16	14	15	21	27	29	30
Median	290	280	280	270	260	245	250	240	235	230	225	220	220	220	230	235	245	250	U260	260	260	255	265	270
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'F — Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

W 10

May.1963

h'Es

IONOSPHERIC DATA

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

h'Es

Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

The Radio Research Laboratories, Japan

W 11

IONOSPHERIC DATA

May.1963

Types of Es

135° E Mean Time (G. M. T. +9h)

Wakkanai

Lat. 45°23.6' N
Long. 141°41.1' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		f3				c	h	h	h	c	c		c	h	h		h				f	f		
2							c	c2	c	c	c	c		l			h	c2	c2					
3							c	c	c	c	c	c	c		h	h.l	c	c	c	c	f			
4				f			h	h	c	c		l			h		c2	c2	c					f2
5	f3		f				c	c	c	c		c2	l2	l2	l	h.l	h	c2	c4	c3	f2	f2	f2	f3
6	f2	f2	f4	f	f	c2	c	c2	c	c	c	c2	c2	c		c	c2	c2	c2	c3	f2	f3	f2	f
7	f	f	f	f	f				c		c	c	c	c			c	c2	c3	c	f3	f		
8				f	f	c	c	c	c	c			c		c		h	c2	c2	c3	f			
9			f				c	c	c	c	c							h	c					
10		f			l	h	h	h	c	c	c				c		h	c	c2		f	f	f	f
11							h	c	c	c	c	c	c	l	l				c	c			f	
12			f	f		c	c2	c2	c3	c2	c	c	c	l	c	l	l	c	c5	c3	f	f3		f
13						c	c	c	c	c	c	c			c	c3	l3	l	c2	f	f		f2	
14							c	c	c	c		c	c					c	c		f			
15		f	f				h	c	c		c		l					l	l2				f3	f2
16		f	f						h	h		c						h	c2		f	f		
17	f				l	c.l	c	c	c	h	h	c	c	c2	l	l		c	c	c2	f2	f		
18							c	c4	c3	c3	c	c	c	c2	l2	l2.h	c2	c2.l	c4	c3	f2	f		
19			f2	f	c.l	c	c	c	c	c3	c	c	c		c2	c	c2	c2	c2	f2	f	f		f
20		f	f	f2			c	c	c	c	c	c	c3	l	c		c	c2	c3	c4	f	f2	f2	f
21			f2	f	l	h	c	c	c	c	c	c	c	c	c	c	c	c	c2	c3	f	f	f	f
22	f3	f2	f	f2	l	l	c	c	c2	c2	c	c2	c2	l	l	l	l	c	c2	c2	f5	f3	f	
23					c	c	c2	c2	c	c			c	c	c	h	h	c2	c2	c2	f3	f		
24				f			c	c2	c2	c2	c	c	c2	c	l2		c	c2	c2	c4	f5	f4	f5	
25						c	h	c2	c2	c2	c	c	c	c	c	l2	l	c.l	c	c3		f	f	
26					l	h	c3	c2	c3	c2	c	c	c	l	c	c2	c	c3	c3	c2	f4	f2	f4.f	f2.f2
27	f.f	f	f	f.f3	c2	c	c	c	c	c	c	c				c	c	c	c	c		f	f	
28	f		f	f	c	c3	c2	c	c2	c	c	c			h	c2	c2	c2	c2	c2	f4	f2	f2	f.f2
29	f2	f3	f	f2	l2	c3.l	c3	c2	c2	c4	c3	c3	c3	c3	l	l2	l2	c3	c5	c3	f5	f4	f2	f5
30	f6	f6	f5	f6	c.l	c3	c3	c4	c2	c2	c	c2	c	l	l		c2	c5	c5	c4	f3	f2	f2	
31	f2			f		h	c	c	c2	c3	c	c3	c	c			h	h	c	c2	f2	f	f4	f3
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

Types of Es

Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

W 12

IONOSPHERIC DATA

May. 1963 | **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	RS	RS	5.0R	4.2	I4.0R	4.2S	4.2	6.2	6.3HR	7.3	5.9	I5.2R	7.1	6.4	I8.2R	8.2R	7.6	6.3	6.1	6.1	6.0	6.1	RF	RS
2	I5.2R	4.8S	4.5	4.5	4.7	4.5	4.6	5.0	A	A	G	5.2R	A	R	5.1	5.7	5.6	5.9	5.8	6.1	I4.8RS	I4.4RS	I4.4RS	I4.4RS
3	I4.1RS	I4.0RS	3.9	3.8	I4.0R	I4.3R	5.2	5.7	6.6	I6.1A	6.0	6.1	6.4	6.5	6.8	6.6	6.0	6.5	I7.6RS	I7.3RS	I5.6RS	4.5S	4.0	3.8R
4	3.9	3.6	3.9	4.2	3.5	3.9	5.0	J5.6R	5.2	5.9	6.9	6.6	5.7	5.8	6.1	A	R	A	I7.6RS	7.6S	I7.0A	I6.5RS	I5.5RS	5.1
5	I4.7RS	I4.2RS	I4.4RS	4.1	I3.4RS	3.9	G	4.6	5.6	5.4R	5.2	5.1	I5.3A	I5.4A	5.9	6.3	6.9	I6.6C	A	A	A	A	A	I4.2RS
6	4.0S	4.1	4.1	3.9	3.9	J5.0R	5.0R	I5.6RS	6.4	A	A	A	A	A	6.7	7.1S	6.6	6.8S	A	RS	A	5.9	RS	RS
7	RS	I4.2RS	3.9	4.1	I4.8R	4.7	5.1	5.7	6.3	I6.6C	6.5	6.0	6.2	6.7	6.7	I6.4A	6.2	I6.6A	I7.0A	8.0S	8.8	RS	C	C
8	C	C	C	C	C	C	C	C	C	6.1	6.0	6.1	6.4	I6.9R	7.2	6.2	5.9	5.8	RS	RS	RS	RS	RS	RS
9	RS	4.7RS	4.6	4.4	J4.6R	5.4	5.6	5.9	7.3S	I7.2R	6.5	5.4	6.1	6.4	6.8	7.3	6.8	6.6S	RS	RS	RS	RS	5.9S	5.9S
10	5.6	5.6	5.1	5.2R	J5.3R	6.1	I5.2RS	5.6	5.8	6.5	5.6	I5.6R	I6.2C	I6.2C	6.2	6.7	I6.8C	6.2	6.3	RS	RS	7.0S	5.6	I5.2A
11	I4.9RS	I4.6RS	I4.4RS	4.7	4.8	5.5	6.0	6.2	5.6	5.8	6.1	6.7	6.2	6.5	7.5R	U7.4R	I7.8R	I7.3RS	6.3	6.3S	I6.8RS	I6.6RS	I6.4RS	5.9
12	5.5	5.5RS	5.1	I4.8RS	4.5	4.8	I4.9R	5.5	6.0	A	A	6.0	6.7R	6.9	7.3	7.3	7.0	6.8	7.0	RS	RS	RS	RS	RS
13	FS	I5.3RS	I5.0FS	5.1	I5.0RS	5.5	I6.0RS	5.9	5.7	I5.7A	5.7	6.2	I6.7C	6.7	8.0	I8.2C	8.6	8.4	RS	A	7.1RS	RS	RS	FS
14	RS	RF	5.1S	4.8S	4.8S	5.8	5.6	5.4	5.7	5.2R	I5.2C	5.4	5.4	5.6	5.7	5.8	5.9	A	A	8.3R	6.8	FS	FS	I6.4RS
15	I6.6FS	I6.1FS	6.0	5.7	I4.8RS	4.7	4.9	I5.7A	5.9	6.1	6.7	5.6	6.6R	6.3	6.2	6.9	6.7	R	A	A	A	RS	5.1S	I5.2RS
16	5.1	I5.7RS	I4.8RS	I4.2RS	I3.8R	4.7R	5.3	6.6	5.8H	5.8	6.6	6.6	6.0	6.6	7.1	7.7R	6.7	6.1	6.5	8.1S	I7.6RS	6.4	I6.6RS	I6.4RS
17	6.0	I5.4RS	5.2S	4.9S	4.7R	5.3S	I6.6RS	6.7	5.7	5.8	6.1H	6.1	6.4	7.0	7.3	7.4	7.0	6.7	I7.0RS	7.1S	RS	RS	RS	6.6S
18	6.0	5.6	J5.2S	5.3S	5.1S	5.8	6.9	7.0S	6.4	5.6	I5.9R	I6.7A	7.1	6.6	6.6	6.5	6.6	A	A	A	RS	A	RS	I5.4RS
19	I5.0FS	4.9S	5.1S	4.7S	I4.6RS	4.9	6.7	7.0	7.3R	6.7	6.2	6.3R	6.0	I6.0A	6.3	6.0	6.3	I6.2A	6.9	A	RS	6.3S	5.6	I5.2RS
20	I5.0RS	FS	RS	I4.6RS	I4.6RS	5.5	6.2	5.9	6.2	6.1	6.2	6.0	6.4	6.9	6.4	6.2	6.5	6.5	6.6	6.1	6.1	I6.0FS	I5.8RS	I5.4FS
21	5.4RS	I5.4RS	5.4	I5.0RS	4.6S	5.0	6.1	I6.2RS	5.8	5.8	5.8	I6.3A	6.1	6.0	6.3	6.6	6.5	6.6	6.7R	R	RS	R	U6.4R	5.6R
22	I5.0R	4.8R	I4.8R	I4.6R	I4.6R	J4.9R	6.9	7.0S	6.1	6.0R	I5.4A	A	R	6.0	6.1	I6.5C	6.1	6.6	I7.4RS	8.3	RS	RS	RS	FS
23	6.0S	5.7	5.5	5.0	4.8	5.0	6.4	7.6	6.9	7.3	6.7	6.0	5.6	I5.6R	5.8	6.8	7.3	7.0	6.9	RS	RS	6.7	I6.3RS	6.0
24	5.6	J5.2RS	5.0	5.1	4.6	5.1	7.0S	8.4	7.7R	I6.0A	5.7	6.3	6.6	5.9	5.7	6.1	I6.6C	6.6	7.6RS	I7.9R	8.1	6.1S	RS	A
25	A	A	A	A	A	R	5.7H	A	A	6.5	6.1	5.6	6.1	6.5	6.9	7.4	7.0	6.2	5.9	A	RS	RS	6.6	I6.4A
26	RS	RS	R	R	R	4.4	A	A	6.4	6.8	5.3	5.6	I6.2A	5.9	6.8	6.9	6.9	6.9	7.0R	8.1	8.0	RS	RS	A
27	A	A	A	R	J4.4R	5.4	I6.0A	I6.5A	6.8	6.3	5.6	I6.0A	5.5	5.6	5.5	5.9	I6.3A	6.5S	6.7	7.3S	7.6S	6.9S	6.2	I5.4R
28	4.9S	5.0	I5.0RS	5.0S	5.1S	5.1	6.9S	I6.7A	6.3	I6.6R	5.9	A	A	6.4	5.6	6.2	7.2	I8.4RS	8.1	6.6	6.3S	6.5S	6.0S	6.1
29	5.9	I5.6RS	5.2R	4.5	4.2	I4.0A	A	A	5.5	6.0	I5.2RS	I5.2A	4.9	C	A	5.9	6.4	5.9	I6.4RS	A	A	A	A	A
30	A	A	A	A	RS	4.0R	A	A	A	A	A	G	A	G	5.3R	6.1	6.2	5.9	5.6	5.8	I6.2A	6.3S	I5.4A	I4.9RS
31	4.1S	3.9S	I3.8F	3.8F	I4.0RF	4.7R	6.5	6.2	U5.4R	5.4R	I5.3R	5.7	I5.5A	5.0	I5.4A	5.6	5.4	I5.3A	I5.8A	7.2S	7.5S	5.2S	I5.6RS	5.0
No.	21	23	25	26	27	29	27	26	27	27	28	28	26	28	30	30	30	27	23	17	16	16	17	21
Median	5.1	5.0	5.0	4.6	4.6	4.9	5.7	6.0	6.1	6.1	5.9	6.0	6.2	6.4	6.4	6.6	6.6	6.6	6.7	7.3	6.9	6.3	U5.8	U5.4
U.Q.	5.8	5.5	5.2	5.0	4.8	5.4	6.5	6.7	6.4	6.6	6.2	6.2	6.4	6.6	6.9	7.3	7.0	6.8	7.0	8.0	7.6	6.6	6.4	6.0
L.Q.	4.8	4.2	4.4	4.2	4.0	4.4	5.0	5.6	5.7	5.8	5.5	5.5	5.7	5.8	5.8	6.1	6.2	6.2	6.3	6.2	6.2	6.0	5.2	5.0
Q.R.	1.0	1.3	0.8	0.8	0.8	1.0	1.5	1.1	0.7	0.8	0.7	0.7	0.7	0.8	1.1	1.2	0.8	0.6	0.7	1.8	1.4	0.6	1.2	1.0

The Radio Research Laboratories, Japan

foF2 Sweep 1.60 Mc to 20.0 Mc in 20 sec in automatic operation

A 1

IONOSPHERIC DATA

May.1963 | 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	4.0	I4.2L	A	L	4.5	4.5S	4.5	4.5H	I4.3B	L							
2							L	A	A	A	4.2	I4.4R	I4.2A	4.2	4.2	A	A	A						
3							L	L	L	A	A	I4.5A	4.4	4.5	4.2	I4.2R	4.0L	L						
4							L	A	A	A	4.5	4.5	I4.6L	4.5	A	A	A	A	A					
5							3.6	I4.0A	A	R	A	4.5	I4.5A	I4.5A	I4.4RH	4.2	4.1L	C						
6							L	L	R	A	A	A	A	A	4.6	I4.4L	A	A						
7								A	L	I4.6C	4.6	I4.6L	I4.6L	4.6L	4.6L	A	A	A						
8							C	C	C	A	I4.6L	4.6	4.6R	4.6	4.5L	4.4L	L	A	A					
9							L	L	A	4.5	4.6L	4.6L	4.6R	4.6	4.6	4.3L	L	A	L					
10								A	A	4.3	4.6	5.0H	C	C	A	4.5L	I4.2C	L	A					
11							L	A	A	A	4.6	4.6	4.7L	I4.6R	4.6	4.5	L	R	A					
12							L	A	A	A	A	I4.7A	4.7	4.7L	4.6	4.4	I4.2A	L	A					
13						L	L	A	A	A	4.7LH	4.7	I4.7C	4.6	A	C	A	L						
14							L	4.3L	4.5	4.5	I4.5C	4.5	4.6	4.6	4.5	4.3R	A	A						
15							A	A	A	4.5	4.5	I4.6L	4.8	4.7	4.6	A	A	A						
16								A	4.5L	4.6	4.6L	I4.6L	I4.8R	I4.7A	4.6	4.5L	I4.2L	L	L					
17						L	L	L	L	4.5	I4.6A	4.8L	4.7R	4.6	4.4	4.3	A	A	A					
18							A	A	A	L	A	A	A	A	I4.6R	4.5	A	A	A					
19							A	4.3	A	A	4.7L	I4.6A	A	A	A	I4.5L	4.2	A	A					
20						L	L	L	A	4.6	4.6	I4.6A	4.6	4.6	4.5	4.5H	L	A	L					
21							L	A	L	I4.6L	A	A	A	4.6	4.5	4.3	I4.2R	L	L					
22							L	L	A	A	A	A	A	A	A	C	A	A	A					
23							L	A	A	I4.5A	4.5	4.7	4.6R	4.5	4.3	4.3	A	A	A					
24						L	A	A	A	A	A	R	A	A	4.6	I4.4C	I4.2C	L	A					
25							A	A	A	A	A	L	4.6	4.3R	I4.4R	I4.3A	4.2	L	A					
26						A	A	A	4.4	4.5	A	A	A	4.5	A	A	A	A	L					
27						A	A	A	I4.3L	4.5	A	A	A	I4.6A	4.4	A	A	A	A					
28							A	A	A	I4.4A	L	A	A	A	A	A	L	3.8	A					
29							A	A	A	I4.2A	4.4	A	A	I4.4C	I4.4A	I4.2A	4.1	A	A					
30						L	A	A	A	A	A	4.0	I4.2A	4.4	4.4	4.2	A	A	A					
31						L	3.7L	4.1L	I4.2A	I4.2A	I4.4A	4.6	A	A	I4.4A	4.2	4.2	A	A					
No.							2	5	6	15	17	21	19	23	24	22	11	1						
Median							3.6	4.1	U4.4	4.5	4.6	4.6	4.6	4.6	4.5	4.3	4.2	3.8						
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foF1 Sweep 1.60 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

May.1963 **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						B	A	A	A	A	A	I 3.30	3.40	3.35	3.20	I 3.15 B	3.05	A	B					
2						B	2.20	A	A	A	A	A	A	A	A	A	A	A	B					
3						B	A	A	A	A	A	A	A	A	3.15	3.05	A	A	B					
4						B	A	A	A	A	A	A	A	3.40	I 3.30 A	3.15	A	A	B					
5						B	A	A	A	A	A	A	A	A	3.30	3.10	A	C	A					
6						B	2.45	A	A	A	A	A	A	A	A	I 3.30 A	A	A	B					
7						B	A	A	A	C	A	A	A	A	A	A	2.95	A	B					
8						C	C	C	C	A	A	A	A	A	A	A	A	A	B					
9						B	A	A	A	A	A	A	A	A	A	3.25	2.95	A	B					
10						1.85	I 2.50 A	A	A	A	A	A	C	C	A	3.20	I 2.90 C	A	B					
11						R	A	A	A	A	A	R	R	R	R	3.05	I 2.85 A	2.55	B					
12						R	A	A	A	R	R	R	R	A	A	A	A	A	A					
13						A	A	A	A	A	A	R	C	A	A	C	A	A	R					
14						B	A	2.70	I 3.00 A	A	C	A	A	A	A	I 3.20 A	A	A	A					
15						B	A	A	A	A	A	A	R	R	A	A	A	A	A					
16						B	A	A	I 3.05 A	I 3.15 A	3.25	A	R	A	I 3.40 R	I 3.20 A	3.00	A	A					
17						B	2.55	I 2.85 A	A	A	A	A	A	A	A	A	A	A	A					
18						B	A	A	A	A	R	R	R	R	R	I 3.00 R	2.80	A	A					
19						A	A	A	A	A	A	A	A	A	A	3.25	2.95	A	A					
20						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
21						2.05 H	A	A	A	A	A	A	A	A	A	A	A	A	A					
22						B	A	A	A	A	A	A	A	A	A	C	A	A	A					
23						B	A	A	A	A	A	A	A	A	I 3.30 A	3.20	2.85	A	B					
24						A	A	A	A	A	A	A	R	A	3.30	I 3.15 C	I 2.95 C	A	B					
25						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
26						A	A	A	A	A	A	A	A	A	3.30	3.05	A	A	A					
27						A	A	A	A	A	A	A	A	A	A	A	A	A	B					
28						A	A	A	A	A	A	A	A	A	A	A	A	A	B					
29						B	A	A	A	A	A	A	A	C	A	A	A	A	A					
30						A	A	A	A	A	A	A	A	A	A	3.05	I 2.80 A	2.50	A					
31						A	A	A	A	A	A	A	A	A	A	3.10	2.90	A	A					
No.						2	4	2	2	1	1	1	1	2	8	17	12	2						
Median						1.95	2.50	U 2.80	U 3.00	U 3.15	3.25	U 3.30	3.40	3.40	3.30	3.15	2.90	2.50						
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

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

A 3

IONOSPHERIC DATA

May.1963 — foEs — 135° E Mean Time (G. M. T. +9h) — Akita — Lat. 39°43.5′ N, Long. 140°08.2′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	G	2.8	3.7	4.0	4.6	4.5	3.8	4.2	3.6	3.7	B	3.3	3.5	J3.3	J2.6	2.1	J2.5	E	E
2	J1.8	E	E	2.1	E	G	2.5	J5.0	J7.4	4.0	4.2	3.8	J4.3	4.0	3.6	4.6	J5.2	J5.1	J3.3	J5.3	J5.1	J2.5	J2.5	E
3	E	2.2	E	J2.5	E	G	3.0	3.5	J4.0	J6.3	J5.2	J6.3	4.0	4.3	G	3.6	3.2	3.7	3.9	J3.8	J3.5	J2.2	J2.1	E
4	E	E	E	E	E	G	2.8	3.8	J4.8	4.5	4.0	3.8	3.6	G	4.6	J7.8	J7.1	J15.8Y	J4.8	J2.5	J7.8	J5.3	J3.0	J2.1
5	E	J2.6	J2.3	J2.8	J1.9	J3.0	3.1	3.9	J5.8Y	4.2	J5.1	4.1	J7.6	J7.4	G	3.7	3.4	C	J6.3	J11.8Y	J5.6	J5.8	J6.0	E
6	J3.1	J3.0	E	E	E	2.2	G	3.9	4.2	J10.3	J10.5	J7.5	J9.4	J8.5	3.9	3.5	4.2	J5.7	J6.1	J6.0	J6.2	J5.9	J3.0	J3.2
7	J3.0	J2.5	2.5	2.4	E	G	3.0	J6.1	J5.1	C	4.0	3.5	3.6	3.5	3.9	J6.2	J6.2	J8.4	J8.1	J6.2	J6.3	J3.0	C	C
8	C	C	C	C	C	C	C	C	C	4.5	4.1	3.7	4.5	3.7	J5.9	J3.6	3.8	J5.0	J5.7	J6.5	J6.3	J4.0	J2.1	E
9	J2.0	2.1	2.2	E	E	G	3.0	3.3	4.5	J4.5	4.4	4.2	4.1	4.0	J4.4	G	3.6	J3.9	J2.8	J2.8	E	E	E	E
10	E	E	E	E	J2.5	G	3.3	J4.1	J5.0	3.9	4.1	4.0	C	C	J6.1	G	C	3.1	J3.7	J5.1	2.6	E	J2.8	J5.1Y
11	2.0	E	E	J2.1	J2.5	G	3.9	4.6	J4.6	4.6	4.0	G	J4.7	G	G	2.8G	3.6	3.4	3.8	J3.6	J2.6	J2.3	J2.0	J2.0
12	J2.7	2.1	E	E	E	G	3.7	J5.5	J6.0	J7.6	J6.8	J6.0	G	J4.3	J5.1-	3.3	J5.0	J4.1	J3.1	J6.5	J6.1	J6.0	J6.0Y	J3.8
13	E	E	E	E	E	2.6	3.5	J4.3	J6.2	J5.5	4.0	G	C	3.5	4.7	C	J6.0	J13.3	2.6	J6.0	J8.2Y	J3.1	J2.0	2.2
14	2.3	2.2	E	2.1	E	2.0	3.1	3.7	4.0	4.1	C	4.0	3.6	4.0	4.0	3.6	J5.8	J10.7	J13.5	J6.0	J5.1	J2.9	J2.6	E
15	J2.9	J2.9	J2.0	J2.3	2.3	J3.6	J4.3	J7.0	J5.0	4.2	4.1	3.5	G	G	3.7	J6.5	J4.6	J6.0	J10.8	J7.1	J10.5	J3.0	J2.9	J2.7
16	J1.9	J2.6	J2.5	E	E	2.2	3.1	4.0	3.6	4.5	4.5	3.8	3.6	J5.3	4.1	4.0	3.7	3.3	2.9	J3.0	J2.9	J2.3	J2.0	E
17	E	E	E	E	E	2.4	3.4	4.0	J5.1	J5.9	J6.1	J5.0	4.3	3.9	3.6	3.9	J5.6	J6.3	J7.4	J8.3	J5.2	J2.8	2.3	2.2
18	2.2	E	E	E	E	2.2	J4.3	J6.0	J6.0	J4.6	4.6	J6.1	4.8	J5.4	G	3.8	J6.0	J10.0	J11.7	J7.9	J6.0	J6.1	J5.1	2.2
19	2.0	J2.8	J2.8	J2.0	J2.7	2.5	3.8	J5.2	4.5	J5.6	J5.2	J5.3	J5.9	J7.4	J7.5	3.4	3.2	J7.3	J9.3Y	J8.4	J5.0Y	J3.0	J2.8	J3.8
20	J3.8	J3.1	J3.1	J2.6	J2.3	2.0	3.0	3.6	4.6	3.6S	J6.0	J4.6	4.0	3.9	3.7	3.7	3.4	J5.9	J3.6	J5.1	J2.9	J4.1	J2.9	J2.4
21	J2.1	J1.8	E	E	E	G	3.1	J5.1	J8.2Y	J4.6	4.7	J6.1	J5.9	3.7	3.9	4.0	3.5	2.8	2.4	J5.1	J3.0	J3.0	J2.6	J2.9
22	2.3	J2.7	J3.0	J1.9	J3.8	G	3.0	3.9	J5.2	J5.1	J5.2	J7.3	4.7	J5.3	J5.0	C	J5.3	J4.9	J5.5	J5.6	J3.8	J6.1Y	J3.1	J3.8
23	J2.1	J2.0	J2.1	E	E	2.6	J3.7	J6.1	J6.1	J5.5	4.0	J3.9	4.0	3.8	3.5	3.7	4.0	J4.5	J5.3	J4.3	J5.0	J3.1	J5.1	J3.0
24	E	E	E	E	E	2.2	3.9	J4.3	J6.0	J7.2	4.7	4.2	4.6	J5.1	3.9	C	C	3.7	J3.3	J5.2	J7.2	J5.2	J4.5	J7.6
25	J6.0	J4.1	J6.3	J6.1	J6.9	3.1	J4.5	J8.1	J7.0	J5.0	5.0	J4.8	3.9	3.5	3.9	J5.1	J3.2	J3.8	J3.5	J6.8	J6.1Y	J3.3	J3.6	J7.0
26	J7.6	J3.5	J5.0	J3.5	J2.8	J3.6	J7.0	J8.1	J8.3	J8.5	J8.8	J7.2	J6.9	J7.2	J5.9	J5.2	J5.2	J7.9Y	J3.5	J4.9	J3.0	J5.2Y	J5.0Y	J7.3
27	J10.8Y	J7.5	J8.0	J3.4	2.8	J5.2	J7.2	J7.9	J3.4	4.1	J5.0	J8.0	J6.9	J5.0	J4.0	J5.2	J8.1	J12.2	J7.2	J2.6	J3.0	J3.2	E	J2.5
28	J3.8	J3.1	J2.5	J2.4	E	J3.3	J4.4	J10.0	J14.3	J7.0	J5.4	J7.7	D20.0D	J5.8	J6.2	4.5	3.7	J5.1	J6.2	J5.9	J2.3	J2.6	J3.0	J6.1
29	J5.8	J2.9	J3.1	J5.0	J3.0	J3.9	J4.6	J8.1	J6.1	5.9	4.2	J6.0	4.5	C	J8.1	J5.1	J4.8	J5.3	J5.9	J6.6	J11.0Y	J8.1	J7.2	J5.2
30	J6.5	J6.8	J6.1	J3.6	J3.2	3.0	J6.5	J8.3	J6.8	J7.8	J5.3	4.2	J6.3	3.9	3.5	4.0	4.5	J4.9	J6.0	J7.6	J6.0	J5.9	J6.4	J3.0
31	J2.5Y	J3.4	J2.9	J3.0	J2.3	2.0	J4.0	3.9	4.5	J5.1	4.5	4.2	J6.2	4.6	J7.1	G	3.8	J6.1	J7.0	J3.2	J2.1	J2.5	J3.1	J3.0
No.	30	30	30	30	30	30	30	30	30	30	30	31	29	29	31	27	29	30	31	31	31	31	30	30
Median	2.2	2.4	2.0	2.0	E	2.2	3.4	4.4	5.1	4.8	4.6	4.2	4.5	4.0	3.9	3.8	4.2	5.1	5.3	5.6	5.1	3.1	2.9	2.6
U.Q.	3.1	3.0	2.9	2.6	2.5	3.0	4.3	6.1	6.1	5.9	5.2	6.1	6.0	5.3	5.1	5.1	5.4	7.3	7.0	6.6	6.2	5.3	4.5	3.8
L.Q.	E	E	E	E	E	E	3.0	3.9	4.5	4.5	4.1	3.8	4.0	3.6	3.6	3.5	3.6	3.8	3.3	3.8	2.9	2.5	2.1	E
Q.R.							1.3	2.2	1.6	1.4	1.1	2.3	2.0	1.7	1.5	1.6	1.8	3.5	3.7	2.8	3.3	2.8	2.4	

The Radio Research Laboratories, Japan

foEs — Sweep 1.60 Mc to 20.0 Mc in 20 sec in automatic operation

A 4

IONOSPHERIC DATA

May.1963 **fbEs** 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							2.8	3.4	4.0	4.5	4.0	u3.8R	4.0	3.6	3.6	B	3.3	3.4	3.3	2.4	1.7	2.1		
2	1.8			1.7			2.5	4.5	A	A	3.9	u3.8R	A	3.6	3.4	4.5	5.2	5.0	u3.3R	u5.3R	3.1	2.5	2.5	
3		1.8		2.0			2.7	3.5	4.0	A	4.8	5.3	3.9	4.3		3.3	3.1	3.6	u3.9R	1.9	3.5	2.1	2.1	
4							2.7	3.8	4.8	u4.5R	3.9	3.7	u3.6R		4.6	A	5.5	A	4.1	2.3	A	2.6	1.9	1.8
5		1.9	1.9	2.0	1.8	3.0	3.0	u3.9R	4.8	3.7	4.8	3.9	A	A		3.6	3.1	C	A	A	A	A	A	
6	2.5	2.5				2.0		3.8	4.1	A	A	A	A	A	u3.9R	3.4	u4.2R	5.6	A	E6.0R	A	5.0	2.8	E3.2R
7	E3.0R	1.8	1.8	1.7			3.0	5.3	4.0	C	3.2	u3.5R	u3.6R	3.5	3.9	A	6.0	A	A	5.2	4.6	1.8	C	C
8	C	C	C	C	C	C	C	C	C	4.4	4.1	u3.7R	4.2	3.7	4.4	3.5	3.4	4.8	E5.7R	6.2	E6.3R	E4.0RS	1.9	
9	1.9	1.8	1.8				2.7	u3.3R	4.5	4.3	4.3	4.0	3.9	4.0	4.4		3.4	u3.9R	2.8	2.7				
10					1.8		3.1	4.1	5.0	u3.9R	4.0	3.9	C	C	5.3		C	2.8	E3.7R	5.1	E2.6R		2.4	A
11	1.9			1.7	2.1		3.6	4.5	4.5	4.5	4.0		4.3			2.8G	E3.6R	E3.4R	u3.8R	E3.6R	2.6	2.3	E2.0R	1.9
12	2.5	1.8					E3.7R	5.1	5.8	A	A	5.3		4.3	4.4	E3.3R	4.7	3.0	u3.1R	3.7	5.3	5.5	2.8	2.5
13						2.3	3.4	4.2	4.5	A	E4.0R		C	E3.5R	u4.7R	C	5.7	3.3	2.6	A	4.1	E3.1R	1.8	1.8
14	1.8	1.7		2.0		2.0	3.0	3.7	3.9	4.1	C	E4.0R	E3.6R	u4.0R	3.7	3.4	5.6	A	A	2.3	2.8	2.7	2.3	
15	2.2	1.8	1.8	1.8	1.9	2.6	E4.3R	A	4.8	3.9	E4.1R	E3.5R			3.6	6.5	4.5	4.8	A	A	A	2.3	2.6	2.2
16	1.8	2.3	1.8			2.2	2.8	4.0	3.5	4.3	4.5	E3.8R	E3.6R	5.3	4.1	u4.0R	3.5	3.2	2.9	3.0	u2.9R	2.3	1.8	
17						2.2	3.4	3.9	4.2	4.0	5.2	4.5	4.0	E3.9R	3.5	3.8	5.5	6.2	5.3	5.5	4.5	2.1	1.7	1.7
18	1.8					2.2	4.3	5.5	5.0	4.4	E4.6R	A	4.7	u5.4R		E3.8R	4.8	A	A	A	5.5	A	4.4	1.8
19	1.7	1.7	1.7	1.8	2.0	2.3	3.8	4.0	4.4	5.3	4.1	5.2	5.3	A	5.7	3.4	3.2	A	3.5	A	2.6	2.0	2.2	1.8
20	2.2	2.0	2.7	2.5	1.7	2.0	2.8	3.3	4.6	E3.6RS	4.2	u4.6RS	4.0	3.9	3.6	3.4	3.4	u5.9R	3.0	4.3	2.9	1.8	1.8	2.1
21	1.8	1.7					2.7	4.8	3.5	4.1	4.6	A	5.5	u3.7R	3.8	4.0	3.1	2.7	2.4	E5.1R	2.6	2.8	2.0	2.6
22	1.8	2.3	3.0	1.9	E3.8R		2.8	3.7	5.2	4.6	A	A	E4.7R	5.2	4.6	C	5.3	4.5	5.1	4.1	3.5	2.8	1.9	2.2
23	1.8	2.0	1.8			2.6	3.4	4.5	4.6	4.8	4.0	u3.9R	4.0	u3.8R	3.4	u3.7R	u4.0R	4.5	u5.3R	4.1	5.0	1.9	3.2	E3.0RS
24						2.2	3.9	4.3	6.0	A	4.5	u4.2R	E4.6R	4.9	3.8	C	C	2.8	E3.3R	E5.2R	5.8	4.9	4.1	A
25	A	A	A	A	A	2.4	4.3	A	A	5.0	5.0	4.4	u3.9R	u3.5R	3.6	4.6	u3.2R	3.4	u3.5R	A	4.5	2.5	3.6	A
26	1.9	2.0	4.0	2.5	1.7	3.5	A	A	3.8	3.9	4.7	5.3	A	4.1	5.4	4.8	4.5	4.8	2.3	4.5	1.8	1.8	2.6	A
27	A	A	A	2.7	2.1	4.6	A	A	3.4	4.0	4.9	A	5.0	4.7	u4.0R	5.1	A	5.2	3.5	2.0	2.4	E3.2R		1.7
28	3.5	2.3	1.8	1.8		3.3	4.4	A	5.2	5.5	4.3	A	A	5.3	4.4	4.4	3.3	3.5	E6.2R	5.3	2.3	2.0	2.2	4.9
29	A	2.4	2.5	3.1	1.9	A	A	A	4.3	4.4	3.5	A	4.5	C	A	4.7	3.8	5.2	5.4	A	A	A	A	A
30	A	A	A	A	2.5	2.7	A	A	A	A	A	4.2	A	3.8	u3.5R	4.0	u4.5R	u4.9R	5.3	5.1	A	5.3	A	3.0
31	1.8	2.6	2.5	2.5	1.8	2.0	3.5	3.7	4.5	4.9	4.5	4.0	A	4.6	A		3.0	A	A	3.0	1.8	2.0	2.9	1.9
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

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

A 5

IONOSPHERIC DATA

May.1963 | **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	1.75	1.80	1.70	1.75	1.75	1.90	1.70	1.75	1.85	1.90	2.05	2.20	2.70	1.95	1.90	6.15	2.20	1.75	1.70	1.70	1.70	1.80	1.75	1.70
2	1.75	1.70	1.70	1.70	1.75	1.80	1.70	1.70	1.90	1.90	1.90	2.00	2.20	2.20	1.80	1.75	1.75	1.75	1.80	1.80	1.75	1.75	1.75	1.80
3	1.80	1.80	1.70	1.80	2.00	1.80	1.70	1.85	1.80	1.90	2.20	2.50	2.05	1.80	1.95	1.90	1.75	1.70	1.80	1.75	1.80	1.70	1.80	1.80
4	1.75	1.70	1.75	1.75	1.95	2.00	1.80	1.80	1.85	1.90	2.10	2.10	2.40	2.20	1.85	1.85	1.80	1.80	1.80	1.70	1.85	1.80	1.75	1.80
5	1.75	1.80	1.70	1.70	1.80	1.75	1.85	1.85	1.85	2.20	2.00	2.25	1.90	1.90	1.85	1.90	1.80	I1.75C	1.70	1.80	1.70	1.75	1.70	1.70
6	1.70	1.75	1.80	1.70	1.70	1.75	1.70	1.75	1.75	2.00	1.95	2.00	2.00	1.95	1.80	1.90	1.90	1.70	1.85	1.85	1.70	1.70	1.70	1.75
7	1.80	1.75	1.80	1.70	1.70	1.80	1.70	1.75	1.85	I1.85C	1.85	1.85	2.40	2.00	2.00	1.75	1.75	1.70	1.90	1.80	1.75	1.75	C	C
8	C	C	C	C	C	C	C	C	C	1.80	2.00	2.10	2.50	2.00	1.90	2.00	1.75	1.85	1.80	1.85	1.70	1.80	1.75	1.80
9	1.75	1.80	1.80	1.80	1.75	1.80	1.70	1.80	1.80	1.70	1.80	1.80	1.90	1.85	1.85	1.75	1.75	1.65	1.85	1.75	1.80	1.80	1.70	1.85
10	1.70	1.80	1.75	1.75	1.75	1.75	1.75	1.70	1.75	1.80	1.95	1.90	I1.75C	I1.75C	1.70	1.75	I1.80C	1.75	1.80	1.70	1.75	1.80	1.75	1.80
11	1.80	1.70	1.75	1.70	1.70	1.80	1.80	1.85	1.90	2.00	2.00	2.15	2.90	2.10	1.90	1.80	1.80	1.90	1.80	1.70	1.70	1.70	1.80	1.80
12	1.80	1.80	1.75	1.75	1.75	1.80	1.80	1.80	1.80	1.85	2.55	2.20	2.05	2.20	2.20	1.95	1.80	1.80	1.70	1.75	1.75	1.75	1.75	1.70
13	1.80	1.75	1.70	1.75	1.80	1.75	1.75	1.80	1.90	2.00	1.95	1.90	I2.45C	2.05	1.90	I2.00C	1.80	1.70	1.80	1.75	1.70	1.75	1.75	1.80
14	1.80	1.70	1.70	1.70	1.75	1.80	1.75	1.80	1.85	1.90	I2.20C	2.50	2.50	2.45	2.35	1.85	1.90	1.75	1.75	1.75	1.70	1.75	1.70	1.70
15	1.70	1.70	1.70	1.80	1.80	1.80	1.75	1.80	1.80	2.10	1.85	1.80	2.55	2.25	2.05	1.90	1.80	1.80	1.80	1.75	1.80	1.75	1.75	1.80
16	1.80	1.75	1.80	1.75	1.80	1.80	2.00	1.85	1.95	2.20	2.20	1.95	2.20	2.05	1.90	1.95	2.10	1.85	1.70	1.75	1.75	1.70	1.75	1.80
17	1.80	1.75	1.75	1.75	1.75	1.75	1.85	1.80	1.80	1.90	2.00	2.05	2.10	2.00	1.80	1.80	1.85	1.70	1.70	1.70	1.70	1.70	1.70	1.70
18	1.75	1.75	1.70	E	1.65	1.70	1.75	1.80	1.70	1.90	2.65	2.20	2.50	2.50	2.50	2.00	1.95	1.80	1.70	1.75	1.75	1.70	1.70	1.80
19	1.70	1.70	1.70	1.70	1.75	1.75	1.80	1.90	1.90	1.90	2.50	2.00	2.50	2.80	2.05	2.00	1.90	1.80	1.75	1.70	1.70	1.75	1.70	1.70
20	1.80	1.75	1.70	1.80	1.70	1.80	1.75	1.80	2.00	2.00	1.80	1.80	2.90	1.85	1.80	1.85	1.75	1.75	1.70	1.70	1.80	1.70	1.70	1.70
21	1.70	1.70	1.70	1.70	1.70	1.75	1.70	1.75	1.80	1.80	1.95	2.05	1.90	1.85	2.00	1.80	2.25	1.75	1.85	1.80	1.75	1.70	1.75	1.75
22	1.80	1.75	1.75	1.85	1.70	1.85	1.75	1.75	1.80	2.75	2.90	2.55	2.05	2.25	1.75	I2.00C	1.80	1.75	1.85	1.70	1.70	1.75	1.75	1.75
23	1.70	1.75	1.75	1.75	1.70	1.75	1.80	1.95	1.80	1.95	1.80	2.20	2.05	2.20	1.95	1.95	1.90	1.80	1.80	1.75	1.75	1.80	1.80	1.85
24	1.90	1.80	1.80	1.75	1.75	1.80	1.80	1.80	1.80	2.50	2.70	2.85	2.50	2.20	2.25	E5.20C	I1.80C	1.70	1.80	1.75	1.80	1.80	1.70	1.75
25	1.80	1.75	1.75	1.75	1.80	1.75	1.80	1.80	1.90	1.90	1.95	1.95	2.10	1.95	1.95	2.00	1.80	1.70	1.80	1.80	1.75	1.75	1.75	1.80
26	1.75	1.75	1.75	1.70	1.70	1.70	1.75	1.90	1.80	1.90	1.80	1.95	2.45	2.45	2.00	1.80	1.75	1.75	1.70	1.70	1.70	1.75	1.75	1.70
27	1.75	1.70	1.70	1.75	1.70	1.75	1.70	1.80	2.20	2.20S	2.20	2.65	1.95	1.90	2.10	1.80	1.80	1.70	1.75	1.70	1.70	1.70	1.80	1.70
28	1.75	1.70	1.70	1.75	1.70	1.75	1.70	1.75	1.80	1.90	1.80	2.70	3.05	2.50	1.90	1.85	1.80	1.75	1.80	1.70	1.70	1.75	1.70	1.70
29	1.70	1.70	1.75	1.70	1.70	1.75	1.70	1.70	1.80	1.80	2.05	1.85	1.80	I1.80C	1.80	1.80	1.80	1.70	1.80	1.70	1.85	1.70	1.80	1.70
30	1.70	1.70	1.70	1.70	E	1.75	1.70	1.80	1.90	1.85	1.90	2.30	2.00	2.20	2.45	1.75	1.70	1.70	1.70	1.70	1.65	E	1.70	1.70
31	1.70	1.70	E	E	1.70	1.70	1.65	1.70	1.75	1.75	2.30	1.95	1.80	1.80	1.80	1.80	1.70	1.75	1.70	1.70	1.70	1.70	1.70	1.65
No.	30	30	30	30	30	30	30	30	30	31	31	31	31	31	31	30	31	31	31	31	31	31	30	30
Median	1.75	1.75	1.70	1.75	1.75	1.75	1.75	1.80	1.80	1.90	2.00	2.05	2.20	2.05	1.90	1.85	1.80	1.75	1.80	1.75	1.75	1.75	1.75	1.75
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

f-min Sweep 1.60 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

May.1963 **M(3000)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	RS	RS	3.00R	2.90	I2.90R	3.40S	2.85	3.05	2.55RH	3.45	3.20	I2.60R	3.20	2.75	I3.10R	3.15R	3.30	3.35	3.30	3.10	2.90	2.90	RF	RS
2	I2.90R	2.95S	2.90	2.75	2.85	3.10	3.20	2.90	A	A	G	2.90R	A	R	2.80	3.15	3.25	3.15	3.15	3.15	I3.10RS	I3.10RS	I3.65RS	I3.60RS
3	I3.10RS	I2.90RS	3.00	3.00	I2.90R	I3.05R	3.50	3.20R	3.20	I3.20A	3.10	3.00	2.85	3.10	3.25	3.35	3.15	3.05	I3.10RS	I3.25RS	I3.30RS	2.95S	2.90	2.80R
4	2.80	2.85	2.90	3.20	3.45	3.45	3.35	J3.35R	3.25	3.05	3.15	3.25	3.10	2.95	3.15	A	R	A	I3.10RS	3.20S	I3.15A	I3.05RS	I2.90RS	2.90
5	I2.95RS	I2.90RS	I3.10RS	3.25	I3.00RS	3.10	G	2.80	3.25	3.30R	2.95	2.50	I2.85A	I2.90A	3.00	3.15	3.20	I3.20C	A	A	A	A	A	I3.00RS
6	2.75S	3.10	3.10	2.90	2.90	J3.30R	3.40R	I3.10RS	3.40	A	A	A	A	A	3.10	3.25S	3.20	3.30S	A	RS	A	3.00	RS	RS
7	RS	I2.80RS	2.85	2.95	I3.20R	3.60	3.30	3.20	3.10	I3.40C	3.25	2.85	3.05	3.15	3.20	A	A	I3.10A	I3.10A	3.10S	3.40	RS	C	C
8	C	C	C	C	C	C	C	C	C	3.05	3.10	3.05	3.00	I3.00R	3.20	3.30	3.20	3.10	RS	RS	RS	RS	RS	RS
9	RS	2.90RS	2.85	2.85	J3.10R	3.30	3.35	3.25	3.25S	I3.40R	3.50	3.40	3.00	3.00	3.10	3.25	3.15	3.20S	RS	RS	RS	RS	2.95S	2.80S
10	2.90	2.90	2.80	2.90R	J2.90R	3.50	I3.25RS	3.30	3.30	3.25	3.25	I2.90R	I3.00C	I3.05C	3.00	3.05	I3.20C	3.20	2.90	RS	RS	3.15S	3.05	I2.85A
11	I2.80RS	I2.80RS	I2.80RS	2.90	3.15	3.40	3.40	3.60	3.45	3.15	2.90	3.20	2.95	2.90	3.10R	U3.05R	I3.15R	I3.35RS	3.20	2.95S	I3.00RS	I2.95RS	I2.90RS	2.90
12	2.75	2.95RS	2.90	I2.95RS	2.90	3.10	I3.10R	3.20	A	A	A	2.90	3.10R	3.10	3.25	3.25	3.10	3.10	3.00	RS	RS	RS	RS	RS
13	FS	I2.80RS	I2.80FS	2.95	I3.00RS	3.30	I3.25RS	3.60	3.40	I2.95A	3.05	2.90	I3.00C	2.90	3.00	I2.90C	2.95	3.10	RS	A	3.00RS	RS	RS	FS
14	RS	RF	2.95S	3.00S	3.00S	3.40	3.25	3.10	3.15	2.90R	I2.80C	2.90	2.85	2.90	2.75	2.95	2.95	A	A	3.15R	2.85	FS	FS	I2.85RS
15	I2.90FS	I3.00FS	3.05	3.20	I3.25RS	3.60	3.00	I3.10A	3.05	3.15	3.30	2.80	3.05R	3.05	3.10	3.10	3.15	R	A	A	A	RS	2.85S	I2.90RS
16	2.85	I3.00RS	I3.10RS	I3.30RS	I3.00R	3.20R	3.25	3.35	3.35H	3.05	3.20	3.15	2.90	3.05	3.20	3.30R	3.30	3.25	2.90	3.10S	I3.15RS	3.00	I2.90RS	I2.95RS
17	3.05	I3.00RS	3.05S	2.90S	3.00R	3.10S	I3.35RS	3.50	3.25	3.20	3.15H	3.00	3.00	3.05	3.20	3.20	3.30	3.20	I3.15RS	3.15S	RS	RS	RS	3.00S
18	3.00	2.90	J2.95S	2.90S	2.85S	3.90	3.30	3.50S	3.55	3.10	I2.85R	I3.05A	3.10	3.05	3.10	3.00	3.10	A	A	A	RS	A	RS	I3.10RS
19	I3.00FS	2.90S	3.10S	3.10S	I3.05RS	3.00	3.30	3.20	3.30R	3.15	3.10	3.10R	3.05	I3.05A	3.10	2.95	3.20	I3.10A	2.85	A	RS	3.05S	3.05	I2.90RS
20	I2.90RS	FS	RS	I3.00RS	I3.00RS	3.30	3.40	3.20	3.35	3.20	3.15	2.90	2.85	3.20	3.15	3.10	3.25	3.20	3.15	3.15	3.00	I2.95FS	I3.00RS	I2.90FS
21	2.80RS	I2.95RS	3.00	I3.00RS	3.15S	3.30	3.45	I3.30RS	3.15	3.30	3.20	I3.15A	3.00	3.05	3.05	3.15	3.10	3.10	3.15R	R	RS	R	U3.20R	3.00R
22	I3.00R	2.95R	I3.00R	I3.05R	I3.00R	J3.20R	3.30	3.50S	3.55	3.40R	I3.00A	A	R	3.00	3.05	I3.20C	3.15	3.10	I3.20RS	3.15	RS	RS	RS	FS
23	3.05S	3.10	3.00	3.05	2.95	3.00	3.10	3.40	3.40	3.40	3.50	3.20	3.10	I3.00R	2.80	3.15	3.25	3.30	3.10	RS	RS	3.00	I3.15RS	3.05
24	3.10	J2.95RS	3.00	3.15	3.05	3.00	3.20S	3.40	3.45R	I3.40A	3.35	3.20	3.25	3.10	2.90	3.00	I3.05C	3.10	2.90RS	I3.20R	3.35	3.15S	RS	A
25	A	A	A	A	A	R	3.00H	A	A	3.40	3.40	2.90	3.05	2.95	3.05	3.15	3.30	3.30	3.10	A	RS	RS	3.20	I3.10A
26	RS	RS	R	R	R	3.35	A	A	3.30	3.70	3.40	3.20	I3.00A	2.70	3.05	3.10	3.10	3.05	3.10R	3.10	3.05	RS	RS	A
27	A	A	A	R	J3.10R	3.15	I3.35A	I3.30A	3.60	3.55	3.10	I3.15A	3.10	3.05	2.90	3.00	I3.05A	3.10S	3.05	3.00S	3.10S	3.15S	3.20	I3.00R
28	2.90S	2.90	I2.90RS	2.90S	3.15S	3.00	3.25S	I3.35A	3.30	I3.45R	3.10	A	A	3.05	3.00	2.90	2.95	I3.20RS	3.40	3.20	2.80S	2.85S	2.85S	2.95
29	2.85	I2.95RS	2.95R	2.95	3.15	A	A	A	2.85	3.10	I2.75RS	I2.90A	2.70	C	A	3.00	2.95	3.10	I3.15RS	A	A	A	A	A
30	A	A	A	A	RS	2.65R	A	A	A	A	A	G	A	G	2.65R	3.00	3.10	2.95	I3.10A	2.90	I2.90A	3.10S	I3.00A	I3.00RS
31	3.05S	2.70S	I2.85F	3.05F	I2.95RF	2.85R	3.25	3.50	U3.00R	3.25R	I2.80R	2.90	I2.90A	2.60	I2.70A	3.05	3.05	I3.00A	I2.90A	3.10S	3.15S	3.25S	I2.80RS	2.85
No.	21	23	25	26	27	28	27	26	26	27	28	28	26	28	30	29	29	27	23	17	16	16	17	21
Median	2.90	2.90	2.95	3.00	3.00	3.25	3.25	3.30	3.30	3.25	3.10	2.95	3.00	3.00	3.10	3.10	3.15	3.10	3.10	3.15	3.10	3.00	U3.00	U2.95
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

M(3000)F2 Sweep 1.60 Mc to 20.0 Mc in 20 sec in automatic operation

A 7

IONOSPHERIC DATA

May.1963

M(3000)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	3.40	L	A	L	385	3.80S	3.95	3.60H	I3.55B	L							
2							L	A	A	A	3.85	I3.80R	I3.80A	3.70	3.50	A	A	A						
3							L	L	L	A	A	I3.55A	3.90	I3.70A	3.75	I3.55R	3.60L	L						
4							L	A	A	A	3.70	3.75	I3.70L	3.75	A	A	A	A	A					
5							3.45	I3.50A	A	R	A	3.75	I3.75A	I3.80A	I3.60HR	3.50	3.45L	C						
6							L	L	R	A	A	A	A	A	A	I3.50L	A	A						
7								A	L	I3.75C	3.95	I3.80L	I3.90L	3.80L	3.50L	A	A	A						
8							C	C	C	A	I3.80L	3.80	3.70R	3.80	I3.60AL	3.60L	L	A	A					
9							L	L	A	3.60	3.70L	3.85L	3.95R	3.85	I3.70A	3.60L	L	A	L					
10								A	A	I3.80A	3.70	3.60H	C	C	A	3.35L	I3.45C	L	A					
11							L	A	A	A	3.90	3.75	I3.70AL	I3.65R	3.45	R	L	R	A					
12							L	A	A	A	A	A	3.65	A	A	R	A	L	A					
13						L	L	A	A	A	3.65HL	3.75	I3.65C	3.70	A	C	A	L						
14							L	3.45L	3.45	3.70	I3.80C	3.80	3.70	3.50	3.55	3.45R	A	A						
15							A	A	A	3.80	I3.60R	I3.85L	3.80	3.65	3.70	A	A	A						
16								A	3.60L	3.70	A	L	I3.80R	I3.60A	I3.35A	I3.50AL	I3.60L	L	L					
17						L	L	L	L	3.85	I3.80A	3.55L	3.70R	3.60	3.90	3.65	A	A	A					
18							A	A	A	L	A	A	A	A	I3.65R	R	A	A	A					
19							A	A	A	A	3.90L	I3.70A	A	A	A	I3.65L	3.40	A	A					
20						L	L	L	A	3.75	3.75	I3.80A	3.55	3.55	3.60	3.45H	L	A	L					
21							L	A	L	I3.80L	A	A	A	3.70	3.85	3.75	I3.50R	L	L					
22							L	L	A	A	A	A	A	A	A	C	A	A	A					
23							L	A	A	A	4.05	3.90	4.10R	3.90	3.90	3.55	A	A	A					
24						L	A	A	A	A	A	R	A	A	3.60	I3.60C	I3.50C	L	A					
25							A	A	A	A	A	L	3.90	4.05R	I3.80R	I3.70A	3.55	L	A					
26						A	A	A	3.80	3.80	A	A	A	3.70	A	A	A	A	L					
27						A	A	A	I3.60L	3.50	A	A	A	I3.70A	A	A	A	A	A					
28							A	A	A	I3.85A	L	A	A	A	A	A	L	A	A					
29							A	A	A	I4.00A	3.70	A	A	I3.70C	I3.55A	I3.50A	3.45	A	A					
30						L	A	A	A	A	A	A	A	3.60	3.55	A	A	A	A					
31						L	A	3.55L	I3.85A	I4.00A	I3.90A	3.80	A	A	I3.80A	3.75	3.40	A	A					
No.							1	4	5	14	16	18	18	22	21	18	10							
Median							3.45	3.50	3.60	3.80	3.80	3.80	3.80	3.70	3.60	3.55	3.50							
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

M(3000)F1

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

A 8

IONOSPHERIC DATA

May.1963 | 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							I405L	330	I340H L	250	300	I515R	300	395	300	I290B	260							
2							270	A	A	A	G	R	A	R	430	340	I315A	I300A						
3							245	290	305	I330A	335	350A	380	340	305	295	305	300						
4							250	290	I370A	345	330	300	345	385	330	I325A	300A	I300A	285					
5							G	440	315	315	395	430	I335A	I350A	355	325	295	I300C						
6							255	295A	295	A	A	A	A	A	340	300	295	295						
7								I265	325	I285C	305	I325L	350	340	330	A	A	A						
8							C	C	C	300	345	350	350	345	300	300	300	315	A					
9							245	260	300	255	285	300	355	355	345	295	295	290	290					
10								265	295	300	305	355	I350C	I350C	I350A	335	I300C	290	A					
11							270	250	290	300	385	305	350	380	335	320	290	255L	260					
12							375L	A	A	A	A	395	340	340	300	295	305	265	280					
13						250	270	255	295	I360A	350	395	I350C	370	340	I335C	320A	280						
14							270L	340	I335	I350R	I395C	395	420	400	415	380	A	A						
15							A	A	I310A	325	295	390L	345	350	345	I320A	300	305						
16								275	300	355	320	340	345	355	305	295	295	290	300					
17						290L	250	250	300	320	325A	355	350	335	305	300	295	A	A					
18							255	250	255	350	I390R	I350A	340	340	340	345	340	A	A					
19							290	305	295	305	350	340	I350A	I350A	I330A	345	305	I310A	305					
20						280L	290	290	300	320	315	395	380	320	340	340	295	I295A	270					
21							250	255	285L	305	320	I340A	I350A	350	345	325	310	305	280					
22							270	260	260	280	I355A	I380A	I390A	355	345	I310C	I320A	320	285A					
23							280	265	270	290	280	325	390	I380R	395	325	295	290	I290A					
24						290	285	255	255	I310A	305	335	305	345	400	I345C	I315C	305	305					
25							295	A	A	290	290	400	350	350	345	300	295	280	295					
26						245	A	A	300	250	300	I400A	I380A	415	345	325	305	300	290					
27						A	A	A	250	280	345	I340A	I350A	360	395	350	I330A	I330A	290					
28							285	I275A	300	330	300	A	A	340A	345	350	345	260	A					
29							A	A	395	320	I435RS	I405A	470	C	A	355	325	A	A					
30						295L	A	A	A	A	A	G	A	G	445	345	305	I330A	A					
31						335L	295	275	355	330	I430R	390	I445A	500	I430A	345	350	A	A					
No.						7	22	22	26	27	28	28	27	28	30	30	29	24	14					
Median						290	270	270	300	310	330	355	350	350	345	325	305	300	290					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'F2 Sweep 1.60 Mc to 20.0 Mc in 20 sec in automatic operation

A 9

IONOSPHERIC DATA

May.1963 | **h'F** | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39°43.5' N, Long. 140°08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	270	290	245	295	295	245	250	I260A	I245A	I240A	220	220	I205A	200	225	I250B	265	250	255	250	270	280	295	280
2	250	280	290	295	295	245	245	A	A	A	I230A	I220A	I230A	235	245	A	A	A	270	I250A	I250A	I280A	I295A	295
3	270	275	280	295	I280B	250	240	245	A	A	A	A	220	I230A	235	240	240	I260A	275	235	I230A	275	290	295
4	300	305	295	255	225	240	245	A	A	A	I235A	230	230	220	A	A	A	A	A	235	I250A	255A	250	290
5	245	335	260	255	255	I250A	A	A	A	240	I235A	225	I230A	I225A	205H	255	245	C	A	A	A	A	A	265
6	I295A	295A	280	295	285	245	210	A	A	A	A	A	A	A	A	235	A	A	A	A	A	A	A	A
7	A	295	295	285	240	235	245	I240A	I235A	I215C	205	200	205	195	I200A	A	A	A	A	I270A	240	220	C	C
8	C	C	C	C	C	C	C	C	C	A	215	210	A	200	I230A	240	245	A	A	A	A	A	235	270
9	290	295	295	295	255	245	240	240	I230A	I230A	I225A	215	215	230	I225A	240	250	A	A	255	245	245	245	290
10	290	290	290	295	280	245	245	A	A	I215A	230A	205	C	C	A	220	I240C	245	A	A	250	240	245A	I285A
11	295	295	300	295	250	240	A	A	A	A	210	I215R	I220A	I230R	240R	R	A	A	I250A	I270A	280A	290	290	255
12	I285A	290	275	260	295	250	A	A	A	A	A	A	230	A	A	R	A	240	I265A	275	I240A	I245A	290	290
13	260	300	295	290	245	240	A	A	A	A	A	210	I210C	210	A	C	A	A	275	A	A	A	240	280
14	285	280	280	285	280	250	250	A	A	A	A	I215R	230R	I210A	230	245	A	A	A	240	250A	I280A	300	290
15	290	285	255	240	245	245	A	A	A	230	I220A	210	205	230	220	A	A	A	A	A	A	255	I290A	290
16	290	290	260	230	275	240	245	I250A	210	A	A	R	I235R	I230A	I230A	I240A	210	245	I250A	270	245	245	290	255
17	245	255	260	275	285	245	I250A	A	A	220	I220A	I220A	225	I230A	200	245	A	A	A	A	A	270	265	255
18	255	275	275	270	290	250	I245A	A	A	A	A	A	A	A	R	R	A	A	A	A	I250A	I260A	I240A	250
19	265	295	260	255	255	245	I240A	I230A	I225A	I230A	230	A	A	A	A	210	220	I245A	I240A	I240A	240A	240	240	280
20	295	300	I300A	295A	260	245	240	235	I235A	240	A	A	I235A	230	220	240	250	A	A	I260A	I270A	290	250	285A
21	295	290	255	245	240	245	245	I230A	210	I205A	A	A	A	245	205	I230A	225	240	245	I250A	255	250A	245	255
22	265	295	I280A	255	I260A	245	240	A	A	A	A	A	A	A	A	C	A	A	A	255	I255A	260	250	260
23	245	255	260	245	290	240	A	A	A	A	220	210	205	210	200	A	A	A	A	255	I255A	255	250A	I250A
24	245	255	275	250	265	250	A	A	A	A	A	220	A	A	240	I220C	I240C	245	I250A	270	255	A	A	A
25	A	A	A	A	A	245	A	A	A	A	A	A	200	205	220	I225A	230A	A	A	A	I280A	250	245	I260A
26	250	295	I280A	270	215	I210A	A	A	240	215	A	A	A	A	A	A	A	A	250	290A	245	240	I245A	A
27	A	A	A	A	290	A	A	A	240	I230A	A	A	A	I225A	A	A	A	A	A	255	245	260	240	255
28	I270A	295A	295	290	255	260A	A	A	A	I230A	A	A	A	A	A	A	240	A	A	A	285	255	290	A
29	A	290	295	I270A	250	A	A	A	A	I205A	RS	A	A	C	A	A	A	A	A	A	A	A	A	A
30	A	A	A	A	A	A	A	A	A	A	A	A	A	I230A	255	A	A	A	A	A	A	A	A	275A
31	275	I315A	315A	I300A	280	245	I250A	I240A	I240A	I230A	I220A	240	A	A	I215A	210	220	A	A	260A	240	210	I265A	290
No.	25	27	27	27	28	27	17	9	10	15	14	16	17	20	19	16	14	8	11	19	23	24	25	25
Median	270	290	280	275	260	245	245	U240	U235	U230	U220	215	220	230	225	240	240	245	250	255	250	255	250	280
U.Q.																								
L.Q.																								
Q.R.																								

h'F Sweep 1.60 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

A 10

IONOSPHERIC DATA

May.1963 | **h'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	E	E	E	E	E	G	145	140	140	140	130	135	140	145	145	B	150	140	120	120	120	105	E	E
2	105	E	E	145	E	G	145	135	120	120	125	115	110	115	135	145	140	125	120	115	115	110	105	E
3	E	105	E	100	E	G	140	140	130	120	115	115	125	110	G	145	145	140	120	115	110	110	110	E
4	E	E	E	E	E	G	145	140	125	120	120	130	125	G	140	140	135	115	120	130	120	125	125	120
5	E	115	120	115	120	140	140	140	125	120	100	120	115	120	G	155	145	C	115	115	115	120	115	E
6	110	105	E	E	E	135	G	130	120	110	105	110	110	120	135	135	140	115	120	120	115	115	105	105
7	105	105	105	115	E	G	125	115	115	C	120	135	115	130	135	140	140	115	115	115	110	110	C	C
8	C	C	C	C	C	C	C	C	C	120	120	120	120	115	110	110	105	140	135	130	120	115	105	E
9	105	105	105	E	E	G	135	140	125	115	115	110	105	110	110	G	145	125	135	120	E	E	E	E
10	E	E	E	E	105	G	140	140	115	120	110	110	C	C	110	G	C	145	120	115	115	E	105	105
11	105	E	E	100	100	G	135	120	115	120	120	G	110	G	G	105	145	140	135	120	110	110	105	105
12	105	105	E	E	E	G	140	130	120	115	110	110	G	115	110	110	110	110	120	110	115	115	110	110
13	E	E	E	E	E	140	140	130	125	115	120	G	C	120	120	C	115	110	145	130	120	110	105	105
14	100	100	E	135	E	140	135	130	135	115	C	110	105	105	110	135	135	120	115	115	110	120	105	E
15	105	105	105	105	105	145	140	125	130	120	120	115	G	G	110	105	105	100	105	105	125	110	110	105
16	105	110	115	E	E	150	145	140	140	135	140	130	130	145	165	150	145	145	145	130	120	115	115	E
17	E	E	E	E	E	150	140	145	140	135	120	125	120	135	135	145	140	110	105	115	120	115	105	105
18	105	E	E	E	E	145	135	135	135	140	130	115	120	115	G	180	145	135	120	115	115	110	110	105
19	105	140	145	100	100	140	140	120	120	110	110	110	115	120	120	140	150	140	130	120	115	110	105	105
20	105	105	105	105	110	145	140	140	140	140	120	110	135	120	120	120	135	125	130	120	125	115	110	110
21	105	105	E	E	E	G	125	115	115	115	115	115	110	135	115	110	110	145	140	120	115	115	110	110
22	110	105	105	105	105	G	140	140	125	115	115	110	110	110	105	C	105	105	140	120	120	110	120	110
23	105	105	105	E	E	140	135	120	115	120	120	120	120	130	135	145	140	140	120	115	110	110	110	110
24	E	E	E	E	E	150	140	140	125	110	115	110	115	110	140	C	C	140	120	115	115	115	110	110
25	105	105	105	105	100	140	140	120	115	115	115	115	115	130	110	105	105	100	100	105	100	135	115	110
26	110	105	110	110	115	145	140	140	130	125	115	115	110	125	140	140	125	110	115	105	110	110	125	120
27	110	100	105	100	105	105	115	115	135	120	115	110	110	105	105	145	125	110	120	120	110	110	E	120
28	105	105	105	115	E	145	145	130	120	115	115	110	105	115	115	115	140	140	115	115	125	125	110	105
29	105	105	105	105	120	145	140	125	125	140	120	110	110	C	105	105	140	130	120	130	115	110	110	110
30	105	105	105	105	100	140	120	115	115	110	110	110	105	115	140	145	145	140	120	115	120	110	110	105
31	110	105	105	105	110	145	135	140	140	140	135	130	110	125	110	G	150	135	125	125	120	115	110	105
No.	22	21	16	17	13	19	29	30	30	30	30	29	27	26	27	24	29	30	31	31	30	29	27	22
Median	105	105	105	105	105	145	140	130	125	120	120	115	115	120	120	140	140	130	120	115	115	110	110	110
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'Es Sweep 1.60 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

May. 1963 | Types of Es | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39°43.5' N Long. 140°08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							h2	h2	h2	h2	h	h	h	h	h		h	h3	h3	f2	f	f2		
2	f2			f			h2	h2	h2	h2	h	c	c2	c	h	h3	h2	h3	c3	f2	f2	f2	f2	
3		f		f2			h2	h2	h2	h2	c2	c	h	c		h	h	h3	c3	f	f2	f2	f2	
4							h	h2	h2	h2	h	h	h		h2	h2	h2	c3	c3	f2	f4	f2	f	f
5		f2	f2	f2	f	h	h3	h2	h2	c	l	h	c3	h3		h	h		c2	f2	f5	f5	f4	
6	f2	f3				h		h2	h2	c2	c2	c2	c2	h2	h	h	h2	c3	c3	f2	f2	f4	f3	f3
7	f3	f	f2	f			h2	c2	c2		h	h	c	h	h	h2	h3	c6	c3	f2	f3	f		
8										c	h	h	h	c	c2	c	l3	h3	h3	f2	f4	f2	f	
9	f2	f	f				h2	h2	h2	c	c	c	c.	c2	c2		h2	h2	h2	f2				
10					f		h2	h3	c3	h	c	c			c3			h2	c4	f2	f2		f2	f2
11	f			f2	f2		h2	h2	c2	h	h		c			l	hl	h	h2	f3	f2	f2	f3	f
12	f2	f					h2	h2	h2	c3	c3	c2		c	c	l	c2	l2	h2	f4	f2	f4	f2	f2
13						h2	h3	h	h2	c2	h			h	h		c2	l3	h2	f3	f3	f4	f	f2
14	f	f2		f2		h	h2	h2	h	c		c	l	l2	c	h	h2	c3	c2	f2	f2	f3	f2	
15	f2	f2	f	f	f	h2	h4	h4	h2	h2	h	c			c	l3	l2	l3	l3	f3	f3	f2	f2	f2
16	f	f2	f			h	h	h2	h	h	h	h	h	hc	h	h	h	h2	h3	f3	f4	f4	f	
17						h2	h2	h2	h	h	h2	h	h	h	h	h	h2	c4	l2	f2	f3	f2	f2	f
18	f					h	h3	h	h2	h	h	c	h	c		h	h2	h3	h2	f2	f2	f2	f2	f
19	f2	f2	f	f2	f2	h2	h3	h2	h2	c2	c	c2	c	h2	h3	h	h	h2	h2	f3	f2	f2	f2	f2
20	f2	f2	f2	f2	f	h	h2	h2	h2	h	h	c	h	h	h	c	h	h2	h2	f3	f2	f2	f2	f4
21	f2	f2					h2	c2	c	c	c2	c2	c2	h	c2	c2	c2	h	h	f2	f2	f2	f2	f2
22	f	f2	f2	f2	f2		h	h2	h2	c	c	c2	c	c2	c2		c3	l2	h3l2	f3	f3	f2	f	f3
23	f	f2	f2			h2	h3	h2	c	h	h	h	h	h	h	h	h	h2	h3	f3	f2	f2	f2	f
24						h	h2	h2	h2	c2	c	c	c	c2	h			h	c2	f2	f3	f3	f3	f2
25	f3	f3	f5	f3	f2	h	h2	h3	c2	c	c2	c	c	h	c	l2	l2	l3	l3	f2	f3	f	f4	f2
26	f2	f2	f3	f2	f	h2	h2	h4	h	h	c2	c	c2	h	h2	h2	h2	c2	c2	f3	f2	f	f5	f2
27	f2	f4	f4	f3	f2	h3	c3	c4	h	c	c	c2	c2	c2	c2	h2c2	h3c3	c2	c2	f	f3	f2		f
28	f4	f2	f2	f2		h2	h3	h5	h2	c2	c2	c2	c2	c2	c	c2	h2	h2	c2	f3	f3	f2	f2	f3
29	f3	f2	f3	f2	f2	h2	h2	h3	h2	h2	h	c	c2		l2	c3	h2c2	h2	c3	f3	f3	f3	f3	f6
30	f3	f5	f3	f3	f3	h2	h3	c4	c3	c4	c2	c	c2	c2	h	h2	h3	h3	c3	f3	f5	f5	f6	f3
31	f2	f2	f3	f3	f2	h	h3	h2	h2	h2	h	h2	c2	h	c2		h	h3	h2	f3	f	f3	f3	f2
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

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

The Radio Research Laboratories, Japan

A 12

IONOSPHERIC DATA

May.1963 — **foF2** — 135° E Mean Time (G. M. T. +9h) — Kokubunji Tokyo — Lat. 35° 42.4'N, Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	4.2S	U4.3S	U4.5S	3.7S	3.4S	U4.0S	5.6	5.8	6.8	J7.0R	6.3	I5.2S	7.4	7.9	8.6	I9.5B	7.3	7.1	6.8	U5.9S	5.8	5.6	5.3	J5.4F
2	5.5	5.3	4.8S	4.5	J4.4F	4.9	5.0	5.2	5.5R	I5.0A	I5.4A	5.6	I5.4B	5.4	5.8	6.6	6.8	6.5	A	A	I4.6A	I3.8A	3.7S	J4.3F
3	U4.1S	3.4S	3.4	3.5	3.3	J4.3S	5.3S	5.8	J6.1R	6.6	6.7	6.9	J7.4R	J8.0S	7.2	J8.4R	7.4	J8.1S	U7.9S	I8.0S	4.8	3.5	I4.2A	4.0
4	3.6	3.6	3.9	4.2	U2.5S	3.8	5.0	5.8	5.8	I6.0A	6.9	J7.9S	6.3R	I6.1A	I6.7A	7.6S	J8.0R	J7.8S	I8.0A	J7.6S	A	A	A	A
5	AS	F	A	4.4S	3.2F	U4.0S	4.3S	5.0	5.8	A	A	I5.6A	5.6	5.9	6.3	7.2	7.5	A	A	A	I5.1A	A	A	A
6	3.8S	I4.2A	I4.0A	4.0S	I3.6F	4.4S	5.3	6.2	6.8	6.6	6.2	5.8	U5.4R	6.4	7.2	J8.3R	7.3S	7.2	7.3	J8.0S	6.2	5.0S	A	A
7	F	I4.1A	J4.4F	3.8	I3.9F	J4.8S	5.5	I5.7A	I6.3A	6.4S	A	A	6.7	7.2	7.2	7.6	6.8	7.2S	U8.4S	U8.8S	7.4S	5.8	I5.2A	4.4S
8	U4.0A	U3.7S	4.0S	3.6AS	3.5	4.3S	6.3R	I6.8A	I6.1A	5.8	6.8	6.4	6.9	6.5	7.9	7.3	6.5	6.0	7.0S	J8.2R	J7.8S	I5.3A	J5.2S	5.1
9	4.9	4.4S	J4.3F	I4.4F	I4.4F	5.0	6.0	6.0	7.4S	7.1	6.4	6.1	J6.4R	7.0	7.2	J8.3S	A	A	I7.6A	8.6	8.6R	5.9	5.8	5.5
10	5.6	5.5	F	F	F	6.3S	5.5	6.0	6.6	6.4R	5.8R	5.8	6.6	7.3	6.9	7.7S	U8.5R	7.3	6.5S	U7.5S	U7.6S	6.0S	4.2S	4.5S
11	U4.8S	4.7S	4.4	4.7	4.6S	5.6S	5.2	6.7	I5.8A	I5.9A	6.2	7.0	6.5	I7.0A	J7.9S	8.4	8.9	7.9S	6.8	I7.1S	6.9	6.0	U6.0S	J6.1F
12	5.5	I5.3F	I5.4F	J5.3F	I4.6F	4.7	5.2	6.9	6.0	I5.9A	I6.1A	6.8	7.7R	U8.4R	8.8	7.6S	U8.4R	J8.1R	U7.8S	8.7	I7.8S	U5.7A	I6.6F	J6.8S
13	I6.4F	5.3	5.1S	U5.2S	5.2F	5.1S	6.3	I6.2A	6.2	5.7	I5.9A	6.4	7.2	6.9	8.5	U8.4R	I9.2A	8.6	J8.4R	7.9	7.0	I6.1F	I6.3S	I6.3F
14	5.8F	J5.1F	5.0	I4.7F	4.9F	5.3	J6.2R	5.9	6.4	6.1	5.7R	6.0	I5.2R	U5.8R	6.3	6.6	7.1	I7.0A	U7.3AS	9.1	6.7S	6.5S	I6.3F	U6.5S
15	U6.0S	U5.8S	U6.0S	U5.2S	4.3S	I4.1S	A	A	A	6.9D	6.8	6.8	6.3	7.2	I7.3A	U7.4S	7.4	U7.4S	I7.1R	I7.0S	5.9	I5.4F	J5.4F	F
16	F	F	F	3.8F	3.4	4.6	5.7	6.6	6.2	I5.9A	6.1	6.4	7.1	6.9	I8.0R	J8.0R	I7.4S	6.2	6.6	J8.0R	I7.3S	6.2	6.0	5.8
17	5.6	J5.4S	5.1S	C	C	C	C	C	C	C	6.9	6.6R	7.5	J8.3R	9.0S	8.6	U7.6S	I7.1S	I7.0A	I7.1A	I6.9S	F	F	F
18	F	5.6F	I5.2F	4.9	4.8	J5.3S	7.4	J8.3R	I5.6A	A	A	A	7.9	J8.1R	7.1	7.4	J7.8S	I7.5A	S	A	A	F	5.4F	A
19	F	U4.5F	4.9	3.9F	I4.2F	5.0	5.7	6.7	I6.8A	6.5	I6.2A	I6.7A	6.8	I6.9A	6.4	6.5	6.5	7.1	7.2	J7.8S	I7.2F	I5.8F	4.8	5.0F
20	I4.9F	U4.6F	4.5	4.4	U4.4S	5.1	5.9	6.5	6.5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	5.7	5.9	I6.2R	7.0	6.2	6.4	7.0	6.9	7.2S	J7.2S	J7.2S	I7.1F	I6.8F	6.0	5.4
22	4.9	4.8	I4.8F	4.4	J4.4S	4.9S	6.3	6.8	6.1	I5.7A	6.0R	A	A	6.1	7.1	A	A	A	A	A	A	I7.1A	6.4	F
23	F	U5.5F	F	F	F	4.4	6.6	6.8	6.9	7.4	5.8	5.7	5.6	5.3	5.8	7.1	U7.3S	7.1	6.9	6.9S	U6.7S	6.8	5.9	5.4
24	5.4F	4.9	5.3F	I4.8F	I4.7A	J5.4R	6.5	J7.8R	6.8	A	A	A	6.0R	C	C	C	U7.8R	J7.9R	J8.2R	J9.6S	I8.4S	4.9	J5.2S	J5.0F
25	U5.1S	A	S	4.0	I4.6F	5.1F	6.3	A	A	A	I5.9A	5.9	6.8	6.9	8.2	C	C	C	6.6	6.7	7.1	I6.2A	6.8	5.7
26	F	A	A	5.5F	I5.1F	4.5	A	A	R	A	I5.3A	5.4	5.9	6.5	7.4S	8.2S	J7.9R	8.5R	8.4	J8.5R	I7.5S	7.1	5.9	I5.6F
27	I5.1F	I4.6S	F	F	I5.2F	4.7	A	6.1S	7.3	U6.2R	5.4	6.0	U6.0R	6.1	5.7	6.3	6.9	7.1	I7.2A	U7.0F	J8.1S	I7.2F	6.0	J5.2S
28	4.8	J4.4S	U4.2S	J4.3S	4.5	4.9	6.5	6.4	I5.8A	I6.6A	I6.2A	5.8	6.6	7.2	6.9	6.8	J8.2R	9.7S	U7.9S	6.0	5.7	J5.3S	5.8	5.5
29	5.4	5.2	I5.0F	4.1S	4.5	4.2	4.4	A	A	5.5	A	A	A	A	U5.0S	6.1	7.4	6.7	6.8	I4.9A	4.8	A	A	I4.4A
30	I4.3A	I4.4FS	I4.0A	3.4	I3.1F	A	A	A	A	A	A	A	A	A	6.1	6.9	6.4	5.5	5.9	I6.1A	I6.3A	6.2	A	A
31	4.4S	3.5	3.5	I3.7A	I3.5A	J4.5S	6.2	6.8	6.5	5.3	4.9	A	5.6	I5.7R	5.5	5.7	5.7	5.5	6.0	7.0	7.0	5.0	I4.5A	I4.5F
No.	23	26	23	26	27	28	25	24	24	23	24	23	27	27	29	27	27	26	26	26	27	25	24	22
Median	4.9	4.6	4.5	4.4	4.4	4.8	5.7	6.3	6.2	6.1	6.1	6.1	6.6	6.9	7.1	7.4	7.4	7.2	7.2	7.6	7.0	5.9	5.8	5.4
U.Q.	5.5	5.3	5.1	4.7	4.6	5.1	6.3	6.8	6.8	6.6	6.4	6.7	7.1	7.2	7.9	8.3	7.9	7.9	7.9	8.2	7.5	6.4	6.0	5.7
L.Q.	4.3	4.3	4.0	3.8	3.5	4.4	5.2	5.8	5.9	5.7	5.8	5.8	5.9	6.1	6.3	6.8	6.9	7.0	6.8	7.0	5.9	5.3	5.2	4.5
Q.R.	1.2	1.0	1.1	0.9	1.1	0.7	1.1	1.0	0.9	0.9	0.6	0.9	1.2	1.1	1.6	1.5	1.0	0.9	1.1	1.2	1.6	1.1	0.8	1.2

foF2 — Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K 1

IONOSPHERIC DATA

May.1963 **foF1** 135° E Mean Time (G.M.T. +9h)

Kokubunji Tokyo

Lat. 35° 42.4'N
Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								S	A	A	A	S	A	A	U4.5L	B	S	A						
2								A	A	A	A	A	B	4.5S	U4.6S	A	A	A	A					
3								L	L	A	4.7L	A	U4.6S	S	U4.5S	4.5L	L	L						
4								A	A	A	A	A	A	A	A	A	A	A	A					
5								A	A	A	A	A	S	L	U4.5S	A	A	A	A					
6								LH	U4.2L	4.6	4.6	B	L	4.5	4.6	4.5L	L	A						
7								A	A	A	A	A	A	A	S	S	L	A						
8								A	A	A	A	A	A	A	A	4.5L	A		A					
9								L	A	A	A	A	L	4.6	A	A	A	A	A					
10							L	L	A	A	L	5.0L	S	A	A	S	A	A	A					
11								A	A	A	A	U4.7L	L	A	A	4.5L	A	A	A					
12							L	A	A	A	A	A	L	S	A	L	L	L						
13								A	A	L	A	R	L	A	A	A	A	A						
14								L	U4.6L	A	S	S	A	S	S	S	A	A	A					
15							A	A	A	A	L	A	A	A	A	A	L	A						
16							A	A	A	A	L	A	A	A	I4.6L	I4.5L	A	A	A					
17						C	C	C	C	C	A	L	A	A	A	A	A	A	A					
18							L	A	A	A	A	A	A	4.8L	U4.5S	4.4L	A	A	A					
19							L	A	A	A	A	A	A	A	4.5S	4.5	U4.3S	U3.9L	A					
20							L	L	4.5L	C	C	C	C	C	C	C	C	C	C					
21						C	C	C	C	A	A	AS	4.7	A	A	A	A	L	L					
22							L	A	L	A	A	A	A	A	A	A	A	A	A					
23							A	A	A	A	L	L	U4.6L	S	S	A	A	A	A					
24							A	A	A	A	A	A	B	C	C	C	L	A	A					
25							A	A	A	A	A	5.0	A	A	A	C	C	C						
26							A	A	A	A	A	A	A	A	U4.5S	A	4.1	A	L					
27							A	A	A	A	4.5L	4.5	B	B	4.4	B	A	U4.0L	A					
28							L	A	A	A	A	S	L	A	L	A	B	A	A					
29								A	A	A	A	A	A	A	S	4.5L	4.2L	L						
30						A	A	A	A	A	A	A	A	A	S	U4.5L	A	A	A					
31							L	L	A	A	A	A	S	A	A	4.4L	U4.5L	L	A					
No.									3	1	3	4	3	4	10	10	4	2						
Median									U4.5	4.6	4.6	4.8	U4.6	4.6	U4.5	4.5	U4.2	U4.0						
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foF1 Sweep 1.0 Mc to 20.0 Mc in 20 sec ' in automatic operation

K 2

IONOSPHERIC DATA

May.1963 | **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						S	R	I2.60R	I2.90R	I3.20S	A	S	S	I3.50B	S	B	S	A	S					
2						S	B	I2.65A	2.80R	I3.00A	I3.20S	A	B	A	I3.40S	3.15	I2.90S	2.25	S					
3						S	S	I2.60R	3.00	I3.10R	I3.20S	I3.30A	3.55R	I3.45R	I3.25S	U3.20R	2.75	B	S					
4						S	B	2.80R	I3.00R	S	S	A	B	A	S	A	2.85	A	S					
5						S	B	I2.70R	U2.95R	A	S	S	S	S	S	I3.15S	2.70	A	S					
6						S	B	R	R	S	S	B	B	S	B	U3.20A	3.05	A	S					
7						S	2.50R	2.75	3.05	A	A	A	A	A	S	I3.20S	I2.85R	2.35R	A					
8						S	S	S	I2.90A	3.35S	I3.40A	S	A	A	A	A	R	2.50R	S					
9						S	R	2.70	I2.95S	S	A	A	A	S	S	S	B	2.50S	S					
10						S	2.25	2.60R	I3.05A	3.05R	S	R	S	S	S	3.15	I2.85R	2.40R	S					
11						S	S	R	S	A	S	A	S	A	A	A	A	A	A					
12						S	2.40	I2.80R	3.00	S	S	S	S	S	A	R	S	A	A					
13						S	S	S	S	S	A	A	A	A	A	A	3.05	U2.60R	S					
14						S	R	2.65R	R	S	S	S	A	A	A	A	S	S	S					
15						S	S	I2.70S	I3.00S	A	S	B	A	A	A	A	A	A	S					
16						S	2.40	2.90	I3.15S	U3.45R	3.45	A	A	A	A	A	3.05S	2.65	B					
17						C	C	C	C	C	S	A	A	A	A	A	A	A	S					
18						S	I2.20B	2.80	R	S	A	A	A	B	S	S	2.75R	A	S					
19						S	U2.15S	I2.60A	I2.85A	3.35	A	A	A	A	S	I3.25S	I2.95R	2.50	S					
20						S	R	S	S	C	C	C	C	C	C	C	C	C	C					
21						C	C	C	C	A	A	A	S	A	A	A	A	A	S					
22						S	I2.50R	I2.70A	R	S	A	A	S	A	A	A	A	I2.50A	A					
23						A	U2.25R	2.70	S	A	S	S	A	S	U3.45S	3.40	I2.95A	A	S					
24						S	2.60	I2.85R	A	A	S	A	B	C	C	C	R	A	S					
25						S	2.40	2.80	A	A	A	A	A	A	A	C	C	C	S					
26						B	I2.55S	2.85	U3.00A	S	A	A	A	S	S	A	A	S	S					
27						S	A	A	S	S	B	A	B	I3.55B	S	B	I2.90A	B	S					
28						S	I2.50A	I3.00A	A	A	A	A	B	S	A	A	B	B	B					
29						S	2.50	2.80	A	A	A	A	A	A	S	S	2.85	A	S					
30						S	B	I2.65A	A	A	A	A	A	A	A	S	I2.95S	A	A					
31						S	2.40	U2.70R	S	U3.50S	I3.50A	A	R	A	A	I3.30A	2.85	A	B					
No.							14	23	14	8	5	1	1	3	3	9	16	9						
Median							2.40	U2.70	U3.00	U3.30	U3.40	U3.30	3.55	U3.50	U3.40	U3.20	2.90	2.50						
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

K 3

IONOSPHERIC DATA

May.1963 | **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	2.1	2.7	E	S	G	3.7	5.8	5.4M	4.4	4.1S	4.6	5.0	4.0	B	S	5.4	6.0	4.2M	3.9M	2.9M	3.3M	J3.8
2	2.8M	J3.9	2.5	J2.1	1.4	S	B	4.1M	5.8	8.7M	5.9M	4.8Y	B	3.7	S	J4.8	5.9	5.7M	9.4M	J12.0	11.6M	5.0M	2.9M	2.3
3	2.0M	3.2M	J2.6	2.3	J3.5	S	2.6	2.9	3.8	6.6	3.8	5.5	4.1	S	S	4.0	3.4	3.4	3.5M	3.8M	J4.2	J5.1	J5.0	J4.1
4	3.0M	J3.2	J3.0	J3.4S	J3.9	2.4	3.3	4.7	5.0	6.6M	5.5	J4.9	5.8M	8.1M	8.6M	6.1	J4.6	4.9	J7.9	J13.9	9.0M	8.9M	6.9M	9.0M
5	J8.0	10.6	J5.0	3.4M	E	S	2.8	J4.1S	5.4	8.9M	8.7M	7.3M	S	5.3M	3.9	5.5M	6.1M	11.8M	14.8M	J14.8	12.1M	J5.8	J7.2S	7.4M
6	J9.8	4.3M	8.8M	3.1M	3.1M	2.4	2.6	G	3.3	S	3.7S	B	B	S	B	3.9	4.2	5.7M	3.6M	3.2M	5.7M	4.8	5.8M	J8.2
7	6.4M	J5.5	J3.6S	J5.6	2.4	J3.5Y	G	11.9M	9.0M	J5.9	J14.4	J8.1	J7.4	J8.1	S	3.8	3.3	J6.5	J8.9	8.5	J6.2	7.0M	J6.2	3.1
8	J4.3	J3.0	J4.2	5.0	J3.4	3.3	4.0	7.8	6.6	6.0M	5.4	4.9	5.2M	5.4	J6.2	4.1M	J5.0	3.6	5.9M	4.8M	6.8M	J6.9S	5.2M	J5.4
9	2.3	2.5	E	E	E	S	G	3.9	5.7M	5.4M	4.9	6.6M	5.3M	4.6Y	5.4	6.8M	9.9M	11.5M	J11.8	2.7M	2.4M	S	S	S
10	S	S	2.0	2.4M	2.5M	S	G	3.3	5.7M	J5.0	4.5	4.8	4.0	6.6	6.9	G	4.8	5.9	5.6	4.8	5.7	4.4	J6.3	J6.3
11	J4.2	3.3	E	E	1.9	2.2	2.9	5.8	6.9	6.1M	5.7M	3.9S	S	7.8M	5.4M	5.5	12.3M	9.2Y	5.6M	J6.5	6.4M	J4.5	J6.2	J3.3
12	2.3M	5.7M	J4.3S	J4.0	2.4	S	J3.6	6.6M	J7.1	7.5	J8.0	8.5	3.8	J4.2	4.7	J4.7	J4.2	3.1	3.5	J2.7	J2.4	J7.1	J6.5	J6.8
13	J5.8	3.2	E	2.2	E	S	4.9	8.3	5.7	J4.3Y	5.8	3.9	J4.0	5.2M	7.4M	J6.3	J8.4	4.4	3.8M	4.8M	5.8M	J6.3	J7.1	J3.3
14	S	2.8M	2.4	2.1Y	J1.6Y	S	2.7	3.4	3.6	4.7	3.6	4.2	5.3	3.6	4.4	4.0	J7.2	J11.5	J8.3	5.7	J3.9	J5.1	J5.1	J3.3
15	J3.0	3.3	3.3	3.3	J3.3	3.2	7.4	7.6	11.8	6.5M	5.4M	6.0	9.0M	J12.6	J9.0	5.8M	D3.6S	J8.9	4.6M	2.5	2.4	J3.4	J5.9	2.7M
16	J5.4	J3.2	E	E	E	2.3	2.8	5.3M	5.5M	6.4M	5.9	5.9	6.8M	J5.4	4.0S	3.8	5.8M	J4.9	5.0M	5.1	3.9M	J3.5	4.4	J6.4Y
17	S	S	E	C	C	C	C	C	C	C	7.6M	5.8M	4.8M	J9.3	J8.5	J8.1	J5.0	J8.8	8.6M	6.8M	3.9M	6.4M	J6.2	J2.4Y
18	2.3Y	2.1	1.8	2.0M	2.1M	J2.2	J3.7	5.4	6.7M	6.3M	8.1M	15.0M	4.8	B	S	S	J4.8	9.0M	J5.6	7.8M	J8.9	J5.3	J5.9	J8.1
19	J2.4	J4.1	E	3.2M	J3.4	1.9	3.8M	J6.4	15.2M	7.0	6.9M	8.6M	J5.6	14.4M	S	3.5	G	J3.8	J3.5	J6.4	J5.7	J5.3	J4.9	J5.6
20	3.9M	J3.4	J2.6	J2.6	S	S	G	S	2.9G	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	8.3M	J4.8	J4.6Y	3.9S	J7.7	J6.2	J4.8	J4.8	4.8M	J2.5	S	J6.0	J4.2	J3.4	3.0M
22	2.3	2.4	J3.9	3.4M	2.4M	2.2	G	J6.9	3.8	6.0M	5.7	7.2M	7.2M	4.8M	J4.8	J10.0	11.8M	10.9M	J11.7	J13.1	11.6M	J11.6	J5.2	J8.4
23	3.2	S	E	E	2.2	4.1	5.8	4.8	J5.7	J5.2	4.1S	4.2	3.8S	4.3	S	J5.9	4.7M	5.1M	4.5M	J5.2	4.8M	3.4M	J5.5	J5.8
24	J5.4	J4.2	J5.4	J1.4	J3.9S	S	J4.6	J7.0	5.9M	7.0M	8.5M	J7.2	B	C	C	C	G	4.8M	6.0M	J2.9	J5.0	J5.4	3.6M	J3.8
25	4.2M	J9.0	J5.0	J4.2	J3.4	3.4	J5.4	J10.0	14.6M	9.0M	J8.8	5.6Y	5.8	5.9M	5.4	C	C	C	2.5	S	J3.7	J8.3	3.2	J4.8
26	5.9M	J7.4	J6.7	J7.4S	4.0M	2.5	5.6M	7.4M	6.3M	8.6M	11.8M	5.9M	J5.1	J4.6	G	6.8	12.2Y	3.9	S	3.0Y	3.2M	S	J9.0	J5.2
27	14.5M	J7.3	3.3	J2.4	2.5	J6.4	J7.1	J8.4	7.1M	J9.9	B	3.8	B	B	S	B	4.7	3.3	12.8	5.9M	6.0M	3.3	2.4	2.2
28	3.2M	3.1M	E	E	E	G	J3.4	5.9M	6.0	7.9M	5.7	4.1	B	5.8S	3.7S	J6.8	B	6.8	5.4	S	2.3	S	2.4	2.3
29	J3.1S	J2.4	2.5	J3.4	E	S	3.0	7.9	12.0Y	7.8M	7.8M	14.5M	J12.2	11.1	S	S	3.3	3.1	5.8	6.7M	J3.8	7.6M	J6.8	J7.0
30	J4.2	3.8M	J5.0	3.3	3.1M	J4.9	7.1	J8.0	14.7M	7.4	9.4M	11.7Y	J9.4	7.5	3.9	S	4.4	4.8Y	4.8	7.1M	J9.4	5.4M	8.6M	J8.0
31	J6.1	4.0M	3.4	4.3M	J4.4	3.1	3.3	4.7Y	J4.4	5.4	5.7M	10.6M	D4.0S	4.8Y	4.9	3.8	3.8	3.3	4.6	3.3	J5.3	3.1	5.9	J4.8
No.	26	26	30	29	28	17	28	28	29	28	29	29	22	25	20	23	26	29	29	27	30	27	29	29
Median	4.0	3.4	2.6	2.7	2.4	2.5	3.3	5.8	5.8	6.6M	5.7	5.8	5.2	5.4	5.2	4.8	4.8	5.1	5.6	5.2	5.5M	5.3	5.8	4.8
U.Q.	5.4	4.3	4.0	3.4	3.4	3.4	4.8	7.7	7.1	7.8	8.0	8.3	6.8	8.0	6.6	6.1	6.1	8.8	8.4	7.1	6.4	6.9	6.4	6.7
L.Q.	2.8	3.1	E	2.0	E	2.2	2.6	4.1	5.2	5.6	4.8	4.4	4.1	4.7	4.0	3.9	4.2	3.8	4.2	3.3	3.9	4.2	4.0	3.2
Q.R.	2.6	1.2		1.4		1.2	2.2	3.6	1.9	2.2	3.2	3.9	2.7	3.3	2.6	2.2	1.9	5.0	4.2	3.8	2.5	2.7	2.4	3.5

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

The Radio Research Laboratories, Japan

K 4

IONOSPHERIC DATA

May.1963 **fbEs** 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	1.8	E		S		3.5	4.6	4.7	4.4	S	4.5	5.0	U3.9S	B	S	4.6	4.8	3.5	E3.9S	E	2.5	2.1
2	1.9	3.1	1.6	1.1	1.4	S	B	4.0	4.6	A	A	4.6	B	U3.7S	S	4.5	5.1	5.2	A	A	A	A	1.9	2.0
3	1.9	2.6	E	1.7	2.0	S	U2.3S	2.9	U3.5S	6.1	E3.8S	4.5	U4.1S	S	S	3.6	3.2	3.3	2.8	2.5	3.1	2.7	A	2.7
4	2.6	2.1	E	1.9	2.0	2.1	2.8	4.5	4.6	A	5.2	4.9S	5.1	A	A	5.5	4.5	4.6	A	4.6	A	A	A	A
5	2.1	U2.1A	A	2.1		S	2.8	4.1	4.6	A	A	A	S	4.0	E3.9S	4.8	5.7	A	A	A	A	A	A	A
6	2.0	A	A	2.1	1.8	S	2.6		3.3	S	U3.7S	B	B	S	B	3.8	4.0	5.0	3.0	2.7	4.5	4.3	A	A
7	4.3	A	1.9	2.1	1.5	3.1		A	A	4.8	A	A	5.3	6.5	S	E3.8S	3.1	5.4	3.4	8.0	4.6	5.6	A	2.1
8	2.4	E	2.4	2.7	2.6	2.1	4.0	A	A	5.5	4.9	4.8	4.8	4.9	5.5	3.8	4.8	3.5	U5.9S	2.9	4.4	A	4.6	4.4
9	2.2	2.1				S		3.3	5.0	4.8	4.9	5.6	4.8	4.0	5.4	6.3	A	A	A	2.1	2.1	S	S	S
10	S	S	E	1.5	1.4	S		3.2	5.3	4.5	4.0	4.6	E4.0S	5.8	6.2		4.6	4.4	5.0	4.4	3.6	4.1	2.2	2.3
11	2.3	2.0			E	2.1	2.8	4.7	A	A	5.1	E3.9S	S	A	4.6	U3.5S	4.4	7.0	5.1	5.4	4.0	4.0	4.6	2.2
12	E	4.0	2.2	2.8	1.6	S	3.1	5.5	5.7	A	A	5.3	3.6	E4.2S	4.5	4.3	4.0	3.1	E3.5S	2.5	2.2	4.2	4.5	3.0
13	2.1	2.2		1.7		S	4.4	A	5.0	4.1	A	E3.9S	E4.0R	5.1	6.8	5.3	A	4.4	2.9	3.5	4.3	5.0	5.8	2.2
14	S	2.0	1.7	E	1.6	S	2.7	3.3	U3.6S	4.5	E3.6S	E4.2S	E5.3R	3.6S	E4.4S	E4.0S	5.8	A	3.5	2.6	3.5	4.2	4.1	2.2
15	2.8	1.8	2.6	2.0	2.6	E3.2S	A	A	A	5.2	4.5	5.9	6.0	5.1	A	4.6	D3.6S	6.1	3.0	2.5	2.1	2.8	4.5	2.1
16	4.0	1.8				2.2	2.8	4.6	5.1	A	4.3	5.8	6.5	5.1	E4.0S	U3.8S	5.2	4.9	4.6	4.4	3.2	1.9	4.4	3.5
17	S	S		C	C	C	C	C	C	C	4.8	4.8	4.6	8.0	U8.4A	4.6	4.6	5.1	A	A	2.8	A	4.8	E
18	E	1.7	E	1.6	E	2.1	3.2	4.5	A	A	A	A	4.8	B	S	S	4.5	A	4.7	A	A	3.2	2.0	A
19	1.6	E		2.3	2.3	U1.9S	3.5	4.7	A	5.5	A	A	5.1	A	S	E3.5S		3.2	3.5	3.5	4.0	2.6	3.4	1.7
20	3.7	2.6	2.2	2.1	S	S		S	E2.9S	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	4.6	4.6	E4.6S	E3.9S	5.1	5.0	4.6	4.7	3.6	2.2	S	3.5	2.6	2.6	2.1
22	1.8	E	2.1	1.8	S	2.2		4.5	3.8	A	5.6	A	A	4.8	4.6	A	A	A	A	A	A	A	1.9	2.8
23	E	S			1.1	2.6	4.7	4.4	5.2	5.1	U3.9S	E4.2R	E3.8S	E4.3S	S	5.5	4.4	4.5	3.9	4.1	4.6	E	2.7	2.6
24	2.4	1.8	3.1	1.4	A	S	4.5	6.4	5.6	A	A	A	B	C	C	C		4.5	5.2	2.0	4.0	3.8	2.6	3.8
25	2.7	A	3.5	2.7	2.0	2.6	4.6	A	A	A	A	4.7	5.5	5.2	5.2	C	C	C	E2.5R	S	E	A	2.9	3.8
26	4.6	A	A	4.5	2.1	2.5	A	A	5.0	A	A	4.8	5.0	4.6		6.6	3.9	3.8	S	2.6	2.2	S	2.6	2.2
27	A	2.7	1.6	E	1.6	2.2	A	4.5	5.8	5.0	B	E3.8R	B	B	S	B	4.6	3.3	A	2.1	3.1	2.7	2.4	E
28	2.2	2.2					3.1	4.2	A	A	A	E4.1S	B	4.7	U3.6S	4.9	B	6.5	4.7	S	2.1	S	2.2	2.0
29	2.3	E	1.8	1.5		S	2.9	A	A	4.5	A	A	A	A	S	S	3.2	3.0	4.9	A	2.7	A	A	A
30	A	3.1	A	2.7	1.7	A	A	A	A	A	A	A	A	A	E3.9S	S	4.4	4.2	4.0	A	A	4.2	A	A
31	2.2	1.9	2.0	A	A	2.6	2.8	3.4	4.4	4.5	4.5	A	S	4.5	4.9	3.5	3.8	3.2	4.0	2.8	4.4	2.6	A	2.6
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

K 5

IONOSPHERIC DATA

May.1963 | **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	E2.00S	E1.80S	E1.65S	1.00	E	E2.00S	1.60	2.10	2.10	E3.50S	3.20	E3.20S	E3.20S	3.70	E3.30S	B	E4.10S	2.10	E1.70S	E1.80S	E2.00S	E1.80S	E1.80S	E1.60S
2	E1.80S	E1.80S	E1.50S	E	E	E1.80S	2.60	2.05	2.10	E3.20S	E3.40S	3.20	B	2.80	2.80	2.80	E3.10S	1.85	E1.70S	E1.80S	E1.70S	E1.80S	E1.70S	E1.70S
3	E1.50S	E1.60S	E1.50S	1.10	1.00	E1.80S	E2.20S	E2.20S	2.10	E2.75S	E3.40S	E3.10S	2.90	2.90	E3.60S	2.70	2.10	2.60	E1.70S	E1.70S	E1.70S	E1.60S	E1.60S	E1.60S
4	E1.60S	E1.60S	E1.60S	1.10	1.10	E1.70S	2.55	1.90	2.10	E3.10S	E3.60S	3.10	3.70	E3.10S	E3.60S	2.60	2.30	1.95	E2.10S	E1.90S	E1.50S	E1.80S	E1.90S	E1.80S
5	E1.70S	E1.50S	E1.50S	E1.95S	E	E1.70S	2.30	2.10	2.10	E3.20S	E3.50S	E3.50S	E4.80S	E3.60S	E3.50S	2.30	2.30	2.10	E1.50S	E1.80S	E1.50S	E1.50S	E1.80S	E1.50S
6	E1.80S	E1.60S	1.40	E	E	E1.90S	2.10	2.00	2.20	E3.90S	E2.90S	4.70	4.80	E4.40S	4.40	3.00	2.30	2.05	E1.70S	E1.60S	E1.70S	E1.80S	E1.80S	E1.50S
7	E1.70S	E1.50S	E	E	E	E1.60S	2.10	1.90	2.00	2.15	2.95	3.00	2.80	2.80	E4.55S	E3.55S	2.05	2.05	1.75	2.05	E1.90S	E1.90S	E1.75S	E1.90S
8	1.40	1.50	E1.60S	E	1.10	E1.90S	E2.10S	E2.80S	2.20	2.60	2.65	E3.75S	3.40	2.75	2.75	2.10	2.10	1.80	E2.00S	E1.90S	E1.85S	E1.70S	E1.60S	E1.50S
9	E1.60S	E1.50S	1.35	1.10	1.05	E1.90S	1.75	2.00	E3.10S	E4.10S	E2.85S	3.40	3.40	E3.10S	E4.00S	E2.80S	2.95	E2.15S	E1.90S	E1.80S	E1.70S	E1.90S	E2.00S	E1.80S
10	E1.90S	E1.80S	1.50	1.10	1.00	E2.00S	2.05	2.10	2.15	2.10	2.75	2.10	E3.60S	E3.45S	E3.40S	2.10	2.10	2.05	E2.10S	E2.10S	E1.70S	E1.80S	E1.75S	E1.70S
11	E1.85S	E1.60S	1.50	1.00	1.40	E1.90S	E2.15S	2.10	E2.60S	3.00	E3.80S	3.05	E3.90S	2.70	2.30	2.10	2.10	2.00	1.50	E1.80S	E1.70S	E1.90S	E1.50S	E1.50S
12	E1.50S	E1.50S	E1.70S	E	E	E1.90S	E1.80S	2.10	2.05	2.20	E3.40S	E3.70S	2.80	E3.60S	2.80	2.10	E2.60S	2.00	2.05	1.55	E1.85S	E1.90S	E1.80S	E1.65S
13	1.50	E1.60S	1.15	1.00	1.00	E2.20S	E2.20S	E2.70S	E3.15S	E3.20S	E3.00S	2.80	2.80	2.80	2.80	2.50	2.15	2.10	E2.05S	E1.90S	E1.50S	E1.60S	E1.50S	E1.80S
14	E1.80S	E1.50S	E1.50S	1.00	1.00	E2.10S	2.20	2.10	2.20	E3.40S	E3.30S	E3.45S	3.00	2.80	2.80	2.80	E3.40S	E2.75S	E2.05S	E1.90S	E1.95S	E1.65S	E1.85S	E1.80S
15	E1.70S	E1.60S	E1.60S	1.00	1.40	E2.10S	E2.60S	E2.70S	E3.40S	2.75	E3.65S	3.60	2.80	2.80	2.65	2.60	2.20	2.80	E1.85S	E1.80S	E1.90S	E1.80S	E1.80S	E1.80S
16	E1.70S	E1.70S	1.10	1.10	1.50	E1.80S	2.00	2.10	E3.10S	3.05	2.80	2.80	3.00	3.00	2.60	2.80	2.15	2.10	2.10	E1.80S	E1.60S	E1.80S	E1.70S	E1.80S
17	E1.50S	E1.60S	1.40	C	C	C	C	C	C	C	E3.30S	3.05	3.50	E3.00S	E2.80S	E2.70S	E2.70S	2.00	E1.60S	E1.90S	E1.50S	E1.90S	E1.50S	E1.50S
18	E1.50S	E1.50S	1.40	1.40	1.10	E1.60S	2.20	2.10	2.10	E3.30S	E3.10S	E3.40S	E3.40S	3.80	E3.80S	E3.30S	2.20	2.10	E1.95S	E1.40S	E1.80S	E1.50S	E1.50S	E1.50S
19	E1.50S	1.40	1.40	E	1.10	E1.70S	E1.70S	2.15	2.10	2.15	E3.50S	3.10	E3.50S	E3.55S	E3.80S	E3.30S	2.10	2.00	E1.90S	E1.60S	E1.80S	E1.50S	E1.50S	E1.60S
20	E1.80S	E1.60S	E1.50S	1.20	E1.50S	E1.80S	E2.10S	E3.00S	2.30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	E3.05S	2.80	E3.50S	E3.60S	2.80	3.00	2.80	2.20	2.10	E1.80S	E2.10S	E1.90S	E1.50S	E1.50S	E1.60S
22	E1.50S	E1.50S	1.05	E	E1.50S	E1.90S	2.00	2.60	2.30	E3.45S	E3.40S	E3.50S	E4.10S	E3.10S	2.70	2.10	2.20	2.15	E1.80S	E1.80S	E1.90S	E1.50S	E1.80S	E1.60S
23	E1.50S	E1.60S	1.40	E	E	E1.50S	1.80	1.90	2.10	E2.70S	E3.45S	E3.50S	E3.10S	3.00	2.85	2.80	2.10	2.10	E2.00S	E1.90S	E1.90S	E2.00S	E1.70S	E1.50S
24	E1.80S	E1.50S	1.40	1.10	1.10	E2.00S	1.80	2.10	E2.10S	2.80	E3.60S	E3.50S	4.80	C	C	C	2.20	2.10	E2.10S	E1.90S	E1.80S	E1.60S	E1.80S	E1.70S
25	E1.90S	E1.80S	E1.40S	1.30	1.10	E1.90S	1.80	2.10	2.10	2.90	E3.20S	3.50	E3.10S	2.80	3.00	C	C	C	E2.15S	E1.70S	E1.60S	E1.95S	E1.80S	E1.80S
26	E1.50S	E1.50S	E1.60S	E	1.10	1.70	E2.60S	2.10	2.10	E3.40S	E3.10S	E3.50S	E3.10S	E3.65S	E3.05S	2.90	E3.00S	E2.60S	E2.20S	E1.90S	E1.80S	E2.00S	E1.90S	E1.80S
27	E1.50S	E1.50S	1.30	1.00	1.10	E1.90S	E1.90S	2.10	E3.40S	E3.60S	4.05	3.50	5.60	4.60	E3.70S	4.40	3.05	2.80	E1.80S	E1.60S	E1.70S	E2.00S	E2.00S	E1.50S
28	E1.80S	1.50	1.40	E	1.10	E1.60S	2.20	2.30	E2.80S	E2.90S	2.80	3.10	4.85	E3.80S	E3.10S	2.90	4.50	2.65	1.90	E2.00S	E1.80S	E2.10S	E2.00S	E1.80S
29	E1.70S	E1.80S	E1.50S	E	1.00	E1.70S	2.10	2.30	2.80	E3.40S	E3.10S	3.05	3.40	2.80	E4.40S	E3.80S	2.20	2.20	E1.95S	E1.70S	E1.70S	E1.70S	E1.90S	E1.70S
30	E1.50S	E1.80S	E1.50S	E	E	E1.80S	2.60	2.10	E2.70S	2.85	3.10	3.10	3.40	3.40	3.00	E3.70S	E2.90S	2.20	E1.60S	E1.90S	E1.80S	E1.90S	E1.70S	E1.80S
31	E1.50S	E1.60S	E1.50S	E	1.00	E1.60S	1.80	2.10	E2.90S	2.80	3.10	E3.60S	E3.30S	E3.50S	3.35	2.30	2.10	2.10	1.80	E2.05S	E1.90S	E1.60S	E1.70S	E1.70S
No.	30	30	30	28	27	29	22	24	20	29	30	18	23	17	16	22	22	26	30	30	30	30	30	30
Median	E1.65	E1.60	E1.50	100	100	E1.80	2.00	2.10	2.10	E3.05	E3.20	3.10	E3.30	2.80	2.80	E2.70	2.20	2.10	E1.90	E1.80	E1.80	E1.80	E1.80	E1.70
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

f-min Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

K 6

IONOSPHERIC DATA

May.1963

M(3000)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	2.95S	U2.75S	U3.00S	2.85S	2.75S	U2.95S	3.40	2.85	2.70	J3.40R	3.20	I3.05S	2.95	3.05	2.90	I3.20B	3.25	3.50	3.25	U3.20S	2.90	2.80	2.80S	J2.75F
2	2.95	2.80	2.90S	2.80	J2.95F	2.90	3.40	2.70	3.10R	A	A	3.00	I2.90B	2.90	2.95	3.05	3.25	3.25	A	A	A	A	2.90S	J2.80F
3	U2.90S	2.75S	2.90	3.10	2.75	J3.20S	3.25S	3.25	J3.15R	3.05	2.95	2.95	J2.95R	J3.00S	3.05	J3.10R	3.15	J3.00S	U3.30S	S	3.10	2.85	I2.90A	2.80
4	2.70	2.70	2.80	3.30	U3.65S	3.20	3.40	3.45	3.25	I3.10A	3.05	J3.10S	3.05R	I2.85A	I2.90A	3.05S	J3.15R	J3.10S	I3.20A	J3.15S	A	A	A	A
5	AS	F	A	3.00S	2.75F	U3.00S	2.80S	3.00	3.35	A	A	I2.95A	2.95	2.95	3.00	3.05	3.20	A	A	A	I2.95A	A	A	A
6	2.70S	I2.75A	I3.00A	3.00S	I2.80F	3.35S	3.30	3.20	3.30	3.45	3.10	3.40	U2.70R	3.00	2.90	J3.00R	3.25S	3.20	3.15	J3.25S	3.25	3.00S	A	A
7	F	I2.80A	J2.90F	3.00	I3.05F	J3.30S	3.45	I3.15A	I3.15A	3.10S	A	A	2.95	3.15	3.05	3.05	3.05	2.95S	U3.15S	U3.50S	3.25S	2.95	I2.80A	2.75S
8	U2.65A	U2.70S	2.75S	2.85AS	2.70	3.05S	3.20R	I3.35A	I3.10A	2.95	3.20	3.05	2.90	2.90	3.10	3.15	3.20	3.05	3.10S	J3.30R	J3.30S	A	J2.95S	2.95
9	2.95	2.95S	J3.00F	F	F	3.20	3.50	3.30	3.35S	3.35	3.15	2.95	J2.95R	3.00	3.05	J3.10S	A	A	A	3.25	3.25R	3.00	2.75	2.90
10	2.80	2.90	F	F	F	3.50S	3.45	3.30	3.20	3.35R	3.15R	2.90	2.80	3.05	2.95	3.00S	U3.15R	3.10	2.90S	U3.25S	U3.15S	3.10S	2.75S	2.70S
11	U2.65S	2.60S	2.75	2.80	3.00S	3.25S	3.30	3.30	I3.30A	I3.20A	3.05	3.00	2.95	I2.80A	J3.05S	3.10	3.15	3.15S	3.10	I3.05S	3.05	3.10	U2.80S	I2.80F
12	2.75	I2.80F	I2.90F	I2.80F	I2.85F	3.00	3.15	3.40	A	A	I3.00A	2.95	2.90R	U3.05R	3.10	2.90S	U3.10R	J3.10R	U3.05S	3.10	I3.10S	U2.80A	I2.80F	J2.90S
13	I2.90F	2.70	2.60S	U2.70S	2.85F	3.05S	3.30	I3.30A	3.25	3.15	I3.10A	2.90	2.90	2.85	2.95	U3.10R	I3.05A	3.20	J3.10R	3.10	3.00	I3.00F	I3.00S	I2.95F
14	3.05F	J2.75F	2.85	I2.95F	3.00F	3.25	J3.40R	3.55	3.30	3.20	2.75R	3.05	I2.70R	U2.70R	2.85	2.90	3.10	I3.00A	U3.05AS	3.10	3.05S	2.70S	I2.65F	U2.75S
15	U2.85S	U2.85S	U2.85S	U3.05S	3.05S	I3.20S	A	A	A	2.80	2.95	2.90	3.05	3.05	I3.00A	U3.10S	3.10	U3.25S	I3.25R	I3.15S	3.05	I2.80F	J2.90F	F
16	F	F	F	2.90F	2.90	3.30	3.35	3.40	3.35	I3.35A	3.15	3.00	3.00	2.95	R	J3.15R	I3.25S	3.30	2.90	J3.05R	I3.20S	3.10	2.85	2.95
17	3.00	J3.15S	2.95S	C	C	C	C	C	C	C	3.15	2.80R	3.05	A	A	3.25	U3.20S	I3.10S	I3.10A	I3.25A	S	F	F	F
18	F	2.80F	I2.90F	2.90	2.75	J3.00S	3.05	J3.60R	I3.40F	A	A	A	2.90	J3.05R	2.95	3.00	J3.20S	I3.30A	S	A	A	F	3.30F	A
19	F	U2.90F	3.25	3.10F	I3.00F	3.20	3.15	3.15	I3.20A	3.50	I2.95A	I3.00A	2.95	I3.00A	2.95	3.05	3.05	3.20	3.15	J2.95S	F	I3.00F	2.75	3.00F
20	I3.00F	U2.80F	3.10	3.00	U2.95S	3.30	3.35	3.30	3.20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	3.20	3.25	I3.00R	3.20	3.05	2.95	3.00	2.85	3.20S	J3.15S	J3.35S	F	F	3.15	2.95
22	3.00	2.90	F	3.00	J3.15S	3.10S	3.35	3.55	3.50	I3.40A	3.05R	A	A	2.95	3.05	A	A	A	A	A	A	I3.00A	3.10	F
23	F	U2.90F	F	F	F	2.95	3.30	3.35	3.45	3.35	3.20	3.15	3.20	2.75	2.85	3.10	U3.30S	3.40	3.15	3.15S	U2.95S	3.05	2.95	3.05
24	2.95F	2.90	3.10F	F	A	J2.95R	3.10	J3.35R	3.70	A	A	A	3.00R	C	C	C	U3.05R	J3.05R	J3.00R	J3.10S	I3.50S	3.00	J2.90S	J2.90F
25	U2.75S	A	S	3.00	I3.05F	3.10F	3.20	A	A	A	I3.00A	2.90	2.90	2.85	2.90	C	C	C	3.15	2.85	3.10	I3.30A	3.10	2.95
26	F	A	A	3.10F	F	3.55	A	A	R	A	I3.60A	2.75	2.75	2.75	2.90S	2.90S	J3.05R	3.10R	3.10	J3.20R	S	3.10	2.90	F
27	A	S	F	F	F	3.10	A	3.35S	3.40	U3.05R	3.25	3.00	U3.00R	2.95	2.80	3.00	3.15	3.10	I3.00A	3.15	J3.20S	I3.15F	3.25	J2.85S
28	2.90	J3.00S	U2.85S	J3.00S	3.15	3.00	3.40	2.80	I3.20A	I3.40A	I3.20A	2.80	3.00	2.90	2.90	2.80	J3.00R	3.20S	U3.45S	3.20	2.80	J3.00S	2.80	2.95
29	2.90	2.90	F	2.90S	2.65	3.05	2.75	A	A	2.90	A	A	A	A	U2.20S	2.70	3.20	3.20	3.35	I3.30A	2.90	A	A	A
30	A	I2.75FS	A	2.95	I2.85F	A	A	A	A	A	A	A	A	A	2.95	3.05	3.25	2.90	3.00	I2.95A	I2.95A	3.05	A	A
31	3.10S	2.75	2.85	I3.00A	I3.05A	J3.10S	2.95	3.25	3.40	2.90	3.00	A	3.00	I2.95R	2.85	2.95	2.95	2.95	3.00	3.15	3.15	2.90	I2.85A	F
No.	21	25	20	24	23	28	25	24	23	21	23	23	27	26	27	27	27	26	25	25	22	22	24	19
Median	2.90	2.80	2.90	3.00	2.95	3.10	3.30	3.30	3.30	3.20	3.10	3.00	2.95	2.95	2.95	3.05	3.15	3.10	3.10	3.15	3.10	3.00	2.90	2.90
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

M(3000)F2

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

K 7

IONOSPHERIC DATA

May.1963 | M(3000)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								S	A	A	A	S	A	A	U3.40L	B	S	A						
2								A	A	A	A	A	B	3.35S	S	A	A	A	A					
3								L	L	A	3.40L	A	U3.35S	S	U3.55S	3.25L	L	L						
4								A	A	A	A	A	A	A	A	A	A	A	A					
5								A	A	A	A	A	S	L	S	A	A	A	A					
6								LH	U3.55L	3.70	3.30	B	L	S	B	3.40L	L	A						
7								A	A	A	A	A	A	A	S	S	L	A						
8								A	A	A	A	A	A	A	A	3.50L	A		A					
9								L	A	A	A	A	L	3.45	A	A	A	A	A					
10							L	L	A	A	L	3.40L	S	A	A	S	A	A	A					
11								A	A	A	A	S	L	A	A	3.35L	A	A	A					
12							L	A	A	A	A	A	L	S	A	L	L	L						
13								A	A	L	A	R	L	A	A	A	A	A						
14								L	S	A	S	S	A	S	S	S	A	A	A					
15							A	A	A	A	L	A	A	A	A	A	L	A						
16							A	A	A	A	L	A	A	A	I3.30L	I3.45L	A	A	A					
17						C	C	C	C	C	A	L	A	A	A	A	A	A	A					
18							L	A	A	A	A	A	A	3.40L	S	3.65L	A	A	A					
19							L	A	A	A	A	A	A	A	3.75S	3.60	U3.50S	U3.45L	A					
20							L	L	S	C	C	C	C	C	C	C	C	C	C					
21						C	C	C	C	A	A	AS	S	A	A	A	A	L	L					
22							L	A	L	A	A	A	A	A	A	A	A	A	A					
23							A	A	A	A	L	L	S	S	S	A	A	A	A					
24							A	A	A	A	A	A	B	C	C	C	L	A	A					
25							A	A	A	A	A	3.90	A	A	A	C	C	C						
26							A	A	A	A	A	A	A	A	U3.30S	A	A	A	L					
27							A	A	A	A	S	R	B	B	3.80	B	A	U3.60L	A					
28							L	A	A	A	A	S	L	A	L	A	B	A	A					
29								A	A	A	A	A	A	A	S	3.20L	3.35L	L						
30						A	A	A	A	A	A	A	A	A	S	U3.35L	A	A	A					
31							L	L	A	A	A	A	S	A	A	3.40L	U3.65L	L	A					
No.									1	1	2	2	1	3	6	10	3	2						
Median									U3.55	3.70	3.35	3.65	U3.35	3.40	U3.50	3.40	U3.50	U3.50						
U.Q.																								
L.Q.																								
Q.R.																								

M(3000)F1 Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K 8

IONOSPHERIC DATA

May.1963 | **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								355	370	250	270	S	330	300	325	B	255	260						
2								375	305	A	A	360	B	380	355	310	280	E300A	A					
3								285	310	E360A	340	345	330	295	325	295	290	285						
4								250A	310	A	330	295	325	A	A	305	290	280	A					
5								355	300A	A	A	A	380	360	340	310	300A	A	A					
6								300	275	265	325	290	450	345	340	300	285	290A						
7								A	A	290	A	A	335	355	320	305	315	315						
8								A	A	E400A	305	325	345	355A	300	290	300		E340A					
9								275	275	275	300	E370A	355	275	325	E300A	A	A	A					
10							255	270	E280A	265	315	400	375	315	355	315	275	260	315					
11								265	A	A	350A	330	340	A	320	300	275	E310A	295A					
12							285	275A	E310A	A	A	355	330	310	305	310	295	280						
13								A	270	305	A	370	350	370	E360A	300A	A	260						
14								250	275	280	375	350	A	420	355	340	315	A	290					
15							A	A	A	E395A	310	E355A	E360A	320A	A	310	300	E300A						
16							240	260A	260A	A	320	E360A	E360A	345	310	285	275	280	E300A					
17						C	C	C	C	C	300	370	310	E350A	E340A	275	280	300A	A					
18							280	230	A	A	A	A	325	300	330	305	285	A	260A					
19							300	285	A	270A	A	A	345	A	350	315	305	295	270					
20							250	255	310	C	C	C	C	C	C	C	C	C	C					
21						C	C	C	C	310	305	E360S	305	350	355	325	340	295	255					
22							270	250	265	A	E360A	A	A	375	315	A	A	A	A					
23							260A	260	260	275	300	345	345	425	380	305	285	260	260					
24							280A	260A	245	A	A	A	350	C	C	C	305	295	E280A					
25							E250A	A	A	A	A	380	E350A	360	330	C	C	C						
26							A	A	250A	A	A	E440A	400A	385	345	E325A	300	295	270					
27							A	280	260	320	325	340	E380B	355	355	345	300	300	A					
28							250	250	A	A	A	E395R	375	325	340	350	325	260	245					
29								A	A	360	A	A	A	A	E540S	395	295	280						
30						A	A	A	A	A	A	A	A	A	350	310	275	350	E280A					
31							300	250	250	350	E350A	A	E460S	365	360	350	345	330	300					
No.							12	21	17	13	15	14	20	24	25	25	26	20	10					
Median							260	265	275	280	310	350	345	350	340	310	295	290	270					
U.Q.																								
L.Q.																								
Q.R.																								

h'F2 Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K 9

IONOSPHERIC DATA

May.1963

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	290	300	235	260	300	255	225	260	A	A	A	S	A	A	E255A	B	S	A	E260A	E260S	E310S	300	305	300
2	260	300A	280	300	300	255	230	A	A	A	A	A	B	E250S	E300S	A	A	A	A	A	A	A	305	305
3	295	E360A	300	250	300A	245	255	230	245	I220A	E255S	I255A	E255S	S	210	E280A	245	E260A	250A	225	260A	E350A	I315A	E340A
4	E360A	320A	260	250A	220A	210	235	A	A	A	A	A	A	A	A	A	A	A	A	E250A	A	A	A	A
5	260A	320A	I285A	255A	255	260	250A	I260A	A	A	A	A	S	280A	I240S	A	A	A	A	A	I255A	A	A	A
6	310	I310A	I270A	260	270	240	240	180H	220	230	255	B	E360B	I205S	I240B	250	250A	I255A	260	240A	E255A	E320A	A	A
7	E350A	I310A	300	305	250	E250A	245	A	A	A	A	A	A	A	S	I270S	235	I255A	270	260	260	350	I330A	310
8	360	315	300	305	350	260	270	I230A	A	A	A	A	I230A	A	A	E250A	A	E270A	A	250A	E250A	A	E350A	E355A
9	300	305	285	260	250	245	245	225	A	A	A	A	A	260A	A	A	A	A	A	250A	225	215	245	300
10	285	300	295	300	255	225	245	225	A	A	220	E295A	S	A	A	S	A	A	A	265	260	265	275	315
11	330	310	310	270	245	230	225	A	A	A	A	S	E300S	A	A	220	A	A	A	E305A	E280A	E280A	E360A	250A
12	300	E350A	280A	300A	300	250	250A	A	A	A	A	A	220	S	A	E310A	E310A	255	280	255	225	325	365	295
13	260	310	290	285	240	250	265	I260A	A	250S	A	R	E350R	A	A	A	A	A	260A	250A	270A	E350A	E350A	280
14	245	295	270	260	260	245	230	240	210	A	S	S	A	S	S	S	A	A	A	260	255	325	360	310
15	275	275	265	245	280	I255S	A	A	A	A	A	A	A	A	A	A	E300S	A	255	240	235	310A	E350A	280
16	E370A	250	225	205	260	230	A	A	A	A	E305A	A	A	A	E300S	255A	A	A	A	E275A	250A	245	E350A	E300A
17	255	255	255	C	C	C	C	C	C	C	A	E355A	A	A	A	A	A	A	A	A	250	I260A	E350A	285
18	255	260	255	255	285	250	E250A	A	A	A	A	A	A	245	E310S	210	A	A	A	A	A	320A	255	I275A
19	260	295	240	280	E300A	245	E250A	A	A	A	A	A	A	A	220	210	205	270A	I250A	260A	E300A	250A	E350A	260
20	E350A	305	260	260	250	215	235	225	E255S	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	A	A	AS	S	A	A	A	I255A	E305A	250	245	260	260	250A	280
22	270	295	310	255	255	250	245	I250A	260A	A	A	A	A	A	A	A	A	A	A	A	A	A	250	260
23	255	280	255	250	255	250A	A	A	A	I240A	230	E295R	S	S	S	A	A	A	A	E260A	E310A	260	260	260
24	260	260	260	245	I275A	250	A	A	A	A	A	A	B	C	C	C	E260S	A	A	235	230	E310A	300	E350A
25	310	A	E350A	300	260	245	A	A	A	A	A	245	A	A	A	C	C	C	E260R	255	245	I250A	260	E300A
26	E350A	A	A	E320A	245	240	A	A	A	A	A	A	A	A	E300S	A	I240A	I245A	245	245	245	245	260	260
27	A	320A	300	280	260	225	A	A	A	A	E295B	E310R	B	I220B	205	I245B	I250A	205	I255A	250	250A	250	220	250
28	295	270	285	285	245	255	245	A	A	A	A	S	B	A	255S	A	B	I245A	I235A	230	270	260	275	260
29	295	260	255	255	245	250	E260A	A	A	A	A	A	A	A	S	255S	250	240	E250A	I245A	295	A	A	I330A
30	I345A	E350A	I300A	310A	300	A	A	A	A	A	A	A	A	A	S	E250S	A	A	A	A	A	E300A	A	A
31	250A	305	300	I300A	I280A	260	245	245	I245A	A	A	A	S	A	A	245	245	250	I265A	250A	260	250	I320A	310A
No.	24	25	28	28	28	28	18	12	5	4	6	6	6	5	6	9	9	9	13	20	21	18	18	21
Median	280	300	280	260	260	E250	245	235	245	U235	E255	E295	E280	245	230	245	245	250	255	250	E255	260	275	280
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'F

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

K 10

IONOSPHERIC DATA

May.1963 — **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	130	120	E	S	G	130	120	115	110	130	125	115	115	B	S	115	110	105	105	105	100	105
2	100	105	105	105	130	S	B	120	110	105	110	105	B	105	S	130	115	115	110	110	110	110	105	105
3	100	100	100	110	115	S	150	130	120	110	110	110	130	S	S	130	130	110	110	105	105	105	110	105
4	105	105	105	105	100	100	145	125	120	110	115	110	115	115	110	115	125	115	110	105	110	105	105	105
5	105	105	105	105	E	S	130	120	110	110	105	105	S	120	135	125	115	110	110	110	110	110	110	110
6	110	105	100	100	105	130	110	G	110	S	110	B	B	S	B	135	130	115	110	110	105	105	110	105
7	105	100	130	100	100	105	G	110	105	110	105	110	105	110	S	135	130	115	115	110	110	110	110	110
8	110	130	105	125	105	130	125	120	115	110	110	105	105	105	100	100	130	120	115	110	105	105	110	105
9	100	100	E	E	E	S	G	120	115	105	105	105	105	105	140	125	125	115	110	110	105	S	S	S
10	S	S	105	105	105	S	G	115	110	115	115	115	120	110	110	G	130	115	110	110	110	110	110	110
11	105	105	E	E	105	105	125	115	110	105	105	105	S	100	100	130	110	110	110	110	105	105	105	100
12	100	100	100	100	100	S	125	110	110	110	110	110	110	110	110	110	110	110	115	105	110	110	110	110
13	110	110	E	105	E	S	120	115	110	110	105	105	100	105	105	115	125	125	125	110	105	105	105	105
14	S	100	100	125	125	S	120	110	110	115	110	110	110	110	110	110	120	110	110	115	110	110	110	110
15	110	110	105	110	100	130	120	115	115	105	105	105	100	105	100	105	100	105	100	100	100	110	110	105
16	110	115	E	E	E	145	150	130	125	125	120	110	110	115	105	105	130	125	110	105	110	105	105	105
17	S	S	E	C	C	C	C	C	C	C	110	110	105	105	100	100	100	115	115	105	100	105	105	105
18	105	100	100	100	105	120	110	115	110	105	105	105	105	B	S	S	130	115	110	105	105	105	105	105
19	100	100	E	100	100	130	110	105	105	105	105	105	115	105	S	145	G	125	105	110	105	105	105	105
20	100	100	100	100	S	S	G	S	105	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	100	105	100	105	105	110	105	105	110	110	S	105	110	105	105
22	105	105	105	110	105	135	G	110	115	110	110	105	110	105	140	125	120	115	115	110	110	110	110	105
23	105	S	E	E	105	110	115	110	110	110	110	110	105	145	S	130	130	120	110	110	110	110	105	105
24	105	105	105	105	100	S	120	115	105	110	105	105	B	C	C	C	G	125	110	110	110	110	110	110
25	105	100	100	100	100	130	125	115	105	110	105	105	105	100	105	C	C	C	110	S	115	125	110	100
26	105	105	100	100	100	155	125	115	110	105	105	105	105	110	G	115	105	105	S	105	100	S	100	105
27	100	100	100	100	100	105	105	105	105	100	B	105	B	B	S	B	110	100	105	105	105	100	105	100
28	100	100	E	E	E	G	110	110	105	105	105	100	B	105	115	105	B	110	105	S	105	S	110	110
29	110	105	100	105	E	S	125	110	105	100	100	100	100	100	S	S	115	105	105	105	105	100	100	100
30	100	100	100	100	100	110	110	100	105	100	100	100	100	100	100	S	115	105	105	100	100	105	105	100
31	105	100	100	100	100	100	120	115	120	115	110	105	105	105	105	145	125	110	105	105	110	105	105	100
No.	26	26	22	24	21	16	22	27	29	28	29	29	23	25	19	22	25	29	29	27	30	27	29	29
Median	105	100	100	105	100	125	120	115	110	110	105	105	105	105	110	120	120	115	110	110	105	105	105	105
U.Q.																								
L.Q.																								
Q.R.																								

h′Es — Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K 11

IONOSPHERIC DATA

May. 1963 | **Types of Es** | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1			f	f				h	h	l	l	h	h	l	l			l	l2	f3	f3	f2	f3	f2
2	f	f3	f2	f	f2			h	c2	l2	l	l		l		h	l	c2	l4	f3	f3	f2	f2	f2
3	f	f2	f2	f	f3		h	h	c	l	l	l	h			h	h	l2	l	f2	f2	f2	f4	f3
4	f2	f2	f	f2	f2	l	h2	h	h2	l2	l2	l	l	l2	l2	l2	h	l	l3	f2	f3	f3	f3	f3
5	f3	f3	f3	f2			h	c	c2	l2	l2	l2		l	h	h2	c2	l2	l4	f3	f2	f3	f3	f3
6	f	f3	f4	f3	f2	h	l		c		c					h	h	l2	l2	f3	f3	f3	f3	f2
7	f3	f2	f2. f	f3	f2	l2		c3	c2	l2	l2	l2	l	l3		h	h	l2	l2	f3	f2	f2	f3	f2
8	f3	f	f2	f. f	f2	h	h	h2	l2	c2	l	l	l	l	l2	l	h2. l	c2	l2	f2	f3	f3	f3	f3
9	f	f2						c	l2	l3	l2	l2	l	l	h2	h2	h2	c3	l3	f	f			
10			f	f	f2			c	l2	c	l	c	l	l2	l2		h	c	l2	f	f3	f	f2	f2
11	f2	f2			f	l	h	c2	l2	l2	l2	l		l2	l2	h. l	c2. l	l2	l3	f2	f3	f3	f3	f2
12	f	f3	f3	f3	f2		c	c2	c2	l2	l2	l2	l	l	l2	l	l	l	l	f2	f	f2	f4	f3
13	f3	f2		f			l3	l3	l2	l	l2	l	l	l	l2	l2	h2	c	l2	f2	f2	f3	f3	f2
14		f2	f2	f	f		c	c	c	l	l	l	l	l	l	l	h	l2	l	f2	f2	f2	f2	f2
15	f2	f	f2	f2	f2	h	l4	l3	l2	l2	l2	l	l3	l	l2	l	l	l. l	l2	f2	f	f2	f3	f2
16	f3	f				h	h2	h2	h	c2	c	l	l	l	l	l	h2	h	l	f3	f2	f2	f4	f3
17											l2	l	l	l3	l2	l2	l2	l2. l2	l3. l	f3	f2	f3	f3	f
18	f	f2	f	f	f	l	l2	c	c2	l2	l2	l2	l				h2	l2	l2	f3	f3	f2	f2	f2
19	f2	f		f2	f2	l	c2	l2	l3	c2	l3	l2	l	l3. h		h		c	l	f2	f2	f3	f3	f3
20	f3	f2	f	f					l															
21										l	l	l	l	l2	l2	l	l	l	l		f2	f2	f	f2
22	f	f	f2	f. f2	f	h		l	c	l2	l2	l2	l	l2	h. l	h2. l	l2	c3	l2	f2	f3	f3	f	f2
23	f				f2	l2	h2	c2	c2	l	l	l	l	h		h	h. l	l2	l2	f2	f2	f2	f2	f2
24	f2	f2	f3	f	f2		c2	c2	l2	l2	l2	l3						h	l2	f	f2	f3	f2	f2
25	f2	f4	f3	f3	f2	h. l2	h2	c2	l2	l3	l2	l	l2	l	l2				l		f	f2. f	f3	f3
26	f3	f4	f3	f3	f3	h	h2	c3	c2	l2	l2	l	l	l		l2	l2	l		f	f		f2	f2
27	f2	f2	f2	f2	f	l2	l3	l2	l2	l2		l					l	l	l3	f2	f2	f3	f2	f
28	f2	f2					l	l	l2	l2	l	l		l	l	l2		l2	l2		f		f	f
29	f2	f	f2	f2			c	c3	l2	l2	l2	l2	l2	l2			c	l	l2	f3	f2	f3	f2	f2
30	f2	f2	f3	f2	f2	l3	l2	l2	l2	l2	l2	l2	l2	l2	l		l	l2	l2	f3	f3	f2	f3	f2
31	f3	f2	f2	f3	f3	l2	c	c2	l	c	l	l	l	l	l	h. l	h. l	l	l2	f2	f2	f2	f3	f2
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K 12

IONOSPHERIC DATA

May.1963

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	330S	U350S	U300S	305S	345S	U300S	245	355	375	J255R	300	S	350	310	350	I290B	295	280	295	U290S	355	360	375	J385F
2	330	350	350S	380	J355F	330	255	385	305R	A	A	A	B	G	S	315	300	300	A	A	A	A	350S	J385F
3	U340S	370S	350	305	360	J280S	300S	300	J315R	A	350	350	J350R	J310S	340	J310R	305	J315S	U295S	S	300	350	I350A	380
4	380	370	340	295	U225S	280	255	255	315	I340A	330	J305S	325R	A	A	325S	J305R	J305S	A	J295S	A	A	A	A
5	AS	F	A	320S	390F	U305S	355S	A	300	A	A	A	G	G	340	320	300	A	A	A	I330A	A	A	A
6	365S	I350A	I325A	320S	I340F	275S	260	305	280	265	330	G	B	345	350	J315R	300S	305	305	J290S	280	330S	A	A
7	F	I370A	J350F	345	I310F	J260S	255	A	A	295S	A	A	335	A	325	310	320	320S	U300S	I290A	275S	A	A	360S
8	U390A	U355S	355S	310AS	370	305S	275R	I255A	A	A	305	330	350	355	305	300	300	310	A	J295R	J290S	A	J355S	355
9	350	355S	J355F	F	F	290	260	295	290S	285	300	A	J355R	330	330	J320S	A	A	A	305	275R	320	375	375
10	360	360	F	F	F	250S	260	290	300	265R	315R	G	375	320	A	330S	U295R	295	330S	U290S	U285S	295S	360S	370S
11	U375S	370S	375	345	295S	270S	260	265	A	A	A	335	350	I380A	J345S	330	300	A	305	I320S	320	310	U385S	I370F
12	370	I375F	I355F	I365F	I340F	315	300	280	A	A	A	355	345R	U325R	320	325S	U310R	J305R	U315S	315	I290S	U350A	I365F	J345S
13	I340F	360	395S	U370S	335F	290S	275	I275A	275	305	A	370	355	370	360	U310R	I325A	300	J300R	305	310	I345F	I350S	I340F
14	320F	J355F	350	I340F	330F	280	J255R	255	280	290	375R	350	R	S	355	350	315	A	U315AS	315	300S	385S	I400F	U370S
15	U325S	U345S	U345S	U300S	305S	I280S	A	A	A	A	325	A	A	335	I340A	U325S	310	U300S	I300R	I305S	305	I365F	J360F	F
16	F	F	F	310F	340	260	280	270	275	I290A	320	A	A	350	R	J305R	I300S	295	330	J320R	I295S	305	355	345
17	320	J315S	315S	C	C	C	C	C	C	C	310	370R	320	A	A	300	U300S	I300S	I300A	I295A	S	F	F	F
18	F	355F	I335F	350	355	J325S	305	J245R	A	A	A	A	350	J310R	345	330	J300S	I300A	S	A	A	F	300F	A
19	F	U355F	280	310F	I310F	300	315	300	I300A	275	A	A	350	I345A	350	320	320	305	310	J345S	F	I315F	380	320F
20	I335F	U370F	310	330	U325S	300	265	280	310	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	330	305	R	305	350	355	345	355	310S	J305S	J285S	F	F	300	340
22	335	350	F	320	J300S	300S	285	260	270	A	A	A	A	A	325	A	A	A	A	A	A	I340A	325	F
23	F	U355F	F	F	F	325	295	280	270	295	305	G	G	G	G	310	U295S	290	300	300S	U350S	310	345	310
24	330F	335	310F	F	A	J330R	300	J270R	250	A	A	A	G	C	C	C	U345R	J320R	J330R	J305S	I255S	330	J355S	J350F
25	U380S	A	S	310	I300F	295F	285	A	A	A	A	G	355	360	350	C	C	C	300	345	300	I280A	305	325
26	F	A	A	A	F	255	A	A	R	A	A	A	A	390	355S	345S	J330R	305R	300	J300R	S	305	330	F
27	A	S	F	F	F	290	A	285S	265	U325R	G	340	B	G	355	350	310	310	I320A	310	J295S	I300F	285	J330S
28	340	J305S	U345S	J345S	300	340	270	295	A	A	A	R	375	350	350	360	J350R	300S	U250S	295	355	J320S	355	345
29	350	340	F	345S	350	320	310	A	A	G	A	A	A	A	S	400	305	300	280	A	355	A	A	A
30	A	I360FS	A	350	I375F	A	A	A	A	A	A	A	A	A	G	320	300	350	315	A	A	320	A	A
31	300S	370	350	I340A	I310A	J310S	345	290	255	A	A	A	S	R	A	350	350	350	320	300	300	330	A	F
No.	21	25	20	23	23	28	25	22	18	13	13	9	16	17	20	27	27	24	23	23	21	21	22	19
Median	340	355	350	330	335	300	275	280	285	290	315	350	350	345	350	320	305	305	305	300	300	320	355	350
U.Q.																								
L.Q.																								
Q.R.																								

hpF2

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

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

May.1963

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	70S	U 100S	U 105S	95S	90S	U 110S	105	75	120	J 50R	55	S	75	75	80	I 65B	55	50	55	U 60S	85	60	75	J 55F
2	70	60	60S	65	J 50F	70	50	70	50R	A	A	A	B	G	S	65	45	50	A	A	A	A	60S	J 45F
3	U 65S	75S	60	45	85	J 75S	40S	50	J 50R	A	55	50	J 50R	J 90S	40	J 70R	50	J 65S	U 45S	S	50	55	I 55A	65
4	70	75	100	60	U 65S	75	55	45	30	I 45A	50	J 55S	55R	A	A	40S	J 60R	J 55S	A	J 55S	A	A	A	A
5	A S	F	A	75S	65F	U 90S	70S	A	30	A	A	A	G	G	45	60	55	A	A	A	I 65A	A	A	A
6	75S	I 80A	I 70A	75S	I 95F	40S	90	45	50	45	45	G	B	55	70	J 70R	45S	50	65	J 60S	70	65S	A	A
7	F	I 70A	J 60F	55	I 60F	J 65S	40	A	A	95S	A	A	65	A	75	90	70	95S	U 100S	I 100A	100S	A	A	100S
8	U 85A	U 100S	85S	95AS	95	115S	90R	I 100A	A	A	45	70	55	55	75	60	50	70	A	J 50R	J 50S	A	J 45S	45
9	50	55S	J 45F	F	F	60	45	20	50S	45	55	A	J 45R	65	50	J 50S	A	A	A	30	55R	75	70	35
10	80	75	F	F	F	55S	45	55	50	80R	60R	G	80	85	A	100S	U 105R	115	100S	U 90S	U 95S	105S	105S	95S
11	U 95S	90S	60	105	105S	95S	95	75	A	A	A	60	80	I 65A	J 55S	60	55	A	60	I 70S	70	60	U 80S	I 85F
12	75	I 75F	I 70F	I 70F	I 70F	80	60	35	A	A	A	50	95R	U 105R	70	100S	U 90R	J 95R	U 95S	85	I 110S	U 100A	I 90F	J 100S
13	I 95F	100	105S	U 90S	100F	100S	80	I 70A	105	45	A	35	70	55	85	U 85R	I 65A	50	J 85R	80	80	I 55F	I 55S	I 60F
14	55F	J 70F	75	I 55F	50F	75	J 45R	45	65	115	70R	45	R	S	90	105	85	A	U 85AS	110	95S	110S	I 100F	U 105S
15	U 110S	U 105S	U 105S	U 100S	75S	I 100S	A	A	A	A	80	A	A	60	I 55A	U 55S	60	U 50S	I 50R	I 55S	70	I 80F	J 55F	F
16	F	F	F	85F	65	50	45	35	40	I 40A	35	A	A	50	R	J 60R	I 50S	40	75	J 75R	I 55S	55	75	50
17	50	J 55S	80S	C	C	C	C	C	C	C	70	65R	65	A	A	40	U 45S	I 75S	I 65A	I 55A	S	F	F	F
18	F	60F	I 65F	50	90	J 75S	90	J 30R	A	A	A	A	50	J 50R	50	70	J 50S	I 40A	S	A	A	F	50F	A
19	F	U 50F	60	75F	I 80F	55	35	55	I 55A	30	A	A	50	I 45A	55	65	50	50	60	J 60S	F	I 90F	75	75F
20	I 60F	U 75F	55	70	U 75S	80	80	60	45	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	25	45	R	50	45	45	50	75	45S	J 45S	J 30S	F	F	60	60
22	60	50	F	65	J 55S	50S	30	45	30	A	A	A	A	A	70	A	A	A	A	A	A	I 55A	50	F
23	F	U 50F	F	F	F	75	55	45	40	50	70	G	G	G	G	55	U 23S	20	65	55S	U 45S	65	50	85
24	75F	60	70F	F	A	J 65R	60	J 60R	30	A	A	A	G	C	C	C	U 30R	J 65R	J 65R	J 65S	I 45S	55	J 50S	J 65F
25	U 60S	A	S	85	I 70F	60F	65	A	A	A	A	G	80	70	80	C	C	C	65	70	55	I 55A	90	70
26	F	A	A	A	F	45	A	A	R	A	A	A	A	60	55S	70S	J 60R	60R	65	J 50R	S	90	75	F
27	A	S	F	F	F	70	A	25S	40	U 70R	G	50	B	G	70	50	55	45	I 70A	45	J 50S	I 55F	65	J 70S
28	60	J 60S	U 60S	J 55S	55	25	50	50	A	A	A	R	70	55	55	90	J 50R	50S	U 45S	55	90	J 65S	70	55
29	50	60	F	50S	75	75	85	A	A	G	A	A	A	A	S	50	45	50	35	A	50	A	A	A
30	A	I 90FS	A	55	I 75F	A	A	A	A	A	A	A	A	A	G	75	45	50	80	A	A	85	A	A
31	50S	75	55	I 50A	I 65A	J 55S	55	60	50	A	A	A	S	R	A	45	45	50	75	55	65	70	A	F
No.	21	25	20	23	23	28	25	22	18	13	13	9	16	17	20	27	27	24	23	23	21	21	22	19
Median	70	75	70	70	75	70	55	50	50	45	55	50	65	60	60	65	50	50	65	60	65	65	70	65
U.Q.																								
L.Q.																								
Q.R.																								

ypF2

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

The Radio Research Laboratories, Japan

K 14

IONOSPHERIC DATA

May.1963 | 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	A	A	A	A	A	I3.3^{S}	5.0	5.6	5.9	8.3^{H}	6.1	5.6	9.2	J9.7^{S}	8.3	10.1	9.0	7.9^{S}	6.5	6.4^{S}	I5.9^{A}	I5.8^{S}	5.5^{H}	J5.4^{S}
2	5.4	5.0	I4.7^{S}	4.6	I4.3^{S}	I4.0^{S}	5.0	5.9	I6.8^{S}	6.7	8.5	8.1	8.2^{S}	8.3	8.5	10.6	J10.4^{S}	7.4	I6.4^{A}	6.0^{S}	I5.9^{S}	S	A	A
3	I4.9^{A}	I4.3^{A}	3.1	I3.1^{S}	I3.2^{S}	3.2	4.4	5.3	5.6	6.4	6.7	7.1	8.6	9.1	8.5	I9.5^{S}	J10.1^{S}	9.3	I8.6^{S}	J8.7^{S}	A	A	A	A
4	A	A	3.9^{S}	I3.8^{S}	I2.3^{S}	2.4	4.3	5.7	U6.3^{S}	6.2	U7.4^{S}	J7.7^{S}	8.5	J7.7^{S}	8.6	I10.1^{S}	10.6	8.7	I8.1^{S}	I8.3^{S}	8.8	6.0^{S}	S	A
5	S	A	S	I3.6^{S}	S	F	5.4	6.6^{S}	I5.7^{A}	5.2	I5.6^{A}	6.1	6.3	7.4	8.1	8.9	9.1	8.3	I7.5^{S}	I6.3^{S}	5.8	5.5	I4.6^{S}	4.9
6	A	A	A	I3.7^{A}	I3.4^{S}	I3.5^{S}	5.0	6.1	6.9	I6.6^{A}	5.7	5.6	6.2	7.1^{S}	8.0	8.5	J9.6^{S}	J9.5^{S}	9.0	9.4^{S}	I7.1^{S}	S	S	A
7	S	S	S	J3.4^{S}	3.3	2.8	5.0	6.3	I6.5^{A}	I6.6^{A}	A	A	A	8.4	9.1	J9.9^{S}	J9.9^{S}	9.3^{S}	9.2	8.7	I6.4^{C}	J5.3^{S}	S	S
8	S	S	C	I5.4^{S}	J4.3^{S}	I4.1^{S}	J5.2^{S}	5.5	I6.2^{S}	I7.0^{A}	7.2	7.8	8.9	9.1	9.4	J9.5^{S}	9.0	J8.6^{S}	8.9	A	A	S	S	S
9	A	S	S	S	5.0	I5.5^{S}	6.0	I6.8^{S}	J6.6^{S}	7.0	5.7	6.8	7.1	8.1	8.9	9.1	8.4	I7.9^{S}	I9.1^{S}	S	A	A	I5.9^{S}	I5.8^{S}
10	5.9	6.5	I6.2^{S}	5.9^{S}	I5.8^{S}	I5.4^{S}	5.6	I6.4^{S}	I7.1^{S}	J6.9^{S}	5.9	6.9^{S}	8.5	J8.3^{S}	8.3	J10.0^{S}	J10.0^{S}	9.0	I8.5^{A}	J8.2^{S}	I7.7^{S}	I6.2^{C}	I5.0^{S}	S
11	S	S	S	J5.7^{S}	5.9	J4.7^{S}	4.8	5.7	A	A	A	I6.6^{A}	7.3	8.3	I9.3^{S}	J10.0^{S}	I9.7^{S}	8.7^{S}	S	S	S	S	S	S
12	J4.9^{S}	I5.0^{S}	J5.0^{S}	4.6^{S}	J4.3^{S}	4.2	6.0	J8.0^{S}	5.6	6.2	6.5	J7.7^{S}	9.3	9.3^{S}	I8.8^{S}	9.0	I9.8^{S}	9.2^{S}	9.4^{S}	9.3^{S}	J7.5^{S}	I6.2^{A}	5.0^{S}	A
13	S	A	A	J5.3^{S}	J5.3^{S}	3.7^{S}	5.0	I6.2^{A}	I6.8^{A}	6.0	I6.0^{A}	6.9	7.0	I8.1^{S}	9.4^{S}	10.6	I9.8^{S}	9.9^{S}	8.7	S	S	S	S	S
14	S	I5.9^{S}	I5.7^{S}	I5.7^{S}	5.4	J5.3^{S}	6.0	I6.6^{S}	6.5	6.4	6.5	6.7	8.3	9.0	J9.9^{S}	J10.0^{S}	J10.4^{S}	I9.9^{S}	I9.3^{S}	9.4^{S}	7.4	I6.2^{S}	I6.5^{S}	I6.0^{S}
15	I6.1^{S}	6.3	S	S	I5.5^{S}	4.9	5.3	I6.1^{S}	5.8	I6.2^{A}	I6.9^{A}	I8.0^{A}	9.1	I9.5^{S}	J10.3^{S}	10.7	11.2	10.1	J9.7^{S}	9.2	I8.1^{S}	6.4	5.3	S
16	S	S	J6.1^{S}	F	I5.0^{S}	I5.5^{S}	5.7	I6.1^{A}	6.2	6.3	5.6	6.5	7.7^{R}	J7.9^{S}	J7.7^{S}	8.8	8.5	7.0^{S}	I7.2^{S}	J7.8^{S}	I7.9^{S}	I7.3^{S}	I5.8^{S}	6.4
17	I5.6^{S}	5.8	5.7	J5.3^{S}	J4.8^{S}	J4.3^{S}	5.8	I6.2^{S}	6.1	6.5	6.5^{H}	I7.2^{C}	8.5	9.2	9.1	9.2	8.6	J8.6^{S}	J8.2^{SH}	J8.0^{S}	I7.8^{S}	S	S	S
18	S	S	S	J5.3^{S}	I5.0^{S}	5.7	I6.3^{S}	I6.8^{S}	5.0	5.2	I6.3^{S}	J7.4^{S}	9.0	8.6	8.1^{R}	9.2	8.8	8.6	7.2^{S}	I6.3^{A}	6.0^{S}	I6.2^{S}	S	A
19	S	S	I6.2^{S}	5.9^{S}	I5.7^{S}	5.4	I5.8^{S}	6.2^{S}	S	A	A	6.7	7.3	8.4	8.7	8.6	8.8	J8.3^{S}	I8.1^{S}	I7.5^{S}	S	S	S	I6.2^{S}
20	J6.0^{S}	I5.4^{S}	J5.3^{S}	J4.6^{S}	4.2	J4.0^{S}	5.3	I6.4^{SH}	I6.6^{S}	6.1^{S}	6.7	I6.3^{R}	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	5.6	C	C	A	A	J6.4^{R}	6.7	7.8	8.7	8.4	J8.5^{S}	I8.9^{S}	S	S	S	S
22	S	S	4.4^{S}	4.7	I4.4^{S}	I4.4^{S}	5.8^{S}	6.6^{S}	J6.4^{S}	6.0	5.6	I5.7^{A}	6.3	7.0	7.4	J7.9^{S}	8.0^{S}	7.6	A	S	S	S	S	S
23	S	S	I5.7^{S}	I5.2^{S}	A	S	5.8^{S}	I8.0^{A}	I7.0^{A}	I6.0^{S}	A	A	A	6.1	A	A	S	A	S	A	I5.8^{S}	I5.7^{A}	I5.4^{A}	J5.3^{S}
24	I5.5^{S}	S	S	A	S	S	5.8	I6.7^{S}	6.6	I6.2^{S}	I6.3^{A}	I6.2^{S}	5.8	6.6	7.4^{S}	8.5	9.2	S	A	S	S	S	S	S
25	S	A	A	3.3^{S}	3.1	J3.4^{S}	5.6	I6.1^{S}	A	A	A	A	A	8.7	I10.0^{S}	11.4	11.0	I9.5^{S}	J8.1^{S}	S	S	S	S	S
26	A	A	A	3.6	I3.6^{S}	I4.3^{S}	6.0	A	A	A	A	A	A	A	8.7	J10.0^{S}	10.2^{S}	J10.0^{S}	9.0^{S}	8.4	I7.7^{S}	S	C	C
27	C	C	C	C	C	C	C	C	C	5.6	5.7	I5.9^{A}	5.7	I6.9^{A}	7.5	7.7	U7.7^{S}	I7.6^{A}	I7.6^{S}	I7.7^{S}	8.8^{S}	I7.2^{S}	5.2^{S}	I4.0^{S}
28	I3.5^{S}	J4.4^{S}	I4.3^{S}	I3.8^{S}	J3.7^{S}	I4.0^{S}	5.7	5.9	J5.3^{S}	5.4	5.7	6.0	7.2	8.5	8.3	I8.0^{S}	8.7	8.9	6.8	5.6	I5.8^{S}	I6.0^{S}	I5.5^{S}	I5.2^{S}
29	5.7	5.9	6.1	J4.6^{S}	4.2	J4.3^{S}	4.8	5.8	5.3	6.0	I5.5^{R}	5.4	5.9	6.0	I6.7^{S}	7.2^{S}	9.3^{S}	8.8	5.9	5.0	5.4	J5.6^{S}	I5.3^{S}	J5.3^{S}
30	I5.2^{S}	I4.5^{S}	I4.5^{S}	4.9^{S}	I4.5^{S}	I3.6^{S}	5.0	6.8	6.1^{S}	A	A	A	A	A	A	7.7^{S}	7.7	6.8	6.6	A	A	5.6	A	S
31	A	A	S	I3.5^{S}	I3.4^{S}	I3.6^{S}	4.8	I6.8^{S}	I6.0^{A}	I5.6^{A}	I5.5^{A}	5.7	6.3	6.5	6.5	6.7	6.8^{S}	6.9^{S}	I6.5^{S}	I6.6^{S}	S	S	S	S
No.	11	11	15	24	25	26	29	28	26	25	23	25	24	28	28	29	29	28	26	21	18	15	12	10
Median	U5.5	5.4	5.3	4.6	U4.3	4.2	5.4	6.2	6.2	6.2	6.1	6.7	7.5	8.3	8.5	9.2	9.2	8.6	8.2	8.0	U7.2	U6.0	U5.4	U5.4
U.Q.	5.9	5.9	6.1	5.3	5.2	4.9	5.8	6.6	6.6	6.6	6.7	7.3	8.6	8.8	9.1	10.0	10.0	9.3	9.0	8.8	7.8	6.2	5.6	6.0
L.Q.	4.9	4.5	4.4	3.6	3.5	3.6	5.0	5.9	5.7	6.0	5.7	6.0	6.3	7.0	7.8	8.2	8.6	7.9	7.2	6.4	5.9	5.6	5.1	5.2
Q.R.	1.0	1.4	1.7	1.7	1.7	1.3	0.8	0.7	0.9	0.6	1.0	1.3	2.3	1.8	1.3	1.8	1.4	1.4	1.8	2.4	1.9	0.6	0.5	0.8

The Radio Research Laboratories, Japan

foF2

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

Y 1

IONOSPHERIC DATA

May.1963

foF1

135° E Mean Time (G. M. T. +9h)

Yamagawa

Lat. 31°12.5′ N
Long. 130°37.7′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	A	5.1H	$I4.5^{R}$	4.8	$I4.7^{R}$	4.5	$I4.4^{B}$	4.1	L	A					
2									A	A	A	A	A	4.6	4.5	A	A	A	A					
3									A	A	A	A	A	4.6	4.7	4.5	A	A	A					
4									$I4.1^{L}$	$I4.5^{L}$	4.7	R	4.8	4.7	4.5	$I4.4^{A}$	$I4.2^{A}$	A	A					
5									A	A	A	A	R	4.6R	4.6R	$I4.5^{A}$	4.3	4.1	L					
6								L	A	A	4.7	5.0	4.8	$I4.8^{A}$	4.7	A	A	A	A					
7								A	A	A	A	A	A	4.9	4.7	4.5	A	A	A					
8									A	A	A	4.8	A	A	A	4.6	4.5	A	A					
9									L	4.5	A	5.0	4.9	A	A	A	A	A	A					
10								L	A	A	A	A	A	4.8	4.8	5.2	A	A	A					
11									A	A	A	A	A	A	S	4.7	4.5	A	A					
12								3.9	A	A	A	A	A	A	A	A	4.4	A	A					
13								A	A	A	A	$I4.8^{A}$	$I4.8^{A}$	A	4.8	$I4.6^{A}$	4.4	4.1	L					
14									4.3	$I4.7^{A}$	A	A	$I5.0^{L}$	5.1	4.8R	4.6	4.5	A	A					
15								A	A	A	A	A	A	A	A	A	4.4	L	A					
16								A	L	4.5	4.7	5.0	5.0	4.8	4.9	4.8	4.4	L	L					
17								L	A	A	4.7	4.8	4.8	A	4.6	4.5	$I4.5^{R}$	3.9						
18								A	A	A	A	A	A	A	4.9H	4.5	A	A	A					
19								A	A	A	A	A	4.9	A	$I4.6^{B}$	$I4.6^{R}$	4.3	A	R					
20									L	$I4.6^{A}$	A	$I4.7^{A}$	C	C	C	C	C	C	C					
21								C	A	C	C	A	A	A	A	A	A	4.2	L					
22								L	A	L	A	A	R	A	R	A	A	A	A					
23								A	A	4.6	A	A	A	A	A	A	A	A	A					
24								A	A	A	A	A	A	4.7R	R	A	4.3	A	A					
25								A	A	A	A	A	A	A	A	4.5	4.2	4.0	A					
26								A	A	A	A	A	A	A	A	4.5	4.2	A	$I3.6^{A}$					
27								C	C	A	A	A	A	A	A	A	A	A	A					
28								3.6	4.5	A	4.6	$I4.6^{R}$	B	4.5	A	A	A	A	A					
29								3.8	A	$I4.3^{A}$	4.4	$I4.7^{R}$	A	4.5R	$I4.4^{R}$	$I4.3^{R}$	4.1	3.9	A					
30							L	3.7	$I4.1^{A}$	A	A	A	A	A	A	A	$I4.2^{A}$	A	A					
31								A	A	A	A	A	$I4.7^{R}$	4.6	A	A	$I4.3^{A}$	4.1H	3.6					
No.								4	4	7	7	10	10	14	15	17	18	7	2					
Median								3.8	U4.2	U4.5	4.7	U4.8	4.8	4.7	4.7	4.5	4.3	4.1	U3.6					
U.Q.																								
L.Q.																								
Q.R.																								

foF1

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

The Radio Research Laboratories, Japan

Y 2

IONOSPHERIC DATA

May. 1963

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	2.75	3.10	3.15	A	R	R	R	B	3.20R	2.70	1.90					
2							S	2.30	2.80	3.10	3.20	I3.20B	3.10	A	A	I3.30R	3.00	2.50	2.05					
3							S	2.40	2.80	3.10	3.20	3.15	A	A	R	A	A	A	2.00					
4							S	2.45H	2.85	3.10	R	R	R	R	I3.40R	3.20	3.10	2.75	2.20					
5							S	2.50	A	A	A	A	A	R	R	3.35R	3.05	2.70	2.10					
6							S	2.50	2.90	3.10	3.20	3.20	A	R	R	3.40R	3.10	2.70	2.10					
7							1.90	2.45	2.90	3.25	3.25R	3.20	2.95	R	R	3.20	3.15	2.80	2.10					
8							S	2.65	2.90	3.00	3.25	A	A	A	A	A	3.10H	2.70	2.10					
9							S	2.35	2.80	3.15H	R	A	R	R	R	S	3.15	2.80	2.05					
10							S	2.45	2.90	I3.10A	3.30	I3.30A	R	R	R	3.40R	3.10	2.70	2.00					
11							1.90	2.50	2.80	3.20	3.20	3.05	A	A	A	A	A	I2.80S	2.40					
12							S	2.40	2.85	3.20	I3.25A	A	A	A	A	A	A	A	A					
13							S	2.40	2.80	3.10	3.15	S	A	A	A	A	A	2.70	2.20					
14							A	A	2.90	3.10	3.30R	B	R	R	3.30	3.20	I3.15R	2.90	I2.15B					
15							1.80	2.50	2.90	3.05	A	A	A	A	A	R	3.20R	A	A					
16							1.80	2.45	2.95	A	A	A	A	R	A	3.30R	A	A	2.25					
17							S	2.50	2.90	3.20	3.40	3.50R	3.60	I3.60R	I3.45R	3.20	3.10	2.70	2.35					
18							S	2.40	2.80	I3.05S	3.20S	3.25R	I3.20R	I3.20R	B	A	3.15	2.80	2.25					
19							S	2.50	2.80	3.00	3.05	I3.15B	3.70	3.65R	B	R	I3.10R	2.70	2.10					
20							S	A	A	A	A	R	C	C	C	C	C	C	C					
21							C	C	3.00	C	C	A	A	A	A	A	A	2.90R	2.15					
22							2.05	2.50H	2.90	3.10	3.20	B	R	R	R	R	I3.15A	I2.65A	I2.15B					
23							S	2.50	2.90	3.15	3.30	I3.30R	R	A	A	A	A	A	A					
24							2.10	2.45	2.85	I3.15R	R	R	R	R	R	R	3.15	2.75	2.15					
25							S	2.45	3.00	3.20R	3.40	I3.35R	R	R	A	3.20	3.15	2.80	2.15					
26							S	2.40	2.90	3.15	3.30R	R	R	U3.50R	3.30	3.05	3.00	2.60	2.00					
27							C	C	C	3.10	I3.20R	I3.15R	A	A	A	A	3.10	2.60	2.10					
28							A	A	A	A	A	R	B	R	B	R	3.05	2.60	B					
29							S	2.60H	2.90	3.20	3.35	R	R	R	R	3.20	3.00	2.75	2.10					
30							S	2.50	3.00	3.10	3.15	I3.25R	I3.20R	I3.15R	B	A	A	A	2.20					
31							S	A	2.95	3.20	3.20	I3.25R	3.30R	A	A	A	A	A	2.20					
No.							6	25	27	26	22	14	7	5	4	12	21	23	26					
Median							1.90	2.45	2.90	3.10	3.20	U3.20	3.20	U3.50	U3.35	3.20	3.10	2.70	2.10					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foE

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

Y 3

IONOSPHERIC DATA

May.1963 — 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	J12.2	6.0M	6.5	8.4M	9.0	2.8	2.3	3.6	5.0	J5.7	4.8	3.9	4.1	4.3	3.7	B	G	3.1	J4.7	J4.2	6.7M	5.8M	3.0	2.3
2	2.7	S	S	2.6	S	S	2.3	3.8	J6.5	J6.9	5.3	5.7	5.2	4.6	3.5	4.6	J5.7	J6.8	J7.0	J4.4	J3.3	3.3	4.9M	5.8
3	J9.9	J5.1	S	S	S	S	S	3.5	J5.4	6.8	7.2	J5.6	7.7	4.0	3.8	3.8	J5.0	6.2	J5.2	6.0	6.7	8.9	J5.9	3.8
4	J5.6	J4.1	3.8M	3.2M	E	2.1	2.9	3.2	3.4	4.9	4.2	G	G	4.6	4.4	J8.6	4.8	7.3	J4.7	J5.1	J4.7	8.3M	5.5M	6.0M
5	3.0M	6.0M	J3.9	3.5	3.4	E	3.0	J5.2	J5.9	J5.0	J8.4	J8.5	4.4	G	4.4	4.6	4.0	4.0	2.9	J3.8	J5.3	6.1M	J3.4	5.2M
6	7.2	5.8M	J5.1	J5.5	2.8M	S	2.1	2.9	J6.2	7.8	J4.4	J5.4	3.6	5.3	4.4	5.8	6.4	6.3	J4.5	J5.2	2.9	3.8	3.6	4.4
7	3.0	2.9	J5.2	J3.8	J3.7	J5.2	2.4	5.9	12.2M	J11.6	11.9	J14.9	J13.2	G	4.0	G	J7.1	J5.4	5.9	J4.6	C	J3.5	J3.2	5.0
8	2.4	4.3M	C	J3.8	J2.7	J5.1	5.5	3.4	7.2M	9.4	6.2	4.5	7.8	J10.2	J7.3	3.3	4.2	J6.7	8.7	J10.2	J11.5	J5.2	J5.2	J3.1
9	J5.1	4.6	J3.3	2.9	J5.0	4.1	5.8	J5.2	3.8	3.7	4.9	4.7	4.5	6.7	7.9	4.9	J6.2	7.0M	J6.6	5.7M	J8.5	11.4M	S	S
10	2.8	S	S	E	2.2	S	G	3.3	J4.9	J5.2	J5.2	J5.7	7.1M	4.1	4.1	5.2	6.3	7.3	9.0M	5.9	5.9M	C	J4.7	J5.1
11	3.0	4.2	4.3	3.0	3.1	S	2.7	3.7	7.0	7.1	J10.3	8.9M	5.6M	J5.7	4.5	J3.6	4.0	6.0	J6.5	J5.4	6.3M	5.9M	5.8M	3.6M
12	3.0M	2.5	2.4	S	2.8	S	J3.2	3.8	5.1	6.9M	6.2	J5.6	9.5M	J10.1	6.8	J4.9	J5.1	J5.3	J8.4	2.9	3.0	10.7	4.8	7.4M
13	3.8	5.8M	5.9	J5.1	3.0	3.1	J3.9	7.9	10.8	J11.5	7.2	J5.4	J5.5	J5.4	5.4	J5.5	3.5	3.1	2.5	2.2	2.4	S	S	3.0
14	4.8	S	J2.4	4.0M	J3.7	3.7	3.0	J5.4	4.3	J5.7	4.9	5.1	4.6	4.0	4.5M	3.9	3.5	J5.0	J5.6	4.4	5.5M	J5.3	5.8	3.2
15	2.7	4.1M	J3.0	J2.3	2.9M	S	3.0	J5.2	J5.3	J8.2	11.9	8.9	10.8	J5.2	J5.4	4.5	3.5	3.8	7.2	5.7	3.0	4.3	4.9	J5.2
16	J5.3	3.7	J2.4	2.2	3.1	4.5	J4.1	J7.4	3.9	4.5	J5.3	J5.3	4.2	3.3G	4.6	G	3.3	3.1	3.3	4.9	J5.3	3.0	4.3M	S
17	2.4	S	S	S	S	S	2.5	3.6	J5.3	J8.4	4.3	4.8	G	4.7	4.8	G	G	G	2.7	2.3	J2.3	9.0M	3.0M	5.9M
18	3.2M	J3.7	J5.1	3.0	2.7	E	2.7	3.8	J4.8	8.3	J6.2	7.6M	6.0	7.8M	B	4.1	J5.4	J8.1	6.3	9.0M	J2.4	2.8	3.8	9.0M
19	2.9	3.0M	J3.4	3.0	3.2M	3.0	3.9	J5.3	J6.2	9.0M	12.2	J5.3	6.6	4.6	B	G	3.6	4.5	J3.5	6.0	5.3	3.6M	3.7M	4.3
20	2.8	2.8	S	2.9	2.4	S	2.1	3.2	J5.2	6.9M	J5.2	J5.4	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	J5.3	C	C	J12.7	J8.5	6.7	4.8	J5.4	4.4	3.3	3.3	J3.4	3.0	6.0M	4.0M	3.8M
22	2.8	2.9	2.9	2.4	S	S	2.4	4.0	4.5	4.8	J6.4	6.8	4.4	5.4	G	5.9	J8.4	J6.7	J10.4	6.9M	6.8M	4.1	5.7M	4.1
23	J5.2	3.1	3.4	3.0	9.0M	3.6	J5.3	9.4M	7.6	J4.8	J6.6	J8.5	J8.5	J5.8	J6.8	J8.6	6.2	J8.5	6.7M	6.7M	5.8M	5.9M	5.8	3.7
24	2.9	2.9	J5.1	J8.6	4.0M	J5.0	2.5	4.1	J5.1	J6.2	J8.5	J5.7	J5.4	3.1G	3.2G	4.5	J5.0	9.4	11.5M	8.3M	5.9M	3.8	5.7M	4.8
25	5.7	5.9	5.8	J2.4	S	2.3	3.0	J5.4	J8.5	J8.2	J13.9	J12.7	13.3	5.3	8.0	7.7M	G	3.6	J3.7	J3.0	5.9M	3.6M	3.5	J5.3
26	J5.3	4.9	5.6M	5.0	J2.3	J4.3	5.0	J7.8	J8.6	12.4	J9.3	J8.4	J10.4	8.4	J11.7	J5.3	J5.1	6.5	4.3	2.9	3.0	5.8M	C	C
27	C	C	C	C	C	C	C	C	C	J5.4	J5.3	J14.2	J7.4	9.6	J6.4	J8.7	6.8	10.1M	5.9	J5.3	5.8M	5.8M	5.7M	3.0
28	3.0M	J3.9	3.1M	J2.2	E	J2.2	3.0	3.1	4.4	4.4	J5.4	3.1G	B	G	J5.2	J5.4	J6.6	J4.7	4.3	J5.2	2.4	S	S	3.1
29	J3.7	3.0	2.9	3.0	3.0	E	2.5	3.2	4.3	6.1	J8.2	J5.4	4.7	G	G	G	4.4	3.3	4.4	J2.7	J2.3	2.7	3.0	2.5
30	2.7	3.0	2.8	S	S	S	2.6	3.7	4.4	8.9	12.4	J15.6	J13.0	12.0	J10.1	7.2	J5.2	J5.0	5.8	10.5M	9.0M	5.9M	9.0M	5.0M
31	5.8	5.8	6.8M	2.9	2.9	6.0	3.0	4.2	J8.3	J7.6	J8.7	6.2	3.8	J5.3	J10.2	6.8	J5.2	3.0	3.3	J4.2	4.4M	3.8	5.9	2.7
No.	29	25	23	25	23	18	28	29	30	30	30	31	29	30	28	29	30	30	30	30	29	27	26	27
Median	3.0	4.1	3.8	3.0	3.0	3.4	3.0	3.8	5.3	6.9	6.3	5.7	5.6	5.2	4.7	4.9	5.0	5.4	5.4	5.2	5.3	5.3	4.8	4.3
U.Q.	5.3	5.4	5.2	3.9	3.7	4.5	3.6	5.4	7.0	8.3	8.7	8.5	8.5	6.7	6.8	5.8	6.2	6.8	6.7	6.0	6.1	6.0	5.7	5.2
L.Q.	2.8	3.0	2.9	2.5	2.7	2.2	2.4	3.4	4.5	5.2	5.2	5.3	4.4	4.0	4.0	3.7	3.6	3.6	3.7	3.8	3.0	3.6	3.6	3.1
Q.R.	2.5	2.4	2.3	1.4	1.0	2.3	1.2	2.0	2.5	3.1	3.5	3.2	4.1	2.7	2.8	2.1	2.6	3.2	3.0	2.2	3.1	2.4	2.1	2.1

The Radio Research Laboratories, Japan

foEs — Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Y 4

May.1963 **f_bEs**

IONOSPHERIC DATA

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	A	A	A	A	A	E	2.3	3.6	4.4	5.1	4.2	3.9	$E_{4.1}^{R}$	4.1	$E_{3.7}^{R}$	B		G	4.4	3.8	A	A	2.3	E
2	E	S	S	1.5	S	S	2.2	3.6	A	6.2	5.0	4.9	4.8	4.3	$E_{3.5}^{R}$	4.5	5.7	$E_{6.8}^{S}$	A	4.2	A	2.7	A	A
3	A	A	S	S	S	S	S	G	5.4	4.7	6.0	5.5	5.8	$E_{4.0}^{R}$	3.7	3.8	4.3	4.5	4.8	5.7	A	A	A	A
4	A	A	E	A		E	2.6	3.1	3.4	3.9	4.2			4.4	4.3	5.5	4.8	6.8	4.6	5.1	4.6	5.5	A	1.9
5	E	A	1.7	2.8	2.0		2.6	5.2	A	4.5	A	5.5	$E_{4.4}^{R}$		4.3	4.5	4.0	4.0	2.8	3.8	4.8	4.1	2.0	2.8
6	A	A	A	A	1.7	S	G	G	5.6	A	4.2	4.5	$E_{3.6}^{R}$	5.2	4.3	5.8	6.4	5.6	4.2	4.9	2.0	A	A	A
7	A	2.0	1.9	2.0	1.9	2.1	G	5.3	A	A	A	A	A		4.0		6.4	5.2	4.8	4.1	C	2.5	2.3	3.5
8	2.0	A	C	2.5	1.7	1.9	4.0	$E_{4.3}^{R}$	5.3	A	6.2	4.2	7.2	7.6	5.4	$E_{3.3}^{R}$	4.1	5.5	7.4	A	A	A	A	A
9	A	A	2.5	1.9	2.0	2.1	4.1	4.8	3.7	3.7	4.8	4.5	4.5	6.7	6.7	4.5	5.2	A	A	4.5	A	A	S	S
10	$E_{2.8}^{S}$	S	S		E	S		3.3	4.8	4.8	4.6	5.0	5.8	$E_{4.1}^{R}$	4.1	5.1	5.5	$E_{7.3}^{S}$	A	$E_{5.9}^{S}$	4.8	C	A	A
11	A	A	A	1.9	1.8	S	2.5	3.6	A	A	A	A	4.8	5.4	$E_{4.5}^{S}$	$E_{3.6}^{R}$	$E_{4.0}^{R}$	5.9	A	5.4	A	A	A	A
12	2.6	1.9	E	S	E	S	2.7	3.5	4.6	5.5	5.6	5.3	6.5	8.3	6.5	4.7	3.6	4.8	8.3	2.6	2.1	A	3.2	A
13	A	A	A	2.3	E	2.1	2.9	A	A	5.4	A	4.9	5.5	4.7	4.7	5.3	$E_{3.5}^{R}$	3.1	G	2.1	1.9	S	S	A
14	4.6	S	2.1	2.5	2.3	2.2	2.4	5.1	4.2	5.5	4.7	$E_{5.1}^{R}$	$E_{4.6}^{R}$	$E_{4.0}^{R}$	4.4	$E_{3.9}^{R}$	3.5	4.6	3.7	3.9	5.5	4.4	A	2.2
15	2.0	2.8	2.8	1.9	2.0	S	G	5.0	5.0	A	A	A	8.6	4.9	4.8	4.5	3.3	3.4	4.9	3.3	2.8	3.4	3.8	A
16	2.9	2.2	2.0	2.0	2.2	4.2	4.1	A	3.7	4.3	4.1	4.3	$E_{4.2}^{R}$	$E_{3.3}^{R}$	4.5		$E_{3.3}^{R}$	$E_{3.1}^{R}$	3.2	3.7	5.1	2.4	3.8	S
17	E	S	S	S	S	S	2.3	3.5	5.0	4.8	4.1	4.2		4.7	4.5				G	2.3	1.9	3.5	2.6	A
18	A	A	A	2.4	1.7		2.3	3.5	4.8	4.9	A	A	5.5	5.2	B	4.1	5.3	7.6	6.2	A	2.0	E	2.7	A
19	2.0	E	A	2.4	2.4	2.3	3.3	5.3	A	A	A	4.9	4.8	$E_{4.6}^{R}$	B		3.6	4.5	3.2	3.7	A	A	A	4.3
20	2.0	2.6	S	1.9	2.0	S	G	2.9	3.5	5.4	4.7	5.2	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	4.7	C	C	A	A	A	4.8	5.1	4.4	3.3	$E_{3.3}^{R}$	2.7	A	A	A	A
22	2.0	2.9	2.0	E	S	S	G	3.5	4.4	4.4	5.1	A	4.3	4.6		5.9	6.5	6.7	A	A	A	A	A	A
23	4.7	2.1	2.9	A	A	2.3	4.2	A	A	4.1	A	A	A	5.6	A	A	5.2	A	A	A	A	A	A	2.5
24	A	2.5	A	A	A	2.2	G	4.1	4.7	A	A	A	4.8	$E_{3.1}^{R}$	$E_{3.2}^{R}$	4.5	4.2	A	A	A	A	A	A	A
25	A	A	A	2.3	S	E	2.7	A	A	A	A	A	A	4.7	A	4.3		3.6	3.7	2.8	A	2.5	A	A
26	A	A	A	A	2.2	2.0	4.6	A	A	A	A	A	A	A	4.5	3.7	4.1	4.4	3.5	2.5	2.6	4.1	C	C
27	C	C	C	C	C	C	C	C	C	5.3	5.2	A	5.2	A	6.3	5.2	6.8	A	5.3	4.3	5.1	4.6	3.3	2.0
28	2.3	2.5	2.5	1.8		1.9	G	2.8	4.2	4.2	4.5	$E_{3.1}^{R}$	B		4.5	4.6	5.1	4.7	4.3	4.6	2.4	S	S	E
29	1.9	2.0	2.0	1.8	1.9		2.5	G	3.9	5.3	4.2	4.2	4.7				3.9	3.3	3.8	2.3	2.0	1.9	E	E
30	E	1.9	2.0	S	S	S	G	2.9	4.2	A	A	A	A	A	A	5.2	4.4	4.7	5.3	A	A	3.9	A	A
31	A	A	2.1	1.7	2.2	2.4	2.6	3.8	A	A	A	5.4	$E_{3.8}^{R}$	4.5	5.6	4.5	4.3	$E_{3.0}^{R}$	3.1	3.3	3.6	2.6	A	E
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

f_bEs

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

The Radio Research Laboratories, Japan

Y 5

IONOSPHERIC DATA

May.1963 — f-min — 135° E Mean Time (G. M. T. +9h) — Yamagawa — Lat. 31°12.5′ N Long. 130°37.7′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E1.80S	E1.60S	E1.60S	E1.70S	E1.75S	E1.80S	E1.65S	E1.65S	1.90	1.90	2.25	2.40	2.30	2.60	2.30	8.20	2.40	2.00	1.80	E1.70S	E1.50S	E1.70S	E1.90S	E1.90S
2	E1.90S	E1.80S	E1.80S	E	E2.10S	E1.75S	E1.90S	E1.65S	2.20	2.20	2.30	3.40	2.50	2.40	2.40	2.00	2.40	2.00	E1.70S	E1.70S	E1.60S	E1.80S	E1.90S	E1.90S
3	E1.85S	E1.80S	E1.70S	E1.70S	E1.80S	E1.80S	1.95	E1.70S	1.80	2.00	2.00	2.30	2.40	2.50	2.20	2.00	2.05	1.80	E1.65S	E1.80S	E1.90S	E1.90S	E1.85S	E1.80S
4	1.30	E1.90S	E1.60S	E	1.40	E1.70S	E1.80S	1.80	1.90	2.05	2.25	2.20	2.30	2.20	2.50	2.20	1.95	1.90	1.30	E1.80S	E1.80S	E2.00S	E1.85S	E1.80S
5	E1.80S	E1.80S	E1.65S	E	E	1.30	E1.70S	1.70	1.90	2.30	2.30	2.40	2.45	2.40	2.50	2.40	2.00	1.90	E1.60S	E1.70S	E1.60S	E1.80S	E1.60S	E1.80S
6	E1.85S	E1.70S	E1.70S	E	E	E1.80S	E1.70S	E1.60S	1.90	2.20	2.25	2.40	2.30	2.40	2.30	2.20	2.00	1.90	1.30	E1.70S	E1.70S	E1.85S	E1.90S	E1.75S
7	E1.80S	E1.60S	E	E	E	E1.70S	E1.60S	E1.70S	1.80	2.20	2.30	2.50	2.30	2.50	2.20	2.40	1.90	1.90	1.70	E1.70S	C	E1.80S	E1.90S	E1.60S
8	E1.90S	E1.90S	C	E	E	E1.50S	E1.60S	1.80	1.85	2.05	2.25	2.30	2.50	2.65	2.40	2.20	2.05	1.90	E1.80S	E1.60S	E1.90S	E1.60S	E1.80S	E1.90S
9	E1.90S	E1.80S	1.30	1.40	E1.80S	E1.90S	E1.60S	1.90	1.90	2.30	2.20	2.90	2.40	2.20	2.25	2.30	2.20	1.80	1.50	E1.70S	E1.70S	E1.60S	E1.80S	E1.90S
10	E1.60S	E2.40S	E1.80S	1.30	E1.90S	E1.80S	E1.70S	1.70	1.95	2.25	2.30	2.40	2.25	2.25	2.30	2.20	1.90	1.90	1.80	E1.70S	E1.60S	C	E1.60S	E1.80S
11	E1.70S	E1.70S	E1.70S	E	E1.70S	E1.70S	E1.60S	1.90	2.00	1.95	2.00	2.50	2.30	2.40	2.20	2.00	1.90	1.80	E2.30S	E1.50S	E1.70S	E1.80S	E1.70S	E1.70S
12	E1.80S	E1.80S	E1.80S	E1.90S	E2.30S	E1.70S	E1.70S	E1.60S	2.20	2.20	2.30	2.85	2.70	2.60	2.70	2.30	2.30	2.00	1.60	1.80	E1.90S	E1.80S	E1.85S	E1.90S
13	E1.90S	E1.80S	E1.70S	E	E1.60S	E1.90S	E1.75S	E1.60S	2.35	2.05	2.20	E3.30S	3.00	2.50	2.10	2.30	1.90	1.90	E1.65S	E1.65S	E1.70S	E2.00S	E2.00S	E1.90S
14	E1.80S	E1.90S	E1.90S	E1.80S	E1.95S	E1.70S	1.40	1.80	1.85	2.00	2.50	3.45	2.40	2.40	2.30	2.40	2.20	1.95	2.15	E1.60S	E1.80S	E1.70S	E1.70S	E1.80S
15	E1.90S	E1.65S	E1.80S	E	1.20	E1.90S	E1.60S	E1.70S	1.70	2.20	2.40	2.30	2.20	2.40	2.25	1.95	1.85	1.90	E1.65S	E1.70S	E1.80S	E1.80S	E1.90S	E1.60S
16	E1.70S	E1.80S	E1.70S	E1.70S	1.25	1.40	E1.70S	1.65	1.90	2.30	2.50	2.25	2.80	2.60	2.50	2.35	2.25	2.20	1.80	E1.60S	E1.65S	E1.80S	E1.70S	E1.80S
17	E1.60S	E1.80S	E1.90S	E2.00S	E1.70S	E1.80S	E1.80S	1.80	1.80	2.20	2.50	2.30	2.30	2.60	2.65	2.30	2.20	1.80	E1.60S	E1.80S	1.30	E1.65S	E2.00S	E1.70S
18	E1.80S	E1.70S	E1.80S	E	E	1.30	E1.80S	E1.70S	1.80	1.85	2.70	2.20	2.50	2.50	4.00	2.40	2.10	2.00	E1.70S	E1.70S	E1.70S	E1.90S	E1.90S	E1.80S
19	E1.80S	E1.50S	E1.70S	E	E	E1.60S	E1.70S	1.80	2.00	2.50	2.25	3.20	3.35	2.50	4.80	2.35	2.25	2.05	E1.60S	E1.90S	E1.60S	E1.70S	E1.80S	E1.60S
20	E1.70S	E1.70S	E2.00S	E1.70S	1.20	E1.90S	1.90	1.80	1.90	1.95	2.40	2.40	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	2.05	C	C	2.50	2.60	2.50	2.30	2.05	2.05	2.20	2.00	E1.70S	E1.90S	E1.90S	E1.85S	E1.80S
22	E1.90S	E1.90S	E1.90S	E1.60S	E2.20S	E1.90S	E1.80S	1.90	1.95	2.25	2.15	3.50	2.40	2.35	2.35	2.55	2.20	2.05	2.20	E1.90S	E1.65S	E1.70S	E1.80S	E1.80S
23	E2.00S	E2.00S	E1.70S	E1.80S	1.10	E1.70S	E1.80S	1.95	1.90	2.20	2.25	2.30	2.30	2.20	2.60	2.25	2.30	1.90	1.95	E1.90S	E1.60S	E1.90S	E1.80S	E1.90S
24	E1.80S	E1.95S	E1.80S	E1.80S	E1.80S	E1.90S	E1.75S	E1.70S	1.90	2.30	2.25	2.25	2.30	2.30	2.40	2.20	2.20	2.00	E1.60S	E1.80S	E1.70S	E1.60S	E1.80S	E1.90S
25	E1.80S	E1.80S	E1.90S	E1.70S	E1.65S	E1.70S	E1.80S	1.90	2.30	2.20	2.20	2.70	2.20	2.25	2.90	2.25	2.15	2.00	1.90	E1.70S	E1.80S	E2.00S	E1.65S	E1.70S
26	E1.80S	E1.80S	E1.90S	E1.80S	E	E1.70S	E1.90S	E1.70S	1.95	2.00	2.25	2.30	2.70	2.50	2.20	2.20	2.10	2.00	E1.65S	E1.60S	E1.65S	E1.70S	C	C
27	C	C	C	C	C	C	C	C	C	2.30	2.50	2.30	2.60	2.90	2.20	2.30	2.05	2.00	E1.60S	E1.70S	E1.80S	E1.70S	E1.70S	E1.85S
28	E1.60S	E1.60S	E1.80S	E	1.30	E1.70S	E1.70S	1.40	1.90	2.35	2.20	2.70	5.10	2.50	3.70	2.25	2.20	2.20	2.00	E1.80S	E2.00S	E1.80S	E1.90S	E1.85S
29	E1.90S	E1.80S	E1.90S	1.20	E	1.30	1.80	1.80	1.80	2.20	1.95	2.50	2.70	2.50	2.00	2.20	2.00	1.70	E1.60S	1.40	E1.80S	E1.60S	E1.70S	E1.70S
30	E1.90S	E1.60S	1.40	E1.70S	E1.80S	E1.70S	1.80	1.90	2.20	2.10	2.20	2.25	2.65	2.50	3.40	2.20	1.90	1.95	E1.70S	E1.85S	E1.90S	E1.90S	E1.80S	E1.90S
31	E1.90S	E1.70S	E1.50S	1.40	E	1.20	E1.70S	E1.70S	1.80	2.00	2.50	2.30	2.30	2.40	2.35	2.20	2.00	2.20	E1.60S	E1.70S	E1.70S	E1.85S	E1.90S	E1.70S
No.	29	29	28	16	15	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	29	29	29	29
Median	E1.80	E1.80	E1.75	E	E	E1.70	E1.70	1.70	1.90	2.20	2.25	2.40	2.40	2.50	2.35	2.25	2.10	1.95	E1.70	E1.70	E1.70	E1.80	E1.80	E1.80
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

f-min — Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Y 6

IONOSPHERIC DATA

May.1963 | **M(3000)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	A	A	A	A	A	I3.10S	3.40	3.00	2.90	3.15H	2.80	2.75	2.95	J3.20S	2.75	3.10	3.20	3.30S	3.40	3.15S	I2.90A	I2.80S	2.75H	J2.80S
2	2.90	2.85	I2.95S	3.00	I2.95S	I3.10S	3.15	3.05	I3.15S	2.85	2.80	2.85	2.80S	2.80	2.80	3.10	J3.35S	3.40	I3.25A	3.20S	I3.15S	S	A	A
3	I2.90A	I2.90A	2.90	I3.10S	I3.20S	2.95	3.25	3.40	A	3.30	3.10	2.70	2.80	3.10	2.95	I3.00S	J3.25S	3.35	I3.20S	J3.35S	A	A	A	A
4	A	A	2.80S	I3.45S	I3.10S	3.10	3.30	3.40	U3.35S	3.25	U2.95S	J2.75S	2.85	J2.70S	2.85	I3.00S	3.30	3.15	I3.05S	I3.05S	3.10	3.10S	S	A
5	S	A	S	I3.10S	S	F	3.35	3.25S	I3.20A	2.90	I2.95A	3.00	2.85	2.95	2.95	3.05	3.20	3.00	I3.30S	I3.20S	2.95	3.00	I2.95S	2.85
6	A	A	A	I3.10A	I3.30S	I3.15S	3.15	3.30	3.35	I3.40A	3.30	3.05	2.95	2.80S	2.80	2.85	J3.00S	J3.10S	3.10	3.20S	I3.45S	S	S	A
7	S	S	S	J2.95S	3.35	2.90	3.40	3.20	I3.20A	I3.20A	A	A	A	2.85	2.80	J3.05S	J3.15S	3.15S	3.25	3.45	I3.30C	J2.85S	S	S
8	S	S	C	I3.05S	J2.90S	I3.30S	J3.35S	3.25	I3.25S	I3.10A	2.95	2.75	2.75	2.85	2.85	J3.00S	3.10	J3.00S	3.15	A	A	S	S	S
9	A	S	S	S	3.10	I3.20S	3.35	I3.45S	J3.40S	3.45	3.35	3.05	2.95	2.85	3.00	3.05	3.00	I2.90S	I2.95S	S	A	A	I2.65S	I2.70S
10	2.70	2.60	I2.90S	2.90S	I3.05S	I3.10S	3.20	I3.30S	I3.40S	J3.45S	3.00	2.80S	2.95	J2.95S	2.85	J2.95S	J3.10S	3.20	I3.05A	J2.95S	I3.00S	I2.80C	I2.70S	S
11	S	S	S	J3.05S	3.45	J3.25S	3.25	3.35	A	A	A	I3.10A	2.75	2.70	I2.85S	J3.00S	I3.00S	3.20S	S	S	S	S	S	S
12	J2.70S	I2.80S	J3.00S	3.00S	J2.95S	2.85	3.20	J3.55S	3.45	3.25	2.90	J2.75S	3.00	3.00S	I2.95S	2.95	I3.00S	3.15S	3.00S	3.25S	J3.30S	I3.15A	3.00S	A
13	S	A	A	J2.90S	J3.20S	3.15S	3.35	I3.35A	I3.30A	3.05	I2.90A	2.90	2.75	I2.70S	2.85S	3.05	I3.05S	3.05S	3.10	S	S	S	S	S
14	S	I3.00S	I3.05S	I3.00S	3.00	J3.10S	3.35	I3.45S	3.25	3.25	3.25	2.75	2.65	2.70	J2.95	J3.00S	J3.10S	I3.10S	I3.25S	3.30S	3.20	I2.95S	I2.95S	I3.15S
15	I3.10S	3.05	S	S	I3.10S	3.10	3.35	I3.40S	3.10	I3.00A	I2.85A	I2.75A	2.90	I2.90S	J2.90S	2.90	3.05	3.15	J3.05S	3.20	I3.15S	3.15	2.70	S
16	S	S	J2.90S	F	I3.15S	I3.25S	3.45	I3.40A	3.50	3.20	3.20	2.80	3.00R	J3.00S	J2.90S	3.10	3.20	3.05S	I3.00S	J3.10S	I3.05S	I3.10S	I3.10S	2.85
17	I2.70S	2.90	2.95	J3.10S	J3.25S	J3.10S	3.30	I3.30S	3.45	3.15	2.75H	I2.80C	2.85	3.00	3.00	3.00	3.00	J2.95S	J3.00SH	J3.10S	I3.05S	S	S	S
18	S	S	S	J3.15S	I3.05S	3.05	I3.40S	I3.70S	3.50	2.70	I2.85S	J2.80S	2.95	3.00	2.85R	3.05	3.15	3.25	3.25S	I3.20A	3.10S	I3.00S	S	A
19	S	S	I3.00S	3.00S	I3.05S	3.15	I3.25S	3.40S	S	A	A	3.00	2.80	2.80	2.95	2.90	3.05	J3.15S	I3.10S	I3.15S	S	S	S	I3.05S
20	J2.85S	I2.85S	J2.90S	J3.05S	2.85	J3.25S	3.25	I3.30SH	I3.25S	3.00S	3.15	I2.85R	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	3.30	C	C	A	A	J2.95R	2.90	2.80	3.05	2.95	J3.05S	I3.10S	S	S	S	S
22	S	S	3.25S	3.20	I3.35S	I3.25S	3.40S	3.40S	J3.35S	3.35	3.20	I3.05A	2.85	3.10	3.00	J3.15S	3.20S	3.15	A	S	S	S	S	S
23	S	S	I3.25S	I3.35S	A	S	3.15S	I3.45A	I3.50A	I3.30S	A	A	A	2.85	A	A	S	A	S	A	I3.05S	I3.10A	I3.05A	J3.20S
24	I3.10S	S	S	A	S	S	3.45	I3.35S	3.60	I3.50S	I3.20A	I3.20S	2.65	2.85	2.85S	2.85	3.00	S	A	S	S	S	S	S
25	S	A	A	2.90S	2.90	J3.25S	3.55	I3.45S	A	A	A	A	A	2.70	I2.85S	3.10	3.20	I3.10S	J3.15S	S	S	S	S	S
26	A	A	A	2.95	I3.30S	I3.30S	3.35	A	A	A	A	A	A	A	2.80	J3.00S	3.05S	J3.15S	3.10S	3.05	I3.00S	S	C	C
27	C	C	C	C	C	C	C	C	C	3.30	3.25	I2.95A	2.70	I2.80A	2.95	2.90	U3.00S	I3.00A	I3.00S	I2.90S	3.30S	I3.25S	3.25S	I3.15S
28	I3.25S	J3.05S	I3.10S	I3.15S	J3.10S	I3.40S	3.65	3.55	J3.25S	3.50	3.00	2.75	2.75	2.95	2.90	I2.80S	2.95	3.25	3.30	3.05	I2.90S	I2.90S	I2.85S	I2.90S
29	2.85	2.90	3.15	J3.05S	3.00	J3.00S	2.95	3.20	3.10	2.60	R	2.60	2.80	2.65	I2.70S	2.75S	3.15S	3.40	3.40	3.10	2.80	J2.90S	I2.85S	J2.95S
30	I2.90S	I2.95S	I2.90S	2.85S	I2.95S	I3.00S	3.05	3.25	3.45S	A	A	A	A	A	A	2.90S	3.10	2.90	3.00	A	A	3.05	A	S
31	A	A	S	I3.00S	I3.05S	I3.15S	3.10	I3.40S	I3.35A	I3.35A	I3.25A	2.75	2.85	3.00	2.90	3.05	2.95S	3.00S	I3.30S	I3.40S	S	S	S	S
No.	11	11	15	24	25	26	29	28	25	25	22	25	24	28	28	29	29	28	26	21	18	15	12	10
Median	U2.90	2.90	2.95	3.05	U3.10	3.10	3.35	3.40	3.35	3.25	3.00	2.80	2.85	2.85	2.90	3.00	3.10	3.15	3.10	3.15	U3.10	U3.00	U2.90	U2.90
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

M(3000)F2 Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Y 7

IONOSPHERIC DATA

May.1963 | M(3000)F1 | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31°12.5′N Long. 130°37.7′E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	A	3.55H	A	3.45	I3.55R	3.60	I3.50B	3.65	L	A					
2									A	A	A	A	A	A	3.40	A	A	A	A					
3									A	A	A	A	A	3.70	3.45	3.40	A	A	A					
4									L	L	3.45	R	3.50	A	A	A	A	A	A					
5									A	A	A	A	R	3.70R	A	A	A	A	L					
6								L	A	A	3.60	A	3.70	A	A	A	A	A	A					
7								A	A	A	A	A	A	3.65	3.60	3.55	A	A	A					
8									A	A	A	3.80	A	A	A	3.50	A	A	A					
9									L	3.75	A	3.30	A	A	A	A	A	A	A					
10								L	A	A	A	A	A	R	3.55	A	A	A	A					
11									A	A	A	A	A	A	S	3.25	A	A	A					
12								A	A	A	A	A	A	A	A	A	3.65	A	A					
13								A	A	A	A	A	A	A	A	A	3.50	3.45	L					
14									A	A	A	A	A	R	3.55R	A	3.35	A	A					
15								A	A	A	A	A	A	A	A	A	3.45	L	A					
16								A	L	A	3.70	3.60	R	R	A	3.40	3.60	L	L					
17								L	A	A	3.70	3.75	3.75	A	A	3.75	I3.60R	3.60						
18								A	A	A	A	A	A	A	3.45H	A	A	A	A					
19								A	A	A	A	A	A	A	I3.65B	I3.60R	3.50	A	R					
20									L	I3.60A	A	I3.70A	C	C	C	C	C	C	C					
21								C	A	C	C	A	A	A	A	A	A	3.40	L					
22								L	A	A	A	A	R	A	R	A	A	A	A					
23								A	A	3.90	A	A	A	A	A	A	A	A	A					
24								A	A	A	A	A	A	R	R	A	A	A	A					
25								A	A	A	A	A	A	A	A	A	3.70	3.50	A					
26								A	A	A	A	A	A	A	A	3.45	A	A	I3.55A					
27								C	C	A	A	A	A	A	A	A	A	A	A					
28								3.90	A	A	A	R	B	3.55	A	A	A	A	A					
29								3.65	A	A	A	R	A	3.75R	I3.70R	I3.85R	3.75	3.60	A					
30							L	3.55	A	A	A	A	A	A	A	A	A	A	A					
31								A	A	A	A	A	I3.95R	A	A	A	A	3.45H	3.50					
No.								3		3	5	5	5	6	9	10	10	6	2					
Median								3.65		3.75	3.60	3.70	3.70	3.70	3.55	3.50	3.60	3.50	U3.50					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

M(3000)F1 Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Y 8

IONOSPHERIC DATA

May.1963 | 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								305	340	285H	400	390	330	290	355	315	280	260	255					
2									I315A	E400A	330	310	345	340	340	295	265	E310S	I290A					
3									I345A	295	350	395	355	300	330	310	285	275	275					
4									260	305	340	310	330	345	340	305	275	290	285					
5									A	E360A	A	380	380	340	325	310	280	280	260					
6								275	280	A	305	365	370	360	340	330	320	280	275					
7								E300A	A	I300A	A	A	A	340	340	305	295	290	255					
8									295	I315A	350	350	375	360	335	305	280	295	305					
9									260	260	280	355	335	355	320	305	290	I330A	A					
10								280	260	270	310	360	340	305	345	325	295	305	A					
11									A	A	A	I335A	375	370	345	305	290	280	A					
12								250	255	310	390	365	335	350	340	325	305	295	345					
13								A	A	350	I390A	355	355	370	340	300	305	290	265					
14									280	300	290	400	355	370	325	310	300	290	290					
15								250	320	I360A	I375A	I345A	355	325	320	320	290	280	280					
16								I280A	260	305	290	405	340	330	350	305	280	305	300					
17								260	275	325	310H	350	340	325	305	305	305	295						
18								230	E290A	455	A	I350A	335	305	350	305	290	305	305					
19								275	A	A	I325A	345	360	345	315	325	300	285	290					
20									265	E350A	305	395	C	C	C	C	C	C	C					
21								C	285	C	C	A	A	A	355	350	305	300	285					
22								260	280	300	335	I375A	385	310	340	305	305	E325A	A					
23								A	I260A	290	A	A	A	405	A	A	300	A	A					
24								245	250	I285A	I325A	I335A	E400A	380	355	340	310	A	A					
25								250A	A	A	A	A	A	360	I365A	305	290	280	275					
26								A	A	A	A	A	A	A	350	310	300	280	270					
27								C	C	320	320	A	465	I375A	350	335	E360A	A	300					
28								255	335	270	390	405	390	340	330	345	325	265	255					
29								305	340	470	400	490	400	430	395	390	290	260	260					
30							335	285	285	A	A	A	A	A	A	315	305	340	340					
31								265	I285A	I305A	A	E450A	395	355	375	340	345	325	280					
No.							1	16	22	21	21	23	23	27	28	29	29	25	23					
Median							335	260	280	305	330	360	355	345	340	310	295	290	280					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'F2 Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Y 9

IONOSPHERIC DATA

May.1963 | h'F | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31°12.5′ N Long. 130°37.7′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	A	A	320	230	I260A	I270A	I250A	225H	200	280	255	255	I255B	260	255	I250A	270	I335A	A	300H	300
2	295	305	290	275	305	305	255	250	A	A	A	A	A	A	E300R	A	A	A	A	290	I250A	300	I310A	I315A
3	I315A	I305A	310	320	255	275	245	255	A	A	A	A	A	250	220	255	A	A	A	250	A	A	A	A
4	A	A	270	I225A	305	305	245	245	240	250	E280A	200	255	I255A	I245A	A	A	A	A	280	275	E355S	I255A	255
5	255	I285A	255	260	320	265	255	270	A	A	A	A	A	225	A	A	A	A	255	250	350A	E305A	300	305
6	A	A	I280A	I265A	260	275	240	240	A	A	255	A	245	A	A	A	A	A	A	250	210	I240A	I305A	A
7	A	285	300	300	250	E305A	255	A	A	A	A	A	A	240	245	240	A	A	A	240	I230C	270	350	355
8	295	I295A	I280C	255	275	250	255	250	A	A	A	220	A	A	A	240	A	A	A	A	A	A	A	A
9	A	A	355	280	275	290	255	250	230	210	A	300	E295A	A	A	A	A	A	A	255	I260A	I280A	305	305
10	370	320	280	270	255	255	240	255A	A	A	A	A	A	R	250	A	A	A	A	E350S	310	I305C	I310A	A
11	A	A	A	255	230	230	235	250	A	A	A	A	A	A	A	E300R	A	A	A	295	A	A	A	A
12	345	300	285	285	325	300	250	A	A	A	A	A	A	A	A	A	240	I250A	I265A	255	240	I305A	305	A
13	A	A	A	300	245	255	265	A	A	A	A	A	A	A	I265A	I260A	245	250	250	260	245	270	280	I285A
14	280	270	290	275	280	275	240	260	A	A	A	A	I270A	I260R	E275A	I240A	245	A	A	255	E305S	340	I345A	290
15	295	300	255	245	240	275	255	A	A	A	A	A	A	A	A	A	240	250	A	250	245	250	375	I325A
16	300	260	270	250	275	E340A	250	I250A	240	I255A	250	240	I225A	I250R	E300A	200	250	300	280	265	290	255	290	290
17	275	295	275	255	260	240	245	255	I270A	I265A	235	240	210	I210A	I205A	205	I235R	210	230H	260	250	255	320	A
18	A	I300A	A	290	290	255	240	A	A	A	A	A	A	A	245H	A	A	A	A	A	255	265	305	I280A
19	255	250	300A	290	270	250	260	A	A	A	A	A	A	A	I250B	I235R	255	A	E275A	255	A	A	A	300
20	305	310	260	280	290	260	245	225H	240	I240A	I240A	I240A	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	A	C	C	A	A	A	A	A	A	250	A	255	I240A	I250A	I280A	I300A
22	290	255	295	270	250	250	250	260	A	A	A	A	E300A	A	R	A	A	A	A	A	A	A	A	A
23	330	280	295	I260A	I265A	285	295	A	A	250	A	A	A	A	A	A	A	A	A	A	I295A	I300A	I350A	255
24	I295A	300	I260A	I285A	I305A	270	245	A	A	A	A	A	A	I200R	I250R	A	A	A	A	A	A	I245A	I280A	A
25	A	A	I295A	300	310	255	250	A	A	A	A	A	A	A	A	A	240	E260A	I250A	295	I270A	250	I280A	I265A
26	A	A	A	305A	300	300	280	A	A	A	A	A	A	A	A	250	I250A	A	I260A	255	250	295	C	C
27	C	C	C	C	C	C	C	C	C	A	A	A	A	A	A	A	A	I250A	I265A	305	300	250	255	290
28	320	310	290	255	270	250	240	230	I230A	I210A	I230A	I 250R	I250B	275	I250A	I230A	I240A	A	A	E325A	290	295	280	320
29	305	290	250	260	280	275	255	245	A	A	A	E270A	A	270	250	220	255	250	I250A	250	290	280	300	270
30	300	315	305	295	295	305	255	250	I245A	A	A	A	A	A	A	A	A	A	A	A	A	280	A	A
31	A	A	300	300	295	290	270	A	A	A	A	A	220	A	A	A	A	225H	275	255	280	305	A	280
No.	18	20	24	28	28	27	29	18	8	8	6	8	8	11	12	12	12	10	11	22	22	22	22	19
Median	300	300	290	275	275	275	250	250	U240	U250	240	240	250	250	U250	240	245	250	U255	255	265	275	300	290
U.Q.																								
L.Q.																								
Q.R.																								

h'F

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

The Radio Research Laboratories, Japan

Y 10

IONOSPHERIC DATA

May.1963 | **h'Es** | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31°12.5′N Long. 130°37.7′E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	120	120	115	110	120	125	150	140	135	130	125	120	140	140	150	B	G	145	120	120	120	120	110	110
2	110	S	S	110	S	S	145	130	120	120	115	115	120	115	120	145	135	130	125	125	120	125	120	125
3	110	110	S	S	S	S	S	140	125	125	120	110	110	110	130	115	130	125	125	120	120	120	120	120
4	115	110	120	115	E	120	145	140	145	140	135	G	G	140	130	120	140	130	125	120	120	120	120	120
5	115	110	110	110	105	E	135	130	125	110	110	110	110	G	140	130	135	130	130	120	120	120	120	115
6	110	115	110	105	110	S	150	150	120	110	120	120	120	145	145	130	125	125	125	120	110	115	110	115
7	110	110	105	110	110	110	140	130	125	120	110	110	105	G	155	G	130	130	120	120	C	120	120	115
8	110	105	C	125	120	120	120	140	120	110	110	115	105	105	105	105	150	130	130	125	120	110	110	110
9	105	105	105	105	105	105	130	130	130	130	120	115	120	145	140	140	135	125	120	125	120	120	S	S
10	130	S	S	E	105	S	G	130	125	120	115	115	120	155	170	145	130	130	120	120	115	C	110	110
11	110	105	105	105	105	S	130	130	120	120	110	105	110	105	105	105	145	130	125	120	120	120	115	110
12	105	105	105	S	105	S	140	130	125	115	120	120	110	110	105	110	110	130	125	115	105	120	115	110
13	115	105	105	105	105	110	140	130	120	110	110	110	110	105	105	105	150	140	145	125	120	S	S	115
14	110	S	140	130	140	130	105	130	130	120	125	125	125	135	125	125	150	140	130	120	120	115	110	110
15	105	105	105	105	105	S	135	125	125	110	110	110	105	110	110	150	155	120	110	110	110	110	110	120
16	120	105	110	110	105	105	140	130	140	135	105	105	110	110	150	G	125	125	150	120	120	125	120	S
17	110	S	S	S	S	S	145	135	130	125	135	130	G	135	135	G	G	G	145	130	120	125	115	120
18	120	110	105	105	110	E	135	130	125	115	110	110	110	110	B	150	135	130	120	125	120	110	110	110
19	110	110	105	105	105	100	120	125	120	115	110	115	125	130	B	G	160	135	125	120	120	125	125	120
20	110	110	S	105	105	S	150	120	125	120	120	120	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	130	C	C	110	110	110	110	110	110	145	130	125	130	120	120	115
22	110	105	105	105	S	S	140	130	125	125	120	125	125	125	G	135	130	135	125	125	120	120	120	120
23	115	110	110	120	115	110	130	125	125	125	115	110	110	145	110	130	135	130	130	130	125	125	120	110
24	110	110	110	110	110	140	140	130	125	120	110	110	110	115	120	150	140	130	125	120	120	115	115	110
25	110	110	105	105	S	110	130	130	130	125	120	120	115	125	115	125	G	130	120	115	110	110	120	125
26	115	125	110	110	110	155	140	130	125	125	125	130	130	130	125	130	125	120	120	115	110	105	C	C
27	C	C	C	C	C	C	C	C	C	120	125	110	110	105	105	105	125	120	125	125	125	110	110	110
28	110	105	105	105	E	110	110	110	120	120	110	110	B	G	115	130	125	125	120	110	135	S	S	130
29	125	125	130	120	125	E	145	150	145	135	130	140	140	G	G	G	140	130	120	110	115	110	140	140
30	130	105	105	S	S	S	140	130	130	115	110	105	110	105	105	105	140	135	125	120	120	110	110	115
31	115	110	110	110	105	135	140	110	125	120	120	120	125	115	110	110	110	120	130	125	120	120	120	115
No.	29	25	23	24	21	15	27	29	30	30	30	30	27	26	26	24	27	29	30	30	29	27	26	27
Median	110	110	105	110	105	110	140	130	125	120	120	115	110	115	120	130	135	130	125	120	120	120	120	115
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'Es Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Y 11

IONOSPHERIC DATA

May.1963

Types of Es

135° E Mean Time (G.M.T. +9h)

Yamagawa

Lat. 31°12.5′N
Long. 130°37.7′E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f2	f3	f2	f5	f2	f	h2	h4	h3	h	h	l	h	h	h			h	c6	f6	f8	f4	f3	f
2	f			f			h2	h2	c2	c3	c2	c2	c	l	l	h	h3	c4	c	f3	f	f2	f	f2
3	f2	f3						hl	h4	h2	c2	c2	l3	l	hl	l	hl2	h3l3	c2	f6	f3	f3	f	f2
4	f3	f3	f	f4		f	h2	h2	hl	hl	h			h	h	h2	h2	h4	c5l	f2f	f	f3	f3	f2
5	f	f3	f2	f2	f2		h2	h4	h2l2	l	l2	l2	l		h	h	h	c2	c3	f6	f3	f2	f2	f3
6	f3	f7	f4	f3	f		h	hl	c2	c2	c	c	l	h	h	h3	c3	c2	c4	f2	f3	f3	f3	f2
7	f	f4	f2	f2	f3	f3	h	h5	h3	c3	c3	c4	c4		h		h4	h5	c2	f7		f2	f2	f3
8	f2	f2		ff2	f	f2	c6	h3	c3	c2	c2	l	l2	l2	l3	l	h2	h2	h3	f2	f2	f2	f3	f2
9	f3	f2	f4	f2	f2	f2	h2	c2	h	h	c	l	h	h2	h	h2	h3	h2	c2	f3	f3	f3		
10	f				f			h2l	h	c2l	c2	l2	h2	h	h	h2	h2	h3	c5	f	f2		f3	f4
11	f2	f4	f3	f2	f		c2	c2	c5	c4	c2	c2	l	l	l	l	hl2	c2l2	c2	f3	f2	f2	f3	f
12	f3	f2	f		f		c2	h2	h2	c2	l2	l	l2	l3	l2	l2	l	h2l2	h5l2	f2	f2	f3f	f2	f2
13	f3	f2	f3	f4	f2	f2	h4	h2	h2	c2	c2	c	l	l2	l	l3	hl2	hl	h	f	f			f2
14	f2		f	f2	f	ff	l2h2	h3l	hl2	h2	h	h	h	h	h2	c	hl	h2	h4	f6	f2	f3	f2	f2
15	f	f3	f2	f	f		c	h2	h2	c2	l2	l4	l2	l	l	h	hl	l2	l2	f3	f2	f2	f2	f3
16	ff2	f	f2	f	f2	f4	h2	h3l	hl	h2l2	l2	l	l	l	hl		l	l	h2	f4	f4	f	f3	
17	f2						h2	h2	h2	h2	h	h		h	h				h2l	f2	f2	f2	f	f3
18	f2	f	f2	f3	f2		c2	h2	h2	c3	c2	c3	c	c		hl	h2l	c3	c3	f2	f	f	f2	f2
19	f2	f	f3	f2	f2	f2	c3	c5	c3	c2	c3	c2	c	h			h	h2	c4	f4	f2	f2	f	f3
20	f2	f4		f2	f		h	l2	l	l	l	c2												
21									h2			l2	l2	l2	l	l3	l2	h	h3	f2	f	ff2	f	f2
22	f2	f2	f	f2			c	c2	c	c2	c2	c	h	h		h2	h2l	h3l2	c3	f2	f2	f2	f2	f4
23	f4	f2	f2	f	f2	f2	c2	c4	c3	h	c2	c2	c3	hl	l2	h2l	h3l2	h2l3	hl2	f2f4	f	f2	f2	f2
24	f2	f	f2	f3	f3	ff2	c2	c	c2	c2	c2	c2	c	l	l	h	h2	h3	c	f	f3	f2	f	f2
25	f2	f3	f2	f		f2	h3	h4	h4	c3	c2	c2	c4	h	l3	h		c	c2	f2	f	f2	f2	f2
26	f3	f2	f2	f3	f2	ff	c3	h2	h3	h2	h4	h4	h2	h	h	h	c2	c2	c3	f	f3	f2		
27										c2	c	c2	l2	l3	l3	l2	h2l	c2	c3	f3	f2	f2	f2	f2
28	f2	f2	f2	f2		f	l	l2c	cl2	l	l	l			l2	c	c2	c2	c	f4	f2			f2
29	f2	f2	f	f	f2		h2	h	h	h2	h	h	h				h	h	c5	f3	f	f2	f2	f
30	f	f3	f2				h	h2	h	c2	c5	c5	c5	c5	l5	l2	hl	hl	c4	f4	f3	f2	f2	f2
31	f3	f2	f2	f2	f2	ff	h3l	l4h	h3	c2	c3	c2	h	l	l2	l2	l2	l	h2	f2	f2	f2	f2	f
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

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

The Radio Research Laboratories, Japan

SOLAR RADIO EMISSION 200 Mc/s

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

HIRAISO Time in U.T.

May 1963	Steady Flux					Variability				
	00-03	03-06	06-09	21-24	mean	00-03	03-06	06-09	21-24	mean
1	6	7	7	6	7	0	0	0	0	0
2	6	6	6	6	6	0	0	0	0	0
3	6	7	7	6	6	0	0	0	0	0
4	6	6	-	6	6	0	0	-	0	0
5	6	6	6	-	6	0	0	0	-	0
6	6	(6)	-	7	6	0	(0)	-	0	0
7	7	6	6	-	6	0	0	0	-	0
8	(6)	6	6	7	6	(0)	0	0	0	0
9	7	6	6	-	7	0	0	0	-	0
10	6	7	-	-	7	0	0	-	-	0
11	-	-	-	6	-	-	-	-	0	-
12	6	6	6	6	6	0	0	0	0	0
13	6	6	6	6	6	0	0	0	0	0
14	6	6	6	6	6	0	0	0	0	0
15	6	6	6	-	6	0	0	0	-	0
16	7	7	7	10	7	0	0	0	0	0
17	7	9	8	(10)	8	0	0	0	(1)	0
18	12	8	8	14	10	2	1	1	2	1
19	8	10	10	7	10	1	1	1	0	1
20	8	7	7	7	7	0	0	0	0	0
21	7	7	7	6	7	0	0	0	0	0
22	6	6	6	7	6	0	0	0	0	0
23	7	7	7	9	7	0	0	0	0	0
24	7	7	7	7	8	0	0	0	0	0
25	12	7	7	8	8	1	0	0	0	0
26	9	8	7	9	8	0	0	0	0	0
27	6	7	7	-	7	0	0	0	-	0
28	6	6	6	7	6	0	0	0	0	0
29	7	7	7	-	7	0	0	0	-	0
30	8	7	7	7	7	0	0	0	0	0
31	7	7	7	7	7	0	0	0	0	0

Note No observation during the following period:

2nd 0130 - 0300
2nd 0500 - 0600
4th 0500 - 0900
6th 0330 - 0730
7th 1940 - 8th 0130
9th 1940 - 10th 0030
10th 0440 - 0930
10th 1940 - 11th 0930
17th 0310 - 0430
27th 1920 - 2400
29th 1920 - 2400

Outstanding Occurrences

May 1963	Start-time	Duration	Type	Max. Int.		Max. Time	Remarks
				Inst.	Smd.		
01	0533.8	2 35	CD/9	1000 180	250 40	0534.9 0541.5	1st part plus part
17	1945.5	1.3	CD/4	~290	~70	1945.8	
24	0203.9	0.8	ECD/4	820	60	-	

RADIO PROPAGATION QUALITY FIGURES

HIRAISO — Time in U.T.

May 1963	Whole Day Index	L. N. 06-12	L. N. 12-18	L. N. 18-24	W W V 00-06	W W V 06-12	W W V 12-18	W W V 18-24	S. F. 00-06	S. F. 06-12	S. F. 12-18	S. F. 18-24	W W V H 00-06	W W V H 06-12	W W V H 12-18	W W V H 18-24	Warning 00-06	Warning 06-12	Warning 12-18	Warning 18-24	Principal magnetic storms Start	End	ΔH
1*	3o	4	3	2	2	-	-	1	3	4	(4	3)	3	2	2	1	U	U	U	U	---	---	112 γ
2*	2+	3	2	2	1	-	-	2	(3	3)	3	3	3	2	2	3	U	W	W	W	---	---	
3*	3-	4	(2	2)	1	-	-	1	3	4	4	3	4	4	4	5	W	U	U	U	---	---	
4	2+	3	3	2	1	-	-	1	4	3	2	2	4	5	5	4	U	U	U	U	---	2100	
5	3+	4	(4	3)	3	-	-	1	3	4	4	3	4	3	4	4	U	U	U	U			
6	3o	3	(3)	3	1	-	-	2	4	4	4	(4)	5	5	4	4	U	N	N	N			
7	4o	4	4	4	4	-	(4)	3	(4)	4	5	5	5	3	4	4	N	N	N	N			
8	4-	4	(4)	4	4	-	-	(4)	4	4	3	3	5	3	4	4	N	N	N	N			
9	4-	4	3	3	4	-	-	4	4	4	4	4	4	4	4	3	N	N	N	N			
10	4o	4	3	3	4	-	-	4	5	5	4	3	4	5	4	4	N	N	N	N			
11	4-	4	5	4	3	-	-	4	3	3	3	3	5	5	C	4	N	N	N	N			
12	4o	4	3	4	3	-	-	4	5	5	4	3	4	5	5	5	N	N	N	N			
13	3+	4	4	3	3	-	-	4	3	3	3	2	5	5	4	2	N	N	N	N			
(14)	3o	4	4	4	3	-	-	3	2	3	2	2	3	4	4	4	U	U	U	U			
(15)	4-	4	5	(5)	2	-	(5	4)	2	4	4	3	4	4	(4	5)	U	U	U	N			
(16)	4+	4	5	5	4	-	(5)	4	4	4	5	4	5	5	4	4	N	N	N	N			
17	4o	4	4	(3)	4	-	(4)	3	4	4	5	4	4	3	4	4	N	N	N	N			
18	4+	5	5	(4)	3	(4	5)	4	4	5	5	4	4	2	3	3	N	N	N	N			
19	5-	5	5	4	(3)	-	(5)	5	4	(5	5	4)	4	3	4	4	N	N	N	N			
20	4o	4	(4	4)	(4)	-	(4)	4	4	4	4	3	4	4	4	4	N	N	N	N			
21	4+	5	5	4	(4	4	5)	4	3	4	4	4	(4	4)	C	5	N	N	N	N			
22	4+	5	5	5	(4	4	5)	4	3	(4)	5	5	5	4	C	4	N	N	N	N			
23	5-	(5	5	5)	5	-	(4)	5	5	(5)	4	5	4	5	C	5	N	N	N	N			
24	5-	5	5	5	5	(5	5)	5	4	5	5	4	5	5	5	5	N	N	N	N			
25	4o	5	(4	4)	4	-	(4)	4	3	5	4	4	5	5	3	3	N	N	N	N			
26	4o	5	5	4	3	-	-	C	(3	4)	4	4	3	4	4	5	N	N	N	N			
27	3+	4	4	4	3	-	(4)	3	3	3	4	3	3	4	5	5	U	U	U	U			
28	3+	4	4	4	3	-	(3)	2	3	3	4	3	3	3	3	2	U	U	U	U			
29	3-	3	5	3	(2)	-	-	1	3	3	3	2	4	3	3	3	W	W	W	W			
30	3o	(2)	4	4	(1)	-	-	3	(3)	3	3	3	4	5	3	3	U	U	U	U			
31	3o	4	4	3	(1)	-	-	(1)	(3	4	3	3)	3	2	3	3	U	U	U	U			

* = day of Special World Interval

[ ] = Regular World Day

\- = impossible to evaluate

( ) = inaccurate

C = artificial accident

--- = continuing magnetic storm

SUDDEN IONOSPHERIC DISTURBANCES

(S.I.D.)

HIRAISO

Time in U.T.

May 1963	S W F										Correspondence		
	Drop-out Intensities (db) WS	SF	HA	TO	LN	SH	Start-time	Duration	Type	Imp.	Flare	Solar Noise	Mag.
1	-		23' 17	22	-		05.30	39	Slow	2-	x	x	

IONOSPHERIC DATA IN JAPAN FOR MAY 1963

第15号 第5巻

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