F—172

IONOSPHERIC DATA IN JAPAN

FOR APRIL 1963

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THE RADIO RESEARCH LABORATORIES

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KOKUBUNJI, TOKYO, JAPAN

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THE RADIO RESEARCH LABORATORIES

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CONTENTS

SITES OF THE RADIO WAVE OBSERVATORIES

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

	Latitude	Longitude	Site
Wakkanai	45°23.6′N.	141°41.1′E.	Wakkanai-shi, Hokkaido
Akita	39°43.5′N.	140°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_0F2, f_0F1, f_0E — The ordinary-wave critical frequency for the $F2$, $F1$ and E layers respectively.

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

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

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

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

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

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

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

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

$hpF2$ The virtual height of the $F2$ layer measured on the ordinary-wave branch at a frequency equal to 0.834 f_0F2.

$ypF2$ The semi-thickness of the $F2$ layer deduced from a parabolic fit to the " nose " of the electron density distribution with height and based on the observed $h'f$ trace. (The difference between $hpF2$ and the virtual height at 0.969 f_0F2).

a. Descriptive Symbols

Used following the numerical value on monthly tabulation sheets.

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

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

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

D Measurement influenced by, or impossible because of, the upper limit of the 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. 0539x)

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

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

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

activity

M : multiple peaks separated by relatively long period of quietness

F : multiple peaks separated by relatively short period of quietness

E : sudden commencement or rise of activity

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

Maximum intensity

Instantaneous: The highest value above the base level.

Smoothed: By multiplying the duration, the approximate total power of the phenomenon 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 preparated from the field intensity records on following circuits received at Hiraiso. Characteristics of the phenomenon are classified as follows.

Circuits and Drop-out intensity

W S.....WWV 20 Mc, 15 Mc and 10 Mc (Washington)
S F.....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

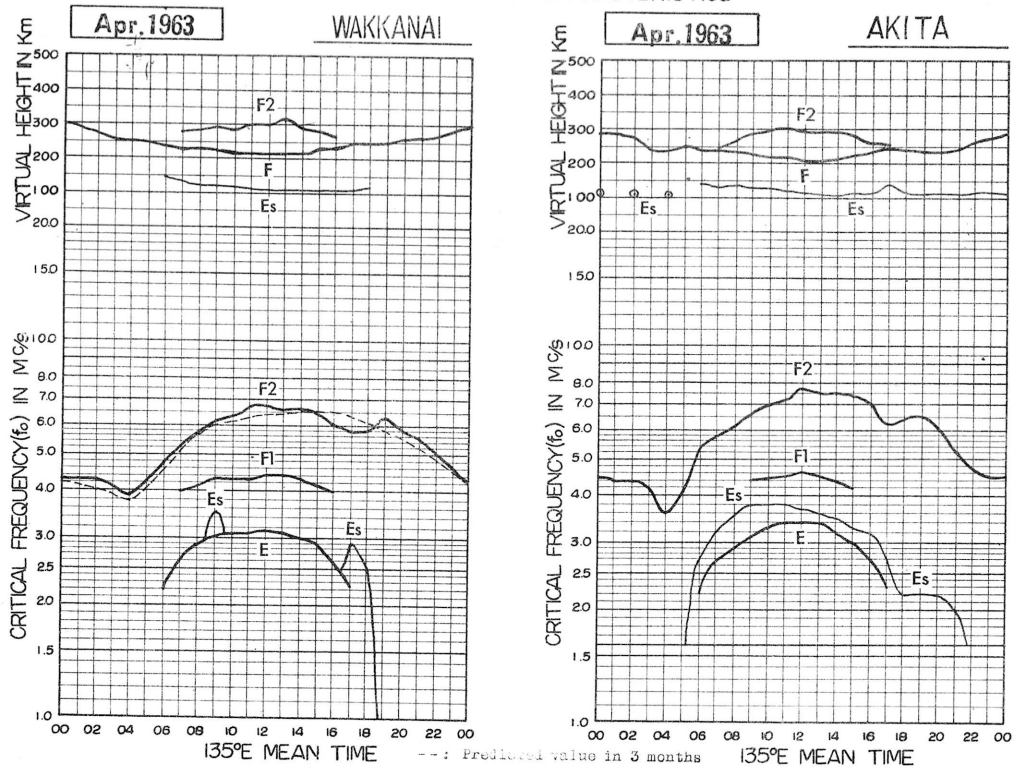
Degrees of SWF are classified into 9 grades according to the amplitude of fade-out;

1–	1	1+
2–	2	2+
3–	3	3+

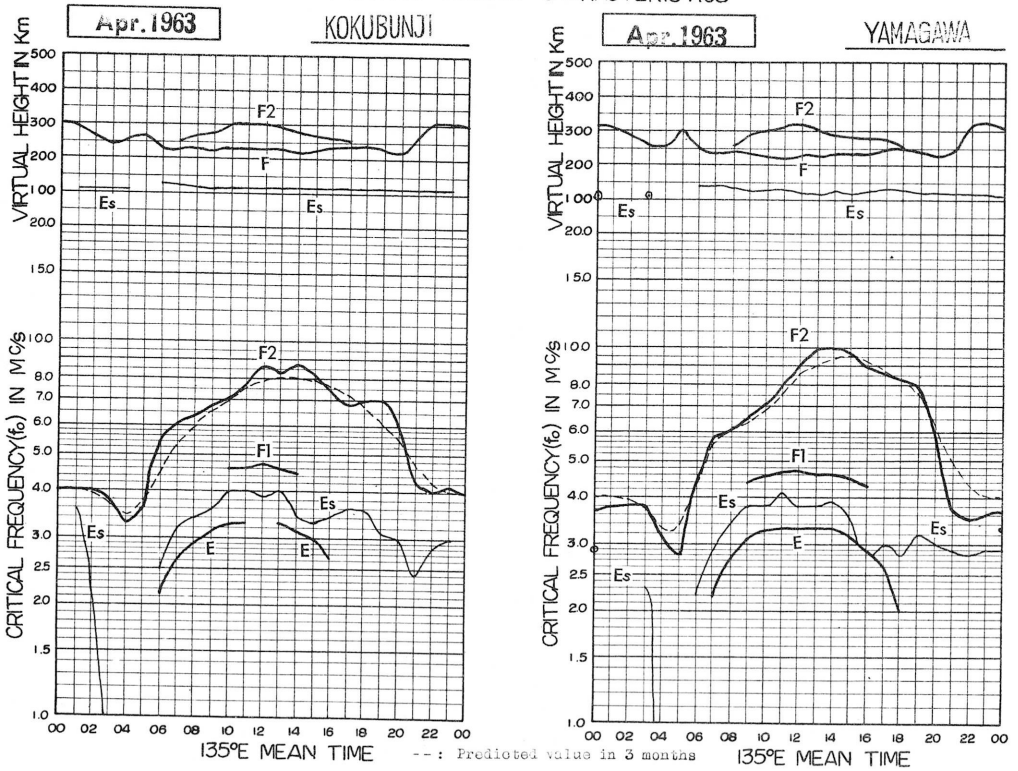
The data of sudden enhancement of atmospheric (SEA) observed on 28 kc are tabulated on each *Start-time, Duration and Importance*.

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

IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS



IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS



IONOSPHERIC DATA

Apr. 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	4.2	4.2	4.2	4.4	4.4	3.8	4.5	5.2	5.3	6.2	7.0	7.8	8.0	6.6	7.4	7.7	6.2	5.5	5.8	6.4	5.6	5.3	5.0	U4.7S
2	4.4	4.5	4.3	U4.4S	3.7	4.2	5.1	5.3	6.1	7.2	7.3	7.3	6.3	6.6	6.4	7.0	5.7	5.3	5.4	5.1	5.0	5.0	5.0	4.6
3	4.3	4.3	4.3	U4.5Sf	I4.5Sf	U4.6Sf	5.8	5.3	6.8	7.3	7.0	7.1	7.2	U6.3S	6.6	6.1	5.7	5.3	5.4	5.5	5.6	5.8	4.3	3.9
4	4.0	U4.3S	U4.3S	4.0	U4.4S	3.8	4.4	5.2	6.2	6.2	6.1	7.3	7.0	7.3	6.4	6.0	5.7	5.2	5.0	5.6	5.5	5.8	4.3	3.9
5	4.0	4.0	3.7	U3.7S	3.6	3.5	5.3	5.1	5.8	5.8	6.8	8.6	8.6	8.6	6.9	5.7	5.8	5.3	6.3	6.6	6.2	5.6	4.8	4.5
6	4.3	4.3	4.5	4.5	3.9	4.0	4.7	4.9	5.2B	4.7	5.1	5.2	I5.1R	5.4	5.7	5.4	5.2	5.4	5.3	5.9	5.5	U5.3S	4.9	4.3
7	4.0	4.0	4.0	3.9	3.7	4.3	4.5	5.0	5.4	6.3	6.7	7.3	6.5	6.4	6.6	6.6	5.8	5.5	5.7	6.4	6.0	5.5	I4.9S	4.8
8	I4.7Sf	4.3	U4.3S	3.9	3.6	3.6	4.7	4.8	5.0	5.8	6.6	7.4	7.0	6.5	6.8	6.4	6.3	5.8	5.6	5.5	5.0	4.6	4.1	I4.0S
9	I4.1Sf	4.0	3.8	3.6	3.3	3.8	4.3	5.0	6.0	6.3	6.5	7.3	7.4	7.2	7.0	6.1	6.3	5.8	5.5	5.6	5.2	5.0	4.9	4.6
10	U4.4S	4.3	4.2	3.8	3.6	4.0	4.6	5.3	5.9	6.3	6.2	6.6	6.5	6.7	5.7	6.4	U6.1S	5.8	5.6	5.7	5.3	5.2	5.1	U4.6S
11	4.5	4.4	U4.5S	I4.4Sf	4.0	4.3	5.3	5.4	6.3	6.8	6.8	7.3	7.4	6.6	6.6	6.3	6.1	5.9	6.0	U6.3S	5.6	5.0	5.0	4.8
12	4.4	4.4	4.1	4.0	3.8	4.3	5.3	6.0H	6.4	7.4	7.6	7.0	6.8	7.2	6.8	6.7	6.0	5.8	6.0	6.3	5.8	5.5	5.4	4.9
13	4.6	4.4	4.4	4.3	4.1	4.5	4.8	5.3	6.0	7.0	7.0	6.9	7.1	7.2	6.8	6.6	6.9	6.3	6.0	6.3	6.0	5.5	5.4	5.0
14	5.1	5.0	5.0	4.4	3.9	U4.3S	4.3	4.6	4.7	5.9	6.3	5.6	5.9	6.4	6.4	6.3	5.3	5.3	5.5	6.0	6.2	6.0	5.0	4.6
15	4.1	3.8	4.2	4.0	4.4	4.3	4.8	5.2H	4.8	5.8	6.9	7.2	6.8	7.0	6.6	5.8	5.5	5.4	5.5	6.9	U6.3S	5.9	5.0	4.3
16	4.1	4.0	4.3	U4.1S	3.6	4.0	4.8	5.1H	5.5	6.3	6.4	6.4	7.0	7.3	7.1	6.8	6.4	6.2	6.3	6.8	6.3	6.1	5.3	U4.6S
17	4.3	U4.3S	4.0	3.9	3.9	4.7	5.3	6.5	5.9	I6.0C	6.3	6.7	6.6	7.1	7.1	6.4	6.3	5.8H	6.2	6.6	6.4	5.7	U4.5S	4.3
18	4.3	4.0	I4.2Sf	4.1	3.7	4.3	5.3	5.5	6.0	6.2	6.4	5.8	7.0	7.0	6.9	6.6	6.0	6.3	5.4	5.6	5.9	5.6	5.1	5.0
19	5.0	4.7	U4.6Sf	U4.8Sf	U4.1Sf	5.1	5.5	5.5	5.7	6.0	6.7	7.3	6.8	6.8	6.9	7.1	6.8	7.3H	6.8	7.2	5.8	5.0	4.3	4.4
20	4.3	4.5	4.4	U4.3S	4.1	4.5	4.8	5.3	5.4	5.8	7.1	6.4	6.8	6.3	6.1	6.5	7.1	7.3	6.8	U7.3S	U7.3S	5.4	4.4	4.4
21	U4.3S	4.3	4.2	4.1	3.8	U4.3S	5.0	5.1	5.1	5.1	5.9	I6.2C	6.1	5.8	6.1	6.2	5.8	5.7	5.8	6.7	5.8	5.4	5.0	4.4
22	4.4	U4.5S	4.3	3.8	3.7	4.7	5.8	5.5	6.1	6.7	6.2	6.6	6.5	7.4	8.1	6.8	6.3	5.6	6.4	7.3	6.4	5.5	5.0	4.8
23	Sf	Sf	Sf	Sf	Sf	U4.3S	5.6	6.0	6.5	6.7	5.8	6.4	6.3	5.6	6.4	7.3	6.8	7.0	U7.7S	U7.2S	6.4	5.6	5.1	U4.4S
24	4.7	4.6	4.3	4.3	4.1	4.7	4.5	4.7	5.2	5.9	5.8	6.3	6.6	I6.4A	6.7	6.3	6.0	5.7	6.0	6.3	5.4	4.6	I4.3A	Sf
25	Sf	Sf	Sf	I3.5Sf	I3.5Sf	4.4	5.3	6.0	5.6	5.7	5.8	6.8	6.8	6.3	6.8	7.0	6.1	5.6	5.8	6.3	5.7	5.5	4.9	4.7
26	Sf	Sf	Sf	U3.7S	3.5	4.4	5.1	5.7	5.7	6.4	7.1	7.1	6.3	6.1	7.0	7.4	6.9	6.3	6.1	5.8	5.3	4.7	4.5	4.3
27	4.3	3.8	3.8	3.6	3.8	4.9	4.9	5.0H	5.6	6.0	6.5	6.5	6.2	6.2	6.4	6.3	6.6	5.8	5.7	6.7	U6.7S	6.6	U6.6S	5.6
28	5.0	4.8	4.5	U4.3S	4.3	3.8	4.6	5.0	5.1	5.5	5.3	5.8	U5.9R	5.8	6.1	6.2	5.6	5.5H	5.6H	7.1	6.9	U6.5S	5.3	4.2
29	I4.0S	4.0	I3.9Sf	U3.8S	4.3	4.3	4.7	5.6	6.6	6.1	6.0	5.2	5.8	5.8	6.1	6.3	6.7	6.4	6.6	U7.7S	6.9	6.0	5.1	4.1
30	4.3	4.3	4.0	4.3	U4.5S	5.0	5.4	5.4	5.8	6.3	5.7	5.6	5.8	5.8	6.3	6.3	6.2	5.4	5.4	6.3	U6.3S	U6.3S	I6.0S	U5.6S
31																								
No.	27	27	27	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29
Median	4.3	4.3	4.3	4.1	3.9	4.3	4.8	5.3	5.8	6.2	6.4	6.8	6.7	6.6	6.6	6.4	6.1	5.8	5.8	6.3	5.8	5.5	5.0	4.6
U.Q.	4.5	4.5	4.4	4.4	4.2	4.5	5.3	5.5	6.1	6.4	6.9	7.3	7.0	7.1	6.9	6.8	6.4	6.2	6.2	6.8	6.3	5.8	5.1	4.8
L.Q.	4.1	4.0	4.0	3.8	3.6	4.0	4.6	5.0	5.3	5.8	6.0	6.3	6.3	6.2	6.4	6.2	5.8	5.4	5.5	5.8	5.6	5.2	4.5	4.3
Q.R.	0.4	0.5	0.4	0.6	0.6	0.5	0.7	0.5	0.8	0.6	0.9	1.0	0.7	0.9	0.5	0.6	0.6	0.8	0.7	1.0	0.7	0.6	0.6	0.5

The Radio Research Laboratories, Japan

foF2

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

W 1

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IONOSPHERIC DATA

Apr. 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									U4.0L	4.2	4.3	4.3	4.3	4.4	4.3	4.0	U3.6L							
2									4.1	4.2	4.3	4.3	4.4	4.3	4.1	4.1L	U3.6L							
3									4.0	4.2	4.3	4.3	4.3	4.2	4.2H	4.0	U3.8L							
4									4.1	4.2	4.2	4.3	4.3	4.3	4.2H	4.0H	U3.5L							
5								U3.8L	U4.0L	4.1	4.3	4.3	4.3	I4.3A	I4.2A	I4.0L								
6								4.0	3.8	4.0	4.2	4.2	4.3	4.2	4.2H	4.0								
7									U4.0L	4.2	4.3	4.3	4.3	4.3	4.2	4.1	U3.4L							
8									A	4.3	4.3	4.3	4.3	4.4	4.3	4.2	3.6							
9									4.1H	4.3	4.4	4.4	4.4H	4.5	4.3	4.1	3.8							
10									4.0	4.3	4.4	4.5	4.4	4.4	4.1	4.2	U4.0L							
11								U4.0L	4.0	4.3	4.3	4.5	4.5	4.4	4.3	4.2	3.8							
12									4.1	4.3	4.6	4.4	4.6	4.6	4.2	4.2	U4.0L							
13									4.2	4.3	4.3	4.6	4.4	4.4	4.3	4.2	3.9	L						
14								4.0	4.1	4.3	4.3	4.3	4.3	4.3	4.3	4.1	3.7							
15									4.1	I4.3A	4.3	4.3	4.5	4.4	4.3	4.1	U3.7L							
16									4.1	4.3	4.4	4.6	4.5	4.4	I4.2A	I4.1A	4.0							
17								U4.0L	U4.2L	I4.2L	4.5	4.3	4.3	4.5	4.2H	4.2	3.7							
18									4.2	4.3	4.4	4.5	4.5	4.5	4.3	4.1	4.0							
19									I4.2A	I4.4A	4.5	4.6	4.5	4.5	4.3	4.2	4.1							
20								3.9	4.1	4.3	4.4	4.6	4.5	4.4	4.3	4.2	4.0							
21								3.9	4.1	4.3	I4.4A	I4.4L	4.5	4.4	4.3	4.2	4.0							
22							U4.0L	4.0	4.2	4.3	4.3	4.4	4.6	4.4	4.3	4.2	U4.0L							
23								U4.0L	4.2	4.3	4.3	4.3	4.4	4.3	4.3	4.1	4.0	U3.5L						
24									A	A	4.4	A	A	A	A	I4.1A	4.0							
25								4.0	4.1	4.3	4.3	4.3	4.4	4.4	4.3	4.2	4.0							
26								3.9	4.1	4.3	4.3	4.3	4.4	4.4	4.3	4.1	4.0							
27									4.1	4.3	4.3	4.4	4.4	I4.3A	4.3	4.2	3.9							
28							3.6	3.8	4.1	4.2	4.4	4.4	4.4	4.3	I4.2A	4.1	U3.9L							
29								4.0	I4.2A	4.3	4.3	4.3	4.4	4.4	4.3	4.2	4.0							
30								4.0	4.2	I4.2A	4.5	4.4	4.5	4.4	4.3	4.2	4.0							
31																								
No.							2	14	28	29	30	29	29	29	29	30	28	1						
Median							U3.8	4.0	4.1	4.3	4.3	4.3	4.4	4.4	4.3	4.1	4.0	U3.5						
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foF1

Sweep 1.0 Mc to 18.0 Mc in 1 sec in automatic operation

W 2

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IONOSPHERIC DATA

Apr. 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						S	S	2.50	2.80	3.00	3.00	2.95	I3.20R	3.00	3.00	2.85	2.50	S	S					
2						S	S	2.50	2.75	2.95	2.90	3.20	3.15	3.05	2.95	2.70	B	S	S					
3						S	2.15	2.50	2.80	3.00	3.00	3.00	3.00	3.15	3.00	2.90	2.65	A	S					
4						S	S	2.60	2.85	3.00	3.00	3.00	3.05	I3.00R	3.00	2.95	2.60	S	S					
5						S	S	2.45	2.90	3.00	3.05	3.15	3.20	3.10	3.00	2.80	A	A	S					
6						S	2.10	2.45	2.85	3.00	3.05	3.20	I3.20R	2.95	3.00	2.95	2.50	S	S					
7						S	S	2.50	2.90	3.00	3.05	3.00	I3.10A	3.20	I3.15A	3.00	2.70	S	S					
8						S	S	2.55	2.85	3.00	3.10	3.20	3.20	3.15	3.00	2.90	B	B	S					
9						S	S	2.50	2.85	3.00	3.15	3.00	I3.20A	3.20	3.00	2.95	2.60	S	S					
10						S	S	I2.65A	2.90	2.95	3.05	I3.00A	3.00	I3.10A	3.15	2.95	2.70	2.20	S					
11						S	2.10	2.60	3.00	3.00	3.25	3.25	3.25	3.10	3.00	3.00	2.75	S	S					
12						S	S	2.60	2.90	3.10	3.20	3.30	3.30	3.15	3.00	3.00	I2.60A	A	A					
13						S	S	2.55	2.80	3.10	3.15	3.30	3.05	3.10	I3.00A	I2.90A	2.60	S	S					
14						S	S	2.60	2.85	3.00	3.10	3.15	3.25	I3.15A	I3.15A	I3.00A	2.65	A	S					
15						S	2.10	2.60	2.90	3.00	3.05	3.05	3.20	3.05	3.10	2.90	2.50	2.05	S					
16						S	2.10	2.70	2.95	3.00	3.05	3.15	A	A	A	A	A	2.15	S					
17						S	2.15	2.50	2.90	I3.05C	3.20	3.25	I3.25R	I3.10R	3.00	3.00	2.70	2.25	S					
18						S	2.10	2.70	2.95	3.05	3.15	3.10	3.15	3.25	I3.00R	2.90	I2.60R	S	S					
19						S	2.20	2.65	2.95	3.10	3.15	3.00	I3.00A	I3.05A	3.10	I3.00A	2.70	S	S					
20						S	2.20	2.55	2.95	3.15	3.25	3.10	3.00	3.15	3.05	2.80	2.60	2.20	S					
21						S	S	2.70	2.90	3.05	3.10	I3.20C	3.25	3.15	3.10	2.85A	2.50	A	S					
22						S	2.30	2.70	2.90	3.05	I3.10A	I3.15A	3.05	3.00	2.70	I2.60A	I2.50A	S	S					
23						S	2.25	2.70	2.85	3.05	3.10	3.10	3.00	2.95	I2.95A	2.85	2.65	S	S					
24						1.80	2.15	2.70	2.90	3.05	3.20	3.15	3.00	I3.00A	I2.95A	2.85	2.40	A	A					
25						S	2.20	2.70	2.95	3.05	3.10	3.05	3.00	3.00	I3.00A	2.95	2.80	A	S					
26						S	2.20	2.65	2.95	3.05	3.00	3.05	3.15	3.20	3.05	2.95	2.50	S	S					
27						1.90	2.25	2.80	2.95	3.05	3.20	3.00	3.00	I3.00A	I2.90A	2.80	2.60	I2.30A	S					
28						I1.55S	2.30	2.65	2.90	3.05	3.15	3.25	3.15	I3.00A	I2.95A	2.90	2.80	2.30	S					
29						I1.55S	2.45	2.75	2.95	3.05	3.20	3.15	3.00	I3.05A	3.05	3.00	2.75	2.30	S					
30						S	2.35	2.80	3.00	3.15	3.10	3.10	3.20	3.25	3.10	3.00	2.85	2.35	S					
31																								
No.						4	18	30	30	30	30	30	29	29	29	29	26	9						
Median						1.70	2.20	2.60	2.90	3.05	3.10	3.10	3.15	3.10	3.00	2.90	2.60	2.25						
U.Q.																								
L.Q.																								
Q.R.																								

foE

Sweep 1.0 Mc to 18.0 Mc in 4.0 sec in automatic operation

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Apr. 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	E	E	E	E	S	2.3	G	G	3.4	G	3.3	3.0^{g}	G	G	G	G	S	S	E	E	E	E	E
2	E	E	E	J2.4	J2.2	S	2.3	G	G	3.4	3.7	G	3.0^{g}	2.8^{g}	G	G	B	S	S	E	E	E	E	E
3	E	E	E	E	E	S	G	G	3.5	3.9	3.7	G	3.3	3.3	2.5^{g}	G	2.9	J3.6	J3.0	2.5	E	E	E	E
4	E	E	E	E	E	S	2.2	G	3.3	3.6	G	G	G	G	2.7^{g}	G	G	S	S	E	E	E	E	E
5	E	E	E	E	E	S	S	2.9	3.3	3.4	G	3.8	G	J5.3	J4.3	3.4	J5.0	J7.3	2.2	E	E	E	E	E
6	E	E	J2.3	2.3	E	S	2.4	G	3.2	3.4	G	2.9^{g}	2.9^{g}	G	G	G	G	S	S	E	E	E	E	E
7	E	E	E	E	E	S	S	G	G	3.6	G	4.0	4.1	G	3.2	G	G	S	S	2.8	E	E	S	E
8	E	2.4	E	E	1.3	S	S	3.8	5.0	3.6	3.7	G	3.1^{g}	G	G	G	B	B	S	E	E	E	E	E
9	E	E	E	E	E	S	S	G	G	3.5	G	3.7	3.3	G	G	J3.3	G	S	S	E	2.4	E	E	J2.3
10	E	2.4	2.4	1.6	J2.0	S	S	3.2	G	3.6	3.6	3.8	3.7	3.3	G	G	G	G	S	E	E	2.4	E	E
11	E	E	E	E	E	S	G	3.0	3.2	3.5	G	G	G	G	3.2	2.6^{g}	G	S	S	E	E	E	2.5	E
12	2.3	E	2.4	E	E	S	S	3.0	G	G	G	G	G	G	4.0	G	3.3	3.3	3.0	E	E	E	E	E
13	E	E	E	E	E	S	S	G	G	G	G	3.8	3.4	3.6	3.7	J3.2	2.3^{g}	S	2.3	E	E	E	E	E
14	E	E	E	E	E	S	S	G	G	3.6	G	G	G	3.2	3.3	J3.3	2.3^{g}	J2.3	S	J2.5	2.4	E	2.4	E
15	2.4	E	E	E	E	S	2.4	G	G	J4.3	G	G	G	G	G	G	G	G	S	E	J3.0	J2.3	J2.5	J3.1
16	J3.1	J2.5	1.6	J2.3	1.5	S	2.5	G	G	3.4	G	G	3.9	J6.0	J5.6	J6.0	J3.3	G	S	E	J2.6	E	E	E
17	E	E	E	J1.4	2.0	S	G	G	G	C	3.0^{g}	3.0^{g}	G	G	G	G	G	G	S	E	E	E	E	E
18	E	E	E	E	E	S	G	G	3.3	3.5	G	3.3	G	G	3.0^{g}	2.5^{g}	G	S	S	E	E	E	E	E
19	E	2.4	E	1.5	J2.3	S	G	3.7	J4.3	J5.1	3.8	4.0	3.4	J3.5	G	3.0	G	S	S	E	E	E	E	E
20	E	E	E	E	E	S	G	3.1	G	G	G	G	3.8	G	G	G	G	2.8	S	E	E	E	E	E
21	E	E	E	E	E	S	2.6	3.1	3.4	3.9	J4.5	C	G	G	G	J3.3	2.3^{g}	3.0	2.3	J2.7	E	E	E	J4.3
22	E	2.4	E	1.4	E	S	G	3.1	3.3	3.4	3.3	3.8^{M}	3.4	G	3.3	3.0	J3.3	J2.3	S	E	2.2	E	E	J4.0
23	J2.3	E	E	E	E	S	G	3.0	G	3.3	3.4	3.4	3.4	3.3	3.3	G	G	3.0	2.5	E	E	E	E	E
24	E	E	E	E	E	2.5	3.0	3.3	4.0	4.4	4.4	4.4	J6.4	J6.8	J6.6	J4.8	3.6	J4.3	J3.3	J3.0	J3.1	J7.3	J4.3	J2.6
25	E	E	E	E	E	S	3.0	3.0	3.3	G	G	G	3.4	G	3.2	G	2.6	J3.5	S	E	E	E	E	E
26	E	E	E	J2.5	E	S	G	3.1	G	G	G	G	G	G	G	3.0	G	S	S	E	E	E	E	E
27	E	E	E	E	E	G	G	G	G	G	3.6	3.4	3.5	J4.5	3.5	2.5^{g}	2.5^{g}	J2.8	S	E	E	E	E	E
28	E	E	E	E	E	S	G	G	3.6	3.8	3.8	3.8	G	J7.3	J4.3	G	G	G	2.5	J3.0	E	E	J2.5	E
29	J3.0	J2.5	E	E	E	2.2	G	3.1	4.3	4.3	4.0	G	3.5	3.5	G	G	3.3	J4.3	J5.0	J3.5	J3.3	E	E	E
30	E	E	E	E	E	S	3.0	3.2	3.8	J4.8	3.6	3.9	G	G	G	G	G	3.4	2.3	2.5	E	E	E	E
31																								
No.	30	30	30	30	30	3	22	30	30	29	30	29	30	30	30	30	28	18	10	30	30	30	29	30
Median	E	E	E	E	E	2.2	G	G	G	3.5	G	G	G	G	G	G	G	2.9	2.5	E	E	E	E	E
U.Q.	E	E	E	1.4	E	2.5	2.4	3.1	3.4	3.8	3.7	3.8	3.4	3.5	3.3	3.0	2.8	3.5	3.0	2.5	E	E	E	E
L.Q.	E	E	E	E	E	G	G	G	G	3.4	G	G	G	G	G	G	G	G	2.3	E	E	E	E	E
Q.R.										0.4									0.7					

foEs

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Apr. 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						S	G			G		G	3.0					S	S					
2				E	E	S	G			G	G		3.0	2.7			B	S	S					
3						S			G	G	G		G	3.0	2.5		G	2.5	G	E				
4						S	G		G	G					2.6			S	S					
5						S	S	G	G	G		G		5.0	4.1	G	4.5	2.6	G					
6			E	E		S	G		G	G		2.9	E2.9R					S	S					
7						S	S			G		G	4.1		3.1			S	S	E			S	
8		E			E	S	S	G	4.2	G	G		3.0				B	B	S					
9						S	S			G		G	3.3			2.6		S	S		E			E
10		E	E	E	E	S	S	2.7		G	G	3.4	G	3.2					S			E		
11						S		G	G	G					G	2.6		S	S				E	
12	E		E			S	S	G							G		2.7	2.3	2.1					
13						S	S					G	G	G	3.4	3.0	2.3	S	G					
14						S	S			G				3.2	3.2	3.0	2.3	2.2	S	E	E		E	
15	E					S	G			4.3									S		2.8	E	E	E
16	E	E	E	E	E	S	G			G			3.2	3.6	4.8	4.2	2.7		S		E			
17				E	E	S				C	3.0	3.0							S					
18						S			G	G		G			E3.0R	2.5		S	S					
19		E		E	E	S		G	4.1	5.0	G	G	3.4	3.4		3.0		S	S					
20						S		G					G					G	S					
21						S	G	G	G	G	4.5	C				3.0	G	2.8	G	E				E
22		E		E		S		G	G	2.9	3.3	3.5	G		G	3.0	2.9	G	S		E			E
23	E					S		G		G	G	G	G	G	3.3			G	G					
24						G	G	G	4.0	4.3	4.2	4.3	6.1	A	4.5	4.7	G	3.0	2.6	E	E	E	A	E
25						S	G	G	G				G		3.2		2.5	2.5	S					
26				E		S		G								2.6		S	S					
27											G	G	G	4.4	3.5	2.5	2.5	2.5	S					
28						S			G	G	G	G		4.0	4.2				G	2.7			E	
29	E	E				G		G	4.1	4.1	G		G	3.5			G	4.1	4.8	3.4	2.5			
30						S	G	G	3.8	4.8	G	G						3.2	G	E				
31																								
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

foEs

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Apr. 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	E1.30S	E	E	E2.00S	E2.00S	1.85	2.00	2.00	2.05	2.20	2.15	2.30	2.40	2.00	2.00	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E2.15S
2	E2.00S	E1.60S	E	E	E	E1.20S	E2.00S	1.90	2.00	2.00	2.00	2.30	2.00	2.00	2.00	2.15	2.60	E2.20S	E2.00S	E2.00S	E1.90S	E2.00S	E2.10S	E2.00S
3	E1.90S	E1.90S	E	E	E	E1.50S	1.85	2.00	1.90	1.90	2.60	2.00	2.00	2.40	2.05	2.00	1.90	1.90	E1.90S	E2.00S	E2.00S	E2.00S	E2.00S	E1.90S
4	E2.00S	E1.80S	E	E1.50S	E	E1.50S	E2.00S	1.90	2.00	2.00	2.10	2.00	2.00	2.50	2.00	2.15	2.15	E2.20S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
5	E2.00S	E2.00S	E	E1.70S	E	E1.60S	E2.20S	2.00	2.00	2.20	2.00	2.50	2.00	2.00	2.40	2.00	2.00	2.00	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
6	E2.00S	E1.70S	E2.00S	E1.90S	E	E1.60S	E2.00S	2.00	2.00	2.10	2.15	2.15	2.00	2.05	2.50	2.00	2.00	E2.30S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
7	E1.90S	E2.00S	E1.95S	E	E	E1.80S	E2.15S	2.00	2.00	2.00	2.00	2.10	2.20	2.05	2.50	2.05	2.00	E2.30S	E2.00S	E2.10S	E2.00S	E2.00S	E2.70S	E2.00S
8	E2.00S	E1.85S	E1.20S	E	E	E1.80S	E2.10S	1.90	1.90	2.15	2.10	2.10	2.00	2.00	2.10	2.10	2.70	2.40	E2.00S	E2.10S	E2.00S	E2.00S	E2.00S	E2.00S
9	E2.00S	E1.95S	E1.90S	E	E	E2.00S	E2.40S	2.00	2.00	2.00	2.40	2.05	2.70	2.30	2.00	2.00	2.15	E2.30S	E2.00S	E1.80S	E2.00S	E2.00S	E2.00S	E2.00S
10	E2.00S	E1.90S	E1.80S	E	E	E2.00S	E2.30S	2.00	2.00	2.15	2.30	2.00	2.30	2.40	2.00	2.10	2.00	1.95	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
11	E2.00S	E1.80S	E	E	E1.70S	E1.90S	E1.95S	2.00	2.00	2.00	2.20	2.00	2.60	2.20	2.20	2.00	1.90	E2.40S	E1.80S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
12	E1.85S	E2.00S	E1.60S	E	E	E1.70S	E2.40S	1.90	2.00	2.00	2.00	2.00	2.00	2.10	2.00	2.00	1.90	1.90	E1.80S	E2.00S	E2.00S	E2.00S	E2.00S	E1.90S
13	E2.00S	E2.00S	E1.80S	E	E	E1.70S	E2.30S	1.90	2.00	2.00	2.40	2.20	2.20	2.00	2.00	2.10	1.90	E2.30S	E2.00S	E1.90S	E2.00S	E2.00S	E1.90S	E2.00S
14	E2.00S	E1.70S	E1.50S	E	E	E1.80S	E2.20S	1.90	2.40	2.20	2.10	2.40	2.20	2.40	2.00	2.00	1.90	1.90	E1.90S	E2.00S	E1.85S	E2.00S	E2.00S	E1.90S
15	E2.00S	E	E	E	E	E1.70S	1.90	1.80	2.20	2.00	2.00	2.00	2.00	2.00	2.50	2.00	1.80	E1.80S	E1.90S	E2.00S	E2.00S	E1.90S	E1.80S	E1.90S
16	E1.90S	E2.00S	E	E	E	E2.00S	1.85	1.85	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.80	1.80	E2.00S	E2.00S	E1.80S	E2.00S	E2.00S	E2.00S
17	E2.00S	E2.00S	E1.60S	E	E	E1.80S	1.90	1.90	1.90	I2.20C	2.00	2.50	2.50	2.00	2.00	2.00	2.00	2.00	E1.80S	E1.90S	E2.00S	E2.00S	E2.00S	E2.00S
18	E1.80S	E1.90S	E	E1.50S	E1.20S	E2.00S	1.80	2.00	2.10	2.00	2.00	2.15	2.10	2.00	2.20	2.00	2.00	E2.40S	E2.00S	E2.00S	E2.15S	E2.00S	E2.00S	E2.00S
19	E2.00S	E1.80S	E	E	E	E1.70S	2.00	1.90	1.90	2.00	2.15	2.10	2.20	2.50	2.40	2.40	2.15	E2.30S	E2.15S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
20	E2.00S	E2.00S	E2.00S	E	E	E1.80S	1.80	1.80	2.10	2.40	2.30	2.10	2.20	2.50	2.15	2.00	2.00	2.00	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
21	E2.00S	E2.00S	E2.15S	E2.00S	E	E2.00S	E2.00S	2.20	2.50	2.40	2.50	I2.10C	2.00	2.00	2.15	2.00	2.00	2.00	E1.80S	E1.90S	E2.00S	E2.00S	E2.00S	E2.00S
22	E2.00S	E1.90S	E2.00S	E	E	E1.80S	2.00	2.00	2.00	2.00	2.00	2.00	2.20	2.20	2.00	2.00	2.00	E2.00S	E2.10S	E2.00S	E1.90S	E2.00S	E2.00S	E2.00S
23	E2.00S	E1.60S	E1.50S	E	E	E2.00S	E2.00S	2.00	2.00	2.00	2.15	2.00	2.05	2.15	2.15	2.00	2.00	E2.30S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
24	E2.00S	E1.80S	E1.60S	E	E	E	E2.00S	2.00	2.00	2.00	2.20	2.15	2.50	2.00	2.00	2.05	2.00	2.80	E1.85S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
25	E1.90S	E1.90S	E1.70S	E	E	E2.00S	2.00	2.00	2.00	2.20	2.00	2.40	2.00	2.10	2.00	2.00	2.00	2.00	E2.10S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
26	E2.00S	E1.80S	E2.00S	E	E	E2.00S	2.00	2.00	2.00	2.15	2.00	2.00	2.05	2.05	2.50	2.00	2.00	E2.40S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
27	E1.95S	E2.00S	E	E1.70S	E	1.50	1.90	2.00	2.00	2.00	2.00	2.50	2.00	2.00	2.00	2.00	2.00	1.90	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
28	E1.90S	E2.00S	E1.70S	E1.80S	E	E2.00S	2.00	2.00	2.00	2.00	2.00	2.00	2.40	2.20	2.50	2.00	2.00	2.00	E1.90S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
29	E1.90S	E1.70S	E	E1.60S	E	E1.60S	2.00	2.00	2.00	2.40	2.15	2.00	2.10	2.30	2.00	2.00	2.00	2.00	E2.00S	E1.90S	E2.00S	E2.00S	E2.00S	E1.90S
30	E1.90S	E2.00S	E1.95S	E	E	E2.00S	2.00	2.00	2.00	2.00	2.00	2.00	2.60	2.20	2.00	2.00	2.00	2.00	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S	E2.00S
31																								
No.	30	29	30	22	28	29	30	30	30	30	30	30	30	30	30	30	30	19	30	30	30	30	30	30
Median	E2.00	E1.90	E1.55	E	E	E1.80	E2.00	2.00	2.00	2.00	2.10	2.10	2.10	2.10	2.00	2.00	2.00	2.00	E2.00	E2.00	E2.00	E2.00	E2.00	E2.00
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

f-min

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

IONOSPHERIC DATA

Apr. 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	2.85	2.95	2.95	3.20	3.50	3.20	3.50	3.55	3.45	3.10	3.30	3.25	3.20	3.10	3.10	3.25	3.35	3.30	3.10	3.15	3.20	3.10	3.00	U3.00S
2	2.80	2.90	3.05	U3.20S	3.15	3.10	3.50	3.40	3.30	3.35	3.35	3.40	3.25	3.40	3.30	3.45	3.50	3.40	3.20	3.00	3.00	3.00	3.20	3.15
3	3.00	3.00	2.85	U3.10SF	I2.95SF	U2.85SF	3.60	3.15	3.65	3.30	3.35	3.25	3.40	U3.00S	3.35	3.30	3.45	3.40	3.30	3.15	3.05	3.25	3.05	3.10
4	2.95	U2.85S	U2.80S	3.00	U3.35S	3.20	3.50	3.45	3.30	3.55	3.35	3.25	3.15	3.25	3.45	3.35	3.50	3.45	3.15	3.05	3.00	3.30	3.35	2.85
5	2.90	2.85	2.85	U3.25S	3.15	2.95	3.30	3.35	3.30	3.10	2.80	3.00	2.95	3.15	3.40	3.30	3.45	3.25	3.05	3.05	3.10	3.10	2.90	2.95
6	2.80	3.00	2.90	3.15	2.85	3.00	3.25	3.00	2.95Z	2.95	2.95	3.15	I3.00R	3.15	3.20	3.35	3.35	3.25	3.25	3.10	3.05	U3.20S	3.00	3.30
7	2.95	2.90	3.00	2.95	3.10	3.25	3.55	3.35	3.25	3.15	3.15	3.25	3.15	3.15	3.25	3.30	3.45	3.30	3.05	3.10	3.20	3.10	I2.90S	2.90
8	I2.95SF	3.00	U2.85S	3.00	3.35	3.15	3.25	3.25	3.10	3.15	3.20	3.25	3.20	3.10	3.25	3.35	3.35	3.45	3.25	3.25	3.20	3.05	2.95	I2.80S
9	I2.90SF	3.00	3.15	3.15	3.20	3.15	3.55	3.30	3.35	3.30	3.15	3.30	3.20	3.20	3.35	3.45	3.35	3.40	3.25	3.15	3.10	3.00	3.05	3.05
10	U3.30S	3.00	3.00	3.15	3.10	3.25	3.50	3.40	3.30	3.35	3.25	3.40	3.25	3.35	3.30	3.30	U3.30S	3.35	3.25	3.15	3.00	2.95	3.00	U3.00S
11	2.90	2.80	U3.10S	I3.15SF	3.25	3.25	3.45	3.35	3.25	3.35	3.40	3.20	3.30	3.30	3.25	3.35	3.30	3.25	3.20	U3.00S	3.10	2.90	3.00	3.00
12	2.95	3.00	3.10	3.00	3.10	3.25	3.40	3.35H	3.30	3.25	3.35	3.30	3.25	3.05	3.25	3.35	3.35	3.25	3.15	3.15	3.15	2.90	3.05	3.00
13	3.05	2.80	3.20	3.00	3.10	3.35	3.55	3.30	3.35	3.45	3.40	3.20	3.25	3.25	3.25	3.15	3.35	3.35	3.20	3.00	3.00	3.10	2.95	2.80
14	2.90	3.00	3.05	3.00	2.90	U2.85S	3.30	3.25	2.55	3.15	3.35	3.20	3.05	3.15	3.35	3.35	3.45	3.25	3.15	2.95	2.90	3.05	2.85	3.10
15	2.75	2.80	2.85	2.85	3.35	3.35	3.30	3.00H	3.10	2.95	3.10	3.20	2.95	3.15	3.20	3.30	3.15	3.20	2.95	3.05	U3.00S	3.05	3.10	3.00
16	2.90	2.80	3.00	U2.95S	3.30	3.40	3.40	3.35H	3.25	3.25	3.30	3.15	3.05	3.05	3.25	3.25	3.30	3.25	3.20	3.00	3.00	3.05	3.10	U2.85S
17	2.80	U3.00S	3.00	2.90	2.90	3.25	3.45	3.40	3.40	I3.15C	3.35	3.20	3.25	3.10	3.25	3.35	3.30	3.30H	3.25	3.10	3.15	3.20	U3.10S	2.90
18	2.80	2.85	I2.80SF	3.00	3.00	3.20	3.40	3.35	3.35	3.25	3.35	3.05	3.15	3.15	3.25	3.35	3.20	3.35	3.35	3.05	2.90	3.00	2.95	2.95
19	2.85	3.00	U2.85SF	U2.90SF	U2.95SF	3.55	3.50	3.60	3.25	3.20	3.20	3.30	3.10	3.25	3.25	3.25	3.20	3.30H	3.25	3.20	3.20	3.00	2.85	2.95
20	2.95	2.85	3.00	U2.85S	2.95	3.35	3.15	3.25	3.50	3.30	3.40	3.15	3.25	3.35	3.15	3.25	3.25	3.30	3.15	U3.05S	U3.10S	3.15	2.95	2.95
21	U2.75S	2.80	2.85	2.95	3.10	U3.20S	3.30	3.40	3.50	2.90	2.95	I3.10C	3.35	3.10	3.25	3.25	3.30	3.20	3.30	3.15	3.20	3.10	3.10	3.05
22	2.95	U2.65S	3.00	3.10	3.05	3.40	3.30	3.25	3.25	3.30	3.25	3.20	3.10	3.00	3.15	3.25	3.25	3.25	3.15	3.20	3.15	3.10	2.95	2.75
23	SF	SF	SF	SF	SF	U3.10S	3.25	3.35	3.40	3.55	3.20	3.30	3.35	3.00	2.95	3.20	3.25	3.15	U3.05S	U3.20S	3.20	3.05	3.00	U2.95S
24	2.90	2.90	3.00	3.10	3.15	3.30	3.55	3.45	3.15	3.35	3.10	3.15	3.20	I3.10A	3.30	3.35	3.35	3.25	3.15	3.35	3.25	3.05	I3.00A	SF
25	SF	SF	SF	I3.05SF	I3.20SF	3.35	3.35	3.35	3.40	3.20	3.10	3.20	3.20	3.15	3.25	3.30	3.30	3.35	3.30	3.15	3.05	3.15	2.90	2.95
26	SF	SF	SF	U3.20S	3.25	3.50	3.45	3.35	3.35	3.30	3.25	3.25	3.10	3.20	3.15	3.25	3.35	3.30	3.30	3.30	3.10	3.00	3.10	3.00
27	2.90	3.10	3.00	3.15	3.30	3.55	3.45	3.40H	3.25	3.30	3.35	3.25	3.05	3.20	3.15	3.20	3.25	3.40	3.05	2.95	U3.05S	3.05	U3.05S	3.10
28	2.95	2.90	2.90	U3.00S	3.25	3.15	3.10	3.10	3.20	3.30	3.10	3.10	U3.05R	3.20	3.30	3.25	3.25	3.25H	3.05H	3.00	3.20	U3.30S	3.25	3.00
29	I2.85S	2.90	I3.00SF	U3.05S	3.25	3.50	3.25	3.05	3.40	3.20	3.40	3.15	3.20	2.95	3.25	3.20	3.30	3.20	3.10	U3.05S	3.25	3.20	3.20	3.00
30	2.70	3.15	3.05	3.00	U3.00S	3.25	3.40	3.35	3.30	3.15	3.50	3.05	3.20	3.00	3.15	3.20	3.25	3.35	3.20	3.00	U2.95S	U2.85S	I3.05S	U3.10S
31																								
No.	27	27	27	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29
Median	2.90	2.90	3.00	3.00	3.15	3.25	3.40	3.35	3.30	3.25	3.30	3.20	3.20	3.15	3.25	3.30	3.30	3.30	3.20	3.10	3.10	3.05	3.00	3.00
U.Q.																								
L.Q.																								
Q.R.																								

M(3000)F2

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

The Radio Research Laboratories, Japan

W 7

IONOSPHERIC DATA

Apr. 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									U3.90L	3.70	3.70	3.70	3.75	3.80	3.90	3.75	U3.75L							
2									3.70	3.75	3.70	3.70	3.85	3.65	3.80	3.70L	U3.70L							
3									3.75	3.80	3.95	3.85	3.85	3.95	3.70H	3.75	U3.95L							
4									3.65	3.80	4.00	3.95	3.95	3.70	3.75H	3.75H	U3.95L							
5								U3.75L	U3.75S	3.75	3.60	3.55	3.70	I3.65A	I3.75A	I3.75L								
6								3.45	3.75	3.60	4.05	3.80	3.95	3.90	3.55H	3.75								
7									U3.80L	3.65	3.60	3.90	I3.80A	3.70	3.60	3.70	U3.85L							
8									A	3.50	3.60	3.95	3.95	3.65	3.60	3.65	3.90							
9									3.65H	3.70	3.80	3.85	3.95H	3.60	3.70	3.75	3.90							
10									3.75	3.70	3.85	3.70	3.85	3.70	3.90	3.60	U3.80L							
11								U3.80L	3.95	3.70	3.95	3.85	3.65	3.85	3.75	3.70	3.75							
12									3.75	3.70	3.55	4.05	3.80	3.70	3.80	3.05	U3.75L							
13									3.60	3.70	3.75	3.70	3.85	3.80	3.80	3.75	3.60	L						
14								3.40	3.65	3.40	3.70	3.80	3.95	3.85	3.70	3.70	3.85							
15									3.75	I3.65A	3.65	3.75	3.60	3.60	3.70	3.70	U3.80L							
16									3.70	3.55	3.65	3.70	3.55	3.85	I3.80A	I3.65A	3.75							
17								U3.75L	U3.80L	I3.85L	3.80	3.95	3.75	3.80	3.80H	3.75	3.80							
18									3.60	3.70	3.65	3.80	3.85	3.60	3.60	3.60	3.75							
19									I3.60A	I3.65A	3.80	3.75	3.80	3.75	3.75	3.55	3.65							
20								3.65	3.70	3.75	3.65	3.70	3.65	3.70	3.60	3.60	3.55							
21								3.65	3.65	3.65	I3.70A	I3.70C	3.75	3.85	3.55	3.55	3.75							
22							U3.75L	3.75	3.75	3.70	3.85	3.80	3.65	3.70	3.55	3.65	U3.65L							
23								U3.75L	3.65	3.70	3.95	3.95	3.60	3.80	3.75	3.50	3.70	U3.70L						
24									A	A	A	A	A	A	A	A	3.70							
25								3.75	3.75	3.80	3.95	3.80	3.70	3.65	3.60	3.55	3.75							
26								3.85	3.70	3.70	3.90	3.80	3.85	3.80	3.55	3.60	3.70							
27									3.85	3.75	3.75	3.80	3.65	I3.80A	3.65	3.60	3.60							
28							3.35	3.75	3.70	3.75	3.70	3.80	3.65	I3.90A	I3.70A	3.70	U3.75L							
29								3.70	I3.65A	I3.80A	3.90	3.95	3.85	3.80	3.70	3.65	3.55							
30								3.75	I3.75A	I3.85A	3.65	4.05	4.00	3.80	3.90	3.60	3.60							
31																								
No.							2	14	28	29	29	29	29	29	29	29	28	1						
Median							U3.55	3.75	3.70	3.70	3.75	3.80	3.80	3.80	3.70	3.65	3.75	U3.70						
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

IONOSPHERIC DATA

Apr. 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									260	315	280	280	270	245	300	260	260							
2									295	265	270	260	285	270	280	260	250							
3									260	260	255	285	270	300	265	270	250							
4									275	250	260	295	305	275	270	280	260							
5								270	270	295	360	295	305	270	265	280								
6								360	350	400	390	350	E390R	340	310	290								
7									300	305	310	290	290	310	295	270	250							
8									355	315	300	295	290	295	275	280	260							
9									270	290	305	280	295	300	270	270	260							
10									290	265	310	280	285	295	280	285	265							
11								V280L	290	280	275	295	270	275	295	275	270							
12									270	280	270	295	300	310	280	280	270							
13									295	270	280	305	300	285	280	295	260	255						
14								325	465	325	295	320	350	320	285	275	260							
15									340	350	315	300	320	310	290	280	280							
16									300	295	290	310	310	315	280	285	270							
17								260	275	E290C	285	305	295	320	290	275	270							
18									300	300	285	335	315	295	290	280	285							
19									290	285	290	285	305	300	280	290	290							
20								295	265	295	275	300	300	285	295	290	285							
21								275	295	400	350	E300C	295	330	295	290	265							
22							270	280	285	280	295	305	325	315	285	285	265							
23								270	275	260	300	295	300	330	330	295	275	275						
24									315	295	325	325	E300A	E300A	300	290	275							
25								265	270	310	325	300	305	305	300	280	275							
26								270	270	285	290	290	310	310	300	290	260							
27									300	300	290	300	315	315	300	295	285							
28							350	345	330	300	325	345	350	310	310	290	280							
29								320	275	305	275	330	325	360	305	295	285							
30								280	300	280	275	340	325	340	315	295	285							
31																								
No.							2	14	30	30	30	30	30	30	30	30	28	2						
Median							310	280	290	295	290	300	300	310	290	280	270	265						
U.Q.																								
L.Q.																								
Q.R.																								

h'F2

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

The Radio Research Laboratories, Japan

17

IONOSPHERIC DATA

Apr. 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	275	265	235	210	245	230	245	230	220	200	215	220	220	210	235	245	255	260	250	250	250	265	275
2	300	300	260	250	250	250	230	245	225	235	225	215	215	215	220	210	230	245	245	250	275	280	260	250
3	270	280	290	255	270	280	225	240	240	235	230	210	200	220	205H	230	240	250	245	255	265	240	235	260
4	285	290	310	270	240	230	230	235H	240	225	210	205	210	255	195H	210H	240	245	260	260	275	250	240	310
5	300	320	300	245	245	275	250	230	250	230	225	240	230	I240A	I230A	260	I250A	260	265	250	250	245	275	270
6	310	275	300	255	250	270	260	230	235	250	205	240	200	210	200H	240	250	260	250	250	275	245	285	260
7	280	300	275	255	240	250	235	245	245	245	230	215	I225A	215	215	250	240	250	250	260	245	265	I280S	300
8	310	255	270	260	240	245	245	260	I245A	250	245	210	200	200	245	235	235	250	245	240	260	260	275	300
9	310	285	260	245	230	260	230	235	250H	225	220	215	200H	225	215	230	245	250	245	250	260	275	270	290
10	290	290	275	260	280	250	240	245	240	230	220	215	210	215	205	240	230	245	245	250	260	280	265	260
11	290	305	250	250	235	250	230	235	230	220	220	210	225	205	215	225	230	240	245	250	250	300	275	275
12	290	290	270	255	250	245	240	240H	220	230	230	215	230	210	215	220	235	250	250	260	260	275	260	260
13	270	310	270	260	240	260	235	225	240	240	220	230	225	215	220	225	225	245	245	260	260	275	280	300
14	300	285	270	230	270	275	250	240	230	250	225	205	215	210	215	245	235	240	260	265	280	250	270	285
15	325	310	280	280	220	230	245	230H	230	I230A	220	245	235	230	220	235	245	250	260	260	265A	265	260	290
16	325	305	280	280	250	245	240	230H	225	230	220	210	220	220	I225A	I235A	240	250	255	250	260	260	250	260
17	305	280	260	305	285	245	240	240	230	I225C	220	225	210	215	210H	245	235	235H	250	250	250	240	250	285
18	290	300	300	260	280	265	240	240	240	235	220	220	205	200	215	235	235	250	235	260	275	260	285	285
19	290	290	285	255	250	235	235	250	I250A	I240A	220	210	205	200	220	225	245	240H	250	250	240	250	290	290
20	290	300	295	260	260	250	250	235	235	230	210	225	220	220	205	235	250	260	250	250	240	250	280	300
21	320	315	310	260	250	265	250	245	230	245	I230A	I220C	210	210	240	240	250	250	250	250	240	260	250	300
22	300	315	270	235	265	240	250	235	230	220	210	215	215	215	200	235	250	250	260	245	240	250	285	310
23	290	275	290	280	265	250	240	240	240	230	215	210	250	210	220	240	250	265	260	240	245	255	260	300
24	295	290	290	240	250	250	245	250	A	A	A	A	A	A	A	A	270	260	250	240	260	255	I300A	310
25	310	300	290	250	250	245	245	235	230	215	210	215	200	200	230	250	230	240	250	245	250	255	270	295
26	300	280	250	255	225	235	240	230	240	225	215	220	210	200	225	230	245	240	245	230	250	260	275	275
27	290	275	275	270	220	225	225	230H	235	225	225	210	240	I220A	210	240	250	230	260	270	270	270	250	250
28	280	295	300	285	230	250	250	230	230	220	240	220	230	I220A	I230A	240	235	245H	270H	265	250	240	245	250
29	310	300	270	275	230	230	245	235	I245A	I230A	225	210	200	220	250	250	250	A	A	A	245	245	235	270
30	305	260	260	250	265	240	250	235	I235A	I230A	230	210	205	200	210	220	250	265A	260	260	260	260	250	260
31																								
No.	30	30	30	30	30	30	30	30	29	29	29	29	29	29	29	29	30	29	29	29	30	30	30	30
Median	300	290	275	255	250	250	240	235	235	230	220	215	215	215	215	235	240	250	250	250	260	260	270	285
U.Q.																								
L.Q.																								
Q.R.																								

h'F

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

The Radio Research Laboratories, Japan

W 10

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	S	175	G	G	125	G	120	115	G	G	G	G	S	S	E	E	E	E	E
2	E	E	E	105	105	S	160	G	G	115	115	G	110	110	G	G	B	S	S	E	E	E	E	E
3	E	E	E	E	E	S	G	G	125	125	120	G	120	110	110	G	105	105	105	105	E	E	E	E
4	E	E	E	E	E	S	160	G	120	120	G	G	G	G	105	G	G	S	S	E	E	E	E	E
5	E	E	E	E	E	S	S	150	140	130	G	125	G	120	115	120	110	110	140	E	E	E	E	E
6	E	E	105	105	E	S	150	G	140	125	G	110	105	G	G	G	G	S	S	E	E	E	E	E
7	E	E	E	E	E	S	S	G	G	125	G	115	110	G	120	G	G	S	S	130	E	E	S	E
8	E	110	E	E	140	S	S	135	125	125	120	G	110	G	G	G	B	B	S	E	E	E	E	E
9	E	E	E	E	E	S	S	G	G	125	G	115	110	G	G	105	G	S	S	E	125	E	E	110
10	E	115	110	110	110	S	S	125	G	120	120	115	115	110	G	G	G	G	S	E	E	105	E	E
11	E	E	E	E	E	S	G	155	150	120	G	G	G	G	120	110	G	S	S	E	E	E	115	E
12	110	E	105	E	E	S	S	150	G	G	G	G	G	G	115	G	105	105	105	E	E	E	E	E
13	E	E	E	E	E	S	S	G	G	G	G	130	115	120	115	110	110	S	105	E	E	E	E	E
14	E	E	E	E	E	S	S	G	G	135	G	G	G	110	110	115	110	110	S	110	110	E	110	E
15	105	E	E	E	E	S	150	G	G	125	G	G	G	G	G	G	G	G	S	E	120	125	110	110
16	110	110	110	110	110	S	150	G	G	130	G	G	110	110	105	105	105	G	S	E	115	E	E	E
17	E	E	E	105	105	S	G	G	G	C	110	110	G	G	G	G	G	G	S	E	E	E	E	E
18	E	E	E	E	E	S	G	G	150	130	G	125	G	G	110	110	G	S	S	E	E	E	E	E
19	E	110	E	110	110	S	G	140	125	120	115	115	110	110	G	115	G	S	S	E	E	E	E	E
20	E	E	E	E	E	S	G	130	G	G	G	G	110	G	G	G	G	145	S	E	E	E	E	E
21	E	E	E	E	E	S	150	140	130	125	115	C	G	G	G	110	110	110	135	125	E	E	E	110
22	E	110	E	105	E	S	G	130	125	120	105	105	115	G	110	110	110	160	S	E	105	E	E	120
23	115	E	E	E	E	S	G	150	G	135	130	125	120	115	115	G	G	140	135	E	E	E	E	E
24	E	E	E	E	E	145	145	140	130	120	120	110	110	105	105	110	120	105	100	125	145	125	115	120
25	E	E	E	E	E	S	130	130	120	G	G	G	115	G	110	G	105	105	S	E	E	E	E	E
26	E	E	E	115	E	S	G	125	G	G	G	G	G	G	G	105	G	S	S	E	E	E	E	E
27	E	E	E	E	E	G	G	G	G	G	115	115	110	110	110	110	105	105	S	E	E	E	E	E
28	E	E	E	E	E	S	G	G	135	130	125	125	G	110	110	G	G	G	130	115	E	E	110	E
29	105	110	E	E	E	140	G	140	120	115	115	G	110	110	G	G	140	125	115	115	115	E	E	E
30	E	E	E	E	E	S	140	140	125	120	120	130	G	G	G	G	G	130	140	125	E	E	E	E
31																								
No.	5	6	4	8	6	2	10	15	15	23	14	16	18	13	16	13	12	13	10	8	7	3	5	5
Median	110	110	110	110	110	140	150	140	125	125	120	115	110	110	110	110	110	110	120	120	115	125	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

19

IONOSPHERIC DATA

Apr. 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							h			c		c	l											
2				f	f		h			c	c		l	l										
3									c	c	c		c	l	l		l	l2	l	f				
4							h		c	c					l									
5								h	h	h		c		c	c	c	l2	l2	h					
6			f	f			h		h	c		l	l											
7										c		c	l		l					f				
8		f			f			h	c2	c	c		l											
9										c		c	l			l					f			f
10		f	f	f	f			l		c	c	l	c	l								f		
11								h	h	c					c	l							f	
12	f		f					h							c		l	l	l2					
13												c	c	c	l	l	l		l					
14										h				l	l	l	l	l		f	f		f	
15	f						h			c											f	f	f2	f2
16	f2	f	f	f	f		h			c			l	l	l2	l2	l2				f2			
17				f	f						l	l												
18									h	c		c			l	l								
19		f		f	f			h	c	c	c	c	l	l		l								
20								c					c					h						
21							h	h	c	c	c2					l	l	l2	c	f				f2
22		f		f				c	c	c l	l	l	c		c	l	l	h			f			f2
23	f							h		h	c	c	c	c	l			h	h					
24						c	c	h	h	c	c	c	c	l3	l	c2	c l	l2	l2	f	f-f	f	f3	f
25							c	c	c				c		l		l	l						
26				f				c								l								
27											c	c	c	l	l	l	l	l						
28									h	c	c	c		l	l				c	f2			f	
29	f2	f				c		h	c	c	c		c	l			h	c2	c4	f2	f2			
30							c	h	c	c	c	h						c	c	f				
31																								
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

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

The Radio Research Laboratories, Japan

W 12

20

IONOSPHERIC DATA

Apr. 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	I 4.4 R S	R S	R S	I 3.8 R S	2.8 S	2.9	I 4.6 R S	5.3	5.8	6.0	6.6	7.6	8.2 R	8.3	7.8 R	8.0	7.6 R S	6.3	5.7	I 6.0 R S	5.8	R S	R S	4.5
2	4.3 S	4.4 S	4.4 S	4.1 R S	3.3	3.6	5.1	5.9	6.7	7.3	7.3	7.3	8.1	6.7	6.8	7.0	I 6.3 C	I 5.5 C	5.5 R	5.3	R S	R S	R S	R S
3	R S	R	R	R	I 3.8 R	3.9	I 5.6 R	C	C	7.1	I 7.6 C	7.7	7.8	7.2 R	6.9	7.0 R	5.9	6.1	6.1	I 6.0 R S	I 5.8 R S	J 5.2 R S	I 4.4 R S	4.0
4	4.1	4.3 R S	4.1 S	C	C	C	C	C	C	6.3	7.0	7.0	I 7.6 R	8.0	7.1	6.5	5.6	5.2	5.6	6.1	6.1 S	5.7 S	I 4.9 R S	4.5 S
5	I 4.2 R S	4.0	4.0	4.4 S	3.0	3.2	5.4	6.1	6.7	7.1	7.7	R	R	R	R	6.3	6.1	5.8	6.8	7.5 S	6.1	I 4.8 R S	I 4.6 R S	I 4.6 R S
6	4.5	4.5 S	4.1 S	5.1 R S	3.2	4.0	5.3	6.3 R	I 5.9 R	5.6	6.1 R	6.9 R	6.1	6.7	6.6	6.5	6.0	5.5	6.7	6.9	5.7	J 5.3 S	4.1 S	I 4.4 R S
7	I 4.2 R S	4.0	4.4 R	3.8	3.5	3.9	5.1	5.1	5.3	6.1	C	C	C	R	7.6	7.7	6.7	6.3	6.4	6.4 R	I 5.6 R S	I 5.0 A S	4.3 S	R S
8	R F	R F	I 4.2 R S	I 4.2 R S	3.0	J 3.4 R	4.9 R	6.0	6.2	6.7	7.8	8.1	8.1	I 8.3 R	I 8.2 R	7.9	6.9	6.3	6.2	5.7	5.1	4.6 R S	4.2 S	4.0
9	I 4.2 R F	4.1 S	3.9	3.3	2.9 F	3.2	4.8 R H	J 5.5 R U	6.3 R	7.6	7.2	7.9	7.7	8.6	J 7.4 R	6.8	6.2	6.2	6.4	6.1	5.3	R S	R S	R S
10	R S	4.6	I 4.2 R S	3.9	I 3.6 R S	I 3.9 R S	5.1	5.8	6.2	6.7	7.1	7.0	7.1	7.3	6.7	7.1	7.3 S	6.5	5.6	5.8 S	R S	R S	R S	R S
11	I 4.6 R S	4.6 S	4.7 S	I 4.6 R S	3.4	3.6 S	5.2 S	5.7	6.0	7.2	8.1	6.9	7.4	7.3	7.2	7.0	6.5	6.1	6.1	I 6.3 R S	5.6	R S	R S	I 4.6 R S
12	I 4.6 R S I	4.4 R S	4.4 S	4.0	3.6	I 4.3 R S	5.6	5.9	6.6	7.1	8.0	7.6	7.7	6.9	7.1	7.4	6.0	5.9	I 6.6 R S	I 7.0 R S	6.1 S	R S	R S	R S
13	R S	4.5 S	4.9 S	4.6 S	4.1 S	4.5 S	5.6	5.8	6.7	7.1	7.2	7.6	8.0	7.8	7.3	7.6 R	7.1	6.9	6.9 S	I 6.6 R S	5.9	J 5.3 R S	I 5.1 R S	I 5.1 R S
14	J 5.1 R S	5.1 R S	I 5.0 R S	4.0 S	I 4.1 R S	4.3 S	5.6	4.7	6.0	6.3	8.5	6.8	6.7	7.1	7.9	6.7	6.3	5.6	6.1	7.1 S	U 6.3 R S	5.8	5.3 R S	5.4
15	4.9	I 4.7 R S	I 4.6 R S	I 4.4 R S	5.1 R	4.1	4.6	5.1 R	5.2 R	6.0	7.6	8.6 R	8.1	8.0	7.7	6.2	5.8	5.6	6.4	I 7.2 R S	I 6.8 R S	5.6	R S	R S
16	I 4.8 R S	4.3 R I	4.4 F I	4.4 R S I	3.8 F I	4.6 R	5.4	5.3 R	6.2	6.6	6.6	7.3	7.8	7.8	8.3	I 7.7 R S	I 7.2 R S	6.5 R I	6.6 R S	R S	R S	R S	R S	R S
17	R S	R S	R S	R S	R S	R S	5.9 S	6.0	I 6.6 R S	6.6	6.9	6.7	7.7	8.4	8.1	7.4 R	6.6	6.1	6.6	R S	R S	R S	R S	R S
18	R S	R S	R S	R S	R S	R S	5.4 S I	5.7 R S	6.0 H	6.5	6.7	7.3	7.6	8.1	8.3 R	8.4 R S	I 7.1 R S	5.9	6.1	5.7	R S	R S I	5.1 R S	I 5.1 R S
19	I 5.0 R S I	4.8 R S	J 4.8 R S	I 4.6 R S	I 4.4 R S	5.5 R S	5.4	5.5	6.4	7.3	7.1	7.7	8.0	8.0	8.1	I 7.7 R	7.6 R I	8.1 R S	J 8.1 R S	8.1 R S	6.6	5.1	R S	R S
20	I 4.5 R S	4.6 S	4.6	4.6	4.1 S	4.7 S	5.5	6.6	6.9	6.8	7.8	7.8	7.9	7.5	7.2	6.8	7.4	J 8.0 R S	R S	R S	6.3 R S	R S	R S	R S
21	C	C	C	C	4.2 S I	4.8 R S	5.6	6.1	5.7	6.0	6.1	7.1	J 7.3 R	6.2	6.6	7.0	7.1 S	6.6	6.6 S I	6.4 R S	6.1	R S	A	R S
22	R S	R S	R S	R S	F S	R S	5.6	6.6	7.6	5.9	6.6	6.6	7.8	8.2	9.0	I 9.2 R S	7.8 R S	6.2	7.0 S	8.1 S	I 6.6 R S	4.2 S	I 4.2 R S	I 4.2 R S
23	4.4 S	3.9 S	F S	R S	F I	4.4 R S	5.5	6.1	7.1	7.2	7.0	6.4	C	C	C	C	I 8.8 R	8.1 R S	I 8.2 C I	7.8 R S	I 6.1 A I	5.0 R S I	4.7 R S I	4.5 R S
24	I 4.5 R S	4.5	I 4.3 R S	I 4.2 R S	4.0	4.7	5.3	I 5.2 A	5.5	5.8	6.8	J 7.4 R	7.6	I 7.4 A	8.1	7.9 S I	7.4 C	6.4	7.1 S I	7.0 S	5.2 S	3.5 S	F S	R S
25	A	F S	F S I	3.1 R S	2.8	4.1	5.6	6.2	6.2	6.3	6.3	7.0	7.9	8.1	8.4	I 8.8 R	7.6	5.9	6.4 S	7.2 S	6.2 S I	5.0 R S I	5.0 R U	5.0 R S
26	I 4.8 R S	R S	R S	4.3 R	3.7 I	4.2 R S	5.2	5.8	6.1	6.7	6.9	7.3 R	7.0	7.5	8.6 R	8.6	8.1	6.6	6.8	6.3 S	R S	R S	4.6 S	R S
27	R	4.0	I 4.0 R	3.8	3.4	4.0	5.2	5.5	6.1	6.3	6.2 R	6.6	7.6	7.7	7.5 R	7.8	7.1	6.4	5.8	R S	R S	7.1 S	6.0 S I	5.1 R S
28	I 4.9 R S I	4.9 R S I	4.6 R S	4.5	I 4.6 R S	4.6 S I	5.8 R S	5.8	5.9	I 6.0 A I	5.8 A I	6.4 R	6.7	I 7.4 R	7.5	6.8	5.8	5.7	6.3	7.9 S	8.1	6.0	I 4.7 R S	3.6 S
29	I 3.6 R S	C	R S	R S	R S	R S	5.2	5.7	7.0	6.5	6.2	6.1	5.7	6.4	7.5	7.5	7.6	6.9	7.1	I 7.4 R S	6.9	R S	A	A
30	4.3	4.1	R S	R F	F S	4.9	5.0	5.7	6.5	6.4	I 6.2 C	6.4	6.4	7.0	6.8	7.7	6.6	6.2	5.4	6.4 S I	6.5 R S	6.1	5.9	5.0 S
31																								
No.	20	20	19	21	23	25	29	28	28	30	29	28	27	27	28	29	30	30	29	26	23	16	16	17
Median	U 4.5	4.4	4.4	4.2	3.6	4.1	5.4	5.8	6.2	6.6	7.0	7.2	7.7	7.5	7.5	7.4	7.0	6.2	6.4	6.5	6.1	5.2	U 4.7	U 4.5
U.Q.	4.8	4.6	4.6	4.6	4.1	4.6	5.6	6.0	6.6	7.1	7.6	7.6	7.9	8.1	8.1	7.8	7.4	6.5	6.8	7.2	6.3	5.8	5.1	5.0
L.Q.	4.2	4.1	4.1	3.8	3.2	3.8	5.1	5.5	6.0	6.1	6.4	6.8	7.1	7.1	7.1	6.8	6.2	5.9	6.1	6.1	5.6	4.9	4.4	4.3
Q.R.	0.6	0.5	0.5	0.8	0.9	0.8	0.5	0.5	0.6	1.0	1.2	0.8	0.8	1.0	1.0	1.0	1.2	0.6	0.7	1.1	0.7	0.9	0.7	0.7

foF2

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

The Radio Research Laboratories; Japan

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IONOSPHERIC DATA

Apr. 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^{H}	L	L	46^{L}	43^{L}	46^{LH}	46^{L}	$I43^{L}$	$I42^{L}$	L							
2								L	L	43^{L}	43^{L}	45^{LH}	44	44^{R}	L	L	C							
3								C	C	R	$I44^{C}$	$I46^{A}$	43^{L}	43^{L}	42^{L}	L^{H}	A	A						
4								C	C	43^{L}	44^{L}	45^{H}	45^{L}	$I44^{R}$	42^{H}	L	L							
5								L	L	L	45	$I45^{R}$	45^{L}	45^{R}	L	L	L							
6								L	L	R	R	R	45	$I43^{R}$	42^{L}	40^{L}	L	L						
7									L	45^{L}	C	C	C	R	R	R	L							
8								L	L	L	R	A	R	44^{R}	45	42^{L}	3.8^{L}	L^{H}						
9								L	L	$I43^{R}$	$I44^{R}$	$I45^{R}$	46^{L}	45^{L}	L	L	L							
10									L	44	46	45^{L}	46	45	$I44^{L}$	L	L							
11									L	44	45	44	46	46^{L}	46^{L}	L	L							
12								L	L	46^{L}	46^{L}	$I46^{L}$	46^{R}	46^{R}	45^{L}	L	L	L						
13									L	L	46^{L}	46	46	45	43^{L}	43^{L}	40^{L}							
14									42	45	$I46^{R}$	47^{L}	$I46^{R}$	46	43^{L}	L	A	L						
15								L	L	45^{H}	$I43^{R}$	$I44^{A}$	$I44^{R}$	$I44^{R}$	A	L	L^{H}	L						
16									L	A	C	45^{L}	46	45^{L}	L	L	A	L						
17								L	L	45	46^{L}	45	46	45	L	L^{H}	L	L						
18								L	L	L	$I46^{L}$	46	45	46^{L}	46	L	L	L						
19									L	L	46^{L}	L	A	A	A	L	L	L						
20								L	L	44	$I44^{LH}$	$I45^{L}$	$I47^{L}$	47^{LH}	45	L	L	L						
21							L	L	L	45^{L}	$I45^{L}$	$I46^{L}$	$I46^{L}$	47	44^{L}	A	A	A						
22								L	L	45^{L}	R	L	46^{L}	46	46^{L}	L	L	A						
23									L	L	45	45^{L}	C	C	C	C	A	A						
24									A	A	A	A	A	A	A	A	C							
25								A	L	L	45	45	45	45	44	42^{L}	A	L						
26								L	L	43^{L}	43^{L}	46^{L}	45	43	$I44^{R}$	41	3.9^{LH}	L						
27								L	$I40^{R}$	$I43^{R}$	$I44^{R}$	$I45^{R}$	45	44	44^{L}	42^{L}	A							
28							L	A	42^{L}	A	A	$I46^{R}$	$I46^{L}$	$I46^{A}$	44	40^{L}	L	L	L						
29								A	A	A	A	46	46^{L}	46	45	A	L	A						
30								L	A	A	C	46^{LH}	46	$I44^{LH}$	$I45^{L}$	L^{H}	L	A						
31																								
No.									3	15	21	24	25	26	20	8	3							
Median									42	44	45	45	46	45	44	42	3.9							
U.Q.																								
L.Q.																								
Q.R.																								

foF1

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Apr. 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	A	A	A	3.00	2.55	2.15						
2							B	A	I 2.90 A	A	A	3.20	I 3.20 A	I 3.20 R	I 3.10 R	2.95	I 2.65 C	I 2.20 C						
3							2.05	C	C	A	C	A	A	A	A	C	A	A						
4							C	C	C	A	A	I 3.20 A	A	A	3.20	2.85	2.45	A						
5							B	A	A	3.05	A	A	A	R	R	I 3.00 A	2.60	2.30 H						
6							A	A	A	R	R	A	3.30 R	R	A	3.05	2.70	R						
7							2.15	A	A	R	C	C	C	R	A	A	I 2.75 A	I 2.20 A						
8							A	A	A	R	R	A	R	3.30 R	3.20	3.05	2.70	R	B					
9							A	A	I 2.90 R	R	R	B	A	A	3.30	3.10	2.85	2.35	B					
10							A	2.65	A	A	A	A	A	A	3.25	3.10	I 2.75 R	2.40	B					
11							A	A	A	3.15	I 3.25 A	3.45	3.50	I 3.40 R	I 3.20 R	I 3.10 A	2.80	2.30 H	B					
12							I 2.25 A	2.75	3.00	3.20	A	A	3.50	I 3.40 A	A	A	A	2.35	A					
13							R H	I 2.80 A	3.00	I 3.20 A	I 3.30 A	3.45	I 3.40 A	I 3.25 A	3.15	3.00	2.75	2.30	B					
14							A	A	2.85	A	A	3.40	I 3.40 R	I 3.40 A	A	A	A	A						
15							2.05	A	A	A	A	A	A	3.35	A	A	A	2.25	B					
16							A	A	A	A	C	A	A	A	A	A	A	A						
17							A	A	A	A	A	A	A	A	A	A	A	A	B					
18							R	A	A	A	A	A	A	A	I 3.20 A	I 3.00 A	I 2.70 A	2.45	B					
19						B	A	A	A	A	A	3.40	A	A	A	A	A	A	A					
20							2.20	A	A	A	A	A	A	3.40	3.30	A	A	A	B					
21							2.25	2.65	3.05	3.20	I 3.30 A	A	A	A	A	A	A	A						
22							A	I 2.70 A	A	A	A	A	A	A	R	A	A	A						
23							A	A	3.00	3.10	3.20	A	C	C	C	C	A	A						
24						E	A	2.55	I 2.90 A	I 3.10 A	A	A	A	A	A	A	C	A	B					
25							A	A	A	A	A	A	A	A	A	A	A	A	B					
26							A	A	A	A	A	A	R	A	A	A	A	A	B					
27							2.40 H	2.65	2.90	I 3.05 R	3.20	R	R	A	R	3.00	A	A	B					
28						B	A	A	2.95	A	A	A	A	A	A	A	2.70	A	A					
29						B	A	A	2.90	3.05	A	A	A	A	A	A	A	A	A					
30						B	A	A	A	A	C	A	A	A	A	3.10	2.85	A	B					
31																								
No.						1	7	7	11	9	5	6	6	8	9	13	14	11						
Median						E	2.20	2.65	2.90	3.10	u 3.25	3.40	u 3.40	u 3.40	3.20	3.00	2.70	2.30						
U.Q.																								
L.Q.																								
Q.R.																								

foE

Sweep 1.60 Mc to 2.00 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Apr. 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	E	2.4	2.8	3.1	3.9	3.9	3.7	3.9	4.0	3.5	G	G	G	E	2.2	2.2	E	E	2.2
2	E	E	E	E	E	E	2.5	2.8	3.0	3.4	3.5	G	3.3	G	G	G	C	C	E	E	E	E	E	E
3	E	E	E	E	J2.1	E	G	C	C	3.5	C	J6.0	3.8	3.6	3.2	C	J4.9	J4.1	J2.8	J2.8	J2.8	J2.4	E	E
4	E	E	E	C	C	C	C	C	C	3.6	3.8	3.5	3.6	3.5	G	3.2	G	2.3	E	E	2.2	E	E	E
5	E	E	E	E	E	E	2.2	3.0	3.2	3.4	3.6	3.7	3.5	G	3.5	3.0	G	G	E	E	2.2	J2.2	E	E
6	E	E	E	E	E	E	2.5	3.0	3.1	G	3.7	3.8	G	G	3.1G	G	G	G	E	E	E	E	E	E
7	E	E	E	E	E	E	G	2.8	3.4	3.5	C	C	C	G	3.7	3.7	3.2	J3.2	2.2	J2.2	J3.3	J6.0Y	J2.5	J3.5
8	J1.8	E	E	2.5	J2.3	E	2.3	2.8	3.6	3.3	3.2	J5.1Y	G	G	G	G	G	G	G	E	E	E	E	E
9	E	E	E	E	E	2.3	2.4	3.0	3.1	3.8	3.6	3.9	3.5	3.7	G	G	2.1G	G	G	E	J2.4	J2.3	2.0	E
10	J2.5	J1.9	J2.0	E	E	E	2.5	G	3.1	3.6	3.9	4.0	4.0	3.5	G	G	G	G	G	E	J2.5	2.3	E	E
11	2.1	E	E	2.2	2.1	E	2.6	3.0	3.5	3.6	3.8	G	G	G	G	3.6	G	G	G	E	2.1	E	2.2	E
12	E	E	2.1	E	E	E	2.3	G	3.6	3.8	3.7	3.5	G	3.7	3.4	J5.0	3.2	G	J2.2	J2.4	J1.7	E	E	E
13	E	E	E	E	E	E	G	3.1	G	4.0	3.7	G	3.5	3.3	G	G	G	G	J2.5	J2.5	2.1	2.0	E	E
14	E	E	2.2	E	E	E	2.5	3.0	3.3	3.6	3.9	G	G	3.7	3.6	3.3	3.9	J2.8	J2.9	J2.8	J2.8	J1.9	J2.0	E
15	E	J1.9	2.2	E	E	E	2.4	3.1	3.6	3.7	3.9	J6.5	3.7	G	J7.3	3.3	3.3	G	2.2	J2.5	J2.0	J2.0	J2.4	J3.0
16	J2.8	J2.3	E	E	E	E	J2.6	3.9	3.6	J4.8	C	J5.0	J5.2	3.9	4.1	3.7	J3.9	2.5	J2.8	J2.9Y	J2.4Y	J1.8	2.3	2.2
17	2.2	2.3	2.2	E	2.1	2.1	2.5	3.2	3.7	3.8	J4.0	J4.0	3.7	3.8	3.7	3.6	3.5	2.7	G	J1.9	J1.8	E	E	E
18	E	E	S	S	2.1	S	G	3.5	3.7	J4.3	3.7	3.7	3.7	3.7	3.5	3.6	J3.6	G	G	J3.0	J1.9	2.4	E	E
19	E	E	E	E	E	2.0	2.6	3.3	3.7	4.1	3.7	3.9	4.4	J5.0	J5.0	J3.7	J3.5	J2.9	J2.9	J2.1	2.2	2.2	E	2.2
20	2.2	2.1	2.2	E	2.2	E	G	3.0	3.7	3.7	3.3	3.6	3.7	G	G	3.7	3.3	3.1	J2.5	J2.3	2.3	1.9	E	E
21	C	C	C	C	E	E	2.6	3.2	3.5	3.9	4.0	3.9	3.7	3.6	J3.7	J43	J5.0	J53	J8.0	J2.1	J2.5	J2.5	J5.1Y	2.3
22	E	E	J2.8	J2.3	J1.8	2.4	3.0	3.2	3.5	3.9	3.9	3.9	3.7	3.6	G	3.7	3.1	J4.5	J2.8	J3.0	J2.0	J2.2	J2.0	J1.9
23	E	J3.5	J2.8	J2.5	J1.8	E	3.1	3.7	3.7	4.1	4.2	3.9	C	C	C	C	J5.0	J6.2	C	J5.0	J8.3	J2.1	J2.5	2.3
24	2.3	J1.8	J2.3	J2.4	J2.5	1.9	3.7	J5.8	4.5	4.2	4.6	J5.0	J6.7	J7.8	J5.5	J7.1	C	3.3	J4.0	J2.6	J1.8	J2.6	E	J2.5
25	J4.1	J2.6	J2.9	J2.8	J2.9	J3.5	3.0	J4.0	3.7	3.5	3.5	3.5	3.7	3.6	3.4	3.0	J3.8	2.6	2.1	2.2	J2.7	E	E	E
26	E	E	E	E	E	E	2.5	3.2	3.5	3.6	3.7	3.6	G	3.7	3.9	J3.3	3.0	3.0	2.0	J2.0	J2.0	2.5	E	E
27	E	E	E	E	E	E	G	3.3	3.4	4.0	G	G	G	3.7	G	G	3.9	3.3	J2.9	J2.9	J2.0	E	E	J2.4
28	E	E	J2.2	E	E	G	3.2	J3.8	4.0	J7.1	J7.1	3.7	J3.9	J11.7	4.0	J3.2	G	2.8	J2.5	J2.9	J2.9	J2.5	J2.4	J3.1
29	J3.0	C	J3.4	J2.5	J2.0	2.8	J5.0	J5.6	J5.0	J5.7	J4.6	4.0	3.9	J4.4	J3.5	J6.0	J4.5	J3.6	J4.5	J6.1	J6.3	J3.1	J5.7	J4.1
30	2.2	E	E	J2.0	J2.9	J3.3	J4.3	J4.0	J5.1	J4.4	C	3.8	4.1	4.1	3.7	G	3.2	J3.9	3.0	J2.4	J2.8	E	J1.9	E
31																								
No.	29	28	28	27	29	28	29	28	28	30	26	29	28	29	29	28	28	29	29	30	30	30	30	30
Median	E	E	E	E	E	E	2.5	3.2	3.6	3.8	3.8	3.8	3.7	3.6	3.5	3.3	3.2	2.7	2.2	2.2	2.2	2.0	E	E
U.Q.	2.2	1.8	2.2	2.2	2.1	2.0	2.8	3.6	3.7	4.1	3.9	4.0	3.9	3.8	3.7	3.7	3.8	3.3	2.8	2.8	2.7	2.4	2.2	2.3
L.Q.	E	E	E	E	E	E	2.2	3.0	3.2	3.6	3.6	3.5	G	G	G	G	G	G	G	E	2.0	E	E	E
Q.R.							0.6	0.6	0.5	0.5	0.3	0.5									0.7			

foEs

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							2.3	2.8	3.1	3.4	3.7	3.5	3.4	3.5	3.3					1.7	1.7			1.7
2							2.2	2.7	3.0	3.4	3.4		$^{U}3.3^{R}$				C	C						
3					2.1			C	C	3.5	C	5.2	3.7	3.4	3.2	C	4.0	3.2	2.7	2.6	2.7	2.4		
4				C	C	C	C	C	C	3.5	3.4	3.5	3.5	3.5		$^{U}3.2^{R}$		2.3			1.8			
5							2.2	2.8	3.2	3.4	3.6	3.7	3.5		3.4	2.5					1.7	2.0		
6							2.4	3.0	3.1		3.6	3.8			$^{U}3.1^{R}$									
7								2.8	3.2	3.5	C	C	C		3.5	$^{U}3.7^{R}$	3.0	$^{U}3.2^{R}$	2.2	2.0	3.0	A^{S}	2.2	2.7
8	1.7			1.8	1.8		2.3	$E2.8^{R}$	3.4	$E3.3^{R}$	$E3.2^{R}$	$^{U}5.1^{R}$												
9						1.8	2.3	2.8	3.1	3.8	$^{U}3.6^{R}$	$E3.9^{R}$	3.5	3.6			2.0[9]				1.9	2.1	1.8	
10	1.7	1.8	1.8				2.4		3.1	$^{U}3.6^{R}$	3.9	3.9	3.9	3.5							1.9	1.8		
11	1.7			1.7	1.7		2.6	3.0	3.4	3.6	$E3.8^{R}$					3.2					1.7		1.7	
12			1.7				2.3		3.4	3.8	$^{U}3.7^{R}$	$E3.5^{R}$		3.5	3.4	3.9	3.1		2.0	1.9	1.7			
13								3.1		3.8	3.7		$^{U}3.5^{R}$	$^{U}3.3^{R}$					1.9	2.1	1.7	1.8		
14			1.7				2.4	2.9	3.3	3.6	$^{U}3.9^{R}$			3.7	3.6	3.2	3.9	$^{U}2.8^{R}$	2.9	$E2.8^{R}$	2.1	1.8	1.7	
15		1.7	1.7				2.3	3.0	3.5	3.5	$^{U}3.9^{R}$	$E6.5^{R}$	$E3.7^{R}$		5.5	3.1	2.8		2.1	2.2	1.8	1.7	$E2.4^{R}$	2.1
16	2.0	1.8					2.5	3.6	3.5	$E4.8^{R}$	C	4.0	4.0	3.9	4.0	3.5	$E3.9^{R}$	2.5	1.8	$E2.9^{R}$	$E2.4^{R}$	1.8	1.7	1.8
17	1.8	1.7	1.7		1.7	1.7	2.5	3.0	3.5	3.5	3.5	4.0	3.5	3.4	3.2	3.3	3.4	2.6		1.8	1.7			
18			S	S	1.7	S		3.5	$E3.7^{R}$	4.1	3.7	3.5	3.7	3.7	3.4	3.2	3.4			1.8	1.8	1.8		
19						1.8	2.6	3.3	3.5	3.9	$^{U}3.7^{R}$	3.9	$E4.4^{R}$	5.0	4.8	3.4	3.5	2.7	2.1	1.9	1.8	1.7		2.0
20	1.9	1.8	1.7		1.9			2.9	3.7	3.5	$^{U}3.3^{R}$	$^{U}3.6^{R}$	$E3.7^{R}$			3.3	3.3	2.9	2.5	2.3	1.8	1.8		
21	C	C	C	C			2.5	3.0	3.4	3.9	$E4.0^{R}$	$^{U}3.9^{R}$	$E3.7^{R}$	3.5	3.5	4.3	4.8	4.1	2.9	1.8	1.8	2.5	A	1.7
22			1.8	1.7	1.8	2.0	2.8	3.1	3.4	3.9	$E3.9^{R}$	$^{U}3.9^{R}$	3.7	3.5		3.3	3.1	4.0	2.8	3.0	1.8	1.8	1.9	1.9
23		1.7	2.3	2.3	1.8		2.9	3.7	3.7	$^{U}4.1^{R}$	$^{U}4.2^{R}$	$^{U}3.9^{R}$	C	C	C	C	4.7	$^{U}6.2^{R}$	C	4.2	A	1.8	2.0	1.9
24	1.9	1.8	2.0	2.1	2.3	1.8	$^{U}3.7^{R}$	A	4.5	4.2	$E4.6^{R}$	5.0	6.7	A	5.5	7.0	C	3.3	$^{U}4.0^{R}$	$E2.6^{R}$	1.8	1.8		1.9
25	A	2.3	1.7	2.1	1.8	2.8	2.9	4.0	3.7	3.5	3.5	$^{U}3.5^{R}$	$^{U}3.7^{R}$	$^{U}3.6^{R}$	3.4	3.0	$E3.8^{R}$	2.6	2.0	1.9	2.0			
26							2.5	2.0	3.4	3.6	3.7	$E3.6^{R}$		3.5	$E3.9^{R}$	3.2	2.8	2.5	2.0	1.8	1.8	2.0		
27								3.3	3.4	4.0				3.7			$^{U}3.9^{R}$	2.5	2.6	2.0	2.0			1.9
28			1.8				3.0	3.8	4.0	A	A	3.6	$E3.9^{R}$	6.3	3.5	3.1		2.8	2.3	$E2.9^{R}$	$E2.9^{R}$	1.8	2.0	2.5
29	2.0	C	A	1.7	1.7	2.6	4.9	5.2	$^{U}5.0^{R}$	5.6	4.6	3.6	3.6	4.3	3.5	4.7	3.4.	3.6	4.5	5.5	3.5	2.6	A	A
30	1.8			1.7	1.8	3.2	4.1	4.0	4.5	4.3	C	3.8	4.1	3.8	3.5		3.2	3.9	3.0	2.4	2.5		1.7	
31																								
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

f_bEs

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

The Radio Research Laboratories, Japan

A 5

25

IONOSPHERIC DATA

Apr. 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	1.70	1.75	1.70	1.70	1.75	1.70	1.75	1.75	1.75	1.70	1.75	1.75	1.80	1.90	1.75	1.75	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
2	1.70	1.70	1.70	1.70	1.75	1.75	1.70	1.75	1.75	1.70	1.85	2.10	2.00	2.25	1.80	1.75	I 2.00 C	I 2.00 C	1.75	1.75	1.75	1.70	1.75	1.70
3	1.75	1.70	1.80	1.75	2.05	1.70	1.95	C	C	2.10	I 2.10 C	2.15	1.95	1.90	1.90	E 3.00 C	1.70	1.70	1.70	1.70	1.80	1.70	1.75	1.70
4	1.80	1.70	1.75	C	C	C	C	C	C	1.90	1.85	2.05	2.15	2.20	2.20	2.20	1.85	1.80	1.80	1.75	1.75	1.75	1.75	1.80
5	1.75	1.75	1.75	1.75	1.75	1.75	1.80	1.75	1.85	1.75	2.00	2.30	2.40	2.40	2.30	1.75	2.20	1.75	1.75	1.75	1.70	1.70	1.80	1.80
6	1.75	1.75	1.75	1.70	1.70	1.75	1.80	1.70	2.10	2.20	2.25	2.25	2.30	2.10	1.80	2.20	1.80	1.75	1.70	1.80	1.70	1.75	2.00	2.00
7	1.80	1.70	1.70	1.70	1.70	1.70	1.70	1.80	2.20	2.20	C	C	C	2.25	2.20	2.20	2.00	1.75	1.75	1.75	1.75	1.70	1.70	1.70
8	1.70	1.70	1.70	1.80	1.70	1.75	1.75	2.00	2.20	2.20	2.40	2.55	2.40	2.20	2.30	2.15	1.80	1.70	1.75	1.70	1.70	1.70	1.70	1.70
9	1.75	1.70	1.80	1.80	1.85	1.75	1.75	2.10	1.80	2.10	2.20	3.30	2.70	2.00	1.80	1.90	1.80	1.75	1.85	1.70	1.75	1.75	1.80	1.70
10	1.70	1.70	1.70	1.70	1.70	1.70	1.75	1.80	1.80	1.95	1.95	2.00	2.65	2.20	2.00	1.75	1.80	1.80	1.80	1.75	1.70	1.75	1.70	1.70
11	1.70	1.65	1.70	1.70	1.70	1.75	1.80	1.85	1.80	1.80	1.80	1.95	1.85	1.80	1.90	1.85	1.85	1.75	1.70	1.80	1.70	1.70	1.70	1.70
12	1.80	1.75	1.70	1.75	1.70	1.70	1.80	1.80	1.80	1.80	1.80	1.90	1.90	1.85	1.85	1.85	1.75	1.75	1.70	1.70	1.70	1.75	1.70	1.70
13	1.70	1.70	1.70	1.70	1.70	1.70	1.80	1.80	1.80	1.80	1.85	1.90	1.80	1.90	1.75	1.85	1.70	1.70	1.75	1.70	1.70	1.80	1.70	1.70
14	1.70	1.65	1.70	1.70	1.70	1.70	1.70	1.75	1.80	1.85	1.80	1.85	2.20	1.85	1.85	1.75	1.75	1.80	1.70	1.80	1.75	1.70	1.70	1.70
15	1.70	1.70	1.70	1.70	1.70	1.70	1.80	1.80	1.85	1.90	1.85	1.95	2.00	1.85	1.75	1.80	1.70	1.70	1.70	1.75	1.70	1.65	1.70	1.70
16	1.70	1.75	1.80	1.70	1.70	1.75	1.80	1.75	1.80	1.80	E 5.30 C	1.90	1.75	1.75	1.75	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
17	1.70	1.65	E	1.70	1.70	1.65	1.70	1.70	1.75	1.80	1.80	1.80	1.75	1.70	1.75	1.70	1.75	1.70	1.80	1.70	1.70	1.70	1.80	1.65
18	1.70	1.65	1.65	E	1.65	1.65	1.70	1.80	1.80	1.80	1.85	1.90	1.80	1.80	1.80	1.75	1.75	1.80	1.75	1.75	1.70	1.80	1.70	1.80
19	1.70	1.75	1.75	1.80	1.70	1.70	1.80	1.85	1.85	1.85	1.80	1.90	1.85	1.90	1.80	1.75	1.85	1.75	1.75	1.80	1.80	1.70	1.80	1.85
20	1.90	1.75	1.70	1.75	1.80	1.75	1.80	1.80	1.80	1.80	1.90	1.90	2.05	1.90	1.80	1.75	1.75	1.75	1.70	1.70	1.75	1.75	1.75	1.80
21	C	C	C	C	1.75	1.80	1.75	1.80	1.80	1.95	1.90	1.80	1.85	1.80	1.85	1.75	1.80	1.70	1.70	1.75	1.75	1.70	1.70	1.70
22	1.85	1.70	1.70	1.70	1.75	1.70	1.70	1.80	1.80	1.80	1.85	1.85	1.80	1.80	1.80	1.75	1.70	1.75	1.80	1.75	1.75	1.70	1.70	1.80
23	1.75	1.70	1.70	1.70	1.70	1.70	1.95	1.80	1.90	1.90	1.90	1.95	C	C	C	C	1.80	1.75	I 1.80 C	1.75	1.75	1.80	1.70	1.85
24	1.85	1.70	1.80	1.70	1.70	1.70	1.80	1.80	1.85	2.10	1.95	1.90	1.85	1.95	1.80	1.90	I 1.85 C	1.85	1.75	1.80	1.70	1.80	1.75	1.75
25	1.75	1.80	1.70	1.70	1.70	1.70	1.80	1.80	1.85	2.00	2.10	2.10	2.05	2.20	1.85	1.90	1.80	1.80	1.80	1.80	1.85	1.80	1.75	1.75
26	1.80	1.80	1.70	1.70	1.75	1.75	1.75	1.75	1.85	1.85	2.20	2.10	1.90	2.15	2.80	1.90	1.80	1.80	1.80	1.75	1.80	1.90	1.75	1.80
27	1.90	1.90	1.75	1.70	1.75	1.80	2.05	1.95	1.90	2.05	2.60	2.70	1.85	1.95	1.75	1.75	1.75	1.70	1.80	1.70	1.80	1.80	1.80	1.80
28	1.75	1.75	1.80	1.75	1.80	1.80	1.70	1.80	1.80	1.85	1.90	1.90	1.90	1.80	1.85	1.75	1.75	1.70	1.70	1.70	1.75	1.70	1.70	1.70
29	1.70	I 1.70 C	1.70	1.65	1.70	1.70	1.70	1.75	1.90	1.80	1.80	1.75	1.90	1.85	1.80	1.70	1.70	1.70	1.75	1.75	1.75	1.70	1.70	1.75
30	1.80	1.70	1.70	1.70	1.70	1.75	1.70	1.75	1.75	1.80	I 1.90 C	1.90	1.80	1.85	1.75	1.80	1.75	1.70	1.75	1.70	1.70	1.75	1.70	1.80
31																								
No.	29	29	29	28	29	29	29	28	28	30	28	29	28	29	29	28	30	30	30	30	30	30	30	30
Median	1.75	1.70	1.70	1.70	1.70	1.70	1.75	1.80	1.80	1.85	1.90	1.90	1.90	1.90	1.80	1.75	1.80	1.75	1.75	1.75	1.75	1.70	1.70	1.70
U.Q.																								
L.Q.																								
Q.R.																								

f-min

Sweep 1.80 Mc to 2.00 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 6

26

IONOSPHERIC DATA

Apr. 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	I 3.00 RS	RS	RS	I 3.10 RS	3.45 S	2.95	I 3.50 RS	3.45	3.65	3.25	3.20	3.20	3.15 R	3.15	3.15 R	3.20	3.30 RS	3.40	3.10	I 3.40 RS	3.25	RS	RS	3.00
2	2.95 S	2.90 S	3.20 S	3.20 RS	3.20	2.95	3.40	3.40	3.50	3.40	3.45	3.35	3.40	3.30	3.30	3.40	I 3.40 U	I 3.30 C	3.25 R	3.20	RS	RS	RS	RS
3	RS	R	R	R	I 2.90 R	2.85	I 3.40 R	C	C	3.30	I 3.30 C	3.30	3.30	3.25 R	3.20	3.45 R	3.40	3.35	3.30	I 3.15 RS	I 3.00 RS	J 3.30 RS	I 3.05 RS	3.00
4	2.95	2.90 RS	2.95 S	C	C	C	C	C	C	3.35	3.30	3.20	I 3.30 R	3.30	3.45	3.40	3.30	3.20	3.15	3.15	3.10 S	3.25 S	I 3.05 RS	2.75 S
5	I 2.90 RS	2.80	2.90	3.30 S	3.15	2.95	3.30	3.35	3.50	3.10	2.95	R	R	R	R	3.40	3.30	3.20	3.20	3.30 S	3.40	I 3.05 RS	I 3.00 RS	I 2.90 RS
6	2.90	2.90 S	3.00 S	3.15 RS	3.00	2.90	3.25	3.45 R	I 3.05 R	3.05	3.20 R	3.30 R	3.45	3.45	3.40	3.45	3.40	3.15	3.45	3.25	3.20	J 3.40 S	2.95 S	I 3.00 RS
7	I 3.00 RS	2.80	3.10 RS	2.95	2.90	3.00	3.50	3.35	3.40	3.10	C	C	C	R	3.25	3.35	3.40	3.40	3.45	3.40 RS	I 3.10 RS	I 2.90 AS	3.00 S	RS
8	RF	RF	L 3.45 R	I 3.30 RS	3.05	J 3.25 R	3.15 R	3.25	3.40	3.30	3.20	3.25	3.10	I 3.20 R	I 3.30 R	3.35	3.50	3.40	3.40	3.30	3.30	3.05 RS	2.90 S	2.80
9	I 2.90 RF	2.85 S	2.95	3.35	2.95 F	3.15	3.35 RH	J 3.55 R	U 3.40 R	3.35	3.35	3.25	3.20	3.30	J 3.40 R	3.40	3.35	3.40	3.30	3.20	3.25	RS	RS	RS
10	RS	3.00	I 3.15 ES	3.10	I 3.00 RS	I 3.10 RS	3.55	3.60	3.50	3.50	3.45	3.25	3.30	3.30	3.35	3.35	3.45 S	3.50	3.30	3.15 S	RS	RS	RS	RS
11	I 2.85 RS	2.95 S	3.05 S	I 3.30 RS	3.10	3.05 S	3.50 S	3.50	3.20	3.40	3.40	3.30	3.25	3.20	3.20	3.35	3.40	3.40	3.30	I 3.30 RS	3.30	RS	RS	I 2.90 RS
12	I 2.90 RS	I 2.95 RS	3.05 S	3.05	3.15	I 3.10 RS	3.50	3.40	3.30	3.25	3.15	3.30	3.35	3.20	3.25	3.40	3.45	3.15	I 3.20 RS	I 3.30 RS	3.20 S	RS	RS	RS
13	RS	2.90 S	2.90 S	3.10 S	3.10 S	3.15 S	3.50	3.45	3.35	3.25	3.20	3.25	3.20	3.35	3.50	3.50 R	3.35	3.35	3.30 S	I 3.30 RS	3.10	J 2.85 RS	I 2.75 RS	I 2.80 RS
14	J 2.90 RS	3.00 RS	L 3.00 R	3.00 S	I 2.85 R	3.00 S	3.40	3.65	3.35	2.90	3.30	3.15	3.25	3.25	3.35	3.30	3.45	3.20	3.10	3.10 S	J 3.30 RS	3.10	2.95 RS	2.85
15	2.85	I 2.75 RS	I 2.80 RS	I 2.90 RS	3.10 R	3.25	3.30	3.25 R	3.30 R	2.90	3.05	3.20 R	3.20	3.15	3.35	3.40	3.40	3.20	3.10	I 3.10 RS	I 3.25 RS	2.95	RS	RS
16	I 2.85 RS	2.90 R	I 2.95 F	I 3.30 RS	I 3.45 F	I 3.45 R	3.35	3.55 R	3.30	3.25	3.20	3.20	3.20	3.20	3.20	I 3.30 RS	I 3.40 RS	3.25 R	I 3.20 RS	RS	RS	RS	RS	RS
17	RS	RS	RS	RS	RS	RS	3.40 S	3.40	I 3.40 PS	3.40	3.40	3.20	3.20	3.20	3.20	3.30 R	3.35	3.40	3.20	RS	RS	RS	RS	RS
18	RS	RS	RS	RS	RS	RS	3.45 S	I 3.45 RS	3.10 H	3.25	3.20	3.20	3.10	3.15	3.20 R	3.35 RS	I 3.45 RS	3.40	3.40	3.10	RS	RS	I 3.00 RS	I 2.90 RS
19	I 2.90 RS	I 2.90 RS	J 2.90 RS	I 3.00 RS	I 3.20 RS	3.30 RS	3.55	3.30	3.40	3.35	3.20	3.20	3.20	3.25	3.20	I 3.30 R	3.30 R	I 3.20 RS	I 3.10 RS	3.35	3.25	RS	RS	2.95 S
20	I 2.95 RS	2.95 S	2.90	3.05	2.95 S	3.20 S	3.25	3.50	3.40	3.10	3.25	3.15	3.25	3.20	3.30	3.25	3.25	J 3.25 RS	RS	RS	3.35 R	RS	RS	RS
21	C	C	C	C	3.20 S	I 3.25 RS	3.30	3.65	3.30	3.40	3.20	3.30	J 3.30 R	3.15	3.20	3.35	3.40 S	3.40	3.30 S	I 3.35 RS	3.40	RS	A	RS
22	RS	RS	RS	RS	FS	RS	3.45	3.50	3.45	3.55	3.30	2.95	3.10	3.10	3.05	I 3.20 RS	3.30 RS	3.30	3.25 S	3.20 S	I 3.45 RS	3.10 S	I 2.85 RS	I 2.70 RS
23	2.85 S	2.85 S	FS	RS	F	I 3.10 RS	3.45	3.45	3.55	3.45	3.40	3.05	C	C	C	C	I 3.15 R	3.20 RS	I 3.25 U	I 3.40 RS	I 3.25 A	I 3.05 RS	I 2.95 RS	I 2.85 RS
24	I 2.90 RS	2.95	I 3.00 RS	I 3.10 RS	3.15	3.40	3.60	I 3.60 A	3.25	3.20	3.25	I 3.15 R	3.20	I 3.10 A	3.10	3.20 S	I 3.35 L	3.40	3.40 S	I 3.50 S	3.60 S	2.90 S	FS	RS
25	A	FS	FS	I 3.20 ES	3.10	3.25	3.40	3.55	3.55	3.40	3.20	3.05	3.10	3.10	3.10	I 3.30 R	3.35	3.40	3.30 S	3.30 S	3.40 S	I 3.05 RS	I 2.95 RS	U 2.90 RS
26	I 2.95 RS	RS	RS	3.30 R	3.25	I 3.40 RS	3.45	3.35	3.40	3.35	3.25	3.10 R	3.20	3.10	3.15 R	3.30	3.45	3.35	3.40	3.30 S	RS	RS	3.10 S	RS
27	R	2.95	I 3.10 R	3.35	3.55	3.35	3.35	3.35	3.40	3.35	3.30 R	3.10	3.10	3.20	3.20 R	3.30	3.35	3.25	3.00	RS	RS	3.25 S	3.20 S	I 2.90 RS
28	I 2.98 RS	I 2.98 RS	I 3.00 RS	2.95	I 3.00 RS	3.10 S	I 3.20 RS	3.60	3.55	I 3.40 A	I 3.20 A	J 3.10 R	3.20	I 3.20 R	3.30	3.50	3.35	3.15	3.05	3.15 S	3.45	3.45	I 3.20 RS	2.70 S
29	I 2.90 RS	C	RS	RS	RS	RS	3.30	3.25	3.00	3.55	3.35	3.15	3.00	3.10	3.15	3.20	3.25	3.35	3.10	I 3.30 RS	3.35	RS	A	A
30	3.05	3.00	RS	RF	FS	3.50	3.40	3.50	3.55	3.50	I 3.35 C	3.25	3.15	3.20	3.20	3.35	3.35	3.60	3.35	3.00 S	I 3.10 RS	3.10	3.00	3.15 S
31																								
No.	20	20	19	21	23	25	29	28	28	30	29	28	27	27	28	29	30	30	29	26	23	16	16	17
Median	U 2.90	2.90	3.00	3.10	3.10	3.15	3.40	3.45	3.40	3.35	3.25	3.20	3.20	3.20	3.20	3.35	3.35	3.35	3.25	3.30	3.25	3.10	U 3.00	U 2.90
U.Q.																								
L.Q.																								
Q.R.																								

M(3000)F2

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

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Apr. 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^{H}	L	L	3.65^{L}	4.15^{L}	3.70^{LH}	3.65^{L}	I3.80^{L}	I3.50^{L}	L							
2								L	L	3.65^{L}	3.90^{L}	3.80^{LH}	3.70	3.80^{R}	L	L	C							
3								C	C	R	I3.70^{C}	I3.75^{A}	4.00^{L}	3.90^{L}	3.80^{L}	L^{H}	A	A						
4								C	C	3.80^{L}	4.00^{L}	3.80^{H}	4.05^{L}	I3.90^{R}	3.80^{H}	L	L							
5								L	L	L	3.65	I3.70^{R}	3.70^{L}	3.75^{R}	L	L	L							
6								L	L	R	R	R	3.65	I3.70^{R}	3.65^{L}	3.70^{L}	L	L						
7									L	3.50^{L}	C	C	C	R	R	R	L							
8								L	L	L	R	A	R	3.85^{R}	3.60	3.60^{L}	4.15^{L}	L^{H}						
9								L	L	I3.70^{R}	I3.75^{R}	I3.80^{R}	3.75^{L}	3.75^{L}	L	L	L							
10									L	3.70	3.70	3.80^{L}	3.80	3.80	I3.65^{L}	L	L							
11									L	3.70	I3.65^{R}	3.90	3.90	3.70^{L}	3.50^{L}	L	L							
12								L	L	3.70^{L}	3.90^{L}	I3.80^{L}	3.85^{R}	3.80^{R}	3.80^{L}	L	L	L						
13									L	L	3.80^{L}	3.75	3.75	3.80	3.75^{L}	3.50^{L}	3.65^{L}							
14									3.60	3.45	I3.60^{R}	3.65^{L}	I3.70^{R}	3.50	3.70^{L}	L	A	L						
15								L	L	3.60^{H}	I3.90^{R}	I3.65^{A}	I3.80^{R}	I3.65^{R}	A	L	L^{H}	L						
16									L	A	C	3.75^{L}	3.70	3.70^{L}	L	L	A	L						
17								L	L	3.65	3.75^{L}	3.90	3.90	3.80	L	L^{H}	L	L						
18								L	L	L	I3.60^{L}	3.80	3.85	3.70^{L}	3.55	L	L	L						
19									L	L	3.85^{L}	L	A	A	A	L	L	L						
20								L	L	3.90	I4.00^{LH}	I4.00^{L}	I3.60^{L}	3.65^{LH}	3.55	L	L	L						
21							L	L	L	3.60^{L}	I3.90^{L}	I3.80^{L}	I3.60^{L}	3.60	3.50^{L}	A	A	A						
22								L	L	3.85^{L}	R	L	3.70^{L}	3.70	3.45^{L}	L	L	A						
23									L	L	A	3.80^{L}	C	C	C	C	A	A						
24									A	A	A	A	A	A	A	A	C							
25								A	L	L	3.80	3.80	3.80	3.60	3.60	3.55^{L}	A	L						
26								L	L	3.80^{L}	3.75^{L}	I3.75^{R}	3.80	3.95	I3.60^{R}	3.85	3.65^{LH}	L						
27								L	I3.75^{R}	I3.70^{R}	I3.70^{R}	I3.85^{R}	3.90	3.85	3.50^{L}	3.60^{L}	A							
28							L	A	A	A	A	I3.75^{R}	I3.80^{L}	I3.80^{A}	3.90	3.75^{L}	L	L	L						
29								A	A	A	A	3.75	3.70^{L}	I3.70^{A}	3.80	A	L	A						
30								L	A	A	C	3.70^{LH}	3.75	I4.05^{LH}	I3.65^{L}	L^{H}	L	A						
31																								
No.									2	15	20	24	25	26	20	8	3							
Median									U3.70	3.70	3.75	3.80	3.75	3.75	3.65	3.60	3.65							
U.Q.																								
L.Q.																								
Q.R.																								

M(3000)F1 Sweep 1.60 Mc to 20.0 Mc in 2.0 sec in automatic operation

The Radio Research Laboratories, Japan

A 8

IONOSPHERIC DATA

Apr. 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								250	255	290	295	295	295	295	295	285	255							
2								255	265	265	255	290	290	295	295	285	C							
3								C	C	290	I 280 C	290	290	275	295	265	260	255						
4								C	C	285	295	290	290	295	260	270	260							
5								250	250	300	330	330	290	285	260	260	285							
6								270	295	I 300 R	I 310 R	300	290	290	290	285	260	270 L						
7									255	325	C	C	C	295	295	275	250							
8								255	290	295	295	280	300	290	290	255	255	250						
9								245	290	275	285	290	290	280	280	290	260							
10									260	265	290	295	295	295	290	295	255							
11									255	280	285	290	295	295	300	290	260							
12								255	285	300	295	285	290	310	295	255	260	280						
13									295	275	300	300	300	280	290	290	285							
14									295	380	290	300	295	300	285	285	280	250						
15								280	315	365	310	I 300 A	295	295	280	290	270	280 L						
16									300	295	I 295 C	295	295	295	285	280	255	250						
17								250	250	285	290	300	305	295	285	285	260	255						
18								250	265	295	310	300	300	295	290	265	250	250						
19									270	285	295	295	290	290	295	285	285	250						
20								255	275	295	290	295	290	295	295	295	290	275						
21							255	250	280	295	300	300	290	320	300	290	275	255						
22								260	260	255	295	350	305	300	300	265	255	270						
23									250	275	285	305	C	C	C	C	270	A						
24									305	300	305	310	I 320 A	I 320 A	295	A	C							
25								255	275	290	310	335	305	300	295	280	255	255						
26								250	290	295	295	300	305	310	295	290	250	250						
27								250	265	295	285	340 R	300	295	295	285	280							
28							280	250	255	I 310 A	I 330 A	335	305	I 295 A	290	270	295	290	280					
29								A	280	270 A	295	335	345	345	310	295	290	250						
30								270	270	275	I 300 C	330	335	300	300	280	280	245						
31																								
No.							2	18	28	30	29	29	28	29	29	28	28	18	1					
Median							270	250	270	290	295	300	295	295	295	285	260	255	280					
U.Q.																								
L.Q.																								
Q.R.																								

h'F2

Sweep 1.60 Mc to 2.00 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Apr. 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	280	280	285	245	210	270	230	235^{H}	235	230	210	200	200	240	205	230	245	245	250	245	225	245	260	265
2	290	290	245	240	235	260	245	245	245	225	210	195	205	220	220	210	I 245^{C}	I 245^{C}	240	240	250	280	275	260
3	260	275	290	285	290	290	245	C	C	220	I 205^{C}	I 215^{A}	200	210	200	195^{H}	I 240^{A}	I 245^{A}	245	245	245	240	240	275
4	285	290	290	C	C	C	C	C	C	220	195	200^{H}	190	200	195^{H}	245	245	240	245	245	245	240	245	290
5	295	305	295	240	245	285	245	245	240	235	235	240	200	200	200	220	245	250	255	240	220	245	290	285
6	295	295	295	240	240	275	245	245	230	I 235^{R}	200	225	210	220	240	245	245	245	250	240	240	225	295	285
7	280	290	250	250	255	275	240	245	245	240	C	C	C	205	235	I 240^{A}	245	250	245	240	245	I 270^{A}	295	275
8	290	295	250	220	245	245	240	I 245^{R}	240	215	195	I 215^{A}	225	220	240	240	240	245	240	240	240	255	270	300
9	290	295	250	240	E 290^{E}	265	230	240	220	240	200	I 210^{A}	200	200	205	230	240	245	245	240	240	295	270	295
10	295	260	250	245	275	250	240	245	240	220	230	220	205	205	240	200	245	250	245	245	240	290	275	255
11	290	280	255	220	240	250	245	245	230	230	I 220^{A}	220	205	220	210	200	215	250	245	240	230	275	295	275
12	285	270	250	265	245	255	240	240	240	230	220	225^{R}	205	215	205	I 240^{A}	240	245	250	240	220	260	275	270
13	265	295	285	255	240	245	240	250	245	I 240^{A}	220	220	220	215	205	200	220	245	250	245	245	275	295	295
14	295	265	245	250	290	270	250	240	240	240	I 245^{A}	230	205	230	235	240	I 220^{A}	230	260^{A}	I 245^{A}	250	250	265	290
15	300	310	290	280	255	240	245	245	245	200	I 220^{A}	I 230^{A}	I 205^{A}	200	I 230^{A}	220	215^{H}	245	270	250	240	245	I 255^{A}	I 275^{A}
16	270	285	300	240	300	245	245	245	240	A	C	220	215	I 220^{A}	I 240^{A}	225	I 240^{A}	240	250	I 235^{A}	I 225^{A}	245	225	255
17	245	290	270	290	290	250	230	240	240^{A}	215	235	220	200	195	195	225	240^{A}	245	255	235	225	220	245	295
18	285	295	275	265	290	255	240	245	I 250^{A}	I 240^{A}	220	215	215	200	200	200	I 245^{A}	245	245	255	245	245	275	260
19	280	265	255	240	245	240	205	240	235	240	220	210	A	A	A	240	I 230^{A}	235	240	240	240	260	300	295^{A}
20	295	290	285	250	275	245	245	245	I 230^{A}	210	200^{H}	210	I 225^{R}	200^{H}	245	240	245	255	245	240	215	245	290	295
21	C	C	C	C	245	245	245	245	230	240	I 240^{A}	225^{A}	I 205^{R}	235	230	A	A	A	245	245	240	A	A	270
22	295	255	240	245	250	245	245	240	235	215	I 210^{A}	220	205	200	200	220	245	I 250^{A}	255	250	210	240	305	305
23	290	300	A	A	E 305^{E}	245	240	250	A	A	A	A	C	C	C	C	A	A	C	240^{A}	I 240^{A}	245	295	285
24	270	275	285	255	255	245	240	A	A	A	A	A	A	A	A	A	C	255	250	240	205	245	330	A
25	A	A	290	I 260^{A}	290	255	245	I 245^{A}	I 240^{A}	220	200	200	205	220	235	230	I 225^{A}	245	245	240	240	250	255	290
26	295	290	305	240	240	240	235	240	245	225	220	I 220^{R}	I 205^{R}	205	I 225^{A}	230	200^{H}	240	240	240	240	310	270	255
27	270	295	275	240	220	240	245	240	245^{A}	I 230^{A}	I 220^{A}	I 205^{R}	200	200	245	240	I 250^{A}	255	245	260	245	240	240	245
28	295	295	285	280	250	290	I 250^{A}	I 245^{A}	A	A	A	205	I 210^{A}	I 200^{A}	205	235	230	245	250	260	240	235	240	I 270^{A}
29	I 310^{A}	I 305^{C} I	290^{A}	240	220	255	A	A	A	A	A	230	210	I 210^{A}	200	A	A	A	A	270	245	245^{A}	A	A
30	255	270	255	255	245	245	A	A	A	A	C	210	225^{A}	205	200	215^{H}	240	I 245^{A}	245	260	250	245	245	225
31																								
No.	28	28	28	27	27	29	27	25	23	24	23	27	26	27	27	26	26	27	28	30	30	29	28	28
Median	290	290	280	245	245	250	245	245	240	230	220	220	205	205	210	230	240	245	245	240	240	245	270	275
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Apr. 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	E	145	160	155	120	120	120	120	115	120	G	G	G	E	120	105	E	E	105
2	E	E	E	E	E	E	150	140	155	125	120	G	105	G	G	G	C	C	E	E	E	E	E	E
3	E	E	E	E	105	E	G	C	C	130	C	110	110	110	110	C	105	105	100	100	105	110	E	E
4	E	E	E	C	C	C	C	C	C	115	125	110	115	140	G	170	G	155	E	E	120	E	E	E
5	E	E	E	E	E	E	145	145	145	145	140	130	140	G	145	100	G	G	E	E	125	115	E	E
6	E	E	E	E	E	E	145	145	140	G	120	125	G	G	100	G	G	G	E	E	E	E	E	E
7	E	E	E	E	E	E	G	145	145	140	C	C	C	G	120	110	135	120	145	140	135	120	125	110
8	125	E	E	110	110	E	150	145	140	135	130	110	G	G	G	G	G	G	G	E	E	E	E	E
9	E	E	E	E	E	105	155	145	145	135	130	115	105	105	G	G	105	G	G	E	115	115	110	E
10	120	110	105	E	E	E	155	G	145	120	120	110	110	105	G	G	G	G	G	E	120	105	E	E
11	115	E	E	110	110	E	150	145	140	140	135	G	G	G	G	135	G	G	G	E	105	E	100	E
12	E	E	125	E	E	E	145	G	140	125	120	125	G	110	130	110	150	G	100	100	100	E	E	E
13	E	E	E	E	E	E	G	145	G	140	140	G	115	115	G	G	G	G	105	100	100	100	E	E
14	E	E	110	E	E	E	145	145	145	140	140	G	G	135	140	145	110	110	105	105	115	105	105	E
15	E	110	120	E	E	E	145	145	140	140	120	110	120	G	105	135	135	G	150	125	115	135	120	115
16	105	105	E	E	E	E	145	140	140	120	C	110	105	105	145	140	100	170	100	110	105	105	100	105
17	100	105	105	E	105	100	150	140	125	130	115	110	105	110	110	160	145	135	G	110	105	E	E	E
18	E	E	S	S	105	S	G	140	135	135	130	130	125	110	110	130	110	G	G	110	135	115	E	E
19	E	E	E	E	E	145	145	140	140	130	130	130	115	110	120	120	110	110	105	110	135	130	E	115
20	110	110	105	E	105	E	G	140	125	135	130	120	115	G	G	120	135	140	140	115	110	120	E	E
21	C	C	C	C	E	E	145	140	140	130	130	120	130	120	110	110	105	105	105	110	110	120	110	145
22	E	E	105	105	100	145	145	145	135	120	135	120	120	140	G	105	155	100	100	100	100	100	100	100
23	E	105	105	105	105	E	145	145	140	135	135	130	C	C	C	C	140	140	C	120	130	110	110	110
24	120	105	110	100	100	150	140	140	145	140	120	110	110	105	120	115	C	150	145	120	110	140	E	115
25	110	105	105	100	105	105	140	130	120	125	140	130	115	110	110	110	105	145	125	100	105	E	E	E
26	E	E	E	E	E	E	145	140	125	120	125	120	G	110	110	105	105	105	145	105	100	100	E	E
27	E	E	E	E	E	E	G	145	145	135	G	G	G	140	G	G	145	145	135	100	100	E	E	110
28	E	E	105	E	E	G	140	140	140	115	110	130	110	105	105	105	G	140	130	110	110	105	105	105
29	105	C	105	105	105	150	135	135	125	115	110	110	110	105	110	105	100	135	120	115	105	110	110	105
30	115	E	E	105	105	140	130	135	125	120	C	120	115	115	135	G	170	140	135	135	115	E	120	E
31																								
No.	10	8	12	8	12	8	23	26	27	29	25	24	21	21	19	19	19	18	18	22	27	19	12	12
Median	110	105	105	105	105	140	145	140	140	130	130	120	115	110	110	115	110	140	120	110	110	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

A 11

IONOSPHERIC DATA

Apr. 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							h	h2	h	h	h2	h	h	C	h					6	f			f
2							h2	h	h	h	h2		l											
3					f					h		C2	C2	C2	C2		l3	l5	f3	f3	f3	f3		
4										C2	h	C	C	h		h		h			f			
5							h	h2	h	h	h	h	h		h	l					f	f2		
6							h2	h3	h		h	h			l									
7								h	h	h					h	C	h	C3	h2	f	f3	f3	f	f2
8	f			f	f		h	h2	h	h	h	l												
9						f	h	h	h	h	h	C	l	l2			l				f	f2	f	
10	f	f	f				h		h	h	h	C	C	l2							f	f		
11	f			f	f		h2	h2	h	h	h					h					f		f	
12			f				h		h	h	h	h		C	h	C2	h		l3	f2	f			
13								h2		h	h		C	C					l	f2	f2	f		
14			f				h2	h2	h	h2	h2			h	h	h	C2	C2	l3	f3	f2	f2	f	
15		f	f				h2	h2	h	h	h	C	h		l2	h	h		h2	f2	f	f	f2	f2
16	f2	f					h	h	h2	h		C2	C2	C	h	h2	l3	h2	f2	f3	f2	f2	f	f
17	f2	f2	f2		f	f	h2	h2	h2	h	C	C2	C2	C	C	hC	h2	h2		f	f			
18					f			h	h2	h	h	h	h	C	C2	h	C2			f2	f	f		
19						h	h2	h2	h	h	h	h	C	C2	h2	h2	C3	C	l2	f	f	f2		f2
20	f2	f	f2		f			h	h	h	h	h	C			h	h2	h2	h3	f3	f	f		
21							h2	h2	h	h	h	h	h	h	C	C2	C2	l4	f2	f	f	f2	f4	f
22			f2	f	f2	h	h2	h2	h2	h	h	h	h	h		l2	h2l	l4	f3	f2	f	f	f	f
23		f2	f5	f4	f2		h2	h2	h	h	h	h					h	h4C3		f4	f3	f	f3	f
24	f	f2	f2	f2	f2	h	h2	h2	h	h	h	C	C2	C3	h2	C2		h2	h5	f2	f	f		f2
25	f3	f2	f2	f2	f2	f2	h2l2	h3	h2	h	h	h	C	C	C2	C2	C3	h	hl	f	f			
26							h	h	h2	h	h	h		C	l	C2	l2	C	h	f2	f2	f		
27								h	h	h				h			h2	hl2	h2	f2	f2			f2
28			f				h2	h2	h2	C3	C3	h	C	C2	C	C		h2	h2	f3	f3	f	f2	f2
29	f2		f3	f2	f	h2	h3	h2	h2	C2	C2	C	C	C2	C	l3	l3	h3	C6	f2	f3	f3	f4	f3
30	f			f	f2	h2	h3	h3	h2	h3		h2	C3	C2	h		h2	h3	h2	f2	f3		f	
31																								
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

IONOSPHERIC DATA

Apr. 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	U 3.2 F	U 3.2 F	3.5 S	3.6 S	2.7 S	2.3	4.6	5.2	6.2	6.4 S	6.8	7.3 R	8.6	9.5 S	9.0	8.3 S	8.7	7.3 S	6.5	U 6.6 S	U 6.4 S	U 4.4 S	U 4.1 S	4.0 S
2	4.0 S	U 3.9 S	4.2 S	3.4	2.8	3.1 S	5.0 S	6.6 S	7.4 S U	7.5 S	6.7	7.7 R	U 8.5 S	U 8.3 S	7.3 S	6.9 S I	6.4 C	6.0	U 5.6 S	5.7	5.0 S	4.5	4.4 S	4.5 S
3	4.4 S	4.2 S	3.8	3.8	3.3	3.6	5.7	6.2 S	U 6.5 S	6.6	7.1	7.2 S	8.3 R	J 8.2 R	7.2	6.7	6.1	6.5	6.4	J 6.1 S	J 5.2 S	3.6	3.8	U 3.8 S
4	U 3.6 S	3.9 I	3.9 S	3.6	3.3	3.4	5.5 S	6.1	6.0	6.6	6.6	7.8 R	8.7	7.5 S	8.2 S	6.2	5.7	5.6	6.3	7.0	J 6.7 S	4.8 S	U 3.4 S	4.0 S
5	U 4.0 S	4.0 S	3.9 S	4.5 S	2.6 S	3.0 S	4.8 S U	6.7 S	6.8	7.3	7.2	8.7 R	J 9.8 S	10.0	J 10.5 R	7.1	6.1	6.8	I 7.3 S	I 7.5 S	5.9	3.8	U 3.8 S I	4.2 S
6	J 3.8 S	3.9	3.8	4.1	3.0	C	C	C	6.3	6.2	7.3	J 8.0 R	8.8	7.6	6.5	6.6	6.7	6.1	U 7.1 S	D 7.3 S	6.0 S	J 4.2 S	U 3.8 S I	4.0 S
7	3.6	U 3.5 S	3.9 S	3.7	3.3	3.3	J 5.3 R	J 5.2 R	I 5.6 C	6.6	7.3	J 8.1 R	8.6	8.9	C	C	C	6.9	7.2 S	5.8	I 5.0 A	I 4.2 S	A	A
8	J 3.5 S	A	F	J 3.8 F	2.6	2.9	5.3	J 6.4 R	6.4	7.3	7.4	9.1	9.2	9.3 R	J 10.2 R	9.4 S	U 7.4 S	7.0	6.4	5.4	J 4.8 S	3.8	U 3.8 S I	3.8 S
9	U 4.0 S	C	C	C	C	C	C	C	C	7.5	7.7	U 7.8 S	9.1 S	9.2	8.5 S	8.1	6.7	6.1	6.8	6.3 S	U 4.8 S	3.7	3.6 S	3.4
10	J 3.5 S	3.3	4.0	3.3	J 3.2 F	3.4	5.2	6.2	6.8	6.2	6.9	7.3	7.4 R I	8.0 R J	8.1 R U	7.5 R I	7.6 R	6.8	5.9	5.9	5.0	I 4.2 S J	4.1 S I	4.3 S
11	U 4.5 S I	4.4 F	4.4	U 4.7 S	2.7	3.1	5.1	5.7	J 6.3 R	7.0	J 7.8 S	7.5 R	7.4	U 7.8 R	8.5	J 8.1 R	6.8	6.0	J 6.4 R	6.8	5.6	3.5 S	U 3.9 S U	4.1 S
12	I 4.1 S J	3.8 S	3.9	3.6	3.4	U 3.6 S	5.4	5.8	6.4	6.7	7.3 S U	8.3 S	U 8.3 S U	7.2 S U	7.4 S U	8.1 S	6.2	6.8	7.2 S	U 7.1 S	5.8 S	4.1	U 3.8 S	4.7 S
13	U 4.2 S U	4.5 S U	4.2 S	4.1 S	3.5	3.2 S	5.8 S	6.1	U 6.5 S I	7.2 S U	7.5 S J	8.2 R	J 8.2 R	8.4	7.8	J 8.2 S	I 7.6 R	7.4	U 7.3 S	J 6.4 S	J 5.3 S I	4.8 S	4.8	J 4.6 S
14	U 4.4 S U	4.6 S	4.4 S U	4.1 S	U 4.1 S U	3.4 S	5.6	5.9	6.4	6.5	9.5	8.7	J 7.8 R U	7.6 R J	7.8 S	6.8	6.8	6.4	6.6	U 7.4 S	6.2 S J	5.4 S	5.2	5.1
15	I 4.9 F I	4.7 F U	4.4 S J	4.3 S	4.4	J 4.5 S	5.1	I 5.4 A	5.6	6.6	7.7 S J	9.2 R	9.4	9.0	8.4	7.3	6.0	6.1 S	7.0	I 6.9 S	U 7.3 S J	5.2 S J	4.9 F	4.8 S
16	I 4.7 S	4.4 F	3.8 F	I 3.6 F	2.6	I 4.0 F	5.7	5.9	5.8	6.9	7.1	7.7	U 8.3 S	8.5	9.1	8.5	7.3 S	6.7	7.1	U 7.8 S	7.1	U 4.4 S	5.0 S	4.5
17	U 4.5 S	4.1	4.0 S	3.6 S	3.6 S	4.1 S	5.7	5.8 S	6.8 S	7.2 S	7.1	7.1 S U	8.8 S	9.5	9.0 S J	8.4 S	6.9	6.4	7.3 S	8.4 R U	6.6 S	3.8 S	3.5	3.7
18	U 3.8 S	3.7 S U	3.6 S	3.8 S	3.4 S U	3.9 S	5.9	5.8	6.1 S	6.0	6.8	8.4	8.7	9.0	9.0	9.1	7.4	6.4	U 6.5 S	J 5.5 S	U 3.9 S I	4.7 S I	4.8 S I	4.8 S
19	U 4.7 S J	4.5 S I	4.6 S U	4.5 S	3.8 I	4.4 S	5.3	6.0	6.8	7.0	6.8	8.9	9.7	8.9	9.1	8.9	U 8.3 S U	9.0 S	7.2 S	5.8	4.7 S	4.1 S	3.7 S	3.7
20	U 3.8 S	3.8 S	4.3 S	4.2 S	3.3 S U	4.3 S U	5.9 S U	6.6 S	7.0 S	6.9	7.5 J	7.9 R	9.0	9.0 J	8.0 S	7.3	J 8.1 R	J 8.3 S	9.4	I 8.0 S	5.6	4.5	I 4.3 S	4.4
21	U 4.3 S	4.1	J 4.1 F I	4.0 S F	3.8 S U	4.3 S	5.8	6.1	6.4 R	6.8	6.9	7.1 S	U 7.8 S I	7.6 A	7.0	U 7.5 S	J 8.2 R	J 7.8 R	6.9	I 6.4 A	6.1	3.9	F	A
22	3.5	3.5	A	A	2.5	3.5	5.4 S	6.6	I 7.6 R	7.2	5.8	7.2	9.1	9.1 S U	9.5 S	10.5	9.2	U 7.4 S U	7.5 S U	7.4 S	5.9	3.4	3.3 S U	3.4 S
23	U 3.5 S U	3.5 S	3.3	3.1 S	3.3 S	3.8 S	5.4	6.1 S	6.9	7.0	7.4	6.9	7.5 I	8.4 R U	8.9 R J	10.3 R	10.5 D	9.5 S	9.4 S U	7.8 S	J 5.1 S U	4.3 S I	3.7 F	J 3.8 F
24	I 3.7 S I	3.9 A I	3.9 S U	3.8 S I	3.7 A I	4.4 A	5.5	U 5.6 R	A	6.1	7.3 S U	8.1 S	U 8.4 S	9.0 R	9.9 S U	9.8 S	U 9.8 S U	8.4 S U	7.6 S I	7.8 S	3.9 S	2.9 S	3.2 S U	3.2 S
25	3.2 S	3.6 S	3.4 S U	3.3 S	2.4	3.5	5.9	U 6.3 S	6.4 S	7.3	6.8	7.2 S	U 8.7 S U	9.7 S U	10.1 S	10.5 S	9.0 S	7.2 S	6.7 S U	7.5 S	5.7	4.1	U 4.4 S	4.7 S
26	U 4.7 S	4.3 S	4.1 S	3.9 S	3.6 S	3.7	5.3	6.2 S	6.7 S	6.9	7.1	7.7 S	8.6	9.3	9.5 S U	9.9 S	8.8	U 7.6 S	7.3	6.1 S	5.1	4.8	U 4.3 S U	4.8 S
27	4.3	4.2 S U	4.3 S U	4.8 S	2.7	3.4 S	5.4	U 7.0 S	5.8	6.3	6.5	7.1	J 8.1 R	8.4 R	8.7	8.9	U 7.6 R	6.8	6.4	J 7.5 S	I 6.8 S	6.9	5.3	J 4.9 S
28	J 4.6 S	5.1	J 5.0 S U	4.4 S	4.8 S	5.3	J 6.5 R U	7.8 S	A	5.2	5.7	6.4	7.6	J 8.4 R	9.1	I 7.0 A	6.5	6.4	7.4	8.9	J 8.4 R	J 5.4 S	3.6	3.4
29	3.3	I 3.3 A I	3.2 A I	2.9 A	2.6 R	3.9	5.8	6.0	I 7.3 R	6.2 R I	6.5 A	7.2	J 6.6 R I	7.0 A J	8.1 R	8.6	J 8.1 R	J 7.9 S	7.4	J 8.4 R	I 7.0 S I	5.2 S	4.4 S	A
30	A	4.4 S I	4.0 S I	4.0 A I	4.1 F	4.2	5.3	J 6.4 R	6.1	6.4	6.6	7.0	7.5	8.2 S	8.7 R	8.6 R	U 8.0 S	7.0	6.2	6.6	7.1 S U	6.3 S	5.4	4.6
31																								
No.	29	28	27	28	29	28	28	28	27	30	30	30	30	30	29	29	29	30	30	30	30	30	28	27
Median	U 4.0	4.0	4.0	3.8	3.3	3.6	5.4	6.1	6.4	6.8	7.1	7.7	8.6	8.4	8.7	8.2	7.4	6.8	7.0	7.0	5.8	4.2	4.0	4.1
U.Q.	4.4	4.4	4.3	4.2	3.6	4.2	5.7	6.6	6.8	7.2	7.4	8.2	8.8	9.1	9.1	8.9	8.2	7.4	7.3	7.5	6.6	4.8	4.6	4.7
L.Q.	3.6	3.6	3.8	3.6	2.7	3.4	5.3	5.8	6.1	6.5	6.8	7.2	7.8	8.0	7.9	7.2	6.6	6.4	6.4	6.1	5.0	3.8	3.7	3.8
Q.R.	0.8	0.8	0.5	0.6	0.9	0.8	0.4	0.8	0.7	0.7	0.6	1.0	1.0	1.1	1.2	1.7	1.6	1.0	0.9	1.4	1.6	1.0	0.9	0.9

The Radio Research Laboratories, Japan

foF2

Sweep 1.0 Mc to 2.0 Mc in 20 sec in automatic operation

K 1

IONOSPHERIC DATA

Apr. 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	S	L	S	S	S	L	S	L	S						
2								S	S	L	S	L	S	S	S	S	C							
3									L	4.2L	L	4.5L	A	A	A	L	A	A						
4								L	L	L	L	S	S	L	"4.4S	S	S	S						
5								L	L	L	L	L	"4.7L	L	A	L	A							
6							C	C	L	L	A	L	L	4.5L	L	L	L							
7									C	L	4.6L	L	L	S	C	C	C	L						
8							A		L	L	L	L	4.7L	L	4.6L	L	L	L						
9							C	C	C	L	S	L	L	S	S	L	L							
10									L	L	L	L	L	"4.6S	4.5L	"4.5L	L							
11									L	4.6L	"4.6L	"4.5L	4.7L	4.6	4.5L	L	L							
12									L	L	L	S	L	S	S	A	A	L						
13									S	L	L	"4.8L	L	L	S	4.5L	L	L						
14								L	L	"4.8L	"4.6L	"4.7L	L	L	L	L	L							
15								A	A	S	4.6L	L	B	S	L	L	L							
16								L		L	L	A	A	S	L	L	A	A						
17									L	A	S	S	A	A	L	S	S							
18									S	A	"4.8L	4.6L	4.6	4.7L	A	L		A						
19									L	L	S	A	L	A	S	L	L	L						
20								L	L	L	L	L	4.7	4.7	4.5S	L	L	L						
21								L	L	L	4.7L	L	L	A	L	L	L	A						
22								L	L	L	S	S	S	S	S	S	S	S						
23									A	A	A	A	4.8L	A	A	A	A	A						
24								A	A	A	S	A	S	A	S	S	A							
25								S	A	A	S	S	S	S	S	S	A							
26								S	L	S	L	S	S	S	S	S	4.0L							
27								S	S	L	L	"4.6L	4.7L	S	S	L	L							
28							A	A	A	A	A	A	L	S	L	A	L	L	A					
29							A	A	A	L	A	A	A	A	A	A	A	A	A					
30							A	A	A	A	A	A	S	S	S	S	L	S						
31																								
No.										3	6	6	7	5	5	2	1							
Median										4.6	"4.6	"4.6	4.7	4.6	4.5	"4.5	4.0							
U.Q.																								
L.Q.																								
Q.R.																								

foF1

Sweep 10 Mc to 200 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K 2

IONOSPHERIC DATA

Apr. 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	S	I2.75R	2.90R	3.15	S	A	A	3.15S	A	R	S						
2							S	S	R	I2.90S	I3.10S	3.25R	S	A	A	I2.90S	I2.60C	S						
3							S	I2.20S	2.70	3.00	A	A	A	A	A	A	A	A						
4							"2.10S	2.55	I2.90S	3.05R	A	S	S	I3.30S	I3.15A	2.95R	S	S						
5							S	S	R	3.10	S	S	A	S	I3.00A	R	A	S						
6							C	C	2.80	3.05	B	S	R	R	R	A	"2.50R	S						
7							S	2.40	I2.85CI	3.00SI	3.30SI	3.30S	I3.35S	S	C	C	C	A						
8							B	I2.45RI	2.80B	S	S	B	B	A	S	S	S	S						
9							C	C	C	I3.20R	S	S	S	S	S	I3.05R	2.75R	S						
10							S	I2.50R	I2.90R"	3.20S	A	S	A	A	"3.30SI	3.10RI	2.80S	2.30						
11							S	I2.55SI	3.00RI	3.20SI	3.35SI	3.35S	"3.40S	3.30SI	3.15SI	2.80RI	2.40A"	2.25R	S					
12							I2.15S	2.80	2.95	A	I3.30SI	3.40S	I3.40SI	3.35S	R	A	A	S	A					
13							S	I2.55R	I3.00RI	3.30SI	3.50S	A	S	S	I3.30S	3.05R	I2.60A	A	S					
14							S	2.55	2.90R"	3.35R	S	S	B	"3.35R	3.20RI	3.10R"	2.85R	A	S					
15							A	2.60"	3.00R	3.35SI	3.35R	S	B	S	S	I3.00SI	2.65B	S	S					
16							2.10R	2.60R	I2.80RI	3.10R	S	A	A	A	A	R	S	A	S					
17							S	R	2.80RI	3.05RI	3.25S	A	A	S	I3.10SI	2.90RI	2.65R	S	S					
18							2.45RI	2.65R	I2.95R	3.40SI	3.40RI	3.35R	S	S	S	A	R	A	S					
19							2.10	2.75	3.00	I3.25RI	3.40S	S	S	S	S	R	A	2.25	S					
20							S	I2.50R	2.70RI	3.15S	A	S	B	A	A	S	2.80	B	S					
21							2.15	2.60	2.90RI	3.15AI	3.25SI	3.30S	"3.30SI	3.20A	A	A	A	A	S					
22						S	2.20	I2.90R	2.80	R	A	S	S	A	S	A	A	A	S					
23							S	S	R	S	S	S	S	S	S	S	I2.50A	S	S					
24							2.20	"2.60R	"3.00R	S	S	R	R	S	S	S	S	A	S					
25							A	R	R	3.25	S	S	S	A	A	S	R	A	S					
26							S	S	R	A	3.35S	S	A	A	S	S	R	A	S					
27							I2.15SI	2.50S	S	S	S	S	S	S	S	S	R	I2.30S	S					
28							S	2.70R	I3.00RI	3.30S	S	S	S	S	S	R	I2.80B	2.60	S					
29							I2.40S	2.70	R	S	S	S	A	A	A	A	2.70	2.25	S					
30							2.30	2.60	3.00	S	S	S	A	A	S	A	S	R	S					
31																								
No.							11	21	22	21	12	6	4	5	8	9	13	6						
Median							2.15	2.60	"2.90	"3.15	"3.30	"3.30	"3.40	"3.30	"3.15	"3.00	"2.65	2.30						
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

IONOSPHERIC DATA

Apr. 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	S	S	E	S	S	S	3.4	4.5	3.7	3.7	J3.9	3.5	G	3.1	3.1	S	S	2.0	S	S	S	S
2	S	S	S	E	E	S	S	S	3.1	3.4	S	G	3.2	3.3	3.4	S	C	S	S	S	S	S	S	S
3	S	S	S	E	S	S	S	S	3.1	3.4	3.3	J3.7	5.7M	J6.0	5.4M	J4.9	5.0M	4.9M	3.2	2.2M	S	3.2M	3.0Y	2.4
4	S	S	E	E	E	E	G	2.8	S	3.4	4.0	G	S	S	3.1	G	S	S	S	S	S	S	S	S
5	S	S	S	E	E	S	2.3	2.4	G	G	S	S	4.0S	G	4.9	3.5S	J3.7	2.5	S	3.2	S	S	2.3	2.4
6	S	S	E	E	S	C	C	C	3.2	3.4	5.0	4.1	3.3G	3.2G	3.0G	3.3M	G	S	S	3.0M	2.3	S	S	S
7	S	2.1M	E	E	E	S	J2.8	3.1	C	3.9S	3.8	4.7M	3.8	5.1S	C	C	C	J4.2	3.2M	4.6M	4.3M	2.4M	4.9M	J6.5
8	5.0M	5.7M	4.0M	E	2.4	2.2M	J4.2	G	3.2	G	S	B	B	3.3	S	S	S	S	S	S	S	S	S	S
9	S	C	C	C	C	C	C	C	C	G	S	S	S	G	S	G	G	S	S	2.3M	S	2.3	3.0M	2.3
10	S	J3.6	1.9	E	E	S	2.5	G	G	G	4.1S	G	3.8	4.0	G	2.2G	S	G	S	S	S	2.2	S	S
11	S	S	E	E	S	S	2.3	S	G	S	G	4.0S	3.9	G	G	3.0	3.1Y	G	S	S	S	S	S	S
12	S	S	E	2.2M	E	S	G	2.4G	3.3S	3.3	S	S	S	G	3.1	J5.4	4.2	2.9	4.0	J4.1	3.2	2.2	S	2.4
13	S	2.3	S	1.8	S	S	S	G	G	G	G	3.7	3.7	G	S	2.8G	2.5	2.3	2.2	2.4M	S	S	S	S
14	S	S	S	E	E	S	2.4S	3.1	3.4	G	3.9	G	B	3.9	G	G	G	2.3	S	2.4	2.4M	3.7M	2.4M	2.2M
15	S	2.4	E	2.4	2.3	S	2.5	5.5M	5.8M	4.1	G	4.0Y	B	S	S	4.1Y	B	S	S	3.3M	2.4	3.2M	S	J4.3
16	E	2.0M	2.1	E	1.3	E	2.4	3.2	3.1	G	S	7.6M	7.3	4.8	3.3	G	5.8	5.8	5.0	3.6	4.6	2.3	2.3	2.2
17	S	S	2.2	2.0	E	S	2.4	3.0	4.2	J7.2	3.6	4.1	7.3	4.6	G	G	3.4	2.7	4.2	3.1	3.1	3.3	2.3	2.3
18	S	S	2.2	2.2	E	S	G	3.4	4.0	J4.7	4.3	4.0	3.7S	4.1S	5.7M	4.2	2.5G	4.7M	3.9	2.2	2.4	3.4M	3.6M	4.0M
19	S	S	S	E	E	S	2.5	3.3	3.8	4.7	S	5.0	4.3	5.8	4.0	3.4	3.0	G	S	J5.6	2.3	2.1	S	J3.4
20	2.0	S	2.4	2.2	1.8	S	2.2	3.1	3.4	4.1	4.0S	S	B	4.1	3.4	3.3	3.5	3.8	4.9M	3.3M	2.4	2.2M	S	S
21	S	S	E	E	1.8	S	2.4	3.4	3.6	3.5S	3.6	3.8S	3.8	8.3MJ	4.2S	5.7M	3.9	5.8M	2.6S	J7.0	J4.8	3.3M	3.3M	5.8M
22	J3.6	4.2S	J6.2S	J4.8	3.0M	2.4	3.4	4.9	J3.7S	3.3	3.3	S	3.3	4.4	S	3.3	3.3	2.3	3.1	S	2.3	1.7	2.3	J3.0
23	S	2.2	2.5	2.2	1.9	S	2.9	5.5	6.2	5.6	5.8	6.2M	J4.2S	6.8	4.8M	5.8	5.7	4.8	2.4	S	2.4	S	2.5	J3.0
24	3.0M	4.1M	3.2M	3.3	4.0M	4.4M	3.3	5.7M	J7.4	5.7	5.5	4.3	4.7	4.8	4.1	3.6	4.5	4.0	3.1	2.9	2.9	2.2	S	S
25	S	2.1	3.0	J4.1	2.3	J3.1	3.2	3.3	5.3	5.6	4.0	S	S	3.6	3.0	3.2	J5.7	J5.3	3.6	3.1	3.1	S	S	S
26	S	S	S	S	E	S	2.3	3.1	3.3	4.1	G	S	4.0	3.6	S	3.4	3.3	3.8	J3.6	2.5	2.2	S	S	S
27	S	S	S	E	E	S	S	3.4	3.6	3.6	4.1S	S	S	S	S	S	G	S	3.7M	5.5M	J3.3	S	S	S
28	S	3.9M	3.0	3.0	S4.3S	J4.9S	5.7	4.9	7.1M	5.6	4.3	4.8	J4.0S	4.2	5.1	11.1M	4.0	3.4	J7.4S	J6.1	J3.2	2.2	3.2M	5.7M
29	3.3M	4.9M	3.8M	4.6M	2.3	3.2	4.9	5.4M	4.8	S	6.8M	5.4M	5.9MJ	7.8	7.5M	5.9M	4.5	J4.6	5.2M	4.5M	J6.2	J6.8	3.6	5.9M
30	4.8M	4.0M	3.1MJ	4.9S	2.5	S	4.9M	J5.1	J6.8	5.6	J6.0	5.8	3.9	4.0	J4.1	3.1	S	3.3	5.2	J3.0	3.6	2.4	2.2	S
31																								
No.	7	13	20	27	25	8	23	24	27	28	23	21	21	27	22	26	23	22	18	23	20	18	14	16
Median	3.3	3.6	2.2	E	E	2.8	2.5	3.2	3.4	3.6	4.0	4.0	3.9	4.0	3.4	3.3	3.4	3.6	3.6	3.1	3.0	2.4	2.8	3.0
U.Q.	4.8	4.2	3.0	2.4	2.3	3.8	3.3	4.9	4.8	4.7	4.3	4.9	4.5	4.8	4.8	4.2	4.5	4.7	4.9	4.5	3.4	3.3	3.3	5.0
L.Q.	2.0	2.2	E	E	E	E	2.3	2.9	3.1	G	3.3	3.7	3.8	3.3	G	G	2.5	2.3	3.1	2.4	2.4	2.2	2.3	2.4
Q.R.	2.8	2.0					1.0	2.0	1.7		1.0	1.2	0.7	1.5			2.0	2.4	1.8	2.1	1.0	1.1	1.0	2.6

foEs

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

The Radio Research Laboratories, Japan

K 4

IONOSPHERIC DATA

Apr. 1963 | f_bEs | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35°42.4'N | Long. 139°29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	S	S		S	S	S	3.3	3.4	3.6	E3.7S	E3.9S	E3.5S		E3.1S	3.0	S	S	1.9	S	S	S	S
2	S	S	S			S	S	S	E3.1S	E3.4S	S		E3.2S	E3.3S	E3.4S	S	C	S	S	S	S	S	S	S
3	S	S	S		S	S	S	S	3.0	3.3	3.3	3.6	5.1	5.3	4.3	3.1	4.6	4.0	U3.1S	E	S	2.5	2.5	2.2
4	S	S						2.8	S	E3.4S	3.9		S	S	E3.1S		S	S	S	S	S	S	S	S
5	S	S	S			S	E2.3S	E2.4S			S	S	3.9S		4.6	U3.5S	3.5	2.5	S	2.5	S	S	E	1.9
6	S	S			S	C	C	C	U3.2S	3.2S	4.5	E4.1S	E3.3S	3.0	E3.0S	3.3		S	S	2.8	E	S	S	S
7	S	E				S	2.6	3.0	C	U3.5S	3.7	4.0	U3.8S	5.1	C	C	C	3.5	3.0	3.5	A	E2.4S	A	A
8	2.0	A	1.8		1.6	2.1	U4.1A		3.2		S	B	B	E3.3S	S	S	S	S	S	S	S	S	S	S
9	S	C	C	C	C	C	C	C	C		S	S	S		S			S	S	E2.3S	S	2.3	2.0	1.8
10	S	2.8	1.9			S	2.5			S	U3.9S		3.8	4.0		E2.2R	S		S	S	S	E	S	S
11	S	S			S	S	E2.3S	S		S		3.9	U3.6S			U3.0S	3.1		S	S	S	S	S	S
12	S	S		1.7		S		2.3H	U3.3S	3.3	S	S	S		E3.1S	4.1	4.2S	2.8	2.8	2.6	2.8	2.1	S	2.4
13	S	1.9	S	E	S	S	S					3.7	E3.7S		S	2.8H	E2.5RU	2.3S	2.2	E	S	S	S	S
14	S	S	S			S	S	3.0	3.3		3.8S		B	U3.9S				E2.3S	S	2.1	1.9	3.0	E	2.1
15	S	E		2.0	E	S	2.5	A	5.0	E4.1S		U3.9S	B	S	S	3.8	B	S	S	2.7	2.1	2.4	S	2.6
16		E	E		E		E2.2R	2.8	3.1		S	7.0	6.3	4.5	3.3		4.9	4.7	2.8	2.6	A	2.1	2.0	2.1
17	S	S	1.6	E		S	E2.4S	2.8	3.4	4.5	3.6	4.1	6.5	4.6			E3.4S	2.3	4.0	U3.0A	2.2	E3.0A	E	2.2
18	S	S	2.0	1.7		S		3.2	3.9	4.5	4.3	3.9S	3.7	3.9	5.1	4.2	E2.5S	4.5	U3.9S	1.8	2.2	2.6	3.0	1.9
19	S	S	S			S	2.5	3.1	3.8	4.1	S	4.6	4.0	4.7	E4.0S	3.4	2.9		S	3.5	E	2.0	S	2.6
20	E	S	E	1.5	1.6	S	E2.2S	3.0	3.3	3.6	E4.0S	S	B	E4.1SE	3.4S	3.3	3.2	3.1	4.2	3.0	1.9	1.8	S	S
21	S	S			E	S	2.4	3.0	3.5	U3.4SE	3.6S	3.6	E3.8S	A	E4.2S	4.2	3.7	4.7	2.6	A	E	2.1	2.1	A
22	2.6	2.7	A	A	1.8	S	3.3	3.4	U3.5SE	3.3SE	3.3S	S	E3.3SE	4.4S	S	E3.3SE	E3.3SE	2.3SE	3.1S	S	E2.3SE	1.7S	E	2.4
23	S	E	1.7	E	E	S	2.9	4.5	5.6	5.0	5.3	5.6	4.1	6.2	4.5	5.4	5.1	A	2.1	S	2.0	S	1.9	E
24	2.5	A	2.0	2.6	A	A	3.2	4.6	A	4.8	4.5S	4.3	E4.7R	4.3	E4.1S	E3.6S	4.0	3.3	2.6	2.2	2.1	2.0	S	S
25	S	2.0	1.8	2.1	1.6	2.5	3.0	3.2	4.4	4.8	3.9	S	S	E3.6SE	3.0SE	3.2S	3.3	4.4	3.0	2.1	2.1	S	S	S
26	S	S	S	S		S	E2.3SE	3.1SE	3.3SE	4.1S		S	E4.0SE	3.6S	S	E3.4S	3.2	E3.8S	3.0	2.2	E	S	S	S
27	S	S	S			S	S	E3.4SE	3.6SU	3.6SE	4.1S	S	S	S	S	S		S	3.1	5.1	3.1	S	S	S
28	S	3.6	2.0	1.8	2.0	E	U4.2A	4.2	A	4.5	E4.3S	4.8	E4.0SE	4.2S	4.5	A	3.9	3.3	5.4	4.2	2.0	2.1	2.2	2.8
29	2.6	A	A	A	1.5	2.1	4.5	4.6	4.4	S	A	4.7	5.1	A	7.0S	4.7	4.4	4.0	4.5	4.2	6.3	2.7	3.5	A
30	A	2.8	2.8	A	1.8	S	4.4	4.6	5.1	4.7	4.7	5.1	E3.9SE	4.0SE	4.1S	3.1	S	3.3	3.5	2.8	2.6	E	E	S
31																								
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

K 5

IONOSPHERIC DATA

Apr. 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	E1.90S	E1.70S	E1.70S	E1.70S	1.10	E1.55S	E2.20S	E2.80S	2.05	2.05	2.65	E3.40S	2.20	2.70	2.60	2.80	2.00	E2.60S	E2.20S	E1.60S	E2.10S	E2.20S	E2.05S	E1.85S
2	E2.10S	E2.15S	E1.55S	1.10	1.20	E2.15S	E2.70S	E3.60S	2.05	E3.00S	E4.10S	2.65	2.70	2.70	2.50	E4.05S	I2.00C	E3.25S	E2.00S	E2.15S	E1.80S	E2.00S	E2.00S	E1.70S
3	E2.00S	E1.65S	E1.75S	1.50	E1.65S	E2.10S	E2.15S	E2.70S	2.20	2.60	2.70	3.10	2.70	2.70	2.20	2.10	2.10	2.10	E1.90S	E1.70S	E1.95S	E2.10S	E2.00S	E1.60S
4	E1.60S	E1.90S	1.10	1.50	1.20	1.70	E1.70S	2.10	E3.00S	2.45	2.75	3.00	E4.50S	E4.00S	2.70	2.15	E2.95S	E2.90S	E2.70S	E2.05S	E2.00S	E2.05S	E1.90S	E1.85S
5	E1.90S	E1.85S	E1.70S	1.00	1.45	E1.90S	E2.10S	E2.15S	2.15	2.25	2.70	E4.40S	E3.25S	E2.80S	3.10	2.20	2.30	E2.00S	E2.80S	E1.80S	E2.00S	E1.90S	E1.80S	E1.80S
6	E1.80S	E1.70S	1.50	1.05	E1.60S	C	C	C	2.10	2.15	3.15	E3.60S	2.80	2.10	2.10	2.10	2.00	E2.20S	E2.00S	E2.10S	E1.70S	E1.80S	E1.80S	E1.90S
7	E1.80S	1.50	1.60	1.10	1.10	E1.60S	E1.85S	1.60	I2.15C	2.65	E3.30S	E3.45S	E3.05S	2.20	C	C	C	E1.90S	E1.50S	E1.80S	E1.80S	E1.70S	E2.00S	E1.60S
8	E1.60S	E1.60S	E1.65S	1.30	1.05	E1.60S	2.10	2.20	2.95	E3.00S	E3.60S	4.30	3.60	2.70	E3.70S	E3.50S	E3.00S	E2.75S	E2.10S	E2.00S	E1.70S	E2.20S	E2.00S	S
9	E1.90S	C	C	C	C	C	C	C	C	2.80	E4.50S	E3.70S	E4.50S	2.80	E3.50S	2.65	2.10	E2.50S	E2.10S	E1.95S	E2.20S	E1.80S	E1.60S	E1.60S
10	E1.70S	E1.60S	E1.50S	1.60	1.60	E1.70S	E2.10S	2.10	2.10	2.80	E3.00S	2.75	E3.20S	E3.00S	2.80	2.00	E2.95S	E1.70S	E2.10S	E2.00S	E2.00S	E2.10S	E2.00S	E1.80S
11	E1.90S	E1.85S	1.40	1.20	E1.95S	E1.60S	E2.15S	E3.00S	2.00	E2.30S	E2.80S	E3.60S	3.05	2.70	E3.00S	2.15	2.10	E2.00S	E2.00S	E1.80S	E1.70S	E2.60S	E2.00S	E2.00S
12	E1.80S	E1.80S	1.50	1.15	1.10	E1.70S	E2.00S	2.10	2.30	2.30	E3.55S	E5.00S	E4.50S	2.80	2.15	2.10	2.10	E2.70S	E1.80S	E2.05S	E1.85S	E1.70S	E2.25S	E1.90S
13	E2.00S	E1.55S	E1.65S	E1.70S	E1.55S	E1.85S	E2.65S	2.00	2.05	E2.70S	2.80	2.80	E3.40S	E2.80S	E4.60S	2.60	1.80	E1.80S	E1.80S	E1.90S	E1.80S	E1.90S	E1.80S	E1.80S
14	E1.80S	E1.70S	E1.70S	1.50	1.05	E2.10S	E2.25S	1.80	2.10	2.70	E3.50S	E3.20S	4.00	3.10	2.80	2.10	2.20	E1.65S	E2.00S	E1.70S	E1.60S	E1.70S	E1.50S	E1.70S
15	E1.50S	1.40	1.40	1.30	1.40	E1.80S	1.60	1.80	2.15	2.75	2.30	E3.55S	5.10	E4.50S	E3.80S	E3.45S	2.60	E2.10S	E1.60S	E1.70S	1.30	E1.80S	E1.50S	E1.80S
16	1.40	1.40	1.40	E	E	1.20	E1.80S	2.00	2.00	2.10	E4.00S	2.80	2.80	2.75	2.10	2.20	E2.80S	1.90	E1.85S	E1.65S	E1.70S	E1.85S	E1.65S	E1.90S
17	E1.95S	E1.85S	1.45	E1.60S	1.10	E1.85S	E2.20S	2.00	2.00	2.10	E3.40S	3.05	2.75	2.65	2.60	2.15	2.10	E2.25S	E1.95S	E1.85S	E2.00S	E1.75S	E1.85S	E1.95S
18	E2.10S	E1.60S	E1.55S	E1.60S	E	E1.95S	E2.10S	2.10	2.10	2.15	2.80	2.80	2.80	2.80	E2.80S	2.15	2.00	E2.00S	E1.70S	E1.50S	E1.90S	E1.70S	E1.70S	E1.70S
19	E1.90S	E1.60S	E1.70S	E	1.00	E1.60S	E1.70S	2.10	1.90	2.10	E4.30S	2.75	2.60	2.30	E3.40S	2.10	2.10	1.80	E2.05S	E1.90S	E1.80S	E1.90S	E1.65S	E1.90S
20	E1.60S	E1.90S	1.40	E	E	E2.55S	E2.05S	E2.75S	2.05	E3.10S	E2.80S	E4.00S	4.40	2.60	2.85	E2.80S	2.00	2.60	E1.60S	E1.50S	E1.60S	E1.40S	E1.80S	E1.60S
21	E1.50S	E1.55S	1.50	1.50	1.00	E2.10S	E1.95S	2.10	2.10	2.70	2.70	2.50	2.10	E2.80S	2.10	2.10	2.10	E1.90S	E1.75S	E1.70S	E1.50S	E1.70S	E1.50S	E1.60S
22	E1.50S	E1.50S	1.40	1.10	E1.70S	E1.50S	1.70	2.10	2.10	2.15	2.80	E5.05S	3.10	2.80	E5.05S	2.25	2.25	1.80	E2.60S	E2.70S	E2.10S	1.50	E1.70S	E1.90S
23	E2.15S	E1.75S	1.40	1.15	1.00	E2.15S	E2.10S	2.00	2.10	2.00	E3.50S	E3.50S	E3.65S	E3.50S	E3.50S	E2.90S	2.20	E2.00S	E1.90S	E1.80S	E1.50S	E1.95S	E1.50S	E1.70S
24	E1.50S	E1.70S	E1.30S	E1.50S	E1.70S	E1.70S	1.40	2.10	2.15	E3.20S	E3.45S	2.50	2.20	E3.45S	E3.30S	E2.80S	E2.80S	1.60	E1.90S	E1.90S	E1.60S	E1.75S	E1.75S	E2.25S
25	E1.90S	E1.80S	E1.70S	1.00	1.40	1.30	1.90	2.10	2.20	2.15	2.80	E4.60S	E4.60S	2.70	2.10	E2.80S	2.05	2.00	E2.00S	E1.95S	E1.90S	E1.85S	E2.10S	E2.05S
26	E2.50S	E1.90S	E2.00S	E2.00S	1.50	E1.80S	E2.10S	2.00	2.15	2.60	2.65	E5.10S	3.05	2.80	E5.05S	E3.10S	2.15	2.05	E1.85S	E2.05S	E1.90S	E1.85S	E1.90S	E1.80S
27	E1.85S	E1.85S	E1.70S	1.40	1.00	E1.90S	E2.55S	2.10	E3.00S	2.10	E2.70S	E4.40S	E4.10S	E4.50S	E4.50S	E3.50S	2.10	E2.80S	E2.00S	E1.90S	E1.70S	E1.90S	E1.80S	E1.80S
28	E1.90S	E1.60S	E1.50S	E1.50S	1.00	E1.90S	E2.40S	1.70	2.10	2.75	E3.45S	E3.50S	E3.50S	E3.50S	2.80	2.10	2.85	2.00	E1.60S	E1.50S	E1.80S	E1.60S	E1.60S	E1.80S
29	E1.90S	E1.60S	E1.50S	E	E	E2.00S	E2.20S	2.10	2.10	E4.10S	2.90	E3.40S	E3.00S	2.60	2.70	2.15	2.20	1.50	E1.70S	E1.70S	1.40	E1.80S	E1.80S	E1.50S
30	E1.50S	E1.60S	1.40	1.00	1.00	E2.00S	1.60	1.80	2.10	2.75	2.60	E3.50S	2.40	2.80	2.70	2.70	E3.60S	2.10	E2.10S	1.60	E1.75S	E1.70S	E1.80S	E2.05S
31																								
No.	30	29	29	22	23	28	28	22	27	24	30	30	18	20	17	20	23	30	30	30	30	30	30	29
Median	E1.90	E1.70	E1.50	1.10	1.05	E1.80	E2.10	2.10	2.10	E2.30	E2.85	E3.50	2.80	2.70	2.70	2.15	2.10	E2.00	E2.00	E1.80	E1.80	E1.80	E1.80	E1.80
U.Q.																								
L.Q.																								
Q.R.																								

f-min

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

The Radio Research Laboratories, Japan

K 6

IONOSPHERIC DATA

Apr. 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	U2.80 F U2.80 S	2.75 S	3.05 S	3.15 S	3.05	3.40	3.40	3.20	3.10 S	3.15	2.90 R	2.95	3.05 S	3.20	3.05 S	3.20	3.20 S	3.10	U3.05 S	U3.30 SU	3.00 S	U2.70 S	2.75 S	
2	2.80 SU	2.85 S	3.05 S	3.10	3.25	2.80 S	3.15 S	3.15 S	3.15 S U	3.35 S	3.15	3.15 S	U3.20 SU	3.15 S	3.20 S	3.30 S	I3.25 C	3.35	U3.20 S	3.15	3.10 S	2.85	2.85 S	2.90 S
3	2.95 S	2.90 S	2.75	2.90	3.10	2.70	3.35	3.35 S	U3.25 S S	3.35	3.10	3.35 S	3.25 RJ	3.30 R	3.05	3.15	3.25	3.25	3.25	J3.40 S	J3.25 S	3.35	3.10	U2.85 S
4	U2.85 S	2.85	S	3.20	3.00	2.95	3.45 S	3.45 S	3.35	3.25	3.15	3.15 R	3.20	3.25 S	3.15 S	3.25	3.20	3.20	3.15	3.05	J3.15 S	3.05 S	U2.70 S	2.75 F S
5	U2.75 S	2.65 S	2.65 S	3.15 S	3.05 S	2.70 S	3.25 SU	3.25 S	3.10	3.25	2.90	2.90 R	J3.05 S	3.00	J3.15 R	3.30	3.15	3.20	S	S	3.40	2.85	U2.85 S	S
6	J2.90 S	2.85	2.90	3.25	3.30	C	C	C	3.10	3.25	3.15	J3.10 R	3.30	3.20	3.20	3.15	3.30	3.20	U3.35 S	S	3.50 SJ	3.20 S U	2.80 S	S
7	3.30	U3.05 S	3.05 S	3.20	2.90	2.95	J3.50 R	J3.50 R	I3.30 C	3.10	3.10	J3.00 R	3.05	3.20	C	C	C	3.30	3.35 S	3.40	A	I2.90 S	A	A
8	J2.90 S	A	F	J3.40 F	2.70	3.10	3.30	J3.35 R	3.20	3.15	3.00	3.10	3.20	3.20 R	J3.25 R	3.30 S	U3.45 S	3.40	3.40	3.30	J3.35 S	2.90 U	2.90 SI	2.85 S
9	U2.95 S	C	C	C	C	C	C	C	C	3.35	3.15	U3.20 S	3.10 S	3.20	3.20 S	3.20	3.10	3.30	3.30	3.35 S	U3.50 S	2.95	2.65 S	2.85
10	J2.85 S	3.05	3.10	3.25	J2.80 F	2.95	3.45	3.25	3.25	3.35	3.20	3.25	3.10 RI	3.30 R	J3.20 RU	3.25 R	R	3.25	3.35	3.25	3.25	S	J2.90 SI	2.90
11	U2.85 S I	3.00 S F	3.25	U3.60 S	3.10	3.15	3.35	3.35	J3.30 R	3.15	J3.30 S	3.35 R	3.10	U3.10 R	3.30	J3.30 R	3.35	3.35	J3.30 R	3.20	3.40	3.00 SU	2.85 U	2.95 S
12	I3.00 SJ	3.15 S	3.10	3.10	2.95	U3.10 S	3.45	3.45	3.25	3.15	3.15 SU	3.05 S	U3.20 SU	3.05 S U	3.25 SU	3.30 S	3.10	3.05	3.15 SU	3.15 S	3.10 S	2.80 U	2.75 S	2.75 S
13	U2.90 SU	2.75 SU	2.60 S	2.95 S	3.15	2.95 S	3.10 S	3.25	U3.10 SI	3.10 S U	3.20 S I	2.90 R	J3.00 R	3.25	3.10 J	3.05 S	R	3.30	U3.40 S J	3.25 S	3.00 S	S	2.90 J	2.80 S
14	U2.90 SU	3.20 S	2.75 SU	2.90 SU	2.90 SU	3.00 S	3.45	3.40	3.25	2.85	3.15	3.35	J3.10 R	U3.15 RJ	3.30 S	3.20	3.25	3.15	3.15 U	3.35 S	3.15 SJ	3.10 S	3.00	2.95
15	F	F	U2.80 SJ	2.95 S	3.00 J	3.30 S	3.55	J3.40 A	3.40	2.95	2.95 SJ	3.15 R	3.15	3.10	3.20	3.35	3.30	3.15 S	3.05	S	U3.55 SJ	3.10 S	F	2.90 S
16	FS	3.00 F	2.85 FI	3.05 F	3.30	I3.10 F	3.45	3.40	3.25	3.30	3.15	3.10	U3.00 S	3.05	3.20	3.30	3.30 S	3.30	3.10	U3.20 S	3.25 S	U2.90 S	2.80 S	2.95
17	U2.90 S	2.75	2.60 S	2.80 S	2.60 S	2.70 S	3.50	3.25 S	3.20 S	3.50 S	3.15	3.10	SU3.00 S	3.05	3.20	SJ3.35 S	3.30	3.20	3.25 S	3.35 R	U3.10 S	2.90 S	2.70	2.75
18	U2.90 S	2.80 SU	2.85 S	2.90 S	2.70 SU	3.00 S	3.40	3.45	3.30 S	3.15	2.95	3.20	3.10	3.10	3.10	3.30	3.45	3.30	U3.50 S J	3.25 S	U3.10 S	S	S	S
19	U2.90 SJ	3.05 S I	2.95 SU	3.35 S	2.90	I3.30 S	3.60	3.50	3.40	3.10	3.10	3.10	3.10	3.05	3.10	3.15	U3.15 S U	3.30 S	3.50 S J	3.25 S	3.00 S	2.75 S	2.55 S	2.75
20	U2.65 S	2.65 S	2.80 S	3.00 S	2.90 SU	2.90 S U	3.20 SU	3.25 S	3.20 S	3.25	3.15	J3.05 R	3.10	3.25	J3.25 S	3.25	J3.30 RJ	3.20 S	3.40 I	3.40 S	3.20	2.90	S	2.90
21	U2.80 S	2.90	J2.70 FI	3.00 F S	3.05 SU	3.35 S	3.45	3.35	3.45 R	3.25	3.15	3.10 S	U3.15 SI	3.25 A	3.15 U	3.20 S	J3.20 RJ	3.35 R	3.30 I	3.35 A	3.45	3.05	F	A
22	2.85	2.85	A	A	2.80	3.15	3.25 S	3.20	I3.35 R	3.35	3.30	2.85	3.00	3.00 SU	2.95 S U	3.15	3.25 S	U3.40 SU	3.25 S U	3.40 S	3.55	2.60	2.70 SU	2.65 S
23	U2.75 SU	3.05 S	2.80	2.65 S	2.55 SU	3.00 S	3.40	3.30 S	3.35	3.20	3.30	3.20	3.00	R	U2.95 RJ	3.10 R	3.25 S	I3.40 S	3.40 S	U3.45 S	J3.50 SU	3.05 SI	2.85 FJ	2.90 F
24	I2.85 SI	3.10 AI	3.05 SU	2.90 S	I2.95 A	A	3.45	U3.45 R	A	3.10	3.05 SU	3.10 SU	2.95 S	3.10 R	3.05 SU	3.05 S	U3.25 SU	3.30 S U	3.30 SI	3.50 S	3.40 S	2.75 S	2.55 SU	2.60 S
25	2.60 S	2.65 S	2.95 SU	3.35 S	3.05	3.10	3.35	U3.35 S	3.15 S	3.15	3.10	2.90 S	U2.85 SU	3.10 S U	3.00 S	3.15 S	3.20 S	3.40	3.05 SU	3.30 S	3.35	2.90 U	3.00 S	2.80 S
26	U2.85 S	3.00 S	2.95 S	2.90 S	3.05 SU	3.25 S	3.40	3.35 S	3.15 S	3.30	3.05	2.80 S	3.05	3.00	3.05 SU	3.15 S	3.20	U3.30 S	3.30	3.30 S	3.05	2.85 U	2.95 SU	2.85 S
27	2.90	2.80 SU	3.00 S U	3.25 S	3.35	2.95 S	3.35 S U	3.30 S	3.30	3.20	3.25	3.05	J3.00 R	3.10 R	3.10	3.25	U3.30 R	3.15	3.00	J2.95 S	S	3.35	2.80 S	J2.80 S
28	J2.80 S	2.75	J2.90 SU	2.95 S U	3.10 S	3.00	J3.50 RU	3.50 S	A	3.10	2.80	3.10	3.10	J3.15 R	3.40 I	3.25 A	3.15	3.00	3.10	3.15	J3.55 R	J3.50 S	2.95	2.85
29	2.80	I2.90 A	I2.95 A	I2.90 A	2.70 R	3.05	3.40	3.20	I3.50 R	3.25 RI	3.25 A	3.20	J2.95 R	I3.00 A	J3.00 R	3.35	J3.20 R	J3.35 S	3.10	J2.85 R	I3.60 SI	3.30 S	3.00 S	A
30	A	2.95 SI	2.90 SI	2.95 A	I3.05 F	3.20	3.40	J3.40 R	3.45	3.10	3.05	2.90	3.00	3.00 S	3.20 R	3.05 R	U3.30 S	3.25	3.25	3.00	3.15 SU	3.15 S	3.00	2.95
31																								
No.	27	27	26	28	29	27	28	28	27	30	30	30	30	29	29	29	27	30	29	27	28	27	25	24
Median	U2.85	2.90	2.90	3.00	3.00	3.00	3.40	3.35	3.25	3.20	3.15	3.10	3.10	3.10	3.20	3.25	3.25	3.30	3.25	3.25	3.30	2.95	2.85	2.85
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

K 7

IONOSPHERIC DATA

Apr. 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	S	L	S	S	S	L	S	L	S						
2								S	S	L	S	L	S	S	S	S	C							
3									L	3.80 L	L	3.55 L	A	A	A	L	A	A						
4								L	L	L	L	S	S	L	S	S	S	A						
5								L	L	L	L	L	" 3.40 L	L	A	L	A							
6							C	C	L	L	A	L	L	3.55 L	L	L	L							
7									C	L	3.65 L	L	L	S	C	C	C	L						
8							A		L	L	L	L	3.60 L	L	3.50 L	L	L	L						
9							C	C	C	L	S	L	L	S	S	L	C							
10									L	L	L	L	L	" 3.70 S	3.55 L	" 3.55 L	L							
11									L	3.65 L	" 3.65 L	" 3.65 L	3.40 L	3.45	3.55 L	L	L							
12									L	L	L	S	L	S	S	A	A	L						
13									S	L	L	" 3.50 L	L	L	S	3.50 L	L	L						
14								L	L	" 3.35 L	" 3.50 L	" 3.60 L	L	L	L	L	L							
15								A	A	S	3.80 L	L	B	S	L	L	L							
16								L		L	L	A	A	S	C	L	A	A						
17									L	A	S	S	A	A	L	S	S							
18									S	A	" 3.35 L	3.15 L	3.45	3.60 L	A	L		A						
19									L	L	S	A	L	A	S	L	L	L						
20								L	L	L	L	L	B	S	3.55 S	L	L	L						
21								L	L	L	3.60 L	L	L	A	L	L	L	A						
22								L	L	L	S	S	S	S	S	S	S	S						
23									A	A	A	A	3.35 L	A	A	A	A	A						
24								A	A	A	S	A	S	A	S	S	A							
25								S	A	A	S	S	S	S	S	S	A							
26								S	L	S	L	S	S	S	S	S	3.70 L							
27								S	S	L	L	S	3.60 L	S	S	L	L							
28							A	A	A	A	A	A	L	S	L	A	L	L	A					
29							A	A	A	L	A	A	A	A	A	A	A	A	A					
30							A	A	A	A	A	A	S	S	S	S	L	S						
31																								
No.										3	6	5	6	4	4	2	1							
Median										3.65	" 3.60	" 3.55	3.40	3.60	3.55	" 3.50	3.70							
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

40

IONOSPHERIC DATA

Apr. 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									270	275	295	330	315	285	270	280	260	255						
2								255	270	260	275	300	275	275	270	265	C							
3									270	255	295	280	270A	270	285	260	280A	255						
4								245	260	265	295	300	275	280	275	265	275	265						
5								265	265	280	330	325	295	285	255	260	260							
6							C	C	295	310	300	300	275	265	275	275	255							
7									C	305	300	300	300	280	C	C	C	250						
8							255A		285	275	305	300	285	295	275	260	250	250						
9							C	C	C	275	280	285	295	275	275	270	270							
10									260	275	285	295	305	275	295	285	255							
11									260	295	280	275	305	305	275	275	255							
12									275	295	305	310	275	315	295	260	260	270						
13									270	300	300	300	300	285	295	285	260	255						
14								255	255	340	300	255	290	300	275	270	270							
15								A	E300A	320	325	295	270	295	270	255	260							
16								250		280	305	E350A	305	305	280	270	265	265						
17									280	260	280	305	320	305	275	270	260							
18									265	300	345	285	285	305	280	275		E250A						
19									255	275	275	305	275	290	280	270	275	250						
20								270	260	275	305	305	295	280	280	275	280	270						
21								255	250	285	285	310	300	A	300	295	270	250A						
22								260	255	265	280	345	310	300	315	275	250	250						
23									270	280	275	300A	330	E340A	325	290	255	255						
24								E250A	A	280	315	290	315	300	280	280	260							
25								255	270	280	300	340	325	295	280	265	255							
26								260	280	285	290	345	310	305	295	270	255							
27								255	275	300	295	305	320	305	300	275	270							
28							250A	245	A	310AE	345S	330	310	300	260	A	295	305	E300A					
29							260	E290A	250	300	A	295	330A	A	320A	275	280	255	275					
30							260	255	250	280	305	335	305	310	295	290	260	265						
31																								
No.							4	14	24	30	28	29	30	27	29	28	27	17	1					
Median							260	255	270	280	300	300	300	295	280	270	260	255	275					
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

41

IONOSPHERIC DATA

Apr. 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	315	295	265	245	210	280	230	230	250	235	215	I220 S	I240 S	210	215	225	245	245	245	235	220	230	305	295
2	295	285	240	230	220	305	255	I240 S	I245 S	230	I215 S	230	I220 S	I220 S	I210 S	I210 S	I250 C	240	235	230	235	280	280	280
3	265	275	275	260	260	310	235	230	225	210	230	225	A	A	A	220	I245 A	I245 A	245	225	230	250 A	290 A	300 A
4	285	300	260	245	260	260	235	235	215	215	E310 A	225	I235 S	245	I205 S	I220 S	230	245	255	245	225	230	305	315
5	310	325	295	220	260	310	240	240	230	225	E255 S	E355 S	245	225	I225 A	240	I245 A	250 A	E250 S	245	205	285	310	305
6	305	300	295	235	225	C	C	C	255	225	I230 A	I240 S	E255 S	245	E255 S	225	230	245	245	235 A	205	245	310	295
7	255	270	275	210	255	285	225	225	I225 C	225	220	230	E250 S	I240 S	C	C	C	240 A	240 A	E250 A	I245 A	E310 S	A	A
8	E295 A	I300 A	305	210	300	305	I250 A	235	225	230	225	E310 B	200	225	230	235	235	245	225	220	225	E300 S	300	I305 S
9	300	C	C	C	C	C	C	C	C	225	I230 S	215	E325 S	I210 S	205	235	225	245	245	230	220	300 A	340 A	310
10	300	E310 A	250	240	300	285	230	235	225	210	210	210	245	225	200	220	225	245	230	245	230	270	310	305
11	300	305	250	205	E295 S	260	230	240	240 S	230	245	225	245	245	E255 S	210	240	235	245	230	210	E305 S	325	300
12	255	265	250	255	235	255	235	235	225 S	I215 S	215	I240 S	E310 S	225	S	A	A	255	250	230	230	305	320	305
13	280	285	290	245	225	270	245	230	I240 S	E250 S	I230 S	240	225	E255 S	I220 S	210	235	245	240	245	230	280	275	305
14	305	260	255	285	260	305	230	245	245	205	245	245	E255 S	250	205	E255 S	245	245	250	245	235	270 A	260	260
15	310	310	300	275	255	225	225	I230 A	I230 A	I240 S	210	250 S	I230 B	I220	230	250	205	265	270	250 A	215	250 A	295	305
16	255	255	255	225	245	255	245	220	230	225	245	A	A	S	220	255	I255 A	I260 A	265	240	230	260	305	270
17	255	275	305	295	300	270	220	225	245	A	S	S	A	A	220	I210 S	I230 S	250	265	235	210	E315 A	310	320
18	305	280	275	260	295	265	225	230	S	A	A	250	245	230	A	E305 S	E250 S	I240 A	240 A	230	270 A	310	E350 A	295
19	305	285	255	225	250	230	205	240	E250 A	E270 A	S	A	225	I265 A	I230 S	230	225	245	220	245	235	265	330	365
20	320	305	270	245	240	265	225	240	225	210	E250 S	245	E305 B	E300 S	E250 S	205	E250 A	E250 A	E250 A	225	210	270	300	300
21	305	305	305	300	280	225	225	245	E245 A	220	205	245	I235 S	I240 A	I250 S	E255 A	E255 A	A	235	I230 A	225	230	355	I340 A
22	E350 A	E355 A	A	A	E305 A	250	240	245	220	220	I240 S	I330 S	S	S	I230 S	250	I250 S	240	255	230	210	300	350	330
23	290	260	260	270	305	260	225	250	A	A	A	A	E255 S	A	A	A	A	A	240	225	205	255	310	305
24	E340 A	I295 A	260	300 A	I270 A	I240 A	225	A	A	A	S	A	I230 S	I230 A	I220 S	200	I230 A	255	240	215	215	315	335	340
25	340	310	265	U230 A	265	265	245	225	I245 A	I255 A	230	S	S	I240 S	I235 S	I235 S	250	250	260	230	210	275	270	285
26	290	270	280	255	225	230	225	255	230 S	I225 A	265	I220 S	I250 S	I220 S	I220 S	I220 S	225	250	235	230	245	270	285	260
27	290	305	225	215	200	250	240	I230 S	I240 S	220	E255 S	I220 S	245	I205 S	I230 S	225	220	240	E250 A	E300 A	250 A	215	250	250
28	310	E350 A	260	260	250 A	250 I	250 A	A	A	A	A	A	E300 S	I250 S	E260 S	A	E305 A	270 A	I260 A	250 A	205	205	305	E350 A
29	E350 A	A	A	A	E350 A	260	A	A	A	E275 S	A	A	A	A	I245 A	I245 A	I250 A	A	A	240	E250 A	E350 A	E340 A	A
30	A	305	320 A	I300 A	250	235	A	A	A	A	A	A	S	S	S	230	245	260	255	275	255	225	240	250
31																								
No.	26	25	27	27	26	28	26	24	21	21	18	19	15	21	20	23	23	26	26	28	29	25	27	27
Median	300	295	265	245	255	260	230	235	230	225	230	230	235	U230	U220	225	235	245	245	230	225	270	305	305
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

K 10

IONOSPHERIC DATA

Apr. 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	S	S	E	S	S	S	150	125	115	115	115	110	G	115	115	S	S	115	S	S	S	S
2	S	S	S	E	E	S	S	S	135	125	S	G	105	105	125	S	C	S	S	S	S	S	S	S
3	S	S	S	E	S	S	S	S	135	115	110	105	100	100	100	130	100	100	100	100	S	105	105	105
4	S	S	E	E	E	E	G	155	S	125	115	G	S	S	100	G	S	S	S	S	S	S	S	S
5	S	S	S	E	E	S	130	130	G	G	S	S	115	G	110	110	105	105	S	105	S	S	105	120
6	S	S	E	E	S	C	C	C	125	130	110	110	100	100	100	100	G	S	S	115	105	S	S	S
7	S	105	E	E	E	S	155	130	C	105	120	110	115	110	C	C	C	110	110	110	105	105	110	105
8	110	110	105	E	105	155	130	G	125	G	S	B	B	100	S	S	S	S	S	S	S	S	S	S
9	S	C	C	C	C	C	C	C	C	G	S	S	S	G	S	G	G	S	S	110	S	110	110	105
10	S	105	100	E	E	S	155	G	G	G	110	G	110	105	G	100	S	G	S	S	S	110	S	S
11	S	S	E	E	S	S	E 190 G	S	G	S	G	115	115	G	G	110	110	G	S	S	S	S	S	S
12	S	S	E	105	E	S	G	105	150	110	S	S	S	G	115	110	115	145	125	120	115	115	S	125
13	S	110	S	100	S	S	S	G	G	G	G	110	105	G	S	105	105	105	100	100	S	S	S	S
14	S	S	S	E	E	S	150	140	125	G	115	G	B	115	G	G	G	110	S	100	100	100	105	105
15	S	105	E	105	105	S	145	125	120	110	G	110	B	S	S	105	B	S	S	110	110	105	S	105
16	E	105	105	E	115	E	145	120	120	G	S	105	105	105	105	G	120	115	110	115	110	105	110	110
17	S	S	105	105	E	S	155	140	125	115	130	110	105	125	G	G	145	130	115	115	110	110	110	110
18	S	S	105	110	E	S	G	145	125	120	115	110	110	110	105	105	105	105	105	105	120	120	115	110
19	S	S	S	E	E	S	150	125	115	125	S	115	115	110	115	120	125	G	S	105	105	110	S	115
20	115	S	105	105	110	S	160	115	120	105	110	S	B	105	105	110	130	125	110	110	105	105	S	S
21	S	S	E	E	105	S	130	110	120	115	115	110	110	110	105	105	105	105	115	110	115	110	110	105
22	105	105	105	105	105	155	130	115	110	115	115	S	110	105	S	105	105	105	105	S	115	110	105	110
23	S	110	105	105	110	S	130	125	120	125	115	110	110	115	110	110	110	110	105	S	100	S	110	115
24	110	110	100	100	100	130	130	125	120	115	120	115	115	115	120	115	110	110	110	125	110	110	S	S
25	S	105	105	105	110	105	105	115	120	115	115	S	S	115	110	105	110	120	120	115	115	S	S	S
26	S	S	S	S	E	S	125	120	110	115	G	S	105	110	S	120	115	110	110	110	100	S	S	S
27	S	S	S	E	E	S	S	120	125	130	110	S	S	S	S	S	G	S	125	115	115	S	S	S
28	S	110	110	120	115	130	130	130	120	110	110	110	110	110	130	115	E 190 G	155	110	110	105	105	105	105
29	105	105	105	100	105	150	130	125	130	S	110	110	105	110	100	100	125	110	105	110	105	105	105	105
30	100	100	100	100	100	S	125	110	110	115	115	110	110	110	110	125	S	140	120	120	115	110	110	S
31																								
No.	6	13	13	13	12	6	19	21	23	21	19	17	21	22	17	21	18	19	18	23	20	18	14	16
Median	110	105	105	105	105	140	130	125	120	115	115	110	110	110	110	110	110	110	110	110	110	110	110	110
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

IONOSPHERIC DATA

Apr. 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									h	h	C	l	l	l		l	C			f				
2									h	h			l	l	h									
3									h	C	l	l	lz	lz	lz	h.l	lz	lz	fz	f		fz	fz	f
4								h		h	l				l									
5							h	h					l		l	C	lz	l		f			f	f
6									h	h	l	l	l	l	l	l				f	f			
7		f					h	h		C	h	l	C	C				lz	fz	fz	fz	f	f3	fz
8	fz	fz	fz		fz	f	hz		h					l								f		
9																				f		f	fz	f
10		fz	f				h				l		l	l		l						f		
11							h					l	C			C	l							
12				f				l	h	l					C	lz	h.l	h	h.l	f3	fu	f		f
13		f		f								l	l			l	l	lz	l	fz				
14							h	h	h		l			C				l		fz	fz	fz	f	fz
15		f		f	fz		h	h3	C	C		l				lz				fz	f	fz		f3
16		f	f		fz		h	C	h			lz	lz	l	l		h3	lz	lz	f	fz	f	f	f
17			f	f			h	h	h	C	h	l	lz	h			h	h	lz	fz	f	fz	f	f
18			fz	fz				h	h	h	C	C	C	C	lz	l	l	lz	lz	f	f	fz	fz	fz
19							h	h	C	h		C	C	C	l	h	h			fz	f	f		fz
20	f		f	fz	f		h	C	h	l	l			l	l	l	h	hz	lz	fz	f	fz		
21					f		h	C	C	l	C	C	C	lz	l	lz	lz	lz	l	f3	f	fz	f3	f3
22	f3	f3	f3	f3	fz	h	hz	C	C	C	l		l	l		l	l	l	l		f	f	f	fz
23		fz	fz	fz	f		h	h	hz	h.l	hz	lz	l	lz	l	lz	lz	lz	l		f		f	fz
24	f3	f3	fz	f3	f3	f3	hz	C	h3	lz	h.h	C	C	lz	l	l	l	lz	l	f3	f	f		
25		f	fz	f3	fz	fz	lz	C	h	Cz	l			l	l	l	C	h	hz	f	f			
26							h	h	l	l			l	l		h	C	l	lz	f	f			
27								h	h	h	C								lz	f3	fz.f			
28		f3	fz	fz.fz	f3	f	hz	h	hz	Cz	l	lz	l	l	h	Cz	h	h	l3	f3	f	f	fz	f3
29	f3	f3	fu	f6	f3	fz	h	h	h		Cz	l	lz	lz	l3	lz	h	C	lz	f3	fz	fz	fz	f3
30	f3	fz	fz	f3	f		Cz	Cz	Cz	lz	lz	l	l	l	l	h		h	hu	fz	fz	f	f	
31																								
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

Types of Es

Sweep 1.0 Mc to 21.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Apr. 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	365	365	345	295	275	300	255	250	280	310	295	345	340	340	295	305	280	270	280	300	250	325	360	350
2	355	305	295	290	285	350	285	275	280	265	280	300	295	285	280	275	275	265	275	295	295	340	350	345
3	315	325	340	315	295	360	260	255	275	270	305	285	300	300	300	295	295	295	285	255	270	255	310	350
4	335	340	S	295	350	305	260	260	280	270	300	310	290	290	280	275	280	275	285	280	275	295	380	370
5	360	385	375	275	300	345	275	275	295	295	355	360	315	305	295	270	300	305	S	S	255	335	355	S
6	350	350	340	285	255	C	C	C	305	345	305	310	295	295	295	300	275	300	290	S	245	295	355	S
7	290	305	305	265	335	340	250	250	270	305	310	330	320	300	C	C	C	260	260	270	A	345	A	A
8	335	A	F	255	365	335	280	255	300	300	325	310	300	310	300	285	260	275	255	265	255	330	345	350
9	350	C	C	C	C	C	C	C	C	275	290	305	315	295	295	280	290	280	280	255	255	340	350	355
10	340	350	300	285	350	320	250	265	285	280	300	300	310	305	300	300	R	280	260	295	280	S	355	350
11	350	335	290	240	300	300	255	255	285	300	300	285	305	315	300	300	270	275	285	290	255	320	325	320
12	315	305	310	300	305	300	255	255	295	295	310	315	285	325	300	270	285	295	275	275	275	365	360	375
13	325	365	385	300	280	305	290	270	295	305	315	305	320	300	325	300	R	290	260	295	330	S	350	395
14	350	300	310	350	350	310	250	260	290	375	310	295	310	305	300	300	295	290	300	295	300	305	320	320
15	F	F	350	340	325	260	250	A	A	350	350	310	305	305	295	290	295	305	310	S	260	310	F	350
16	FS	325	340	315	295	300	255	260	280	285	310	A	325	310	300	295	275	275	305	270	270	325	350	325
17	330	340	375	350	385	340	235	270	280	275	300	305	335	315	290	280	275	275	285	275	260	330	365	360
18	325	330	330	325	365	305	240	265	270	305	350	300	305	320	305	295	260	275	255	285	305	S	S	S
19	355	340	330	255	320	275	240	250	275	305	310	315	295	310	320	290	295	275	245	280	290	335	395	375
20	390	370	360	305	310	330	270	280	270	295	320	340	320	300	300	300	300	300	260	255	275	340	S	355
21	365	355	385	340	300	260	250	280	255	295	300	320	310	290	305	300	300	270	275	280	260	305	F	A
22	355	355	A	A	350	300	275	295	270	275	280	360	335	325	330	290	275	265	275	255	230	385	380	350
23	350	295	325	395	395	305	260	260	270	295	295	300	345	R	345	325	300	270	260	255	250	295	350	350
24	345	330	305	340	325	A	250	255	A	335	330	305	330	315	310	310	275	275	265	240	250	350	375	375
25	405	370	310	245	300	295	255	255	295	280	310	345	350	315	315	280	270	260	295	265	245	340	320	350
26	340	320	325	295	275	265	245	270	280	295	310	360	320	325	315	285	275	265	260	275	310	345	345	345
27	350	355	305	265	230	295	265	265	280	300	300	315	340	325	310	300	290	285	325	325	S	255	305	350
28	360	390	325	340	320	310	280	255	A	A	355	330	330	305	280	300	300	335	310	300	250	245	350	355
29	355	A	A	A	355	305	270	300	260	300	310	300	340	350	320	300	300	285	305	265	250	300	345	A
30	A	350	340	330	300	275	260	275	250	310	310	345	315	325	310	310	270	280	275	320	300	275	300	310
31																								
No.	27	26	25	27	29	27	28	27	26	29	30	29	30	29	29	29	27	30	29	27	28	27	25	24
Median	350	340	330	300	310	305	255	260	280	295	310	310	315	310	300	295	280	275	275	275	260	325	350	350
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

hpF2 | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

K 13

45

IONOSPHERIC DATA

Apr.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	85	85	105	110	125	95	70	85	105	60	65	105	105	110	95	95	90	90	100	115	100	125	95	105
2	95	100	110	95	115	110	120	120	90	80	75	85	105	100	100	100	85	105	105	110	110	85	100	105
3	100	95	100	80	90	105	95	100	80	40	50	25	55	50	65	55	50	40	30	50	60	60	85	55
4	70	60	S	55	65	90	45	50	40	75	70	80	115	85	100	65	75	80	95	120	105	115	90	90
5	95	115	85	100	105	90	85	110	105	35	55	60	75	80	80	50	55	50	S	S	50	70	85	S
6	55	60	60	60	70	C	C	C	65	50	50	65	50	55	50	65	45	50	35	S	50	60	80	S
7	55	85	80	60	70	60	55	45	60	75	50	70	75	60	C	C	C	65	50	40	A	60	A	A
8	65	A	F	55	80	50	55	60	55	50	50	70	50	40	60	50	45	40	55	60	60	75	55	65
9	55	C	C	C	C	C	C	C	C	65	65	75	95	95	85	90	85	65	50	55	50	55	50	50
10	60	50	55	70	65	85	60	75	45	30	50	50	45	50	55	50	R	65	55	55	65	S	50	60
11	65	60	55	55	60	55	75	60	45	50	45	40	65	55	45	40	45	50	50	65	55	75	80	75
12	80	60	65	60	90	55	50	45	35	65	65	80	115	70	75	105	120	110	125	105	125	65	100	120
13	105	110	115	105	105	115	110	120	105	80	55	60	75	55	70	55	R	55	65	60	80	S	S	55
14	55	55	85	65	50	65	55	65	60	70	65	55	70	55	40	70	55	75	65	45	65	70	80	80
15	F	F	65	65	80	65	50	A	A	90	55	65	65	70	60	45	60	60	85	S	50	85	F	55
16	FS	80	75	60	60	60	50	50	85	70	75	A	120	95	100	75	95	75	95	105	115	110	80	80
17	115	115	90	100	105	110	90	80	85	70	90	90	95	105	100	85	75	80	90	100	95	105	95	95
18	100	95	95	120	105	100	110	60	95	50	70	55	55	50	50	40	50	70	50	35	65	S	S	S
19	80	45	65	55	85	50	35	55	30	80	85	90	105	95	65	85	90	75	75	60	65	120	85	75
20	110	105	90	95	90	115	105	85	105	50	40	55	55	50	45	45	50	50	60	50	70	65	S	60
21	75	50	65	55	55	60	55	40	50	50	50	40	50	45	50	50	50	50	65	60	45	90	F	A
22	50	50	A	A	65	55	75	60	40	100	95	110	100	115	100	75	105	85	80	70	80	110	105	85
23	95	95	105	85	100	95	80	70	75	55	50	55	50	R	60	45	55	45	70	45	50	60	70	65
24	55	50	60	60	60	A	45	40	A	85	85	85	100	90	90	90	110	100	105	95	85	115	90	95
25	95	95	95	85	70	100	95	95	90	85	80	80	90	90	85	95	90	75	100	65	110	110	85	100
26	95	75	85	110	105	105	105	85	120	60	85	95	85	85	100	80	95	100	100	80	75	95	80	95
27	60	95	100	105	120	110	85	95	70	55	50	70	55	45	50	45	30	100	60	80	S	60	60	60
28	85	65	75	65	55	80	25	45	A	A	90	45	45	55	35	45	55	70	50	55	50	55	65	50
29	50	A	A	A	90	75	35	50	45	45	40	55	60	50	55	25	55	40	55	50	40	50	50	A
30	A	45	75	65	70	75	70	35	50	65	85	85	85	80	90	90	95	80	100	85	75	95	105	85
31																								
No.	27	26	25	27	29	27	28	27	26	29	30	29	30	29	29	29	27	30	29	27	28	27	25	24
Median	80	80	85	65	80	85	70	60	70	65	65	70	75	70	65	65	60	70	65	60	65	75	80	80
U.Q.																								
L.Q.																								
Q.R.																								

ypF2

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

IONOSPHERIC DATA

Apr. 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	S	$I_{3.8}^{S}$	$J_{3.8}^{S}$	$I_{4.0}^{S}$	3.5	2.8	3.1	4.8	5.7	$J_{6.5}^{S}$	6.4	6.6	8.3	$J_{10.0}^{S}$	10.0	9.2	9.2	9.2	8.6^{S}	$I_{8.3}^{S}$	$I_{7.0}^{S}$	$I_{5.5}^{S}$	$I_{4.3}^{S}$	3.3
2	$I_{3.4}^{S}$	3.5	$I_{3.3}^{S}$	3.2	2.7	2.4	3.0^{S}	6.0^{S}	$I_{7.3}^{S}$	$I_{7.3}^{S}$	6.9	7.4	8.9	$J_{9.9}^{S}$	8.8	7.5	6.4	6.6	$J_{6.3}^{S}$	$I_{6.4}^{S}$	S	S	$J_{3.9}^{S}$	S
3	S	S	$J_{4.0}^{S}$	3.6	3.3	3.1	$J_{3.5}^{S}$	$I_{6.3}^{S}$	5.9	6.1	6.1	8.0	9.5	8.9	8.3	8.7^{S}	$J_{7.8}^{S}$	$I_{7.8}^{S}$	$I_{7.3}^{S}$	$I_{6.4}^{S}$	$I_{5.3}^{S}$	3.2^{S}	3.3	3.2
4	$I_{3.4}^{S}$	$J_{3.5}^{S}$	3.5^{S}	3.4^{S}	3.0	2.4	3.3^{S}	5.1^{S}	5.9	6.3^{S}	6.8	7.9^{S}	9.0	9.2	7.9	7.0^{S}	6.3	6.1	$I_{7.3}^{S}$	8.6	$I_{7.2}^{S}$	$J_{3.2}^{S}$	3.2	$J_{3.5}^{S}$
5	$I_{3.2}^{S}$	$I_{3.2}^{S}$	$I_{3.4}^{S}$	$I_{3.9}^{S}$	2.0	$I_{1.8}^{S}$	$J_{3.2}^{S}$	5.5	6.2	6.0	6.2	8.1	$J_{9.4}^{S}$	10.5	10.5	9.6^{S}	8.5	8.8	8.9^{S}	$I_{7.6}^{S}$	$J_{6.5}^{S}$	3.5^{H}	3.2	$I_{3.6}^{S}$
6	$J_{3.8}^{S}$	$I_{3.7}^{S}$	$J_{3.6}^{S}$	3.5	3.6	2.5	3.5^{S}	5.8	6.1^{H}	$I_{6.6}^{S}$	6.8	$J_{7.9}^{S}$	$J_{9.9}^{S}$	9.1	8.1	6.8	7.0	$J_{7.8}^{S}$	8.0	8.8^{S}	$I_{5.5}^{S}$	3.6	$I_{3.4}^{S}$	3.5
7	$I_{3.7}^{S}$	$I_{3.6}^{S}$	$J_{3.4}^{S}$	3.6	$I_{2.8}^{S}$	$I_{2.7}^{S}$	3.9	5.2	$J_{6.4}^{S}$	6.7	7.0	7.3	8.9	10.3	$J_{10.2}^{S}$	$J_{9.8}^{S}$	8.5	8.4	7.1_{H}^{S}	$I_{6.3}^{S}$	$J_{5.4}^{S}$	S	S	$I_{4.3}^{S}$
8	$I_{4.1}^{S}$	$I_{4.4}^{S}$	4.1^{S}	3.8^{S}	3.3	$I_{3.4}^{S}$	4.0	5.9	$J_{7.5}^{S}$	6.8	$J_{7.6}^{S}$	8.2	9.5^{S}	$J_{10.1}^{S}$	12.1	11.0	$J_{9.9}^{S}$	$J_{9.6}^{S}$	$J_{8.1}^{S}$	5.7	4.5	$J_{3.7}^{S}$	$I_{3.8}^{S}$	$I_{3.7}^{S}$
9	$I_{3.7}^{S}$	$J_{3.6}^{S}$	3.4	$J_{3.7}^{S}$	2.9	2.8	$J_{3.8}^{S}$	6.0^{S}	$J_{6.6}^{S}$	6.6	$J_{7.8}^{S}$	8.9	9.7^{S}	10.5^{S}	$J_{11.6}^{S}$	11.3^{S}	9.1^{S}	9.0	8.5	$I_{6.8}^{S}$	$I_{5.8}^{S}$	$I_{3.6}^{S}$	$I_{3.4}^{S}$	S
10	S	$J_{3.9}^{S}$	4.1	$I_{3.6}^{S}$	3.0	$I_{3.0}^{S}$	$I_{4.2}^{S}$	5.7	6.0	6.5	7.1	8.4	8.7	9.4^{S}	$J_{9.6}^{S}$	$J_{9.4}^{S}$	8.6	$I_{8.2}^{S}$	$I_{7.6}^{S}$	$I_{6.5}^{S}$	$J_{5.6}^{S}$	3.3	$I_{3.5}^{S}$	$I_{3.6}^{S}$
11	$I_{3.6}^{S}$	$J_{3.6}^{S}$	$J_{3.6}^{S}$	$I_{3.7}^{S}$	2.5^{H}	S	S	5.4^{S}	$J_{6.3}^{S}$	$I_{7.3}^{S}$	7.4	7.1	8.3^{S}	9.3	$J_{10.1}^{S}$	9.3	7.2	6.9	$I_{6.8}^{S}$	$I_{6.4}^{S}$	$J_{6.0}^{S}$	$I_{4.6}^{S}$	$I_{4.0}^{S}$	$J_{5.1}^{S}$
12	$I_{4.5}^{S}$	$J_{4.0}^{S}$	4.0^{S}	$J_{3.9}^{S}$	$J_{4.0}^{S}$	3.3	$J_{4.0}^{S}$	5.8	$I_{6.8}^{S}$	6.9	7.1^{S}	8.0	8.3	9.0^{S}	9.2	8.4	7.3	7.3	$I_{6.6}^{S}$	$I_{6.3}^{S}$	$J_{5.8}^{S}$	S	S	S
13	S	S	$I_{3.3}^{S}$	$I_{3.5}^{S}$	3.0	2.2	$I_{4.5}^{S}$	$I_{6.2}^{S}$	$J_{6.3}^{S}$	7.1^{S}	7.7	7.8	8.8	$J_{9.3}^{S}$	$J_{9.8}^{S}$	8.9	8.9	8.5	$J_{8.1}^{S}$	$J_{7.9}^{S}$	5.7^{S}	4.2^{S}	$I_{4.0}^{S}$	S
14	S	4.4^{S}	$I_{4.0}^{S}$	$J_{3.9}^{S}$	$J_{3.8}^{S}$	$I_{3.6}^{S}$	5.0	5.6	6.1^{S}	6.8	8.9	$J_{9.4}^{S}$	8.1	8.9	9.3	9.0	7.6	7.1	$J_{8.4}^{S}$	$J_{8.3}^{S}$	S	S	$I_{4.0}^{S}$	$I_{4.0}^{S}$
15	$J_{4.5}^{S}$	$J_{4.4}^{S}$	4.6^{S}	$J_{4.5}^{S}$	4.1	3.1	4.4^{S}	5.0	5.9	7.5	8.0	9.4	10.5^{S}	$J_{9.6}^{S}$	$J_{10.0}^{S}$	$I_{9.8}^{S}$	$J_{8.4}^{S}$	6.8^{H}	$J_{8.0}^{S}$	$J_{8.2}^{S}$	8.9^{S}	5.9^{S}	3.5^{S}	S
16	S	4.6	3.3	$I_{3.4}^{S}$	2.6	$I_{2.7}^{S}$	4.7	6.2^{S}	5.7	6.7	7.1	7.6	9.1	$J_{9.6}^{S}$	$J_{9.5}^{S}$	$J_{9.6}^{S}$	8.5	8.5	$J_{8.4}^{S}$	$I_{8.1}^{S}$	$I_{6.7}^{S}$	5.2	$I_{3.7}^{S}$	$I_{3.6}^{S}$
17	$J_{3.8}^{S}$	$I_{3.9}^{S}$	$I_{3.8}^{S}$	$I_{4.1}^{S}$	$I_{3.5}^{S}$	$I_{3.9}^{S}$	$J_{5.3}^{S}$	6.1^{S}	6.1	7.0	7.0^{S}	8.3	9.0	$J_{10.0}^{S}$	11.1	10.7	$J_{9.8}^{S}$	9.2^{S}	$I_{9.8}^{S}$	9.4^{S}	S	S	2.9	$I_{3.1}^{S}$
18	$I_{3.2}^{S}$	3.3	3.2	$J_{3.4}^{S}$	3.1	2.8	4.8	5.8	5.7	5.9	7.3	9.1	$J_{10.0}^{S}$	10.3	10.9	11.1	$I_{9.9}^{S}$	9.2	$I_{7.7}^{S}$	$I_{6.3}^{S}$	$J_{5.0}^{S}$	3.7	S	S
19	4.4^{S}	$I_{4.2}^{S}$	4.3	5.2	3.1	2.8^{S}	4.3	5.9	6.7	6.3	6.9	8.1	$J_{9.7}^{S}$	$I_{10.5}^{C}$	11.2	11.6	11.0	$I_{9.6}^{S}$	$I_{7.7}^{S}$	$J_{5.7}^{S}$	$I_{4.8}^{A}$	$I_{3.6}^{S}$	$I_{3.8}^{S}$	$I_{3.7}^{S}$
20	$I_{3.8}^{S}$	4.0	4.0^{S}	$I_{4.2}^{S}$	3.0	2.8	4.5	5.7^{H}	6.4	$J_{8.0}^{S}$	7.1	7.7	9.4^{S}	10.2^{S}	9.2	8.7	8.7	9.4	10.8	9.3^{S}	$I_{5.9}^{S}$	$I_{4.6}^{S}$	$I_{4.3}^{S}$	4.1
21	$I_{4.2}^{S}$	$I_{4.1}^{S}$	$J_{4.1}^{S}$	$I_{4.0}^{S}$	$J_{3.7}^{S}$	$I_{3.7}^{S}$	$J_{5.0}^{S}$	$J_{6.2}^{S}$	$I_{7.2}^{S}$	$J_{7.1}^{S}$	7.2	8.0	9.1	$J_{9.6}^{S}$	$J_{9.7}^{S}$	9.1	9.0	$J_{7.6}^{S}$	$J_{7.9}^{S}$	S	S	3.9^{S}	$J_{3.7}^{S}$	$J_{3.7}^{S}$
22	S	S	$J_{4.2}^{S}$	$J_{3.9}^{S}$	3.1^{S}	$J_{2.9}^{S}$	$J_{4.6}^{S}$	$I_{6.1}^{S}$	6.8	$J_{6.3}^{S}$	6.6	$I_{8.1}^{C}$	9.4	10.5	10.7	11.1^{S}	$J_{11.6}^{S}$	$I_{10.3}^{S}$	$I_{9.5}^{S}$	8.5	$I_{5.6}^{S}$	3.3^{S}	$I_{3.3}^{S}$	$I_{3.3}^{S}$
23	$I_{3.2}^{S}$	3.4	3.8	$J_{3.5}^{S}$	$J_{3.5}^{S}$	$I_{3.4}^{S}$	5.6	5.1	5.8	6.1	$J_{7.4}^{S}$	8.1	8.6	10.3	10.7	11.6	$J_{12.1}^{S}$	10.9	11.0	$J_{10.2}^{S}$	6.6	S	S	S
24	S	S	S	S	4.4	3.9^{S}	5.4	5.5	5.9	6.5	7.6	9.0	$J_{10.0}^{S}$	11.5	11.9	11.8	11.5	10.7	$I_{10.3}^{A}$	9.3	4.4^{S}	2.8	2.8	2.9
25	$I_{3.0}^{S}$	3.1	3.1	3.5	2.6^{S}	2.2	4.4	5.5	6.5	7.2^{S}	7.4^{S}	8.9	$J_{10.2}^{S}$	11.7^{S}	12.3	$J_{12.1}^{S}$	11.0	10.2	$J_{8.7}^{S}$	$I_{7.2}^{S}$	5.7	5.1^{S}	S	S
26	S	$I_{3.5}^{S}$	3.5^{S}	4.0^{S}	2.4	2.4	3.9	6.1	7.2	$I_{7.2}^{S}$	6.6	8.5	10.5^{S}	11.9^{S}	11.7	12.4	11.4	$J_{10.0}^{S}$	$I_{8.4}^{S}$	$I_{6.3}^{S}$	$I_{6.1}^{S}$	S	S	S
27	S	S	S	$J_{5.0}^{S}$	$I_{2.4}^{S}$	$J_{2.0}^{S}$	4.3	6.2	5.7	6.4	5.5	7.0	8.1	9.1	$J_{10.2}^{S}$	10.9	$I_{9.7}^{S}$	$J_{8.2}^{S}$	$I_{8.5}^{S}$	$J_{8.9}^{S}$	S	S	$I_{3.5}^{S}$	3.7
28	S	S	$I_{4.5}^{S}$	$I_{4.0}^{S}$	$I_{3.6}^{S}$	$J_{3.5}^{S}$	$J_{6.1}^{S}$	$I_{6.5}^{S}$	5.9^{H}	5.6	5.6	6.9	8.6	9.1	8.7	7.8	$J_{7.9}^{S}$	8.3	$J_{9.9}^{S}$	10.9^{S}	S	S	A	A
29	S	A	3.6	$I_{3.5}^{S}$	3.2^{S}	$J_{2.6}^{S}$	4.9	$I_{6.4}^{S}$	6.0	6.1	$I_{6.2}^{A}$	$I_{6.6}^{S}$	7.6	8.4	9.5	10.2	9.1	8.9	9.2^{S}	$I_{9.1}^{A}$	S	A	A	A
30	A	S	S	S	$J_{2.8}^{S}$	$I_{2.7}^{S}$	4.8	6.1^{S}	6.4	$I_{6.2}^{A}$	7.0	8.1	9.0	$J_{10.4}^{S}$	$J_{11.6}^{S}$	$J_{11.7}^{S}$	$J_{11.0}^{S}$	9.1	8.4	S	S	S	S	A
31																								
No.	17	22	27	28	30	29	29	30	30	30	30	30	30	30	30	30	30	30	30	28	22	19	21	18
Median	$U_{3.7}$	3.8	3.8	3.8	3.1	2.8	4.4	5.8	6.2	6.6	7.0	8.0	9.0	10.0	10.0	9.7	9.0	8.6	8.4	$U_{8.0}$	5.8	3.7	$U_{3.5}$	$U_{3.6}$
U.Q.	4.2	4.1	4.1	4.0	3.5	3.4	4.8	6.1	6.6	7.1	7.4	8.4	9.7	10.4	11.1	11.1	9.9	9.4	8.9	8.8	6.5	4.6	4.0	3.7
L.Q.	3.3	3.5	3.4	3.5	2.8	2.4	3.8	5.5	5.9	6.3	6.6	7.6	8.6	9.2	9.3	8.9	7.9	7.8	7.7	6.4	5.4	3.3	3.3	3.3
Q.R.	0.9	0.6	0.7	0.5	0.7	1.0	1.0	0.6	0.7	0.8	0.8	0.8	1.1	1.2	1.8	2.2	2.0	1.6	1.2	2.4	1.1	1.3	0.7	0.4

The Radio Research Laboratories, Japan

foF2

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

Y 1

IONOSPHERIC DATA

Apr. 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										4.3	4.3	4.4	4.5^{H}	4.6	4.6	4.4	L	L						
2									L	$I_{4.3}^{L}$	4.5	4.6	4.8	4.5	4.6^{H}	4.5^{H}								
3										4.3	$I_{4.6}^{LH}$	4.5^{H}	4.5	4.5	4.6	4.4^{H}	4.3	L	L					
4										L^{H}	4.4^{H}	4.5	4.6	4.5	4.5	L	L^{H}	L						
5										L	4.7	4.6	4.7^{H}	4.6	4.5	4.4	L	L						
6										L	4.5^{RH}	4.4	4.7^{H}	4.7^{H}	4.5	$I_{4.4}^{L}$	$I_{4.2}^{L}$	L						
7									L	L	$I_{4.5}^{L}$	4.7	4.7	4.6	4.8	4.4^{R}	$I_{4.2}^{L}$	3.5						
8									L	L	4.7	4.8	4.8	$I_{4.7}^{L}$	4.6	4.6	L	L						
9									L	L	4.6	4.7	4.9	4.7	4.7	4.5	L^{H}	L						
10										L	4.6	4.8	4.8	4.7	4.8	4.6	4.2	L						
11									L	$I_{4.4}^{L}$	4.6	4.8	4.8	4.8	4.6	$I_{4.6}^{L}$	4.5	3.5						
12									L	L	4.6	4.7	4.8	4.9	4.7	4.5	4.3	A						
13									L	L	A	A	A	A	4.8	4.6	4.3	L						
14									L	A	4.6	4.7	4.8	4.9	4.7	4.6	L^{H}	L						
15									L	L	4.7	4.6	4.6	4.6	4.8	4.6	L^{H}							
16										4.5	4.8	4.7	$I_{4.7}^{R}$	4.6	4.7	4.5	4.4	A	A					
17									L	L	4.7	4.7	4.8	4.9	4.8	4.4	4.4	L	L					
18										4.2	4.9	4.8	4.7	4.8	4.7	$I_{4.6}^{A}$	$I_{4.3}^{L}$	L						
19									L	L	4.6	4.8	4.8	$I_{4.8}^{C}$	4.5	4.5^{H}	L	L						
20									L	L	4.5	4.6	4.7	4.7	4.6	4.5	L	A	A					
21									L	L	L	5.0^{H}	4.7	4.6	4.6	4.5	A							
22									A	4.5	4.7	$I_{4.9}^{C}$	4.8	A	4.7	4.5	4.3	L						
23									A	A	A	L	4.7	4.4	4.7	4.4	4.3	L	A					
24									A	A	A	A	A	A	A	A	A	A	A					
25									L	L	R	$I_{4.7}^{A}$	4.7^{R}	4.6	4.5	4.4	4.3	L^{H}						
26									L	4.4	4.5	4.8^{R}	4.6^{R}	$I_{4.6}^{A}$	$I_{4.5}^{B}$	4.4^{H}	4.2	3.9						
27										4.4	$I_{4.6}^{L}$	4.6	$I_{4.7}^{R}$	4.6	4.4^{R}	$I_{4.5}^{A}$	4.1	A	A					
28										A	4.7	A	$I_{4.4}^{A}$	A	4.7	4.3	3.9	A	A					
29									A	A	A	A	A	A	A	R	R	A	A					
30									A	A	A	4.6	4.7	$I_{4.7}^{R}$	4.6	4.4^{R}	4.2	L	L					
31																								
No.										9	23	25	27	25	28	27	17	3						
Median										4.4	4.6	4.7	4.7	4.6	4.6	4.5	4.3	3.5						
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

Apr. 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	1.85	2.50	3.00^{H}	3.15^{H}	3.25^{H}	I3.30^{R}	I3.30^{R}	3.20	3.00	2.85	2.55	1.80					
2							S	2.10	2.65	3.00	I3.20^{A}	3.10	3.20	I3.30^{A}	3.35^{R}	3.10	2.90	A	S					
3							S	2.00	2.50	2.90	3.05	3.15	3.15^{R}	3.05	I3.10^{A}	I3.20^{R}	2.95	2.50	S					
4							S	2.10	2.60	2.85	A	R	R	R	3.30	3.10	I2.85^{A}	2.60	1.90					
5							S	2.00	2.70	3.00	3.15	I3.30^{R}	3.25	3.25	3.20	3.00	2.80	2.50	1.90					
6							S	2.00	2.50	2.85	3.15	3.30	I3.30^{R}	I3.30^{R}	I3.25^{R}	3.20	2.95	2.50	A					
7							S	2.10	2.70	3.10	3.30	3.40	3.40	3.40^{R}	3.20	3.00	2.90	2.45	S					
8							S	2.25^{H}	2.70^{H}	3.00^{H}	3.15	3.20^{R}	3.10	3.50^{R}	3.30	3.25	2.90	A	A					
9							S	2.20	2.70	3.00	I3.20^{R}	I3.30^{R}	3.35^{R}	3.35^{R}	I3.35^{R}	3.20	3.00	2.60	S					
10							S	2.00	2.60	3.10	3.20	I3.30^{R}	R	R	R	R	2.90	2.70	A					
11							S	2.20	2.70	3.05	I3.30^{R}	I3.40^{R}	3.50	I3.35^{R}	3.20	3.20	3.00	2.60	S					
12							S	2.40^{H}	2.80^{H}	3.10	I3.40^{R}	3.50	A	A	A	A	2.95^{R}	2.55	2.00					
13							S	2.20	2.80	3.15	3.35	3.45	3.40	3.20^{R}	3.00	I2.95^{A}	2.90	I2.50^{A}	1.75					
14							S	2.20	2.70	3.05^{R}	3.25	R	R	R	R	I3.25^{R}	2.90	2.50	1.90					
15							S	2.30	2.80	3.10	A	A	A	R	R	3.10	2.90	2.60	S					
16							S	2.30	2.80	3.00^{R}	R	R	R	R	R	I3.35^{R}	2.95	2.70	S					
17							S	2.25	2.80	3.05	3.25^{R}	3.30	A	A	A	R	3.00	2.60	S					
18							S	2.30^{H}	2.75	3.15	R	R	R	R	3.40	3.10	2.80	2.30	S					
19							S	2.25	2.75	3.20	3.30	3.40	3.45	I3.50^{C}	3.50	I3.10^{A}	2.85	2.60	2.00					
20							S	2.30	2.80	3.10	3.30	3.40	3.30	A	R	3.30	3.10	2.50	1.90					
21							S	2.30^{H}	2.80	3.10	I3.30^{R}	3.40^{R}	I3.40^{R}	3.45	I3.35^{R}	I3.25^{R}	2.95	2.70	2.05					
22							S	2.10	2.85	3.10	A	C	A	A	A	R	2.80	2.50	2.05					
23							S	2.20	2.75	3.10	3.20	3.35	R	R	R	3.20^{R}	2.95	2.60	1.80					
24							S	2.40^{H}	2.80	3.10	3.30	3.30	I3.30^{R}	3.30^{R}	3.35	3.20	2.90	2.35	S					
25							S	2.40^{H}	2.80	3.05	R	R	R	I3.45^{R}	I3.30^{R}	3.25	3.00	2.60	2.00					
26							S	2.40	2.70	2.95	I3.20^{R}	3.25	3.20	3.20	I3.25^{B}	3.20^{R}	2.95	2.60	1.90					
27							S	2.40	2.80	3.10	3.25^{R}	R	R	R	R	R	3.05^{R}	2.60^{H}	2.05					
28							S	2.20	2.80	3.10	I3.35^{R}	3.50	R	R	R	I3.15^{R}	2.90	2.60	2.05					
29							S	2.35	2.85	3.15	3.35	3.35^{R}	R	R	I3.45^{R}	I3.30^{R}	3.00	2.60	2.10					
30							S	2.40	2.90	3.10	3.25	A	A	A	A	3.20	3.00	2.60	2.10					
31																								
No.								30	30	30	24	21	15	15	18	25	30	28	17					
Median								2.20	2.75	3.10	3.25	3.30	3.30	3.30	3.30	3.20	2.90	2.60	2.00					
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

Apr. 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	S	S	S	S	S	S	S	G	3.2	3.9	4.2	4.3	4.2	4.3	4.3	3.8	3.2	2.9	2.5	S	2.3	2.9	3.8^{M}	2.8
2	2.4	S	S	S	S	S	S	2.6	3.1	3.2	3.8	3.8	3.4	3.8	G	G	G	3.4	2.6	2.0	S	2.6	S	S
3	S	S	S	S	S	S	S	G	G	3.1	3.2	3.3	G	3.7	3.6	3.1^{G}	2.9^{G}	2.4^{G}	2.3	S	S	S	2.8	2.9^{M}
4	2.8	S	S	E	2.6	2.2	S	G	3.2	3.1	3.3	2.9^{G}	2.8^{G}	2.8^{G}	2.5^{G}	2.8^{G}	3.0	2.9	2.2	2.0	S	S	S	S
5	S	S	S	S	E	S	S	G	3.0	3.3	G	4.1	3.8	3.7	3.8	$J_{5.2}$	3.3	G	G	S	S	S	S	S
6	S	S	S	3.1	E	S	S	G	G	G	G	G	G	G	G	2.7^{G}	3.0	3.2	3.0	2.8	2.2	S	S	2.7
7	S	S	S	E	S	S	2.3	3.0	3.4	3.8	4.4	4.2	4.0	4.4	4.4	3.5	G	2.8	G	S	S	2.4	2.7	2.2
8	2.9	3.9^{M}	S	2.9	2.1	S	2.1	2.9	3.3	3.9	4.3	3.8	$J_{5.7}$	G	4.1	4.8	3.6	$J_{3.1}$	2.9	2.8	2.3	S	S	S
9	S	S	S	S	E	S	S	2.8	3.1	3.3	3.6	G	G	G	G	G	G	G	2.3	S	2.7	S	2.8	2.5
10	S	S	S	S	S	3.0^{M}	2.3	2.6	3.1	3.4	3.6	G	3.0^{G}	2.8^{G}	2.6^{G}	2.5^{G}	G	G	2.8	S	S	S	S	S
11	S	S	S	S	S	S	S	2.6	3.0	2.5^{G}	G	4.3	G	G	G	G	G	G	2.6	S	S	2.3	S	S
12	S	S	S	E	E	S	S	G	3.5	3.9	3.9	$J_{5.5}$	$J_{5.5}$	3.9	4.4	3.8	3.5	$J_{5.6}$	$J_{5.0}$	3.2^{M}	3.3^{M}	S	S	S
13	S	S	S	S	E	S	S	2.8	3.3	4.4	4.7	6.3	7.8	$J_{5.9}$	$J_{5.0}$	3.5	2.6^{G}	3.0	$J_{2.0}$	2.4	S	S	S	S
14	S	S	S	E	E	S	S	2.7	3.6	6.0	3.8	3.9	G	G	4.0	2.5^{G}	G	G	3.0	$J_{3.5}$	2.4^{M}	S	S	S
15	S	S	S	E	E	S	S	2.7	G	3.7	3.2	5.9	3.8	3.1^{G}	3.2^{G}	2.5^{G}	2.2^{G}	1.8^{G}	G	3.0	S	S	S	S
16	S	S	S	S	S	S	2.0	2.6	3.5	3.9	G	4.6	3.1^{G}	2.9^{G}	4.4	3.9	3.8	$J_{5.3}$	$J_{5.5}$	6.8	3.8	2.9	3.7^{M}	2.6^{M}
17	S	S	S	S	S	S	S	3.0	3.9	5.1	3.9	3.9	5.2	4.3	$J_{5.3}$	3.0^{G}	G	G	G	2.2	3.0	$J_{4.2}$	2.8	S
18	2.9	3.0	$J_{4.7}$	2.8	2.5	S	2.0	3.4	3.4	3.7	3.7	4.1	4.0	3.9	4.1	5.0	3.9	4.0	2.0	2.3	S	2.9	2.5	3.2
19	$J_{3.8}$	3.0	3.0	2.3	2.3	S	2.1	2.7	3.6	$J_{4.7}$	4.4	3.7	3.9	C	G	3.7	3.1	2.6^{G}	2.9	$J_{3.6}$	$J_{5.3}$	3.8^{M}	2.8	S
20	S	S	E	2.3	2.7	$J_{2.2}$	S	2.7	3.2	3.6	3.8	3.6	3.9	4.3	4.0	4.3	4.1	$J_{6.3}$	9.0^{M}	$J_{5.4}$	2.9	2.6	S	S
21	S	3.3^{M}	S	S	S	S	S	3.0	3.4	4.0	3.9	4.1	4.4	3.8	4.3	4.3	4.4	3.8	3.8	$J_{5.3}$	3.0	$J_{2.4}$	3.0	2.2
22	S	$J_{3.9}$	2.9^{M}	2.7	S	S	S	3.0	5.0	3.8	3.5	C	3.5	4.5	$J_{4.0}$	3.1^{G}	G	3.6	2.4	2.2	S	2.3	S	S
23	S	S	S	S	E	S	S	3.2	5.2	$J_{4.7}$	5.0	4.7	4.3	4.3	G	3.7	G	3.2	$J_{5.5}$	4.3	4.3	3.0	2.8	S
24	2.2	S	2.2	3.0	2.9	2.0	2.2	3.4	4.2	4.5	4.8	5.0	9.2^{M}	6.8	$J_{5.7}$	$J_{5.4}$	6.4^{M}	6.9^{M}	$J_{10.4}$	5.7	$J_{3.1}$	S	2.8	$J_{3.6}$
25	S	S	S	E	S	S	2.3	2.8	3.8	4.3	4.1	$J_{5.6}$	3.6	G	3.9	3.9	G	2.9	3.3	3.9^{M}	3.8^{M}	3.0	3.0^{M}	3.2
26	3.0	S	S	E	S	S	G	2.5	3.7	3.8	4.1	3.9	4.3	$J_{5.1}$	B	G	G	G	2.7	2.1	2.8	S	S	S
27	S	S	S	S	S	S	2.2	3.0	3.2	3.3	3.7	G	G	3.7	3.6	4.6	3.6	3.9	3.5	2.4	$J_{3.0}$	S	2.8	S
28	S	S	2.8	3.2^{M}	S	S	2.0	3.1	4.5	$J_{5.1}$	4.3	$J_{5.3}$	4.5	4.8	3.9	G	3.2	4.2	$J_{4.8}$	$J_{5.3}$	5.9^{M}	6.2	5.8^{M}	5.8^{M}
29	3.8^{M}	4.2^{M}	2.2^{M}	2.7^{M}	S	S	2.8	$J_{4.3}$	4.1	$J_{5.9}$	$J_{6.8}$	$J_{6.6}$	$J_{5.1}$	$J_{6.6}$	7.0	4.2	3.8	5.8	5.9	9.2^{M}	7.0^{M}	9.0^{M}	12.7	5.0^{M}
30	3.7	3.3	2.9	$J_{3.3}$	2.6	$J_{2.4}$	2.3	$J_{4.3}$	$J_{5.1}$	$J_{8.4}$	6.4^{M}	$J_{5.3}$	3.7	3.7	3.8	G	G	3.3	3.1	6.0^{M}	3.2^{M}	5.9^{M}	5.9^{M}	6.7^{M}
31																								
No.	9	7	8	17	15	5	13	30	30	30	30	29	30	29	29	30	30	30	30	23	19	16	16	13
Median	2.9	3.3	2.8	2.3	E	2.2	2.2	2.8	3.4	3.8	3.8	4.1	3.8	3.8	3.9	3.5	G	3.0	2.8	3.2	3.0	2.9	2.8	2.9
U.Q.	3.8	3.9	3.0	3.0	2.6	2.7	2.3	3.0	3.8	4.5	4.3	5.2	4.4	4.4	4.4	4.2	3.6	3.9	3.8	5.3	3.8	4.0	3.8	4.3
L.Q.	2.6	3.0	2.2	E	E	2.1	2.0	2.6	3.1	3.3	3.5	3.6	G	G	G	G	G	G	2.3	2.3	2.7	2.5	2.8	2.6
Q.R.	1.2	0.9	0.8			0.6	0.3	0.4	0.7	1.2	0.8	1.6							1.5	3.0	1.1	1.5	1.0	1.7

foEs

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

The Radio Research Laboratories, Japan

Y 4

50

IONOSPHERIC DATA

Apr. 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	S	S	S	S	S	S	S		3.1	3.8	4.0	4.1	3.9	3.9	4.2	3.7	$E_{3.2}^{R}$	G	2.3	S	2.0	1.9	A	2.4
2	2.0	S	S	S	S	S	S	G	3.0	3.2	3.4	3.8	$E_{3.4}^{R}$	3.7				3.4	2.6	1.9	S	2.3	S	S
3	S	S	S	S	S	S	S			G	G	$E_{3.3}^{R}$		3.6	3.6	2.7^{G}	2.3^{G}	2.0^{G}	2.2	S	S	S	E	1.9
4	1.8	S	S		1.7	1.9	S		3.0	G	G	$E_{2.9}^{R}$	$E_{2.8}^{R}$	2.8^{G}	2.5^{G}	2.6^{G}	G	2.8	2.2	1.9	S	S	S	S
5	S	S	S	S		S	S		G	G		4.1	3.8	3.7	3.8	3.8	3.2			S	S	S	S	S
6	S	S	S	E		S	S									2.2^{G}	2.3	2.2	2.3	2.0	E	S	S	1.9
7	S	S	S		S	S	E	3.0	3.3	3.7	4.3	4.2	4.0	4.4	4.3	G		G		S	S	2.0	2.1	1.9
8	1.8	1.8	S	2.1	1.9	S	2.0	2.8	3.2	3.9	3.9	3.7	4.6		3.7	4.5	3.5	2.9	2.5	2.0	E	S	S	S
9	S	S	S	S		S	S	G	G	3.3	3.6								2.3	S	E	S	A	A
10	S	S	S	S	S	A	E	G	G	3.4	3.6		$E_{3.0}^{R}$	2.8^{G}	$E_{2.6}^{R}$	$E_{2.5}^{R}$			2.1	S	S	S	S	S
11	S	S	S	S	S	S	S	G	3.0	2.5^{G}		4.2							G	S	S	1.9	S	S
12	S	S	S			S	S		3.5	3.8	3.9	4.3	4.4	$E_{3.9}^{R}$	4.3	3.7	3.3	4.7	A	3.0	$E_{3.3}^{S}$	S	S	S
13	S	S	S	S		S	S	G	3.1	4.0	4.7	5.3	6.0	5.6	4.3	3.5	2.6^{G}	2.7	G	1.9	S	S	S	S
14	S	S	S			S	S	2.7	3.2	5.8	3.8	$E_{3.9}^{R}$			3.9	2.5^{G}			2.9	3.0	2.0	S	S	S
15	S	S	S			S	S	2.6		3.7	$E_{3.2}^{R}$	4.2	3.8	$E_{3.1}^{R}$	$E_{3.2}^{R}$	2.4^{G}	2.2^{G}	1.8^{G}		2.0	S	S	S	S
16	S	S	S	S	S	S	1.9	G	3.4	3.9		4.5	$E_{3.1}^{R}$	$E_{2.9}^{R}$	4.2	3.8	3.7	5.3	5.5	6.3	2.7	2.3	A	A
17	S	S	S	S	S	S	S	3.0	3.8	3.6	3.5	3.8	4.3	4.3	4.0	$E_{3.0}^{R}$				2.1	2.9	A	1.9	S
18	2.0	2.3	A	1.9	1.8	S	2.0	3.3	3.4	3.6	3.7	4.1	4.0	3.9	4.1	4.9	3.4	2.9	G	E	S	2.6	2.0	2.1
19	E	A	2.0	1.8	1.8	S	G	2.7	3.6	4.3	4.4	3.7	$E_{3.9}^{R}$	C		3.7	$E_{3.1}^{R}$	2.3^{G}	2.5	3.6	A	2.2	2.1	S
20	S	S		1.6	1.9	1.7	S	2.6	3.2	3.4	3.7	$E_{3.6}^{R}$	$E_{3.9}^{R}$	4.2	4.0	4.2	4.0	$E_{6.3}^{R}$	8.7	$E_{5.4}^{S}$	2.5	E	S	S
21	S	2.0	S	S	S	S	S	3.0	3.4	3.9	3.9	4.1	4.4	$E_{3.8}^{R}$	4.2	4.1	4.4	3.4	3.1	4.7	2.3	1.9	2.0	E
22	S	2.0	1.8	1.9	S	S	S	2.9	4.1	3.6	$E_{3.5}^{R}$	C	$E_{3.5}^{R}$	4.5	4.0	$E_{3.1}^{R}$		3.5	G	E	S	2.2	S	S
23	S	S	S	S		S	S	3.1	4.4	4.6	4.7	4.5	4.2	4.2		3.7		3.1	4.4	3.7	4.3	2.2	1.9	S
24	1.9	S	1.9	1.8	1.8	1.8	2.1	3.3	4.0	4.4	4.7	4.8	7.8	$E_{6.8}^{R}$	5.4	5.2	4.4	4.2	A	$E_{5.7}^{S}$	3.1	S	2.0	1.9
25	S	S	S		S	S	2.3	G	3.7	4.2	$E_{4.1}^{R}$	5.0	$E_{3.6}^{R}$		$E_{3.9}^{R}$	$E_{3.9}^{R}$		G	3.3	3.7	$E_{3.8}^{S}$	2.4	2.4	A
26	2.4	S	S		S	S		G	3.4	$E_{3.8}^{R}$	4.1	$E_{3.9}^{R}$	4.2	4.9	B				2.6	2.1	2.5	S	S	S
27	S	S	S	S	S	S	G	2.9	G	3.3	3.7			$E_{3.7}^{R}$	3.6	4.6	3.5	3.9	$E_{3.5}^{S}$	2.4	$E_{3.0}^{S}$	S	2.7	S
28	S	S	E	1.9	S	S	G	3.0	4.3	4.7	4.2	4.7	4.5	4.6	$E_{3.9}^{R}$		G	$E_{4.2}^{R}$	4.5	A	A	A	A	A
29	A	A	2.1	E	S	S	2.7	4.0	4.0	5.7	A	A	4.9	6.4	6.7	$E_{4.2}^{R}$	$E_{3.8}^{R}$	4.7	A	A	A	A	A	A
30	A	A	2.0	2.3	1.7	A	G	3.8	4.3	A	4.9	4.0	$E_{3.7}^{R}$	$E_{3.7}^{R}$	$E_{3.8}^{R}$			3.3	2.5	A	3.2	A	A	A
31																								
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

foEs

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

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Apr. 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	$E_{1.80}^{S}$	$E_{1.80}^{S}$	$E_{1.60}^{S}$	$E_{1.70}^{S}$	$E_{1.90}^{S}$	$E_{1.60}^{S}$	$E_{1.80}^{S}$	$E_{1.60}^{S}$	$E_{1.50}^{S}$	1.85	1.90	2.25	2.25	2.30	2.30	2.30	1.95	1.90	$E_{1.60}^{S}$	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$	$E_{1.65}^{S}$
2	$E_{1.80}^{S}$	$E_{2.00}^{S}$	$E_{1.80}^{S}$	$E_{1.55}^{S}$	$E_{1.70}^{S}$	$E_{1.80}^{S}$	$E_{1.80}^{S}$	1.80	1.70	1.80	1.90	2.20	2.25	2.05	2.00	1.80	1.90	1.80	1.95	$E_{1.70}^{S}$	$E_{2.00}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{1.90}^{S}$
3	$E_{2.00}^{S}$	$E_{2.00}^{S}$	$E_{1.80}^{S}$	$E_{1.65}^{S}$	$E_{1.90}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$	1.90	$E_{1.60}^{S}$	1.80	1.90	2.05	1.95	2.20	2.10	2.00	1.90	1.60	$E_{1.80}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$	$E_{1.60}^{S}$	$E_{1.90}^{S}$	$E_{1.70}^{S}$
4	$E_{1.65}^{S}$	$E_{1.90}^{S}$	$E_{1.60}^{S}$	1.35	E	$E_{1.80}^{S}$	$E_{1.70}^{S}$	1.80	1.65	1.90	1.90	2.05	2.60	2.40	2.20	1.90	1.90	1.90	1.75	$E_{1.60}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{2.50}^{S}$
5	S	$E_{2.00}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$	1.30	$E_{1.70}^{S}$	$E_{1.90}^{S}$	$E_{1.60}^{S}$	1.80	1.80	1.90	2.20	2.20	2.05	2.00	1.85	1.95	1.90	$E_{1.60}^{S}$	$E_{1.80}^{S}$	$E_{1.60}^{S}$	$E_{1.80}^{S}$	$E_{1.50}^{S}$	$E_{1.80}^{S}$
6	$E_{1.80}^{S}$	$E_{1.70}^{S}$	$E_{1.90}^{S}$	1.10	1.20	$E_{1.60}^{S}$	$E_{1.70}^{S}$	1.75	1.80	1.80	2.00	2.25	2.30	2.35	2.20	1.90	1.75	1.70	$E_{1.60}^{S}$	$E_{1.75}^{S}$	$E_{1.70}^{S}$	$E_{1.90}^{S}$	$E_{2.00}^{S}$	$E_{1.60}^{S}$
7	$E_{1.90}^{S}$	$E_{1.95}^{S}$	$E_{1.90}^{S}$	E	S	$E_{1.80}^{S}$	$E_{1.60}^{S}$	$E_{1.60}^{S}$	1.80	1.90	2.25	2.20	2.40	2.40	2.20	2.20	1.85	1.80	1.85	$E_{1.80}^{S}$	$E_{1.80}^{S}$	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{1.70}^{S}$
8	$E_{1.70}^{S}$	$E_{1.65}^{S}$	$E_{1.80}^{S}$	E	E	$E_{1.80}^{S}$	$E_{1.75}^{S}$	$E_{1.60}^{S}$	1.75	1.90	2.00	2.30	2.25	2.10	2.20	2.30	1.75	1.70	1.85	$E_{1.90}^{S}$	$E_{1.70}^{S}$	$E_{1.95}^{S}$	$E_{2.50}^{S}$	$E_{1.80}^{S}$
9	$E_{1.70}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{1.90}^{S}$	1.10	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{1.70}^{S}$	1.80	1.90	2.30	2.30	2.50	2.40	2.40	2.30	1.90	2.00	1.80	$E_{1.80}^{S}$	$E_{2.00}^{S}$	$E_{1.85}^{S}$	$E_{2.00}^{S}$	$E_{1.60}^{S}$
10	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$	1.80	2.00	2.30	2.45	2.45	2.50	2.20	2.25	1.85	2.05	1.90	$E_{1.75}^{S}$	$E_{1.90}^{S}$	$E_{2.20}^{S}$	$E_{2.00}^{S}$	$E_{2.00}^{S}$
11	$E_{1.90}^{S}$	$E_{1.90}^{S}$	$E_{1.70}^{S}$	$E_{1.80}^{S}$	$E_{1.80}^{S}$	S	$E_{1.70}^{S}$	$E_{1.70}^{S}$	1.70	2.00	2.30	2.40	2.35	2.20	2.40	2.30	2.35	1.90	1.90	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$
12	$E_{1.90}^{S}$	$E_{2.00}^{S}$	$E_{1.90}^{S}$	E	E	$E_{1.70}^{S}$	$E_{1.80}^{S}$	$E_{1.65}^{S}$	1.70	1.80	2.40	2.30	2.40	2.30	2.40	2.30	1.85	1.70	$E_{1.80}^{S}$	$E_{1.60}^{S}$	$E_{1.80}^{S}$	$E_{1.80}^{S}$	$E_{2.05}^{S}$	$E_{2.20}^{S}$
13	$E_{1.90}^{S}$	$E_{1.90}^{S}$	$E_{1.90}^{S}$	$E_{1.90}^{S}$	E	$E_{1.60}^{S}$	$E_{1.90}^{S}$	$E_{1.70}^{S}$	1.70	2.00	2.00	2.25	2.30	2.50	2.20	2.05	1.90	1.90	$E_{1.60}^{S}$	$E_{1.70}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$
14	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{1.50}^{S}$	E	E	$E_{1.80}^{S}$	$E_{1.80}^{S}$	$E_{1.50}^{S}$	1.70	2.00	2.00	2.30	2.50	2.35	2.40	1.90	1.95	1.90	$E_{1.70}^{S}$	$E_{1.70}^{S}$	$E_{1.90}^{S}$	$E_{2.20}^{S}$	$E_{1.90}^{S}$	$E_{2.10}^{S}$
15	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{1.60}^{S}$	1.10	1.40	$E_{2.10}^{S}$	$E_{1.80}^{S}$	1.65	1.80	1.85	2.00	2.30	2.20	2.50	2.40	2.10	1.80	1.65	1.90	$E_{1.70}^{S}$	$E_{1.80}^{S}$	$E_{1.80}^{S}$	$E_{2.10}^{S}$	$E_{1.80}^{S}$
16	$E_{1.60}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{1.70}^{S}$	$E_{1.75}^{S}$	$E_{1.80}^{S}$	$E_{1.70}^{S}$	$E_{1.60}^{S}$	1.70	2.00	2.30	2.40	2.50	2.30	2.00	2.00	1.90	2.00	1.95	$E_{1.80}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$
17	$E_{1.90}^{S}$	$E_{2.00}^{S}$	$E_{1.80}^{S}$	S	$E_{1.90}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	1.85	1.80	2.05	2.30	2.00	2.20	2.30	2.10	1.80	2.00	2.25	2.20	$E_{1.60}^{S}$	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{2.50}^{S}$
18	$E_{1.70}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{1.80}^{S}$	E	$E_{1.80}^{S}$	$E_{1.70}^{S}$	1.70	2.00	2.00	2.30	2.30	2.30	2.30	2.40	2.10	2.30	1.90	1.70	$E_{2.00}^{S}$	$E_{1.70}^{S}$	$E_{1.60}^{S}$	$E_{1.60}^{S}$	$E_{1.80}^{S}$
19	$E_{1.70}^{S}$	$E_{1.60}^{S}$	$E_{1.80}^{S}$	E	E	$E_{1.90}^{S}$	$E_{1.70}^{S}$	1.75	1.85	1.85	2.20	2.30	2.25	$I_{2.55}^{C}$	2.25	2.20	2.25	1.85	$E_{1.60}^{S}$	$E_{1.80}^{S}$	$E_{1.70}^{S}$	$E_{1.90}^{S}$	$E_{1.60}^{S}$	S
20	$E_{1.80}^{S}$	$E_{2.00}^{S}$	1.20	E	E	1.30	$E_{1.80}^{S}$	1.70	1.75	1.80	2.00	2.25	2.60	2.30	2.30	2.30	2.20	1.90	$E_{1.65}^{S}$	$E_{1.70}^{S}$	$E_{1.90}^{S}$	$E_{1.90}^{S}$	$E_{1.90}^{S}$	$E_{1.90}^{S}$
21	$E_{1.60}^{S}$	$E_{1.90}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$	$E_{1.60}^{S}$	1.70	1.90	1.95	2.25	2.30	2.35	2.30	2.20	2.00	1.40	$E_{1.50}^{S}$	$E_{1.65}^{S}$	$E_{1.75}^{S}$	$E_{1.70}^{S}$	$E_{1.80}^{S}$	$E_{1.70}^{S}$
22	$E_{2.00}^{S}$	$E_{1.80}^{S}$	$E_{1.60}^{S}$	E	$E_{1.90}^{S}$	$E_{1.60}^{S}$	$E_{1.90}^{S}$	$E_{1.60}^{S}$	1.70	1.95	2.20	$I_{2.40}^{C}$	2.30	2.30	2.20	2.00	1.80	1.85	1.80	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{1.90}^{S}$	$E_{2.10}^{S}$	S
23	$E_{1.95}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{1.80}^{S}$	E	$E_{1.80}^{S}$	$E_{1.85}^{S}$	$E_{1.60}^{S}$	1.85	2.00	2.00	1.95	2.00	2.70	2.30	2.00	1.90	$E_{1.70}^{S}$	$E_{1.60}^{S}$	$E_{1.60}^{S}$	$E_{1.70}^{S}$	$E_{1.45}^{S}$	$E_{1.70}^{S}$	$E_{1.90}^{S}$
24	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	E	E	$E_{1.70}^{S}$	$E_{1.70}^{S}$	1.85	1.80	1.85	2.35	2.30	2.25	2.25	2.20	2.20	1.90	1.80	$E_{1.75}^{S}$	$E_{1.75}^{S}$	$E_{1.80}^{S}$	$E_{1.80}^{S}$	$E_{1.60}^{S}$	$E_{1.80}^{S}$
25	$E_{1.80}^{S}$	$E_{1.50}^{S}$	$E_{1.80}^{S}$	E	$E_{1.80}^{S}$	$E_{1.50}^{S}$	$E_{1.70}^{S}$	$E_{1.60}^{S}$	1.80	2.00	2.25	2.30	2.30	2.30	2.40	2.30	2.05	$E_{1.70}^{S}$	$E_{1.90}^{S}$	$E_{1.90}^{S}$	$E_{1.70}^{S}$	$E_{1.80}^{S}$	$E_{1.80}^{S}$	$E_{1.70}^{S}$
26	$E_{1.90}^{S}$	$E_{1.90}^{S}$	$E_{1.90}^{S}$	1.25	$E_{1.60}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{1.70}^{S}$	1.85	1.95	2.40	2.40	2.60	2.45	5.00	2.80	2.20	2.05	1.70	$E_{1.70}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{2.40}^{S}$	$E_{2.00}^{S}$
27	$E_{2.10}^{S}$	S	$E_{1.60}^{S}$	$E_{1.70}^{S}$	S	$E_{1.80}^{S}$	$E_{1.80}^{S}$	$E_{1.60}^{S}$	1.90	2.10	2.40	2.50	2.30	2.30	2.20	2.45	2.20	1.90	$E_{1.70}^{S}$	$E_{1.60}^{S}$	$E_{1.90}^{S}$	$E_{1.90}^{S}$	$E_{1.70}^{S}$	$E_{1.90}^{S}$
28	$E_{2.10}^{S}$	$E_{1.90}^{S}$	$E_{1.70}^{S}$	$E_{1.80}^{S}$	$E_{1.80}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$	1.90	2.00	2.30	2.30	2.40	2.40	2.60	2.00	1.90	$E_{1.70}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$	$E_{1.90}^{S}$	$E_{1.80}^{S}$	$E_{1.90}^{S}$	$E_{1.90}^{S}$
29	$E_{1.60}^{S}$	$E_{1.80}^{S}$	$E_{1.70}^{S}$	$E_{1.80}^{S}$	$E_{1.70}^{S}$	$E_{1.80}^{S}$	$E_{1.70}^{S}$	$E_{1.70}^{S}$	1.80	2.00	2.30	2.40	2.40	2.40	2.30	2.30	2.10	1.80	$E_{1.70}^{S}$	$E_{1.80}^{S}$	$E_{1.95}^{S}$	$E_{1.80}^{S}$	$E_{1.80}^{S}$	$E_{1.80}^{S}$
30	$E_{1.90}^{S}$	$E_{1.90}^{S}$	$E_{1.70}^{S}$	E	E	$E_{1.75}^{S}$	$E_{1.80}^{S}$	$E_{1.70}^{S}$	1.80	2.05	2.05	2.45	2.30	2.50	2.35	2.20	2.25	1.95	1.80	$E_{1.80}^{S}$	$E_{1.80}^{S}$	$E_{1.60}^{S}$	$E_{1.80}^{S}$	$E_{1.90}^{S}$
31																								
No.	29	29	30	29	28	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28
Median	$E_{1.80}$	$E_{1.90}$	$E_{1.80}$	$E_{1.55}$	$E_{1.35}$	$E_{1.80}$	$E_{1.80}$	$E_{1.70}$	1.80	1.90	2.20	2.30	2.30	2.30	2.30	2.20	1.90	1.90	$E_{1.75}$	$E_{1.75}$	$E_{1.80}$	$E_{1.80}$	$E_{1.90}$	$E_{1.80}$
U.Q.																								
L.Q.																								
Q.R.																								

f-min

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

The Radio Research Laboratories, Japan

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52

IONOSPHERIC DATA

Apr. 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	S	$I_{2.90}^{S}$	$J_{3.00}^{S}$	$I_{3.35}^{S}$	3.55	2.95	3.25	3.55	3.40	$J_{3.35}^{S}$	3.30	2.90	2.80	$J_{3.00}^{S}$	3.10	3.05	3.10	3.15	3.15^{S}	$I_{3.30}^{S}$	$I_{3.35}^{S}$	$I_{3.35}^{S}$	$I_{3.00}^{S}$	2.85
2	$I_{3.00}^{S}$	2.90	$I_{3.15}^{S}$	3.15	3.35	2.85	3.15^{S}	3.35^{S}	$I_{3.35}^{S}$	$I_{3.40}^{S}$	3.25	3.10	3.05	$J_{3.20}^{S}$	3.30	3.25	3.15	3.35	$J_{3.35}^{S}$	$I_{3.30}^{S}$	S	S	$J_{3.10}^{S}$	S
3	S	S	$J_{3.10}^{S}$	3.30	2.95	2.70	$J_{3.10}^{S}$	$I_{3.50}^{S}$	3.55	3.40	2.95	3.10	3.25	3.25	3.05	3.15^{S}	$J_{3.20}^{S}$	$I_{3.35}^{S}$	$I_{3.35}^{S}$	$I_{3.40}^{S}$	$I_{3.35}^{S}$	3.15^{S}	2.70	3.15
4	$I_{3.00}^{S}$	$J_{2.95}^{S}$	3.10^{S}	3.10^{S}	3.40	3.10	3.35^{S}	3.55^{S}	3.45	3.35^{S}	3.25	3.10^{S}	3.10	3.10	3.20	3.15^{S}	3.35	3.15	$I_{3.20}^{S}$	3.35	$I_{3.60}^{S}$	$J_{2.90}^{S}$	2.95	$J_{2.90}^{S}$
5	$I_{2.75}^{S}$	$I_{2.80}^{S}$	$I_{2.90}^{S}$	$I_{3.40}^{S}$	4.05	$I_{2.90}^{S}$	$J_{3.05}^{S}$	3.45	3.30	3.25	2.75	2.75	$J_{2.95}^{S}$	3.10	3.15	3.15^{S}	3.05	3.20	3.25^{S}	$I_{3.40}^{S}$	$J_{3.55}^{S}$	2.70^{H}	2.95	$I_{2.90}^{S}$
6	$J_{2.95}^{S}$	$I_{3.05}^{S}$	$J_{3.15}^{S}$	3.05	3.40	2.55	3.25^{S}	3.45	3.30^{H}	$I_{3.30}^{S}$	3.20	$J_{2.95}^{S}$	$J_{3.15}^{S}$	3.20	3.25	3.15	3.15	$J_{3.10}^{S}$	3.30	3.40^{S}	$I_{3.55}^{S}$	2.80	$I_{2.90}^{S}$	2.80
7	$I_{3.00}^{S}$	$I_{3.10}^{S}$	$J_{3.10}^{S}$	3.25	$I_{3.10}^{S}$	$I_{2.90}^{S}$	3.35	3.60	$J_{3.35}^{S}$	3.15	3.00	3.00	2.90	3.20	$J_{3.20}^{S}$	$J_{3.25}^{S}$	3.25	3.45	3.30^{S}_{H}	$I_{3.30}^{S}$	$J_{3.35}^{S}$	S	S	$I_{2.90}^{S}$
8	$I_{3.00}^{S}$	$I_{3.00}^{S}$	3.10^{S}	2.95^{S}	3.05	$I_{3.15}^{S}$	3.25	3.35	$J_{3.45}^{S}$	3.25	$J_{3.15}^{S}$	2.95	2.90^{S}	$J_{2.95}^{S}$	3.20	3.20	$J_{3.15}^{S}$	$J_{3.35}^{S}$	$J_{3.55}^{S}$	3.40	3.10	$J_{3.10}^{S}$	$I_{2.80}^{S}$	$I_{2.85}^{S}$
9	$I_{2.90}^{S}$	$J_{3.10}^{S}$	3.20	$J_{3.30}^{S}$	3.30	2.65	$J_{3.30}^{S}$	3.50^{S}	$J_{3.40}^{S}$	3.20	$J_{3.20}^{S}$	3.15	3.00^{S}	3.05^{S}	$J_{3.10}^{S}$	3.20^{S}	3.05^{S}	3.20	3.40	$I_{3.40}^{S}$	$I_{3.45}^{S}$	$I_{3.00}^{S}$	$I_{2.90}^{S}$	S
10	S	$J_{2.70}^{S}$	2.85	$I_{3.20}^{S}$	2.85	$I_{2.90}^{S}$	$I_{3.25}^{S}$	3.50	3.40	3.25	3.10	3.15	3.00	3.10^{S}	$J_{3.15}^{S}$	$J_{3.30}^{S}$	3.25	$I_{3.20}^{S}$	$I_{3.40}^{S}$	$I_{3.45}^{S}$	$J_{3.45}^{S}$	3.25	$I_{2.70}^{S}$	$I_{2.80}^{S}$
11	$I_{2.75}^{S}$	$J_{2.85}^{S}$	$J_{3.15}^{S}$	$I_{3.50}^{S}$	3.20^{H}	S	S	3.20^{S}	$J_{3.35}^{S}$	$I_{3.30}^{S}$	3.25	2.95	2.90^{S}	3.00	$J_{3.15}^{S}$	3.30	3.35	3.15	$I_{3.45}^{S}$	$I_{3.45}^{S}$	$J_{3.35}^{S}$	$I_{3.25}^{S}$	$I_{2.90}^{S}$	$J_{2.95}^{S}$
12	$I_{3.00}^{S}$	$J_{3.05}^{S}$	3.05^{S}	$J_{3.15}^{S}$	$J_{3.25}^{S}$	3.10	$J_{3.35}^{S}$	3.35	$I_{3.45}^{S}$	3.20	3.25^{S}	3.10	3.00	3.00^{S}	3.15	3.25	3.25	3.20	$I_{3.50}^{S}$	$I_{3.35}^{S}$	$J_{3.30}^{S}$	S	S	S
13	S	S	$I_{3.00}^{S}$	$I_{3.25}^{S}$	3.65	2.80	$I_{3.25}^{S}$	$I_{3.50}^{S}$	$J_{3.35}^{S}$	3.25^{S}	3.20	3.10	3.00	$J_{3.10}^{S}$	$J_{3.05}^{S}$	3.05	3.15	3.25	$J_{3.30}^{S}$	$J_{3.40}^{S}$	3.35^{S}	2.90^{S}	$I_{2.75}^{S}$	S
14	S	3.00^{S}	$I_{3.05}^{S}$	$J_{2.90}^{S}$	$J_{3.00}^{S}$	$I_{2.80}^{S}$	3.20	3.50	3.40^{S}	3.10	3.10	$J_{3.30}^{S}$	3.10	3.00	3.10	3.20	3.20	3.25	$J_{3.25}^{S}$	$J_{3.35}^{S}$	S	S	$I_{2.95}^{S}$	$I_{2.90}^{S}$
15	$J_{2.80}^{S}$	$J_{2.75}^{S}$	2.85^{S}	$J_{3.15}^{S}$	3.20	3.05	3.60^{S}	3.45	3.20	3.05	2.90	3.00	3.15^{S}	$J_{3.00}^{S}$	$J_{3.05}^{S}$	$I_{3.20}^{S}$	$J_{3.15}^{S}$	2.95^{H}	$J_{3.05}^{S}$	$J_{3.10}^{S}$	3.25^{S}	3.40^{S}	3.00^{S}	S
16	S	3.35	3.25	$I_{3.05}^{S}$	3.40	$I_{3.05}^{S}$	3.35	3.45^{S}	3.40	3.00	3.20	3.00	3.00	$J_{3.15}^{S}$	$J_{3.05}^{S}$	$J_{3.25}^{S}$	3.20	3.20	$J_{3.40}^{S}$	$I_{3.35}^{S}$	$I_{3.35}^{S}$	3.30	$I_{3.40}^{S}$	$I_{3.20}^{S}$
17	$J_{3.00}^{S}$	$I_{3.05}^{S}$	$I_{3.20}^{S}$	$I_{3.05}^{S}$	$I_{3.15}^{S}$	$I_{3.10}^{S}$	$J_{3.40}^{S}$	3.60^{S}	3.35	3.30	3.25^{S}	2.90	3.00	$J_{3.00}^{S}$	3.15	3.15	$J_{3.20}^{S}$	3.15^{S}	$I_{3.35}^{S}$	3.55^{S}	S	S	2.70	$I_{2.80}^{S}$
18	$I_{2.85}^{S}$	2.75	3.05	$J_{3.30}^{S}$	3.05	2.70	3.40	3.40	3.50	3.10	3.00	3.05	$J_{3.10}^{S}$	3.10	3.10	3.15	$I_{3.25}^{S}$	3.30	$I_{3.35}^{S}$	$I_{3.40}^{S}$	$J_{3.20}^{S}$	2.95	S	S
19	2.85^{S}	$I_{2.80}^{S}$	2.95	3.45	3.30	2.85^{S}	3.30	3.45	3.45	3.35	3.10	2.95	$J_{3.05}^{S}$	$I_{3.05}^{G}$	3.05	3.20	3.25	$I_{3.30}^{S}$	$I_{3.35}^{S}$	$J_{3.35}^{S}$	$I_{3.15}^{A}$	$I_{3.10}^{S}$	$I_{2.90}^{S}$	$I_{2.80}^{S}$
20	$I_{2.75}^{S}$	2.95	2.85^{S}	$I_{3.25}^{S}$	3.20	2.85	3.40	3.35^{H}	3.20	$J_{3.25}^{S}$	3.20	2.75	3.00^{S}	3.10^{S}	3.25	3.05	3.10	3.20	3.35	3.45^{S}	$I_{3.25}^{S}$	$I_{2.95}^{S}$	$I_{2.80}^{S}$	2.95
21	$I_{2.85}^{S}$	$I_{2.85}^{S}$	$J_{2.95}^{S}$	$I_{3.30}^{S}$	$J_{3.45}^{S}$	$I_{3.25}^{S}$	$J_{3.45}^{S}$	$J_{3.55}^{S}$	$I_{3.30}^{S}$	$J_{3.30}^{S}$	3.15	2.90	2.95	$J_{3.05}^{S}$	$J_{3.30}^{S}$	3.25	3.35	$J_{3.30}^{S}$	$J_{3.30}^{S}$	S	S	3.25^{S}	$J_{2.85}^{S}$	$J_{2.90}^{S}$
22	S	S	$J_{3.00}^{S}$	$J_{3.65}^{S}$	3.00^{S}	$J_{2.85}^{S}$	$J_{3.30}^{S}$	$I_{3.45}^{S}$	3.50	$J_{3.35}^{S}$	3.05	$I_{2.85}^{G}$	3.00	3.00	3.00	3.10^{S}	$J_{3.30}^{S}$	$I_{3.35}^{S}$	$I_{3.45}^{S}$	3.55	$I_{3.30}^{S}$	2.90^{S}	$I_{2.80}^{S}$	$I_{2.75}^{S}$
23	$I_{2.90}^{S}$	2.95	2.90	$J_{3.25}^{S}$	$J_{3.00}^{S}$	$I_{3.00}^{S}$	3.65	3.75	3.45	3.30	$J_{3.25}^{S}$	3.10	2.70	2.90	2.95	3.10	$J_{3.20}^{S}$	3.30	3.25	$J_{3.55}^{S}$	3.20	S	S	S
24	S	S	S	S	3.15	3.10^{S}	3.65	3.65	3.50	3.25	2.95	3.00	$J_{2.90}^{S}$	3.15	3.10	3.15	3.30	3.35	$I_{3.45}^{A}$	3.55	3.45^{S}	2.75	2.70	2.80
25	$I_{2.95}^{S}$	2.70	3.15	3.35	3.40^{S}	3.00	3.65	3.25	3.25	3.25^{S}	3.10^{S}	2.80	$J_{2.95}^{S}$	3.10^{S}	3.20	$J_{3.20}^{S}$	3.25	3.35	$J_{3.25}^{S}$	$I_{3.30}^{S}$	3.35	3.15^{S}	S	S
26	S	$I_{3.05}^{S}$	3.15^{S}	3.10^{S}	3.30	3.05	3.65	3.45	3.40	$I_{3.35}^{S}$	3.05	2.80	3.05^{S}	3.10^{S}	3.10	3.15	3.25	$J_{3.35}^{S}$	$I_{3.40}^{S}$	$I_{3.45}^{S}$	$I_{3.25}^{S}$	S	S	S
27	S	S	S	$J_{3.80}^{S}$	$I_{3.20}^{S}$	$J_{2.95}^{S}$	3.55	3.60	3.35	3.45	3.15	3.15	2.80	3.00	$J_{3.10}^{S}$	3.30	$I_{3.15}^{S}$	$J_{3.05}^{S}$	$I_{3.00}^{S}$	$J_{3.30}^{S}$	S	S	$I_{3.20}^{S}$	2.95
28	S	S	$I_{2.95}^{S}$	$I_{2.85}^{S}$	$I_{2.90}^{S}$	$J_{3.20}^{S}$	$J_{3.30}^{S}$	$I_{3.70}^{S}$	3.40^{H}	3.35	2.95	2.95	3.15	3.10	3.10	2.95	$J_{2.90}^{S}$	2.90	$J_{3.15}^{S}$	3.60^{S}	S	S	A	A
29	S	A	3.35	$I_{3.40}^{S}$	3.30^{S}	$J_{3.10}^{S}$	3.45	$I_{3.55}^{S}$	3.55	3.50	$I_{3.25}^{A}$	$I_{3.00}^{S}$	2.95	2.95	3.05	3.15	3.10	3.10	3.15^{S}	$I_{3.40}^{A}$	S	A	A	A
30	A	S	S	S	$J_{3.70}^{S}$	$I_{3.15}^{S}$	3.55	3.50^{S}	3.45	$I_{3.25}^{A}$	3.10	3.05	2.90	$J_{2.90}^{S}$	$J_{3.10}^{S}$	$J_{3.15}^{S}$	$J_{3.00}^{S}$	3.10	3.25	S	S	S	S	A
31																								
No.	17	22	27	28	30	29	29	30	30	30	30	30	30	30	30	30	30	30	30	28	22	19	21	18
Median	$U_{2.90}$	2.95	3.05	3.25	3.20	2.95	3.35	3.50	3.40	3.30	3.15	3.00	3.00	3.10	3.10	3.15	3.20	3.20	3.30	$U_{3.40}$	3.35	3.10	$U_{2.90}$	$U_{2.90}$
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Apr. 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										3.50	3.75	3.90	3.85^{H}	3.75	A	3.45	L	L						
2									L	I$_{3.60}^{L}$	3.75	3.70	3.45	3.80	3.70^{H}	4.00^{H}								
3										3.75	I$_{3.70}^{L}$$_{H}$	3.85^{H}	3.80	3.80	3.70	3.65^{H}	3.55	L	L					
4										L^{H}	3.85^{H}	R	3.50	3.75	3.75	L	L^{H}	L						
5										L	3.45	3.50	3.60^{H}	3.70	3.55	3.55	L	L						
6										L	3.55^{R}$_{H}$	4.10	3.45^{H}	3.60^{H}	3.65	I$_{3.70}^{L}$	I$_{3.55}^{L}$	L						
7									L	L	I$_{3.70}^{L}$	3.50	3.55	A	A	3.85^{R}	I$_{3.65}^{L}$	3.85						
8									L	L	3.60	3.55	A	I$_{3.75}^{L}$	3.65	A	L	L						
9									L	L	3.70	3.80	3.45	3.85	3.60	3.60	L^{H}	L						
10										L	3.65	3.55	3.55	3.45	3.55	3.50	3.70	L						
11									L	I$_{3.60}^{L}$	3.70	3.70	3.95	3.80	3.50	I$_{3.60}^{L}$	3.75	4.30						
12									L	L	3.70	3.65	3.65	3.45	A	3.70	3.50	A						
13									L	L	A	A	A	A	3.55	3.70	3.50	L						
14									L	A	3.50	3.60	3.50	3.50	3.60	3.50	L^{H}	L						
15									L	L	3.65	3.70	3.70	3.65	3.45	3.55	L^{H}							
16										3.60	3.60	A	I$_{3.70}^{R}$	R	A	3.55	3.60	A	A					
17									L	L	3.60	3.70	A	A	3.55	3.65	3.45	L	L					
18										3.85	3.30	3.55	3.65	3.55	3.60	I$_{3.60}^{A}$	I$_{3.60}^{L}$	L						
19									L	L	A	3.55	3.60	C	3.75	3.60^{H}	L	L						
20									L	L	3.80	3.95	3.55	3.55	3.55	A	A	A	A					
21									L	L	L	3.60^{H}	A	3.60	A	3.55	A							
22									A	3.75	3.75	I$_{3.45}^{C}$	3.40	A	3.60	3.75	3.55	L						
23									A	A	A	L	3.60	3.80	3.45	3.60	3.50	L	A					
24									A	A	A	A	A	A	A	A	A	A	A					
25									L	L	R	A	3.50^{R}	3.85	R	A	3.60	L^{H}						
26									L	3.65	3.75	3.70^{R}	A	A	I$_{3.60}^{B}$	3.65^{H}	3.65	3.60						
27										3.65	I$_{3.80}^{L}$	R	I$_{3.70}^{R}$	3.70	3.75^{R}	A	3.55	A	A					
28										A	3.70	A	A	A	3.45	3.75	3.95	A	A					
29									A	A	A	A	A	A	A	A	A	A	A					
30									A	A	A	3.75	3.55	R	R	3.70^{R}	3.55	L	L					
31																								
No.										9	22	21	22	19	21	23	17	3						
Median										3.65	3.70	3.70	3.60	3.70	3.60	3.60	3.55	3.85						
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

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IONOSPHERIC DATA

Apr. 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										290	280	355	340	305	295	285	295	275						
2									260	260	290	305	295	285	265	280								
3										270	320	305	285	270	295	285	280	260	245					
4										275	290	290	290	290	280	300	295	300						
5										255	405	335	325	295	275	275	285	280						
6										290	300	325	295	280	275	300	290	285						
7									270	290	305	325	330	285	285	280	270	255						
8									260	280	305	310	325	305	280	270	280	255						
9									250	290	295	290	305	295	285	265	280	270						
10										295	300	290	305	295	295	280	280	270						
11									285	290	280	335	320	310	295	270	260	280						
12									260	285	290	305	320	305	290	280	280	285						
13									290	295	290	305	320	300	300	290	280	265						
14									260	325	300	275	290	325	295	280	280	290						
15									310	320	285	305	280	290	290	260	280							
16										290	295	320	305	290	295	265	285	280	260					
17									280L	280	290	320	300	315	300	285	280	280	255					
18										305	345	305	305	295	290	275	260	255						
19									255	285	295	310	300	I300C	300	285	280	255						
20									285L	275	275	340	315	295	280	295	290	285	290					
21									260	275	295	330	320	305	280	290	270							
22									250	285	345	I340C	320	305	300	295	270	255						
23									260	295	300	300	355	340	320	300	280	255	265					
24									260	310	330	305	355	300	295	295	280	255	I260A					
25									290	290	290	355	330	305	290	280	275	255						
26									275	255	305	355	335	295	300	290	270	250						
27										265	305L	310	355	330	305	275	280	290	295					
28										285	380	355	305	300	295	290	315	310	280					
29									255	295	I310A	I355A	330	330	325	295	285	295	290					
30									260	I305A	320	300	335	325	295	290	265	280	260					
31																								
No.									20	30	30	30	30	30	30	30	29	27	10					
Median									260	290	300	310	320	300	295	285	280	275	260					
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

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IONOSPHERIC DATA

Apr. 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	300	315	295	245	225	240	250	235	250	E_{265}^{A}	250	240	205^{H}	200	I_{240}^{A}	260	255	255	255	245	220	210	I_{320}^{A}	350
2	290	295	260	255	255	340	285	245	240	240	220	220	260	230	205^{H}	225^{H}	290	275	255	240	240	250	280	300
3	290	290	290	255	270	330	275	245	240	220	200^{H}	200^{H}	210	205	210	205^{H}	240	255	240	235	220	230	355	305
4	300	300	270	255	250	300	250	240	250	240^{H}	205^{H}	I_{220}^{R}	280	205	220	230	200^{H}	250	260	235	210	E_{260}^{S}	310	340
5	I_{320}^{S}	370	330	250	200	460	290	240	245	230	210	260	205^{H}	220	240	250	255	245	250	245	220	$E_{290}^{S}{}_{H}$	320	320
6	290	300	290	275	220	370	260	240	235^{H}	240	200^{H}	205	250^{H}	195^{H}	245	225	210	260	255	240	210	295	320	340
7	285	280	295	250	I_{275}^{S}	355	275	235	255	245	I_{250}^{A}	E_{270}^{A}	250	A	A	230	230	230	240^{H}	240	220	250	280	300
8	290	305	250	300	340	300	255	245	245	250	225	220	I_{220}^{A}	E_{250}^{R}	240	I_{245}^{A}	255	250	240	220	240	290	340	335
9	305	290	260	240	225	350	255	245	240	235	230	220	205	205	205	220	205^{H}	240	245	240	225	245	A	I_{310}^{A}
10	305	300	285	240	E_{295}^{S}	A	250	240	240	235	220	255	240	240	235	250	230	230	250	235	230	255	355	340
11	330	305	270	235	$I_{230}^{S}{}_{H}$	I_{310}^{S}	255	240	250	250	220	235	200	205	275	240	240	210	255	235	235	230	320	325
12	295	285	290	255	250	250	250	240	250	245	225	255	E_{250}^{A}	300	E_{275}^{A}	240	270	I_{265}^{A}	255^{A}	245	E_{250}^{S}	250	340	330
13	295	270	310	255	200	345	250	240	245	E_{250}^{A}	A	A	A	A	E_{270}^{A}	210	205	245	250	240	225	255	335	320
14	305	290	275	255	255	340	245	220	240	I_{250}^{A}	245	250	260	225	225	245	220^{H}	255	255	245	230	270	305	320
15	320	340	300	255	220	E_{290}^{S}	240	240	225	240	235	E_{250}^{A}	210	250	225	255	230^{H}	205^{H}	260	255	245	210	290	325
16	355	245	255	255	255	300	255	240	240	255	240	A	I_{235}^{R}	I_{240}^{R}	I_{255}^{A}	255	245	A	A	275	240	245	I_{255}^{A}	I_{260}^{A}
17	300	290	260	I_{260}^{S}	295	280	235	240	245	240	230	215	I_{200}^{A}	I_{250}^{A}	245	240	240	230	255	230	215	I_{290}^{A}	370	360
18	340	340	335^{A}	260	255	330	240	235	240	230	220	250	225	225	250	I_{240}^{A}	240	250	245	240	240	320	335	340
19	330	I_{330}^{A}	300	240	205	320	250	245	250	I_{250}^{A}	A	210	255	I_{245}^{C}	250	250^{H}	240	240	240	255	I_{280}^{A}	305	320	I_{340}^{S}
20	350	325	290	255	255	335	235	225^{H}	240	240	235	205	260	E_{280}^{A}	265	A	A	A	A	E_{275}^{S}	220	275	325	320
21	310	330	305	255	250	255	240	245	250	245	240	220^{H}	I_{230}^{A}	260	I_{265}^{A}	E_{270}^{A}	A	260	260	250	240	240	305	325
22	325	315	300	245	255	305	245	245	I_{250}^{A}	220	210	I_{255}^{C}	E_{270}^{R}	I_{250}^{A}	240	215	260	I_{255}^{A}	255	240	205	300	340	I_{335}^{S}
23	345	310	290	275	290	300	235	225	A	A	A	A	250	255	220	250	255	I_{250}^{A}	I_{245}^{A}	240	255	260	280	300
24	290	320	275	270	265	255	230	240	I_{260}^{A}	I_{270}^{A}	A	A	A	A	A	A	A	A	A	250	240	300	350	350
25	345	320	290	230	250	290	240	240	255	I_{250}^{A}	A	A	250	210	E_{250}^{R}	A	240	205^{H}	245	250	255	250	305	I_{330}^{A}
26	340	305	290	230	E_{250}^{S}	E_{305}^{S}	240	245	240	250	250	220	A	I_{250}^{A}	I_{245}^{B}	230^{H}	225	240	240	240	240	245	310	335
27	310	I_{310}^{S}	270	210	I_{320}^{S}	S	245	240	240	230	235	I_{220}^{R}	225	225	220	I_{225}^{A}	255	A	A	255	250	205	270	300
28	315	320	255	260	290	295	250	225	235	I_{240}^{A}	245	A	A	A	255	245	230	I_{220}^{A}	I_{240}^{A}	250^{A}	230^{A}	A	A	A
29	A	I_{290}^{A}	280	240	270	300	240	245	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
30	A	I_{270}^{A}	315	260	220	I_{300}^{A}	245	255	A	A	A	225	250	255	E_{260}^{R}	235	225	270	250	I_{255}^{A}	255	I_{255}^{A}	A	A
31																								
No.	28	30	30	30	29	27	30	30	27	25	23	21	23	23	23	25	26	25	25	28	28	26	26	27
Median	310	305	290	255	255	300	250	240	245	240	230	220	235	230	240	240	240	250	250	240	230	250	320	325
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

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IONOSPHERIC DATA

Apr. 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	S	S	S	S	S	S	S	G	155	145	135	130	130	130	130	135	140	190	155	S	125	125	115	115
2	120	S	S	S	S	S	S	150	140	135	125	125	135	115	G	G	G	160	165	140	S	125	S	S
3	S	S	S	S	S	S	S	G	G	150	140	140	G	125	125	120	125	120	140	S	S	S	110	125
4	115	S	S	E	105	105	S	G	160	125	110	115	110	120	110	105	110	170	145	120	S	S	S	S
5	S	S	S	S	E	S	S	G	155	150	G	140	130	130	130	125	125	G	G	S	S	S	S	S
6	S	S	S	110	E	S	S	G	G	G	G	G	G	G	G	105	105	105	105	105	105	S	S	120
7	S	S	S	E	S	S	145	145	140	135	130	130	130	130	120	135	G	130	G	S	S	115	110	115
8	110	120	S	105	105	S	145	145	140	130	130	130	115	G	130	130	130	105	105	140	105	S	S	S
9	S	S	S	S	E	S	S	155	155	145	140	G	G	G	G	G	G	G	150	S	125	S	120	110
10	S	S	S	S	S	110	120	155	150	145	140	G	110	110	105	105	G	G	105	S	S	S	S	S
11	S	S	S	S	S	S	S	170	170	110	G	140	G	G	G	G	G	G	165	S	S	120	S	S
12	S	S	S	E	E	S	S	G	140	130	140	125	120	115	115	115	150	130	140	135	120	S	S	S
13	S	S	S	S	E	S	S	155	140	135	130	115	110	110	110	110	110	105	105	105	S	S	S	S
14	S	S	S	E	E	S	S	150	140	130	140	140	G	G	145	105	G	G	140	110	120	S	S	S
15	S	S	S	E	E	S	S	140	G	130	110	110	110	120	115	110	105	105	G	125	S	S	S	S
16	S	S	S	S	S	S	150	155	145	140	G	135	110	105	150	150	140	135	130	120	120	120	115	110
17	S	S	S	S	S	S	S	140	130	130	125	110	110	110	105	105	G	G	G	100	125	120	120	S
18	125	115	110	110	115	S	170	150	145	135	145	140	140	140	130	120	125	120	125	120	S	125	120	110
19	110	110	110	110	110	S	145	140	135	130	130	140	135	C	G	120	120	105	130	125	125	125	125	S
20	S	S	E	115	120	115	S	165	145	130	135	140	120	140	170	155	150	135	130	125	125	125	S	S
21	S	120	S	S	S	S	S	135	140	140	140	130	130	135	155	150	140	150	135	125	115	120	115	120
22	S	120	110	110	S	S	S	130	130	125	120	C	115	110	110	105	G	140	140	105	S	125	S	S
23	S	S	S	S	E	S	S	140	135	130	125	130	125	130	G	155	G	140	120	115	115	110	120	S
24	105	S	120	110	110	120	140	140	135	140	135	125	120	120	125	125	120	120	120	115	135	S	115	120
25	S	S	S	E	S	S	150	155	140	130	130	120	125	G	140	130	G	125	140	135	130	125	120	120
26	110	S	S	E	S	S	G	150	130	125	120	115	115	115	B	G	G	G	130	125	125	S	S	S
27	S	S	S	S	S	S	150	140	145	145	140	G	G	145	145	155	155	140	135	125	125	S	120	S
28	S	S	120	120	S	S	145	135	135	130	135	130	160	145	160	G	140	155	140	130	120	120	120	120
29	120	110	110	115	S	S	140	135	140	130	125	125	130	125	130	145	140	135	130	120	120	120	120	120
30	110	110	105	110	120	145	140	130	130	120	120	120	120	120	120	G	G	180	130	120	120	125	120	120
31																								
No.	9	7	7	10	7	5	12	24	27	29	26	25	24	23	23	24	18	23	26	23	19	16	16	13
Median	110	115	110	110	110	115	145	145	140	130	130	130	120	120	130	120	130	135	130	120	120	120	120	120
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

Y 11

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IONOSPHERIC DATA

Apr. 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									h	h2	h	h	h	h	h	h	h	h	h		f	f	f4	f3
2	f							h	h2	h	h1	h	h	1				h1	h	f		f2		
3										h1	h1	h1		h	h1	1	1	1	h2				f2	f2
4	f3				f	f2			h	h	1	1	1	1	1	1	1	h	h	f				
5									h	h		h	h	h	h	c	c2							
6				f2												1	1	12	13	f	f			f
7							h	h3	h2	h	h	h	h	h	c	h		c				f	f	f2
8	f2	f2		f2	f		h2	h2	h	h	h	h1	c2		h	h	h21	13	12	f	f			
9								h2	h1	h	h								h		f		f2	f2
10						f4	1	h	h	h	h		1	1	1	1			1					
11								h	h	1		h1							h2			f		
12									h	h	h	h	1	1	1	1	h1	h21	h21	ff3	f			
13								h	h2	h2	h	c3	c4	c4	c2	1	12	13	1	f2				
14								h2	h	h2	h	h			h	1			h4	f2	f2			
15								h2		h	1	1	1	1	1	1	1	1		f2				
16							h	h	h	h		h	1	1	h1	h	h	h2	c4	f	f2	f	f2	f
17								h2	h2	h	h	c	1	1	1	1				f	f2	f2	f	
18	f2	f2	f3	f	f2		h	h3	h	h	h	h	h	h	h	c	c	c2	c	f		f2	f2	f3
19	f2	f	f	f	f		c	h	h	h2	h	h	h			1	h	12	h21	f2	f3	f2	f2	
20				f	f	f		h	h	h	h	h	c	h1	h1	h	h	h2	h51	f2	f	f		
21		f						h4	h2	h	h	h	h	h	h	h	h2	h	h4	f6	f5	f	f2	f
22		f2	f2	f2				h2	h	h	1		1	1	12	1		h2	c1	f		f		
23								h3	h2	h	h	h2	h	h		h		h2	c4	f5	f2	f2	f2	
24	f		f2	f2'	f2	f2	h2	h2	h	h	h	h	c2	h2	h2	h2	h	c2	c3	f3	f2f		f	f2
25							h2	h2	h	h1	c1	c2	h		h	h		h	h3	f3	f2	f	f2	f2
26	f2							h	h	h	c	c	c	c					c2	f	f			
27							h	h2	h	h	h			h	h	h	h	h	h2	f3	f2f		f	
28			f	f2			h	h2	h2	h	h	h	h	h	h		h	h2	h2	f2	f2	f4	f	f4
29	f2	f2	f	f2			h3	h2	h2	h2	h3	h2	h	h2	h2	h	h	h21	c3	f2	f2	f2	f3	f3
30	f2	f2	f2	f3	f	f2	h	h3	h	c2	h	1	1	1	1			h2	c2	f2	f2	f3	f2	f2
31																								
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

Types of Es

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

SOLAR RADIO EMISSION 200 Mc/s

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

HIRAISO

Time in U.T.

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

Note No observations during the following periods:

1st	2030-	2nd	0100	12th	2010-	13th	0200
2nd	2030-	3rd	0030	16th	0300-		0910
3rd	2030-	4th	0100	16th	2010-	17th	0030
5th	2030-		2400	20th	2000-	21st	0030
6th	2030-		2300	22nd	2000-	23rd	0040
7th	2030-	8th	0100	24th	0300-		0920
9th	2010-		2400	24th	2000-		2400
12th	0200-		0910	29th	1950-	30th	0030

Outstanding Occurrences

Apr. 1963	Start-time	Dura-tion	Type	Max. Inst.	Int. Smd.	Max. Time	Remarks
03	0552.5	2	CD/4	110	40	0553.8	
15	0313.3	0.6	CD/4	230	60	-	
	0316.7	0.9	CD/4	180	40	-	
16	0212.7	2.0	CD/4	>1200	90	-	off scale
26	0351.5	0.5	CD/4+1	720	200	0351.7	1st peak
	0351	20		20	10	-	plus part

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Apr. 1963	Whole Day Index	L. N. 06 12 18 / 12 18 24	W W V 00 06 12 18 / 06 12 18 24	S. F. 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Warning 00 06 12 18 / 06 12 18 24	Principal magnetic storms Start	End	ΔH
1	4o	4 3 4	(4) - - 3	5 4 3 5	5 5 (3) 4	N N N N			
2	4+	5 (3) 4	- - - 4	5 5 4 5	4 4 (4) 4	N N N N			
3	4+	5 4 5	- - - 4	5 4 3 4	4 4 (4) 4	N N N N			
4	4o	5 (2) 4	(4) - - 3	5 3 4 5	4 (3 3) 4	N N N N	0546	---	84γ
5	3+	2 2 3	- - - 3	4 4 4 4	4 4 4 4	N U U U	---	---	
6	3o	2 2 4	- - - 2	4 3 4 3	3 4 3 3	U U U U	---	---	
7	3+	2 3 4	- - - 3	4 (3 3) 4	4 4 4 3	U U U U	---	1900	
8	4-	4 (3) 4	- - - 2	4 5 4 3	4 4 3 3	U U U U			
9	4o	3 3 4	- - - 4	5 5 5 4	(4) 3 3 3	U U U U			
10	5-	5 5 (4)	(4) - - 4	5 5 5 4	4 3 4 4	U N N N			
11	5-	5 5 5	- - - 4	5 4 5 5	4 4 4 4	N N N N			
12	4+	4 3 (5)	(5) - - 5	5 4 5 4	5 5 4 4	N N N N			
13	4o	4 3 4	(5) - - 4	4 5 4 4	5 4 4 3	N N N N			
14	4+	4 (4) 4	(4) - - 4	5 5 5 4	(3) 4 4 (3)	N N N N			
15	3o	(1) 2 4	- - - 2	3 3 4 4	4 4 3 (3)	N N N N			
(16)	4o	4 3 3	- - - 4	5 5 (5) 4	(3) 4 (3 4)	N N N N			
(17)	4-	4 2 2	(4) - - 4	4 4 4 (4)	4 4 4 4	N N N N			
(18)	4o	4 3 3	4 - - 4	5 4 5 5	4 4 5 4	N N N N			
19	4o	4 2 3	5 - - 4	5 5 4 4	5 5 5 4	N N N N	0317	---	44γ
20	4o	4 3 4	4 - - (4)	4 5 (5) 4	3 5 5 4	N U U U	---	1800	
21	4o	5 4 (4)	(4) - - 3	(4 5) 4 4	4 5 5 5	U U U U			
22	4-	3 4 3	3 - - 4	5 4 4 4	5 5 5 5	U U N N			
23	4-	4 3 3	4 - - 2	4 5 5 4	4 4 4 2	N N N N			
24	4o	4 4 4	2 - - 4	(4 4) 4 5	3 4 4 3	N N N N			
25	4+	4 5 4	3 - (4 4)	5 5 4 4	4 4 4 4	N N N N			
26	4o	4 3 2	3 - - (4)	5 5 5 4	4 4 4 4	N N N N			
27	4-	4 3 2	(3) - - 3	5 5 4 (3)	4 5 5 4	N N N N			
28	4-	5 4 4	3 - - 3	(3) 4 4 4	3 (5 5 4)	N N N N			
29	4o	5 5 4	3 - (4) 4	4 4 4 4	5 5 4 4	N N N N			
30	3+	5 3 1	4 - (5) 2	3 4 4 3	5 5 4 3	N N N N	1522	---	112γ

* = 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.

Apr. 1963	S W F										S E A			Correspondence		
	Drop-out Intensities (db)						Start-time	Duration	Type	Imp.	Start-time	Duration	Imp.	Flare	Solar Noise	Mag.
	WS	SF	HA	TO	LN	SH										
20	34	70	29	-	-	22'	02.10	44	S	3+	02.12	50	2	x	x	x

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