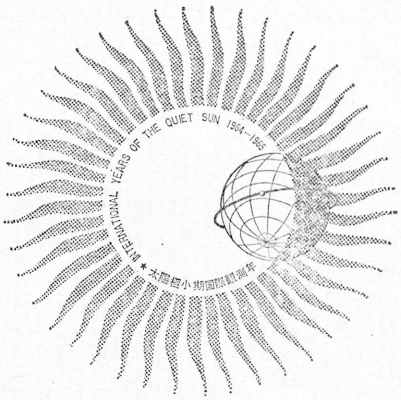
F—187

IONOSPHERIC DATA IN JAPAN

FOR JULY 1964

Vol. 16 No. 7



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Prepared by

THE RADIO RESEARCH LABORATORIES
MINISTRY OF POSTS AND TELECOMMUNICATIONS
KOKUBUNJI, TOKYO, JAPAN

IONOSPHERIC DATA IN JAPAN

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THE RADIO RESEARCH LABORATORIES

KOKUBUNJI, TOKYO, JAPAN

CONTENTS

SITE 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, Tokyo-to
Yamagawa	31°12.1′N.	130°37.1′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, Ibaraki-ken

SYMBOLS AND TERMINOLOGY

A. IONOSPHERE

All symbols and terminology in the table of ionospheric data are used in accordance with the "URSI Handbook of Ionogram Interpretation and Reduction," 1961.

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 lowest ordinary wave frequency at which the E_s layer begins to become transparent. This is usually determined from the minimum frequency at which reflections from layers at greater heights are observed.

f-min — The 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 Letters

The following letters are entered after or used to replace a numerical value on the 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 of the layer is too small to enable it to be made accurately.

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

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

M Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

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

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

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

V Forked trace which may influence the measurement.

W Measurement influenced or impossible because the echo lies outside the height range recorded.

X Measurement refers to the extraordinary component.

Y Intermittent trace.

Z Third magneto-ionic component present.

b. Qualifying Letters

The following letters are entered in the first column before a numerical

value on the 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.

O Extraordinary component characteristic deduced from the ordinary component. (Used for x- characteristics only.)

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 eight standard types of E_s are identified by corresponding lower case letters: *f, l, c, h, q, r, a, s*. These letters suggest the names flat, low, cusp, high, equatorial, retardation, auroral and slant, respectively. It is strongly emphasized that these names are not restrictive. The letter '*n*' is used to designate any E_s trace that does not correspond to any of the eight types.

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 hight: *h* or *l*.

l A flat E_s trace at or below the normal E layer minimum virtual height in the day or below the night E layer minimum virtual height at night.

c An E_s trace showing a relatively symmetrical cusp at or below f_0E. This is usually continuous with the normal E trace, although when the deviative absorption is large, part or all of the cusp may be missing. (Usually a daytime type.)

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. (Usually a daytime type.)

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

r An E_s trace showing an increase in virtual height at the high frequency end similar to group retardation but which is non-blanketing over part or all of its frequency range. This is distinguished from the usual group retardation (as in the case of an occulting thick E layer) by the lack of group retardation in the F layer traces at corresponding frequencies and the lack of complete blanketing.

a An E_s having a well defined flat or gradually rising lower edge with stratified and diffuse (spread) traces present above it. These

sometimes extend over several hundred kilometers of virtual height.

s A diffuse E_s trace which rises steadily with frequency and usually emerges from another type E_s trace. The rising trace alone is classified as '*s*'; the horizontal trace is classified separately. At high latitudes the slant trace usually starts to rise from a horizontal E_s trace such as E_s-*l* or E_s-*f*, at frequencies which grealy exceed the E layer critical frequency, whereas at low latitudes it usually rises from E_s-*q*, E_s-*c*, or E_s-*h* at frequencies near the regular E critical frequency. Type *s* is never used to determine f_0E_s and $h'E_s$. The slant trace is sometimes observed to start at f_0E without echoes clearly identifiable as E_s echoes being seen.

n The designation '*n*' is used to denote an E_s trace which cannot be classified into one of the standard types. When a trace appears to be intermediate between any two classes a choice should be made whenever possible even if it is uncertain. '*n*' should be used sparingly.

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 observations are carried out on 200 and 500 Mc/s at Hiraiso Radio Wave Observatory.

Antennas are a broadside array of 6×4 doublets for 200 Mc/s and a parabolic reflector of 5 meter for 500 Mc/s, each having the total power receiver.

Observations are feasible almost from sunrise to sunset.

a. Time and Unit

The time is expressed as U.T.

The unit is 10^{-22} W·m^{-2}·(c/s)$^{-1}$ for both components of polarization.

b. Daily Data

Flux density

The three-hourly and daily mean values are given.

Variability

The three-hourly and daily mean values are given at 200 Mc/s only.

Variability is expressed in the following four grades:

0=Quiet or no burst,
1=A few bursts,
2=Many bursts,
3=Very many bursts.

The number of bursts exceeding the flux level is counted.

c. Distinctive Events

The phenomena are picked up on the following criteria:

1. Distinct from the prevailing kind of activity,
2. Correlated with other known solar phenomena,
3. Remarkable change-over from one situation to another.

Starting time and *Time of maximum* are given to nearest minute in general, but to nearest a tenth minute for short intense occurrences or clear commencements.

Duration is given in minutes and to nearest a tenth minute, if short or clear.

Descriptive type is denoted by the following symbols:

S =Simple rise and fall of intensity;
C =Complex variation of intensity,
C+=Prolonged broad-band enhancement of radiation, generally of spectral type IV;
F =Group of bursts: multiple peaks probably belonging to the same event, but separated by relatively short period of quietness;
RF=More or less irregular rise and fall of intensity, at metric or decimetric wavelengths;
e =Sudden beginning of burst with steep rise of intensity;
E =Steep rise of intensity of continuum background;
p.i.=post-burst increase;
onset storm=clear-cut beginning of a noise storm.

Peak intensity is the flux density of the highest peak reached during the occurrence, measured above the pre-burst level.

Mean intensity is the flux density averaged over the burst's duration, measured above the pre-burst level; therefore, multiplying the duration, the total energy of the occurrence 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 Disturbance (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

WS.....WWV 20 Mc, 15 Mc and 10 Mc (Washington)
SF.....Various commercial circuits (San Francisco)
HA.....WWVH 15 Mc and 10 Mc (Hawaii)
TO.....JJY 15 Mc and 10 Mc (Tokyo)
SH.....BPV 15 Mc and 10 Mc (Shanghai)
LN.....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. Drop-out Intensities of 10 Mc (’), 15 Mc (none) and 20 Mc (”).

Start-times and Durations

Types

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

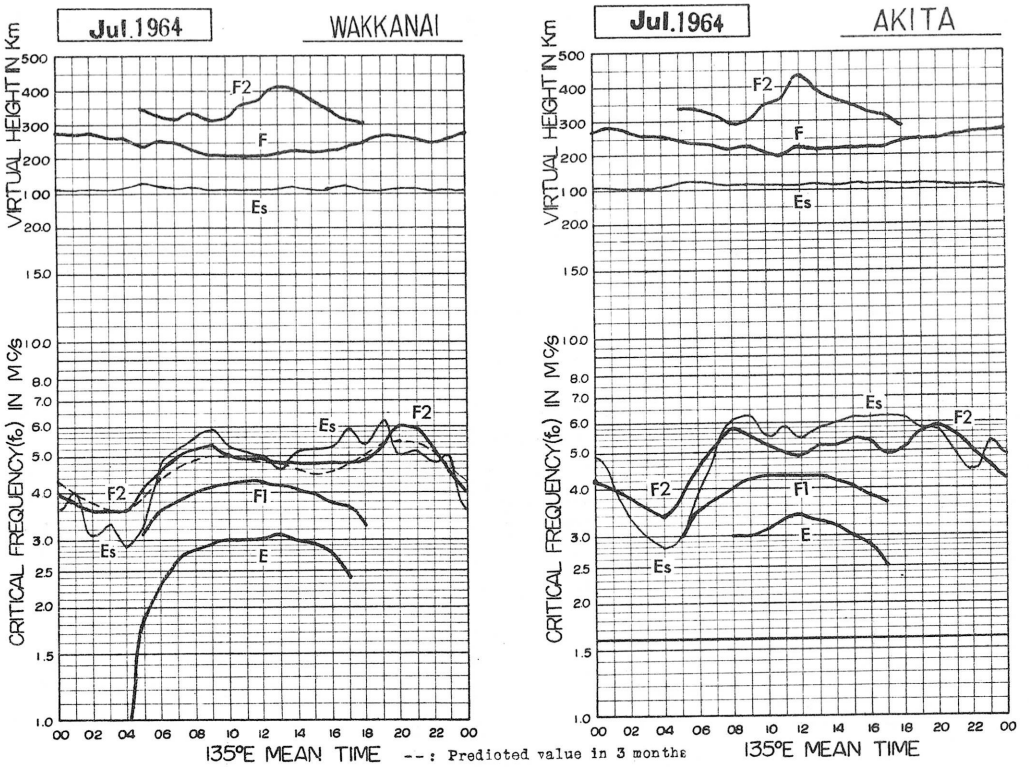
Importances

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

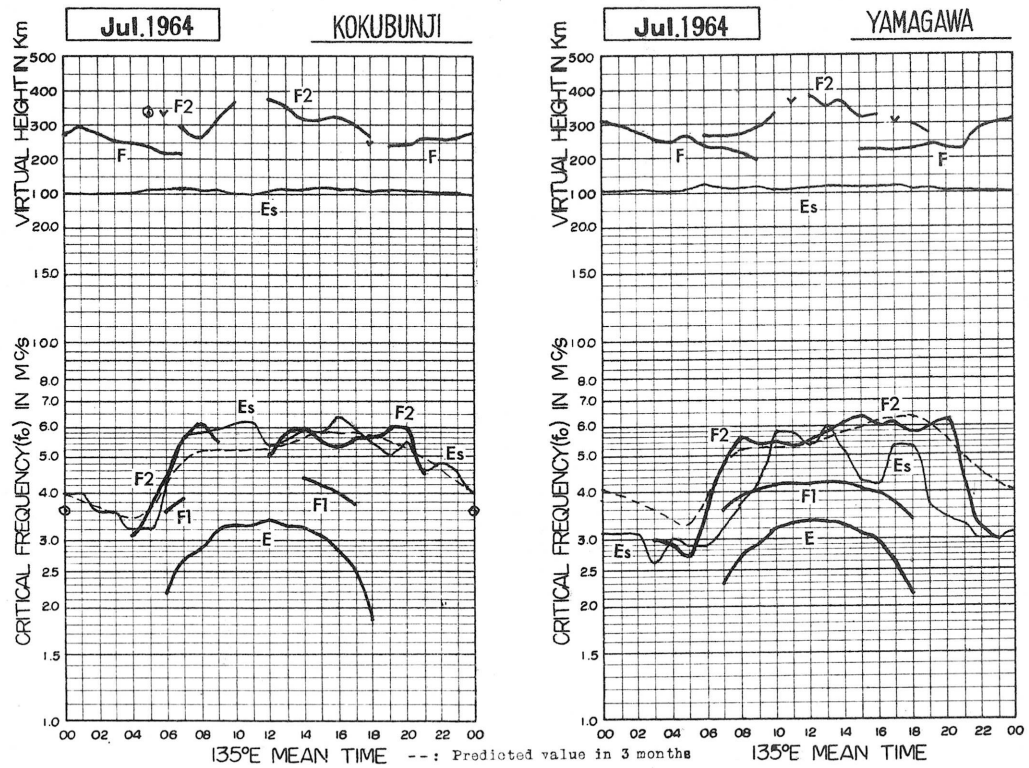
1−	1	1+
2−	2	2+
3−	3	3+

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

IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS



IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS



IONOSPHERIC DATA

Jul.1964 | foF2 | 0.1 Mc | 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	032	033	033	033	037	038	049	049	048	I047R	049	I049A	049	047	050	048	050	I048A	047	050	060	063	SF	047
2	040	040	SF	FS	FS	050	049	A	046	U065R	060	053	050	I050A	I050A	050	051	I054A	052	051	A	A	A	A
3	FS	A	A	FS	FS	040	A	A	050	054	053	054	051	I050A	050	I050A	051	058	A	A	064	SF	SF	A
4	A	SF	SF	SF	SF	A	A	A	A	A	A	A	A	050	A	R	A	A	050	048	053	051	051	I049A
5	048	044F	F	SF	038F	042	050	056	A	U065R	A	A	A	A	A	054	055	055	042	I049A	056	I056A	A	FS
6	FS	A	A	A	FS	FS	A	A	A	A	A	A	051	A	A	A	A	A	A	U065R	SF	050	A	A
7	A	A	A	SF	F	043	A	I054A	I065A	I053A	052	I050A	052	I047A	I049A	051	058	057	062	I066S	I060S	A	A	SF
8	SF	SF	SF	FS	040F	034	A	A	A	A	I050A	R	A	A	A	A	A	A	A	055	056	051	I044A	040
9	A	SF	SF	SF	A	039	A	A	A	A	A	A	A	A	R	046	046	043	044	050	054	050F	SF	FS
10	SF	FS	FS	FS	FS	045F	043	A	053	046	I046R	047	050	046	045	051	050	051	051	055	061	063	057	035F
11	035	033F	030F	F	F	036	I046A	I045A	050	050	047	R	R	R	U044R	044	045	I046A	047	I052A	060	060	056	053F
12	042	036F	030F	FS	033F	043	056	C	C	A	A	048	I048R	044	045	I046A	R	A	049	059	061	U063S	053F	048F
13	044	038	037	036	036	I041A	044	056	050F	047	I047A	049	I046R	I047A	I048A	I049A	I046A	046S	048	I060A	J063S	061	U060S	SF
14	FS	029	027	I030A	033	A	047	049	053	050	A	A	A	R	A	A	I046A	I045A	A	A	060	059	050F	I037A
15	030	030F	030F	SF	036F	040H	I047A	A	A	I047A	051	051	046	046	046	045	I043R	046	053	065	063	056	SF	SF
16	A	SF	F	F	032F	040	044	047	051	I054A	A	050	056	053	I048A	048	047	050	I047A	046	050	052	050	043
17	FS	F	038F	FS	036F	042	053	053	052	C	C	C	C	055	I051A	A	A	A	A	A	A	SF	056F	050F
18	050F	SF	SF	SF	SF	039	A	A	A	A	A	053	050	I049A	056	I056A	I053A	050	I051A	I055A	060	U063S	057S	050
19	051	046	040	036	035	043	A	054	A	053	051	A	A	051	049	I052A	I054A	057	065	A	U063S	SF	SF	SF
20	SF	SF	SF	036F	034S	040H	045	A	053	A	C	A	A	I050A	I051A	048	044	048	052	050	057	I051S	045	041
21	040S	038	036F	033F	SF	043H	046	058	048	A	A	A	A	048	045	048	046	045	I049A	059	A	A	SF	049F
22	FS	F	F	F	F	037	I042A	053	I056A	060	A	A	I045A	047	047	047	054	055	056	065	070	061	043	043
23	043	039	037	035F	034F	044	I045A	044	050	049	051	I047R	048	I044C	047	047	046	050	055	068	073	045	035	033
24	036	038	037	F	F	041	045	052	045	I047A	I046R	053	I049A	048	I047R	047	045	045	048	A	066	I063A	I054A	A
25	040F	FS	036F	037F	036F	A	A	I050A	049	I051A	I050A	I050A	048	048	I045A	048	A	A	A	A	U065S	SF	C	SF
26	A	SF	FS	F	F	C	043	048	054	C	C	C	C	C	C	C	C	C	047	I045A	053	A	SF	SF
27	SF	040F	FS	FS	040S	038H	043	044	053	I054A	051	I046R	I046R	050	050	048	I045R	I045A	044	055	061	060	051	046F
28	038	036	036	038	037	041	050	052	053	062	050	045	R	A	A	046	055	I044A	040	A	054	SF	050F	042
29	I035A	036	036	038	041	043	045	050	I052A	068	059	047	050	I048R	050	053	047	I043A	I044A	054	067	SF	SF	050
30	043	039	SF	SF	SF	039	I045A	I049A	053	057	I050R	I049R	047	050	054	050	049	048	052	055	A	S	SF	SF
31	SF	SF	F	F	F	041	I045A	A	A	050	051	I049A	047	I047R	047	048	I048A	051	I045A	049	A	F	A	SF
No.	16	16	14	10	16	26	22	19	22	21	18	18	19	23	23	25	24	24	25	24	25	19	16	17
Median	040	038	036	036	036	041	045	050	052	053	050	049	049	048	048	048	048	048	049	055	060	059	051	046
U.Q.	044	040	037	037	038	043	049	054	053	058	051	051	050	050	050	050	052	052	052	060	064	063	056	050
L.Q.	036	034	030	033	034	039	044	048	050	048	049	047	047	047	046	047	046	045	046	050	056	051	048	040
Q.R.	008	006	007	004	004	004	005	006	003	010	002	004	003	003	004	003	006	007	006	010	008	012	008	010

The Radio Research Laboratories, Japan

foF2

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

W 1

IONOSPHERIC DATA

Jul. 1964 | foF1 | 0.01 Mc | 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						310	360	410	I400A	U420R	A	A	A	420	420	420	I400A	I380A	A					
2						320	370	A	A	A	430	I430A	440	A	A	A	A	A	A					
3							A	A	A	A	I420A	I430A	430	I430A	430	I420A	400H	370	A					
4						A	A	A	A	A	A	A	A	420	I410A	400	A	A	A					
5						310	360	A	A	A	A	A	A	A	A	A	380	370						
6						330	A	A	A	A	A	A	430	A	A	A	A	A	A					
7							A	A	A	A	A	A	A	A	A	A	380	370	330					
8						290	A	A	A	A	A	U430R	A	A	A	A	A	A	A					
9						300	A	A	A	A	A	A	A	I410A	400	390	370	370	I330A					
10						U320L	A	A	A	400	U420R	430	420	420	A	A	A	370	330					
11						310	A	A	390	410	410	U430R	U420R	U410R	I400R	A	A	A	A					
12					U230L	A	A	C	C	A	A	A	A	410	I410A	I400A	A	A	A					
13						A	370	I390A	410	420	I420A	420	U430R	I420A	I410A	I400A	I370A	370	A					
14					A	A	A	370	I390A	390	A	A	A	U400R	I400A	I400A	A	A	A					
15							A	A	A	I420A	I420A	I430A	430	430	420	410	380H	360	340					
16							I340A	400	I410A	I420A	I420A	430	430	430	I420A	410	400	A	A					
17						330	360	400	410	C	C	C	C	430	I420A	A	A	A	A					
18							A	A	A	A	A	430	430	I430A	A	A	A	380	A					
19							A	A	A	A	A	A	A	A	A	A	A	A	A					
20							360	A	A	A	C	A	A	A	A	A	390	350	320L					
21							360	A	400	A	A	A	A	A	420	400	A	A	A					
22							I350A	A	A	A	A	A	I420A	410	I410A	410H	390	A	A					
23						I300A	I350A	380	I400A	410	I420A	430	420	I410C	410	410	380	I350A	A					
24							350	I370A	I390A	I410A	430	430	I430A	430	410R	410	370	360	A					
25						A	A	A	A	A	A	A	430	420	I410A	A	A	A	A					
26							A	A	A	C	C	C	C	C	C	C	C	C	A					
27							I360A	A	A	A	420	430	420R	420	410	I410A	400	I360A	330L					
28						310	I340A	380	I390A	I410A	420H	420	A	A	A	A	A	A						
29							350	I380A	I390A	400	420	430	420	430	420	400	380	I360A	I320A					
30						A	A	A	400	400	410	I430A	420	I410A	410	400	I380A	370	310					
31							A	A	A	A	I410A	I410A	410	I400R	410	I400A	I380A	340	A					
No.					1	10	14	9	12	12	14	10	17	21	20	17	16	16	8					
Median					U230	310	360	380	U400	410	U420	430	430	420	410	400	380	370	330					
U.Q.																								
L.Q.																								
Q.R.																								

foF1

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

The Radio Research Laboratories, Japan

10

IONOSPHERIC DATA

Jul.1964 | foE | 0.01 Mc | 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	A	A	240	280	295	300	310	315	300	300	300	I290A	I275A	245	A	S				
2				E	A	A	240	270	290	300	310	300	295	A	A	A	A	240	S	S				
3				E	A	S	235	265	290	300	300	310	300	315	300	I300A	I295A	260	A	S				
4				E	A	200	235	270	300	300	305	300	295	300	A	A	A	A	S	S				
5				E	A	S	250	270	290	300	295	I290A	300	I295A	I300A	300	270	215	S	S				
6				E	A	190	245	270	295	310	310	315	A	A	A	A	A	240	S	S				
7				E	A	A	240	275	295	295	300	I300A	I305A	310	315	300	265	225	S	S				
8				S	E	195	230	255	295	300	295	300	I305A	320	315	295	270	235	S	S				
9				E	A	S	230	265	280	295	300	I300S	I310B	315	300	290	275	235	S	S				
10				E	A	200	230	270	300	300	315	320	310	310	295	295	I275A	245	S	S				
11				E	E	195	230	250	275	290	I290B	295	300	305	315	300	275	240	S	S				
12				E	115	200	235	I260A	I275A	295	305	325	320	325	305	275	285	250	205	S				
13				E	E	190	235	270	270	A	A	A	A	320	310	300	285	A	S	S				
14				E	A	S	230	265	285	295	290	295	I295A	315	315	295	275	240	S	S				
15				E	S	I195S	225	260	285	285	300	295	290	300	290	295	270	245	S	S				
16					R	I185S	235	285	300	310	315	300	A	A	A	A	285	250	215	S				
17				E	115	I175S	250	280	290	I300C	C	C	C	I310A	I310A	315	275	250	205	S				
18				E	E	200	240	275	295	300	300	315	320	330	315	300	275	240	200	S				
19				E	115	170	235	260	285	295	295	A	A	A	315	305	285	215	S	S				
20					A	I165S	225	265	280	285	I295A	300	305	305	300	I265A	270	230	S	S				
21					S	I170S	230	265	280	290	295	305	300	300	300	300	280	235	S	S				
22					120	180	220	265	285	290	A	A	A	A	A	A	A	240	S	S				
23					S	190	225	255	285	295	295	I315A	320	I310C	305	290	260	240	S	S				
24					E	I150S	I195S	I230A	250	290	295	300	300	305	300	A	A	A	A	A				
25					E	195	215	250	285	295	295	I300A	I315R	320	315	300	270	225	S	S				
26					A		225	250	295	C	C	C	C	C	C	C	C	C	S	S				
27					120	195	235	260	270	A	A	A	310	305	300	290	275	S	S	S				
28					E	I170S	235	260	280	305	305	A	A	A	A	A	A	250	S	S				
29					E	I160S	220	265	280	A	A	R	A	R	300	300	265	230	S	S				
30					E	155	220	250	275	300	300	305	315	320	305	290	245	205	S	S				
31					E	170	215	265	285	290	295	I290A	I295A	310	295	295	265	230	S	S				
No.				17	15	23	31	31	31	27	24	23	22	23	24	23	24	26	4					
Median				E	E	190	230	265	285	295	300	300	300	310	300	295	275	240	205					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

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

W 3

IONOSPHERIC DATA

Jul. 1964 | foEs | 0.1 Mc | 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	040	031	028	J052	027	G	G	045	037	051	050	056	G	G	042	051	077	038	025	025	034	032	034
2	E	E	J045	034	028	031	033	060	048	045	040	070	053	063	070	050	053	J065	J051	J083	J080	090	087	052
3	057	J063	J053	052	038	J033	051	063	059	045	045	062	039	J059	038	J071	033	J043	083	080	050	J073	060	J083
4	080	J063	058	J040	039	059	074	J086	J098	J093	J131	J073	J053	J050	055	037	081	D180D	J063	044	J050	J033	J043	J070
5	J065	S	J030	J043	J020	J043	035	J045	J075	J052	059	J098	J060	070	J096	080	J043	J038	J033	J068	J051	J076	J075	051
6	J050	J060	J050	042	036	026	J063	J075	J080	J080	J071	J072	J052	J057	071	J056	J096	J070	J070	J035	J096	J073	072	050
7	051	050	050	048	J043	035	093	J073	080	J066	051	J080	050	053	J073	J083	035	G	023	J038	043	J097	J075	J051
8	J035	J033	S	027	J028	028	J044	051	058	J055	J105	J051	050	J058	J074	062	079	073	J085	J064	033	J034	J053	J050
9	052	J045	J063	060	J050	J073	J053	J063	J055	J098	J070	J079	053	051	036	G	036	J051	J050	J045	J039	J033	030	J033
10	J070	J031	J038	030	030	G	041	043	J046	036	043	040	038	041	051	J065	J066	030	026	J060	051	052	J038	024
11	S	S	S	J053	028	033	053	J063	038	035	035	G	G	G	039	043	045	J073	J043	J062	J033	S	J033	050
12	028	J053	J040	J025	G	035	J048	C	C	J059	043	044	043	J050	J045	050	042	051	J098	J033	030	J051	053	J033
13	J033	S	030	J052	J032	072	036	J051	J051	040	J053	J051	040	075	060	080	J071	J073	043	J069	040	J050	050	J053
14	S	J032	J053	J043	J034	043	J045	036	J057	J103	J096	J120	J095	035	061	J073	J066	073	J111	J095	J040	050	J040	050
15	J033	J021	J030	J033	S	024	J051	J078	J083	J071	J054	043	040	028G	038	G	034	J100	J053	043	024	S	J030	J038
16	051	043	J035	J033	G	S	038	038	043	060M	J053	035	036	040	050	038	G	045	J073	025	040	J030	J033	S
17	027	030	029	E	G	027	033	036	037	C	C	C	C	J043	094	J084	J113	J083	J100	J098	J099	051	040	040
18	J036	040	J034	050	028	027	J060	J095	J073	J080	J076	G	037	J068	J052	D180D	J070	J100	J140	J100	J036	J035	S	S
19	S	S	020	017	038	J075	J063	J043	J073	J053	J053	J096	076M	058	D180D	J086	J071	J100	J073	J141	J096	J053	J063	S
20	027	S	J031	J033	J021	S	033	J053	041	J135	C	J053	J053	J065	J054	041	G	G	S	S	J063	J083	J033	028
21	J051	050	031	016	S	S	032	J045	J100	J120	J050	J068	072	J046	043	034	J053	050	J063	J093	J096	J073	J048	040
22	J033	030	J023	J043	G	030	J058	041	J080	063	J090	058	J086	J053	J051	033	035	041	050	J065	J053	030	033	040
23	S	020	S	J063	S	036	050	034	040	043	J053	040	G	C	G	038	038	J043	052	044	J033	030	S	S
24	S	S	J023	020	J033	J043	J063	080	J076	043	J050	036	050	G	G	033	033	J043	J063	J090	J073	J080	J080	J053
25	J035	040	J023	J023	J030	060	J058	060	055	080	J064	051	038	G	054	J063	J093	J163	D180D	J140	J070	040	C	S
26	J053	041	031	J023	J023	C	040	051	050	C	C	C	C	C	C	C	C	C	050	J073	J043	080	063	050
27	043	J053	J023	023	031	029	038	038	J055	J063	043	040	G	G	G	090	J095	J080	J053	J043	J051	J033	J043	J033
28	J033	J023	S	J023	015	028	045	J070	J070	043	G	035	040	J044	J056	J053	050	J053	033	J053	J030	J033	J063	J053
29	J053	031	030	020	E	028	030	J045	084	035	033	G	035	G	G	039	040	J083	J053	043	031	J053	S	S
30	S	E	J043	J030	E	035	051	J058	039	040	G	043	050	040	041	J073	J053	043	028	051	J073	J053	J043	J040
31	J030	E	E	J063	J045	033	J063	080	J056	J063	J053	J105	050	038	040	041	J054	J051	J073	J063	070	040	050	J050
No.	25	25	27	31	28	27	31	30	30	29	28	29	29	29	30	30	30	30	30	30	31	29	27	25
Median	036	040	031	033	029	033	048	052	056	059	053	051	050	046	051	052	052	059	053	062	050	051	048	050
U.Q.	052	050	045	048	037	043	058	070	076	080	067	072	053	058	061	073	071	080	073	083	070	073	063	052
L.Q.	032	026	029	023	018	028	036	043	046	043	043	040	038	032	038	038	036	043	043	043	033	034	033	036
Q.R.	020	024	016	025	019	015	022	027	030	037	024	032	015	026	023	035	035	037	030	040	037	039	030	016

The Radio Research Laboratories, Japan

foEs

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

IONOSPHERIC DATA

Jul. 1964 | f_bEs | 0.1 Mc | 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		021	E	E	020	022			040	G	045	A	045			036	047	A	040	024	E	024	024	E
2			028	026	028	022	G	A	041	043	G	044	G	A	A	040	043	A	040	047	A	A	A	A
3	035	A	A	028	022	026	A	A	048	043	044	044	G	A	G	A	029	036	A	A	034	034	044	A
4	A	028	032	025	020	A	A	A	A	A	A	A	A	G	A	035	A	A	034	037	032	E	035	A
5	030	S	E	024	019	G	034	043	A	049	A	A	A	A	A	050	036	035	033	A	050	A	A	032
6	040	A	A	A	027	G	A	A	A	A	A	A	036	A	A	A	A	A	A	034	050	046	A	A
7	A	A	A	020	026	032	A	A	A	A	043	A	047	A	A	040	035		G	033	040	A	A	040
8	E	E	S	G	022	G	A	A	A	A	A	G	A	A	A	A	A	A	A	040	025	033	A	E
9	A	E	E	020	A	027	A	A	A	A	A	A	A	A	G		034	G	043	044	035	E	E	E
10	E	E	E	G	020		040	A	040	G	G	G	G	G	040	046	040	G	G	049	040	033	E	E
11	S	S	S	018	020	027	A	A	G	G	G				038	040	040	A	036	A	027	S	E	030
12	E	E	020	018		033	042	C	C	A	A	044	043	G	042	A	042	A	040	025	E	030	E	E
13	E	S	E	E	G	A	032	040	G	032	A	035	037	A	A	A	A	032	034	A	028	E	E	E
14	S	E	E	A	025	A	042	035	048	G	A	A	A	G	A	A	A	A	A	A	041	035	E	A
15	E	E	E	016	S	G	A	A	A	A	044	043	G	027	G		G	G	026	038	024	S	E	030
16	A	030	E	020		S	E038R	037	042	A	A	G	035	035	A	033		023	A	023	032	E	E	S
17	E	E	E			G	G	G	G	C	C	C	C	036	A	A	A	A	A	A	A	030	030	E
18	032	029	026	021	020	G	A	A	A	A	A		G	A	043	A	A	030	A	A	027	E	S	S
19	S	S	E	E	020	032	A	043	A	043	047	A	A	044	044	A	A	036	045	A	040	032	030	S
20	E	S	E	020	020	S	G	A	040	A	C	A	A	A	A	040			S	S	040	040	030	E
21	E	E	E	E	S	S	G	036	035	A	A	A	A	044	038	G	043	039	A	033	A	A	E	025
22	024	E	E	E		G	A	038	A	052	A	A	A	034	044	032	030	038	048	048	037	E	E	033
23	S	E	S	E	S	032	A	G	040	G	043	035		C		G	G	037	042	034	030	E	S	S
24	S	S	E	E	021	030	030	040	042	A	G	G	A			032	032	030	040	A	050	A	A	A
25	030	027	E	E	017	A	A	A	042	A	A	A	G		A	042	A	A	A	A	047	028	C	S
26	A	032	E	E	017	C	038	048	049	C	C	C	C	C	C	C	C	C	040	A	034	A	032	039
27	E	030	E	E	G	G	036	037	040	A	036	036				044	G	A	022	032	040	E	025	E
28	028	E	S	018	E	G	037	035	044	041		035	040	A	A	042	047	A	032	A	E	031	030	025
29	A	E	025	E		G	G	045	A	035	033		035			G	G	A	A	035	E	E	S	S
30	S		E	E		030	A	A	G	G		043	G	E040R	037	036	043	032	026	032	A	A	028	031
31	E			E	019	030	A	A	A	043	041	A	035	G	038	040	A	G	A	045	A	026	A	E
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

W 5

IONOSPHERIC DATA

Jul.1964 | f-min | 0.1 Mc | 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	E020S	E	E	E	E	E015S	020	020	020	025	020	022	022	023	021	021	020	020	E020S	E020S	E020S	E019S	E020S	E020S
2	E020S	E015S	E	E	E	E017S	020	020	020	021	020	021	022	022	023	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S
3	E020S	E	E	E	E	E020S	020	020	020	020	021	021	025	022	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S
4	E020S	E	E	E	E	016	020	020	020	020	020	021	021	021	020	021	020	020	E020S	E020S	E020S	E020S	E020S	E020S
5	E020S	E018S	E	E	E	E020S	020	020	020	020	021	025	023	028	025	021	020	020	E020S	E020S	E020S	E020S	E020S	E020S
6	E020S	E017S	E019S	E	E	015	020	020	025	020	020	022	022	021	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S
7	E020S	E	E	E	E	E019S	020	020	020	026	020	021	022	021	021	021	020	020	E020S	E020S	E020S	E020S	E020S	E020S
8	E020S	E018S	E020S	E020S	E	016	020	020	020	020	022	021	021	021	021	021	020	020	E020S	E020S	E020S	E020S	E020S	E020S
9	E020S	E	E	E	E	E020S	020	020	020	021	020	E031S	032	020	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S
10	E020S	E	E	E	E	015	020	020	020	021	020	021	020	020	020	021	020	020	E020S	E019S	E020S	E019S	E020S	E020S
11	E020S	E016S	E015S	E	E	E018S	020	020	020	021	030	020	021	022	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E019S
12	E020S	E018S	E	E	E	016	020	C	C	020	023	023	023	021	021	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S
13	E020S	E018S	E017S	E	E	014	020	020	020	020	021	023	025	025	021	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S
14	E020S	E020S	E017S	E	E	E020S	020	020	020	020	020	021	026	022	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S
15	E020S	E	E018S	E	E017S	E020S	E020S	020	020	020	023	021	020	020	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S
16	E020S	E020S	E017S	E	E	E022S	020	020	020	020	020	020	020	020	020	020	020	020	E019S	E019S	E020S	E020S	E020S	E020S
17	E020S	E017S	E018S	E	E	E020S	020	020	020	C	C	C	C	020	020	020	021	020	E020S	E020S	E020S	E020S	E020S	E020S
18	E020S	E018S	E	E	E	017	019	020	020	020	021	022	025	022	020	020	020	020	E019S	E020S	E020S	E020S	E020S	E020S
19	E020S	E020S	E	E	E	015	020	020	020	020	020	024	020	020	020	020	020	020	E020S	E020S	E020S	E020S	E019S	E020S
20	E020S	E016S	E	E	E	E020S	020	020	020	020	C	020	020	020	021	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S
21	E020S	E	E	E	E015S	E022S	019	019	020	020	020	021	021	020	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S
22	E020S	E	E	E	E	015	020	020	020	020	020	025	020	020	020	021	020	020	E020S	E020S	E020S	E020S	E020S	E020S
23	E020S	E	E017S	E	E018S	015	020	020	020	021	020	025	020	C	021	020	020	020	E020S	E020S	E020S	E020S	E020S	E019S
24	E020S	E015S	E	E	E	E020S	E020S	020	021	022	021	020	025	022	021	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S
25	E020S	E	E	E	E	017	020	020	020	020	020	025	022	024	020	020	020	020	E020S	E020S	E020S	E020S	C	E020S
26	E020S	E019S	E018S	E	E	C	020	020	020	C	C	C	C	C	C	C	C	C	E020S	E020S	E020S	E020S	E020S	E020S
27	E020S	E	E	E	E	017	020	020	020	020	021	024	020	020	020	020	020	E020S	E019S	E020S	E020S	E020S	E020S	E020S
28	E020S	E020S	E018S	E	E	E020S	020	020	020	020	021	023	020	020	020	020	020	019	E020S	E020S	E020S	E020S	E020S	E020S
29	E020S	E	E020S	E	E	E020S	019	020	020	020	025	024	022	020	020	020	023	020	E020S	E020S	E020S	E020S	E020S	E020S
30	E020S	E	E	E	E	014	020	020	020	020	020	023	025	023	021	023	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S
31	E020S	E	E	E	E	014	E020S	020	020	020	020	022	021	020	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S
No.	31	31	19	30	28	30	31	30	30	30	28	28	29	29	30	30	30	30	31	31	31	31	30	31
Median	E020	E015	E	E	E	E017	020	020	020	020	020	022	022	021	020	020	020	020	E020	E020	E020	E020	E020	E020
U.Q.																								
L.Q.																								
Q.R.																								

f-min

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

The Radio Research Laboratories, Japan

W 6

IONOSPHERIC DATA

Jul.1964 | M(3000)F2 | 0.01 | 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	290	305	325	310	345	300	350	345	315	I270R	310	I305A	300	285	305	315	325	I315A	300	300	305	305	SF	325
2	325	305	SF	FS	FS	335	325	A	260	U340R	325	320	350	I335A	I315A	300	310	I325A	315	315	A	A	A	A
3	FS	A	A	FS	FS	340	A	A	320	325	335	300	315	I305A	285	I345A	300	330	A	A	315	SF	SF	A
4	A	SF	SF	SF	SF	A	A	A	A	A	A	A	A	310	A	R	A	A	305	305	305	295	315	I300A
5	295	305F	F	SF	300F	285	305	320	A	U340R	A	A	A	A	A	310	325	345	320	I315A	310	I300A	A	FS
6	FS	A	A	A	FS	FS	A	A	A	A	A	A	300	A	A	A	A	A	A	U320R	SF	310	A	A
7	A	A	A	SF	F	300	A	I320A	I335A	I325A	310	I305A	310	I300A	I295A	310	315	305	295	I315S	I315S	A	A	SF
8	SF	SF	SF	FS	325F	270	A	A	A	A	I305A	R	A	A	A	A	A	A	A	310	315	310	I300A	310
9	A	SF	SF	SF	A	315	A	A	A	A	A	A	A	A	R	285	310	280	I280A	320	310	305F	SF	FS
10	SF	FS	FS	FS	FS	295F	280	A	315	305	I270R	255	295	260	245	300	300	315	300	290	290	305	325	315F
11	285	295F	300F	F	F	280	I305A	I290A	275	320	315	R	R	R	U255R	265	310	I305A	300	I300A	285	300	320	310F
12	335	305F	300F	FS	310F	300	315	C	C	A	A	305	I275R	270	290	I285A	R	A	310	315	300	U300S	310F	310F
13	320	310	315	320	315	I305A	275	340	305F	325	I305A	325	I295R	I280A	I290A	I320A	I305A	315S	290	I295A	J290S	295	U335S	SF
14	FS	310	315	I300A	295	A	300	305	315	280	A	A	A	R	A	A	I310A	I300A	A	A	305	310	320F	I315A
15	305	300F	305F	SF	330F	305H	I335A	A	A	I280A	300	325	300	255	290	275	I280R	285	300	310	315	310	SF	SF
16	A	SF	F	F	345F	335	I325A	345	325	I335A	A	305	295	320	I290R	300	300	340	I330A	335	300	310	300	315
17	FS	F	310F	FS	315F	285	345	290	295	C	C	C	C	315	I300A	A	A	A	A	A	A	SF	310F	320F
18	300F	SF	SF	SF	SF	335	A	A	A	A	A	315	285	I255A	290	I305A	I310A	315	I300A	I290A	285	U280S	300S	285
19	290	305	305	315	310	300	A	320	A	340	335	A	A	295	305	I310A	I315A	315	320	A	U295S	SF	SF	SF
20	SF	SF	SF	305F	325S	310H	310	A	295	A	C	A	A	I280A	I300A	315	255	300	325	305	300	I315S	290	300
21	300S	315	305F	310F	SF	295H	290	345	315	A	A	A	A	290	250	275	295	305	I300A	320	A	A	SF	305F
22	FS	F	F	F	F	325	I290A	325	I335A	350	A	A	I260A	305	I285A	260	320	310	305	305	300	315	290	305
23	300	310	325	315F	310F	320	I315A	275	315	310	320	I300R	290	I255C	285	290	285	300	310	310	340	330	315	305
24	310	310	295	F	F	310	310	325	320	I325A	I295R	335	I315A	315	I300R	300	295	295	305	A	305	I310A	I310A	A
25	305F	FS	305F	305F	305F	A	A	I330A	305	I330A	I330A	I325A	310	285	I280A	315	A	A	A	A	U290S	SF	C	SF
26	A	SF	FS	F	F	C	280	315	325	C	C	C	C	C	C	C	C	C	350	I310A	300	A	SF	SF
27	SF	325F	FS	FS	350S	300H	350	275	340	I330A	355	I335R	I285R	320	300	335	I315A	I315A	320	300	300	315	335	355F
28	335	320	315	315	325	295	320	315	310	365	340	360	R	A	A	305	350	I340A	305	A	295	SF	330F	320
29	I320A	335	305	330	315	340	300	310	I310A	340	320	295	310	I285R	290	340	320	I315A	I300A	295	305	SF	SF	335
30	305	310	SF	SF	SF	310	I325A	I305A	305	320	I335R	I315R	270	285	320	295	315	300	305	300	A	S	SF	SF
31	SF	SF	F	F	F	315	I315A	A	A	325	335	I325A	310	I285R	275	295	I320A	355	I340A	345	A	F	A	SF
No.	16	16	14	10	16	26	22	19	21	21	18	18	19	23	23	25	24	24	25	24	25	19	16	17
Median	305	310	305	310	315	305	310	320	315	325	320	315	300	285	290	300	310	315	305	310	300	310	310	310
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

M(3000)F2 Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

W 7

IONOSPHERIC DATA

Wakkanai

Lat. 45°23.6' N
Long. 141°41.1' E

Jul.1964

M(3000)F1

0.01

135° E Mean Time (G.M.T. +9h)

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						365	375	370	I405A	U385R	A	A	A	405	375	360	A	A	A					
2						395	395	A	A	A	395	I410A	385	A	A	A	A	A	A					
3							A	A	A	A	I385A	I390A	390	I395A	395	I385A	375H	A	A					
4						A	A	A	A	A	A	A	A	380	I380A	395	A	A	A					
5						355	A	A	A	A	A	A	A	A	A	A	A	A						
6						345	A	A	A	A	A	A	375	A	A	A	A	A	A					
7							A	A	A	A	A	A	A	A	A	A	A	355	360					
8						340	A	A	A	A	A	U370R	A	A	A	A	A	A	A					
9						A	A	A	A	A	A	A	A	I375A	400	390	I380A	350	A					
10						U350L	A	A	A	390	U380R	395	385	385	A	A	A	355	360					
11						A	A	A	390	395	410	U390R	U410R	U390R	A	A	A	A	A					
12					350L	A	A	C	C	A	A	A	A	395	I395A	I395A	A	A	A					
13						A	375	I375A	390	405	I410A	415	U395R	I410A	I415A	I390A	I385A	I365A	A					
14					A	A	A	A	I370A	365	A	A	A	U405R	I385A	I380A	A	A	A					
15							A	A	A	I405A	I390A	I405A	395	395	385	390	400H	350	335					
16							I355A	I370A	A	A	A	400	395	400	I380A	390	350	A	A					
17						345	360	375	390	C	C	C	C	370	I380A	A	A	A	A					
18							A	A	A	A	A	400	370	I355A	A	A	A	345	A					
19							A	A	A	A	A	A	A	A	A	A	A	A	A					
20							360	A	A	A	C	A	A	A	A	A	380	365	375L					
21							360	I370A	380	A	A	A	A	A	360	375	A	A	A					
22							I355A	A	A	A	A	A	I375A	390	I375A	365H	360	A	A					
23						I350A	I360A	375	I370A	405	I395A	410	405	I385C	365	380	370	A	A					
24							A	I365A	I395A	I400A	395	400	I390A	380	390R	370	400	350	A					
25						A	A	A	A	A	A	A	370	400	I385A	A	A	A	A					
26							A	A	A	C	C	C	C	C	C	C	C	C	A					
27							I365A	A	A	A	405	420	410R	420	400	I380A	370	I365A	360L					
28						355	I365A	375	I385A	I395A	380H	410	A	A	A	A	A	A	A					
29							355	I390A	I395A	400	405	420	420	385	355	370	400	I360A	I340A					
30						A	A	A	395	425	415	I400A	405	I400A	I380A	375	I355A	380	355					
31							A	A	A	A	I400A	I410A	415	I410R	I385A	I375A	I370A	370	A					
No.					1	9	12	9	11	11	13	16	14	21	19	17	13	12	7					
Median					350	350	360	U375	U390	400	395	400	390	395	385	380	375	360	360					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

M(3000)F1

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

IONOSPHERIC DATA

Jul.1964 | h'F2 | km | 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						360	260	305	360	R	360	I370A	385	415	370	365	I345A	I335A	I300A					
2						260	395	A	500	280	300	350	310	A	A	375	350	I310A	300					
3							A	A	A	320	305	360	370	I375A	425	A	365	270	A					
4						A	A	A	A	A	A	A	A	365	A	R	A	A	305					
5						355	345	310	I310A	280	A	A	A	A	A	A	310	275						
6						380	A	A	A	A	A	A	380	A	A	A	A	A	A					
7							A	I310A	I285A	I285A	360	I380A	375	I420A	I410A	360	300	305	305					
8						470	A	A	A	A	I360A	R	A	A	A	A	A	A	A					
9						330	A	A	A	A	A	A	A	A	R	400	360	420	A					
10						U325S	A	A	340	400	R	500	395	475	535	380	365	330	320					
11						450	A	A	410	320	375	R	R	R	R	490	350	I340A	345					
12					320	350	310	C	C	A	A	400	A	475	440	I425A	R	A	A					
13							420	280	360	360	I395A	350	R	A	A	I335A	I340A	320	360					
14					350	I350A	I370A	355	350	410	A	A	A	R	A	A	I380A	I385A	A					
15								A	A	I430A	365	335	410	505	405	440	I445R	390	315					
16							I305A	300	330	A	A	400	385	335	I390A	380	390	295	A					
17						390	295	380	360	C	C	C	C	330	A	A	A	A	A					
18							A	A	A	A	A	360	415	A	370	I365A	I340A	320	A					
19							A	300	A	300	310	A	A	415	380	A	I315A	290	280					
20							350	A	350	A	C	A	A	A	A	355	480	350	270					
21							340	275	325	A	A	A	A	410	530	410	435	370	A					
22							I395A	295	I285A	A	A	A	A	380	I430A	460	315	310	I300A					
23						320	A	420	340	350	345	R	415	C	420	405	410	350	310					
24							335	300	I320A	A	R	310	A	365	I395R	395	400	370	350					
25						I280A	I295A	I320A	335	I315A	I325A	I340A	385	430	A	360	A	A	A					
26						C	A	A	A	C	C	C	C	C	C	C	C	C	280					
27							270	425	290	I300A	290	R	I455R	350	380	325	A	I320A	310					
28						370	305	340	340	245	305	500	R	A	A	380	270	A						
29							350	I320A	I340A	270	300	425	355	I420R	385	295	345	A	I335A					
30						330	I325A	I325A	350	305	320	R	450	390	320	390	340	330	295					
31							I320A	A	A	320	300	A	385	R	445	380	I315A	270	A					
No.					2	15	18	17	20	17	16	14	15	17	17	22	23	22	17					
Median					335	350	330	310	340	315	320	365	385	410	405	380	350	325	305					
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

IONOSPHERIC DATA

Wakkanai

Lat. 45°23.6' N
Long. 141°41.1' E

Jul.1964

h'F km

135° E Mean Time (G.M.T. +9h)

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	300	300	290	255	250	235	240	245	I220A	210	A	A	A	215	225	240	A	A	A	275	260	260	245	240
2	260	255	A	290A	A	240	235	A	A	A	230	I205A	215	A	A	A	A	A	A	A	A	A	A	A
3	A	A	A	A	240	240	A	A	A	A	I220A	I215A	210	I205A	220	I225A	200H	A	A	A	A	A	A	A
4	A	I300A	I305A	300	305	A	A	A	A	A	A	A	A	220	I235A	230	A	A	A	A	A	265	A	A
5	A	260	285	300A	260	260	A	A	A	A	A	A	A	A	A	A	A	I255A	265	A	A	A	A	A
6	A	A	A	A	285A	245	A	A	A	A	A	A	215	A	A	A	A	A	A	A	A	A	A	A
7	A	A	A	295	275	A	A	A	A	A	A	A	A	A	A	A	A	240	220	A	A	A	A	A
8	305	300	270	275	265	245	A	A	A	A	A	220	A	A	A	A	A	A	A	A	250	I260A	I265A	270
9	I330A	315	310	310	I280A	A	A	A	A	A	A	A	A	I230A	210	230	I235A	250	A	A	A	275	260	260
10	255	265	275	250	280	245	A	A	A	230	240	205	225	220	A	A	A	215	250	A	A	A	245	270
11	300	300	275	270	200A	A	A	A	220	210	210	220	200	240	A	A	A	A	A	A	290A	260	245	I265A
12	250	285	290A	300	280	A	A	C	C	A	A	A	A	225	I225A	I220A	A	A	A	260	260	I255A	255	260
13	270	265	265	250	300	A	250	I250A	215	200	I205A	190	210	I210A	I215A	I220A	I210A	I225A	I250A	I265A	280A	260	240	240
14	260	300	300	I315A	A	A	A	A	I255A	210	A	A	A	220	I240A	I245A	A	A	A	A	A	A	245	I280A
15	300	300	300	280	255	250H	A	A	A	I210A	I225A	I220A	205	215	215	205	200H	240	250	I245A	245	250	245	I300A
16	I320A	I335A	310	245	255	225	I345A	I325A	A	A	A	225	200	200	I240A	220	245	I250A	I255A	260	I270A	260	250	250
17	300	275	270	250	250	245	250	245	225	C	C	C	C	235	I240A	A	A	A	A	A	A	A	I260A	260
18	A	A	300A	300A	340	245	A	A	A	A	A	235	230	I255A	A	A	A	255	A	A	310A	300	250	295
19	290	245	300	250	305	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	I270A	I300A	I250A	260
20	275	260	250	290	270	235H	250	A	A	A	C	A	A	A	A	A	230	235	235L	275	I255A	I255A	I260A	[illegible]
21	270	270	265	270	255	260	245	I250A	250	A	A	A	A	A	250A	225	A	A	A	A	A	A	300	270
22	275	295	255	250	245	250	I265A	A	A	A	A	A	I240A	220	I230A	225H	230	A	A	A	A	225	270	A
23	260	260	250	255	295	I265A	I250A	245	I240A	200	I205A	200	190	I215C	245	225	250	A	A	A	225A	225	265	285
24	290	280	300	270	250	I260A	I240A	I250A	I230A	I215A	210	200	I220A	220	225	215	210	250	A	A	A	A	A	A
25	A	295	280	280	275	A	A	A	A	A	A	A	245	215	I235A	A	A	A	A	A	A	250	I240C	235
26	A	A	265	290	285	I240C	A	A	A	C	C	C	C	C	C	C	C	C	I240A	I245A	I275A	I290A	I300A	I285A
27	250	I255A	280	250	225	240H	I240A	A	A	A	210	195	200	210	200	I230A	240	I245A	250	I275A	I265A	250	260	245
28	255	260	270	250	250	240	I250A	250	I240A	I225A	215H	205	I220A	A	A	A	A	A	A	A	285	I295A	I270A	250
29	I280A	255	290	240	245	240	250	I220A	I215A	210	200	200	185	215	240	260	215	I260A	I275A	I275A	260	240	240	225
30	250	255	250	265	285	A	A	A	230	200	200	I210A	200	I215A	I230A	250	I240A	240A	250	I275A	I300A	I305A	I280A	I290A
31	300	260	255	270	250	A	A	A	A	A	I210A	I210A	210	230	I235A	I235A	I225A	235	A	A	A	300	I295A	295
No.	23	26	27	29	29	20	13	9	11	11	13	16	18	21	19	17	13	14	11	10	16	21	28	23
Median	275	270	280	270	265	245	250	U250	U230	210	210	210	210	220	U230	225	230	240	250	U270	270	260	250	260
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

IONOSPHERIC DATA

Jul. 1964 | h'Es | km | 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	115	110	110	105	110	G	G	120	120	110	115	110	G	G	105	120	120	120	120	120	115	110	110
2	E	E	105	105	105	105	125	115	120	120	110	110	110	105	120	110	105	120	115	115	115	115	110	110
3	130	105	105	105	105	125	125	120	120	120	115	115	115	120	120	110	110	120	115	115	115	125	110	110
4	110	105	105	105	105	125	115	120	115	115	110	110	110	110	125	110	120	120	130	125	125	120	110	105
5	110	S	105	105	100	115	140	120	110	110	110	105	110	110	110	110	115	110	110	125	125	115	105	115
6	105	105	105	105	105	130	120	115	115	115	110	110	110	105	105	110	120	120	115	115	120	120	115	110
7	105	100	100	100	100	140	120	115	110	110	110	105	110	110	110	110	120	G	120	115	115	115	115	110
8	110	120	S	125	115	125	115	110	115	115	110	110	110	130	125	125	120	120	115	115	115	120	110	110
9	135	140	130	105	105	125	125	120	115	110	110	110	115	120	120	G	140	125	120	120	115	110	115	120
10	110	110	105	135	110	G	130	125	125	130	120	125	120	120	120	115	110	120	115	115	115	115	110	110
11	S	S	S	110	125	125	110	110	110	115	110	G	G	G	140	130	125	115	120	115	110	S	110	110
12	105	105	105	105	G	120	120	C	C	110	120	120	120	115	115	115	135	120	115	120	110	110	115	120
13	110	S	110	110	125	115	120	115	110	110	110	110	110	115	125	115	115	110	120	115	115	115	115	115
14	S	110	110	105	120	135	125	120	115	135	110	110	110	145	120	115	115	110	110	110	110	110	110	110
15	105	105	110	105	S	135	115	115	115	110	110	110	110	105	110	G	140	120	115	110	110	S	115	105
16	105	105	105	105	G	S	135	125	120	110	110	115	110	110	110	110	G	125	115	140	115	115	115	S
17	110	105	110	E	G	135	130	135	125	C	C	C	C	105	115	115	110	120	115	115	115	120	110	115
18	105	100	105	110	130	140	120	115	110	110	110	G	125	125	125	120	125	120	120	115	120	115	S	S
19	S	S	135	125	120	120	115	115	110	110	110	105	105	125	120	120	115	115	115	110	115	110	110	S
20	145	S	110	105	110	S	130	115	115	110	C	115	115	110	110	110	G	G	S	S	120	115	115	115
21	115	110	105	105	S	S	140	125	115	110	110	110	110	110	110	125	115	120	110	110	115	115	120	110
22	110	100	100	105	G	140	125	125	115	110	105	105	105	110	110	110	110	125	115	115	115	110	110	110
23	S	105	S	110	S	135	120	120	115	115	110	110	G	C	G	125	125	115	115	110	110	110	S	S
24	S	S	110	110	115	115	110	110	110	115	120	120	110	G	G	105	105	105	120	115	115	115	110	110
25	105	105	105	105	110	120	115	110	115	110	110	110	145	G	120	120	115	110	105	110	115	110	C	S
26	105	105	105	105	105	C	120	115	115	C	C	C	C	C	C	C	C	C	110	110	125	120	120	110
27	110	105	105	110	125	170	130	120	115	110	110	105	G	G	G	115	110	110	110	110	105	110	105	110
28	105	110	S	110	110	115	120	115	115	125	G	115	105	105	110	110	125	120	120	115	110	110	110	105
29	110	110	105	125	E	125	120	115	110	110	110	G	110	G	G	125	125	115	120	115	120	115	S	S
30	S	E	105	105	E	125	115	115	115	120	G	120	120	125	130	120	110	115	125	115	110	115	110	110
31	110	E	E	115	110	120	120	120	120	110	110	105	105	160	120	115	115	125	120	120	120	120	115	110
No.	23	22	26	30	22	26	30	29	30	29	26	26	26	23	25	28	28	28	30	30	31	30	27	25
Median	110	105	105	105	110	125	120	115	115	110	110	110	110	110	120	115	115	120	115	115	115	115	110	110
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'Es

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

W 11

19

IONOSPHERIC DATA

Jul. 1964

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		f2	f2	12	12	1			c	c	c2	c	c2			12	c 1	c2	c 1	c	f	f2	f2	f2
2			f3	12	12	1	c	c3	c2	c	c	c	c	1	c 1	1	12	e2	c2	c2	f3	f2	f3	f6
3	f f	f6	f5	12	12	c 1	c3	c2	c2	c3	c2	c2	c	c	c	12	1	c	c3	c6	f3	f f3	f2	f4
4	f4	f2	f3	1	12	c2	c3	c3	c2	c2	c	c2	c2	c	c21	1	c312	c312	c2	c4	f3	f2	f4	f4
5	f4		f2	1	1	c	h	c2	c3	c	c2	12	c2	c2	c2	c2	c	c3	c2	c	f3	f4	f3	f2f2
6	f2	f2	f4	14	12	h	c4	c4	c3	c2	c2	c2	1	12	13	12	c 1	c4	c6	c2	f6	f f2	f4	f4
7	f4	f3	f2	12	1	h 1	c3	c2	c2	c4	c2	12	12	c2	c2	c	c		c	c2	f5	f6	f4	f2
8	f2	f2		c	c2	c	c2	c2	c2	c2	c4	c	1	c	c4	c2	c3	c4	c4	c5	f2	f4	f4	f2
9	f2f2	f f	f2f2	12	13	c2	c2	c2	c3	c3	c	c2	c	c	c		h	c	c3	c	f4	f	f2	f
10	f2	f	f2	c	1		h2	c	c	h	c	c	c	c	c	c2	12	c	c	c5	f3	f3	f2	f
11				1	c	c2	c3	c3	c	c	c				h	h	c2	c 1	c3	c5	f2		f	f4
12	f	f2	f2	1		c3	c3			c2	c	c	c	c	c	c	h	c2	c3	c	f2	f3	f2	f
13	f2		f	1	c	c3	c3	c2	c	1	1	1	1	c2	c2	c3	c2	1	c3	c2	f2	f2	f2	f
14		f	f2	14	c21	c3	c2	c	c	h	c2	c2	12	h	c2	c2	c3	c5	c4	c4	f3	f2	f3	f2
15	f2	f	f	1		h	c4	e2	c2	c2	c2	c	c	1	c		h	c	c2	c	f		f	f2
16	f4	f3	f	f2			h	c	c	c	c2	c	1	1	12	1		c 1	c5	e	f4	f	f	
17	f	f	f			c	c	h	c					1	c 1	c3	c2	c2	c3	c3	f3	f	f	f2
18	f2	f2	f2	e 1	e2	e	c3	c5	c3	c4	c2		c	c	c	c	c2	c2	c3	c3	f2	f		
19			f	c	c2	c4	c3	c2	c2	c2	c2	12	12	c 1	c	c2	c2	c2	c2	c2	f3	f4	f3	
20	f		f	f2	12		c	c2	c	c4		c2	c	c2	c2	12					f2	f2	f2	f
21	f	f	f	f			h	c	c2	c3	c2	e2	c2	c	c	c	c2	c2	c2	c2	f2	f2	f	f2
22	f	f2	f	f		h	c2	c	c2	c2	12	12	12	1	1	1	1	c2	c2	c3	f6	f	f2	f2
23		f2		f2		h	c2	c	c2	c	c	1				c	c	c4	c5	e2	f	f		
24			f	f	c21	c2	e2	c2	c	c	c	e	c			1	12	12	c31	c4	f4	f6	f3	f6
25	f3	f3	f	f2	1	c5	c3	e2	c2	c2	c2	1	h		c	c	c4	c2	c2	c3	f4	f		
26	f5	f3	f	f	1		c3	c2	c2										c3	c3	f2	f4	f3	f5
27	f	f2	f2	f	c	h	c	c2	c2	12	1	1				c2	c2	c2	c2	c2	f2	f	f2	f2
28	f2	f		f	1	c	c2	c2	c2	c		1	1	1	13	12	c 1	c2	c2	c4	f	f2	f2	f2
29	f6	f2	f	f		c	c	c2	c3	1	1		1			c	c	c3	c3	c2	f	f		
30			f2	f2		c2	c2	c3	e	c		c	c	c	h	c2	c2	c2	c	c2	f2	f6	f2	f3
31	f2			f2	1	c2	c2	c3	c3	c2	c	12	1	h	c	c	c	c	c4	c2	f4	f	f	f
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

Types of Es

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

W 12

IONOSPHERIC DATA

Jul. 1964 | foF2 | 0.1 Mc | 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	A	F	A	A	FS	A	I052R	044	046	051	054	I054A	049	I049R	051R	056	050	A	A	052	061	063R	I050R	I040A
2	I036A	F	I035R	I034A	F	042	048	I050R	059S	I057A	058	056	I051A	048R	I047A	052	062	065	058	053	053	I048A	044	043F
3	A	RF	F	RF	F	037F	040S	050	063R	A	A	A	A	056	059	A	A	A	I050A	060S	I069A	A	A	A
4	053S	FS	F	FS	F	I046A	059F	068F	A	A	A	A	A	053R	I052A	I048A	I050A	J049A	050	049	A	A	RS	FS
5	A	A	FS	F	F	040H	049S	052F	FS	061F	I056A	I050A	052	I056A	060	063	062	048	050	047	048S	A	A	R
6	R	F	F	F	F	RF	FS	062	A	A	A	A	A	A	051	056	059	I064A	068S	I070A	A	A	A	A
7	A	A	FS	A	F	040	051	060	A	A	J050A	I052A	A	A	A	I055A	I060A	065	074R	074	061	058	046	048
8	044R	041F	038	036	034	033	037S	044	I046A	I048A	050	048	E043G	A	A	A	A	A	A	A	059	A	A	A
9	FS	RF	038	039F	037	I038A	035	A	A	A	A	A	A	050	047R	050	046	I046A	I049A	051	051R	I055A	I050R	I044R
10	I046R	RF	RF	RF	F	036F	I046R	050	058	I054A	I048A	049	I050A	048R	A	A	A	A	A	A	061S	060S	I052R	I047R
11	046	I044R	040F	F	036F	040	I048A	054	I056A	057	I048A	046R	E043G	A	A	I050A	046	I049A	I051A	I059A	I061R	FS	F	F
12	033F	I030A	I030R	I030R	030F	039	I052A	I062A	058	050	A	A	A	A	A	A	A	052	054	058	F	F	U058R	050
13	I046R	039	F	F	F	038	050	I053A	I054A	046R	A	A	I050A	I052A	056	I050A	046	044	049	I062A	067	067R	I062R	RS
14	A	A	A	A	F	039	FS	054	065	059	I056A	I051A	E044G	A	A	I047A	050	047	I048A	056R	062S	053F	049	I048A
15	041S	A	F	F	F	040F	039S	050	I052A	056	057	064	058	054	050	046	I046A	I049A	058	072S	FS	FS	FS	A
16	A	I038A	FS	F	F	034	043S	I045A	059	051R	J050R	E043G	055	055	050R	051	I049A	048	I047A	I050A	053S	FS	046	043
17	FS	040R	038F	034	033F	039	051S	051	070	062	053	E044G	053	I057A	058	I056A	054	I046A	051	U058R	059F	FS	FS	FS
18	RF	RF	F	039F	F	J047R	I058A	068	U053R	051	U050R	I053A	I053A	052R	062	065	066R	048	I053A	062	061F	058F	060F	051R
19	051F	FS	FS	045	041R	045	047	061R	RS	A	A	A	A	057	I058A	060	I061R	060	I064A	065	J062A	FS	I052R	I051R
20	FS	044F	U041F	FS	036F	039	048R	053	I049R	I050R	A	A	A	052	059	052	053R	051	053R	U055R	054	I044R	042	I039R
21	A	RF	038	037F	F	039	I049R	055	049	052	049	I046A	049	051	053	052	048	051	058	068	055	I046R	FS	FS
22	FS	FS	F	034F	FS	036	045	055F	065	050H	054R	I050R	I048R	050R	I055A	I059A	065R	070S	049R	I054R	066R	056R	A	A
23	RF	A	I037A	I034R	033F	041	046R	I048A	056	063H	049	046R	E042G	050	049	I048A	054	I058A	I064A	U082R	053	044	033	031
24	033	035	034	034S	U033F	037	046R	I053C	053	048	A	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	056R	C	C	046	I048A	051	I050A	I050A	I057A	RS	RF	RF	RS
26	A	FS	035F	F	F	036F	045	I051A	I061A	A	A	A	A	A	047R	057	054	054	I042A	I040A	048	F	RF	RS
27	038F	A	A	F	F	040	045	044	I058A	I058C	I051A	048	047	053	I050A	I050A	I050A	046	I050A	057	I062A	FS	FS	I040R
28	030F	F	F	036F	035	039	045	051	058	061	046	E044G	E043G	046	051	056	049	I046A	I040A	I042A	050	F	FS	A
29	RS	A	039F	F	FS	037F	044S	054F	064	060	I060A	I052R	052	048	053	056	A	A	A	058R	F	A	A	A
30	A	FS	F	035F	F	036F	I043A	048	063S	061	054	I050A	049	I054A	J057A	063	056	048	050	I056A	056R	053S	FS	I048R
31	RF	F	F	036F	033F	040	045R	A	A	067	056H	053	044	I049A	055	055	055	055	054	I042A	036	RF	RF	RS
No.	12	8	12	14	11	28	28	28	23	23	20	21	20	22	24	26	25	25	26	28	24	13	13	14
Median	042	040	038	036	034	039	046	052	058	056	052	050	049	052	052	054	053	049	050	057	059	055	050	U046
U.Q.	046	042	038	037	036	040	050	055	063	061	056	053	052	054	058	056	060	056	058	062	062	059	055	048
L.Q.	034	036	035	034	033	037	044	050	053	050	050	046	E044	049	050	050	049	048	049	052	053	047	045	040
Q.R.	012	006	003	003	003	003	006	005	010	011	006	007	D008	005	008	006	011	008	009	010	009	012	010	008

foF2

Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Jul. 1964 | foF1 | 0.01 Mc | 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						A	L	L	390A	420	I430A	I440A	430	440R	430R	A	A	A	A	L				
2						L	L	460	A	A	440	A	A	430	I430A	410	400	380	R					
3						L		390	400	A	A	A	A	430H	430A	A	A	A	A					
4						A	A	A	A	A	A	A	A	A	I410A	I400A	I380A	I370A	L					
5						320	380L	400	I420A	430	A	A	430	I420A	410A	410	400	I370A	L					
6						A	A	A	A	A	A	A	A	A	420	A	A	A	A					
7						L	360	390	A	A	A	A	A	A	A	A	A	A	A					
8						300	330	I370A	I400A	I410A	I420A	430	430R	A	A	A	A	A	A					
9								A	A	A	A	A	A	430	420R	400	390	A	A					
10							380L	A	A	A	I430A	U430R	I430A	430R	A	A	A	A	A					
11						L	A	A	A	A	I420A	430	430	A	A	A	390	A	A					
12						L	A	A	A	430	A	A	A	A	A	A	A	360	I320A					
13						300	350	A	A	420	A	A	A	A	A	I410A	I400A	380	330					
14						A	LS	370	410	420	I420A	I420A	440	I420A	I410A	I400A	390	360	A					
15								400H	I410A	420	430	430	430A	430	430H	430	A	A	A					
16							L	A	I400A	I420A	430	430R	440R	430R	430	420R	I410A	L	A					
17						310L	370	390	390	430	430	440	440A	I440A	440	I420A	I400A	A	L					
18						L	I360A	A	A	A	440	A	A	440A	I430A	410	400	L	A					
19						A	370	A	A	A	A	A	A	430	A	A	A	370	A					
20								360	410	430	A	A	A	420	410R	400	390	360	A					
21							340L	380	410	410	430	A	A	U420R	420	410	I380A	360	320L					
22						280L	350	360	380S	400	430R	440	430	I440A	A	A	A	A	L					
23							I350A	I380A	400	I410A	430	430	420	420	410	A	A	A	A					
24						L	340H	I380A	390	410	A	C	C	C	C	C	C	C	C					
25						C	C	C	C	C	C	A	C	C	410	I400A	390S	A	A					
26							A	A	A	A	A	A	A	A	420	400	390	350	A					
27							A	A	A	I410C	I440A	430	430	420	I420A	I400A	I390A	370L	A					
28						L	I340A	370	400	410	420	440	430	410	420A	400	L	A	A					
29						L	350	390	390	A	A	440R	430	430	410	I420A	A	A	A					
30							A	A	I390A	I410A	430	I430A	430	I420A	I400A	400	390S	370L	L					
31						A	L	A	A	420	I420A	430	430L	I430A	U430A	410	390S	370L	A					
No.						5	14	15	16	18	17	15	16	21	22	19	17	13	3					
Median						300	350	380	400	420	430	430	430	430	420	410	390	370	320					
U.Q.																								
L.Q.																								
Q.R.																								

foF1 | Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Jul. 1964 | foE | 0.01 Mc | 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						A	A	A	A	A	A	A	A	A	A	A	A	A	A	E				
2						A	A	A	A	A	I325A	I330A	A	A	325A	300A	285	A	A	E				
3						A	A	A	A	A	A	335	A	A	A	A	A	A	E					
4						A	A	A	310	I315A	A	A	A	A	A	A	300	250	A	E				
5						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
6						A	A	A	A	A	A	A	A	A	AH	310	A	A	A					
7						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
8						A	A	A	A	A	A	A	A	A	320R	295	A	A	A					
9						A	245A	A	A	A	A	A	A	A	A	A	A	245A	A					
10						A	245A	A	A	A	A	A	A	A	A	A	A	A	A					
11						A	A	A	A	A	A	A	A	335R	325R	305	285A	250A	A					
12						A	A	A	A	A	320A	330A	340A	A	A	A	A	A	A					
13						A	A	A	A	A	A	A	A	335	I325A	310	A	A	A					
14						A	A	A	I300A	310	A	A	A	A	320	305	A	A	A					
15						A	A	A	295	I305A	A	A	A	A	A	310	290	A	A					
16						A	A	A	305	A	A	A	A	A	A	A	A	A	A					
17						A	A	270A	A	A	A	A	A	A	A	A	285A	250A	A					
18						A	A	A	A	285A	I300A	I320A	I330A	330A	320	300	285A	A	A					
19						A	A	A	A	A	A	A	A	330R	315	300	285A	A	A					
20						A	A	I255A	280A	A	A	A	335A	A	A	295A	275A	A	A					
21						A	A	A	A	A	305	A	A	A	A	A	A	A	A					
22						E	A	A	A	A	A	A	A	A	A	A	A	A	A					
23						E	A	A	A	A	A	A	A	330A	315	295A	275A	A	A					
24						A	A	A	A	I300A	315	C	C	C	C	C	C	C	C					
25						C	C	C	C	C	C	A	C	C	A	A	285A	I250A	A					
26						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
27						A	A	A	A	C	A	A	A	335A	I320A	305A	275A	A	A					
28						A	A	A	A	A	A	A	A	A	A	320	A	A	A					
29						A	A	A	A	A	A	A	I340A	345	A	A	290A	A	A					
30						A	A	A	A	295A	I315A	330A	345R	330A	320A	300A	A	A	A					
31						A	A	270R	A	A	A	A	A	330	320A	A	A	250A	A					
No.							2	3	5	6	6	5	5	9	11	14	12	6	1	3				
Median							245	270	300	U300	U315	330	340	330	320	300	285	250	E	E				
U.Q.																								
L.Q.																								
Q.R.																								

foE

Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 3

IONOSPHERIC DATA

Jul. 1964 | foEs | 0.1 Mc | 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	J049	J035	J056	J061	J068	J064	J033	J036	J060	J046	J055	J077	J043	J050	J051	J068	J088	J102Y	J052	J024	J036	J053	J030	J071S
2	J052	J031	J053	J042	J043	J032	J038	J053	J054	J073	038	J048	J113	038	J056	035	037	033	J047	J024	J047	J073	J043	J043
3	J042	J058	J037	J039	J021	J027	J062	J048	J043	J121	J183	J098	J125Y	J089	J061	J103	J083	J074	J067	J063	J090	J080	J050	J065
4	J072	J042	J040	J030	J064	J053	J043	J068	J088	J076	J088	J102	J130	049	J063	J128	J113	J060	J033	019	J071	J066	J072	J045
5	J072	J058	J056	J061	J028	J035	028	J048	J078	J063	J082	J067	J043	J074	J065	J041	J040	J046	J031	J051	J073	J064	J070	J086
6	J092	J053	J040	J033	J042	J040	J055	J070	J105	J138	J073	J087Y	J075	J063	036	J054	J062	J083	J063	J076	J073	J084	J063	J090
7	J060	J043	J034	J049	J030	J033	J049	J038	J123	J093	J053	J055	J068	J122	J118	J074	J061	J063	J086	J033	J025	023	E	023M
8	S	J028	E	J023	J030	020	J029	J041	J061	J040	J050	J042	037	J058	J068	J064	J073	J068	J073	J073	J040	J037	J053	J036
9	J061	J038	J025	J027	J033	J068	J037	J078	J100	J088	J108	J089	J110	J064	J050	J034	J043	J063	J063	J060	J063	J063	J053	J043
10	J017	J061	J033	J057	J043	J030	028	J051	J062	J071	J048	036	J057	038	J071	J136	J123	J128	J075	J061	J061	J064	J043	J070
11	J039	J043	J028	J025	J028	J031	J057	J060	D200D	J066	J051	J037	038	042	J050	J050	J040	J063	J101	J076	J073	J053	J036	J053
12	J033	J039	J033	J025	J036	J033	J063	J076	J058	040	J073	J078	J058	J093	J101	J087	J073	J079	J046	J026	J035	J040	J023	J024
13	J040	J050	J030	J035	J039	J028	J055	J065	J061	J061	J055	J067	J050	J045	J069	J065	J055	J048	J052	J065	J042	J035	J032	J060
14	J070	J077	J088	J070	J058	J047	J036	J060	J059	044	J088	J056	J056	051	J062	J052	038	J060	J111	J038	J060	J043	J057	J073
15	J046	J051	J042	J033	J023	J052	J073	J062	J113	J072	J068	J061	J065	040	036	J035	J083	J067	J060	J056	J066	J038	J043	J062
16	J038	J058	J039	J020	E	025	036	J048	J053	J078	J040	035	J048	J038	J060	J062	J062	J056	J038	J060	J031	J030	J022	J018
17	E	E	J024	J021	E	028	032	J052	J050	J038	037	J049	J062	J090	J060	J140	J062	J065	J048	J130Y	J030	J050	J060	J029
18	J042	J036	J026	J028	J023	024	J048	J048	J062	J051	J058	J113	J082	J061	J048	J045	J049	J063	J136	J087	J054	J040S	J046	J053
19	J034	J025	J025	J043	J061	J061	J061	J136	J088	J080	J058	J110	J113	J058	J070	J066	J085	J076	J084	J051	J064	J065	J083	J042
20	J083	J053	J018	J030	E	022	028S	036	J035	J051	J115	J060	J055	J066Y	J043	035	J038	J034	J040	J038	J035	J028	J063	J038
21	J073	J044	J032	J023	J021	020	J033	J038	J053	037	J039	J058	J047	042	J047	J040	J060	035	J048	J023	J018	J037	J035	J025
22	J019	J019	J020	J020	E	025	032	039	038	J040	J050	J048	J042	J040	J078	J073	J060	J047	J036	J068	J065	J058	J040	J058
23	J050	J043	J047	J041	J028	025	J061	J072	J049	J053	J035	J050	J041	037	044	J062	J053	J069	J078	J042	J040	J037	J030	E
24	E	J018	E	J021	J018	023	025	D047C	J058	035	J055	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	J071	C	C	J048	D200D	J120	J061	J064	J087	J093	J048	J045	J046
26	J060	J030	J028	J025	J032	021	J052	J087	J082	J103	J076	J085	J138	J087	J043	J036	J038	J060	J099	J039	J033	J031	J063	J058
27	J071	J042	J053	J025	J023	029	J041	J050	J088	C	J060	042	J038	J058	J137	J120	J138	J120	J146	J076	J090	J071	J036	J074
28	J036	J037	J061	J023	J028	J030	J038	032	J038	J065	J055	J038	J041	J040	J046	J061	J074	J056	J038	J040	J026	J037	J056	J055
29	J060	J061	J056	J041	J028	028	J032	033	J038	J093	J092	J057	J038	G	037	J054	J066	J068	J084	J083	J072	J098	J075	J064
30	J060	J051	J044	J025	J026	J028	J053	J063	J068	J048	036	J050	J043	J071	J070	J053	J058	J040	J043	J071	J039	J051	J033	J057
31	J030	J025	023S	S	J024	J039	J033	J059	J061	J062	J054	J051	J053	J058	J061	J083	J071	J034	J061	J044	J060	J033	J045S	J038
No.	29	30	30	29	30	30	30	29	30	29	30	30	29	29	30	30	30	30	30	30	30	30	30	30
Median	049	042	034	030	028	030	038	052	061	063	055	058	055	058	060	062	062	063	062	058	057	049	045	053
U.Q.	066	053	047	042	039	039	055	066	088	079	076	078	078	068	069	083	083	069	084	073	071	064	060	064
L.Q.	035	031	025	024	023	025	032	040	053	045	050	048	042	040	047	045	049	048	046	038	035	037	035	038
Q.R.	031	022	022	018	016	014	023	026	035	034	026	030	036	028	022	038	034	021	038	035	036	027	025	026

The Radio Research Laboratories, Japan

foEs

Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Jul. 1964 | foEs | 0.1 Mc | 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	A	026	A	A	023	A	026	034	040	042	049	A	U043R	036	037	051	044	A	A	021	017	035	023	A
2	A	017	028	A	029S	021	032	043	056	A	037	046	A	036	A	032	035	030	021	020	046	A	035	025
3	A	032	018	025S	017	021	028	033	033	A	A	A	A	036	045	A	A	A	A	035	A	A	A	A
4	E	028	E	E	E	A	040	040	A	A	A	A	A	046	A	A	A	A	023	017	A	A	032	E
5	A	A	030	026	017	024	027	040	053	042	A	A	U043R	A	042	035	032	042	023	018	033	A	A	020
6	E	E	020	024	E	035	050	055	A	A	A	A	A	A	036	054	054	A	060	A	A	A	A	A
7	A	A	028	A	018	021	033	029	A	A	A	A	A	A	A	A	A	054	060	018	022	017		017
8	S	019		018	E	020	025	040	A	A	048	043	037	A	A	A	A	A	A	A	031	A	A	A
9	020	033	020	017	017	A	028	A	A	A	A	A	A	038	037A	031	036	A	A	041	040S	A	017	025
10	017	022	017	017	018	025	025	046	055	A	A	036	A	035	A	A	A	A	A	A	057	052	040	018
11	033	S	020	021	020	020	A	050	A	045	A	035	037	A	A	A	039	A	A	A	025	048	027	020S
12	020	A	025S	017	017	028	A	A	053	037	A	A	A	A	A	A	A	036	E046R	021	018	022	E	017
13	022	030	E	017	027	019	030	A	A	039	A	A	A	A	048	A	042	030	027	A	033	E	018	030
14	A	A	A	A	E	033	025	037	041	042	A	A	042	A	A	A	031	033	A	038	039	036	040	A
15	035	A	031	017	E	023	024	030	A	037	036	037	044	036	033	034	A	A	039	018	018	E	018	A
16	A	A	020	017		021	035	A	049	044	U040R	035	040	037	036	036S	A	033S	AS	A	023	022S	017	017
17			E	E		023	029	039S	039	034	036	039	047	A	044	A	045	A	026S	020	017	040S	030	023
18	022	027	017	017	E	020	A	042	042	047	037	A	A	045	050	040	030	032	A	050S	025	027S	023S	040S
19	019S	017	020	020S	030	040	030	052	053S	A	A	A	A	040	A	049	050	032	A	040	A	E	017	017
20	017	017	E	E		019S	025	032	035	043	A	A	A	032	036	032	039	033	033	035	017	018	017	030S
21	A	E	026	E	019	019	025	033	030	033	039	A	046	U042R	042	035	043	031	026	020	E	035	020	E
22	E	E	E	E		020	028	036	033	035	035	036	042	045	A	A	060	043	023	019	042	052	A	A
23	029S	A	A	018	017	020	044S	A	040	048	035	035	035	033	038	A	053	A	A	038	032S	022S	017	
24		E		017	E	E	023	040	039	034	A	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	051	C	C	040	A	035	A	A	A	037	035S	028S	035
26	A	017	017	020	017	018	041	A	A	A	A	A	A	A	042	034	032	035	A	A	026	020	017	020S
27	019	A	A	017	017	022	035	040	A	C	A	035	037	037	A	A	A	033	A	030	A	018	025	030
28	E	017	017	E	E	020	E038R	029	033	039	042	037	037	036	043	036	037	A	A	A	E	020	035	A
29	017	A	E	017	E	020	028	030	034	045	A	039	035		035	047	A	A	A	053	018	A	A	A
30	A	018	032	017	017	025	A	041	050	044	035	A	U043R	A	A	036	030	025	025	A	017	018	021	021
31	017	017	017	S	E	032	026	A	A	042	047	035	040	A	045	034	035	028	039S	A	019	025	019	017
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

foEs

Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 5

25

IONOSPHERIC DATA

Jul. 1964 | f-min | 0.1 Mc | 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	017	E	017	E	E	017	017	017	017	017	017	018	018	017	017	017	017	E	017	017	E	017
2	017	E	E	E	E	017	017	017	017	E	017	017	017	017	018	017	017	017	017	E	E	E	017	E
3	017	E	E	E	E	E	017	E	E	017	017	018	017	018	017	E019S	017	E	E	E	E	E	E	E
4	E	E	E	E	E	E	017	017	017	017	017	017	017	017	018	018	017	018	017	E	E	017	E	E
5	E	E	E	E	E	E	017	017	017	017	017	018	017	017	018	018	017	017	017	E	E	E	E	E
6	E	E	E	E	E	E	017	017	017	017	017	018	018	017	017	017	017	017	017	E	E	E	E	E
7	017	E	E	E	E	E	017	017	017	017	018	018	019	017	018	017	017	017	017	017	E	017	017	017
8	017	E	017	E	E	017	017	017	017	017	017	017	019	017	017	017	018	017	017	017	E	017	017	E
9	017	E	E	E	E	017	017	017	017	017	017	017	017	017	017	E	017	017	017	E	E	E	E	017
10	E	E	E	E	E	E	017	017	017	017	017	017	018	017	017	018	017	017	017	017	017	017	017	E
11	017	E	E	017	E	E	017	017	017	017	017	017	017	017	017	018	017	017	E	E	017	017	017	E
12	017	E	E	E	E	E	017	017	017	017	017	017	018	017	017	017	E	E	E	E	E	E	E	E
13	E	E	E	E	E	E	017	017	017	017	018	017	017	018	017	017	017	017	017	E	E	E	E	E
14	E	E	E	E	E	E	017	017	017	017	017	018	017	017	017	017	017	017	E	E	E	E	E	E
15	E	E	E	E	E	E	017	E	017	017	017	017	017	017	017	017	017	017	017	E	E	E	E	E
16	E	E	E	E	E	E	017	017	017	017	017	018	017	017	017	017	017	E	017	E	E	E	017	017
17	E	E	E	E	E	E	E	E	017	E	017	017	017	018	019	017	017	E	017	E	017	E	E	E
18	E	E	E	E	E	E	017	017	017	017	017	017	017	018	018	017	017	017	017	E	E	E	E	E
19	E	E	E	E	E	E	017	E	017	018	017	017	017	018	017	017	017	E	017	E	017	E	017	E
20	E	E	E	E	E	E	017	E	017	017	017	017	017	017	017	017	017	017	017	017	017	017	E	017
21	017	E	E	E	E	E	E	E	017	017	017	017	018	017	017	017	018	E	017	E	E	E	E	E
22	E	E	E	E	E	E	017	017	017	017	018	018	019	017	018	017	017	017	E	E	E	E	017	E
23	E	E	E	E	E	017	017	017	017	017	017	017	018	017	017	017	E	E	E	017	017	017	E	017
24	017	E	E	E	E	E	E	E	017	017	017	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	017	C	C	017	017	017	017	017	017	E	E	E	017
26	017	E	E	E	E	E	017	017	017	017	017	018	018	017	017	017	017	017	017	E	E	E	E	017
27	E	E	E	E	E	E	E	017	017	C	E	017	019	017	017	E	017	018	E	E	E	E	E	E
28	E	E	E	E	E	E	017	017	017	017	018	018	017	018	018	017	017	017	E	E	E	E	E	E
29	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	017	017	E	017	017	017	E	E	017
30	017	E	E	E	E	E	017	017	017	017	018	017	E	018	017	017	017	017	017	E	017	E	E	017
31	017	E	017	E	E	E	017	017	017	017	018	017	018	017	017	018	017	017	017	017	017	E	E	E
No.	30	30	30	30	30	30	30	30	30	29	30	30	29	29	30	29	30	30	30	30	30	30	30	30
Median	E	E	E	E	E	E	017	017	017	017	017	017	017	017	017	017	017	017	017	E	E	E	E	E
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

f-min | Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Jul. 1964 | M(3000)F2 | 3.01 | 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	A	F	A	A	FS	A	I365R	350	290	305	365	I310A	285	I280R	280R	340	310	A	A	310	310	320R	I335R	I330A
2	I320A	F	I305R	I315A	F	335	335	I330R	I335A	I340A	325	345	I320A	295R	I275A	285	300	325	330	330	315	I305A	305	300F
3	A	RF	F	RF	F	295F	330S	320	355R	A	A	A	A	295	305	A	A	A	I285A	285S	I320A	A	A	A
4	290S	FS	F	FS	F	I290A	285F	310F	A	A	A	A	A	300R	I300A	I300	I300A	I305A	310	305	A	A	RS	FS
5	A	A	FS	F	F	300H	310S	295F	FS	315F	I325A	I300A	285	I295A	295	320	335	315	325	320	340S	A	A	R
6	R	F	F	F	F	RF	FS	305	A	A	A	A	A	A	275	I290A	295	I310A	305S	I310A	A	A	A	A
7	A	A	FS	A	F	315	315	355	A	A	J305A	I310A	A	A	A	I300A	I300A	295	315R	340	315	315	305	290
8	295R	295F	290	305	325	245	225S	300	I260A	I250A	I285A	300	G	A	A	A	A	A	A	A	325	A	A	A
9	FS	RF	300	300F	350	I370A	370	A	A	A	A	A	A	290	270R	300	295	A	A	335	315R	I320A	I330R	I320R
10	I310R	RF	RF	RF	F	300F	I310R	300	330	I320A	I280A	270	I270A	270R	A	A	A	A	A	A	305S	320S	I320R	I305R
11	300	I305R	310F	F	305F	295	I300A	I320A	I325A	350	I275A	220R	G	A	A	I305A	280	I305A	I300A	I295A	I310R	FS	F	F
12	350F	I310A	I300R	I300R	315F	300	I330A	I340A	330	315	A	A	A	A	A	A	A	320	310	325	F	F	U305R	300
13	I300R	315	F	F	F	295	325	I320A	I330A	305R	A	A	I310A	I305A	320	I300A	305	285	290	I290A	290	315R	I340R	RS
14	A	A	A	A	F	310	FS	305	320	325	I325A	I340A	G	A	A	I300A	305	305	I295A	305R	340S	315F	310	I310A
15	310S	A	F	F	F	330F	365S	305	I300A	325	305	320	320	330	290	285	I300A	I285A	300	325	FS	FS	FS	A
16	A	I305A	FS	F	F	325	290S	I315A	345	325R	J315R	G	305	315	285R	310	I295A	315	I320A	I320A	310S	FS	325	315
17	FS	335R	330F	305	305F	285	305S	305	355	345	320	G	295	I300A	315	I305A	315	I300A	315	U310R	315R	FS	FS	FS
18	RF	RF	F	305F	F	J325R	I280A	350	U340R	345	U270R	I310A	I340A	270R	300	290	305R	305	I305A	310	295F	290F	315F	290R
19	285F	FS	FS	310	315R	315	300	330R	RS	A	A	A	A	305	I305A	310	I315R	320	I330A	325	J315A	FS	I290R	I310R
20	FS	305F	U295F	FS	310F	335	305R	345	I330R	I340R	A	A	A	285	305	290	310R	325	300R	U325R	320	I295R	305	I305R
21	A	RF	330	325F	F	345	I335R	330	305	355	330	I260A	270	285	290	295	300	295	325	325	340	I320R	FS	FS
22	FS	FS	F	315F	FS	300	290	295F	355	310H	335R	I300R	I270R	280R	I295A	I300A	310R	330S	335R	I290R	320R	320R	A	A
23	RF	A	I330A	I340R	335F	315	I330A	I305A	325	325H	300	270R	G	300	295	I285A	305	I310A	I305A	U340R	325	325	315	295
24	300	305	310	340S	U335F	325	300R	I335A	350	325	A	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	340R	C	C	300	I310A	315	A	A	I310A	RS	RF	RF	RS
26	A	FS	300F	F	F	325F	310	I315A	I335A	A	A	A	A	A	280R	325	345	340	I335A	I310A	305	F	RF	RS
27	340F	A	A	F	F	350	320	300	I340A	I350C	I340A	315	275	320	I300A	I300A	I320A	310	I290A	295	I300A	FS	FS	I330R
28	305F	F	F	325F	315	300	290	330	350	355	300	G	G	265	305	345	310	I340A	I310A	I305A	290	F	FS	A
29	RS	A	315F	F	FS	315F	290S	315F	335	320	I350A	I300R	325	260	300	340	A	A	A	305R	F	A	A	A
30	A	FS	F	325F	F	315F	I310A	280	320S	345	335	I300A	285	I300A	I310A	320	340	305	300	I315A	310R	330S	FS	I300R
31	RF	F	F	310F	320F	340	325R	A	A	345	330H	320	295	I305A	300	310	310	335	365	I340A	340	RF	RF	RS
No.	12	8	12	14	11	28	28	28	23	23	20	21	20	22	24	26	25	23	24	28	24	13	13	14
Median	300	305	310	310	315	315	310	315	330	325	320	300	285	295	300	300	305	310	310	310	315	320	315	U305
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

M(3000)F2 | Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Jul. 1964 | M(3000)F1 | 0.01 | 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						A	L	L	A	A	I360A	I340A	I360A	385R	355R	A	A	A	A	L				
2						L	L	A	A	A	420	A	A	420	I395A	380	355	360	R					
3						L		360	385	A	A	A	A	370H	A	A	A	A	A					
4						A	A	A	A	A	A	A	A	A	A	A	A	I365A	L					
5						350	360L	A	A	A	A	A	A	A	A	395	370	I380A	L					
6						A	A	A	A	A	A	A	A	A	385	A	A	A	A					
7						L	375	370	A	A	A	A	A	A	A	A	A	A	A					
8						335	345	I375A	I370A	A	A	A	370R	A	A	A	A	A	A					
9								A	A	A	A	A	A	360	370R	375	360	A	A					
10							350L	A	A	A	A	U395R	I385A	375R	A	A	A	A	A					
11						L	A	A	A	A	I390A	395	400	A	A	A	A	A	A					
12						L	A	A	A	385	A	A	A	A	A	A	A	A	I360A					
13						345	350	A	A	375	A	A	A	A	A	A	A	365	335					
14						A	LS	A	A	I400A	I410A	I420A	I380A	I375A	A	A	365	370	A					
15								355H	I380A	400	390	410	I380A	410	400H	355	A	A	A					
16							L	A	I375A	I390A	I385A	430R	415R	405R	405	355R	I360A	L	A					
17						340L	355	I370A	I385A	405	420	395	A	A	A	I365A	I355A	A	L					
18						L	A	A	A	A	420	A	A	A	I365A	I370A	365	L	A					
19						A	345	A	A	A	A	A	A	360	A	A	A	350	A					
20								410	365	I370A	A	A	A	385	390R	375	I380A	360	A					
21							385L	385	375	390	365	A	A	A	I360A	370	I370A	355	355L					
22						345L	365	I360A	385	400	420R	410	375	I370A	A	A	A	A	L					
23							I350A	I370A	I380A	I390A	405	405	385	380	370	A	A	A	A					
24						L	360H	I380A	I370A	415	A	C	C	C	C	C	C	C	C					
25						C	C	C	C	C	C	A	C	C	A	A	385S	A	A					
26							A	A	A	A	A	A	A	A	I375A	385	370	A	A					
27							A	A	A	C	I390A	415	420	375	I400A	I380A	I385A	375L	A					
28						L	I370A	395	385	A	A	430	420H	420	I375A	380	L	A	A					
29						L	350	370	385	A	A	405R	395	420	370	A	A	A	A					
30							A	A	A	A	405	I380A	I375A	I370A	I375A	355	360S	360L	L					
31						A	L	A	A	A	A	420	375L	A	A	365	365S	365L	A					
No.						5	13	12	12	11	13	14	14	16	15	14	14	11	3					
Median						345	355	370	U380	390	405	410	380	380	375	370	365	365	355					
U.Q.																								
L.Q.																								
Q.R.																								

M(3000)F1 Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 8

28

IONOSPHERIC DATA

Jul. 1964 | h'F2 | km | 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						A	245	240	390	355	A	I360A	440	455	430	300A	345	A	A	300				
2						275	305L	I270R	I295A	I300A	310	295	A	420	A	400	325	285	270					
3						L		335	265	A	A	A	A	380	345	A	A	A	A					
4						A	355	300	A	A	A	A	A	370	I350A	I370A	I355A	A	270					
5						350	345	355H	295A	295	A	A	405	I385A	345	300	295	I320A	280					
6						I345A	I325A	A	A	A	A	A	A	A	410	A	A	A	I310A					
7						325L	320	260	A	A	I380A	I370A	A	A	A	I375A	I355A	350	I275A					
8						525	595	375A	A	A	A	400	G	A	A	A	A	A	A					
9								A	A	A	A	A	A	400	475	350	400	A	A					
10							390L	I340A	I310A	A	A	450R	I470A	450	A	A	A	A	A					
11						L	I330A	A	A	290	I445A	645	G	A	A	I360A	445	A	A					
12						350	A	A	300	350	A	A	A	A	A	A	A	320	I300A					
13						360	295	I290A	I300A	355	A	A	I370A	A	330	I355A	I310A	410	350					
14						340	330S	345	300	290	I305A	I305A	G	A	A	A	345	350	A					
15								345	I365A	320	345	310	325	310	400	445	I365A	A	315					
16							L	A	290	325	380R	G	350	345	420	355	A	325L	A					
17						395	305	350	250	275	350	G	395	I355A	340	I340A	310A	I385A	310					
18						270	I350A	260	290	A	375	I350A	A	450	365	350	305	325L	A					
19						A	390	300A	275S	I255A	A	A	A	350	I350A	325	325	295	I265A					
20								280	440	645	A	A	A	405	345	395	345	305	315					
21							270	300	355	270	330	A	A	400	390	390	A	350	290					
22					○	345	390	320	245	345H	305	I400R	390	450	I380A	A	A	260	245					
23							A	I355A	305	300	395	485	G	360	395	I430A	A	I305A	I290A					
24						315	370	285	280	345	A	C	C	C	C	C	C	C	C					
25						C	C	C	C	C	C	310	C	C	420	A	325	A	A					
26							355A	I340A	I265A	A	A	A	A	A	450	300	285	275	A					
27							305A	400A	A	I260C	A	370	475	335	I370A	I360A	I320A	350	I375A					
28						340L	I355A	310	275	250	405	G	G	490	370	290	300	A	A					
29						300	405	325	290	310	A	R	330	500	355	285	A	A	A					
30							A	400A	330	275	300	A	435	I370A	I335A	300	300	340	300					
31						265A	305	A	A	A	A	200	230A	A	A	210	245A	280	240					
No.						15	22	24	22	20	13	17	17	20	22	22	20	18	17	1				
Median						340	340	320	295	300	350	370	435	390	370	350	325	320	290	300				
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'F2 | Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

A 9

29

IONOSPHERIC DATA

Akita

Lat. 39°43.5' N
Long. 140°08.2' E

Jul. 1964

h'F km

135° E Mean Time (G.M.T. +9h)

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	I260A	A	A	240	210	A	A	A	A	A	220A	250A	A	A	A	A	I265A	250	260A	230	A
2	A	270	300A	I295A	I285A	245	250	A	A	A	205	A	A	195	I200A	195H	I240A	205A	250	245	A	A	I305A	300
3	I305	I300	250	265S	250	225	240	255	210	A	A	A	A	195H	A	A	A	A	A	I305	I250	A	A	A
4	290	I260A	245	240	250	A	A	A	A	A	A	A	A	A	A	A	A	A	245	245	A	A	A	260
5	I260A	I265A	I250A	I260A	240	245	240	A	A	A	A	A	A	A	A	220	235	I230A	235	240	A	A	A	240
6	275	250	280	275	290	A	A	A	A	A	A	A	A	A	220	A	A	A	A	A	A	A	A	A
7	A	A	A	A	260	245	I240A	210	A	A	A	A	A	A	A	A	A	A	A	230	235	245	250	280S
8	300	310	305	300	250	245	250	I250A	I250A	A	A	A	245	A	A	A	A	A	A	A	250	A	A	A
9	330A	I315A	295	250	245	I235A	230	A	A	A	A	A	A	245	240A	220	A	A	A	A	A	A	270	I260A
10	250	275	270	250	300	I250A	245	A	A	A	A	215	I225A	245	A	A	A	A	A	A	A	A	I285A	265
11	310A	I300S	290	290	290A	235	A	A	A	A	I220A	210	225	A	A	A	A	A	I240A	245	275A	I290A	265	225
12	225A	A	A	325	295	A	A	A	A	215	A	A	A	A	A	A	A	A	I240A	I250A	275	250	240	245
13	285A	I285A	275	290	I240A	240	A	A	A	230	A	A	A	A	A	A	A	225	I240A	I260A	290A	250	240	A
14	A	A	A	A	290	I235A	225	A	A	I220A	I205A	I195A	I245A	I240A	A	A	245	I240A	I260A	290A	245A	A	A	A
15	A	A	A	245	240	255	205	200H	I210A	220	205	200	I235A	200H	200H	210	A	A	A	250	240	245	285	A
16	A	I250A	255A	240	210	245	I245A	I240A	I240A	I230A	I225A	195H	200	205	200	250A	I240A	I235A	A	A	280	275S	235	270
17	255	250	240	260	290	250	230	I240A	I220A	205	195	220	A	A	A	I240A	I245A	A	A	255	250	A	300	300
18	290	I300A	280	295	280	250	A	A	A	A	195	A	A	A	I250A	I235A	225	255A	A	A	325A	300	255	I275A
19	300S	250	295A	290S	I260A	I260A	255	A	A	A	A	A	A	A	A	A	A	250	I255A	250A	I275A	275S	290	250
20	235	240	270	290	260	230	220	205	255	I230A	A	A	A	215	205	205	I225A	I235A	I245A	255A	245	250	270	I275A
21	I275A	295A	275A	255	280	245	220	235	220	205	I225A	A	A	A	A	240	I225A	I225A	I250A	245	200	I250A	I265A	255
22	270	290	245	230	240	295	245	I235A	210	230	180	190	I230A	I220A	A	A	A	A	245	260	275A	I285A	A	A
23	A	A	A	275	250	230	I245A	I240A	I240A	I230A	195H	205	205	185H	250A	A	A	A	A	245	230A	250	245	290
24	275	290	285	245	230	255	200H	I230A	I215A	210	A	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	A	C	C	A	A	225A	A	A	A	E300S	290S	260	270S
26	I265A	290	300	280	280	250	A	A	A	A	A	A	A	A	I245A	215	200	I260A	I250A	I270A	275	300	250	260S
27	245	A	A	255	250	245	A	A	A	C	I230A	200	195	230	I220A	I230A	I225A	A	A	A	A	255H	235	225A
28	275	250	245	245	275	245	I225A	195H	200	A	A	180	190	195H	I220A	230A	I225A	A	A	A	280	285	A	A
29	215	A	245	230	220	255	245	230	210	A	A	205	220	200	240	A	A	A	A	A	230	A	A	A
30	A	290	I280A	265	265	A	A	A	A	A	200	I220A	I230A	I230A	I225A	I230A	205	210H	240A	I260A	255	250	295	295A
31	300	285	250	260	255	I260A	255	A	A	A	A	200	230A	A	A	210	245A	225	I240A	I270A	255	I265A	275S	270S
No.	22	22	23	28	29	25	21	14	12	11	12	13	13	15	14	14	14	12	13	19	22	19	21	20
Median	275	285	275	260	260	245	240	230	U220	220	205	200	225	215	220	225	U225	U230	U245	250	250	260	265	270
U.Q.																								
L.Q.																								
Q.R.																								

h'F

Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Jul. 1964 | h'Es | km | 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	115	110	105	105	105	105	105	105	145	120	120	110	105	135	110	105	105	120	120	120	125	120	120	115
2	110	105	105	105	105	105	125	120	115	115	125	115	110	135	120	125	140	120	110	110	105	110	105	105
3	105	105	105	100	105	125	115	120	125	120	120	120	110	125	115	105	105	105	100	105	115	115	120	110
4	110	110	105	100	105	135	135	130	125	120	120	120	115	125	125	115	125	135	145	135	135	130	120	115
5	110	105	105	105	100	100	145	125	110	115	110	110	110	120	125	125	145	130	135	120	120	130	120	115
6	110	110	105	100	130	130	130	125	120	120	120	120	120	120	145	140	135	110	105	105	105	110	115	110
7	105	100	105	100	100	130	110	110	110	105	105	105	105	110	110	105	105	105	105	105	100	100	E	130
8	S	120	E	125	110	130	125	110	110	115	110	110	E155G	130	125	125	120	120	115	115	115	115	115	110
9	110	105	105	105	125	130	130	120	115	115	115	115	110	110	110	115	130	120	120	105	105	120	110	105
10	110	110	110	110	105	110	150	130	120	115	120	120	110	120	120	115	110	110	110	110	105	120	110	105
11	105	105	100	100	125	130	115	110	105	105	105	110	160	150	140	130	130	120	115	115	115	110	105	105
12	100	100	100	100	140	125	120	115	115	125	120	120	115	110	110	110	110	115	105	110	120	110	110	105
13	110	110	105	100	105	110	130	120	110	110	110	115	120	130	130	130	120	125	120	115	115	115	115	120
14	110	110	105	105	110	110	130	130	120	120	110	110	145	140	130	135	175	125	115	110	110	110	110	110
15	110	105	105	100	105	130	130	130	120	120	110	110	115	110	125	145	130	130	120	115	105	110	110	105
16	105	100	100	105	E	155	140	130	120	115	110	105	105	115	105	105	105	105	125	115	120	115	110	110
17	E	E	100	100	E	130	125	125	125	125	125	120	110	105	120	115	120	125	120	115	110	115	120	115
18	105	105	100	100	100	130	120	115	115	110	115	105	105	115	140	125	130	125	125	115	115	110	105	105
19	105	100	100	125	120	105	115	110	110	105	105	105	105	135	125	125	120	120	115	120	120	110	110	105
20	105	105	105	105	E	120	125	125	130	110	105	110	115	120	115	125	120	125	120	115	110	110	120	105
21	105	105	105	105	105	105	125	125	120	120	120	120	120	120	110	120	115	120	115	115	100	100	110	110
22	105	105	105	105	E	145	140	140	130	120	110	110	110	110	110	105	105	105	105	110	125	120	110	110
23	130	105	100	100	105	115	120	115	105	105	110	105	105	105	135	125	120	115	110	110	110	105	105	E
24	E	100	E	100	100	100	120	115	115	125	115	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	105	C	C	140	120	125	120	115	110	110	100	110	105
26	105	100	100	100	100	125	115	110	115	105	105	105	105	105	105	110	125	115	110	105	105	120	120	110
27	110	105	105	105	105	130	125	120	115	C	110	110	105	125	120	120	115	115	110	115	110	110	115	110
28	105	105	105	105	105	110	105	110	105	105	105	105	115	110	110	135	135	130	125	125	140	110	115	110
29	105	105	105	105	110	130	130	110	115	105	105	105	105	G	155	130	125	120	115	120	115	115	115	105
30	105	105	100	105	155	130	125	120	115	120	130	120	120	120	115	115	120	115	120	110	110	110	105	110
31	100	100	105	S	135	120	125	125	115	105	110	115	120	120	115	115	120	120	115	110	110	120	120	110
No.	27	29	28	29	26	30	30	30	30	29	30	30	28	28	30	30	30	30	30	30	30	30	29	29
Median	105	105	105	105	105	125	125	120	115	115	110	110	110	120	120	120	120	120	115	115	110	110	110	110
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'Es

Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Jul. 1964

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	f4	f5	f5	f3	f4	13	13	14	h2	h2	h	h3	c2	hh	hh	c2h2	c2	h3	h4	c3	f	f4	f4	f4
2	f5	f3	f4	f4	f3	13	h2	h4	h3	h3	h	h2	c2	h	h2	h	h2	h2	15	14	f4	f7	f4	f5
3	f5	f6	f3	f3	f2	h3	13	ch2	h2	h3	h3	h2	c3	h	h2	c4	c3	13	15	f4	f3	f5	f6	f4
4	f3	f3	f2	f2	f2	h313	h6	h3	h5	h3	h4	h3	h3	h2	h2	h2	h4h	h3	h2	h	f3	f5	f4	f
5	f5	f3	f3	f3	f2	13	h	h2	c3	h2	c2	c3	c2	h2	h2	h	h2	h3	h2	f2	f2f	f3	f3	f3
6	f2	f2	f2	f3	ff2	h212	h6	h3	h3	h3	h2	h3	h2	h3	h	h2	h3	c3	14	f5	f6	f4	f5	f4
7	f3	f4	f3	f3	f2	h2	c6	c2	c3	12	c2	c3	c2	c3	c3	c4	c3	12	14	f3	f3	f5		f2
8		f4		f2	f	h21	h21	c3	c3	h2	c2	c2	h	h2	h2	h4	c512	c313	c512	f3	f8	f4	f4	f6
9	f5	f6	f6	f2	f2	h2	h3	h4	h4	h2	h3	h2	c2	c	c2	h	h2	h2	c612	f4	f3	f3	f2	f5
10	f	f5	f2	f2	f2	14	h	h2	h4	h7	h	h	c2	h	h2	h3	c2	c5	14	f4	f4	f3	f3	f2
11	f5	f7	f3	f2	f2f5	h13	c5	c3	c3	c2	c3	c2	h1	h	h2	h3	h2	h3	c4	f4	f3	f2	f4	f3
12	f2	f3	f2	f2	f2f	h6	h6	h3	h4	h2	h3	h3	h2	c4	c2	c2	c4h	c4	13h	f2	f2	f3	f2	f2
13	f6	f5	f2	f2	f3	12	h4	h6	c3	c2	c2	c3	h2	h2	h2	h2	h2	h3	h4	f5	f6	f4	f3	f3
14	f6	f4	f3	f2	f2	13	h4	h2	h3	h2	c3	c2	h2c2	hc	h2	h2	h2	h3	c2	f6	f6	f6	f4	f6
15	f4	f4	f5	f4	f2	h4	h2	h2	h3	h2	c2	c2	c212	c	h	h	h3	h4	h3	f5	f3	f3	f2	f3
16	f3	f2	f2	f2		h	h3	h3	h3	c2	c2	12	12	h2	12	12	13	14	h3	f5	f8	f7	f2	f2
17			f2	f2		h4	h3	h3	h3	h	h2	h2	c2	13	h2	h4	h3	h4	c3	f3	f3	f7	f4	f4
18	f3	f5f3	f2	f2	f	h3	c31	h4	h2	h3	h2	c3	c3	h2	h3	h2	h	h2	h4	f2	f4	f2	f2	f2
19	f2	f2	f4	f3f	f5	13	13	c3	c3	c3	c3	c3	c4	h212	h3	h2	h3	h4	14	f6	f5	f2	f3	f2
20	f3	f3	f	f3		c3	h2	h2	h3	c3	c2	h3	h2	h	h2	h	h2	h2	c4	f5	f3	f4	f2	f3
21	f3	f3	f3	f2	f2	12	h3	h3	h	h	h2	h2	h2	h2	c2	h2	c3	c4	c4	f3	f	f4	f2	f2
22	f2	f2	f	f		h2	h2	h3	h2	h2	c2	c	c2	c2	c4	c3	c4	13	14	f2f2	f5	f5	f5	f4
23	ff3	f3	f3	f2	f2	12	c4	h2	c3	c2	h2	c2	c2	c	h12	h2	h3	c3	15	f4	f2	f3	f2	
24		f		f2	f2	1	c2	c3	h3	h2	c2													
25												c3			h2h2	h3	h2	h5	c3	f3	f3	f3	f4	f4
26	f4	f2	f2	f4	f2	h1	c3	c3	h3	c3	c2	c3	c2	c2	c3	c2	h2	c3	12	f4	f2	f5	f2	f4
27	f2	f9	f4	f6	f3	h3	h3	h3	h4		c2	c	12	h1	h2	h2	h2	c3	c3	f2	f3	f2	f4	f3
28	f2	f3	f2	f2	f2	c2	14	c	13	12	13	c2	hh	c2	c3	h	h2	h3	h6	f7	f2	f3	f3	f2
29	f3	f4	f2	f2	f	h	h3	c2	h3	c2	c3	c2	c		hh	h3	h2	h3	14	f7	f4	f5	f5	f3
30	f6	f3	f4	f3	ff2	h8	h3	h4	h3	h2	h	h2	h2	h2	h3	h2	h2	c2	c	f4	f6	f5	f5	f5
31	f5	f5	f		f	c6	h6	h3	h3	c2	c3	h	h2	h2	h2	h2	h3	h2	16	f2	f2	f3	f3	f6
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 12

IONOSPHERIC DATA

Jul. 1964 | foF2 | 0.1 Mc | 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	025F	F	A	U025S	F	U050S	U044S	038	I047R	058	054	A	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	056	A	055	068	U072S	A	058	050	045	A	F
3	F	F	F	A	027F	037	043	049	U074S	A	A	A	A	061	I069S	A	A	A	058	U064S	S	A	A	A
4	A	F	F	F	A	040F	047	F	A	061	I064A	I057A	I056A	I058A	I060R	054R	053	054	053	057	050	A	A	A
5	F	A	A	A	F	042	046	I053R	061	A	A	A	A	060	063	070S	A	055	I052R	U050S	U044S	F	A	A
6	A	A	A	U039S	F	039	U050S	A	A	A	A	A	A	A	A	A	U071S	070S	I069A	A	A	F	A	A
7	F	F	F	F	F	U040S	A	U060R	A	A	A	A	A	059	A	A	064R	A	J086R	073S	U052R	049S	U049R	047
8	042	040	035F	J037F	038	028	E034G	044	A	A	A	U055R	049	A	A	050	052	056	060	060	054	041F	A	A
9	A	A	F	F	F	035	A	A	A	A	A	A	A	A	J055R	055	050	049	053R	058	F	F	A	A
10	U038F	A	A	A	F	F	I043A	A	I056A	U051R	A	A	A	A	A	A	A	A	056	A	A	054S	AF	F
11	F	F	F	F	F	038F	049	061	A	A	A	051	A	A	A	A	A	A	A	A	I062A	A	A	A
12	A	027F	029	A	029	I037A	A	U061S	A	055	U052R	A	A	A	A	I050A	I053A	058	062R	063S	S	F	U054F	U051R
13	F	A	038F	F	F	035	047R	056	059	U050R	050R	R	053	A	053	051	J052R	053R	A	U062S	U073S	S	058	FS
14	A	031	A	A	030F	040S	A	056	A	A	A	A	A	A	A	A	053R	A	I046A	061R	I060R	048	F	037F
15	I038A	A	U038R	F	025F	034	038	050	061R	056	A	062	U066R	060	051	E042G	A	A	A	R	U076S	045	F	F
16	A	F	030F	F	F	034	042R	A	058	050R	050R	U052R	050	056	055	056	051	048H	J050R	J054S	F	FS	A	F
17	040F	040	031F	F	A	037	044	A	I070R	A	A	A	053	A	068	059R	057	053	055	I062A	059	F	F	F
18	F	F	F	F	038F	036F	A	071	A	R	A	I048A	I050A	058	062	U072S	A	A	050	A	A	A	F	U052R
19	045F	F	040	039	035	038	048	U066R	061	I057R	A	A	056	I060A	A	A	062	065	R	U064S	F	A	F	F
20	F	034F	F	F	F	040	047	A	A	A	A	A	I050A	U056R	065	A	S	J052S	056	U056S	S	F	F	F
21	F	F	U033S	032	030F	040	C	C	C	A	A	A	A	A	A	U053C	I054C	060	066	I070S	U060S	U041S	041S	F
22	F	F	F	F	F	A	U045S	I060A	R	A	A	A	A	A	I059R	072S	I073S	071	051	053	I062S	F	F	A
23	A	A	035F	038F	034	034	A	A	A	C	A	A	E044G	049R	047	A	A	A	A	U081S	A	A	A	A
24	030	F	A	030F	032F	033	042S	056	054	C	A	A	A	A	A	A	A	A	A	071	058	033	A	F
25	036F	A	A	F	F	041R	045R	A	052	053	A	A	I050R	A	A	A	053	A	056	064R	060	J053R	F	F
26	034F	F	F	F	F	036F	044	J055R	069	E046G	A	A	050	U051R	U049R	060R	063	A	041	A	050	F	F	A
27	F	031F	A	A	030F	J042R	040	A	064	058	A	A	A	057	A	053R	A	A	A	A	066S	A	058F	A
28	030F	029F	F	J030F	F	031	044S	050	065	050R	U047R	A	A	A	063	059	I048A	A	A	I040A	048	U043F	U040S	A
29	A	A	A	A	A	034	A	A	J056S	R	A	A	A	A	A	A	A	A	A	A	A	S	A	A
30	036F	A	F	F	034F	035	I042A	A	R	J062A	U052R	I055A	I054A	058	I065A	U075S	A	049	J052S	057	U062S	A	A	F
31	F	F	F	F	F	A	045	050	S	A	A	A	A	A	I060A	068	A	068	059	041	A	031	F	031F
No.	11	7	9	8	12	27	22	17	15	13	7	7	13	14	16	18	17	16	20	22	18	11	6	5
Median	036	031	035	034	031	037	044	056	061	055	U052	U055	050	058	060	056	053	056	056	060	060	045	052	047
U.Q.	040	040	038	038	034	040	047	060	065	058	054	057	055	060	064	060	064	066	060	064	062	049	058	052
L.Q.	030	029	030	030	030	034	042	050	056	050	050	051	050	056	054	053	052	052	052	056	050	041	041	034
Q.R.	010	011	008	008	004	006	005	010	009	008	004	006	005	004	010	007	012	014	008	008	012	008	017	018

The Radio Research Laboratories, Japan

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

K 1

IONOSPHERIC DATA

Jul. 1964 | foF1 | 0.01 Mc | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4' N | Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						L	A	A	U400S	S	A	A	C	C	C	C	C	C	C					
2						C	C	C	C	C	C	C	C	450	A	430	A	A	A					
3							350	U400S	A	A	A	A	A	A	A	A	A	A	340					
4						L	370	410	A	A	A	A	A	A	440	420R	420	380	L					
5							A	390R	A	A	A	A	A	440	440	U430S	A	U370S	A					
6						300	A	A	A	A	A	A	A	A	A	A	A	A	A					
7						L	A	A	A	A	A	A	A	A	A	A	A	A	A					
8							340	380	A	A	A	A	R	A	A	A	A	A	A					
9							A	A	A	A	A	A	A	A	A	410	S	380	330					
10							A	A	A	A	A	A	A	A	A	A	A	A	A					
11						L	U360L	A	A	A	A	U440S	A	A	A	A	A	A	A					
12						A	A	A	A	A	A	A	A	A	A	A	A	A	320					
13							L	400	A	A	A	R	A	A	A	A	400	A	A	L				
14							A	400	A	A	A	A	A	A	A	A	A	A	U320R					
15								380R	A	A	A	A	A	A	A	420	A	A	A					
16							A	A	420	440	R	440	R	440	A	A	390		L					
17							A	A	A	A	A	A	A	A	A	A	400	A	A					
18							A	A	A	A	A	A	A	450	440	A	A	A	A					
19							350	A	A	A	A	A	A	A	A	A	A	L	L					
20							A	A	A	A	A	A	A	A	A	A	A	U360S	A					
21							C	C	C	A	A	A	A	A	A	420	U420C	U380S	L					
22						A	A	A	A	A	A	A	A	A	430R	A	A	A						
23							A	A	A	C	A	A	440	A	420	A	A	A	A					
24							S	L	410	C	A	A	A	A	A	A	A	A	A					
25								A	400	A	A	A	A	A	A	A	400	A	A					
26							360	R	A	460	A	A	R	R	R	A	A	A	A					
27								A	A	A	A	A	A	A	A	A	A	A	A					
28							360	380	A	A	A	A	A	A	A	A	A	A	A					
29							A	A	A	A	A	A	A	A	A	A	A	A	A					
30							A	A	A	A	A	A	A	A	A	A	A	U370S						
31						A	L	U380S	A	A	A	A	A	A	A	A	A	A	A					
No.						1	7	9	4	2		2	1	4	5	6	6	6	4					
Median						300	360	390	405	450		U440	440	445	440	420	400	U375	325					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

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

K 2

IONOSPHERIC DATA

Jul. 1964 | foE | 0.01 Mc | 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						A	A	A	290A	320	330	S	C	C	C	C	C	C	C					
2						C	C	C	C	C	C	C	C	330	325	310	275	250	A					
3						B	A	U280A	300	315	U330S	A	A	A	A	A	A	250S	A					
4						A	A	A	300	320	335	335	350	I340A	I330A	320	290	250	200					
5						A	I220A	A	A	A	A	A	A	325S	320	310	280	250	A					
6						A	A	275	290	I320A	330	330	335	330	320	U300A	I275A	A	A					
7						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
8						A	220	A	A	A	A	A	A	345	I340A	A	A	A	A					
9						A	225	265	300	320	A	A	A	A	A	A	A	A	A					
10						A	A	280	A	A	A	A	A	A	325	310	A	A	A					
11						A	U220A	A	A	A	A	A	U365S	A	A	I310A	290A	250A	I200A					
12						A	U235A	270A	285A	310	330	330	340	I320A	320	300	A	A	A					
13						A	A	A	A	A	325	340	340	335	335	305	A	U270A	A	B				
14						A	A	280	A	300	A	A	360	U340R	325	325	285	A	A					
15						B	235	255	295	300	I315A	315	A	A	A	330	280	250	A					
16						B	220	260	I290A	A	A	R	A	A	A	A	A	260	190					
17						B	220	275	275	320	A	A	A	A	A	315	285	A	180					
18						150	A	I250A	270	A	A	A	350	345	340	320	285	A	180					
19						A	A	A	A	A	A	A	A	340	325	310	280	250	A					
20						A	185	A	A	A	A	A	325	320	315	295	260A	235	A					
21						C	C	C	C	A	310	325	I325A	I320A	315	300	I280A	255A	A					
22						U140S	200A	260A	280	A	A	A	A	A	A	A	A	A	A					
23						B	U220A	A	A	C	A	A	A	350	335	290	270	245	A					
24						S	A	A	A	C	A	A	A	A	A	A	A	A	A					
25						B	A	A	275	A	A	A	A	A	A	315	290	A	A					
26						B	A	A	A	A	A	A	A	A	A	A	280	A	A					
27						A	A	A	285	A	A	A	A	A	I335A	310	270	A	A					
28						A	A	A	A	A	A	A	A	A	A	320	285	245	180					
29						A	A	A	A	A	A	A	A	A	A	A	280	250	B					
30						A	A	250	I285A	300	325	335	U340S	330	320	310	A	A	B					
31						A	A	240A	275	A	A	A	A	330	330	310	A	A	A					
No.						2	11	13	15	10	9	7	10	15	17	21	18	14	6					
Median						U145	220	265	285	320	330	330	340	330	325	310	280	250	185					
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

Jul.1964 | **foEs** 0.1 Mc | 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	030M	035	J035	J035	031M	J030	J040	039	039	059Y	057	075	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	040	048	035	J051	059	J069	J032	037	048	J059	036
3	025	J029	J030	047	J040	J023	046M	058	068M	058	160M	060Y	J060	058M	055	060	059	059	058	034	035	059	048	058
4	059	J030	039	048	055	032	032	036	070Y	J063	J054	J078	J062	J114	J059	038	035	030	025	J023	037M	059	J094	J080
5	J050	090M	069M	060M	J049	J039	043	J051	067M	066	J114	060	047	040	036	033	112M	049	048	049	050	059	058	059
6	058	050	047	J041	J035	038	050M	086M	J065	116M	098M	J090	072Y	144	090M	072	060	068	068	070Y	070	060	058	059
7	048	039	045	032	057M	036	090M	060	049	072M	J089	087M	J074	058M	J079	J081	J068	082S	059M	035M	J053	037M	032	036M
8	020	018	020	024	018	021	029	033	057M	J059	085M	J043	040	046	059	J042	J043	J049	J041	J046	046M	040M	J056	J058
9	059M	059M	J034	J027	031M	J030	073M	060	J073	J092	J063	125M	J120	J115	J063	033	J037	J030	J031	J040	J051	J040	060M	045M
10	058M	086M	J069	073M	J050	040	059M	069M	075M	J051	J062	J083	J073	J074	J150	J148	069	080M	J050	J118	J080S	J037	048M	034M
11	J052	J043	040M	037M	030M	030M	J042	049	113	060	059	J041	046M	J041	067	J068	067	091S	068	115	059	060	069	060
12	058	037	038	J045	036	J050	072	060	110M	J083	048M	J063	060	072M	072S	058M	J072	J051	034M	044	035M	038F	J037	033
13	032M	059M	J053	J038	030M	J028	029	J030	J042	J051	043	039	047	050	050	057M	059M	J064	J062	036M	033M	J026	J047	J047
14	J048	049M	059M	050M	038M	039	061M	034M	J079	113S	155M	086M	J052	050	049	J081	089M	J149	J043	J039	060M	J041	J032	032
15	J052	058	035	J038	J032	033	033	J042	049	048M	060M	047M	048	048	043	037	060	J064S	J112	069M	058M	J035	J032	036
16	J040	039	034	J027	025	020	J040	059	037	034	037	G	J045	039	J044	048M	048	032	028	039M	J052	J050	J048	036M
17	023	033M	J024	J025	J032	J042	046M	059M	058	072M	J053	J112	048	J094	J118	066	035	049	057	128M	J091S	J052	040	040
18	035	034	J022	021	J032	023	068M	069M	J071	J059	J089	059M	058	040	039	J052	J107	089	048	J090	069M	061M	029	035M
19	038M	J048	034M	J084	J052	J032	J041	059M	048M	058M	066M	059	J052	084M	089M	143M	J145	J085S	059M	059M	J064S	J068	J064	058M
20	J049	J025F	J054	J041	J028	J030	054M	J095S	059M	047	058	038	048	J045	040	083M	067	034	043	067	030	J040	030	035M
21	036	032	031	031	027	C	C	C	C	070	040	069	070M	J088	057	048M	070M	035	036M	J047	031	021	036	031
22	035	036	019	030	027	058M	J040	057	058M	058M	059	J060	J079	J080	036	054	059	J059	J041	J051	035	J043	J038	J069
23	J071	047	J031	J048	030	J038	J078	057M	066M	C	060M	058	047	J054	J086	J150	098	J175	J154	J063	090M	J079	050	056M
24	J033	037M	J050	030	J025	S	022	037	J033	C	J146	085M	069	060	059	060M	J141S	J081	J072	059M	048	J040	J054	058
25	J039	J059	060M	J036	J040	J040	J029	047	034	J042	074S	J126	046	J053	J114	057	059	059M	J053	J038	060M	J034	048M	034
26	J037	038	J040	032	032	024	029	034	J042	036	045	059	035	035	035	050	040	059	050	068M	J059	J048	J040	058M
27	058M	032	059M	J060S	J024	031M	J034	J075	058	J061	J068	068M	J060	J053	J118	059M	J122	156M	J131	J073	060	J067	030	074
28	039	J053	J032	030	J027	032	036	032	J053	048	046	049	058	058	045	049	060M	060	071	J054	J038	036	033	J069
29	J043	058	045	058	059	J053	J073	089M	J074	058M	121	J085	J082	J108	J083	058	072M	108M	J110	107M	J063	060M	108M	058M
30	J038	049M	J027	J034	J039	031	054	J073	089	058	049M	058	047M	049	J052	045M	J062	048M	040M	033	057	070M	043M	033
31	030	042	033	E	E	055	039	029	057	090M	087	J083	J054	J067	059M	J084	072	058	058	J039	J061	J034	031	J037
No.	30	30	30	30	30	28	29	29	29	28	30	30	29	30	30	30	30	30	30	30	30	30	30	30
Median	040	040	036	036	032	032	042	057	058	059	061	062	054	056	059	058	064	059	055	050	055	046	048	046
U.Q.	052	053	050	048	040	040	060	064	072	071	089	085	070	080	083	072	072	082	068	069	061	060	058	058
L.Q.	035	034	031	030	027	030	034	036	048	051	053	058	047	046	045	048	059	049	041	039	037	037	033	035
Q.R.	017	019	019	018	013	010	026	028	024	020	036	027	023	034	038	024	013	033	027	030	024	023	025	023

The Radio Research Laboratories, Japan

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

IONOSPHERIC DATA

Jul. 1964 | foEs | 0.1 Mc | 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	018	017	A	019	013	024	035	034	036	042	045	A	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	040	A	E035S	049	045	A	022	030	040	A	025
3	025	020	022	A	017	023	030	032	057	A	A	A	A	056	053	A	A	044	027	025	017	A	A	A
4	A	020	021	023	A	025	030	035	A	051	A	A	A	A	039	038	033	029	024	019	026	A	A	A
5	029	A	A	A	020	020	034	032	052	A	A	A	A	040	036	E033A	045	031	035	025	030	020	A	A
6	A	A	024	027	025	027	044	A	A	A	A	A	A	A	A	A	053	059	A	A	A	051	A	A
7	024	016	017	020	018	023	A	043	043	A	A	A	A	052	A	A	053	A	052	026	025	029	022	022
8	016	S	E	E	E	018	026	031	A	A	A	043	E040R	A	A	042	043	045	036	044	029	018	A	A
9	A	A	016	E	017	023	A	A	A	A	A	A	A	A	046	033	E037S	029	025	021	019	018	A	A
10	017	A	A	A	025	022	A	A	A	043	A	A	A	A	A	A	A	A	U046A	A	A	021	021	E
11	019	028	028	023	019	018	030	041	A	A	A	037	A	A	A	A	A	A	A	A	A	A	A	A
12	A	021	024	A	021	A	A	054	A	051	046	A	A	A	A	A	A	037	028	040	020	021	016	019
13	019	A	025	015	015	017	025	029	042	043	043	R	045	A	050	045	035	045	A	C18	017	021	040	020
14	A	023	A	A	021	031	A	027	A	A	A	A	A	A	A	A	041	A	027	019	052	026	026	020
15	A	A	026	022	015	025	027	029	044	044	A	045	045	045	043	036	A	A	A	052	040	025	026	017
16	A	018	016	016	016	019	035	A	034	034	035		043	038	043	044	035	032	028	025	025	022	A	024
17	E	017	016	020	A	018	039	A	045	A	A	A	045	A	052	044	033	040	052	A	026	020	029	029
18	015	015	014	E	015	018	A	053	A	043	A	A	A	E040R	039	052	A	A	034	A	A	A	015	025
19	020	021	015	025	016	017	027	049	043	043	A	A	051	A	A	A	041	032	026	050	028	A	015	015
20	020	E	025	015	015	C20	041	A	A	A	A	A	A	044	E040S	A	059	032	037S	045	025	024	020	018
21	020	020	017	020	014	C	C	C	C	A	A	A	A	A	A	035	035	U032A	025	E047A	025	E	017	S
22	018	019	S	016	E	A	038	A	042	A	A	A	A	A	034	050	042	050	034	028	028	038	025	A
23	A	A	016	019	019	026	A	A	A	C	A	A	038	045	040	A	A	A	A	041	A	A	A	A
24	025	025	A	017	016	S	E022S	028	030	C	A	A	A	A	A	A	A	A	A	040	042	020	A	016
25	018	A	A	018	025	023	024	A	034	041	A	A	045	A	A	A	034	A	033	027	043	027	027	020
26	025	026	017	018	018	018	025	033	042	035	A	A	035	E035R	E035R	044	040	A	033	A	019	023	015	A
27	024	020	A	A	E	024	024	A	052	044	A	A	A	051	A	050	A	A	A	A	040	A	021	A
28	016	015	015	E	013	020	025	029	041	042	042	A	A	A	042	043	A	A	A	A	024	022	027	A
29	A	A	A	A	A	017	A	A	050	052	A	A	A	A	A	A	A	A	A	A	A	043	A	A
30	020	A	S	015	019	023	A	A	041	A	045	044	A	044	A	042	A	029	027	025	045	A	A	018
31	017	016	018			A	U029A	029	045	A	A	A	A	A	A	052	A	052	051	025	A	016	E	016
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foEs

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

K 5

IONOSPHERIC DATA

Jul. 1964 | f-min | 0.1 Mc | 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	013	014	013	013	010	010	014	015	015	016	017	020	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	016	016	016	015	015	014	013	013	014	E015S	E015S
3	014	014	014	013	011	015	013	014	015	018	017	015	019	020	017	017	016	015	016	015	012	E015S	014	E016S
4	014	012	014	012	E	014	015	015	015	016	017	018	017	019	019	016	015	015	016	015	E015S	014	E015S	012
5	012	011	011	013	010	011	015	015	016	016	019	020	023	018	018	016	016	015	015	015	E016S	E016S	E016S	014
6	E016S	014	014	E015S	012	014	015	016	015	018	019	020	021	020	018	018	016	015	016	013	E015S	E015S	013	014
7	E016S	014	012	012	012	014	014	015	016	016	015	016	017	019	016	016	015	015	014	014	014	E015S	014	E015S
8	014	E015S	013	014	014	013	013	015	016	019	017	018	018	017	016	017	014	014	014	014	014	E015S	014	013
9	014	014	012	014	011	013	014	016	015	015	015	018	018	016	018	016	015	015	015	014	012	012	012	012
10	014	012	011	010	E	014	015	015	015	017	016	019	016	016	016	015	015	015	014	013	E015S	E015S	012	014
11	011	013	011	013	E	010	013	015	015	017	015	017	019	017	018	016	015	015	014	014	012	014	E016S	E016S
12	E016S	E015S	E015S	E015S	010	014	015	015	016	016	016	020	017	018	016	016	015	014	013	013	011	014	012	E015S
13	014	010	010	011	010	013	011	015	015	016	018	016	020	020	017	015	015	015	014	014	010	010	013	010
14	E015S	011	012	012	E	012	014	015	015	015	017	017	018	020	016	017	015	015	016	014	014	E015C	013	013
15	014	E015C	E015C	014	012	015	015	015	016	017	018	015	015	018	017	015	014	015	016	015	012	E016C	E016C	014
16	E016C	014	014	014	013	016	015	015	018	016	017	020	019	017	015	014	014	015	016	012	013	014	014	E015S
17	014	012	010	013	014	015	015	015	016	017	018	015	024	020	019	015	015	015	013	014	013	E015S	012	010
18	010	012	013	011	E	013	013	014	015	016	016	015	018	017	016	017	016	014	015	011	010	014	011	012
19	014	012	010	010	E	012	013	013	014	015	015	016	015	018	015	016	015	015	015	012	012	012	011	011
20	012	013	010	010	010	010	014	014	014	016	016	016	020	017	016	016	016	015	015	015	E015S	E015S	E016S	E016S
21	E015S	014	013	013	E	E017C	C	C	C	015	017	016	016	018	018	016	015	015	013	013	013	014	014	E016S
22	014	E016S	E015S	012	011	012	014	015	015	016	015	016	015	015	015	015	015	014	014	014	012	014	011	011
23	014	012	010	011	E	014	014	014	014	C	016	015	018	015	019	019	018	011	010	011	010	010	011	010
24	E015S	010	E	E	E	E018S	012	014	018	C	018	016	018	018	016	016	014	014	013	014	014	013	012	E015S
25	012	013	014	010	011	015	014	015	015	015	018	019	021	025	018	015	015	016	016	E016S	E015S	014	014	014
26	014	014	013	010	E017S	016	014	015	015	016	016	018	018	019	015	015	016	014	014	015	012	013	014	014
27	014	011	011	011	014	012	014	015	015	015	015	019	020	015	014	015	015	015	014	012	E015S	014	014	E015S
28	014	013	014	013	011	012	014	014	015	016	015	018	018	015	014	016	016	015	015	012	012	014	E016S	E016S
29	E016S	014	014	012	011	011	012	015	014	016	015	015	017	016	016	015	015	015	015	011	012	E015S	E015S	E015S
30	011	013	E015S	011	013	012	013	015	015	016	017	018	017	017	016	016	016	016	015	011	E015S	E015S	E015S	E016S
31	E016S	014	011	E	E	012	015	015	016	015	016	018	018	017	015	015	016	016	014	012	E016S	014	014	013
No.	21	26	26	28	29	28	29	29	29	28	30	30	29	30	30	30	30	30	30	29	21	18	21	17
Median	014	013	012	012	010	013	014	015	015	016	016	018	018	018	016	016	015	015	014	014	012	014	013	013
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

f-min

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

IONOSPHERIC DATA

Jul.1964 | M(3000)F2 | 0.01 | 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	320F	F	A	U300S	F	U355S	U385S	365	I320R	350	335	A	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	305	A	275	300	U325S	A	340	300	310	A	F
3	F	F	F	A	315F	320	280	300	U375S	A	A	A	A	295	I300S	A	A	A	295	U295S	S	A	A	A
4	A	F	F	F	A	310F	300	F	A	310	I315A	I310A	I300A	A	R	280R	295	315	320	330	320	A	A	A
5	F	A	A	A	F	330	330	I300R	345	A	A	A	A	290	320	305S	A	310	I350R	U340S	U305S	F	A	A
6	A	A	A	U335S	F	260	U310S	A	A	A	A	A	A	A	A	A	U310S	315S	I335A	A	A	F	A	A
7	F	F	F	F	F	U270S	A	U350R	A	A	A	A	A	300	A	A	290R	A	J335R	290S	U305R	285S	U300R	280
8	285	280	285F	J290F	325	330	G	275	A	A	A	U305R	285	A	A	A	290	300	315	325	330	310F	A	A
9	A	A	F	F	F	330	A	A	A	A	A	A	A	A	J290R	320	280	270	310R	310	F	F	A	A
10	U290F	A	A	A	F	F	I310A	A	I325A	U310R	A	A	A	A	A	A	A	A	305	A	A	345S	AF	F
11	F	F	F	F	F	290F	305	330	A	A	A	300	A	A	A	A	A	A	A	A	I335A	A	A	A
12	A	315F	275	A	330	I325A	A	U330S	A	345	U330R	A	A	A	A	I275A	I290A	315	325R	320S	S	F	U290F	U310R
13	F	A	290F	F	F	310	320R	355	355	U300R	285R	R	300	A	280	290	J305R	300R	A	U315S	U315S	S	340	FS
14	A	300	A	A	295F	325S	A	310	A	A	A	A	A	A	A	A	310R	A	I285A	325R	I340R	330	F	295F
15	I290A	A	U310R	F	320F	355	310	300	325R	320	A	300	U320R	330	330	G	A	A	A	R	U380S	300	F	F
16	A	F	335F	F	F	355	315R	A	345	320R	295R	U290R	A	305	300	305	290	295H	J340R	J330S	F	FS	A	F
17	310F	325	315F	F	A	320	290	A	I350R	A	A	A	285	A	320	320R	315	305	315	I315A	325	F	F	F
18	F	F	F	F	290F	305F	A	325	A	R	A	A	I260A	275	290	U320S	A	A	300	A	A	A	F	U285R
19	290F	F	300	290	315	290	290	U340R	350	I360R	A	A	295	I315A	A	A	320	305	R	U325S	F	A	F	F
20	F	295F	F	F	F	325	340	A	A	A	A	A	I250A	U270R	290	A	S	J325S	320	U320S	S	F	F	F
21	F	F	U305S	315	325F	340	C	C	C	A	A	A	A	A	A	U295C	I285C	315	325	I325S	U350S	U305S	295S	F
22	F	F	F	F	F	A	U300S	I330A	R	A	A	A	A	A	I300R	305S	I325S	340	325	280	I320S	F	F	A
23	A	A	315F	315F	340	295	A	A	A	C	A	A	G	265R	265	A	A	A	A	U335S	A	A	A	A
24	290	F	A	300F	315F	305	285S	305	310	C	A	A	A	A	A	A	A	A	A	335	345	315	A	F
25	305F	A	A	F	F	365R	375R	A	310	320	A	A	I270R	A	A	A	300	A	305	330R	335	J340R	F	F
26	290F	F	F	F	F	305F	275	J300R	360	G	A	A	280	U295R	U265R	320R	335	A	295	A	300	F	F	A
27	F	320F	A	A	330F	J355R	350	A	345	350	A	A	A	315	A	A	A	A	A	A	315S	A	330F	A
28	300F	305F	F	J300F	F	335	300S	320	355	375R	U290R	A	A	A	335	375	I340A	A	A	I320A	310	U300F	U330S	A
29	A	A	A	A	A	305	A	A	J330S	R	A	A	A	A	A	A	A	A	A	A	A	S	A	A
30	305F	A	F	F	325F	285	A	A	R	A	U310R	I310A	I285A	290	I305A	U325S	A	305	J325S	315	U325S	A	A	F
31	F	F	F	F	F	A	355	295	S	A	A	A	A	A	I310A	325	A	355	385	335	A	295	F	320F
No.	11	7	9	8	12	27	21	17	15	12	7	6	12	13	15	16	17	16	20	22	18	11	6	5
Median	290	305	305	300	320	320	310	320	345	320	U310	U300	U285	295	300	305	300	310	320	325	U320	310	U315	295
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

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

K 7

IONOSPHERIC DATA

Jul. 1964 | M(3000)F1 | 0.01 | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4' N | Long. 139° 29.3' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						L	A	A	U365S	S	A	A	C	C	C	C	C	C	C					
2						C	C	C	C	C	C	C	C	385	A	370	A	A	A					
3							345	U370S	A	A	A	A	A	A	A	A	A	A	335					
4						L	365	350	A	A	A	A	A	A	365	350R	355	365	L					
5							A	330R	A	A	A	A	A	365	350	U365S	A	U370S	A					
6						335	A	A	A	A	A	A	A	A	A	A	A	A	A					
7						L	A	A	A	A	A	A	A	A	A	A	A	A	A					
8							350	365	A	A	A	A	R	A	A	A	A	A	A					
9							A	A	A	A	A	A	A	A	A	380	S	355	345					
10							A	A	A	A	A	A	A	A	A	A	A	A	A					
11						L	U360L	A	A	A	A	U385S	A	A	A	A	A	A	A					
12						A	A	A	A	A	A	A	A	A	A	A	A	A	345					
13							L	360	A	A	A	R	A	A	A	A	370	A	A	L				
14							A	370	A	A	A	A	A	A	A	A	A	A	U365R					
15								390R	A	A	A	A	A	A	A	380	A	A	A					
16							A	A	375	380	R	405	R	385	A	A	380		L					
17							A	A	A	A	A	A	A	A	A	A	370	A	A					
18							A	A	A	A	A	A	A	R	330	A	A	A	A					
19							355	A	A	A	A	A	A	A	A	A	A	L	L					
20							A	A	A	A	A	A	A	A	A	A	A	U360S	A					
21							C	C	C	A	A	A	A	A	A	360	U345C	U345S	L					
22						A	A	A	A	A	A	A	A	A	345R	A	A	A						
23							A	A	A	C	A	A	385	A	A	A	A	A	A					
24							S	L	345	C	A	A	A	A	A	A	A	A	A					
25								A	395	A	A	A	A	A	A	A	375	A	A					
26							360	R	A	365	A	A	R	R	R	A	A	A	A					
27								A	A	A	A	A	A	A	A	A	A	A	A					
28							360	415	A	A	A	A	A	A	A	A	A	A	A					
29							A	A	A	A	A	A	A	A	A	A	A	A	A					
30							A	A	A	A	A	A	A	A	A	A	A	U345S						
31						A	L	U340S	A	A	A	A	A	A	A	A	A	A	A					
No.						1	7	9	4	2		2	1	3	4	6	6	6	4					
Median						335	360	365	370	370		U395	385	385	350	370	370	U360	345					
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

Jul. 1964 | h'F2 km | 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						230	220	250	R	295	E300A	A	C	C	C	C	C	C	C					
2						C	C	C	C	C	C	C	C	345	A	390	325	280	A					
3							370	350	230	A	A	A	A	E380A	315	A	A	360	315					
4						320	350	310	A	340	A	A	A	A	300	375	345	300	280					
5							260	340	280	A	A	A	A	360	305	300	280	300	270					
6						415	340	A	A	A	A	A	A	A	A	A	300	300	A					
7						350	A	240	A	A	A	A	A	360A	A	A	360A	A	250A					
8							G	415	A	A	A	350	400	A	A	E500A	360	320	295					
9							A	A	A	A	A	A	A	A	330	300	380	400	300					
10							A	A	A	340	A	A	A	A	A	A	A	A	E310A					
11						340	295	300	A	A	A	375	A	A	A	A	A	A	A					
12						A	A	300	A	300A	295	A	A	A	A	A	A	305	290					
13							300	260	260	375	400	R	350	A	E410A	360A	340	325	A	295				
14							A	310	A	A	A	A	A	A	A	A	320	A	A					
15								345	310	320	A	350	300	300	305	G	A	A	A					
16							290A	A	270	320	380	375	500	340	315	340	350		260					
17							E350A	A	240	A	A	A	400	A	300	300	305	320	E340A					
18							A	260	A	310	A	A	A	405	380	310	A	A	310					
19							355	250	260	290	A	A	E370A	A	A	A	300	300	255					
20							E290A	A	A	A	A	A	A	405	345	A	270S	280	270					
21							C	C	C	A	A	A	A	A	A	370	380	300	250					
22						A	E330A	A	240	A	A	A	A	A	345	300	275	250						
23							A	A	A	C	A	A	G	380	440	A	A	A	A					
24							355	300	300	C	A	A	A	A	A	A	A	A	A					
25								A	310	305	A	A	355	A	A	A	345	A	300					
26							400	310	230	G	A	A	380	360	445	310	275	A	E300A					
27								A	255	260	A	A	A	320A	A	E400A	A	A	A					
28							345	290	245	250	380	A	A	A	295	240	A	A	A					
29							A	A	280	260	A	A	A	A	A	A	A	A	A					
30							A	A	310	A	360	A	A	380	A	280	A	320						
31						A	255	350	275	A	A	A	A	A	A	300A	A	250	220A					
No.						5	16	17	16	13	6	4	9	11	13	15	17	16	14	1				
Median						340	E335	300	265	305	370	360	380	360	315	310	325	300	275	295				
U.Q.																								
L.Q.																								
Q.R.																								

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

IONOSPHERIC DATA

Jul. 1964 | h'F | km | 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	E325A	E330A	A	E310A	240	220	I200A	A	E305A	S	A	A	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	220	A	230S	A	A	A	230	275	E325S	A	E320A
3	E300A	300	255	A	E325A	250	E270S	225	A	A	A	A	A	A	A	A	A	A	260	280	220	A	A	A
4	I295A	300	300	250	A	240	225A	240	A	A	A	A	A	A	225	245	210	220	230	240	230	A	A	A
5	300A	A	A	A	E290A	240	I215A	250	A	A	A	A	A	E240S	245	230	A	225	A	230	240	290	A	A
6	A	A	E300A	255	290	E260A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E300A	A	I300A
7	325	320	300	250	240	225	A	A	A	A	A	A	A	A	A	A	A	A	A	225	E260A	E300A	270	300
8	300	295	300	290	230	245	250A	210	A	A	A	A	R	A	A	A	A	A	A	E260A	225	260	A	A
9	A	A	345	245	240	220	A	A	A	A	A	A	A	A	A	A	I215S	245	250	250	260	250	I245A	A
10	260	I300A	A	A	290A	260	I240A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	220	300A	250
11	300	310A	300A	300	300	250A	250A	A	A	A	A	195	A	A	A	A	A	A	A	A	I245A	A	A	A
12	A	305	E350A	A	260	A	A	A	A	A	A	A	A	A	A	A	A	A	240	E260A	230	300A	250	230
13	250	A	E300A	250	240	230	210	210	A	A	A	R	A	A	A	A	230	A	A	E270A	250	210	230A	250A
14	A	E300A	A	A	310	260A	A	240	A	A	A	A	A	A	A	A	A	A	260	255	E270A	250	E320A	290
15	I310A	A	290	250A	260	250	200	180	A	I225A	A	A	A	I225A	I220A	210	A	A	A	260A	210	275	E330A	275
16	I280A	295	260	215	250	230	A	A	210	220	160	210	220	225	I230A	I240A	240	E250AH	255A	250	250	300	A	260
17	250	220	250	300	I300A	230	A	A	A	A	I210A	A	A	A	A	A	200	A	A	A	225	245	300	E350A
18	250	280	280	270	255	245	A	A	A	A	A	A	A	E395R	260	A	A	A	I265A	I250A	I275A	I295A	245	290
19	305	250	275	320	250	250	225	I230A	I225A	A	A	A	A	A	A	A	A	E250A	E250A	E260A	250	I250A	295	255
20	220	250	300	255	250	250	A	A	A	A	A	A	A	A	A	A	A	E250A	A	E280S	240	E300A	E280A	265
21	275	290	270	280	280	230	C	C	C	A	A	A	A	A	A	230	230	240A	250	250	220	255	260	260
22	255	E300A	250	230	270	A	A	A	A	A	A	A	A	A	245	A	A	A	E250A	E300A	250	E250A	250	A
23	A	A	255	250	230	E310A	I235A	A	A	C	A	A	205	A	E300A	A	A	A	A	210	A	A	A	A
24	E350A	E350A	A	260	260	265	210	210	205	C	A	A	A	A	A	A	A	A	A	240A	225	240	A	250
25	290	A	A	250	250A	225	205	A	180	A	A	A	A	A	A	A	220	A	A	240A	245	225	280	250
26	310A	310	300	295	260	240	210	225	A	180	A	A	225	R	R	A	A	A	A	A	255	280	300	I245A
27	250A	290	A	A	250	250A	210	A	A	A	A	A	A	A	A	A	A	A	A	A	260A	I260A	225	A
28	260	270	250	250	250	220	210	200	A	A	A	A	A	A	A	A	A	A	A	A	280	300	245	A
29	A	A	A	A	A	260	A	A	A	A	A	A	A	A	A	A	A	A	A	A	I240A	230	A	A
30	250	I300A	260	260	250	E310A	I255A	A	A	A	A	A	A	A	A	I220A	I225A	210	280	240	255	I280A	I265A	280
31	280	270	250	255	240	A	250A	220	A	A	A	A	A	A	A	A	A	A	A	225	A	270	340	250
No.	21	18	19	22	26	24	17	12	4	3	2	2	3	3	6	7	8	5	11	16	24	22	16	17
Median	280	295	275	255	250	240	215	220	210	220	U185	200	220	225	240	230	220	225	E250	240	245	260	260	260
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

IONOSPHERIC DATA

Jul. 1964 | h'Es | km | 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	100	105	100	100	100	100	100	165	135	120	110	105	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	125	115	120	120	110	105	105	105	105	100	105
3	105	100	100	100	100	105	115	110	110	105	105	100	100	100	100	100	120	105	105	110	130	100	105	105
4	100	100	100	100	100	100	100	100	110	110	110	110	115	110	105	125	130	110	130	115	115	110	110	110
5	100	100	100	100	100	100	100	100	100	100	100	100	100	120	120	135	115	120	105	105	105	105	105	105
6	100	100	100	100	100	100	105	105	105	100	100	100	110	105	110	110	110	110	105	100	100	100	100	105
7	100	100	100	100	100	125	105	100	100	100	100	100	105	105	105	100	100	100	100	100	100	100	100	100
8	100	110	105	105	110	130	115	110	105	105	100	105	105	130	125	125	125	115	110	110	105	105	105	105
9	100	100	100	120	100	100	120	115	110	110	110	105	105	105	100	100	105	100	100	100	120	105	105	105
10	105	100	100	100	100	100	105	120	110	110	105	105	100	105	105	110	105	105	100	100	100	100	115	110
11	110	100	100	100	100	100	110	105	105	100	100	100	140	100	125	125	125	115	110	105	105	105	100	100
12	100	100	100	100	100	125	115	115	105	110	110	110	105	100	100	100	100	110	110	100	100	100	100	100
13	100	100	100	100	100	105	110	105	100	105	125	130	125	125	120	120	110	110	105	105	100	105	110	105
14	100	100	100	100	100	100	100	105	110	105	100	100	125	125	120	115	110	110	105	105	105	100	100	100
15	100	100	100	100	105	115	120	115	110	110	105	110	105	110	105	150	115	115	110	100	100	100	105	100
16	100	100	100	100	100	160	120	110	120	110	110	G	105	105	105	100	105	120	115	110	100	105	105	100
17	100	100	095	090	090	125	115	110	110	110	110	105	110	110	105	110	110	110	110	105	100	100	100	100
18	100	100	100	100	100	120	105	105	100	100	100	105	125	130	130	120	110	105	110	105	105	105	105	100
19	100	100	100	100	100	100	100	105	100	100	100	100	105	120	120	115	110	110	110	110	105	105	105	100
20	100	125	100	100	100	105	105	100	100	100	100	110	105	120	110	100	105	115	105	105	110	100	100	100
21	100	100	100	100	100	C	C	C	C	110	115	110	100	105	105	115	105	115	105	100	100	100	100	100
22	100	100	100	100	110	130	115	110	110	110	100	100	100	100	105	100	100	100	095	100	100	100	100	100
23	105	100	100	100	100	125	110	105	100	C	100	100	100	125	125	120	115	105	110	105	105	105	100	105
24	100	100	100	100	100	S	115	115	105	C	100	100	100	100	100	100	100	100	100	100	100	105	105	105
25	100	100	105	100	100	100	105	105	125	110	100	105	105	110	115	115	115	110	110	100	100	100	100	100
26	100	100	095	100	090	100	105	110	100	105	100	100	100	100	100	105	110	105	105	100	100	100	110	105
27	105	105	100	100	100	125	110	110	105	105	105	100	100	115	115	125	110	110	105	105	100	100	100	105
28	105	110	100	100	100	100	100	100	100	100	100	100	100	100	100	125	120	125	110	110	105	105	100	105
29	105	100	100	100	100	105	115	100	100	100	100	100	100	110	100	115	115	110	105	105	105	105	105	100
30	100	100	105	100	100	110	115	110	110	115	115	110	120	115	110	120	105	120	105	105	105	105	105	105
31	105	100	100	E	E	110	110	120	110	100	105	100	105	110	110	110	105	105	105	105	105	105	105	105
No.	30	30	30	29	29	28	29	29	29	28	30	29	29	30	30	30	30	30	30	30	30	30	30	30
Median	100	100	100	100	100	105	110	110	105	105	100	100	105	110	110	115	110	110	105	105	105	105	105	105
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'Es

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

K 11

IONOSPHERIC DATA

Kokubunji Tokyo

Lat. 35° 42.4' N
Long. 139° 29.3' E

Jul. 1964

Types of Es

135° E Mean Time (G.M.T. +9h)

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f3	f3	f4	f3	f3	14	12	h1	h1	h2	c2	c2												
2														h	c	h	h2	e3	12	f2	f5	f5	f3	f4
3	f3	f3	f2	f3	f3	1	c2	c	c2	c2	c2	c2	12	c2	12	12	h213	e3	121	f3f	f3f2	f2	f5	f4
4	f3	f2	f2	f4	f4	12	12h	12	c2	c2	c2	c2	c2	12	12	h	h	c2	h2	f2	f3f2	f4	f4	f4
5	f4	f4	f3	f4	f3	13	13	13	13	12	1	12	1	h	h	h	c2	h3	12	f2	f2	f2	f3	f4
6	f3	f3	f3	f3	f2	12	e3	e3	e3	12	c2	c2	e3	c2	c2	c	12	13	13	f4	f5	f3	f3	f4
7	f3	f3	f2	f4	f2	h212	13	12	12	12	12	12	12	12	13	12	14	12	12	f3	f3	f4	f4	f3
8	f	f	f	f	f	h	c2	1	13	12	12	12	1	h	h	h212	h13	c213	c213	f2f3	f6f2	f4	f6	f6
9	f4	f5	f4	f2	f2	13	h312	c4	e3	c2	1	12	12	12	12	12	12	13	12	f2	f3f5	f4	f5	f6
10	f3	f4	f4	f3	f3	12	13	h3	12	12	12	12	12	12	e3	c2	13	13	15	f3	f5	f3	f4	f3
11	f3	f3	f4	f4	f3	12	e3	12	12	14	12	1	h	12	h212	h313	h412	e31	c2	f3	f7	f5	f7	f2
12	f2	f	f	f2	f2	h4	c4	c2	c2	c2	c2	c2	e3	12	c2	c2	13	13	14	f4	f5	f3	f4	f2
13	f4	f5	f4	f3	f3	12	12	12	12	12	h	h	h	h2	h2	h	12	c2	12	12	f3	f3	f3	f6
14	f5	f4	f5	f3	f4	15	15	c	12	13	12	12	h	h1	h2	c2	c2	12	12	f3	f4	f3	f4	f3
15	f4	f4	f3	f3	f3	13	h	c2	c	c	12	c1	1	c1	1	h1	e3	c2	13	f2	f3	f3	f3	f2
16	f3	f2	f2	f2	f	h2h	h2	c2	h	1	1		12	1	1	12	1	h2	c2	f3	f3	f4	f4	f4
17	f2	f2	f2	f2	f2	h	e3	c2	c2	c2	12	12	1	12	12	c2	c	13	e3	f3	f3	f3	f2	f4
18	f2	f3	f2	f2	f2	h	13	12	c2	12	12	12	h	h	h	h	c2	13	c2	f4	f4	f5	f3	f3
19	f3	f3	f3	f3	f3	12	13	13	12	12	12	12	12h	h2	h3	c2	c2	e3	14	f5	f3	f4	f3	f3
20	f3	ff	f3	f2	f2	12	c2	12	12	1	12	1	c2	h	c	c	e3	c2	e3	f3	f2	f2	f2	f2
21	f2	f2	f2	f3	f2					c2	c	c	1	c2	c2	c	1	c2	12	f	f5	f	f2	f2
22	f2	f2	f	f2	f2	h5	c2	c2	c	12	1	12	12	12	12	12	12	12	12	f2	f3	f3	f4	f4
23	f4	f4	f4	f4	f3	h2	e3	13	13		12	12	1	h1	h2	e3	e2	e5	14	f2	f3	f2	f2	f4
24	f2	f2	f3	f2	f2		1	1	1		12	12	12	1	12	12	12	12	12	f3	f3	f3	f5	f4
25	f4	f4	f4	f3	f4	13	13	12	h	1	12	12	1	1	13	c2	c2	12	14	f2	f3	f3	f4	f3
26	f3	f3	f2	f2	f2	1	12	12	12	1	1	1	12	1	1	12	c2	14	15	f5	f4	f4	f3	f3
27	f4	f3	f6	f4	f2	h21	12	13	c2	1	12	12	12	c1	c12	h2	c2	12	12	f4	f3	f2	f2	f3
28	f2	f2	f2	f	f2	12	12	1	12	12	12	1	1	1	1	h	h2	h3	c4	f6	f3	f3	f3	f3
29	f4	f4	f3	f5	f3	14	h4	13	12	12	12	12	12	112	12	c212	c2	e3	12	f4	f4	f3	f3	f3
30	f2	f3	f2	f3	f3	14	15	c2	12	c2	c	c	h	c	c2	h2	c2	h2	13	f4f	f3	f3	f5	f3
31	f2	f2	f2			14	e3	h2	c2	13	1	12	12	c2	c2	c2	13	12	13	f3	f4	f4	f3	f3
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

IONOSPHERIC DATA

Jul.1964 | **hpF2** km | 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	340F	F	A	U340S	F	U250S	U220S	A	R	G	G	A	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	G	A	G	330	U300S	A	260	325	S	A	F
3	F	F	F	A	340F	300	G	G	U230S	A	A	A	A	A	I320S	A	A	A	330	U340S	S	A	A	A
4	A	F	F	F	A	G	G	F	A	340	I310A	A	A	A	R	G	G	300	300	270	295	A	A	A
5	F	A	A	A	F	260	280	R	A	A	A	A	A	360	305	305S	A	G	R	U265S	U300S	F	A	A
6	A	A	A	U300S	F	G	S	A	A	A	A	A	A	A	A	A	U310S	300S	A	A	A	F	A	A
7	F	F	F	F	F	G	A	U240R	A	A	A	A	A	A	A	A	A	A	J270R	250S	U295R	345S	U320R	345
8	355	345	350F	J325F	270	250	G	G	A	A	A	G	A	A	A	A	A	325	300	295	270	305F	A	A
9	A	A	F	F	F	225	A	A	A	A	A	A	A	A	A	G	S	G	305R	300	F	F	A	A
10	U310F	A	A	A	F	F	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	245S	AF	F
11	F	F	F	F	F	340F	G	295	A	A	A	G	A	A	A	A	A	A	A	A	I270A	A	A	A
12	A	A	A	A	300	I285A	A	A	A	A	A	A	A	A	A	A	A	305	295R	290S	S	F	U315F	U300R
13	F	A	340F	F	F	300	300R	260	260	A	A	R	A	A	A	A	G	A	A	U305S	U315S	S	250	FS
14	A	320	A	A	340F	290S	A	310	A	A	A	A	A	A	A	A	G	A	A	295R	R	260	F	310F
15	I340A	A	U300R	F	300F	250	245	G	A	G	A	350	U300R	300	G	G	A	A	A	R	U230S	310	F	F
16	A	F	300F	F	F	250	A	A	G	G	G	G	A	G	G	345	G	300H	J270R	J270S	F	FS	A	F
17	305F	255	300F	F	A	295	A	A	I260R	A	A	A	A	A	300	300R	310	320	A	A	295	F	F	F
18	F	F	F	F	325F	310F	A	260	A	R	A	A	A	G	G	U310S	A	A	310	A	A	A	F	U330R
19	345F	F	325	350	300	315	G	U260R	260	R	A	A	A	A	A	A	305	310	R	U290S	F	A	F	F
20	F	310F	F	F	F	285	A	A	A	A	A	A	A	G	350	A	S	G	290	U300S	S	F	F	F
21	F	F	U320S	320	325F	260	C	C	C	A	A	A	A	A	A	G	C	300	275	S	U250S	U325S	350S	F
22	F	F	F	F	F	A	A	I275A	R	A	A	A	A	A	R	305S	I295S	260	260	360	I295S	F	F	A
23	A	A	300F	290F	250	330	A	A	A	C	A	A	G	A	G	A	A	A	A	U250S	A	A	A	A
24	350	F	A	310F	305F	320	360S	310	310	C	A	A	A	A	A	A	A	A	A	265	250	290	A	F
25	310F	A	A	F	F	240R	220R	A	G	305	A	A	R	A	A	A	G	A	305	285R	260	J260R	F	F
26	340F	F	F	F	F	295F	G	R	250	G	A	A	R	R	R	310R	290	A	305	A	300	F	F	A
27	F	300F	A	A	300F	J250R	235	A	255	260	A	A	A	A	A	A	A	A	A	A	300S	A	265F	A
28	310F	310F	F	J305F	F	250	G	G	250	A	A	A	A	A	300	245	A	A	A	I280A	305	U310F	U260S	A
29	A	A	A	A	A	305	A	A	A	R	A	A	A	A	A	A	A	A	A	A	A	S	A	A
30	300F	A	F	F	295F	350	A	A	R	A	G	A	A	380	A	U295S	A	G	J305S	300	U270S	A	A	F
31	F	F	F	F	F	A	260	G	S	A	A	A	A	A	A	300	A	255	220	250	A	305	F	300F
No.	11	6	8	8	12	24	8	8	8	3	1	1	1	3	5	9	6	11	15	20	17	10	6	5
Median	340	310	310	315	300	290	250	270	260	305	U310	350	U300	360	305	305	310	300	300	290	295	305	U290	310
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

IONOSPHERIC DATA

Jul. 1964 | ypF2 | km | 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	060F	F	A	U060S	F	U050S	U040S	A	R	G	G	A	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	G	A	G	070	U080S	A	070	075	S	A	F
3	F	F	F	A	060F	080	G	G	U020S	A	A	A	A	A	I080S	A	A	A	070	U060S	S	A	A	A
4	A	F	F	F	A	G	G	F	A	050	I050A	A	A	A	R	G	G	060	050	055	065	A	A	A
5	F	A	A	A	F	050	045	R	A	A	A	A	A	040	070	095S	A	G	R	U065S	U080S	F	A	A
6	A	A	A	U080S	F	G	S	A	A	A	A	A	A	A	A	A	U090S	070S	A	A	A	F	A	A
7	F	F	F	F	F	G	A	U060R	A	A	A	A	A	A	A	A	A	A	J055R	030S	U055R	060S	U070R	080
8	060	080	075F	J075F	045	055	G	G	A	A	A	G	A	A	A	A	A	065	060	055	070	050F	A	A
9	A	A	F	F	F	075	A	A	A	A	A	A	A	A	A	G	S	G	075R	060	F	F	A	A
10	U090F	A	A	A	F	F	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	055S	AF	F
11	F	F	F	F	F	060F	G	050	A	A	A	G	A	A	A	A	A	A	A	A	I050A	A	A	A
12	A	A	A	A	080	I055A	A	A	A	A	A	A	A	A	A	A	A	050	050R	055S	S	F	U085F	U045R
13	F	A	060F	F	F	070	050R	040	040	A	A	R	A	A	A	A	G	A	A	U045S	U065S	S	050	FS
14	A	075	A	A	055F	050S	A	060	A	A	A	A	A	A	A	A	G	A	A	035R	R	045	F	085F
15	I055A	A	U050R	F	095F	045	075	G	A	G	A	030	U045R	045	G	G	A	A	A	R	U045S	090	F	F
16	A	F	050F	F	F	050	A	A	G	G	G	G	A	G	G	050	G	060H	J040R	J045S	F	FS	A	F
17	050F	055	050F	F	A	050	A	A	I040R	A	A	A	A	A	045	050R	040	075	A	A	050	F	F	F
18	F	F	F	F	075F	085F	A	045	A	R	A	A	A	G	G	U035S	A	A	090	A	A	A	F	U070R
19	055F	F	070	050	055	085	G	U040R	040	R	A	A	A	A	A	A	050	080	R	U035S	F	A	F	F
20	F	085F	F	F	F	055	A	A	A	A	A	A	A	G	080	A	S	G	060	U060S	S	F	F	F
21	F	F	U055S	050	045F	070	C	C	C	A	A	A	A	A	A	G	C	090	085	S	U100S	U075S	100S	F
22	F	F	F	F	F	A	A	I075A	R	A	A	A	A	A	R	045S	I050S	045	065	080	I050S	F	F	A
23	A	A	060F	060F	050	070	A	A	A	C	A	A	G	A	G	A	A	A	A	U070S	A	A	A	A
24	050	F	A	080F	085F	080	055S	070	090	C	A	A	A	A	A	A	A	A	A	065	050	065	A	F
25	070F	A	A	F	F	055R	035R	A	G	040	A	A	R	A	A	A	G	A	065	060R	055	J055R	F	F
26	060F	F	F	F	F	060F	G	R	045	G	A	A	R	R	R	045R	040	A	090	A	070	F	F	A
27	F	050F	A	A	045F	J055R	060	A	045	040	A	A	A	A	A	A	A	A	A	A	055S	A	045F	A
28	085F	085F	F	J055F	F	050	G	G	045	A	A	A	A	A	040	030	A	A	A	I050A	065	U085F	U045S	A
29	A	A	A	A	A	065	A	A	A	R	A	A	A	A	A	A	A	A	A	A	A	S	A	A
30	070F	A	F	F	050F	055	A	A	R	A	G	A	A	045	A	U075S	A	G	J055S	090	U080S	A	A	F
31	F	F	F	F	F	A	040	G	S	A	A	A	A	A	A	045	A	040	040	050	A	090	F	045F
No.	11	6	8	8	12	24	8	8	8	3	1	1	1	3	5	9	6	11	15	20	17	10	6	5
Median	060	080	060	060	055	055	050	055	040	040	U050	030	U045	045	070	045	050	065	060	060	065	060	U060	070
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

ypF2 | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Jul.1964 | foF2 | 0.1 Mc | 135° E Mean Time (G. M. T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'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	I032S	027	J026S	J028S	I028S	I028A	037	I044S	050S	059	S	A	A	A	A	A	A	A	A	I059S	I057S	A	S	034
2	S	S	S	S	S	S	I037S	056S	I052S	052S	051S	051S	051	A	S	S	I068S	I080S	I068S	I054H	S	S	S	S
3	S	S	S	032S	030	029S	I033S	C	C	A	A	A	A	S	A	I064S	060S	I062S	064S	S	S	S	028S	S
4	S	028	S	S	S	J026S	I037S	S	S	060	A	056S	059S	I058A	I063S	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	SH	S	S	S
6	A	S	A	A	A	A	C	C	A	A	S	C	A	A	C	J077S	084	S	A	A	S	S	S	S
7	S	S	S	S	I035S	I039S	I053S	062	S	A	A	C	A	A	A	A	A	A	A	A	S	S	S	S
8	S	S	S	S	027	025	I031A	042S	A	S	A	056	S	A	S	J050S	060	063S	058	I062S	I057S	I046S	S	S
9	S	S	S	A	A	025	A	A	A	A	A	A	A	056	A	A	A	057	057S	057S	S	S	S	S
10	S	A	A	S	I026A	028	S	S	A	S	A	A	S	I056S	061	064	A	S	A	A	S	S	S	S
11	S	S	I034S	032S	I031S	I032S	I043S	J053S	S	A	A	A	A	A	051	058S	A	A	A	A	S	S	S	A
12	S	A	A	A	A	024	I041S	I056S	055	A	A	A	S	S	A	A	057	A	A	A	A	S	S	S
13	S	A	S	S	S	030	S	S	S	S	C	A	A	S	S	S	S	A	A	S	S	S	S	S
14	S	S	S	I030A	I027S	025	I038S	I050S	061S	I057S	A	A	S	I053C	I056S	053	S	S	S	S	S	S	S	S
15	S	A	A	S	S	I022S	I037S	I047S	060S	056S	055	I059S	062	I057A	S	S	S	J051S	S	S	I059S	I043C	S	C
16	S	S	S	C	S	025	I038S	I050S	I058S	S	C	058	I066S	I078S	I073S	064S	059S	S	S	S	S	I030S	I028A	I028C
17	I028C	I028S	027S	026F	026	I025S	I037S	056	I058C	S	S	A	S	A	065	I064S	S	S	S	S	S	S	S	S
18	S	S	S	A	A	I028A	039S	I048S	056S	C	C	C	C	I059S	062S	J076S	I066S	057S	S	C	S	C	C	C
19	C	C	C	S	S	S	SH	S	056	A	A	A	C	C	S	J057S	I056S	063	S	S	S	S	S	S
20	S	S	S	S	A	031	S	S	S	C	C	C	C	C	I067S	J078S	067S	065	066	057	038S	037S	I034S	I030S
21	J030S	S	S	030	030S	I032S	039S	J057S	J049S	A	A	A	A	062S	064	066	070S	I077S	I072S	064S	S	S	043H	S
22	S	S	037	F	030	025S	040	065S	J044S	053S	S	C	C	C	C	085	077S	063	058	060	I067S	064	027	025S
23	024F	024	026S	S	A	A	032	045S	I057A	I064A	058	A	A	A	052	A	A	I067A	079	I064A	A	A	A	S
24	S	A	S	F	F	J027S	035	046	060	050	066	050R	S	A	I050A	055	061	060	064	I067S	J065S	030	028	029
25	I028A	I027A	J026S	024	033S	I030A	032	I040A	049	060	054	048	I051A	048	048	J053S	054	055	I055S	J055S	062S	J054S	A	S
26	S	S	I032S	F	F	030	036	046S	062	048	047	I053S	I056A	A	054	068	067	057	052S	062S	I063C	I045S	036	033S
27	I032S	A	A	F	F	F	033	049	A	A	A	051	058	059	054	I058A	I056A	A	A	I060A	070	A	A	035
28	S	F	F	F	F	J027S	040	J050S	057	E044G	E042G	E042G	049	061	052	I047R	044	I042S	043	J055S	J052S	I037A	040S	J033S
29	S	A	A	S	A	A	033	I048S	J051S	I054A	I056A	053	052	058	I062A	061	051	A	A	S	065S	J062S	A	S
30	A	S	A	026F	028	F	036	048	052S	055	I070S	061	054	063	J076S	089	058	J051S	I056A	I070S	064	A	S	S
31	I036S	I036S	I036A	036	F	024	035	046	064	050	A	A	A	068	J078S	082	I076A	I070S	I056S	048	I042S	037	I032S	I030A
No.	7	6	8	9	12	23	24	22	19	14	9	12	10	14	18	21	19	17	14	15	13	11	9	9
Median	U030	U028	030	030	029	027	037	048	056	054	055	053	055	058	062	064	060	062	058	060	062	043	032	030
U. Q.	032	028	035	032	030	030	039	056	060	059	062	057	059	062	065	076	068	066	066	064	065	054	038	034
L. Q.	028	027	026	026	027	025	034	046	051	050	049	050	051	056	052	056	056	056	056	055	054	037	028	028
Q. R.	004	001	009	006	003	005	005	010	009	009	013	007	008	006	013	020	012	010	010	009	011	017	010	006

Sweep 0.55 Mc to 17.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Jul. 1964 | foF1 | 0.01 Mc | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31°12.1′ N | Long. 130°37.1′ 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								L	I390S	I410A	A	A	A	A	A	A	A	A	A	L				
2								360	I390S	I410A	430	440	A	A	C	390	I380S	I380A	A					
3							320	C	C	A	A	A	A	A	A	A	400S	A	A					
4								L	390	A	A	C	C	A	C	C	C	C	C	C				
5							C	C	C	C	C	C	C	C	C	C	C	C	C					
6							C	C	A	A	A	C	A	A	C	A	A	A	A	A				
7							A	I370S	S	A	A	C	A	A	A	A	A	A	A					
8								350	I380A	A	A	A	A	A	A	A	S	A	A					
9							A	A	A	A	A	A	A	C	A	A	A	I370S	I350S	A				
10								L	A	A	C	A	C	C	C	C	A	A	A					
11								L	A	A	A	A	A	A	C	A	A	A	A					
12							L	L	A	A	A	A	A	A	A	A	A	A	A					
13							L	L	SH	C	C	A	A	I420C	410	I410A	380	A	A					
14								I370H	I390A	420	A	A	A	C	410	A	A	A	A					
15								A	S	A	A	A	C	A	C	I410C	I400S	400	340S	L				
16								S	I400A	IH	C	A	C	C	C	C	390H	390	340	L				
17								360	I390C	420	A	S	C	C	A	A	I400C	S	S					
18							L	S	400	C	C	C	C	C	C	C	C	370S	340	C				
19								350L	A	A	A	A	C	C	C	C	C	I380C	350	L				
20								A	S	C	C	C	C	C	A	C	410	380	340					
21								350L	370	A	A	A	A	450	I420A	420	400	370	A					
22							L	L	L	400	420	C	C	C	C	430	400	390	340					
23								A	A	A	A	I440A	A	A	A	A	A	A	A					
24								370	390	410	410	430	I420S	A	A	410	400H	370	I340A	L				
25								A	I390A	410	A	A	A	I420A	420	430R	400	380	I320A	250				
26								370	390	410	410	S	A	A	I420A	410	410	A	A					
27								A	A	A	A	420	I430A	I420A	I410A	A	A	A	A					
28							L	360	400	440	420	420	420	420R	I420R	420	400	380	340					
29							L	350	A	A	A	420R	430	A	A	A	A	A	A					
30								I350A	420	400	I410A	I420A	420	I410A	A	A	A	A	A					
31								I360A	I380A	410	A	A	A	A	A	A	A	A	A					
No.							1	13	15	11	6	7	5	6	7	9	13	12	10	1				
Median							320	360	U390	410	415	420	420	U420	U420	410	400	380	340	250				
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foF1 | Sweep 0.55 Mc to 17.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Jul. 1964 | foE | 0.01 Mc | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31°12.1′ N, Long. 130°37.1′ 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	A	A	A	325	I335C	C	C	A	A	A	A	A	S				
2							S	240	A	A	C	C	350	C	C	320	290	260	205	S				
3							S	I230C	I270C	I300C	330	A	A	A	A	C	300	260	210					
4							A	A	A	C	C	C	C	C	C	C	C	C	C	C				
5							C	C	C	C	C	C	C	C	C	C	C	C	C					
6							C	C	A	A	C	C	C	C	C	A	A	A	A	S				
7							S	230	270	A	C	C	C	340	330C	300	A	A	A					
8							S	220	255	A	A	C	A	A	A	A	A	A	A					
9							A	250	285	C	C	C	C	C	C	A	A	A	A	S				
10							S	A	A	C	C	C	C	C	C	C	290	260	A					
11							S	220	270	280	300	A	A	A	A	A	310C	260	210					
12							190	225	275	A	C	C	C	C	C	C	300	260	195					
13							S	240	A	C	C	C	C	C	C	I315C	I300C	270	215					
14							S	230	A	A	C	C	C	C	C	C	300C	265	210					
15							S	245S	270	C	A	A	A	A	C	A	A	270	220	S				
16							S	230	270	270	C	A	C	C	C	C	300	270	220	S				
17							S	230	270	C	C	C	C	C	A	A	300	280	I215A					
18							S	240	260	C	C	C	C	C	C	C	C	265	220	C				
19							S	A	A	A	A	A	A	C	C	C	300	270	220					
20							S	220	260	300	C	C	C	C	C	C	295	265	220					
21							S	A	A	I300C	C	C	330	I335C	I330C	320	300	265	220					
22							S	240	A	A	A	C	C	C	C	A	300	260	I190A					
23							S	A	260	290	305	340	I350A	A	A	330	300	260	220					
24							S	A	270	300	320	320	S	A	A	310	290	260	I215A	S				
25							S	A	A	290	320	330	330	340	335	320H	300	270	220	S				
26							S	240	270	300	335	I340S	340	340	335	I310A	I295A	260	A					
27							S	230	270	I295A	A	A	A	A	A	330	290	260	210					
28							S	225	I275A	310	325	I330A	I330A	335	I320A	315R	300	260	I220A					
29							S	I240A	270	A	A	A	335	A	A	A	300	260	210					
30							S	240	265	295	315	320	340	330R	325	310	290	260	185					
31							S	215	260	285	305	315	I320A	325	320	310	290	250	200					
No.							1	21	19	13	10	8	9	7	7	12	22	24	22					
Median							190	230	270	295	320	330	335	335	330	315	300	260	215					
U.Q.																								
L.Q.																								
Q.R.																								

foE

Sweep 0.55 Mc to 17.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 3

IONOSPHERIC DATA

Jul. 1964 | foEs | 0.1 Mc | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31°12.1′ N | Long. 130°37.1′ 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	J015S	J015S	J016S	J016S	J030	J031	J030	031	J050	J054	J066	J117	J117	J061	094M	123M	090M	088M	J023	J029	057M	022M	S
2	S	031M	031M	S	S	S	G	031	031	041	037	043	J048	J061	J051	035	039	039	058M	J021	J015S	J015S	J015S	022M
3	J025	S	S	S	S	J020	G	C	C	J061	J095	144M	141M	060M	090M	J052	038	J052	J051	J029	J033	J024	023M	J025
4	J026	J020	J026	J024	J023	J021	030	J032	J031	040	J056	042	043	J080	J054	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	S	027M	034M	031M
6	056M	030M	057M	036M	060M	056M	C	C	090M	092M	J051	C	J111	120M	C	J060	055M	J063	J077	088M	057M	036M	029M	J015S
7	022	J024	038M	022M	J020	J021	J030	031	038	090M	J102	C	052	093M	107M	093M	117M	143M	090M	089M	058M	040M	025M	024M
8	021M	J015S	J018S	S	J029	030M	J032	031	J061	042	061	J052	J054	J063	J050	042	J036	J053	057M	058M	037M	036M	030M	036M
9	037M	J021	085M	058M	061M	030	042M	J061	J063	074M	122M	090M	116M	060M	091M	J068	J055	J032	030	J030	036M	027M	030M	037M
10	035M	037M	057M	S	037M	028M	029	031	058M	042	J100	125	050	052	J052	J049	084M	090M	119M	067M	036M	037M	036M	031M
11	030M	028M	026M	022M	S	025M	036M	036	J053	J054	089M	J085	090M	J096	039	J050	072M	J079	104M	084M	038M	058M	057M	J080
12	057M	067M	090M	036M	056M	J030	026	J030	J052	066M	090M	082M	J050	J058	085M	J060	J055	091M	089M	115M	058M	036M	030M	024M
13	031M	057M	058M	025M	026M	030M	023	027	029	037	C	J053	J060	038	036	043	042	107M	106M	056M	031M	031M	037M	024M
14	035M	030M	S	031M	037M	J022	021	025	090M	042	J066	J063	053M	C	042	042	J050	067M	044M	057M	030M	030M	030M	030M
15	027M	038M	057M	025M	S	S	028	038	J031	J051	J053	J054	042	064M	030G	038M	037	029	030	J024	027M	C	027M	C
16	024M	030M	030M	C	S	027M	023	J036	057M	030	J036	068M	041	056M	037	039	G	034	028	021	031M	027M	030M	C
17	C	031M	027M	S	E	S	S	029	036	036	042M	056M	042	J060	063M	043	G	036	037M	031	030M	S	031M	030M
18	S	S	031M	032M	032M	028M	021	027	032	037	C	C	042	043	037	043	C	031	028	C	S	C	C	C
19	C	C	C	J021	S	030M	S	029	091M	057M	092M	058M	035M	C	C	038	038	J036	039	028	S	024M	020	S
20	025M	036M	030M	023M	037M	024M	020	036	031	038	066M	039	C	C	051	042	034	035	029	023	021	022	023M	S
21	042M	037M	036M	026M	037M	032M	022	J033	035	056M	057	J113	J084	045	045	040	039	034	J049	042M	037M	033M	030M	030M
22	031M	031M	031M	028M	J029	J023	025	028	J035	037	038M	C	C	C	C	040	038	058M	024	J030	J033	J021	021	018
23	031M	031	J031	J034	J053	058	039M	J047	074M	J099	J109	J083	J137	J098	061	070	J114	J127	J135	J136	J109	J125	D066S	J033
24	J047	J061	J030	J051	J027	J054	J052	J029	033	039	J048	053	S	J074	J060	G	031	050	J053	J032	J031	J031	024	021
25	J052	039	J017	032	J052	047M	J029	J062	039	038	046	045	089M	046	037	G	033	044	J084	J127	D070S	J036	090M	J037
26	042M	J035	J029	021M	J025	J032	021	032	031	037	053	S	082M	053	046	039	039	J051	031	J023	C	J026	J026	J036
27	J031	J036	J038	J026	J021	021	J029	039	J063	144	J098	044	J064	060	J078	J061	J145	J108	J111	J137	J108	J065	J108	J032
28	J022	021	021	E	E	J025	J025	022G	J037	036	037	J048	041	037	047	029G	041	038	031	J029	021	068M	032	J024
29	J030	058	J053	J032	J041	J043	032	032	J050	J077	J060	J078	039	045	152M	115M	J051	J088	J058	J046	J052	J052	090M	J053
30	J051	J038	J030	J024	J032	J024	026	J038	038	039	J050	J048	042	J053	J044	J049	J065	060	J084	J051	J084	J067	J032	J035
31	J024	J033	J051	J024	E	J024	J032	J050	J061	J059	J065	J119	D170D	J108	J066	J053	082M	070	J051	J030	J033	028	J031	J032
No.	25	27	27	24	24	27	27	28	29	30	28	25	27	26	27	29	28	29	29	28	26	27	29	24
Median	031M	031	031M	026M	030	028	028	032	038	042	058	058	053	060	051	043	042	053	053	037	034M	033M	030M	030
U.Q.	042	038	053	032	039	032	032	037	061	061	091	084	090	080	066	060	068	089	088	076	057	052	035	036
L.Q.	025	028	027	022	022	024	022	029	032	038	049	048	042	052	042	039	038	036	031	028	030	027	024	024
Q.R.	017	010	026	010	017	008	010	008	029	023	042	036	048	028	024	021	030	053	057	048	027	025	011	012

The Radio Research Laboratories, Japan

foEs | Sweep 0.55 Mc to 17.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Jul. 1964 | f_bE_s | 0.1 Mc | 135° E Mean Time (G. M. T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	S	S	S	A	029	029	E031S	050	E054S	A	A	A	A	A	A	A	A	020	E029S	A	020	S
2	S	020	E031S	S	S	S		031	E031R	E041C	037	036	046	A	040	034	E039S	039	E058S	020	S	S	S	019
3	E025S	S	S	S	S	019		C	C	A	A	A	A	E060S	A	E052S	036	E052S	E051S	E029S	E033S	024	019	018
4	E026S	019	E026S	018	018	019	023	E032S	031	040	A	E042S	E043C	A	049	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	S	020	E034S	E031S
6	A	E030S	A	A	A	A	C	C	A	A	E051S	C	A	A	C	E060S	051	E063S	A	A	E057S	E036S	020	S
7	E	E024S	E038S	022	018	E	E030S	E031S	E038S	A	A	C	A	A	A	A	A	A	A	A	E058S	E040S	020	018
8	S	S	S	S	018	E	A	028	A	E042S	A	050	E054S	A	E050S	E042S	E036S	E053S	049	E058S	E037S	E036S	020	E036S
9	E037S	E	018	A	A	018	A	A	A	A	A	A	A	050	A	A	A	E032S	030	E030S	E036S	E027S	E030S	E037S
10	E	A	A	S	A	021	026	E031R	A	040	A	A	E050S	E052C	050	049	A	054	A	A	032	E037S	E036S	022
11	E030S	E028S	018	E	S	E025S	E036S	035	E053S	A	A	A	A	A	E039C	050	A	A	A	A	E038S	E058S	E057S	A
12	E037S	A	A	A	A	020	G	032	052	A	A	A	E050S	E058S	A	A	053	A	A	A	A	E036S	E030S	E024S
13	E031S	A	019	E	018	018	020	026	E029C	037	C	A	A	E038C	036	E043S	034	A	A	E056S	E031S	E031S	E037S	E024S
14	E035S	E030S	S	A	019	019	020	G	051	040	A	A	E053S	C	040	E042C	E050S	E067S	E044S	E057S	E030S	E030S	E030S	E030S
15	E027S	A	A	018	S	S	E028S	E038S	E031C	051	052	E054S	E042C	A	E030C	035	E037S	E029C	029	022	019	C	E027S	C
16	E024S	E030S	E030S	C	S	021	020	036	052	E030C	E036C	055	E041C	046	E037C	E039C		030	025	021	019	E027S	A	C
17	C	020	018	S		S	S	029	034	035	E042C	A	E042C	A	053	E043C		E036S	E037S	E031S	E030S	S	E031S	020
18	S	S	E031S	A	A	A	021	E027S	032	C	C	C	C	E043C	036	E043C	C	031	024	C	S	C	C	C
19	C	C	C	020	S	019	S	027	055	A	A	A	C	C	C	E038C	E038C	034	029	E	S	E024S	E020S	S
20	020	E036S	E030S	021	A	022	019	036	031	C	C	C	C	C	E051S	E042C	034	032	024	022	E	E	018	S
21	018	020	020	E	018	022	022	028	034	A	A	A	A	044	E045S	039	038	031	043	032	E037S	020	E	019
22	E	E	019	017	023	E	024	G	032	034	035	C	C	C	C	038	036	035	024	029	029	E	E	E
23	E	018	015	015	A	A	025	035	A	A	048	A	A	A	045	A	A	A	047	A	A	A	A	E033S
24	E047S	A	030	019	016	016	019	024	G	036	036	041	S	A	A		023	034	E053S	018	018	024	019	017
25	A	A	015	021	023	A	026	A	039	034	042	044	A	043	036		032	031	036	020	020	025	A	E037S
26	E042S	E035S	021	013	018	017	020	022	030	034	036	S	A	A	044	034	038	049	E031R	019	C	024	021	020
27	017	A	A	019	016	016	021	038	A	A	A	036	047	052	047	A	A	A	A	A	047	A	A	026
28	020	E	017			016	019	019G	033	033	034	035	039	036	038	028G	034	029	029	019	E	A	020	020
29	023	A	A	020	A	A	023	032	A	A	A	038	038	043	A	053	047	A	A	E046S	026	052	A	E053S
30	A	E038S	A	014	019	E	020	036	037	039	047	045	038	041	042	041	047	042	A	031	048	A	E032S	020
31	020	020	A	012		019	023	035	052	038	A	A	A	045	062	046	A	E070S	E051S	025	E033S	019	E031S	A
No.																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

f_bE_s

Sweep 0.55 Mc to 17.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 5

51

IONOSPHERIC DATA

Yamagawa

Lat. 31°12.1′ N
Long. 130°37.1′ E

Jul. 1964

f-min 0.1 Mc

135° E Mean Time (G.M.T. +9h)

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E019S	E017S	E017S	E017S	E016S	E017S	E017S	017	016	017	019	020	020	021	022	020	019	017	E018S	E016S	E017S	E017S	E017S	E019S
2	E018S	E016S	E016S	E017S	E018S	E019S	E017S	016	017	019	018	021	020	022	021	020	019	E018S	E017S	E017S	E017S	E017S	E016S	E017S
3	E017S	E019S	E019S	E018S	E017S	E018S	E018S	C	C	018	019	019	022	022	021	021	019	E018S	E017S	E017S	E017S	E017S	E017S	E017S
4	E016S	E017S	E017S	011	010	E017S	E017S	016	017	019	020	020	E023C	E035C	E034C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E018S	E018S	E017S	E016S	E017S
6	E018S	E017S	011	E017S	E018S	E017S	C	C	018	019	020	C	E034C	E028C	C	019	019	017	E017S	E017S	E017S	E017S	E017S	E018S
7	E018S	E017S	E017S	010	011	E017S	E018S	017	018	020	021	C	020	022	022	020	018	018	E018S	E017S	E017S	E017S	E017S	E017S
8	E017S	E018S	E019S	S	011	E018S	E017S	017	017	019	021	020	020	021	020	021	020	017	E017S	E017S	E017S	E018S	E017S	E017S
9	E017S	E017S	E017S	010	010	E017S	E017S	017	018	023	E035C	024	022	E034C	E034C	020	021	018	E018S	E017S	E017S	E017S	E017S	E017S
10	E017S	E017S	E018S	E019S	E018S	E018S	E017S	017	020	020	E032C	022	E035C	E023C	E024C	020	021	E020C	E020C	E017S	E018S	E017S	E018S	E017S
11	E018S	E019S	E017S	E018S	E018S	E017S	E017S	017	020	020	020	020	022	021	020	021	018	018	018	E017S	E016S	E016S	E017S	E017S
12	E017S	E017S	E018S	E017S	E017S	E017S	E017S	017	019	020	021	E023C	E037C	020	020	020	019	E017S	E018S	E018S	E017S	E017S	E018S	E019S
13	E017S	E017S	E017S	E018S	010	E017S	E017S	017	019	019	019	E048C	022	E026C	019	020	019	E018S	E017S	E017S	E017S	E017S	E017S	E017S
14	E017S	E017S	S	E017S	010	E017S	E017S	018	017	020	020	020	020	C	020	020	020	E017S	E017S	E017S	E017S	E017S	E017S	E017S
15	E019S	E017S	E017S	010	E018S	E017S	E018S	017	018	019	018	020	022	020	020	019	017	E017S	E017S	E018S	E017S	C	E018S	C
16	E017S	E017S	E017S	C	S	E019S	E017S	018	017	019	020	022	020	020	E024C	020	019	017	E017S	E017S	E017S	E017S	E018S	C
17	C	E017S	E017S	E017S	010	E019S	E018S	017	018	018	E034C	E034C	E035C	E034C	022	022	022	019	E017S	E017S	E018S	E017S	E019S	E017S
18	E020S	S	E017S	E018S	E017S	E017S	E016S	017	017	020	C	C	022	E025C	022	022	019	018	E019S	C	E019S	C	C	C
19	C	C	C	010	E018S	E016S	E020S	017	019	023	022	E031S	E024S	C	E023C	E024C	020	020	E020S	E021S	E019S	E017S	E017S	S
20	E017S	E019S	E017S	E018S	011	E020S	E016S	017	018	020	E024C	E034C	C	C	E034C	E024C	018	E016S	E017S	E016S	E017S	E017S	E016S	E016S
21	E016S	E016S	E016S	E016S	011	E016S	E017S	016	016	016	E023C	E025C	021	021	E023C	019	E024C	E016S	E016S	E016S	E016S	E016S	E016S	E016S
22	E016S	E016S	E016S	010	010	E016S	E016S	016	016	017	022	C	C	C	C	016	019	016	E015S	E016S	E017S	E016S	E016S	E016S
23	E016S	E016S	011	E	E	E	E015S	016	012	015	017	016	018	019	017	017	016	014	E016S	E016S	E016S	E016S	E016S	E017S
24	E016S	E016S	E016S	E	010	012	E016S	015	016	016	019	019	S	022	020	019	017	016	015	E016S	E016S	E016S	E016S	E016S
25	E016S	E016S	011	010	009	011	E016S	014	016	016	016	016	019	022	020	020	016	016	014	E016S	E017S	E016S	E016S	E016S
26	E016S	E016S	012	011	010	E016S	E016S	014	015	016	018	S	020	025	022	019	016	016	E016S	E015S	C	E016S	E016S	E016S
27	E016S	E016S	011	008	007	012	E016S	016	016	016	016	016	019	019	017	019	016	016	E016S	E016S	E015S	E016S	E016S	E016S
28	E016S	E016S	E016S	012	011	011	E016S	013	016	016	018	018	018	020	016	016	016	015	015	E015S	E015S	E015S	E016S	E015S
29	E016S	E016S	E	008	007	E	E016S	016	016	016	016	019	019	020	019	016	016	E016S	E016S	E016S	E016S	E016S	E016S	E016S
30	E016S	E016S	E016S	E	E	E015S	E016S	015	016	016	016	019	020	020	019	016	016	016	E016S	E016S	E016S	E016S	E016S	E015S
31	E016S	E015S	E015S	010	011	E016S	E016S	015	016	016	018	019	019	020	019	016	015	016	E016S	E016S	E016S	E015S	E016S	E016S
No.	28	28	28	15	19	30	29	28	29	30	24	19	21	19	21	27	28	25	29	29	29	29	29	26
Median	E017	E017	E017	010	010	E017	E017	017	017	019	019	020	020	021	020	020	019	E017	E017	E017	E017	E017	E017	E017
U.Q.																								
L.Q.																								
Q.R.																								

f-min

Sweep 0.55 Mc to 17.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Jul.1964 | **M(3000)F2** | 0.01 | 135° E Mean Time (G. M. T. +9h) | Yamagawa | Lat. 31° 12. 1'N | Long. 130° 37. 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	I305S	310	J310S	J325S	I345S	I325A	370	I345S	320S	350	S	A	A	A	A	A	A	A	A	I320S	I330S	A	S	295
2	S	S	S	S	S	S	I340S	355S	I345S	310S	310S	310S	300	A	S	S	S	S	I330S	I320H	S	S	S	S
3	S	S	S	305S	305	310S	I335S	C	C	A	A	A	A	S	A	I295S	265S	I300S	310S	S	S	S	300S	S
4	S	285	S	S	S	J345S	I330S	S	S	335	A	290S	295S	I285A	I310S	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	SH	S	S	S
6	A	S	A	A	A	A	C	C	A	A	S	C	A	A	C	J285S	315	S	A	A	S	S	S	S
7	S	S	S	S	I325S	I330S	I345S	355	S	A	A	C	A	A	A	A	A	A	A	A	S	S	S	S
8	S	S	S	S	380	300	I330A	290S	A	S	A	305	S	A	S	J270S	305	335S	330	I320S	I335S	I300S	S	S
9	S	S	S	A	A	320	A	A	A	A	A	A	A	305	A	A	A	315	300S	325S	S	S	S	S
10	S	A	A	S	I325A	295	S	S	A	S	A	A	S	I295S	280	315	A	S	A	A	S	S	S	S
11	S	S	I295S	305S	I310S	I330S	I325S	J355S	S	A	A	A	A	A	285	310S	A	A	A	A	S	S	S	A
12	S	A	A	A	A	340	I330S	I330S	325	A	A	A	S	S	A	A	305	A	A	A	A	S	S	S
13	S	A	S	S	S	355	S	S	S	S	C	A	A	S	S	S	S	A	A	S	S	S	S	S
14	S	S	S	I315A	I320S	330	I310S	I315S	355S	S	A	A	S	I300C	I285S	325	S	S	S	S	S	S	S	S
15	S	A	A	S	S	S	I320S	I320S	310S	315S	A	I295S	320	I310A	S	S	S	J295S	S	S	I350S	I335C	S	C
16	S	S	S	C	S	320	I330S	I310S	I360S	S	C	305	I290S	I290S	I305S	315S	305S	S	S	S	S	I310S	I290A	I295C
17	I295C	I290S	305S	310F	315	I290S	I320S	345	I355C	S	S	A	S	A	290	I290S	S	S	S	S	S	S	S	S
18	S	S	S	A	A	I325A	335S	I345S	355S	C	C	C	C	I290S	290S	S	S	320S	S	C	S	C	C	C
19	C	C	C	S	S	S	SH	S	355	A	A	A	C	C	S	J315S	I320S	300	S	S	S	S	S	S
20	S	S	S	S	A	340	S	S	S	C	C	C	C	C	I285S	J310S	325S	320	335	370	340S	305S	I295S	I310S
21	J335S	S	S	275	335S	I340S	345S	J355S	J355S	A	A	A	A	290S	280	290	290S	I320S	I330S	345S	S	S	285H	S
22	S	S	325	F	280	295S	315	385S	J370S	300S	S	C	C	C	C	320	325S	295	300	285	I325S	345	325	285S
23	290F	290	310S	S	A	A	315	310S	I320A	I330A	345	A	A	A	275	A	A	I320A	285	I300A	A	A	A	S
24	S	A	S	F	F	J285S	310	310	350	305	355	320R	S	A	A	300	295	315	325	I340S	J355S	275	285	305
25	I290A	I305A	J310S	310	335S	I335A	370	I320A	305	340	325	275	I310A	275	275	J285S	300	305	I300S	J300S	310S	J315S	A	S
26	S	S	I285S	F	F	335	330	305S	370	355	295	I315S	I325A	A	290	310	305	320	290S	325S	I325C	I325S	315	275S
27	I290S	A	A	F	F	F	365	345	A	A	A	295	310	305	280	I310A	I330A	A	A	I300S	330	A	A	305
28	S	F	F	F	F	J350S	355	J340S	365	G	G	G	285	345	310	I310R	295	I290S	300	J335S	J350S	I325A	300S	J325S
29	S	A	A	S	A	A	315	I330S	J340S	I340A	I330A	300	285	315	I315A	305	290	A	A	S	325S	J375S	A	S
30	A	S	A	310F	320	F	310	320	270S	295	I340S	330	275	285	J265S	335	290	J280S	I305A	I330S	375	A	S	S
31	I315S	I315S	I325A	345	F	340	340	325	350	360	A	A	A	275	J295S	315	I310A	I325S	I340S	335	I320S	325	I305S	I295A
No.	7	6	8	9	12	22	24	22	19	13	8	12	10	14	17	20	17	16	14	15	13	11	9	9
Median	U295	U300	310	310	320	330	330	330	350	330	330	300	300	290	285	310	305	315	310	325	330	325	300	295
U. Q.																								
L. Q.																								
Q. R.																								

Sweep 0.55 Mc to 17.0 Mc in 20 sec in automatic operation

M(3000)F2

The Radio Research Laboratories, Japan

Y 7

IONOSPHERIC DATA

Jul.1964 | M(3000)F1 | 0.01 | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31°12.1′ N, Long. 130°37.1′ 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								L	I380S	I380A	A	A	A	A	A	A	A	A	A	L				
2								365	I390S	I390A	385	410	A	A	C	425	I410S	A	A					
3							345	C	C	A	A	A	A	A	A	A	390S	A	A					
4								L	385	A	A	C	C	A	C	C	C	C	C	C				
5							C	C	C	C	C	C	C	C	C	C	C	C	C					
6							C	C	A	A	A	C	A	A	C	A	A	A	A	A				
7							A	I380S	S	A	A	C	A	A	A	A	A	A	A					
8								345	I380A	A	A	A	A	A	A	A	S	A	A					
9							A	A	A	A	A	A	A	C	A	A	A	I370S	I340S	A				
10								L	A	A	C	A	C	C	C	C	A	A	A					
11								L	A	A	A	A	A	A	C	A	A	A	A					
12							L	L	A	A	A	A	A	A	A	A	A	A	A					
13							L	L	SH	C	C	A	A	I420C	425	I395A	395	A	A					
14								I370H	I380A	A	A	A	A	C	A	A	A	A	A					
15								A	S	A	A	A	C	A	C	I400C	I375S	360	360S	L				
16								S	I360A	LH	C	A	C	C	C	C	430H	365	360	L				
17								360	I380C	385	A	S	C	C	A	A	I385C	S	S					
18							L	S	370	C	C	C	C	C	C	C	C	390S	360	C				
19								400L	A	A	A	A	C	C	C	C	C	I365C	345	L				
20								A	S	C	C	C	C	C	A	C	375	370	355					
21								370L	405	A	A	A	A	A	I345A	370	A	395	A					
22							L	L	L	425	405	C	C	C	C	360	365	350	355					
23								A	A	A	A	I380A	A	A	A	A	A	A	A					
24								350	385	400	420	375	I420S	A	A	395	390H	360	I365A	L				
25								A	I370A	355	A	A	A	I395A	380	370R	375	375	I365A	355				
26								355	385	410	445	S	A	A	I395A	390	A	A	A					
27								A	A	A	A	410	I390A	I385A	I390A	A	A	A	A					
28							L	380	400	385	405	435	385	405R	I420R	380	390	370	375					
29							L	A	A	A	A	380R	440	A	A	A	A	A	A					
30								I365A	345	A	A	A	380	I390A	A	A	A	A	A					
31								I345A	I370A	390	A	A	A	A	A	A	A	A	A					
No.							1	12	15	9	5	6	5	5	6	9	11	11	10	1				
Median							345	365	U380	390	405	395	390	U395	U390	390	390	370	360	355				
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

M(3000)F1 Sweep 0.55 Mc to 17.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Jul. 1964 | h'F2 km | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31°12.1′ N, Long. 130°37.1′ 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								250	330	275	A	A	A	A	A	A	A	A	A	275				
2								250	I290S	350	360	360	395	A	S	425	330	275	I245A					
3							S	C	C	A	A	A	A	A	A	I345A	405	A	320					
4								350	275	300	A	E400S	E360S	A	325	C	C	C	C	C				
5							C	C	C	C	C	C	C	C	C	C	C	C	C					
6							C	C	A	A	A	C	A	A	C	A	300	A	A	A				
7							A	250	S	A	A	C	A	A	A	A	A	A	A					
8								395	I345A	A	A	350	A	A	A	S	330	U300C	U305C					
9							A	A	A	A	A	A	A	U355C	A	A	A	E325S	320	280				
10								275	A	S	A	A	A	I380A	375	325	I330A	330	A					
11								255	A	A	A	A	A	A	420	350	A	A	A					
12							290	240	E300A	A	A	A	A	A	A	A	E370S	A	A					
13							245	240	I340S	C	C	A	A	C	425	S	S	A	A					
14								270	260	275	A	A	A	C	C	325	A	A	A					
15								I340A	I340C	C	I385A	A	325	A	S	S	S	370	I305S	235				
16								S	260	S	C	E360A	380	335	300	300	330	340S	255	235				
17								275	I250C	C	C	A	C	A	350	345	340	I300S	S					
18							250	I270S	255	C	C	C	C	390	380	300	275	300	285	C				
19								250	E300A	A	A	A	C	C	300	325	325	355	275	275				
20								240	255	C	C	C	C	C	A	300	280	300	275					
21								250	245	A	A	A	A	350	370	350	345	255	260					
22							305	225	250	350	S	C	C	C	C	295	275	300	310					
23								345	I320A	I295A	280	A	A	A	405	A	A	I310A	250					
24								335	275	375	275	330	S	A	A	350	330	300	295	240				
25								A	345	290	310	410	A	440	445	390	335	345	300	300				
26								360	245	290	410	I350S	A	A	390	310	305	E305A	340					
27								265	A	A	A	380	340	350	400	I335A	I305A	A	A					
28							255	285	250	G	G	G	405	285	345	310	420	I420S	375					
29							350	270	305	I320A	A	370	405	335	I330A	340	400	A	A					
30								325	375	290	255	310	415	355	340	260	E350A	390	A					
31								300	275	260	A	A	A	375	340	295	A	A	A					
No.							6	25	21	13	8	10	8	11	17	20	18	17	16	7				
Median							270	270	275	295	335	E360	390	355	370	325	330	E305	300	275				
U.Q.																								
L.Q.																								
Q.R.																								

h'F2

Sweep 0.55 Mc to 17.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 9

IONOSPHERIC DATA

Jul.1964 | h'F | km | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31°12.1' N, Long. 130°37.1' 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	295	300	310	250	210	A	225	205	205	A	A	A	A	A	A	A	A	A	A	250	I220A	A	290	300
2	260	295	I285A	255	250	250	250	245	I220A	I240A	225	250	A	A	A	200	I240A	I225A	I220A	200H	245	255	250	260
3	I250A	260	260	260	300	300	245	C	C	A	A	A	A	A	A	A	220	A	A	A	A	225	300	320
4	I335A	325	I295A	280	280	250	230	A	215	A	A	A	A	A	A	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	230	215H	250	A	A
6	A	A	A	A	A	A	C	C	A	A	A	C	A	A	C	A	A	A	A	A	A	I225A	250	295
7	255	I305A	I295A	255	255	240	I255A	I220S	A	A	A	C	A	A	A	A	A	A	A	A	A	A	U290C	U300C
8	U300C	280	U330C	I280A	225	330	A	250	I250A	A	A	A	A	A	A	A	A	A	A	A	I285A	I290A	U305C	I330A
9	I360A	U300C	U240C	A	A	E275A	A	A	A	A	A	A	A	A	A	A	A	I250A	I240A	A	A	A	A	A
10	330	I305A	A	230	A	320	280	265	A	A	A	A	C	A	A	A	A	A	A	A	240	A	A	295
11	I320A	I300A	290	295	300	I260A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	I245A	A	A	A
12	A	A	A	A	A	275	240	I240A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
13	A	A	290	300	250	215	215	215	200H	E250A	C	A	A	I220A	200	I220A	220	A	A	A	A	A	A	245
14	A	A	S	I290A	250	295	230	245H	I240A	A	A	A	A	C	E290A	I240A	I225A	A	A	A	A	A	A	A
15	A	A	A	300	U250C	I300C	I265A	A	A	A	A	A	A	A	180	225	I245A	230	230	235	200	I240C	I290A	C
16	A	I290A	A	C	S	E295A	225	255	A	195H	I220C	A	A	A	C	A	190H	230	215	215	225	A	I340A	I355C
17	C	300	285	255	250	E290S	245	240	225	215	A	A	A	A	A	A	215	A	A	A	I245A	220	I255A	280
18	275	S	A	A	A	I265A	225	E250S	200	C	C	C	C	C	240	I245A	230	220	220	I250C	250	C	C	C
19	C	C	C	300	250	270	245H	225	A	A	A	A	C	C	C	A	I225A	E270A	250	250	225	I235A	I280A	I315S
20	325	I275A	I245A	250	I265A	250	235	I240A	235	C	C	C	C	C	A	A	245	245	240	215	240	255	305	290
21	290	300	275	300	255	250	250	245	220	A	A	A	A	A	A	250	E300A	225	I245A	225	I240A	250	275H	300
22	345	300	260	245	E340A	E300S	250	230	210	185	195	C	C	C	C	235	265	E250A	200	300	250	210	250	E305S
23	E345S	350	300	240	A	A	E290A	A	A	A	A	I245A	A	A	A	A	A	A	A	A	A	A	A	A
24	A	A	E250A	250	235	E275A	250	225	210	200	200	260	I205S	A	A	205	210H	E275A	A	240	210	E325A	300	300
25	I355A	I345A	315	E340A	260	A	250	A	I255A	250	A	A	A	I215A	225	220	225	225	I230A	230	270	245	A	A
26	A	A	350	255	255	245	240	225	220	200	195	S	A	A	I245A	225	A	A	A	250	I230C	240	290	350
27	310	I305A	I265A	300	250	270	240	A	A	A	A	220	I230A	I245A	I230A	A	A	A	A	A	255	A	A	300
28	305	270	285	260	260	285	230	205	200	185	230	180	250	195	215	225	210	220	240	250	215	A	305	290
29	320	A	A	E250A	A	A	260	E250A	A	A	A	245	180	A	A	A	A	A	A	A	270	230	A	A
30	A	A	A	290	250	255	255	A	275	I210A	I235A	I215A	250	A	A	A	A	A	A	260	225	A	A	275
31	280	300	I250A	220	230	270	250	I245A	I255A	E250A	A	A	A	A	A	A	A	A	A	235	I240A	240	I295A	I345A
No.	18	19	20	24	21	21	25	18	17	9	7	7	5	4	7	11	14	9	11	16	22	15	17	19
Median	310	300	285	260	250	270	245	240	220	200	220	245	230	U220	225	225	225	225	230	240	240	240	290	300
U.Q.																								
L.Q.																								
Q.R.																								

h'F | Sweep 0.55 Mc to 17.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 10

IONOSPHERIC DATA

Jul. 1964 | h'Es | km | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31°12.1' N, Long. 130°37.1' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	S	S	S	100	100	100	100	120	120	115	110	105	100	100	100	100	100	100	100	110	100	S
2	S	100	100	S	S	S	G	145	105	130	140	125	125	120	120	130	120	115	110	105	S	S	S	100
3	100	S	S	S	S	100	G	C	C	105	110	105	105	100	115	115	125	115	110	110	105	105	105	110
4	105	105	105	105	100	105	130	105	105	130	120	125	120	115	110	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	S	110	110	100
6	100	105	100	105	100	100	C	C	105	105	105	C	105	105	C	105	100	125	120	115	115	100	100	S
7	100	105	105	100	105	125	115	115	110	110	110	C	110	110	110	105	105	105	105	100	100	U100C	U100C	U100C
8	U110C	S	S	S	105	110	110	105	105	105	105	105	105	105	100	100	100	U100C	U100C	U100C	U100C	U100C	U100C	U105C
9	U105C	U105C	U105C	U100C	U100C	U130C	U130C	U125C	U125C	U120C	U115C	U110C	U110C	U110C	U105C	105	105	130	105	100	100	105	105	105
10	105	100	100	S	100	100	140	140	120	115	105	105	115	115	120	125	115	110	105	105	100	100	100	100
11	110	110	100	100	S	110	110	110	105	105	110	110	105	105	110	100	125	120	120	115	110	100	100	100
12	100	105	105	110	105	110	125	120	120	115	110	110	120	125	115	110	110	110	105	105	100	100	100	100
13	110	105	105	110	110	105	105	160	105	150	C	125	120	135	150	140	135	115	110	110	110	105	105	105
14	105	105	S	100	105	105	135	150	105	135	130	125	130	C	145	145	130	125	120	U115C	115	U115C	C	C
15	U115C	C	110	115	S	S	U150C	U145C	C	C	105	100	100	100	100	100	125	130	110	95	100	C	100	C
16	100	100	100	C	S	115	135	115	105	110	100	100	160	120	125	120	G	125	110	105	105	U110C	115	C
17	C	110	110	S	E	S	S	140	125	130	115	110	120	105	105	105	G	135	105	105	105	S	C	105
18	S	S	100	100	100	100	130	120	130	120	C	C	130	130	145	130	C	130	130	C	S	C	C	C
19	C	C	C	100	S	110	S	105	105	105	105	105	105	C	C	145	135	125	120	120	S	115	110	S
20	105	105	105	105	105	105	105	120	120	120	110	125	C	C	120	125	135	125	120	110	105	100	110	S
21	105	105	105	105	100	100	150	105	140	125	120	115	115	125	120	120	120	135	115	105	105	105	105	105
22	105	105	100	105	105	145	140	145	105	105	105	C	C	C	C	120	125	120	110	100	100	100	100	100
23	110	110	110	105	105	105	145	130	125	115	110	125	110	120	100	125	120	115	115	110	110	110	105	100
24	100	130	100	110	110	110	105	110	135	130	130	115	S	105	110	G	110	120	115	115	100	100	100	100
25	105	115	115	110	110	105	105	105	130	125	125	120	115	125	140	G	150	130	110	105	105	100	105	110
26	105	100	100	100	110	105	150	105	135	130	125	S	120	120	120	120	110	110	105	100	C	100	100	125
27	110	105	105	105	100	100	100	125	120	110	105	105	110	110	110	130	125	120	110	110	105	105	105	100
28	100	100	100	E	E	100	105	105	100	145	145	100	170	135	120	105	140	125	120	115	100	110	125	120
29	120	110	110	110	105	100	110	105	120	105	105	105	110	145	125	125	150	130	125	110	115	115	115	110
30	110	105	105	105	105	110	125	125	125	125	120	120	125	125	125	120	120	110	110	110	105	105	110	105
31	105	105	105	105	E	105	120	120	120	120	115	110	110	120	120	120	120	115	115	115	110	110	130	115
No.	25	24	25	22	20	27	25	28	28	29	28	26	27	26	27	27	26	29	29	28	25	26	27	22
Median	105	105	105	105	105	105	125	120	120	120	110	110	115	120	120	120	120	120	110	110	105	105	105	105
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

Sweep 0.55 Mc to 17.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 11

IONOSPHERIC DATA

Jul. 1964 | Types of Es | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31°12.1′ N, Long. 130°37.1′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		f	f	f	f	f2	13	12	1	h 1	h2	c2	c2	c3	12	12	12	12	1	12	f	f2	f	
2		f2	f					h 1	1	h 1	h	h	h	h 1	h	h	h 1	c	c3	c2	f	f	f	f
3	f					f				c2	c3	12	12	1	h 1	h	h 1	c2	c2	f3	f4	f2	f	f
4	f3	f2	f	f2	f2	f2	h 12	12	1	h2	h2	h	h	c	c									
5																						f	f3	f3
6	f	f3	f	f2	f2	f			12	12	c		c2	c4		12	1	h 12	h 13	h213	f f2	f2	f2	f
7	f	f2	f2	f	f	f	c3	c2	c	c 1	c3		c	c3	c2	c3	12	13	12	f2	f3	f3	f2	f2
8	f	f	f		f	f2	c2	c2	c2	1	12	1	1	12	1	12	12	12	12	f2	f2	f	f2	f
9	f3	f2	f2	f2	f2	f2f	h 1	c2	c2	c2	c2	c	c2	c	1	12	12	h 12	1	12	f3	f2	f3	f2
10	f	f	f2		f2	f	h 12	h 1	h 1	c 1	12	13	c	c	c	c	c	c3	1	f2	f2	f	f3	f
11	f2	f2	f2	f		f2	c2	c2	c2	c	c2	1	1	12	1	1	h5	h3	h2	f2	f2	f2	f2	f
12	f	f2	f	f2	f	f	h2	h 1	h 1	c21	c2	c2	c	c2	c	c3	c2	c3	c2	f	f2	f	f2	f
13	f	f2	f2	f	f2	f	12	h 1	12	h		h	h	h	h	h2	h	c2	c3	f2	f2	f2	f3	f2
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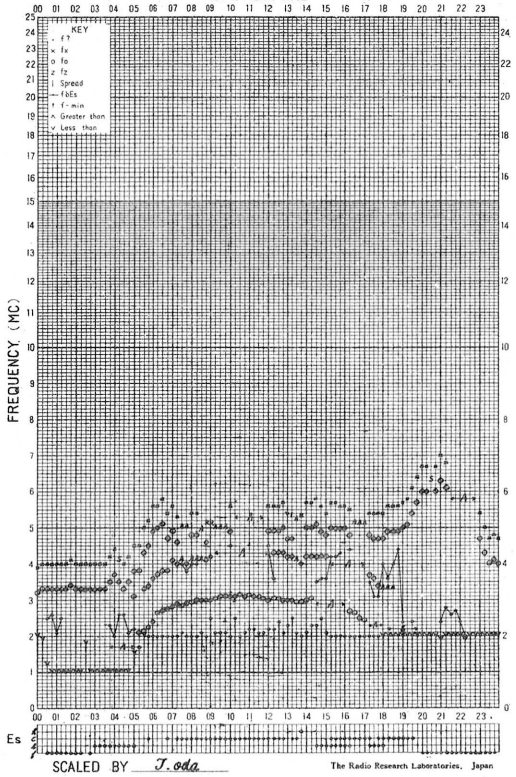
STATION WAKKANAI 135°E MEAN TIME DATE JUL. 1.1964



SCALED BY T. Oda

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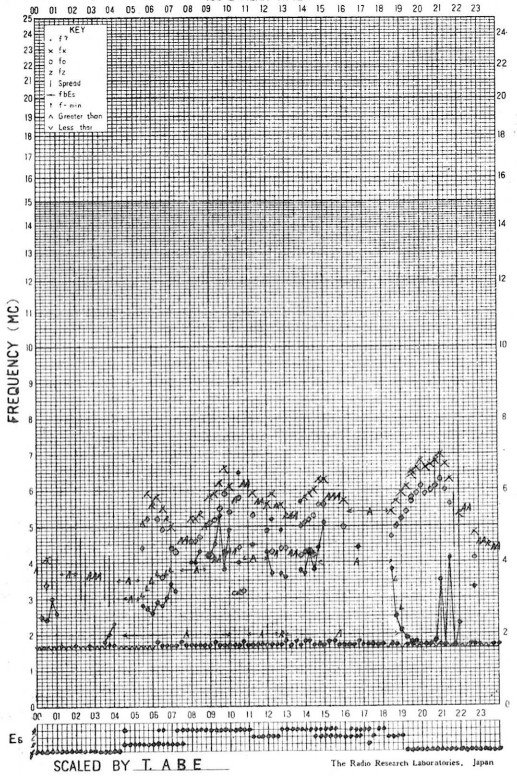

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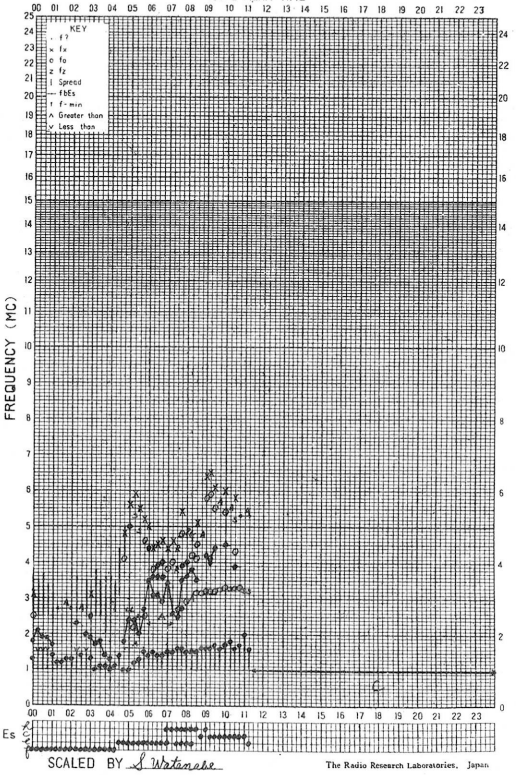

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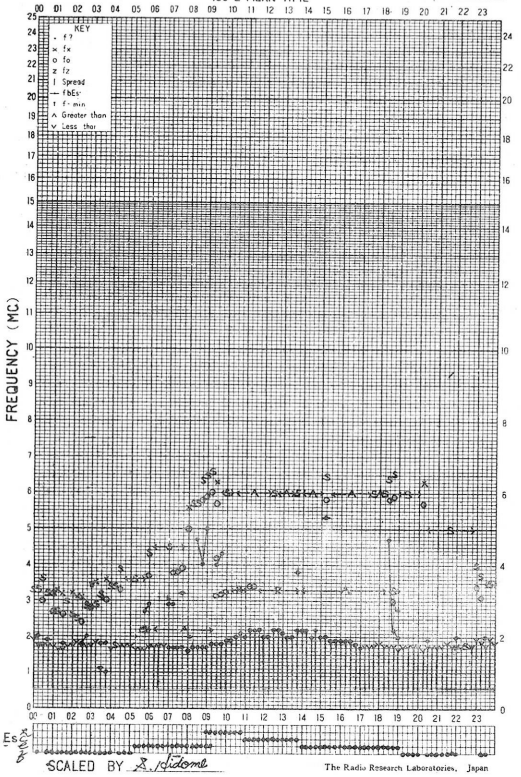
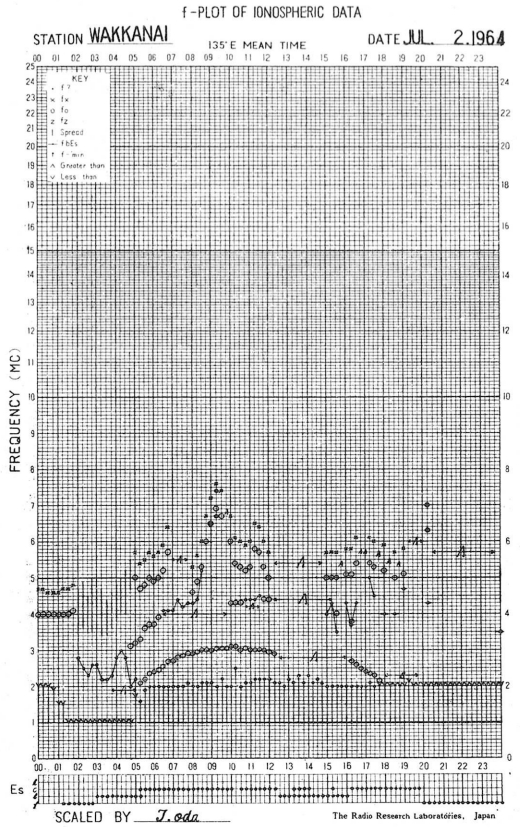


SCALED BY S. Kitamura

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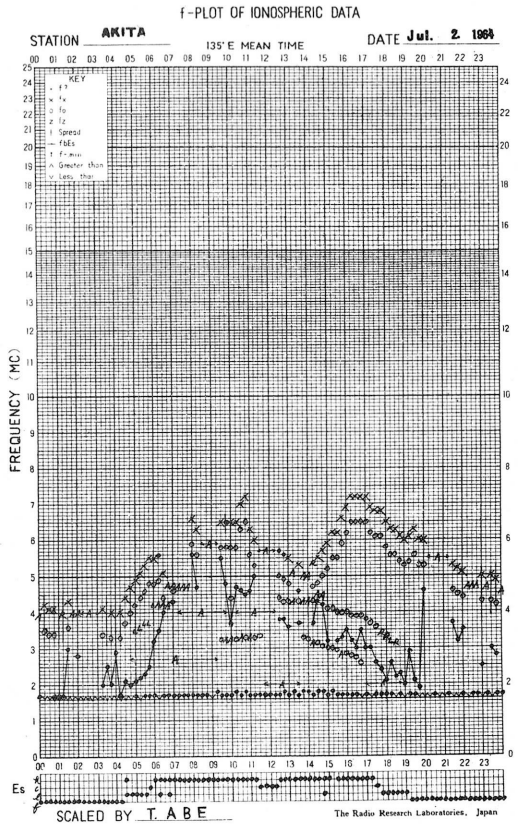
SCALED BY T. oda
The Radio Research Laboratories, Japan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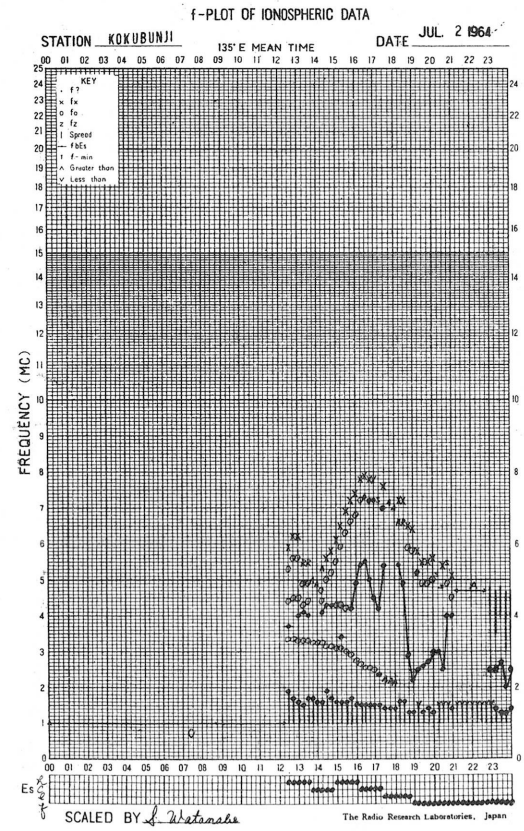
The Radio Research Laboratories, Japan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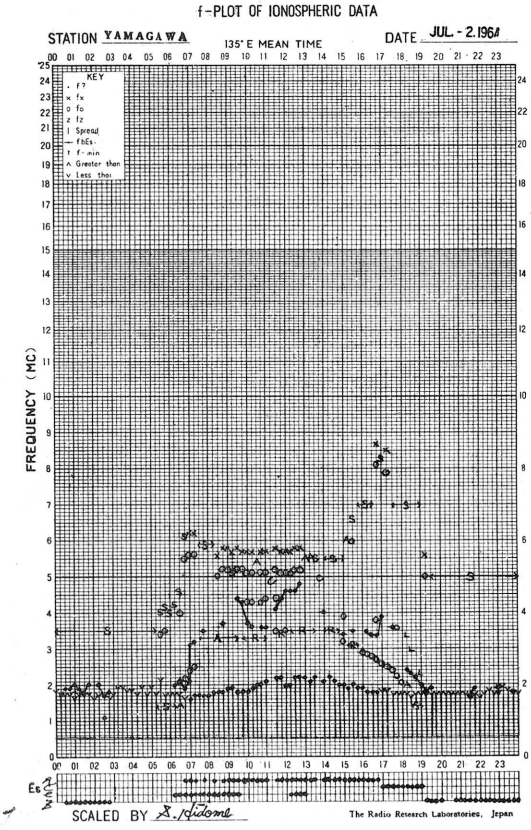
The Radio Research Laboratories, Japan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The Radio Research Laboratories, Japan

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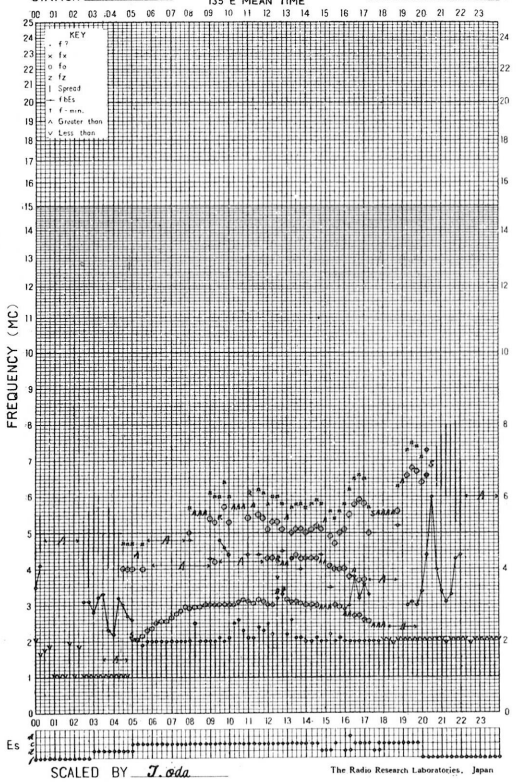

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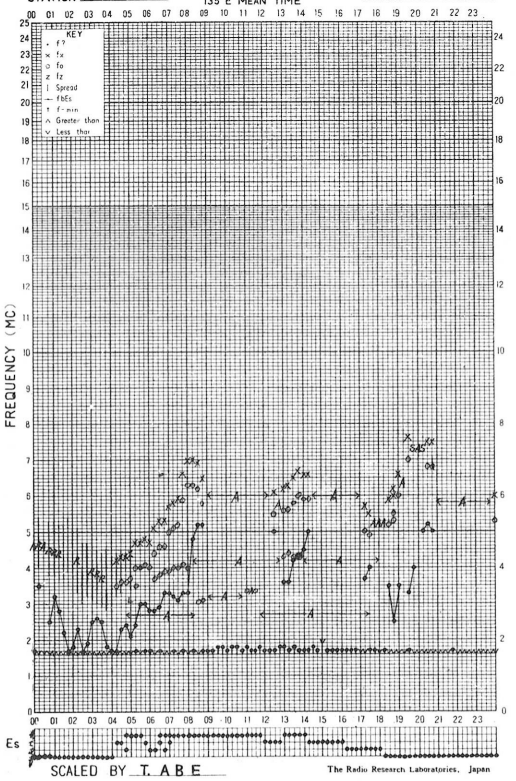

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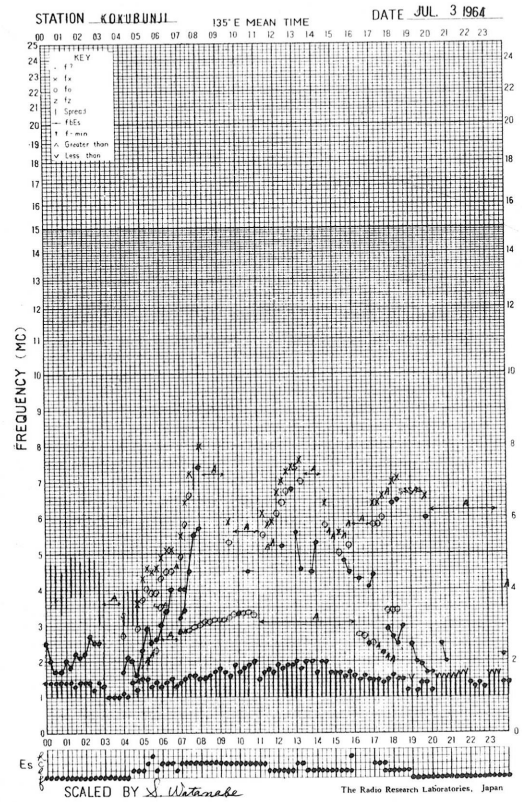

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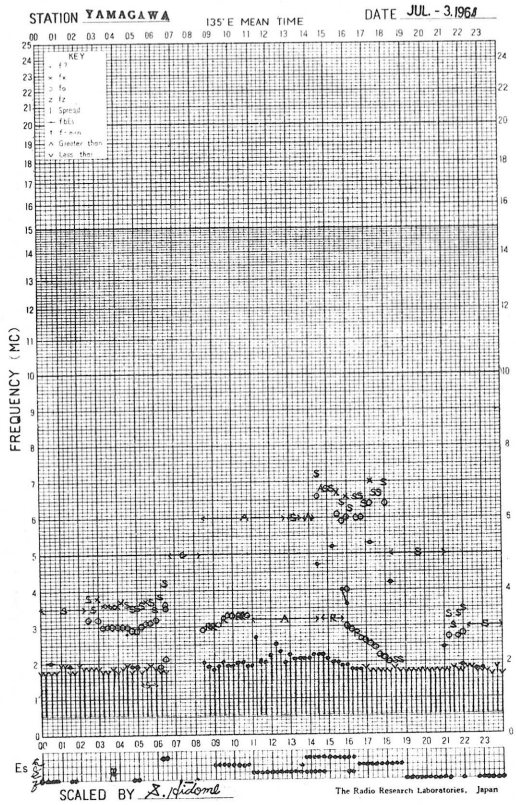

SCALED BY S. Ichitomi The Radio Research Laboratories, Japan

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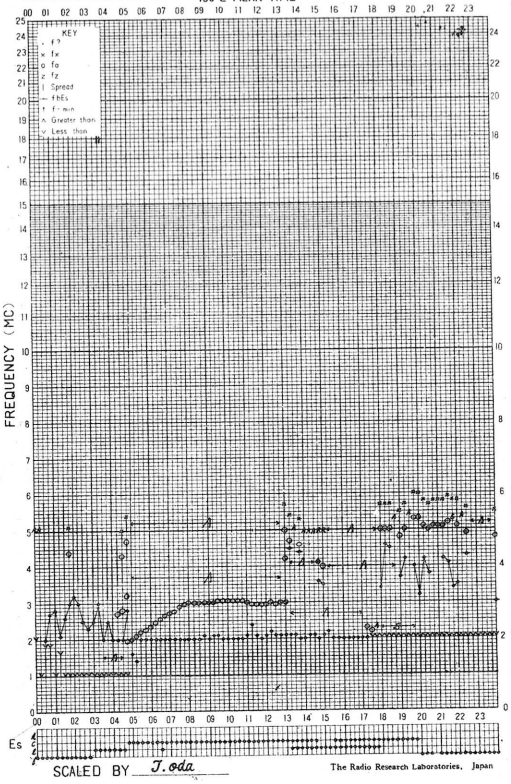

SCALED BY J. oda

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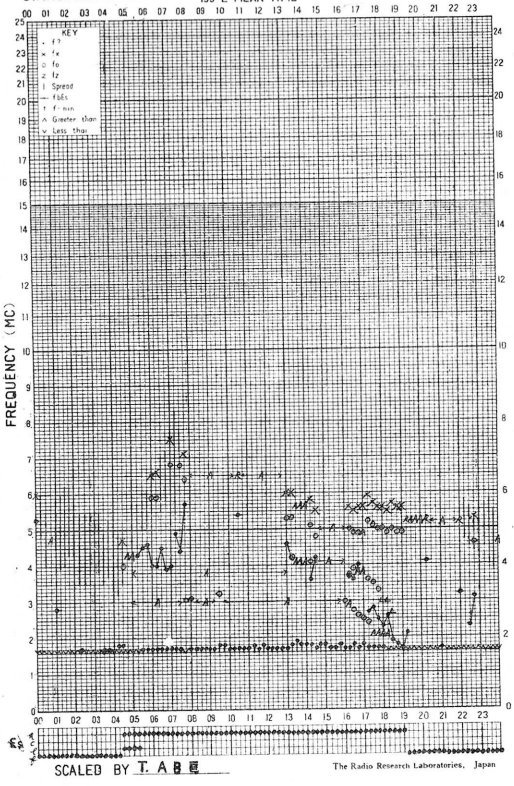

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The Radio Research Laboratories, Japan

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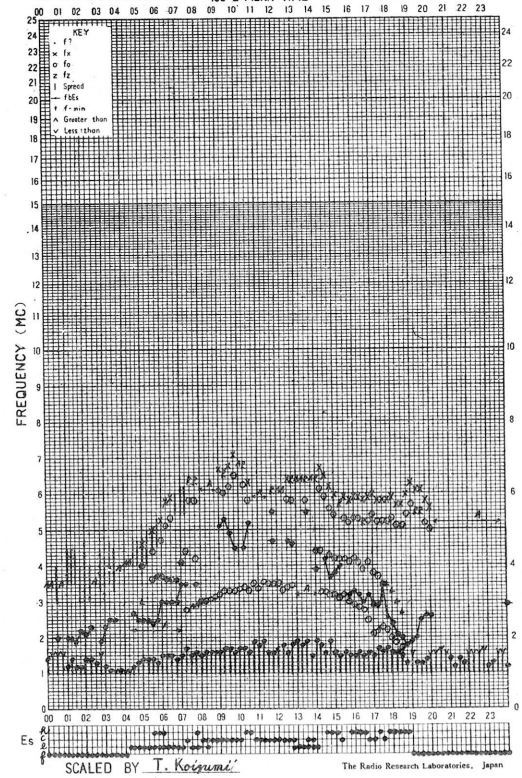

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The Radio Research Laboratories, Japan

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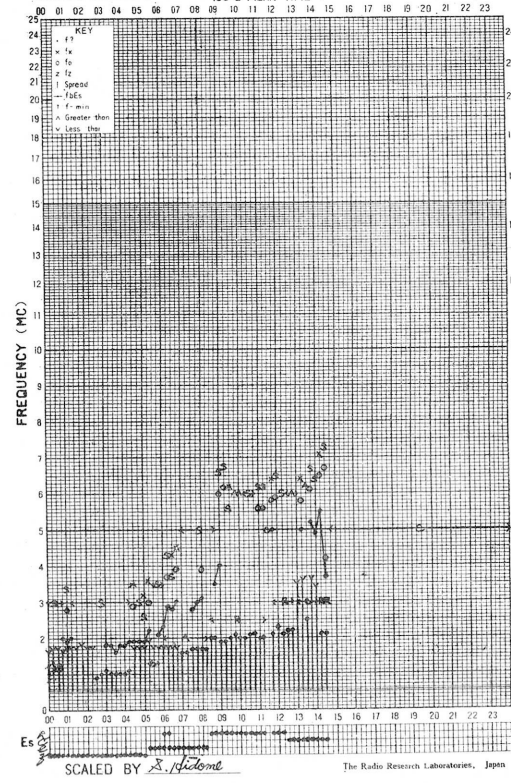

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The Radio Research Laboratories, Japan

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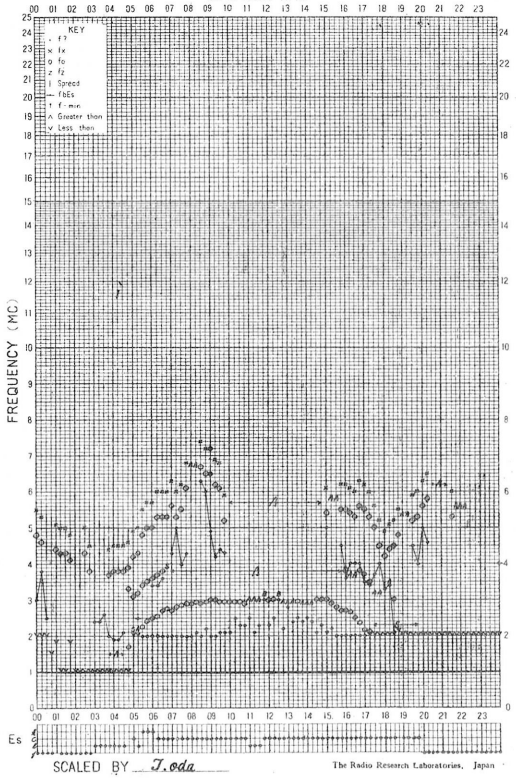
135°E MEAN TIME



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The Radio Research Laboratories, Japan

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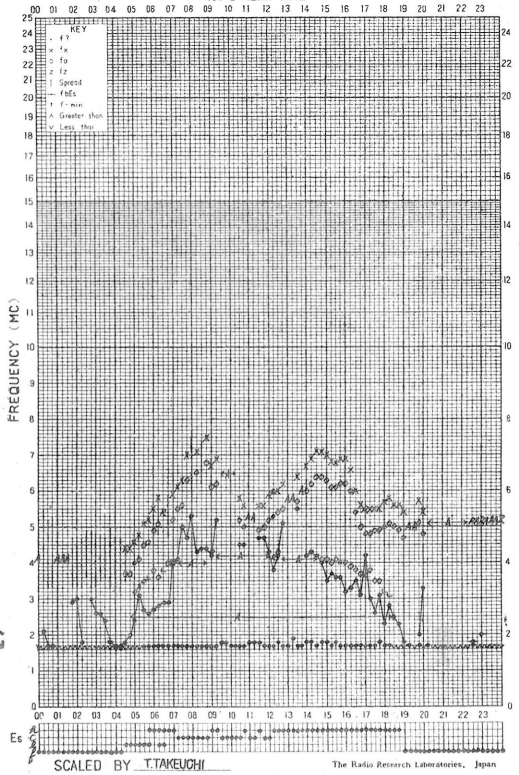

SCALED BY T. TAKEUCHI

The Radio Research Laboratories, Japan

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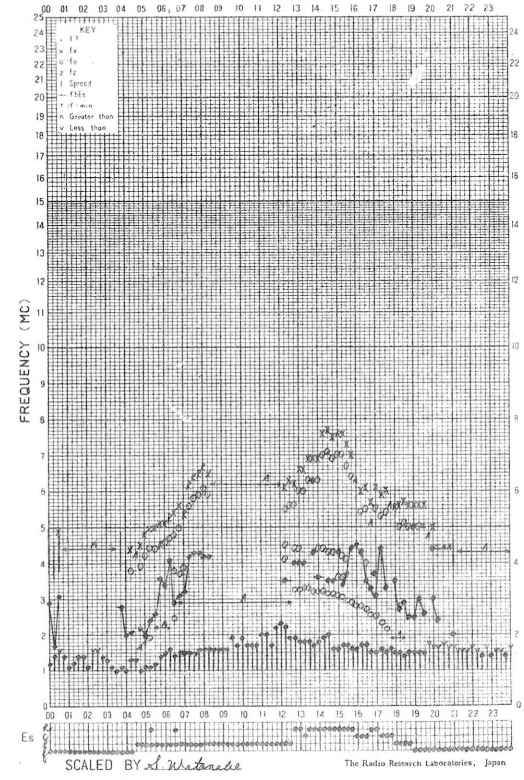

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The Radio Research Laboratories, Japan

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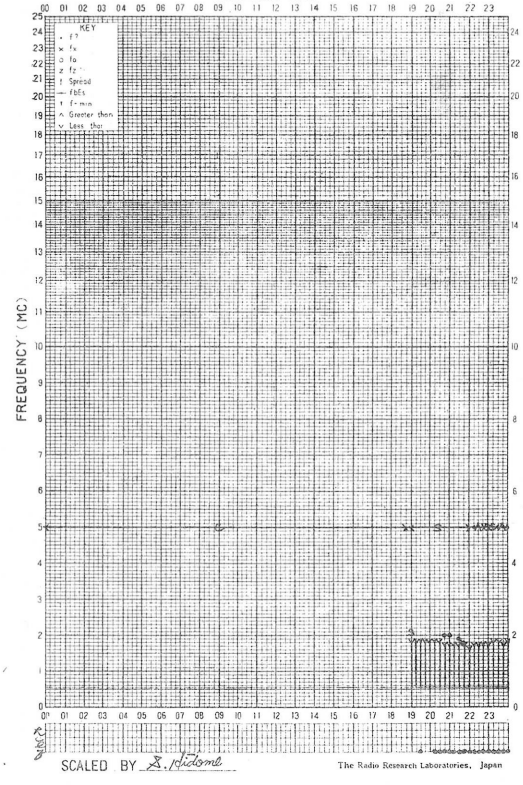

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The Radio Research Laboratories, Japan

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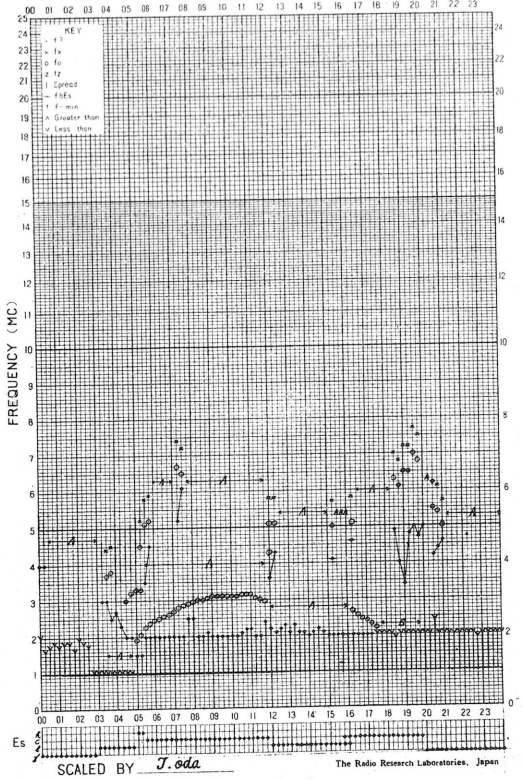

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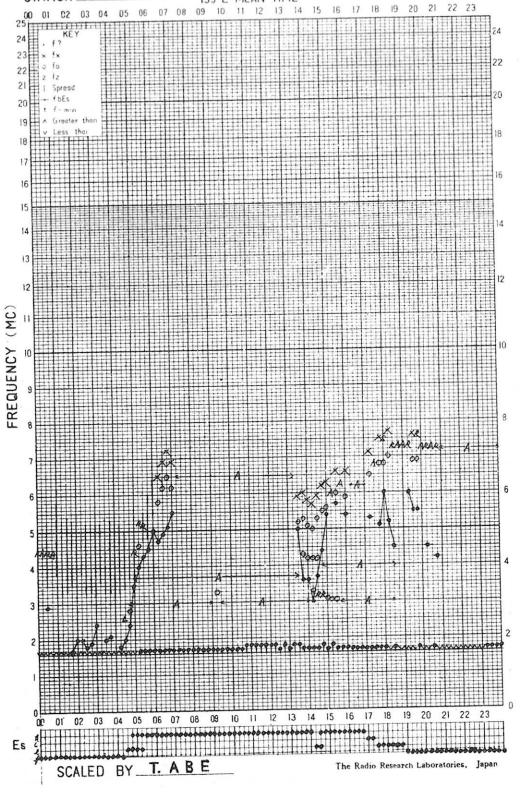

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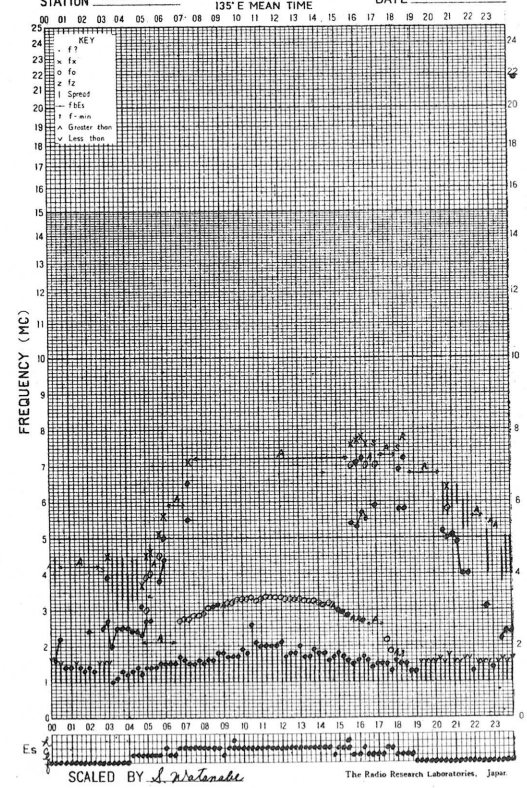

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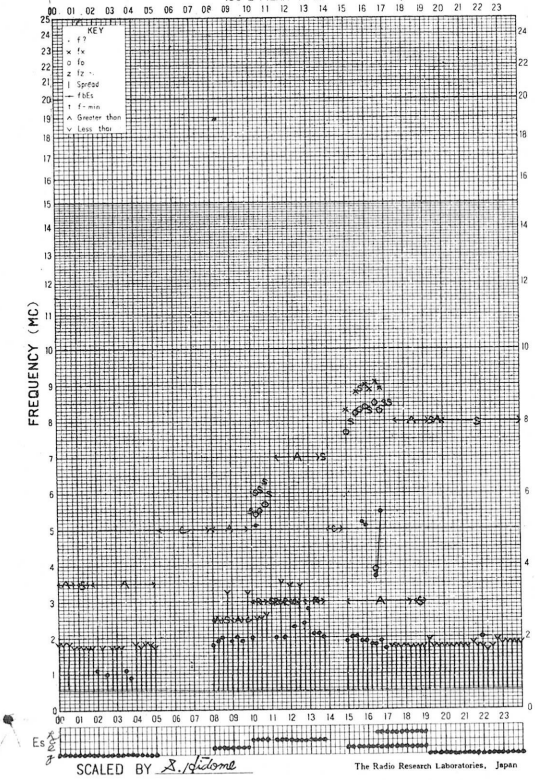

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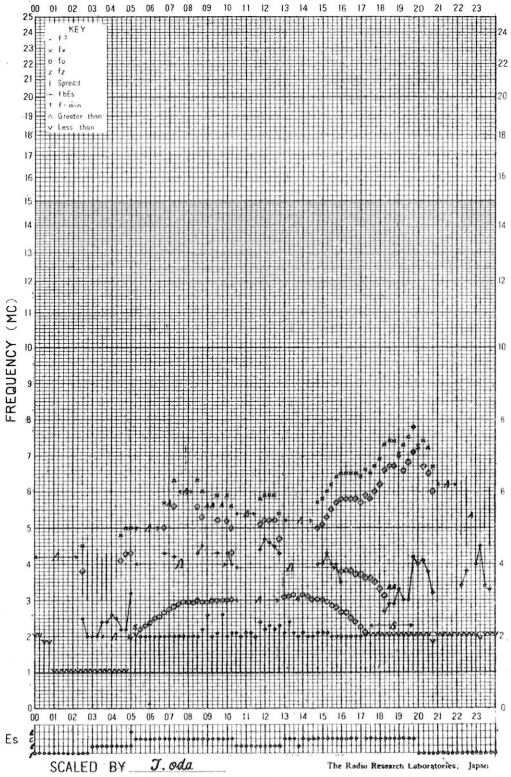

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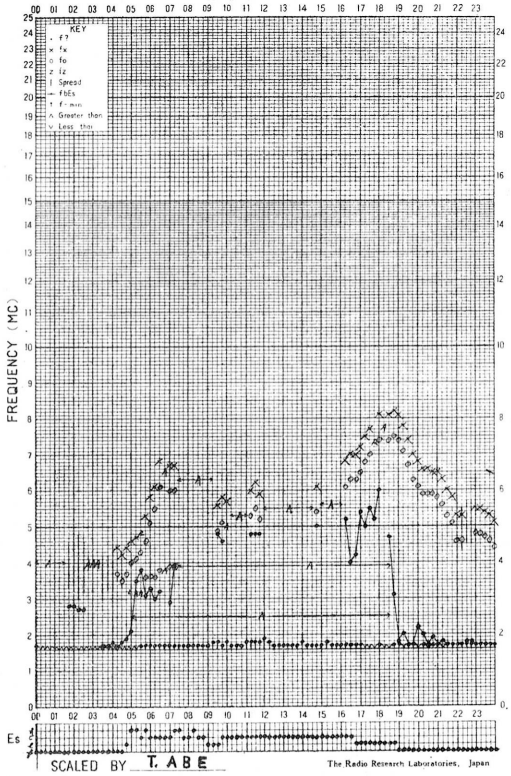

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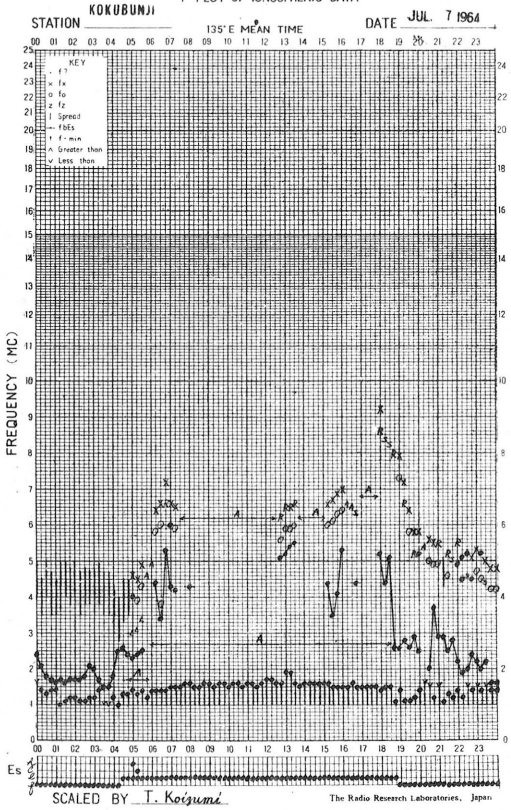

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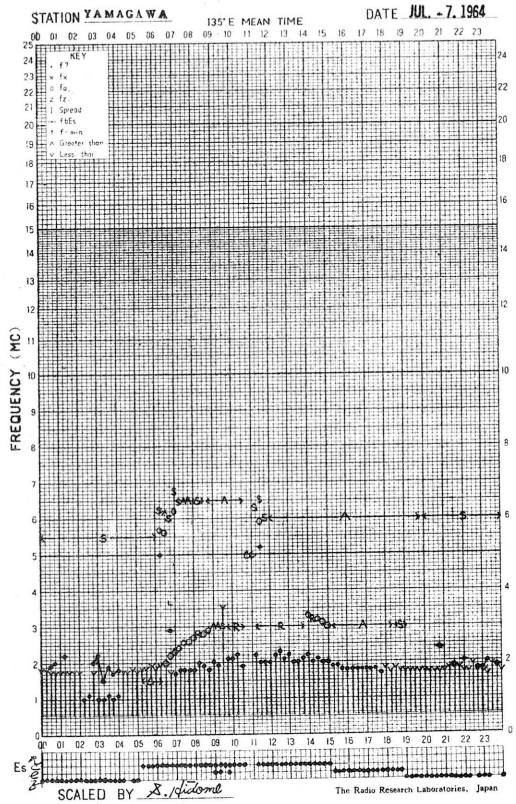

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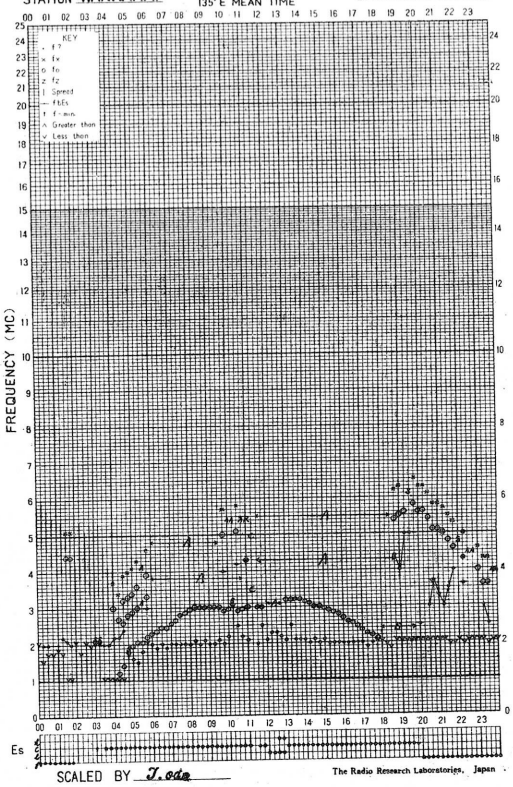

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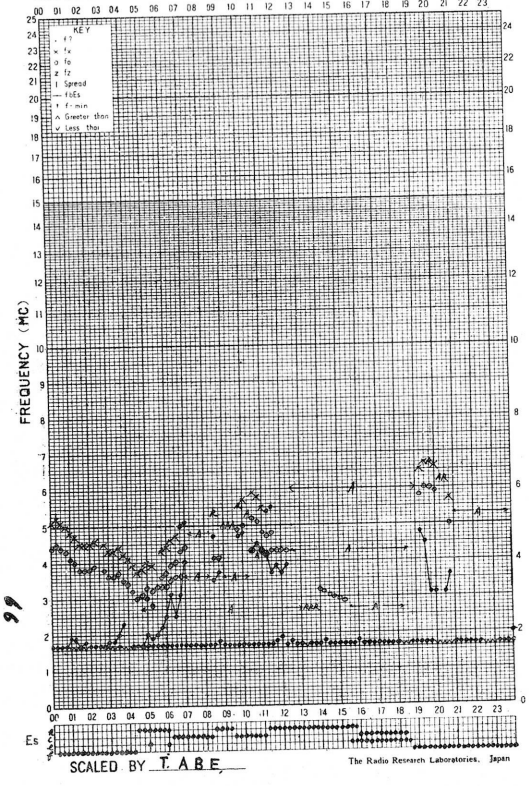

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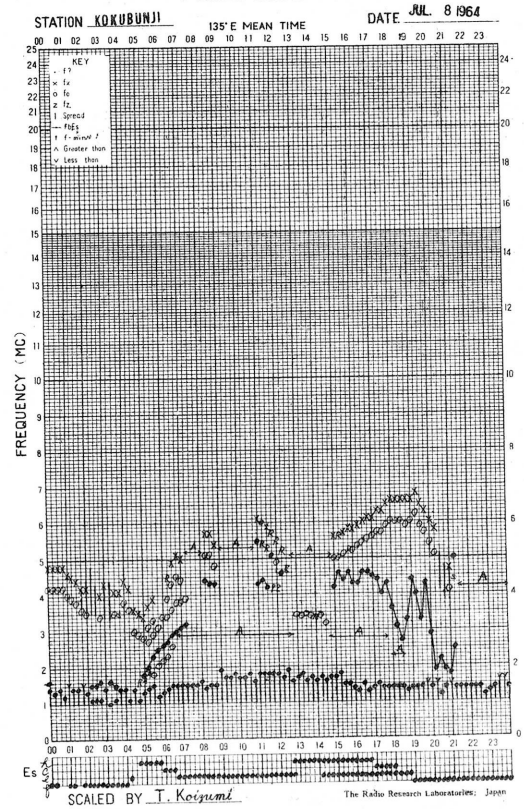

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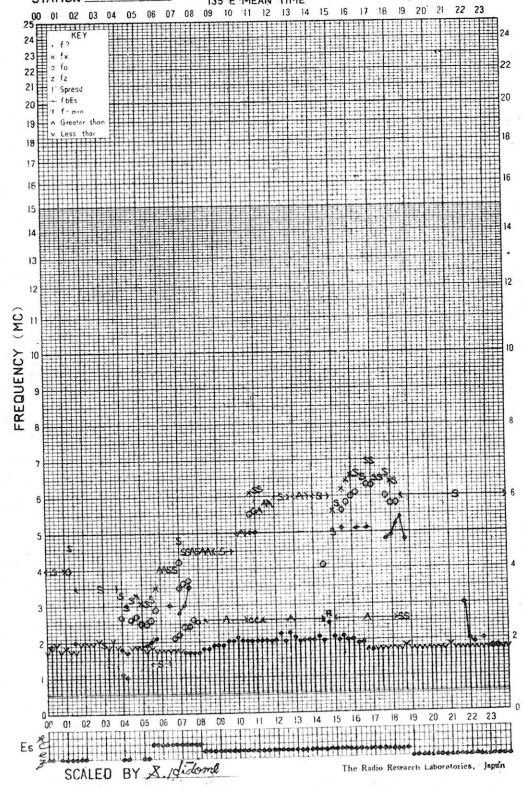

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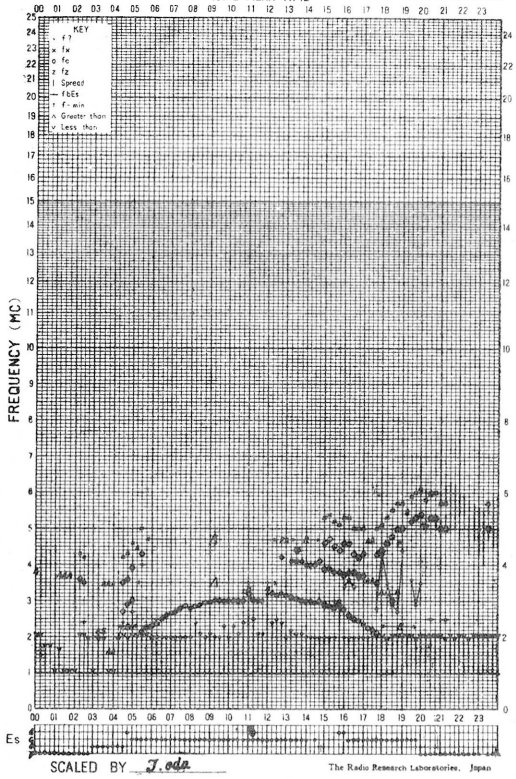

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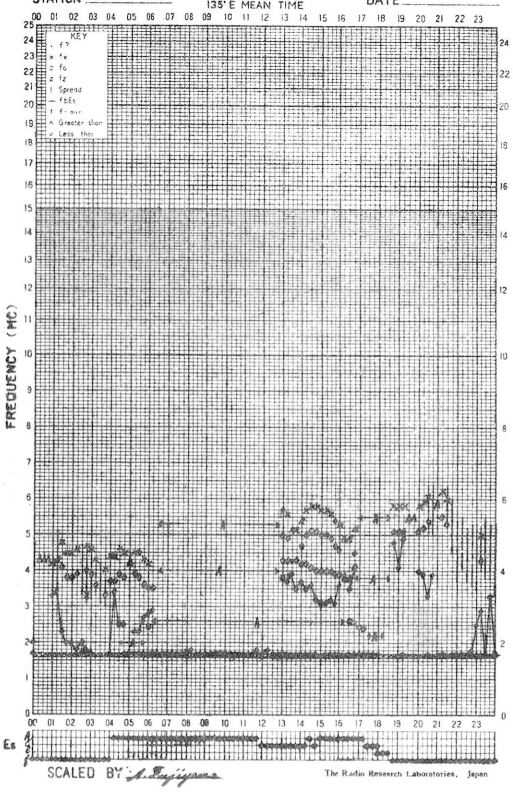

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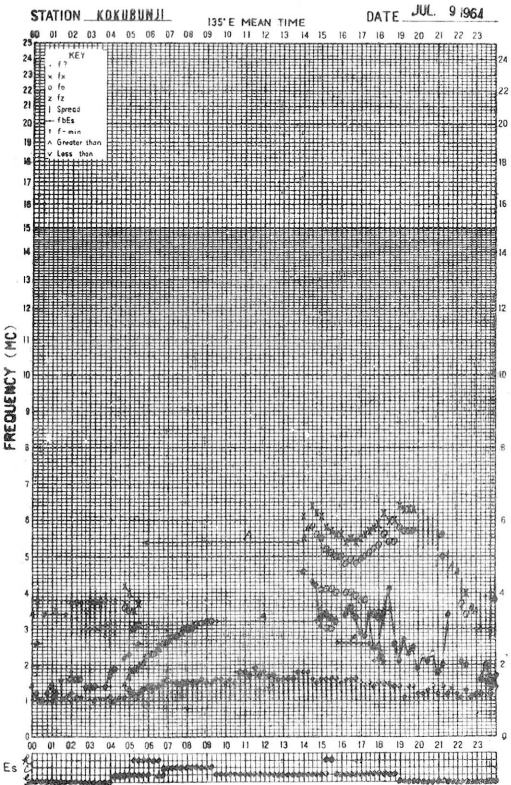

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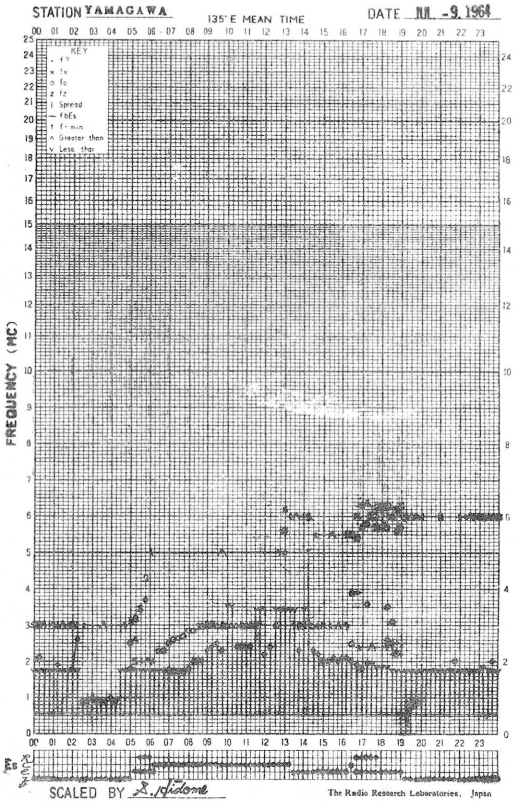
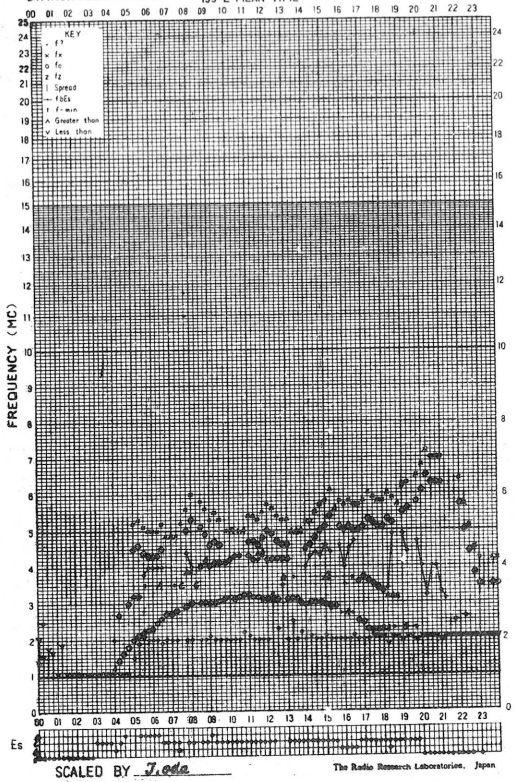


SCALED BY S. Shidomi The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE JUL. 10.1964



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The Radio Research Laboratories, Japan

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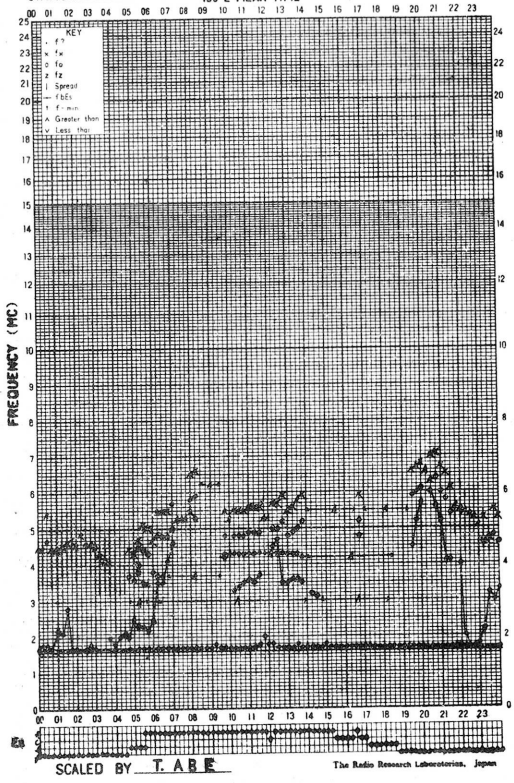

SCALED BY T. ABE

The Radio Research Laboratories, Japan

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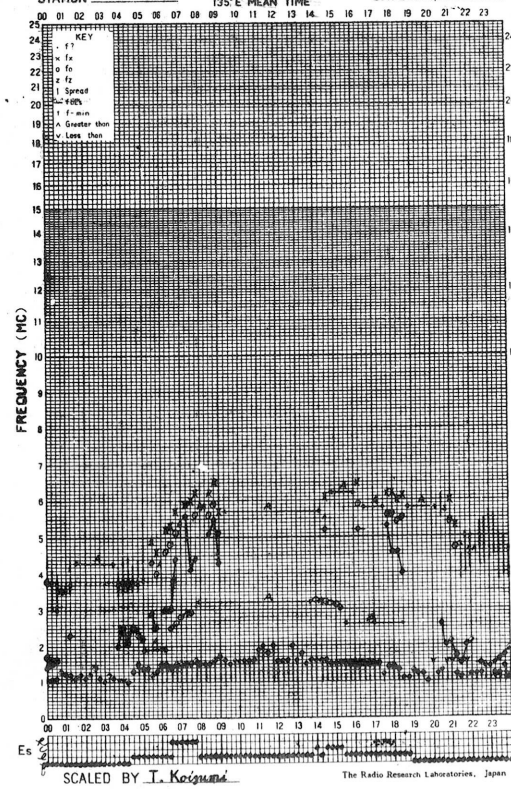

SCALED BY T. Koizumi

The Radio Research Laboratories, Japan

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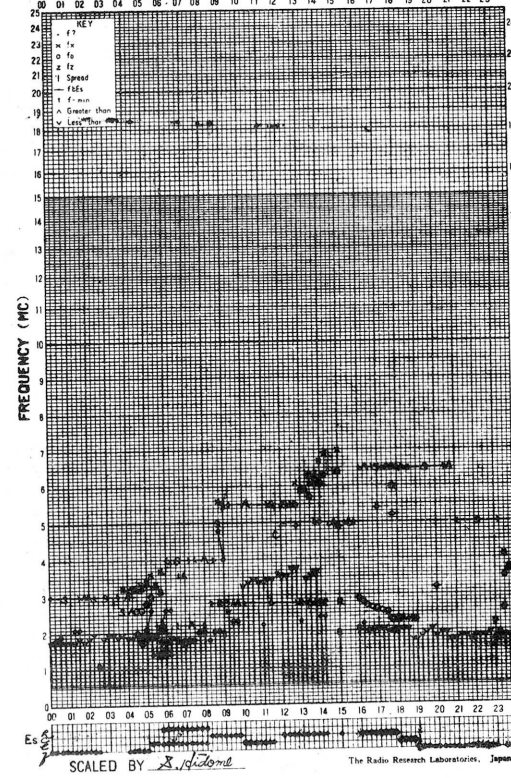

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The Radio Research Laboratories, Japan

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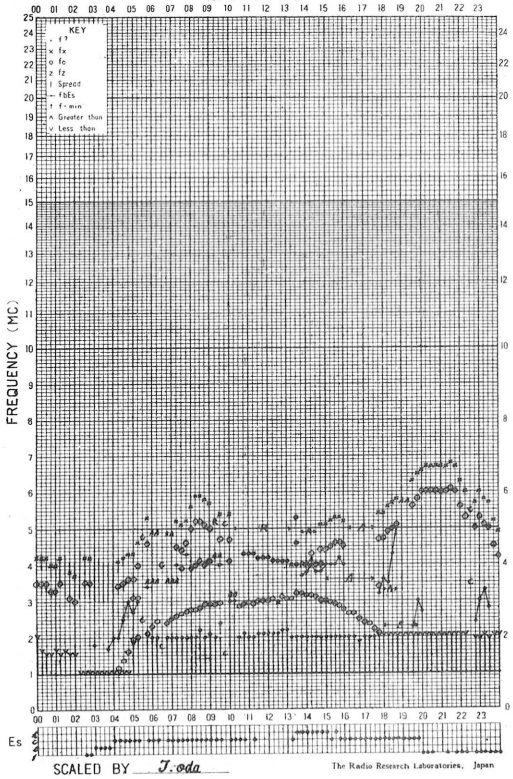

SCALED BY J. oda

The Radio Research Laboratories, Japan

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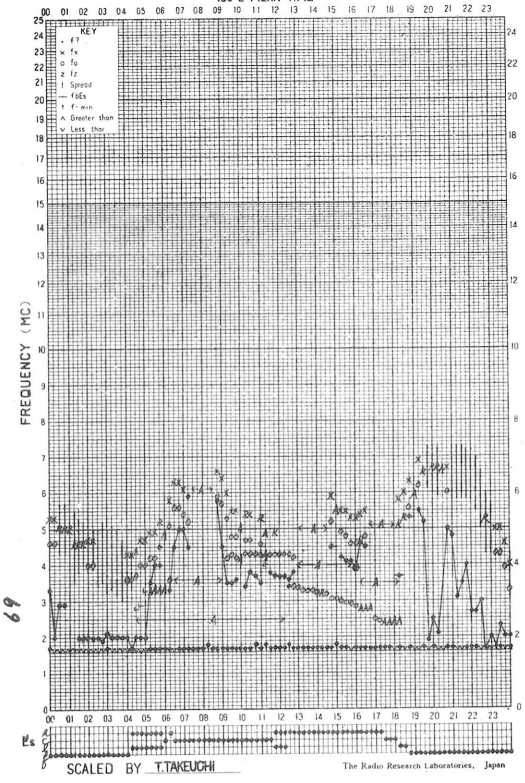

SCALED BY T. TAKEUCHI

The Radio Research Laboratories, Japan

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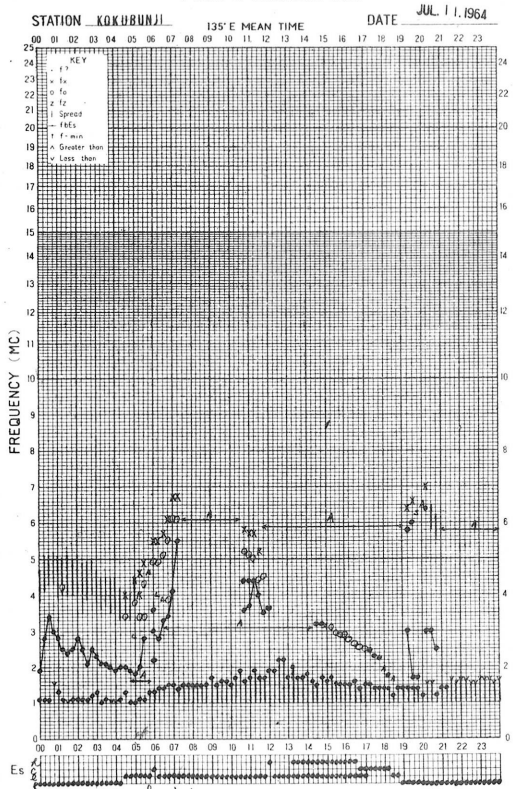

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The Radio Research Laboratories, Japan

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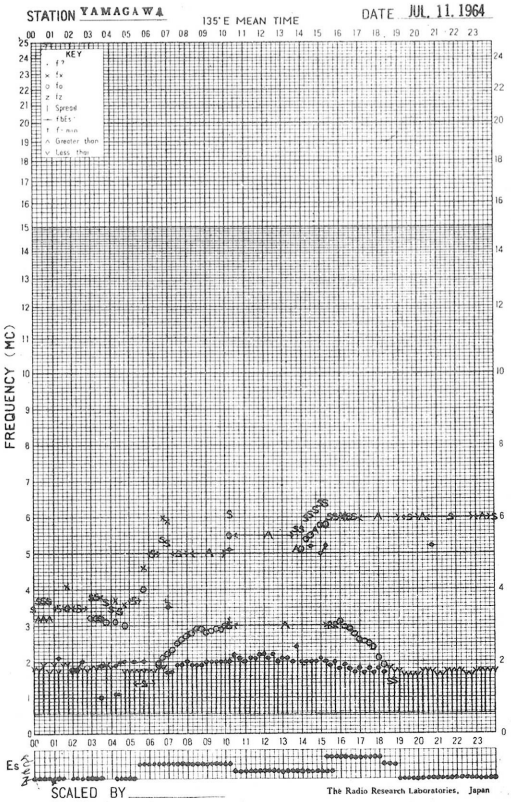

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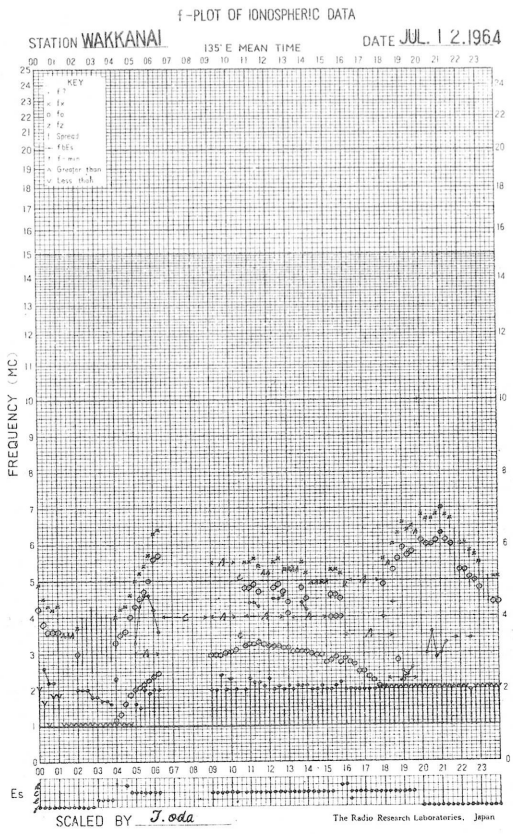
The Radio Research Laboratories, Japan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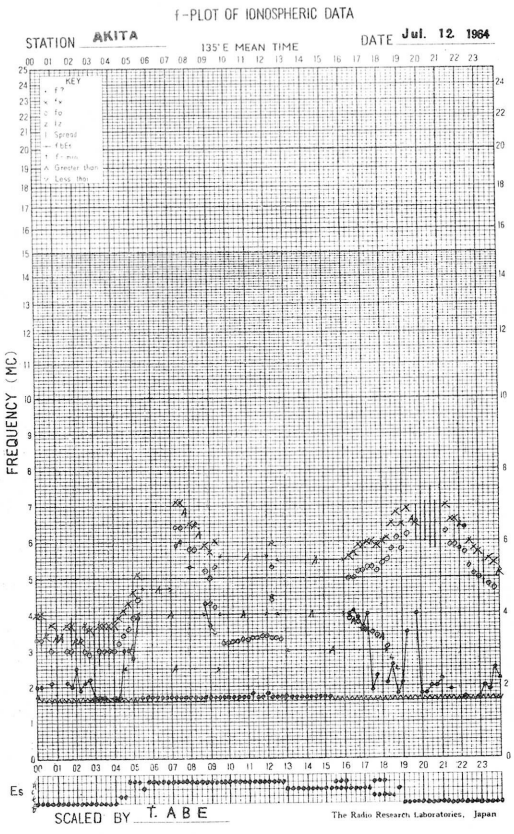
SCALED BY J. Oda
The Radio Research Laboratories, Japan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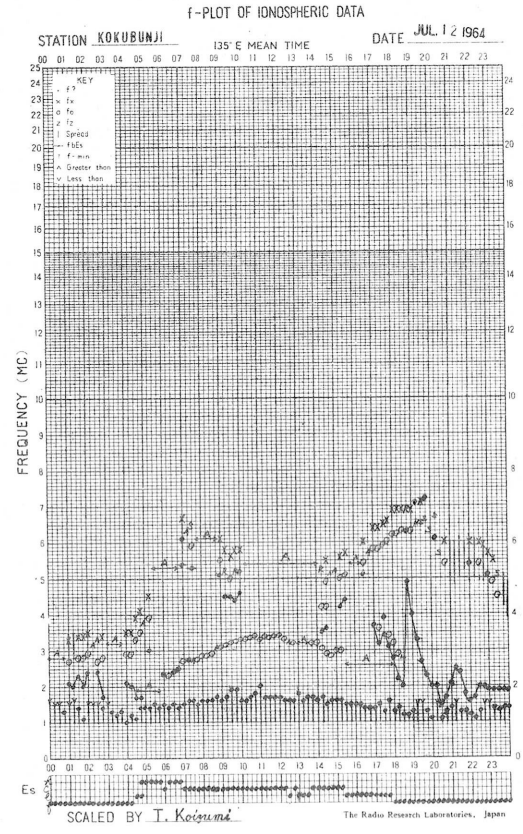
The Radio Research Laboratories, Japan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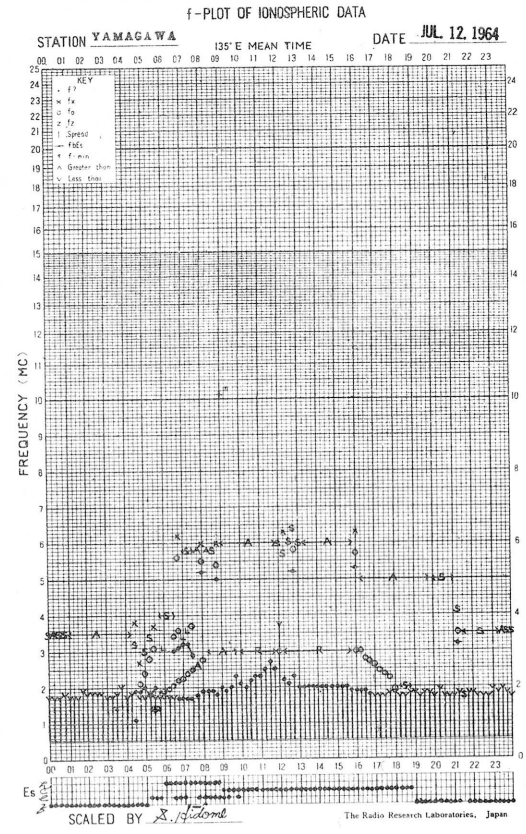
SCALED BY T. Koizumi
The Radio Research Laboratories, Japan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The Radio Research Laboratories, Japan

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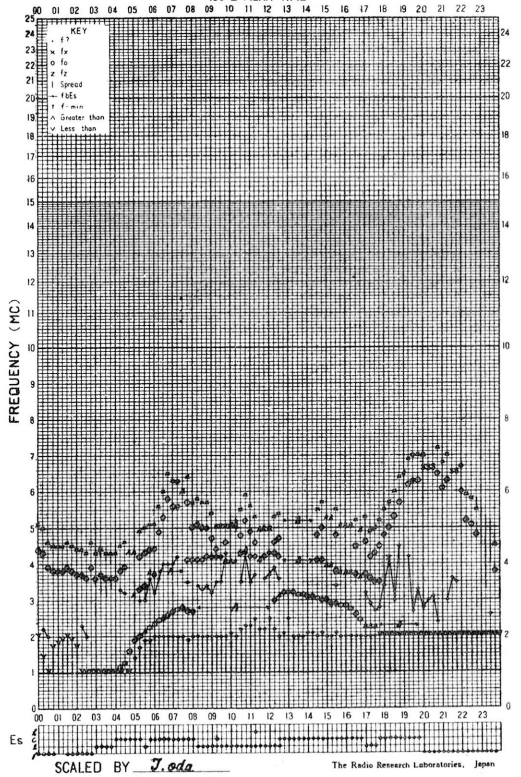

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The Radio Research Laboratories, Japan

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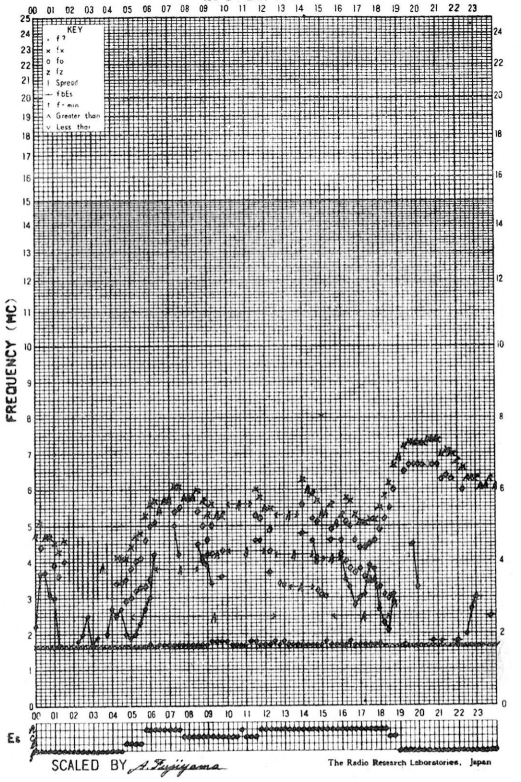

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The Radio Research Laboratories, Japan

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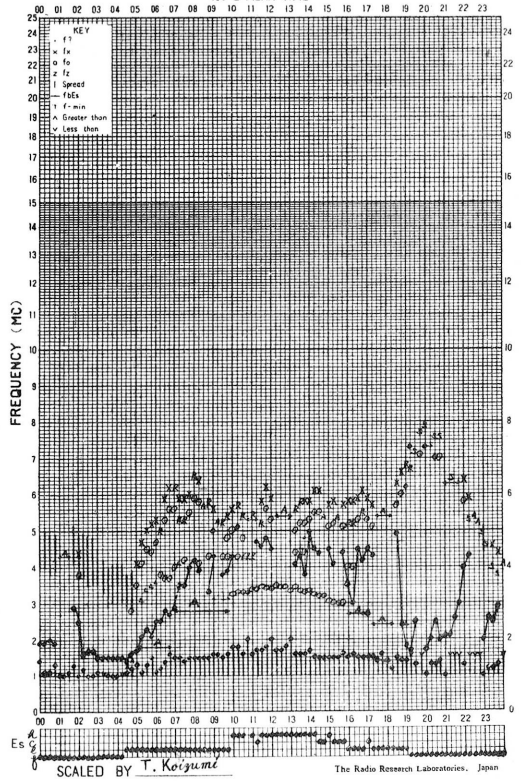

SCALED BY T. Koizumi

The Radio Research Laboratories, Japan

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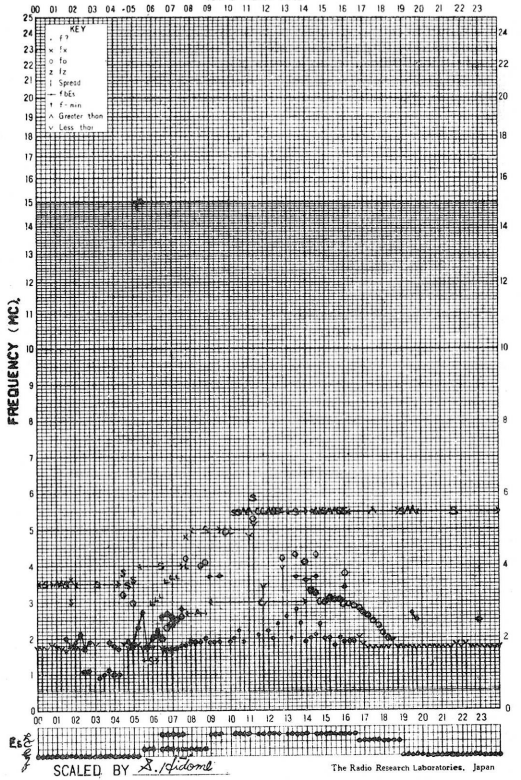

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The Radio Research Laboratories, Japan

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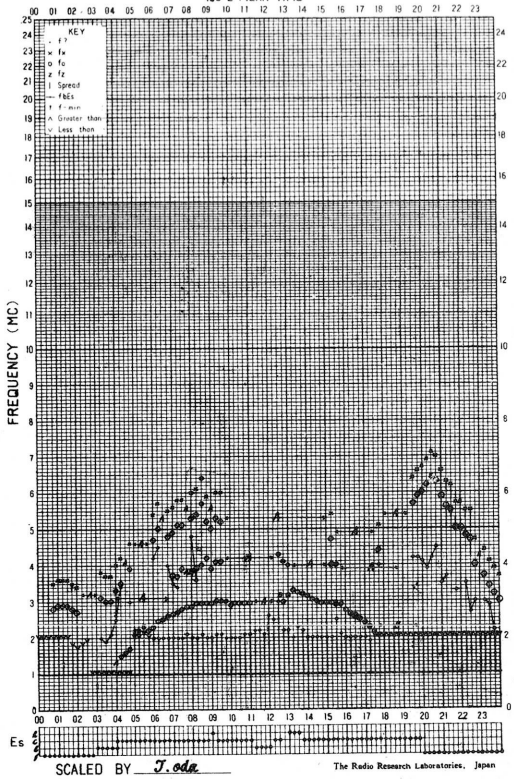

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The Radio Research Laboratories, Japan

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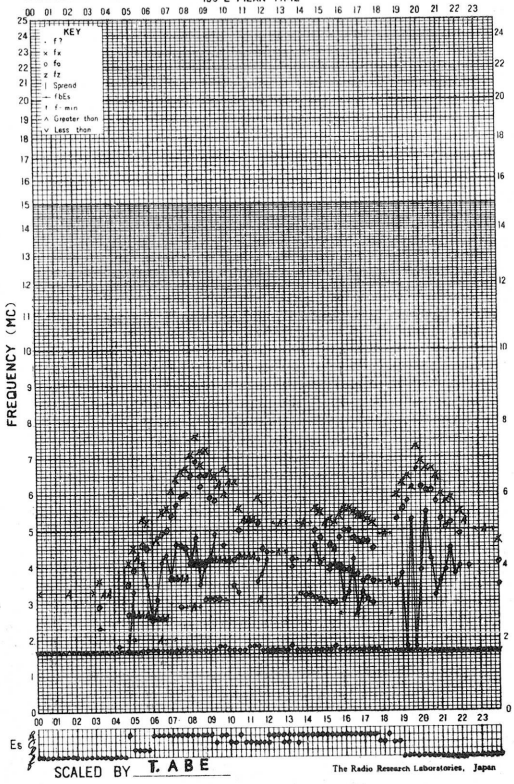

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The Radio Research Laboratories, Japan

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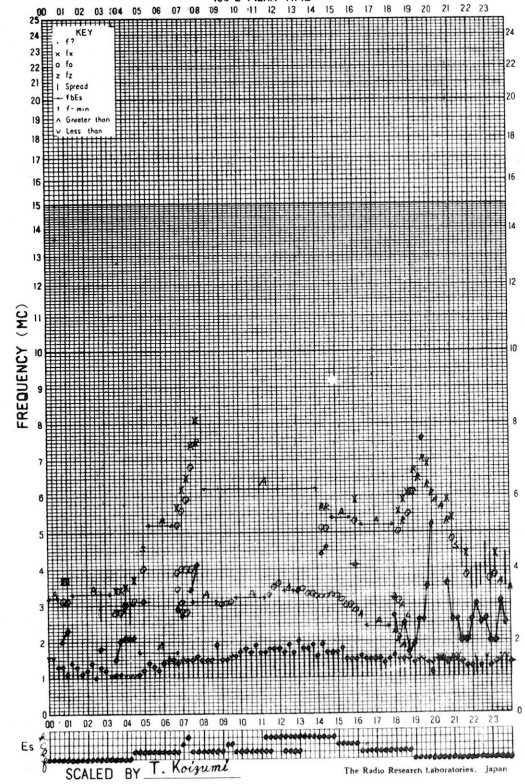

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The Radio Research Laboratories, Japan

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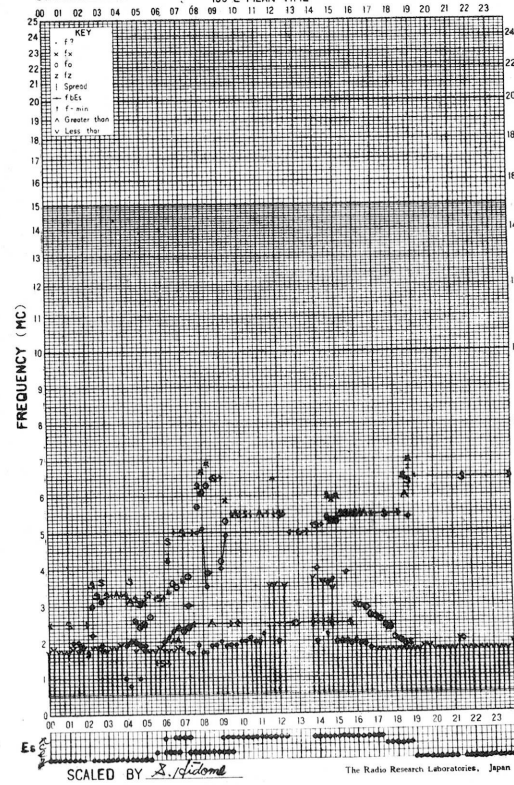
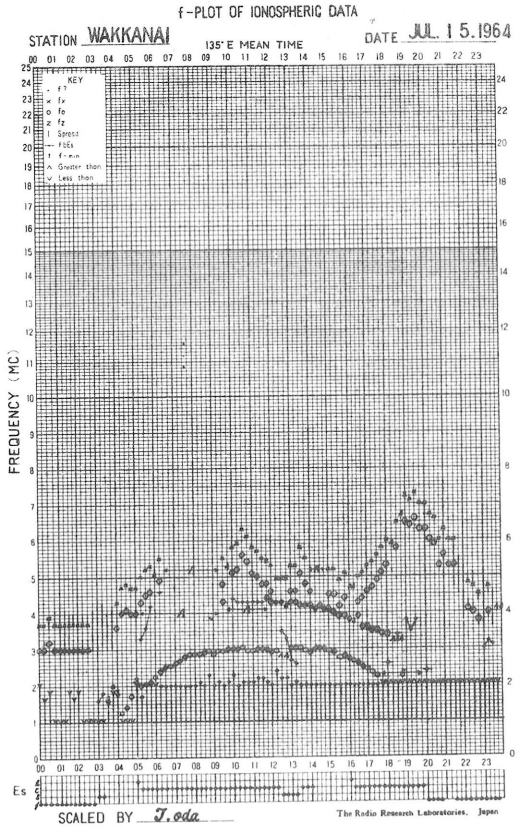


SCALED BY S. Shiono

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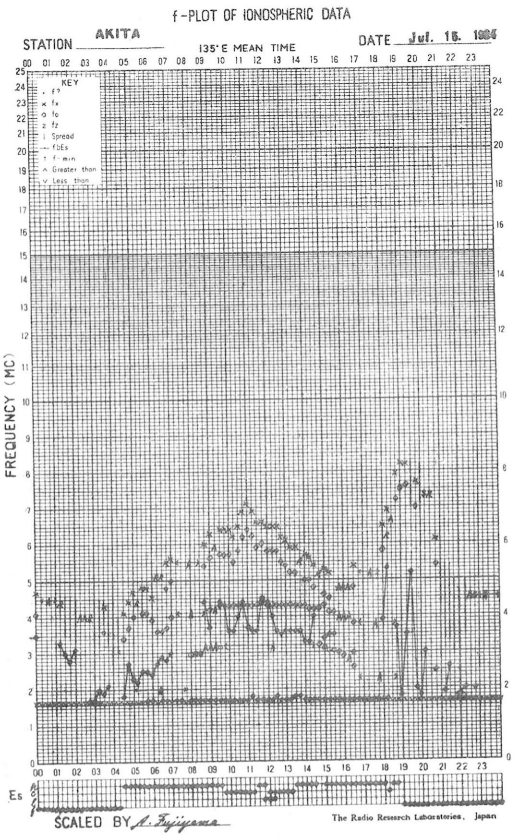
The Radio Research Laboratories, Japan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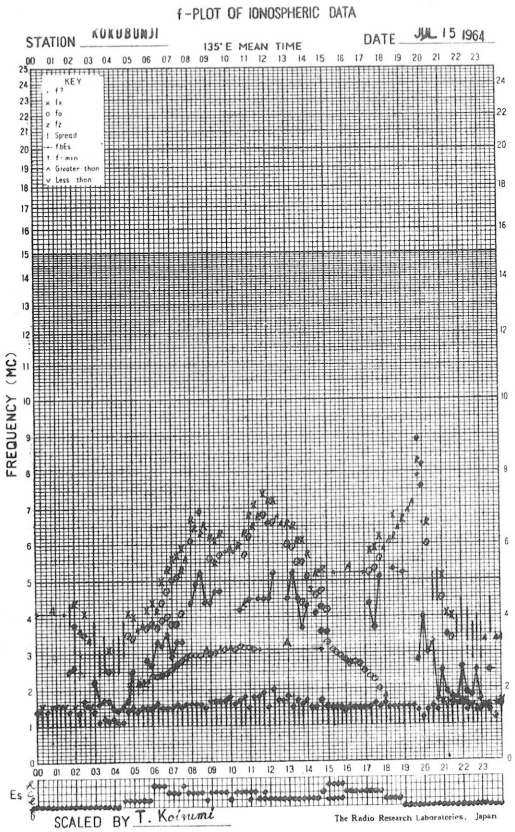
The Radio Research Laboratories, Japan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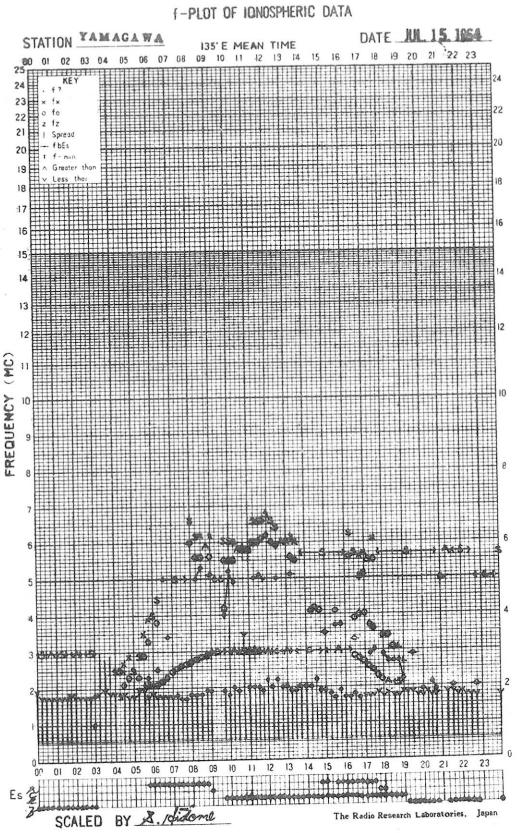
SCALED BY T. Koizumi
The Radio Research Laboratories, Japan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The Radio Research Laboratories, Japan

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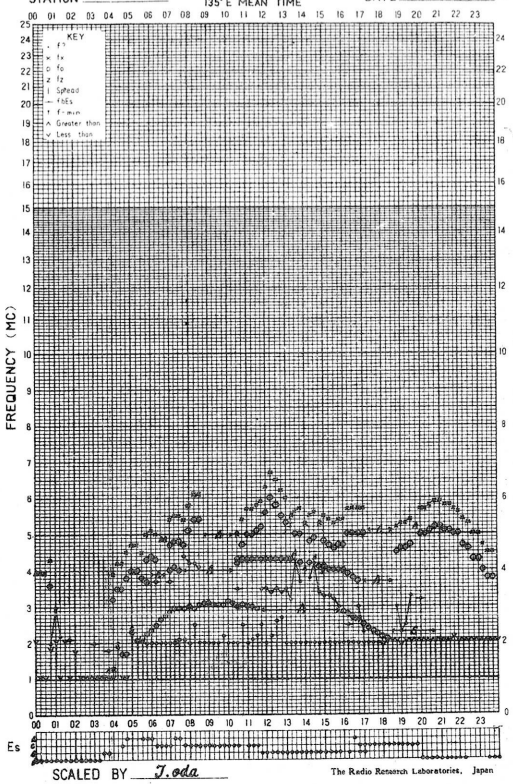

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The Radio Research Laboratories, Japan

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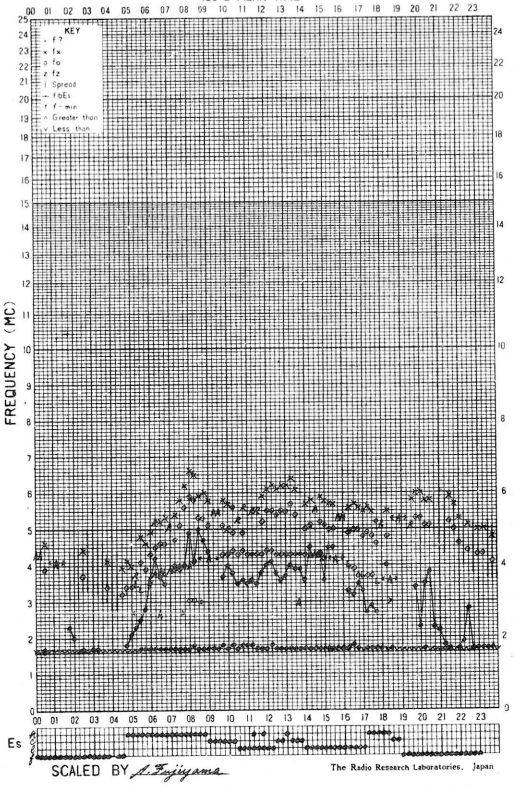

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The Radio Research Laboratories, Japan

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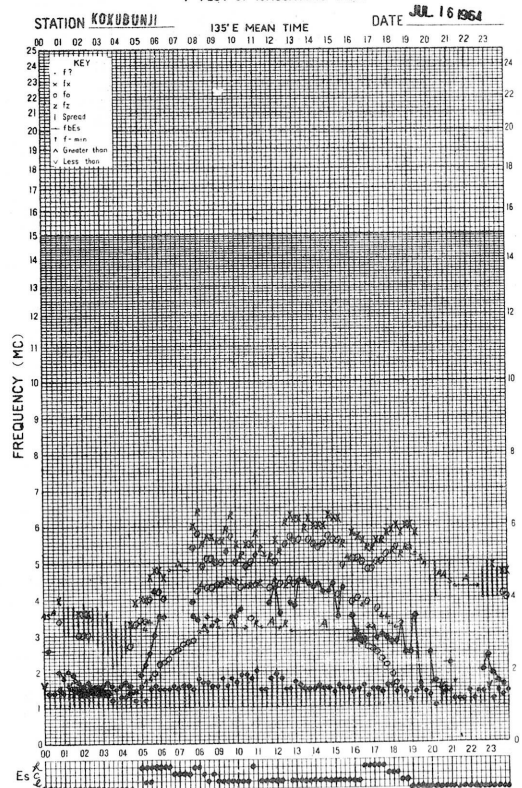

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The Radio Research Laboratories, Japan

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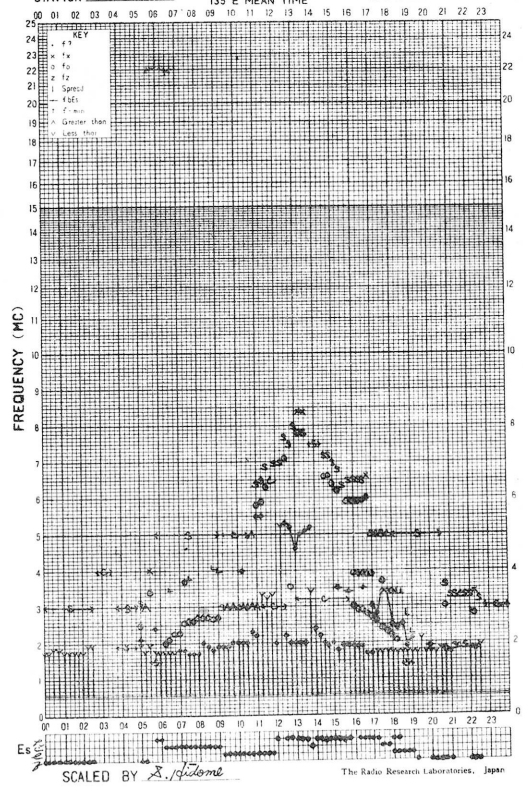

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The Radio Research Laboratories, Japan

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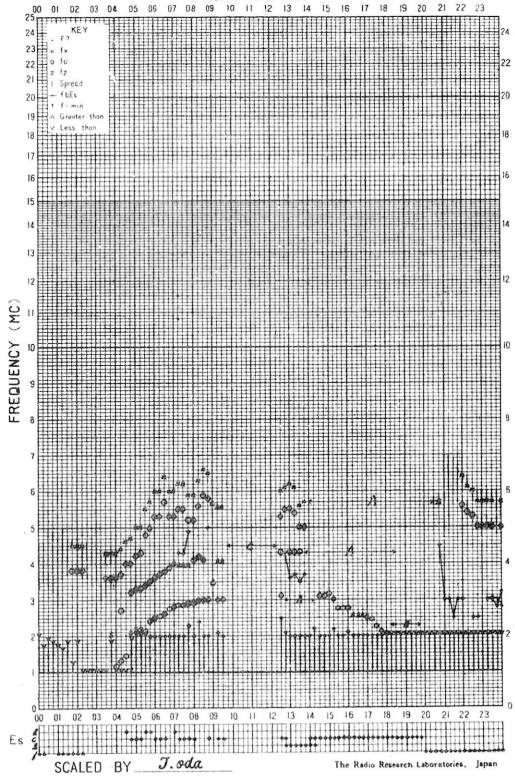

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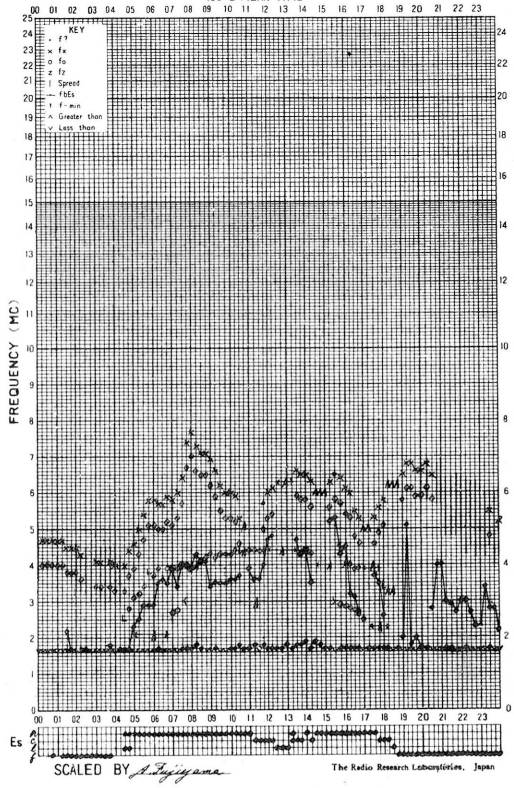

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The Radio Research Laboratories, Japan

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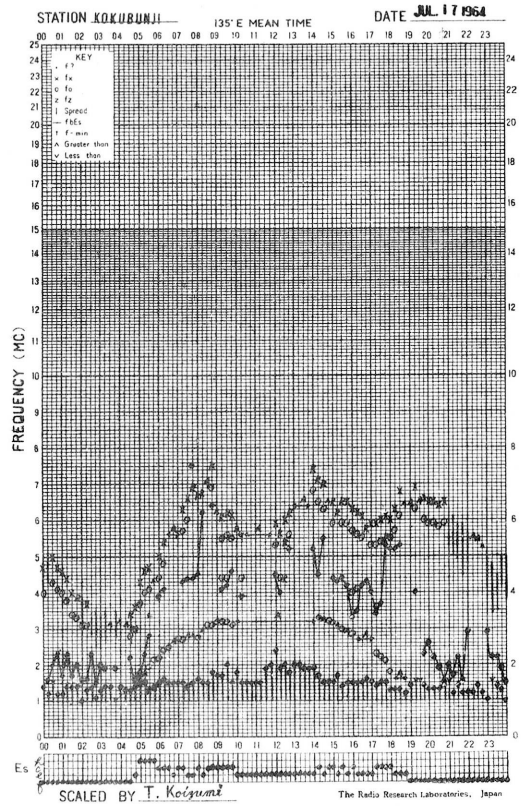

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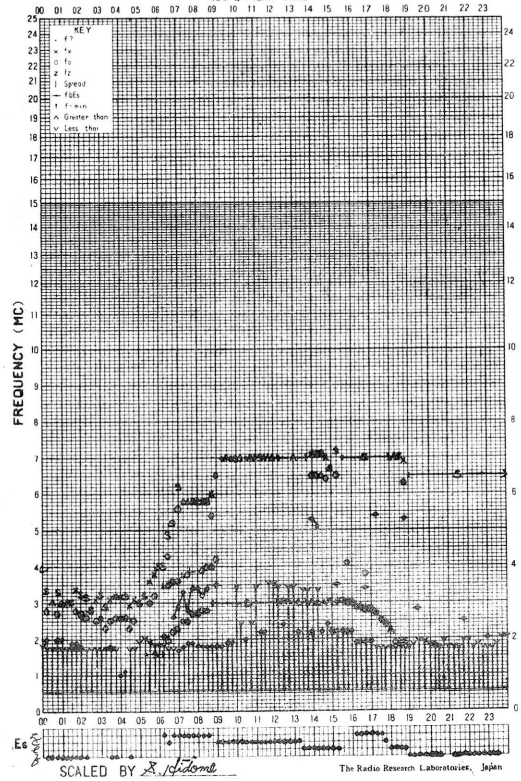

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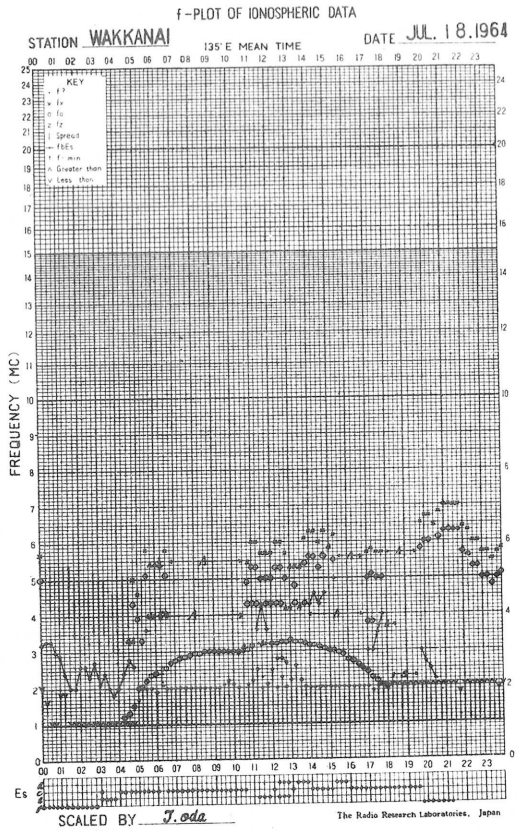
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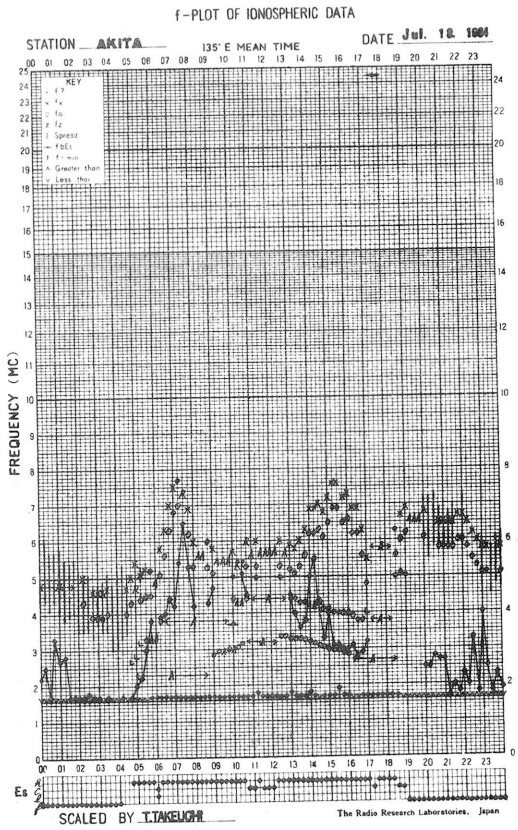
The Radio Research Laboratories, Japan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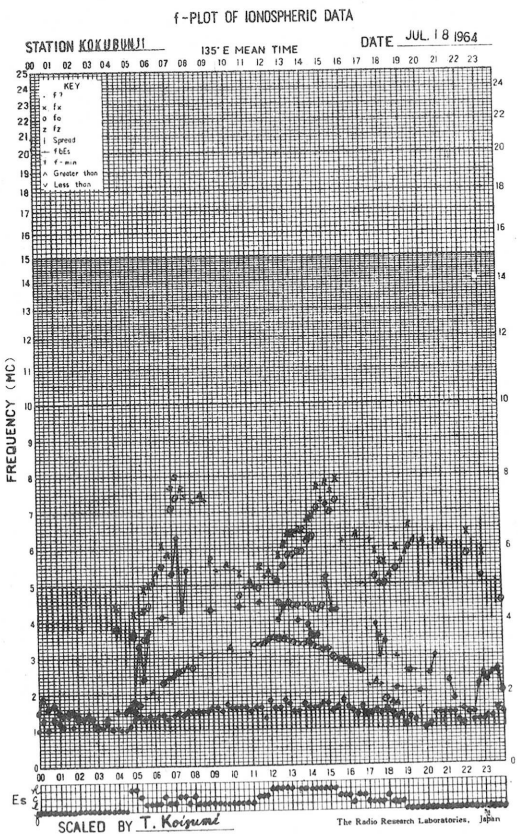
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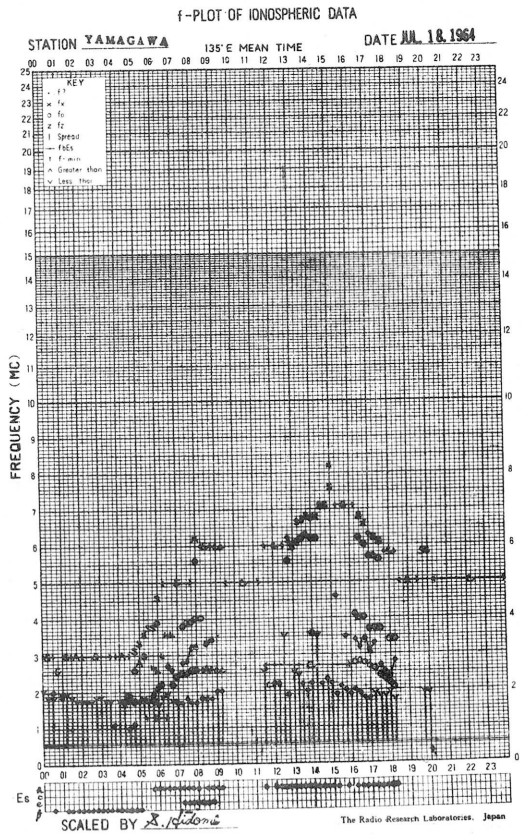
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The Radio Research Laboratories, Japan

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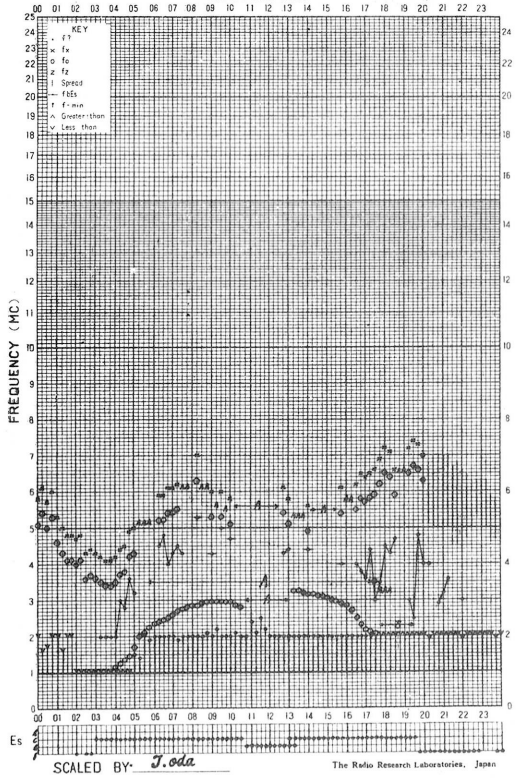

SCALED BY J. Oda

The Radio Research Laboratories, Japan

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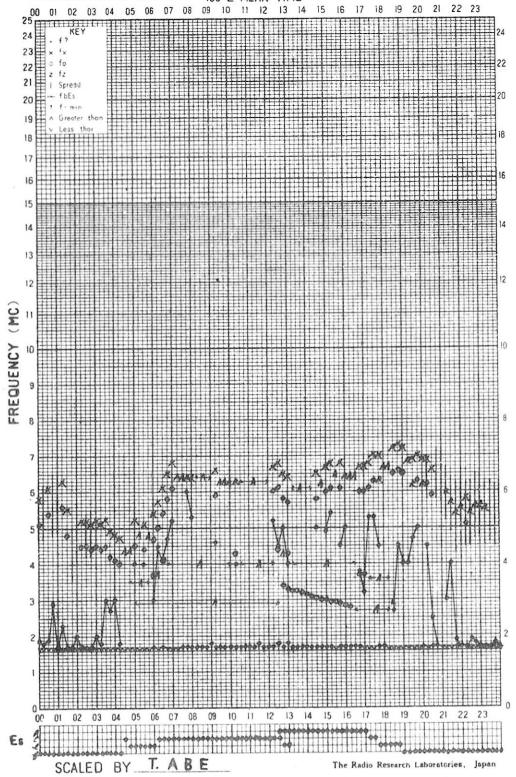

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The Radio Research Laboratories, Japan

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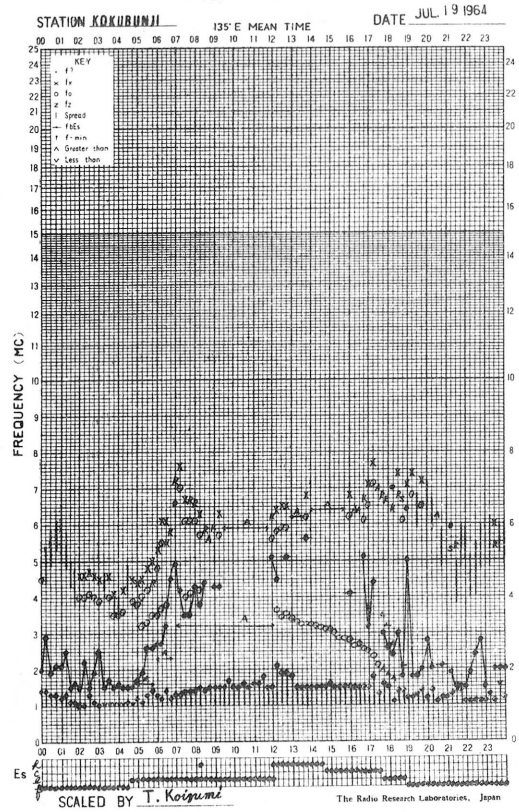

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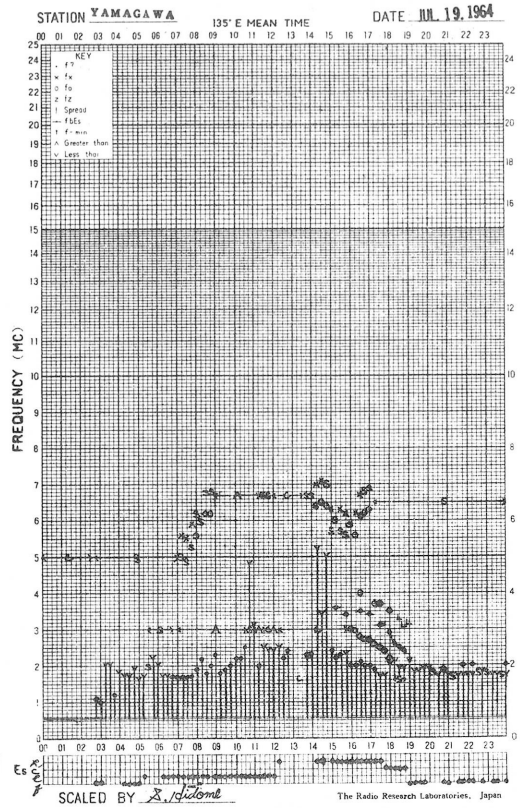

SCALED BY S. Fidomi

The Radio Research Laboratories, Japan

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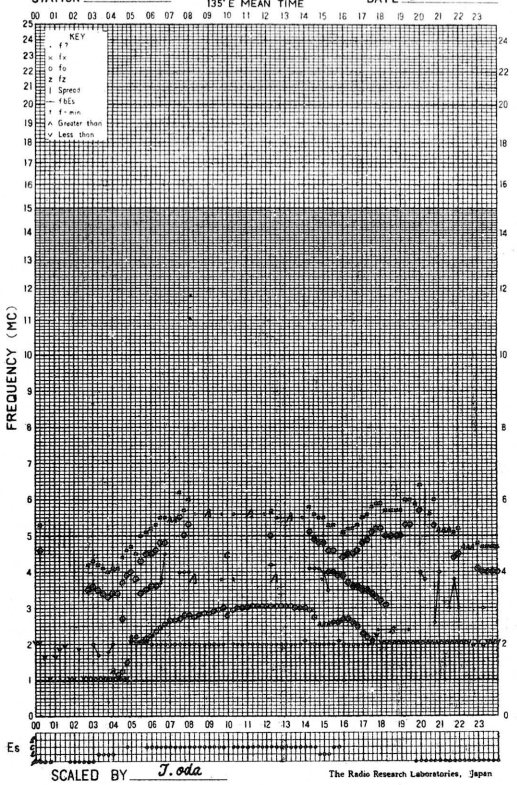
STATION WAKKANAI 135°E MEAN TIME DATE JUL. 20. 1964

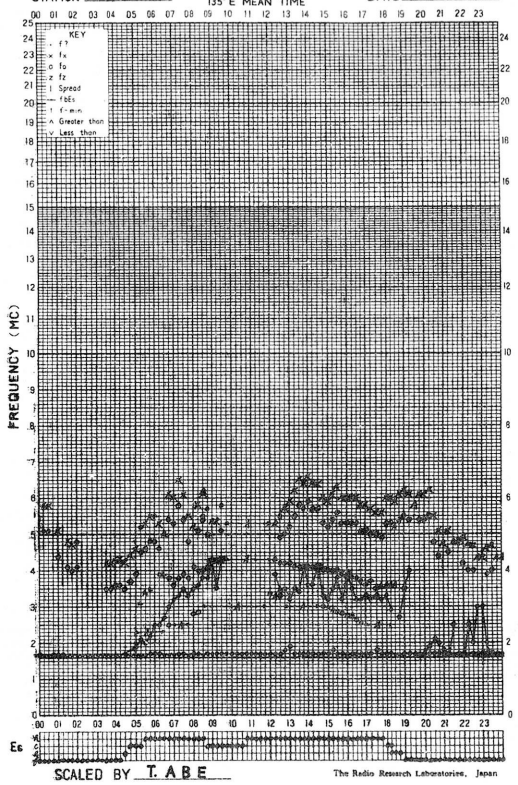


SCALED BY T. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Jul. 20. 1964



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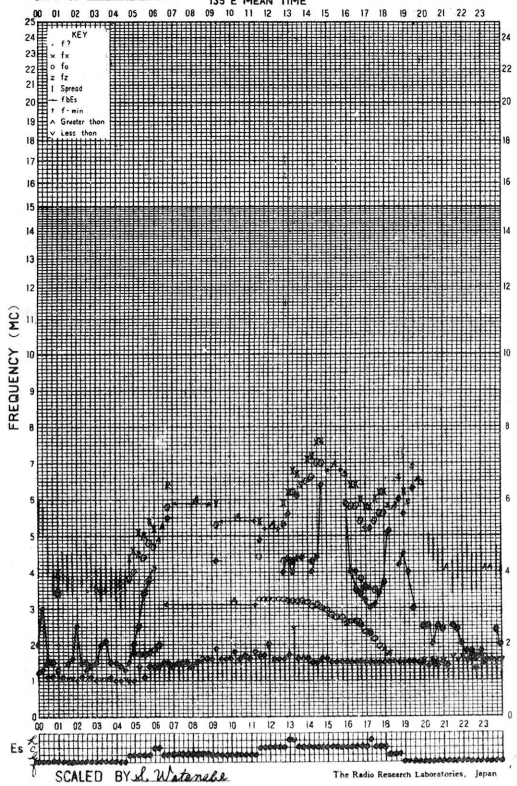
The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE JUL. 20 1964



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The Radio Research Laboratories, Japan

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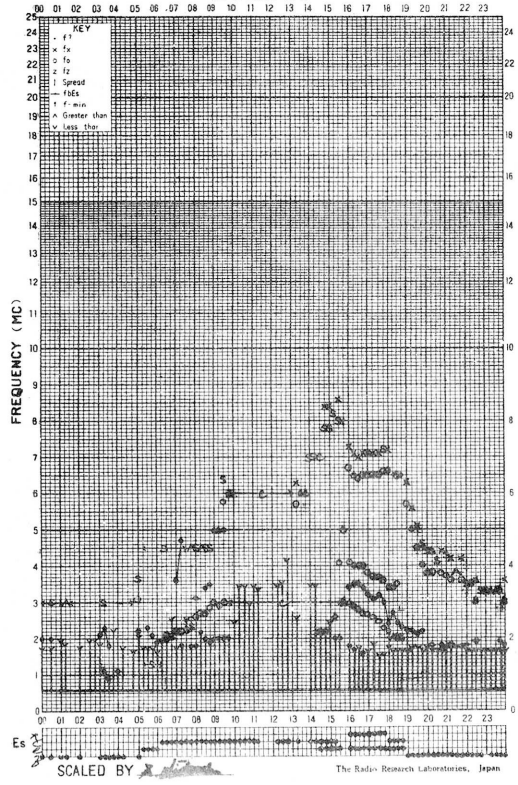

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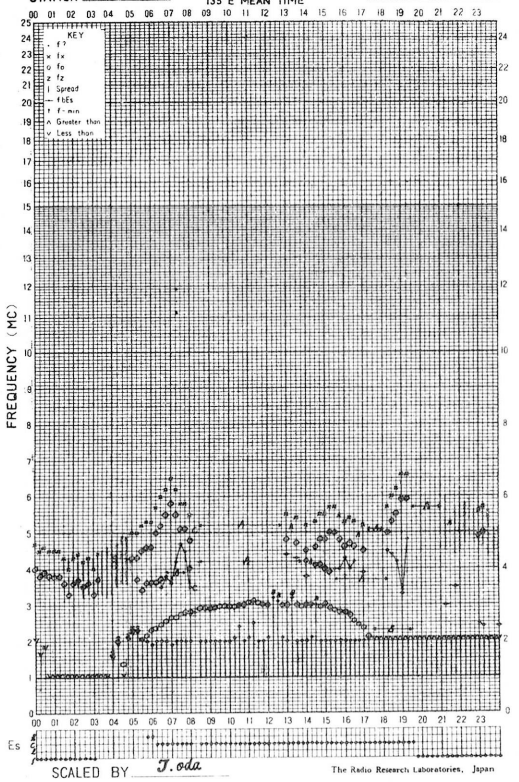

SCALED BY J. Oda

The Radio Research Laboratories, Japan

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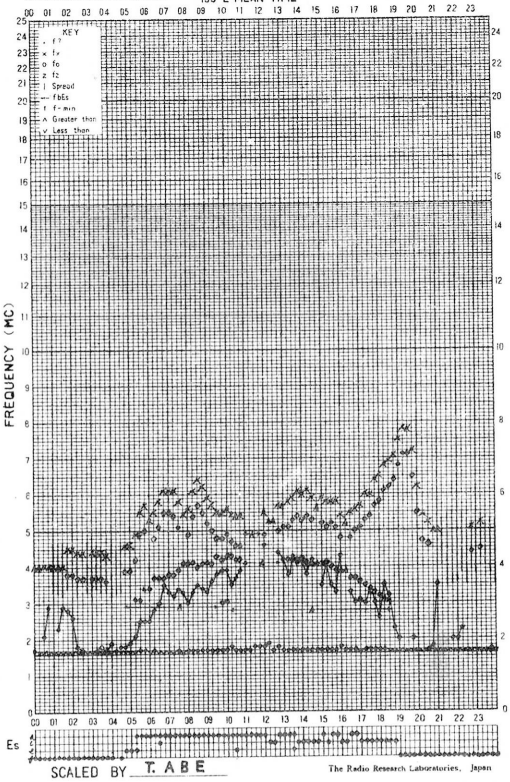

SCALED BY T. ABE

The Radio Research Laboratories, Japan

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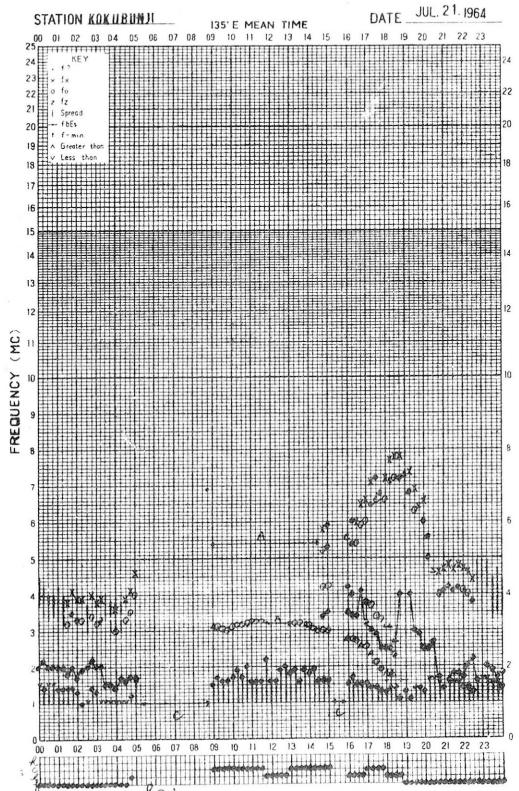

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The Radio Research Laboratories, Japan

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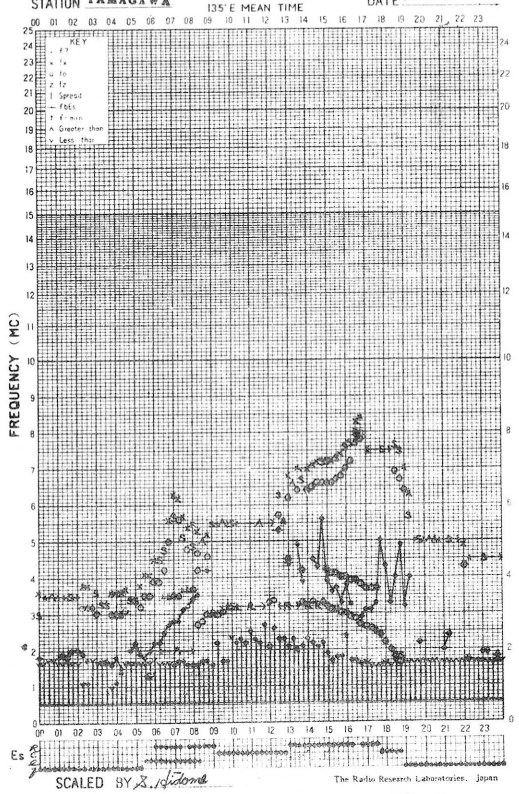
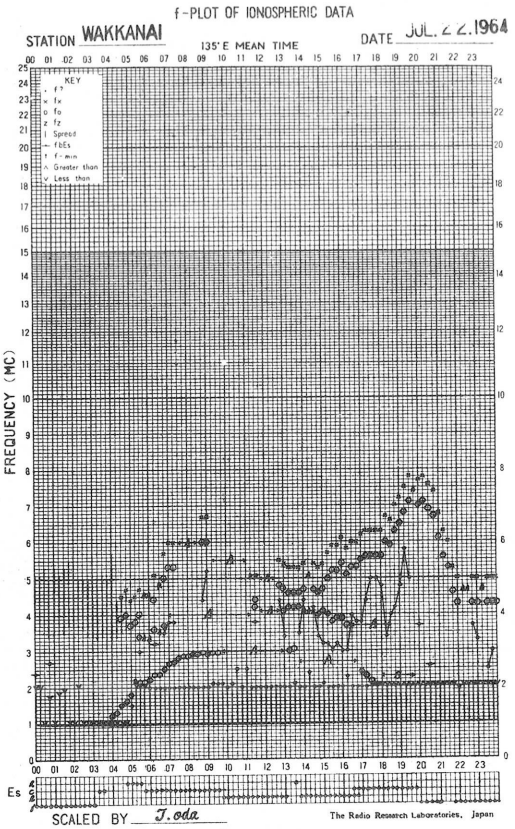
STATION YAMAGAWA 135° E MEAN TIME DATE JUL. 21. 1964



SCALED BY S. Shirono

The Radio Research Laboratories, Japan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STATION WAKKANAI
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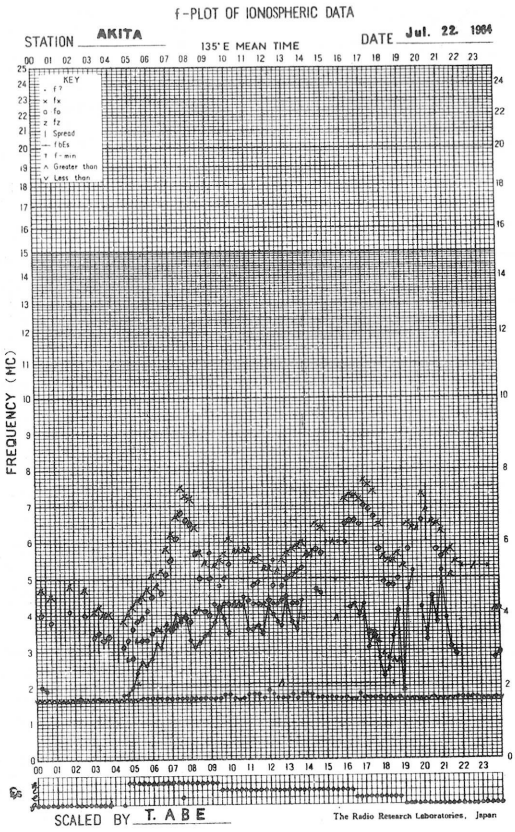
The Radio Research Laboratories, Japan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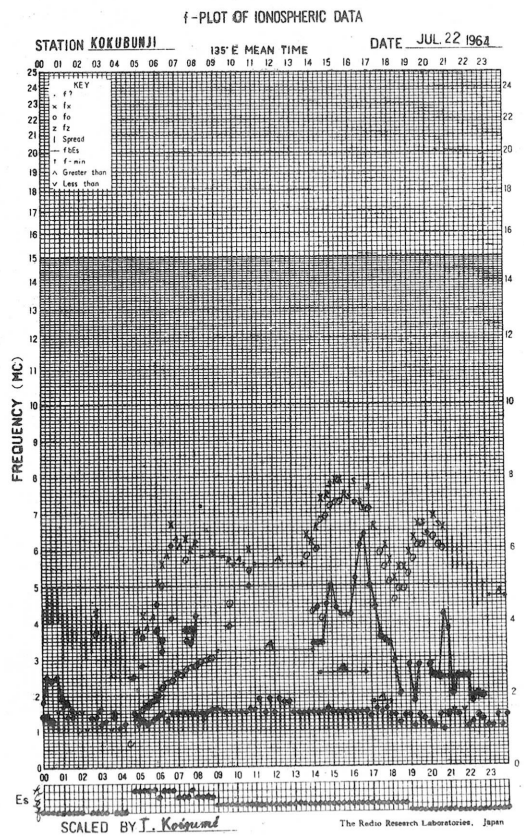
The Radio Research Laboratories, Japan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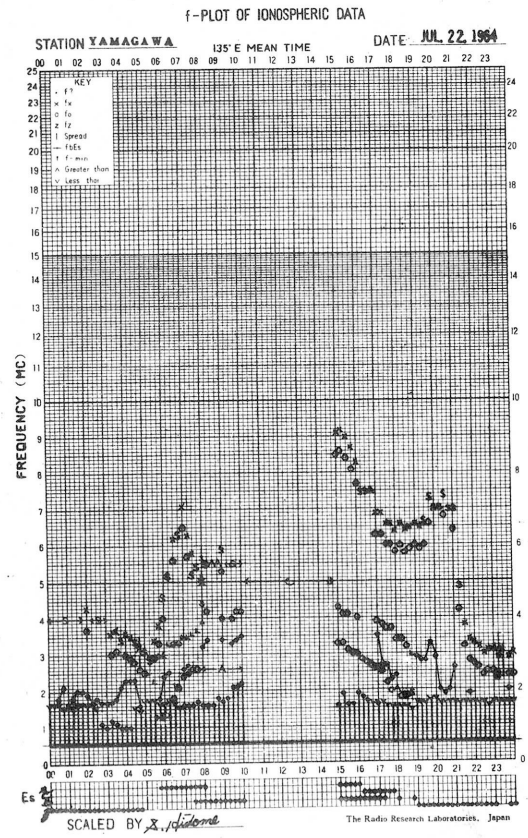
The Radio Research Laboratories, Japan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SCALED BY S. Hidemi
The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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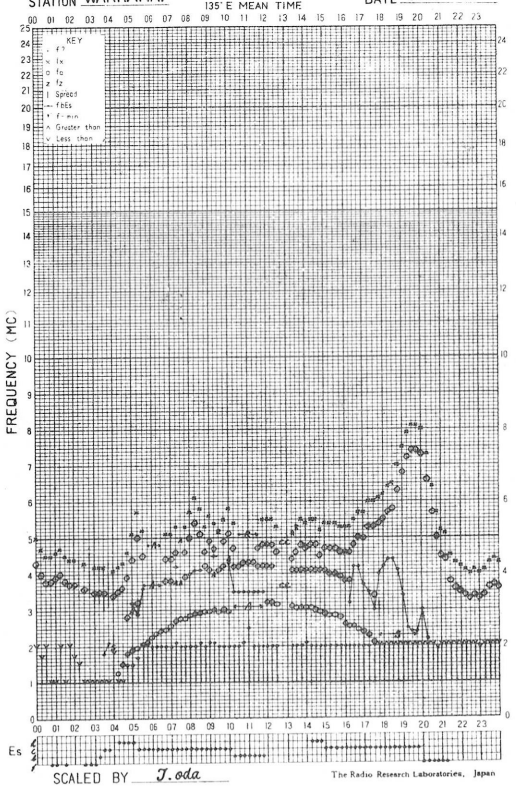

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The Radio Research Laboratories, Japan

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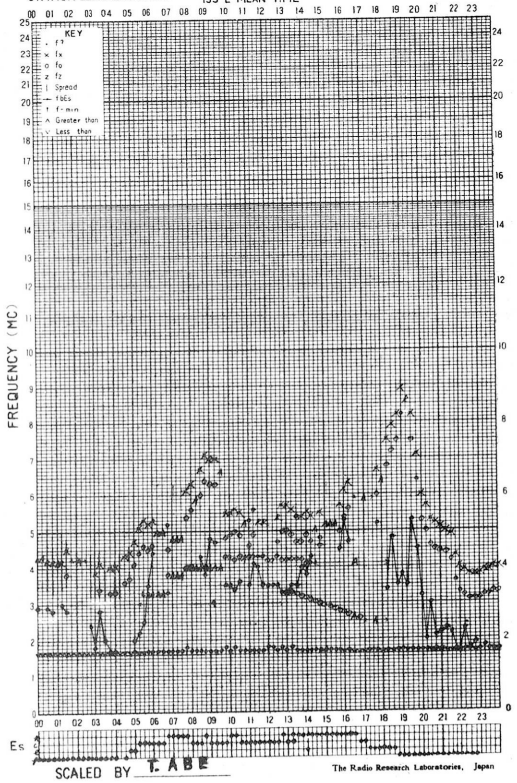

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The Radio Research Laboratories, Japan

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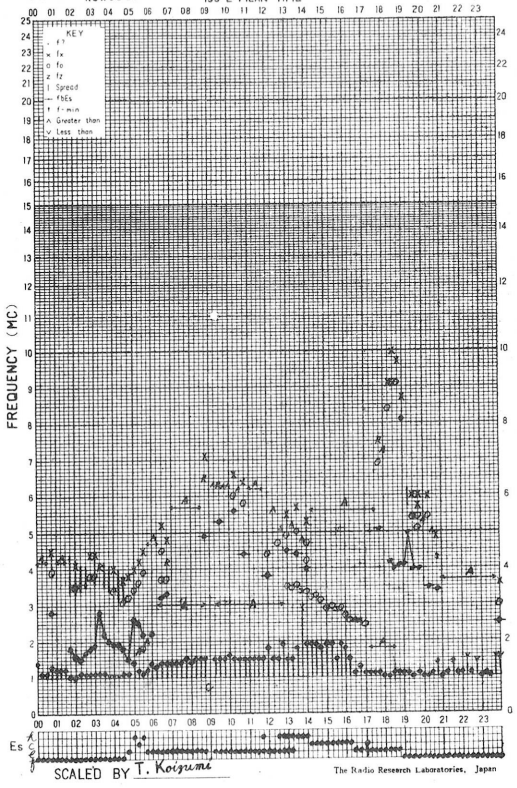

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The Radio Research Laboratories, Japan

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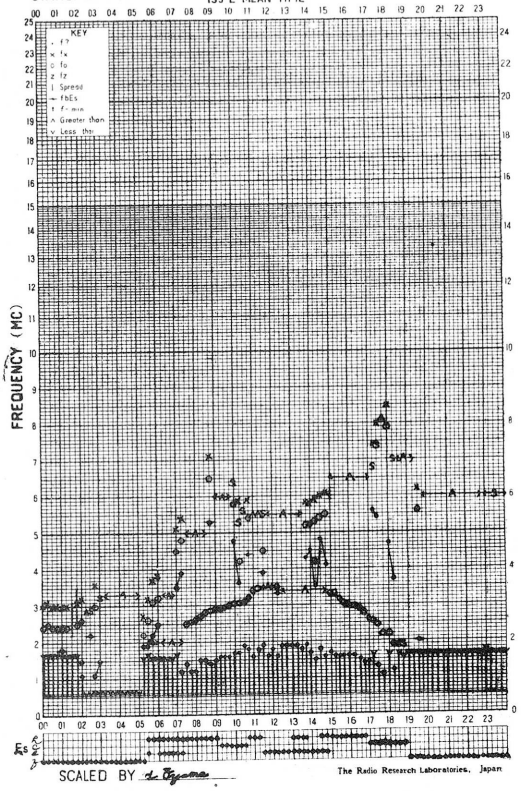

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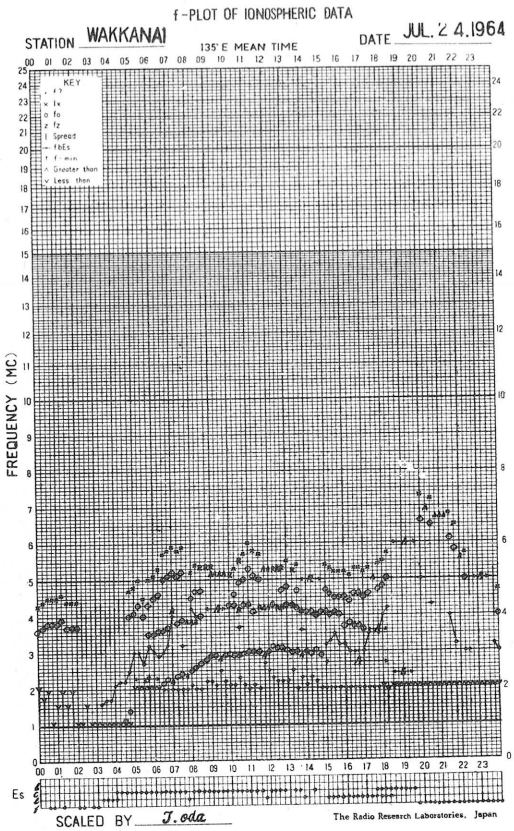
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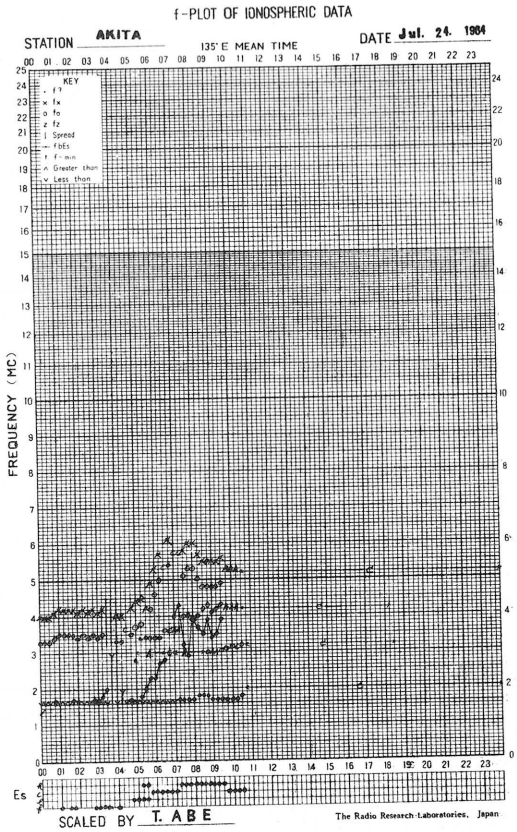
SCALED BY T. Oda
The Radio Research Laboratories, Japan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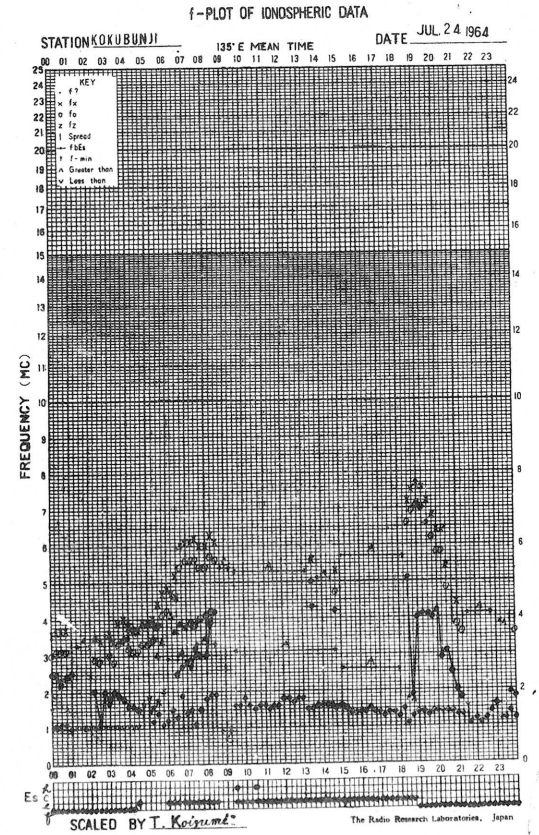
The Radio Research Laboratories, Japan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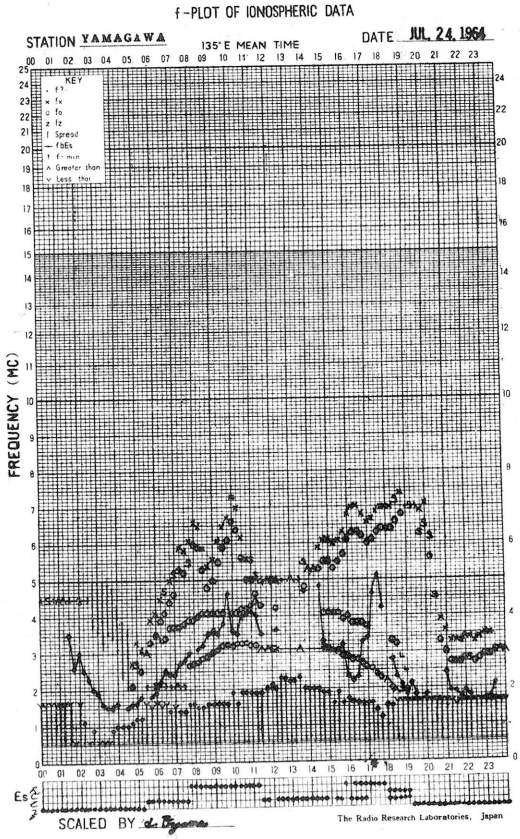
SCALED BY T. Koizumi
The Radio Research Laboratories, Japan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The Radio Research Laboratories, Japan

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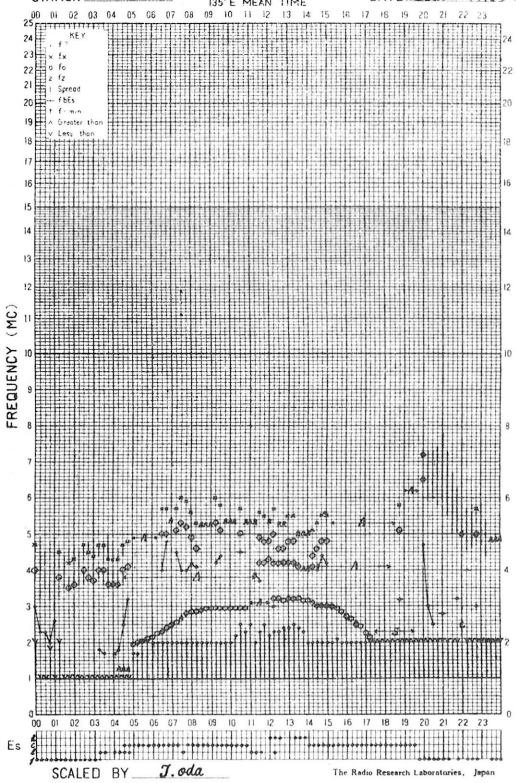

SCALED BY J. Oda

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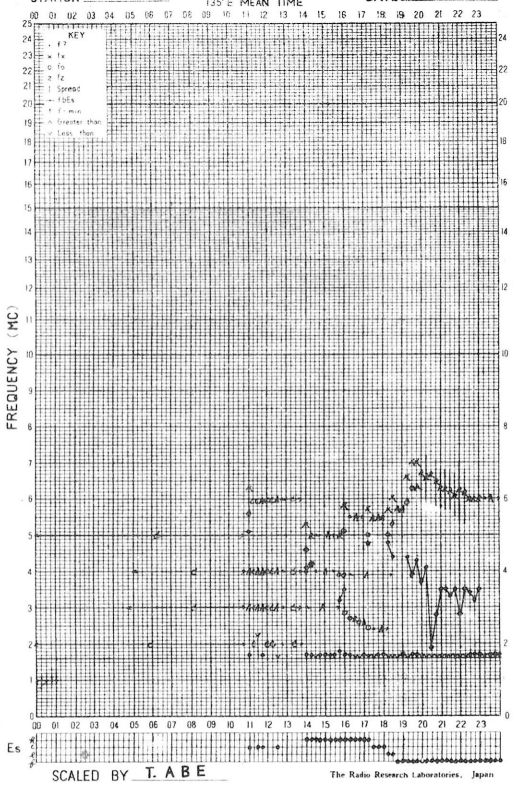

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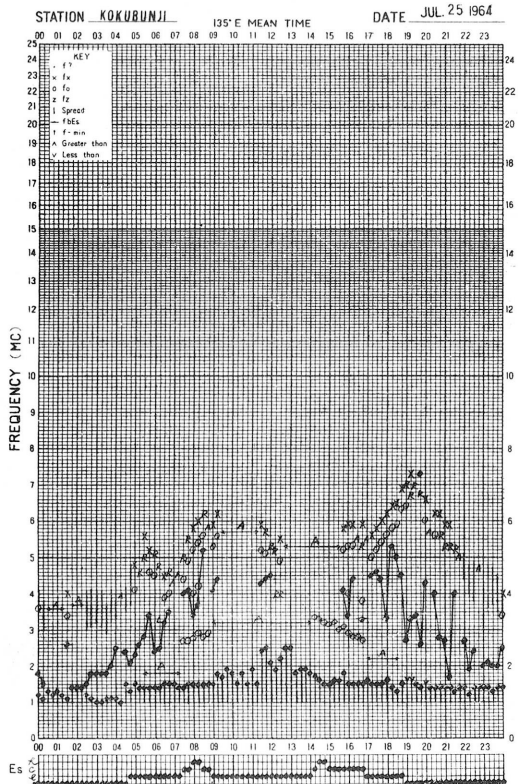

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The Radio Research Laboratories, Japan

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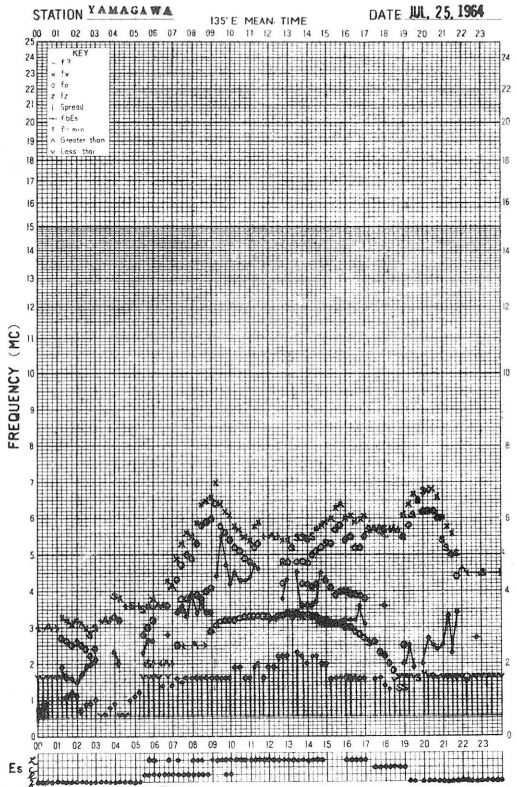
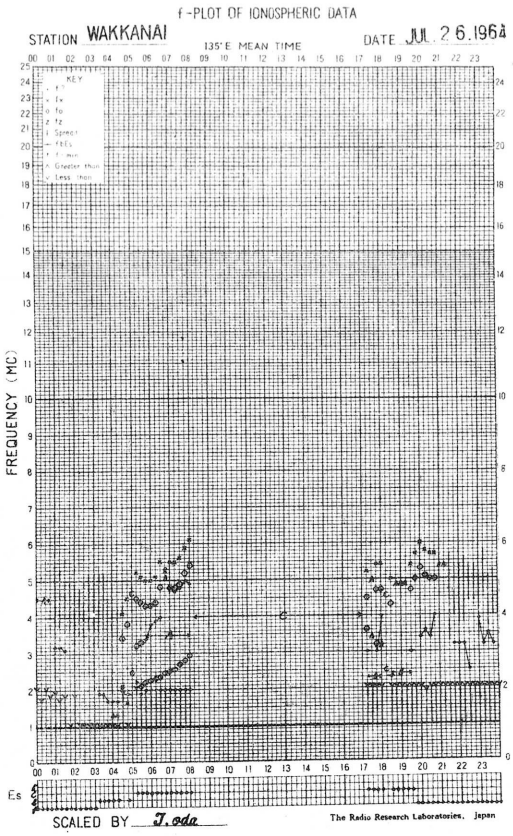


SCALED BY A. Ogawa

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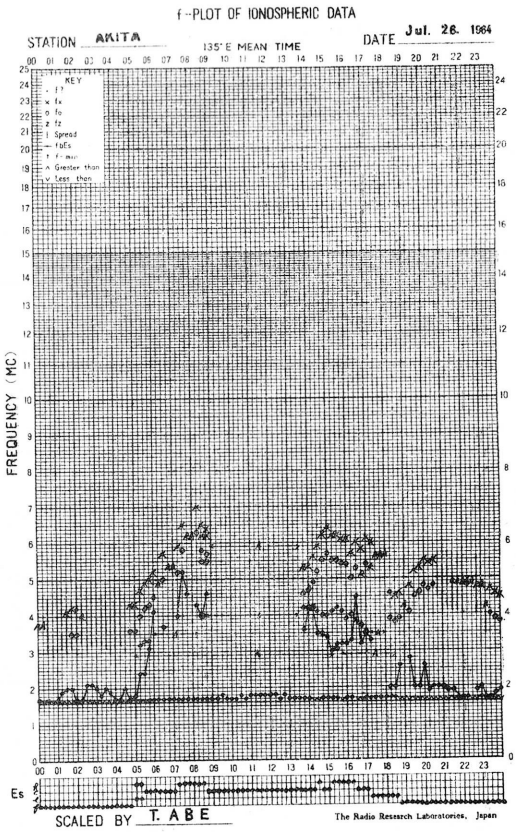
SCALED BY T. Oda
The Radio Research Laboratories, Japan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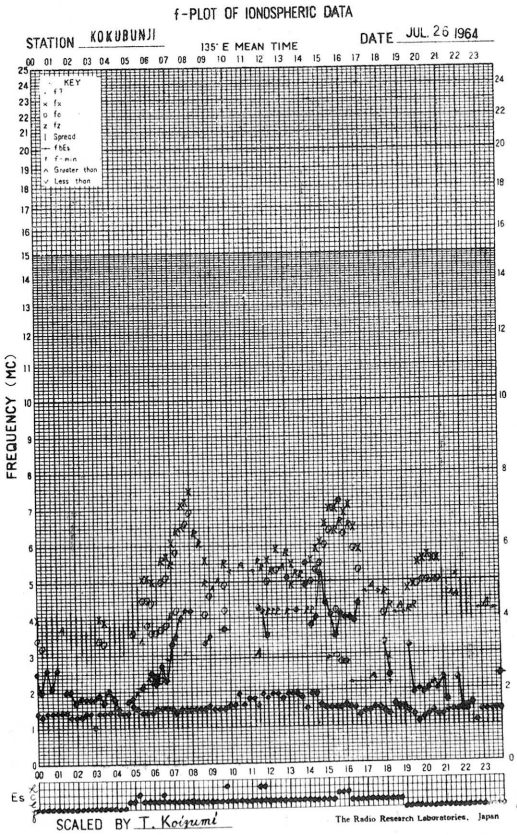
The Radio Research Laboratories, Japan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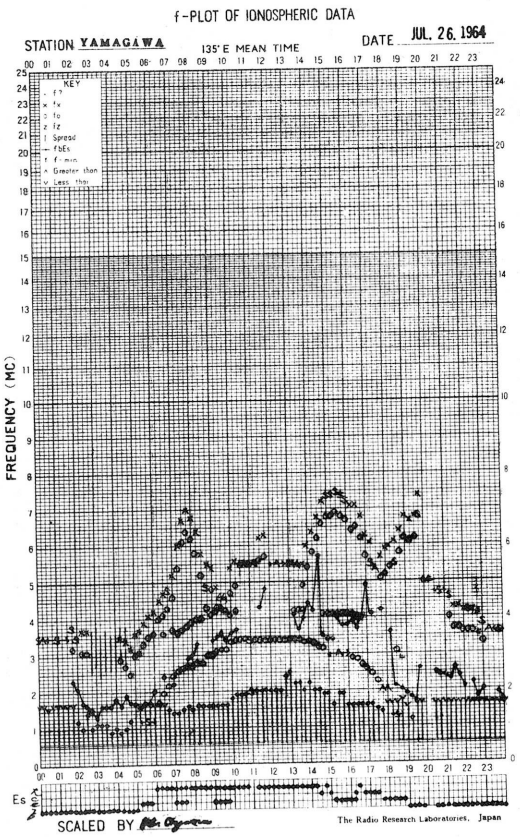
The Radio Research Laboratories, Japan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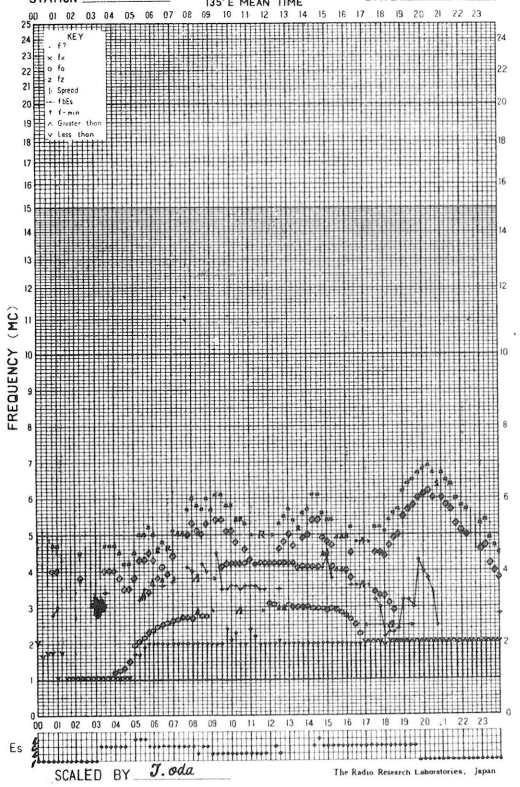

SCALED BY J. oda The Radio Research Laboratories, Japan

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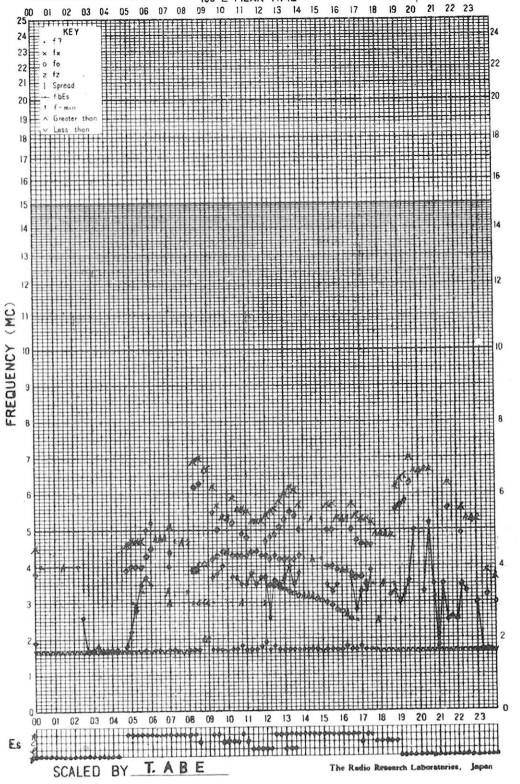

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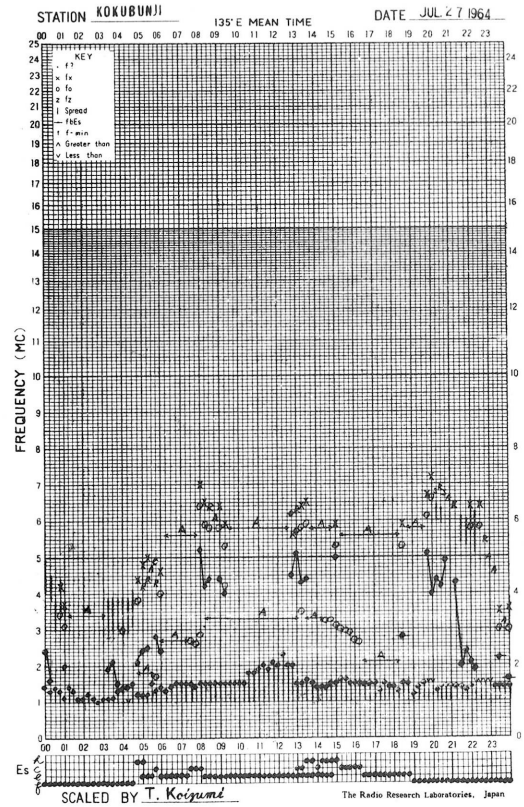

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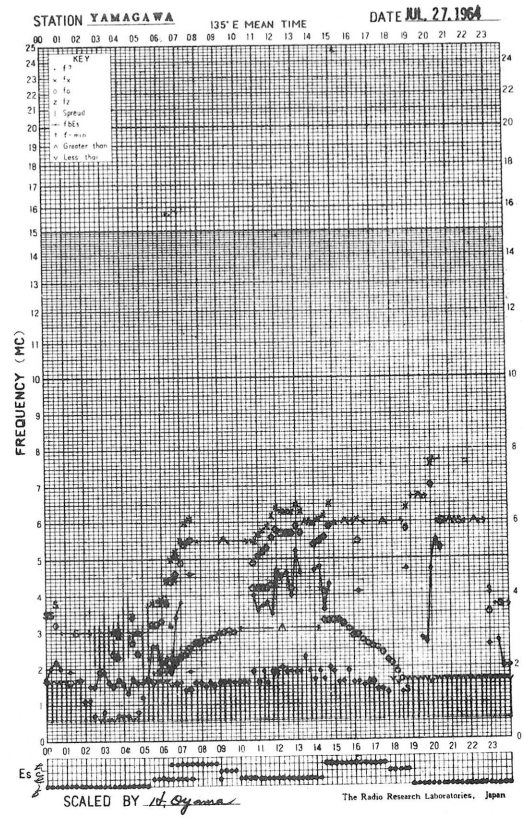

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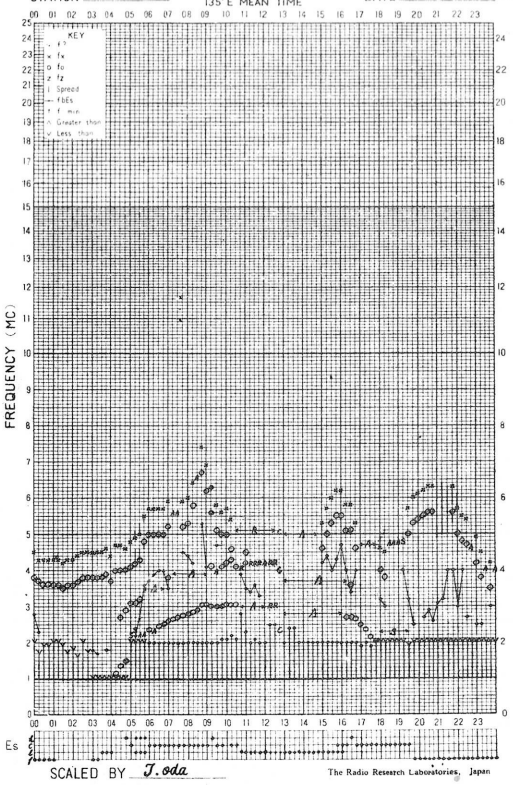

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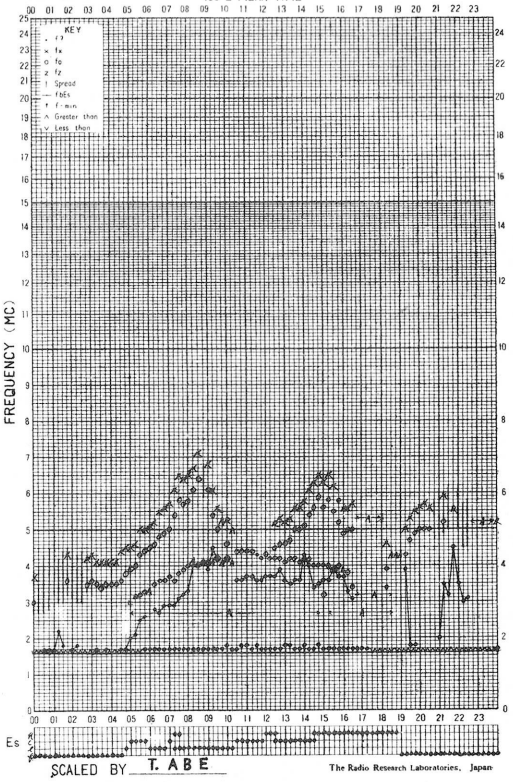

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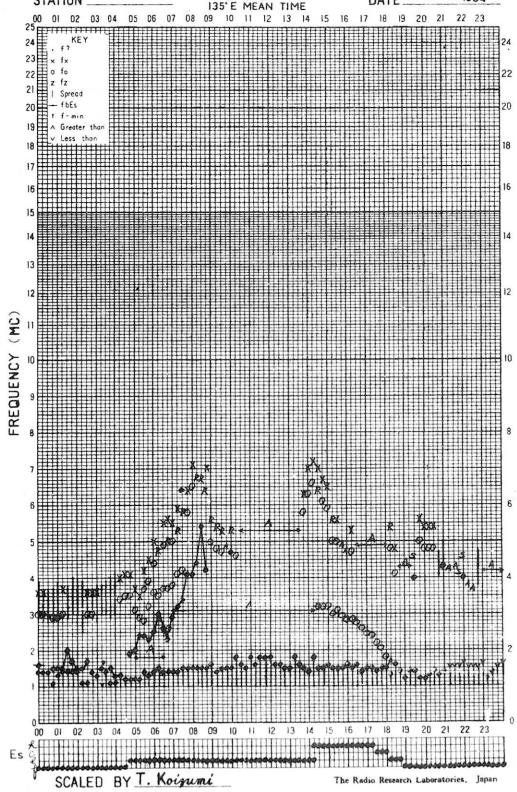

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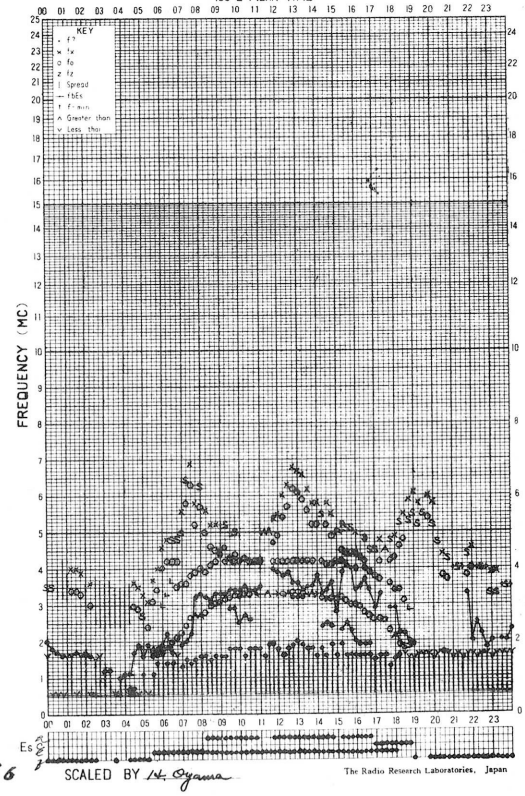

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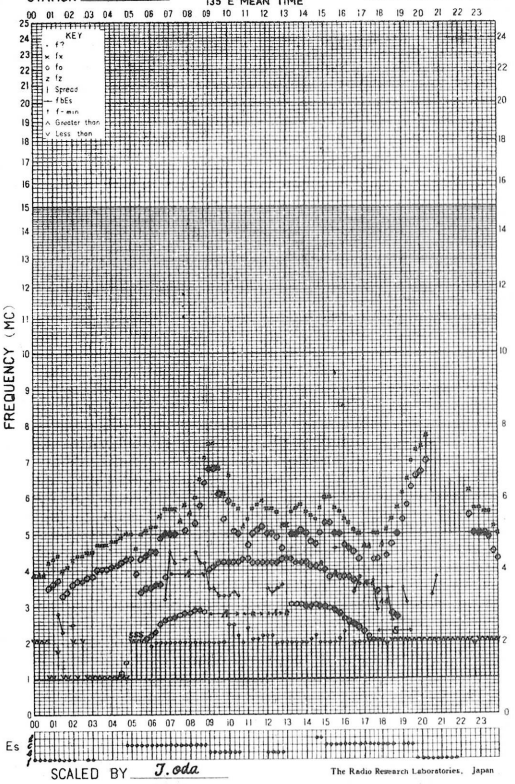

SCALED BY J. Oda

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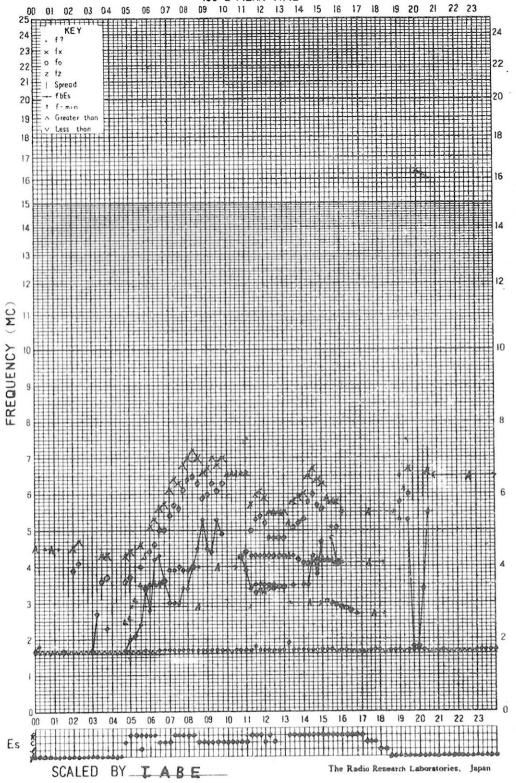

SCALED BY I. ABE

The Radio Research Laboratories, Japan

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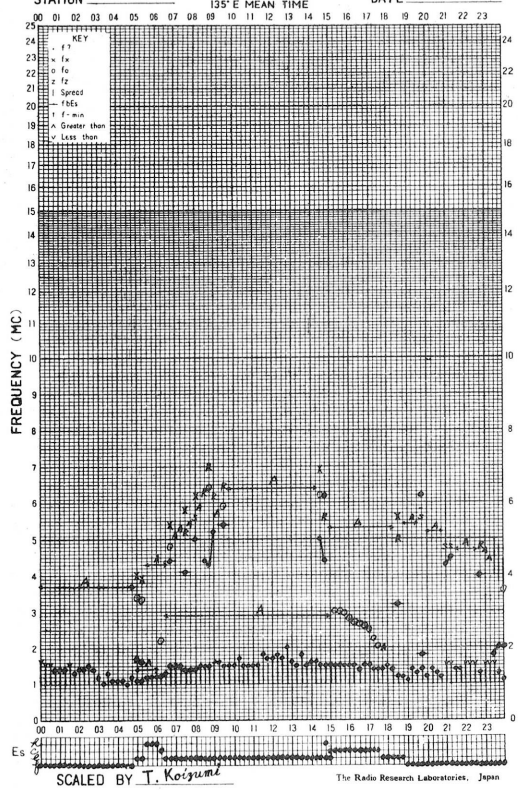

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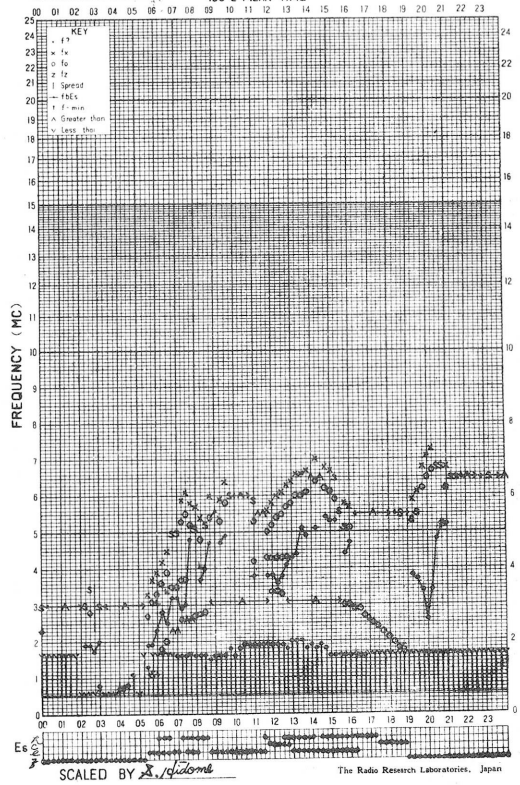

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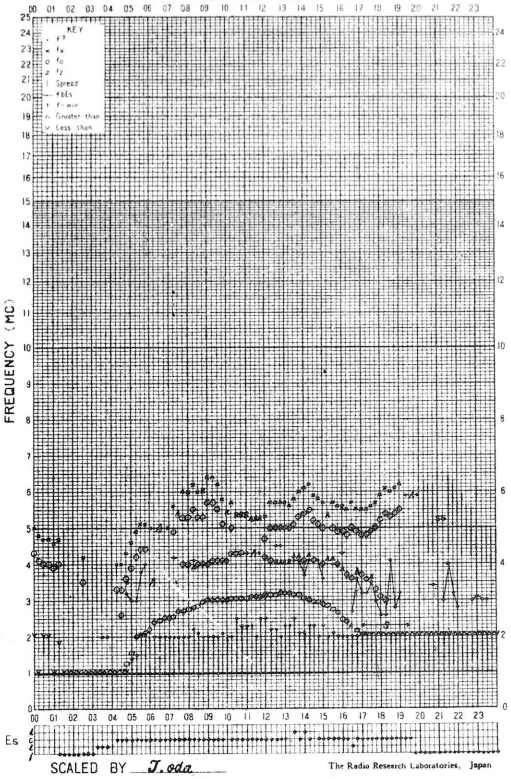
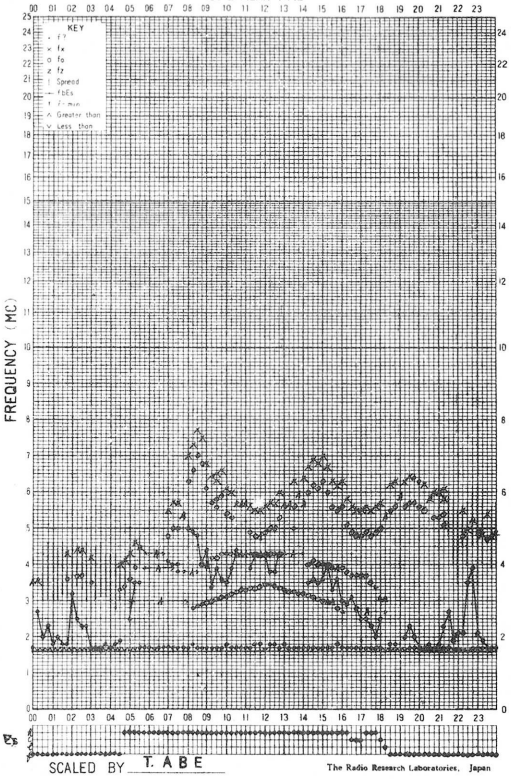


SCALED BY J. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Jul. 30. 1964

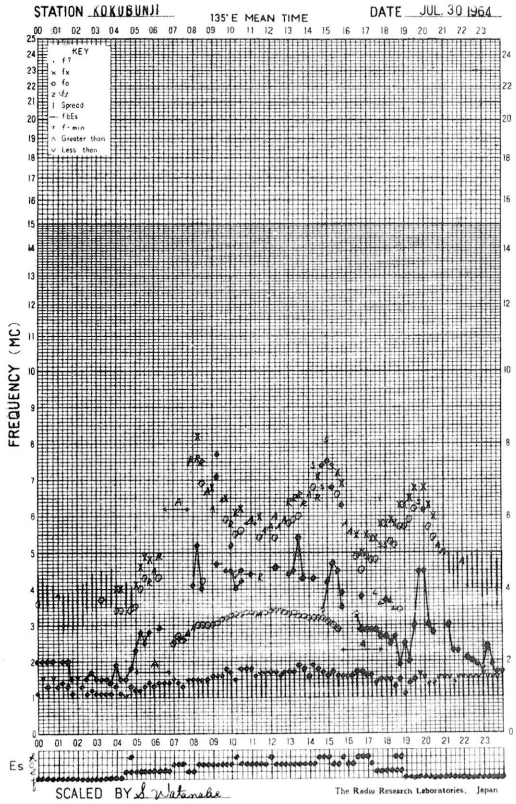


SCALED BY T. ABE

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE JUL. 30 1964



SCALED BY S. Watanabe

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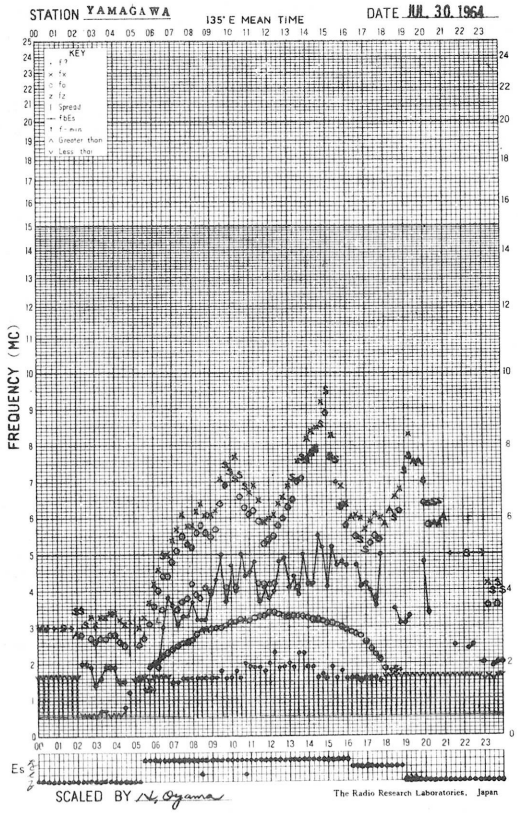
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE JUL. 30 1964



SCALED BY N. Ogawa

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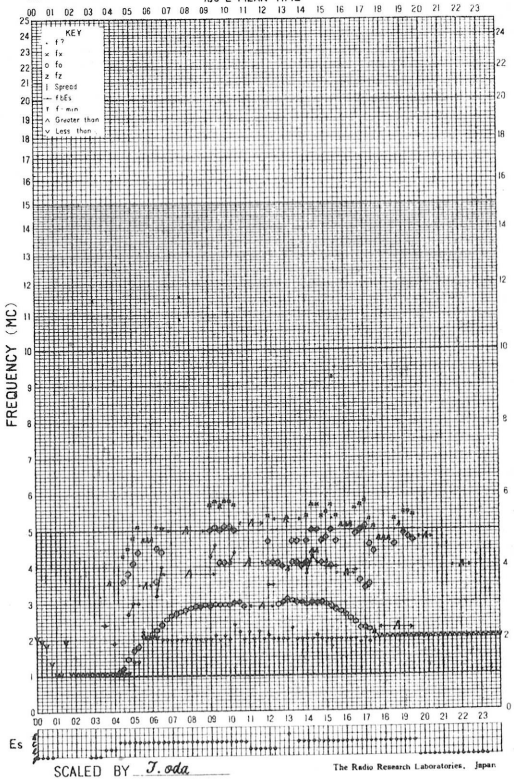
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE JUL. 31. 1964



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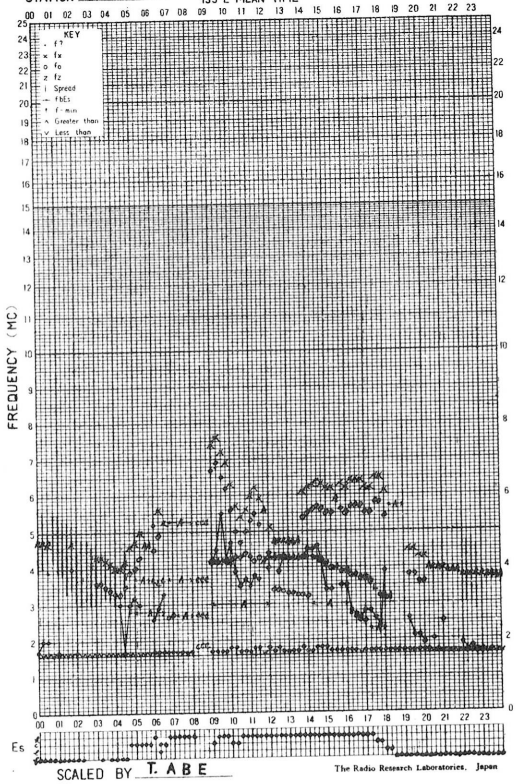
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Jul. 31. 1964



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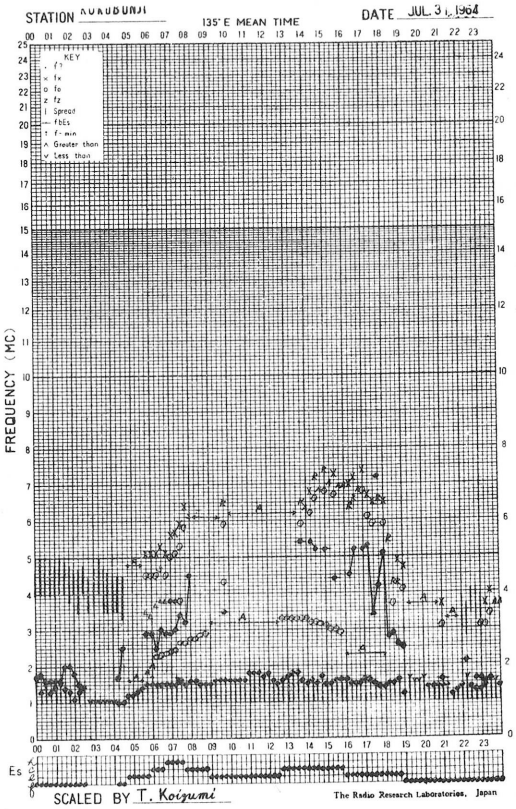
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE JUL. 31. 1964



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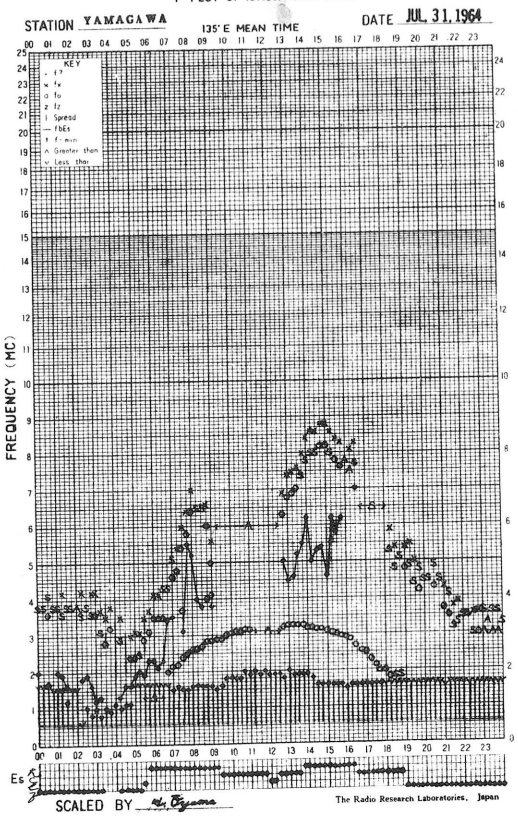
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE JUL. 31, 1964



SCALED BY S. Toyama

The Radio Research Laboratories, Japan

SOLAR RADIO EMISSION

Flux Density and Variability

Month: July 1964.
Observing Station: Hiraiso
Frequency: 200 Mc/s

	Flux density $10^{-22}Wm^{-2}(c/s)^{-1}$					Variability 0 to 3				
UT	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
Date										
1	8	7	7	7	7	0	0	0	0	0
2	7	7	7	8	7	0	0	0	0	0
3	8	7	8	6	8	0	0	0	0	0
4	7	6	7	(7)	7	0	0	0	(0)	0
5	7	7	7	(5)	7	0	0	0	(0)	0
6	7	6	8	(8)	7	0	0	0	(0)	0
7	8	8	7	-	8	0	0	0	-	0
8	(7)	7	7	-	7	0	0	0	-	0
9	8	7	7	-	7	0	0	0	-	0
10	8	7	8	8	8	0	0	0	0	0
11	8	7	7	-	8	0	0	0	-	0
12	6	7	8	7	7	0	0	0	0	0
13	7	8	7	7	7	0	0	0	0	0
14	8	6	5	7	7	0	0	0	0	0
15	7	6	6	6	6	0	0	0	0	0
16	7	8	8	6	7	0	0	0	0	0
17	7	7	7	7	7	0	0	0	0	0
18	7	6	6	-	6	0	0	0	-	0
19	-	7	7	8	7	-	0	0	0	0
20	9	7	(6)	6	8	0	0	(0)	0	0
21	7	7	7	6	7	0	0	0	0	0
22	7	7	6	6	7	0	0	0	0	0
23	8	8	7	-	7	0	0	0	-	0
24	-	-	-	-	-	-	-	-	-	-
25	6	7	8	-	7	0	0	0	-	0
26	8	7	7	-	7	0	0	0	-	0
27	7	7	5	-	6	0	0	0	-	0
28	6	6	6	-	6	0	0	0	-	0
29	7	6	6	-	6	0	0	0	-	0
30	6	7	7	6	7	0	0	0	0	0
31	6	6	7	7	6	0	0	0	0	0

SOLAR RADIO EMISSION

Flux Density

Month: July 1964.
Observing Station: Hiraiso Frequency: 500 Mc/s

Flux density 10^{-22} $Wm^{-2}(c/s)^{-1}$

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

Note No observations during the following periods:

2nd	0650-		0800	13th	0500-		0600
2nd	1930-	3rd	0200	18th	0400-	19th	0200
3rd	0530-		0740	20th	0100-		0300
4th	0040-		0300	20th	0600-		0700
6th	0140-		0300	21st	0540-		0720
7th	0120-		0300	23rd	0130-		0300
7th	0450-		0600	24th	0500-		0550
11th	0700-		0950	31st	0800-		0950

Distinctive Event

No Distinctive Event was observed during July, 1964.

Note No observations during the following periods, at 200 Mc/s:

5th	1930-		2300	20th	0700-		0950
6th	1930-		2200	23rd	0200-		0300
6th	2300-		2400	23rd	1930-	24th	2400
7th	1930-	8th	0200	25th	1930-		2400
8th	0300-		0400	26th	0200-		0300
8th	1930-		2400	26th	0800-		0950
9th	0500-		0700	26th	1930-	27th	0100
9th	1930-	10th	0100	28th	1930-		2400
11th	1930-		2400	29th	0300-		0400
15th	0800-		0950	29th	0300-	30th	0100
18th	1930-	19th	0300	30th	1930-		2200
19th	0800-		0950				

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

July 1964	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	5-	4 5 5	5 5 5 5	5 5 4 4	4 5 4 4	N N N N			
2	5-	4 5 (5)	5 5 5 5	5 5 5 (4)	5 5 5 5	N N N N	2323	---	47γ
3	4+	5 4 4	5 5 4 4	4 5 4 (4)	5 5 4 4	N N N N	---	---	
4	4+	3 5 5	3 3 4 4	5 5 5 3	5 5 4 5	N N N N	---	13xx	
5	4+	4 5 4	4 4 5 4	4 5 5 4	4 4 5 4	N N N N			
6	5-	4 5 5	4 4 5 5	5 5 5 4	4 4 4 4	N N N N	17.6	---	54γ
7	3+	4 4 3	4 4 1 3	4 4 (3) 3	4 4 3 3	N N N N	---	---	
8	3-	3 4 (3)	2 2 2 1	3 3 (3) 3	4 5 3 3	U U U U	---	---	
9	3o	3 4 4	1 2 3 1	3 4 (4) 4	4 4 4 4	U U U U	---	---	
10	3+	(3) 3 4	4 4 3 1	3 3 4 3	4 5 3 3	N N U U	---	16xx	
11	3o	4 3 3	1 4 4 2	3 3 3 3	3 4 3 4	U U U U			
12	4-	4 5 4	2 4 4 3	(4) 5 4 4	4 4 4 4	N N N N			
13	3+	4 5 5	1 1 1 2	5 5 (4) 4	4 5 4 4	N N N N			
(14)	4+	(4) 5 5	4 4 4 5	(4) 3 4 5	4 4 4 3	N N N N			
(15)	5-	5 5 5	4 5 5 5	(4 5) 4 (4)	4 4 4 (4)	N N N N			
(16)°	4+	4 4 4	5 4 5 5	4 4 4 4	4 5 5 4	N N N N	10.4	---	69γ
17	4-	4 3 3	5 4 3 1	4 5 4 4	4 4 4 4	N N N N	---	---	
18	2+	2 2 2	1 (1 1 1)	4 3 4 4	4 3 (3 3)	N N U U	---	---	
19	3o	2 3 4	1 1 4 3	4 4 4 4	3 4 4 4	U U U U	---	---	
20	3+	2 3 4	1 3 4 4	4 3 4 4	4 3 4 5	U U U U	---	16xx	
21	4-	4 4 3	4 3 (3) 4	4 4 5 4	4 4 4 4	N N N N			
22	4o	4 4 4	3 C (4) 4	4 4 3 4	4 4 3 4	N N N N			
23	3-	3 2 2	1 1 1 4	3 4 3 4	5 4 3 3	N N N N			
24	3+	4 4 5	1 3 3 4	4 3 4 4	4 5 4 4	N N N N			
25	4o	5 3 3	4 4 4 5	5 4 (4) 4	4 5 4 5	N N N N			
26	4o	4 4 4	5 4 4 4	4 3 (3) 4	4 4 4 4	N N U U			
27	4o	4 4 4	4 4 5 5	4 4 4 5	4 3 3 4	N N N N			
28	4+	4 5 (5)	5 4 4 5	4 3 5 5	4 3 4 4	N N N N			
29	4+	4 3 3	5 4 3 4	5 5 3 4	4 4 3 4	N N N N			
30	3o	4 3 3	4 2 2 1	4 3 4 4	4 4 4 4	N N N N			
31	3+	4 3 4	2 3 3 3	3 4 4 4	4 4 4 4	N N N N			

IQSY GEOALERT and ADALERT (Western Pacific Region)

* = MAGSTORM

o = MAGCALME

∧ = COSMIC EVENT

( ) = Regular World Day

\- = impossible to evaluate

( ) = inaccurate

C = artificial accident

--- = continuing magnetic storm

SUDDEN IONOSPHERIC DISTURBANCES (S.I.D.)

HIRAISO

No Sudden Ionospheric Disturbance was observed during July, 1964.

IONOSPHERIC DATA IN JAPAN FOR JULY 1964
第 16 巻　第 7 号

1964年9月20日　印　刷
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