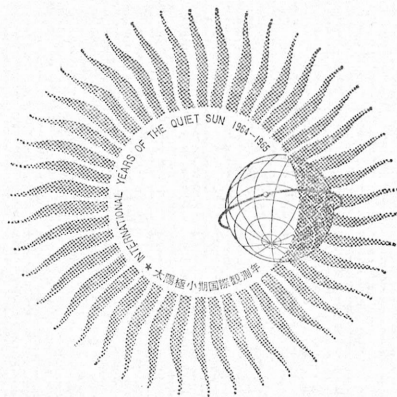


F—190

# IONOSPHERIC DATA IN JAPAN

FOR OCTOBER 1964

Vol. 16 No. 10



Issued in December 1964

Prepared by

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

# IONOSPHERIC DATA IN JAPAN

FOR OCTOBER 1964

Vol. 16 No. 10

THE RADIO RESEARCH LABORATORIES

KOKUBUNJI, TOKYO, JAPAN

## CONTENTS

	Page
Site of radio wave observatories ... ..	2
Symbols and Terminology ... ..	2
Graphs of Ionospheric Data ... ..	8
Tables of Ionospheric Data at Wakkanai ... ..	9
Table of Ionospheric Data at Akita ... ..	21
Tables of Ionospheric Data at Kokubunji... ..	33
Tables of Ionospheric Data at Yamagawa ... ..	47
<i>f</i> -Plot of Ionospheric Data, September ... ..	59
Data on Solar Radio Emission ... ..	91
Radio Propagation Conditions... ..	94

## 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

$f_oF2$ $f_oF1$ $f_oE$	}	The ordinary wave critical frequency for the $F2$ , $F1$ and $E$ layers, respectively.
$f_oE_s$		The ordinary wave top frequency corresponding to highest frequency at which a mainly continuous trace is observed.
$f_oE_s$		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 $f_oE_s$ .
$h_pF2$		The virtual height of the $F2$ layer measured on the ordinary

$ypF2$ 

wave branch at a frequency equal to  $0.834f_0F2$ .

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  $0.969f_0F2$ ).

**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 height: *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 greatly 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  $10^{-22} \text{ W} \cdot \text{m}^{-2} \cdot (\text{c/s})^{-1}$  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 , 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)

4 = normal

2 = poor (disturbed)

5 = good

3 = rather poor (unstable)

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 prepared from the field intensity records on following circuits received at Hiraiso. Characteristics of the phenomenon are classified as follows.

*Circuits and Drop-out intensity*

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

*Importances*

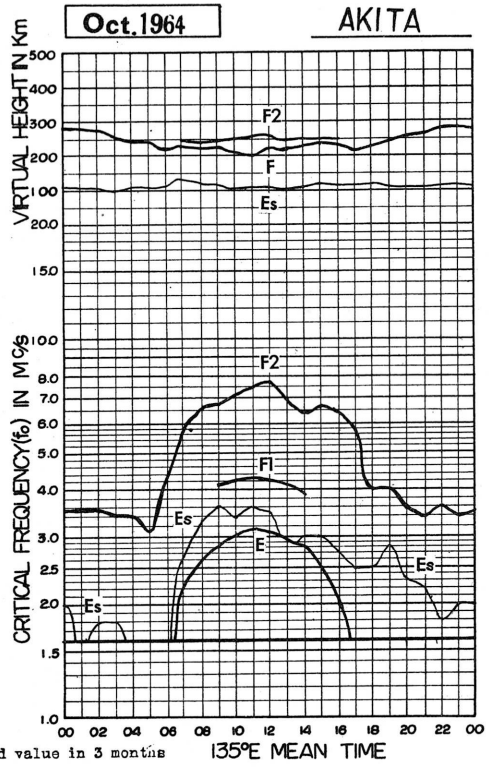
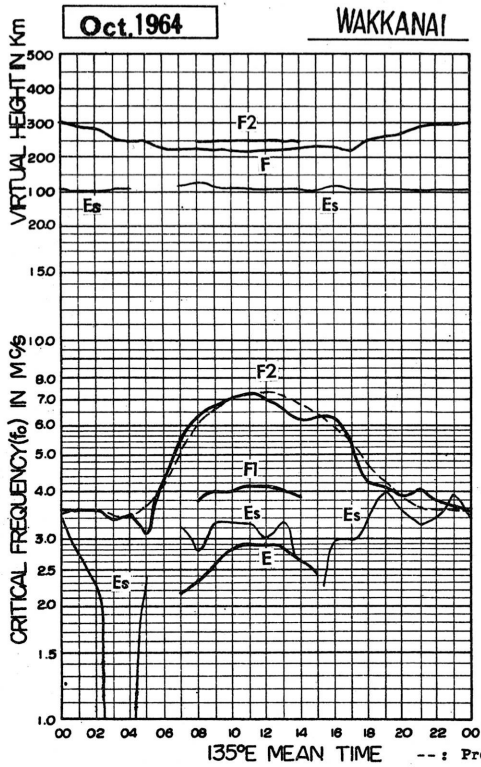
Degrees of SWF are classified into 9 grades according to the amplitude of fade-out;

1-	1	1+
2-	2	2+
3-	3	3+

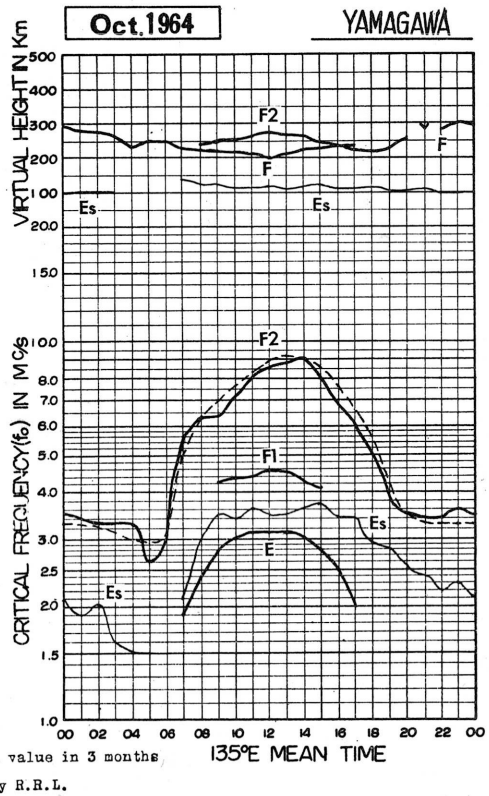
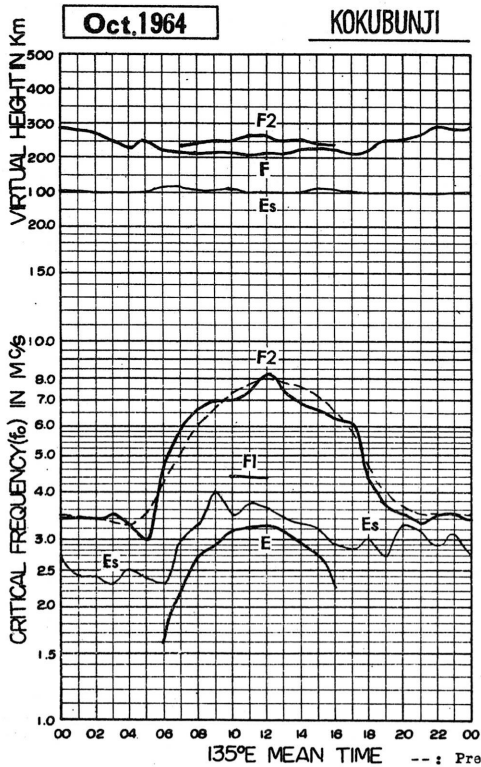
Besides, the time associated phenomena of SID's, that is, solar flare, solar radio noise outburst and crochet (solar flare effect in magnetic record) are given in this table from interchange messages or measurements at Hiraiso.



IONOSPHERIC DATA  
MONTHLY MEDIAN CHARACTERISTICS



IONOSPHERIC DATA  
MONTHLY MEDIAN CHARACTERISTICS



Lat. 45° 23.6'N  
Long. 141° 41.1'E

Wakkanai

IONOSPHERIC DATA

0.1 Mc 135° E Mean Time (G. M. T. + 9h)

foF<sub>2</sub>

Oct. 1964

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	SF	F	F	F	F	F	044F	048	051	058	057	057	057	061	052	055	058	054	047	047	047	046	046	046	046
2	033F	SF	SF	SF	SF	SF	050H	057	053	060	060	057	058	058	053	057H	059H	061	051	046	045	044	044	037	037
3	034	033	033	034	033	033S	043	055	058	I055C	I055R	057H	055	056	057	061	063	057	041	040	040	039	040	039	039
4	038	037	036	FS	FS	041	040	050	051	C	C	C	C	C	C	C	063	048	044	051	048	050	044	042	
5	043	043	038	036	037	043F	043	065S	054H	065	069	080	I076C	076	060	I059C	056	057	058	048	044	SF	SF	048F	
6	046	SF	SF	SF	SF	028S	043S	057	056	067	066	068	068	067	066	065	064	058	I043C	I043S	I042A	SF	043F	SF	
7	SF	049F	045F	040	041	SF	051	049H	058	065	085	083R	J076R	068	057H	058	059	053	043	043	042	040	042	042	036
8	036	036	038	SF	SF	029	044	051	065	068	075	077	076	063	060H	063	067	052	037	041	037	037	037	037	F
9	035F	037F	034F	037F	037	036	050	057	063H	078	062	074	065	065	061	061	058	051	045	045	045	043	044	043	043
10	039	035	036	034	036	033	048	061	075	083	071	071	068H	067	065	069	068	053	042	042	037	040	040	040	040
11	041	040	041	044S	042S	044S	044	054H	059	067	070	069	074	067	065	069	075	055	SF	SF	SF	SF	SF	SF	SF
12	SF	SF	A	SF	SF	SF	041F	057	063H	058H	070	077	071	066	061	063	063	052	SF	A	SF	046F	SF	043F	043F
13	040F	043F	040	037F	035F	SF	I041A	I055A	068	081	I088R	068	073	072	061	067H	066H	061	038	029	I028A	030	032	032	031
14	032	032	031	030	030F	028	041	053	061H	063	067	073	069	066	065	073	072	A	037	036	039	040	040	037	040
15	040S	037	036	035	035	034	043	053	055	067	068	070	063	069	066	065	065	049	035	032	033	036	035	035	035
16	036	036	038	034	035	037	040	051	056	070	070	080	068	066	062	065	060	050	044	044	040	037	038	039	039
17	041	043F	044F	SF	SF	SF	040	047	065H	068	068	068	I064C	I061C	057	060	057	054	046	048	048	047	SF	SF	SF
18	SF	033F	SF	SF	SF	027F	045	063	I074S	I071C	068	071	072	064	059	059	055	054	I046S	044	035	SF	SF	SF	033F
19	I034F	032F	030F	FS	FS	FS	038	062	062R	072	068	073	081	I075C	063H	058	063	062	052	046	040	041	041	041	037
20	037	036	037	042	039	027	041	059	I057A	076	086	097	084	I082C	066	063	064	058	042	037	038	042	F	FS	FS
21	FS	036F	FS	C	C	C	C	C	C	C	093	086	084	070	067	068	061F	SF	C	SF	SF	FS	FS	SF	SF
22	SF	F	F	FS	FS	046F	040S	055	066	I067A	079	077	070	I074C	070	063	068	053	040F	038F	039F	SF	F	SF	SF
23	SF	SF	SF	SF	SF	SF	035F	050	062	070	074	R	062	067	067H	067	067	043	033	A	A	A	SF	A	A
24	A	030F	030F	SF	SF	SF	SF	056	053	060	064	065	067	057	063	060	058	043	046S	050F	040F	SF	SF	SF	SF
25	SF	SF	F	F	F	F	050F	069	072	066	073	071	076	067	063	067	066	050S	041	040	FS	FS	SF	SF	FS
26	SF	FS	F	F	F	SF	SF	054	069	066	076	083	073	063	057	060	064	051	043	040	I038A	039	041	033	
27	030	030	031	030	030	030	037	065	078	084	070	069	070	061	064	065	064	048	035S	030	026	028	I030A	030	
28	033	033S	033	033	033	027	C	C	C	I073S	070	086	081	070	058	064	058	046	I039A	030	I031A	033	033	SF	SF
29	035F	035F	035F	030F	031F	027	036	056	061	066H	067	076H	073	066	057	055	I065S	044	040	040	036	033	034	033	
30	034	033	033	031	031	031	043	059	063	071H	073	081	075	064	064H	060	062	051	035	026	025	030	032	032	
31	033	033	034	033	SF	030	033	058	I071S	I066C	I075S	077	067	063	068H	058	I055S	036	029	034	035	032	033S	SF	
No.	021	023	021	016	016	019	027	029	029	029	030	029	030	030	030	030	030	031	029	028	027	026	022	019	019
Median	036	036	036	034	035	031	043	055	062	067	070	073	070	066	062	063	063	052	042	041	039	040	038	037	037
U. Q.	040	038	038	037	038	036	044	059	067	072	075	080	076	069	065	065	066	056	046	046	042	043	041	040	040
L. Q.	033	033	033	032	032	028	040	051	056	065	067	068	067	063	057	059	058	048	038	036	035	035	033	033	033
Q. R.	007	005	005	005	006	008	004	008	011	007	008	012	009	006	008	006	008	008	008	008	010	007	010	008	007

foF<sub>2</sub>

Oct. 1964

foF1

0.01 Mc 135° E Mean Time (G. M. T. +9h)

Wakkanai

Lat. 45° 23.0'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										390	410	420	410	400	390L									
2									390	400	410	410	400	400										
3									380	I400C	410		410H	380		400								
4										C	C	C	C	C	C	C								
5										390L	410	430	I410C	I380A	380	C								
6										410L	I410A	420	420	410	360									
7									400L	410L	400	410H	420H	390										
8									360	400	410	420	410	400										
9										400	410	420	400	420	390L									
10									390	410	400	410		390L										
11										400	410	420L	420	400		A								
12										420	430	420	400	400										
13									A	I400L	400	400	I400H	400	400L									
14										400	400	I400A	410	400	A	A								
15										400	400	410	400	400										
16										400	400	410	410	400	380L									
17										390	410	400	I400C	I400C										
18									380L	I400C	400	410H	410H	400L										
19											410	410	430	I400C										
20										A	400	420H	410	I400C										
21										C	C	I410A	420L	400L										
22										A	400	400	I410A	390										
23										400L	I410A	430	400	400										
24										370	400	400	410	400	400L									
25										360L	390	400	400	400										
26											380L	430L	410	400L										
27										I380L	I400A	400L	400	400										
28										390L	380L	420L	400	400										
29											390H			380										
30											I400L	400L	400L	400										
31											400L	400												
No.									8	20	29	28	27	27	8	1								
Median									380	400	400	410	410	400	390	400								
U. Q.																								
L. Q.																								
Q. R.																								

foF1

Sweep 1.0 Mc total 0.0 Mc in 40 sec in automatic operation

The Radio Research Laboratories, Japan

Lat. 45° 23.6'N  
Long. 141° 41.1'E

Wakkanai

IONOSPHERIC DATA

0.01 Mc 135° E Mean Time (G. M. T. +9h)

foE

Oct. 1964

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	I275A 280	285	295	290	285	265	255	B	S	S						
2							S	215	255 285	295	295	300	300	275	245	A	S	S						
3							S	225	245 I270C	285	270	285	290	280	245	225	S	S						
4							S	A	250 C	C	C	C	C	C	C	S	S							
5							S	A	A	290	290	290	C	A	C	215	S	S						
6							S	S	260	A	A	A	295	270	250	S	S							
7							S	S	255	275	290	295	290	I285A 270	245	S	S							
8							S	220	250 260	270	I280A I295A	295	280	245	S	S								
9							S	S	230	245	A	A	A	A	A	A	A							
10							S	A	A	A	290	R	A	A	245	S	S							
11							S	S	R	A	A	I295A I300A	I290A	275	245	S	S							
12							S	S	A	280	285	A	A	A	A	S	S							
13							S	A	A	A	A	I280A 285	I280R	265	240	S	S							
14							S	A	235	255	295	285	A	A	A	215	S							
15							S	S	A	A	A	A	A	A	A	A	A							
16							S	S	250	275	280	285	295	275	260	S	S							
17							S	S	235	265	A	A	C	C	A	230	S							
18							S	A	A	I260C	270	A	A	A	250	230	S							
19							S	S	A	255	280	295	290	I280C	260	220	S							
20							S	205	245	255	I270A I295R	290	I275C	255	A	S	S							
21							C	C	C	C	255	A	A	A	265	230	S							
22							S	S	225	I235A I240A	A	A	A	A	A	A	S							
23							S	210	225	A	A	A	290	275	255	A	S							
24							S	S	235	270	290	I290A 290	I280A	A	A	S	S							
25							S	S	215	265	I290A I295A	I295A	275	255	220	S	S							
26							S	S	205	I225A I255A	285	290	A	A	A	S	S							
27							S	S	235	I250A I280A	290	290	I275A I255A	S	S	S								
28							C	C	C	I235A	A	A	A	275	250	225	S							
29							S	S	235	I255A I280A	290	285	275	245	B	S								
30							S	S	225	250	I260A 295	295	280	250	B	S								
31							S	S	225	I245C I270A	I290A I290A	275	245	S	S	S								
No.								5	21	22	22	19	18	19	20	15	3							
Median								215	235	260	280	290	290	280	260	245	215							
U. Q.																								
L. Q.																								
Q. R.																								

Lat. 45° 23.6'N  
Long. 141° 41.1'E

Wakkanai

IONOSPHERIC DATA

0.1 Mc 135° E Mean Time (G. M. T. +9h)

foEs

Oct. 1964

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	038	026	S	S	J026	J043	J063	J073	031	J051	G	G	G	G	G	G	B	S	030	028	033	033	S	S
2	S	S	S	S	E	S	S	G	G	G	043	G	G	G	G	G	025	051	S	S	S	S	S	S
3	S	S	S	S	E	S	S	G	028	C	G	G	G	G	G	031	029	S	S	S	S	S	S	S
4	S	S	S	S	E	S	S	027	G	C	C	C	C	C	C	C	S	S	S	S	030	S	S	S
5	S	S	S	S	E	S	S	050	033	033	027	025G	C	J043	040	C	035	S	040	037	050	040	S	S
6	J043	032	S	031	E	S	S	034	042	038	071	J043	038	034	033	G	S	S	C	S	050M	029	S	S
7	S	S	S	J020	020	S	S	S	G	G	027G	G	G	034	G	G	S	S	S	S	S	S	S	S
8	S	S	S	E	E	E	S	G	G	030	G	035	040	G	G	G	S	030	050	S	S	S	S	S
9	S	S	S	E	E	S	S	036	028	035	031	041	040	044	035	J043	039	030	040	J035	034	031	S	S
10	S	S	S	E	018	024	J034	041	043	030	G	G	G	035	038	032	030	024	S	S	030	028	S	S
11	S	S	S	E	E	S	S	S	G	029	033	033	039	030	041	J043	043	J033	040	040	043	050	040	J033
12	038	040	062M	031	J027	J053	S	043	025	G	G	039	042	J043	040	033	035	S	050	J063	040	030	S	034
13	S	S	E	026	035	031	050	J063	072	030	041	038	028G	033	G	G	029	028	034	J043	062M	040	032	043
14	029	035	029	J027	J023	S	S	037	G	033	G	052	052	J053	063M	051	033	J061	033	043	040	042	J043	039
15	051	S	J023	E	S	S	S	S	040	037	050	J053	033	033	J044	040	030	033	S	S	S	S	S	S
16	S	S	S	E	J020	S	S	026	G	053	036	G	G	G	G	S	S	S	S	S	S	S	S	S
17	034	024	S	E	E	S	S	S	G	033	040	030	C	C	030	G	023	S	J031	050	S	S	S	034
18	S	S	E	E	033	062	S	034	040M	C	G	033	033	030	G	G	S	033	J073	J043	J065	034	S	035
19	031	023	J025	020	026	E	S	033	029	028	034	039	G	C	G	G	S	S	S	S	S	J044	J040	S
20	026	S	E	E	E	S	S	027	060	071	033	G	G	C	G	J033	S	S	S	S	S	S	S	J050
21	J030	J033	J044	C	C	C	C	C	C	J053	J057	050	038	G	G	G	S	S	C	S	S	S	S	J065
22	043	J025	J024	J023	013	S	S	028	033	075M	J056	040	J043	J031	037	023	030	S	025	J033	J033	030	034	J041
23	043	J063	J033	J021	018	S	S	025	J053	037	J065	036	G	025G	G	030	026	J025	J030	J033	036	J076	J043	J043
24	045M	J028	J025	016	018	S	S	030	G	G	J060	033	033	033	033	033	S	027	032	S	S	S	J033	J038
25	S	E	018	J023	015	J025	S	S	028	G	032	J033	038	G	G	G	S	J025	J036	J040	J033	028	S	S
26	S	S	J030	J021	E	E	S	S	027	028	J033	G	024G	038	030	033	S	S	S	S	J045	J033	J030	J039
27	J033	S	S	E	E	S	S	S	027	J071	030	G	G	J033	033	S	033	S	030M	028	033M	J051	J043	040M
28	J033	037	J020	E	E	S	C	C	C	039	033	060	040	J033	G	G	S	J060	J063	J053	J063	J043	J033	033
29	S	S	018	J020	E	S	S	S	023G	050	038M	G	G	G	B	B	S	S	S	S	S	028	S	025
30	J025	021	J025	E	E	E	S	S	035	J052	J050	G	G	030	030	B	S	S	J028	S	S	024	S	S
31	S	S	E	S	J023	S	S	025	030	C	J063	030	J033	G	G	S	S	S	029	J023	030	J023	S	025
No.	15	14	20	26	29	11	3	20	29	26	30	30	28	27	30	24	14	13	18	15	19	19	13	15
Median	034	027	023	E	E	024	050	032	028	033	033	033	030	033	G	G	030	030	034	040	036	033	034	039
U. Q.	043	035	027	021	022	043	063	039	038	050	043	040	040	035	035	033	035	042	040	043	050	043	043	043
L. Q.	030	023	E	E	E	E	034	026	G	028	G	G	G	G	G	G	029	026	030	033	033	029	033	033
Q. R.	013	012					029	013	022	022							006	016	010	010	017	014	010	010

The Radio Research Laboratories, Japan

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

foEs

Lat. 45° 23.6'N  
Long. 141° 41.1'E

Wakkanai

IONOSPHERIC DATA

0.1 Mc 135° E Mean Time (G. M. T. +9h)

f<sub>o</sub>E<sub>s</sub>

Oct. 1964

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	020	S	S	020	021	030	030	030	G							B	S	021	021	E020S	E020S	S	S	
2	S	S				S	S			G							023	G	S	S	S	S	S	S	
3	S	S	S			S	S			C							G	S	S	S	S	S	S	S	
4	S	S	S	S		S	S	027		C	C	C	C	C	C	C	S	S	S	S	E020S	S	S	S	
5	S	S	S			S	S	040	030	030	025	024	C	042	030	C	025	S	030	024	026	032	S	S	
6	037	024	S	022		S	S	034	042	032	048	032	035	G	G		S	S	C	S	A	021	S	S	
7	S	S	S	018	016	S	S	S		G	026			030			S	S	S	S	S	S	S	S	
8	S	S	S			S	S			G		032	033				S	021	030	S	S	S	S	S	
9	S	S	S	S		S	S	035	G	G	030	037	034	035	030	030	026	020	030	025	E020S	024	S	S	
10	S	S	S		015	E018S	021	040	037	030				035	030	030	G	022	S	S	022	E020S	S	S	
11	S	S	S			S	S	S		029	030	030	032	030	041	038	034	023	025	030	035	025	030	025	
12	025	030	A	015	021	030	S	030	025			031	035	035	030	025	025	S	022	A	025	021	S	022	
13	S	S		018	021	020	A	A	060	029	032	031	025	032			G	E020S	021	021	A	024	021	025	
14	022	025	020	020	013	S	S	024		G		041	036	031	057	043	029	A	023	026	022	027	028	026	
15	023	S	018		S	S	S	S	030	030	035	032	030	030	036	025	024	021	S	S	S	S	S	S	
16	S	S	S		E	S	S	G		G						S	S	S	S	S	S	S	S	S	
17	024	E015S	S			S	S	S	G	G	032	030	C	C	030		G	S	021	030	S	S	021	S	
18	S	S			021	015	S	030	025	C		030	030	030			S	021	E020S	030	E020S	021	S	E020S	
19	021	021	022	E	014	S	S	027	026	G	G	038		C			S	S	S	S	S	E020S	022	S	
20	021	S				S	S	025	A	060	028					025	S	S	S	S	S	S	E020S	E020S	
21	021	022	032	C	C	C	C	C	C	C	049	042	030	029			S	S	C	S	S	S	032	025	
22	024	022	020	018	E	S	S	G	G	A	030	033	040	030	030	023	E030S	S	020	030	030	022	021	E020S	
23	028	020	020	019	E	S	S	G	040	037	050	030		023		025	E020S	021	021	A	A	A	024	A	
24	A	019	020	013	013	S	S	G				031	G	028	025	023	S	E020S	021	S	S	S	022	022	
25	S		017	012	013	E017S	S	S	G		029	030	030				S	021	025	030	021	021	S	S	
26	S	S	017	016		S	S	S	G	028	030		023	030	027	027	S	S	S	S	A	022	021	027	
27	021	S	S			S	S	S	G	042	030		030	025		S	E020S	S	E019S	E020S	022	E020S	A	023	
28	027	020	017			S	C	C	C	028	027	030	030	025			S	034	A	E020S	A	022	025	023	
29	S	S	018	E		S	S	S	022	030	030					B	S	S	S	S	S	E020S	S	E020S	
30	E020S	017	018			S	S	S	G	G	030				G	B	S	S	S	020	S	S	E020S	S	
31	S	S			S	S	S	G	G	C	030	030	030	030		S	S	S	S	020	020	020	020	S	
No.																									
Median																									
U. Q.																									
L. Q.																									
Q. R.																									

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

The Radio Research Laboratories, Japan

f<sub>o</sub>E<sub>s</sub>

W 5

IONOSPHERIC DATA

Wakkanai

Lat. 45° 23.6'N  
Long. 141° 41.1'E

Oct. 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	E0205	E0125	E0185	E0185	E	E0185	E0205	E020	E020	E020	E020	E020	E022	E020	E020	E020	E025	E0205	E0205	E0205	E0205	E0205	E0205	E0205
2	E0205	E0195	E	E	E	E0175	E0205	E020	E020	E020	E020	E023	E020	E021	E020	E020	E0205	E0205	E0205	E0205	E0205	E0205	E0205	E0205
3	E0205	E0205	E0205	E	E	E0195	E0205	E020	E020	C	E0195	E020	E020	E020	E020	E020	E0205	E0205	E0205	E0205	E0205	E0205	E0205	E0205
4	E0225	E0205	E0205	E0185	E	E0175	E0205	E020	E020	C	C	C	C	C	C	C	E0205	E0255	E0205	E0205	E0215	E0225	E0205	E0205
5	E0205	E0205	E0195	E	E	E	E0205	E0205	E021	E021	E020	E020	E020	E020	E020	E020	E0205	E0245	E0205	E0245	E0215	E0225	E0205	E0205
6	E0215	E0205	E0215	E	E	E0205	E0205	E0225	E021	E021	E021	E020	E021	E021	E020	E020	E0215	E0245	C	E0245	E0215	E0205	E0205	E0205
7	E0205	E	E0165	E	E	E0205	E0205	E0215	E021	E020	E021	E022	E024	E020	E021	E021	E0205	E0205	E0205	E0205	E0205	E0205	E0205	E0205
8	E0205	E0165	E0155	E	E	E	E0195	E020	E020	E020	E020	E021	E021	E021	E020	E020	E0215	E0205	E0205	E0205	E0205	E0205	E0205	E0205
9	E0205	E0175	E	E0125	E	E0195	E0205	E0205	E020	E020	E022	E020	E021	E021	E020	E022	E0205	E0195	E0205	E0205	E0205	E0205	E0205	E0205
10	E0205	E0175	E0155	E	E	E0185	E0195	E0205	E020	E020	E022	E023	E022	E020	E020	E020	E0205	E0205	E0205	E0205	E0205	E0205	E0205	E0205
11	E0205	E0205	E	E	E	E0205	E0205	E0225	E020	E020	E022	E022	E020	E020	E020	E020	E0205	E0205	E0205	E0205	E0205	E0205	E0205	E0205
12	E0205	E	E	E	E	E0155	E0205	E0205	E019	E020	E020	E020	E020	E020	E020	E020	E0205	E0205	E0205	E0205	E0205	E0205	E0205	E0205
13	E0205	E0185	E	E	E	E	E0205	E0205	E020	E020	E022	E021	E020	E020	E020	E020	E0205	E0205	E0205	E0205	E0205	E0205	E0205	E0205
14	E0205	E	E	E	E	E0145	E0195	E0205	E020	E022	E023	E021	E023	E022	E021	E020	E0205	E0205	E0205	E0205	E0215	E0205	E0205	E0205
15	E0205	E0185	E	E	E0155	E0185	E0205	E0235	E020	E020	E021	E023	E022	E022	E020	E020	E0205	E0205	E0205	E0205	E0205	E0205	E0205	E0205
16	E0205	E0145	E0205	E	E	E0205	E0205	E0215	E020	E020	E020	E020	E022	E022	E020	E0245	E0215	E0205	E0205	E0205	E0215	E0205	E0205	E0205
17	E0205	E0155	E0175	E	E	E0175	E0205	E0235	E020	E020	E022	E025	C	C	E020	E020	E0205	E0205	E0205	E0215	E0205	E0205	E0205	E0205
18	E0205	E0125	E	E	E	E0135	E0205	E0205	E020	C	E020	E020	E021	E020	E020	E020	E0215	E0205	E0205	E0205	E0205	E0205	E0205	E0205
19	E0205	E	E	E	E	E	E0185	E0205	E020	E020	E021	E023	E022	E021	E020	E020	E0215	E0205	E0205	E0205	E0215	E0205	E0205	E0205
20	E0205	E0205	E	E	E	E0205	E0205	E0205	E020	E020	E021	E022	E022	E022	E020	E020	E0215	E0205	E0205	E0205	E0215	E0205	E0205	E0205
21	E0205	E0135	E0155	C	C	C	C	C	C	C	C	E020	E020	E020	E020	E020	E0205	E0205	C	E0205	E0205	E0205	E0205	E0205
22	E0205	E	E	E	E	E0155	E0205	E0205	E020	E020	E020	E021	E020	E020	E020	E020	E0205	E0195	E0185	E0205	E0205	E0205	E0205	E0205
23	E0195	E	E	E	E	E0165	E0205	E020	E020	E020	E020	E020	E020	E019	E020	E020	E0205	E0185	E0195	E0205	E0205	E0205	E0195	E0205
24	E0205	E	E	E	E	E0185	E0195	E0215	E020	E020	E020	E020	E020	E020	E020	E020	E0205	E0205	E0205	E0205	E0205	E0205	E0205	E0205
25	E0205	E	E	E	E	E0175	E0205	E0215	E019	E020	E020	E020	E020	E020	E020	E020	E0205	E0195	E0185	E0205	E0185	E0205	E0215	E0205
26	E0205	E0175	E	E	E	E	E0205	E0215	E018	E020	E020	E020	E020	E020	E020	E020	E0205	E0195	E0185	E0205	E0205	E0205	E0205	E0205
27	E0205	E0175	E0145	E	E	E0165	E0195	E0215	E020	E020	E020	E020	E020	E020	E020	E0235	E0205	E0195	E0195	E0205	E0205	E0205	E0205	E0205
28	E0205	E0185	E	E	E	E0165	C	C	C	E020	E020	E020	E020	E020	E020	E020	E0205	E0205	E0205	E0205	E0205	E0205	E0205	E0205
29	E0205	E0195	E	E	E	E0145	E0195	E0215	E020	E020	E020	E020	E020	E020	E020	E024	E0205	E0205	E0205	E0205	E0205	E0205	E0205	E0205
30	E0205	E	E	E	E	E	E0195	E0205	E020	E020	E020	E020	E020	E020	E020	E023	E0205	E0205	E0205	E0185	E0185	E0205	E0205	E0205
31	E0185	E0155	E	E0205	E	E0205	E0205	E0205	E020	C	E020	E020	E020	E020	E020	E0235	E0205	E0185	E0175	E0175	E0185	E0195	E0195	E0195
No.	31	31	19	26	29	30	29	29	29	26	30	30	28	27	30	26	31	31	29	31	31	31	31	31
Median	E020	E016	E	E	E	E017	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020
U. Q.																								
L. Q.																								
Q. R.																								

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

f-min

The Radio Research Laboratories, Japan

W 6

IONOSPHERIC DATA

Lat. 45° 23.6'N  
Long. 141° 41.1'E

Wakkanai

135° E Mean Time (G. M. T. + 9h)

M(3000)F2 0.01

Oct. 1964

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	SF	F	F	F	F	305F	320F	335	340	350	335	335	335	350	365	345	355	320	305	310	325	SF	335F	
2	280F	SF	SF	SF	SF	350	360H	350	350	350	355	360	360	335	360	335H	340H	345	335	325	310	325	340	320
3	300	305	305	315	320	335S	355	350	345	1355C	1355R	355H	365	340	320	340	350	335	340	320	305	300	340	305
4	305	305	290	FS	FS	370	370	360	350	C	C	C	C	C	C	C	340	335	300	305	295	305	315	295
5	290	300	295	295	295	310F	305	355S	370H	340	320	320	1335C	305	350	1345C	345	320	330	310	295	SF	SF	285F
6	285	SF	SF	SF	SF	315S	340S	350	355	360	335	335	340	335	350	345	350	350	1320C	1295S	SF	290F	SF	SF
7	SF	310F	310F	300	335	SF	270	365H	340	325	330	335R	1340R	355	360H	350	355	350	305	295	310	300	320	310
8	285	315	315	SF	SF	310	365	350	345	345	335	340	340	335	350H	335	350	350	325	310	295	305	320	F
9	285F	305F	305F	310F	325	320	355	340	350H	350	340	350	355	345	345	340	345	335	330	295	310	275	290	305
10	310	295	305	320	315	305	355	345	335	360	340	340	325H	335	345	350	370	360	330	335	295	290	300	290
11	300	300	300	320S	305S	320S	365	370H	340	340	345	335	355	360	325	350	360	365	SF	SF	SF	SF	SF	SF
12	SF	SF	A	SF	SF	SF	365F	355	350H	330H	335	350	350	355	345	350	350	360	SF	A	SF	290F	SF	285F
13	275F	280F	295	305F	295F	SF	1335A	1345A	325	325	1350R	325	340	345	345	350H	345H	370	360	350	1295A	300	290	290
14	280	295	295	300	325F	310	365	360	345H	355	340	330	335	335	355	345	355	A	310	305	310	310	295	300
15	320S	320	315	310	330	320	350	360	365	355	350	345	335	350	350	355	355	350	335	315	305	310	295	285
16	310	305	300	305	315	350	375	375	360	360	330	340	355	335	355	345	350	330	320	320	325	310	295	310
17	300	280F	285F	SF	SF	SF	360	370	355H	355	355	340	1345C	1355C	340	345	345	335	320	315	330	325	SF	SF
18	SF	310F	SF	SF	SF	310F	345	350	1345C	355	340	345	345	345	340	360	355	350	1335S	340	325	SF	SF	285F
19	1295F	315F	325F	FS	SF	F	340	355	345R	345	340	330	345	1335C	355H	335	335	340	330	325	295	SF	SF	305
20	305	280	295	310	335	295	325	355	1340A	315	325	340	340	1345C	365	340	360	345	335	305	315	285	F	FS
21	FS	305F	FS	C	C	C	C	C	C	C	340	350	345	345	345	345	355F	SF	C	SF	SF	FS	FS	SF
22	SF	F	F	FS	FS	310F	SF	340S	365	355	1340A	335	345	335	1345C	355	370	355	350F	330F	320F	SF	F	SF
23	SF	SF	SF	SF	SF	SF	SF	345F	360	350	365	R	355	350	345H	360	345	360	350	A	A	A	SF	A
24	A	305F	300F	SF	SF	SF	SF	375	375	350	350	325	365	360	335	365	345	335	325S	350F	350F	SF	SF	SF
25	SF	SF	F	F	F	F	F	325F	360	365	355	340	340	350	335	350	355	345S	315	320	FS	FS	FS	FS
26	SF	FS	F	F	SF	SF	SF	370	375	375	350	335	350	350	340	350	355	355	305	290	1305A	295	320	320
27	300	325	320	305	305	325	325	355	340	365	345	355	355	345	345	350	345	355	345S	335	310	300	1290A	295
28	305	305S	320	320	335	320	C	C	C	1340S	335	350	360	355	345	360	365	335	1345A	320	1310A	295	305	SF
29	290F	315F	295F	295F	325F	315	340	375	360	365H	345	345H	355	370	335	350	1345S	320	330	330	335	295	295	305
30	310	300	275	295	300	305	390	360	365	350H	340	345	345	365	345H	350	360	360	350	345	300	295	305	305
31	305	305	300	305	SF	335	335	380	1350S	1355C	1335S	355	350	350	340H	360	1365S	355	310	330	330	335	295S	SF
No.	21	23	21	16	16	19	27	29	29	29	30	29	30	30	30	30	31	29	28	27	26	22	19	19
Median	300	305	300	305	320	315	345	360	350	350	340	340	345	345	345	350	350	350	330	320	310	300	300	305
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

W 7



Lat. 45° 23.6'N  
Long. 141° 41.1'E

Wakkanai

IONOSPHERIC DATA

0.01 M(3000)F1 135° E Mean Time (G. M. T. +9h)

M(3000)F1

Oct. 1964

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	385	375	385	375	405L										
2								370	380	385	390	400	385												
3								410	I395C	415			395H	400		375									
4									C	C	C	C	C	C	C	C									
5									390L	370	370	I375C	I390A	380	390	C									
6									380L	I380A	380	380	390	390											
7								375L	390L	380	370H	370H	385												
8								390	400	390	370	390	400												
9										410	I385A	400	380	390L											
10								A	390	400	390			385L											
11									400	390	385L	380	400		A										
12										360	365	380	380												
13								A	U400L	375	405	400H	390	395L											
14									385	390	I395A	390	380	A	A										
15									380	390	390	400	385												
16									400	400	390	390	380	395L											
17									385	385	400	I395C	I385C												
18									375L	I405C	405	390H	385H	375L											
19											395	I375A	370	I385C											
20									A	375	385H	375	I380C												
21									C	C	A	A	380L	395L											
22										A	400	385	I390A	385											
23									A	A	I390A	375	395	380											
24										415	400	400	385	395											
25									390L	410	400	400	390	400											
26											405L	375L	385	395L											
27									U395L	I400A	395L	395	400												
28										385L	400L	365L	400	400											
29											400H														
30											U395S	395L	395L	400											
31											400L	380													
No.								7	19	29	27	27	27	27	8	1									
Median								390	390	395	385	390	385	390	390	375									
U. Q.																									
L. Q.																									
Q. R.																									

The Radio Research Laboratories, Japan

Sweep 1.0 Mc to 10.0 Mc in 40 sec in automatic operation

M(3000)F1

Oct. 1964

R'F2

km

135° E Mean Time (G. M. T. + 9h)

Wakkanai

Lat. 45° 23.6'N  
Long. 141° 41.1'E

IONOSPHERIC DATA

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										265	300	290	275	260	250										
2									260	260	255	250	260	270											
3									240	I250C	260		250	265		265									
4										C	C	C	C	C	C	C									
5										265	290	260	I260C	250	255	C									
6										250	275	260	265	270	250										
7									270	255	265	250	255	250											
8									250	250	260	250	260	200											
9											245	260	250	265	260										
10									255	240	250	250			250										
11										250	250	265	250	250		250									
12										260	250	260	260	245											
13									A	245	245	250	260	250	250										
14										245	260	250	260	245	I265A	250									
15										260	250	250	240	250											
16										230	260	255	235	245	245										
17										240	245	255	I250C	I255C											
18									250	I250C	260	245	245	260											
19											235	260	260	I250C											
20										A	260	250	260	I250C											
21									C	C	260	250	250	250	250										
22										A	250	245	250	250											
23									240	240	245	300	245	250											
24										245	240	265	245	245	270										
25									225	245	245	260	255	240											
26										240	240	260	245	250											
27									290	240	240	245	250												
28										240	240	250	230	230											
29											245		225	225											
30											250	250	245	240											
31											225	245													
No.									9	20	30	28	27	27	9	3									
Median									250	250	250	250	250	250	250	250									
U. Q.																									
L. Q.																									
Q. R.																									

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

The Radio Research Laboratories, Japan

W 9

Lat. 45° 23.6'N  
Long. 141° 41.1'E

Wakkanai

IONOSPHERIC DATA

135° E Mean Time (G. M. T. + 9h)

km

f'F

Oct. 1964

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	300	275	260	265	290	260A	250A	260	245	220	205	215	220	230	210H	250	240	250	270	270	290	270	250
2	290	310	285	290	275	225	235	240H	220	210	200	205	200	195	240H	240H	250H	240	235	260	265	255	245	260
3	295	295	300	250	250	255	220	210H	210	1195C	200	210H	200H	190	250	245	240	220	230	260	270	290	285	280
4	300	310	305	310	255	215	215	240	240H	C	C	C	C	C	C	C	235	230	250	270	280	280	250	260
5	280	270	290	290	275	250	230	1245A	225H	200	225	230	1215A	1225A	235	C	240	245	225A	260	300A	1300A	280	300
6	1310A	300	250	250	245A	290	240	1235A	1245A	245	1215A	225	220	220	230	240H	230	230	1245C	250	1315A	290	295	275
7	285	250	260	290	225	260	220	205H	225	230	210	200H	205H	215	230H	250	235	230	245	265	265	285	255	260
8	305	285	260	240	235	235	220	225	245	230	210	205	240	225	205H	250	240	215	1250A	270	275	290	320	330
9	325	280	270	280	250	265	225	1220A	225H	245	220	1225A	240	250	240	250	240	235	1260A	300A	270	325	300	275
10	275	280	270	250	250	245	230	1235A	1245A	240	220	215	235H	240	250	250	225	215	225	240	310	300	275	280
11	270	280	275	245	250	250	205	205H	210H	215	245	215	225	220	1245A	1240A	230	210	250	2280A	265	290	A	265
12	300	1320A	1340A	265	300	235	205	220	220H	220	240	215	225	225	235H	240H	225	210	255	A	295	290	275	320
13	340	305	285	275	280	275	1260A	1255A	1245A	220	210	200	200H	255	235	240H	230	210	235	245	A	320A	310	350A
14	345A	345A	315	300	250	270	210	220	220H	225	185	1195A	225	225	1225A	1230A	230	1230A	260	300A	285	300A	2300S	300
15	275	260	260	250	260	250	230	230	240	220	220	220	210	215	260A	240	225	210	245	250	250	280	300	300
16	295	275	290	250	275	230	210	220	225	230	205	205	235	210	225	240	220	230	250	245	260	290	285	280
17	290	285	300	250	250	245	205	220	240H	215	225	200	1210C	1245C	245	245	230	225	250	270A	245	230	275	305
18	290	290	270	250	230	250	225	245	230	1210C	205	220H	235H	225	225	230	220	225	250	1250A	250	300	330	330
19	300	300	300	250	225	245	240	230	205H	240	225	1235A	230	1225C	210H	230	245	225	235	260	250	290	290	280
20	315	350	300	250	250	250	240	230	1245A	1240A	220	215H	220	1230C	240H	235	230	225	225	270	270	280	300	300
21	300	300	1285A	C	C	C	C	C	C	A	A	A	220	225	210H	240	220	210	1240C	260	250	245	1305A	305
22	275	270	270	240	250	250	240	230	240	1240A	230	220	1235A	230	240	240	220	210	240	1275A	1300A	300	300	290
23	310A	325	300	290	230	215	230	220	1240A	1245A	1225A	210	215	230	240H	230H	220	210	230	A	A	A	300	1325A
24	1325A	310	300	260	250	225	210	220	210	200	210	200	240	220	230	240	225	220	230	230	260	260	300	290
25	295	265	250	235	260	250	225	225	205	205	200	200	215	220	225	245	225	220	250	1260A	260	270	260	245
26	300	280	275	265	220	210	215	210	220	215H	195L	200	210	230	235	240	230	215	265	300	1310A	300	260	A
27	300	250	265	250	260	250	245	225	230	1230A	210	220	220	210H	240	235	230	210	230	245	A	330	1335A	350
28	340A	320	290	250	250	260	C	C	C	210	200	200	240	230	210H	240	225	A	A	260	A	300	1305A	300
29	300	290	300	285	250	250	230	225	220H	200H	200H	200H	200H	225	210H	235	230	215	260	250	255	295	295	300
30	295	290	300	300	280	275	235	220	225	220H	235	220	210	225	215H	230	225	215	225	230	2300S	305S	295	280
31	300	290	260	300S	260	245	250	210	240	1205C	225	210	220	210H	220H	225	220	210	275	250	255	260	255	305
No.	31	31	31	30	30	29	29	29	29	29	29	29	30	30	30	29	31	30	30	28	26	30	29	30
Median	300	290	285	255	250	250	230	225	220	220	210	220	225	230	240	240	230	220	250	260	270	290	295	295
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

Sweep 1.0 Mc total 40 sec in automatic operation

f'F

W 10

Oct. 1964

km

RES

135° E Mean Time (G. M. T. +9h)

Wakkanai

Lat. 45° 23.6'N  
Long. 141° 41.1'E

IONOSPHERIC DATA

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

Sweep 1.0 Mc tot 8.0 Mc in 40 sec in automatic operation

The Radio Research Laboratories, Japan

RES

W 11

IONOSPHERIC DATA

Lat. 45° 23.6'N  
Long. 141° 41.1'E

Wakkanai

135° E Mean Time (G.M.T. +9h)

Oct. 1964

Types of Es

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	f			f2	f3	e2	12	1	1							1	12	1	f	f	f			
2										1							1	h							
3									c								h								
4								1																	
5								12	1	1	1	1	12	1	1		c		f	f	f2	f2			
6	f2	f		f				h	e	1	12	1	1	e	e										
7				f2						1	1	1	1	1				1	f2						
8									c	c	1	1	1	c	1	1	1	1	f2	f2					
9								e2	c	c	1	1	1	1	1	h	c	c							
10					f2	f	c	12	1	1			12	1	1	h	c	c							
11									1	1	1	1	1	1	c	e2	e2	e2	f	f3	f2	f2			
12	f2	f2	f4	f	f2	f2		e	1	1	1	1	12	12	1	1	c		f4	f4	f2	f			
13				f	f2	f2	15	14	13	1	1	1	1	1	1	c	c	e	f	f	f2	f	f	f2	
14	f	f2	f	f2	f			1	e	e	c	c	12	1	12	13	c	c2	f	f2	f	f2	f	f	
15	f								1	1	1	1	1	1	12	1	1	1	1						
16					f			h		c	e						c		f	f2					
17	f								c	1	1	1	1	1	1			c	f	f2	f				
18					f	f		12	1	c	1	1	1	1				c	f	f2	f	f			
19	f	f2	f2	f	f			e	1	c	h	h													
20	f							h	e5	c2	1				1										
21	f	f	f2							e2	12	12	12	1											
22	f	f2	f	f	f			h	e	12	1	1	12	1	12	1	c		f	f2	f2	f	f2		
23	f2	f2	f2	f2	f			h	c	12	12	1	1	1	1	1	1	1	f	f2	f2	f	f4	f2	f5
24	f2	f2	f	f	f			e				12	1	1	1	1		1	f	f	f	f2	f2		
25					f	f			c	1	1	1	1	1	1	1		12	f2	f2	f	f			
26									c	1	1	1	1	1	1	1					f4	f2	f	f3	
27	f2								c	1	1	1	1	1	1	1	1		f	f	f	f	f2	f	
28	f3								1	1	1	1	1	1	1	1		f2	f2	f2	f4	f2	f2	f	
29				f					1	1	1	1			1										
30	f	f	f						c	c	1	1			1				f						
31					f			h	e		1	1	1	1	1	1			f	f	f2	f			
No.																									
Median																									
U. Q.																									
L. Q.																									
Q. R.																									

Sweep 1.0 Mc to 8.0 Mc in 40 sec in automatic operation

The Radio Research Laboratories, Japan

W 12

Types of Es

IONOSPHERIC DATA

Lat. 39° 43.5'N  
Long. 140° 08.2'E

foF2

Oct. 1964

0.1 Mc 135° E Mean Time (G. M. T. + 9h)

Akita

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	039	041F	040F	043	040	035	047R	057	I067C	071H	072	067	061	060V	061	058	057	I062R	057	050	050	047R	045	037
2	031	F	F	033F	034S	036F	048	061S	I069R	064	060H	059	059	059	054	058	060	072S	069	046	043	043S	038	034
3	035	034S	034	034	032	031	047	I070S	062	060	060	061R	059	059	060	065	I072R	061	047	031	032	034	035	035
4	033	033R	032	031	034	030	040	050R	058	061	066	088	081	064	066	065	062S	058	047	045	046S	048F	049F	045
5	043	044	041	040	040	043	044	058S	I064R	059	067	096	080	065	I060C	063	056	062	050	048	046	048R	046	046
6	046	045	I044R	029	030V	028	043	061	070	066	070	070	072S	069	061R	068S	067	054	041	040S	I041A	I042A	045	045
7	I045R	F	F	F	F	F	058	051	061R	077	091	087	092	076	063	056R	056	063	043	040	039	038	040	034
8	034	035S	036S	034	033	027	047R	056	059S	070	074S	083	075	072	062	062	062R	071	042	032	034S	034S	035	035
9	035	036	035	034	F	034	053	067	059	061	071	069	079	061	060	062	066S	058	055	I040R	041S	039S	040	037S
10	039S	036	036	035	035	033S	047S	061	071S	076S	085	070	063	069	068	074S	I072S	055	I039A	A	RS	RS	A	A
11	FS	F	F	F	037F	036F	050	054	065	058	074R	078	074	073R	058	I066A	I078R	064	040	036	038S	FS	FS	FS
12	FS	FS	FS	040F	FS	FS	046S	I056A	I062R	058	068	084	083	066	060	069	073R	055	038	038S	F	F	040F	F
13	F	F	F	037F	I034A	F	046R	060	I075R	083S	084	081	076R	080	072	070	I076R	I058A	037	028S	028	031	033	032
14	032	032	031	030	030	029	046	055R	065R	066	058	075	082	077	068	070R	070	054	I036A	I034A	036	038	F	F
15	F	040	036S	036F	033	030S	043	063S	061S	060	074R	I072R	071	069	073	065S	067	051	038	034	033	034	035	034S
16	I036R	035S	035	036	034	036	038	051	I063R	064	076S	081	076	069	066	066	067	059	043	042	034	033	034F	035S
17	037S	036S	036S	036S	036S	037F	041	I050R	I063R	067	071S	070	081	066	058	061	063	058	054	047	045	044	035	FS
18	038F	036F	F	034F	041	027F	040	057	081S	083	078	083	080R	070	063	066	065	051	045	043	I031A	032	032	032F
19	032F	033	033	030	029	024S	043	066	I068R	067H	076	078	091	I087R	I071G	057	056	068	054	046	039	034	036	037
20	037	035S	036	044	037	029	037	057	070	085	096S	108	097	080	070	068	065	053	038	038	041	I040R	040S	F
21	F	F	F	I042R	039F	F	040	059	071S	075S	092	087	079	076	064	066	067	058	045	I044R	041F	I040R	I040R	RF
22	RF	RF	RF	F	F	F	039	058	072S	071S	I083R	075	092	074S	072	068	061	054	F	F	I034A	039S	FS	FS
23	040F	FS	F	F	FS	FS	039	052	058	068	070S	078	074	070	I078R	066S	I064R	043	030S	027	025S	027S	FS	FS
24	FS	FS	FS	FS	F	FS	040S	049	I056S	057	060	071	069	068	060	067	061	044	039	046	037F	031S	FS	FS
25	C	C	C	C	C	C	C	C	C	C	062	070	074	083	071	061	062	057	039	040S	034	RS	FS	FS
26	FS	F	F	F	F	F	042	055	066	067	068	I074R	080	071S	066	I066R	064S	046	040	041	038S	041	040S	I033R
27	032	032	031	030	030	029	041	064R	072S	082	078	073	073	068	061	068	065	051	I042A	032	026	029	031	032F
28	033	034S	FS	033	033S	031	040	061	077	082	071	070	079	071	065	056H	062	047	033	034S	030S	032	FS	032S
29	033S	034S	034	F	F	028F	037	055	I070R	066	062	070	074	061	060	056	055	058	038S	042S	I036A	029	031	031S
30	032F	032	031F	029	029F	031S	045	066	066	071	076	081	086	073	065	062	061	050	036	028	036	028	030	031
31	031	032	034	031	032	031S	040S	056	060	068V	069	072	077	060	065	I066A	054	040	029	FS	FS	033S	028S	FS
No.	22	20	18	23	22	22	30	30	30	30	31	31	31	31	31	31	31	31	31	30	28	27	23	19
Median	035	035	035	034	034	031	043	057	066	067	071	075	077	069	064	066	064	057	040	040	036	034	036	034
U. Q.	039	036	036	037	037	035	047	061	070	075	078	083	081	074	068	068	067	061	047	044	041	041	040	037
L. Q.	032	033	033	031	032	029	040	055	061	061	067	070	073	065	060	061	061	051	038	034	032	032	033	032
Q. R.	007	003	003	006	005	006	007	006	009	014	011	013	008	009	008	007	006	010	009	010	009	009	007	005

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

foF2

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Lat. 39° 43.5'N  
Long. 140° 08.2'E

Akita

0.01 Mc 135° E Mean Time (G. M. T. + 9h)

foF1

Oct. 1964

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	I400C	420	400L	430	420	400L	LH	L								
2								L	L	420L	420	L	420L	400	LH	L	L							
3								L	L	410L	420L	420L	LH	LH	L	L	L							
4								L	LH	L	450H	440L	450L	410L	LH	L	L							
5								L	L	420L	470L	430H	430L	420	I390C	380L	L							
6									L	L	L	L	430L	420L	390R	LH	L							
7								270	LH	L	420L	430	440L	A	A	L								
8									L	440	440L	440	440L	L	L	L								
9								L	L	380L	L	L	410	L	L	L								
10									L	L	L	L	L	L	L	L								
11									L	L	420L	420	L	430L	L	A								
12								A	L	420	410	430L	430	420	400L	L	L							
13								L	L	L	410L	430L	L	L	L	L	A							
14								L	390L	L	L	L	430L	L	390L	L								
15									L	L	LH	430L	450L	L	LH	L								
16									L	400L	420L	L	LH	410	L	L								
17									L	L	410	420L	420L	LH	L	L								
18								270	LH	410L	420	420	LH	420	L	L								
19								LH	L	370	460L	LH	LH	C	C	320								
20									L	410L	I430A	420	420L	410L	350L	L								
21								A	L	A	I400A	L	L	L	L	L								
22									L	L	400L	L	L	L	L	L								
23									L	L	L	430L	430L	430	LH	A								
24									L	L	400L	L	420L	410	370L	L								
25									C	C	L	L	420L	400L	L	L								
26									L	L	L	L	L	L	L	L								
27									L	400L	A	L	420L	A	L	L								
28									L	L	L	L	L	410L	L	L								
29									L	L	L	400	420L	L	L									
30									L	L	L	L	L	L	L									
31									L	L	L	L	420L	L	L									
No.								2	2	12	18	15	19	14	6	2								
Median								270	U395	410	420	430	420	410	390	350								
U. Q.																								
L. Q.																								
Q. R.																								

foF1

Oct. 1964

foE

0.01 Mc

135° E Mean Time (G. M. T. +9h)

Akita

Lat. 39° 43.5'N  
Long. 140° 08.2'E

IONOSPHERIC DATA

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2							E	A	C	A	I310A	I320A	I315R	305	285	265	AS	A						
3							E	S	I270A	300	310	315	310	305	280	255	220	E						
4							E	235	270	295	310	325	325	315R	295	260A	A	A						
5							E	RS	I255A	I280A	305	315	320A	310	290	270S	RS	S						
6							E	AS	A	A	A	315	325	315	I290C	270R	A	A						
7							A	A	265A	290	305	I315A	320A	310R	290	270S	A	E						
8							E	235A	275	300	310	320	A	A	A	A	A	A						
9							E	I210A	I260A	295	305	I305A	I310A	305	295	270	S	E						
10							E	A	A	A	A	A	A	295	280	255	A	A						
11							A	A	A	A	A	A	A	A	A	A	A	A						
12							E	A	A	I295R	I310A	320R	A	A	A	A	A	E						
13							E	A	A	A	A	A	A	A	295	260A	A	E						
14							E	A	A	295	A	A	310	300	275	I250A	220S							
15							E	A	A	A	A	I315A	315	300	275	I250S	RS							
16							E	250	280A	285	305	I305A	310	295	275R	245	A							
17							E	225	255	I280A	I290A	300	300H	I290A	I280A	255	205							
18							E	220	I250A	280	300	305	305	295	275	245	A							
19							E	A	260R	285	295	300	300	I290C	I280C	245	200S							
20							E	210	255	A	A	A	A	A	A	235	A							
21							E	A	A	280	A	A	A	A	A	245	195							
22								230	I270A	I280A	A	A	A	I290A	A	A	A							
23								A	A	A	300	305	305	295	280	250	A							
24								A	250	285	300	A	A	A	285	I250A	A							
25								C	C	C	A	300	300	I290A	I275A	A	A							
26								I210A	255	280	300	305	305	295	285	250	A							
27								205	A	A	A	A	A	A	A	A	A							
28							E	A	A	A	A	A	A	300	I270A	235	195							
29							E	205	I255A	285	290	300	I300A	290	260	A	A							
30							E	A	A	A	A	A	300	295	270	230	I180A							
31								205	A	A	A	A	300	290	A	A	180							
No.							21	12	15	17	16	19	20	23	23	22	8	5						
Median							E	215	260	285	305	315	310	295	280	250	200	E						
U. Q.																								
L. Q.																								
Q. R.																								

foE

Sweep 1.5 Mc to 20.0Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 3



IONOSPHERIC DATA

foEs

0.1 Mc 135° E Mean Time (G. M. T. +9h)

Akita

Lat. 39° 43.5'N  
Long. 140° 08.2'E

Oct. 1964

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	J020	E	J021	E	J018	E	J033	C	J050	J063	J042	J025G	G	G	G	030	030	J028	J028	J035	J018	J020	E	J018	E
2	E	E	E	E	E	E	S	J036	G	G	J031G	J035	G	G	G	019	026	J024	E	J029	J018	E	E	E	E
3	J019	E	E	E	E	E	G	G	G	G	G	J025G	G	G	G	033	031	J024	J017	F	J021	J022	E	E	E
4	E	E	E	E	E	E	E	J028	J028	J033	J033	J025G	G	G	G	G	G	S	E	E	J021	J022	E	E	E
5	E	E	E	E	J030	J018	J017	J036	J043	J043	J023G	J023G	G	G	C	G	027	023	J018	E	E	J018	J029	E	E
6	J027	J032	J019	E	E	E	E	025	028	E	J046	J043	036	G	J027G	G	024S	J027	J067	J050S	J051	J040	J035	J028	J028
7	J025	J024	E	J018	J017	E	J023	025	J028	037	G	0228	J037	J053	J058	J065	J043	J034	J033	J023	E	J018	E	E	E
8	E	E	J018	E	E	E	E	028	032	035	J033	J033	J038	G	G	J020G	J023	020	J028	E	E	J034	E	E	E
9	E	E	E	E	J023	J017	E	J029	030	G	G	J033	J031G	G	G	033	J026	027	J025	J023	J027	J022	J029	J023	J023
10	J019	J022	J018	J019	J018	J018	J028	J038	J036	035	J041	J038	J037	036	033	035	J037	J062	J038	J065	J063	J033	J037	J037	J037
11	J035	J027	J019	J028	J020	J024	J033	J027	J054	J042	J032	J068	036	J036	J073	J061	J060	J032	J024	J028	J018	E	E	E	E
12	J023	E	J026	J023	J028	J028	J045	J082	J048	J033	J033	J037	J038	J039	J035	032S	028S	J026	J019	J033	J034	J028	E	E	J025
13	J018	E	E	E	J030	J030	J038	J032	J058S	J053	J042	J060	J043	J023G	033	J063	J063	J063	J056	J036	J028	J023	E	E	E
14	J022	E	E	E	E	E	E	020	026	025	033	J043	J020G	J021G	J033	J028	G	023	J039	J058	J023	J022	J030	J028	J028
15	J041	J035	J028	J019	J018	E	E	026S	028	035	J034	033	J027G	J026G	G	G	024S	J020	J018	E	E	E	E	E	E
16	E	E	E	E	E	E	E	G	032S	036	J058	035	035	G	G	J061	J025	E	J026	J021	J020	E	E	E	E
17	E	E	J030	J026	J033	J018	J022	025	030	J040	J038	J028G	G	030	030	G	028	J059	J018	J027	J023	J025	J023	J023	J021
18	J019	E	E	J018	J025	E	G	G	J031	G	G	G	G	G	G	G	023	J021	J019	J027	J033	J033	J039	J020	J020
19	E	J023	J019	J019	E	E	E	024	J028	J033	023G	J031	026G	C	C	026	J023	J029	J023	J023	E	E	E	E	E
20	J034	J027	J024	E	J020	J020	E	025	037	J043	J091	J040	J036	J045	027	J024	J039	E	E	E	E	J036	E	E	J020
21	J040	J036	E	J022	E	J028	022	J060	J049	040	J050	J043	J037	J035	037	031	024	J018	E	E	E	E	E	E	J026
22	J040	J029	J025	J020	E	E	J018	026	J045	J046	034	J037	035	032	J029	J029	J025	J029	J021	J029	J040	J030	J042	J035	J035
23	J048	J018	J018	E	E	E	E	025	J049	J067	G	J033	J032	032	G	J039	J034	J029	J030	J026	J034	J021	J038	J020	J020
24	J028	J031	J020	E	J026	J020	J028	J029	J033	G	J041	J051	J065	J050	034	032	J029	J018	J036	J035	J036	J034	E	E	E
25	C	C	C	C	C	C	C	C	C	C	J035	G	J035	J034	J030	J028	J035	J031	J032	J030	J025	J021	J020	J018	J018
26	E	E	J020	J018	E	E	E	025	G	030	026G	J027G	030G	G	027G	G	J020	E	E	J033	J025	E	J036	J059	J059
27	J033	J025	J030	J023	J020	J020	J018	G	030	J033	J070	J058	J060	J073	J060	J046	J040	J050	J060	J034	J026	J023	J023	J030	J030
28	J042	J042	J038	J020	E	E	E	J025	J041	J039	J050	J060	J050	J033	J030	J031	G	E	J039	J070	J041	J028	J028	J025	J025
29	J020	J018	J020	J020	E	E	E	026	J042	026G	J033	J036	J033	027G	J033	J033	J029	J030	J047	J043	J028	E	J029	J039	J039
30	E	E	E	J025	J017	E	E	J023	J041	J045	J050	J038	031	J033	J029	G	J023	E	J021	J031	J017	J038	E	J020	J020
31	E	E	E	E	E	J025	J018	J021	032	J038	J062	J045	033	G	J034	J110	J028	E	J028	J025	J043	J060	J028	J025	J025
No.	30	30	30	30	30	30	30	29	29	30	31	31	31	30	29	31	31	30	31	31	31	31	31	31	31
Median	020	E	018	018	E	E	E	026	033	036	034	036	035	G	030	030	027	025	025	028	023	022	018	020	020
U. Q.	033	027	024	021	020	020	022	028	042	042	050	043	037	036	034	035	035	030	036	035	034	033	029	026	026
L. Q.	E	E	E	E	E	E	E	024	029	033	G	G	G	G	G	G	023	E	018	021	E	E	E	E	E
Q. R.							004	013	009							012	012	018	014	014					

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

The Radio Research Laboratories, Japan

foEs

A 4

Lat. 39° 43.5'N  
Long. 140° 08.2'E

Akita

IONOSPHERIC DATA

0.1 Mc  
135° E Mean Time (G. M. T. +9h)

fbEs

Oct. 1964

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	017			019		E		EO3R	C	031	040	035	019G			030	024	019	020	E	E	E		E	
2							S		028	G	018G	018	017			019	026			E	E				
3	E													033	032	032	029	023S	E						
4									027	U028R	021	021G	035					S			017	018			
5				E	E	E	018	024	036S	035	031	020G		C			024	020	E		E	E	025	E	
6	024	026	017		020	028	034	028	034	036	040	038	033		021G		023	U027R	018	018S	A	A	021	E	
7	E	018		E	017	025	017	025	017	017		022G	034	052	057	035S	028S	027	020	022		018			
8			E					027	030	031	033	030	G		018G	U023R	018	017	017			025S			
9					E	E			023	029		032	U031R		032	029	024	024	024	023	E	E	E	E	
10	E	E	E	E	E	E	E	022	030	034	035	034	035	G	031	029	U037R	049	A	A	A	024	A	A	
11		018	E	E	017	E	032	024	032	035	031	035	035	032	033	A	042S	021	E	E	E				
12	E		E	E	E	E	041	A	032	E	030	019S	031	032	029	027	022S	E	017	025	020	020S		025	
13	017				A	018S	U038R	021S	033S	038S	035	035S	031	038	018G	031	EO63R	A	030	025S	019S	E			
14	E					019	025	U025R	031	031	037	019G	019G	020G	018	027		018	A	A	019	E	020	E	
15	019	024	E	E	E		026	027	031	032	032	033	019G	021G			017	E	E						
16								G	032	032	032	033	G		018	022	022		E	020	E				
17			E	017	E	E	024	029	033	034	018G			029		025	053	E	E	E	E	E	E	E	
18	E			E	E			025								022	020	017	E	A	027S			E	
19		018	E	017				021	020S	G	019G	020	020G	C	C	017	017	E	019	021		E			
20	E	017	E		E	E		025	034	035	080S	034	033	035	027	018	027								
21	E	E		E		E	E	032	029	040	050	039	032	030	034	020	022		E		A	E	022	E	
22	021	018	E	017		E	E	025	034	035	031	032	031	029	028	025	022	027	E	E	019	E	E	E	
23	E	E	017					023	029	034		023	020	031	037	037	053S	E	023	E	023	E	E	E	
24	E	018	E		E	E	E	024	027		027	032	033	031	030	026	025	018	E	E	023	E		E	
25	C	C	C	C	C	C	C	C	C	C	030		025	031	028	026	025	017	019	019	E	020	E	E	
26			E	E				023		G	022G	021G	020G		018G	020				E	E		023	E	
27	020	017	017	018	E	E	E		029	031	054	038	035	048	031	027	023	026	A	019	017	E	017	017	
28	025	017	017	E				021	027	030	033	036	032	025	028	G		025	025	026	023	E	E	E	
29	E	E	E	017				024	028	025G	025	026	030	024G	G	023	020	022	019	017	025		E	019	
30			E		E			022	027	032	032	031	029	025	024	019	019		019	020	E	017		E	
31			021	E				018	028	032	039	032	G	029	A	017		019	019	E	025	023	018	E	
No.																									
Median																									
U. Q.																									
L. Q.																									
Q. R.																									

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

The Radio Research Laboratories, Japan

A 5

fbEs

Lat. 39° 43.5'N  
Long. 140° 08.2'E

Akita

IONOSPHERIC DATA

0.1 Mc 135° E Mean Time (G. M. T. + 9h)

f-min

Oct. 1964

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	E	E	E	C	E	017	017	017	017	017	E	018	017	E	E	E	E	E	E
2	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	017	017	E	E	E	E	E	E
3	E	E	E	E	E	E	E	017	017	017	017	017	E	017	017	017	E	017	E	E	E	E	E	E
4	E	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	017S	E	E	E	E	E	E
5	E	E	E	E	E	E	E	017	017	017	017	017	017	017	C	019	017	E	E	E	E	E	E	E
6	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	E	017	017	017	E	E	E	E	E
7	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E	E	E
8	E	E	E	E	E	E	E	E	017	E	017	017	017	017	017	E	E	017	E	E	E	E	E	E
9	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	017	017	E	E	E	E	E	E
10	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	018	E	E	E	E	E	E	E
11	E	E	E	E	E	E	E	E	E	017	017	017	017	E	017	017	E	E	E	E	E	E	E	E
12	E	E	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	E	E	017	018S	017	017	017
13	017	E	E	E	E	E	E	017	017	017	017	E	017	017	017	E	017	E	E	E	E	E	E	E
14	E	E	E	E	E	E	E	E	E	E	017	017	017	E	017	017	E	E	E	E	E	E	E	E
15	017	E	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	E	E	E	E	E	E	E
16	E	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E
17	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E
18	E	E	E	E	E	E	E	E	017	E	017	017	017	E	017	017	017	E	E	017	E	E	E	E
19	E	E	E	E	E	E	E	E	E	017	017	017	017	C	017	017	017	E	E	E	E	E	E	E
20	E	E	E	E	E	E	E	E	017	017	E	017	017	017	017	017	017	017	E	E	E	E	E	E
21	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	E	017	017	017	018	017	017	017	017	E	E	E	E	E	E	E	E
23	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E	E
24	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E	E
25	C	C	C	C	C	C	C	C	C	C	017	017	017	017	017	E	017	E	E	E	E	E	E	E
26	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E
27	E	E	E	E	E	E	E	E	017	017	017	017	017	017	E	017	E	E	017	E	E	E	E	E
28	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	E	017	E	E	E	E	E	E
29	E	E	E	E	E	E	E	E	017	017	017	E	017	E	E	017	E	E	E	E	E	E	E	E
30	E	E	E	E	E	E	E	E	E	017	E	E	E	E	E	E	E	E	E	E	E	E	E	E
31	E	E	E	E	E	E	E	E	E	E	017	017	017	017	017	E	E	E	E	E	E	E	E	E
No.	30	30	30	30	30	30	30	30	29	30	31	31	31	30	29	31	31	31	31	31	30	31	31	31
Median	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	017	017	E	E	E	E	E	E
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

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

f-min

IONOSPHERIC DATA

Lat. 39° 43.5'N  
Long. 140° 08.2'E

Akita

135° E Mean Time (G. M. T. + 9h)

0.01

M(3000)F2

Oct. 1984

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	280	295F	310F	335	350	365	340R	335	I350C	325H	350	345	350	320V	345	350	335	I340R	325	305	305	320R	325	365
2	300	F	F	290F	305S	340F	365	355S	I360R	365	375H	335	350	350	320	335	340	340S	355	325	305	315S	315	295
3	305	305S	295	295	320	305	350	I370S	385	385	360	330R	370	335	320	345	I350R	360	370	325	285	295	300	300
4	310	290R	285	290	340	350	375	355R	360	350	320	330	340	330	330	335	355S	345	345	295	305S	300F	325F	310
5	295	300	305	300	300	330	365	I360R	345	345	300	335	350	355	I345C	355	340	355	340	315	295	295R	295	295
6	310	305	I350R	295	305V	290	340	355	365	350	355	345	350S	350	345R	355S	360	345	335	310S	I310A	I305A	305	310
7	I310R	F	F	F	F	F	365	375	350R	330	350	335	335	355	350	355R	345	355	330	325	310	315	325	305
8	300	315S	310S	325	330	320	360R	355	355S	340	340S	340	345	350	355	350	340R	365	360	290	300S	285S	315	290
9	290	295	295	320	F	295	370	380	370	350	345	365	345	370	355	330	350S	340	340	I325R	295S	285S	310	310S
10	310S	310	310	305	325	330S	345S	345	360S	340S	360	335	345	340	345	350S	I365S	365	I350A	A	A	RS	A	A
11	FS	F	F	F	335F	360F	360	355	360	350	345R	345	345	355	360R	375	I365R	370	360	300	305S	FS	FS	FS
12	FS	F	FS	310F	FS	FS	370S	I365A	I365R	345	305	360	345	365	350	355	370R	380	360	310S	F	F	305F	F
13	F	F	F	325F	I310A	F	375R	320	I350R	325S	335	335	340R	350	350	355	I365R	I365A	360	320S	320	305	305	305
14	290	310	295	305	315	340	360	375R	360R	355	345	335	345	350	355	355R	370	360	I330A	I340A	310	315	F	F
15	F	325	350S	305F	335	315S	335	380S	365S	350	340R	I350R	340	345	355	345S	375	370	345	315	290	310	295	310S
16	I305R	300S	300	325	320	375	375	365	I365R	355	345S	350	345	360	325	345	350	365	330	345	335	300	295F	305S
17	300S	310S	305S	315S	315S	340F	345	I380R	I360R	350	335S	325	350	350	360	355	355	335	345	305	320	325	350	FS
18	300F	295F	F	315F	335	335F	345	340	345S	335	350	345	325R	345	350	365	355	345	335	360	I320A	305	285	285F
19	295F	325	330	330	350	335S	350	350	I360R	305H	330	335	330	I350C	I355C	340	325	340	330	360	I320A	305	295	300
20	295	290S	305	320	320	340	340	345	335	320S	330	330	340	345	350	350	365	365	325	305	310	I310R	310S	F
21	F	F	F	I340R	350F	F	345	350	350S	325S	345	340	345	345	350	365	365	360	315	I320R	325F	I310R	I300R	RF
22	RF	RF	RF	F	F	F	345	350	365S	350S	I345R	325	350	335S	360	360	365	365	F	F	I310A	295S	FS	FS
23	305F	FS	F	F	FS	FS	345	365	350	345	350S	345	355	330	I345R	350S	I370R	380	315S	305	305S	305S	FS	FS
24	FS	FS	FS	FS	F	FS	365S	380	I380S	380	330	350	355	360	330	360	370	345	315	330	355F	295S	FS	FS
25	C	C	C	C	C	C	C	C	C	C	360	335	335	345	345	355	365	350	335	340S	310	RS	FS	FS
26	FS	F	F	F	F	F	355	370	345	355	345	I340R	345	340S	350	I355R	350S	335	300	295	320S	305	325S	I330R
27	315	315	325	305	305	315	325	345R	355S	365	360	355	345	355	340	360	360	345	I340A	330	310	290	290	285F
28	305	300S	FS	335	310S	330	350	360	345	350	345	335	345	360	365	340H	360	345	340	330S	310S	295	FS	295S
29	310S	280S	305	F	F	325F	340	360	I365R	360	350	360	345	365	345	345	345	345	330S	325S	I330A	310	295	275S
30	305F	315	285F	290	305F	300S	335	390	365	355	345	345	345	360	350	365	350	350	335	330	290	285	290	295
31	295	305	295	305	330	325S	340S	360	355	340V	345	335	360	340	350	I355A	370	350	335	FS	FS	335S	315S	FS
No.	22	20	18	23	22	22	30	30	30	30	31	31	31	31	31	31	31	31	30	28	28	27	23	19
Median	300	305	305	310	320	330	350	360	360	350	345	340	345	350	350	355	360	350	335	320	310	305	305	300
U. Q.																								
L. Q.																								
Q. R.																								

M(3000)F2

Lat. 39° 43.5'N  
Long. 140° 08.2'E

Akita

IONOSPHERIC DATA

135° E Mean Time (G. M. T. + 9h)

0.01

M(3000)F1

Oct. 1964

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	I365C	375	I365A	400	395	400L	LH	L								
2								L	L	385L	400	L	385L	405	LH	L	L							
3								L	LH	390L	395L	405L	LH	LH	L	L	L							
4								L	L	L	360H	355L	360L	390L	LH	L	L							
5								L	L	360L	345L	355H	370L	380	I375C	355L	L							
6								L	L	L	L	L	365L	370L	385L	LH	L							
7								4.10	LH	L	380L	370	355L	A	A	L								
8								L	L	385	375L	370	370L	L	L	L								
9								L	L	420L	L	L	395	L	L	L								
10								L	L	L	L	L	L	L	L	L								
11								L	L	L	360L	385	L	350L	L	A								
12								A	L	405	385	370L	375	375	375L	L	L							
13								L	L	L	390L	370L	L	L	L	L	A							
14								L	L	385L	L	L	370L	L	360L	L								
15								L	L	L	LH	395L	355L	L	LH	L								
16								L	L	395L	380L	L	LH	385	L	L								
17								L	L	L	380	375L	360L	LH	L	L								
18								4.25	LH	375L	385	375	LH	360	L	L								
19								LH	L	405	370L	LH	LH	C	C	440								
20								L	L	380L	I360A	370	370L	375L	405L	L								
21								A	L	A	A	L	L	L	L	L								
22								L	L	L	380L	L	L	L	L	L								
23								L	L	L	L	370L	365L	370	LH	A								
24								L	L	L	425	L	365L	370	395L	L								
25								C	C	C	L	L	365L	380	L	L								
26								L	L	L	L	L	L	L	L	L								
27								L	L	390L	A	L	375L	A	L	L								
28								L	L	L	L	L	L	385L	L	L								
29								L	L	L	L	390	360L	L	L									
30								L	L	L	L	L	L	L	L									
31								L	L	L	L	L	370L	L	L									
No.								2	2	12	17	15	19	14	6	2								
Median								420	U375	390	380	370	370	380	380	400								
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

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

M(3000)F1

Oct. 1964

R'F2

km

IONOSPHERIC DATA

Akita

Lat. 39° 48.5'N  
Long. 140° 08.2'E

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							270	1250C	275	255	260	265	250H	255	260									
2							245	245	245	245	275	260	270	260	275	250	250							
3								205	235	235	250	250	275	265	275L	250	245							
4							245	240	260	340	250	260	250	I255C	260	250								
5								225	250	260	250	260	255	250	I250A	250								
6									245	290	260	265	260	235	250	250								
7									230	245	255	250	265	250	250	250								
8									245	250	245	250	255	270	255	250								
9									235	240	255	250	250	250	255	I255A								
10									240	255	270	250	255	250	255	250								
11							A	250	245	250	245	260	250	270	260	245	235							
12							250	245	250	245	260	250	270	260	245	A								
13							215	240	245	240	275	270	245	250	250									
14									230	240	255	245	270	270	250	250								
15									240	245	250	255	245	245	245	245								
16									245	250	260	260	255	250	255	250								
17									255	245	250	260	245	260	240	240								
18							245	245	250	245	260	245	260	260	240									
19							245	250	225H	295	260	285	I245C	I245C	240									
20									255	270	I260A	250	250	250	245	245								
21							230	245	250	240	255	250	250	250	240	240								
22									245	255	255	265	250	280	255	245								
23									235	255	255	260	255	295	250	240								
24									220	230	275	265	270	250	250	250								
25									C	C	240	275	280	255	250	240								
26									235	240	250	240	260	250	250	245								
27									240	240	245	245	255	250	245									
28									255	245	255	260	260	250	245	245								
29									240	230	250	245	250	245	245									
30									230	245	245	255	255	245	250									
31									240	245	250	250	245	250	250									
No.							11	29	30	31	31	31	31	31	31	27	6							
Median							245	240	245	250	255	255	250	250	250	250	250							
U. Q.																								
L. Q.																								
Q. R.																								

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

R'F2

The Radio Research Laboratories, Japan

A 9

# IONOSPHERIC DATA

Lat. 39° 43.5'N  
Long. 140° 08.2'E

Akita

135° E Mean Time (G. M. T. +9h)

km

**R'F**

**Oct. 1964**

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	290	280	250	225S	255	250	I250A	I245C	225	I230A	200	200	200	240H	240	245	245	240	250	250	245	245	220
2	245	300	295	290	265	235	225	230	220	220	225	200	195	195	185H	255	245	245	215	235	245	245	245	265
3	260	260	280	270	245	255	220	230	220	200	200H	200	195H	200H	245	260	250	220	250	220	300S	300	285	280
4	295	305	305	300	245	220	210	200	185H	215	200H	245	245	200	200H	250	245	225	215	290	275	290	240	245
5	270	265	275	275	285	230	220	210	I240A	245	220	200H	210	235	I210C	210	230	230	215	250	255	275	305A	300
6	290	I280A	215	E255E	250	270	230	240	245	240	I235A	I220A	220	220	205	200H	240	220	245S	250	A	A	290	280
7	270	255	250	285	235	250	220	205	185H	250	200H	200	200	A	A	220S	245	235	250	250	260	280	250	250
8	270	260	250	240	245	260	215	230	235	210	230	205	225	235	235	240	245	225	205	250	255S	I265A	255	290
9	290	280	275	255	245	275	210	225	220	200	195	195H	220	200H	235	240	245	225	215	I220A	290	290	275	270
10	255	250	270	260	245	245	235	230	220	230	240	220	240	230	225	250	230	I225A	I205A	A	A	A	A	A
11	280	275	270	250	230	205	225	210	230	230	200H	200	250	220	235	I240A	240	210	205	245	270	270	260	250
12	280	285	290	260	240	240	I200A	I200A	I220A	200	205	205	210	225	205	235	240	205	205	250	295S	280S	275	A
13	325	310	280	250	I290A	255	I230A	240	225S	220S	225	230	225	250	240	245	I230A	I230A	I235A	I240A	300S	295	295	300
14	300	295	295	290	270	250	220	220	205	205	205	255	230	230	205	225	225	205	A	A	285	255	275S	250
15	270	255	240	250	250	245	215	230	220	220	200H	215	200	200	200H	225	220	205	230	250	275S	280	285S	280
16	300S	275	275	250	265	205	195	215	230	220	220	200	195H	220	220	210	240	215	225	230	235	260	270	255
17	260	275	295	280	245	230	200	235	235	220	205	195	195	195H	240	235	245	I230A	220	245	240	240	240	280
18	280	290	260	265	220	240	215	200	195H	220	205	195	185H	220	220	235	230	205	230	220	A	A	A	330
19	305	270	255	245	220	245	230	220	200	200	195H	200H	230H	I230C	I240C	220	235	240	225	250	225	250	285	260
20	290	320	290	245	245	210	235	245	I240A	210	I220A	205	220	230A	225	245	225	210	235	250	245	245	240	290
21	E300E	285	255	245	215	265	235	I240A	230	I220A	I220A	230	220	220	245	240	230	205	215	245	230	240	245	280
22	290A	275	255	240	225	210	235	230	I230A	240	200	220	195	230	220	245	225	215	200	245	I260A	260	I275A	260
23	275	280	275	245	205	215	220	225	215	245	210	230	220	220	200H	I230A	I225A	200	I230A	250	I255A	260	275	E295E
24	E295E	I310A	290	250	245	210	220	200	210	205	195	185	230	240	225	245	230	220	245	230	230	285	255	245
25	C	C	C	C	C	C	C	C	C	C	200	195	195	230	225	230	240	210	210	245	240	I260A	260	245
26	260	275	280	245	225	240	215	210	215	200	195	215	235	210	245	245	240	195	255	290	240	260	240	245
27	I250A	270	245	285	290	270	245	240	220	230	I220A	I205A	230	I235A	220A	245	230	220	I235A	240	280	285	290	290
28	I300A	290	275	240	245	245	220	220	205	210	200	I185A	240	245	245	205	230	200	A	A	A	295	280	290
29	285	295	280	275	245	245	215	230	225	220	200	200	200	200	240	230	230	210	230	245	I225A	255	275	I290A
30	290	260	E300E	290	290	290	245	205	225	225	210	205	220	235	215H	235	215	200	230	245A	250	290	295	300
31	280	280	260	275	245	240	215	215	220	210	I195A	225	220	200	240	I235A	205	215	I240A	250	I230A	250A	255	290
No.	28	30	29	30	30	30	30	30	30	30	31	31	31	30	30	31	31	31	29	28	27	28	29	28
Median	280	280	275	255	245	220	225	220	220	220	205	200	220	220	225	235	230	215	230	245	255	260	275	280
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

**R'F**

A 10

IONOSPHERIC DATA

Lat. 39° 43.5'N  
Long. 140° 08.2'E

Akita

135° E Mean Time (G. M. T. +9h)

km  
f<sub>o</sub>F<sub>2</sub>

Oct. 1964

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	E	E	100	E	100	E	105	C	105	105	105	100	G	G	150	130	115	110	105	105	105	E	100
2	E	E	E	E	E	E	S	S	100	130	100	100	100	G	G	175	145	E	E	105	100	E	100	E
3	100	E	E	E	E	E	E	G	G	G	G	G	G	G	165	150	130	120	100	100	E	E	E	E
4	E	E	E	E	E	E	E	G	120	115	105	100	145	G	G	G	G	S	E	E	E	115	110	E
5	E	E	E	105	135	125	150	120	105	105	105	100	G	G	C	G	145	130	130	E	E	105	110	110
6	110	105	110	E	E	E	150	140	135	130	125	120	125	G	100	G	150	120	110	105	105	105	100	100
7	100	100	E	100	100	E	100	145	100	100	G	105	100	100	100	100	100	100	100	100	E	100	E	E
8	E	E	100	E	E	E	E	150	145	125	120	105	120	G	G	100	100	145	100	E	E	100	E	E
9	E	E	E	E	105	105	E	105	120	G	G	100	100	G	150	140	100	140	120	110	105	105	105	105
10	105	105	105	100	100	120	120	120	110	110	110	110	110	120	155	135	115	115	110	110	110	105	105	100
11	100	100	100	115	115	110	105	110	105	130	105	110	135	120	120	115	110	110	105	105	105	E	E	E
12	110	E	100	100	115	125	110	110	105	105	100	100	100	100	130	125	100	100	100	100	105	105	E	105
13	115	E	E	E	120	120	115	115	105	105	105	100	105	105	100	130	120	115	115	110	110	105	105	E
14	100	E	E	E	E	E	145	150	125	150	105	100	100	100	100	100	G	100	110	110	110	110	100	105
15	105	105	105	105	100	E	E	150	140	130	100	155	100	100	G	G	100	100	100	115	E	E	E	E
16	E	E	E	E	E	E	E	G	145	135	120	120	125	G	G	105	110	E	105	105	105	E	E	E
17	E	E	105	105	100	105	105	155	130	115	115	100	G	115	120	G	135	120	125	105	105	105	100	100
18	105	E	E	100	130	E	G	G	105	G	G	G	G	G	G	G	135	100	100	100	100	100	100	105
19	E	105	100	110	E	E	E	150	105	140	105	100	105	C	C	100	100	100	100	100	E	E	E	E
20	125	105	105	E	105	145	E	155	140	120	115	110	110	105	130	100	100	E	E	E	E	120	E	135
21	105	105	E	105	E	105	150	145	140	130	120	110	105	100	180	100	145	E	100	E	E	E	E	105
22	105	105	105	105	E	E	105	145	125	115	115	110	120	105	110	100	100	105	100	120	115	105	110	105
23	100	105	105	E	E	E	E	155	115	105	G	105	100	145	G	145	120	120	110	105	105	100	105	105
24	105	105	105	E	105	105	110	115	110	G	105	100	100	100	140	125	100	100	100	105	105	105	E	E
25	C	C	C	C	C	C	C	C	C	C	120	G	100	100	100	100	100	105	105	105	100	100	100	100
26	E	E	100	100	E	E	E	140	G	115	100	100	100	G	100	G	125	E	E	E	105	E	105	105
27	105	105	100	100	100	100	100	100	120	110	105	105	100	100	100	105	105	105	105	105	105	105	105	105
28	105	105	105	105	E	E	E	105	110	110	105	105	105	100	100	110	G	E	110	130	105	105	105	100
29	100	100	100	100	E	E	E	145	135	115	105	105	100	100	100	100	100	100	100	110	105	E	105	105
30	E	E	100	100	100	E	E	130	130	120	120	115	105	105	105	G	105	E	115	115	110	105	E	105
31	E	E	E	E	E	100	105	115	120	110	105	105	110	G	115	110	110	E	125	115	110	105	100	100
No.	19	14	17	17	14	13	14	24	27	26	26	28	27	18	21	23	23	22	27	24	23	22	16	20
Median	105	105	105	100	105	105	110	140	120	115	105	105	105	100	105	110	110	110	110	105	105	105	105	105
U. Q.																								
L. Q.																								
Q. R.																								



IONOSPHERIC DATA

Types of Es

135° E Mean Time (G. M. T. +9h)

Akita

Lat. 39° 43.5'N  
Long. 140° 08.2'E

Oct, 1964

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	f2			f3		f2		12	12	13	13	12	1			h3	h3	o2	f3	f2	f	f		f2	
2									12	h1	1	1	1		h	h	h3			f2	f		f		
3	f								h						h	h3	h3	c3	f						
4									h	13	h	12	h2				h3	h3			f	f2			
5	f4	f6	f3	f	f	h	h	e4	e3	e3	h2	h2		12		h	o4	f	f3	f5	f	f	f3	f2	
6	f3	f5	f2	f2	f2	1	h2	1	1	1	h2	1	14	13	13	12	12	12	f	f2	f	f	f4	f5	
7			f2				h2	1	h	h	h2	1	h		12	13	13	h1	f2		f2				
8								1	h2			12	13		h1	h13	13	h2	12	f2	f	f	f	f	
9	f	f2	f2	f2	f2	f	h	e4	e3	e3	e3	e2	e3	h	h2	h2	o6	h6	f4	f4	f7	f4	f2	f4	
10	f2	f3	f	f	f	f2	15	14	13	h	e3	e2	h	h	h3	h5	15	o2	f	f	f				
11			f2	f2	f	f	e4	e3	13	12	12	12	13	14	13	h1	h1	12	f	f2	f	f2		f4	
12	f				f8	f6	13	15	13	14	13	13	12	13	1	h3	o3	13	f2	f3	f	f			
13	f						h	h2	h2	h	e2	13	12	12	12	12	1	f2	f8	f3	f2	f	f2	f	
14	f						h2	13	h2	h2	12	h	12	1		1	1	f	f						
15	f3	f4	f2	f			h2	h2	h	h	h1	h2	h		12	12	12	h	f2	f2	f				
16			f3	f2	f2	f	h	h	h2	e3	12	1		h2	h	h3	h3	f2	f	f2	f2	f2	f2	f2	
17	f2			f2	f		h	h	12	12	12	1	1			1	1	f	f	f	f4	f3	f3	f	
18		f3	f	f3			h	h	h2	h12	1	1	1			1	1	f	f	f					
19							h2	h2	h3	h3	e5	e3	c3	12	h	1	14				f2	f2		f	
20	f	f	f2				h1	h2	1	h3	h4	c3	c3	13	h12	1	h2		f						
21	f3	f2	f2	f2			f	h2	h4	e3	h2	e2	h	1	c	13	13	f3	f2	f2	f5	f2	f2	f2	
22	f2	f2	f				h	h	c	13	12	12	12	h	h2	h2	h3	f3	f2	f2	f2	f	f2	f	
23	f2	f2	f2				h	c	c		12	12	12	12	h2	h1	12	f	f2	f2	f2	f2	f2	f	
24	f2	f3	f2				f	c		h	12	12	12	12	12	13	13	f	f3	f3	f4	f2	f	f2	
25								h	h	13	13	12	12	1	1	h	h	f2	f2	f2	f2	f2	f2	f2	
26	f							h	h3	e3	e5	14	13	14	14	12	12	f3	f3	f2	f2	f2	f2	f2	
27	f3	f2	f2	f2	f2	f		1	e3	e3	c3	13	12	12	c			f6	f4	f2	f2	f2	f2	f2	
28	f3	f2	f2	f2			h3	h	h	12	12	12	12	12	12	14	14	f3	f2	f2	f2	f2	f2	f3	
29	f2	f2	f2	f2			h	h3	h2	1	h2	h2	1	1	1	1	1	f3	f3	f3	f2	f4	f2	f2	
30	f2	f2	f				h	h3	h2	1	h2	h2	1	1	1	c	12	f2	f2	f2	f3	f3	f2	f2	
31							f3	f	1	h3	e3	12	c					f2	f2	f2	f3	f3	f2	f2	
No.																									
Median																									
U. Q.																									
L. Q.																									
Q. R.																									

Sweep 1.6 Mc to 20.0Mc in 20\_sec in automatic operation

The Radio Research Laboratories, Japan

Types of Es

A 12

IONOSPHERIC DATA

foF2

Oct. 1964

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	035	035	035	039R	034	030	046	059	I070R	I071R	073R	071S	062	058	060	060	058	068	067	057	049	049	044	038	
2	033	030	031	034	033	034	052	065	R	071R	J065R	063	060	056	054	J061R	I072S	070S	I067S	051S	040	035	038	035	
3	035	036	034	033	033	030	057	067R	I070S	068	058	060	060	062	057	066	S	S	052	030	030	033	035	035	
4	034	033S	029	030	033	029	046	J054R	060	059	059	J077R	085R	071	065	069	066	071S	045	037	041	042	044	042	
5	039	040	041	043	040F	044	049S	J054R	064	061	072	J104R	J080R	068	060	060	063	J065R	045	045	S	F	F	044	
6	045	043	040	028	029	030	043	062	I070R	072	068	I068C	R	064R	J065R	063	070	065	047	A	039	040	038	041F	
7	039F	039	038S	034	F	028F	051	059	064	R	091R	I092R	J099R	R	R	061	053	063	057S	040S	038	035	038	038	
8	035	035	038S	034	028	026	048	053	066	J062R	C	R	R	R	R	I066R	C	065	068	031	030	033	034	035	
9	033	034	F	035	035	034	045	061R	071	C	C	073	073	071	063	060	066	073	061	034	035F	038	038	038	
10	038	038	034	035	034	034	049	068	074	070	085	071	068	066	073	073	073	064R	035	030	A	A	034	035	
11	035	034F	034	035	034	026	044	064	066	065	065	081	082	080	063	069	069	070S	052S	030	F	F	F	037F	
12	F	036F	034	035	035	028F	052	055	063	063	064	089	092	077S	070	066	072	063	034	033	036	F	F	F	
13	J033R	034	035	036	034	034	051	058	069	087	J097S	J100R	092	076	081R	080	S	062	A	A	A	030	034	F	
14	033F	033	034	033	034	030	048	060	063	J066R	060	070	084	093	078	073	065	J061R	039	034	034	F	036	036	
15	036	039	034	038	034	030F	048	057	071	070	071	071	069	J073R	J077S	J079R	060	056	040	033	034	033	035	034	
16	035F	035	036	037	036	033	042	051	061	063	071	088	077	069	064	063	071	068	049	038	I030A	029	030F	F	
17	035F	035	034F	F	F	033	048R	056	065	067	067	077R	085	J075S	064	058	070	059	055	045	042F	040	038	038	
18	034	034	035F	F	F	J042F	043	062	073	090	091	086	092	075	065	074	064	064	057	042	044	028	031	032	
19	034	034	037	030	027	022	043	061	074	072S	069	074	086	094	072H	065	061	061	061	046	046	040	035	035	
20	036F	036	037	038	038	032	039	056	074	084	113	108	096	084	J077R	074	065	J052R	037	037	041	039	037	F	
21	035F	038F	037	040	030	028	045	060	069	J072S	091	096S	087	073	066	069	063	059	042	040	039	035	035	032	
22	032	030	033	036F	F	F	049F	059	071	I070A	074	084	093	082	071	S	062	054	036	028	033	030	F	F	
23	F	F	F	I039F	030F	019F	046	058	059	058	072	084	084	071	084	085	057	053R	028	027	027	026	030F	029F	
24	030F	J034F	F	F	C	028F	044	050	055	057	054	066	066	074	071	066	063	050	035	040	037	031	033	031F	
25	030	031	031F	030	030	028F	041	063	070	J072S	065	066	073	083	080	062	057	059	048	039	035	035	038	038	
26	032	034	033F	032F	032F	031	046	064	060	066	067	072	075R	077	066	066	056	C	038	040	045	042	038	034	
27	I032A	031	032	030	029	030	043	C	C	C	C	C	C	C	C	C	C	C	A	034R	032	031	032	034	
28	033	034	035	036	030	030	041	055	C	085	081	068	I074C	079	073	065	058	056	I035R	033	I032C	032	034	034	
29	034	034	034	036	032	029	042	057	065	072	065	I066C	I067R	065	059	059	098	056	043	039	040F	A	A	029	
30	029	031	I031R	030F	030F	I030C	044	J072S	063	071	074	080	088	088	073	I064C	058	047	036	038	028	I030S	I030F	033	
31	034	034	034	035	035	030	043	053	063	073	064	070	074	071	072	066	055	048	033	I034A	I032A	032	030F	030	
No.	29	30	26	27	27	30	31	30	28	28	28	28	28	28	28	28	29	27	28	29	29	27	25	26	26
Median	034	034	034	035	033	030	046	059	066	070	070	074	081	074	068	066	063	063	061	043	037	035	033	035	035
U. Q.	035	036	036	037	034	032	049	062	070	073	078	087	088	080	073	071	069	065	054	040	038	038	038	038	038
L. Q.	033	034	033	032	030	028	043	055	063	064	065	069	071	068	064	062	058	056	036	032	031	033	033	033	033
Q. R.	002	002	003	005	004	004	006	007	007	009	013	018	017	012	009	009	011	009	018	007	008	007	005	005	005

foF2

K 1

Lat. 35° 42.4'N  
Long. 139° 29.3'E

Kokubunji Tokyo

IONOSPHERIC DATA

0.01 Mc 135° E Mean Time (G. M. T. +9h)

foF1

Oct. 1964

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L	L	L	L	L	L	L	L	L							
2								L	L	L	L	L	U440L	L	L	L	L							
3								L	L	L	L	L	L	L	L	A								
4								L	L	L	L	L	L	L	L	L								
5								L	L	L	L	L	L	L	L	L								
6								A	L	L	L	C	L	L	L	L	L							
7								L	L	L	L	L	L	L	L	L	L							
8								L	L	L	C	L	L	L	L	L	C							
9								L	C	C	C	LH	L	L										
10								A	L	L	L	L	L	L	L	L	L							
11								A	L	L	L	LH	L	L	A	L	A							
12							A	A	L	L	L	L	L	LH	L	A								
13								A	A	L	L	L	U450L	LH	L	L								
14								L	L	L	L	L	L	LH	L	L								
15								L	L	L	L	L	L	L	L	L								
16								L	L	L	A	L	L	L	A	L	L							
17								L	L	L	L	L	L	L	L	L	L							
18								L	L	L	U440L	L	L	L	L	L								
19								L	L	L	L	L	L	L	L	L								
20								L	L	L	A	U440L	A	A		LH								
21								L	L	A	A	A	L	L	L	L								
22								L	A	L	L	L	L	L	L	S								
23								L	L	L	L	L	L	L	L	LH	L							
24								L	L	L	L	L	L	L	L	L								
25								L	L	L	L	L	L	L	L	L								
26								L	L	L	U450L	L	LH	L	L	L	C							
27								C	C	C	C	C	C	C	C	C	C							
28								C	L	L	L	L	C	L	L	L								
29								L	L	L	L	C	C	L	A									
30								A	L	L	L	L	L	L	L	C								
31								L	L	L	L	L	L	A	L	L								
No.								3	9	8	10	1	1											
Median								410	440	440	440	420	410											
U. Q.																								
L. Q.																								
Q. R.																								

Lat. 35° 42.4'N  
Long. 139° 29.3'E

Kokubunji Tokyo

IONOSPHERIC DATA

foE

Oct. 1964

0.01 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																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
No.																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

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

foE

K 3

Lat. 35° 42.4'N  
Long. 139° 29.3'E

Kokubunji Tokyo

IONOSPHERIC DATA

0.1 Mc 135° E Mean Time (G. M. T. + 9h)

foEs

Oct. 1964

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	J050	051	J030	J025	J042S	029M	025	030	033M	048	023G	030G	024G	022G	G	033	034	J038	030M	J040	J037	033	J033	J025
2	025	024	J032	019	023	021	024	028	031	031	033	G	G	G	036	033	029	023	E	E	E	024	025	S
3	022	E	E	E	E	E	G	030	029	G	G	G	0228	038	040	J041	035	J025	023	025	026	E	022	J034
4	025	022	019	E	E	E	019	032M	035	J041	040	041	040	G	037	040	030	028	018	E	E	E	019	E
5	022	E	019	J018	027	025	J027	036	J037	J038	031G	G	G	G	G	028	019G	J029	032	E	024	J034	024	E
6	021	J033	J034	J032	024	024	030	032	J044	042	042	C	038	034	033	030	G	036	032	040M	035M	J032	036M	031
7	025	J034	024	023	024	021	022	J026	025G	034M	G	037	023G	024G	024G	J024G	031	036M	033	J028	J034	J024	023	030
8	J028	023	J024	J023	J026	019	022	029	033	J031	C	045	044	034	G	J030	C	J024	030M	026	J027	020	030M	J024
9	E	E	E	E	J024	J026	026	037M	G	C	C	J024G	039	037	037	033	032	025	032M	025	J032	J035	025	033
10	J036	J033	J029	J028	J025	021	J028	039M	087M	J040	J036	J037	035	037	023G	032	J030	018	J019	J023	J062	J044	J040	034M
11	J027	024	E	E	E	E	019	J043	J050	048M	J048	035	030G	034	J048	J048	J075	J115	J130	J044	034	J042	J042	034
12	034	032M	043M	J072	J053	048	034M	J059	J040	J042	040	038	036M	J034	J032	049M	J037	J032	J039	J040	J038	J040	J040	034M
13	031	025	J024	032	J030	032M	J030	J049	J054	J073S	040	J050	038	031G	029G	034	J041	J042	J069	J078	J085	J054	J038	J038
14	J027	E	E	E	J028	E	J024	J029	J033	J034	J029G	039M	J038	036	035	033	025	J025	J025	025	J039	J050	J038	039M
15	031M	J024	J030	J023	030M	J024	J025	029	024G	033	J032	037	J043	J048	031	J028	J025	J025	024	025	J024	E	E	E
16	E	021	E	J024	022	033M	G	032M	031	J042	J049	050	034	039M	048M	J039	024	J062	J045	J034	J052	J026G	J029	J031
17	J024	E	J030	E	J030	J024	021	029	034	J037	034M	J038	J028G	J024G	033	J031	J029	J037	J040	037M	035	J025	025	029M
18	022	J029	J024	J023	J025	J028	J025	J028	J025G	024G	G	024G	J026G	034M	J033	032	030	028	J033	J033S	050	J031	025	E
19	033	J029	E	J025	E	J025	J029	J028	J024G	044M	J028G	J030G	038	037	J026G	J031	J023G	J026	J030	024	030M	J033	019	E
20	E	E	J038	J025	J030	J025	J019	018G	G	032	037	034	J051	J109	046	J024G	G	022	019	027M	024	E	E	E
21	E	E	J028	031	J027	018	J023	032	J040	039	060M	J091	J083	049M	J042	G	019G	B	E	033	032M	J031	029	E
22	J031	032	E	E	031	030M	024	030	G	078	044M	048M	036	G	030	G	024	031	031	023	039	J037	034	034
23	030	023	E	E	031	018	023	031M	045M	J040	035	031G	G	036	033	033	G	J030	J020	J034	J033	J030	034	J035
24	030M	J023	E	E	C	E	018	036M	J043	J048	J029G	J032	041	039	030	J034	048M	J029	023M	J024	J024	J040	023M	J034
25	J028	021	J031	J023	J021	J027	J031	J028	J031	J041	J043	J043	J068	036	J029G	034	J034	J039	031M	J028	022	024	023	J031
26	030	033	J019	J029	J025	020	G	024	031M	J026G	033M	035	029G	J033G	022G	J023G	J024	C	025	S	J029	J040	023	022
27	J033	J035	J037S	J029	J027	031	J026	C	C	C	C	C	C	C	C	C	C	C	J052	029	026	028M	024	024M
28	019	020	J031	J038	019	J015R	020	J024	C	036	034	031G	C	034	038	029	J024	B	C	S	C	J025	J034	J040
29	033	025	023	020	024	E	017	031	045	J038	039	C	C	J043	039	038	025	019	J019	027	036M	J052	J046	036M
30	J032	J039	S	024	019	C	020	J025	J042	J042	J043	J039	J033	032	033	C	G	025	031	J027	J031	036M	035	J034
31	027	J019	022M	E	J027	019	J019	J024	033	J043	J035	J043	J043	034	034	J031	035	B	J026	J043	J058	J037	034	J028
No.	31	31	30	31	30	30	31	30	29	29	28	28	28	30	30	29	29	26	30	29	30	31	31	30
Median	027	024	024	023	025	024	023	030	033	040	035	037	036	034	033	032	029	028	030	027	033	032	029	031
U. Q.	031	032	030	028	030	028	032	042	042	042	042	042	040	037	038	034	034	036	033	038	038	040	035	034
L. Q.	022	019	E	E	022	018	019	028	G	034	G	G	G	G	G	G	G	G	025	023	024	026	024	023
Q. R.	009	013			008	010	007	004	008	008						006		011	010	014	012	016	012	

The Radio Research Laboratories, Japan

in automatic operation

Sweep 1.0 Mc to 20.0 Mc in 20 sec

foEs

K 4

IONOSPHERIC DATA

fbEs

Oct. 1964

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	019	019	E	E	015	018	017	025	029	033	022G	025G	023G	022G		032	032	026	025	019	018	E	017	E	
2	E	016	E	E	E	E	020	027	029	E031R	025G				036	033	026	019			017	E	E	S	
3	E							026	029				022G	038	040	040	035	025	E	E			E	E	
4	E	016	E				015G	027	035	038	039	041	039	039	037	040	029	026	016				E	E	
5	E		E	015	016	016	018	026	032	033	026G					028	018G	025	026		E	S	S		
6	E	018	023	E	E	E	020	028	043	040	038	C	038	033	033	029		035	028	A	017	018	029	015	
7	019	018	016	014	015	E	022	025	024G	033			037	023G	023G	023G	028	021	021	017	020	E	E	017	
8	015	E	E	E	E	E	020	026	031	031	C	039	035	025		030	C	020	021	019	019	E	019	E	
9					E	020	016	025		C	C	021G	037	036	035	032	030	024	022	016	019	019	016	017	
10	023	016	017	015	E	E	019	052	053	036	024	035	035	036	022G	032	026	016	E	017	A	A	028	020	
11	016	E					019	041	035	037	041	034	E030A	034	042	035	033	061	045	017	019	026	025	021	
12	022	022	022	018	029	015	045	041	029	034	038	025	026	029	032	038	033	022	021	025	022	017	022	017	
13	015	016	016	019	017	019	019	035	040	044	035	035	034	024G	023G	032	035	040	A	A	A	A	022	022	
14	E				E	E	019	027	030	033	023G	034	033	033	034	029	023	016	016	016	016	016	018	015	
15	017	E	015	E	E	E	G	025	023G	031	026G	034	035	033	030	026	018	017	017	S				025	
16		E		E	E	E		G	G	040	043	042	034	042	042	030	023	022	027	023	A	E	015	014	
17	014		E	E	E	E	G	025	028	032	026	036	019G	021G	032	025	026	027	021	021	019	015	015	014	
18	E	E	E	E	E	E	016	018G	018G	018G	023G	024G	024G	027	030	026G	026	022	017	020	017	016	E		
19	017	E		E	E	E	015	018	017G	029	024G	027G	035	032	021G	023	018G	018	017	017	017	020	S		
20			E	E	015	015	015	017G		031	053	032	045	053	035	021G		G	017	015	018				
21			015	016	E	E	021	029	034	038	046	065	045	033	031		017G	B		019	017	016	016		
22	E	025			E	015	017	026		A	036	032	033		029		024	017	022	E	018	019	016	017	
23	016	015			E	E	015	025	029	031	032	022G		035	033	023		019	017	E	020	017	016	017	
24	019	E			C		018	025	029	034	024G	026	040	037	033	025	025	021	017	016	016	015	E	E	
25	016	E	016	015	015	015	016	023	025	035	039	033	034	025	025G	025	025	039	026	017	E	E	E	017	
26	020	016	E	E	E	E	024	024	G	023G	026	026	025G	023G	019G	019G	021	C	015	S	017	025	019	E	
27	A	019	015	E	013	015	016	C	C	C	C	C	C	C	C	C	C	C	C	A	026	017	016	015	
28	E	S	E	017	E	E	G	019	C	029	032	030G	C	034	032	028	017	B	C	S	C	018	021	022	
29	019	016	015	E	016		015	026	030	035	033	C	C	034	045	030	025	018	E	E	025	A	A	015	
30	017	022	S	E	E	C	020	022	036	033	038	032	032	024	021	C		017	022	018	018	023	015	E	
31	016	015	014		017	E	S	017	027	025	032	036	040	034	032	028	026	B	024	A	A	017	015	014	
No.																									
Median																									
U. Q.																									
L. Q.																									
Q. R.																									

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

The Radio Research Laboratories, Japan

fbEs

K 5

Lat. 35° 42.4'N  
Long. 139° 29.3'E

Kokubunji Tokyo

IONOSPHERIC DATA

0.1 Mc 135° E Mean Time (G. M. T. + 9h)

f<sub>min</sub>

Oct. 1964

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	E015S	014	013	011	011	013	010	015	015	015	016	016	017	016	017	015	015	012	E015S	E015S	014	013	014	014
2	014	014	014	012	014	012	015	015	014	015	016	021	017	020	018	016	015	016	014	012	012	E015S	014	E015S
3	014	014	012	011	011	012	014	013	014	015	017	017	015	016	015	016	014	014	014	014	012	013	014	013
4	014	014	012	012	012	012	013	014	015	015	017	015	017	016	016	018	015	015	010	012	012	014	014	014
5	014	014	012	011	013	010	012	014	013	016	018	020	020	017	018	015	014	014	E015S	012	014	E015S	E016S	012
6	014	012	011	012	013	014	015	015	016	016	015	C	019	019	015	015	015	015	014	013	012	013	013	012
7	014	013	012	012	011	014	016	014	017	017	019	020	016	015	017	015	011	011	012	014	014	013	014	014
8	012	013	014	011	014	014	013	014	015	015	C	018	015	015	016	015	C	011	011	010	014	011	011	014
9	012	014	011	011	E	E015S	011	019	014	C	C	015	015	015	014	014	011	014	012	013	012	012	012	013
10	012	E	011	010	011	013	011	012	014	016	016	018	017	016	015	014	015	013	013	014	012	012	012	012
11	012	014	011	014	012	012	012	015	016	016	015	016	016	016	015	014	014	012	012	012	012	012	012	013
12	012	011	010	013	011	012	011	014	015	016	016	016	016	016	014	014	014	014	013	011	012	014	014	011
13	011	010	E	010	E	010	011	013	014	016	015	015	015	016	016	015	014	014	012	011	012	013	012	013
14	010	011	012	011	010	011	014	013	015	016	016	016	016	014	015	017	013	013	E015S	014	012	013	014	011
15	012	012	012	012	013	014	013	015	015	015	015	015	016	014	015	014	014	015	E015S	E015S	011	012	012	012
16	012	013	012	011	011	013	E015S	011	016	015	014	017	018	016	017	014	015	014	011	013	012	014	E	011
17	010	012	012	011	011	012	014	014	015	016	016	016	015	016	017	015	014	014	014	013	012	012	013	012
18	014	012	011	012	010	010	011	014	012	015	016	015	016	014	014	015	011	012	E015S	013	014	011	014	014
19	013	012	014	014	012	013	012	011	014	015	015	015	015	015	015	015	014	015	014	012	012	013	E015S	012
20	013	014	012	012	E	011	014	012	017	016	015	016	014	015	016	015	016	017	E015S	012	014	012	011	011
21	011	011	E	010	010	011	013	014	014	014	015	014	015	015	014	015	013	016	014	E015S	014	014	011	012
22	014	011	014	012	E	E	011	012	014	014	015	016	015	017	015	016	015	013	011	E	E015S	014	013	E015S
23	E015S	011	010	011	E	010	010	014	011	014	015	015	015	014	014	014	014	014	014	012	013	012	013	011
24	011	013	011	010	C	011	E015S	011	011	015	015	015	014	014	014	014	014	011	012	012	012	013	012	012
25	011	012	013	010	010	012	011	013	013	015	015	017	015	016	016	014	011	015	011	013	012	013	013	014
26	013	011	011	011	012	011	012	012	014	016	015	015	016	014	014	014	014	C	011	E015S	011	E016S	E015S	014
27	012	011	011	011	E	010	011	C	C	C	C	C	C	C	C	C	C	C	E016S	E017S	014	014	012	012
28	011	E015S	013	012	013	013	014	014	C	017	017	016	C	015	017	016	016	016	E024C	E015S	C	011	013	014
29	012	013	012	013	011	012	013	015	015	015	015	C	C	015	016	014	015	015	014	014	013	012	014	011
30	013	011	E018S	014	014	C	014	015	015	016	016	015	015	015	015	C	016	012	012	012	012	010	012	012
31	012	010	011	014	010	013	E015S	011	014	015	014	015	014	015	016	013	014	015	014	013	013	012	012	012
No.	29	30	30	31	30	29	28	30	29	29	28	28	28	30	30	29	29	29	23	25	29	28	28	29
Median	012	012	012	011	011	012	012	014	014	015	015	016	015	015	015	015	014	014	012	012	012	013	013	012
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

f<sub>min</sub>

IONOSPHERIC DATA

Kokubunji Tokyo

Lat. 35° 42.4'N  
Long. 139° 29.3'E

135° E Mean Time (G. M. T. +9h)

M(3000)F2 0.01

Oct. 1964

Day	00	01	02	08	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	290	290	295	320R	335	295	335	340	I345R	I350R	355R	350S	340	350	335	355	340	350	355	345	305	320	340	315	
2	315	305	290	290	305	340	365	360	R	365R	J350R	350	355	330	320	J330R	U345S	355S	I350S	350S	300	320	305	310	
3	315	305	310	305	330	320	360	365R	I370S	370	345	350	350	325	335	350	S	S	370	330	285	300	290	290	
4	295	275S	315	295	320	330	365	J360R	365	330	335	J325R	340R	350	335	355	335	365S	345	295	290	295	320	325	
5	305	300	295	300	300F	340	365S	J355R	345	345	320	J330R	J350R	360	345	350	350	J370R	330	330	S	F	F	285	
6	310	295	350	320	305	340	355	I350R	350	350	I360C	R	360R	R	J350R	350	360	365	340	A	295	300	300	300F	
7	295F	295	F	F	F	325F	360	360	335	R	350R	U325R	J325R	R	R	360	340	350	350S	335S	295	290	285	295	
8	320	310	315S	325	320	310	350	345	365	J355R	C	R	R	R	R	J345R	C	325	340	350	310	310	295	290	
9	305	305	F	315	315	315	370	340R	350	C	C	355	345	350	350	350	350	355	360	325	275F	290	300	290	
10	305	315	315	325	325	320	345	370	365	355	350	350	355	330	330	340	360	370R	345	280	A	A	290	310	
11	310	295F	290	330	355	305	345	375	350	370	325	345	340	350	350	360	360	355S	365S	295	F	F	F	295F	
12	F	305F	290	310	360	320F	380	360	350	350	315	335	360	350S	345	355	360	380	355	300	285	F	F	F	
13	J275R	280	305	305	320	320	355	345	330	330	J340S	J330R	340	330	345R	350	S	370	A	A	A	285	295	F	
14	295F	305	290	305	295	335	350	365	350	J360R	335	335	325	345	335	370	370	J360R	340	300	300	F	310	305	
15	300	330	325	320	345	295F	350	355	365	360	355	340	350	330	J340R	J340S	370	390	330	310	310	300	305	295	
16	310F	315	305	320	330	335	360	370	360	350	340	350	350	350	350	330	350	350	350	330	310	310	300	295	
17	315F	315	320F	F	F	335	355R	395	370	365	345	335R	340	J360S	360	360	360	350	345	330	I325A	305	295F	F	
18	325	U295F	F	F	J325F	370F	335	330	325	335	340	335	340	345	340	350	360	370	330	345	295	300	285	290	
19	295	320	325	365	365	320	350	360	365	J345S	350	330	315	340	335R	370	350	330	360	345	335	290	300	U290F	
20	305F	285	295	330	320	340	355	355	325	310	360	345	340	345	J335R	350	365	J345R	320	295	300	315	315	F	
21	290F	285F	320	345	335	305	350	365	345	J335S	330	355S	345	340	345	350	365	355	355	315	305	320	315	300	295
22	300	300	305	U335F	F	F	345F	360	350	I350A	330	325	340	365	350	S	385	365	390	320	305	315	F	F	
23	F	F	F	U305F	335F	310F	350	375	370	360	335	330	355	335	345	355	365	360R	320	325	330	305	295F	280F	
24	275F	J295F	F	F	C	320F	360	380	380	350	345	340	325	340	340	345	350	355	315	315	330	300	295	290F	
25	300	305	295F	340	330	290F	325	350	345	J355S	340	320	325	325	340	355	345	350	335	310	310	295	285	315	
26	305	295	300F	320F	340F	325	350	375	365	365	345	320	335R	340	320	360	355	C	295	295	315	290	310	325	
27	I310A	305	320	300	280	300	325	C	C	C	C	C	C	C	C	C	C	C	C	A	325R	295	280	295	
28	275	300	315	325	320	315	335	345	C	355	360	345	I330C	345	355	355	360	360	U340R	300	I310C	310	290	295	
29	295	285	305	305	340	310	335	355	370	345	355	I340C	I330R	340	340	340	345	355	335	310	345F	A	A	305	
30	300	315	I300R	295F	285F	I300C	320	J370S	350	340	325	330	350	340	I360C	360	345	345	330	315	295	I290S	U275F	300	
31	290	295	295	310	340	315	335	365	340	360	340	345	325	340	335	365	360	335	335	I300A	I310A	280	315F	300	
No.	29	30	26	27	27	30	31	30	28	28	28	29	28	28	28	29	27	28	29	29	27	25	26	26	
Median	300	300	305	320	325	320	350	360	350	350	340	340	340	340	340	355	360	355	340	315	305	300	300	295	
U. Q.																									
L. Q.																									
Q. R.																									

The Radio Research Laboratories, Japan

K 7

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

M(3000)F2



IONOSPHERIC DATA

Lat. 35° 42.4'N  
Long. 139° 29.3'E

Kokubunji Tokyo

M(3000)F1 0.01 135° E Mean Time (G.M.T. +9h)

Oct. 1964

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L	L	L	L	L	L	L	L								
2								L	L	L	L	L	L	L	L	L	L							
3								L	L	L	L	L	L	L	L	L	L							
4								L	L	L	L	L	L	L	L	L	L							
5								L	L	L	L	L	L	L	L	L	L							
6								L	L	L	L	L	L	L	L	L	L							
7								L	L	L	L	L	L	L	L	L	L							
8								L	L	L	L	L	L	L	L	L	L							
9								L	L	L	L	L	L	L	L	L	L							
10								L	L	L	L	L	L	L	L	L	L							
11								L	L	L	L	L	L	L	L	L	L							
12								L	L	L	L	L	L	L	L	L	L							
13								L	L	L	L	L	L	L	L	L	L							
14								L	L	L	L	L	L	L	L	L	L							
15								L	L	L	L	L	L	L	L	L	L							
16								L	L	L	L	L	L	L	L	L	L							
17								L	L	L	L	L	L	L	L	L	L							
18								L	L	L	L	L	L	L	L	L	L							
19								L	L	L	L	L	L	L	L	L	L							
20								L	L	L	L	L	L	L	L	L	L							
21								L	L	L	L	L	L	L	L	L	L							
22								L	L	L	L	L	L	L	L	L	L							
23								L	L	L	L	L	L	L	L	L	L							
24								L	L	L	L	L	L	L	L	L	L							
25								L	L	L	L	L	L	L	L	L	L							
26								L	L	L	L	L	L	L	L	L	L							
27								L	L	L	L	L	L	L	L	L	L							
28								L	L	L	L	L	L	L	L	L	L							
29								L	L	L	L	L	L	L	L	L	L							
30								L	L	L	L	L	L	L	L	L	L							
31								L	L	L	L	L	L	L	L	L	L							
No.								3	9	8	10	1	1											
Median								380	385	370	360	385	370											
U. Q.																								
L. Q.																								
Q. R.																								

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

M(3000)F1

The Radio Research Laboratories, Japan

K 8

IONOSPHERIC DATA

Lat. 35° 42.4'N  
Long. 139° 29.3'E

Kokubunji Tokyo

R'F2 km

135° E Mean Time (G. M. T. +9h)

Oct. 1964

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								240	255	245	250	250	260	250	270									
2								230	215	230	250	260	260	260	300	290	245							
3								210	225	230	260	270	260	290	280	255								
4									230	270	280	290	255	250										
5									250	290	305	260	250	250	250	245								
6									245	250	250	C	270	250	240	240	240							
7									250	250	250	260	255	240	255	240								
8									240	240	C	250	250	260	255	245	C							
9									225	C	C	260	250	260										
10									240	240	245	240	255	280	260	240	225							
11									240	245	280	250	260	245	250	240	240							
12									220	250	300	275	240	250	250	245								
13							220	210	250	255	255	250	250	275	250	230								
14									250	225	255	275	270	245	225									
15									225	230	245	255	260	255	250	225								
16									230	250	255	245	240	255	245	230	240							
17									225	230	250	260	260	245	250	240								
18								230	240	245	240	260	250	250	250	250								
19									245	245	245	275	270	250	230H	240								
20									260	300	245	245	250	260	240									
21									260	255	250	255	250	255	245									
22									250	A	275	295	270	230		235								
23									230	240	280	260	245	270	260	225	205							
24									210	250	250	270	290	290	255	250								
25									250	250	260	290	290	275	250	245								
26									240	245	270	280	260	250	240									
27									C	C	C	C	C	C	C	C	C							
28									C	250	245	230	C	255	250	240								
29									240	250	250	C	C	270	260									
30									230	250	255	260	270	250	290	C								
31									250	240	250	270	260	255	255									
No.							1	7	27	28	28	28	28	30	26	24	6							
Median							220	230	240	250	250	260	260	250	250	240	240							
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

K 9

R'F2

IONOSPHERIC DATA

Lat. 35° 42.4'N  
Long. 139° 29.3'E

Kokubunji Tokyo

135° E Mean Time (G. M. T. + 9h)

km **K'F**

**Oct. 1964**

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	300	280	225	210	280	225	220	220	205	190	210	225	205	210	240	240A	230	225	220	250	240	225	240
2	240	300	300	280	260	225	220	225	210	210	185	200	195	205	250	245	240	230	210	200	255	240	250	255
3	255	260	260	255	220	255	225	220	200	200	205	180	175	240	E270A	I255A	240	210	200	210	295	280	295	280
4	290	310	290	290	240	210	210	210	220	220	220	E270A	E250A	205	260	250A	240	210	200	260	300	290	250	225
5	255	260	260	260	260	225	210	210	210	210	225	205	210	225	210	210	245	210	250A	240	255	295	295	280
6	260	255	220	220	250	255	220	225	I240A	E250A	225	I240C	220	210	225	210	225	225	250	I250A	260	280	E310A	260
7	290	270	290	255	250	210	225	225	200	205	210	225	210	220	210	220	220	220	210	225	260	285	300	280
8	250	250	240	220	220	255	220	210	220	225	I205C	240	210	210	210	240	0	225	250	250	275	260	305	280
9	290	275	310	250	225	250	220	210	210	0	190H	220S	240	240	240	245	245	230	200	210	250	300	260	270
10	290	250	270	245	240	240	210	I210A	I210A	210	220	225	210	210	230	225	210	200	195	260	A	A	E350A	300
11	260	255	255	245	210	210	I220A	240	240A	210	180H	200	220	220	I230A	240	I220A	E250A	250	250	330	E350A	E310A	300A
12	290	300	340A	290	E250A	250	I215A	I210A	190	205	240	200	195	180H	225	I210A	220	205	205	E310A	250	260	310A	345
13	345	310	260	260	260	250	210	210	I220A	I230A	205	200	210	200H	210	240	205	210	A	A	A	E310A	310A	300
14	260	255	260	250	250	210	210	210	210	220	200	195	190	200H	225	210	210	205	210	260	270	290	250	E300A
15	290	230	240	225	210	255	210	210	210	220	240	200	200	205	200	225	210	205	225	210	230	280	260	280
16	275	250	250	240	225	195	200	200	200	E250A	A	E270A	205	I220A	I230A	220	225	210	210	E250A	I230A	260	300	270
17	260	255	260	255	240	225	210	210	205	200	190	170H	225	210	220	220	240	210	210	245	245	240	250	245
18	255	300	295	250	210	200	210	210	200	210	205	195	180	205	220	210	220	205	230	210	260	290	290	300
19	300	260	240	200	200	260	220	210	200	200	190	240	210	205	210	225	225	240	210	220	225	300	290	260
20	290	300	290	230	250	205	210	225	240	230	I240A	205	I240A	A	245	205H	220	205	260	260	250	255	240	250
21	295	275	255	240	210	250	225	225	250	E260A	A	A	A	205	205	210	220	205	210	250	250	260	255	255
22	290	E350A	270	230	200	240	210	230	220	I240A	240	195	235	210	220	230	215	210	200	250	260	270	290	230
23	300	280	275	245	180	E250E	210	210	205	205	200	205H	210	210	220	200H	205	200	220	250	E250A	280	300	310
24	300	305	285	250	I200C	230	205	205	195	220	180	225	E270A	E260A	E250A	220	225	210	245	250	210	270	260	260
25	290	260	290	250	250	255	240	230	220	240	210	200	220	210	230	225	245	240A	220	250	245	250	255	255
26	290	300	255	230	225	250	230	220	210	210	200	200	195H	245	225	245	230	I220C	245	290	250	E300A	250	245
27	I260A	295	250	260	290	295	250	I235C	C	C	C	C	C	C	C	C	C	C	C	E290A	255	280	310	290
28	295	280	270	250	230	250	230	225	I200C	210	220	210	I210C	250A	230	230	210	210	E250C	260	I250C	270	320A	E310A
29	300	310	280	275	205	260	230	230	220	240	225	I210C	I205C	220	I225A	240	240	230	230	245	E250A	A	A	295
30	330	300A	300	320	300	I290C	250	225	I225A	220	E250A	205	200	220	230	I235C	220	205	250	280	E360A	310	300	300
31	300	280	260	270	230	255	220	210	210	220	230	205	I220A	240	245	240	220	220	250	I300A	I290A	270	290	250
No.	31	30	31	31	30	31	31	31	30	26	26	27	27	28	28	30	29	29	27	28	29	25	27	29
Median	290	280	270	250	230	250	220	210	210	215	210	205	210	210	225	225	225	210	220	250	255	270	290	280
U. Q.																								
L. Q.																								
Q. R.																								

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

**K'F**

The Radio Research Laboratories, Japan

K 10

IONOSPHERIC DATA

Kokubunji Tokyo

Lat. 35° 42.4'N  
Long. 139° 29.3'E

135° E Mean Time (G. M. T. +9h)

km **f<sub>o</sub>F<sub>2</sub>**

**Oct. 1964**

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	100	100	100	110	100	100	105	105	120	100	100	100	100	g	145	120	110	110	100	100	100	100	100	
2	100	095	100	100	100	095	115	120	115	115	095	g	g	g	E175E	145	125	120	E	E	E	100	100	S	
3	100	E	E	E	E	E	g	125	130	g	g	g	100	150	135	130	130	110	100	105	090	E	100	100	
4	100	090	100	E	E	E	130	110	125	125	150	150	g	g	E190E	130	130	125	115	E	E	E	100	E	
5	100	E	095	125	110	110	110	110	105	105	100	g	g	g	105	110	110	115	110	E	100	100	100	E	
6	110	100	100	110	105	105	130	120	115	115	g	110	110	110	110	110	g	105	100	100	100	100	100	100	
7	100	100	100	100	090	090	130	110	105	105	g	155	100	100	100	100	100	100	100	100	100	100	100	100	
8	100	100	100	100	095	100	135	140	130	100	g	100	100	100	g	100	g	100	100	100	100	095	095	100	
9	E	E	E	E	105	105	100	100	g	g	g	100	160	170	145	150	130	130	115	100	100	100	100	100	
10	100	110	100	095	110	110	110	100	100	105	100	100	115	110	100	130	110	105	100	095	100	100	100	100	
11	100	095	E	E	E	E	160	130	110	110	110	110	105	150	110	110	100	100	100	100	100	100	100	100	
12	095	105	100	100	100	100	105	105	105	100	100	100	100	095	100	090	110	095	095	100	100	100	100	100	
13	115	100	110	110	110	110	110	100	100	100	100	100	100	100	100	110	110	110	100	100	100	100	100	100	
14	100	E	E	E	105	E	115	145	105	100	100	100	100	095	090	115	110	090	085	100	100	100	100	095	
15	095	095	095	090	095	100	110	130	100	100	100	100	100	100	100	105	090	085	085	105	E	E	E	E	
16	E	100	E	090	095	090	g	095	145	110	110	100	105	100	105	105	105	100	100	100	100	100	100	100	
17	100	E	100	E	100	100	100	100	105	100	100	100	090	115	150	110	105	100	105	100	100	100	100	095	
18	100	100	095	095	095	110	100	100	100	100	g	095	095	090	090	095	085	090	100	100	100	100	100	E	
19	100	100	E	100	E	090	100	100	100	095	095	100	095	095	100	100	100	100	100	100	095	095	095	E	
20	E	E	100	100	100	100	100	100	g	E150E	105	100	100	100	100	100	g	095	100	100	100	E	E	E	
21	E	E	100	100	100	100	130	130	130	125	115	110	105	100	095	g	100	B	E	115	140	100	100	E	
22	105	100	E	E	115	100	100	140	g	105	105	100	100	g	100	g	150	100	110	110	105	100	105	105	
23	100	100	E	E	105	100	100	110	105	100	100	g	140	170	095	g	095	100	105	100	100	100	100	100	
24	100	100	E	E	E	C	E	140	105	105	100	150	105	100	100	120	100	100	100	110	110	105	110	100	
25	100	100	105	100	100	100	100	100	100	110	105	105	125	110	110	115	110	110	110	110	110	105	100	100	
26	100	100	100	100	100	100	g	120	105	110	105	110	100	100	100	100	115	C	100	S	105	110	100	110	
27	105	105	100	105	105	105	100	C	C	C	C	C	C	C	C	C	C	C	C	110	110	110	110	105	
28	105	105	105	110	110	110	R	105	125	C	110	110	C	115	115	115	115	B	C	S	C	110	105	105	
29	100	105	105	100	100	100	E	150	130	110	115	C	C	100	100	100	160	150	130	125	115	110	110	105	
30	105	100	S	100	100	100	C	100	130	115	115	115	115	110	110	C	g	105	110	110	110	110	105	105	
31	115	110	110	E	100	100	110	110	145	110	110	105	120	115	125	115	115	B	130	115	110	110	105	105	
No.	27	24	21	21	26	23	28	30	26	27	25	25	25	26	25	27	25	26	28	26	27	27	29	23	
Median	100	100	100	100	100	100	110	110	105	105	105	100	100	100	100	110	110	100	100	100	100	100	100	100	
U. Q.																									
L. Q.																									
Q. R.																									

The Radio Research Laboratories, Japan

Sweep 1.0 Mc to 20.9 Mc in 20 sec in automatic operation

**f<sub>o</sub>F<sub>2</sub>**

IONOSPHERIC DATA

Oct. 1964

Types of Es

135° E Mean Time (G.M.T. +9h)

Kokubunji Tokyo

Lat. 35° 42.4'N  
Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f3	f3	f	f2	ff2	f4	f	1	12	h12	1	1	1	1	h	h3	13	f4	f3	f2	f2	f2	f	
2	f	f4	f2	f	f	f	12	e212	e212	c	1			h	h21	h2	h2	13		f	f	f2	f2	
3	f						h212		h				1	h	h21	h2	h2	e21	f	f	f	f	f2	
4	f2	f2	f	ff	f2	f2	h	12h	h1	h212	h	h	h1	h	h1	h2	h212	h21	f2	f	f	f	f	
5	f	f4	f3	f	f	f2	h2	e2	e2	e2	e2		1	e1	1	1	1	f3	f3	f3	f3	f4	f4	
6	f	f2	f2	f	f2	f2	h2	12h	1	1	h	h	1	1	1	12	12	12	f3	f2	f2	f	f	
7	f2	f	f2	f	f2	f	h21	h1	h1	1	1	1	1	1	1	1		1	f2	f2	f	f	f2	
8	f2	f	f2	f2	f	f	12	13				1	h1	h1	h1	h213	h21	h31	f4	f2	f3	f3	f	
9							12	13	13	12	1	1	1	c	1	h2	13	12	f	f	f3	f4	f3	
10	f4	ff3	f3	ff22	f	f	13	13	13	12	1	1	1	1	1	1	1	12	f	f	f3	f4	f3	
11	f2	f2					h1	h3	13	12	12	c	1	h	e212	e3	14	13	f4	f3	f3	f4	f3	
12	f2	f2	f5	f3	f3	f2	15	13	12	h12	12h	1	1	12	12h	13	e212	13	f2	f3	f2f2	f4	f4	
13	ff22	f2	ff22	f5	f6	f6	12	13	13	12	12	12	1	1	1	12	13	13	f5	f4	f4	f4	f2	
14	f						1h2	h212	12h2	12	1	1	1	12h	12h	e2	e1	12	f2	f2	f3	f3	f4	
15	f2	f	f	f	f2	f	1	1	1	h1	1	1	12	12	e21	e212	1	12	f3	f	f	f	f	
16							1	1	h	e3	e2	13	12	13	13	13	12	14	f3	f5	f4	f2	f3	
17	f3						1	1h	e212	12	1	12	1	1	h	12h	13	13	f2	f5	f5	f2	f2	
18	f	f	f	f	f	f	1	1	1	1	1	1	1	12	12h	1	13	12	f2	f4	f3	f3	f	
19	f	f	f	f	ff	ff	12	13	1	12	12	1	12	12	1	12	1	1	f	f	f	f2	f	
20							1	1	h	h	14	12	13	13	13	1		1	f	f	f	f	f	
21							h4	h3	h1	h2	e212	e312	e3	13	12		1		f3	f3f2	f2	f4		
22	f2	f4					1h	h212	14	12	12	12	12	1	1	h	1h	f6	f2	f2	f2	f2	f	
23	f	f	f				1h2	13h2	13	12	12	1	h12	h	h	12	h	12	f	f3	f4	f2	f3	
24	f3	f2					h	13	13	13	1	1	h1	h12	13	12	h13	12	f3	f2f	f	f2	f2	
25	f3	f	f2	f2	f2	f2	13	h212	12	13	13	13	h13	1	12	e2	13	13	f4	f3	f	f2	f3	
26	f3	f2	f	f	f	f	e2	1	1	1	1	1	1	1	1	12	c		f2	f2	f2	f2	f	
27	f4	f3	f2	f	f2	f2	13											f4	f	f2	f2	f2	f2	
28	f	f	f3	f4	f	f	1	c		1	1	1	e1	e2	e3	12							f4	
29	f3	f2	f2	f2	f2	f2	h	h2e2	12	12	12	12	12	12	12	h	h	h2	f	f2	f4	f5	f4	
30	f4	f3					1	h2	e3	e2	e2	e2	e2	1	1		e3	1	f4	f2	f3	f4	f2	
31	f3	ff	f2				1	12	h12	1	12	12	h1	e2	h2	e2	e3	f2	f2	f5	f4	f3	f3	
No.																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

Types of Es

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

The Radio Research Laboratories, Japan

Lat. 35° 42.4'N  
Long. 139° 28.3'E

Kokubunji Tokyo

IONOSPHERIC DATA

135° E Mean Time (G. M. T. + 9h)

km **fpF2**

**Oct. 1964**

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	345	340	310	260R	250	310	265	260	I260R	I255R	260R	290S	260	260	280	255	270	255	260	260	305	295	260	295
2	300	320	330	340	305	250	250	250	R	240R	J250R	260	260	285	300	J300R	I255S	250S	I250S	240S	310	270	300	300
3	300	310	305	300	280	295	240	225R	I240S	245	260	270	270	295	295	260	S	S	220	260	340	325	330	315
4	320	355S	310	325	290	275	230	J240R	250	290	290	J300R	260R	250	280	260	280	245S	250	340	350	345	295	290
5	310	315	320	320	320F	260	225S	J250R	260	295	310	J295R	J250R	250	260	260	260	J240R	260	290	S	F	F	330
6	300	310	250	290	310	300	250	250	I255R	255	255	I250C	R	250R	J250R	260	250	250	260	A	310	320	320	315F
7	315F	315	F	F	F	290F	250	250	280	R	270R	I295R	R	R	R	250	255	260	250S	260S	305	320	340	310
8	295	295	290S	290	290	300	250	250	250	J250R	C	R	R	R	R	J250R	C	300	270	260	290	290	300	310
9	310	310	F	295	310	310	240	260R	225	C	C	260	255	260	260	255	255	250	240	265	370F	345	315	325
10	310	290	305	290	290	280	250	250	250	250	250	250	255	295	290	260	250	220R	220	340	A	A	A	310
11	305	305F	310	285	250	305	250	220	250	250	300	260	285	250	260	250	250	250S	250S	310	F	F	F	320F
12	F	310F	360	310	A	290F	A	230	250	250	305	295	250	260S	260	255	250	220	220	325	350	F	F	F
13	J360R	360	300	300	300	290	250	250	290	J285S	J280R	275	295	295	260R	250	S	235	A	A	A	345	330	F
14	320F	310	320	300	305	280	250	220	250	J240R	260	290	295	285	260	250	220	J230R	250	305	320	F	300	305
15	310	290	290	285	250	250	245	245	245	245	250	260	290	J260R	J260R	240	230	260	280	290	320	310	315	330
16	310F	295	300	285	270	250	220	230	250	260	260	255	255	260	255	280	250	250	240	270	1280A	310	315F	F
17	305F	300	305F	F	F	260	250R	210	240	245	260	290R	260	J255S	250	250	250	255	255	290	295F	300	310	300
18	300	J340F	F	F	J290F	240F	255	255	290	270	260	290	265	260	260	260	240	240	285	250	310	315	350	350
19	340	300	290	240	240	290	250	245	250	J260S	290	275	295	280	260H	290	250	290	250	260	260	330	325	U330F
20	325F	355	340	260	300	260	250	250	295	320	275	280	270	265	J260R	250	245	J245R	280	310	310	300	295	F
21	330F	340F	300	265	260	305	250	240	265	J285S	290	260S	260	260	270	250	250	245	290	315	295	305	305	320
22	325	A	300	U265F	F	F	250F	250	260	I255A	290	300	270	245	260	S	220	250	220	315	320	310	F	F
23	F	F	F	U300F	250F	305F	250	220	245	250	290	290	250	290	270	250	230	240R	290	300	270	310	330F	380F
24	360F	J355F	F	F	C	290F	230	210	220	255	260	275	300	300	260	260	250	250	295	290	270	310	310	320F
25	310	300	315F	270	295	310F	280	250	260	J255S	270	305	300	295	260	250	260	250	260	300	305	305	320	300
26	320	300	315F	290F	260F	295	250	240	245	250	280	300	270R	260	290	250	260	C	315	325	290	345	300	290
27	I300A	305	285	320	350	320	290	C	C	C	C	C	C	C	C	C	C	C	A	295R	320	305	360	325
28	365	310	305	290	290	295	255	260	C	255	290	265	I295C	280	250	290	245	250	U250R	305	I300C	310	350	345
29	320	360	305	305	250	305	260	250	250	255	255	I280C	I265C	I280R	280	260	260	255	275	300	250F	A	A	325
30	355	310	I320R	350F	350F	I320C	290	J245S	245	270	285	295	295	260	260	I250C	245	245	285	290	305	I345S	U390F	330
31	340	325	315	310	255	300	255	240	260	250	260	270	290	270	285	250	240	260	290	I330A	I310A	350	310F	310
No.	29	29	26	27	26	30	30	30	28	28	28	29	28	28	28	29	27	28	29	29	27	25	25	26
Median	315	310	305	290	290	295	250	250	250	255	260	280	270	260	260	250	250	250	260	295	305	310	315	320
U. Q.																								
L. Q.																								
Q. R.																								

**fpF2**

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

The Radio Research Laboratories, Japan

# IONOSPHERIC DATA

Kokubunji Tokyo

Lat. 35° 42.4'N  
Long. 139° 29.3'E

135° E Mean Time (G. M. T. +9h)

km  
y p F 2

Oct. 1964

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	055	060	070	052R	060	090	045	050	I045R	I040R	I040R	040S	050	040	050	040	050	045	030	040	065	060	050	065	
2	065	075	065	060	065	055	030	035	R	040R	J050R	050	050	040	055	J045R	I040S	035S	I050S	055S	090	050	060	060	
3	050	050	050	060	060	055	030	025R	I040S	035	040	040	030	050	025	040	S	S	050	085	070	055	065	080	
4	070	065S	050	075	055	075	040	J060R	030	050	055	J050R	050R	050	050	040	040	030S	050	055	065	050	055	055	
5	075	080	075	075	075F	045	050S	J045R	050	020	055	J052R	J050R	040	050	040	040	J050R	080	060	S	F	F	060	
6	060	070	050	070	085	060	050	045	I045R	045	040	I040C	R	045R	J045R	045	045	035	040	A	085	075	075	080F	
7	085F	080	F	F	F	060F	040	045	040	R	045R	I035R	J055R	R	R	040	065	050	050S	050S	095	075	065	090	
8	055	060	055S	055	070	045	045	050	035	J050R	C	R	R	R	R	J050R	C	050	040	055	055	050	095	080	
9	050	060	F	055	050	035	030	050R	075	C	C	040	050	025	045	045	045	045	040	080	070F	055	080	075	
10	085	060	050	050	055	065	050	030	045	050	040	055	045	055	050	045	030	060R	075	100	A	A	A	060	
11	055	090F	085	035	040	085	050	060	045	030	055	045	030	045	050	045	040	045S	050S	090	F	F	F	080F	
12	F	060F	050	070	A	095F	A	070	055	050	055	045	045	040S	050	040	040	045	080	070	050	F	F	F	
13	J080R	080	060	060	050	055	045	050	055	050	J055S	J070R	055	030	045R	045	S	045	A	A	A	055	065	F	
14	060F	050	075	060	060	055	045	050	050	J040R	060	050	055	055	025	055	055	J045R	060	085	075	F	055	055	
15	060	050	050	065	045	080F	045	045	045	045	045	060	070	J045R	J060S	J030R	040	035	080	060	060	060	055	065	
16	050F	055	060	055	040	060	040	050	040	040	060	045	045	050	045	075	045	050	060	070	I070A	080	085F	F	
17	045F	055	055F	F	F	050	040R	050	040	030	045	050R	055	J040S	045	045	045	040	050	050	055F	095	085	095	
18	050	I040F	F	F	J060F	050F	050	070	055	060	050	040	065	045	055	040	050	035	065	050	090	075	090	050	
19	055	050	055	055	065	070	050	045	040	J040S	050	070	045	045	025R	030	050	055	040	045	055	060	050	I070F	
20	035F	050	040	050	095	055	050	045	045	050	035	045	050	040	J045R	045	030	J052R	060	075	050	055	055	F	
21	065F	065F	050	040	080	090	050	040	040	J020S	050	035S	040	050	030	050	030	050	065	045	055	050	050	080	
22	065	A	060	I040F	F	F	050F	040	030	I045A	055	055	030	055	040	S	060	030	060	085	080	070	F	F	
23	F	F	F	I080F	055F	085F	040	040	025	040	050	030	025	040	035	050	050	050R	065	050	070	085	070F	075F	
24	090F	J050F	F	F	C	052F	060	040	035	045	040	035	025	050	045	040	045	050	060	060	040	085	080	070	
25	085	060	080F	070	055	090F	060	050	050	J040S	040	045	045	050	050	040	045	050	060	095	085	075	090	055	
26	075	065	065F	055F	055F	055	040	035	045	030	030	045	040R	050	080	045	040	C	085	065	060	060	095	055	
27	I060A	055	060	080	065	080	060	C	C	C	C	C	C	C	C	C	C	C	C	A	055R	085	085	065	
28	080	055	045	025	070	060	050	040	C	040	040	I040C	025	040	040	045	045	045	I050R	075	I080C	085	055	055	
29	060	070	055	055	050	085	045	040	030	040	035	I040C	I030R	040	040	045	045	035	045	060	055F	A	A	070	
30	045	050	I070R	090F	050F	I070C	060	J030S	030	040	020	055	045	040	045	I045C	050	055	055	070	095	I075S	I060F	060	
31	060	070	075	045	045	060	055	035	050	040	065	035	065	050	045	030	045	050	050	I050A	I050A	055	060F	085	
No.	29	29	26	27	26	30	30	30	28	28	28	29	28	28	28	29	27	28	29	29	27	25	25	26	
Median	060	060	060	055	055	060	050	045	045	040	050	045	045	045	045	045	045	045	055	060	070	060	065	070	
U. Q.																									
L. Q.																									
Q. R.																									

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

The Radio Research Laboratories, Japan

y p F 2

IONOSPHERIC DATA

Yamagawa

Lat. 31° 12' N  
Long. 130° 37' E

0.1 Mc 135° E Mean Time (G. M. T. + 9h)

foF2

Oct. 1964

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	037	036	035	036	026	026	029	059	069	I070S	064	073S	068	J062S	056	062	066	073S	073S	062	042	034	035	032
2	030	030	029	030	030	030	036	063S	064S	058	I068S	074S	I064S	058	I060S	064S	070S	J065S	063	I061S	I044S	I030S	033S	034
3	I036S	I036S	033	031	030	029	032	057	I066S	064S	I066S	055	066	082	J078S	072S	072S	I069S	062	038	I034S	I034S	036	J037S
4	I038S	I036S	036S	J033S	032	030	032	057	066	062	062	062	066	082	072S	062	065	J077S	056	033	036	I039S	I040S	040
5	036	035	I036S	036	035	038	034	I045S	055	064	J076S	J096S	097	087	080	064	070	056	I052A	I046S	I043C	044	043	043
6	042	039	036	028	030	028	J036S	056	066	069	072	I076S	067	078	064	066	066	066	065S	043S	038	039S	038	037
7	036S	035S	034	035	035	026	030	053	064	083	100S	J108H	J139S	I146S	U146S	124	074S	066	I069S	065	035	032	034	036S
8	040	036	034	028	024	020	030	056	067	062	068	088	096S	104	091	087	J082S	056	058	044	I030A	032	I033S	032S
9	032	033	034	034S	033	029	032S	063	066	062S	J062S	071	078	078	071	065	061	J074S	I071S	A	I032S	036	I036S	036S
10	038	039	036	036	031	027	032	057	086S	073S	076	066	066	066	066	066	066	066	066	066	066	066	066	066
11	032	034S	033	032	040S	022	027	056	070	068	072	087	U096S	089	091S	080	068	064	060	033	026	A	A	A
12	033	034	032	032	035	024	030	I050A	J062S	067	075	088	J100S	084	088	075	066	061	J051S	032	033	034	034	036S
13	035	035	039	038	038V	J033S	I030A	I048C	I068C	086	100	I102S	107	105	111	103	074S	064	I050A	J033S	034	037	041S	037
14	037S	035	032	034	032	024F	027	J049S	072S	J064S	066	065	074S	093	094S	073	067	057	U046S	I041A	I036S	036	032	029
15	031S	033S	033S	033S	031	023	028	058	061S	072	I076S	070	074	085	093	102S	087	075	045	036	030	032	035S	I032S
16	032	034	035	038	045S	021H	026	049	058	059	065	085	089	069	073	083	084	J078S	068	039	031	031	030	031
17	U032S	I034S	033	032	038	024	030	059	055	061S	068	070	083	083	077	068	070	074S	J063S	039	033	035	036	I036A
18	036	034S	032	032S	035	029	026	054	068	083	J097S	083	J098S	J098S	J097S	093S	081S	060	050	041	035	031	031	031
19	032S	035S	035	035	032	021	024	055	U070S	064	U068S	066	093S	102	096S	J076S	060	J062S	072S	J056S	036	033	033	I036S
20	036	037	036	044	031	030	030	056	J062S	I071S	107	109	087	083	I097S	089S	072S	057H	J046S	042	039	038	039	036
21	038	036	040	039	028S	025	I029C	048	063	071	081	090	085	092	097S	091S	066	059	050	044S	033	I034A	J032S	036S
22	J034S	033S	J033S	035	037	023	027	050S	J061S	058	068	J079S	100S	096	078S	077S	071	057	I048S	I030A	032	032S	028	028
23	029	030	030	033	035	021	024	049	056	055	071	091	J097S	107S	J110S	113	091S	J065S	040	036	033	037	037	036
24	037	036	037S	037S	052S	030S	027	045	J050S	053	057	059	064S	077	J088S	083	I074S	058	042S	036	043S	038S	025S	026
25	028	030	029	030S	034S	027	027	054	J063S	066	U071S	065	071	J095S	110	J087S	065	066	057	037	043	037	035S	034
26	J036S	I030S	029	030	033S	025	030	057	056	057	073S	086	092S	J104S	I096S	080	J063S	058	J049S	040	I045S	U042S	I040S	037
27	030S	028	029	030S	032S	027	027	031S	U061S	S	072S	081S	089	078S	088	091S	088S	065	055	041	038	040S	040	I040S
28	031	031	031S	032	S	026	028	055	S	070S	082	J078S	069	I078C	U095S	I080C	066	061S	041S	033S	038S	038	J035S	J035S
29	032	031	031	031	033S	030	030	056	064	J064S	J064S	077S	I066S	U071S	079	U072S	J062S	056	050	I048S	043	I046S	I033S	I032S
30	J033S	J033S	033	J032S	034	J032S	034	066	064	J065S	I075C	086	090	093S	I093S	081	062S	053	J047S	I037S	030	J032S	J031S	I036S
31	036S	037	035	037	S	025	024	050	061H	061	C	078	J078S	077S	071S	066	066	056	I046A	I034A	030	029	I030S	031
No. ^	31	31	31	31	29	29	29	29	28	31	29	28	29	29	30	30	30	31	31	31	30	31	30	30
Median	035	034	033	033	033	026	030	055	064	064	072	081	085	087	091	080	068	061	050	038	035	034	034	036
U. Q.	037	036	036	036	035	029	032	058	068	071	078	088	096	097	096	088	072	068	063	044	040	038	037	036
L. Q.	032	033	032	031	030	024	027	050	061	061	067	070	072	078	078	071	065	057	046	036	032	032	032	032
Q. R.	005	003	004	005	005	005	005	008	007	010	011	018	024	019	018	017	007	011	017	008	008	006	005	004

The Radio Research Laboratories, Japan

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

foF2

Y



IONOSPHERIC DATA

Oct. 1964

f<sub>o</sub>F<sub>1</sub>

0.01 Mc 135° E Mean Time (G. M. T. + 9h)

Yamagawa

Lat. 31° 12' N  
Long. 130° 37' 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	L	A	420	450	L	L	L	A						
2									L	L	L	045	450	L	460	410	A	A						
3									L	410L	L	440	440	430	430	410L	A	A						
4								C	C	A	C	C	C	C	440	A	L	A						
5								A	A	L	440L	440H	440	430	430	L	L	A						
6								L	L	L	430L	440C	4450C	440	430	390L	L	L						
7								L	L	L	420L	440H	450H	470	450H	400	LH							
8								L	L	L	430L	450H	450H	440	430	420	L							
9								L	L	L	420H	440	450H	450H	450	L	A							
10								L	LH	LH	430	C	C	C	C	C	C							
11								L	L	L	420	430L	450	440	450L	450	410	L						
12								A	L	L	440H	450	450	440L	440	410H	L	A						
13								C	C	L	LH	440	440	450	420	400L	L	A						
14								L	L	L	420	420H	440A	450H	L	A	A	A						
15								L	L	A	440L	450	450H	450H	430	L	L	A						
16									L	L	430	420	4450A	L	LH	400L	L	A						
17									L	L	410	L	450L	440	430L	L	L							
18								L	LH	LH	430H	L	450H	450H	450H	410L	L							
19								L	L	L	LH	470L	450H	440L	LH	410	A							
20								L	L	L	420L	450	400	LH	LH	L	L							
21									L	L	430	450	440	440	420	410H	L							
22									L	L	430	450H	450H	440H	L	A	L	A						
23									L	L	450	450	430	440A	420	LH	L							
24									LH	L	L	440	450	A	430	L	L							
25									L	L	430	440	LH	460	L	L	L							
26									L	L	450	440	460	440	440	410	L							
27									L	L	L	A	L	450	440	L	L	A						
28									LH	L	430	440H	450	4450C	L	C	L							
29								C																
30									A	C	A	450	L	440	L	440	L							
31									LH	C	C	L	460	420	A	A	A							
No.									5	20	23	25	23	23	13									
Median									420	430	440	450	450	430	410									
U. Q.																								
L. Q.																								
Q. R.																								

f<sub>o</sub>F<sub>1</sub>

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

The Radio Research Laboratories, Japan  
Y 2

# IONOSPHERIC DATA

Lat. 31° 12.1'N  
Long. 130° 37.1'E

Yamagawa

0.01 Mc  
135° E Mean Time (G. M. T. + 9h)

**foE**

**Oct. 1964**

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	190	230	A	A	A	A	A	A	A	A	A	A	S					
2						S	A	A	290	305	315	I320R	I320R	I320R	310H	290	250	200	S					
3						S	210	I250A	290	310	320H	I320R	I320R	I320R	R	A	250	220	S					
4						C	C	C	280	C	C	C	C	C	310	290	I280A	190	S					
5						S	190	A	A	A	A	A	A	A	A	A	A	220	S					
6						S	210	255	285	310	I310C	I320C	I320C	I320C	320	305	285	A	S					
7						S	200	260	290	310	310	320	310	320	310	290	260	A	S					
8						S	A	A	I275A	I300A	320	I320R	I320R	I320R	320	310	280	A	S					
9						S	200	250	280	310	320R	320	I315R	I300R	280	260	260	A	S					
10						S	A	A	A	A	C	C	C	C	C	C	C	180	S					
11						S	210	260	290	300	310	A	A	A	A	A	A	A	S					
12						S	A	A	A	A	A	R	I315A	300	285	285	A	A	S					
13						S	C	C	A	285	295	310	310	305	285	250	A	S						
14						S	200	255	I285A	I305A	I310A	315	315	305R	285	A	A	S						
15						S	210	260	280	300	310R	310	I310A	305	280	A	A	S						
16						S	S	260	280	300	310	315R	310	305	I280A	250	S	S						
17						S	195	A	275	300	300	R	R	I310A	280	A	S	S						
18						S	S	I230A	270	295	A	R	310	290	290	250	S	S						
19						S	S	250	290	I300R	R	R	R	A	A	A	A	S						
20						S	S	250	I260R	290	290	I300R	I305R	300	270	I235R	S	S						
21						C	200	240R	270	300	310	A	A	A	305	280	240	175	S					
22						S	190	240	260	A	A	A	A	R	320R	280	250	210	S					
23						S	S	225	260	A	A	A	A	A	310R	I275A	240	S	S					
24						S	190	A	A	A	A	A	310	310	295	255	215	S	S					
25						S	190	220	280	280	I290A	I300A	300	300	I280A	240	S	S						
26						S	185	240	270	280	I285A	I305A	310	I295A	280	250	S	S						
27						S	190	230	260	270	A	A	A	S	310	280	220	S	S					
28						S	180	I240A	280	A	A	A	C	A	C	A	A	S	S					
29						C	C	240	270	I290A	300	305	310R	305	285	230	S	S						
30						S	S	225	265	I290C	300	295	295	280	A	A	S	S						
31						S	190	240	285	C	C	A	A	A	A	A	A	S	S					
No.							18	22	25	21	18	16	18	18	23	22	17	7						
Median							190	240	280	300	310	310	310	310	305	280	250	200						
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

Y 3

IONOSPHERIC DATA

Oct. 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	S	S	S	J020	J015S	S	021	J037	J066	J051	J055	J038	J048	J052	J052	J037	J036	J030	J024	J037	J022	J026	
2	J021	S	J015S	S	S	S	S	024	030	G	025G	027G	J025G	G	038	042	038	037	J027	S	S	S	S	
3	S	S	S	S	S	S	S	023	029	031	G	G	G	G	G	037	043	J052	J032	031	J015S	J015S	J017S	
4	J015S	S	J014	S	J016	C	C	C	G	J037	G	G	G	G	032	039	J038	J055	J032	J030	S	S	S	
5	J015S	J018	J019	J019	J021	J015S	S	029	032	035	J042	J051	036	042	042	037	J034	025	J056	J042	C	J022	S	
6	J015S	J017S	S	E	E	S	S	025	030	033	040	C	C	042	038	032	036	036	S	J030	J021	J026	J030	
7	J024	J015S	J018	J016S	E	S	S	G	G	030	027G	032	033	032	G	027G	021G	021	J025	S	J024	J024	J024	
8	J020	J020	J018	J015	E	S	S	025	034	033	J054	037	032G	022G	G	022G	J036	J034	J029	J037	S	S	S	
9	S	S	S	S	S	J015S	S	G	026	023G	024G	036	G	021G	037	037	044	039	J030	J043	J024	J025	J023	
10	J018	J015S	S	S	E	S	S	023	J036	J037	031	C	G	G	C	C	C	024	S	S	J024	J014S	J021	
11	J015S	J019	J018	S	E	S	S	G	J035	039	J052	J054	037	J041	J037	032	027	J024	J021	J020	J017S	J051	J034	J038
12	J022	J024	S	E	S	S	J021	J098	039	J037	J037	032	G	J039	031	032	039	J040	J047	J027	J022	J034	J018	S
13	J022	J019	J020	J016	J016	J051	J040	C	G	031	034	J085	J054	040	034	036	031	J052	067	J037	J026	038	J034	J031
14	J020	J019	J022	J028	J020	021	020	029	030	030	J032	J042	045	035	J022G	040	040	J035	030	J051	J021	J015S	J022	J031
15	J020	J017S	J022	J020	J015S	S	J017S	G	030	040	034	034	035	037	036	038	J051	J036	J032	J051	028	J019	J021	J014S
16	J015S	J015S	J018	E	S	S	S	024	031	037	034	037	J051	037	J051	J054	J051	J051	J051	J021	J018	037M	S	S
17	S	S	S	E	E	S	S	022	026	025G	025G	021G	039	036	J033	030	028	026	023	J016S	J024	J036	J030	J051
18	J029	J020	J020	J019	J018	S	S	G	024	030	033	J036	028G	025G	G	020G	020G	S	J020	S	S	J014S	S	S
19	S	S	S	E	E	J015S	J015S	021	022G	030	027G	030G	030G	030G	J034	035	J039	021	J024	S	022	J024	J017S	S
20	S	S	S	E	E	S	S	021	021G	030	035	031	028G	020G	019G	028	022G	S	020	S	J015S	S	S	J014S
21	S	S	S	E	J015	J015S	C	G	031	036	037	037	043	J040	021G	G	031	029	020	J033	043M	J061	J032	S
22	S	S	S	J019S	E	J021	S	021	027	035	032	036	036	020G	038	040	035	032	021	J037	J030	S	J034	S
23	J021	J022	021	J016S	J015S	S	J024	022	032	035	J037	043M	J052	J053	G	J037	021G	022	J021	J017S	J018	J017	021M	S
24	028M	J021	022	J023	J017S	J014S	S	021	028	J037	037	037	J037	044	036	039	032	027	J023	021	J033	J018	J018	J016S
25	021	J017	S	S	E	S	S	021	036	036	J037	J036	035	033	G	029	023G	G	J022	J017S	S	022	S	S
26	S	S	S	J015	S	S	S	021	027	035	037	J032	033	031G	J039	037	036	J024	J020	022	S	S	S	S
27	S	S	S	021M	S	E	S	024	027	036	J043	J046	030	034	035	036	J037	J053	J035	028	J020	S	J022	023M
28	023M	023M	J022	J020	J019	021M	021	G	026	030	031	033	033	C	037	G	029	021	J019	J018S	S	S	S	S
29	S	S	S	E	E	G	C	C	027	031	037	032	035	035	039	036	033	027	S	J020	J021	022	J022	023M
30	S	023M	J022	J023	J015S	021	021	030	032	044	G	J054	044	J054	038	J037	J032	044	J037	J051	J031	021M	J023	J022
31	021	S	S	S	S	E	S	021	026	031	C	C	033	033	J051	J043	031	J041	J053	J051	J026	030	J031	J023
No.	19	17	16	22	23	12	8	28	29	31	28	27	28	28	30	29	30	29	27	26	25	22	22	20
Median	021	019	020	016	015	015	021	021	030	035	034	036	035	035	036	037	034	034	029	028	025	024	022	023
U. Q.	022	022	022	020	017	021	022	024	032	037	037	046	038	040	038	039	038	040	035	037	030	036	026	030
L. Q.	015	017	018	E	E	015	018	G	026	030	031	032	G	G	G	031	029	024	021	021	020	019	018	021
Q. R.	007	005	004			006	004		006	007	006	014			008	009	009	016	016	010	010	017	008	009

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

The Radio Research Laboratories, Japan

Y 4

foEs

# IONOSPHERIC DATA

Yamagawa

Lat. 31° 12.1'N  
Long. 130° 37.1'E

**fbEs**

0.1 Mc

135° E Mean Time (G. M. T. +9h)

**Oct. 1964**

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	S	S	S	S	S	S	S	G	036	E066S	035	053	037	037	035	037	G	032	E030S	025	021	019	021	018	
2	019	S	S	S	S	S	S	023	G		025G	025G	025G		038	040	038	037	026	022	S	S	E	S	
3	S	S	S	S	S	S	S	G	G	G							E043S	041	030	E	021	S	S	S	
4	S	S	S	S	016	C	C	C	G	E037S	C	C	C	C	E032R	039	037	050	031	030	022	S	S	S	
5	S	017	017	E	E	S	S	025	032	032	036	037	035	037	036	034	031	G	A	032	C	017	S	E	
6	S	S	S			S	S	G	G	032	039	C	C	038	037	032	029	028	S	S	E	019	022	024	
7	017	S	S	S		S	S			025	025G	E032R	G	E032R		022G	021G	E021R	022	E	021	S	022	018	
8	E	018	018	014		S	S	G	G	032	034	036	G	022G		022G	030	023	023	022	A	S	S	S	
9	S	S	S	S	S	S	S		G	022G	021G	035		021G	036	036	041	E039S	030	A	E026S	017	025	E	
10	018	S	S	S		S	S	022	G	032	G	C	C	C	G	C	C	022	S	S	S	E024S	S	021	
11	S	018	017	S		S	S		029	034	037	040	034	036	032	032	G	G	019	018	S	A	A	A	
12	018	019	S		S	S	G	A	033	032	032	032		035	027	031	032	025	E047S	019	E	018	017	S	
13	020	017	019	E016S	014	023	A	C	C	G	041	041	041	039	034	G	G	E052S	A	022	019	026	032	022	
14	E	018	018	023	019	E	G	027	019	E030R	G	035	045	034	019G	039	039	031	E030S	A	E021S	S	E022S	022	
15	018	S	017	018	S	S	S		G	040	033	033	034	035	034	036	033	025	026	034	019	018	E021S	S	
16	S	S	E		S	S	S	024	G	034	G	G	046	037	033	032	033	040	042	019	E	E	S	S	
17	S	S	S		S	S	S	G	G	024G	025G	020G	039	036	033	E030R	E028R	026	023	S	022	018	019	A	
18	025	020	017	018	E	S	S		G	G	032	032	025G	025G		019G	018G	S	019	S	S	S	S	S	
19	S	S	S		S	S	S	G	022G	019	G	022G	E030R	E030R	032	034	037	G	018	S	018	019	S	S	
20	S	S	S		S	S	S	G	019G	G	033	G	027G	020G	019G	G	G	S	018	S	S	S	S	S	
21	S	S	S		015	S	S		031	035	035	034	036	036	018G		031	027	019	029	019	A	E	S	
22	S	S	S		018	S	S	G	G	034	032	033	033	018G	038	040	031	031	018	A	017	026	S	019	
23	E	E	E	S	S	S	G	021	032	033	032	036	037	049		032	018G	022	G	020	S	018	017	E	
24	018	021	E	020	S	S	S	021	026	035	037	040	034	E044S	036	033	031	026	022	019	025	018	018	S	
25	E	E017S	S	S	S	S	S	G	029	034	032	G	033	033		E029R	022G		S	020	S	S	018	S	
26	S	S	S	S	S	S	S	021	027	033	032	E032R	033	030G	035	024	G	E024S	019	022	S	S	S	S	
27	S	E	S	S		S	S	022	026	036	040	046	E030R	032	033	033	031	039	031	026	018	S	019	E	
28	E	E	E	017	018	E	G		025	024	031	033	033	G	034	C	027	020	G	S	S	S	S	S	
29	S	S	S			C	C	C	G	G	034	G	G	034	033	036	032	024	S	019	017	019	E022S	017	
30	S	018	020	018	S	E	G	029	031	043	C	048	033	039	033	032	024	041	019	027	023	018	E023S	E022S	
31	E	S	S	019	S	S	S	G	026	030	C	C	033	033	G	043	031	041	A	A	020	020	019	019	
No.																									
Median																									
U. Q.																									
L. Q.																									
Q. R.																									

# IONOSPHERIC DATA

**f-min**

**Oct. 1964**

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	E019S	E017S	E017S	E017S	O11	E017S	E015S	O17	O16	O17	O21	O22	O22	O18	O17	O16	O16	E016S	E017S	E016S	E016S	E016S	E017S	E017S
2	E017S	E017S	E017S	E016S	E017S	E017S	E017S	O16	O16	O16	O17	O18	O18	O17	O22	O21	O18	O17	E016S	E017S	E020S	E017S	E019S	E019S
3	E018S	E018S	E018S	E017S	E018S	E017S	E017S	O16	O16	O17	O17	O21	O22	O16	O16	O16	O16	E016S	E016S	E017S	E017S	E017S	E016S	E016S
4	E016S	E017S	E016S	E017S	O11	C	C	C	C	O16	C	C	C	C	O16	O16	O16	E016S	E017S	E017S	E017S	E019S	E017S	E017S
5	E016S	E016S	O11	E016S	E016S	E018S	E016S	O16	O17	O18	O18	O21	O18	O22	O22	O16	O16	E016S	E016S	C	E016S	E017S	E017S	E017S
6	E016S	E016S	E017S	O11	O12	E014S	E017S	O17	O16	O16	O16	C	O16	O16	O16	O16	O16	E016S	E016S	E017S	E016S	E016S	E017S	E017S
7	E016S	E018S	E016S	E016S	O11	E016S	E016S	O16	O17	O18	O19	O19	O21	O17	O16	O16	O16	E016S	E016S	E017S	E017S	E018S	E017S	E016S
8	E016S	E016S	E015S	O11	O13	E016S	E016S	O16	O15	O16	O16	O17	O17	O18	O18	O18	O16	E016S	E016S	E016S	E016S	E018S	E018S	E018S
9	E017S	E018S	E017S	E017S	E016S	E016S	E017S	O16	O16	O16	O16	O17	O17	O16	O16	O16	O15	E016S	E016S	E016S	E016S	E016S	E016S	E016S
10	E016S	E016S	E016S	E016S	O11	E018S	E016S	O16	O16	O16	O17	C	C	C	C	C	C	E016S	E016S	E017S	E016S	E016S	E019S	E017S
11	E016S	E017S	O10	E018S	O10	E016S	E016S	O16	O16	O16	O16	O19	O18	O16	O18	O16	O16	E016S	E016S	E016S	E016S	E017S	E016S	E017S
12	E016S	E016S	E016S	O12	E016S	E016S	E016S	O16	O14	O16	O16	O16	O17	O16	O16	O14	O15	E016S	E016S	E016S	E016S	E016S	E016S	E017S
13	E016S	E016S	O11	O09	O08	O13	E016S	C	C	O14	O16	O16	O18	O19	O16	O16	O16	E016S	E016S	E016S	E017S	E017S	E017S	E017S
14	E016S	E017S	E015S	O09	O07	E016S	E017S	O17	O17	O16	O16	O16	O16	O16	O16	O16	O17	E016S	E016S	E017S	E017S	E017S	E017S	E016S
15	E016S	E017S	E016S	O11	O09	E017S	E017S	O16	O16	O16	O16	O16	O16	O16	O16	O16	O17	E016S	E017S	E017S	E016S	E016S	E016S	E017S
16	E017S	E016S	O11	O13	E017S	E017S	E016S	O16	O16	O16	O16	O18	O18	O18	O18	O17	O16	E016S	E017S	E016S	E016S	E016S	E016S	E016S
17	E016S	E017S	E016S	O11	O09	E016S	E017S	O17	O16	O17	O16	O17	O16	O16	O16	O16	O17	E019S	E016S	E017S	E016S	E016S	E016S	E016S
18	E016S	E016S	O11	O10	E016S	E018S	E017S	O19	O17	O16	O17	O16	O17	O16	O18	O16	O16	E020S	E018S	E018S	E018S	E019S	E018S	E019S
19	E017S	E016S	E017S	O09	O11	E016S	E017S	O16	O17	O16	O18	O17	O18	O18	O19	O18	O16	E016S	E017S	E018S	E017S	E016S	E018S	E017S
20	E016S	E016S	E017S	O11	E016S	E016S	E017S	O16	O16	O16	O16	O18	O18	O18	O16	O16	O16	E019S	E016S	E018S	E017S	E016S	E018S	E017S
21	E017S	E016S	E016S	O09	O09	E016S	C	O16	O16	O18	O16	O18	O16	O16	O16	O19	O16	E016S	E017S	E017S	E017S	E018S	E018S	E018S
22	E017S	E016S	E017S	O11	O11	E017S	E017S	O17	O17	O16	O16	O16	O16	O16	O16	O18	O16	E017S	E016S	E016S	E017S	E018S	E016S	E016S
23	E017S	E016S	E017S	E016S	E018S	E017S	E016S	O16	O16	O17	O17	O18	O18	O18	O17	O16	O17	E017S	E017S	E017S	E017S	E016S	E016S	E018S
24	E017S	E017S	E017S	O11	E015S	E017S	E017S	O17	O18	O18	O17	O17	O19	O18	O19	O18	O17	E017S	E016S	E016S	E017S	E016S	E017S	E018S
25	E018S	E016S	E018S	E018S	O10	E017S	E017S	E016S	O17	O18	O17	O18	O16	O19	O19	O18	O18	E017S	E017S	E016S	E018S	E018S	E017S	E017S
26	E017S	E018S	E017S	E	E017S	E018S	E017S	E016S	O16	O17	O17	O17	O17	O17	O17	O17	O17	E017S	E018S	E018S	E017S	E018S	E017S	E017S
27	E017S	E016S	E017S	E018S	O12	E018S	E017S	E016S	O16	O17	O17	O17	O18	O18	O17	O17	O16	E018S	E017S	E017S	E016S	E016S	E017S	E017S
28	E017S	E018S	E018S	O11	O11	E018S	E017S	E017S	O16	O17	O17	O18	O18	O18	O18	C	O19	E016S	E017S	E016S	E018S	E018S	E017S	E017S
29	E018S	E018S	E018S	O14	O13	C	C	C	O16	O16	O16	O17	O17	O18	O17	O16	O16	E017S	E017S	E016S	E016S	E018S	E016S	E017S
30	E018S	E017S	E016S	E016S	O11	E017S	E016S	E016S	O16	O16	C	O17	O17	O19	O18	O16	O16	E017S	E016S	E017S	E017S	E017S	E017S	E017S
31	E018S	E018S	E018S	E017S	O11	O12	E018S	E017S	O16	O17	C	C	O18	O16	O18	O17	O17	E016S	E017S	E017S	E016S	E017S	E016S	E016S
No.	31	31	31	17	20	29	28	25	29	31	28	27	28	29	30	29	30	31	31	31	30	31	31	31
Median	E017	E017	E017	O11	O11	E017	E017	O16	O16	O16	O16	O17	O18	O17	O17	O16	O16	E016	E016	E017	E017	E017	E017	E017
U. Q.																								
L. Q.																								
Q. R.																								

IONOSPHERIC DATA

Lat. 31° 12.1'N  
Long. 130° 37.1'E

Yamagawa

135° E Mean Time (G. M. T. +9h)

M(3000)F2

Oct. 1964

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	305	335	310	290	310	355	360	I350S	34.5	340S	355	J350S	325	335	335	355S	34.5S	340	355	320	325	315
2	305	300	285	300	320	335	340	360S	360S	I350S	340S	I365S	340	I320S	330S	345S	345S	J355S	340	I370S	I360S	I280S	305S	280
3	I315S	I305S	325	305	335	345	370	370	I365S	360S	I365S	365	320	320	J335S	34.5S	340S	I345S	355	335	I305S	I275S	270	J320S
4	I305S	J335S	290S	J285S	315	C	C	C	C	350	C	C	C	C	335S	325	325	J350S	375	305	280	I280S	I320S	300
5	315	295	I305S	290	295	370	345	I375S	325	325	J315S	J315S	330	335	340	335	355	355	I335A	I330S	I295C	280	310	300
6	300	315	330	315	295	320	J320S	375	365	325	345	I330C	320	340	375	355	355	355	360S	350S	295	310S	320	310
7	335S	315S	310	295	315	385	320	350	330	315	330S	J295H	J300S	I325S	U315S	34.5	340S	320	I350S	340	370	295	280	305S
8	325	310	335	330	365	320	325	355	370	330	345	310	315S	335	325	330	J365S	355	350	355	I290A	285	U290S	295S
9	290	295	310	320S	340	315	345S	365	380	370S	J340S	325	335	345	330	340	345	J340S	I375S	A	I280S	300	I295S	285S
10	310	315	305	320	330	315	330	355	375S	355S	355	C	C	C	C	C	C	I375S	370	320	295	305	290	315
11	305	305S	335	335	385S	370	335	370	355	355	335	335	U335S	335	320S	375	355	360	385	385	310	A	A	A
12	305	325	315	340	370	340	335	I335A	J370S	330	335	320	J340S	335	340	360	365	360	J396S	315	295	295	295	285S
13	270	270	305	330	330V	J365S	I330A	I360C	I310C	335	335	I325S	320	325	325	370	365S	360	I365A	J305S	285	290	300S	295
14	325S	315	315	325	345	350P	335	J365S	370S	J360S	335	325	330S	325	350S	355	375	370	U350S	I330A	I320S	315	315	285
15	290S	325S	320S	335S	390	305	325	360	360S	345	I355S	345	310	320	335	345S	360	380	345	310	295	280	315S	I300S
16	310	305	315	340	375S	345H	325	365	360	355	340	340	360	350	330	330	355	J360S	360	335	315	315	295	295
17	U305S	I315S	310	315	355	310	335	370	365	350S	350	325	330	335	325	360	345	350S	J365S	355	305	290	290	I310A
18	310	295S	295	290S	345	365	320	355	340	325	J350S	300	J325S	J325S	J335S	34.5S	375S	365	340	335	330	295	305	295
19	305S	300S	315	330	345	335	310	365	U355S	360	U370S	290	300S	335	355S	J370S	350	J340S	335S	J360S	280	290	305	I280S
20	285	295	290	340	310	305	305	345	J340S	I290S	325	350	335	315	I325S	355S	360S	360H	J335S	310	295	300	305	290
21	290	305	325	345	320S	320	I305G	340	350	340	335	335	320	325	320S	350S	360	360	330	340S	305	I300A	J320S	310S
22	J305S	300S	J305S	295	380	280	320	345S	J355S	350	315	J305S	320S	340	335S	350S	350	350	I370S	I295A	320	315S	295	305
23	305	300	285	310	370	340	335	365	355	340	325	340	J320S	315S	J320S	345	355S	J370S	345	305	305	320	300	310
24	300	295	300S	345S	365S	365S	345	380	J350S	345	350	340	315S	315	J330S	340	I345S	365	360S	315	310S	340S	320S	310
25	295	305	310	300S	345S	300	335	340	J365S	360	U365S	330	295	J310S	335	J355S	355	350	355	330	310	340	320S	305
26	J310S	I300S	300	305	335S	320	350	385	390	350	330S	330	325S	J325S	I325S	340	J365S	350	J335S	320	I310S	U310S	I335S	315
27	335S	300	320	305S	310	295	325S	U345S	S	335S	335S	350	320S	325	330S	365S	370	365	315	320	325S	295	I310S	330
28	305	310	315S	335	S	290	320	360	S	330S	355	J350S	350	I320C	U345S	I360C	365	365S	340S	335S	300S	325	J330S	J315S
29	320	305	295	305	360S	C	C	C	395S	J375S	J350S	365S	I365S	U325S	345	U345S	J355S	355	340	I345S	300	I345S	I325S	I295S
30	J290S	J310S	320	J305S	330	J295S	310	375	375	J355S	I330C	325	325	340S	I355S	360	370S	365	J360S	I330S	305	J315S	J290S	I290S
31	285S	325	295	340	S	350	335	360	365H	350	C	C	335	J335S	350S	355S	360	355	I370A	I345A	285	295	I305S	295
No.	31	31	31	31	29	29	29	29	28	31	29	28	29	29	30	30	30	31	31	30	31	30	30	30
Median	305	305	310	320	340	320	330	360	360	350	340	330	325	325	330	350	355	355	355	350	330	305	300	300
U. Q.																								
L. Q.																								
Q. R.																								

# IONOSPHERIC DATA

**M(3000)F1**

0.01

135° E Mean Time (G. M. T. + 9h)

Yamagawa

Lat. 31° 12.1'N  
Long. 130° 37.1'E

**Oct. 1964**

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	L	A	405	375	L	L	L	A						
2									L	L	L	L	375	350	L	L	A	A						
3								C	L	L	L	400	395	370	375	365L	A	A						
4									C	A	C	C	C	C	365	A	L	A						
5								A	A	L	L	365L	380	375	370	L	L	A						
6								L	L	L	L	380L	1360C	385	370	385L	L	L						
7								L	L	L	L	360L	390H	385H	360	360H	LH							
8								L	L	L	L	395L	370H	380H	380	395	L							
9								L	L	L	L	405H	390	390H	375H	360	A	A						
10								L	L	LH	LH	385	C	C	C	C	C							
11								L	L	L	L	390	375L	375	370L	360	380	L						
12								A	L	L	L	365H	370	385L	350	365H	L	A						
13								C	C	L	LH	A	A	375	380	375L	L	A						
14								L	L	L	L	405	405H	1375A	360H	L	A	A						
15								L	L	A	A	370L	380	375H	375H	365	L	L	A					
16									L	L	L	390	1365A	L	LH	400L	A	A						
17									L	L	L	400	L	365L	365	370L	L	L						
18								L	LH	LH	LH	370H	L	375H	385H	370L	L							
19									L	L	L	LH	360L	345H	375L	LH	A							
20								L	L	L	L	355L	355	400	LH	LH	L	L						
21									L	L	L	365	370	380	365	380	L							
22									L	L	L	370	355H	365H	370H	L	A	A						
23									L	L	L	360	355	375	1365A	385	LH	L						
24									LH		L	L	375	380	A	355	L	L						
25									L	L	L	385	395	LH	350	L	L							
26									L	L	L	370	380	370	360	365	L							
27									L	L	L	L	A	L	355	365	L	A						
28									LH	L	L	375	390H	375	1360C	L	L							
29								C		400	L	405H	395	LH	360	L	A							
30									A	C	A	C	375	L	365	L	L							
31									LH	C	C	L	L	370	375	A	A							
No.										5	20	22	24	23	23	12								
Median										390	370	380	375	370	365	370								
U. Q.																								
L. Q.																								
Q. R.																								

IONOSPHERIC DATA

Lat. 31° 12.1'N  
Long. 130° 37.1'E

Yamagawa

Oct. 1964

km **f'F2**

135° E Mean Time (G. M. T. + 9h)

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								245	240	I250A	270	255	255	275	250	290	280	250						
2									230	260	255	260	250	280	310	290	250	250						
3									230	240	250	250	320	285	275	250	250	240						
4								G	G	250	G	G	G	G	280	275	290	240						
5									235	295	295	280	270	255	270	275	245	230						
6									245	245	250	I260C	I260C	260	270	230	260	240						
7									245	280	255	275H	280	255	250	245	240							
8									240	270	250	280	280	265	270	250	240							
9									220	235	245	270	270	255	280	250	255							
10									235	255	250	G	G	G	G	G	G							
11									240	255	260	280	255	255	255	240	240							
12								A	245	250	265	275	250	255	260	245	230	220						
13								G	G	255	255	265	255	275	250	235	230	E240A						
14									240	240	260	270	280	280	250	245	240	225						
15									240	250	250	260	295	260	265	245	230	225						
16										245	255	265	250	245	275	260	250	235						
17									215	255	270	275	280	270	265	250	245							
18									255	275	250	275	255	275	265	250	230							
19									230	250	245	340	305	250	245	245	225							
20									245	320	275	245	255	280	260	240	245							
21										260	260	255	270	275	275	250	230							
22									250	245	300	300	280	250	255	250	245	230						
23										255	295	255	270	250	255	250	230							
24									290		265	280	295	300	275	255	245							
25									235	250	245	285	330	300	255	240	250							
26									220	250	280	260	260	260	260	255	240							
27									245	255	270	260	260	285	260	245	240	230						
28									250	265	250	245	270	I280C	250	I245C	240							
29										240	255	255	245	270	270	250	240							
30										245	I270C	255	280	260	255	245	230							
31										230	G	G	275	270	255	250	240	245						
No.								2	23	30	29	28	29	29	30	30	30	13						
Median								240	240	250	255	265	270	270	260	250	240	235						
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

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

**f'F2**

Y 9



Lat. 31° 12.1'N  
Long. 130° 37.1'E

Yamagawa

IONOSPHERIC DATA

135° E Mean Time (G. M. T. +9h)

km

R'F

Oct. 1964

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	290	270	240	250	E295S	275	240	I225A	I230A	215	A	200	205	200	E260A	240	I245A	230	240	215	270	255	265
2	295	295	320	295	275	255	240	230	225	200	200	205	205	200	255	A	A	A	240	215	200	300	305	320
3	285	270	255	290	250	250	220	220	230	205	220	200	195	230	240	A	A	A	220	230	E300A	330	305	300
4	290	290	300	280	265	C	C	C	C	A	C	C	C	C	235	A	E280A	A	220	E340A	330	300	275	260
5	285	295	260	290	280	250	200	220	I225A	200	230	240H	200	230	230	225	250	A	260	I270C	300	280	280	
6	260	250	225	225	260	250	250	225	240	230	E245A	I215G	I230G	E240A	240	225	235	240	215	210	260	300	250	295
7	275	250	280	290	255	200	240	230	230	215	220	210H	200H	200	210H	220	210H	250	225	220	200	290	340	300
8	250	250	245	240	200	300	250	230	245	235	230	200H	205H	215	220	245	245	225	225	225	A	310	305	310
9	305	300	275	265	230	250	250	225	225	215	205H	215	195H	245H	245	I250A	I240A	250	230	A	A	300	E300A	300
10	295	255	265	250	225	275	250	220	240	200H	205	C	C	C	C	C	C	225	205	240	255	E320S	345	300
11	290	275	250	250	210	200	255	225	225	220	E240A	200	E250A	225	225	210	210	225	205	200	E260S	A	A	A
12	305	290	275	250	205	250	240	A	225	215	200H	200	200	225	210	230H	A	A	E250S	250	270	300	300	300
13	350	315	275	250	240	240	A	I205G	I210G	240	235H	A	A	E245A	245	220	240	A	A	A	250	305	350	E315A
14	280	275	290	290	240	240	250	225	230	235	200	200H	I220A	195H	250	A	A	A	A	A	I250A	245	E300A	E350A
15	300	250	255	245	200	E295S	E250S	235	225	I220A	215	210	200H	200H	225	A	I240A	I220A	230	E315A	295	315	290	275
16	300	275	255	230	200	E270H	240	220	240	220	215	205	I215A	225	200H	210	E250A	A	230	215	270	275	300	300
17	300	280	255	250	225	E275S	250	220	210	205	195	250	265	240	240	250	250	240	220	210	280	325	305	A
18	300	275	295	280	240	225	E260S	225	205H	205H	190H	200	195H	190H	200H	245	225	220	235	225	245	275	265	300
19	295	255	255	230	200	E260S	E300S	240	230	200	190H	220	195H	230	195H	250	I240A	245	235	200	250	E275A	290	325
20	320	295	295	230	230	250	E250S	230	240	235	235	215	225H	210	230	225	235	205H	230	245	255	280	280	300
21	295	285	250	225	240	250	C	235	250	245	235	225	200	215	225	225H	240	225	220	250	280	A	275	260
22	280	280	300	265	200	E345A	250	230	230	215	200	200H	200H	200H	260	A	245	I230A	200	A	275	E290A	E270S	310
23	E300S	300	325	265	215	E275S	E255S	215	230	220	200	250	225	A	230	205H	225	210	200	245	280	245	260	275
24	290	300	300	280	210	205	235	210	195H	245	255	250	210	A	250	E250A	E245A	225	210	245	255	225	E250A	300
25	E300S	280	280	E300S	235	275	255	220	225	225	195	190	195H	225	210	230	225	230	215	225	260	230	265	270
26	250	300	290	270	245	E255S	240	225	215	215	200	195	200	250	250	225	230	230	220	250	260	260	225	250
27	230	E270S	270	270	240	E295S	260	250	230	240	I240A	I220A	220	200	240	245	240	I240A	E250A	280	250	300	255	245
28	275	285	290	255	235	E300S	265	240	230H	220	220	200H	200	I200G	245	I230C	220	220	220	235	265	250	250	260
29	260	290	300	290	225	C	C	C	225	200	230	190H	210	210H	200	A	I240A	220	225	215	285	230	A	290
30	300	290	280	295	250	270	270	235	230	A	C	A	215	E250A	240	230	225	230	225	250	E300A	270	E340S	340
31	300	270	280	255	210	205	E260S	220	210H	200H	C	C	220	225	225	A	A	A	A	A	E300A	335	305	E305A
No.	29	31	31	30	31	19	23	28	30	29	27	24	28	23	30	20	22	22	26	25	26	28	25	27
Median	295	280	275	260	235	250	250	225	230	220	215	210	200	215	230	230	240	230	220	235	260	E290	280	300
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

Sweep 0.55 Mc to 17.9 Mc in 20 sec in automatic operation

R'F

# IONOSPHERIC DATA

Yamagawa

135° E Mean Time (G. M. T. + 9h)

f<sub>o</sub>F<sub>2</sub>

Oct. 1964

km

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	100	S	S	125	110	105	100	100	100	100	100	100	100	100	100	100	100	105	100	100	
2	100	S	S	S	S	S	S	110	105	G	100	100	100	G	170	145	130	125	115	110	S	S	100	S	
3	S	S	S	S	S	S	S	150	150	160	G	G	G	G	G	150	140	130	120	100	105	S	S	S	
4	S	S	S	S	100	C	C	C	C	115	C	C	C	C	130	145	125	120	115	110	110	S	S	S	
5	S	100	100	100	100	S	S	125	110	110	105	105	105	105	105	105	105	150	120	115	C	110	S	110	
6	S	S	S	E	E	S	S	140	140	135	130	C	C	120	120	125	115	110	S	S	105	100	100	100	
7	100	S	100	S	E	S	S	G	G	105	105	130	135	140	G	100	100	100	100	100	100	S	100	100	
8	100	100	100	100	E	S	S	150	140	130	100	140	G	100	100	100	100	100	100	100	105	S	S	S	
9	S	S	S	S	S	S	S	G	E160G	100	100	145	G	100	160	150	130	140	135	120	100	100	100	100	
10	100	S	S	S	E	S	S	150	105	125	105	C	C	C	C	C	C	125	S	S	S	100	S	100	
11	S	100	100	S	E	S	S	G	130	115	110	105	110	105	105	105	105	100	100	100	S	100	100	100	
12	100	100	S	E	S	S	110	105	105	100	100	100	G	100	100	150	125	115	110	105	105	100	100	S	
13	100	100	100	100	110	105	105	C	C	115	115	110	110	110	130	150	150	120	105	105	100	105	100	100	
14	105	100	100	100	100	100	100	135	110	100	100	100	115	135	100	120	115	115	110	105	105	S	100	100	
15	100	S	100	100	S	S	S	G	135	130	125	130	130	125	120	115	110	110	105	105	105	105	105	S	
16	S	S	100	E	S	S	S	S	150	140	130	125	110	125	115	115	110	105	105	105	105	115	S	S	
17	S	S	S	E	E	S	S	E150G	145	110	100	100	150	155	100	E135G	115	135	135	S	100	100	100	100	
18	100	100	100	100	S	S	S	G	105	140	140	100	100	100	100	G	100	100	S	100	S	S	S	S	
19	S	S	S	E	E	S	S	150	110	105	105	100	100	100	100	155	100	105	105	S	105	100	S	S	
20	S	S	S	E	S	S	S	155	100	125	115	120	105	100	100	130	115	S	100	S	S	S	S	S	
21	S	S	S	E	100	S	C	G	150	145	140	145	125	100	100	G	155	140	140	130	125	120	110	S	
22	S	S	S	105	E	100	S	150	140	125	115	110	105	100	155	170	175	140	140	120	120	110	S	105	
23	105	105	105	S	S	S	125	120	120	115	105	100	100	100	G	100	100	120	105	100	S	100	100	100	
24	100	100	100	105	S	S	S	145	110	105	170	110	120	140	150	110	110	110	110	105	105	105	100	S	
25	105	100	S	S	E	S	S	E145G	120	125	115	120	125	125	G	120	110	G	S	100	S	S	110	S	
26	S	S	S	S	100	S	S	130	130	120	120	120	115	100	100	100	120	100	100	110	S	S	S	S	
27	S	S	100	S	E	S	S	140	120	120	110	110	115	130	125	120	110	110	110	105	105	S	105	105	
28	100	100	100	100	100	100	100	G	120	115	110	110	110	C	110	C	110	110	S	S	S	S	S	S	
29	S	S	S	E	E	C	C	C	130	150	105	120	120	150	130	125	115	110	S	110	120	110	110	110	
30	S	100	100	100	S	105	100	120	120	115	C	110	110	110	115	105	105	105	105	105	100	105	100	100	
31	100	S	S	100	S	E	S	145	130	130	C	C	105	105	140	110	160	130	125	120	110	110	105	105	
No.	14	12	14	12	8	5	6	19	27	30	27	26	25	26	24	27	30	28	27	24	21	19	19	16	
Median	100	100	100	100	100	100	100	140	120	120	110	110	110	105	110	120	110	110	110	105	105	105	100	100	
U. Q.																									
L. Q.																									
Q. R.																									

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

The Radio Research Laboratories, Japan

f<sub>o</sub>F<sub>2</sub>

Y 11

Lat. 31° 12.1'N  
Long. 130° 37.1'E

Yamagawa

IONOSPHERIC DATA

135° E Mean Time (G. M. T. +9h)

Types of Es

Oct. 1964

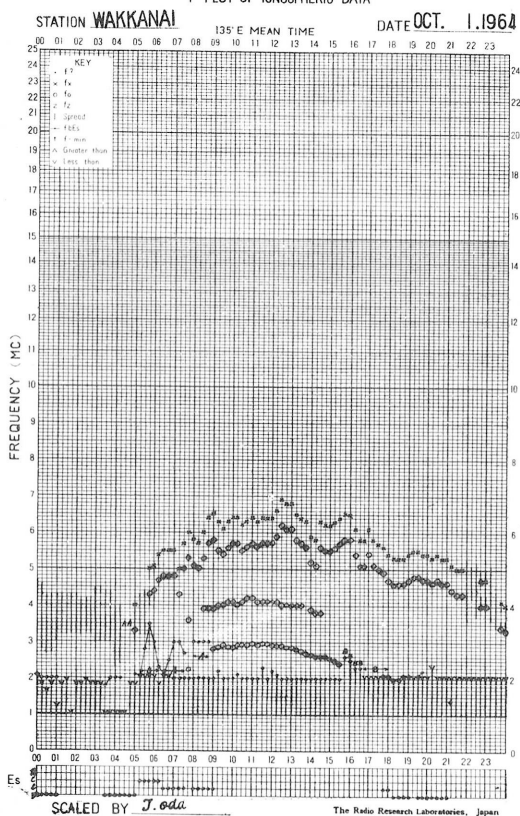
Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1					f	f		c	e2	13	12	12	12	12	h	12	12	14	14	f2	f2	f2	f	f	
2	f2		f					12	12	1	1	1	1		h	h	b2	e3	e2	f2		f	f	f	
3								h	h1	h						h1	b3	h3	e7	f2	f2	f	f	f	
4	f		f		f			e3	14	1	12	12	1	12	h1	b21	b212	h31	e21	f2	f2	f2	f2	f2	
5	f	f2	f2	f2	f	f		h	b2	h	e1	e1	e1	e21	c1	c1	12	12		f2	f2	f2	f2	f2	
6	f	f	f	f				h	b212	h12	13h	h1	12	e	1	1	12	12	12	f	f2	f	f2	f2	
7	f	f	f2	f				b21	h	1	1	h1	12	1	1	12	12h	12	12	f2	f2	f2	f2	f2	
8	f	f	f2	f				h	h	1	1	h1	1	1	h12	h1	b31	h1	b2	f2f3	f4	f	f2	f	
9						f												c			f	f	f	f3	
10	f	f						b21	12	h12	1							12	12	1	f	f2	f2	f2	
11	f	f	f					h	h	e2	e2	e2	1	12	1	1	12	12	1	f	f	f2	f2	f2	
12	f	f					12	13	13	12	12	1		12	12	h12	h12	c13	e212	f2	f	f2	f	f	
13	f2	f3	f2	f	f	f2	12		1	e	e2	e2	e2	e	h	h	b2	b412	e3	f2	f2	f3	f2	f3	
14	f2	f2	f2	f4	f2	f2	1	b2	1	1	1	12	c1	h1	12	h	c12	c12	e1	f4	f2	f	f3	f4	
15	f	f	f2	f	f	f	1		h	b2	h1	h1	h1	c12	c1	c1	12	1	12	f2f2	f	f	f3	f	
16	f	f	f					h	h	h2	h	h	e2	e	c	c	e2	e2	e2	f	f	f2	f2	f4	
17								h	h12	1	1	1	h1	h1	12	h1	1	h	b2	f	f2	f2	f2	f4	
18	f4	f2	f	f	f			h	12	h	h	1	1	1	1	1	1	1	1	f	f	f3	f	f	
19						f	1	h1	1	1	1	1	1	1	1	h12	13	12	1	f	f	f3	f	f	
20							1	b21	12	e1	e	c	1	1	1	c1	1	1	1	f	f	f3	f	f	
21					f	f			h	h2	h	h1	h1	12	1		h	h	b2	f4	f2	f2	f2	f	
22				f		f2		h	h	e	12	1	12	1	h12	h	b2	b3	h3	f6	f2	f2	f2	f2	
23	f	f2	f	f	f	1	e3	e2	e2	e	12	12	12	12	h	12	1	e1	1	f2	f	f2	f	f2	
24	f	f	f	f2	f	f	h	12	1	h1	h1	12	c	h	h	h	e2	e2	e2	f3	f5	f	f	f	
25	f	f					h	h3	h3	h	h	h	h	h	h	o	1			f2	f	f	f	f	
26				f			b5	b2	h	h	h	e1	e12	12	12	1	c	12	1	f2					
27			f				h3	h	h	b2	e2	e2	1	h	c1	e1	e3	e2	13	f2	f2	f2	f	f	
28	f	f	f2	f	f	f	1	1	1	1	1	1	1	1	12	12	12	12	1	f					
29							h	h	h	h	1	e	e	h	h	h2	e2	e2	e2	f	f2	f2	f4	f2	
30		f2	f	f2	f	f	e2	e31	e2	e2	e2	e2	e2	e	e2	e2	12	13	13	f2	f3	f2	f2	f2	
31	f			f2			h	h	h13	h1			1	1	h1	12	h12	h3	b2	f2	f2	f2	f2	f	
No.																									
Median																									
U. Q.																									
L. Q.																									
Q. R.																									

The Radio Research Laboratories, Japan

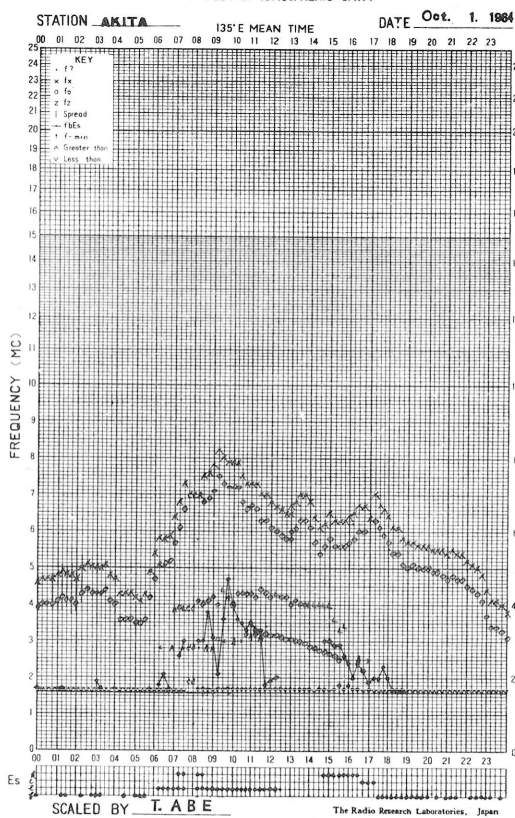
Sweep 0.55 Mc to 17.0 Mc in 20 sec in automatic operation

Types of Es

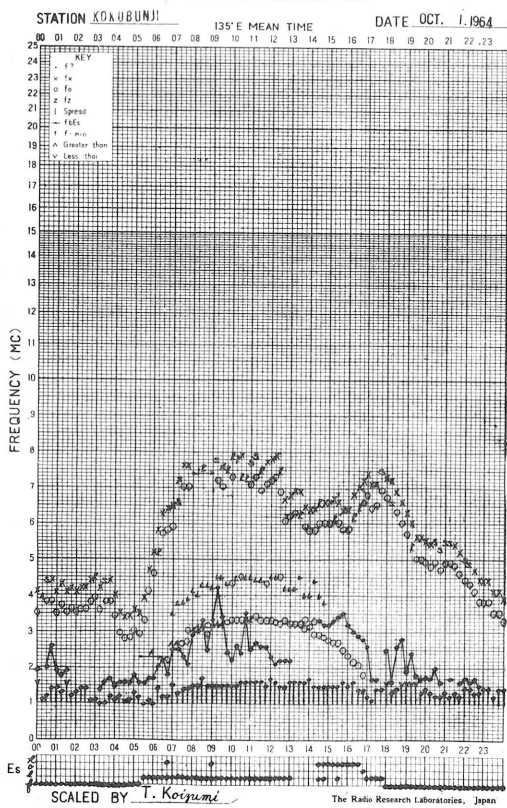
f-PLOT OF IONOSPHERIC DATA



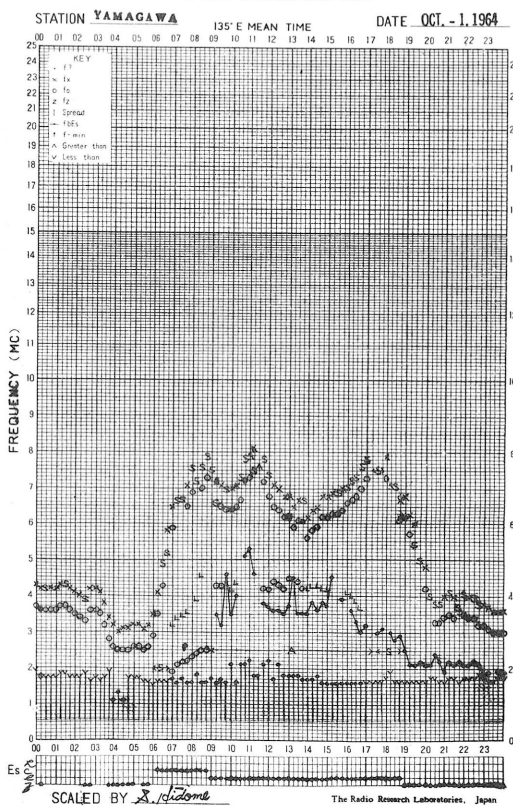
f-PLOT OF IONOSPHERIC DATA



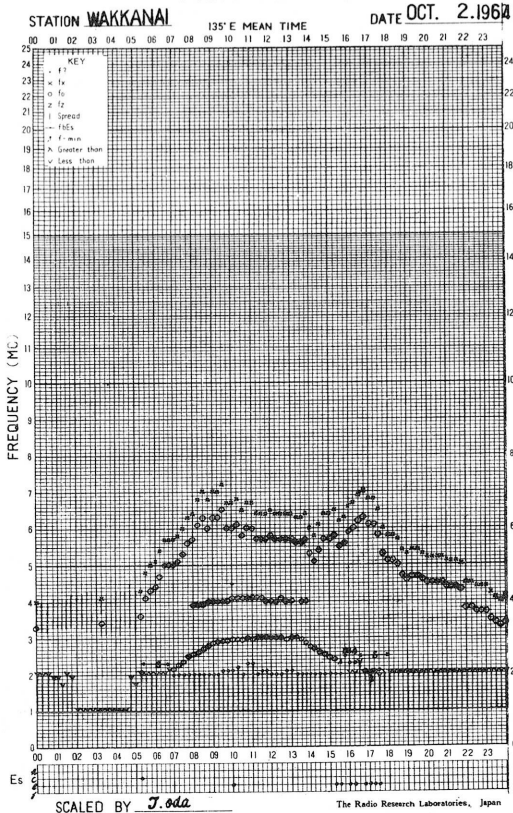
f-PLOT OF IONOSPHERIC DATA



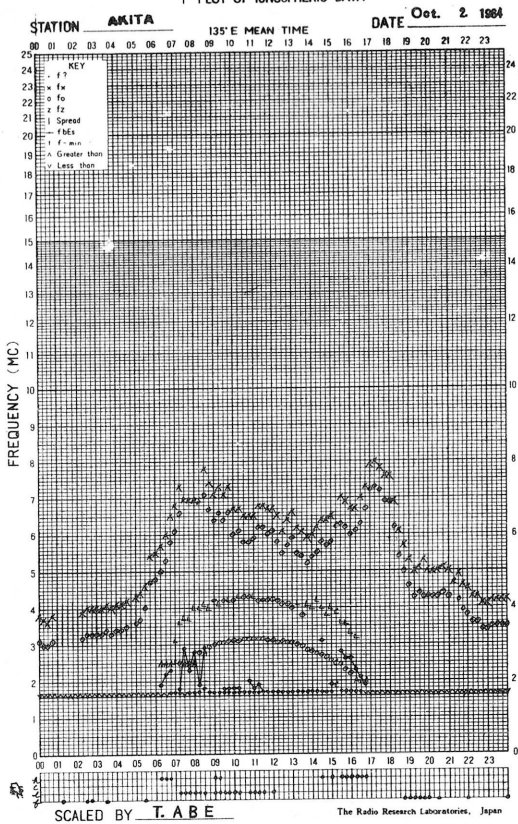
f-PLOT OF IONOSPHERIC DATA



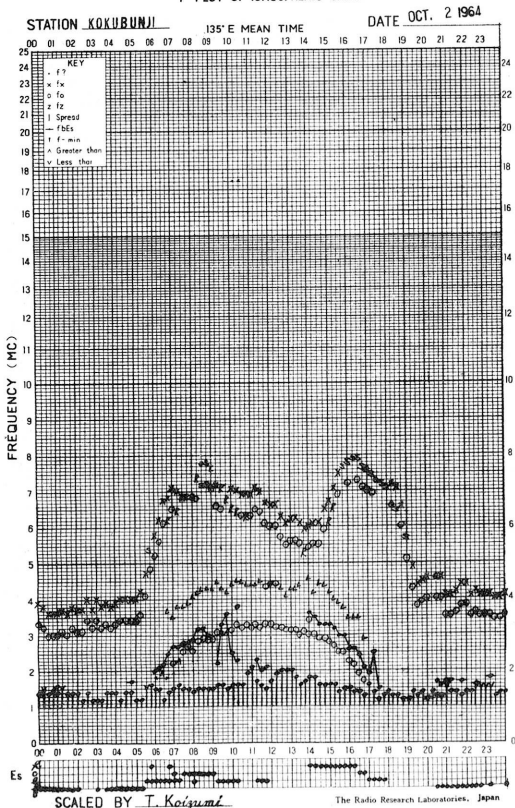
f-PLOT OF IONOSPHERIC DATA



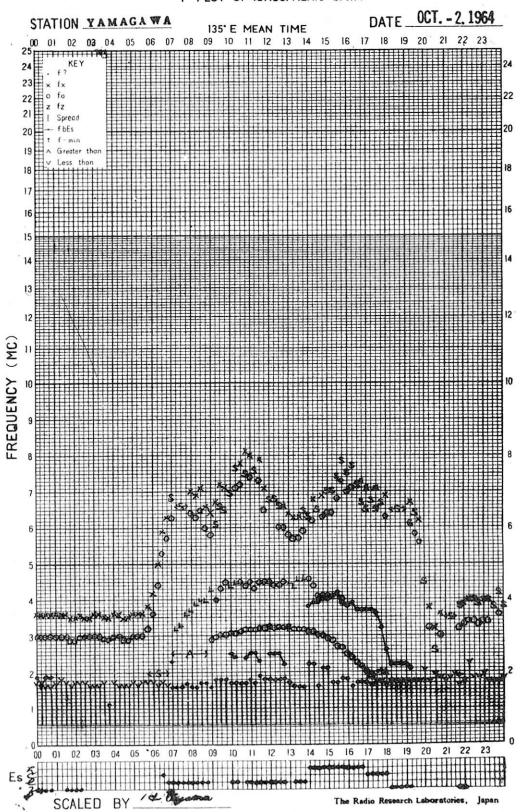
f-PLOT OF IONOSPHERIC DATA



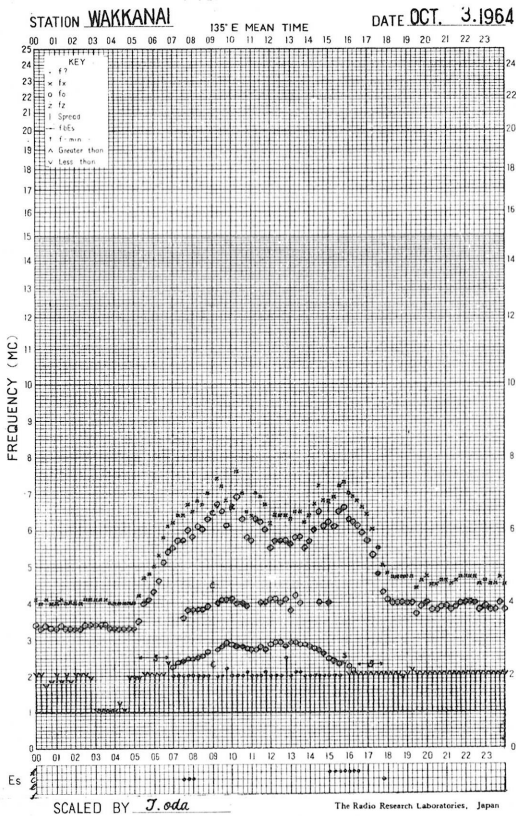
f-PLOT OF IONOSPHERIC DATA



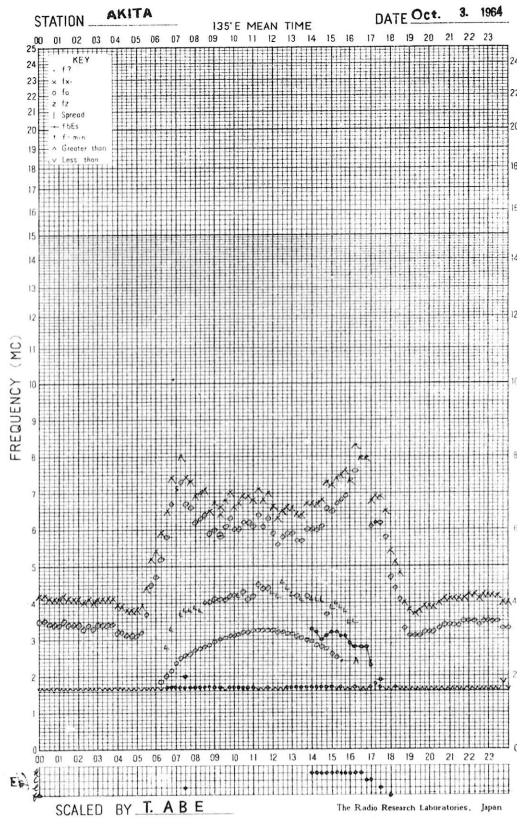
f-PLOT OF IONOSPHERIC DATA



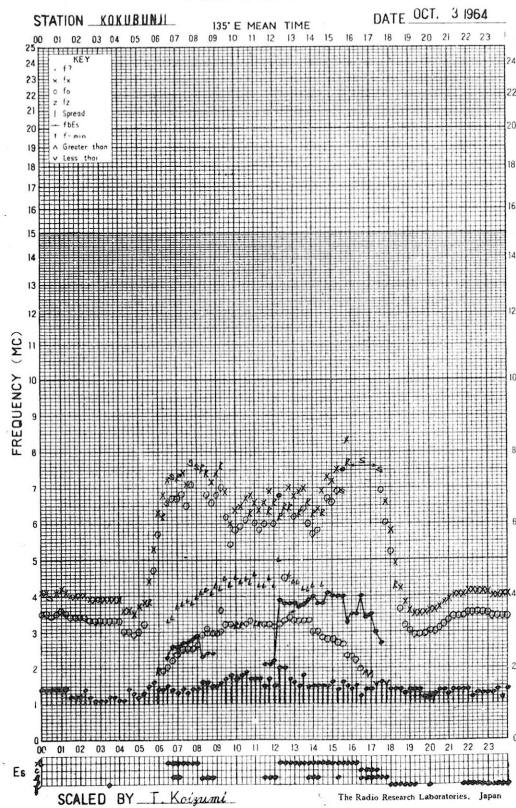
f-PLOT OF IONOSPHERIC DATA



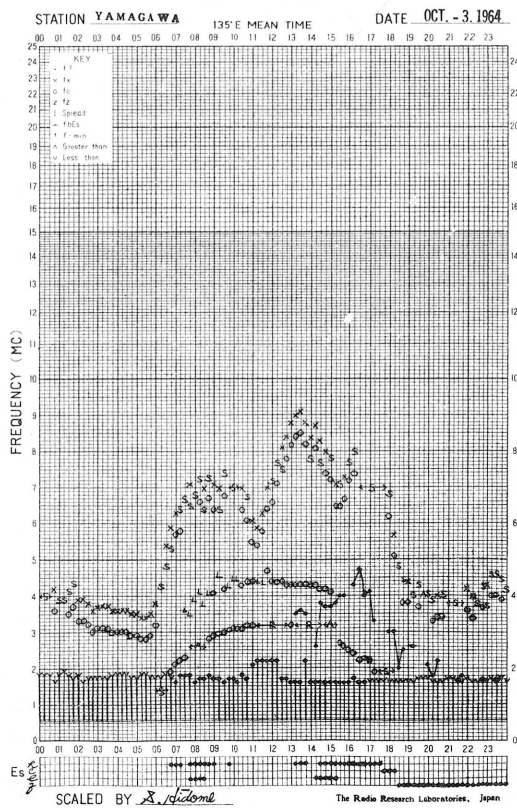
f-PLOT OF IONOSPHERIC DATA



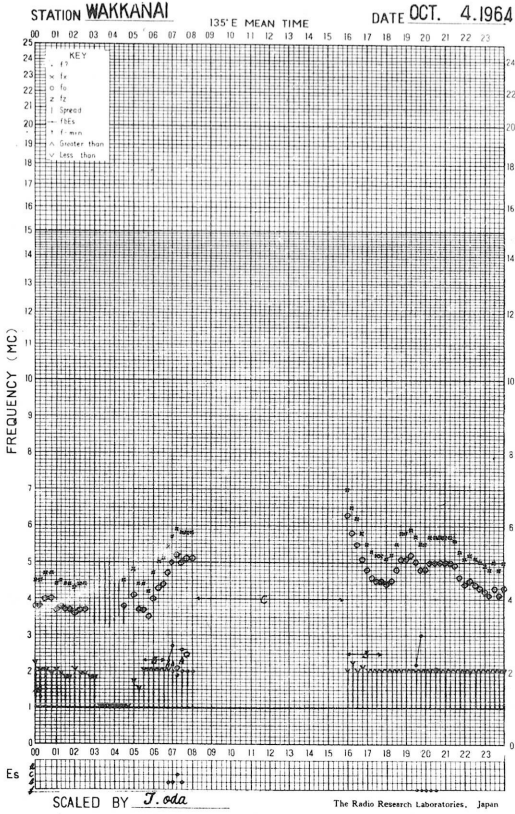
f-PLOT OF IONOSPHERIC DATA



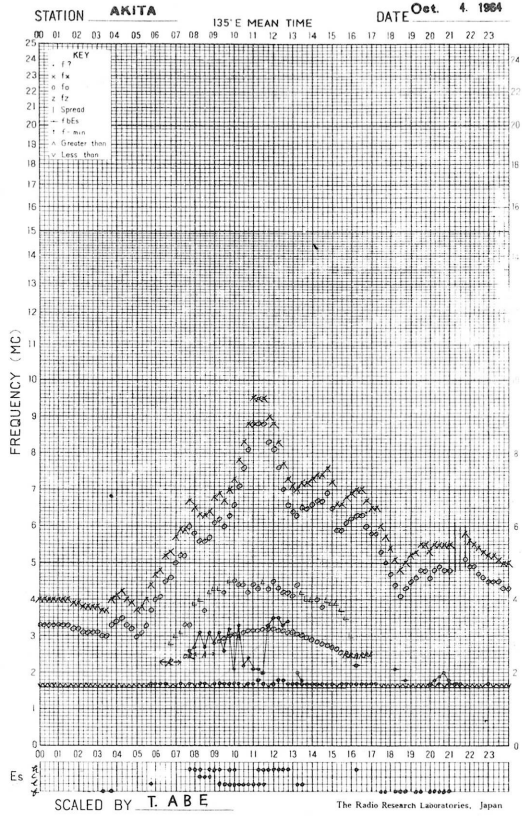
f-PLOT OF IONOSPHERIC DATA



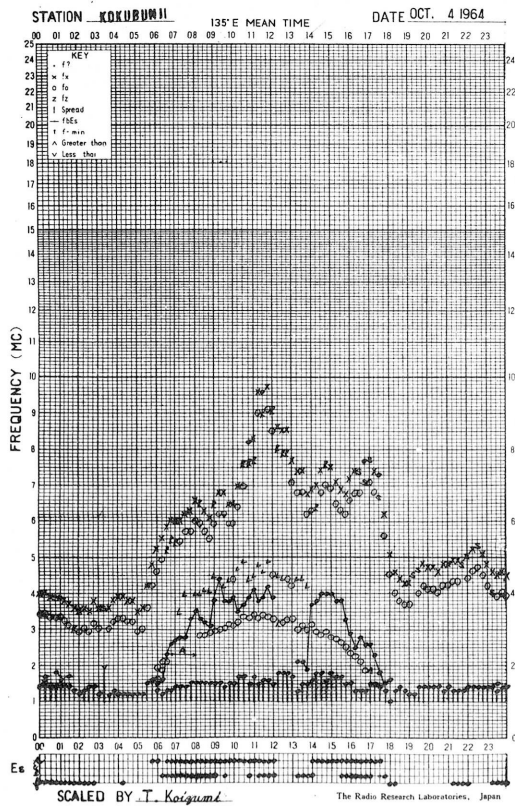
f-PLOT OF IONOSPHERIC DATA



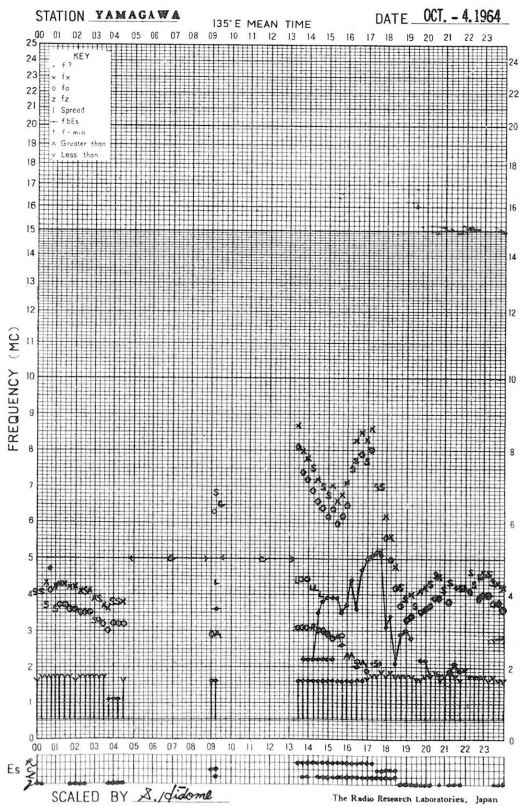
f-PLOT OF IONOSPHERIC DATA



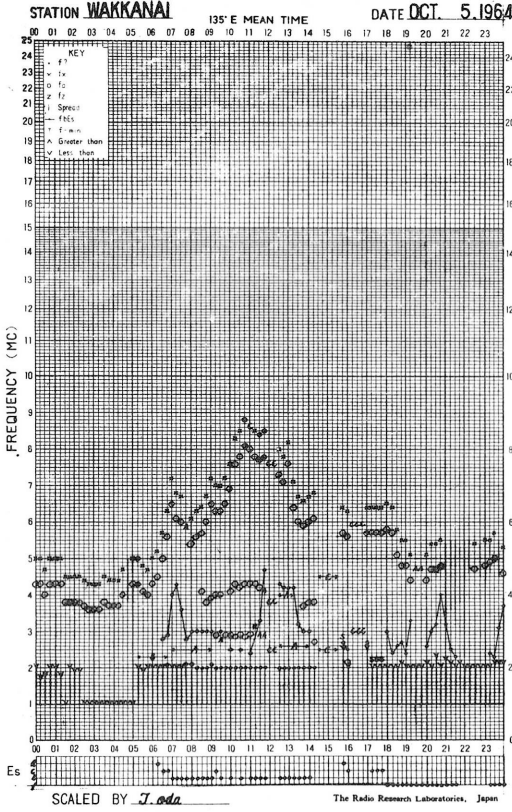
f-PLOT OF IONOSPHERIC DATA



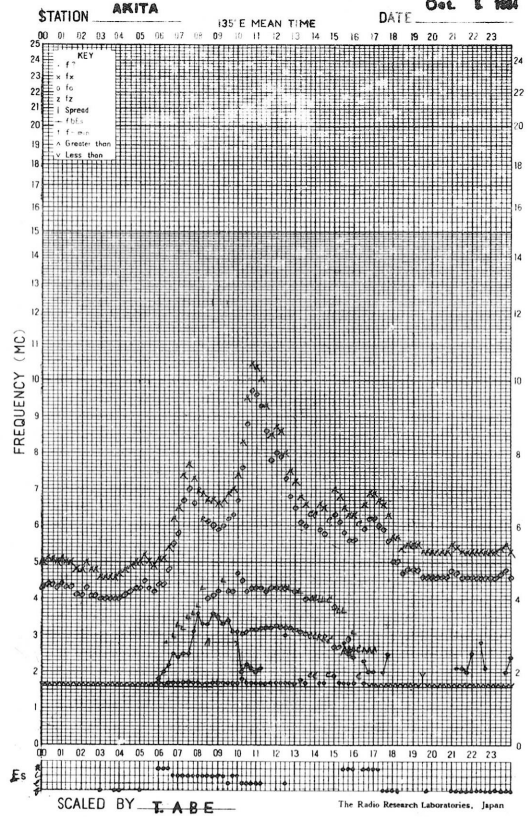
f-PLOT OF IONOSPHERIC DATA



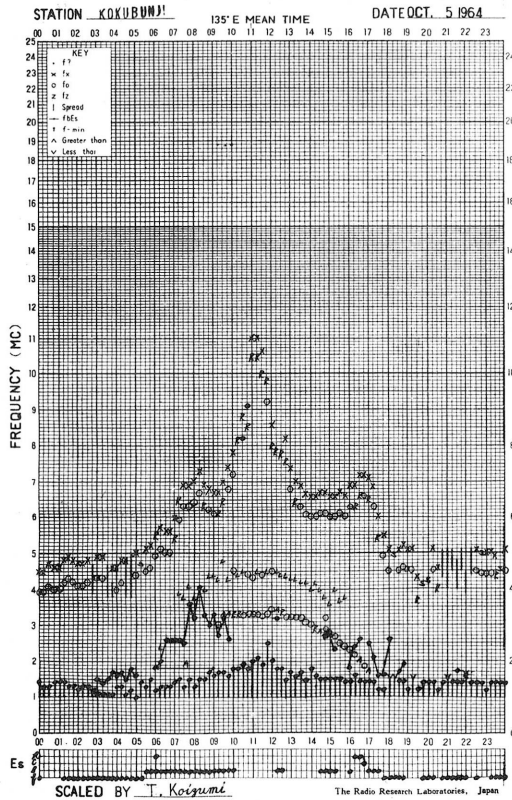
f-PLOT OF IONOSPHERIC DATA



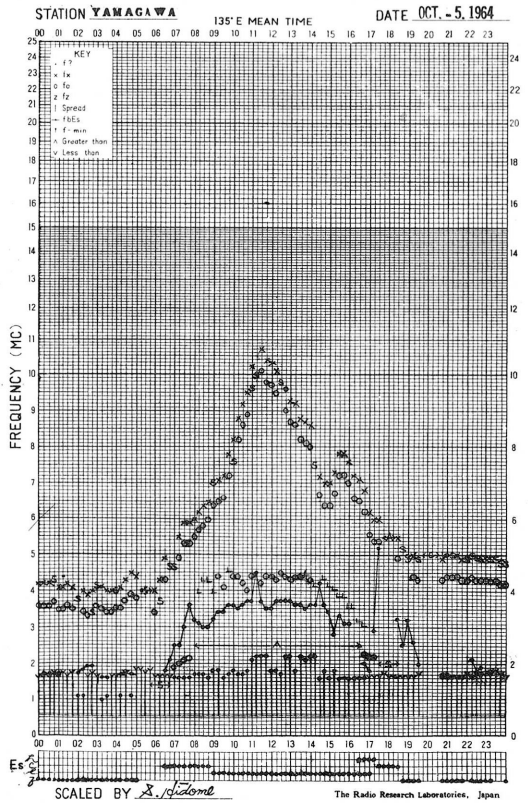
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

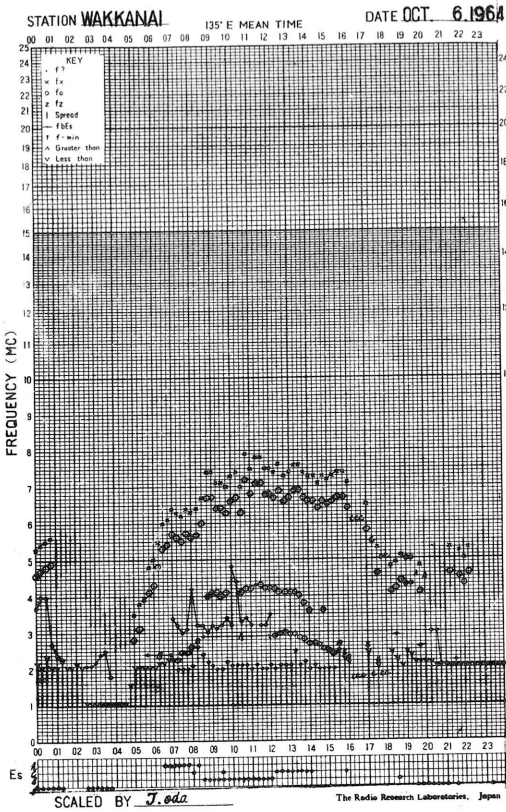


f-PLOT OF IONOSPHERIC DATA

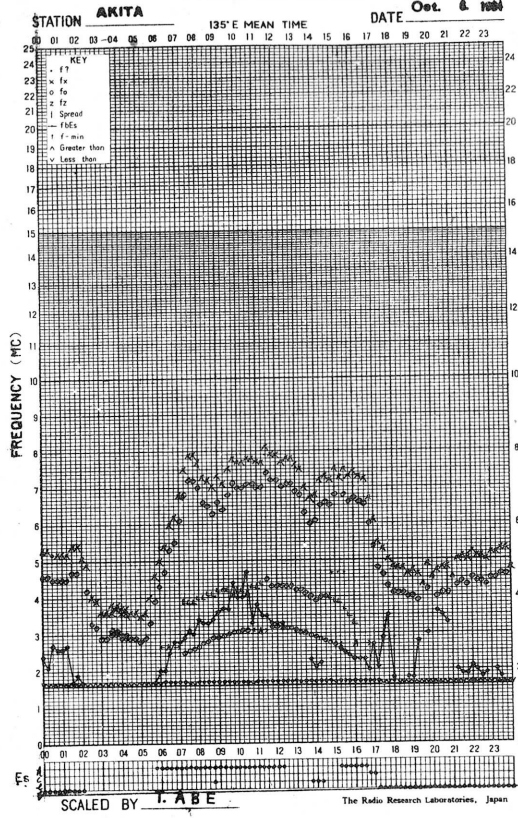




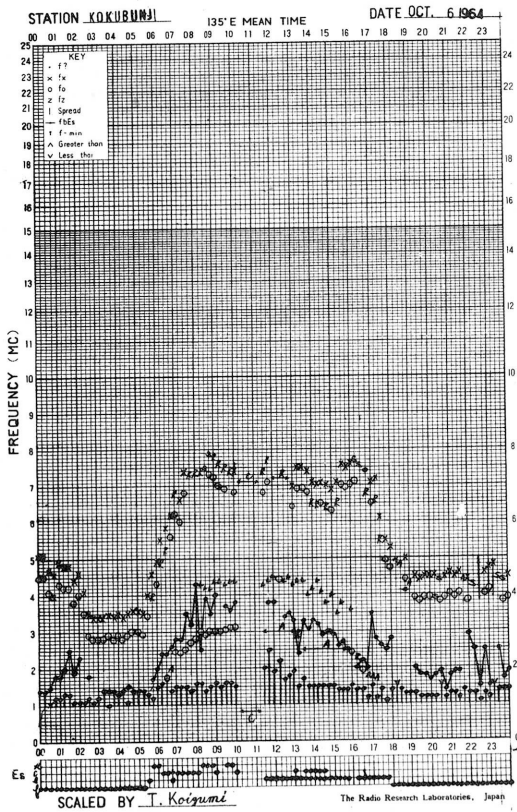
f-PLOT OF IONOSPHERIC DATA



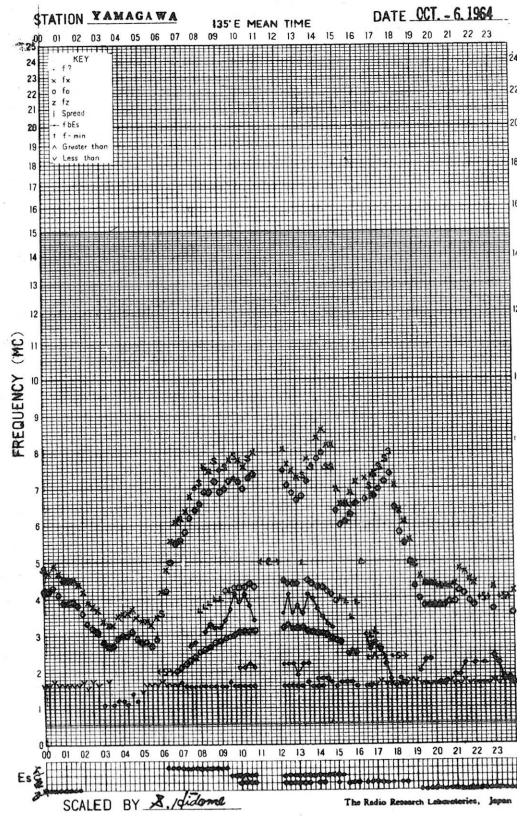
f-PLOT OF IONOSPHERIC DATA



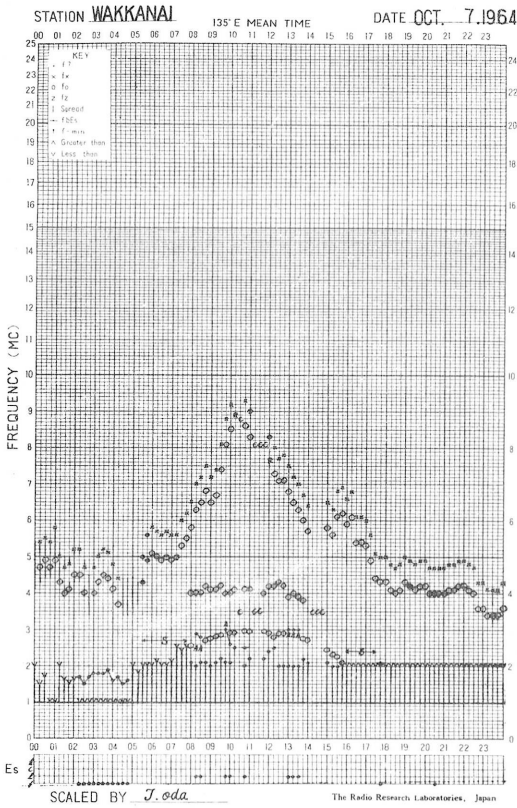
f-PLOT OF IONOSPHERIC DATA



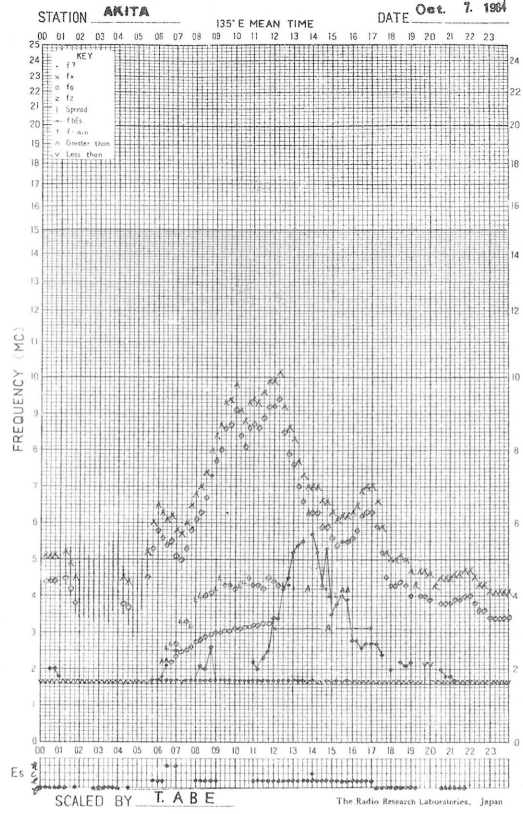
f-PLOT OF IONOSPHERIC DATA



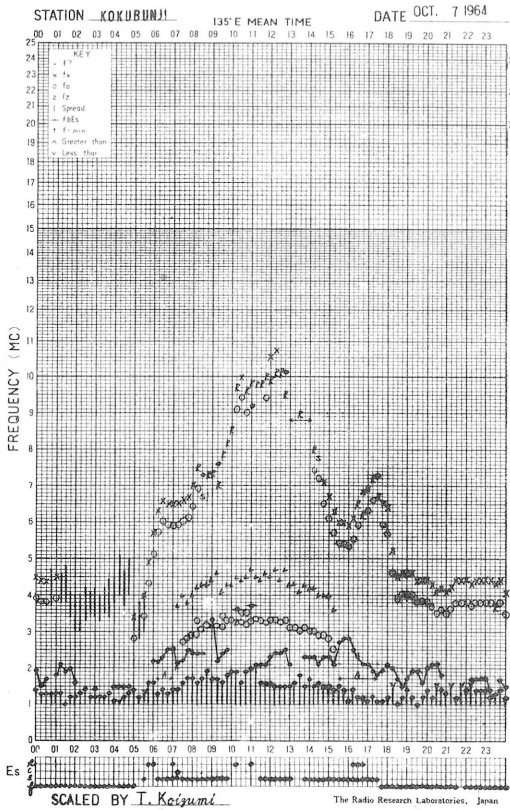
f-PLOT OF IONOSPHERIC DATA



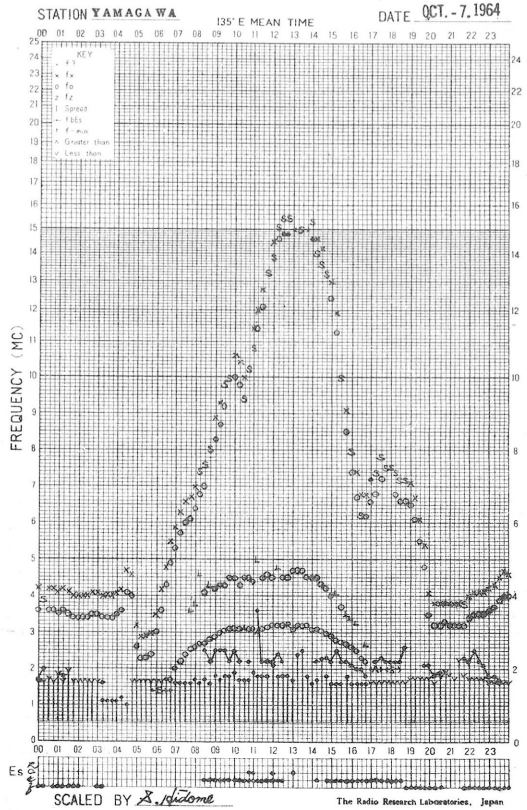
f-PLOT OF IONOSPHERIC DATA



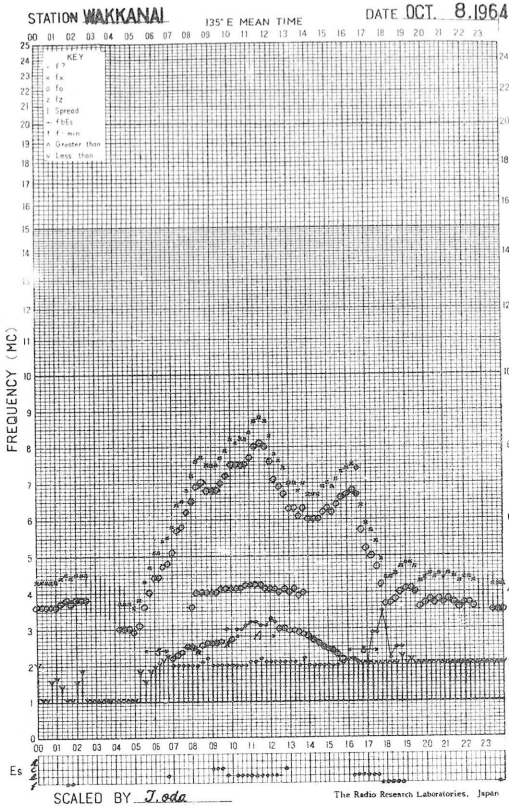
f-PLOT OF IONOSPHERIC DATA



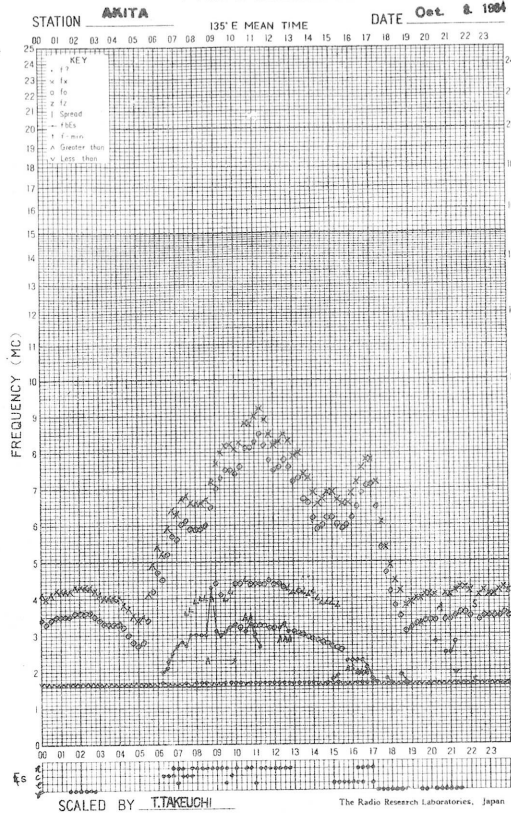
f-PLOT OF IONOSPHERIC DATA



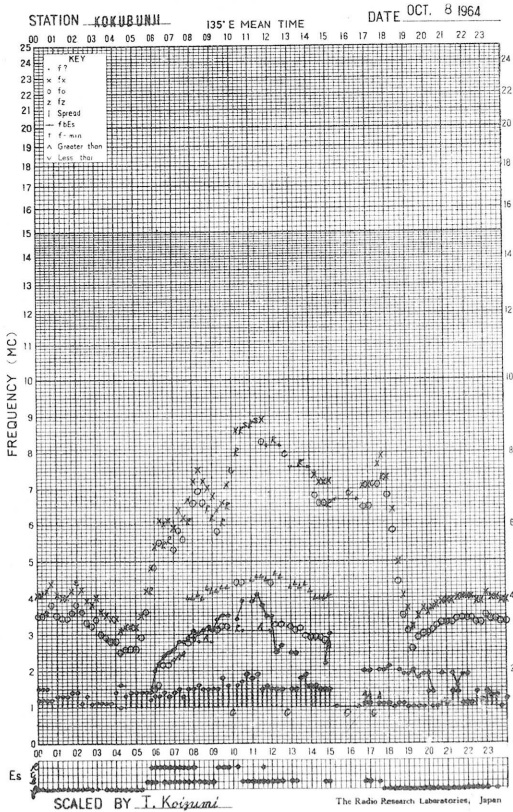
f- PLOT OF IONOSPHERIC DATA



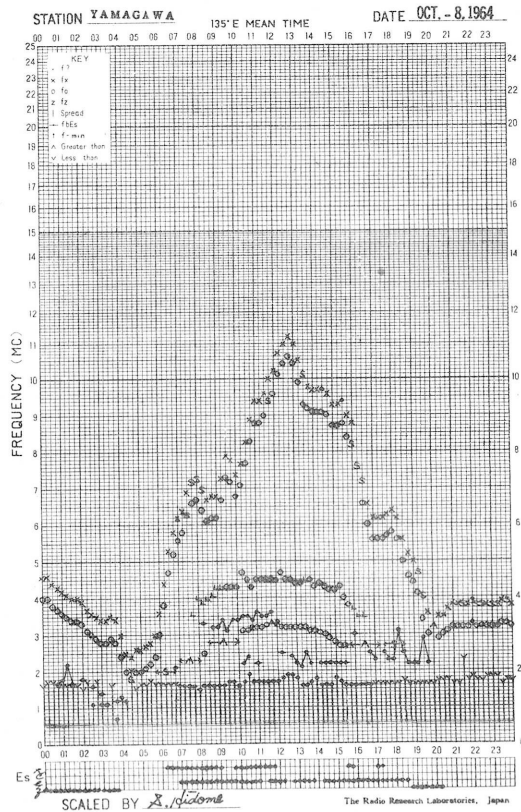
f- PLOT OF IONOSPHERIC DATA



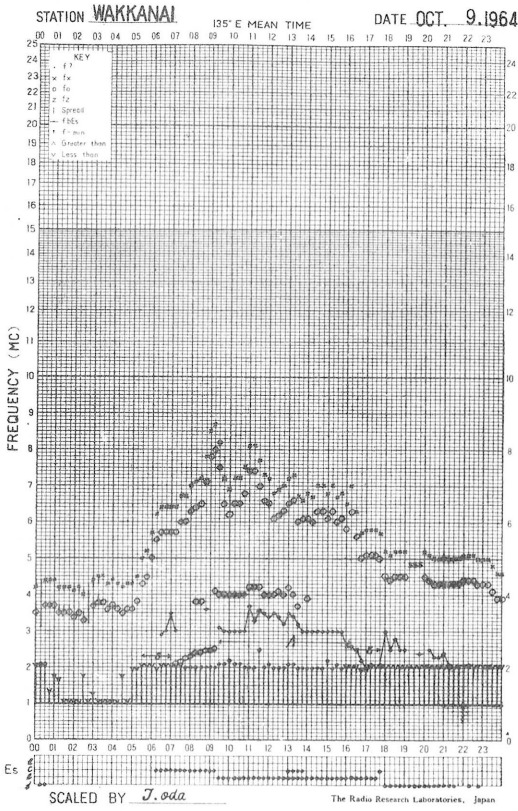
f- PLOT OF IONOSPHERIC DATA



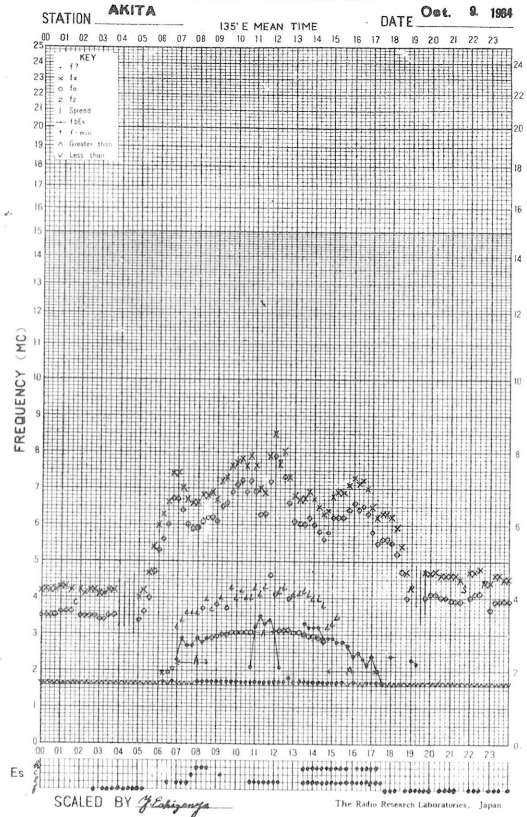
f- PLOT OF IONOSPHERIC DATA



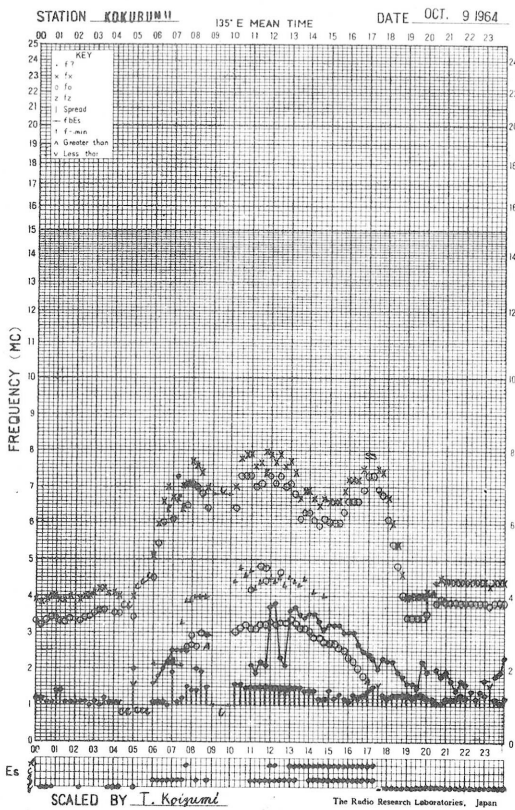
f-PLOT OF IONOSPHERIC DATA



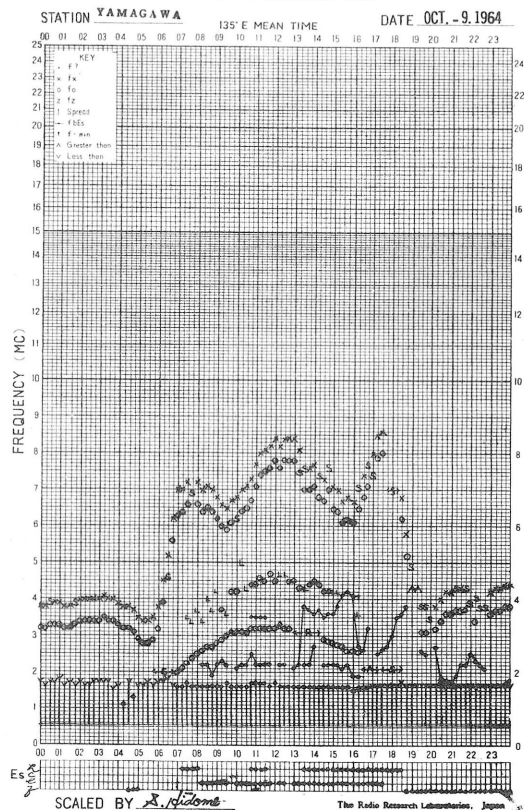
f-PLOT OF IONOSPHERIC DATA



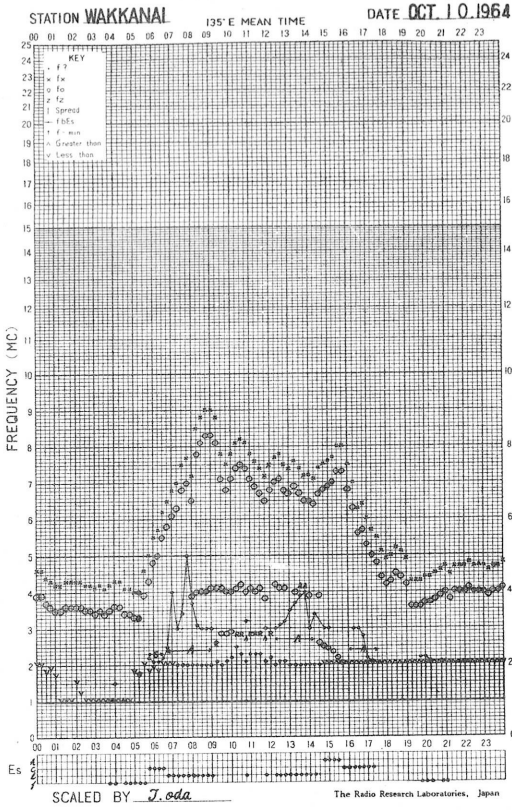
f-PLOT OF IONOSPHERIC DATA



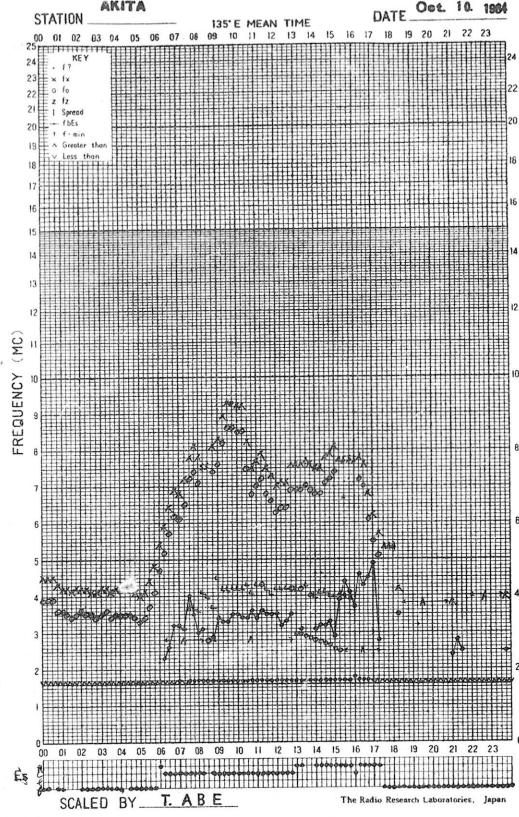
f-PLOT OF IONOSPHERIC DATA



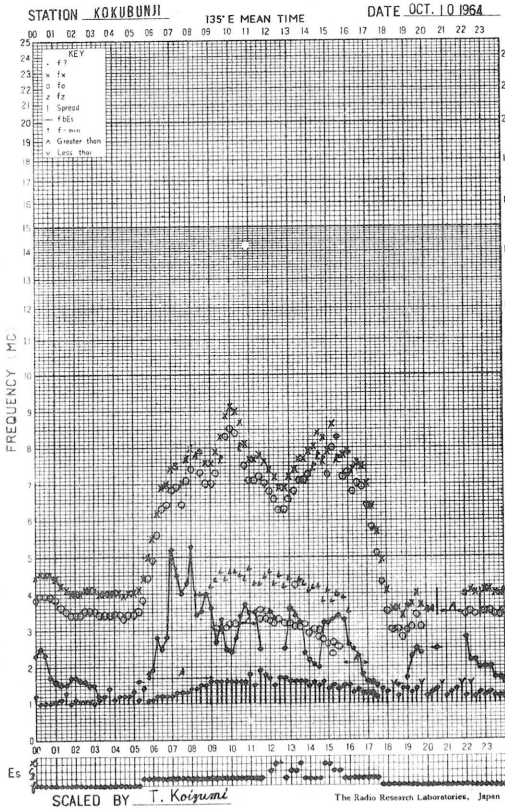
f-PLOT OF IONOSPHERIC DATA



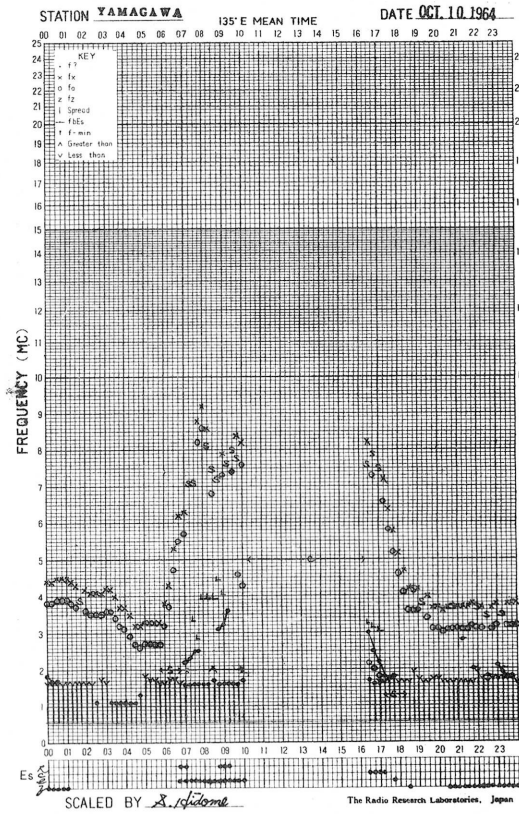
f-PLOT OF IONOSPHERIC DATA



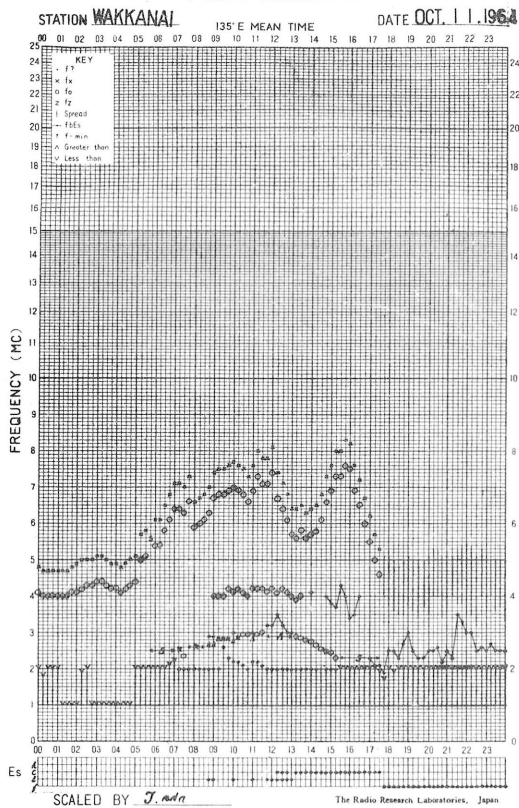
f-PLOT OF IONOSPHERIC DATA



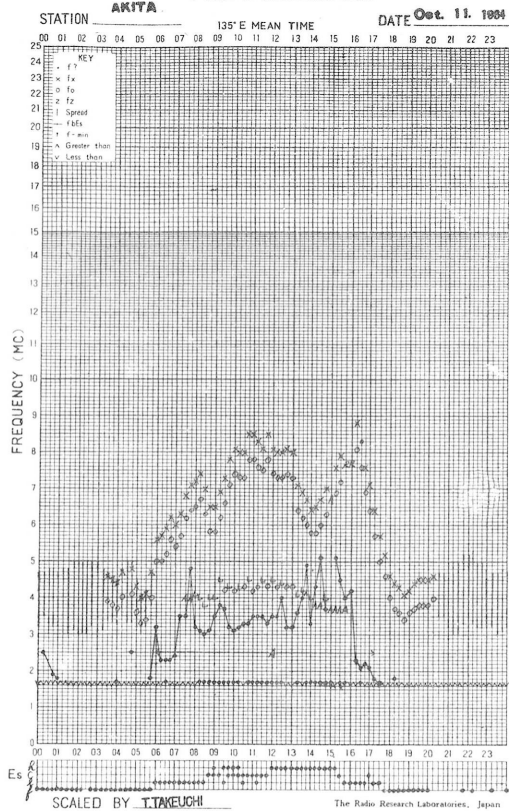
f-PLOT OF IONOSPHERIC DATA



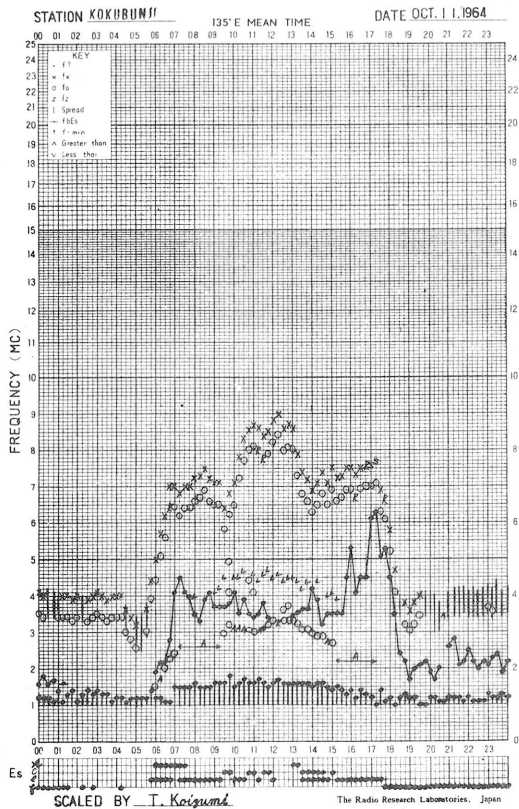
f-PLOT OF IONOSPHERIC DATA



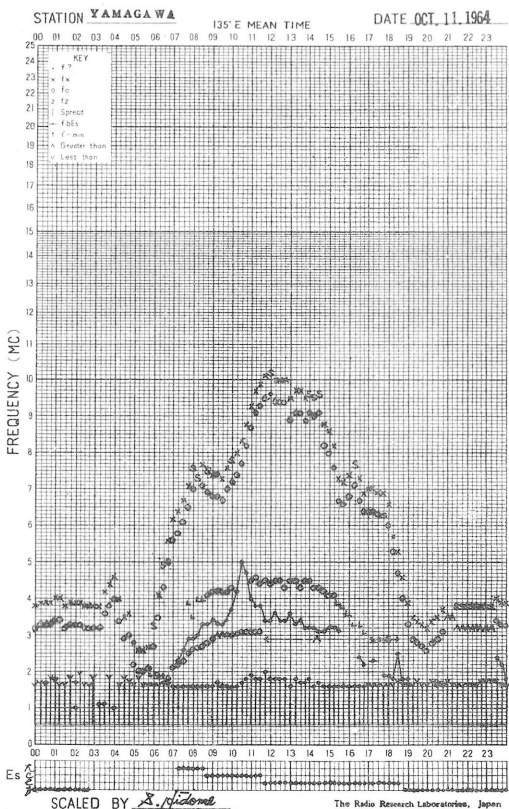
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

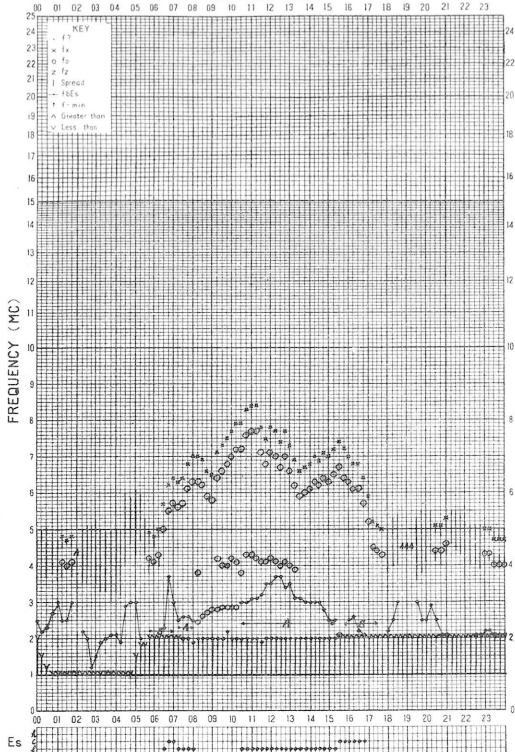


f-PLOT OF IONOSPHERIC DATA



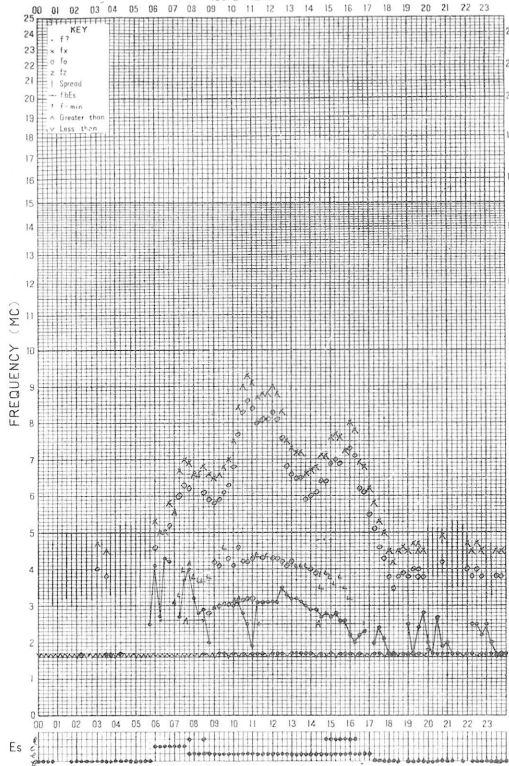
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE OCT. 12, 1964



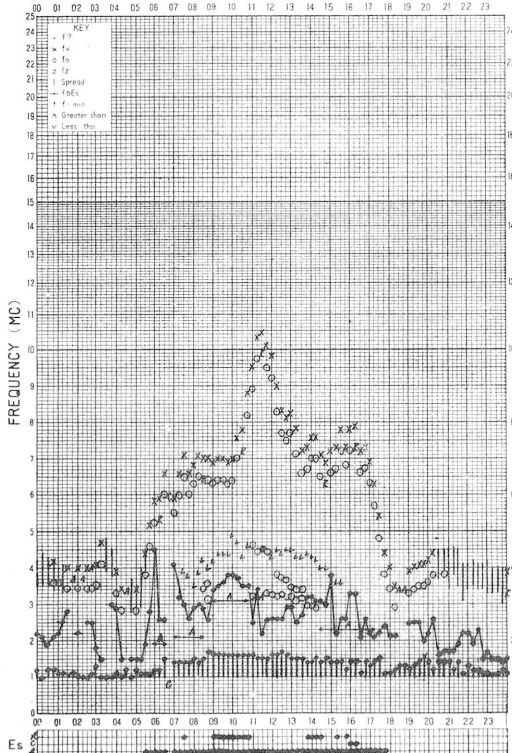
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Oct. 12, 1964



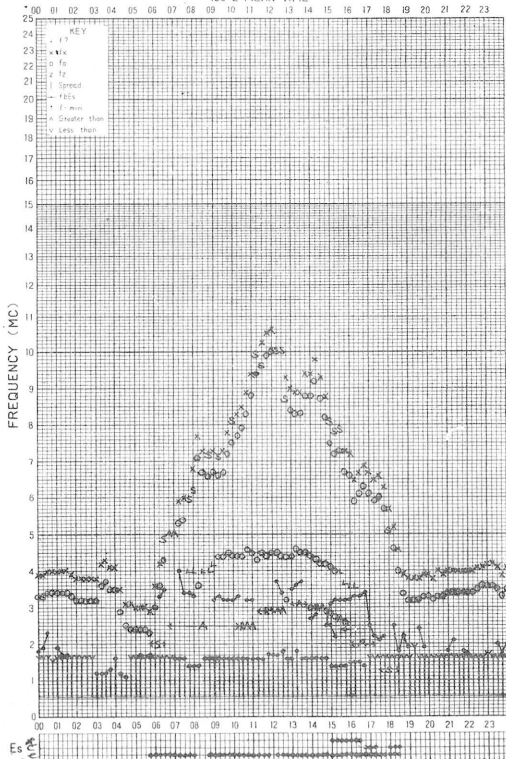
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE OCT. 12, 1964

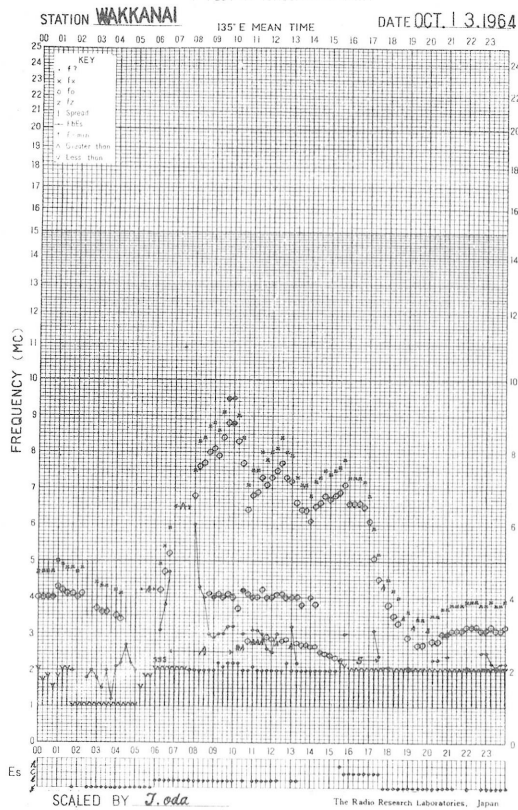


f-PLOT OF IONOSPHERIC DATA

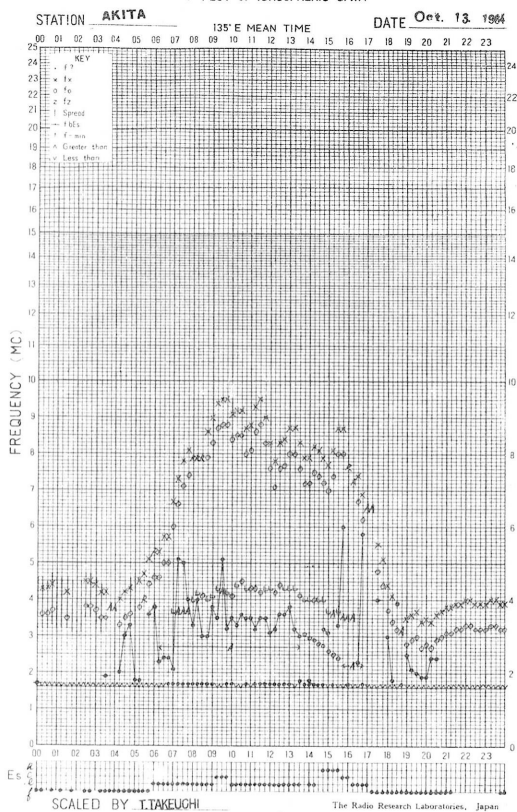
STATION YAMAGAWA 135°E MEAN TIME DATE OCT. 12, 1964



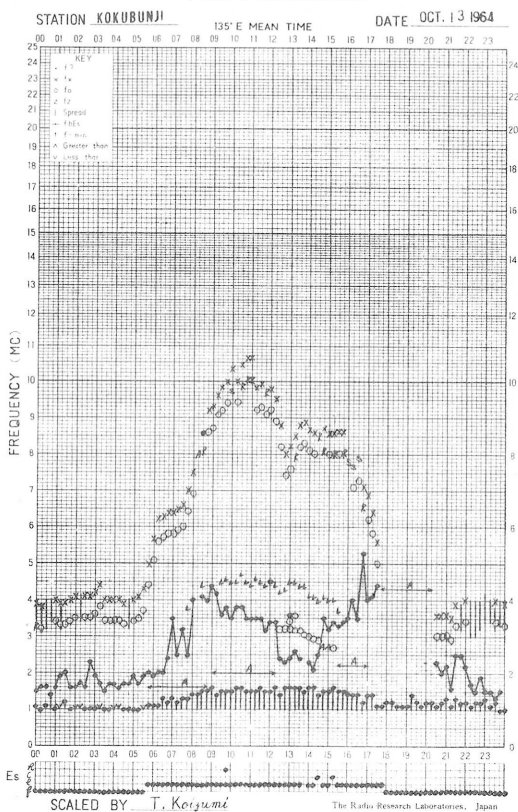
f- PLOT OF IONOSPHERIC DATA



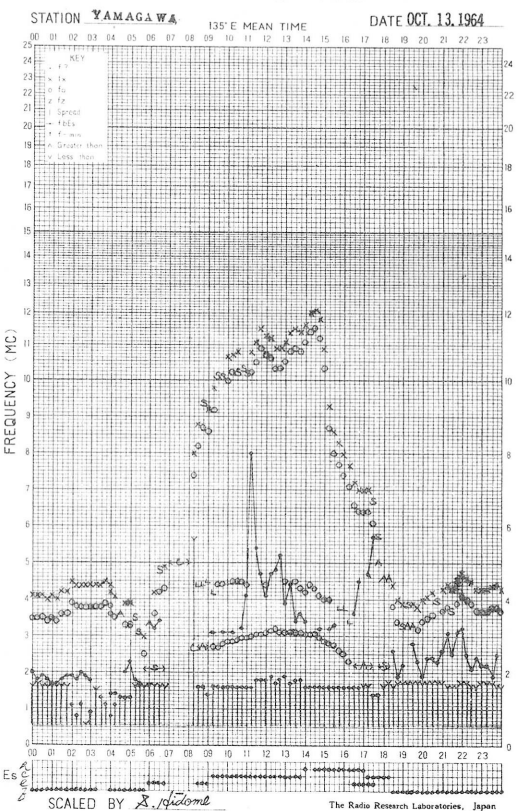
f- PLOT OF IONOSPHERIC DATA



f- PLOT OF IONOSPHERIC DATA

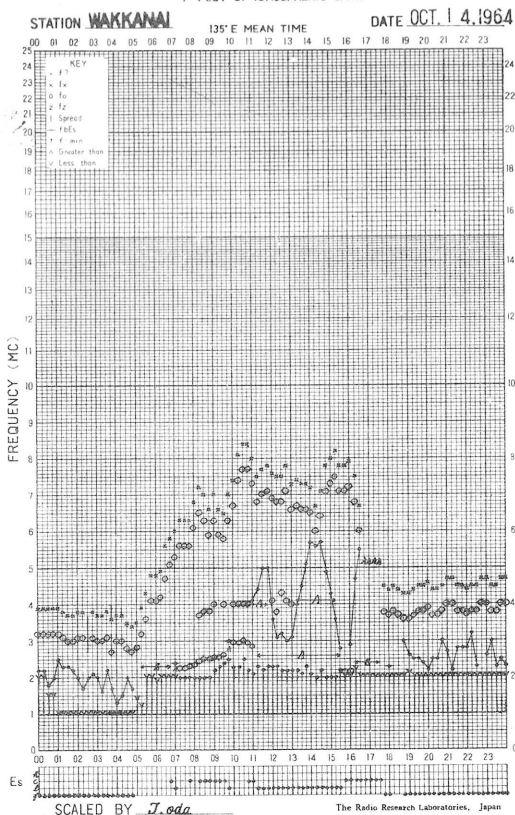


f- PLOT OF IONOSPHERIC DATA

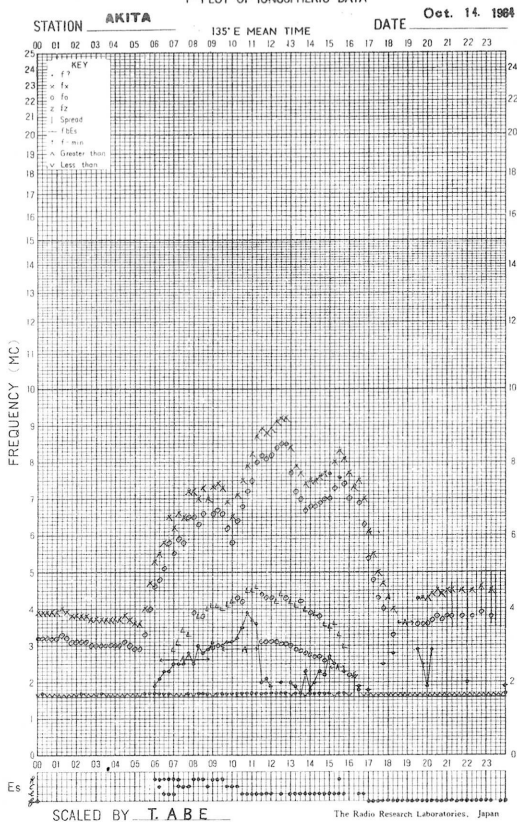




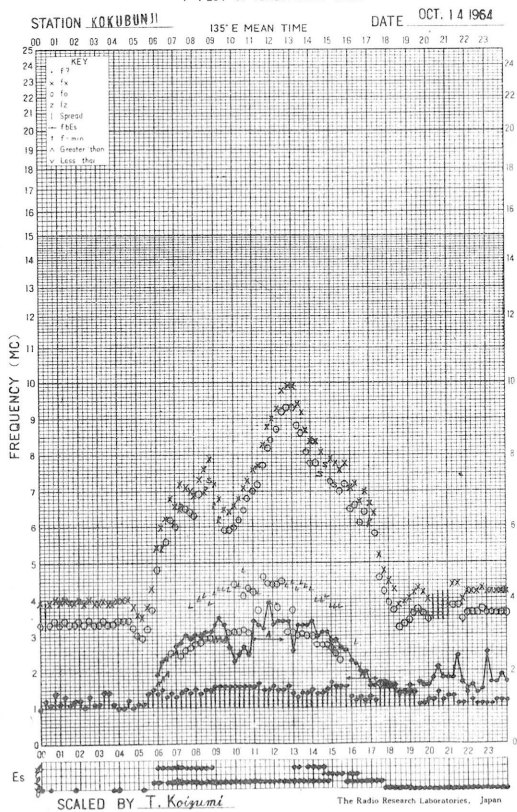
f-PLOT OF IONOSPHERIC DATA



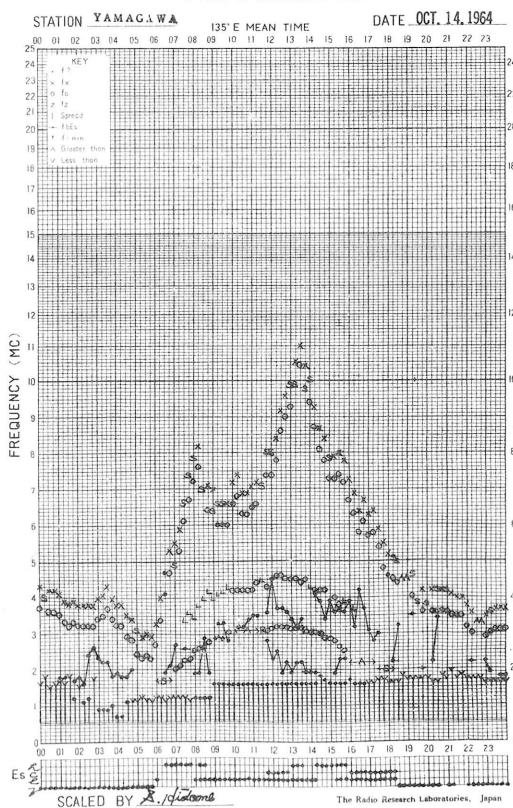
f-PLOT OF IONOSPHERIC DATA



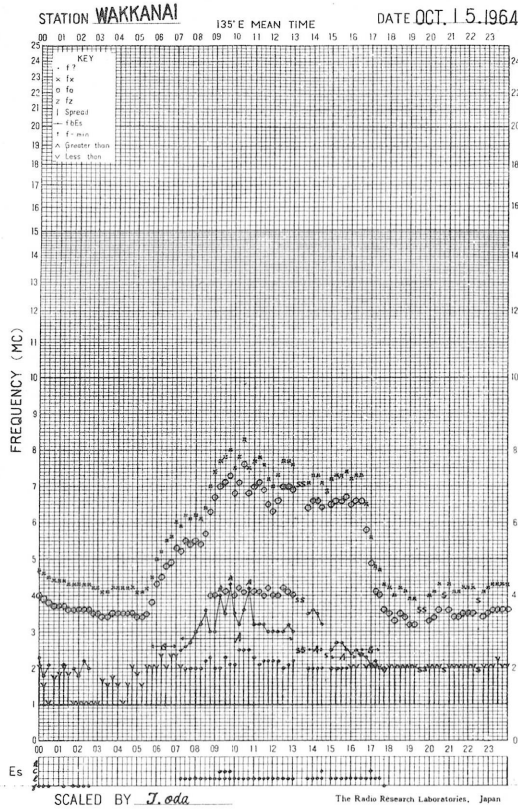
f-PLOT OF IONOSPHERIC DATA



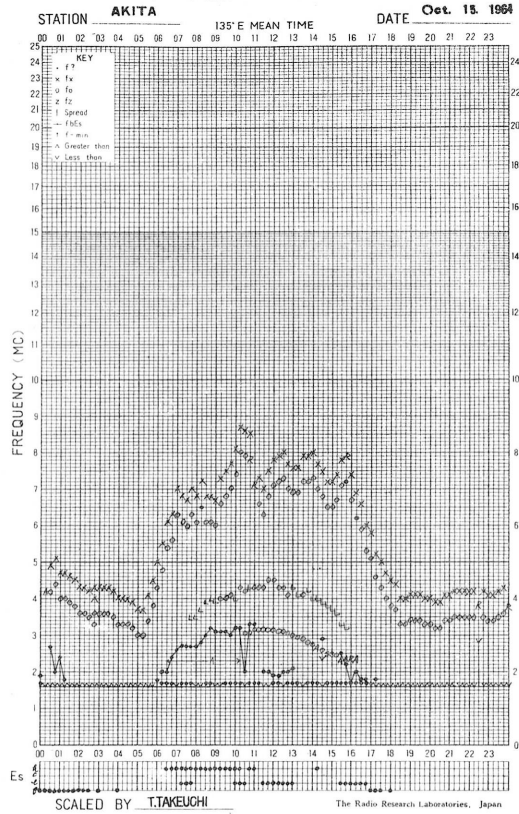
f-PLOT OF IONOSPHERIC DATA



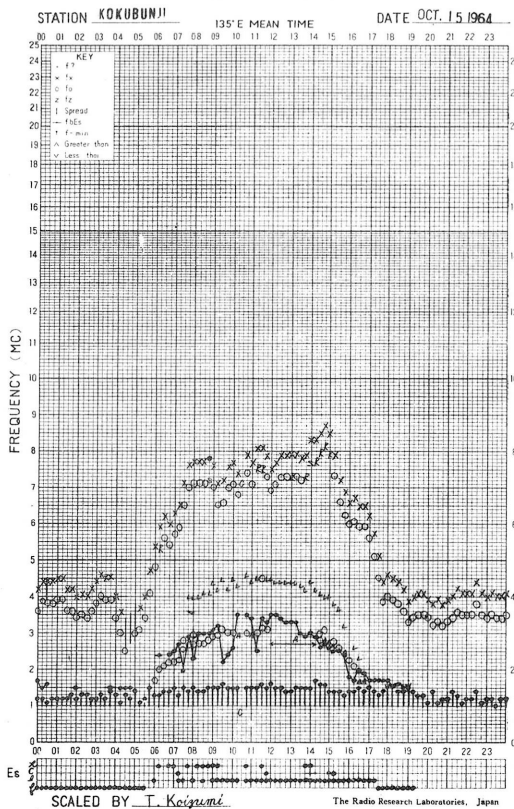
f-PLOT OF IONOSPHERIC DATA



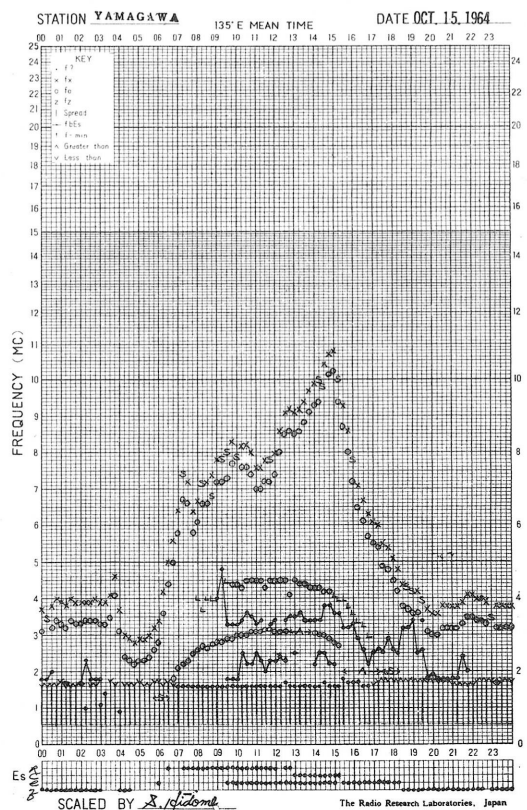
f-PLOT OF IONOSPHERIC DATA



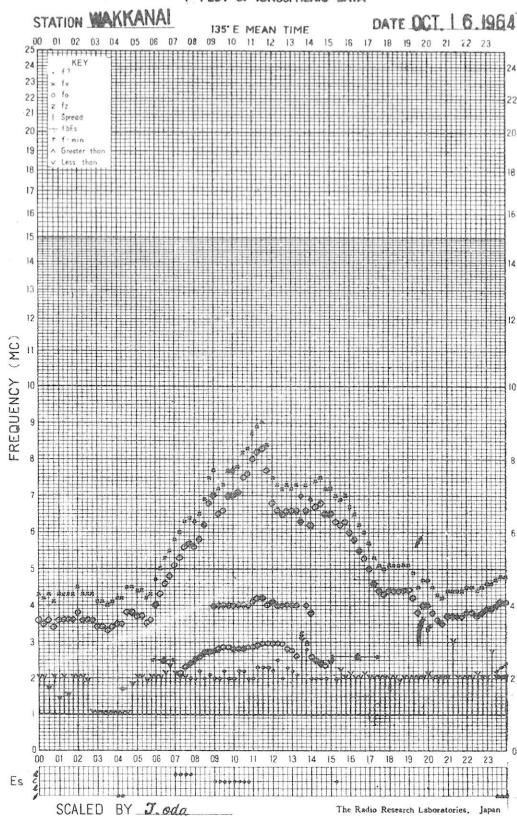
f-PLOT OF IONOSPHERIC DATA



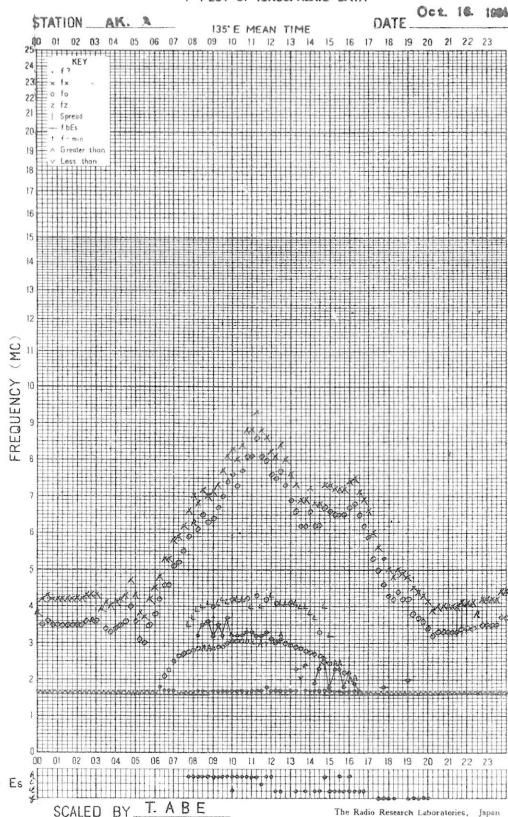
f-PLOT OF IONOSPHERIC DATA



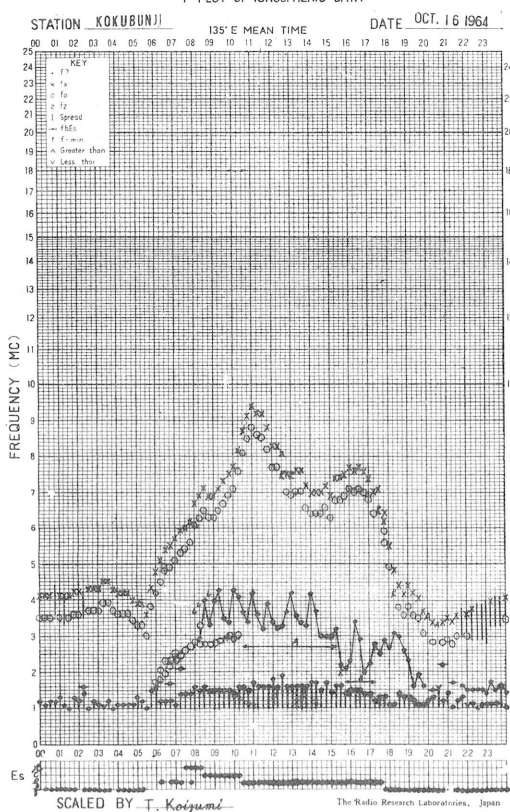
f-PLOT OF IONOSPHERIC DATA



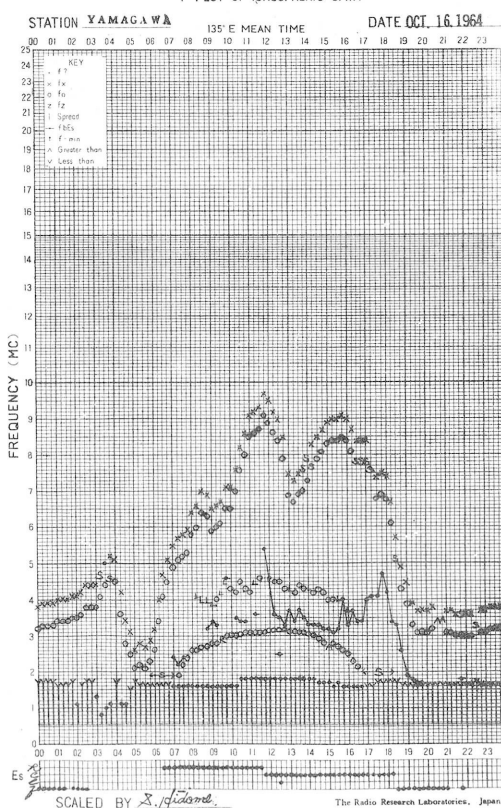
f-PLOT OF IONOSPHERIC DATA



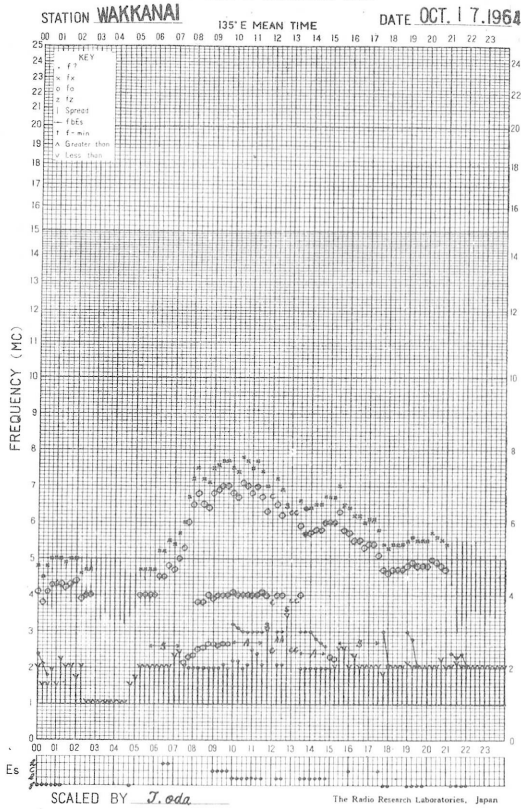
f-PLOT OF IONOSPHERIC DATA



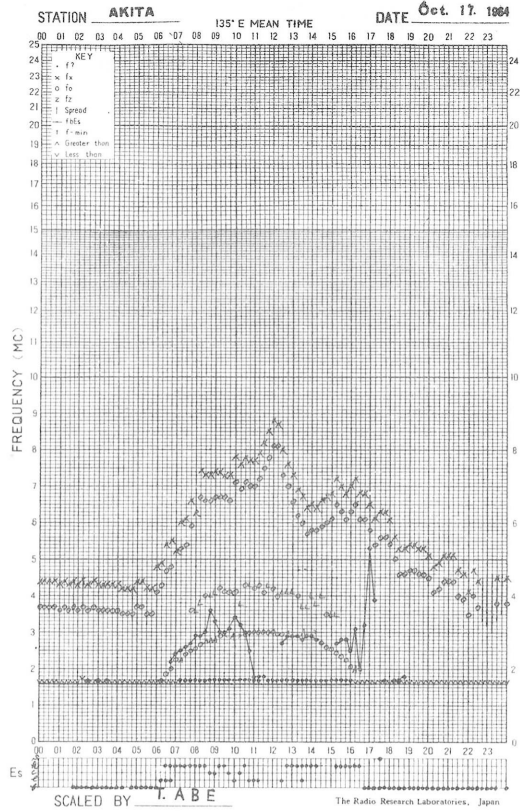
f-PLOT OF IONOSPHERIC DATA



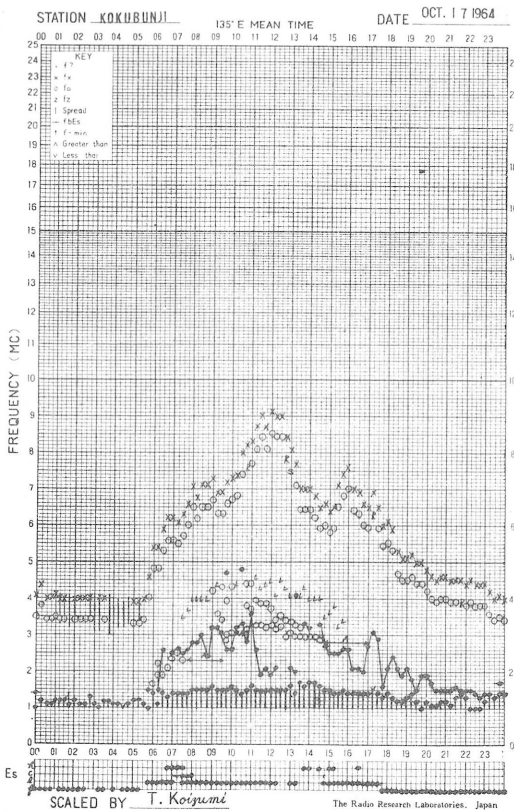
f-PLOT OF IONOSPHERIC DATA



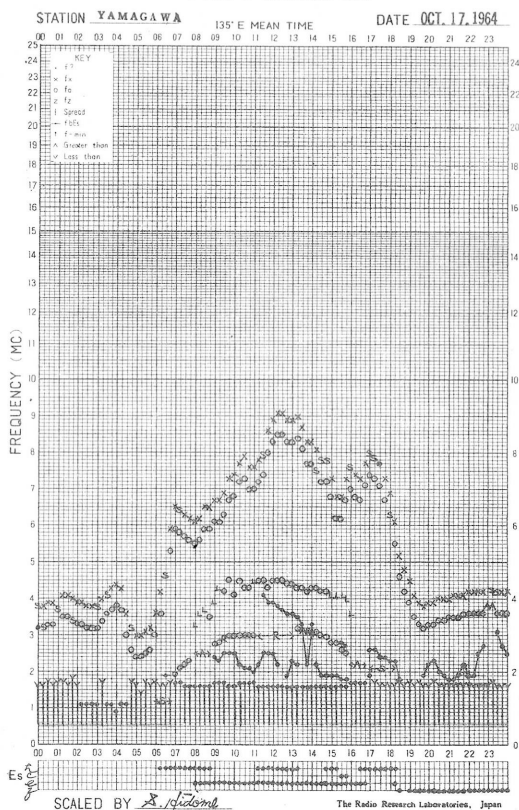
f-PLOT OF IONOSPHERIC DATA



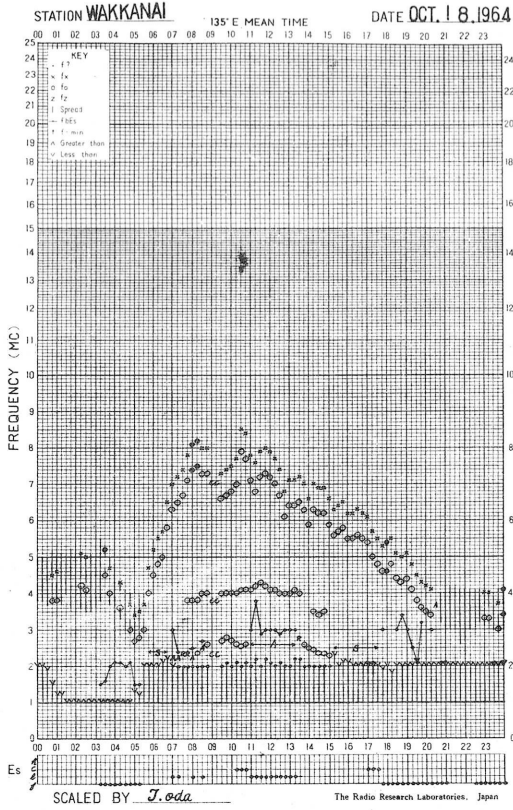
f-PLOT OF IONOSPHERIC DATA



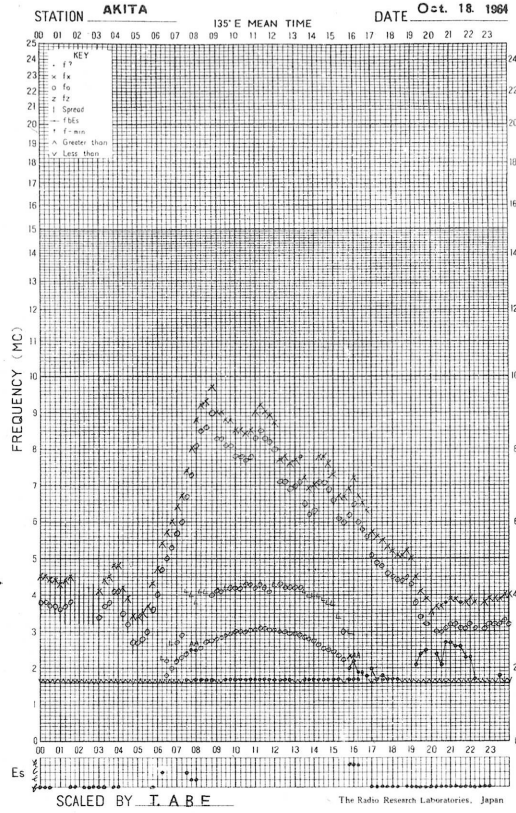
f-PLOT OF IONOSPHERIC DATA



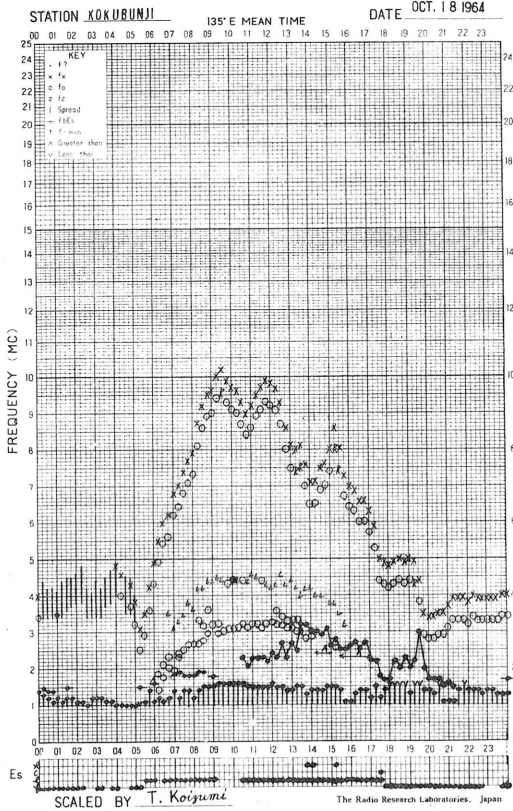
f-PLOT OF IONOSPHERIC DATA



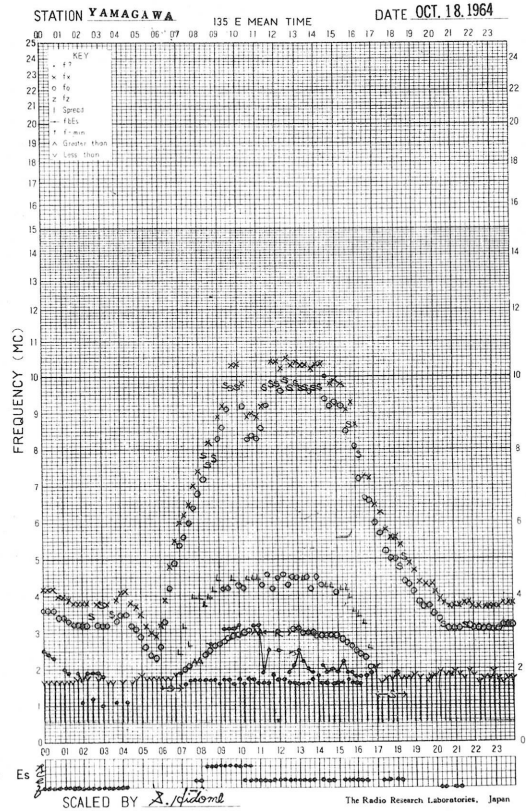
f-PLOT OF IONOSPHERIC DATA



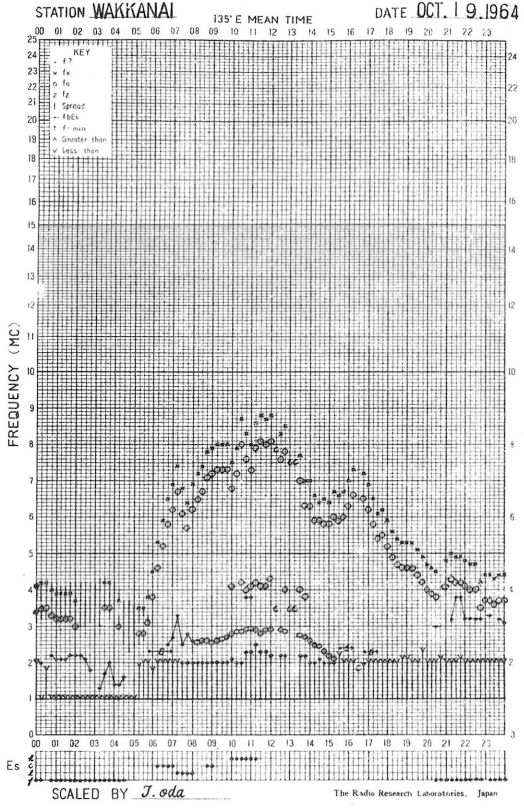
f-PLOT OF IONOSPHERIC DATA



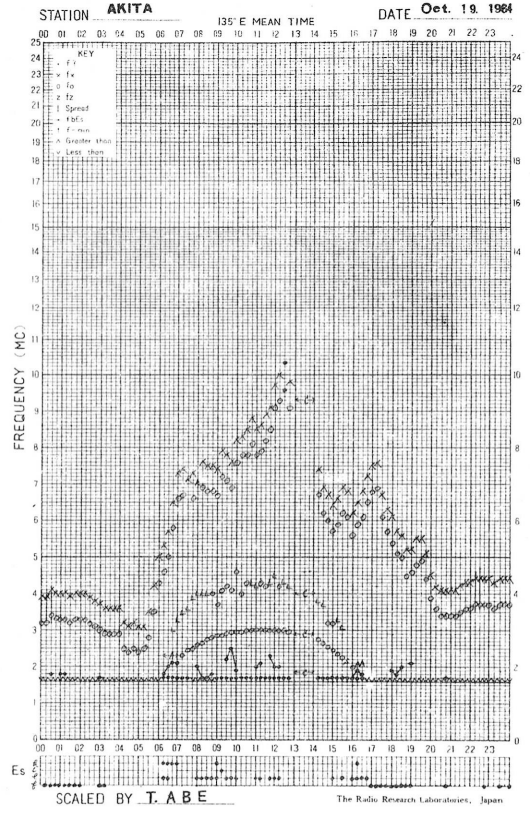
f-PLOT OF IONOSPHERIC DATA



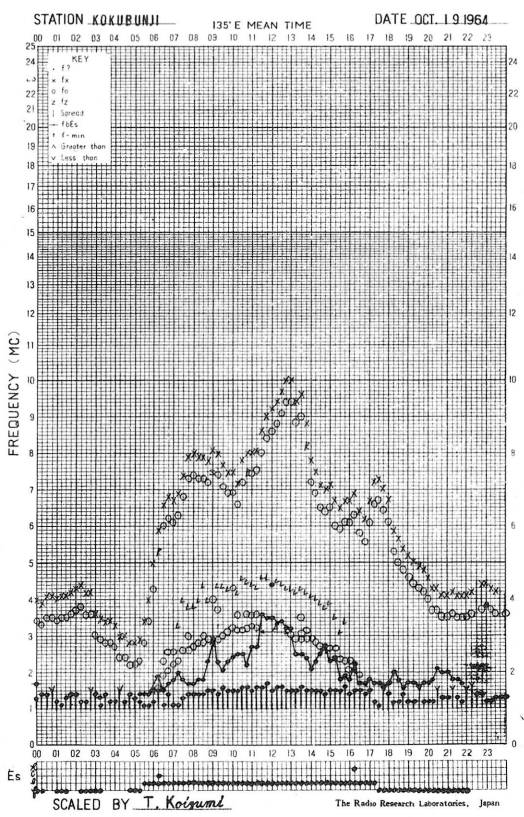
f-PLOT OF IONOSPHERIC DATA



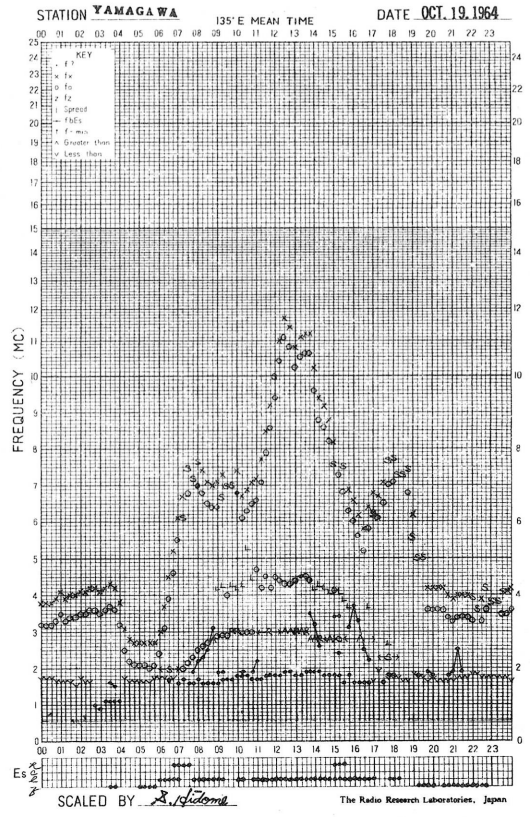
f-PLOT OF IONOSPHERIC DATA



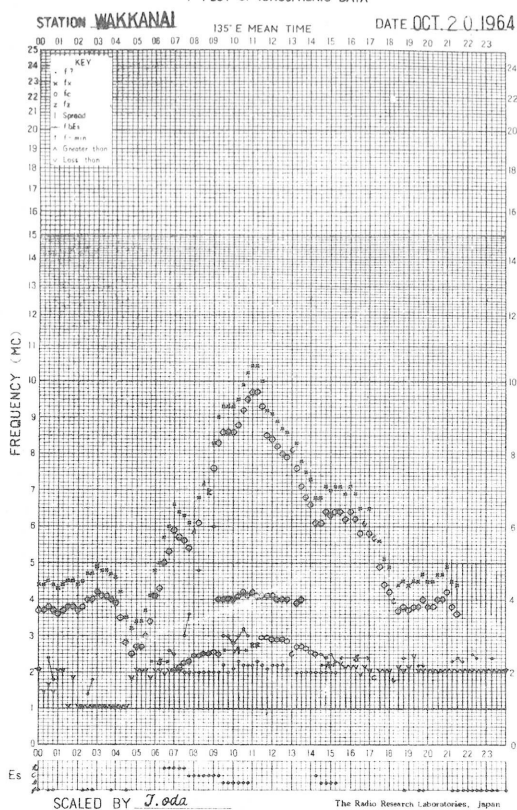
f-PLOT OF IONOSPHERIC DATA



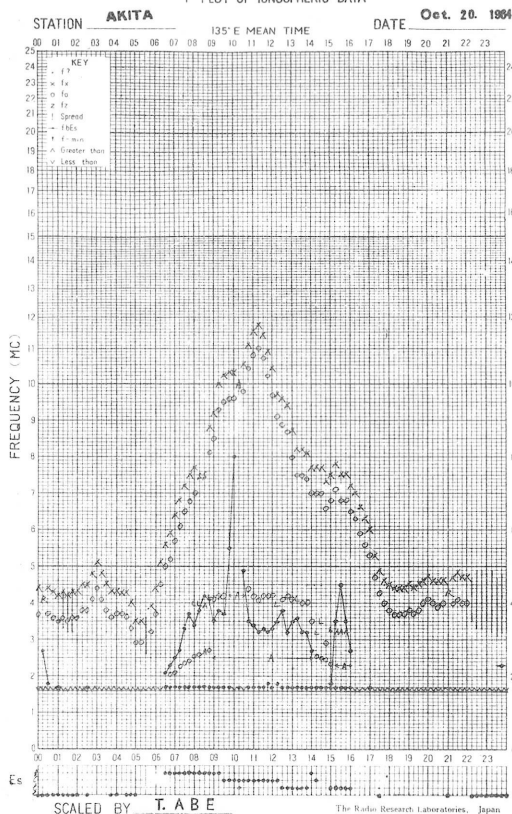
f-PLOT OF IONOSPHERIC DATA



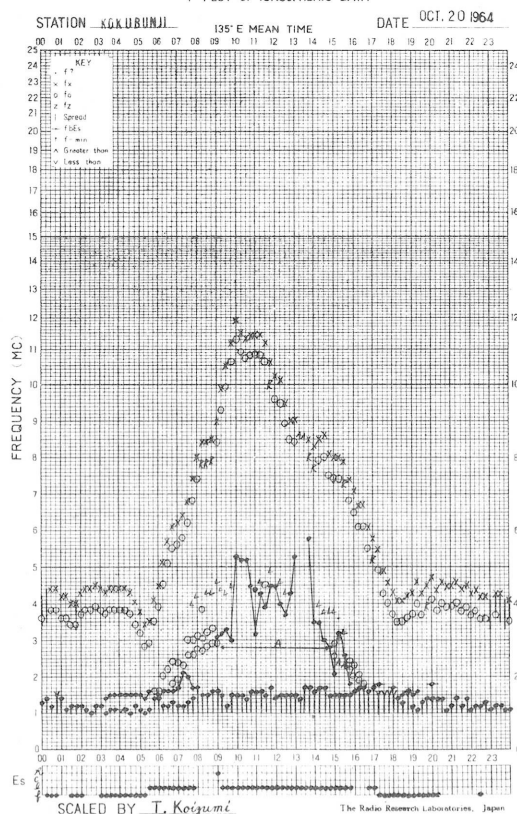
f- PLOT OF IONOSPHERIC DATA



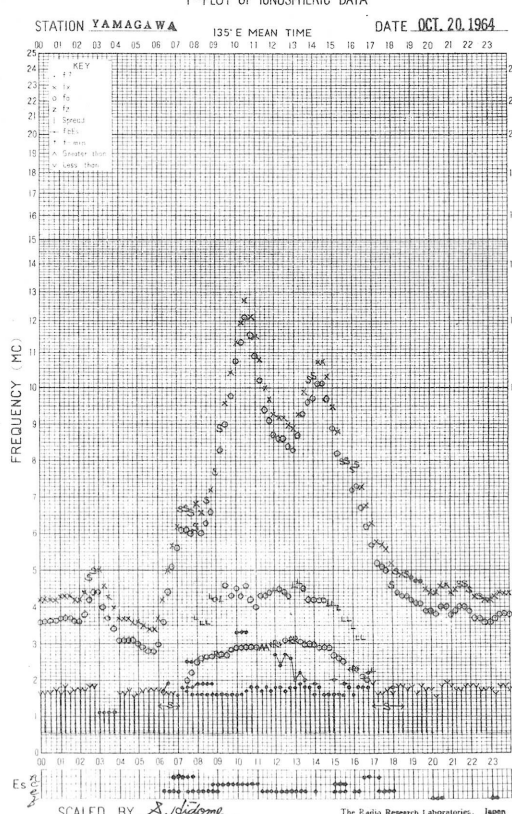
f- PLOT OF IONOSPHERIC DATA



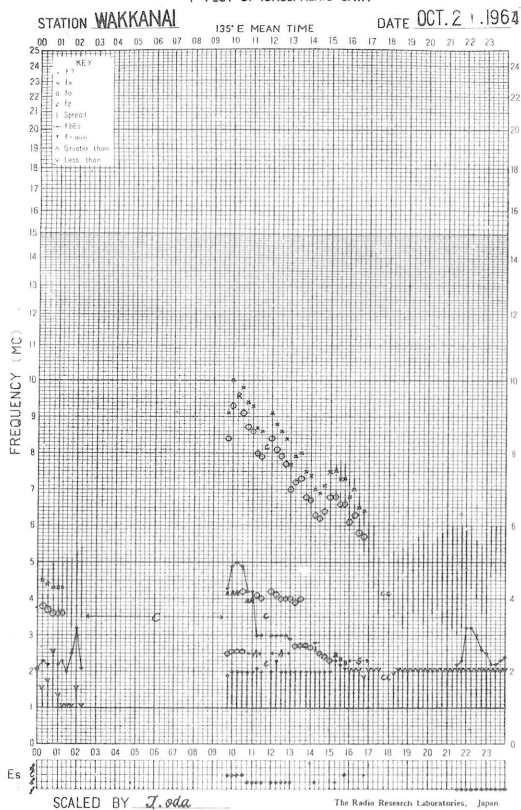
f- PLOT OF IONOSPHERIC DATA



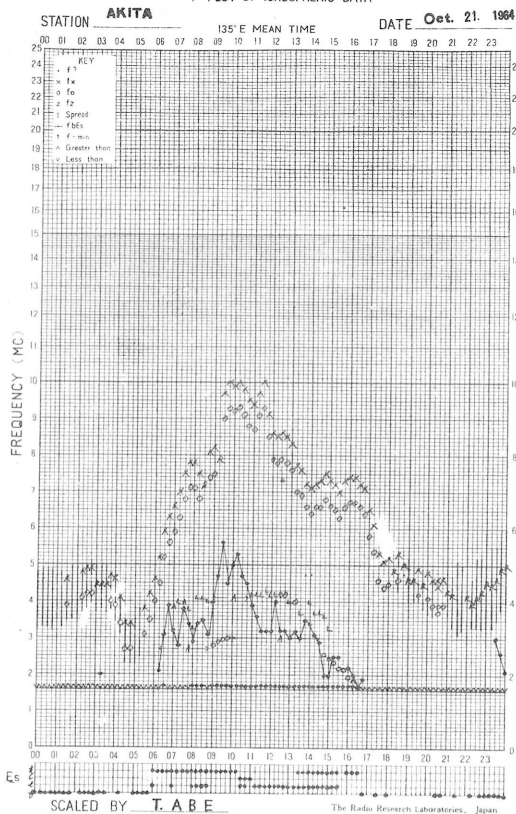
f- PLOT OF IONOSPHERIC DATA



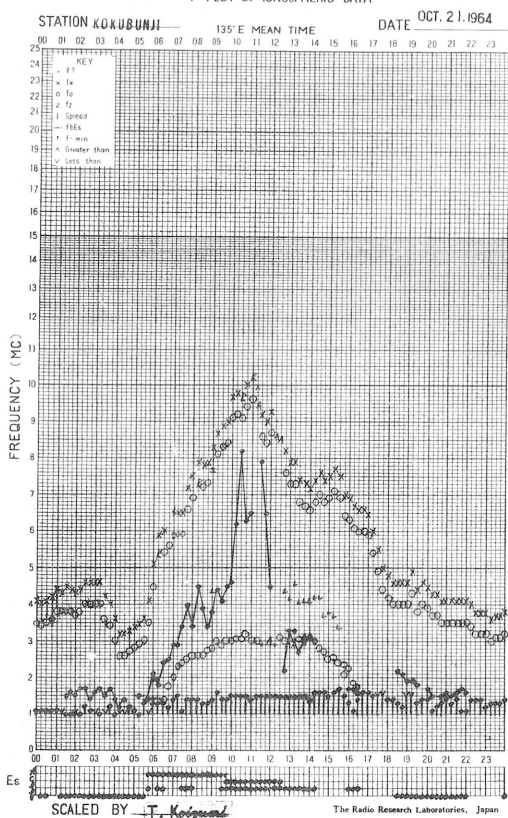
f-PLOT OF IONOSPHERIC DATA



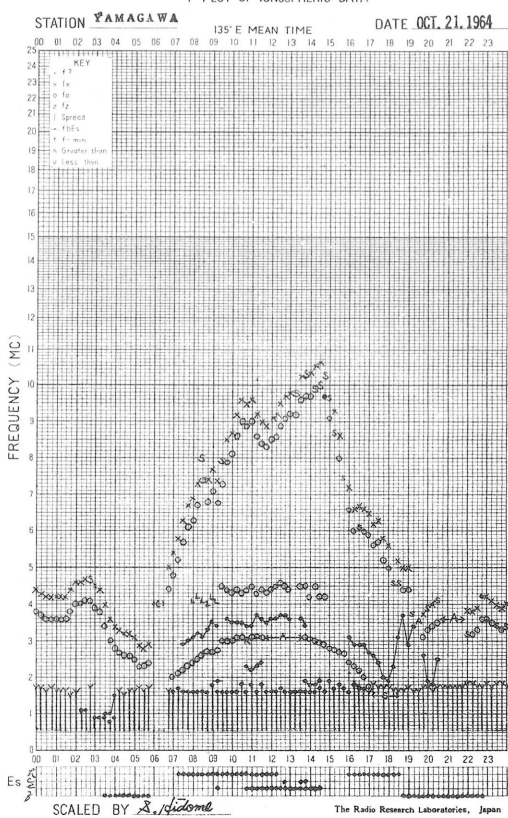
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

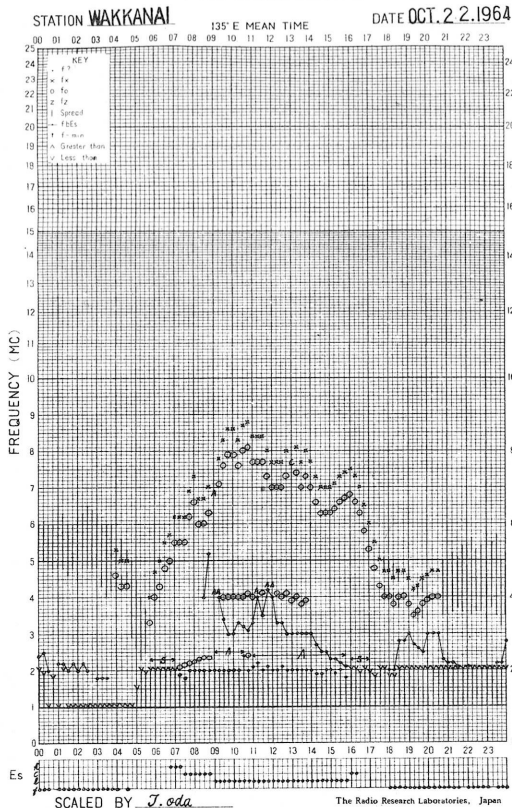


f-PLOT OF IONOSPHERIC DATA

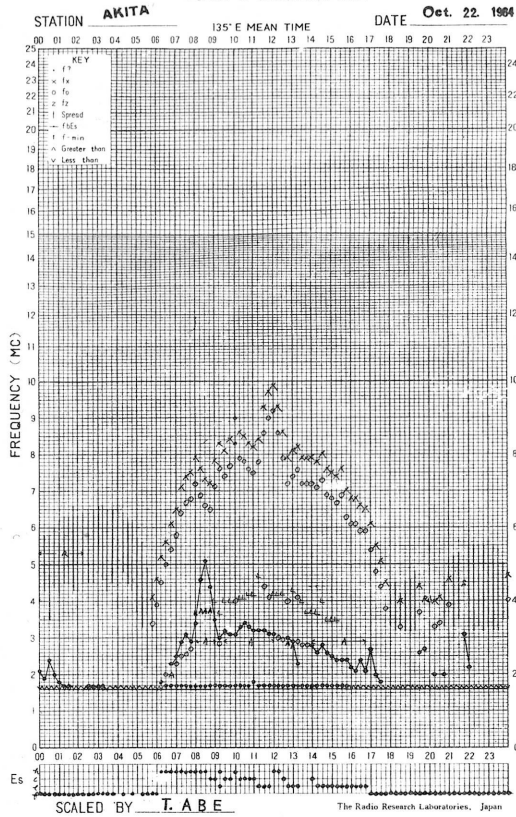




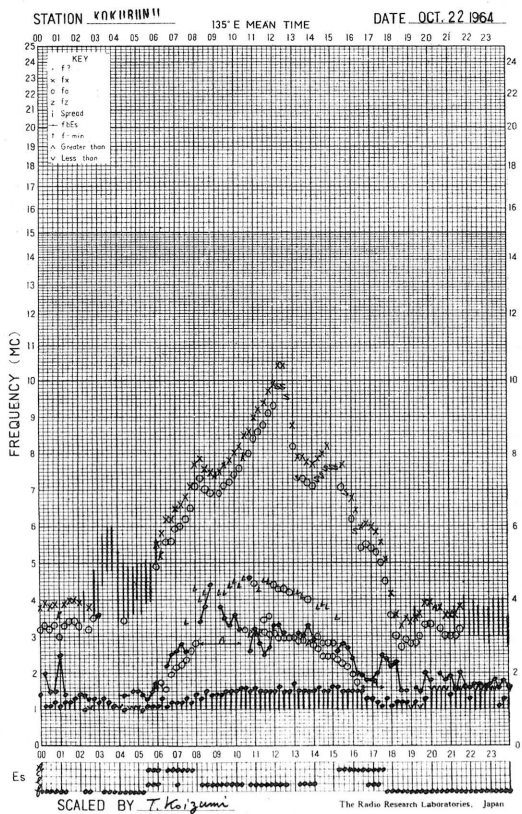
f-PLOT OF IONOSPHERIC DATA



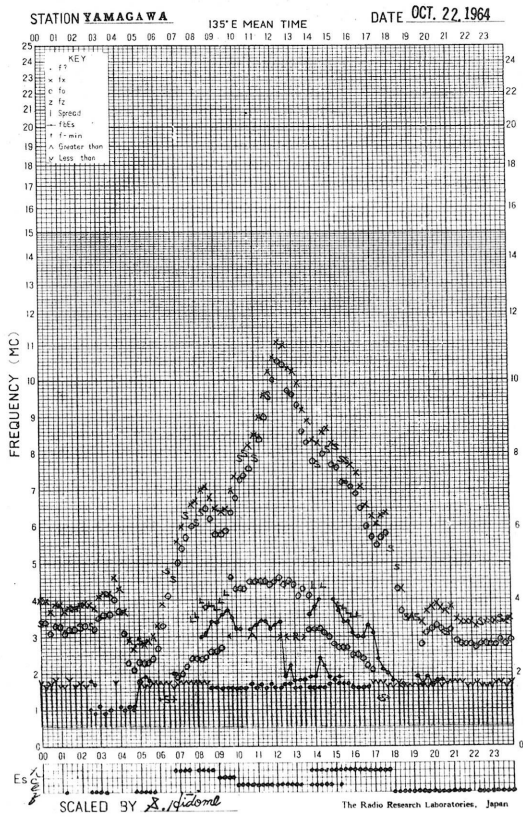
f-PLOT OF IONOSPHERIC DATA



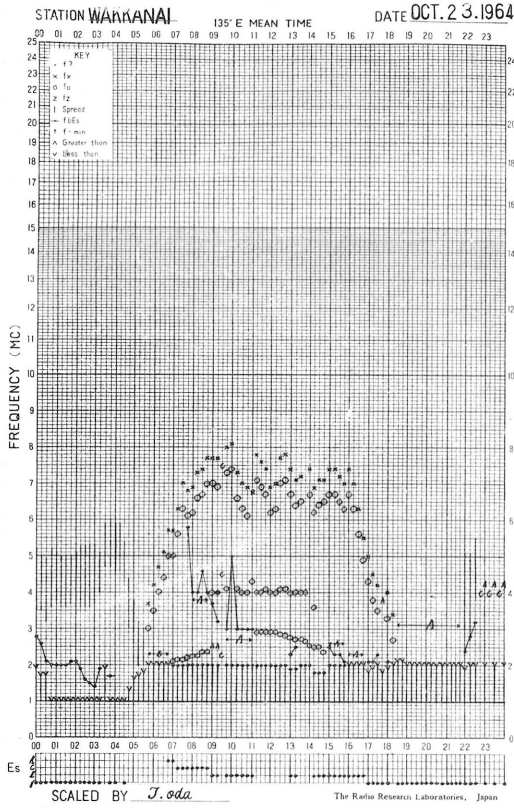
f-PLOT OF IONOSPHERIC DATA



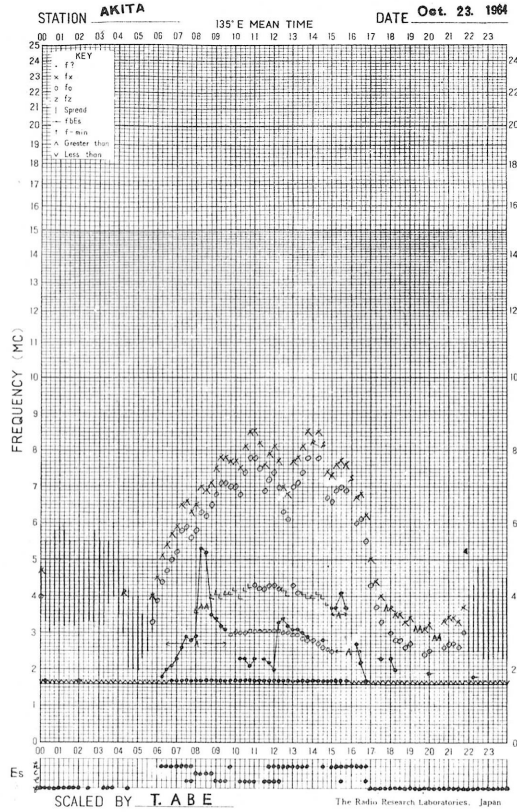
f-PLOT OF IONOSPHERIC DATA



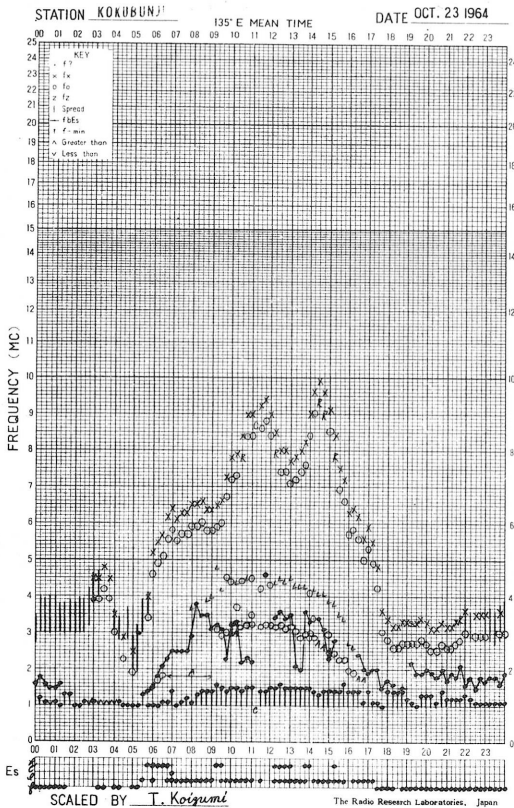
f- PLOT OF IONOSPHERIC DATA



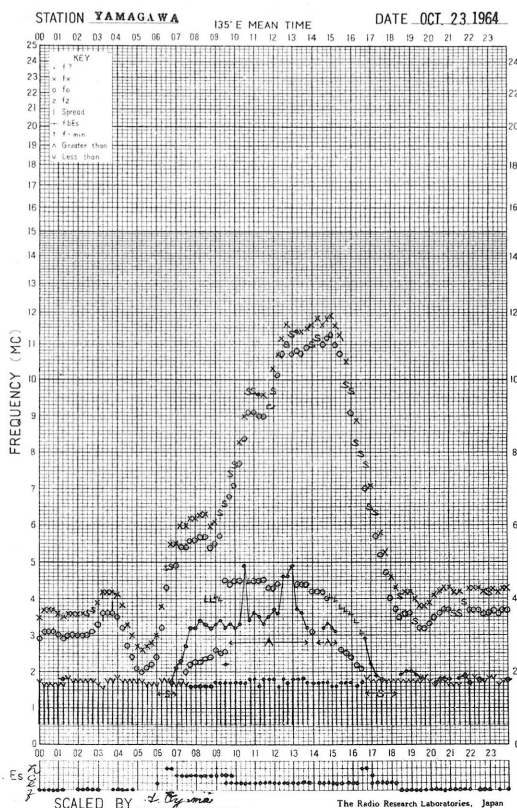
f- PLOT OF IONOSPHERIC DATA



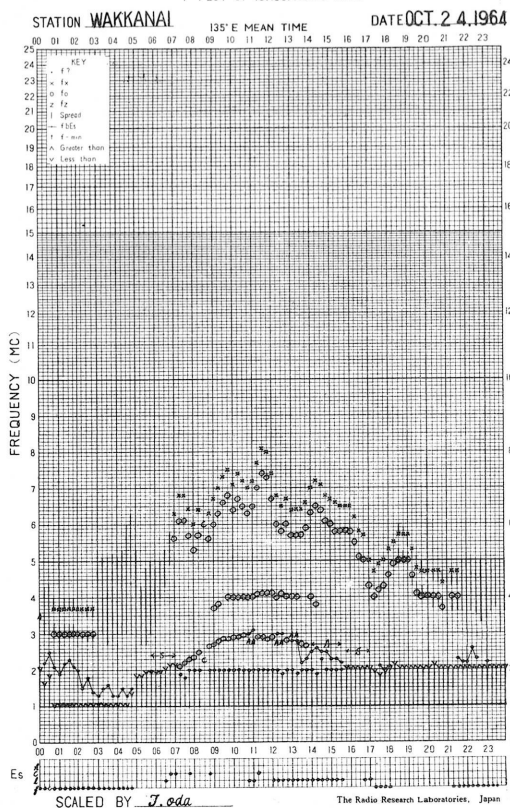
f- PLOT OF IONOSPHERIC DATA



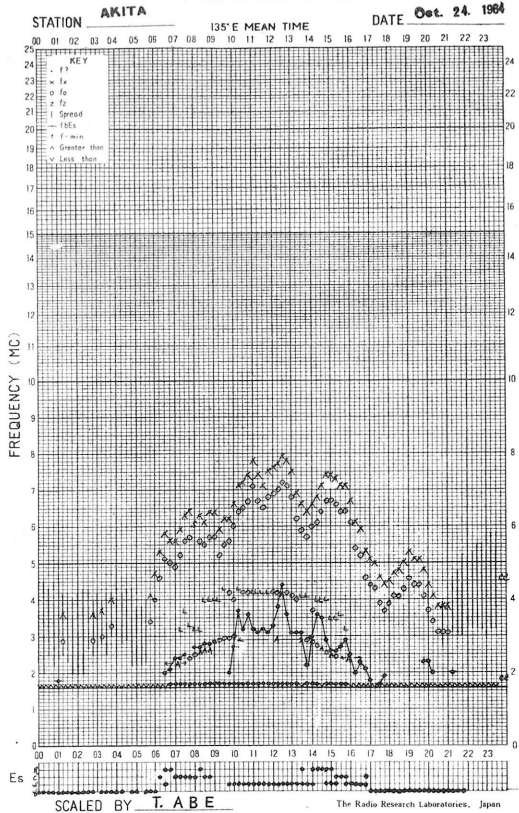
f- PLOT OF IONOSPHERIC DATA



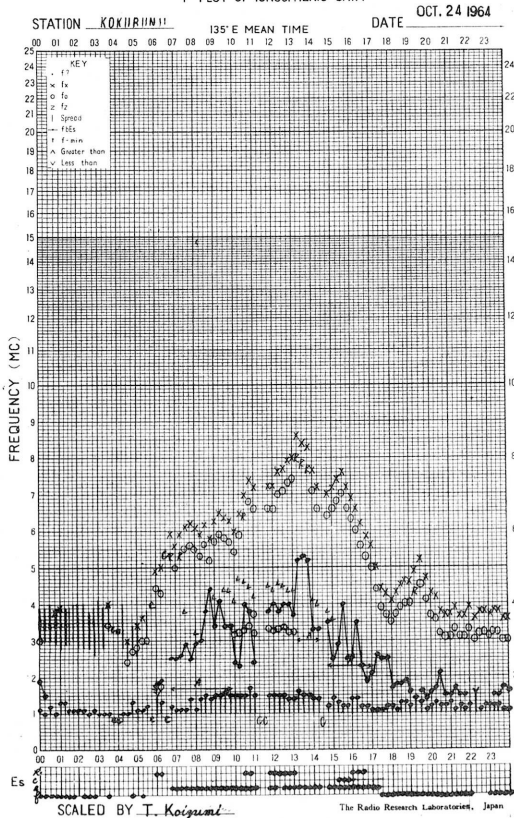
f-PLOT OF IONOSPHERIC DATA



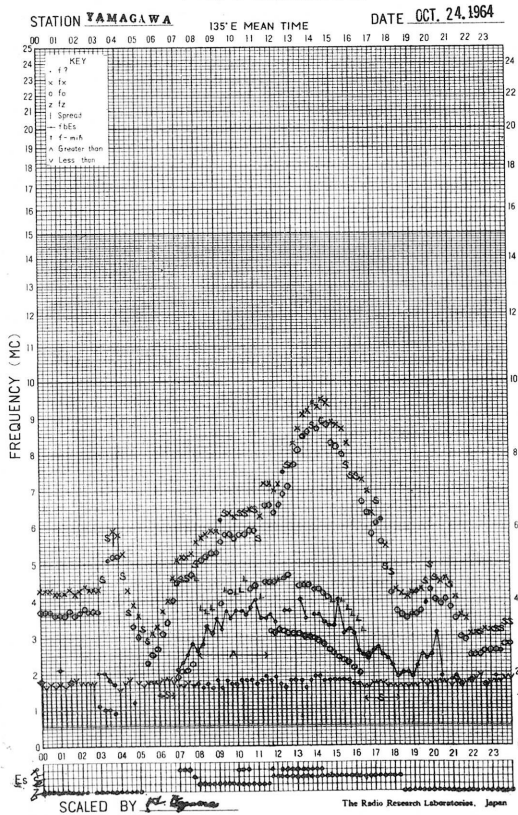
f-PLOT OF IONOSPHERIC DATA



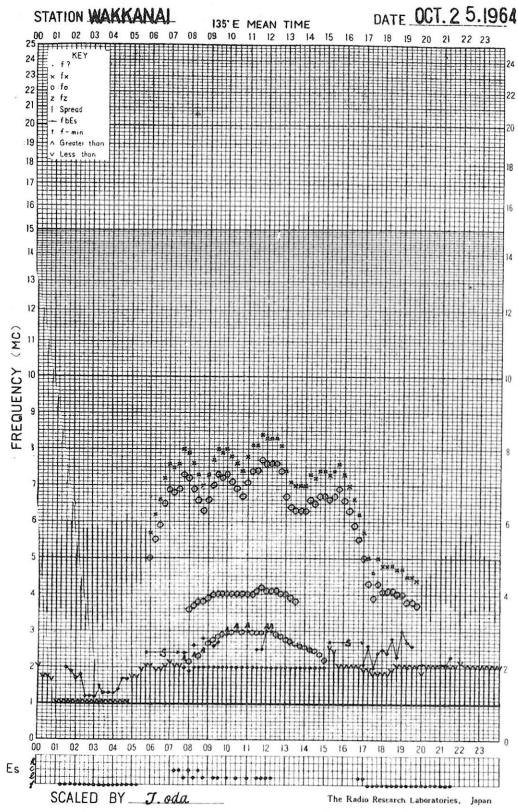
f-PLOT OF IONOSPHERIC DATA



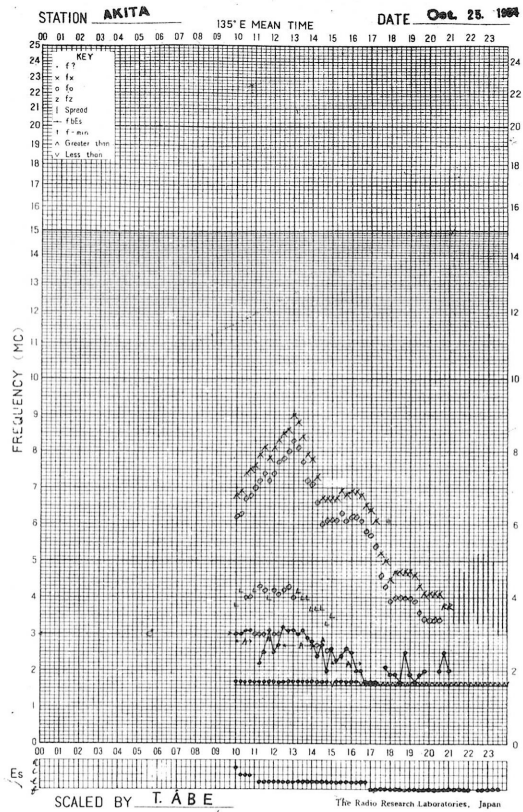
f-PLOT OF IONOSPHERIC DATA



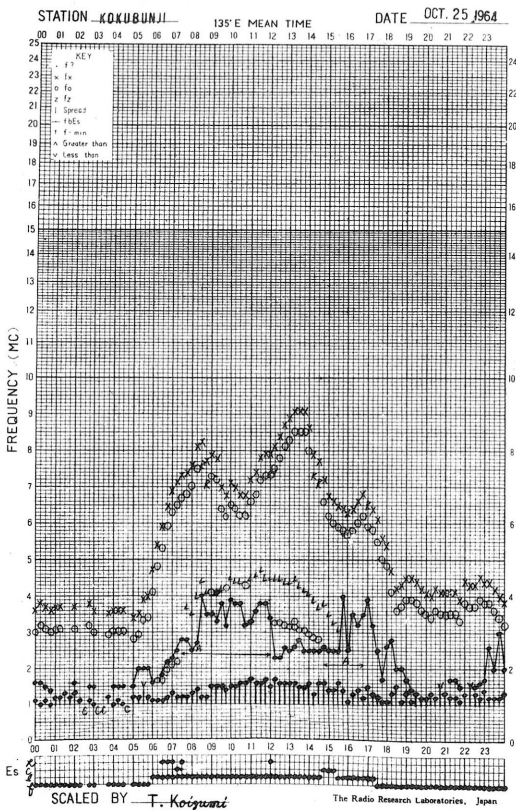
f-PLOT OF IONOSPHERIC DATA



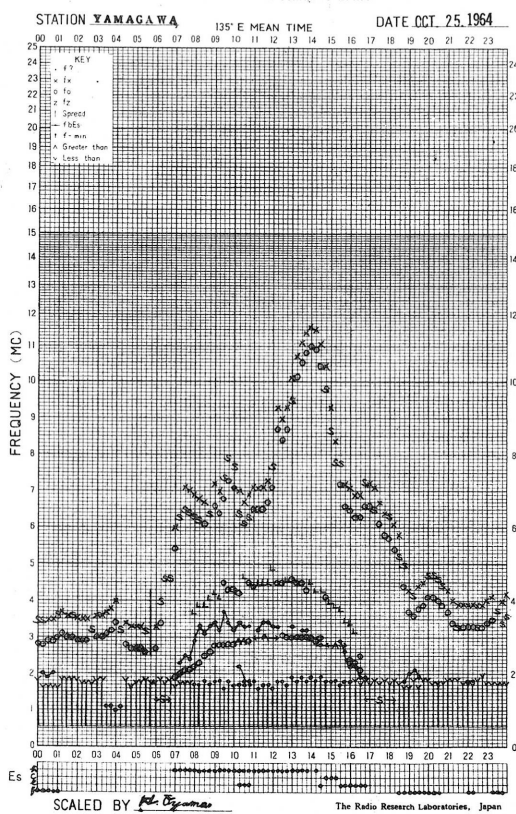
f-PLOT OF IONOSPHERIC DATA



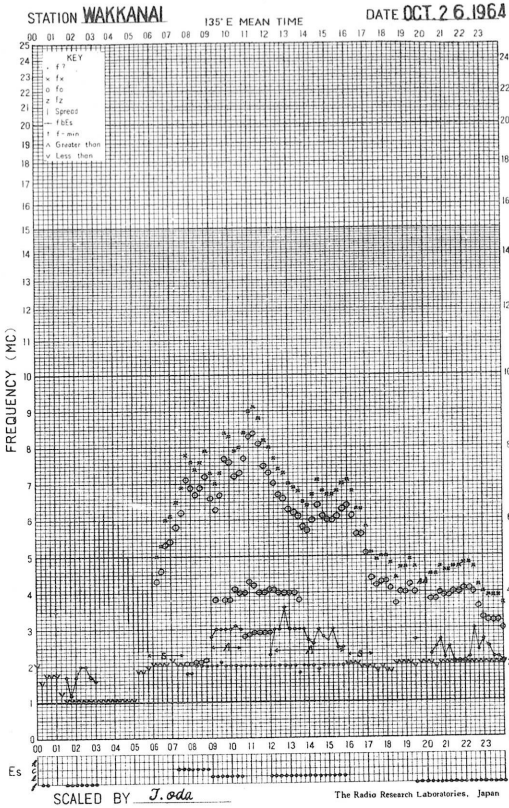
f-PLOT OF IONOSPHERIC DATA



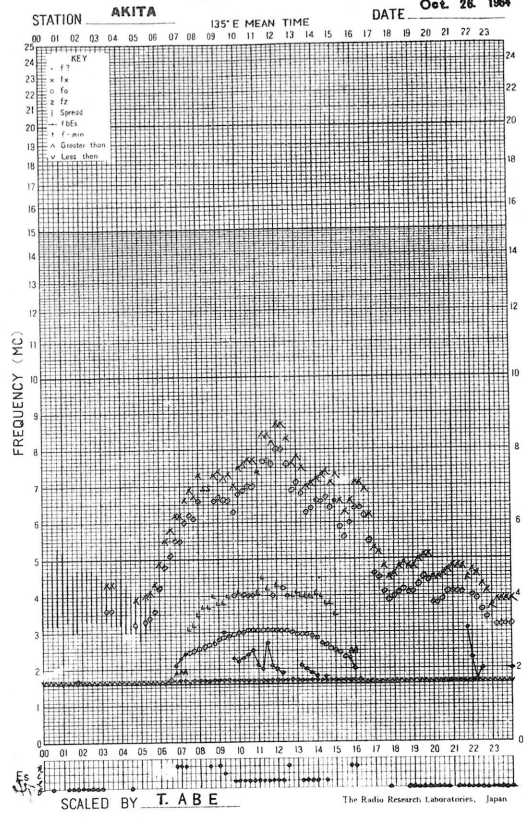
f-PLOT OF IONOSPHERIC DATA



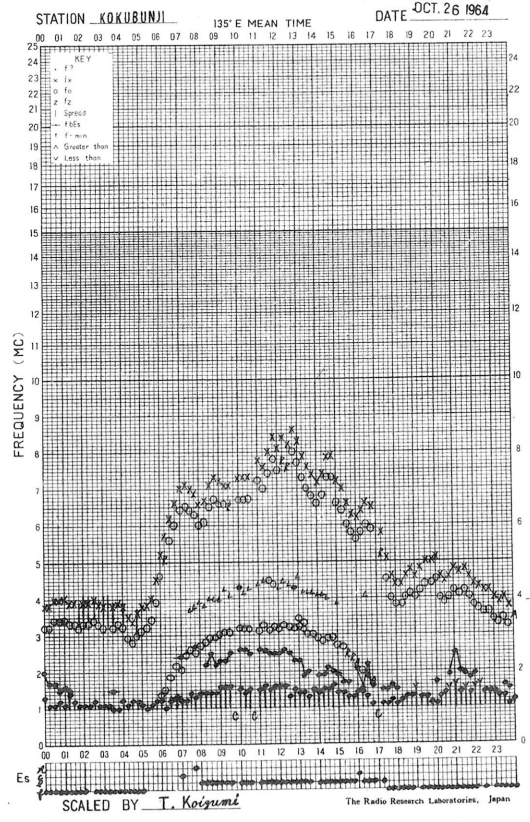
f- PLOT OF IONOSPHERIC DATA



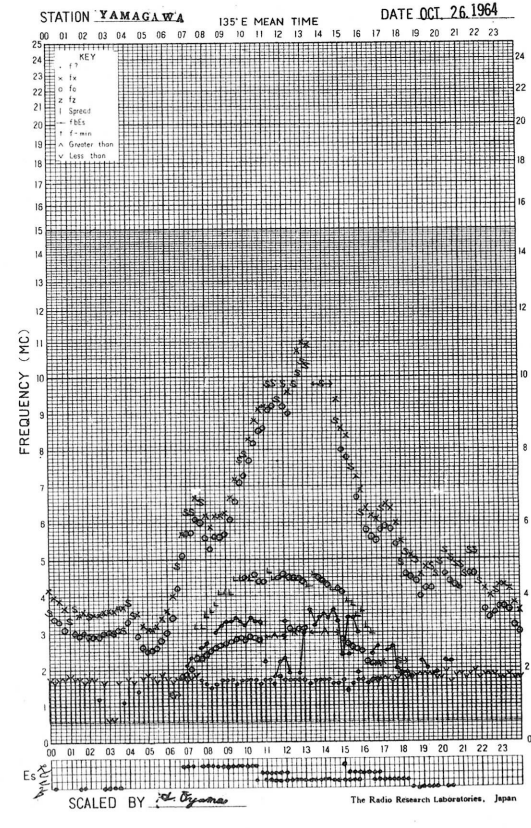
f- PLOT OF IONOSPHERIC DATA



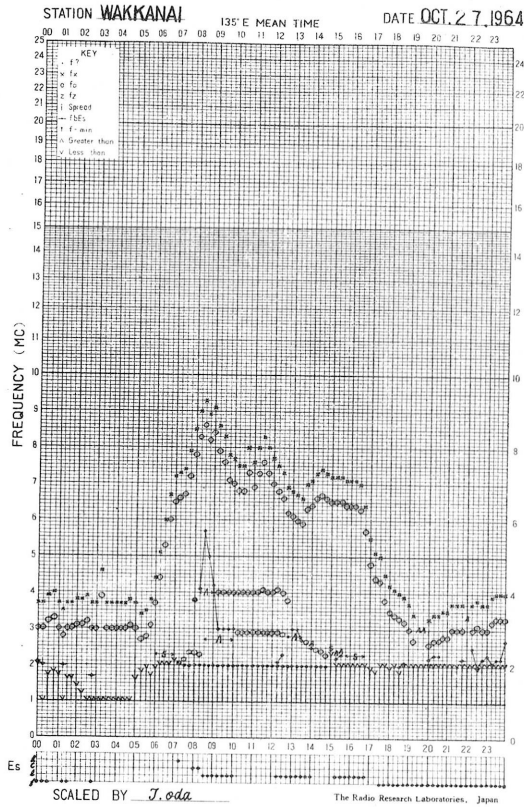
f- PLOT OF IONOSPHERIC DATA



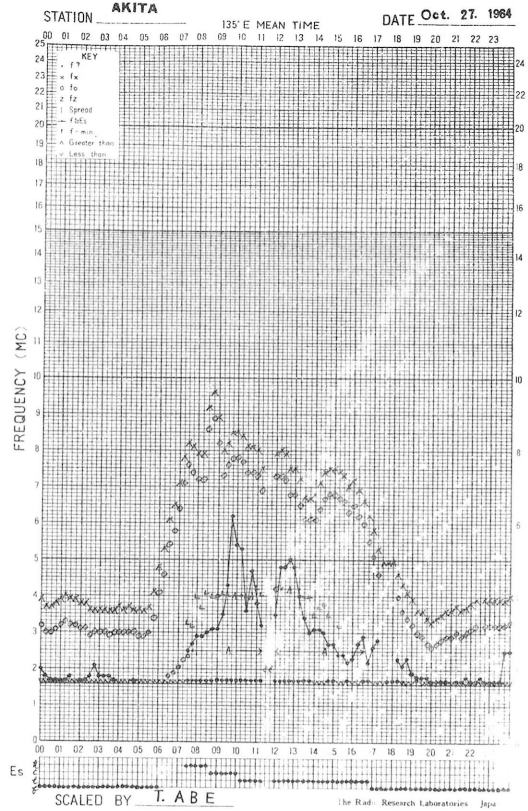
f- PLOT OF IONOSPHERIC DATA



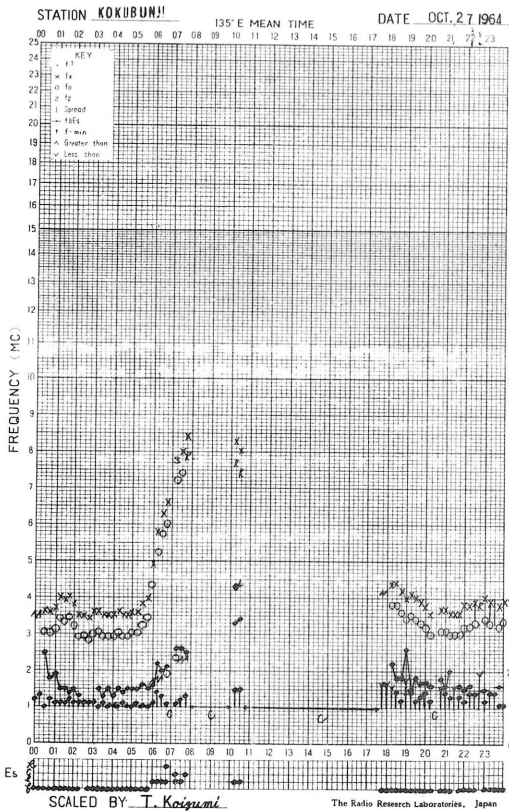
f-PLOT OF IONOSPHERIC DATA



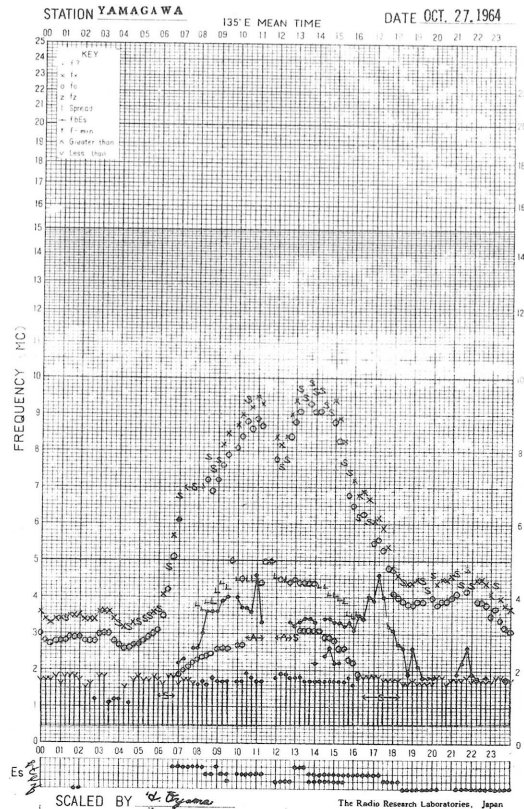
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

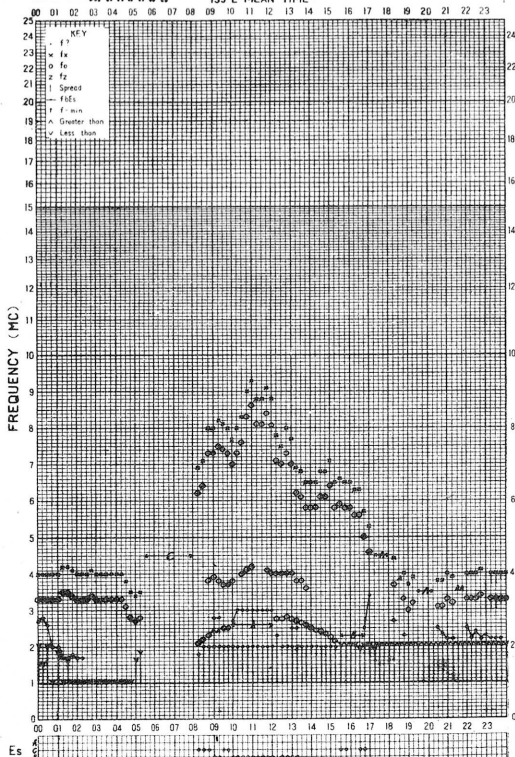


f-PLOT OF IONOSPHERIC DATA



f- PLOT OF IONOSPHERIC DATA

STATION MAKANAI 135°E MEAN TIME DATE OCT. 28, 1964

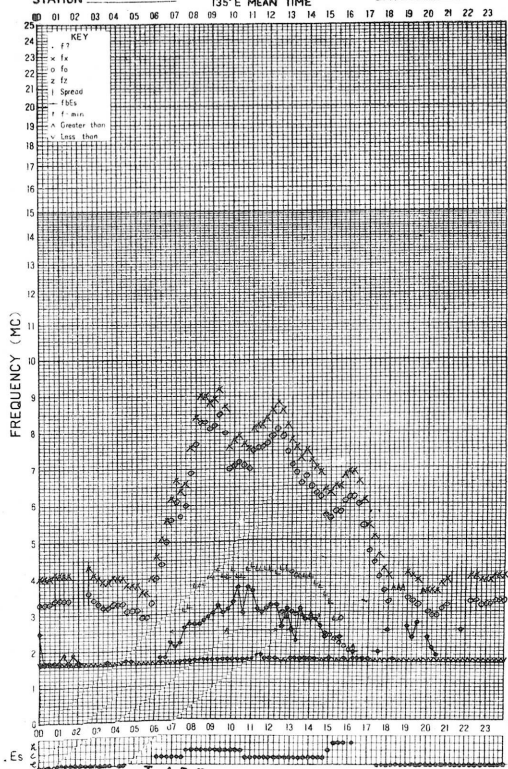


SCALED BY T.oda

The Radio Research Laboratories, Japan

f- PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Oct. 28, 1964

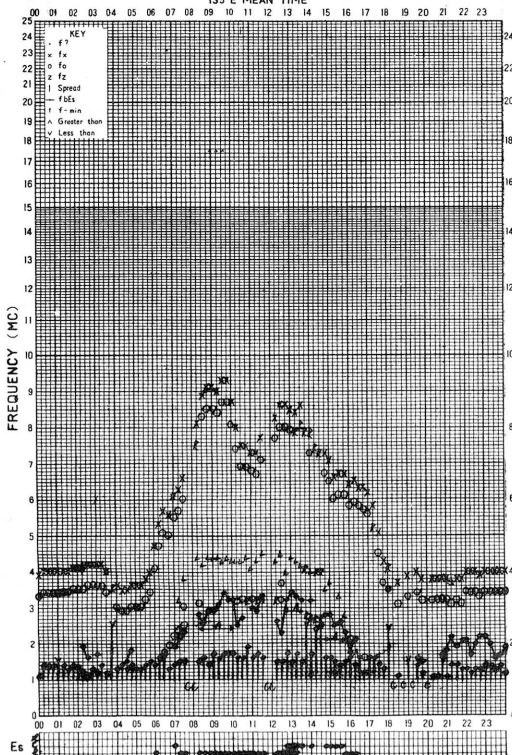


SCALED BY T.ABE

The Radio Research Laboratories, Japan

f- PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE OCT. 28, 1964

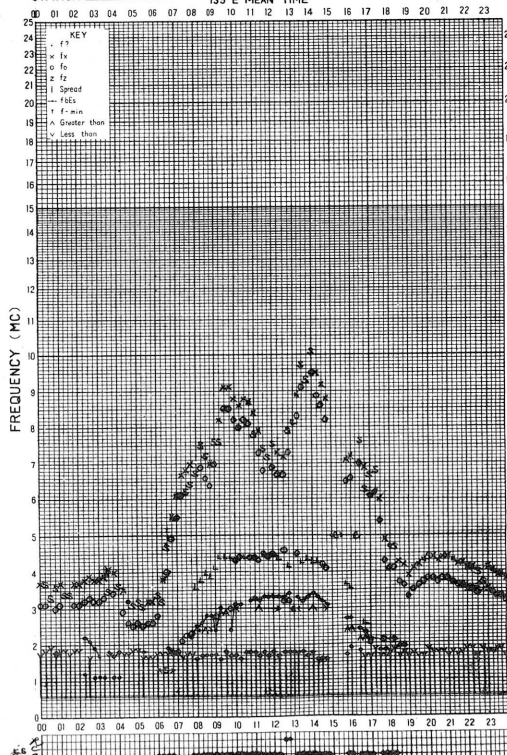


SCALED BY T. Koizumi

The Radio Research Laboratories, Japan

f- PLOT OF IONOSPHERIC DATA

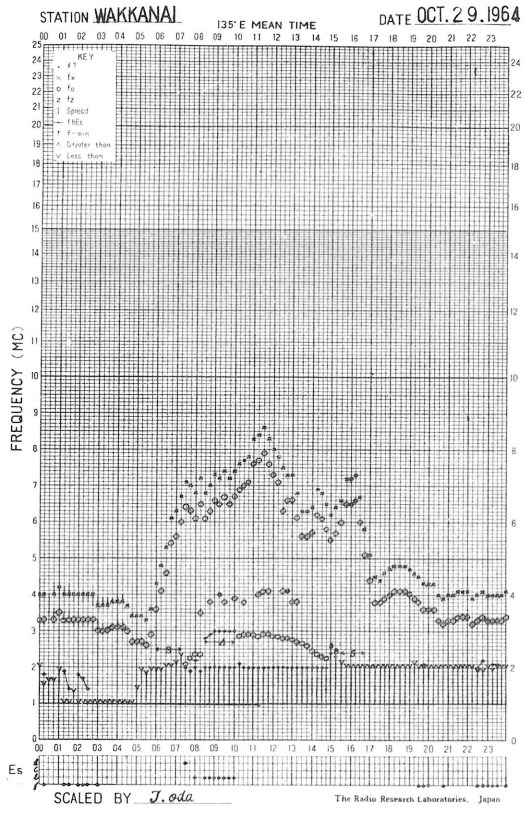
STATION YAMAGAWA 135°E MEAN TIME DATE OCT. 28, 1964



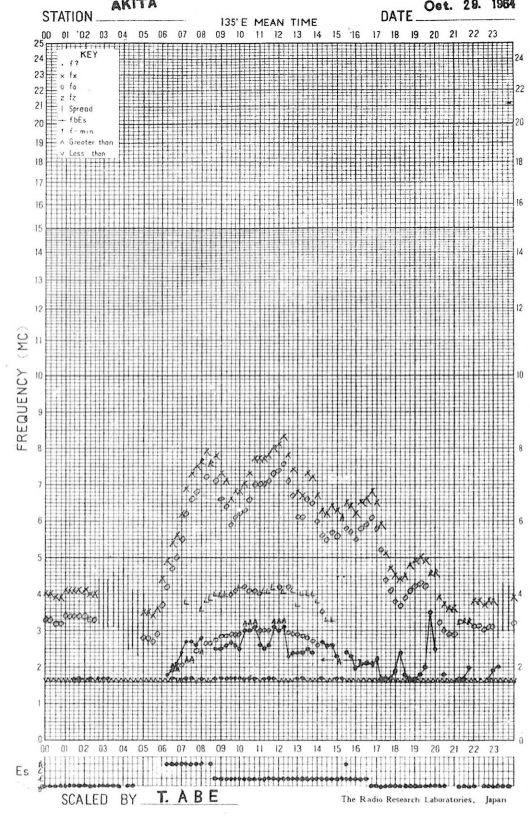
SCALED BY M. Oguma

The Radio Research Laboratories, Japan

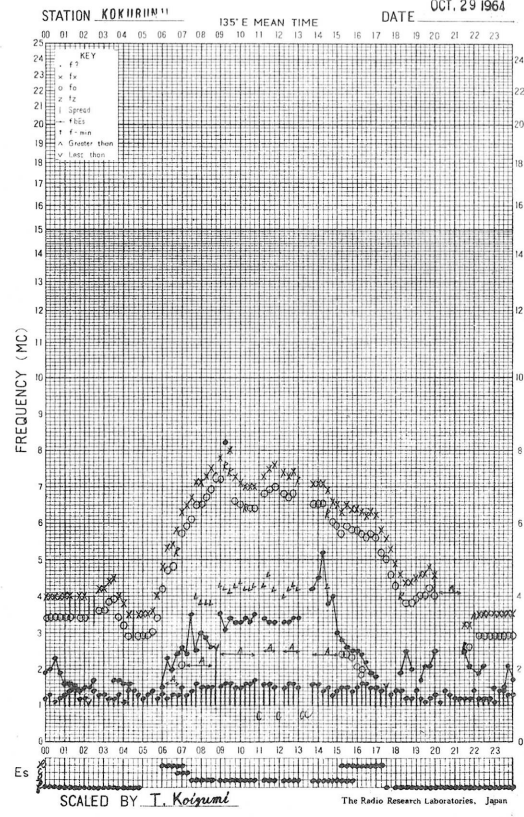
f-PLOT OF IONOSPHERIC DATA



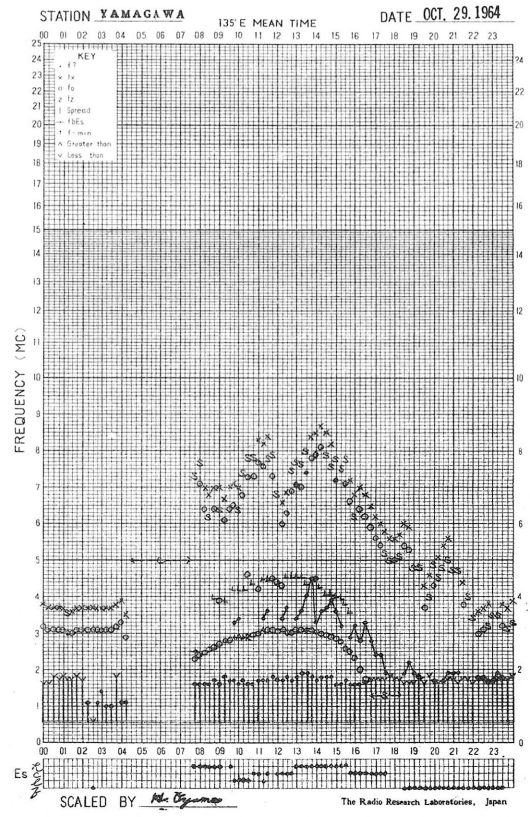
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

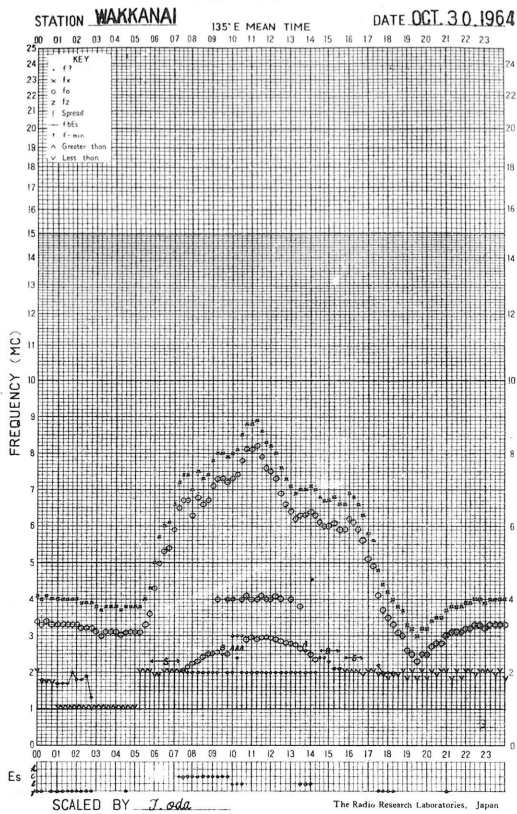


f-PLOT OF IONOSPHERIC DATA

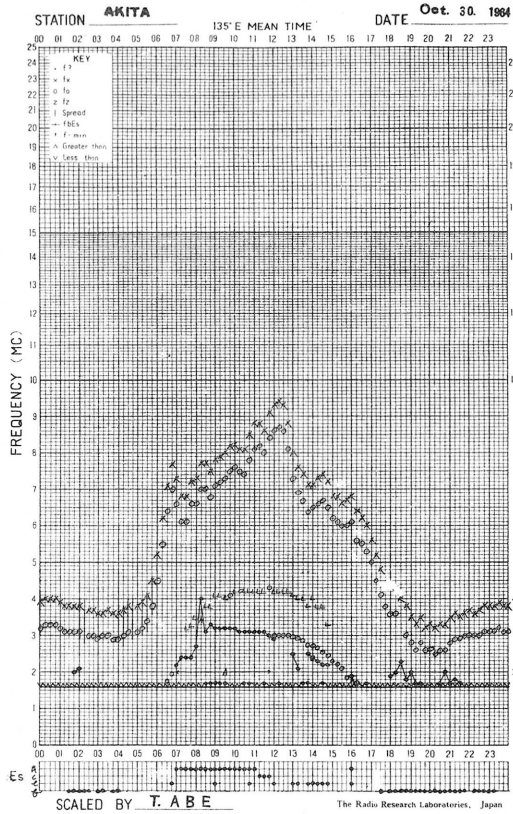




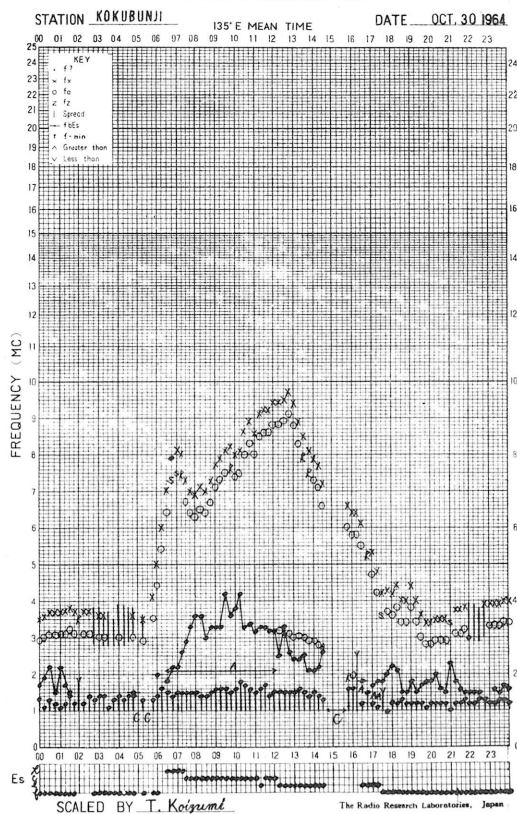
f-PLOT OF IONOSPHERIC DATA



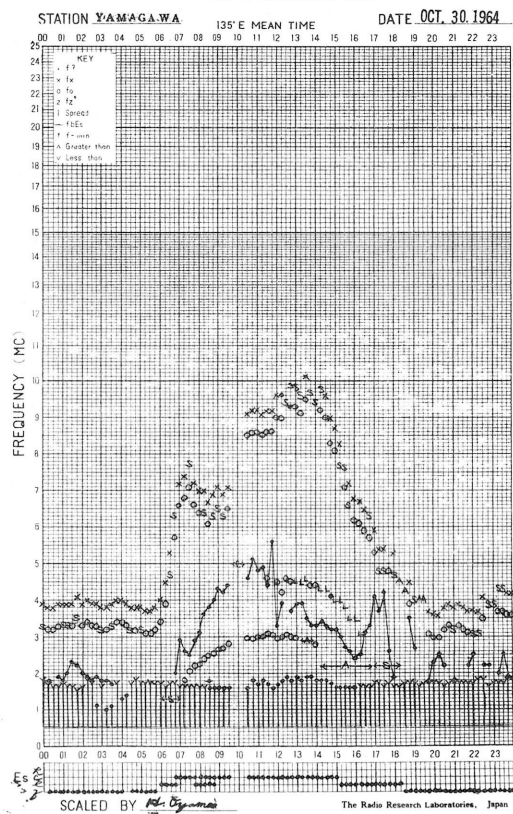
f-PLOT OF IONOSPHERIC DATA



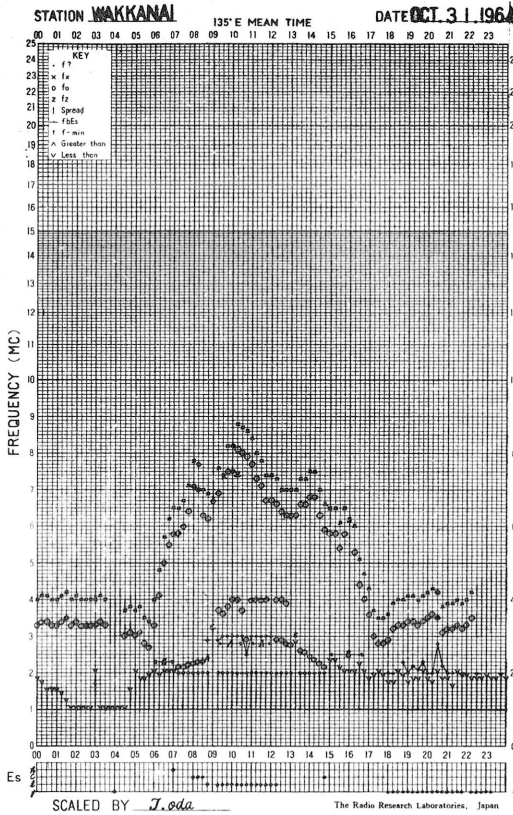
f-PLOT OF IONOSPHERIC DATA



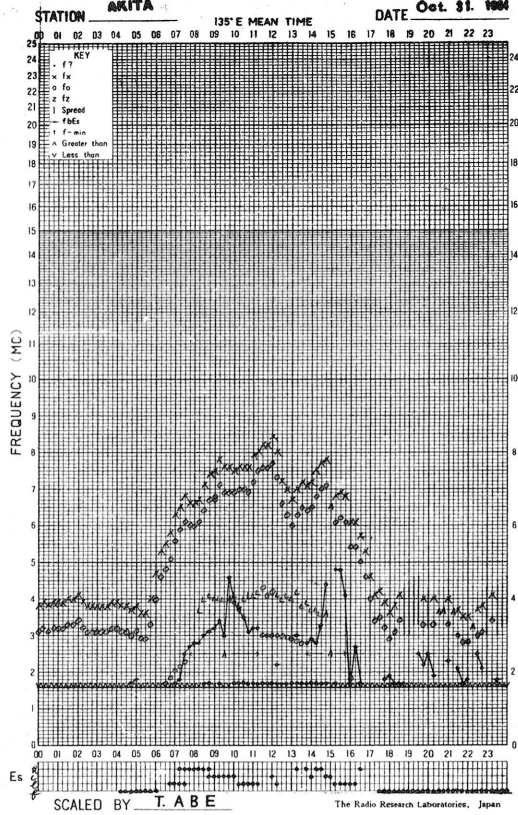
f-PLOT OF IONOSPHERIC DATA



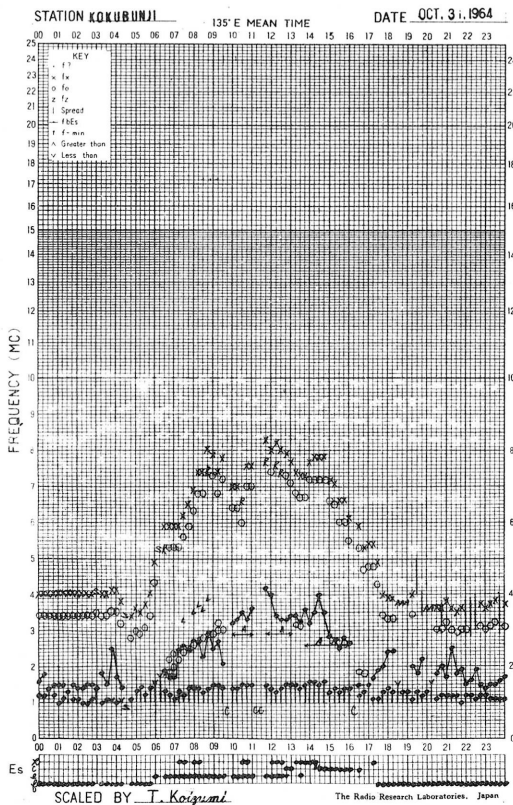
f- PLOT OF IONOSPHERIC DATA



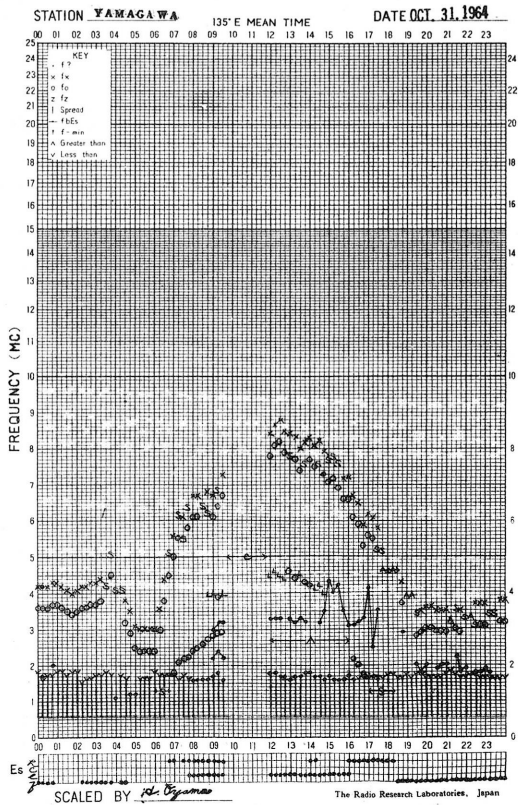
f- PLOT OF IONOSPHERIC DATA



f- PLOT OF IONOSPHERIC DATA



f- PLOT OF IONOSPHERIC DATA



## SOLAR RADIO EMISSION

<u>Flux Density and Variability</u>										
Month: October 1964.						Frequency: 200 Mc/s				
Flux density $10^{-22} W_m^{-2} (c/s)^{-1}$						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	5	5	5	-	5	0	0	0	-	0
2	8	8	8	-	8	0	0	0	-	0
3	9	8	8	9	8	0	0	0	0	0
4	9	9	9	(8)	9	0	0	0	(0)	0
5	8	8	9	(9)	8	0	0	0	(0)	0
6	8	8	8	-	9	0	0	0	-	0
7	8	8	8	-	8	0	0	0	-	0
8	9	-	-	-	(9)	0	-	-	-	(0)
9	8	9	8	-	8	0	0	0	-	0
10	6	7	7	-	7	0	0	0	-	0
11	-	-	-	-	-	-	-	-	-	-
12	(6)	6	(7)	-	6	(0)	0	(0)	-	0
13	6	6	5	-	6	0	0	0	-	0
14	(6)	5	-	(5)	(6)	(0)	0	-	(0)	(0)
15	6	6	5	(6)	6	0	0	0	(0)	0
16	6	5	5	6	5	0	0	0	0	0
17	6	5	5	(6)	6	0	0	0	(0)	0
18	6	5	5	6	6	0	0	0	0	0
19	6	6	5	(7)	6	0	0	0	(0)	0
20	7	6	5	(8)	6	0	0	0	(0)	0
21	8	6	6	5	7	0	0	0	0	0
22	5	5	(4)	-	5	0	0	(0)	-	0
23	-	-	-	-	-	-	-	-	-	-
24	6	5	(5)	-	6	0	0	(0)	-	0
25	6	6	5	(6)	6	0	0	0	(0)	0
26	6	6	(7)	-	6	0	0	(0)	-	0
27	6	6	6	(6)	6	0	0	0	(0)	0
28	6	6	(7)	(5)	6	0	0	(0)	(0)	0
29	6	6	6	(7)	6	0	0	0	(0)	0
30	7	6	6	(7)	6	0	0	0	(0)	0
31	6	5	6	7	6	0	0	0	0	0

## SOLAR RADIO EMISSION

<u>Flux Density</u>					
Month: October 1964.					
Observing Station: Hiraiso			Frequency: 500 Mc/s		
Flux density $10^{-22} W_m^{-2} (c/s)^{-1}$					
UT	00-03	03-06	06-09	21-24	Day
Date					
1	20	19	18	20	19
2	18	19	18	-	18
3	19	19	18	19	19
4	19	20	19	19	19
5	20	20	21	20	20
6	19	21	21	(21)	20
7	22	18	20	19	20
8	20	19	18	21	19
9	20	20	21	21	21
10	21	21	22	21	21
11	21	20	20	21	20
12	20	21	20	-	21
13	19	18	19	-	19
14	20	19	20	-	20
15	19	18	19	(18)	19
16	18	19	18	-	19
17	17	18	(17)	18	18
18	18	18	-	17	18
19	19	19	(18)	17	18
20	19	19	(17)	19	18
21	19	18	(17)	19	18
22	19	19	(19)	20	19
23	19	18	(17)	18	18
24	19	19	(17)	20	18
25	20	19	(18)	20	20
26	19	20	(19)	20	20
27	20	19	-	-	20
28	18	18	(18)	18	18
29	19	20	(17)	19	19
30	20	19	(17)	19	19
31	20	17	(16)	-	18

Note No observations during the following periods:

1st	0000-	0100	15th	2050-	2300
2nd	2050-	3rd 0100	16th	2050-	17th 0100
6th	2300-	7th 0100	18th	0500-	0810
12th	2050-	2400	27th	0600-	28th 0100
13th	2050-	2400	31st	2050-	2400
14th	2050-	2400			

Distinctive Event

No Distinctive Event was observed during October, 1964.

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

1st	0000-		0100	14th	0400-		0810
1st	2050-		2400	14th	2050-		2300
2nd	2050-	3rd	0030	15th	2050-		2300
4th	2050-		2300	17th	2050-		2300
5th	2050-		2300	19th	2050-		2300
6th	2050-	7th	0100	20th	2050-		2300
7th	2050-		2400	22nd	2050-	24th	0020
8th	0220-		0810	24th	2050-		2400
8th	2050-		2400	25th	2050-		2300
9th	2050-	10th	0100	26th	2050-	27th	0100
10th	2050-	12th	0200	27th	2050-		2300
12th	0610-		0810	28th	2050-		2300
12th	2050-	13th	0100	29th	2050-		2300
13th	2050-	14th	0200	30th	2050-		2300

## RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Oct. 1964	Whole Day Index	L. N.			W W V			S. F.			W W V H			Warning			Principal magnetic storms							
		06 12 18 24	06 12 18 24	06 12 18 24	00 06 12 18 24	00 06 12 18 24	00 06 12 18 24	00 06 12 18 24	00 06 12 18 24	00 06 12 18 24	00 06 12 18 24	00 06 12 18 24	00 06 12 18 24	00 06 12 18 24	Start	End	ΔH							
1	4-	C	C	C	(4)	-	-	4	4	4	3	3	4	4	3	3	N	N	N	N				
2	4-	C	C	C	(4)	-	-	3	4	5	3	3	4	4	3	3	4	N	N	N	N			
3	4-	C	C	C	3	-	-	4	4	4	4	4	4	3	3	4	N	N	N	N				
4	4+	C	C	C	4	-	-	4	4	4	5	4	4	4	5	4	N	N	N	N				
5	4o	C	C	C	5	-	-	3	4	5	4	3	4	4	3	4	N	N	N	N				
6	4o	C	C	C	4	-	-	(4)	5	4	4	3	4	4	3	4	N	N	N	N				
7	4o	C	C	C	C	-	-	4	4	5	4	3	4	4	4	3	N	N	N	N				
8	5-	C	C	C	5	-	-	5	5	5	4	4	4	4	3	3	N	N	N	N				
9	5-	C	C	C	5	-	-	5	4	5	4	4	4	5	5	5	N	N	N	N				
10	4+	C	C	C	4	-	-	5	5	4	4	3	4	5	5	5	N	N	N	N				
11	4+	C	C	C	4	(5)	5	5	4	3	4	5	4	5	5	5	N	N	N	N				
12	3+	3	4	4	3	-	-	(3)	3	3	4	3	5	4	4	5	N	N	U	U	05.2	22xx	90 <sup>y</sup>	
13	4-	3	4	4	(3)	-	-	4	4	4	4	3	5	5	4	4	N	N	N	N				
14	4o	4	4	4	4	-	-	4	4	4	4	3	4	4	4	3	N	N	N	N				
15	4-	3	4	4	4	-	-	3	3	4	4	3	4	4	4	4	N	N	N	N				
16	4+	4	4	5	4	-	-	5	4	4	4	4	5	5	3	4	N	N	N	N				
17	4o	4	5	4	3	-	-	4	3	4	5	4	5	4	5	5	N	N	N	N				
18	4o	5	5	4	4	-	-	3	5	4	4	3	5	5	4	4	N	N	N	N				
19	4+	5	5	4	3	-	-	4	4	5	5	4	5	5	4	4	N	N	N	N				
(20)	4+	3	4	4	4	-	-	5	4	5	5	5	4	3	4	(4)	N	N	N	N				
(21)	5-	3	4	4	5	-	(5)	5	5	5	5	5	3	4	4	5	N	N	N	N				
(22)	4o	3	3	4	4	-	(5)	4	5	4	4	3	(5)	5	4	4	N	N	N	N				
23	4o	4	3	4	2	-	(4)	4	5	5	5	5	4	3	3	4	N	N	N	N				
24	4+	5	5	5	2	-	(5)	5	4	5	4	4	4	4	4	4	N	N	N	N				
25	4o	5	5	5	3	-	-	4	3	3	5	4	4	3	4	3	N	N	N	N				
26	3+	3	4	4	2	-	-	3	3	3	4	3	4	4	3	3	N	N	U	U	0009	21xx	87 <sup>y</sup>	
27	4-	5	4	4	2	-	-	3	3	3	5	3	4	(4)	4	4	N	N	N	N				
28	4o	5	4	5	4	-	-	4	C	(4)	3	3	3	4	3	3	N	N	N	N				
29	3+	3	4	4	4	-	-	3	3	3	3	3	4	4	4	3	N	N	N	N				
30	4-	3	3	5	4	-	-	4	4	3	3	3	4	3	3	4	N	N	N	N				
31	4+	4	3	4	4	-	-	5	5	4	5	4	4	3	3	4	N	N	N	N				

## IQSY GEOALERT and ADALERT (Western Pacific Region)

\* = MAGSTORM

o = MAGCALME

Δ = 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 October, 1964.

---

IONOSPHERIC DATA IN JAPAN FOR OCTOBER 1964

第 16 卷 第 10 号

---

1964年12月20日 印刷  
1964年12月25日 発行 (不許複製非売品)

編 集 兼  
發 行 人

糟 谷 績

東京都小金井市貫井北町4の573

發 行 所

郵 政 省 電 波 研 究 所

東京都小金井市貫井北町4の573  
電話 国分寺 (0423) (2) 1211 (代)

印 刷 所

山 内 欧 文 社 印 刷 株 式 會 社

東京都豊島区日ノ出町2の228  
電話 (971) 9341

---