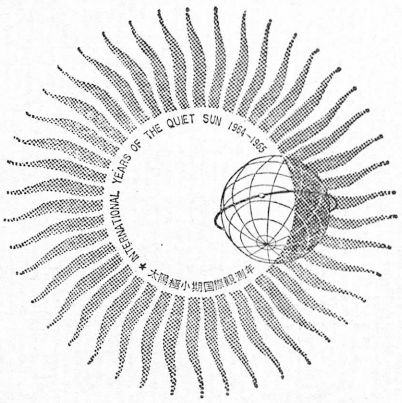
F—189

IONOSPHERIC DATA IN JAPAN

FOR SEPTEMBER 1964

Vol. 16 No. 9



Issued in November 1964

Prepared by

THE RADIO RESEARCH LABORATORIES

MINISTRY OF POSTS AND TELECOMMUNICATIONS

KOKUBUNJI, TOKYO, JAPAN

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THE RADIO RESEARCH LABORATORIES

KOKUBUNJI, TOKYO, JAPAN

CONTENTS

SITE OF THE RADIO WAVE OBSERVATORIES

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

	Latitude	Longitude	Site
Wakkanai	45°23.6′N.	141°41.1′E.	Wakkanai-shi, Hokkaido
Akita	39°43.5′N.	140°08.2′E.	Tegata Nishishin-machi, Akita-shi, Akita-ken
Kokubunji	35°42.4′N.	139°29.3′E.	Koganei-shi, Tokyo-to
Yamagawa	31°12.1′N.	130°37.1′E.	Yamagawa-machi, Ibusuki-gun, Kagoshima-ken

Solar radio emission and radio propagation conditions are observed at Hiraiso Radio Wave Observatory.

	Latitude	Longitude	Site
Hiraiso	36°22.0′N.	140°37.5′E.	Isozaki-machi, Nakaminato-shi, Ibaraki-ken

SYMBOLS AND TERMINOLOGY

A. IONOSPHERE

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

Terminology

f_0F2, f_0F1, f_0E — The ordinary wave critical frequency for the $F2$, $F1$ and E layers, respectively.

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

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

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

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

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

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

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

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

$hpF2$ — The virtual height of the $F2$ layer measured on the ordinary

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

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

a. Descriptive Letters

The following letters are entered after or used to replace a numerical value on the monthly tabulation sheets.

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

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

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

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

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

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

G Measurement influenced or impossible because the ionization density of the layer is too small to enable it to be made accurately.

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

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

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

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

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

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

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

V Forked trace which may influence the measurement.

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

X Measurement refers to the extraordinary component.

Y Intermittent trace.

Z Third magneto-ionic component present.

b. Qualifying Letters

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

value on the monthly tabulation sheets.

D greater than.

E less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

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

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

U Uncertain or doubtful numerical value.

Z Measurement deduced from the third magneto-ionic component.

c. Description of Standard Types of E_s

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

f An E_s trace which shows no appreciable increase of height with frequency. The trace is usually relatively solid at most latitudes. This classification may only be used at night; apparently flat E_s traces observed in the daytime are classified according to their virtual hight: *h* or *l*.

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

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

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

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

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

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

sometimes extend over several hundred kilometers of virtual height.

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

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

d. Multiple Reflections from E_s

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

B. SOLAR RADIO EMISSION

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

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

Observations are feasible almost from sunrise to sunset.

a. Time and Unit

The time is expressed as U.T.

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

b. Daily Data

Flux density

The three-hourly and daily mean values are given.

Variability

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

Variability is expressed in the following four grades:

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

The number of bursts exceeding the flux level is counted.

c. **Distinctive Events**

The phenomena are picked up on the following criteria:

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

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

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

Descriptive type is denoted by the following symbols:

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

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

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

C. RADIO PROPAGATION CONDITIONS

a. **Radio Propagation Quality Figures**

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

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

The tabulated circuits contain London (commercial circuit), WWV (frequencies 10, 15, 20 Mc broadcast from Washington, D.C.), San Francisco (commercial circuit) and WWVH (frequencies 10, 15 Mc broadcast from Hawaii), which are received at Hiraiso Radio Wave Observatory near Tokyo.

Warnings of radio propagation broadcast from JJY station are expressed in three grades:

N=normal
U=unstable
W=disturbed

The letter W expresses disturbed condition expected to be during the following 12 hours after issue. The letter U and N means also unstable or normal conditions, respectively.

Whole day radio quality indices are the averages of the 6-hourly indices of London, WWV and S. F.

Start- and end-time of principal geomagnetic storms closely correlated to radio propagation conditions are tabulated from observations at Kakioka.

b. Sudden Ionospheric Disturbance (S. I. D.)

The data of short wave fade-out (SWF) are preparated from the field intensity records on following circuits received at Hiraiso. Characteristics of the phenomenon are classified as follows.

Circuits and Drop-out intensity

WS.....WWV 20 Mc, 15 Mc and 10 Mc (Washington)
SF.....Various commercial circuits (San Francisco)
HA.....WWVH 15 Mc and 10 Mc (Hawaii)
TO.....JJY 15 Mc and 10 Mc (Tokyo)
SH.....BPV 15 Mc and 10 Mc (Shanghai)
LN.....Various commercial circuits (London)

Start-time and Duration, Types and Importances are described from the data of a circuit whose Drop-out Intensity is underlined. Drop-out Intensities of 10 Mc (’), 15 Mc (none) and 20 Mc (”).

Start-times and Durations

Types

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

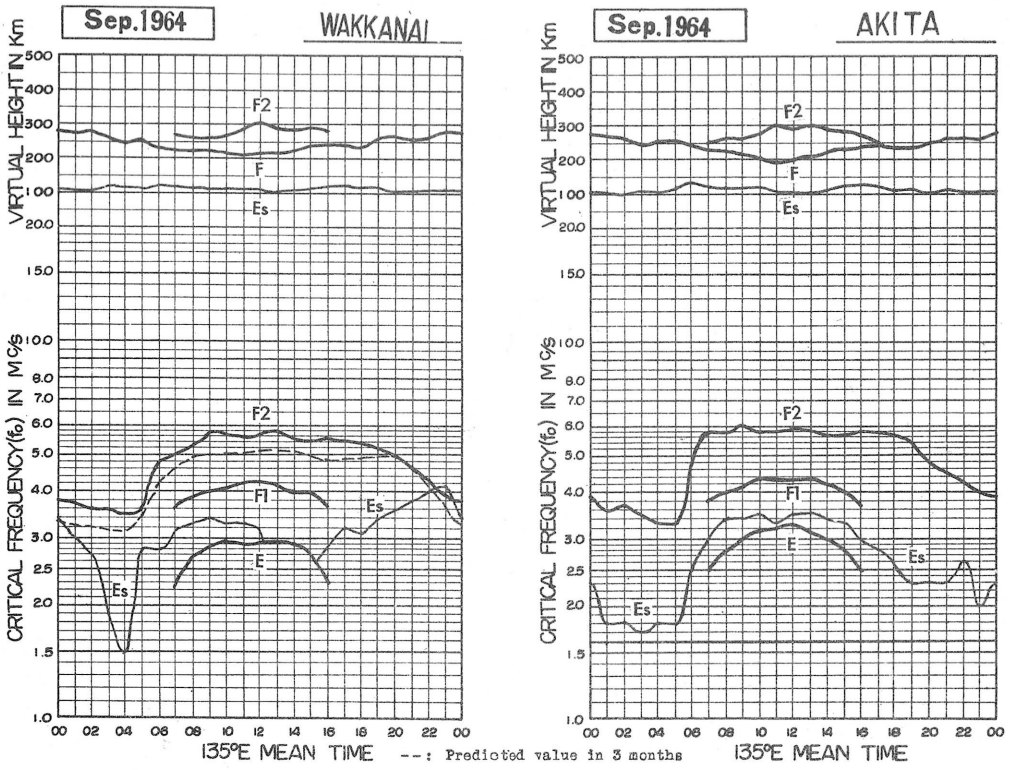
Importances

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

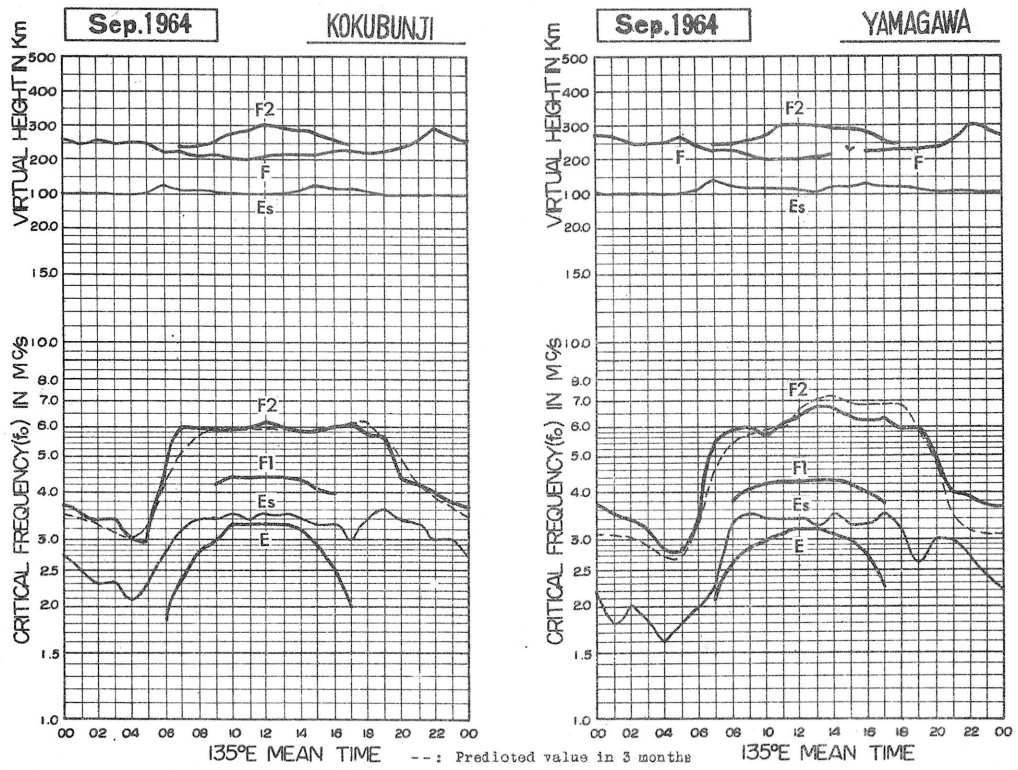
1−	1	1+
2−	2	2+
3−	3	3+

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

IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS



IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS



IONOSPHERIC DATA

Sep.1964 | foF2 | 0.1 Mc | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	043S	044	043F	SF	037F	031F	I039A	043	050	I060A	051	050	056	059	055	054	058	I055A	052	060	064S	053	SF	SF
2	035F	034	030F	030F	030F	030	I035A	I039R	I041R	I045A	048	053	050	050	046	050	I050A	049	050	055	056	046	037	C
3	C	C	C	C	C	C	C	C	C	057	051	050	050	046	048	050	049	055	064	069S	067	052	041	037
4	038	SF	042	044F	SF	SF	051	047H	058	059	056	053	055	050	058	050	050	047	050	058	060	059	052	052
5	046	036	034	036	036	I042S	049	053H	058	071	068	057	053	050	057	051	049H	053H	050	056	056	056	046S	037
6	037	036	033	033	033	034	041	049	052	056	056	048H	051	049	053	051	050	049	050	057	056	SF	A	036
7	037	034	036	036F	SF	035F	047	048	050	063R	I056A	051	054	054	053	049	048	045	053	062	059	057	045	038
8	041	038	036	034	F	SF	050	053	051	057	053	055	056	051	058	057	057	054	053	052	049	047	050	037
9	035	034	SF	041	SF	040	043H	050	057	055	056	057	053	060	053	056	056	049	049	049	050	045	041	041
10	040	039	038	033	SF	036	047	054	066	063	060	057	056	056	057	052	055	055	054	055	053	052	050	043
11	039	039	040	038	038	037	048	049	061	061	056	059	057	061	055	057	056H	054	053	061	052	048	047	048
12	044	044	044	043	SF	F	055	054	053	055	063	057	059	061	058	054	060	056	052	S	053F	SF	A	A
13	F	037	SF	F	FS	FS	049	057	051H	C	C	C	C	C	C	C	C	060	059	051	051	SF	SF	041
14	035	035F	034	034	033	039	053	058	059	063	062	053	056	056	053	055	054	058	059	053	044	045	043	040
15	038	038	037	037	036	039	056	062	062	060	058	055	056	057	053H	051	054H	054	055	055	051	043	041	034
16	033	033	033	034	035	038	048	056H	058	061	059	055	053	059	061	065	055	057	058	050	049	051	044	043
17	038	043	042	046	034	036	044	058	049	I053A	052	I053A	I057A	058	061	065	058	060	045	044	044F	044	043	040
18	036	037	036	SF	SF	SF	040	049	049	054	I056A	055	054	057	055	058	056	050	050	SF	SF	SF	SF	SF
19	SF	SF	F	F	F	FS	SF	050	057	056	057	055	054	055	055	050	055H	050	051	050	047	040	036	SF
20	SF	SF	SF	036F	SF	SF	049	053H	050	I053C	050	053	051	051	058	054	053H	058	065	055	053	041	036	036
21	036	038F	035F	SF	034F	036F	048	050	057	056	056	051	050	048	049	049H	050	061H	072S	050	043	034	033	033
22	033	033	033	033	035	034	045	049	051	056	056	059	057	058	071	081	074	065	045	040	042	043	040	040
23	038	038	036	033	033	034	051	I056A	058	063	060	066	061	055	059	056H	058	053	057	050	051	050	048	043
24	040	041	041	042	038	037	041	046	051	053	067	066	068	056	053	054	063	056	055	056	I048A	044	042	I037A
25	I036C	I035C	034	SF	033	036	I047C	I055C	I056C	061	070	062	057	065	055	056	051	054	049	047	043	040	040	037
26	037	036	035	034	035	034	045	045	053	063	060	057	054	058	056H	052	051	053	050	043	040	037	034	035
27	035	034	032	034	SF	SF	053	050	050H	056	061	059	063	057	055	049H	051	053	058	052	050	046	042	043
28	041	040	040	038	036	036	048	047	060	066	063	069	063	060	057	056H	058	068	062	050	048	048	048	046
29	045	046	044	038	042	036	048	046	050	053	061	061	059	063	065	058	055	050	049	052	050	A	SF	034F
30	SF	F	F	SF	SF	SF	046	043	056	057	056	060	056	060	055H	054H	056	058	064	SF	SF	A	A	SF
31																								
No.	25	25	24	22	17	20	28	29	29	29	29	29	29	29	29	29	29	30	30	27	28	24	23	24
Median	038	037	036	036	035	036	048	050	053	057	056	055	056	057	055	054	055	054	053	052	050	046	043	039
U. Q.	040	040	040	038	036	038	050	054	058	062	061	059	057	060	058	056	058	058	059	056	054	052	047	043
L. Q.	036	034	034	034	033	034	044	047	050	055	056	053	053	051	053	050	050	050	050	050	048	043	040	036
Q. R.	004	006	006	004	003	004	006	007	008	007	005	006	004	009	005	006	008	008	009	006	006	009	007	007

foF2

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

The Radio Research Laboratories, Japan

W 1

IONOSPHERIC DATA

Sep.1964 | foF1 | 0.01 Mc | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	A	A	420	I420A	I420A	410	400	380	A						
2								360	390	I400A	410	410	420	410	410	400	I360A	I310A						
3							C	C	C	400	420	420	430	410	400	400	380	330						
4								350	390	410H	420	420	420	420	410H	400	380							
5									410	400	I420A	430	430	430	400	400								
6								360	390	400H	410		430	420	410	390	380L							
7							370	370	390	400	I410A	I430A	430	410	400	I390A	360L							
8								350	380	410	410	430	430	410	400	380	370L							
9								380	380	400H	410	410	430	420	400	400	350L							
10								370	400	420	400	430	430	420	400	380	360L							
11									400	410	I420A	430	430	430	410	400								
12									400	420	410	420	430	420H	410	400	350L							
13									400L	C	C	C	C	C	C	C	C							
14									400	400	420	430	430	430	380	400								
15								360	400	410	420	430	420	420		400								
16									410L	410	410	430	430L	380	410	400	A							
17								360	400L	A	A	A	A	410	400	380	A							
18									400	I400A	I410A	420	420	420	I400A	A	A							
19									400	400	410	410	410	400	400									
20									380	I400C	400	410H	410	420	390	370								
21									380	400	420	410	410	400	390H									
22									410H	410	400	430	410	420	420H	390								
23									380L	I400A	400	410	I410A	420	400									
24									A	A	A	410	420	400	400	380								
25									I380C	400	400	410	420	400	400	A	A							
26									390	400	400	410	410	410										
27										400	410H	420	420	400	400									
28									380L	400	410	420	410	410H	410									
29									380	I400A	I420A	400	410	410	400									
30									A	390	410	410	400	410										
31																								
No.							1	9	25	26	26	27	28	29	26	19	10	2						
Median							370	360	390	400	410	420	420	410	400	400	365	U320						
U. Q.																								
L. Q.																								
Q. R.																								

foF1

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

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Sep.1964 | foE | 0.01 Mc | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						S	210	240	270	290	300	A	A	A	A	295	255	210	S					
2						S	A	220	260	A	A	A	A	285	A	A	A	A	S					
3						C	C	C	C	270	A	A	A	A	A	R	250	S	S					
4						S	S	240	265	I285A	I295R	285	295	295	290	280	245	S	S					
5						S	S	A	245	255	I270A	I285A	300	300	295	275	245	S	S					
6						S	S	245	265	285	A	A	A	300	290	270	245	S	S					
7						S	S	220	245	A	A	A	A	A	R	A	A	S	S					
8						S	S	200	240	I275R	300	I300R	300	295	295	A	A	S	S					
9						S	S	230	I270A	295	290	300	I315A	305	300	270	235	S	S					
10						S	S	A	R	R	R	300	310	295	285	270	250	S	S					
11						S	S	235	270	290	300	I290A	295	300	290	280	230	S	S					
12						S	S	235	280	295	295	I290A	I295A	300	A	A	A	A	S					
13						S	S	205	230	C	C	C	C	C	C	C	C	S	S					
14						S	S	A	A	295	A	A	A	A	295	275	245	S	S					
15						S	S	255	285	290	I295R	295	300	300	290	270	235	S	S					
16						S	S	245	275	295	305	305	300	295	290	275	220	S	S					
17						S	S	I225A	I265A	290	300	295	290	285	280	260	230	S	S					
18						S	S	A	A	280	295	295	295	290	290	275	230	S	S					
19						E	S	A	A	A	A	R	300	285	270	255	225	S	S					
20						S	S	235	270	I285C	295	290	290	285	290	265	210	S	S					
21							S	A	I260A	285	290	295	295	290	280	260	220	S	S					
22							S	A	A	270	300	280	I290A	I290A	280	A	A	S	S					
23						S	S	225	250	270	290	A	A	A	270	255	215	S	S					
24						S	S	210	245	250	A	A	A	290	280	260	220	S	S					
25						S	C	I220C	I240C	270	295	295	295	A	A	A	A	A	S					
26						S	S	215	265	285	295	290	295	290	I290R	260	210	S	S					
27						S	S	215	245	265	280	285	290	300	280	250	A	S	S					
28						S	S	225	265	280	290	I295A	300	295	A	A	A	S	S					
29						S	S	215	250	275	285	290	290	290	275	250	S	S	S					
30						S	A	A	A	A	290H	290	295	285	275	250	A	S	S					
31																								
No.						1	1	21	23	24	21	20	21	23	22	21	19	1						
Median						E	210	225	265	285	295	290	295	295	290	270	230	210						
U. Q.																								
L. Q.																								
Q. R.																								

foE

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

The Radio Research Laboratories, Japan

W 3

IONOSPHERIC DATA

Sep.1964 | **foEs** | 0.1 Mc | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	040	J030	J034	J033	S	J038	044	040	050	J065	046	J043	J059	043	036	G	037	J053	J033	051	J033	J033	J033	050
2	J043	S	S	E	E	S	044	033	035	J043	042	041	033	G	033	J033	J058	J053	S	034	S	S	032	C
3	C	C	C	C	C	C	C	C	C	032	033	034	034	033	033	G	G	S	S	S	S	031	J050	J035
4	S	J035	J023	J021	020	S	S	030	G	034	G	G	G	G	G	033	G	J043	033	S	S	S	S	S
5	S	S	S	J020	E	S	023	030	G	032	J058	050	G	G	G	G	027	S	S	S	S	S	033	028
6	030	020	S	E	E	S	024	029	033	G	040	050	034	G	G	G	028	028	040	J053	J043	050	051	041
7	031	S	027	028	021	033	033	034	034	040	063	050M	J060	035	G	J052	025	S	031	J044	J033	034	060	037
8	027	S	S	J025	J024	027	023	027	G	G	G	G	G	G	024G	030	033	033	S	031	030	S	S	S
9	S	S	S	J024	023	S	S	G	030	027G	G	G	033	G	G	G	G	S	S	S	S	S	S	S
10	S	S	S	E	E	S	026	033	G	G	G	G	024G	G	G	G	028	053	S	S	S	030	S	S
11	S	S	S	S	E	J023	S	027	035	034	J055	035	G	G	G	G	028	027	027	S	S	S	S	S
12	S	S	S	S	E	S	025	034	033	040	035	039	040	G	035	J033	J033	J033	030	J063	J073	043	J094	J072
13	J043	J053	041	J028	J035	030	034	050	043	C	C	C	C	C	C	C	C	028	J053	J075	061	J053	J051	043
14	J034	J030	028	E	015	028	S	028	040	027G	038	039	040	040	G	G	G	S	S	S	J031	S	S	S
15	S	S	023	E	E	S	S	G	G	G	G	G	G	G	G	G	G	S	028	025	S	S	S	S
16	S	S	E	E	015	S	S	G	023G	026G	025G	G	G	025G	G	G	041	030	027	028	S	S	S	S
17	S	S	S	013	018	J024	S	035	060	J073	076	J061	064M	G	035	035	043	J033	038M	033	030	032	J035	033
18	S	S	S	J023	J035	S	060	J063	043	042	J071	J084	051	033	045	043	051	024	S	050	J044	J043	J053	S
19	S	S	J028	E	020	J031	037	J043	038	035	043	G	G	G	G	G	G	S	S	J027	J030	J030	J033	S
20	S	030	020	018	J024	026	J029	G	G	C	G	G	G	G	034	G	029	S	S	030	030	034	028	S
21	S	J022	J024	J023	J028	024	S	030	033	G	G	G	G	G	G	G	G	023	S	S	S	S	J031	S
22	S	S	027	015	E	S	S	032	029	G	G	033	032	038	G	033	040M	038	034	030	036	J033	050	042
23	037	S	S	S	E	S	S	062M	J053	050	033	041	J073	034	026G	G	G	S	030	043	036	J043	034	038
24	S	026	038	034	E	S	023	J045	J043	060	J053	J051	042	025G	034	032	026	026	J066	065	J073	050	041	055
25	C	C	E	025	023	025	C	C	C	040	G	G	027G	033	J040	050	051	J043	J031	S	S	S	S	S
26	S	S	S	E	E	S	S	G	030	036	G	G	G	G	G	G	G	S	030	034	S	S	S	S
27	S	S	S	043	037	035	027	G	G	G	032	033	G	G	G	G	028	030	033	S	S	S	S	S
28	S	S	S	E	E	S	S	028	G	G	038	037	033	G	035	043	Q40	029	029	S	S	S	S	S
29	S	S	S	E	E	S	024	033	G	051	042	033	040	040	G	G	S	S	028	029	J076	J081	J082	050
30	031	042M	J035	022	J025	032	038	042	J053	042	G	G	G	G	G	027	040	S	J053	J075	J080	051	J052	J035
31																								
No.	9	9	14	26	28	13	16	28	28	28	29	29	29	29	29	29	28	18	19	19	16	16	18	13
Median	034	030	027	019	015	028	028	031	033	034	033	033	032	G	G	G	028	032	031	034	036	038	040	041
U. Q.	042	038	034	025	024	032	038	038	042	042	044	042	040	033	034	033	040	043	038	053	067	050	052	050
L. Q.	030	024	023	E	E	024	024	027	G	G	G	G	G	G	G	G	G	028	029	030	030	032	033	035
Q. R.	012	014	011			008	014	011										015	009	023	037	018	019	015

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

IONOSPHERIC DATA

Sep. 1964 | foEs | 0.1 Mc | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	027	022	S	028	A	040	046	A	044	035	050	042	035		035	A	033	038	E	032	030	030
2	E	S	S			S	A	027	034	A	034	040	032		030	030	A	040	S	027	S	S	E	C
3	C	C	C	C	C	C	C	C	C	G	032	034	034	033	030			S	S	S	S	E	E	E
4	S	E	E	E	017	S	S	G		032						G		040	030	S	S	S	S	S
5	S	S	S	E		S	G	027		G	058	037					G	S	S	S	S	S	021	021
6	E	020	S			S	G	G	G		035	037	034				G	G	030	040	040	E020S	A	034
7	022	S	E	026	018	028	032	033	G	034	A	043	035	032		040	025	S	030	041	030	033	021	022
8	E	S	S	020	017	G	023	G							024	030	030	028	S	023	023	S	S	S
9	S	S	S	022	018	S	S		030	026			032					S	S	S	S	S	S	S
10	S	S	S			S	G	026					024				G	023	S	S	S	E020S	S	S
11	S	S	S	S		020	S	G	033	G	052	035					G	022	025	S	S	S	S	S
12	S	S	S	S		S	G	031	G	G	G	035	035		031	030	030	022	025	024	021	027	A	A
13	025	032	027	030	025	026	026	033	031	C	C	C	C	C	C	C	C	027	021	030	032	021	E020S	024
14	021	020	018		E	027	S	026	030	026	035	034	034	032				S	S	S	021	S	S	S
15	S	S	020			S	S											S	G	E020S	S	S	S	S
16	S	S			E	S	S		023	026	025			025			040	028	023	E020S	S	S	S	S
17	S	S	S	E	017	020	S	028	033	A	046	A	A		G	G	039	030	023	025	024	021	022	E020S
18	S	S	S	020	020	S	021	027	032	026	A	G	G	G	045	040	042	G	S	030	E020S	E020S	E020S	S
19	S	S	020		E	E	026	041	030	033	037							S	S	021	E020S	E020S	023	S
20	S	019	019	017	018	019	025								G		027	S	S	E020S	022	022	E020S	S
21	S	020	020	017	019	022	S	023	030									G	S	S	S	S	023	S
22	S	S	020	017		S	S	027	029			G	032	031		030	028	G	E020S	E020S	027	027	033	032
23	022	S	S	S		S	S	A	G	042	G	040	043	032	025			S	022	033	025	041	021	027
24	S	021	022	022		S	G	032	040	047	044	032	037	025	G	G	G	023	044	045	A	025	022	A
25	C	C		016	016	023	C	C	C	G			027	030	033	043	037	031	023	S	S	S	S	S
26	S	S	S			S	S		G	G								S	E020S	021	S	S	S	S
27	S	S	S	020	022	020	021				G	G					023	021	022	S	S	S	S	S
28	S	S	S			S	S	G			G	032	031		031	030	026	E020S	E020S	S	S	S	S	S
29	S	S	S			S	G	G		040	040	G	040	G			S	S	025	025	E020S	A	028	025
30	E020S	021	021	020	020	021	031	035	050	031						G	026	S	021	E020S	021	A	A	025
31																								
No.																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

foEs

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

The Radio Research Laboratories, Japan

W 5

IONOSPHERIC DATA

Sep.1964 | f-min | 0.1 Mc | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E020S	E015S	E018S	E	E018S	E017S	E020S	020	020	020	020	021	020	020	020	020	020	E020S	E019S	E020S	E020S	E020S	E020S	E020S
2	E020S	E019S	E019S	E	E	E020S	E020S	020	020	020	022	020	021	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	C
3	C	C	C	C	C	C	C	C	C	020	020	020	020	020	020	020	020	E021S	E020S	E020S	E020S	E020S	E020S	E020S
4	E020S	E	E	E	E	E017S	E021S	020	020	020	020	020	020	020	020	020	020	E020S	E019S	E020S	E020S	E020S	E020S	E020S
5	E020S	E020S	E020S	E	E	E020S	E020S	020	020	020	020	020	020	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S
6	E020S	E	E019S	E	E	E020S	E020S	020	020	020	020	021	020	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S
7	E020S	E016S	E018S	E	E	E015S	E020S	E020S	020	020	020	020	020	021	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S
8	E020S	E020S	E020S	E	E	E020S	E020S	019	020	020	020	021	020	020	020	020	020	E020S	E019S	E020S	E020S	E020S	E020S	E020S
9	E020S	E020S	E020S	E	E	E020S	E020S	020	020	020	020	020	020	020	021	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S
10	E020S	E016S	E019S	E	E	E020S	E020S	019	020	020	020	020	020	021	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S
11	E020S	E019S	E020S	E015S	E	E015S	E020S	020	020	020	020	020	020	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S
12	E020S	E013S	E020S	E017S	E	E020S	E020S	020	020	020	020	023	020	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S
13	E020S	E	E	E	E	E017S	E020S	E020S	020	C	C	C	C	C	C	C	C	E020S	E020S	E020S	E020S	E020S	E020S	E020S
14	E020S	E015S	E	E	E	E016S	E020S	020	020	020	020	020	021	020	020	020	020	E021S	E020S	E020S	E020S	E020S	E020S	E020S
15	E020S	E020S	E	E	E	E017S	E020S	020	020	020	020	020	021	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S
16	E020S	E020S	E	E	E	E016S	E021S	020	020	020	020	021	020	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S
17	E020S	E020S	E020S	E	E	E017S	E020S	019	020	020	020	020	020	020	020	020	E020S	E020S	E019S	E019S	E020S	E020S	E020S	E020S
18	E020S	E020S	E020S	E	E	E017S	E020S	020	020	020	020	020	020	020	020	020	020	E019S	E020S	E020S	E020S	E020S	E020S	E020S
19	E020S	E016S	E	E	E	E	E020S	020	020	020	020	020	020	021	020	023	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S
20	E020S	E018S	E	E	E	E017S	E019S	020	020	C	020	020	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S	E020S
21	E020S	E	E	E	E	E	E020S	020	020	020	020	020	021	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S	E020S
22	E020S	E020S	E019S	E	E	E020S	E023S	020	020	021	020	020	020	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S
23	E018S	E020S	E020S	E019S	E	E020S	E020S	E020S	020	020	022	020	022	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S	E020S
24	E020S	E020S	E017S	E	E	E020S	E020S	E020S	020	020	020	021	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S	E020S
25	C	C	E	E	E	E019S	C	C	C	020	021	021	020	020	020	020	E020S	E020S	E020S	E021S	E020S	E020S	E020S	E020S
26	E020S	E020S	E020S	E	E	E019S	E020S	020	020	020	020	020	020	021	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S
27	E020S	E020S	E019S	E	E	E017S	E020S	020	020	020	020	025	020	020	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E022S	E020S
28	E020S	E019S	E020S	E	E	E020S	E020S	020	020	020	020	020	020	021	020	020	E020S	E020S	E020S	E020S	E020S	E020S	E020S	E020S
29	E020S	E018S	E020S	E	E	E020S	E020S	020	020	021	021	020	023	020	020	020	E023S	E020S	E019S	E020S	E020S	E019S	E020S	E020S
30	E020S	E019S	E	E	E	E018S	E020S	019	020	020	020	020	020	020	020	020	020	E020S	E019S	E020S	E020S	E020S	E020S	E020S
31																								
No.	28	28	29	26	28	29	28	28	28	28	29	29	29	29	29	29	29	30	30	30	30	30	30	29
Median	E020	E019	E019	E	E	E018	E020	020	020	020	020	020	020	020	020	020	020	E020	E020	E020	E020	E020	E020	E020
U. Q.																								
L. Q.																								
Q. R.																								

f-min

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

The Radio Research Laboratories, Japan

W 6

IONOSPHERIC DATA

Sep.1964 | M(3000)F2 | 0.01 | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	290S	315	300F	SF	350F	300F	I340A	305	310	I340A	315	300	320	310	325	315	315	I325A	310	290	330S	325	SF	SF
2	305F	305	300F	265F	325F	335	I345A	I335R	I335R	I305A	295	300	310	305	300	310	I320A	315	320	315	320	295	305	C
3	C	C	C	C	C	C	C	C	C	325	340	320	335	335	315	310	305	310	310	320S	330	345	335	320
4	310	SF	295	310F	SF	SF	325	320H	350	335	355	300	335	320	345	330	340	340	300	295	305	320	325	325
5	330	310	305	310	320	I335S	325	330H	295	325	325	345	340	335	335	350	305H	330H	315	305	305	320	350S	315
6	315	310	305	305	305	320	345	335	335	345	355	335H	315	320	330	335	320	335	315	305	320	SF	A	320
7	305	295	310	305F	SF	325F	360	340	300	335R	I315A	335	300	335	330	345	325	300	290	285	295	315	305	290
8	295	305	305	285	F	SF	350	350	350	335	305	325	310	335	310	335	320	335	320	300	315	300	340	295
9	310	305	SF	335	SF	315	305H	335	320	365	340	345	340	335	320	315	355	325	325	300	300	320	295	290
10	295	310	325	295	SF	310	325	335	340	335	340	335	330	320	340	325	330	335	320	315	305	310	320	305
11	305	300	300	305	310	325	360	345	350	360	335	340	335	330	335	320	340H	335	315	330	310	310	300	315
12	320	315	300	315	SF	F	350	385	355	330	365	315	340	330	330	315	335	345	315	S	320F	SF	A	A
13	F	305	SF	F	FS	FS	350	360	355H	C	C	C	C	C	C	C	C	335	340	310	310	SF	SF	330
14	325	305F	295	295	305	335	345	350	355	375	355	355	340	320	325	350	350	345	335	335	320	305	315	325
15	315	305	310	315	320	310	355	355	355	350	370	330	335	350	320H	340	355H	350	325	325	320	320	310	295
16	310	305	310	320	320	325	340	355H	350	360	340	350	330	340	330	340	345	340	330	305	290	335	320	300
17	295	285	285	305	330	310	325	360	315	I325A	325	I330A	I320A	335	330	335	345	350	340	320	285F	295	300	290
18	305	295	305	SF	SF	SF	350	345	320	325	I340A	330	335	335	345	345	335	340	340	SF	SF	SF	SF	SF
19	SF	SF	F	F	F	FS	SF	345	350	355	355	345	340	345	345	325	350H	350	325	325	325	310	320	SF
20	SF	SF	SF	295F	SF	SF	345	380H	360	I365C	350	360	335	320	345	335	335H	340	325	325	345	315	310	310
21	310	325F	330F	SF	310F	305F	330	340	355	345	355	355	360	335	335	345H	320	330H	345S	340	350	320	305	305
22	305	295	310	320	345	315	360	345	345	355	355	340	345	290	295	310	325	360	335	300	285	300	300	300
23	305	315	320	325	305	315	335	I345A	350	320	335	350	340	330	340	340H	345	355	335	290	315	320	335	300
24	310	295	295	335	340	345	355	350	335	325	345	350	350	360	350	350	350	360	335	320	I315A	305	285	I310A
25	I310C	I320C	325	SF	310	340	I345C	I355C	I360C	345	355	350	325	345	345	340	345	350	330	320	325	300	320	325
26	305	310	315	325	340	330	380	360	360	360	365	355	335	330	325H	335	335	345	325	315	330	315	310	310
27	310	325	315	325	SF	SF	360	360	350H	355	360	325	345	335	345	335H	335	340	330	315	315	330	310	305
28	310	305	300	315	315	315	355	340	335	350	340	340	350	335	335	345H	330	350	330	290	275	300	315	315
29	320	305	280	290	295	335	340	350	340	325	350	330	340	330	345	350	340	335	305	295	320	A	SF	320F
30	SF	F	F	SF	SF	SF	350	365	355	360	340	350	340	335	355H	350H	340	330	330	SF	SF	A	A	SF
31																								
No.	25	25	24	22	17	20	28	29	29	29	29	29	29	29	29	29	29	30	30	27	28	24	23	24
Median	310	305	305	310	320	320	345	345	350	345	340	340	335	335	335	335	335	340	325	315	315	315	310	310
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

W 7

IONOSPHERIC DATA

Sep.1964 | M(3000)F1 0.01 | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	A	A	380	I380A	I375A	375	350	I360A	A						
2								370	365	I375A	400	I365A	380	395	365	360	I370A	I365A						
3							C	C	C	390	400	405	370	395	380	340	340	345						
4								405	385	390H	390	390	380	405	365H	375	370							
5									365	390	I380A	385	380	375	375	375								
6								380	385	400H	400		375	360	360	370	370L							
7							355	380	360	375	I390A	I370A	370	365	375	I375A	360L							
8								375	395	370	395	370	360	390	380	370	360L							
9								370	390	375H	385	405	370	375	395	375	385L							
10								355	350	385	405	380	375	380	385	375	370L							
11									375	385	I380A	375	370	370	375	370								
12									400	400	395	400	390	380H	385	380	400L							
13									410L	C	C	C	C	C	C	C	C							
14									395	380	385	390	370	370	395	360								
15								415	380	390	390	400	380	370		375								
16									375L	410	410	375	395L	420	365	375	A							
17								390	375L	A	A	A	A	400	375	370	A							
18									380	I395A	I385A	380	400	365	I385A	A	A							
19									375	380	385	390	395	390	375									
20									395	I380C	410	395H	390	380	400	390								
21									395	395	380	400	390	405	380H									
22									390H	385	400	360	380	380	345H	360								
23									395L	I385A	400	I375A	I390A	385	375									
24									A	A	A	380	I365A	380	380	380								
25									I390C	390	425	400	380	380	375	A	A							
26									375	380	395	395	390	365										
27										400	390H	405	380	385	380									
28									395L	380	390	380	380	375H	370									
29									370	I380A	I375A	395	I380A	365	375									
30									A	390	385	395	380	385										
31																								
No.							1	9	25	26	26	27	28	29	26	19	10	2						
Median							355	380	385	385	390	390	380	380	375	375	370	U355						
U. Q.																								
L. Q.																								
Q. R.																								

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

M(3000)F1

IONOSPHERIC DATA

Sep. 1964 | h'F2 | kmp | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	A	A	370	I320A	315	285	310	280	A						
2								R	R	A	400	360	350	350	400	345	I295A	300						
3								C	C	290	295	345	315	300	350	345	330	300						
4								250H	260	270	265	350	290	350	285	320	290							
5									330	280	I260A	285	300	315	295	280								
6								285	300	270	275		350	340	305	310	300L							
7							275	275	350	265	I310A	300	370	295	300	290	295							
8								260	270	275	350	315	335	300	320	285	280							
9								290	300	255	300	285	300	290	320	320	255							
10								290	270	260	265	290	290	310	290	300	275							
11									255	245	I275A	305	300	290	280	300								
12									250	305	250	295	300	290	280	290	260							
13									240L	C	C	C	C	C	C	C	C							
14									260	240	260	270	290	315	270	275								
15								245	255	260	240	315	305	275		270								
16									255	250	270	265	310	275	295	265	260							
17								250	300	I305A	315	I295A	I310A	290	285	270	255							
18									295	285	I295A	310	310	280	275	265	265							
19									250	275	260	280	290	275	275									
20									250	I255C	270	280	315	315	280	295								
21									250	270	270	270	275	290	290									
22									270	260	260	280	290	375	315	290								
23									250	260	270	260	280	285	280									
24									270	A	270	265	255	255	270	270								
25									I250C	255	250	275	295	270	270	275	255							
26									260	250	245	260	295	275										
27										260	255	285	270	280	270									
28									260	250	265	265	255	270	280									
29									280	300	265	270	275	290	265									
30									I260A	250	270	270	285	275										
31																								
No.							1	8	26	26	28	28	29	29	26	21	14	2						
Median							275	270	260	260	270	285	300	290	285	290	280	300						
U. Q.																								
L. Q.																								
Q. R.																								

h'F2

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Sep.1964 | h'F | km | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	275	275	290A	260	215	A	A	A	A	A	A	225	I225A	I230A	240	225	I250A	A	A	A	230	I250A	I280A	I280A
2	300	280	300	270	250	270	I255A	230	250	I245A	215	I245A	230	210	230	240	I230A	I245A	260	260	250	270	280	C
3	C	C	C	C	C	C	C	C	C	225	205	200	210	215	200	260	250	250	260	250	235	225	240	250
4	260	265	275	260	250	250	235	225	210	225H	210	200	225	200	200H	240	235	I250A	I255A	270	255	250	245	250
5	250	240	285	245	250	230	225	225H	235	230	I235A	230	200	200	200	240	220H	240H	250	265	265	235	240	275
6	280	275	295	250	255	260	245	240	230	200H	210	230H	210	240	240	230	235	245H	I255A	I265A	I275A	255	I250A	I250A
7	275	275	275	310A	250	I245A	275	250	235	225	I220A	I230A	215	210	250	I230A	230	245	295A	I290A	I290A	I285A	280	325
8	285	295	285	300	300	275	250H	245	225	225	210	200	230	220	220	235	250	255	250	260	285	295	245	280
9	295	300	275	250	270	260	220H	250	230	200H	240	200	225	215	205	200	250	225H	235	260	275	250	290	310
10	290	270	255	270	250	275	260	250	215	220	210	205	210	215	210	220	245	250	240	260	275	260	250	250
11	280	290	280	270	260	255	235	225H	250	230	I225A	225	210	230	215	230	245H	250	245	250	250	260	280	255
12	260	260	285	260	250	230	225	225	210	200	210	210	210	190H	210	235	250	230	260	260	250	300A	A	A
13	300	I320A	330A	I275A	260	270A	240	240	215	C	C	C	C	C	C	C	C	250A	235	I245A	I265A	260	255	250
14	265	290	290	250	250	250	225	230H	215	200	215	220	230	220	210	210	255	255	225	230	270	265	255	250
15	275	280	275	255	250	260	235	210	210	215	220	210	195	220	230H	230	245H	240	240	245	245	250	260	270
16	275	290	260	230	260	245	225	210H	230	210	210	200	200	195	225	245	I250A	245	240	245	280	245	250	275
17	310	300	305	250	240	260	250	235	260	A	A	A	A	210	220	250	I250A	240A	230	260	310	295	260	280
18	295	300	290	265	260	225	215	245	225	I220A	I230A	200	195	250	I240A	I245A	I245A	235	230	I265A	275	250	265	255
19	275	275	290	250	255	240	235	I240A	235	215	240A	200	200	220	225	230	245H	240	240	250	245	250	280	290
20	280	290	280	275	280	250	240	225H	210	I215C	210	195H	210	220	235	210	245H	255	240	240	245	250	270	285
21	265	250	265	280	275	270	230	225	220	220	240	210	200	200	200H	230H	230H	250H	230	225	230	260	300	290
22	300	300	290	265	235	255	235	225	200H	230	210	240	220	200	220H	250	245	225	240	270	310A	315A	I335A	I305A
23	300	275	250	260	255	275	240	I235A	235	I230A	210	I205A	I210A	230	200	245H	250H	240	240	I275A	275	I275A	240	300A
24	260	290	300	255	225	245	215	260	A	A	A	235	I230A	250	250	250	260	235	A	A	A	280	265	I300A
25	I285C	I270C	260	255	260	250	I235C	I250C	I235C	230	200	200	210	210	250	I250A	I250A	255A	240	260	260	280	265	260
26	280	275	265	250	220	260	210	210	235	225	210	200	200	200	250H	245	245	225	220	260	250	265	295	295
27	295	260	260	265	295	260	210	220	215H	225	205H	225	210	210	230	225H	250	250	240	250	250	245	270	260
28	280	275	280	250	235	260	220	230	240	215	210	210	200	190H	230	260H	265	230	225	290	300	270	255	260
29	250	260	310	280	280	250	250	250	245	I240A	I235A	220	I245A	240	240	250	245	245	265	295	270	A	245	300
30	325	300	275	265	250	250	I250A	235	I240A	210	200	195	205	225	225H	250H	250	245	240	250	235	I260A	I265A	285
31																								
No.	29	29	29	29	29	28	28	28	27	26	26	28	28	29	29	29	29	29	28	28	29	29	29	28
Median	280	275	280	260	250	255	235	230	230	220	210	210	210	215	225	240	245	245	240	260	265	260	265	280
U. Q.																								
L. Q.																								
Q. R.																								

h'F

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

The Radio Research Laboratories, Japan

W 10

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IONOSPHERIC DATA

Sep.1964 | h'Es | km | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

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

h'Es

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

The Radio Research Laboratories, Japan

W 11

IONOSPHERIC DATA

Sep.1964 | **Types of Es** | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N, Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f2	f2	f2	f2		c2	c3	c2	c2	c2	c	1	12	12	1		h	c5	c2	f4	f	f2	f5	f2
2	f						13	c	c2	1	1	12	1		1	1	13	12		f2			f	
3										c	1	1	1	1	1							f	f	f
4		f2	f	f	f			c		1						h		c3	12					
5				f			c	1		c	12	12					c						f	f
6	f	f2					h	c	c		1	12	1				h	c	c2	f2	f3	f2	f3	f
7	f2		f	f f	f	c2	c2	c3	c	1	1	12	1	1		12	h 1		c	f4	f2	f2	f2	f2
8	f			f3	f	c	c	c							1	12	1	c2		f	f2			
9				f	f				1	1			1											
10							c	h 1					1				h	1				f		
11						12		c	c	c	c2	1					h	c	c					
12							h	c	c	c	c	1	1		1	1	1	1	c	f2	f2	f	f4	f4
13	f2	f2	f2	f	f3	13	12	13	c2									c	c2	f	f2	f2	f2	f2
14	f2	f2	f		f	c3		1	12	1	1	1	1	1							f			
15			f																c	f				
16					f				1	1	1			1			c2	c	c	f				
17				f	f	c2		h 1	h 1	c31	c2	c2	c3		h	h	c	c2	c	f	f2	f	f	f
18				f	f2		c	c 1	1	c 1	c4	c	c	c	c	c	c2	c		f2	f2	f	f	
19			f2		f	c	c2	12	1	12	12									f	f	f	f2	
20		f	f	f	f2	c	c2								h		c			f	f	f2	f	
21		f2	f2	f	f2	f2		1	12									c					f	
22			f	f				1	1			c	1	1		1	1	c	1	f	f2	f2	f3	f2
23	f2							c3	c	c2	c	1	12	1	1				c	f3	f	f8	f	f2
24		f	f2	f			c	c2	c3	c2	1	1	1	1	h	h	h	c	c2	f2	f2	f	f2	f2
25				f	f	c				c			1	12	13	12	12	12	1					
26									h	c									1	f				
27				f2	f	1	1				c	c					1	1	1					
28								h			c	1	c		1	12	1 h	1	1					
29							c	c		c3	c	h	c	c					c	f2	f2	f4	f2	f2
30	f	f	f2	f2	f	f2	12	12	12	12						h	1		c	f	f2	f3	f	f2
31																								
No.																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

Types of Es

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

The Radio Research Laboratories, Japan

W 12

IONOSPHERIC DATA

Sep. 1964 | foF2 | 0.1 Mc | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39°43.5' N, Long. 140°08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	F	043F	F	F	027S	043	054F	059	065	I058A	I057A	069	074	066	055	056	059	069S	071	F	F	I040R	I040R
2	039	F	F	031F	I030A	030	I040S	041S	E040G	045	053	061	058	053	049R	054	057	I060A	062R	I070R	I059R	I036A	I032A	I031A
3	I030A	032F	031F	I032A	033	035	044	058	059	060	056	050	052	I049R	I049R	053	054	054	070	073	066	050	036	033
4	F	FS	037	041	040	043	J052R	058	058	065	055	053R	059	050	053	057	054	051	049R	057R	060	060	043R	045
5	F	037	032	035	F	039	I047R	061R	066	083	081	062	055	051	054	060	051R	049S	053	C	C	C	C	C
6	C	C	034	035	033	033	044	060R	055	059	056	052	056	056	052R	057	053	054	060	063	059	I046R	044R	036
7	036	034	036R	039	036	036	043R	I052A	I056A	060	053	052	057	058	053	053	050	048R	057R	063	062	057	FS	050R
8	050	045	040	035F	035	035F	I052R	058	056	056	055	059	064	058H	054H	055	059	058	050	I052R	051	048	051	046S
9	040S	039	039	032S	F	035S	I047R	048	059	U071R	059	061	059	057	060	055	068	059	051	044	044	045	042	041
10	040	039	040	033	031	032S	I046S	059	069	071	058	059	057	059	057	057	055	060	063	055S	051	052	049S	046S
11	041	040	039	036	034	035S	I054R	055	058	060	057	058	060	060	060	059	065	061	060	054	048	045	043	040
12	I042R	040R	037	036	037F	039	046	053R	059	059	058	056	060	059	058R	062V	063	057	051	052R	049R	044S	FS	041F
13	040	038	F	036	031	033	052R	058	061H	060	053	058	058	061	060	058	066	061	059	058	053R	050	046	039
14	I038A	036	036F	034	034S	033	050	064	071S	066	058	058	059H	055	062	057	054	058	058	051	046	043F	044S	042S
15	037	036S	034	035S	034	033	051S	070	058	062	056	057	053	059	057	053	054S	055	057	060	053	046	041	039
16	035	034	035	032	031	032	050	064	065	056	C	C	054	056	068	059	063	059	059	060	048	047	045	042R
17	039	040	039	043	042	034S	J056R	060	059	069	062	056H	065	066	062	078	066	055	049	041	042R	I042R	RS	FS
18	FS	036F	034	037	034	026	045	051	I050A	054	061	060	055R	059	058	055	058	058	053R	I047A	044	043	044	042R
19	039F	040S	037F	035	F	034F	046R	053	057	067	059	057	055	055	057	052	052	057	049S	050R	045	038	037S	039
20	037	037S	036F	F	F	F	048	060	051	056	057	053	051	055	052R	056	056	060	068	065	048R	044R	041	039
21	038	035	033	033	030	030R	048	059S	055	057	057	051	049	050	049	048	050	055	071R	057	032	029	028	029
22	028	029	029	030	028	025	046S	054R	053	057	051R	060	063	058	070	075	085	074	043	040	042	I043R	043F	039F
23	040	041	040	035	030	032	051	062S	057	073	I068R	062	065	C	C	C	C	C	051	045	I046R	I044R	I042R	038S
24	035R	033	F	F	040	F	049R	048	059S	062	068	066	073	064	058	057	062	065	I056A	050	F	045	FS	FS
25	FS	F	037	036	033	033	I046R	059	058	072	060	060	068	066	064	056	060	063	049S	040	I040R	FS	037F	038
26	033F	034	033	033	029	F	046S	052R	053	061	062	058	056	059	055H	058	058	062	053	038S	036	034	034	034
27	035S	035	033	032	031	C	C	C	C	061	054	062	066	064	057	052	055	058	061	054	049	I045C	041S	040
28	040	040	038	036	034	FS	046S	058	057	065	I064C	067	064	057	059	060	065	068	U065R	047R	045R	048	048	043
29	046	035	039S	038	036	035	049	J063R	053	056	079	067	065	067	067	063	058	057	054	054	I052A	A	FS	FS
30	F	F	037F	F	033F	029F	039S	055	060	059	055	064	061	059	057	056	062	063R	064	062	054	044	043	042
31																								
No.	23	24	27	26	25	25	29	29	29	30	29	29	30	29	29	29	29	29	30	29	27	26	24	26
Median	039	036	037	035	033	033	047	058	058	060	058	058	059	058	057	057	058	058	057	054	048	045	042	040
U.Q.	040	040	039	036	036	035	050	060	059	066	062	062	064	060	061	059	063	061	062	061	053	048	044	042
L.Q.	035	034	034	033	031	031	046	053	055	057	055	056	055	055	054	054	054	055	051	047	044	043	038	038
Q.R.	005	006	005	003	005	004	004	007	004	009	007	006	009	005	007	005	009	006	011	014	009	005	006	004

foF2

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

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Sep. 1964 | foF1 | 0.01 Mc | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39°43.5' N, Long. 140°08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	A	A	420	A	A	A	420	410	390	A	A						
2								L	400	410L	420	U420A	430	430	430L	400	370S	A						
3							L	380L	400	420	430	430	440	430	430	400	390L	360L						
4								390L	410	410	440L	440	430	430	430	410	380L	L						
5							L	390	I420A	420	420H	44C	440	430	420	400	L							
6								380L	400	420	430L	430L	430H	I430A	L	400	A	L						
7								A	A	I420A	430	440	420	430L	420L	400	370L	L						
8								350	420L	LH	440	420	430H	430	430	LH	LH	L						
9								L	400	410	410	420H	430H	440	430L	410	370L	L						
10								L	400L	420	430	430	430	420	420L	380L	L	L						
11								L	400	420L	430L	430	440	L	430	420L	L	L						
12								L	A	440L	440	450L	450	430L	I430A	420L	390L							
13								L	410H	I420A	430	440H	440	440H	440L	400	390L	L						
14								L	L	410	430	L	430L	430	420L	400	L	L						
15								L	400L	430	420	430	L	L	420	410L	A	L						
16								L	400L	420L	C	C	430	430	410A	I400A	A	A						
17							L	A	A	410L	430L	430L	440	430	430H	400	L							
18								L	A	400L	410	430	430	420	400	400L	L							
19								L	400	410	430L	430	420	420L	410L	L	L							
20								370L	370	410	410H	440	430	430	420	400	L	L						
21								L	400	410	410	430H	410H	410L	410L	400L	L							
22								L	380L	410	450H	430	430	430	410	400	L							
23								L	L	A	I420A	I420A	430L	C	C	C	C							
24									L	I400A	420L	440H	420	420H	L	L	L							
25								L	L	410L	420L	440	440H	430	420	L	L							
26									400L	410	430H	430	430	420H	410L	L	360							
27								C	C	410	L	420R	440L	420L	400	L	L							
28									L	400	I420C	430H	430	430	420	L	370S							
29								L	L	L	430L	I420A	420L	I420A	410L	L								
30								L	L	410L	430	420	L	L	L	L	L							
31																								
No.								6	17	27	27	27	27	26	26	20	9	1						
Median								380	400	410	430	430	430	430	420	400	370	360						
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

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

IONOSPHERIC DATA

Sep. 1964 | foE | 0.01 Mc | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39°43.5' N, Long. 140°08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	240	A	A	A	A	A	A	A	290	265	A						
2							A	A	A	A	A	A	A	325R	305	I290A	260A	A	E					
3							A	A	A	A	A	A	A	A	A	A	A	A	E					
4							A	A	A	A	I315A	325R	U335R	330	A	A	A	A	E					
5							A	A	A	A	315R	325R	330	A	A	285A	A	A						
6							A	255	275A	I295A	I315A	A	A	A	315A	300A	A	A	E					
7							A	A	A	A	A	A	A	A	A	300A	270A	A						
8							A	A	A	A	320	I320A	320	310	305	I280A	250	215						
9							A	A	290	I300R	310	320	I320A	320	305	A	A	A						
10							A	A	I285A	I305A	I320A	320	320	I310A	295	280	250	A						
11							A	A	I270A	A	A	325R	I330A	I340A	310A	I290A	I260A	A	E					
12							A	A	275A	A	A	A	A	A	A	A	A	A						
13							A	A	A	A	A	A	A	325	I310A	295	A	A						
14							A	A	A	A	320	A	A	A	A	A	A	A						
15							A	A	280	310	I315A	320	320	315	I300A	270	I235A	A						
16							A	A	275	300	C	C	335S	320	300	280A	255A	A	E					
17							A	A	275A	300	310A	320A	A	A	300	285	245A	A						
18							A	A	A	A	310A	320	325A	315A	A	A	A	A						
19							A	250A	I270A	I300A	310	320	320	310	290	270	I240A	A						
20							E	255	280	300	315A	320	325	315	295	275	230A	A						
21							A	A	280	300	315	325	325	305	290	275S	A	A						
22							A	A	A	A	A	A	A	A	A	A	A	A						
23							A	A	A	A	A	A	A	C	C	C	C	C						
24							A	A	A	A	A	A	320	310	295	275	240A	A						
25							A	A	A	A	A	A	325A	315	295	270S	A	A						
26							A	A	A	A	310A	325	325R	R	A	A	A	A						
27							C	C	C	A	R	315	320	305	I295A	A	A	A						
28							A	250	280	I290R	I305C	320	330	320	A	A	A	A						
29							A	A	A	295	310	305	305	305	300	270	230	E						
30							S	I235A	I280A	295	305	310	A	A	A	265	235	A						
31																								
No.							1	6	13	12	17	17	18	18	17	19	14	2	6					
Median							E	250	280	300	315	320	325	315	300	280	250	E	E					
U.Q.																								
L.Q.																								
Q.R.																								

foE

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Sep. 1964 | foEs | 0.1 Mc | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39°43.5' N, Long. 140°08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J063	J039	J025	J033	J020	E	036	J048	J061	J043	J080	J083	J054	J036	J051	034	J039	J046	J050	J025	J069	J034	J035	J030
2	J030	J034	E	J041	J033	J028	J033	J031	036	J033	J037	J046	J043	J039	G	033	029	J073	J051	J033	J042	J060	J059	J051
3	J053	J023	J035	J058	J043	E	J029	029	J033	J033	J033	J050	J035	J065	J048	J043	J042	028	J025	J023	J022	J021	J023	J043
4	J029	J022	J017	J058	J022	S	023S	027	J050	J033	J034	J025G	G	J028G	J028G	J033	030	023	023	J023	E	J030	J026	J023
5	J034	J020	J027	J021	J021	J045	J022	J028	J061	J033	G	G	J032G	J042	J037	032	032	J031	J025	C	C	C	C	C
6	C	C	E	E	E	E	028	033	033	033	033	035	034	J048	040	J053	J040	J046	J025	J018	J031	J063	J037	J021
7	J038	J043	J030	J025	J028	J028	J038	J065	J054	J058	J037	J045	J038	J050	035S	033	028	026	J026	J028	J023	J025	J018	J034
8	J028	J018	J030	E	J018	J024	J032	J033	J029	031	J050	J033	G	G	023G	030	G	G	J031	J053	J036	J020	J024	E
9	J021	E	E	E	E	E	022	035	032	036	035	G	035	035	G	035	030	J022	J020	J020	E	J023	E	E
10	E	J025	J019	E	E	J018	J035	030	035	038	035	G	035	J035	G	030	027	J031	J033	J027	E	E	J021	E
11	E	J023	E	E	J018	J018	024	030	032	033	033	J033	J045	J035	033	031	030	023	024	023	S	E	J018	J018
12	E	E	J017	J043	J041	J047	J030	033	J050	J054	J040	J050	J067	035	J062	J043	J033	J038	J036	J018	E	E	J027	J025
13	J042	J035	J025	E	J018	E	025	J038	J034	J053	J038	J038	J033G	J033	J044	J030	J026	026	J030	J038	J030	J038	J026	J031
14	J038	J032	J025	J018	E	E	J028	J038	033	034	G	J031G	J036	J040	J041	J039	J033	J030	J025	J028	J021	J026	J037	J020
15	J023	J023	E	J025	J018	J025	J024	031	034	G	034	034	G	030G	J033	034	037	030	J027	E	J023	J023	E	E
16	E	E	E	E	J018	J018	022	026	G	G	C	C	038	040	044	J060	J042	J043	022	023	J030	E	J018	J018
17	S	E	J018	023	023	S	025	J038	J053	032	037	037	032G	035	G	J031	033	J029	J021	J019	E	J019	J032	J025
18	J018	J017	J018	E	J018	E	028	J035	J065	J067	J040	037	043	036	034	J038	J048	J026	J033	J043	J028	J028	J018	S
19	E	E	E	S	J027	J021	024	029	J033	035	034	035	G	G	G	G	028	023	J018	J020	J034	J023	J029	J019
20	J036	J043	J035	J030	J030	J029	J025	G	G	G	J040	G	G	035	039	033	J040	023	S	J021	J021	E	J021	E
21	S	E	J019	E	E	J025	J034	J037	G	G	G	G	G	034	035	030	J028	J028	S	E	E	E	J026S	E
22	E	E	J018	J017	J023	J018	J023S	028	030	037	J033	J033	036	J038	J035	033	J025	027	J028	S	J021	J025	J028	J035
23	J026	J025	E	E	E	E	J018	J030	J043	J058	J080	J092	J045	C	C	C	C	C	J021	J029	J038	J033	J043	J033
24	J035	J018	J021	E	J018	E	025	J035	J053	J056	J050	J033	034	G	031	G	032	J037	J048	J038	J061	J032	J028	J051
25	J028	J030	J028	J022	E	J018	J042	J029	J083	J038	J041	035	035	028G	J026G	J023G	J028	J025	E	J038	J027	S	017	E
26	J018	E	E	J017	S	S	021S	030	030	J033	034	G	G	G	J031	J035	028	J025	J033S	J023	J023	J017	E	E
27	E	E	E	E	E	C	C	C	C	034	G	G	037	034	034	032	J028	J028	J025	J018	E	C	E	E
28	E	J017	E	E	E	E	023	030	030	G	C	G	J033G	G	J035	034	J036	J030	J032	J026	J018	J018	E	E
29	E	E	E	E	E	E	J019	J028	J033	035	036	J049	035	J051	G	G	G	025	E	J064	J075	J074	J033	J024
30	E	E	J019	J024	J019	E	S	J030	J048	J033	G	028G	J036	J034	J029	G	028	023	J028	J018	J023	E	J028	J021
31																								
No.	27	29	30	29	29	26	28	29	29	30	28	29	30	29	29	29	29	29	28	28	28	27	29	28
Median	023	018	018	017	018	018	025	030	034	034	035	033	035	035	034	033	030	028	026	023	023	023	026	020
U.Q.	035	028	025	025	023	025	031	035	052	038	040	042	038	040	040	035	036	031	032	031	032	032	030	030
L.Q.	E	E	E	E	E	E	023	029	031	033	033	G	G	G	G	030	028	024	022	020	E	E	018	E
Q.R.							008	006	021	005	007					005	008	007	010	011			012	

The Radio Research Laboratories, Japan

foEs

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

A 4

IONOSPHERIC DATA

Sep. 1964 | foEs | 0.1 Mc | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39°43.5' N, Long. 140°08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	025	E	017	E		035	046	046	042	A	A	050	034	034	031	039	044	050	E	017	E	030	032
2	031	E		E	A	020	031	029	033	030	033	044	043	G		031	028	A	035	020	A	A	A	A
3	A	017	020S	A	E		019	026	032	032	032	040	034	040	038	033	034	027	025	017	018	018	018	018
4	017	E	017	017	017	S	020	025	030	031	033	023G		028G	E028G	030	028	021	019	020		018	017	019
5	020	018	017	E	E	020	021	027	045S	032			020G	036	034	031	030	027	018	C	C	C	C	C
6	C	C					026	030	031	032	033	034	034	047	040	032	040	032	023	017	020	019	018	017
7	021	022S	020	018	020S	020	030	A	A	051	035	039	037	036	033	G	G	024	020	023	019	017	017	024
8	019	017	018		E	018	030	027	028	030	G	032			022G	028			029	040	030	E	017	
9	E						021	033	G	031	034		033	034		029	027	018	E	E		E		
10		E	017			E	023	027	030	032	033		035	035		030	027	021	030	018			E	
11		E			E	E	020	028	030	033	032	G	037	034	G	U031R	030	023	017	E	S		017	018
12			E	019	018	027	028	029	041	039	034	040	038	032	051	035	030	025S	029	017			020	018
13	017	018	017		E		023	032	029	053	036	035	033G	033	038	024	026	023	020	038	017	018	017	020
14	A	025	022	017			028	030	031	033		E031R	034	035	031	029	027	021	E	E	E	E	E	E
15	E	018		017	E	E	018	026	G		033	G		029H	031	030	035	025	E		E	E		
16					E	E	020	026			C	C	G	040	042	055	040	031S	017	021	019		017	017
17	S		E	E	019	S	019	038S	045	031	033	035	032G	034		G	029	025	017	017		017	025	017
18	017	E	E		E		024	028	A	036S	037	037	036	034	034	032	035S	025	017	A	020S	017	017	S
19				S	E	018	020	G	020S	031	G	028					026	019	E	017	E	E	E	E
20	E	030	017	017	017	017	018				G			035	035	032	028	020	S	E	E		017	
21	S		E			017	020S	025						034	034	G	027	025S	S				E	
22			E	E	017	E	021S	026	030	032	033	032	032	038	034	030	025	022	017	S	E	018	017	019S
23	020	E					018	025	035	051S	055	055	033	C	C	C	C	C	E	E	018	023	022	030
24	025S	E	E		E		023S	026	031S	048	040	032	034		031		032	033	A	017	019S	017	017	020S
25	025	018	020	E		017	035	023	031	033S	033	033	G	028G	025G	022G	025	023		020S	020S	S	017	
26	E			E	S	S	019	025	028	031	G				029	030	028	020S	017	E	019	E		
27						C	C	C	C	034			036	033	031	030	025	022	018	E				
28		E					021	027	030		C		028G		031	031	028S	022	020S	E	019	E		
29							018	025	029	032	035	045	035	051				021		017	A	A	E	E
30			E	E	E		S	024	029	025		026G	032	034	029		G	017	017	E	E		E	018
31																								
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

foEs

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Sep. 1964 | f-min | 0.1 Mc | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39°43.5' N, Long. 140°08.2' E

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

f-min

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

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Sep. 1964 | M(3000)F2 | 0.01 | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39°43.5' N, Long. 140°08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	F	295F	F	F	315S	310	320F	340	350	I325A	I310A	305	330	340	320	315	315	315S	325	F	F	I305R	I310R
2	310	F	F	300F	I315A	330	I350S	320S	G	265	310	330	335	325	280R	325	315	I320A	320R	I330R	I360R	I310A	I305A	I305A
3	I300A	290F	305F	I315A	305	330	325	360	340	350	355	340	310	I310R	I310R	325	325	315	315	330	355	350	345	315
4	F	FS	320	305	335	325	J350R	340	345	355	320	320R	340	345	315	335	350	355	305R	305R	315	335	320R	320
5	F	315	315	320	F	335	I320R	345R	320	335	350	330	335	345	315	340	335R	305S	300	C	C	C	C	C
6	C	C	295	305	305	305	335	350R	345	340	325	325	350	340	330R	345	325	330	330	320	340	I320R	325R	335
7	335	305	320R	330	330	325	345R	I340A	I335A	350	340	280	315	325	335	340	335	305R	305R	310	325	300	FS	290R
8	300	310	330	290F	295	320F	I340R	365	340	320	330	315	335	320H	310H	320	325	335	310	I310R	295	295	300	305S
9	305S	310	315	320S	F	320S	I335R	345	335	U360R	335	335	325	300	325	305	340	360	335	310	290	295	295	295
10	305	310	310	310	305	315S	I330S	335	345	355	335	340	335	340	320	340	330	345	340	325S	315	300	300S	300S
11	300	305	305	310	315	315S	I350R	350	335	350	335	330	325	330	340	320	340	355	345	335	305	310	305	320
12	I300R	305R	300	310	325F	345	395	360R	360	355	340	345	350	325	325R	340V	350	355	335	315R	345R	300S	FS	310F
13	315	315	F	340	340	325	365R	380	335H	350	385	325	330	330	335	330	345	350	325	325	320R	305	330	335
14	I320A	310	310F	325	325S	335	340	360	360S	375	340	330	340H	320	330	345	330	340	335	340	315	305F	310S	325S
15	320	310S	305	300S	305	310	335S	365	360	350	350	340	305	325	350	340	335S	340	335	320	335	310	315	315
16	325	310	315	315	310	310	345	355	375	360	C	C	345	325	345	340	335	340	320	345	315	310	310	310R
17	300	300	285	315	330	315S	J350R	335	335	335	360	340H	335	340	325	345	365	345	345	320	300R	I300R	RS	FS
18	FS	310F	325	325	335	305	340	355	I355A	350	340	350	335R	340	345	340	345	345	340R	I320A	300	300	305	310R
19	310F	310S	320F	290	F	295F	360R	355	345	370	360	345	335	335	340	350	360	355	340S	325R	315	305	305S	300
20	315	325S	310F	F	F	F	340	350	370	370	360	345	330	330	335R	340	340	340	340	345	335R	320R	315	310
21	320	335	330	320	325	315R	355	355S	355	360	340	345	315	340	345	335	330	330	340R	350	320	330	305	310
22	305	315	315	335	340	310	360S	370R	360	355	320R	310	335	305	300	300	335	355	340	320	290	I300R	290F	305F
23	305	320	330	335	315	310	350	355S	340	345	I350R	310	340	C	C	C	C	C	335	325	I300R	I300R	I300R	290S
24	320R	310	F	F	350	F	355R	365	355S	365	345	320	340	350	345	325	340	355	I345A	330	F	300	FS	FS
25	F	F	315	330	310	330	I340R	355	345	370	345	320	340	330	340	330	350	365	345S	330	I310R	FS	285F	320
26	330F	325	330	335	325	F	350S	365R	360	365	355	345	340	340	320H	345	345	355	360	345S	320	315	315	320
27	315S	315	325	315	325	C	C	C	C	375	345	340	325	335	335	330	330	340	335	330	310	I325C	320S	310
28	305	300	315	310	320	FS	350S	365	355	355	I360C	345	355	330	325	320	335	350	U325R	300R	300R	300	315	305
29	335	285	285S	290	290	350	345	J380R	380	340	345	335	345	325	335	345	340	335	320	295	I300A	A	FS	FS
30	F	F	310F	F	330F	335F	355S	355	370	365	360	340	335	345	330	335	330	350R	315	330	330	315	305	320
31																								
No.	23	24	27	26	25	25	29	29	29	30	29	29	30	29	29	29	29	29	30	29	27	26	24	26
Median	310	310	315	315	325	320	345	355	345	355	345	335	335	330	330	335	335	345	335	325	315	305	305	310
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Sep. 1964 | M(3000)F1 | 0.01 | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39°43.5' N, Long. 140°08.2' E | 28

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	A	A	A	A	A	A	375	375	370	A	A						
2								L	365	390L	380	I360A	I360A	370	355L	365	385S	A						
3							L	370L	365	380	395	395	405	355	365	360	345L	345L						
4								360L	370	395	405L	395	395	395	360	360	360L	L						
5							L	360	I360A	380	410H	365	385	365	355	350	L							
6								350L	370	380	400L	415L	395H	I380A	L	375	A	L						
7								A	A	I380A	375	385	380	350L	375L	365	380L	L						
8								390	355L	LH	365	410	405H	375	360	LH	LH	L						
9								L	355	370	435	410H	410H	370	355L	370	365L	L						
10								L	355L	360	390	375	400	380	365L	375L	L	L						
11								L	380	370L	410L	410	410	L	370	340L	L	L						
12								L	A	365L	410	380L	355	395L	I360A	355L	350L							
13								L	365H	I390A	420	420H	385	385H	385L	375	360L	L						
14								L	L	385	395	L	395L	385	375L	375	L	L						
15								L	395L	385	395	420	L	L	355	360L	A	L						
16								L	380L	385L	C	C	395	370	A	A	A	A						
17							L	A	A	365L	370L	395L	355	375	350H	350	L							
18								L	A	360L	365	360	355	380	395	365L	L							
19								L	350	385	400L	390	385	375L	365L	L	L							
20								385L	395	380	415H	395	385	365	355	360	L	L						
21								L	375	385	415	395H	420H	370L	365L	365L	L							
22								L	370L	415	390H	405	370	350	365	365	L							
23								L	L	A	A	A	370L	C	C	C	C							
24									L	I400A	I395A	365H	380	380H	L	L	L							
25								L	L	390L	380L	385	365H	370	355	L	L							
26									375L	380	385H	395	375	405H	370L	L	360							
27								C	C	375	L	415R	360L	365L	375	L	L							
28									L	380	I380C	395H	370	365	360	L	385S							
29								L	L	L	365L	I375A	385L	I375A	365L	L								
30								L	L	375L	390	405	L	L	L	L	L							
31																								
No.								6	17	26	26	26	27	26	25	19	9	1						
Median								365	370	380	395	395	385	375	365	365	360	345						
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

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

IONOSPHERIC DATA

Sep. 1964 | h'F2 km | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39°43.5' N, Long. 140°08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	I280A	285	260	A	A	325	285	290	300	295	300						
2								L	G	L	350	305	300	320	455	330	305	I295A						
3							310	260	280	270	270	320	355	350	I365R	320	305	305						
4								270	270	265	290	345	300	300	355	300	270	250						
5							315	280	305	260	255	300	295	295	340	280	255							
6								255	280	280	300	345	285	300	300	290	300	280						
7								I285A	I300A	275	305	420	345	305	300	290	295	300L						
8								245	300	315	310	320	295	295	345	300	290	260						
9								255	295	250	300	295	320	355	395	345	275	245						
10								270	260	250	295	295	300	300	300	285	290	255						
11								245	260	260	295	300	325	300	295	310	275	245						
12								245	250	265	295	295	295	305	I300A	290	270							
13								235	250	285	250	300	325	300	300	280	270	250						
14								250	250	235	255	315	295	305	290	275	255	250						
15								240	245	250	250	295	320L	300	290	290	270	250						
16								245	245	250	C	C	300	325	280	I280A	275	250						
17							245	270	275	270	250	310	295	280	310	255	245							
18								250	I260A	280	290	290	280	270	280	260	250							
19								245	280	245	250	295	295	295	290	260	250							
20								250	245	265	260	300	330	315	290	290	275	250						
21								235	250	245	285	305	325	305	295	295L	280							
22								250	250	265	345	335	290	345	325	290	250							
23								230	270	270	250	I300A	265	C	C	C	C							
24									250	250	280	300	250	260	265	295	255							
25								255	260	240	270	300	270	290	280	290	255							
26									250	250	260	265	295	275	280	275	260							
27								C	C	250	280	295	275	295	280	295	285							
28									245	250	I270C	260	270	300	280	280	270							
29								230	235	245	245	285	260	I285A	265	250								
30								235	245	245	255	295	285	270	270	255	270							
31																								
No.							3	25	29	29	28	28	30	29	29	29	28	15						
Median							310	250	260	260	275	300	295	300	295	290	270	250						
U.Q.																								
L.Q.																								
Q.R.																								

h'F2

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Sep. 1964 | h'F | km | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39°43.5' N / Long. 140°08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	I290A	I290A	240	240	230	245	A	A	A	A	A	A	A	210	220	240	I260A	I260A	I255A	225	225	290	I240A	I290A
2	I285A	295	260	290	I290A	240A	235	245	240	190H	200H	I240A	I250A	210	220	230	240	I260A	270	250	I230A	A	A	A
3	I300A	300	320	I290A	285	250	245	240	240	230	200	235A	180	I245A	250	235	I245A	245	275	240	220	225	245	255
4	255	265	270	265	250	245	240	240	210	200	190H	210	205	205	210	225	230	220	250	280A	250	250	220	250
5	285A	250	250	250	245	255	245	225	I245A	215	200H	205	200	220	210	245	240	250	255	C	C	C	C	C
6	C	C	285	275	270	275	235	245	225	220	180H	195	195H	I235A	I240A	225	A	A	250	245	245	245	255	250
7	255	I290A	290S	255	255S	270	250	A	A	I210A	240	225	205	250	220	220	205	240	270	270	250	275	270	300A
8	295	255	255	245	280	270	250	230	230	205H	225	190	185H	215	200	200H	230	240	260A	A	A	280	275	255
9	270	255	245	240	270	260	235	245	205	240	195	200H	185H	220	220	200	235	240	245	245	285	270	290	290
10	270	255	255	270	280	260	250	240	220	200H	205H	190	200	210	240	220	225	245	245	235	245	260	255	230
11	255	280	280	280	280	250	245	240	225	220	205H	190	200H	200S	205	245	255	240	240	230	250	270	275	255
12	250	275	290	285	255	240	250	220	I225A	245A	195	230	245A	200	I235A	250	225	250	260	245	230	290	295	275
13	280	275	280	250	240	250	225	225	200H	I210A	205	180H	185H	190H	200	220	245	250	230	250A	245	250	245	250
14	I275A	300	295	245	250	255	245	235	245	210	200	195	210	220	200	225	245	245	240	230	240	250	250	240
15	240	260	280	290	280	260	235	235	210	220	210	195	195	195H	215	245	I240A	245	245	240	235	240	255	240
16	250	260	255	250	255	260	245	235	240	190H	C	C	205	250	A	A	A	A	235	240	250	250	255	270
17	300	300	300	260	250	250	245	I240A	I235A	225	240	210	225	205	195H	225	245	240	215	250	275	280	I300A	295
18	290	270	260	250	225	275	250	240	I230A	250	240	250	250	205	210	250	I240A	230	245	I240A	265	280	270	250
19	265	255	260	250	275	250	230	220	205	205	195	195	200	200	200H	245	245	245	230	240	230	245	285	275
20	255	I280A	255	285	260	250	245	230	225	200	215H	205	200	210	250	230	230	245	235	230	240	245	255	265
21	250	245	250	255	250	280	240S	220	200	200	200	190H	180H	205	245	215	250	260	225	200	240	250	280S	295
22	300	280	275	250	245	290	225	220	205	200	195H	200	I205A	275A	225	230	240	230	205	250	295	270	295	300
23	295	255	245	230	270	270	240	230	245A	I250A	A	A	195H	C	C	C	C	C	225	235	280S	300	280	I300A
24	290S	275	280	250	230	245	205	220	220	I220A	I220A	185H	225	180H	230	235	255	235	I230A	220	250	280	255	290
25	280A	235	270A	245	255	250	245A	235	225S	200	200	200	190H	205	220	225	245	230	205	245A	275S	300	300S	250
26	250	260	255	250	245	255	225	235	215	205	200H	195	190	175H	240	250	240	230	210	225	260	265	280	265
27	250	250	250	255	260	C	C	C	C	245	205	190H	240	225	200	245	240	245	245	220	245	I230C	245	255
28	285	285	255	260	245	260	245	245	225	205H	I200C	180H	200	225	230	250	220S	240	230	245	290	275	250	250
29	230	295	300	285	300	215	245	245	220	210	200	I230A	245	I225A	210H	225H	250	245	240	255	I250A	I240A	235	290
30	275	250	250	230	225	235	220	235	225	200	200	195	220	245	205	220H	245	245	245	230	240	250	275	255
31																								
No.	29	29	30	30	30	29	28	27	27	29	27	27	29	29	28	28	27	27	30	28	28	28	28	28
Median	275	270	260	250	255	255	245	235	225	210	200	195	200	210	220	230	240	245	240	240	250	260	260	260
U.Q.																								
L.Q.																								
Q.R.																								

h'F

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

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Sep. 1964 | h'Es | km | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39°43.5' N, Long. 140°08.2' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	105	105	100	100	105	E	140	125	120	115	110	105	105	105	105	145	145	125	120	115	110	120	115	110
2	105	105	E	105	105	140	135	105	125	105	100	100	105	105	G	150	130	115	105	105	105	105	115	110
3	105	155	105	130	130	E	125	120	115	120	115	105	105	105	105	105	105	135	125	125	120	120	110	110
4	110	105	105	105	105	S	145	130	100	110	125	100	G	105	105	105	140	130	105	110	E	105	105	100
5	125	120	125	120	150	125	125	120	105	105	G	G	100	100	100	150	130	120	115	C	C	C	C	C
6	C	C	E	E	E	E	140	120	125	115	110	105	110	105	135	130	120	115	115	120	110	110	110	105
7	105	105	105	105	130	125	120	115	115	115	115	110	105	100	145	145	140	120	110	115	120	120	110	105
8	105	105	105	E	105	105	120	110	105	110	120	105	G	G	105	135	G	G	120	120	100	105	110	E
9	110	E	E	E	E	E	150	140	160	125	150	G	120	130	G	110	155	105	105	100	E	135	E	E
10	E	105	105	E	E	115	140	130	130	120	120	G	170	100	G	150	155	100	100	100	E	E	105	E
11	E	100	E	E	100	105	105	125	120	120	110	105	105	105	150	140	110	145	105	105	S	E	105	105
12	E	E	100	100	100	105	135	135	120	115	110	105	105	120	105	105	100	100	100	100	E	E	110	110
13	105	105	100	E	105	E	125	115	120	105	105	110	105	110	110	105	130	135	110	120	110	110	110	105
14	105	105	100	100	E	E	115	110	125	115	G	105	105	105	100	100	100	100	100	100	100	110	105	110
15	100	105	E	105	105	105	100	125	120	G	120	120	G	110	105	145	145	140	120	E	100	100	E	E
16	E	E	E	E	120	110	160	105	G	G	C	C	125	150	140	125	120	115	115	110	105	E	100	100
17	S	E	100	125	125	S	145	130	125	165	140	125	125	115	G	100	130	125	120	100	E	120	110	105
18	100	100	100	E	100	E	150	145	125	120	120	125	120	125	120	120	120	115	110	105	100	105	105	S
19	E	E	E	S	125	120	130	130	110	105	145	105	G	G	G	G	145	140	100	105	110	115	105	105
20	105	105	105	115	110	110	110	G	G	G	120	G	G	150	130	130	105	120	S	110	105	E	115	E
21	S	E	110	E	E	115	110	105	G	G	G	G	G	160	145	150	130	115	S	E	E	E	100	E
22	E	E	100	100	105	105	100	150	145	130	115	120	115	105	110	115	115	130	105	S	115	110	105	105
23	100	100	E	E	E	E	145	120	120	115	110	105	105	C	C	C	C	C	130	120	120	105	105	105
24	105	100	100	E	145	E	145	110	125	110	105	105	165	G	165	G	150	125	115	110	110	110	110	105
25	105	100	100	100	E	130	120	125	115	120	115	110	120	105	105	100	100	100	E	115	105	S	100	E
26	100	E	E	105	S	S	150	135	140	125	150	G	G	G	120	105	145	110	105	100	100	100	E	E
27	E	E	E	E	E	C	C	C	C	120	G	G	155	145	130	100	100	100	100	105	E	C	E	E
28	E	100	E	E	E	E	150	145	135	G	C	G	105	G	100	140	130	100	100	100	100	100	E	E
29	E	E	E	E	E	E	135	130	125	140	135	120	135	120	G	G	G	125	E	120	115	110	105	105
30	E	E	105	105	100	E	S	105	105	105	G	105	105	100	105	G	135	105	105	100	100	E	100	100
31																								
No.	17	18	18	15	19	14	28	28	26	25	23	21	23	24	23	25	27	28	26	26	21	20	24	18
Median	105	105	100	105	105	110	135	125	120	115	115	105	105	105	110	125	130	120	110	110	105	110	105	105
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

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

The Radio Research Laboratories, Japan

A 11

IONOSPHERIC DATA

Sep. 1964 | **Types of Es** | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39°43.5′ N, Long. 140°08.2′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f3	f3	f2	f2	f		h4	h2	h2	h3	c2	12	13	12	12	h1	h2	h3	f3	f	f	f2	f2	f2
2	f3	f2		f2	f3	f2f2	h2	14	h212	12	1	12	c3	c		h2	h2	13	13	f4	f4	f2	f4	f5
3	f6	f2f2	f2f2	f2	f3		h	c31	h2	h2	h	c2	c2	12	13	12	c3	h3	h3	f3	f	f	f	f2
4	f2	f3	f2	f3	f3		h2	h13	12h	c	h12	12		12	12	13	h212	h1	13	f3		f3	f	f3
5	f2f2	ff	ff	f	ff	f4	h4	c2	c3	c			12	12	12	h	h21	c3	f5					
6							h2	h3	h2	c2	c	c2	c2	c3	h2	h2	h3	c4	16	f	f3	f2	f3	f3
7	f3	f3	f4f3	f4	f3	f3	c3	13	h3	h2	h2	h2	c2	13	h1	h1	h	c2	f2	f4	f3	f3	f2	f3
8	f5	f3	f5		f2	f2	c5	c2	1	c2	h	12			12	h			f3	f2f	f2	f	f2	
9	f2						h	h2	h	h	h		h	h		c	h1	1	f	f		f2		
10		f2	f2			f	h21	h2	h	h	h		h	13		h1	h2	14	f3	f			f	
11		f2			f	f	1	h	h2	h3	h2	c	12	12	h12	h12	c2	h2	1	f			f	f2
12			f	f2	f2	f3	h2	h2	h2	h2	c2	c2	c2	h	12	12h	13	13	f3	f			f3	f2
13	f3	f3	f2		f		h2	c3	h2h2	c3	c2h	c2	12	c2	c3	12	h	h2	f	f3	f	f3	f2	f4
14	f3	f3	f5	f2			13	12	h2	c		12	12	12	12	12	12	1	f2	f2	f2	f2	f2	f2
15	f	f3		f3	f3	f2	1	h	h		h	h		12	12	h21	h212	h3	ff		f2	f2		
16					f	f2	h2	12					h212	h2	h2	h4	h3	17	1h	f5	f3		f3	f
17			f	f2	f3		h	h3	h3	h	h	h2	h	h2		1h	h5	h31	ff	f2		f	f7	f2
18	f2	f2	f2f		f		h2	h3	h3	h4	h2	h2	h3	h	h2	h3	c6	14	f2	f7	f4	f	f	
19					f2	f2	h	h	13	12	h	12					h	h	f	f	f	f	f	f
20	f2	f3	f2	f2	f2	f2	c				h2			h	h2	h2	1h3	c3		f	f		f3	
21			f			f2	13	12						h	h2	h	h2	13					f	
22			f	f	f3	f	1	h2c	hh2	h2	h2	h	h2	c2	h3	h5	c4	h1	f		f2	f2	f2	f2
23	f2	f3					h	h	h3	h3	c4	13	12						f	f3	f2	f2	f3	f4
24	f4	f2	f2		f		h	1h3	h3h	c3	c3	c	h		h		h3	h5	f2	f3	f2	f2	f2	f4
25	f3	f4	f5	f		f	c4	h1	c2	h	h2	c2	h	12	12	12	13	15		f2	f2		f	
26	f			f			h	h	h	h2h	h				h2	1h	hh	12h	f	f2	f2	f		
27										h3			h	h	h	12h	12	14	f2	f				
28		f					h	h2	h				12		14	h214	h14	12	f3	f3	f	f		
29							h	h1	h2	h2	h	h	h	h2				h7		f2	f4	f3	f2	f2
30			f	f	f			1h	13	12h		13	13	13	13		h	1	f2	f	f		f	f3
31																								
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Sep. 1964 | **foF2** | 0.1 Mc | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4′N | Long. 139° 29.3′E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	047F	034	039	035	028F	029	A	061	A	A	058	I060A	072S	R	R	056	054	061	J073S	S	S	A	A	032F
2	035S	F	F	034	F	034	044	046	051	048	057	067	066	055	058	I058A	R	071S	R	S	J048S	A	C	C
3	C	C	C	C	C	C	C	C	C	063R	059	058	050	R	050	A	056	A	071	067	S	042F	I032A	031
4	I032A	F	034	035	034	035	049	057	072S	063R	058	058	055	058	049R	059	058	054	050	056	060	051	045F	038
5	038	039	033	033	031	035	A	C	C	R	R	R	058	053	J053R	I058R	055	046	057	A	S	058	045	I038A
6	036	U032S	032	031	030	030	047S	060	058	J063R	052	062R	061	057	056	055	057	060	071	070S	056	038	F	039
7	034	030F	035	038	037	038	048	058	053V	U062R	049	056	I060S	R	I060R	054	050	049	058	059S	056	J053F	J052F	F
8	F	J052R	J045S	033	035	038	053	057R	A	I058R	064	061	065	062	054	059	057	066	052	054	051	046	049	045
9	C	C	C	C	C	C	C	C	C	066	060	057	060	067	070	062R	C	071S	050	039	039S	S	038	038
10	038	035	034	030	030	032	046S	C	C	069S	063R	I058R	059R	058	057	058	058	061R	061	060	S	S	045	S
11	S	040	F	036F	036	037	051	I060S	058	I059R	059	059	I060R	063	R	R	J066R	072S	I063R	J053S	046	I044S	U040S	I040A
12	C	C	C	034R	040	035	041	055	059	059R	R	U060R	R	R	R	U066R	071R	R	055R	R	S	S	I041R	I042S
13	I042S	F	F	I035S	031	F	R	R	R	R	R	058	R	R	R	R	S	059	R	R	R	R	S	F
14	S	F	C	C	C	C	C	C	C	R	060R	R	062R	R	R	U064R	056	056	056	U056S	I044S	J044S	U038S	S
15	037	I033A	034	030	030	030	053	R	059	059	R	R	063R	I060R	064	054	055	053	064	068	051	044	042	039
16	035	035	035	032	030	030	J053R	070S	066	056	060R	059	063	059	067	A	A	066	I069A	I072S	S	040	040F	F
17	038F	F	F	038	042	036	060	J067R	A	061	072R	J064R	067	R	064	J080S	070	062	050	044	040S	044S	F	F
18	F	F	F	F	030	030S	042	053	059	060	063	060R	068R	056	058	059	060	058	057	046S	I039A	039	F	F
19	040F	039	038	035	032F	035F	047	052	068	070	059	060	060	056	058	056	058	053	054	050	040	036	038	038
20	037	036	037	034	033F	F	044	063	061	057	057	058	056	056	058	055	065	064	069	057	046	045	F	040
21	038	035	034	032	031R	030	047	J064R	055	057	058	053	054R	059	057	J055R	051	057	067S	055S	029	027	F	F
22	029	030F	029	029	025	023	045	066R	J053R	056	052	057	066	065	068	S	092S	S	042	040	038	040F	042	041
23	J040R	041	046	039	030	030	049	060	J062R	068	R	072	065	066	066	060	061	060	050S	S	041S	F	A	A
24	035F	036	035	034	030F	030F	051	058	060	065	059	071	U073R	068	065R	058	064R	066	059	045	040F	F	F	034F
25	I036A	034	034	F	029F	031F	048S	061	066R	J059R	C	C	C	C	C	064R	065	064	053	I036A	F	F	F	F
26	035	034	034	035	028	028	045	064	060	059	066R	I064R	058	060	059	059	I062R	J066S	058	041	032	033F	033	034
27	034S	033	032	030	030	029	J049R	054	060	057	054	058	070R	I068R	061	058	061	061	I062A	A	A	038	036	036
28	034F	034F	034	034	033	028F	052	064R	062R	058	063R	069	J065R	R	R	R	062	R	060	059	F	R	I045S	I044S
29	042	036	035	038	034	041S	056	R	I061R	059	C	C	C	C	C	066	063	062	061	058	S	A	F	F
30	041	041F	038	041	030F	030	046	058	J065R	C	060	062	065R	061	059	061	J062S	068S	059S	U060S	J054R	042S	038	I039A
31																								
No.	23	21	21	25	26	25	24	22	21	25	23	25	26	20	22	24	26	26	28	23	19	19	18	18
Median	037	035	034	034	030	030	048	060	060	059	059	060	062	060	058	058	060	061	058	056	044	042	040	038
U. Q.	040	039	038	036	034	035	052	064	064	063	063	063	066	064	064	062	064	066	064	060	051	045	045	040
L. Q.	035	034	034	032	030	030	046	057	058	058	057	058	059	056	057	056	056	057	054	045	039	038	038	036
Q. R.	005	005	004	004	004	005	006	007	006	005	006	005	007	008	007	006	008	009	010	015	012	007	007	004

foF2

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

The Radio Research Laboratories, Japan

K 1

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	A	A	A	A	A	A	440	A	410L	420L	A						
2								L	L	430	430R	A	440	450	A	A	A	340L						
3						C	C	C	C	430	440	440	450	450	430	A	A							
4								L	420	420	460	430	440	440R	L	410	400L	L						
5							A	C	C	A	A	440	440	L	440	U400S	L							
6								L	420	420	L	440	A	430	430	420	L	A	A					
7							A	A	A	A	A	450	A	450	L	420L	A							
8								A	A	A	440L	450	450R	440L	L	410L	L	L						
9							C	C	C	420L	L	450H	440	A	460	400	C	L						
10								C	C	440L	440	450L	440L	450L	L	L	L	L						
11								L	L	L	440L	450L	R	450R	L	430	L	L						
12									A	R	A	460	R	R	R	A	A	L						
13								L	S	R	R	A	R	R	S	R	U370S	L						
14							C	C	C	L	L	460R	R	450	440	L	L							
15								L	L	L	L	B	460R	440L	440L	A	A	A						
16								L	L	L	450L	L	440	A	430	A	A	A	A					
17								L	L	L	L	440L	450	L	L	U410L	L	L						
18									A	A	A	A	450	440L	A	L	L	L						
19									400L	420	440	440L	440L	430L	L	L	L							
20								L	L	L	440L	440L	450L	430L	420	L	L	L						
21								L	LH	L	440L	L	L	420	420	L	L	L						
22								L	L	L	430	420	440	430	430	L	L							
23								L	LH	L	U440L	440	440H	L	U430L	L	L							
24								L	L	L		430R	470L	420L	L	L	L							
25								A	L	A	C	C	C	C	C	U400L	L							
26								L	L	L	440L	440L	430L	L	L	L	L							
27										L	L	L	L	L	L	A	A	A	A					
28								L	L	L	440L	440L	L	L	L	A	A	A						
29								L	L		C	C	C	C	C	L	L							
30									L	C	440	L	U450L	L	L	L	L							
31																								
No.									3	7	15	19	18	17	11	10	3	1						
Median									420	420	440	440	440	440	430	410	400	340						
U. Q.																								
L. Q.																								
Q. R.																								

foF1

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

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	A	A	A	A	A	A	A	A	A	295	270	A	B					
2						B	A	A	270	A	A	A	R	335	320	290	A	A	B					
3						C	C	C	C	A	A	A	R	320	A	A	A	A	A					
4							210	260	270	280	330R	I325R	I330A	335	320R	295	270	I220A	S					
5							A	C	C	A	A	A	A	A	A	A	A	A	B					
6							185	255	275	275	A	A	A	A	325	295	I275A	A	B					
7							170	240	270	295	A	A	A	330	320	300	270	195	B					
8							190	A	A	A	I320A	I330R	320	325	320	300	I270R	215	B					
9							C	C	C	320R	330R	R	A	A	A	285	C	210	B					
10							155	C	C	315	330	340R	340	330	I330R	300	260	210	B					
11							200	225	260	285	R	A	A	A	A	A	270	200	S					
12							B	250	280	A	U300A	A	A	R	R	A	A	A	B					
13							B	I235A	270	I300A	A	A	R	R	R	290R	A	195	B					
14							C	C	C	310R	330	R	A	A	A	300	260	A	B					
15							A	A	290	325	I340R	B	R	A	320	290	260	A	A					
16							200	A	A	A	A	I335A	345	330	320	290	250	A	S					
17							A	A	A	A	I320A	330	A	A	A	285	255	180	B					
18							I180A	235	285	320	325	325	330	300	I305A	I285A	250	A	B					
19							A	240	290	310	I330A	340	330	330R	315	285	250	210	B					
20							A	A	270	I285A	330	I320A	335	330	310	280	245	A	B					
21							A	A	285	325	330	340	325	325	300	280	A	A	B					
22							170	260	290	295	R	A	A	A	A	I270A	I230A	A	E					
23							180	A	A	A	A	I330A	325	R	R	280	225	A	B					
24							B	255	I285A	A	A	325	330	325	320	280	240	A	B					
25							A	A	I270A	290	C	C	C	C	C	A	245	175	B					
26							A	230	A	A	330	U330R	320	320	320	300	I250A	A	B					
27							B	240	280	300	310	I320A	320R	I310A	320R	I285A	250	170	B					
28							185	240	280	280	I300A	I310R	R	A	A	A	A	A	B					
29							210	A	A	A	C	C	C	C	C	275	A	A	B					
30							B	I230A	275	C	A	325	330R	330	310	280	A	A	S					
31																								
No.							12	14	18	17	15	15	13	15	16	24	20	11	1					
Median							185	240	280	300	330	U330	330	330	320	290	250	200	E					
U. Q.																								
L. Q.																								
Q. R.																								

foE

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

The Radio Research Laboratories, Japan

K 3

IONOSPHERIC DATA

Sep. 1964 | foEs | 0.1 Mc | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	030	035	023	027M	J024	023	J038	049M	J060	090M	J062	065M	060M	040	047	036	033	J039	J063	J056	J040S	040M	J050	060M
2	J063	032	058M	J042	J029	033	035M	035	034	J033	J038	.047M	031G	027G	048	J067	058	034	J029	J040S	034	036M	C	C
3	C	C	C	C	C	C	C	C	C	032	040	036	029G	038	038	088M	J052	J091	044M	048	048	J039	036	J042
4	J049	J040	038	J030	J028S	023	028	028	034	034	032G	029G	J034	025G	J031G	024G	030	027	024	025	J027	036M	033	032M
5	J034	025	J024	J023	E	024	054	C	C	J042	057	040	048	039	035	033	032	030	044	040	035	035	059	038
6	035	026	E	E	E	E	024	029	045M	038	034	036	J050	044	036	033	033	050	065M	J052	034M	J032	035	033
7	023	J032	J027	032	040M	J026	044	056	048	057	047M	J040	048M	028G	036	033	036	029	J030	031	036M	037	036	J040
8	J029	J030	029	028	024	024	J031	048	070M	048M	J034	025G	G	G	G	G	G	023	J017	023	J044	J040	030M	J027
9	C	C	C	C	C	C	C	C	C	G	025G	J030G	045M	049M	040	021G	C	J026	029M	029M	025	J024	019	024
10	022	E	E	022	023	024	024	C	C	025G	025G	025G	037	024G	023G	033	032	025	017	025M	J025S	J026	E	025
11	S	E	E	023	E	E	G	028	032	033	031G	037	035	035	035S	032	034	025	059M	035	025	J040	J036	050M
12	C	C	C	029	024	J024	023	034	059	040	047	046	036	028G	029G	047	048	030	B	036	S	S	S	025
13	030	030	S	023	021	E	031	032	033	034	035	035	032G	030G	030G	G	026	024	B	020	031	030	025	030
14	027	027	C	C	C	C	C	C	C	G	G	029G	J036	J042	J034	029G	J033	033	036	030M	J024	S	027	036
15	036	038	J030	J032	039M	031M	J034	037	029G	G	G	B	032G	036	040	J038	048	J054	054M	036	035	J024	024	E
16	J024	E	035	E	J023	E	019G	J040	033	J033	038	J043	039	045	037	J063	073	058	D072S	070M	043	J028S	036	J032
17	J030	033	021	033	021	024	028	033	060	037	035	G	035	J040	031	032	030	025	J032	036M	034	J072	025	033
18	027	027M	024	025	025	024	J028	030	050M	060M	048	046	049	J052	J049	J041	032	J028	J024	J040S	J046	034	J030	022
19	025	E	025M	E	E	J031	032	G	G	032	J084	G	G	035	J028G	031	028	J030	J030	J027	J027	J034	J038	J034
20	J044	J027	J033	J029	J028	037M	J031	032	032	035	G	033	G	037	039	035	034	033	024	029	025	E	E	J030
21	E	E	E	J025	E	J020	J044	J044	J033	G	G	G	G	G	034	031	030	025	023	022	J028	J024	J029	025
22	024	023	022	E	E	E	024	030	035	035	035	036	045	033	J034	034	025	024	020	J036	J039	J024	J031	J034
23	J028	034	J032	035M	J029	024	G	030	031	032	032	034	030G	032G	G	G	030	026	J038	036	J036	J046	045M	J029
24	025	E	E	E	E	E	025	031	036M	J052	J035	G	025G	G	G	G	G	J030	J043	J050	038	030M	034M	J029
25	045M	036	J024	023	E	024	037M	J059	040	049M	C	C	C	C	C	030	J026	026	032M	J042	J042	J030	E	029
26	J025	E	E	E	E	E	J025	029	030	032	G	G	G	G	G	035	031	025	J030	J035	J030	J037	J035	J024S
27	E	E	021	021	E	021	J024	032	034	034	040	035	039	036	037	041	J041	056M	068M	053	J059	J024	E	E
28	023	019	E	029	E	E	026	032	035	038	036	029G	036	041	045	042	058	053	049	056	034	020	021	E
29	E	022	022	E	S	E	J027	030	036	048	C	C	C	C	C	036	037M	032	J053	J048	022	J063	J029	027
30	021	E	018	018	E	022	J027	J029	019G	C	043	025G	G	022G	023G	025G	034	033	035	033M	J033	032	029	044M
31																								
No.	26	27	25	27	26	27	27	25	25	29	28	27	28	28	28	30	29	30	28	30	29	28	28	29
Median	027	025	023	023	021	023	028	032	034	034	035	034	035	035	034	033	033	030	034	036	034	033	030	030
U. Q.	034	032	030	029	025	024	034	038	046	045	042	040	042	040	038	038	039	034	051	048	030	038	036	035
L. Q.	023	E	E	E	E	E	024	030	032	032	G	030G	G	031G	G	G	030	025	026	029	027	025	024	025
Q. R.	011						010	008	014	013		010		009			009	009	025	019	003	013	012	010

foEs

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

IONOSPHERIC DATA

Sep. 1964 | f_bEs | 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	015	S	014	E	G	A	038	A	A	053	A	052	040	046	035	032	036	043	029	019	A	A	016
2	017	016	017	018	E	020	021	028	034	033	E038R	045	030G	026G	045	A	053	026	020	030	029	A	C	C
3	C	C	C	C	C	C	C	C	C	032	035	035	023G	038	037	A	043	A	030	040	U041A	022	A	018
4	A	019	019	E	E	E	024	028	033	034	026G	026G	034	025G	026G	024G	029	025	S	E	020	035	015	019
5	020	017	015	E		E	A	C	C	E042R	045	040	035	037	033	032	032	U026A	025	A	025	025	022	025
6	019	021					024	G	038	036	034	036	045	034	035	032	029	042	053	040	U028A	017	020	017
7	E	015	015	019	025	015	040	050	041	053	042	038	045	026G	035	032	035	025	018	020	020	027	029	021
8	018	015	017	018	015	E	026	041	A	043	034	E025R						023	016	S	028	020	017	016
9	C	C	C	C	C	C	C	C	C		025G	029G	036	045	037	020G	C	018	018	020	019	015	016	E
10	E			E	015	E	023	C	C	025G	025G	025G	037	024G	023G	033	030	024	016	019	S	S		S
11	S			E				028	032	033	031R	E037R	E035R	E035R	E035S	032	033	024	043	028	018	S	019	A
12	C	C	C	020	018	E	022	033	052	E040R	E047R	042	R	E028R	E029R	041	042	026	B	020	S	S	S	024
13	020	018	S	E	014		025	030	E033S	E034R	R	E035R	E032R	E030R	E030R		E026R	024	B	S	020	019	017	019
14	020	019	C	C	C	C	C	C	C			029G	E036R	041	034	025G	030	025	025	019	020	S	018	032
15	026	A	021	E	018	021	024	027	022G			B	E032R	036	039	038	040	040	035	034	026	E	E	
16	E		E		E		017G	026	032	033	038	042	038	045	035	A	A	050	A	050	029	E	025	017
17	E	015	S	018	012	E	024	028	A	037	034		034	039	031	032	028	024	017	022	016	E	E	020
18	016	015	E	E	E	E	024	029	042	058	042	044	040	040	045	034	032	026	017	017	A	023	E	017
19	S		E			015	019			022G	035			025	G	021	027	G	019	E	E	017	016	016
20	019	E	017	E	E	017	022	025	030	033		033		036	036	035	032	025	G	E	016			E
21				E		E	020	028	G						034	030	025	021	B	E	016	E	017	E
22	E	E	E				023	029	032	035	032	034	040	E033R	E034S	029	025	023	015	026	017	S	017	022
23	017	018	017	018	015	E		024	028	032	032	034	030G	E032R			028	024	035	025	015	020	A	A
24	017	E					G	029	030	040	035		025G					024	042	040	022	016	018	015
25	A	019	015	E		S	028	035	028	043	C	C	C	C	C	029	021	022	022	A	015	017		014
26	E						022	026	030	032						032	028	020	025	019	S	017	017	E
27			E	E		S	021	028	034	034	035	035	E039R	036	036	041	039	046	A	A	A	S		
28	E	S		E			022	029	034	037	035	E029R	036	038	042	042	051	054	045	050	015	S	E	
29		S	E		S		025	025	032	041	C	C	C	C	C	036	032	022	040	030	E	A	015	015
30	E		E	E		E	025	019	019G	C	035	025G		021G	023G	023G	026	025	028	026	017	018	018	A
31																								
No.																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

f_bEs

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

The Radio Research Laboratories, Japan

K 5

IONOSPHERIC DATA

Sep. 1964 | f-min | 0.1 Mc | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E015S	013	E015S	011	013	013	012	013	015	017	015	015	015	018	016	015	015	016	015	014	012	014	011	014
2	012	013	011	010	013	015	014	014	015	015	016	016	015	018	015	015	015	014	014	014	014	014	C	C
3	C	C	C	C	C	C	C	C	C	016	015	016	018	016	015	015	015	014	011	013	014	E015S	E015S	014
4	013	012	010	013	014	013	014	015	014	016	015	015	015	019	015	015	016	015	E015S	014	014	013	014	014
5	014	012	013	011	014	014	012	C	C	016	018	018	016	018	016	015	015	016	015	E015S	E018S	E016S	E015S	E017S
6	014	013	011	013	013	015	015	015	017	015	015	018	017	015	018	015	016	016	015	013	013	013	013	014
7	014	013	011	010	011	010	012	015	015	015	018	018	019	018	018	015	016	015	014	014	E016S	014	013	013
8	E015S	012	012	011	012	013	015	015	015	016	015	016	018	021	018	016	015	014	014	E015S	E015S	014	014	011
9	C	C	C	C	C	C	C	C	C	013	016	016	016	015	015	015	C	015	012	014	014	014	014	014
10	013	011	014	014	010	013	014	C	C	017	015	016	016	016	015	015	016	016	015	E016S	E015S	E015S	012	E015S
11	E015S	014	012	013	014	014	015	015	016	015	018	019	019	020	019	016	017	016	E016S	E015S	E016S	E015S	E015S	E015S
12	C	C	C	014	014	014	015	015	016	017	016	022	018	022	018	016	014	015	016	E017S	E016S	E016S	E015S	E016S
13	E015S	E016S	E015S	014	E	013	016	017	015	024	020	022	025	015	020	018	018	014	015	E015S	E015S	E016S	E015S	E015S
14	E015S	014	C	C	C	C	C	C	C	018	019	019	016	019	015	015	015	014	015	E015S	E015S	E017S	E015S	E015S
15	014	E015S	014	014	011	E015S	014	014	015	019	025	046	020	016	016	015	014	014	012	014	013	013	014	014
16	013	014	012	011	011	E	014	015	017	017	015	015	018	015	017	015	015	014	E017S	012	013	014	012	013
17	014	013	E015S	011	E	010	012	015	015	015	015	015	015	015	015	017	015	014	013	012	014	012	012	012
18	012	014	011	012	011	012	013	015	015	018	015	017	019	015	016	015	014	015	013	011	012	014	014	014
19	E015S	014	014	010	010	010	011	015	015	016	014	017	016	017	017	015	015	014	012	013	014	014	011	013
20	E015S	014	011	012	010	011	011	015	016	016	017	016	016	016	016	015	015	016	014	014	014	012	011	013
21	012	014	011	E	010	014	012	014	015	017	017	017	015	015	015	015	015	015	013	014	014	014	014	014
22	014	012	014	014	012	012	012	014	015	016	016	016	016	015	017	016	015	015	011	013	014	E015S	013	014
23	E015S	012	012	012	011	012	014	014	016	017	019	017	016	017	018	016	014	012	015	011	012	014	013	013
24	014	014	012	013	013	012	016	015	015	017	019	015	016	016	015	016	015	015	013	E015S	011	013	012	011
25	013	012	011	013	012	E015S	011	015	017	016	C	C	C	C	C	015	015	014	013	014	013	E015S	014	012
26	014	014	014	012	014	012	014	015	015	016	016	016	015	015	016	015	016	013	013	012	E015S	014	012	014
27	014	014	014	014	014	E015S	015	014	016	016	016	016	016	015	015	014	015	014	014	E015S	E015S	E015S	014	014
28	014	E015S	012	014	014	014	015	016	016	016	015	015	015	015	016	015	016	015	013	E015S	013	E015S	014	014
29	014	E015S	014	014	E015S	011	014	014	015	016	C	C	C	C	C	016	015	014	014	014	014	013	012	012
30	014	012	012	014	014	012	016	011	014	C	015	016	017	015	016	015	014	012	E016S	014	014	013	013	012
31																								
No.	19	23	23	27	26	24	27	25	25	29	28	28	28	28	28	30	29	30	26	20	20	19	23	23
Median	014	013	012	013	012	012	014	015	015	016	016	016	016	016	016	015	015	014	014	014	014	014	013	014
U. Q.																								
L. Q.																								
Q. R.																								

f-min

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

The Radio Research Laboratories, Japan

K 6

IONOSPHERIC DATA

Sep. 1964 | M(3000)F2 | 0.01 | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	320F	335	290	340	305F	320	A	345	A	A	310	I290A	325S	R	R	345	290	310	J325S	S	S	A	A	305F
2	310S	F	F	320	F	295	335	325	350	290	315	330	340	305	315	I305A	R	315S	R	S	J370S	A	C	C
3	C	C	C	C	C	C	C	C	C	355R	355	335	260	R	310	A	320	A	310	345	S	330F	I320A	320
4	I310A	F	305	315	320	315	325	330	330S	350R	340	325	330	325	310R	335	335	350	320	300	330	350	305F	290
5	285	305	320	320	325	315	A	C	C	R	R	R	345	285	J300R	I340R	345	345	305	A	S	315	300	I310A
6	305	U310S	305	325	305	325	340S	365	355	J350R	310	345R	325	340	320	315	320	335	335	345S	360	310	F	310
7	325	295F	290	320	325	320	350	370	325V	U340R	325	300	I320S	R	I335R	335	320	315	300	325S	320	J280F	J290F	F
8	F	J335R	J340S	315	310	295	340	350R	A	I320R	325	325	325	340	345	335	330	360	315	305	290	300	285	310
9	C	C	C	C	C	C	C	C	C	350	330	305	310	330	320	335R	C	350S	340	325	290S	S	285	275
10	315	315	305	315	300	310	340S	C	C	355S	350R	J335R	345R	325	335	340	340	340R	360	350	S	S	285	S
11	S	290	F	310F	305	320	355	I370S	360	I355R	340	335	I320R	315	R	R	J330R	350S	I350R	J325S	320	I290S	U300S	I320A
12	C	C	C	330R	325	345	365	365	360	370R	R	U330R	R	R	R	U320R	330R	R	355R	R	S	S	I300R	I300S
13	I295S	F	F	I310S	315	F	R	R	R	R	R	320	R	R	R	R	S	365	R	R	R	R	S	F
14	S	F	C	C	C	C	C	C	C	R	350R	R	320R	R	R	U350R	330	360	340	U330S	I325S	J285S	U315S	S
15	325	I310A	295	315	290	305	335	R	390	360	R	R	350R	I330R	345	350	345	340	340	355	335	310	305	310
16	320	315	330	320	300	305	J340R	375S	365	355	350R	340	350	340	345	A	A	350	I340A	I360S	S	300	275F	F
17	290F	F	F	295	350	320	365	J355R	A	355	335R	J345R	310	R	310	J335S	355	355	340	320	300S	280S	F	F
18	F	F	F	F	290	315S	330	360	370	350	340	335R	340R	325	325	335	335	355	335	350S	I315A	285	F	F
19	320F	310	305	315	320F	310F	355	345	370	370	370	350	350	340	340	340	350	345	350	335	335	300	315	315
20	315	305	320	320	305F	F	340	380	375	330	350	345	340	320	345	330	350	345	350	335	300	310	F	330
21	310	310	320	340	320R	290	355	J360R	360	365	345	330	320R	340	335	J325R	315	335	360S	370S	345	295	F	F
22	295	295F	315	340	360	305	330	370R	J355R	355	345	315	325	320	300	S	335S	S	340	300	290	295F	305	285
23	J300R	305	330	325	300	305	340	350	J355R	340	R	335	350	335	345	335	360	350	330S	S	315S	F	A	A
24	315F	305	315	325	330F	360F	350	360	350	355	320	340	U315R	350	350R	325	345R	360	360	335	290F	F	F	320F
25	I320A	320	320	F	330F	320F	335S	345	365R	J355R	C	C	C	C	C	340R	350	365	360	I340A	F	F	F	F
26	335	295	320	340	305	315	340	360	370	355	335R	I350R	330	335	340	330	I350R	J345S	350	340	280	300F	305	290
27	320S	305	315	325	330	315	J365R	350	370	355	335	310	345R	I330R	330	330	345	345	I345A	A	A	340	320	310
28	280F	310F	310	305	300	290F	365	360R	370R	365	350R	335	J335R	R	R	R	345	R	340	325	F	R	I315S	I320S
29	310	295	290	290	290	325S	360	R	I350R	340	C	C	C	C	C	335	350	345	340	345	S	A	F	F
30	295	310F	310	340	315F	295	345	365	J370R	C	345	340	350R	350	360	330	J345S	340S	325S	U335S	J330R	330S	290	I300A
31																								
No.	23	21	21	25	26	25	24	22	21	25	23	25	26	20	22	24	26	26	28	23	19	19	18	18
Median	310	310	315	320	310	315	340	360	360	355	340	335	330	330	335	335	340	345	340	335	320	300	300	310
U. Q.																								
L. Q.																								
Q. R.																								

M(3000)F2

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

The Radio Research Laboratories, Japan

K 7

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	A	A	A	A	A	A	345	A	365L	335L	A						
2								L	L	375	R	A	350	355	A	A	A	345L						
3						C	C	C	C	350	385	385	375	340	360	A	A							
4								L	360	380	370	395	385	385R	L	365	360L	L						
5							A	C	C	A	A	390	390	L	345	U360S	L							
6								L	375	400	L	365	A	350	350	360	L	A	A					
7							A	A	A	A	A	355	A	355	L	355L	A							
8								A	A	A	370L	380	375R	365L	L	385L	L	L						
9							C	C	C	365L	L	375H	380	A	370	375	C	L						
10								C	C	365L	385	360L	385L	360L	L	L	L	L						
11								L	L	L	350L	375L	R	365R	L	345	L	L						
12									A	R	A	385	R	R	R	A	A	L						
13								L	S	R	R	A	R	R	S	R	U375S	L						
14							C	C	C	L	L	395R	R	360	350	L	L							
15								L	L	L	L	B	370R	365L	350L	A	A	A						
16								L	L	L	375L	L	390	A	370	A	A	A	A					
17								L	L	L	L	365L	375	L	L	U365L	L	L						
18									A	A	A	A	375	370L	A	L	L	L						
19									365L	400	385	385L	380L	395L	L	L	L							
20								L	L	L	405L	385L	395L	370L	350	L	L	L						
21								L	LH	L	405L	L	L	400	365	L	L	L						
22								L	L	L	395	380	340	350	350	L	L							
23								L	LH	L	U365L	380	365H	L	U360L	L	L							
24								L	L	L		395R	360L	385L	L	L	L							
25								A	L	A	C	C	C	C	C	U375L	L							
26								L	L	L	360L	385L	390L	L	L	L	L							
27										L	L	L	L	L	L	A	A	A	A					
28								L	L	L	385L	385L	L	L	L	A	A	A						
29								L	L		C	C	C	C	C	L	L							
30									L	C	405	L	U375L	L	L	L	L							
31																								
No,									3	7	14	19	18	17	11	10	3	1						
Median									365	375	385	385	375	365	350	365	360	345						
U. Q.																								
L. Q.																								
Q. R.																								

M(3000)F1

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

IONOSPHERIC DATA

Sep. 1964 | h'F2 | km | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	250	A	A	E330A	A	310	290	260	260	350	290A						
2								300	270	400	325	300	270	345	310	A	E300A	275						
3						C	C	C	C	250	255	300	460	345	350	A	E300A							
4								260	260	250	295	300	300	305	310	295	275	255						
5							A	C	C	265	255	265	295	350	340	280	275							
6								245	250	260	340	280	300	290	305	320	290	260	260					
7							250	240A	260	280A	E280A	350	360S	300	290	300	260							
8								245	A	300	285	305	295	280	290	280	295	240						
9							C	C	C	265	280	320	330	295	300	290	C	240						
10								C	C	255	260	295	295	300	295	280	275	255						
11								260	240	250	290	300	310	310	340	305	260	250						
12									250A	245	R	310	R	R	295	300	260	240						
13								250	240	265	R	E325R	R	280	290	280	270	235						
14							C	C	C	225	260	285	E300R	280	285	250	260							
15								225	225	255	250	345	275	300	255	270	250A	270						
16								225	225	255	270	290	275	295	275	A	A	260	A					
17								240	A	260	280	260	310	255	310	260	245	240						
18									250	E300A	275	275	255	300	300	295	255	240						
19									245	240	250	275	260	285	275	260	245							
20								220	240	310	280	280	300	310	280	280	255	250						
21								225	260	255	280	275	305	295	280	290	280	250						
22								225	250	255	290	290	310	330	320	300	235							
23								230	255	260	250	260	250	275	270	275	245							
24								240	255	255		260	300	255	260	295	250							
25								250	240	250	C	C	C	C	C	270	245							
26								230	225	260	280	260	300	300	265	280	255							
27										255	290	310	270	280	275	280	260	260	A					
28								220	225	245	295	275	285	275	295	260	260	260						
29								210	240		C	C	C	C	C	260	245							
30									225	C	280	260	260	260	250	275	250							
31																								
No.							1	20	21	26	24	26	26	27	28	27	26	18	1					
Median							250	240	245	255	280	290	300	295	290	280	260	250	260					
U. Q.																								
L. Q.																								
Q. R.																								

h'F2

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

The Radio Research Laboratories, Japan

K 9

41

IONOSPHERIC DATA

Sep. 1964 | h'F | km | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	240	240	255	220	245	245	I245A	A	A	A	A	A	A	E290A	I240A	230	220	I240A	E250A	210	180	A	A	260
2	260	250	255	280	250	260	240	210	220	210	R	A	240	210	A	A	A	245	240	210	205	A	C	C
3	C	C	C	C	C	C	C	C	C	210	205	185	180	250S	245	A	A	A	260A	240A	210A	240	I240A	260
4	I260A	300	290	250	220	240	240	230	220	210	200	200	205	200	205	210	220	240	250	250	240	220A	250	300
5	300	260	245	245	210	250	I250A	C	C	A	A	220	200	215	200	230	240	240	260	I245A	240A	240	230	250
6	255	E295A	265	275	275	280	240	230	230	200	230	205	A	210	210	205	240	A	A	220	205	240	310	240
7	220	250	290	250	260	250	A	A	A	A	A	E290A	I220A	210	210	210	I220A	220	260	250	220	310	300	295
8	290	220	210	260	280	250	240	A	I240A	I210A	180	210	I205R	240	210	200	230	240	240	225	300	260	290	250
9	C	C	C	C	C	C	C	C	C	210	220	200H	210	I240A	200	210	I210C	220	210	240	295	295	300	300
10	260	250	255	250	275	255	230	C	C	210	205	240	205	210	I220R	210	230	230	220	210	230	260	295	290
11	255	260	260	260	260	225	225	230	220	220	220	210	I220R	245	210	210	245	240	220A	250	240	280	300	I320A
12	C	C	C	260	245	200	200	230	A	R	A	210	R	R	I210R	A	A	230	220	240	225	250	250	E315S
13	290	275	270	250	245	250	220	225	235	R	R	A	R	R	S	I230R	230	230	240	235	225	230	270	275
14	270	265	C	C	C	C	C	C	C	210	220	205	I225R	245	210	230	210	230	225	225	245	255	270	260
15	245	I285A	300	300	310	300	225	210	210	205	220	B	200	210	245	A	A	A	240A	225	220	240	250	245
16	250	245	245	210	255	255	225	210	200	195	245	220	210	I210A	210	A	A	A	A	240A	210	245	310A	295
17	300	300	285	290	215	250	225	225	I230A	220	200	200	210	240	200	240	220	240	210	250	250	270	295	300
18	295	255	245	210	250	240	240	225	A	A	A	A	240	220	I250A	260A	245	240	210	210	I250A	305	300	255
19	250	250	250	245	240	255	210	210	210	200	200	190	200	195	220	225	230	225	205	205	205	270	255	250
20	255	250	245	240	255	255	220	220	210	195	190	200	190	195	250A	210	E245A	240	210	205	255	255	220	245
21	245	250	245	210	250	250	210	225	180H	185	180	200	170	155	245	210	210	225	210	200	205	255	300	295
22	295	290	260	225	200	270	210	225	210	210	210	180	E270S	210	250	E220A	E240A	215	200	290A	295	290	260	310
23	280	260	230	220	250	270	225	205	200H	200	185	180	180H	220	210	225	225	225	E250A	210	260	295	A	I295A
24	250	250	255	225	225	205	210	225	210	240	210	180	210	210	205	220	210	225	210	E300A	300	310	300	260
25	I270A	250	250	250	220	250	250	I240A	205	A	C	C	C	C	C	220	240	205	205	I220A	295	290	300	240
26	225	250	230	210	250	255	225	230	210	200	200	190	180	205	E255A	210	245	210	205	210	290	290	290	290
27	250	240	245	250	250	240	205	210	230	210	210	210	R	210	250A	A	A	A	A	A	A	210	250	275
28	290	280	260	260	260	260	220	210	210	240	200	200	210	240	E290A	A	A	A	E250A	E300A	260	295	255	250
29	210	290	310	295	290	210	210	220	220	225	C	C	C	C	C	E250A	240	240	E250A	250A	210	I290A	250	300
30	275	245	250	210	240	240	210	210	205	C	190	210	205	220	210	205	225	245	250A	225	225	225	295	I270A
31																								
No.	27	26	26	27	27	27	26	22	21	22	21	22	22	25	24	21	21	24	23	27	29	28	27	28
Median	260	250	255	250	250	250	225	225	210	210	205	200	205	210	210	210	230	230	220	225	240	260	290	270
U. Q.																								
L. Q.																								
Q. R.																								

h'F

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

The Radio Research Laboratories, Japan

K 10

IONOSPHERIC DATA

Sep. 1964 | **h'Es** km | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42. 4'N | Long. 139° 29. 3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	100	100	100	100	105	100	110	100	100	100	100	100	100	100	130	120	110	105	100	100	100	105	100
2	100	100	100	100	100	100	100	100	105	100	100	100	100	100	125	110	105	105	105	100	100	100	C	C
3	C	C	C	C	C	C	C	C	C	100	100	100	100	E155G	140	100	100	115	110	105	105	105	100	100
4	100	100	100	100	100	100	130	130	110	115	100	100	100	100	100	100	150	110	100	100	105	105	100	100
5	100	090	095	095	E	115	110	C	C	100	100	100	100	100	100	140	120	120	110	110	105	100	100	100
6	100	100	E	E	E	E	130	125	115	105	105	160	100	105	130	130	115	110	105	105	100	100	100	100
7	100	100	105	100	100	100	110	110	110	105	100	100	100	100	140	130	115	110	105	100	105	110	100	100
8	100	100	100	100	100	100	120	100	100	100	100	100	G	G	G	G	G	145	110	110	105	105	100	100
9	C	C	C	C	C	C	C	C	C	G	100	100	100	100	095	100	C	110	100	100	100	100	100	095
10	100	E	E	100	100	100	120	C	C	100	100	100	E170G	100	100	140	120	120	110	110	105	100	E	100
11	S	E	E	100	E	E	G	110	110	105	110	105	110	110	105	105	120	120	100	100	100	105	100	100
12	C	C	C	095	100	100	130	115	110	110	110	100	100	100	100	100	095	095	B	105	S	S	S	105
13	100	100	S	100	100	E	120	120	115	100	100	100	100	100	100	G	130	130	B	110	100	100	100	100
14	100	100	C	C	C	C	C	C	C	G	G	100	095	095	100	100	100	090	095	095	095	S	105	100
15	100	100	100	100	100	100	095	095	100	G	G	B	100	100	145	130	110	105	105	105	100	100	100	E
16	100	E	100	E	105	E	105	105	110	110	140	110	140	130	125	115	105	105	105	100	100	100	100	100
17	110	100	105	110	110	110	120	110	105	120	105	G	110	105	105	130	130	120	105	100	100	105	105	100
18	095	100	100	100	100	100	140	130	115	110	110	110	110	105	105	105	110	110	105	100	100	100	100	105
19	100	E	100	E	E	110	110	G	G	100	100	G	G	100	100	100	130	100	100	100	100	100	100	105
20	100	100	100	105	115	110	105	110	110	105	G	110	G	150	125	125	110	110	100	110	100	E	E	100
21	E	E	E	100	E	115	105	100	100	G	G	G	G	G	155	130	110	110	095	105	100	100	100	100
22	100	100	095	E	E	E	130	155	130	125	115	100	100	100	105	105	140	125	090	105	105	100	100	100
23	100	100	100	100	100	100	G	110	110	110	105	105	100	100	G	G	145	125	115	110	100	100	100	100
24	100	100	E	E	E	E	130	150	110	110	110	G	100	G	G	G	G	110	105	100	100	100	105	100
25	100	100	100	100	E	115	110	110	110	110	C	C	C	C	C	105	095	125	105	100	100	100	E	100
26	105	E	E	E	E	E	140	110	105	110	G	G	G	G	G	130	110	110	100	100	100	100	100	100
27	E	E	100	100	E	100	130	115	125	110	115	110	110	110	160	130	125	115	110	110	110	140	E	E
28	100	095	E	115	E	E	150	140	110	110	105	100	140	100	100	130	115	110	110	110	110	105	100	E
29	E	100	100	E	S	E	120	110	110	100	C	C	C	C	C	130	110	110	105	105	105	105	105	100
30	100	E	100	100	E	105	125	105	100	C	100	100	G	100	100	100	100	100	100	095	100	100	100	100
31																								
No.	23	19	18	20	14	18	25	24	24	25	23	22	21	23	24	26	27	30	28	30	29	27	24	26
Median	100	100	100	100	100	100	120	110	110	105	100	100	100	100	105	120	115	110	105	100	100	100	100	100
U. Q.																								
L. Q.																								
Q. R.																								

h'Es

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

The Radio Research Laboratories, Japan

K 11

IONOSPHERIC DATA

Sep.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	f2	f3	f	12	12	13	12	12	12	12	12	12	1	h1	h1	13	13	f3	f3	f5	f4	f3
2	f3	f4	f3	f5	f2	14	12	12h	c2	1	12	12	1	1	h2	c3	12	14	12	f4	f4	f4		
3										1	12	1	1	h	h1	13	13	c5	14	f3	f3	f3	f5	f3
4	f4	f3	f4	f2	f2	f	h3	h	c	c	1	1	1	1	1	1	h	1	1	f	f2	f4	f3	f3
5	f3	f2	f2	f		f	15			1	13	12	12	1	1	h1	h212	h3	15	f3	f2	f6	f3	f2
6	f3	f3					h	h2	c2	c2	1	h1	1	1	h1	h	1	14	14	f4	f4	f3	f3	f3
7	f3	f3	f3	f5	f4	f3	c3	c2	c21	c3	12	12	12	1	h1	h	c2	c2	12	f2	f3	f4	f4	f4
8	f3	f3	f2	f3	f2	f	h2	12	14	12	1	1						h	1	f	f6	f3	f3	f2
9											1	1	12	12	12	1		1	12h2	f2	f2	f	f	f
10	f			f	f2	f2	c2			1	1	1	h1	1	1	h1	h2	c2	1	f	f	f2		f2
11				f2				c2	c2	c	1	1	1	1	1	1	h	h2	13	f4	f3	f2	f2	f3
12				f2	f2	f	h	c2	c2	c	c	1	1	1	1	12	12	12		f2				f3
13	f2	f2		f	f2		h2	h2	c	1	1	1	1	1	1		h1	h1		f	f6	f2	f	f
14	f2	f2										1	1	1	1	1	1h	12c	12	f2	f		f3	f3
15	f2	f4	f4	f4	f3	f3	12	12	1				1	1	h12	h212	c3	14	16	f5	f4	f	f	
16	f		f2		f		1	13	12	1	h1	1	h	h	h	c	c3	14	15	f3	f4	f2	f3	f3
17	f2f2	f3	f3	f4	f	f	h2	1	13	h	1		1	12	1	h	h	c21	1212	f3	f2	f2	f	f3
18	f2	f	f	f2	f2	f	h2	h2	c2	c2	c2	c2	c2	c2	12	13	c2	14	1	f6	f4	f3	f2	f
19	f		f			f2	12			1	12			1	1	1	h	1	12	f	f	f	f2	f3
20	f3	f2	f3	f	f2	f4	13	12	c2	1		1		h	h	h2	c3	13	1	f	f2			f
21				f		f	12	12	1						h	h	1	12	12	f	f3	f	f	f
22	f	f	f				h2	h	h	h	c	1	12	1	12	1h	h3	h41	11	f3	f3	f2	f3	f3
23	f2	f3	f3	f3	f3	f		12	12	1	1	1	1	1			h12	h212	h412	f3f2	f2	f3	f3	f5
24	f2	f					h	h	12h	12	1		1					13	13	f3	f3	f2	f3	f4
25	f5	f3	f3	f		f	14	13	1	c2						c1	1	c212	12	f5	f2	f3		f3
26	f						h2	c2	1	1						h	1	12	12	f4	f2	f2	f2	f2
27			f	f2		f2	h312	c2	h	c212	c2	1	c1	c1	h12	h13	c212	c31	15	f4	f4	f		
28	f2	f		f			h2	h2	c2	c2	1	1	h1	12	1	h1	c212	13	13	f3	f3	f	f	
29		f	f2				h2	1	12	12						h	14	12h2	13	f5	f	f4	f2	f2
30	f2		f	f		f	h2	12	1		1	1		1	1	1	12	12	13	f2	f3	f3	f4	f6
31																								
No.																								
Median																								
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

Types of Es

K 12

IONOSPHERIC DATA

Sep. 1964 | hpF2 | km | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	290F	295	300	250	305F	295	A	255	A	A	A	A	310S	R	R	275	350	310	J295S	S	S	A	A	305F
2	300S	F	F	300	F	310	250	G	G	G	330	300	270	350	315	I330A	R	295S	R	S	J220S	A	C	C
3	C	C	C	C	C	C	C	C	C	250R	255	300	G	R	G	A	300	A	300	250	S	265F	I290A	300
4	I300A	F	300	295	290	290	280	295	260S	250R	295	300	G	305	G	295	280	255	295	305	290	245	305F	340
5	325	300	295	295	260	295	A	C	C	R	R	R	G	G	G	R	280	275	310	A	S	300	320	I310A
6	325	U325S	340	310	330	330	260S	245	255	J260R	G	280R	300	290	305	325	300	295	260	250S	240	295	F	295
7	260	330F	320	290	290	290	A	A	295V	A	295	350	I320S	R	I295R	300	290	295	305	295S	285	J380F	J330F	F
8	F	J260R	J250S	300	305	300	260	250R	A	I305R	295	310	300	280	290	280	300	250	295	300	325	305	340	295
9	C	C	C	C	C	C	C	C	C	265	280	G	330	295	300	290R	C	250S	245	295	345S	S	350	360
10	300	295	300	295	320	300	265S	C	C	255S	260R	R	295R	300	295	280	280	260R	250	260	S	S	355	S
11	S	340	F	305F	300	280	250	I230S	250	I260R	290	300	I310R	310	R	R	J265R	250S	I260R	J290S	295	I340S	U315S	I310A
12	C	C	C	270R	280	230	310	245	255	245R	R	U310R	R	R	R	U300R	290R	R	240R	R	S	S	I340R	I335S
13	I355S	F	F	I320S	315	F	R	R	R	R	R	R	R	R	R	R	S	240	R	R	R	R	S	F
14	S	F	C	C	C	C	C	C	C	R	260R	R	R	R	R	U255R	290	250	255	U265S	I280S	J315S	U300S	S
15	280	I300A	310	305	350	300	260	R	225	255	R	R	280R	I310R	255	270	260	270	260	250	255	300	300	295
16	300	295	260	285	310	305	J255R	225S	245	255	270R	295	275	300	275	A	A	260	I265A	I240S	S	310	355F	F
17	345F	F	F	315	250	300	250	J250R	A	265	280R	J260R	315	R	315	J280S	250	250	250	290	305S	350S	F	F
18	F	F	F	F	320	300S	275	250	250	A	275	290R	260R	300	300	295	270	250	260	250S	I295A	350	F	F
19	290F	295	300	295	295F	305F	250	255	245	250	250	275	260	285	275	260	250	250	250	250	250	305	300	290
20	295	300	290	290	300F	F	255	225	240	310	280	280	300	310	280	295	255	255	250	255	305	305	F	295
21	305	300	295	255	295R	295	245	J240R	260	255	230	275	305R	295	280	J295R	300	260	250S	230S	250	300	F	F
22	325	320F	300	250	225	305	250	225R	J250R	255	G	290	310	330	340	S	250S	S	240	310	330	345F	310	345
23	J310R	300	270	250	310	310	250	255	J255R	270	R	270	250	280	270	275	250	250	260S	S	300S	F	A	A
24	300F	300	300	260	290F	245F	250	250	255	255	300	260	U305R	255	260R	300	260R	250	240	A	330F	F	F	300F
25	I295A	290	290	F	290	295F	255S	255	245R	J250R	C	C	C	C	C	280R	255	240	245	I260A	F	F	F	F
26	260	300	290	250	300	300	250	250	240	260	280R	I260R	300	300	265	285	I260R	J240S	240	240	340	310F	310	315
27	290S	290	290	295	295	290	J225R	240	240	255	290	310	275R	I280R	275	300	270	260	A	A	A	250	290	305
28	350F	310F	305	310	310	310F	240	245R	225R	250	295R	280	J285R	R	R	R	260	R	260	300	F	R	I300S	I290S
29	295	340	350	340	320	260S	230	R	I250R	260	C	C	C	C	C	260	255	255	260	270	S	A	F	F
30	320	300F	300	250	295F	310	250	250	J245R	C	280	265	265R	260	250	295	J260S	260S	295S	U270S	J280R	255S	340	I320A
31																								
No.	23	21	21	25	26	25	23	20	20	22	20	21	22	19	19	23	26	26	27	22	19	19	18	18
Median	300	300	300	295	300	300	250	250	250	255	280	290	300	300	280	290	270	255	260	260	295	305	310	305
U. Q.																								
L. Q.																								
Q. R.																								

hpF2

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

The Radio Research Laboratories, Japan

K 13

45

IONOSPHERIC DATA

Sep. 1964 | ypF2 km | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	055F	050	095	050	090F	055	A	045	A	A	A	A	045S	R	R	025	050	060	J035S	S	S	A	A	055F
2	060S	F	F	050	F	085	065	G	G	G	020	040	035	045	035	I035A	R	050S	R	S	J060S	A	C	C
3	C	C	C	C	C	C	C	C	C	045R	045	040	G	R	G	A	055	A	055	050	S	060F	I060A	055
4	I050A	F	055	060	055	055	065	050	045S	045R	025	040	G	040	G	030	030	045	060	090	050	050	065F	060
5	080	055	050	055	065	055	A	C	C	R	R	R	G	G	G	R	040	055	065	A	S	070	080	I070A
6	045	U060S	060	065	070	070	060S	055	045	J040R	G	040R	030	025	050	030	055	050	065	055S	045	075	F	055
7	085	070F	080	055	060	060	A	A	045V	A	060	045	I030S	R	I050R	025	065	060	070	055S	055	J065F	J065F	F
8	F	J055R	J050S	055	055	080	060	045R	A	I055R	050	040	040	045	030	060	045	045	055	090	070	065	060	055
9	C	C	C	C	C	C	C	C	C	035	065	G	055	045	050	035R	C	045S	055	055	060S	S	060	085
10	060	055	055	055	080	060	035S	C	C	045S	035R	R	030R	045	045	045	045	045R	045	040	S	S	070	S
11	S	060	F	055F	055	060	045	I045S	045	I040R	035	045	I040R	060	R	R	J060R	045S	050R	J055S	050	I075S	U080S	I060A
12	C	C	C	075R	065	070	070	025	040	035R	R	U040R	R	R	R	U050R	080R	R	060R	R	S	S	I070R	I065S
13	I055S	F	F	I060S	085	F	R	R	R	R	R	R	R	R	R	R	S	040	R	R	R	R	S	F
14	S	F	C	C	C	C	C	C	C	R	040R	R	R	R	R	U045R	055	045	050	U080S	I050S	J085S	U050S	S
15	065	I070A	085	045	050	050	055	R	050	045	R	R	025R	I030R	045	030	045	050	065	045	050	055	060	060
16	050	045	060	065	090	090	J065R	035S	040	040	030R	045	035	045	030	A	A	040	I070A	I050S	S	085	090F	F
17	060F	F	F	085	050	060	045	J050R	A	035	035R	J045R	040	R	065	J035S	045	045	055	060	065S	060S	F	F
18	F	F	F	F	080	050S	070	045	045	A	050	050R	065R	045	045	030	075	045	045	050S	I080A	085	F	F
19	060F	060	085	060	055F	065F	040	050	025	030	045	035	045	055	035	050	050	050	050	055	050	080	085	065
20	055	050	060	060	080F	F	060	035	020	035	020	030	040	040	030	050	045	050	050	050	075	055	F	050
21	085	050	060	045	055R	050	050	J055R	035	030	030	070	045R	030	030	J060R	060	055	045S	040S	065	095	F	F
22	075	075F	050	060	075	090	050	045R	J045R	045	G	070	040	040	060	S	020S	S	060	085	070	055F	070	055
23	J085R	050	080	075	085	085	060	045	J045R	040	R	045	050	045	030	050	045	050	050S	S	045S	F	A	A
24	050F	055	050	085	050F	050F	050	045	040	040	060	045	U045R	055	040R	040	040R	040	055	A	065F	F	F	050F
25	I050A	060	050	F	060F	055F	055S	040	025R	J050R	C	C	C	C	C	025R	045	040	050	I060A	F	F	F	F
26	050	090	055	045	090	095	055	040	050	040	030R	I045R	045	040	045	060	I040R	J060S	060	060	065	080F	085	080
27	055	J060S	060	060	065	080F	085	080	055S	040	035	050	025R	I040R	070	050	050	040	A	A	A	060	055	055
28	060F	080F	050	050	085	090F	040	030R	045R	030	055R	050	J035R	R	R	R	035	R	065	050	F	R	I060S	I050S
29	055	050	050	060	075	055S	065	R	I030R	050	C	C	C	C	C	050	045	045	050	045	S	A	F	F
30	075	055F	060	050	055F	085	050	030	J050R	C	030	045	035R	040	045	045	J040S	050S	055S	U070S	J065R	055S	060	I080A
31																								
No.	23	21	21	25	26	25	23	20	20	22	20	21	22	19	19	23	26	26	27	22	19	19	18	18
Median	060	055	060	060	065	060	055	045	045	040	035	045	040	045	045	045	045	045	055	055	060	065	065	060
U. Q.																								
L. Q.																								
Q. R.																								

ypF2

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

The Radio Research Laboratories, Japan

K 14

IONOSPHERIC DATA

Sep. 1964 | foF2 | 0.1 Mc | 135° E Mean Time (G. M. T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	I037S	036S	036	032	027	024	030	057	066	054	049	056	066	074	070	059	056	064	080S	I077S	053S	A	A	A
2	I026A	I029A	I028S	024	J025F	022F	037	047	045	054	061S	066S	058S	065	065	063	070	079S	I089S	I069S	I041A	025S	J030S	I028A
3	028S	029	029	027S	F	028S	I035A	051	055	060S	J062S	052	050	054	055	067	054	054S	060S	S	C	A	A	S
4	A	027S	027S	030	I025S	024	C	C	065	058	057	050	050	056	052	060	058	053	057S	062S	060S	057	044	036
5	039S	034	032	026	026	026	033	C	C	S	C	C	C	061	I056A	055	C	C	060	066S	064	A	S	S
6	I030A	I030A	I029A	027	I026A	028	040	058	053	J064S	058	058	060	060	057	055	060	078S	077	072S	040	I034S	035	037
7	036	I034S	030S	030	028	028S	036	055	052	064	054	058	066	072	065	061	I056A	057	J060S	068	062S	042	042S	044S
8	I041S	041	038	027	030	030	038S	049	047	054	071	066	066	064	054	060	056	063S	061	J061S	J062S	I053S	I056S	042
9	041S	043	038	034	033S	029	041	I049S	060	061S	055	064	061	071	075S	J074S	I069S	I065S	057	038	040	039S	040S	I038S
10	038	037	035	030	I026S	027S	035	058	064S	067	062	064	061S	061	055	057	057	059	059S	062	J050S	039	040S	I040S
11	039S	036	034	033	031	031	042	054	056	059	060	059	056	058	076	093	088	J094S	I079S	I057A	I050A	I046S	040S	I037S
12	I037S	I036S	I033S	034S	034S	028	035	049	064S	J062S	055	058	061	062S	080	091S	086	C	C	057	047	044	S	S
13	S	041	033	033	030	028	038	054	058	057	059	058	059	069	082	081	065	062	067S	066S	056	044	040	I037S
14	I036S	034	034	031	027	028	029	056	078	I060A	055	054	056	071	082	064	058	I053A	057	I059S	I046S	040	038	S
15	S	033S	030	029	030	026	I031S	061	073S	061S	056	059	062	063	064	057	052	050	I059A	I069S	I054S	043	038S	037
16	037S	037S	034S	032	023	024	033S	I065S	057S	056	057	061	062	066	061S	058S	059	I073S	084	I071S	J062S	A	A	034
17	I035S	035S	034S	032	033	034	I041S	060	I054S	056	058	067	071	081	080	I076S	085	059	060	061	I051S	033S	S	S
18	S	S	034S	028	I027S	I027A	036	049	061	060S	056	060S	073S	058	058	068	I076S	070S	069	057	I040S	I034S	036	I035S
19	036	036	034S	032	031	029S	031S	056	J077S	061	061	070	U076S	066	067	061	061S	059	I063S	058	050S	039	038S	037
20	I040S	I040S	I038S	036	031	028	032	056	J062S	058	055	061S	059	057	058S	062	063	070	U069S	I061S	054	045S	043S	I040S
21	I038S	032	032	031	029S	028	033S	055	058	I067S	055	053	053H	069	065S	060S	056	057	I068S	J054S	I044S	032	J034S	I038S
22	036S	035	033	038	022	J019S	030S	051	054	052S	054	056	066S	068	067	086	I092S	066	J052S	041	041	I040S	041	041
23	I040S	041	038	039	034S	J033S	035	I063S	061S	077	J076S	J078S	I100C	I104S	J080S	J065S	063	J062S	053	I047S	043	040S	037S	036
24	036	035	036	035S	034	022	030S	051S	060S	066	056	I062S	072	087	085	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	055	I061S	076S	I095S	I098S	J078S	063	061	047	I042S	037S	037S	S	S
26	036S	034S	031	027	023	022	029	055	067	J064S	062	J066S	080	086	087	I079C	I070C	I068S	I058S	I041S	027	027	030	031S
27	031S	029	027	029	026	024	U033S	050S	052	056	056	062	064	J077S	U074S	071	065	I070S	084	I060S	I040A	I031A	J030S	I031S
28	032S	031S	032S	U032S	031S	027	034	049	056	058	054	058	082	082	081	072S	066	065	I061S	052S	I049S	040	I040S	042S
29	I042S	042	035S	036	037	037	038	054	I064S	063S	057H	071S	J079S	084	082	067	066S	S	S	S	I052S	044S	042S	040S
30	I040S	I042S	I042S	I038C	027	025	033	I058S	058	056	062	067	072	069	063	C	C	066S	S	S	051	036	036	035
31																								
No.	25	28	29	29	28	29	28	27	28	28	29	29	29	30	30	28	27	26	26	26	28	25	22	22
Median	037	035	034	032	028	028	034	055	059	060	057	061	064	068	067	064	063	064	060	060	050	040	039	037
U. Q.	040	038	036	034	031	028	038	058	064	064	061	066	072	077	080	075	070	070	069	066	054	044	041	040
L. Q.	036	032	030	028	026	024	032	050	054	056	055	058	059	061	058	060	057	059	058	054	041	034	036	035
Q. R.	004	006	006	006	005	004	006	008	010	008	006	008	013	016	022	015	013	011	011	012	013	010	005	005

foF2

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

The Radio Research Laboratories, Japan

Y 1

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IONOSPHERIC DATA

Sep. 1964 | foF1 | 0.01 Mc | 135° E Mean Time (G. M. T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	380L	410	420	430H	430	420	420	420	400	390	L					
2										420	420	420	440	I430A	440	420	400	380L	A					
3								L	L	A	A	420	440	420C	430	410	410L	A	A					
4							C	C	390L	420	430	440	440	430H	420	420	400	390H	L					
5								C	C	430	C	C	C	I440A	I430A	410	C	C	A					
6								L	L	420	430	440	430	440	430	430	410	370	L					
7								L	A	410	430	I440A	I440R	430	430	A	A	A	A					
8									L	440H	420	420H	440C	430	440	420	390H	L						
9									L	410	420	440	450	440	420	410H	400	340L						
10								L	400L	410	420	430	440	430	430H	420	400	L	A					
11									L	410H	430H	440	430	440	I430S	I410A	400H	A	A					
12								A	A	410	420	430	430	440H	440	420	400	C	C					
13								L	L	420H	420	430H	430H	420	440	420H	400L	L						
14								L	380L	I420A	430	440	430	450	440H	430	A	A						
15								L	380L	410L	L	440H	450	440H	420	410	400	A	A					
16								L	L	420	430	430	440	430	I430A	420	A	A	A					
17										430	430	420	430	440H	420	420	A	A	A					
18									A	A	A	A	A	A	450	420	400	L	A					
19								L	370	410	420H	440	430	430H	430	420	400L	L						
20								L	A	I410A	410	420R	430	420	420	400	I390A	A						
21								L	370	400	420H	430	440H	410	420	400	400H	340L						
22									L	410	L	440S	420H	420	410S	420H	390L	A						
23								L	L	410	430	LH	I420C	440H	430H	420	L	L						
24									L	400	410	420	440R	430	430	C	C	C						
25								C	C	C	430	430	430	430	420H	410	L	A						
26								L	L	400L	420	420	430	430H	430	I410C	I380C	L						
27									L	410	I420A	440	430H	430	430H	410H	390	L	A					
28									A	A	A	I430A	440H	I420A	440	410	390	L	A					
29									L	L	410	430	430H	440H	440	L	370L	L						
30									L	400	420	430H	440	440	430	C	C	L						
31																								
No.									7	25	24	27	28	29	30	26	21	6						
Median									380	410	420	430	430	430	430	420	400	380						
U. Q.																								
L. Q.																								
Q. R.																								

foF1

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

The Radio Research Laboratories, Japan

Y 2

48

IONOSPHERIC DATA

Sep. 1964 | foE | 0.01 Mc | 135° E Mean Time (G. M. T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	220	I250A	270	280	A	A	A	310	300	290	245	190					
2						S	S	220	I260A	A	C	A	310	I325A	315	310	290	240	S					
3							S	A	A	A	A	A	A	A	A	A	290	260	S					
4							C	C	250	280	290	300	310	330	320	305	290	240	170					
5							S	C	C	290	C	C	C	A	A	300	C	C	170					
6							S	210	250	280	280	A	A	330	320	310	290	250	S					
7							S	210	250	275	295	300	300	310	310	305	280	240	S					
8							S	215	260	285	I295A	310	I325R	330	320	300	270	230	S					
9							S	200	260	300	300	310R	325	320	340	305	270	220	S					
10							S	200	260	280	300	R	R	320	320	300	270	230	S					
11							S	200	240	275	290	305	310	315	A	A	A	240	S					
12							S	210	260	285	305	315	310	I310R	310	305	275	C	C					
13							S	205	260	I300A	300	I310R	I300R	I305R	320R	305	280	230	S					
14							S	190	235	A	A	330	330	A	A	A	A	A	A					
15							S	210	260	300	305R	310	320	320	I310R	295	260	220	S					
16							S	A	A	A	310	320	330	330	320	305	270	220	S					
17							S	210	A	A	A	310	R	R	310	300	265	230	S					
18							S	205	260	285	305	A	A	A	A	A	A	A	S					
19							S	A	A	290	300	310	320	320	310	I285A	260	A	S					
20							S	220	250	290	305	315	320	320R	330	300	270	210	S					
21							S	215	I260A	290	A	R	R	R	310	300	260	210	S					
22							S	220	I260R	280	305	300	315	I310A	I310R	A	265	210	S					
23							S	175	230	A	A	A	C	A	R	A	A	210	S					
24							S	215	260	270	285	A	R	I320R	320	C	C	C	C					
25							C	C	C	C	280	290	A	A	R	300	260	225	S					
26							S	I210A	260	300	310	315	325	320	310	I290C	I260C	220	S					
27							S	190	250	290	305	315	310	310	310	280	260	210	S					
28							S	200	260H	270	295	305	R	A	A	A	A	A	S					
29							S	200	250	270	A	R	R	R	R	I285A	250	200	S					
30							S	190	260	285	I310R	R	R	R	A	C	C	215	S					
31																								
No.								24	24	23	22	18	16	18	20	21	22	23	3					
Median								210	260	285	300	310	320	320	310	300	270	225	170					
U. Q.																								
L. Q.																								
Q. R.																								

foE

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

The Radio Research Laboratories, Japan

Y 3

IONOSPHERIC DATA

Sep. 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	J030	J032	J025	J024	J018	J027	J018	025	J033	030	036	035	035	033	G	J023G	030	035	J033	J024	J024	J035	J036	J024
2	J051	J051	J051	J029	E	J015S	025	028	J036	035	036	J036	039	J071	037	034	037	035	J053	J052	J051	J027	J029	J031
3	J022	J018	S	S	S	J036	J051	J029	J036	J051	J045	J037	J045	J042	J035	034	035	036	J034	J061	C	J036	J032	J026
4	J051	J025	J023	J015	J024	J023	C	C	030	032	032	034	033	033	G	035	030	029	022	S	J030	020	S	S
5	S	S	S	E	J013	016	J016S	C	C	J044	C	C	C	J054	J071	J032	C	C	034	J036	J036	J062	J051	J025
6	J051	J037	J031	J031	J030	J024	J016S	029	036	033	033	J034	037	030G	023G	G	030	029	024	J023	J030	J036	J019	J018S
7	J018	J024	J019	J020	E	S	J026	028	J050	041	043	J048	042	041	041	051	J063	J058	J041	J037	J030	J035	J033	J033
8	J024	J017	S	S	024	S	023	023	029	032	J041	033	025G	G	036	G	G	G	S	S	S	S	J026	S
9	S	S	S	S	S	S	J018S	029	030	036	035	036	035	G	036	038	042	026	018	018	021	024	S	S
10	S	S	J015S	S	J015S	J015S	J016S	030	033	035	G	023G	022G	022G	G	G	033	029	027	019	S	S	S	J016S
11	S	S	S	S	E	S	S	026	028	031	033	034	035	035	035	J045	J032	J051	J064	J082	J083	J031	S	J033
12	S	J032	J026	030M	J029	J025	J016S	030	038	038	038	036	037	037	J053	038	042	C	C	J036	J051	J051	J030	J021
13	S	S	S	S	S	S	S	023	030	030	029G	030G	029G	024G	038	035	034	J036	025	J030	J024	021	S	J020
14	J018	J016S	S	E	S	J017S	S	030	035	068	042	035	030G	044	J051	J035	044	J055	J030	J052	J032	J032	S	S
15	J020	J018	J017	E	J017	J020	J029	J024	028	G	G	G	036	037	G	038	038	036	J064	J025	J026	023	S	S
16	S	S	J014S	J017S	E	S	S	028	028	J036	040	038	040	037	J055	050	J058	J045	J054	J054	J051	J051	J052	J018
17	S	J017S	S	J014S	E	S	S	J051	030	030	030	033	G	023G	037	033	J061	J055	J037	J024	S	J015S	J017	J026
18	J019	J018	J017	J019	J029	J028	021	040	J054	054	057	044	060	050	040	033	032	028	J034	J020	J030	J033	J017	J024
19	S	S	S	S	E	S	S	026	030	034	G	024G	G	G	027G	030	G	J026	J025	J024	J017	J016S	S	S
20	J020	J018S	J020	J017S	J016	S	S	G	058	J069	042	J051	041	G	035	032	J043	033	J030	J015S	S	S	S	S
21	S	S	S	S	S	S	S	024	031	031	030	G	G	G	035	G	G	025	J018S	S	S	S	S	S
22	S	S	S	S	S	S	S	026	029	032	031	031	033	033	G	029	032	J036	J034	J026	J032	J020	S	J021
23	J030	J029	J021	J019	J017	J014S	S	025	J051	J036	034	033	C	034	030G	038	J029	025	J018	J016S	023	J033	J030	J034
24	J019	S	J017	S	E	S	J021	025	J035	J036	034	J035	J031G	G	G	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	J036	035	J037	J036	025G	G	033	J036	J030	J026	J024	J023	J024	J025
26	J025	S	S	S	S	J016S	S	025	026	030G	025G	G	G	G	G	C	C	031	020	J024	S	J020	J027	J024
27	J021	J014S	S	S	S	S	S	028	035	036	J047	J054	038	020G	033	G	029	J036	J037	J036	J052	J052	J016S	J023
28	J020	S	S	S	J017	J017S	J015S	025	039	044	J050	J046	032G	046	039	J035	J033	035	036	J051	J051	J029	S	S
29	S	S	J015S	S	J015S	S	S	026	040	037	030	030G	030G	031G	030G	030	030	J036	024	J024	J025	J026	J021	J017S
30	S	S	S	C	S	S	S	021	025G	030	028G	030G	025G	027G	031	C	C	024	S	020	S	S	J024	J026
31																								
No.	16	15	14	14	20	14	14	27	28	29	29	29	28	30	30	27	26	27	26	26	21	24	17	20
Median	022	018	020	018	016	018	020	026	033	035	034	034	034	033	035	033	033	035	032	026	030	030	027	024
U. Q.	030	032	025	024	021	025	025	029	037	040	042	036	038	037	038	038	042	036	037	037	051	036	032	026
L. Q.	020	017	017	014	E	016	016	025	030	031	030	G	G	G	G	G	030	028	024	023	024	022	020	020
Q. R.	010	015	008	010		009	009	004	007	009	012						012	008	013	014	027	014	012	006

foEs

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

The Radio Research Laboratories, Japan

Y 4

IONOSPHERIC DATA

Sep.1964 | f_bEs | 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	021	028	020	020	017	E	E	025	028	030	034	033	035	033		023G	G	034	029	019	021	A	A	A
2	A	A	022	014		S	025	027	034	035	036	036	039	062	034	033	037	033	E053S	052	A	021	020	A
3	022	E	S	S	S	016	A	025	036	046	041	037	039	038	035	033	032	036	034	050	C	A	A	E026S
4	A	020	018	014	E024S	019	C	C	G	032	G	E034C	E033C	031		033	G	026	020	S	019	E	S	S
5	S	S	S		013	016	S	C	C	037	C	C	C	054	A	028	C	C	032	028	028	A	018	020
6	A	A	A	020	A	020	S	028	034	033	033	E340R	G	029G	E023R		G	G	023	019	E	020	019	S
7	E	E	E	020		S	024	027	047	039	042	047	E042R	037	039	047	A	055	041	036	029	028	019	020
8	E	E	S	S	016	S	G	G	029	032	033	033	E025R		035				S	S	S	S	019	S
9	S	S	S	S	S	S	S	027	G	G	034	035	E035R		036	036	036	G	018	017	E	020	S	S
10	S	S	S	S	S	S	S	027	033	G		023G	E022R	E022R			031	028	027	019	S	S	S	S
11	S	S	S	S		S	S	025	028	030	G	G	G	G	E035S	043	028	042	063	A	A	026	S	019
12	S	028	019	023	021	019	S	025	037	037	G	G	035	034	041	038	038	C	C	E036S	034	021	019	019
13	S	S	S	S	S	S	S	G	G	E030R	029G	E030R	029G	E024R	037	032	030	030	023	020	018	E	S	019
14	E	S	S		S	S	S	028	034	A	040	G	028G	038	034	035	044	A	020	E052S	032	018	S	S
15	E	017	017		016	019	E029S	018	G				035	036		037	037	034	A	E	019	017	S	S
16	S	S	S	S		S	S	027	028	031	039	036	038	037	050	040	054	044	053	046	050	A	A	018
17	S	S	S	S		S	S	040	028	G	E030R	G		023G	037	033	041	055	037	020	S	S	E	022
18	019	018	016	016	021	A	016	E040S	053	045	054	043	060	048	039	031	030	020	033	019	028	E033S	E	019
19	S	S	S	S		S	S	022	028	G		023G			024G	030		025	022	022	017	S	S	S
20	E	S	020	S	E	S	S		045	050	039	039	040		035	G	042	033	U030A	S	S	S	S	S
21	S	S	S	S	S	S	S	G	G	G	G				G			G	S	S	S	S	S	S
22	S	S	S	S	S	S	S	G	G	032	G	G	G	E033R		E029R	032	033	032	025	019	E020S	S	020
23	021	E029S	020	017	016	S	S	024	036	035	034	033	C	034	E030R	035	028	025	018	S	020	024	021	031
24	E	S	017	S		S	019	G	033	033	G	035	E031R			C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	036	035	036	035	E025R		033	035	030	E026S	E	E	020	E
26	021	S	S	S	S	S	S	024	025	027G	022G					C	C	028	020	021	S	E	023	018
27	019	S	S	S	S	S	S	028	031	033	046	039	036	E020R	G		G	031	036	033	A	A	S	019
28	018	S	S	S	017	S	S	G	037	044	049	044	E032R	044	038	034	031	026	033	035	022	021	S	S
29	S	S	S	S	S	S	S	025	036	036	E030R	E030R	E030R	G	E030R	G	G	030	021	020	025	022	017	S
30	S	S	S	C	S	S	S	G	G	G	022G	E030R	025G	E027R	E031R	C	C	G	S	E020S	S	S	020	021
31																								
No.																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

f_bEs

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

The Radio Research Laboratories, Japan

Y 5

51

IONOSPHERIC DATA

Sep.1964 | f-min | 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	E016S	E016S	E016S	008	007	E015S	E016S	013	016	016	016	016	016	016	016	016	016	015	E016S	E016S	E016S	E016S	E016S	E016S
2	E016S	E016S	E016S	008	010	E016S	E016S	012	014	016	016	016	016	E021S	016	016	016	016	E016S	E017S	E016S	E016S	E016S	E016S
3	E016S	E015S	E016S	E016S	E015S	E014S	E015S	013	014	016	016	017	016	016	016	016	016	E016S	E016S	E016S	C	E018S	E016S	E016S
4	E016S	E014S	009	009	009	E014S	C	C	015	016	016	016	016	016	016	016	016	016	E016S	E017S	E016S	E015S	E016S	E016S
5	E014S	E015S	E015S	013	008	E014S	E015S	C	C	016	C	C	C	018	018	016	C	C	E015S	E016S	E016S	E016S	E016S	E016S
6	E016S	E016S	009	009	008	E014S	E017S	016	016	015	019	017	016	019	019	016	016	E016S	E016S	E016S	E016S	E018S	E016S	E016S
7	E016S	E017S	E015S	009	009	E016S	E016S	015	015	015	016	018	018	018	017	018	018	E016S	E016S	E016S	E016S	E016S	E017S	E016S
8	E016S	E015S	E015S	E014S	009	E017S	E016S	016	014	016	016	018	018	025	020	019	017	E016S	E017S	E016S	E016S	E017S	E016S	E015S
9	E016S	E016S	E016S	E018S	E014S	E015S	E016S	016	016	017	018	016	016	019	020	019	017	015	E016S	E016S	E017S	E019S	E019S	E018S
10	E018S	E016S	E016S	E015S	E014S	E015S	E016S	013	014	015	017	018	016	016	019	017	016	E016S	E016S	E016S	E015S	E016S	E016S	E018S
11	E017S	E016S	E016S	E014S	011	E016S	E016S	016	015	016	E018S	020	019	018	019	016	017	016	E016S	E016S	E016S	E016S	E016S	E016S
12	E016S	E016S	E016S	E016S	008	E016S	E016S	016	016	016	017	019	018	018	018	017	014	C	C	E016S	E016S	E016S	E016S	E016S
13	E016S	E015S	E017S	E017S	E015S	E015S	E016S	014	016	016	019	020	019	019	019	019	016	E015S	E016S	E016S	E016S	E016S	E017S	E016S
14	E016S	E016S	E016S	013	E016S	E015S	E016S	016	016	016	019	018	021	020	019	016	014	016	E016S	E016S	E016S	E017S	E018S	E019S
15	E016S	E016S	E016S	008	009	E016S	E016S	016	016	016	016	020	018	021	016	016	016	E016S	E016S	E016S	E016S	E016S	E016S	E016S
16	E017S	E015S	E015S	E014S	012	E015S	E016S	016	016	016	016	019	019	018	016	016	018	E016S	E016S	E016S	E016S	E016S	E016S	E016S
17	E016S	E017S	E017S	E014S	014	E016S	E017S	014	016	016	016	017	018	019	016	014	014	016	E016S	E016S	E016S	E016S	E015S	E016S
18	E016S	E016S	E015S	008	E016S	E015S	E015S	016	017	E020S	020	021	021	020	019	016	016	E016S	E016S	E016S	E016S	E016S	E015S	E016S
19	E016S	E015S	E015S	E014S	012	E015S	E017S	016	016	016	016	017	020	021	019	016	014	E016S	E016S	E016S	E016S	E016S	E017S	E020S
20	E017S	E017S	E017S	E017S	E015S	E015S	E016S	016	016	019	017	019	018	016	016	020	016	E017S	E016S	E018S	E016S	E018S	E017S	E019S
21	E016S	E016S	E017S	E017S	E016S	E016S	E016S	E016S	015	016	017	E020S	016	021	021	018	020	E016S	E019S	E017S	E019S	E018S	E019S	E019S
22	E019S	E017S	E016S	E018S	E014S	E018S	E019S	016	016	017	018	020	018	017	016	016	016	E016S	E016S	E016S	E016S	E016S	E019S	E017S
23	E016S	E016S	E016S	E016S	011	E019S	E016S	016	017	014	016	020	C	E026S	022	018	016	E017S	E016S	E017S	E016S	E016S	E016S	E016S
24	E015S	E016S	E016S	E016S	013	E019S	E016S	016	016	016	016	020	020	018	018	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	E022C	E021C	022	018	016	E025C	016	E017S	E016S	E016S	E016S	E016S	E016S	E017S
26	E016S	E016S	E017S	E016S	E015S	E017S	E017S	017	016	018	018	018	018	018	018	C	C	E017S	E017S	E017S	E016S	E016S	E017S	E017S
27	E017S	E016S	E017S	E017S	E017S	E016S	E018S	016	016	018	016	018	018	016	022	016	016	E016S	E016S	E016S	E016S	E016S	E017S	E016S
28	E015S	E017S	E017S	E016S	014	E016S	E016S	016	016	016	018	021	022	025	021	016	016	E016S	E016S	E016S	E016S	E017S	E017S	E017S
29	E016S	E016S	E016S	E017S	E017S	E017S	E017S	016	016	018	022	021	025	023	022	021	016	E016S	E016S	E016S	E016S	E016S	E016S	E017S
30	E017S	E016S	E016S	C	E016S	E017S	E017S	017	016	017	017	018	018	017	016	C	C	E017S	E018S	E017S	E016S	E017S	E017S	E020S
31																								
No.	29	29	29	28	16	29	28	27	28	28	27	27	28	28	30	26	26	27	28	29	28	29	29	29
Median	E016	E016	E016	E014	010	E016	E016	016	016	016	017	018	018	018	018	016	016	E016	E016	E016	E016	E016	E016	E016
U. Q.																								
L. Q.																								
Q. R.																								

f-min

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

The Radio Research Laboratories, Japan

Y 6

IONOSPHERIC DATA

Sep.1964 | M(3000)F2 | 0.01 | 135° E Mean Time (G. M. T. +9h) | Yamagawa | Lat. 31° 12. 1'N | Long. 130° 37. 1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	I310S	320S	335	340	335	305	315	360	365	350	360	305	295	320	320	310	305	315	325S	I350S	375S	A	A	A
2	I325A	I335A	I330S	315	J320F	320F	350	360	360	330	330S	350S	300S	315	310	315	330	330S	I350S	I365S	I355A	320S	J280S	I290A
3	310S	310	305	305S	F	330S	I330A	370	355	350S	J355S	345	305	300	310	335	315	315S	315S	S	C	A	A	S
4	A	335S	310S	340	I335S	295	C	C	355	350	350	340	270	325	310	315	345	325	335S	315S	315S	330	320	305
5	310S	320	345	320	315	310	330	C	C	S	C	C	C	335	I330A	345	C	C	335	335S	330	A	S	S
6	I320A	I310A	I305A	265	I310A	320	330	380	390	J345S	350	330	335	335	315	300	315	335S	355	355S	340	I295S	315	295
7	335	I315S	300S	325	315	320S	340	380	365	345	330	295	320	320	335	345	I310A	330	J315S	325	350S	285	250S	285S
8	I295S	340	340	300	300	335	370S	375	365	300	340	335	335	340	315	335	330	320S	310	J305S	J320S	I340S	I325S	325
9	300S	300	320	325	330S	315	340	I360S	350	360S	310	330	295	310	320S	J325S	I335S	I345S	370	325	260	280S	300S	I275S
10	305	300	315	305	I305S	295S	345	350	360S	360	340	340	330S	330	315	315	315	340	340S	340	J340S	310	290S	I300S
11	305S	305	295	310	320	320	350	370	375	350	335	320	340	285	290	310	325	J340S	I330S	I325A	I275A	I310S	300S	I310S
12	I325S	I300S	I310S	325S	325S	350	345	365	375S	J360S	355	320	330	305S	300	340S	320	C	C	335	310	U320C	S	S
13	S	U335C	U310C	U305C	U300C	U315C	U345C	U390C	U365C	U350C	340	340	305	310	315	345	325	320	345S	345S	350	320	330	I290S
14	I310S	U330C	U320C	U340C	U325C	U320C	U310C	U345C	U370C	I380A	350	350	305	325	350	350	345	I340A	340	I310S	I335S	310	290	S
15	S	305S	305	315	325	295	I320S	350	370S	360S	340	340	330	330	355	350	345	320	I330A	I350S	I345S	325	320S	320
16	320S	310S	330S	330	315	310	335S	I365S	370S	355	355	345	335	350	335S	315S	305	I320S	345	I350S	J385S	A	A	300
17	I290S	285S	295S	315	310	310	I330S	380	I380S	335	345	330	310	320	340	I320S	355	330	330	340	I335S	275S	S	S
18	S	S	325S	285	I300S	I330A	350	365	360	365S	335	335S	340S	330	310	315	I330S	335S	350	370	I345S	I300S	300	I300S
19	305	305	320S	315	310	315S	325S	355	S	360	340	345	U330S	330	345	330	350S	345	I345S	340	340S	290	295S	295
20	I300S	I305S	I320S	335	325	320	320	380	J355S	360	360	340S	355	335	335S	325	335	330	U335S	I345S	330	335S	310S	I305S
21	I320S	315	330	325	315S	325	335S	380	365	I360S	365	315	265H	320	355S	335S	325	345	I350S	J345S	I330S	285	J275S	I315S
22	325S	315	315	365	365	J325S	335S	370	385	365S	345	320	300S	320	270	320	I335S	365	J385S	295	295	I285S	300	295
23	I305S	300	320	305	320S	J305S	310	I355S	365S	340	J335S	J300S	I315C	I295S	J315S	J325S	335	J340S	375	I320S	315	285S	340S	320
24	285	310	325	315S	355	275	335S	370S	350S	365	315	I315S	310	320	330	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	345	I325S	305S	I310S	I330S	J345S	350	360	360	I335S	315S	285S	S	S
26	335S	355S	325	335	305	320	330	365	375	J350S	340	J335S	315	325	300	I315C	I340C	I345S	I370S	I365S	305	295	300	330S
27	325S	315	310	325	345	340	U320S	390	365	355	355	340	330	J310S	U310S	325	325	I340S	355	I350S	I330A	I300A	J335S	I290S
28	290S	295S	315S	U315S	325S	295	355	370	375	360	335	295	330	330	320	320S	325	325	I340S	325S	I305S	275	I300S	300S
29	I315S	320	285S	305	305	340	365	360	I365S	395S	310H	325S	J315S	325	325	330	335S	S	S	S	I330S	305S	295S	300S
30	I310S	I300S	I315S	I345C	365	320	335	I375S	380	365	340	350	340	335	335	C	C	335S	S	S	355	320	280	295
31																								
No.	25	28	29	29	28	29	28	27	27	28	29	29	29	30	30	28	27	26	26	26	28	25	22	22
Median	310	310	315	315	320	320	335	370	365	360	340	335	315	320	320	325	330	335	340	340	330	300	300	300
U. Q.																								
L. Q.																								
Q. R.																								

M(3000)F2

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Sep.1964 | M(3000)F1 | 0.01 | 135° E Mean Time (G. M. T. +9h) | Yamagawa | Lat. 31° 12. 1'N | Long. 130° 37. 1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	370L	380	430	385H	380	405	380	375	355	A	L					
2										355	355	400	365	I390A	365	360	A	340L	A					
3								L	L	A	A	385	410	405C	370	380	365L	A	A					
4							C	C	360L	380	385	385	415	375H	400	365	350	385H	L					
5								C	C	360	C	C	C	I385A	I370A	370	C	C	A					
6								L	L	375	395	395	385	395	390	370	365	350	L					
7								L	A	A	A	I370A	I375R	380	350	A	A	A	A					
8								*	L	345H	380	395H	375C	370	365	360	360H	L						
9									L	375	385	390	375	380	365	340H	A	370L						
10								L	360L	385	385	370	375	395	360H	355	360	L	A					
11									L	390H	370H	365	400	390	I375S	I370A	360H	A	A					
12								A	A	385	405	420	370	365H	A	385	A	C	C					
13								L	L	385H	405	420H	380H	400	350	375H	370L	L						
14								L	390L	A	A	385	420	355	365H	370	A	A						
15								L	380L	395L	L	385H	375	365H	375	365	A	A	A					
16								L	L	380	380	400	380	375	A	A	A	A	A					
17										370	370	405	400	385H	375	355	A	A	A					
18									A	A	A	A	A	A	360	355	350	L	A					
19								L	390	390	405H	385	385	390H	370	355	350L	L						
20								L	A	A	A	410R	A	395	380	400	A	A						
21								L	385	390	395H	405	385H	405	360	375	355H	355L						
22									L	380	L	385S	405H	380	395S	350H	340L	A						
23								L	A	375	375	LH	I400C	370H	370H	355	L	L						
24									L	375	415	405	370R	375	360	C	C	C						
25								C	C	C	380	390	395	395	380H	365	L	A						
26								L	L	400L	380	405	405	410H	350	I370C	I370C	L						
27									L	390	I415A	385	385H	380	360H	350H	360	L	A					
28									A	A	A	I395A	380H	I390A	345	365	365	L	A					
29									L	L	415	380	395H	365H	370	L	370L	L						
30									L	400	405	395H	370	385	375	C	C	L						
31																								
No.									7	22	21	27	27	29	28	25	16	5						
Median									380	380	385	390	385	385	370	365	360	355						
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Sep. 1964 | h'F2 km | 135° E Mean Time (G. M. T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								250	250	275	280	350	345	300	290	330	350	305	265					
2										300	300	280	345	E350A	330	310	300	285	I245A					
3								245	255	260	250	285	375	375	355	295	330	300	300					
4							C	C	250	270	275	310	445	300	350	300	280	280	250					
5								C	C	255	C	C	C	300	I300A	295	C	C	275					
6								230	230	270	275	310	300	300	325	350	315	265	240					
7								230	E275A	275	305	355	305	300	295	290	A	E350A	285					
8									245	345	280	300	300	295	330	295	275	290						
9									235	255	280	300	345	320	275	295	275	250						
10								250	250	250	280	290	300	300	310	300	295	280	245					
11									250	260	290	305	295	395	345	290	275	250	255					
12								230	235	250	255	330	300	340	320	275	280	C	C					
13								U225C	U235C	U270C	280	295	320	325	295	250	275	275						
14								U250C	U240C	I235A	260	290	350	300	265	260	280	A						
15								245	240	250	290L	300	305	300	275	275	280	250	A					
16								230	240	275	280	290	300	290	300	315	E350A	290	240					
17										300	275	300	300	295	270	300	250	E315A	275					
18									255	250	E340A	300	265	305	325	300	250	255	245					
19								250	240	245	275	280	260	280	270	300	260	255						
20								230	250	250	270	300	275	295	300	300	290	260						
21								230	250	250	250	350	360H	305	260	295	290	260						
22									240	250	275	320	330	295	380	280	250	245						
23								250	250	255	265	295	I290C	260	285	295	280	250						
24									250	250	255	300	300	295	280	C	C	C						
25								C	C	C	275	315	300	290	260	250	250	240						
26								245	245	255	270	275	290	280	285	I285C	I275C	250						
27									240	250	260	280	295	290	300	290	295	255	230					
28									230	250	E300A	350	290	270	270	270	275	260	240					
29									250	215	245H	300	280	270	290	255	280	250						
30									210	250	290	255	270	270	280	C	C	250						
31																								
No.								15	25	29	27	29	29	29	30	28	25	24	14					
Median								245	245	255	275	300	300	300	295	295	280	260	250					
U. Q.																								
L. Q.																								
Q. R.																								

h'F2

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	295	E325A	260	250	230	270	245	230	220	200	200	195H	225	195	225	215	240	A	A	225	200	A	A	A
2	A	A	250	260	270	250	245	240	A	245	E250A	230	E250A	I220A	200	235	I245A	E275A	A	225	I220A	E310A	E320A	A
3	E315A	295	295	270	250	225	I260A	230	E250A	A	A	240	200	230	225	235	240	A	I250A	275	C	I220A	A	A
4	A	295	300	240	A	E300A	C	C	245	225	210	215	200	185H	210	225	245	230H	235	245	250	220	245	295
5	255	250	235	235	250	260	250	C	C	E245A	C	C	C	I215A	I205A	200	C	C	I250A	250	250	I260A	250	230
6	A	A	A	E350A	A	290	240	230	235	230	200	200	230	215	200	225	220	230	235	215	200	300	295	300
7	255	315	275	280	250	270	250	225	A	A	I240A	A	A	230	E275A	A	A	A	A	250	240	E325A	330	320
8	295	245	235	250	270	250	230	230	230	220H	195	190H	235	210	215	205	200H	230	250	250	245	225	350	250
9	265	255	250	245	245	245	240	225	235	235	215	200	200	225	270	E230H	A	225	225	240	300	330	300	300
10	295	270	250	250	290	295	250	245	245	215	210	200	220	205	200H	235	230	245	I245A	240	225	250	290	300
11	275	265	300	280	260	250	240	225	215	215H	200H	225	210	200	I210A	I235A	230H	A	A	A	A	255	260	275
12	260	330	300	275	250	250	235	I225A	I235A	230	200	200	175	190H	I190A	240	A	C	C	250	E305A	U250C	U275C	U295C
13	U275C	U250C	U250C	U250C	U280C	U280C	U245C	U230C	U230C	U200H	200	200H	200H	230	245	225H	230	E250A	250	235	220	230	U250C	U300C
14	U275C	U250C	U250C	U250C	U255C	U270C	U250C	U245C	U240C	I210A	E245A	180	195	E250A	200H	240	A	A	245	A	250	265	300	260
15	250	275	285	285	250	300	A	230	230	200	200	195H	195	185H	225	E250A	E270A	A	A	230	210	245	255	275
16	275	260	250	235	270	295	245	230	225	200	245	205	230	230	A	A	A	A	A	240	240	A	A	295
17	290	310	290	290	250	280	240	225	225	215	225	210	215	200H	245	250	A	A	A	235	215	E305A	325	285
18	300	300	250	300	E345A	A	230	E250A	A	A	A	A	A	A	240	200	230	230	I240A	215	240	I300A	300	330
19	275	275	250	250	250	250	260	230	225	205	195H	195	190	180H	215	240	240	240	245	225	225	265	300	300
20	295	270	260	250	245	250	250	230	A	A	E240A	200	A	200	230	225	A	I230A	235A	240	215	240	275	255
21	250	270	250	250	255	250	250	225	220	200	180H	195	180H	200	270	220	230H	205	230	210	230	250	320	300
22	275	280	260	225	200	S	250	225	235	205	200	190	175H	225	220	225H	E245A	I240A	230	270	275	I300A	295	300
23	280	E300S	250	250	260	280	255	245	A	230	200	195H	I195C	195H	190H	245	230	230	220	235	255	330	250	E340A
24	300	275	250	250	225	E430S	260	230	245	220	200	195	190	180	245	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	215	200	200	205	225H	235	250	A	225	I240A	245	305	300	280
26	280	235	260	250	270	300	250	235	225	200	200	200	195	175H	255	I240C	I245C	245	225	200	E250S	305	E325A	265
27	265	275	275	250	250	275	245	215	230	200	A	240	200H	240	195H	205H	245	260	I235A	225	A	A	290	300
28	300	300	290	255	250	255	230	215	A	A	A	A	200H	I230A	250	240	215	245	I235A	240	260	300	300	290
29	280	250	315	295	250	245	225	225	I235A	230	195	210	190H	200H	230	200	210	250	240	230	250	260	300	300
30	300	270	250	I240C	230	265	240	210	225	200	190	185H	235	210	215	C	C	235	240	220	210	240	300	310
31																								
No.	25	25	28	28	26	25	27	26	21	23	22	26	25	28	28	25	18	16	21	27	24	23	24	25
Median	275	270	255	250	250	265	245	230	230	215	200	200	200	205	220	E230	230	230	235	235	240	260	300	295
U. Q.																								
L. Q.																								
Q. R.																								

h'F

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	105	100	100	100	105	100	105	150	110	110	110	120	120	120	G	100	160	130	120	110	110	105	105	105
2	105	105	105	100	E	S	140	130	125	120	125	100	110	120	130	155	150	135	115	110	105	105	105	105
3	105	105	S	S	S	105	105	100	100	100	100	100	100	100	100	160	140	125	115	110	C	105	110	115
4	110	105	105	100	100	100	C	C	130	130	130	120	120	105	G	135	150	150	135	S	105	105	S	S
5	S	S	S	E	140	130	S	C	C	120	C	C	C	105	100	100	C	C	120	110	110	110	110	105
6	105	100	100	100	100	100	S	125	120	125	115	105	160	100	100	G	135	130	110	110	110	110	105	S
7	100	105	105	100	E	S	100	120	115	115	115	110	110	115	120	125	120	115	110	105	105	105	105	105
8	105	105	S	S	100	S	100	145	145	140	100	130	100	G	145	G	G	G	S	S	S	S	110	S
9	S	S	S	S	S	S	S	145	140	135	130	130	145	G	170	145	130	150	145	100	100	110	S	S
10	S	S	S	S	S	S	S	130	125	125	G	100	100	100	G	G	140	130	125	120	S	S	S	S
11	S	S	S	S	E	S	S	140	130	125	120	120	120	120	115	105	105	125	115	105	105	105	S	105
12	S	100	100	100	100	100	S	145	130	130	130	130	125	130	125	125	130	C	C	110	110	U110C	U105C	U105C
13	S	S	S	S	S	S	S	U175C	U150C	U105C	100	100	105	105	150	150	135	120	110	105	105	100	S	U110C
14	U110C	S	S	E	S	S	S	125	120	105	105	155	105	100	100	100	130	125	135	120	115	110	S	S
15	105	100	100	E	100	100	100	100	140	G	G	G	130	125	G	145	130	125	115	110	105	105	S	S
16	S	S	S	S	E	S	S	105	125	110	120	130	125	140	125	120	115	115	110	105	105	105	105	100
17	S	S	S	S	E	S	S	135	110	105	100	125	G	100	130	145	125	120	110	105	S	S	105	105
18	100	100	100	100	150	145	145	140	130	135	125	130	120	120	125	125	110	110	105	105	105	100	100	100
19	S	S	S	S	E	S	S	115	115	130	G	100	G	G	100	100	G	100	100	100	100	S	S	S
20	110	S	105	S	100	S	S	G	115	115	115	120	120	G	155	E150G	130	120	110	S	S	S	S	S
21	S	S	S	S	S	S	S	120	145	150	100	G	G	G	175	G	G	150	S	S	S	S	S	S
22	S	S	S	S	S	S	S	150	150	120	130	120	130	110	G	110	150	135	125	120	110	105	S	100
23	100	100	100	100	100	S	S	120	110	105	105	110	C	115	110	100	100	150	100	S	120	120	115	115
24	100	S	100	S	E	S	145	140	130	110	115	105	100	G	G	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	110	110	100	100	100	G	145	120	110	105	105	105	100	100
26	100	S	S	S	S	S	S	145	110	110	105	G	G	G	G	C	C	120	105	100	S	100	100	100
27	100	S	S	S	S	S	S	130	135	125	120	110	115	100	E150G	G	175	130	130	120	115	115	S	105
28	105	S	S	S	105	S	S	145	125	120	115	115	100	145	150	100	100	140	125	115	120	105	S	S
29	S	S	S	S	S	S	S	145	125	115	105	105	110	100	110	110	120	115	105	105	100	100	100	S
30	S	S	S	C	S	S	S	140	125	150	100	100	100	100	100	C	C	130	S	100	S	S	100	100
31																								
No.	16	11	11	8	11	8	8	26	28	28	26	26	24	23	22	20	23	26	25	24	21	22	16	17
Median	105	100	100	100	100	100	105	140	125	120	115	110	110	105	120	120	130	125	115	110	105	105	105	105
U. Q.																								
L. Q.																								
Q. R.																								

h'Es

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

The Radio Research Laboratories, Japan

Y 11

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IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f2	f6	f2	f2	f2	f2	1	h	c2	c	c	c	c	c		1	h 1	h212	c3	f	f2	f3	f2	f2
2	f4	f4	f2	f2		h	h21	c212	c212	c 12	c 1	1	c 1	c21	h 1	h	h2	h	c4	f4	f2	f2	f	f2
3	f	f				f	14	12	14	12	12	1	12	12	12	h 1	h	h2	c2	f3		f2	f3	f3
4	f2	f2	f2	f2	f2	f3			h2	h	h	c	1	1		h	h	h2	c2		f2	f		
5					f	f	c			c2				1212	12	12			c4	f5	f2	f3	f3	f2
6	f3	f3	f3	f3	f4	f4	h	h2	h	h	c	1	h 1	1	1		h	c	c2	f	f	f	f	f
7	f	f2	f2	f2			12	c2	c2	c2	c2	c21	c 1	c 1	h 1	h2	h5	c2	c3	f6	f3	f3	f2	f2
8	f	f			f2		12	h	h 1	h	1	c 1	1		h								f2	
9							h	h2	h	h	h	h	h		h	h	h2	h	h2	f	f	f2		
10			f		f	f	h	h 12	h	h		1	1	1			h	h2	h6	f				f
11								h	c	c	c	c	c	c	1	12	12	h3	h4	f2	f2	f2		f2
12		f3	f2	f2	f2	f2	1	h2	h2	c 1	c 1	c 1	c 1	c	c21	c 1	h 1			f4	f3	f2	f2	f2
13								h	h 1	12	1	1	1	1	h	h	h	c2	c3	f2	f	f		f
14	f	f				f		c3	c2	13	12	h 1	1	12	12	1	h212	h21	h 1	f2f	f2	f2		
15	f	f2	f2		f2	f3	12	1	h				h	h		h	h	h3	c5	f	f2	f		
16			f	f f				12	1	1	h	h	h 1	h 1	c2	c2	c4	c3	c2	f3	f3	f2	f3	f
17		f		f				h3	1	1	1	c		1	h	h	c21	c4	c2	f2		f	f	f3
18	f2	f2	f2	f2	f3	f3	h	h4	h2	h2	h2	h21	h 1	h 1	h 1	h 1	12	12	12	f	f2	f3	f	f
19								1	1	h		1			1	12		12	13	f2	f	f		
20	f	f	f	f	f				c2	c2	c	c	c		h	h	h	c3	c5	f				
21								c	h 1	h	1				h			h	h					
22								h	h	c 12	h	h	h	1		1	h	h3	h4	f3	f2	f		f3
23	f4	f5	f4	f3	f3	f		c3	c3	12	1	1		1	1	12	13	h	1	f	f3	f3	f f	f3
24	f		f				h2	h2	h	c	c	1	1											
25											c	c	12	12	1		h2	h3	12	f2	f	f2	f2	f2
26	f2					f		h 1	1	1	1							c2	c	f		f2	f2	f2
27	f2	f						h21	h21	h	h212	c 1	c 1	1	h		h	h3	h4	f2f2	f2f	f2f2	f	f2
28	f				f2	f	h	h	h2	c	c	c2	1	h 1	h 1	12	12	h21	h212	f f2	f f	f2		
29			f		f			h3	h2	c	1	1	1	1	1	1	h	c2	12	f	f2	f3	f	f
30								c	1	h	1	1	1	1	12			h		f			f	f
31																								
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U. Q.																								
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Q. R.																								

Types of Es

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

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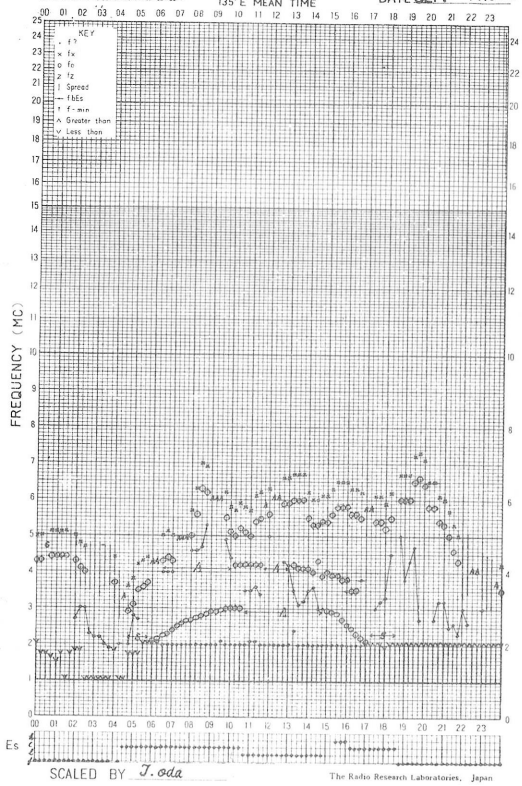
Y 12

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE SEP. 1. 1964



SCALED BY T. oda

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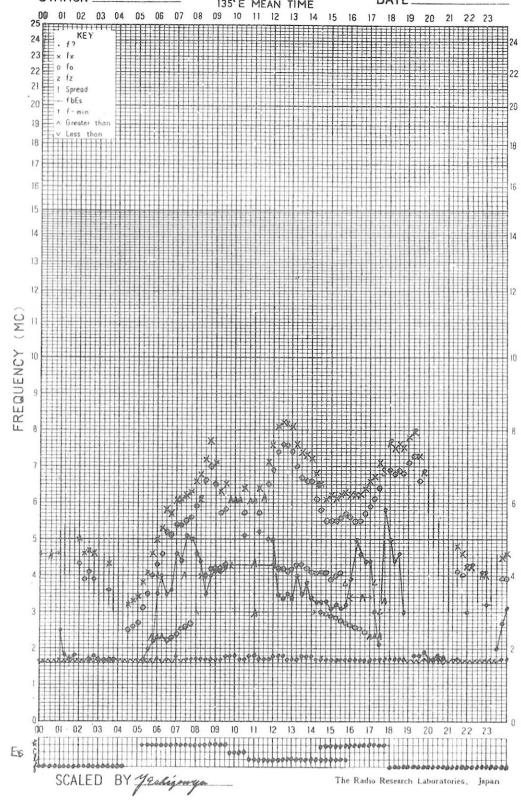

SCALED BY Yoshizawa

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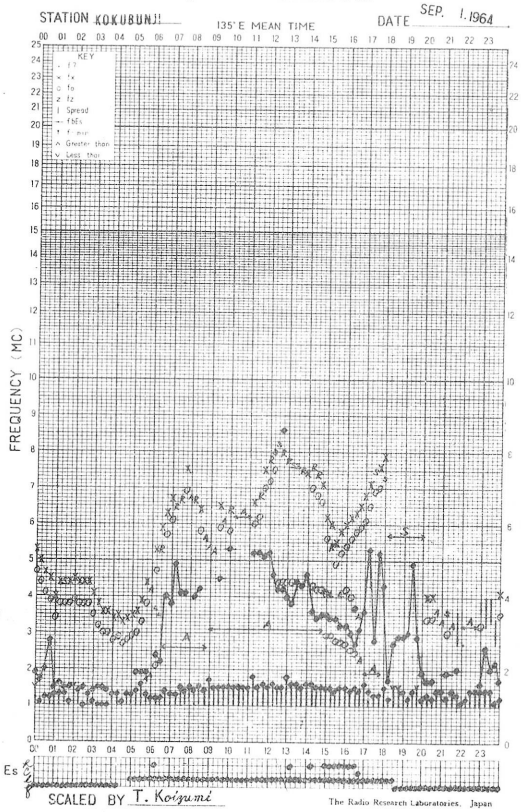

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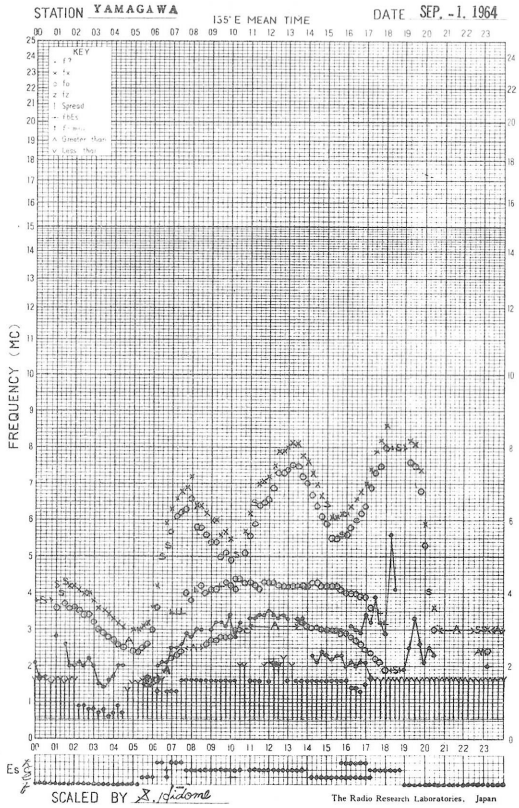

SCALED BY S. Ishimoto

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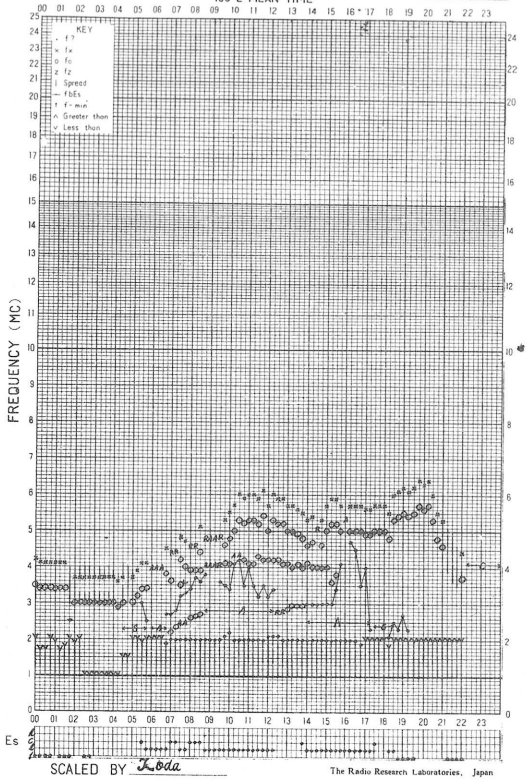

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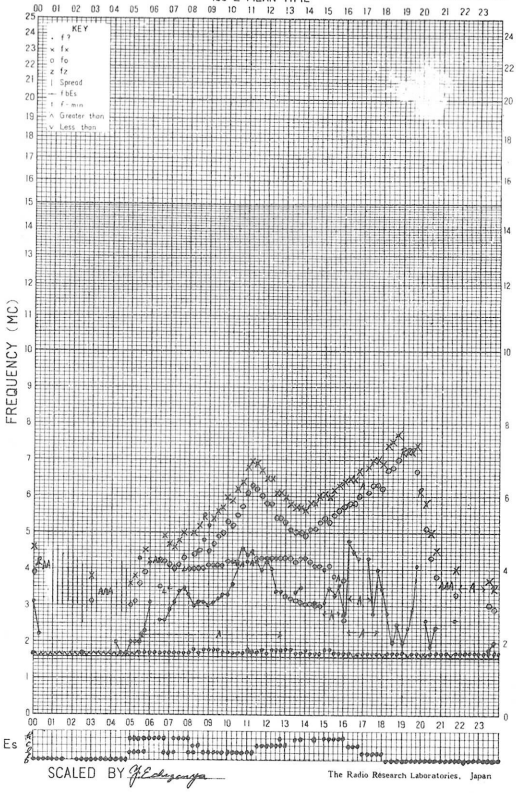

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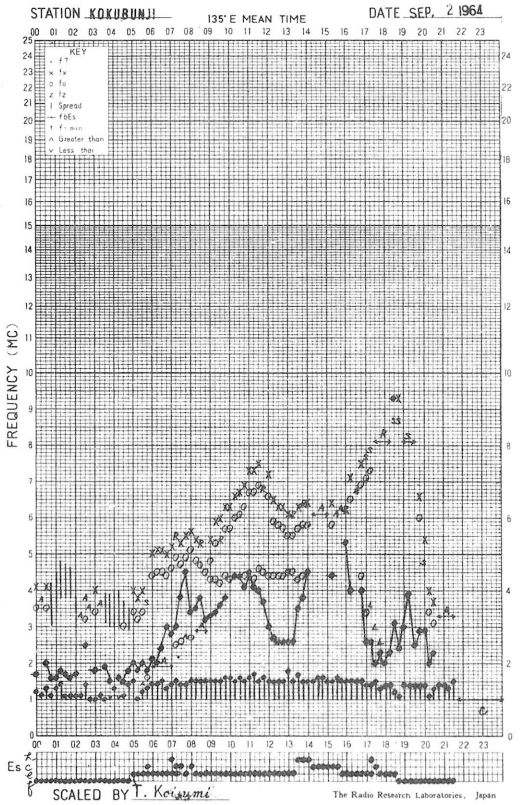

SCALED BY T. Koizumi

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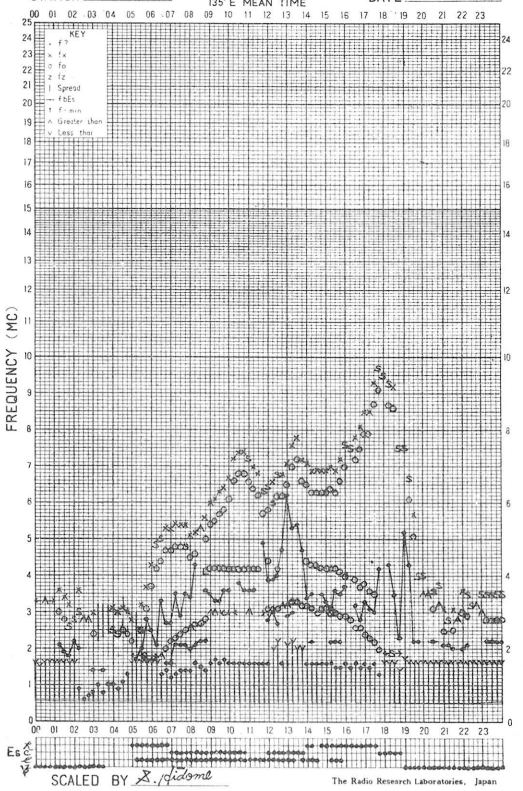

SCALED BY S. Yidome

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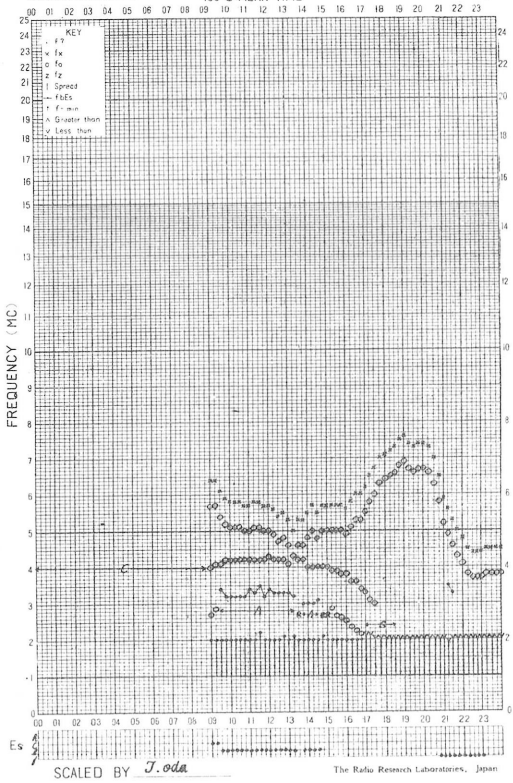

SCALED BY T. Oda

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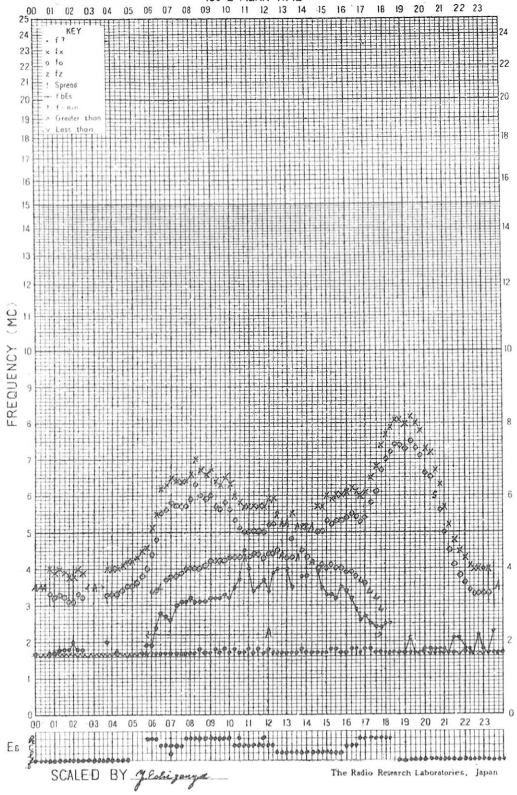

SCALED BY Y. Ichizawa

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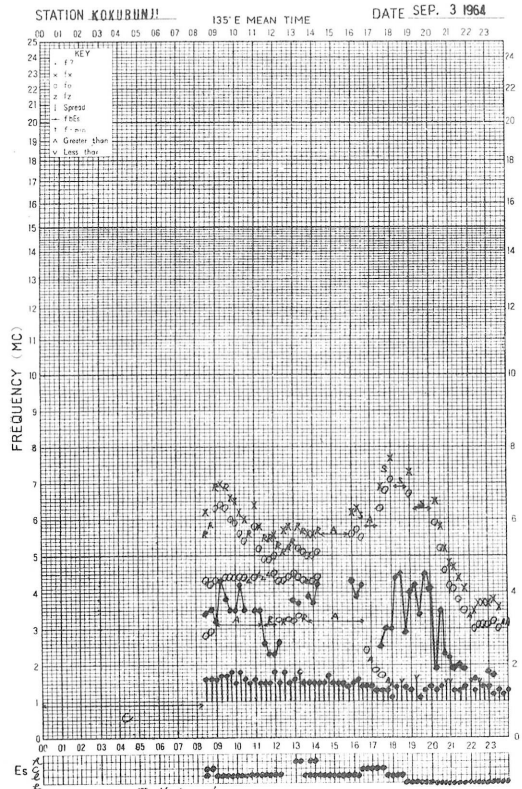

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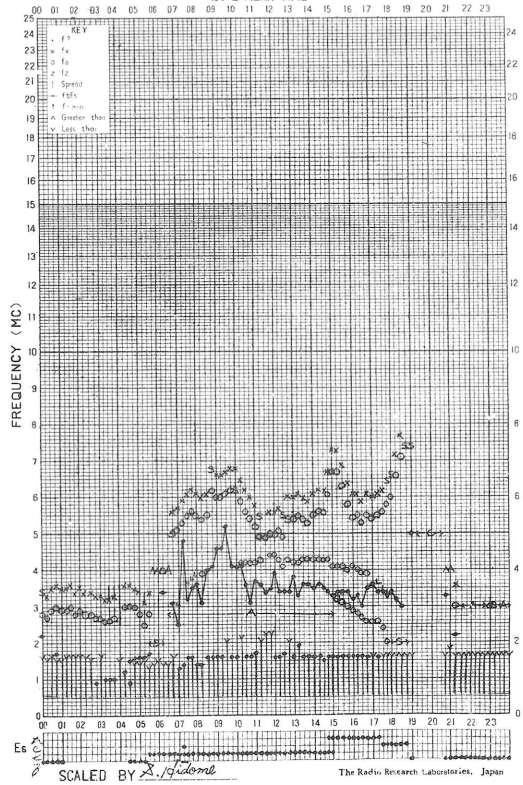

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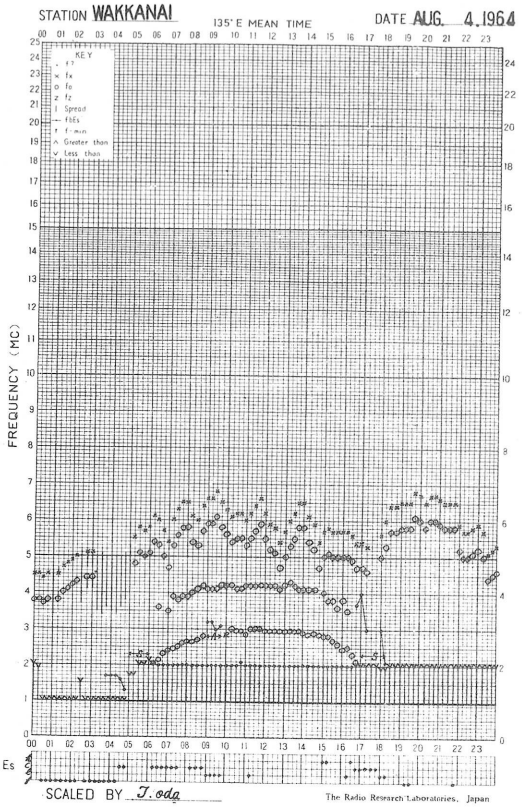

SCALED BY T. Oda

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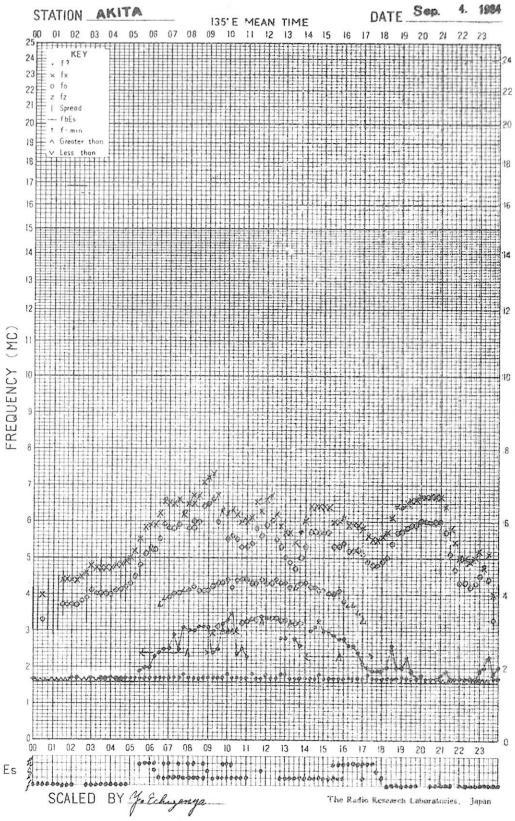

SCALED BY Yatchugeya

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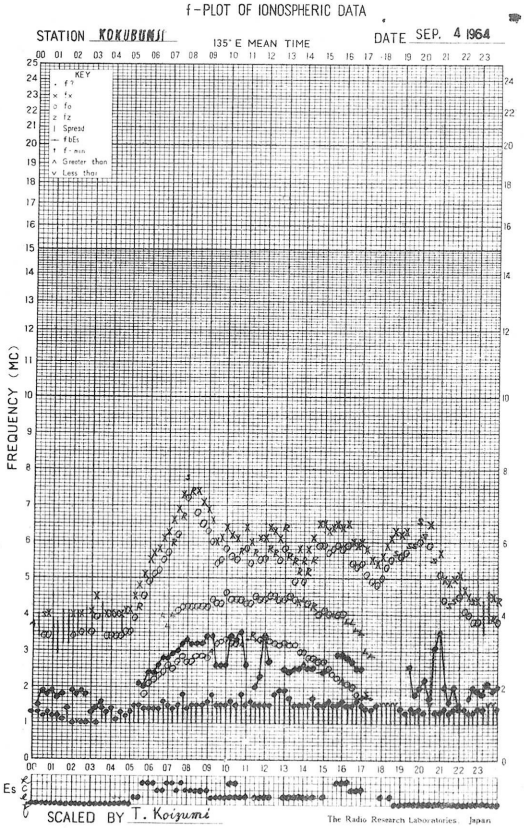

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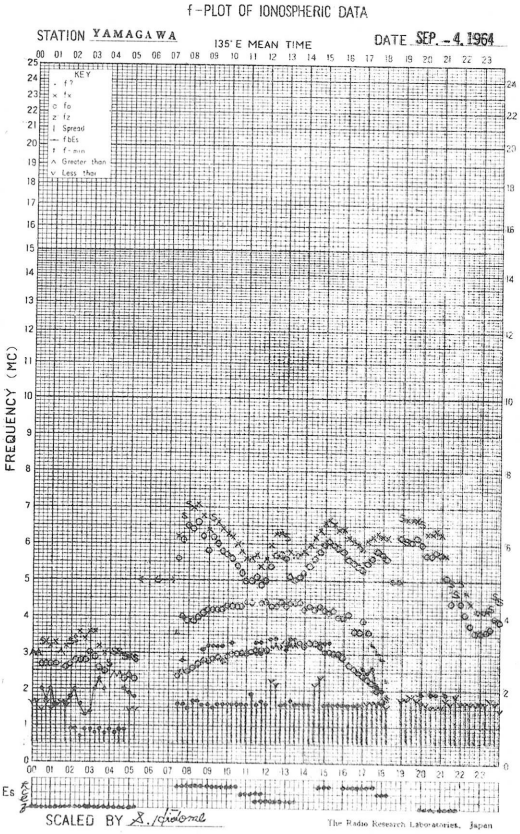

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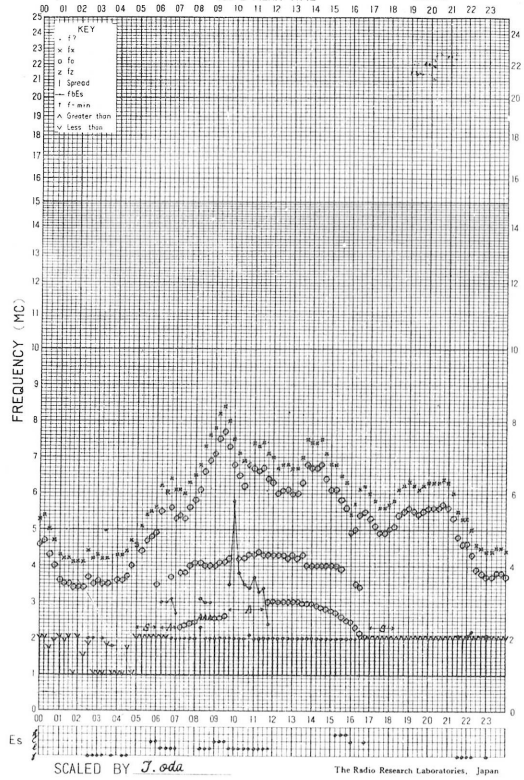

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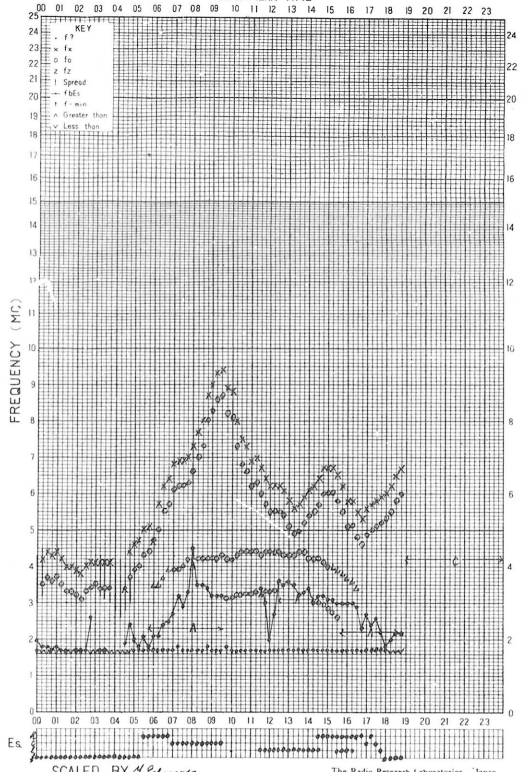

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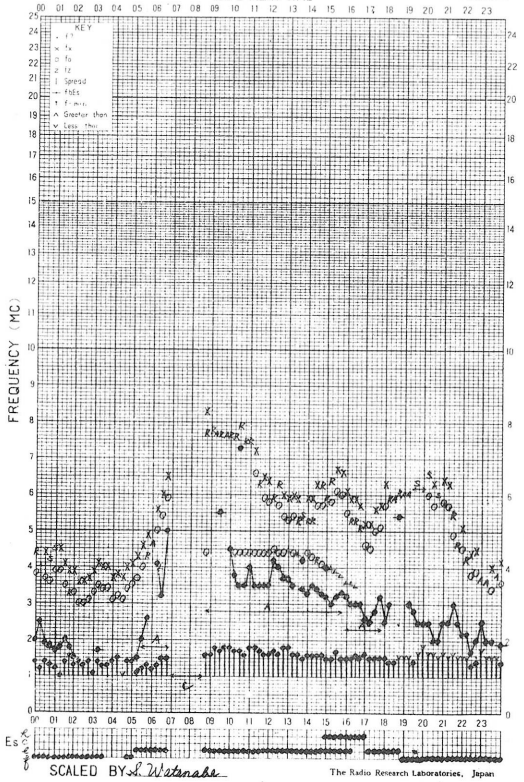

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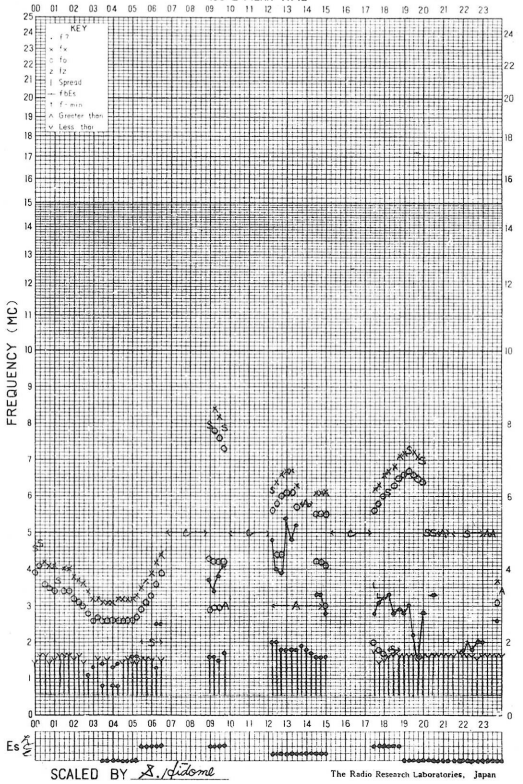

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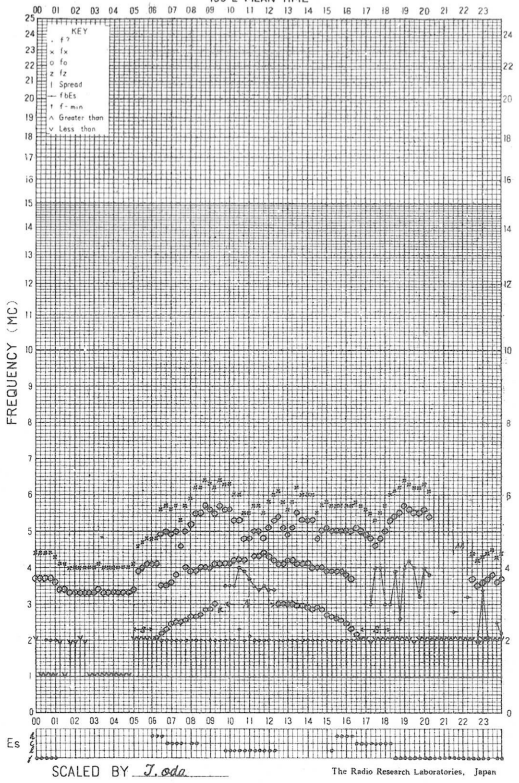

SCALED BY I. oda

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f-PLOT OF IONOSPHERIC DATA

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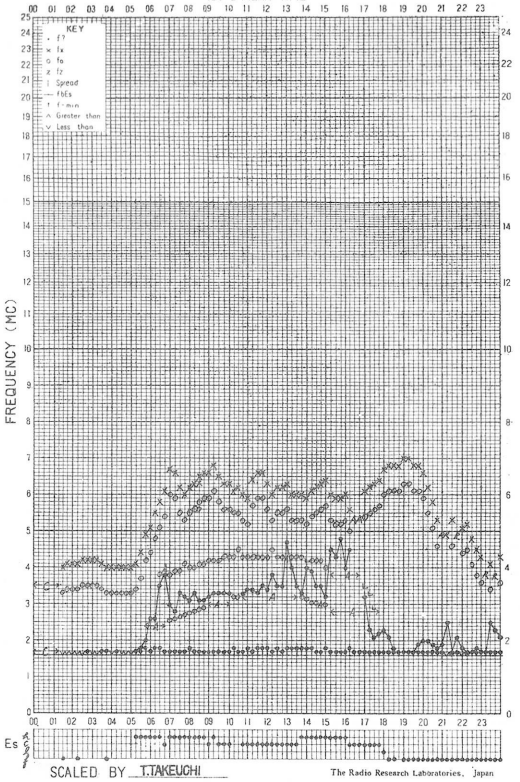

SCALED BY T. TAKEUCHI

The Radio Research Laboratories, Japan

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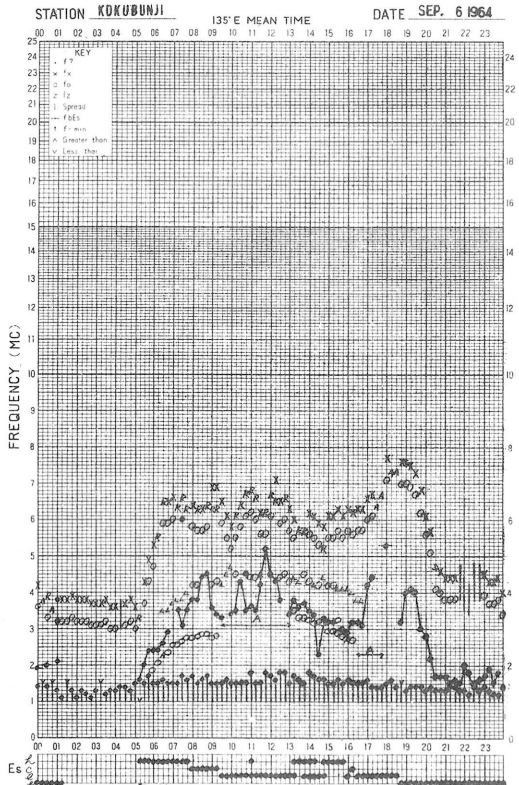

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The Radio Research Laboratories, Japan

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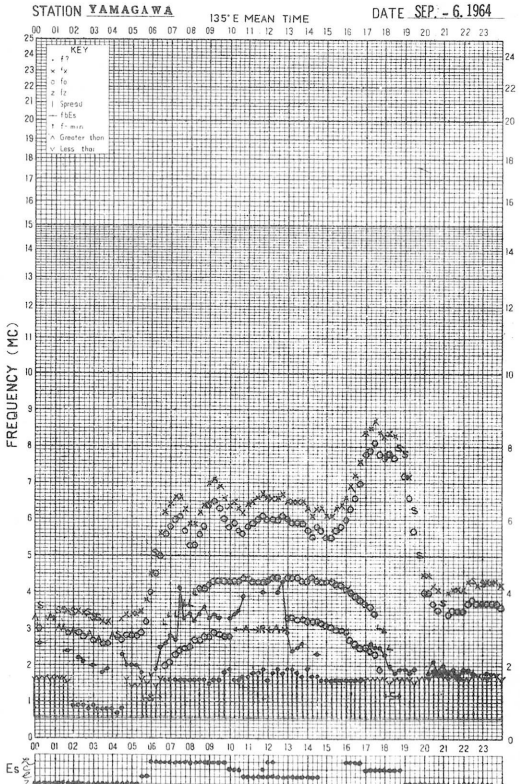

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The Radio Research Laboratories, Japan

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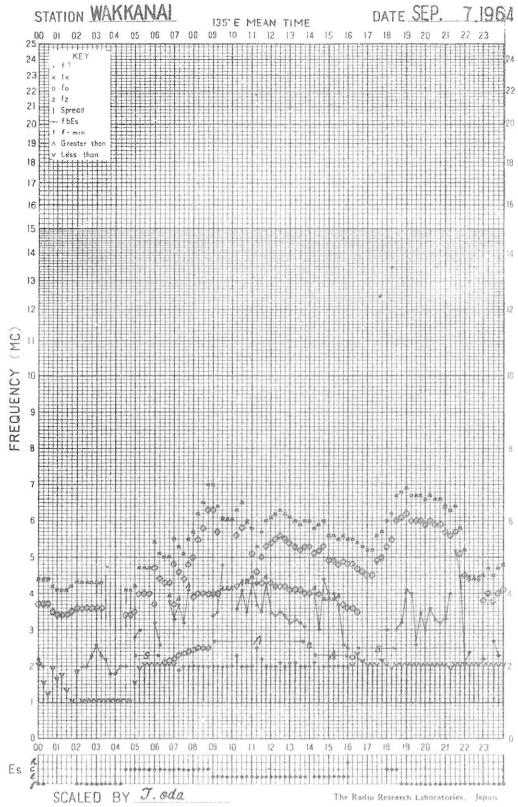

SCALED BY T. Oda

The Radio Research Laboratories, Japan

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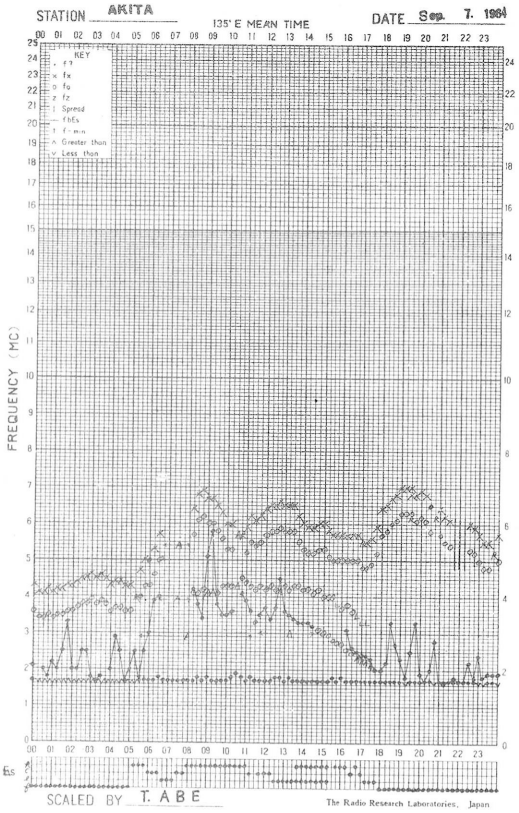

SCALED BY T. ABE

The Radio Research Laboratories, Japan

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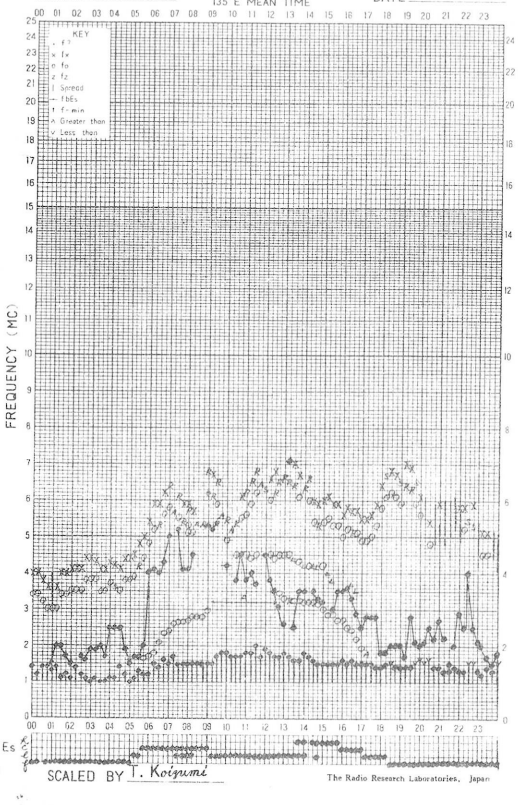

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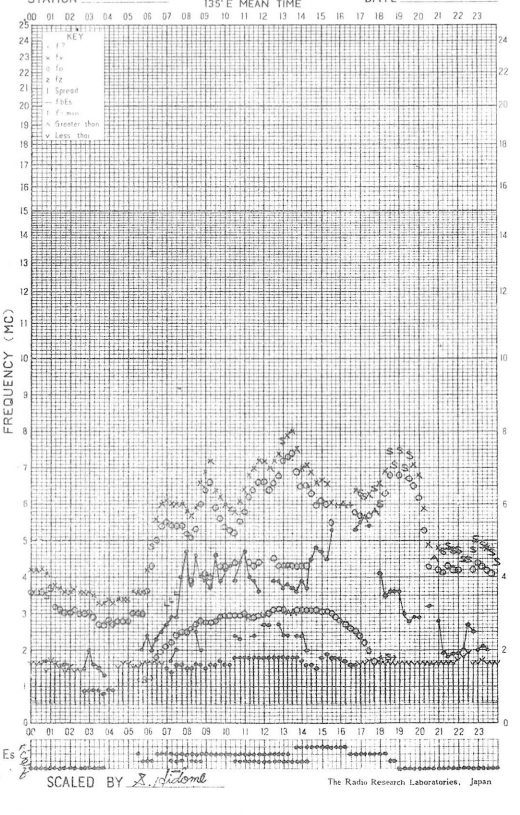

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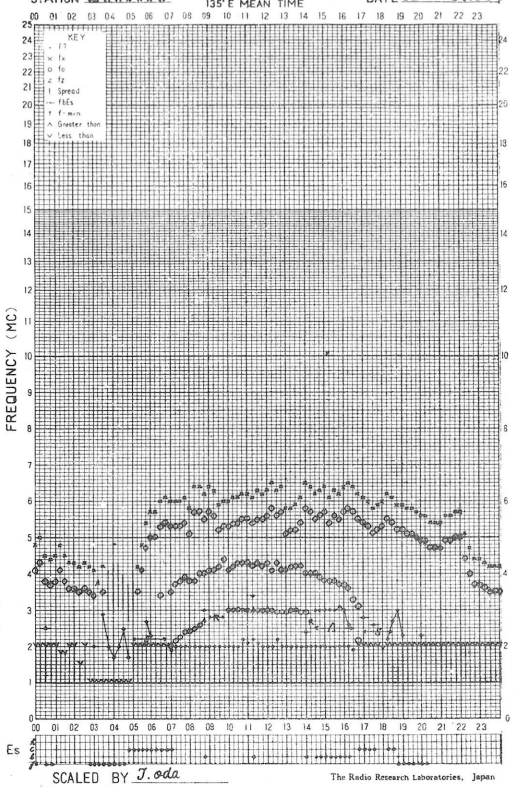

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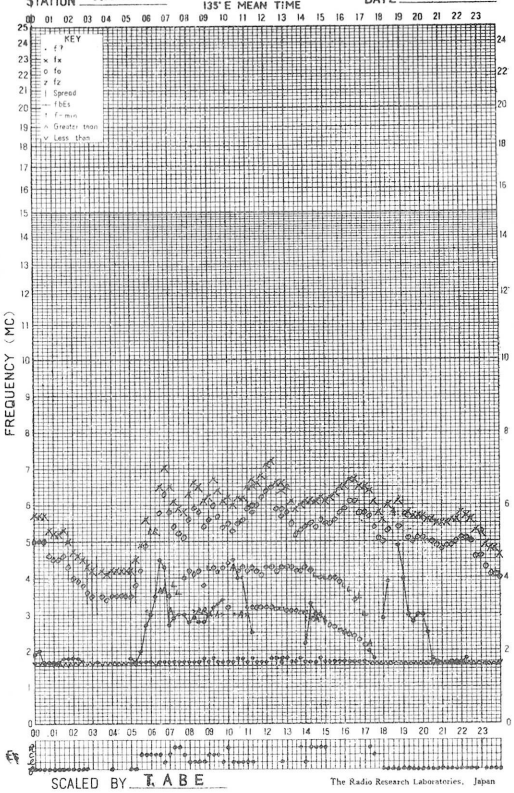

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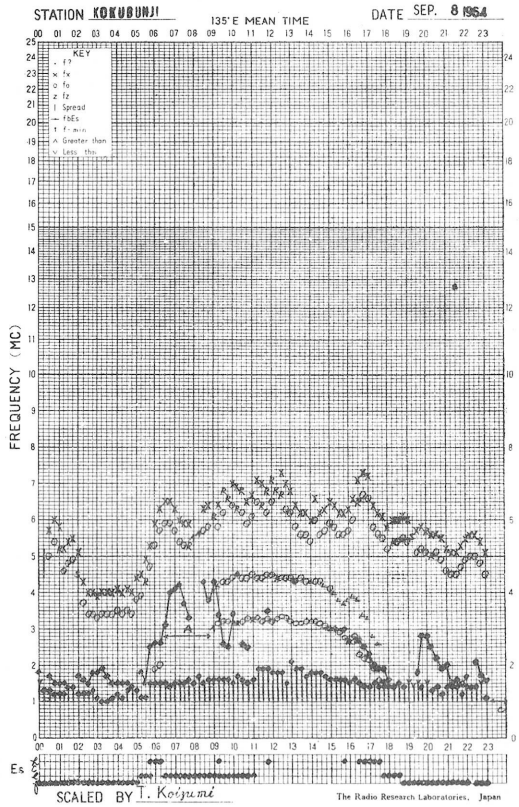

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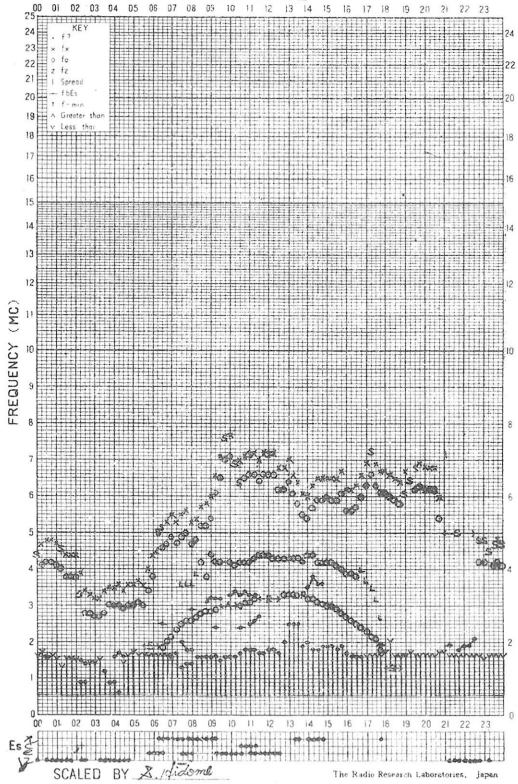

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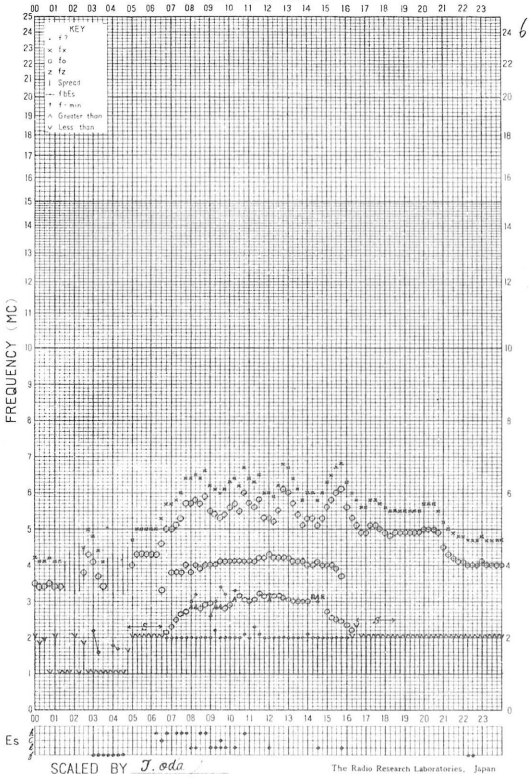

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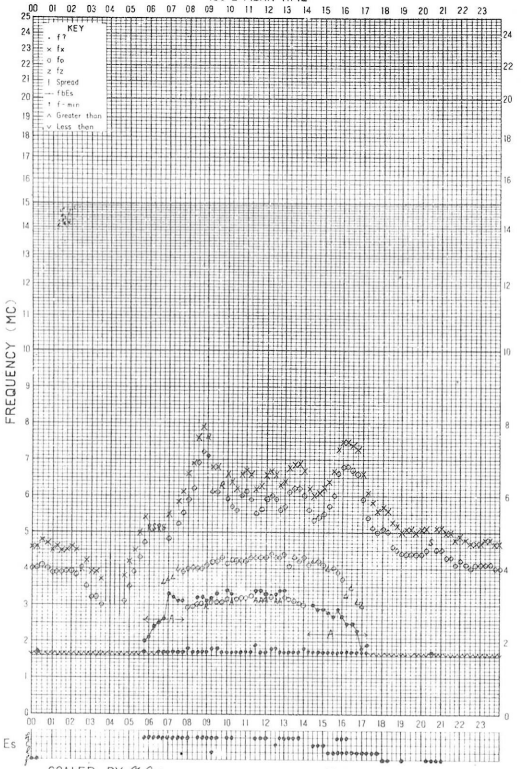

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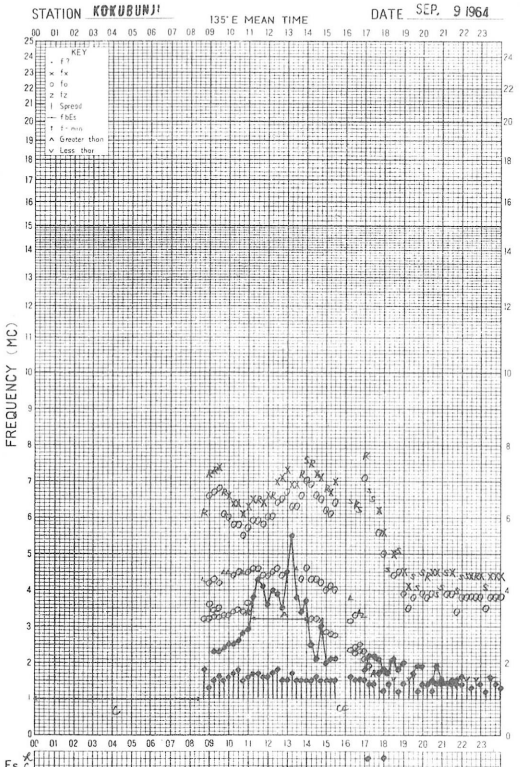

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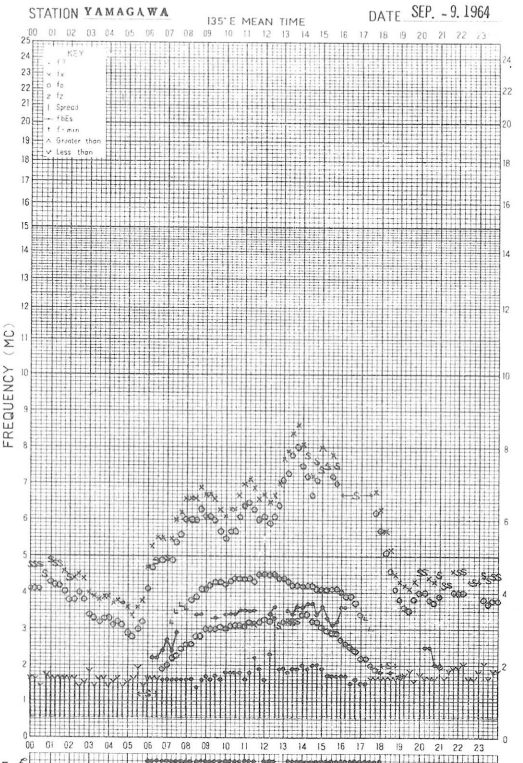

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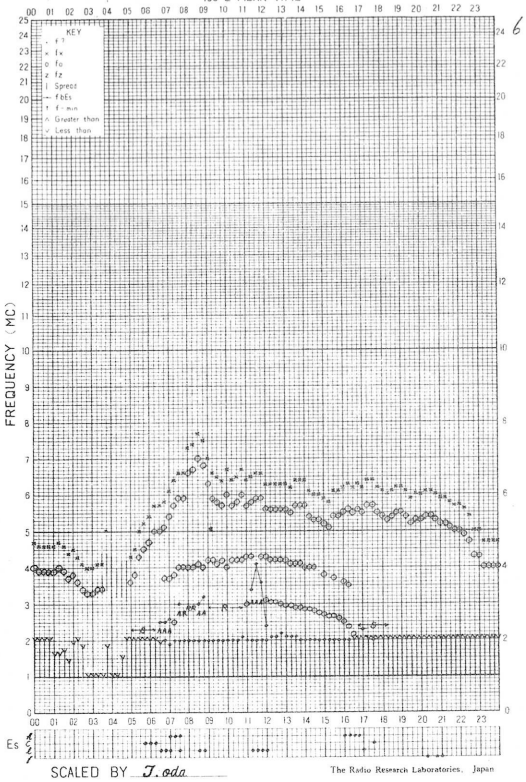

SCALED BY J. Oda

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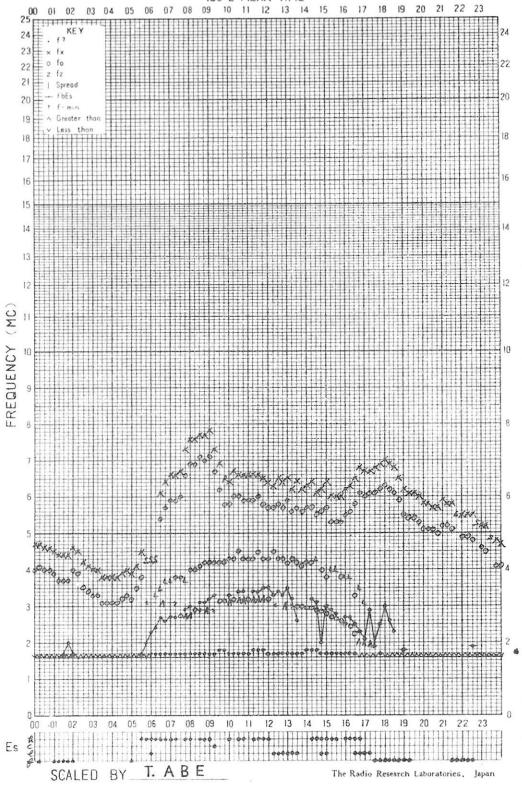

SCALED BY T. ABE

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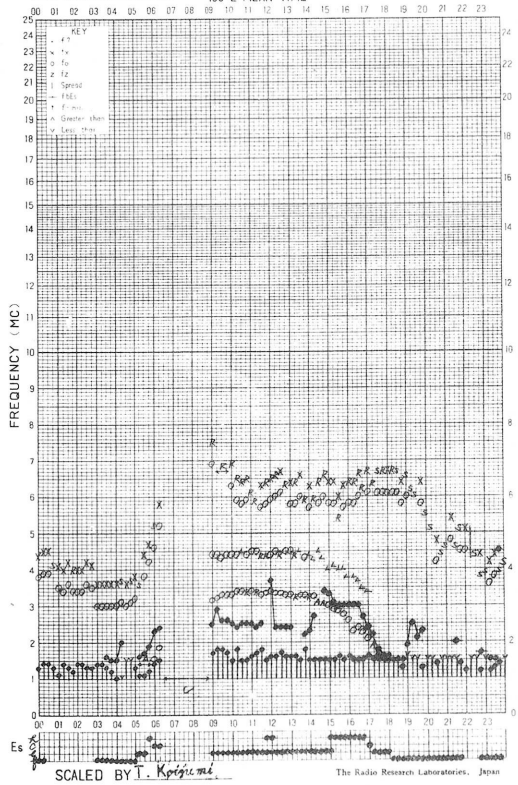

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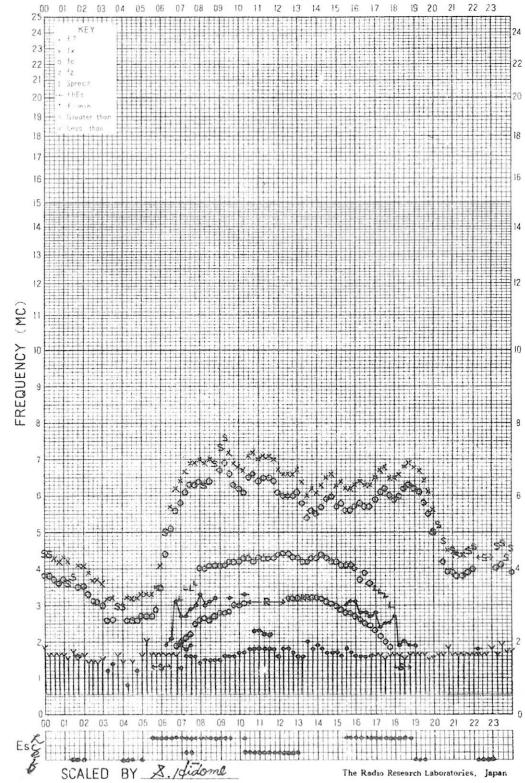

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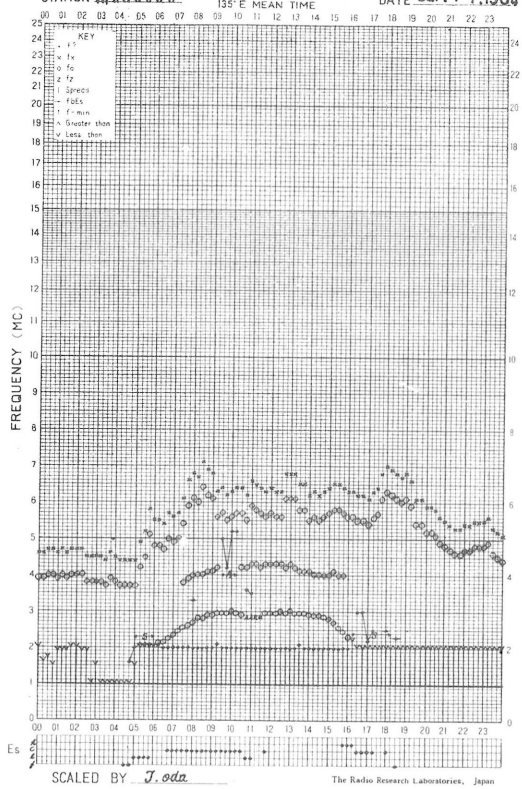

SCALED BY J. oda

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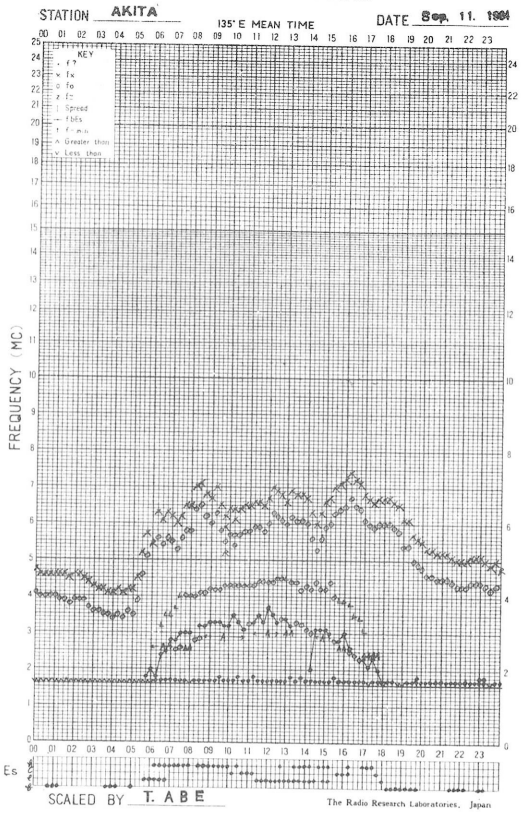

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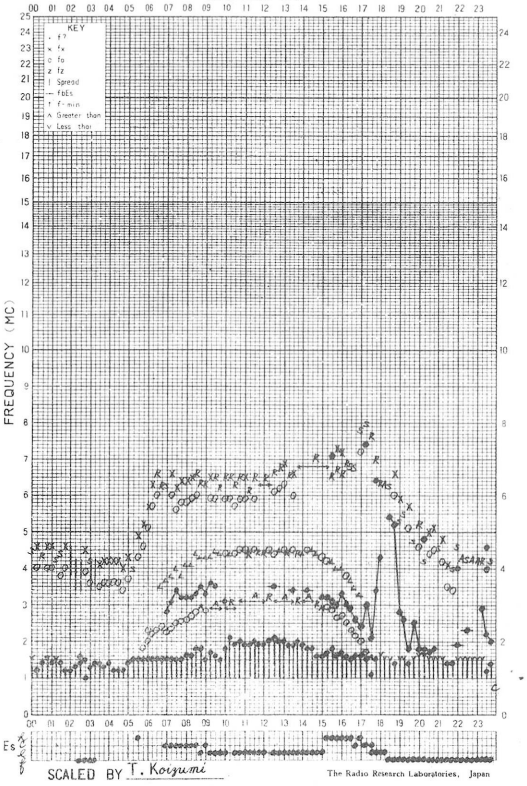

SCALED BY T. Koizumi

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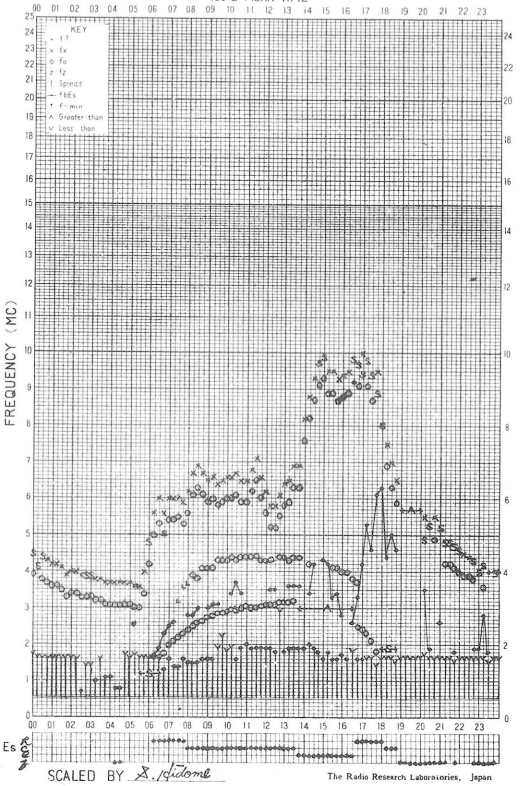

SCALED BY S. Shidomi

The Radio Research Laboratories, Japan

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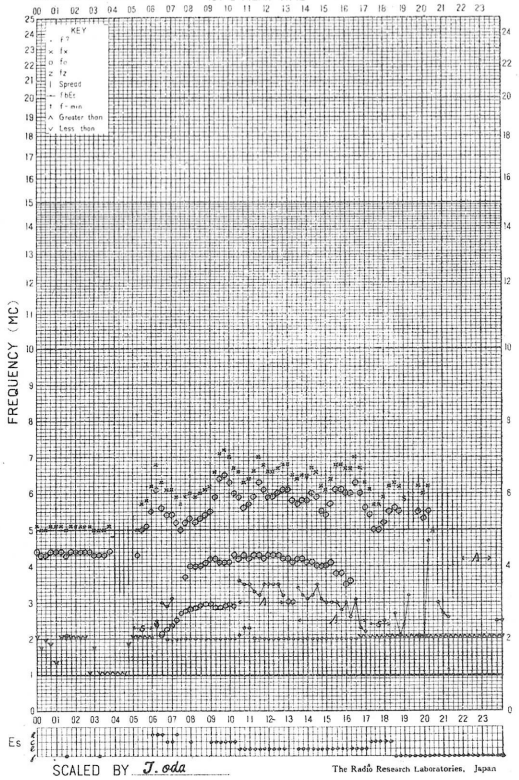

SCALED BY J. oda

The Radio Research Laboratories, Japan

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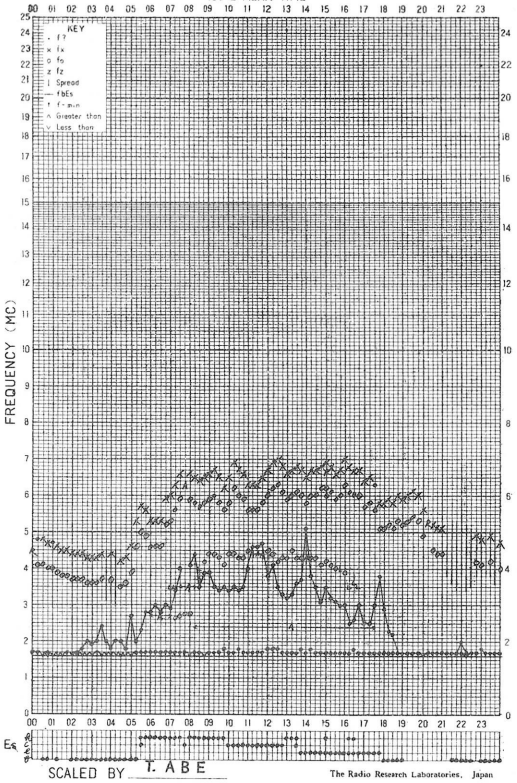

SCALED BY T. ABE

The Radio Research Laboratories, Japan

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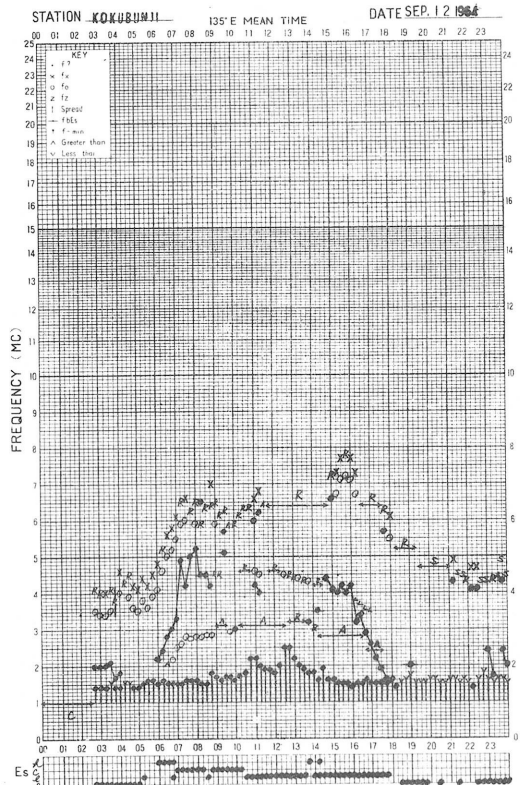

SCALED BY S. Watanabe

The Radio Research Laboratories, Japan

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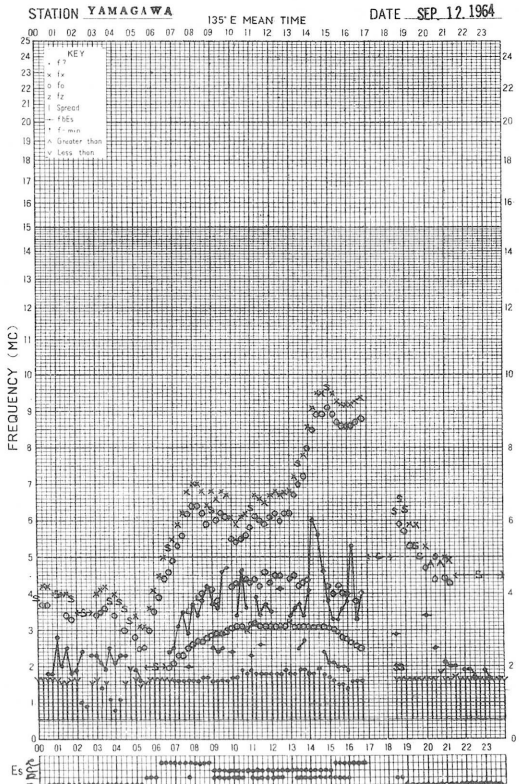

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The Radio Research Laboratories Japan

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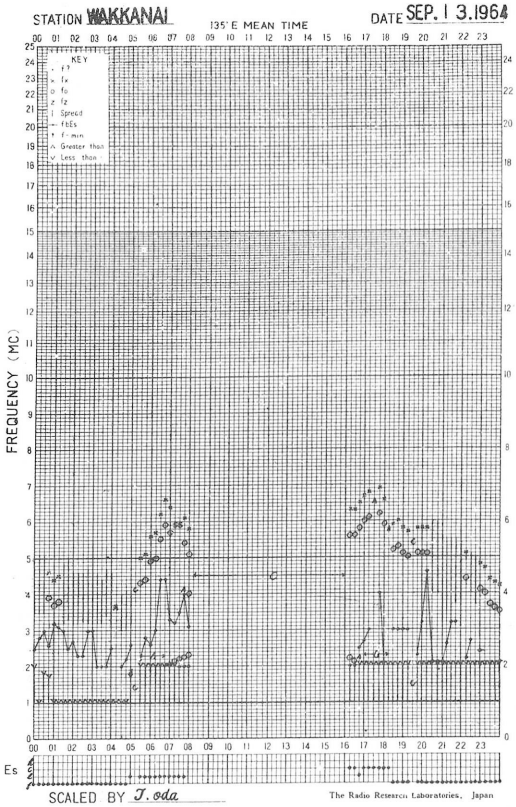

SCALED BY T. Oda The Radio Research Laboratories, Japan

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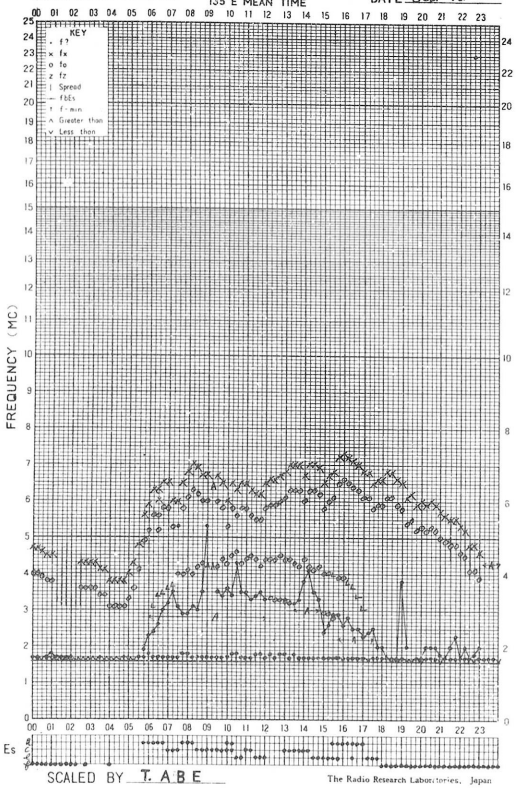

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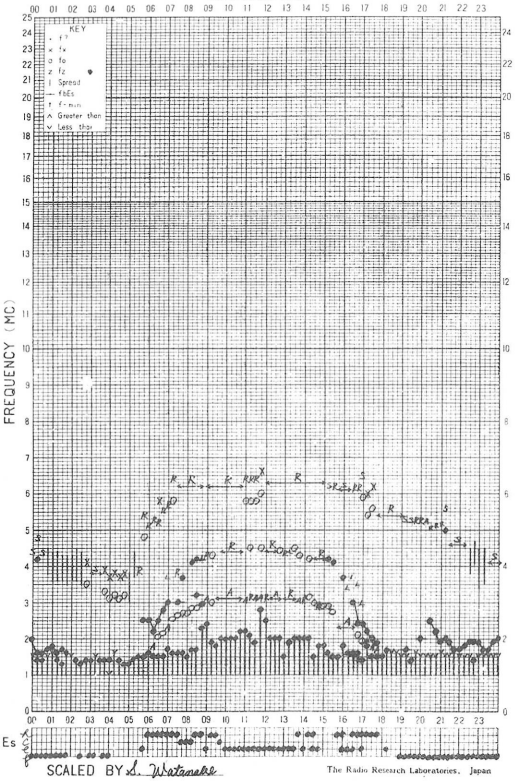

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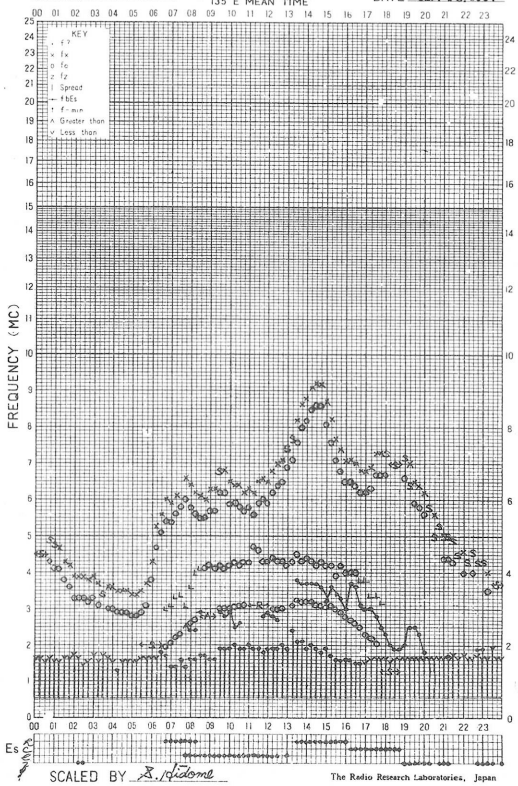

SCALED BY S. Kitsumi The Radio Research Laboratories, Japan

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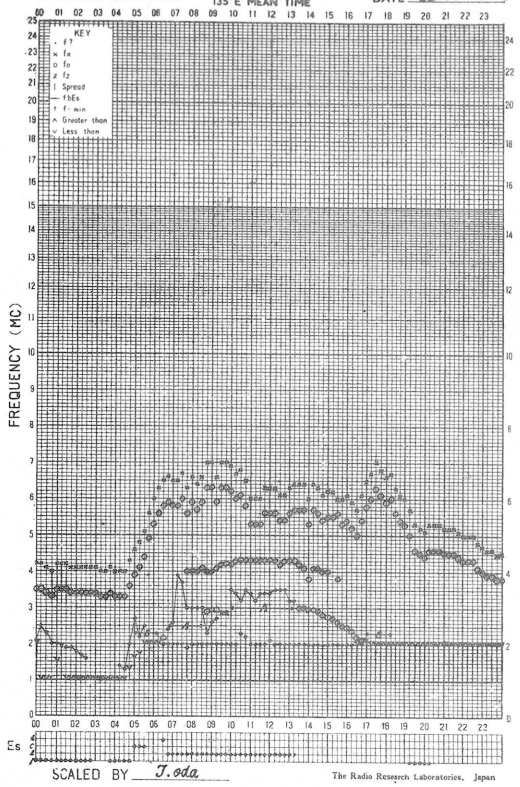

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The Radio Research Laboratories, Japan

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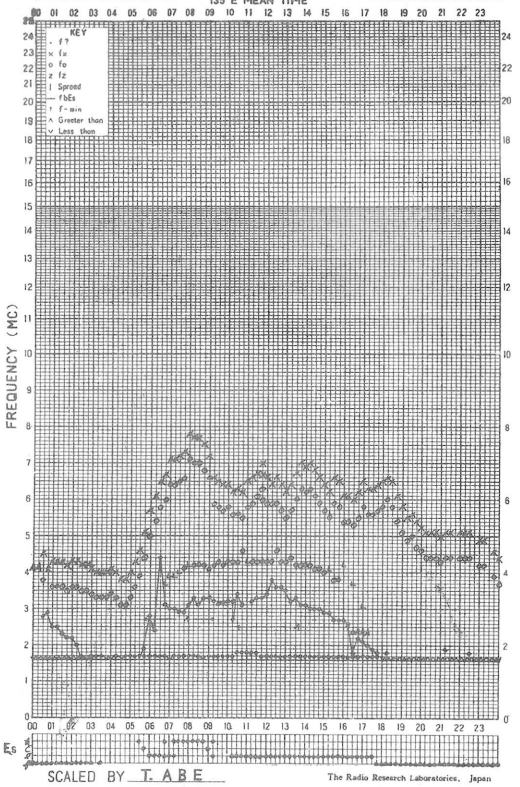

SCALED BY T. A B E

The Radio Research Laboratories, Japan

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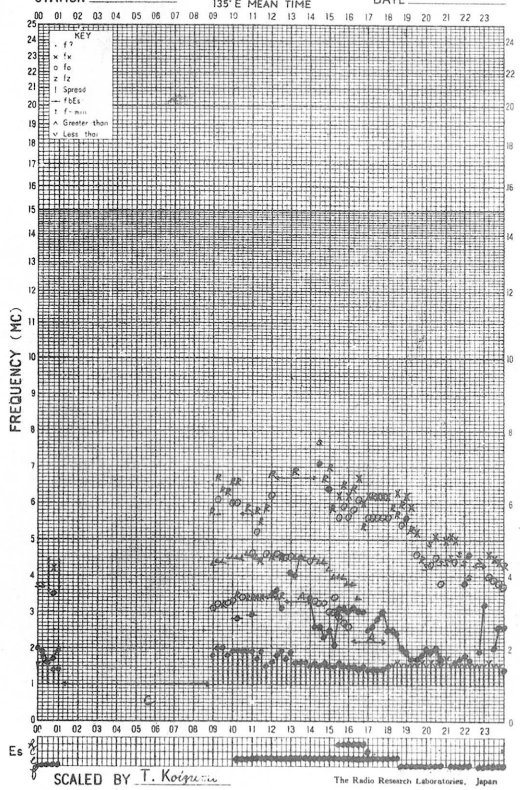

SCALED BY T. Koizumi

The Radio Research Laboratories, Japan

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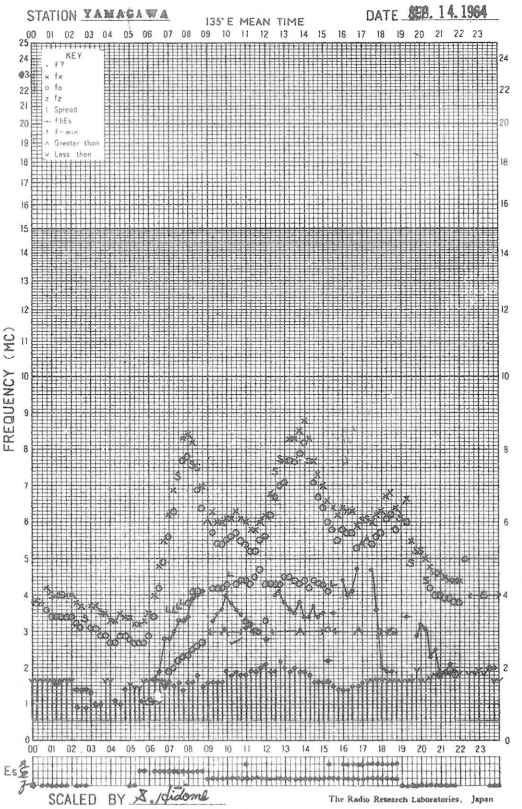

SCALED BY S. Yidomi

The Radio Research Laboratories, Japan

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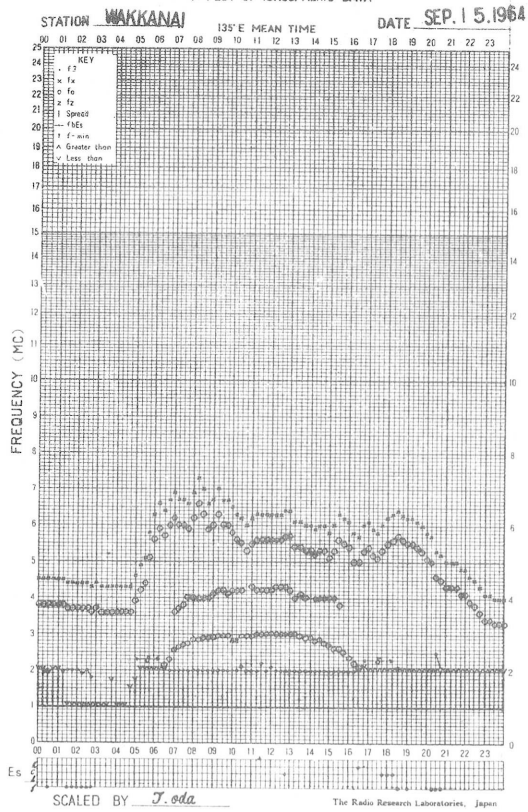

SCALED BY T. oda

The Radio Research Laboratories, Japan

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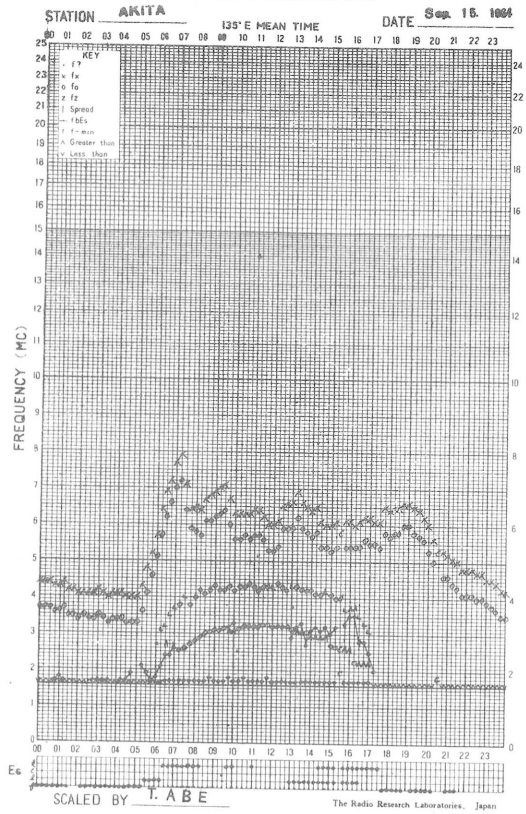

SCALED BY T. ABE

The Radio Research Laboratories, Japan

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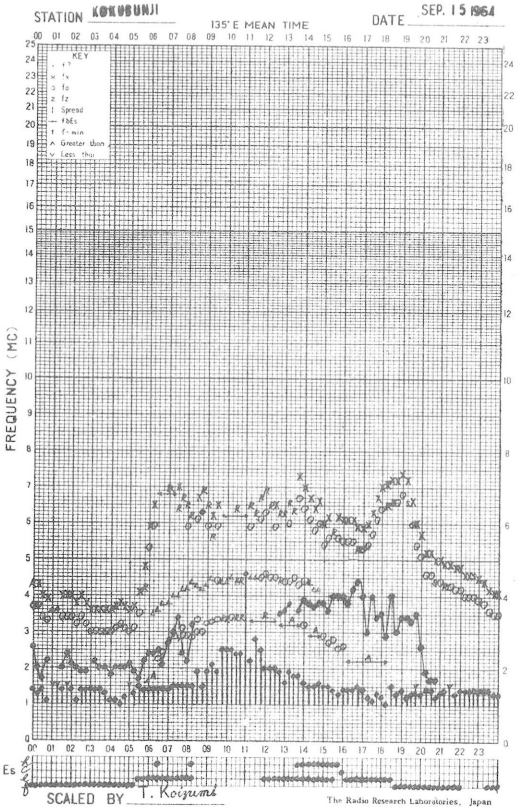

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The Radio Research Laboratories, Japan

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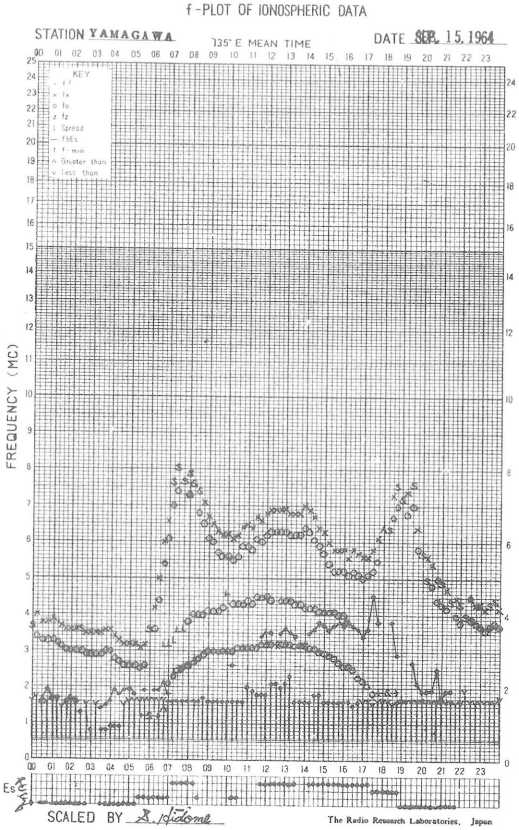

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The Radio Research Laboratories, Japan

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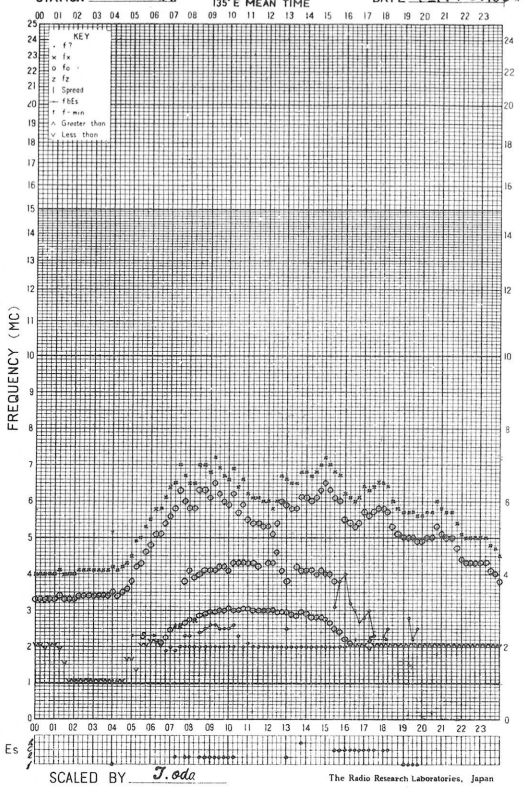

SCALED BY T. oda

The Radio Research Laboratories, Japan

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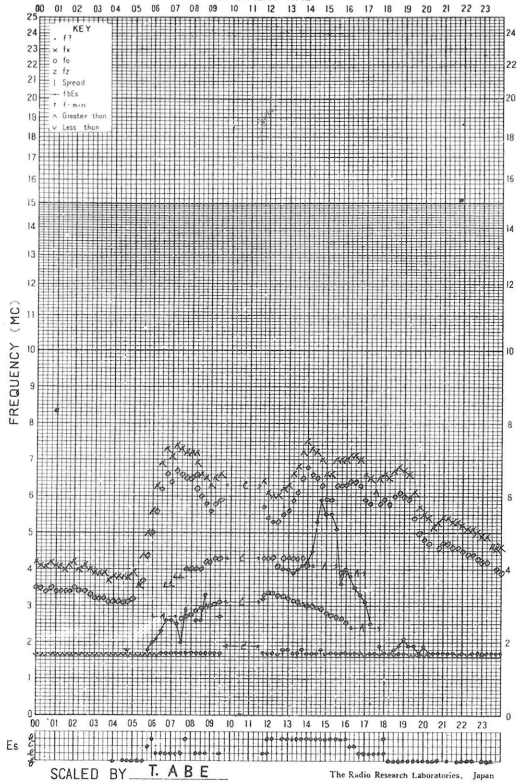

SCALED BY T. ABE

The Radio Research Laboratories, Japan

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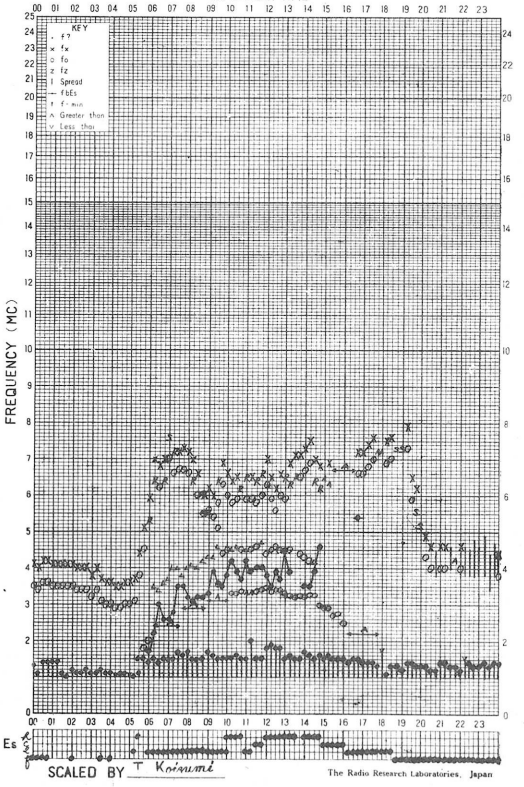

SCALED BY T Kawumi

The Radio Research Laboratories, Japan

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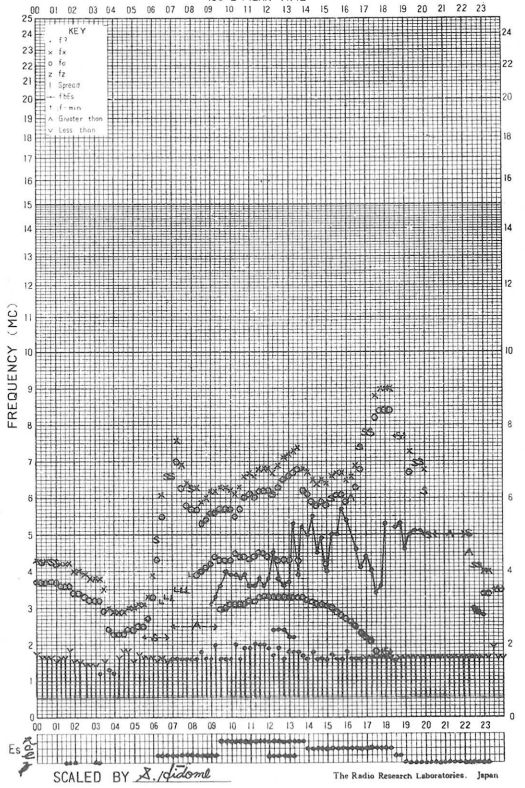

SCALED BY S. Hidomi

The Radio Research Laboratories, Japan

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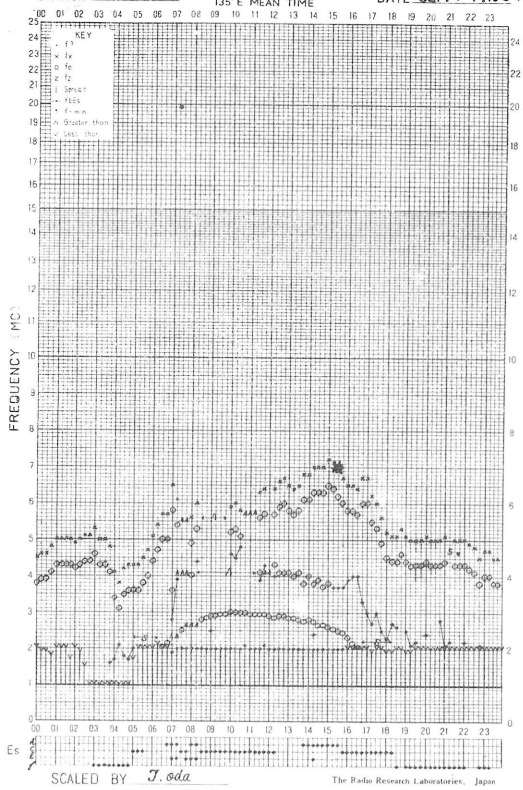

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The Radio Research Laboratories, Japan

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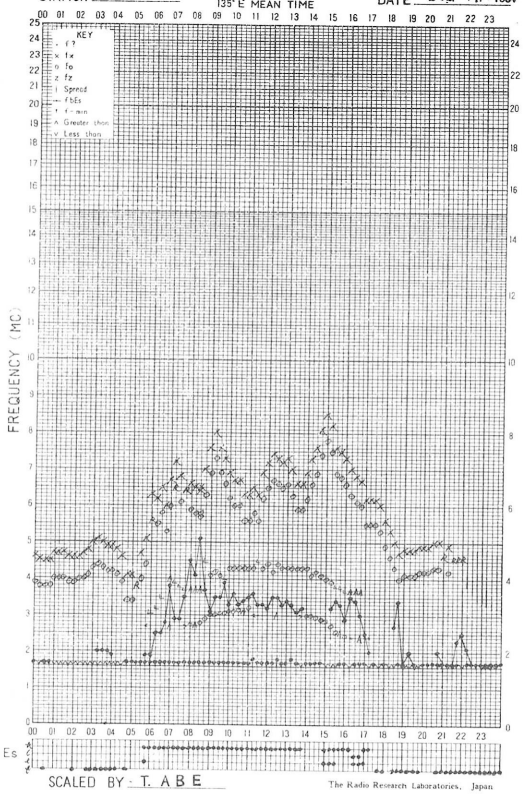

SCALED BY T. A B E

The Radio Research Laboratories, Japan

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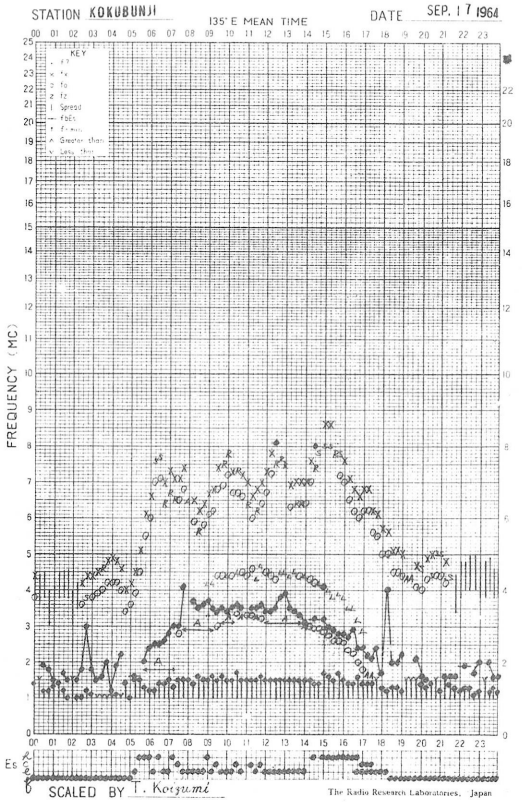

SCALED BY T. Koizumi

The Radio Research Laboratories, Japan

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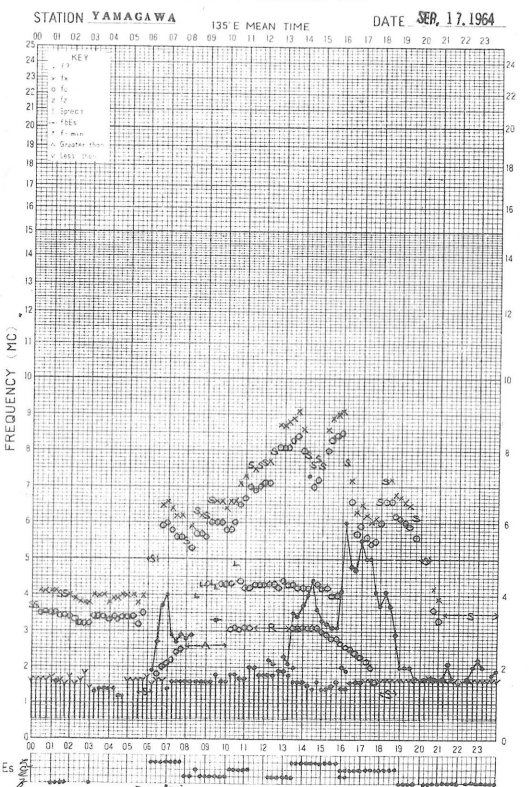

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The Radio Research Laboratories, Japan

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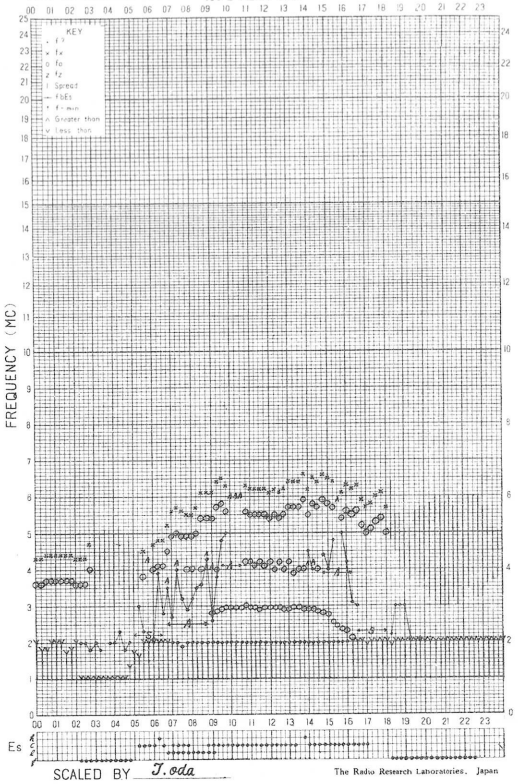

SCALED BY T. Oda The Radio Research Laboratories, Japan

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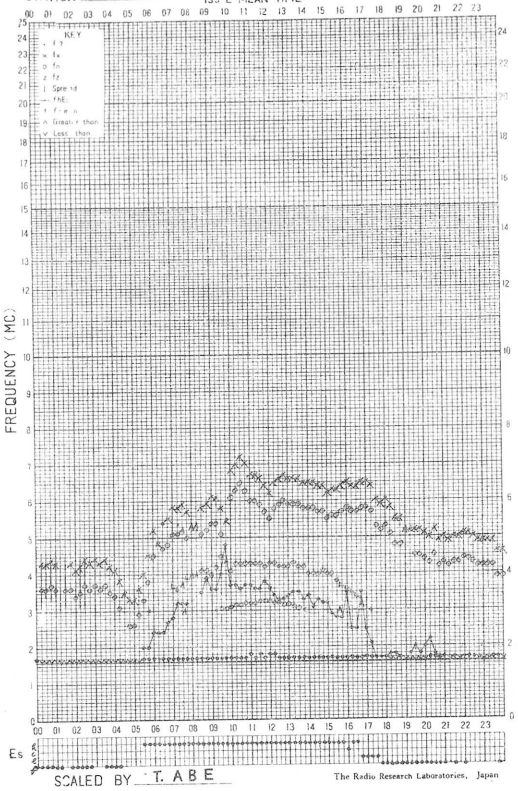

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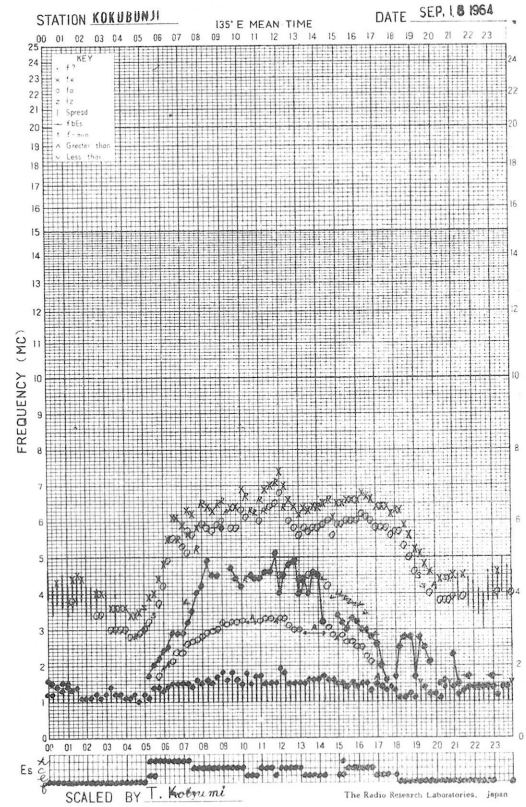

SCALED BY T. Kobayami The Radio Research Laboratories, Japan

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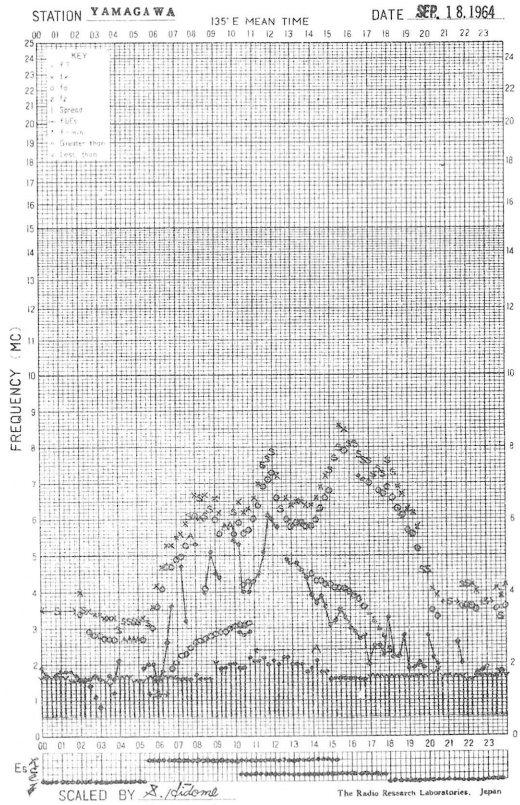

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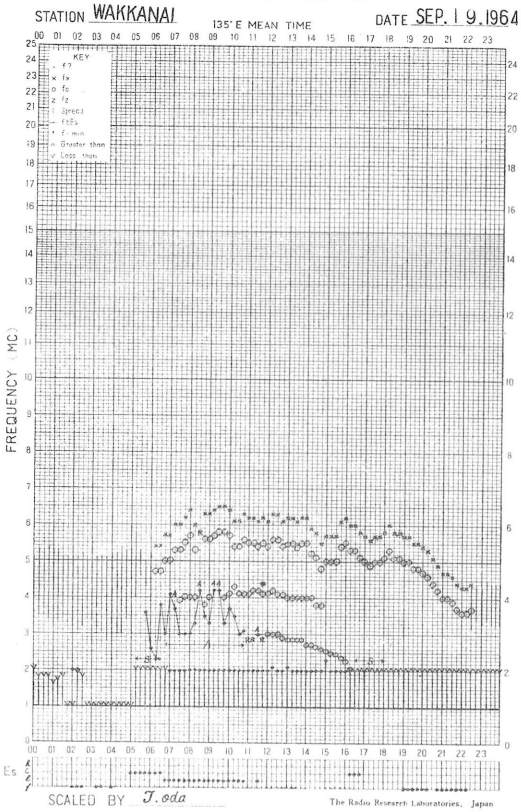

SCALED BY J. oda

The Radio Research Laboratories, Japan

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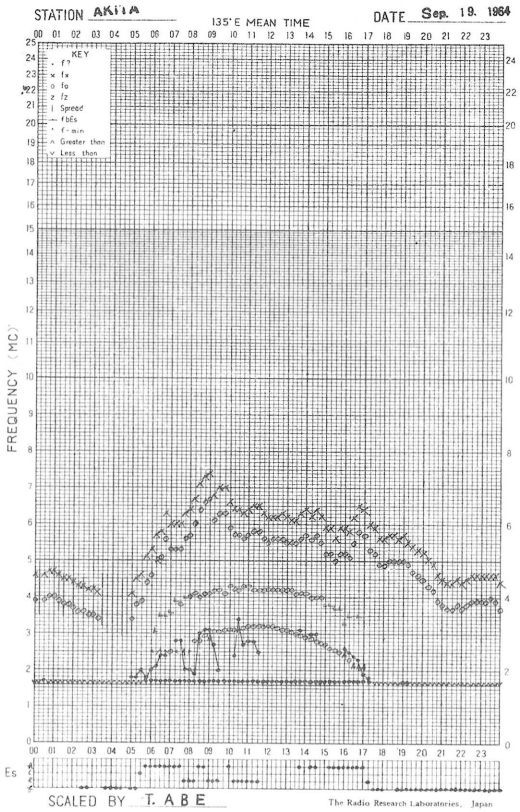

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The Radio Research Laboratories, Japan

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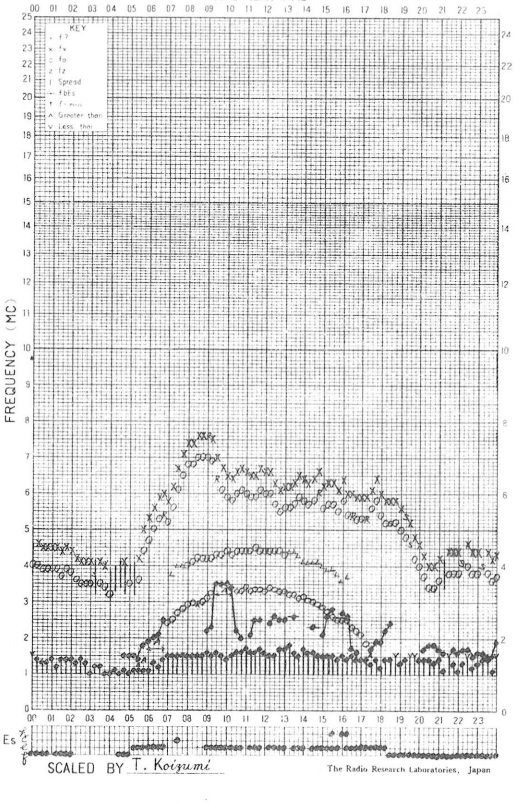

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The Radio Research Laboratories, Japan

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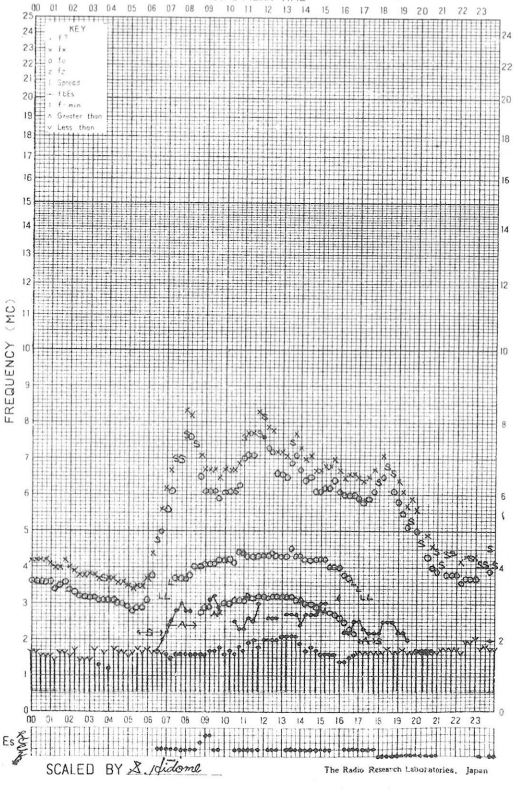

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The Radio Research Laboratories, Japan

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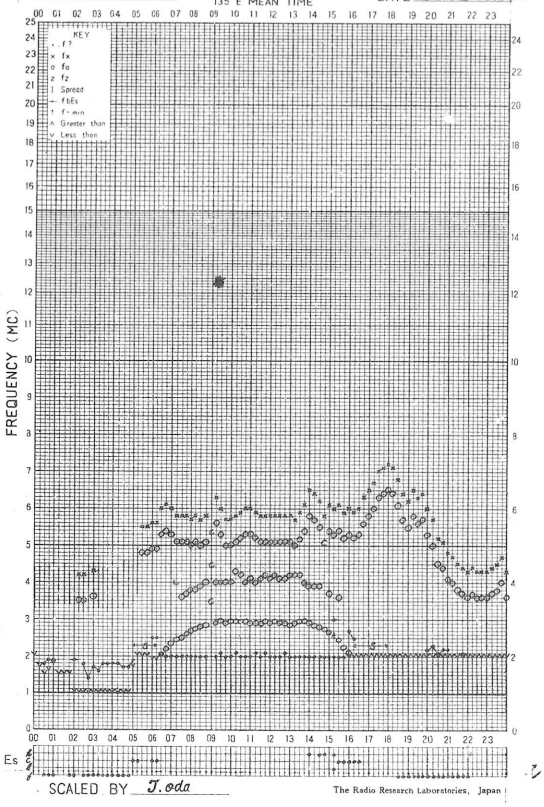

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The Radio Research Laboratories, Japan

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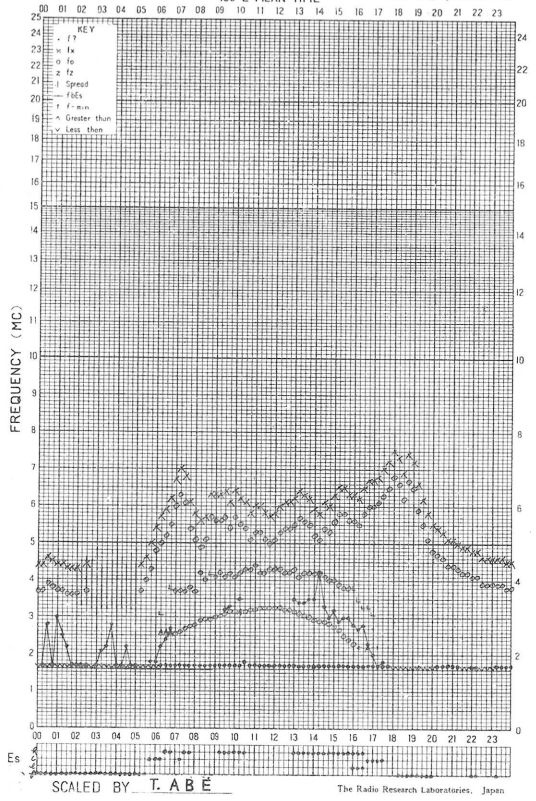

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The Radio Research Laboratories, Japan

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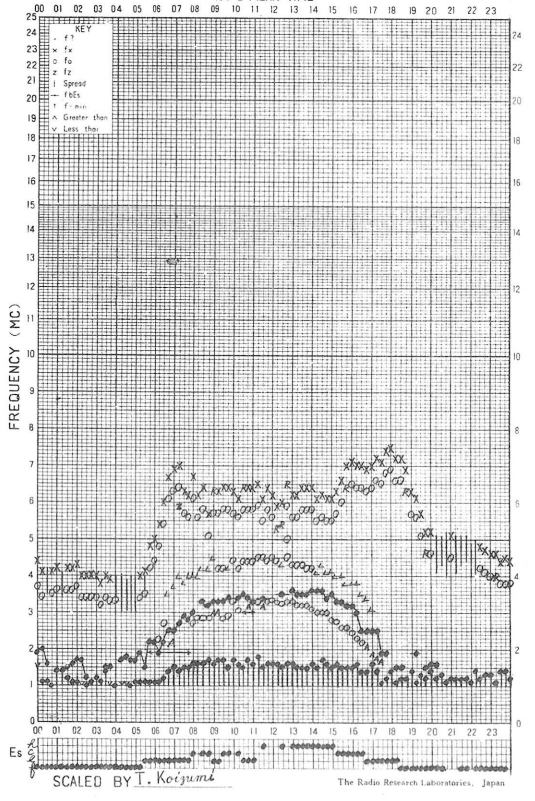

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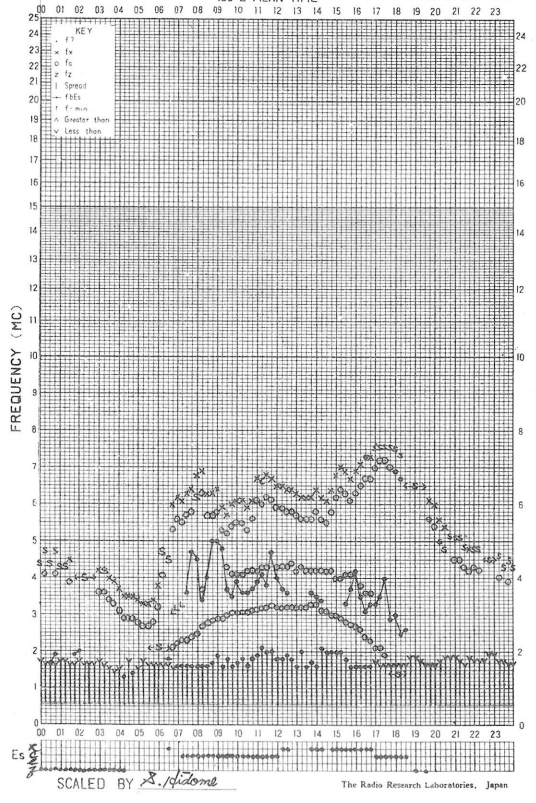

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The Radio Research Laboratories, Japan

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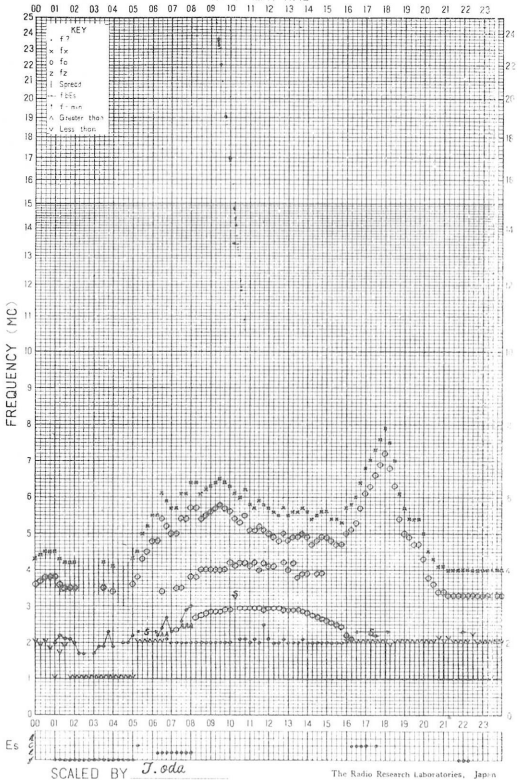

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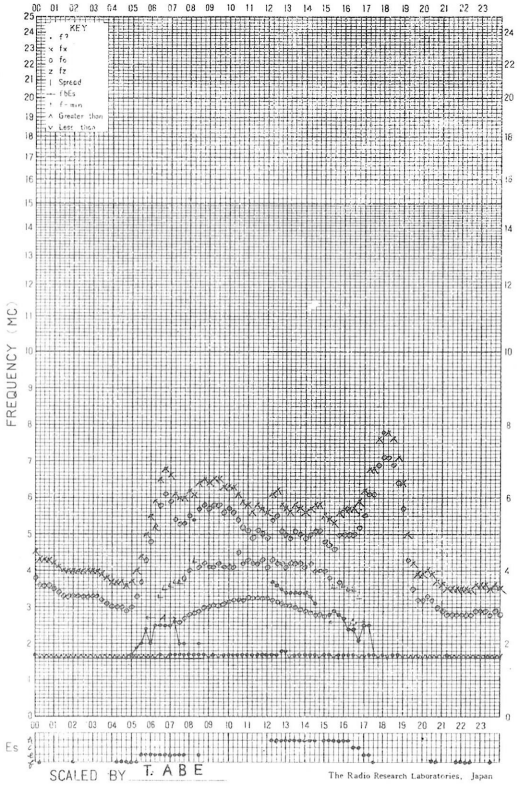

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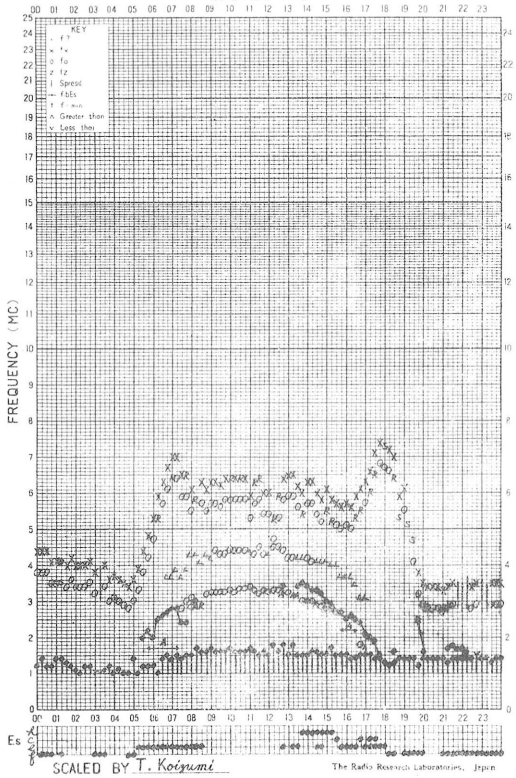

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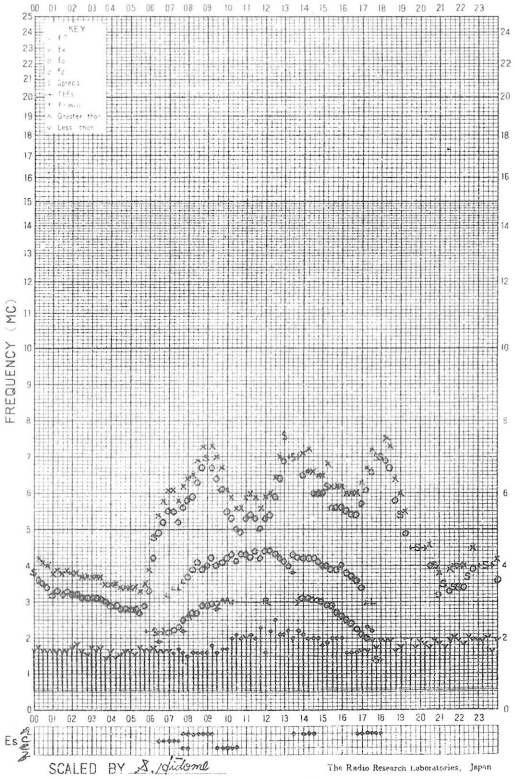

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The Radio Research Laboratories, Japan

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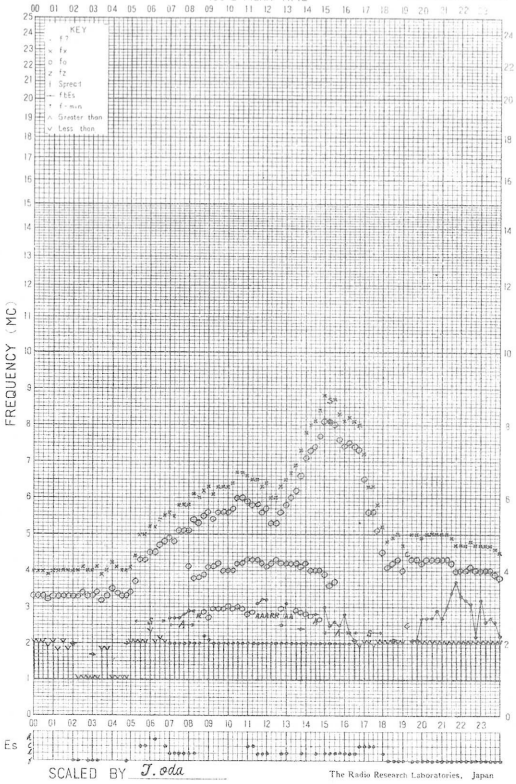

SCALED BY J. oda The Radio Research Laboratories, Japan

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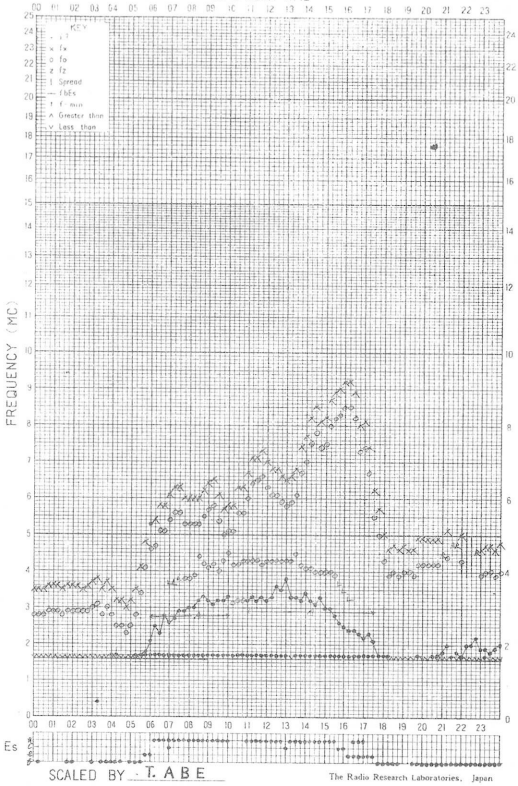

SCALED BY T. ABE The Radio Research Laboratories, Japan

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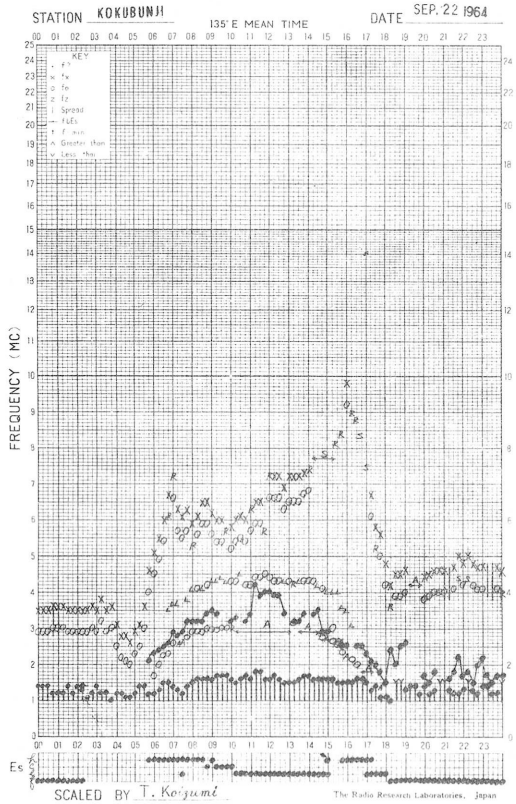

SCALED BY T. Koizumi The Radio Research Laboratories, Japan

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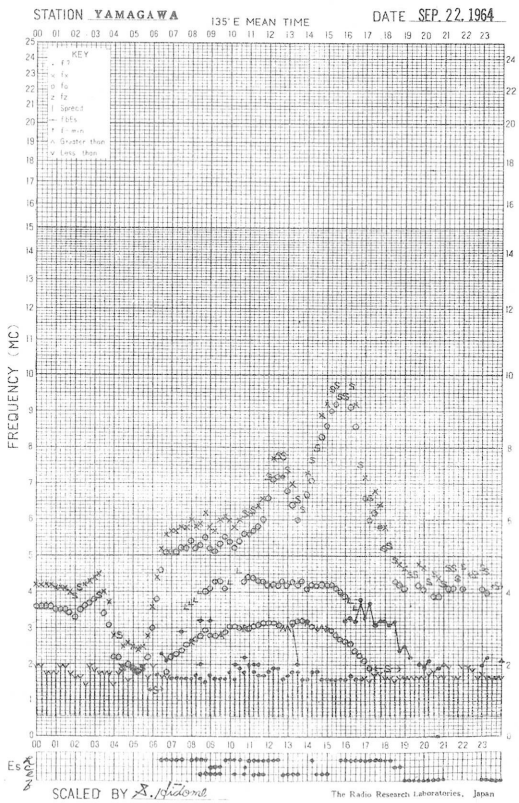
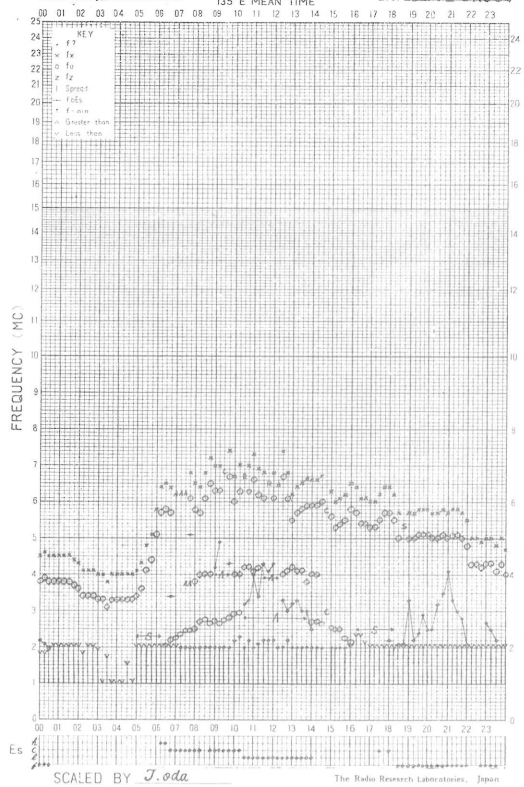


SCALED BY A. Ishioka The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE SEP. 23. 1964

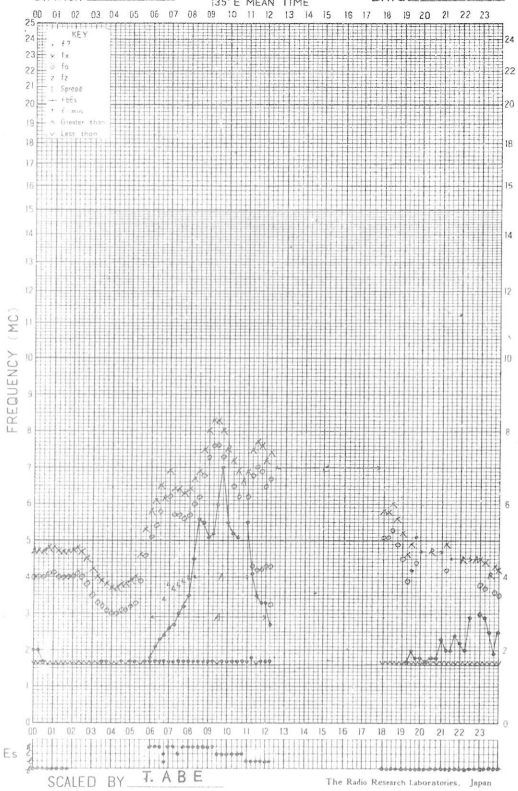


SCALED BY T. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Sep. 23. 1964

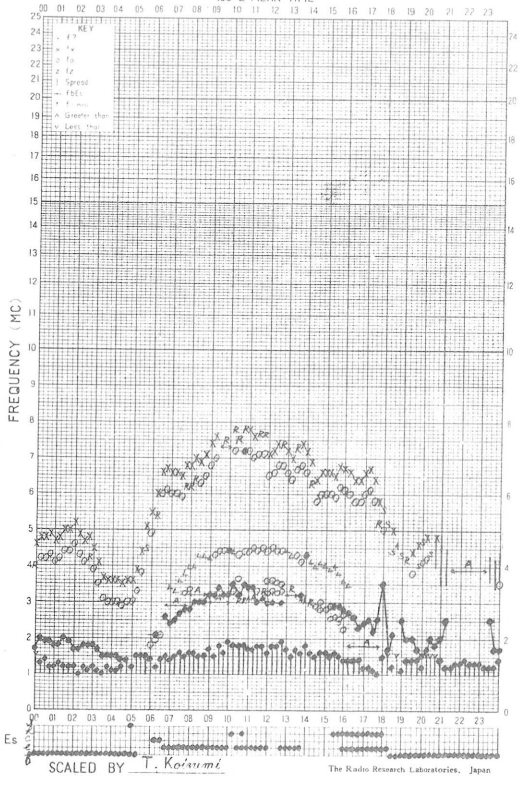


SCALED BY T. ABE

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE SEP. 23 1964

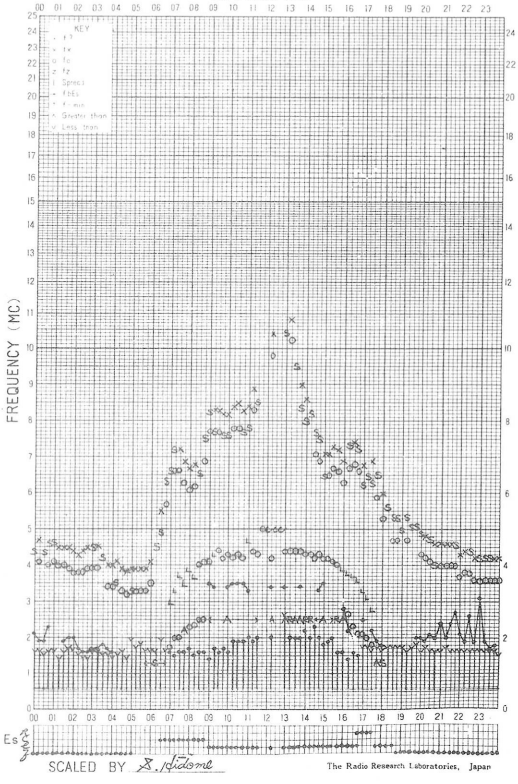


SCALED BY T. Koizumi

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE SEP. 23. 1964

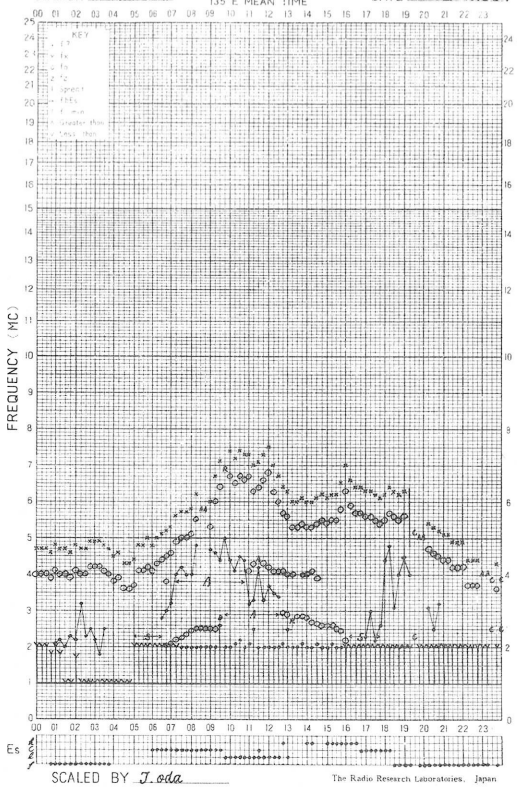


SCALED BY K. Shiomi

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE SEP. 24. 1964

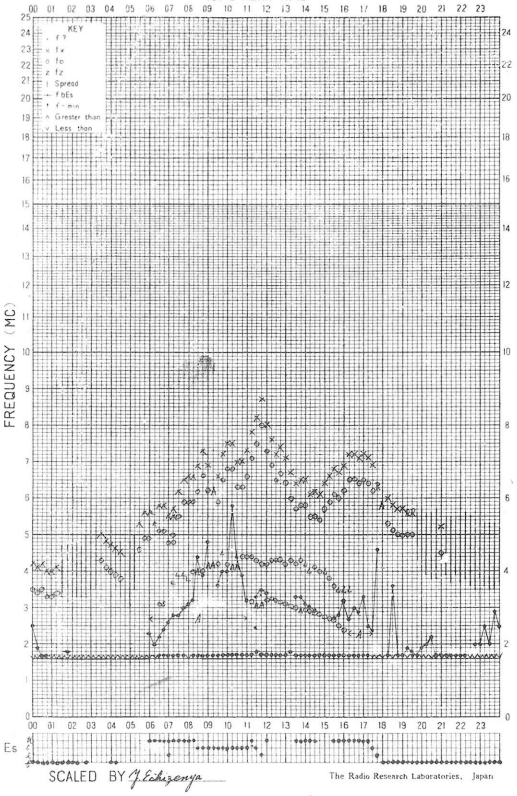


SCALED BY T. Oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Sep. 24. 1964



SCALED BY T. Echizenya

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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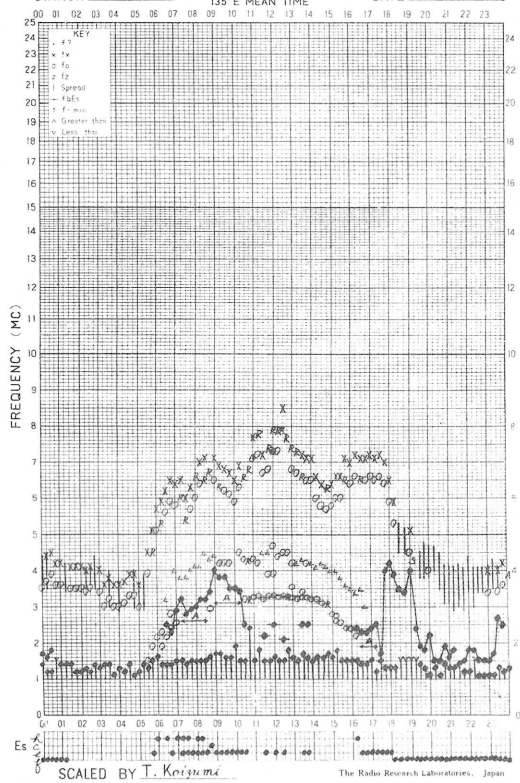
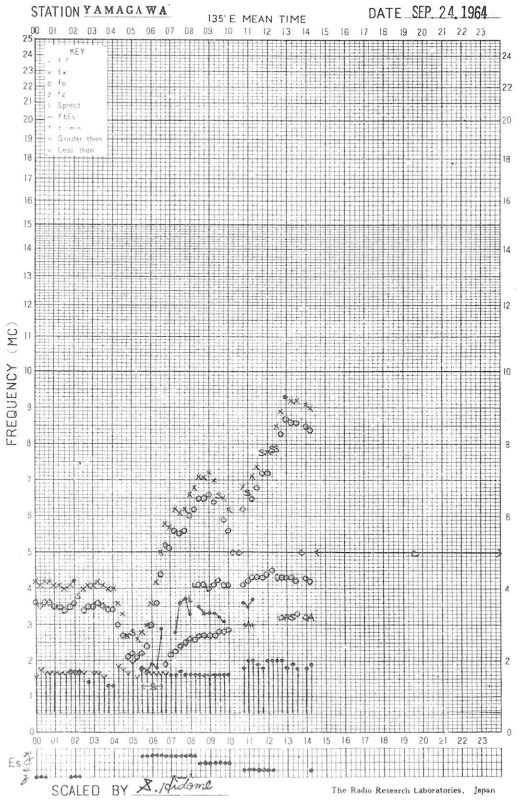


SCALED BY T. Koizumi

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE SEP. 24, 1964

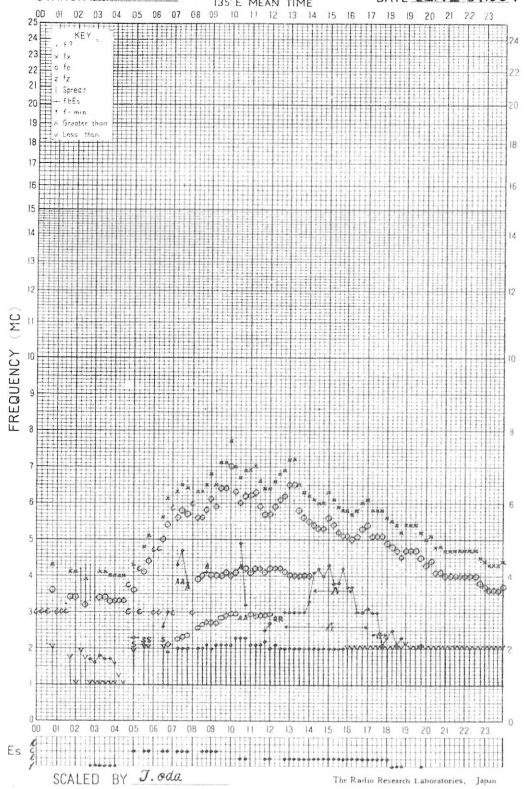


SCALED BY S. Fukuoka

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE SEP. 25. 1964

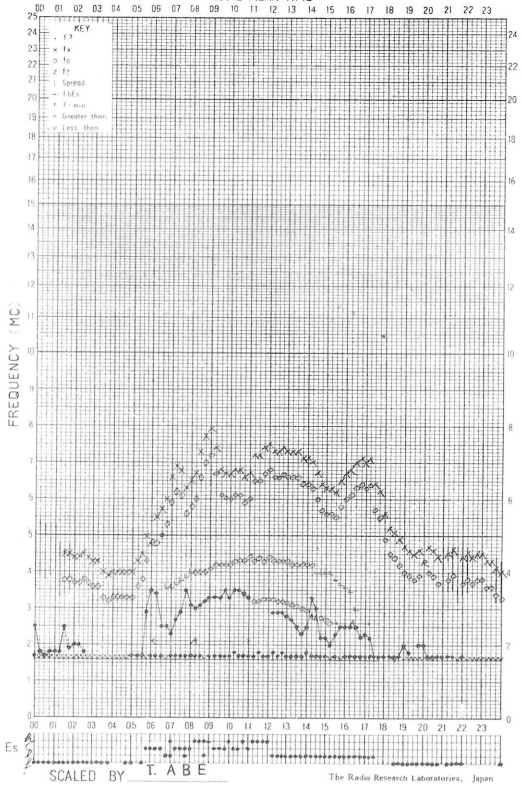


SCALED BY J. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Sep. 25. 1964



SCALED BY T. ABE

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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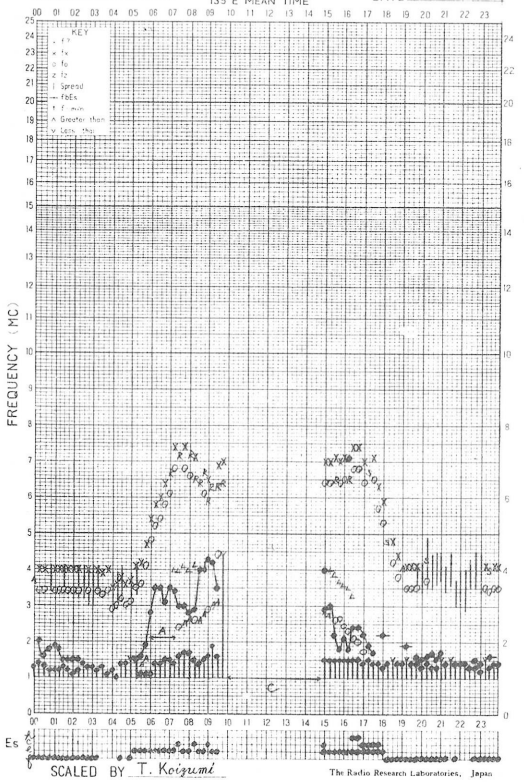
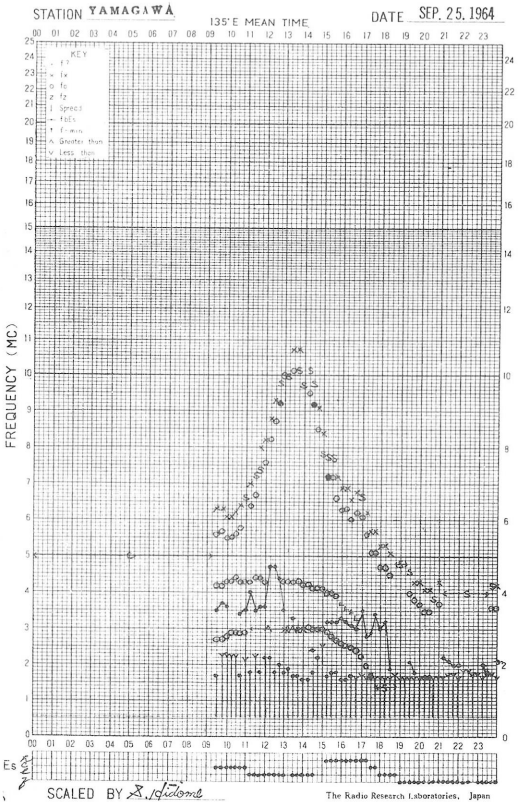


SCALED BY T. Koizumi

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE SEP. 25. 1964

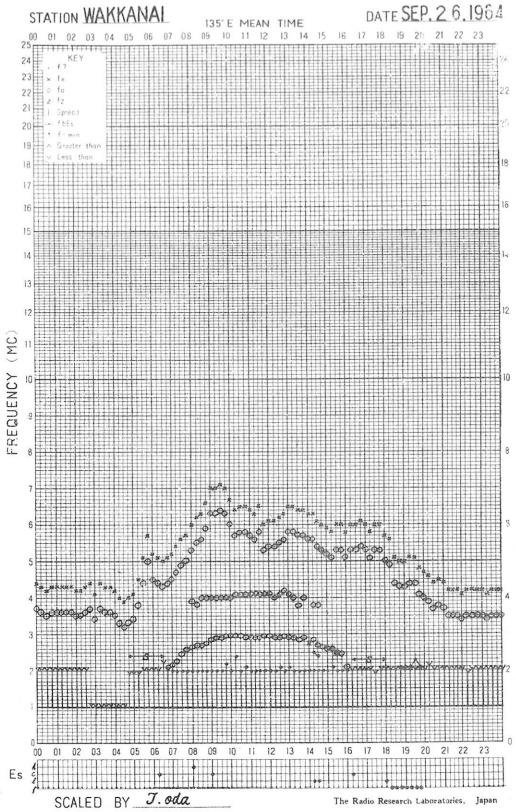


SCALED BY S. Ichiomi

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE SEP. 26. 1964

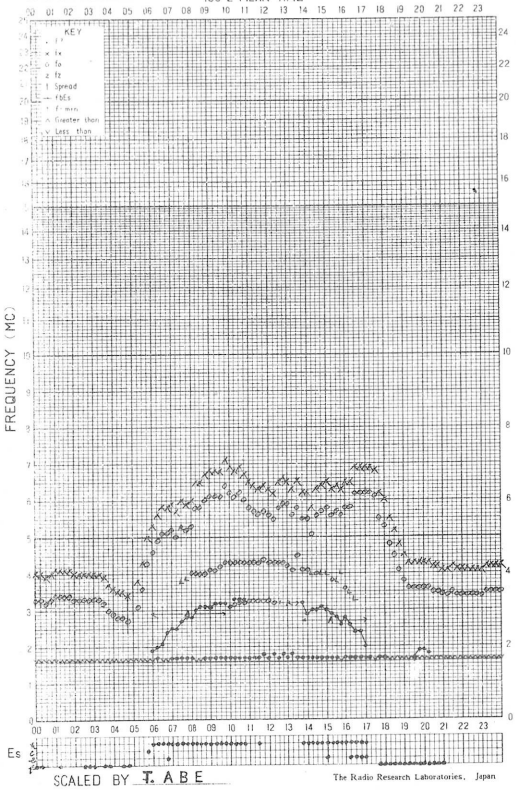


SCALED BY T. oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Sep. 26. 1964

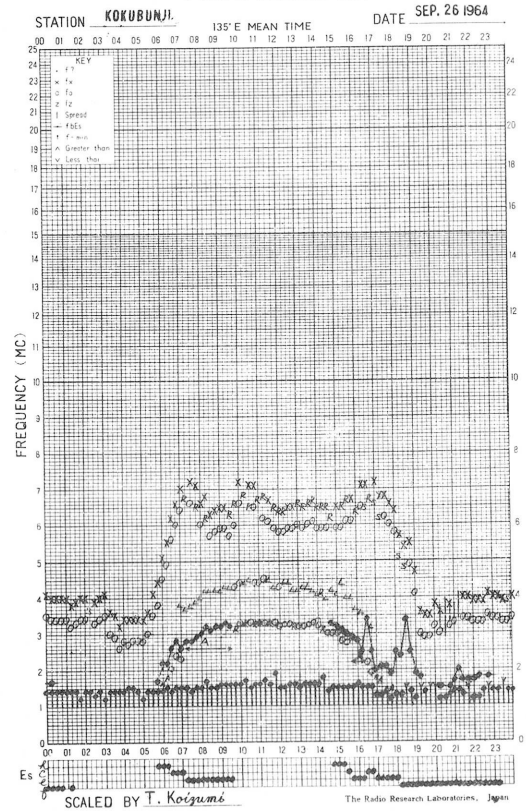


SCALED BY T. ABE

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE SEP. 26 1964



SCALED BY T. Koizumi

The Radio Research Laboratories, Japan

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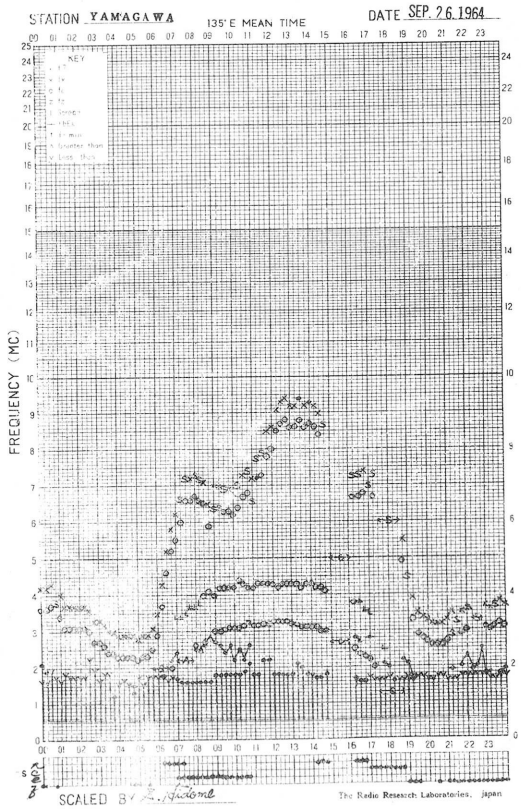
STATION YAMAGAWA 135°E MEAN TIME DATE SEP. 26. 1964

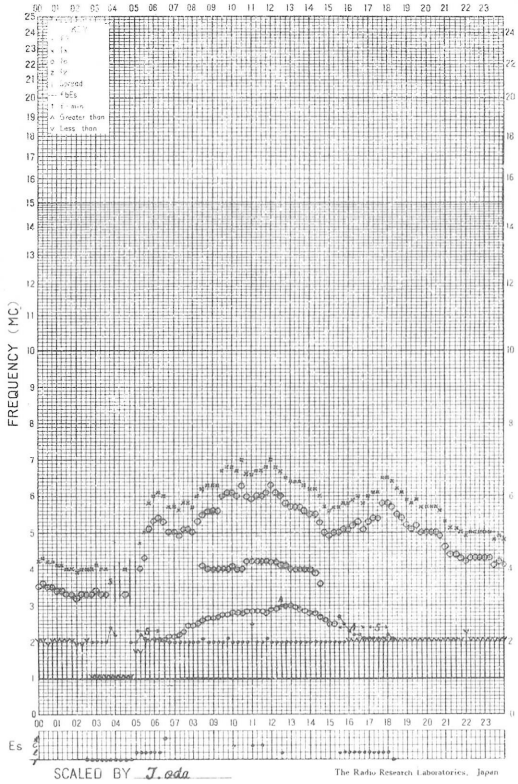


SCALED BY [illegible]

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

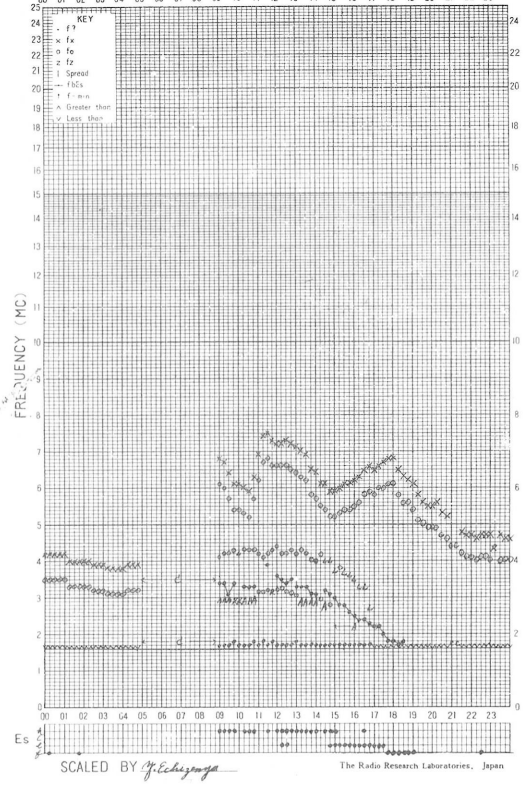
STATION WAKKANAI 135° E MEAN TIME DATE SEP. 27. 1964



SCALED BY T. Oda The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Sep. 27. 1964



SCALED BY H. Echizenya The Radio Research Laboratories, Japan

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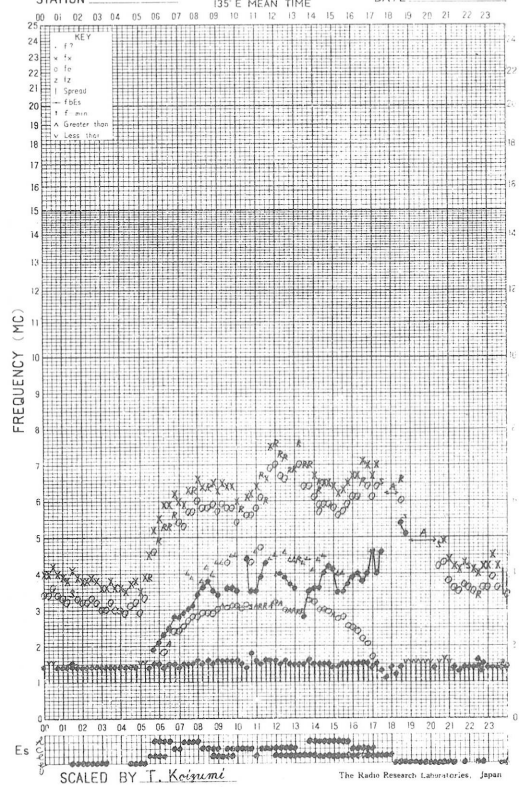
STATION KOKUBUNJI 135° E MEAN TIME DATE SEP. 27 1964



SCALED BY T. Koizumi The Radio Research Laboratories, Japan

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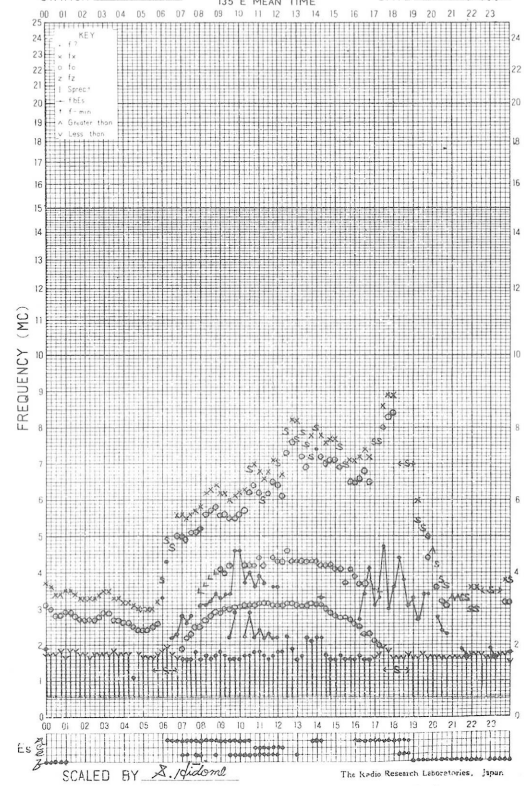
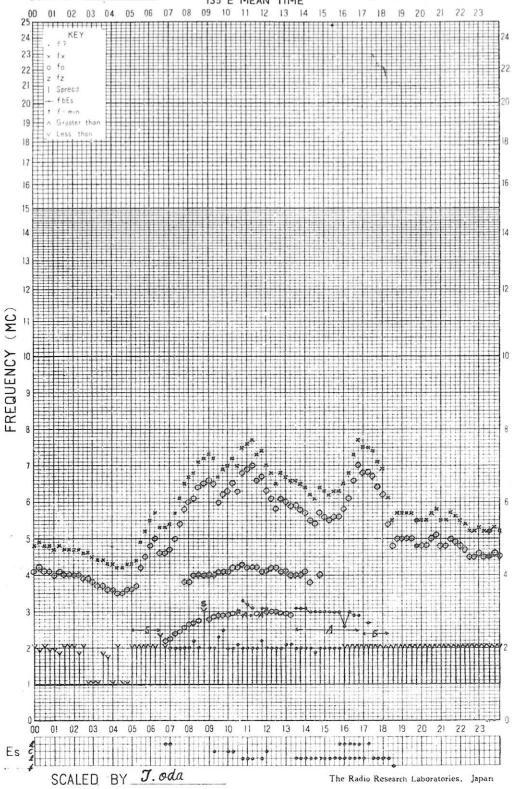
STATION YAMAGAWA 135° E MEAN TIME DATE SEP. 27. 1964



SCALED BY S. Ishioni The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE SEP. 28. 1964

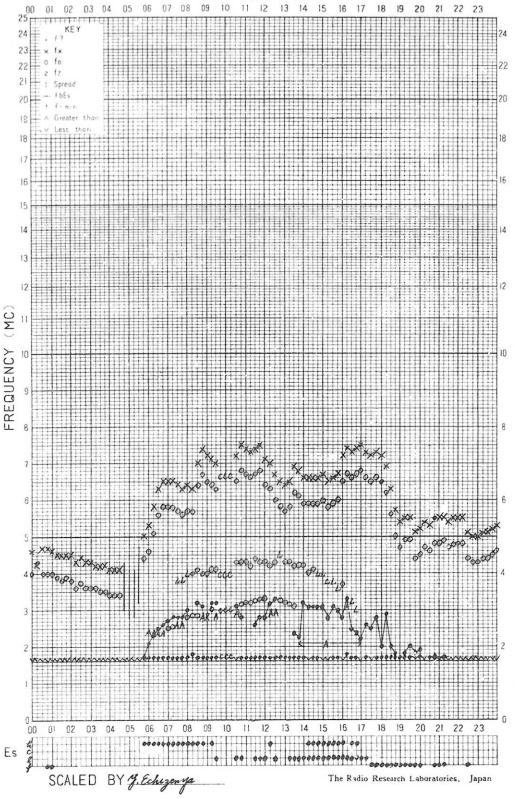


SCALED BY T. Oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Sep. 28. 1964

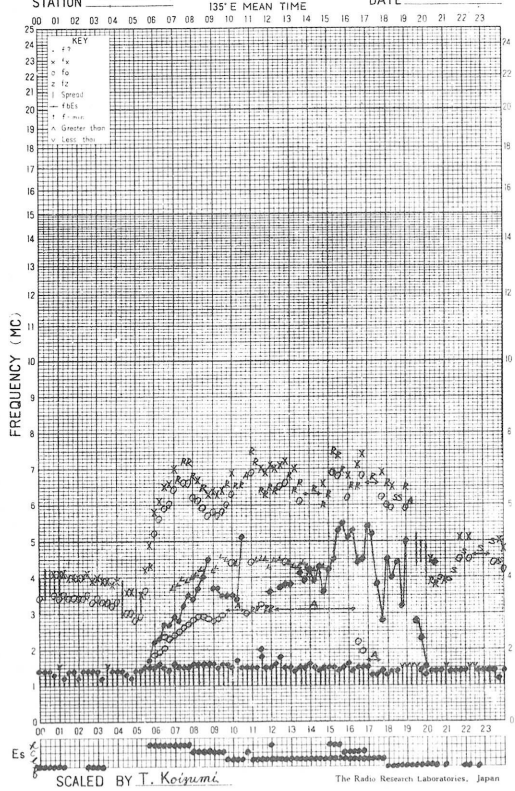


SCALED BY T. Ichizawa

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE SEP. 28 1964

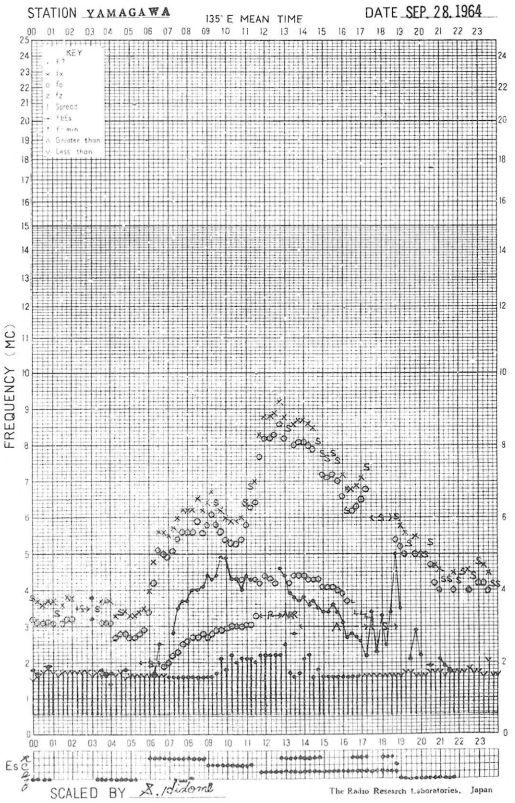


SCALED BY T. Koizumi

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE SEP. 28. 1964

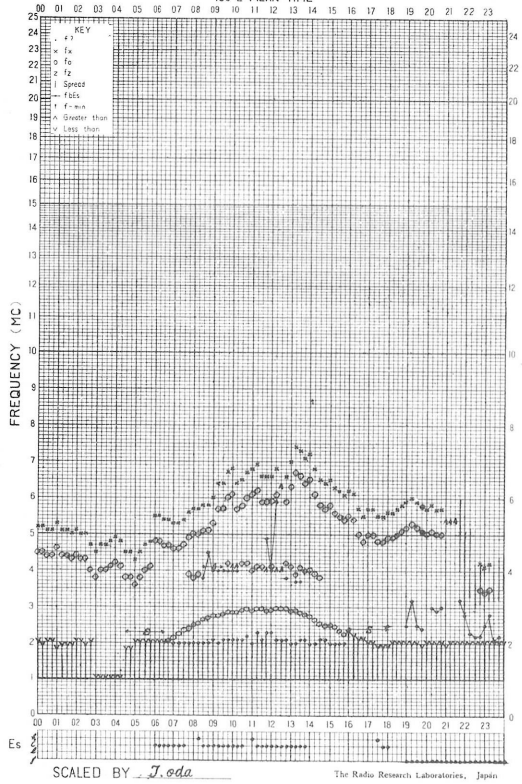


SCALED BY T. Watanabe

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE SEP. 29. 1964

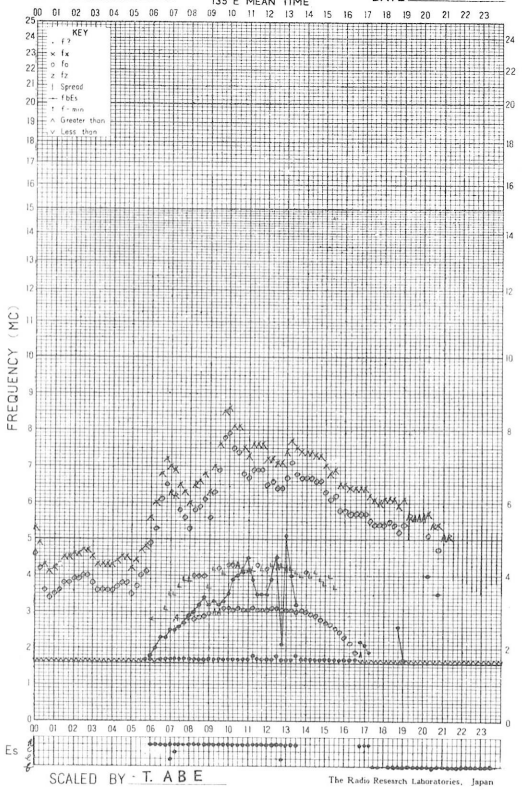


SCALED BY J. Oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Sep. 29. 1964

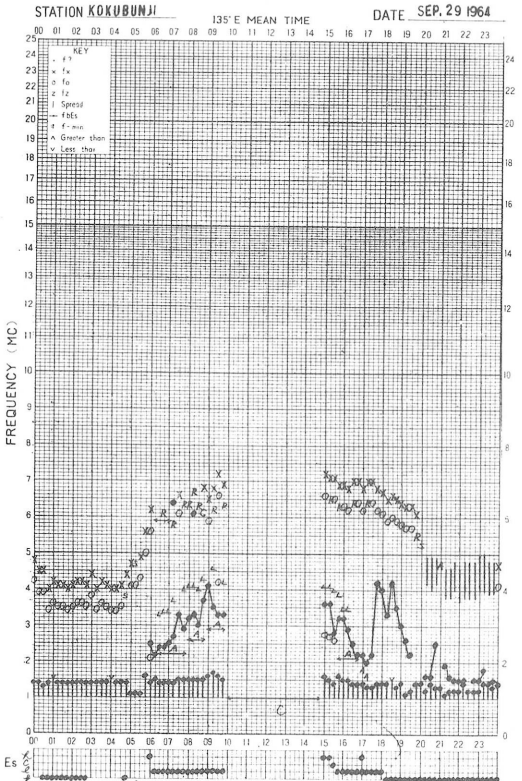


SCALED BY T. ABE

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE SEP. 29 1964

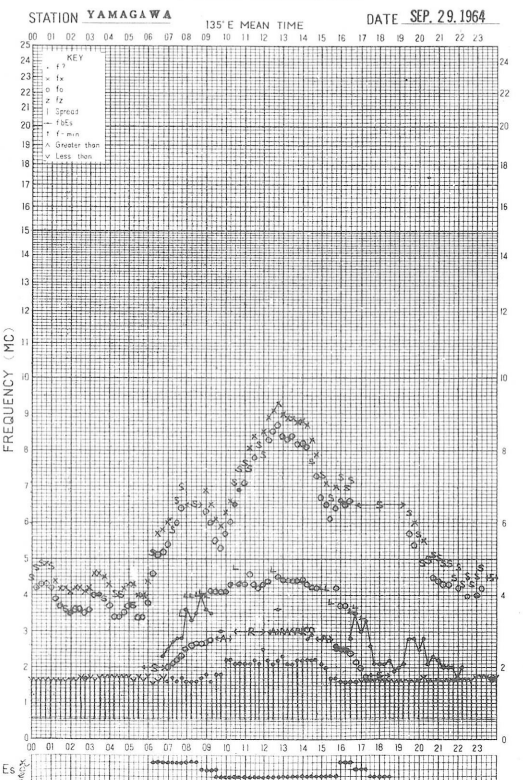


SCALED BY I. Kuriyama

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE SEP. 29. 1964

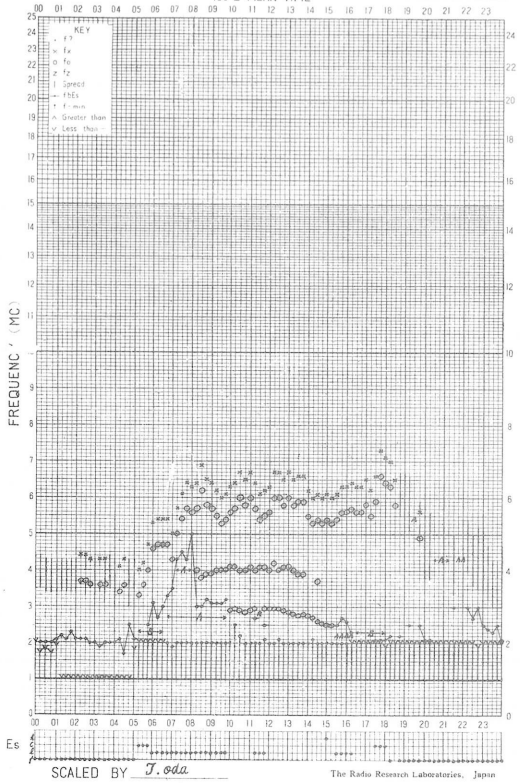


SCALED BY S. Ishidome

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE SEP. 30. 1964

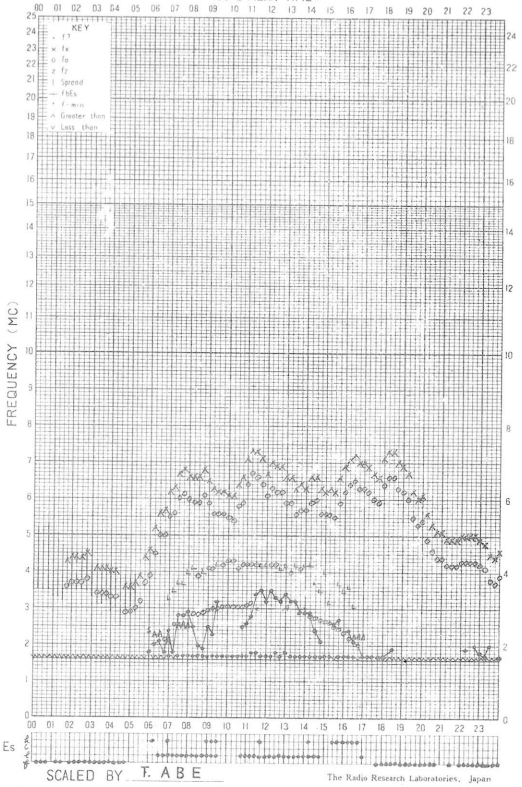


SCALED BY T. Oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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

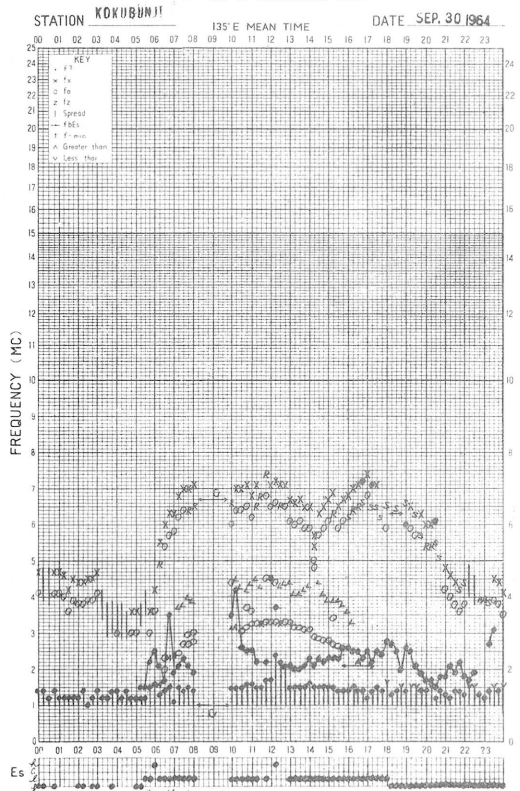


SCALED BY T. ABE

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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

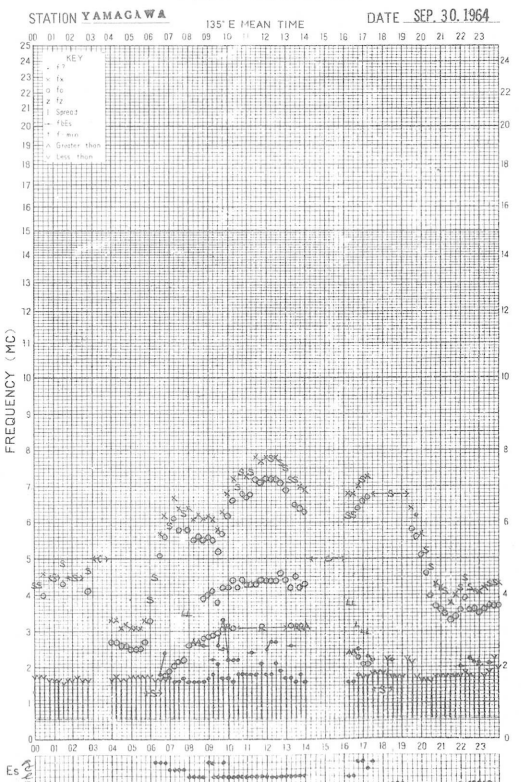


SCALED BY I. Koizumi

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

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



SCALED BY S. Shidome

The Radio Research Laboratories, Japan

SOLAR RADIO EMISSION

Flux Density and Variability

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

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

) uncertain owing to off beam of antenna

SOLAR RADIO EMISSION

Flux Density

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

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

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

Note No observations during the following periods:

1st	2010-	2nd	2400	16th	2010-	17th	0200
3rd	2010-	4th	0100	24th	2010-		2400
5th	0700-		1010	25th	0300-		0400
7th	0000-		0100	25th	0500-		1010
11th	0600-	12th	0100	25th	2010-		2400
12th	2010-	13th	1010	27th	2010-	28th	0100

Distinctive Event

No Distinctive Event was observed during September, 1964.

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

1st	2010-	2nd	0200	18th	0600-		1010
2nd	2010-		2400	20th	0000-		0200
4th	2010-	5th	0100	20th	2010-	21st	0100
6th	2010-		2300	21st	2010-	22nd	0200
10th	2010-		2400	22nd	0500-		1010
11th	2010-		2400	23rd	2010-	24th	2400
12th	0330-	14th	0100	25th	0300-		2400
14th	2010-	15th	0200	26th	2010-	27th	0300
15th	0430-		1010	27th	2010-	29th	0100
16th	2010-		0200	29th	2010-	30th	0100

RADIO PROPAGATION QUALITY FIGURES

HIRAISO — Time in U.T.

Sept. 1964	Whole Day Index	L. N. 06 12 18 / 12 18 24	W W V 00 06 12 18 / 06 12 18 24	S. F. * 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Warning 00 06 12 18 / 06 12 18 24	Principal magnetic storms Start	End	ΔH
1	4o	(4) 4 (5)	5 - - 4	3 4 4 4	5 5 4 4	N N U U			
2	4+	(4) 4 (4)	4 - - (4)	4 4 5 (5)	4 4 3 4	N N N N			
3	4+	4 4 4	5 - - 5	4 4 4 5	4 4 4 4	N N N N			
4	4o	C (4 4)	4 - - 4	5 4 4 4	5 5 4 4	N N U U			
5	4o	(4 4) 5	4 - - 4	4 3 4 4	4 4 4 3	N N N N			
6	5-	4 4 C	4 - - (5)	4 5 5 5	4 4 4 4	N N N N	1954	---	68γ
7	4-	3 C 3	5 - - 3	3 4 4 4	(4) 4 4 4	N U U U	---	---	
8	3+	3 3 3	1 - - 4	4 4 4 4	5 4 4 4	U U U U	---	---	
9	4-	3 3 3	3 - - 4	4 4 4 4	4 3 3 3	U U U U	---	21xx	
10	4o	4 4 4	4 - - 4	4 4 4 4	4 3 3 4	N N N N			
11	4+	4 5 5	3 - (4) 4	4 5 4 4	4 4 4 4	N N N N			
12	4-	4 4 4	1 - - 4	5 4 4 4	4 5 5 5	N N N N			
13°	4+	4 5 4	4 - - (4)	5 4 4 4	5 4 4 4	N N N N			
14°	4+	4 4 5	4 - (4) 4	4 5 4 4	4 4 3 4	N N N N			
15	4o	4 4 4	3 - - 5	4 4 4 4	4 5 4 4	N N N N	2334	---	67γ
16	4o	5 3 3	4 - - 4	4 4 4 4	5 5 4 4	N N N N	---	---	
17	4o	4 5 4	1 - - 5	4 5 5 4	5 4 4 5	N N N N	---	17xx	
18	4o	4 4 (5)	3 - (4) 5	3 3 4 4	5 4 4 4	N N N N			
19	4o	4 (4 4)	4 - - 5	3 3 4 5	3 3 3 4	N N N N			
20	4o	5 4 5	3 - (4) 5	3 4 4 4	5 3 3 (4)	N N N N			
21	4-	4 3 4	4 - - 4	3 3 4 4	(4 4 4) 4	N N N N	2352	---	98γ
[22	3+	3 3 3	4 - - (4)	3 3 4 4	4 4 4 4	N N N N	---	18xx	
23	4-	3 3 4	(2) - - 5	3 4 4 4	4 4 4 4	N N N N			
24]	4o	5 5 4	1 - - 5	3 4 4 4	4 3 4 4	N N N N			
25	4+	C C 4	4 - - 4	(5) C C 4	(4) C C 4	N N N N			
26	4o	3 4 (4)	4 - - 5	3 4 4 4	4 3 3 4	N N N N			
27	4+	4 4 4	5 - (4) 5	4 5 4 4	5 4 4 4	N N N N	20.2	---	65γ
28	4+	4 5 (4)	4 - - 4	4 5 4 4	4 4 3 4	N N U U	---	22xx	
29	4o	4 5 4	2 - - 4	5 4 4 4	4 4 3 4	U N N N			
30	4o	(4) 4 5	4 - - 4	3 3 4 4	4 4 4 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 September, 1964.

IONOSPHERIC DATA IN JAPAN FOR SEPTEMBER 1964

第 16 巻　第 9 号

1964年11月20日　印　刷
1964年11月25日　発　行

(不許複製非売品)

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東京都豊島区日ノ出町2の2 28
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