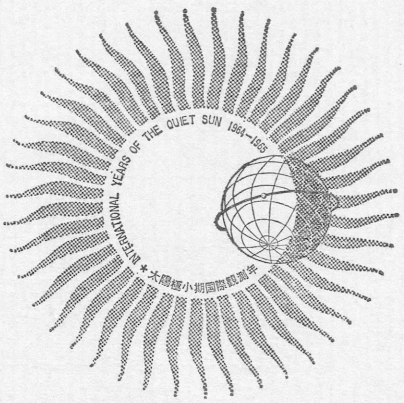
F—204

IONOSPHERIC DATA IN JAPAN

FOR DECEMBER 1965

Vol. 17 No. 12



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Prepared by

THE RADIO RESEARCH LABORATORIES

MINISTRY OF POSTS AND TELECOMMUNICATIONS

KOKUBUNJI, TOKYO, JAPAN

F－204

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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. Field Intensities of WWV and WWVH

Field intensity observations of WWV and WWVH transmitted from Washington D.C. and Hawaii, respectively, are carried out at Hiraiso Radio Wave Observatory. In order to avoid interferences with several standard frequency waves on the same frequency, the upper side-band of 440 c/s is picked up by the use of a narrow band pass filter of ± 40 c/s bandwidth.

Tabulated *field intensity* is the average of peak value of the incident upper side-band field intensity in dB above one microvolt per meter. Tne *duration* of observation is two minutes for WWV and three minutes for WWVH following the time indicated in universal time on the table.

Particulars of the transmitter and receiver are summarized in the following tables:

Transmitter

	WWV	WWVH
Location	Washington, D.C. Long. 76°51′ W Lat. 39°00′ N	Maui, Hawaii Long. 156°28′ W Lat. 20°46′ N
Power	3 kW for the upper side-band	0.5 kW* for the upper side-band
Antenna	$\lambda/2$ vertical	$\lambda/2$ vertical
Distance	10050 km	6270 km

* Reduced from the carrier power of 2 kW with amplitude modulation of 100%.

Receiver

Antenna	4.5 m vertical rod
Bandwidth	±40 c/s for the upper side-band
Calibration	each half hour

Descriptive symbols are as follows:

C: Measurement influenced by, or impossible because of, any non-propagational reasons.

S: Measurement influenced by, or impossible because of, interferences or atmospherics.

( ): Unaccurate measurement influenced by interferences, atmospherics, or non-propagational reasons.

<: Less than the following figure.

b. 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 Hamburg (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 Hamburg WWV and S. F.

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

c. 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)
HB .....Various commercial circuits(Hamburg)

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

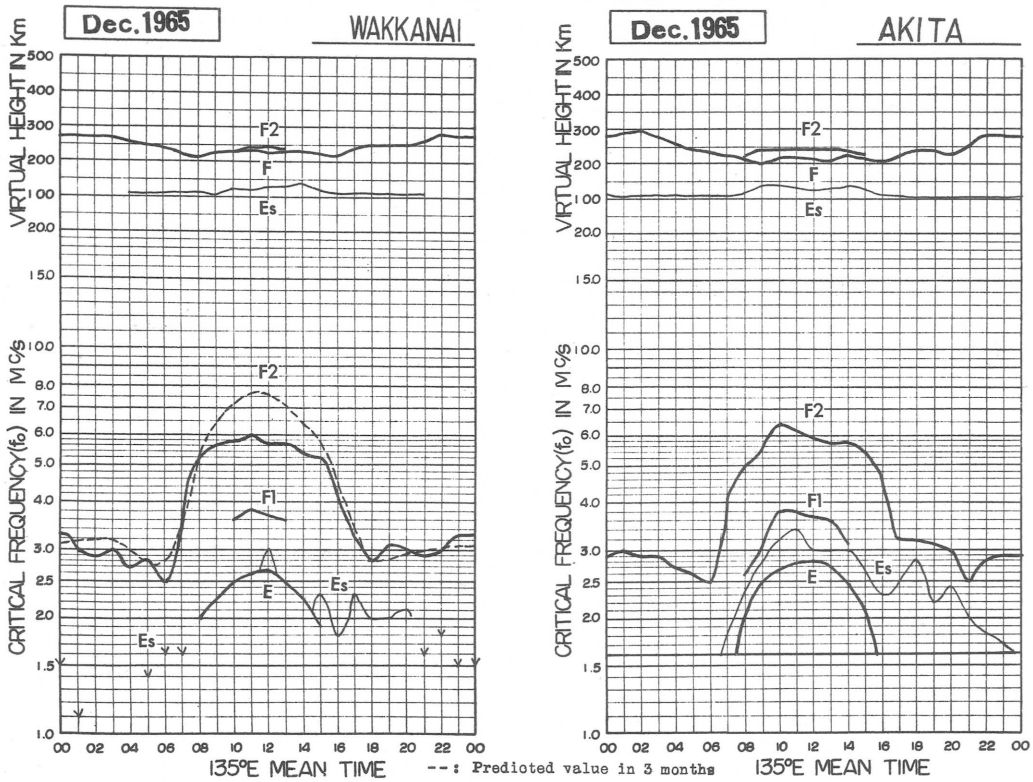
Importances

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

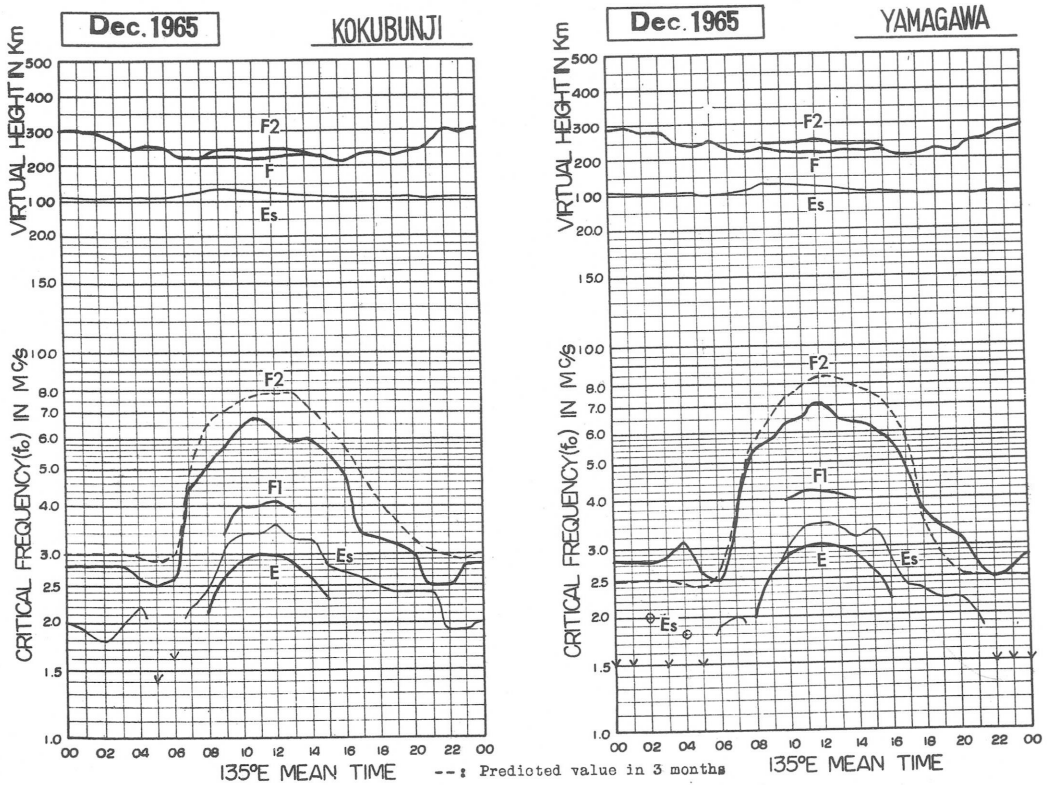
1−	1	1+
2−	2	2+
3−	3	3+

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

Dec. 1965 | 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	SF	SF	029F	031	023	020	024	038	I060S	I070S	I067S	I065R	I060S	054	054	056	049	031	025	028	029	030	033	034
2	033	033	039S	SF	040F	021F	019	041	I053S	I068S	U088S	056	057	056	I052R	050	051	043S	A	031S	037	039	I038S	041
3	041	038	041S	SF	SF	030F	S	S	055H	U060S	U059R	R	R	R	R	056S	I038A	031	034	036	036	026	031	029
4	U035S	SF	SF	SF	SF	SF	026	I042S	050	S	S	S	S	053	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	R	I057R	I054R	037	036	037	034	029	030	031	033
6	033	033	030	030	027	033	027	044S	056S	052	058	060	057	052	052	053	036	028	025	I024S	I025S	024	I023A	026
7	027S	026	028	030	028	026	031	043	053S	053	053H	058S	058	I059R	063	060	039	035	I030C	024	028	I027C	028	028
8	030	030	029	030	027	030	027	036	U047S	053	054	I054R	057	I060S	053	052	040	031	I028S	030	036	I027S	030	032
9	033	033	034	033	031F	033	030	040S	048	I056S	I060R	I055R	056	U053R	054	043	040	S	A	032	028	030	033	034
10	U034S	033	031	032	030	029	026	U043S	054	058	060	I060R	060	057	056	I048S	040	033	031	031	026	028	033	SF
11	SF	SF	SF	034	035	I034S	I035A	042	I062S	056	053	I068R	068	I066R	I058S	U053S	052	I040S	034	027	026	028	036	I039S
12	038	SF	SF	043F	036F	SF	I025S	C	C	C	C	C	C	R	060	047	050	033	I027S	033	033	033	033	035
13	032	033	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	057	054	054	043	028	028	SF	025	027	C	SF
17	SF	SF	SF	SF	SF	SF	025	036	050	053	057	056	I057C	058	063	046	C	C	027	I030A	027	025	028	SF
18	SF	F	F	F	025F	026	023	033	051	054	058	053	061	051	062	053	C	C	I025C	030	030	024	027	SF
19	SF	030F	030F	030	F	035F	023F	042	065	068	053	067	058	071	064	053	051	027	026	031	033	033	031	028
20	SF	SF	036	SF	SF	037F	F	035	I052S	062	057	057	054	061	060	052	045	025	023	027	030	025	027F	031F
21	033	031	030	028	SF	SF	023	037	054	056	060	060	051	059	054	045	040	033	023	026	026	024F	F	F
22	F	027F	027F	025F	025F	035F	F	F	046	050F	053F	056	056	057	051	050	037	A	F	F	F	F	F	F
23	F	F	F	F	040F	SF	025F	038	049	048	056	056	053	055	050	045	038	I032A	030	037	026	F	F	F
24	F	F	F	028F	F	F	030F	041S	048	051	052	055H	056	047	I048R	044	045	029	028	038	033	040	F	F
25	C	F	028F	023F	025F	I026A	025F	033	053	056	057	067	061	055	048	050	036	F	F	037F	F	F	F	040F
26	F	F	F	032F	033F	031	021	032	052	070	079	064	053	053	050H	048	043	030F	026	025	030	031	030	033
27	R	023	023	026	026	026	I025A	036	065	I070S	067	076	060	054	048	052	048	034	028	031	033	033	F	033F
28	032F	025F	023F	023F	027F	025	023	037	055	063	070	068	054	057	060	054	052	033	I032A	032	033	034	030	029
29	028	I028A	029F	030F	030F	027	024	037	058	069	069	068	058V	057	059	051	043	036	031	033	036	043	F	F
30	033F	028F	026F	026F	026F	026	I025A	034	053	065	068	073	068	063	054	053	036	033	031	F	F	F	F	033F
31	027F	027F	027F	028F	027F	028	027	036	048	054	056	061	053	053	055H	050	040	028	025	028	032	S	027	031S
No.	15	16	18	19	19	20	23	23	25	24	24	23	23	25	26	27	25	22	23	24	24	22	18	18
Median	033	030	029	030	027F	028	025	037	053	056	058	060	057	057	054	052	040	032	028	031	030	029	030	033
U. Q.	034	033	031	032	033	033	027	042	056	066	067	067	060	059	060	053	048	034	031	033	033	033	033	034
L. Q.	030	027	027	026	026	026	023	036	050	053	055	056	054	053	052	048	038	029	025	028	026	026	028	029
Q. R.	004	006	004	006	007	007	004	006	006	013	012	011	006	006	008	005	010	005	006	005	007	007	005	005

foF2

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

The Radio Research Laboratories, Japan

W 1

IONOSPHERIC DATA

Dec. 1965 | 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											L	U390L	380	330										
2										310	U380L													
3											U390L	410	370											
4											A	A	A											
5										C	C	C	C											
6												400L	U390L											
7																								
8																								
9																								
10																								
11												400		U380L										
12										C	C	C	C	350										
13										C	C	C	C	C										
14										C	C	C	C	C										
15										C	C	C	C	C										
16										C	C	C	C	380										
17													C	360										
18												370												
19										A	A	A	A	350										
20													360	U360L										
21											340	U380L	340											
22																								
23																								
24																								
25											380	380	360											
26										U350L	360	360L												
27											360L	350												
28											350			330										
29											U340L													
30													390											
31																								
No.										2	8	9	7	8										
Median										U330	360	380	370	360										
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

W 2

IONOSPHERIC DATA

Dec. 1965 | 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	S	210	I245A	265	265	I275A	250	230	200	S							
2								S	200	225	240	255	255	250	230	195	S							
3								S	215	240	I250A	260	270	255	240	195	S							
4								S	190	230	250	260	265	A	C	C	C							
5							C	C	C	C	C	C	C	250	225	170	S							
6								S	210	230	260	260	255	250	230	S	S							
7								S	A	225	240H	I260A	275	265	245	195	S							
8								S	200	235	270	280	270	250	225	195	S							
9								A	225	I240A	280	280	285	I260B	I230S	195	S							
10								S	195	220	250	270	270	250	225	185								
11								A	195	225	235	255	250	250	I210S	185	E							
12								C	C	C	C	C	C	240	230	180	S							
13								C	C	C	C	C	C	C	C	C	C							
14								C	C	C	C	C	C	C	C	C	C							
15								C	C	C	C	C	C	C	C	C	C							
16								C	C	C	C	C	C	220	220	175	S							
17								S	205	I230A	255	265	I270C	250	215	145	C							
18								S	200	215	240	250	245	250	220	180	C							
19								S	190	220	245	250	245	225	230	A	A							
20								S	A	A	255	265	260	250	A	A	A							
21								S	195	235	250	270	255	250	220	190	S							
22								S	200	225	250	265	260	260	225	180	A							
23								S	200	220	255	260	270	250	225	195	E							
24								E	160	210	240	265	270	250	I225B	195								
25								E	195	220	245	I250R	265	255	225	190	E							
26								S	I170A	225	255	265	265	250	210	A	A							
27								S	A	B	A	245	260	I240A	S	A	S							
28								S	S	220	235	250	260	I245B	230	200	S							
29								E	210	215	240	255	265	245	A	S	S							
30								S	190	I220A	250	270	A	R	A	S	S							
31								S	185	230	260	275	275	255	230	S	S							
No.								3	21	23	24	25	24	26	23	19	3							
Median								E	200	225	250	260	265	250	225	190	E							
U. Q.																								
L. Q.																								
Q. R.																								

foE

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

The Radio Research Laboratories, Japan

W 3

IONOSPHERIC DATA

Dec. 1965 | 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	E013S	E011S	E012S	E012S	E	E016S	E013S	E016S	G	026	G	G	030	G	G	017G	E016S	E012S	E017S	J033	J023	E016S	E017S	E017S
2	E018S	E012S	E	E	E012S	E015S	E015S	E016S	024	G	028	030	030	G	G	G	E015S	J026	J040	021	E016S	E014S	E020S	E015S
3	E012S	E014S	E014S	E	E	E015S	E014S	E015S	G	G	030	032	031	030	G	033	046M	E015S	025	E016S	E015S	E015S	E015S	E016S
4	E015S	J033	J023	E	E	E	E015S	021	030	037	040	053	043	032M	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	G	G	G	E016S	027	E015S	E015S	021	E020S	E020S	E012S
6	E015S	E	E	E	E013S	E012S	E014S	E015S	G	G	G	G	031	033	G	J035	030	022	E015S	S	S	E013S	023	E014S
7	E012S	E013S	E012S	E	E011S	E012S	E013S	E015S	023	G	G	036M	032	032	G	G	E014S	E016S	C	E015S	019	C	E015S	E013S
8	E019S	E	E	E	E	E013S	E014S	E014S	028	030	031	033	037	036	G	G	E013S	018	S	020	025	025	E015S	E012S
9	E015S	E	E	E	E	E015S	E015S	022	G	033	031	G	G	E030B	E030S	023	032	030	042M	E020S	E012S	E013S	E018S	E015S
10	E018S	E013S	E011S	E	E	E020S	J040	J033	G	G	G	G	G	G	028	040	J023	J025	E015S	J030	E016S	E020S	E018S	E015S
11	E012S	E012S	E	E	E	E013S	J036	020	G	G	G	G	032	G	E028S	G	018	J029	E016S	E015S	E012S	E012S	E015S	S
12	E013S	E	E	E	016	E	024	C	C	C	C	C	C	G	030	022	E015S	E016S	S	E017S	E015S	E015S	E018S	E015S
13	E012S	E	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	G	G	025	025	J031	J061	J025	E016S	E017S	C	E020S
17	021	E	020	J043	J023	E017S	E015S	E013S	J050	J035	G	G	C	030	G	023	C	C	016	040M	J043	E013S	E014S	E016S
18	E015S	E	E	E	013	E	E012S	E016S	G	026	031	031	030	G	026	024	C	C	C	J030	024	E017S	022	E015S
19	E014S	E	E	E	E	E012S	E017S	E015S	G	J043	J043	J055	J042	026	020	022	J030	020	022	E013S	E012S	E012S	E	J021
20	J022	J021	E	E	E	E011S	E015S	E018S	030	038	032	G	030	028	025	032	J022	030	J090	J033	J029	J024	E016S	E015S
21	E014S	E	013	E	E	E	021	023	G	G	G	G	030	G	G	023	025	J023	E017	E014	E015	E	E015S	E015S
22	E012S	E	E	E	E	J034	E	E015S	G	G	G	G	030	G	028	024	J043	J073	J033	E015S	023	023	E018S	E015S
23	021	018	J022	013	018	022	022	E015S	G	G	G	G	G	G	032	024	016	J085	J023	J022	024	E017S	E015S	E017S
24	E015S	E	E	E	E	J023	E	E	G	G	G	032	032	030	030	033	J083	J033	J020	J023	J023	020	E018S	E018S
25	C	E	E	E	013	J033	J021	J023	G	G	G	G	G	032	028	025	028	J023	J033	E020S	E012S	E	E017S	E020S
26	E	E	E	E	017	E	J023	J023	024	G	G	G	032	G	G	025	015	J025	020	J025	J033	E	E018S	J023
27	025	J025	024	020	J043	J033	J053	E015S	021	E047B	031	G	G	030	E025S	028	E018S	E016S	E018S	J053	J033	J032	J020	E014S
28	E018S	020	E	E	E	E	E016S	E015S	E020S	G	G	G	G	E026B	G	G	E016S	J031	J043	E019S	021	J023	E018S	E018S
29	E018S	034M	E	016	J020	017	J020	020	023	G	026	G	024G	023G	026	E020S	E016S	E018S	E020S	J033	J045	J023	E018S	E018S
30	E017S	015	E	E	013	E	J038	J026	G	027	G	023G	029	G	030	E020S	E015S	E016S	E018S	J030	J030	E016S	E018S	E015S
31	E018S	018	E	013	017	017	E017S	E015S	G	G	G	G	G	G	G	E020S	E019S	E016S	E019S	E018S	E018S	S	E016S	J033
No.	26	27	26	26	26	26	26	25	25	25	25	25	24	28	27	27	25	25	23	26	26	25	26	26
Median	E015S	E011	E	E	E	E014	E016S	E016S	G	G	G	G	030	G	G	023	018	023	020	020	021	E016S	E018S	E015S
U. Q.	E018	018	E012	E	016	017	022	022	024	032	031	032	032	030	028	025	029	030	033	030	025	022	E018	E018
L. Q.	E013	E	E	E	E	E	E014	E015	G	G	G	G	G	G	G	G	E016	E016	E017	E016	E015	E013	E015	E015
Q. R.							D008	D007									D013	D014	D016	D014	D010	D009		

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

foEs

The Radio Research Laboratories, Japan

W 4

IONOSPHERIC DATA

Dec. 1965 | f_bEs | 0.1 Mc | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	S	S		S	S	S		026			030			017	S	S	S	020	022	S	S	S
2	S	S			S	S	S	S	G		G	G	G				S	020	A	020	S	S	S	S
3	S	S	S			S	S	S			030	G	020G	G		030	A	S	024	S	S	S	S	S
4	S	E012S	012				S	020	029	037	040	E053S	040	028	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C				S	025	S	S	020	S	S	S
6	S				S	S	S	S					G	G		G	017	016	S	S	S	S	A	S
7	S	S	S		S	S	S	S	022			030	G	G			S	S	C	C	020	C	S	S
8	S					S	S	S	G	G	G	G	G	035			S	017	S	016	023	E025S	S	S
9	S					S	S	014		027	G			B		G	030	015	A	S	S	S	S	S
10	S	S	S			S	012	020							G	027	016	020	S	020	S	S	S	S
11	S	S				S	A	016					G		S		G	026	S	S	S	S	S	S
12	S				012		S	C	C	C	C	C	C		G	G	S	S	S	S	S	S	S	S
13	S		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C			G	022	019	018	018	S	S	C	S
17	E016S		015	016	011	S	S	S	G	026			C	G		G	C	C	016	A	018	S	S	S
18	S				E		S	S		G	G	G	G		G	G	C	C	C	018	E015S	S	020	S
19	S					S	S	S		040	040	048	038	G	020	021	020	018	E016S	S	S	S		016
20	020	017				S	S	S	025	026	G		G	G	024	030	017	018	018	018	018	017	S	S
21	S		E				E017S	E015S					G			G	023	020	S	S	S		S	S
22	S					016		S					G		019	G	030	A	021	S	E016S	018	S	S
23	017	013	E	E	012	E	E014S	S							G	G	016	A	017	016	E016S	S	S	S
24	S					016						G	G	G	G	G	040	018	018	019	019	018	S	S
25	C				E	A	018	019						G	G	G	024	019	022	S	S		S	S
26					011		017	019	021				G			023	015	020	018	020	025		S	020
27	E025R	020	018	E	012	018	A	S	018	B	026			027	S	020	S	S	S	020	024	018	020	S
28	S	016					S	S	S					B			S	025	A	S	021	020	S	S
29	S	A		013	018	016	018	020	018		G		023G	022G	025	S	S	S	S	020	024	020	S	S
30	S	015			E		A	020		024		G	029		024	S	S	S	S	018	020	S	S	S
31	S	011		E	012	017	S	S								S	S	S	S	S	S	S	S	024
No.																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

f_bEs

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

The Radio Research Laboratories, Japan

W 5

IONOSPHERIC DATA

Dec. 1965 | 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	E013S	E011S	E012S	E012S	E	E016S	E013S	E016S	015	017	017	017	012	012	017	012	E016S	E012S	E017S	E019S	E012S	E016S	E017S	E017S
2	E018S	E012S	E	E	E012S	E015S	E015S	E016S	012	017	016	012	017	017	015	012	E015S	E012S	E020S	E015S	E016S	E014S	E020S	E015S
3	E012S	E014S	E014S	E	E	E015S	E014S	E015S	012	011	016	012	011	017	012	015	E012S	E015S	E016S	E016S	E015S	E015S	E015S	E016S
4	E015S	E012S	E	E	E	E	E015S	E012S	012	017	018	018	018	012	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	013	015	012	E016S	E012S	E015S	E015S	E012S	E020S	E020S	E012S
6	E015S	E	E	E	E013S	E012S	E014S	E015S	016	012	018	016	018	017	017	E017S	E015S	E015S	E015S	S	S	E013S	E021S	E014S
7	E012S	E013S	E012S	E	E011S	E012S	E013S	E015S	011	012	012	012	016	017	015	015	E014S	E016S	C	E015S	E012S	C	E015S	E013S
8	E019S	E	E	E	E	E013S	E014S	E014S	012	016	016	017	018	020	016	012	E013S	E012S	S	E013S	E016S	E016S	E015S	E012S
9	E015S	E	E	E	E	E015S	E015S	E	016	E018S	017	017	020	030	E030S	017	E012S	E012S	E011S	E020S	E012S	E013S	E018S	E015S
10	E018S	E013S	E011S	E	E	E020S	E011S	E012S	011	016	017	020	021	017	018	013	E012S	E015S	E015S	E011S	E016S	E020S	E018S	E015S
11	E012S	E012S	E	E	E	E013S	E015S	E011S	015	016	016	017	020	015	E028S	011	E	E014S	E016S	E015S	E012S	E012S	E015S	S
12	E013S	E	E	E	E	E	E015S	C	C	C	C	C	C	018	E018S	012	E015S	E016S	S	E017S	E015S	E015S	E018S	E015S
13	E012S	E	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	013	012	011	E018S	E015S	E017S	E015S	E016S	E017S	C	E020S
17	E016S	E	E	E	E	E017S	E015S	E013S	012	011	017	019	C	017	012	010	C	C	E	E019S	E016S	E013S	E014S	E016S
18	E015S	E	E	E	E	E	E012S	E016S	015	011	010	011	011	011	011	E	C	C	C	E011S	E015S	E017S	E017S	E015S
19	E014S	E	E	E	E	E012S	E017S	E015S	012	012	018	019	018	020	013	011	011	E	E016S	E013S	E012S	E012S	E	E012S
20	E	E	E	E	E	E011S	E015S	E018S	012	012	018	018	018	018	018	016	E	E	E	E	E011S	E	E016S	E015S
21	E014S	E	E	E	E	E	E017S	E015S	012	012	018	012	019	019	017	012	E015S	E	E017S	E014S	E015S	E	E015S	E015S
22	E012S	E	E	E	E	E015S	E	E015S	015	017	019	012	018	013	011	012	E	E	E	E015S	E016S	E016S	E018S	E015S
23	E	E	E	E	E	E	E014S	E015S	E015S	018	011	011	011	011	012	012	E	E015S	E	E014S	E016S	E017S	E015S	E017S
24	E015S	E	E	E	E	E	E	E	E014S	012	015	011	012	020	023	012	E	E	E	E	E	E011S	E018S	E018S
25	C	E	E	E	E	E	E011S	E	011	011	012	018	018	012	018	012	E	E011S	E011S	E020S	E012S	E	E017S	E020S
26	E	E	E	E	E	E	E	E015S	E	011	012	017	018	018	011	E	E	E	E	E	E	E	E018S	E
27	E	E	E	E	E	E	E	E015S	E	047	017	020	020	012	E025S	011	E018S	E016S	E018S	E018S	E012S	E018S	E	E014S
28	E018S	E	E	E	E	E	E016S	E015S	E020S	011	018	018	020	026	020	015	E016S	E	E	E019S	E	E011S	E018S	E018S
29	E018S	E	E	E	E	E	E011S	E	017	020	018	020	020	020	020	E020S	E016S	E018S	E020S	E018S	E012S	E018S	E018S	E018S
30	E017S	E	E	E	E	E	E015S	E011S	011	018	020	020	020	020	017	E020S	E015S	E016S	E018S	E011S	E011S	E016S	E018S	E015S
31	E018S	E	E	E	E	E	E017S	E015S	012	020	020	020	018	020	018	E020S	E019S	E016S	E019S	E018S	E018S	S	E016S	E011S
No.	26	27	26	26	26	26	26	25	25	25	25	25	24	28	27	27	25	25	23	26	26	25	26	26
Median	E014S	E	E	E	E	E	E014S	E015S	012	U014	017	017	018	017	016	012	E014S	E012S	E015S	E015S	E012S	E015S	E017S	E015S
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

f-min

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

W 6

IONOSPHERIC DATA

Dec. 1965 | 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	SF	SF	340F	325	350	300	335	340	I325S	I335S	I350S	I360R	I360S	355	345	365	365	355	300	320	305	310	335	300
2	305	290	310S	SF	375F	300F	255	345	I330S	I345S	U350S	365	375	375	I355R	360	355	355S	A	295S	310	310	I325S	315
3	340	335	315S	SF	SF	325F	S	S	345H	U365S	U385R	R	R	R	R	355S	I360A	315	345	335	335	310	325	310
4	U325S	SF	SF	SF	SF	SF	345	I350S	340	S	S	S	S	375	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	R	I370R	I370R	380	335	350	355	320	300	295	290
6	305	305	305	305	335	335	345	340S	375S	365	360	365	355	355	365	360	360	355	370	I335S	I335S	335	I315A	310
7	325S	310	300	300	315	325	325	370	360S	345	350H	355S	360	I335R	350	350	340	345	I340C	315	330	I325C	320	300
8	300	290	300	300	320	340	370	390	U355S	355	355	I340R	360	I340S	375	385	365	320	I335S	325	355	I310S	300	300
9	300	305	295	320	295F	305	340	375S	365	I360S	I370R	I360R	375	U330R	350	375	335	S	A	320	340	300	290	315
10	U295S	310	305	315	300	330	325	U355S	370	375	345	I350R	370	370	375	I355S	340	335	325	330	325	295	290	SF
11	SF	SF	SF	305	290	I310S	I320A	345	I365S	375	350	I330R	360	I335R	I355S	U360S	340	I355S	355	335	300	310	310	I325S
12	315	SF	SF	280F	305F	SF	I320S	C	C	C	C	C	C	R	355	340	345	335	I310S	325	335	305	325	315
13	315	275	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	375	350	370	370	355	330	SF	320	305	C	SF
17	SF	SF	SF	SF	SF	SF	345	360	360	370	350	360	I365C	375	385	390	C	C	370	I330A	350	340	320	SF
18	SF	F	F	F	320F	330	355	340	375	365	355	375	350	355	355	375	C	C	I320C	335	345	290	325	SF
19	SF	300F	300F	285	F	325F	305F	340	370	370	365	355	380	350	360	360	335	335	295	325	335	335	325	320
20	SF	SF	305	SF	SF	350F	F	335	I355S	355	385	365	350	375	375	350	365	340	320	335	335	330	305F	315F
21	320	290	300	320	SF	SF	350	345	355	370	365	365	355	360	340	380	370	355	350	320	320	325F	F	F
22	F	305F	305F	330F	320F	350F	F	F	370	350F	360F	355	355	370	365	375	355	A	F	F	F	F	F	F
23	F	F	F	F	325F	SF	330F	365	390	355	355	355	375	365	360	360	370	I335A	315	370	385	F	F	F
24	F	F	F	305F	F	F	335F	365S	400	370	375	345H	355	350	I370R	340	375	345	320	370	335	345	F	F
25	C	F	315F	325F	330F	I330A	330F	325	365	360	320	360	375	365	365	365	360	F	F	325F	F	F	F	335F
26	F	F	F	290F	335F	355	335	345	330	350	355	375	360	360	350H	365	355	335F	325	335	290	290	295	340
27	R	305	305	300	310	315	I320A	330	355	I355S	380	370	380	370	375	350	360	355	345	325	335	305	F	305F
28	330F	310F	305F	310F	305F	315	315	325	345	375	355	375	355	350	355	375	365	360	I345A	315	310	295	300	310
29	315	I320A	300F	300F	305F	320	335	340	360	365	385	380	335V	355	355	370	355	335	355	310	305	300	F	F
30	290F	295F	310F	295F	320F	320	I355A	355	345	350	370	355	355	360	370	375	380	330	325	F	F	F	F	290F
31	295F	320F	295F	285F	305F	305	335	365	370	370	375	365	360	360	360H	380	375	330	325	325	360	S	305	305S
No.	15	16	18	19	19	20	23	23	25	24	24	23	23	25	26	27	25	22	23	24	24	22	18	18
Median	315	305	305	305	320F	325	335	345	360	360	360	360	360	360	360	365	360	340	330	325	335	310	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

17

IONOSPHERIC DATA

Dec. 1965 | 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											L	U400L	395	395										
2										400	U395L													
3											U405L	390	405											
4											A	A	A											
5										C	C	C	C											
6												395L	U410L											
7																								
8																								
9																								
10																								
11												385		U395L										
12										C	C	C	C	405										
13										C	C	C	C	C										
14										C	C	C	C	C										
15										C	C	C	C	C										
16										C	C	C	C	415										
17													C	390										
18												410												
19										A	A	A	A	385										
20													415	U360L										
21											410	U395L	430											
22																								
23																								
24																								
25											390	415	395											
26										U370L	390	415L												
27											395L	390												
28											400			395										
29											U400L													
30													385											
31																								
No.										2	8	9	7	8										
Median										U385	400	395	405	395										
U. Q.																								
L. Q.																								
Q. R.																								

M(3000) F1

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

The Radio Research Laboratories, Japan

W 8

IONOSPHERIC DATA

Dec. 1965 | h'F2 km | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N, Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											225	235	225	230										
2										260	230													
3											225	250	220											
4											250	I2458	225											
5										C	C	C	C											
6												250	245											
7																								
8																								
9																								
10																								
11												250		245										
12										C	C	C	C	240										
13										C	C	C	C	C										
14										C	C	C	C	C										
15										C	C	C	C	C										
16										C	C	C	C	240										
17													C	245										
18												225												
19										240	240	260	245	250										
20													250	240										
21											225	245	245											
22																								
23																								
24																								
25											295	225	235											
26										245	240	230												
27											225	230												
28											225			245										
29											230													
30													255											
31																								
No.										3	11	11	9	8										
Median										245	230	245	245	240										
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

W 9

19

IONOSPHERIC DATA

Dec. 1965 | 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	310	300	300	250	235	E330S	240	240	225	230	230	230	225	200	225	225	215	205	280	270	315	260	270	290
2	295	300	270	260	210	335	E460S	240	245	210	240	220	240	225	240	220	220	220	A	300	265	265	285	265
3	250	250	250	260	250	275	235	220	200H	225	225	235	225	235	235	230	I210A	265	255	250	235	250	275	275
4	275	255	235	250	235	250	250	225	225	220	A	A	A	225H	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	240	230	215	210	250	230	220	255	300	315	280
6	290	270	270	275	260	230	230	220	205	225	245	245	240	240	235	215	215	215	255	I245S	I250S	260	I300A	300
7	270	300	290	260	260	245	225	215	210	225	195H	240	225	250	250	220	200	225	I240C	275	270	I265C	270	300
8	300	270	280	280	260	250	215	210	220	235	250	250	245	255	240	220	200	250	I255S	280	245	A	280	275
9	270	260	280	255	280	250	235	220	210	240	240	225	230	240	245	220	245A	220	A	260	220	255	300	255
10	310	280	270	255	265	260	250	215	215	225	225	240	240	240	235	225	210	250	250	260	250	325	300	280
11	260	260	275	285	275	230	I235A	215	210	215	230	230	245	245	230	225	225	235	220	215	250	275	260	I260S
12	250	250	265	275	270	225	I230S	C	C	C	C	C	C	220	225	210	220	230	I250S	260	230	250	250	260
13	250	300	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	225	225	220	210	230	250	235	250	295	I295C	300
17	295	270	275	265	225	265	205	210	210	210	210	240	I230C	230	230	210	C	C	215	I250A	245	240	270	275
18	300	250	230	275	250	230	220	235	220	230	235	215	210H	220	240	210	C	C	I255C	250	220	E240S	280	295
19	275	260	270	280	275	220	335	225	225	A	A	A	A	220	235	215	210	240	260	250	250	225	235	270
20	300	290	275	250	250	225	240	240	215	225	225	240	225	240	225	215	215	245	285	265	250	270	295	265
21	250	275	275	280	260	230	240	235	210	225	225	240	220	240	235	220	220	245	245	260	245	260	280	275
22	305	280	280	280	260	220	215	210	210	230	245	245	245	230	230	220	240	I260A	260	230	210	250	255	250
23	285	290	270	265	240	210	250	210	210	225	245	240	235	235	235	230	205	A	260	230	215	250	275	250
24	260	275	275	280	250	260	205	200	210	195H	225	245	235	245	230	235	I225A	230	250	220	245	245	260	250
25	I270C	250	270	250	260	I250A	250	240	220	230	230	225	210	225	215	220	215	240	270	250	225	255	240	245
26	250	250	250	250	250	205	E300A	230	250	240	235	215	245	235	225	225	210	260	250	260	350	285	300	260
27	A	A	315	300	310	300	I285A	250	235	I225B	215	225	220	230	220	225	215	220	240	280	295	280	320	300
28	260	250	250	275	260	260	300	250	220	220	240	210H	220	210	240	220	220	245	I250A	245	300	305	290	285
29	295	I310A	275	290	300	265	295	225	225	230	220	225	205H	230	235	220	210	245	240	250	300	270	245	280
30	300	295	265	290	250	230	I240A	225	220	225	240	245	240	235	225	215	200	250	250	260	240	260	300	285
31	275	260	260	260	265	280	250	210	210	205H	220	240	220	200H	230	220	210	230	290	250	225	S	300	320
No.	26	26	26	26	26	26	26	25	25	24	23	23	23	28	27	27	25	24	25	27	27	25	27	27
Median	275	270	270	270	260	250	240	225	215	225	230	240	230	230	230	220	215	240	250	250	250	260	280	275
U. Q.																								
L. Q.																								
Q. R.																								

h'F

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

The Radio Research Laboratories, Japan

W 10

IONOSPHERIC DATA

Dec. 1965 | 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	S	S	S	S	E	S	S	S	G	105	G	G	105	G	G	105	S	S	S	110	110	S	S	S
2	S	S	E	E	S	S	S	S	150	G	145	135	140	G	G	G	S	110	110	110	S	S	S	S
3	S	S	S	E	E	S	S	S	G	G	110	155	150	145	G	125	115	S	110	S	S	S	S	S
4	S	140	125	E	E	E	S	150	145	140	130	120	120	120	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	G	G	G	S	110	S	S	110	S	S	S
6	S	E	E	E	S	S	S	S	G	G	G	G	140	125	G	115	110	110	S	S	S	S	105	S
7	S	S	S	E	S	S	S	S	105	G	G	105	150	170	G	G	S	S	C	C	105	C	S	S
8	S	E	E	E	E	S	S	S	170	175	150	150	135	130	G	G	S	160	S	145	135	130	S	S
9	S	E	E	E	E	S	S	110	G	105	150	G	G	B	S	155	145	110	110	S	S	S	S	S
10	S	S	S	E	E	S	110	105	G	G	G	G	G	G	145	115	110	110	S	110	S	S	S	S
11	S	S	E	E	E	S	110	110	G	G	G	G	125	G	S	G	120	110	S	S	S	S	S	S
12	S	E	E	E	110	E	115	C	C	C	C	C	C	G	140	125	S	S	S	S	S	S	S	S
13	S	E	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	G	G	120	110	110	110	110	S	S	C	S
17	100	E	110	110	110	S	S	S	110	105	G	G	C	120	G	115	C	C	105	105	105	S	S	S
18	S	E	E	E	110	E	S	S	G	120	120	120	125	G	140	130	C	C	C	105	110	S	110	S
19	S	E	E	E	E	S	S	S	G	115	115	115	110	120	105	105	105	100	105	S	S	S	E	110
20	105	105	E	E	E	S	S	S	105	105	150	G	170	150	100	100	100	110	120	105	105	105	S	S
21	S	E	100	E	E	E	110	110	G	G	G	G	120	G	G	165	145	105	S	S	S	E	S	S
22	S	E	E	E	E	110	E	S	G	G	G	G	165	G	145	145	105	105	110	S	110	105	S	S
23	105	105	105	105	110	110	110	S	G	G	G	G	G	G	145	150	105	105	105	105	100	S	S	S
24	S	E	E	E	E	110	E	E	G	G	G	160	160	150	140	120	110	110	110	110	105	105	S	S
25	C	E	E	E	120	110	110	110	G	G	G	G	G	150	140	125	110	100	110	S	S	E	S	S
26	E	E	E	E	115	E	110	110	105	G	G	G	170	G	G	105	105	110	110	110	110	E	S	105
27	100	105	105	110	110	110	110	S	105	B	105	G	G	100	S	120	S	S	S	110	110	110	110	S
28	S	100	E	E	E	E	S	S	S	G	G	G	G	B	G	G	S	110	110	S	110	110	S	S
29	S	100	E	115	110	115	110	115	110	G	105	G	105	100	100	S	S	S	S	110	110	110	S	S
30	S	100	E	E	115	E	110	110	G	105	G	100	100	G	100	S	S	S	S	110	110	S	S	S
31	S	105	E	105	105	110	S	S	G	G	G	G	G	G	G	S	S	S	S	S	S	S	S	105
No.	4	8	5	5	10	7	10	9	9	9	10	9	17	12	11	18	14	17	13	14	15	7	3	3
Median	100	105	105	110	110	110	110	110	110	105	125	120	135	130	140	120	110	110	110	110	110	110	110	105
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

Dec. 1965 | 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										1			1			1				f	f			
2									h		h	h	h					f	f	f				
3											1	h	h1	h		c2	c2		f					
4		f	f					h	h	h	c	c2	c	1										
5																		f			f			
6													h	c		c	c	f					f	
7									1			1	h	h							f			
8									h	h	h	h	h	h				f		f	f	f		
9								1		1	h					h	h	f	f					
10							f	1							h	c2	f	f		f				
11							f	1					c				c	f2						
12					f		f								h	c								
13																								
14																								
15																								
16																c	c	f	f	f				
17	f		f2	f2	f				1	1				c		c			f	f	f			
18					f					c	c	c	c		h	c				f2	f		f	
19										c2	c2	c4	c2	c	1	1	1	f	f					f
20	f	f							1	1	h		h	h	1	1	1	ff	ff	f	f2	f		
21			f				f	f					c			h	h	f2						
22						f							h		hl	h	1	f3	f2		f	f		
23	f	f	f	f	f	f	f								h	h	1	f2	f	f	f			
24						f2						h	h	h	h	c	f3	f2	f	f	f	f		
25					f	f	f	1						h	h	c	1	f	f2					
26					f2		f2	1	1				h			1	1	f2	f	f	f2			f
27	f	f2	f	f	f	f	f2		1		1			1		c1				f	f	f	f	
28		f																f3	f2		f	f		
29		f2		f	f2	f	f	c2	1		1		1	1	1					f	f2	f		
30		f			f		f2	1		1		1	1		1					f	f			
31		f		f	f	f																		f2
No.																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

Types of Es

W 12

IONOSPHERIC DATA

Dec. 1965 | 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	F	F	030F	033S	019	018	022	041	I064R	061	070	067H	062	062H	058	061	053	031	026	027	029	031	028F	031
2	031	I032R	032	034S	023H	022	020	047R	053	069	082	062	056	062	060	053	047	040S	037	030	035S	FS	FS	FS
3	FS	034F	FS	035S	033F	031F	032F	I052R	060	062	068	077	066	069	053	058	046	I034A	032	043	037	024	029	033
4	036	036	035	036	029	029	025	047	051	056	064	060	068	057	057	064	I048R	035	032	028	027	025	025	027
5	030	030	029	028	029	030	026	039	049	055	066	068	057	064	065	056V	047	032	036	032	028	027	029	029F
6	029	032	029	029	031	028	025	044	060	051	066	061	057	056H	060H	050	043	032	031S	I029R	023	022	024	026
7	027	028	028	028	029	026	026	045	049	053	054H	060H	054R	055H	063	056	049	031H	031	031	I029R	028	026	028F
8	029F	029	030	029	028	028	025	042	050S	051	054	059	055	058H	066	056	044	026	029	029	032	027	026	N
9	030	031	033	032S	030F	030	035S	042	047	051	062	058	056	054	057	053	041	039	035	032F	FS	026	031	030F
10	030	031	030	031	028	026	030	044	I052R	052	057	062H	063	069	054	045	I045R	I036R	I034A	032S	I028R	022F	FS	FS
11	F	FS	FS	FS	FS	FS	033S	042	059	062	062	065	064H	064	070S	060	046H	046	032S	I028A	029	024	031	034
12	033	034	035	035	034	037F	031S	039	051	062	064H	072	070	064	058	051	049	038	035	035	033S	FS	031S	032
13	036S	032S	F	F	F	025F	023S	036	046	065	067	066	063	060	061	051H	046H	032	034	032	039	FS	026	029S
14	028F	029	029	030S	029	025	025	041	057	057	066	060	055	054	057	056	046	027H	029	029	FS	F	F	F
15	027	028	028	026	025	024	024	043	052	059H	066	065	060	057H	057	049	048	034	028	030	032	024	028	028
16	028	029F	028	027	026F	024F	020	037	048S	051	058	064	056	061	I058C	I057C	049	028	I028A	035S	024	F	FS	F
17	F	FS	F	FS	025F	024	026	040	048	048	051H	057	I063R	054	057	056	042	I036A	033	I031A	038	A	A	027
18	023	025	027	025	I024R	024	020	036	047	050	053H	I060R	054	055	051	051	044	I030A	029	029	032	022	026S	028
19	029S	027F	030	030	027F	030	022S	039	057H	066	066	063	074S	068H	056	058H	049Z	029	032	030	034	027S	030F	030
20	029	030	032F	031F	036S	032	FS	042R	055	051H	062	061	057	060	058	060	046	031	027	031	032	023	027	028
21	029	031	031	031	028	027	028V	044	055	050H	060	066	059	057H	060H	060	041	030	030	029	I026A	022F	I024R	027S
22	027	027	027	026	026	025	020	036	043	050	054	057H	I058R	061	059H	051	039	I030A	036S	036	025	023	026	026
23	027	026	FS	FS	FS	031F	026F	043	046S	051	059	061	057	056H	055	056	040	029H	I032A	036	024	I026C	028	028F
24	026S	FS	028S	027S	026F	FS	036Z	044	045	045	057	054	051	055H	054H	050	040H	I034A	I028A	I027A	F	024F	F	FS
25	032Z	FS	FS	FS	025	025	025F	038	047	054H	I056R	074	062Z	055	051	049	042	036S	I036R	035S	033F	030	I033R	F
26	F	F	FS	F	FS	029F	022	036	050	074	088	086	060	052	050	047	043	038	028	029	030	030S	F	F
27	025F	026F	024S	024	027	I026A	028S	038S	070S	086	088R	071	057	055	052	048	052	037	028	030	032	031F	032F	033F
28	F	028F	023	023F	026F	025F	022	041	064	062	069	062H	058H	057	060H	052	046	041	036	036	026H	I027A	029	029F
29	F	030	024F	028F	027	027	025	057	050H	069	069	065	059H	057	060H	058	040	037	036	029	033H	037F	036F	033F
30	F	032F	030	026	028	029S	025F	037S	045	052H	072	076	076	076	056	054	041	028	034	034	I030A	024	I027A	029
31	029	026	I027R	028	026S	F	025	041S	050	056	060	060	063H	055	052	052	045	032	029	033	029	020	022	026F
No.	23	25	24	25	27	28	30	31	31	31	31	31	31	31	31	31	31	31	31	31	28	25	24	23
Median	029	030	029	029	027	026	025	041	050	055	064	062	059	057	057	054	046	032	032	031	030	025	028	029
U. Q.	030	032	030	032	029	030	028	044	057	062	068	067	063	062	060	058	048	037	035	034	033	028	030	031
L. Q.	027	028	028	026	026	025	022	038	047	051	057	060	056	055	054	051	042	030	029	029	028	023	026	027
Q. R.	003	004	002	006	003	005	006	006	010	011	011	007	007	007	006	007	006	007	006	005	005	005	004	004

The Radio Research Laboratories, Japan

foF2

Sweep 1.6 Mc to 16.0 Mc in 20 sec in automatic operation

A 1

IONOSPHERIC DATA

Dec. 1965 | 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										300	LH	380L	L	L	A	A								
2										L	A	L	L	360L	L									
3									LH	330	370	L	L	L	A									
4										A	L	L	L	L	L	240								
5									260H	310	L	L	L	L	LH	L								
6									260	300H	L	L	L	L	A	270								
7									L	290	I380A	380L	L	L	350L	L	L							
8										A	L	L	I380A	370	L	L								
9									280	I320A	L	390L	360	LH	L	270								
10										350L	LH	390L	LH	L	A	A								
11											L	L	L	L	L									
12									260	300	L	380L	L	L	310	L								
13										L	L	400L	L	L	L									
14										L	380L	L	380L	LH										
15									250L	I310A	L	400	400L	L	L									
16										320	320	LH	L	400H	I310C	I280C								
17									270	LH	L	L	L	370	L	L								
18										320L	L	380	370L	350L										
19										L	A	A	A	L		L								
20										280	L	L	380L	L	A									
21										LH	LH	L	350	360	A									
22									250	280	L	380L	360	L	L									
23									280L	320	LH	L	330	LH	L									
24									L	330H	LH	LH	LH	L	L									
25									LH	L	L	380	360H	L										
26									230	LH	380L	380L	LH	A	A									
27									A	370L	400	390L	370L	320L	L	L								
28									L	300L	L	390L	LH	LH	330	LH								
29									290		L	L	L	L	L	LH								
30										280	320	L	400L	370	L									
31									250	330L	L	L	L	L	280									
No.									11	19	7	13	12	8	5	4								
Median									260	310	380	380L	370L	360	310	270								
U. Q.																								
L. Q.																								
Q. R.																								

foF1

Sweep 1.6 Mc to 16.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 2

IONOSPHERIC DATA

Dec. 1965 | 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	210	A	A	A	A	I270A	I250A	I210A	E							
2								E	220	250	270	I275A	I270A	I260A	240	I210A	E							
3								E	210	I250A	270	280	I285A	I270A	240	A	E							
4								A	215	250	270	280	A	A	A	A	E							
5								A	205H	240	260	I275A	I280A	265	240	A	E							
6								E	I210A	245	265	275	280	275	250	A	E							
7								E	205	250	275	285	I280A	I270A	260	225H	E							
8								E	210	245	270	280	275	265	I250A	A	E							
9								E	205	250	275	285	280	265	250	200	E							
10								E	I205A	250	270	285	280	270	245	A	B							
11								E	I220A	250	270	I275A	280	275	245	205	E							
12								E	A	240	265	270	275	255	230	A	E							
13								E	210	240	260	I275A	285	I265A	245	I210A	B							
14								E	I200A	250	I265A	275	275	I260A	235	190	E							
15								E	195	250	270	285	275	265	245	I200A	E							
16								E	A	A	A	A	A	A	C	C	E							
17								E	200	250	265	275	280	A	A	A	E							
18								E	A	A	I260A	275	275	I265A	245	215	E							
19								E	205	250A	270	I280A	A	A	A	205	B							
20								E	200	240	260	I270A	A	A	240	A	E							
21								E	A	240	265	I275A	280	I265A	I230A	195	E							
22								E	190	235	260	275	280	270	235	200	E							
23								E	A	235	260	275	280H	265R	240	220	E							
24								E	A	235	260	270	275	275	250	215	E							
25								E	200	240	265	275	270	260	240	S	E							
26								E	185	250	270	280	280	265	240	A	E							
27								E	A	A	260	270	280	270	240	210	E							
28								E	185	235	I260A	I270A	280	I270A	240	205	E							
29								E	A	A	270	280	280	275	255	I215A	E							
30								E	A	A	I280R	I290A	295	280	260	225	E							
31								E	205	260	280	295	290	275	250	I215A	B							
No.								28	22	25	29	29	26	26	27	19	27							
Median								E	205	250	265	275	280	270	245	210	E							
U. Q.																								
L. Q.																								
Q. R.																								

foE

Sweep 1.6 Mc to 16.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 3

IONOSPHERIC DATA

Dec. 1965 | 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	E	E	E	E	E	E	J012E	019	025	035	J034	J056	J060	J036	J036	J036	J024	J022	J025	E	J025	J025	J030	J023
2	J015E	J015E	J013E	J018	E	J013E	J013E	022	023	029	J041	037	034	032	026	J024	E	E	J026	J050	J035	J063	J024	J018
3	J013E	J019	J025	J019	E	E	E	E	024	028	032	035	036	038	033	027	J020	J078	J035	E	J016E	J021	E	E
4	E	E	E	E	E	E	J015E	J024	029	034	039	038	036	032	J030	021	J047	J021	J019	J012E	E	E	E	E
5	E	J018	J016E	J020	J018	J022	J021	J028	G	J028	031	J037	034	033	027	J032	J038	J026	J019	J018	J025	J025	J026	J018
6	J016E	E	E	018M	J021	J015E	E	J016E	025	G	033	037	035	036	J037	J028	J023	J028	J033	J028	J023	E	E	E
7	E	E	J018	E	E	E	E	J016E	022	G	036	035	032	030	031	J026	E	E	J015E	E	J037	J018	E	J018
8	J012E	E	E	E	E	E	J013E	E	024	033	035	038	J043	035	J035	029	J040	J058	J028	J018	J018	J018	E	N
9	E	E	E	E	E	E	J018	E	G	033	J041	033	025G	030	031	023	025	J031	J020	J028	J035	J028	J028	J025
10	J022	J016E	J025	J017	J016E	J016E	J013E	J013E	J063	G	J031	035	G	031	J035	J046	E017B	J088	J078	J029	J025	J018	J026	J032
11	J016E	E	E	E	E	E	E	J023	J028	G	029	J033	G	G	027	022	023	J021	J030	J039	J024	J016E	J017	E
12	J020	J013E	E	E	J018	J016E	J020	J018	J028	G	G	G	G	G	025	022	J022	J020	E	J012E	E	J034	J030	J016E
13	J017	E	E	018M	E	E	J013E	E	029	034	033	034	032	J029	028	025	E017B	E	E	J013E	J025	J024	J021	J017
14	E	J013E	E	E	J013E	E	J013E	019	023	G	J042	J034	025G	J035	G	G	J017	J013E	J015E	J013E	J013E	J017	J015E	E
15	E	E	J017	J017	J020	E	018M	E	G	032	038	036	034	030	026	J022	J030	E	J040	J023	J021	J016E	J018	J025
16	J017	J018	J013E	E	E	E	E	E	J026	J031	J029	J033	028	029	C	C	J043	J025	J049	J022	J023	J015E	J018	J017
17	E	E	J017	J013E	E	J017	J015E	E	G	027	034	035	034	029	031	J027	J029	J041	J051	J064	J042	J056	J049	J015E
18	J015E	E	E	J015E	J037	J031	J027	J021	J030	J034	029	035	033	030	030	024	023	J054	J026	E	E	J015E	E	J016E
19	E	E	J013E	E	E	E	J013E	J015E	023	J036	J043	J043	J045	J037	027	023	019	J016E	E	J018	E	J017	J013E	J020
20	J015E	J017	E	E	E	E	E	E	G	G	031	032	031	J042	J037	033	J041	J016E	E	J013E	J014E	E	J024	J017
21	J018	J018	J017	E	E	E	J016E	E	024	026	J031	031	029	J028	033	024	J035	J035	J030	J030	J046	J021	J026	J016E
22	J013E	J026	J017	018M	E	E	J013E	J020	021	026	031	032	030	032	035	032	J020	J057	J064	J030	J023	J015E	J016E	J013E
23	J018	E	J015E	J018	J036	J020	J023	J039	J028	G	G	031	030	G	J040	J036	J018	J025	J065	J025	J015E	C	E	E
24	E	J013E	E	E	E	E	J025	J030	J060	J055	G	G	029	031	032	029	022	J065	J060	J088	J035	J020	J013E	J023
25	J024	E	E	E	E	J013E	E	E	J052	028	J038	G	028	029	027	E032S	E	J040	J057	J060	J030	J025	J017S	J028
26	J032	J028	J025	J028	J024	J019	J020	J035	J022	J022G	G	G	G	033	033	029	J028	J025	J031	J031	J047	J031	J020	E
27	E	J016E	J018	J017	J018	J040	J055	J034	J048	J060	G	024G	G	G	026	026	J040	J051	J018	E	J035	J038	J037	J028
28	J030	J028	J013E	J018	J015E	J016E	J026	J025	022	G	J033	J033	023G	029	031	G	026	051	J031	J018	J028	J038	J015E	J017
29	J023	J027	J018	E	J035	E	E	J016E	J031	J050	J036	035	035	033	G	023	021	J023	J028	J034	J017	J023	J039	J031
30	J017	J015E	E	E	E	E	J015E	J025	J061	J025	029	033	G	G	G	025	023	J028	J025	J038	J055	J035	J033	J022
31	J020	J029	J035	J035	J020	J018	J017	J021	J024	G	G	028G	J030	G	G	024	J022	E	J018	E	E	J017	J015E	E
No.	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	30	31	30
Median	E	E	E	E	E	E	E	018	024	028	032	034	030	030	030	026	023	025	028	022	024	020	018	017
U. Q.	018	018	017	018	018	E	020	024	029	034	036	036	034	033	033	029	030	051	040	031	035	028	026	023
L. Q.	E	E	E	E	E	E	E	E	022	G	029	031	G	029	026	023	019	E	018	E	E	E	E	E
Q. R.									007		007	005		004	007	006	011		022					

Sweep 1.6 Mc to 16.0 Mc in 20 sec in automatic operation

foEs

IONOSPHERIC DATA

Dec. 1965 — f_bEs — 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								018	025	028	028	029	030	028	039	025	017	E	017		E	017	020	017
2				017				021	023	029	040	035	033	031	026	023			E	017	017	017	E	E
3		E	020	E					023	028	032	035	033	032	030	025	017	A	017			E		
4								021	027	033	034	034	033	030	029	020	047	E	E					
5		E		E	E	E	017	018		G	031	035	033	031	027	026	037	026	018	E	018	E	E	E
6				E	E				017		032	035	034	035	037	022	017	E	023	020	E			
7			E						G		034	033	032	030	028	023					017	E		E
8									U024R	032	033	036	040	033	030	023	021	E	E	E	E	017		N
9							E			037	019	032	017G	029	031	022	021	020	E	E	018	E	E	E
10	E		E	E					041		G	034		030	030	028	B	E	A	017	E	E	018	018
11								019	017		028	028			027	022	022	E	018	A	E		E	
12	018				E		E	E	020						G	020	017	E				020	E	
13	017			E					027	034	032	031	031	028	027	024	B				017	017	E	E
14								018	023		028	022	023G	027			E					E		
15			E	E	E		E			032	036	033	031	029	025	022	020		017	017	017		E	E
16	E	E							022	027	028	028	028	028	C	C	038	E	A	018	E		E	E
17			E			E				027	033	032	033	028	030	025	024	A	021	A	024	A	A	
18					021	020	E	E	022	025	028	034	033	029	028	024	018	A	E					
19									023	035	040	U043R	040	035	027	022	019			E		E		E
20		E									030	031	030	030	037	025	031						E	E
21	E	E	E						023	026	022	030	029	027	033	024	027	018	018	026	A	E	017	
22		E	E	E				E	020	026	030	032	029	029	032	024	E	A	021	021	E			
23	E			E	024	E	018	033	020			030	030		027	029	018	018	A	E		C		
24							018	E	021	021			026	030	027	025	022	A	A	A	017	E		E
25	E								018	026	027		028	029	027	S		020	019	020	018	017	E	018
26	E	018	017	017	E	E	E	018	E	020G				032	032	027	024	017	023	017	E	020	E	
27			E	E	E	A	026	018	040	025		021G			026	025	018	018	E		E	E	018	E
28	017	017		E			E	018	022		028	029	022G	027	030		026	021	E	E	017	A		E
29	017	018	E		025				026	032	023	032	035	032		023	022	E	E	E	E	E	022	020
30	E							021	033	025	029	031				023	021	E	E	019	A	019	A	E
31	E	020	018	017	E	E	E	018	021			026G	028			023	018		E			E		
No.																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

f_bEs

Sweep 1.6 Mc to 16.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 5

IONOSPHERIC DATA

Dec. 1965 | 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	E	E	017	017	E	017	017	E	E	E	E	E	E	E	E	E	E	E
2	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E	E
3	E	E	E	E	E	E	E	E	017	017	017	018	017	017	E	E	E	E	E	E	E	E	E	E
4	E	E	E	E	E	E	E	E	017	017	017	E	E	017	017	E	E	E	E	E	E	E	E	E
5	E	E	E	E	E	E	E	E	E	017	E	017	017	017	017	E	E	E	E	E	E	E	E	E
6	E	E	E	E	E	E	E	E	017	017	017	017	017	E	E	017	E	E	E	E	E	E	E	E
7	E	E	E	E	E	E	E	E	E	017	017	017	017	017	E	017	E	E	E	E	E	E	E	E
8	E	E	E	E	E	E	E	E	E	E	017	017	017	017	E	E	E	E	E	E	E	E	E	N
9	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E	E
10	E	E	E	E	E	E	E	E	E	017	017	017	017	017	017	E	017	E	E	E	E	E	E	E
11	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	E	E	E	E	E	E	E	E	E
12	E	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	E	E	E	E	E	E	E	E
13	E	E	E	E	E	E	E	E	017	017	E	017	017	E	017	E	017	E	E	E	E	E	E	E
14	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E	E
15	E	E	E	E	E	E	E	E	017	017	017	017	018	017	017	017	E	E	E	E	E	E	E	E
16	E	E	E	E	E	E	E	E	017	E	017	017	017	017	C	C	E	E	E	E	E	E	E	E
17	E	E	E	E	E	E	E	E	017	017	017	018	018	017	018	E	E	E	E	E	E	E	E	E
18	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E	E
19	E	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E
20	E	E	E	E	E	E	E	E	017	017	017	017	017	017	E	017	E	E	E	E	E	E	E	E
21	E	E	E	E	E	E	E	E	017	017	017	018	017	E	017	017	E	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	E	E	017	017	018	018	017	017	017	E	E	E	E	E	E	E	E
23	E	E	E	E	E	E	E	E	E	017	017	018	E	017	E	E	E	017	E	E	E	C	E	E
24	E	E	E	E	E	E	E	E	E	017	017	017	017	017	017	E	E	E	E	E	E	E	E	E
25	E	E	E	E	E	E	E	E	E	017	017	018	018	019	017	E032S	E	E	E	E	E	E	E	E
26	E	E	E	E	E	E	E	E	E	E	017	017	017	017	017	E	E	E	E	E	E	E	E	E
27	E	E	E	E	E	E	E	E	E	E	017	017	019	017	017	017	E	E	E	E	E	E	E	E
28	E	E	E	E	E	E	E	E	017	018	017	017	018	018	017	017	E	017	E	E	E	E	E	E
29	E	E	E	E	E	E	E	E	E	017	017	020	018	018	019	017	E	E	E	E	E	E	E	E
30	E	E	E	E	E	E	E	E	E	017	018	018	022	022	018	017	E	E	E	E	E	E	E	E
31	E	E	E	E	E	E	E	E	E	018	018	017	017	017	017	E	017	E	E	E	E	E	E	E
No.	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	30	31	30
Median	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E	E
U. Q.																								
L. Q.																								
Q. R.																								

f-min

Sweep 1.6 Mc to 16.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Dec. 1965 | 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	F	F	285F	315S	400	285	320	355	I360R	340	370	340H	350	355	365	370	355	325	305	285	320	335	310F	305
2	295	I290R	300	335S	320	320	320	330	345	355	350	380	355	350	370	365	355	330S	290	305	315S	FS	FS	FS
3	FS	345F	FS	310S	310F	305F	330F	I350R	380	380	365	370	360	350	390	365	380	I340A	295	340	370	360	305	315
4	310	330	305	335	315	325	320	360	360	345	380	360	320	345	380	370	I360R	365	340	320	325	310	290	295
5	300	310	315	300	305	315	370	370	355	355	360	370	365	340	370	340V	360	315	330	345	320	315	325	305F
6	295	295	310	320	340	335	335	350	385	365	375	375	350	365	375H	360	365	325	340S	I335R	310	300	315	315
7	300	310	300	310	325	345	355	365	370	345	350H	350H	345R	335H	345	375	390	310H	315	350	I330R	335	300	315F
8	295F	315	285	305	315	335	345	355	360S	370	380	330	355	355H	365	365	370	310	345	320	315	330	285	N
9	305	315	300	305S	310F	315	355S	360	365	345	350	370	370	365	365	370	350	330	330	315F	FS	300	315	315F
10	290	300	305	310	320	310	345	360	I370R	360	375	340H	350	365	365	360	I355R	I345R	I340A	345	I330R	330F	FS	FS
11	F	FS	FS	FS	FS	FS	375S	355	340	365	365	335	335H	345	360	365	345H	350	345S	I330A	340	295	315	310
12	315	310	305	295	315	335F	365S	360	335	350	345H	350	350	360	370	375	345	335	330	335	355S	FS	305S	315
13	310S	295S	F	F	F	355F	345S	340	355	350	360	370	355	365	370	335H	335H	320	325	330	360	FS	305	285S
14	305F	300	295	315S	330	305	325	365	375	345	355	375	370	365	355	360	350	295H	340	345	FS	F	F	F
15	290	305	305	305	305	315	335	350	355	355H	365	365	375	350H	365	350	350	355	320	330	365	315	300	315
16	305	305F	295	310	330F	355F	325	365	365S	365	355	370	350	355	I360C	I365C	365	330	I335A	335S	335	F	FS	F
17	F	FS	F	FS	320F	355	355	365	375	370	335H	360	I370R	365	365	390	380	I250A	335	I335A	355	A	A	280
18	315	305	305	305	I320R	365	315	375	360	360	350H	I370R	360	370	380	365	355	I325A	350	335	345	355	295S	305
19	285S	300F	305	305	290F	300	355S	340	355H	365	365	360	360S	355H	340	360H	340Z	340	330	325	330	345S	305F	305
20	300	300	285F	315F	330S	330	FS	350R	380	355H	355	350	360	360	365	370	370	295	305	325	330	295	300	320
21	310	305	300	295	310	325	320V	355	375	345H	360	365	365	330H	320H	365	385	320	335	340	I330A	320F	I290R	310S
22	305	305	305	295	325	345	350	370	365	375	350	350H	I350R	360	355H	375	375	I320A	330S	360	330	315	310	315
23	295	285	FS	FS	FS	350F	340F	365	370S	375	360	370	365	330H	365	365	375	320H	I340A	360	370	I340C	315	310F
24	305S	FS	285S	295S	290F	FS	345Z	380	390	365	355	360	345	325H	335H	375	370H	I340A	I330A	I340A	F	305F	F	FS
25	295Z	FS	FS	FS	325	330	340F	365	355	345H	I345R	335	335Z	365	375	375	335	320S	I325R	355S	340F	315	I320R	F
26	F	F	FS	F	FS	340F	320	325	340	340	355	370	365	375	375	370	370	360	335	315	305	300S	F	F
27	330F	255F	305S	285	305	I300A	300S	315S	345	345	360R	380	355	355	365	345	355	350	330	335	310	310F	330F	295F
28	F	345F	325	310F	305F	305F	320	355	375	350	380	360H	355H	360	350H	375	350	355	335	360	345H	I290A	315	305F
29	F	300	310F	295F	300	330	320	380	360H	370	365	380	360	355	355H	375	380	345	325	330	305H	285F	325F	315F
30	F	305F	315	310	320	310S	365F	380S	360	340H	360	350	355	370	370	365	370	320	335	345	I345A	330	I300A	290
31	325	310	I320R	325	310S	F	335	360S	370	345	360	365	350H	375	360	375	365	330	325	340	365	325	265	305F
No.	23	25	24	25	27	28	30	31	31	31	31	31	31	31	31	31	31	31	31	31	28	25	24	23
Median	305	305	305	310	315	330	340	360	360	355	360	365	355	355	365	365	360	330	330	335	330	315	305	310
U. Q.																								
L. Q.																								
Q. R.																								

M(3000) F2

Sweep 1.6 Mc to 16.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Dec. 1965 | M(3000) F1 | 0.01 | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										400	LH	410L	L	L	A	A								
2										L	A	L	L	390L	L									
3									LH	395	395	L	L	L	A									
4										A	L	L	L	L	L	415								
5									395H	405	L	L	L	L	LH	L								
6									420	445H	L	L	L	L	A	420								
7									L	440	I400A	405L	L	L	405L	L	L							
8										A	L	L	I405A	410	L	L								
9									430	I440A	L	400L	415	LH	L	430								
10										410L	LH	395L	LH	L	A	A								
11											L	L	L	L	L									
12									440	405	L	390L	L	L	395	L								
13										L	L	390L	L	L	L									
14										L	395L	L	405L	LH										
15									430L	I435A	L	395	395L	L	L									
16										415	430	LH	L	385H	I410C	I420C								
17									425	LH	L	L	L	395	L	L								
18										405L	L	405	395L	405L										
19										L	A	A	A	L		L								
20										430	L	L	400L	L	A									
21										LH	LH	L	425	395	A									
22									435	440	L	380L	440	L	L									
23									420L	430	LH	L	425	LH	L									
24									L	450H	LH	LH	LH	L	L									
25									LH	L	L	380	435H	L										
26									450	LH	390L	395L	LH	A	A									
27									A	390L	385	400L	410L	420L	L	L								
28									L	420L	L	410L	LH	LH	410	LH								
29									435		L	L	L	L	L	LH								
30										430	445	L	380L	380	L									
31									405	405L	L	L	L	L	435									
No.									11	19	7	13	12	8	5	4								
Median									430	420	395	395L	410L	395	410	420								
U. Q.																								
L. Q.																								
Q. R.																								

Sweep 1.6 Mc to 16.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Dec. 1965 | 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										230	240	245	235	245	250	230								
2										245	235	230	240	250	245									
3									220	230	245	245	240	240	235									
4										240	240	245	265	240	235	230								
5									230	245	245	245	245	245	240H	220								
6									215	225	245	245	245	245	230	220								
7									205	205	245	245	240	245	245	215	205							
8										240	245	260	250	245	245	230								
9									225	245	245	240	245	250	250	240								
10										235	245	245	250	250	235	220								
11											245	250	245	245	245									
12									230	245	255	245	250	240	240	230								
13										255	245	240	245	240	245									
14										240	240	240	235	245										
15									225	240	240	245	240	240	245									
16										230	240	245	235	245	I240C	I230C								
17									210	210	245	250	240	240	240	220								
18										230	245	245	240	235										
19										245	240	265	255	240		245								
20										230	255	245	250	240	245									
21										225	255	245	250	245	250									
22									215	240	260	265	250H	250	240									
23									215	240	245	240	245	245	235									
24									205	225	240	245	245	250	235									
25									235	250	230	250	240	245										
26									240	275	240	225	240	240	240									
27									245	250	230	230	235	235	240	220								
28									230	230	230	230	245	245	245	225								
29									210		240	230	240	245	240	230								
30										220	245	245	250	240	230									
31									220	240	240	240	240	240	230									
No.									17	29	31	31	31	31	27	15	1							
Median									220	240	245	245	245	245	240	230	205							
U. Q.																								
L. Q.																								
Q. R.																								

h'F2

Sweep 1.6 Mc to 16.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Dec. 1965 | 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	285	300	300	250	200	E380E	285	235	240	220	180H	195	235	205H	I210A	I210A	220	200	280	255	255	240	I270A	280
2	290	290	295	230	E255E	255	E290E	240	235H	240	A	A	230	210	245	215	210H	245	230	255	255	250	280	280
3	240	220	295A	260	280	280	255	235	200	200	220	I240A	225	235	I235A	230	210	A	275	240	210	215	270	270
4	250	245	255	220	245	245	255	225	220	I230A	I240A	230	230A	215	230	205	I200A	205	235	245	225	270	295	300
5	270	270	280	305	280	245	195	210	170H	230	245	I240A	240	240	235	220	I215A	I245A	240	215	250	260	305	290
6	295	295	270	270	235	235	245	230	205	180H	245	245	240	235A	I225A	205	210	210	I240A	240A	E280E	E295E	290	300
7	295	280	295	280	245	240	235	210	200	195	I225A	220	235	240	230	205	210	230	250	240	240	240	280	260
8	290	270	295	295	260	240	245	220	215	I235A	240	I240A	I240A	205	245	230	215	240	225	245	245	240	300	N
9	255	270	275	280	290	255	215	200	200	A	245	235	185	235	245	190	230	240	240	240	230	295	260	260
10	305	280	295	270	255	265	230	215	220	195H	195H	210	180H	240	I230A	A	205	255	I240A	245	220	255	290A	290A
11	290	270	260	295	295	255	185H	210	230	235	240	190H	190H	185H	240	230	215	210	215	A	240	E300E	290	250
12	265	270	280	285	260	225	205	200	190H	180H	220	230	205	195H	195H	225	215	240	240	225	220	A	260	260
13	250	295	305	300	235	200	250	200	225	250	245	225	210	235	245	220	185H	240	240	245	210	250	290	295
14	300	295	305	265	245	290	245	220	230	205H	215	210	190H	195	245	230	210	225	240	215	230	250	270	290
15	295	295	290	295	290	280	245	215	210	I200A	A	220	220	210	200	220	230	205	250	245	210	255	285	270
16	270	295	290	280	270	230	250	210	200	200	185	195H	210	205H	I200C	I190C	I210A	210	I230A	240	250	275	240	260
17	280	295	295	245	245	235	210	205	195	190H	I215A	245	245	215	235A	220	205	A	255	I245A	205A	A	A	295
18	300	300	295	305	I275A	240	E300E	200	215	190H	220	200	230	200	220	220	220	I230A	235	245	215	230	285	275
19	295	295	290	270	305	240	230	240	235	240	I235A	A	A	220	225	225	225	195	250	245	230	215	240	285
20	290	295	300	270	240	240	255	235	215	195	245	240	225	240	I240A	230	220	225	240	250	215	E280E	300	270
21	260	280	295	280	265	245	265	235	205	205	190H	185H	190	200	I200A	240	200	255	245	I230A	I260A	E270E	A	285
22	290	295	295	290	255	240	240	210	195	190	230	235	190	250	245	225	200	I235A	250	240	245	250	285	275
23	295	325	310	295	250	225	240	225	200	190	180H	240	200	190H	230	235	205	245	I250A	205	200	C	260	285
24	230	320	310	295	295	280	240	200	195	185H	195H	190H	180H	235	235	230	205	I240A	I250A	I235A	230	270	270	290
25	250	295	260	250	260	255	240	205	190H	200H	205	185H	180H	240	230	230S	205H	I220A	255	245	230	260	290S	240
26	245	290	250	255	240	225	E275E	240	190	185H	240	215	200H	A	I230A	215	210	225	I235A	255	285	I280A	290	255
27	250	290	300	325	290	I295A	I290A	245	I240A	225	200H	200	205	185H	230	215	220	220	225	240	270	270	295	255
28	270	235	285	315	280	300	E295E	240	230	205	230	220	200H	180H	220	190H	225	235	235	225	230	I280A	255	290
29	280A	250	E295E	300	I310A	245	285	220	200	210	240	215	220	235	230	195H	210	220	235	225	260	255	255	250
30	280	280	270	295	265	270	220	230	215	200	195	230	225	205	230	230	210	225	235	230	I245A	A	A	305
31	255	I300A	290	275	280	260	255	210	220	200	180H	230	210	200H	195	225	210	230	250	230	220	E270E	E370E	295
No.	31	31	31	31	31	31	31	31	31	30	29	29	30	30	31	30	31	29	31	30	31	27	28	30
Median	280	290	295	280	260	245	240	220	210	200	220	220	210	210	230	220	210	230	240	240	230	255	280	280
U. Q.																								
L. Q.																								
Q. R.																								

h'F

Sweep 1.6 Mc to 16.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Dec. 1965 | 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	E	E	E	E	E	E	E	145	140	140	120	115	110	110	105	105	105	100	100	E	110	105	100	105
2	E	E	E	115	E	E	E	140	145	155	140	135	130	125	E145G	130	E	E	115	110	105	105	110	110
3	E	105	105	105	E	E	E	E	135	135	165	150	140	140	130	120	105	105	105	E	E	105	E	E
4	E	E	E	E	E	E	E	150	145	145	135	130	120	115	115	115	105	105	100	E	E	E	E	E
5	E	115	E	115	110	110	110	105	G	125	155	100	140	135	145	135	115	110	105	110	105	105	105	100
6	E	E	E	120	105	E	E	E	110	G	150	140	135	130	120	110	110	105	100	100	100	E	E	E
7	E	E	110	E	E	E	E	E	160	G	150	145	165	155	145	145	E	E	E	E	120	110	E	100
8	E	E	E	E	E	E	E	E	170	155	150	145	135	140	100	120	110	105	100	100	100	100	E	N
9	E	E	E	E	E	E	105	E	G	160	100	145	100	160	160	150	145	140	145	130	105	105	100	110
10	110	E	110	110	E	E	E	E	100	G	140	145	G	150	140	125	B	110	105	110	105	105	100	100
11	E	E	E	E	E	E	E	105	105	G	155	125	G	G	155	155	155	145	105	105	100	E	105	E
12	130	E	E	E	115	E	115	110	110	G	G	G	G	G	120	140	125	125	E	E	E	105	110	E
13	105	E	E	110	E	E	E	E	155	145	145	145	140	125	145	130	B	E	E	E	110	105	100	100
14	E	E	E	E	E	E	E	145	160	G	110	105	100	100	G	G	100	E	E	E	E	105	E	E
15	E	E	110	105	110	E	105	E	G	160	145	140	145	145	E145G	105	100	E	110	105	100	E	100	115
16	120	120	E	E	E	E	E	E	115	110	120	115	125	120	C	C	100	110	110	110	110	E	110	110
17	E	E	110	E	E	110	E	E	G	145	135	130	130	135	120	110	110	110	110	105	105	105	105	E
18	E	E	E	E	105	110	105	110	105	110	140	125	125	125	140	140	155	120	115	E	E	E	E	E
19	E	E	E	E	E	E	E	E	145	125	115	115	115	110	110	165	145	E	E	110	E	105	E	100
20	E	105	E	E	E	E	E	E	G	G	160	160	110	115	115	110	110	E	E	E	E	E	105	100
21	105	100	105	E	E	E	E	E	140	145	105	140	130	105	130	130	110	110	145	110	105	105	100	E
22	E	140	135	135	E	E	E	105	145	145	160	150	145	150	145	140	130	110	105	105	105	E	E	E
23	110	E	E	120	110	110	110	105	105	G	G	160	150	G	140	145	105	110	105	105	E	C	E	E
24	E	E	E	E	E	E	110	105	105	105	G	G	115	160H	140	145	110	105	105	100	100	100	E	100
25	100	E	E	E	E	E	E	E	105	140	110	G	145	160	150	S	E	110	110	105	105	100	105	105
26	110	110	105	105	120	120	110	105	105	100	G	G	G	160	145	125	105	105	105	100	100	100	105	E
27	E	E	110	110	105	110	110	105	100	100	G	100	G	G	160	130	120	115	100	E	105	110	105	105
28	105	105	E	105	E	E	105	105	165	G	100	100	100	105	145	G	145	105	105	105	105	100	E	105
29	105	105	110	E	110	E	E	E	110	105	105	145	140	140	G	125	160	100	100	100	100	105	105	100
30	100	E	E	E	E	E	E	115	110	105	145	100	G	G	G	160	135	130	125	110	105	105	105	105
31	120	105	110	110	110	110	110	110	125	G	G	110	105	G	G	150	110	E	100	E	E	100	E	E
No.	12	10	11	13	10	7	11	16	26	21	25	27	25	25	26	27	26	23	25	20	22	22	18	17
Median	110	105	110	110	110	110	110	110	120	140	140	135	130	135	140	130	110	110	105	105	105	105	105	105
U. Q.																								
L. Q.																								
Q. R.																								

h'Es

Sweep 1.6 Mc to 16.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 11

IONOSPHERIC DATA

Dec. 1965 | Types of Es | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								h2	h2	h2	h2	h	c2	12	13	12 h2	1 h	f	f2		f	f3	f3	f
2				f				h2	h2	h	h3	h2	h2	h2	h	h2			f2	f2	f3	f2	f2	f
3		f2	f2	f2					h2	h2	h2	h2	h2	h2	h4 12	h2 12	1	f3	f2			f2		
4								h2	h2	h4	h2	h3	h2	h2	c2	c3	13	f2	f2					
5		f		f2	f2	f2	f	13		h	h2 12	12 h	h2	h2	h	h2	c3 1	f4	f2	f	f3	f2	f2	f2
6				f	f				1 h2		h2	h2	h2	h3 1	h3	12	1	f2	f3	f2	f			
7			f2						h		h2 h	h	h h	h h2	h2	h2					f	f		f
8									h	h2 12	h2	h2	h2	h2	12	c2 12	14	f2	f2	f2	f	f2		
9							f			h3	1 h2	h2 12	1	h	h2	h2	h	f2	f	f2	f2	f2	f	f2
10	f		f2	f2					13		h	h2		h	h2	h3		f2	f2	f2	f	f	f2	f2
11								12	1 h		h	h			h	h	h	f2	f2	f3	f2		f	
12	f4				f		f	1	c						h	h2	h	f				f	f2	
13	f2			f2					h2	h2	h2	h2	h	h	h2	h2					f	f2	f	f
14								h	h2 h2		13	12	1	12			1					f		
15			f2	f2	f		f			h2	h2	h2	h	h 1	h 12	14 h	13		f2	f2	f		f	f
16	f	f							c	12	h	c2	h	c2			12	f	f3	f2	f2		f	f
17			f2			f2				h	h2	h	h3	h	c2	13	14	f5	f4	f4	f3	f3	f3	
18					f3	f3	f2	1	13	12	h2	h3	h2	h2	h2	h2 1	h	f4	f					
19									h	h4	h2	h2	h2	c3	c2	h	h			f		f		f2
20		f									h2	h h	c3	h	h2	c 12	12						f2	f2
21	f	f2	f						h2	h	1 h	h2 12	h 12	12 h	h3	h	12 h	f2 f	f f2	f6 f	f3	f2	f2	
22		f2	f2	f				1	h	h	h	h	h	h 12	h3	h2	h	f3	f3	f3	f2			
23	f			f2	f4	f2	f2	13	1			h	h2 1		h2 12	h2	12	f2	f2	f				
24							f2	1	12	12			c2	h	h	h2	14	f5	f3	f3	f2	f2		f2
25	f								12	h 1	c		h	h	h 1			f3	f4	f3	f3	f2	f	f4
26	f2	f2	f2	f2	f2	f	f	13	1	1				h	h3	h3 1	12	f2	f4	f2	f2	f4	f	
27			f2	f	f	f5	f4	14	14	1		1	—		h	h2	h2	f f	f		f2	f2	f2	f
28	f2	f2		f			f2	1	h		1	1	1	1	h		h2	f2	f	f	f2	f4		f
29	f	f2	f		f8				12	1 h2	1 h	h	h	h		h	h 12	f	f	f	f	f2	f	f2
30	f							c3	12	h 1	h	1				h	h	f	f	f2	f2	f2	f2	f
31	f	f3	f2	f2	f2	f	f2	12	h			1	1			h	1		f			f		
No.																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

Types of Es

Sweep 1.6 Mc to 16.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Dec. 1965 | 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	030S	031F	030	033	025	017	022	050	U062S	059	072	073S	070	068	U066S	058	U051S	038S	A	027	029	030	025	028
2	030	030	029	030	022	021	022	048	U072S	061	090	074S	057	058	064	055	053	032H	039	033S	033	030	030	031
3	035	029	025	027S	026S	U024S	026	056	065	059	061	070	068	066	058	056	052	032S	028	037S	A	026S	025	028S
4	030	029	033S	028	026	026S	026	052	051	060	U074S	072	056	U074S	062R	056	053	040S	030	020	032	031	U025S	027S
5	030	C	C	C	C	C	C	C	C	057	057	072	069	058	U070S	054	050	031	032	030	031	027	026	029
6	030	031	029S	030	033	023	024	047	059	054	063S	061	056	065	057	050	051	036S	038	031	021	022	025	026
7	027	028	028	030	032	026	023	046	051	050	055	058H	065	060	063	062	051	029	033	039	031	028	026	027
8	029	029	028	028	032	025	025	047	050	049	058	069	065	059V	062	058	J054R	035	028	029	031	027	024	025
9	028	029	030	030	028	030	031	043	049	052R	060	U073S	054	053	058	054	047	040	034S	031	030	025	028	030
10	030	030	032	031S	030	026	026	048	051	052	057	062Z	U063Z	060	058Z	054	U049R	032	032S	026S	027S	024S	024S	029F
11	U028F	025S	U029S	027S	030S	030S	026S	045	048	060	069	067	066	061	061	064	052	037S	035	029	025	021	026	028
12	031	032	033	032	033S	031S	032S	042	045	064	078	066	070S	066	055	055	046	039S	040	036	034S	023	029S	030F
13	034Z	033S	U030F	U030F	040	017	022	041	048	057	073	U074S	U064R	059	058	055	041	036	040	038	030	020	U025S	028
14	028	029	029	030	027	024	024	048	052	064	067	064	057	058	058	058	048	036	029	I030A	023	020	025	025S
15	026	027	028	027	024	025	026	047	054	057	067	069	060	061	060	053	049	U041S	032	030	028	023	024S	026S
16	026	026S	026S	027F	025	021	020	041	051	050	C	067	C	C	C	058	C	C	C	C	C	C	026	029F
17	U025S	C	U027S	030F	U030F	022	023	045	049	U051R	050	060	063	057	062	C	C	026	033S	033S	023H	019	023	024R
18	024	024	U025S	U024S	028	U022S	021	043	047	055	054	062	062	053	050	050	049	034	027	I024A	026	025S	022	024
19	025	025	025	028	U026S	029	026	040S	051	C	U072S	061	073	061	068	U055S	U062R	036S	036	033S	029	027	U029S	030S
20	030	029	031	030F	032S	028	028	052S	052	047	056	070	060	056	064	066	050	034	030	032	030S	024	024	026
21	026	028	026F	026S	028	023	027	049	050H	052R	060	070	065	059R	065	062R	047	027	035	033	022	I022A	022S	025
22	026	026	026	027	027	023	021	U040S	045	047	054	058	056	061	061	054	047R	026	034	032	I031A	I025A	024S	025
23	025	025	025	I026A	032S	U029S	027	041	051	052	055	060	059	056	I059R	056R	045R	030S	A	U034S	030S	A	021	024
24	023	022	U023S	023S	022S	U022S	033S	039	046	048	057	058	052	056H	057	052	046	034S	035	030	024	019	024S	025S
25	025S	U025S	028S	U027F	022S	023	027	U042S	043	063	060	067	078	060	056	U053R	048R	038	036	037S	F	026	031	031F
26	I026A	026S	U027F	030F	024	024S	023	042S	U051R	U064R	095	090	068	058	U056R	049	041	039	027	028	028	029	026	030F
27	030F	025	024S	023	I024A	025S	A	039	U061S	084	106	070S	057	053	056	053	046	040S	033	030	030F	U029F	U029F	031
28	U029S	025	022	023	023	025	022	045	058S	072	I070S	064	059	056	059	055	048	041S	034	I032A	030	024	A	A
29	A	026S	023	024	025	027	024	051	057	059	072R	069	059	058V	063	059	048	034	037	032	030	032	032	030
30	029	030	031	029	026	028	032	041	056	062	069R	082	089	074	060	054	J048R	032	033	039	026	024	026	026
31	028	I028A	028	028	I025C	C	C	C	C	060	067	C	063	059	057	057	044	033	032	031	028	021	020	023
No.	30	29	30	30	30	29	28	29	29	30	30	30	30	30	30	30	29	30	28	30	28	29	30	30
Median	028	028	028	028	026	025	026	045	051	057	065	068	063	059	060	055	048	034	033	032	030	025	025	028
U. Q.	030	030	030	030	030	028	027	048	056	061	072	072	068	061	063	058	051	038	036	033	030	028	026	030
L. Q.	026	025	025	027	025	022	022	041	048	052	057	062	059	057	057	054	046	032	031	030	026	022	024	025
Q. R.	004	005	005	003	005	006	005	007	008	009	015	010	009	004	006	004	005	006	005	003	004	006	002	005

The Radio Research Laboratories, Japan

foF2

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

K 1

IONOSPHERIC DATA

Dec. 1965 | foF1 | 0.01 Mc | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L		A	L	A	370L	A	A							
2									L	L	L	L	A	A										
3									L		L	L	L	L	L									
4										L	L	L	A	L	L	A								
5								C	C		L	L	L	A	L									
6											L	L	L	L	S									
7									290L		L	L	U410L	U400L	L	L								
8												A	410L	L	L									
9										L	L	L	L	370L	L									
10									L	L	430L	U390L	L		L									
11										L	L	410L	L	400L	L									
12										390L	L	L	L	370L		L								
13										L	L	L	L	L										
14										370L	410L	U410L	A	390L	L									
15										330L	L	410L	400L	390L	L									
16									290L		C	L	C	C	C		C							
17											350L	L	A	L	S	C	C							
18										L	370L	L	U400L	L	L	300L								
19										C	L	L	U410L	L	A									
20									290L		L	400L	400L	L	L									
21									L	340L	400L	400L	L	390L	L									
22											L	A	410L	410L	360L	320L								
23								L	L	L	L	L	L		L									
24									L	330L	400L	L	U420L		A									
25									L	330L	U400L	400L	400L	L										
26										A	410L	U400L	410L	L	L	L								
27									L	L	410L	400L	400L	370L	330L									
28									L	L	U410L	L	L	L	A	A								
29											L	L	L	L	L									
30											390	L	L	L	L									
31								C	C		L	C	L	L	L									
No.									3	6	11	9	11	9	3	2								
Median									290L	340L	400L	400L	410L	390L	360L	310L								
U. Q.																								
L. Q.																								
Q. R.																								

foF1

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

The Radio Research Laboratories, Japan

K 2

IONOSPHERIC DATA

Dec. 1965 | foE | 0.01 Mc | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	210	280	300	A	A	A	A	A	B							
2								A	220	255	295	295	290	285	255	220	B							
3								B	220	275	280	300	300	285	260	A	B							
4								A	220	260	290	A	A	A	A	A	B							
5								C	C	260	I290A	305	300	I280A	270	215	B							
6								A	A	260R	275R	300	305	A	A	225	B							
7								B	220	U260A	290	300	A	300	270	I240A	B							
8								B	220	260	290	300	300	280	260	I210A	190							
9								160	225	250	295	300	300	290	260	220	B							
10								B	225	255	290	295	300	285	255	230	B							
11								175	210	275	285	300	300	285	260R	240	B							
12								A	A	260R	I290R	305	290	275	265	205	175							
13								B	190	260R	285	300	I300R	285	255	230	B							
14								B	A	A	295	A	A	A	260	240	A							
15								B	R	280	290	300	290	275R	A	A	A							
16								A	A	A	C	R	C	C	C	230	C							
17								B	A	A	300	285	300	280	250	C	C							
18								170	I210A	280	I290A	290	295	275	I270R	A	B							
19								B	225	C	275	A	A	R	A	A	A							
20								B	215	260	280	295	I295R	275	I260R	230	B							
21								B	210	I260A	285	310	295R	290	R	A	B							
22								B	215	250	280	300	290	280	265	225	B							
23								A	A	A	300	280	295	A	I270A	I240R	B							
24								B	205	255R	275	295	A	A	A	A	B							
25								B	210	255	A	R	A	A	A	225R	B							
26								B	A	A	285	300	300	295	A	A	B							
27								B	210	I265A	280	300	300	290	I260R	235	B							
28								B	A	250	I280A	300	A	A	A	A	B							
29								B	205	260	I280A	300	310	290	270	I250R	I200R							
30								A	A	A	A	I310A	315	295	A	B	R							
31								C	C	I260A	290	I300C	310	300	280	240	175							
No.								3	19	24	28	25	22	21	19	19	4							
Median								170	215	260	290	300	300	285	260	230	180							
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

Dec. 1965 | 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	E013B	E013B	E011B	E013B	019	E014B	E013B	022	025	034	041	J054	J040	J054	J038	J065	J040	J035	036	J024	020	019	E013B	020
2	E016S	E013B	E015S	024	024	022	020	022	026	G	035	036	J041	038	J036	029	019	E013B	E014S	023	023	E014S	J026	J024
3	019	021	024	022	023	E013B	E013B	J023	026	031	033	035	038	034	032	J026	J025	J029	J025	J054	J039	J029	E016S	025
4	J030	023	021	019	020	E013B	E013B	022	G	032	037	J041	J063	042	036	J040	J028	J030	025	018	E015S	E013B	019	019
5	E011B	C	C	C	C	C	C	C	C	J036	035	036	033	039	035	029	J030	J027	J023	J030	J024	022	025	023
6	020	025	024	023	019	018	026	024	036	031	037	036	036	J044	J038	J022G	J029	J027	J035	028	020	E014S	020	E015S
7	E013B	E013B	E013B	020	024	E011B	E016B	E018B	G	032	034	J064	J039	G	G	026	016G	E014S	E014S	J014S	022M	024	J020	024M
8	020M	E011B	E	E012B	E012B	E012B	E013B	E015B	J022G	032	037	040	040	035	G	J025	G	023	J025	J026	024M	021	E012B	E013B
9	E013B	E011B	E011B	E011B	J023	E	019	024	018G	G	033	039	036	G	035	G	020	J026	032	024	E011B	023	E015S	E013B
10	E014B	020	023	025	J041	E011B	E014B	027	G	027	033	036	036	033	032	J030	J037	J026	J026	J023	J052	023	020	E013B
11	025	E015B	E016B	E	E011B	E014B	E013B	G	G	031	034	G	G	031	G	027	E021B	023	019	018	025	J025	E015S	E015S
12	E014B	E015B	J025	029	J026	023	023	J026	031	030	G	J051	035	G	035	G	G	J023	021	024	024	E013B	E015S	E015S
13	E013B	022	E012B	E015B	E011B	E013B	E011B	019	G	032	035	036	036	032	031	025	020	E014B	E014B	E016S	024	024	035	025
14	023	E012B	E012B	E012B	024	019	E013B	020	022	J026	G	J031	J054	J038	G	018G	028	022	E013B	J054	J024	J024	E013B	021
15	E014B	019	019	023	019	019	018	E015B	027	030	031	034	035	032	J039	032	J028	J025	025	J052	025	J024	022	045
16	J031	J038	025	E011B	E011B	E014B	019	024	J028	J033	C	G	C	C	C	J030	C	C	C	C	C	C	J039	J024
17	024	C	E012B	018	E011B	E011B	E015B	E016B	J030	J031	G	J064	J041	036	J034	C	C	024	029	E014B	E015S	E012B	J027	J037
18	J025	J027	E013B	E014B	J025	024	J031	J039	037	031	033	037	037	034	029	G	025	E015S	022	033	J023	J025	J023	E013B
19	024	E013B	023	024	E013B	J021	E013B	025	028	C	034	J032	036	J037	J037	031	J032	024	023	024	E013B	E015S	E017S	024
20	E013B	E014B	E014B	020	E011B	E013B	J023	028	025	G	033	031	032	034	033	020G	022	025	021	E015S	E013B	E013B	E013B	E011B
21	E013B	E017S	E014B	019	022	021	E013B	E016B	G	035	G	G	G	G	033	029	030	020	032	023	J030	036	E017S	E013B
22	E014B	018	022	E011B	E	E012B	J025	E015B	024	029	036	J044	036	G	033	G	022	035	J041	024	J056	042	037	E014B
23	E015S	020	023	035	J040	J037	024	019	J030	J054	035	033	032	033	032	029	J027	J066	J103	049	J025	034	E014B	E013B
24	022	E012B	E014B	E014B	E	E015B	E013B	E014B	022	G	035	G	032	033	J040	J029	044	J031	J035	J025	021	J051	024	E015S
25	E013B	E013B	E013B	E	E014B	E013B	E013B	E015B	G	030	J032	G	J037	032	033	030	J028	024	J025	J051	J038	J025	J027	J036
26	046	J040	J026	J029	J028	037	J030	J037	J090	J073	033	021G	G	G	J038	034	J028	J038	J026	024	J028	E015S	E016S	J025
27	021	025	J025	J028	042	J032	J062	J038	029	036	G	G	G	G	G	028	021	J060	024	022	J022	J026	E015S	E013B
28	J037	J020	J023	023	022	021	024	J026	J026	033	J036	G	J030	J040	J038	J037	J037	J039	J074	J062	J027	J030	047	044
29	036	J040	024	032	024	E014B	E015B	E015B	023	J036	J038	034	G	031	029	G	G	J025	J023	025M	E012B	J060	J036	J035
30	037M	022M	E011B	020M	J024	020M	021M	022	035M	J054	J038	033	G	G	029	E027B	019G	J026	J032	J036	J030	J023	E015S	E014B
31	J025	J036	030M	J018	C	C	C	C	C	036	G	C	G	G	J025G	G	029	J030	J025	024	E015S	E015S	E015S	E013B
No.	31	29	30	30	29	29	29	29	29	30	30	30	30	30	30	30	29	30	30	30	30	30	31	31
Median	020	019	018	020	022	E014B	E016B	022	025	032	034	034	036	033	033	028	027	026	025	024	024	024	019	019
U. Q.	025	024	024	024	024	021	024	026	030	035	036	039	038	037	036	030	030	030	032	033	027	026	026	025
L. Q.	E013	E013	E012	E013	E012	E013	E013	E016	G	030	032	G	030	G	029	G	020	023	022	023	020	E015	E015	E013
Q. R.	D012	D011	D012	D011	D012	D008	D011	D010		005	004		008		007		010	007	010	010	007	D011	D011	D012

The Radio Research Laboratories, Japan

foEs

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

K 4

IONOSPHERIC DATA

Dec. 1965 | **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	B	B	B	B	E	B	B	021	025	029	039	048	033	047	026	048	040	016	A	017	E	E	B	E
2	S	B	S	013	E	E	E	021	026		033	033	040	037	033	025	018	B	S	014	E	S	E	014
3	E	E	012	E	012	B	B	018	024	030	032	033	036	032	028	020	018	016	018	018	A	019	S	E
4	E	E	E	E	E	B	B	021		031	036	033	047	033	026	040	018	015	E	E	S	B	016	015
5	B	C	C	C	C	C	C	C	C	032	033	035	032	036	032	026	027	016	016	020	016	E	017	016
6	017	017	E	E	E	E	E	020	027	030	035	034	033	032	033	019	020	017	021	E	E	S	E	S
7	B	B	B	E	015	B	B	B		031	033	032	033			026	G	S	S	E	E	E	E	E
8	E	B		B	B	B	B	B	G	032	036	040	038	033		022		016	022	015	015	E	B	B
9	B	B	B	B	E		E	G	017G		033	035	024		031		020	023	025	E	B	E	S	B
10	B	E	012	E	026	B	B	017		026	033	033	031	033	029	028	037	015	025	015	017	E	E	B
11	014	B	B		B	B	B			029	031			030		025	B	E	E	E	E	017	S	S
12	B	B	017	E	015	E	E	021	030	030		032	030		034			014	E	E	E	B	S	S
13	B	E	B	B	B	B	B	017		032	033	033	032	032	030	025	019	B	B	S	E	E	016	016
14	E	B	B	B	E	E	B	019	E022R	026		029	040	026		018G	020	E	B	A	017	015	B	E
15	B	E	E	E	E	E	E	B	026	030	030	032	033	030	031	025	025	E	E	026	E	019	020	017
16	015	019	014	B	B	B	E	014	025	027	C		C	C	C	026	C	C	C	C	C	C	017	016
17	015	C	B	E	B	B	B	B	025	E031R		038	041	034	033	C	C	018	020	B	S	B	017	020
18	021	021	B	B	E	016	E	018	033	029	032	037	034	032	027		025	S	E	A	E	E	015	B
19	E	B	E	012	B	E	B	023	025	C	033	032	033	036	035	024	028	E	E	017	B	S	S	E
20	B	B	B	E	B	B	E	028	025		032	030	032	032	030	020G	021	016	E	S	B	B	B	B
21	B	S	B	E	E	E	B	B		026					033	027	020	019	020	E	E	A	S	B
22	B	E	E	B		B	017	B	024	029	034	042	035		033		021	022	017	017	A	A	018	B
23	S	E	E	A	016	024	E	016	026	033	034	032	032	032	030	027	022	022	A	022	023	A	B	B
24	E	B	B	B		B	B	B	022		028		031	033	038	027	036	023	023	E	E	015	E	S
25	B	B	B		B	B	B	B		028	028		033	032G	029G	029	026	016	017	027	016	018	019	020
26	A	020	018	E	015	013	021	027	031	054	021	021G			028	025	022	016	015	E	022	S	S	015
27	017	017	014	017	A	016	A	028	022	027						026	020	021	016	016	E	E	S	B
28	019	017	014	E	E	E	E	017	022	027	030		030	037	034	029	020	021	026	A	020	018	A	A
29	022	023	014	016	E	B	B	B	023	020	033	033		031	026			016	E	E	B	022	018	017
30	021	E	B	E	014	E	G	022	028	040	033	033			029	B	E019R	022	017	017	015	015	S	B
31	017	A	020	014	C	C	C	C	C	G		C			025G		028	023	017	016	S	S	S	B
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

Dec. 1965 | **f-min** | 0.1 Mc | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	013	013	011	013	013	014	013	014	013	014	014	014	016	015	015	014	014	E015S	013	013	E014S	013	013	E015S
2	E016S	013	E015S	011	011	012	016	014	013	017	016	015	015	015	015	015	013	013	E014S	011	013	E014S	013	010
3	011	013	010	011	010	013	013	015	013	014	016	015	016	015	014	014	013	013	011	013	E014S	012	E016S	013
4	013	013	013	013	013	013	013	013	014	015	015	014	015	015	016	015	014	E014S	E015S	E014S	E015S	013	E015S	E014S
5	011	C	C	C	C	C	C	C	C	014	015	014	015	017	017	015	016	E014S	011	E015S	E014S	E014S	013	E015S
6	E014S	014	014	013	013	013	014	014	015	014	014	016	015	015	014	015	014	E016S	E014S	E014S	013	E014S	E015S	E015S
7	013	013	013	011	011	011	016	018	014	015	015	014	016	016	015	012	014	E014S	E014S	011	E014S	012	012	012
8	013	011	010	012	012	012	013	015	015	014	016	015	016	016	014	014	014	E015S	E015S	011	012	013	012	013
9	013	011	011	011	013	010	013	014	014	015	015	016	015	015	016	013	014	E014S	013	013	011	E015S	E015S	013
10	014	012	010	014	015	011	014	015	014	015	015	014	015	014	015	014	014	013	E015S	011	014	013	014	013
11	013	015	016	010	011	014	013	015	014	015	015	015	015	015	015	014	021	E015S	013	013	013	E015S	E015S	E015S
12	014	015	014	014	010	013	015	012	014	015	014	015	015	013	015	015	013	013	013	014	014	013	E015S	E015S
13	013	014	012	015	011	013	011	014	012	015	015	016	015	015	015	014	014	014	014	E016S	014	E015S	013	013
14	013	012	012	012	011	014	013	014	015	015	015	014	013	014	015	012	012	014	013	013	013	012	013	013
15	014	013	011	013	011	012	013	015	015	015	016	016	015	015	014	014	013	013	E015S	013	014	E016S	014	014
16	013	013	010	011	011	014	012	011	015	013	C	014	C	C	C	016	C	C	C	C	C	C	013	013
17	013	C	012	011	011	011	015	016	014	015	017	015	017	014	016	C	C	013	013	014	E015S	012	013	014
18	013	013	013	014	013	012	013	012	015	016	016	015	015	016	018	015	018	E015S	014	013	013	014	013	013
19	013	013	011	E	013	013	013	014	014	C	015	015	016	015	014	015	013	014	E015S	E015S	013	E015S	E017S	E015S
20	013	014	014	013	011	013	014	016	015	015	015	015	016	017	017	015	015	013	E015S	E015S	013	013	013	011
21	013	E017S	014	013	014	013	013	016	013	016	016	016	015	017	015	016	015	014	E015S	E015S	014	014	E017S	013
22	014	013	E	011	010	012	015	015	014	014	016	016	016	016	016	016	016	E015S	011	E015S	E015S	013	014	014
23	E015S	011	011	012	011	012	013	013	015	015	015	016	015	016	015	015	014	013	E015S	013	E015S	013	014	013
24	014	012	014	014	010	015	013	014	014	015	016	017	017	017	016	016	016	014	013	E015S	E016S	014	E015S	E015S
25	013	013	013	010	014	013	013	015	016	016	016	020	016	016	016	016	015	014	013	011	014	013	014	014
26	013	013	013	013	013	011	012	014	015	014	015	014	017	017	016	014	013	014	013	014	013	E015S	E016S	014
27	014	013	013	011	011	012	011	014	015	016	016	019	018	018	016	016	015	013	013	E015S	E015S	013	E015S	013
28	013	013	011	011	013	012	012	014	014	015	016	017	022	021	021	015	015	014	013	013	013	013	E015S	013
29	E015S	013	010	011	011	014	015	015	014	015	016	021	025	016	016	018	016	013	011	013	012	014	013	E015S
30	013	015	011	010	013	012	013	013	014	016	020	022	026	026	022	027	016	012	012	E015S	013	013	E015S	014
31	013	012	013	011	C	C	C	C	C	016	016	C	017	017	016	016	016	E015S	014	014	E015S	E015S	E015S	013
No.	31	29	30	30	29	29	29	29	29	30	30	30	30	30	30	30	29	30	30	30	30	30	31	31
Median	013	013	012	012	011	013	013	014	014	015	016	015	016	016	016	015	014	E014	013	013	014	013	013	013
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

Dec. 1965 | 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	265S	270F	300	310	380	295	300	350	U340S	365	310	350S	340	335	U350S	350	U365S	350S	A	315	305	315	295	280
2	290	295	285	315	320	305	285	315	U350S	325	355	360S	350	335	350	355	370	250H	310	340S	300	315	305	275
3	315	350	280	280S	285S	U290S	295	350	345	345	340	325	345	335	355	350	360	345S	285	315S	A	295S	305	290S
4	305	330	300S	320	310	310S	305	350	365	345	U340S	350	350	U340S	350R	355	370	340S	325	350	305	305	U310S	280S
5	285	C	C	C	C	C	C	C	C	360	350	355	355	340	U355S	360	360	305	300	315	315	335	290	285
6	285	275	295S	300	335	365	295	340	345	340	325S	365	350	350	365	350	360	315S	330	345	320	280	290	285
7	285	300	295	300	340	355	305	360	360	360	345	345H	350	340	350	355	375	350	305	330	325	325	270	280
8	275	280	285	285	340	295	320	365	360	345	345	350	355	335V	335	345	J370R	360	285	305	310	310	290	300
9	305	310	295	300	295	310	340	345	365	345R	340	U340S	345	345	340	350	340	310	350S	320	315	265	280	295
10	285	290	290	295S	310	290	325	355	365	365	340	330Z	U315Z	340	340Z	350	U365R	330	330S	310S	335S	270S	290S	285F
11	U280F	280S	U305S	290S	305S	325S	360S	365	325	335	340	335	325	345	320	345	360	325S	345	320	340	260	275	290
12	310	295	285	295	315S	315S	345S	365	340	330	345	355	350S	345	340	340	350	320S	315	350	340S	285	275S	295F
13	280Z	280S	U265F	U285F	360	365	305	365	365	330	355	U350S	U360R	350	340	360	370	330	325	340	355	315	U270S	270
14	280	280	285	310	315	280	305	365	370	365	335	360	345	350	340	370	365	330	345	I340A	340	300	300	290S
15	275	280	290	300	290	290	325	340	345	325	330	340	330	325	340	355	340	U340S	345	350	340	280	280S	290S
16	295	290S	270S	295F	330	300	315	360	360	335	C	335	C	C	C	355	C	C	C	C	C	C	275	305F
17	U285S	C	U275S	295F	U345F	320	375	370	370	U365R	345	340	340	345	335	C	C	325	305S	340S	340H	295	270	295R
18	290	280	U270S	U290S	305	U335S	320	350	355	355	335	355	355	370	370	370	375	330	350	I280A	295	320S	300	305
19	300	290	300	300	U310S	300	345	350S	325	C	U360S	330	335	355	360	U365S	U365R	350S	315	325S	350	310	U285S	280S
20	285	280	290	280F	310S	305	325	365S	365	375	340	335	345	350	345	335	355	340	320	315	335S	300	290	310
21	295	305	290F	295S	315	290	295	355	345H	355R	340	335	325	325R	345	350R	355	320	310	335	340	A	300S	290
22	290	280	285	295	310	315	320	U355S	355	355	340	340	340	335	340	365	370R	315	315	330	I320A	A	315S	290
23	290	280	270	I290A	330S	U330S	340	365	365	340	335	355	345	350	I340R	345R	390R	260S	A	U310S	335S	A	285	290
24	315	280	U280S	295S	290S	U295S	340S	365	360	365	345	355	340	345H	350	345	360	315S	345	370	325	280	280S	310S
25	300S	U270S	295S	U305F	305S	305	350	U335S	345	350	345	320	355	345	365	U370R	340R	330	350	320S	F	305	315	295F
26	I280A	290S	U310F	305F	300	305S	305	330S	U325R	U315R	330	345	365	345	U350R	360	360	325	355	340	305	295	290	275F
27	305F	290	295S	260	A	290S	A	320	U325S	340	340	370S	355	350	350	370	350	340S	325	355	300F	U315F	U300F	325
28	U290S	310	295	285	295	290	295	340	355S	345	I350S	350	335	350	335	335	370	330S	335	I330A	335	265	A	A
29	A	295S	305	270	285	310	300	365	365	350	345R	360	360	340V	350	370	355	320	320	310	330	340	290	305
30	I305A	300	290	290	275	290	345	350	365	355	315R	340	345	355	365	370	J365R	320	305	355	345	290	270	270
31	280	I290A	270	305	I290C	C	C	C	C	350	350	C	325	355	345	345	355	320	325	330	340	345	275	265
No.	30	29	30	30	29	29	28	29	29	30	30	30	30	30	30	30	29	30	28	30	28	27	30	30
Median	290	290	290	295	310	305	320	355	355	350	340	350	345	345	345	355	360	330	325	330	330	300	290	290
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

M(3000) F2

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

K 7

IONOSPHERIC DATA

Dec. 1965 | M(3000) F1 | 0.01 | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4′N | Long. 139° 29.3′E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L		A	L	A	370L	A	A							
2									L	L	L	L	A	A										
3									L		L	L	L	L	L									
4										L	L	L	A	L	L	A								
5								C	C		L	L	L	A	L									
6											L	L	L	L	S									
7									425L		L	L	U390L	U375L	L	L								
8												A	415L	L	L									
9										L	L	L	L	380L	L									
10									L	L	370L	U380L	L		L									
11										L	L	380L	L	360L	L									
12										350L	L	L	L	425L		L								
13										L	L	L	L	L										
14										360L	380L	U370L	A	350L	L									
15										400L	L	380L	380L	385L	L									
16									445L		C	L	C	C	C		C							
17											410L	L	A	L	S	C	C							
18										L	380L	L	U370L	L	L	415L								
19										C	L	L	U365L	L	A									
20									400L		L	360L	370L	L	L									
21									L	430L	365L	380L	L	395L	L									
22											L	A	370L	365L	390L	395L								
23								L	L	L	L	L	L		L									
24									L	415L	390L	L	U370L		A									
25									L	385L	U380L	370L	365L	L										
26										A	335L	U355L	375L	L	L	L								
27									L	L	365L	370L	385L	390L	335L									
28									L	L	U350L	L	L	L	A	A								
29											L	L	L	L	L									
30											390	L	L	L	L									
31								C	C		L	C	L	L	L									
No.									3	6	11	9	11	9	3	2								
Median									425L	390L	380L	370L	370L	380L	370L	405L								
U. Q.																								
L. Q.																								
Q. R.																								

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

IONOSPHERIC DATA

Dec. 1965 | h'F2 km | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										230		250	250	240	240	230	230							
2									225	250	235	230	250	250										
3									230		240	250	260	265	245									
4										245	260	230	250	245	245	225								
5								C	C		240	230	255	260	240									
6											275	240	260	250	230									
7									225		250	250	245	250	250	240								
8												250	240	250	250									
9										255	255	250	240	250	255									
10									215	235	265	255	260		240									
11										265	250	265	260	250	265									
12										260	250	250	250	250		230								
13										275	230	245	250	250										
14										245	250	230	250	235	235									
15										250	260	245	250	260	260									
16									230		C	250	C	C	C		C							
17											230	275	260	255	260	C	C							
18										250	240	245	235	225	210	210								
19										C	250	250	255	250	225									
20									230		270	260	235	250	245									
21									225	250	265	260	260	230	250									
22											255	275	270	270	240	235								
23								220	230	270	275	245	250		260									
24									225	240	265	250	275		250									
25									225	250	250	280	230	250										
26										310	265	240	240	250	235	225								
27									265	260	250	220	250	235	250									
28									230	240	245	230	255	250	250	230								
29											250	245	240	250	250									
30											300	250	250	240	230									
31								C	C		250	C	275	250	240									
No.								1	12	18	28	30	30	27	26	8	1							
Median								220	230	250	250	250	250	250	245	230	230							
U. Q.																								
L. Q.																								
Q. R.																								

h'F2

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

The Radio Research Laboratories, Japan

K 9

IONOSPHERIC DATA

Dec. 1965 | 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	320	310	280	250	200	370	275	230	235	230	E255A	I240A	240	I240A	210	I230A	I230A	205	A	255	260	230	270	310
2	305	300	300	225	230	250	295	245	230	210	250	230	A	A	250	220	210	190	245	210	240	255	260	325
3	255	215	275	285	290	300	270	225	210	230	195H	230	235	215	220	230	220	205	300	265	A	295	280	290
4	250	230	250	220	225	245	255	230	220	230	255	240	I230A	225	225	I225A	210	200	215	200	255	250	280	300
5	285	C	C	C	C	C	C	C	C	230	230	250	200H	I250A	250	230	210	205	235	255	255	245	315	300
6	320	305	290	260	225	215	290	225	230	230	250	240	230	240	230	240	215	235	240	225	245	260	300	300
7	295	275	280	260	230	210	250	220	200	230	210	220	210	240	210	210	210	200	250	230	240	240	275	300
8	300	290	300	290	245	250	250	220	220	230	E250A	A	240	230	200H	240	205	200	300A	250	240	240	295	290
9	275	260	290	260	270	250	210	200H	240	230	250	250	220	205	245	230	210	255	245	245	225	300	300	270
10	305	295	280	265	E320A	265	250	225	210	200	205H	215	175H	250	230	225	215	200	255A	230	240	295	285	275
11	295	300	265	300	255	225	210	210	230	235	230	200H	230	210	205H	230	215	210	215	230	245	405	325	300
12	250	270	300	300	240	245	210	200	230	220	250	225	205H	210	240	250	215	220	230	215	220	225	310	295
13	280	280	320	300	210	235	265	220	225	250	240	215H	205H	210	230	230	200	235	230	225	205	250	330	340
14	280	300	305	250	230	290	260	225	225	200	200	290	I205A	180H	195H	210	210	210	215	I220A	240	290	255	275
15	330	320	290	280	275	295	250	230	230	230	250	210	220	210	240	230	250	230	200	250	200	350	350	295
16	305	325	305	275	250	275	250	215	195	225	C	250	C	C	C	230	C	C	C	C	C	C	320	260
17	315	C	285	255	210	210	205	200	200	240	175	E260A	I255A	245	250	C	C	225	255	225	200	250	345	310
18	350	360	305	295	230	240	260	220	225	230	200	E250A	230	205	200	200	215	230	220	I230A	250	225	270	260
19	300	305	275	275	265	275	230	225	230	I230C	255	225	225	235	I240A	225	230	230	230	220	200	255	305	305
20	280	300	295	290	245	265	245	220	210	220	230	215	230	230	220	235	210	210	250	230	225	255	290	255
21	260	295	300	280	250	220	275	230	210	185	215	180H	200	200	255	220	220	265	260	215	250	I315A	300	280
22	295	305	300	270	250	245	260	215	225	230	230	A	235	230	240	215	215	E305A	265	230	I270A	I240A	270	290
23	305	305	320	I300A	245	255	225	210	210	235	245	230	240	255	250	250	205	360A	A	255	230	A	310	275
24	255	310	300	300	280	280	220	200	205	185	200H	195H	190H	245	I240A	230	225	260	245	210	225	355	295	260
25	260	270	255	230	280	255	230	210	210	210	200H	200	230	255	240	225	225	240	225	255A	250	295	245	305
26	I320A	320	260	225	255	255	345	245	255	I260A	225	230	210	210H	240	210	200	210	230	230	300	275	265	315
27	255	305	280	360	A	330	A	275	215	210	225H	215	200	200	205	225	215	230	230	225	250	260	270	230
28	300	275	305	275	260	285	280	230	225	210H	225	215	245	245	A	A	210	250	245	I240A	240	365	A	A
29	A	285	280	330	300	275	275	220	225	220	250	220	225	205	225	230	210	245	240	240	210	245	300	250
30	E320A	290	255	260	290	290	210	215	260	240	205	200H	200	230	220	230	210	260A	260	220	210	250	305	320
31	300	A	310	255	I280C	C	C	C	C	245	225	I210C	220	225	195H	225	220	250	240	225	230	230	340	330
No.	30	28	30	30	30	29	28	29	29	31	30	29	29	29	29	29	29	30	28	30	29	29	30	30
Median	300	300	290	275	250	255	250	220	225	230	230	220	225	230	230	230	215	230	240	230	240	255	300	295
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

K10

IONOSPHERIC DATA

Dec. 1965 | **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	B	B	B	B	110	B	B	155	155	155	130	115	110	110	110	110	100	100	100	100	100	100	B	120
2	S	B	S	115	115	115	155	150	150	G	145	130	130	125	120	120	115	B	S	110	110	S	110	110
3	110	110	110	110	110	B	B	110	145	130	125	155	145	130	125	110	110	105	100	105	105	105	S	130
4	110	110	110	110	115	B	B	150	G	155	130	110	110	110	115	110	110	110	105	105	S	B	100	105
5	B	C	C	C	C	C	C	C	C	175	155	130	150	125	125	130	115	110	110	110	110	110	110	100
6	105	100	105	110	110	115	115	170	150	175	150	130	130	115	115	110	110	110	105	105	100	S	130	S
7	B	B	B	110	110	B	B	B	G	E195G	140	120	115	G	G	170	115	S	S	S	120	110	110	100
8	105	B	E	B	B	B	B	B	105	170	150	140	130	125	G	115	G	100	130	125	105	105	B	B
9	B	B	B	B	100	E	115	110	115	G	155	130	110	G	160	G	145	145	125	120	B	110	S	B
10	B	115	115	115	110	B	B	150	G	160	180	130	130	150	145	120	110	110	115	110	110	120	120	B
11	115	B	B	E	B	B	B	G	G	165	120	G	G	175	G	180	B	105	110	105	110	105	S	S
12	B	B	115	120	110	120	110	120	180	165	G	130	140	G	195	G	G	120	155	120	110	B	S	S
13	B	115	B	B	B	B	B	170	G	160	140	140	150	155	150	130	120	B	B	S	110	110	110	110
14	110	B	B	B	110	120	B	155	120	115	G	100	100	090	G	090	090	090	B	100	110	110	B	110
15	B	110	110	110	110	110	110	B	190	175	170	145	160	160	110	110	105	110	100	100	095	100	100	115
16	120	110	115	B	B	B	105	110	110	110	C	G	C	C	C	105	C	C	C	C	C	C	110	115
17	115	C	B	105	B	B	B	B	110	115	G	130	125	125	120	C	C	100	105	B	S	B	110	105
18	105	105	B	B	115	115	110	110	110	160	155	130	125	110	150	G	160	S	130	110	120	110	110	B
19	120	B	120	110	B	110	B	150	130	C	110	110	115	120	110	100	105	100	100	110	B	S	S	110
20	B	B	B	110	B	B	100	160	150	G	160	190	125	120	120	110	155	105	105	S	B	B	B	B
21	B	S	B	110	105	110	B	B	G	120	G	G	G	G	115	160	155	150	130	130	115	115	S	B
22	B	145	130	B	E	B	125	B	160	160	130	130	130	G	135	G	150	105	100	105	110	105	105	B
23	S	130	150	115	110	110	110	115	110	110	155	155	175	165	150	180	115	110	110	125	105	100	B	B
24	110	B	B	B	E	B	B	B	150	G	105	G	120	115	115	115	110	110	110	110	105	105	100	S
25	B	B	B	E	B	B	B	B	G	130	115	G	115	175	145	130	120	115	110	110	110	105	105	110
26	110	110	110	110	110	110	110	110	115	100	105	105	G	G	110	110	110	110	110	110	100	S	S	110
27	110	115	120	120	120	115	110	110	105	100	G	G	G	G	G	130	120	115	100	100	105	115	S	B
28	110	105	105	110	110	110	105	100	100	105	100	G	110	110	110	110	110	110	105	100	105	105	105	100
29	100	110	110	110	110	B	B	B	180	110	105	145	G	150	110	G	G	105	110	110	B	100	100	100
30	100	105	B	130	105	110	120	115	110	100	100	100	G	G	115	B	100	110	100	110	105	105	S	B
31	110	105	105	110	C	C	C	C	C	110	G	C	G	G	105	G	130	105	105	100	S	S	S	B
No.	17	16	15	19	19	13	14	19	22	26	24	23	23	21	25	23	25	26	26	26	23	21	16	16
Median	110	110	110	110	110	110	110	120	125	135	135	130	125	125	120	115	110	110	110	110	110	105	110	110
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

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

K 11

IONOSPHERIC DATA

Dec. 1965 | **Types of Es** | 135° E Mean Time (G. M. T +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					f			h2	h	h	h2	12	1	13	12	12	12	f	f7	f2	f	f		f
2				f	f	f	f	h	h		h	h2	h3	h3	c3	c	1			f	f		f2	f2
3	f	f	f2	f2	f2			1	h	h	h3	h	h	h2	h	1	12	f	f2	f3	f3	f2		f
4	f2	f	f	f	f			h		h2	h2	12	12	13	1	12	1	f	f	f			f	f
5										h21	h212	h212	h1	h212	h2	h2	12	f	f2	f3	f	f	f	f
6	f2	f	f	f	f	f	f	h1	h12	h1	h2	h2	h	1	13	12	12	f2	f3	f2	f		f	
7				f	f2					h1	h	c	c2			h13	1			f	f	f	f	f
8	f								1	h	h31	h	h2	h2		12		f	f2f	ff2	f2	f		
9					f		f	1	1		h2	h	1h		h2		h	f2	f2	f		f		
10		f	f2	f2	f6			h		h	h2	h2	h1	h	h2	c2	13	f	f2	f2	f	f	f	
11	f2									h12	c2			h		h		f	f	f	f	f		
12			f2	f2	f2	f2	f	1	h31	h		h	h		h			f	f	f	f			
13		f2						h		h2	h2	h	h	h2	h2	h	h				f	f	f2	f
14	f				f2	f		h2	12	1		1	12	12		12	13	f		f4	f2	f2		f
15		f	f	f	f	f	f		h	h	h	h	h2	h12	12	12	15	f	f	f2	f	f2	f	f2
16	f2	f3	f2				f	1	12	12						12h							f2	f2
17	f2			f					1	1		h2	h	h21	c3			f3	f2				f3	f2
18	f2	f2			f	f2	f2	1	1	h	h1	h2	h2	c2	h		h		f	f2	f	f	f2	
19	f		f2	f2		f		h3	h2		12	13	1	c3	13	1	1	f	f	f				f2
20				f			f	h	h		h	h	h	c2	c	1	h	f	f					
21				f	f2	f				1					c2	h1	h1	f	f2f	f	f	f2		
22		f	f				f		h	h12	h2	h2	h2		h		h2	f3	f3	f2	f2	f2	f2	
23		f	ff2	f6	f2	f3	f	1	12	12	h2	h	h	h1	h1	h1	12h2	f6	f4	f2f	f2	f2		
24	f								h2		12		1	12	12	12	13	f2	f3	f	f	f2	f	
25										h	1		1	h12	h1	h	13	f	f2	f4	f	f3	f	f2
26	f2	f2	f2	f	f2	f2	f6	13	12	13	1	1			12	12	13	f	f	f	f2			f2
27	f	f	f	f4	f5	f2	f3	13	12h2	1						h	13	f2f2	f	f	f	f		
28	f2	f2	f2	f2	f2	f	f	12	13	1	1		1	12	12	13	1	f3	f2	f3	f2	f2	f3	f3
29	f	f3	f2	f3	f3				h	1	1	h		h	1			f	f	f		f2	f2	f2
30	f2	f		f	f	f	f	1	13	12	1	1			1		1	f2	f2	f	f	f		
31	f2	f3	f2	f						1					1		h2	f	f	f				
No.																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

Types of Es

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

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Dec. 1965 | h_pF_2 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	390S	355F	325	300	210	350	300	260	U265S	230	310	250S	255	265	U255S	245	U230S	250S	A	290	305	270	330	335
2	335	330	330	255	270	290	310	295	U240S	275	255	230S	250	270	250	245	235	380H	295	255S	300	295	320	370
3	295	240	345	335S	350S	U335S	310	250	255	265	250	275	265	275	250	255	235	270S	350	300S	A	320S	330	320S
4	295	260	305S	270	280	285S	305	255	230	260	U265S	250	A	U260S	255R	240	225	245S	285	250	305	300	U305S	350S
5	340	C	C	C	C	C	C	C	C	250	250	240	255	250	U250S	250	235	285	295	290	295	270	345	330
6	350	345	340S	300	240	235	345	260	265	270	275S	240	260	250	240	250	245	290S	270	240	270	340	335	340
7	335	320	330	310	260	240	300	245	250	240	255	260H	250	250	260	250	220	240	300	260	270	270	340	350
8	350	340	350	350	255	290	290	250	250	255	255	255	250	260V	255	250	J220R	230	330	300	290	290	340	340
9	305	305	340	310	320	300	250	250	250	255R	260	U260S	265	255	260	255	250	295	250S	285	290	370	340	325
10	345	330	330	320S	I295A	320	275	250	230	240	265	275Z	U285Z	260	260Z	250	U225R	260	260S	295S	270S	360S	330S	330F
11	U335F	335S	U300S	340S	300S	265S	240S	235	280	275	265	275	265	260	275	255	245	270S	250	275	275	405	370	325
12	280	330	340	325	275S	280S	240S	210	255	280	260	250	250S	255	270	250	245	280S	295	235	260S	345	340S	335F
13	335Z	335S	U355F	U340F	245	235	305	230	235	290	250	U250S	U250R	255	260	240	220	270	275	255	250	265	U365S	380
14	335	345	340	285	295	345	295	255	245	255	260	245	255	245	255	230	230	260	245	I250A	255	300	300	325S
15	380	345	320	315	330	330	280	255	245	280	270	255	260	270	260	235	270	U265S	250	A	240	A	350S	315S
16	345	325S	370S	315F	275	305	295	230	240	255	C	260	C	C	C	245	C	C	C	C	C	C	340	300F
17	U365S	C	U335S	310F	U240F	280	235	215	210	U260R	250	275	260	255	270	C	C	275	280S	255S	265H	300	360	310R
18	A	A	U380S	U325S	305	U250S	295	245	235	255	275	250	245	230	225	230	230	265	255	A	300	260S	300	300
19	325	330	315	320	U300S	315	265	245S	280	C	U260S	275	265	250	240	U240S	U250R	255S	285	265S	250	295	U345S	340S
20	335	330	325	330F	280S	305	275	245S	230	225	270	265	245	250	250	265	250	250	285	285	260S	300	320	295
21	310	310	355F	320S	285	310	310	245	250H	255R	270	265	275	275R	260	240R	240	295	280	250	260	A	325S	320
22	325	340	330	310	275	275	265	U230S	235	240	270	275	275	275	255	245	230R	A	300	260	A	A	295S	330
23	330	340	355	A	260S	U265S	250	235	235	280	280	255	255	270	I260R	270R	210R	395S	A	U300S	245S	A	325	310
24	290	350	U335S	315S	310S	U310S	245S	225	235	240	280	250	280	265H	255	250	230	290S	255	225	265	355	340S	300S
25	305S	U355S	295S	U285F	310S	295	260	U230S	235	250	260	280	245	250	245	U230R	255R	275	260	275S	F	320	280	325F
26	I345A	335S	U290F	265F	285	290S	A	270S	U275R	A	280	260	245	260	U250R	230	230	280	255	265	305	320	315	355F
27	310F	330	315S	390	A	330S	A	300	U285S	275	265	220S	255	260	260	240	240	260S	275	255	305F	U295F	U320F	255
28	U325S	300	310	325	305	335	305	265	255S	245	I250S	240	260	255	265	255	230	275S	255	I275A	260	375	A	A
29	A	345S	320	355	330	310	310	235	235	250	255R	250	250	260V	250	230	240	290	290	300	280	260	340	300
30	I300A	320	310	320	340	330	250	245	240	250	305R	275	250	250	250	240	J240R	280	300	250	250	300	350	360
31	330	I320A	340	305	I310C	C	C	C	C	255	255	C	275	255	260	270	240	275	275	250	270	245	355	385
No.	29	28	30	29	29	29	27	29	29	29	30	30	29	30	30	30	29	29	28	28	27	26	30	30
Median	335	330	330	315	285	300	290	245	245	255	260	255	255	260	255	245	235	270	280	260	270	300	340	330
U. Q.																								
L. Q.																								
Q. R.																								

h_pF_2

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

The Radio Research Laboratories, Japan

K 13

IONOSPHERIC DATA

Dec. 1965 | 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	055S	070F	050	050	045	055	050	040	U040S	040	045	045S	045	045	U045S	050	U050S	050S	A	040	050	050	060	065
2	060	060	065	055	055	045	065	035	U045S	055	045	050S	050	045	050	045	045	050H	055	045S	050	050	035	055
3	045	040	050	060S	050S	U050S	045	050	045	040	050	050	040	040	050	040	060	045S	055	035S	A	040S	045	065S
4	055	060	055S	040	050	035S	040	045	050	040	U040S	045	A	U040S	040R	055	050	055S	040	050	045	050	U050S	040S
5	050	C	C	C	C	C	C	C	C	045	045	050	045	055	U040S	045	055	065	050	050	050	050	045	055
6	050	060	050S	050	060	035	050	040	040	040	050S	045	040	050	040	050	050	050S	040	055	050	060	045	045
7	045	050	055	050	040	050	050	040	040	050	050	045H	050	060	040	050	050	060	055	050	050	060	080	055
8	060	065	050	050	050	065	055	040	040	045	045	050	045	050V	055	050	J050R	060	075	055	060	060	060	050
9	050	050	060	055	050	050	055	050	040	050R	050	U040S	040	045	050	050	045	055	055S	045	060	060	060	050
10	050	050	045	045S	I050A	040	055	045	050	045	050	045Z	U055Z	050	050Z	045	U060R	040	045S	055S	035S	050S	050S	055F
11	U065F	065S	U055S	060S	050S	055S	055S	045	040	040	045	040	055	040	050	040	050	050S	050	045	030	045	040	065
12	055	030	060	050	045S	045S	050S	050	045	050	045	050	050S	045	040	050	045	045S	040	050	040S	050	065S	065F
13	065Z	065S	U065F	U060F	045	045	045	045	040	040	040	U040S	U045R	045	040	045	050	040	045	050	050	065	U060S	055
14	065	055	055	055	050	055	050	035	050	030	045	045	045	055	050	040	050	045	055	I050A	050	050	040	045S
15	065	060	065	040	040	050	040	045	045	045	040	045	045	055	045	055	035	U040S	050	A	060	A	060S	040S
16	050	050S	055S	050F	035	050	050	055	050	045	C	040	C	C	C	035	C	C	C	C	C	C	060	060F
17	U040S	C	U065S	055F	U060F	050	040	040	045	U040R	050	035	045	045	045	C	C	050	040S	045S	035H	050	050	075R
18	A	A	U060S	U070S	050	U055S	035	045	055	030	040	035	045	045	050	040	040	035	040	A	040	050S	050	045
19	040	040	035	035	U045S	040	035	055S	050	C	U035S	040	040	040	050	U035S	U030R	050S	040	055S	050	035	U055S	060S
20	050	045	040	050F	060S	040	050	040S	050	030	045	045	055	050	045	040	045	050	040	045	040S	055	040	045
21	040	055	045F	040S	045	040	045	045	070H	045R	040	045	050	050R	040	050R	040	035	055	050	045	A	055S	040
22	045	060	050	045	055	050	060	U055S	055	050	040	040	035	035	050	050	035R	A	045	045	A	A	040S	045
23	045	060	050	A	055S	U045S	050	050	055	035	035	045	045	040	I040R	040R	040R	050S	A	U035S	055S	A	055	045
24	045	045	U065S	050S	045S	U045S	055S	050	050	040	035	045	030	075H	045	045	045	040S	050	050	065	065	060S	050S
25	050S	U050S	060S	U055F	055S	055	040	U050S	060	050	040	050	050	050	035	U045R	045R	050	040	060S	F	060	055	040F
26	I055A	065S	U060F	065F	045	050S	A	040S	U055R	A	050	045	045	040	U050R	050	045	040	045	035	050	040	040	050F
27	040F	050	045S	040	A	065S	A	045	U045S	040	040	050S	045	040	040	045	060	045S	045	045	045F	U050F	U045F	055
28	U060S	045	040	030	040	040	050	040	040S	055	I050S	055	045	045	045	045	055	045S	055	I045A	045	055	A	A
29	A	030S	040	045	050	040	045	050	045	050	045R	030	040	060V	040	050	045	060	050	060	060	045	055	050
30	I050A	075	085	075	060	070	040	055	030	050	045R	040	050	040	040	050	J050R	065	060	040	050	090	075	085
31	065	I070A	060	045	I085C	C	C	C	C	030	050	C	060	040	040	035	045	050	040	050	040	050	060	065
No.	29	28	30	29	29	29	27	29	29	29	30	30	29	30	30	30	29	29	28	28	27	26	30	30
Median	050	055	055	050	050	050	050	045	045	045	045	045	045	045	045	045	045	050	050	050	050	050	055	050
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

Dec. 1965 | 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	J031S	I033S	I037S	J041S	029S	019S	020S	046	051S	058	U071S	075S	I073S	I068S	066	067S	057S	047	040	U034S	J033S	U036S	033S	028S
2	029S	U031S	030	033	025	022	021S	U034S	062	086	066	085	A	I065A	069	J061S	I066S	049S	J035S	046	042S	026	030S	026
3	I029S	030S	J029S	027	030S	I028S	026S	043S	055	J064S	J073S	074	072S	065S	067	J071S	061	057	033S	032	040	J033S	025	028
4	028F	J028S	I032S	J037S	J031S	J025F	025S	040S	058	I063C	066	I070S	071S	067	063	069	062S	054	J040S	037	J034S	036	J031S	030
5	J030S	031S	040S	029	028	030S	026S	037	055	065S	058	065	067	069	064	063	065S	051	028	A	A	S	027S	027
6	025	028	030	036S	I035S	031S	021	035S	055	063	065	069	066	067	063S	051	056	052	055	I048S	034	025	C	C
7	C	C	C	C	C	C	C	C	C	C	060	062S	060	058	063	I066S	063	042	032	038	033	J034S	031S	027
8	028	028	030	030	031	033	025	036S	060S	061	058	063	075S	075	064	064	066S	050S	I034S	034	035	028	025S	025
9	028	031	027	027	028	031	026S	I038S	054	053	J054S	062	064S	069	064	C	C	C	C	C	C	C	026	030S
10	031	031	031	032	033S	029	026S	042S	057S	057S	056	059	057	075S	067	058	063	046S	036S	030S	026	I025S	025S	027
11	I028S	J027S	I028S	I029S	I031S	S	J023S	I034S	051	059	071S	J083S	J080S	I067S	J064S	069	J068S	056	I036S	J032S	I032S	021	022	025
12	028	J030S	029	028	034S	030	J025S	J033S	046	064	068	066	073	065	056	061	054	048	044S	048	028	023	022	025
13	029S	031S	029F	030	U046S	019	J018S	033	052	057	J057H	077S	069S	063	059	061	054	052	041	I038S	025S	J026S	J025S	023S
14	J026S	026	028	029	035S	025	021	038S	J064S	059S	076S	J063S	J064S	059S	059	062	056	048	038	029	028	J027S	023	026S
15	U026S	026S	028	030	031	I031S	032S	J037S	J053S	052	065S	071S	J066S	055	056	058	058	047	053S	032S	025	I023A	I024A	026
16	025S	027S	J029S	I030S	U034S	026	I022A	030S	048	051	056S	J063S	I072S	061	064	056	056	I047S	034	029	028S	J027S	027	031
17	030	028	027	028	037S	J027S	022	034S	047S	051	052	058	076	056	057	J066S	056	046S	032	036	J031S	J021S	020	024
18	026	027	027	027	S	023	020	I033S	050	056	054	058	061Z	056	052	051	058	048	J038S	030	028	J028S	023	I025A
19	026S	027	J028S	028S	025	026	J026S	035S	058	062	072	J065S	084V	067	071S	063	057	054	044	S	I028S	024	025	029
20	027	025	026	J028S	I032S	022	025	U039S	052	052	054	071	062	066	065	J065S	061	053	037S	J038S	043S	J036S	029	027
21	028	029	029	029	034S	026S	I027S	J036S	058	056	060	084	086	077S	066	069	062	044	037S	I045S	033	026	024S	024S
22	026	028	027S	U030S	J033S	029	021	030S	051	047	052	059	057	056	J061S	065	055	I045A	J032S	031S	J031S	035S	030	029
23	027S	027S	025S	028Z	I032S	I031S	S	029S	054S	054	054	062	067	066	J065V	058	J054S	050	I039S	I034A	I033S	023	J021S	024S
24	025	024	024S	024S	J025F	J028S	034S	029	046	049	053	056	061	061	056	057	060S	I046A	I031A	032	026	026S	I026S	I025S
25	025S	025	026	J027S	025	J024F	025S	035S	048	056	055	064S	086	057	056	054	053	067S	I038A	A	I029A	028	A	A
26	A	030S	F	I032S	J025S	021S	020	030S	052	060	086	102	093S	069	056	055	053	046S	034	A	I033S	I028S	025S	022
27	029	019	029	030S	026	025F	I027A	028	053	I071S	090	J080S	062	059	057	055	054	040S	049	031	029	J026S	I028S	033S
28	029	022	023	024	024	I024S	023	032S	J060S	061	066	072S	072S	072	064	061S	058	044	J040S	S	030	031	027	I030A
29	I030S	I030A	I031S	029	030	027	025S	J033S	066	057	069	090S	083	067	J064S	064S	062	044	030	035	040S	033	024	J025S
30	028	025	027	027	027	025	J028S	033S	049S	057	J065S	074S	078S	085	083	062	064S	048	028H	036S	038S	024S	021	025
31	I028A	027	026	027	029	022	020	030S	055	057	064S	063S	071S	065	065	057	055	050	J040S	036	J040S	J031S	024S	022
No.	29	30	29	30	29	29	29	30	30	30	31	31	30	31	31	30	30	30	30	25	29	29	29	29
Median	028	028	028	029	031S	026	025S	034S	054	057	064	066	071	066	064	062	058	048	037S	034	032S	027S	025	026
U. Q.	029	030	030	030	034	030	026	037	058	062	069	075	076	069	065	065	062	052	040	038	034	032	028	028
L. Q.	026	026	027	027	026	024	021	032	051	054	055	062	064	059	057	057	055	046	033	032	028	024	024	025
Q. R.	003	004	003	003	008	006	005	005	007	008	014	013	012	010	008	008	007	006	007	006	006	008	004	003

foF2

Sweep 1.0 Mc to 19.5 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 1

IONOSPHERIC DATA

Dec. 1965 | 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	L	420	I420A	430	L	L	L							
2											L	420	I420A	I410A	390	L	A							
3											L	420	A	A	L	L								
4										C	L	430	450	L	410L	L	L							
5										L	L	L	L	L	370	360	L							
6										L	L	420	430L	430	A	L	A							
7										C	L	410	420L	410	L	L	L							
8										L	L	420	430	420	LH	L								
9											L	410	420	400	L	C	C							
10										L	L	400L	420	420	380	L								
11										L	L	420	L	410	L	L	L							
12										L	L	I410A	410	420	L	L								
13												LH	L	420	390	A								
14											410	410	430H	LH	L	L	L							
15											410L	420L	L	410	L	L	A							
16											L	L	L	L	410L	L								
17											L	L	L	410	L	L	L							
18											L	400	A	400	400									
19										L	400L	410	430	L	400	A								
20											400	L	420	420	410	320								
21											L	400	440L	LH	L	LH								
22											370L	400	410	A	410	A								
23												LH	A	410	A	L								
24											380	380	410	410	I410A	A								
25											400	L	400	L	L	L	L							
26										L	410	420L	420	410	390	L								
27										L	410	L	390H	L	L	L								
28										L	L	L	L	L	L	L								
29										L	410	L	L	L	L	L								
30										L	370	420	430L	L	L	LH								
31											L	L	L	L	410L	L	290							
No.											11	20	19	17	13	2	1							
Median											400	420	420	410	400	340	290							
U. Q.																								
L. Q.																								
Q. R.																								

foF1

Sweep 1.0 Mc to 19.5 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 2

IONOSPHERIC DATA

Dec. 1965 | 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	200	260	300	300	300	I295A	290	I255A	I205A	S						
2								S	220H	260	290R	300	310R	300	295	265	190	S						
3								S	210	260	290	300	300	300	290	250	A	S						
4								S	210	I250C	270	280	I285R	A	A	A	230	S						
5								S	220	260	295	305	305	305	I290A	A	A	S						
6								S	210H	255	290	305	310R	I300R	I280A	250	A	S						
7								C	C	C	A	A	A	A	A	A	A	S						
8								S	200	260	290	310	310	310	I290A	260R	225	S						
9								S	200	250	290	A	R	310R	295	C	C	C						
10								S	190	260	I290H	295	300R	300	290	270	A	S						
11								S	220H	260	300	300	300	300	300R	270	220	S						
12								S	200	250	290	300	300	I300R	285	260	200	S						
13								S	190	250	280	300	305	295	290H	260	220	S						
14								S	A	260	290	300R	I300R	305R	I290A	I265A	230R	S						
15								S	180	265H	300H	305	I300R	I300A	A	A	A	S						
16								S	200	255	290	300	300	290	280	265	210	S						
17								S	205	260H	280R	I305R	305	305	280	I255A	I210A	S						
18								S	185	250	280	300	300	I300R	295	260	I210A	S						
19								S	A	250	290	290	310	300	I285A	I260A	230	S						
20								S	200	260	300	310	320	A	A	260	200	S						
21								S	A	A	270	300	305	I300R	285	I250R	210	S						
22								S	190	250	285	300	310	305	295	260	A	S						
23								S	190	250	290	I305R	310	305	I290A	270	230H	S						
24								S	200	I255A	295	300R	300	300	280	A	A	S						
25								S	200	250	270	295	300R	300	290	270	A	S						
26								S	A	250	290	300	305	300	295	260	220H	S						
27								S	180	250	290	305	300	300	290	I260A	220	S						
28								S	A	250	290	295	300R	I300A	A	A	A	S						
29								S	190	250	A	A	310	310R	295	I270A	230	S						
30								S	S	260	295	I305A	320	310	300R	260	220H	S						
31								S	200	250	285	I290A	310	310	310	285R	240	S						
No.									24	29	29	28	29	28	26	24	20							
Median									200	255	290	300	305	300	290	260	220							
U. Q.																								
L. Q.																								
Q. R.																								

foE

Sweep 1.0 Mc to 19.5 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 3

IONOSPHERIC DATA

Dec. 1965 | foEs | 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	E015S	E015B	E015S	E	E	E014S	E015S	E015S	027	029	040	J084	J056	042	060M	J035	J038	J030	J022	J021	018M	E015S	E015S	E015S
2	E015S	E015S	E015B	E014B	E015B	019M	E015S	E016S	G	G	032	042	J064	094M	J053	030	J033	J030	J027	J024	J036	J023	E019S	E015S
3	E015S	E015S	J022	J023	019M	E015S	E015S	E015S	G	G	034	J042	J049	J053	J043	031	025	J022	J016	J022	J022	E015S	E015S	E015S
4	E015S	E015S	E015B	021M	E014B	E015S	023	E015S	G	C	G	031	033	036	J038	J034	J028	J024	J022	J018	J021	E015S	E015S	E015S
5	E015S	E015S	027	E015B	J024	J022	J021	J022	018G	G	033	036	040	J054	037	J033	J041	J032	J055	J055	J061	J024	021M	E016S
6	E016S	E015S	020M	J021	023M	J024	022M	J019	G	033	036	J044	036	J047	J043	J040	J039	J051	J040	J036	J023	022	C	C
7	C	C	C	C	C	C	C	C	C	C	030	037	037	038	041	J038	025	J020	J019	J030	J033	030M	J024	J022
8	E015S	E015S	E014B	E	017M	E015S	E015S	E015S	G	G	G	039	039	037	031	032	026	J022	J030	020	J019	J031	J021	E014S
9	E016S	E015S	E013B	E015B	E013B	E015B	019M	E015S	G	G	033	033	030G	022G	032	C	C	C	C	C	C	C	018M	E017S
10	E015S	E015S	022M	E014B	020M	020M	024M	025	023	G	G	026G	G	035	G	033	J034	021	J018	J023	022M	018M	E015S	E015S
11	E015S	E015S	020M	E	E	E013S	E015S	E015S	G	G	G	036	039	024G	021G	030	027	024	J032	J022	J019	029M	E015S	E015S
12	E015S	E014S	E015B	E013B	E	E015S	E016S	J024	023	029	035	J054	038	030G	G	J022G	027	022	021M	J018	J021	E015S	E015S	E016S
13	E016S	E014S	E015S	E015B	E	E015S	E014S	E015S	G	035	038	032	043	040	032	037	027	025	J024	J023	034M	E015S	J020	J022
14	J017	E015S	023M	E013B	020M	E015S	022M	023	J025	021G	033	027G	029G	J028G	J040	031	023G	J024	J025	J020	J023	025	E015S	E015S
15	E015S	E015S	E	E012B	J019	J023	021M	J023	G	G	033	034	034	J033	J044	J051	J040	E015S	E015S	E015S	E015S	J032	J030	E015S
16	E015S	J052	E013B	019	J020	021	J025	J019	J024	020G	035	038	051	038	046	037	028	018	J023	J019	J019	E016S	E014S	E014S
17	J022	J022	J020	E013B	J021	024M	J015	E015S	G	029	029	033	J051	033	034	033	030	J036	019	021M	022M	022M	J021	E015S
18	J018	J018	J020	021	021M	E015S	J024	J022	024	030	030	039	J053	036	023G	034	037	028	J024	J024	022M	J022	J028	J052
19	E015S	J021	022M	E013B	022M	024M	E015S	023M	025	028	034	J039	G	035	031	J058	J024	020	J023	J024	J023	E015S	E015S	E015S
20	E015S	E015S	022	E013B	E015B	E015S	021M	E015S	G	J023G	G	034	038	034	J033	G	028	017	E015S	E015S	E015S	E015S	E015S	E015S
21	E015S	E013B	E015B	022M	E015B	E015B	J018	J021	019	029	029	G	029G	030G	G	023G	J030	J024	J019	019M	E015S	023M	E015S	020M
22	E015S	E015S	E014S	E015B	018M	018M	E016S	E015S	G	G	G	040	040	042	041	070M	J044	142M	023	J035	J023	J021	E015S	J020
23	J031	019M	020M	020	023M	J039	J025	J051	J032	G	J025G	035	042	035	051	033	030	022	030	J040	J054	E016S	E015S	E015S
24	E015S	E015S	E018B	E011B	E015B	E015S	023M	021M	J031	J047	G	J024G	028G	032	J051	J051	J032	J065	J041	023M	019M	J021	J021	J021
25	J020	J024	J020	018M	E013B	E013B	E015S	E015S	G	026	029	G	G	034	032	037	031	026	J047	J036	J038	029	060M	J056
26	J038	J038	020M	J022	E	J021	J021	J022	J034	G	G	G	G	027G	022G	021G	019G	J036	J040	J040	J022	J027	020M	020M
27	E015S	E015S	020	J027	019M	023M	J031	036M	J026	044M	J047	029G	025G	G	G	026	025	021	J019	J016	J013S	E015S	E015S	E015S
28	E016S	E014S	E	026	025	022	023	023	J024	G	027G	026G	025G	032	J031	028	032	039	020	J029	J016	J017	J015S	J081
29	J062	J036	J021	J024	J016	E014B	E015S	E015S	G	029	J033	J063	028G	025G	022G	J031	J023G	J029	J024	J023	021M	018	E016S	E015S
30	E015S	E013B	E014B	E015B	E013B	E011B	E015S	J022	J022	G	G	J034	027G	021G	025G	J022G	026	021	E015S	021M	E015S	E015S	E015S	E015S
31	J032	J022	J021	J021	022M	J019	J019	021M	G	031	031	J033	J032	030G	023G	027G	026	J027	030	J021	J021	J016	J017	E015S
No.	30	30	30	30	30	30	30	30	30	29	31	31	31	31	31	30	30	30	30	30	30	30	30	30
Median	E015S	E015S	020	E015	018	E015	019	020	G	G	030	034	035	034	032	033	028	J024	J023	J022	J022	020	E015S	E015S
U. Q.	017	019	021	021	021	022	023	023	024	029	034	039	042	038	043	037	033	030	030	029	023	024	021	020
L. Q.	E015	E015	E015	E013	E013	E015	E015	E015	G	G	G	G	G	G	G	028	026	021	019	020	019	E015	E015	E015
Q. R.	D002	D004	D006	D008	D008	D007	D008	D008								009	007	009	011	009	004	D009	D006	D005

The Radio Research Laboratories, Japan

foEs

Sweep 1.0 Mc to 19.5 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Dec. 1965 | 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	S	B	S			S	S	S	G	029	037	037	046	030	023	029	025	G	022	019	E	S	S	S
2	S	S	B	B	B	E	S	S			032	040	A	A	033	030	031	G	023	019	030	020	S	S
3	S	S	015	014	015	S	S	S			033	041	045	046	040	030	025	018	E	017	E	S	S	S
4	S	S	B	E	B	S	016	S		C		G	032	032	034	029	020	018	E022S	E	E	S	S	S
5	S	S	025	B	015	E	E	016	G		G	035	040	045	031	030	030	018	020	A	A	E024S	018	S
6	S	S	E	015	020	E	E	G		032	034	039	033	039	041	033	033	034	020	023	021	016	C	C
7	C	C	C	C	C	C	C	C	C	C	E030R	035	036	037	038	033	024	016	E	023	026	019	E	E
8	S	S	B		E	S	S	S				037	036	035	031	032	026	018	E030S	016	E	018	E	S
9	S	S	B	B	B	B	E	S			033	E033R	E030R	021G	E032R	C	C	C	C	C	C	C	E	S
10	S	S	013	B	E	E	E	016	G			025G		035		031	032	018	E	E	E	E	S	S
11	S	S	E	E	E	S	S	S				035	038	024G	020G	030	026	023	E032S	E	E	016	S	S
12	S	S	B	B	E	S	S	015	E023R	029	033	045	037	E030R		019G	025	020	E	E	018	S	S	S
13	S	S	S	B		S	S	S		034	037	030	040	038	031	037	026	021	021	020	017	S	E	E
14	E	S	E	B	E	S	E	G	023	019G	032	026G	E029R	025G	034	031	018G	021	020	016	019	018	S	S
15	S	S		B	016	E	E	016			G	G	033	032	034	035	033	S	S	S	S	A	A	S
16	S	020	B	E	016	016	A	G	G	017G	032	035	038	034	032	032	027	017	016	E	017	S	S	S
17	016	016	E	B	015	E	S	S		028	E029R	032	034	033	034	030	024	033	018	E	E	E	E	S
18	E	E	E	015	E	S	E	017	023	030	030	032	046	035	021G	032	037	025	023	022	016	016	E	A
19	S	E	E	B	E	E	S	G	024	G	032	035		034	E031R	044	019	G	018	024	E023S	S	S	S
20	S	S	E	B	B	S	E	S		G		033	033	031	031		026	016	S	S	S	S	S	S
21	S	B	B	012	B	B	E	G	019	028	E029R		026G	E030R		020G	027	020	017	016	S	E	S	E
22	S	S	S	B	E	E	S	S				038	038	041	035	043	035	A	E	025	019	017	S	E
23	019	E	E	E	013	020	019	020	023		022G	035	041	034	049	030	G	020	019	A	019	S	S	S
24	S	S	B	B	B	S	E	G	021	030		022G	021G	032	044	048	031	A	A	019	E	019	E021S	016
25	E	017	E	015	B	B	S	S		G	E029R			034	G	031	028	019	A	A	A	019	A	A
26	A	016	E	018		015	E	G	020					026G	021G	021G	016G	024	025	A	022	E027S	018	E
27	S	S	015	014	013	015	A	016	015	019	021	019G	019G			E026R	G	020	016	E	S	S	S	S
28	S	S		E	013	E	E	016	019		022G	021G	025G	032	031	028	024	032	017	016	S	E	S	A
29	017	A	E	018	015	B	S	S		028	030	034	026G	021G	021G	029	020G	025	022	017	E	E	S	S
30	S	B	B	B	B	B	S	018	020			032	026G	019G	025G	020G	026	020	S	E	S	S	S	S
31	A	017	015	018	E	E	016	G		030	030	033	030	027G	021G	020G	G	021	018	E	018	E	E	S
No.																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

f_bEs

Sweep 1.0 Mc to 19.5 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 5

IONOSPHERIC DATA

Dec. 1965 | 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	E015S	015	E015S	E	E	E014S	E015S	E015S	014	015	015	015	015	015	015	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S
2	E015S	E015S	015	014	015	014	E015S	E016S	015	015	015	015	015	015	015	015	015	E015S	E015S	E015S	E015S	E015S	E019S	E015S
3	E015S	E015S	011	E	E	E015S	E015S	E015S	015	015	015	015	015	015	016	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S
4	E015S	E015S	015	015	014	E015S	E015S	E015S	015	C	017	017	016	015	015	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S
5	E015S	E015S	014	015	E	E015S	E015S	E015S	015	015	015	015	014	013	015	014	015	E015S	E015S	E015S	E015S	E015S	E015S	E016S
6	E016S	E015S	014	E	E	E015S	E015S	E015S	014	015	015	015	016	015	015	015	015	015	E015S	E015S	E015S	E015S	C	C
7	C	C	C	C	C	C	C	C	C	C	015	015	015	015	015	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S
8	E015S	E015S	014	E	012	E015S	E015S	E015S	015	015	015	015	014	015	015	014	014	E015S	E015S	E015S	E015S	E015S	E015S	E014S
9	E016S	E015S	013	015	013	015	E015S	E015S	015	015	015	015	015	015	015	C	C	C	C	C	C	C	E015S	E017S
10	E015S	E015S	011	014	014	E013S	E015S	E015S	015	015	015	015	014	015	015	014	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S
11	E015S	E015S	E014S	E	E	E013S	E015S	E015S	015	015	015	015	015	015	015	012	014	E015S	E015S	E015S	E015S	E015S	E015S	E015S
12	E015S	E014S	015	013	E	E015S	E016S	E013S	015	015	015	015	015	015	015	013	015	E016S	E015S	E015S	E015S	E015S	E015S	E016S
13	E016S	E014S	E015S	015	E	E015S	E014S	E015S	015	015	015	015	015	015	017	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S
14	E015S	E015S	015	013	E	E015S	E014S	E015S	015	013	015	015	015	015	015	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S
15	E015S	E015S	E	012	011	E016S	E016S	E015S	015	015	014	013	015	013	012	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S
16	E015S	E013S	013	E	E	E014S	E015S	E015S	015	015	014	014	015	015	015	015	E015S	E015S	E015S	E015S	E015S	E016S	E014S	E014S
17	E015S	E015S	014	013	E	E015S	E015S	E015S	E015S	015	015	014	015	014	015	015	015	E016S	E015S	E015S	E015S	E016S	E015S	E015S
18	E015S	E015S	013	E	E	E015S	E015S	E015S	015	015	015	014	015	015	014	015	015	E014S	E015S	E015S	E015S	E015S	E015S	E015S
19	E015S	E015S	015	013	E	E017S	E015S	E016S	015	015	015	015	014	014	014	015	013	E013S	E015S	E015S	E015S	E015S	E015S	E015S
20	E015S	E015S	014	013	015	E015S	E015S	E015S	015	014	015	015	015	015	014	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S
21	E015S	013	015	E	015	015	E015S	E015S	E015S	015	014	015	015	015	015	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S
22	E015S	E015S	E014S	[illegible]	015	E015S	E016S	E015S	E015S	015	015	016	017	015	015	013	E015S	E015S	E015S	E015S	E015S	E015S	E015S	E015S
23	E015S	E016S	015	[illegible]	E	E014S	E016S	E015S	E015S	015	015	015	017	015	015	015	015	E015S	E015S	E015S	E015S	E016S	E015S	E015S
24	E015S	E015S	018	011	015	E015S	E015S	E015S	015	015	015	014	014	014	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S	E015S
25	E015S	E014S	E015S	E	013	013	E015S	E015S	015	015	014	015	015	015	014	015	015	E015S	E015S	E015S	E015S	E015S	E016S	E015S
26	E016S	E014S	E014S	E	E	E	E015S	E017S	E015S	015	015	016	015	017	015	015	015	E015S	E015S	E015S	E015S	E015S	E016S	E015S
27	E015S	E015S	013	E	E	E013S	E015S	E015S	E014S	015	015	013	015	017	016	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S	E015S
28	E016S	E014S	E	014	E	E015S	E015S	E015S	014	014	015	015	016	019	016	015	015	E013S	E015S	E015S	E015S	E015S	E016S	E015S
29	E015S	015	012	E	E	014	E015S	E015S	013	015	015	015	016	015	015	015	015	E014S	E015S	E015S	E015S	E015S	E016S	E015S
30	E015S	013	014	015	013	011	E015S	E015S	015	015	018	015	017	018	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S	E015S
31	E015S	E015S	012	015	E	E014S	E015S	E015S	015	015	016	015	016	015	015	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S
No.	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31	30	30	30	30	30	30	30	30	30
Median	E015S	E015S	014	013	E	E015S	E015S	E015S	015	015	015	015	015	015	015	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E015S
U. Q.																								
L. Q.																								
Q. R.																								

f-min

Sweep 1.0 Mc to 19.5 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 6

IONOSPHERIC DATA

Dec. 1965 | 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	J275S	I275S	I285S	J315S	360S	265S	290S	350	335S	345	U350S	335S	I345S	I345S	350	360S	350S	345	350	U295S	J305S	U285S	305S	315S
2	280S	U275S	275	330	295	355	285S	U325S	330	375	340	365	A	I335A	340	J330S	I360S	350S	J270S	325	340S	290	300S	305
3	I300S	300S	J300S	280	295S	I320S	290S	335S	350	J345S	J355S	355	330S	340S	330	J340S	345	350	340S	290	310	J335S	285	290
4	295F	J330S	I310S	J285S	J350S	J330F	305S	330S	345	I350C	365	I355S	300S	365	345	360	355S	350	J305S	310	J300S	335	J285S	285
5	J295S	290S	340S	305	280	350S	340S	350	345	345S	360	340	350	335	330	345	355S	355	330	A	A	S	270S	280
6	290	290	300	330S	I340S	330S	280	315S	345	335	340	360	335	350	370S	345	350	345	335	I320S	355	280	C	C
7	C	C	C	C	C	C	C	C	C	C	360	380S	365	335	350	I350S	375	360	330	305	350	J310S	290S	295
8	300	305	295	285	325	340	320	335S	350S	345	345	325	335S	365	360	345	350S	370S	I340S	300	300	320	310S	285
9	310	305	295	295	305	320	340S	I330S	370	350	J325S	355	340S	355	305	C	C	C	C	C	C	C	275	275S
10	295	295	295	295	305S	295	325S	345S	380S	350S	350	350	335	345S	345	360	365	350S	330S	305S	310	I310S	285S	275
11	I310S	J300S	I280S	I305S	I320S	S	J310S	I330S	335	320	340S	J325S	J330S	I350S	J330S	350	J355S	355	I340S	J315S	I325S	340	280	290
12	305	J300S	295	285	325S	350	J310S	J320S	325	340	360	360	340	350	350	350	360	345	320S	350	335	305	270	290
13	285S	295S	275F	300	U350S	345	J315S	330	350	370	J310H	365S	340S	365	355	325	335	355	315	I360S	340S	J350S	J280S	305S
14	J305S	315	290	300	340S	285	310	325S	J360S	345S	360S	J335S	J345S	350S	355	370	360	375	340	350	320	J315S	305	310S
15	U290S	290S	285	300	290	I300S	315S	J335S	J365S	355	340S	365S	J350S	345	355	345	345	340	345S	345S	320	I330A	I305A	315
16	310S	295S	J270S	I280S	U325S	320	I310A	335S	365	365	355S	J320S	I340S	355	345	365	360	I360S	350	330	295S	J325S	310	335
17	300	295	285	285	325S	J365S	310	330S	360S	355	365	300	340	340	350	J355S	355	350S	290	305	J360S	J325S	300	290
18	310	290	290	300	S	380	300	I330S	345	365	350	350	360Z	360	365	340	350	355	J370S	315	285	J355S	310	I290A
19	280S	285	J285S	290S	300	290	J325S	310S	345	340	335	J345S	325V	365	365S	355	340	350	340	S	I350S	295	285	295
20	325	265	290	J285S	I320S	280	310	U310S	355	355	335	325	345	325	340	J335S	345	350	340S	J315S	305S	J290S	310	295
21	290	305	310	305	340S	325S	I310S	J320S	360	355	315	345	325	350S	350	350	370	365	295S	I340S	350	310	295S	290S
22	300	285	265S	U285S	J320S	350	315	340S	355	360	365	360	350	350	J330S	340	365	I360A	J315S	315S	J355S	325S	305	310
23	305S	280S	275S	280Z	I300S	I340S	S	340S	355S	350	350	340	350	340	J345V	350	J315S	340	I355S	I340A	I330S	310	J285S	295S
24	320	290	300S	290S	J285F	J335S	325S	360	370	355	360	365	345	360	340	355	355S	I345A	I335A	330	365	355S	I285S	I285S
25	320S	285	305	J350S	325	J290F	320S	345S	365	350	320	305S	345	350	355	335	350	390S	I330A	A	I310A	285	A	A
26	A	265S	F	I335S	J300S	310S	320	300S	345	315	320	345	355S	360	355	350	385	350S	315	A	I335S	I325S	345S	275
27	325	265	280	295S	310	260F	I280A	325	345	I335S	345	J380S	355	350	355	360	385	350S	365	370	345	J310S	I300S	315S
28	340	325	310	290	290	I290S	310	345S	J365S	360	350	350S	340S	345	345	345S	360	365	J350S	S	345	335	290	I295A
29	I285S	I285A	I290S	290	305	300	295S	J320S	350	350	320	365S	340	345	J345S	345S	370	365	285	315	340S	340	290	J290S
30	320	300	295	310	305	300	J320S	335S	350S	350	J350S	345S	320S	335	360	355	365S	380	285H	315S	370S	370S	285	290
31	I285A	305	300	305	335	345	300	315S	365	370	355S	350S	340S	340	370	370	345	340	J350S	330	J325S	J340S	335S	275
No.	29	30	29	30	29	29	29	30	30	30	31	31	30	31	31	30	30	30	30	25	29	29	29	29
Median	300	290	290	295	320S	320	310S	330S	350	350	350	350	340	350	350	350	355	350	335S	315	335S	325S	290	290
U. Q.																								
L. Q.																								
Q. R.																								

M(3000) F2

Sweep 1.0 Mc to 19.5 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Dec. 1965 | 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	L	355	A	365	L	L	L							
2											L	A	A	A	385	L	A							
3											L	A	A	A	L	L								
4										C	L	380	365	L	385L	L	L							
5										L	L	L	L	L	400	400	L							
6										L	L	A	370L	A	A	L	A							
7										C	L	415	400L	390	L	L	L							
8										L	L	370	370	380	LH	L								
9											L	400	380	385	L	C	C							
10										L	L	395L	380	355	395	L								
11										L	L	355	L	390	L	L	L							
12										L	L	A	375	375	L	L								
13												LH	A	380	385	A								
14											370	400	390H	LH	L	L	L							
15											370L	380L	L	390	L	L	A							
16											L	L	L	L	390L	L								
17											L	L	L	390	L	L	L							
18											L	385	A	400	375									
19										L	375L	375	375	L	365	A								
20											385	L	380	380	390	410								
21											L	395	370L	LH	L	LH								
22											385L	A	A	A	380	A								
23												LH	A	365	A	L								
24											395	390	380	380	A	A								
25											375	L	395	L	L	L	L							
26										L	365	355L	375	370	385	L								
27										L	365	L	410H	L	L	L								
28										L	L	L	L	L	L	L								
29										L	385	L	L	L	L	L								
30										L	390	375	380	L	L	LH								
31											L	L	L	L	390L	L	450							
No.											11	15	16	15	12	2	1							
Median											375	380	380	380	385	405	450							
U. Q.																								
L. Q.																								
Q. R.																								

Sweep 1.0 Mc to 19.5 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

M(3000) F1

Y 8

IONOSPHERIC DATA

Dec. 1965 | 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										260	250	260	250	250	240	225	220							
2											245	230	I240A	I270A	250	230	225							
3											230	240	270	235	245	250								
4										I240C	250	250	295	240	245	230	230							
5										240	240	245	255	275	250	235	230							
6										255	250	250	260	255	230	235	230							
7										C	230	225	235	255	245	240	215							
8										250	245	270	255	240	230	250								
9											300	240	275	260	280	C	C							
10										230	240	245	270	270	270	240								
11										255	265	270	245	245	275	245	235							
12										250	240	250	255	250	240	245								
13												235	255	240	250	245								
14											230	240	260	250	250	235	230							
15											260	235	250	250	245	255	240							
16											250	285	255	250	240	230								
17											240	300	255	260	260	240	240							
18											250	245	250	245	245									
19										235	250	250	255	240	240	245								
20											275	270	250	260	260	245								
21											290	250	270	245	250	235								
22											250	255	255	270	275	255								
23												265	235	275	260	240								
24											250	240	270	245	250	255								
25											260	285	250	230	250	260	225							
26										270	280	245	235	250	245	250								
27										250	245	230	250	255	250	245								
28										230	245	245	255	250	245	250								
29										245	280	240	255	250	245	250								
30										240	240	255	280	255	240	240								
31											245	260	255	255	240	230	230							
No.										14	29	31	31	31	31	29	12							
Median										250	250	250	255	250	245	245	230							
U. Q.																								
L. Q.																								
Q. R.																								

h'F2

Sweep 1.0 Mc to 19.5 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 9

IONOSPHERIC DATA

Dec. 1965 | 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	320	300	265	220	190	E410S	E320S	225	220H	230	E250A	E250A	A	220	210H	220	210	220	215	235	250	230	250	250
2	295	295	305	225	265	230	E320S	255	230	225	230	I225A	A	A	215	225	I210A	215	E280A	245	240	E300A	255	275
3	250	270	270	300	290	220	250	220	215H	225H	240	A	A	A	A	200	225H	210	195	255	240	195	E295S	285
4	300	280	250	240	225	235	E270A	220	230	I230C	235	230	205	220	215	210	205	205	E300S	210	235	225	255	285
5	290	280	235	255	325	225	240	225	240	230	225	240	I240A	I235A	225	205	I225A	200	230	I275A	I260A	I265A	E325A	E290S
6	300	300	265	225	225	225	E335S	250	225	235	240	I220A	225	I230A	I225A	230	A	240	225	230	215	315	C	C
7	C	C	C	C	C	C	C	C	C	C	225	220	215	225	I225A	225	220	200	220	265	E240A	245	260	285
8	290	300	280	270H	270	220	250	230	190H	235	220	E250A	220H	245	210H	225	230	200	I200A	230	220	250	250	E300S
9	260	255	270	300	280	250	205	240	210	200H	230	225	205	225	240	C	C	C	C	C	C	C	275	300
10	275	280	260	260	260	265	270	230	220	205	225	225	250	250	220	230	215	205	240	240	250	260	300	300
11	255	270	250	275	235	215	245	225	230	240	225	240	240	215	195	225	240	210	A	220	215	240	E325S	E300S
12	275	250	280	300	240	205	E250S	200	240	245	235	I225A	230	205	230	220	225	230	225	215	220	E260S	E320S	E320S
13	310	270	310	280	220	200	E410S	230	230	230	225	200H	A	E240A	200	I210A	225	225	210	215	E245A	240	E300S	320
14	295	300	255	275	225	I275S	E300S	240	240	240H	210	195	190H	195H	230	245	205	215	210	210	255	250	270	270
15	295	305	270H	280	290	285	250	230	225	225	240	220	215H	190	235	E250A	I235A	225	205	200	245	I255A	A	250
16	E300S	E310A	325	280	240	240	A	210	225	225	240	220	240	200	220	220	220	205	205	200	275	245	270	230
17	280	305	310	305	240	205	280	230	220	220H	225	190H	245	200	E240A	240	225	205	225H	220	220H	S	E300S	285
18	290	300	315	300	230	200	E310S	230	235	235H	225	205H	I235A	215	195	240H	245	220	200	250	E290A	200	250	I230A
19	320	295	280	300	275	310	255	235	250	230	230	230	250	230	225	I210A	230	225	225	210	I240A	300	275	245
20	270	350	305	305	240	300	280	230	215H	220H	205	240	225	210	205	210	230	215	200	235H	220	225	250	290
21	295	255	260	275	220	230	290	240	200H	200H	230	200H	180H	195H	255	190H	220	200	245	225	205	215	250	300
22	295	300	300	290	250	210	E275S	240	240	230	225	I230A	I220A	I235A	230	I230A	230	I210A	225H	E290A	215	250	250	265
23	280	300	325	325	275	240	E300A	255	210H	200H	230H	E250A	I225A	230	I235A	240	230	205	205	I240A	260	260	E335S	280
24	260	E300S	E375S	320	300	245	225	200	190H	200H	200	230	225H	220H	I235A	I235A	235	I230A	I245A	240	210	250	A	300
25	290	310	280	250	250	275	255	225	210H	200H	200H	180H	200	225	235	240	220	210	I220A	I245A	A	305	A	A
26	A	300	280F	240	220	E300A	E300S	260	240H	240	235	210H	205H	200H	225	200H	210	225H	E275A	I245A	225	I265A	240	345
27	270	E400S	330	290	280	300	A	250	240	215H	205	190H	200	200H	195H	235	220	205	215	220	220	275	255	250
28	240	270	255	295	305	320	300	245	210H	205H	225	200H	205	210	220	205	230	235	205	230	210	225	300	I300A
29	285	I320A	300	340	285	280	300	250	230	210H	195H	240	215	200H	240	220	230	210	E330A	250	220	225	E270S	300
30	250	275	290	260	255	275	250	225	210H	230	235	220H	205	200	250	200H	230	215	200H	250	210	205	E330S	275
31	I305A	290	290	285	250	235	E330A	250	230	230	230	220	200H	220	225	220	200	230	210	245	225	210	E245S	E350S
No.	29	30	30	30	30	30	28	30	30	30	31	30	27	29	30	30	29	30	29	30	29	29	27	29
Median	290	295	280	280	250	240	U255	230	225	230	225	220	220	220	225	220	225	210	215	230	220	250	260	280
U. Q.																								
L. Q.																								
Q. R.																								

h'F

Sweep 1.0 Mc to 19.5 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 10

IONOSPHERIC DATA

Dec. 1965 | h'Es | km | 135° E Mean Time (G. M. T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	B	S	E	E	S	S	S	140	130	125	120	110	110	105	100	100	100	100	100	100	S	S	S
2	S	S	B	B	B	150	S	S	G	G	145	125	120	115	120	120	110	100	100	110	105	100	S	S
3	S	S	105	105	105	S	S	S	G	G	140	125	120	115	115	120	115	110	105	105	100	S	S	S
4	S	S	B	115	B	S	100	S	G	C	G	125	120	115	110	105	105	100	100	100	100	S	S	S
5	S	S	105	B	105	100	100	100	105	G	150	140	130	120	120	115	105	125	115	100	100	095	100	S
6	S	S	105	105	105	100	100	100	G	155	140	125	120	120	130	115	110	100	100	100	100	100	C	C
7	C	C	C	C	C	C	C	C	C	C	110	160	170	155	120	110	150	100	100	100	120	115	120	120
8	S	S	B	E	110	S	S	S	G	G	G	145	140	130	E145G	170	170	100	100	125	120	115	105	S
9	S	S	B	B	B	B	105	S	G	G	155	125	120	100	145	C	C	C	C	C	C	C	105	S
10	S	S	105	B	105	105	100	105	140	G	G	105	G	155	G	125	115	110	105	100	100	100	S	S
11	S	S	100	E	E	S	S	S	G	G	G	130	125	100	100	150	145	180	150	125	120	105	S	S
12	S	S	B	B	E	S	S	100	150	145	135	125	115	115	G	100	125	100	100	120	125	S	S	S
13	S	S	S	B	E	S	S	S	G	145	125	130	125	120	140	120	155	145	125	115	110	S	110	110
14	110	S	105	B	110	S	105	105	100	100	150	105	110	100	095	095	095	095	095	100	100	100	S	S
15	S	S	E	B	100	100	100	100	G	G	160	145	135	105	100	100	100	S	S	S	S	100	105	S
16	S	110	B	120	110	105	100	100	100	100	120	120	120	120	120	120	115	110	105	110	105	S	S	S
17	100	100	105	B	110	105	S	S	G	130	125	125	120	125	115	100	115	115	115	110	105	110	105	S
18	105	110	100	100	100	S	110	105	150	145	150	130	120	150	100	150	140	125	120	110	100	100	110	105
19	S	105	105	B	120	125	S	100	155	145	145	125	G	125	120	100	100	150	100	095	095	S	S	S
20	S	S	100	B	B	S	100	S	G	100	G	150	130	110	110	G	140	120	S	S	S	S	S	S
21	S	B	B	110	B	B	100	100	120	110	130	G	105	105	G	105	100	095	100	100	S	120	S	125
22	S	S	S	B	125	120	S	S	G	G	G	130	145	140	140	120	110	100	110	110	100	100	S	105
23	105	110	120	125	115	105	100	100	100	G	100	150	140	130	135	150	180	150	125	105	105	S	S	S
24	S	S	B	B	B	S	105	100	100	100	G	100	100	130	110	110	110	105	100	100	100	095	095	105
25	120	110	110	105	B	B	S	S	G	125	125	G	G	125	150	130	110	105	105	100	100	100	100	105
26	105	105	115	110	E	105	100	100	100	G	G	G	G	105	105	100	100	105	100	100	100	095	100	100
27	S	S	105	105	110	100	100	100	100	100	100	100	100	G	G	110	150	120	100	100	S	S	S	S
28	S	S	E	105	100	105	100	100	110	G	105	105	105	105	105	105	110	105	105	110	S	100	S	110
29	100	105	105	100	100	B	S	S	G	135	105	105	100	100	105	100	100	100	100	100	100	100	S	S
30	S	B	B	B	B	B	S	100	100	G	G	100	100	105	100	100	150	130	S	100	S	S	S	S
31	110	105	105	105	105	105	100	100	G	125	120	110	110	105	105	105	130	100	100	100	100	100	100	S
No.	8	9	16	13	17	14	17	17	15	16	22	28	27	30	27	29	30	29	27	28	24	19	12	9
Median	105	105	105	105	105	105	100	100	105	130	130	125	120	115	110	110	110	105	100	100	100	100	105	105
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

h'Es

Sweep 1.0 Mc to 19.5 Mc in 20 sec in automatic operation

Y 11

IONOSPHERIC DATA

Dec. 1965 | 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									h2	h2	c2	c2	c2	c2	13	12	12	1	f2	f2	f			
2						f					h	h2	c2	c3	c2	c	c512	14	f3	f2f	f2	f3		
3			f3	f2	f2						h2	h2	c4	c3	c3	c	c5	12	f	f2	f			
4				f			f2					c	c 1	c 1	c 1	12	13	13	f2	f2	f		f2	
5			f5		f2	f3	f2	12	1		h	h2	h21	c212	c 13	c 12	13c	c 1	f f4	f2	f2	f3	f	
6			f	f	f3	f3	f2	1		h2	h2	c2	c	c31	c312	c2	13	13	f3	f3	f2	f		
7											1	h 1	h 1	h 1	c31	13	h 12	1	f	f3	f f	f2	f	f
8					f							h3	h21	h2	h 1	h c 1	h c 1	1 h	f4	f2	f	f2	f	
9							f				h212	c 1	c 1	1	h 1								f	
10			f		f	f	f	12	h212			1		h		h	c3	1	f	f	f	f		
11			f									h21	h21	1	1	h 1	h 1	h 1	f2f	f	f	f2		
12								1	h21	h21	h212	h212	c212	1		1	h	1	f	f	f			
13										h21	h3	h	h	c2	h	c2	h	h3	f4	f2	f		f	f2
14	f		f		f		f2	12	13	12	h 1	1	1 1	12	14	12	12	16	f3	f	f	f		
15					f	f	f	12			h	h	h 1	12h	13	14	12					f2	f3	
16		f2		f	f3	f2	f5	12	12	1	c 12	c21	c212	c 12	c 12	c 12	c5	c	f	f	f2			
17	f	f2	f		f2	f	f			h	h	h	c2	c	c2	14	c2	c512	f2f	f	f	f	f	
18	f	f	f2	f	f		f2	13	h	h	h 12	h	c3	h212	12	h 13	h212	h31	f2f2	f3f	f	f	f f	f2
19		f	f		f	f		1 h	h21	h	h2	c2		c212	c 12	13	12	h 1	f2	f3	f2			
20			f				f			1		h	h	1	12		h212	c						
21				f			f3	1	c2	12	h		12	12		12	13h	12	f	f f		f		f f
22					f	f						h2	h2	h2	h2	c4	13	12	f f2	f2f2	f2	f		f
23	f3	f	f	f2	f2	f2	f2	13	13		12	h 1	h	h2	h21	h 13	h 1	h	f2f	f2f	f2f			
24							f	1	12c	12		12	1	c 12	c2	c4	c41	17	f4	f	f	f	f	f
25	f	f2	f2	f						c21	c			c	h c	h	c314	12	f3	f4	f3	f	f2	f f
26	f2	f2	f	f2		f2	f2	12	12c					1	1	1	1	14	f3	f2	f3	f2	f	f
27			f2	f3	f	f2	f4	12	1	1	13	1	1			1	h 1	c 1	f	f	f			
28				f	f	f	f2	12	1		1	1	1	12	1	1	12	12	f2	f	f	f	f	f?f
29	f2	f3	f	f2	f					c 12	12	12	1	1	1	12	1	13	f2	f	f	f		
30								12	1			1	1	1	12	1	h	h2		f				
31	f	f	f	f	f	f2	f3	13		h	c	1	1	1 1	1	1	h	12	f	f	f	f	f	
No.																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

Sweep 1.0 Mc to 19.5 Mc in 20 sec in automatic operation

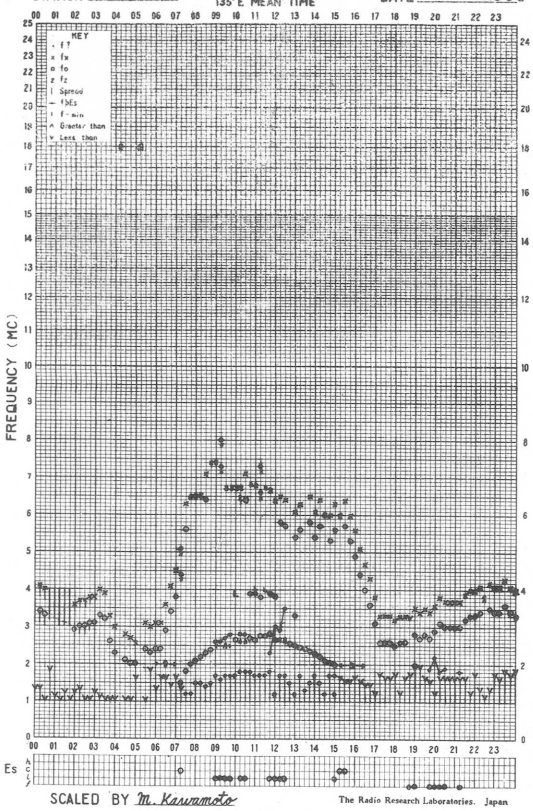
The Radio Research Laboratories, Japan

Types of Es

Y 12

f-PLOT OF IONOSPHERIC DATA

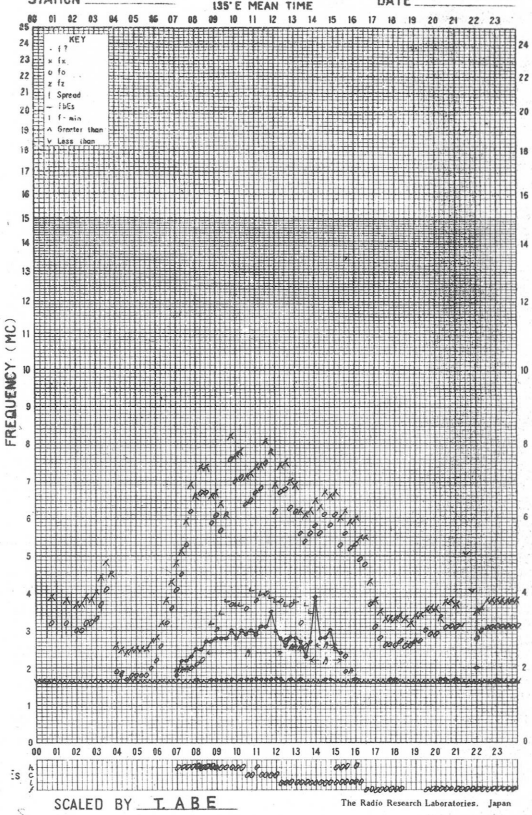
STATION WAKKANAI 135°E MEAN TIME DATE DEC. 1.1965



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Dec. 1. 1965



SCALED BY T. ABE The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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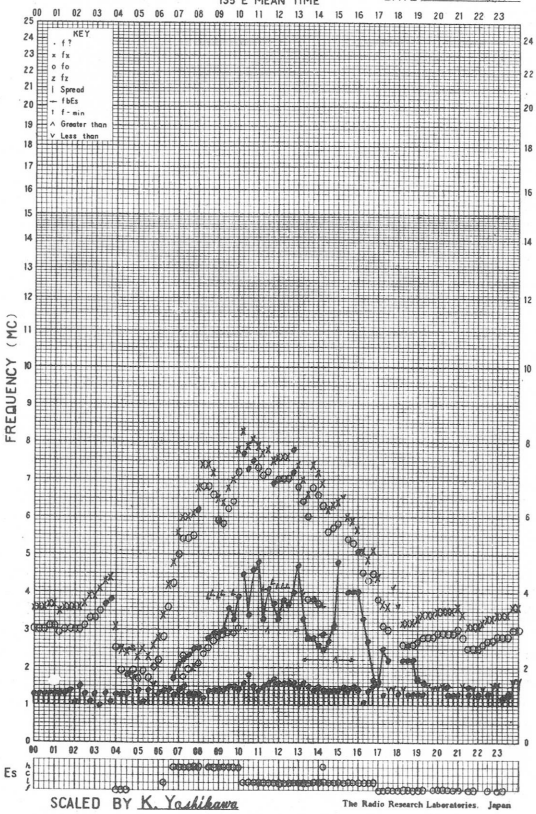
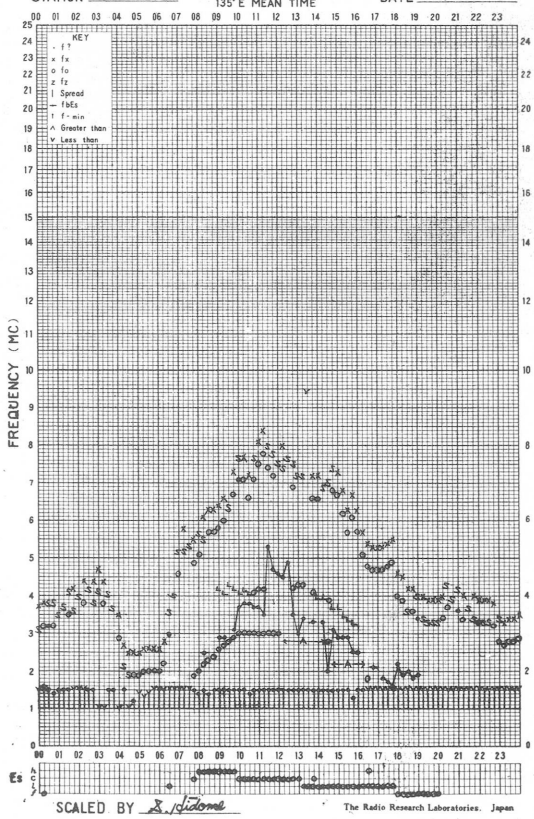


SCALED BY K. Yoshikawa The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

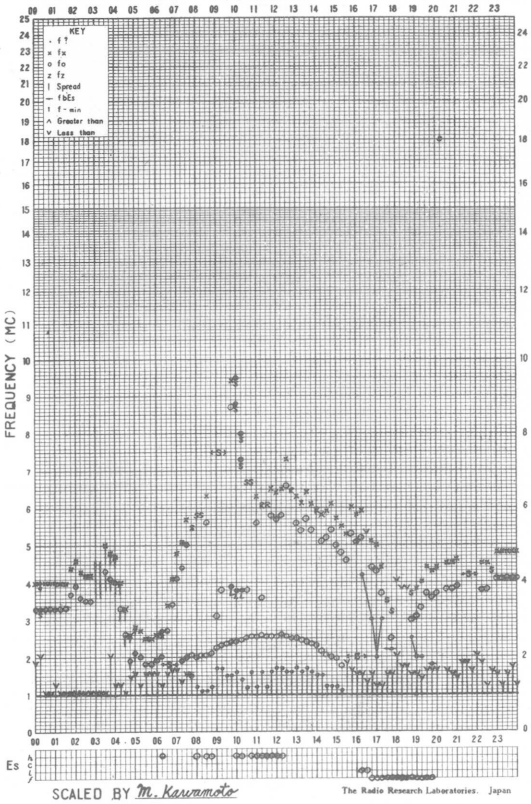
STATION YAMAGAWA 135°E MEAN TIME DATE DEC. -1.1965



SCALED BY S. Tidomi The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE DEC. 2.1965

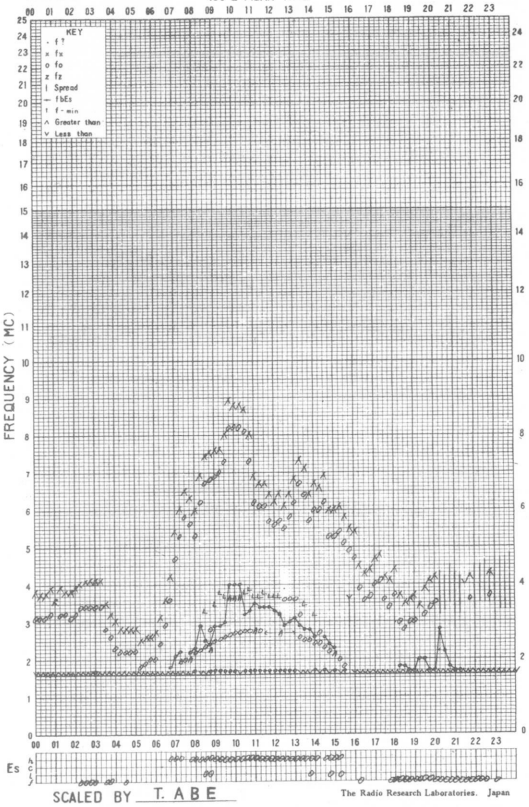


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Dec. 2 1965

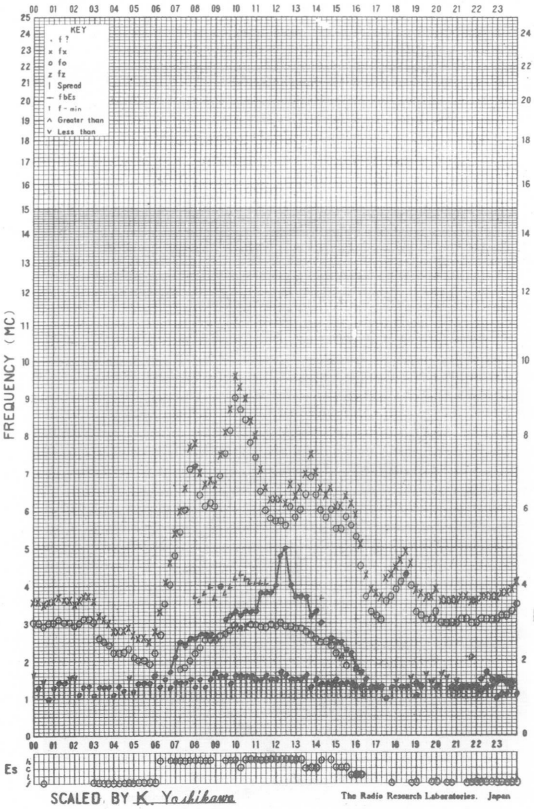


SCALED BY T. ABE

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE DEC. 2 1965

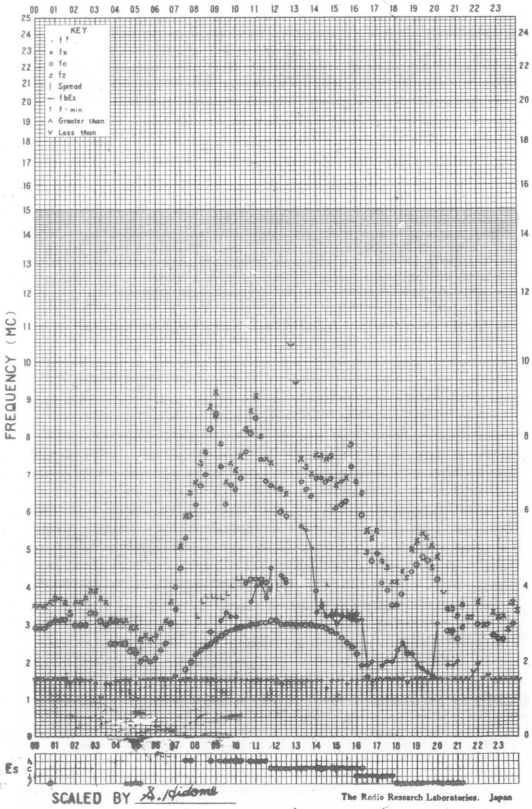


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE DEC. - 2. 1965

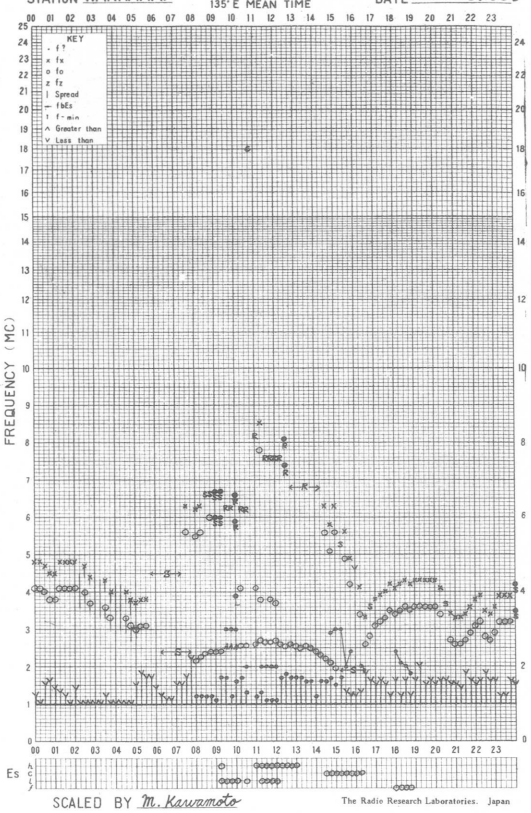


SCALED BY S. Kidoma

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE DEC. 3.1965

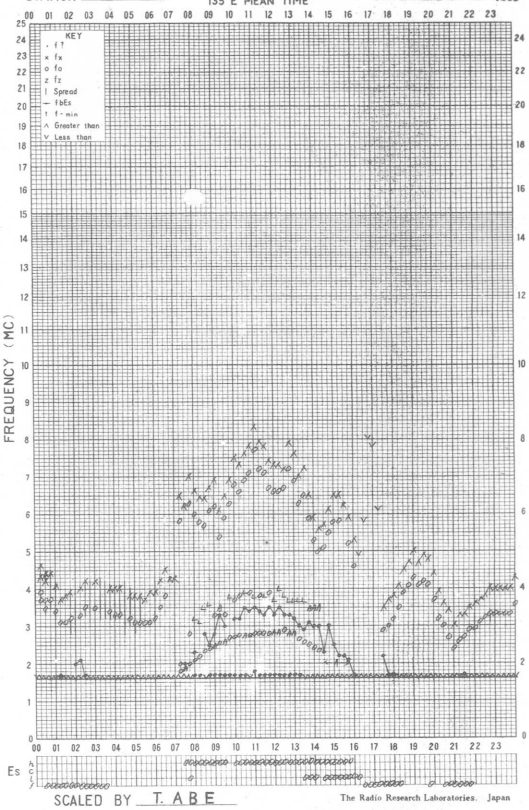


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Dec. 3. 1965



SCALED BY T. ABE

The Radio Research Laboratories. Japan

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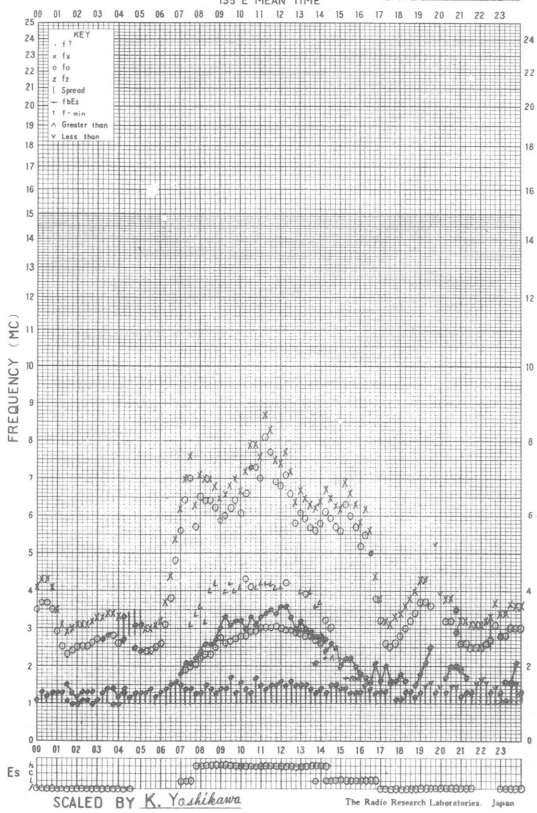

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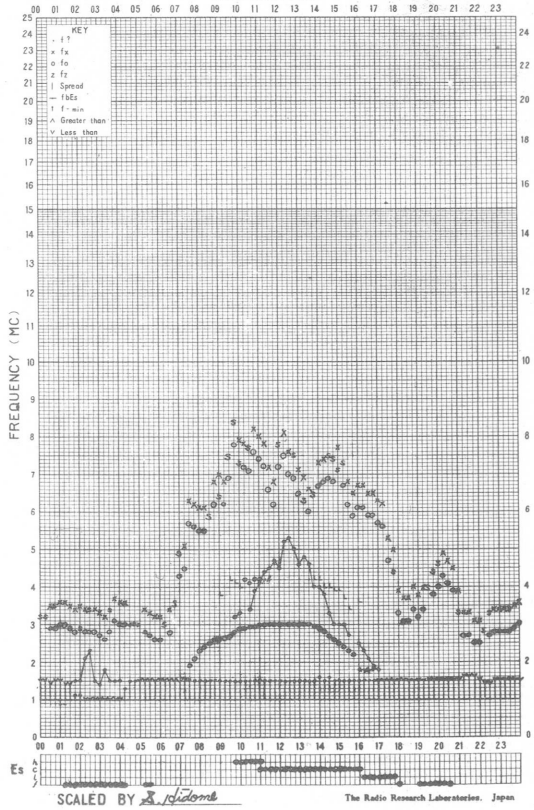

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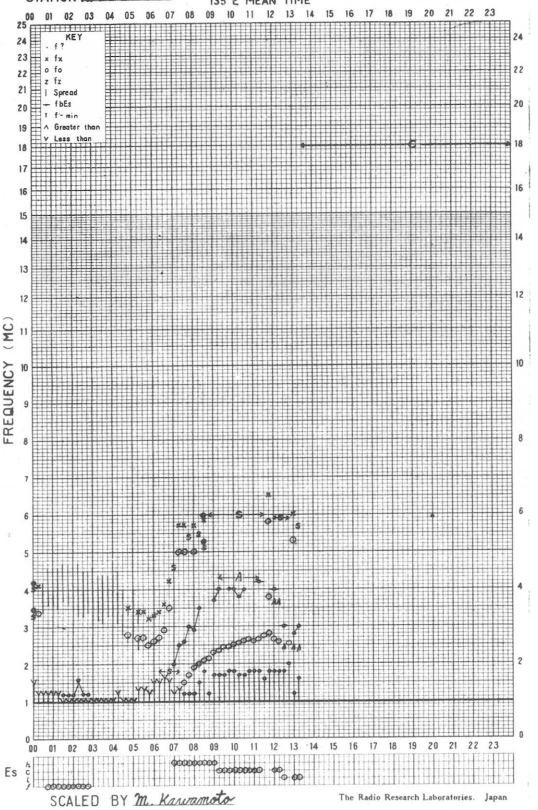

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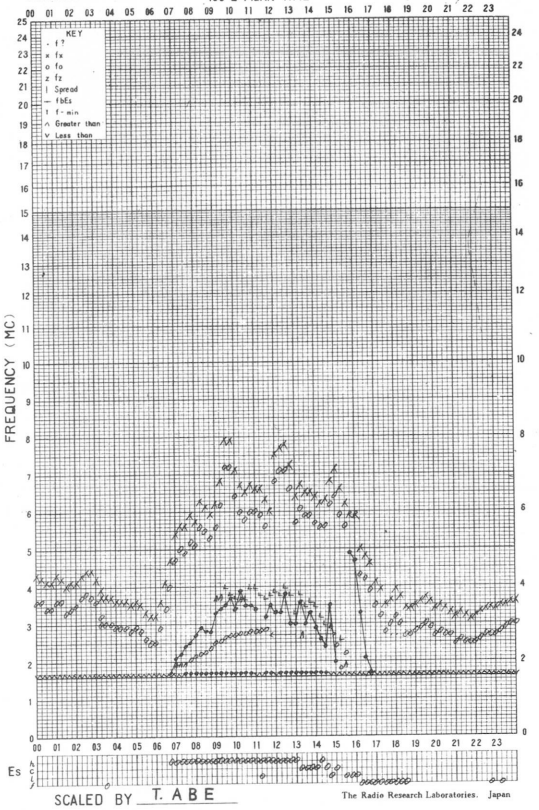

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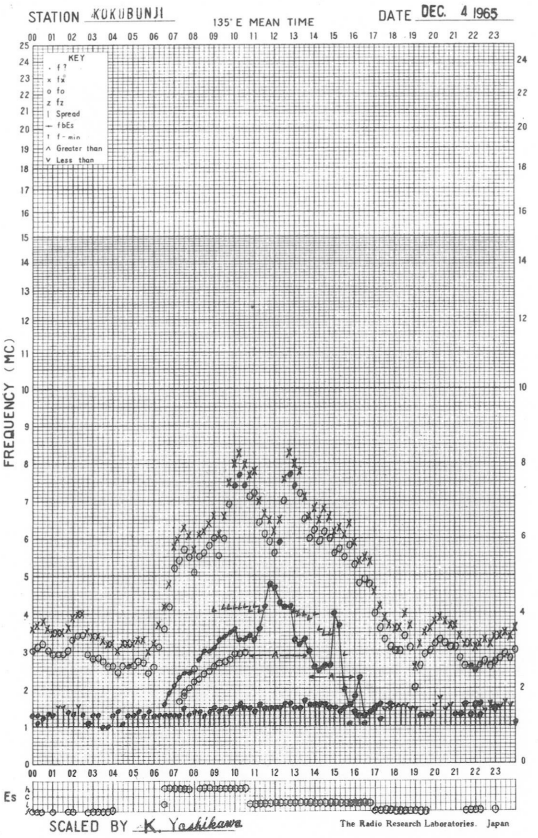

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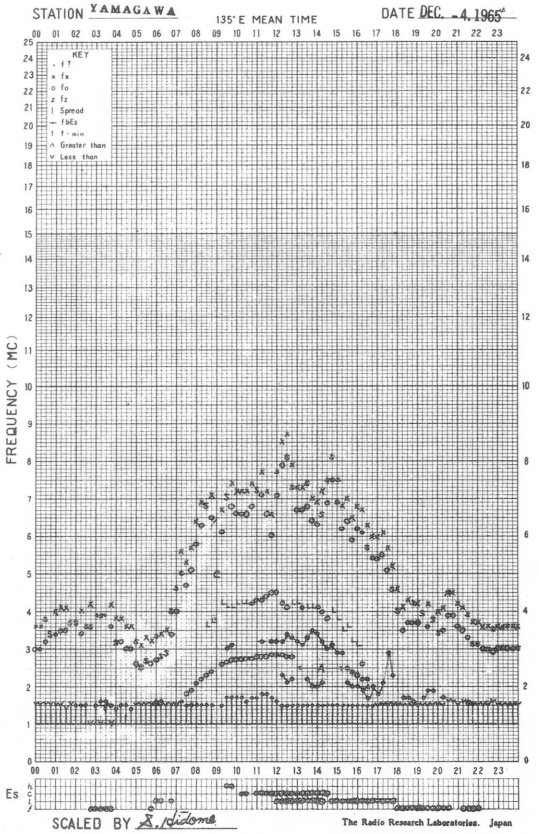

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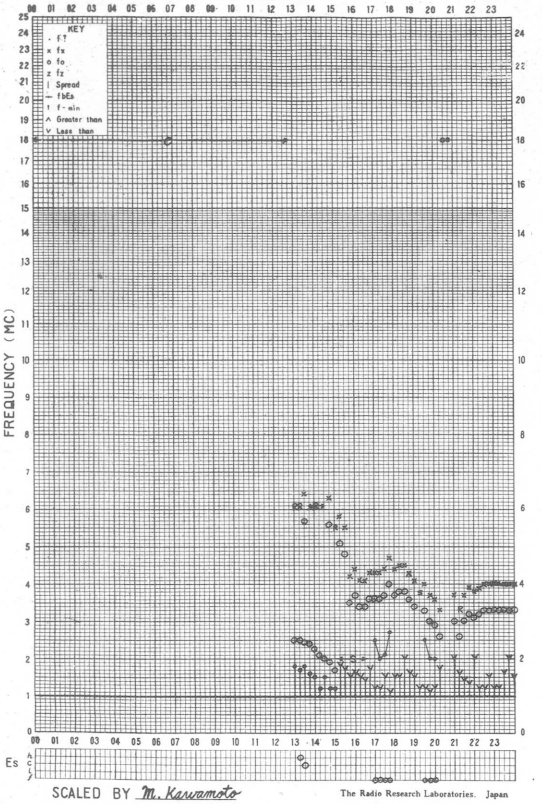

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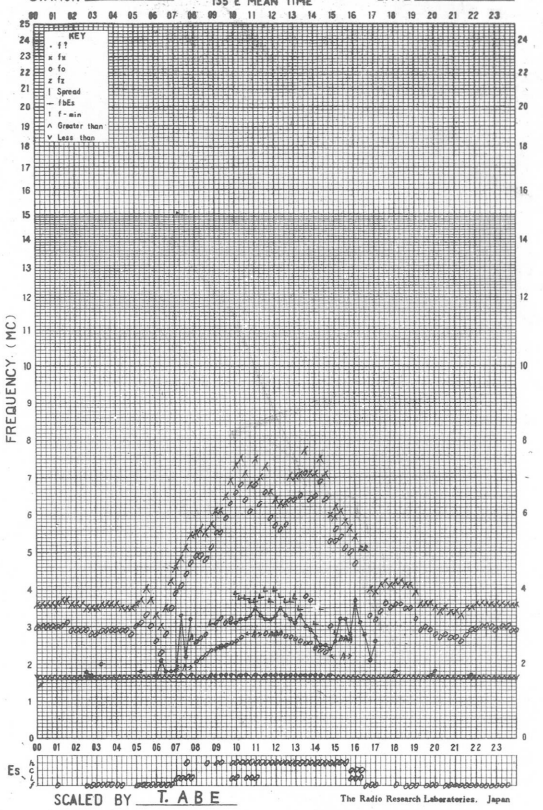

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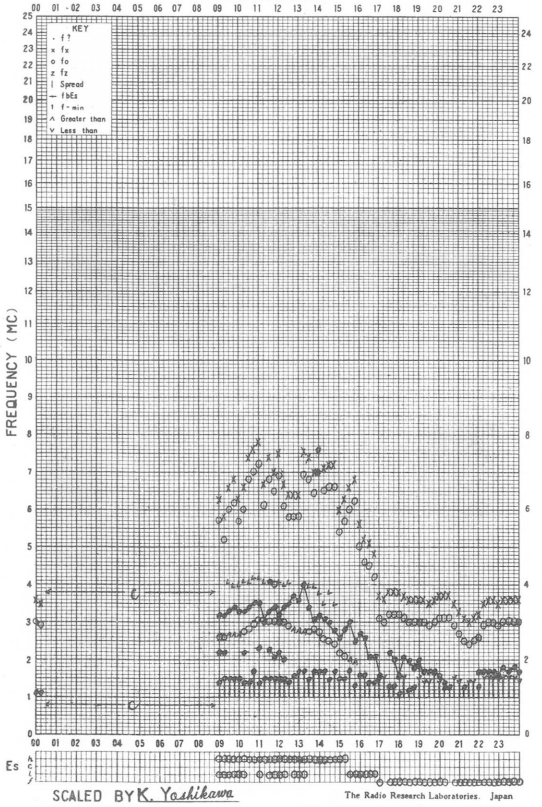

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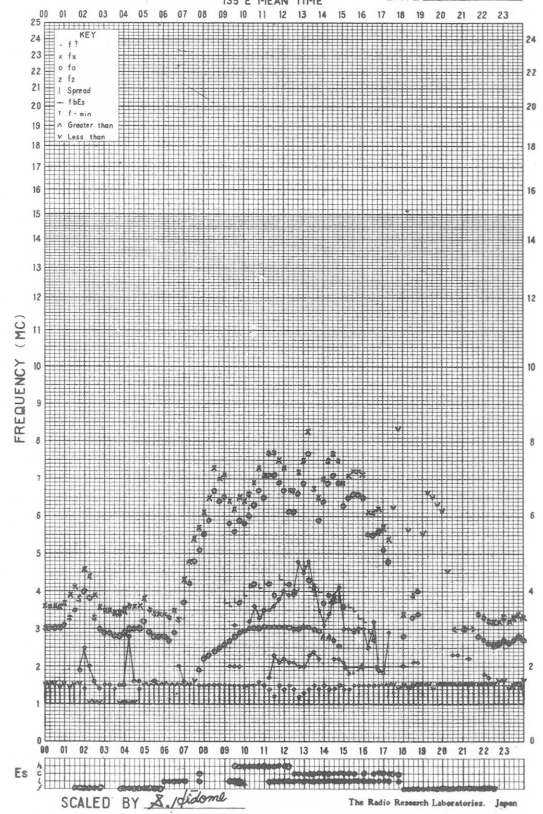

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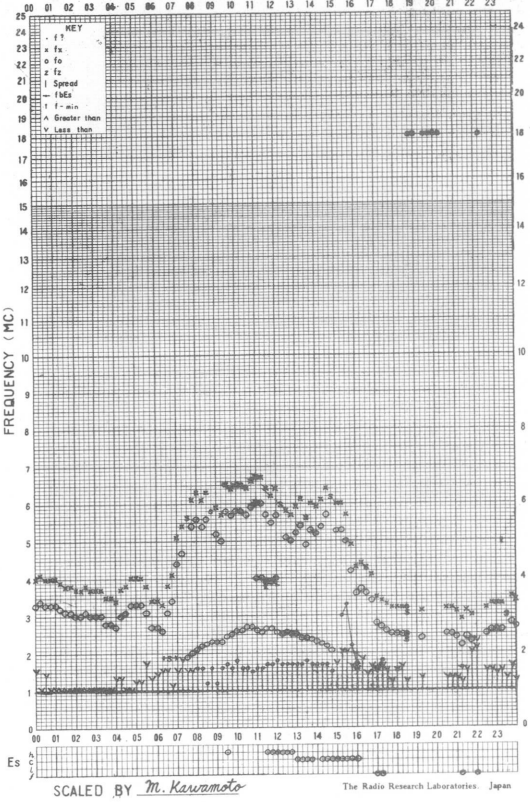

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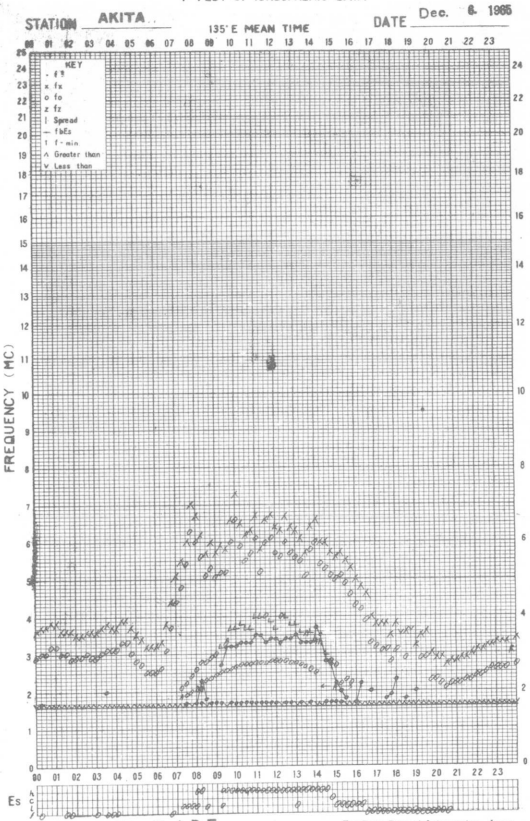

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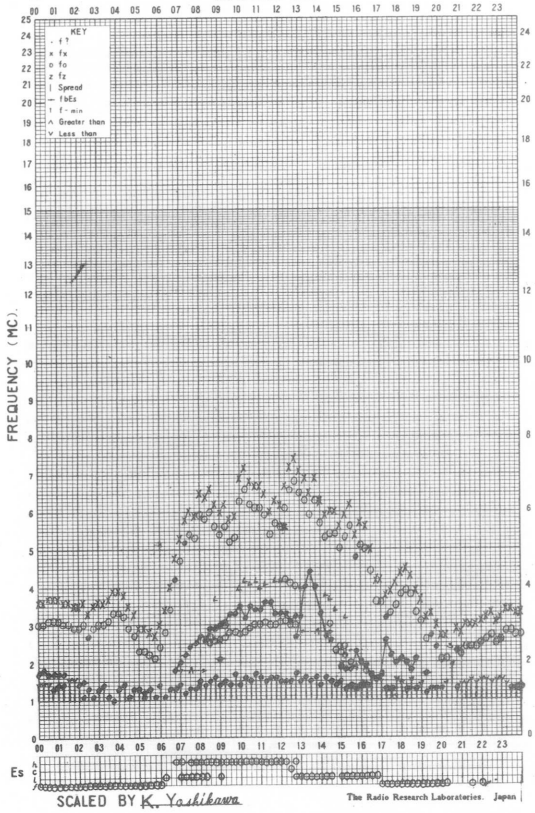

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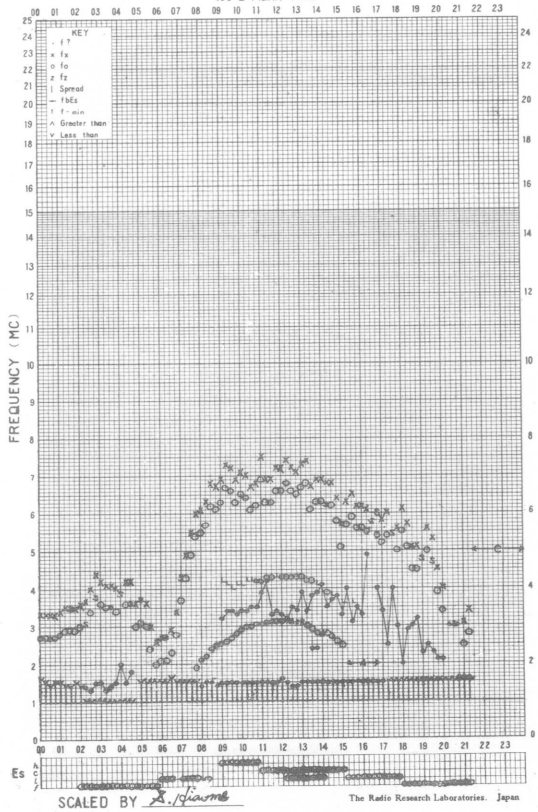

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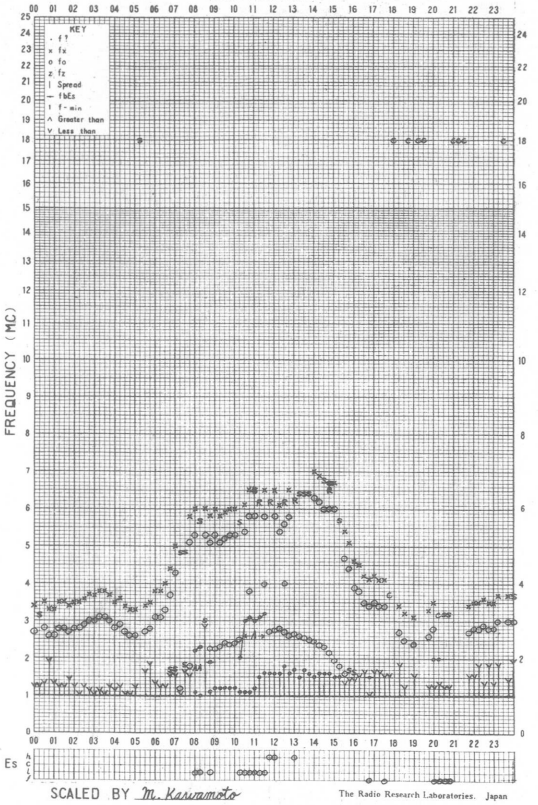

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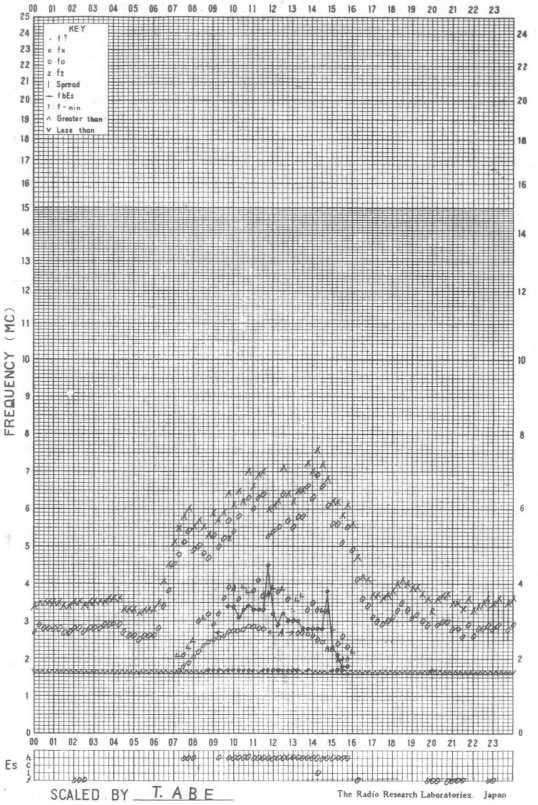

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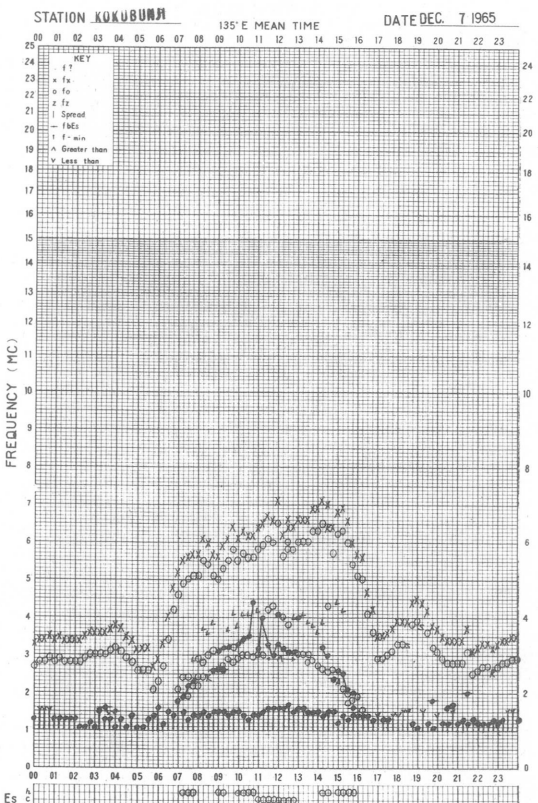

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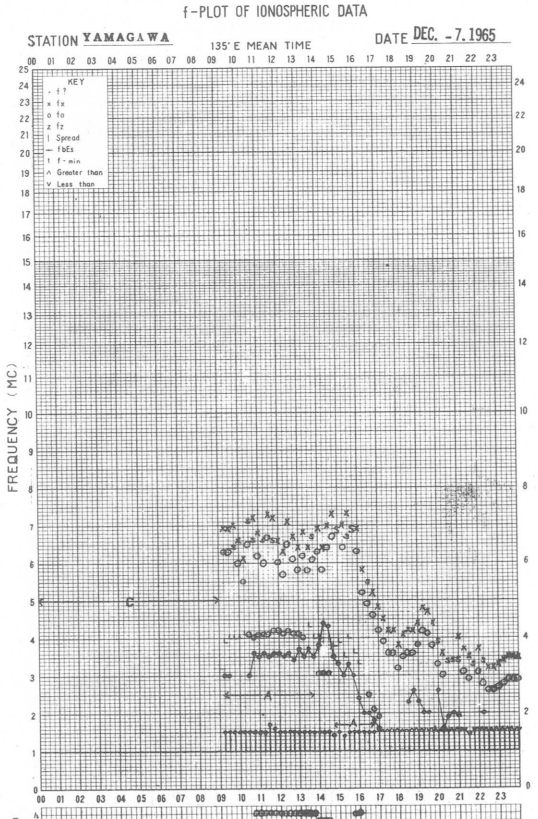

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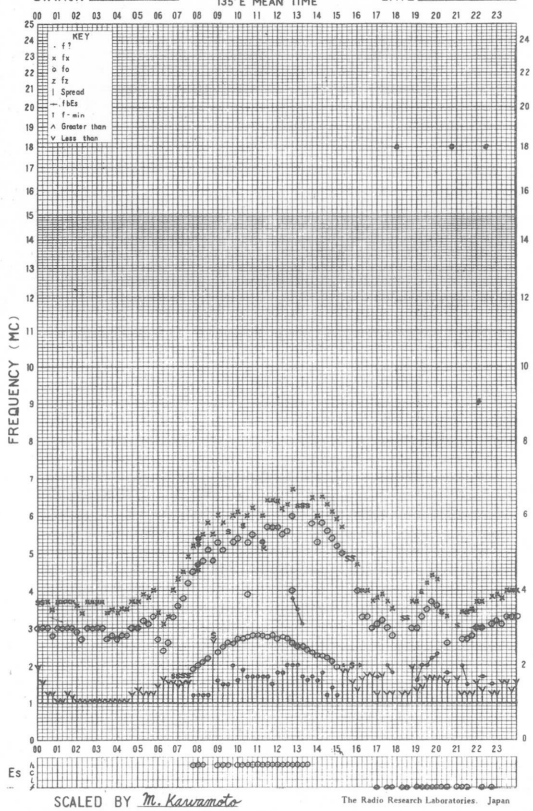

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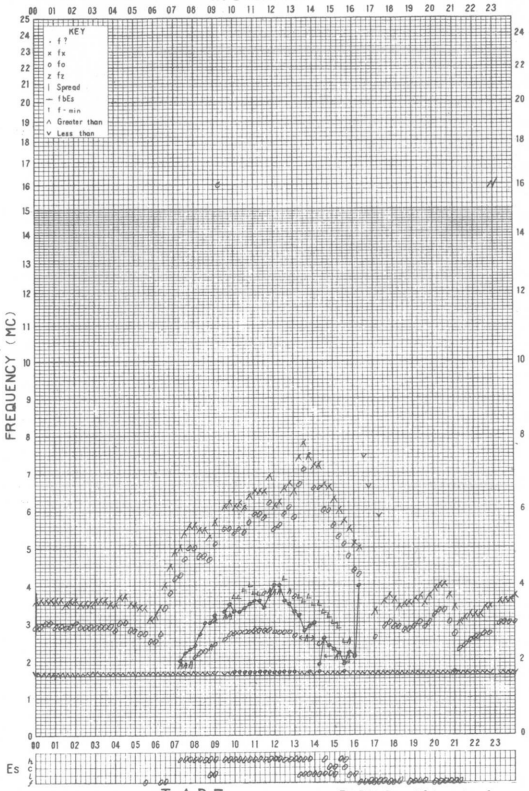

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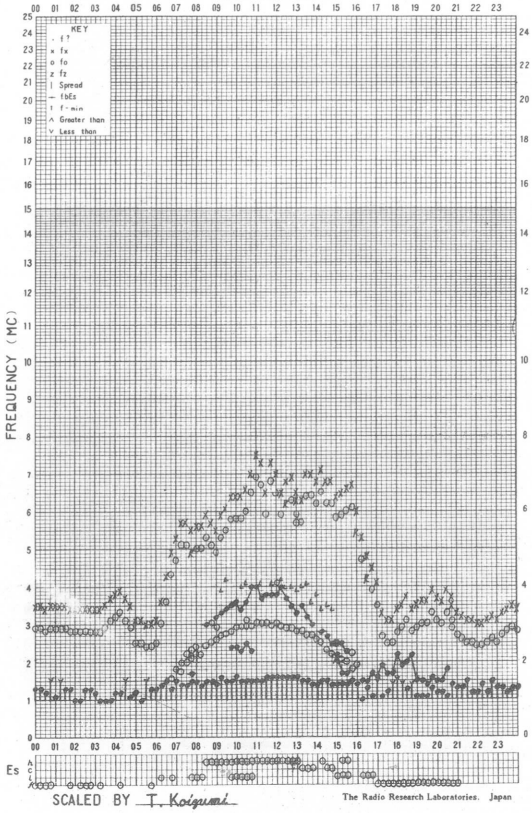

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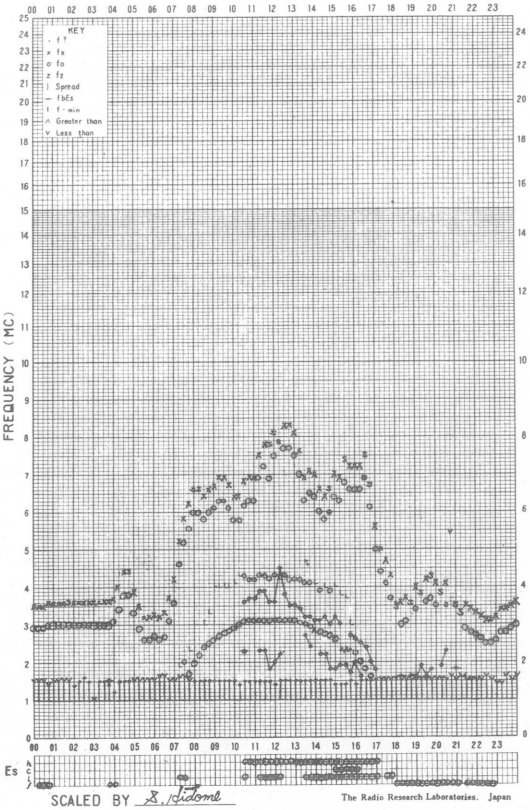

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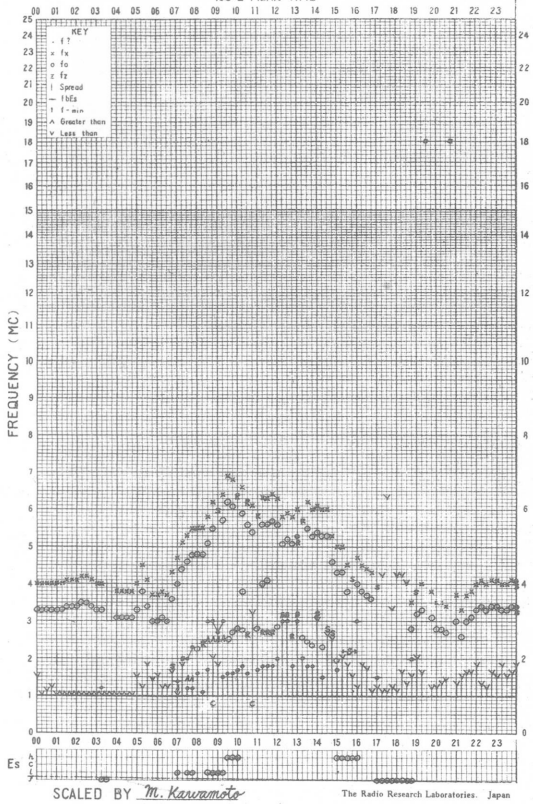

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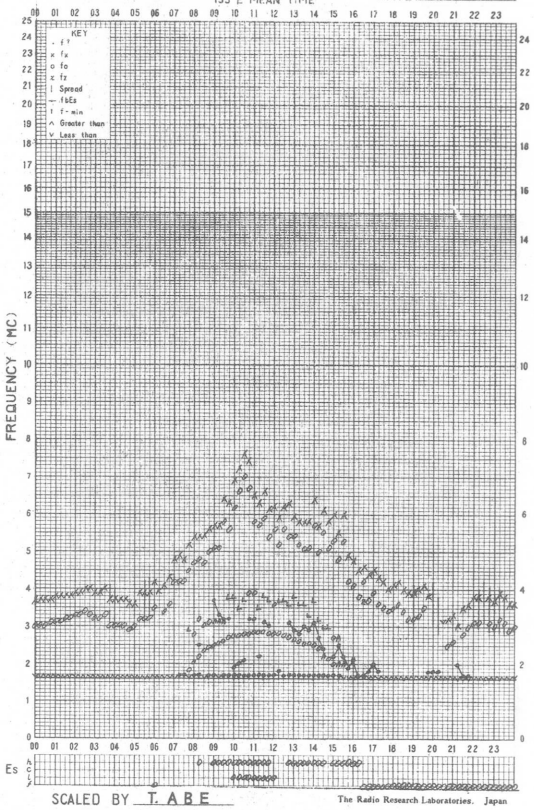

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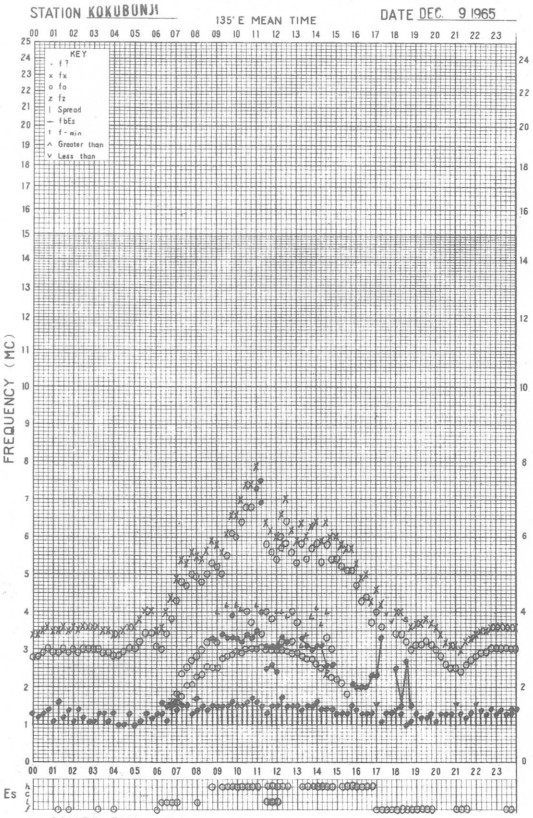

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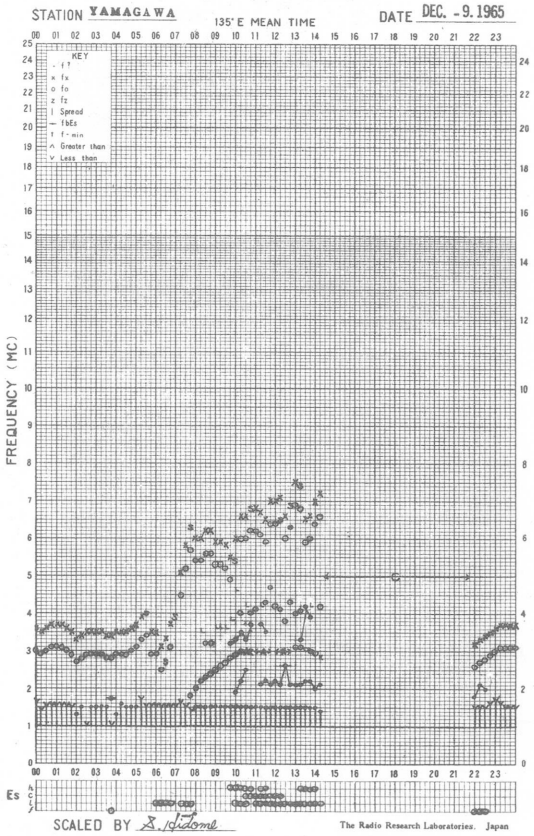

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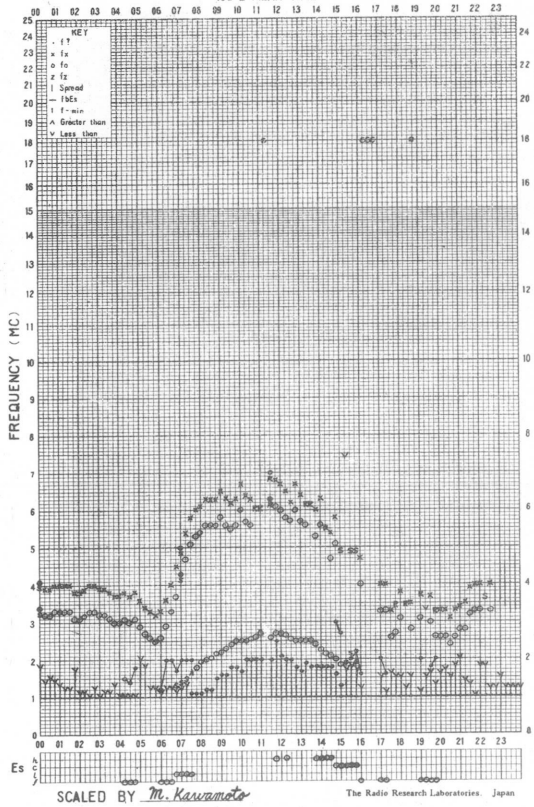

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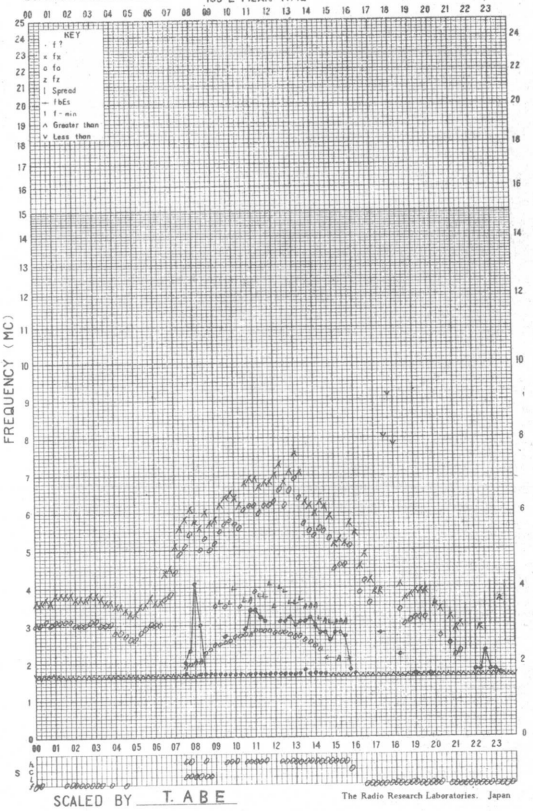

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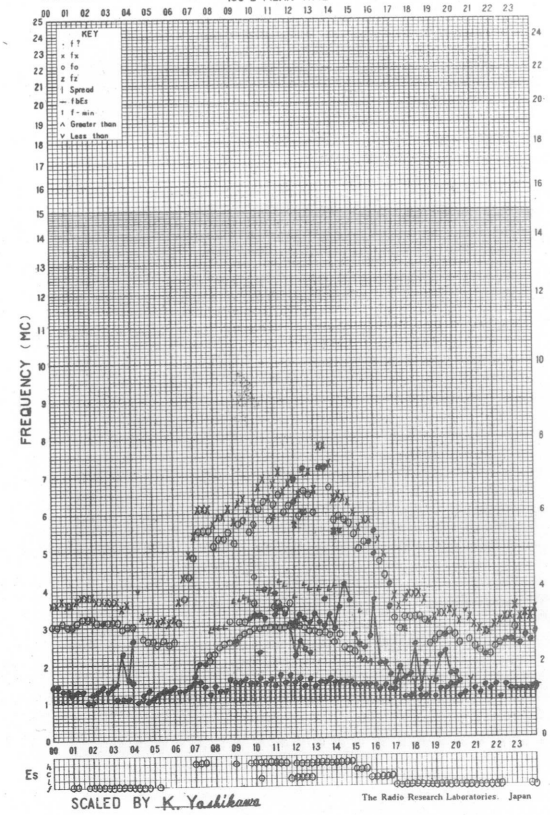

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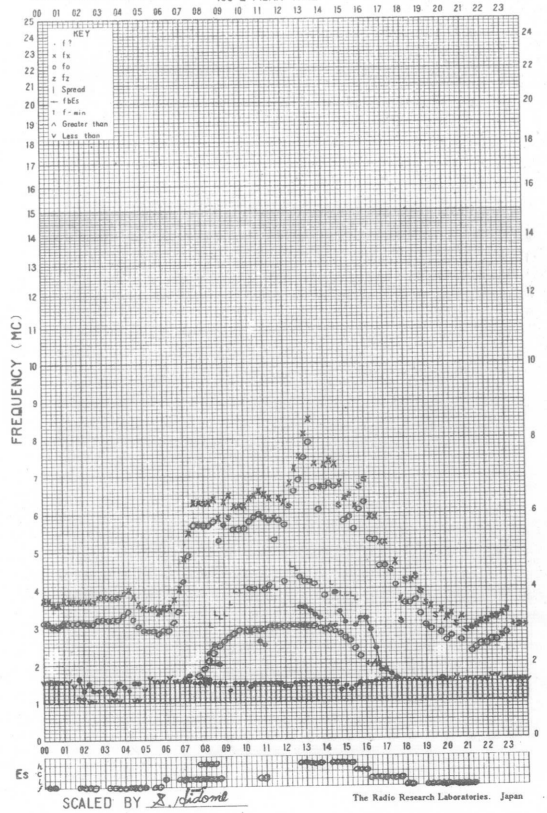

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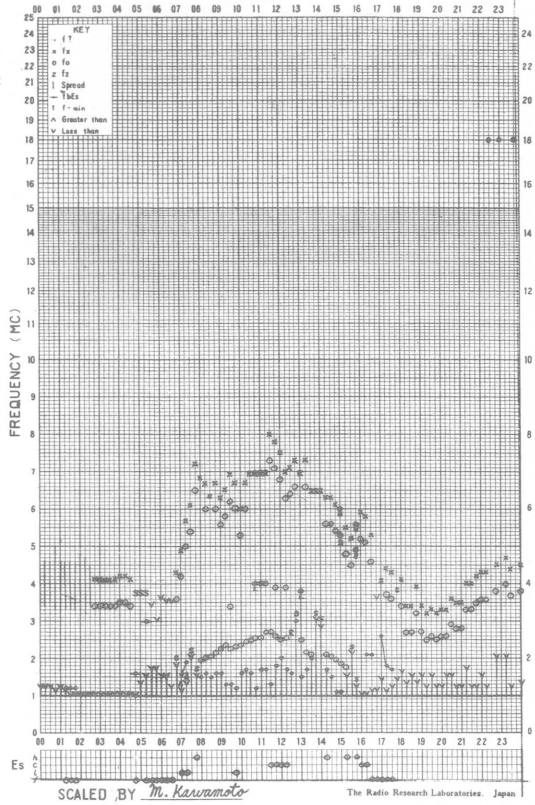

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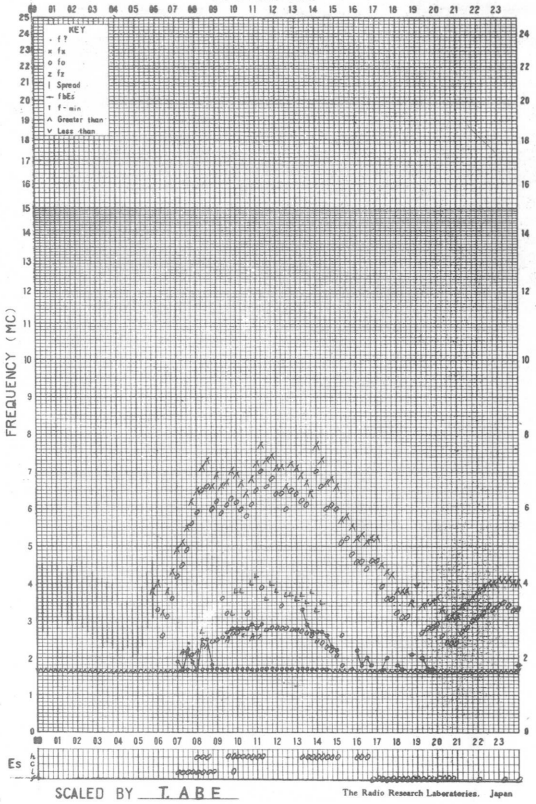

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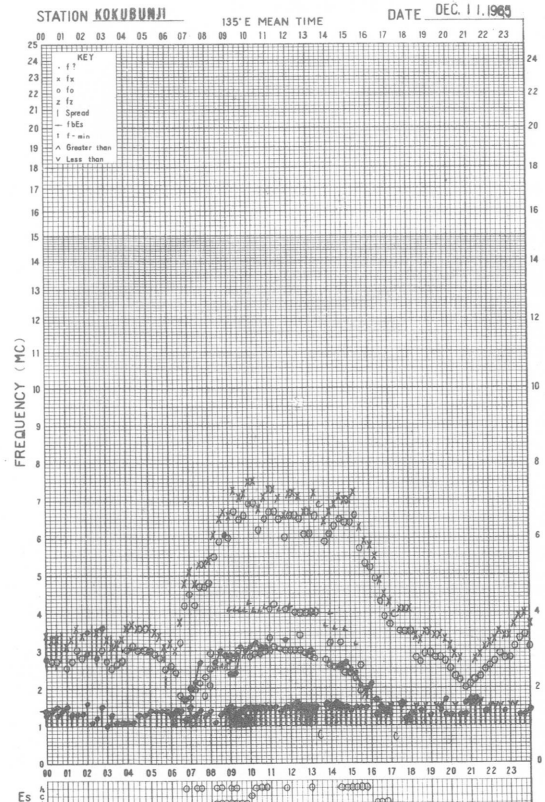

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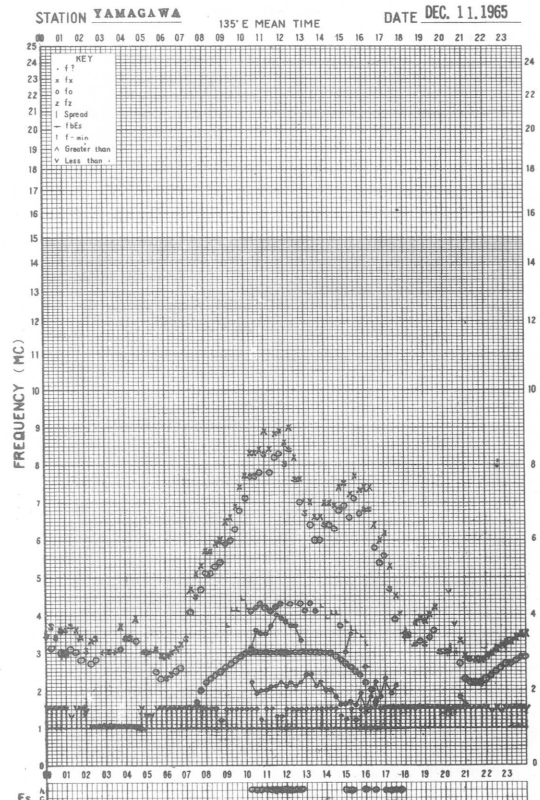

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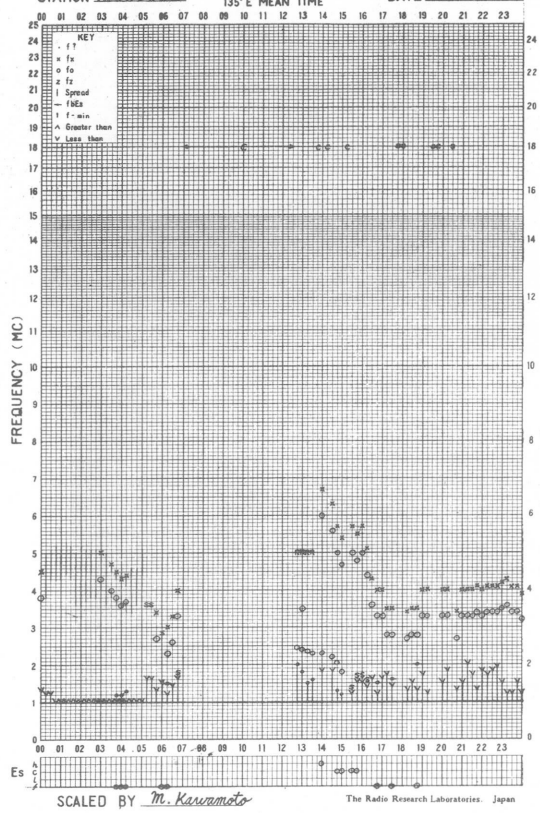

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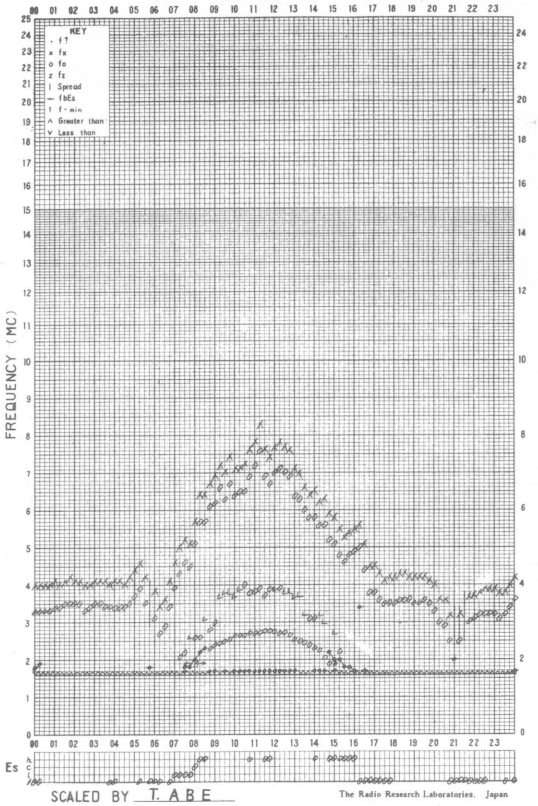

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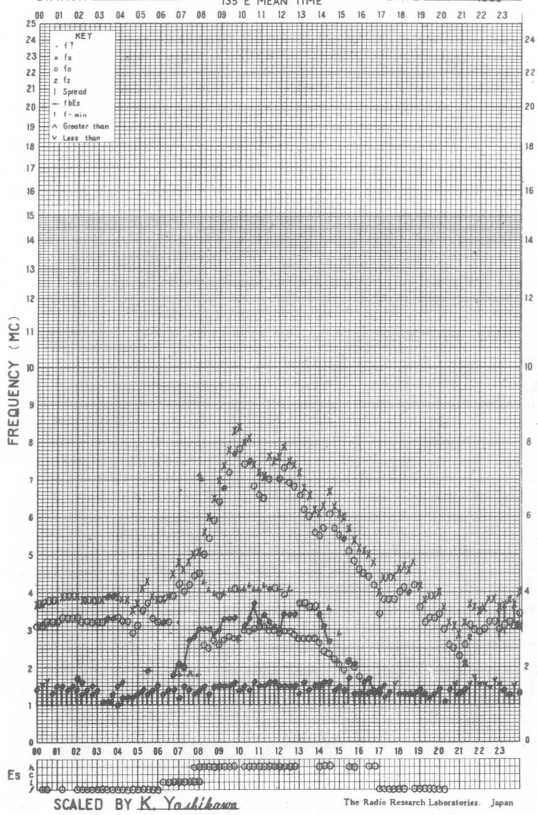

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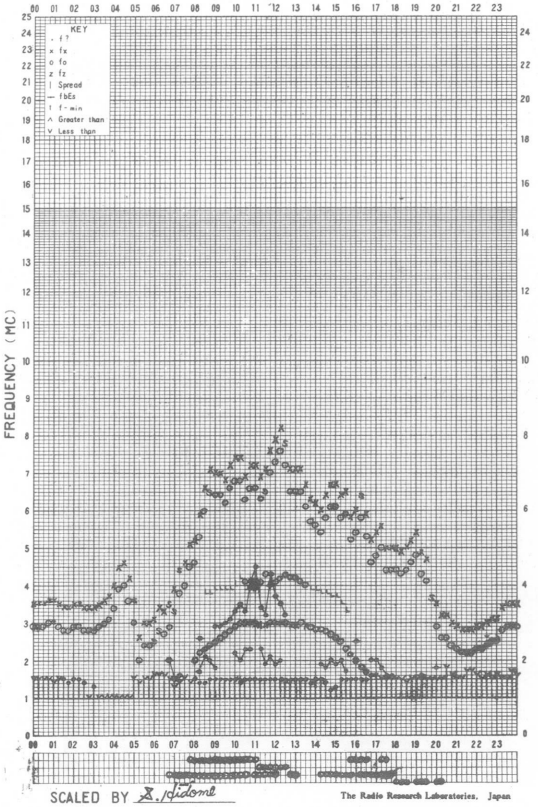

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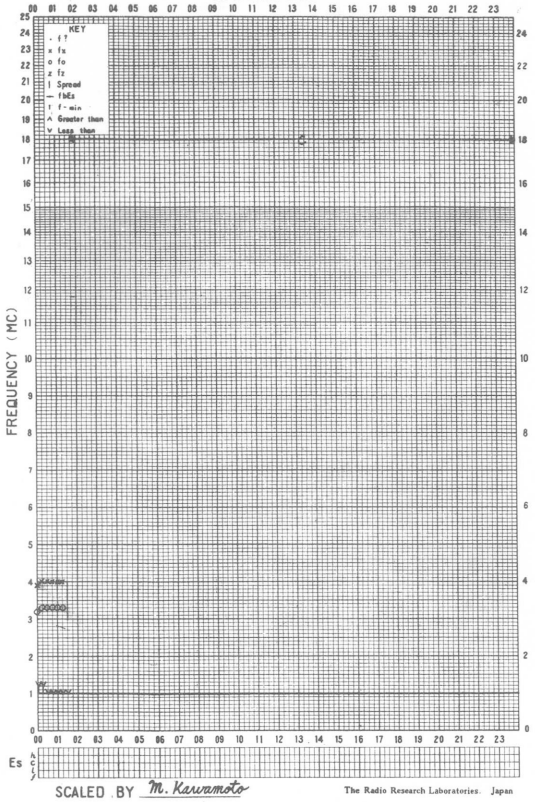

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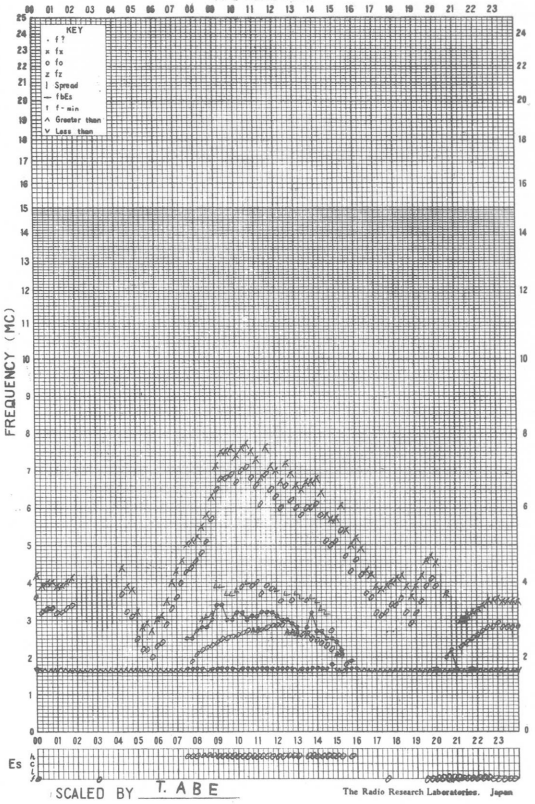

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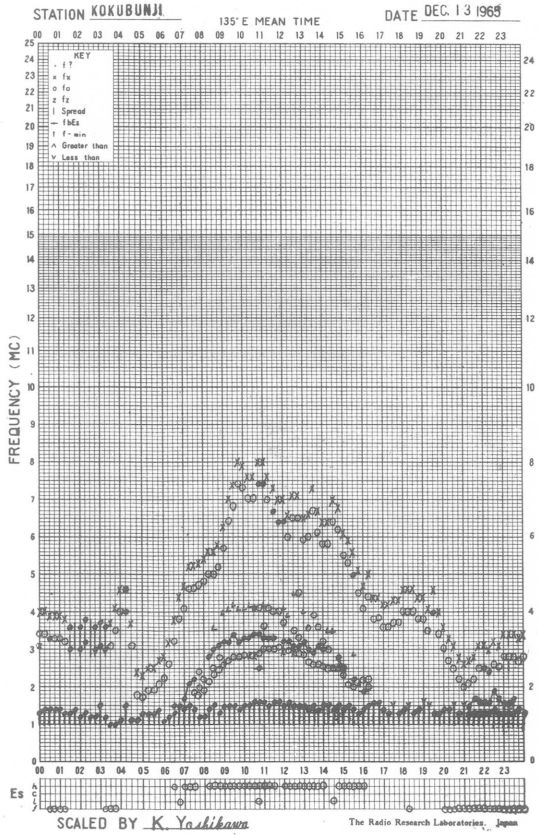

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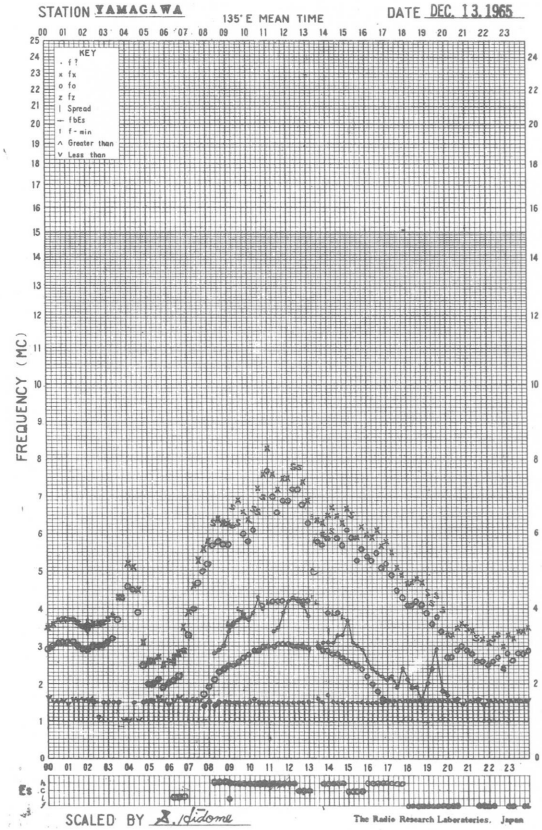

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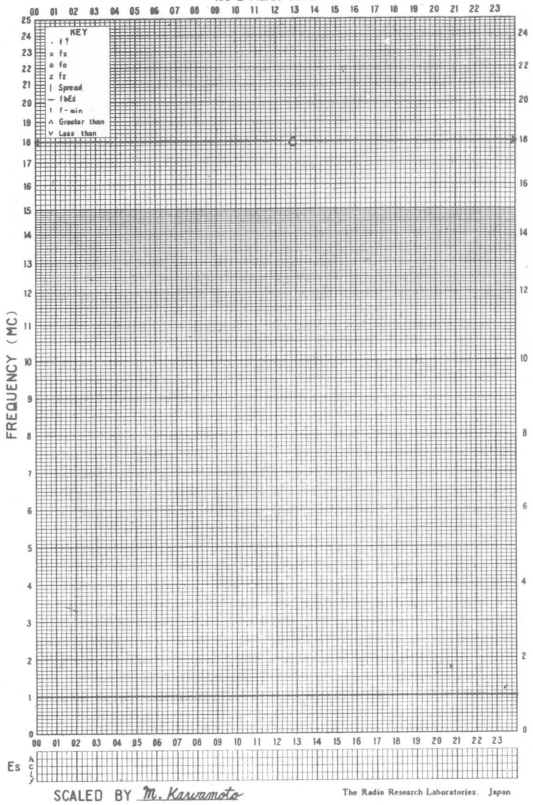

SCALED BY M. Kasuamoto

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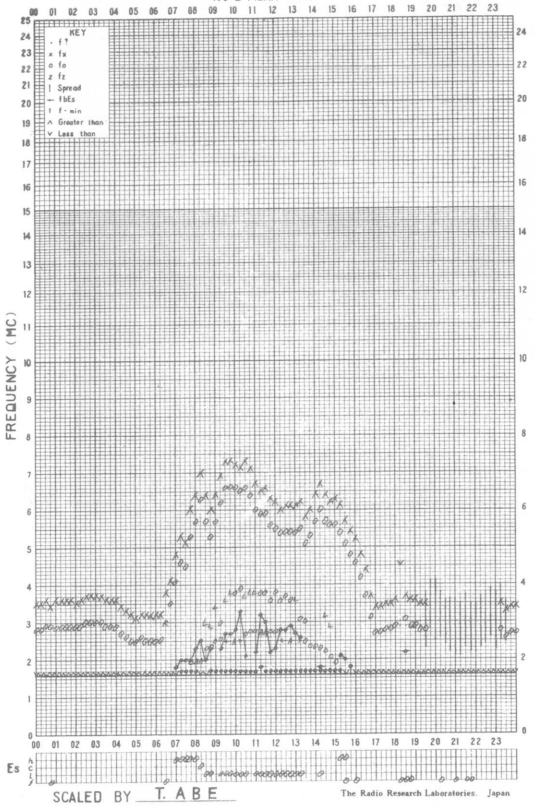

SCALED BY T. ABE

The Radio Research Laboratories. Japan

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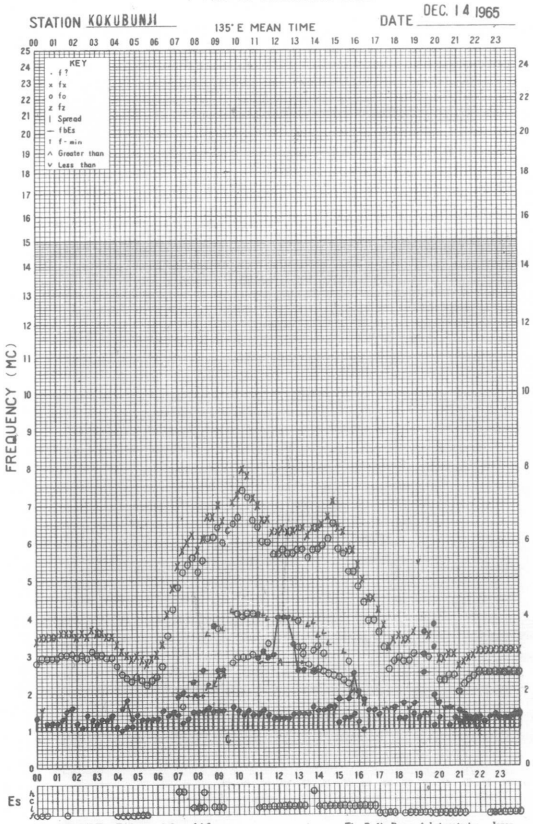

SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

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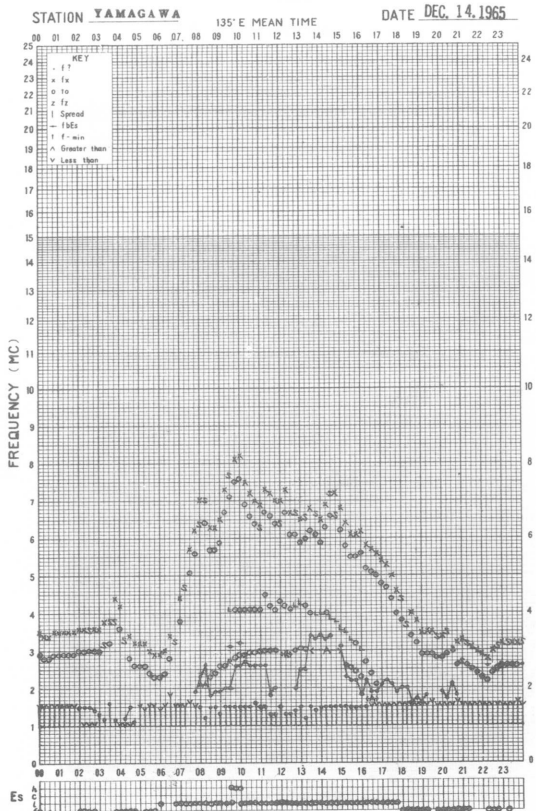

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The Radio Research Laboratories. Japan

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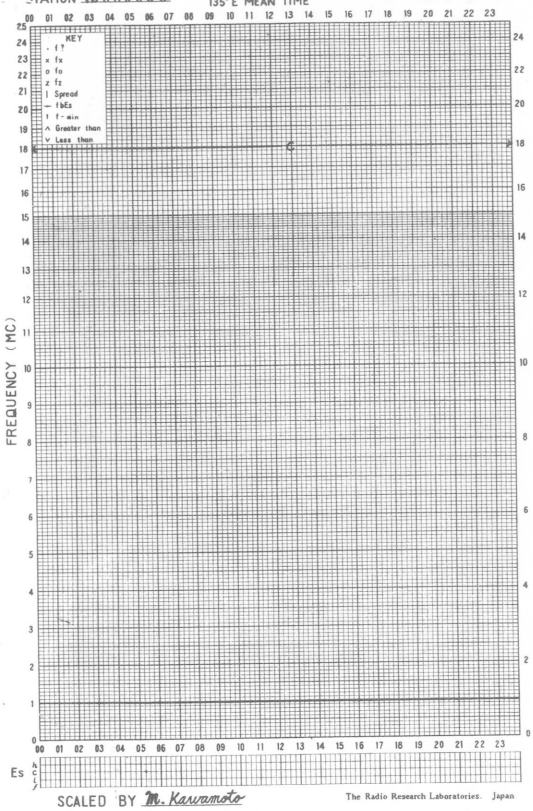

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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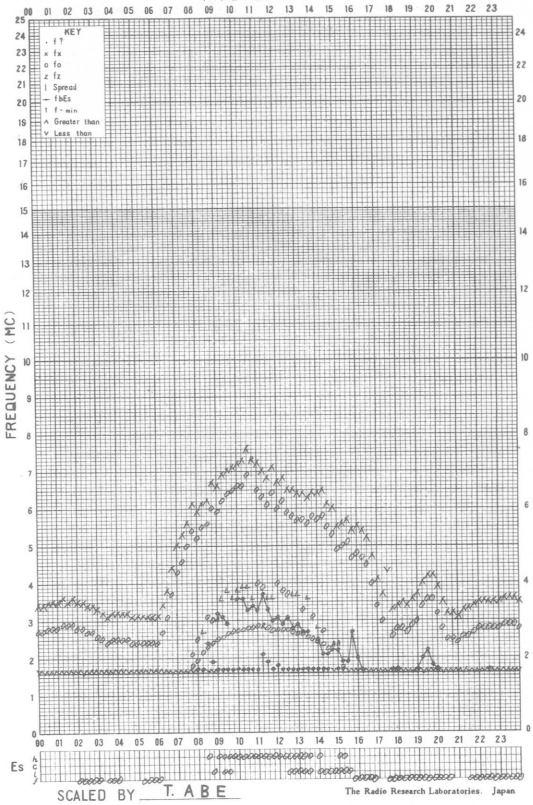

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The Radio Research Laboratories. Japan

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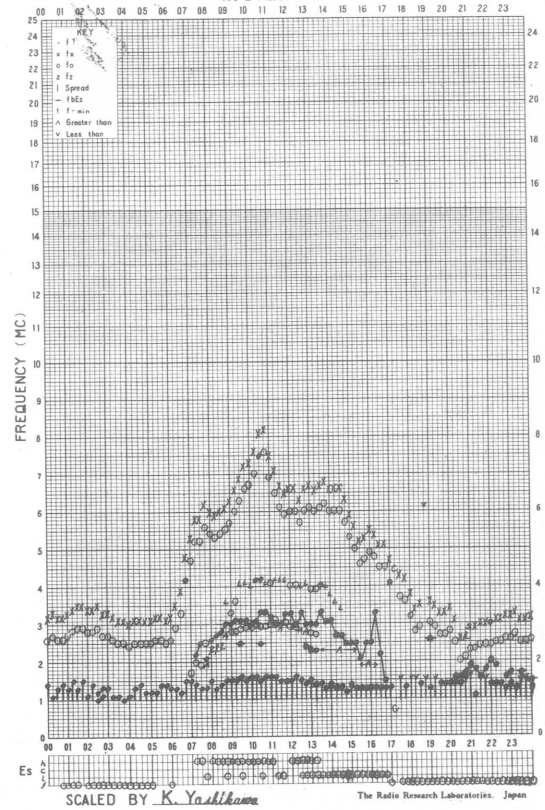

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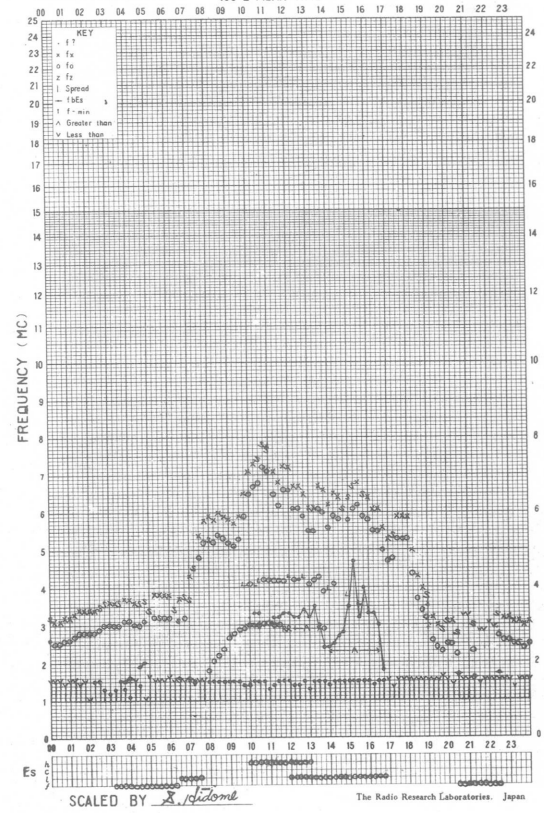

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The Radio Research Laboratories. Japan

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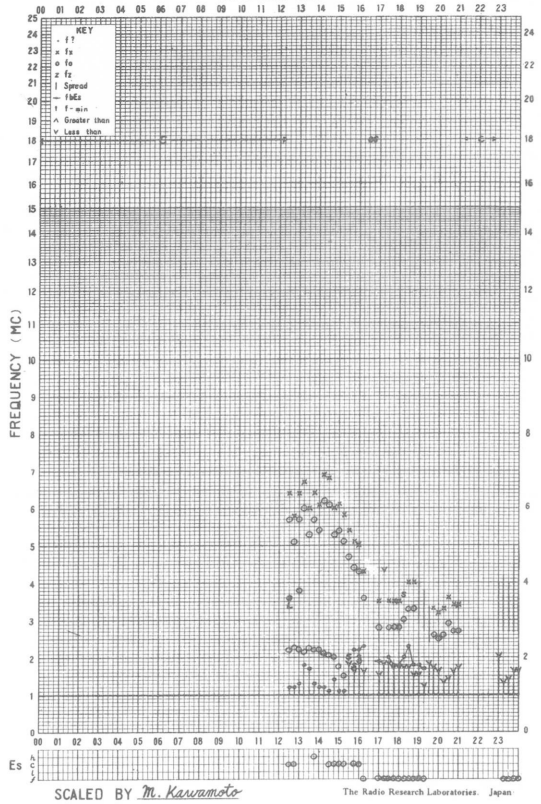

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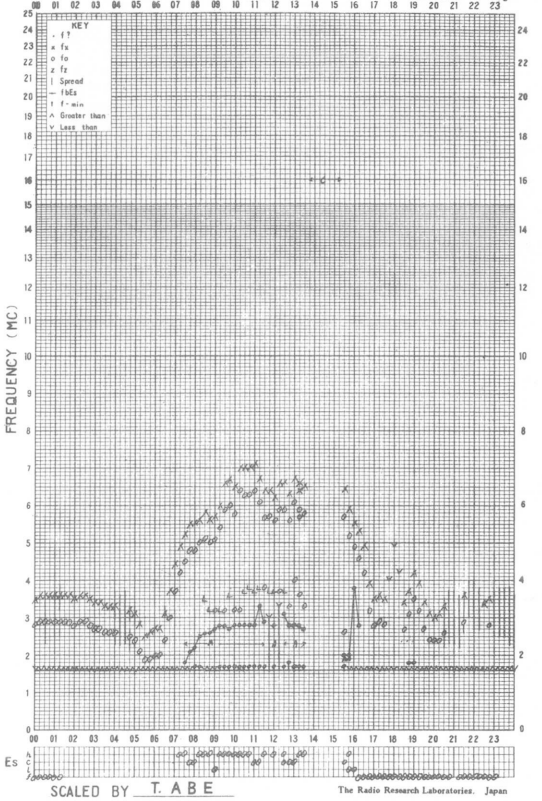

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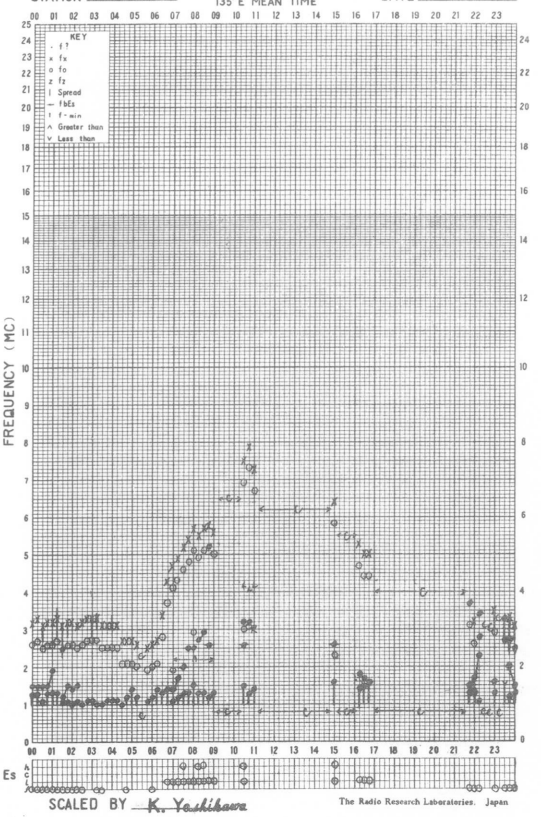

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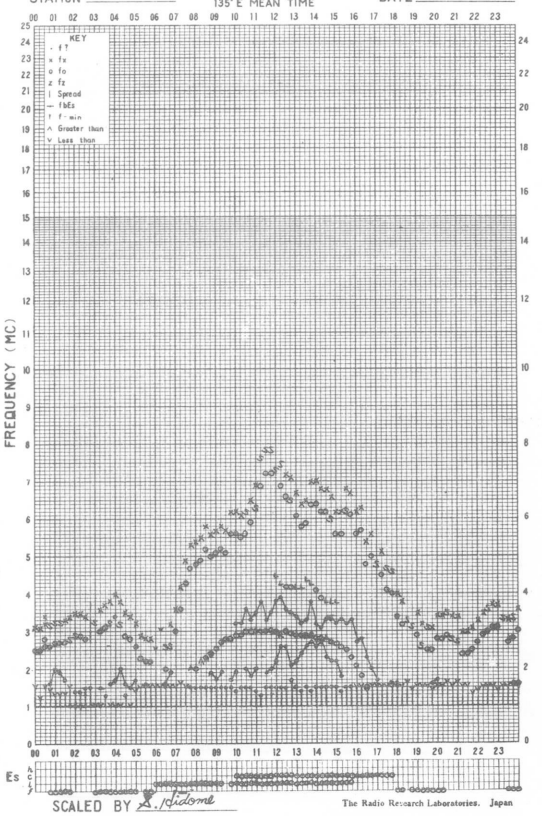

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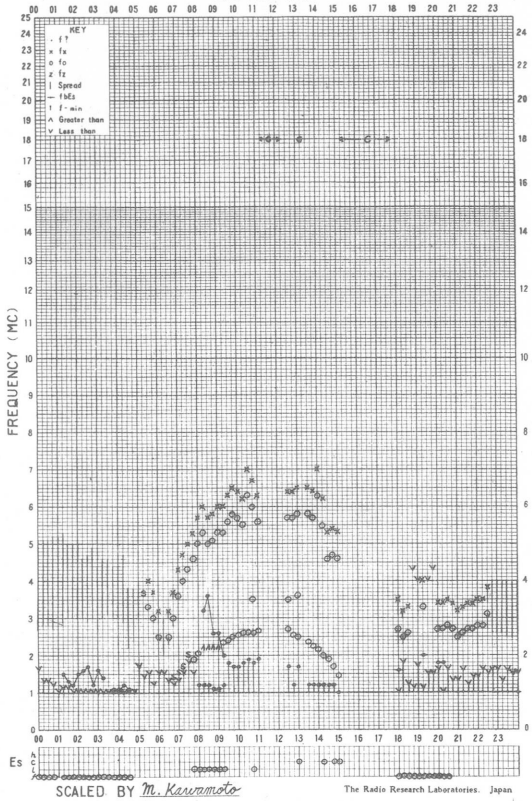

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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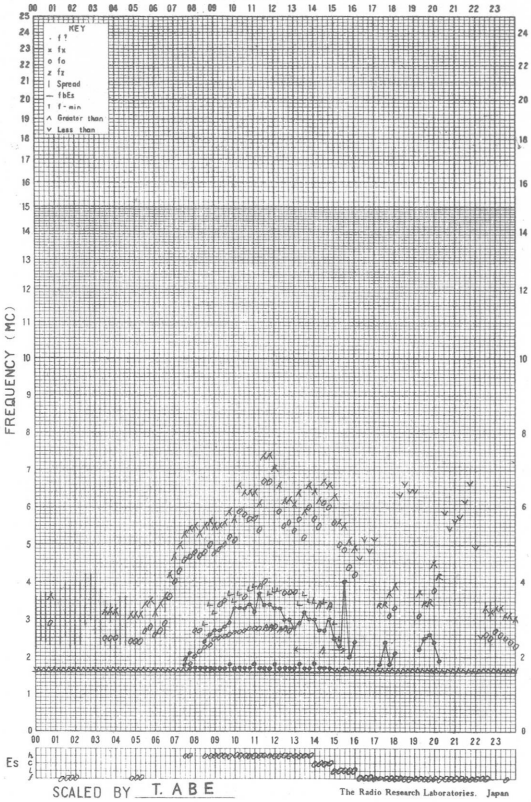

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The Radio Research Laboratories. Japan

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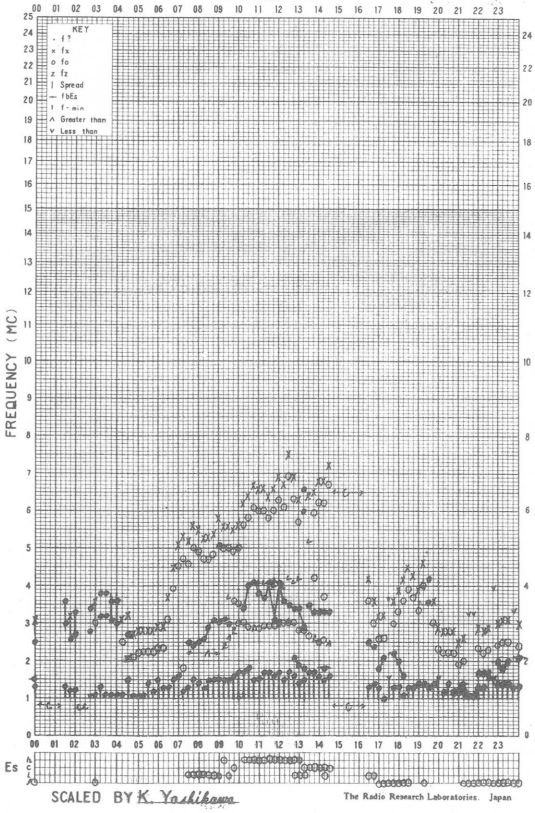

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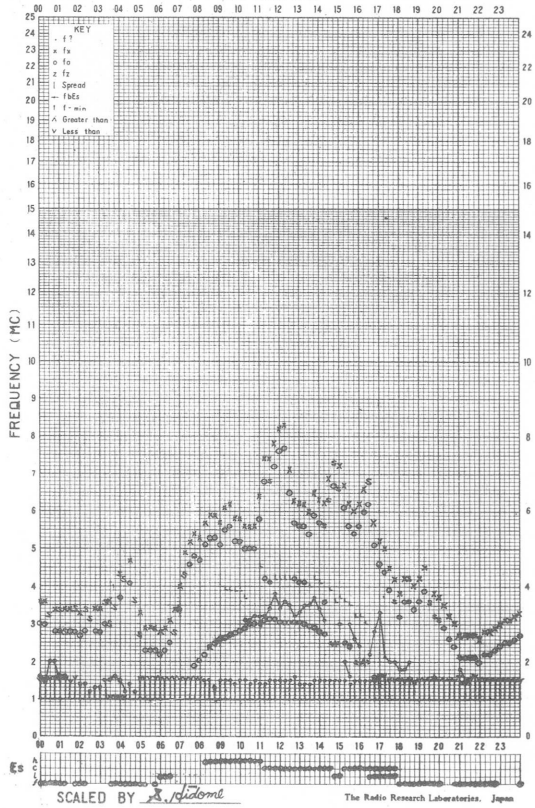

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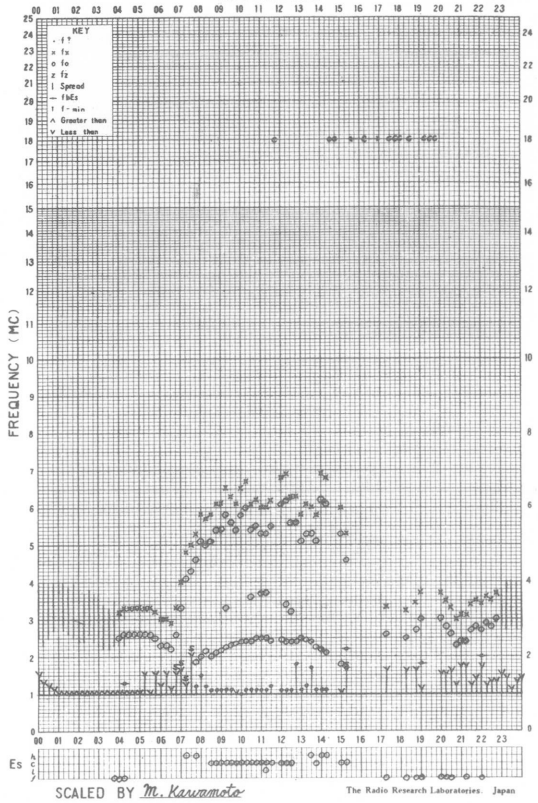

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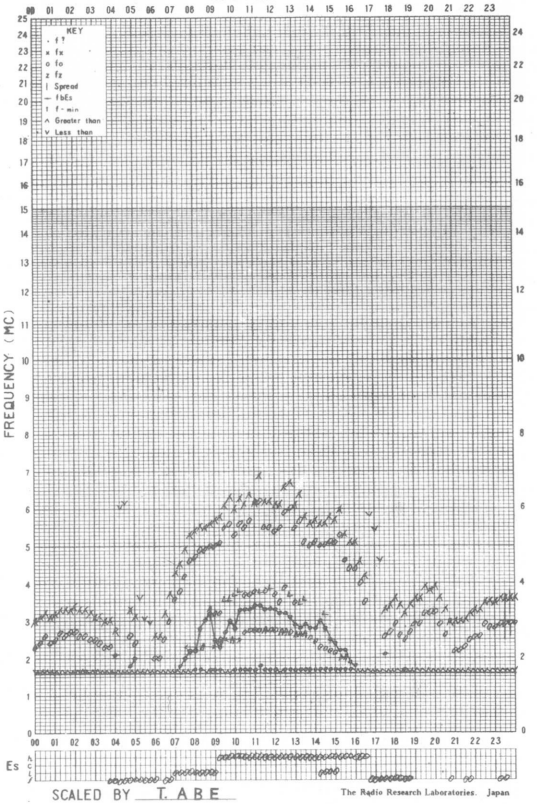

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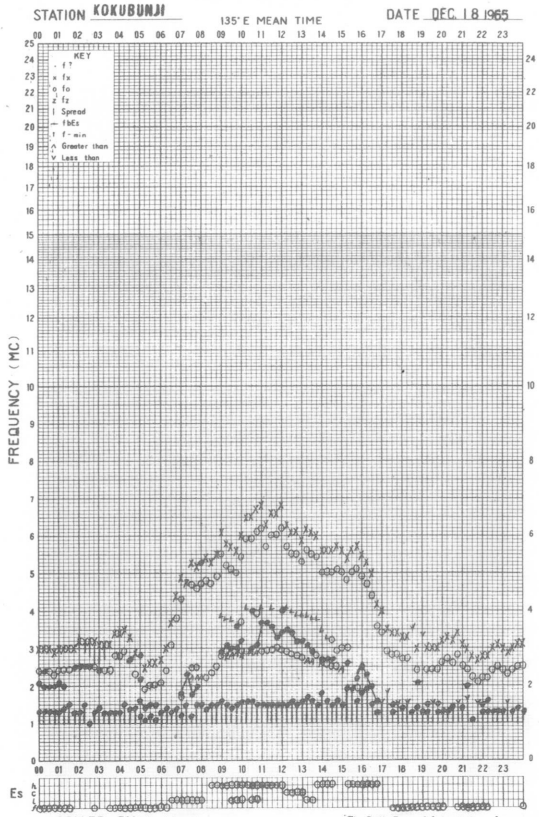

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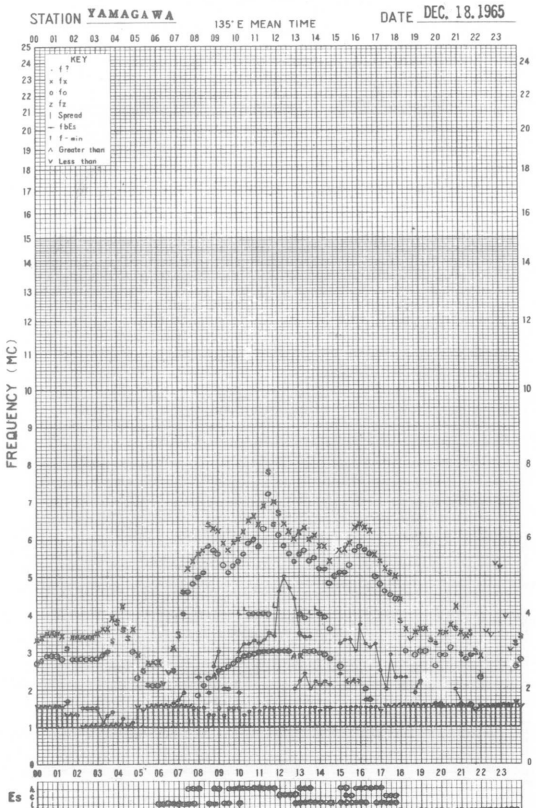

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The Radio Research Laboratories. Japan

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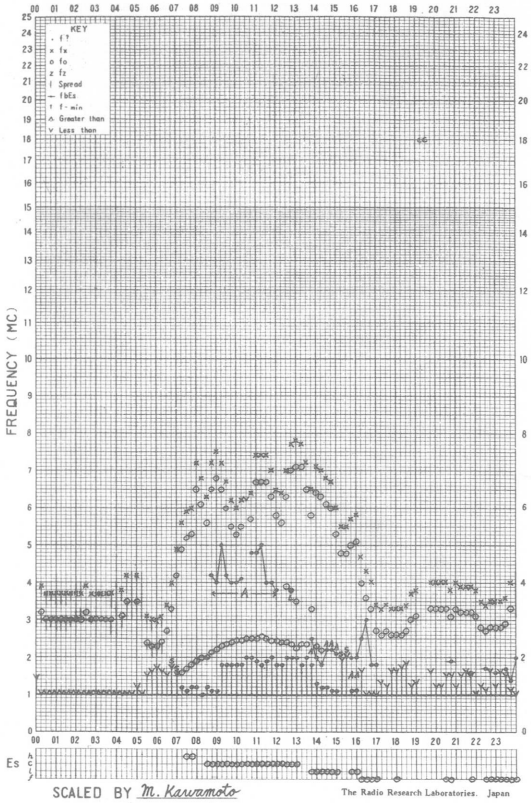

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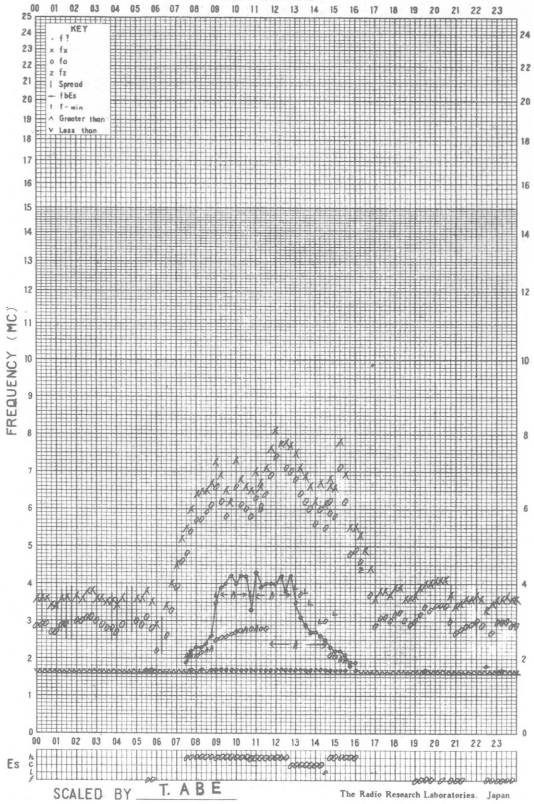

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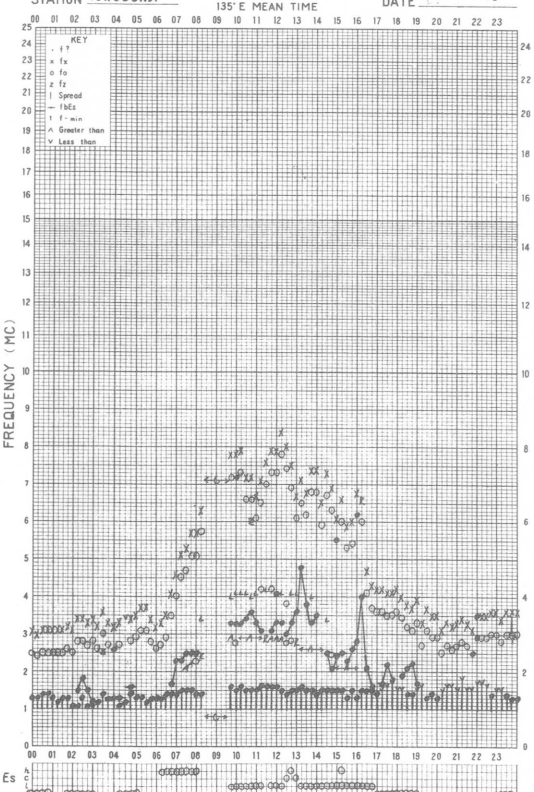

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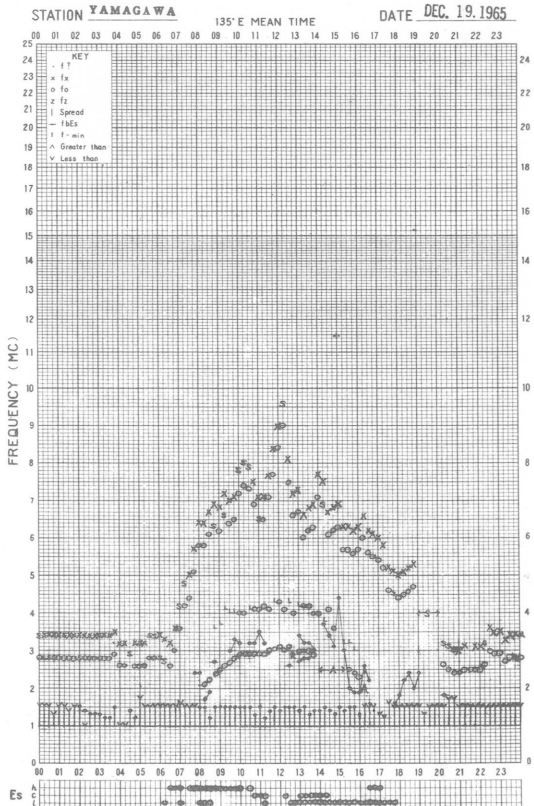

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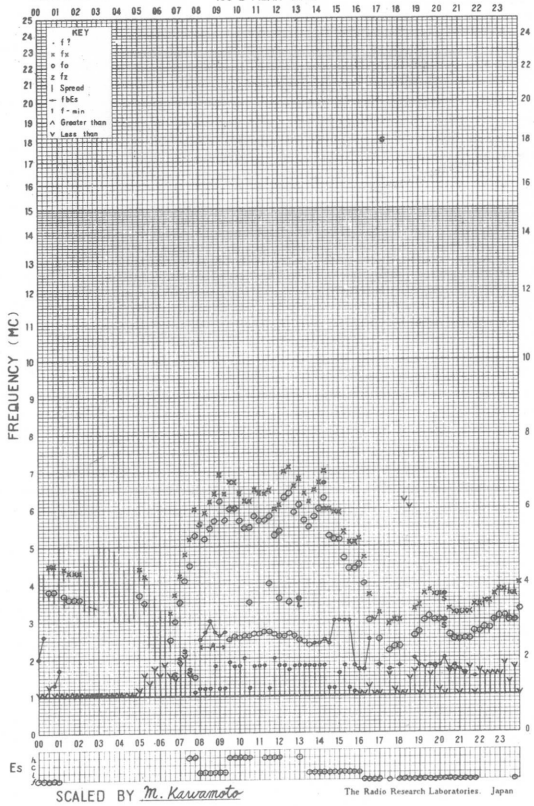

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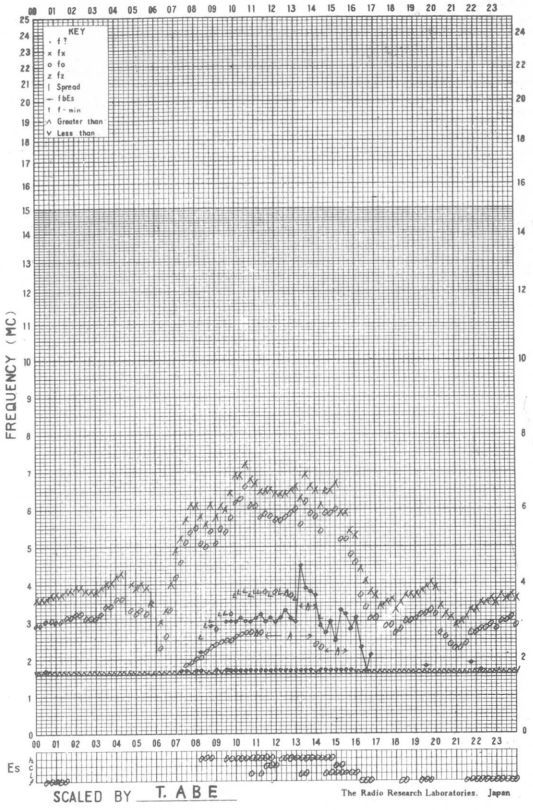

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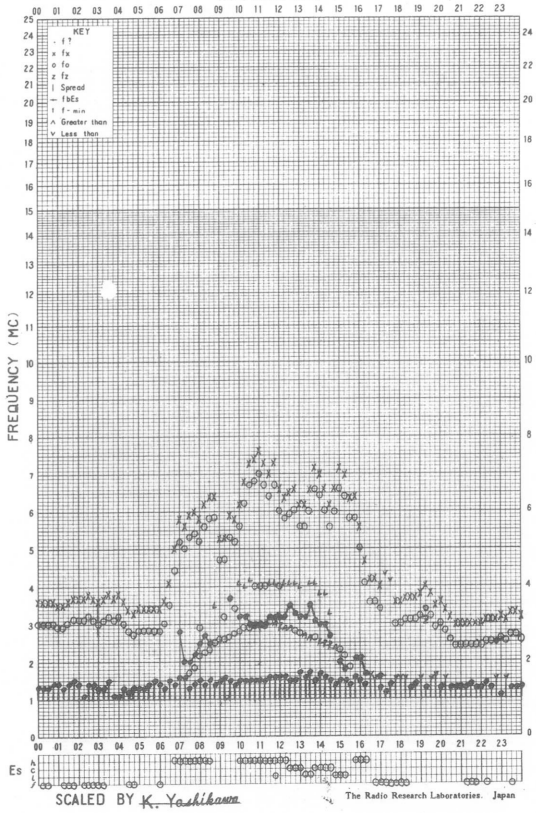

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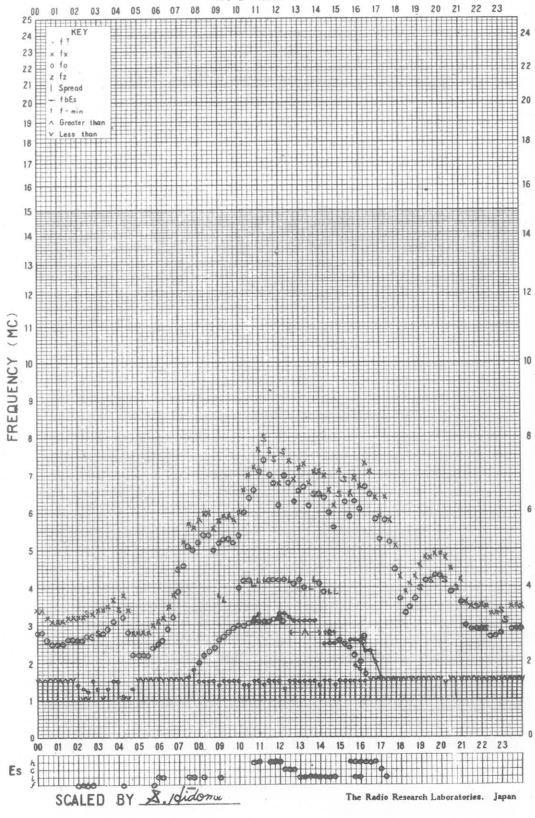

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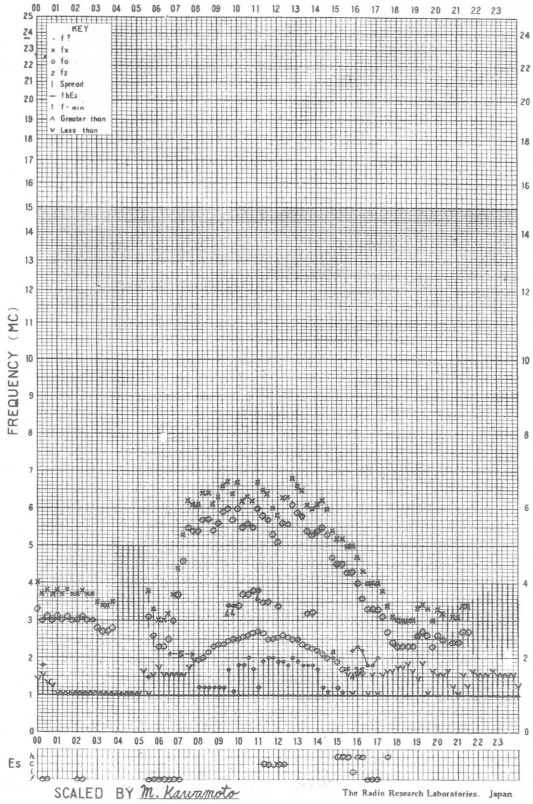

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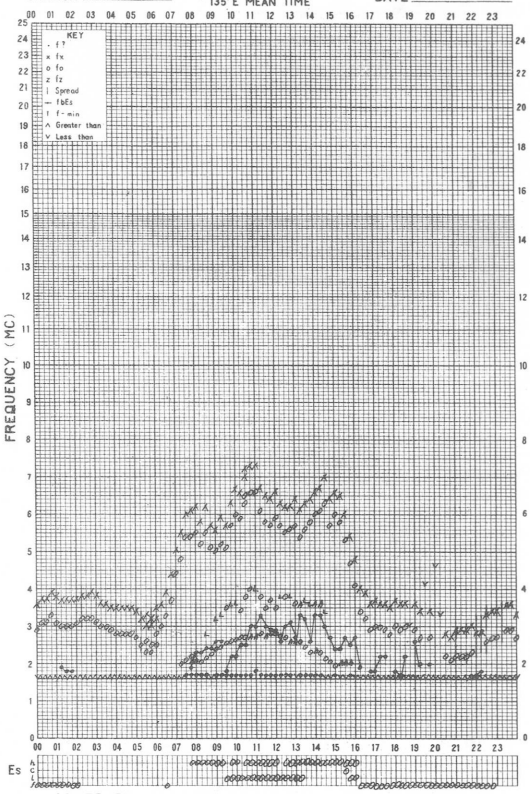

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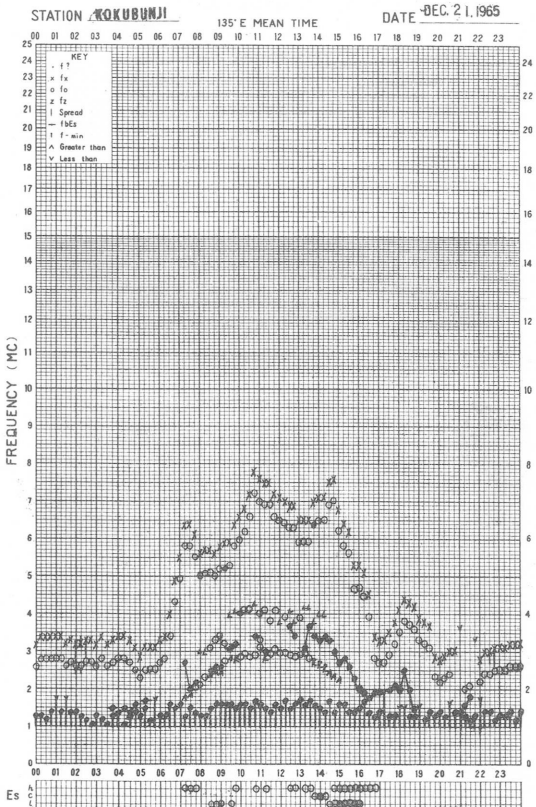

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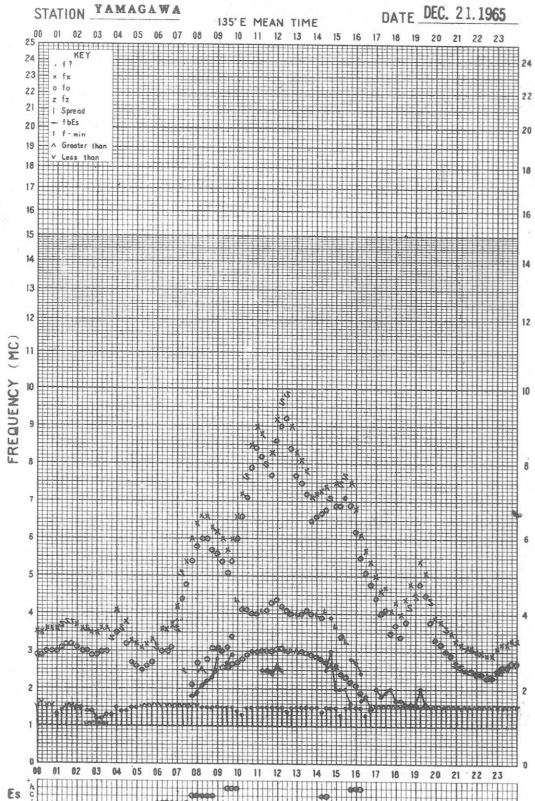

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The Radio Research Laboratories. Japan

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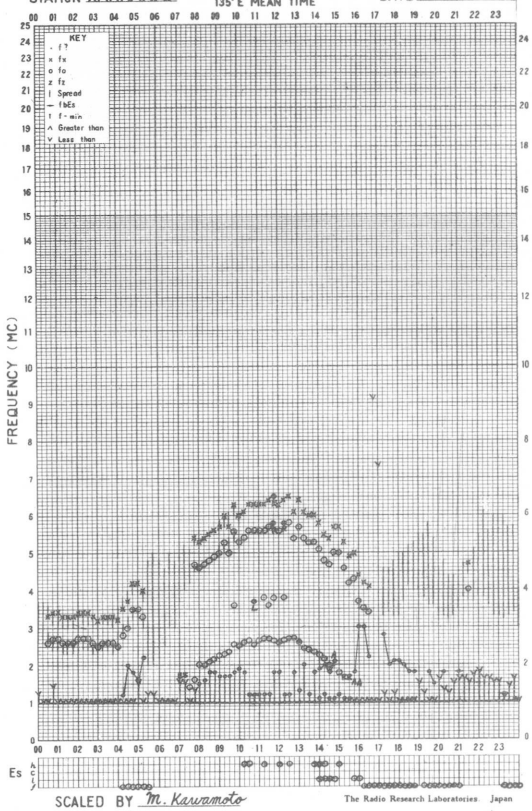

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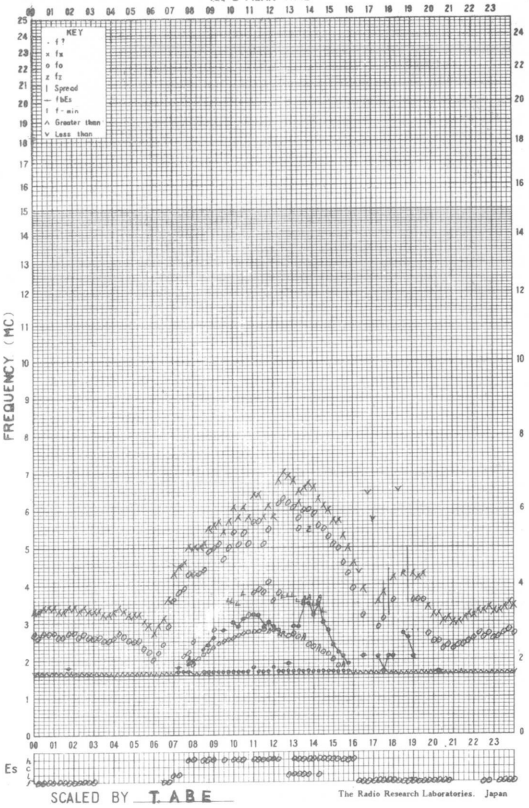

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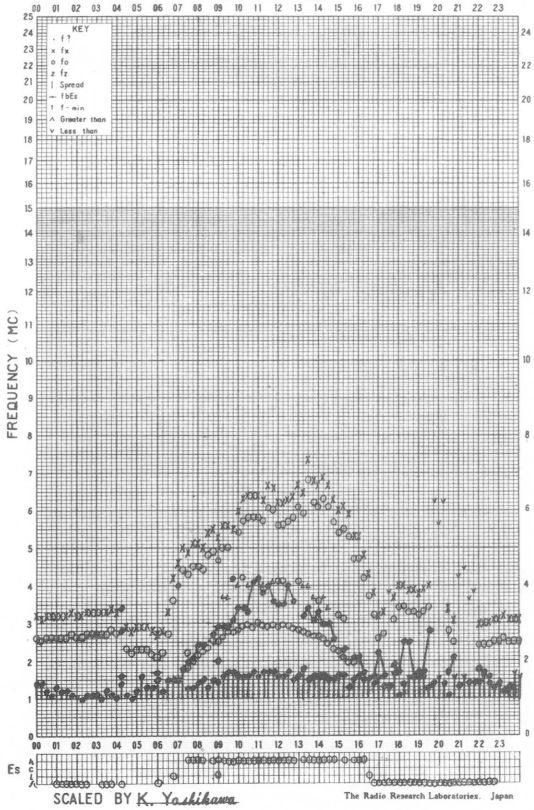

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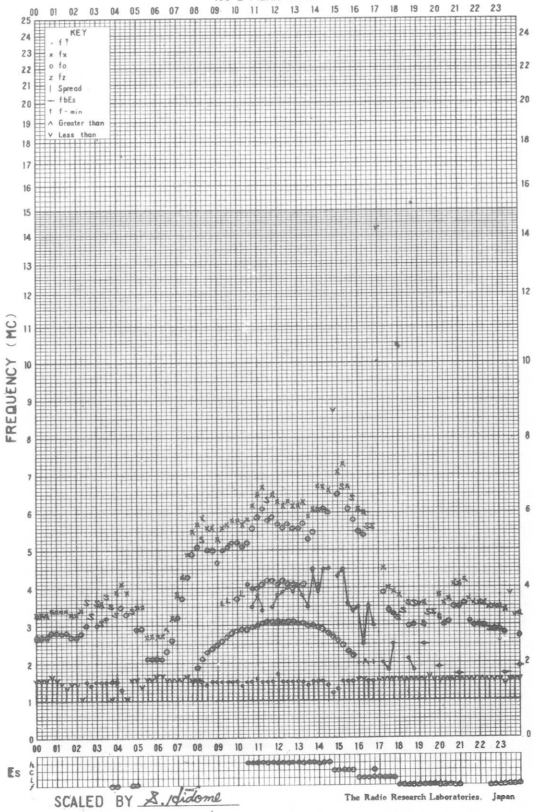

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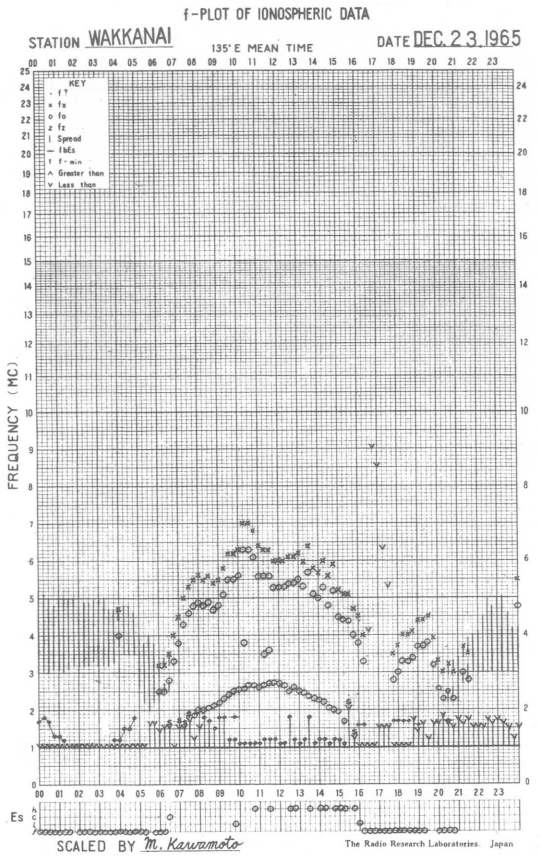
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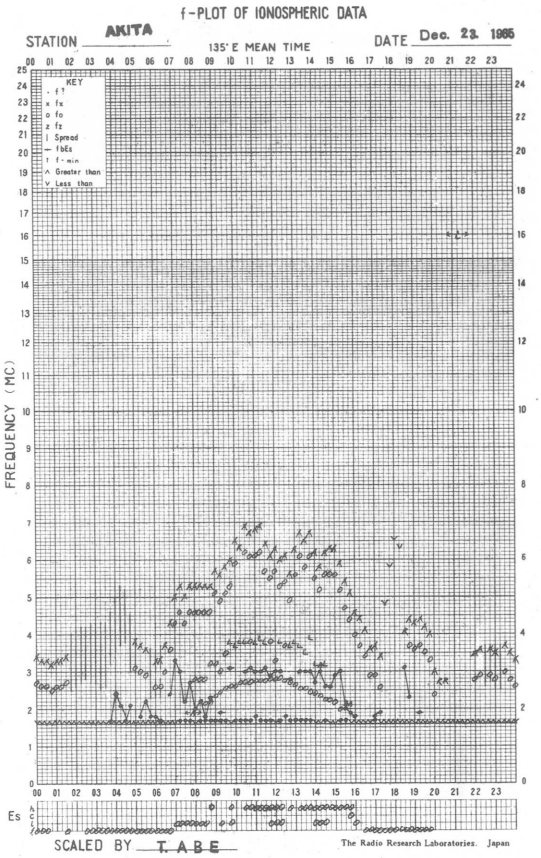
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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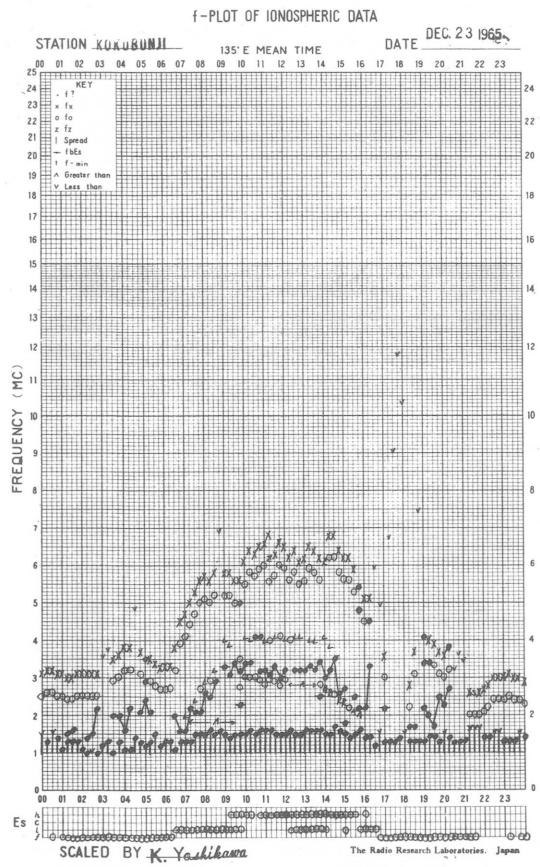
SCALED BY T. ABE
The Radio Research Laboratories. Japan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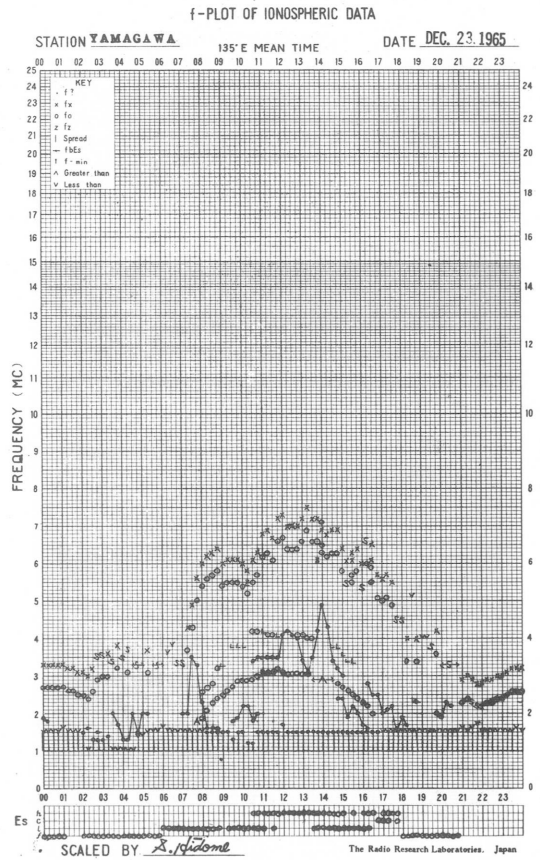
The Radio Research Laboratories. Japan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The Radio Research Laboratories. Japan

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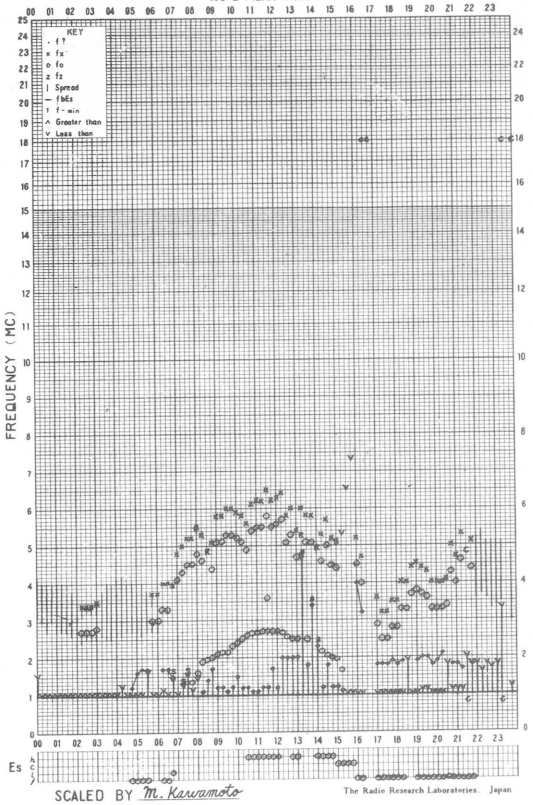

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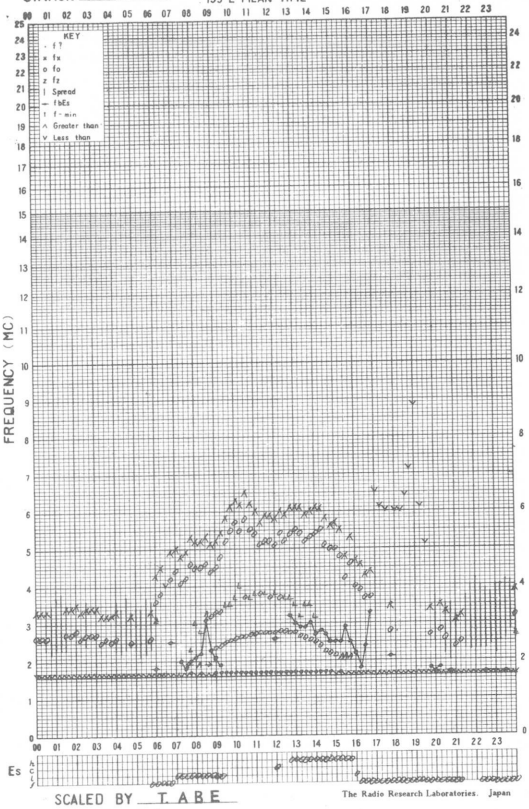

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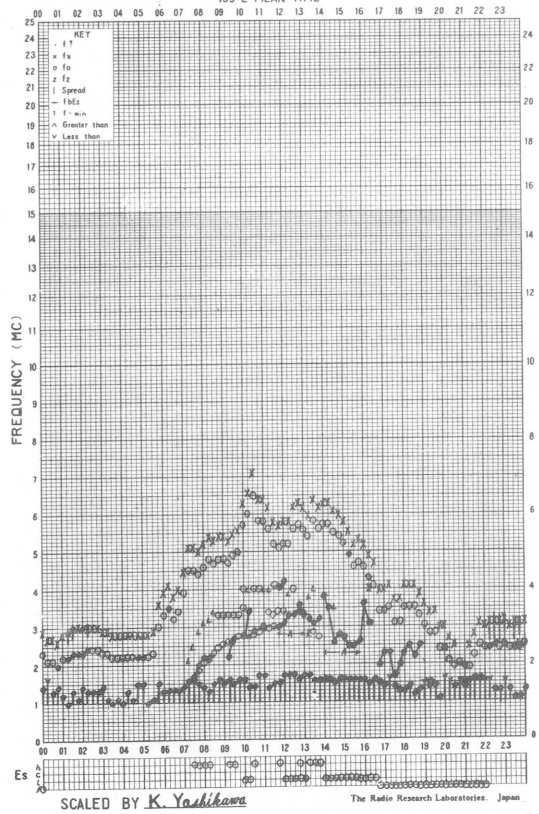

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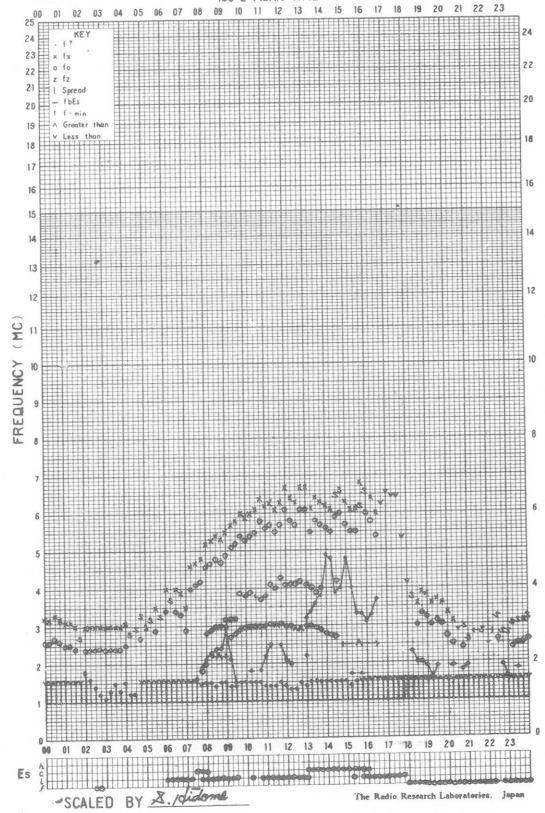
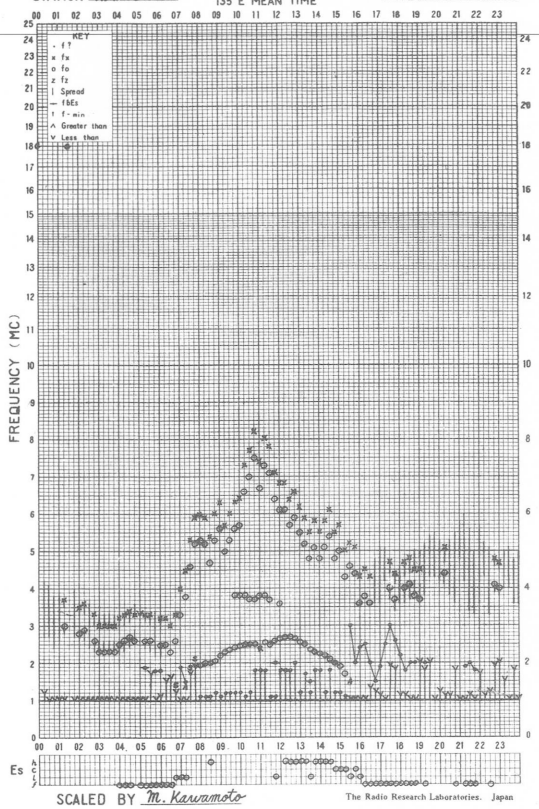


SCALED BY S. Shidomi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE DEC. 25. 1965

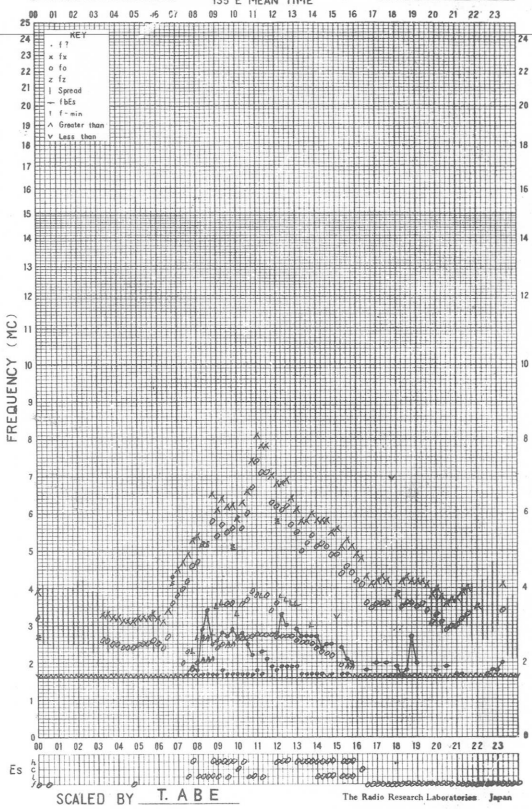


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Dec. 25. 1965

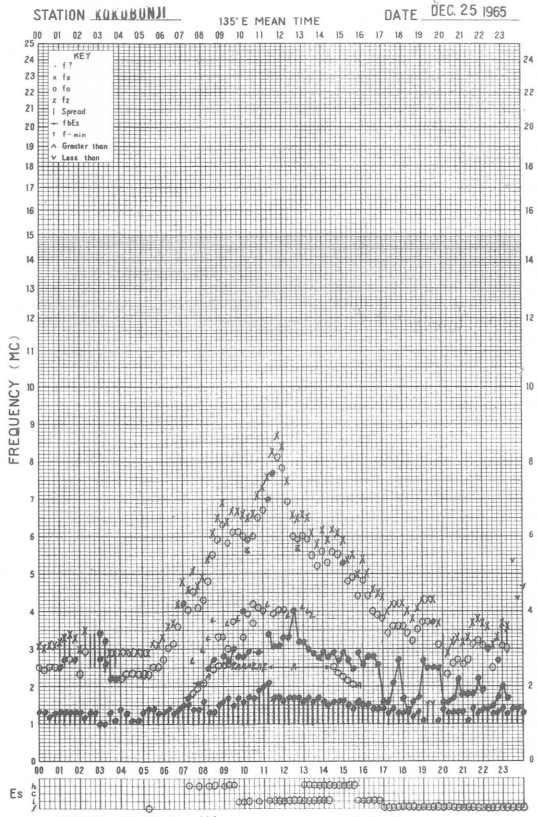


SCALED BY T. ABE

The Radio Research Laboratories Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE DEC. 25 1965

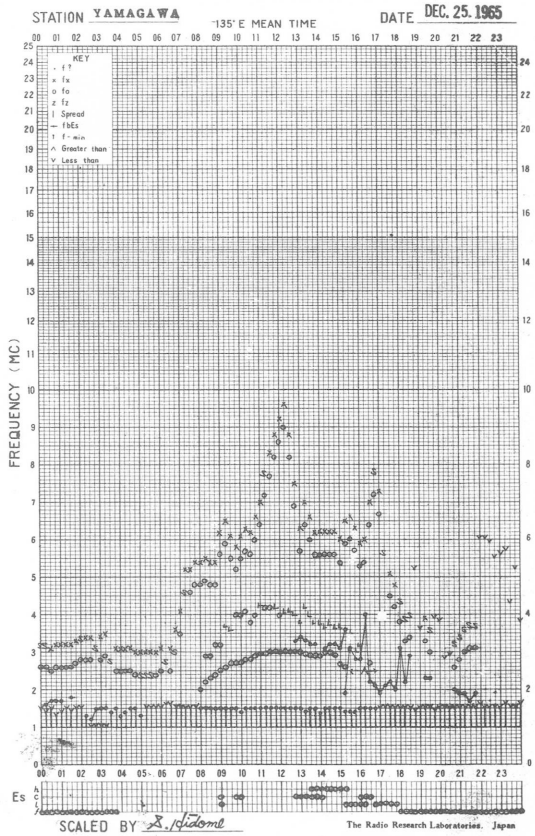


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE DEC. 25. 1965



SCALED BY S. Sidomi

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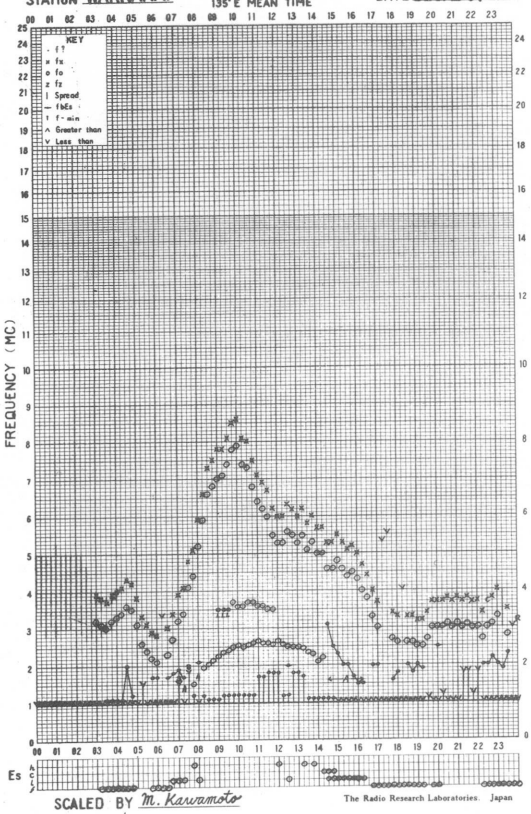
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE DEC. 26. 1965



SCALED BY M. Kawamoto

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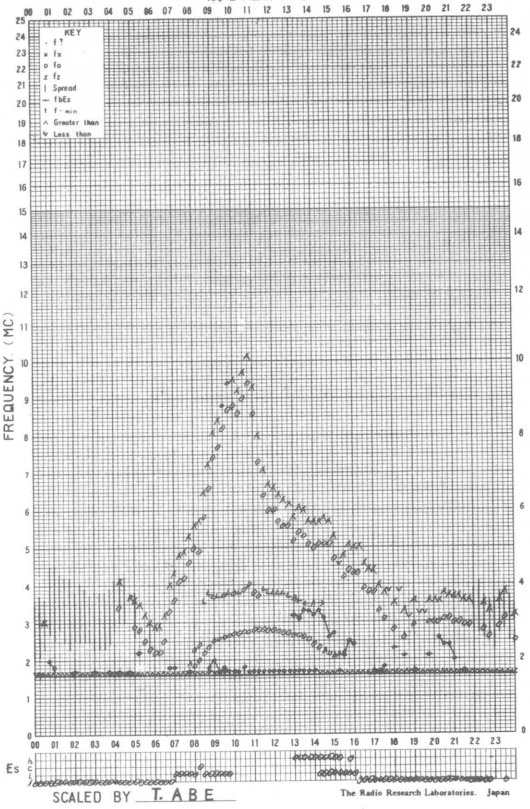
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Dec. 26. 1965

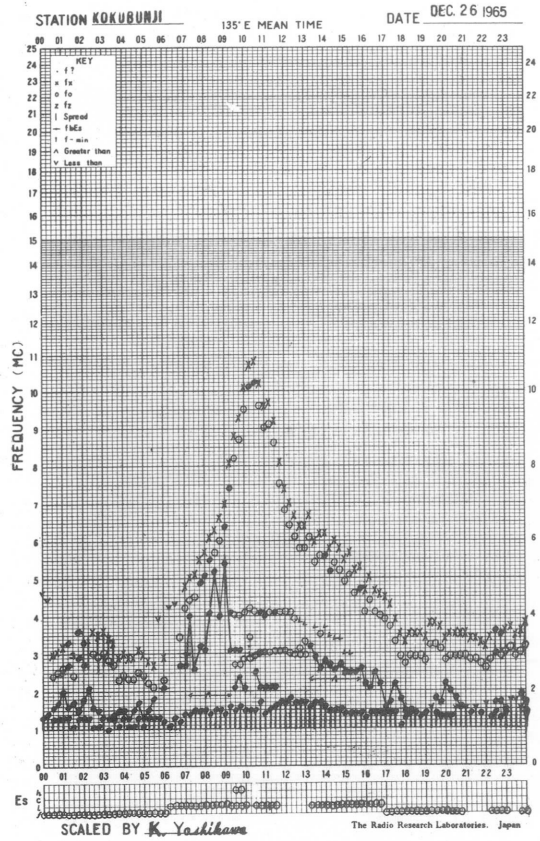


SCALED BY T. ABE

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE DEC. 26 1965

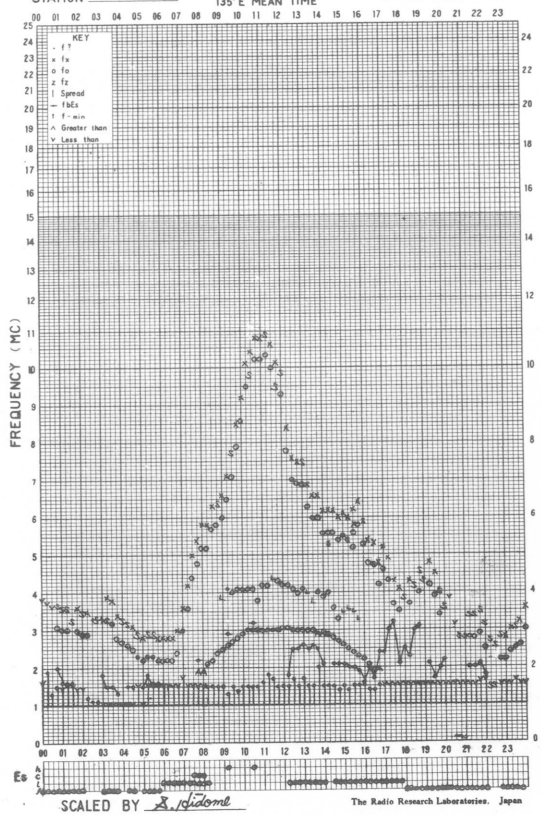


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE DEC. 26. 1965

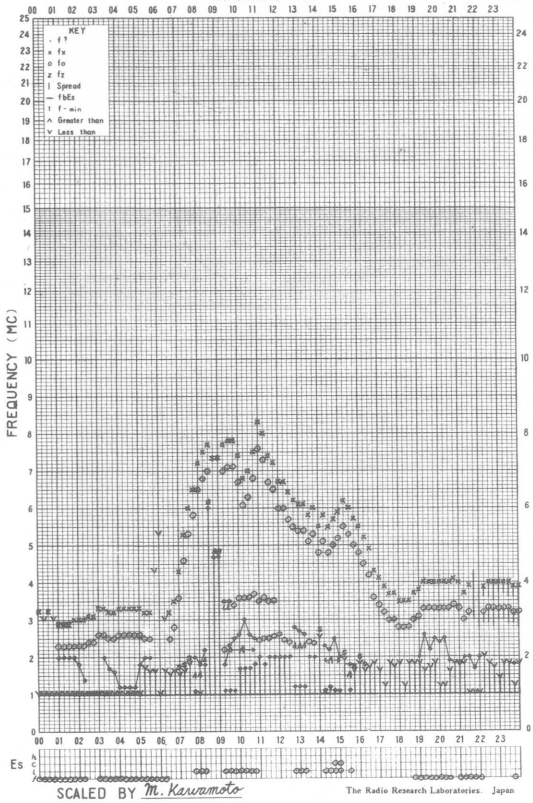


SCALED BY S. Sidomi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE DEC. 27. 1965



SCALED BY M. Kawamoto

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f-PLOT OF IONOSPHERIC DATA

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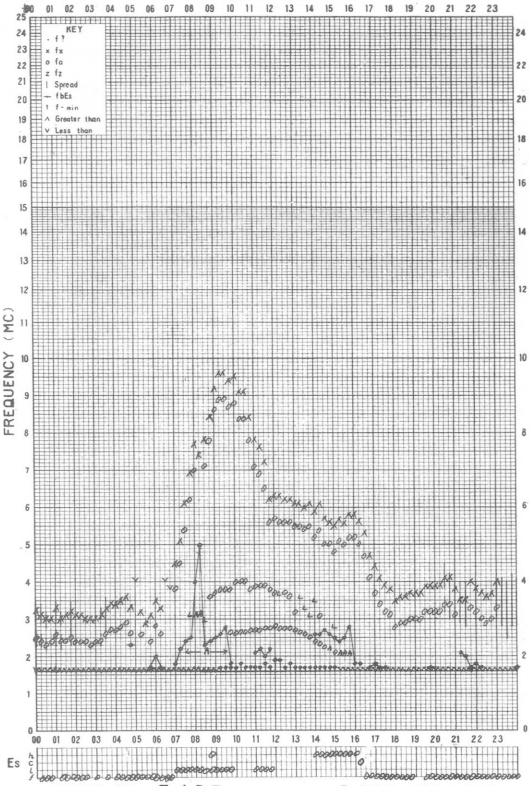
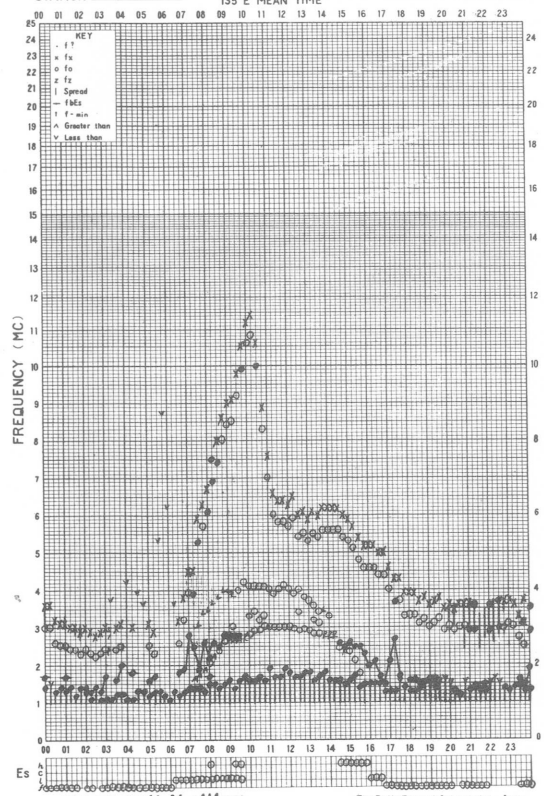


SCALED BY T. ABE

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE DEC. 27 1965

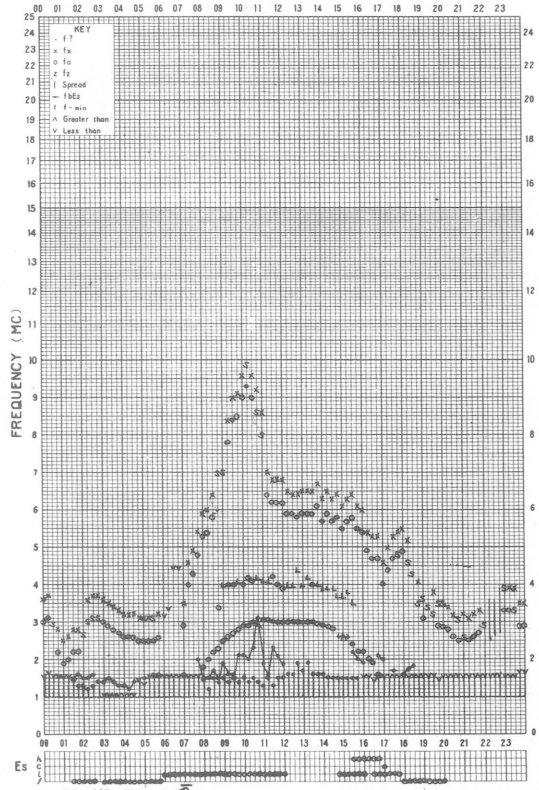


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE DEC. 27. 1965

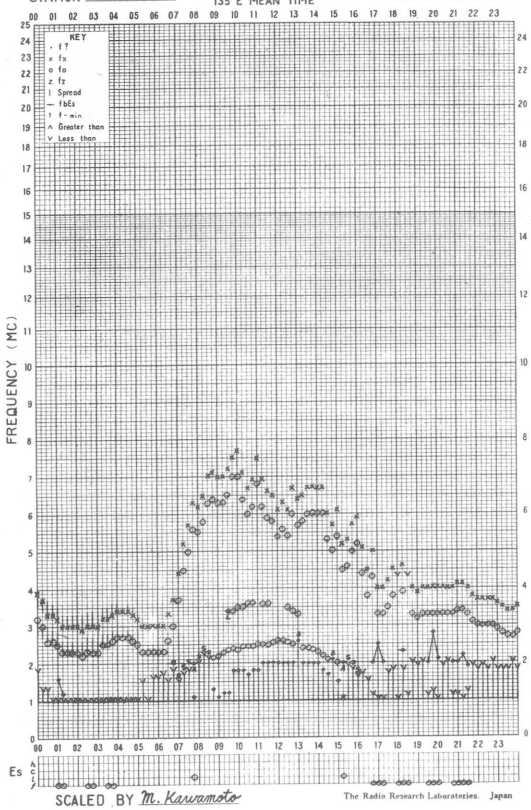


SCALED BY H. Oyama

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE DEC. 28. 1965

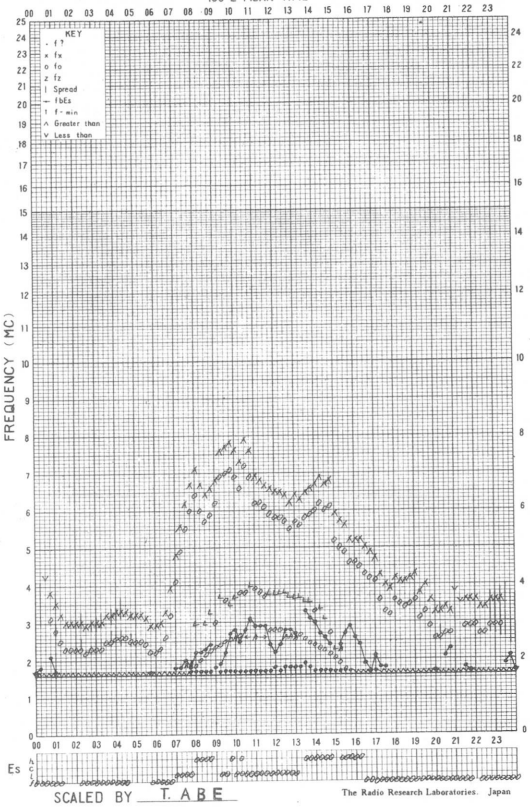


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Dec. 28. 1965



SCALED BY T. ABE

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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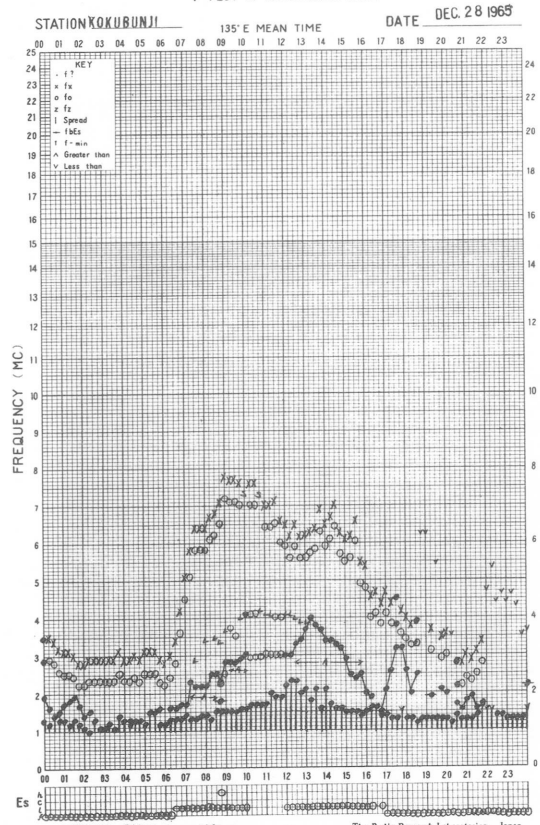
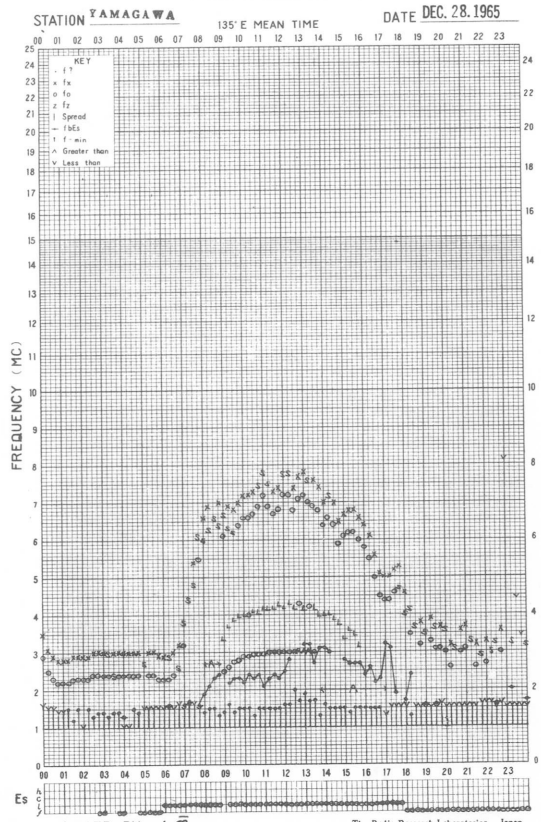


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE DEC. 28. 1965

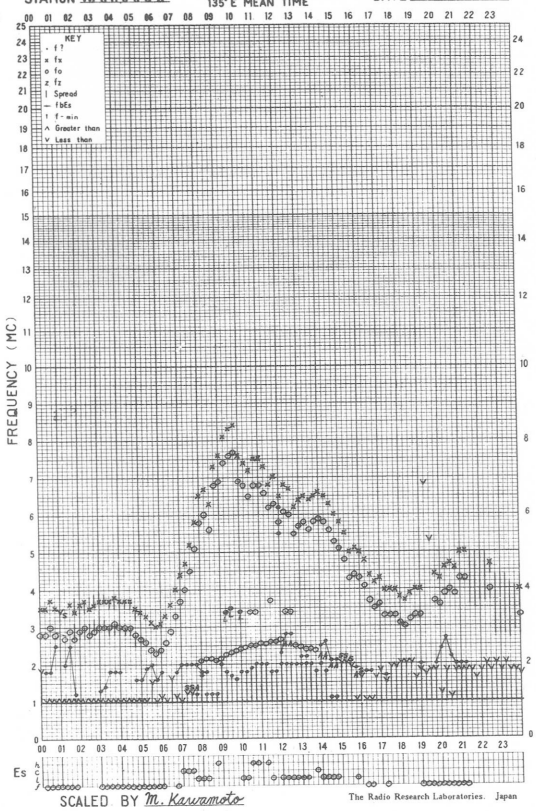


SCALED BY K. Oyama

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE DEC. 29. 1965



SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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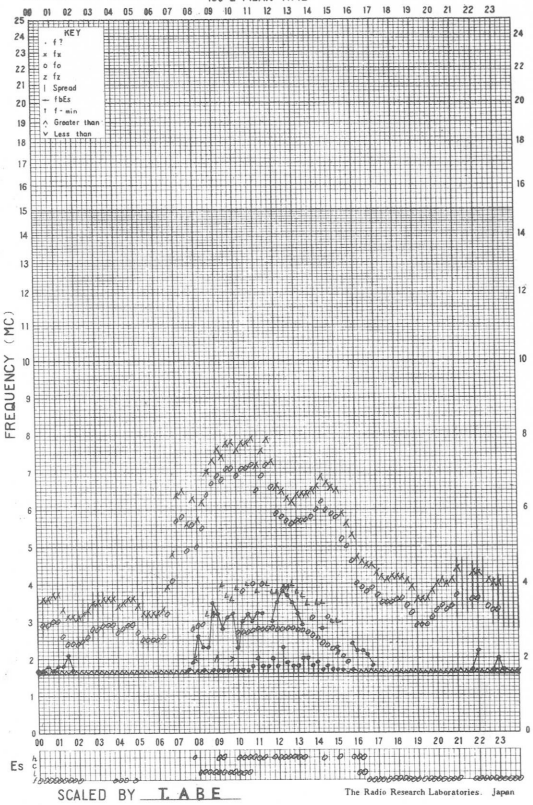
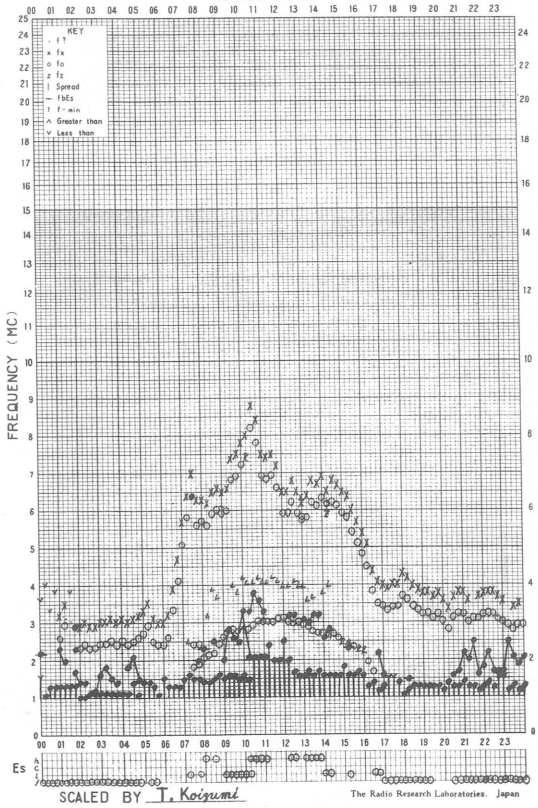


SCALED BY T. ABE

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE DEC. 29 1965



SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

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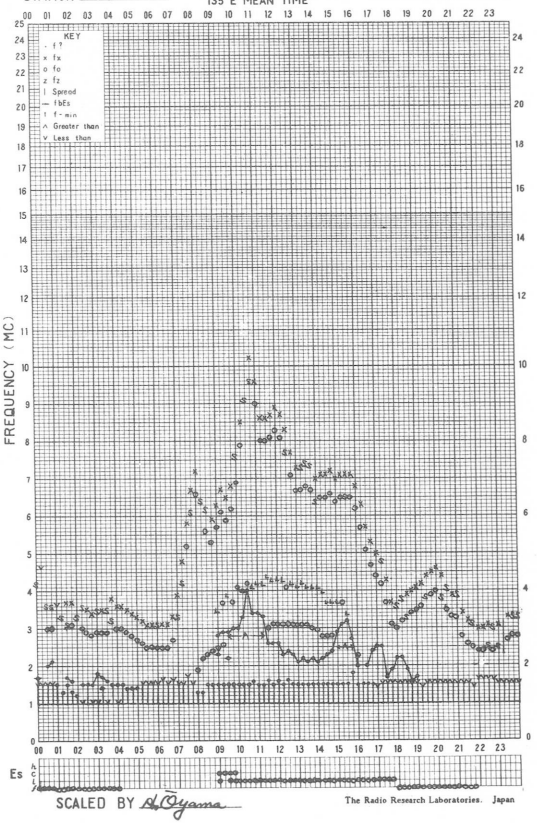
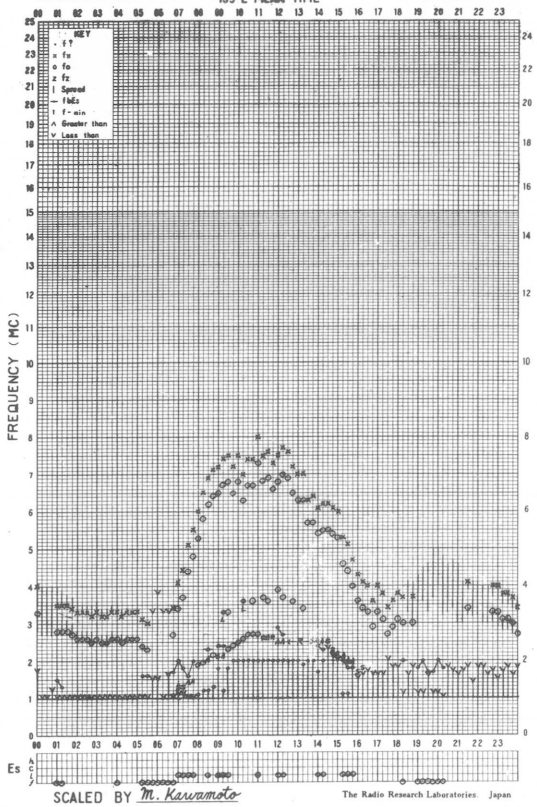


SCALED BY A. Ogyama

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE DEC. 30.1965



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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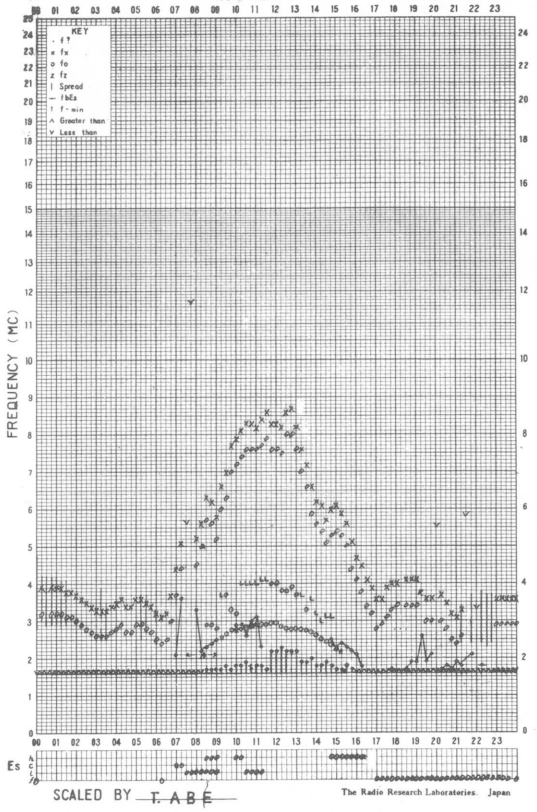

SCALED BY T. ABE The Radio Research Laboratories. Japan

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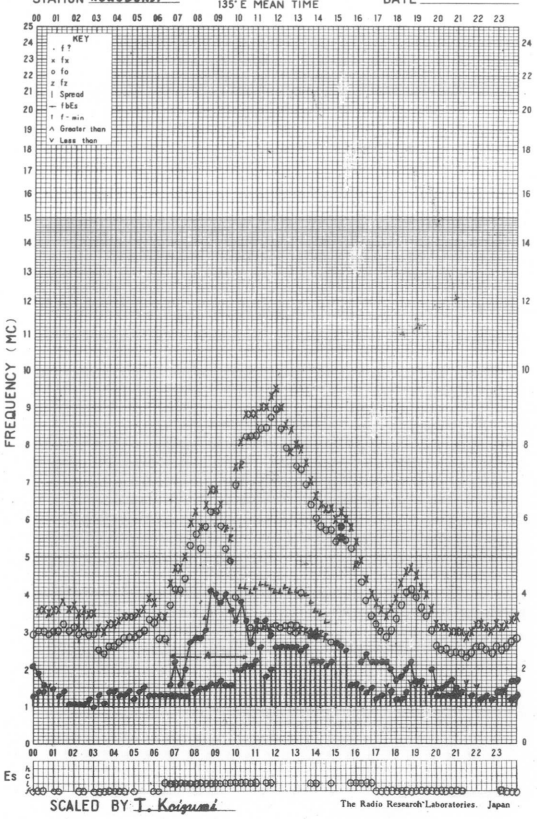

SCALED BY T. Koizumi The Radio Research Laboratories. Japan

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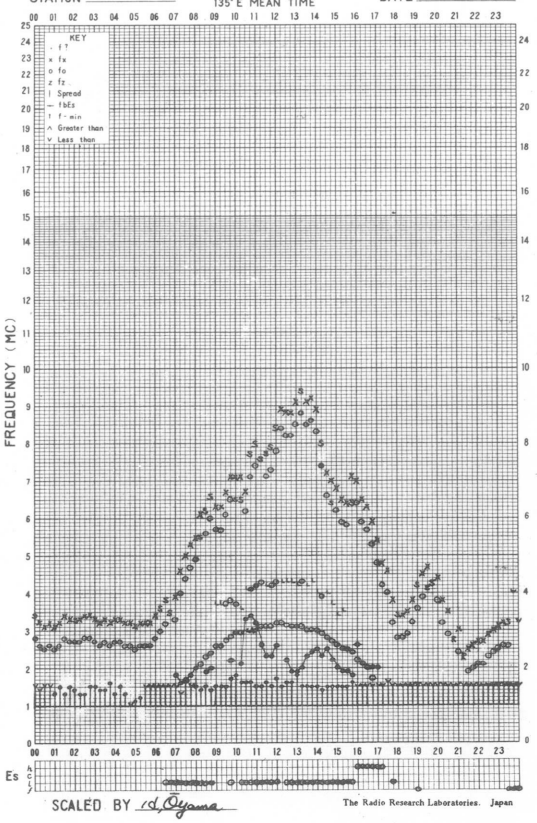
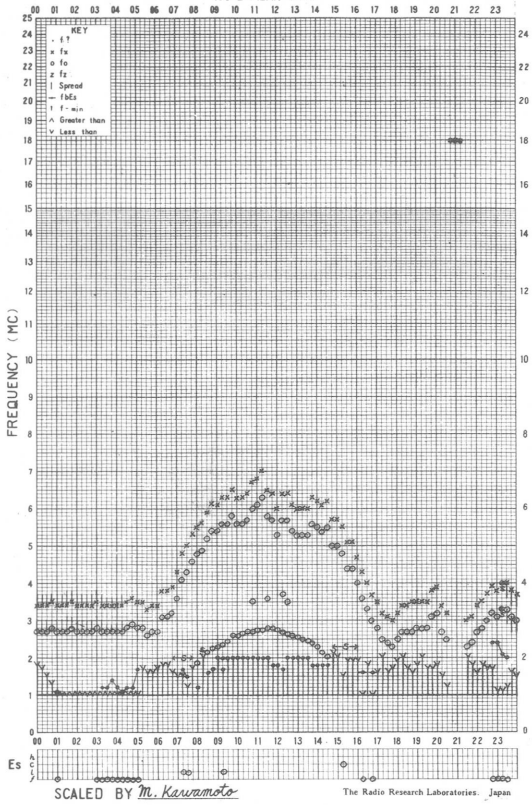


SCALED BY M. Oyama The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE DEC. 31. 1965



SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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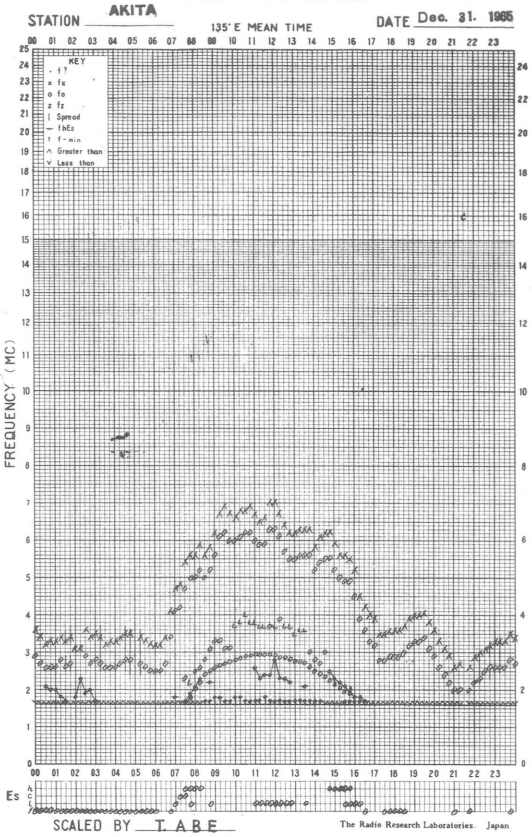

SCALED BY T. ABE

The Radio Research Laboratories. Japan

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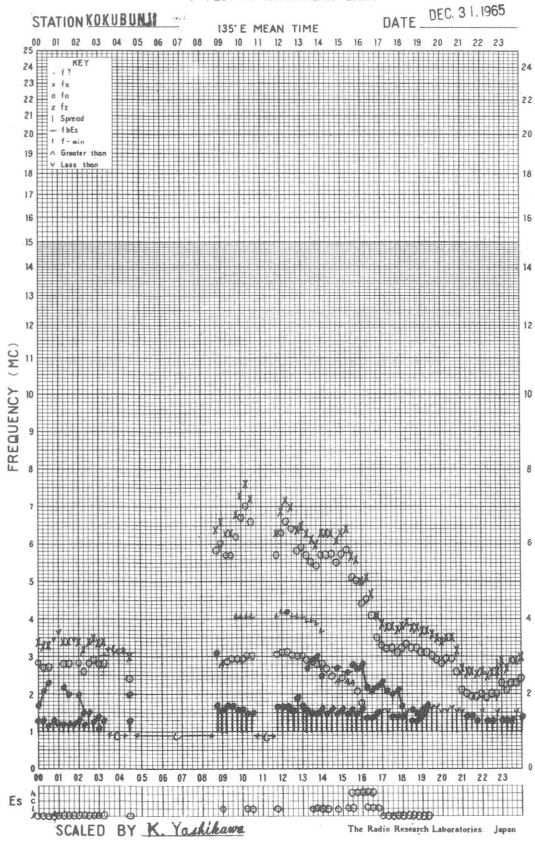
STATION KOKUBUNJI 135°E MEAN TIME DATE DEC. 31. 1965

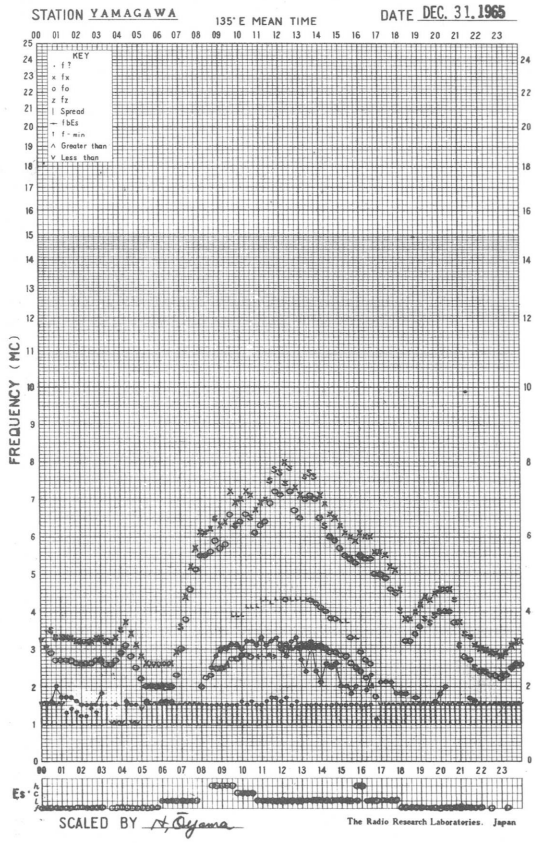


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE DEC. 31. 1965



SCALED BY A. Ōyama

The Radio Research Laboratories. Japan

SOLAR RADIO EMISSION

Flux Density and Variability

Month: December 1965
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	11	11	(11)	10	11	0	0	(0)	0	0
2	10	12	(13)	11	11	0	0	(0)	0	0
3	11	10	(9)	9	10	0	0	(0)	0	0
4	10	10	(10)	12	10	0	0	(0)	0	0
5	11	11	(11)	11	11	0	0	(0)	0	0
6	11	11	(11)	11	11	0	0	(0)	0	0
7	(11)	11	(9)	9	11	(0)	0	(0)	0	0
8	9	10	(9)	10	9	0	0	(0)	0	0
9	10	10	(10)	9	10	0	0	(0)	0	0
10	10	9	(9)	10	10	0	0	(0)	0	0
11	10	10	(10)	-	10	0	0	(0)	-	0
12	10	10	(10)	10	10	0	0	(0)	0	0
13	10	10	(9)	9	10	0	0	(0)	0	0
14	9	9	(9)	9	9	0	0	(0)	0	0
15	9	10	(10)	10	10	0	0	(0)	0	0
16	10	10	(10)	10	10	0	0	(0)	0	0
17	11	10	(10)	10	10	0	0	(0)	0	0
18	11	10	(9)	-	10	0	0	(0)	-	0
19	11	10	(10)	10	10	0	0	(0)	0	0
20	10	10	(10)	10	10	0	0	(0)	0	0
21	10	10	(10)	10	10	0	0	(0)	0	0
22	10	10	(10)	10	10	0	0	(0)	0	0
23	-	-	-	10	(10)	-	-	-	0	(0)
24	10	10	(11)	10	10	0	0	(0)	0	0
25	10	10	(10)	10	10	0	0	(0)	0	0
26	10	10	(10)	10	10	0	0	(0)	1	0
27	10	9	(10)	20	10	1	1	(1)	2	1
28	17	14	(15)	15	17	2	2	(2)	1	2
29	14	13	(14)	7	14	1	0	(1)	1	1
30	11	11	(12)	10	10	1	1	(1)	1	1
31	10	10	(10)	-	10	1	1	(1)	-	1

Note No observations during the following periods:

7th 0100- 0300 23rd 0000- 0730
11th 2140- 12th 0100 31st 2140- 2400
18th 2140- 19th 0010

SOLAR RADIO EMISSION

Flux Density

Month: December 1965
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	26	(27)	-	-	26
2	27	26	(27)	27	27
3	27	28	(27)	26	26
4	(26)	26	(26)	26	26
5	27	26	(25)	27	26
6	26	26	(25)	26	26
7	26	25	(25)	25	26
8	26	25	(24)	25	25
9	26	24	(24)	26	25
10	26	25	(23)	-	25
11	26	25	(25)	26	25
12	26	26	(26)	26	26
13	26	26	(24)	25	26
14	26	25	(25)	26	25
15	26	25	(25)	25	26
16	27	27	(27)	27	27
17	27	27	(26)	28	27
18	27	27	(28)	26	27
19	27	27	(25)	25	26
20	26	26	(25)	24	25
21	25	26	(25)	24	25
22	25	24	(23)	23	24
23	24	(24)	(24)	24	24
24	25	24	(24)	24	24
25	25	24	(24)	24	24
26	25	24	(24)	23	24
27	25	24	(25)	26	24
28	28	29	(29)	25	28
29	28	27	(26)	25	27
30	26	25	(25)	24	25
31	26	25	(25)	24	25

Note No observations during the following periods:

1st	0400-	2400	5th	0300-	0400
4th	0000-	0100	10th	2140-	2400
4th	0200-	0400	23rd	0300-	0500

Distinctive Events

(single-frequency observations)

Month: December 1965
Observing station: Hiraiso
Normal observing period: 2140 - 0730 (sunrise to sunset)

Date	Frequency	Starting time	Time of maximum	Duration	Type	Flux density $10^{-22}Wm^{-2}(c/s)^{-1}$		Remarks
	Mc/s	UT	UT	minutes		peak	mean	
27	200	0621	0621	2	C	1100	650	
	500	0621.3	0622	2.5	C	228	45	
27	200	2140		>600	storm			sunset fadeout
29	500	0411		>200	series			sunset fadeout
	500	0554	0555.2	5	C	>710	67	*
	500	0640.5	0641.2	5.5	C	>710	70	**
	200	0641		5	C	>1360	780	
30	500	0016	0021.6	54	C	198	15	
	200	0018	0022	10	C	446	89	
	200	0327	0327.5	2	C	1212	202	

* a burst in the series

** dit., inaccurate owing to low elevation

Measurement of H.F. Field Strength (Upper Side-band of WWV)

Dec. 1965 Frequency: 15 Mc/s, Bandwidth: ±40 c/s, Receiving Antenna: Rod (4.5 m) Measured at Hiraiso

UT Date	0015	0115	0215	0315	0415	0515	0615	0715	0815	0915	1015	1115	1215	1315	1415	1515	1615	1715	1815	1915	2015	2115	2215	2315
1	- 1	-19	<-22s	<-26s	<-13s	<-18s	<-19s	<-25s	<-30s	<-35s	<-36s	<-22s	<-36s	<-36s	<-36s	<-35s	<-36s	<-34s	<-31s	<-35s	(-34)s	-31	- 7	11
2	-17	<-19s	<-22s	<-31s	< 4s	< 5s	< 1s	< 7s	<-11s	<-13s	<-23s	<-13s	<-33s	<-33s	-24	<-30s	<-33s	<-33s	<-33s	<-34s	-34	-15	- 6	5
3	- 2	-21	-18	<-15s	<-21s	<-12s	< 2s	<-10s	<-13s	<-30s	<-29s	<-12s	<-31s	<-31s	<-39s	<-40s	<-40s	<-40s	C	C	C	C	C	C
4	<-18s	-21	<-17s	<-19s	<-14s	<-11s	< 3s	<-13s	<-29s	<-32s	<-31s	<-18s	<-31s	<-36s	<-34s	<-34s	<-34s	<-34s	<-34s	-31	<-34s	-18	-10	-16
5	<-24s	<-24s	<-23s	<-31s	<-17s	< 3s	< 7s	<-19s	<-19s	<-25s	<-35s	<-13s	<-31s	<-34s	<-34s	S	S	S	S	S	<-37s	-30	-15	<-20s
6	-37	-20	<-19s	-24	< 8s	<-11s	<-11s	<-17s	<-19s	<-19s	<-28s	<-12s	<-22s	<-34s	<-34s	<-34s	<-34s	<-34s	<-33s	<-33s	<-33s	- 7	- 2	<-13s
7	-26	-11	<-19s	<-29s	<-14s	<-23s	<-15s	<-26s	<-30s	<-34s	<-34s	<-12s	<-34s	<-34s	<-33s	<-32s	<-30s	<-30s	<-29s	<-29s	<-29s	-22	1	0
8	-25	-18	<-20s	-20	-14	<-10s	< 2s	< 8s	<-16s	<-24s	<-28s	<-26s	<-33s	<-33s	<-33s	<-33s	<-32s	<-32s	<-32s	<-32s	C	C	10	C
9	-23	<-17s	<-19s	<-20s	< 9s	<-12s	S	<-15s	<-14s	<-26s	<-22s	<-11s	<-31s	<-31s	<-31s	<-32s	<-33s	<-33s	<-33s	<-32s	<-32s	C	2	C
10	<-23s	<-21s	<-20s	<-32s	-14	<-18s	S	<-12s	< 7s	<-15s	<-23s	<-14s	<-33s	<-33s	<-33s	<-33s	<-32s	<-33s	<-33s	<-33s	C	C	C	C
11	C	<-17s	< 5s	<-21s	S	<-13s	<-11s	<-15s	<-22s	<-24s	<-25s	<-28s	<-35s	<-35s	-18	<-36s	<-36s	<-36s	<-36s	<-36s	-35	-18	- 3	-21
12	-22	<-15s	<-18s	<-27s	<-15s	<-12s	<-13s	<-18s	<-21s	<-34s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-37s	<-37s	-15	-25	- 8	<-15s
13	-24	<-16s	<-16s	<-24s	<-19s	< 7s	<-13s	<-19s	<-34s	<-34s	<-35s	<-26s	<-36s	<-31s	<-37s	<-29s	<-31s	<-37s	<-37s	<-37s	<-37s	-23	-13	<-11s
14	<-26s	<-21s	<-16s	<-30s	< 9s	< 8s	< 9s	<-15s	<-21s	<-34s	<-35s	<-15s	<-37s	<-37s	<-37s	<-37s	<-37s	<-37s	<-37s	<-36s	-27	8	-13	<-28s
15	<-27s	<-21s	<-15s	<-18s	<-10s	< 8s	S	<-23s	<-33s	<-34s	<-36s	<-23s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	-28	0	0
16	-24	<-17s	<-15s	<-30s	<-20s	<-19s	< 6s	<-11s	<-21s	<-30s	<-22s	<-34s	<-35s	<-35s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	<-35s	-23	- 4	<-17s
17	-27	<-21s	<-19s	-27	<-23s	<-20s	<-11s	<-15s	<-13s	<-19s	<-29s	<-13s	<-36s	<-36s	<-36s	<-35s	<-35s	<-35s	<-36s	<-35s	<-32c	-21	- 8	- 6
18	-11	S	<-22s	<-29s	<-13s	<-21s	<-15s	<-24s	<-23s	<-35s	<-35s	<-11s	<-35s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	<-32s	-19	-31	- 5	< 4s
19	<-23s	<-13s	<-20s	<-18s	-13	-10	< 4s	<-13s	<-22s	<-30s	<-34s	<-33s	<-33s	<-33s	-20	(-33)s	(-33)s	<-33s	<-33s	<-32s	<-32s	(-32)s	- 6	-12
20	-25	<-18s	<-23s	<-18s	<-16s	< 5s	< 2s	<-11s	<-12s	<-22s	<-24s	<-16s	<-33s	<-33s	-24	<-33s	<-33s	<-33s	<-34s	<-34s	<-33s	-29	- 8	- 8
21	<-33s	<-20s	(-23)s	(-25)s	(-19)s	(-13)s	C	<-18s	<-19s	<-30s	< 7s	<-15s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	-35	-27	-19	-13	-18	-24
22	<-32s	<-14s	<-13s	<-31s	<-19s	<-11s	<-13s	<-14s	<-14s	<-21s	<-26s	< 6s	<-35s	<-35s	<-35s	<-34s	<-31s	<-29s	<-29s	<-29s	-16	-27	3	-13
23	-18	-22	< 8s	C	< 4s	< 2s	< 7s	<-13s	<-19s	<-11s	<-33s	<-14s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	<-34s	<-34s	<-34s	-19	- 7	<-17s
24	<-18s	<-17s	C	<-25s	< 7s	< 6s	<-11s	<-11s	<-13s	<-14s	<-24s	< 7s	<-30s	<-30s	<-30s	<-30s	<-29s	<-29s	<-29s	<-29s	(-29)s	- 8	- 3	- 1
25	- 3	<-25s	<-15s	<-23s	<-14s	< 9s	<-17s	<-10s	<-14s	<-14s	< 6s	<-16s	<-30s	<-31s	-20	<-28s	<-28s	<-28s	<-28s	<-28s	<-20s	-21	1	< 0s
26	(-20)s	<-15s	<-13s	-22	C	C	< 5s	< 4s	<-15s	<-12s	<-22s	<-15s	<-29s	<-30s	<-30s	<-30s	<-30s	<-30s	<-30s	<-30s	<-30s	(-30)s	-10	- 7
27	- 9	<-14s	-15	<-21s	< 9s	< 5s	< 7s	<-12s	<-18s	<-29s	<-33s	<-18s	<-32s	<-32s	<-32s	<-32s	<-32s	<-33s	<-33s	<-33s	<-33s	(-33)s	-11	- 8
28	(-28)s	<-29s	-21	-23	<-15s	< 8s	S	<-18s	<-19s	<-21s	<-33s	<-33s	<-33s	<-25s	<-33s	<-33s	<-33s	<-33s	<-32s	<-32s	<-32s	-23	- 8	- 5
29	-14	<-16s	-11	(-16)s	< 6s	<-14s	<-13s	<-16s	<-27s	<-30s	<-29s	<-11s	<-32s	<-32s	<-32s	<-32s	<-32s	<-33s	<-33s	(-33)s	-32	- 5	-16	- 9
30	- 9	<-18s	<-20s	<-23s	<-11s	<-11s	<-17s	<-17s	<-31s	<-26s	<-31s	<-32s	<-33s	<-33s	<-34s	<-32s	<-32s	<-32s	<-33s	<-33s	<-34s	(-33)s	- 8	-19
31	<-18s	<-18s	<-15s	<-31s	<-15s	< 9s	< 9s	<-21s	<-29s	<-30s	<-31s	<-31s	<-32s	<-32s	<-32s	<-32s	<-32s	<-32s	<-32s	<-31s	<-30s	<-30s	-19	<-18s
Median	(-24)s	(-18)s	(-19)s	(-24)s	(-14)s	(-11)s	(-10)s	(-15)s	(-19)s	(-26)s	(-29)s	(-15)s	(-33)s	(-33)s	(-34)s	(-33)s	(-33)s	(-33)s	(-33)s	(-33)s	(-32)s	-23	- 7	(-12)s
Med. Count	30	30	30	30	29	30	26	31	31	31	31	31	31	31	31	30	30	30	29	29	28	27	29	27
Upper decile	- 6	<-14s	<-11s	<-18s	<-16s	< 3s	< 2s	< 8s	<-12s	<-13s	<-22s	<-11s	<-30s	<-30s	-20	<-30s	<-30s	<-29s	<-29s	<-29s	-19	- 7	2	0
Lower decile	<-32s	<-24s	<-23s	<-31s	<-20s	<-20s	<-17s	<-24s	<-31s	<-34s	<-36s	<-33s	<-36s	<-36s	<-37s	<-36s	<-36s	<-37s	<-37s	<-36s	<-36s	<-33s	-16	<-21s

Measurement of H.F. Field Strength (Upper Side-band of WWVH)

Dec. 1965 Frequency: 15 Mc/s, Bandwidth: ±40 c/s, Receiving Antenna: Rod (4.5 m) Measured at Hiraiso

UT Date	0045	0145	0245	0345	0445	0545	0645	0745	0845	0945	1045	1145	1245	1345	1445	1545	1645	1745	1845	1945	2045	2145	2245	2345
1	13	12	13	14	9	2	-14	<-28s	<-30s	<-35s	<-35s	<-31s	<-28s	<-28s	<-28s	<-27s	<-35s	<-26s	<-35s	-31	- 3	12	10	13
2	C	14	14	C	12	5	< 2s	<- 2s	C	<-17s	<-18s	<-16s	<-33s	<-33s	<-28s	<-33s	<-34s	<-34s	<-34s	(-34)s	4	6	11	7
3	7	7	12	16	3	< 0s	<- 3s	<- 6s	<-17s	<-38s	<-38s	<-16s	<-29s	<-40s	<-39s	<-40s	<-40s	C	C	C	C	C	C	C
4	12	15	13	19	23	7	<- 1s	<- 8s	<-31s	<-31s	<-31s	<-22s	<-31s	<-36s	<-37s	<-33s	<-33s	<-33s	<-33s	-19	- 2	7	5	10
5	12	8	11	25	0	<- 5s	<- 4s	<-20s	<-16s	<-34s	<-35s	<-15s	<-35s	<-34s	S	S	S	S	S	(-24)s	-14	-10	- 7	1
6	- 4	4	15	17	-11	<-14s	- 6	<-16s	<-24s	<-32s	<-32s	<-10s	<-34s	<-34s	<-34s	<-34s	<-33s	<-33s	<-33s	<-33s	- 6	7	9	11
7	11	13	9	10	2	-13	<-21s	<-27s	(-30)s	-26	<-33s	<- 9s	<-34s	<-33s	<-32s	<-30s	<-29s	<-28s	<-28s	(-28)s	7	11	7	11
8	11	13	15	20	8	- 3	<- 6s	<- 9s	<-25s	<-26s	<-29s	<-28s	<-33s	<-33s	<-33s	<-33s	<-32s	<-32s	<-32s	<-32s	C	C	C	C
9	10	13	10	14	7	<-10s	<- 6s	<-18s	<-31s	<-31s	<-14s	<-12s	<-31s	<-31s	<-31s	<-33s	<-33s	<-33s	<-37s	<-32s	6	7	9	6
10	8	8	11	15	8	<- 4s	<- 5s	<- 5s	<- 6s	<-22s	<-33s	<-15s	<-34s	<-28s	<-34s	<-33s	<-33s	<-34s	C	-30	4	8	C	C
11	C	13	9	14	1	<-10s	<-15s	<-10s	<-11s	<-31s	<-24s	<-31s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	<-36s	-21	2	4	3	10
12	6	10	15	13	5	<-15s	<-13s	<-11s	<-24s	<-34s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-37s	<-37s	-20	3	5	6
13	9	8	16	12	11	2	<-11s	<-24s	<-24s	-31	<-35s	<-29s	<-36s	<-37s	<-37s	<-32s	<-32s	<-37s	-29	-34	1	- 1	4	1
14	7	8	5	5	<-14s	<-12s	<- 9s	<-20s	<-25s	<-31s	<-17s	<-18s	<-37s	<-37s	<-37s	<-37s	<-37s	<-37s	-28	1	4	7	8	3
15	10	9	11	11	3	- 7	<-18s	<-32s	<-35s	<-35s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	-28	1	0	4	7
16	8	8	8	8	1	- 9	<-13s	<- 6s	<-21s	<-32s	<-18s	<-25s	<-35s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	-30	- 5	4	6	7
17	9	7	10	9	7	- 5	<-12s	<- 7s	<-23s	<-30s	<-19s	-30	-23	-28	-25	-12	-11	- 7	- 1	1	1	1	1	1
18	S	7	9	14	9	4	(-12)s	<-18s	<-22s	-34	-34	<-18s	<-34s	<-33s	<-32s	<-32s	<-32s	<-31s	-22	- 1	14	13	15	
19	7	8	12	15	15	17	13	<- 1s	-16	<-28s	-30	<-33s	<-35s	<-34s	<-34s	<-34s	<-34s	<-34s	<-33s	<-33s	- 1	7	8	9
20	7	10	11	13	10	9	4	1	- 6	<-26s	<-21s	<-24s	<-33s	<-33s	<-33s	<-33s	<-33s	<-34s	-15	-11	-12	4	4	7
21	- 2	(- 7)c	(10)c	(10)c	(10)c	(9)c	3	- 4	- 8	<-28s	<-23s	<-21s	<-35s	<-35s	<-35s	<-35s	<-35s	-24	0	-24	0	2	- 1	- 2
22	0	7	8	13	9	1	<- 7s	<-12s	<-28s	<-23s	<- 1s	<-15s	<-35s	<-35s	<-35s	<-34s	<-31s	<-29s	<-29s	<-29s	-13	7	8	5
23	7	7	C	C	3	- 3	<- 8s	- 4	<- 9s	<-25s	<-34s	<-20s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	<-34s	<-34s	- 9	- 3	4	4
24	7	C	10	6	<- 2s	< 2s	<- 3s	< 0s	<- 9s	-19	<-30s	<-17s	<-30s	<-30s	<-29s	<-29s	<-29s	<-29s	<-29s	<-29s	- 2	12	15	14
25	22	12	15	17	14	8	4	7	16	2	<-19s	<-25s	- 9	-21	<-29s	<-28s	<-28s	<-28s	- 2	2	7	7	12	12
26	15	14	16	C	C	C	<-10s	<- 4s	<- 4s	<-10s	<-30s	<-21s	<-29s	<-30s	<-30s	<-30s	<-30s	(-30)s	15	2	- 4	8	11	13
27	8	10	9	9	1	- 2	<- 7s	-11	<-23s	<-29s	<-33s	<-18s	<-28s	<-28s	<-28s	<-33s	<-33s	<-33s	<-33s	<-32s	-19	8	10	6
28	2	6	7	12	14	4	<-16s	<-14s	<-26s	<-17s	<-33s	<-33s	<- 6s	<-25s	<-33s	<-33s	<-32s	<-32s	<-32s	<-32s	0	7	13	12
29	9	12	9	10	13	- 1	<-13s	<- 9s	<-23s	<-30s	<- 7s	<-24s	<-32s	<-19s	<-26s	<-32s	<-32s	<-33s	-27	3	7	5	10	- 3
30	- 3	3	4	13	12	<-14s	<-13s	-11	-22	<-32s	<-32s	<-32s	<-33s	<-33s	<-33s	<-32s	<-32s	<-32s	<-32s	-25	- 8	3	5	3
31	2	4	7	12	13	- 8	<-17s	-13	<-30s	<-32s	<-32s	<-32s	<-32s	<-32s	<-32s	<-32s	<-32s	<-32s	<31s	(-30)s	-16	4	- 7	1
Median	8	8	11	13	8	<- 3s	(- 7)s	((-11)s	((-23)s	((-30)s	((-31)s	((-21)s	((-33)s	((-33)s	((-33)s	((-33)s	((-33)s	((-33)s	((-32)s	(-29)s	- 1	7	8	7
Med. Count	28	30	30	28	30	30	31	31	30	31	31	31	31	31	30	30	30	29	28	30	29	29	28	28
Upper decile	13	14	15	19	14	(9)s	4	< 0s	<- 6s	<-17s	<-14s	<-12s	<-28s	<-23s	<-28s	<-28s	<-29s	<-26s	- 2	2	7	12	13	13
Lower decile	- 2	4	7	8	<- 2s	<-14s	<-17s	<-27s	<-31s	<-35s	<-36s	<-33s	<-36s	<-37s	<-37s	<-36s	<-36s	<-36s	<-36s	<-34s	-16	- 1	- 1	1

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Dec. 1965	Whole Day Index	H B 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	4+	4 4 4	- - - 4	4 5 5 4	4 4 - (4)	N N N N			
2	5-	4 4 4	- - - 5	5 5 5 5	4 4 - (4)	N N N N			
3	4o	4 4 4	- - - (3)	4 4 5 4	4 5 - (4)	N N N N			
4	4o	3 4 4	- - - 4	4 4 4 4	4 3 - 4	N N N N			
5	4o	4 4 C	- - - 4	(4) 4 4 4	4 3 - 4	N N N N			
6	4-	3 C C	- - - 4	(3) 4 4 4	(4 4) - 4	N N N N			
7	4+	4 4 (4)	- - - 4	4 4 5 5	4 (4) - 4	N N N N			
8	4+	C C C	- - - 4	4 4 5 5	4 (3) - 4	N N N N			
9	4o	C (4) 5	- - - (4)	4 4 4 4	4 3 - 4	N N N N			
10	4o	C C 4	- - - (5)	4 4 4 4	(4) 4 - (5)	N N N N			
11	4o	(5) C 4	- - - 4	4 4 4 4	(5) 5 - (4)	N N N N			
12	4+	(5) C (4)	- - - 4	5 4 4 4	4 3 - 4	N N N N			
13	4o	C C C	- - - 4	4 4 4 4	4 4 - 4	N N N N			
(14)	4o	C C 4	- - - 4	4 4 4 4	3 3 - 4	N N N N			
(15)	4o	4 4 4	- - - 5	4 4 4 4	4 4 - 4	N N N N			
(16)	4o	4 4 4	- - - 4	4 4 4 4	4 4 - (4)	N N N N			
17	4o	4 4 4	- - - 5	4 4 4 4	4 4 (4) 5	N N N N			
18	4+	4 4 4	- - - 4	5 4 4 5	5 5 - (4)	N N N N	0621	---	45γ
19	4o	4 (3) 4	- - - 4	4 4 4 4	5 5 - 4	N N N N	---	03xx	
20	4o	4 (4) C	- - - 4	4 4 4 3	5 (4) - 4	N N N N			
21	4o	4 4 4	- - - 4	(4) 4 (4) 4	4 4 - 5	N N N N			
22	4o	4 4 4	- - - 4	4 4 4 4	4 3 - 4	N N N N			
23	4o	(4) 4 C	- - - 4	4 4 4 4	4 4 - 4	N N N N			
24	4o	4 4 4	- - - 4	4 4 4 4	4 4 - (4)	N N N N			
25	4o	4 4 4	- - - (4)	3 4 4 4	(5 5) - 5	N N N N			
26	4o	4 4 4	- - - 3	4 4 4 5	4 C - 5	N N N N			
27	4o	4 (4) C	- - - 4	4 4 4 C	4 C - (4)	N N N N			
28	4o	4 C C	- - - 4	5 4 4 (4)	4 (4) - (4)	N N N N			
29	4-	4 4 (3)	- - - 4	4 4 4 (3)	4 (5) - 4	N N N N			
30	4-	4 4 C	- - - 3	(3) 4 4 (3)	3 4 - 4	N N N N			
31	3+	3 (4) C	- - - 2	3 4 4 C	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

Time in U.T.

Dec. 1965	S W F										Correspondence		
	Drop-out Intensities (db)						Start-time	Dura-tion	Type	Imp.	Flare	Solar Noise	Mag.
	WS	SF	HA	TO	HB	SH							
31	-		15				22.26	31	Slow	2-			

IONOSPHERIC DATE IN JAPAN FOR DECEMBER 1965
第 17 巻　第 12 号

1966年 3 月20日　印　刷
1966年 3 月25日　発　行　（不許複製非売品）

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