F—233

IONOSPHERIC DATA IN JAPAN

FOR MAY 1968

Vol. 20 No. 5

Issued in August 1968

Prepared by

THE RADIO RESEARCH LABORATORIES

MINISTRY OF POSTS AND TELECOMMUNICATIONS

KOKUBUNJI, TOKYO, JAPAN

F - 233

IONOSPHERIC DATA IN JAPAN

FOR MAY 1968

Vol. 20 No. 5

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.	Midori-cho, Wakkanai-shi, Hokkaido
Akita	39°43.5′N.	140°08.2′E.	Tegata Sumiyoshi-cho, Akita-shi, Akita-ken
Kokubunji	35°42.4′N.	139°29.3′E.	Nukuikita-machi, 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 Branch.

	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 two parabolic reflectors : 10 meter for 200 Mc/s and 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} $W \cdot m^{-2} \cdot (c/s)^{-1}$ 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 Fort Collins, Colorado and Hawaii, respectively, are carried out at Hiraiso Branch. In order to avoid interferences with other 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 with ±40 c/s bandwidth.

The *tabulated field intensity* is the average of peak value of the incident upper side-band field intensity in dB above one microvolt per meter. The *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	Fort Collins, Colorado Long. 105°02′ W Lat. 40°41′ 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	9150 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	every half an hour

The meaning of *Descriptive symbols* is 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.

( ): Inaccurate 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 (10, 15 and 20 Mc/s frequencies broadcast from Fort Collins, Colorado), San Francisco (commercial circuit) and WWVH (10 and 15 Mc frequencies broadcast from Hawaii), which are received at Hiraiso Branch (Lat. 36°22′ N, Long. 140°38′ E).

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

N=normal
U=unstable
W=disturbed

The letter W expresses HF propagation disturbances which are expected to occur during the following 12 hours after issue. The letter U and N also means unstable and normal conditions, respectively.

Whole day radio quality indices stand for the averages of the 6-hourly indices of the circuits of Hamburg, WWV and San Francisco.

Start- and end-time of principal geomagnetic storms correlated with 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 prepared from the records of field intensities at Hiraiso, of the following circuits. Start-time, Duration, Type and Importance are obtained from the data of a circuit whose Drop-out Intensity is underlined. Drop-out Intensities of 10, 15 and 20 Mc/s are indicated by (′), (none), and (″), respectively. Characteristics of the phenomenon are classified as follows.

Circuits and Drop-out intensities

C O .....WWV 20, 15 and 10 Mc/s (Fort Collins, Colorado)
S F .....Various frequencies of commercial circuit (San Francisco)
H A .....WWVH 15 and 10 Mc/s (Hawaii)
T O .....JJY 15 and 10 Mc/s (Tokyo)
S H .....BPV 15 and 10 Mc/s (Shanghai)
H B .....Various frequencies of commercial circuit (Hamburg)

Start-time and Duration

Types

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

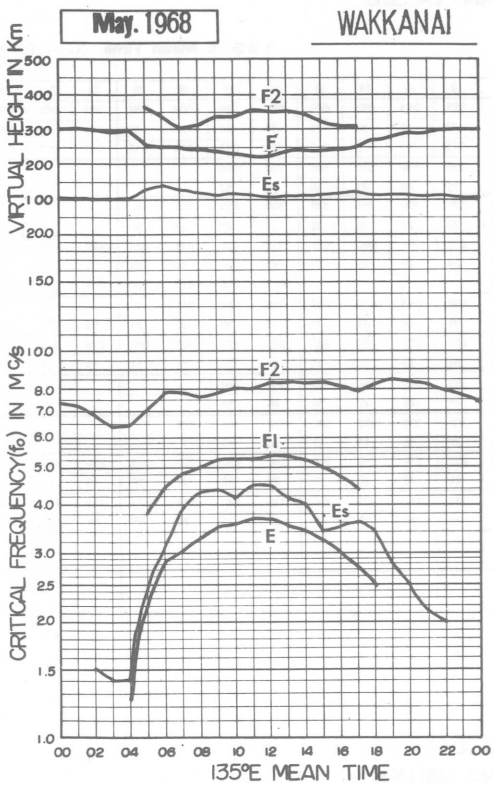
Importances

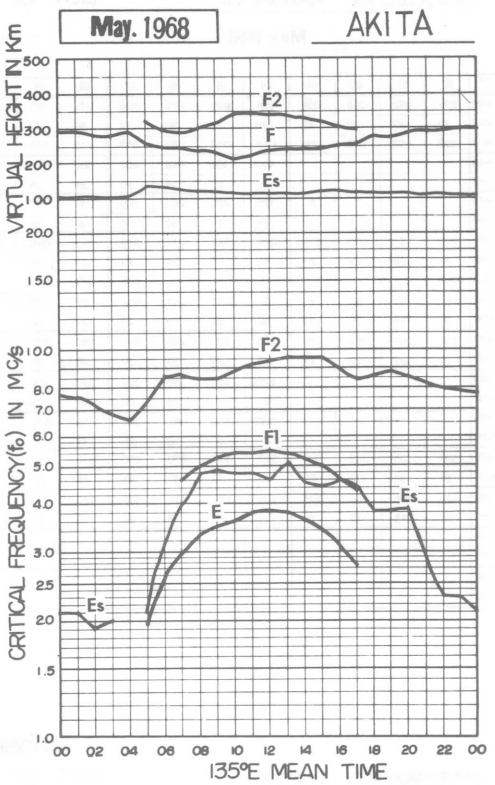
Degrees of SWF are classified into 9 grades according to the amplitude of fade-out;

1−	1	1+
2−	2	2+
3−	3	3+

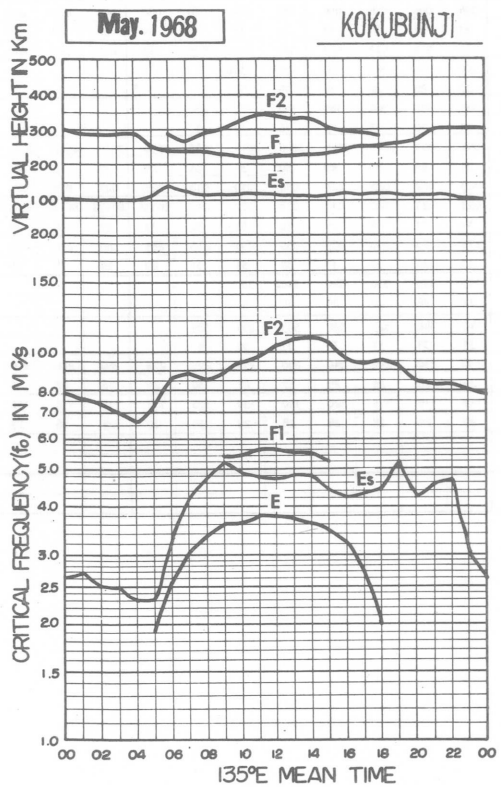
Besides, the time associated phenomena with SID's, that is, solar flare, solar radio noise outburst and crochet (solar flare effect in magnetic record), are given in this table from interchange messages of IUWDS or measurements at Hiraiso.

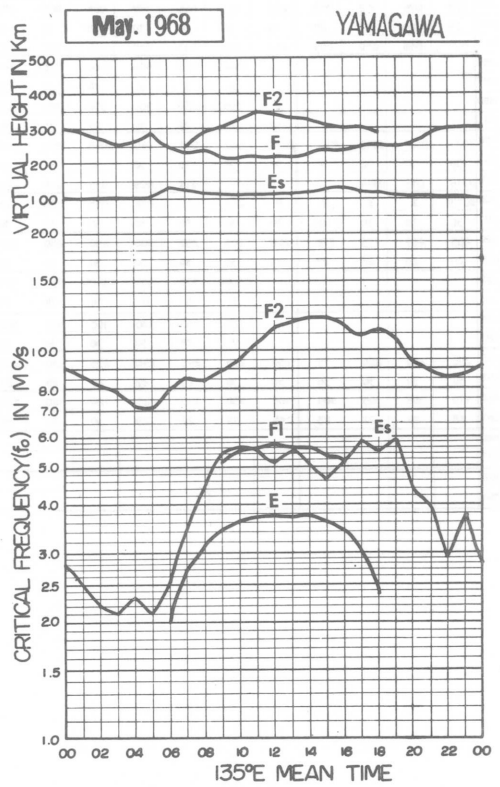
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: WAKKANAI

May 1968

135° E Mean Time (G.M.T. +9h)

CHAR	HR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foF2	MED	074	072	068	064	064	070	078	078	076	078	080	080	083	083	083	083	082	079	082	085	083	082	080	077
	CNT	29	27	27	27	28	29	30	30	30	30	29	28	28	30	30	31	31	31	31	31	31	31	30	31
	Q R	008	012	010	009	013	018	021	017	013	015	016	017	013	016	015	017	014	013	014	016	011	008	009	011
foF1	MED					300L	380	440	480	500	520	520	520	530	530	520	500	470	U440						
	CNT					2	9	16	20	24	26	27	22	25	29	27	30	24	12						
foE	MED				E	125	220	285	305	330	350	355	370	370	350	345	325	300	275	200	E				
	CNT				1	22	29	30	30	30	30	29	29	28	27	26	26	28	27	25	8				
foEs	MED	016	E	015	014	014	024	031	039	043	044	041	045	045	041	040	034	035	036	034	028	J025	021	020	E016
	CNT	31	28	29	29	30	28	29	29	29	30	29	27	29	29	29	30	29	30	30	29	31	31	31	30
	Q R	D011							014	014	011		016					017	010	018	020	014	017	014	
f-min	MED	E	E	E	E	E	011	011	012	017	017	018	018	018	018	017	017	014	012	011	E	E	E	E	E
	CNT	31	28	29	29	30	28	29	29	29	30	29	27	29	29	29	30	29	30	30	29	31	31	31	30
M (3000) F2	MED	260	260	260	255	260	270	280	290	280	280	280	280	275	275	280	285	285	290	285	280	270	265	265	265
	CNT	29	27	27	27	28	29	30	30	30	30	29	28	28	30	30	31	31	31	31	31	31	31	30	31
M (3000) F1	MED					305L	310	340	350	350	350	350	350	345	340	340	345	350	340						
	CNT					2	9	16	20	24	25	26	22	25	28	27	30	24	11						
h'F2	MED					360L	365	340	300	310	335	330	355	350	355	345	320	310	310	275					
	CNT					2	9	18	24	24	28	27	26	27	30	28	31	30	19	1					
h'F	MED	300	300	295	290	300	260	250	250	240	230	225	225	225	230	240	240	240	250	270	275	280	285	295	295
	CNT	31	30	30	29	30	30	30	29	28	28	28	26	26	28	28	31	27	28	29	30	31	31	31	31
h'Es	MED	105	105	100	100	100	125	140	125	120	115	115	115	110	110	110	110	115	120	115	115	110	110	110	105
	CNT	16	13	17	16	16	15	18	26	28	27	22	21	22	19	18	19	24	27	28	28	24	22	23	14
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: AKITA

May 1968

135° E Mean Time (G.M.T. +9h)

CHAR	HR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foF2	MED	077	076	072	068	066	073	086	087	084	085	088	092	094	096	096	096	089	084	086	088	085	082	079	078
	CNT	29	29	28	27	29	30	30	30	30	31	30	30	31	31	31	31	31	31	31	29	28	28	29	28
	Q R	007	010	010	009	012	016	013	017	014	020	012	016	019	022	022	022	014	014	015	012	012	009	011	009
foF1	MED						U360L	400	460	U500L	520L	540	540	550	540	520	500	460L	430L						
	CNT						2	3	6	16	24	28	26	27	26	20	20	15	5						
foE	MED					E	195	260	300	330	350	360	U380A	385	380	360	340	310	275	230					
	CNT					12	21	29	30	27	21	20	18	11	10	13	15	16	15	2					
foEs	MED	J021	J021	J019	J020	E013	022	031	040	J048	J049	J048	J048	046	J051	J045	J044	J046	J044	J038	J038	J039	J029	J023	J023
	CNT	30	30	30	30	30	30	30	30	30	31	30	31	31	31	31	29	30	31	31	29	27	28	29	29
	Q R	D016	015	D014				011	009	017	014	036	021	023	022	025	028	016	019	018	025	027	018	027	025
f-min	MED	E013S	E	E	E	E	014	016	018	018	019	021	021	023	021	020	018	018	017	015	E013S	E013S	E013S	E013S	E013S
	CNT	30	30	30	30	30	30	30	30	30	31	30	31	31	31	31	29	30	31	31	29	27	28	29	29
M (3000) F2	MED	265	265	275	270	270	285	290	300	290	280	275	275	275	275	280	285	285	290	285	285	280	270	265	265
	CNT	29	29	28	27	29	30	30	30	30	31	30	30	31	31	31	31	31	31	31	29	28	28	29	28
M (3000) F1	MED						U320L	320	350	U340L	350L	335	345	335	335	330	340	340L	330L						
	CNT						2	3	6	16	24	28	26	27	26	20	20	15	5						
h'F2	MED						320	290	280	300	315	340	340	340	340	325	320	305	295	285					
	CNT						7	21	30	30	30	29	30	31	31	31	31	31	30	4					
h'F	MED	290	290	280	275	290	255	245	240	235	230	215	220	230	230	240	240	250	250	275	270	280	280	290	290
	CNT	30	30	30	30	30	30	29	27	25	26	25	26	24	26	26	25	27	27	30	29	28	28	29	29
h'Es	MED	110	105	105	105	105	130	130	125	120	120	120	115	115	115	115	120	120	120	120	115	115	110	110	110
	CNT	18	24	22	23	14	19	27	29	30	31	30	31	27	29	28	24	28	29	30	29	25	26	25	23
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: KOKUBUNJI

May 1968

135° E Mean Time (G.M.T.+9h)

CHAR \ HR		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foF2	MED	078	076	073	070	066	072	086	088	086	088	095	098	104	108	109	106	097	094	096	094	085	083	083	081
	CNT	28	29	29	29	29	30	30	30	30	30	30	31	31	31	31	31	31	30	30	30	28	29	30	30
	Q R	010	013	014	009	009	013	014	013	014	012	013	016	016	020	026	024	019	019	021	014	014	015	011	011
foF1	MED							400L	450L	500L	540L	540L	560L	560	550L	550	520L	490	U460L						
	CNT							1	3	4	10	14	17	20	15	16	9	3	1						
foE	MED						190	255	305	335	360	365	380	380	375	365	350	320	270	200					
	CNT						15	28	26	27	23	17	15	12	16	15	20	21	17	11					
foEs	MED	026	027	025	025	023	023	032	042	J047	J052	049	047	047	048	048	044	042	J043	J044	052	J042	J046	J047	031
	CNT	30	30	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	30	30	30	31
	Q R	021	023	011	011	D018	010	007	016	015	019	013	016	017	020	016	029	023	031	027	047	026	030	028	019
f-min	MED	012	012	011	010	010	014	014	015	015	017	025	025	025	025	025	017	015	014	013	010	011	012	012	013
	CNT	30	30	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	30	30	30	31
M (3000) F2	MED	270	280	280	280	275	290	305	300	290	280	265	270	275	280	280	285	290	295	290	285	280	270	270	270
	CNT	28	29	29	29	29	30	30	30	30	30	30	31	31	31	31	31	31	30	30	30	27	29	30	30
M (3000) F1	MED							350L	335L	350L	350L	340L	350L	345	335L	335L	335L	340	U335L						
	CNT							1	3	4	10	12	16	19	15	13	9	3	1						
h'F2	MED						300	280	270	290	300	325	340	340	330	330	310	295	290	280					
	CNT						4	16	27	26	29	30	31	31	30	30	30	30	26	15					
h'F	MED	300	290	280	280	290	255	240	240	240	230	225	220	220	220	225	230	240	250	250	260	265	295	300	300
	CNT	31	30	31	31	30	30	29	24	21	23	25	25	25	24	21	18	21	20	18	23	27	27	29	30
h'Es	MED	105	105	105	105	105	110	140	125	115	115	115	115	115	115	115	115	120	115	115	115	110	110	110	105
	CNT	28	25	27	25	23	27	31	31	31	30	30	29	31	26	31	28	29	31	31	31	30	28	27	29
hpF2	MED	380	365	360	375	380	340	310	320	345	355	385	380	365	360	355	350	340	325	340	340	355	380	385	395
	CNT	28	29	29	29	28	30	30	30	29	28	29	28	30	29	29	30	31	30	30	30	27	29	30	30
ypF2	MED	085	090	090	090	090	090	095	100	100	105	105	100	100	095	100	100	100	100	100	100	090	100	090	090
	CNT	28	29	29	29	28	30	30	30	29	28	29	28	30	29	29	30	31	30	30	30	27	29	30	30

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: YAMAGAWA

May 1968

135° E Mean Time (G.M.T.+9h)

CHAR \ HR		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foF2	MED	091S	087S	082S	078	072	072	080	086	084	089	094	104	114	118	121	121	115	109	112S	107S	093S	088S	086S	087S
	CNT	25	29	28	29	30	28	30	30	29	29	31	31	31	30	30	31	31	30	30	29	29	28	28	25
	Q R	018	020	012	014	013	016	013	010	010	009	013	014	018	012	016	021	021	019	020	022	022	021	016	019
foF1	MED								460L	510L	510L	550	560	570	560	560	530L	510	530L	360L					
	CNT								2	3	12	12	18	20	20	17	18	6	1	2					
foE	MED							200	270	315	345	360	370	375	370	375	360	340	300	235					
	CNT							22	26	25	23	22	18	16	16	19	21	23	22	21					
foEs	MED	J028	J025	J022	021	J023	021	025	034	044	J054	J056	J056	051	055	051	046	052	058	054	059	J044	J039	J029	J038
	CNT	30	30	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31	30	30	30	30	30	30	30
	Q R	018	009	009	009	011	D011	005	014	013	015	013	017	018	029	023	027	028	050	036	045	045	033	028	032
f-min	MED	E015S	013	013	013	012	014	E015S	014	015	016	017	019	020	020	018	018	016	015	015	014	E015S	E015S	E015S	E015S
	CNT	30	30	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31	30	30	30	30	30	30	30
M (3000) F2	MED	265S	275S	280S	280	275	280	310	310	295	280	265	265	275	275	280	285	285	290	290S	290S	280S	265S	260S	265S
	CNT	25	29	28	29	30	28	30	30	29	29	31	30	30	30	29	30	31	30	29	28	29	28	28	25
M (3000) F1	MED								380L	345L	355L	360	345	340	345	340	340L	335	335L	360L					
	CNT								2	3	12	10	15	18	17	16	15	6	1	2					
h'F2	MED							285	250	280	300	320	350	340	330	325	310	300	300	280					
	CNT							1	22	29	29	29	30	30	30	29	30	31	28	17					
h'F	MED	300	290	275	260	265	280	250	235	240	220	215	U220A	220	220	U225	230H	240	250	260	255	260	280	300	300
	CNT	30	30	30	30	30	30	30	27	25	19	16	20	17	17	19	19	15	13	19	25	29	28	29	30
h'Es	MED	100	100	100	100	100	100	130	125	120	115	110	110	110	110	115	125	125	120	115	110	105	105	105	105
	CNT	28	26	27	25	24	21	26	30	30	30	30	30	31	29	29	27	30	29	29	30	30	30	27	27
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA

May 1968 | foF2 | 0.1Mc | **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	070	067	067	063	062	070	080	068	073	080	083	078	080H	087	085	085	085	086	091	094	084	082	078	074
2	069	067	066	063	060	062	060	056	063	072	C	C	C	067	070	068	I070C	071	071	078	078	079	069	066
3	060	059	059	060	055	060	066	072	076	080	080	083	083	U084C	085	082	083	086	081	081	078	073	069	066
4	065F	I064C	058F	063F	064F	077	091	103	104	U097C	105	I110C	109	108	103	095	091	093	093	094	088	082	074	073
5	073	072	069	068	066	083	088	087	084	082	086	093	094	I100C	093	089	087	086	091	096	085	082	076	077
6	076	074	I073C	071	073	083	094	I094C	095	094	094	097	094	096	093	090	088	090	090	093	086	083	081	078
7	076	075	074	070	073	084	095	096	094	099	097	097	095	094	091	088	080	099	106	113	082	076	074	072
8	069	061	062	061	050	046	047	047	I050A	054	062	068	068	069	068	I072C	075	I077C	084	084	076	077	I075S	074S
9	U070F	F	F	F	F	071F	083	086	083	079	084	080	083	090	I097C	100	091	085	087	093	087	085	082	070
10	074	I071C	063	059	050	053	056	I060A	057	059	061	063	068	074	066	071	073	071	070	068	071F	073	073F	074F
11	U073F	064F	U065F	064F	U060F	070	088	093	094	100	095	088	093	086	089	091	082	074	082	090	094	090	083	067
12	061	F	F	058F	058	064	063	055	I055A	056	I052A	056	C	C	C	060	058	063	059	058	063	062	U061F	U056F
13	F	U057F	U055F	058F	053F	063	067	074	076	086	081	076	075	075	078	076	077	073	074	085	083	079	078S	079
14	074	068	064	059	063F	067	079	077	070	074	072	077	077	071	076	076	074	074	I075C	I077C	076	073F	U068F	064F
15	U065F	U065F	U061F	U062F	063F	070	081	085	080	080	084	083	083	086	082	081	078	077	084	088	081	083	081	I077C
16	073	C	C	C	C	C	C	C	C	C	C	C	083	080	083	077	077	074	078	082	083	080	083	083
17	074	075	068	066	065	068	070	072	073	073	073	069	071	068	075	073	070	069	070	076	074	075F	F	069F
18	F	F	F	057F	053	058	065	068	I063A	I057A	054	I053A	I053A	053	057	059	060	058F	060F	060	066	069	071	068
19	067	065F	063F	F	F	F	U073F	078	074	077	074	I074A	074	076	077	080	078	077	076	077	081	082	U079F	U078F
20	U077F	075	067F	064F	065	069	077	083	076	078	089	086	086	088	093	090	086	080	080	085	083	087S	087	082
21	076	070	068F	066F	066	083	091	086H	I088C	086	085	090	088	089	090	084	082	088	091	099	091	U082F	082F	U076F
22	075	077	073	064	061	067	067	070	071	069	063	A	A	073	076	083	083	079	075	I071C	076	079	078	080
23	074	I074C	071	069	067	068	076	077	078	078	077	081	084	083	090	085	090	086	091	089	086	087	088	088
24	I083S	083	076	071	065	066	I068C	075	067	066	069	070	077	083	079	080	078	076	083	089	087	083	083	081
25	080	078	074	I074C	083	I089C	096	094	082	084	080	085	084	093	094	093	089	086	086	093	094	093	091	088
26	083	080	078	073	074	080	083	083	073	068	073	078	080	083	081	086	090	083	079	078	085	087	085	081
27	078	075	073	073	076	I084C	098	095	083	074	079	I080C	081	080	083	083	I082C	082	083	093	095	092	088	085
28	085	083	083	081	083	090	088	090	085	085	090	096	097	098	098	096	090	088	088	091	094	088	083	082
29	078	078F	073F	F	077F	081F	091	083	080	083	080	085	084	080	089	093	093	088	087	087	087	083	083	083
30	083	078	073	070	063	066	067	066	063	057	056	063	068	065	066	071	070	068	066	068	077	077	077	077
31	073	069	069	070	075	092	073F	075	I079A	081	077	I071A	070	072	074	070	072	073	073	071	075	080	081	078
Count	29	27	27	27	28	29	30	30	30	30	29	28	28	30	30	31	31	31	31	31	31	31	30	31
Median	074	072	068	064	064	070	078	078	076	078	080	080	083	083	083	083	082	079	082	085	083	082	080	077
U.Q.	078	077	073	070	073	083	088	087	083	084	086	087	087	089	091	090	088	086	088	093	087	085	083	081
L.Q.	070	065	063	061	060	065	067	070	070	069	070	070	074	073	076	073	074	073	074	077	076	077	074	070
Q.R.	008	012	010	009	013	018	021	017	013	015	016	017	013	016	015	017	014	013	014	016	011	008	009	011

The Radio Research Laboratories, Japan

foF2

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

W1

IONOSPHERIC DATA

May 1968 | foF1 | 0.01Mc | 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									500L	U530L	500	500L	490	530	490	500L	410L							
2									500	480	C	C	C	510	510L	U480L	I460C							
3							410L	U470L	500	500	510	510	510L	U520L	510L	U500L	460L							
4								U500L	490L	510L	U550L	I520L	530	520	L	500L		L						
5								L	500L	530L	510L	530	510L	I520C	520L	U480L	420							
6								C	500L	510L	530L	540L	560	530	520L	500	480L							
7								L	490L	510	510L	530	550	530L	U540L	500L	500	460L						
8						340	390		I470A	500	510	A	530	530		I470C	L	C						
9								470	490	530L	520	A	A	530	I510C	500	A							
10						380	410	I460A	500	I490A	500	520	510	530	I500A	520	440L	U410L						
11							L	480L	U500L	530H	500H	530L	520	500	540	490H	480L							
12						340L	390	450	I460A	470	I480A	470	C	C	C	460	440	400						
13								460	500	500	520	510	510	520	500	470	L	L						
14								460	500	500	500	510	500	510	520	500	470							
15							L	U460L	500L	L	510	510	540	510	500H	500	U470L							
16					C	C	C	C	C	C	C	C	530	530	520	U480L	450L	L						
17							430	460L	490	500	520	520	520	A	A	500	450							
18						370	410	A	A	A	A	A	A	490	490	480	460	430L						
19							500L	U490L	520	530	530	A	530	540	530	500	470	430						
20					300L	420		A	A	A	A	A	A	530	530	480	U430L							
21									C	540	U600L	550	560	550	530	530	530L	A						
22						380	460	470	I500A	520	510	A	A	530	520	480	A	A						
23							450L	490	500L	510	520	480	I560A	560	560	500	I470A	I470A						
24						400L	I430C	480	520	540	560	560L	540	530	560	U510L	500L	U450L						
25							U500L	480		530	U500L	A	580	550	520L	U500L	500L							
26						400L	440	490	U500L	I540A	530	550	560	530	500	520	500L	U430L						
27							460	490	500L	520L	540	I560C	550	550	560	520	C	U500L						
28								500	570	U540L	560L	570	550L	550	490	A	500	U490L						
29							440L	480	A	570L	530	540	560	560	520	520	500	440	A					
30					290	400	410	A	500	510	510H	520	520	500	530	500	480L	440L						
31							450	450	A	A	530	I510A	530	520	510	500	A	A						
Count					2	9	16	20	24	26	27	22	25	29	27	30	24	12						
Median					300L	380	440	480	500	520	520	520	530	530	520	500	470	U440						
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foF1 | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation | W2

IONOSPHERIC DATA

May 1968 | foE | 0.01Mc | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					E	190	270	300	320	335	350	355	A	A	A	325	300	260	180	S				
2					115	200	250	300	320	330	C	C	C	360	345	330	I300C	255	200	S				
3					E	200	270	300	320	340	350	350	355	340	310	I315A	300	275	200	E				
4					S	195	265	300	315	330R	335	I365C	375	345	335	325	300	265	195	105				
5					A	190	265	300	325	345	360	370	370	I350C	350	330	305	270	195	A				
6					E	170	275	I300C	330	345	355	370	350	340	335	325	300	265	A	A				
7					A	200	280	305	325	350	350	380	365	350	350	325	300	260	195	A				
8					110	195	255	295	320	330	340	I325A	I335A	375	345	I320C	295	I255C	180	E				
9					A	A	275	305	320	340	350	345	335	I335A	I350C	340	300	270	200	S				
10				E	105	200	265	300	330	345	360	370	375	345	330	300	I270A	265	200	S				
11					110	205	280	300	315	335	355	375	355	370	350	325	300	270	195	S				
12					A	200	265	300	315	330	340	320	C	C	C	325	295	260	A	A				
13					115	210	270	305	325	325	330	340	340	320	340	330	300	275	200	S				
14					115	220	285	305	330	350	350	350	340	335	320	305	305	280	C	C				
15					130	220	270	300	320	330	350	350	385	345	315	I325A	310	270	210	S				
16				C	C	C	C	C	C	C	C	C	345	350	370	330	300	265	200	E				
17					110	230	290	305	335	350	375	380	350	A	A	A	305	275	210	A				
18					130	210	285	305	335	350	370	390	380	360	325	A	A	285	220	S				
19					I140A	230	290	310	345	380	385	375	365	350	320	305	310	A	E	E				
20					125	230	295	310	335	365	370	370	370	350	310	A	315	290	225	E				
21					A	225	290	315	I335C	365	395	380	375	360	370	350	320	300	220	E				
22					135	225	290	315	335	360	370	380	370	360	330	315	315	I275A	215	C				
23					130	230	290	320	335	370	385	385	395	I375A	340	325	290	A	A	S				
24					130	225	I285C	315	330	355	360	I370R	370	380	370	350	325	290	215	S				
25					A	I230C	290	325	365	370	390	385	I375A	365	370	355	A	A	A	A				
26					130	250	300	320	350	365	380	390	395	385	375	355	330	295	230	S				
27					125	I235C	300	310	340	385	365	I375C	375	A	A	A	I310C	290	210	S				
28					150	240	300	310	325	335	355	370	380	380	390	340	330	290	I225A	S				
29					140	220	300	315	345	370	380	375	335	345	A	A	A	A	A	A				
30					A	225	290	305	335	350	350	355	350	385	360	345	315	290	215	130				
31					140	230	290	325	325	340	350	365	380	390	365	340	320	285	225	S				
Count				1	22	29	30	30	30	30	29	29	28	27	26	26	28	27	25	8				
Median				E	125	220	285	305	330	350	355	370	370	350	345	325	300	275	200	E				
U.Q.																								
L.Q.																								
Q.R.																								

foE

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

The Radio Research Laboratories, Japan

W3

IONOSPHERIC DATA

May 1968 | **foEs** 0.1Mc | **135° E Mean Time** (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N, Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	013	G	G	J070	036	040	G	G	049	042	J043	025G	018G	039	030	023	025	E012S	E013S	E015S
2	E	E	E	E	G	G	G	J058	040	046	C	C	C	G	G	042	C	014G	G	026	E	E	E	E014S
3	E	E	E	E	E	024	G	035	039	045	043	048	048	G	040	035	G	025G	019G	019	J031	J026	J032	E
4	018	J021	J024	J020	E012S	G	G	033	034	G	G	C	G	040	G	023G	G	015G	015G	013	E	E	E016S	020
5	J023	J026	E	E	020	G	030	034	040	040	G	G	G	C	G	G	034	G	016G	021	E013S	E015S	E015S	E
6	E	E	C	E	E	J033	G	C	040	044	041	041	040	G	G	033	029G	034	024	J025	E015S	016	024	E013S
7	E017S	J023	015	015	014	025	G	G	038	040	041	G	G	G	041	G	035	035	031	028	J025	E	015	E012S
8	E013S	E	015	014	018	026	033	039	J068	038	039	J091	JC81	G	054	C	J061	C	J043	J043	020	E016S	E	J023
9	J065	J064	J061	J068	J025	J033	035	042	045	045	044	J055	J070	J055	C	041	053	045	J045	025	020	J035	J034	J030
10	J028	C	015	E	020	030	037	J070	043	J060	040	044	045	J055	J053	J053	038	033	027	E015S	E017S	E015S	018	J041
11	020	E	E	E	028	023	G	037	040	G	G	G	G	G	040	G	G	036	033	025	J053	015	018	E
12	J020	E	J025	J032	J023	032	J044	J053	J065	050	J053	040	C	C	C	G	025G	021G	032	J041	J028	J063	J063	J065
13	J035	J021	019	018	G	036	034	041	J055	039	040	046	J053	048	G	024G	040	031	027	026	E017S	020	J021	J026
14	016	018	E	E	G	G	033	040	040	042	038	043	JC45	038	037	036	035	034	C	C	J025	017	015	E015S
15	E	E	014	015	G	030	030	034	036	040	040	041	G	040	036	034	030G	030	033	029	020	E016S	017	C
16	J023	C	C	C	C	C	C	C	C	C	C	C	041	G	G	G	031	G	023	016	J028	J022	017	E
17	E016S	E	E	016	G	030	031	G	044	043	G	041	J064	J085	J058	J051	040	031	J054	063	140	J067	J085	J035
18	E	014	017	E	026	033	038	J056	J064	J061	048	079	061	043	038	043	033	G	G	021	J038	J023	021	E016S
19	E015S	E	E	E	J031	G	G	G	043	044	053	J074	045	J071	J061	041	040	036	083	JC73	J040	J081	J083	J063
20	020	J026	J028	021	026	046	041	051	061	J064	J070	J061	J065	050	J068	J048	G	038	041	J048	J023	J055	J061	016
21	J033	J028	018	018	J024	G	024G	039	C	060	053	J055	044	043	041	G	J083	J066	J045	033	021	033	J044	J053
22	J025	J023	J025	020	021	G	041	045	070	049	048	J072	J090	041	046	G	048	J058	J048	C	J026	J029	J025	014
23	E015S	C	E	020	G	G	G	039	G	042	046	045	J068	047	043	041	050	JC52	J035	026	J053	016	E	E
24	J023	J023	J021	023	G	G	C	040	043	041	G	G	G	G	G	G	041	039	041	J033	J024	J073	020	E
25	015	E	016	C	022	C	G	039	044	043	041	056	060	040	G	G	033	044	033	018	019	E018S	E016S	E
26	E	E	E	E	G	G	036	039	043	J062	J072	053	044	J054	G	G	037	039	043	036	J031	032	016	016
27	018	E	E	E	G	C	035	036	040	G	043	C	040	J053	041	040	C	J053	061	030	E013S	020	E016S	E
28	E012S	E	015	E	G	G	G	039	J053	J073	G	G	G	G	G	J056	038	040	J067	J043	J033	J021	028	E
29	E015S	019	019	018	G	028	041	038	050	051	049	054	047	045	J063	J074	063	J036	J070	113	J040	J028	J024	J023
30	J033	J035	J024	J024	023	067	036	048	J053	051	050	045	046	G	G	G	G	033	J043	028	J028	J024	J024	E017S
31	E016S	E	E	013	J023	G	034	106	J138	J080	J055	J073	051	050	044	130	105	J070	J060	J053	J043	J063	J030	025
Count	31	28	29	29	30	28	29	29	29	30	29	27	29	29	29	30	29	30	30	29	31	31	31	30
Median	016	E	015	014	014	024	031	039	043	044	041	045	045	041	040	034	035	036	034	028	J025	021	020	E016
U.Q.	023	023	020	020	023	031	036	050	054	051	050	056	060	050	045	042	044	040	045	042	033	033	030	025
L.Q.	E012	E	E	E	G	G	G	036	040	040	G	040	G	G	G	G	027	030	027	022	019	016	016	E
Q.R.	D011							014	014	011		016					017	010	018	020	014	017	014	

The Radio Research Laboratories, Japan

foEs

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

W4

IONOSPHERIC DATA

May 1968 | f_bEs | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					E			G	G	G			042	037	040	024G	018G	G	028	020	018	S	S	S
2								G	G	042	C	C	C			G	C	014G		024				S
3						G		G	G	045	G	047	044		G	035		020G	016G	018	029	E	E	
4	014	017	015	012			S	G	G			C		G		022G		015G	014G	G			S	018
5	017	016			015		G	G	G	030							G		015G	018	S	S	S	
6			C			G		C	G	G	G	G	G			030	027G	021	023	021	S	015	S	S
7	S	E	014	E	013	G			G	G	G				G		G	020	029	024	022		015	S
8	S		E	012	G	G	G	G	A	G	G	052	040		G	C	G	C	040	040	012	S		022
9	020	025	016	020	019	024	G	G	G	G	G	052	058	048	C	023G	050	039	040	017	015	034	032	029
10	020	C	014		G	G	G	A	042	051	G	G	G	G	062	050	032	G	G	S	S	S	017	018
11	E				G	G		G	G						G			G	G	G	052	014	014	
12	017		E	017	013	G	G	042	A	G	A	G	C	C	C		025G	020G	030	030	028	027	020	022
13	014	014	016	E		G	G	G	045	G	G	G	G	025G		021G	040	G	G	024	S	018	021	025
14	013	011					G	G	G	G	044	G	G	G	G	G	G	G	C	C	024	015	015	S
15			E	E		015	G	G	G	G	G	G		G	G	033	027G	021	G	025	017	S	012	C
16	019	C	C	C	C	C	C	C	C	C	C	C	G				026		G	G	022	017	015	
17	S			E		G	G		G	G		G	046	054	055	037	032	G	054	051	022	053	054	020
18		E	E		020	030	037	054	A	A	048	A	A	G	G	035	032			G	038	018	020	S
19	S				015				G	G	050	A	G	G	050	G	G	034	027	048	027	060	046	E
20	E	017	017	E	G	020	040	048	060	060	070	058	062	047	047	035		G	038	045	022	048	050	016
21	018	021	014	E	016		023G	G	C	047	051	G	G	G	G		050	066	036	032	019	017	030	016
22	017	017	020	016	G		G	042	068	047	046	A	A	G	044		046	057	046	C	026	027	026	E
23	S	C		E				G		G	G	G	065	041	G	G	049	050	030	024	033	014		
24	015	016	014	E			C	G	G	G							G	G	039	028	021	022	017	
25	E		E	C	018	C		G	G	G	G	056	042	G			033	030	030	018	015	S	S	
26							G	G	G	057	A	G	G	G			G	G	042	035	029	027	015	016
27	016					C	G	G	G		G	C	G	044	040	035	C	041	048	017	S	018	S	
28	S		014					G	045	G						048	G	G	066	042	031	020	013	
29	S	E	017	E		G	G	G	048	050	G	G	G	G	040	036	033	030	040	030	032	025	020	018
30	020	017	015	013	015	017	G	045	048	G	G	G	G					G	032	027	026	020	020	S
31	S			E	G		G	G	A	059	G	A	049	G	G	045	060	047	033	021	017	046	020	S
Count																								
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

W5

IONOSPHERIC DATA

May 1968 | **f-min** 0.1Mc | **135° E Mean Time** (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	012	012	012	015	018	018	018	017	018	018	017	011	012	011	E015S	E017S	E012S	E013S	E015S
2	E	E	E	E	E	012	E	011	017	017	C	C	C	027	021	018	C	E	E	E015S	E	E	E	E014S
3	E	E	E	E	E	015	015	016	015	020	020	020	022	027	020	020	020	012	011	E	E012S	E	E	E
4	E	E	E	E	E012S	011	012	012	020	020	027	C	018	018	017	016	018	E	E	E	E	E	E016S	E
5	E	E	E	E	E	013	012	011	011	016	018	018	018	C	018	019	017	011	E	E	E013S	E015S	E015S	E
6	E	E	C	E	E	E	011	C	014	017	018	018	016	017	012	012	012	011	E	E	E015S	E	E015S	E013S
7	E017S	E	E	E	E	012	012	012	011	017	E	022	018	017	017	013	011	E	E	E	011	E	E	E012S
8	E013S	E	E	E	E	011	011	012	017	017	017	018	020	017	016	C	011	C	011	E	E	E016S	E	E015S
9	E	E	E	E	E	E	012	013	015	018	017	017	017	019	C	016	012	E	013	E013S	E	E	E	E
10	E	C	E	E	E	011	012	013	017	017	020	020	017	018	015	018	017	E	E	E015S	E017S	E015S	E	E
11	E	E	E	E	E	E	011	012	012	018	013	020	018	016	017	012	011	012	012	E015S	E	E	E	E
12	E	E	E	E	E	011	012	012	013	018	017	018	C	C	C	017	016	011	E	E	E	E015S	E	E
13	E	E	E	E	E	E	011	012	012	018	018	020	018	018	017	011	018	012	017	E013S	E017S	E	E	E
14	E	E	E	E	E	012	012	015	017	017	017	018	018	018	018	018	012	016	C	C	E	E	E	E015S
15	E	E	E	E	E	E	E	011	016	017	017	017	012	012	012	011	017	E	E	E012S	E	E016S	E	C
16	E	C	C	C	C	C	C	C	C	C	C	C	018	015	018	012	016	012	011	E	E	E	E	E
17	E016S	E	E	E	E	E	011	012	017	018	020	020	017	018	018	017	013	016	015	E	E	E	E	E
18	E	E	E	E	E	E	012	014	018	018	019	020	018	020	018	017	012	012	012	E012S	E	E	E	E016S
19	E015S	E	E	E	E	E	011	012	019	020	020	024	017	016	016	018	012	013	E	E	E	E	E	E
20	E	E	E	E	E	012	017	012	017	017	017	017	017	019	017	018	017	017	012	E	E	E015S	E	E
21	E	E	E	E	E	013	013	012	C	017	017	020	018	018	017	017	012	012	012	E	E	E	E	E
22	E	E	E	E	E	E	011	017	017	018	018	018	018	018	019	017	016	013	011	C	E	E	E	E
23	E015S	C	E	E	E	012	011	017	017	019	017	018	017	018	018	018	012	017	E	E012S	E	E	E	E
24	E	E	E	E	E	012	C	016	018	020	017	019	018	020	022	017	014	011	012	E012S	E	E	E	E
25	E	E	E	C	E	C	011	015	018	019	020	020	020	020	017	018	017	011	E	E	E	E018S	E016S	E
26	E	E	E	E	E	E	E	016	017	014	017	017	016	017	016	017	011	012	012	E014S	E	E	E	E
27	E	E	E	E	E	C	011	E	016	016	018	C	018	018	017	015	C	E	E	E013S	E013S	E	E016S	E
28	E012S	E	E	E	E	E	011	012	012	016	020	018	016	018	018	020	018	016	015	E015S	E013S	E	E	E
29	E015S	E	E	E	E	013	013	017	018	017	018	018	020	018	017	016	011	016	E	E	E	E	E	E
30	E015S	E	E	E	E	E	E	012	017	017	017	017	018	016	017	016	017	011	016	E	E	E	E	E017S
31	E016S	E	E	E	E	012	011	011	012	012	017	017	020	018	018	017	018	018	011	E015S	E	E	E	E017S
Count	31	28	29	29	30	28	29	29	29	30	29	27	29	29	29	30	29	30	30	29	31	31	31	30
Median	E	E	E	E	E	011	011	012	017	017	018	018	018	018	017	017	014	012	011	E	E	E	E	E
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

W6

IONOSPHERIC DATA

May 1968 | 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	270	270	270	260	265	290	315	325	305	300	280	285	275H	285	295	300	295	300	295	310	290	280	280	270
2	260	255	260	255	270	285	280	285	270	290	C	C	C	270	285	280	I285C	290	280	280	260	280	270	270
3	250	255	255	275	260	270	275	270	290	285	280	290	280	U285C	285	295	275	290	295	280	270	275	265	250
4	255F	I260C	255F	270F	265F	285	285	275	290	U280C	275	I280C	280	280	290	280	285	290	290	285	285	275	275	275
5	260	265	270	265	270	290	295	300	305	280	280	290	275	I285C	285	290	300	280	290	290	280	275	275	270
6	265	260	I265C	255	265	295	295	I285C	295	275	280	280	280	280	290	295	295	295	285	285	280	270	270	270
7	275	265	275	265	260	285	295	290	285	290	275	275	275	275	265	265	230	245	265	285	270	235	245	230
8	245	230	240	265	260	245	260	300	I255A	220	260	285	295	275	280	I290C	295	I290C	300	285	270	255	I255S	255S
9	U250F	F	F	F	F	265F	295	305	300	290	300	280	260	270	I275C	280	280	285	275	280	265	265	280	255
10	260	I265C	260	240	250	245	250	I250A	245	255	280	270	285	295	295	285	300	300	300	270	230F	255	250F	245F
11	U245F	250F	U260F	265F	U260F	255	275	285	275	270	285	275	270	265	280	295	295	270	275	280	280	275	300	275
12	250	F	F	250F	260	260	275	225	I255A	220	I215A	225	C	C	C	275	255	285	295	275	270	270	U250F	U255F
13	F	U260F	U260F	275F	270F	285	255	275	265	290	285	265	270	280	290	290	295	300	285	285	275	275	250S	270
14	280	265	265	255	270F	290	290	295	275	280	280	285	300	270	275	285	295	295	I295C	I295C	275	275F	U270F	U255F
15	U260F	U245F	U260F	U275F	270F	270	285	305	305	290	300	280	290	290	285	285	295	290	285	280	270	265	280	I275C
16	275	C	C	C	C	C	C	C	C	C	C	C	285	285	290	300	310	295	290	280	275	265	265	265
17	255	265	255	255	260	265	260	265	275	290	280	280	280	275	295	290	285	285	275	280	270	275F	F	270F
18	F	F	F	290F	250	250	245	265	I255A	I240A	235	I230A	I220A	240	255	245	265	280F	285F	265	260	260	255	260
19	275	270F	240F	F	F	F	U265F	280	270	275	290	I280A	270	290	280	285	295	295	295	285	260	255	U250F	U255F
20	U260F	265	250F	255F	245	260	255	310	275	250	280	265	275	260	280	280	290	290	280	260	265	265S	260	270
21	280	255	250F	240F	245	270	295	280	I290C	300	265	280	275	275	290	295	280	275	275	285	275	U270F	270F	U250F
22	240	250	245	235	235	250	255	255	280	260	305	A	A	250	265	270	280	290	295	I265C	255	255	245	265
23	255	I255C	265	255	270	265	275	295	285	295	270	275	275	265	275	280	280	280	285	280	260	260	265	260
24	I265S	265	275	260	255	260	I265C	305	285	255	245	255	270	275	265	290	280	280	270	270	275	260	255	255
25	250	255	255	I255C	270	I285C	290	320	280	300	275	290	265	280	280	290	280	290	270	275	280	270	265	275
26	270	265	265	250	250	270	275	285	270	265	275	285	265	275	275	280	290	300	295	270	265	265	265	265
27	260	265	255	260	260	I265C	290	295	290	295	280	I270C	285	275	275	280	I290C	285	270	280	275	270	275	265
28	260	265	265	275	295	290	285	300	280	265	260	265	270	270	270	280	270	280	285	275	280	285	270	270
29	260	270F	260F	F	285F	265F	295	295	285	265	270	265	265	255	270	265	280	285	280	275	275	265	270	265
30	265	260	255	250	250	245	245	275	270	230	215	260	280	265	260	295	300	295	275	270	260	260	260	265
31	260	255	260	255	265	285	285F	295	I285A	270	275	I245A	245	255	265	260	270	290	290	270	255	265	270	270
Count	29	27	27	27	28	29	30	30	30	30	29	28	28	30	30	31	31	31	31	31	31	31	30	31
Median	260	260	260	255	260	270	280	290	280	280	280	280	275	275	280	285	285	290	285	280	270	265	265	265
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

W 7

IONOSPHERIC DATA

May 1968 | 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									350L	U340L	350	350L	365	345	365	350	365L							
2									330	350	C	C	C	355	325L	U335L	I335C							
3							340L	U340L	340	345	355	I350A	355L	U350L	345L	U355L	350L							
4								U360L	365L	370L	U330L	I350C	350	350	L	360L		L						
5								L	365L	360L	365L	375	370L	I340C	350L	U365L	385							
6								C	360L	355L	340L	335L	330	340	345L	340	360L							
7								L	365L	355	355L	345	325	340L	U335L	340L	300	300L						
8						305	320		I340A	360	345	A	340	330		I360C	L	C						
9								365	365	345L	345	A	A	A	I335C	330	A							
10						310	315	I320A	325	I335A	340	345	355	340	I345A	I340A	365L	U360L						
11							L	355L	U355L	340H	360H	350L	345	350	335	345H	355L							
12						340L	335	I345A	I360A	365	I365A	385	C	C	C	345	340	340						
13								330	I340A	350	350	355	355	345	340	360	L	L						
14								370	350	360	I345A	355	360	350	330	335	340							
15							L	U370L	345L	L	355	355	345	355	345H	340	U350L							
16					C	C	C	C	C	C	C	C	345	340	335	U350L	355L	L						
17							345	335L	345	340	350	345	I345A	A	A	335	360							
18						320	I335A	A	A	A	A	A	A	365	345	345	325	335L						
19							320L	U325L	340	345	A	A	355	330	I335A	350	345	350						
20					300L	310		A	A	A	A	A	A	330	330	355	U380L							
21									C	340	I335A	330	340	335	340	340	I345A	A						
22						305	315	I350A	I360A	I355A	365	A	A	340	325	355	A	A						
23							355L	345	355L	355	355	415	I320A	340	320	345	I350A	I350A						
24						305L	I330C	345	345	335	325	340L	365	340	315	U355L	340L	U345L						
25							U350L	375		360	U380L	A	330	335	345L	U350L	350L							
26						350L	355	335	U360L	I335A	340	330	320	340	355	330	340L	U370L						
27							355	365	380L	355L	350	I340C	345	345	320	335	C	A						
28								345	325	U330L	340L	335	345	335	390	A	335	U325L						
29							365L	355	A	A	350	370	330	325	345	335	330	340	A					
30					310	310	340	A	I350A	365	365H	365	365	375	340	340	340L	325L						
31							360	360	A	A	340	I365A	I345A	345	345	I330A	A	A						
Count					2	9	16	20	24	25	26	22	25	28	27	30	24	11						
Median					305L	310	340	350	350	350	350	350	345	340	340	345	350	340						
U.Q.																								
L.Q.																								
Q.R.																								

M(3000) F1 Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

May 1968 | 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									300	335	310	300	305H	320	290	310	275							
2									395	360	C	C	C	400	360	U335L	I310C							
3							335	335L	340	325	325	320	320	310	315	300	315							
4								295	270	285	330	I305A	300	315	300	300		275						
5								260	275	300	300	315	305	I310C	300	270	275							
6								C	295	300	315	310	320	315	310	305	300							
7								270	290	300	305	320	335	325	345	330	445	375						
8						445	450		A	625	445	370	345	375		I320C	300L	I305C						
9								275	285	315	315	315	400	370	I330C	315	290							
10						345	415	A	490	A	400	440	365	350	A	350	300	300						
11							300	300	300	335	300	350	325	310	345	295	305							
12						345	320	540	A	600	A	590	C	C	C	395	440	320						
13								345	360	335	325	350	360	365	345	320	305	290						
14								290	315	375	360	365	340	390	390	345	320							
15							290L	275	300	300L	320	320	335	325	325	315	300							
16					C	C	C	C	C	C	C	C	350	345	320	300	300	300L						
17							340	320	360	345	365	360	390	390	345	340	330							
18						400	420	400	A	A	570	A	A	550	470	465	410	350						
19							370	345	385	360	360	I365A	375	360	365	320	305	300						
20					360L	350		275	A	420	A	370	345	360	325	310	280L							
21									I295C	310	360L	325	350	340	310	320	340	I315A						
22						390	390	400	I350A	415	305	A	A	420	400	350	310	310						
23							300	300	300	300	320	300	350	400	345	325	310	310						
24						365	I345C	310	350	490	485	420	400	360	380	320	320	320						
25							295	260		320	U275L	330	400	350	320	310	320							
26						305	300	315	U320L	350A	400	360	405	320	320	340	305	290						
27							290	275	290	305	350	I365C	360	350	380	340	I320C	315						
28								290	340	320	370	360	350	340	320	310	340	310						
29							270	300	310	380	310	405	390	400	370	345	340	310	275					
30					360	410	405	375	405	600	670	465	385	440	460	350	320	305						
31							340	345	A	380	365	A	490	425	395	370	390	325						
Count					2	9	18	24	24	28	27	26	27	30	28	31	30	19	1					
Median					360L	365	340	300	310	335	330	355	350	355	345	320	310	310	275					
U.Q.																								
L.Q.																								
Q.R.																								

h'F2

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

The Radio Research Laboratories, Japan

W 9

IONOSPHERIC DATA

May 1968 | *h'F* km | **135° E Mean Time** (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N, Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	275	290	300	270	300	260	250	250	235	235	215	215	230	215	250A	240	225	250	270	250	250	255	270	275
2	295	325	300	315	315	255	235	250	250	270A	C	C	C	245	235H	260	I255C	255	265	280	280	260	265	270
3	300	310	300	275	315	270	260	250	245	265A	245	I245A	250	240	240	245	255	250	255	260	290A	260	275	300
4	315	300	310	285	300	260	250	250	240	220	210H	I210C	225	215	230	240	235	250	260	260	245	250	260	280
5	300	310	275	275	300	250	240	245	230	215	210	200	200	I225C	245	240	250	245	260	255	240	250	275	285
6	300	300	I285C	265	290	245	245	I235C	225	245	230	215	225	220	240	235	235	250	260	260	250	265	275	275
7	295	270	290	260	295	250	240	240	230	220	210	225	210	225	235	235	250	300	290	250	225	300	305	325
8	335	325	335	295	290	260	260	285	I270A	215	210	I250A	245	225	235	I235C	260	I260C	I265A	270A	250	295	300	305
9	300	320	285	295	275	255	250	250	250	215	235	A	A	A	C	250	I255A	I260A	290A	255	260	300A	290A	315A
10	315	I280C	300	295	325	260	285	I285A	290A	I270A	230	240	240	240	I270A	I265A	240	245	250	265	305	300	300	325
11	300	300	270	255	275	260	245	235	230	200H	200H	200H	200	240	225	240H	230	245	270	275	I285A	260	245	240
12	295	300	295	290	310	295	285	I270A	I260A	250	I240A	205	C	C	C	240	240	255	285A	300	300A	300	315	325
13	285	310	300	275	290	260	250	260	I260A	210	215	240	250	250	240	225	I250A	250	260	275	265	265	300	300
14	275	260	265	300	290	260	250	250	225	215	I250A	240	210	215	245	245	250	260	I260C	I260C	265	260	265	300
15	300	315	300	250	270	255	245	240	220	210	215	225	215	205	200H	235	240	245	250	265	265	275	275	I285C
16	295	C	C	C	C	C	C	C	C	C	C	C	220	215	235	220	235	240	260	270	280	295	300	295
17	310	280	250	300	300	265	240	240	250	240	225	225	I250A	A	A	245	240	260	I290A	I290A	290	I285A	I280A	280
18	285	290	270	260	310	300	I275A	I260A	I270A	I255A	I250A	I240A	I230A	220	225	230	240	245	260	300	I320A	300	300	300
19	290	270	310	330	300	260	245	250	250	260	I245A	I255A	240	245	I255A	225	225	265	280	I285A	300	I310A	I300A	300
20	290	300	295	290	315	275	285A	A	A	A	A	A	A	275	250	240	235	270	280A	I285A	280	I310A	I300A	260
21	265	300	295	295	280	260	245	245H	I260C	260A	I250A	240	225	245	235	235	I265A	I265A	I280A	270A	250	260	300A	330
22	340	310	310	350	315	265	275	I285A	A	A	260	A	A	225	280A	240	A	A	A	C	310A	310	325	300
23	300	I295C	270	295	250	265	250	250	235	220	215	200	I255A	240	230	250	A	I255A	275A	265	290A	290	295	300
24	300	275	250	270	305	275	I255C	250	235	215	225	200	210	240	225	240H	250	280	I290A	285	260	275	300	295
25	280	300	280	C	290	I250C	245	240	245	210	210	I250A	215	220	215	230	240	250	260	275	265	270	285	265
26	265	290	285	300	300	265	260	250	225	I255A	250	240	210	240	245	255	250	260	I270A	295A	300A	300A	265	275
27	300	280	295	290	285	I255C	250	225	215	210	210	I210C	210	245	240	240	C	A	A	285	260	260	260	275
28	300	285	290	265	255	250	235	235	250	260	200	200	205	220	220	I245A	250	250	I275A	I285A	275A	260	260	285
29	275	295	290	285	270	250	250	230	I245A	I250A	240	200	225	235	240	225	235	250	I265A	290A	300A	300	300	295
30	305	305	300	300	300	260	250	I245A	I240A	210	205H	240	220	215	245	220	240	240	270A	305	300	285	300	295
31	295	290	300	270	285	250	220	230	I235A	I245A	240	I215A	I230A	260	245	I235A	A	A	295A	275	300	I325A	300	285
Count	31	30	30	29	30	30	30	29	28	28	28	26	26	28	28	31	27	28	29	30	31	31	31	31
Median	300	300	295	290	300	260	250	250	240	230	225	225	225	230	240	240	240	250	270	275	280	285	295	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

W 10

IONOSPHERIC DATA

May 1968 | **h'Es** km | **135° E Mean Time** (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N, Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	100	G	G	105	140	125	G	G	105	105	100	105	100	125	115	100	115	S	S	S
2	E	E	E	E	G	G	G	130	120	115	C	C	C	G	G	120	C	100	G	120	E	E	E	S
3	E	E	E	E	E	150	G	140	125	120	115	115	115	G	110	110	G	110	110	120	110	110	110	E
4	105	105	105	100	S	G	G	140	125	G	G	C	G	110	G	100	G	100	100	125	E	E	S	100
5	105	100	E	E	100	G	160	140	125	105	G	G	G	C	G	G	150	G	105	105	S	S	S	E
6	E	E	C	E	E	105	G	C	135	120	115	120	115	G	G	105	105	105	115	100	S	100	100	S
7	S	105	100	100	100	150	G	G	140	120	115	G	G	G	115	G	145	120	120	115	110	E	105	S
8	S	E	125	115	145	135	125	115	110	125	125	110	115	G	125	C	115	C	110	110	120	S	E	110
9	110	105	100	100	100	105	145	140	125	125	115	110	110	110	C	150	125	125	115	135	125	120	110	110
10	105	C	105	E	135	145	140	120	125	115	125	120	115	110	110	110	110	130	120	S	S	S	110	105
11	110	E	E	E	100	140	G	115	120	G	G	G	G	G	150	G	G	125	115	110	105	105	105	E
12	100	E	100	100	100	125	125	125	115	115	110	115	C	C	C	G	105	100	120	105	100	105	105	100
13	105	100	100	100	G	105	140	125	110	115	110	110	105	115	G	100	150	150	140	115	S	110	105	105
14	100	105	E	E	G	G	145	135	125	120	115	115	110	120	115	120	150	140	C	C	110	105	100	S
15	E	E	100	105	G	105	140	125	120	120	120	125	G	110	110	105	105	105	120	120	120	S	100	C
16	105	C	C	C	C	C	C	C	C	C	C	C	110	G	G	G	105	G	145	125	110	115	110	E
17	S	E	E	100	G	100	140	G	135	140	G	120	110	105	105	105	100	140	120	120	115	115	110	110
18	E	105	105	E	150	140	140	120	115	115	115	115	110	115	110	110	110	G	G	125	115	110	110	S
19	S	E	E	E	110	G	G	G	120	120	120	110	120	115	110	115	120	115	110	110	110	115	115	125
20	115	110	100	115	130	120	140	120	115	115	110	110	110	110	110	105	G	145	135	115	115	110	110	105
21	105	105	100	105	105	G	105	140	C	115	115	110	125	120	120	G	115	140	125	115	115	110	110	110
22	110	110	115	125	150	G	125	120	115	115	115	110	110	110	110	G	140	125	115	C	115	110	110	110
23	S	C	E	100	G	G	G	125	G	135	120	120	110	115	115	120	110	105	105	110	110	110	E	E
24	100	100	100	100	G	G	C	120	120	115	G	G	G	G	G	G	150	125	115	115	110	110	105	E
25	100	E	100	C	100	C	G	125	125	120	125	115	110	115	G	G	105	105	105	100	100	S	S	E
26	E	E	E	E	G	G	140	140	125	115	110	120	115	115	G	G	185	155	140	120	115	110	110	105
27	105	E	E	E	G	C	125	125	120	G	115	C	110	105	110	105	C	115	115	115	S	110	S	E
28	S	E	100	E	G	G	G	120	110	110	G	G	G	G	G	110	115	115	110	115	110	110	110	E
29	S	105	105	105	G	150	125	145	120	115	115	110	110	110	110	105	105	105	105	105	100	100	100	100
30	100	100	100	100	100	100	125	110	110	115	115	110	110	G	G	G	G	135	115	115	110	110	105	S
31	S	E	E	100	105	G	140	115	110	110	110	110	140	140	140	115	115	115	120	120	110	105	105	105
Count	16	13	17	16	16	15	18	26	28	27	22	21	22	19	18	19	24	27	28	28	24	22	23	14
Median	105	105	100	100	100	125	140	125	120	115	115	115	110	110	110	110	115	120	115	115	110	110	110	105
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

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

The Radio Research Laboratories, Japan

W 11

IONOSPHERIC DATA

May 1968 | 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	h	c			12	1	12	1	1	c	c3	1	f			
2								h	c	c2						c		1		c2				
3						h		h	c	c	c	c	c		c	1		1	1	c 1	f4	f	f	
4	f	f2	f	f				h	c					c		1		1	1	c				f
5	f2	f2			1		h	h	c	1							h		1	1				
6						1			h	c	c	c	c			1	12	1	c 12	12		f	f	
7		f	f2	f	1	h			h	c	c				c		h	c 1	c	c3 12	f2		f	
8			f	f	h	h	c	c	c2	c	c	12	1		c		c2		c4	c5	f			f
9	f2	f2	f2	f2	1	12	h	h	c	c	c	c2	c3	12		h 1	c 1	c4 12	c3	h	f	f3	f4	f3
10	f2		f2		c2	1 h	h	c5	c	c3	c	c	c	c	c2	c4	1	h	c2				f2	f4
11	f				1	h		c	c						h			c	c4	c3	f6	f	f	
12	f2		f2	f2	1	c	c	c2	c4	c2	c2	c					1	1	c2 12	14	f4	f2	f2	f2
13	f2	f	f2	f		1 h	h	c	c2	c	c	c	c2	c 1		1	h	h	h	c2		f2	f2	f3
14	f	f					h	h	c	c	c2	c	c	c	c	c	h	h			f3	f	f	
15			f	f		1	h	c	c	c	c	c		c	c	1	1	12	c	c2	f		f	
16	f2												c				1		h	c	f2	f2	f	
17				f		1	h		h	h		c	c	12	12	12	1	h	c3	c5 1	f3 f	f4	f7	f4
18		f	f		h	h	h	c2	c3	c2	c	c2	c2	c	c	1	1			c	f6	f2	f2	
19					1				c	c	c2	c2	c	c2	c2	c	c	12	c2	c3	f3	f4	f4	f
20	f	f2	f2	f	c	c 1	h	c2	c3	c2	c3	c3	c2	c2	c2	12		h	c4	c4	f2	f5	f4	f2
21	f2	f5	f2	f2	12		1	h		c2	c2	c	c	c	c		c2	h4	c3	c4	f2	f2	f3	f2
22	f2	f2	f2	f	h		c2	c	c2	c2	c	c3	c2	c	c		h	c2 1	c4		f6	f4	f2	f
23				f				c		h	c	c	c2	1	c	c	c3	14	14	c2	f5	f		
24	f	f	f	f				c	c	c							h	c	c2	c3	f2	f3	f2	
25	f		f		1			c	c	c	c	c2	1	c			1	12	14	1	f			
26							h	h	c	c3	c2	c	c	c			h	h	h2	c6	f3	f2	f	f
27	f						c	c	c		c		c	12	1	1		c2	c4	c2		f		
28			f2					c	c2	c2						c2	c	c2	14	c3	f4	f2	f2	
29		f2	f2	f		h	c	h	c	c	c	c	c2	c	12	12	12	13	14	13	f4	f4	f2	f2
30	f2	f2	f	f	1	1	c	c2	c2	c	c	c	c					h	c2	c3	f4	f2	f2	
31				f	1		h	c2	c4	c3	c	c3	h	h	h	c2	c3	c3	c3	c3	f2	f3	f2	f
Count																								
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

W12

IONOSPHERIC DATA

May 1968 | foF2 | 0.1Mc | **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	074	070	066	064	064	078	089	081	083	089	082	087	098	101	100	100	095	091	096	101	083	079	078	081
2	079	072	071	066	065	061	058	059	069	072	074	079	079	069	075	078	077	080	084	084	076	079	073	071
3	066	062	061	062	061	070	077	087	088	093	096	097	101	099	099	097	087	094	097	091	076	074	071	070
4	068	071	066	062	065	077	093	104	108	097	096	108	121	115	112	I106C	I102C	099	099	097	I090C	081	075	075
5	073	073	072	069	068	077	091	092	091	093	097	103	108	114	109	103	096	092	098	099	089	076	077	078
6	078	075	073	071	069	082	094	089	095	092	094	102	106	106	110	102	099	092	091	094	087	083	083	079
7	077	077	075	071	071	086	094	093	096	097	100	102	099	100	104	107	092	096	I108R	111R	086	074	079	073
8	075	070	064	062	049	043	048	055	I061A	066	074	081	082	078	077	077	084	082	081	083	077	072	I074R	075
9	075	076	073	FS	066S	073	086	093	084	088	I090A	I091A	094	100	104	107	106	093	089	090	085	086	086	078
10	079	080	071	068	061	060	071	I071A	074	076	082	083	077	077	078	I078A	083	074	074	069	C	C	C	C
11	071	070	067	059	059	066	088	098	098	100	098	099	095	100	100	101	086	083	093	C	C	C	077	066
12	063	061	060	059	059	064	067	061	061	054	058	I059A	I064A	067	068	I066A	060	I060R	066	063	062	061	061	I059R
13	061S	058	059	061	059	064	075	081	089	107	103	096	085	094	094	086	089	083	082	091	085	080	075	077
14	077	071	067	064	062	069	082	081	076	083	086	094	093	091	087	087	087	080	079	082	074	071	073	070
15	070	068	069	064	061	065	080	087	084	084	091	093	094	091	091	091	091	082	079	084	084	084	085	083
16	076	071	071	067	067	078	086	093	094	096	092	093	103	103	101	094	087	078	079	084	084	082	085	085
17	080	076	077	072	074	073	074	076	085	088	091	086	I086A	084	085	082	076	075	074	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	057	A	A	055	057	061	062	063	061	057	055	060	063S	064S	FS
19	FS	FS	FS	FS	FS	059S	079	090	093	087	I086C	089	088	089	082	088	087	082	079	081	086	084	082	078
20	080	080	073	068	066	073	083	086	089	083	096	103	103	100	106	104	099	087	085	I086A	086	085	084	084
21	081	077	073	066	066	081	095	095	087	094	088	105	110	I102R	102	098	094	099	099	098	I088R	082	083	079
22	076	077	077	063	063	067	078	I074A	077	073	073	067	I072A	079	I086A	096	I096A	083	073	068	076	079	077	079
23	079	076	079	068	066	073	088	094	090	085	082	086	096	094	102	I106A	103	096	093	088	088	086	086S	089
24	093	086	083	076	068	076	080	089	082	072	074	085	094	099	093	092	089	086	086	093	087	085	082	082
25	084	077	076	074	076	087	103	097	083	084	089	095	098	101	104	105	099	093	092	094	094	092	091	090
26	087	085	081	074	076	088	096	087	073	075	084	096	098	101	108	104	098	094	086	084	084	086	091	089
27	081	080	077	074	077	093	106	104	084	080	082	082	087	087	094	I094C	088	084	088	I094R	089	087	086	090
28	091	091	RS	RS	086	089	087	089	089	086	091	104	111	114	114	107	096	101	097	097	I095R	087	086	083
29	082	081	077	076	076	084	090	086	082	085	091	091	093	096	099	108	103	099	094	090	089	091	093	087
30	086	085	080	078	073	073	079	073	069	066	063	070	076	073	074	077	078	072	069	068	074	078	077	077
31	076	071	070	071	074	084	089	074	073	I072A	I072A	068	074	074	076	074	074	072	067	067	073	078	077	076
Count	29	29	28	27	29	30	30	30	30	31	30	30	31	31	31	31	31	31	31	29	28	28	29	28
Median	077	076	072	068	066	073	086	087	084	085	088	092	094	096	096	096	089	084	086	088	085	082	079	078
U.Q.	081	080	077	072	074	082	091	093	090	093	094	099	101	101	104	104	098	094	094	094	088	086	086	084
L.Q.	074	070	067	063	062	066	078	076	076	073	082	083	082	079	082	082	084	080	079	082	076	077	075	075
Q.R.	007	010	010	009	012	016	013	017	014	020	012	016	019	022	022	022	014	014	015	012	012	009	011	009

foF2

Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

A1

IONOSPHERIC DATA

May 1968 | foF1 | 0.01MC | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	U490L	480L	510L	610H	540	I530A	L	A	A	A						
2								460	I480A	520	540	520	510L	L	550L	L	L	L						
3								L	L	L	510L	L	540L	L	L	L	L	L						
4								L	L	L	630H	560L	550L	510	L	C	C	L						
5								L	L	L	U540L	520L	590H	530L	L	L	L	L						
6								L	L	U490L	550H	U520L	L	550L	L	490L	U450L	A						
7							L	L	L	U500L	580L	540L	510L	570L	540	500	U480L	460L						
8							400	I450A	I510A	480	590L	510S	510L	U510L	L	L	460L	L						
9							L	L	L	540	A	A	570	580	520H	500L	L	A						
10								A	A	560L	540L	540L	550L	A	A	I500A	I490A	A						
11							L	L	480L	560H	520L	540	510L	540L	520L	470L	A	A						
12							390I.	420	450	490	480	A	A	A	A	A	470	430L						
13							L	L	A	520L	510L	530	560L	510L	500L	490L	A							
14							L	L	L	490L	540	530L	540	530	520	520	450L	U400L						
15							L	L	L	U530L	520	520	540H	520	510L	510L	U470L	L						
16								L	500L	520L	540L	550L	550	540	520L	490L	460L	L						
17							L	L	U500L	480L	I540A	540	I540A	540	500	480	L							
18							C	C	C	A	A	A	A	510	490	470	460L	430L						
19						U360L	L	U470L	U540L	510H	I530C	570L	550	540	560L	520	L	L						
20							A	A	A	A	580H	I570A	I560A	580	I530A	530	L	L						
21						L	L	L	L	L	I600A	580L	I590A	I580A	530L	I510A	L	A						
22						L	A	A	550L	530	A	A	A	540	A	A	A	A						
23							L	L	500L	U550L	580L	600L	570	560	A	A	500	L						
24						L	L	L	500L	530	580	570	550	540	540	510L	A	L	A					
25						L	L	L	L	510L	600	550	570	580	520	510	460L	L	L					
26							L	L	I480A	570H	590	570	550	570	530	L	440	L						
27						L	L	L	A	L	580	580	580	570	560	C	A	A						
28								L	510	520	600	580H	550	550	570	520	500L	L	L					
29							L	L	U590L	530L	570	540	560H	560	I550A	I520A	A	L	A					
30						U370L	430	470	I510A	530	570	550	I540A	L	A	510	470L	L						
31							L	470	I480A	I530A	I530A	530	I520A	510	520	500	480	420						
Count						2	3	6	16	24	28	26	27	26	20	20	15	5						
Median						U360L	400	460	U500L	520L	540	540	550	540	520	500	460L	430L						
U.Q.																								
L.Q.																								
Q.R.																								

foF1

Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

IONOSPHERIC DATA

May 1968 | foE | 0.01Mc | 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						195	250	295	325	I340A	355	I365A	375	I370A	I355A	330	305	265	A	A				
2						A	A	290	320	A	A	A	A	380	360	340	325	280	A	S				
3						200	I255A	290	325	340	360	I365A	A	A	A	A	A	A	A	S				
4						A	245	300	A	A	A	A	I390A	I380A	360	I330C	I305C	275	A	S				
5						190	250	I290A	A	A	350	A	A	380	365	345	315	A	A	S				
6						175	265	300	325	340	355	365	A	A	A	A	A	A	A	S				
7						200	260	295	325	340	I350A	370	A	A	A	A	305	260	A	S				
8						A	I245A	I290A	315	340	A	A	A	A	360	330	305	A	A	S				
9						A	I260A	305	325	345	I360A	A	A	A	A	335	310	A	A	B				
10						185	245	300	330	350	370	I380A	A	A	A	A	A	A	A	S				
11					S	195	I265A	I305A	320	A	A	I360A	I370A	385	355	330	305	A	A	C				
12					E	180	I245A	290	I320A	A	A	A	A	A	A	A	A	260	A	S				
13					E	A	I250A	I295A	I320A	I340A	355	A	A	A	A	340	310	265	A	S				
14					E	185	255	300	320	345	365	375	A	A	A	340	320	275	A	S				
15					E	195	250	300	330	345	360	I365A	I370A	380	360	345	310	275	A	S				
16					S	190	260	300	330	355	I360A	370	A	A	A	A	A	A	A	S				
17					S	175	260	300	330	350	365	380	A	A	360	345	315	270	A	C				
18					C	C	C	C	C	A	I360A	A	A	A	A	350	315	280	225	S				
19					E	195	265	315	A	A	C	385	400	390	365	A	A	A	A	S				
20						A	275	315	350	360	I370A	I380A	A	A	A	A	A	285	A	S				
21					E	205	265	315	A	A	375	I385A	I390A	I380A	I370A	355	A	A	A	S				
22					E	205	I265A	305	335	355	370	380	385	A	A	A	A	A	A	S				
23						A	270	320	345	355	A	A	375	A	A	A	A	A	A	S				
24					S	210	270	315	I340A	355	I370A	I380A	390	I390A	I385A	365	325	285	A	S				
25					E	A	275	315	340	355	A	A	A	A	A	A	A	290	A	S				
26					S	210	270	310	335	360	375	I380A	390	A	A	A	A	A	230	S				
27					S	I160A	275	I305A	335	350	A	A	C	A	A	C	325	285	A	S				
28					E	I200A	I245A	295	325	A	A	A	A	A	380	A	A	A	A	S				
29					E	A	285	315	340	A	A	A	A	A	A	A	A	A	A	S				
30					E	210	260	I310A	I330A	355A	370	380	A	A	A	A	A	A	A	S				
31					E	210	275	310	335	355	365	I375A	385	390	370	350	I320A	280	A	S				
Count					12	21	29	30	27	21	20	18	11	10	13	15	16	15	2					
Median					E	195	260	300	330	350	360	U380A	385	380	360	340	310	275	230					
U.Q.																								
L.Q.																								
Q.R.																								

foE

Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

A 3

IONOSPHERIC DATA

May 1968 | foEs | 0.1Mc | 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	E012S	E	E	E	E	G	028	035	039	041	039	039	G	J066	J038	J065	J068	J070	J050	J029	J048	J035	J054	J034
2	E014S	J013	J033	J020	J015	020	031	039	J051	J055	J050	J062	J044	044	G	G	G	G	J033	J046	J042	J031	J020	E013S
3	021M	J022	E	J014	E	G	028	035	042	045	045	046	045	J049	J045	J041	J040	J052	J057	J038	J035	J049	J040	J034
4	J021	J019	J014	J025	J025	J020	027	035	J047	042	044	039	040	040	J037	C	C	032	027	J023	C	J018	E014S	E013S
5	E014S	J019	J022	J021	E	G	J048	037	J051	J038	038	039	J063	042	G	041	041	J037	026	J034	J020	E013S	E013S	E013S
6	E014S	E013S	E	E	E	G	G	034	035	041	041	048	045	045	J044	J065	J048	J053	J042	J038	J031	J026	J018	J021
7	E014S	E013S	E013S	E	E	G	G	033	037	039	041	045	041	039	J039	033	037	041	J033	J021	E013S	J022	E013S	E012S
8	E014S	J023	J023	J020	J018	020	028	J044	J073	J074	J048	J039	044	J049	J054	J063	J050	J053	J054	J033	J039	J053	J050	J055
9	J063	J039	J044	J078	J038	J028	J033	036	J051	J053	J155	J111	J076	J051	J039	038	040	J066	J048	J053	J064	J034	J020	J043
10	J030	J036	J033	J024	J037	030	J049	J080	J058	049	046	049	J052	J066	J067	J086	J103	J065	J077	J033	C	C	C	C
11	E014S	E014S	J036	J023	E012S	022	030	036	041	J052	J040	J043	040	G	J059	038	J053	J085	J035	C	C	C	J018	J018
12	021M	J014	E	J018	E	021	031	038	039	042	J050	J091	J073	J055	J089	J100	J066	J077	J043	J044	J043	J025	J065	J049
13	J068	J036	J024	J029	J018	027	039	J050	J060	J048	041	041	J055	J041	J039	035	049	J053	J039	022	J017	J023	J029	J053
14	J033	J029	J022	J014	E	024	034	045	J049	045	045	042	043	045	042	G	036	029	J038	J071	J030	J020	E014S	E014S
15	E013S	J014	J016	J020	E	G	028	036	038	041	044	042	040	G	G	G	G	035	J038	J030	J023	J017	J016	E014S
16	E013S	E013S	J019	E	E013S	G	031	038	044	045	047	J051	046	J053	J046	J049	034	J034	029	J032	J043	J036	J029	J023
17	J023	J019	J024	J027	E012S	G	030	045	J053	J055	J082	J067	J106	J064	047	G	041	043	035	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	J053	J056	J061	J061	J073	038	G	028G	G	G	018	J027	J029	J023	J019
19	E013S	J022	J014	E	E	G	G	031G	039	039	C	042	G	042	044	041	J048	J050	J057	J015	E014S	E013S	J031	J043
20	J051	J063	J049	J029	J022	J044	J054	J072	J065	J087	J109	J116	J087	J069	J078	J041	J044	031	J036	J089	J032	J077	J033	J053
21	J025	E	J018	J021	J021	023	031	040	044	J052	J080	J053	J065	J091	044	J055	J068	J067	J032	J045	J079	J025	J019	021M
22	J020	J024	J054	J030	J028	032	J064	J083	J055	J049	J055	J063	J098	J081	J143	J128	J120	J073	J036	J043	J033	J048	J064	J042
23	J041	J024	J028	J020	J024	J024	030	041	042	041	J078	J045	G	J055	J071	J135	J058	J043	J027	J074	J044	J051	J058	J029
24	J039	J035	J034	J029	J023	G	031	G	J048	J061	044	042	G	J078	J042	045	J051	J044	J077	J051	J025	J029	J021	J041
25	J032	J024	E	J026	E	024	033	045	044	040	039	044	040	J040	J046	039	037	J035	030	J035	J051	J040	J022	J030
26	E013S	J020	E014S	E	E013S	024	036	044	J051	047	J082	J097	J051	044	J064	J047	J037	029	027	J037	J073	J074	J023	J022
27	J020	J028	J018	E	E013S	027	034	J044	J060	J055	J064	J059	042	J057	J054	C	J071	J050	J065	J108	J063	J032	J091	J044
28	E014S	J029	E	J013	E	025	J047	J053	J066	J057	J060	J064	J060	J061	044	044	J051	J040	J034	J063	J108	J024	J033	J018
29	J023	J018	J017	J031	J029	J029	J045	041	039	J054	042	J049	J050	J049	J072	J063	J052	J054	J078	J084	J054	J029	J023	J018
30	J024	J048	J025	J028	J023	024	031	038	J068	J053	J115	J067	J080	J064	J058	J045	J039	J040	J038	J033	J034	J019	J019	J023
31	J028	J019	J019	J025	J020	G	J044	J063	J058	J094	J112	J044	055	J063	J074	J075	044	J047	042	J058	J077	J039	J055	J063
Count	30	30	30	30	30	30	30	30	30	31	30	31	31	31	31	29	30	31	31	29	27	28	29	29
Median	J021	J021	J019	J020	E013	022	031	040	J048	J049	J048	J048	046	J051	J045	J044	J046	J044	J038	J038	J039	J029	J023	J023
U.Q.	030	029	028	027	023	025	039	045	058	055	078	063	063	064	064	064	053	054	050	056	054	040	045	043
L.Q.	E014	014	E014	E	E	G	028	036	041	041	042	042	040	042	039	036	037	035	032	031	027	022	018	018
Q.R.	D016	015	D014				011	009	017	014	036	021	023	022	025	028	016	019	018	025	027	018	027	025

foEs

Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

IONOSPHERIC DATA

May 1968 | f_bEs 0.1Mc | 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	S						027	034	038	040	038	039		062	036	058	061	070	044	025	042	032	030	025
2	S	013	E	014	012	019	030	G	049	050	043	041	042	043					032	044	022	028	020	S
3	E	020		E			028	033	040	043	043	043	043	045	039	040	038	034	032	021	030	018	017	022
4	017	015	014	019	018	019	027	033	035	040	038	039	040	039	031	C	C	032	026	020	C	017	S	S
5	S	E	E	016			018	035	040	038	038	039	040	042		039	040	035	024	028	018	S	S	S
6	S	S						033	035	039	040	044	043	041	040	041	033	050	033	030	028	023	E	E
7	S	S	S					032	036	038	039	044	040	039	036	033	037	040	030	018	S	017	S	S
8	S	014	014	015	014	020	028	038	A	043	039	039	041	047	049	G	037	036	050	024	034	027	035	025
9	018	026	021	040	016	021	032	034	044	046	A	A	048	042	038	038	040	058	048	051	045	029	018	043
10	026	027	024	018	022	028	045	A	052	048	045	048	051	059	063	A	059	064	044	019	C	C	C	C
11	S	S	018	E	S	022	028	034	040	038	039	039	038		040	036	050	062	031	C	C	C	E	E
12	E	E		E		021	027	033	037	041	044	A	A	052	054	A	038	036	039	043	024	022	028	017
13	028	024	016	013	013	026	038	044	054	039	040	039	044	041	037	035	046	052	033	018	016	020	024	026
14	020	017	015	E		024	033	045	048	044	043	041	042	044	041		036	029	033	U071R	025	U020R	S	S
15	S	E	013	016			028	036	038	039	043	041	039					033	033	027	022	015	E	S
16	S	S	015		S		031	037	044	043	042	042	043	043	044	042	034	031	028	028	025	018	018	016
17	E	014	015	018	S		028	040	038	041	059	049	A	042	044		040	042	031	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	047	A	A	052	042	038		028G			017	025	028	020	017
19	S	014	E					027G	039	039	C	042		042	043	039	041	036	057	015	S	S	026	033
20	024	023	035	014	017	029	049	054	057	077	046	060	078	051	055	039	042	030	034	A	026	040	023	018
21	020		E	014	015	023	030	037	040	048	062	052	059	E091R	043	053	045	067	031	040	061	020	018	E
22	E	018	017	018	021	030	051	A	046	047	054	060	A	044	A	081	A	068	034	019	024	026	044	025
23	034	021	024	017	021	024	030	040	042	040	044	044		051	055	A	041	042	027	038	043	038	021	015
24	024	018	017	021	021		031		044	045	042	041		040	041	042	050	042	052	043	020	022	020	E
25	018	014		014		024	033	042	044	039	039	042	040	040	044	039	036	018	028	028	050	029	021	016
26	S	017	S		S	024	034	040	047	042	042	042	041	042	047	045	035	029	026	036	058	018	017	018
27	016	017	E		S	026	032	040	052	048	045	043	042	052	045	C	058	050	058	060	022	022	017	016
28	S	E		E		024	040	040	039	045	054	042	043	049	044	038	038	031	025	046	074	017	017	E
29	018	014	E	017	020	026	043	037	037	045	040	045	048	048	057	057	052	042	065	054	024	016	017	016
30	022	019	018	019	015	024	029	035	052	048	043	045	065	054	053	042	036	032	030	021	023	017	017	018
31	015	013	016	021	016		038	027	058	A	A	043	053	048	045	044	041	035	030	033	053	025	017	040
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

f_bEs Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

A5

IONOSPHERIC DATA

May 1968 | **f-min** 0.1Mc | **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	E012S	E	E	E	E	014	014	018	018	018	020	018	019	021	016	019	017	016	013	014	E014S	E012S	E013S	E012S
2	E014S	E	E	E	E	014	014	018	019	018	019	018	022	022	022	021	016	018	016	E014S	E014S	016	E014S	E013S
3	E014S	E	E	E	E	014	014	018	018	018	021	019	021	021	019	021	018	016	013	E012S	E014S	E013S	E013S	E013S
4	016	E	E	E	E	013	017	018	019	019	019	021	021	021	017	C	C	016	014	E014S	C	E013S	E014S	E013S
5	E014S	E	E	E	E	016	018	017	017	019	021	021	023	023	022	023	018	018	016	E012S	E013S	E013S	E013S	E013S
6	E014S	E013S	E	E	E	013	014	015	016	020	019	023	023	019	018	020	018	015	014	E014S	E013S	E013S	E013S	E013S
7	E013S	E013S	E013S	E	E	014	015	018	021	018	019	023	023	018	018	019	019	019	014	E012S	E013S	E013S	E013S	E012S
8	E014S	E	E	E	E	014	014	018	019	021	020	023	024	023	020	020	017	015	014	E013S	E013S	E014S	E013S	E014S
9	E013S	E	E013S	E	E	013	015	020	019	023	023	023	025	023	020	014	017	017	018	018	E014S	E014S	E012S	E014S
10	E013S	E	E	E	E	014	016	019	019	022	023	023	023	021	022	019	017	017	014	E012S	C	C	C	C
11	E014S	E014S	E	E	E012S	015	014	015	020	019	020	019	018	023	018	017	018	016	017	C	C	C	E012S	E013S
12	E013S	E	E	E	E	013	017	015	017	018	022	023	021	020	020	018	017	015	015	E013S	016	E013S	E013S	E012S
13	E013S	E	E	E	E	013	017	018	018	019	022	020	020	020	018	014	016	018	016	E013S	E013S	E013S	E012S	E012S
14	E013S	E	E	E	E	014	020	017	021	024	023	024	024	023	023	020	017	018	014	E013S	E014S	E012S	E014S	E014S
15	E013S	E	E	E	E	014	014	019	020	019	021	021	022	020	020	016	018	018	013	E014S	E013S	E013S	E012S	E014S
16	E013S	E013S	E	E	E013S	015	018	015	018	024	023	021	023	020	020	017	023	017	015	E013S	E013S	E012S	E013S	E012S
17	E012S	E	E	E	E012S	015	014	018	019	019	021	028	025	023	019	018	018	018	016	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	017	023	023	025	024	019	020	018	019	017	E013S	E012S	E013S	E012S	E013S
19	E013S	E	E	E	E	014	015	018	024	020	C	023	025	021	021	018	020	018	016	E012S	E014S	E013S	E012S	E012S
20	E013S	E	E	E	E	013	017	018	018	020	023	024	024	023	020	018	018	018	015	E013S	E012S	E012S	E013S	E013S
21	E013S	E	E	E	E	013	017	017	017	017	018	020	020	024	018	018	020	017	015	E013S	E013S	E	E012S	E014S
22	E014S	E	E	E	E	012	014	017	018	023	023	021	018	019	018	018	022	017	016	E013S	E014S	E013S	E013S	E013S
23	E013S	E	E	E	E	015	017	018	021	023	023	027	024	023	024	021	021	020	016	E012S	E013S	E012S	E012S	E
24	E	E	E	E	E013S	012	018	017	023	022	022	023	024	024	022	019	020	017	016	E013S	E	E013S	E012S	E013S
25	E013S	E	E	E	E	014	017	017	022	019	023	023	028	026	020	020	018	018	017	E013S	E013S	E013S	E014S	E013S
26	E013S	E	E014S	E	E013S	014	014	019	018	018	017	023	019	018	018	017	019	016	015	E013S	E013S	E013S	E013S	E012S
27	E012S	E	E	E	E013S	014	017	018	017	018	017	020	020	017	024	C	017	017	017	E013S	E013S	E012S	E012S	E012S
28	E014S	E	E	E	E	015	016	014	017	018	024	019	023	024	025	020	019	018	014	E013S	E012S	E012S	E012S	E013S
29	E	E	E	E	E	014	017	018	019	020	023	020	023	020	020	018	020	017	013	E013S	E014S	E013S	E	E013S
30	E013S	E	E	E	E	015	014	014	018	019	020	021	019	019	018	017	017	017	012	E013S	E013S	E013S	E012S	E012S
31	E013S	E	E	E	E	017	015	018	018	017	018	020	019	020	019	018	017	017	013	E013S	E013S	E012S	E013S	E012S
Count	30	30	30	30	30	30	30	30	30	31	30	31	31	31	31	29	30	31	31	29	27	28	29	29
Median	E013S	E	E	E	E	014	016	018	018	019	021	021	023	021	020	018	018	017	015	E013S	E013S	E013S	E013S	E013S
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

f-min Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

A6

IONOSPHERIC DATA

May 1968 | 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	270	265	275	280	270	295	320	320	305	315	275	275	280	280	285	285	295	300	295	300	290	270	265	270
2	270	255	255	270	265	285	310	270	290	260	285	280	305	275	280	295	285	295	285	285	270	280	265	265
3	270	260	260	275	265	285	285	300	300	295	295	290	285	285	285	295	280	290	295	295	285	260	265	255
4	260	265	275	265	265	280	290	300	300	290	270	270	290	285	285	I285C	I285C	295	305	295	I285C	280	270	270
5	270	265	275	275	275	300	310	305	310	280	280	285	275	290	295	290	290	295	295	305	305	270	270	270
6	270	270	275	270	270	295	315	305	295	285	280	275	275	280	290	285	295	295	290	290	285	275	275	270
7	265	275	275	270	275	305	315	310	295	285	275	275	275	260	270	270	250	245	I265R	285R	290	240	255	245
8	235	250	245	270	275	275	265	285	I285A	290	270	285	295	295	295	285	305	305	295	295	280	255	I255R	255
9	270	275	290	FS	270S	285	305	315	305	280	I285A	I280A	270	270	270	275	285	285	280	285	270	280	270	260
10	255	275	270	255	250	265	295	I280A	285	270	275	280	295	295	310	I290A	300	325	310	280	C	C	C	C
11	265	265	280	275	255	275	285	295	285	270	275	275	265	275	280	285	290	280	290	C	C	C	285	265
12	260	250	270	265	265	285	300	250	270	225	240	I240A	I250A	260	260	I265A	265	I285R	290	290	265	265	255	I250R
13	265S	260	265	280	275	300	290	280	270	285	290	290	285	270	285	290	295	300	280	290	285	275	265	270
14	275	265	280	270	270	305	290	300	275	270	265	275	280	275	285	285	300	285	290	295	285	265	265	260
15	260	260	275	290	280	290	290	305	290	285	290	290	290	285	285	290	300	295	280	285	290	275	280	280
16	285	265	275	270	270	280	285	300	300	285	285	270	280	285	290	300	300	295	290	275	280	270	270	270
17	265	260	275	270	270	275	275	275	280	295	290	280	I280A	280	285	295	290	295	290	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	260	A	A	250	250	265	270	285	290	285	270	265	255S	255S	FS
19	FS	FS	FS	FS	FS	265S	285	295	290	275	I260C	280	280	285	275	285	295	290	290	270	275	275	270	260
20	260	275	275	260	255	275	275	280	280	265	265	275	265	270	275	280	300	295	285	I270A	270	265	265	270
21	275	265	275	260	255	275	300	305	280	280	265	265	275	I280R	280	280	285	285	295	295	I280R	255	265	265
22	245	260	260	245	245	250	275	I270A	265	285	275	250	I260A	270	I275A	280	I285A	295	275	270	260	260	250	255
23	265	255	280	290	260	260	285	300	305	295	280	270	270	260	270	I270A	285	290	280	285	265	270	260S	270
24	270	265	270	275	270	275	295	280	305	280	260	265	270	275	280	280	285	270	270	280	280	270	270	265
25	270	265	265	265	275	285	305	295	305	280	270	275	270	270	280	275	285	285	285	285	285	275	275	270
26	275	275	270	260	265	285	295	315	300	280	265	270	275	270	280	280	285	285	280	275	265	265	270	270
27	260	265	265	260	265	290	295	310	300	285	280	270	275	265	275	I285C	280	275	280	I285R	290	275	270	265
28	265	270	RS	RS	285	305	290	310	280	280	260	260	265	270	265	275	265	275	280	285	I280R	290	270	265
29	270	270	275	270	280	295	290	290	270	285	270	265	265	260	255	275	275	285	290	275	275	265	275	270
30	265	265	260	260	245	245	270	260	265	260	250	260	275	260	270	285	285	290	275	275	265	260	260	270
31	265	250	255	265	270	265	280	285	295	I255A	I260A	245	255	250	265	260	285	295	280	270	255	270	260	265
Count	29	29	28	27	29	30	30	30	30	31	30	30	31	31	31	31	31	31	31	29	28	28	29	28
Median	265	265	275	270	270	285	290	300	290	280	275	275	275	275	280	285	285	290	285	285	280	270	265	265
U.Q.																								
L.Q.																								
Q.R.																								

M(3000) F2 Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

A7

IONOSPHERIC DATA

May 1968 | 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								L	U350L	370L	360L	340H	350	I350A	L	A	A	A						
2								330	I320A	I340A	325	345	355L	L	310L	L	L	L						
3								L	L	L	355L	L	340L	L	L	L	L	L						
4								L	L	L	335H	340L	335L	355	L	C	C	L						
5								L	L	L	U350L	380L	335H	345L	L	L	L	L						
6								L	L	U370L	355H	U350L	L	335L	L	350L	U350L	A						
7							L	L	L	U360L	330L	345L	355L	320L	320	335	U320L	300L						
8							325	I330A	I320A	370	315L	355S	355L	U360L	L	L	340L	L						
9							L	L	L	350	A	A	335	310	330H	340L	L	A						
10								A	A	315L	335L	335L	I325L	A	A	I340A	I350A	A						
11							L	L	360L	340H	355L	350	355L	335L	340L	355L	A	A						
12							315L	355	355	335	350	A	A	A	A	A	325	325L						
13							L	L	A	340L	355L	365	335L	355L	340L	345L	A							
14							L	L	L	345L	335	345L	335	335	325	325	340L	350L						
15							L	L	L	U345L	365	365	355H	345	340L	335L	U345L	L						
16								L	340L	350L	355L	345L	325	335	345L	345L	350L	L						
17							L	L	U345L	365L	I335A	355	I350A	340	360	340	L							
18							C	C	C	A	A	A	A	355	350	345	330L	330L						
19						U315L	L	U355L	U335L	355H	I370C	330L	340	335	320L	330	L	L						
20							A	A	A	A	325H	I330A	I315A	310	I340A	335	L	L						
21						L	L	L	L	L	I335A	325L	I335A	I335A	340L	I350A	L	A						
22						L	A	A	310L	340	A	A	A	335	A	A	A	A						
23							L	L	360L	U345L	335L	330L	335	335	A	A	340	L						
24						L	L	L	360L	355	345	345	330	335	335	340L	A	L	A					
25						L	L	L	L	365L	335	355	335	325	350	355	370L	L	L					
26							L	L	I370A	345H	325	345	350	335	340	L	380	L						
27						L	L	L	A	L	345	340	340	325	325	C	A	A						
28								L	355	355	335	340H	345	340	330	345	340L	L	L					
29							L	L	U325L	345L	335	360	340H	340	I320A	I325A	A	L	A					
30						U325L	320	350	I335A	360	320	340	I330A	L	A	335	345L	L						
31							L	350	I340A	I325A	I320A	370	I330A	315	330	340	335	360						
Count						2	3	6	16	24	28	26	27	26	20	20	15	5						
Median						U320L	320	350	U340L	350L	335	345	335	335	330	340	340L	330L						
U.Q.																								
L.Q.																								
Q.R.																								

M(3000)F1 Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

IONOSPHERIC DATA

May 1968 | 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								255	290	280	285	340	325	320	310	300	280	290						
2								390	340	405	355	360	305	350L	360	325	320	290						
3								290	290	290	285	310	305	315	310	295	305	280						
4								265	265	285	325	335	305	300	305	I290C	I285C	285						
5								290	265	305	315	300	330	310	290	280	290	270						
6								280	275	270	320	305	325	315	305	300	280	285						
7							250	250	280	280	325	310	320	345	340	320	345	390						
8							425	280	I390A	325	380	330	320	305	305	305	300	275						
9							255	260	325	330	I335A	I345A	360	350	345	320	295	280						
10								I310A	345	380	350	350	340	330	320	I330A	305	I270A						
11							290	275	285	315	310	325	315	330	315	295	275	325A						
12							315	430	410	650	550	I540A	I470A	430	415	I370A	405	360						
13							300	305	305	315	280	320	340	335	305	310	305	280						
14							300	275	300	325	340	350	330	350	325	330	300	300						
15							290	275	280	320	325	315	315	330	320	325	300	295						
16								290	300	310	310	340	325	325	300	300	295	280						
17							340	300	300	305	325	335	I350A	340	330	315	310							
18							C	C	C	465	A	A	540	520	445	415	360	330						
19						325	295	305	325	305	I340C	355	355	340	355	330	300	295						
20							280	285	295	A	375	330	355	350	320	320	285	295						
21						295	265	265	275	340	345	360	325	I330A	325	305	305	305						
22						365	340	I365A	395	350	400	A	I430A	400	I380A	365	I330A	320						
23							320	280	295	280	335	365	355	340	330	I320A	295	275						
24						320	290	300	275	350	425	400	360	340	340	330	310	305	315					
25						290	275	265	275	285	365	335	340	340	325	315	290	285	280					
26							285	280	275	360	380	340	325	350	315	310	285	270						
27						290	275	255	250	305	350	380	360	350	350	I320C	305	295						
28								260	305	295	370	375	345	330	340	315	315	315	280					
29							270	260	345	300	340	320	380	370	370	330	310	295	290					
30						345	330	400	350	440	510	440	360A	400	390	350	305	290						
31							315	350	335	I405A	A	495	440	435	405	380	350	300						
Count						7	21	30	30	30	29	30	31	31	31	31	31	30	4					
Median						320	290	280	300	315	340	340	340	340	325	320	305	295	285					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'F2 Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

A 9

IONOSPHERIC DATA

May 1968 | *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	275	275	275	255	290	245	235	230	230	225	215	230H	210	I245A	235	A	A	A	275	250	245	290	320	310
2	270	290	300	280	290	250	240	245	I240A	I230A	235	220	230	240	225	240	230	255	280	280	265	285	285	280
3	280	320	295	280	295	255	245	240	240	240	230	230	240	245	220	240	255	260A	255	245	270	290	290	310
4	310	290	275	300	300	265	240	230	235	220	215H	205	210	220	220	I240C	I250C	245	265	245	I245C	235	255	285
5	285	295	285	260	270	235	230	225	240	225	205	210	205H	230	230	255	255	240	270	255	240	240	280	290
6	290	290	270	260	275	245	240	225	220	220	205H	240	240	230	240	240	230	I230A	245	255	260	255	275	285
7	280	280	260	260	290	255	230	230	220	220	210	230	225	220	210	230	250A	I295A	280	255	215	335	315	340
8	340	320	300	275	280	290	255	A	A	230A	220	205	230	250A	I250A	250	250	I270A	285	240	280	305	320	340
9	300	310	280	I270A	280	250	245	230	255	235	A	A	280	220	200H	260	260	I270A	280	280	310	290	280	330
10	340	285	290	260	270	280	285	A	A	A	240	I255A	A	A	A	A	I230A	I250A	275	265	C	C	C	C
11	295	285	260	240	310	265	245	230	220	210H	200	205	215	215	220	220	I265A	I285A	280	C	C	C	240	235
12	295	315	290	290	310	280	260	245	235	250	I225A	A	A	A	A	A	250	I240A	290	290	290	295	320	350
13	330	320	295	275	280	250	255	I250A	I240A	230	210	205	250	225	240	230	I255A	I275A	275	270	250	280	290	315
14	290	280	260	265	290	240	250	I250A	I260A	I230A	245	200	215	265	240	230	235	240	275	I290A	250	270	280	290
15	290	295	280	245	260	250	235	235	225	220	215	200	195H	200	240	225	240	235	275	260	265	280	275	270
16	250	275	280	265	305	255	240	240	I240A	240	205	220	235	230	240	250	230	240	270	280	280	290	300	290
17	290	275	270	290	290	245	245	I240A	240	230	I250A	I250A	I240A	220	230A	240	265	285	275	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	A	A	A	A	230	225	245	240	250	265	290	315	340	320	305
19	280	290	290	325	330	255	245	235	245	215H	I215C	215	225	225	240	240	260	270	300A	285	275	260	290	300
20	330	280	290	300	340	290	I270A	I260A	A	A	230H	I240A	I250A	I245A	I250A	235	I235A	240	280	I300A	285	310	285	280
21	280	270	270	280	340	270	240	245	230	260	A	A	A	A	240	I230A	I240A	I280A	275	260	I285A	270	295	300
22	320	320	310	330	340	290	A	A	A	A	A	A	A	240	A	A	A	A	275	275	300	330	380	320
23	320	305	290	250	290	255	260	245	230	220	240	240	235	A	A	A	230	I240A	265	260	300	295	310	290
24	320	275	255	255	260	280	250	240	240A	240	215	200	225	230	240	255	I250A	I245A	I270A	290	240	265	290	290
25	300	285	285	290	270	240	240	240	240	220	215	200	215	225	240	230	230	245	255	270	290	280	285	285
26	270	285	275	275	310	270	250	250	I230A	215H	215	230	205	230	I240A	I235A	235	230	245	270	I290A	280	275	285
27	280	290	285	290	315	260	240	235	I240A	I255A	210	225	230	I235A	265	C	A	A	300	300	255	260	290	310
28	290	300	275	245	255	245	245	240	210	240	A	195H	205	I220A	245	230	230	240	250	270	I255A	255	275	290
29	285	280	275	290	250	240	I250A	240	220	250	200	215	I260A	I270A	I265A	I245A	A	A	A	300	300	275	275	280
30	290	295	310	295	290	270	260	220	I230A	I230A	240	250	A	A	A	240	250	250	275	280	310	295	295	290
31	285	300	290	310	300	230	265	240	A	A	A	205	A	I250A	240	250A	250A	255	245	290	I300A	305	300	315
Count	30	30	30	30	30	30	29	27	25	26	25	26	24	26	26	25	27	27	30	29	28	28	29	29
Median	290	290	280	275	290	255	245	240	235	230	215	220	230	230	240	240	250	250	275	270	280	280	290	290
U.Q.																								
L.Q.																								
Q.R.																								

h'F Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

A 10

IONOSPHERIC DATA

May 1968 | **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	S	E	E	E	E	G	150	130	125	125	125	130	G	105	105	125	120	120	115	100	110	110	110	110
2	S	105	105	105	105	130	130	130	115	115	110	105	115	130	G	G	G	G	120	115	110	110	110	S
3	105	105	E	105	E	G	145	130	130	125	120	120	115	110	115	115	110	110	105	105	115	115	110	105
4	105	105	105	100	100	105	140	140	120	115	115	110	125	120	105	C	C	130	125	110	C	110	S	S
5	S	105	105	105	E	G	110	120	115	120	125	125	110	130	G	155	130	120	120	115	115	S	S	S
6	S	S	E	E	E	G	G	140	140	125	125	115	120	115	110	115	105	105	120	100	100	100	100	100
7	S	S	S	E	E	G	G	140	130	130	120	115	100	115	110	120	140	125	120	115	S	110	S	S
8	S	105	105	105	110	130	130	120	115	120	120	115	125	120	125	125	120	120	115	115	110	110	110	115
9	115	105	105	105	105	115	110	125	120	115	110	110	110	110	115	170	130	125	120	115	115	115	120	115
10	110	105	105	100	100	130	125	120	120	125	120	120	115	115	115	105	105	125	120	120	C	C	C	C
11	S	S	105	110	S	140	145	130	120	115	110	105	115	G	130	150	125	120	120	C	C	C	110	110
12	110	105	E	105	E	145	130	125	120	120	120	115	110	110	105	105	125	120	120	115	115	110	110	105
13	105	100	100	100	100	135	130	125	120	120	120	125	115	115	125	130	140	125	120	120	115	110	110	110
14	110	105	105	115	E	140	130	125	125	125	125	120	120	120	120	G	140	140	125	115	115	115	S	S
15	S	110	105	105	E	G	140	125	125	125	120	120	120	G	G	G	G	135	120	115	115	115	105	S
16	S	S	100	E	S	G	140	130	125	125	120	115	115	115	110	110	120	110	130	120	115	115	110	110
17	105	105	105	100	S	G	150	130	125	120	120	120	110	110	120	G	145	135	125	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	125	125	120	115	115	115	G	110	G	G	125	115	115	115	115
19	S	110	115	E	E	G	G	105	130	120	C	140	G	140	125	125	120	120	115	115	S	S	110	115
20	110	110	105	105	105	130	125	125	120	115	115	115	110	110	110	115	110	140	125	115	115	115	110	115
21	110	E	110	105	105	E175G	150	130	130	120	115	120	115	115	140	120	115	115	115	120	115	115	120	120
22	115	115	110	110	105	130	125	115	120	120	120	120	115	115	110	110	110	110	105	110	105	105	105	105
23	110	110	110	110	110	110	150	135	130	135	110	110	G	110	110	110	115	110	120	110	105	105	110	105
24	100	100	105	100	100	G	150	G	110	115	120	115	G	125	115	145	140	130	120	120	115	110	110	115
25	110	100	E	105	E	140	135	125	125	125	130	125	120	110	115	120	120	100	130	115	115	110	110	110
26	S	105	S	E	S	155	130	125	120	130	125	120	120	120	110	115	115	120	150	120	120	120	115	115
27	115	105	110	E	S	135	130	125	115	120	115	115	120	125	125	C	120	125	120	115	115	115	115	110
28	S	130	E	100	E	130	115	115	115	115	110	110	110	110	125	125	110	110	110	110	110	110	105	105
29	105	105	110	100	100	115	130	130	130	120	120	110	110	115	110	110	110	110	110	105	105	105	105	100
30	100	100	100	100	105	150	150	130	115	120	130	115	110	105	105	105	110	105	120	100	105	100	105	105
31	105	100	105	105	110	G	130	105	125	120	120	140	130	125	120	120	120	120	120	120	120	110	110	105
Count	18	24	22	23	14	19	27	29	30	31	30	31	27	29	28	24	28	29	30	29	25	26	25	23
Median	110	105	105	105	105	130	130	125	120	120	120	115	115	115	115	120	120	120	120	115	115	110	110	110
U.Q.																								
L.Q.																								
Q.R.																								

h'Es Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

A11

IONOSPHERIC DATA

May 1968 | Types of Es | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							h	h2	h2	h	h	h		13	12	h212	h2	h5	c4	14	f6	f6	f6	f3
2		f	f	f	f	h	h2	h	h3	h3	c2	c2	c2	h2					c3	c4	f3	f3	f	
3	f	f2		f			h6	h2	h2	h2	h2	h2	h2	c2	c2	c2	c2	c3	13	12	f3	f3	f2	f2
4	f2	f2	f2	f2	f2	1	h	h	h	h2	h	c	h	h	12			h2	h3	12		f		
5		f2	f	f2			1	h2	h2	h2	h	h	1	h		h	h2	h2	c2	c5	f2			
6								h	h	h2	h2	h	h2	c2	c2	c2	12	15	c314	17	f5	f3	f2	f
7								h	h	h2	h	h2	h	h	c2	c2	h	h	c3	c2		f2		
8		f	f2	f3	f4	c	h2	h2	h3	h3	h	h	h	h2	h	h	h2	h4	c3	c5	f3	f3	f4	f4
9	f2	f3	f2	f5	f2	c2	13	h	h4	h2	c2	c3	c2	c2	c	h 1	h 1	h3	c3	c3	f4	f3	f2	f4
10	f5	f4	f4	f2	f2	h3	h3	h4		h3	h	h2	h2	c2	c3	c3	14	13	h4	c3	c3			
11			f3	f		h	h	h	h2	h2	c2	12	c		h	h2	h2	c3	c3				f2	f
12	f	f		f		h	h	h2	h2	h2	h2	c2	c4	c2	13	14	h2	h3	c4	c3	f2f2	f5	f3	f3
13	f3	f3	f4	f2	12	h3	h2	h3	h3	h	h	h	c3	h	h	h 1	h3	h3	h3	c2	f2	f2	f3	f3
14	f2	f2	f3	f		h	h2	h3	h2	h2	h	h	h2	h2	h		h	h	h4	c5	f3	f2		
15		f	f	f3			h	h2	h2	h2	h2	h	h					h2	c4	c3	f3	f2	f2	
16			f2				h2	h2	h2	h2	h	h	h2	c2	c2	c3	c2	c2	h3	c5	f3	f3	f2	f2
17	f2	f	f2	f2			h	h3	h2	h	h2	h2	c2	c2	h2		h2	h2	h3					
18										h2	h3	h2	c2	c	c		12			c3	f5	f3	f2	
19		f2	f					12	h2	h2		h		h	h2	h2	h2	c2	c2	c2			f3	f5
20	f4	f3	f4	f2	f2	h31	h4	h2	h3	c3	c2	c2	c4	c2	c3	c2	c2	h	h4	c6	f5	f4	f3	f3
21	f4		f2	f2	12	h 1	h	h2	h2	h2	h2	h2	h2	h4	h	h	c2	c3	c3	c5	f5	f4	f	f
22	f	f2	f2	f2	13	h4	h5	h5	h3	h2	h2	h2	h3	c2	c4	c3	c5	c3	14	12	f4	f3	f4	f2
23	f6	f3	f3	f2	f4	13	h	h2	h2	h	c	c		c	c2	c3	c2	c	c3	c4	f5	f5	f3	f
24	f2	f2	f2	f2	1		h		c2	c2	h	h		h	c	h2	h2	h2	c4	c3	f2	f3	f2	f2
25	f2	f		f2		h 1	h2	h2	h2	h	h	h	h	c	c2	h2	c	1	h2	c5	f4	f4	f2	f2
26		f2				h	h2	h2	h3	h	h	c	h	h	c2	c2	c2	c2	h2	c3	f6	f4	f2	f2
27	f2	f2	f2			h2	h2	h	h4	h2	h2	h	h	h3	h2		h2	h4	c3	c4	f3	f3	f2	f2
28		f2		f2		h	c3	h3	h2	c2	c3	c2	c2	c2	h2	h	c2	c2	c2	c4	f4	f2	f2	f
29	f3	f2	f	f2	12	c2	h3	h	h	h2	h	c2	c2	c3	c2	c3	c4	c3	c3	14	f2	f2	f2	f2
30	f2	f2	f2	f2	12	h	h	h2	c3	h	h	h	c4	c2	12	12	c2	12h	c213	12	f3	f2	f2	f2
31	f	f	f2	f3	12		h2	12h2	h4	h4	h3	h	h	h2	h2	h2	c2	c3	c4	c4	f4	f5	f2	f3
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

May 1968 | foF2 | 0.1Mc | 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	U077S	U074S	068S	067	U063S	U078S	082	086	091	083	081H	100	107	110	114	113	104	A	102	102S	083	079S	080S	U083F
2	J088R	080	073	073Z	064	063	058	059	072	074	080	084	092	078	083	089	088	091	096	095	079	078	074	074
3	072	065	064	066	063	073	086	097	098	101	103	108	115	116	112	109	096	102	106	100	075	070	071	07Z
4	069	071	068	060	061V	071	094	103	102	092	098	113	126	127	123	115	111	111	109	100	J091R	083	080	077
5	078	075	072	070	067	071	088	090	094	098	103	111	112	119	119	111	108	104	105	103	084	074	075S	U075S
6	I079S	U076S	074	070	067	081	088	089	091	093H	097	106	112	117	119	114	107	098	099	098	091	086	084	J081R
7	080	I080S	074	071	070	083	094	094	093	096	098	105	106	110	119	123	107	105	133	115	081S	074	083S	075S
8	074	U075S	070	072	053	045	058	065	070	078	086	090	098	094	088	091	089	086	086	I085A	072	072S	073S	074
9	077	076	073	064F	065	070	089	090	080H	089	096	103	107	110	113	116	117	105	097	I092A	090	091	091	083V
10	082	092	088R	077V	065	065	078	078	081	088	103	102	096	088	087	085	094	085	078	075	071	072S	072S	071S
11	071	070	068	058	058	060	086	096	093	098	096	098	102	112	111	106	095	096	101S	096	090	087	071	068
12	068	062F	061	060	059F	060	070	064	060	055	062	U060S	065	072	074	075	065	067	069	071	058F	057F	061	060
13	060F	063	061	063	058	063	075	083	098	110	116	105	J102R	106	108	102	096	095	A	094	087	081	J078R	I078R
14	075	073	071	064	062	070	080	080V	077	087	094	098	104	104	100	102	096	090	088	086	074	070	071	073
15	J071F	067F	J068R	069	060	063	075	086	089	089	093	097	104	098	101	104	099	088	084	090	091	082	085	082
16	074	073	071	068	067	073	090	092	097	096	094	100	113	115	110	106	094	090	081	086	084	084	084	088
17	084	081	082	074	074	076	081	084	098	099	099	098	104	102	095	089	086	080	076	084	080	078	J074F	081F
18	068	067	I066A	063	060F	058	A	A	A	057	R	057	060	063	067	072	067	064	061	056	058V	060F	063	063
19	061	060F	F	F	F	057	078	089	094	090	092	098	100	095	092	094	094	087	086	089	092	088	089	087
20	081	078	072	069	066	072	080	087	090	086	102	114	109	112	121	119	113	096	092	092	091	090	083	084
21	J083R	083	078	071	070	076R	101	096	085H	095	096	112	125	115	110	109	112	114	113	097	085	083	I085R	083
22	J078R	079	081	068	065	071	079	076	078	A	073	080	082	090	101	108	105	085	078	A	A	086	084F	083
23	081V	J083F	J082R	070	067	074	093	104	093	087	087	093	102	108	118	123	112	106	095	090	090	091V	089	086F
24	F	J097S	096F	078	070	075	093	091	085	073	078	096	108	109	J106R	102	097	092	090	095	092	088	I084R	085
25	J085S	U081S	U076R	U074S	072	095	096	093	086	I090C	099	J105R	111	112	115	117	113	J106R	104	106	098	097	096	093
26	092	091S	081	078	075	094	103	084	076H	085	096	110	112	114	124	115	107	101	099	095	085	084F	093F	090F
27	088F	083	I082R	080	081	094	105	102	085Z	083	085	088	092	100	103	102	090	J087A	098	102	F	090	091	F
28	F	F	F	F	F	F	092	092	086	086	098	109	117	125	123	119	109	114	115	113	J104R	091	084F	U090F
29	F	085	084	J080R	J080R	J082R	082	087	083	088	093	098	097	104	109	115	109	108	098	093	095	095V	100	097
30	I097C	095	J086R	083	080	074	082	077	079	076	J072R	076	086	I082A	080	I076A	087	083	078	069	C	C	C	U075S
31	U077S	C	070	071	073	076	094	080	065	060H	066	J069R	074	074	074	078	074	069	067	I068A	073	A	074F	072F
Count	28	29	29	29	29	30	30	30	30	30	30	31	31	31	31	31	31	30	30	30	28	29	30	30
Median	078	076	073	070	066	072	086	088	086	088	095	098	104	108	109	106	097	094	096	094	085	083	083	081
U.Q.	082	083	082	074	071	076	093	093	093	095	098	106	112	114	118	115	109	105	102	100	091	089	085	085
L.Q.	072	070	068	065	062	063	079	080	079	083	085	090	096	094	092	091	090	086	081	086	077	074	074	074
Q.R.	010	013	014	009	009	013	014	013	014	012	013	016	016	020	026	024	019	019	021	014	014	015	011	011

The Radio Research Laboratories, Japan

foF2

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

K1

IONOSPHERIC DATA

May 1968 | foF1 | 0.01Mc | 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	L	L	L	560L	L	L	L	L	A	A						
2							L	A	L	530L	520L	550	U550L	L	L	530L	L	L						
3								L	L	U500L	L	R	U600L	550L	U570L	L	L							
4								A	A	L	L	A	L	U570L	L	L	L	L						
5							L	L		A	U590L	570L	I560A	530L	550L	L	L	A						
6								L	L	L	U500L	L	L	600L	U530L	L	L							
7								L	L	L	L	L	L	570L	530L	L	L	L	A					
8							L	L	A	L	L	A	L	A	A	A	A	A	A					
9									L	U540L	540L	L	U550L	550	550	520L	L	L						
10						A		A	A	A	A	A	L	L	L	A	L	A	A					
11							L	L	L	L	L	U500L	540L	U520L	530	A	L	L	A					
12							400L	430L	A	490	500	500	500	510	490	470L	A	A	A					
13								L	L	A	560L	L	530L	A	L	470	L	A	A					
14								L	A	A	600	530	540	560	560	A	L	L	L					
15							L	L	510L	A	530L	U550L	520	530	560L	L	L	L	A					
16								L	L	A	L	L	L	L	L	U500L	L	L						
17								L	L	570L	A	530	570	A	A	520L	L							
18						A	A	A	A	A	490	510	530	I510A	510	500	480	U460L	L					
19							L	U520L	U500L	U530L	U600L	570	550	540L	A	A	L	A						
20								L	L	A	A	A	560H	A	U570L	A	A	L	A					
21							L	L		L	L	600L	L	A	A	A	A	L	L					
22						L	A	A	A	A	570	A	A	A	A	A	A	L	A					
23							L	L	A	L	L	570	590	A	550	A	A	A	A					
24							L	L	L	U610L	590L	580L	560	570L	I560A	L	A	A	A					
25							L	L	A	C	U550L	600L	580L	L	U600L	U540L	L	L	L					
26							L			600L	L	U580L	590L	590L	550	L	L	L						
27							L	L		550L	L	L	A	A	A	L	L	A	A					
28									L	A	L	600	U600L	L	A	U550L	540L	L						
29								A	A	570L	A	R	610L	L	L	A	A	A	A					
30							L	A	520	R	A	A	A	A	A	A	A	A	A					
31						L	L	450	480		510H	U530R	520	U540R	U540R	A	490	L	A					
Count							1	3	4	10	14	17	20	15	16	9	3	1						
Median							400L	450L	500L	540L	540L	560L	560	550L	550	520L	490	U460L						
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

K2

IONOSPHERIC DATA

May 1968 | foE | 0.01Mc | 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	220	295	325	345	360	R	R	I385R	375	350	325	A	B					
2						B	235	I285A	I320A	340	340	A	A	355	355	340	320	270	A					
3						B	260	300	325	365	365	370	370	A	A	A	A	280	190					
4						B	250	A	A	A	A	A	A	365	I345R	I340R	315	270	A					
5						B	250	290	325	A	A	A	A	375	355	355	330	265	A					
6						B	250	300	330	360	360	I370R	365	360	A	330	320	265	A					
7						165	245	300	330	350	360	B	A	A	A	345	315	250	B					
8						B	R	A	A	A	A	A	A	380	360	A	305	250	A					
9						A	A	A	335	350	A	A	A	A	A	A	315	250	A					
10						U165A	250	305	330	350	375	380	I390R	I380R	365	A	A	A	215					
11						175	255	A	320	A	A	I375R	A	R	375	335	315	I265A	A					
12						175	245	280	315	335	A	A	A	R	A	A	A	A	A					
13						B	250	300	330	350	360	A	A	A	A	A	310	275	A					
14						170	260	300	335	350	365	375	375	370	360	345	320	A	A					
15						B	255	305	325	365	365	I370A	A	A	A	I340A	325	275	A					
16						170	255	305	350	355	355	370	A	355	360	340	A	A	180					
17						190	235	300	345	365	A	A	I380A	375	365	350	320	270	200					
18						A	270	320	340	375	380	380	375	370	A	340	325	275	I200A					
19						210	I260A	I315A	A	A	A	A	390	390	380	350	330	A	A					
20						190	280	310	340	360	380	385	A	A	A	A	A	280	200					
21						I205A	270	320	350	370	I390A	390	395	I385A	380	355	325	A	A					
22						A	280	310	340	370	380	395	385	A	A	A	A	A	A					
23						A	A	320	345	I370A	I390A	400	A	A	380	360	320	A	A					
24						175	270	A	A	A	A	A	A	A	A	380	340	A	A					
25						I200A	275	I330A	I360A	I370C	R	R	R	A	A	A	340	285	210					
26						210	280	325	350	I375A	I390A	I390R	395	I400A	A	A	A	A	210					
27						200	265	I310A	345	355	I360A	I370A	I380A	395	I370A	360	325	I270A	190					
28						200	I255A	300	320	340	A	A	A	A	A	360	A	280	210					
29						A	275	315	350	A	A	A	A	A	A	355	A	A	A					
30						A	270	320	I340A	A	A	A	A	A	A	A	A	A	A					
31						B	250	300	350	U375R	R	U400R	400	375	380	350	330	A	210					
Count						15	28	26	27	23	17	15	12	16	15	20	21	17	11					
Median						190	255	305	335	360	365	380	380	375	365	350	320	270	200					
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

K3

IONOSPHERIC DATA

May 1968 | **foEs** 0.1Mc | **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	E	E	019	E	020	027	036	043	J051	039	042	042	G	043	042	J072	J145	J148	J085	J029	J030	J018	J108
2	J036	023	019	J029	J018	E015B	027	J054	048M	J044	049	043	J043	047	048	038	G	021G	021	037M	J037	J066	J052	J036
3	025M	019M	020M	024M	023M	021	031	036	044	044	045	047	044	043	J054	J064	047M	032	J030	035	J053	J042	J052	044M
4	J052	032M	J023	032	J022	E016B	030	J063	J084	J087	J079	J106	J066	G	029G	033G	040	J040	043	J029	J025	J024	023	020
5	020M	023M	E012B	E	J016	018	029	036	J043	J081	049	045	J066	G	042	042	040	J075	J044	080M	035M	J046	E	E015S
6	021M	E013B	022M	E	E012B	021	030	036	039	040	043	G	043	J054	043	042	036	J043	J033	017	036M	042	035	023M
7	022	020	020M	E	E	020	028	037	J042	J042	045	043	043	046	J039	G	042	J042	J053	021	J025	E014B	J025	023
8	020	E015S	E014B	021	022	020	032	J052	J055	J053	J097	J114	J058	J070	J113	J087	J065	J084	J062	090	J108	J053	J039	J053
9	J060	J061	J042	J029	J055	J030	J041	J040	040	J043	045	J084	J054	042	045	J043	020G	032	J054	J118	J052	J062	J062	J057
10	J085	J038	J043	035	036M	J035	J042	J052	J062	J077	J057	065	057	J058	047	060	J042	J047	J054	J066	J028	J029	E014B	021
11	024	E011B	020	E	E	J030	032	037	044	J041	045	G	043	G	043	054	048	J054	J061	J041	J028	J024	J063	J024
12	J024	022	J025	E	E	G	031	037	J047	041	040	041	044M	G	044	J041	J075	J065	J043	J111	J054	J056	J047	035Y
13	031M	J043	048M	J046	J066	053	J042	J049	048	J061	J053	J056	049	J083	J052	042	034	J051	114M	073	J025	J030	J025	J029
14	J029	J063	J042	J042	J056	021	028	040	J051	J066	045	043	043	047	J058	068M	038	J037	036M	J052	J043	068	J104	035M
15	021M	022M	021M	E	022M	E015B	029	036	040	058	049	046	043	038	J040	038	034	037	J037	J042	J053	022M	018	021M
16	021M	018	021M	J015	E	022	031	037	J058	050	048M	047	047	044	044	G	J037	032	035	031	070	J050	J040	J029
17	034	032	031	021	021	020	031	035	J040	J062	068	059	043	J062	J088	G	037	035	037	J036	050M	J042	J054	J042
18	J055	J070	J086	J042	031M	049	J074	074M	J077	J054	049	048	044	J055	J053	J038	G	J029	022	J024	J025	J035	J032	031M
19	031M	030	J026	J025	J024	021G	J029	J033	039	044	047	046	043	045	J058	067	J043	J053	023	058M	019	E012B	E013B	023
20	J025	J029	J025	J025	023	024	039	J043	J058	J084	077	J112	042	J116	040	J070	077	032	J067	071M	J050	J053	J053	J054
21	J060	J043	024	021	023	J025	035	035	043	042	048	J055	J056	J062	069	068	J052	J042	034	J026	113M	060	J080	031
22	030	030	022	022	035	036	J054	J060	061	080M	J058	J071	J064	J058	J065	057	060M	051	063M	141M	J130	J043	J062	J069
23	J042	J126	J029	022M	027M	032	035	040	J053	J049	J041	045	J063	J071	045	J086	102M	J071	J110	J089	J088	J052	J052	069M
24	060M	051	032	030M	022M	023	032	J051	J042	J053	J054	J053	J060	J054	060	J053	090	J112	072Y	078M	036M	021M	047	022M
25	E015S	E011B	J029	J030	024	J028	033	J043	059	C	043	044	043	042	039	039	040	035	J030	021	024M	J121	J051	024
26	021	021M	E011B	022M	E	023	032	J049	043	043	J043	048	047	048	J054	J043	033	J034	026	J029	J031	J090	059	J026
27	J026	J025	031	032M	E	J030	J037	042	J044	J052	J052	042	J140	J081	090	044	045	090M	J061	J071	J067	047M	J072	035
28	J064	048	047	041	030M	025	057M	057	J072	080M	060	046	J060	J063	065	048	J042	J053	J036	043	J068	091Y	J053	035
29	J025	J036	J029	J026	J025	J029	030	J051	J058	058	J058	068M	055	043	J059	070	070	066	046	068	047	J051	047	031
30	C	023	031	025	035M	021	034	047	047	042	J095	049	J119	100M	059	J119	060	067	048	049	C	C	C	E016S
31	J024	C	J025	J028	J030	J027	030	J054	044	039	G	047	042	048	047	J072	037	043	J049	072M	J042	073M	J047	J042
Count	30	30	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	30	30	30	31
Median	026	027	025	025	023	023	032	042	J047	J052	049	047	047	048	048	044	042	J043	J044	052	J042	J046	J047	031
U.Q.	042	043	031	030	030	030	037	052	058	062	058	059	060	062	059	068	060	066	061	078	054	060	053	042
L.Q.	021	020	020	019	E012	020	030	036	043	043	045	043	043	042	043	039	037	035	034	031	028	030	025	023
Q.R.	021	023	011	011	D018	010	007	016	015	019	013	016	017	020	016	029	023	031	027	047	026	030	028	019

The Radio Research Laboratories, Japan

foEs

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

K4

IONOSPHERIC DATA

May 1968 | foEs | 0.1Mc | 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			E		019	025	034	042	043	039	041	042		039	037	067	A	043	079	025	025	017	040
2	035	E	E	020	013	B	026	044	044	044	042	040	043	046	042	038		017G	021	029	030	049	040	030
3	016	012	014	016	016	G	028	036	040	040	044	E047R	044	041	042	040	033	032	029	025	037	016	025	025
4	034	016	016	∪19	016	B	030	051	053	042	040	075	052		029G	030G	038	037	033	025	022	016	016	E
5	E	015	B		E	018	027	036	043	065	040	040	066		038	040	035	069	044	054	025	017		S
6	E	B	E		B	G	027	034	038	039	042		042	041	040	040	036	042	032	015	029	024	027	015
7	015	E	E			G	027	035	038	040	041	041	043	040	039		040	036	051	018	018	B	018	E
8	E	S	B	012	013	018	026	040	045	038	040	058	047	068	081	085	053	080	052	A	040	025	028	036
9	015	034	025	013	025	019	037	040	038	040	044	045	046	040	038	040	019G	032	047	A	040	054	052	029
10	042	025	025	020	025	033	040	051	059	070	056	055	053	050	046	057	041	045	053	040	017	025	B	E
11	015	B	E			020	026	032	042	039	040		041		043	054	046	041	040	037	019	018	033	016
12	015	E	015				026	031	045	040	040	041	039		040	038	053	052	041	023	025	036	025	022
13	016	025	028	045	048	025	040	045	046	058	045	048	044	055	051	040	033	049	A	073	021	027	018	025
14	E	040	025	030	042	G	027	040	051	062	045	042	043	046	046	061	038	033	029	038	042	040	015	016
15	E	E	E		015	B	028	034	039	053	045	043	040	038	040	035	G	036	035	029	045	015	E	016
16	E	E	E	E		021	029	037	045	050	047	040	041	040	038		033	027	025	025	E	029	E	016
17	016	021	017	017	014	G	027	031	040	047	057	048	042	052	064		037	033	033	027	044	041	033	029
18	040	050	A	016	018	035	A	A	A	051	044	045	041	052	045	029		026	020	015	017	027	022	020
19	020	016	015	016	015	016G	027	032	039	040	041	040	041	043	056	061	041	041	022	044	016			E
20	019	020	016	014	014	022	033	041	047	055	075	079	041	065	040	070	075	032	067	064	025	032	020	029
21	025	025	014	011	014	023	029	033	042	041	045	053	056	062	062	062	050	030	026	022	079	042	E080R	016
22	020	017	E	E	016	025	048	054	055	A	055	061	060	055	060	050	050	040	052	A	A	035	026	026
23	016	038	016	E	018	027	029	040	052	046	040	045	053	064	045	074	096	070	064	075	085	026	040	050
24	046	040	018	015	016	021	029	041	040	053	045	047	039	047	055	053	090	053	029	075	019	016	046	E
25	S	B	016	025	013	022	032	040	054	C	041	043	043	041	E039R	039	040	034	030	019	016	028	025	015
26	E	E	B	E		016	032	040	043	042	042	045	046	046	053	042	033	032	025	025	024	054	050	015
27	016	016	018	025		028	034	040	044	045	046	E042R	062	080	084	043	043	A	058	055	055	026	025	E
28	016	017	020	026	016	024	052	041	053	063	054	045	054	053	062	045	038	026	019	040	029	067	025	019
29	017	026	025	019	015	025	030	051	058	053	055	E068R	053	E043R	055	062	068	058	045	E068R	027	031	025	016
30	C	E	017	017	027	019	029	045	038	E042R	061	E049R	053	A	054	A	061	064	041	043	C	C	C	S
31	020	C	019	024	026	025	029	041	041	039		E047R	E042R	046	E047R	066	036	039	040	A	029	A	018	034
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

foEs

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

The Radio Research Laboratories, Japan

K5

IONOSPHERIC DATA

May 1968 | f-min | 0.1Mc | 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	E	E	011	010	013	011	014	015	017	019	028	019	026	025	017	014	013	013	014	013	012	013	014
2	014	013	012	E	010	015	013	016	015	015	023	025	026	025	025	016	015	010	010	E015S	E015S	E015S	012	E015S
3	012	010	E	E	E	014	016	015	015	018	018	025	025	024	018	026	017	014	014	012	011	012	012	014
4	014	E	010	E	010	016	015	015	015	015	019	024	019	025	014	016	014	014	012	010	012	013	E015S	012
5	012	010	012	010	010	016	015	015	014	016	025	025	019	025	019	019	015	012	013	010	013	E015S	010	E015S
6	014	013	012	010	012	015	014	014	015	016	017	026	020	024	025	019	015	014	013	012	010	012	E015S	013
7	010	014	014	010	010	013	014	016	016	015	025	038	026	026	025	015	015	012	015	010	011	014	012	013
8	012	E015S	014	E	010	015	014	016	017	016	025	026	025	019	020	019	014	014	012	013	013	012	E	012
9	013	013	014	011	E	012	014	015	015	025	019	025	025	020	025	015	014	012	010	012	010	E016S	E015S	E015S
10	012	012	011	010	E	013	016	016	018	017	021	027	027	025	025	019	015	013	012	010	012	014	014	012
11	010	011	011	E	010	011	013	012	013	025	017	025	017	019	018	017	016	014	013	010	012	011	011	012
12	012	014	010	010	E	014	015	014	015	025	025	025	027	025	025	017	012	013	012	011	012	013	012	012
13	013	012	012	012	010	014	013	012	012	016	017	026	019	019	025	025	015	016	012	E015S	010	012	011	E015S
14	014	010	E	010	E	014	015	015	016	020	026	024	016	026	019	020	014	014	012	010	E015S	012	010	012
15	013	012	010	E	010	015	010	014	017	016	016	016	017	020	018	016	015	015	013	013	E016S	010	012	014
16	012	014	012	E	010	014	011	014	015	016	013	019	020	015	026	017	016	012	014	011	012	013	E015S	014
17	012	011	014	011	011	015	014	014	016	017	018	019	025	025	025	016	013	015	014	010	010	E015S	012	012
18	010	012	010	010	E	015	015	016	016	017	025	025	019	025	020	015	015	015	014	012	E015S	010	010	013
19	014	014	010	011	010	014	014	015	017	019	019	026	022	020	019	016	014	014	013	E015S	E015S	012	013	013
20	012	012	010	E	E	014	014	014	016	016	025	018	025	025	018	016	014	014	014	014	010	E015S	E015S	E015S
21	E015S	010	E	E	010	013	014	015	015	E024C	025	026	025	025	026	016	014	016	013	011	E015S	012	E016S	012
22	013	012	011	011	011	012	015	014	014	016	018	019	017	018	018	018	015	014	011	010	011	013	013	013
23	013	010	014	012	010	015	014	014	016	016	026	025	025	017	019	015	014	015	014	E015S	E015S	E015S	012	014
24	011	012	010	E	011	014	015	015	015	025	025	022	024	026	025	017	016	014	011	011	012	011	E015S	E015S
25	E015S	011	012	014	010	013	014	015	025	C	025	022	029	026	025	025	018	014	015	012	010	012	E015S	014
26	E015S	012	011	E	010	014	014	012	014	016	025	019	025	016	019	019	014	014	012	010	012	014	E015S	012
27	012	011	010	E	010	014	015	014	019	026	026	026	026	026	026	020	015	016	014	E015S	E015S	E015S	011	E016S
28	014	012	013	016	011	012	013	013	015	018	026	025	030	031	020	026	025	015	014	010	012	013	012	012
29	E015S	011	013	014	010	014	015	016	020	026	027	025	028	027	029	025	019	016	013	011	E015S	013	E015S	014
30	C	016	013	016	016	014	012	015	016	025	026	027	026	025	026	025	016	016	014	E016S	C	C	C	E016S
31	013	C	013	E016S	010	016	016	020	019	020	027	027	026	026	026	017	018	015	015	010	E015S	E015S	014	E015S
Count	30	30	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	30	30	30	31
Median	012	012	011	010	010	014	014	015	015	017	025	025	025	025	025	017	015	014	013	010	011	012	012	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

K6

IONOSPHERIC DATA

May 1968 | 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	U290S	U285S	280S	280	U280S	U320S	310	315	320	315	265H	270	285	285	295	295	300	A	305	310S	290	275S	275S	U265F
2	J275R	265	280	275Z	265	295	315	275	295	285	300	285	305	290	290	300	295	295	300	305	290	280	270	270
3	280	270	265	285	275	280	310	300	295	295	285	285	290	300	295	295	280	295	300	310	300	270	280	280
4	275	280	295	275	270V	285	310	310	305	290	265	280	285	300	285	295	290	305	300	310	J300R	280	275	280
5	280	285	295	300	300	310	305	310	285	295	290	290	285	285	295	295	295	305	305	300	305	270	280S	U280S
6	I285S	U290S	285	300	275	310	310	315	295	290H	290	280	285	285	295	300	300	295	290	295	295	275	280	J275R
7	275	I280S	310	280	285	320	320	330	290	275	275	285	270	265	275	270	260	240	290	300	260S	250	255S	245S
8	245	U270S	255	290	290	290	290	290	305	285	285	290	295	310	295	300	305	I305A	300	I295A	285	265S	265S	270
9	265	285	280	275F	285	295	300	310	310H	290	280	270	275	280	275	285	300	295	290	I285A	275	275	285	275V
10	250	285	275R	275V	260	275	295	290	295	275	285	295	295	290	295	305	310	310	305	285	280	265S	265S	265S
11	270	280	295	260	265	275	285	300	285	265	265	260	260	280	285	285	290	280	295S	285	275	285	275	265
12	270	260F	270	275	280F	310	310	275	255	235	250	U235S	250	265	275	285	275	290	305	295	290F	255F	260	270
13	265F	275	280	285	270	300	310	265	275	280	295	285	J285R	275	290	285	300	295	A	290	285	275	J275R	I270R
14	290	275	285	290	275	315	315	285V	280	270	265	265	280	285	280	290	300	300	300	300	290	270	275	270
15	J270F	280F	J290R	305	300	285	305	300	280	285	290	275	300	285	285	290	295	295	280	280	285	280	285	280
16	285	280	285	290	270	305	300	295	300	290	270	260	275	295	290	290	285	300	285	280	280	260	265	265
17	260	255	260	255	275	275	280	280	295	280	280	285	280	275	295	290	290	290	295	285	300	280	J260F	260F
18	270	280	I280A	285	275F	280	A	A	A	255	R	260	250	255	280	295	295	295	295	280	260V	255F	255	270
19	285	300F	F	F	F	275	280	295	280	270	260	275	290	295	285	285	300	290	280	275	280	275	270	270
20	280	280	290	275	275	290	320	285	270	280	260	285	270	270	280	285	300	295	275	270	275	265	265	275
21	J265R	280	280	265	255	285R	305	300	270H	275	250	265	285	285	280	280	280	295	300	310	A	260	I270A	265
22	J250R	260	260	245	245	260	280	280	265	A	255	275	265	265	265	285	285	290	275	A	A	265	255F	260
23	265V	J265F	J285R	285	265	285	290	310	300	280	265	270	265	270	270	285	285	290	285	270	I260A	260V	280	265F
24	F	J270S	305F	285	285	280	300	310	310	255	260	260	275	285	J280R	285	I280A	280	265	275	275	275	I265R	260
25	J270S	U270S	U275R	U280S	265	305	315	290	275	I265C	260	J260R	275	275	275	280	285	J275R	290	285	275	270	270	270
26	280	285S	270	270	270	290	310	310	290H	270	260	275	275	275	285	295	290	290	280	285	270	250F	275F	275F
27	270F	265	I275R	265	275	290	295	295	290Z	285	275	260	270	270	280	295	280	I270A	275	305	F	260	255	F
28	F	F	F	F	F	F	305	315	265	255	245	265	265	275	275	280	275	270	280	290	J295R	285	265F	U255F
29	F	275	270	J285R	J295R	J315R	285	300	290	265	260	260	260	260	260	275	285	285	265	275	265	260V	255	260
30	I260C	265	J260R	260	255	245	260	255	270	280	J280R	265	295	I285A	275	I275A	300	280	295	270	C	C	C	U275S
31	U270S	C	265	265	275	300	300	290	255	290H	235	J230R	260	255	265	275	285	295	285	I275A	250	A	265F	255F
Count	28	29	29	29	29	30	30	30	30	30	30	31	31	31	31	31	31	30	30	30	27	29	30	30
Median	270	280	280	280	275	290	305	300	290	280	265	270	275	280	280	285	290	295	290	285	280	270	270	270
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

K7

IONOSPHERIC DATA

May 1968 | 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	L	L	L	350L	L	L	L	L	A	A						
2							L	A	L	320L	345L	345	U345L	L	L	330L	L	L						
3								L	L	U380L	L	R	U335L	355L	U350L	L	L							
4								A	A	L	L	A	L	U320L	L	L	L	L						
5							L	L		A	U340L	355L	I345A	330L	330L	L	L	A						
6								L	L	L	U340L	L	L	350L	U345L	L	L							
7								L	L	L	L	L	L	325L	340L	L	L	L	A					
8							L	L	A	L	L	A	L	A	A	A	A	A	A					
9									L	U350L	355L	L	U345L	345	335	330L	L	L						
10						A		A	A	A	A	A	L	L	L	A	L	A	A					
11							L	L	L	L	L	U380L	365L	U380L	345	A	L	L	A					
12							350L	325L	A	385	340	355	360	335	320	330L	A	A	A					
13								L	L	A	330L	L	360L	A	L	365	L	A	A					
14								L	A	A	335	380	350	320	340	A	L	L	L					
15							L	L	335L	A	355L	U355L	365	375	320L	L	L	L	A					
16								L	L	A	L	L	L	L	L	U360L	L	L						
17								L	L	345L	A	A	335	A	A	345L	L							
18						A	A	A	A	A	360	350	350	I350A	330	335	335	U335L	L					
19							L	U335L	U355L	U360L	U330L	330	345	350L	A	A	L	A						
20								L	L	A	A	A	340H	A	U320L	A	A	L	A					
21							L	L		L	L	330L	L	A	A	A	A	L	L					
22						L	A	A	A	A	A	A	A	A	A	A	A	L	A					
23							L	L	A	L	L	340	A	A	335	A	A	A	A					
24							L	L	L	U345L	355L	345L	340	320L	A	L	A	A	A					
25							L	L	A	C	U350L	335L	335L	L	U315L	U330L	L	L	L					
26							L			335L	L	U350L	335L	335L	A	L	L	L						
27							L	L		355L	L	L	A	A	A	L	L	A	A					
28									L	A	L	320	U315L	L	A	U345L	340L	L						
29								A	A	370L	A	R	320L	L	L	A	A	A	A					
30							L	A	350	R	A	A	A	A	A	A	A	A	A					
31						L	L	345	365		R	I350R	345	U330R	R	A	345	L	A					
Count							1	3	4	10	12	16	19	15	13	9	3	1						
Median							350L	335L	350L	350L	340L	350L	345	335L	335L	335L	340	U335L						
U.Q.																								
L.Q.																								
Q.R.																								

M(3000) F1 Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

May 1968 | 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								245	260	260	255H	340	310	315	305	300	295	A						
2							280	330	330	380	310	340	305	320	340	315	300	285						
3								255	270	270	270	300	320	300	310	290	290							
4								255	255	270	340	340	310	305	290	275	280	270						
5							240	240		300	305	310	320	310	290	270	275	300A						
6								250	250	255H	295	320	310	310	300	280	280							
7								255	270	280	315	320	345	365	330	315	310	355	285					
8							320	330	275	295	285	325	315	290	A	A	280	A	280					
9									295H	305	310	330	325	325	340	305	280	260						
10						300		270	305	E365A	325	310	300	310	300	310	280	270	275					
11							280	260	265	260	300	310	350	330	325	310	280	310	275					
12							300	385	410	610	480	550	475	410	390	355	395	355	290					
13								305	305	300	300	315	320	345	305	300	285	270	A					
14								270	275	360	325	345	340	335	320	305	290	290	270					
15							270	275	280	300	310	320	300	305	345	305	285	260	260					
16								255	285	290	300	340	340	300	300	300	290	265						
17								275	300	330	325	325	330	320	320	325	300							
18						300A	A	A	A	480	R	505	520	455	405	350	350	330	290					
19							310	305	295	305	355	355	325	325	325	340	295	270						
20								300	300	290	380	340	340	350	315	300	300	275	A					
21							255	250		320	360	380	320	320	320	310	320	290	270					
22						355	310	340	380	A	455	360	395	375	350	325	295	270	A					
23							275	270	270	260	360	340	360	360	340	310	E340A	300A	A					
24							270	270	270	440	415	370	350	330	340	325	A	300	270					
25							250	255	250A	I340C	305	370	340	340	340	310	295	290	275					
26							255			375	350	345	345	340	320	295	295	280						
27							255	250		325	340	355	360	E375A	360	315	300	I305A	320					
28									320	E370A	370	380	360	340	330	305	330	320						
29								250	300	375	320	E390R	400	375	360	340	320	300	290					
30							340	330	380	350	380	420	350	A	370	I360A	310	315	290					
31						280	290	320	440		500	490	425	445	420	380	355	300	310					
Count						4	16	27	26	29	30	31	31	30	30	30	30	26	15					
Median						300	280	270	290	300	325	340	340	330	330	310	295	290	280					
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

K9

IONOSPHERIC DATA

May 1968 | 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	270	E280E	280	255	280	245	230	230	255	255	220	200	I220S	225	230	230	A	A	E275A	A	240	275	280	A
2	315	290	285	295	250	250	225	A	A	E250A	220	220	230	240	240	245	240	245	260	250	270	E280A	340	310
3	270	295	295	290	290	255	240	240	240	240	240	I220R	240	220	230	240	240	245	250	240	250A	270	310	310
4	340	280	260	290	300	260	245	I250A	I235A	240	220	I240A	I210A	210	210	240	240	I255A	250A	240	245	250	260	285
5	290	280	255	255	255	240	220	220	240	A	220	200	I200A	210	220	230	240	I255A	260A	260	240	260	295	295
6	280	270	270	255	270	255	230	225	225	205	200	200	225	230	220	230	250	260A	250A	250	250	270	295	280
7	280	275	255	260	280	250	240	240	240	210	225	220	225	215	225	230	E255A	A	A	235	205	330	330	335
8	355	300	315	260	260	255	240	260	A	230	230	I230A	210	A	A	A	A	A	A	I265A	285	295	330	355
9	315	300	265	275	295	255	250	245	215	220	230	E250A	245	205	220	245	230	E250A	A	A	E300A	I300A	310A	300A
10	I325A	280	300	255	275	I270A	250A	A	A	A	A	A	A	A	250	A	260	I255A	I230A	285	280	310	300	310
11	310	265	250	240	310	265	235	230	240	210H	200	200	210	215	245	A	E275A	I275A	I270A	230	280	255	270A	275
12	305	315	300	280	300	250	260	250	A	230	235	215	220	220	225H	235H	A	A	A	260	260	I320A	345	320
13	340	300	305	E340A	A	270	250	I240A	A	A	245	250A	220	I220A	I220A	220	240	A	A	A	250	290	285	310
14	260	320A	290	290	320A	250	240	I240A	I250A	A	225	205	220	250	245	A	E250A	250A	A	260A	E290A	I300A	290	300
15	295	300	260	245	245	255	240	225	225	I250A	250A	225	200	220	210	210	230	E250A	A	275	E300A	255	275	260
16	255	275	260	260	295	255	240	240	I245A	I230A	220	220	230	220	225	220	240	240	250	280	E350S	320	340	325
17	300	E315A	275	260	290	250	250	250	230	260A	A	I235A	210	I225A	I220A	200H	255	250	260A	270	280A	E310A	360	340
18	350A	360A	I310A	280	290	A	A	A	A	A	250	255	230	I220A	I230A	240	240	240	255	270	300	355A	340	300
19	300	280	280	340	310	275	250	240	240	225	210	225	210	230	A	A	E250A	A	250	I285A	270	255	280	280
20	300	275	260	280	305	250	250	250	A	A	I240A	I205A	195H	I230A	210	A	A	245	A	A	295	295	290	300
21	300	290	255	290	325H	250	245	240	245H	225	230	I250A	I250A	I250A	A	A	A	250	260	245	A	310A	I315A	305
22	330	325	290	340	350	290	A	A	A	A	A	A	A	A	A	A	A	245A	A	A	A	310A	325	315
23	300	E350A	260	250	280	260	245	250A	I250A	245A	220	250	I245A	I250A	260A	A	A	A	A	A	A	310	300A	380
24	310	310	250	245	270	255	245	250	220	270A	250	245	200	E260A	A	A	A	A	A	A	270	250	I295A	305
25	295	275	295	300	275	260	245	240A	A	I250A	205	210	220	210	245	225	250	245	250	260	250	295	290	295
26	275	260	280	280	300	250	250	250	250H	200	210	220	22C	220	I240A	240	220	245	255	255	270	A	A	255
27	295	285	280	310	295	255	E250A	245	250	220	245	R	A	A	A	250	260	A	I260A	290	300	270	300	300
28	310	335	290	250	250	240	E265A	250	E270A	A	A	220	A	A	A	220	245	245	260	255A	255	A	295	345
29	290	295	305	270	250	240	240	A	A	215	A	R	A	R	A	A	A	A	A	R	300	330	300	300
30	I300C	295	300	300	305	280	250	A	220	I240R	A	A	A	A	A	A	A	A	A	300A	C	C	C	285
31	285	C	300	315	275	250	240	A	230	200H	200H	R	245	E260A	A	A	240	E260A	I240A	I300A	340	A	290	E360A
Count	31	30	31	31	30	30	29	24	21	23	25	25	25	24	21	18	21	20	18	23	27	27	29	30
Median	300	290	280	280	290	255	240	240	240	230	225	220	220	220	225	230	240	250	250	260	265	295	300	300
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

May 1968 | 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	E	E	105	E	150	150	130	125	120	125	125	130	G	150	150	120	115	115	115	110	110	110	115
2	110	110	140	110	110	B	155	115	120	110	115	115	115	125	125	130	G	100	125	115	110	110	105	105
3	105	105	105	100	100	100	140	130	125	115	110	110	110	110	110	105	110	140	120	110	110	110	110	105
4	105	105	100	100	100	B	115	115	110	110	105	105	105	G	105	100	140	125	120	115	110	110	105	105
5	100	100	B	E	110	170	150	125	115	110	110	110	110	G	130	145	140	115	110	110	110	110	E	S
6	105	B	100	E	B	105	140	130	130	130	125	G	120	115	110	115	145	125	115	115	100	110	100	100
7	100	100	100	E	E	100	155	130	120	120	110	115	110	110	115	G	130	120	115	110	110	B	115	115
8	110	S	B	110	110	130	125	115	110	110	115	110	115	130	120	120	120	115	115	115	115	110	110	110
9	110	110	110	115	110	110	110	115	120	110	110	110	105	110	110	105	100	130	110	110	110	110	105	105
10	105	105	100	100	105	130	125	120	120	120	115	115	115	115	110	110	110	110	115	115	115	110	B	110
11	105	B	105	E	E	110	140	110	115	115	110	G	110	G	145	125	120	115	115	110	110	110	110	110
12	110	110	105	E	E	G	130	125	115	120	115	115	115	G	115	115	110	115	115	115	110	110	105	105
13	105	105	105	105	105	110	125	125	115	115	115	110	110	105	110	115	155	120	115	110	110	105	105	105
14	115	105	105	105	105	100	150	125	115	115	120	115	115	120	115	115	115	115	110	120	110	110	115	110
15	100	105	100	E	105	B	145	130	125	115	115	115	110	115	110	115	155	130	115	115	110	110	110	100
16	100	100	100	100	E	150	145	130	115	120	120	120	120	115	120	G	120	125	140	120	120	120	120	110
17	105	100	100	110	100	100	150	120	140	125	110	110	115	115	115	G	195	145	120	115	110	105	110	110
18	105	105	100	100	100	140	130	125	125	125	120	120	115	115	110	105	G	105	105	105	105	105	110	100
19	105	100	100	100	100	105	110	110	110	110	110	110	120	130	125	115	120	115	110	110	100	B	B	105
20	105	100	100	100	100	150	130	125	120	120	115	110	110	105	105	105	105	140	115	110	110	115	110	110
21	105	105	105	105	105	105	155	150	130	125	125	120	120	115	120	115	115	110	110	105	105	100	105	105
22	105	105	110	110	105	105	120	115	115	110	115	110	110	105	105	105	105	105	105	120	120	100	110	110
23	110	105	105	105	105	105	110	130	115	115	110	115	110	110	125	140	130	120	110	130	110	110	105	105
24	100	100	100	100	100	150	140	115	110	110	105	105	105	105	110	135	125	115	110	110	110	110	105	105
25	S	B	105	100	100	140	130	115	115	C	110	130	115	115	115	155	130	130	120	115	110	110	110	105
26	105	105	B	100	E	100	135	130	115	115	115	115	115	115	110	105	105	105	140	105	105	105	105	110
27	105	110	105	105	E	130	120	115	115	115	115	130	120	130	120	130	120	110	120	115	110	110	110	110
28	110	110	110	100	100	140	120	115	110	110	110	110	110	110	115	115	110	110	105	110	105	105	105	105
29	105	100	100	100	105	110	155	120	115	110	110	110	115	110	110	110	110	110	105	115	100	100	100	105
30	C	100	105	105	105	130	140	130	125	120	120	120	130	115	110	105	140	125	115	110	C	C	C	S
31	100	C	095	110	105	100	150	125	130	135	G	145	155	130	130	115	130	115	115	115	110	110	105	105
Count	28	25	27	25	23	27	31	31	31	30	30	29	31	26	31	28	29	31	31	31	30	28	27	29
Median	105	105	105	105	105	110	140	125	115	115	115	115	115	115	115	115	120	115	115	115	110	110	110	105
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

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

The Radio Research Laboratories, Japan

Ku

IONOSPHERIC DATA

May 1968 | 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	h2	h21	h2	c	c	h	h		h	h	c2	c3	16	f7	f4	f7	f3	f5
2	f7	f2	f	f4	f2		h	c3	c2	c21	c	c2	c	h	h	h		1	h1	f4	f5	f4	f4	f3
3	f2	f2	f2	f2	f2	1	h	h	h	c	c2	c	c	c	c2	12	12	h2	c2	f4	f3	f3	f3	f3
4	f4	f4	f3	f3	f3		c2	c3	12	12	12	12	12		1	12	h1	h21	c3	f3f2	f3	f2	f2	f2
5	f2	f2			f	h	h	h2	c2	12	c	c	c2		h	h	h2	c3	c4	f5	f4	f3		
6	f		f			1	h1	h2	h	h	h		h	c	c	c	h	h2	c4	f2	f4	f2f4	f3	f2
7	f	f	f			1	h	h2	h	c	c	c	c	c	c		h	c3	c3	f	f6		f3	f
8	f			f2	f2	h2	h	c3	c2	c	1	12	1	h	c4	c1	c4	c3	c3	f5	f3	f4	f4	f3
9	f2	f4	f3	f2	f4	12	14	1	c	c	c	c2	1	c	1	12	1	h21	c31	f4f4	f4f	f4	f3	f3
10	f4	f3	f3	f3	f4	h41	h3	h3	c2	c2	c	c	c	c2	c2	c2	12	12	c2	f6f	f3	f4		f
11	f2		f			1	h2	c	c2	c	1		1		h	h	c2	c2	c4	f7	f4	f4	f3	f2
12	f2	f2	f				h	h	c2	c	c	c	c		1	c	c2	c3	c4	f3	f3	f4	f4	f4
13	f3	f4	f4	f4	f6	13	h3	h3	c2	c2	c2	c2	c	12	12	c	h	c4	c4	f6	f4	f4	f3	f6
14	f2	f4	f4	f4	f3	1	h	h2	c2	c2	c	c	c	c	c2	c2	c	c3	c3	f5f5	f4	f3	f4	f4
15	f2	f2	f2		f2		h	h	h2	c2	c2	c	c1	c	c	c1	h	h3	c5	f6	f5	f2	f	f2
16	f	f	f	f		h21	h2	h3	c2	c2	c	c	c	c	c		c	1	h	f3	f4	f3	f6	f6
17	f7	f6	f7	f4	f	1	h	h	h	h2	c2	c2	c	c2	c2		h	h2	c3	f4	f6	f6	f6	f5
18	f4	f6	f4	f2	f2	h3	h4	h3	h3	h2	h	h	c2	c2	12	12		12	12	f2	f2	f4	f4f5	f4
19	f4	f2	f2	f2	f2	1	12	12	12	1	12	1	c	h	h2	c2	c2	c3	13	f4	f2			f2
20	f4	f3	f2	f2	f	h2	h2	h2	c2	c2	c2	c2	c	12	1	12	13	h212	c4	f5	f6	f5	f3	f3
21	f3	f3	f2	f2	f2	13	h12	h1	h2	h	h	c	c	c2	h2	c3	c2	c2	c2	f3	f2	f4	f3f4	f6
22	f6	f5	f	f2	f2	12	c3	c4	c3	c2	c	c2	c2	c2	13	12	14	14	14	f3f4	f4f5	f4	f2f4	f2f3
23	f2f2	f4f2	f3	f2	f5	13	12h	h2	c3	c2	c	c	c2	c2	h	h2h2	h3c3	h2c2	13	f2f3	f3	f4	f4	f5
24	f4	f5	f2	f2	f	h2	h212	c2	c	c2	12	12	1	12	12	h2	h3	c3	13	f6	f5	f2	f5	f2
25			f2	f4	f2	h1	h2	c2	c2		c	h	c	c	c	hc	h	h2	h3	f3	f3	f4	f4	f2
26	f	f		f		1	h2	h2	c2	c	c	c	c	c	c2	12	12	13	h13	f4	f5	f3	f3	f2
27	f3	f2	f4	f6		h2	c3	c2	c2	c	c	h	h	hh	c2	h	c	c2	c6	f5	f3	f3	f3	f5
28	f5	f4	f6	f4	f4	h1	c	c	12	c2	c2	c	12	12	c2	c	c	1	12	f5	f3	f3	f4	f4
29	f2	f2	f2	f2	f2	13	h	c2	c2	c	c	c	c	1	c2	c	c3	1	12	f3f4	f4	f4	f3	f5
30		f3	f3f4	f3	f3	h2	h	h2	h	c	c	c	h	c2	12	13	h212	h312	c2	f4				
31	f2		f	f	f5	13	h2	h2	h	h		h	h	h	h	c2	h	c2	c4	f4	f3	f6	f3	f4
Count																								
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

K12

IONOSPHERIC DATA

May 1968 | 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	U340S	U360S	370S	375	U375S	U300S	300	295	295	300	405H	380	365	370	345	325	325	A	325	315S	340	375S	375S	U400F
2	J380R	385	385	400Z	390	330	300	370	360	380	340	355	340	345	350	340	345	320	315	315	340	360	360	390
3	360	400	395	360	380	350	300	315	315	320	350	360	350	320	350	340	350	335	315	300	305	395	380	390
4	400	365	345	380	400V	355	300	310	300	330	390	365	350	345	350	340	350	310	320	305	J325R	350	390	365
5	370	355	340	330	340	310	300	305	335	350	345	350	350	350	330	340	330	310	310	310	300	390	380S	U380S
6	I360S	U350S	355	340	380	300	295	295	320	345H	345	365	360	355	345	320	325	325	345	335	335	360	360	J380R
7	360	I360S	320	360	360	300	290	280	340	365	370	385	400	415	385	385	400	475	345	325	400S	450	440S	465S
8	465	U395S	445	345	350	350	350	350	330	350	350	345	335	310	A	A	320	I320A	330	I335A	360	400S	410S	405
9	405	365	345	380F	365	335	325	300	305H	345	350	385	375	360	385	355	320	320	340	I345A	365	360	355	370V
10	440	355	360R	380V	405	360	305	340	330	380	360	345	335	330	330	325	310	305	315	350	370	400S	400S	420S
11	395	360	345	410	405	380	340	320	335	415	395	400	400	370	360	370	340	355	330S	350	370	340	385	410
12	400	410F	395	365	390F	300	330	395	410	G	495	G	475	410	395	365	400	360	340	325	350F	410F	405	395
13	410F	380	370	375	A	320	300	390	375	355	340	350	J355R	390	350	350	310	320	A	340	345	380	J390R	I390R
14	355	390	355	350	360	305	300	355V	360	395	380	400	365	355	360	345	330	310	310	310	345	355	380	390
15	J395F	390F	J355R	320	335	355	315	310	345	340	340	360	330	350	355	350	320	325	350	350	355	355	355	365
16	350	365	355	360	380	305	315	325	310	345	370	430	390	355	355	350	335	325	350	360	370	410	415	395
17	395	435	400	430	400	365	365	355	350	355	355	355	360	360	345	350	340	340	330	340	325	365	J385F	405F
18	380	385	I355A	355	390F	355	A	A	A	A	R	G	G	A	G	350	355	345	330	350	410V	410F	415	395
19	365	335F	F	F	F	370	355	340	360	380	390	385	355	350	355	355	325	325	350	355	350	355	390	360
20	380	355	350	390	390	345	295	350	365	350	405	360	370	395	355	345	310	320	360	360	365	380	390	360
21	J390R	350	350	395	420	350R	300	300	350H	390	400	410	355	350	355	350	360	305	310	300	A	395	I390R	400
22	J410R	405	415	465	465	400	350	355	400	A	455	365	400	400	395	350	340	310	360	A	A	375	405F	400
23	390V	J410F	J340R	340	390	350	345	300	305	350	395	360	400	400	370	345	350	330	340	380	I395A	405V	360	405F
24	F	J370S	310F	340	345	350	310	300	295	450	415	400	375	355	J360R	350	I350A	350	370	360	360	350	I385R	400
25	J370S	U360S	U365R	U350S	390	310	295	320	355	I370C	385	J405R	355	360	365	350	345	J360R	345	350	360	350	365	390
26	370	355S	365	375	385	340	300	290	350H	400	400	375	375	365	355	330	350	340	350	340	350	430F	385F	355F
27	385F	385	I375R	395	370	330	310	310	345Z	355	365	400	390	410	360	340	375	I380A	365	335	F	395	440	F
28	F	F	F	F	F	F	305	300	395	405	430	420	405	385	360	350	370	380	350	320	J320R	350	370F	U420F
29	F	360	375	J350R	J330R	J280R	320	295	340	390	405	405	425	405	415	360	380	345	375	390	405	405V	415	400
30	I410C	395	J400R	405	410	430	400	420	390	375	J390R	420	355	A	385	I375A	330	345	330	375	C	C	C	U375S
31	U380S	C	395	395	375	320	315	340	G	340H	G	R	425	445	420	I380A	365	320	350	I365A	420	A	385F	420F
Count	28	29	29	29	28	30	30	30	29	28	29	28	30	29	29	30	31	30	30	30	27	29	30	30
Median	380	365	360	375	380	340	310	320	345	355	385	380	365	360	355	350	340	325	340	340	355	380	385	395
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

K13

IONOSPHERIC DATA

May 1968 | 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	U085S	U085S	085S	075	U070S	U080S	060	075	065	080	105H	095	080	080	090	100	075	A	070	080S	090	090S	075S	U085F
2	J080R	075	065	070Z	085	085	075	090	085	070	105	090	105	075	095	075	110	090	100	085	070	095	110	100
3	085	095	100	090	090	105	100	095	090	100	120	100	105	125	095	105	100	080	100	095	095	100	065	065
4	095	090	060	080	095V	090	095	090	100	115	110	120	095	105	095	105	105	095	085	090	J075R	100	095	085
5	085	090	070	070	065	090	095	110	120	095	100	100	105	095	100	105	115	090	090	100	100	065	075S	U075S
6	I060S	U075S	090	060	070	075	100	100	125	110H	110	090	110	110	095	125	100	090	100	080	080	090	085	J075R
7	085	I085S	075	085	085	095	075	075	110	085	080	070	085	085	110	100	100	090	080	095	100S	085	075S	075S
8	080	U080S	070	090	095	085	075	085	070	095	090	095	075	075	A	A	075	I085A	075	I080A	070	100S	085S	055
9	090	065	105	080F	080	065	075	095	090H	110	115	115	120	095	085	115	125	125	115	I100A	130	100	100	100V
10	110	100	095R	115V	095	095	095	105	115	085	090	085	090	085	090	070	075	085	080	090	075	085S	075S	075S
11	065	090	060	100	075	095	095	090	095	065	100	100	095	080	085	070	100	090	095S	095	085	100	075	085
12	075	095F	085	100	070F	095	075	080	090	G	060	G	075	075	070	080	075	080	105	085	095F	090F	090	100
13	095F	070	085	115	A	080	095	115	085	100	120	105	J095R	105	100	100	100	100	A	105	100	075	J065R	I070R
14	090	100	090	095	095	090	060	090V	140	100	120	110	100	100	100	100	085	085	095	095	100	140	080	065
15	J100F	065F	J090R	075	105	100	080	135	100	120	105	135	075	100	100	095	085	120	110	105	100	100	090	090
16	065	080	090	085	090	080	085	120	095	105	130	075	070	095	100	105	135	125	105	105	105	095	085	105
17	100	155	150	100	115	130	125	145	095	100	100	090	115	110	100	105	110	105	115	105	075	090	J120F	095F
18	075	070	I095A	085	105F	100	A	A	A	A	R	G	G	A	G	095	060	080	075	100	090V	095F	090	100
19	090	065F	F	F	F	125	090	105	110	120	115	070	100	095	100	100	080	120	105	100	105	100	105	135
20	070	100	095	075	070	100	105	100	130	160	095	115	125	090	095	100	095	115	105	110	085	075	105	095
21	J105R	100	100	095	075	090R	095	100	150H	135	140	090	090	095	090	095	105	115	095	090	A	100	I105R	095
22	J140R	105	125	125	110	095	100	100	095	A	055	090	095	110	105	105	110	100	090	A	A	100	090F	100
23	100V	J090F	J100R	100	100	095	110	095	090	110	105	130	095	100	100	080	075	090	100	115	I080A	100V	095	090F
24	F	J085S	085F	100	080	090	090	075	075	070	085	110	105	10C	J110R	095	I100A	095	125	110	110	105	I100R	095
25	J095S	U095S	U090R	U095S	095	085	070	135	115	I125C	115	J095R	115	110	125	100	085	J120R	095	095	090	115	090	105
26	080	090S	085	090	100	105	090	110	145H	100	125	105	105	110	090	090	095	105	095	095	095	115F	070F	100F
27	070F	100	I090R	100	095	115	095	110	100Z	105	115	125	105	080	090	095	125	I120A	110	115	F	120	140	F
28	F	F	F	F	F	F	105	115	120	110	130	125	090	110	100	110	105	115	100	100	J090R	070	085F	U080F
29	F	100	095	J095R	J075R	J090R	125	150	105	120	105	105	100	135	135	110	110	110	115	110	135	135V	155	125
30	I130C	125	J090R	095	130	140	100	105	125	115	J100R	080	110	A	105	I075A	100	140	150	100	C	C	C	U055S
31	U070S	C	105	085	115	070	065	070	G	150H	G	R	075	080	075	I095A	080	090	095	I110A	090	A	110F	105F
Count	28	29	29	29	28	30	30	30	29	28	29	28	30	29	29	30	31	30	30	30	27	29	30	30
Median	085	090	090	090	090	090	095	100	100	105	105	100	100	095	100	100	100	100	100	100	090	100	090	090
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

K14

IONOSPHERIC DATA

May 1968 | foF2 | 0.1Mc | **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	J086S	085	081	U079S	075	079S	J098S	J100R	089	077	090	111	128	131C	137C	136	128	128	129R	129	I110R	I102S	I103R	I098S
2	091S	092S	J085S	089V	J084R	U062S	064	069	081	087	094	097	112	110	108	117	119	117S	U118S	I117S	I094S	080S	I080S	I082S
3	I081S	077	I070S	066	061	061	080S	091S	089	094	097	111	125	127	127	129	121	119	118S	J114S	U085S	071	074S	075S
4	074S	076	072	063	064	065	080	093S	089	090	104	117	J124S	128	130	137	136	128	J126S	I120S	113S	I105S	J097S	S
5	S	I088S	084	080S	074	070	082	087S	094S	093	102	110S	120	117	121S	123	127	122	121S	U113S	J087S	A	I086S	087S
6	087S	J088S	I082S	078S	076S	I078S	089S	088	087	092	094	J102R	U117R	123	127	128	120S	U117S	U116S	U118S	R	J098S	I100S	S
7	S	U083R	081	076S	073S	073	091	J095S	J095S	092	100	108	I118R	128	139	144	133	J124R	I146A	J125R	094S	I094S	I094S	094S
8	U091S	J099S	J092R	U112R	056	045	058	075	074	090	101	J110R	114	U118R	111	110	101	100	094	095S	I078S	078	081	087S
9	I092S	091R	J086R	075	068	072	091	085	085	094	100	113	123	127	128	131	137	130	I118S	113S	J104S	102S	100S	104S
10	096	106S	100S	084Z	069F	067S	078	084	091	104	116	125	126	119	125	114	108	100	093	I090S	082S	076S	080S	080S
11	079	085S	079	061	060	061	074	096	096	084	085	097	111	119	113	107	108	107S	116S	I102S	088S	J088S	076	074
12	074	066	067	067	057	057	077S	092H	073	067	075	078	081	081	082	084H	082	082	083	088S	072S	J055S	062S	065F
13	FS	068F	066F	062	052	047	064	073	084	095	096	103	105	112	124	121	108	108	103	J102S	092	084S	086	080
14	080	072	F	068F	063	064	071	071	078	088H	093	104	114S	117	126	122	118	108	101S	091	084R	079S	084S	094
15	099	U100S	I090S	082	068	063F	068	093S	092	089	086R	093	105	108	113	119	115S	106	096S	U097S	I098S	J098S	092S	J088S
16	I086S	083S	078S	072	069	070S	087R	086	J097S	089	091	099	112	121	120	122	114	110	099S	092S	093S	089F	086	087S
17	J084S	080	U081S	076S	074	074S	081	090	095S	100	098	I116C	129S	118	103	104	107	106	098S	099S	J086S	076	075	073
18	F	I079S	I077S	FS	050	F	075	083	A	A	056	063	I066A	A	A	085	I088A	I077A	070	I066A	064	065	065	065
19	065S	063F	055F	050F	049	053F	063	077	081	079	095	105	103	099	097	096	103	103	107	113	106S	105S	I105S	101S
20	I097S	093S	I086S	080S	071	073	083	080	080	092	104	107	107	114	122	125	113	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	I099C	107	121C	U123C	115	126C	132	129	118S	J101S	090	094S	U096S	J098S
22	092S	089	090	U077S	073	071F	079S	072S	074	078	087	I096A	104	111	117	115	106	J098S	103	I102S	U093R	U087R	I085S	J082S
23	F	084F	081S	077	070F	075F	087F	086R	082	085	091	102	108	120	135	139	130	120S	112	I107A	108	I099S	096	U098S
24	100S	099S	096S	J086S	I079S	F	086	086	078	074	083	101	122	121	116S	121	123	I111A	I112A	A	113S	I101A	I098S	I098S
25	096S	I098S	096S	080S	083S	080	074	085	088	092H	101	111	115	118	121	124	122	126	I122S	116S	112S	J101S	U092S	094S
26	I100S	J098S	090S	086S	082	084	086	076	081	094	102	112S	125	129	130	123	115S	121	120S	119S	094S	092S	095S	093
27	I089S	087S	I086S	082	077	079	090	U083S	084	J084R	090	098	106	111	111	106	100S	103	U116S	110	U087S	083	FS	FS
28	J099S	FS	S	087S	074	073	086	086	082	086	098R	108	125	137S	144	U155S	155S	U148S	144R	J136S	J129R	S	F	S
29	I110R	U113S	U105R	J100R	090	085	079F	084	080	082H	090	101R	106	113	121	121S	114R	I105A	U110R	110	106	I099S	J100S	J102S
30	I100S	J097S	U083R	U085R	J084R	U078S	085S	089	086	089	081	085	094	090	I087A	I093A	103	095	085	078S	075	079S	077	U078S
31	077	077	U078S	077S	073	080	096S	085V	073	063R	058R	063	066	070	076	076	073	071	070	071S	I075A	I074S	I080S	S
Count	25	29	28	29	30	28	30	30	29	29	31	31	31	30	30	31	31	30	30	29	29	28	28	25
Median	091S	087S	082S	078	072	072	080	086	084	089	094	104	114	118	121	121	115	109	112S	107S	093S	088S	086S	087S
U.Q.	098	098	090	084	076	078	087	090	090	092	100	111	123	123	127	128	127	122	118	116	106	099	096	098
L.Q.	080	078	078	070	063	062	074	080	080	083	087	097	105	111	111	107	106	103	098	094	084	078	080	079
Q.R.	018	020	012	014	013	016	013	010	010	009	013	014	018	012	016	021	021	019	020	022	022	021	016	019

foF2

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

The Radio Research Laboratories, Japan

Y 1

IONOSPHERIC DATA

foF1 0.01Mc 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	L	L	590L	550L	LH	500	A	A						
2								LH	500L	A	A	A	A	LH	560L	U540L	L	L	L					
3								L	L	LH	L	U590L	580L	580	LH	LH	L	L	A					
4								L	L	480L	L	A	A	570L	560	A	510	L						
5									L	500L	LH	520	A	L	L	L	L	A	A					
6								L	L	A	520	L	550	590	A	A	A	A						
7								L	L	470L	570	670L	620H	540H	550	530	480	A						
8								L	L	U550L	L	580L	LH	590	550L	530L	A	A						
9								400	L	L	A	560	570	510H	550H	LH	L	L						
10									L	L	A	L	570	L	L	510L	LH	L						
11								L	L	500L	L	570H	540	510	U560L	510L	L	A	L					
12									L	520	510	490	A	A	R	490	A	A	A					
13								A	A	A	490	530	570	A	530	500L	L	A						
14								L	A	A	L	540	570H	560	520L	520L	510H	L						
15								L	510L	510L	A	570H	530	A	A	A	A	A	L					
16									U520L	A	A	L	540	U570L	560	530L	L	L	L					
17									L	490L	A	I500C	I530A	560L	570	550	LH	L	A					
18								A	A	A	A	A	A	A	A	A	A	A	A					
19								L	L	LH	500	540	580	550	A	540L	A	L	A					
20									L	540L	550	LH	I580A	L	560	530H	A	C	C					
21							C	C	C	C	C	LH	L	590L	590L	550H	A	A						
22							L	L	L	580L	560	A	A	560	A	A	A	L	A					
23								A	A	L	L	600H	580	I580A	540	550L	L	L	A					
24								L	LH	L	580H	L	570L	A	590	LH	LH	A	A					
25								L	L	L	580	530H	LH	U570L	530	570	A	A	A					
26									A	A	A	U600L	600	540	A	L	L	L	A					
27								A	A	L	L	LH	590	600H	A	LH	600L	530L	L					
28								A	A	L	U560L	560	570	570	600L	I570A	560L	L	410L					
29								L	L	A	A	A	A	A	A	A	A	A	A					
30								520L	L	520L	550	U560L	A	A	A	A	L	A	A					
31								L	LH	510	510	I510A	500	I520A	520	I500A	I480A	L	320					
Count								2	3	12	12	18	20	20	17	18	6	1	2					
Median								460L	510L	510L	550	560	570	560	560	530L	510	530L	360L					
U.Q.																								
L.Q.																								
Q.R.																								

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

IONOSPHERIC DATA

May 1968 | foE | 0.01Mc | 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	255	300	345	355	365R	C	C	C	360C	340	290	A					
2							S	245	310H	330H	350	365	370R	370R	360	355	330	300	220					
3							170	270	310	335	350	360	I370R	370R	380R	370R	345	305	220					
4							A	270	320	355	375	A	A	A	A	A	335	300	235					
5							180	270	310	330	355	360	I365A	380R	370R	370	345	300	240					
6							200	280	310	335	350R	360R	A	A	370R	360	340	300	235					
7							205	270	310	335H	350	360R	I365R	370R	360	360	335	285	A					
8							190	265	I305A	325	350	365	370	370R	365	355R	330	295	210					
9							A	I260A	A	A	A	A	A	A	375	360	330	290	A					
10							200	270	310	350	360	A	A	A	A	A	I335A	280	230					
11							200	270	305	340	A	A	R	370	360	355	330	290	230					
12							190	260	300	330	A	A	A	A	A	A	A	A	230					
13							190	270	310	325	335	A	A	A	375	360	340	295	230					
14							180	275	310	A	A	A	A	A	385	375	330	280	220					
15							170	270H	320	345	365	365	360	375	360	350H	345	295	235					
16							205H	270	320	350	360	365	I360A	360	370	340	I320A	I280A	240H					
17							220H	280	320	350	370	C	A	A	A	I350A	335	300	240					
18							220	280	315	350	360	I375A	380	A	A	A	A	A	A					
19							A	A	A	A	A	A	A	A	A	A	345	300	240					
20							210H	280	330	355	380	385R	400	I400A	I380A	365	A	C	C					
21							C	C	C	C	C	A	C	C	380C	370	340	A	A					
22							A	A	I320A	I340A	I370A	385	370	I370A	A	A	A	A	A					
23							A	A	A	A	370H	370	380	380	I375A	380	340	310	250					
24							200	A	A	A	A	A	A	A	A	380H	350	310	240					
25							200	270	320	A	A	A	A	A	A	A	A	A	A					
26							220	280	330	360	I375A	375R	380	380	400	A	A	A	260H					
27							190	270	320	345	355	370	I380A	I400A	385R	370	345	305	250					
28							230	290	325	340	A	A	A	A	A	A	350	310	260					
29							A	300	330	360	I365A	375	380	370R	385	365	A	A	A					
30							210	280	320R	350	370	370	380	380	A	A	A	A	A					
31							200H	270	A	A	365	380	390R	I380R	380	370	340	300	240					
Count							22	26	25	23	22	18	16	16	19	21	23	22	21					
Median							200	270	315	345	360	370	375	370	375	360	340	300	235					
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

Y3

IONOSPHERIC DATA

foEs 0.1Mc 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	022	021	019	022	020	020	028	037	J046	J051	J054	J056	050	046	044	050	J054	J054	J043	084	J065	J029	J023	J020
2	J020	J029	J024	J059	J041	J027	023	034	036	054	J062	J064	J078	J066	047	041	G	G	G	017	J030	022	J022	037
3	J075	J044	023	J028	023	J017	G	034	040	047	045	049	049	044	041	G	047	035	J062	J055	J029	J029	023	J041
4	J027	067	J035	035	J030	027	025	033	039	042	051	J067	J108	074	J068	090	034	026G	032	J029	J040	023	J026	J020
5	J020	024	020	021	023	023	023	031	042	041	047	J052	J063	J064	051	046	045	J110	081	J068	J062	091	J031	E015S
6	E015S	E014B	E	E015B	E	E015B	023	031	047	J062	049	J059	045	046	054	060	J086	088M	J054	J029	034M	J029	E015S	E015S
7	019	E014B	E015B	E013B	E	E014B	G	030	038	044	047	047	045	G	050	G	038	113M	155M	J067	J034	J026	023	J024
8	J032	020	021	025	024	023	G	033	J044	J070	J057	067	J063	056	050	046	J054	J072	071M	J089	J061	J025	J029	J049
9	J033	J034	J030	020	J026	023	028	030	043	040	J063	J063	J052	043	G	040	039	040	038	J038	J020	J051	J029	J063
10	J028	J029	J039	021	J030	019	024	045	046	J062	J074	J065	043	055	047	039	037	029	023G	025	J031	J062	E014S	023
11	019	E014B	E013B	E012B	E012B	E015B	026	031	J044	J054	039	040	035G	G	G	G	048	J062	J052	J063	J029	J030	J022	E014S
12	J028	022	022	019	E015B	E014B	024	037	039	043	043	J064	J056	J052	J045	045	J064	J054	J041	035	035	J050	058	056
13	J048	J031	J035	J034	J029	J028	035	047	091	082	042	J082	060	J071	049	039	045	091M	J065	103M	J062	J085	J051	042
14	J029	J024	J024	021	J019	023	023	029	J057	J052	J053	048	047	041	037G	041	042	038	J046	028	J038	020	E015S	J036
15	J051	J029	019	J020	E015B	E016B	G	030	J053	044	J052	043	J049	J072	J061	J067	107	J107	J098	J061	105M	J049	J059	J029
16	023	022	019	E014B	E014B	E012B	024	032	042	J058	J060	056	043	040	044	J053	J048	043	031	028	J028	043	J038	J024
17	J029	J029	J022	J026	J020	E014B	024	032	043	J061	J088	C	154	J054	043	J037	025G	038	038	025	J028	J033	J042	020
18	J052	J051	J055	J036	J036	021	031	J047	J084	J088	077	J060	J083	J076	J087	J098	177	J102	J070	092	J058	J042	J053	J049
19	040	J026	J020	023	019	022	025	031	036	J065	J062	J051	J050	043	071	044	054	050	054	J049	J044	J024	022	020
20	E015S	E013B	024	J021	J020	E015B	027	J052	044	J052	051	J070	J096	J084	J050	J037	J066	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	050	046	035G	052	045	071	J111	J077	059M	J061	J034	J029	J060
22	J062	J051	J026	J032	J029	J026	J028	J029	047	J052	J062	J111	J061	J055	J072	J066	J084	080M	090M	J072	J032	J021	023	J039
23	057M	J063	J017	020	J043	J083	J066	J060	J052	J064	J064	049	052	J083	046	049	046	J064	078	111	J102	103	J039	J050
24	J024	J023	J037	079	072	J041	021	030	034	J061	059	J046	041	083	J059	G	052	D	153	128	108	115	J106	J066
25	J025	J027	022	J026	J024	J040	J040	J049	J054	J049	J061	041	047	040	J103	J053	J059	J056	070	074	076	J042	023	J055
26	J039	J023	026	E	023	E011B	028	037	J054	J064	057	J065	041	061	J110	J053	J072	J059	J065	051	J031	J080	107	044
27	J034	J024	J022	J019	J032	J022	J039	J074	097	J049	051	043	J052	J053	056	038	043	J051	J051	J029	043M	J087	J088	J063
28	J023	J029	J029	J024	J027	J021	026	J072	J087	J083	J084	J071	J051	J063	J053	J098	047	042	028	J050	J088	J085	J084	J101
29	J064	J037	J096	J066	J031	J031	J036	034	041	J059	J086	099M	J069	088M	J077	J087	J138	116M	074M	J063	J081	J036	J028	J026
30	J019	022	J021	020	021	J017	024	038	J047	044	051	044	J066	J103	123	123	J091	J068	J051	104	090M	J034	J039	J032
31	J024	021	J025	J019	J017	J019	025	J034	J037	J054	038	052	043	056	051	J069	060	041	029	059	081	J043	J051	J082
Count	30	30	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31	30	30	30	30	30	30	30
Median	J028	J025	J022	021	J023	021	025	034	044	J054	J056	J056	051	055	051	046	052	058	054	059	J044	J039	J029	J038
U.Q.	040	031	029	028	030	026	028	045	053	062	062	065	063	072	068	066	071	091	074	074	076	062	051	055
L.Q.	022	022	020	019	019	E015	023	031	040	047	049	048	045	043	045	039	043	041	038	029	031	029	023	023
Q.R.	018	009	009	009	011	D011	005	014	013	015	013	017	018	029	023	027	028	050	036	045	045	033	028	032

The Radio Research Laboratories, Japan

foEs

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

Y4

IONOSPHERIC DATA

May 1968 | f_bEs | 0.1Mc | 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	E	E	E	015	E	E	025	036	044	048	050	056	049	046	044	047	052	046	040	048	054	027	020	018
2	018	029	018	040	033	024	G	033	036	053	060	061	073	045	040	039				016	028	E	019	028
3	056	017	015	014	015	E		032	038	045	043	046	048	044	040		047	G	041	041	026	026	E	E
4	017	015	017	017	019	024	G	030	037	041	050	060	069	044	045	070	027	026G	031	029	019	E	E	016
5	017	015	E	E	015	E	G	G	039	039	045	048	059	045	044	042	038	084	053	067	054	A	030	S
6	S	B		B		B	G	G	043	054	047	057	045	046	E054R	059	086	088	046	029	031	019	S	S
7	E	B	B	B		B		G	037	043	046	047	045		048		038	059	A	052	032	016	E	021
8	018	E	015	015	013	E		032	036	040	044	041	047	053	048	042	049	066	071	082	026	016	019	025
9	018	029	027	E	018	E	024	029	043	039	061	046	043	041		040	039	037	035	031	018	026	018	025
10	022	016	032	018	022	016	G	044	044	052	058	055	043	053	046	039	034	026	021G	018	028	033	S	E
11	E	B	B	B	B	B	G	030	037	040	039	040	E035R				046	046	031	018	016	016	018	S
12	E	014	E	E	B	B	G	033	038	038	042	040	054	051	E045R	044	051	049	039	019	017	028	046	E
13	029	019	030	020	024	022	032	045	050	072	039	049	053	055	048	039	043	075	064	048	017	025	030	033
14	026	017	018	015	017	E	G	029	055	049	052	048	047	E041R	037G	G	037	037	043	025	032	E	S	023
15	030	015	015	016	B	B		023G	043	043	050	043	046	062	057	060	101	063	033	046	053	019	017	023
16	017	E	E	B	B	B	G	G	040	056	058	054	040	E040R	043	040	042	042	031	E028R	027	020	021	E
17	018	020	015	018	014	B	G	G	037	044	057	C	100	044	040	037	024G	034	037	022	028	018	024	E
18	031	017	019	021	026	017	030	042	A	A	050	050	A	A	A	074	A	A	064	A	048	037	017	030
19	019	018	E	014	011	E	023	029	035	037	044	049	044	043	054	041	052	049	047	047	018	E	E	E
20	S	B	014	015	E	B	027	043	044	048	050	049	070	052	042	033	051	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	E050C	E046C	035G	048	045	052	089	075	052	054	028	017	028
22	042	024	020	032	023	021	026	028	046	048	051	A	056	053	060	060	054	052	079	061	029	E	E	017
23	046	E	E	E	014	047	065	055	044	054	055	048	049	060	045	044	045	048	078	A	053	053	031	027
24	014	016	027	055	064	034	018	030	034	046	046	042	E041R	059	047		040	A	A	A	067	A	053	052
25	026	018	E	017	016	020	033	038	040	046	041	041	045	E040R	042	050	055	053	057	070	065	041	E	046
26	018	015	016		E	B	G	033	048	058	054	048	040	044	106	045	049	050	060	047	025	023	076	023
27	017	022	017	014	026	018	035	070	068	044	044	043	050	048	054	E038R	039	040	033	025	043	054	041	E
28	023	025	026	021	019	013	G	057	059	043	042	049	046	048	050	061	045	042	G	049	065	055	047	065
29	046	030	018	056	019	020	025	G	040	058	084	096	061	075	076	086	082	A	051	027	033	036	025	025
30	016	E	019	E	015	E	G	034	042	039	045	043	054	057	A	A	051	061	046	064	035	016	020	029
31	016	E	016	017	E	014	G	023	034	044	G	052	G	053	044	066	056	039	G	052	A	029	039	055
Count																								
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

IONOSPHERIC DATA

May 1968 | **f-min** 0.1Mc | **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	E013S	015	E	012	E015S	E015S	015	015	017	018	018	E027C	E039C	E028C	E028C	017	015	015	E015S	E015S	E014S	E015S	E015S
2	E015S	E015S	013	E	013	E014S	E015S	E015S	015	015	018	017	019	018	018	017	017	014	015	E015S	E015S	E015S	E012S	E015S
3	E014S	E013S	012	013	011	015	E015S	015	015	017	017	016	029	027	018	018	017	015	015	015	E015S	E014S	E015S	E015S
4	E015S	014	E	014	012	015	E014S	015	015	016	019	018	018	019	018	016	016	014	014	E014S	E015S	E015S	E015S	E014S
5	E013S	E013S	013	014	E	015	E014S	013	014	015	018	019	016	018	016	018	015	015	015	E015S	E015S	E014S	E015S	E015S
6	E015S	014	E	015	E	015	E015S	014	015	016	017	019	027	022	018	017	015	014	016	014	012	E015S	E015S	E015S
7	E015S	014	015	013	E	014	E015S	E015S	015	015	018	019	019	018	020	017	015	015	015	E015S	E015S	E014S	E015S	E014S
8	E015S	E015S	E	E	E	013	E015S	E015S	015	016	017	020	019	019	018	017	016	015	015	013	E015S	014	E015S	E015S
9	E012S	014	013	015	015	014	E015S	015	015	016	018	018	019	019	023	016	014	013	015	E014S	E015S	E014S	E014S	014
10	014	013	014	014	011	012	014	014	014	016	017	018	023	024	024	018	018	014	014	013	E015S	E014S	E014S	014
11	013	014	013	012	012	015	011	015	015	015	018	018	019	026	019	016	015	013	014	012	E014S	E015S	E014S	E014S
12	E015S	E	E	015	015	014	014	012	014	014	017	018	021	023	015	018	015	015	014	014	011	E015S	E014S	E015S
13	014	011	015	012	014	013	013	014	014	015	017	025	024	020	020	019	016	016	015	014	E015S	E015S	E015S	E015S
14	E015S	014	013	014	015	015	017	015	016	025	022	030	030	023	026	020	017	016	014	015	015	014	E015S	E015S
15	E015S	013	013	014	015	016	015	015	016	016	019	018	017	018	018	018	016	016	015	014	E015S	E013S	E015S	E015S
16	E015S	015	014	014	014	012	015	015	015	016	018	026	020	017	018	017	016	014	014	014	E015S	E015S	E014S	015
17	015	012	014	013	011	014	015	014	015	015	016	C	E030S	020	022	019	016	014	014	015	014	015	015	015
18	014	014	011	015	013	014	017	015	016	016	019	019	023	022	021	021	018	015	013	E014S	E015S	E014S	E014S	E015S
19	E015S	E015S	015	E	E	015	013	014	016	015	016	018	018	023	019	017	016	014	014	E014S	E015S	E015S	E015S	E015S
20	E015S	013	E	E	012	015	016	012	015	015	018	019	024	019	020	019	017	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	E027C	E024C	E029C	E025C	018	015	015	014	E015S	E015S	E015S	E015S	E015S
22	E015S	E012S	011	E	E	E	E015S	015	016	017	017	019	021	020	022	018	017	015	015	014	E013S	E015S	E015S	E015S
23	E015S	E015S	015	015	013	013	016	015	015	014	019	019	019	017	023	019	015	014	017	013	E014S	E015S	E015S	E013S
24	E012S	014	E	E	E	E	014	014	015	017	015	016	017	021	018	016	015	015	014	E013S	E014S	E015S	E015S	E015S
25	E014S	013	015	015	E	012	E015S	015	015	017	017	023	026	028	018	020	018	015	013	012	E014S	E015S	E015S	E015S
26	E015S	E012S	E	E	E	011	E015S	015	016	016	016	020	020	019	018	017	015	015	015	013	E015S	E013S	E014S	E014S
27	012	E012S	E	E	E	E	E015S	014	015	016	020	023	019	019	019	016	017	015	015	014	E015S	E015S	E015S	E015S
28	E015S	015	E	E	E	012	E015S	011	015	015	017	019	018	019	019	022	020	015	015	015	E015S	E015S	E015S	E015S
29	E015S	E015S	015	E	015	013	E015S	015	015	017	017	020	027	025	026	019	019	017	015	015	E015S	E015S	E015S	E015S
30	E015S	E013S	012	015	E	015	E015S	E015S	015	015	016	016	019	016	018	017	015	015	012	013	E015S	E015S	E015S	E015S
31	E014S	014	013	E	012	E	013	014	016	016	017	019	016	018	018	018	016	016	015	015	E015S	E014S	E	E015S
Count	30	30	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31	30	30	30	30	30	30	30
Median	E015S	013	013	013	012	014	E015S	014	015	016	017	019	020	020	018	018	016	015	015	014	E015S	E015S	E015S	E015S
U.Q.																								
L.Q.																								
Q.R.																								

f-min

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

IONOSPHERIC DATA

May 1968 | 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	J290S	290	280	U280S	300	310S	J325S	J345R	355	300	280	270	290	280C	290C	295	295	300	300R	315	I330R	I305S	I290R	I285S
2	275S	270S	J275S	285V	J300R	U285S	285	290	295	305	295	275	290	290	280	280	285	290S	U295S	I310S	I300S	275S	I265S	I260S
3	I265S	265	I260S	270	280	260	300S	315S	295	290	275	270	280	285	280	285	290	285	295S	J305S	U310S	255	260S	260S
4	260S	275	285	260	265	280	310	310S	315	275	280	280	J280S	285	285	285	295	290	J295S	I300S	290S	I275S	J260S	S
5	S	I280S	285	280S	280	285	305	320S	310S	290	285	275S	290	275	275S	285	290	295	290S	U310S	J285S	A	I270S	270S
6	275S	J295S	I295S	280S	265S	I300S	335S	320	310	310	275	J265R	U275R	285	285	290	285S	U290S	U300S	U300S	R	J270S	I275S	S
7	S	U295R	285	290S	290S	290	320	J325S	J315S	285	270	260	I265R	275	280	285	285	J250R	I295A	J290R	270S	I260S	I250S	255S
8	U245S	J285S	J260R	U315R	355	265	310	325	310	295	295	J295R	295	U295R	300	305	295	295	305	310S	I280S	255	250	265S
9	I270S	290R	J305R	285	275	265	330	305	310	285	260	270	285	280	275	275	285	290	I280S	280S	J275S	275S	260S	260S
10	250	295S	295S	270Z	265F	255S	275	300	275	260	285	285	295	280	295	290	295	300	295	I290S	280S	260S	250S	255S
11	265	275S	305	240	265	265	295	315	330	310	260	250	260	280	270	275	290	280S	295S	I300S	275S	J265S	275	260
12	265	260	270	290	265	270	305S	270H	285	240	215	230	230	255	260	250H	275	275	290	305S	330S	J240S	240S	250F
13	FS	275F	280F	285	290	275	295	300	290	280	280	280	265	275	285	295	285	295	300	J295S	310	275S	265	275
14	285	275	F	290F	285	305	320	325	290	255H	255	265	275S	275	285	295	295	305	285S	305	290R	275S	275S	270
15	285	U285S	I295S	295	285	280F	275	320S	320	305	295R	260	275	280	280	290	290S	295	275S	U285S	I290S	J290S	285S	J285S
16	I280S	280S	290S	285	280	280S	310R	315	J320S	305	275	260	265	280	275	295	300	300	295S	285S	280S	275F	255	265S
17	J260S	255	U270S	280S	270	275S	270	280	285S	295	270	I280C	280S	295	270	275	270	290	285S	295S	J285S	265	265	265
18	F	I275S	I300S	FS	260	F	280	295	A	A	230	255	A	A	A	270	I280A	I290A	A	A	265	260	250	260
19	275S	280F	275F	240F	255	265F	285	295	295	255	265	280	275	275	275	270	270	270	270	280	280S	270S	I265S	255S
20	I265S	275S	I280S	275S	260	255	290	300	265	270	275	275	260	265	280	285	290	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	I260C	260	275C	U275C	275	275C	295	300	305S	J285S	265	265S	U270S	J265S
22	260S	245	270	U265S	255	265F	295S	255S	270	260	265	I275A	280	275	280	290	285	J255S	275	I280S	U280R	U265R	I255S	J255S
23	F	265F	285S	295	270F	285F	310F	325R	300	270	265	255	260	260	275	290	275	275S	275	I280A	275	I265S	260	U265S
24	265S	270S	300S	J295S	I280S	F	325	315	330	285	260	250	265	270	265S	265	275	I275A	I270A	A	280S	I265A	I255S	I260S
25	265S	I280S	275S	275S	275S	300	325	305	265	270H	260	265	265	265	265	270	270	280	I280S	290S	280S	J280S	U260S	265S
26	I270S	J280S	280S	260S	270	300	315	305	260	265	255	260S	275	280	285	275	270S	275	290S	305S	275S	260S	265S	270
27	I265S	265S	I275S	280	285	290	320	U315S	290	J280R	255	260	265	275	280	280	270S	270	U290S	265	U310S	265	FS	FS
28	J275S	FS	S	320S	290	275	310	310	295	275	240R	255	265	275S	275	U285S	285S	U285S	300R	J285S	J290R	S	F	S
29	I260R	U295S	U305R	J285R	280	280	300F	295	330	280H	255	A	265	265	275	280S	275R	I270A	U275R	285	280	I265S	J270S	J275S
30	I270S	J280S	U275R	U270R	J265R	U255S	255S	260	270	280	260	260	280	280	A	A	290	295	295	280S	265	255S	260	U255S
31	255	250	U260S	275S	265	300	335S	320V	295	260R	230R	240	240	245	255	255	265	270	275	270S	I270A	I250S	I250S	S
Count	25	29	28	29	30	28	30	30	29	29	31	30	30	30	29	30	31	30	29	28	29	28	28	25
Median	265S	275S	280S	280	275	280	310	310	295	280	265	265	275	275	280	285	285	290	290S	290S	280S	265S	260S	265S
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

Y7

IONOSPHERIC DATA

May 1968 | 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	L	L	330L	345L	LH	360	A	A						
2								LH	340L	A	A	A	A	LH	330L	U330L	L	L	L					
3								L	L	LH	L	U320L	325L	325	LH	LH	L	L	A					
4								L	L	385L	L	A	A	335L	340	A	335	L						
5									L	380L	LH	375	A	L	L	L	L	A	A					
6								L	L	A	385	L	360	330	A	A	A	A						
7								L	L	405L	345	325L	315H	355H	330	335	375	A						
8								L	L	U325L	L	340L	LH	A	355L	350L	A	A						
9								435	L	L	A	350	345	380H	345H	LH	L	L						
10									L	L	A	L	335	L	L	355L	LH	L						
11								L	L	360L	L	335H	360	370	U340L	345L	L	A	L					
12									L	345	355	380	A	A	R	A	A	A	A					
13								A	A	A	380	A	A	A	355	350L	L	A						
14								L	A	A	L	A	330H	355	350L	345L	335H	L						
15								L	360L	355L	A	345H	360	A	A	A	A	A	L					
16									U345L	A	A	L	370	U335L	340	340L	L	L	L					
17									L	365L	A	C	A	345L	335	330	LH	L	A					
18								A	A	A	A	A	A	A	A	A	A	A	A					
19								L	L	LH	400	345	345	345	A	325L	A	L	A					
20									L	345L	A	LH	I340A	L	340	330H	A	C	C					
21							C	C	C	C	C	LH	L	335L	325L	330H	A	A						
22							L	L	L	325L	A	A	A	A	A	A	A	L	A					
23								A	A	L	L	335H	345	I330A	350	340L	L	L	A					
24								L	LH	L	345H	L	335L	A	320	LH	LH	A	A					
25								L	L	L	360	380H	LH	U350L	375	340	A	A	A					
26									A	A	A	U335L	335	370	A	L	L	L	A					
27								A	A	L	L	LH	335	320H	A	LH	335L	335L	L					
28								A	A	L	U355L	355	350	A	A	A	330L	L	340L					
29								L	L	A	A	A	A	A	A	A	A	A	A					
30								330L	L	350L	365	U340L	A	A	A	A	L	A	A					
31								L	LH	355	390	I360A	370	I360A	345	A	I360A	L	380					
Count								2	3	12	10	15	18	17	16	15	6	1	2					
Median								380L	345L	355L	360	345	340	345	340	340L	335	335L	360L					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

M(3000) F1 Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Y8

IONOSPHERIC DATA

May 1968 | 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									245	250	320	355	320	310	320	300	295	285						
2								310	315	300	325	320	305	305	325	325	295	290	275					
3								245	250	300	300	340	325	315	320	310	295	295	275					
4								250	250	250	320	330	305	315	325	325	295	280						
5									250	255	310	300	305	300	320	310	305	300	275					
6								240	250	280	260	300	330	320	320	300	330	320						
7								250	250	245	320	360	380	345	340	310	305	385						
8								250	260L	280	300	300	300	310	305	295	285	295						
9								245	265	275	315	330	330	305	340	325	305	270						
10									300	340	315	300	300	305	300	290	290	265						
11								270	245	255	280	350	345	305	325	305	280	300	280					
12									280	445	495	445	445	400	380	375	340	335	295					
13								275	290	350	275	330	365	350	320	290	300	305						
14								245	300	265	380	355	350	350	320	300	290	280						
15								270	290	295	290	380	325	315	335	310	E355A	300	300					
16									285	295	305	340	325	335	330	305	290	285	275					
17									275	280	320	I335C	E325A	290	340	345	325	290	255					
18								285	A	A	570	450	A	A	A	E400A	I350A	A	A					
19								290	300	510	350	345	345	345	325	340	330	305	295					
20									350	320	330	335	370	360	325	310	295	C	C					
21							C	C	C	C	C	360	340	330	335	335	300	300						
22							285	255	300	370	400	A	340	350	320	305	295	300	E350A					
23								255	250	350	350	365	355	370	340	310	290	280	A					
24								230	255	350	400	400	350	325	340	345	295	A	A					
25								290	440	290	350	330	345	340	340	345	330	305	290					
26									255	320	300	350	340	325	350	310	340	330	300					
27								E300A	E320A	265	340	360	365	345	325	325	340	335	295					
28								250	300	305	310	350	370	340	330	330	305	300	275					
29								255	250	315	A	I360A	365	365	350	335	350	I330A	300					
30								350	300	325	400	360	355	340	A	A	320	295	285					
31								245	315	480	595	515	495	470	420	E420A	400	340	265					
Count							1	22	29	29	29	30	30	30	29	30	31	28	17					
Median							285	250	280	300	320	350	340	330	325	310	300	300	280					
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

Y9

IONOSPHERIC DATA

May 1968 | 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	275	285	280	260	255	250	240	225	I230A	235	A	A	E270A	E250A	E250A	E280A	A	A	265	255	255	250	265	275
2	295	310	295	295	265	280	235H	E245A	235	A	A	A	A	AH	220	220	230	240	260	245	245	245	295	300
3	E340A	295	295	275	250	295	260	245	245C	E240A	230	E250A	A	225	215H	200H	I285A	250	I260A	250	230	295	300	300
4	305	295	260	295	310	300	250	240	230	225	A	A	A	225	240	A	235	240	250	250	240	245	280	295
5	280	270	260	250	250	250	245	225	240	220	225H	E250A	A	245	245	250	245	A	A	255	290	A	305	300
6	280	255	265	250	255	250	240	230	245	A	E250A	A	225	E245A	A	A	A	A	270	255	250	250	260	280
7	275	270	270	260	255	280	235	225	225	E230A	230	E250A	220H	190H	E300A	295	225	A	A	245	250	315H	335	330
8	345	285	300	250	225	250	250	240	230	E240A	E245A	230	E250A	A	E270A	E245A	A	A	295	290	245	310	350	345
9	295	280	265	250	255	290	240	200	260	225	A	250	225	200H	195H	230H	245	250	250	255	255	280	295	300
10	325	270	275	240	245	300	250	245	250	A	A	A	225	A	A	225	I225A	225	250	265	275	315	295	315
11	300	280	245	215H	295	295	250	240	235	215	200	200H	215	210	225	215	A	A	260	255	265	255	250	300
12	300	305	295	250	250	295	245	240	240	225	225	200	A	A	A	A	A	A	A	255	225	E350A	I350A	310
13	E345A	295	300	260	275	305	270	A	A	A	215	E275A	A	A	E285A	230H	E270A	A	290	275	255	255	300	310
14	300	290	300	260	270	255	250	220	I240A	A	E270A	E260A	250H	250	215H	240	220H	265	260	250	270	275	305	305
15	300	270	255	245	235	255	250	250	250	E250A	A	200H	E250A	A	A	A	A	A	260	295	295	265	270	260
16	265	275	260	260	275	295	240	230	245	A	A	A	205	200H	245	230H	E250A	I240A	250	270	280	275	300	295
17	305	320	275	290	295	280	245	240	250	E250A	A	C	A	230	205	215	210H	250	I250A	260	250	270	300	295
18	360	280	255	275	E330A	E350A	270	A	A	A	A	A	A	A	A	A	A	A	A	A	E370A	350	335	320
19	300	290	280	350	330	305	255	240	225	215H	205	I240A	230	210	A	220H	A	A	A	290	250	260	260	275
20	300	275	250	255	275	315	250	245	250	A	A	E270A	A	A	255	220H	A	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	AH	C	250	E270A	250H	A	A	290	270	340	320	300	310
22	350	340	305	300	355	320	265	245	E270A	E275A	A	A	A	A	A	A	A	A	A	305	270	280	300	320
23	E360A	295	265	250	275	E340A	290	A	A	A	A	E240A	A	A	E250A	250H	270	E250A	A	A	E300A	E310A	E320A	320
24	290	295	250	295	E345A	300	230	230	225H	E250A	210H	240	250	A	E260A	245H	245H	A	A	A	E315A	A	E355A	330
25	305	280	275	240	275	250	240	E240A	230	250	210	200H	215H	215	220	A	A	A	A	290	E300A	270	265	355
26	290	270	275	270	280	255	220	220	A	A	A	E250A	205	200	A	A	A	I265A	I290A	270	255	300	A	300
27	280	305	280	275	280	255	250	I240A	A	225	205	200H	E260A	E245A	A	210H	235	250	265	255	250	I280A	E370A	300
28	305	290	245	220	255	255	245	I245A	I235A	230	205	E250A	225	E260A	A	A	270	270	245	255	280	280	300	350
29	325	300	260	300	250	225	225H	220	220	A	A	A	A	A	A	A	A	A	A	290	280	280	305	300
30	295	280	285	290	300	310	250	225	250	220H	225	205H	A	A	A	A	A	A	A	A	E320A	300	295	325
31	310	325	305	295	250	260	245	220	230H	E250A	215	I240A	240	A	E250A	A	A	E250A	230	A	A	E340A	E350A	350
Count	30	30	30	30	30	30	30	27	25	19	16	20	17	17	19	19	15	13	19	25	29	28	29	30
Median	300	290	275	260	265	280	250	235	240	220	215	U220A	220	220	U225	230H	240	250	260	255	260	280	300	300
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

Y 10

60

IONOSPHERIC DATA

May 1968 | **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	100	105	105	100	095	110	135	125	120	115	115	115	120	125	130	140	120	115	110	105	105	105	105	105
2	100	100	100	100	100	100	135	125	135	120	120	120	115	115	120	135	G	G	G	125	105	105	100	100
3	100	100	100	100	100	100	G	130	125C	120	120	115	110	120	150	G	145	160	115	110	105	105	105	105
4	105	105	105	105	100	105	110	120	120	110	110	105	100	100	100	100	100	100	125	120	115	110	105	105
5	105	105	095	095	095	100	150	140	125	125	115	110	105	115	125	125	135	115	115	110	110	110	105	S
6	S	B	E	B	E	B	145	140	120	115	115	110	120	120	160	145	130	125	120	110	105	105	S	S
7	095	B	B	B	E	B	G	145	125	120	115	115	130	G	155	G	150	115	110	105	105	105	105	105
8	105	105	100	100	100	100	G	120	120	115	115	110	110	130	130	145	130	120	120	115	110	110	110	105
9	105	105	105	120	100	110	150	145	165	105	100	105	105	100	G	170	140	125	120	115	100	105	105	105
10	100	100	100	100	100	110	125	120	115	115	110	105	105	100	100	100	125	125	105	105	110	110	S	100
11	100	B	B	B	B	B	145	130	110	105	105	100	100	G	G	G	120	110	110	105	100	100	100	S
12	100	100	095	095	B	B	130	115	115	110	110	105	100	100	100	130	125	120	110	110	110	105	105	100
13	100	100	100	100	100	100	120	115	110	110	110	115	115	120	120	150	135	120	115	110	110	105	100	100
14	100	100	100	105	100	100	150	145	115	105	105	105	105	105	105	165	155	145	125	120	105	100	S	100
15	100	110	100	100	B	B	G	135	120	120	110	115	110	115	115	135	125	120	115	115	110	105	105	105
16	095	100	100	B	B	B	150	140	125	120	110	110	115	120	115	110	110	110	130	120	115	110	105	105
17	100	100	100	100	100	B	150	135	125	115	110	C	100	100	100	100	100	145	120	110	105	105	100	100
18	100	100	100	100	095	100	135	125	115	110	110	110	105	100	100	100	120	100	110	105	100	100	110	105
19	105	105	095	095	095	100	105	105	105	100	100	100	100	100	100	130	120	115	110	105	100	100	100	100
20	S	B	100	095	095	B	130	125	120	120	115	110	110	105	100	100	100	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	125	125	105	145	120	110	105	105	100	100	095	110	105
22	105	105	100	100	100	100	100	100	115	115	110	110	110	105	135	100	140	120	120	115	115	110	115	110
23	105	105	105	105	105	105	105	105	105	120	115	115	110	110	120	145	135	135	115	105	105	105	105	100
24	100	100	100	100	100	100	110	105	100	100	125	100	100	100	100	G	140	120	115	110	105	105	105	100
25	100	095	100	095	095	100	115	110	115	120	110	105	110	105	100	100	100	100	115	105	105	105	105	105
26	100	100	100	E	100	B	130	125	120	115	110	110	120	120	110	105	100	130	120	115	105	105	105	100
27	100	100	100	100	100	100	115	110	105	110	110	115	105	115	125	150	125	115	115	115	110	105	105	105
28	100	100	100	100	100	100	130	115	110	110	105	105	105	105	105	105	130	140	125	105	105	105	105	100
29	100	100	095	100	100	105	105	140	125	115	110	110	110	110	110	125	120	115	115	110	110	100	100	095
30	095	100	095	100	100	100	155	125	125	130	115	120	110	110	105	100	100	100	115	105	105	105	105	100
31	100	095	100	100	100	100	150	100	100	105	140	125	150	130	125	115	115	110	115	105	105	105	105	105
Count	28	26	27	25	24	21	26	30	30	30	30	30	31	29	29	27	30	29	29	30	30	30	27	27
Median	100	100	100	100	100	100	130	125	120	115	110	110	110	110	115	125	125	120	115	110	105	105	105	105
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

Y 11

IONOSPHERIC DATA

May 1968 | Types of Es | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f	f	f	f	f	f f	h3	h3	c3	c2	c2	c2	c	h	h	h	c2	c3	12	f7	f4	f7	f6	f4
2	f6	f8	f5	f5	f5	f7	h2	h3	h	c2	c3	c2	c2	c2	c	h				f	f7	f	f5	f5
3	f5	f4	f2	f2	f2	f		h4	h2	c2	c	c	c	c	h		h2	h2	c2	f5	f7	f7	f	f2
4	f3	f3	f3	f5	f2	f4	c 13	h2	c	c	c2	12	13	1	12	16	12	12	h31	f5	f3	f	f4	f5
5	f4	f2f2	f2	f2	f2	f	h2h2	h2	h3	h h	c2	c2	12	c	c	c	h	c3	c4	f3	f5	f6	f7	
6							h3	h2	c2	c2	c	c	c	c 1	h2h	h2	h2	h4	c4	f4	f4	f4		
7	f							h	h	c2	c	c	h		h		h	c4	13	f4	f7	f2	f	f3
8	f3	f	f2	f2	f2	f		c3	c	c2	c	c	c2	h2	h	h	h212	c4	c3	f5	f3	f2	f3	f3
9	f5	f5	f7	f	f2	f	h 12	h 12	h212	1	12	12	1	1		h 1	h 1	h21	c212	f3f3	f	f3f	f3	f3
10	f3	f	f2	f3	f3	f3	h2	c4	c2	c2	c3	12	1	12	1	12	h 12	h 12	1	f2	f6	f3f2		f2
11	f						h2	h2	c2	c	1	1	1				c2	c2	c3	f3	f4	f3	f3	
12	f2	f	f	f			h2	c2	c2	c	c	12	12	12	1	h 1	h212	c213	c41	f3f3	f f3	f2	f3	f2
13	f3	f3	f4	f2	f4f	f4	c4	c5	c4	c3	c	c	c2	c2	c	h	h	c4	c4	f4	f2	f2	f3	f3
14	f3	f2	f2	f2	f	f	h	h	c2	12	12	1	1	1	1	h	h h	h c 1	h4c 1	f2	f4f	f		f3
15	f4	f3f2	f	f				h 12	c2	c	c2	c	c	c2	c2	h3	h5	c4	c4	f4	f3	f3	f3	f3f
16	f2	f	f				h	h2	h2	c3	c2	c2	c	c	c	c	c2	c2	h5	f4	f7	f2	f3	f2
17	f3	f3	f2	f2	f2		h	h2	h2	c2	c2		1	1	12	12	1	h	c3	f4	f5	f2	f4	f2
18	f6	f4	f3	f3f	f2	f	h2	h3	c4	c5	c2	c2	c3	13	13	14	c214	14	c614	f3f3	f5	f6	f2f2	f5f
19	f4f	f3f3	f2	f3	f2	f	12	13	12	1 h	1	1	1	1	1 h	h 1	h3	c2	c6	f4	f3	f	f	f
20			f	f2	f		h3	h3	h2	c2	c2	c2	c2	13	1	1	12							
21												h 1	h 1	1	h	c	c2	15	14	f4	f3	f4	f2f	f5
22	f6	f7	f4	f5	f4	f5	13	13	c213	c212	c21	c3	c2	c	h212	13h2	h 14	c214	c314	f3f4	f4f4	f2	f	f3f
23	f4	f2f	f	f	f3	f3	14	12	13h	c312	c2	c	c	c3	c 1	h	h	h2	c5	f6	f3	f2f3	f3f	f3
24	f4	f2	f6	f2	f5	f6	12	12	12	12	h 12	1	1	13	1		h	c2	c4	f6	f3	f3	f6	f6
25	f5	f2	f	f	f2	f3	c31	c3	c2	c212	c	1	1	1	13	12	12	13	c314	f4f4	f4f	f7f3	f2f	f5f
26	f5	f2	f3		f		h3	h3	c3	c3	c2	c2	c	c	c2	1	13	h313	h4	f7	f6	f3	f4	f4
27	f6	f6	f4	f2	f5	f2	c4	c2	c3	c2	c2	c	1	c	h2	h	h	c3	c3	f2	f6	f4	f3	f4
28	f7	f5	f4	f5	f6	f2	h	c3	c3	c2	1	1	1	1	1 h	12	h	h2	h	f6	f4	f6	f3	f4
29	f3	f2	f2	f2	f2	f2	12	h	h	c2	c2	c3	c2	c3	c2	h2c4	c31	c213	c313	f2f4	f3f4	f5	f2	f3
30	f	f	f2	f	f	f	h	h	h2	c	c	c	c	c2	c3	14	14	14	c214	f3f3	f4f4	f3f	f2f4	f6
31	f2	f	f2f2	f3	f	f2	h2	12h2	12	12	h	h	h	h2	h	c3	c2	c3	c	f5	f5	f6f2	f7	f6
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

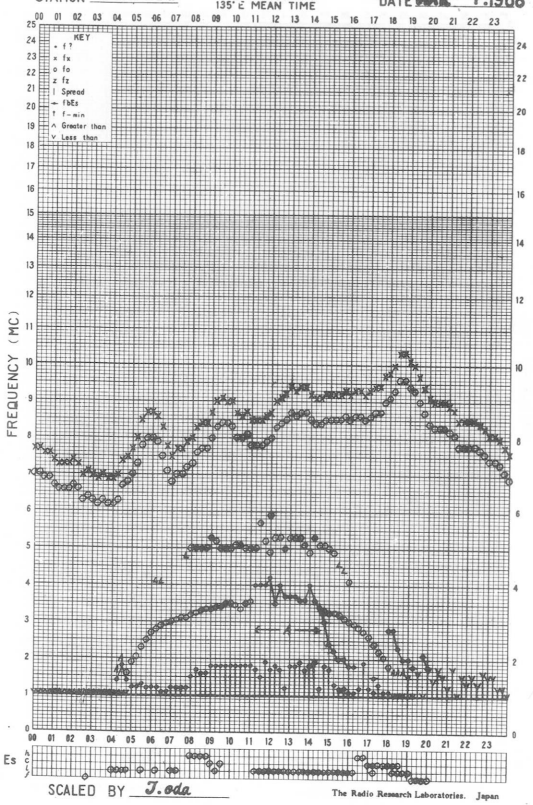
Types of Es

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

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 1.1968

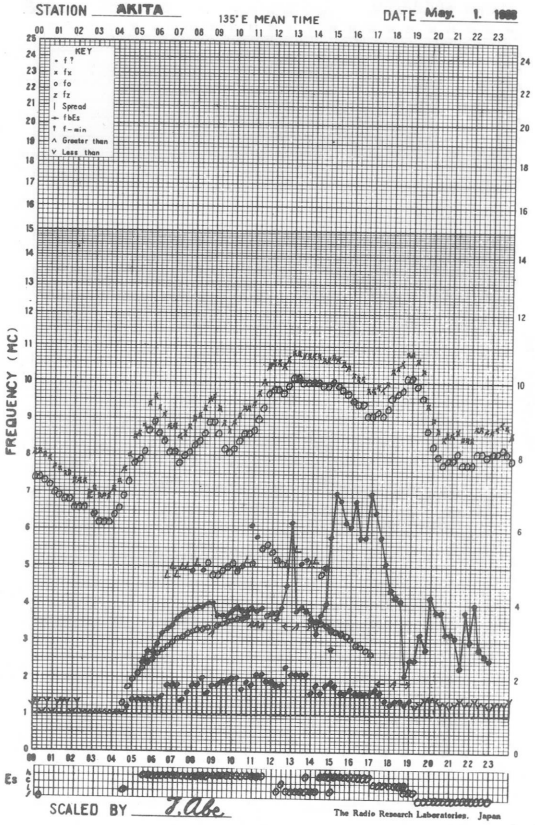


SCALED BY J. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 1. 1968

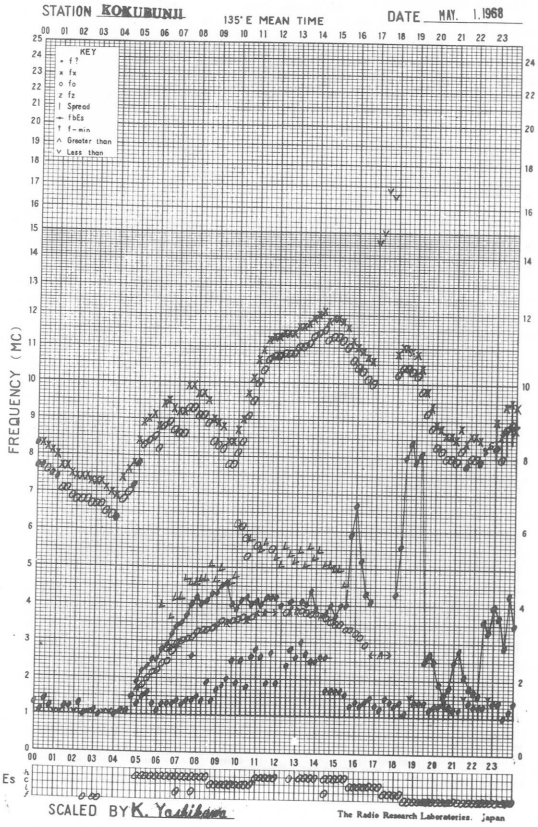


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 1.1968

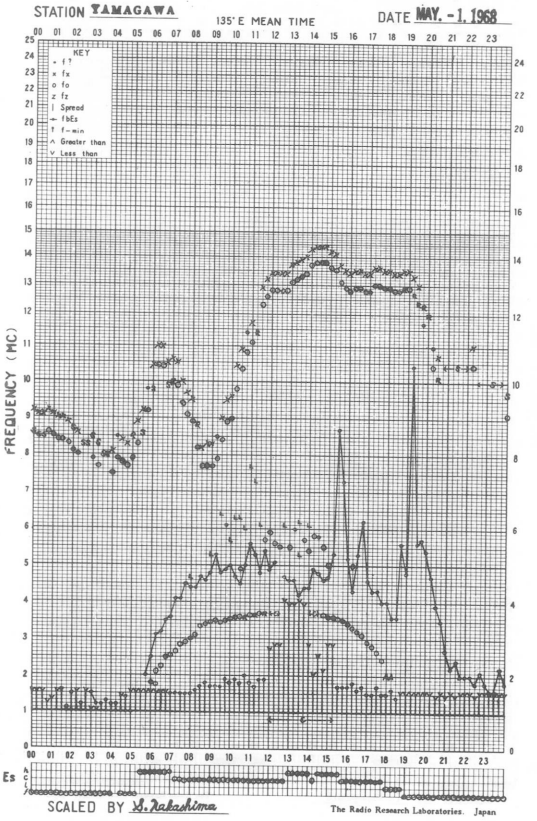


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

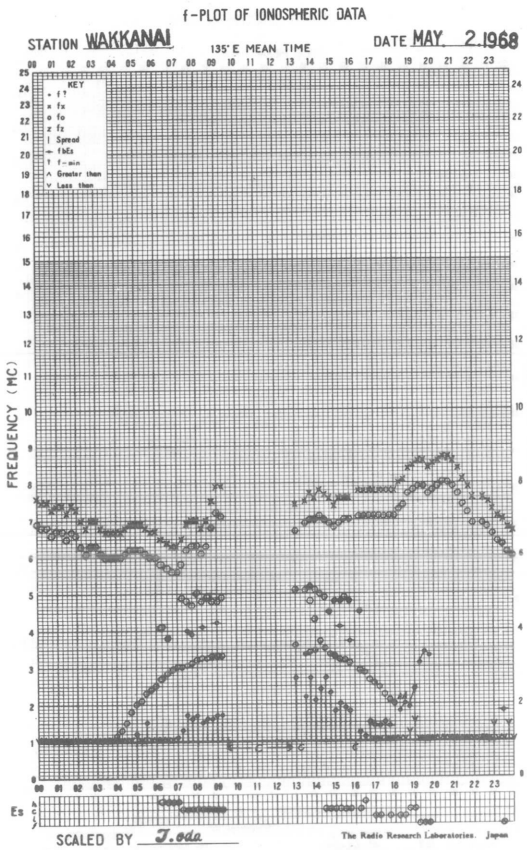
f-PLOT OF IONOSPHERIC DATA

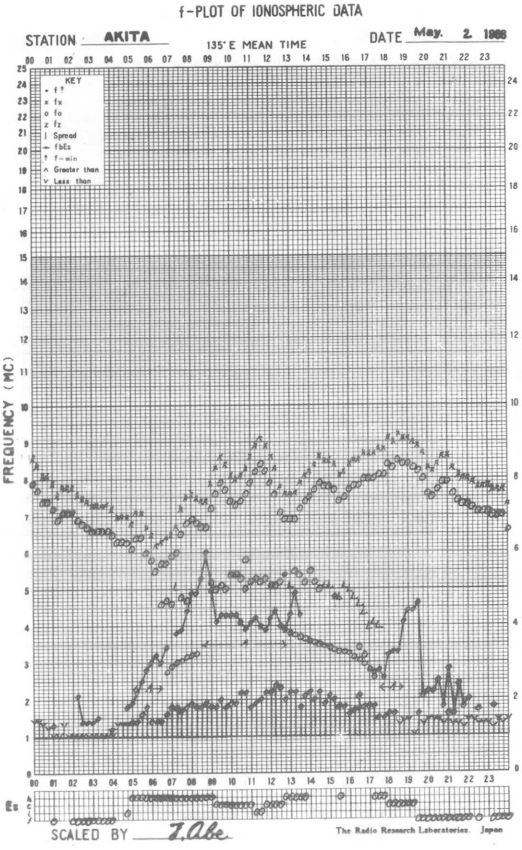
STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 1. 1968

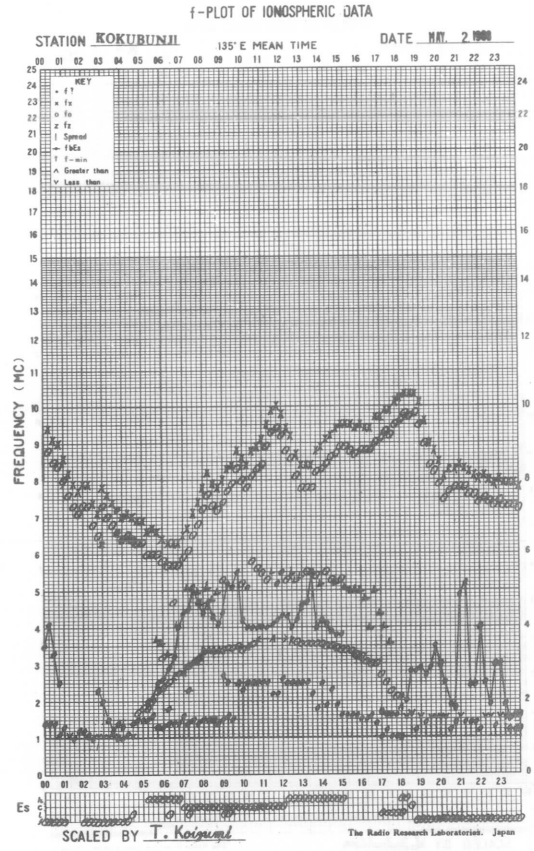


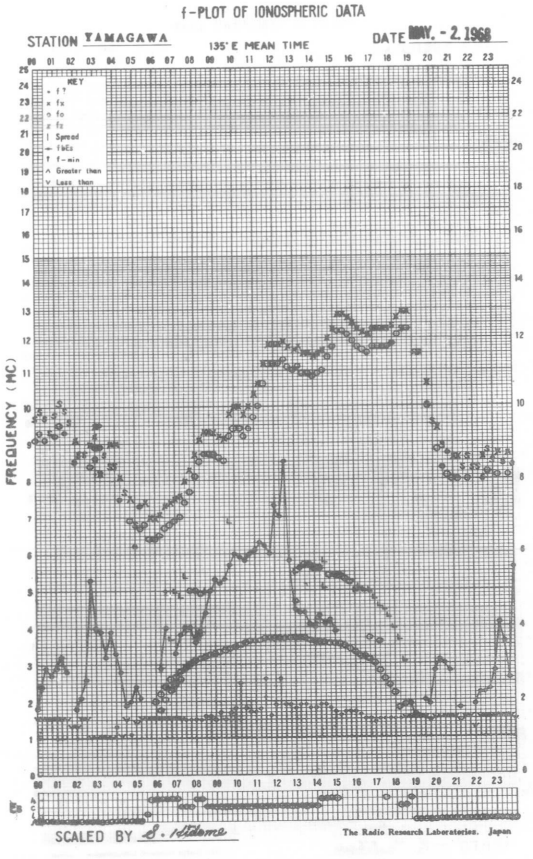
SCALED BY S. Takashima

The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135°E MEAN TIME
DATE MAY. 2.1968
KEY
FREQUENCY (MC)
Es
SCALED BY J.oda
The Radio Research Laboratories. Japan

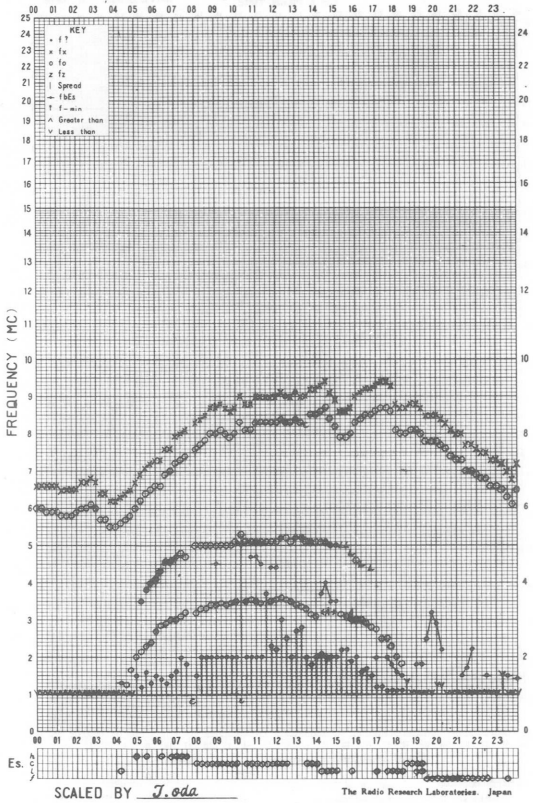

f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135°E MEAN TIME
DATE May. 2. 1968
KEY
FREQUENCY (MC)
Es
SCALED BY T.Abe
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135°E MEAN TIME
DATE MAY. 2 1968
KEY
FREQUENCY (MC)
Es
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135°E MEAN TIME
DATE MAY. - 2. 1968
KEY
FREQUENCY (MC)
Es
SCALED BY S. Ichidome
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 3.1968

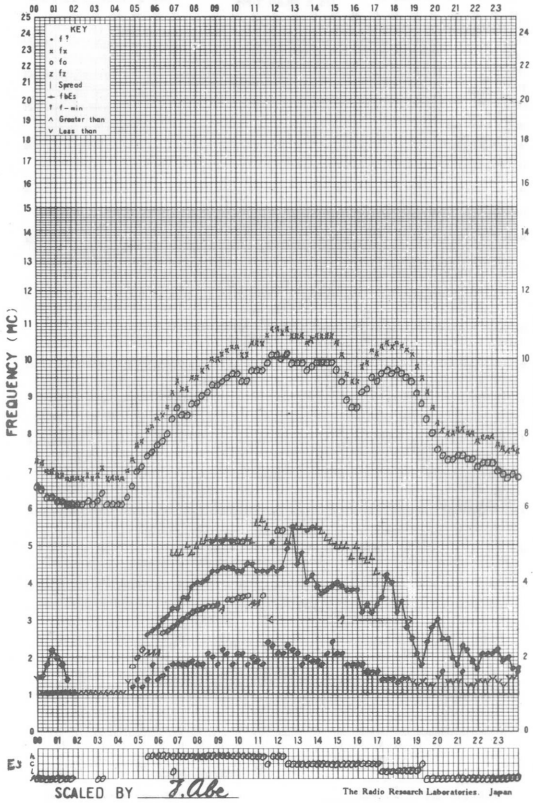


SCALED BY T. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 3. 1968

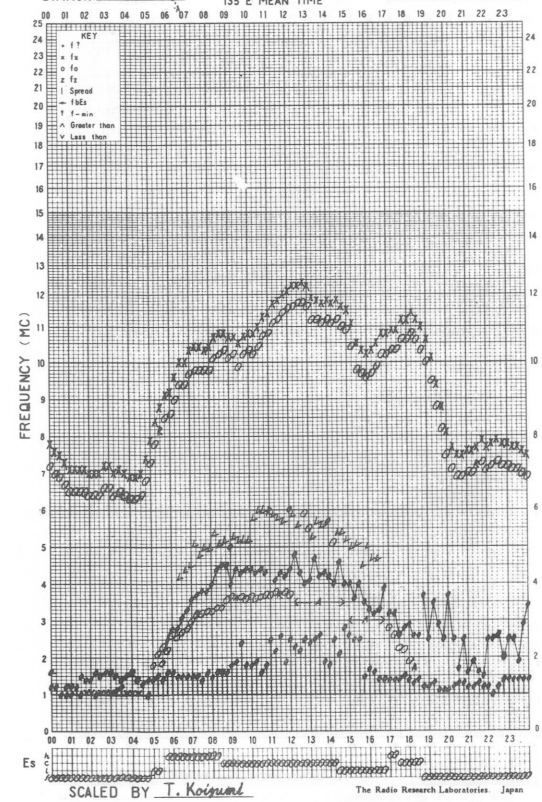


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 3.1968

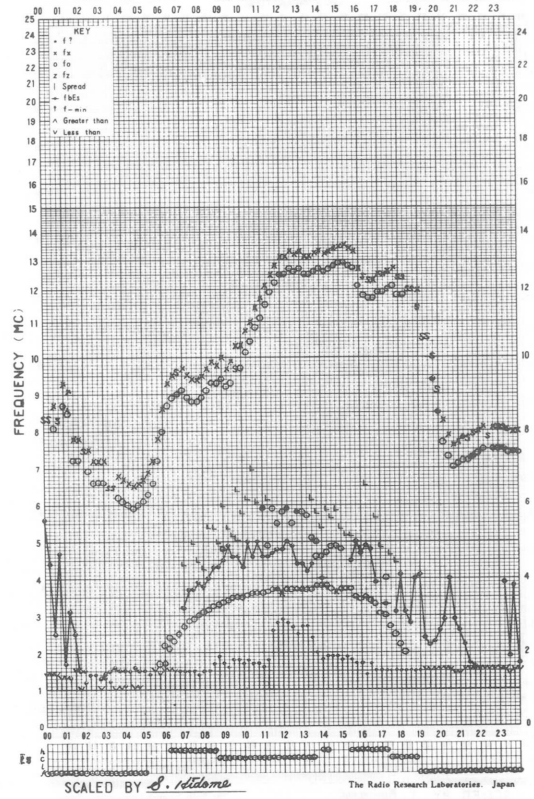


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. - 3. 1968

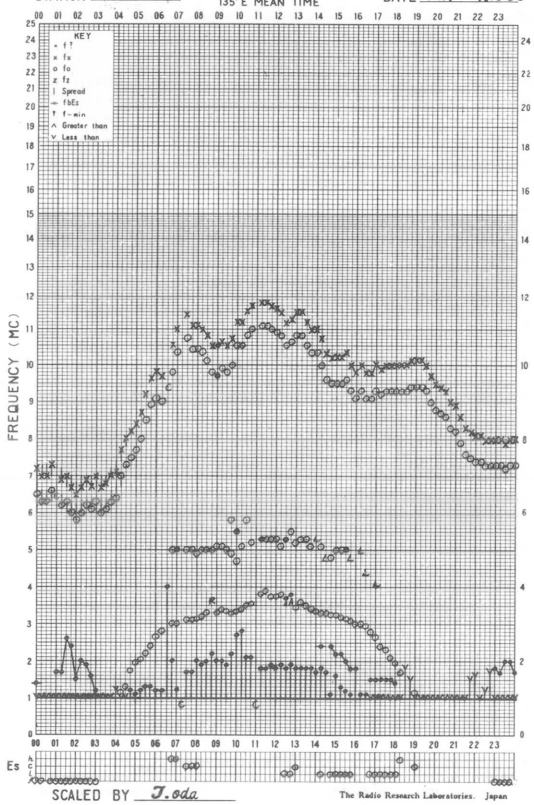


SCALED BY S. Iidoma

The Radio Research Laboratories. Japan

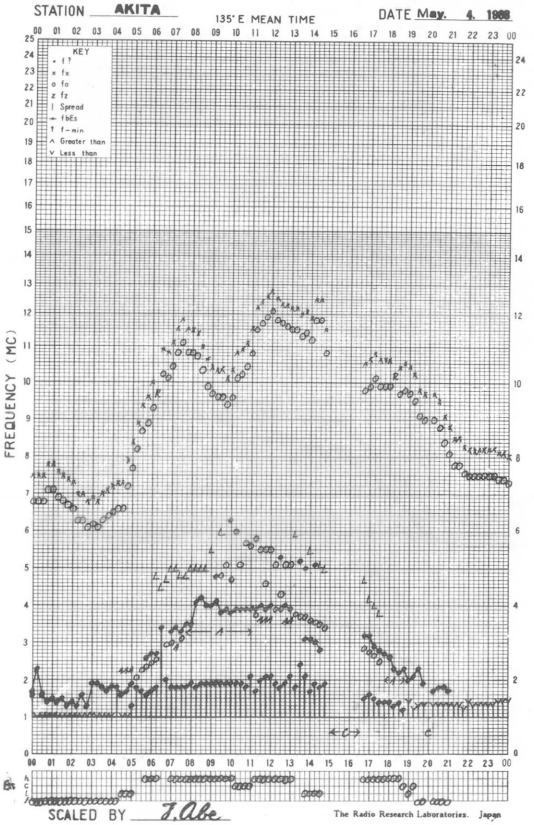
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 4.1968



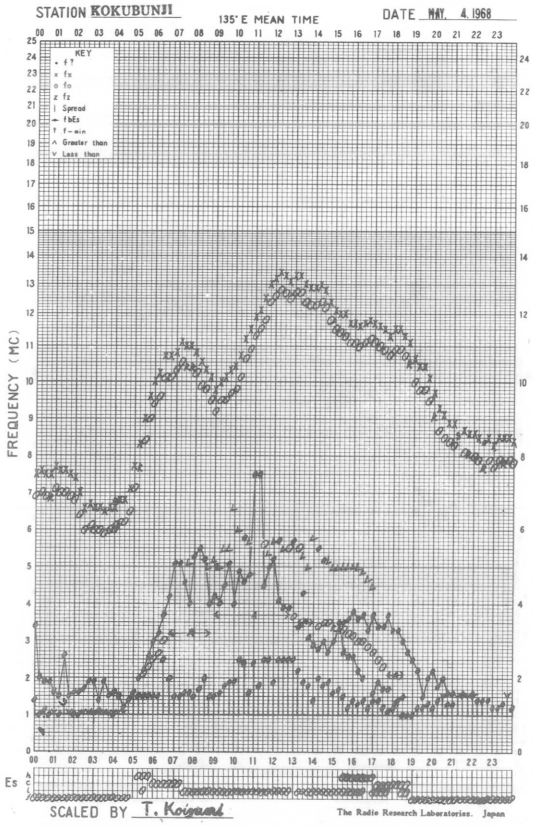
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 4. 1968



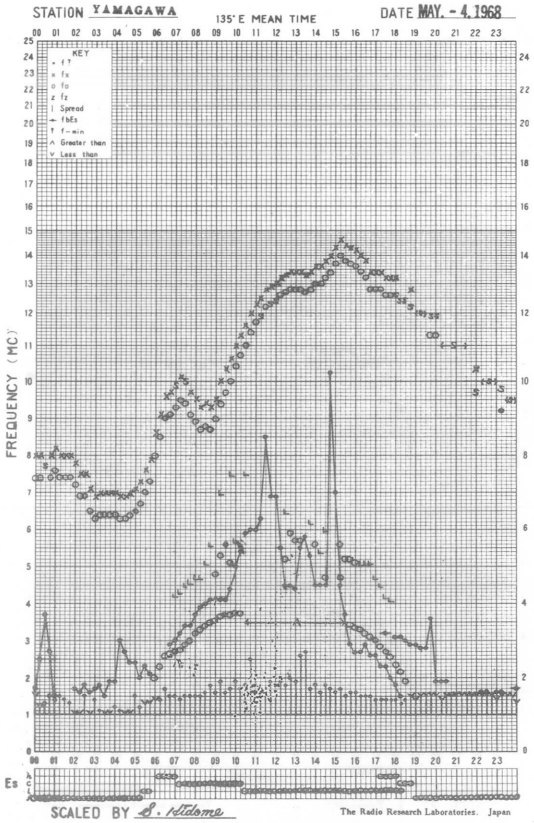
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 4. 1968



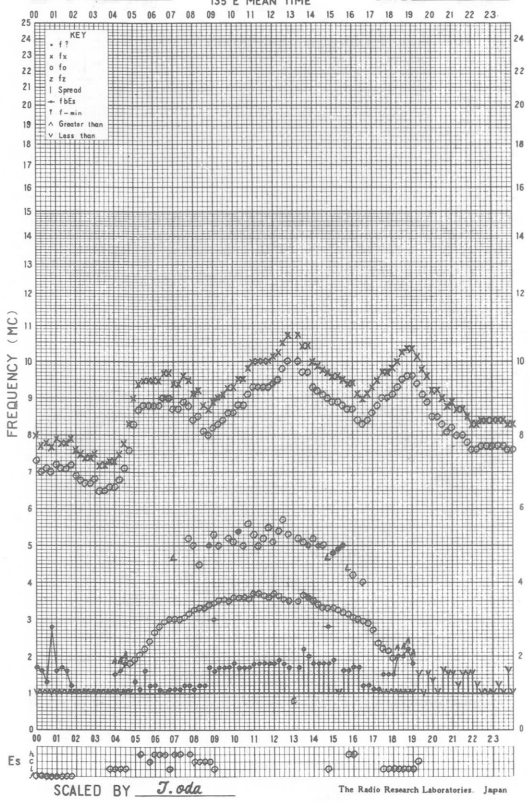
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. - 4. 1968



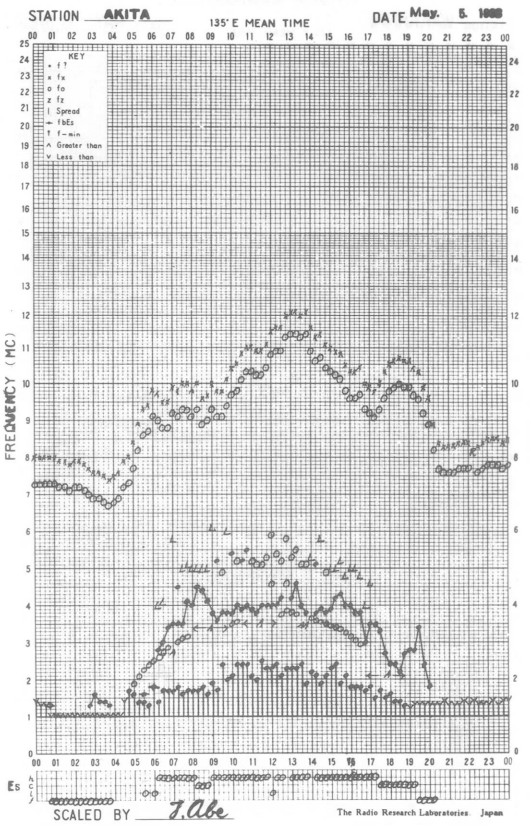
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 5.1968



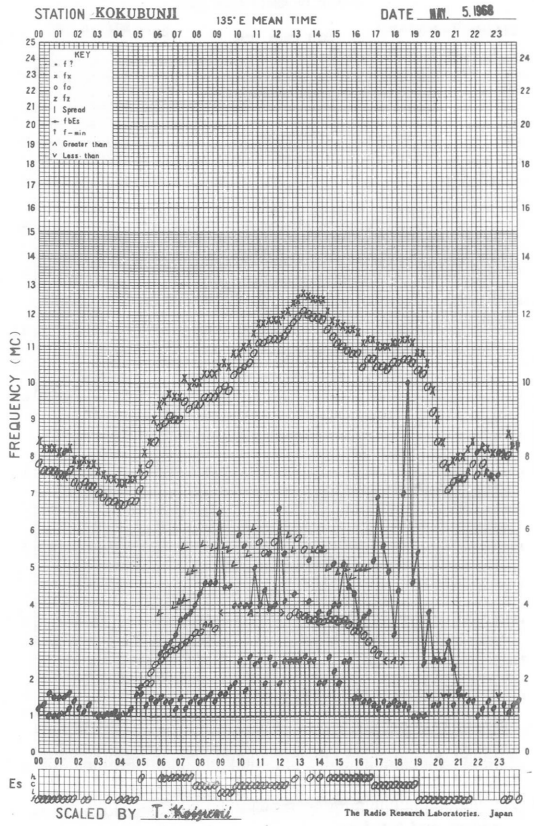
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 5. 1968



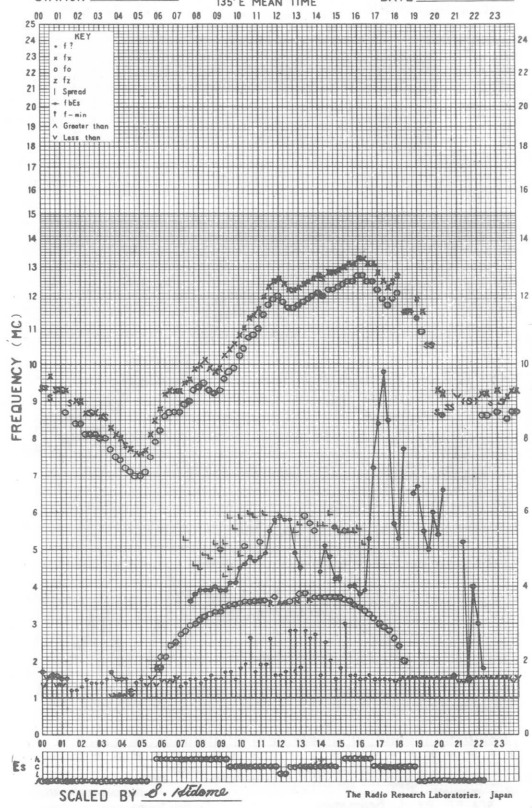
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 5.1968



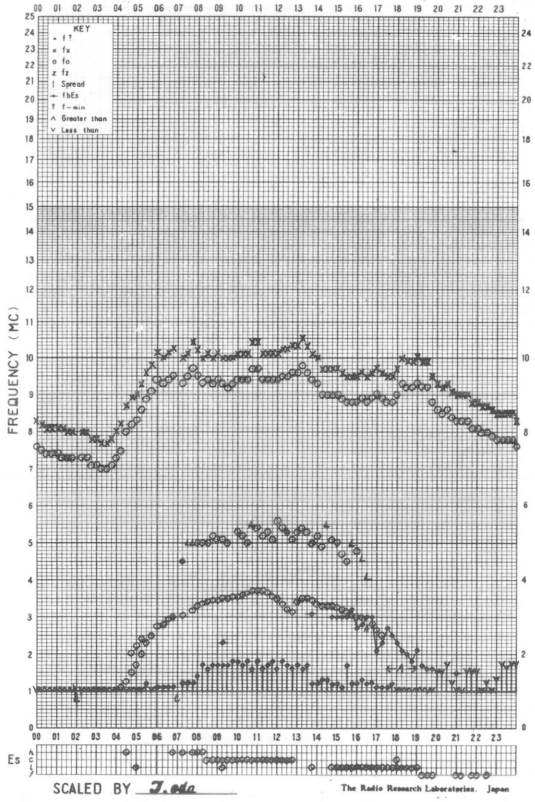
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. - 5. 1968



f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 6,1968

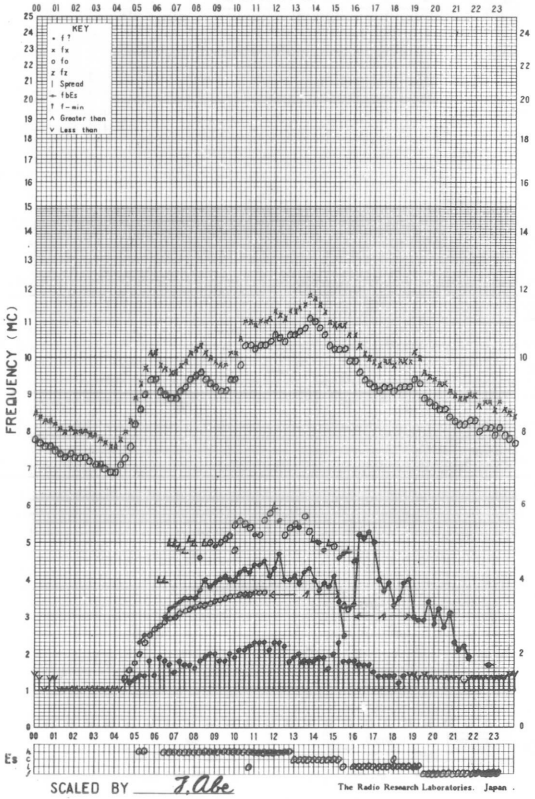


SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 6. 1968

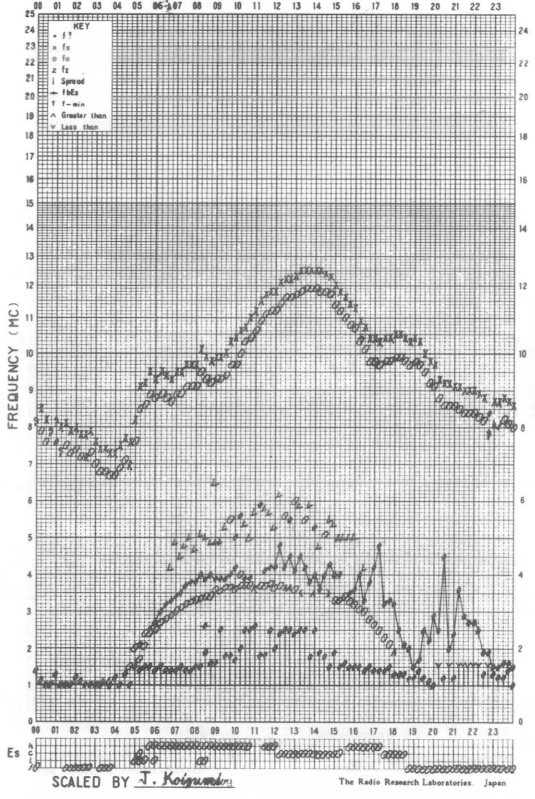


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 6,1968

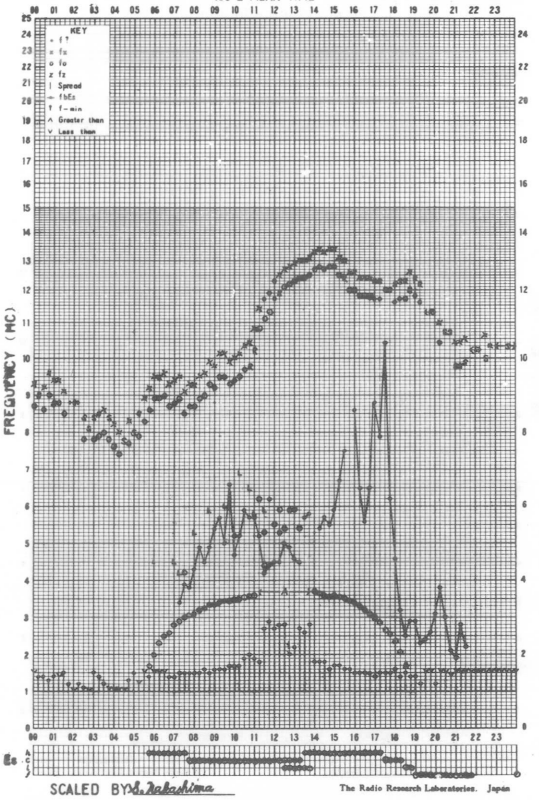


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 6. 1968

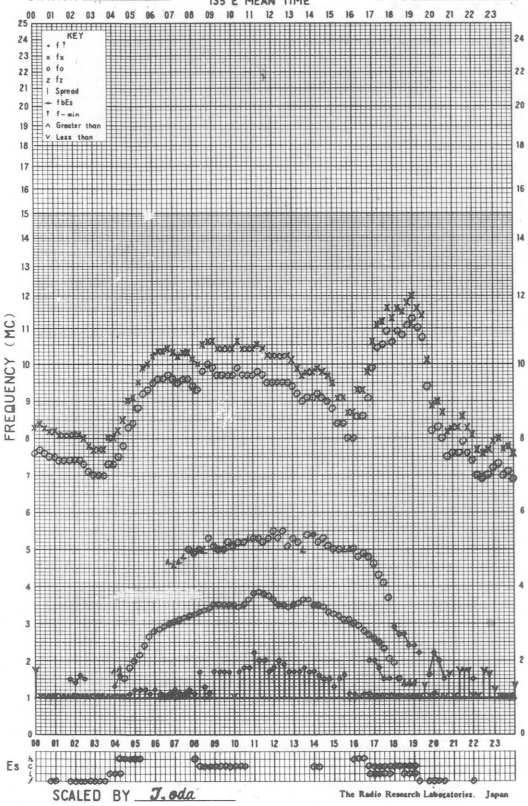


SCALED BY S. Takashima

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 7.1968

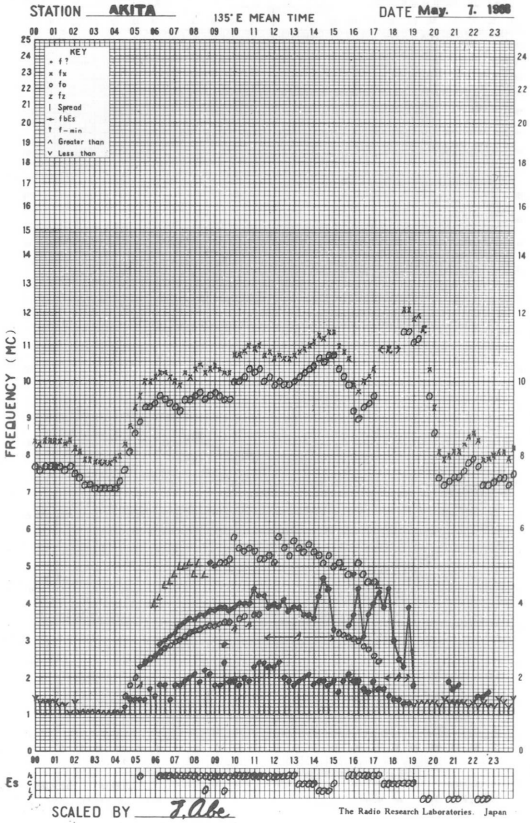


SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 7. 1968

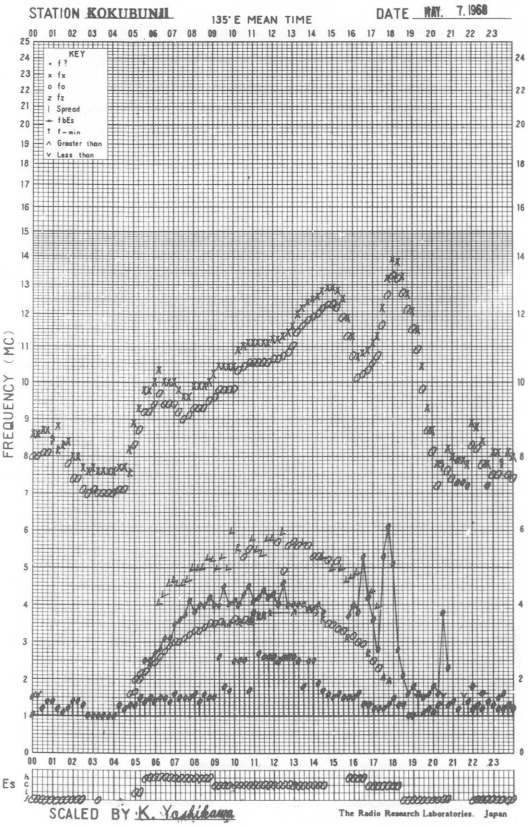


SCALED BY F. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 7. 1968

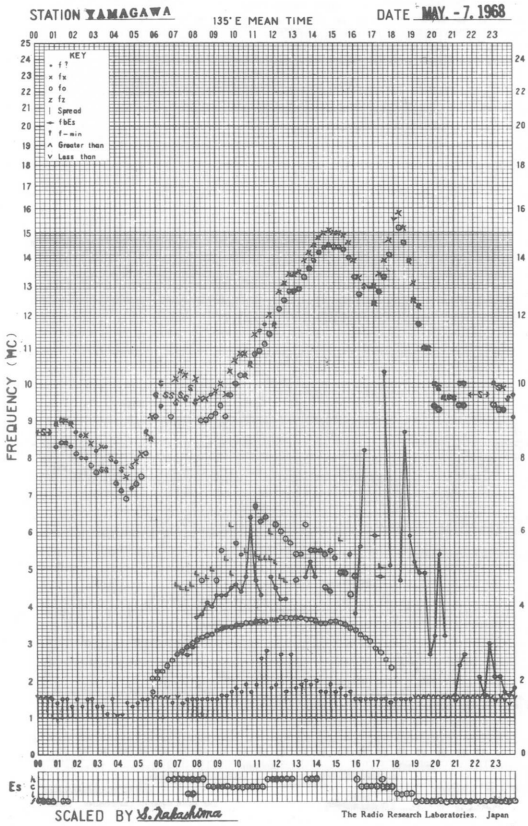


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 7. 1968

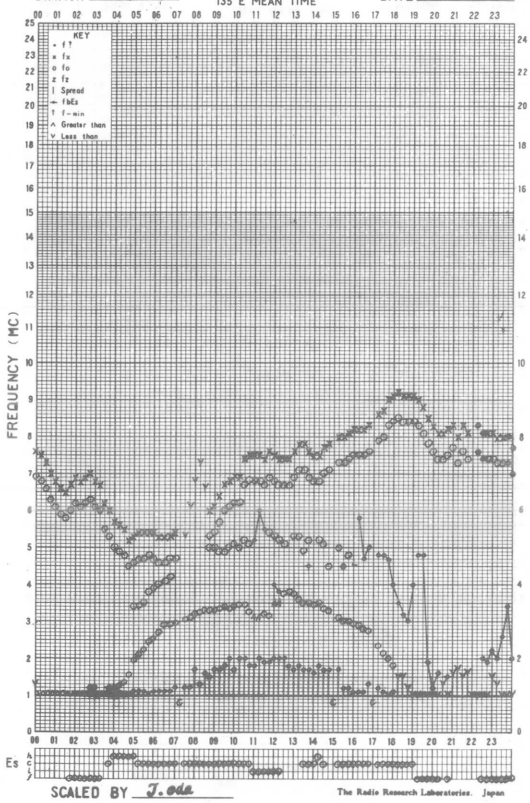


SCALED BY S. Takashima

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 8.1968

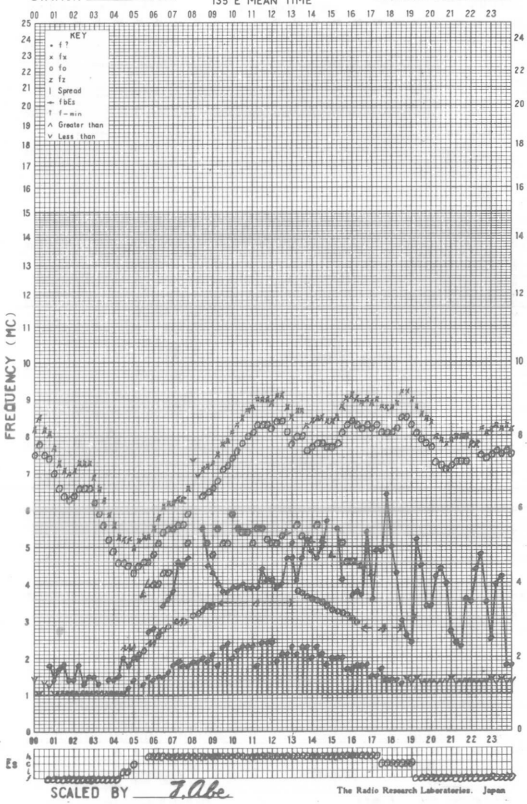


SCALED BY J. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 8. 1968

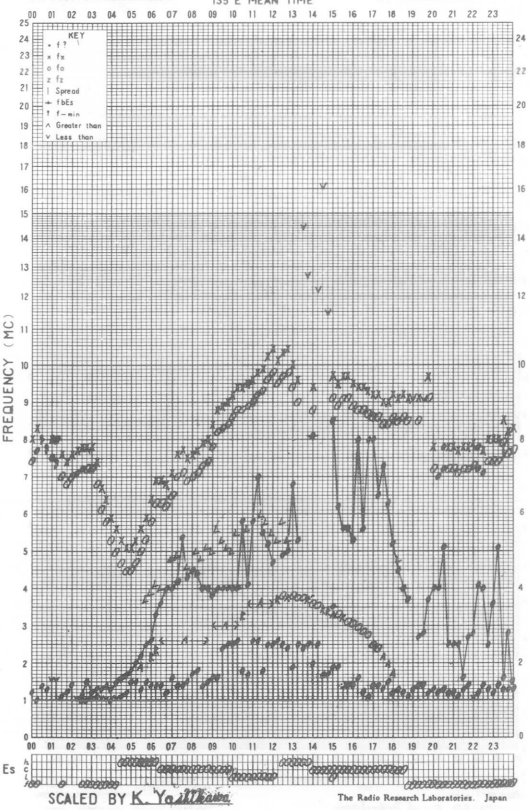


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 8.1968

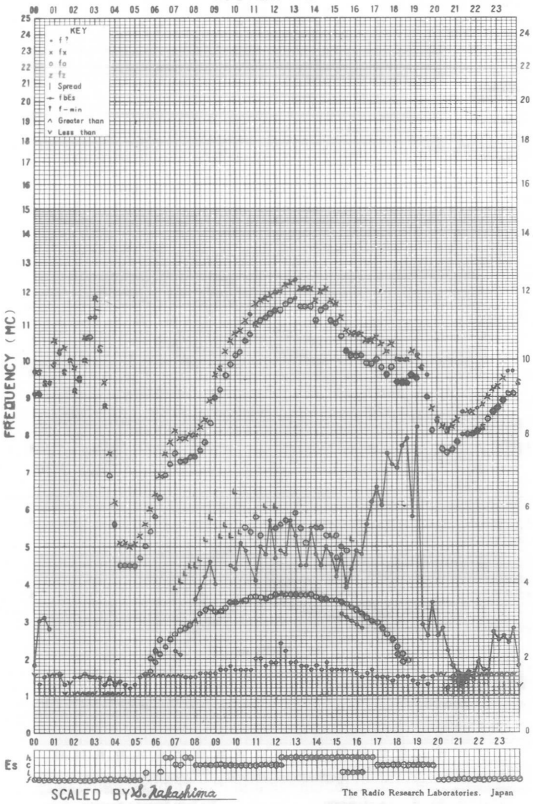


SCALED BY K. Yasukawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. - 8. 1968

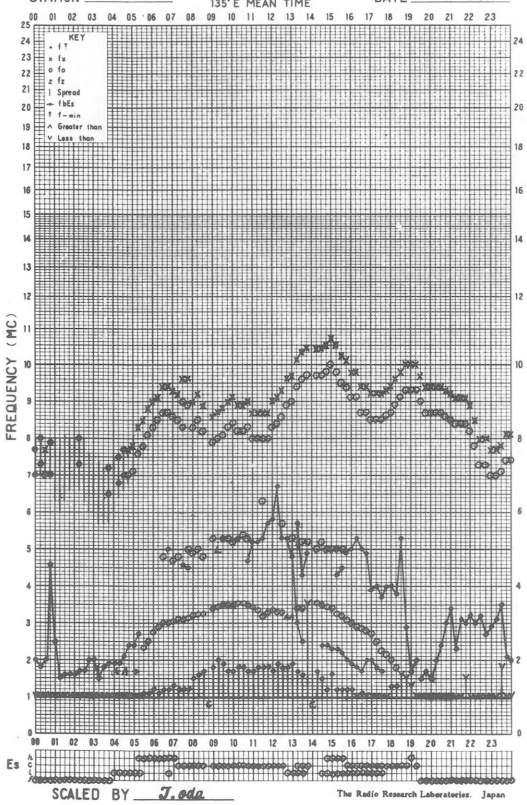


SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 9.1968

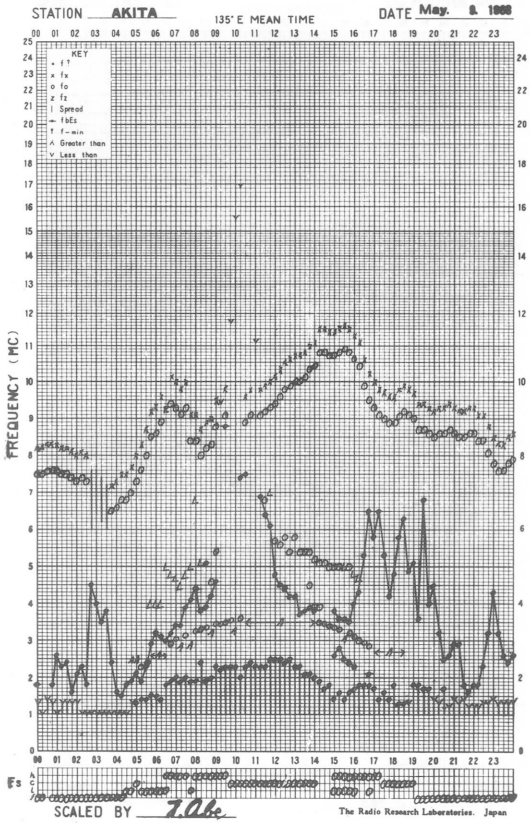


SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 8. 1968

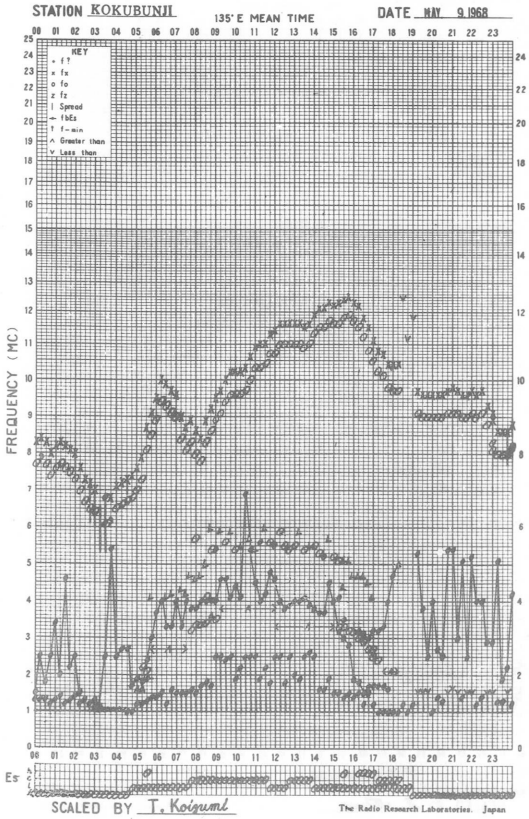


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY 9 1968

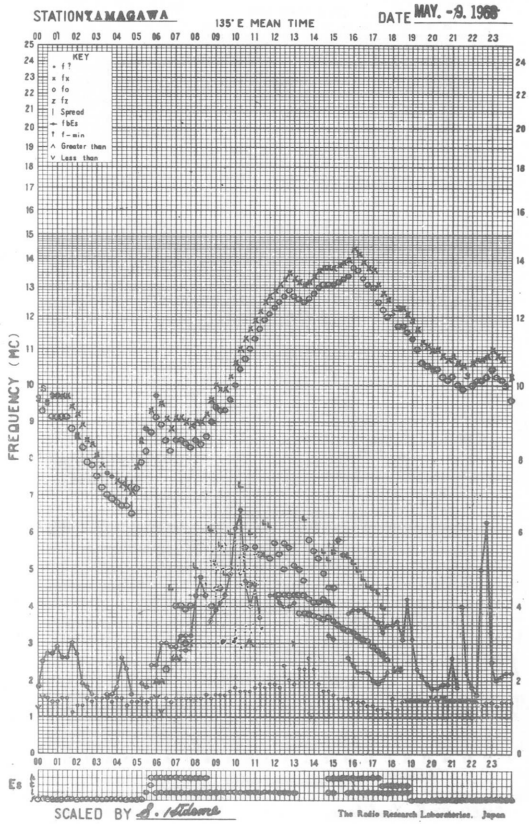


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. -9. 1968

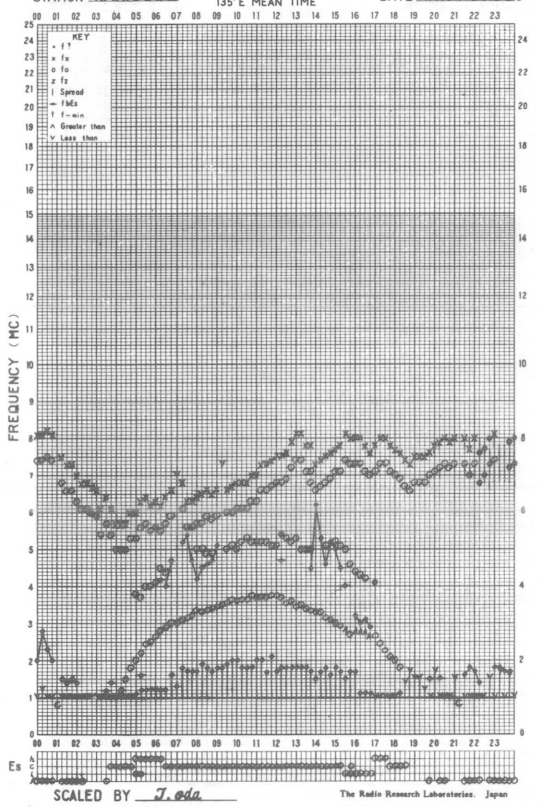


SCALED BY S. Uchiumi

The Radio Research Laboratories. Japan

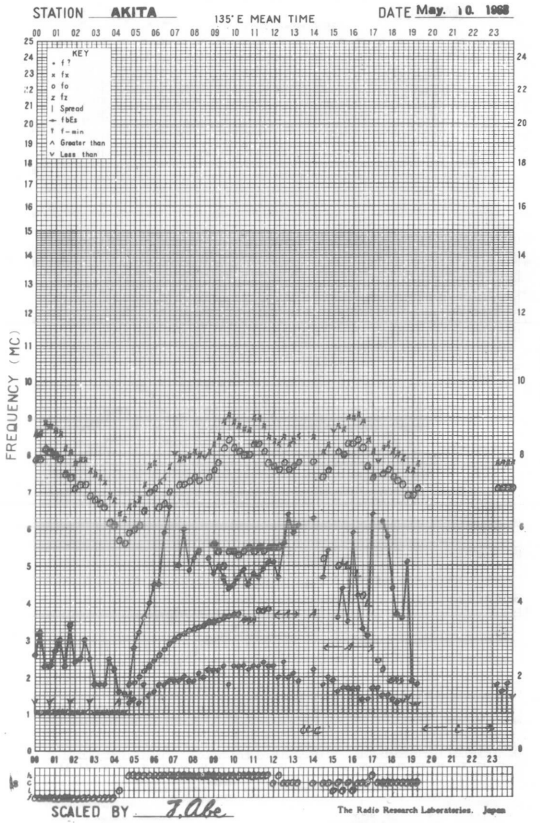
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 10.1968



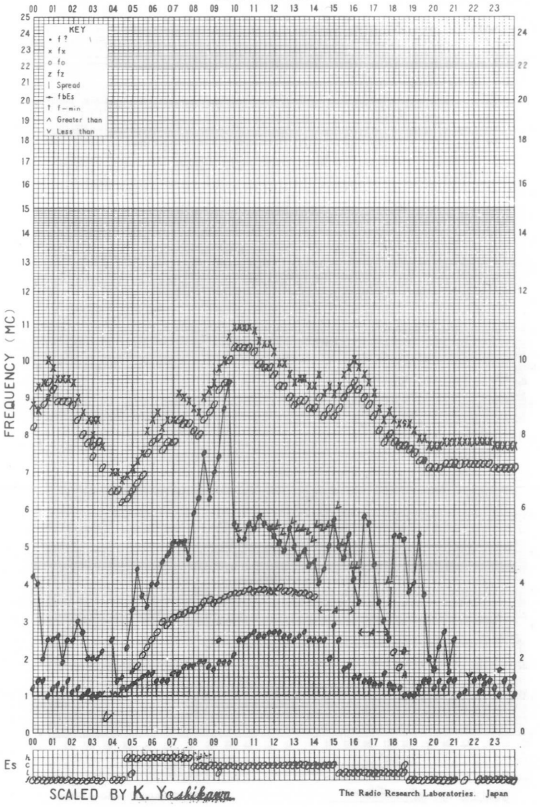
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 10. 1968



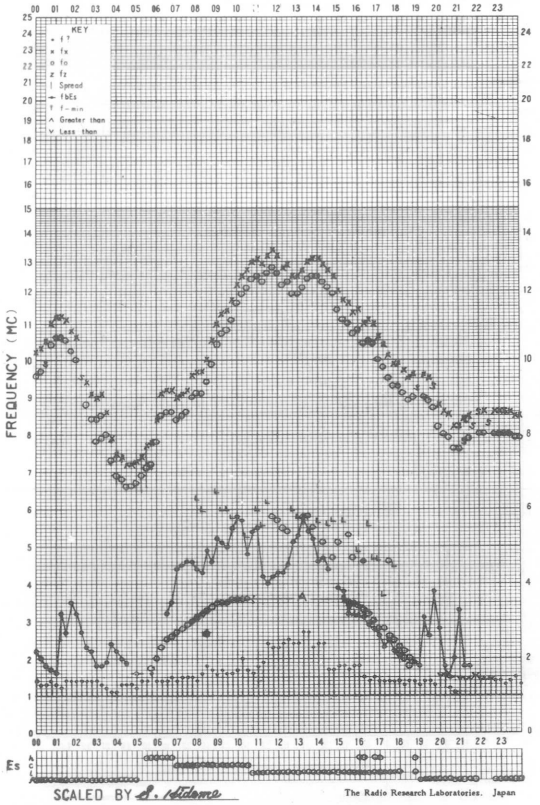
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 10.1968



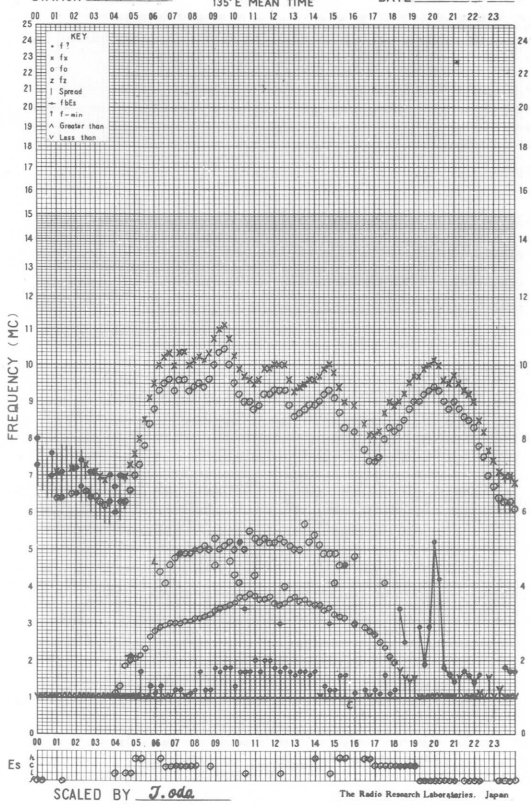
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 10. 1968



f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 11.1968

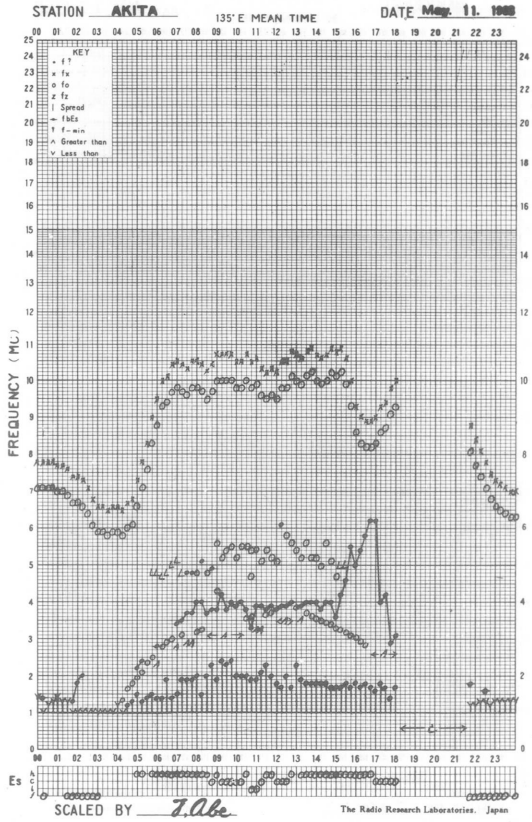


SCALED BY J. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 11. 1968

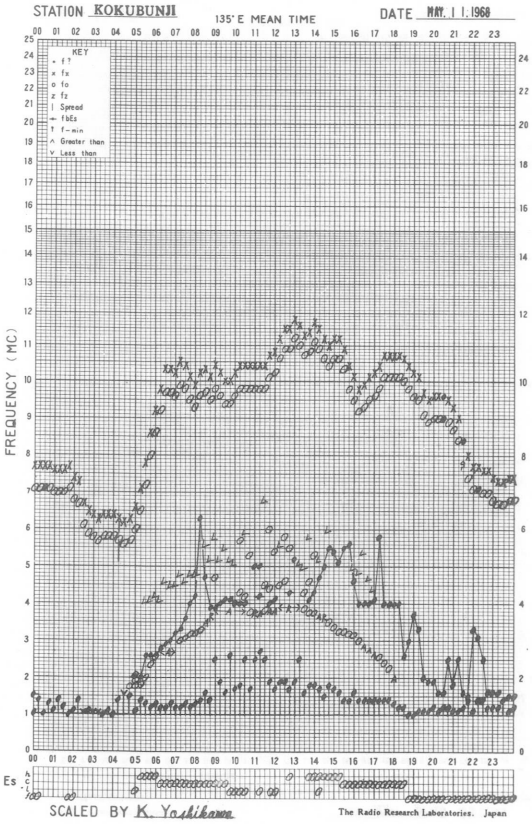


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 11.1968

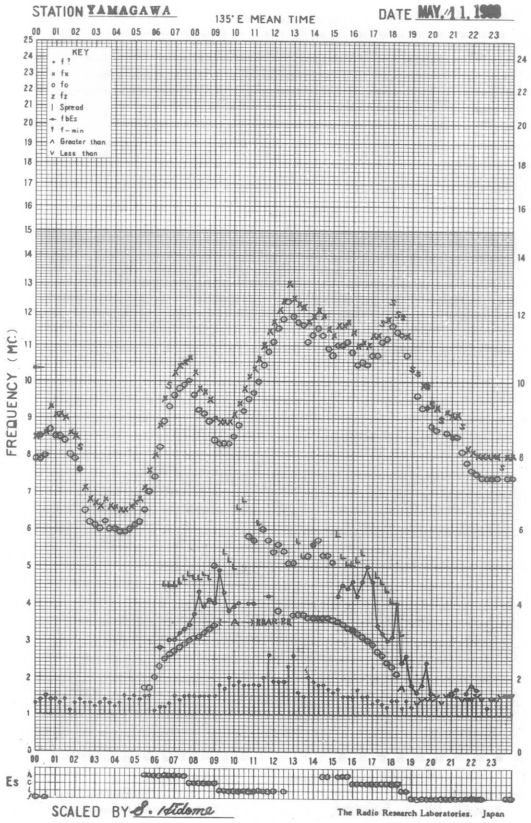


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 11. 1968

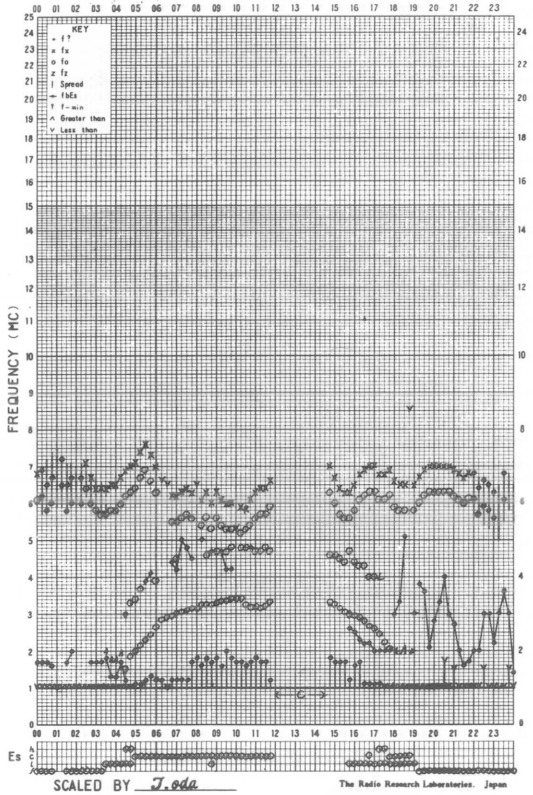


SCALED BY S. Kitdoma

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

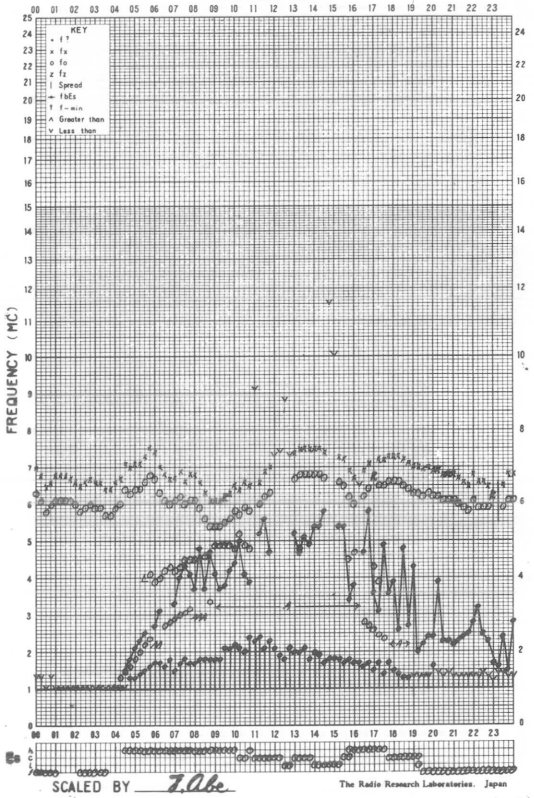
STATION WAKKANAI 135°E MEAN TIME DATE MAY. 12.1968



SCALED BY T. Oda The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

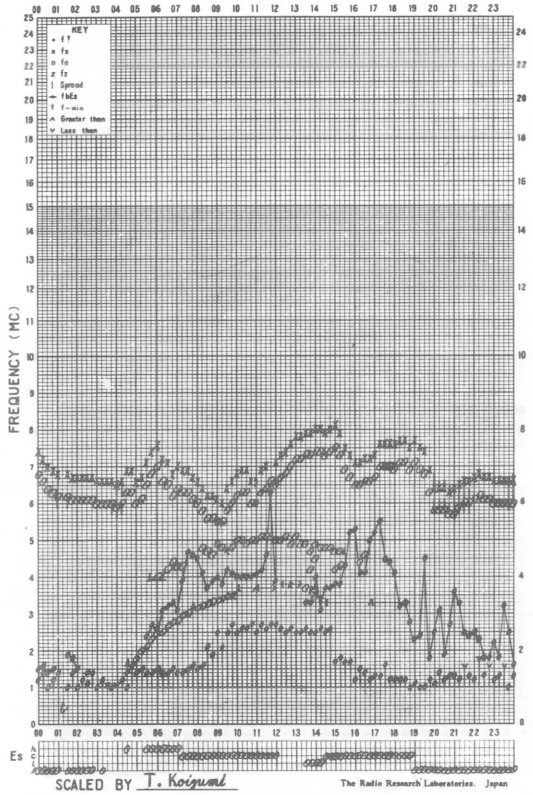
STATION AKITA 135°E MEAN TIME DATE May. 12. 1968



SCALED BY Z. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

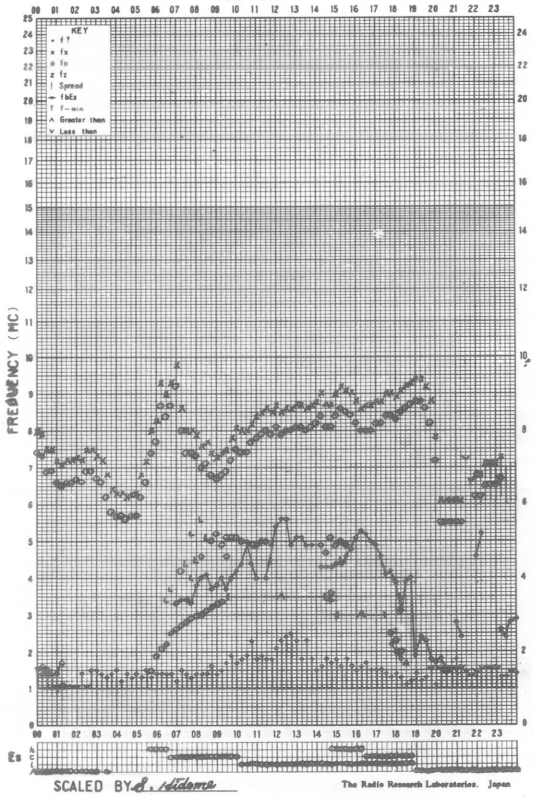
STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 12.1968



SCALED BY T. Koizumi The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

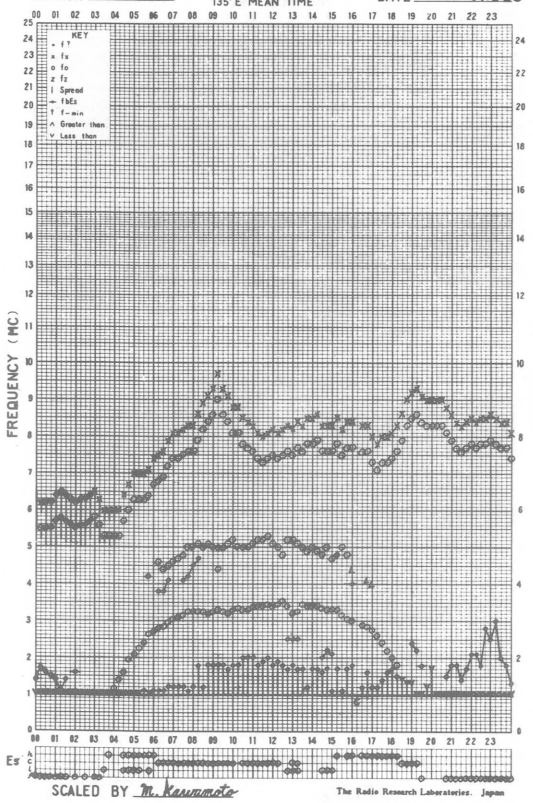
STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 12. 1968



SCALED BY S. Hidoma The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

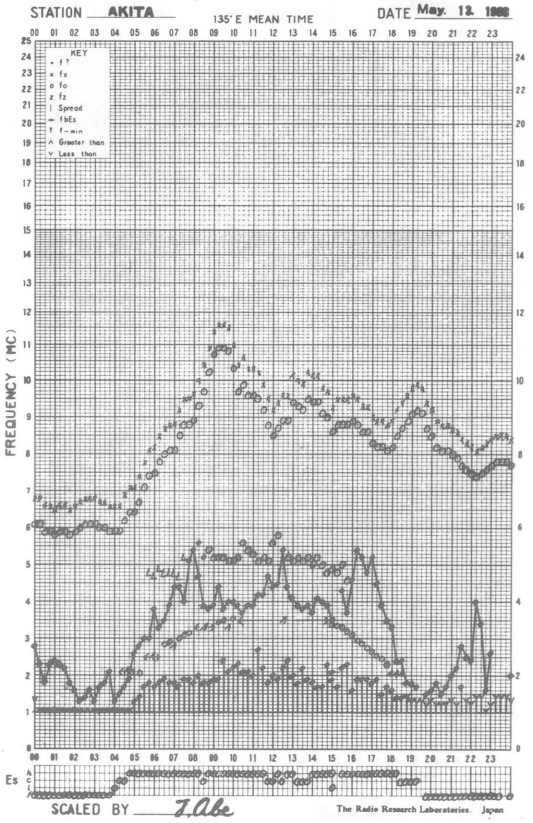
STATION WAKKANAI 135°E MEAN TIME DATE MAY. 13.1968



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

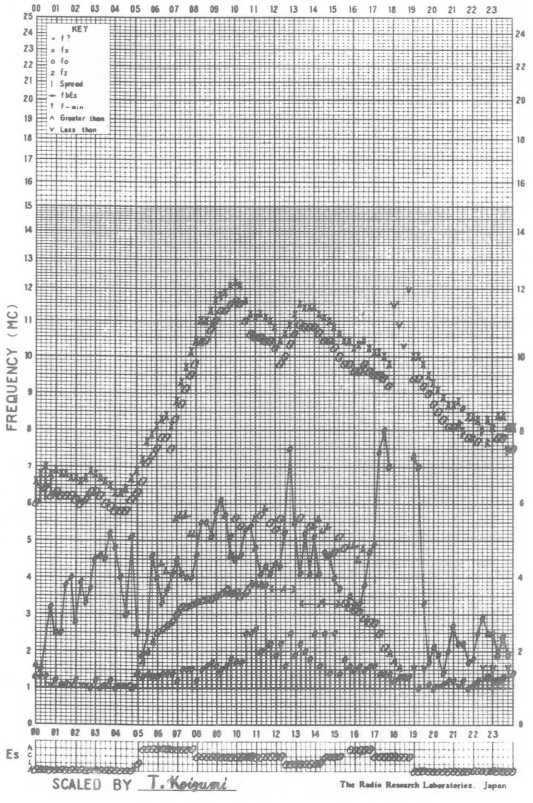
STATION AKITA 135°E MEAN TIME DATE May. 13. 1968



SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

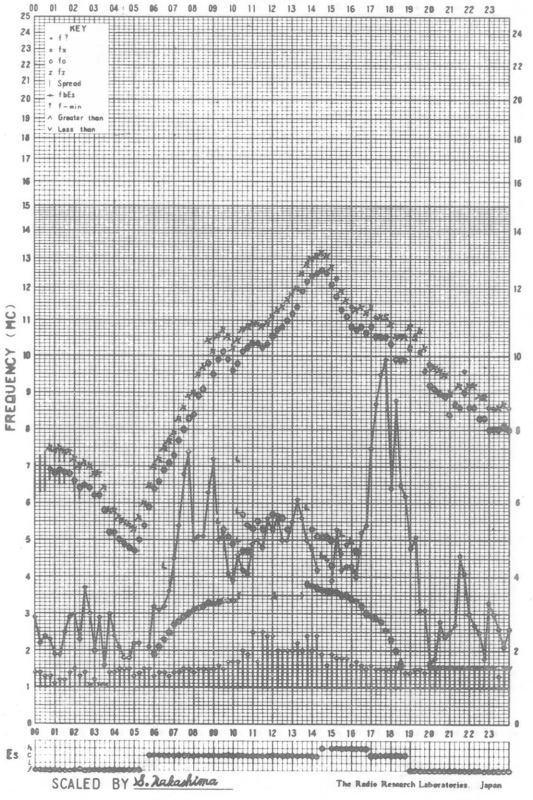
STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 13.1968



SCALED BY T. Koizumi The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

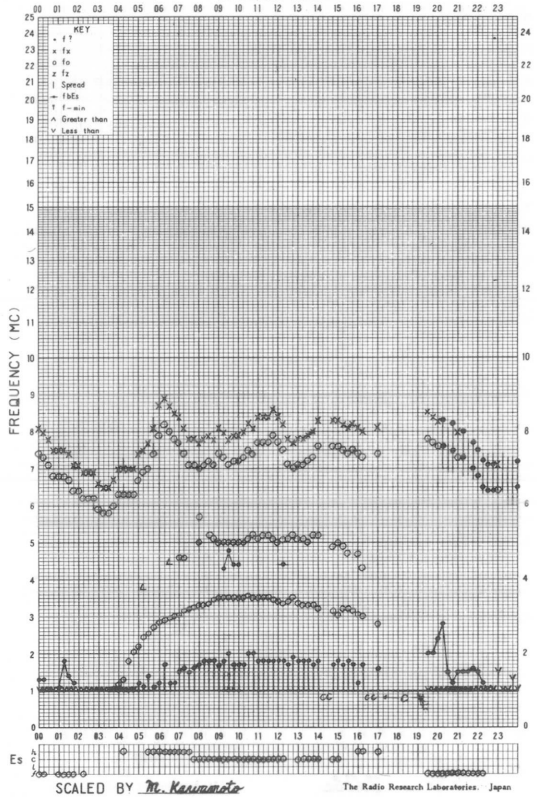
STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 13. 1968



SCALED BY S. Takashima The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

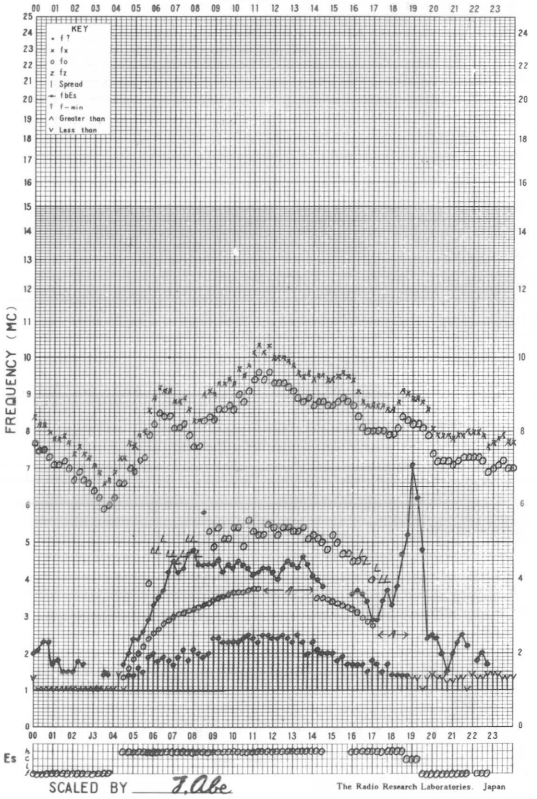
STATION WAKKANAI 135°E MEAN TIME DATE MAY. 14.1968



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

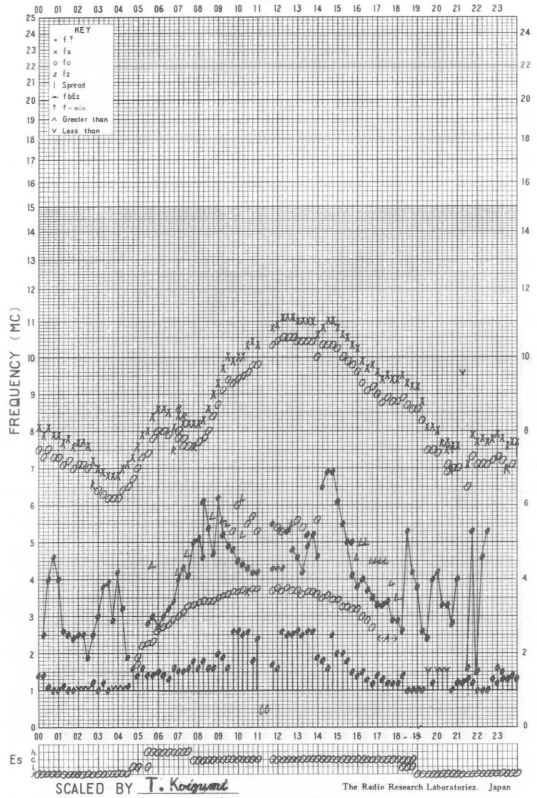
STATION AKITA 135°E MEAN TIME DATE May. 14. 1968



SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

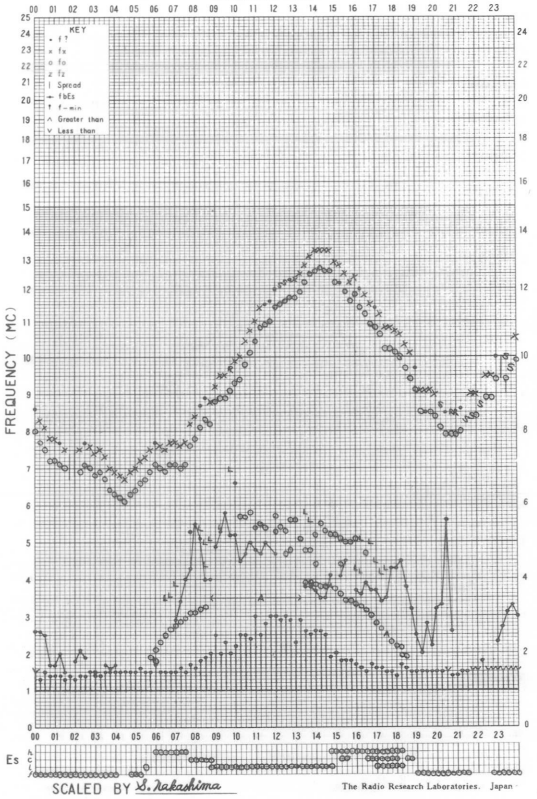
STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 14.1968



SCALED BY T. Koizumi The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

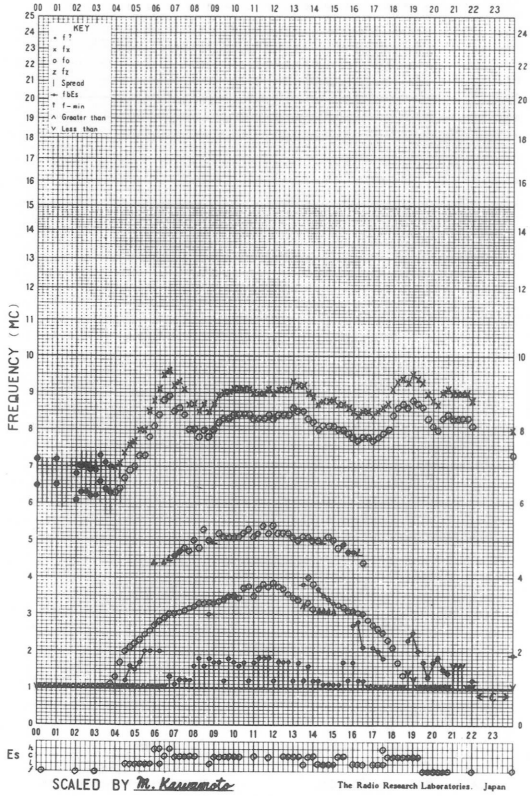
STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 14.1968



SCALED BY S. Nakashima The Radio Research Laboratories. Japan

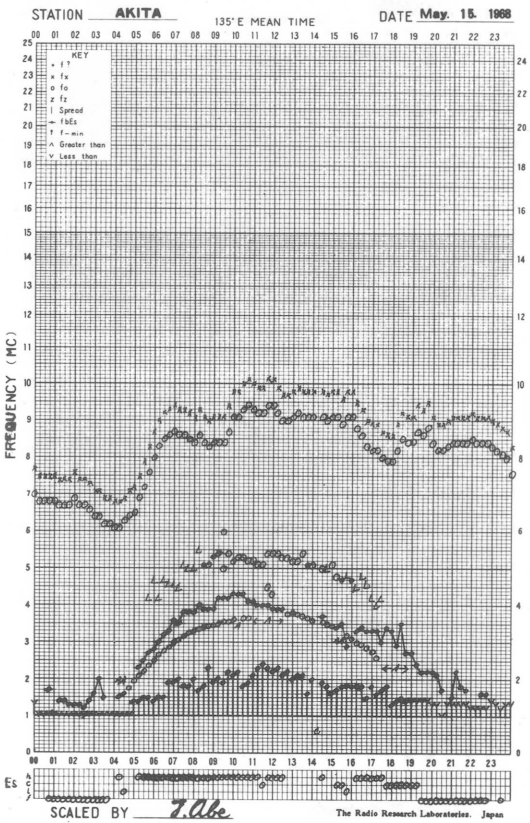
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 15.1968



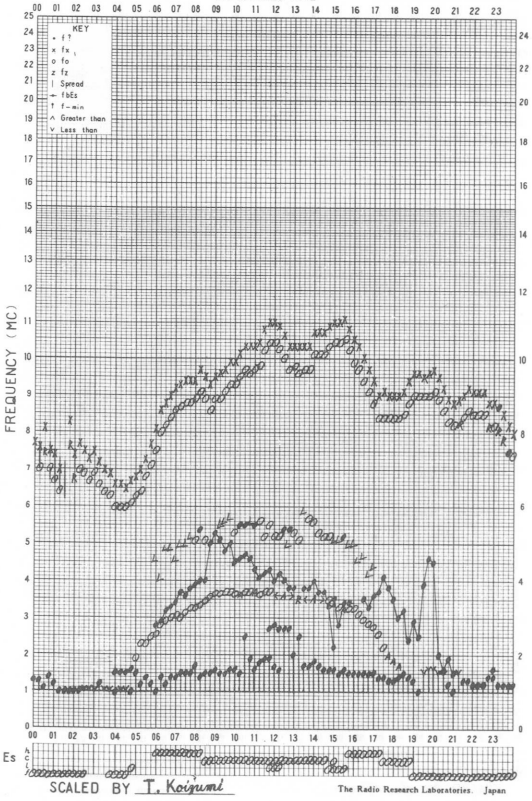
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 15. 1968



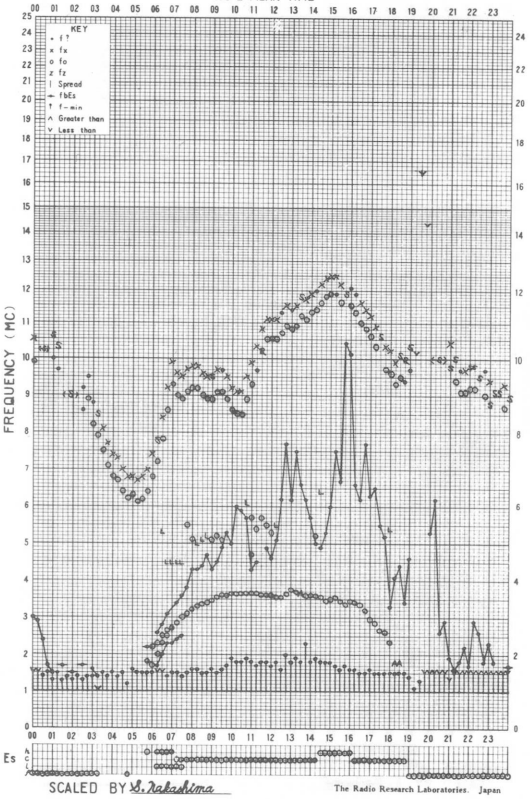
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 15.1968



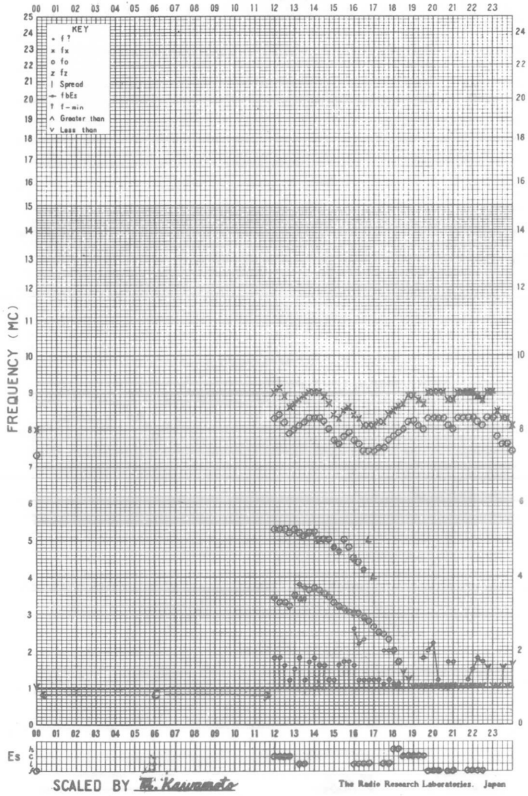
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 15. 1968



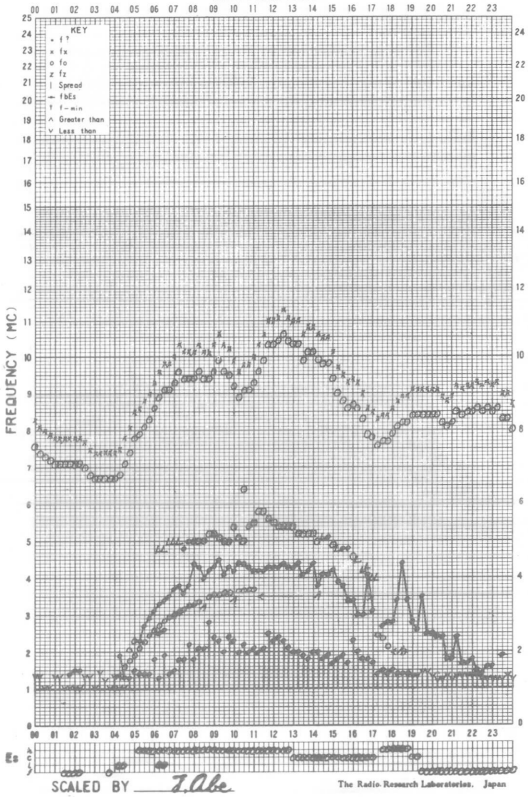
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 16. 1968



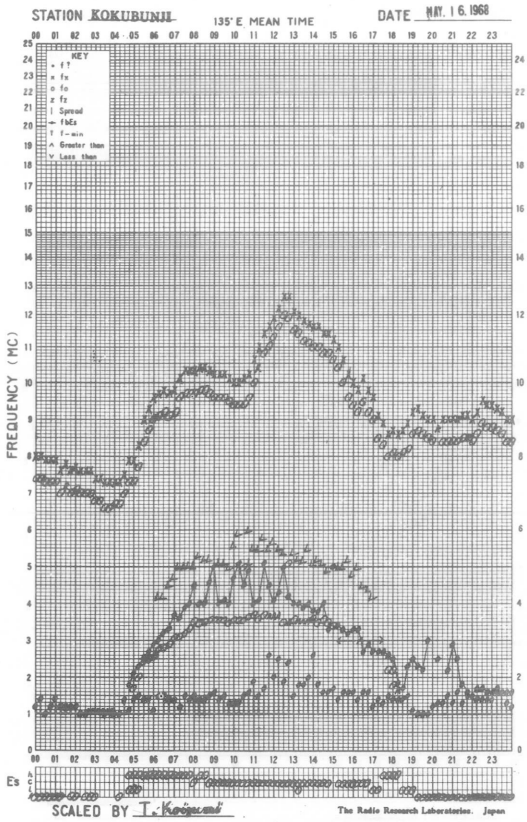
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 16. 1968



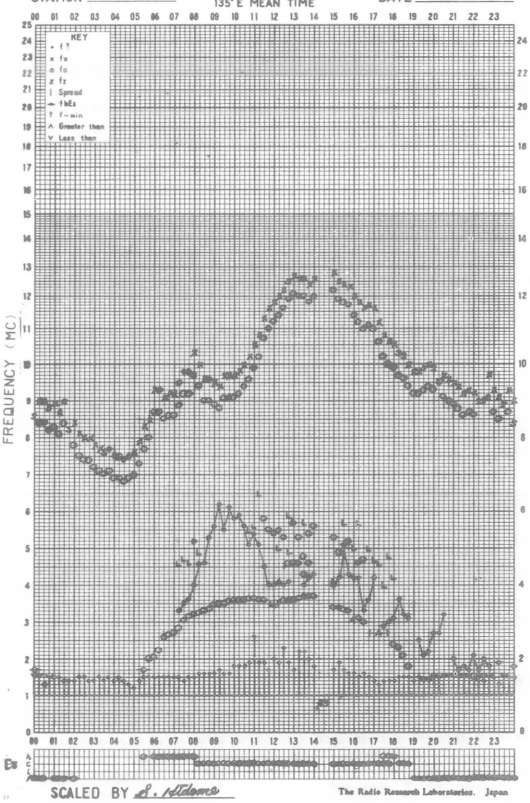
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 16. 1968



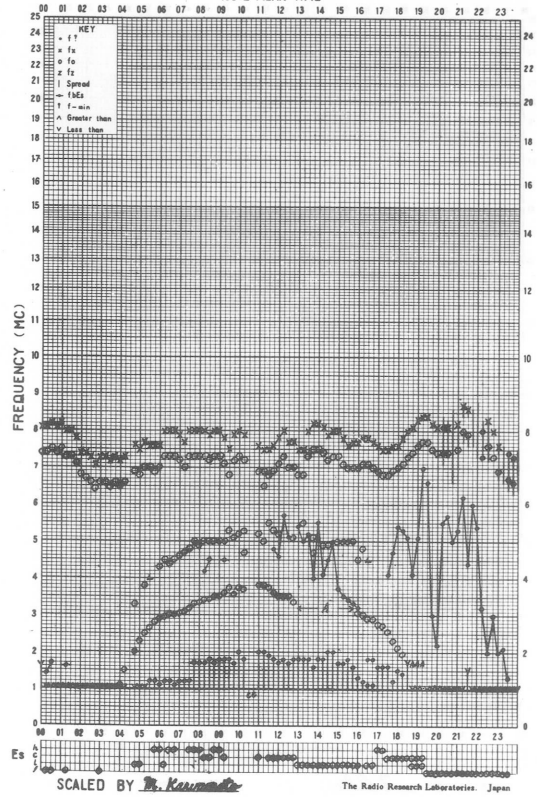
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 16. 1968



f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 17. 1968

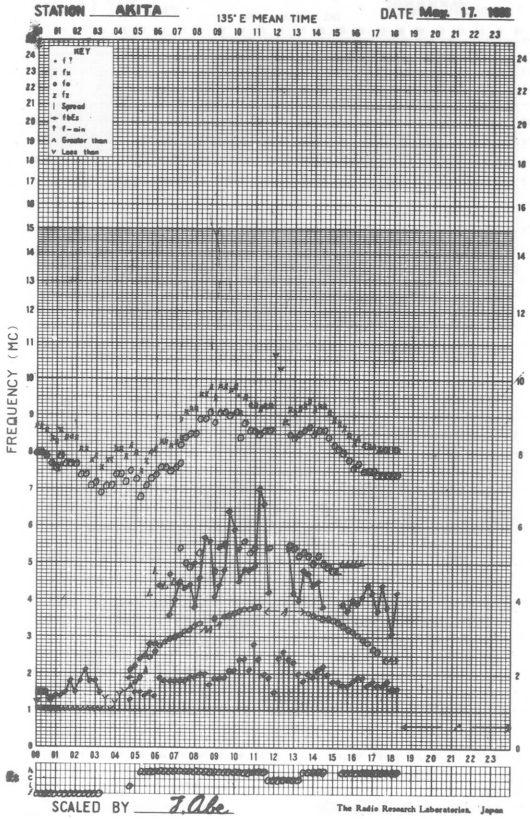


SCALED BY M. Kawamata

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 17. 1968

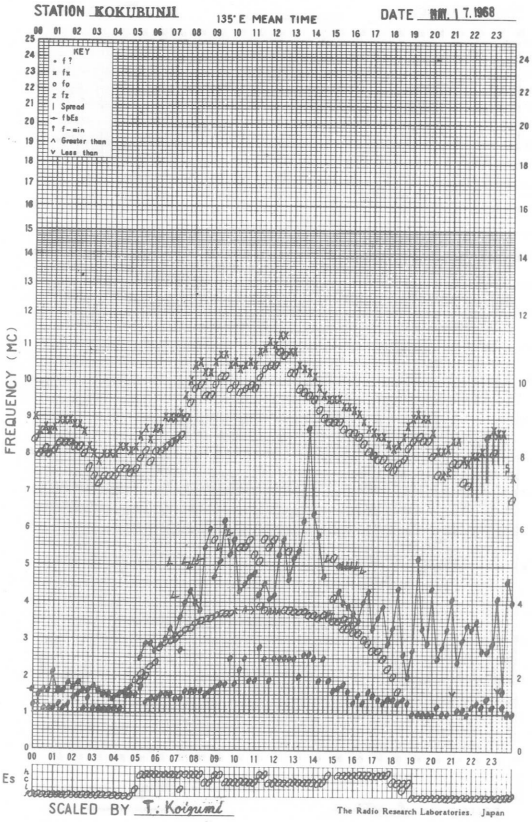


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 17. 1968

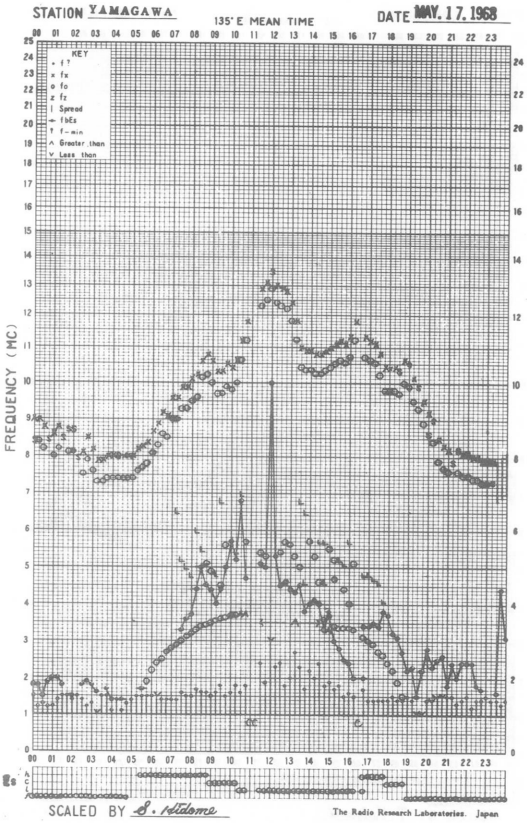


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 17. 1968

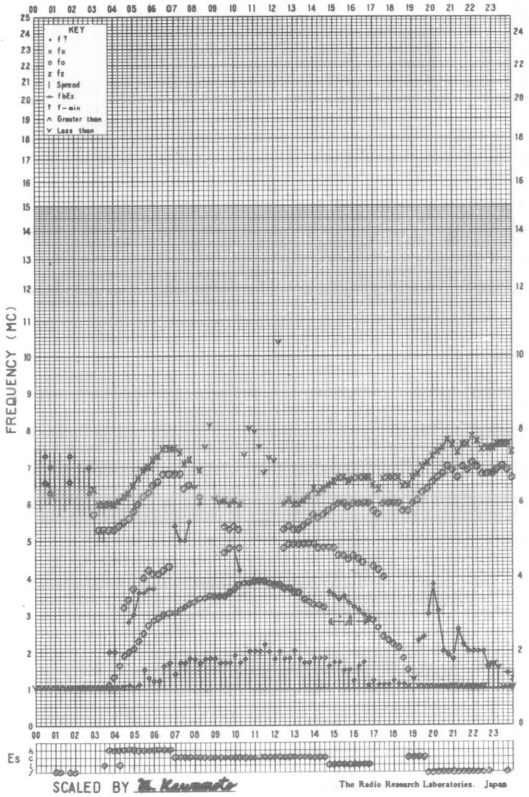


SCALED BY S. Ishidome

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 18.1968

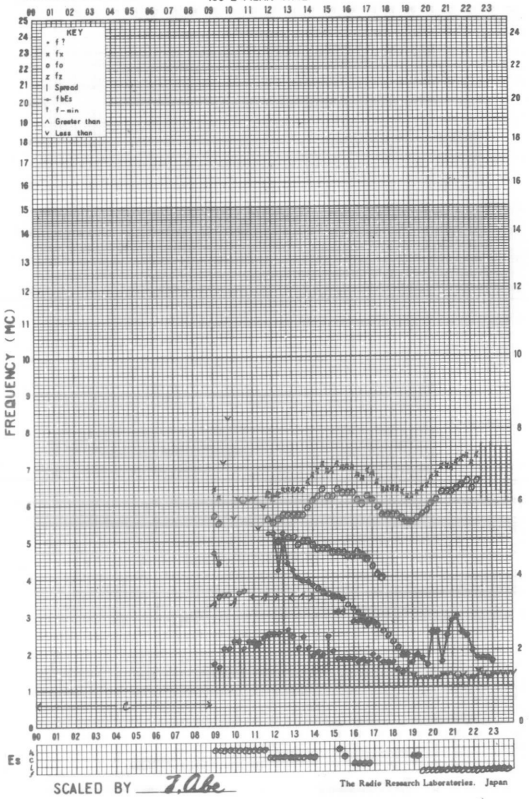


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 18. 1968

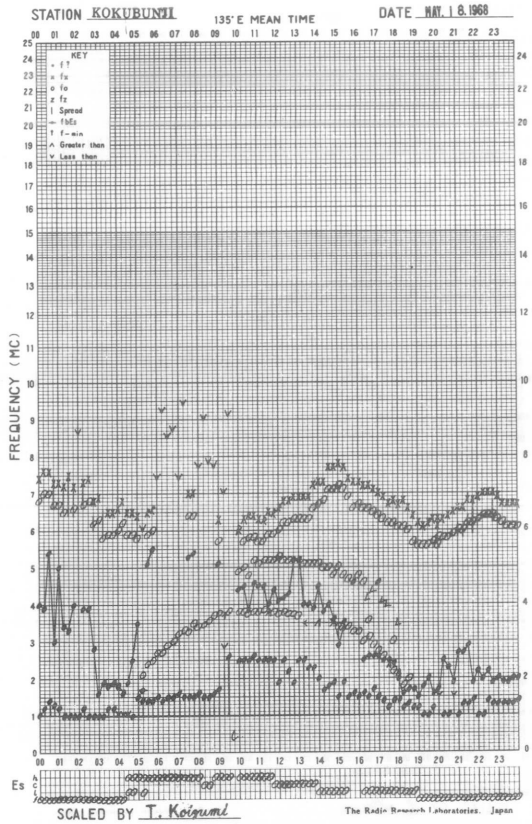


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 18.1968

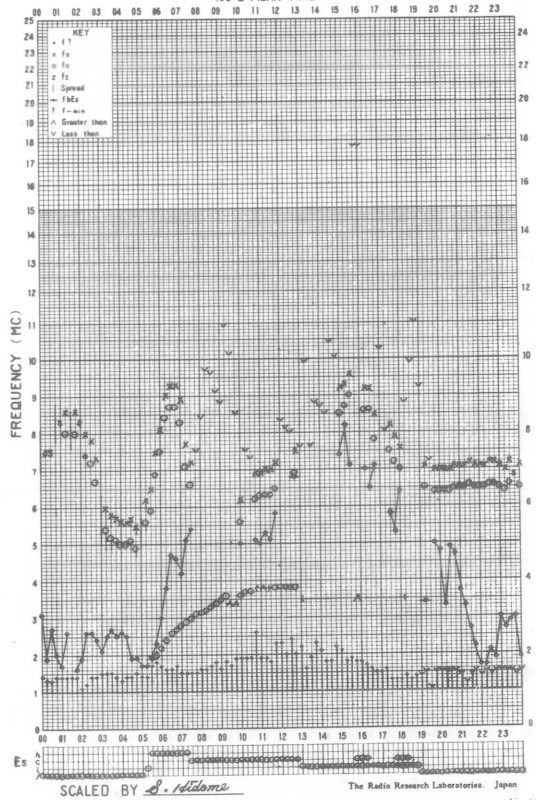


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 18. 1968

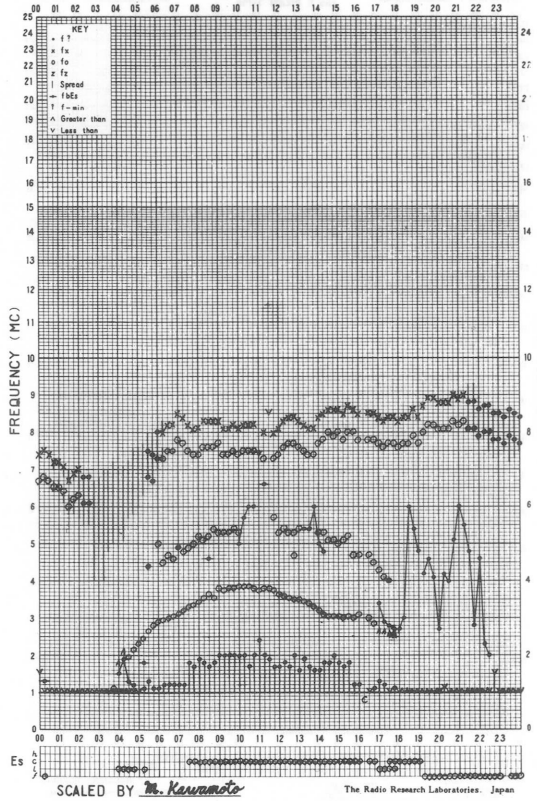


SCALED BY S. Ishioka

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

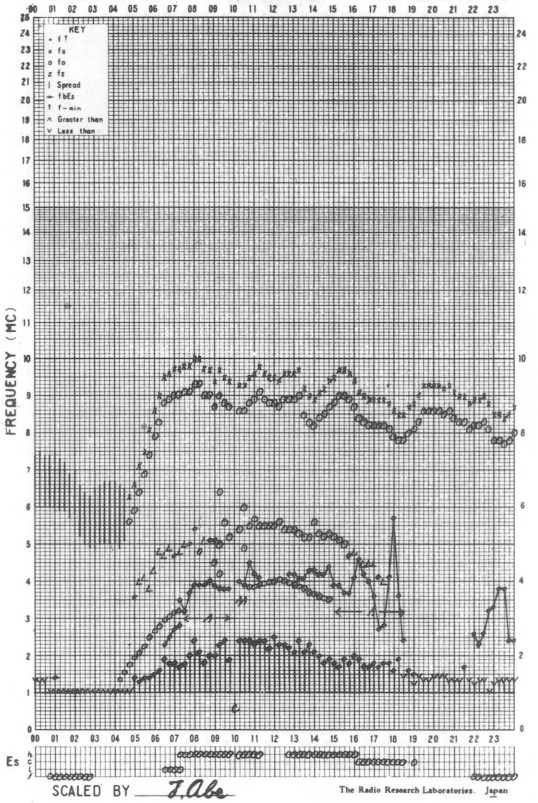
STATION WAKKANAI 135°E MEAN TIME DATE MAY. 19.1968



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

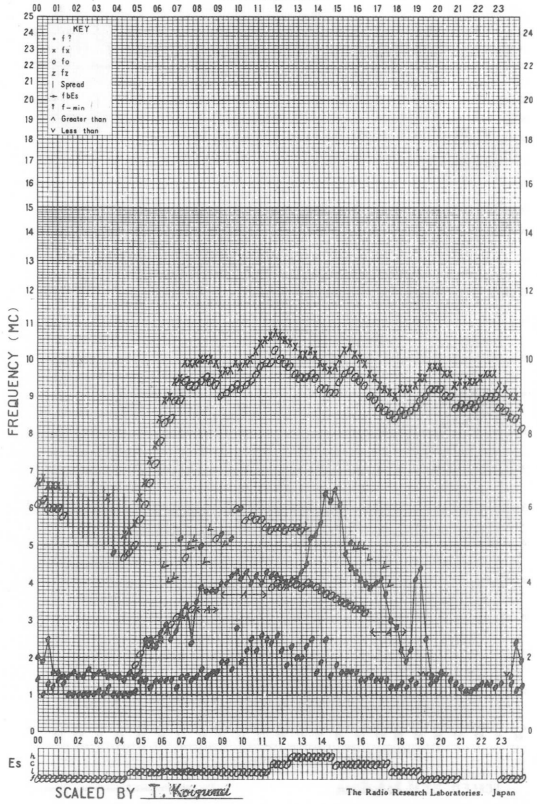
STATION AKITA 135°E MEAN TIME DATE May. 18. 1968



SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

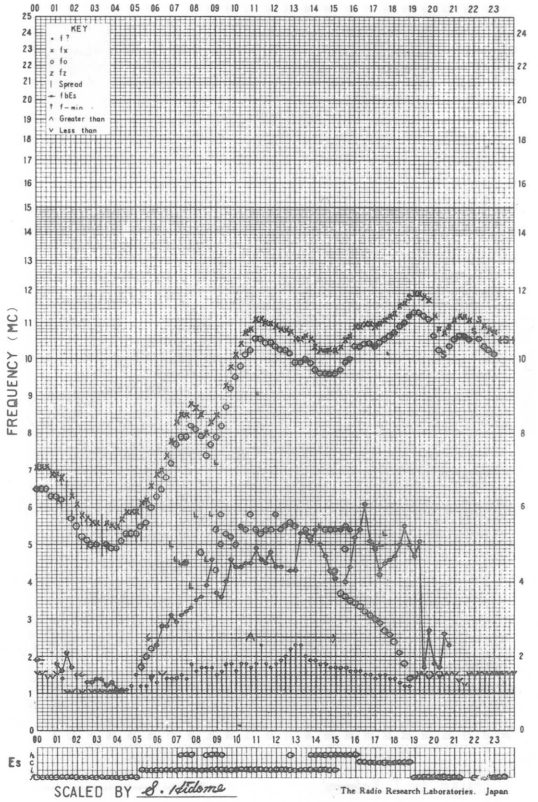
STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 19.1968



SCALED BY T. Koizumi The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

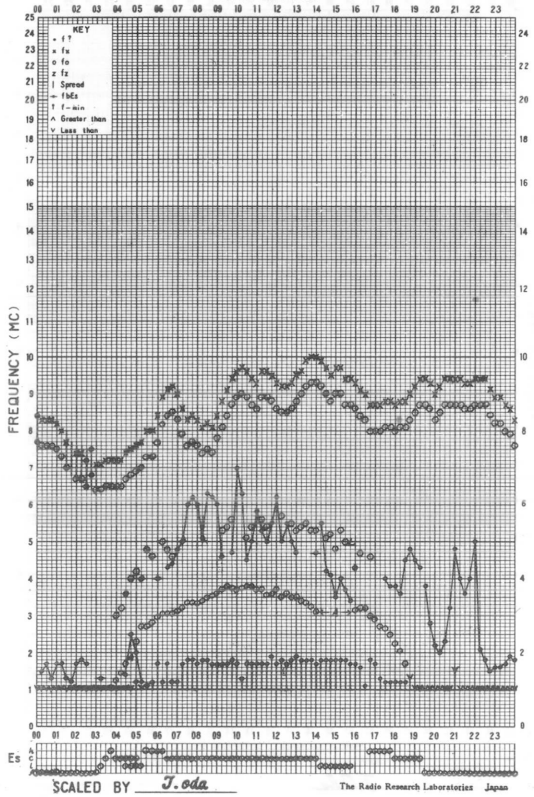
STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 19. 1968



SCALED BY S. Iidoma The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 20. 1968

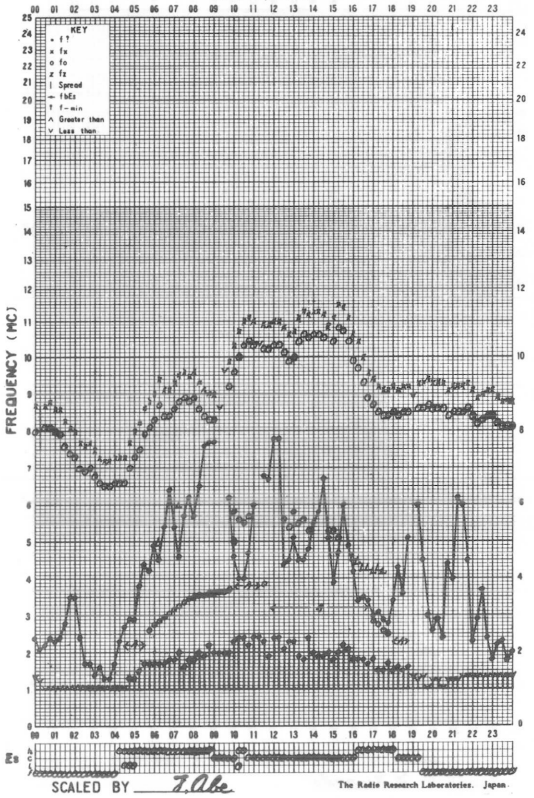


SCALED BY T. Oda

The Radio Research Laboratories Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 20. 1968

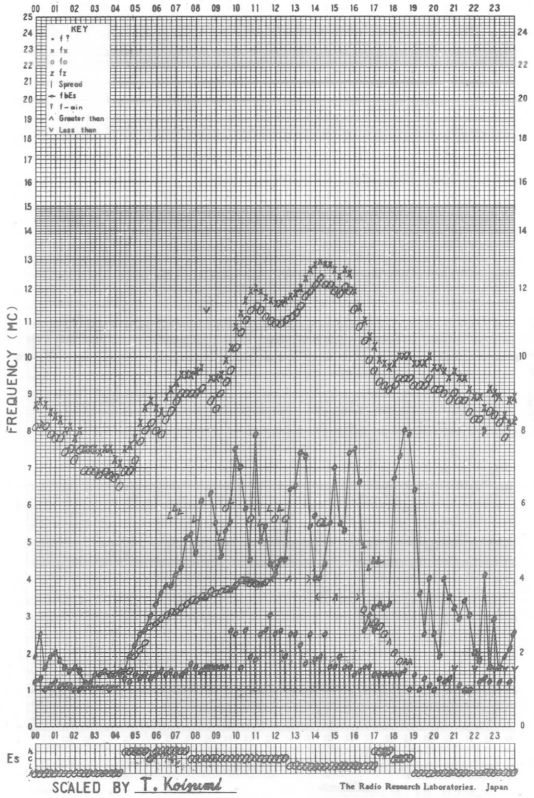


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 20. 1968

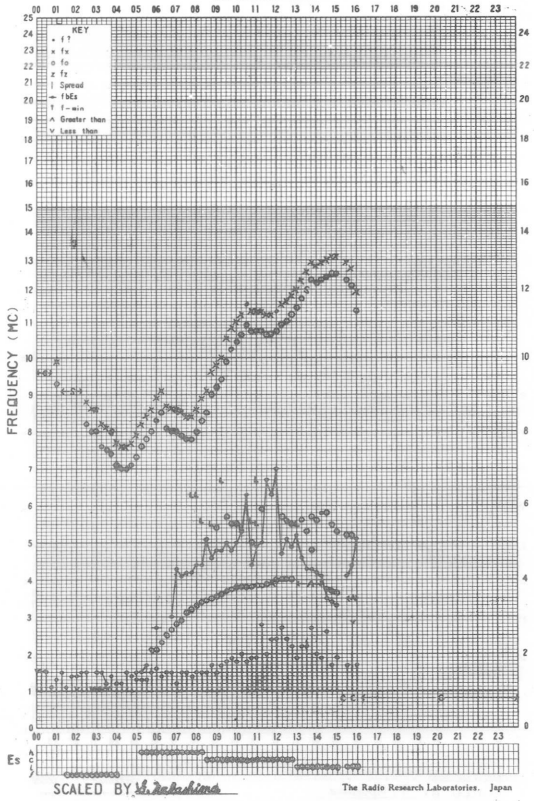


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 20. 1968

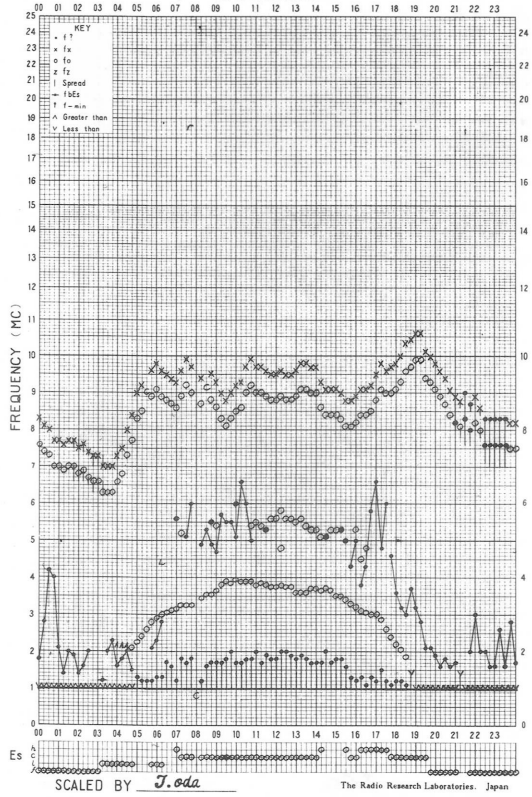


SCALED BY H. Nakashima

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 21. 1968

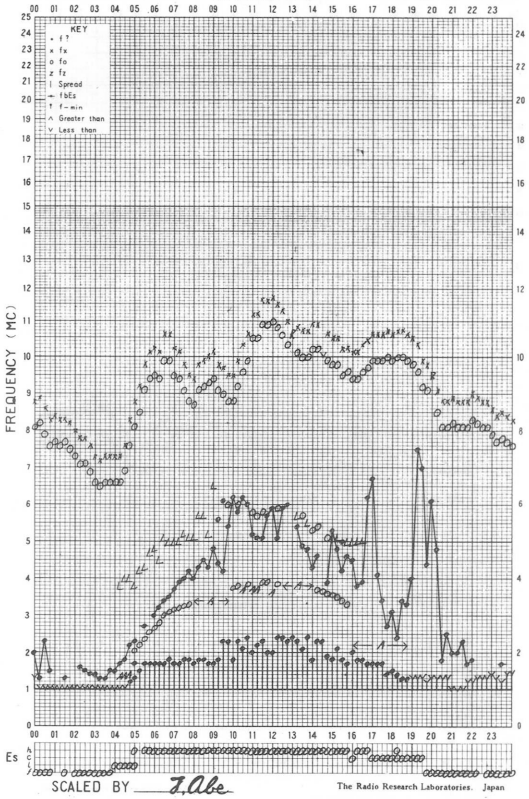


SCALED BY T. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 21. 1968

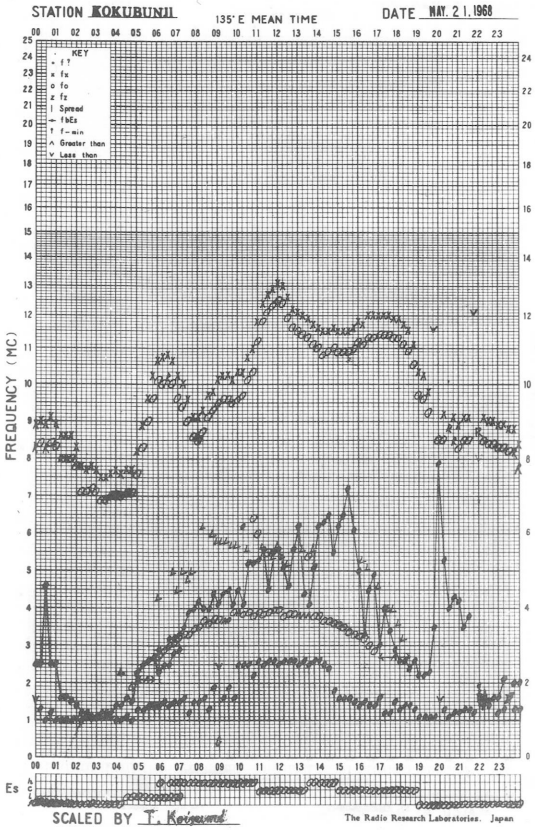


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 21. 1968

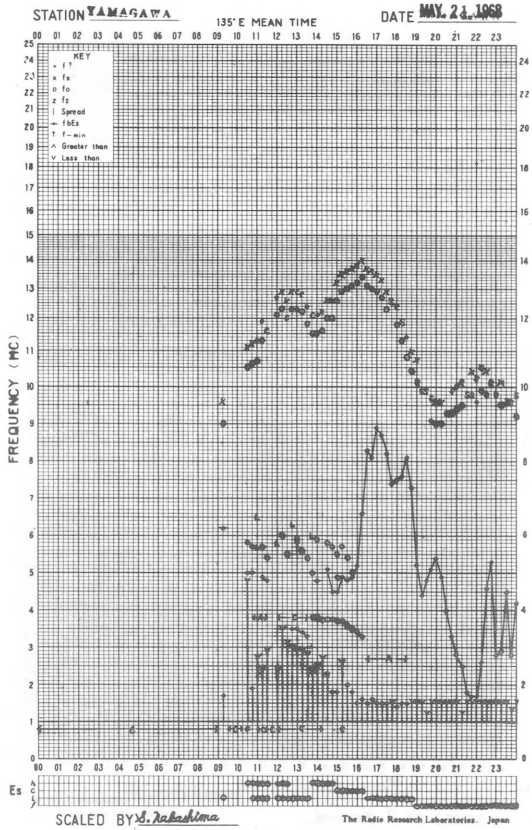


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

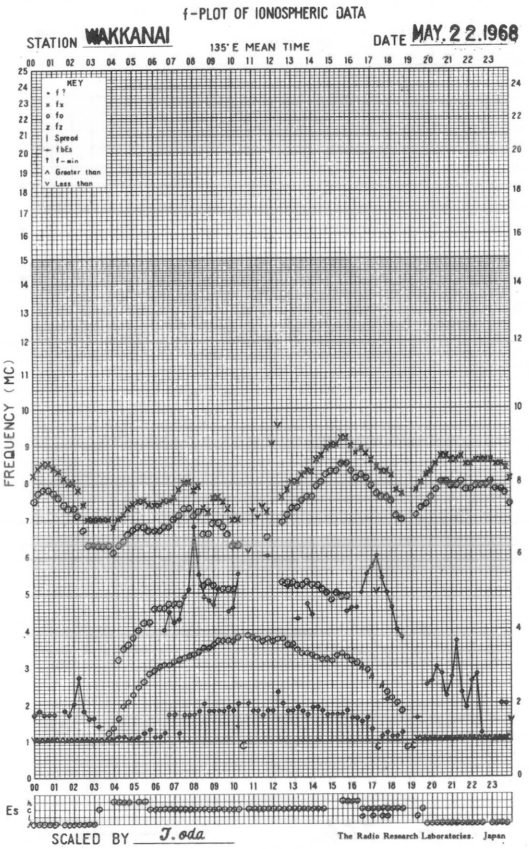
f-PLOT OF IONOSPHERIC DATA

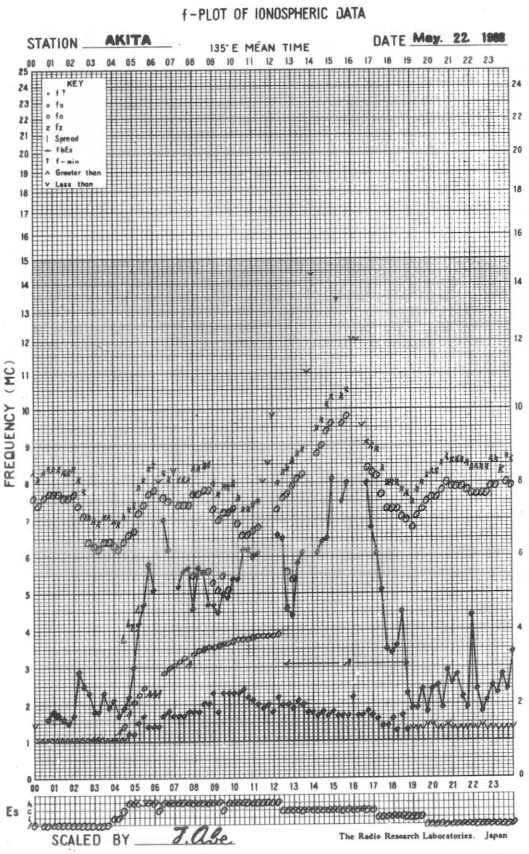
STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 21. 1968

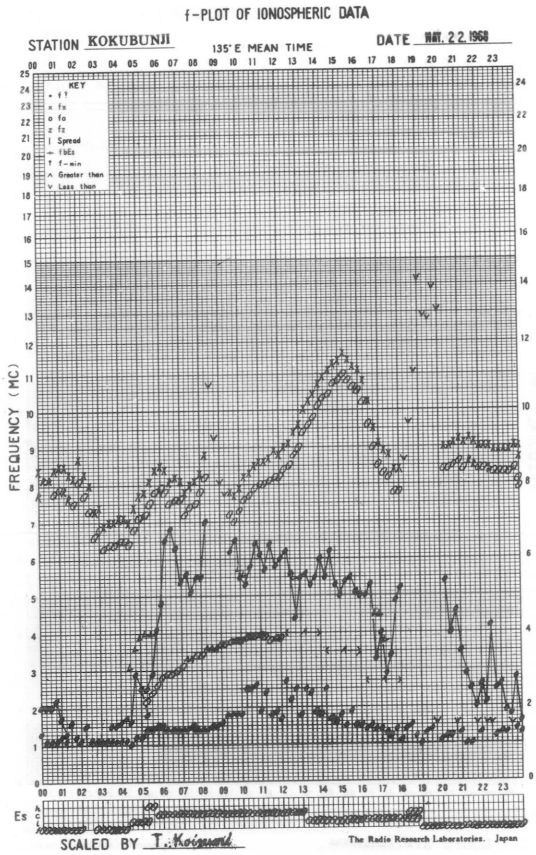


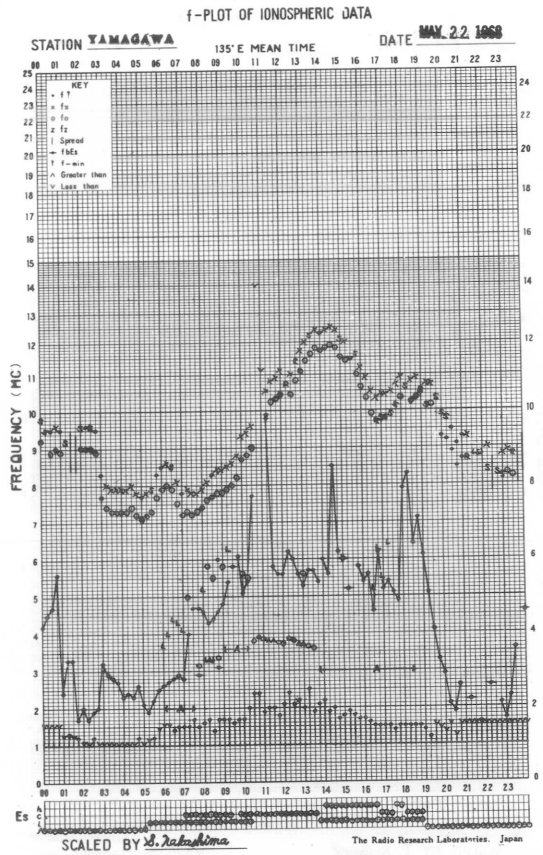
SCALED BY S. Nakashima

The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135°E MEAN TIME
DATE MAY. 22. 1968
KEY
FREQUENCY (MC)
Es
SCALED BY T. Oda
The Radio Research Laboratories. Japan

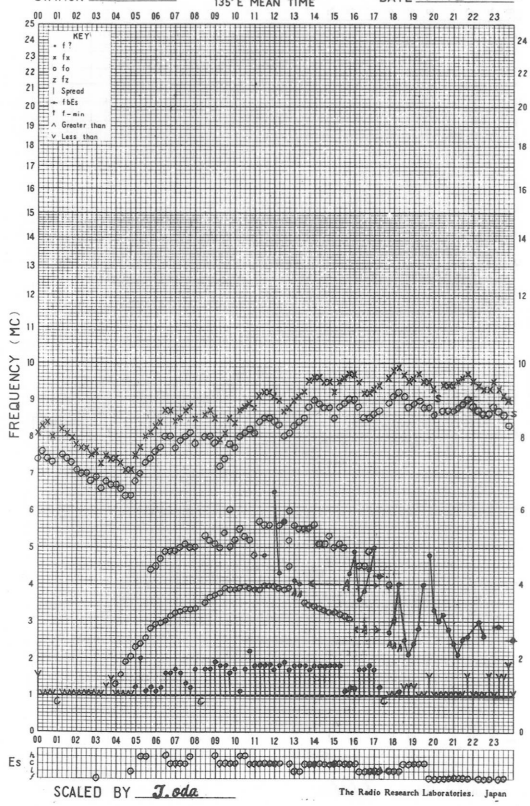

f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135°E MEAN TIME
DATE May. 22. 1968
KEY
FREQUENCY (MC)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135°E MEAN TIME
DATE MAY. 22. 1968
KEY
FREQUENCY (MC)
Es
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135°E MEAN TIME
DATE MAY. 22. 1968
KEY
FREQUENCY (MC)
Es
SCALED BY S. Takashima
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

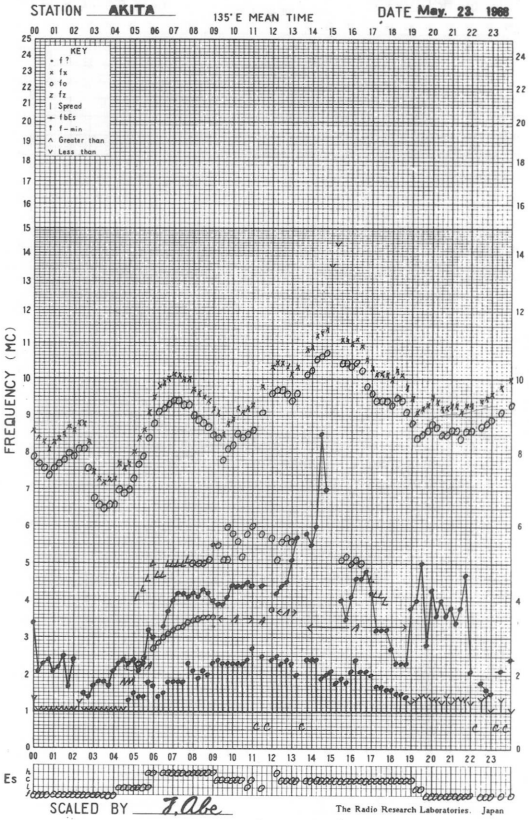
STATION WAKKANAI 135°E MEAN TIME DATE MAY. 23. 1968



SCALED BY T. Oda The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

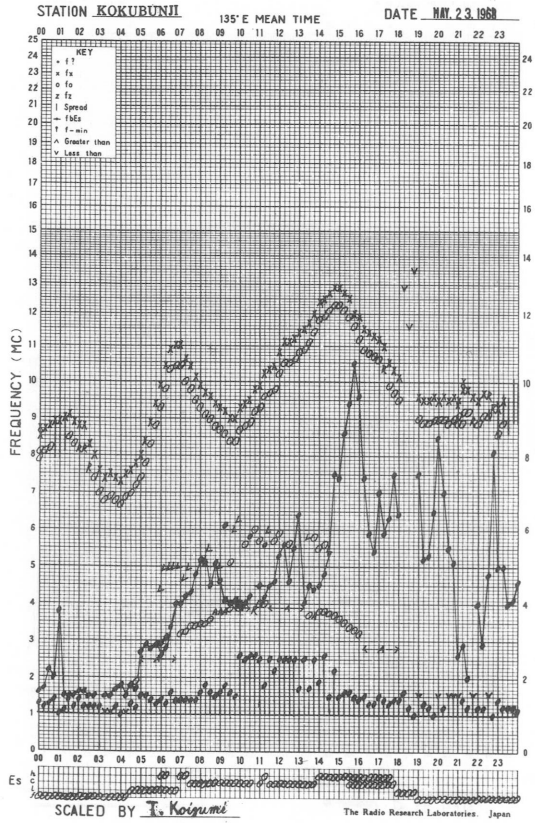
STATION AKITA 135°E MEAN TIME DATE May. 23. 1968



SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

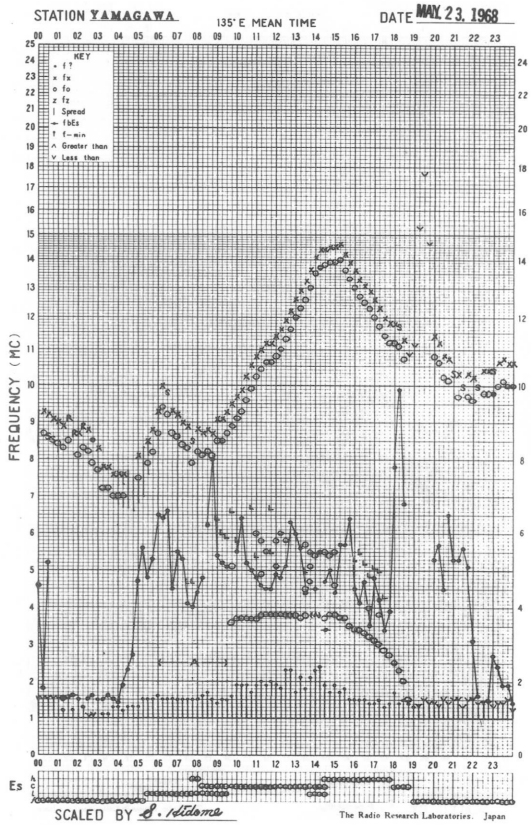
STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 23. 1968



SCALED BY T. Koizumi The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

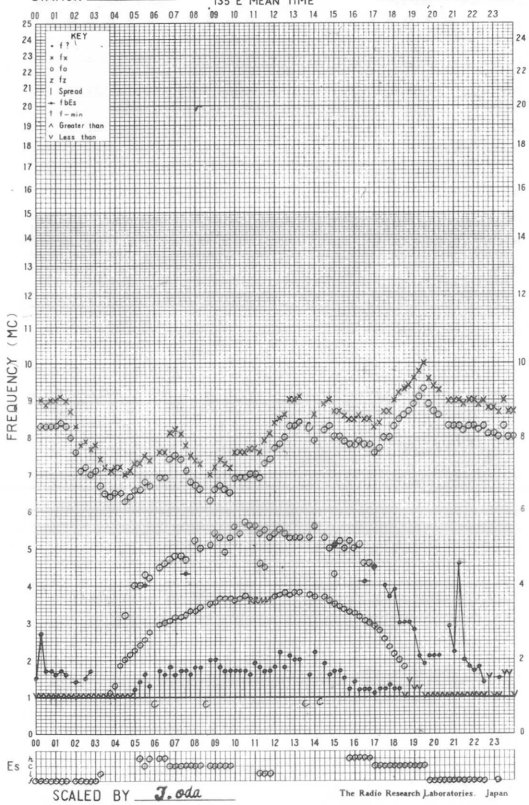
STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 23. 1968



SCALED BY S. Iidema The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 24.1968

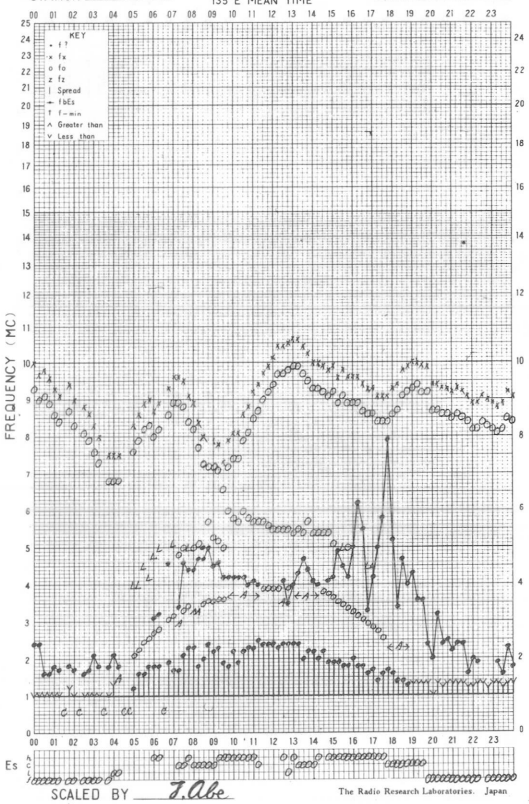


SCALED BY T. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 24. 1968

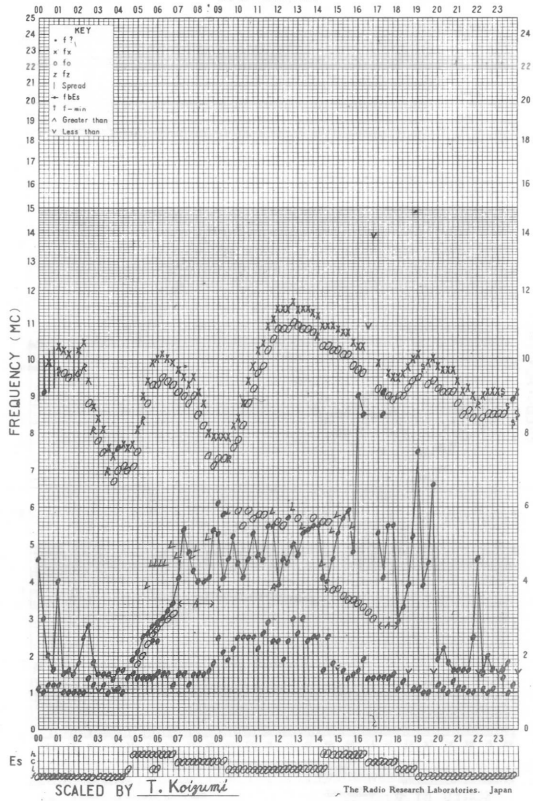


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 24.1968

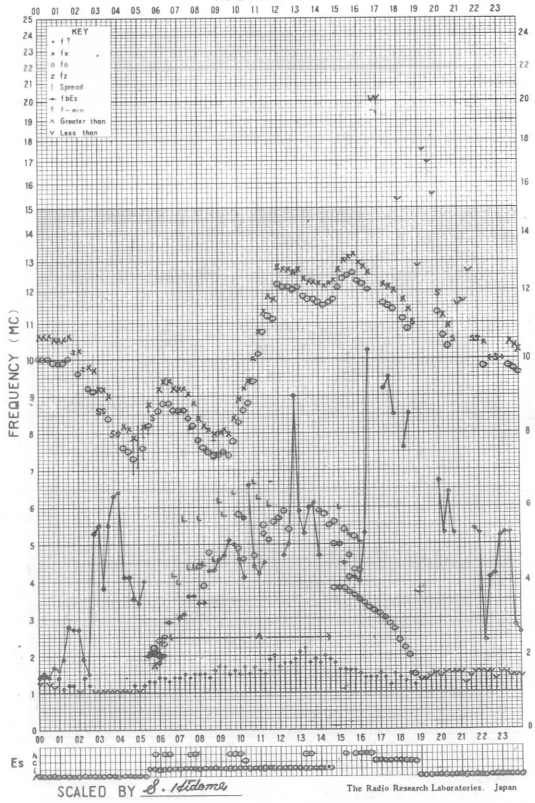


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

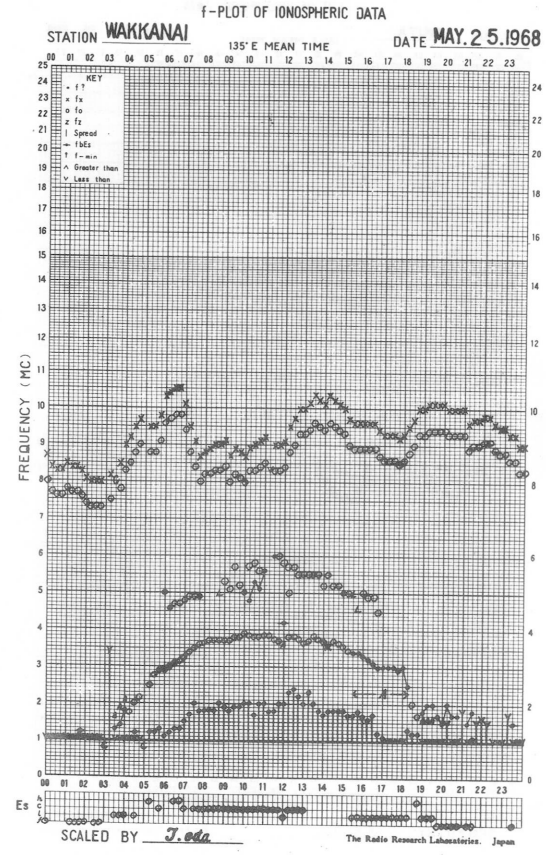
f-PLOT OF IONOSPHERIC DATA

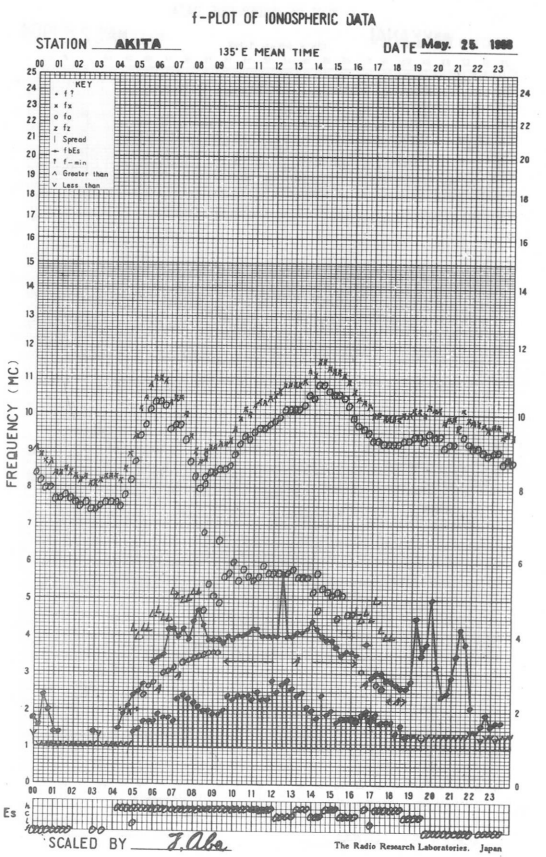
STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 24. 1968

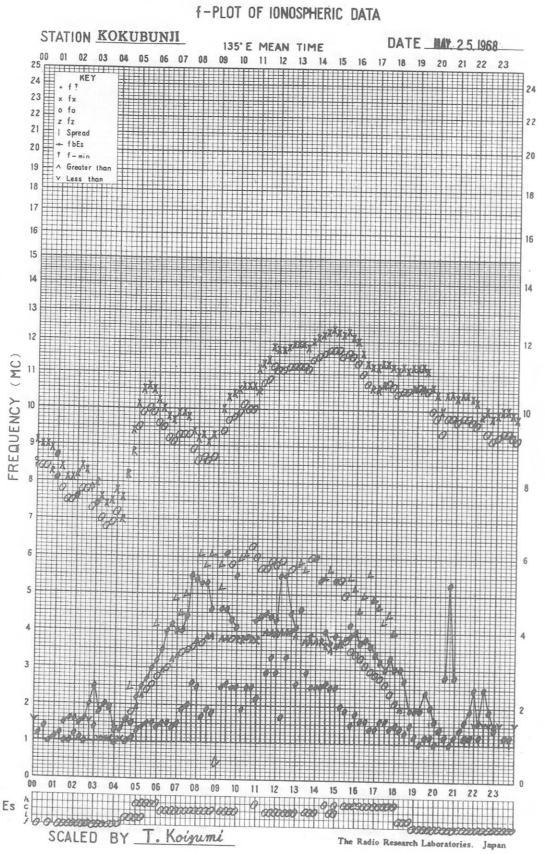


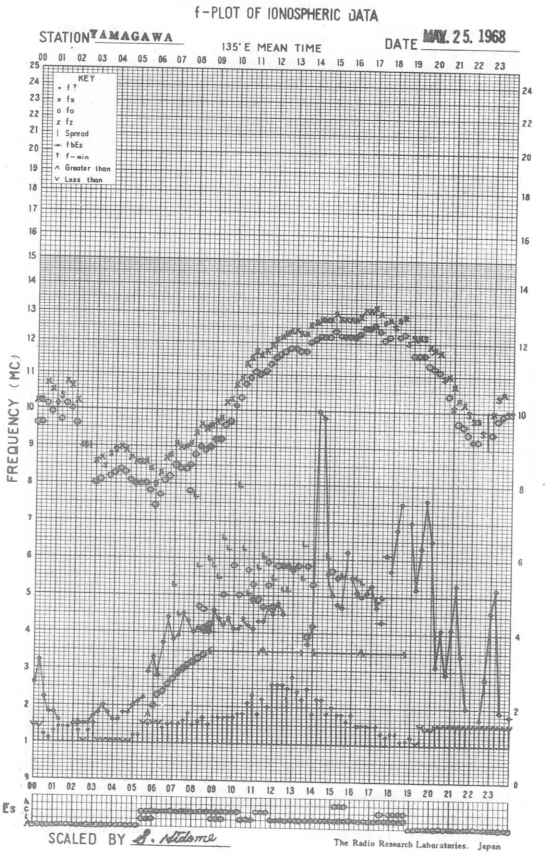
SCALED BY S. Iidoma

The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE MAY. 2 5. 1968
KEY
FREQUENCY (MC)
Es
SCALED BY T. oda
The Radio Research Laboratories. Japan

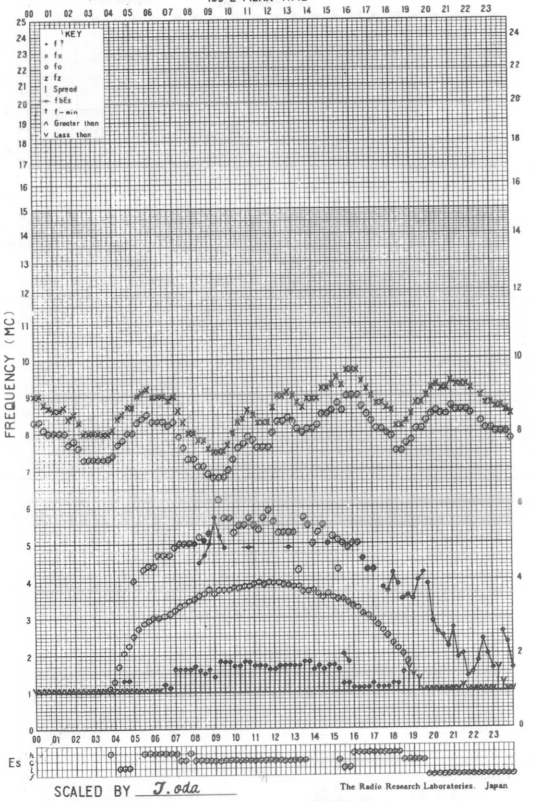

f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135° E MEAN TIME
DATE May. 25. 1968
KEY
FREQUENCY (MC)
Es
SCALED BY I. Abe
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135° E MEAN TIME
DATE MAY. 25. 1968
KEY
FREQUENCY (MC)
Es
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135° E MEAN TIME
DATE MAY. 25. 1968
KEY
FREQUENCY (MC)
Es
SCALED BY S. Shidama
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 26. 1968

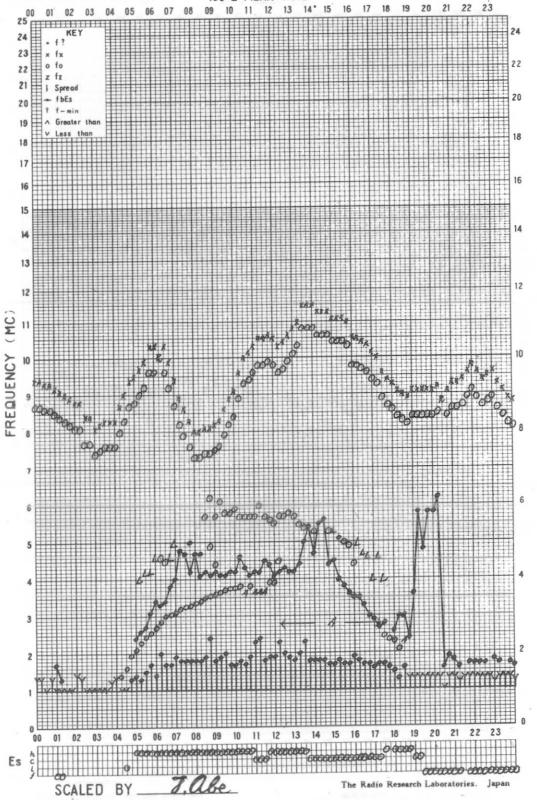


SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 26. 1968

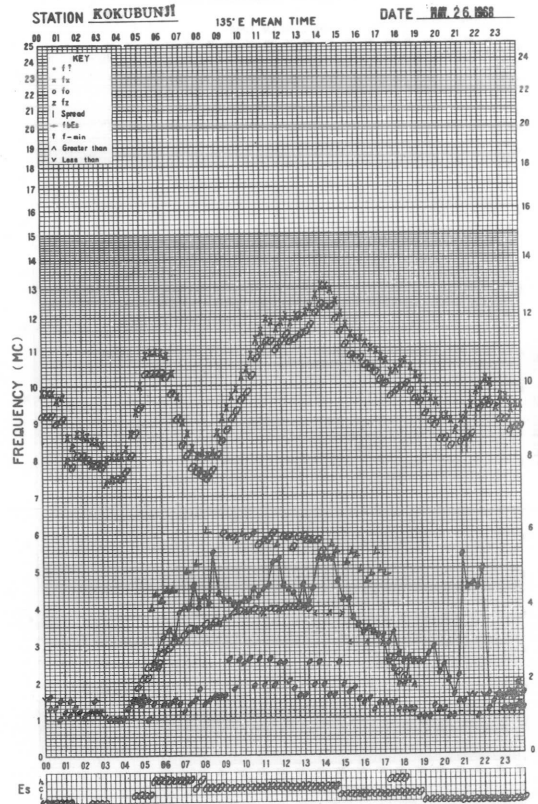


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 26. 1968

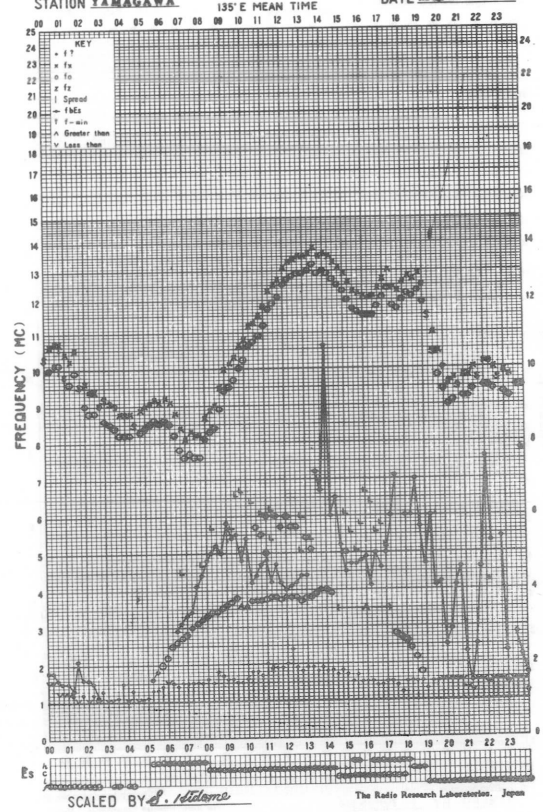


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 26. 1968

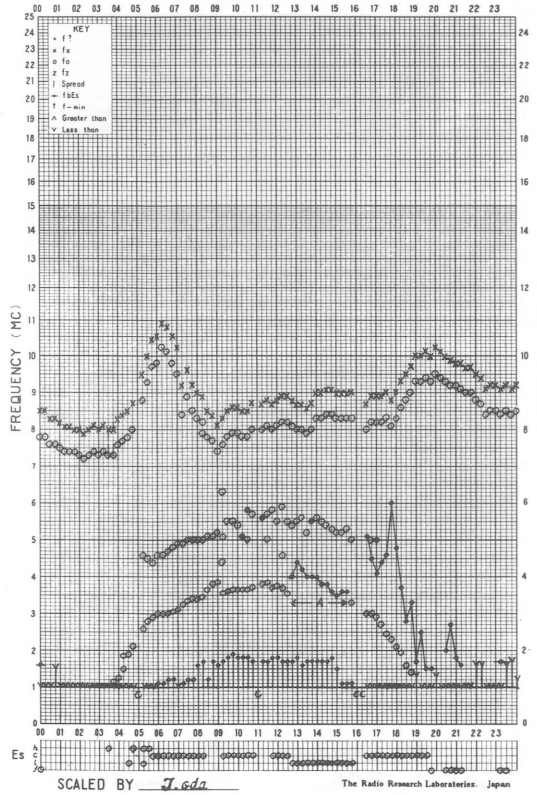


SCALED BY S. Uchiama

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 27.1968

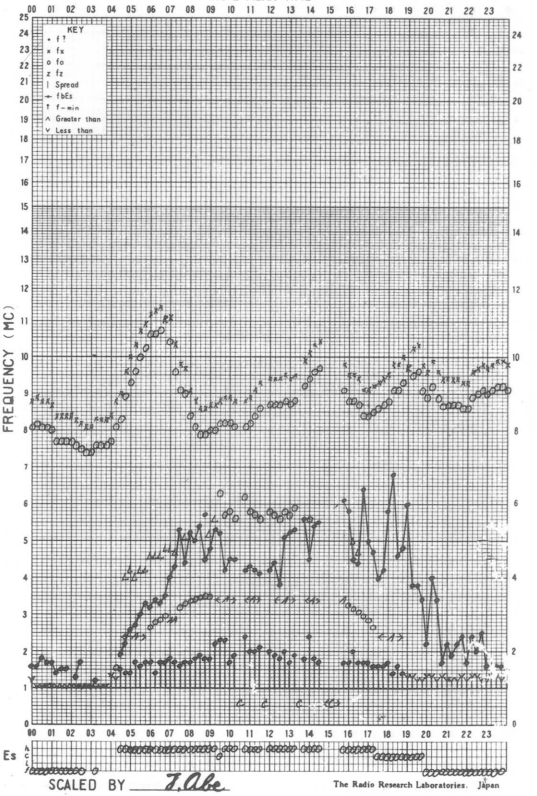


SCALED BY T. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 27. 1968

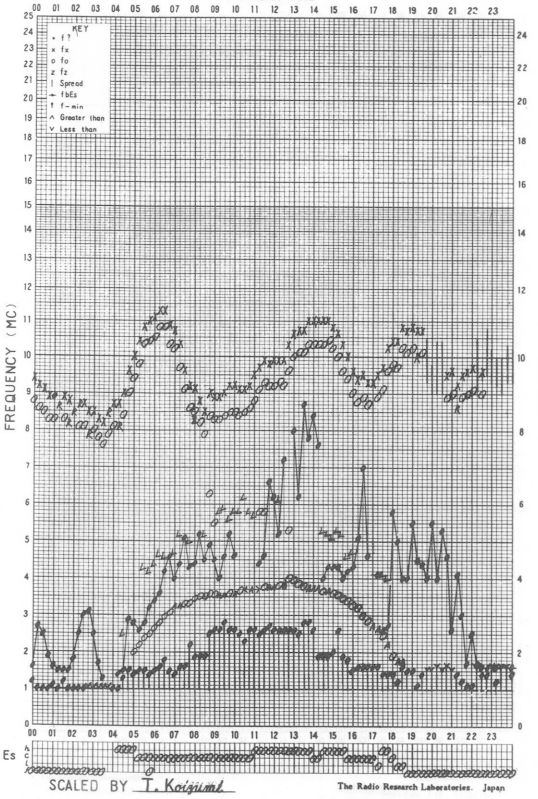


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 27. 1968

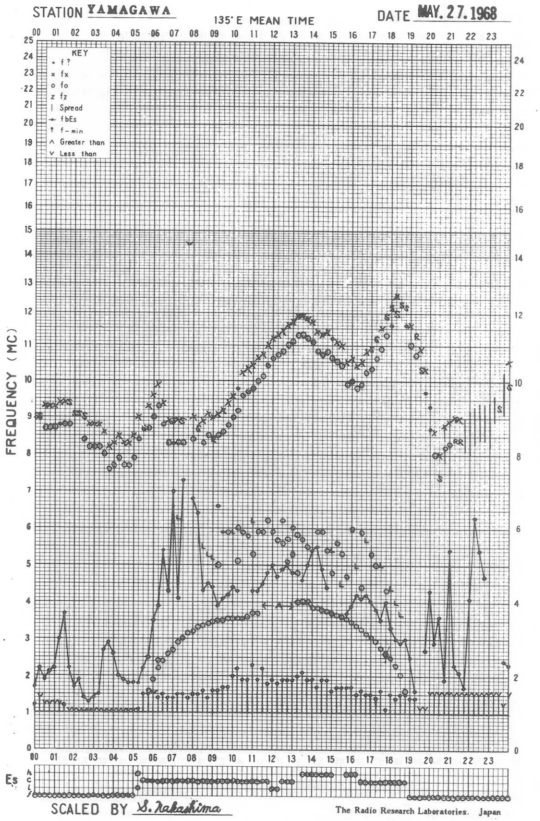


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 27. 1968

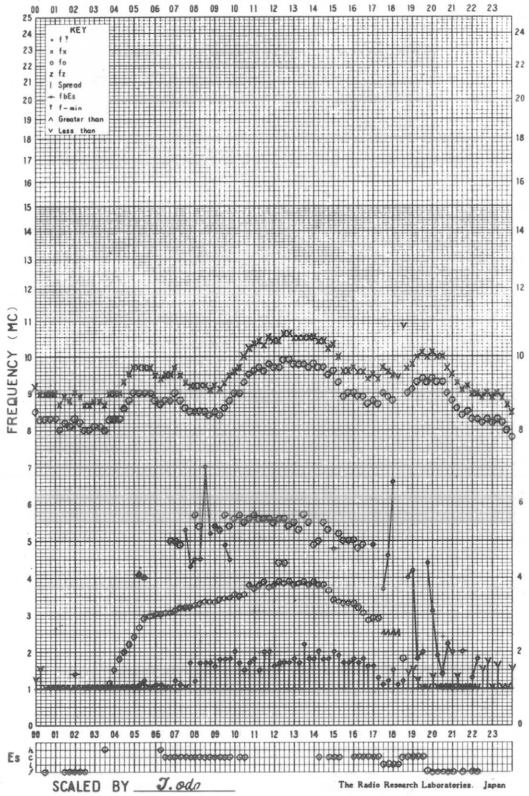


SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 28. 1968

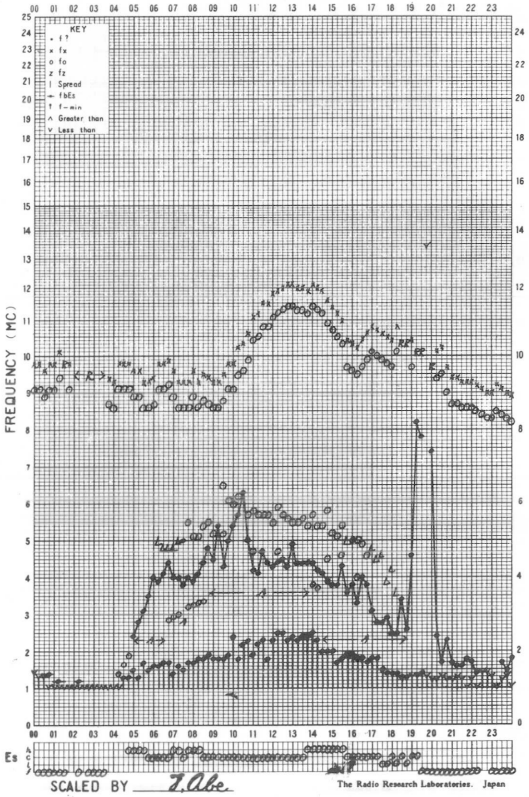


SCALED BY J. ods

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 28. 1968

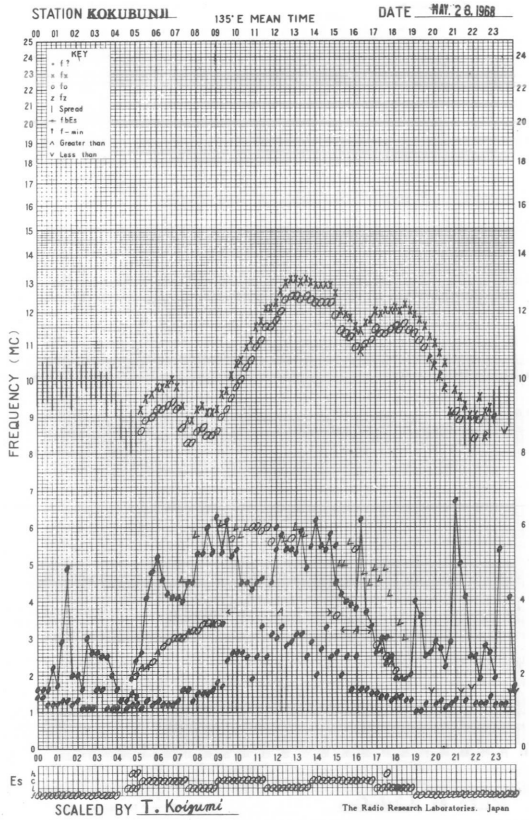


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 28. 1968

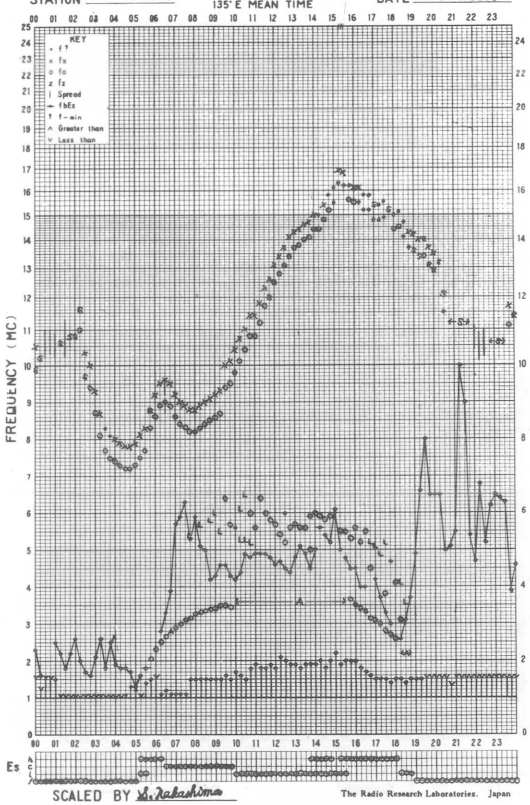


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 28. 1968

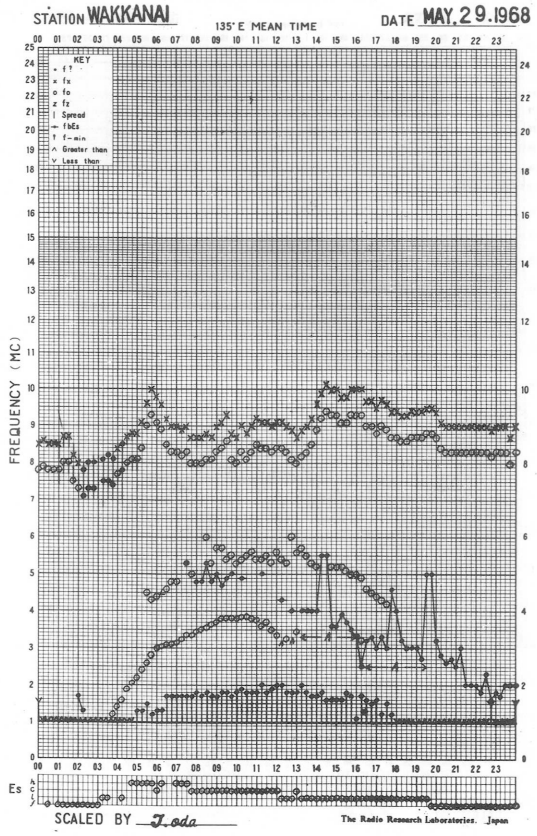


SCALED BY S. Takashima

The Radio Research Laboratories. Japan

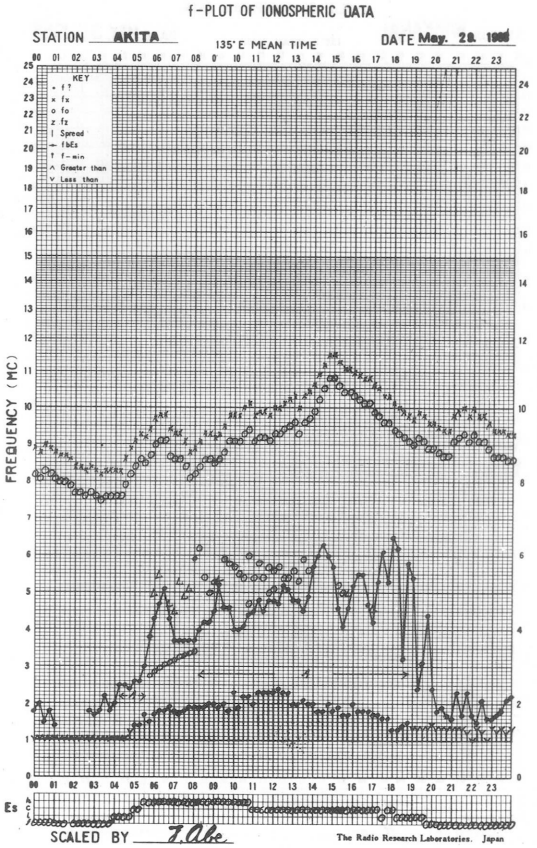
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 29. 1968



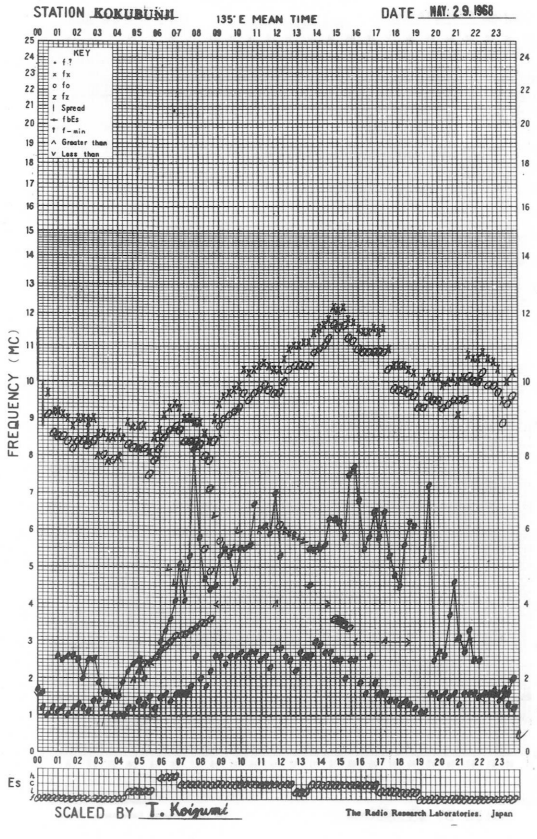
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 29. 1968



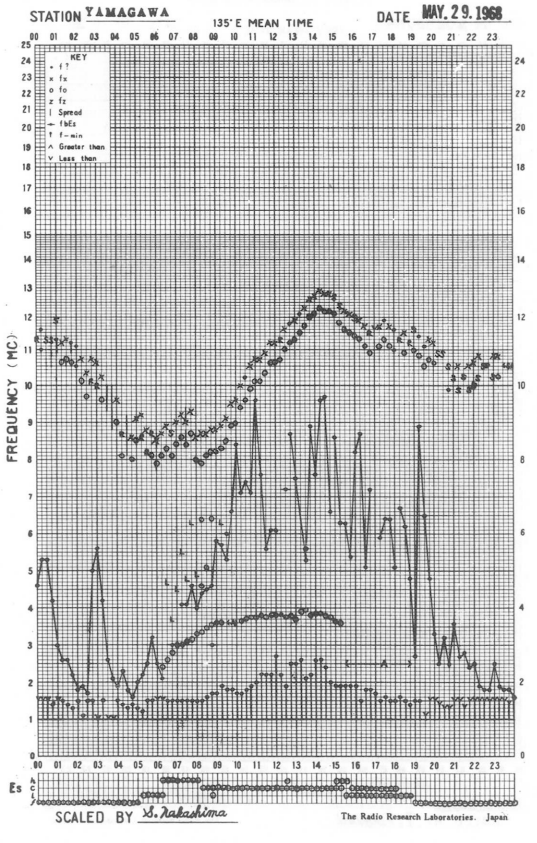
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 29. 1968



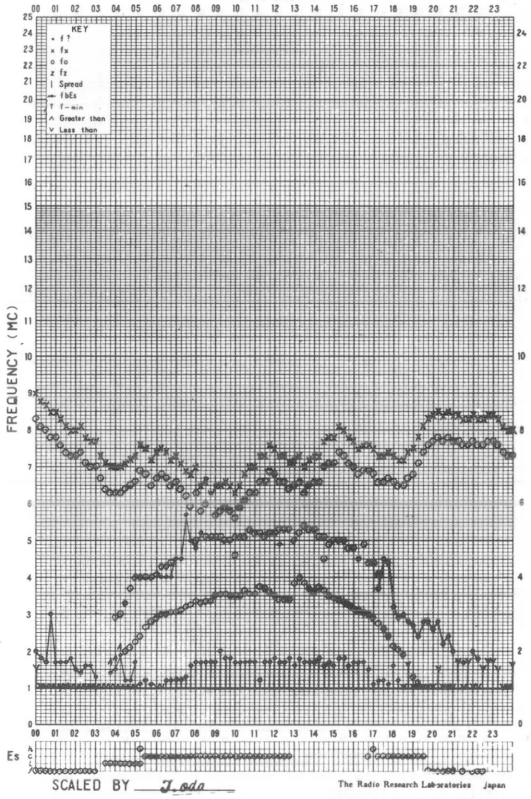
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 29. 1968



f-PLOT OF IONOSPHERIC DATA

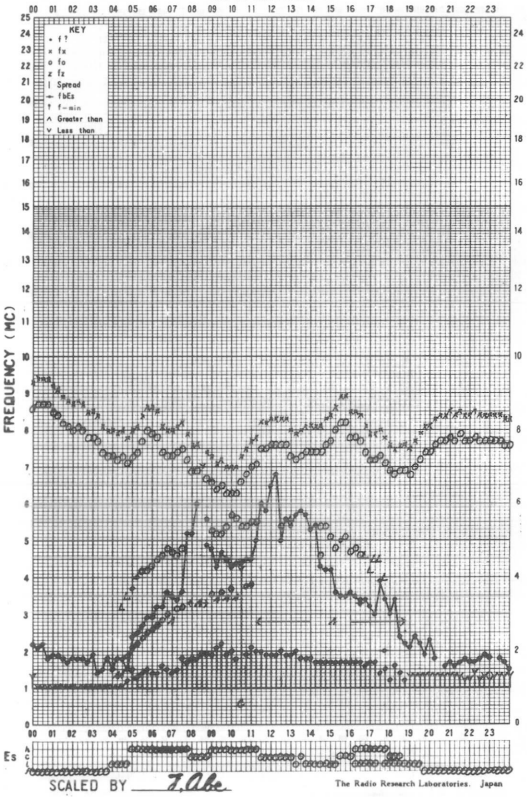
STATION WAKKANAI 135°E MEAN TIME DATE MAY. 30. 1968



SCALED BY T. Oda The Radio Research Laboratories Japan

f-PLOT OF IONOSPHERIC DATA

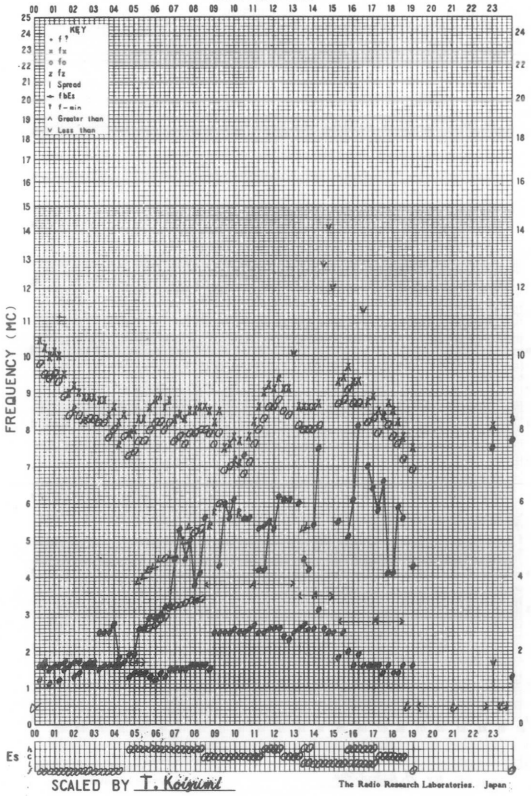
STATION AKITA 135°E MEAN TIME DATE May. 30. 1968



SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

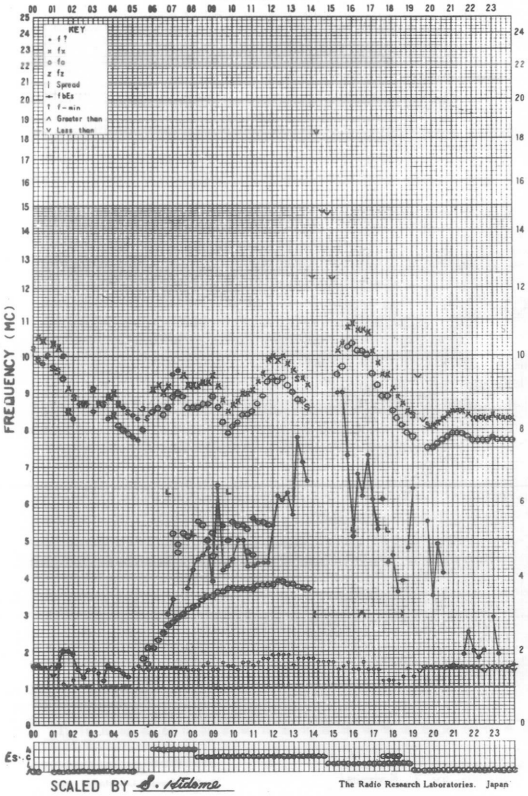
STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 30. 1968



SCALED BY T. Koizumi The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

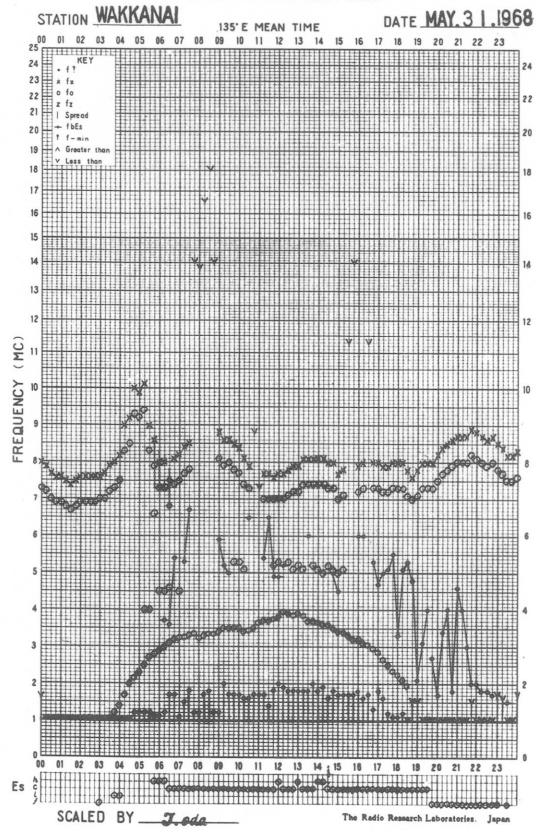
STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 30. 1968



SCALED BY S. Hitotsuma The Radio Research Laboratories. Japan

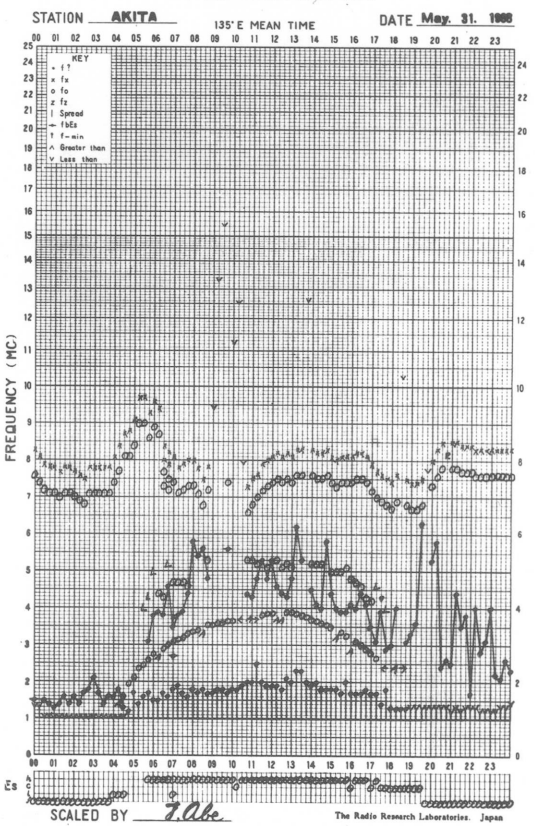
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 3 1, 1968



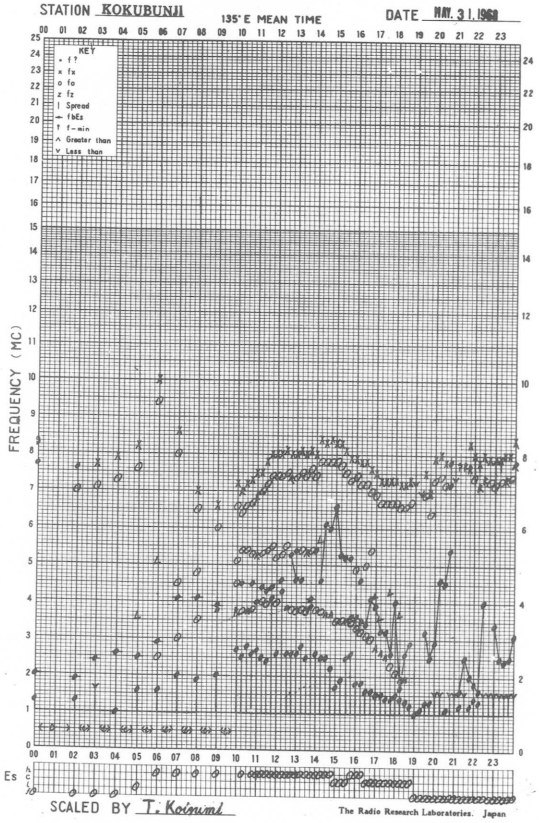
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE May. 31. 1968



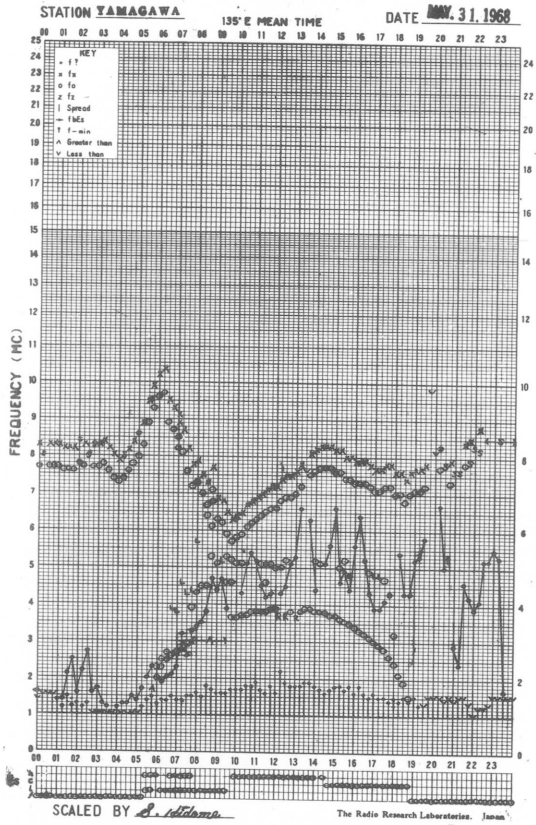
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 3 1, 1968



f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 3 1, 1968



SOLAR RADIO EMISSION

Flux Density and Variability

Month: May 1968
Observing station: Hiraiso
Frequency: 200 MHz

	Flux density $10^{-22}Wm^{-2}(Hz)^{-1}$					Variability 0 to 3				
UT	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
Date										
1	8	8	8	-	8	0	0	0	-	0
2	9	9	9	9	9	1	1	1	1	1
3	7	7	(7)	-	8	1	1	(0)	-	1
4	43	27	26	10	33	1	1	1	1	1
5	13	13	16	10	13	1	1	1	1	1
6	8	8	8	8	8	1	1	1	1	1
7	8	9	10	8	9	1	1	2	1	1
8	8	8	9	10	8	1	1	1	1	1
9	11	9	10	12	10	1	1	1	2	1
10	18	28	16	9	19	2	2	2	1	2
11	18	11	9	7	12	1	1	1	0	1
12	7	7	7	7	7	0	1	1	0	1
13	8	6	7	-	7	1	1	0	-	1
14	7	7	7	7	7	0	1	1	1	1
15	7	8	8	9	7	1	1	1	1	1
16	8	8	8	20	8	1	1	1	2	1
17	35	25	14	11	24	2	2	1	1	2
18	18	18	12	11	15	2	1	1	1	1
19	9	9	18	13	11	1	1	2	2	1
20	9	10	11	55	11	1	1	1	2	1
21	116	30	17	26	58	2	1	1	1	2
22	104	63	37	18	59	2	2	2	1	2
23	13	12	13	10	14	1	1	2	1	1
24	9	11	16	13	11	1	1	2	1	1
25	10	11	9	12	11	1	1	1	2	1
26	9	8	8	9	9	1	1	1	1	1
27	8	8	10	8	8	1	1	1	1	1
28	9	8	8	9	8	2	1	1	1	1
29	8	8	9	10	9	1	0	1	0	1
30	10	9	8	8	9	2	2	1	1	1
31	8	9	10	9	8	0	2	1	1	1

Note No observations during the following periods:

1st 1930- 2400
3rd 1930- 2400
13th 1930- 2400

SOLAR RADIO EMISSION

Flux Density

Month: May 1968
Observing station: Hiraiso Frequency: 500 MHz

Flux density 10^{-22} $Wm^{-2}(Hz)^{-1}$

UT	00-03	03-06	06-09	21-24	Day
Date					
1	27	27	28	28	28
2	28	28	28	28	28
3	28	30	30	-	29
4	(29)	29	30	28	29
5	26	27	28	28	27
6	27	26	27	29	27
7	30	32	31	28	31
8	28	28	29	30	28
9	28	27	29	29	29
10	29	28	29	28	29
11	28	25	26	26	27
12	26	26	26	29	26
13	29	28	28	28	29
14	29	30	29	28	29
15	31	30	29	30	30
16	31	31	30	30	31
17	32	31	31	30	31
18	33	33	33	32	32
19	32	32	31	31	32
20	31	33	30	38	31
21	36	37	33	29	36
22	36	33	(36)	31	33
23	33	31	31	-	31
24	32	32	31	29	32
25	30	30	31	31	30
26	31	30	28	29	30
27	32	32	31	29	31
28	31	31	31	33	30
29	33	32	31	32	32
30	31	28	30	29	30
31	28	29	33	30	30

Note No observations during the following periods:

3rd	1930-	4th	0100	22nd	0500-		0700
4th	0200-		0300	23rd	1930-		2400
9th	0000-		0100	30th	0000-		0100
22nd	0000-		0100				

Distinctive Events

(single-frequency observations)

Month: May 1968
Observing station: Hiraiso
Normal observing period: 1930 - 0940 (sunrise to sunset)

Date	Frequency	Starting time	Time of maximum	Duration	Type	Flux density 10^{-22} Wm^{-2}(Hz)$^{-1}$		Remarks
	MHz	UT	UT	minutes		peak	mean	
4	500	0427.0	0428.5	9.0	C	15	5	
	200	0427.5	0428.0	3.0	C	530	80	
6	200	0317.5	0333.5	30.0	C	20	5	
10	500	2132.5	2134.5	21.5	C	40	5	
15	200	0434.0	0435.0	3.0	C	240	40	
21	500	0020.0	0119.0	104.0	RF	40	10	
		0241.0	0317.5	159.0	RF	20	3	
22	200	2328.5	2328.9	1.0	C	580	160	

MEASUREMENT OF H.F. FIELD STRENGTH (UPPER SIDE-BAND OF WWV)

MAY 1968 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

UT DAY	00H 15M	01H 15M	02H 15M	03H 15M	04H 15M	05H 15M	06H 15M	07H 15M	08H 15M	09H 15M	10H 15M	11H 15M	12H 15M	13H 15M	14H 15M	15H 15M	16H 15M	17H 15M	18H 15M	19H 15M	20H 15M	21H 15M	22H 15M	23H 15M
1	1	-2	1	3	10	13	15	-1	12	21	5	-2	5	23	2	11	18	21	-1	9	8	7	-4	1
2	-2	-2	-3	0	9	4	-5	-10	-4	-4	-4	4	6	6	2	-1	5	6	3	1	6	-3	-1	-2
3	-3	-2	1	2	11	2	-13	-3	2	0	-5	-7	-12	-7	-7	-5	10	C	C	C	C	C	C	7
4	2	4	4	9	7	16	14	-1	-4	ES 1	-4	-5	ES 1	15	-3	2	9	S	S	6	6	2	1	-2
5	-3	-3	2	5	12	17	2	7	-2	-2	4	-3	-1	6	2	1	5	9	1	4	ES 16	10	-2	-9
6	-5	-1	0	5	10	17	22	14	9	4	-2	-4	1	13	30	11	14	5	6	0	8	1	-1	-7
7	-3	0	-2	6	11	17	-5	-7	-9	-1	2	ES -2	-8	-5	-2	-1	4	-9	-15	-1	-15	-12	ES -16	-9
8	8	9	12	5	7	5	10	10	17	20	13	25	3	11	9	10	10	10	6	6	4	1	0	3
9	-1	-3	1	8	11	15	15	-6	-2	-1	-2	-5	6	9	13	10	10	7	ES 11	ES -2	-2	-2	ES -6	5
10	-14	-3	-10	4	10	7	11	1	-9	4	9	-1	6	ES -5	-4	3	12	13	-2	7	5	5	5	6
11	9	4	5	4	12	11	7	-10	-8	-7	ES -7	ES -5	ES -8	3	5	-7	1	5	-8	10	2	ES -7	ES -13	ES -16
12	-6	-9	-2	1	12	9	-13	-11	-9	ES 0	-5	-11	ES -8	-4	-2	12	9	1	8	5	11	5	15	15
13	4	2	5	5	9	4	11	-1	-5	-2	-5	ES -8	-3	3	4	-1	5	5	ES -7	7	8	8	4	-2
14	3	4	8	13	11	18	21	3	15	10	3	3	0	10	17	13	21	16	8	4	-3	4	7	-2
15	-2	0	0	7	10	17	2	-7	9	17	10	4	4	C	C	C	C	C	C	C	C	C	C	4
16	8	9	10	6	9	12	9	3	3	1	2	9	12	20	8	4	8	17	5	10	19	9	9	0
17	25	5	2	18	16	15	7	7	11	4	-2	-1	-3	7	7	13	7	-2	-3	-4	-9	ES -9	ES -4	ES -15
18	ES -19	-8	-3	-3	3	8	6	13	2	3	1	-7	-1	5	-2	11	12	-2	-9	13	17	12	11	-4
19	-2	4	1	3	7	14	8	1	-1	-2	-4	1	8	17	11	12	13	17	4	9	8	-1	-1	2
20	-1	7	0	2	8	13	-3	-2	-1	-3	-1	10	22	30	21	15	1	16	1	1	1	ES -10	6	12
21	12	-1	1	2	7	12	6	-1	0	8	15	12	17	29	9	3	6	3	-4	-1	-3	ES 1	5	10
22	1	-2	2	-7	3	ES -13	ES -10	-8	-7	-9	-6	-3	ES -2	2	17	11	-1	6	-1	4	5	0	8	6
23	2	0	-3	-5	2	7	6	US 2	-3	-6	-3	1	5	22	17	12	18	17	12	3	11	2	4	1
24	-4	0	-5	6	6	11	-6	-7	-5	-3	7	4	ES 0	14	18	12	1	6	3	11	5	7	6	5
25	0	-3	-2	-2	10	14	16	14	19	13	3	7	10	15	19	16	8	16	7	7	9	9	14	2
26	1	2	1	6	7	14	16	18	19	21	14	7	19	26	20	17	17	14	8	6	10	1	5	ES -4
27	-3	2	0	2	6	15	21	22	19	15	17	17	28	23	18	17	15	17	9	11	4	1	-2	-1
28	1	1	0	4	9	14	18	18	26	20	22	20	33	24	18	18	17	9	9	8	3	8	3	4
29	2	4	6	12	7	15	18	2	3	3	-1	1	ES 21	11	19	13	9	11	11	7	5	3	3	7
30	3	6	1	2	6	15	13	3	5	ES 6	S	ES 1	12	13	21	12	6	10	7	9	4	7	0	-5
31	2	3	0	0	12	14	22	20	4	1	1	0	12	19	18	14	15	13	9	8	13	15	13	6
CNT	31	31	31	31	31	31	31	31	31	31	30	31	31	30	30	30	30	28	28	29	29	29	29	31
MED	1	0	1	4	9	14	9	1	2	US 1	1	US 1	US 5	12	10	11	9	10	US 4	6	US 5	2	3	1
UD	9	7	8	12	12	17	21	18	19	20	15	17	22	26	21	17	18	17	ES 11	11	ES 16	10	13	10
LD	-6	-3	-3	-3	3	4	ES -10	-10	-9	ES -6	-5	ES -7	ES -8	-5	-3	-1	1	-2	ES -8	-1	ES -3	ES -9	ES -6	ES -9

MEASUREMENT OF H.F. FIELD STRENGTH (UPPER SIDE-BAND OF WWVH)

MAY 1968 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

UT DAY	00H 45M	01H 45M	02H 45M	03H 45M	04H 45M	05H 45M	06H 45M	07H 45M	08H 45M	09H 45M	10H 45M	11H 45M	12H 45M	13H 45M	14H 45M	15H 45M	16H 45M	17H 45M	18H 45M	19H 45M	20H 45M	21H 45M	22H 45M	23H 45M
1	-7	-5	0	1	7	16	18	22	18	20	21	21	20	19	11	13	14	18	7	1	5	-7	-4	-9
2	-8	-8	-6	-2	4	12	15	20	20	14	16	19	19	20	24	18	15	16	4	6	-3	-5	ES -7	ES -6
3	-11	-8	-8	0	11	12	17	17	21	20	21	18	11	13	22	10	12	C	C	C	C	C	C	-8
4	-12	-5	-6	2	7	14	18	18	19	20	21	23	11	16	19	10	13	S	S	5	0	ES -7	-7	-8
5	-10	-8	-3	-1	8	12	17	21	23	23	22	20	16	16	16	11	20	11	5	4	11	11	-5	-12
6	-11	-8	-5	-1	6	15	17	21	23	23	17	22	15	13	12	17	16	10	8	6	11	1	-3	-7
7	-7	-6	4	11	10	15	19	21	23	24	26	27	22	14	27	17	13	12	12	-1	-8	US -8	-9	-8
8	-13	-4	-3	6	9	11	17	20	24	21	23	17	14	14	18	11	15	13	3	US -1	-8	-5	-8	-10
9	-14	-7	-6	7	11	15	16	21	20	23	20	21	19	18	14	16	19	18	11	4	4	-3	ES -7	-9
10	-11	-13	-4	-3	4	13	16	17	20	21	16	14	19	18	13	12	16	5	1	-1	-3	-3	-10	-12
11	-7	0	-3	1	11	12	16	20	16	20	20	19	17	4	1	ES -8	0	11	1	-4	0	ES -7	ES -14	ES -19
12	-21	-13	-7	-1	4	11	10	16	16	20	16	10	5	12	6	-1	8	12	4	6	-1	-5	-3	ES -4
13	-8	-7	-2	4	10	13	20	18	22	19	15	22	11	18	17	18	18	16	2	4	2	-4	-2	-9
14	-8	-7	0	4	9	15	18	21	20	22	15	20	20	20	10	9	14	8	6	4	3	-8	-6	-7
15	1	0	1	6	8	15	17	21	19	20	20	21	20	C	C	C	C	C	C	C	C	C	-5	-7
16	-8	-3	-1	4	12	15	18	18	19	22	20	17	17	10	15	10	2	14	1	11	-1	2	0	-4
17	-8	-2	-1	3	11	14	18	18	18	19	28	21	18	22	16	16	7	13	-4	1	-10	ES -9	ES -15	ES -25
18	ES -29	-12	-8	2	8	13	18	21	22	14	12	12	14	7	16	13	2	ES 0	-10	2	-6	2	-6	-3
19	-7	-7	-5	2	7	15	16	20	16	20	17	15	19	24	13	21	14	12	1	0	-2	-6	ES -8	-10
20	-4	-6	0	5	9	13	15	18	20	20	23	24	23	19	21	14	10	17	-8	4	0	ES -2	-1	-7
21	ES -12	-6	1	-4	9	11	17	22	22	23	26	23	21	23	14	12	15	13	-1	-2	-2	-1	-3	-6
22	-13	-9	-5	0	6	8	14	20	17	13	26	18	22	18	14	11	16	16	5	4	0	1	-6	-7
23	-4	ES -29	-9	4	10	14	16	21	22	22	22	24	21	20	25	13	22	17	3	3	2	-3	ES -11	-6
24	-9	-8	-5	1	7	14	15	22	19	21	20	16	19	14	16	11	23	8	14	5	-1	-6	ES -15	-7
25	-12	-8	-6	-1	7	12	16	16	19	20	22	23	19	21	20	16	18	12	7	5	-2	-3	ES -7	ES -3
26	-5	ES -7	-5	2	9	14	16	19	22	23	22	22	18	20	21	18	17	14	9	6	2	-4	ES -7	ES -2
27	ES -7	-6	-4	2	7	14	15	17	22	21	22	19	21	19	18	20	20	12	ES 18	7	-3	-4	ES -13	-7
28	-3	-6	-3	0	10	11	15	23	23	19	22	23	18	17	17	24	18	11	6	4	6	3	ES -5	ES -5
29	-7	-8	-7	-2	12	12	17	17	19	21	22	22	23	22	20	12	11	10	15	2	1	1	-8	-13
30	ES -5	ES -12	ES 0	-1	10	15	20	23	20	22	20	21	22	18	21	15	-1	12	8	1	2	-4	2	2
31	-2	-4	-4	-2	2	14	16	22	22	19	14	18	16	10	18	20	17	12	7	2	-2	1	-6	-4
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	30	30	28	28	29	29	29	30	31
MED	US -8	-7	US -4	1	9	14	17	20	20	20	21	21	19	18	16	13	15	12	US 5	4	0	US -4	US -6	ES -7
UD	-3	-2	1	6	11	15	19	22	23	23	26	24	22	22	24	20	20	17	ES 14	6	6	2	-1	ES -3
LD	ES -14	ES -13	ES -8	-2	4	11	15	17	16	14	15	14	11	10	10	9	2	8	ES -4	-1	-8	ES -8	ES -14	ES -13

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

May 1968	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	_H
1	4o	5 4 C	4 4 4 4	4 4 (4) 4	4 4 4 4	N N N N			
2	4o	5 (4) C	4 4 4 4	4 4 4 4	4 4 4 4	N N N N			
3	4-	4 (4) C	4 3 3 C	4 4 4 C	4 4 4 C	N N N N			
4	4-	4 4 5	3 3 4 4	(4) 3 C 4	4 4 4 4	N N N N			
5	4o	4 4 (5)	4 4 (4) 4	C 4 (4)(4)	4 4 4 4	N N N N			
6	5-	5 5 5	4 4 5 4	5 5 4 4	4 4 4 C	N N N N			
7	3+	4 3 3	4 3 3 2	4 3 4 4	4 4 4 4	N U U U	00.30	---	204Y
8*	4o	(4) C 4	3 4 4 4	4 4 5 4	4 4 4 4	U N N N	---	14xx	
9	4-	4 5 3	4 4 4 3	4 4 3 4	4 4 4 4	N N N N			
10	4-	4 4 4	3 3 4 3	4 4 4 4	4 4 4 4	U N N N			
11	3+	3 (4) 3	3 3 4 3	4 4 3 3	4 4 3 3	N N N N			
12	3+	3 3 4	3 3 3 4	3 3 4 C	4 4 4 4	N U U U			
13	4o	4 4 4	4 4 (4) 4	3 4 4 4	4 4 4 4	N N N N			
(14)	4o	4 4 5	4 4 4 4	4 4 4 4	4 4 4 5	N N N N			
(15)	4o	4 (4) C	4 4 4 4	5 4 4 C	4 5 5 4	N N N N			
(16)	4o	4 4 4	4 4 4 4	4 (4) 4 4	4 4 4 5	N N N N			
17	4-	4 4 4	4 4 4 2	4 (4)(4)(3)	4 4 4 3	N N N N			
18	4-	4 4 4	3 4 4 C	(3) 4 (3) 4	4 4 4 C	U N N N			
19	4o	4 5 4	4 4 4 4	3 5 4 4	4 4 4 4	N N N N			
20	4-	4 4 4	4 4 4 3	4 3 4 4	4 4 4 3	N N N N			
21	4-	4 4 4	3 4 4 3	4 4 4 (4)	4 4 4 3	N N N N			
22	3+	3 4 4	3 3 3 3	(3)(3) C (3)	4 4 4 4	N N N N			
23	4-	4 4 4	3 4 4 4	3 4 4 4	4 4 4 4	N N N N			
24	4-	3 4 4	4 3 4 3	4 C C C	4 4 4 4	N N N N			
25	4o	3 4 4	4 4 4 4	C 4 4 C	4 4 4 4	N N N N			
26	4+	4 4 (4)	5 5 5 4	C (4)(4) C	4 4 4 4	N N N N			
27	4+	4 4 4	5 5 5 5	C 4 4 4	4 4 4 4	N N N N			
28	5-	4 4 4	5 5 5 5	4 5 C 4	4 4 4 4	N N N N			
29	4o	4 4 4	4 4 4 4	C (4) 5 4	4 4 4 C	N N N N			
30	4o	4 4 (4)	4 (4) 4 4	4 3 4 5	4 4 4 4	N N N N			
31	4+	4 4 4	4 4 4 4	4 5 4 5	4 4 4 4	N N N N			

IQSY GEOALERT and ADALERT (Western Pacific Region)

* = MAGSTORM

o = MAGCALME

Δ = COSMIC EVENT

( ) = Regular World Day

\- = impossible to evaluate

( ) = inaccurate

C = artificial accident

--- = continuing magnetic storm

SUDDEN IONOSPHERIC DISTURBANCES (S.I.D.)

HIRAISO

No Sudden Ionospheric Disturbance was observed during May, 1968.

IONOSPHERIC DATA IN JAPAN FOR MAY 1968

第20巻 第5号

1968年8月20日 印刷
1968年8月25日 発行

編集兼発行人 越智文雄
東京都小金井市貫井北町4丁目2-1

発行所 郵政省電波研究所
東京都小金井市貫井北町4丁目2-1
電話国分寺(0423)(21)1211(代)

印刷所 (有)丸井工文社
東京都千代田区神田猿楽町2の8
電話 (292) 0841(代)